

# AEROTECH

## Mechanical Bearing, Direct-Drive Linear Stage **PRO190LM**

### Precise, Reliable & Adaptable

The PRO190LM provides an optimal balance of positioning performance, payload capacity and size. Equipped with larger, stiffer bearings, PRO190LM delivers considerable load-carrying improvements and enhanced geometric performance compared to PRO165LM. Plus, PRO190LM features a smaller footprint and lower mass than the larger PRO225LM. Combining superior craftsmanship and the highest quality components, PRO190LM stages consistently and reliably deliver best-in-class positioning performance.

### Key Applications

PRO190LM 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:

- ◆ Offers an **OPTIMAL BALANCE OF POSITIONING PERFORMANCE, LOAD CAPACITY & SIZE**
- ◆ 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

## PRO190LM SPECIFICATIONS

Mechanical Specifications		PRO190LM						
Travel		100	150	200	300	400	500	600
Accuracy <sup>(1)</sup>	Standard	±4 µm	±6 µm	±8 µm	±10 µm	±12 µm	±14 µm	±15.5 µm
	Calibrated	±1 µm						
Resolution (Min. Incremental Motion)		5 nm (-E1 Encoder)						
Bidirectional Repeatability <sup>(1)</sup>		±0.3 µm	±0.4 µm	±0.4 µm	±0.4 µm	±0.4 µm	±0.4 µm	±0.4 µm
Horizontal Straightness <sup>(1)</sup>		±1.5 µm	±2 µm	±2.5 µm	±3.5 µm	±4.5 µm	±5.5 µm	±6.5 µm
Vertical Straightness <sup>(1)</sup>		±1.5 µm	±2 µm	±2.5 µm	±3.5 µm	±4.5 µm	±5.5 µm	±6.5 µm
Pitch		27 µrad	29 µrad	40 µrad	50 µrad	60 µrad	70 µrad	80 µrad
Roll		27 µrad	29 µrad	40 µrad	50 µrad	60 µrad	70 µrad	80 µrad
Yaw		27 µrad	29 µrad	40 µrad	50 µrad	60 µrad	70 µrad	80 µrad
Maximum Speed <sup>(2)</sup>		2 m/s						
Maximum Acceleration <sup>(2)</sup>		3 g						
Maximum Force, Continuous		106.7 N – Standard 154.7 – With Air Cooling (20 psig)						
Load Capacity <sup>(3)</sup>	Horizontal	60 kg						
	Side	60 kg						
Moving Mass		4.5 kg						
Stage Mass		14.4 kg	15.6 kg	16.8 kg	19.3 kg	21.7 kg	24.2 kg	26.6 kg
Material		Anodized Aluminum						
MTBF (Mean Time Between Failure)		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	
Drive System	Brushless Linear Servomotor
Feedback	Non-contact Linear Encoder -E1: 1 Vpp, 20 µm signal period -E2: Digital RS422, 0.1 µm electrical resolution
Maximum Bus Voltage	340 VDC
Limit Switches	5 V, Normally-Closed
Home Switch	Near Center

## PRO190LM ORDERING OPTIONS

### Travel (Required)

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- 0100 100 mm travel stage
- 0150 150 mm travel stage
- 0200 200 mm travel stage
- 0300 300 mm travel stage
- 0400 400 mm travel stage
- 0500 500 mm travel stage
- 0600 600 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
- CMS4 External CMS for upper-axis of two-axis PRO (XY) assembly
- CMS5 External CMS for upper-axis of two-axis (YZ or YT) 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
- CMS10 External CMS for upper-axis of two-axis PRO225LM XY assembly
- CMS11 External CMS for upper-axis of three-axis PRO225LM XYZ/T assembly
- CMS12 External CMS for upper-axis of four-axis PRO225LM XYZT assembly

### Lifting Hardware (Optional)

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- LF Lifting hardware

*NOTE: Lifting option only available on travels 400 mm and greater. Lifting should never be ordered on the upper-axis of an XY set (only order on lower-axis).*

### ThermoComp (Optional)

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- TCMP ThermoComp integrated thermal compensation, single or lower axis

## PRO190LM ORDERING OPTIONS

### Metrology (Required)

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

### 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.

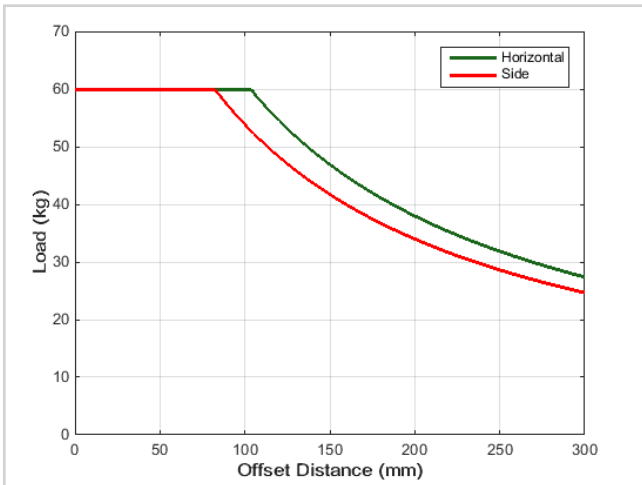
### Accessories (To Be Ordered As Separate Line Item)

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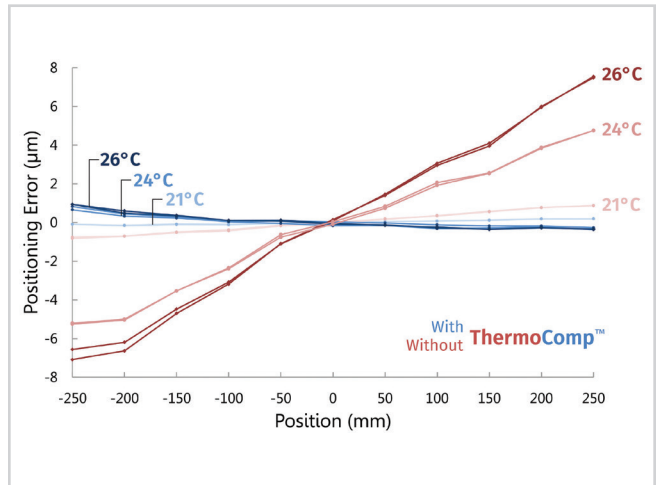
- ALIGN-NPA** Non-precision XY assembly
- ALIGN-NPAZ** Non-precision XZ or YZ assembly
- ALIGN-PA10** XY assembly; 10 arc sec orthogonality. Alignment to within 7 microns orthogonality for short travel stages.
- ALIGN-PA10Z** XZ or YZ assembly with L-bracket; 10 arc second orthogonality. Alignment to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



## PRO190LM SPECIFICATIONS

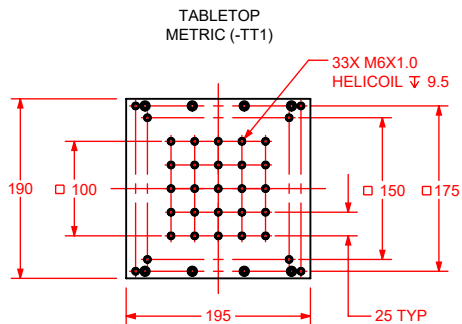
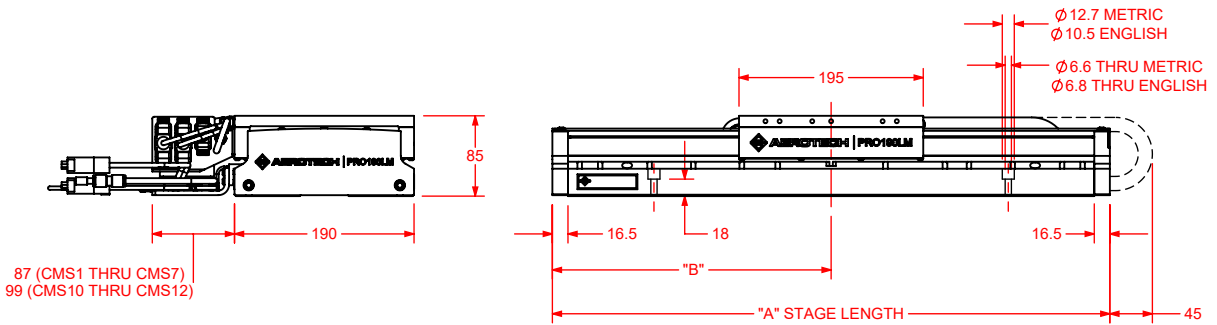
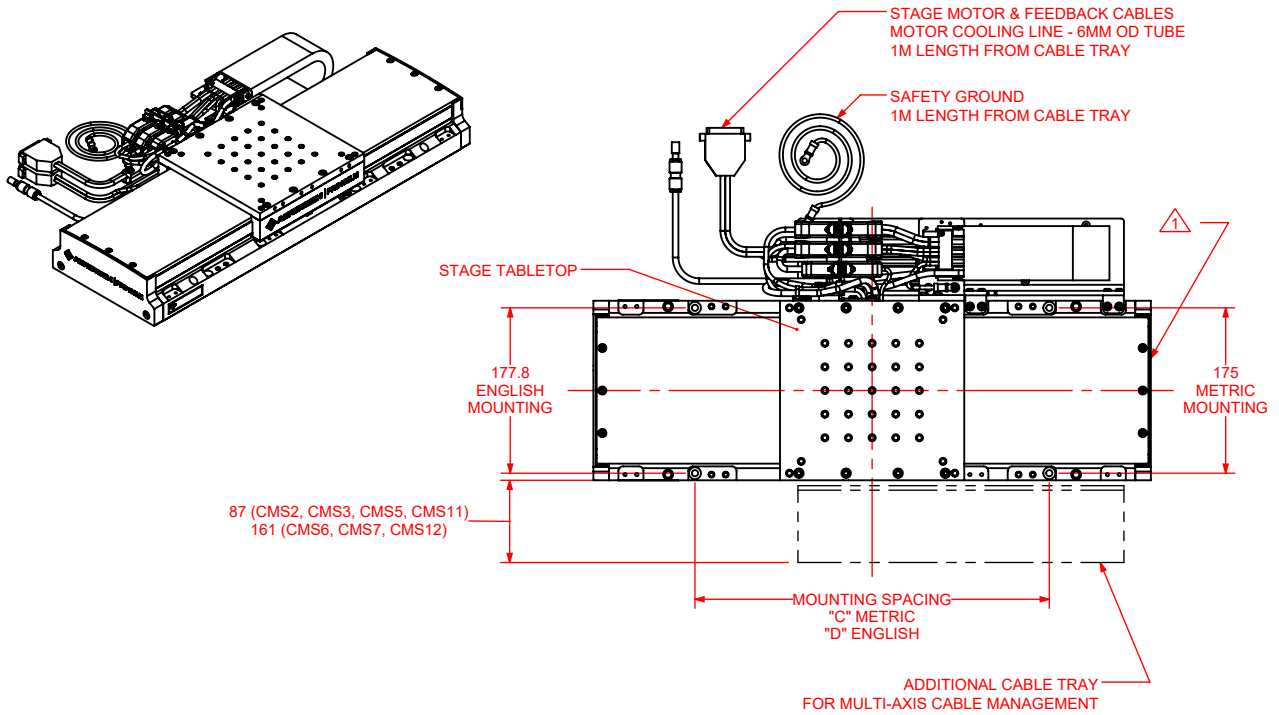


Cantilevered load capability of the PRO190LM.



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.

# PRO190LM DIMENSIONS

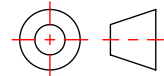


BASIC MODEL	NOMINAL TRAVEL	ELEC LIMIT TRAVEL	MECH LIMIT TRAVEL	A	B	C	D
PRO190LM-0100	100	105	125	390	195	175, 275	177.8
PRO190LM-0150	150	155	175	440	220	175, 275	177.8
PRO190LM-0200	200	205	225	490	245	175, 275	177.8
PRO190LM-0300	300	305	325	590	295	175, 375	177.8, 431.8
PRO190LM-0400	400	405	425	690	345	175, 375, 575	177.8, 533.4
PRO190LM-0500	500	505	525	790	395	175, 375, 575	177.8, 533.4
PRO190LM-0600	600	605	625	890	445	175, 375, 575, 775	177.8, 533.4

**NOTES:**

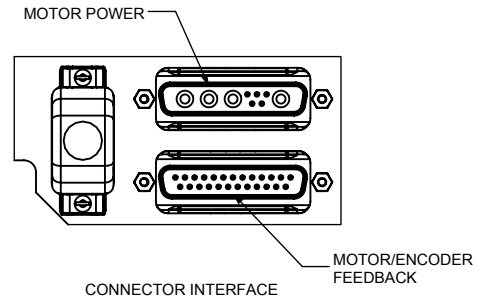
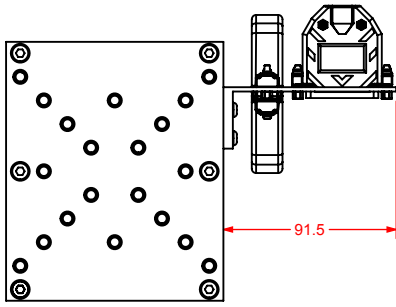
▲ M5X0.8 FOR CUSTOMER-INSTALLED AIR PURGE FITTING.

2. DIMENSIONS: MILLIMETERS.

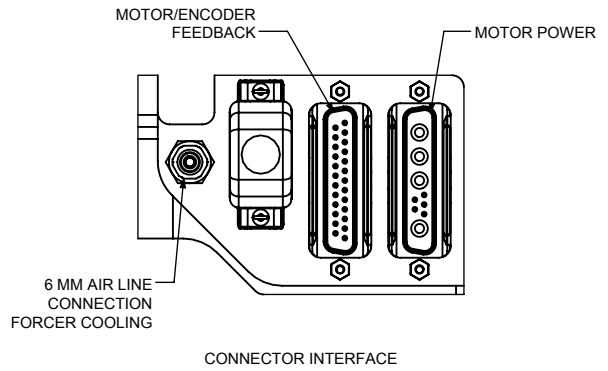
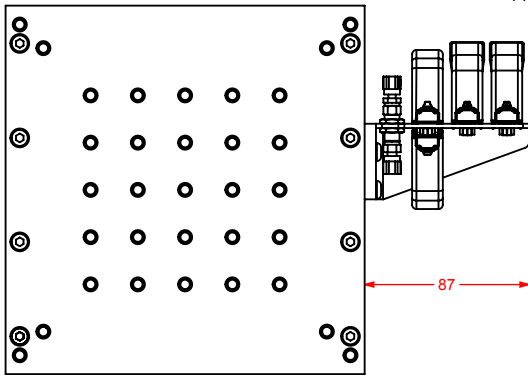


# PRO190LM SERIES CABLE MANAGEMENT (-CMS0) DIMENSIONS

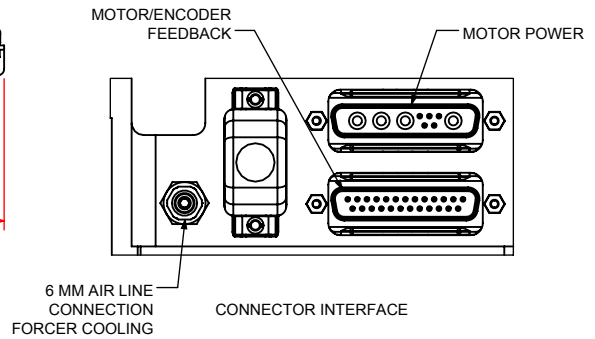
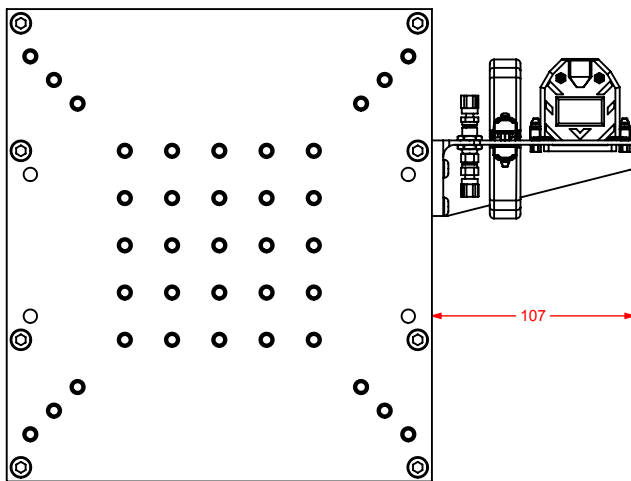
PRO115LM/PRO165LM -CMS0



PRO190LM -CMS0



PRO225LM/PRO280LM/PRO560LM -CMS0



DIMENSIONS: MILLIMETERS