

## M-235

# Heavy-Duty High-Resolution Closed-Loop DC-Mike & Stepper Actuators



M-235.2DG (top) and M-235.5DG (bottom) high-resolution DC-Mike, ballscrew.

### Application Examples

- Quality control
- Test equipment
- Flexible automation
- Metrology
- Photonics packaging
- Fiber alignment

### Ordering Information

#### M-235.2DG

Heavy-Duty, High-Resolution DC-Mike Actuator, 20 mm, Ballscrew, Limit Switches

#### M-235.2DD

Heavy-Duty, High-Resolution DC-Mike Actuator, Direct Drive, 20 mm, Ballscrew, Limit Switches

#### M-235.22S

Heavy-Duty, High-Resolution Stepper-Mike Actuator, 20 mm, Ballscrew, Limit Switches

#### M-235.5DG

Heavy-Duty, High-Resolution DC-Mike Actuator, 50 mm, Ballscrew, Limit Switches

#### M-235.5DD

Heavy-Duty, High-Resolution DC-Mike Actuator, Direct Drive, 50 mm, Ballscrew, Limit Switches

#### M-235.52S

Heavy-Duty, High-Resolution Stepper-Mike Actuator, 50 mm, Ballscrew, Limit Switches

**Higher Speed M-235 versions on request**

**Custom Designs for Volume Buyers**

- **20 mm or 50 mm Travel Range**
- **0.1 µm Minimum Incremental Motion**
- **High-Speed Direct Drive Option**
- **120 N Push/Pull Load**
- **100 N Lateral Load Limit**
- **Preloaded Ultra-Low-Friction Ball Screw with Non-Rotating Tip**
- **Closed-Loop DC Motors and Stepper Motors**
- **Compatible with Leading Industrial Motion Controllers**
- **Integrated Hall-Effect Limit & Origin Switches**
- **>20,000 Hours MTBF**

The M-235 is an ultra-high-resolution linear actuator providing linear motion of up to 50 mm with sub-micron resolution in a compact package. It consists of a preloaded **ultra-low-friction, heavy-duty ballscrew** which is driven by a 2-phase stepper motor or a closed-loop DC motor with motor-shaft-mounted, high-resolution encoder (2048 counts/rev.).

### 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

M-235 actuators provide a cost-effective solution for heavy-duty industrial and OEM environments. They feature an extremely low stiction, low-friction construction, allowing for minimum incremental motion as low as 100 nanometers. The M-235.5DD version is equipped with a **direct drive motor for high-speed** positioning applications.

### Non-Contact Limit and Origin Switches

Integrated, non-contact, high-precision Hall-effect origin and limit switches, protect your equipment and increase versatility in automation applications.

### Integrated Line Drivers

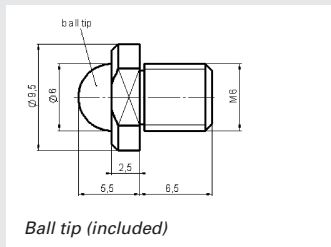
M-235 actuators with DC motors include an integral 0.5 m cable with 15-pin sub-D connector and a 3 m extension cable. The connector features integrated line drivers for cable lengths up to 10 meters between actuator and controller.

A screw-on ball tip and a flat tip are included.

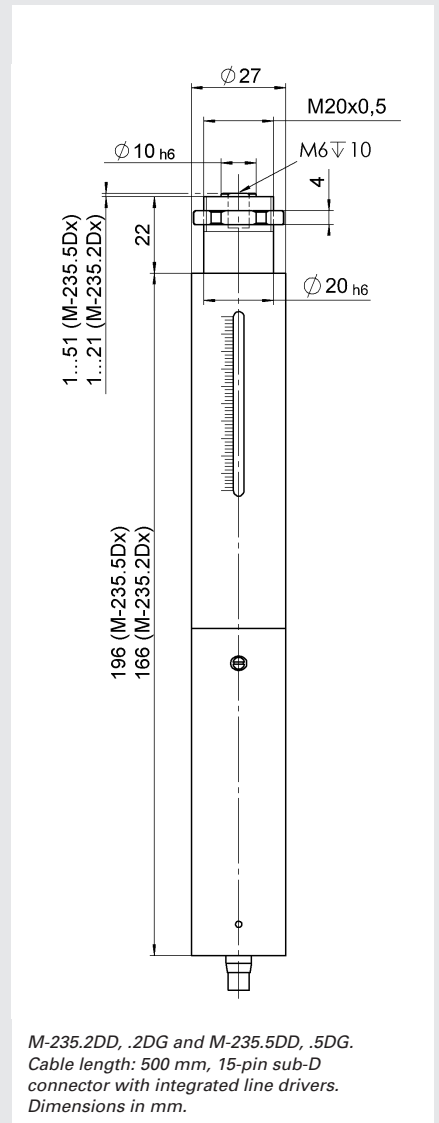
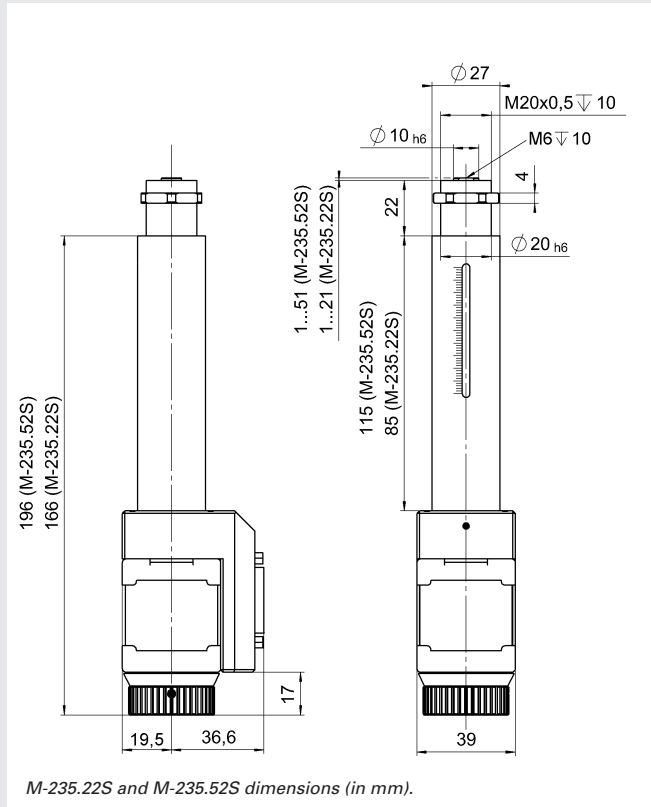
For smaller sizes and lower-duty applications, refer to the M-230, M-231, M-232 and M-227 and M-168 on pages 7-68, 7-70 and 7-74.



M-235.52S high-resolution Stepper-Mike, 50 mm travel range, ballscrew.



Ball tip (included)



## Technical Data

Technical Data Models	M-235.2DG	M-235.2DD	M-235.22S	M-235.5DG	M-235.5DD	M-235.52S	Units	Notes
Travel range	20	20	20	50	50	50	mm	
Design resolution	0.016	0.5	0.05	0.016	0.5	0.05	µm	A3
Min. incremental motion	0.1	0.5	0.1	0.1	0.5	0.1	µm	A4
Unidirectional repeatability	0.1	0.5	0.2	0.1	0.5	0.2	µm	
Bidirectional repeatability	1	1	1	1	1	1	µm	
Max. velocity	3	>30	20	3	>30	20	mm/sec	
Max. push/pull force	120	>50	100**	120	>50	100**	N	
Max. lateral force	100	100	100	100	100	100	N (at tip)	
Encoder resolution	2048	2048	-	2048	2048	-	counts/rev.	
Motor resolution	-	-	20000*	-	-	20000*	steps/rev.	
Ballscrew pitch	1	1	1	1	1	1	mm/rev.	
Gear ratio	29.6 : 1	-	-	29.6:1	-	-		
Nominal motor power	4	17	- *	4	17	-*	W	
Motor voltage range	0 to ±12	0 to ±12	24 *	0 to ±12	0 to ±12	24 *	V	
Origin and limit switches	Hall-Effect	Hall-Effect	Hall-Effect	Hall-Effect	Hall-Effect	Hall-Effect		
Mass	0.55	0.50	0.65	0.7	0.65	0.8	kg	
Recommended motor controllers	C-843, C-848, C-862	C-862	C-600, C-630	C-843, C-848, C-862	C-862	C-600, C-630		D2

\* 2-phase stepper, 24 V chopper voltage, max. 1.5 A / phase, 20,000 microsteps with C-600, C-630 controllers

\*\* at up to 10 mm/sec