



X-LRQ150AL-DE51C Datasheet



- 75, 150, 300, 450, 600 mm travel
- Up to 13 μm accuracy over 600 mm travel
- 100 kg load capacity
- Up to 205 mm/s speed and up to 300 N thrust
- Built-in controller; daisy-chains with other Zaber products
- Integrated linear encoders with 50 nm resolution provide slip/stall detection and position correction
- Inline and parallel drive configurations
- Ball screw and lead screw configurations
- Includes stainless steel dust cover
- Custom versions available

X-LRQ-DEC Series Overview

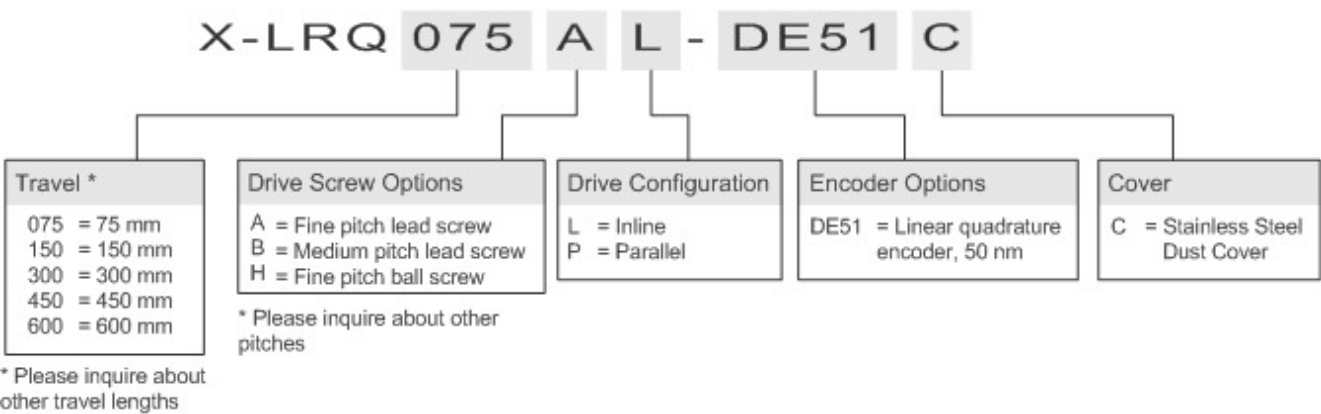
Zaber's X-LRQ-DEC Series devices are computer-controlled, motorized linear stages with high stiffness, load, and lifetime capabilities in a compact size. An integrated linear encoder combined with stage calibration provides high accuracy positioning over the full travel of the device. Each device is available in either an inline or parallel drive configuration. A flexible stainless steel dust cover prevents the ingress of small objects. They are stand-alone units requiring only a standard 24 V or 48 V power supply. 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 48 mm high, these stages are excellent for applications where a low profile is required. The X-LRQ-DEC'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-DEC 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-DEC/6>

X-LRQ-DEC Series Part Numbering



X-LRQ150AL-DE51C Bundle Options

This device may be purchased stand-alone or bundled with one of the following accessory kits:

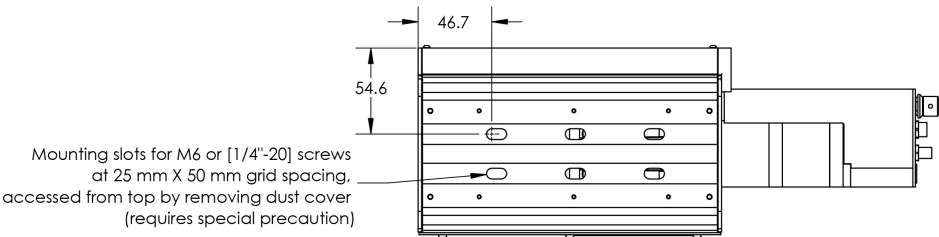
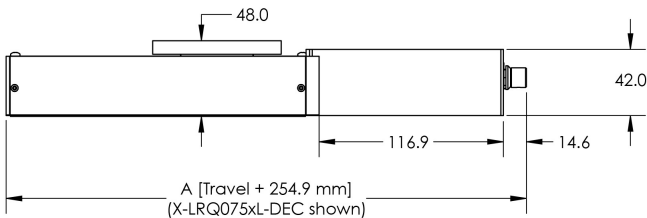
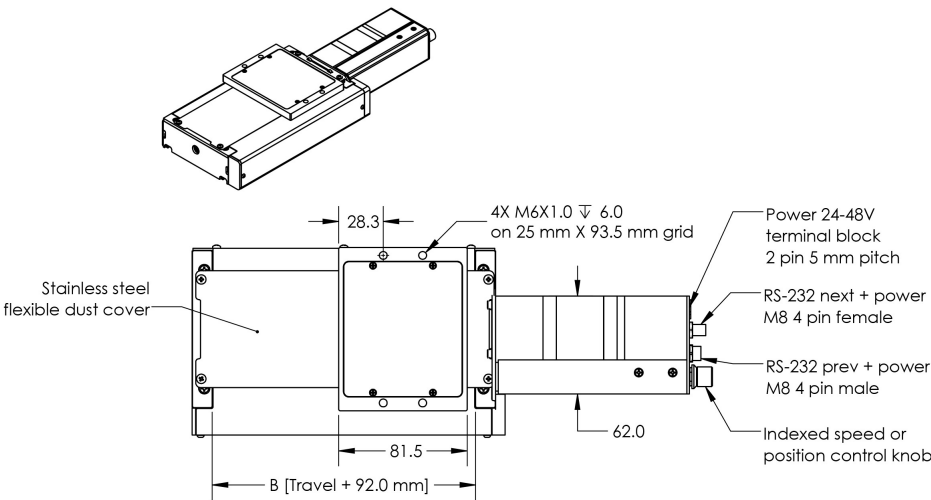
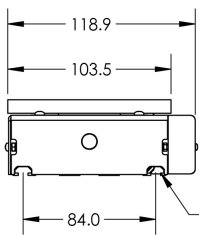
| Products | Description |
|---|---|
| X-LRQ150AL-DE51C | Motorized, lead-screw driven, covered linear stage, 150 mm travel, integrated linear encoder and controller, fine resolution, low speed, inline drive |
| with KX14C accessory kit Power supply: North America, 48 V. Powers multiple X-Series devices | <ul style="list-style-type: none">• 1 x PS14S-48V37: Power Supply, 48 V 3.75 A, Compatible with X-Series Products• 1 x X-DC06: Data Cable, 6 ft (2 m), for Use with all X-Series Products• 1 x X-USBDC: USB to Serial Converter Cable with M8 Female Plug for X-Series Products |
| with KX13C accessory kit Power supply: North America, 48 V. Powers one axis | <ul style="list-style-type: none">• 1 x PS13S-48V12: Power Supply, 48 V 1.25 A, Compatible with X-Series Products• 1 x X-DC06: Data Cable, 6 ft (2 m), for Use with all X-Series Products• 1 x X-USBDC: USB to Serial Converter Cable with M8 Female Plug for X-Series Products |
| with PTB2 accessory Power Supply Not Included | <ul style="list-style-type: none">• 1 x PTB2: Power Terminal Block, 2 Pin, 5 mm Pitch, for Use with X-Series Devices with Custom Power Supply |

X-LRQ150AL-DE51C Drawings

ZABER
X-LRQxL-DEC Motorized Linear Stage
dimensions in mm

| Model Number* | Travel | A | B |
|----------------|--------|-------|-------|
| X-LRQ075xL-DEC | 75.0 | 329.9 | 167.0 |
| X-LRQ150xL-DEC | 150.0 | 404.9 | 242.0 |
| X-LRQ300xL-DEC | 300.0 | 554.9 | 392.0 |
| X-LRQ450xL-DEC | 450.0 | 704.9 | 542.0 |
| X-LRQ600xL-DEC | 600.0 | 854.9 | 692.0 |

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



DWG 1455 R01

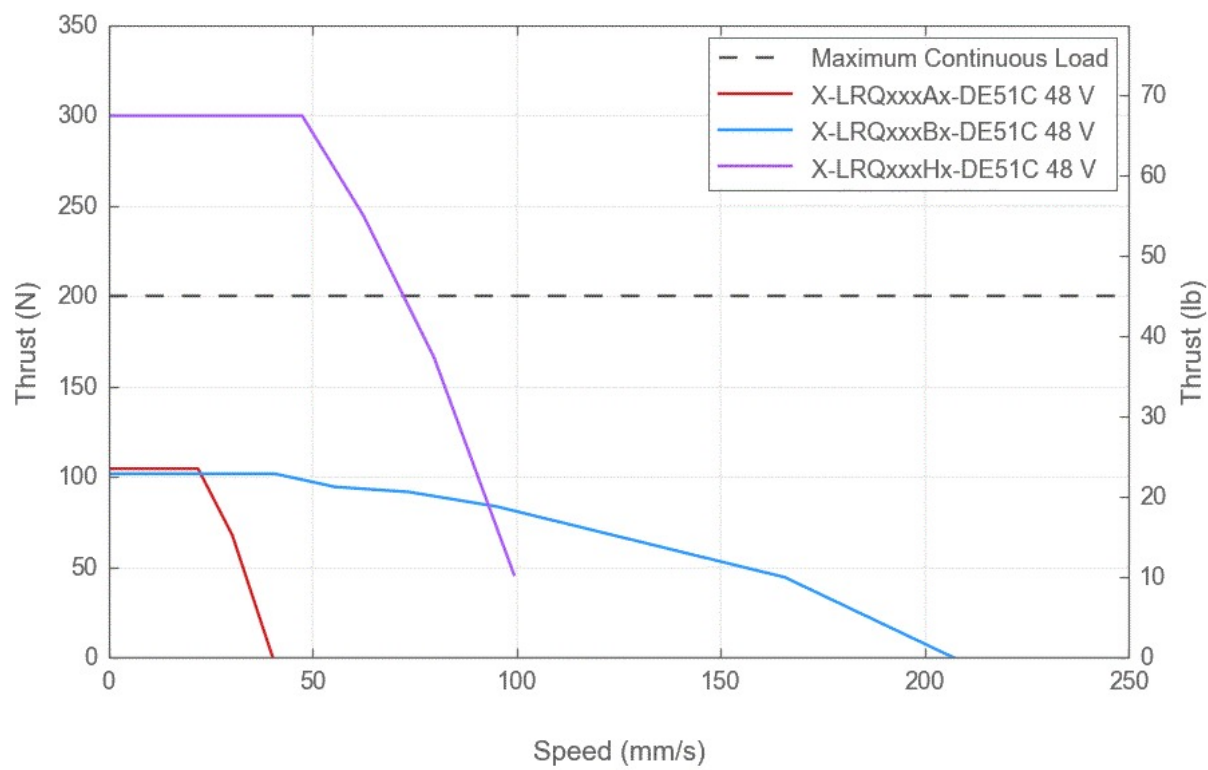
X-LRQ150AL-DE51C Specifications

| Specification | Value | Alternate Unit |
|-------------------------------------|-------------------------------------|------------------------|
| Microstep Size (Default Resolution) | 0.09921875 μm | |
| Built-in Controller | Yes | |
| Travel Range | 150 mm | 5.905" |
| Accuracy (unidirectional) | 13 μm | 0.000512" |
| Repeatability | < 2.5 μm | < 0.000098" |
| Backlash | < 8 μm | < 0.000315" |
| Maximum Speed | 40 mm/s | 1.575"/s |
| Minimum Speed | 0.000061 mm/s | 0.000002"/s |
| Speed Resolution | 0.000061 mm/s | 0.000002"/s |
| Encoder Type | Linear quadrature encoder | |
| Encoder Resolution | 50 nm | |
| Peak Thrust | 110 N | 24.7 lb |
| Back-driving Force | Non-back-driving | |
| Maximum Continuous Thrust | 100 N | 22.4 lb |
| 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 | |
| Vertical Runout | < 25 μm | < 0.000984" |
| Horizontal Runout | < 20 μm | < 0.000787" |
| Pitch | 0.03° | 0.523 mrad |
| Roll | 0.015° | 0.262 mrad |
| Yaw | 0.02° | 0.349 mrad |
| Stiffness in Pitch | 640 N-m/° | 27 $\mu\text{rad/N-m}$ |
| Stiffness in Roll | 1850 N-m/° | 9 $\mu\text{rad/N-m}$ |
| Stiffness in Yaw | 665 N-m/° | 26 $\mu\text{rad/N-m}$ |
| Maximum Current Draw | 1200 mA | |
| Power Supply | 24-48 VDC | |
| Power Plug | 2-pin screw terminal | |

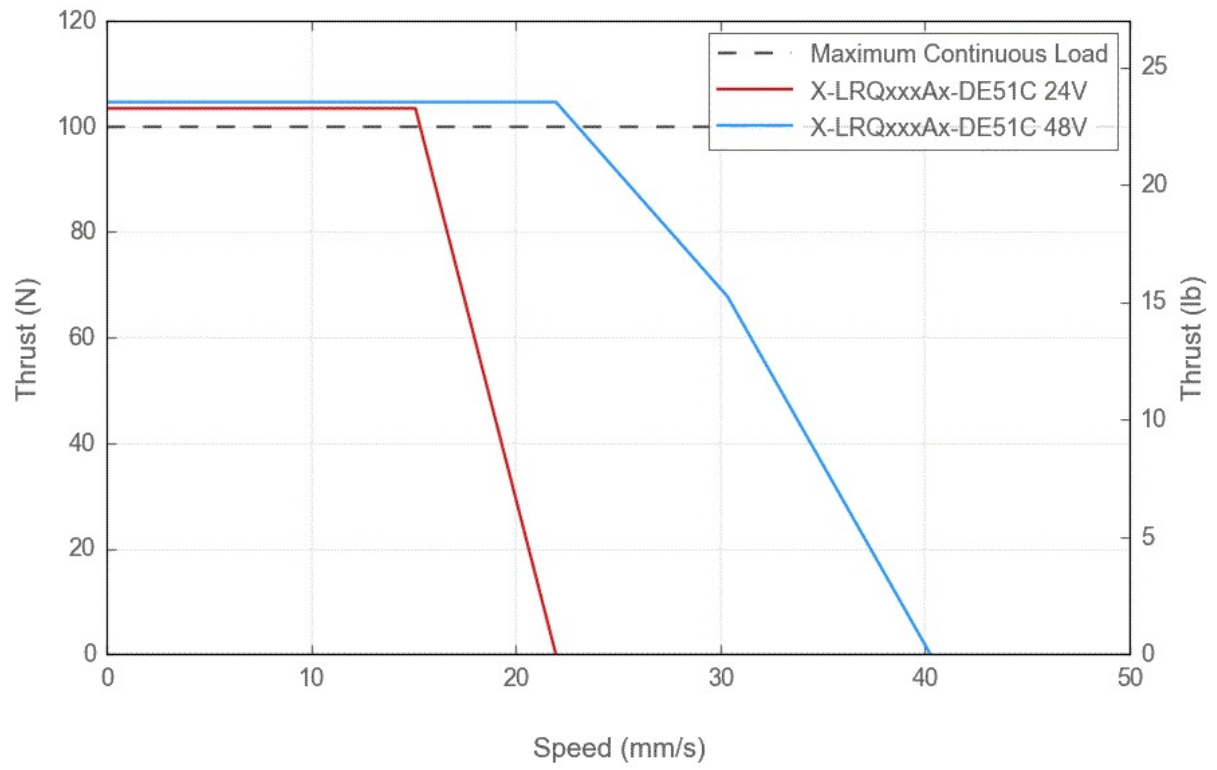
| Specification | Value | Alternate Unit |
|-----------------------------|-------------------------------|----------------|
| Linear Motion Per Motor Rev | 1.27 mm | 0.050" |
| Motor Steps Per Rev | 200 | |
| Motor Type | Stepper (2 phase) | |
| Motor Rated Current | 2300 mA/phase | |
| Inductance | 2.8 mH/phase | |
| Default Resolution | 1/64 of a step | |
| Data Cable Connection | Locking 4-pin M8 | |
| Mechanical Drive System | Precision lead screw | |
| 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 | |
| Weight | 2.93 kg | 6.460 lb |

X-LRQ-DEC Series Charts

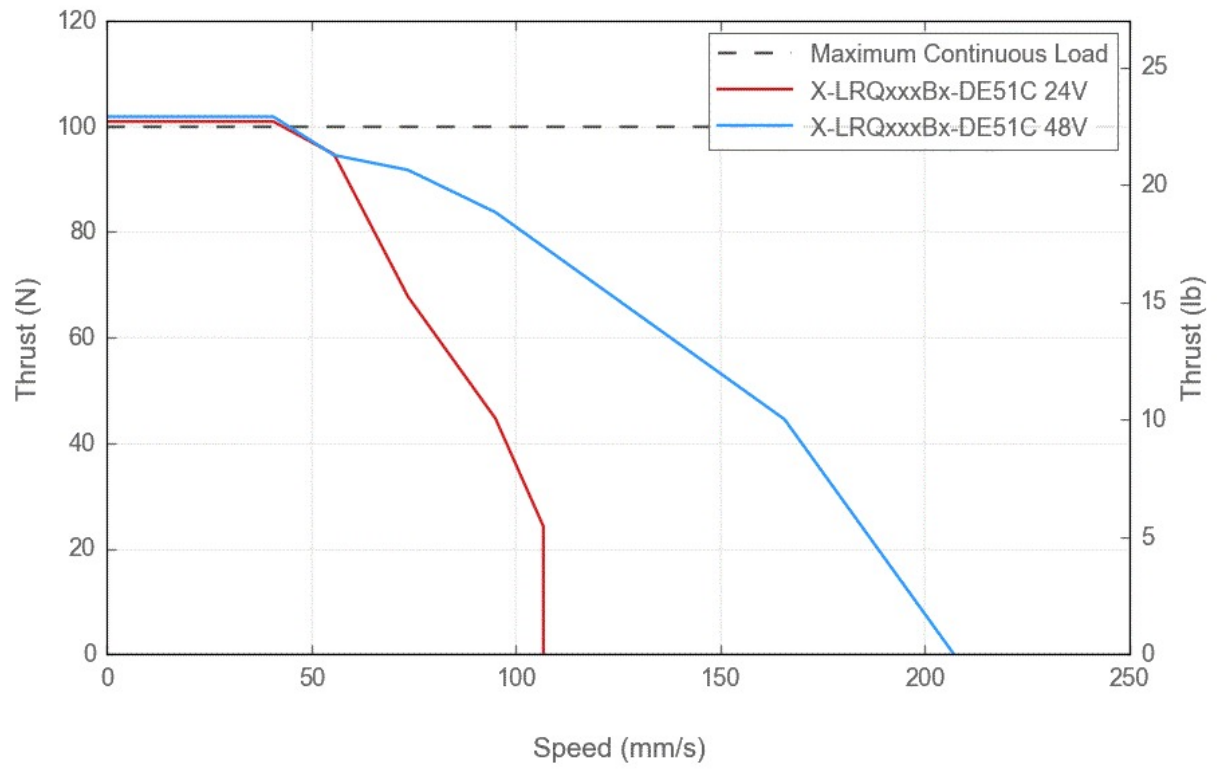
Thrust Speed Performance



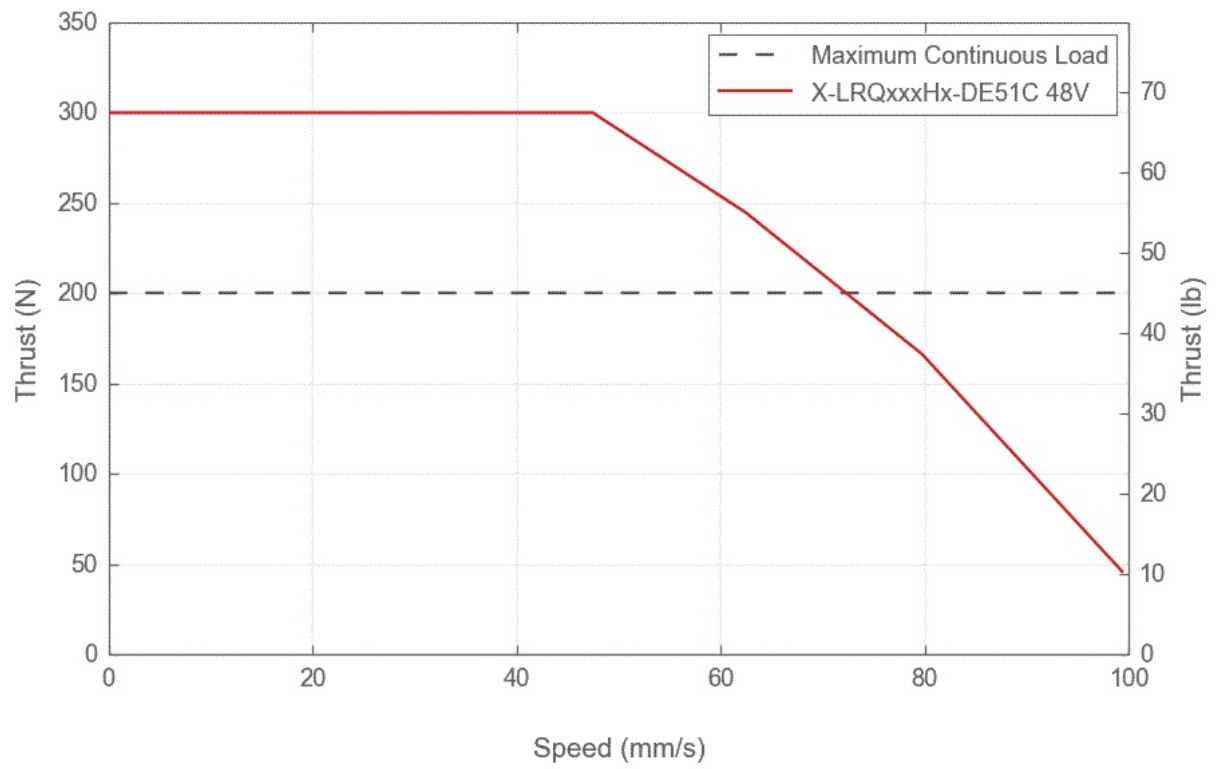
Thrust Speed Performance



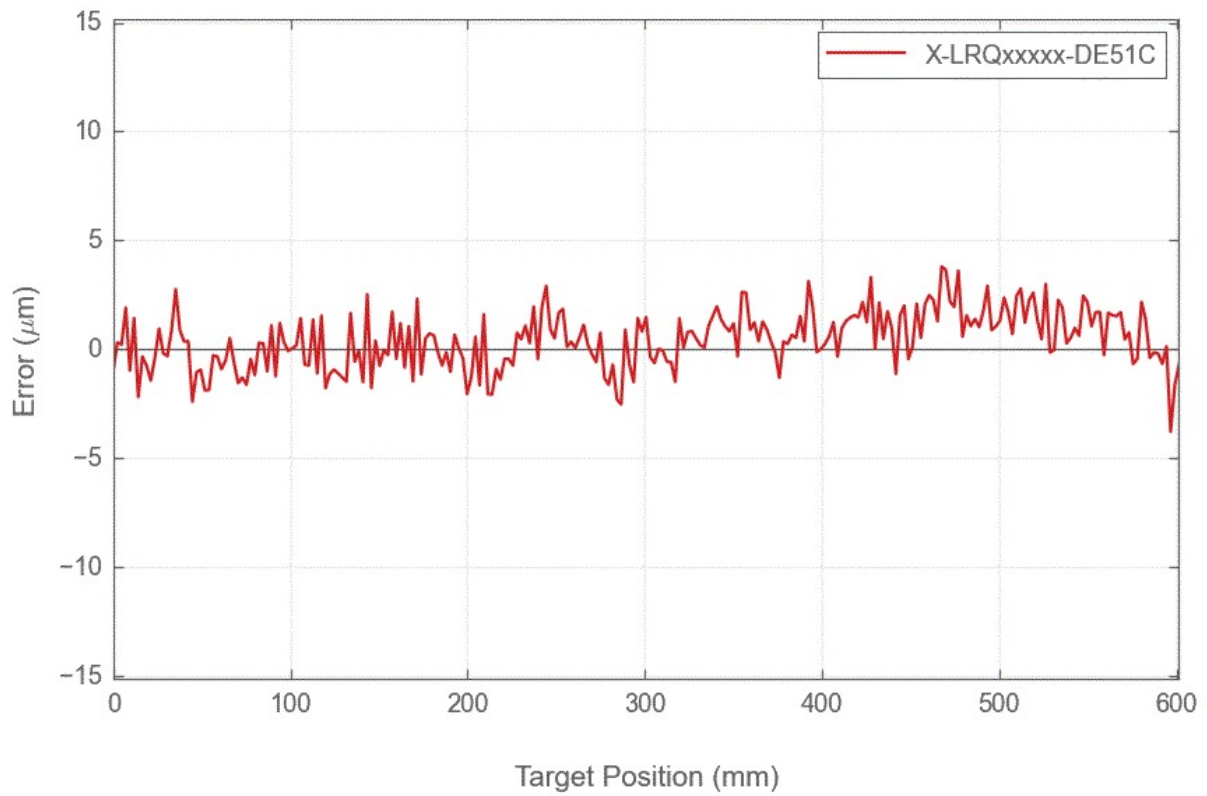
Thrust Speed Performance



Thrust Speed Performance



Typical Accuracy



LRQ Linear Bearing Lifetime

