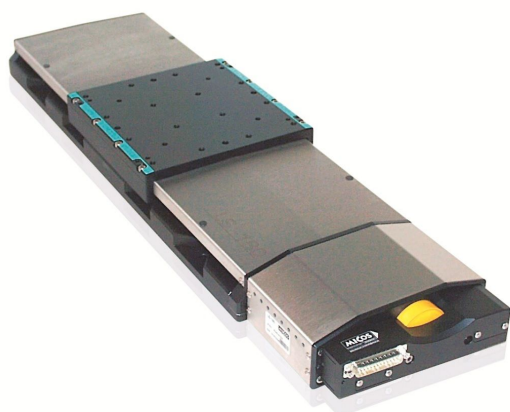


## Linear Stage for Heavy Loads

Robust Design for Industrial Use



### LS-180

- Travel ranges from 155 mm to 508 mm (6" to 20")
- Max. velocity to 150 mm/s
- Load capacity to 1000 N
- Optional: Linear encoder for direct position measuring

#### Reference-class linear stage

Recirculating ball bearings for high travel accuracy and load capacity. 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

#### 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.

#### Recirculating ball bearings

When carefully assembled, recirculating ball bearings are distinguished by a beneficial combination of high load capacity, lifetime, maintenance-free operation, and guiding accuracy. The moving part of the stages is supported by four preloaded linear ball bearing units which run on two guide rails. Each bearing unit is made up of two independent rows of circulating ball bearings.

#### 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 achieves constant low velocities of a few sensor increments per second.

#### Application fields

Sample inspection. Scanning. Research. Semiconductor technology. Vacuum.

## Specifications

	624091x0	624091x1	624092x0	624092x1-0001	Unit	Tolerance
	Linear stage with DC motor and rotary encoder	Linear stage with DC motor, linear and rotary encoder	Linear stage with stepper motor	Linear stage with stepper motor and linear encoder		
Active axes	X	X	X	X		

Motion and positioning	624091x0	624091x1	624092x0	624092x1-0001	Unit	Tolerance
Travel range	155 / 205 / 305 / 508	155 / 205 / 305 / 508	155 / 205 / 305 / 508	155 / 205 / 305 / 508	mm	
Integrated sensor	Rotary encoder	Linear encoder Rotary encoder	–	Linear encoder		
Sensor signal rotary encoder	A/B quadrature, RS-422	A/B quadrature, RS-422	–	–		
Sensor signal linear encoder	–	A/B quadrature, RS-422	–	Sin/cos, 1 V peak-peak, 20 $\mu$ m signal period		
Design resolution	0.25	0.05	25	0.005	$\mu$ m	
Sensor resolution rotary encoder	20000	20000	–	–	Cts./rev.	
Sensor resolution linear encoder	–	0.05	–	–	$\mu$ m	
Minimum incremental motion	0.5	0.1	0.5	0.1	$\mu$ m	typ.
Unidirectional repeatability	0.5	0.1	0.5	0.1	$\mu$ m	typ.
Bidirectional repeatability	$\pm 2.5$	$\pm 0.1$	$\pm 2.5$	$\pm 0.1$	$\mu$ m	typ.
Pitch	$\pm 40 / \pm 50 / \pm 60 / \pm 80$	$\pm 40 / \pm 50 / \pm 60 / \pm 80$	$\pm 40 / \pm 50 / \pm 60 / \pm 80$	$\pm 40 / \pm 50 / \pm 60 / \pm 80$	$\mu$ rad	typ.
Yaw	$\pm 50$	$\pm 50$	$\pm 50$	$\pm 50$	$\mu$ rad	typ.
Straightness	$\pm 2 / \pm 3 / \pm 4 / \pm 6$	$\pm 2 / \pm 3 / \pm 4 / \pm 6$	$\pm 2 / \pm 3 / \pm 4 / \pm 6$	$\pm 2 / \pm 3 / \pm 4 / \pm 6$	$\mu$ m	typ.
Flatness	$\pm 2 / \pm 3 / \pm 4 / \pm 6$	$\pm 2 / \pm 3 / \pm 4 / \pm 6$	$\pm 2 / \pm 3 / \pm 4 / \pm 6$	$\pm 2 / \pm 3 / \pm 4 / \pm 6$	$\mu$ m	typ.
Max. velocity	150	150	75	75	mm/s	

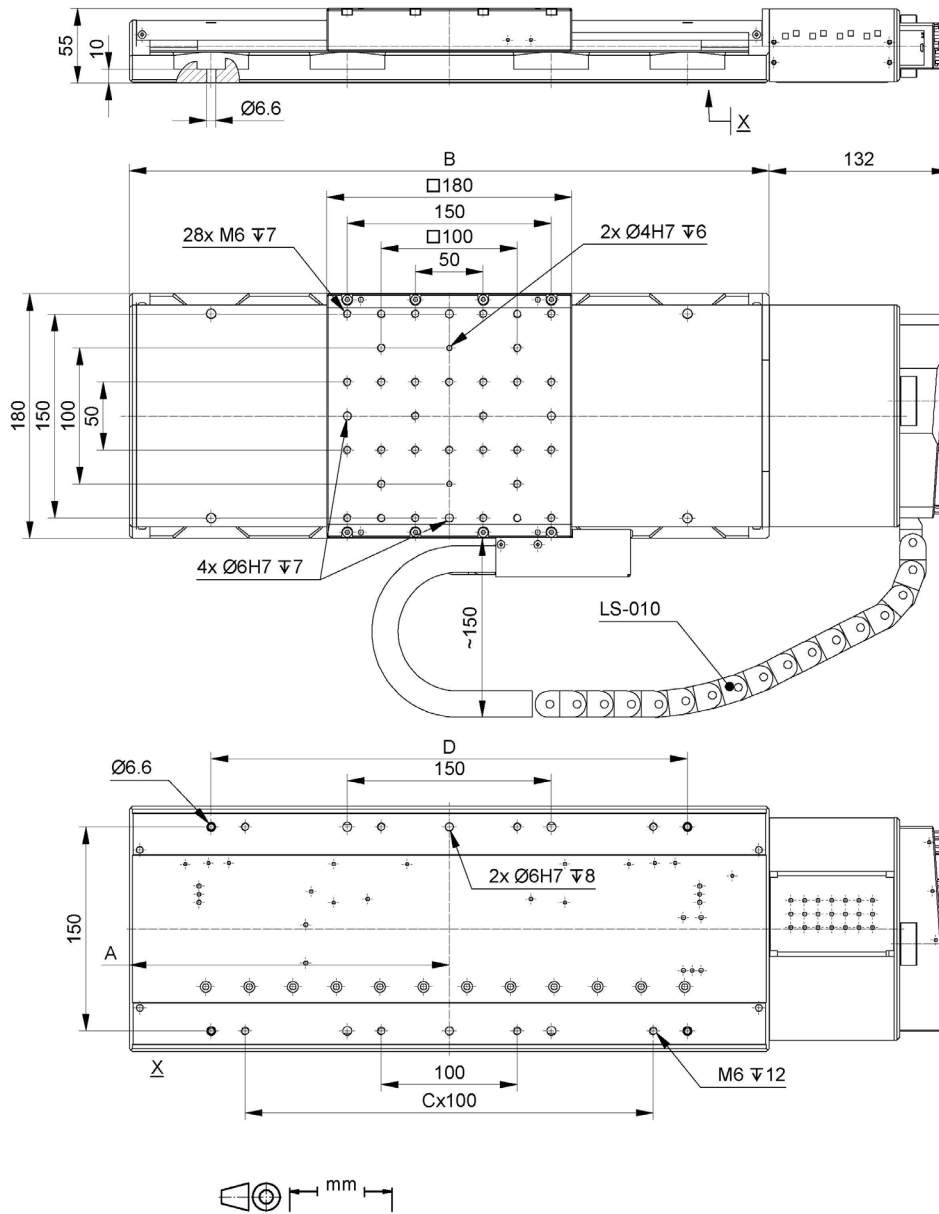
Mechanical properties	624091x0	624091x1	624092x0	624092x1-0001	Unit	Tolerance
Guide type	Recirculating ball bearing guide	Recirculating ball bearing guide	Recirculating ball bearing guide	Recirculating ball bearing guide		
Drive screw type	Ball screw	Ball screw	Ball screw	Ball screw		
Drive screw pitch	5	5	5	5	mm	
Load capacity	1000	1000	1000	1000	N	max.
Push/pull force	200	200	200	200	N	max.
Holding force, power off	20	20	50	50	N	max.
Permissible lateral force	500	500	500	500	N	max.
Permissible torque $M_x$ in $\theta_x$	250	250	250	250	Nm	max.
Permissible torque $M_y$ in $\theta_y$	132	132	132	132	Nm	max.
Permissible torque $M_z$ in $\theta_z$	125	125	125	125	Nm	max.

Drive properties	624091x0	624091x1	624092x0	624092x1-0001	Unit	Tolerance
Motor type	DC motor	DC motor	2-phase stepper motor	2-phase stepper motor		
Operating voltage, nominal	24	24	48	48	V	nom.
Operating voltage, max.	48	48	48	48	V	max.
Peak current, RMS	3.8	3.8	2	2	A	typ.
Torque constant, RMS					Nm/A	typ.
Electrical time constant	6	6			ms	
Resistance phase-phase	0.62	0.62	2.4	2.4	Ω	typ.
Inductance phase-phase	0.13	0.13	2.87	2.87	mH	typ.
Back EMF phase-phase	0.00349	0.00349			V/kRPM	max.
Step resolution			200	200	Full steps/rev	
Limit switches	Inductive	Inductive	Inductive	Inductive		

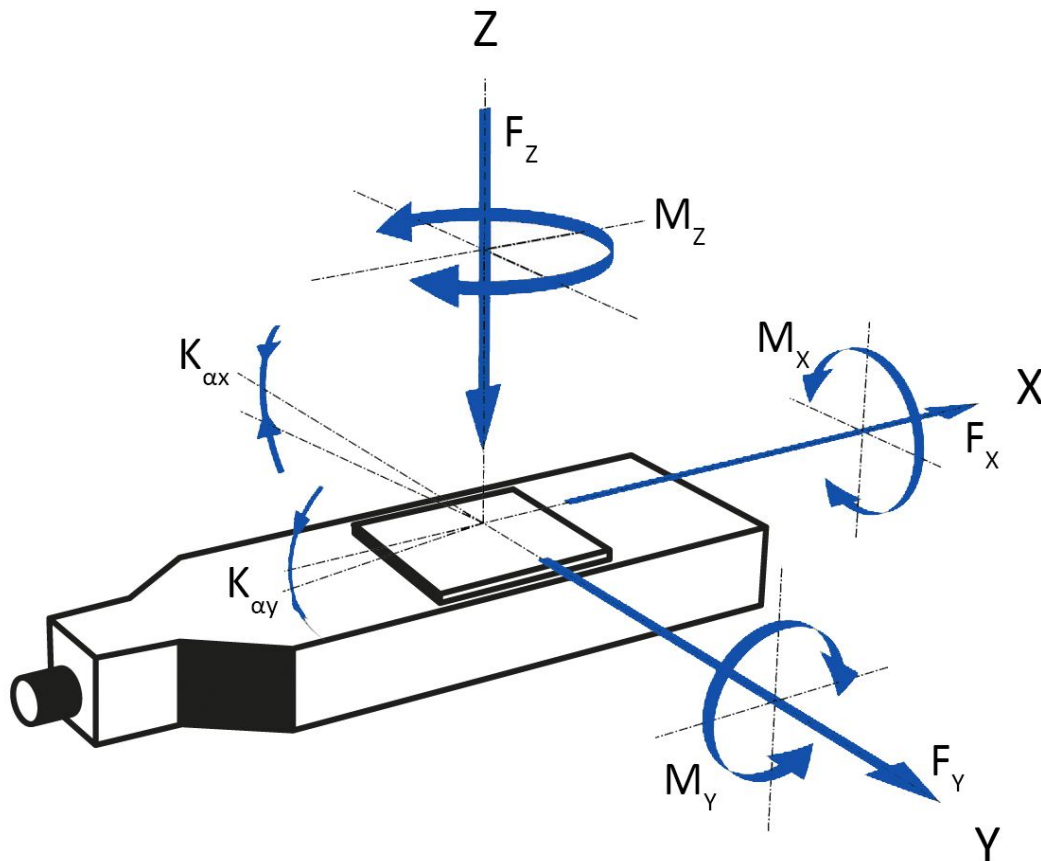
Miscellaneous	624091x0	624091x1	624092x0	624092x1-0001	Unit	Tolerance
Operating temperature range	5 to 40	5 to 40	5 to 40	0 to 55	°C	
Material	Aluminum, steel	Aluminum, steel	Aluminum, steel	Aluminum, steel		
Mass	7.8 / 8.4 / 9.4 / 10.6	8.5 / 9.1 / 10.3 / 11.5	8.3 / 8.9 / 9.9 / 11.0	9.0 / 9.6 / 10.8 / 12	kg	±5 %
Moved mass	2.2	2.2	2.2	2.2	kg	±5%
Connector	D-sub 25 (m)	Motor: D-sub 25 (m) Sensor: D-sub 9 (m)	D-sub 25 (m)	Motor: D-sub 25 (m) Sensor: D-sub 9 (m)		
Recommended controllers	C-863 (single axis) with C-863.AD11 line driver C-884 (to 6 axes) with C-863.AD11 line driver C-885 with C-863.20C885 (to 40 axes) and C-863.AD11 line driver ACS modular controller	C-863 (single axis) with C-863.AD11 line driver C-884 (to 6 axes) with C-863.AD11 line driver C-885 with C-863.20C885 (to 40 axes) and C-863.AD11 line driver 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-663.12 (single axis) SMC Hydra (double axis) C-885 with C-663.12C885 (up to 20 axes) ACS modular controller		

Connecting cables for motor and sensor are not in the scope of delivery and must be ordered separately.  
Ask about customized versions.

## Drawings / Images



LS-180, dimensions in mm, LS-010: Cable for linear encoder



*Direction of the axes and moments for linear stages*

## Ordering Information

### 62409110

LS-180 linear stage, 180 mm width, 155 mm (6") travel range, DC motor, inductive limit switches

### 62409120

LS-180 linear stage, 180 mm width, 205 mm (8") travel range, DC motor, inductive limit switches

### 62409130

LS-180 linear stage, 180 mm width, 305 mm (12") travel range, DC motor, inductive limit switches

### 62409150

LS-180 linear stage, 180 mm width, 508 mm (20") travel range, DC motor, inductive limit switches

### 62409210

LS-180 linear stage, 180 mm width, 155 mm (6") travel range, stepper motor, inductive limit switches

### 62409220

LS-180 linear stage, 180 mm width, 205 mm (8") travel range, stepper motor, inductive limit switches

### 62409230

LS-180 linear stage, 180 mm width, 305 mm (12") travel range, stepper motor, inductive limit switches

### 62409250

LS-180 linear stage, 180 mm width, 508 mm (20") travel range, stepper motor, inductive limit switches

## Stages with direct position measuring

### **62409111**

LS-180 linear stage, 180 mm width, 155 mm (6") travel range, linear encoder with A/B quadrature signal transmission, DC motor, inductive limit switches

### **62409121**

LS-180 linear stage, 180 mm width, 205 mm (8") travel range, linear encoder with A/B quadrature signal transmission, DC motor, inductive limit switches

### **62409131**

LS-180 linear stage, 180 mm width, 305 mm (12") travel range, DC motor, linear encoder with A/B quadrature signal transmission, inductive limit switches

### **62409151**

LS-180 linear stage, 180 mm width, 508 mm (20") travel range, DC motor, linear encoder with A/B quadrature signal transmission, inductive limit switches

### **62409211-0001**

LS-180 linear stage, 180 mm width, 155 mm (6") travel range, stepper motor, linear encoder with sin/cos signal transmission, inductive limit switches

### **62409221-0001**

LS-180 linear stage, 180 mm width, 205 mm (8") travel range, stepper motor, linear encoder with sin/cos signal transmission, inductive limit switches

### **62409231-0001**

LS-180 linear stage, 180 mm width, 305 mm (12") travel range, stepper motor, linear encoder with sin/cos signal transmission, inductive limit switches

### **62409251-0001**

LS-180 linear stage, 180 mm width, 508 mm (20") travel range, stepper motor, linear encoder with sin/cos signal transmission, inductive limit switches

## 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