X-LSM Series Datasheet

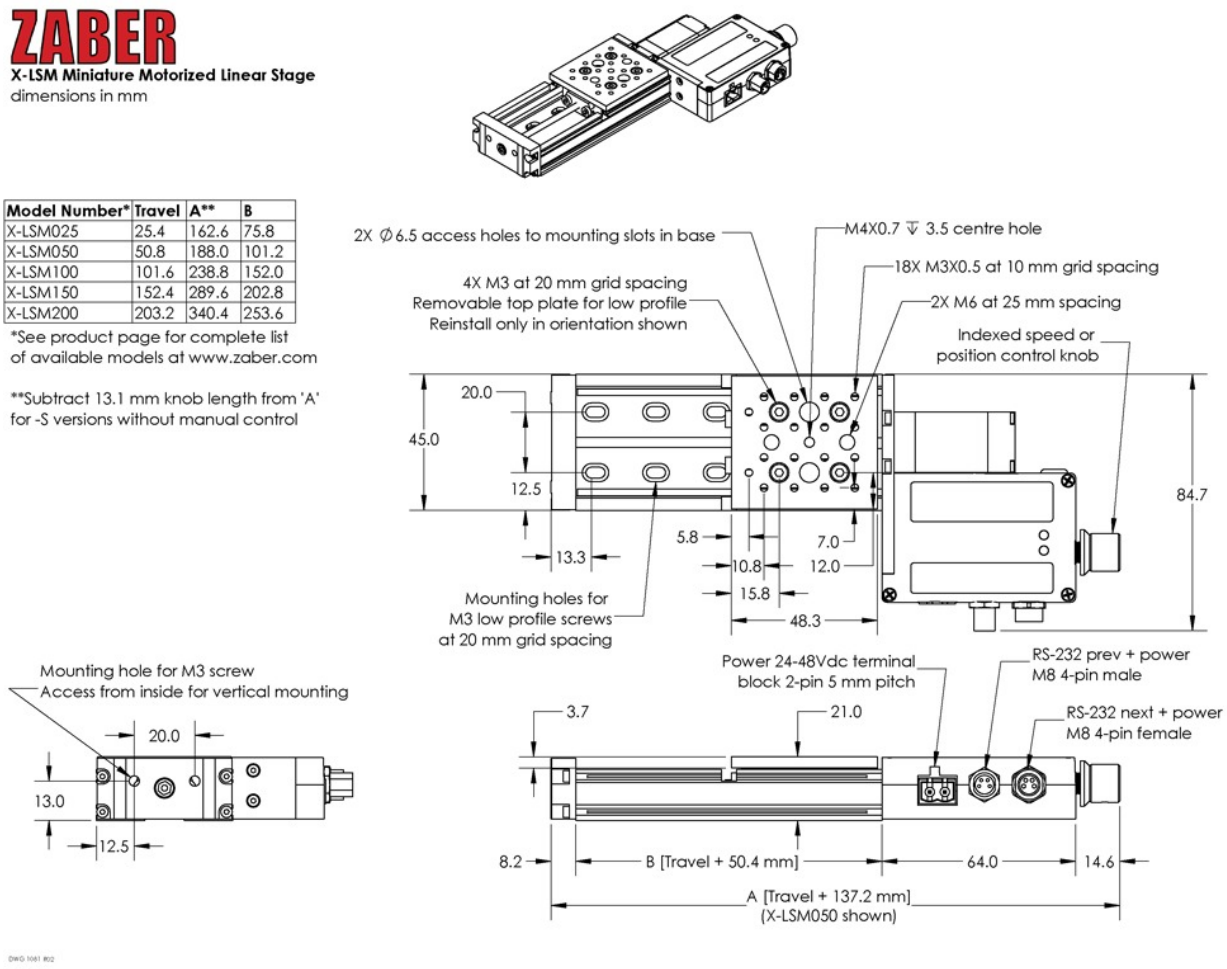
* 25, 50, 100, 150 and 200 mm travel
* 10 kg load capacity
* Up to 104 mm/s speed and up to 55 N thrust
* Built-in controller; daisy-chains with other Zaber products
* Custom versions available

Zaber's X-LSM Series devices are computer-controlled, motorized linear stages with high thrust and speed capabilities and a compact size. They are stand-alone units requiring only a standard 24 V or 48 V power supply. An optional indexed knob provides convenient manual control for versatile operation even without a computer.

These stages connect to the RS-232 port or USB port of any computer, and they can be daisy-chained with any other Zaber products. The daisy-chain also shares power, making it possible for multiple X-Series products to share a single power supply. Convenient locking, 4-pin, M8 connectors on the unit allow for secure connection between units.

At only 21 mm high, these miniature stages are excellent for applications where a small profile is required. The X-LSM's innovative design allows speeds up to 104 mm/s and loads up to 10 kg. Like all of Zaber's products, the X-LSM Series is designed to be 'plug and play' and very easy to set up and operate. If you are considering a multi-axis system, in the XY configuration, these stages make excellent microscope stages. Adding a X-JOY3 joystick controller allows manual control of both X and Y or XYZ axes from a single interface as well as allowing microscope stage positions to be saved and recalled at the touch of a button.

Drawings



Specifications

Specification	Value	Alternate Unit
Built-in Controller	Yes	
Encoder Type	None	
Maximum Continuous Thrust	25 N	5.6 lb
Communication Interface	RS-232	
Communication Protocol	Zaber ASCII (Default), Zaber Binary	

Specification	Value	Alternate Unit
Maximum Centered Load	100 N	22.4 lb
Maximum Cantilever Load	300 N-cm	424.8 oz-in
Guide Type	Needle roller bearing	
Vertical Runout	< 8 µm	< 0.000315 "
Horizontal Runout	< 12 µm	< 0.000472 "
Stiffness in Pitch	55 N-m/°	317 µrad/N-m
Stiffness in Roll	52.5 N-m/°	332 µrad/N-m
Stiffness in Yaw	85 N-m/°	205 µrad/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	
Axes of Motion	1	
LED Indicators	Yes	
Mounting Interface	M3 and M6 threaded holes and M4 threaded center hole	
Vacuum Compatible	No	
Operating Temperature Range	0 to 50 °C	
Stage Parallelism	< 25 µm	< 0.000984 "
RoHS Compliant	Yes	
CE Compliant	Yes	

Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Repeatability
X-LSM025A	0.047625 µm	25.4 mm (1.000 ")	15 µm (0.000591 ")	< 3 µm (< 0.000118 ")

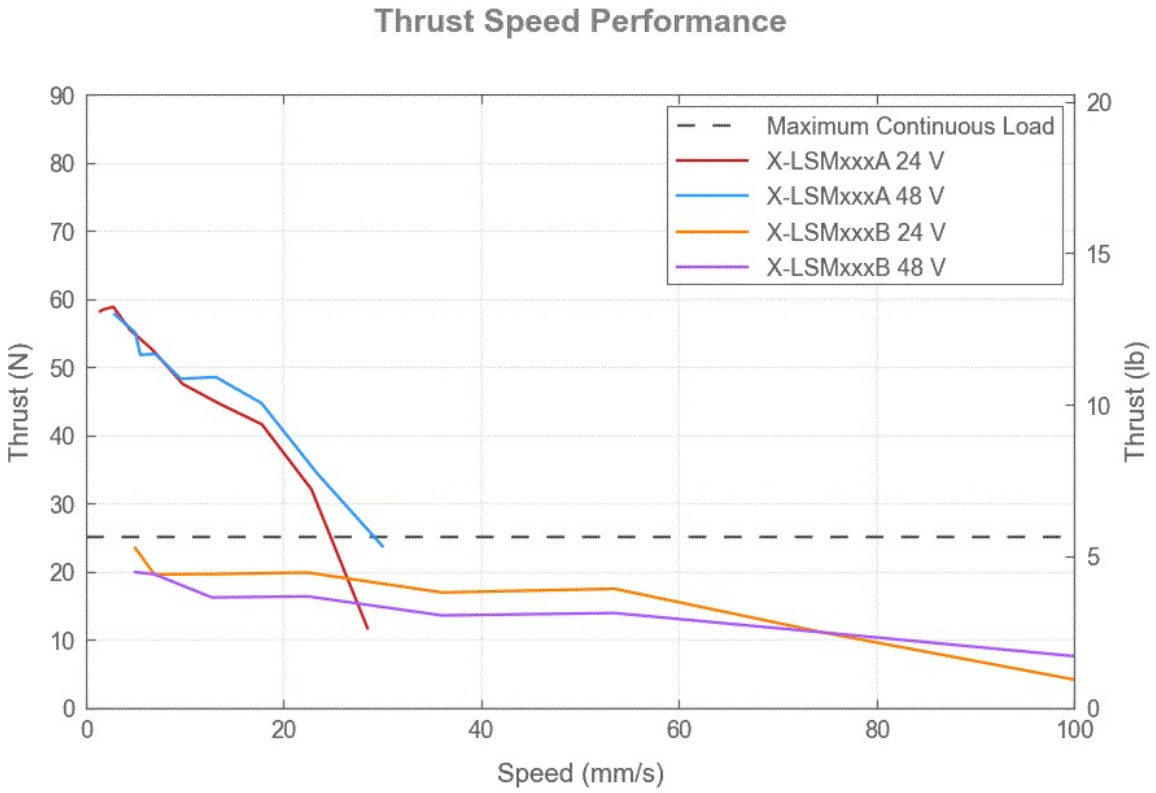
Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Repeatability
X-LSM025A-S	0.047625 µm	25.4 mm (1.000 ")	15 µm (0.000591 ")	< 3 µm (< 0.000118 ")
X-LSM025B	0.1905 µm	25.4 mm (1.000 ")	15 µm (0.000591 ")	< 6 µm (< 0.000236 ")
X-LSM025B-S	0.1905 µm	25.4 mm (1.000 ")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

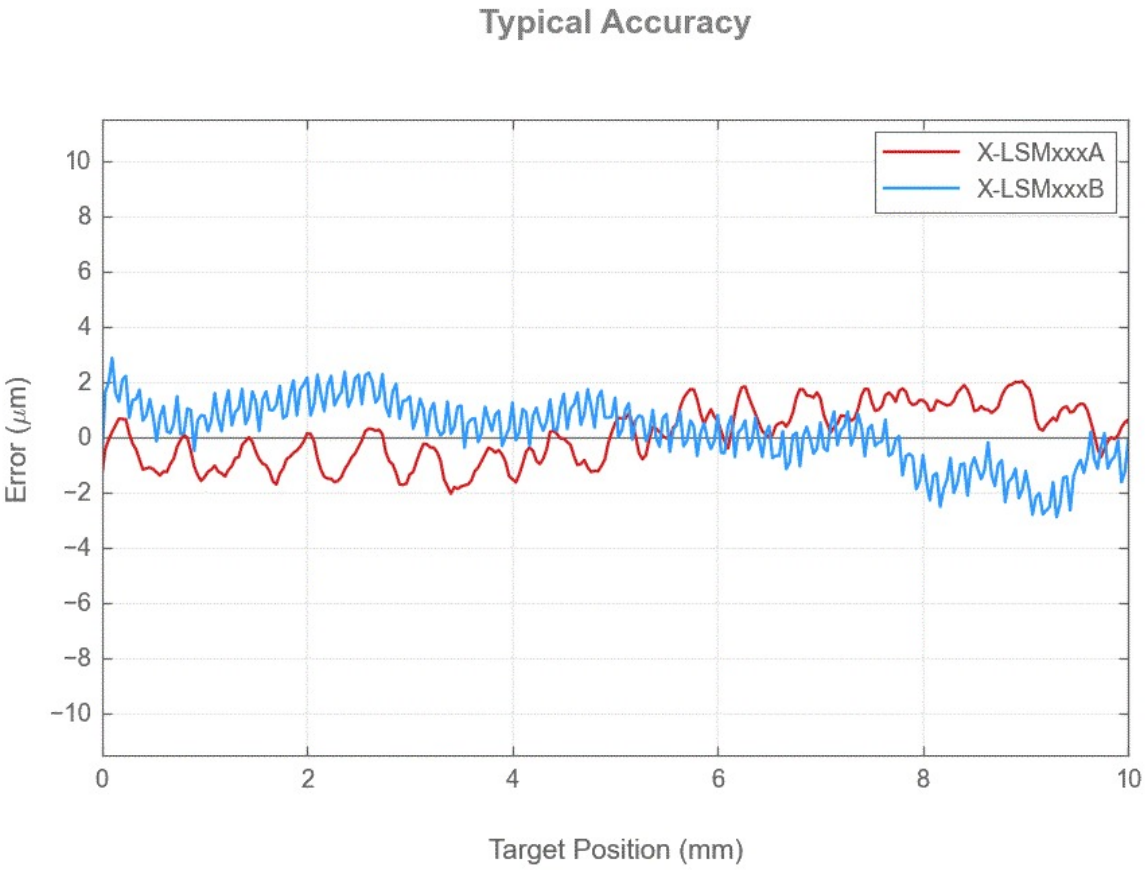
Part Number	Backlash	Maximum Speed	Minimum Speed	Speed Resolution
X-LSM025A	< 12 µm (< 0.000472 ")	26 mm/s (1.024 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
X-LSM025A-S	< 12 µm (< 0.000472 ")	26 mm/s (1.024 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
X-LSM025B	< 16 µm (< 0.000630 ")	104 mm/s (4.094 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)
X-LSM025B-S	< 16 µm (< 0.000630 ")	104 mm/s (4.094 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)
X-LSM050A	< 12 µm (< 0.000472 ")	26 mm/s (1.024 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
X-LSM050A-S	< 12 µm (< 0.000472 ")	26 mm/s (1.024 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
X-LSM050B	< 16 µm (< 0.000630 ")	104 mm/s (4.094 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)
X-LSM050B-S	< 16 µm (< 0.000630 ")	104 mm/s (4.094 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)
X-LSM100A	< 12 µm (< 0.000472 ")	26 mm/s (1.024 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
X-LSM100A-S	< 12 µm (< 0.000472 ")	26 mm/s (1.024 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
X-LSM100B	< 16 µm (< 0.000630 ")	104 mm/s (4.094 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)
X-LSM100B-S	< 16 µm (< 0.000630 ")	104 mm/s (4.094 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)
X-LSM150A	< 12 µm (< 0.000472 ")	26 mm/s (1.024 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
X-LSM150A-S	< 12 µm (< 0.000472 ")	26 mm/s (1.024 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
X-LSM150B	< 16 µm (< 0.000630 ")	104 mm/s (4.094 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)
X-LSM150B-S	< 16 µm (< 0.000630 ")	104 mm/s (4.094 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)
X-LSM200A	< 12 µm (< 0.000472 ")	26 mm/s (1.024 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
X-LSM200A-S	< 12 µm (< 0.000472 ")	26 mm/s (1.024 "/s)	0.000029 mm/s (0.000001 "/s)	0.000029 mm/s (0.000001 "/s)
X-LSM200B	< 16 µm (< 0.000630 ")	104 mm/s (4.094 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)
X-LSM200B-S	< 16 µm (< 0.000630 ")	104 mm/s (4.094 "/s)	0.000116 mm/s (0.000005 "/s)	0.000116 mm/s (0.000005 "/s)

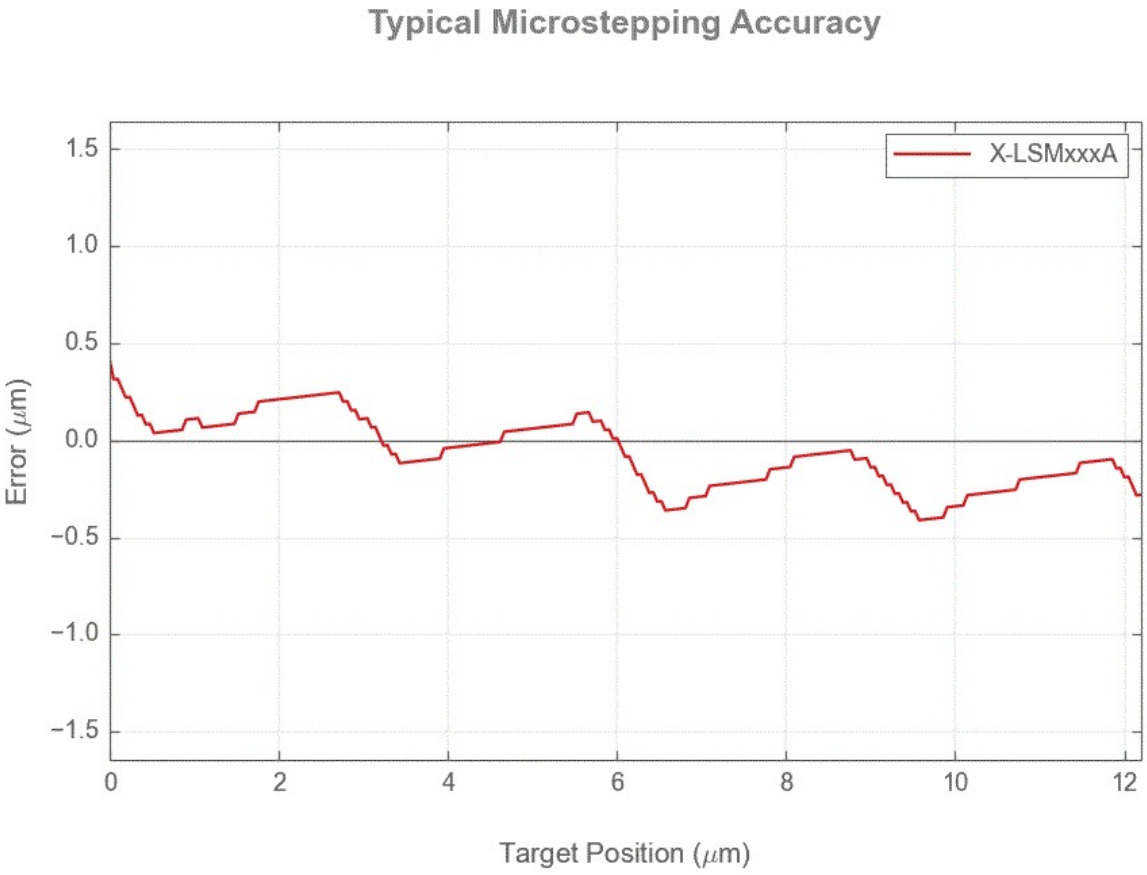
Part Number	Peak Thrust	Pitch	Roll	Yaw
X-LSM025A	55 N (12.3 lb)	0.02 ° (0.349 mrad)	0.005 ° (0.087 mrad)	0.02 ° (0.349 mrad)
X-LSM025A-S	55 N (12.3 lb)	0.02 ° (0.349 mrad)	0.005 ° (0.087 mrad)	0.02 ° (0.349 mrad)
X-LSM025B	25 N (5.6 lb)	0.02 ° (0.349 mrad)	0.005 ° (0.087 mrad)	0.02 ° (0.349 mrad)
X-LSM025B-S	25 N (5.6 lb)	0.02 ° (0.349 mrad)	0.005 ° (0.087 mrad)	0.02 ° (0.349 mrad)
X-LSM050A	55 N (12.3 lb)	0.02 ° (0.349 mrad)	0.005 ° (0.087 mrad)	0.02 ° (0.349 mrad)
X-LSM050A-S	55 N (12.3 lb)	0.02 ° (0.349 mrad)	0.005 ° (0.087 mrad)	0.02 ° (0.349 mrad)
X-LSM050B	25 N (5.6 lb)	0.02 ° (0.349 mrad)	0.005 ° (0.087 mrad)	0.02 ° (0.349 mrad)
X-LSM050B-S	25 N (5.6 lb)	0.02 ° (0.349 mrad)	0.005 ° (0.087 mrad)	0.02 ° (0.349 mrad)
X-LSM100A	55 N (12.3 lb)	0.04 ° (0.698 mrad)	0.02 ° (0.349 mrad)	0.03 ° (0.523 mrad)
X-LSM100A-S	55 N (12.3 lb)	0.04 ° (0.698 mrad)	0.02 ° (0.349 mrad)	0.03 ° (0.523 mrad)
X-LSM100B	25 N (5.6 lb)	0.04 ° (0.698 mrad)	0.02 ° (0.349 mrad)	0.03 ° (0.523 mrad)
X-LSM100B-S	25 N (5.6 lb)	0.04 ° (0.698 mrad)	0.02 ° (0.349 mrad)	0.03 ° (0.523 mrad)
X-LSM150A	55 N (12.3 lb)	0.04 ° (0.698 mrad)	0.02 ° (0.349 mrad)	0.03 ° (0.523 mrad)
X-LSM150A-S	55 N (12.3 lb)	0.04 ° (0.698 mrad)	0.02 ° (0.349 mrad)	0.03 ° (0.523 mrad)
X-LSM150B	25 N (5.6 lb)	0.04 ° (0.698 mrad)	0.02 ° (0.349 mrad)	0.03 ° (0.523 mrad)
X-LSM150B-S	25 N (5.6 lb)	0.04 ° (0.698 mrad)	0.02 ° (0.349 mrad)	0.03 ° (0.523 mrad)
X-LSM200A	55 N (12.3 lb)	0.04 ° (0.698 mrad)	0.02 ° (0.349 mrad)	0.03 ° (0.523 mrad)
X-LSM200A-S	55 N (12.3 lb)	0.04 ° (0.698 mrad)	0.02 ° (0.349 mrad)	0.03 ° (0.523 mrad)
X-LSM200B	25 N (5.6 lb)	0.04 ° (0.698 mrad)	0.02 ° (0.349 mrad)	0.03 ° (0.523 mrad)
X-LSM200B-S	25 N (5.6 lb)	0.04 ° (0.698 mrad)	0.02 ° (0.349 mrad)	0.03 ° (0.523 mrad)

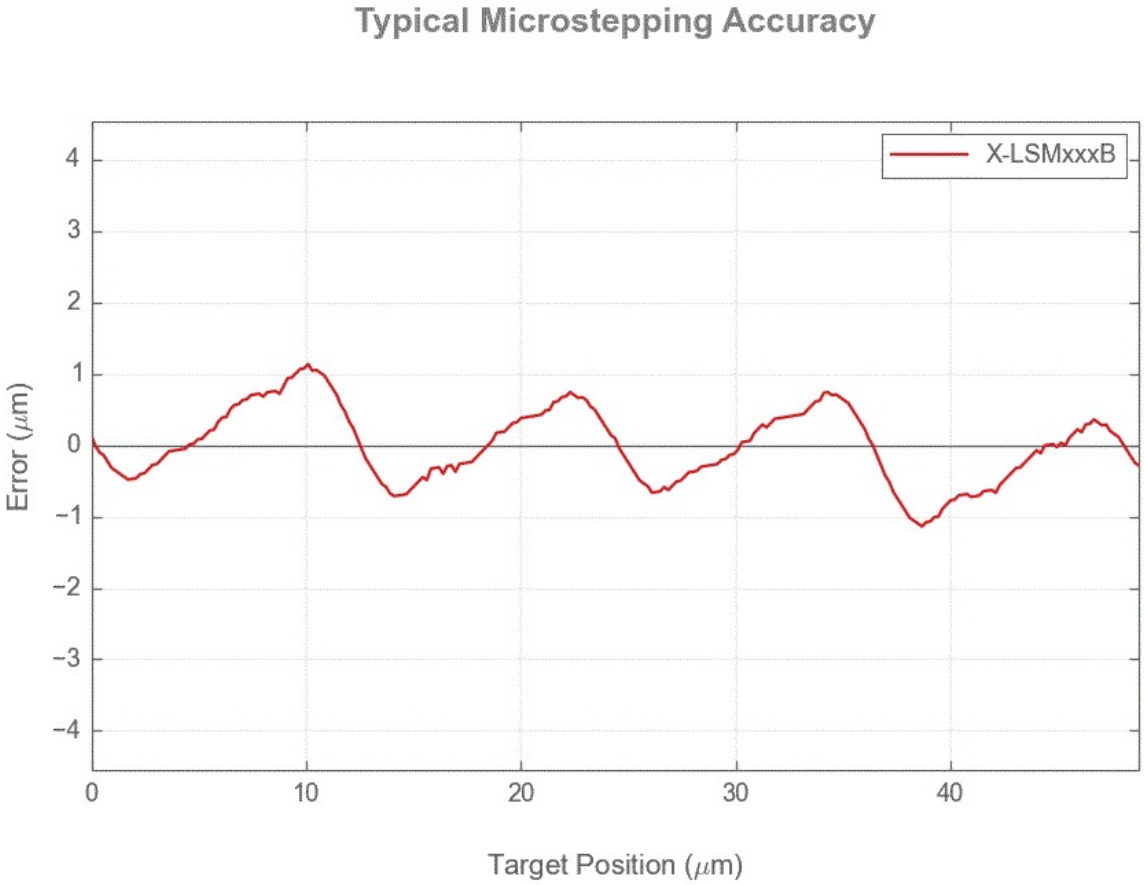
Part Number	Linear Motion Per Motor Rev	Manual Control	Weight
X-LSM025A	0.6096 mm (0.024 ")	Yes	0.33 kg (0.728 lb)
X-LSM025A-S	0.6096 mm (0.024 ")	No	0.33 kg (0.728 lb)
X-LSM025B	2.4384 mm (0.096 ")	Yes	0.33 kg (0.728 lb)
X-LSM025B-S	2.4384 mm (0.096 ")	No	0.33 kg (0.728 lb)
X-LSM050A	0.6096 mm (0.024 ")	Yes	0.34 kg (0.750 lb)
X-LSM050A-S	0.6096 mm (0.024 ")	No	0.34 kg (0.750 lb)
X-LSM050B	2.4384 mm (0.096 ")	Yes	0.34 kg (0.750 lb)
X-LSM050B-S	2.4384 mm (0.096 ")	No	0.34 kg (0.750 lb)
X-LSM100A	0.6096 mm (0.024 ")	Yes	0.37 kg (0.816 lb)
X-LSM100A-S	0.6096 mm (0.024 ")	No	0.37 kg (0.816 lb)
X-LSM100B	2.4384 mm (0.096 ")	Yes	0.37 kg (0.816 lb)
X-LSM100B-S	2.4384 mm (0.096 ")	No	0.37 kg (0.816 lb)
X-LSM150A	0.6096 mm (0.024 ")	Yes	0.41 kg (0.904 lb)
X-LSM150A-S	0.6096 mm (0.024 ")	No	0.41 kg (0.904 lb)
X-LSM150B	2.4384 mm (0.096 ")	Yes	0.41 kg (0.904 lb)
X-LSM150B-S	2.4384 mm (0.096 ")	No	0.41 kg (0.904 lb)
X-LSM200A	0.6096 mm (0.024 ")	Yes	0.44 kg (0.970 lb)
X-LSM200A-S	0.6096 mm (0.024 ")	No	0.44 kg (0.970 lb)
X-LSM200B	2.4384 mm (0.096 ")	Yes	0.44 kg (0.970 lb)
X-LSM200B-S	2.4384 mm (0.096 ")	No	0.44 kg (0.970 lb)

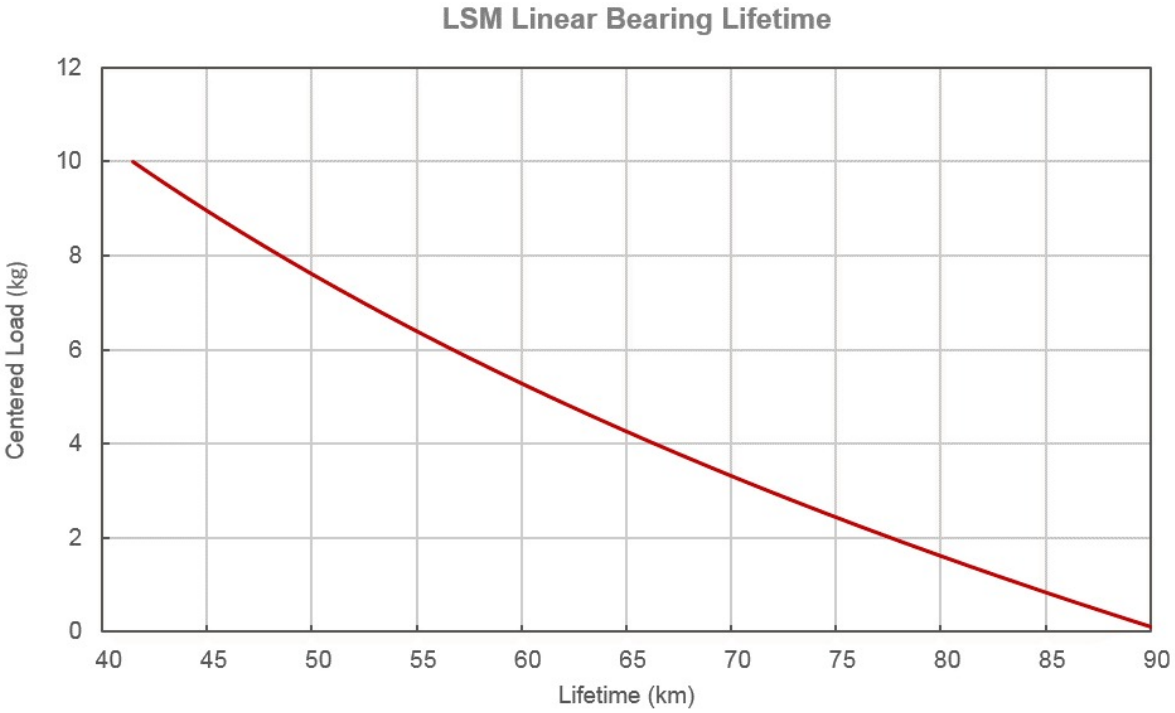
Charts


Thrust Speed Performance
Maximum Continuous Load
X-LSMxxxA 24 V
X-LSMxxxA 48 V
X-LSMxxxB 24 V
X-LSMxxxB 48 V
Thrust (N)
Thrust (lb)
Speed (mm/s)
0
10
20
30
40
50
60
70
80
90
0
5
10
15
20
0
20
40
60
80
100


Typical Accuracy
X-LSMxxxA
X-LSMxxxB
Error (μm)
10
8
6
4
2
0
−2
−4
−6
−8
−10
0
2
4
6
8
10
Target Position (mm)


Typical Microstepping Accuracy
X-LSMxxxA
1.5
1.0
0.5
0.0
−0.5
−1.0
−1.5
Error (μm)
0
2
4
6
8
10
12
Target Position (μm)


Typical Microstepping Accuracy
X-LSMxxxB
Error (μm)
Target Position (μm)
4
3
2
1
0
−1
−2
−3
−4
0
10
20
30
40


LSM Linear Bearing Lifetime
Centered Load (kg)
12
10
8
6
4
2
0
40
45
50
55
60
65
70
75
80
85
90
Lifetime (km)