X-LRQ-E Series Datasheet

- 75, 150, 300, 450, 600 mm travel
- 100 kg load capacity
- Up to 840 mm/s speed and up to 300 N thrust
- Built-in controller; daisy-chains with other Zaber products
- Integrated, 500 CPR, motor mounted encoder provides slip/stall detection and recovery
- Inline and parallel drive configurations
- Ball screw and lead screw configurations
- Custom versions available

X-LRQ-E Series Overview

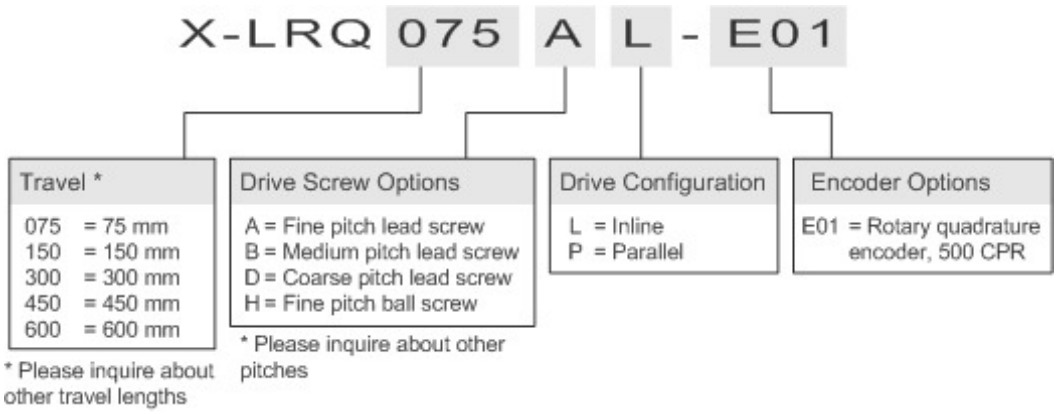
Zaber's X-LRQ-E Series devices are computer-controlled, motorized linear stages with high stiffness, load, and lifetime capabilities in a compact size. Each device is available in either an inline or parallel drive configuration. They are stand-alone units requiring only a standard 24 V or 48 V power supply. The built-in motor encoder allows closed-loop operation and slip/stall recovery features. 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 36 mm high, these stages are excellent for applications where a low profile is required. The X-LRQ-E's innovative design allows speeds up to 840 mm/s and loads up to 100 kg. Like all of Zaber's products, the X-LRQ-E Series is designed to be 'plug and play' and very easy to set up and operate. These stages can bolt together into XY and XYZ systems. Some multi axis configurations may require additional accessories, please contact Zaber Technical Support to ensure the correct ones are selected.

For more information visit: https://www.zaber.com/products/linear-stages/X-LRQ-E/6

X-LRQ-E Series Part Numbering



X-LRQ-E Series Drawings

X-LRQ-E Series Specifications

Specification	Value	Alternate Unit
Built-in Controller	Yes	
Encoder Resolution	500 CPR	2000 states/rev
Encoder Type	Rotary quadrature encoder	
Communication Interface	RS-232	
Communication Protocol	Zaber ASCII (Default), Zaber Binary	
Maximum Centered Load	1000 N	224.3 lb
Maximum Cantilever Load	3000 N-cm	4248.4 oz-in
Guide Type	Recirculating Ball Linear Guide	
Stiffness in Pitch	640 N-m/°	27 µrad/N-m
Stiffness in Roll	1850 N-m/°	9 µrad/N-m
Stiffness in Yaw	665 N-m/°	26 µrad/N-m
Maximum Current Draw	1200 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	2300 mA/phase	
Inductance	2.8 mH/phase	
Default Resolution	1/64 of a step	
Data Cable Connection	Locking 4-pin M8	
Limit or Home Sensing	Magnetic home sensor	
Manual Control	Indexed knob with push switch	
Axes of Motion	1	
LED Indicators	Yes	
Mounting Interface	M6 and M3 threaded holes	
Operating Temperature Range	0 to 50 °C	
Vacuum Compatible	No	
RoHS Compliant	Yes	
CE Compliant	Yes	

Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Repeatability
X-LRQ075AL-E01	0.09921875 µm	75 mm (2.953")	23 µm (0.000906")	< 2.5 µm (< 0.000098")
X-LRQ075BL-E01	0.49609375 µm	75 mm (2.953")	15 µm (0.000591")	< 2.5 µm (< 0.000098")
X-LRQ075DL-E01	1.984375 µm	75 mm (2.953")	48 µm (0.001890")	< 3 µm (< 0.000118")
X-LRQ075HL-E01	0.1953125 µm	75 mm (2.953")	17.5 µm (0.000689")	< 5 µm (< 0.000197")
X-LRQ150AL-E01	0.09921875 µm	150 mm (5.905")	45 µm (0.001772")	< 2.5 µm (< 0.000098")
X-LRQ150BL-E01	0.49609375 µm	150 mm (5.905")	25 µm (0.000984")	< 2.5 µm (< 0.000098")
X-LRQ150DL-E01	1.984375 µm	150 mm (5.905")	55 µm (0.002165")	< 3 µm (< 0.000118")
X-LRQ150HL-E01	0.1953125 µm	150 mm (5.905")	30 µm (0.001181")	< 5 µm (< 0.000197")
X-LRQ075AP-E01	0.09921875 µm	75 mm (2.953")	23 µm (0.000906")	< 2.5 µm (< 0.000098")
X-LRQ075BP-E01	0.49609375 µm	75 mm (2.953")	15 µm (0.000591")	< 2.5 µm (< 0.000098")
X-LRQ075DP-E01	1.984375 µm	75 mm (2.953")	48 µm (0.001890")	< 3 µm (< 0.000118")
X-LRQ075HP-E01	0.1953125 µm	75 mm (2.953")	27.5 µm (0.001083")	< 5 µm (< 0.000197")
X-LRQ150AP-E01	0.09921875 µm	150 mm (5.905")	45 µm (0.001772")	< 2.5 µm (< 0.000098")
X-LRQ150BP-E01	0.49609375 µm	150 mm (5.905")	25 µm (0.000984")	< 2.5 µm (< 0.000098")
X-LRQ150DP-E01	1.984375 µm	150 mm (5.905")	55 µm (0.002165")	< 3 µm (< 0.000118")
X-LRQ150HP-E01	0.1953125 µm	150 mm (5.905")	40 µm (0.001575")	< 5 µm (< 0.000197")

Part Number	Backlash	Maximum Speed	Minimum Speed	Speed Resolution
X-LRQ075AL-E01	< 8 µm (< 0.000315")	40 mm/s (1.575"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)
X-LRQ075BL-E01	< 21 µm (< 0.000827")	205 mm/s (8.071"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
X-LRQ075DL-E01	< 60 µm (< 0.002362")	840 mm/s (33.071"/s)	0.001212 mm/s (0.000048"/s)	0.001212 mm/s (0.000048"/s)
	< 30 µm	100 mm/s	0.000119 mm/s	0.000119 mm/s

Part Number	Backlash	Maximum Speed	Minimum Speed	Speed Resolution
X-LRQ075HL-E01	(< 0.001181")	(3.937"/s)	(0.000005"/s)	(0.000005"/s)
X-LRQ150AL-E01	< 8 µm (< 0.000315")	40 mm/s (1.575"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)
X-LRQ150BL-E01	< 21 µm (< 0.000827")	205 mm/s (8.071"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
X-LRQ150DL-E01	< 60 µm (< 0.002362")	840 mm/s (33.071"/s)	0.001212 mm/s (0.000048"/s)	0.001212 mm/s (0.000048"/s)
X-LRQ150HL-E01	< 30 µm (< 0.001181")	100 mm/s (3.937"/s)	0.000119 mm/s (0.000005"/s)	0.000119 mm/s (0.000005"/s)
X-LRQ075AP-E01	< 14 µm (< 0.000551")	40 mm/s (1.575"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)
X-LRQ075BP-E01	< 27 µm (< 0.001063")	205 mm/s (8.071"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
X-LRQ075DP-E01	< 66 µm (< 0.002598")	840 mm/s (33.071"/s)	0.001212 mm/s (0.000048"/s)	0.001212 mm/s (0.000048"/s)
X-LRQ075HP-E01	< 30 µm (< 0.001181")	100 mm/s (3.937"/s)	0.000119 mm/s (0.000005"/s)	0.000119 mm/s (0.000005"/s)
X-LRQ150AP-E01	< 14 µm (< 0.000551")	40 mm/s (1.575"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)
X-LRQ150BP-E01	< 27 µm (< 0.001063")	205 mm/s (8.071"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
X-LRQ150DP-E01	< 66 µm (< 0.002598")	840 mm/s (33.071"/s)	0.001212 mm/s (0.000048"/s)	0.001212 mm/s (0.000048"/s)
X-LRQ150HP-E01	< 30 µm (< 0.001181")	100 mm/s (3.937"/s)	0.000119 mm/s (0.000005"/s)	0.000119 mm/s (0.000005"/s)

Part Number	Peak Thrust	Back-driving Force	Maximum Continuous Thrust	Vertical Runout
X-LRQ075AL-E01	110 N (24.7 lb)	Non-back-driving	100 N (22.4 lb)	< 20 µm (< 0.000787")
X-LRQ075BL-E01	100 N (22.4 lb)	93 N (20.9 lb) (± 30%)	100 N (22.4 lb)	< 20 µm (< 0.000787")
X-LRQ075DL-E01	25 N (5.6 lb)	14 N (3.1 lb) (± 30%)	25 N (5.6 lb)	< 20 µm (< 0.000787")
X-LRQ075HL-E01	300 N (67.3 lb)	93 N (20.9 lb) (± 30%)	200 N (44.9 lb)	< 20 µm (< 0.000787")
X-LRQ150AL-E01	110 N (24.7 lb)	Non-back-driving	100 N (22.4 lb)	< 25 µm (< 0.000984")
X-LRQ150BL-E01	100 N (22.4 lb)	93 N (20.9 lb) (± 30%)	100 N (22.4 lb)	< 25 µm (< 0.000984")

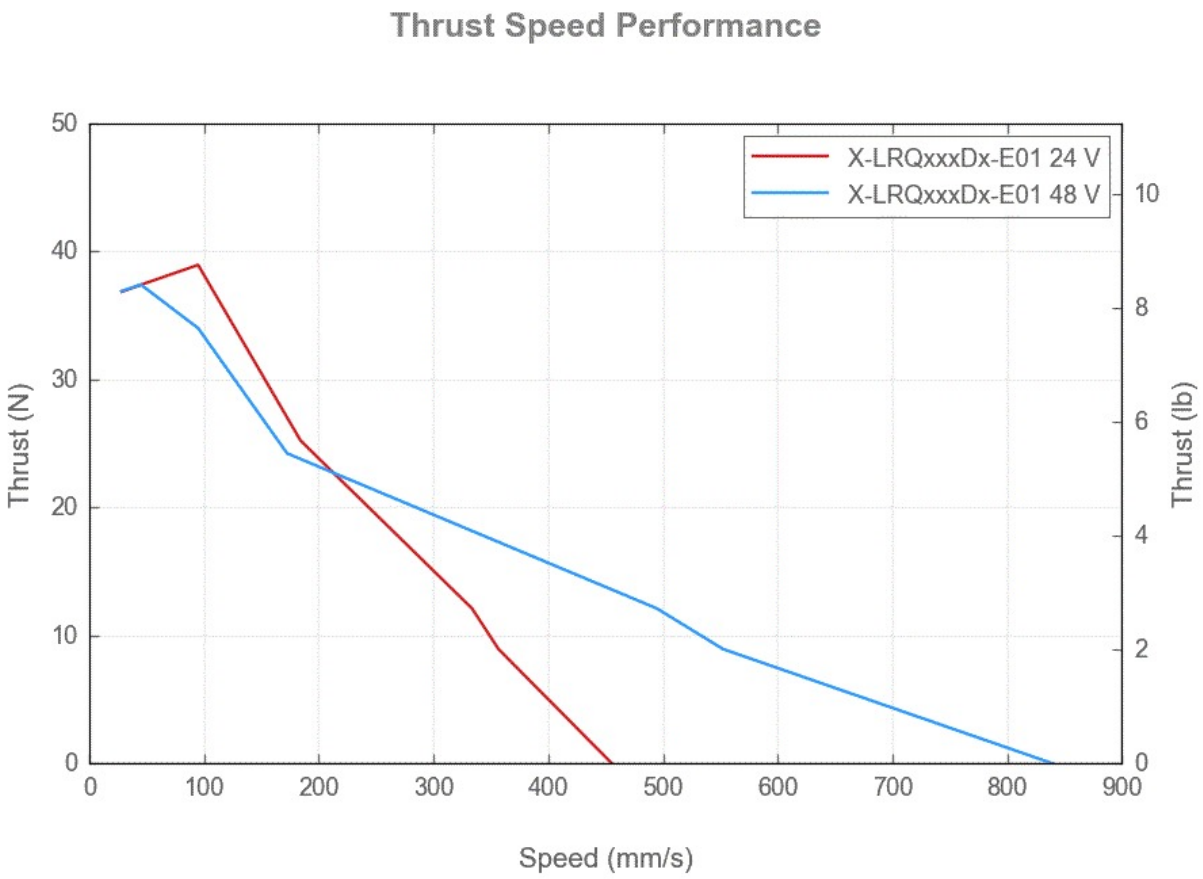
Part Number	Peak Thrust	Back-driving Force	Maximum Continuous Thrust	Vertical Runout
X-LRQ150DL-E01	25 N (5.6 lb)	14 N (3.1 lb) (± 30%)	25 N (5.6 lb)	< 25 µm (< 0.000984")
X-LRQ150HL-E01	300 N (67.3 lb)	93 N (20.9 lb) (± 30%)	200 N (44.9 lb)	< 25 µm (< 0.000984")
X-LRQ075AP-E01	110 N (24.7 lb)	Non-back-driving	100 N (22.4 lb)	< 20 µm (< 0.000787")
X-LRQ075BP-E01	100 N (22.4 lb)	123 N (27.6 lb) (± 30%)	100 N (22.4 lb)	< 20 µm (< 0.000787")
X-LRQ075DP-E01	25 N (5.6 lb)	45 N (10.1 lb) (± 30%)	25 N (5.6 lb)	< 20 µm (< 0.000787")
X-LRQ075HP-E01	300 N (67.3 lb)	123 N (27.6 lb) (± 30%)	200 N (44.9 lb)	< 20 µm (< 0.000787")
X-LRQ150AP-E01	110 N (24.7 lb)	Non-back-driving	100 N (22.4 lb)	< 25 µm (< 0.000984")
X-LRQ150BP-E01	100 N (22.4 lb)	123 N (27.6 lb) (± 30%)	100 N (22.4 lb)	< 25 µm (< 0.000984")
X-LRQ150DP-E01	25 N (5.6 lb)	45 N (10.1 lb) (± 30%)	25 N (5.6 lb)	< 25 µm (< 0.000984")
X-LRQ150HP-E01	300 N (67.3 lb)	123 N (27.6 lb) (± 30%)	200 N (44.9 lb)	< 25 µm (< 0.000984")

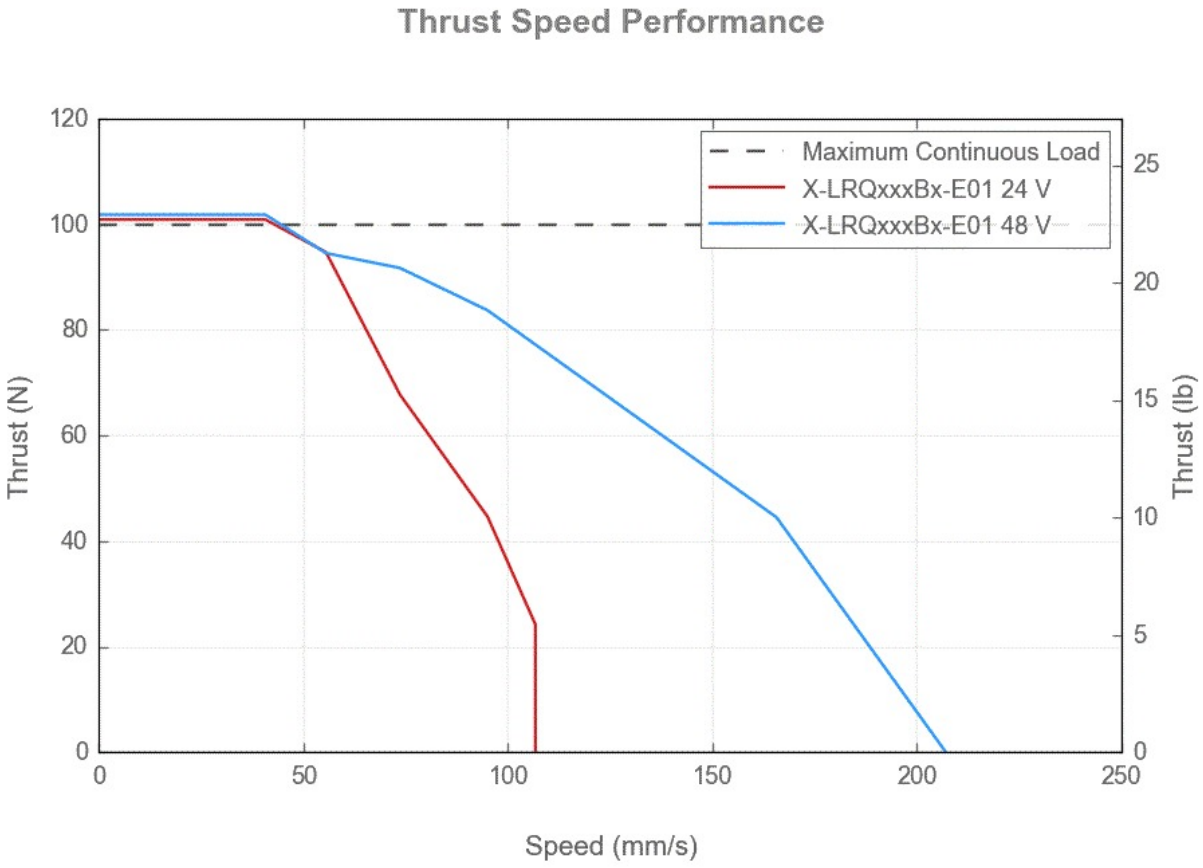
Part Number	Horizontal Runout	Pitch	Roll	Yaw
X-LRQ075AL-E01	< 20 µm (< 0.000787")	0.025° (0.436 mrad)	0.01° (0.174 mrad)	0.02° (0.349 mrad)
X-LRQ075BL-E01	< 20 µm (< 0.000787")	0.025° (0.436 mrad)	0.01° (0.174 mrad)	0.02° (0.349 mrad)
X-LRQ075DL-E01	< 20 µm (< 0.000787")	0.025° (0.436 mrad)	0.01° (0.174 mrad)	0.02° (0.349 mrad)
X-LRQ075HL-E01	< 20 µm (< 0.000787")	0.025° (0.436 mrad)	0.01° (0.174 mrad)	0.02° (0.349 mrad)
X-LRQ150AL-E01	< 20 µm (< 0.000787")	0.03° (0.523 mrad)	0.015° (0.262 mrad)	0.02° (0.349 mrad)
X-LRQ150BL-E01	< 20 µm (< 0.000787")	0.03° (0.523 mrad)	0.015° (0.262 mrad)	0.02° (0.349 mrad)
X-LRQ150DL-E01	< 20 µm (< 0.000787")	0.03° (0.523 mrad)	0.015° (0.262 mrad)	0.02° (0.349 mrad)
X-LRQ150HL-E01	< 20 µm (< 0.000787")	0.03° (0.523 mrad)	0.015° (0.262 mrad)	0.02° (0.349 mrad)
X-LRQ075AP-E01	< 20 µm (< 0.000787")	0.025° (0.436 mrad)	0.01° (0.174 mrad)	0.02° (0.349 mrad)
	< 20 µm	0.025°	0.01°	0.02°

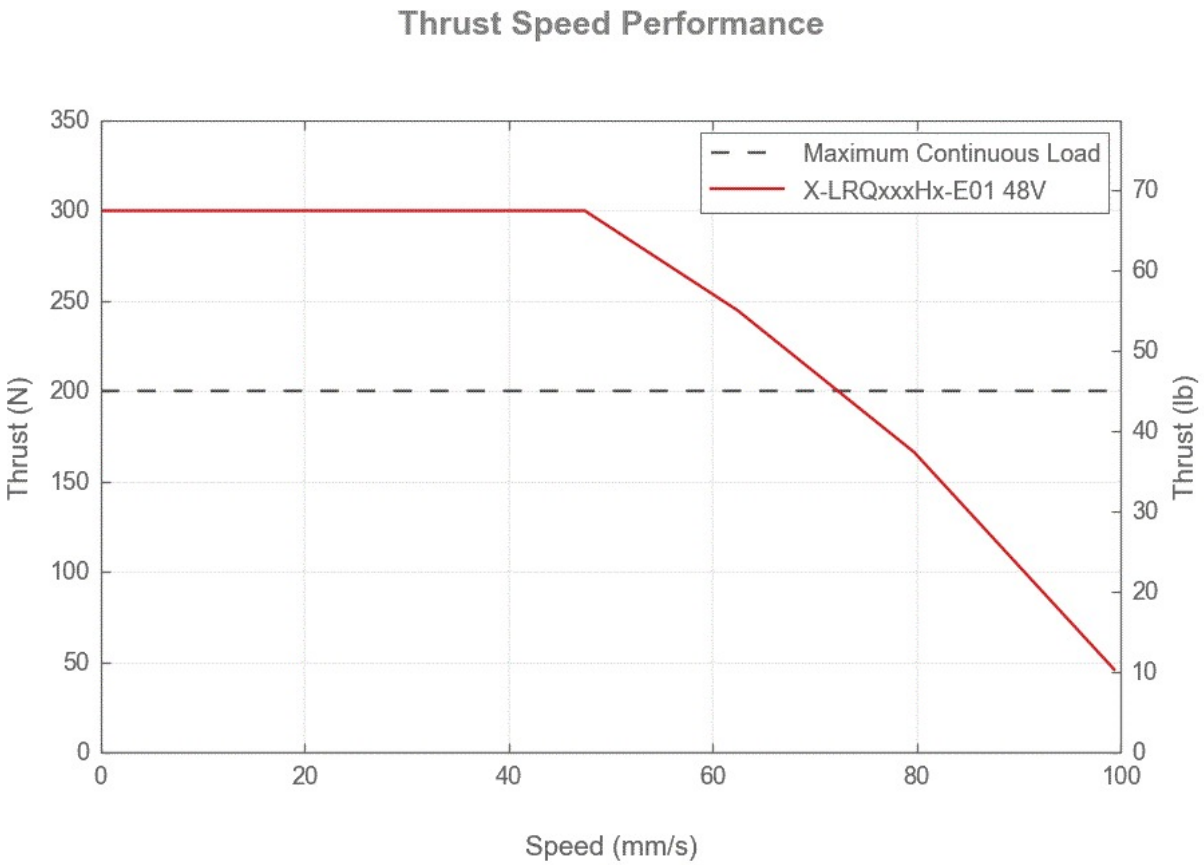
Part Number	Horizontal Runout	Pitch	Roll	Yaw
X-LRQ075BP-E01	(< 0.000787")	(0.436 mrad)	(0.174 mrad)	(0.349 mrad)
X-LRQ075DP-E01	< 20 µm (< 0.000787")	0.025° (0.436 mrad)	0.01° (0.174 mrad)	0.02° (0.349 mrad)
X-LRQ075HP-E01	< 20 µm (< 0.000787")	0.025° (0.436 mrad)	0.01° (0.174 mrad)	0.02° (0.349 mrad)
X-LRQ150AP-E01	< 20 µm (< 0.000787")	0.03° (0.523 mrad)	0.015° (0.262 mrad)	0.02° (0.349 mrad)
X-LRQ150BP-E01	< 20 µm (< 0.000787")	0.03° (0.523 mrad)	0.015° (0.262 mrad)	0.02° (0.349 mrad)
X-LRQ150DP-E01	< 20 µm (< 0.000787")	0.03° (0.523 mrad)	0.015° (0.262 mrad)	0.02° (0.349 mrad)
X-LRQ150HP-E01	< 20 µm (< 0.000787")	0.03° (0.523 mrad)	0.015° (0.262 mrad)	0.02° (0.349 mrad)

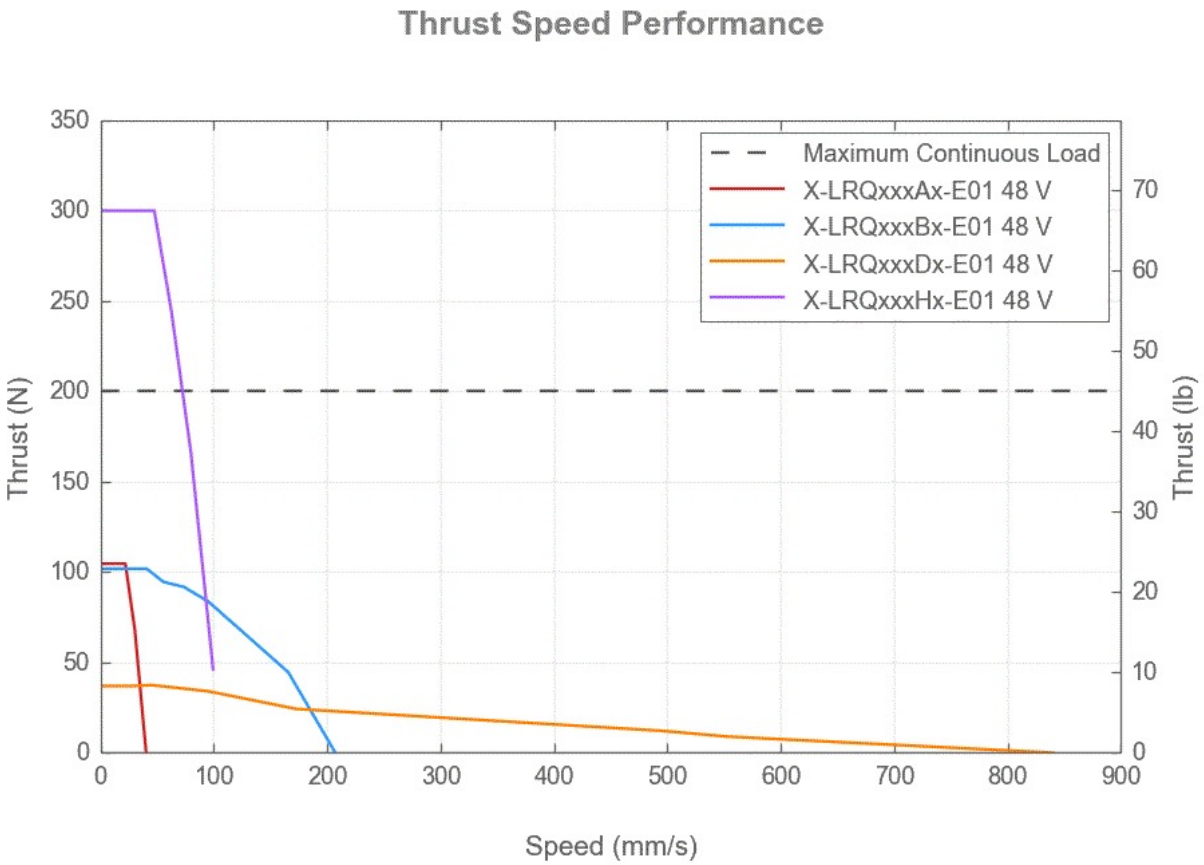
Part Number	Linear Motion Per Motor Rev	Mechanical Drive System	Weight
X-LRQ075AL-E01	1.27 mm (0.050")	Precision lead screw	2.19 kg (4.828 lb)
X-LRQ075BL-E01	6.35 mm (0.250")	Precision lead screw	2.19 kg (4.828 lb)
X-LRQ075DL-E01	25.4 mm (1.000")	Precision lead screw	2.19 kg (4.828 lb)
X-LRQ075HL-E01	2.5 mm (0.098")	Precision ball screw	2.19 kg (4.828 lb)
X-LRQ150AL-E01	1.27 mm (0.050")	Precision lead screw	2.56 kg (5.644 lb)
X-LRQ150BL-E01	6.35 mm (0.250")	Precision lead screw	2.56 kg (5.644 lb)
X-LRQ150DL-E01	25.4 mm (1.000")	Precision lead screw	2.56 kg (5.644 lb)
X-LRQ150HL-E01	2.5 mm (0.098")	Precision ball screw	2.56 kg (5.644 lb)
X-LRQ075AP-E01	1.27 mm (0.050")	Precision lead screw	2.33 kg (5.137 lb)
X-LRQ075BP-E01	6.35 mm (0.250")	Precision lead screw	2.33 kg (5.137 lb)
X-LRQ075DP-E01	25.4 mm (1.000")	Precision lead screw	2.33 kg (5.137 lb)
X-LRQ075HP-E01	2.5 mm (0.098")	Precision ball screw	2.33 kg (5.137 lb)
X-LRQ150AP-E01	1.27 mm (0.050")	Precision lead screw	2.70 kg (5.952 lb)
X-LRQ150BP-E01	6.35 mm (0.250")	Precision lead screw	2.70 kg (5.952 lb)
X-LRQ150DP-E01	25.4 mm (1.000")	Precision lead screw	2.70 kg (5.952 lb)
X-LRQ150HP-E01	2.5 mm (0.098")	Precision ball screw	2.70 kg (5.952 lb)

X-LRQ-E Series Charts

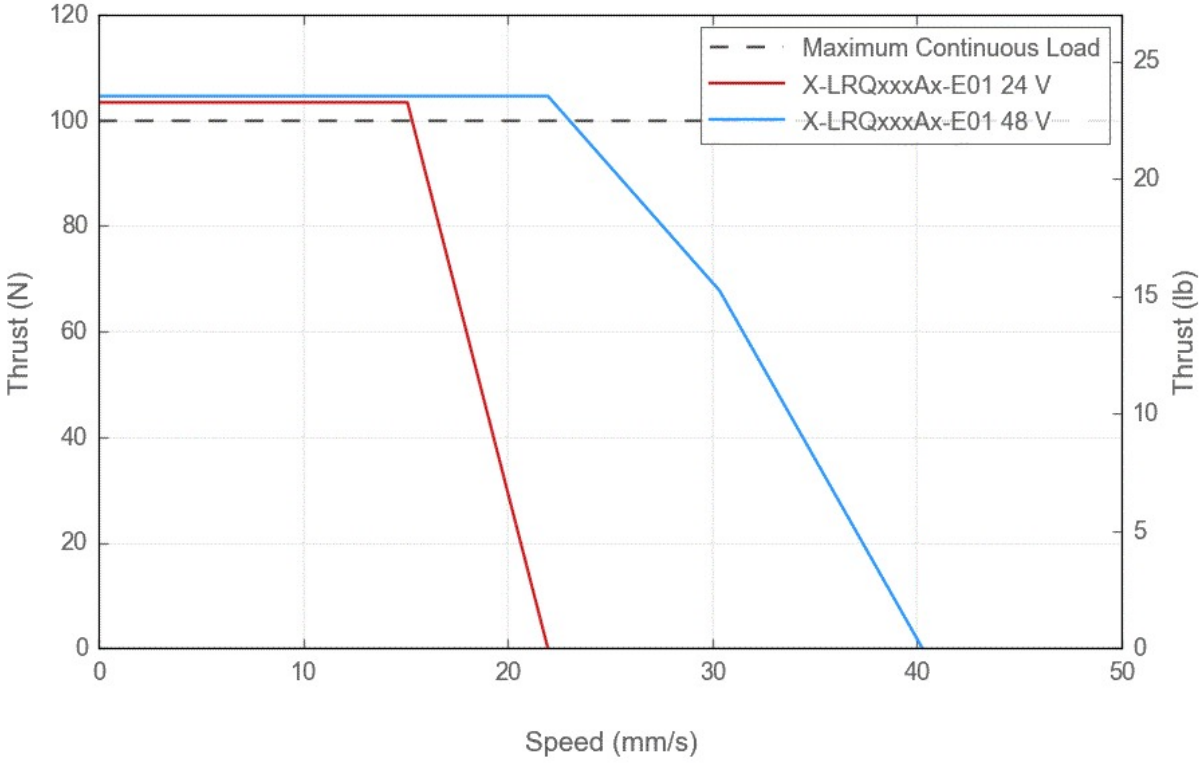



Thrust Speed Performance
Maximum Continuous Load
X-LRQxxxBx-E01 24 V
X-LRQxxxBx-E01 48 V
Thrust (N)
Thrust (lb)
Speed (mm/s)
0
20
40
60
80
100
120
0
5
10
15
20
25
0
50
100
150
200
250

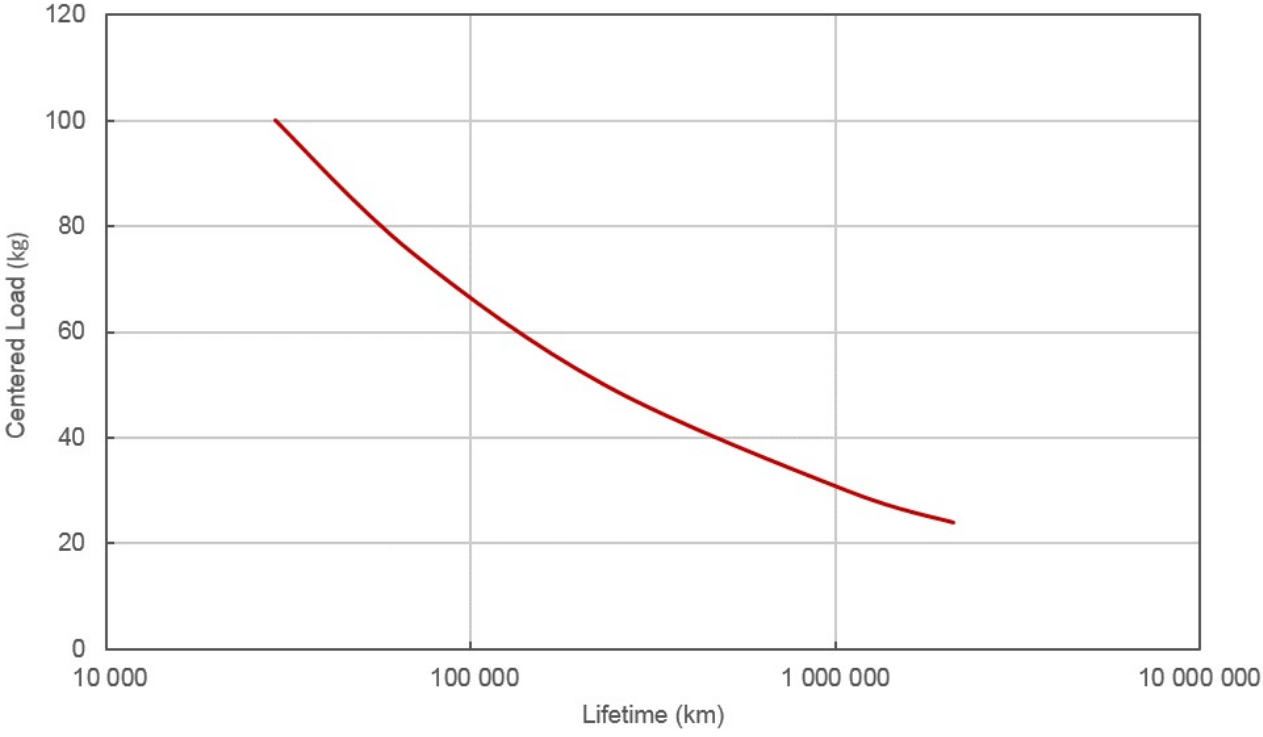

Thrust Speed Performance
Maximum Continuous Load
X-LRQxxxHx-E01 48V
Thrust (N)
Thrust (lb)
Speed (mm/s)
350
300
250
200
150
100
50
0
70
60
50
40
30
20
10
0
0
20
40
60
80
100


Thrust Speed Performance
Maximum Continuous Load
X-LRQxxxAx-E01 48 V
X-LRQxxxBx-E01 48 V
X-LRQxxxDx-E01 48 V
X-LRQxxxHx-E01 48 V
Thrust (N)
Thrust (lb)
Speed (mm/s)
0
50
100
150
200
250
300
350
0
10
20
30
40
50
60
70
0
100
200
300
400
500
600
700
800
900

Thrust Speed Performance



LRQ Linear Bearing Lifetime



Contact

Email: contact@zaber.com

Phone (toll free Canada/USA): 1-888-276-8033

Phone (direct): 1-604-569-3780

Fax: 1-604-648-8033

Zaber Technologies Inc.

#2 - 605 West Kent Ave. N.

Vancouver, British Columbia

Canada, V6P 6T7

https://www.zaber.com