M-505 Linear Slide

Low-Profile Linear Stages with Ballscrew Drives


M-505 translation stages with ballscrew drives

- **Travel Ranges to 150 mm (6")**
- **Velocity up to 50 mm/sec.**
- **ActiveDrive™ Motors**
- **Compatible with Leading Industrial Motion Controllers**
- **Stress-Relieved Aluminum Stage Base for Highest Stability**
- **Zero-Backlash Recirculating Ballscrews**
- **Non-Contact Direction-Sensing Origin Switch**
- **Non-Contact Limit Switches**
- **Load Capacity 100 kg**
- **>20,000 Hours MTBF**

The new M-505 family of translation stages is based on the successful M-510 series. These new stages provide one of the lowest profiles on the market of high-performance translation stages, making them ideally suited for applications where space is limited. The stages feature a precision-machined base of high-density, stress-relieved aluminum for exceptional stability and minimum weight. Precision-ground recirculating ballscrews (better accuracy than rolled ballscrews) with preloaded nuts provide low-friction, maintenance-free and backlash-free positioning.

Application Examples

- Photonics packaging
- Quality control
- Semiconductor test equipment
- Metrology
- Disk drive test assemblies
- R&D

Maintenance Free

High-precision linear guiding rails with recirculating ball bearings guarantee 1 µm / 100 mm straightness and flatness. They are also immune to cage migration problems of crossed roller bearings (can be an issue where small ranges are scanned repeatedly) and are maintenance free.

Three motor drives are currently available:

Models M-505.xPD with ActiveDrive™

This version features a direct-coupled motor/encoder providing 0.25 µm minimum incremental motion and a max. velocity of 50 mm/sec. For superior dynamic performance, we integrated our unsurpassed ActiveDrive™ system. This unique design features a high-efficiency PWM servo-amplifier mounted side-by-side with the motor. It provides several decisive advantages:

- Increased efficiency, by eliminating power losses between the amplifier and motor
- Reduced cost of ownership and improved reliability because no external driver is required
- Elimination of PWM amplifier noise radiation, because the amplifier and motor are mounted together in the same electrically shielded case

Models M-505.xDG are equipped with 3-watt DC motors with zero-backlash gearhead and shaft-mounted optical encoders (2048 counts / rev.). The gear ratio is 29.6:1, providing minimum incremental motion of 50 nanometers (design resolution 17 nm).

Models M-505.x2S are equipped with direct-drive, microstepped, 2-phase, stepper motors (20,000 counts/rev.) providing 0.1 µm minimum incremental motion and ultra-smooth, vibration-free positioning.

Direction-Sensing Origin Switch

Integrated, high-precision, non-contact Hall-effect origin and limit switches with direction sensing on the origin switch protect your equipment and increase versatility in automation applications.

Ordering Information

M-505.1DG
Translation Stage, 25 mm, DC Motor / Gearhead

M-505.1PD
Translation Stage, 25 mm, ActiveDrive™ DC Motor

M-505.1S2
Translation Stage, 25 mm, 2-Phase Stepper Motor

M-505.2DG
Translation Stage, 50 mm, DC Motor / Gearhead

M-505.2PD
Translation Stage, 50 mm, ActiveDrive™ DC Motor

M-505.2S2
Translation Stage, 50 mm, 2-Phase Stepper Motor

M-505.4DG
Translation Stage, 100 mm, DC Motor / Gearhead

M-505.4PD
Translation Stage, 100 mm, ActiveDrive™ DC Motor

M-505.4S2
Translation Stage, 100 mm, 2-Phase Stepper Motor

M-505.6DG
Translation Stage, 150 mm, DC Motor / Gearhead

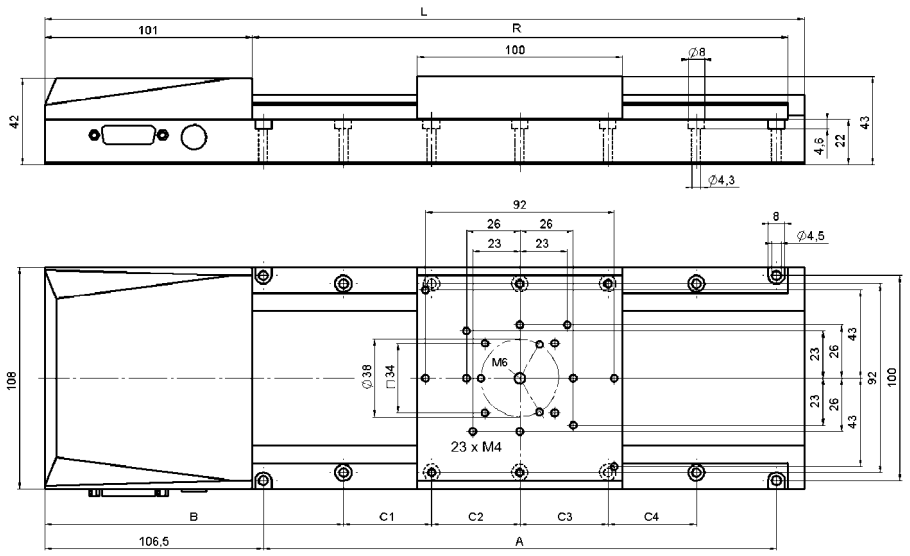
M-505.6PD
Translation Stage, 150 mm, ActiveDrive™ DC Motor

M-505.6S2
Translation Stage, 150 mm, 2-Phase Stepper Motor

Ask about custom designs!

Notes

See "Accessories", page 7-92 *ff.* for adapters, brackets, etc.



	L	R	A	B	C1	C2	C3	C4
M-505.1xx	245	136	125	126	86	-----	-----	-----
M-505.2xx	270	161	150	138,5	86	-----	-----	-----
M-505.4xx	320	211	200	163,5	43	43	-----	-----
M-505.6xx	370	261	250	145,5	43	43	43	43

M-505 dimensions (in mm). C-815.38 motor cable included: 3 m, sub-D, 15/15 pin (m/f).

Technical Data

Models	M-505.1PD	M-505.1DG	M-505.1S2	M-505.2PD	M-505.2DG	M-505.2S2	M-505.4PD	M-505.4DG	M-505.4S2	M-505.6PD	M-505.6DG	M-505.6S2	Units[#]
Travel range	25	25	25	50	50	50	100	100	100	150	150	150	mm
Design resolution	0.25	0.017	0.05	0.25	0.017	0.05	0.25	0.017	0.05	0.25	0.017	0.05	µm
Min. incremental	0.25	0.05	0.1	0.25	0.05	0.1	0.25	0.05	0.1	0.25	0.05	0.1	µm
Unidirectional	0.25	0.1	0.1	0.25	0.1	0.1	0.25	0.1	0.1	0.25	0.1	0.1	µm
Bidirectional	1	1	1	1	1	1	1	1	1	1	1	1	µm
Accuracy per 25 mm	1	1	1	1	1	1	1	1	1	1	1	1	µm
Straightness	1	1	1	1	1	1	1	1	1	1	1	1	µm
Flatness	1	1	1	1	1	1	1	1	1	1	1	1	µm
Pitch (θ_y)	50	50	50	50	50	50	50	50	50	50	50	50	µrad
Yaw (θ_Z)	50	50	50	50	50	50	50	50	50	50	50	50	µrad
Max. velocity	50	3	10	50	3	10	50	3	10	50	3	10	mm/s
Max. normal	100	100	100	100	100	100	100	100	100	100	100	100	kg
Max. push/pull force	50 / 50	50 / 50	50 / 50	50 / 50	50 / 50	50 / 50	50 / 50	50 / 50	50 / 50	50 / 50	50 / 50	50 / 50	N
Max. lateral force	200	200	200	200	200	200	200	200	200	200	200	200	N
Encoder resolution	4000	2048	-	4000	2048	-	4000	2048	-	4000	2048	-	counts/rev.
Motor resolution	-	-	20,000**	-	-	20,000**	-	-	20,000**	-	-	20,000**	steps/rev.
Ballscrew pitch	1	1	1	1	1	1	1	1	1	1	1	1	mm/rev.
Gear ratio	-	(28/12)^4 :1 ≈29.6:1	-	-	(28/12)^4 :1 ≈29.6:1	-	-	(28/12)^4 :1 ≈29.6:1	-	-	(28/12)^4 :1 ≈29.6:1	-	
Nominal motor power	17*	3	- **	17*	3	- **	17*	3	- **	17*	3	- **	W
Motor voltage	24	12	24 **	24	12	24 **	24	12	24 **	24	12	24 **	V
Weight	1.5	1.5	1.5	1.8	1.8	1.8	2.5	2.5	2.5	3.2	3.2	3.2	kg
Body material	Al	Al	Al	Al	Al	Al	Al	Al	Al	Al	Al	Al	
Recommended motor controller	C-843, C-848, C-862	C-843, C-848, C-862	C-600, C-630	C-843, C-848, C-862	C-843, C-848, C-862	C-600, C-630	C-843, C-848, C-862	C-843, C-848, C-862	C-600, C-630	C-843, C-848, C-862	C-843, C-848, C-862	C-600, C-630	

* ActiveDrive™ (integrated PWM servo-amplifier), 24 V power supply included;
** 2-phase stepper, 24 V chopper voltage, max. 0.8 A / phase, 20,000 microsteps with C-600, C-630 controllers
[#] See page 7-106 for notes and explanations.