

X-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
- * Motor encoder position feedback with slip/stall detection and automatic recovery
- * Up to 8 μm accuracy and 50 nm resolution
- * 50 kg load capacity
- * Built-in controller, daisy-chains with other Zaber products

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.

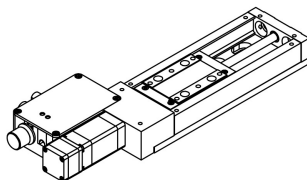
The stages connect to the USB 2.0 or RS-232 port of any computer and can be chained with several units per chain. They can be chained with any other Zaber products. Convenient locking, 4-pin, M8 connectors

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.

Drawings

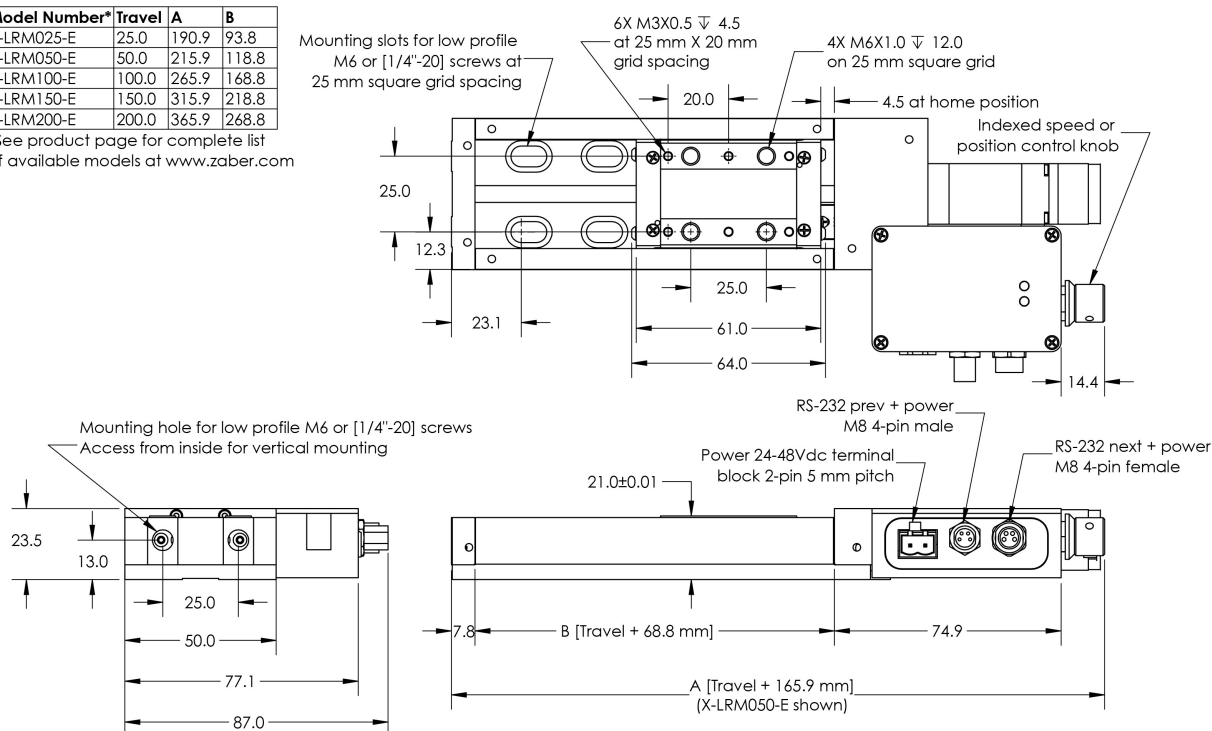
ZABER

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



Specifications

Specification	Value	Alternate Unit
Built-in Controller	Yes	
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	
Maximum Centered Load	500 N	112.1 lb

Specification	Value	Alternate Unit
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 $\mu\text{rad/N-m}$
Maximum Current Draw	350 mA	
Power Supply	24-48 VDC	
Power Plug	2-pin Screw Terminal	
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	
Data Cable Connection	Locking 4-pin M8	
Mechanical Drive System	Precision lead screw	
Limit or Home Sensing	Magnetic hall sensor	
Manual Control	Yes	
Axes of Motion	1	
Mounting Interface	M3 and M6 threaded holes	
Vacuum Compatible	No	
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

Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Repeatability
X-LRM025A-E03	0.047625 µm	25.0 mm (0.984 ")	8 µm (0.000315 ")	< 1 µm (< 0.000039 ")
X-LRM025B-E03	0.1905 µm	25.0 mm (0.984 ")	8 µm (0.000315 ")	< 3 µm (< 0.000118 ")
X-LRM050A-E03	0.047625 µm	50.0 mm (1.969 ")	15 µm (0.000591 ")	< 1 µm (< 0.000039 ")
X-LRM050B-E03	0.1905 µm	50.0 mm (1.969 ")	15 µm (0.000591 ")	< 3 µm (< 0.000118 ")
X-LRM100A-E03	0.047625 µm	100.0 mm (3.937 ")	30 µm (0.001181 ")	< 1 µm (< 0.000039 ")
X-LRM100B-E03	0.1905 µm	100.0 mm (3.937 ")	30 µm (0.001181 ")	< 3 µm (< 0.000118 ")
X-LRM150A-E03	0.047625 µm	150.0 mm (5.905 ")	45 µm (0.001772 ")	< 1 µm (< 0.000039 ")
X-LRM150B-E03	0.1905 µm	150.0 mm (5.905 ")	45 µm (0.001772 ")	< 3 µm (< 0.000118 ")
X-LRM200A-E03	0.047625 µm	200.0 mm (7.874 ")	60 µm (0.002362 ")	< 1 µm (< 0.000039 ")
X-LRM200B-E03	0.1905 µm	200.0 mm (7.874 ")	60 µm (0.002362 ")	< 3 µm (< 0.000118 ")

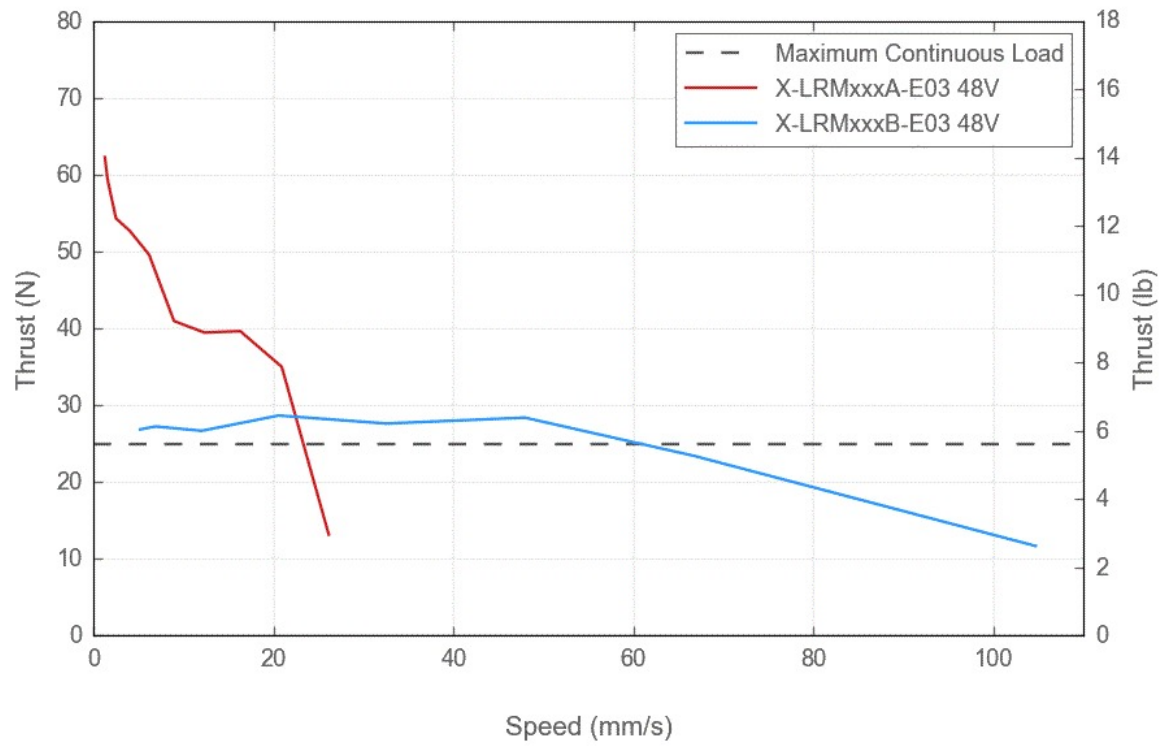
Part Number	Backlash	Maximum Speed	Minimum Speed	Speed Resolution
X-LRM025A-E03	< 5 µm (< 0.000197 ")	25 mm/s (0.984 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
X-LRM025B-E03	< 12 µm (< 0.000472 ")	100 mm/s (3.937 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)
X-LRM050A-E03	< 5 µm (< 0.000197 ")	25 mm/s (0.984 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
X-LRM050B-E03	< 12 µm (< 0.000472 ")	100 mm/s (3.937 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)
X-LRM100A-E03	< 5 µm (< 0.000197 ")	25 mm/s (0.984 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
X-LRM100B-E03	< 12 µm (< 0.000472 ")	100 mm/s (3.937 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)
X-LRM150A-E03	< 5 µm (< 0.000197 ")	25 mm/s (0.984 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
X-LRM150B-E03	< 12 µm (< 0.000472 ")	100 mm/s (3.937 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)
X-LRM200A-E03	< 5 µm	25 mm/s	0.000029 mm/s	0.000029 mm/s

Part Number	Backlash	Maximum Speed	Minimum Speed	Speed Resolution
	(< 0.000197 ")	(0.984 "/s)	(0.000001 "/s)	(0.000001 "/s)
X-LRM200B-E03	< 12 µm (< 0.000472 ")	100 mm/s (3.937 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)

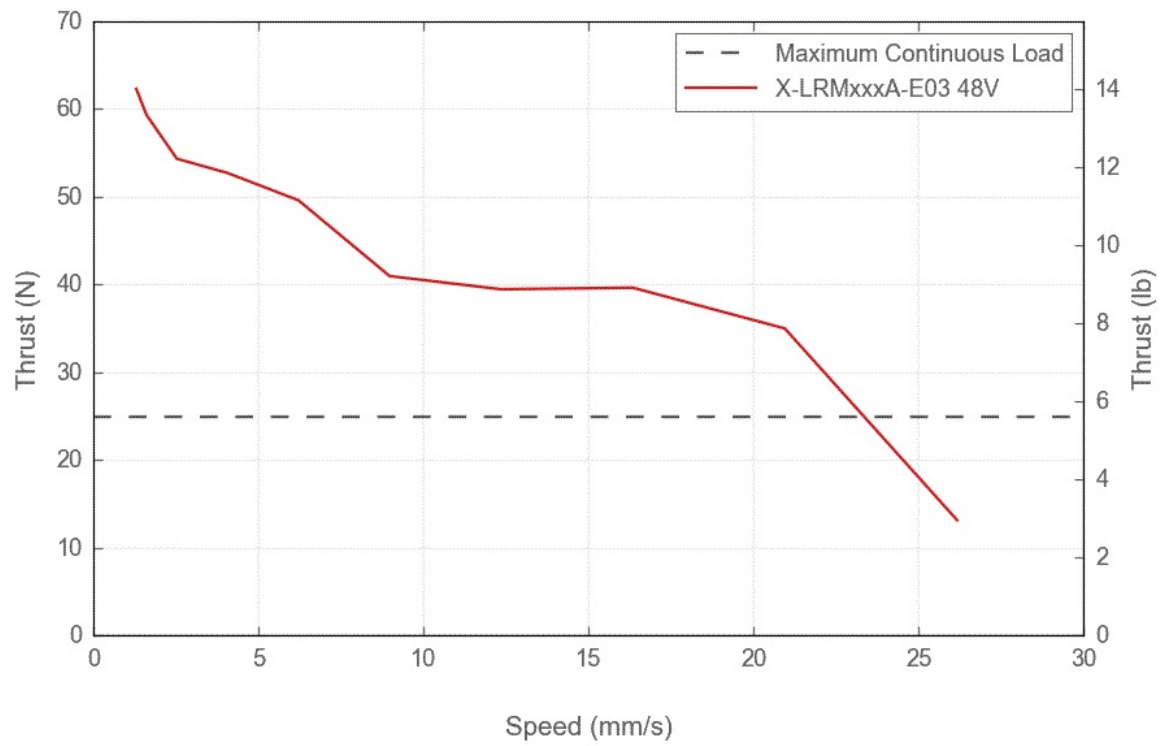
Part Number	Peak Thrust	Linear Motion Per Motor Rev	Weight
X-LRM025A-E03	50 N (11.2 lb)	0.6096 mm (0.024 ")	0.75 kg (1.653 lb)
X-LRM025B-E03	25 N (5.6 lb)	2.4384 mm (0.096 ")	0.75 kg (1.653 lb)
X-LRM050A-E03	50 N (11.2 lb)	0.6096 mm (0.024 ")	0.83 kg (1.830 lb)
X-LRM050B-E03	25 N (5.6 lb)	2.4384 mm (0.096 ")	0.83 kg (1.830 lb)
X-LRM100A-E03	50 N (11.2 lb)	0.6096 mm (0.024 ")	0.98 kg (2.161 lb)
X-LRM100B-E03	25 N (5.6 lb)	2.4384 mm (0.096 ")	0.98 kg (2.161 lb)
X-LRM150A-E03	50 N (11.2 lb)	0.6096 mm (0.024 ")	1.15 kg (2.535 lb)
X-LRM150B-E03	25 N (5.6 lb)	2.4384 mm (0.096 ")	1.15 kg (2.535 lb)
X-LRM200A-E03	50 N (11.2 lb)	0.6096 mm (0.024 ")	1.31 kg (2.888 lb)
X-LRM200B-E03	25 N (5.6 lb)	2.4384 mm (0.096 ")	1.31 kg (2.888 lb)

Charts

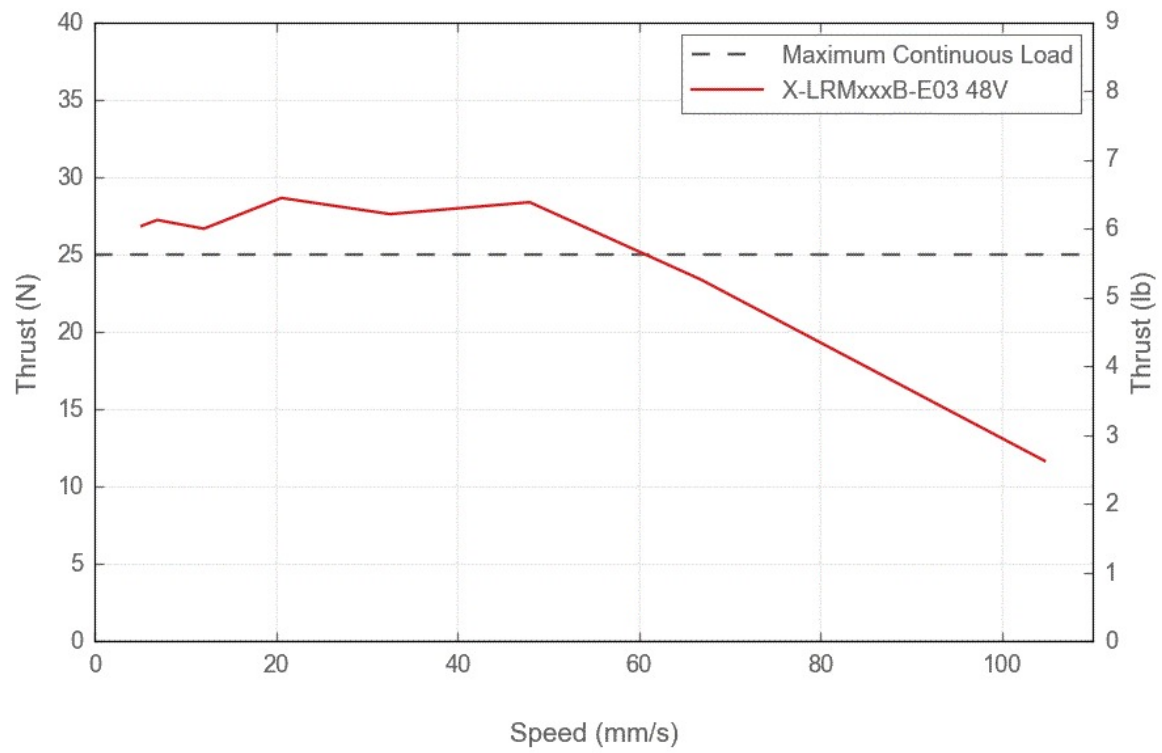
Thrust Speed Performance



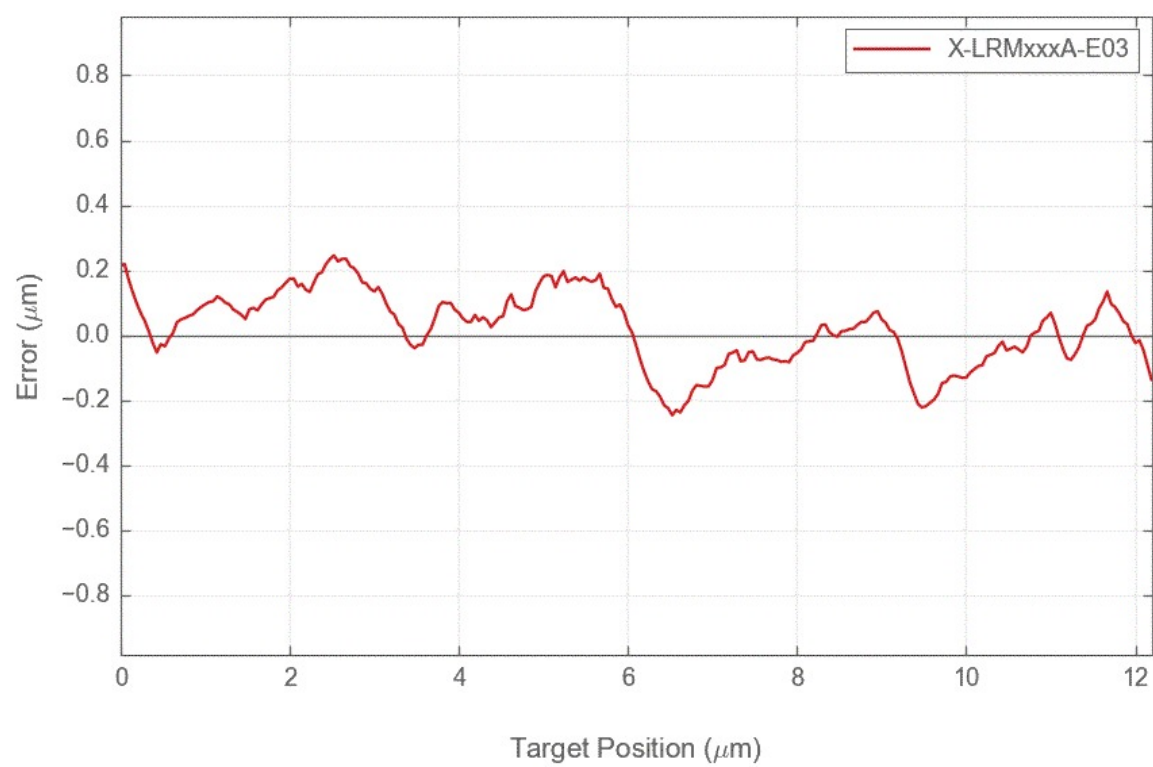
Thrust Speed Performance



Thrust Speed Performance



Typical Microstepping Accuracy



Typical Microstepping Accuracy

