

High- Resolution Linear Actuator with DC Motor

HIGHLY DYNAMIC, HIGH FORCES UP TO 120 N



M-235

- + Travel ranges 20 and 50 mm
- + Min. incremental motion to 0.1 μm
- + Direct drive provides high velocities
- + Push / pull force capacity to 120 N
- + MTBF >10,000 h
- + Preloaded frictionless ball screw
- + Vacuum- compatible version down to 10^{-6} hPa

Reference- class linear drive

Combines high precision, high forces, and high dynamics. Vacuum- compatible versions to 10^{-6} hPa are available

High- quality components

Recirculating ball screw provides high velocity and long lifetime. 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. A direction- sensing reference point switch supports automation applications. Closed- loop variants with differential encoder driver for a safe position signal transmission at distances up to 10 mm

Motor variants

- Highly dynamic, closed- loop DC motors reach high velocities
- Position- controlled DC motors with a gearhead and high- resolution rotary encoders allow for incremental motion of just 100 nm
- Powerful and low- vibration 2- phase stepper motors allow for accurate positioning even without position control. With handwheel

Specifications

	M-235.2DG / M-235.5DG	M-235.2DD / M-235.5DD	M-235.22S / M-235.52S	Unit	Tolerance
	High resolution and force, DC gear motor	High dynamics	With stepper motor		
Motion and positioning					
Travel range	20 / 50	20 / 50	20 / 50	mm	
Integrated sensor	Rotary encoder	Rotary encoder	–		
Sensor resolution	2048	2048	–	cts./ rev.	
Design resolution	0.016	0.5	0.156	μm	typ.
Min. incremental motion	0.1	0.5	0.2	μm	typ.
Backlash	2	2	2	μm	typ.
Unidirectional repeatability	± 0.1	± 0.5	± 0.2	μm	typ.
Velocity	2.6	30	20	mm/ s	max.
Mechanical properties					
Gear ratio	29.6:1	–	–		
Motor resolution	–	–	6400*	steps/ rev.	
Push / pull force	120	50	100**	N	max.
Permissible lateral force	8	8	8	N	max.
Drive properties					
Motor type	DC motor, gearhead	DC motor	2- phase stepper motor*		

Operating voltage	0 to ±12	0 to ±12	24	V	
Electrical power	4	17	–	W	nominal
Limit and reference point switches	Hall- effect	Hall- effect	Hall- effect		
Miscellaneous					
Operating temperature range	-20 to 65	-20 to 65	-20 to 65	°C	
Material	Aluminum anodized, chrome steel				
Mass	0.55 / 0.7	0.5 / 0.65	0.65 / 0.8	kg	±5 %
Cable length	0.5 + 3 m extension cable (included)			m	±10 mm
Connector	15- pin sub- D, incl. encoder driver	15- pin sub- D, incl. encoder driver	Sub- D, 15- pin		
Recommended controller / driver	C-863 single- axis C-843 PCI board, for up to 4 axes	C-863 single- axis C-843 PCI board, for up to 4 axes	C-663 single- axis		

Specifications for vacuum versions can differ.
Ask about custom designs!

* 24 V chopper voltage, max. 0.8 A/ phase; 400 full steps/ rev., motor resolution with C-663 stepper motor controller.
** At a velocity of up to 10 mm/ s.

Order Information

M-235.2DD

High- PowerLinear Actuator, 20 mm, Ball Screw, Direct- Drive DC Motor

M-235.5DD

High- PowerLinear Actuator, 50 mm, Ball Screw, Direct- Drive DC Motor

M-235.2DG

High- PowerLinear Actuator, 20 mm, Ball Screw, DC Gear Motor

M-235.5DG

High- PowerLinear Actuator, 50 mm, Ball Screw, DC Gear Motor

M-235.22S

High- PowerLinear Actuator, 20 mm, Ball Screw, Stepper Motor

M-235.52S

High- PowerLinear Actuator, 50 mm, Ball Screw, Stepper Motor

Vacuum versions

M-235.2VD

High- PowerLinear Actuator, 20 mm, Ball Screw, Direct- Drive DC Motor, Vacuum Compatible to 10⁻⁶ hPa

M-235.5VD

High- PowerLinear Actuator, 50 mm, Ball Screw, Direct- Drive DC Motor, Vacuum Compatible to 10⁻⁶ hPa

M-235.2VG

High- PowerLinear Actuator, 20 mm, Ball Screw, DC Gear Motor, Vacuum Compatible to 10⁻⁶ hPa

M-235.5VG

High- PowerLinear Actuator, 50 mm, Ball Screw, DC Gear Motor, Vacuum Compatible to 10⁻⁶ hPa

Ask about custom designs!

Controllers / Drivers / Amplifiers

[C-863 Mercury Servo Controller](#)

[C-884 Four Axis Motion Controller](#)

[C-663 Mercury Step Controller](#)

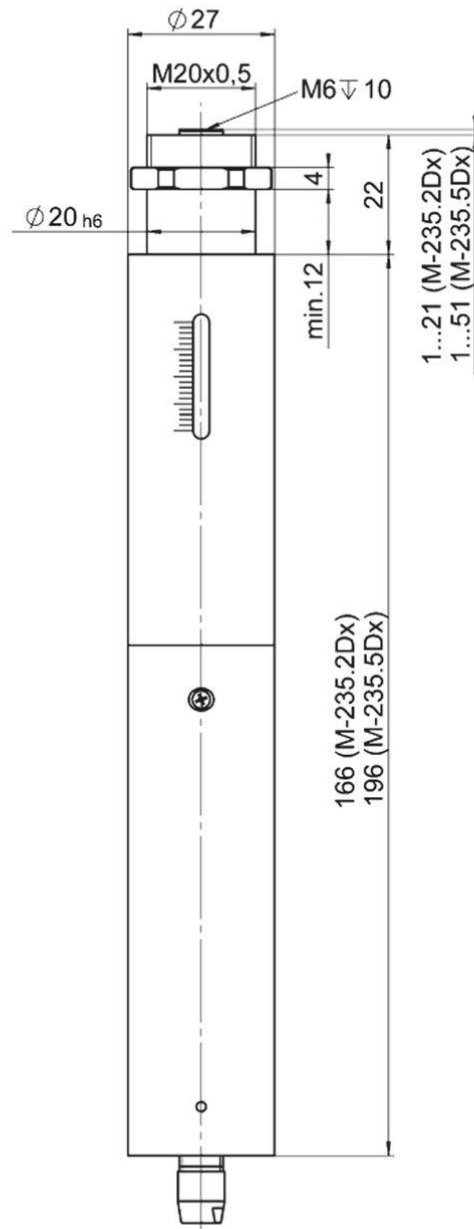
Related Products

[M-228 • M-229 High- Resolution Linear Actuator with Stepper Motor](#)

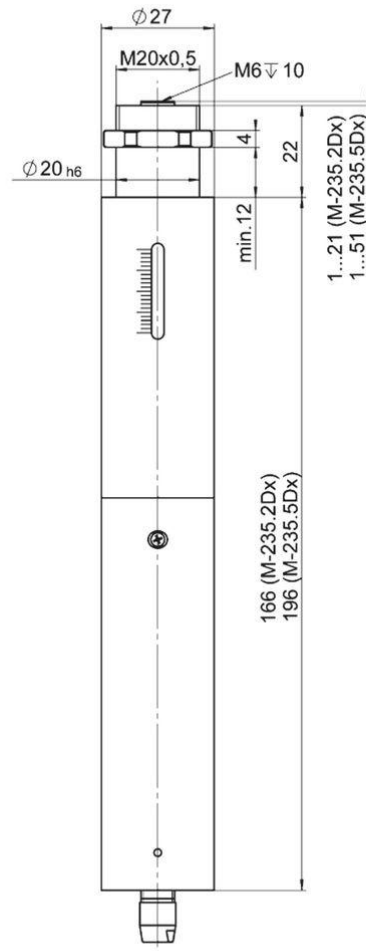
[M-230 High- Resolution Linear Actuator with DC and Stepper Motor](#)

[M-238 High- Load Linear Actuator with DC Motor](#)

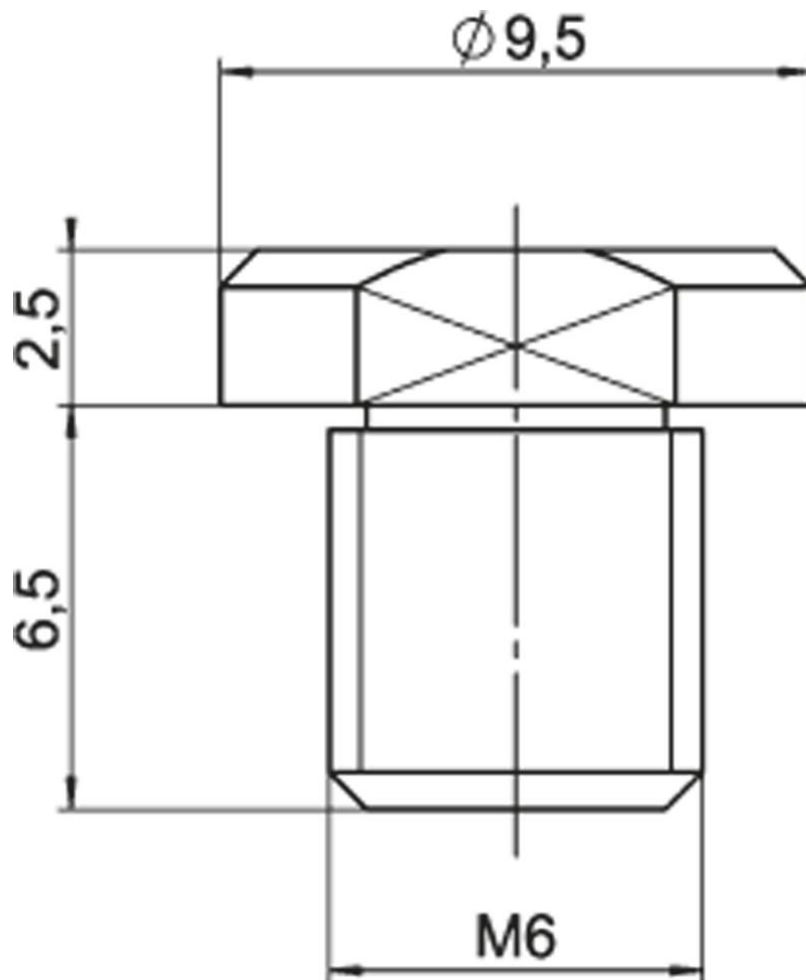
Drawings / Images

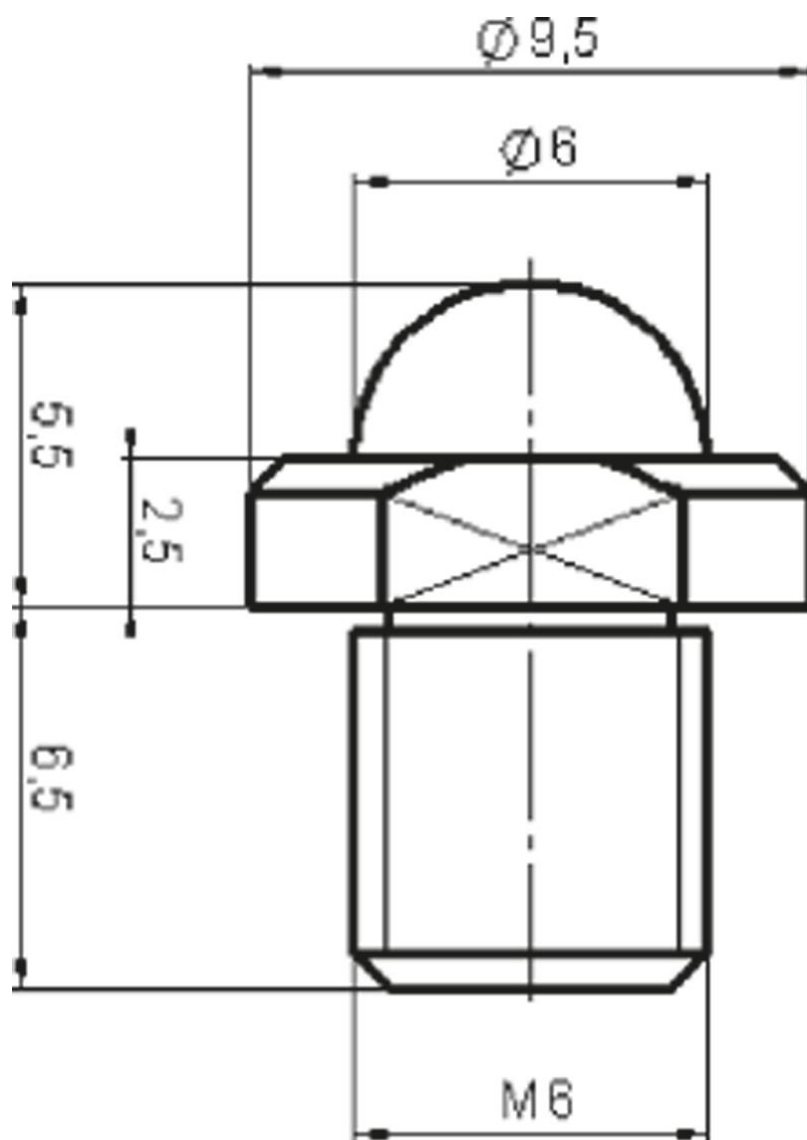


M-235.2DD,
M-235.2DG,
M-235.5DD and
M-235.5DG,
dimensions in mm



Flat end piece
(included)





Ball tip
(included)



M-235.22S stepper
motor direct drive and
handwheel, 20 mm
travel