V-731
High-Precision XY Stage

High Travel Accuracy and Stability, Magnetic Direct Drive

- Travel range 205 mm × 205 mm (8")
- Unidirectional repeatability to 0.1 µm
- Velocity to 200 mm/s
- Incremental encoder with 10 nm resolution
- Optionally with stepper motor

PIMag® magnetic direct drive
3-phase magnetic direct drives doe not use mechanical components in the drivetrain, they transmit the drive force to the motion platform directly and without friction. The drives reach high velocities and accelerations. Ironless motors are particularly suitable for positioning tasks with the highest demands on precision because there is no undesirable interaction with the permanent magnets. This allows smooth running even at the lowest velocities and at the same time, there is no vibration at high velocities. Nonlinearity in control behavior is avoided and any position can be controlled easily. The drive force can be set freely.

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. Force-guided rolling element cages prevent linear guide creeping.

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.
Other travel ranges on request.

Fields of application
Industry and research. Metrology, inspection, industrial microscopy

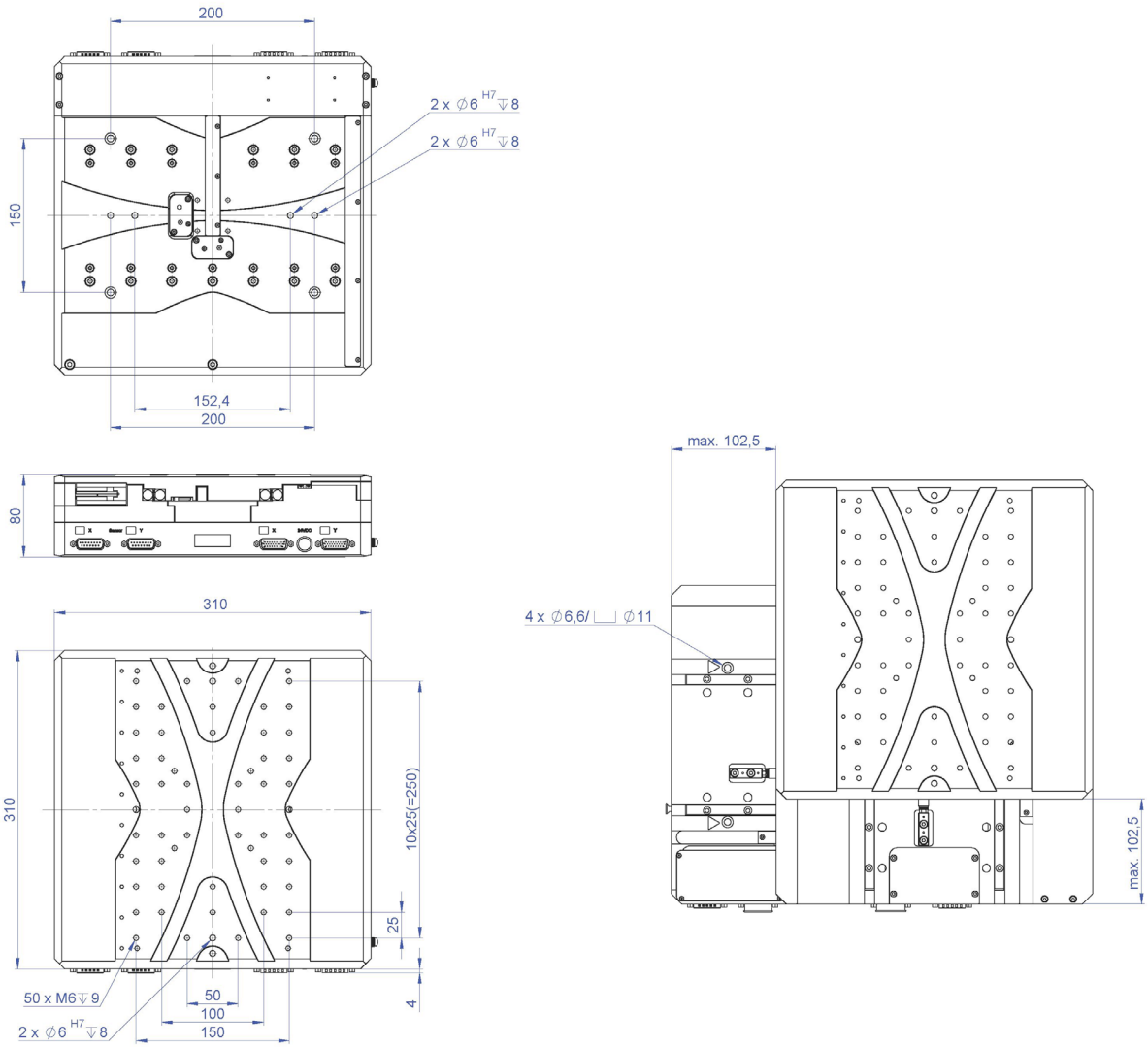
Specifications

	V-731.096111	Unit	Tolerance
Motion and positioning			
Active axes	X, Y		
Travel range	205 × 205	mm	
Integrated sensor	Incremental linear encoder		
Sensor resolution*	10	nm	
Sensor signal period	20	µm	
Minimum incremental motion	0.02	µm	typ.
Unidirectional repeatability	0.1	µm	typ.
Bidirectional repeatability	±0.5	µm	typ.
Pitch	±75	µrad	typ.
Yaw	±75	µrad	typ.
Straightness / flatness	±3	µm	typ.
Velocity	200	mm/s	max.
Reference and limit switches	optical		
Mechanical properties			
Load capacity	50	N	
Permissible torque in θ_X, θ_Y	125	N·m	
Permissible torque in θ_Z	125	N·m	
Moved mass in X	9.84	kg	
Moved mass in Y	5.6	kg	
Overall mass	19.4	kg	
Guiding	Crossed roller guide with anti-creep system		
Drive properties			
Motor type	Linear motor, ironless		
Intermediate circuit voltage	24	V	DC, max.
Peak force	100	N	typ.

	V-731.096111	Unit	Tolerance
Nominal force	21	N	typ.
Peak current, effective	5	A	typ.
Nominal current, effective	1.1	A	typ.
Force constant, effective	19.9	N/A	typ.
Resistance phase-phase	5.5	Ω	typ.
Inductivity phase-phase	1.8	mH	typ.
Back EMF phase-phase	16	V·s/m	max.
Magnetic periods	30	mm	
Miscellaneous			
Operating temperature range	10 to 50	°C	
Humidity	20 – 90% rel., not condensing		
Material	Aluminum, black anodized		
Motor connection	2 × HD Sub-D 26 (m)		
Sensor connection	2 × Sub-D 15 (f)		
Recommended controller	SMC Hydra ACS SPii+EC C-891		

* with SMC Hydra. Other interpolation factors are 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



V-731, dimensions in mm

Ordering Information

V-731.096111
High-Precision XY Stage, 310 mm × 310 mm Width, 205 mm × 205 mm Travel Range, Linear Motor, Linear Encoder with Sin/Cos Signal Transmission, 20 µm Sensor signal period