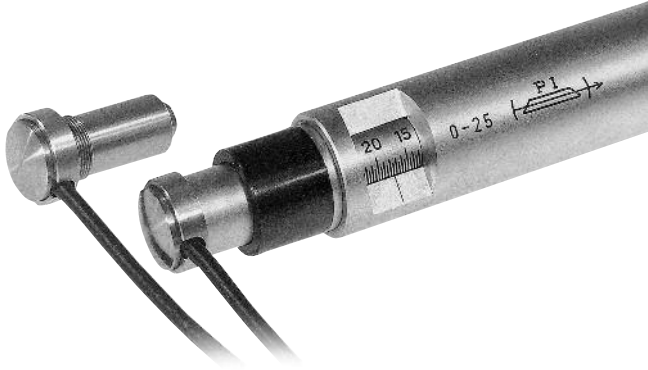


# P-855 Miniature Piezo Actuator

## Micrometer-Mountable Open-Loop Piezo Translator



P-855.20 piezo translator

- Displacement 20  $\mu\text{m}$
- Mounts Inside Micrometer Tip
- Sub-msec Response
- Sub-nm Resolution

P-855 piezo translators are high-resolution linear actuators specially designed for integration in micrometer tips. They fit the M-227 DC-Mike motorized actuators (see p. 1-42), the M-168 Stepper Mike (see p. 1-55) motorized actuators and the M-631 to M-633 manual micrometers (see p. 1-56).

The piezo translators consist of a monolithic PICMA<sup>®</sup> piezo ceramic integrated in a stainless steel housing.

P-855 actuators provide sub-millisecond response and sub-nanometer resolution.

### Application Examples

- Laser tuning
- Static and dynamic positioning of small parts
- Fiber positioning

### Superior Lifetime with Ceramic-Encapsulated Piezos

Highest possible reliability is assured by the use of award-winning PICMA<sup>®</sup> multilayer piezo actuators. PICMA<sup>®</sup> actuators are the only ceramic-encapsulated PZT actuators on the market, which makes them resistant to ambient humidity and leakage-current failures. They are thus far superior to conventional actuators in reliability and lifetime.

### Accessories

Extension cables, adapters & connectors: see in "Accessories" in the "Piezo Drivers / Servo Controllers" (see p. 2-168 ff) section.

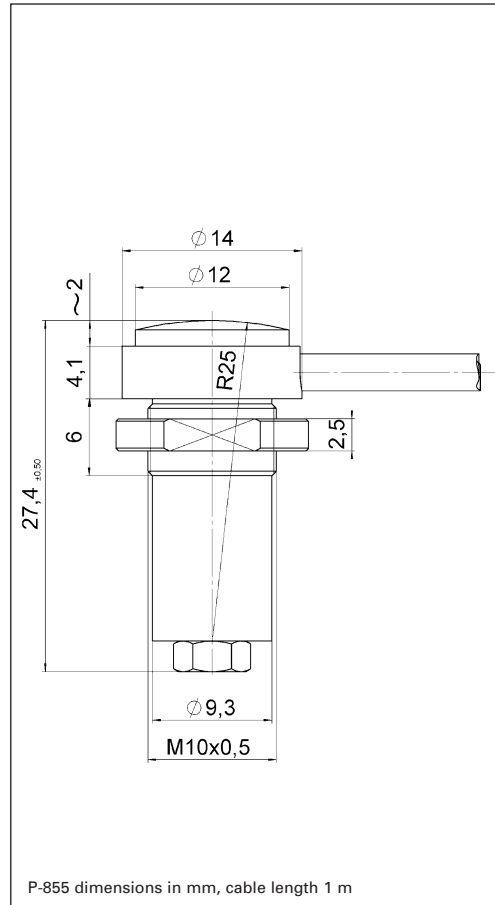
### Notes

See the "Piezo Drivers / Servo Controllers" (see p. 2-99 ff) section for our comprehensive line of low-noise modular and OEM control electronics for computer and manual control.

Read details in Mounting and Handling Guidelines (p. 1-67).

### Ordering Information

**P-855.20**  
Piezo Actuator for Micrometer Drive



P-855 dimensions in mm, cable length 1 m

### Technical Data

Model	P-855.20	Tolerance
Open-loop travel @ -20 to 120 V	20 $\mu\text{m}$	$\pm 20\%$
*Open-loop resolution	0.2 nm	
**Static large-signal stiffness	48 N/ $\mu\text{m}$	$\pm 20\%$
Push / pull force capacity	100 / 5 N	
Operating voltage range	-20 to 120 V	
Piezo ceramic type	PICMA <sup>®</sup>	
Electrical capacitance	1.5 $\mu\text{F}$	$\pm 20\%$
Dynamic operating current coefficient (DOCC)	12.5 $\mu\text{A}/(\text{Hz} \cdot \mu\text{m})$	
Unloaded resonant frequency	18 kHz	$\pm 20\%$
Operating temperature range	-40 bis +80 $^{\circ}\text{C}$	
Voltage connection	VL	
Mass	28 g	$\pm 5\%$
Recommended amplifier	E-610 (p. 2-110) E-500 System (p. 2-142)	

\*Resolution of piezo actuators is not limited by friction or stiction.  
Noise equivalent motion with E-505 amplifier  
\*\*Dynamic small-signal stiffness ~50% higher

### Linear Actuators & Motors

PiezoWalk<sup>®</sup> Motors / ActuatorsPILine<sup>®</sup> Ultrasonic Motors

DC-Servo &amp; Stepper Actuators

### Piezo Actuators & Components

Guided / Preloaded Actuators

Unpackaged Stack Actuators

Patches/Benders/Tubes/Shear...

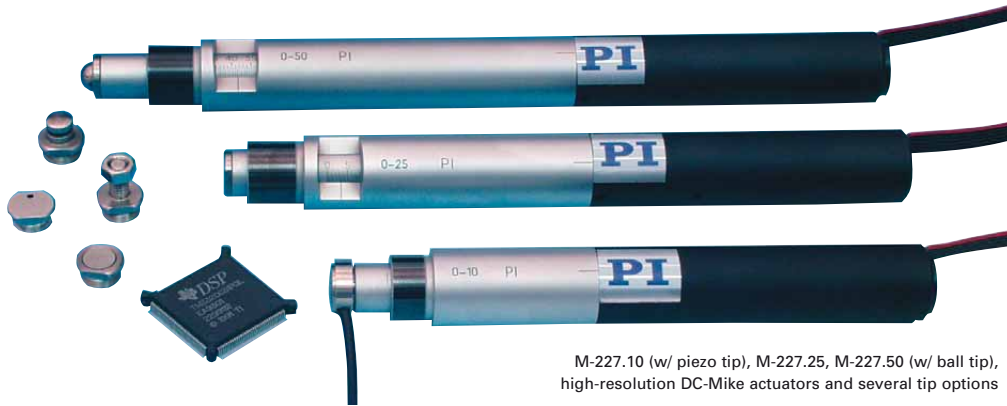
Nanopositioning / Piezoelectrics

Nanometrology

Micropositioning

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## M-227 DC-Mike High-Resolution Linear Actuator Non-Rotating Tip, Long Stroke to 50 mm



M-227.10 (w/ piezo tip), M-227.25, M-227.50 (w/ ball tip), high-resolution DC-Mike actuators and several tip options

### Ordering Information

- M-227.10**  
High-Resolution DC-Mike Linear Actuator, 10 mm
- M-227.25**  
High-Resolution DC-Mike Linear Actuator, 25 mm
- M-227.50**  
High-Resolution DC-Mike Linear Actuator, 50 mm
- M-219.10**  
Ball Tip
- P-855.20**  
Piezo Actuator for Micrometer Drive

- Travel Ranges 10, 25 and 50 mm
- Min. Incremental Motion to 0.05  $\mu\text{m}$
- Non-Rotating Tip
- Closed-Loop DC-Motors
- Sub-nm Resolution with Optional PZT Drive
- MTBF >5,000 h

M-230 (see p. 1-46 ff), M-235 (see p. 1-50 ff) and M-238.

M-227 are ultra-high-resolution linear actuators providing linear motion up to 50 mm with sub-micron resolution in a compact package. They consist of a micrometer with non-rotating tip, driven by a closed-loop DC-motor/gearhead combination with motor-shaft-mounted high-resolution encoder. The combination of an extremely low stiction/friction construction and high-resolution encoder allows for a minimum incremental motion of 50 nanometers at speeds up to 1 mm/sec.

### Compact, High-Precision, Cost-Effective

M-227 actuators provide a cost-effective solution for industrial and OEM environments.

### Integrated Line Drivers

All actuators include an integral 0.5 m cable with 15-pin sub-D connector and come with a 3 m extension cable. On the DC servo versions, the connector features integrated line drivers for cable lengths up to 10 meters between actuator and controller.

### Non-Rotating Tip

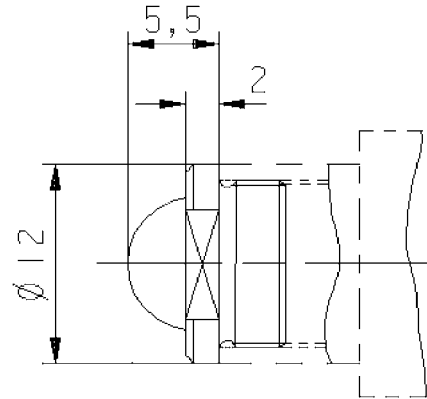
Compared to conventional rotating-tip micrometer drives, the non-rotating-tip design offers several advantages:

- Elimination of torque-induced positioning errors
- Elimination of sinusoidal motion errors
- Elimination of wear at the contact point
- Elimination of tip-angle-dependent wobble

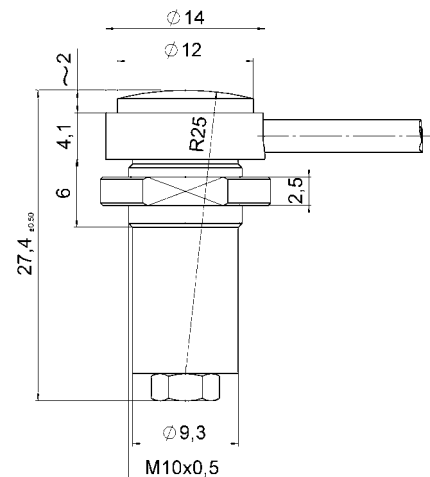
### High-Resolution Piezo Option

All models come with standard flat tips. A variety of other tips are also available, such as a piezoelectric tip featuring 20  $\mu\text{m}$  travel with sub-nanometer resolution for dynamic scanning and tracking see p. 1-73 and 1-58.

For higher loads and integrated limit switches refer to the



M-219.10 ball tip option



P-855.20 piezo tip option