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## Mechanical Bearing, Direct-Drive Linear Stage

# PRO560LM

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### Precise, Reliable & Adaptable

The PRO560LM is a wide-body industrial stage with an exceptional payload-carrying capacity. Compared to PRO280LM, PRO560LM offers improved angular and geometric performance thanks to its wider bearing separation, making it an excellent base axis for a multi-axis stage assembly. Combining superior craftsmanship and the highest quality components, PRO560LM stages consistently and reliably deliver best-in-class positioning performance.

### Key Applications

PRO560LM mechanical bearing, direct-drive linear stages are extremely versatile, trusted and proven in medium- and high-performance applications, such as:

- ◆ Laser material processing
- ◆ Precision metrology, inspection & microscopy
- ◆ Electronics & circuit board manufacturing & inspection
- ◆ Display processing
- ◆ Synchrotron & light source experiments
- ◆ Medical device manufacturing
- ◆ Semiconductor fabrication
- ◆ Fiber optics & silicon photonics processing
- ◆ Additive manufacturing & precision assembly

### KEY FEATURES:

- ◆ **ULTRA HEAVY-DUTY LOAD CAPACITY** with premium geometric performance
- ◆ Ironless, cogless linear motor delivers **SMOOTH, ULTRA-PRECISE MOTION**
- ◆ **EXCELLENT POSITIONING & DYNAMIC CAPABILITIES** in a cost-effective package
- ◆ **BEST-IN-CLASS GEOMETRIC PERFORMANCE** ensures superior workpoint accuracy
- ◆ Rugged, reliable construction is ideal for **VERSATILE INDUSTRIAL USE**
- ◆ Hardcover & side seals offer **PROTECTION AGAINST CONTAMINATION & PARTICULATES**
- ◆ ThermoComp® option automatically **COMPENSATES FOR THERMAL DISTURBANCES**
- ◆ **VACUUM- & CLEANROOM-COMPATIBLE** versions available

## PRO560LM SPECIFICATIONS

| Mechanical Specifications                        |                   | PRO560LM   |         |          |          |          |          |
|--|-------------------|--|---------|----------|----------|----------|----------|
| <b>Travel</b>                                    |                   | 300  | 400     | 500      | 600      | 800      | 1000     |
| <b>Accuracy<sup>(1)</sup></b>                    | <b>Standard</b>   | ±10 µm   | ±12 µm  | ±14 µm   | ±15.5 µm | ±17 µm   | ±18 µm   |
|  | <b>Calibrated</b> | ±1 µm  | ±1 µm   | ±1 µm    | ±1 µm    | ±1.5 µm  | ±1.5 µm  |
| <b>Resolution (Min. Incremental Motion)</b>      |                   | 5 nm (-E1 Encoder)   |         |          |          |          |          |
| <b>Bidirectional Repeatability<sup>(1)</sup></b> |                   | ±0.4 µm  | ±0.4 µm | ±0.4 µm  | ±0.4 µm  | ±0.5 µm  | ±0.5 µm  |
| <b>Horizontal Straightness<sup>(1)</sup></b>     |                   | ±3 µm  | ±4 µm   | ±5 µm    | ±6 µm    | ±7 µm    | ±8 µm    |
| <b>Vertical Straightness<sup>(1)</sup></b>       |                   | ±3 µm  | ±4 µm   | ±5 µm    | ±6 µm    | ±7 µm    | ±8 µm    |
| <b>Pitch</b>                                     |                   | 49 µrad  | 60 µrad | 70 µrad  | 78 µrad  | 90 µrad  | 110 µrad |
| <b>Roll</b>                                      |                   | 39 µrad  | 44 µrad | 53 µrad  | 58 µrad  | 73 µrad  | 87 µrad  |
| <b>Yaw</b>                                       |                   | 49 µrad  | 60 µrad | 70 µrad  | 78 µrad  | 90 µrad  | 110 µrad |
| <b>Maximum Speed<sup>(2)</sup></b>               |                   | 2 m/s  |         |          |          |          |          |
| <b>Maximum Acceleration<sup>(2)</sup></b>        |                   | 3 g  |         |          |          |          |          |
| <b>Maximum Force, Continuous</b>                 |                   | 532.4 N – Standard<br>792.6 N – With Air Cooling (20 psig) |         |          |          |          |          |
| <b>Load Capacity<sup>(3)</sup></b>               | <b>Horizontal</b> | 150 kg   |         |          |          |          |          |
|  | <b>Side</b>       | 150 kg   |         |          |          |          |          |
| <b>Moving Mass</b>                               |                   | 25.0 kg  |         |          |          |          |          |
| <b>Stage Mass</b>                                |                   | 90.4 kg  | 99.5 kg | 108.6 kg | 117.7 kg | 135.9 kg | 154.1 kg |
| <b>Material</b>                                  |                   | Anodized Aluminum  |         |          |          |          |          |
| <b>MTBF (Mean Time Between Failure)</b>          |                   | 20,000 Hours   |         |          |          |          |          |

**Notes:**

1. Certified with -PL1/-PL2 option.
2. Requires the selection of an appropriate amplifier with sufficient voltage and current.
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  |  |
|----------------------------|--|
| <b>Drive System</b>        | Brushless Linear Servomotor  |
| <b>Feedback</b>            | Non-contact Linear Encoder<br>-E1: 1 V <sub>pp</sub> , 20 µm signal period<br>-E2: Digital RS422, 0.1 µm electrical resolution |
| <b>Maximum Bus Voltage</b> | 340 VDC  |
| <b>Limit Switches</b>      | 5 V, Normally-Closed   |
| <b>Home Switch</b>         | Near Center  |

## PRO560LM ORDERING OPTIONS

### Travel (Required)

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- 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
- 1000 1000 mm travel stage

*Other travel options are available upon request. Contact Aerotech for more information.*

### Tabletop (Required)

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- TT1 Tabletop with metric dimension mounting

*NOTE: -TT1 option required for lower axis of XY.*

*Other tabletop options are available upon request. Contact Aerotech for more information.*

### Feedback (Required)

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- E1 Incremental linear encoder, 1 Vpp
- E2 Incremental linear encoder, 0.1  $\mu$ m digital TTL output

*Other feedback options are available upon request. Contact Aerotech for more information.*

### Cable Management (Required)

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- 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 PRO (XY) assembly
- CMS3 External CMS for lower-axis of two-axis (XZ or XT) assembly
- CMS6 External CMS for lower-axis of three-axis (XYZ or XYT) assembly
- CMS7 External CMS for lower-axis of three-axis (XZT) assembly
- CMS9 External CMS for lower-axis of four-axis (XYZT) assembly

### Lifting Hardware (Optional)

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- LF Lifting hardware

*NOTE: Lifting option available on all travels.*

### ThermoComp (Optional)

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- TCMP ThermoComp integrated thermal compensation, single or lower axis

### Metrology (Required)

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

## PRO560LM ORDERING OPTIONS

### Integration (Required)

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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. This is typically used for spare parts, replacement parts or items that will not be used or shipped together (ex: stage only). These components may or may not be part of a larger system.

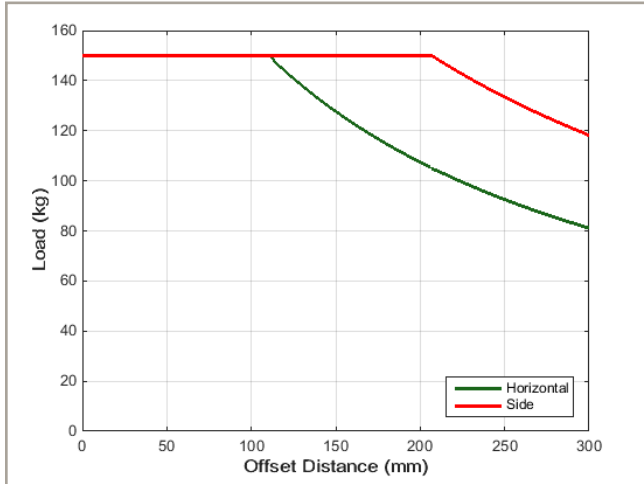
### Accessories (To Be Ordered As Separate Line Item)

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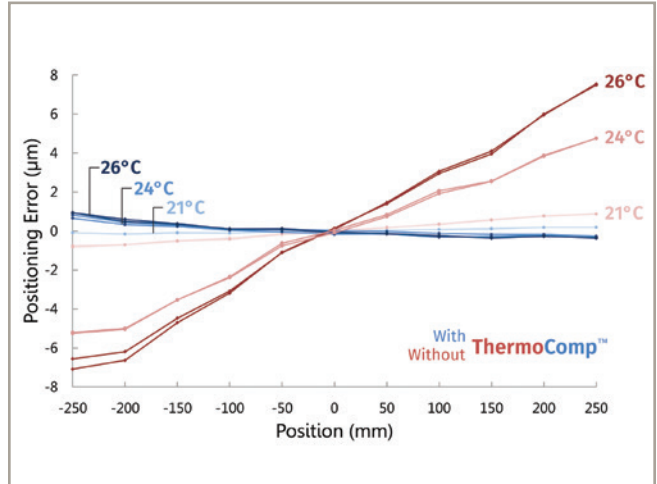
|                    |  |
|--------------------|--|
| <b>ALIGN-NPA</b>   | Non-precision XY assembly  |
| <b>ALIGN-NPAZ</b>  | Non-precision XZ or YZ assembly  |
| <b>ALIGN-PA10</b>  | XY assembly; 10 arc sec orthogonality. Alignment to within 7 microns orthogonality for short travel stages.        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



## PRO560LM SPECIFICATIONS

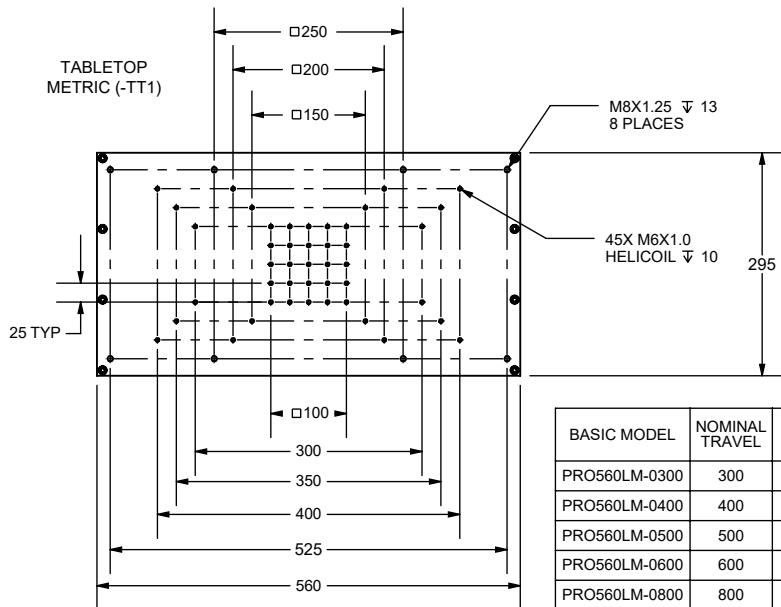
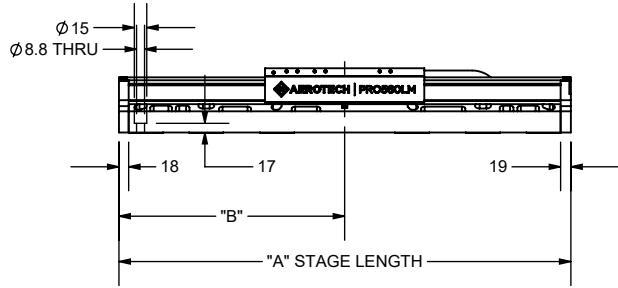
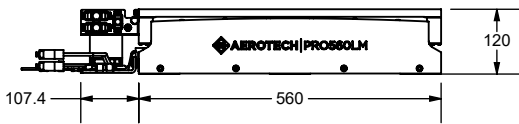
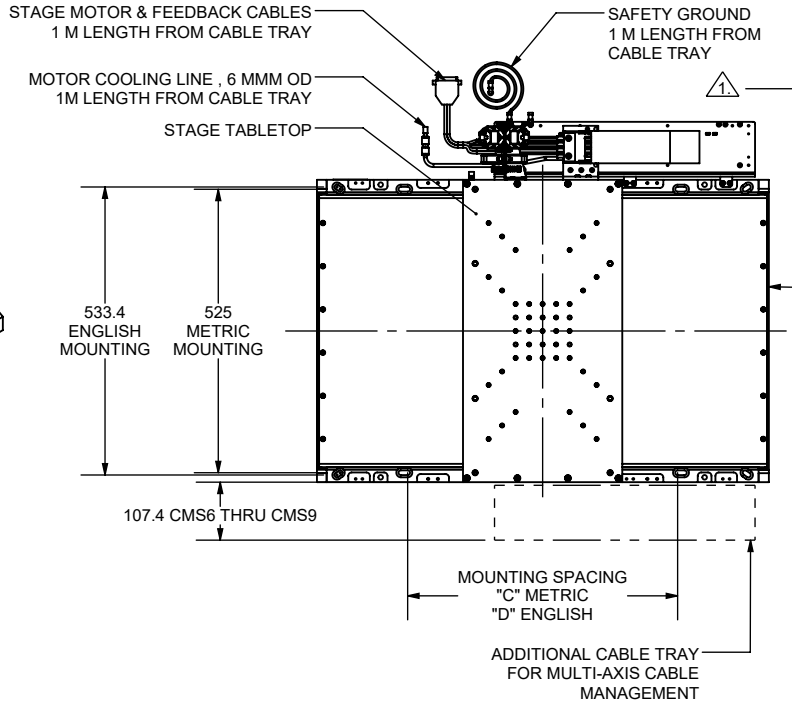
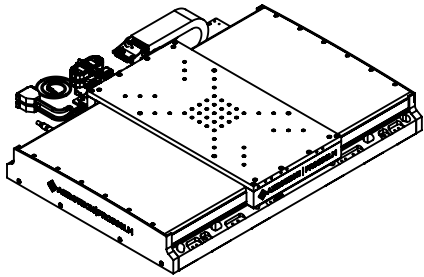


Cantilevered load capability of the PRO560LM.



Measurement data showing successful compensation of thermal related positioning errors at several temperatures using the ThermoComp feature. Results are typical of stage performance with and without ThermoComp.

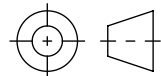
# PRO560LM DIMENSIONS



| BASIC MODEL   | NOMINAL TRAVEL | ELEC LIMIT TRAVEL | MECH LIMIT TRAVEL | A    | B   | C                       | D                |
|---------------|----------------|-------------------|-------------------|------|-----|-------------------------|------------------|
| PRO560LM-0300 | 300            | 302-308           | 334.4             | 737  | 368 | 250, 500-525            | 254              |
| PRO560LM-0400 | 400            | 402-408           | 434.4             | 837  | 418 | 250, 500-525, 750       | 254, 762         |
| PRO560LM-0500 | 500            | 502-508           | 534.4             | 937  | 468 | 250, 500-525, 750       | 254, 762         |
| PRO560LM-0600 | 600            | 602-608           | 634.4             | 1037 | 518 | 250, 500-525, 750       | 254, 762         |
| PRO560LM-0800 | 800            | 802-808           | 834.4             | 1237 | 618 | 250, 500-525, 750       | 254, 762         |
| PRO560LM-1000 | 1000           | 1002-1008         | 1034.4            | 1437 | 718 | 250, 500-525, 750, 1250 | 254, 762, 1193.8 |

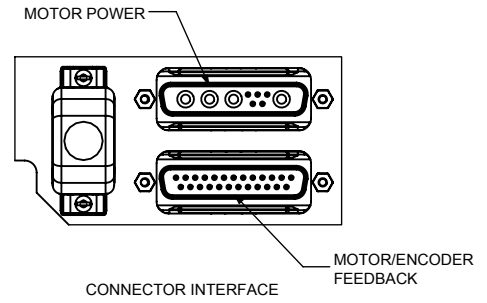
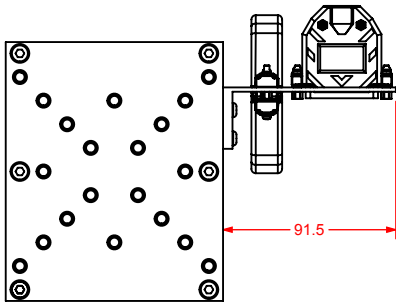
**NOTES:**

1. M5X0.8 FOR CUSTOMER-INSTALLED AIR PURGE FITTING.
2. DIMENSIONS: MILLIMETERS

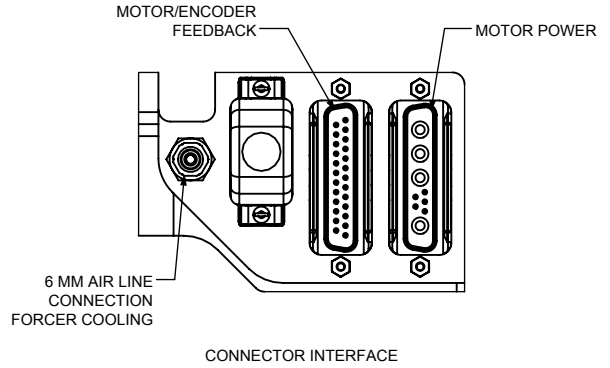
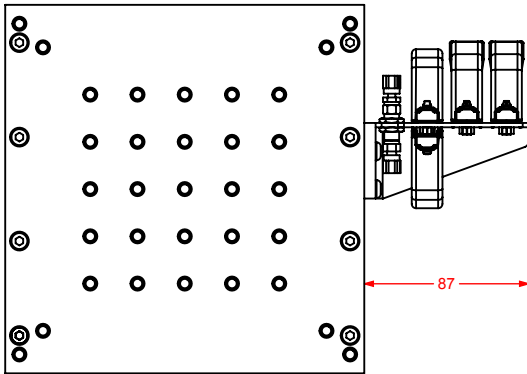


# PRO560LM SERIES CABLE MANAGEMENT (-CMS0) DIMENSIONS

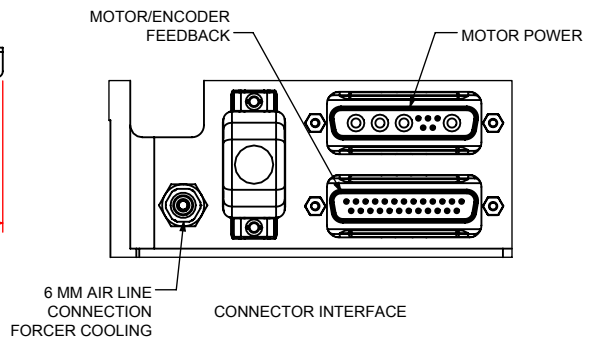
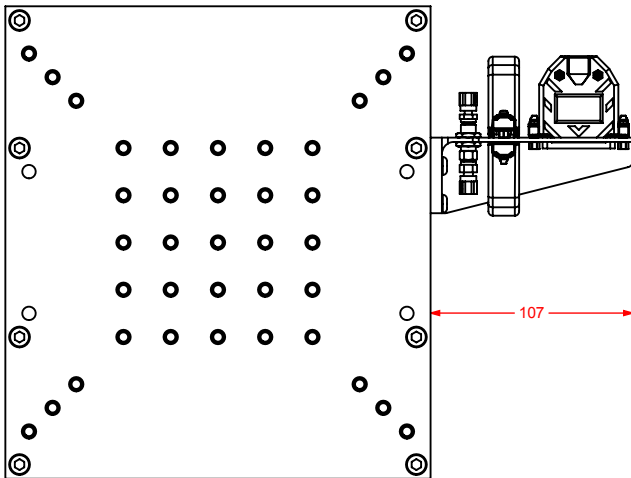
PRO115LM/PRO165LM -CMS0



PRO190LM -CMS0



PRO225LM/PRO280LM/PRO560LM -CMS0



DIMENSIONS: MILLIMETERS