Hexapod for Industrial 24/7 Applications with Highest Precision Requirements

Compact, Robust, and Precise

H-815

- Integrated brakes for safe handling and high process reliability
- Fast system start thanks to position data without referencing due to absolute encoders
- Robust design for long service life with high duty cycles
- High throughput thanks to long-term reliability
- Compact design for easy integration
- Easy cable management with pluggable cables
- High precision thanks to exceptional design and high-quality components

Stewart platform for high loads and 24/7 operation
The H-815 is characterized by its exceptional reliability, high velocity, and precise motion, making it ideal for applications in silicon photonics, semiconductor manufacturing, optics, and metrology. Its combination of precision, flexibility, and durability makes it the ideal tool for modern, high-precision alignment tasks. The H-815 Industrial Hexapod is a compact, robust parallel-kinematic motion system designed for 24/7 operation in industrial environments.

Highest Robustness in Compact Installation Space
The parallel-kinematic arrangement enables the H-815 to perform motion in 6 axes in an extremely compact design. Thanks to its low-profile design (155 mm in height with a 222 mm diameter base plate) and payload and load capacity of up to 10 kg, the hexapod can be seamlessly integrated into existing production lines, enabling reliable positioning and consistent performance in different orientations. The Industrial Hexapod reaches velocities of up to 20 mm/s and offers high precision: minimum incremental motion of 0.05 µm and repeatability to ±0.05 µm. The maximum travel range is ±20 mm in the linear axes and ±16° in the rotary axes. Thanks to its integrated brakes, the H-815 offers maximum safety and robustness in a compact installation space. The absolute encoder enables immediate operation without a referencing move, increasing efficiency and process reliability with high positioning accuracy.

Application fields
The H-815 hexapod is a high-precision, multi-axis motion and positioning system for demanding alignment processes in photonics. With its high precision and repeatability, the H-815 is ideally suited for aligning the smallest components, such as lenses or other optical components. The hexapod performs complex positioning tasks quickly, accurately, and reproducibly in 6 degrees of freedom. The Industrial Hexapod's robust design provides exceptional durability and reliability. The H-815 is designed for permanent use in industrial automation and assembly processes in demanding environments, increasing the productivity of complex manufacturing and metrology processes.
Target applications:

- Precise lens alignment and mounting
- Alignment of optical components and assemblies
- Photonics and optics assembly
- Microassembly of high-precision components
- Industrial assembly processes
- Precision control in laser materials processing
- Automated applications in 24/7 operation

Motion	Unit	Tolerance	H-815.D6A3
Active axes			X | Y | Z | θX | θY | θZ
Travel range in X	mm		±20
Travel range in Y	mm		±20
Travel range in Z	mm		±10
Rotation range in θX	°		±9
Rotation range in θY	°		±9
Rotation range in θZ	°		±16
Maximum velocity in X	mm/s		20
Recommended velocity in X	mm/s		15
Maximum velocity in Y	mm/s		20
Recommended velocity in Y	mm/s		15
Maximum velocity in Z	mm/s		20
Recommended velocity in Z	mm/s		15
Maximum angular velocity in θX	mrad/s		340
Recommended angular velocity in θX	mrad/s		170
Maximum angular velocity in θY	mrad/s		340
Recommended angular velocity in θY	mrad/s		170
Maximum angular velocity in θZ	mrad/s		680
Recommended angular velocity in θZ	mrad/s		340
Amplitude-frequency product in X	mm·Hz		9
Amplitude-frequency product in Y	mm·Hz		8
Amplitude-frequency product in Z	mm·Hz		3.4
Amplitude-frequency product in θX	°·Hz		3
Amplitude-frequency product in θY	°·Hz		3
Amplitude-frequency product in θZ	°·Hz		6.9
Amplitude-frequency² product in X	mm·Hz²		91.2
Amplitude-frequency² product in Y	mm·Hz²		91.2
Amplitude-frequency² product in Z	mm·Hz²		445.8
Amplitude-frequency² product in θX	°·Hz²		725.6
Amplitude-frequency² product in θY	°·Hz²		335
Amplitude-frequency² product in θZ	°·Hz²		136.4
Amplitude error	%	Max.	5
Maximum frequency	Hz		30

Positioning	Unit	Tolerance	H-815.D6A3
Minimum incremental motion in X	µm	Typ.	0.08
Minimum incremental motion in Y	µm	Typ.	0.08
Minimum incremental motion in Z	µm	Typ.	0.05
Minimum incremental motion in θX	µrad	Typ.	1
Minimum incremental motion in θY	µrad	Typ.	1
Minimum incremental motion in θZ	µrad	Typ.	0.7
Unidirectional repeatability in X	µm	Typ.	±0.09
Unidirectional repeatability in Y	µm	Typ.	±0.09
Unidirectional repeatability in Z	µm	Typ.	±0.05
Unidirectional repeatability in θX	µrad	Typ.	±1
Unidirectional repeatability in θY	µrad	Typ.	±1
Unidirectional repeatability in θZ	µrad	Typ.	±0.7
Backlash in X	µm	Typ.	2
Backlash in Y	µm	Typ.	2
Backlash in Z	µm	Typ.	0.1
Backlash in θX	µrad	Typ.	1.6
Backlash in θY	µrad	Typ.	1.6
Backlash in θZ	µrad	Typ.	26.1
Integrated sensor			Absolute rotary encoder, multi-turn

Drive Properties	Unit		H-815.D6A3
Drive type			Brushless DC motor
Nominal voltage	V		24

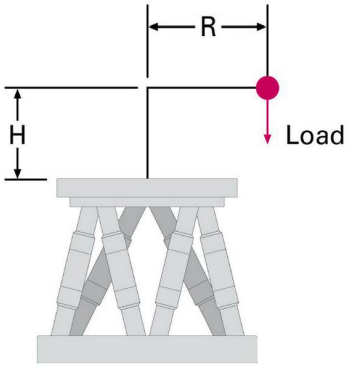
Mechanical Properties	Unit		H-815.D6A3
Stiffness in X	N/µm		0.7
Stiffness in Y	N/µm		0.7
Stiffness in Z	N/µm		8
Maximum load capacity, base plate horizontal	kg		10
Maximum load capacity, base plate in any orientation	kg		4
Maximum holding force, base plate horizontal	N		100
Maximum holding force, base plate in any orientation	N		40
Overall mass	kg		5.5
Material			Aluminum; stainless steel
Height	mm		155
Base plate diameter	mm		222

Miscellaneous	Unit		H-815.D6A3
Operating temperature range	°C		0 to 50
Drive connector			6 × Circular push-pull connector 16-pole (f)
Recommended controllers/ drivers			C-887.4xx1

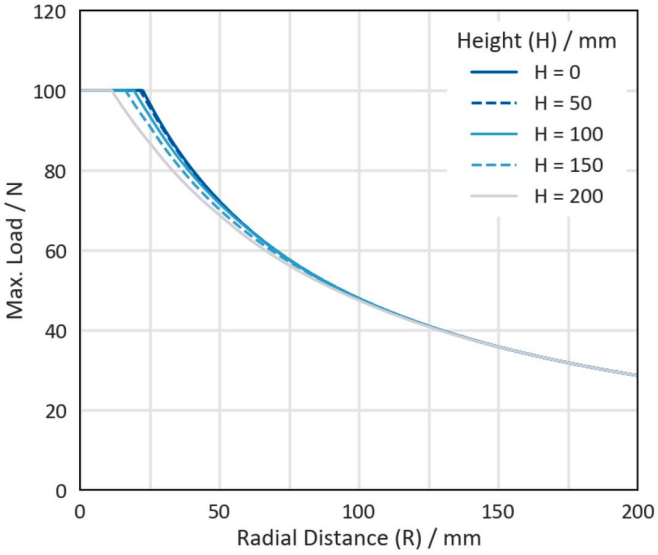
When measuring position specifications, typical velocity is used. The data is included in the delivery of the product in the form of a measurement report and is stored at PI. The maximum travel ranges of the individual coordinates (X, Y, Z, θX, θY, θZ) are interdependent. The data for each axis shows its maximum travel range when all other axes are in the zero position of the nominal travel range and the default coordinate system is in use, or rather when the pivot point is set to 0,0,0.

At PI, technical data is specified at 22 ±3 °C. Unless otherwise stated, the values are for unloaded conditions. Some properties are interdependent. The designation "typ." indicates a statistical average for a property; it does not indicate a guaranteed value for every product supplied. During the final inspection of a product, only selected properties are analyzed, not all. Please note that some product characteristics may deteriorate with increasing operating time.

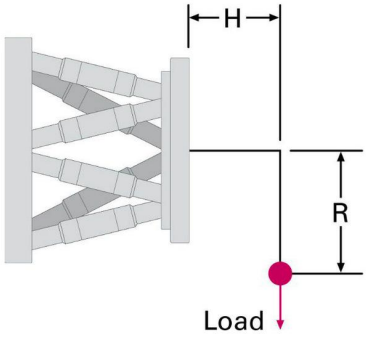
Drawings / Images



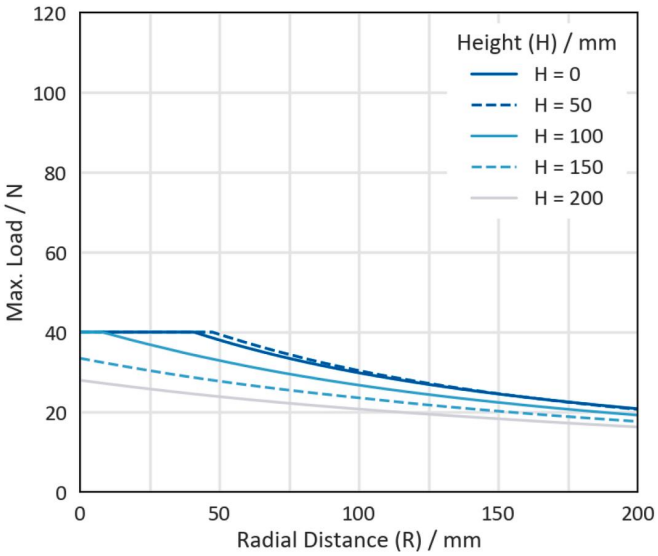
H-815.D6A3



Maximum loads on the H-815.D6A3 when mounted horizontally

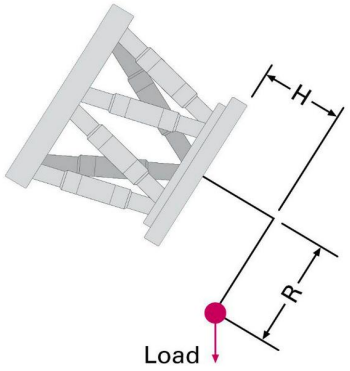


H-815.D6A3

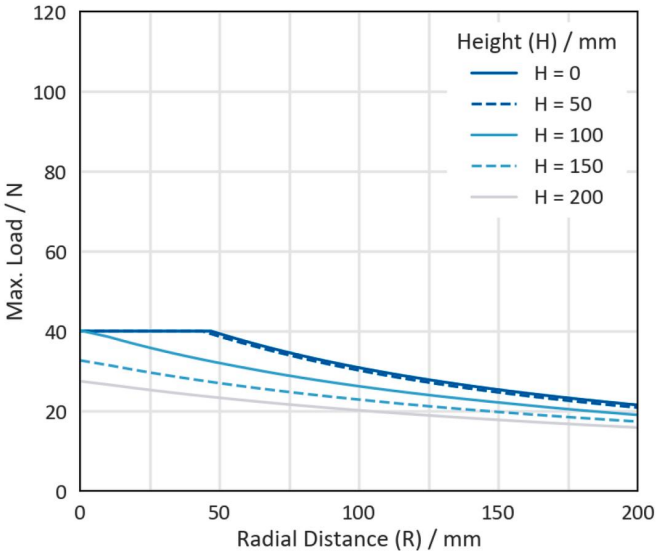


Maximum loads on the H-815.D6A3 when mounted vertically

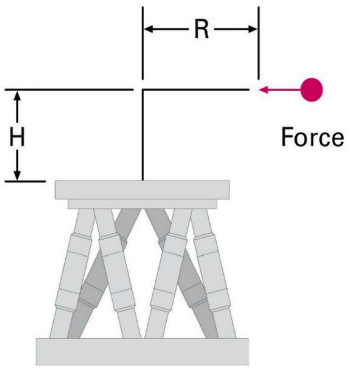
Drawings / Images



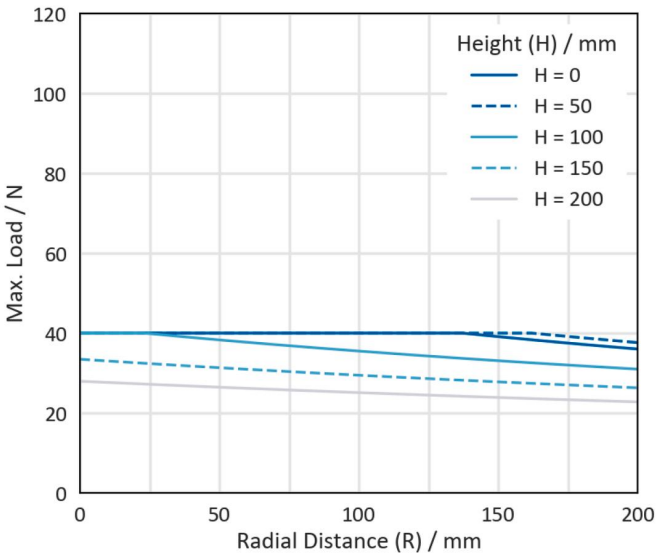
H-815.D6A3



Maximum loads on the H-815.D6A3 when mounted at the most unfavorable angle

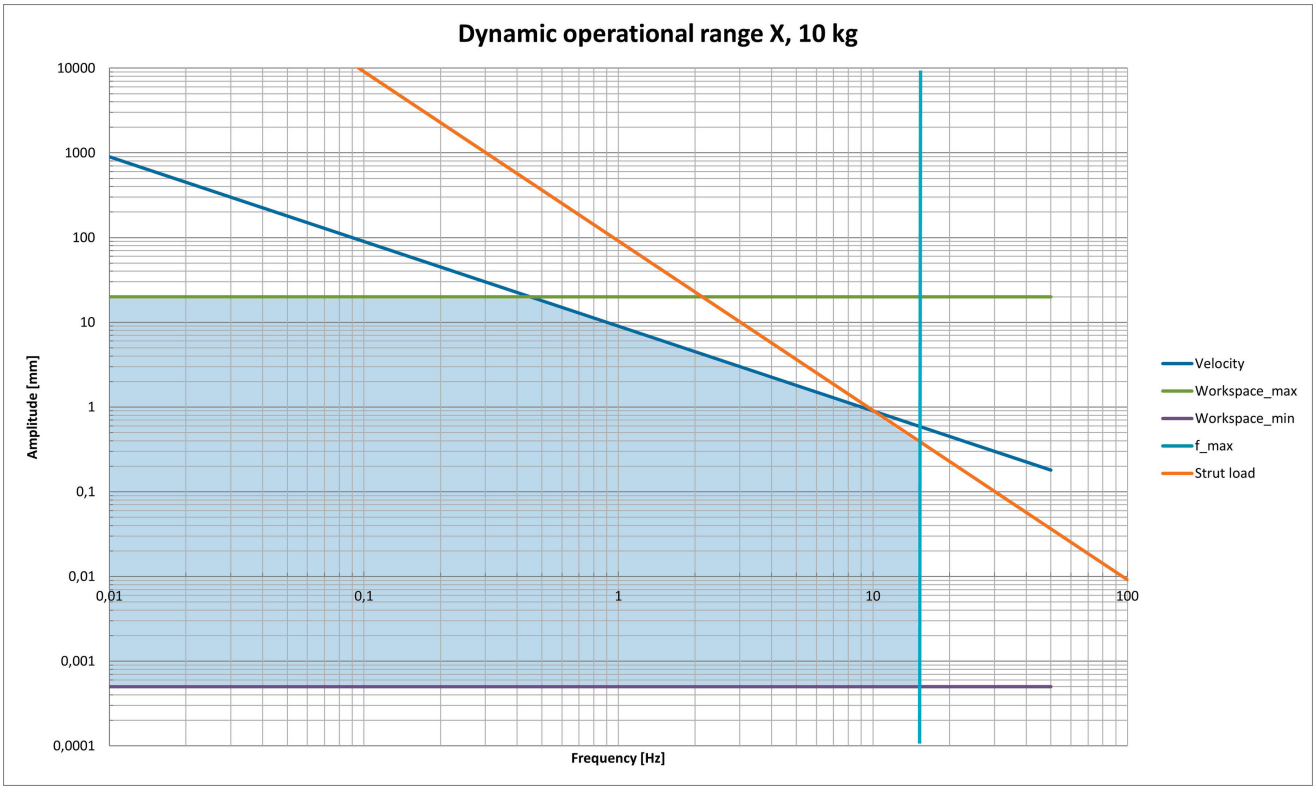


H-815.D6A3

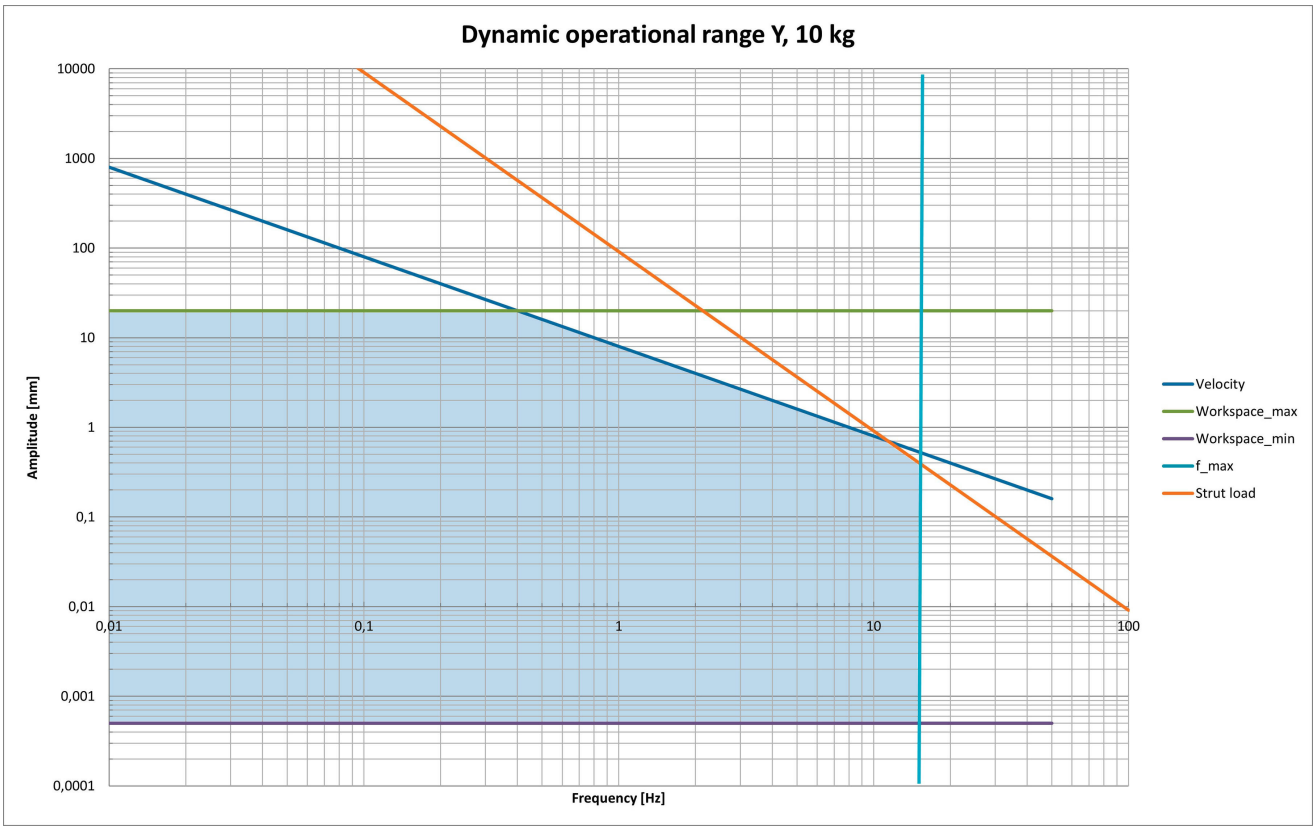


Maximum permissible force acting on the H-815.D6A3 when mounted horizontally

Drawings / Images

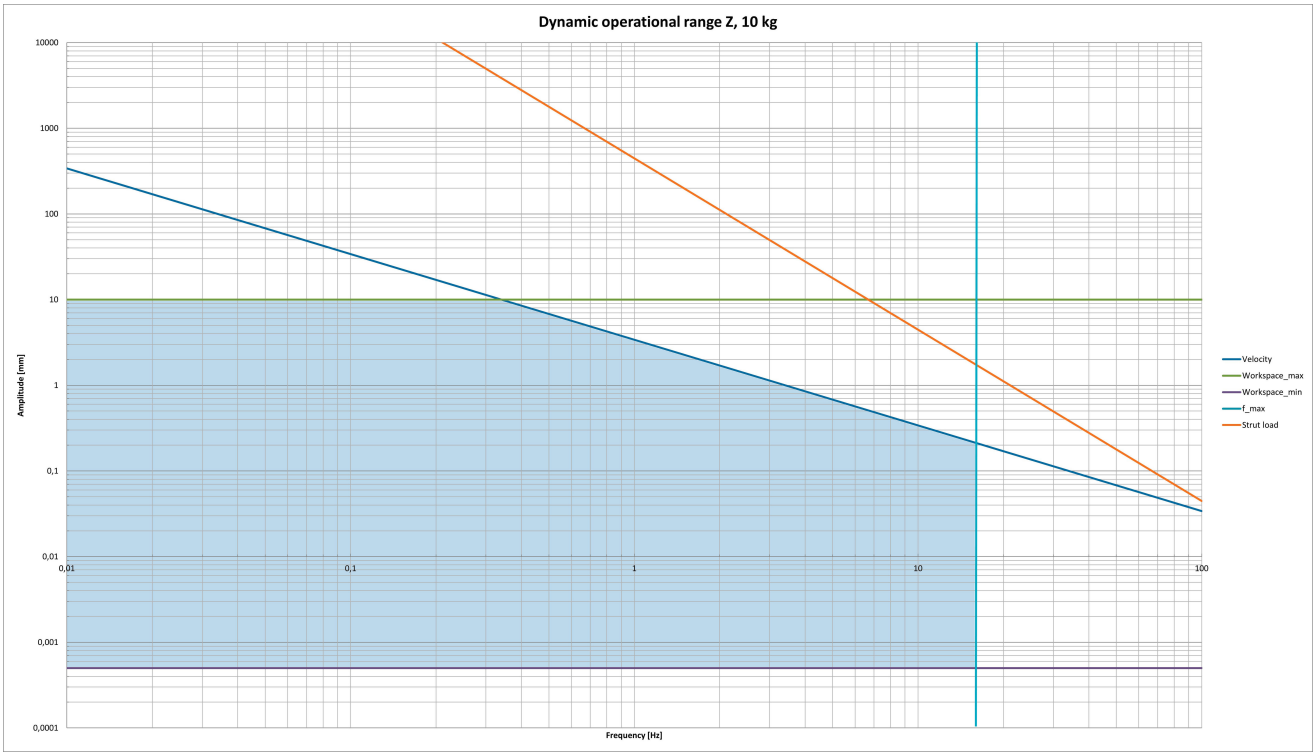


Dynamic working range of the H-815.D6A3, X, 10 kg

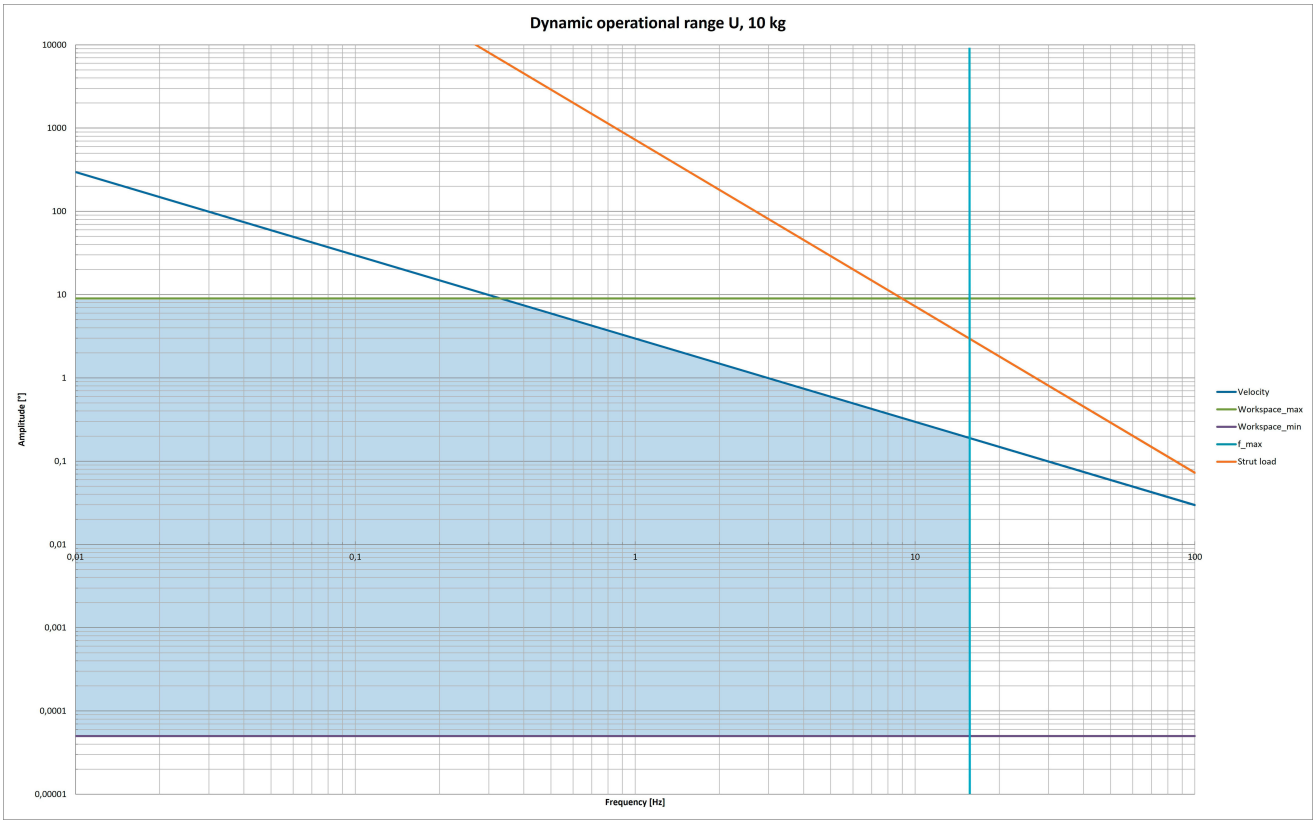


Dynamic working range of the H-815.D6A3, Y, 10 kg

Drawings / Images

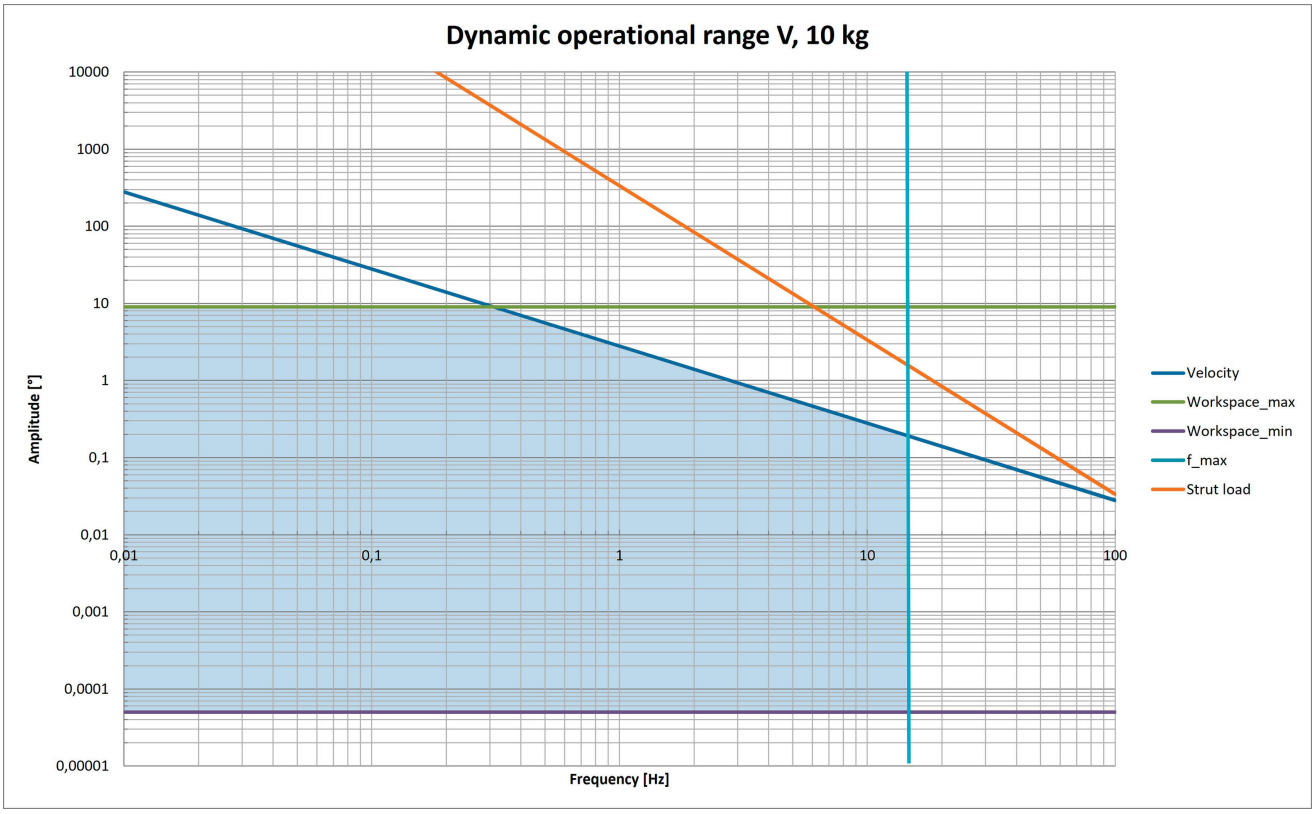


Dynamic working range of the H-815.D6A3, Z, 10 kg

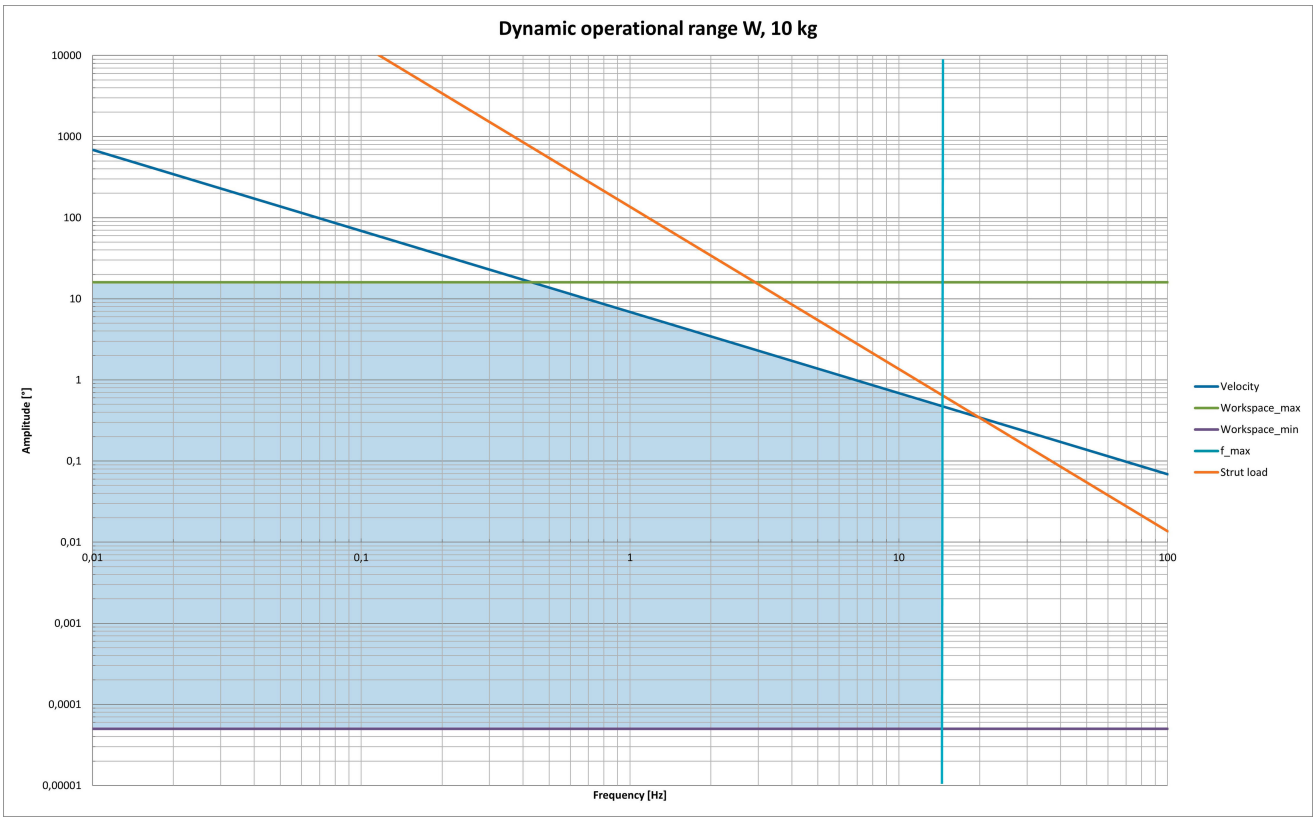


Dynamic working range of the H-815.D6A3, U (ΘX), 10 kg

Drawings / Images

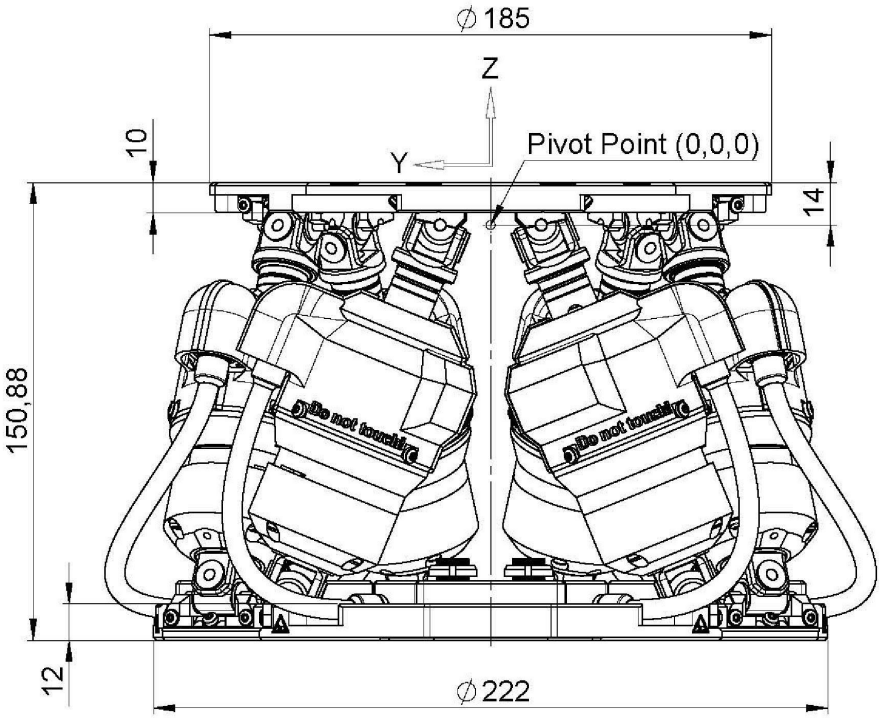


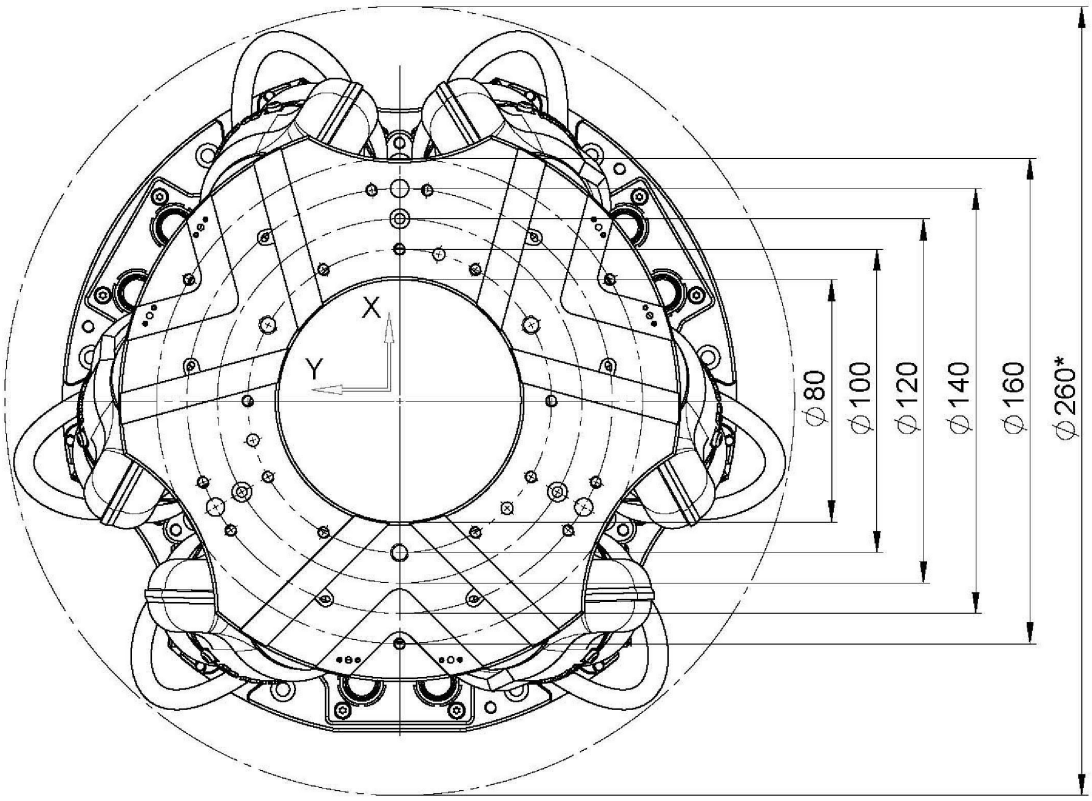
Dynamic working range of the H-815.D6A3, V (ΘY), 10 kg



Dynamic working range of the H-815.D6A3, W (ΘZ), 10 kg

Drawings / Images





H-815, dimensions in mm, at zero position of nominal travel range. Note that a comma is used in the drawings instead of a decimal point.
*Max. footprint with cables can vary.

Order Information

H-815.D6A3
Hexapod for industrial precision applications; BLDC motor; 10 kg payload; 20 mm/s maximum velocity; absolute measuring encoder. Connecting cables are not included in the scope of delivery and must be ordered separately.