

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
- Encoder position feedback with slip/stall detection and automatic recovery
- 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

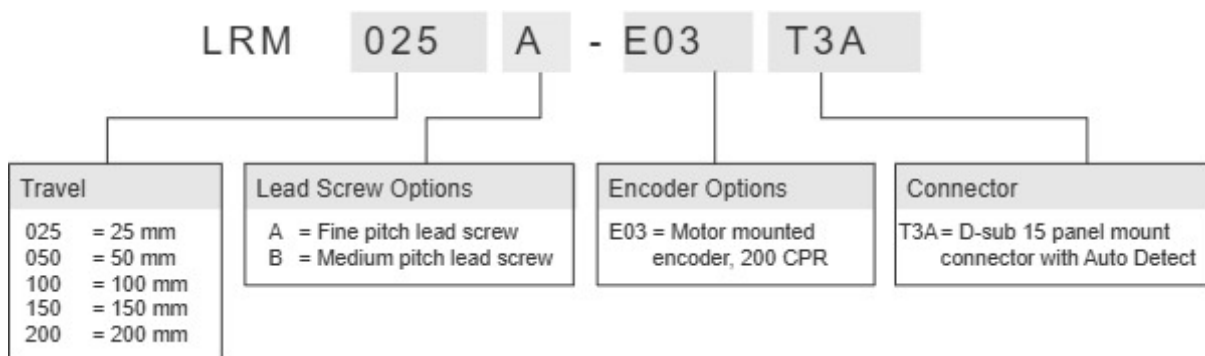
LRM-E Series Overview

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

The stages 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 LRM-E.

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

LRM-E Series Part Numbering & Options



LRM-E Series Drawings

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

LRM-E Series Specifications

Built-in Controller	
Recommended Controller	X-MCC (48 V) Recommended
AutoDetect	Yes
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)
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 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	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 $\mu\text{rad/N-m}$)
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 Rated Power	6.9 Watts
Motor Connection	D-sub 15
Motor Rotor Inertia	2.9 g-cm ²
Default Resolution	1/64 of a step
Motor Frame Size	NEMA 08
Guide Type	Recirculating ball bearing
Mechanical Drive System	Precision lead screw

Built-in Controller	
Limit or Home Sensing	Magnetic hall sensor
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

Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Backlash
LRM025A-E03T3A	0.047625 µm	25 mm (0.984")	8 µm (0.000315")	< 5 µm (< 0.000197")
LRM025B-E03T3A	0.1905 µm	25 mm (0.984")	8 µm (0.000315")	< 12 µm (< 0.000472")
LRM050A-E03T3A	0.047625 µm	50 mm (1.969")	15 µm (0.000591")	< 5 µm (< 0.000197")
LRM050B-E03T3A	0.1905 µm	50 mm (1.969")	15 µm (0.000591")	< 12 µm (< 0.000472")
LRM100A-E03T3A	0.047625 µm	100 mm (3.937")	30 µm (0.001181")	< 5 µm (< 0.000197")
LRM100B-E03T3A	0.1905 µm	100 mm (3.937")	30 µm (0.001181")	< 12 µm (< 0.000472")
LRM150A-E03T3A	0.047625 µm	150 mm (5.905")	45 µm (0.001772")	< 5 µm (< 0.000197")
LRM150B-E03T3A	0.1905 µm	150 mm (5.905")	45 µm (0.001772")	< 12 µm (< 0.000472")
LRM200A-E03T3A	0.047625 µm	200 mm (7.874")	60 µm (0.002362")	< 5 µm (< 0.000197")
LRM200B-E03T3A	0.1905 µm	200 mm (7.874")	60 µm (0.002362")	< 12 µm (< 0.000472")

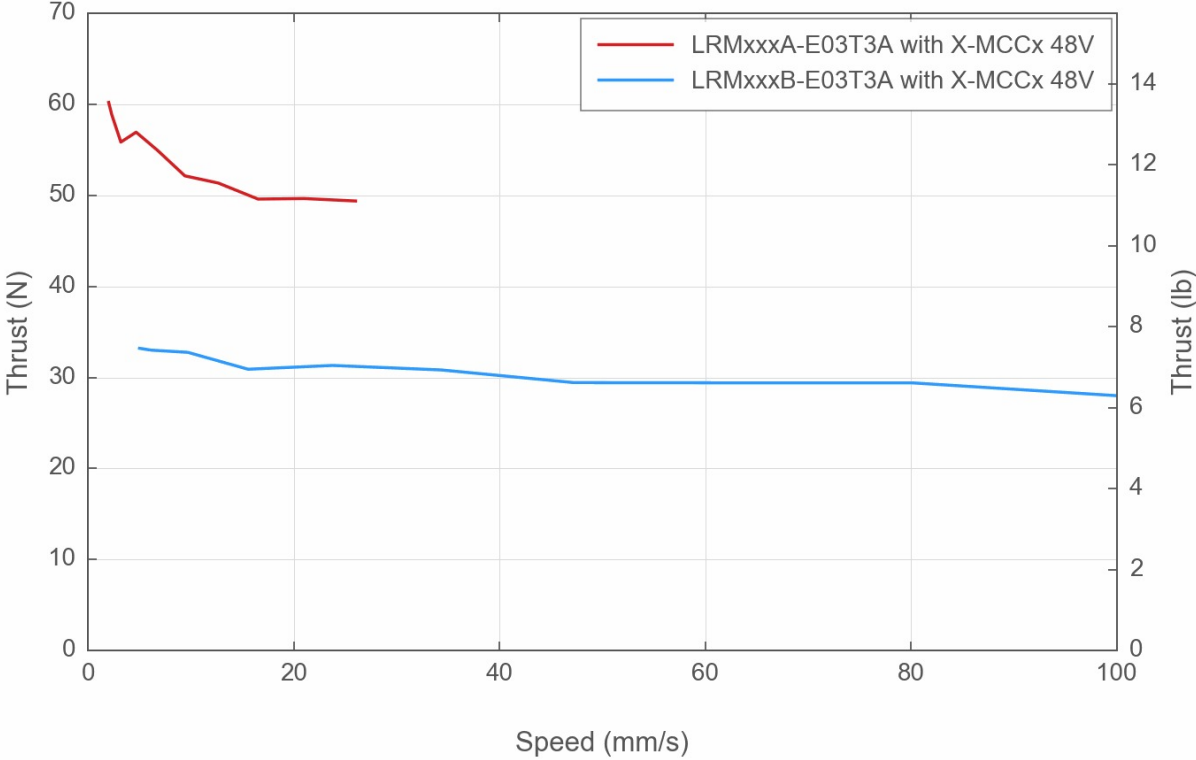
Part Number	Maximum Speed	Minimum Speed	Speed Resolution	Peak Thrust
LRM025A-E03T3A	25 mm/s (0.984"/s)	0.000029 mm/s (0.000001"/s)	0.000029 mm/s (0.000001"/s)	50 N (11.2 lb)
LRM025B-E03T3A	100 mm/s (3.937"/s)	0.000116 mm/s (0.000005"/s)	0.000116 mm/s (0.000005"/s)	25 N (5.6 lb)
LRM050A-E03T3A	25 mm/s (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
LRM050B-E03T3A	(3.937"/s)	(0.000005"/s)	(0.000005"/s)	25 N (5.6 lb)
LRM100A-E03T3A	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)
LRM100B-E03T3A	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)
LRM150A-E03T3A	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)
LRM150B-E03T3A	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)
LRM200A-E03T3A	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)
LRM200B-E03T3A	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)

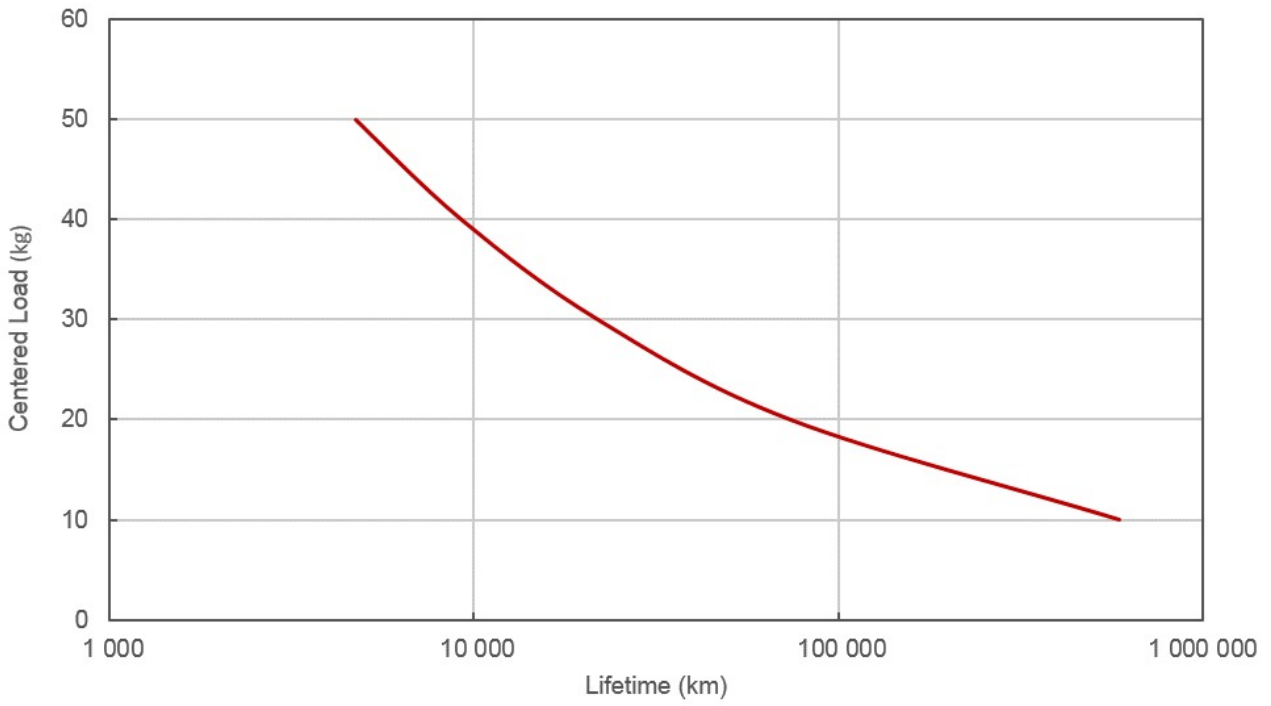
Part Number	Linear Motion Per Motor Rev	Weight
LRM025A-E03T3A	0.6096 mm (0.024")	0.73 kg (1.609 lb)
LRM025B-E03T3A	2.4384 mm (0.096")	0.73 kg (1.609 lb)
LRM050A-E03T3A	0.6096 mm (0.024")	0.81 kg (1.786 lb)
LRM050B-E03T3A	2.4384 mm (0.096")	0.81 kg (1.786 lb)
LRM100A-E03T3A	0.6096 mm (0.024")	0.97 kg (2.138 lb)
LRM100B-E03T3A	2.4384 mm (0.096")	0.97 kg (2.138 lb)
LRM150A-E03T3A	0.6096 mm (0.024")	1.13 kg (2.491 lb)
LRM150B-E03T3A	2.4384 mm (0.096")	1.13 kg (2.491 lb)
LRM200A-E03T3A	0.6096 mm (0.024")	1.31 kg (2.888 lb)
LRM200B-E03T3A	2.4384 mm (0.096")	1.31 kg (2.888 lb)

LRM-E Series Charts

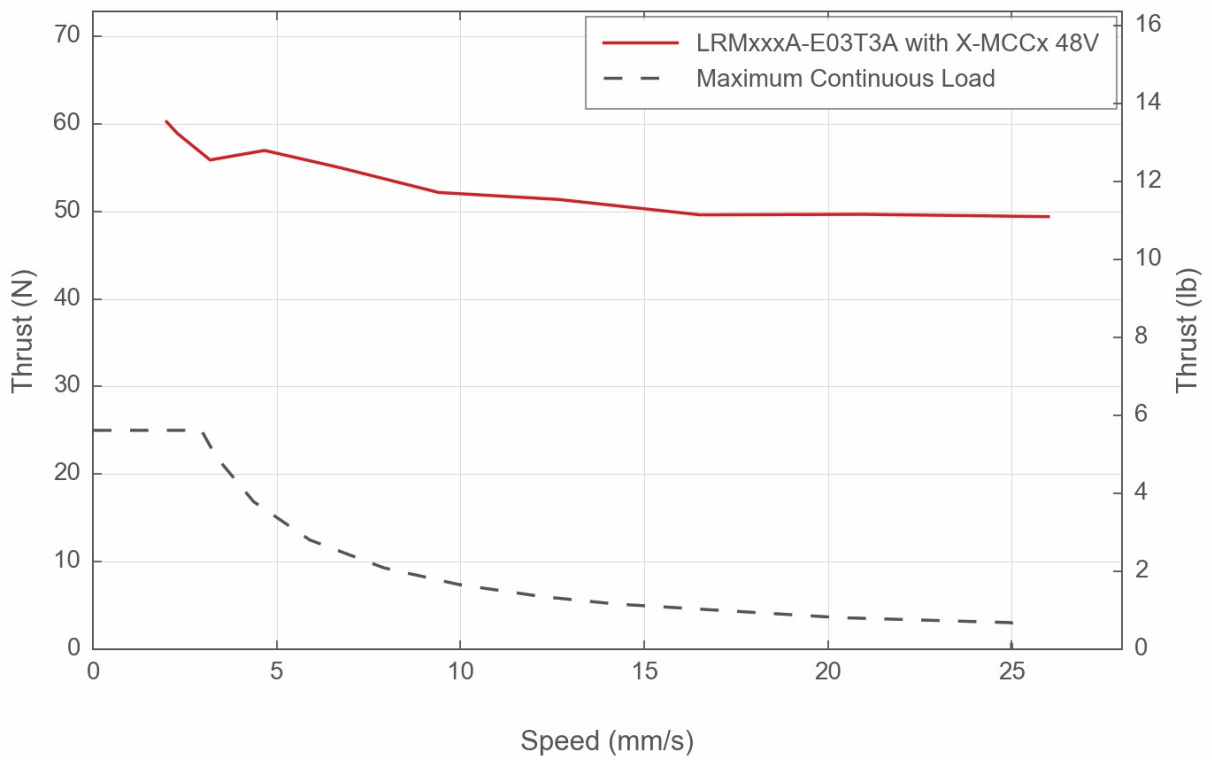
Thrust Speed Performance



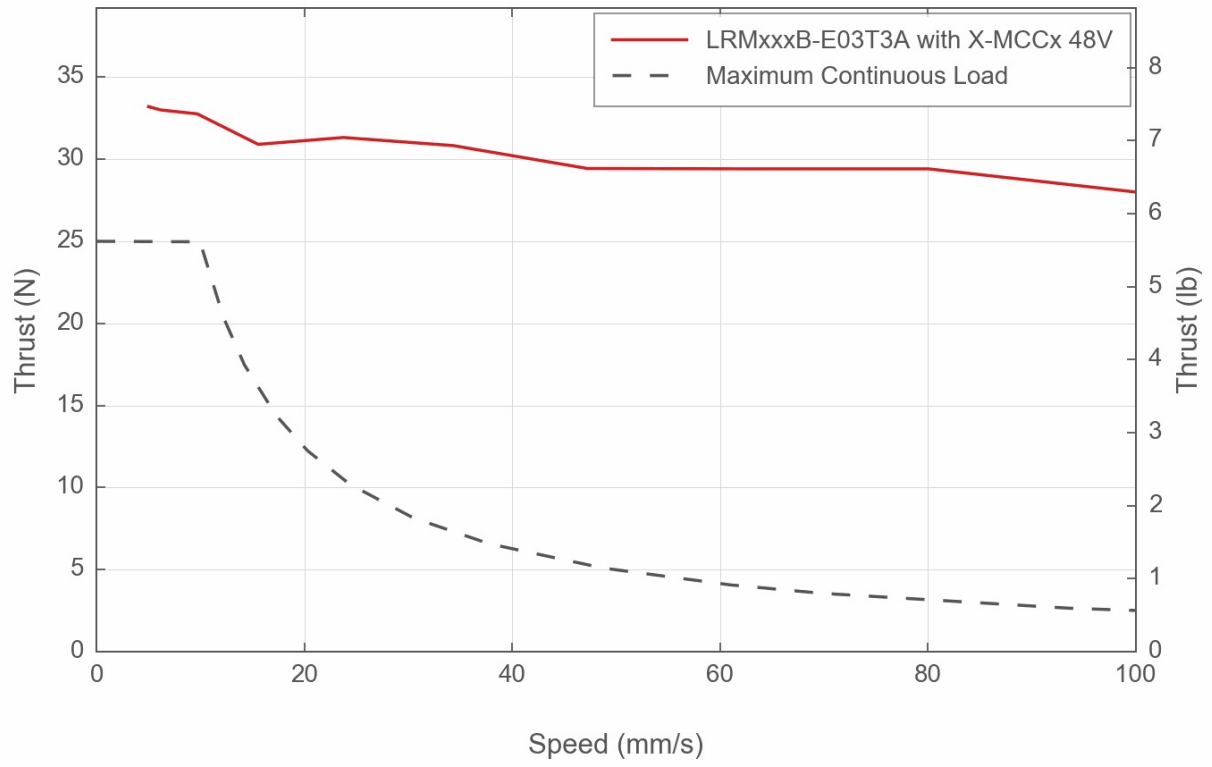
LRM Linear Bearing Lifetime



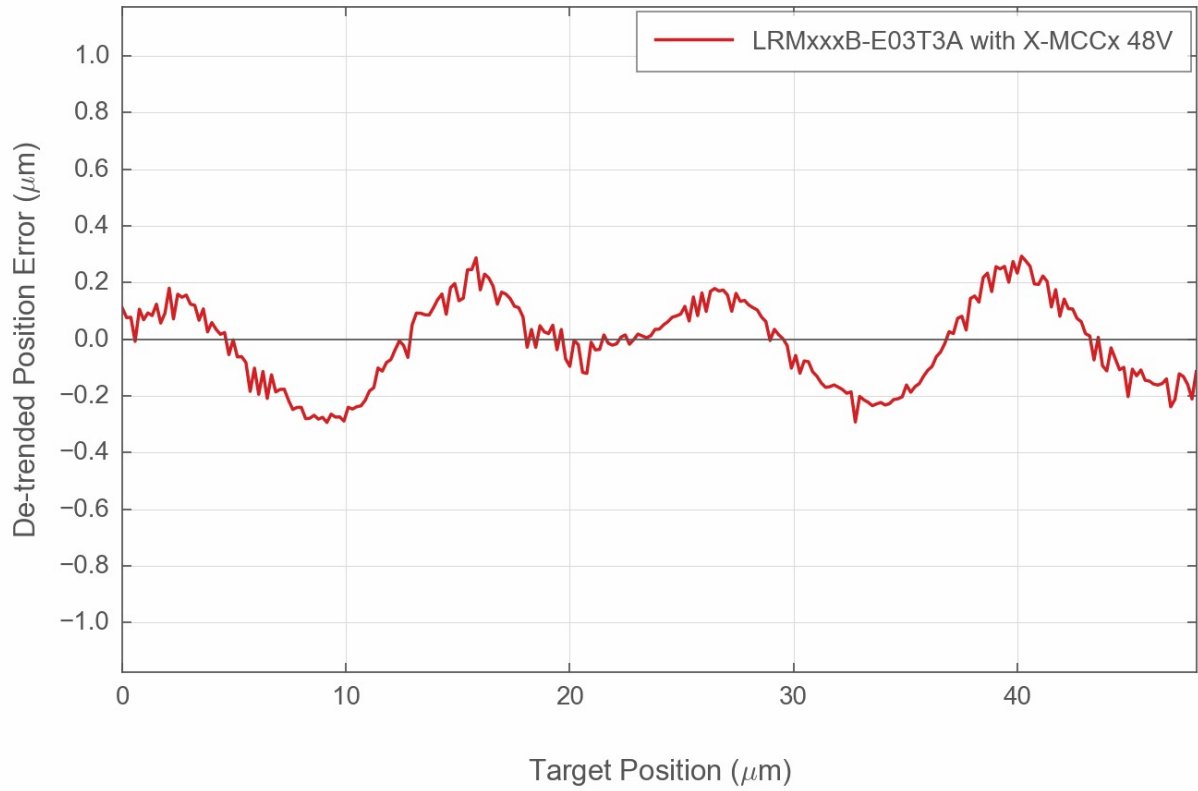
Thrust Speed Performance



Thrust Speed Performance



Typical Microstepping Accuracy



Typical Microstepping Accuracy



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