

## X-LRM-E Series Datasheet



- 25, 50, 100, 150, 200 mm travel
- Up to 8  $\mu\text{m}$  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

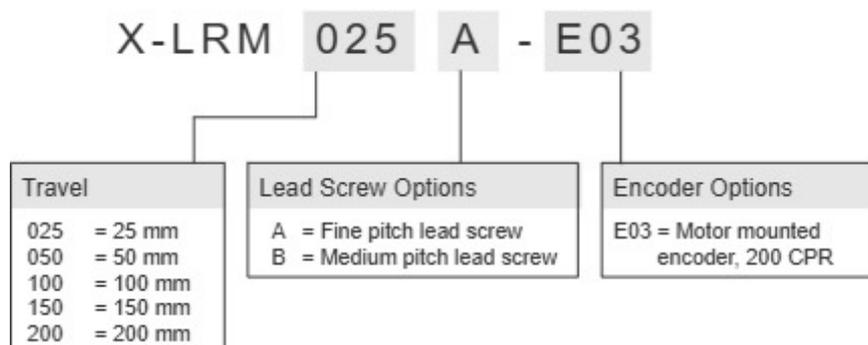
Zaber's X-LRM-E Series products are motorized linear stages with integrated controllers. The X-LRM-E's hardened steel construction and recirculating ball bearing guide provide exceptional rigidity and thermal stability. High stiffness makes the X-LRM-E ideal for multi-axis configurations or applications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

- [X-LRM-E.png \(Drawing for the X-LRM-E\)](#)

## X-LRM-E Series Specifications

<b>Built-in Controller</b>	
Repeatability	< 4 $\mu\text{m}$ (< 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 Moment (Pitch)	6 N-m (4.4 ft-lb)
Maximum Moment (Roll)	15 N-m (11.1 ft-lb)
Maximum Moment (Yaw)	6 N-m (4.4 ft-lb)
Vertical Runout	< 8 $\mu\text{m}$ (< 0.000315")
Horizontal Runout	< 12 $\mu\text{m}$ (< 0.000472")
Pitch	0.02° (0.349 mrad)
Roll	0.02° (0.349 mrad)
Yaw	0.02° (0.349 mrad)
Stiffness in Pitch	550 N-m/° (32 $\mu\text{rad/N-m}$ )
Stiffness in Roll	550 N-m/° (32 $\mu\text{rad/N-m}$ )
Stiffness in Yaw	550 N-m/° (32 $\mu\text{rad/N-m}$ )
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
Guide Type	Recirculating ball bearing
Mechanical Drive System	Precision lead screw
Limit or Home Sensing	Magnetic hall sensor

<b>Built-in Controller</b>	
Manual Control	Yes
Axes of Motion	1
Mounting Interface	M3 and M6 threaded holes
Stage Parallelism	< 10 µm (< 0.000394")
Operating Temperature Range	0 to 50 °C
CE Compliant	Yes
Vacuum Compatible	No

<b>Part Number</b>	<b>Microstep Size (Default Resolution)</b>	<b>Travel Range</b>	<b>Accuracy (unidirectional)</b>	<b>Backlash</b>
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")

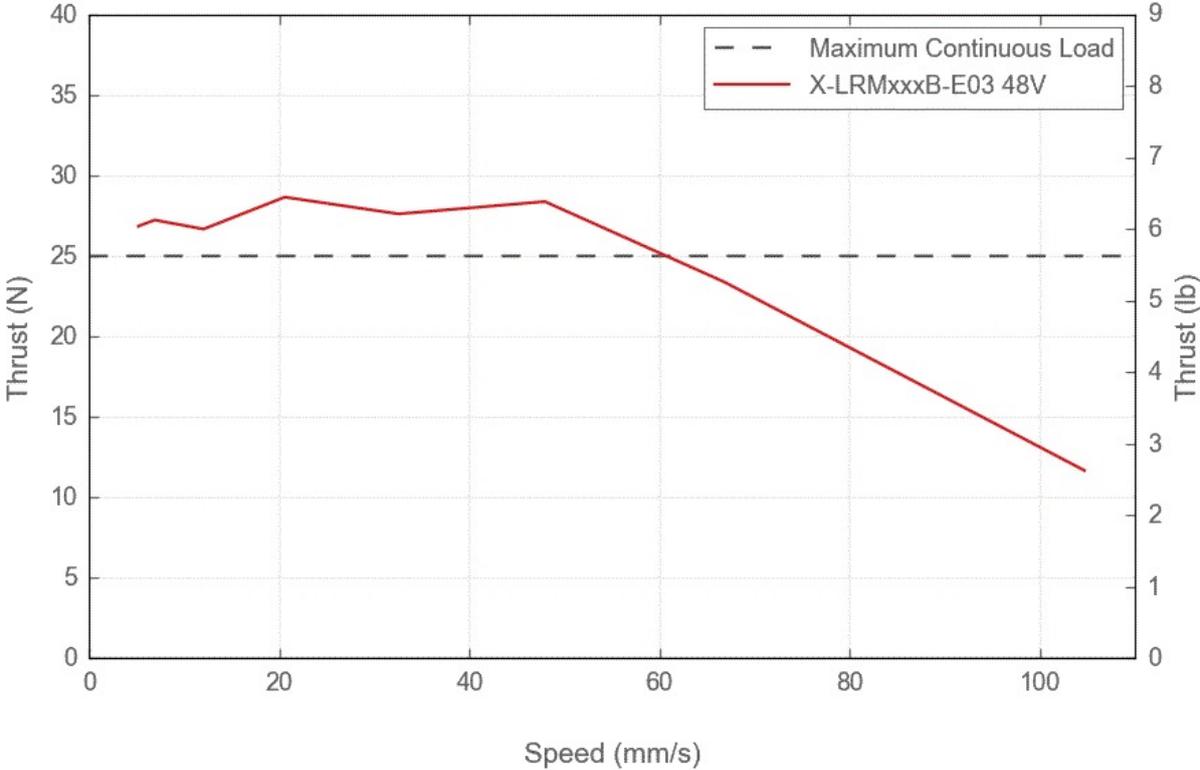
<b>Part Number</b>	<b>Maximum Speed</b>	<b>Minimum Speed</b>	<b>Speed Resolution</b>	<b>Peak Thrust</b>
X-LRM025A-E03	25 mm/s (0.984"/s)	0.000029 mm/s (0.000001"/s)	0.000029 mm/s (0.000001"/s)	50 N (11.2 lb)
X-LRM025B-E03	100 mm/s (3.937"/s)	0.000116 mm/s (0.000005"/s)	0.000116 mm/s (0.000005"/s)	25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

Part Number	Maximum Speed	Minimum Speed	Speed Resolution	Peak Thrust
X-LRM050B-E03	(3.937"/s)	(0.000005"/s)	(0.000005"/s)	25 N (5.6 lb)
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)

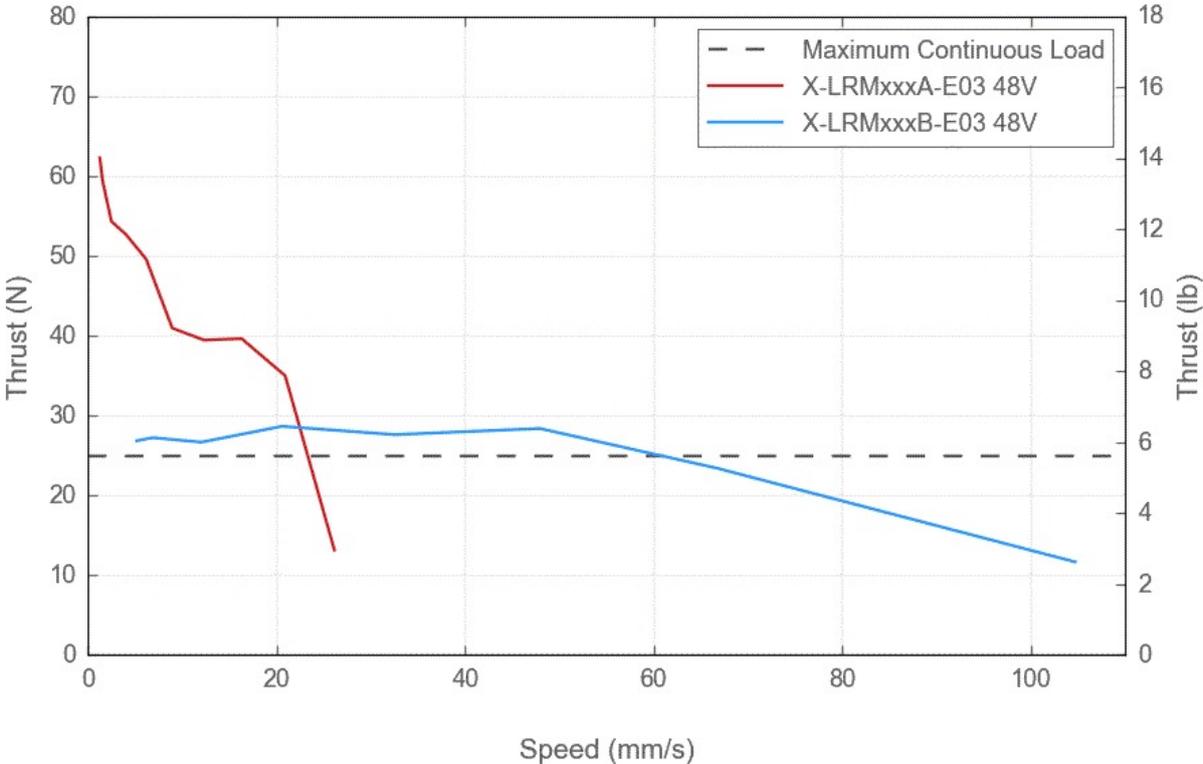
Part Number	Linear Motion Per Motor Rev	Weight
X-LRM025A-E03	0.6096 mm (0.024")	0.75 kg (1.653 lb)
X-LRM025B-E03	2.4384 mm (0.096")	0.75 kg (1.653 lb)
X-LRM050A-E03	0.6096 mm (0.024")	0.83 kg (1.830 lb)
X-LRM050B-E03	2.4384 mm (0.096")	0.83 kg (1.830 lb)
X-LRM100A-E03	0.6096 mm (0.024")	0.98 kg (2.161 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

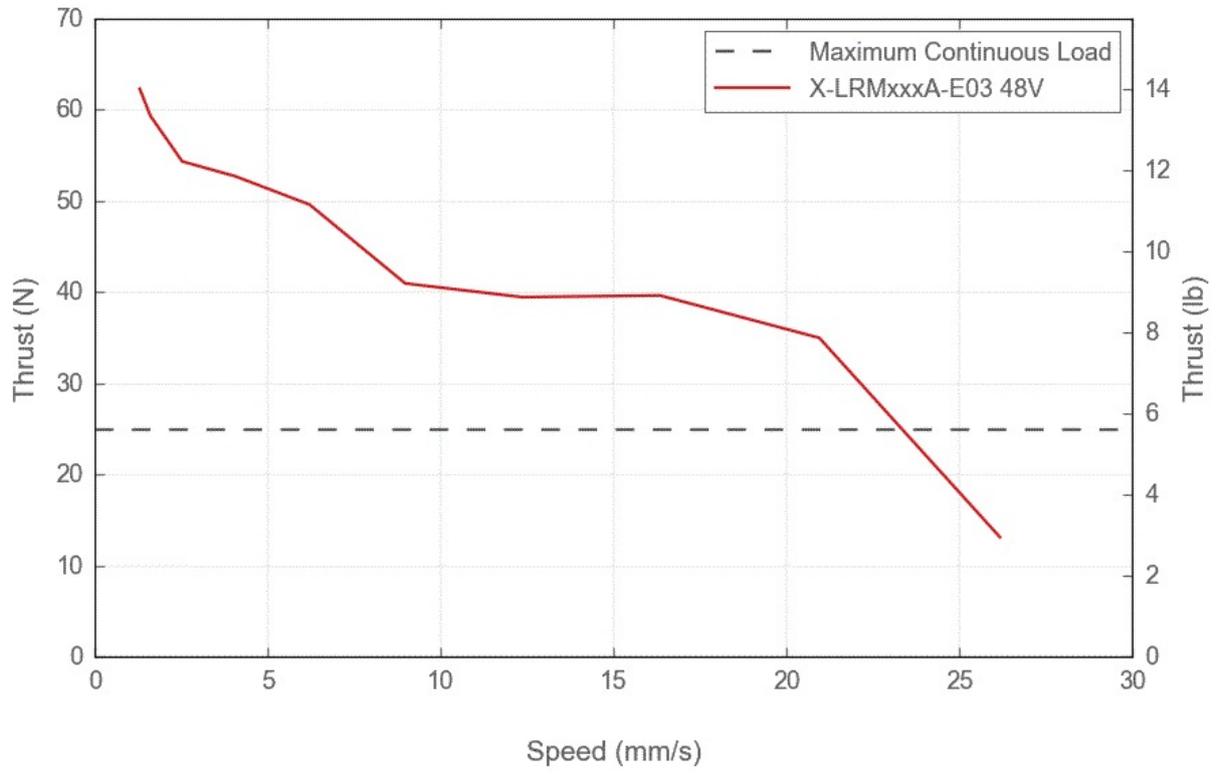
Thrust Speed Performance



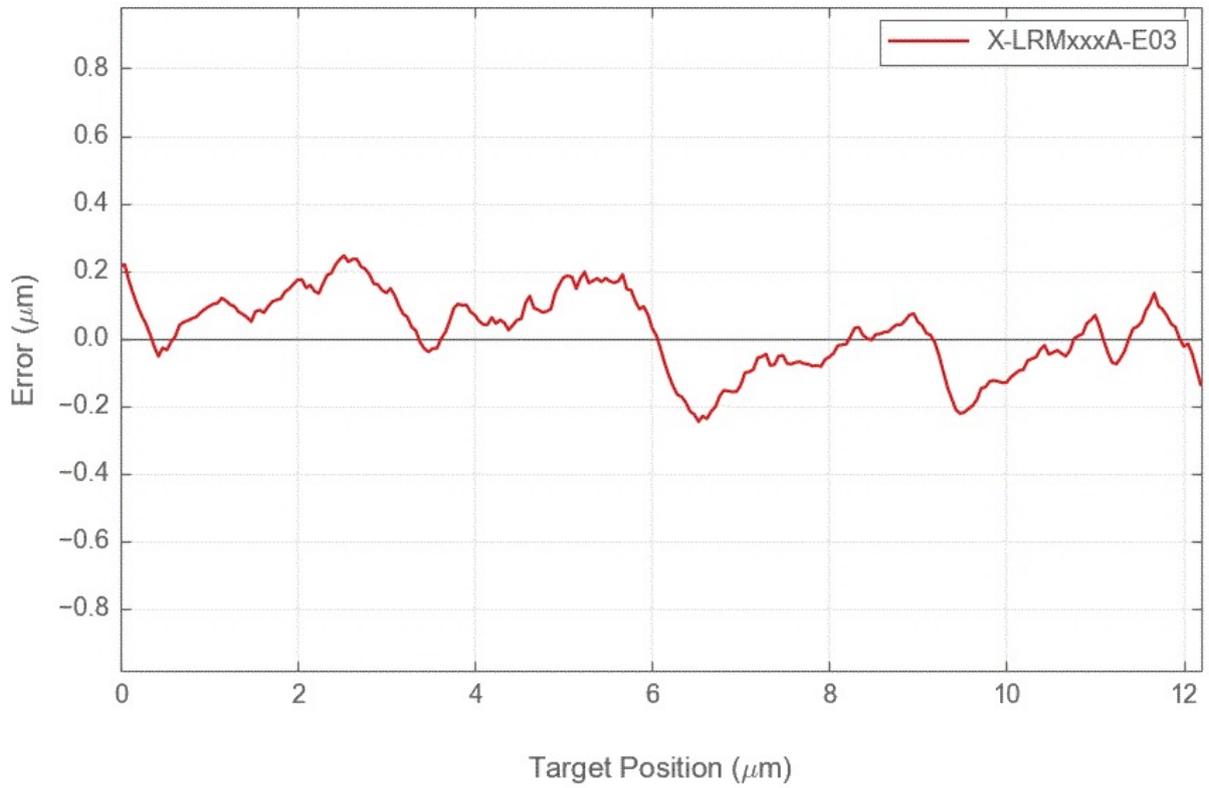
# Thrust Speed Performance



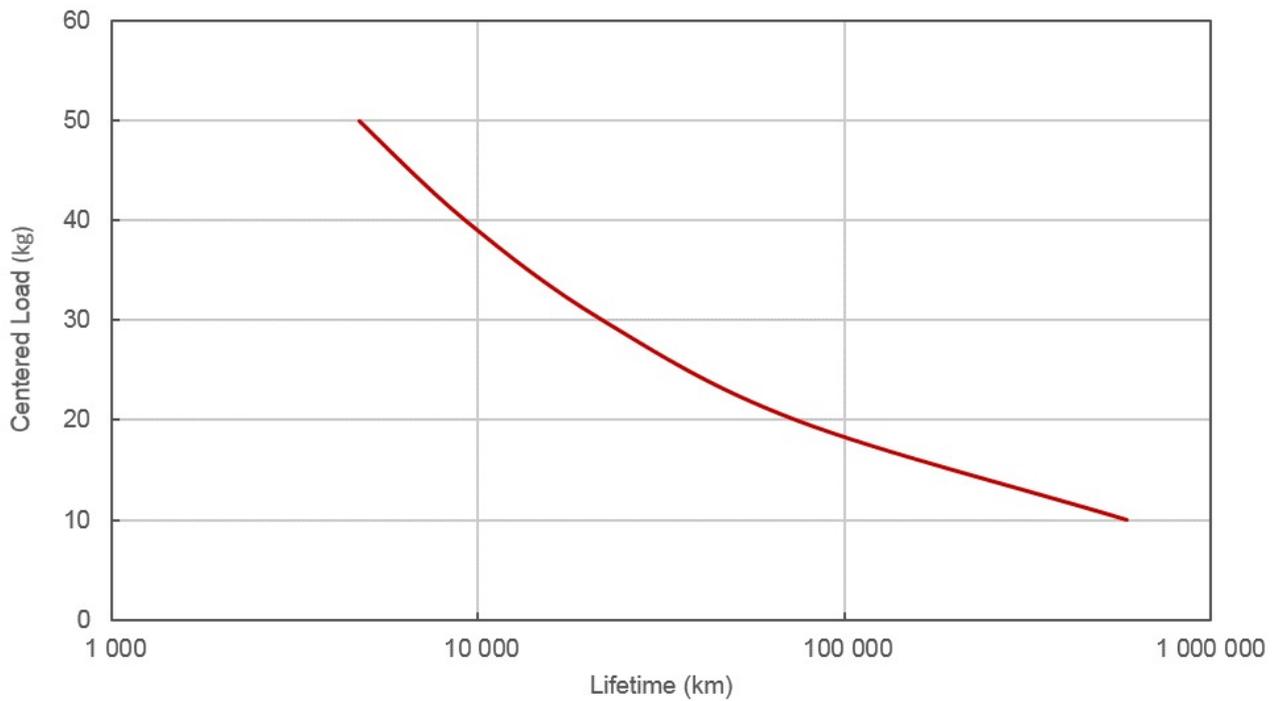
## Thrust Speed Performance



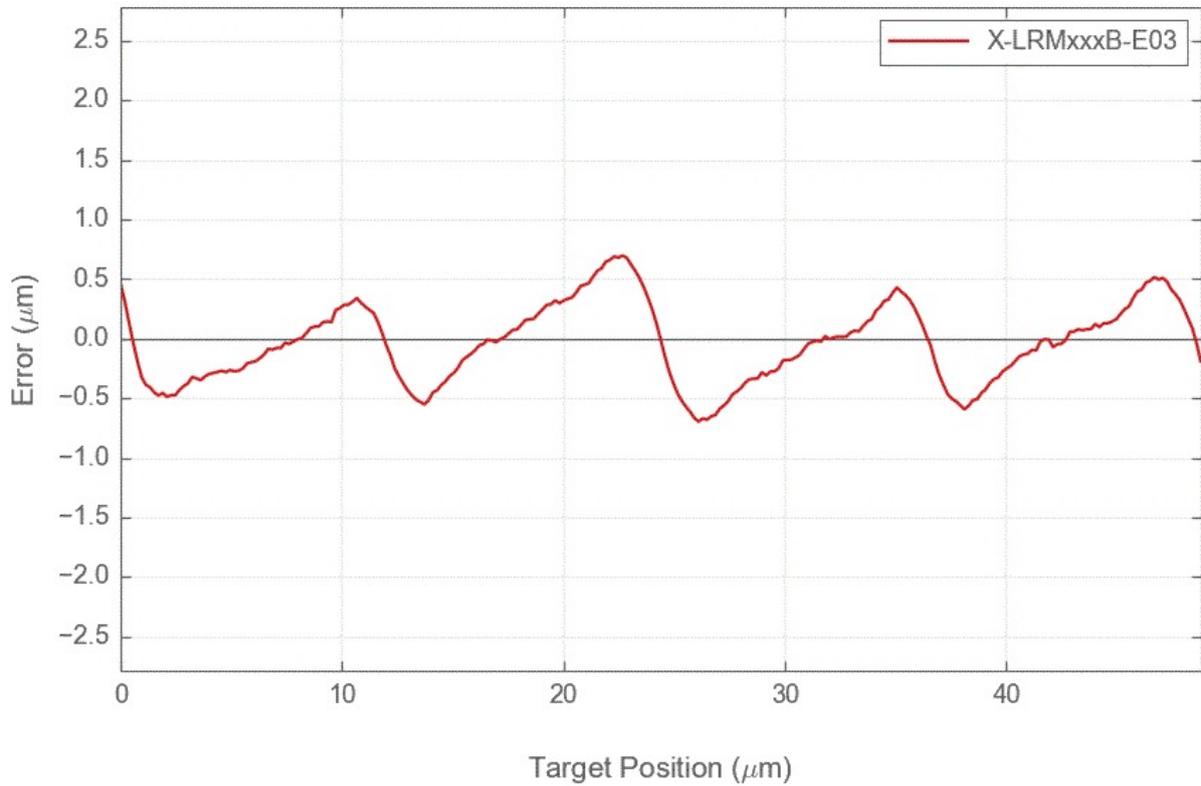
## Typical Microstepping Accuracy



## LRM Linear Bearing Lifetime



## Typical Microstepping Accuracy



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