L-310
Precision Z Stage

Compact Multi-Axis Combinations with Linear and Rotation Stages

- Travel range 26 mm (1")
- High-resolution encoder
- Zero-play ball screws
- MTBF 10000 h
- Self locking to 10 kg

Precision-class Z stage
High guiding accuracy and stiffness due to ball screws and crossed roller guides. Stress-relieved aluminum base for highest stability. Vacuum versions available on request. Noncontact limit and reference point switches.

Drive types

- .xxSD variant: 2-phase stepper motor for high torque even at low velocities and high resolution. Noncontact limit switches. Noncontact optical reference point switch with direction sensing in the middle of the travel range.
- .xxAD variant: ActiveDrive DC motor for high velocity: Control via pulse-width-modulated (PWM) signals, the operating voltage is attained via an amplifier integrated in the motor housing.

Position measurement

- Versions with DC motor: Rotary encoder
- Optional: Integrated linear encoder, installed centrically. Direct position measurement of the motion platform without influence on the positioning precision by mechanical play or hysteresis in the drivetrain

Minimum incremental motion and slow motion
In conjunction with the SMC Hydra controller, versions with stepper motor and integrated linear encoder (L-310.xASD) achieve repeatable minimum incremental motion in the range of the sensor resolution. The same configuration attains constant low velocities of a few sensor increments per second.

Fields of application
Precision positioning in industry and research, high duty cycles.

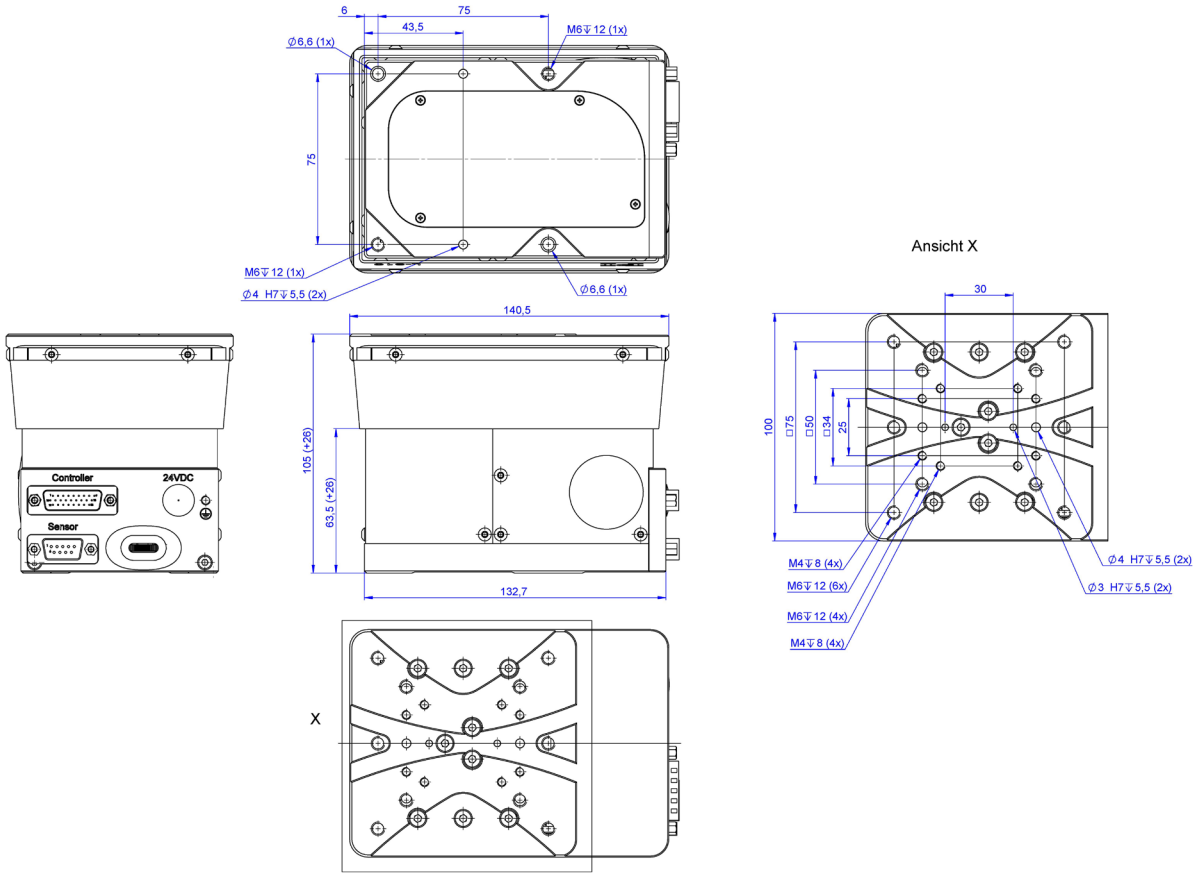
Specifications

	L-310.20SD	L-310.2ASD	L-310.20AD	L-310.24AD	Unit	Tolerance
	Z	Z	Z	Z		
Motion and positioning						
Travel range	26	26	26	26	mm	
Integrated sensor	–	Linear encoder	Rotary encoder	Linear encoder		
Design resolution	5 (full step)	0.05	0.06	0.05	µm	
Minimum incremental motion	0.2	0.1	0.1	0.5	µm	typ.
Unidirectional repeatability	0.2	0.1	0.5	0.05	µm	typ.
Pitch	±150	±150	±150	±150	µrad	typ.
Yaw	±150	±150	±150	±150	µrad	typ.
Straightness / flatness	±3	±3	±3	±3	µm	typ.
Velocity	20	20	20	20	mm/s	max.
Reference point switch repeatability	2	2	2	2	µm	
Mechanical properties						
Drive screw	Ball Screw	Ball Screw	Ball Screw	Ball screw		
Spindle pitch	1	1	1	1	mm	
Guiding	Crossed roller guides	Crossed roller guides	Crossed roller guides	Crossed roller guides		
Load capacity, Fz	55	55	30	30	N	max.
Holding force, power off	100	100	40	40	N	max.
Permissible lateral force, Fx	100	100	100	100	N	max.
Permissible lateral force, Fy	50	50	50	50	N	max.
Tip/tilt stiffness in X ($k_{\alpha x}$)	60	60	60	60	µrad/Nm	
Tip/tilt stiffness in Y ($k_{\alpha y}$)	60	60	60	60	µrad/Nm	

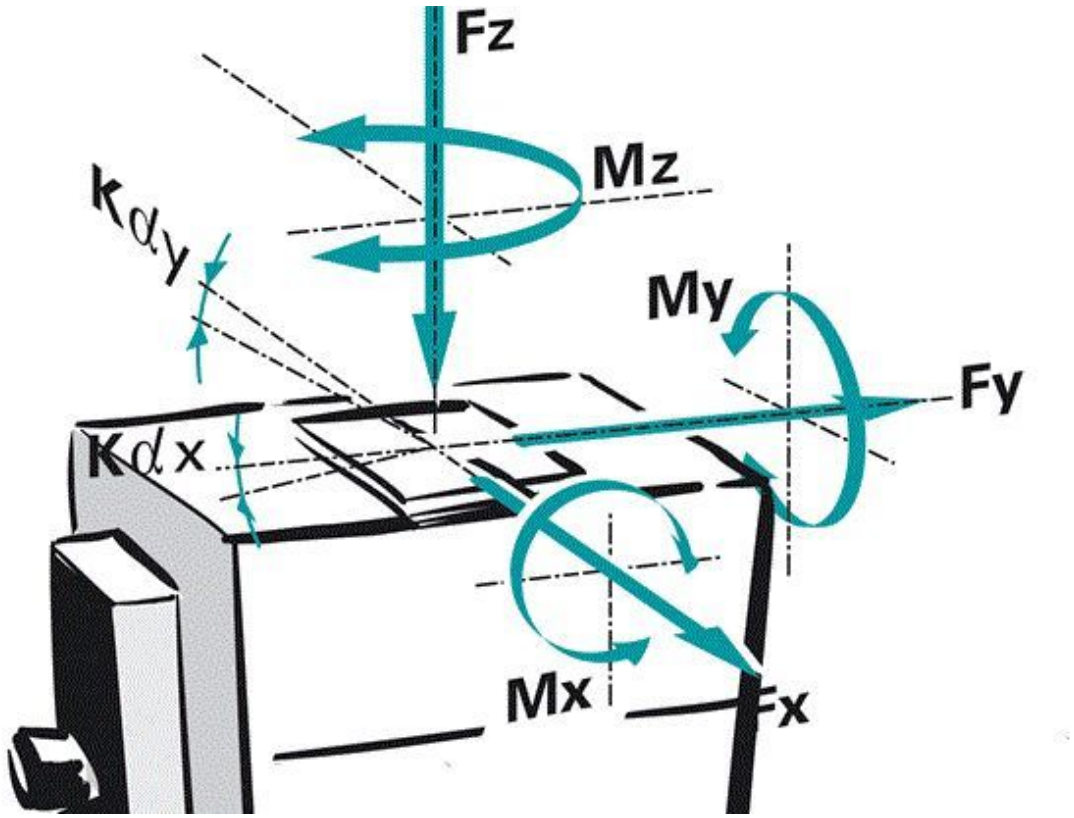
Permissible torque in X (M_x)	40	40	40	40	Nm	max.
Permissible torque in Y (M_y)	80	80	80	80	Nm	max.
Permissible torque in Z (M_z)	80	80	80	80	Nm	max.
Drive properties						
Motor Type	2-phase stepper motor*	2-phase stepper motor*	DC motor with PWM control	DC motor with PWM control		
Reference point switch	Hall effect	Hall effect	Hall effect	Hall effect		
Miscellaneous						
Operating temperature range	-10 to +50	-10 to +50	-20 to +85	-20 to +85	°C	
Material	Al (black anodized)	Al (black anodized)	Al (black anodized)	Al (black anodized)		
Mass	2.7	2.8	2.7	2.7	kg	
Recommended controllers/drivers	C-663 (single axis)	SMC Hydra (double axis)	C-863 (single axis) C-884 (up to 4 axes)	C-863 (single axis) C-884 (up to 4 axes)		

* 200 full steps/rev., max. 1.2 A/phase
Ask about custom designs!

Drawings and Images



L-310, dimensions in mm



Direction of the axes and torques for Z stages

Ordering Information

L-310.20SD
Vertical Stage, 26 mm, Stepper Motor

L-310.2ASD
Vertical Stage, 26 mm, Stepper Motor, Linear Encoder with Sin/Cos Signal Transmission

L-310.20AD
Vertical Stage, 26 mm, DC Motor, Rotary Encoder

L-310.24AD
Vertical Stage, 26 mm, DC Motor, Linear Encoder with A/B Quadrature Signal Transmission

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