

## Precision XY Stage

High Travel Accuracy and Stability, 305 × 305 mm Travel Range



### L-741

- Travel range 305 mm × 305 mm (12")
- Unidirectional repeatability to 0.05 μm
- Velocity to 90 mm/s
- 2-phase stepper motor or DC motors
- Incremental linear encoder with 1 nm resolution
- Rotary encoder with 20000 impulses/revolutions

#### 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.

Optical limit and reference switches.

#### 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.

#### Drive types

- 2-phase stepper motor for high torque even at low velocities and higher resolution
- DC motor for high velocity constancy, low vibration, and high velocities

Other travel ranges on request.

#### Fields of application

Medical industry. Laser cutting. Biotechnology. Metrology. Laser marking.

## Specifications

Motion	L-741.131100 / L-741.131111 / L-741.131112	Unit	Tolerance
Active axes	X, Y		
Travel range	305 × 305	mm	
Angular error xry (pitch)	±60	μrad	typ.
Angular error xrz (yaw)	±40	μrad	typ.
Angular error yrx (pitch)	±60	μrad	typ.
Angular error yrz (yaw)	±40	μrad	typ.
Straightness / flatness	±4	μm	typ.
Orthogonality	±96.963	μrad	typ.
Velocity	45	mm/s	max.

Positioning	L-741.131100	L-741.131111	L-741.131112	Unit	Tolerance
Integrated sensor	–	Incremental linear encoder	Incremental linear encoder		
Sensor signal	–	Sin/cos, 1 V peak-peak, 20 μm signal period	A/B quadrature, TTL		
Design resolution	10.0	0.001	0.01	μm	
Sensor resolution rotary encoder	–	–	–	Cts./rev.	
Sensor resolution linear encoder	–	0.001	0.01	μm	
Minimum incremental motion	1	0.05	0.05	μm	typ.
Unidirectional repeatability	1	0.05	0.05	μm	typ.
Bidirectional repeatability	±2.5	±0.5	±0.5	μm	typ.
Reference switch repeatability	<1	<1	<1	μm	typ.
Reference and limit switches	Optical	Optical	Optical		

Mechanical properties	L-741.131xxx	Unit	Tolerance
Drive screw type	Ball screw		
Drive screw pitch	2	mm	
Guide type	Crossed roller guide with anti-creep system		
Load capacity	200	N	max.
Permissible torque Mx in $\theta_x$	125	N·m	max.
Permissible torque My in $\theta_y$	125	N·m	max.
Permissible torque Mz in $\theta_z$	125	N·m	max.

Drive properties	L-741.131xxx	Unit	Tolerance
Motor type	Stepper motor, 2-phase		
Operating voltage, nominal	24	V	nom.
Operating voltage, max.	48	V	max.
Step resolution	200	Full steps/rev	

Miscellaneous	L-741.131100 / L-741.131112	L-741.131111	Unit	Tolerance
Operating temperature range	5 to 40	5 to 40	°C	
Material	Aluminum, black anodized	Aluminum, black anodized		
Mass	27.5	27.5	kg	±5 %
Moved mass in X, unloaded	19.9	19.9	kg	±5 %
Moved mass in Y, unloaded	6.1	6.1	kg	±5 %
Connector	L-741.131100. 2 × HD Sub-D 26 (m) (motor) L-741.131112. 2 × HD Sub-D 26 (m) (motor/sensor)	2 × HD Sub-D 26 (m) (motor) 2 × Sub-D 15 (f) (sensor)		
Recommended controllers/drivers	C-663.12 (single axis) SMC Hydra (double axis) C-885 with C-663.12C885 (up to 20 axes) ACS modular controller	SMC Hydra (double axis) ACS modular controller		

Motion	L-741.133111 / L-741.133112 / L-741.133132	Unit	Tolerance
Active axes	X, Y		
Travel range	305 × 305	mm	
Angular error xry (pitch)	±60	μrad	typ.
Angular error xrz (yaw)	±40	μrad	typ.
Angular error yrx (pitch)	±60	μrad	typ.
Angular error yrz (yaw)	±40	μrad	typ.
Straightness / flatness	±4	μm	typ.
Orthogonality	±96.963	μrad	typ.
Velocity	L-741.133111 / L-741.133112: 50 L-741.133132: 90	mm/s	max.

Positioning	L-741.133111	L-741.133112	L-741.133132	Unit	Tolerance
Integrated sensor	Incremental linear encoder	Incremental linear encoder	Incremental rotary encoder		
Sensor signal	Sin/cos, 1 V peak-peak, 20 μm signal period	A/B quadrature, TTL	A/B quadrature, TTL		
Design resolution	0.001	0.01	0.1	μm	
Sensor resolution rotary encoder	–	–	20000	Cts./rev.	
Minimum incremental motion	0.1	0.5	0.8	μm	typ.
Unidirectional repeatability	0.1	0.5	0.8	μm	typ.
Bidirectional repeatability	±0.5	±0.5	±2.5	μm	typ.
Reference switch repeatability	<1	<1	<1	μm	typ.
Reference and limit switches	Optical	Optical	Optical		

Mechanical properties	L-741.133xxx	Unit	Tolerance
Drive screw type	Ball screw		
Drive screw pitch	2	mm	
Guide type	Crossed roller guide with anti-creep system		
Load capacity	200	N	max.
Permissible torque $M_x$ in $\theta_x$	125	N·m	max.
Permissible torque $M_y$ in $\theta_y$	125	N·m	max.
Permissible torque $M_z$ in $\theta_z$	125	N·m	max.

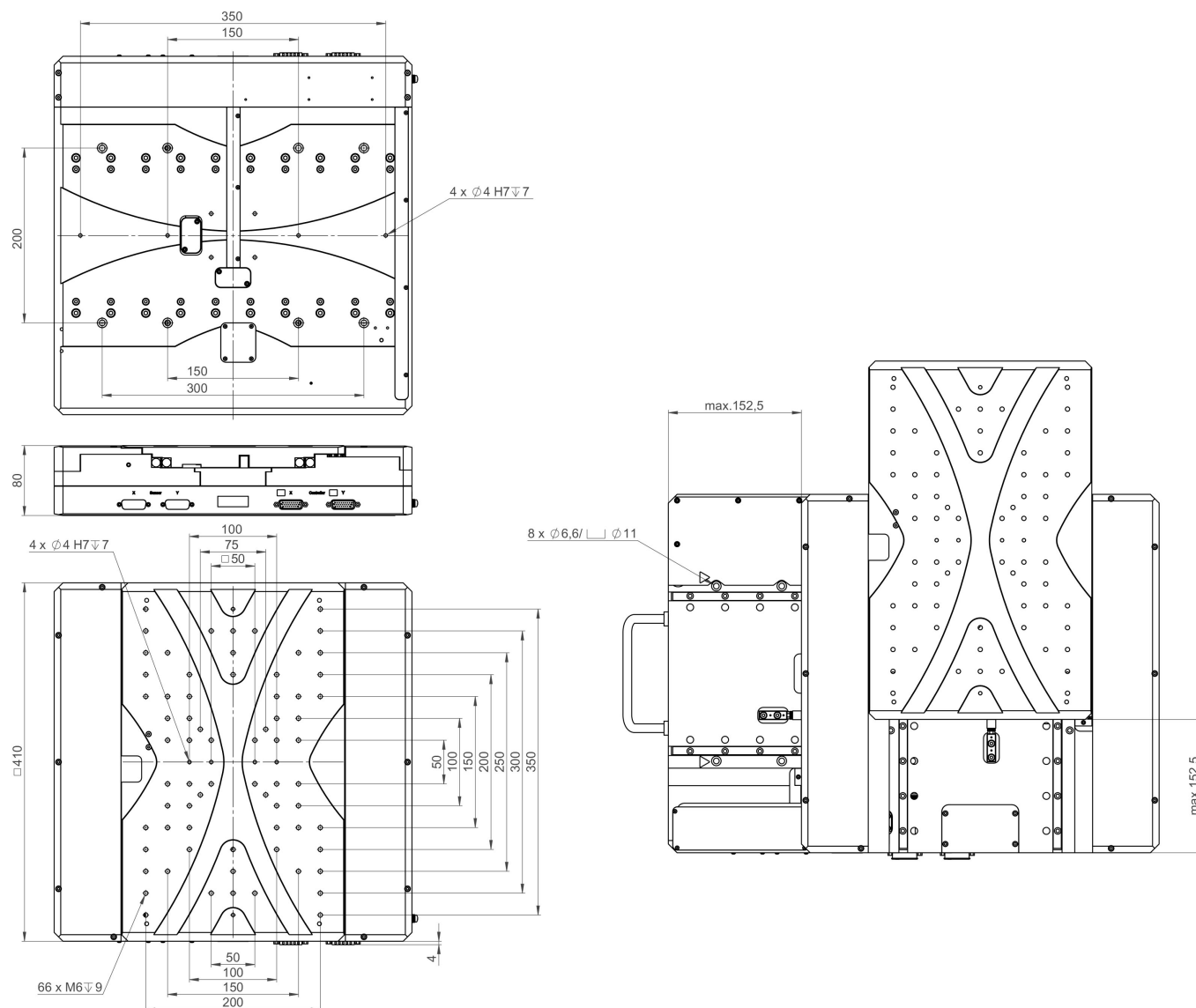
Drive properties	L-741.133xxx	Unit	Tolerance
Motor type	DC motor		
Operating voltage, nominal	24	V	nom.
Operating voltage, max.	48	V	max.

Miscellaneous	L-741.133111	L-741.133112 / L-741.133132	Unit	Tolerance
Operating temperature range	5 to 40	5 to 40	°C	
Material	Aluminum, black anodized	Aluminum, black anodized		
Mass	28	28	kg	±5 %
Moved mass in X, unloaded	20.2	20.2	kg	±5 %
Moved mass in Y, unloaded	6.1	6.1	kg	±5 %
Connector	2 × HD Sub-D 26 (m) (motor) 2 × Sub-D 15 (f) (sensor)	2 × HD Sub-D 26 (m) (motor/sensor)		
Recommended controllers/drivers	SMC Hydra (double axis) C-891 (single axis) C-885 with C-891.11C885 (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-741, dimensions in mm

## Ordering Information

### L-741.131100

Precision XY stage, 410 mm × 410 mm width, 305 mm × 305 mm travel range, stepper motor, including 3 m cable set

### L-741.131111

Precision XY stage, 410 mm × 410 mm width, 305 × 305 mm travel range, stepper motor, incremental linear encoder with sin/cos signal transmission, 20 µm sensor signal period, including 3 m cable set

### L-741.131112

Precision XY stage, 410 mm × 410 mm width, 305 × 305 mm travel range, stepper motor, incremental linear encoder with A/B quadrature signal transmission, 10 nm sensor resolution, including 3 m cable set

### L-741.133111

Precision XY stage, 410 mm × 410 mm width, 305 × 305 mm travel range, DC motor, incremental linear encoder with sin/cos signal transmission, 20 µm sensor signal period, including 3 m cable set

**L-741.133112**

Precision XY stage, 410 mm × 410 mm width, 305 × 305 mm travel range, DC motor, incremental linear encoder with A/B quadrature signal transmission, 10 nm sensor resolution, including 3 m cable set

**L-741.133132**

Precision XY stage, 410 mm × 410 mm width, 305 × 305 mm travel range, DC motor, rotary encoder, including 3 m cable set