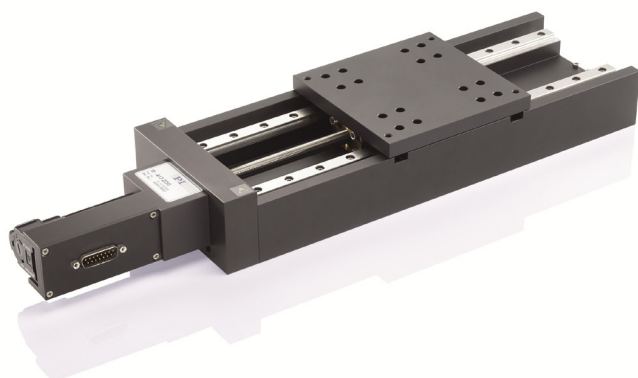


# High-Load Linear Stage

Inexpensive, Reliable, Precise



## M-413

- Very inexpensive, robust models
- Flexible modular system M-403, M-404, M-413, M-414
- Travel ranges from 100 to 300 mm
- Resolution to 0.018  $\mu\text{m}$
- Preloaded precision leadscrew
- Min. incremental motion 0.2  $\mu\text{m}$

### Application fields

Measuring technology, alignment.

### Specifications

	M-413.1PD M-413.2PD M-413.3PD	M-413.1DG M-413.2DG M-413.3DG	M-413.12S M-413.22S M-413.32S	Unit	Tolerance
Active axes	with ActiveDrive X	with DC gear motor X	with stepper motor X		
Motion and positioning	M-413.1PD M-413.2PD M-413.3PD	M-413.1DG M-413.2DG M-413.3DG	M-413.12S M-413.22S M-413.32S	Unit	Tolerance
Travel range	100 / 200 / 300	100 / 200 / 300	100 / 200 / 300	mm	
Integrated sensor	Rotary encoder	Rotary encoder	-		
Sensor resolution	4000	2000	-	Cts./rev.	
Design resolution	0.25	0.018	0.16	$\mu\text{m}$	typ.
Minimum incremental motion	0.25	0.2	0.2	$\mu\text{m}$	typ.
Backlash	6	10	6	$\mu\text{m}$	typ.
Unidirectional repeatability	1	1	1	$\mu\text{m}$	typ.
Pitch / yaw <sup>(1)</sup>	300	300	300	$\mu\text{rad}$	typ. over 100 mm

Motion and positioning	M-413.1PD M-413.2PD M-413.3PD	M-413.1DG M-413.2DG M-413.3DG	M-413.12S M-413.22S M-413.32S	Unit	Tolerance
Velocity	10 <sup>(2)</sup>	2.5	3	mm/s	max.
Reference switch repeatability	1	1	1	µm	typ.

Mechanical properties	M-413.1PD M-413.2PD M-413.3PD	M-413.1DG M-413.2DG M-413.3DG	M-413.12S M-413.22S M-413.32S	Unit	Tolerance
Drive screw pitch	1	1	1	mm	
Gear ratio	–	2304:81	-		
Motor resolution	-	-	6400 <sup>(3)</sup>	Steps/rev	
Stiffness in motion direction	3.5	3.5	3.5	N/µm	±20 %
Load capacity	500	500	500	N	max.
Push/pull force	50	50	50	N	max.
Lateral force	200	200	200	N	max.

Drive properties	M-413.1PD M-413.2PD M-413.3PD	M-413.1DG M-413.2DG M-413.3DG	M-413.12S M-413.22S M-413.32S	Unit	Tolerance
Drive type	DC motor, ActiveDrive	DC gear motor	2-phase stepper motor <sup>(3)</sup>		
Operating voltage	24	0 to ±12	24	V	
Motor power	70	3.6	4.8	W	nominal

Miscellaneous	M-413.1PD M-413.2PD M-413.3PD	M-413.1DG M-413.2DG M-413.3DG	M-413.12S M-413.22S M-413.32S	Unit	Tolerance
Operating temperature range	-20 to 65	-20 to 65	-20 to 65	°C	
Material	Al (black anodized)	Al (black anodized)	Al (black anodized)		
Mass	4.4 / 5.4 / 6.6	4.2 / 5.2 / 6.4	4.4 / 5.4 / 6.6	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		

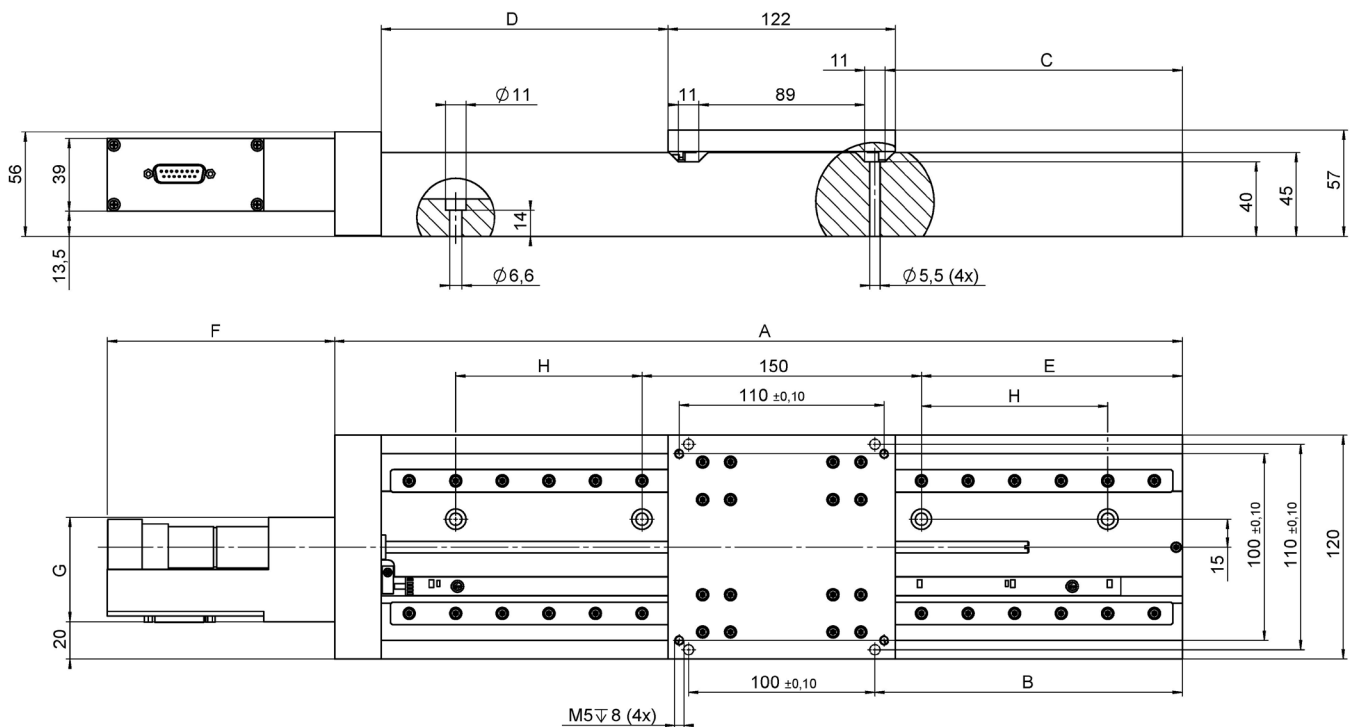
(1) This value applies to 100 mm respectively for travel ranges greater than 100 mm.

(2) Recommended velocity

(3) 24 V chopper voltage, max. 0.8 A/phase; 400 full steps/rev., motor resolution with C-663 stepper motor controller.

Ask about customized versions.

## Drawings / Images



	M-413/414.1xx	M-413/414.2xx	M-413/414.3xx
A	255	355	455
B	65	115	165
C	59,5	109,5	159,5
D	54 (±50)	104 (±100)	154 (±150)
E	40	90	140
H	x	x	100

also valid for M-414.xxx

	M-413/414.xPD	M-413.xDG	M-414.xDG	M-413/414.x2s
F	120	122	133	105,5
G	59,5	56	59,5	59,5

M-413 and M-414, dimensions in mm

## Ordering Information

### M-413.1PD

High-load linear stage, leadscrew, 120 mm width, 100 mm travel range, ActiveDrive

### M-413.2PD

High-load linear stage, leadscrew, 120 mm width, 200 mm travel range, ActiveDrive

### M-413.3PD

High-load linear stage, leadscrew, 120 mm width, 300 mm travel range, ActiveDrive

### M-413.1DG

High-load linear stage, leadscrew, 120 mm width, 100 mm travel range, DC gear motor

### M-413.2DG

High-load linear stage, leadscrew, 120 mm width, 200 mm travel range, DC gear motor

### M-413.3DG

High-load linear stage, leadscrew, 120 mm width, 300 mm travel range, DC gear motor

**M-413.12S**

High-load linear stage, leadscrew, 120 mm width, 100 mm travel range, stepper motor

**M-413.22S**

High-load linear stage, leadscrew, 120 mm width, 200 mm travel range, stepper motor

**M-413.32S**

High-load linear stage, leadscrew, 120 mm width, 300 mm travel range, stepper motor