

## L-731

### Precision XY stage

#### High Travel Accuracy and Stability



- Travel range 205 mm × 205 mm (8")
- Unidirectional repeatability to 0.25 µm
- Velocity to 45 mm/s
- Incremental encoder with 10 nm resolution

#### Direct position measurement with incremental encoder

Noncontact optical encoders measure the actual position directly at the motion platform with the greatest accuracy so that nonlinearity, mechanical play or elastic deformation have no influence on position measuring.

Optical limit and reference point switches.

#### Crossed roller bearings

With crossed roller bearings, the point contact of the balls in ball bearings is replaced by a line contact of the hardened rollers. Consequently, they are considerably stiffer and need less preload, which reduces friction and allows smoother running. Crossed roller bearings are also distinguished by high guiding accuracy and load capacity. Forced guiding of the rolling body cages prevents the roller bearings from creeping.

#### Drive types

- 2-phase stepper motor for high torque even at low velocities and higher resolution
- Version with linear motors available with the same dimensions

Other travel ranges on request.

#### Fields of application

Industry and research. Metrology, inspection, industrial microscopy

## Specifications

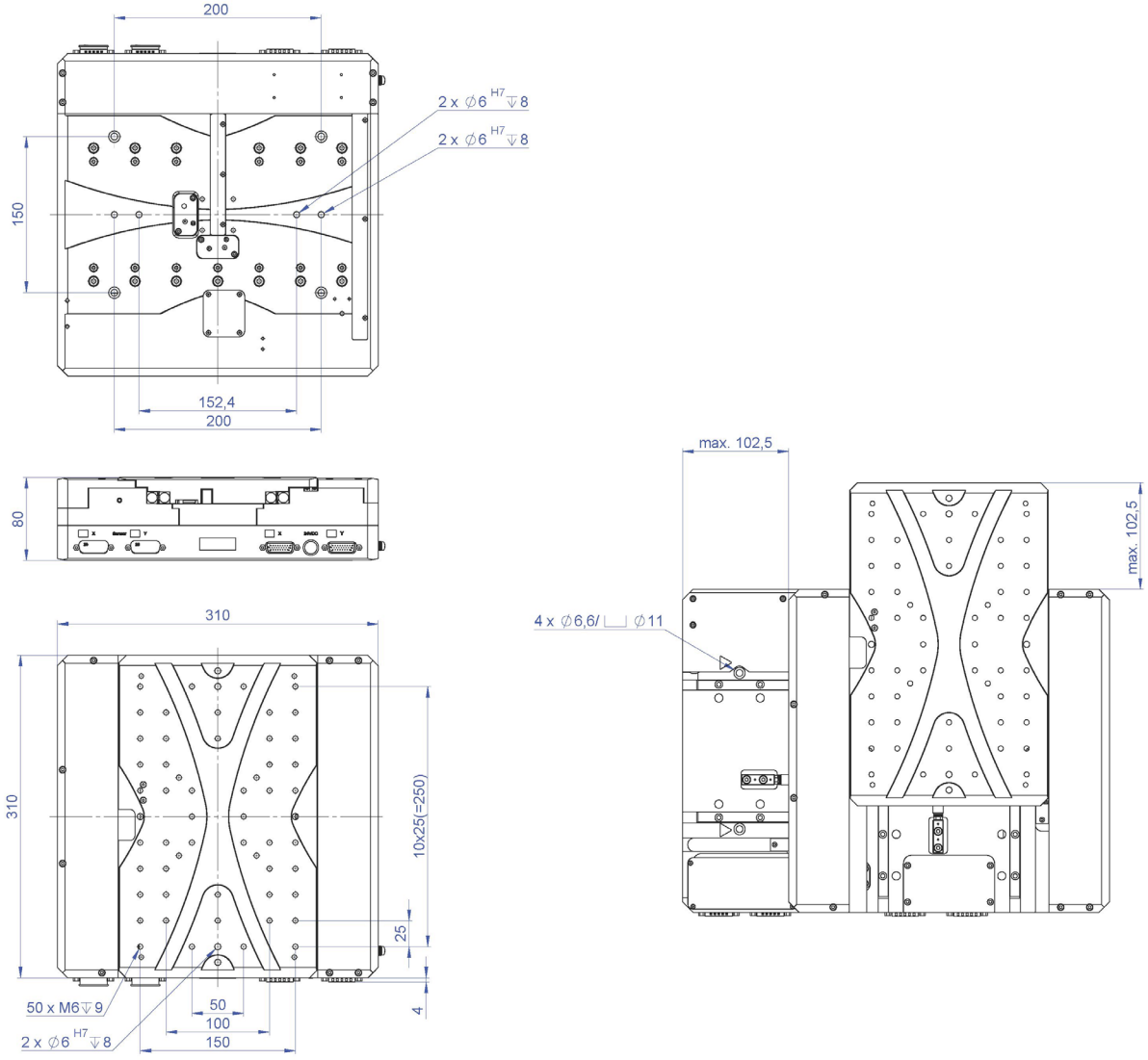
|  | L-731.40SD                                  | L-731.44SD   | L-731.4ASD   | Unit | Tolerance |
|--|---|--|--|------|-----------|
|  | XY stage with stepper motor                 | XY stage with stepper motor and linear encoder (direct position measurement) | XY stage with stepper motor and linear encoder (direct position measurement) |      |           |
| <b>Motion and positioning</b>              |   |  |  |      |           |
| Active axes                                | X, Y  | X, Y   | X, Y   |      |           |
| Travel range                               | 205 × 205                                   | 205 × 205  | 205 × 205  | mm   |           |
| Integrated sensor                          | –   | Incremental linear encoder   | Incremental linear encoder   |      |           |
| Sensor resolution                          | –   | 10   | 10*  | nm   |           |
| Sensor signal period                       | –   | –  | 20   | µm   |           |
| Minimum incremental motion                 | 1.25  | 0.05   | 0.05   | µm   | typ.      |
| Unidirectional repeatability               | 0.5   | 0.25   | 0.25   | µm   | typ.      |
| Bidirectional repeatability                | ±1  | ±0.5   | ±0.5   | µm   | typ.      |
| Backlash                                   | 1   | –  | –  | µm   |           |
| Pitch                                      | ±125  | ±125   | ±125   | µrad | typ.      |
| Yaw  | ±50   | ±50  | ±50  | µrad | typ.      |
| Straightness / flatness                    | ±3  | ±3   | ±3   | µm   | typ.      |
| Velocity                                   | 45  | 45   | 45   | mm/s | max.      |
| Reference and limit switches               | optical                                     | optical  | optical  |      |           |
| <b>Mechanical properties</b>               |   |  |  |      |           |
| Load capacity                              | 50  | 50   | 50   | N    |           |
| Permissible torque in $\theta_x, \theta_y$ | 125   | 125  | 125  | N·m  |           |
| Permissible torque in $\theta_z$           | 125   | 125  | 125  | N·m  |           |
| Moved mass in X                            | 12  | 12   | 12   | kg   |           |
| Moved mass in Y                            | 3.5   | 3.5  | 3.5  | kg   |           |
| Overall mass                               | 16  | 16   | 16   | kg   |           |
| Guiding                                    | Crossed roller guide with anti-creep system | Crossed roller guide with anti-creep system                                  | Crossed roller guide with anti-creep system                                  |      |           |

|                             |  |  |  |    |         |
|-----------------------------|--|--|--|----|---------|
| <b>Drive properties</b>     |  |  |  |    |         |
| Motor Type                  | 2-phase stepper motor  | 2-phase stepper motor  | 2-phase stepper motor  |    |         |
| Operating voltage           | 24   | 24   | 24   | V  |         |
| Motor power                 | 5  | 5  | 5  | W  | nominal |
| <b>Miscellaneous</b>        |  |  |  |    |         |
| Operating temperature range | 10 to 50   | 10 to 50   | 10 to 50   | °C |         |
| Humidity                    | 20 – -90 % rel., not condensing  | 20 – -90 % rel., not condensing  | 20 – -90 % rel., not condensing  |    |         |
| Material                    | Aluminum, black anodized   | Aluminum, black anodized   | Aluminum, black anodized   |    |         |
| Connection                  | Motor connection: 2x HD Sub-D 26 (m)   | Motor connection: 2 × HD Sub-D 26 (m)<br>Sensor connection: 2 × Sub-D 15 (f) | Motor connection: 2 × HD Sub-D 26 (m)<br>Sensor connection: 2 × Sub-D 15 (f) |    |         |
| Recommended controller      | 2 × C-663 Mercury Step Motion Controller, SMC Hydra Motion Controller for 2 axes | 2 × C-663 Mercury Step Motion Controller                                     | SMC Hydra Motion Controller for 2 axes                                       |    |         |

\* with SMC Hydra. Other interpolation factors available as an option.

All cables required for operation with the recommended controller are included in the scope of delivery. Cable for connecting to other controllers can be ordered as accessory.

## Drawings and Images



L-731, dimensions in mm

## Ordering Information

### **L-731.40SD**

Precision XY Stage, 310 mm × 310 mm Width, 205 mm × 205 mm Travel Range, 2-Phase Stepper Motor

### **L-731.4ASD**

Precision XY Stage, 310 mm × 310 mm Width, 205 mm × 205 mm Travel Range, 2-Phase Stepper Motor, Linear Encoder with Sin/Cos Signal Transmission, 20 µm Sensor signal period

### **L-731.44SD**

Precision XY Stage, 310 mm × 310 mm Width, 205 mm × 205 mm Travel Range, 2-Phase Stepper Motor, Linear Encoder with A/B Quadrature Signal Transmission, 10 nm Sensor Resolution