

LSM-E Series Datasheet



- 25, 50, 100, 150 and 200 mm travel
- Recirculating ball bearing design for high load (25 kg) and long lifetime
- Encoder position feedback with slip/stall detection and automatic recovery
- Multiple LSM-E stages can be assembled in XY or XYZ configurations without additional hardware
- Designed for use with an X-MCC Series stepper motor controller or any 2-phase stepper motor controller
- With AutoDetect, the X-MCC controller configures its settings automatically for the connected peripheral
- Custom versions available

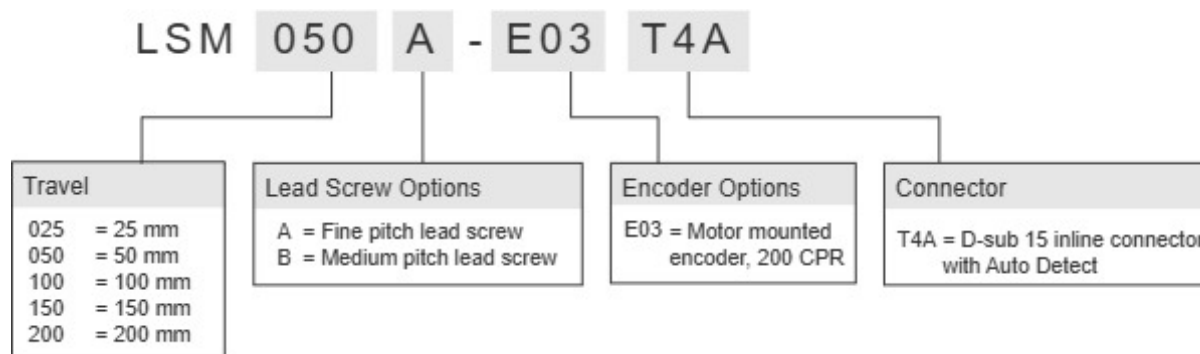
LSM-E Series Overview

Zaber's LSM-E Series devices are computer-controlled, motorized linear stages with high thrust and speed capabilities and a very compact size. They are designed to interface with our X-MCC Series universal motor controllers, offering high resolution daisy-chainable operation. Set up is easy with AutoDetect. Once connected, the X-MCC controller will automatically detect and configure the LSM-E.

The built-in motor encoder allows closed-loop operation and slip/stall recovery features. At only 21 mm high, these miniature stages are excellent for applications where a small profile is required. The LSM-E's innovative design allows speeds up to 104 mm/s and loads up to 25 kg. The stages can be mounted in XY and XYZ configurations with no additional hardware.

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

LSM-E Series Part Numbering & Options



LSM-E Series Drawings

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

LSM-E Series Specifications

Built-in Controller	
Recommended Controller	X-MCC (48 V) Recommended
AutoDetect	Yes
Encoder Resolution	200 CPR (800 states/rev)
Encoder Type	Rotary quadrature encoder
Maximum Continuous Thrust	25 N (5.6 lb)
Maximum Centered Load	250 N (56.1 lb)
Maximum Moment (Roll)	10 N-m (7.4 ft-lb)
Maximum Moment (Pitch)	4 N-m (3.0 ft-lb)
Maximum Moment (Yaw)	4 N-m (3.0 ft-lb)
Guide Type	Recirculating ball bearing
Stiffness in Pitch	150 N-m/° (116 µrad/N-m)
Stiffness in Roll	150 N-m/° (116 µrad/N-m)
Stiffness in Yaw	150 N-m/° (116 µrad/N-m)
Motor Steps Per Rev	200
Motor Type	Stepper (2 phase)
Motor Rated Current	600 mA/phase
Motor Winding Resistance	6.5 ohms/phase
Inductance	3.5 mH/phase
Motor Connection	D-sub 15
Default Resolution	1/64 of a step
Motor Frame Size	NEMA 08
Mechanical Drive System	Precision lead screw
Limit or Home Sensing	Magnetic hall sensor
Axes of Motion	1
Mounting Interface	M3 and M6 threaded holes and M4 threaded centre hole
Stage Parallelism	< 25 µm (< 0.000984")
Operating Temperature Range	0 to 50 °C
CE Compliant	Yes
Vacuum Compatible	No

Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Repeatability
LSM025A-E03T4A	0.047625 µm	25.4 mm (1.000")	15 µm (0.000591")	< 3 µm (< 0.000118")
LSM025B-E03T4A	0.1905 µm	25.4 mm (1.000")	15 µm (0.000591")	< 6 µm (< 0.000236")
LSM050A-E03T4A	0.047625 µm	50.8 mm (2.000")	20 µm (0.000787")	< 3 µm (< 0.000118")
LSM050B-E03T4A	0.1905 µm	50.8 mm (2.000")	25 µm (0.000984")	< 6 µm (< 0.000236")
LSM100A-E03T4A	0.047625 µm	101.6 mm (4.000")	35 µm (0.001378")	< 3 µm (< 0.000118")
LSM100B-E03T4A	0.1905 µm	101.6 mm (4.000")	45 µm (0.001772")	< 6 µm (< 0.000236")
LSM150A-E03T4A	0.047625 µm	152.4 mm (6.000")	50 µm (0.001968")	< 3 µm (< 0.000118")
LSM150B-E03T4A	0.1905 µm	152.4 mm (6.000")	65 µm (0.002559")	< 6 µm (< 0.000236")
LSM200A-E03T4A	0.047625 µm	203.2 mm (8.000")	60 µm (0.002362")	< 3 µm (< 0.000118")
LSM200B-E03T4A	0.1905 µm	203.2 mm (8.000")	85 µm (0.003346")	< 6 µm (< 0.000236")

Part Number	Backlash	Maximum Speed	Minimum Speed	Speed Resolution
LSM025A-E03T4A	< 12 µm (< 0.000472")	26 mm/s (1.024"/s)	0.000029 mm/s (0.000001"/s)	0.000029 mm/s (0.000001"/s)
LSM025B-E03T4A	< 16 µm (< 0.000630")	104 mm/s (4.094"/s)	0.000116 mm/s (0.000005"/s)	0.000116 mm/s (0.000005"/s)
LSM050A-E03T4A	< 12 µm (< 0.000472")	26 mm/s (1.024"/s)	0.000029 mm/s (0.000001"/s)	0.000029 mm/s (0.000001"/s)
LSM050B-E03T4A	< 16 µm (< 0.000630")	104 mm/s (4.094"/s)	0.000116 mm/s (0.000005"/s)	0.000116 mm/s (0.000005"/s)
LSM100A-E03T4A	< 12 µm (< 0.000472")	26 mm/s (1.024"/s)	0.000029 mm/s (0.000001"/s)	0.000029 mm/s (0.000001"/s)
LSM100B-E03T4A	< 16 µm (< 0.000630")	104 mm/s (4.094"/s)	0.000116 mm/s (0.000005"/s)	0.000116 mm/s (0.000005"/s)
LSM150A-E03T4A	< 12 µm (< 0.000472")	26 mm/s (1.024"/s)	0.000029 mm/s (0.000001"/s)	0.000029 mm/s (0.000001"/s)
LSM150B-E03T4A	< 16 µm (< 0.000630")	104 mm/s (4.094"/s)	0.000116 mm/s (0.000005"/s)	0.000116 mm/s (0.000005"/s)
LSM200A-E03T4A	< 12 µm (< 0.000472")	26 mm/s (1.024"/s)	0.000029 mm/s (0.000001"/s)	0.000029 mm/s (0.000001"/s)
	< 16 µm	104 mm/s	0.000116 mm/s	0.000116 mm/s

Part Number	Backlash	Maximum Speed	Minimum Speed	Speed Resolution
LSM200B-E03T4A	(< 0.000630")	(4.094"/s)	(0.000005"/s)	(0.000005"/s)

Part Number	Peak Thrust	Back-driving Force*	Vertical Runout	Horizontal Runout
LSM025A-E03T4A	55 N (12.3 lb)	Non-back-driving	< 8 µm (< 0.000315")	< 12 µm (< 0.000472")
LSM025B-E03T4A	25 N (5.6 lb)	(± 30%) 24 N (5.4 lb)	< 8 µm (< 0.000315")	< 12 µm (< 0.000472")
LSM050A-E03T4A	55 N (12.3 lb)	Non-back-driving	< 11 µm (< 0.000433")	< 14 µm (< 0.000551")
LSM050B-E03T4A	25 N (5.6 lb)	(± 30%) 24 N (5.4 lb)	< 11 µm (< 0.000433")	< 14 µm (< 0.000551")
LSM100A-E03T4A	55 N (12.3 lb)	Non-back-driving	< 18 µm (< 0.000709")	< 18 µm (< 0.000709")
LSM100B-E03T4A	25 N (5.6 lb)	(± 30%) 24 N (5.4 lb)	< 18 µm (< 0.000709")	< 18 µm (< 0.000709")
LSM150A-E03T4A	55 N (12.3 lb)	Non-back-driving	< 20 µm (< 0.000787")	< 20 µm (< 0.000787")
LSM150B-E03T4A	25 N (5.6 lb)	(± 30%) 24 N (5.4 lb)	< 20 µm (< 0.000787")	< 20 µm (< 0.000787")
LSM200A-E03T4A	55 N (12.3 lb)	Non-back-driving	< 20 µm (< 0.000787")	< 20 µm (< 0.000787")
LSM200B-E03T4A	25 N (5.6 lb)	(± 30%) 24 N (5.4 lb)	< 20 µm (< 0.000787")	< 20 µm (< 0.000787")

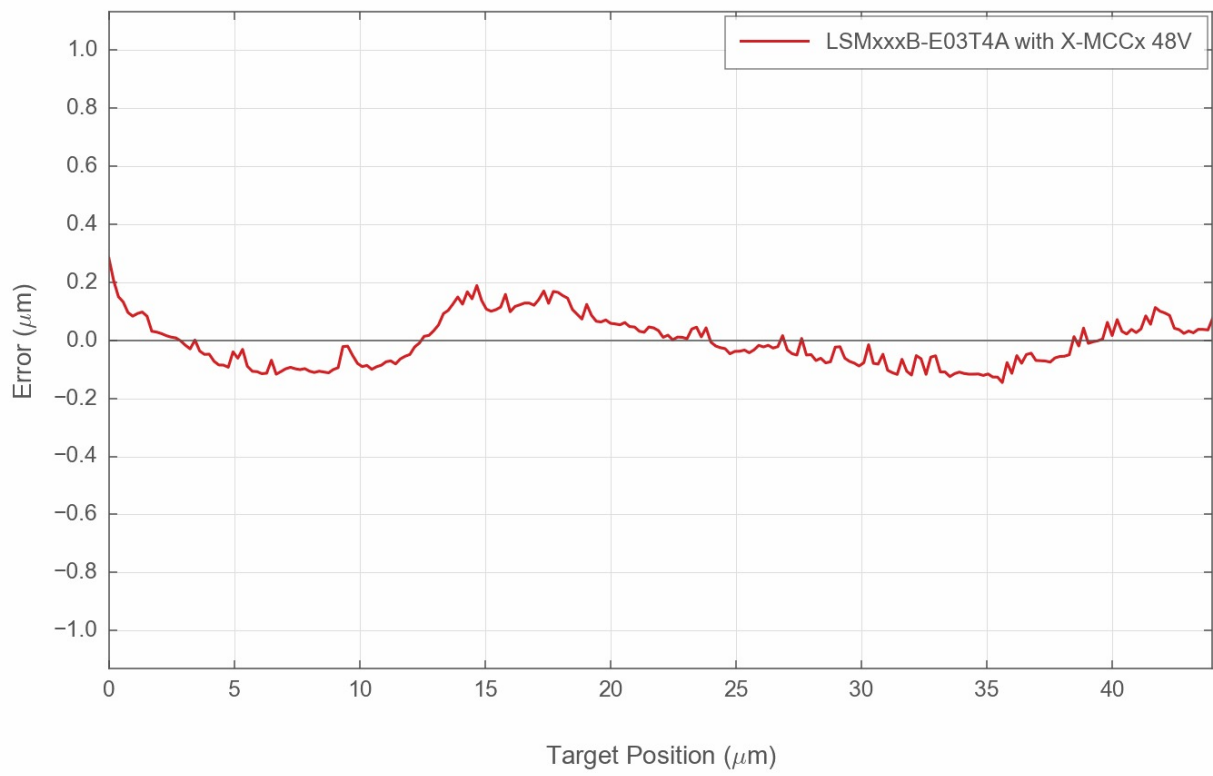
Part Number	Pitch	Roll	Yaw	Linear Motion Per Motor Rev
LSM025A-E03T4A	0.02° (0.349 mrad)	0.02° (0.349 mrad)	0.03° (0.523 mrad)	0.6096 mm (0.024")
LSM025B-E03T4A	0.02° (0.349 mrad)	0.02° (0.349 mrad)	0.03° (0.523 mrad)	2.4384 mm (0.096")
LSM050A-E03T4A	0.03° (0.523 mrad)	0.03° (0.523 mrad)	0.03° (0.523 mrad)	0.6096 mm (0.024")
LSM050B-E03T4A	0.03° (0.523 mrad)	0.03° (0.523 mrad)	0.03° (0.523 mrad)	2.4384 mm (0.096")
LSM100A-E03T4A	0.035° (0.611 mrad)	0.035° (0.611 mrad)	0.04° (0.698 mrad)	0.6096 mm (0.024")
LSM100B-E03T4A	0.035° (0.611 mrad)	0.035° (0.611 mrad)	0.04° (0.698 mrad)	2.4384 mm (0.096")
LSM150A-E03T4A	0.035° (0.611 mrad)	0.035° (0.611 mrad)	0.045° (0.785 mrad)	0.6096 mm (0.024")
	0.035°	0.035°	0.045°	2.4384 mm

Part Number	Pitch	Roll	Yaw	Linear Motion Per Motor Rev
LSM150B-E03T4A	(0.611 mrad)	(0.611 mrad)	(0.785 mrad)	(0.096")
LSM200A-E03T4A	0.035° (0.611 mrad)	0.035° (0.611 mrad)	0.045° (0.785 mrad)	0.6096 mm (0.024")
LSM200B-E03T4A	0.035° (0.611 mrad)	0.035° (0.611 mrad)	0.045° (0.785 mrad)	2.4384 mm (0.096")

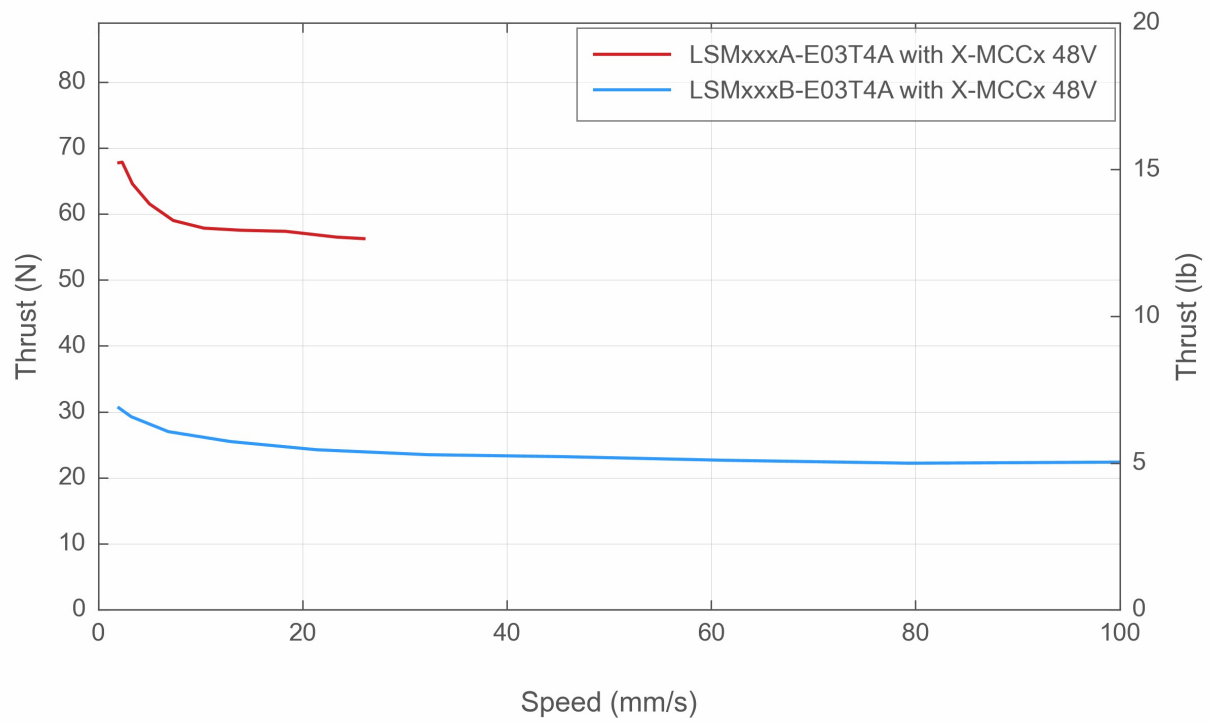
Part Number	Weight
LSM025A-E03T4A	0.26 kg (0.573 lb)
LSM025B-E03T4A	0.26 kg (0.573 lb)
LSM050A-E03T4A	0.28 kg (0.617 lb)
LSM050B-E03T4A	0.28 kg (0.617 lb)
LSM100A-E03T4A	0.32 kg (0.705 lb)
LSM100B-E03T4A	0.32 kg (0.705 lb)
LSM150A-E03T4A	0.37 kg (0.816 lb)
LSM150B-E03T4A	0.37 kg (0.816 lb)
LSM200A-E03T4A	0.42 kg (0.926 lb)
LSM200B-E03T4A	0.42 kg (0.926 lb)

LSM-E Series Charts

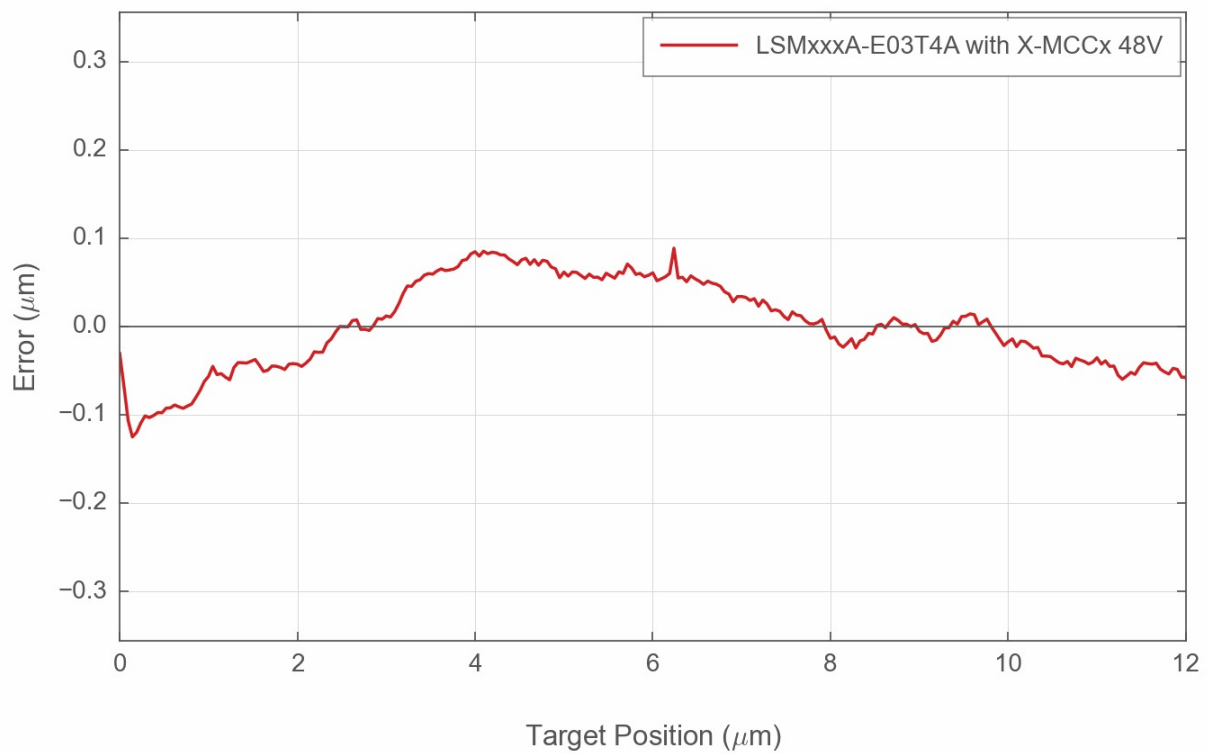
Typical Microstepping Accuracy



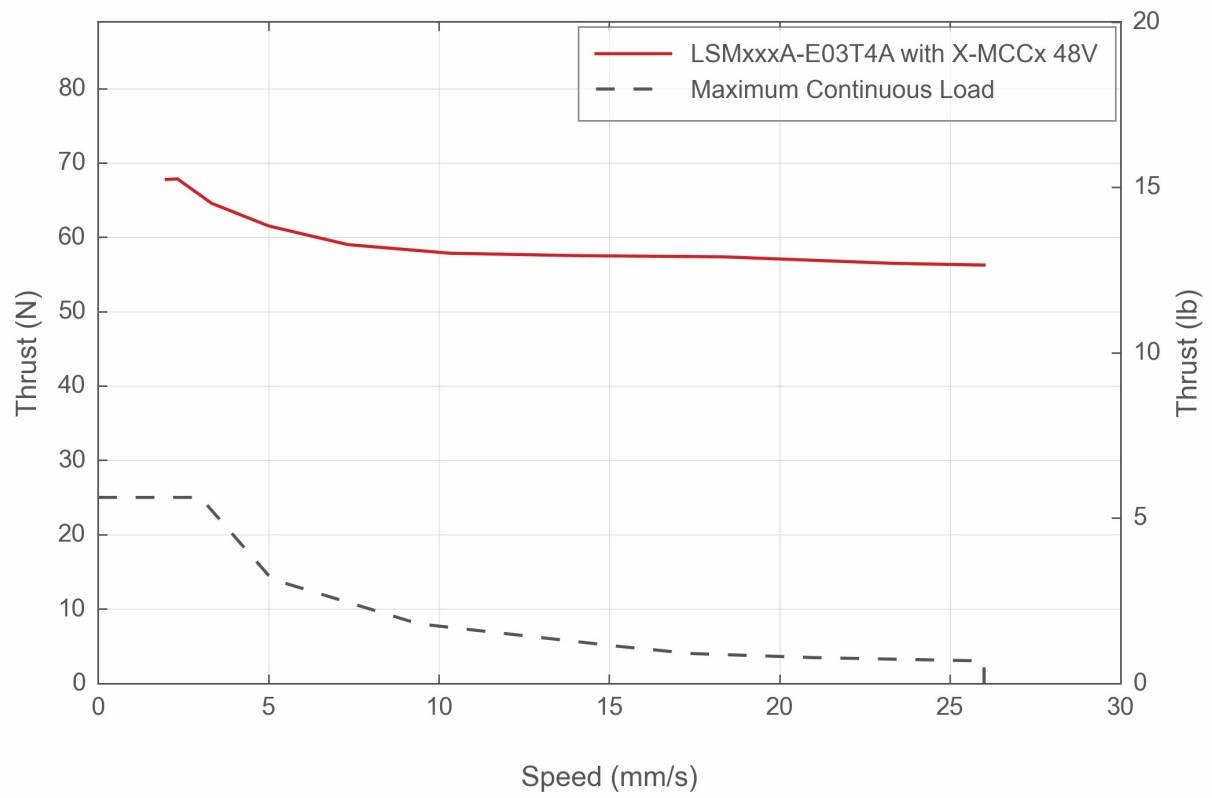
Thrust Speed Performance



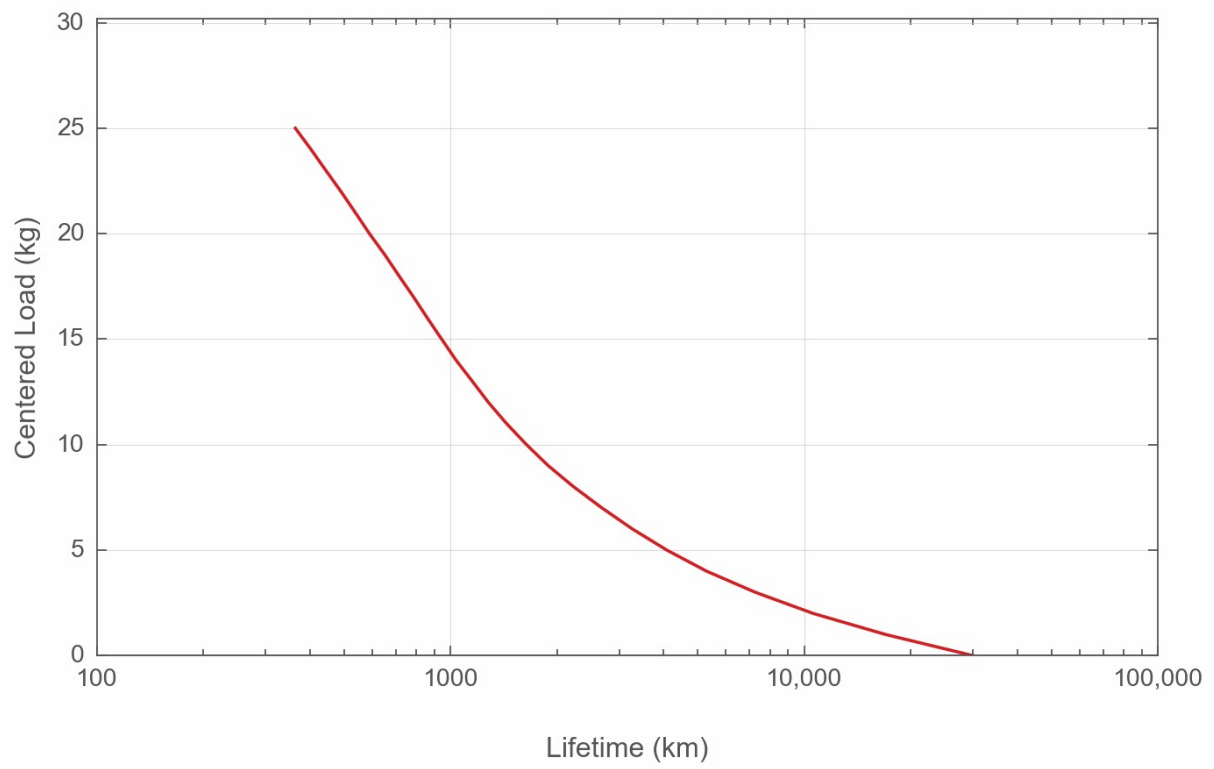
Typical Microstepping Accuracy



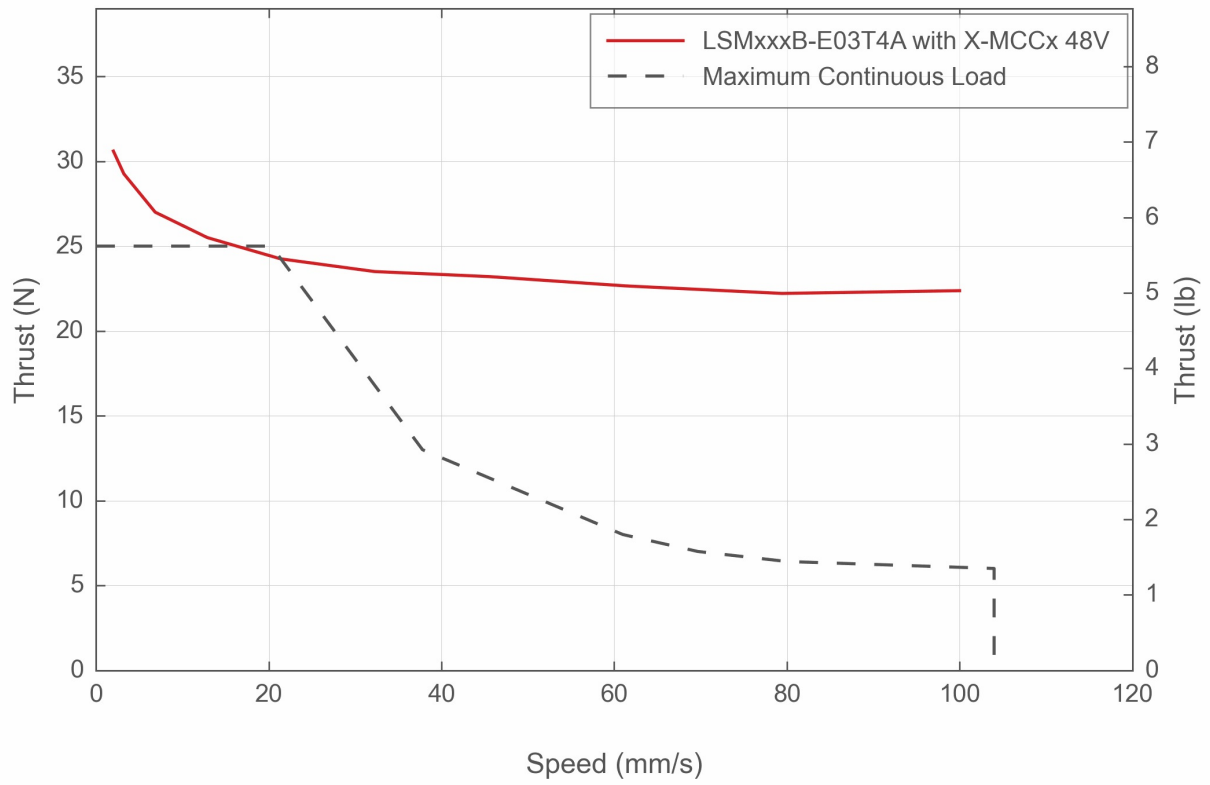
Thrust Speed Performance



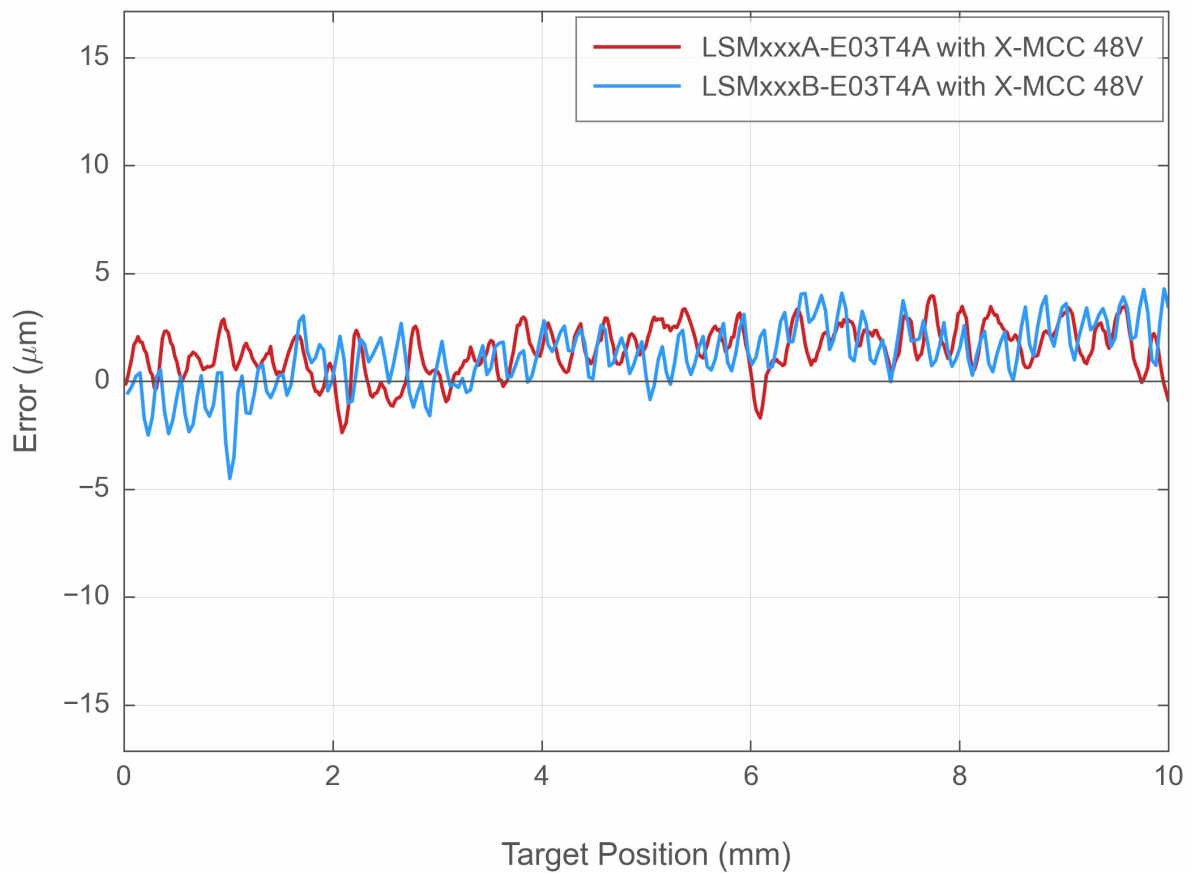
LSM Linear Bearing Lifetime



Thrust Speed Performance



Typical Accuracy



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