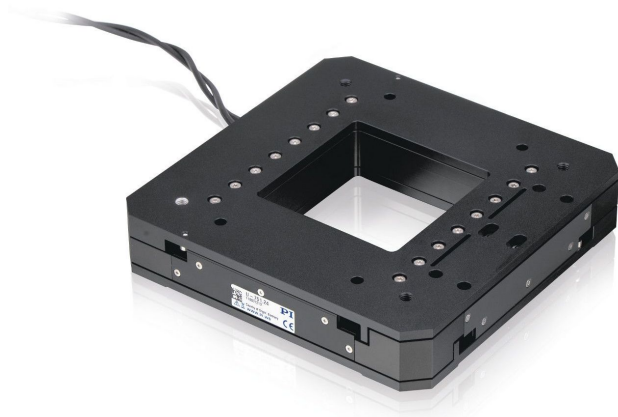


# XY Stage with Piezomotors

Low-profile and Fast, Direct Position Measurement



## U-751.24

- Compact design: Only 32 mm in height, no lead screw ducts or flanged motors
- Direct-measuring linear encoder with 100 nm resolution
- Self-locking, no heat generation at rest, no servo jitter
- Clear aperture 78 mm × 78 mm (at maximum displacement 65 mm × 65 mm)
- Noncontact limit and reference point switches

### Precision-class XY stage

PILine® stages are particularly suitable for applications that require fast precision positioning. When switched off, the self-locking drive holds the position of the stage mechanically stable. Energy consumption and heat generation are therefore considerably reduced. Applications with a low duty cycle that are battery-powered or heat-sensitive benefit from these characteristics. The position of the axis is measured by an encoder and an optical reference switch allows reliable repeatable motion. The piezomotor drive principle and its electrical operation is inexpensive and can be customized.

### PILine® ultrasonic piezomotors

An integral part of a PILine® ultrasonic piezomotor is a piezo actuator that is preloaded against a movable, guided runner via a coupling element. The piezoceramic actuator is excited to ultrasonic oscillation by a high-frequency AC voltage between 100 and 200 kHz. Deformation of the actuator leads to periodic diagonal motion of the coupling element relative to the runner. The feed created is a few nanometers per cycle; the high frequencies lead to the high velocities. Preloading the piezoceramic actuator against the runner ensures self-locking of the drive when at rest and switched off.

### 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.

### 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.

### Valid patents

US patent no. 6,765,335B2

European patent no. 1267425B1

## Fields of application

Research and industry. For microscopy, biotechnology, laboratory automation. Special versions for standard light microscopes available on request.

## Specifications

Motion	U-751.24	Unit	Tolerance
Active axes	x, y		
Travel range	25 mm × 25 mm		
Pitch	±50	μrad	typ.
Yaw	±50	μrad	typ.
Velocity, closed-loop	100	mm/s	max.

Mechanical properties	U-751.24	Unit	Tolerance
Load capacity <sup>(1)</sup>	50	N	max.
Holding force (passive)	6	N	max.

Drive properties	U-751.24	Unit	Tolerance
Motor type	PILine® ultrasonic piezomotor, performance class 2		
Drive force	7	N	max.

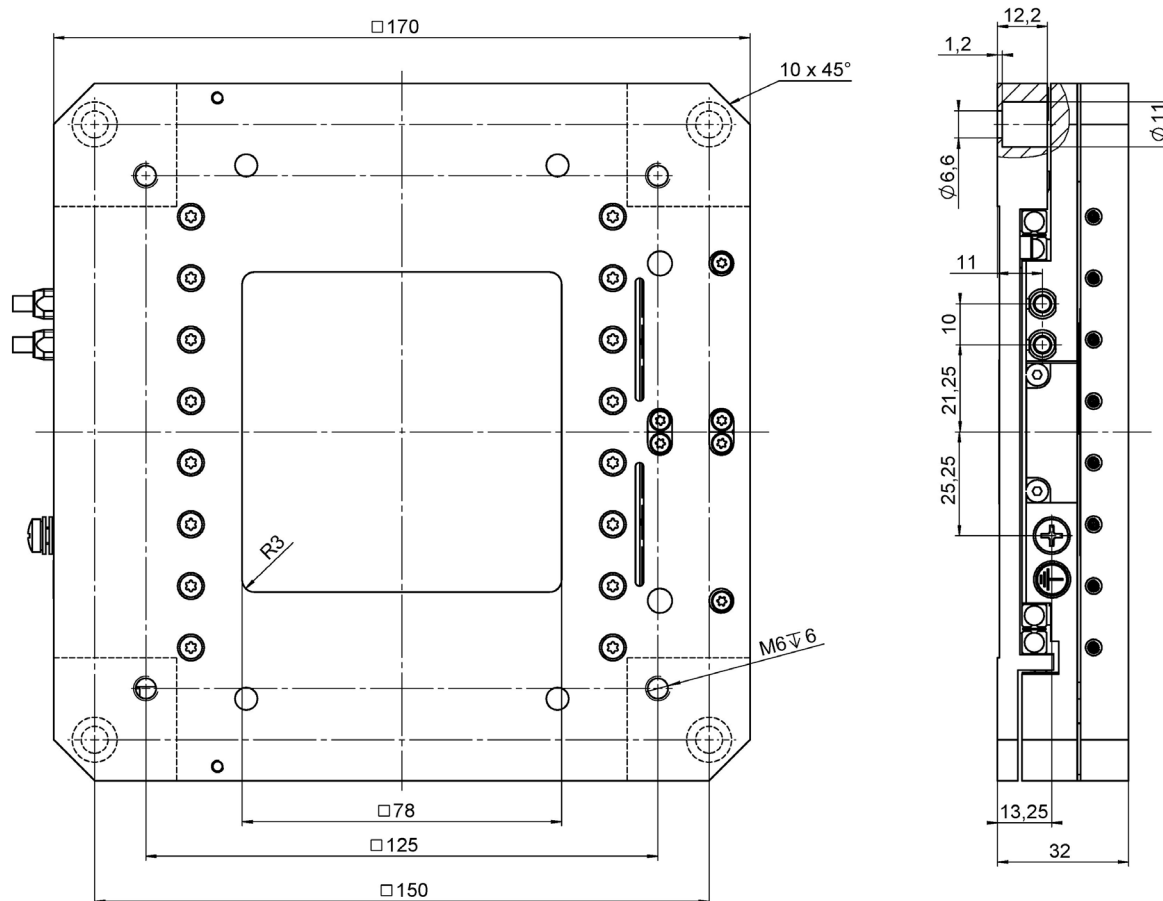
Positioning	U-751.24	Unit	Tolerance
Sensor type	Incremental, optical, direct measuring		
Sensor resolution	0.1	μm	typ.
Minimum incremental motion	0.3	μm	typ.
Bidirectional repeatability	±0.3	μm	
Reference point switches	Optical		
Limit switches	Hall effect		

Miscellaneous	U-751.24	Unit	Tolerance
Operating temperature range	-20 to 50	°C	
Material	Al (black anodized)		
Mass	1.8	kg	±5 %
Motor / sensor connection	2 × Sub-D, 15-pin (m)		
Cable length	1.5	m	±10 mm

<sup>(1)</sup> At max. velocity 10 N.

Ask about custom designs!

## Drawings and Images



U-751.24, dimensions in mm. Clear aperture 78 mm x 78 mm (at maximum displacement 65 mm x 65 mm).

## Ordering Information

### U-751.24

XY Stage with PLine® Piezomotors, 25 mm x 25 mm travel range, 7 N drive force, 0.1 µm resolution

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