

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
- Designed for use with an X-MCC Series stepper motor controller or any 2-phase stepper motor controller
- With AutoDetect, the X-MCC controller configures its settings automatically for the connected peripheral

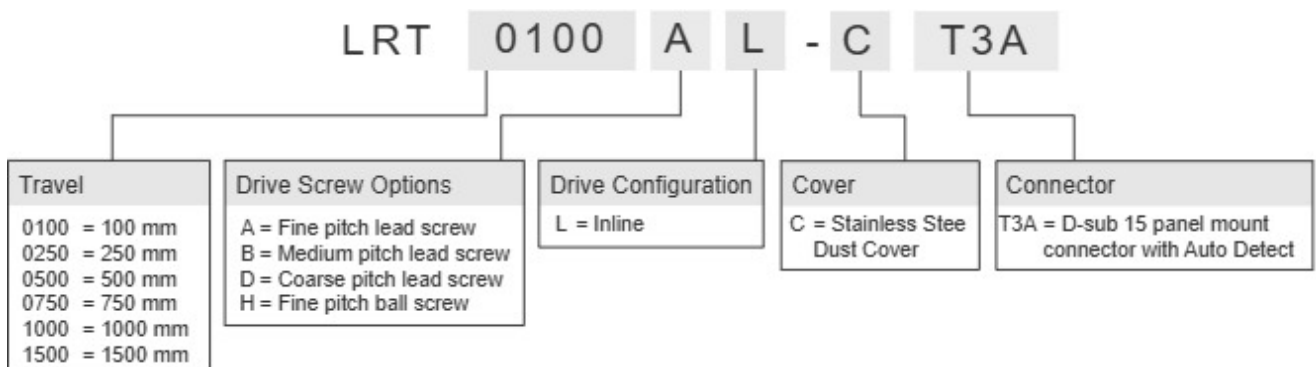
LRT-C Series Overview

Zaber's LRT-C Series devices are computer-controlled, motorized linear stages with high stiffness, load, and lifetime capabilities in a compact size. A flexible stainless steel dust cover prevents the ingress of small objects. These stages can bolt together to make XY and XYZ systems. Some multi-axis configurations may require additional accessories; please contact Zaber Technical Support to ensure the correct ones are selected.

The stages are designed to connect directly to our X-MCC Series universal motor controllers, or they can be used with any 2-phase stepper motor controller through the panel mount DB15 connector. Set up is easy with AutoDetect. Once connected, the X-MCC controller will automatically detect and configure the LRT-C.

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

LRT-C Series Part Numbering & Options



LRT-C Series Drawings

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

LRT-C Series Specifications

Built-in Controller	
Recommended Controller	X-MCC (48 V) Recommended
AutoDetect	Yes
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 $\mu\text{rad/N-m}$)
Motor Steps Per Rev	200
Motor Type	Stepper (2 phase)
Motor Rated Current	3000 mA/phase
Motor Winding Resistance	0.53 ohms/phase
Inductance	2 mH/phase
Motor Connection	D-sub 15
Default Resolution	1/64 of a step
Guide Type	Recirculating Ball Linear Guide
Limit or Home Sensing	Magnetic home sensor
Axes of Motion	1
Operating Temperature Range	0 to 50 °C
CE Compliant	Yes
Vacuum Compatible	No

Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Repeatability
			25 μm	< 4 μm

Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Repeatability
LRT0100AL-CT3A	0.124023438 µm	100 mm (3.937")	(0.000984")	(< 0.000157")
LRT0100BL-CT3A	0.49609375 µm	100 mm (3.937")	25 µm (0.000984")	< 4 µm (< 0.000157")
LRT0100DL-CT3A	1.984375 µm	100 mm (3.937")	25 µm (0.000984")	< 8 µm (< 0.000315")
LRT0100HL-CT3A	0.390625 µm	100 mm (3.937")	45 µm (0.001772")	< 4 µm (< 0.000157")
LRT0250AL-CT3A	0.124023438 µm	250 mm (9.843")	63 µm (0.002480")	< 4 µm (< 0.000157")
LRT0250BL-CT3A	0.49609375 µm	250 mm (9.843")	63 µm (0.002480")	< 4 µm (< 0.000157")
LRT0250DL-CT3A	1.984375 µm	250 mm (9.843")	63 µm (0.002480")	< 8 µm (< 0.000315")
LRT0250HL-CT3A	0.390625 µm	250 mm (9.843")	113 µm (0.004449")	< 4 µm (< 0.000157")
LRT0500AL-CT3A	0.124023438 µm	500 mm (19.685")	125 µm (0.004921")	< 4 µm (< 0.000157")
LRT0500BL-CT3A	0.49609375 µm	500 mm (19.685")	125 µm (0.004921")	< 4 µm (< 0.000157")
LRT0500DL-CT3A	1.984375 µm	500 mm (19.685")	125 µm (0.004921")	< 8 µm (< 0.000315")
LRT0500HL-CT3A	0.390625 µm	500 mm (19.685")	225 µm (0.008858")	< 4 µm (< 0.000157")
LRT0750AL-CT3A	0.124023438 µm	750 mm (29.528")	188 µm (0.007402")	< 4 µm (< 0.000157")
LRT0750BL-CT3A	0.49609375 µm	750 mm (29.528")	188 µm (0.007402")	< 4 µm (< 0.000157")
LRT0750DL-CT3A	1.984375 µm	750 mm (29.528")	188 µm (0.007402")	< 8 µm (< 0.000315")
LRT0750HL-CT3A	0.390625 µm	750 mm (29.528")	338 µm (0.013307")	< 4 µm (< 0.000157")
LRT1000AL-CT3A	0.124023438 µm	1000 mm (39.370")	250 µm (0.009842")	< 4 µm (< 0.000157")
LRT1000BL-CT3A	0.49609375 µm	1000 mm (39.370")	250 µm (0.009842")	< 4 µm (< 0.000157")
LRT1000DL-CT3A	1.984375 µm	1000 mm (39.370")	250 µm (0.009842")	< 8 µm (< 0.000315")
LRT1000HL-CT3A	0.390625 µm	1000 mm (39.370")	450 µm (0.017716")	< 4 µm (< 0.000157")
LRT1500AL-CT3A	0.124023438 µm	1500 mm (59.055")	375 µm (0.014764")	< 4 µm (< 0.000157")

Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Repeatability
LRT1500BL-CT3A	0.49609375 µm	1500 mm (59.055")	375 µm (0.014764")	< 4 µm (< 0.000157")
LRT1500DL-CT3A	1.984375 µm	1500 mm (59.055")	375 µm (0.014764")	< 8 µm (< 0.000315")

Part Number	Backlash	Maximum Speed	Minimum Speed	Speed Resolution
LRT0100AL-CT3A	< 12 µm (< 0.000472")	45 mm/s (1.772"/s)	0.000076 mm/s (0.000003"/s)	0.000076 mm/s (0.000003"/s)
LRT0100BL-CT3A	< 45 µm (< 0.001772")	175 mm/s (6.890"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
LRT0100DL-CT3A	< 75 µm (< 0.002953")	700 mm/s (27.559"/s)	0.001212 mm/s (0.000048"/s)	0.001212 mm/s (0.000048"/s)
LRT0100HL-CT3A	< 25 µm (< 0.000984")	240 mm/s (9.449"/s)	0.000239 mm/s (0.000009"/s)	0.000239 mm/s (0.000009"/s)
LRT0250AL-CT3A	< 12 µm (< 0.000472")	45 mm/s (1.772"/s)	0.000076 mm/s (0.000003"/s)	0.000076 mm/s (0.000003"/s)
LRT0250BL-CT3A	< 45 µm (< 0.001772")	175 mm/s (6.890"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
LRT0250DL-CT3A	< 75 µm (< 0.002953")	700 mm/s (27.559"/s)	0.001212 mm/s (0.000048"/s)	0.001212 mm/s (0.000048"/s)
LRT0250HL-CT3A	< 25 µm (< 0.000984")	240 mm/s (9.449"/s)	0.000239 mm/s (0.000009"/s)	0.000239 mm/s (0.000009"/s)
LRT0500AL-CT3A	< 12 µm (< 0.000472")	45 mm/s (1.772"/s)	0.000076 mm/s (0.000003"/s)	0.000076 mm/s (0.000003"/s)
LRT0500BL-CT3A	< 45 µm (< 0.001772")	175 mm/s (6.890"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
LRT0500DL-CT3A	< 75 µm (< 0.002953")	700 mm/s (27.559"/s)	0.001212 mm/s (0.000048"/s)	0.001212 mm/s (0.000048"/s)
LRT0500HL-CT3A	< 25 µm (< 0.000984")	240 mm/s (9.449"/s)	0.000239 mm/s (0.000009"/s)	0.000239 mm/s (0.000009"/s)
LRT0750AL-CT3A	< 12 µm (< 0.000472")	45 mm/s (1.772"/s)	0.000076 mm/s (0.000003"/s)	0.000076 mm/s (0.000003"/s)
LRT0750BL-CT3A	< 45 µm (< 0.001772")	175 mm/s (6.890"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
LRT0750DL-CT3A	< 75 µm (< 0.002953")	700 mm/s (27.559"/s)	0.001212 mm/s (0.000048"/s)	0.001212 mm/s (0.000048"/s)
LRT0750HL-CT3A	< 25 µm (< 0.000984")	150 mm/s (5.905"/s)	0.000239 mm/s (0.000009"/s)	0.000239 mm/s (0.000009"/s)
LRT1000AL-CT3A	< 12 µm (< 0.000472")	28 mm/s (1.102"/s)	0.000076 mm/s (0.000003"/s)	0.000076 mm/s (0.000003"/s)
	< 45 µm	120 mm/s	0.000303 mm/s	0.000303 mm/s

Part Number	Backlash	Maximum Speed	Minimum Speed	Speed Resolution
LRT1000BL-CT3A	(< 0.001772")	(4.724"/s)	(0.000012"/s)	(0.000012"/s)
LRT1000DL-CT3A	< 75 µm (< 0.002953")	500 mm/s (19.685"/s)	0.001212 mm/s (0.000048"/s)	0.001212 mm/s (0.000048"/s)
LRT1000HL-CT3A	< 25 µm (< 0.000984")	95 mm/s (3.740"/s)	0.000239 mm/s (0.000009"/s)	0.000239 mm/s (0.000009"/s)
LRT1500AL-CT3A	< 12 µm (< 0.000472")	13 mm/s (0.512"/s)	0.000076 mm/s (0.000003"/s)	0.000076 mm/s (0.000003"/s)
LRT1500BL-CT3A	< 45 µm (< 0.001772")	55 mm/s (2.165"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
LRT1500DL-CT3A	< 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
LRT0100AL-CT3A	1200 N (269.1 lb)	Non-back-driving	1200 N (269.1 lb)	1.5875 mm (0.062")
LRT0100BL-CT3A	600 N (134.6 lb)	(± 30%) 420 N (94.2 lb)	600 N (134.6 lb)	6.35 mm (0.250")
LRT0100DL-CT3A	200 N (44.9 lb)	(± 30%) 40 N (9.0 lb)	180 N (40.4 lb)	25.4 mm (1.000")
LRT0100HL-CT3A	1200 N (269.1 lb)	(± 30%) 157 N (35.2 lb)	1200 N (269.1 lb)	5 mm (0.197")
LRT0250AL-CT3A	1200 N (269.1 lb)	Non-back-driving	1200 N (269.1 lb)	1.5875 mm (0.062")
LRT0250BL-CT3A	600 N (134.6 lb)	(± 30%) 420 N (94.2 lb)	600 N (134.6 lb)	6.35 mm (0.250")
LRT0250DL-CT3A	200 N (44.9 lb)	(± 30%) 40 N (9.0 lb)	180 N (40.4 lb)	25.4 mm (1.000")
LRT0250HL-CT3A	1200 N (269.1 lb)	(± 30%) 157 N (35.2 lb)	1200 N (269.1 lb)	5 mm (0.197")
LRT0500AL-CT3A	1200 N (269.1 lb)	Non-back-driving	1200 N (269.1 lb)	1.5875 mm (0.062")
LRT0500BL-CT3A	600 N (134.6 lb)	(± 30%) 420 N (94.2 lb)	600 N (134.6 lb)	6.35 mm (0.250")
LRT0500DL-CT3A	200 N (44.9 lb)	(± 30%) 40 N (9.0 lb)	180 N (40.4 lb)	25.4 mm (1.000")
LRT0500HL-CT3A	1200 N (269.1 lb)	(± 30%) 157 N (35.2 lb)	1200 N (269.1 lb)	5 mm (0.197")
LRT0750AL-CT3A	1200 N (269.1 lb)	Non-back-driving	1200 N (269.1 lb)	1.5875 mm (0.062")

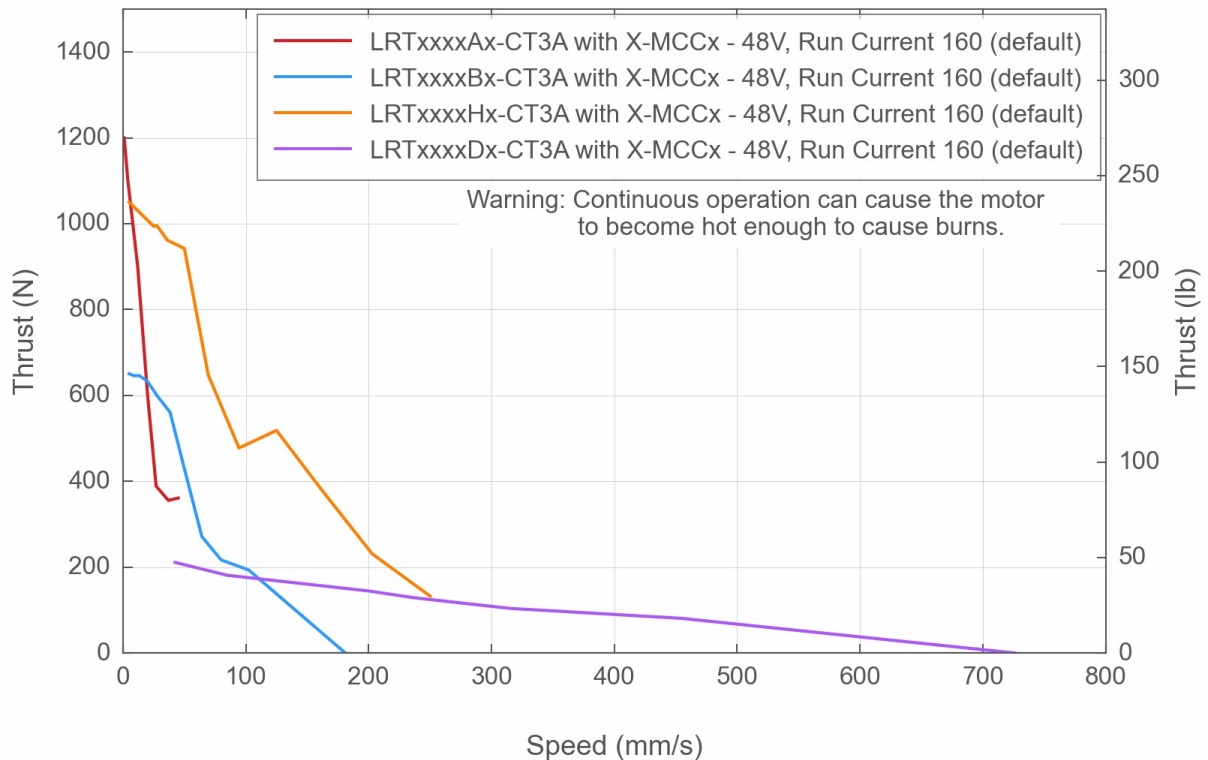
Part Number	Peak Thrust	Back-driving Force*	Maximum Continuous Thrust	Linear Motion Per Motor Rev
LRT0750BL-CT3A	600 N (134.6 lb)	(± 30%) 420 N (94.2 lb)	600 N (134.6 lb)	6.35 mm (0.250")
LRT0750DL-CT3A	200 N (44.9 lb)	(± 30%) 40 N (9.0 lb)	180 N (40.4 lb)	25.4 mm (1.000")
LRT0750HL-CT3A	1200 N (269.1 lb)	(± 30%) 157 N (35.2 lb)	1200 N (269.1 lb)	5 mm (0.197")
LRT1000AL-CT3A	1200 N (269.1 lb)	Non-back-driving	1200 N (269.1 lb)	1.5875 mm (0.062")
LRT1000BL-CT3A	600 N (134.6 lb)	(± 30%) 420 N (94.2 lb)	600 N (134.6 lb)	6.35 mm (0.250")
LRT1000DL-CT3A	200 N (44.9 lb)	(± 30%) 40 N (9.0 lb)	180 N (40.4 lb)	25.4 mm (1.000")
LRT1000HL-CT3A	1200 N (269.1 lb)	(± 30%) 157 N (35.2 lb)	1200 N (269.1 lb)	5 mm (0.197")
LRT1500AL-CT3A	1200 N (269.1 lb)	Non-back-driving	1200 N (269.1 lb)	1.5875 mm (0.062")
LRT1500BL-CT3A	600 N (134.6 lb)	(± 30%) 420 N (94.2 lb)	600 N (134.6 lb)	6.35 mm (0.250")
LRT1500DL-CT3A	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
LRT0100AL-CT3A	Precision lead screw	3.65 kg (8.047 lb)
LRT0100BL-CT3A	Precision lead screw	3.65 kg (8.047 lb)
LRT0100DL-CT3A	Precision lead screw	3.65 kg (8.047 lb)
LRT0100HL-CT3A	Precision ball screw	3.65 kg (8.047 lb)
LRT0250AL-CT3A	Precision lead screw	4.441 kg (9.791 lb)
LRT0250BL-CT3A	Precision lead screw	4.441 kg (9.791 lb)
LRT0250DL-CT3A	Precision lead screw	4.441 kg (9.791 lb)
LRT0250HL-CT3A	Precision ball screw	4.441 kg (9.791 lb)
LRT0500AL-CT3A	Precision lead screw	5.758 kg (12.694 lb)
LRT0500BL-CT3A	Precision lead screw	5.758 kg (12.694 lb)
LRT0500DL-CT3A	Precision lead screw	5.758 kg (12.694 lb)
LRT0500HL-CT3A	Precision ball screw	5.758 kg (12.694 lb)
LRT0750AL-CT3A	Precision lead screw	7.076 kg (15.600 lb)
LRT0750BL-CT3A	Precision lead screw	7.076 kg (15.600 lb)

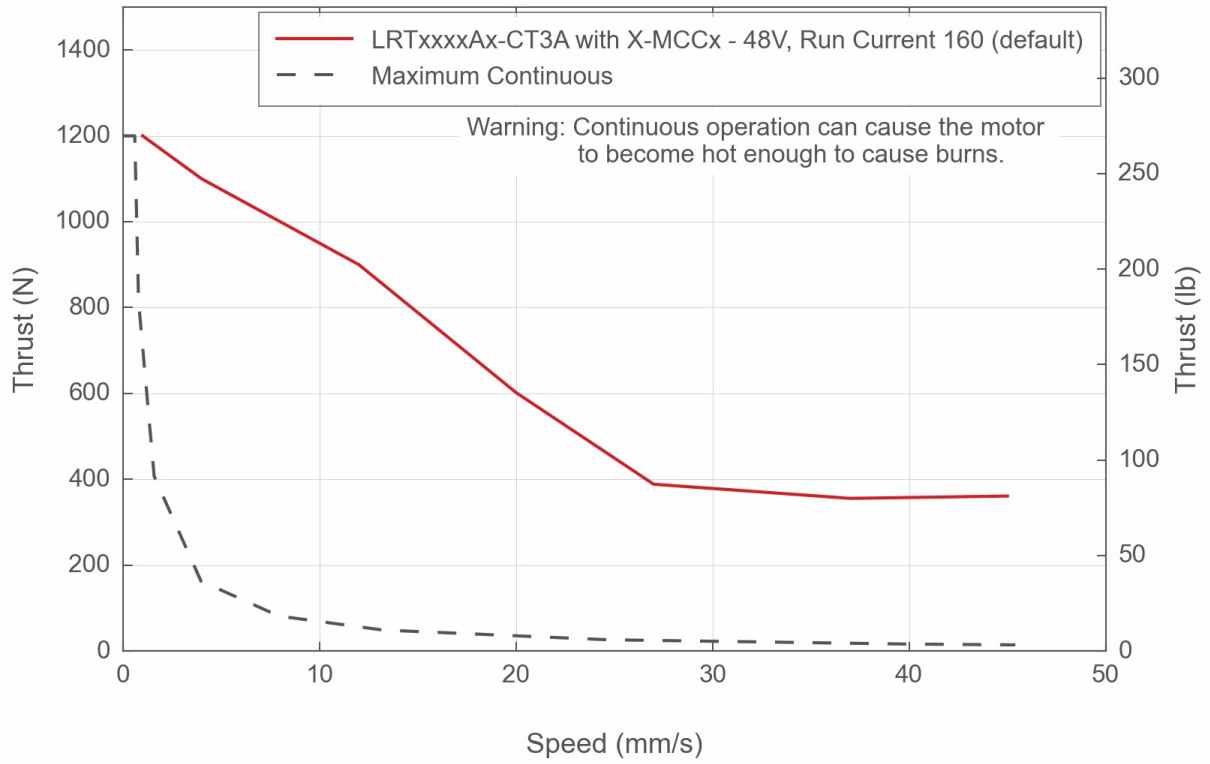
Part Number	Mechanical Drive System	Weight
LRT0750DL-CT3A	Precision lead screw	7.076 kg (15.600 lb)
LRT0750HL-CT3A	Precision ball screw	7.076 kg (15.600 lb)
LRT1000AL-CT3A	Precision lead screw	8.393 kg (18.503 lb)
LRT1000BL-CT3A	Precision lead screw	8.393 kg (18.503 lb)
LRT1000DL-CT3A	Precision lead screw	8.393 kg (18.503 lb)
LRT1000HL-CT3A	Precision ball screw	8.393 kg (18.503 lb)
LRT1500AL-CT3A	Precision lead screw	11.028 kg (24.313 lb)
LRT1500BL-CT3A	Precision lead screw	11.028 kg (24.313 lb)
LRT1500DL-CT3A	Precision lead screw	11.028 kg (24.313 lb)

LRT-C Series Charts

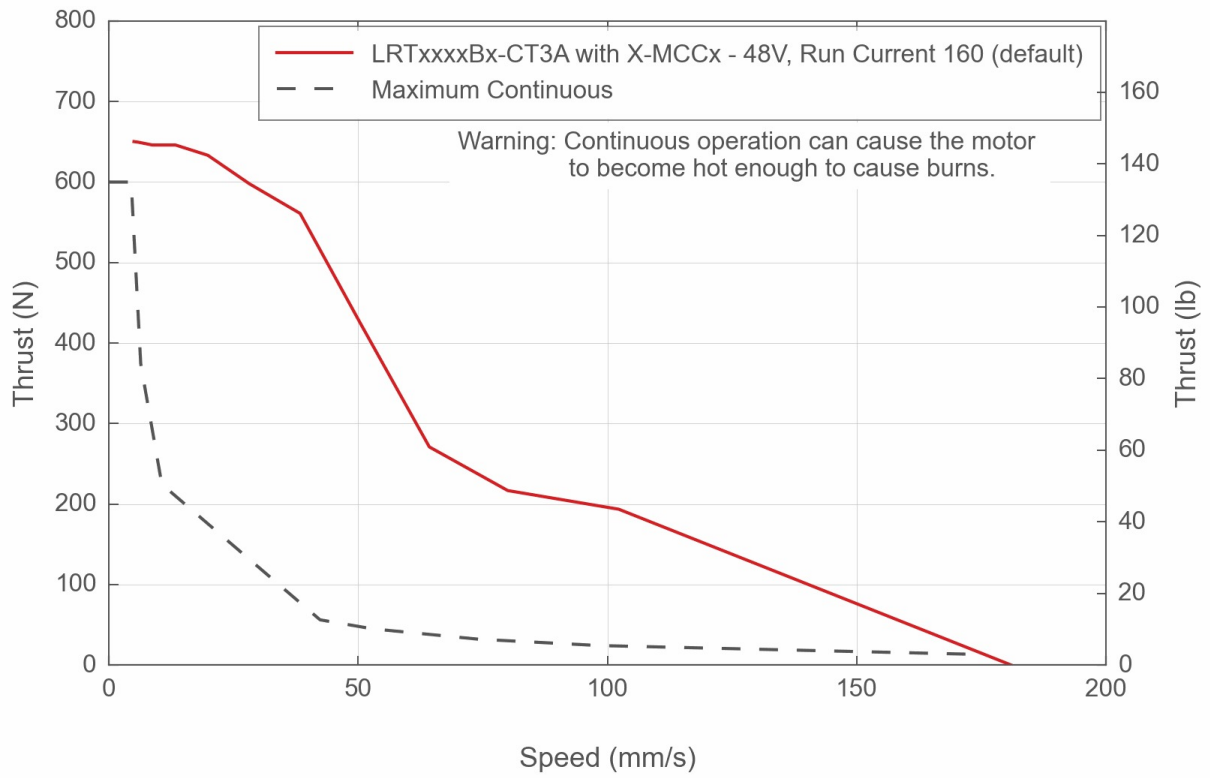
Thrust Speed Performance



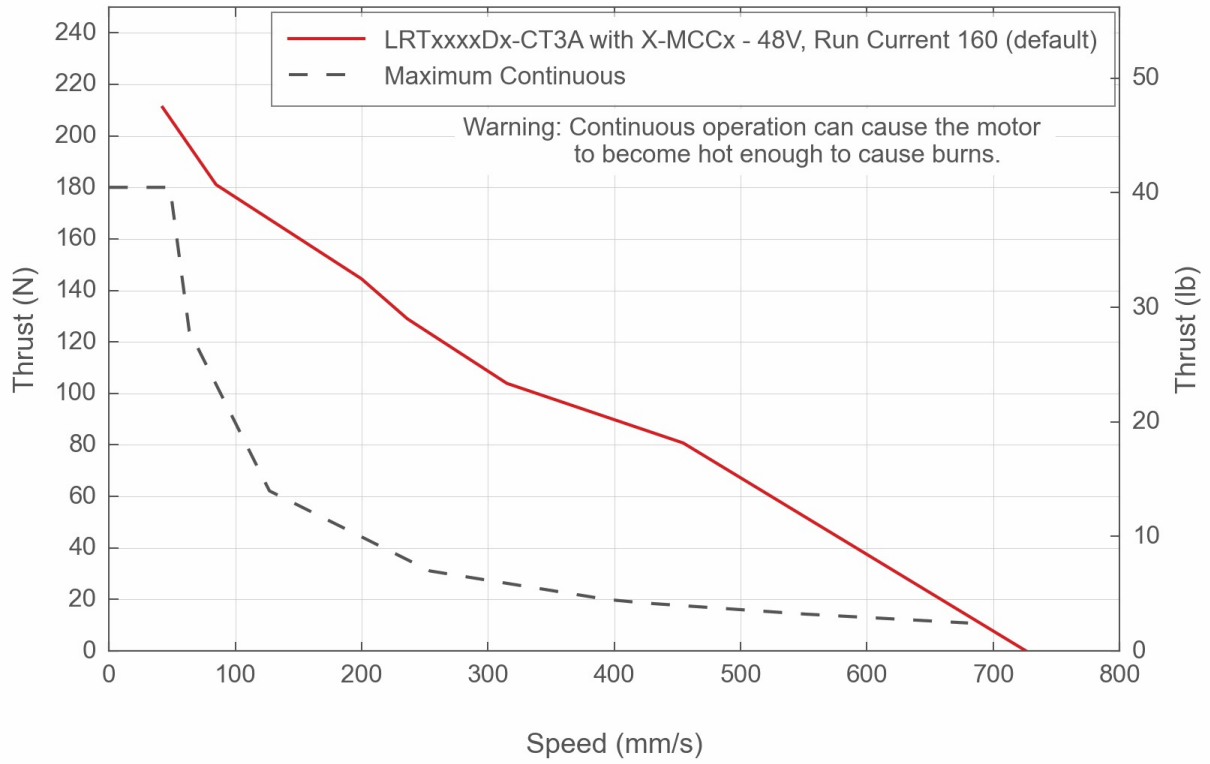
Thrust Speed Performance



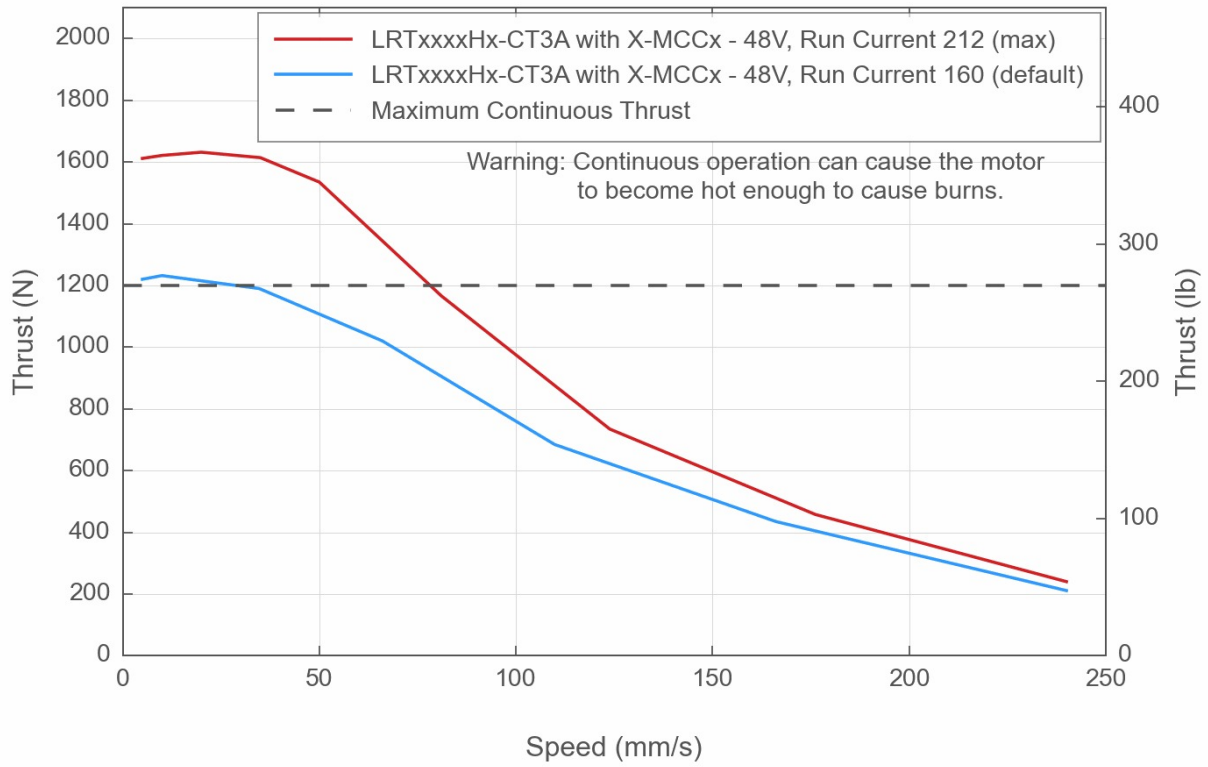
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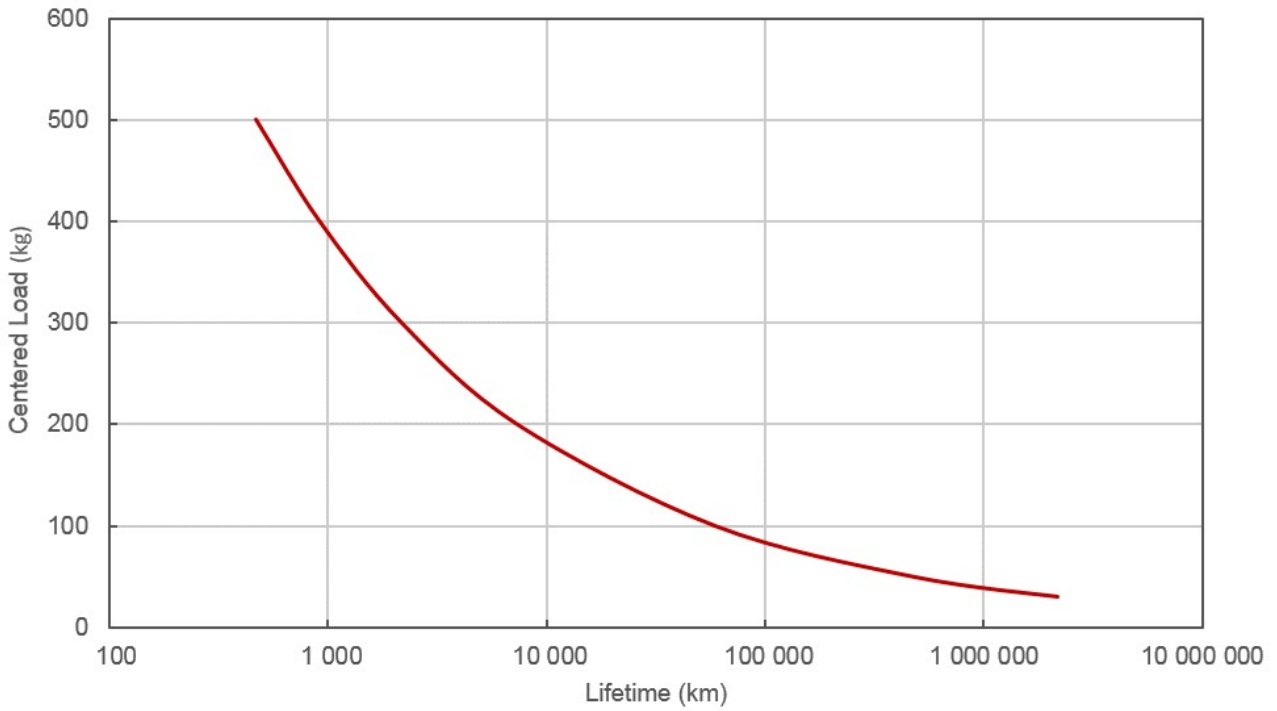
Thrust Speed Performance



Thrust Speed Performance



Typical LRT Bearing Lifetime



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