

X-LRM-E Series Datasheet



- 25, 50, 100, 150, 200 mm travel
- Up to 8 μm accuracy and 50 nm resolution
- 50 kg load capacity
- Hardened steel construction and integrated recirculating ball bearing guide provide exceptional stiffness and thermal stability
- Motor encoder position feedback with slip/stall detection and automatic recovery
- Built-in controller, daisy-chains with other Zaber products

X-LRM-E Series Overview

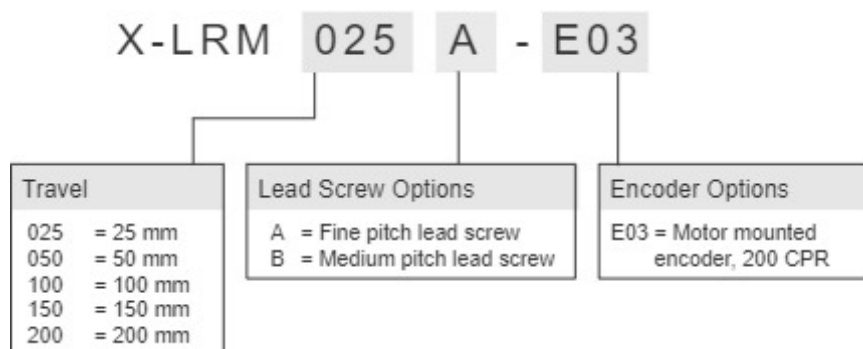
Zaber's X-LRM-E Series products are motorized linear stages with integrated controllers. The X-LRM-E's hardened steel construction and recirculating ball bearing guide provide exceptional rigidity and thermal stability. High stiffness makes the X-LRM-E ideal for multi-axis configurations or applications where excellent stability under cantilever loads is required.

The X-LRM-E stages are stand-alone units requiring only a standard 24-48 V power supply. An indexed knob at the end of the unit permits manual control - press and hold to switch between velocity mode and position mode, turn to move the stage, and press to stop.

The stages connect to the USB 2.0 or RS-232 port of any computer and can be chained with several units per chain. They can be chained with any other Zaber products. Convenient locking, 4-pin, M8 connectors on the unit allow for easy and secure connection between products. The chain also shares power, so multiple X-Series products can use a single power supply.

For more information visit: <https://www.zaber.com/products/linear-stages/X-LRM-E>

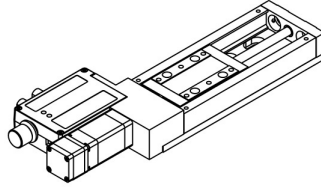
X-LRM-E Series Part Numbering & Options



X-LRM-E Series Drawings

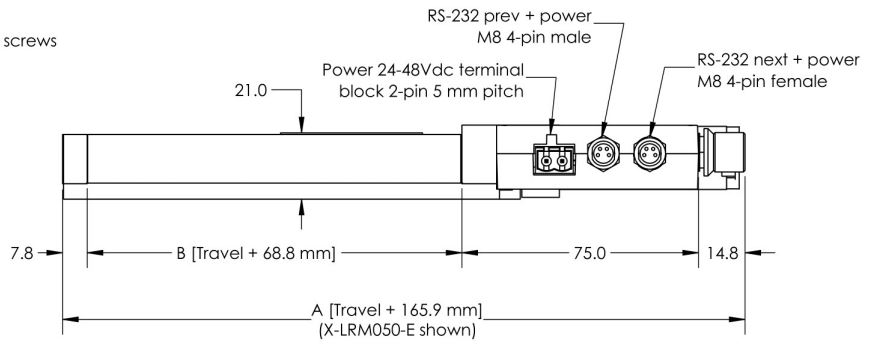
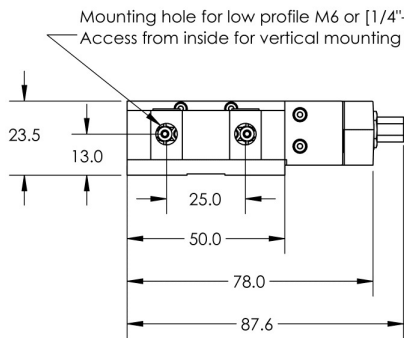
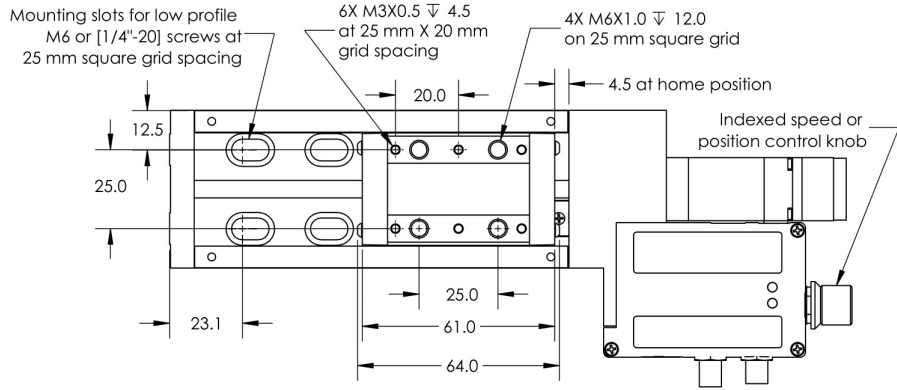
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X-LRM-E Motorized Linear Stage
 dimensions in mm



| Model Number* | Travel | A | B |
|---------------|--------|-------|-------|
| X-LRM025-E | 25.0 | 190.9 | 93.8 |
| X-LRM050-E | 50.0 | 215.9 | 118.8 |
| X-LRM100-E | 100.0 | 265.9 | 168.8 |
| X-LRM150-E | 150.0 | 315.9 | 218.8 |
| X-LRM200-E | 200.0 | 365.9 | 268.8 |

*See product page for complete list of available models at www.zaber.com



DWG 1121 R02

X-LRM-E Series Specifications

| Built-in Controller | |
|----------------------------|-------------------------------------|
| Repeatability | < 4 μm (< 0.000157") |
| Encoder Resolution | 200 CPR (800 states/rev) |
| Encoder Type | Rotary quadrature encoder |
| Maximum Continuous Thrust | 25 N (5.6 lb) |
| Communication Interface | RS-232, USB 2.0 |
| Communication Protocol | Zaber ASCII (Default), Zaber Binary |
| Data Cable Connection | Locking 4-pin M8 |
| Maximum Centered Load | 500 N (112.1 lb) |
| Maximum Cantilever Load | 1500 N-cm (2124.2 oz-in) |
| Guide Type | Recirculating ball bearing |
| Vertical Runout | < 8 μm (< 0.000315") |
| Horizontal Runout | < 12 μm (< 0.000472") |
| Pitch | 0.02° (0.349 mrad) |
| Roll | 0.02° (0.349 mrad) |
| Yaw | 0.02° (0.349 mrad) |
| Stiffness in Pitch | 750 N-m/° (23 $\mu\text{rad/N-m}$) |
| Stiffness in Roll | 550 N-m/° (32 $\mu\text{rad/N-m}$) |
| Stiffness in Yaw | 400 N-m/° (44 $\mu\text{rad/N-m}$) |
| Power Supply | 24-48 VDC |
| Power Plug | 2-pin Screw Terminal |
| Maximum Current Draw | 350 mA |
| Motor Steps Per Rev | 200 |
| Motor Type | Stepper (2 phase) |
| Motor Rated Current | 600 mA/phase |
| Inductance | 3.5 mH/phase |
| Default Resolution | 1/64 of a step |
| Mechanical Drive System | Precision lead screw |
| Limit or Home Sensing | Magnetic hall sensor |
| Manual Control | Yes |
| Axes of Motion | 1 |

| Built-in Controller | |
|-----------------------------|----------------------------------|
| Mounting Interface | M3 and M6 threaded holes |
| Stage Parallelism | < 10 μm (< 0.000394") |
| Operating Temperature Range | 0 to 50 °C |
| RoHS Compliant | Yes |
| CE Compliant | Yes |
| Vacuum Compatible | No |

| Part Number | Microstep Size (Default Resolution) | Travel Range | Accuracy (unidirectional) | Backlash |
|--------------------|--------------------------------------------|---------------------|----------------------------------|----------------------------------|
| X-LRM025A-E03 | 0.047625 μm | 25.0 mm (0.984") | 8 μm (0.000315") | < 5 μm (< 0.000197") |
| X-LRM025B-E03 | 0.1905 μm | 25.0 mm (0.984") | 8 μm (0.000315") | < 12 μm (< 0.000472") |
| X-LRM050A-E03 | 0.047625 μm | 50.0 mm (1.969") | 15 μm (0.000591") | < 5 μm (< 0.000197") |
| X-LRM050B-E03 | 0.1905 μm | 50.0 mm (1.969") | 15 μm (0.000591") | < 12 μm (< 0.000472") |
| X-LRM100A-E03 | 0.047625 μm | 100.0 mm (3.937") | 30 μm (0.001181") | < 5 μm (< 0.000197") |
| X-LRM100B-E03 | 0.1905 μm | 100.0 mm (3.937") | 30 μm (0.001181") | < 12 μm (< 0.000472") |
| X-LRM150A-E03 | 0.047625 μm | 150.0 mm (5.905") | 45 μm (0.001772") | < 5 μm (< 0.000197") |
| X-LRM150B-E03 | 0.1905 μm | 150.0 mm (5.905") | 45 μm (0.001772") | < 12 μm (< 0.000472") |
| X-LRM200A-E03 | 0.047625 μm | 200.0 mm (7.874") | 60 μm (0.002362") | < 5 μm (< 0.000197") |
| X-LRM200B-E03 | 0.1905 μm | 200.0 mm (7.874") | 60 μm (0.002362") | < 12 μm (< 0.000472") |

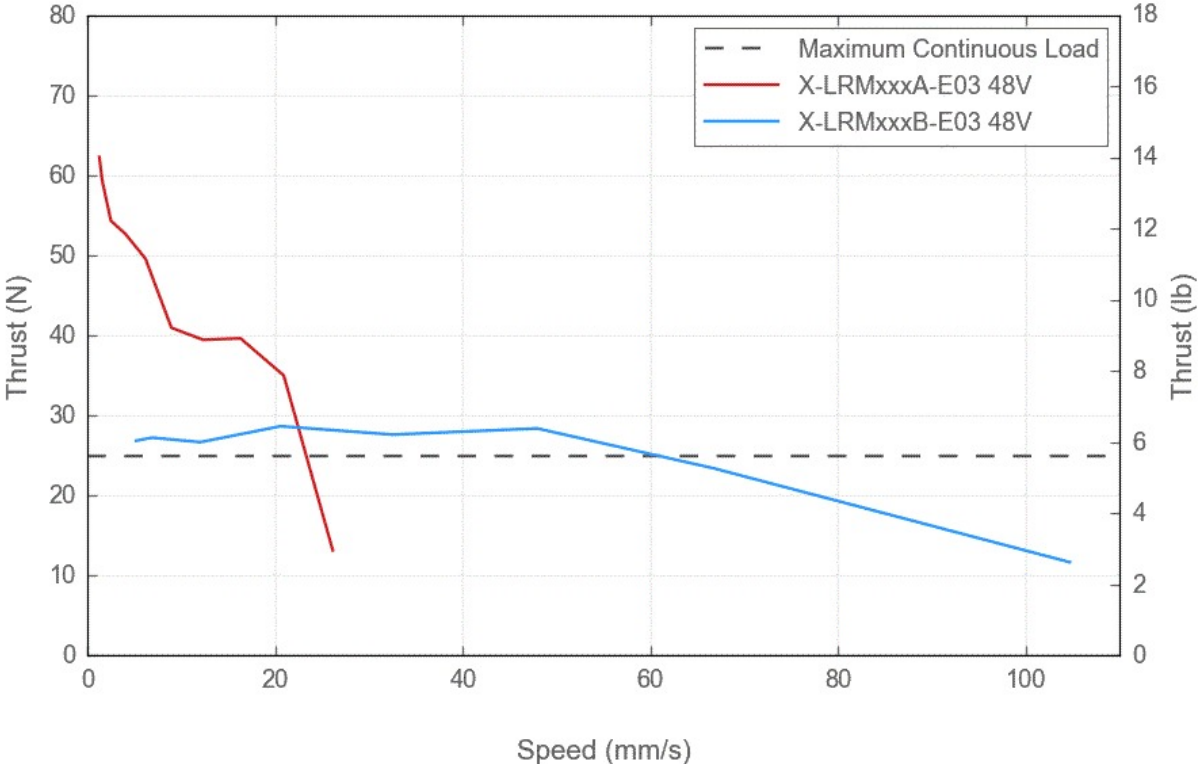
| Part Number | Maximum Speed | Minimum Speed | Speed Resolution | Peak Thrust |
|--------------------|----------------------|-----------------------------|-----------------------------|--------------------|
| X-LRM025A-E03 | 25 mm/s (0.984"/s) | 0.000029 mm/s (0.000001"/s) | 0.000029 mm/s (0.000001"/s) | 50 N (11.2 lb) |
| X-LRM025B-E03 | 100 mm/s (3.937"/s) | 0.000116 mm/s (0.000005"/s) | 0.000116 mm/s (0.000005"/s) | 25 N (5.6 lb) |
| X-LRM050A-E03 | 25 mm/s (0.984"/s) | 0.000029 mm/s (0.000001"/s) | 0.000029 mm/s (0.000001"/s) | 50 N (11.2 lb) |
| X-LRM050B-E03 | 100 mm/s | 0.000116 mm/s | 0.000116 mm/s | 25 N (5.6 lb) |

| Part Number | Maximum Speed | Minimum Speed | Speed Resolution | Peak Thrust |
|---------------|------------------------|--------------------------------|--------------------------------|----------------|
| | (3.937"/s) | (0.000005"/s) | (0.000005"/s) | |
| X-LRM100A-E03 | 25 mm/s (0.984"/s) | 0.000029 mm/s (0.000001"/s) | 0.000029 mm/s (0.000001"/s) | 50 N (11.2 lb) |
| X-LRM100B-E03 | 100 mm/s (3.937"/s) | 0.000116 mm/s (0.000005"/s) | 0.000116 mm/s (0.000005"/s) | 25 N (5.6 lb) |
| X-LRM150A-E03 | 25 mm/s (0.984"/s) | 0.000029 mm/s (0.000001"/s) | 0.000029 mm/s (0.000001"/s) | 50 N (11.2 lb) |
| X-LRM150B-E03 | 100 mm/s (3.937"/s) | 0.000116 mm/s (0.000005"/s) | 0.000116 mm/s (0.000005"/s) | 25 N (5.6 lb) |
| X-LRM200A-E03 | 25 mm/s (0.984"/s) | 0.000029 mm/s (0.000001"/s) | 0.000029 mm/s (0.000001"/s) | 50 N (11.2 lb) |
| X-LRM200B-E03 | 100 mm/s (3.937"/s) | 0.000116 mm/s (0.000005"/s) | 0.000116 mm/s (0.000005"/s) | 25 N (5.6 lb) |

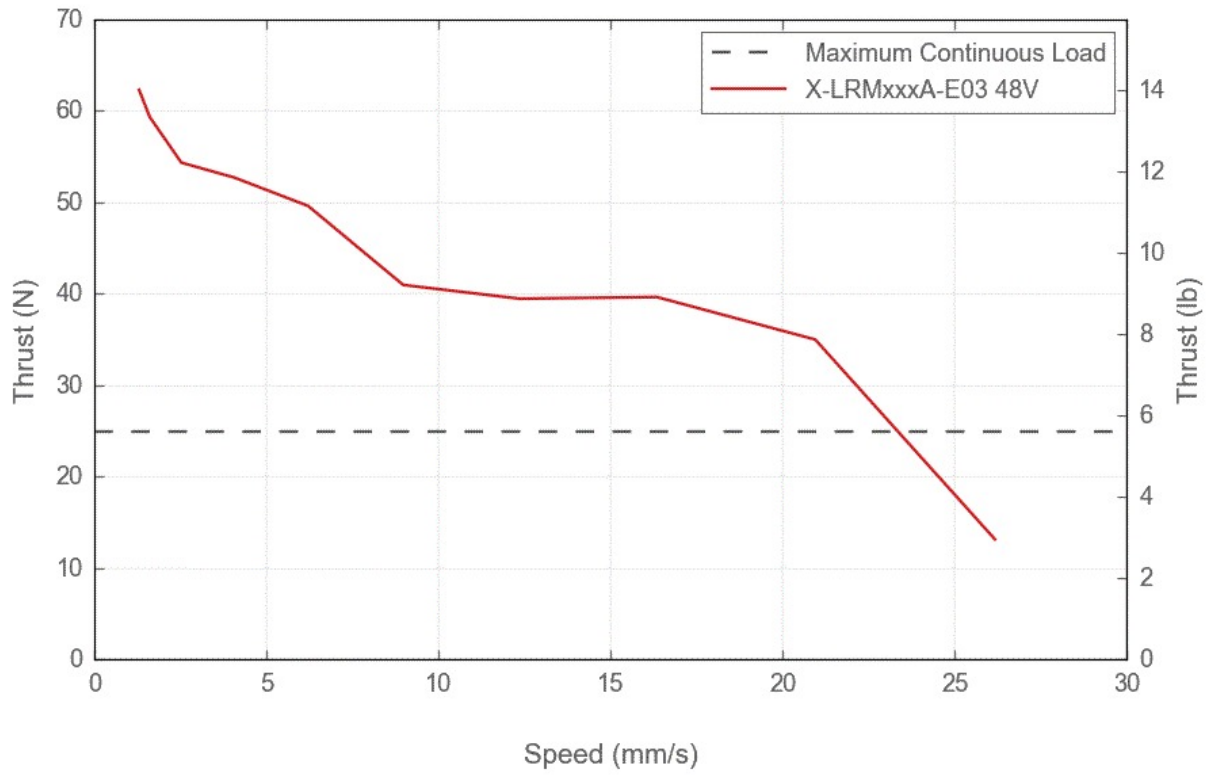
| Part Number | Linear Motion Per Motor Rev | Weight |
|---------------|-----------------------------|--------------------|
| X-LRM025A-E03 | 0.6096 mm (0.024") | 0.75 kg (1.653 lb) |
| X-LRM025B-E03 | 2.4384 mm (0.096") | 0.75 kg (1.653 lb) |
| X-LRM050A-E03 | 0.6096 mm (0.024") | 0.83 kg (1.830 lb) |
| X-LRM050B-E03 | 2.4384 mm (0.096") | 0.83 kg (1.830 lb) |
| X-LRM100A-E03 | 0.6096 mm (0.024") | 0.98 kg (2.161 lb) |
| X-LRM100B-E03 | 2.4384 mm (0.096") | 0.98 kg (2.161 lb) |
| X-LRM150A-E03 | 0.6096 mm (0.024") | 1.15 kg (2.535 lb) |
| X-LRM150B-E03 | 2.4384 mm (0.096") | 1.15 kg (2.535 lb) |
| X-LRM200A-E03 | 0.6096 mm (0.024") | 1.31 kg (2.888 lb) |
| X-LRM200B-E03 | 2.4384 mm (0.096") | 1.31 kg (2.888 lb) |

X-LRM-E Series Charts

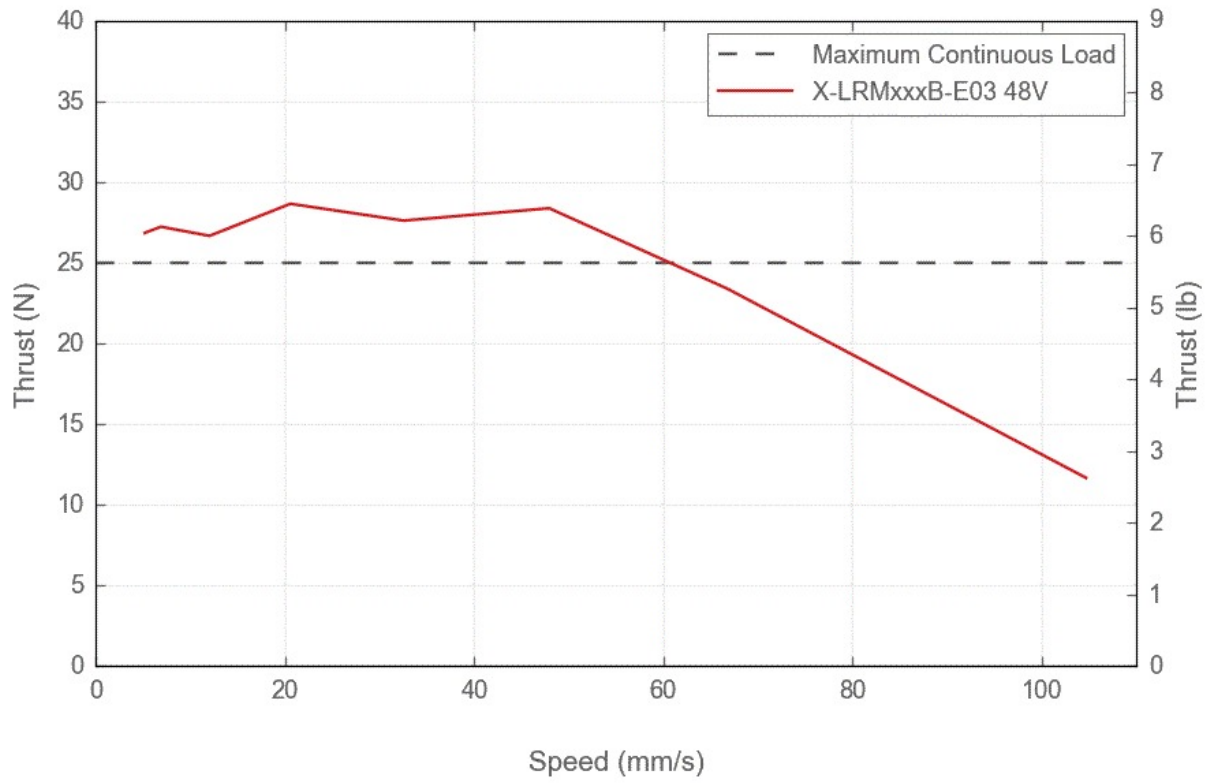
Thrust Speed Performance



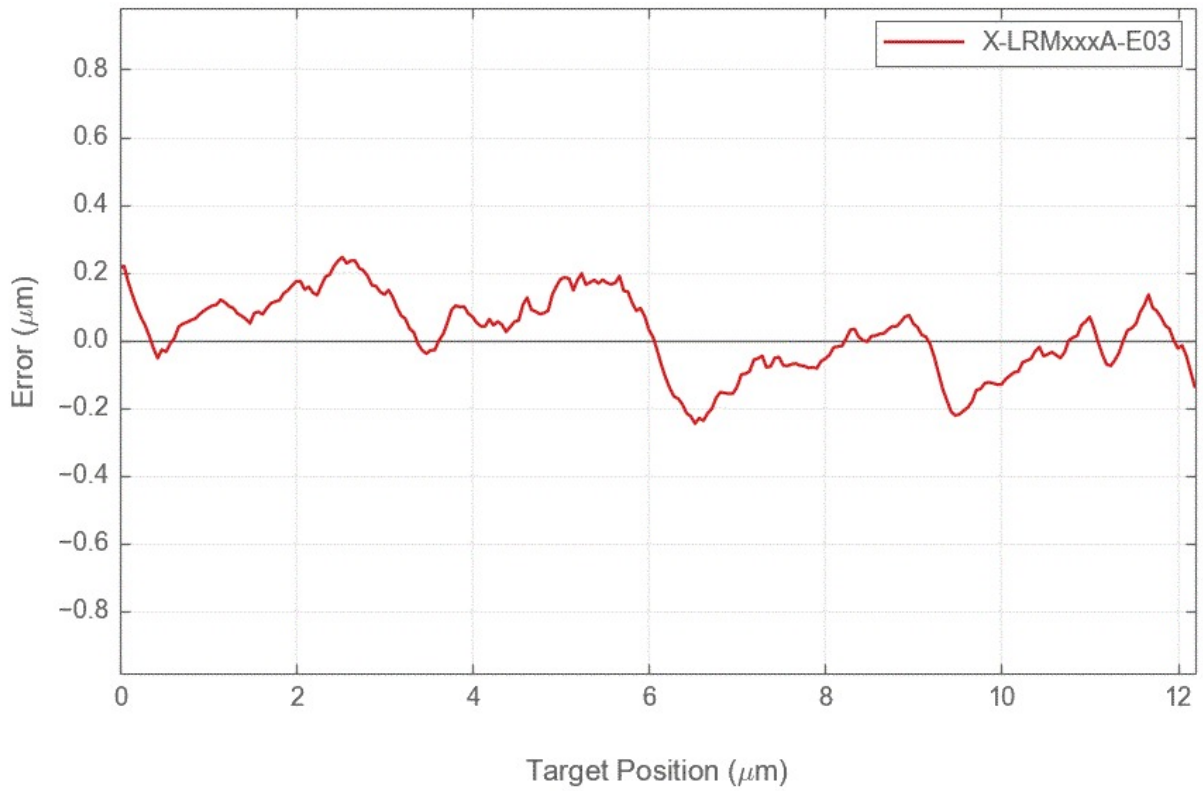
Thrust Speed Performance



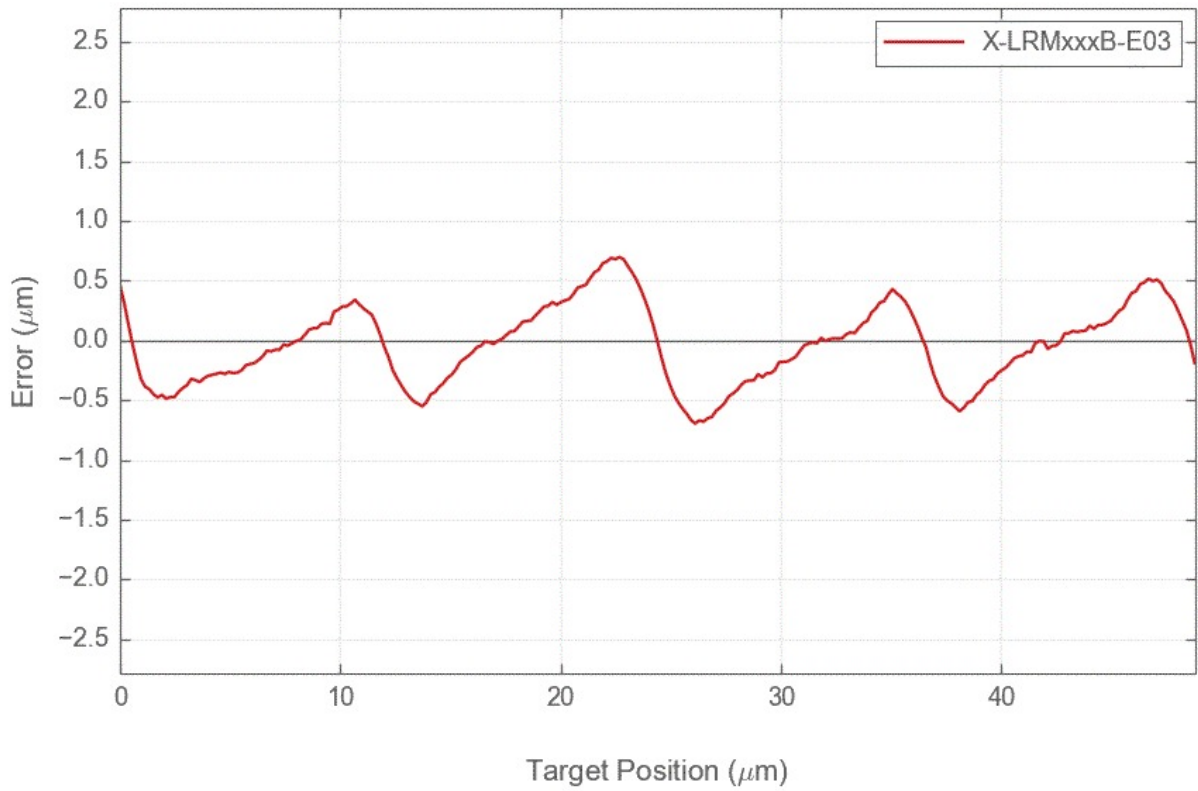
Thrust Speed Performance



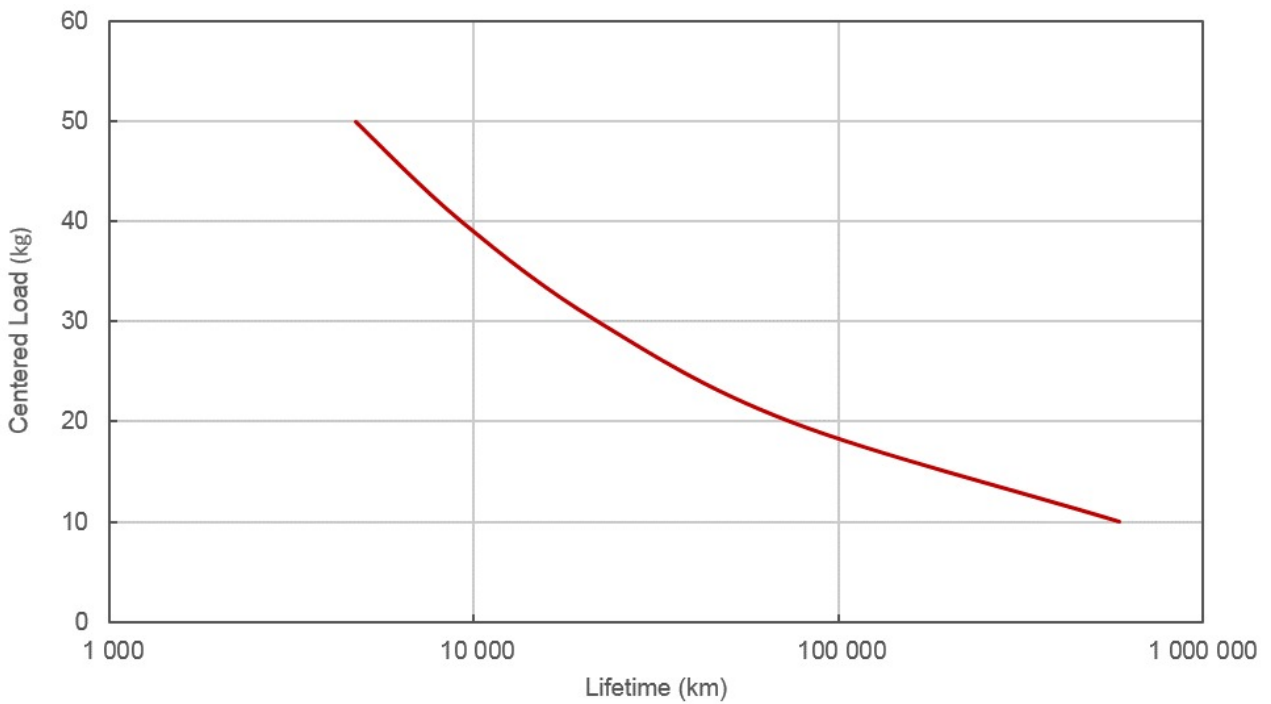
Typical Microstepping Accuracy



Typical Microstepping Accuracy



LRM Linear Bearing Lifetime



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