

PILine® Rotation Stage

Miniature Stage with Ultrasonic Piezo Motor and Central Opening



U-628

- Compact: Edge length 50 mm, height 19 mm
- Positions loads quickly and with precision: Velocity to 720 °/s, minimum incremental motion to 51 µrad
- Unlimited rotation range >360°
- Drive torque 25 mNm
- Self-locking when switched off: Saves energy and reduces generation of heat
- Central aperture for more fields of application

Precision-class rotation 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 are inexpensive and can be customized.

PILine® ultrasonic piezomotor

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.

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.

Fields of application

Micromanipulation, Automation, Biotechnology, Sample manipulation, Sample positioning, Applications with limited space, optical metrology, Vacuum applications to 10^{-6} hPa (optional)

Specifications

Motion	U-628.03	Unit	Tolerance
Active axes	θ_z		
Rotation range	>360	°	
Velocity, closed loop	720	°/s	max.
Minimum incremental motion	51	μ rad	typ.
Bidirectional repeatability	± 102	μ rad	

Positioning	U-628.03	Unit	Tolerance
Sensor type	Incremental encoder		
Sensor resolution	17	μ rad	

Mechanical properties	U-628.03	Unit	Tolerance
Load capacity / axial force	5	N	max.
Holding force	0.03	Nm	max.

Drive properties	U-628.03	Unit	Tolerance
Motor type	PILine® ultrasonic piezo motor, performance class 1		
Drive torque clockwise / counterclockwise (θ_z)	0.025	Nm	max.

Connectors	U-628.03	Unit	Tolerance
Motor / sensor	1 × Sub-D 15 (m)		

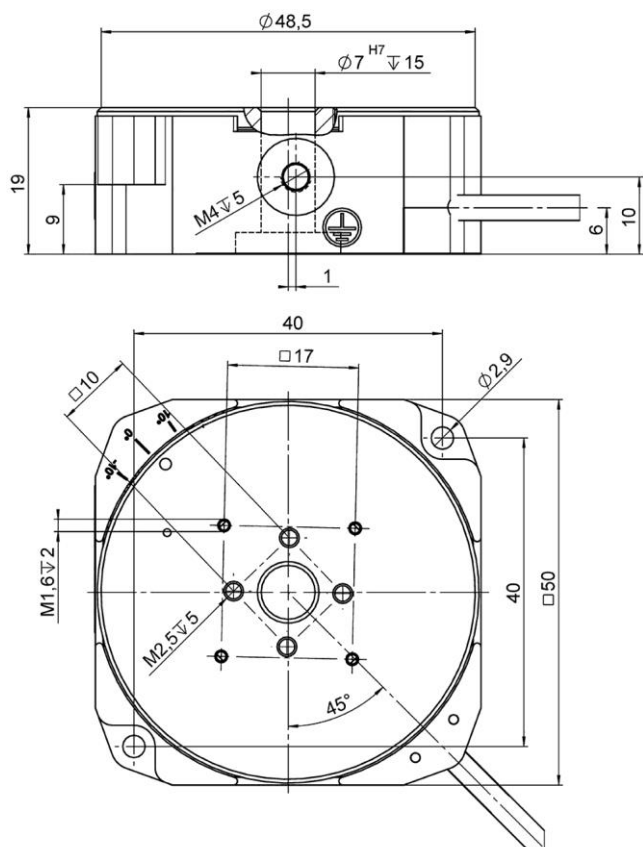
Miscellaneous	U-628.03	Unit	Tolerance
Reference point switch	Optical		
Operating temperature	0 to 40	°C	
Material	Anodized aluminum		
Mass	300	g	± 5 %
Cable length	1.5	m	typ.
Recommended electronics	C-867.1U		

All specifications based on room temperature (22 °C ± 3 °C).

Vacuum versions to 10^{-6} hPa available on request. Specifications for vacuum versions can differ.

Ask about customized versions.

Drawings / Images



U-628, Dimensions in mm

Ordering Information

U-628.03

PILine® rotation stage, >360° rotation range, velocity 720°/s, incremental encoder, 17 µrad resolution, 49 mm diameter, piezoelectric ultrasonic motor

Accessories

U-600.A01

Extension cable for PILine®, Sub-D 15-pin, 1 m

U-600.A03

Extension cable for PILine®, Sub-D 15-pin, 3 m

U-600.A05

Extension cable for PILine®, Sub-D 15-pin, 5 m