M-227

High-Resolution DC-Mike Actuators

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

- **10, 25 & 50 mm Travel Ranges**
- **0.05 µm Minimum Incremental Motion**
- **Non-Rotating Tip**
- **Closed-Loop DC Motor**
- **Compatible with Leading Industrial Motion Controllers**
- **Sub-nm Resolution with Optional PZT Drive**
- **>5,000 Hours MTBF**

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 (2048 counts/ rev.).

Application Examples

- **Metrology**
- **Photonics packaging**
- **Fiber alignment**
- **Quality control**
- **Test equipment**

Ordering Information

M-227.10
DC-Mike Actuator, 10 mm

M-227.25
DC-Mike Actuator, 25 mm

M-227.50
DC-Mike Actuator, 50 mm

Custom Designs for Volume Buyers

Non-Rotating Tip

Compared to conventional rotating-tip micrometer drives the non-rotating-tip design offers several advantages; it eliminates:

- Torque-induced stage platform tilt
- Sinusoidal motion errors
- Wear at the contact point
- Tip-angle-dependent wobble

M-227 actuators provide a cost-effective solution for industrial and OEM environments. Based on the successful M-222/M-226 series which they replace, M-227 DC Mikes offer both improved specs and reduced costs. 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.

Integrated Line Drivers

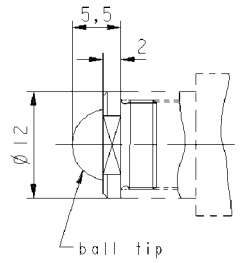
Each actuator includes an integrated 0.1 m cable with 15-pin sub-D connector and a 3 m extension cable. The connector features integrated line drivers for cable lengths up to 10 meters between actuator and controller.

High-Resolution Piezo Option

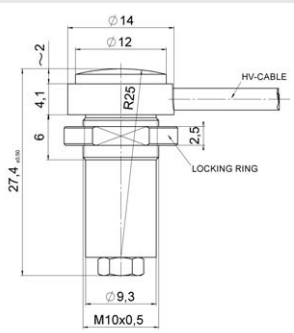
All models come with standard flat tips. A variety of other tips are also available, such as a piezoelectric tip featuring 20 µm travel with sub-nanometer resolution for dynamic scanning and tracking (see page 7-75).

For mounting, the DC-Mikes are clamped around the 19 mm diameter section. High forces around the 16 mm diameter section would increase friction and reduce accuracy. Such forces must be avoided, as must be lateral forces on the tip.

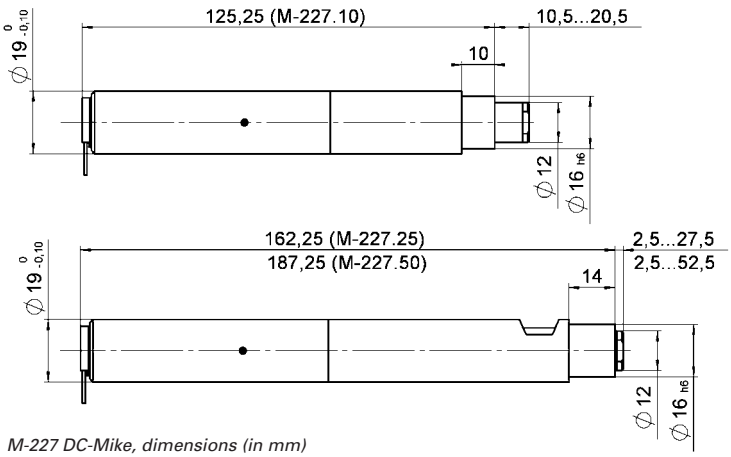
Stepper-motor-driven versions of the M-227 are available on request. For higher loads and integrated limit switches refer to the M-230 and M-235 (see pages 7-68 and 7-72).



M-219.10 ball tip option



P-250.20 piezo tip option



M-227 DC-Mike, dimensions (in mm)

Technical Data

Models	M-227.10	M-227.25	M-227.50	Units	Notes see p. 7-96
Travel range	10	25	50	mm	
Design resolution	0.0035	0.0035	0.0035	µm	A3
Min. incremental motion	0.05	0.05	0.05	µm	A4
Unidirectional repeatability	0.1	0.1	0.1	µm	
Backlash	2	2	2	µm	
Max. velocity	1	1	1	mm/sec	
Max. push/pull force*	40	40	40	N	
Max. lateral force	0.1	0.1	0.1	N (at tip)	
Encoder resolution	2048	2048	2048	Counts/rev.	
Drivescrew pitch	0.5	0.5	0.5	mm/rev.	
Gear ratio	69.12:1	69.12:1	69.12:1		
Nominal motor power	2	2	2	W	
Motor voltage range	0 to ±12	0 to ±12	0 to ±12	V	
Weight	0.16	0.22	0.26	kg	
Recommended motor controllers	C-842, C-844, C-860	C-842, C-844, C-860	C-842, C-844, C-860		D2

** Higher forces on request*