X-LRQ-SV1 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
- Built-in controller; daisy-chains with other Zaber products
- Only 4 feedthrough wires required to control all units in the daisy-chain via serial port (with an X-PIB adaptor)
- Custom versions available

X-LRQ-SV1 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".

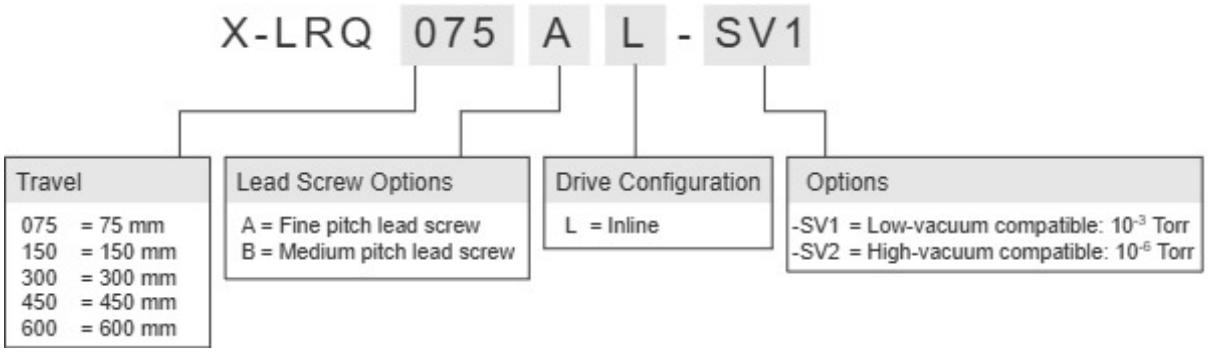
Zaber's X-LRQ-SV1 Series devices are low-vacuum, computer-controlled, motorized linear stages with high stiffness, load, and lifetime capabilities in a compact size. They are stand-alone units requiring only a standard 24 V or 48 V power supply.

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.

At only 36 mm high, these vacuum stages are excellent for applications where a low profile is required. The X-LRQ-SV1's innovative design allows speeds up to 205 mm/s and loads up to 100 kg. Like all of Zaber's products, the X-LRQ-SV1 Series is designed to be 'plug and play' and very easy to set up and operate. These stages can bolt together into an XY system.

For more information visit: https://www.zaber.com/products/vacuum-compatible-stages/X-LRQ-SV1

X-LRQ-SV1 Series Part Numbering & Options



X-LRQ-SV1 Series Drawings

- X-LRQxL-SV.png (Dimension Drawing for the X-LRQxL-SV)

X-LRQ-SV1 Series Specifications

Built-in Controller	
Repeatability	< 2.5 µm (< 0.000098")
Communication Interface	RS-232
Communication Protocol	Zaber ASCII (Default), Zaber Binary
Data Cable Connection	Teflon flying leads with M8 4 pin M/F
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/° (35 µrad/N-m)
Stiffness in Roll	1180 N-m/° (15 µrad/N-m)
Stiffness in Yaw	450 N-m/° (39 µrad/N-m)
Power Supply	24-48 VDC
Power Plug	None, use X-PIB
Maximum Current Draw	1900 mA
Motor Steps Per Rev	200
Motor Type	Stepper (2 phase)
Motor Rated Current	2100 mA/phase
Inductance	2.8 mH/phase
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
LED Indicators	Yes
Mounting Interface	M6 and M3 threaded holes
Operating Temperature Range	0 to 50 °C
CE Compliant	Yes
Vacuum Compatible	Low vacuum (10-3 Torr)

Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Backlash
X-LRQ075AL-SV1	0.09921875 µm	75 mm (2.953")	23 µm (0.000906")	< 8 µm (< 0.000315")
X-LRQ075BL-SV1	0.49609375 µm	75 mm (2.953")	15 µm (0.000591")	< 21 µm (< 0.000827")
X-LRQ150AL-SV1	0.09921875 µm	150 mm (5.905")	45 µm (0.001772")	< 8 µm (< 0.000315")
X-LRQ150BL-SV1	0.49609375 µm	150 mm (5.905")	25 µm (0.000984")	< 21 µm (< 0.000827")
X-LRQ300AL-SV1	0.09921875 µm	300 mm (11.811")	90 µm (0.003543")	< 8 µm (< 0.000315")
X-LRQ300BL-SV1	0.49609375 µm	300 mm (11.811")	35 µm (0.001378")	< 21 µm (< 0.000827")
X-LRQ450AL-SV1	0.09921875 µm	450 mm (17.716")	135 µm (0.005315")	< 8 µm (< 0.000315")
X-LRQ450BL-SV1	0.49609375 µm	450 mm (17.716")	60 µm (0.002362")	< 21 µm (< 0.000827")
X-LRQ600AL-SV1	0.09921875 µm	600 mm (23.622")	150 µm (0.005905")	< 8 µm (< 0.000315")
X-LRQ600BL-SV1	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
X-LRQ075AL-SV1	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)
X-LRQ075BL-SV1	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)
X-LRQ150AL-SV1	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)
X-LRQ150BL-SV1	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)
X-LRQ300AL-SV1	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)
X-LRQ300BL-SV1	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)
X-LRQ450AL-SV1	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)
X-LRQ450BL-SV1	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)
X-LRQ600AL-SV1	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)
	205 mm/s	0.000303 mm/s	0.000303 mm/s	

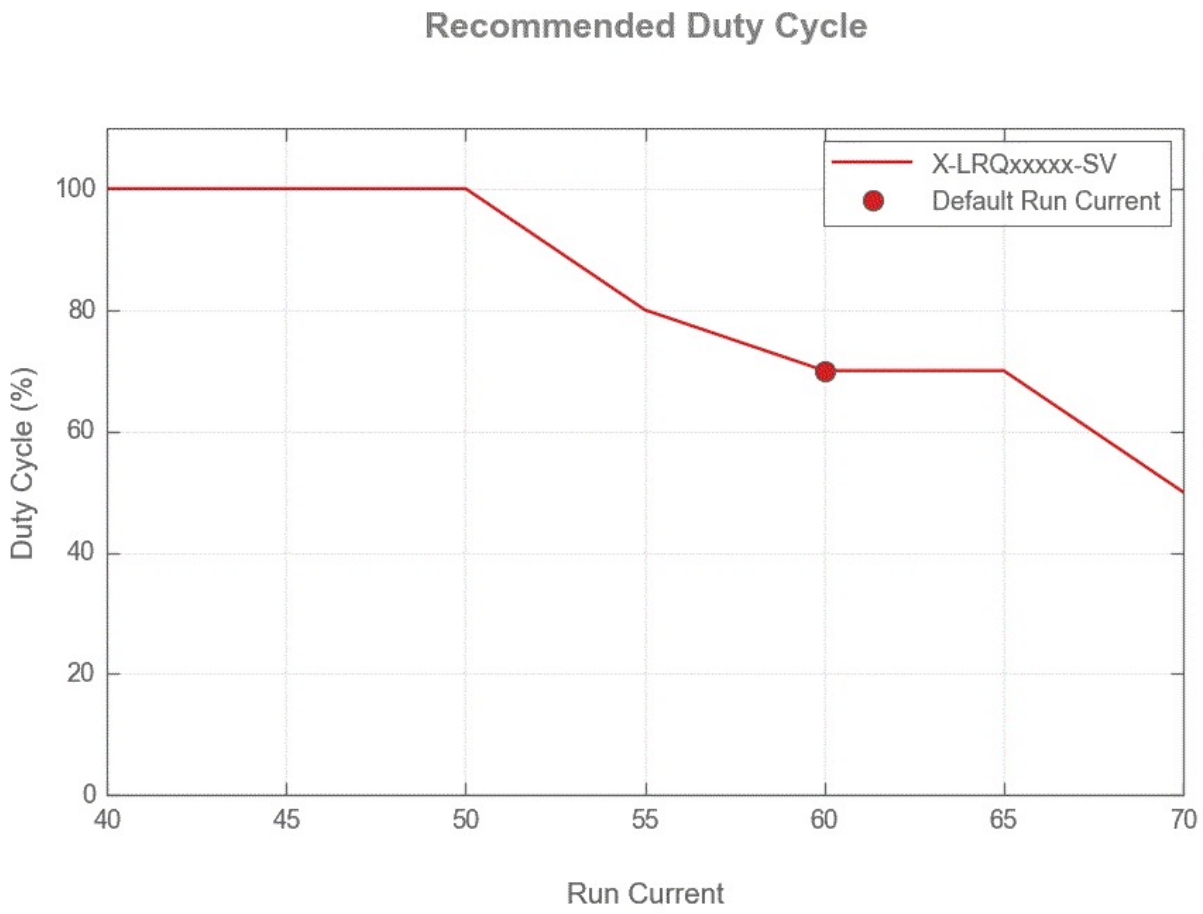
Part Number	Maximum Speed	Minimum Speed	Speed Resolution	Peak Thrust
X-LRQ600BL-SV1	(8.071"/s)	(0.000012"/s)	(0.000012"/s)	60 N (13.5 lb)

Part Number	Maximum Continuous Thrust	Vertical Runout	Horizontal Runout	Pitch
X-LRQ075AL-SV1	100 N (22.4 lb)	< 20 µm (< 0.000787")	< 20 µm (< 0.000787")	0.025° (0.436 mrad)
X-LRQ075BL-SV1	60 N (13.5 lb)	< 20 µm (< 0.000787")	< 20 µm (< 0.000787")	0.025° (0.436 mrad)
X-LRQ150AL-SV1	100 N (22.4 lb)	< 25 µm (< 0.000984")	< 20 µm (< 0.000787")	0.03° (0.523 mrad)
X-LRQ150BL-SV1	60 N (13.5 lb)	< 25 µm (< 0.000984")	< 20 µm (< 0.000787")	0.03° (0.523 mrad)
X-LRQ300AL-SV1	100 N (22.4 lb)	< 35 µm (< 0.001378")	< 30 µm (< 0.001181")	0.034° (0.593 mrad)
X-LRQ300BL-SV1	60 N (13.5 lb)	< 35 µm (< 0.001378")	< 30 µm (< 0.001181")	0.034° (0.593 mrad)
X-LRQ450AL-SV1	100 N (22.4 lb)	< 45 µm (< 0.001772")	< 40 µm (< 0.001575")	0.04° (0.698 mrad)
X-LRQ450BL-SV1	60 N (13.5 lb)	< 45 µm (< 0.001772")	< 40 µm (< 0.001575")	0.04° (0.698 mrad)
X-LRQ600AL-SV1	100 N (22.4 lb)	< 75 µm (< 0.002953")	< 60 µm (< 0.002362")	0.045° (0.785 mrad)
X-LRQ600BL-SV1	60 N (13.5 lb)	< 75 µm (< 0.002953")	< 60 µm (< 0.002362")	0.045° (0.785 mrad)

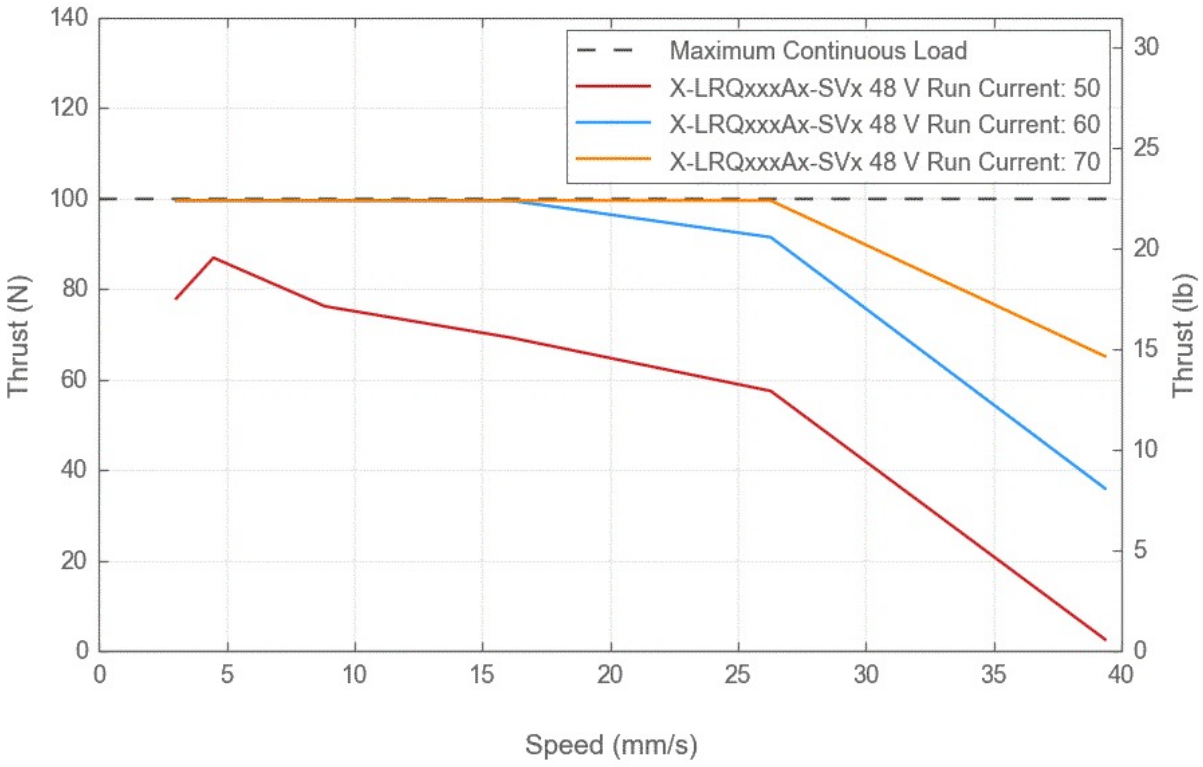
Part Number	Roll	Yaw	Linear Motion Per Motor Rev	Weight
X-LRQ075AL-SV1	0.01° (0.174 mrad)	0.02° (0.349 mrad)	1.27 mm (0.050")	2.27 kg (5.004 lb)
X-LRQ075BL-SV1	0.01° (0.174 mrad)	0.02° (0.349 mrad)	6.35 mm (0.250")	2.27 kg (5.004 lb)
X-LRQ150AL-SV1	0.015° (0.262 mrad)	0.02° (0.349 mrad)	1.27 mm (0.050")	2.64 kg (5.820 lb)
X-LRQ150BL-SV1	0.015° (0.262 mrad)	0.02° (0.349 mrad)	6.35 mm (0.250")	2.64 kg (5.820 lb)
X-LRQ300AL-SV1	0.015° (0.262 mrad)	0.03° (0.523 mrad)	1.27 mm (0.050")	3.4 kg (7.496 lb)
X-LRQ300BL-SV1	0.015° (0.262 mrad)	0.03° (0.523 mrad)	6.35 mm (0.250")	3.4 kg (7.496 lb)
X-LRQ450AL-SV1	0.025°	0.04°	1.27 mm (0.050")	4.15 kg

Part Number	Roll	Yaw	Linear Motion Per Motor Rev	Weight
	(0.436 mrad)	(0.698 mrad)		(9.149 lb)
X-LRQ450BL-SV1	0.025° (0.436 mrad)	0.04° (0.698 mrad)	6.35 mm (0.250")	4.15 kg (9.149 lb)
X-LRQ600AL-SV1	0.035° (0.611 mrad)	0.04° (0.698 mrad)	1.27 mm (0.050")	4.86 kg (10.714 lb)
X-LRQ600BL-SV1	0.035° (0.611 mrad)	0.04° (0.698 mrad)	6.35 mm (0.250")	4.86 kg (10.714 lb)

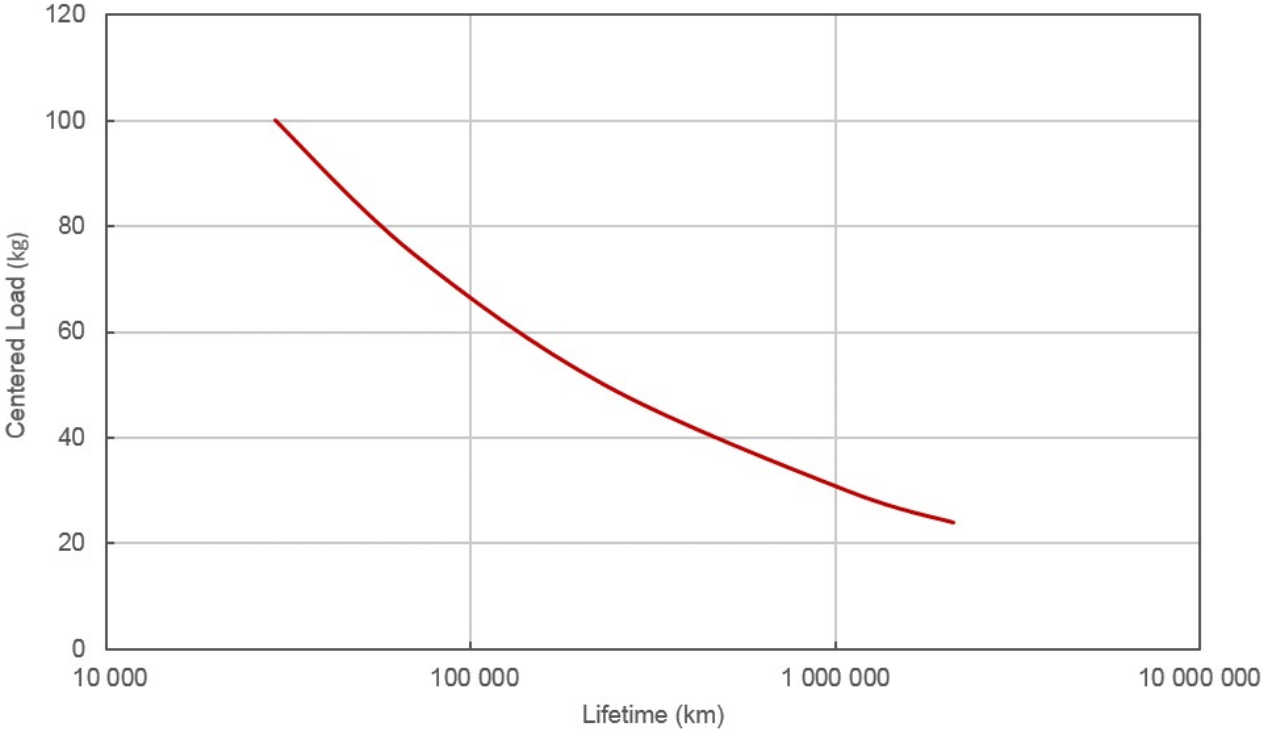
X-LRQ-SV1 Series Charts

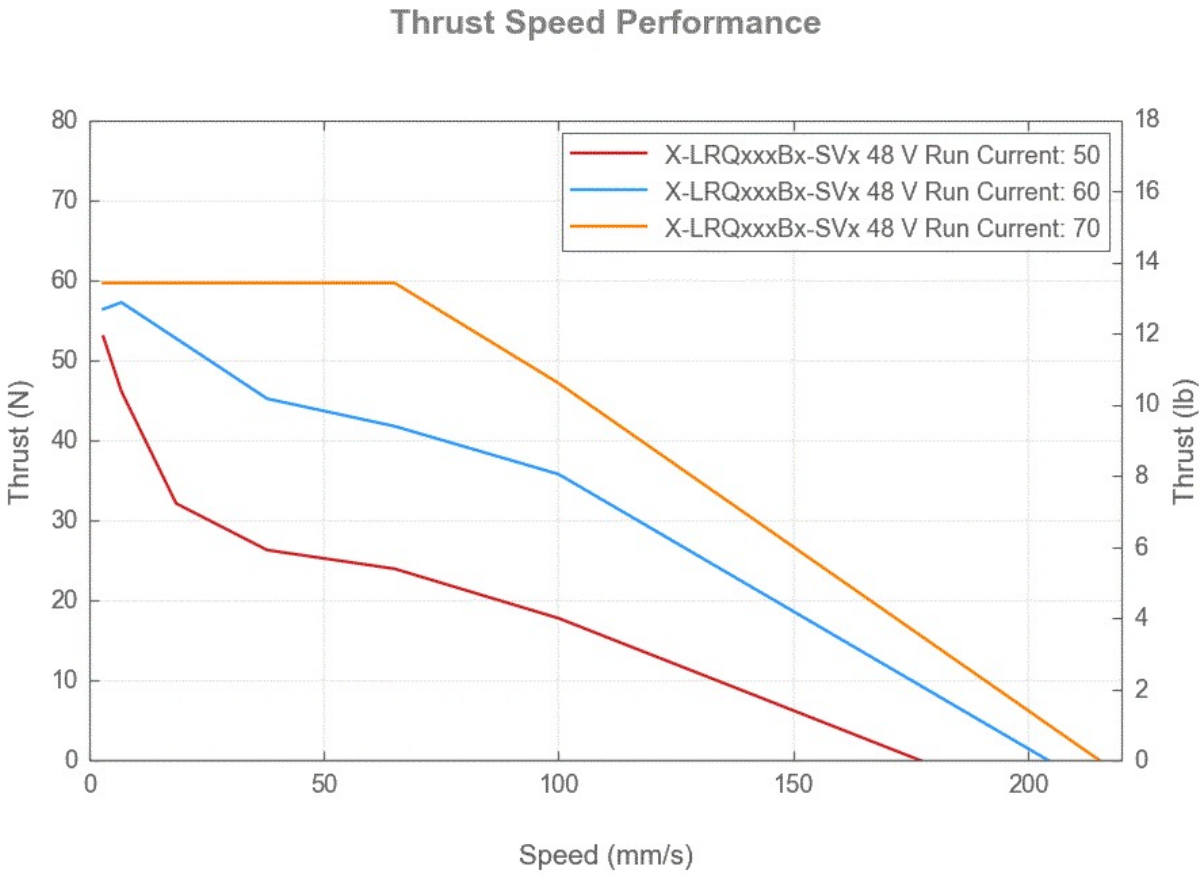


Thrust Speed Performance



LRQ Linear Bearing Lifetime





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