

## Compact Precision Z Stage

Compact Design, Multi-Axis Combinations



### L-306

- Compact design: Surface 63 mm × 63 mm
- Stepper motors and closed-loop DC motors
- Optional linear encoder for direct position measurement
- Crossed roller guides
- Noncontact reference and limit switches

#### Compact Z stage, versatile in use

Z stage with compact size due to folded drive with belt drive. Fits onto linear stages with M6 50 mm × 50 mm connection spacing (e.g., L-406).

#### Drive

- 2-phase stepper motor or closed-loop DC motor
- Backlash-compensated ball screws

#### Position measurement

- Incremental linear encoder (optional with stepper motor variants)
- Noncontact optical reference and limit switches

#### Highly accurate position measuring with incremental encoder

Noncontact optical encoders measure the position directly at the platform with the greatest accuracy. Nonlinearity, mechanical play or elastic deformation have no influence on the measurement.

#### Crossed roller guide

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

#### Fields of application

Research, Semiconductor technology, Photonics, Automation

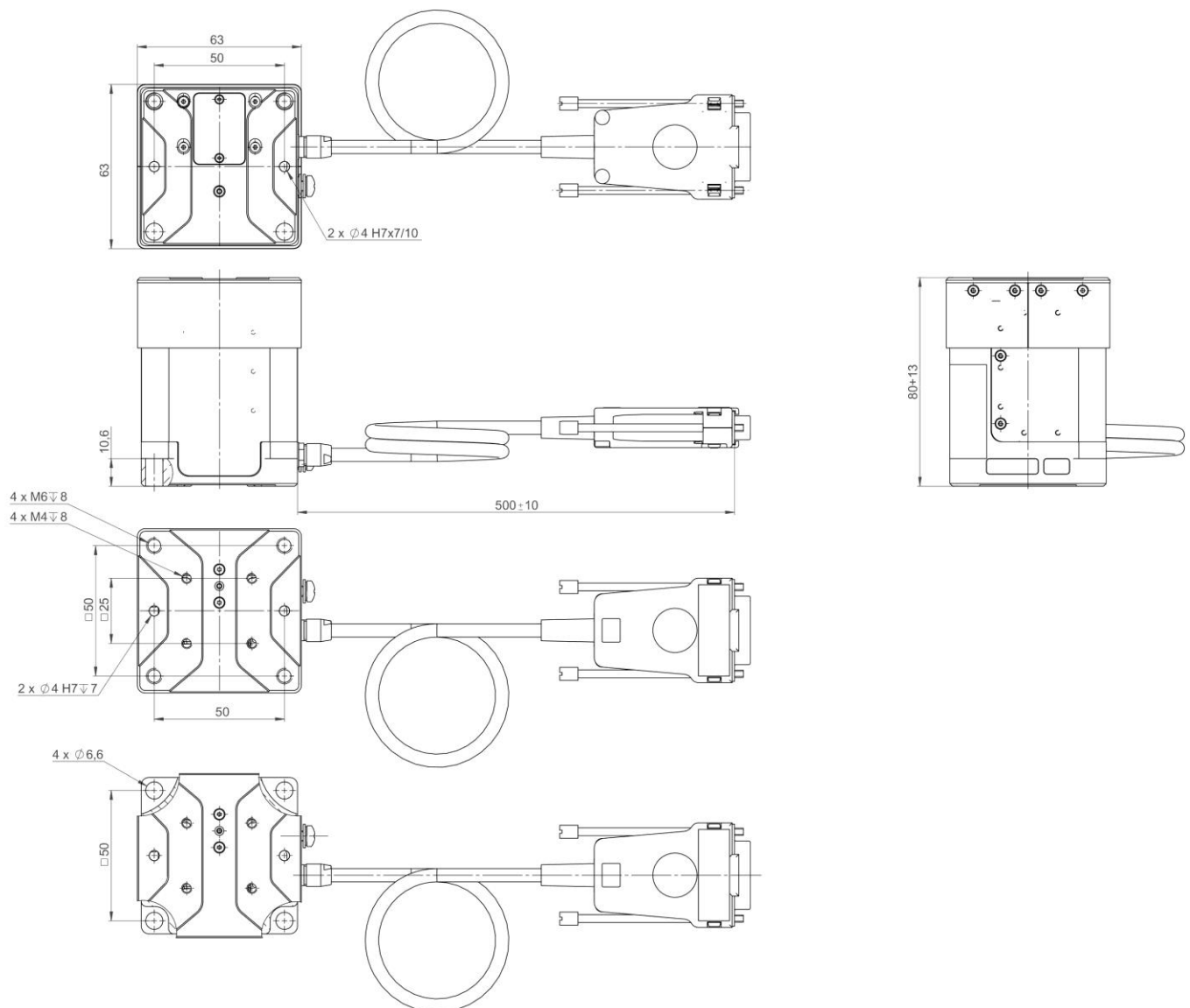
## Specifications

	L-306.011100	L-306.011112	L-306.013112	Unit	Tolerance
	Z stage with 2-phase stepper motor	Z stage with 2-phase stepper motor, linear encoder with A/B quadrature signal transmission	Z stage with DC motor, linear encoder with A/B quadrature signal transmission		
<b>Motion and positioning</b>					
Travel range	13	13	13	mm	
Integrated sensor	–	Incremental linear encoder	Incremental linear encoder		
Sensor resolution	–	5	50	nm	
Design resolution	2.5	0.005	0.05	μm	
Minimum incremental motion	2.5	0.1	0.1	μm	typ.
Unidirectional repeatability	0.5	0.1	0.1	μm	typ.
Bidirectional repeatability	±2	±0.5	±0.5	μm	typ.
Pitch	±175	±175	±175	μrad	typ.
Yaw	±150	±150	±150	μrad	typ.
Straightness / flatness	±3	±3	±3	μm	typ.
Velocity	5	5	5	mm/s	max.
Reference and limit switches	Optical	Optical	Optical		
<b>Mechanical properties</b>					
Guide type	Crossed roller guide with anti-creep system	Crossed roller guide with anti-creep system	Crossed roller guide with anti-creep system		
Drive screw type	Ball screw	Ball screw	Ball screw		
Drive screw pitch	0.5	0.5	0.5	mm	
Push / pull force	20	20	20	N	max.
Holding force, power off	20	20	20	N	typ.
Permissible lateral force	10	10	10	N	max.
Load capacity	20	20	20	N	max.
Permissible torque in $\theta_x, \theta_y$	1	1	1	N·m	max.
Permissible torque in $\theta_z$	2	2	2	N·m	max.
<b>Drive properties</b>					
Motor Type	2-phase stepper motor	2-phase stepper motor	DC motor		
<b>Miscellaneous</b>					
Operating temperature range	5 to 40	5 to 40	5 to 40	°C	
Humidity	20 to 80% rel., not condensing	20 to 80% rel., not condensing	20 to 80% rel., not condensing		
Material	Anodized aluminum, steel	Anodized aluminum, steel	Anodized aluminum, steel		
Mass	0.6	0.6	0.6	kg	±5 %
Moved mass	0.18	0.18	0.18	kg	±5 %
Connection	HD Sub-D 26 (m) (motor)	HD Sub-D 26 (m) (motor and encoder)	HD Sub-D 26 (m) (motor and encoder)		
Cable length	0.5	0.5	0.5	m	

	L-306.011100	L-306.011112	L-306.013112	Unit	Tolerance
Recommended controllers	C-663.12 (single axis) SMC Hydra (double axis) C-885 with C-663.12C885 (up to 20 axes) ACS modular controller	C-663.12 (single axis) SMC Hydra (double axis) C-885 with C-663.12C885 (up to 20 axes) ACS modular controller	C-863 (single axis) C-884 (up to 6 axes) C-885 with C-863.20C885 (to 40 axes) ACS modular controller		

All cables required for operation with the recommended controller are included in the scope of delivery. The cable length is 3 m. Cable for connecting to other controllers can be ordered as accessory.  
Ask about customized versions.

## Drawings / Images



L-306, dimensions in mm

## Ordering Information

### **L-306.011100**

Compact precision Z stage, 13 mm travel range, 20 N load capacity, stepper motor, including 3 m cable set

### **L-306.011112**

Compact precision Z stage, 13 mm travel range, 20 N load capacity, stepper motor, linear encoder with A/B quadrature signal transmission, 5 nm sensor resolution, including 3 m cable set

### **L-306.013112**

Compact precision Z stage, 13 mm travel range, 20 N load capacity, DC motor, linear encoder with A/B quadrature signal transmission, 50 nm sensor resolution, including 3 m cable set