

# M-110.1 · M-111.1 · M-112.1

## High-Resolution Micro-Translation Stages

>> Click <http://www.pi.ws/fwd/Micropositioning> for the Latest Specs on these Products



- 0.05 µm Minimum Incremental Motion
- 5, 15 and 25 mm Travel Ranges
- Velocity to 1.5 mm/sec.
- Closed-Loop DC Motors and Stepper Motors
- Integrated Hall-Effect Limit and Reference Switches

M-110, M-111 and M-112 are ultra-high resolution motorized translation stages providing linear motion of 5 to 25 mm in an extremely compact package. They feature a precision leadscrew with sub-micron resolution and precision linear ball bearings guaranteeing <0.5 µm straightness of travel.

### Stepper and Servo Motors

Both drive options provide a cost effective solution for industrial and OEM environ-

ments. A miniature DC or stepper motor actuates motion via a backlash-compensated lead-screw / nut system and gear-head. To meet the most critical positioning demands, the DC motor is equipped with a high resolution encoder featuring resolution of 0.007 µm per count. The combination of the extremely low stiction / friction construction and high-resolution encoder allows for minimum incremental motion of 50 nanometers at speeds up to 1.5 mm/sec.

### Application Examples

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

### Non-Contact Limit and Reference Switches

To protect your investment, non-contacting Hall-effect limit and reference switches are installed. Each stage includes a 0.5 m cable with 15-pin sub-D connector and a 3 m extension cable. The connector on the DC-servo versions features integrated line drivers for cable lengths up to 10 meters

between actuator and controller.

M-110, M-111 and M-112 can be combined to XY and XYZ systems for multi-axis alignment applications. A variety of add-on piezo-nanopositioning units are also available, see the "Photonics" section.

### Notes

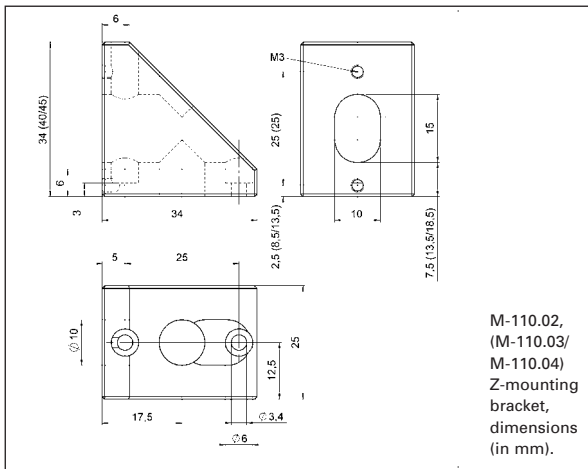
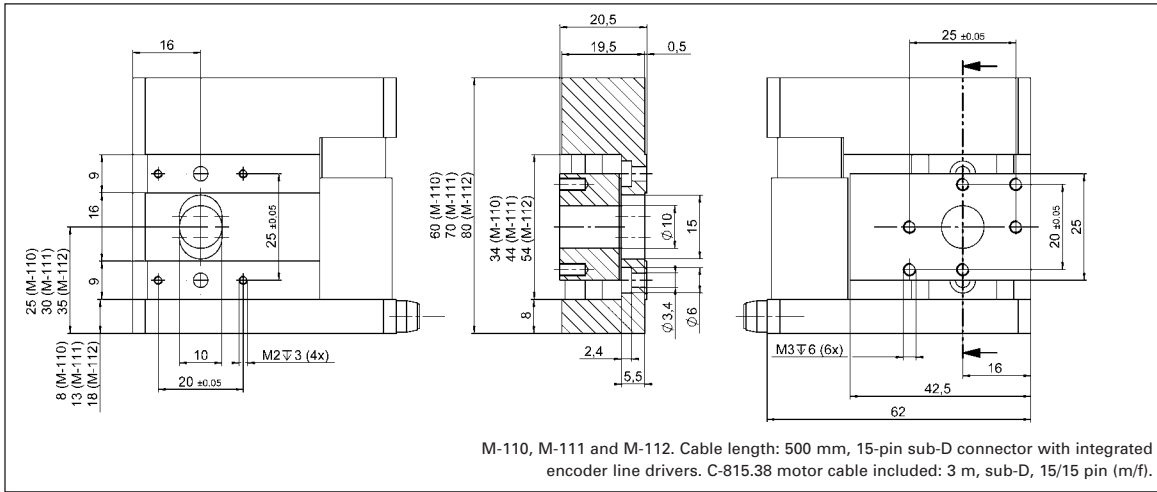
See "Accessories", page 7-92 ff. for adapters, brackets, etc.

### Ordering Information

- M-110.1DG**  
Micro-Translation Stage, 5 mm, Closed-Loop DC Motor
- M-111.1DG**  
Micro-Translation Stage, 15 mm, Closed-Loop DC Motor
- M-112.1DG**  
Micro-Translation Stage, 25 mm, Closed-Loop DC Motor
- M-110.12S**  
Micro-Translation Stage, 5 mm, 2-Phase Stepper Motor
- M-111.12S**  
Micro-Translation Stage, 15 mm, 2-Phase Stepper Motor
- M-112.12S**  
Micro-Translation Stage, 25 mm, 2-Phase Stepper Motor

Ask about custom designs!





**Technical Data**

| Models                        | M-110.1DG           | M-111.1DG           | M-112.1DG           | M-110.12S    | M-111.12S    | M-112.12S    | Units*      |
|-------------------------------|---------------------|---------------------|---------------------|--------------|--------------|--------------|-------------|
| Travel range                  | 5                   | 15                  | 25                  | 5            | 15           | 25           | mm          |
| Design resolution             | 0.007               | 0.007               | 0.007               | 0.012        | 0.012        | 0.012        | µm          |
| Min. incremental motion       | 0.05                | 0.05                | 0.05                | 0.05         | 0.05         | 0.05         | µm          |
| Unidirectional repeatability  | 0.1                 | 0.1                 | 0.1                 | 0.1          | 0.1          | 0.1          | µm          |
| Backlash                      | 2                   | 2                   | 2                   | 2            | 2            | 2            | µm          |
| Max. velocity                 | 1                   | 1.5                 | 1.5                 | 1            | 1            | 1            | mm/sec      |
| Max. normal load capacity     | 3                   | 3                   | 2                   | 3            | 3            | 2            | 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.  |
| Drive screw pitch             | 0.4                 | 0.4                 | 0.4                 | 0.4          | 0.4          | 0.4          | 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          |
| 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.

- Piezo Actuators
- Nanopositioning & Scanning Systems
- Active Optics / Steering Mirrors
- Tutorial: Piezo-electrics in Positioning
- Capacitive Position Sensors
- Piezo Drivers & Nanopositioning Controllers
- Hexapods / Micropositioning**
- Photonics Alignment Solutions
- Motion Controllers
- Ceramic Linear Motors & Stages
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