

X-LRQ-SV2 Series Datasheet



- Vacuum compatible to 10⁻⁶ Torr
- 75, 150, 300, 450, 600 mm travel
- 100 kg load capacity
- Up to 205 mm/s speed and up to 100 N thrust
- 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

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-SV2 Series devices are high-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.

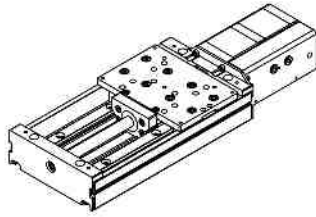
At only 36 mm high, these vacuum stages are excellent for applications where a low profile is

required. The X-LRQ-SV2'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-SV2 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.

Drawings

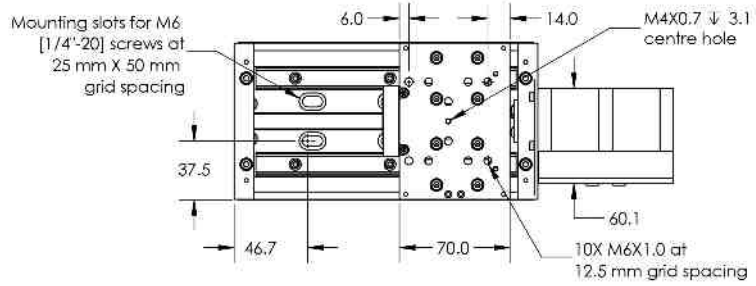
ZABER

X-LRQxL-SV Vacuum Compatible Motorized Linear Stage
 dimensions in mm



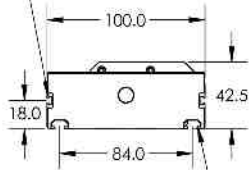
Model Number*	Travel	A	B
X-LRQ075xL-SV	75.0	278.2	167.0
X-LRQ150xL-SV	150.0	353.2	242.0
X-LRQ300xL-SV	300.0	503.2	392.0
X-LRQ450xL-SV	450.0	653.2	542.0
X-LRQ600xL-SV	600.0	803.2	692.0

*See product page for complete list of available models at www.zaber.com

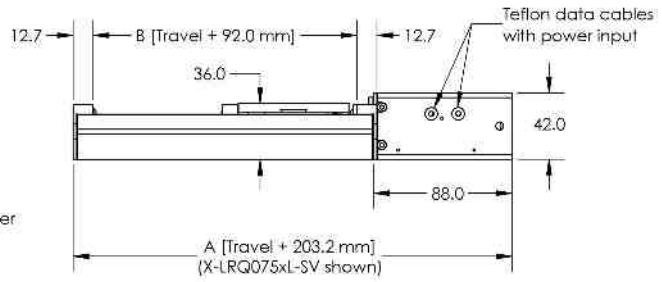


Recommended fastener for side T-slots: standard M2.5 nuts

Note: Do not mount stage using these side T-slots. For accessories only



Recommended fastener for bottom T-slots: 6mm T-nuts



04L 1000

Specifications

Specification	Value	Alternate Unit
Built-in Controller	Yes	
Repeatability	< 2.5 μm	< 0.000098 "
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/ $^{\circ}$	27 $\mu\text{rad/N-m}$
Stiffness in Roll	1850 N-m/ $^{\circ}$	9 $\mu\text{rad/N-m}$
Stiffness in Yaw	665 N-m/ $^{\circ}$	26 $\mu\text{rad/N-m}$
Maximum Current Draw	1200 mA	
Power Supply	24-48 VDC	
Power Plug	None, use X-PIB	
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	
Data Cable Connection	Teflon flying leads with M8 4 pin M/F	
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	
Vacuum Compatible	High vacuum (10 ⁻⁶ Torr)	
Operating Temperature Range	0 to 50 $^{\circ}\text{C}$	
RoHS Compliant	Yes	
CE Compliant	Yes	

Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Backlash
X-LRQ075AL-SV2	0.09921875 µm	75 mm (2.953 ")	23 µm (0.000906 ")	< 8 µm (< 0.000315 ")
X-LRQ075BL-SV2	0.49609375 µm	75 mm (2.953 ")	15 µm (0.000591 ")	< 21 µm (< 0.000827 ")
X-LRQ150AL-SV2	0.09921875 µm	150 mm (5.905 ")	45 µm (0.001772 ")	< 8 µm (< 0.000315 ")
X-LRQ150BL-SV2	0.49609375 µm	150 mm (5.905 ")	25 µm (0.000984 ")	< 21 µm (< 0.000827 ")
X-LRQ300AL-SV2	0.09921875 µm	300 mm (11.811 ")	90 µm (0.003543 ")	< 8 µm (< 0.000315 ")
X-LRQ300BL-SV2	0.49609375 µm	300 mm (11.811 ")	35 µm (0.001378 ")	< 21 µm (< 0.000827 ")
X-LRQ450AL-SV2	0.09921875 µm	450 mm (17.716 ")	135 µm (0.005315 ")	< 8 µm (< 0.000315 ")
X-LRQ450BL-SV2	0.49609375 µm	450 mm (17.716 ")	60 µm (0.002362 ")	< 21 µm (< 0.000827 ")
X-LRQ600AL-SV2	0.09921875 µm	600 mm (23.622 ")	150 µm (0.005905 ")	< 8 µm (< 0.000315 ")
X-LRQ600BL-SV2	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-SV2	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-SV2	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-SV2	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-SV2	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-SV2	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-SV2	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-SV2	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-SV2	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-SV2	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	

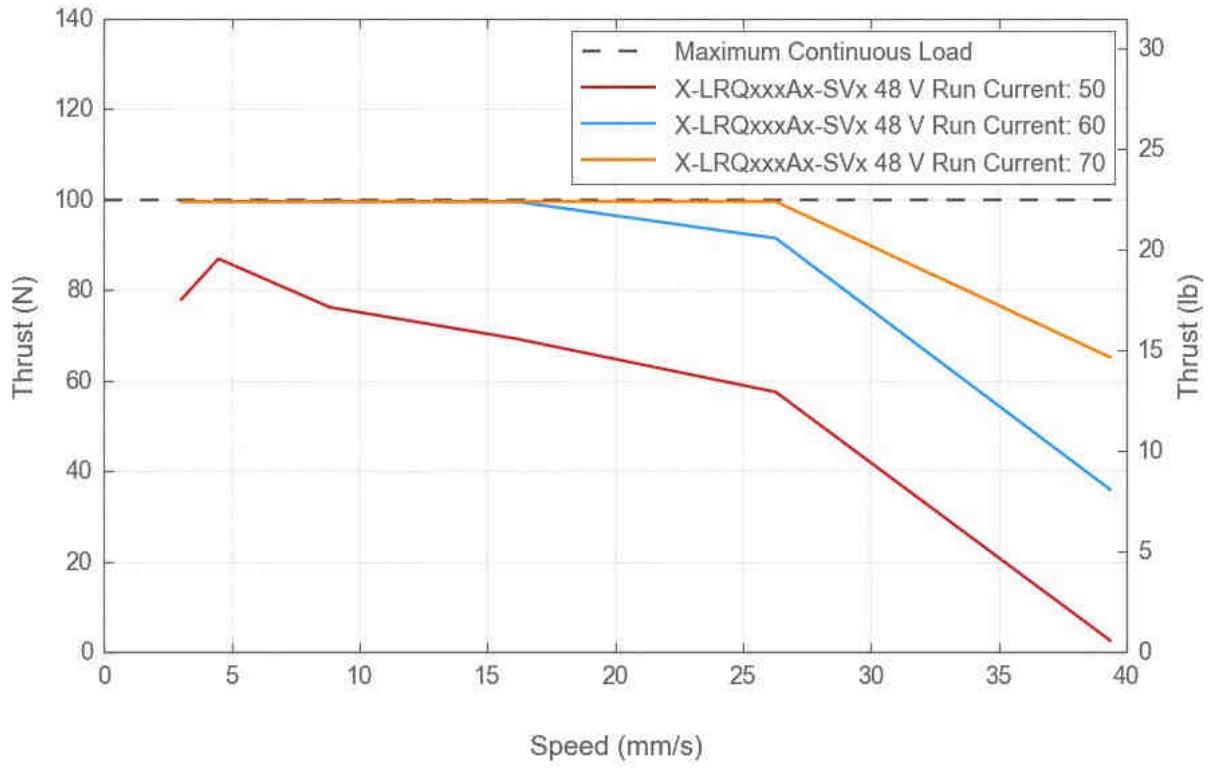
Part Number	Maximum Speed	Minimum Speed	Speed Resolution	Peak Thrust
X-LRQ600BL-SV2	(8.071 "/s)	(0.000012 "/s)	(0.000012 "/s)	60 N (13.5 lb)

Part Number	Vertical Runout	Horizontal Runout	Pitch	Roll
X-LRQ075AL-SV2	< 20 µm (< 0.000787 ")	< 20 µm (< 0.000787 ")	0.025 ° (0.436 mrad)	0.01 ° (0.174 mrad)
X-LRQ075BL-SV2	< 20 µm (< 0.000787 ")	< 20 µm (< 0.000787 ")	0.025 ° (0.436 mrad)	0.01 ° (0.174 mrad)
X-LRQ150AL-SV2	< 25 µm (< 0.000984 ")	< 20 µm (< 0.000787 ")	0.03 ° (0.523 mrad)	0.015 ° (0.262 mrad)
X-LRQ150BL-SV2	< 25 µm (< 0.000984 ")	< 20 µm (< 0.000787 ")	0.03 ° (0.523 mrad)	0.015 ° (0.262 mrad)
X-LRQ300AL-SV2	< 35 µm (< 0.001378 ")	< 30 µm (< 0.001181 ")	0.034 ° (0.593 mrad)	0.015 ° (0.262 mrad)
X-LRQ300BL-SV2	< 35 µm (< 0.001378 ")	< 30 µm (< 0.001181 ")	0.034 ° (0.593 mrad)	0.015 ° (0.262 mrad)
X-LRQ450AL-SV2	< 45 µm (< 0.001772 ")	< 40 µm (< 0.001575 ")	0.04 ° (0.698 mrad)	0.025 ° (0.436 mrad)
X-LRQ450BL-SV2	< 45 µm (< 0.001772 ")	< 40 µm (< 0.001575 ")	0.04 ° (0.698 mrad)	0.025 ° (0.436 mrad)
X-LRQ600AL-SV2	< 75 µm (< 0.002953 ")	< 60 µm (< 0.002362 ")	0.045 ° (0.785 mrad)	0.035 ° (0.611 mrad)
X-LRQ600BL-SV2	< 75 µm (< 0.002953 ")	< 60 µm (< 0.002362 ")	0.045 ° (0.785 mrad)	0.035 ° (0.611 mrad)

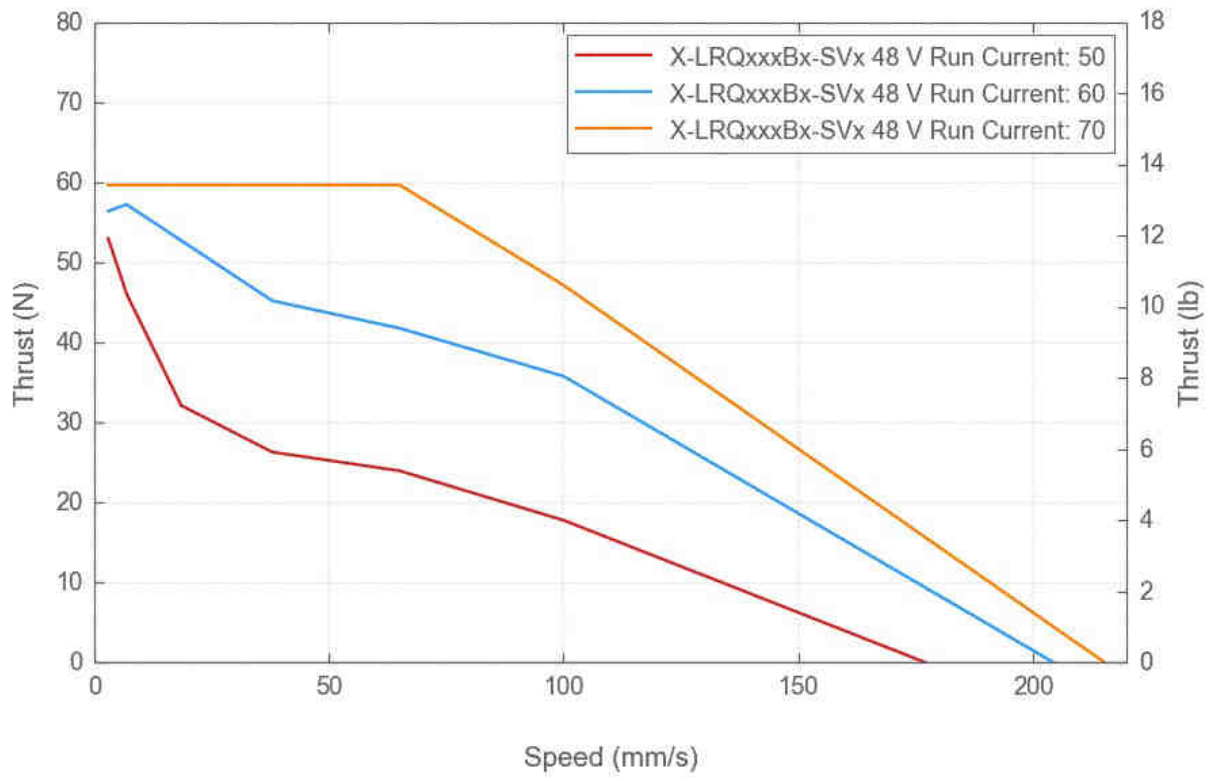
Part Number	Yaw	Linear Motion Per Motor Rev	Weight
X-LRQ075AL-SV2	0.02 ° (0.349 mrad)	1.27 mm (0.050 ")	2.27 kg (5.004 lb)
X-LRQ075BL-SV2	0.02 ° (0.349 mrad)	6.35 mm (0.250 ")	2.27 kg (5.004 lb)
X-LRQ150AL-SV2	0.02 ° (0.349 mrad)	1.27 mm (0.050 ")	2.64 kg (5.820 lb)
X-LRQ150BL-SV2	0.02 ° (0.349 mrad)	6.35 mm (0.250 ")	2.64 kg (5.820 lb)
X-LRQ300AL-SV2	0.03 ° (0.523 mrad)	1.27 mm (0.050 ")	3.4 kg (7.496 lb)
X-LRQ300BL-SV2	0.03 ° (0.523 mrad)	6.35 mm (0.250 ")	3.4 kg (7.496 lb)
X-LRQ450AL-SV2	0.04 ° (0.698 mrad)	1.27 mm (0.050 ")	4.15 kg (9.149 lb)
X-LRQ450BL-SV2	0.04 ° (0.698 mrad)	6.35 mm (0.250 ")	4.15 kg (9.149 lb)
X-LRQ600AL-SV2	0.04 ° (0.698 mrad)	1.27 mm (0.050 ")	4.86 kg (10.714 lb)
X-LRQ600BL-SV2	0.04 ° (0.698 mrad)	6.35 mm (0.250 ")	4.86 kg (10.714 lb)

Charts

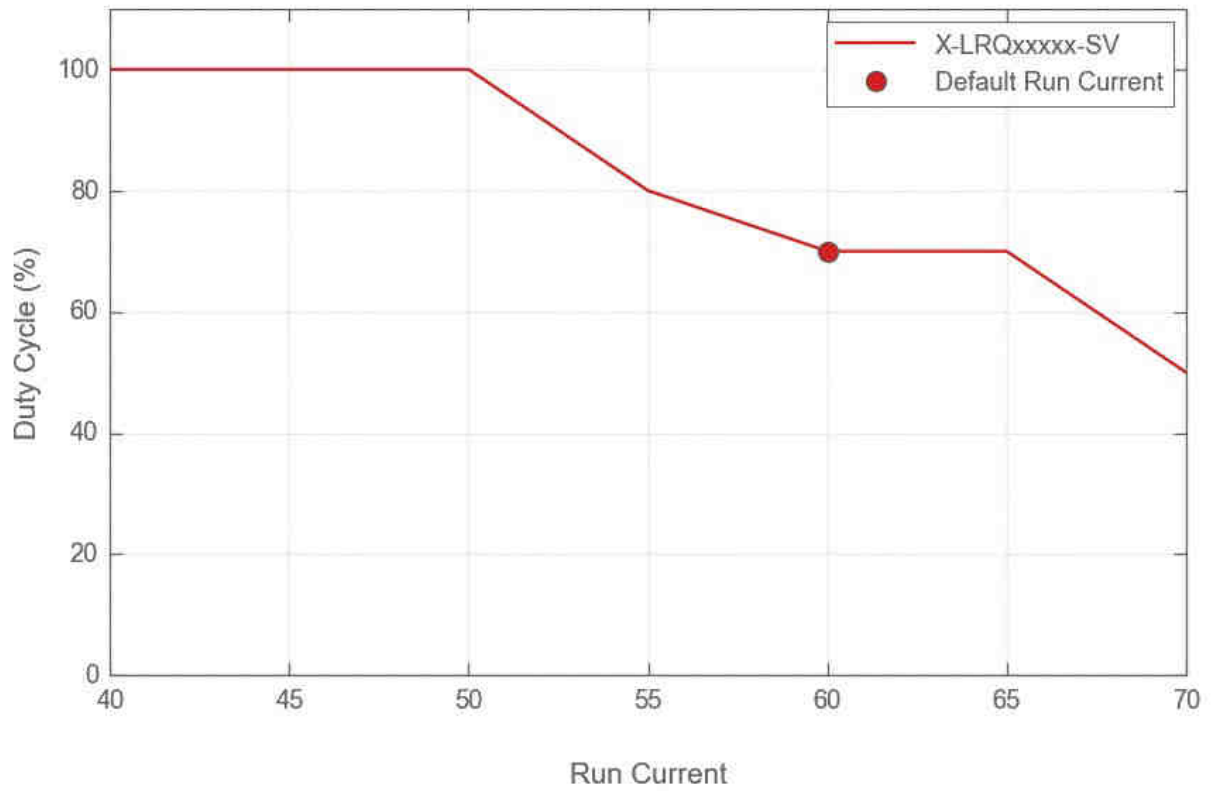
Thrust Speed Performance



Thrust Speed Performance



Recommended Duty Cycle



LRQ Linear Bearing Lifetime

