

# Precision Linear Stage

High Cycle Number, Inexpensive



## M-404

- Inexpensive cost-optimized design for precise positioning
- Travel ranges from 25 mm to 200 mm
- Resolution to 0.012  $\mu\text{m}$
- Min. incremental motion to 0.1  $\mu\text{m}$
- Ball screw for high velocities and number of cycles
- Heavier loads with M-413 and M-414

### Application fields

Measuring technology, alignment.

### Specifications

	M-404.1PD M-404.2PD M-404.4PD M-404.6PD M-404.8PD	M-404.1DG M-404.2DG M-404.4DG M-404.6DG M-404.8DG	M-404.12S M-404.22S M-404.42S M-404.62S M-404.82S	Unit	Tolerance
Active axes	with ActiveDrive X	with DC gear motor X	with stepper motor X		

Motion and positioning	M-404.1PD M-404.2PD M-404.4PD M-404.6PD M-404.8PD	M-404.1DG M-404.2DG M-404.4DG M-404.6DG M-404.8DG	M-404.12S M-404.22S M-404.42S M-404.62S M-404.82S	Unit	Tolerance
Travel range	25 / 50 / 100 / 150 / 200	25 / 50 / 100 / 150 / 200	25 / 50 / 100 / 150 / 200	mm	
Integrated sensor	Rotary encoder	Rotary encoder	-		
Sensor resolution	4000	2000	-	Cts./rev.	
Design resolution	0.25	0.012	0.16	$\mu\text{m}$	typ.
Minimum incremental motion	0.25	0.1	0.2	$\mu\text{m}$	typ.
Backlash	0.5	2	2	$\mu\text{m}$	typ.
Unidirectional repeatability	0.5	1	1	$\mu\text{m}$	typ.

Motion and positioning	M-404.1PD M-404.2PD M-404.4PD M-404.6PD M-404.8PD	M-404.1DG M-404.2DG M-404.4DG M-404.6DG M-404.8DG	M-404.12S M-404.22S M-404.42S M-404.62S M-404.82S	Unit	Tolerance
Pitch	75	75	75	μrad	typ. over 100 mm
Yaw	75	75	75	μrad	typ. over 100 mm
Velocity	50	1.5	3	mm/s	max.
Reference switch repeatability	1	1	1	μm	typ.

Mechanical properties	M-404.1PD M-404.2PD M-404.4PD M-404.6PD M-404.8PD	M-404.1DG M-404.2DG M-404.4DG M-404.6DG M-404.8DG	M-404.12S M-404.22S M-404.42S M-404.62S M-404.82S	Unit	Tolerance
Drive screw pitch	1	1	1	mm	
Gear ratio	–	2704:63	-		
Motor resolution	–	–	6400 <sup>(1)</sup>	steps/rev	
Stiffness in motion direction	3	3	3	N/μm	±20 %
Load capacity <sup>(2)</sup>	200	200	200	N	max.
Push/pull force	50	50	50	N	max.
Lateral force	100	100	100	N	max.

Drive properties	M-404.1PD M-404.2PD M-404.4PD M-404.6PD M-404.8PD	M-404.1DG M-404.2DG M-404.4DG M-404.6DG M-404.8DG	M-404.12S M-404.22S M-404.42S M-404.62S M-404.82S	Unit	Tolerance
Drive type	DC motor, ActiveDrive	DC gear motor	2-phase stepper motor <sup>(1)</sup>		
Operating voltage	24	0 to ±12	24	V	
Motor power	26	2.5	4.8	W	nominal

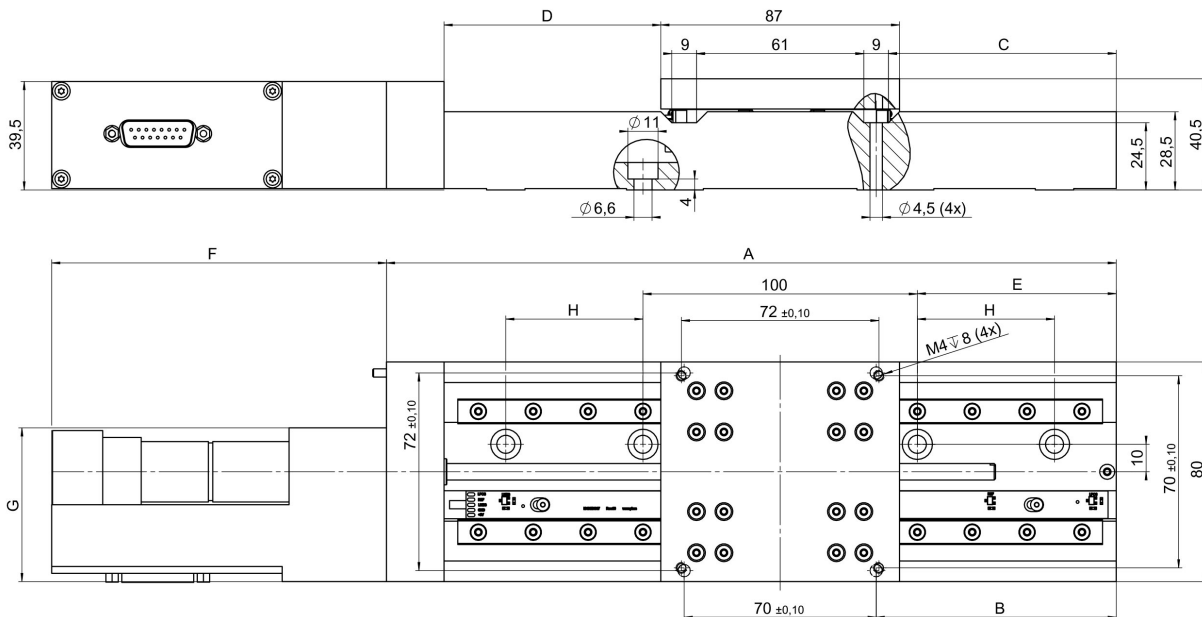
Miscellaneous	M-404.1PD M-404.2PD M-404.4PD M-404.6PD M-404.8PD	M-404.1DG M-404.2DG M-404.4DG M-404.6DG M-404.8DG	M-404.12S M-404.22S M-404.42S M-404.62S M-404.82S	Unit	Tolerance
Operating temperature range	-20 to 65 °C	-20 to 65 °C	-20 to 65 °C		
Material	Al (black anodized)	Al (black anodized)	Al (black anodized)		
Mass	1.8 / 1.9 / 2.2 / 2.3 / 2.6	1.8 / 1.9 / 2.2 / 2.3 / 2.6	1.8 / 1.9 / 2.2 / 2.3 / 2.6	kg	±5 %
Connector	D-sub 15 (m), incl. 3 m cable	D-sub 15 (m), incl. 3 m cable	D-sub 15 (m), incl. 3 m cable		
Recommended controllers/drivers	C-863.11 C-884	C-863.11 C-884	C-663		

(1) Max. 0.85 A/phase; 400 full steps/rev., motor resolution with C-663 stepper motor controller.

(2) Max. possible normal load capacity, centered, vertical load (linear stage horizontal).

Ask about customized versions.

## Drawings / Images



	M-403.1xx M-404.1xx	M-403.2xx M-404.2xx	M-403.4xx M-404.4xx	M-403.6xx M-404.6xx	M-403.8xx M-404.8xx
A	141	166	216	266	316
B	25	37.5	62.5	87.5	112.5
C	20.5	33	58	83	108
D	16.5 ( $\pm 12.5$ )	29 ( $\pm 25$ )	54 ( $\pm 50$ )	79 ( $\pm 75$ )	104 ( $\pm 100$ )
E	10	22.5	47.5	72.5	97.5
H	x	x	x	50	75

	M-403.xPD	M-403.xDG		M-404.xPD	M-404.xDG
F	114	119.5	F	114	128.5
G	59.5	56	G	59.5	56

M-403 and M-404, dimensions in mm

## Ordering Information

### M-404.1PD

Precision linear stage, ballscrew, width 80 mm, 25 mm travel range, ActiveDrive

### M-404.2PD

Precision linear stage, ballscrew, width 80 mm, 50 mm travel range, ActiveDrive

### M-404.4PD

Precision linear stage, ballscrew, width 80 mm, 100 mm travel range, ActiveDrive

### M-404.6PD

Precision linear stage, ballscrew, width 80 mm, 150 mm travel range, ActiveDrive

### M-404.8PD

Precision linear stage, ballscrew, width 80 mm, 200 mm travel range, ActiveDrive

### M-404.1DG

Precision linear stage, ballscrew, width 80 mm, 25 mm travel range, DC gear motor

### M-404.2DG

Precision linear stage, ballscrew, width 80 mm, 50 mm travel range, DC gear motor

### M-404.4DG

Precision linear stage, ballscrew, width 80 mm, 100 mm travel range, DC gear motor

**M-404.6DG**

Precision linear stage, ballscrew, width 80 mm, 150 mm travel range, DC gear motor

**M-404.8DG**

Precision linear stage, ballscrew, width 80 mm, 200 mm travel range, DC gear motor

**M-404.12S**

Precision linear stage, ballscrew, width 80 mm, 25 mm travel range, stepper motor

**M-404.22S**

Precision linear stage, ballscrew, width 80 mm, 50 mm travel range, stepper motor

**M-404.42S**

Precision linear stage, ballscrew, width 80 mm, 100 mm travel range, stepper motor

**M-404.62S**

Precision linear stage, ballscrew, width 80 mm, 150 mm travel range, stepper motor

**M-404.82S**

Precision linear stage, ballscrew, width 80 mm, 200 mm travel range, stepper motor