

X-LRT-C Series Datasheet



- 100, 250, 500, 750, 1000, 1500 mm travel
- Up to 700 mm/s speed and up to 1200 N thrust
- 300 kg load capacity
- High moment stiffness
- Includes stainless steel dust covers
- Ball screw and lead screw configurations
- Built-in controller; daisy-chains with other Zaber products

X-LRT-C Series Overview

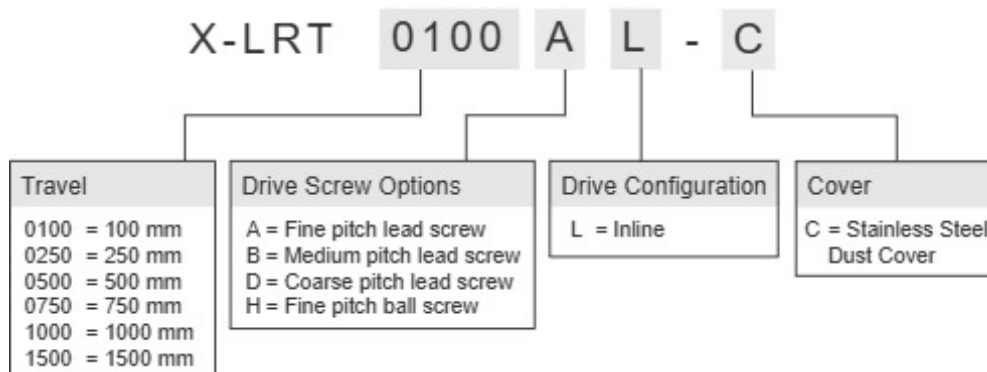
Zaber's X-LRT-C Series devices have high torsional stiffness, load capacity, and long lifetime. They have low pitch, roll, yaw, and runout. A flexible stainless steel dust cover prevents the ingress of small objects. They are stand-alone units requiring only a standard 24 V or 48 V power supply. An indexed 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.

Like all of Zaber's products, the X-LRT-C Series is designed to be 'plug and play' and very easy to set up and operate. These stages can easily be mounted in XY or XYZ configurations with an angle bracket.

For more information visit: <https://www.zaber.com/products/linear-stages/X-LRT-C>

X-LRT-C Series Part Numbering & Options



X-LRT-C Series Drawings

- [X-LRT-C.png \(Drawing for the X-LRT-C\)](#)

X-LRT-C Series Specifications

Built-in Controller	
Communication Interface	RS-232
Communication Protocol	Zaber ASCII
Data Cable Connection	Locking 4-pin M8
Maximum Centered Load	2940 N (659.3 lb)
Maximum Moment (Pitch)	70 N-m (51.7 ft-lb)
Maximum Moment (Roll)	120 N-m (88.6 ft-lb)
Maximum Moment (Yaw)	70 N-m (51.7 ft-lb)
Vertical Runout	< 10 μm (< 0.000394")
Horizontal Runout	< 50 μm (< 0.001968")
Pitch	0.015° (0.262 mrad)
Roll	0.02° (0.349 mrad)
Yaw	0.03° (0.523 mrad)
Stiffness in Pitch	1400 N-m/° (12 $\mu\text{rad/N-m}$)
Stiffness in Roll	700 N-m/° (25 $\mu\text{rad/N-m}$)
Stiffness in Yaw	1200 N-m/° (15 $\mu\text{rad/N-m}$)
Power Supply	24-48 VDC
Power Plug	2-pin screw terminal
Maximum Current Draw	3600 mA
Motor Steps Per Rev	200
Motor Type	Stepper (2 phase)
Motor Rated Current	3000 mA/phase
Inductance	2 mH/phase
Default Resolution	1/64 of a step
Guide Type	Recirculating Ball Linear Guide
Limit or Home Sensing	Magnetic home sensor
Manual Control	Indexed knob with push switch
Axes of Motion	1
LED Indicators	Yes
Operating Temperature Range	0 to 50 °C
CE Compliant	Yes

Built-in Controller

Vacuum Compatible

No

Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Repeatability
X-LRT0100AL-C	0.124023438 μm	100 mm (3.937")	25 μm (0.000984")	< 4 μm (< 0.000157")
X-LRT0100BL-C	0.49609375 μm	100 mm (3.937")	25 μm (0.000984")	< 4 μm (< 0.000157")
X-LRT0100DL-C	1.984375 μm	100 mm (3.937")	25 μm (0.000984")	< 8 μm (< 0.000315")
X-LRT0100HL-C	0.390625 μm	100 mm (3.937")	45 μm (0.001772")	< 4 μm (< 0.000157")
X-LRT0250AL-C	0.124023438 μm	250 mm (9.843")	63 μm (0.002480")	< 4 μm (< 0.000157")
X-LRT0250BL-C	0.49609375 μm	250 mm (9.843")	63 μm (0.002480")	< 4 μm (< 0.000157")
X-LRT0250DL-C	1.984375 μm	250 mm (9.843")	63 μm (0.002480")	< 8 μm (< 0.000315")
X-LRT0250HL-C	0.390625 μm	250 mm (9.843")	113 μm (0.004449")	< 4 μm (< 0.000157")
X-LRT0500AL-C	0.124023438 μm	500 mm (19.685")	125 μm (0.004921")	< 4 μm (< 0.000157")
X-LRT0500BL-C	0.49609375 μm	500 mm (19.685")	125 μm (0.004921")	< 4 μm (< 0.000157")
X-LRT0500DL-C	1.984375 μm	500 mm (19.685")	125 μm (0.004921")	< 8 μm (< 0.000315")
X-LRT0500HL-C	0.390625 μm	500 mm (19.685")	225 μm (0.008858")	< 4 μm (< 0.000157")
X-LRT0750AL-C	0.124023438 μm	750 mm (29.528")	188 μm (0.007402")	< 4 μm (< 0.000157")
X-LRT0750BL-C	0.49609375 μm	750 mm (29.528")	188 μm (0.007402")	< 4 μm (< 0.000157")
X-LRT0750DL-C	1.984375 μm	750 mm (29.528")	188 μm (0.007402")	< 8 μm (< 0.000315")
X-LRT0750HL-C	0.390625 μm	750 mm (29.528")	338 μm (0.013307")	< 4 μm (< 0.000157")
X-LRT1000AL-C	0.124023438 μm	1000 mm (39.370")	250 μm (0.009842")	< 4 μm (< 0.000157")
X-LRT1000BL-C	0.49609375 μm	1000 mm (39.370")	250 μm (0.009842")	< 4 μm (< 0.000157")
X-LRT1000DL-C	1.984375 μm	1000 mm	250 μm	< 8 μm

Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Repeatability
		(39.370")	(0.009842")	(< 0.000315")
X-LRT1000HL-C	0.390625 µm	1000 mm (39.370")	450 µm (0.017716")	< 4 µm (< 0.000157")
X-LRT1500AL-C	0.124023438 µm	1500 mm (59.055")	375 µm (0.014764")	< 4 µm (< 0.000157")
X-LRT1500BL-C	0.49609375 µm	1500 mm (59.055")	375 µm (0.014764")	< 4 µm (< 0.000157")
X-LRT1500DL-C	1.984375 µm	1500 mm (59.055")	375 µm (0.014764")	< 8 µm (< 0.000315")

Part Number	Backlash	Maximum Speed	Minimum Speed	Speed Resolution
X-LRT0100AL-C	< 12 µm (< 0.000472")	45 mm/s (1.772"/s)	0.000076 mm/s (0.000003"/s)	0.000076 mm/s (0.000003"/s)
X-LRT0100BL-C	< 45 µm (< 0.001772")	175 mm/s (6.890"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
X-LRT0100DL-C	< 75 µm (< 0.002953")	700 mm/s (27.559"/s)	0.001212 mm/s (0.000048"/s)	0.001212 mm/s (0.000048"/s)
X-LRT0100HL-C	< 25 µm (< 0.000984")	240 mm/s (9.449"/s)	0.000239 mm/s (0.000009"/s)	0.000239 mm/s (0.000009"/s)
X-LRT0250AL-C	< 12 µm (< 0.000472")	45 mm/s (1.772"/s)	0.000076 mm/s (0.000003"/s)	0.000076 mm/s (0.000003"/s)
X-LRT0250BL-C	< 45 µm (< 0.001772")	175 mm/s (6.890"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
X-LRT0250DL-C	< 75 µm (< 0.002953")	700 mm/s (27.559"/s)	0.001212 mm/s (0.000048"/s)	0.001212 mm/s (0.000048"/s)
X-LRT0250HL-C	< 25 µm (< 0.000984")	240 mm/s (9.449"/s)	0.000239 mm/s (0.000009"/s)	0.000239 mm/s (0.000009"/s)
X-LRT0500AL-C	< 12 µm (< 0.000472")	45 mm/s (1.772"/s)	0.000076 mm/s (0.000003"/s)	0.000076 mm/s (0.000003"/s)
X-LRT0500BL-C	< 45 µm (< 0.001772")	175 mm/s (6.890"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
X-LRT0500DL-C	< 75 µm (< 0.002953")	700 mm/s (27.559"/s)	0.001212 mm/s (0.000048"/s)	0.001212 mm/s (0.000048"/s)
X-LRT0500HL-C	< 25 µm (< 0.000984")	240 mm/s (9.449"/s)	0.000239 mm/s (0.000009"/s)	0.000239 mm/s (0.000009"/s)
X-LRT0750AL-C	< 12 µm (< 0.000472")	45 mm/s (1.772"/s)	0.000076 mm/s (0.000003"/s)	0.000076 mm/s (0.000003"/s)
X-LRT0750BL-C	< 45 µm (< 0.001772")	175 mm/s (6.890"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)

Part Number	Backlash	Maximum Speed	Minimum Speed	Speed Resolution
X-LRT0750DL-C	< 75 μm (< 0.002953")	700 mm/s (27.559"/s)	0.001212 mm/s (0.000048"/s)	0.001212 mm/s (0.000048"/s)
X-LRT0750HL-C	< 25 μm (< 0.000984")	150 mm/s (5.905"/s)	0.000239 mm/s (0.000009"/s)	0.000239 mm/s (0.000009"/s)
X-LRT1000AL-C	< 12 μm (< 0.000472")	28 mm/s (1.102"/s)	0.000076 mm/s (0.000003"/s)	0.000076 mm/s (0.000003"/s)
X-LRT1000BL-C	< 45 μm (< 0.001772")	120 mm/s (4.724"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
X-LRT1000DL-C	< 75 μm (< 0.002953")	500 mm/s (19.685"/s)	0.001212 mm/s (0.000048"/s)	0.001212 mm/s (0.000048"/s)
X-LRT1000HL-C	< 25 μm (< 0.000984")	95 mm/s (3.740"/s)	0.000239 mm/s (0.000009"/s)	0.000239 mm/s (0.000009"/s)
X-LRT1500AL-C	< 12 μm (< 0.000472")	13 mm/s (0.512"/s)	0.000076 mm/s (0.000003"/s)	0.000076 mm/s (0.000003"/s)
X-LRT1500BL-C	< 45 μm (< 0.001772")	55 mm/s (2.165"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
X-LRT1500DL-C	< 75 μm (< 0.002953")	225 mm/s (8.858"/s)	0.001212 mm/s (0.000048"/s)	0.001212 mm/s (0.000048"/s)

Part Number	Peak Thrust	Back-driving Force*	Maximum Continuous Thrust	Linear Motion Per Motor Rev
X-LRT0100AL-C	1200 N (269.1 lb)	Non-back-driving	1200 N (269.1 lb)	1.5875 mm (0.062")
X-LRT0100BL-C	600 N (134.6 lb)	(\pm 30%) 420 N (94.2 lb)	600 N (134.6 lb)	6.35 mm (0.250")
X-LRT0100DL-C	200 N (44.9 lb)	(\pm 30%) 40 N (9.0 lb)	180 N (40.4 lb)	25.4 mm (1.000")
X-LRT0100HL-C	1200 N (269.1 lb)	(\pm 30%) 157 N (35.2 lb)	1200 N (269.1 lb)	5 mm (0.197")
X-LRT0250AL-C	1200 N (269.1 lb)	Non-back-driving	1200 N (269.1 lb)	1.5875 mm (0.062")
X-LRT0250BL-C	600 N (134.6 lb)	(\pm 30%) 420 N (94.2 lb)	600 N (134.6 lb)	6.35 mm (0.250")
X-LRT0250DL-C	200 N (44.9 lb)	(\pm 30%) 40 N (9.0 lb)	180 N (40.4 lb)	25.4 mm (1.000")
X-LRT0250HL-C	1200 N (269.1 lb)	(\pm 30%) 157 N (35.2 lb)	1200 N (269.1 lb)	5 mm (0.197")
X-LRT0500AL-C	1200 N (269.1 lb)	Non-back-driving	1200 N (269.1 lb)	1.5875 mm (0.062")
X-LRT0500BL-C	600 N (134.6 lb)	(\pm 30%) 420 N (94.2 lb)	600 N (134.6 lb)	6.35 mm (0.250")
		(\pm 30%) 40 N		

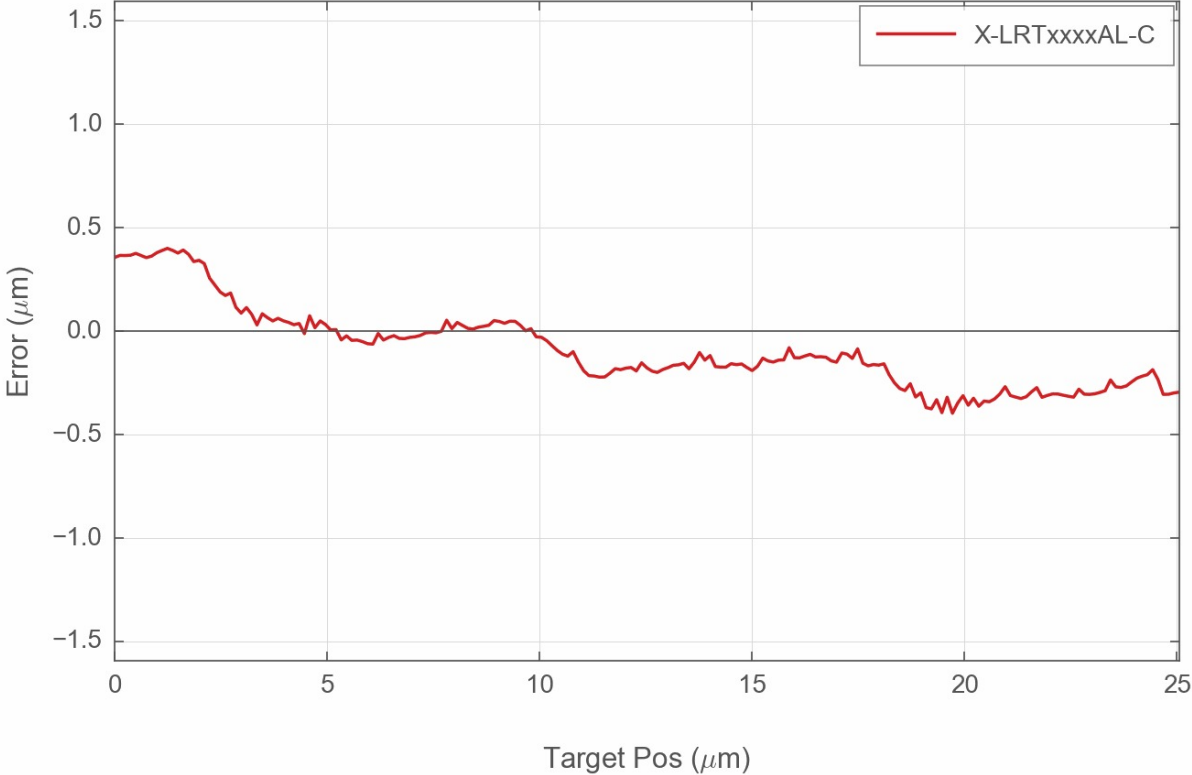
Part Number	Peak Thrust	Back-driving Force*	Maximum Continuous Thrust	Linear Motion Per Motor Rev
X-LRT0500DL-C	200 N (44.9 lb)	(9.0 lb)	180 N (40.4 lb)	25.4 mm (1.000")
X-LRT0500HL-C	1200 N (269.1 lb)	(± 30%) 157 N (35.2 lb)	1200 N (269.1 lb)	5 mm (0.197")
X-LRT0750AL-C	1200 N (269.1 lb)	Non-back-driving	1200 N (269.1 lb)	1.5875 mm (0.062")
X-LRT0750BL-C	600 N (134.6 lb)	(± 30%) 420 N (94.2 lb)	600 N (134.6 lb)	6.35 mm (0.250")
X-LRT0750DL-C	200 N (44.9 lb)	(± 30%) 40 N (9.0 lb)	180 N (40.4 lb)	25.4 mm (1.000")
X-LRT0750HL-C	1200 N (269.1 lb)	(± 30%) 157 N (35.2 lb)	1200 N (269.1 lb)	5 mm (0.197")
X-LRT1000AL-C	1200 N (269.1 lb)	Non-back-driving	1200 N (269.1 lb)	1.5875 mm (0.062")
X-LRT1000BL-C	600 N (134.6 lb)	(± 30%) 420 N (94.2 lb)	600 N (134.6 lb)	6.35 mm (0.250")
X-LRT1000DL-C	200 N (44.9 lb)	(± 30%) 40 N (9.0 lb)	180 N (40.4 lb)	25.4 mm (1.000")
X-LRT1000HL-C	1200 N (269.1 lb)	(± 30%) 157 N (35.2 lb)	1200 N (269.1 lb)	5 mm (0.197")
X-LRT1500AL-C	1200 N (269.1 lb)	Non-back-driving	1200 N (269.1 lb)	1.5875 mm (0.062")
X-LRT1500BL-C	600 N (134.6 lb)	(± 30%) 420 N (94.2 lb)	600 N (134.6 lb)	6.35 mm (0.250")
X-LRT1500DL-C	200 N (44.9 lb)	(± 30%) 40 N (9.0 lb)	180 N (40.4 lb)	25.4 mm (1.000")

Part Number	Mechanical Drive System	Weight
X-LRT0100AL-C	Precision lead screw	3.65 kg (8.047 lb)
X-LRT0100BL-C	Precision lead screw	3.65 kg (8.047 lb)
X-LRT0100DL-C	Precision lead screw	3.65 kg (8.047 lb)
X-LRT0100HL-C	Precision ball screw	3.65 kg (8.047 lb)
X-LRT0250AL-C	Precision lead screw	4.441 kg (9.791 lb)
X-LRT0250BL-C	Precision lead screw	4.441 kg (9.791 lb)
X-LRT0250DL-C	Precision lead screw	4.441 kg (9.791 lb)
X-LRT0250HL-C	Precision ball screw	4.441 kg (9.791 lb)
X-LRT0500AL-C	Precision lead screw	5.758 kg (12.694 lb)
X-LRT0500BL-C	Precision lead screw	5.758 kg (12.694 lb)

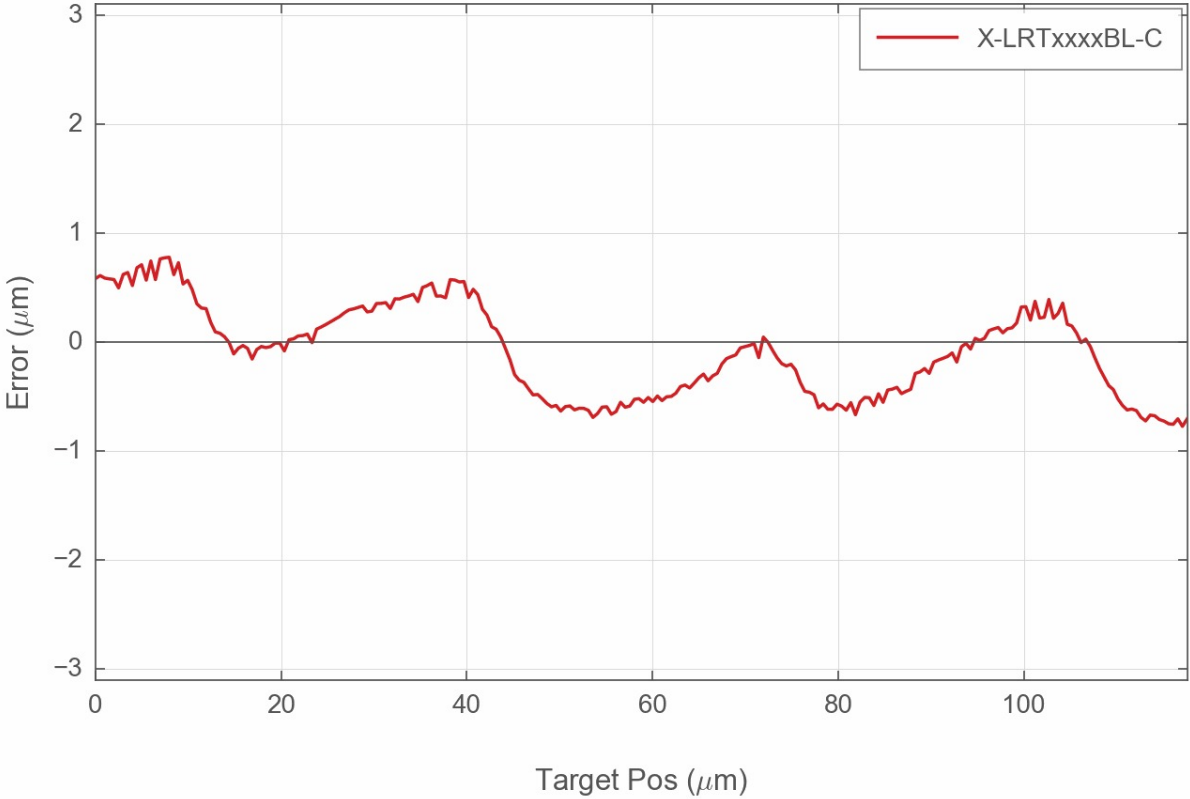
Part Number	Mechanical Drive System	Weight
X-LRT0500DL-C	Precision lead screw	5.758 kg (12.694 lb)
X-LRT0500HL-C	Precision ball screw	5.758 kg (12.694 lb)
X-LRT0750AL-C	Precision lead screw	7.076 kg (15.600 lb)
X-LRT0750BL-C	Precision lead screw	7.076 kg (15.600 lb)
X-LRT0750DL-C	Precision lead screw	7.076 kg (15.600 lb)
X-LRT0750HL-C	Precision ball screw	7.076 kg (15.600 lb)
X-LRT1000AL-C	Precision lead screw	8.393 kg (18.503 lb)
X-LRT1000BL-C	Precision lead screw	8.393 kg (18.503 lb)
X-LRT1000DL-C	Precision lead screw	8.393 kg (18.503 lb)
X-LRT1000HL-C	Precision ball screw	8.393 kg (18.503 lb)
X-LRT1500AL-C	Precision lead screw	11.028 kg (24.313 lb)
X-LRT1500BL-C	Precision lead screw	11.028 kg (24.313 lb)
X-LRT1500DL-C	Precision lead screw	11.028 kg (24.313 lb)

X-LRT-C Series Charts

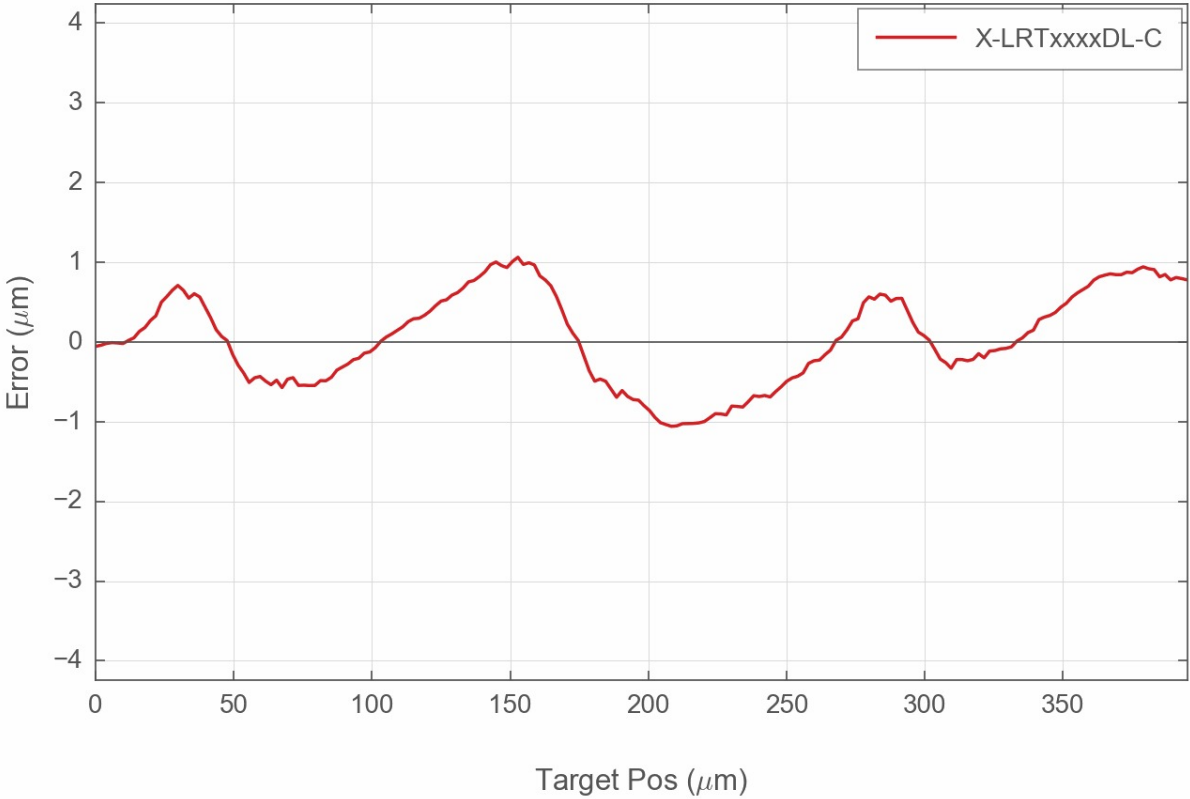
Typical Microstepping Accuracy



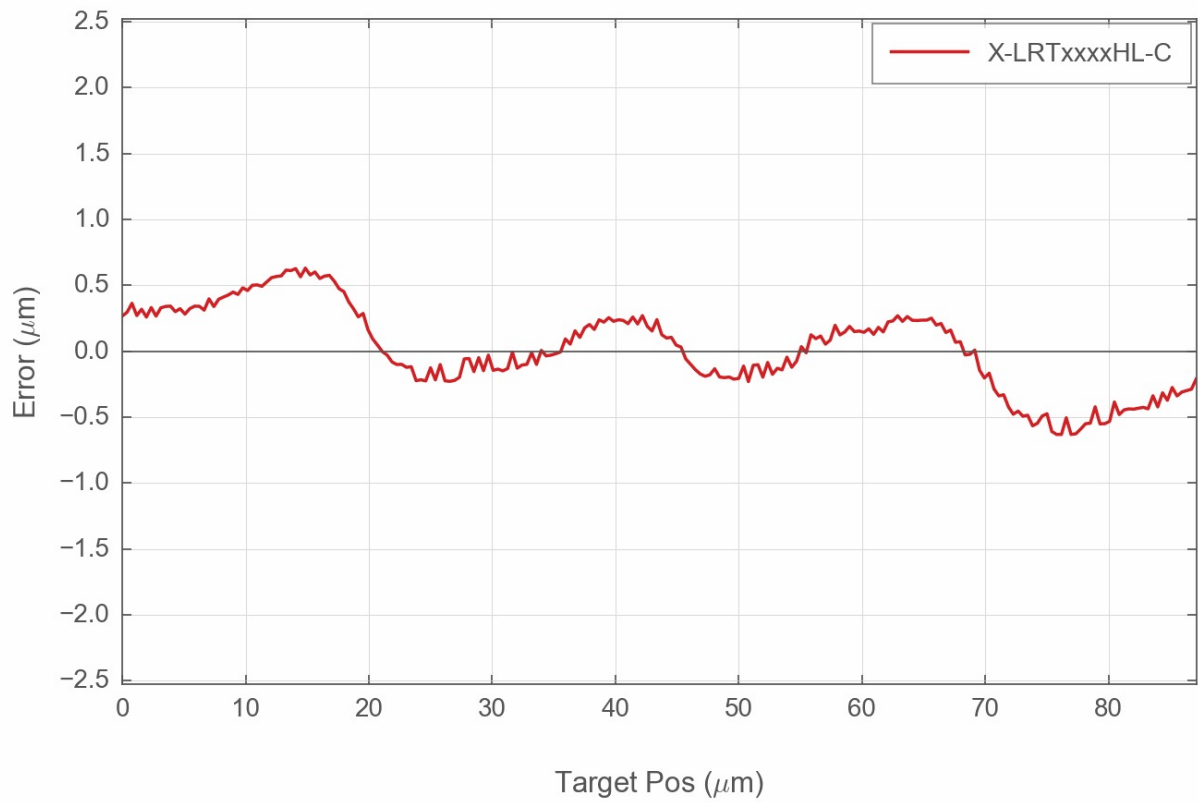
Typical Microstepping Accuracy



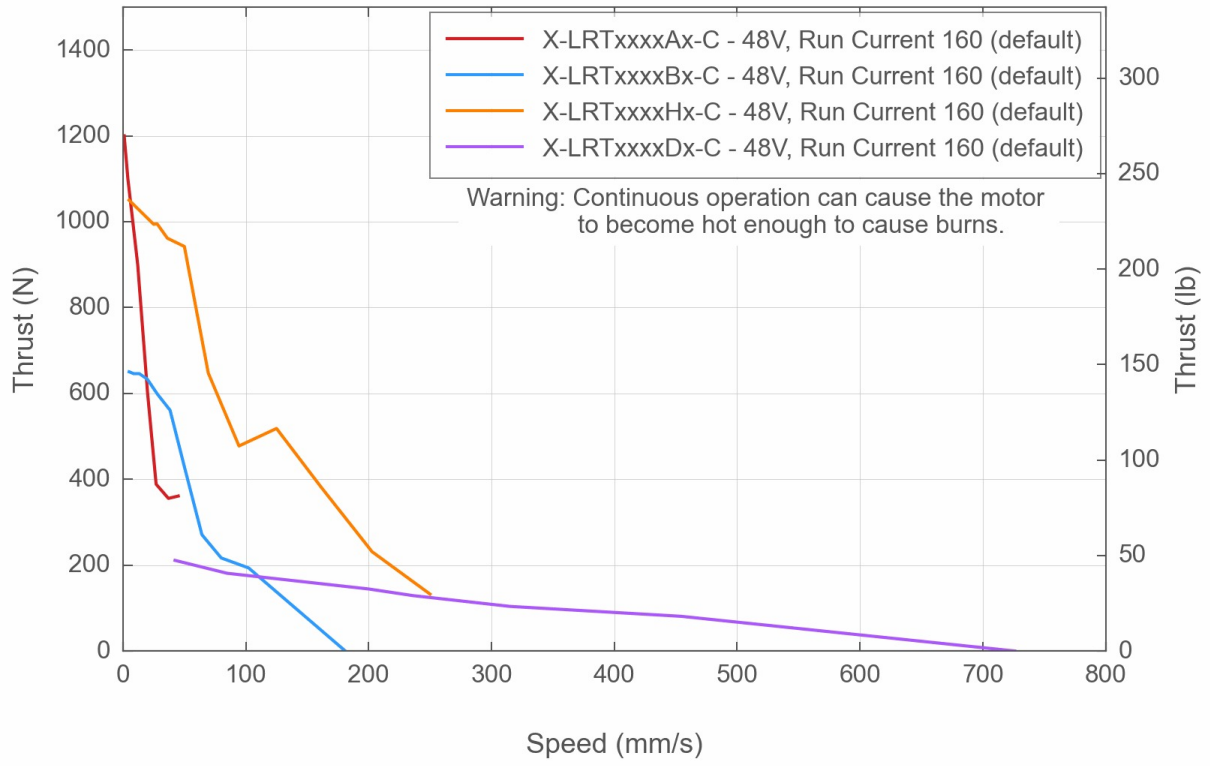
Typical Microstepping Accuracy



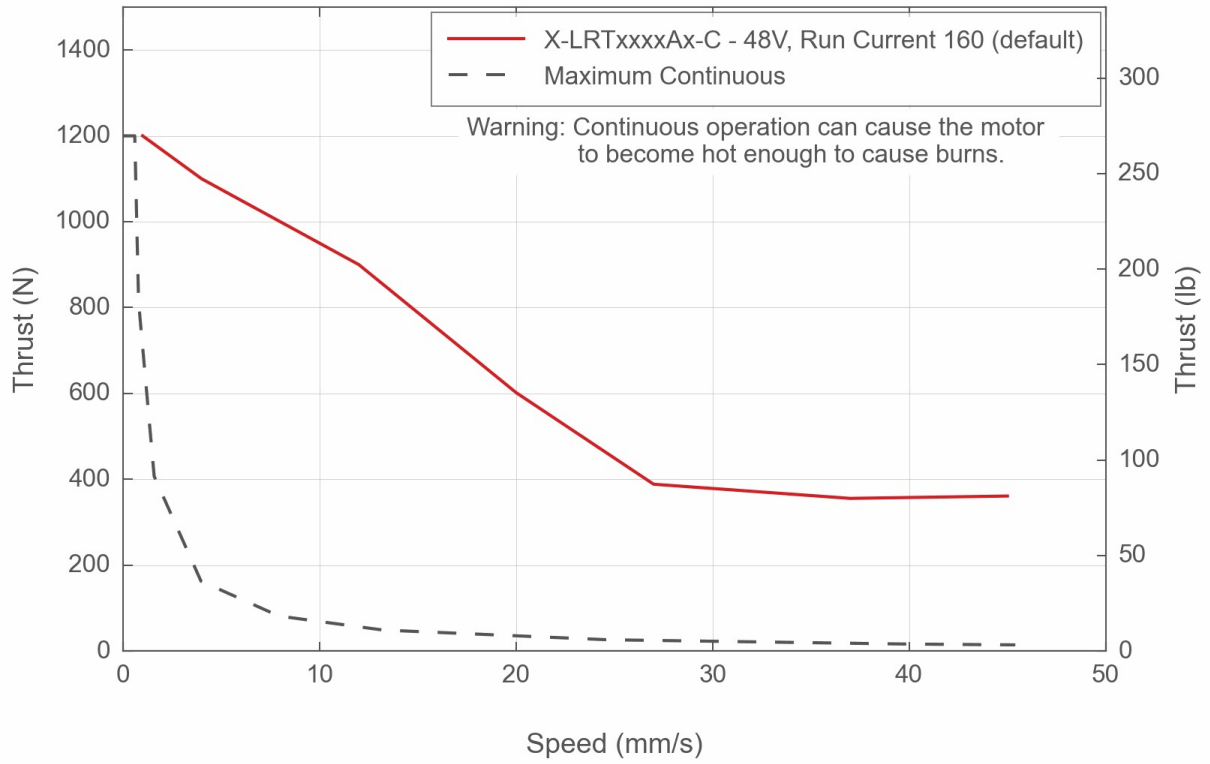
Typical Microstepping Accuracy



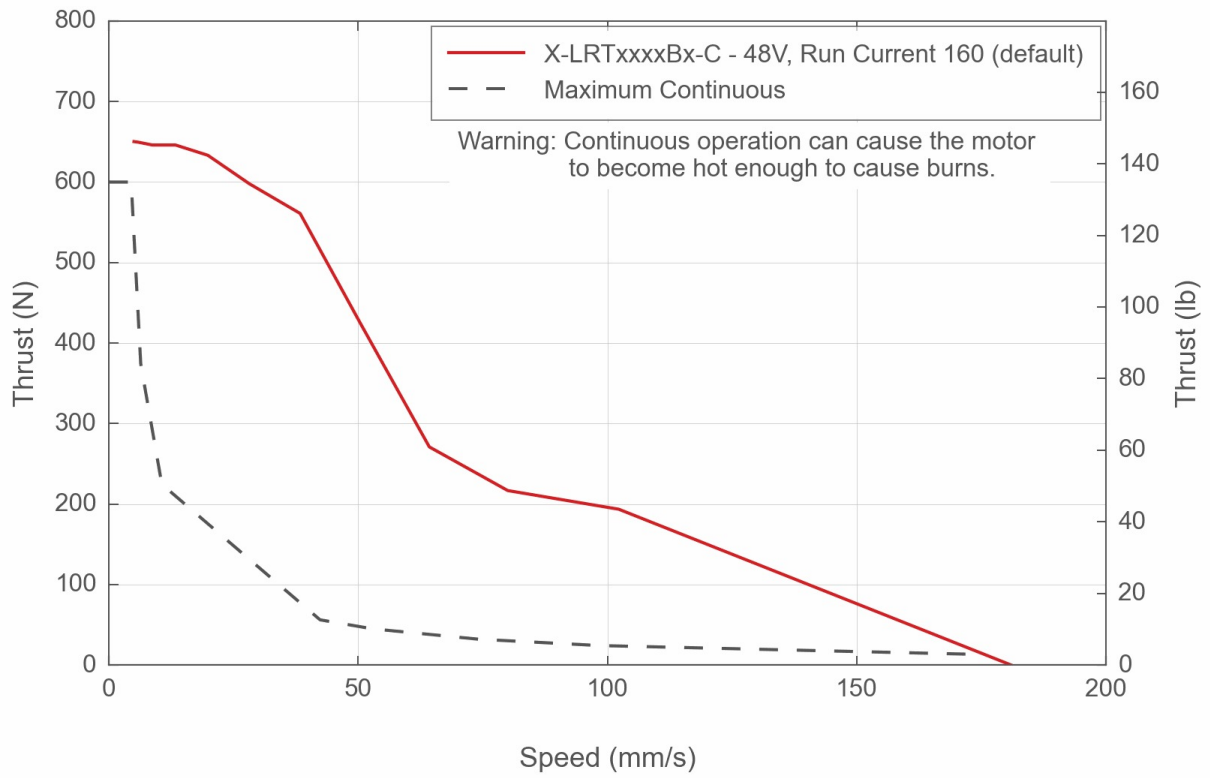
Thrust Speed Performance



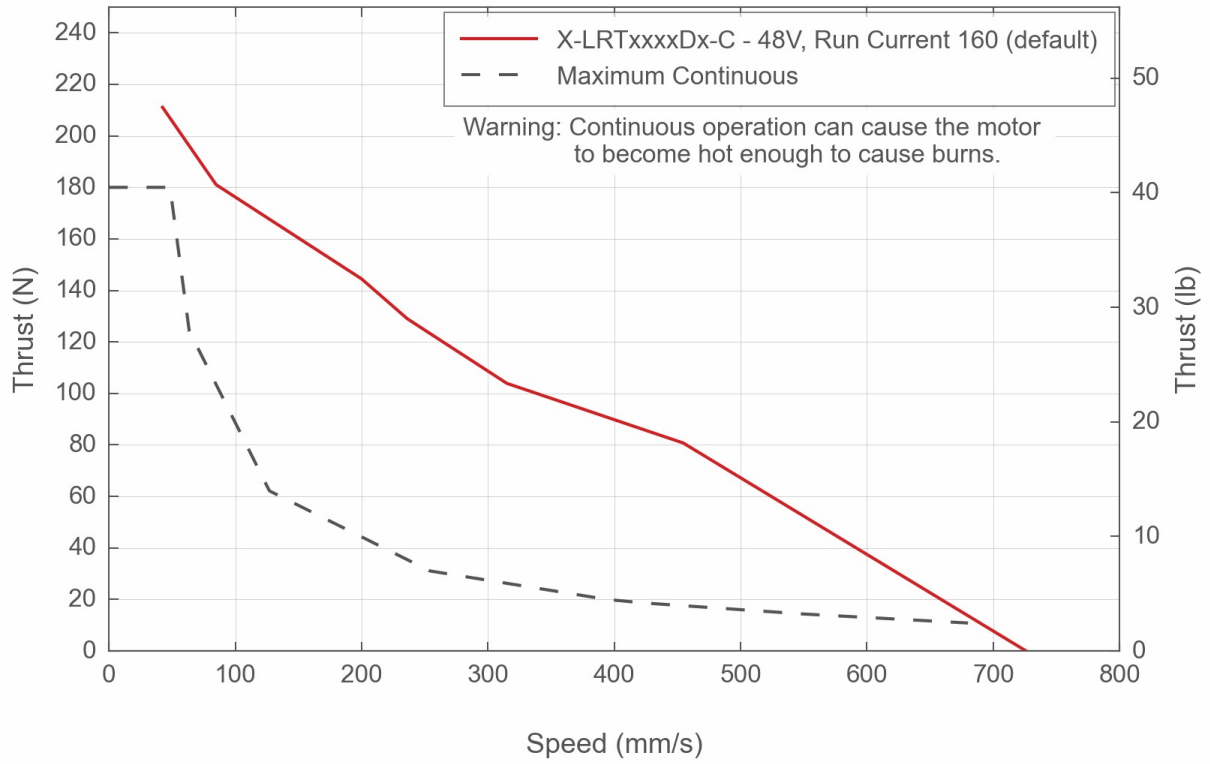
Thrust Speed Performance



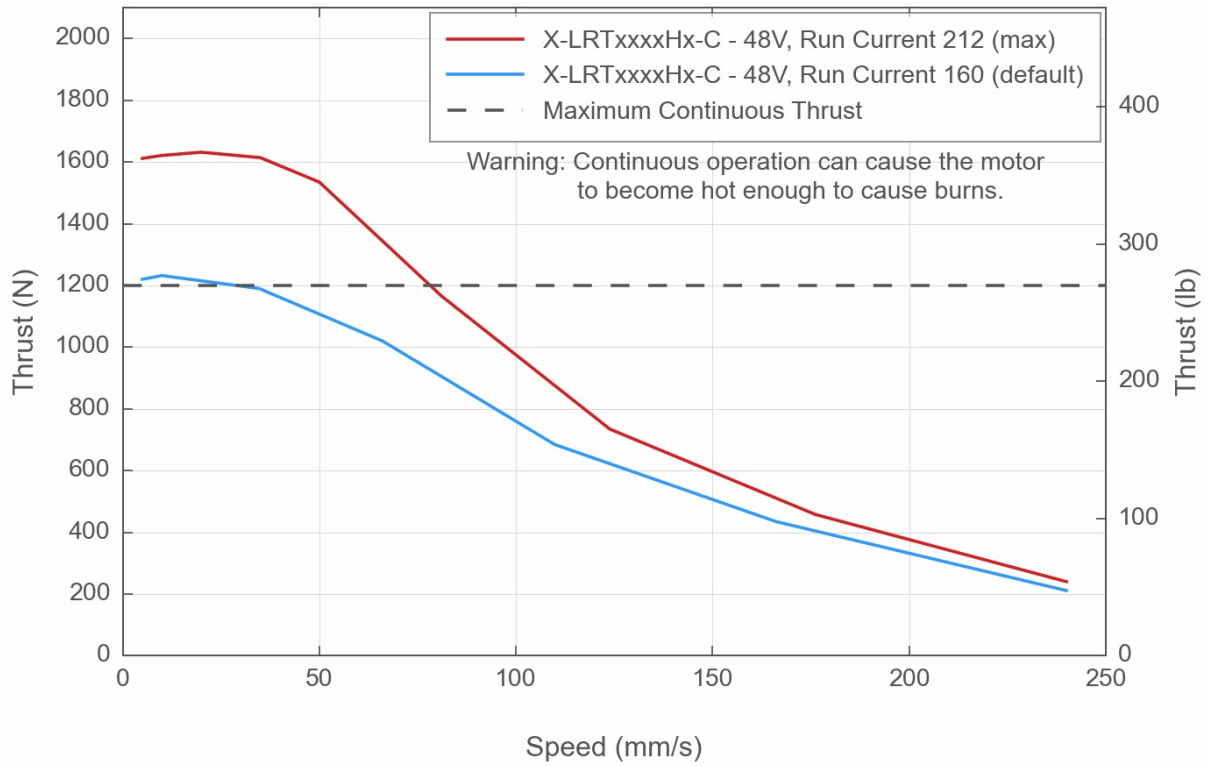
Thrust Speed Performance



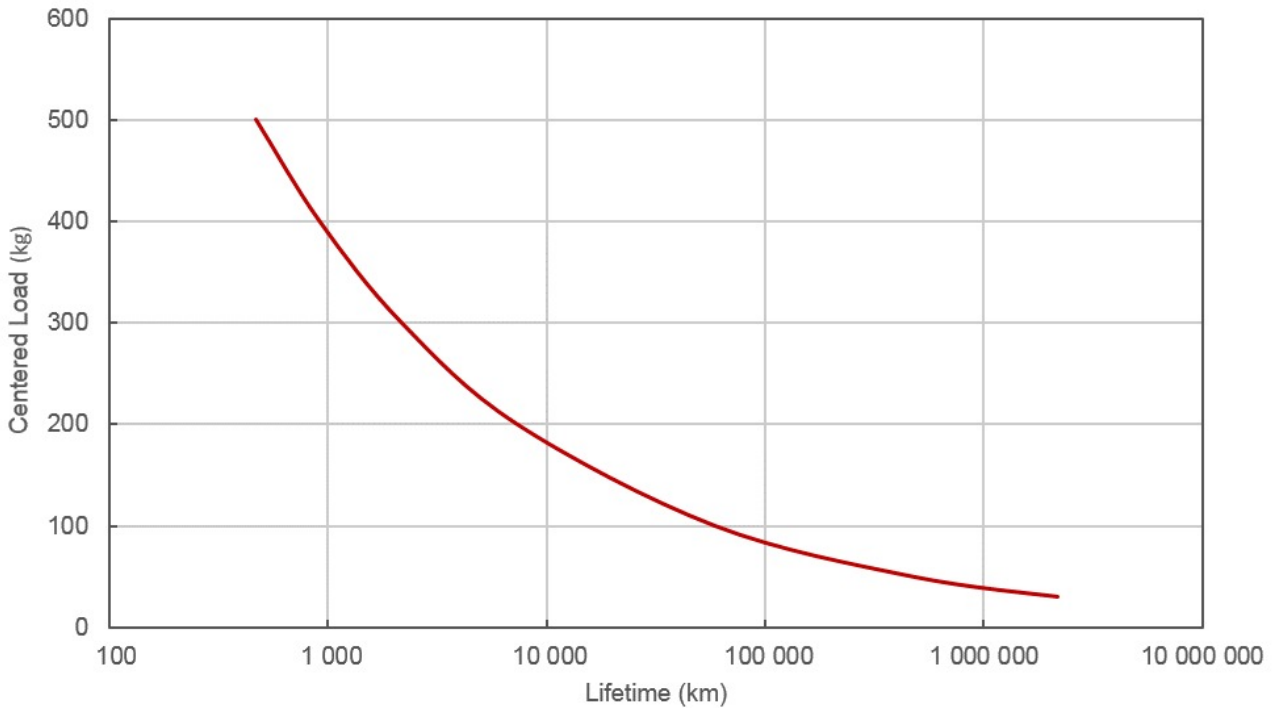
Thrust Speed Performance



Thrust Speed Performance



Typical LRT Bearing Lifetime



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