

# High-Resolution Linear Actuator with DC and Stepper Motor

Nonrotating Tip, Limit Switches



## M-230

- Min. incremental motion 0.05  $\mu\text{m}$
- Travel ranges 10 and 25 mm
- Nonrotating end piece
- Velocity to 1.2 mm/s
- MTBF >20000 h

### Precision-class linear drive

High-resolution linear actuator. Position-controlled DC motors with a gearhead and high-resolution rotary encoders allow for incremental motion and repeatability of just 100 nm. Low-vibration 2-phase stepper motors with gearhead allow for smooth and accurate open-loop positioning.

### High-quality components

Extremely low-friction and backlash-free construction. Nonrotating end piece for uniform motion prevents wobble, torque, and wear at the point of contact. Includes flat and spherical end piece for decoupling of lateral and tilt forces. Noncontact limit switches protect the mechanical system. Closed-loop variants with differential encoder driver for a safe position signal transmission at distances up to 10 m.

### Application fields

Precision alignment, motorized alternative for micrometer screws.

## Specifications

Motion and positioning	M-230.10 / M-230.25	M-230.10S / M-230.25S	Unit	Tolerance
Travel range	10 / 25	10 / 25	mm	
Integrated sensor	Rotary encoder	-		
Sensor resolution	2048	-	Cts./rev.	
Design resolution	0.0046	0.037	μm	typ.
Minimum incremental motion	0.05	0.1	μm	typ.
Backlash	2	2	μm	typ.
Unidirectional repeatability	±0.1	±0.1	μm	typ.
Velocity	0.8	1.2	mm/s	max.
Reference switch repeatability	1	1	μm	typ.

Mechanical properties	M-230.10 / M-230.25	M-230.10S / M-230.25S	Unit	Tolerance
Drive screw	Leadscrew	Leadscrew		
Thread pitch	0.4	0.4	mm	
Gear ratio	42.92063:1	28.44444:1		
Motor resolution	-	384 <sup>(1)</sup>	steps/rev.	
Push/pull force	70	45 <sup>(2)</sup>	N	max.
Permissible lateral force	30 / 20	30 / 20	N	max.

Drive properties	M-230.10 / M-230.25	M-230.10S / M-230.25S	Unit	Tolerance
Motor type	DC gear motor	2-phase stepper motor <sup>(1)</sup>		
Operating voltage	0 to ±12	24	V	
Motor power	1.78	-	W	nominal
Reference and limit switches	Hall effect	Hall effect		

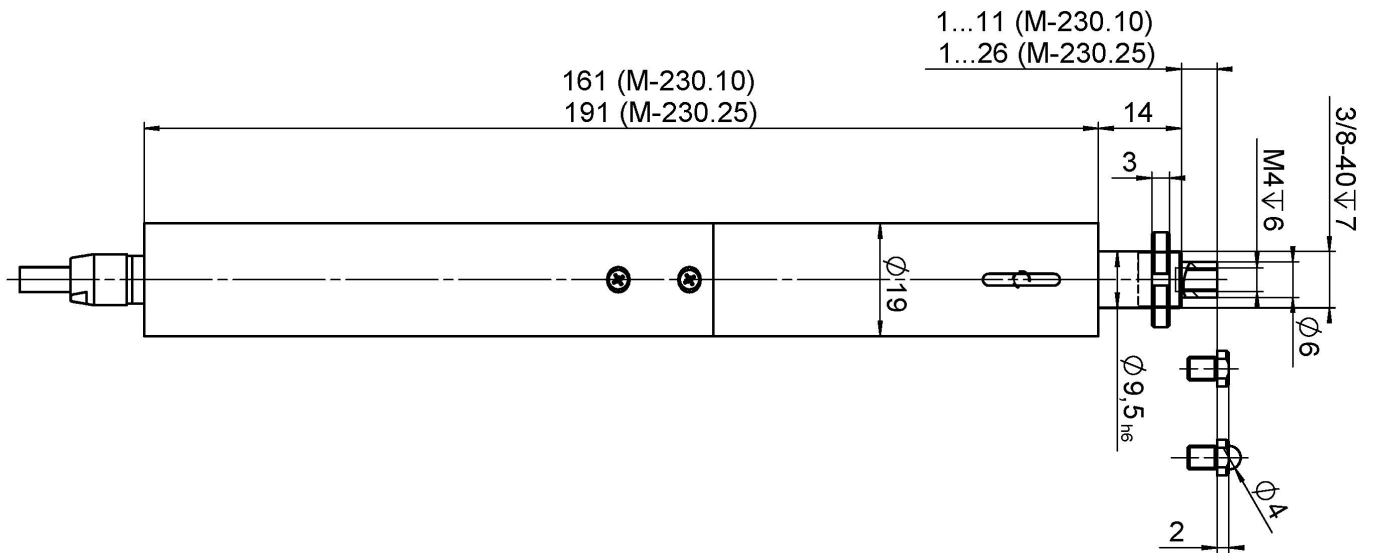
Miscellaneous	M-230.10 / M-230.25	M-230.10S / M-230.25S	Unit	Tolerance
Operating temperature range	-20 to 65	-20 to 65	°C	
Material	Anodized aluminum, chrome steel, brass	Anodized aluminum, chrome steel, brass		
Mass	0.3 / 0.35	0.3 / 0.35	kg	±5 %
Connector	D-sub 15 (m), incl. encoder driver; 3 m cable incl.	D-sub 15 (m), incl. 3 m cable		
Recommended controllers/drivers	C-863.11 C-884	C-663		

(1) Max. 0.25 A/phase, 24 full steps/rev., motor resolution with C-663 stepper motor controller.

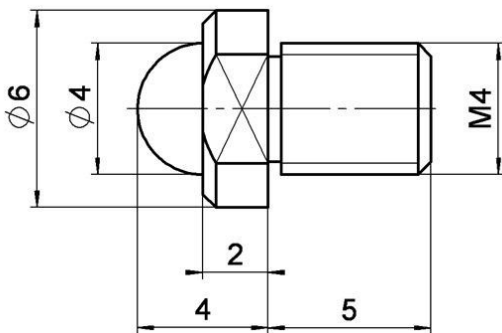
(2) At a velocity to 1 mm/s.

Ask about customized versions.

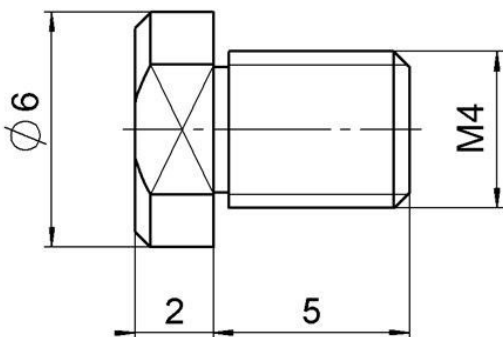
## Drawings / Images



M-230, dimensions in mm



Spherical tip (included)



Flat tip (included)

## Ordering Information

### **M-230.10**

High-resolution linear actuator with DC motor, 10 mm travel range, limit switches

### **M-230.25**

High-resolution linear actuator with DC motor, 25 mm travel range, limit switches

### **M-230.10S**

High-resolution linear actuator with stepper motor, 10 mm travel range, limit switches

### **M-230.25S**

High-resolution linear actuator with stepper motor, 25 mm travel range, limit switches