

LRQ-V1 Series Datasheet



- Vacuum compatible to 10⁻³ Torr
- 75, 150, 300, 450, 600 mm travel
- Up to 205 mm/s speed and up to 100 N thrust
- 100 kg load capacity
- Designed for use with an X-MCC Series stepper motor controller or any 2-phase stepper motor controller
- Only 7 feedthrough wires required to control these units

LRQ-V1 Series Overview

For more information about the basics of a vacuum system and considerations to keep in mind when gathering requirements for your application, read our technical article, "Motion Device Design Considerations for Vacuum Applications".

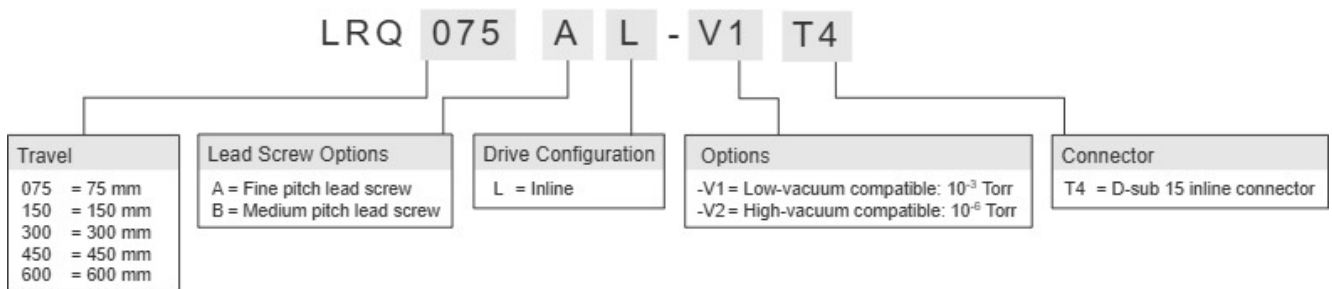
Zaber's LRQ-V1 Series devices are low-vacuum, computer-controlled, motorized linear stages with high stiffness, load, and lifetime capabilities in a compact size.

At only 36 mm high, these vacuum stages are excellent for applications where a low profile is required. The LRQ-V1's innovative design allows speeds up to 205 mm/s and loads up to 100 kg. Like all of Zaber's products, the LRQ-V1 Series is designed to be very easy to set up and operate. These stages can bolt together into an XY system.

These stages are wired with a male D-sub 15 connector for plug-and-play use with our X-MCC Series stepper motor controllers. Simply cut the connector off for flying leads in vacuum and match the wire connections outside of the vacuum for an easy connection. Our handy kits include free software, and all of the accessories that you will need to get the stage running right out of the box.

For more information visit: <https://www.zaber.com/products/vacuum-compatible-stages/LRQ-V1>

LRQ-V1 Series Part Numbering & Options



LRQ-V1 Series Drawings

- [LRQxL-V.png \(Drawing for the LRQxL-V\)](#)

LRQ-V1 Series Specifications

Built-in Controller	
Recommended Controller	X-MCC (48 V) Recommended
AutoDetect	No
Repeatability	< 2.5 μm (< 0.000098")
Maximum Centered Load	1000 N (224.3 lb)
Maximum Moment (Pitch)	30 N-m (22.1 ft-lb)
Maximum Moment (Roll)	30 N-m (22.1 ft-lb)
Maximum Moment (Yaw)	30 N-m (22.1 ft-lb)
Stiffness in Pitch	500 N-m/ $^{\circ}$ (35 $\mu\text{rad/N-m}$)
Stiffness in Roll	1180 N-m/ $^{\circ}$ (15 $\mu\text{rad/N-m}$)
Stiffness in Yaw	450 N-m/ $^{\circ}$ (39 $\mu\text{rad/N-m}$)
Motor Steps Per Rev	200
Motor Type	Stepper (2 phase)
Motor Rated Current	2100 mA/phase
Inductance	2.8 mH/phase
Motor Connection	Teflon flying leads with D-sub15 connector
Default Resolution	1/64 of a step
Guide Type	Recirculating Ball Linear Guide
Mechanical Drive System	Precision lead screw
Limit or Home Sensing	Magnetic home sensor
Manual Control	No
Axes of Motion	1
Mounting Interface	M6 and M3 threaded holes
Operating Temperature Range	0 to 50 $^{\circ}\text{C}$
CE Compliant	Yes
Vacuum Compatible	Low vacuum (10-3 Torr)

Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Backlash
LRQ075AL-V1T4	0.09921875 μm	75 mm (2.953")	23 μm (0.000906")	< 8 μm (< 0.000315")

Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Backlash
LRQ075BL-V1T4	0.49609375 µm	75 mm (2.953")	15 µm (0.000591")	< 21 µm (< 0.000827")
LRQ150AL-V1T4	0.09921875 µm	150 mm (5.905")	45 µm (0.001772")	< 8 µm (< 0.000315")
LRQ150BL-V1T4	0.49609375 µm	150 mm (5.905")	25 µm (0.000984")	< 21 µm (< 0.000827")
LRQ300AL-V1T4	0.09921875 µm	300 mm (11.811")	90 µm (0.003543")	< 8 µm (< 0.000315")
LRQ300BL-V1T4	0.49609375 µm	300 mm (11.811")	35 µm (0.001378")	< 21 µm (< 0.000827")
LRQ450AL-V1T4	0.09921875 µm	450 mm (17.716")	135 µm (0.005315")	< 8 µm (< 0.000315")
LRQ450BL-V1T4	0.49609375 µm	450 mm (17.716")	60 µm (0.002362")	< 21 µm (< 0.000827")
LRQ600AL-V1T4	0.09921875 µm	600 mm (23.622")	150 µm (0.005905")	< 8 µm (< 0.000315")
LRQ600BL-V1T4	0.49609375 µm	600 mm (23.622")	90 µm (0.003543")	< 21 µm (< 0.000827")

Part Number	Maximum Speed	Minimum Speed	Speed Resolution	Peak Thrust
LRQ075AL-V1T4	35 mm/s (1.378"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)	100 N (22.4 lb)
LRQ075BL-V1T4	205 mm/s (8.071"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)	60 N (13.5 lb)
LRQ150AL-V1T4	35 mm/s (1.378"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)	100 N (22.4 lb)
LRQ150BL-V1T4	205 mm/s (8.071"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)	60 N (13.5 lb)
LRQ300AL-V1T4	35 mm/s (1.378"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)	100 N (22.4 lb)
LRQ300BL-V1T4	205 mm/s (8.071"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)	60 N (13.5 lb)
LRQ450AL-V1T4	35 mm/s (1.378"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)	100 N (22.4 lb)
LRQ450BL-V1T4	205 mm/s (8.071"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)	60 N (13.5 lb)
LRQ600AL-V1T4	35 mm/s (1.378"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)	100 N (22.4 lb)
LRQ600BL-V1T4	205 mm/s (8.071"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)	60 N (13.5 lb)

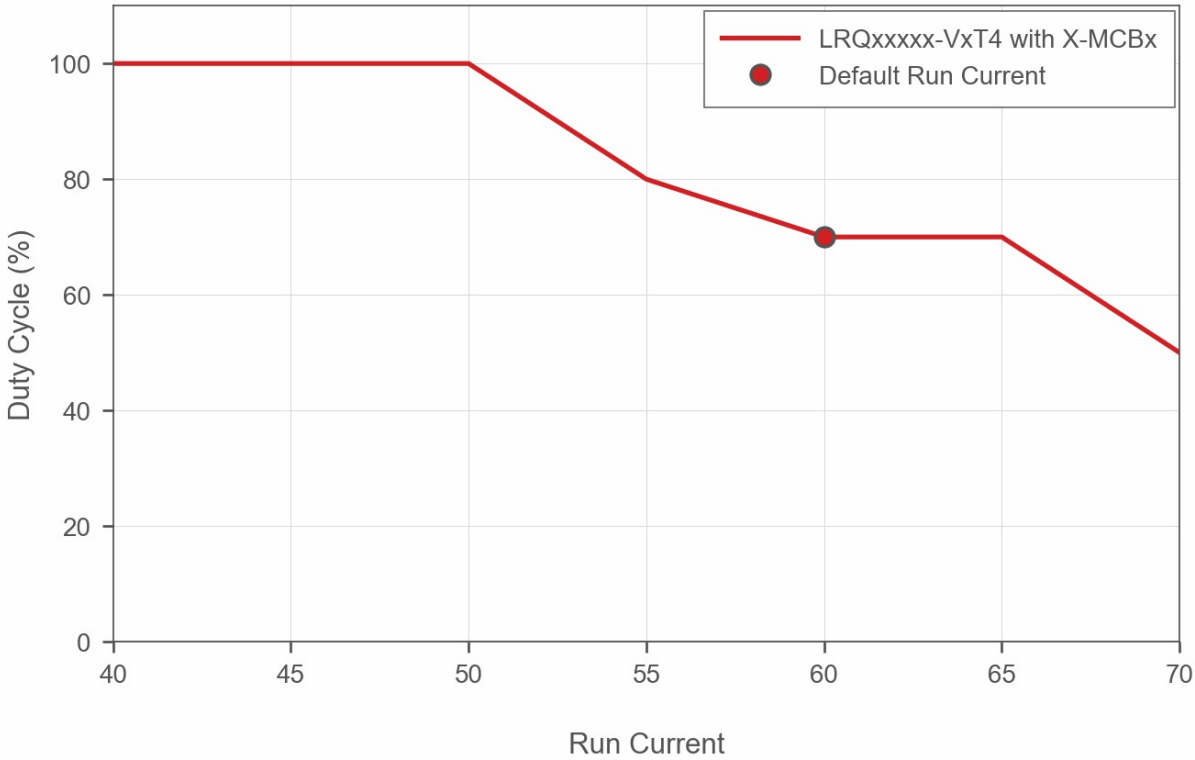
Part Number	Maximum Continuous Thrust	Vertical Runout	Horizontal Runout	Pitch
LRQ075AL-V1T4	100 N (22.4 lb)	< 20 µm (< 0.000787")	< 20 µm (< 0.000787")	0.025° (0.436 mrad)
LRQ075BL-V1T4	60 N (13.5 lb)	< 20 µm (< 0.000787")	< 20 µm (< 0.000787")	0.025° (0.436 mrad)
LRQ150AL-V1T4	100 N (22.4 lb)	< 25 µm (< 0.000984")	< 20 µm (< 0.000787")	0.03° (0.523 mrad)
LRQ150BL-V1T4	60 N (13.5 lb)	< 25 µm (< 0.000984")	< 20 µm (< 0.000787")	0.03° (0.523 mrad)
LRQ300AL-V1T4	100 N (22.4 lb)	< 35 µm (< 0.001378")	< 30 µm (< 0.001181")	0.034° (0.593 mrad)
LRQ300BL-V1T4	60 N (13.5 lb)	< 35 µm (< 0.001378")	< 30 µm (< 0.001181")	0.034° (0.593 mrad)
LRQ450AL-V1T4	100 N (22.4 lb)	< 45 µm (< 0.001772")	< 40 µm (< 0.001575")	0.04° (0.698 mrad)
LRQ450BL-V1T4	60 N (13.5 lb)	< 45 µm (< 0.001772")	< 40 µm (< 0.001575")	0.04° (0.698 mrad)
LRQ600AL-V1T4	100 N (22.4 lb)	< 75 µm (< 0.002953")	< 60 µm (< 0.002362")	0.045° (0.785 mrad)
LRQ600BL-V1T4	60 N (13.5 lb)	< 75 µm (< 0.002953")	< 60 µm (< 0.002362")	0.045° (0.785 mrad)

Part Number	Roll	Yaw	Linear Motion Per Motor Rev	Weight
LRQ075AL-V1T4	0.01° (0.174 mrad)	0.02° (0.349 mrad)	1.27 mm (0.050")	2.27 kg (5.004 lb)
LRQ075BL-V1T4	0.01° (0.174 mrad)	0.02° (0.349 mrad)	6.35 mm (0.250")	2.27 kg (5.004 lb)
LRQ150AL-V1T4	0.015° (0.262 mrad)	0.02° (0.349 mrad)	1.27 mm (0.050")	2.64 kg (5.820 lb)
LRQ150BL-V1T4	0.015° (0.262 mrad)	0.02° (0.349 mrad)	6.35 mm (0.250")	2.64 kg (5.820 lb)
LRQ300AL-V1T4	0.015° (0.262 mrad)	0.03° (0.523 mrad)	1.27 mm (0.050")	3.4 kg (7.496 lb)
LRQ300BL-V1T4	0.015° (0.262 mrad)	0.03° (0.523 mrad)	6.35 mm (0.250")	3.4 kg (7.496 lb)
LRQ450AL-V1T4	0.025° (0.436 mrad)	0.04° (0.698 mrad)	1.27 mm (0.050")	4.15 kg (9.149 lb)
LRQ450BL-V1T4	0.025° (0.436 mrad)	0.04° (0.698 mrad)	6.35 mm (0.250")	4.15 kg (9.149 lb)
LRQ600AL-V1T4	0.035° (0.611 mrad)	0.04° (0.698 mrad)	1.27 mm (0.050")	4.86 kg (10.714 lb)
	0.035°	0.04°		4.86 kg

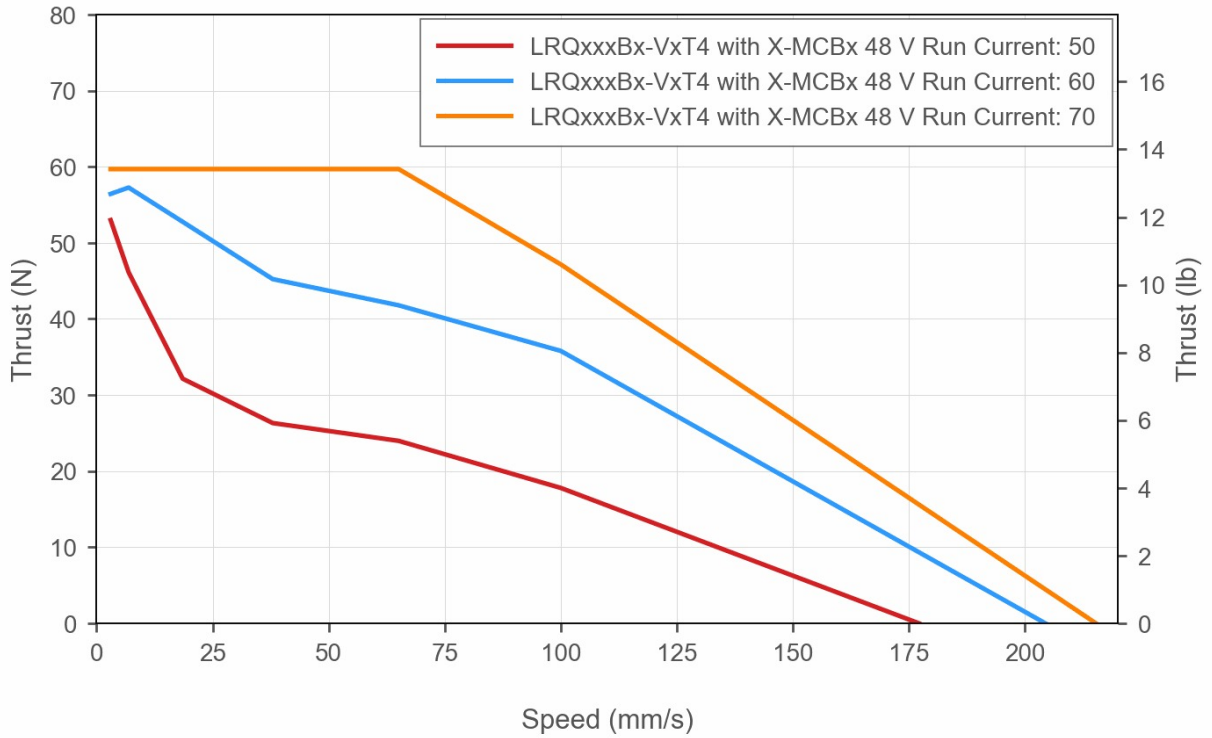
Part Number	Roll	Yaw	Linear Motion Per Motor Rev	Weight
LRQ600BL-V1T4	(0.611 mrad)	(0.698 mrad)	6.35 mm (0.250")	(10.714 lb)

LRQ-V1 Series Charts

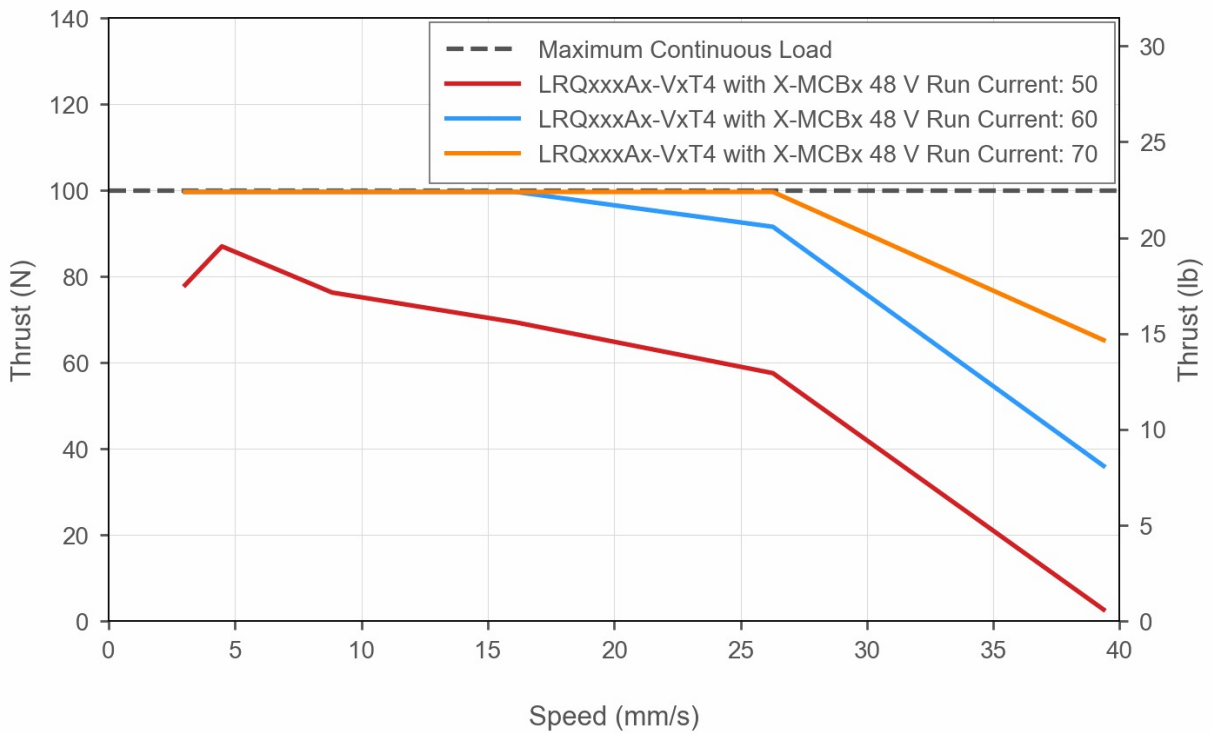
Recommended Duty Cycle



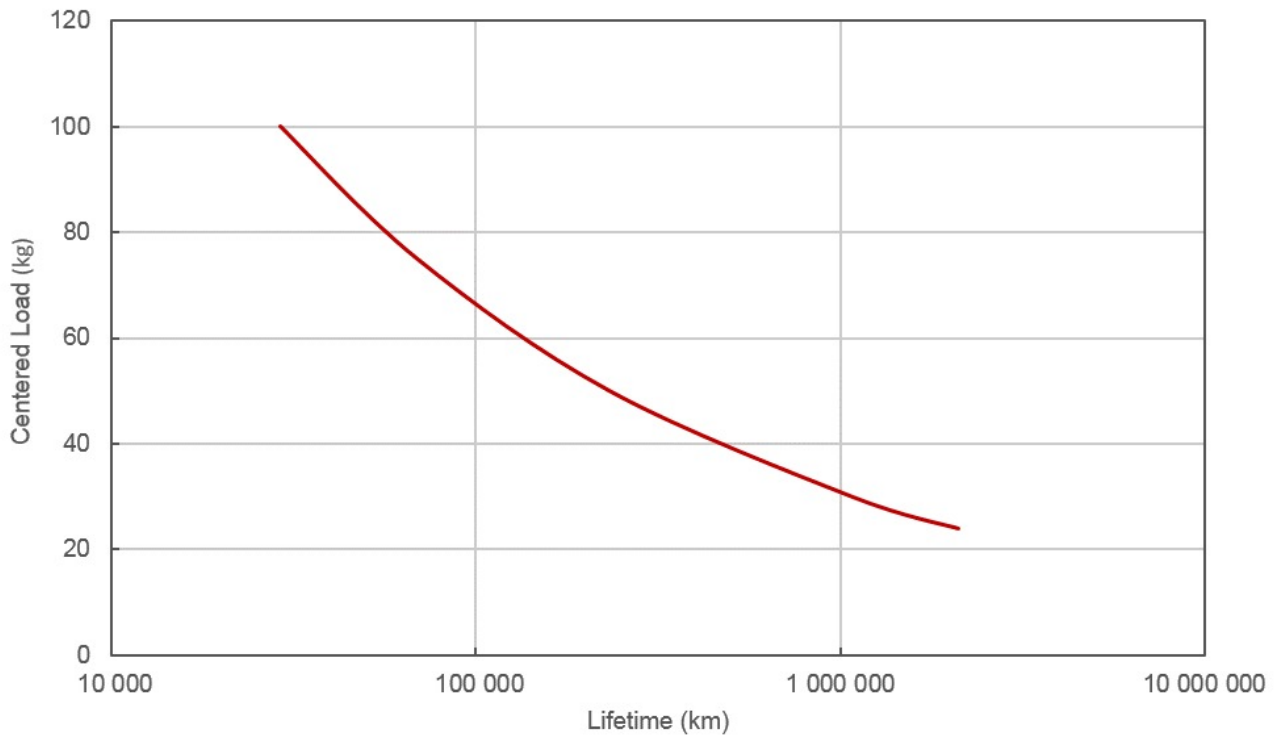
Thrust Speed Performance



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>