

ECO225LM Series

Mechanical Bearing, Linear-Motor Stage

High-performance in a cost-effective, economic package

Rugged mechanical design

Direct-drive linear motor for precision motion

Nine models with travels from 100 mm to 800 mm



The ECO225LM-0500 is one of nine models in the ECO225LM series.

The ECO225LM series, part of the ECO linear stage family, builds upon Aerotech's long tradition of producing low total cost of ownership motion designs. Excellent positioning specifications, high stiffness and load capacity, and a variety of options and features combined with economic pricing make ECO225LM stages an ideal choice for medium-performance production applications.

Quality Mechanical Construction

A long-life recirculating linear guide bearing system and quality construction make the ECO225LM an attractive solution for applications where up-time is critical. Unlike low-cost competitive motion stages, the ECO225LM can be integrated into complex machines with the assurance it will perform at a high level and outlast other machine components.

Precision Motion Performance

ECO225LM series stages are optimized with high precision, noncontact linear encoders. Precision recirculating linear bearings, along with Aerotech's machining and assembly craftsmanship, enable the best geometric performance per unit price on the market.

The precision noncontact encoders enable minimum incremental motion to 10 nm with micrometer-level repeatability. The optional HALAR factory calibration improves positioning accuracy to $\pm 1.5 \mu\text{m}$.

Direct-Drive Linear Motor

The ECO225LM comes standard with Aerotech's field-proven linear motor technology. It is available with a high-performance linear-motor option for applications requiring higher force and acceleration motion profiles. In both cases the ironlessforcer coil provides high force with zero cogging for super-smooth velocity and position control. This ironless design is ideal for applications requiring outstanding contour accuracy and smooth velocity profiling. As with all Aerotech linear motor stages, the linear motor has zero backlash, no windup, zero friction, and excellent dynamic responsiveness.

Design and Integration Flexibility

The ECO225LM is available in nine different models with travels ranging from 100 mm to 800 mm and speeds up to 2 m/s. Configurable cable management solutions are available for single and multi-axis systems as standard options.

The base mounting holes are accessible from the outside of the stage for easy mounting. Standard mounting holes for both English and metric optical tables are present in all travels. Tabletops are available with both English and metric mounting patterns. Tabletop hole patterns allow the direct attachment of several types of Aerotech rotary stages.

The ECO225LM stage is a flexible, yet cost-effective, linear motion stage with many options to fit the exact needs of the application. It is easily the best performing and most versatile linear stage per unit price that money can buy.

ECO225LM Series SPECIFICATIONS

| Mechanical Specifications | | ECO225LM | | | | | | | | |
|--|------------|--------------------------|--------------------------|---------------------------|---------------------------|---------------------------|---------------------------|---------------------------|----------------------------|----------------------------|
| Travel | | 100 | 150 | 200 | 250 | 300 | 400 | 500 | 600 | 800 |
| Accuracy ⁽¹⁾ | Standard | ±6 µm | ±8 µm | ±10 µm | ±12 µm | ±14 µm | ±16 µm | ±18 µm | ±20 µm | ±22 µm |
| | Calibrated | ±1.5 µm | ±1.5 µm | ±2 µm | ±2 µm | ±2 µm | ±2.5 µm | ±2.5 µm | ±3 µm | ±3 µm |
| Resolution (Min. Incremental Motion) | | 10 nm | | | | | | | | |
| Bidirectional Repeatability ⁽¹⁾ | | ±0.75 µm | ±0.75 µm | ±0.75 µm | ±0.75 µm | ±0.75 µm | ±1.0 µm | ±1.0 µm | ±1.0 µm | ±1.0 µm |
| Straightness ⁽¹⁾ | | ±2.5 µm | ±3 µm | ±4 µm | ±4.5 µm | ±5 µm | ±6 µm | ±7 µm | ±8 µm | ±9.5 µm |
| Flatness ⁽¹⁾ | | ±2.5 µm | ±3 µm | ±4 µm | ±4.5 µm | ±5 µm | ±6 µm | ±7 µm | ±8 µm | ±9.5 µm |
| Pitch | | 40 µrad (8.2 arc sec) | 40 µrad (8.2 arc sec) | 50 µrad (10.3 arc sec) | 55 µrad (11.3 arc sec) | 60 µrad (12.4 arc sec) | 70 µrad (14.4 arc sec) | 85 µrad (17.5 arc sec) | 100 µrad (20.6 arc sec) | 115 µrad (23.7 arc sec) |
| Roll | | 40 µrad (8.2 arc sec) | 40 µrad (8.2 arc sec) | 50 µrad (10.3 arc sec) | 55 µrad (11.3 arc sec) | 60 µrad (12.4 arc sec) | 70 µrad (14.4 arc sec) | 85 µrad (17.5 arc sec) | 100 µrad (20.6 arc sec) | 115 µrad (23.7 arc sec) |
| Yaw | | 40 µrad (8.2 arc sec) | 40 µrad (8.2 arc sec) | 50 µrad (10.3 arc sec) | 55 µrad (11.3 arc sec) | 60 µrad (12.4 arc sec) | 70 µrad (14.4 arc sec) | 85 µrad (17.5 arc sec) | 100 µrad (20.6 arc sec) | 115 µrad (23.7 arc sec) |
| Maximum Speed ⁽²⁾ | | 2 m/s | | | | | | | | |
| Maximum Acceleration ⁽²⁾ | | 1.5 g | | | | | | | | |
| Maximum Force, Continuous | M1 | 72.1 N | | | | | | | | |
| | M2 | 153.3 N | | | | | | | | |
| Load Capacity ⁽³⁾ | Horizontal | 100 kg | | | | | | | | |
| | Side | 100 kg | | | | | | | | |
| Moving Mass | | 6.1 kg | | | | | | | | |
| Stage Mass | M1 | 18.6 kg | 20.0 kg | 21.0 kg | 22.3 kg | 23.6 kg | 26.3 kg | 28.6 kg | 31.3 kg | 36.2 kg |
| | M2 | 20.2 kg | 21.8 kg | 22.7 kg | 24.3 kg | 25.9 kg | 29.1 kg | 31.6 kg | 36.8 kg | 40.6 kg |
| Material | | Anodized Aluminum | | | | | | | | |
| MTBF (Mean Time Between Failure) | | 20,000 Hours | | | | | | | | |

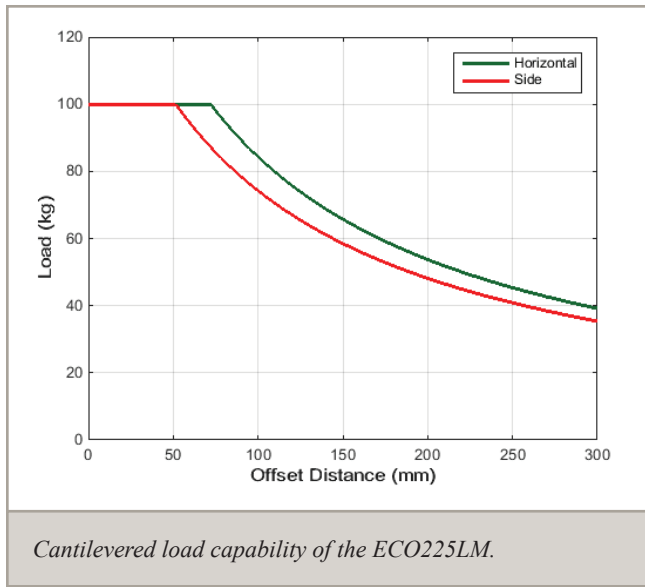
Notes:

1. Certified with -PL1 option
2. Requires the selection of an appropriate amplifier with sufficient voltage and current, and is dependent on motor selection
3. Axis-orientation for on-axis loading is listed
4. Specifications are for single-axis systems measured 25 mm above the tabletop. Performance of multi-axis systems is payload and workpoint dependent. Contact factory for multi-axis applications

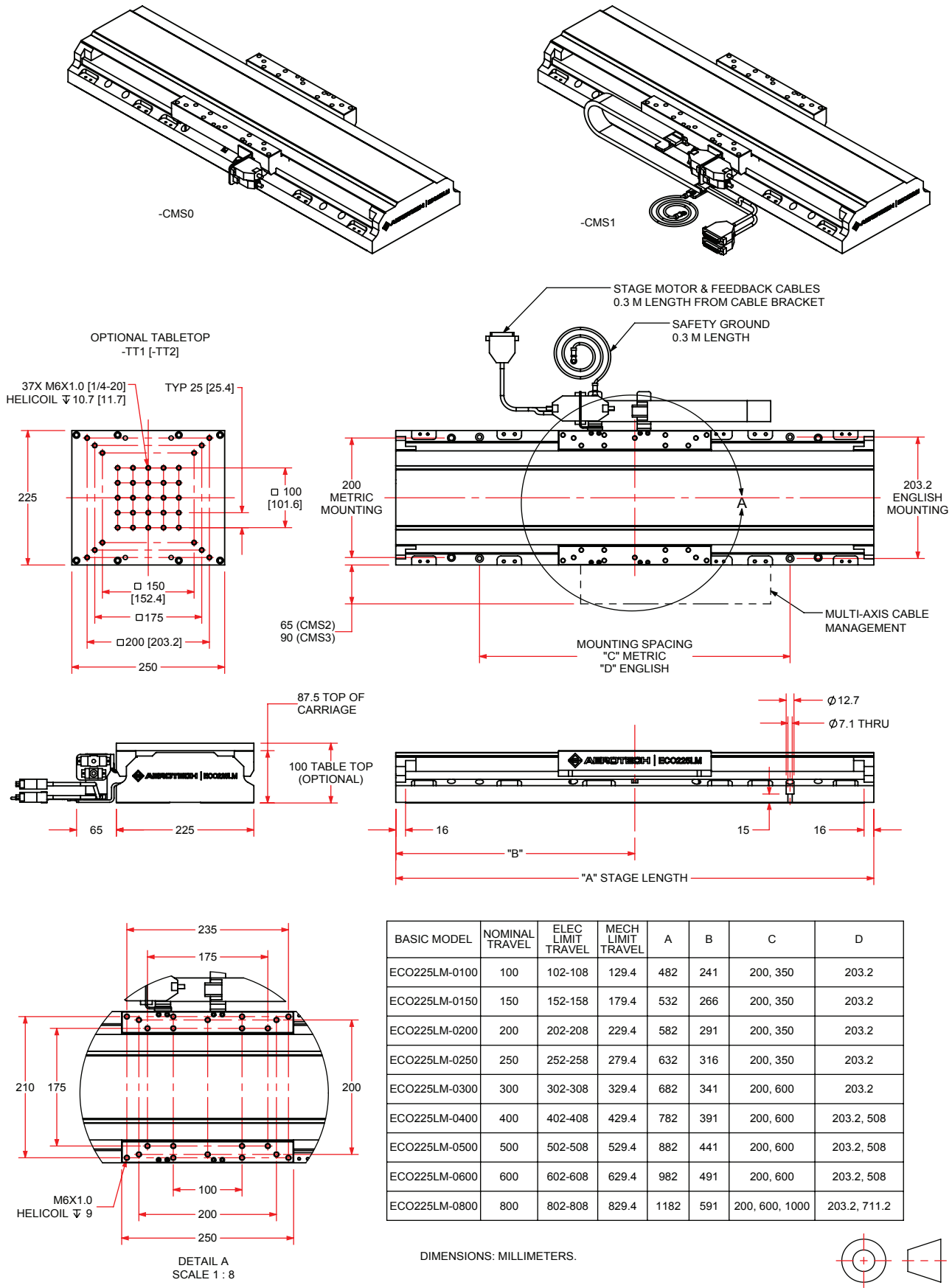
| Electrical Specifications | |
|---------------------------|---|
| Drive System | Brushless Linear Servomotor |
| Feedback | Noncontact Encoder Incremental – 1 Vpp and TTL (0.1 µm) Output |
| Maximum Bus Voltage | 340 VDC |
| Limit Switches | 5 V, Normally-Closed |
| Home Switch | Near Center |

| Recommended Controller | | |
|------------------------|----------|---------------------------------------|
| Multi-Axis | A3200 | Ndrive HLe/Ndrive CP/Ndrive HPe/Npaq |
| | Ensemble | Ensemble HLe/Ensemble CP/Ensemble HPe |
| Single Axis | Soloist | Soloist CP/Soloist HPe |

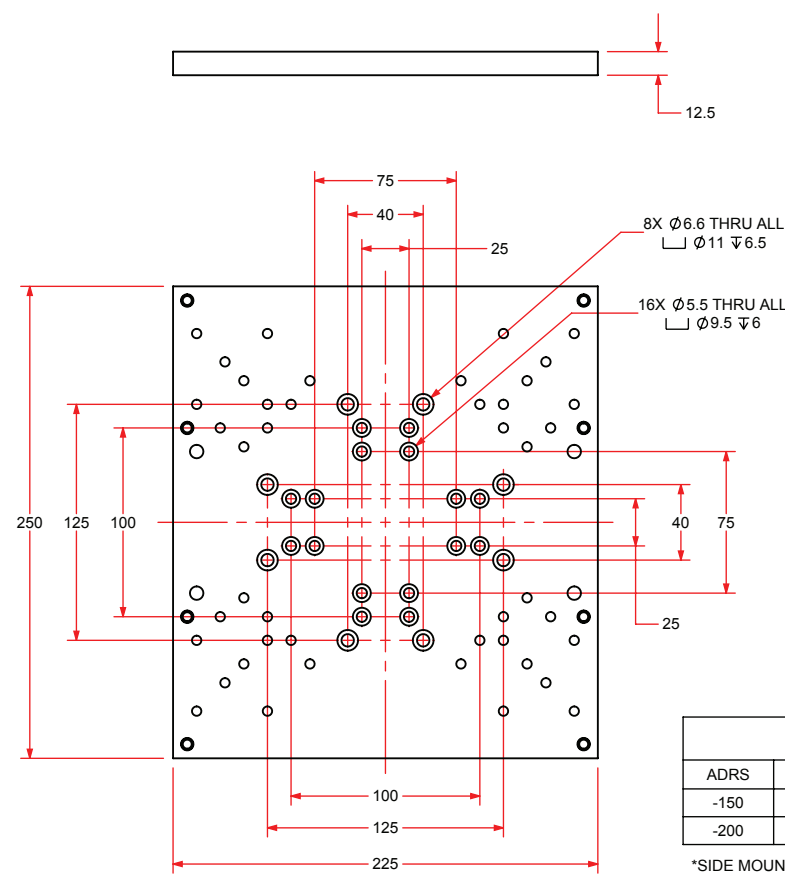
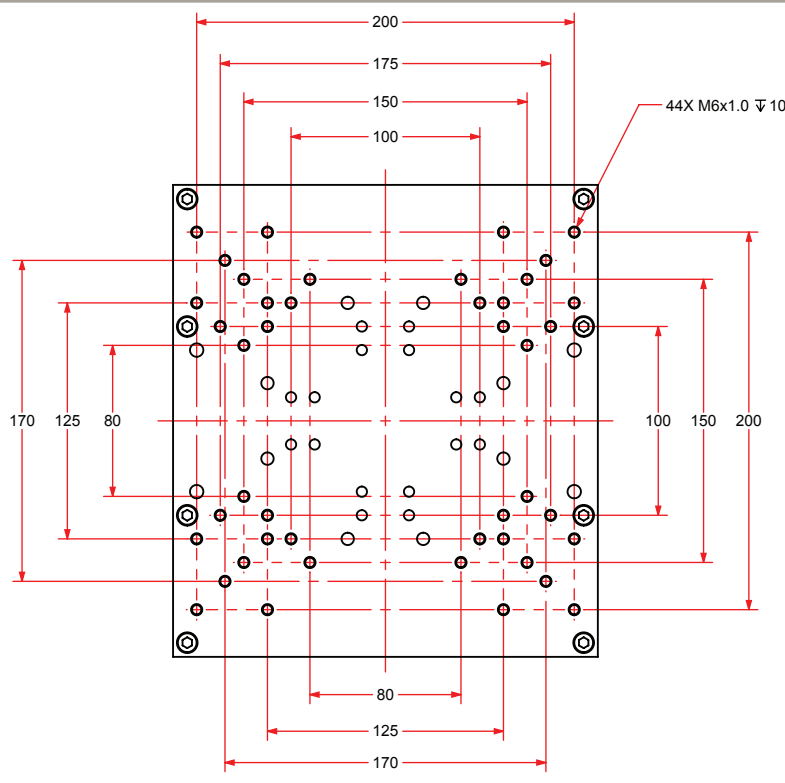
ECO225LM Series SPECIFICATIONS



ECO225LM Series DIMENSIONS



EC0225LM Series Accessory Tabletop DIMENSIONS

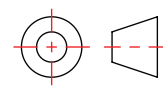


-TT3
MOUNTS THE FOLLOWING

| ADRS | ADRT | AGR | ALAR | CCS190DR |
|------|------|-----|----------|----------|
| -150 | -150 | 100 | -100-SP* | -240 |
| -200 | -200 | 150 | -100-LP* | -260 |

*SIDE MOUNT NOT AVAILABLE

DIMENSIONS: MILLIMETERS



EC0225LM Series ORDERING INFORMATION

Travel (Required)

| | |
|-------|---------------------|
| -0100 | 100 mm travel stage |
| -0150 | 150 mm travel stage |
| -0200 | 200 mm travel stage |
| -0250 | 250 mm travel stage |
| -0300 | 300 mm travel stage |
| -0400 | 400 mm travel stage |
| -0500 | 500 mm travel stage |
| -0600 | 600 mm travel stage |
| -0800 | 800 mm travel stage |

Motor (Optional)

| | |
|-----|-------------------------------|
| -M1 | Standard motor option |
| -M2 | High performance motor option |

Tabletop (Optional)

| | |
|------|---|
| -TT1 | Tabletop with metric dimension mounting |
| -TT2 | Tabletop with English dimension mounting |
| -TT3 | Accessory tabletop with mounting for select rotary stages |

Feedback (Required)

| | |
|-----|--|
| -E1 | Incremental linear encoder, 1 Vpp |
| -E2 | Incremental linear encoder, 0.1 μ m digital TTL output |

Cable Management (Required)

| | |
|-------|---|
| -CMS0 | No external CMS, motor/feedback connector bracket on carriage |
| -CMS1 | External CMS for single axis |
| -CMS2 | External CMS for lower-axis of two-axis ECO (XY) assembly |
| -CMS3 | External CMS for lower-axis of two-axis (XZ or XT) assembly |
| -CMS4 | External CMS for upper-axis of two-axis ECO assembly |

Lifting Hardware (Optional)

| | |
|-----|------------------|
| -LF | Lifting hardware |
|-----|------------------|

NOTE: Lifting option only available on travels 300 mm and greater. Lifting should never be ordered on the upper-axis of an XY set (only order on lower-axis).

Metrology (Required)

| | |
|------|--|
| -PL0 | No metrology performance plots |
| -PL1 | Metrology, uncalibrated with performance plots |
| -PL2 | Metrology, calibrated (HALAR) with performance plots |

Integration (Required)

Aerotech offers both standard and custom integration services to help you get your system fully operational as quickly as possible. The following standard integration options are available for this system. Please consult Aerotech if you are unsure what level of integration is required, or if you desire custom integration support with your system.

| | |
|------|---|
| -TAS | Integration - Test as system Testing, integration, and documentation of a group of components as a complete system that will be used together (ex: drive, controller, and stage). This includes parameter file generation, system tuning, and documentation of the system configuration. |
| -TAC | Integration - Test as components Testing and integration of individual items as discrete components that ship together. This is typically used for spare parts, replacement parts, or items that will not be used together. These components may or may not be part of a larger system. |

EC0225LM Series ORDERING INFORMATION

Accessories (to be ordered as a separate line item)

| | |
|-------------|--|
| ALIGN-NPA | Non-precision XY assembly |
| ALIGN-NPAZ | Non-precision XZ or YZ assembly |
| ALIGN-PA10 | XY assembly; 10 arc sec orthogonality. Alignment to within 7 microns orthogonality for short travel stages. |
| ALIGN-PA10Z | XZ or YZ assembly with L-bracket; 10 arc second orthogonality. Alignment to within 10 microns orthogonality for short travel stages. |
| ALIGN-PA5 | XY assembly; 5 arc sec orthogonality. Alignment to within 3 microns orthogonality for short travel stages. |
| ALIGN-PA5Z | XZ or YZ assembly with L-bracket; 5 arc second orthogonality. Alignment to within 5 microns orthogonality for short travel stages. |