

LRM-E Series Datasheet

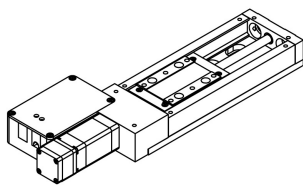


- Hardened steel construction and integrated recirculating ball bearing guide provide exceptional stiffness and thermal stability
- 25, 50, 100, 150, 200 mm travel
- Up to 8 μm accuracy and 50 nm resolution
- Encoder position feedback with slip/stall detection and automatic recovery
- 50 kg load capacity
- Designed for use with a X-MCB1 Series stepper motor controller or any 2-phase stepper motor controller

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

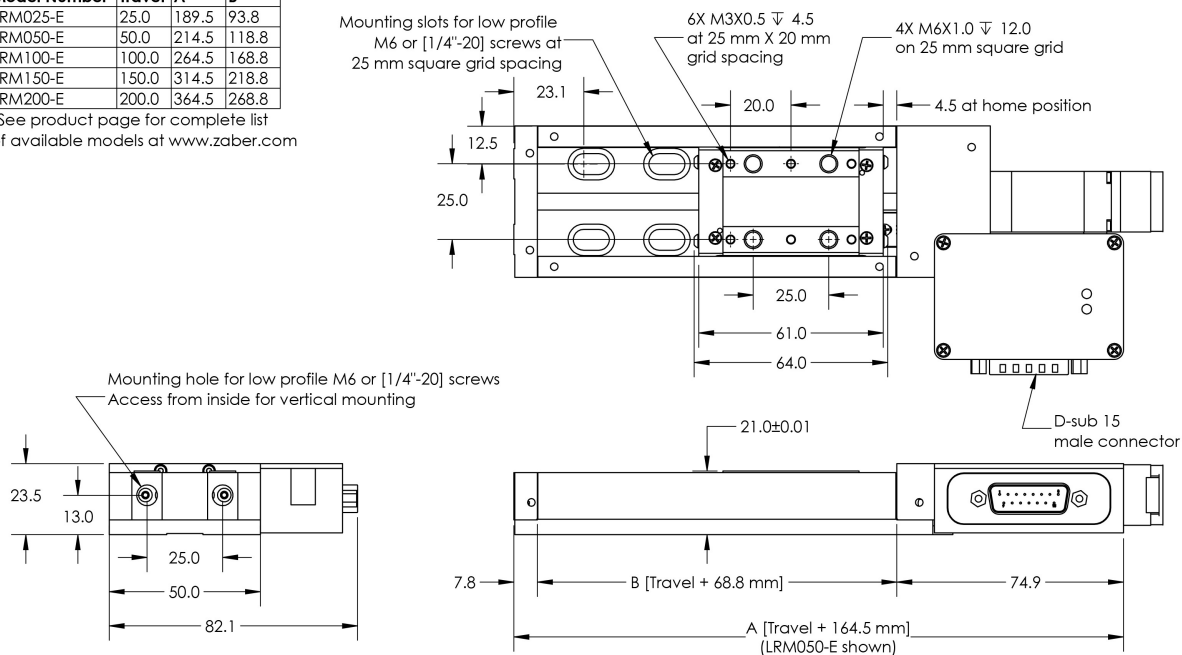
The stages are designed to be used with our X-MCB1 controller, or with any 2-phase stepper motor controller. When connected to our X-Series controllers, the stages are designed to be 'plug and play' just like all of Zaber's other products.

Drawings



Model Number*	Travel	A	B
LRM025-E	25.0	189.5	93.8
LRM050-E	50.0	214.5	118.8
LRM100-E	100.0	264.5	168.8
LRM150-E	150.0	314.5	218.8
LRM200-E	200.0	364.5	268.8

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



DWG 1466 R01A

Specifications

Specification	Value	Alternate Unit
Built-in Controller	No	
Recommended Controller	X-MCB1 (48 V) Recommended	
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 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
Stiffness in Pitch	750 N-m/°	23 $\mu\text{rad/N-m}$
Roll	0.02 °	0.349 mrad
Stiffness in Roll	550 N-m/°	32 $\mu\text{rad/N-m}$
Yaw	0.02 °	0.349 mrad
Stiffness in Yaw	400 N-m/°	44 $\mu\text{rad/N-m}$
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 Rotor Inertia	2.9 g-cm ²	
Motor Connection	D-sub 15	
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	
Vacuum Compatible	No	

Specification	Value	Alternate Unit
Operating Temperature Range	0 to 50 °C	
Stage Parallelism	< 10 µm	< 0.000394 "
RoHS Compliant	Yes	
CE Compliant	Yes	

Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Repeatability
LRM025A-E03T3	0.047625 µm	25 mm (0.984 ")	8 µm (0.000315 ")	< 1 µm (< 0.000039 ")
LRM025B-E03T3	0.1905 µm	25 mm (0.984 ")	8 µm (0.000315 ")	< 3 µm (< 0.000118 ")
LRM050A-E03T3	0.047625 µm	50 mm (1.969 ")	15 µm (0.000591 ")	< 1 µm (< 0.000039 ")
LRM050B-E03T3	0.1905 µm	50 mm (1.969 ")	15 µm (0.000591 ")	< 3 µm (< 0.000118 ")
LRM100A-E03T3	0.047625 µm	100 mm (3.937 ")	30 µm (0.001181 ")	< 1 µm (< 0.000039 ")
LRM100B-E03T3	0.1905 µm	100 mm (3.937 ")	30 µm (0.001181 ")	< 3 µm (< 0.000118 ")
LRM150A-E03T3	0.047625 µm	150 mm (5.905 ")	45 µm (0.001772 ")	< 1 µm (< 0.000039 ")
LRM150B-E03T3	0.1905 µm	150 mm (5.905 ")	45 µm (0.001772 ")	< 3 µm (< 0.000118 ")
LRM200A-E03T3	0.047625 µm	200 mm (7.874 ")	60 µm (0.002362 ")	< 1 µm (< 0.000039 ")
LRM200B-E03T3	0.1905 µm	200 mm (7.874 ")	60 µm (0.002362 ")	< 3 µm (< 0.000118 ")

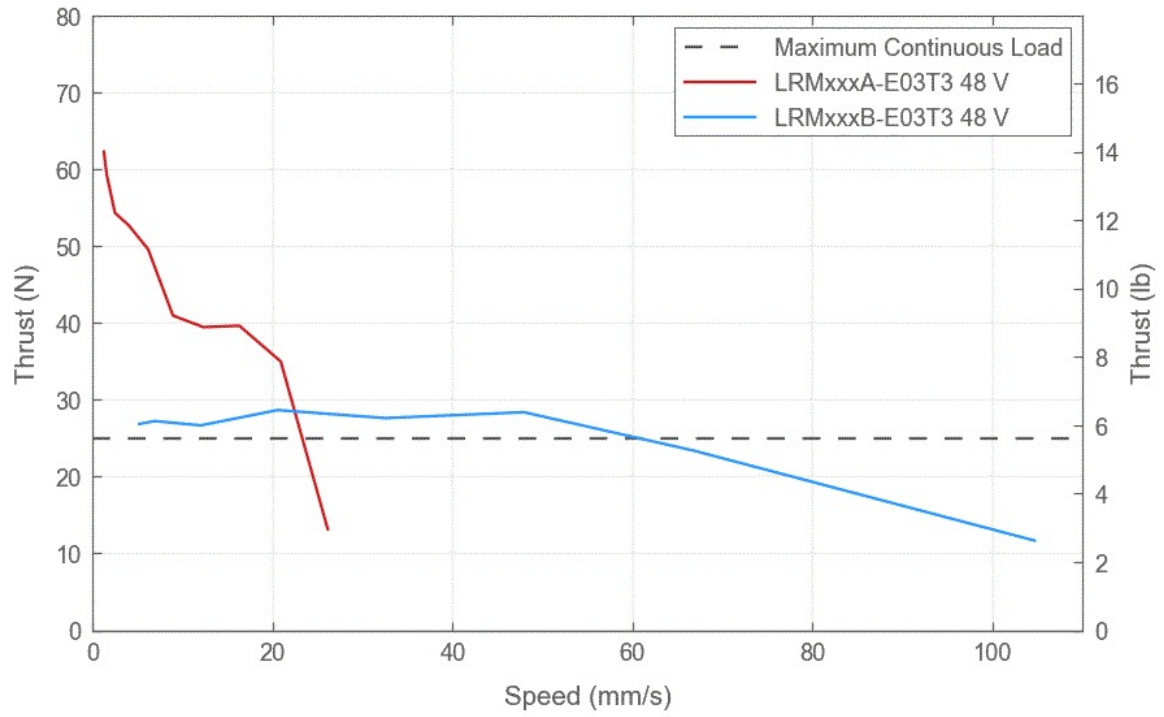
Part Number	Backlash	Maximum Speed	Minimum Speed	Speed Resolution
LRM025A-E03T3	< 5 µm (< 0.000197 ")	25 mm/s (0.984 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
LRM025B-E03T3	< 12 µm (< 0.000472 ")	100 mm/s (3.937 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)
LRM050A-E03T3	< 5 µm (< 0.000197 ")	25 mm/s (0.984 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
LRM050B-E03T3	< 12 µm (< 0.000472 ")	100 mm/s (3.937 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)

Part Number	Backlash	Maximum Speed	Minimum Speed	Speed Resolution
LRM100A-E03T3	< 5 μm (< 0.000197 ")	25 mm/s (0.984 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
LRM100B-E03T3	< 12 μm (< 0.000472 ")	100 mm/s (3.937 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)
LRM150A-E03T3	< 5 μm (< 0.000197 ")	25 mm/s (0.984 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
LRM150B-E03T3	< 12 μm (< 0.000472 ")	100 mm/s (3.937 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)
LRM200A-E03T3	< 5 μm (< 0.000197 ")	25 mm/s (0.984 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
LRM200B-E03T3	< 12 μm (< 0.000472 ")	100 mm/s (3.937 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)

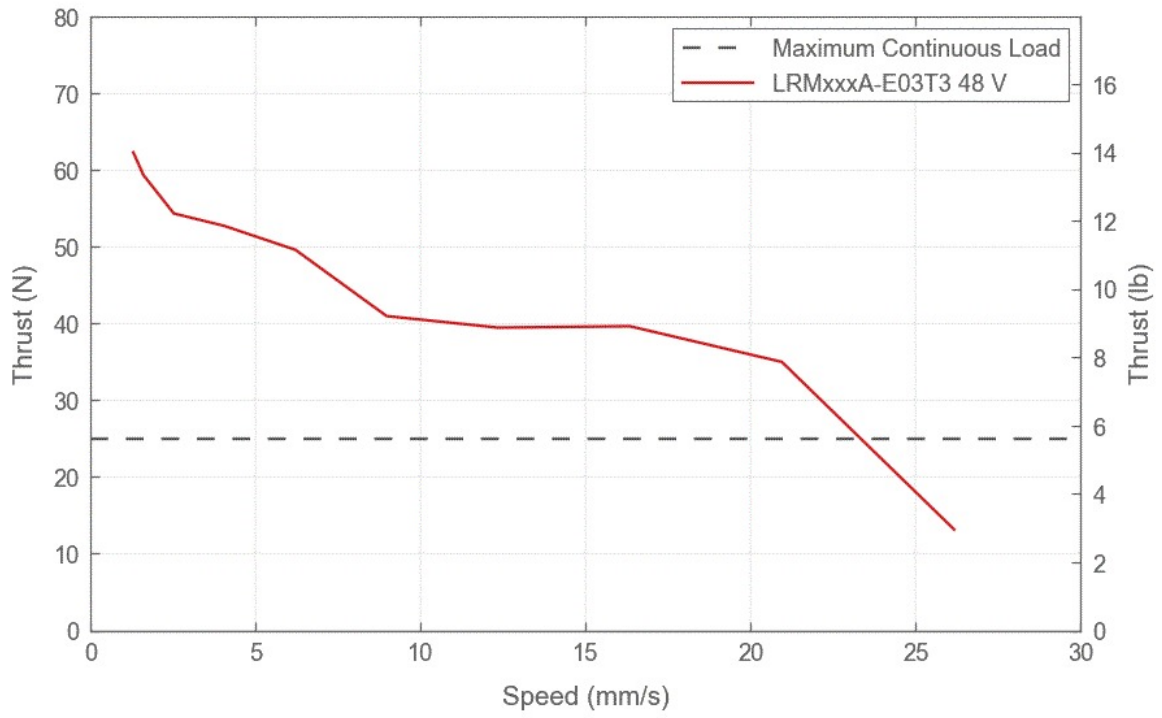
Part Number	Peak Thrust	Linear Motion Per Motor Rev	Weight
LRM025A-E03T3	50 N (11.2 lb)	0.6096 mm (0.024 ")	0.73 kg (1.609 lb)
LRM025B-E03T3	25 N (5.6 lb)	2.4384 mm (0.096 ")	0.73 kg (1.609 lb)
LRM050A-E03T3	50 N (11.2 lb)	0.6096 mm (0.024 ")	0.81 kg (1.786 lb)
LRM050B-E03T3	25 N (5.6 lb)	2.4384 mm (0.096 ")	0.81 kg (1.786 lb)
LRM100A-E03T3	50 N (11.2 lb)	0.6096 mm (0.024 ")	0.97 kg (2.138 lb)
LRM100B-E03T3	25 N (5.6 lb)	2.4384 mm (0.096 ")	0.97 kg (2.138 lb)
LRM150A-E03T3	50 N (11.2 lb)	0.6096 mm (0.024 ")	1.13 kg (2.491 lb)
LRM150B-E03T3	25 N (5.6 lb)	2.4384 mm (0.096 ")	1.13 kg (2.491 lb)
LRM200A-E03T3	50 N (11.2 lb)	0.6096 mm (0.024 ")	1.31 kg (2.888 lb)
LRM200B-E03T3	25 N (5.6 lb)	2.4384 mm (0.096 ")	1.31 kg (2.888 lb)

Charts

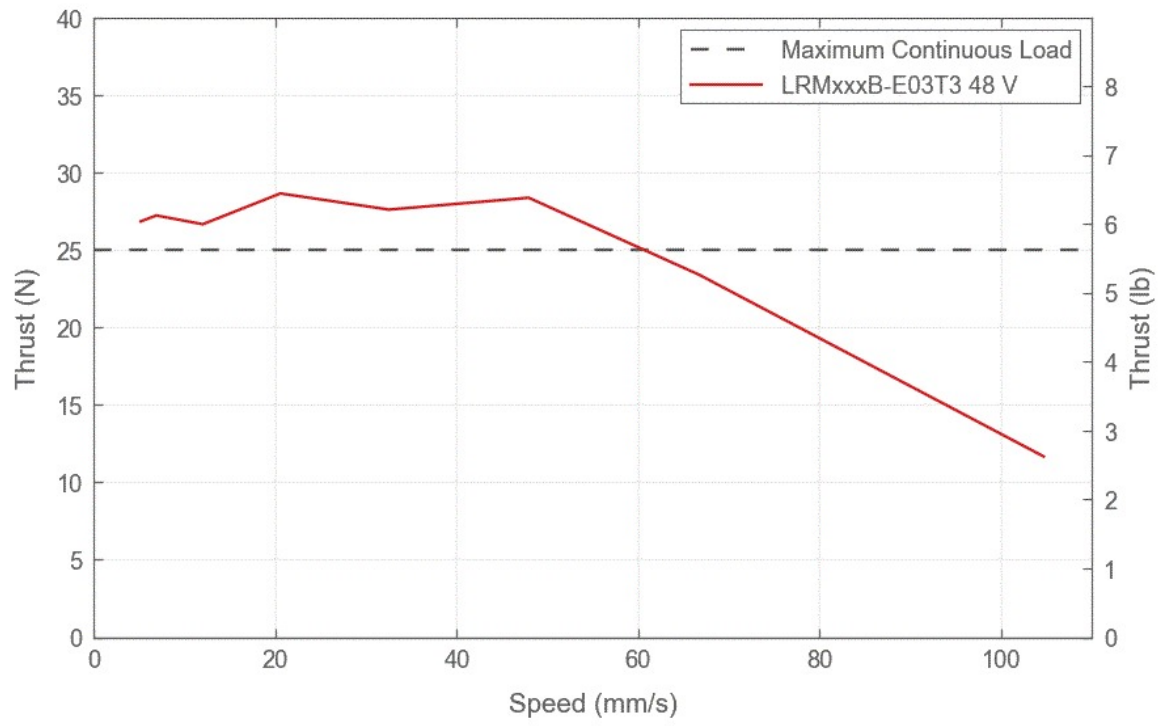
Thrust Speed Performance



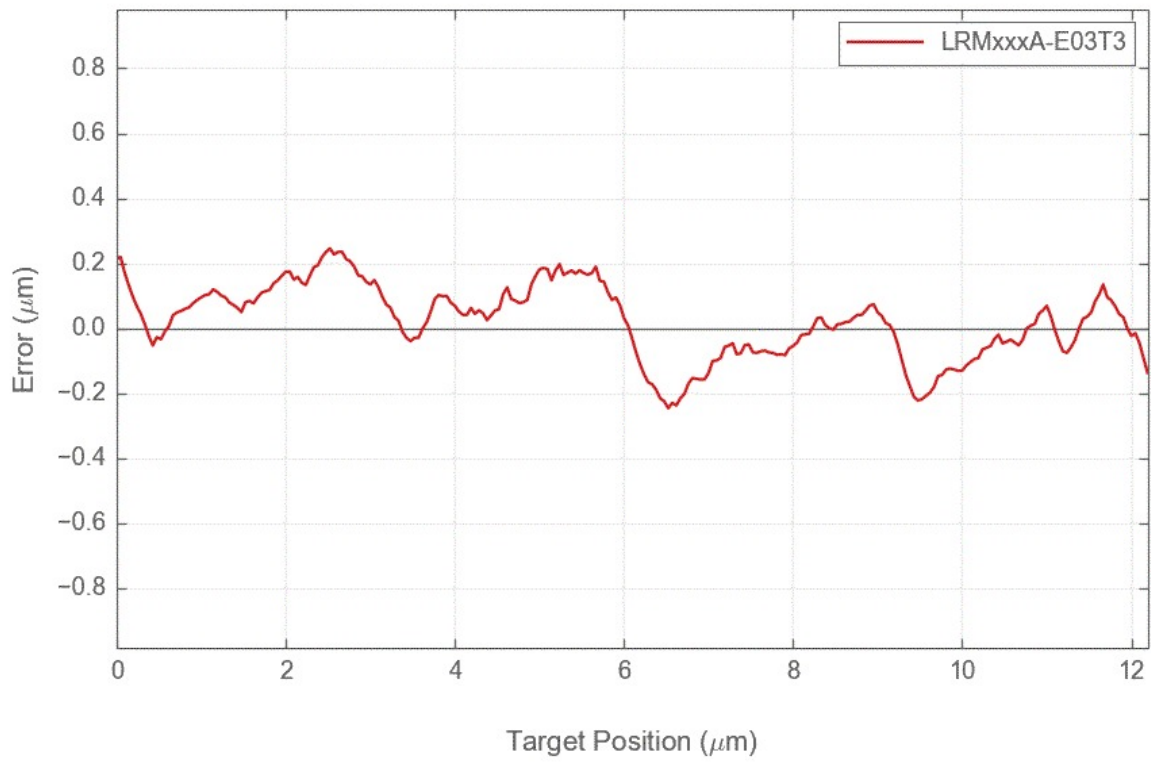
Thrust Speed Performance



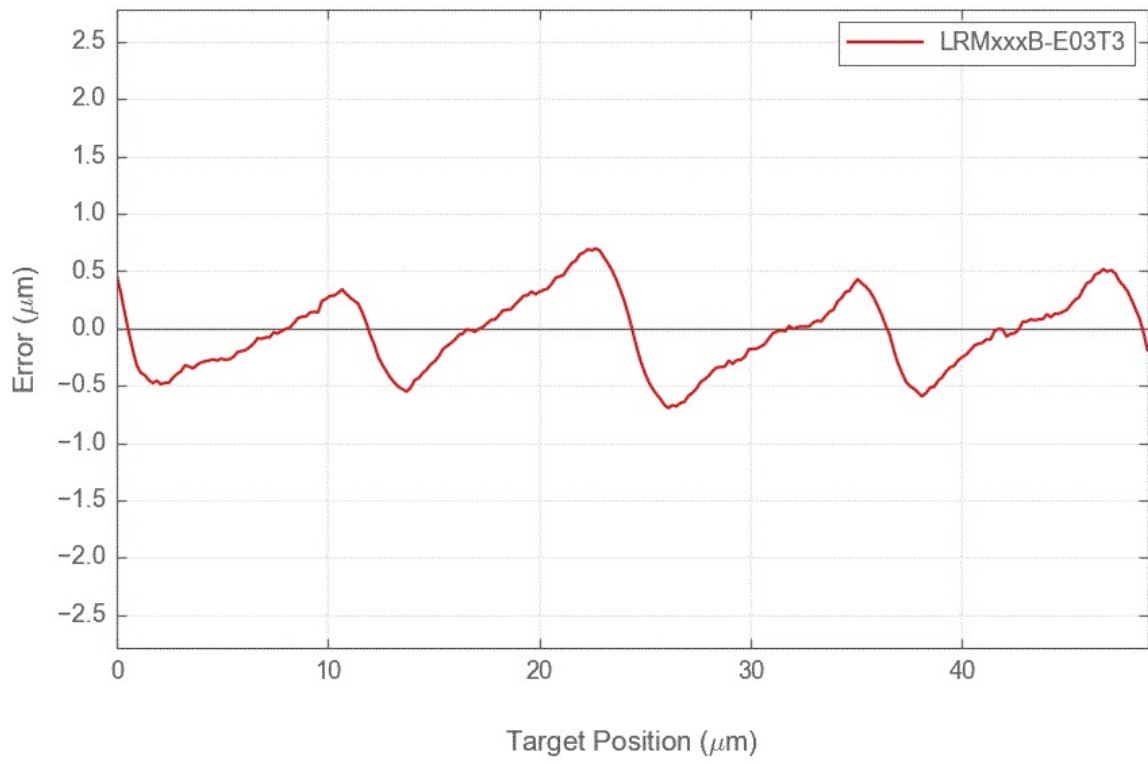
Thrust Speed Performance



Typical Microstepping Accuracy



Typical Microstepping Accuracy



LRM Linear Bearing Lifetime

