Q-845
Q-Motion® SpaceFAB

High Precision and High Stiffness

- Six Degrees of Freedom
- ±7 mm travel range in X and Y, and ±5 mm in Z
- ±7° rotation range in θ_X, θ_Y, and ±8° in θ_Z
- 10 N load capacity, center mounted
- Self-locking, no heat generation at rest
- Vacuum-compatible to 10^{-6} hPa

Piezoelectric inertia drive
Piezo inertia drives are space-saving and affordable piezo-based drives with relatively high holding forces and a virtually unlimited travel range. The inertia drive principle is based on a single piezoelectric actuator that is controlled with a modified sawtooth voltage provided by special drive electronics. The actuator expands slowly and moves the runner. Due to its inertia, the runner is unable to follow the subsequent fast contraction of the actuator and remains at its position. The operating frequency of up to 20 kHz enables directly driven runners to achieve velocities of more than 5 mm/s.

Crossed roller bearings
With crossed roller bearings, the point contact of the balls in ball bearings is replaced by a line contact of the hardened rollers. Consequently, they are considerably stiffer and need less preload, which reduces friction and allows smoother running. Crossed roller bearings are also distinguished by high guiding accuracy and load capacity. Force-guided rolling element cages prevent linear guide creeping.

Fields of application
Industry and research. Measuring technology, microscopy, micromanipulation, biotechnology, and automation.

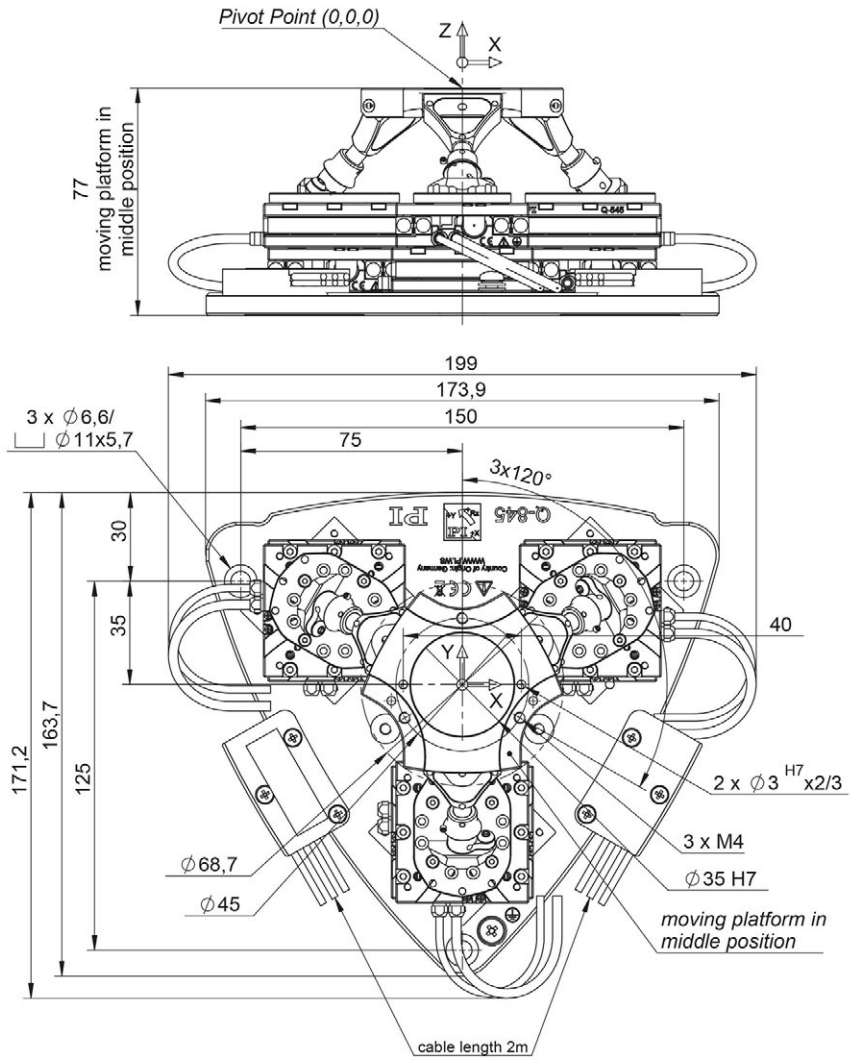
Specifications

	Q-845.140	Unit	Tolerance
Motion and positioning			
Active axes	X, Y, Z, θ_X, θ_Y, θ_Z		
Integrated sensor	Incremental linear encoder		
Travel range in X, Y	±7	mm	
Travel range in Z	±5	mm	
Rotation range in θ_X, θ_Y	±7	°	
Rotation range in θ_Z	±8	°	
Sensor resolution	1	nm	
Minimum incremental motion in X, Y	6	nm	typ.
Minimum incremental motion in Z	20	nm	typ.
Minimum incremental motion in θ_X, θ_Y, θ_Z	0.9	µrad	typ.
Unidirectional repeatability in X, Y	±30	nm	typ.
Unidirectional repeatability in Z	±35	nm	typ.
Unidirectional repeatability in θ_X	±20	µrad	typ.
Unidirectional repeatability in θ_Y	±10	µrad	typ.
Unidirectional repeatability in θ_Z	±6	µrad	typ.
Backlash in X, Y	40	nm	typ.
Backlash in Z	60	nm	typ.
Backlash in θ_X, θ_Y	35	µrad	typ.
Backlash in θ_Z	20	µrad	typ.
Max. velocity in X, Y, Z	5	mm/s	max.
Max. angular velocity in θ_X, θ_Y, θ_Z	50	mrad/s	max.
Mechanical properties			
Stiffness in X, Y	1	N/µm	
Stiffness in Z	2	N/µm	
Load capacity in X, Y	5	N	max.
Load capacity in Z (base plate horizontal)	10	N	max.
Permissible torque in θ_X, θ_Y, θ_Z	0.5	N·m	max.
Drive type	Piezoelectric inertia drive		
Miscellaneous			
Connection	6x Sub-D 15 (m)		

	Q-845.140	Unit	Tolerance
Material	Stainless steel, aluminum		
Mass	1.9	kg	±5 %
Mass without cable and connector	1.2	kg	±5 %
Cable length	2	m	±10 mm

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



Q-845.140, dimensions in mm

Ordering Information

Q-845.140
Q-Motion® SpaceFAB, Piezoelectric Inertia Drive, ±7 mm Travel Range in X und Y, ±5 mm Travel Range in Z, ±7° Rotation Range in θ_x, θ_y, ±8° Rotation Range in θ_z, 10 N Load Capacity, Vacuum-Compatible to 10^{-6} hPa

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