

LS-270

Linear Stage for Very High Loads

Robust Design with High Stiffness



- Travel ranges from 305 to 1016 mm (12 to 40")
- Excellent travel accuracy
- Max. velocity to 150 mm/s
- Load capacity to 1500 N
- Versions with linear measuring system

Reference-class linear stage

High travel accuracy and load capacity due to crossed roller guides with high lifetime. Precision ball screw with 5 mm pitch. Stress-relieved aluminum base for highest stability. Noncontact inductive limit switches.

Drive types

- Closed-loop DC servo motor with rotary encoder on the motor shaft
- 2-phase stepper motor for high torque even at low velocities and high resolution

Versions with direct position measurement

Integrated linear encoder, mounted between the guides. Direct position measurement of the moving platform eliminates the influence of mechanical play and hysteresis in the drivetrain on the positioning accuracy.

Minimum incremental motion

In conjunction with the SMC Hydra controller, versions with stepper motor and integrated linear encoder 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

	623991x04	623992x04	62409xx14	Unit	Tolerance
	Linear stage with DC motor and rotary encoder	Linear stage with stepper motor	Also with linear encoder (direct position measurement)		
Motion axis	X	X			
Motion and positioning					
Travel range*	305 (12") / 508 (20") / 815 (32") / 1016 (40")	305 (12") / 508 (20") / 815 (32") / 1016 (40")		mm (inch)	
Integrated sensor	Rotary encoder	–	Linear encoder		
Design resolution**	0.25	12.5 (full step)	0.05	µm	
Minimum incremental motion	0.5	0.4	0.05	µm	typ.
Unidirectional repeatability	0.5	0.4	0.15	µm	typ.
Backlash	5	5	–	µm	typ.
Bidirectional repeatability	±2,5	±2,5	±0.15	µm	typ.
Crosstalk, angular error xry (pitch)	±40 / ±80 / ±100 / ±120	±40 / ±80 / ±100 / ±120		µrad	typ.
Crosstalk, angular error xrz (yaw)	±20 / ±30 / ±40 / ±50	±20 / ±30 / ±40 / ±50		µrad	typ.
Straightness / flatness	±3 / ±4 / ±7 / ±10	±3 / ±4 / ±7 / ±10		µm	typ.
Max. velocity	150	50		mm/s	
Mechanical properties					
Spindle pitch ball screw	5	5		mm	
Load capacity	1500	1500		N	max.
Push/pull force	200	260		N	max.
Permissible lateral force	1200	1200		N	max.
Holding force	20	30		N	max.
Stiffness k_{ax} in X	1.6	1.6		µrad/Nm	max.
Stiffness k_{ay} in Y	3.2	3.2		µrad/Nm	max.
Permissible torque M_x in X	600	600		Nm	max.

Permissible torque M_y in Y	250	250		Nm	max.
Permissible torque M_z in Z	250	250		Nm	max.
Drive properties					
Motor Type	DC motor	2-phase stepper motor***			
Operating voltage	24			V	
Limit switches	Inductive	Inductive			
Miscellaneous					
Operating temperature range	-20 to 65	-20 to 65	0 to 55	°C	
Material	Aluminum, black anodized	Aluminum, black anodized			
Mass	29 / 35 / 43 / 50	29 / 35 / 43 / 50	also 0.9	kg	±5 %
Connector	Sub-D 25	Sub-D 25	Motor: Sub-D 25 Sensor: Sub-D 9		
Recommended controllers	SMC Hydra motion controller (two channels) C-863 (one channel)	SMC Hydra motion controller (two channels) C-663 (one channel)	SMC Hydra motion controller (two channels)		

* Travel range of the variants: See ordering information

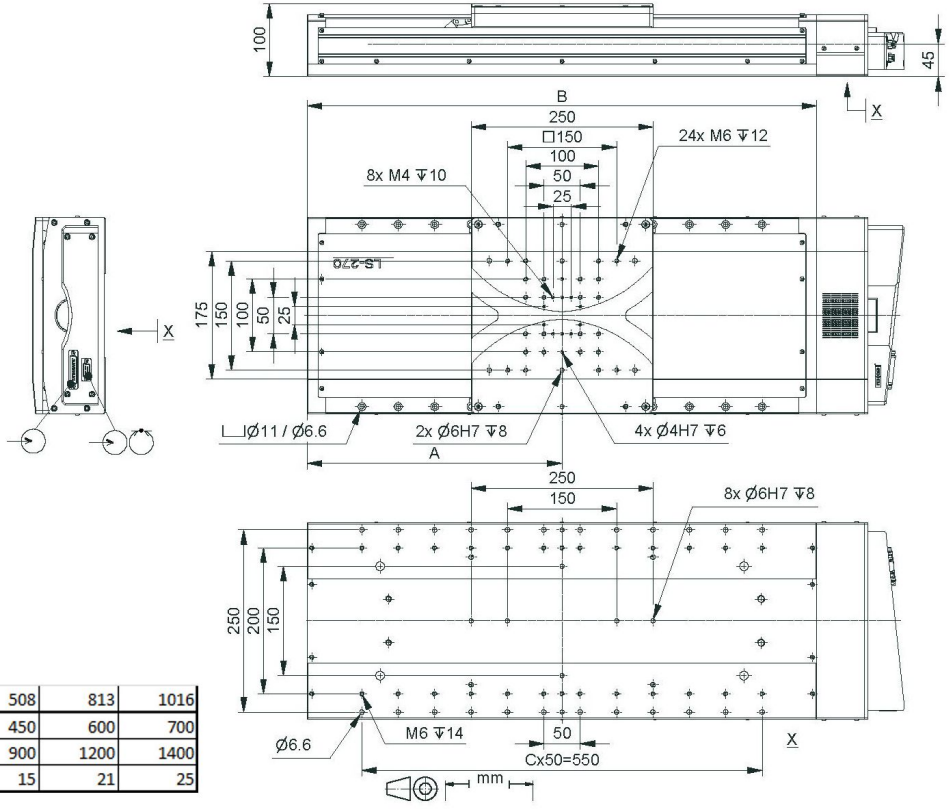
** Sin/cos analog signals with 1 V_{pp}, operation with SMC Hydra controller with maximum interpolation

*** 400 full steps/rev., max. 2 A phase current

Ask about custom designs!

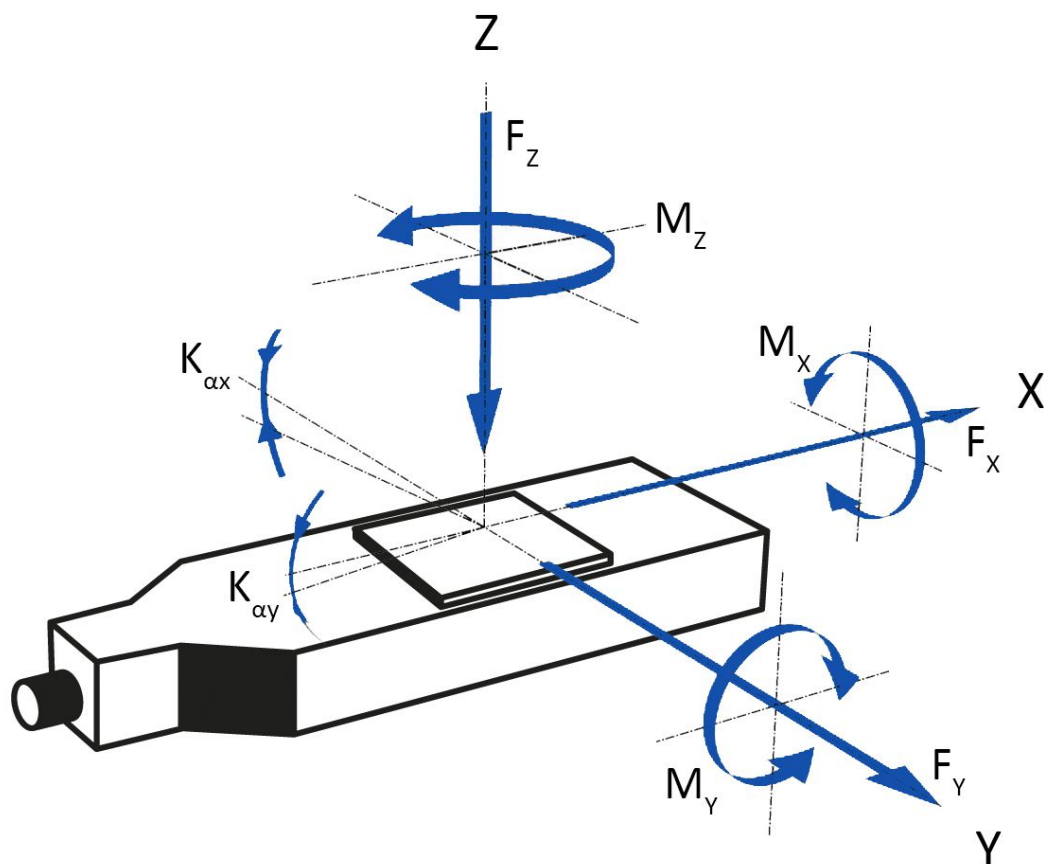
Connection cables for motor and sensor are not in the scope of delivery and must be ordered separately.

Drawings and Images



Stellweg / mm	305	508	813	1016
A / mm	350	450	600	700
B / mm	700	900	1200	1400
C / mm	11	15	21	25

LS-270, dimensions in mm



Direction of the axes and torques for linear stages, dimensions in mm

Ordering Information

623991204

LS-270 Linear Stage, 270 mm Width, DC Motor, 305 mm (12") Travel Range, Inductive Limit Switches

623991304

LS-270 Linear Stage, 270 mm Width, DC Motor, 508 mm (20") Travel Range, Inductive Limit Switches

623991404

LS-270 Linear Stage, 270 mm Width, DC Motor, 815 mm (32") Travel Range, Inductive Limit Switches

623991504

LS-270 Linear Stage, 270 mm Width, DC Motor, 1016 mm (40") Travel Range, Inductive Limit Switches

623992204

LS-270 Linear Stage, 270 mm Width, Stepper Motor 305 mm (12") Travel Range, Inductive Limit Switches

623992304

LS-270 Linear Stage, 270 mm Width, Stepper Motor 508 mm (20") Travel Range, Inductive Limit Switches

623992404

LS-270 Linear Stage, 270 mm Width, Stepper Motor 815 mm (32") Travel Range, Inductive Limit Switches

623992504

LS-270 Linear Stage, 270 mm Width, Stepper Motor 1016 mm (40") Travel Range, Inductive Limit Switches

Stages with direct position measurement

623991214

LS-270 Linear Stage, 270 mm Width, DC Motor, 305 mm (12") Travel Range, Linear Encoder with A/B Quadrature Signal Transmission, Inductive Limit Switches

623991314

LS-270 Linear Stage, 270 mm Width, DC Motor, 508 mm (20") Travel Range, Linear Encoder with A/B Quadrature Signal Transmission, Inductive Limit Switches

623991414

LS-270 Linear Stage, 270 mm Width, DC Motor, 815 mm (32") Travel Range, Linear Encoder with A/B Quadrature Signal Transmission, Inductive Limit Switches

623991514

LS-270 Linear Stage, 270 mm Width, DC-Motor, 1016 mm Travel Range, Linear Encoder with A/B Quadrature Signal Transmission, Inductive Limit Switches

623992214-0001

LS-270 Linear Stage, 270 mm Width, Stepper Motor, 305 mm (12") Travel Range, Linear Encoder with A/B Quadrature Signal Transmission, Inductive Limit Switches

623992314-0001

LS-270 Linear Stage, 270 mm Width, Stepper Motor, 508 mm (20") Travel Range, Linear Encoder with A/B Quadrature Signal Transmission, Inductive Limit Switches

623992414-LS011

LS-270 Linear Stage, 270 mm Width, Stepper Motor, 815 mm (32") Travel Range, Linear Encoder with A/B Quadrature Signal Transmission, Inductive Limit Switches

623992514-LS011

LS-270 Linear Stage, 270 mm Width, Stepper Motor, 1016 mm (40") Travel Range, Linear Encoder with A/B Quadrature Signal Transmission, Inductive Limit Switches

For accessories, please specify when ordering**720090000**

Connection Cable for Stages with Stepper Motor, 3 m

720190000

Connection Cable for Stages with DC Motor, 3 m

721090000

Cable Set for Stages with Measuring System, 3 m

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