Heavy-Duty Hexapod

Position up to 1 Ton with Micrometer Precision

H-845

- Load capacity to 1000 kg
- Velocity to 50 mm/s
- Repeatability to ±0.5 µm
- Travel ranges to 340 mm / 60°
- Scalable design: Dimensions, travel ranges, and loads
- Drive: brushless motors with brake

Product overview

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. Large aperture. Brushless DC motors with brake.

Rapid implementation of customer requests

The high-load hexapod has a modular structure and uses a set of different modules for drive units and joints. The platforms can be adapted to the customer's application. This allows for rapid implementation of special customer requirements.

High-performance digital controller, open software architecture

6-DOF controller for hexapods, incl. control of two additional axes. Freely programmable stable pivot point. Positions commanded in Cartesian coordinates. Macro programming. Open-source NI LabVIEW driver and libraries. Workspace simulation. Virtual machine for hexapod emulation. Optional: Software for avoiding collisions in restricted workspace.

Fields of application

Research and industry. For precision assembly, astronomy, aerospace.

Specifications

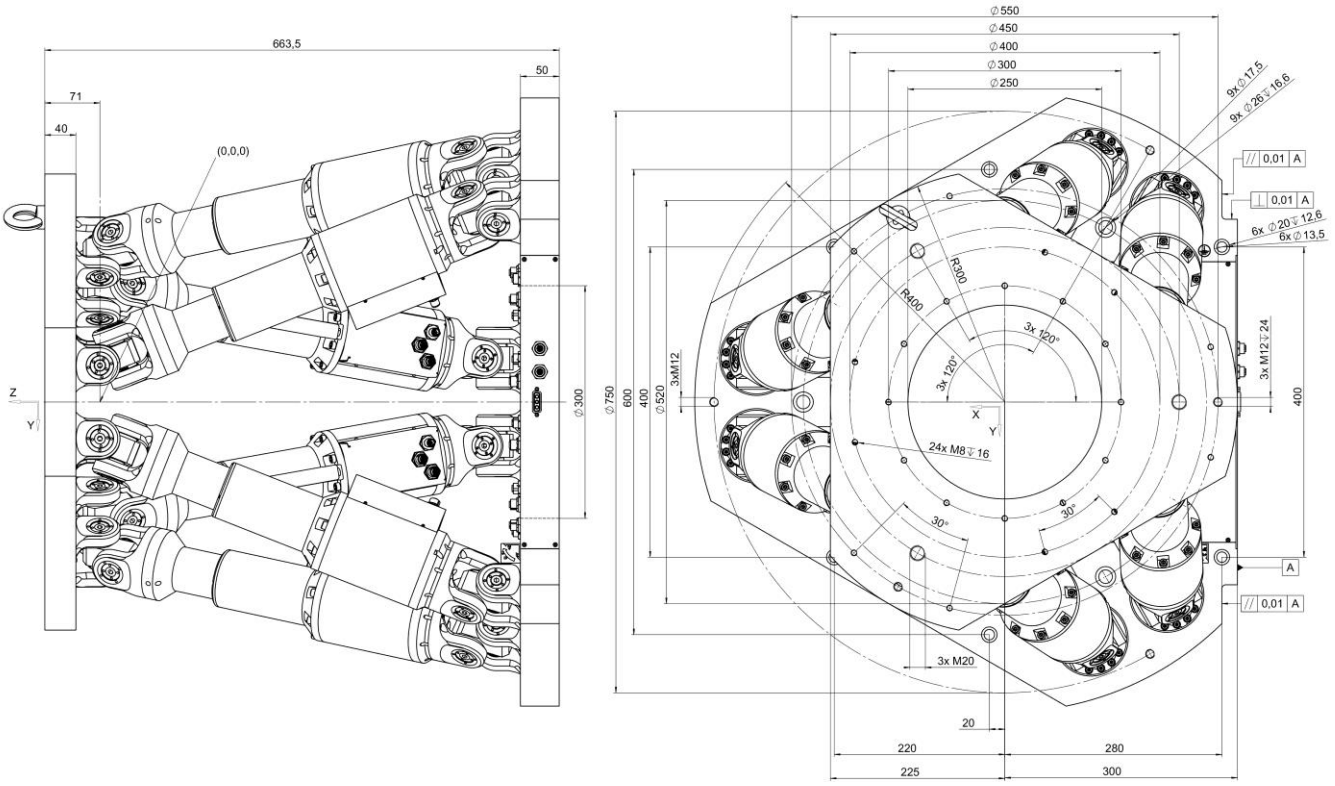
Motion and positioning	H-845.D11	H-845.D31	H-845.D51	H-845.D21	H-845.D41	H-845.D61	Unit	Tole-rance
Active axes	X, Y, Z, θ_X, θ_Y, θ_Z	X, Y, Z, θX, θY, θZ	X, Y, Z, θX, θY, θZ	X, Y, Z, θX, θY, θZ	X, Y, Z, θX, θY, θZ	X, Y, Z, θ_X, θ_Y, θ_Z		
Travel range* X, Y	±110	±110	±110	±170	±170	±170	mm	
Travel range* Z	±50	±50	±50	±105	±105	±105	mm	
Travel range* θ_X, θ_Y	±15	±15	±15	±20	±20	±20	°	
Travel range* θ_Z	±30	±30	±30	±30	±30	±30	°	
Actuator design resolution	0.04	0.08	0.1	0.04	0.08	0.1	µm	
Min. incremental motion X, Y	1	2	2.5	1	2	2.5	µm	typ.
Min. incremental motion Z	0.5	1	1	0.5	1	1	µm	typ.
Minimum incremental motion θ_X, θ_Y, θ_Z	15	30	30	15	30	30	µrad	typ.
Backlash X, Y	5	10	10	5	10	10	µm	typ.
Backlash Z	1	2	2	1	2	2	µm	typ.
Backlash θ_X, θ_Y	15	30	30	15	30	30	µrad	typ.
Backlash θ_Z	30	60	60	30	60	60	µrad	typ.
Repeatability X, Y	±2	±4	±5	±2	±4	±5	µm	typ.
Repeatability Z	±0.5	±1	±2	±0.5	±1	±2	µm	typ.
Repeatability θ_X, θ_Y, θ_Z	±10	±20	±25	±10	±20	±25	µrad	typ.
Max. velocity X, Y, Z	20	40	50	20	40	50	mm/s	
Max. velocity θ_X, θ_Y, θ_Z	50	100	120	50	100	120	mrad/s	
Typ. Velocity X, Y, Z	10	20	25	10	20	25	mm/s	
Typ. Velocity θ_X, θ_Y, θ_Z	20	40	50	20	40	50	mrad/s	

Mechanical properties	H-845.D11	H-845.D31	H-845.D51	H-845.D21	H-845.D41	H-845.D61	Unit	Tole-rance
Load capacity (horizontal base plate / any orientation)	1000 / 300	500 / 150	400 / 120	1000 / 300	500 / 150	400 / 120	kg	max.
Motor type	BLDC motor	BLDC motor	BLDC motor	BLDC motor	BLDC motor	BLDC motor		

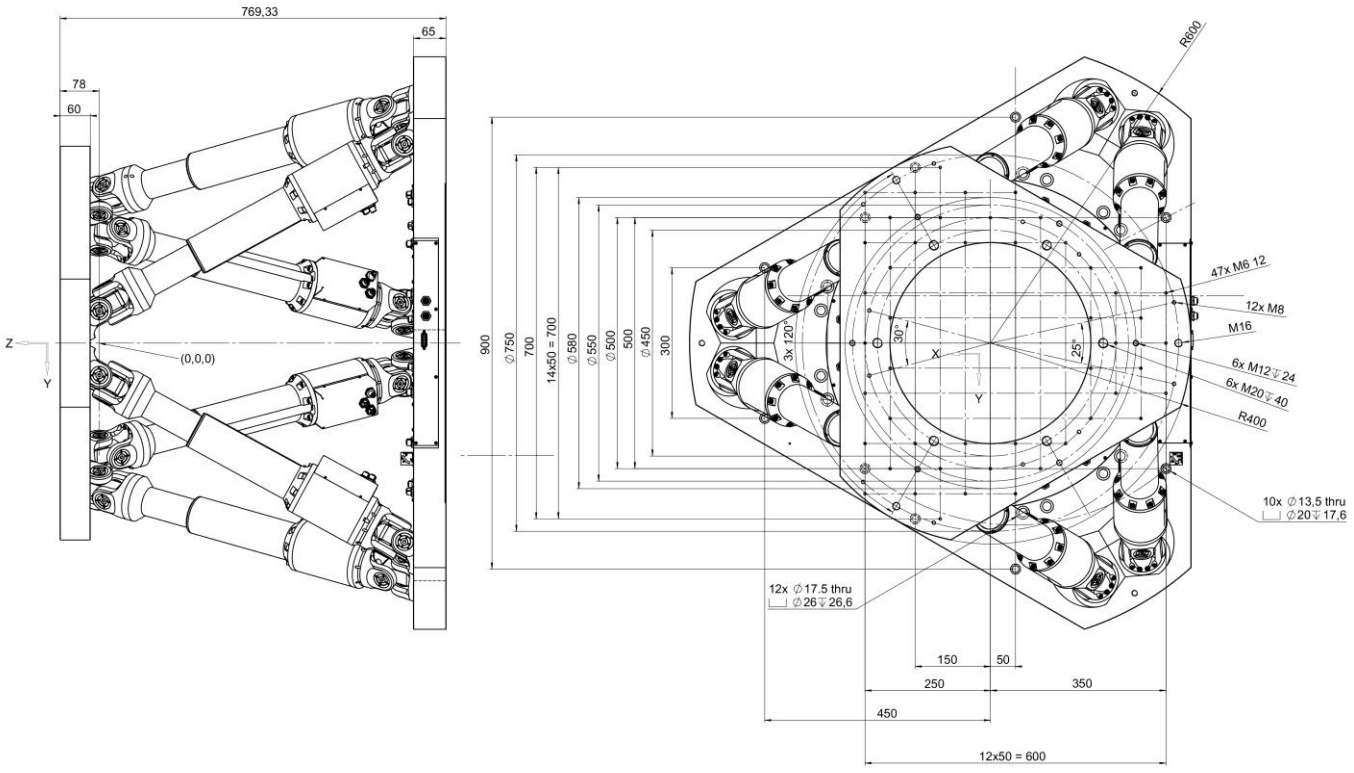
Miscellaneous	H-845.D11	H-845.D31	H-845.D51	H-845.D21	H-845.D41	H-845.D61	Unit	Tole-rance
Operating temperature range	-10 to 50	-10 to 50	-10 to 50	-10 to 50	-10 to 50	-10 to 50	°C	
Material	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum	Aluminum		
Mass	120	120	120	193	193	193	kg	±5 %
Cable length	9	9	9	9	9	9	m	±10 mm
Controller, in the scope of delivery	C-887	C-887	C-887	C-887	C-887	C-887		

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.
Ask about customized versions.

Drawings / Images



H-845.D11, .D31, and .D51, dimensions in mm



H-845.D21, .D41, and .D61, dimensions in mm

Ordering Information

H-845.D11
Heavy-duty hexapod for 1000 kg load, travel ranges ±110 mm (X, Y), ±50 mm (Z), max. velocity 20 mm/s. cable set 9 m, with 6-DOF controller for hexapods, incl. control of two additional axes, TCP/IP and RS-232 interface

H-845.D21
Heavy-duty hexapod for 1000 kg load, travel ranges ±170 mm (X, Y), ±105 mm (Z), max. velocity 20 mm/s. cable set 9 m, with 6-DOF controller for hexapods, incl. control of two additional axes, TCP/IP and RS-232 interface

H-845.D31
Heavy-duty hexapod for 500 kg load, travel ranges ±110 mm (X, Y), ±50 mm (Z), max. velocity 40 mm/s. cable set 9 m, with 6-DOF controller for hexapods, incl. control of two additional axes, TCP/IP and RS-232 interface

H-845.D41
Heavy-duty hexapod for 500 kg load, travel ranges ±170 mm (X, Y), ±105 mm (Z), max. velocity 40 mm/s. cable set 9 m, with 6-DOF controller for hexapods, incl. control of two additional axes, TCP/IP and RS-232 interface

H-845.D51
Heavy-duty hexapod for 400 kg load, travel ranges ±110 mm (X, Y), ±50 mm (Z), max. velocity 50 mm/s. cable set 9 m, with 6-DOF controller for hexapods, incl. control of two additional axes, TCP/IP and RS-232 interface

H-845.D61
Heavy-duty hexapod for 400 kg load, travel ranges ±170 mm (X, Y), ±105 mm (Z), max. velocity 50 mm/s. cable set 9 m, with 6-DOF controller for hexapods, incl. control of two additional axes, TCP/IP and RS-232 interface