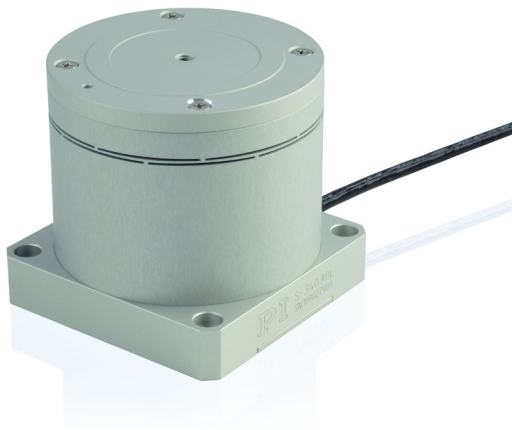


# Piezo Tip/Tilt Platform

High Dynamics for Mirrors and Optics to  $\varnothing$  75 mm (3")



## S-340

- Resolution up to 20 nrad, excellent position stability
- Optical beam deflection to 4 mrad
- Parallel kinematics for higher accuracy and dynamics
- Sub-ms response time
- For mirrors to  $\varnothing$  75 mm (3");  $\varnothing$  100 mm (4") on request
- Closed-loop versions for improved linearity
- Excellent temperature stability

### Fields of application

- Image processing / stabilization
- Optical trapping
- Laser scanning / beam steering with large deflection angle
- Laser tuning
- Optical filters / switches
- Optics
- Beam stabilization

### Outstanding lifetime thanks to PICMA® piezo actuators

The patented PICMA® piezo actuators are all-ceramic insulated. This protects them against humidity and failure resulting from an increase in leakage current. PICMA® actuators offer an up to ten times longer lifetime than conventional polymer-insulated actuators. 100 billion cycles without a single failure are proven.

### High guiding accuracy due to zero-play flexure guides

Flexure guides are free of maintenance, friction, and wear, and do not require lubrication. Their stiffness allows high load capacity and they are insensitive to shock and vibration. They are 100 % vacuum compatible and work in a wide temperature range.

### High dynamics multi-axis operation due to parallel kinematics

In a parallel-kinematic multi-axis system, all actuators act on a common platform. The minimum mass inertia and the identical design of all axes allow fast, dynamic, and nevertheless precision motion.

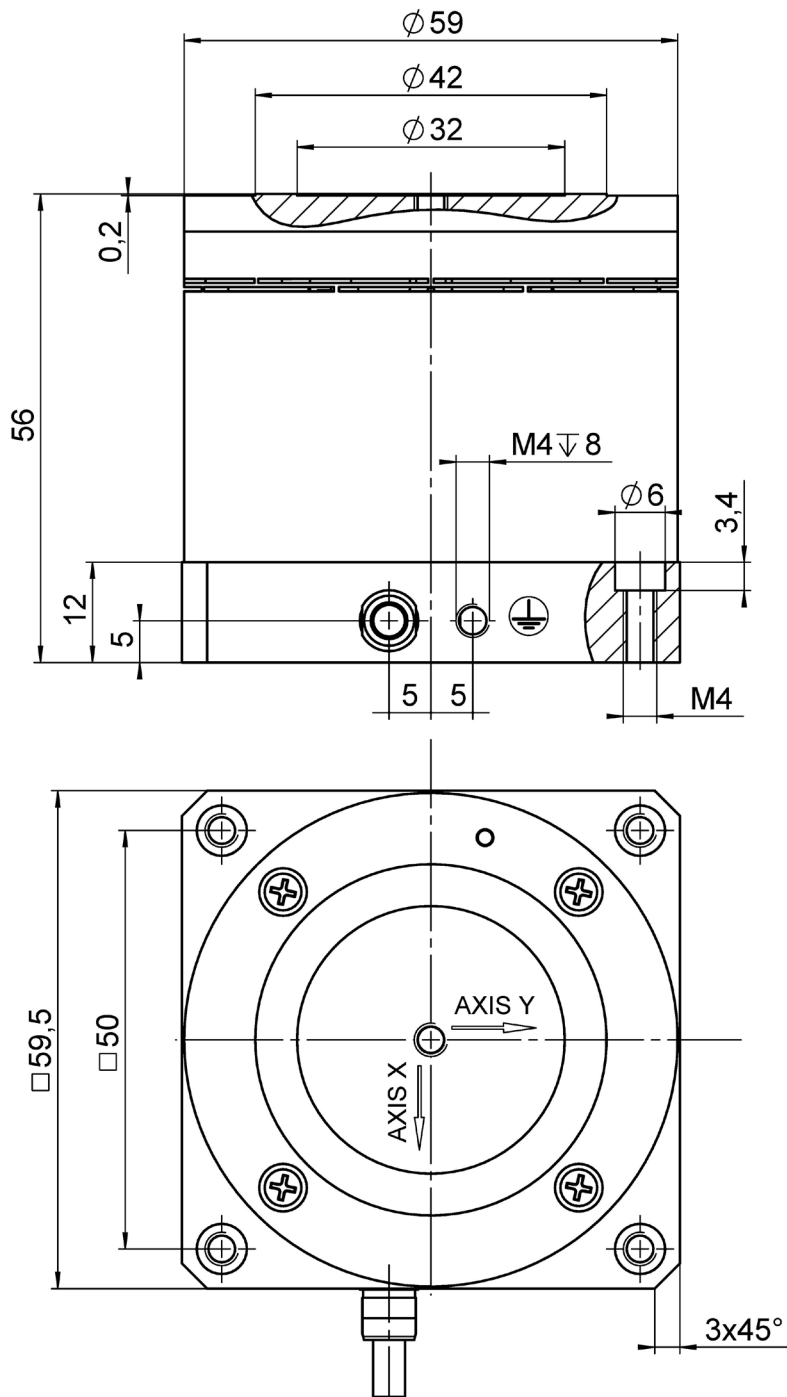
## Specifications

	S-340.ASD / ASL	S-340.A0L	Unit	Tolerance
Active axes	$\theta_x, \theta_y$	$\theta_x, \theta_y$		
<b>Motion and positioning</b>				
Integrated sensor	SGS	-		
Tip/tilt angle in $\theta_x, \theta_y$ at -20 to +120V, open loop	2	2	mrad	min.
Tip/tilt angle in $\theta_x, \theta_y$ , closed loop	2	-	mrad	
Resolution in $\theta_x, \theta_y$ , open loop	0.02	0.02	$\mu$ rad	typ.
Resolution in $\theta_x, \theta_y$ , closed loop	0.2	-	$\mu$ rad	typ.
Linearity error in $\theta_x, \theta_y$	0.1	-	%	typ.
Repeatability in $\theta_x, \theta_y$	0.15	-	$\mu$ rad	typ.
<b>Mechanical properties</b>				
Resonant frequency in $\theta_x, \theta_y$ , no load	1.4	1.4	kHz	$\pm 20$ %
Resonant frequency loaded in $\theta_x, \theta_y$ (with glass mirror, $\varnothing$ 50 mm, thickness 15 mm)	0.9	0.9	kHz	$\pm 20$ %
Resonant frequency loaded in $\theta_x, \theta_y$ (with glass mirror, $\varnothing$ 75 mm, thickness 22 mm)	0.4	0.4	kHz	$\pm 20$ %
Distance of pivot point to platform surface	7.5	7.5	mm	$\pm 1$ mm
Platform moment of inertia	18000	18000	$g \times mm^2$	$\pm 20$ %
<b>Drive properties</b>				
Ceramic type	PICMA®	PICMA®		
Electrical capacitance	6 / axis	6 / axis	$\mu$ F	$\pm 20$ %
<b>Miscellaneous</b>				
Operating temperature range	-20 to 80	-20 to 80	°C	
Housing material	Aluminum	Aluminum		
Platform material	Aluminum; or optionally steel, titanium or Invar	Aluminum; or optionally steel, titanium or Invar		
Mass	0.355	0.350	kg	$\pm 5$ %
Cable length	2	2	m	+100 mm / -0 mm
Sensor/voltage connection	ASD version: Sub-D 25 (m) ASL version: LEMO	LEMO		
Recommended electronics	E-616, E-727	E-616, E-727		

The resolution of the system is limited only by the noise of the amplifier and the measuring technology because PI piezo nanopositioning systems are free of friction.

All specifications based on room temperature (22 °C  $\pm$  3 °C).

## Drawings / Images



S-340, dimensions in mm. The general tolerance according to DIN ISO 2768-f-H applies to all nontolerated dimensions.

## Ordering Information

### S-340.A0L

Tip/tilt platform, 2 mrad, open loop, LEMO connector(s), aluminum covering plate

### S-340.ASL

Tip/tilt platform, 2 mrad, SGS, LEMO connector(s), aluminum covering plate

## **S-340.ASD**

Tip/tilt platform, 2 mrad, SGS, Sub-D connector, aluminum-covering plate