

# M-110.2 · M-111.2 · M-112.2

## High-Resolution Micro-Translation Linear Stage with Ballscrew Drive



M-112.2DG, M-111.2DG, M-110.2DG  
(from front to back) providing 25 mm,  
15 mm and 5 mm travel range

- 5 to 25 mm Travel Ranges
- 5000 h MTBF
- Very Cost Effective
- 200 nm Minimum Inc. Motion
- Hall-Effect Limit & Reference Switches
- Recirculating Ballscrew for Extended Lifetime

M-110, M-111 and M-112 are high-resolution motorized translation stages providing linear motion of 5 mm, 15 mm and 25 mm.

### Small Size, High Performance

A major appeal of these stages is their small form factor in which they feature precision linear ball bearings for flatness and straightness of <0.5 microns over 15 mm. A miniature DC or stepper motor

drives the platform via a backlash-compensated ballscrew system and gearhead. To meet the most critical positioning demands, the DC motor is equipped with a high-resolution encoder featuring resolution of 8.5 nm per count. The combination of the extremely low stiction/friction design and high-resolution encoder allows minimum incremental motion of 0.2  $\mu$ m and speeds to 2 mm/sec.

### 24 Hours a Day—7 Days a Week: 24/7 Duty Cycles

To meet industrial demands, the M-110.2, M-111.2 and M-112.2 linear translation stages are equipped with a recirculating ballscrew instead of a leadscrew for precise motion with reduced friction. This allows 24/7 duty cycles. To protect your investment, integrated non-contact Hall-effect limit and reference switches with

direction sensing are standard. The connector on the DC-servo versions features integrated line drivers for cable lengths up to 10 meters between actuator and controller.

### Low Cost of Ownership

As mentioned before, these compact PI stages are extremely cost effective in industrial applications. The combination of the M-11x.2DG and the networkable C-862 Mercury™ single channel servo controller/driver offers high performance for a very competitive price in both single and multi-axis configurations.

### Notes

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

### Ordering Information

**M-110.2DG**  
Micro-Translation Stage, 5 mm, Closed-Loop DC Motor, Ballscrew

**M-111.2DG**  
Micro-Translation Stage, 15 mm, Closed-Loop DC Motor, Ballscrew

**M-112.2DG**  
Micro-Translation Stage, 25 mm, Closed-Loop DC Motor, Ballscrew

**M-110.22S**  
Micro-Translation Stage, 5 mm, Stepper Motor, Ballscrew

**M-111.22S**  
Micro-Translation Stage, 15 mm, Stepper Motor, Ballscrew

**M-112.22S**  
Micro-Translation Stage, 25 mm, Stepper Motor, Ballscrew

**Adaptors and Angle Brackets:**  
Same as for Leadscrew Versions M-110.1/M-111.1/M-112.1.

**Ask about custom designs!**



XYZ combination of three M-111 stages, with M-110.02 Z axis  
mounting bracket and M-105.NC mounting bracket.

### Application Examples

- Micromachining
- Photonics packaging automation
- Fiber optic instrumentation
- Fiber alignment
- Quality control
- Test equipment

Piezo Actuators

Nanopositioning &amp; Scanning Systems

Active Optics / Steering Mirrors

Tutorial: Piezo-electrics in Positioning

Capacitive Position Sensors

Piezo Drivers &amp; Nanopositioning Controllers

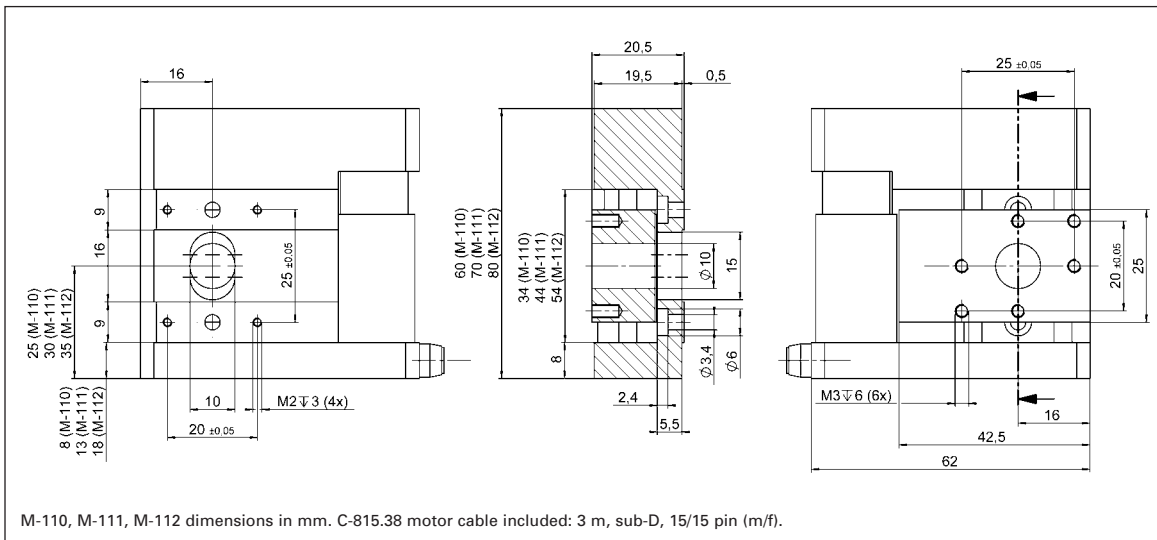
**Hexapods / Micropositioning**

Photonics Alignment Solutions

Motion Controllers

Ceramic Linear Motors &amp; Stages

Index



### Technical Data

Models	M-110.2DG	M-111.2DG	M-112.2DG	M-110.22S	M-111.22S	M-112.22S	Units <sup>†</sup>
Travel range	5	15	25	5	15	25	mm
Design resolution	0.0085	0.0085	0.0085	0.014	0.014	0.014	µm
Min. incremental motion	0.2	0.2	0.2	0.2	0.2	0.2	µm
Unidirectional repeatability	0.5	0.5	0.5	0.5	0.5	0.5	µm
Backlash	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	µm
Max. velocity	1.5	2.0	2.0	1.0	1.0	1.0	mm/sec
Max. normal load capacity	5	5	3	5	5	3	kg
Max. push/pull force	10	10	10	10	10	10	N
Max. lateral force	10	10	10	10	10	10	N
Encoder resolution	2048	2048	2048	–	–	–	counts/rev.
Motor resolution	–	–	–	1200*	1200*	1200*	steps/rev
Drivescrew pitch	0.5	0.5	0.5	0.5	0.5	0.5	mm/rev.
Gear ratio	28.44444:1	28.44444:1	28.44444:1	28.44444:1	28.44444:1	28.44444:1	
Nominal motor power	0.6	2	2	*	*	*	W
Motor voltage	12	12	12	24*	24*	24*	V
Weight	0.3	0.4	0.5	0.3	0.4	0.5	kg
Cable length	500	500	500	500	500	500	mm
Connector	15-pin sub-D	15-pin sub-D	15-pin sub-D	15-pin sub-D	15-pin sub-D	15-pin sub-D	
Recommended motor controllers	C-843, C-848, C-862	C-843, C-848, C-862	C-843, C-848, C-862	C-600, C-630	C-600, C-630	C-600, C-630	

\* 2-phase stepper, 24 V chopper voltage, max. 250 mA / phase, 1,200 microsteps with C-600, C-630 controllers.

† See page 7-106 for notes and explanations.