LRM 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
- 50 kg load capacity
- Designed for use with a X-MCB1 Series stepper motor controller or any 2-phase stepper motor controller

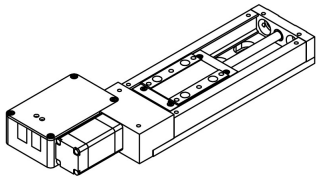
Overview

Zaber's LRM series products are motorized linear stages. 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.

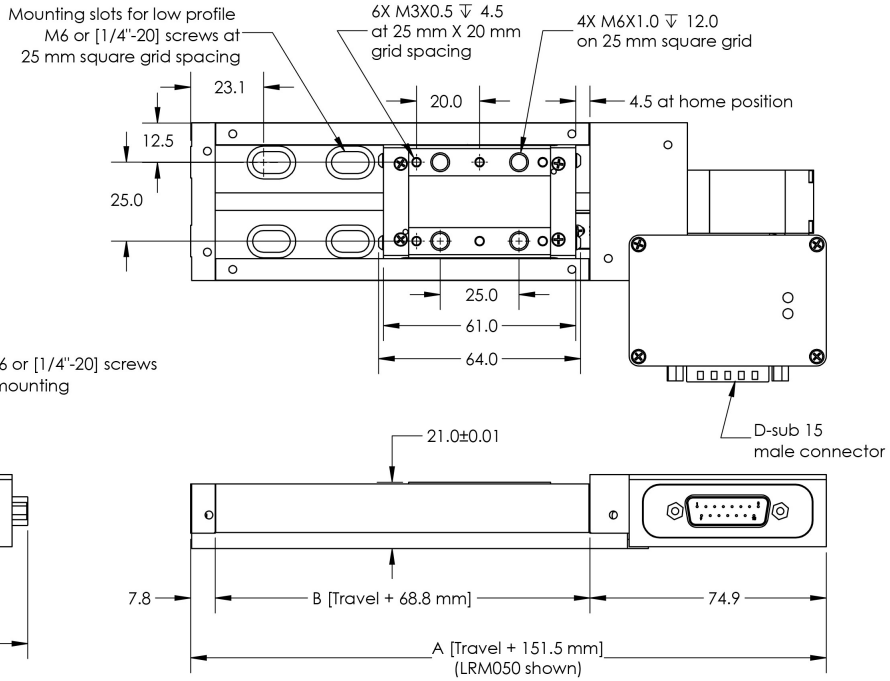
Drawings

LRM Motorized Linear Stage
dimensions in mm



Model Number*	Travel	A	B
LRM025	25.0	176.5	93.8
LRM050	50.0	201.5	118.8
LRM100	100.0	251.5	168.8
LRM150	150.0	301.5	218.8
LRM200	200.0	351.5	268.8

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



DWG 1465 R01A

Specifications

Specification	Value	Alternate Unit
Built-in Controller	No	
Recommended Controller	X-MCB1 (48 V) Recommended	
Repeatability	< 4 µm	< 0.000157 "
Encoder Type	None	
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
Roll	0.02 °	0.349 mrad
Yaw	0.02 °	0.349 mrad
Stiffness in Pitch	750 N-m/°	23 µrad/N-m
Stiffness in Roll	550 N-m/°	32 µrad/N-m
Stiffness in Yaw	400 N-m/°	44 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 Rated Power	6.9 Watts	
Motor Rotor Inertia	2.9 g-cm2	
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	
Operating Temperature Range	0 to 50 °C	

Specification	Value	Alternate Unit
Stage Parallelism	< 10 µm	< 0.000394 "
RoHS Compliant	Yes	
CE Compliant	Yes	

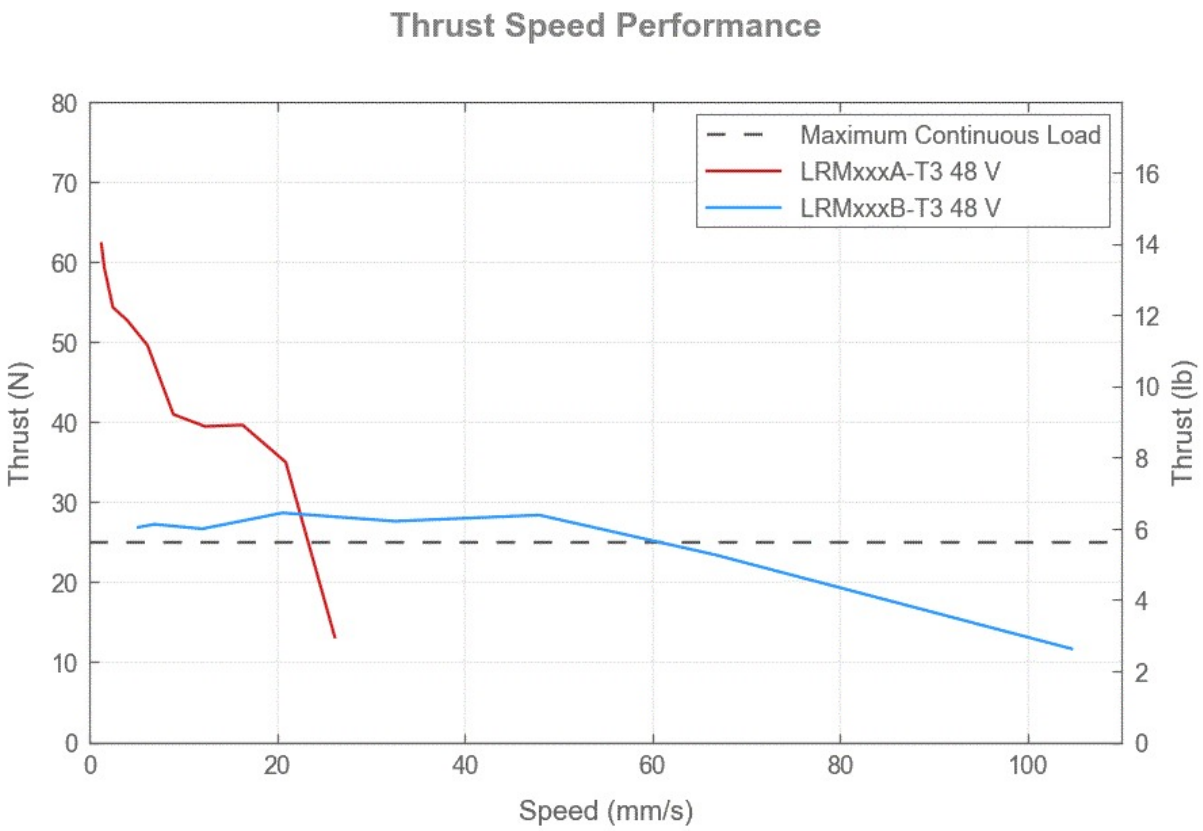
Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Backlash
LRM025A-T3	0.047625 µm	25 mm (0.984 ")	8 µm (0.000315 ")	< 5 µm (< 0.000197 ")
LRM025B-T3	0.1905 µm	25 mm (0.984 ")	8 µm (0.000315 ")	< 12 µm (< 0.000472 ")
LRM050A-T3	0.047625 µm	50 mm (1.969 ")	15 µm (0.000591 ")	< 5 µm (< 0.000197 ")
LRM050B-T3	0.1905 µm	50 mm (1.969 ")	15 µm (0.000591 ")	< 12 µm (< 0.000472 ")
LRM100A-T3	0.047625 µm	100 mm (3.937 ")	30 µm (0.001181 ")	< 5 µm (< 0.000197 ")
LRM100B-T3	0.1905 µm	100 mm (3.937 ")	30 µm (0.001181 ")	< 12 µm (< 0.000472 ")
LRM150A-T3	0.047625 µm	150 mm (5.905 ")	45 µm (0.001772 ")	< 5 µm (< 0.000197 ")
LRM150B-T3	0.1905 µm	150 mm (5.905 ")	45 µm (0.001772 ")	< 12 µm (< 0.000472 ")
LRM200A-T3	0.047625 µm	200 mm (7.874 ")	60 µm (0.002362 ")	< 5 µm (< 0.000197 ")
LRM200B-T3	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-T3	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-T3	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-T3	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)
LRM050B-T3	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)
LRM100A-T3	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-T3	100 mm/s	0.000116 mm/s	0.000116 mm/s	25 N (5.6 lb)

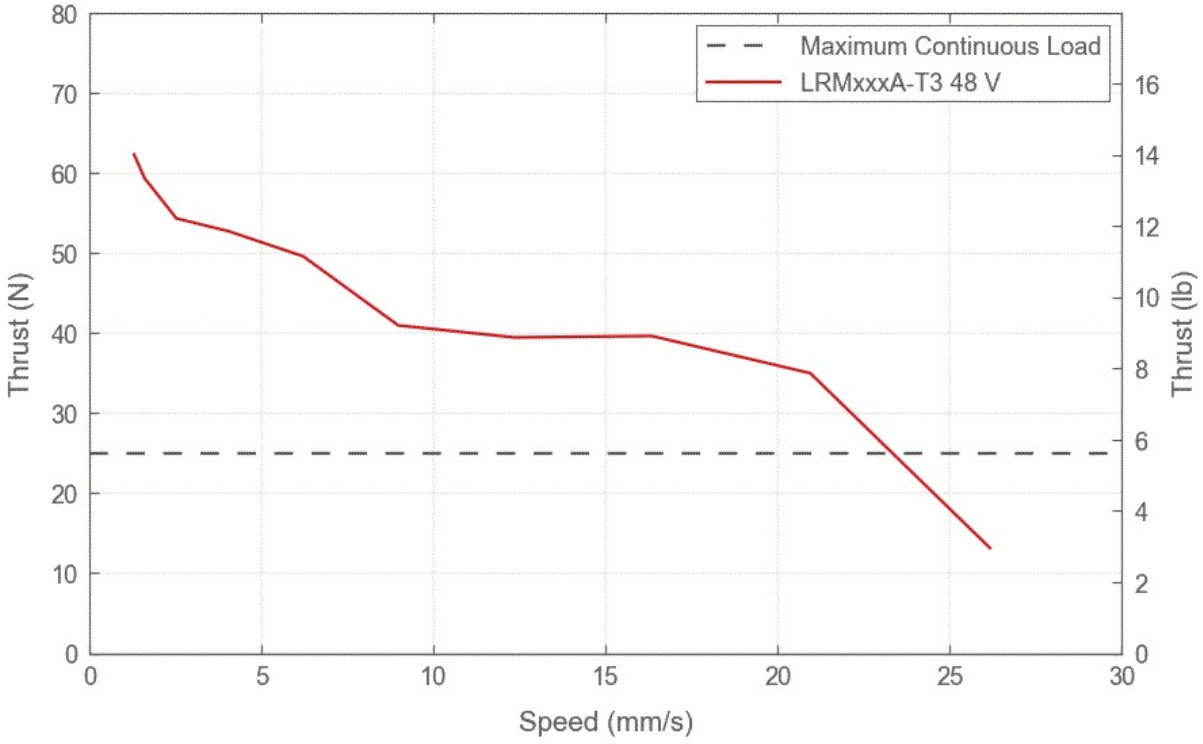
Part Number	Maximum Speed	Minimum Speed	Speed Resolution	Peak Thrust
	(3.937 "/s)	(0.000005 "/s)	(0.000005 "/s)	
LRM150A-T3	25 mm/s (0.984 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)	50 N (11.2 lb)
LRM150B-T3	100 mm/s (3.937 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)	25 N (5.6 lb)
LRM200A-T3	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-T3	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-T3	0.6096 mm (0.024 ")	0.71 kg (1.565 lb)
LRM025B-T3	2.4384 mm (0.096 ")	0.71 kg (1.565 lb)
LRM050A-T3	0.6096 mm (0.024 ")	0.79 kg (1.742 lb)
LRM050B-T3	2.4384 mm (0.096 ")	0.79 kg (1.742 lb)
LRM100A-T3	0.6096 mm (0.024 ")	0.95 kg (2.094 lb)
LRM100B-T3	2.4384 mm (0.096 ")	0.95 kg (2.094 lb)
LRM150A-T3	0.6096 mm (0.024 ")	1.11 kg (2.447 lb)
LRM150B-T3	2.4384 mm (0.096 ")	1.11 kg (2.447 lb)
LRM200A-T3	0.6096 mm (0.024 ")	1.29 kg (2.844 lb)
LRM200B-T3	2.4384 mm (0.096 ")	1.29 kg (2.844 lb)

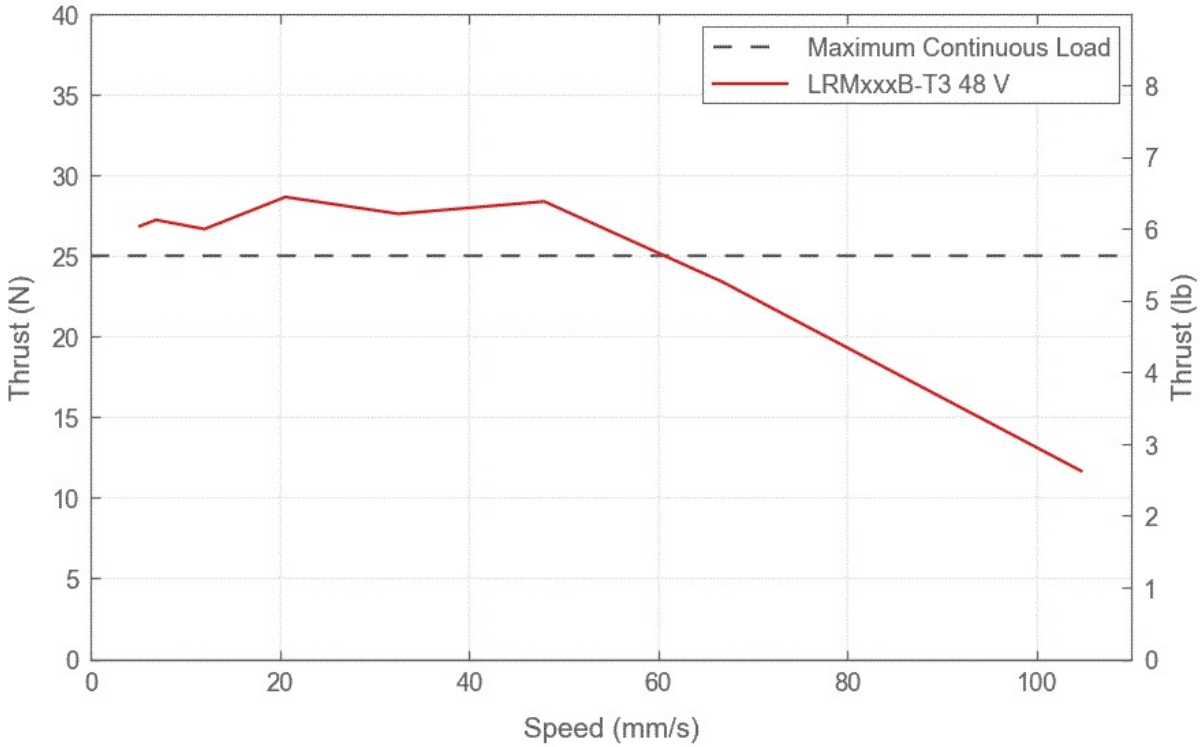
Charts


Thrust Speed Performance
Maximum Continuous Load
LRMxxxA-T3 48 V
LRMxxxB-T3 48 V
Thrust (N)
Thrust (lb)
Speed (mm/s)
0
10
20
30
40
50
60
70
80
0
2
4
6
8
10
12
14
16
0
20
40
60
80
100

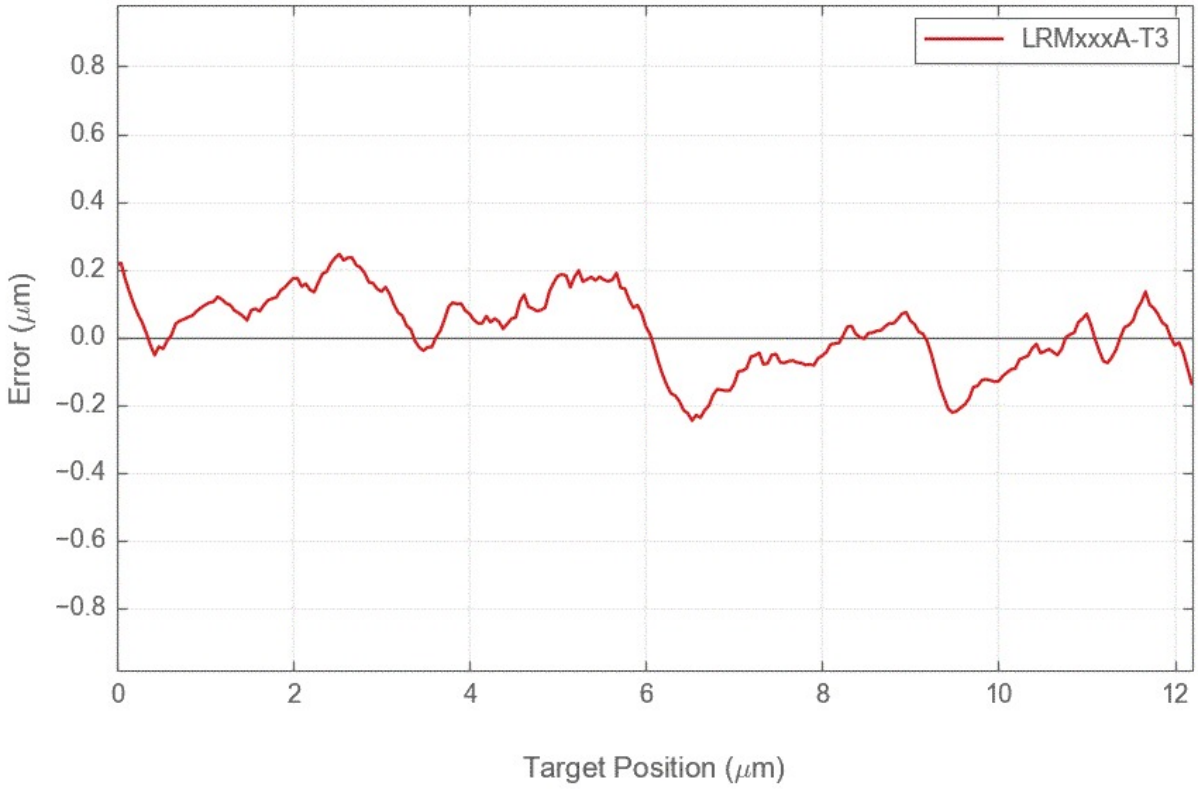
Thrust Speed Performance



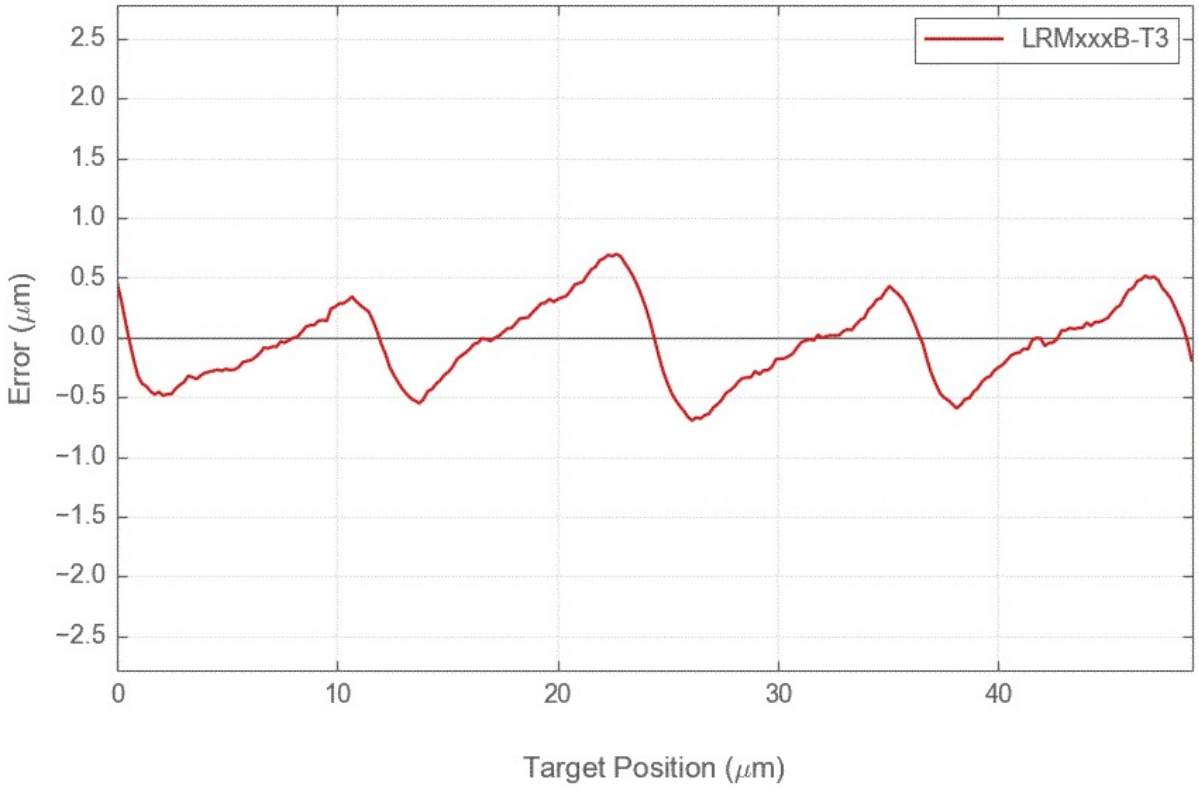
Thrust Speed Performance



Typical Microstepping Accuracy



Typical Microstepping Accuracy



LRM Linear Bearing Lifetime