

## X-LSM050A-SV2 Datasheet



- Vacuum compatible to 10<sup>-6</sup> Torr
- 25, 50, 100, 150, 200 mm travel
- Up to 100 mm/s speed and up to 35 N thrust
- 10 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-LSM-SV2 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".

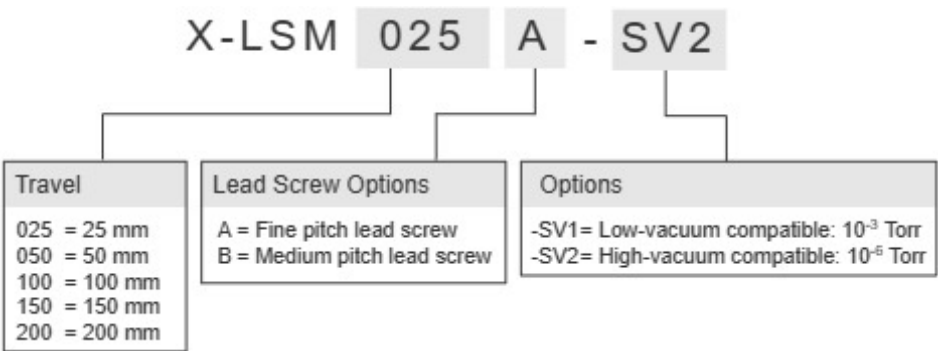
Zaber's X-LSM-SV2 Series devices are high-vacuum compatible, computer-controlled, motorized linear stages with high thrust and speed capabilities, and a compact size. They are stand-alone units requiring only a standard 24 V or 48 V power supply.

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 21 mm high, these miniature stages are excellent for applications where a small profile is required. The X-LSM-SV2 is designed with vacuum compatible materials to minimize outgassing and allow for faster pump down times. Like all of Zaber's products, the X-LSM-SV2 Series is designed to be 'plug and play' and very easy to set up and operate.

For more information visit: <https://www.zaber.com/products/vacuum-compatible-stages/X-LSM-SV2>

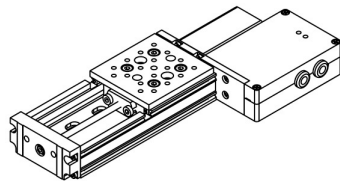
## X-LSM-SV2 Series Part Numbering



X-LSM050A-SV2 Drawings

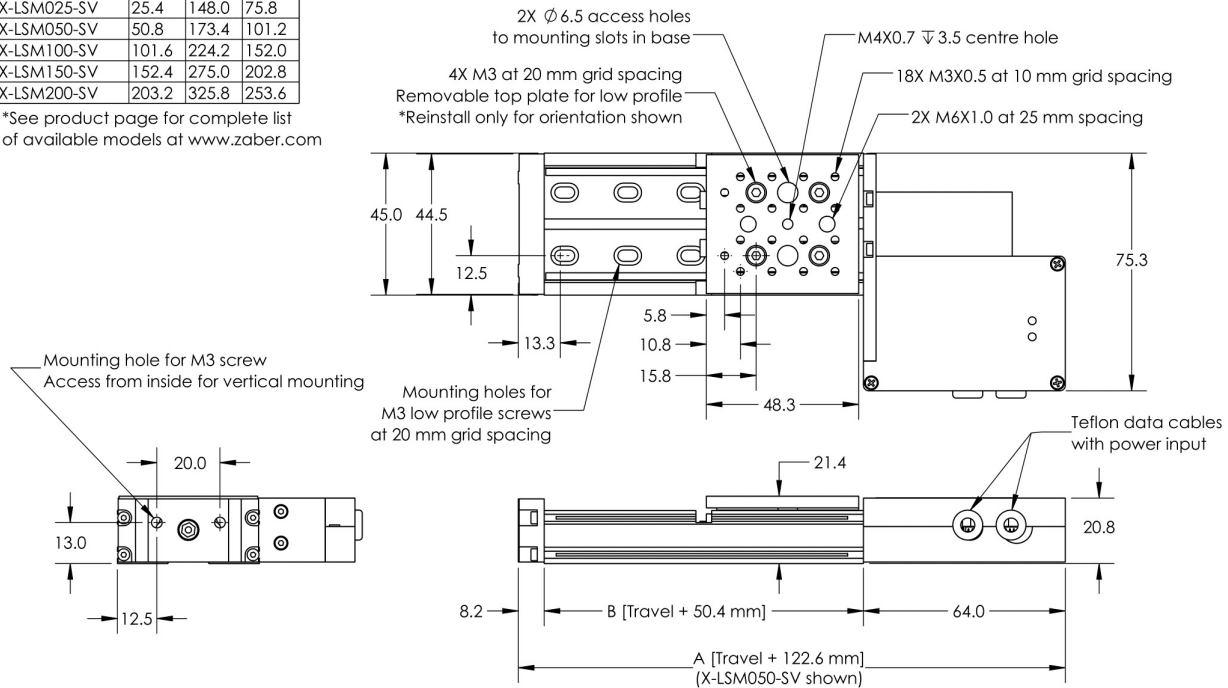


X-LSM-SV Vacuum Compatible Motorized Linear Stage  
dimensions in mm



| Model Number* | Travel | A     | B     |
|---------------|--------|-------|-------|
| X-LSM025-SV   | 25.4   | 148.0 | 75.8  |
| X-LSM050-SV   | 50.8   | 173.4 | 101.2 |
| X-LSM100-SV   | 101.6  | 224.2 | 152.0 |
| X-LSM150-SV   | 152.4  | 275.0 | 202.8 |
| X-LSM200-SV   | 203.2  | 325.8 | 253.6 |

\*See product page for complete list  
of available models at [www.zaber.com](http://www.zaber.com)



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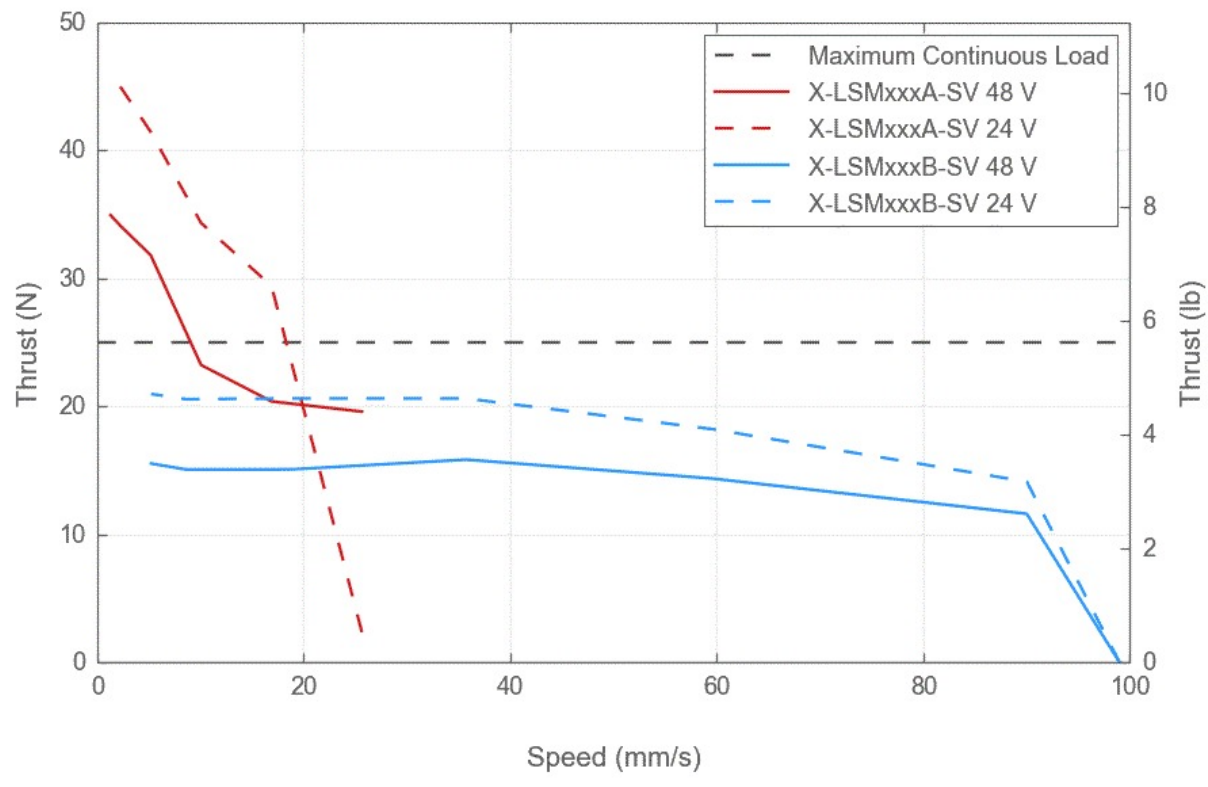
## X-LSM050A-SV2 Specifications

| Specification                       | Value                                 | Alternate Unit          |
|-------------------------------------|---------------------------------------|-------------------------|
| Microstep Size (Default Resolution) | 0.047625 $\mu\text{m}$                |                         |
| Built-in Controller                 | Yes                                   |                         |
| Travel Range                        | 50.8 mm                               | 2.000"                  |
| Accuracy (unidirectional)           | 20 $\mu\text{m}$                      | 0.000787"               |
| Repeatability                       | < 3 $\mu\text{m}$                     | < 0.000118"             |
| Backlash                            | < 12 $\mu\text{m}$                    | < 0.000472"             |
| Maximum Speed                       | 24 mm/s                               | 0.945"/s                |
| Minimum Speed                       | 0.000029 mm/s                         | 0.000001"/s             |
| Speed Resolution                    | 0.000029 mm/s                         | 0.000001"/s             |
| Encoder Type                        | None                                  |                         |
| Peak Thrust                         | 35 N                                  | 7.8 lb                  |
| Maximum Continuous Thrust           | 25 N                                  | 5.6 lb                  |
| 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               | 100 N                                 | 22.4 lb                 |
| Maximum Cantilever Load             | 300 N-cm                              | 424.8 oz-in             |
| Guide Type                          | Needle roller bearing                 |                         |
| Vertical Runout                     | < 11 $\mu\text{m}$                    | < 0.000433"             |
| Horizontal Runout                   | < 14 $\mu\text{m}$                    | < 0.000551"             |
| Pitch                               | 0.03°                                 | 0.523 mrad              |
| Roll                                | 0.03°                                 | 0.523 mrad              |
| Yaw                                 | 0.03°                                 | 0.523 mrad              |
| Stiffness in Pitch                  | 55 N-m/°                              | 317 $\mu\text{rad/N-m}$ |
| Stiffness in Roll                   | 52.5 N-m/°                            | 332 $\mu\text{rad/N-m}$ |
| Stiffness in Yaw                    | 85 N-m/°                              | 205 $\mu\text{rad/N-m}$ |
| Power Supply                        | 24-48 VDC                             |                         |
| Power Plug                          | None, use X-PIB                       |                         |
| Maximum Current Draw                | 350 mA                                |                         |
| Linear Motion Per Motor Rev         | 0.6096 mm                             | 0.024"                  |

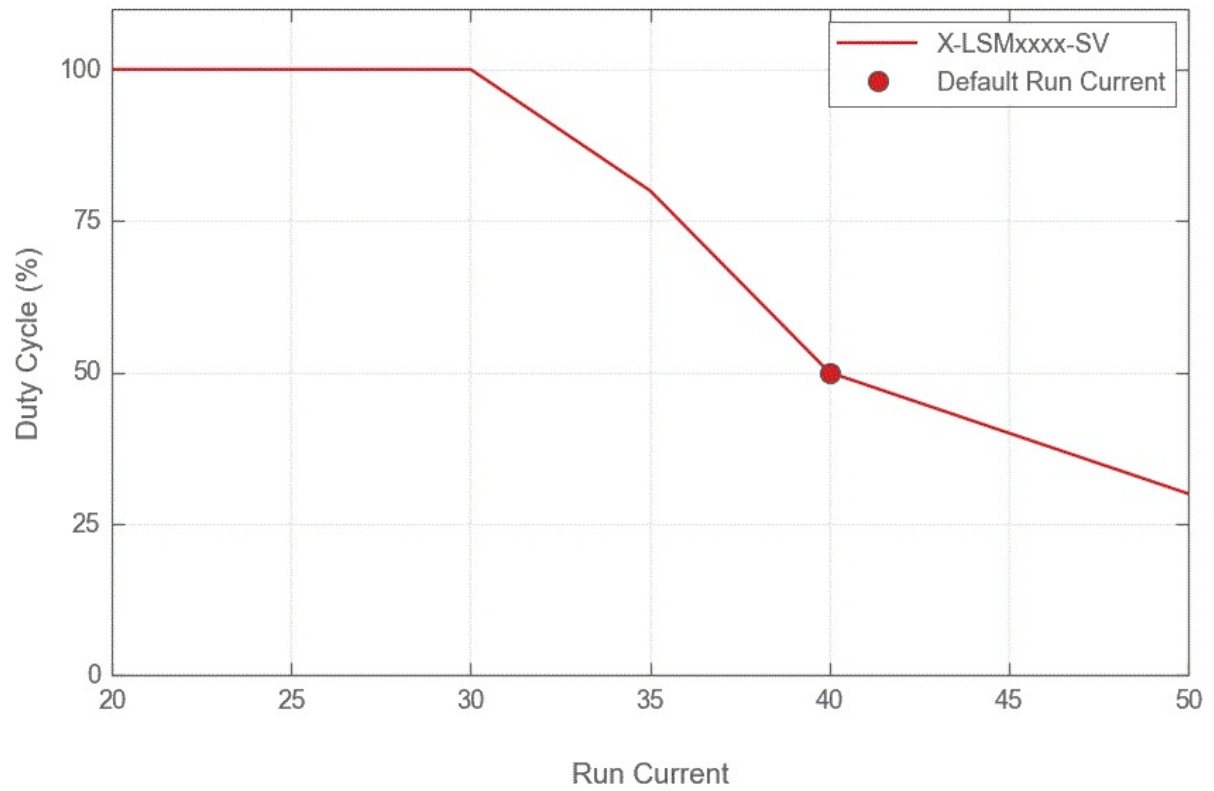
| Specification               | Value                                                | Alternate Unit |
|-----------------------------|------------------------------------------------------|----------------|
| Motor Steps Per Rev         | 200                                                  |                |
| Motor Type                  | Stepper (2 phase)                                    |                |
| Motor Rated Current         | 800 mA/phase                                         |                |
| Inductance                  | 3.5 mH/phase                                         |                |
| Default Resolution          | 1/64 of a step                                       |                |
| Mechanical Drive System     | Precision lead screw                                 |                |
| Limit or Home Sensing       | Magnetic hall sensor                                 |                |
| Manual Control              | No                                                   |                |
| Axes of Motion              | 1                                                    |                |
| LED Indicators              | Yes                                                  |                |
| Mounting Interface          | M3 and M6 threaded holes and M4 threaded center hole |                |
| Stage Parallelism           | < 25 $\mu$ m                                         | < 0.000984"    |
| Operating Temperature Range | 0 to 50 °C                                           |                |
| RoHS Compliant              | Yes                                                  |                |
| CE Compliant                | Yes                                                  |                |
| Vacuum Compatible           | High vacuum (10 <sup>-6</sup> Torr)                  |                |
| Weight                      | 0.40 kg                                              | 0.882 lb       |

X-LSM-SV2 Series Charts

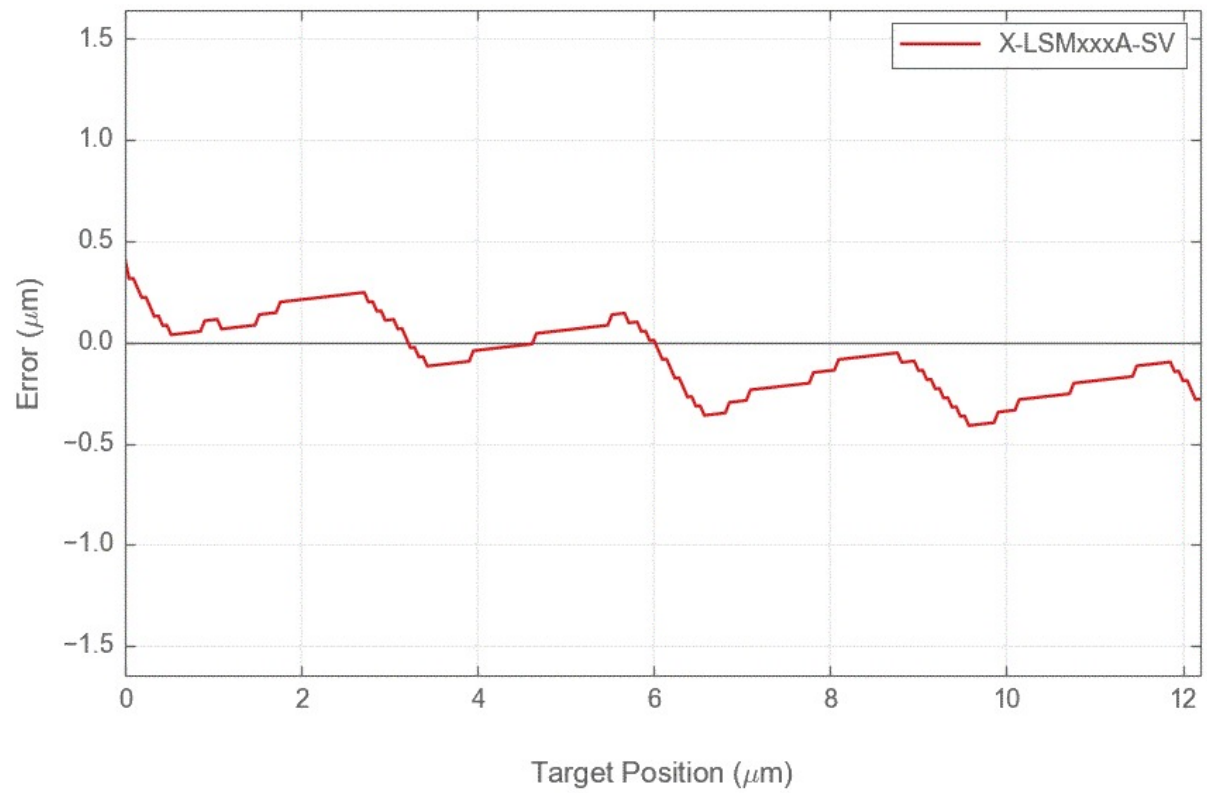
Thrust Speed Performance



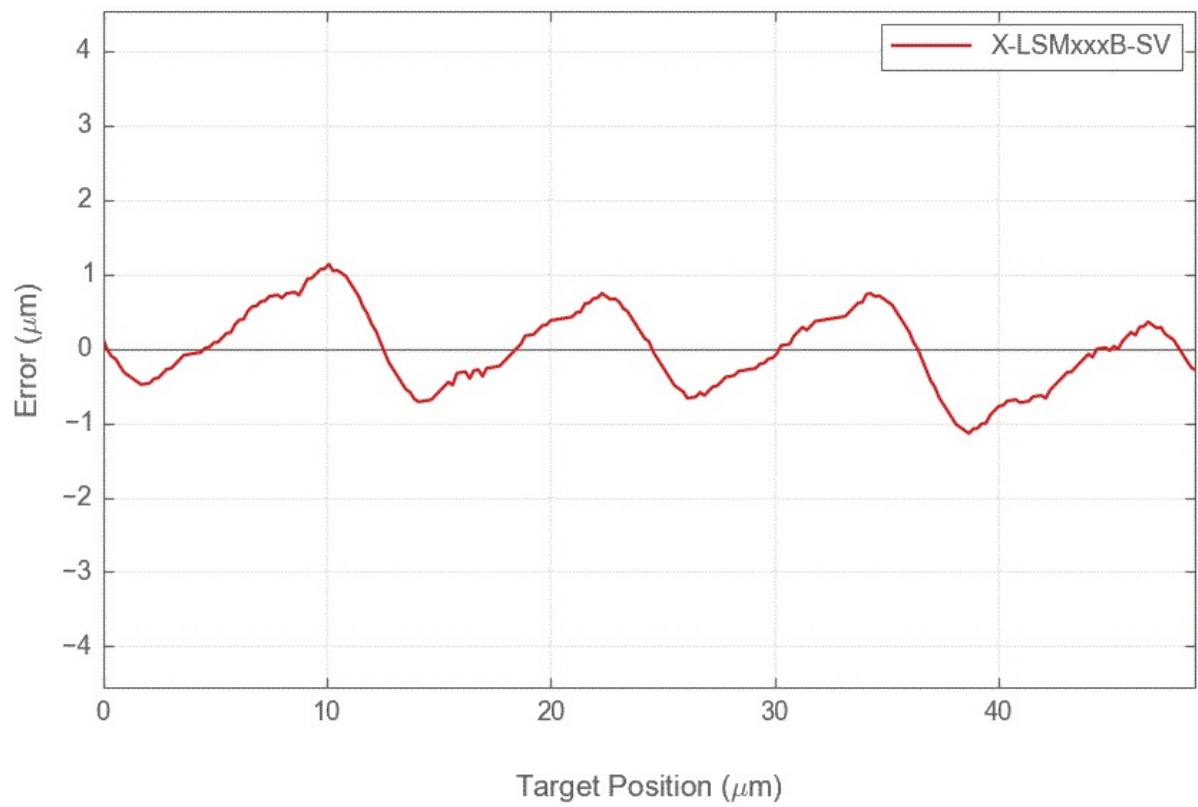
Duty Cycle vs Run Current



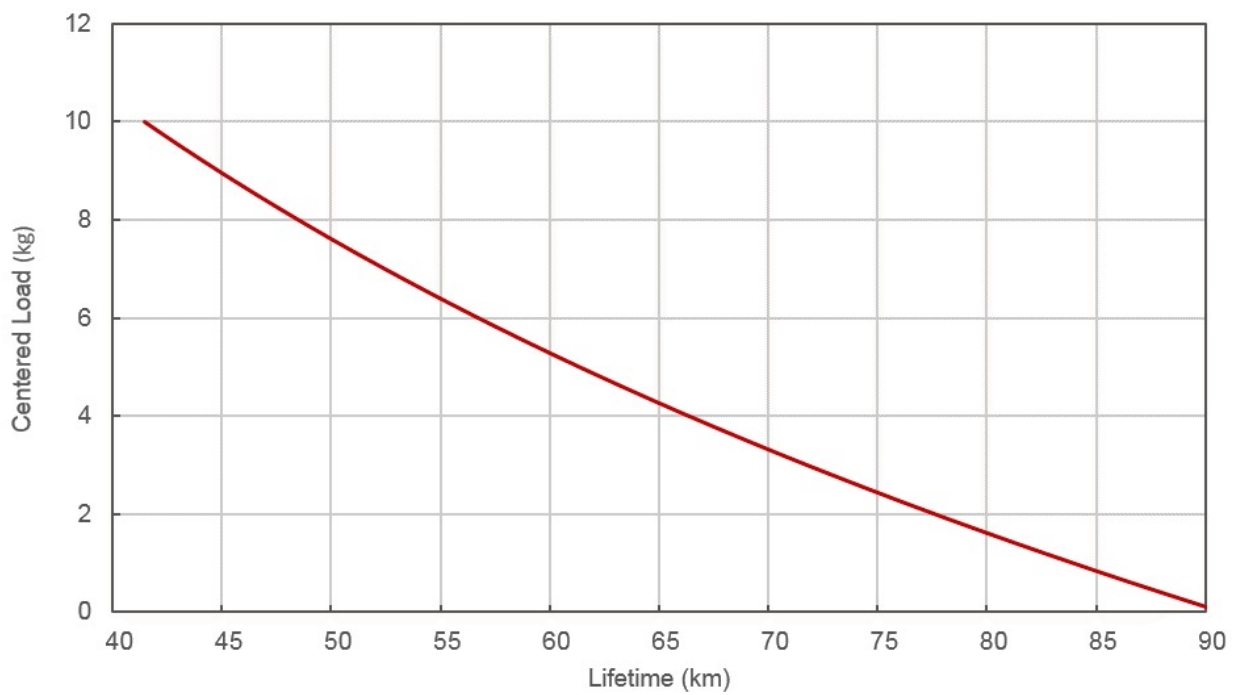
## Typical Microstepping Accuracy



### Typical Microstepping Accuracy



### LSM Linear Bearing Lifetime



## Contact

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