

LRQ-DEC Series User's Manual

High precision linear stages with built-in linear encoders, dust covers



Disclaimer

Zaber's devices are not intended for use in any critical medical, aviation, or military applications or situations where a product's use or failure could cause personal injury, death, or damage to property. Zaber disclaims any and all liability for injury or other damages resulting from the use of our products.

Precautions

Zaber's autodetect peripheral axes are designed to be used effortlessly with Zaber's line of autodetect controllers. The LRQ-DEC includes onboard memory that allows Zaber's controllers to autodetect the model and set reasonable parameters. See the [Protocol Manual](#) for more information on how to modify the settings. Damage to the axis may result if the settings are not correct. To use your Zaber peripheral with a third-party controller, review the motor, sensor, and encoder specifications and pin-outs carefully.

Zaber's motion control devices are precision instruments and must be handled with care. In particular, moving parts must be treated with care. Avoid axial loads in excess of the rated thrust load, axial and radial impact, dust and other contaminants and damage to the lead screw thread. These will reduce the performance of the device below stated specifications.

Lubrication of linear guides

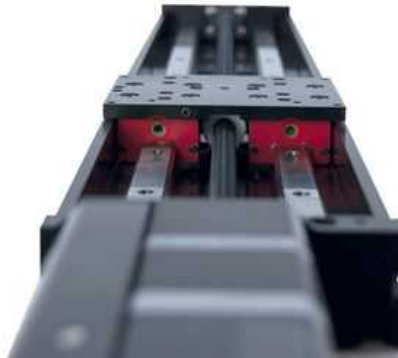
The LRQ-DEC series of linear stages use recirculating ball bearing linear guides to support and guide the stage top of the device. These linear guides require lubrication in order to achieve the longest possible lifetime at the highest possible performance. At the rated load of the device, it is recommended to re-lubricate each bearing block on the linear guide at a 500 km service interval. We recommend using 0.2 cm³ per bearing block of a NLGI Grade 2, lithium soap based grease. The grease ports are located on the motor end of the carriage (see pictures below). Simply remove the screw plugs using a 2.5 mm hex key and inject about 0.2 cm³ of grease into each port. Cycle the stage through its travel several times and wipe off any excess grease from the rails. All guides come pre-lubricated and are ready to go out of the box.

This grease is only intended for lubricating ball bearing guide, and is not suitable for use on the lead screw or any other locations on the stage.



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Re-lubricating LRQ linear guide



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LRQ linear guide lubrication ports

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Conventions used throughout this document

- Fixed width type indicates communication to and from a device. The ↵ symbol indicates a carriage return, which can be achieved by pressing enter when using a terminal program.
- An [ASCII command](#) followed by (T:xx) indicates a legacy T-Series [Binary Protocol](#) command that achieves the same result. For example, `move abs 10000 (T:20:10000)` shows that a move abs ASCII command can also be achieved with Binary command number 20. Not all ASCII commands have an equivalent Binary counterpart.

Device Overview

AutoDetect

Your LRQ-DEC peripheral is equipped with AutoDetect, a feature that allows a Zaber controller to automatically configure its settings for the peripheral when it is connected.



Important: The controller should always be powered down before disconnecting or connecting your LRQ-DEC peripheral.

To connect the peripheral to a controller:

1. Power off the controller.
2. Connect the LRQ-DEC peripheral.
3. Power on the controller.

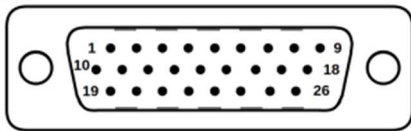
4. The controller will activate the peripheral shortly after it is powered on.

Connectors

Recommended controller(s) for your LRQ-DEC peripheral are provided in the product specifications. Zaber's controllers and peripherals are designed for ease of use when used together. Optimal settings for each peripheral are automatically detected by Zaber's controllers when the device is connected.

For reference, the pinout for the peripheral cable connectors is shown below:

Motor and Sensor Interface



Male High Density D-Sub26 Connector
Motor and Sensor Interface

Pin	Description	Pin	Description
1	AutoDetect Clock	14	N.C.
2	AutoDetect Data	15	+5V
3	N.C.	16	Ground
4	N.C.	17	N.C.
5	Home Limit Sensor	18	Motor B1
6	N.C.	19	Differential Encoder A-
7	Ground	20	Differential Encoder B-
8	Motor A2	21	Differential Encoder Index-
9	Motor A1	22	AutoDetect Presence
10	Differential Encoder A+	23	N.C.
11	Differential Encoder B+	24	N.C.
12	Differential Encoder Index+	25	N.C.
13	Differential Encoder Error	26	Motor B2

NOTE: All hall sensor signals (for limits or motor phase) are open collector and require a pull-up on the controller.

NOTE: All single-ended encoder inputs are non-isolated 5V TTL lines.

NOTE: All differential encoder signals are non-isolated, and must be terminated on the controller with 120 Ω. For -DE peripherals, these signals are RS-422 (digital) with a maximum frequency of 10 MHz.

Alternate Controllers

The LRQ-DEC can be controlled by any 2-phase stepper motor controller with limit sensor and appropriate encoder input. **We do not recommend using your own controller unless you are familiar with how to control a stepper motor with hall sensor limit switches.** Damage to the stage due to incorrect wiring is not covered by warranty.

Motors & Encoders

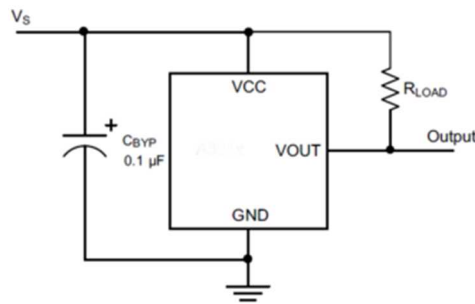
For motor and encoder information see the [LRQ-DEC product page](#)

Limit Sensors

Hall effect sensors are used in the LRQ-DEC as home sensors. The Hall sensors used are part number A1120LLHLT-T made by Allegro. [Click here for data sheet](#). Your controller should be configured so the stage stops immediately (quick deceleration) when the sensors are triggered.

- PCB wire colour code:
 - 3.6-24 Vdc input - red
 - Home signal - yellow
 - Away signal - white
 - Ground - black

The Hall sensor has an open-collector output. The default output is high impedance when the Hall sensor is not active. When the sensor detects a magnet, the Hall sensor pulls the output low to ground.



If you are not using a Zaber controller, ensure that your controller has a pull-up resistor on the output line of each Hall sensor as shown in the diagram. The bypass capacitor is optional, but may help to eliminate false triggering in noisy environments. The typical value for the pull-up resistor (R_{LOAD}) is $10 \text{ k}\Omega$ and for the bypass capacitor is $0.1 \mu F$ to $1 \mu F$. The larger the capacitance, the better the noise filtering but the slower the response time.

Installation

Physical Installation

The LRQ-DEC stage has two sets of mounting features that are acceptable means of fastening the stage to a structure. The first are the slotted holes in the middle of the stage which use M6 fasteners on a $25 \text{ mm} \times 50 \text{ mm}$ grid. The second set of mounting features are the T-slots located on the bottom of the stage which are 84 mm apart. The T-slots will generally accept T-nuts that are used in 20 mm aluminum T-slot extrusions.



Do not mount the stage using the T-slots on the side on the device. The T-slots are designed for use with accessories such as limit sensors, linear encoders, and cable trays only. This T-slot is designed to accept a standard M2.5 hex nut. Damage will occur if these T-slots are used to mount the stage.

Warranty and Repair

For Zaber's policies on warranty and repair, please refer to the [Ordering Policies](#).

Standard products

Standard products are any part numbers that do not contain the suffix ENG followed by a 4 digit number. Most, but not all, standard products are listed for sale on our website. All standard Zaber products are backed by a one-month satisfaction guarantee. If you are not satisfied with your purchase, we will refund your payment minus any shipping charges. Goods must be in brand new saleable condition with no marks. Zaber products are guaranteed for one year. During this period Zaber will repair any products with faults due to manufacturing defects, free of charge.

Custom products

Custom products are any part numbers containing the suffix ENG followed by a 4 digit number. Each of these products has been designed for a custom application for a particular customer. Custom products are guaranteed for one year, unless explicitly stated otherwise. During this period Zaber will repair any products with faults due to manufacturing defects, free of charge.

How to return products

Customers with devices in need of return or repair should contact Zaber to obtain an RMA form which must be filled out and sent back to us to receive an RMA number. The RMA form contains instructions for packing and returning the device. The specified RMA number must be included on the shipment to ensure timely processing.

Email Updates

If you would like to receive our periodic email newsletter including product updates and promotions, please sign up online at www.zaber.com ([news section](#)). Newsletters typically include a promotional offer worth at least \$100.

Contact Information

Contact Zaber Technologies Inc by any of the following methods:

Phone	1-604-569-3780 (direct) 1-888-276-8033 (toll free in North America)
Fax	1-604-648-8033
Mail	#2 – 605 West Kent Ave. N., Vancouver, British Columbia, Canada, V6P 6T7

Web	www.zaber.com
Email	Please visit our website for up to date email contact information.

The original instructions for this product are available at <https://www.zaber.com/manuals/LRQ-DEC>.

Appendix A: Default Settings

Please see [the Zaber Support Page](#) for default settings for this device.

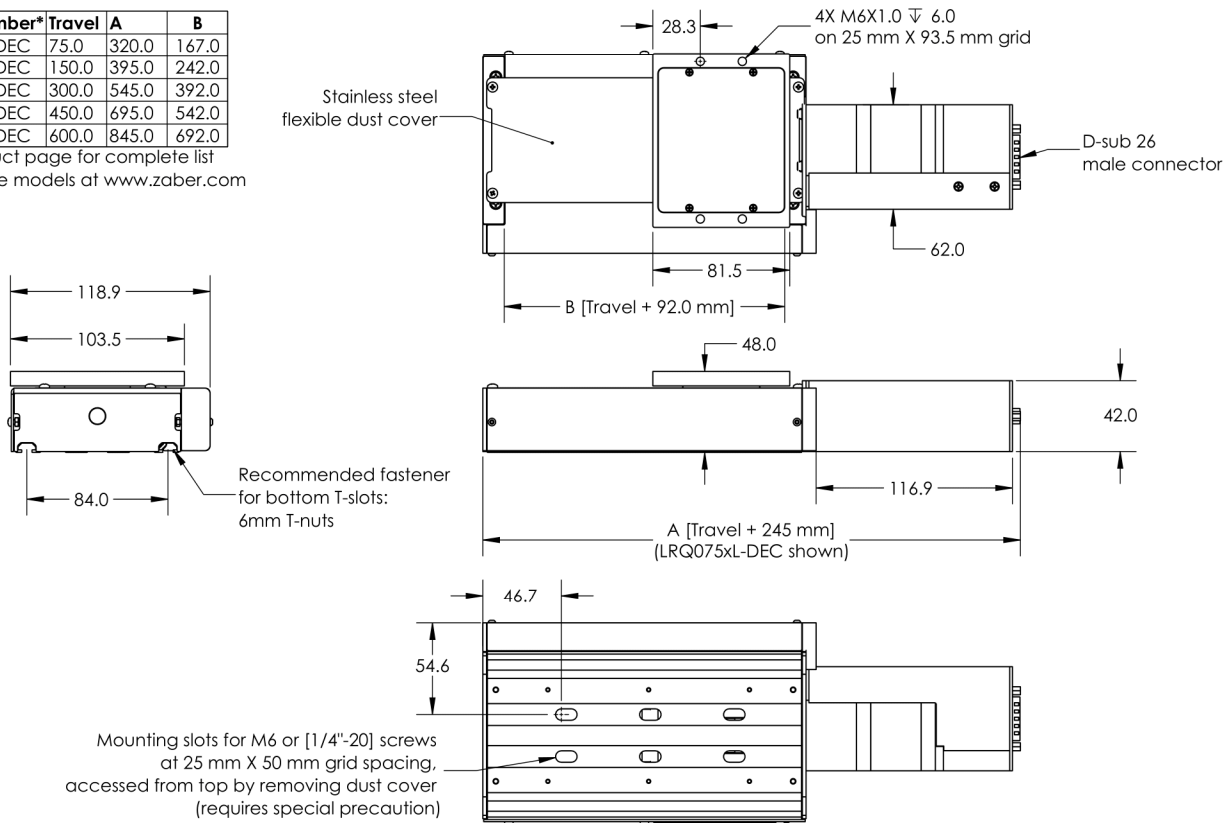
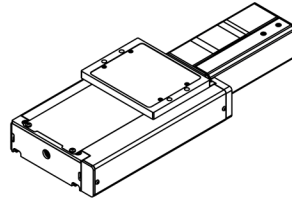
Product Drawings

ZABER

LRQxL-DEC Motorized Linear Stage
dimensions in mm

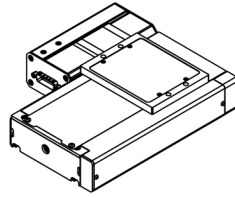
Model Number*	Travel	A	B
LRQ075xL-DEC	75.0	320.0	167.0
LRQ150xL-DEC	150.0	395.0	242.0
LRQ300xL-DEC	300.0	545.0	392.0
LRQ450xL-DEC	450.0	695.0	542.0
LRQ600xL-DEC	600.0	845.0	692.0

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



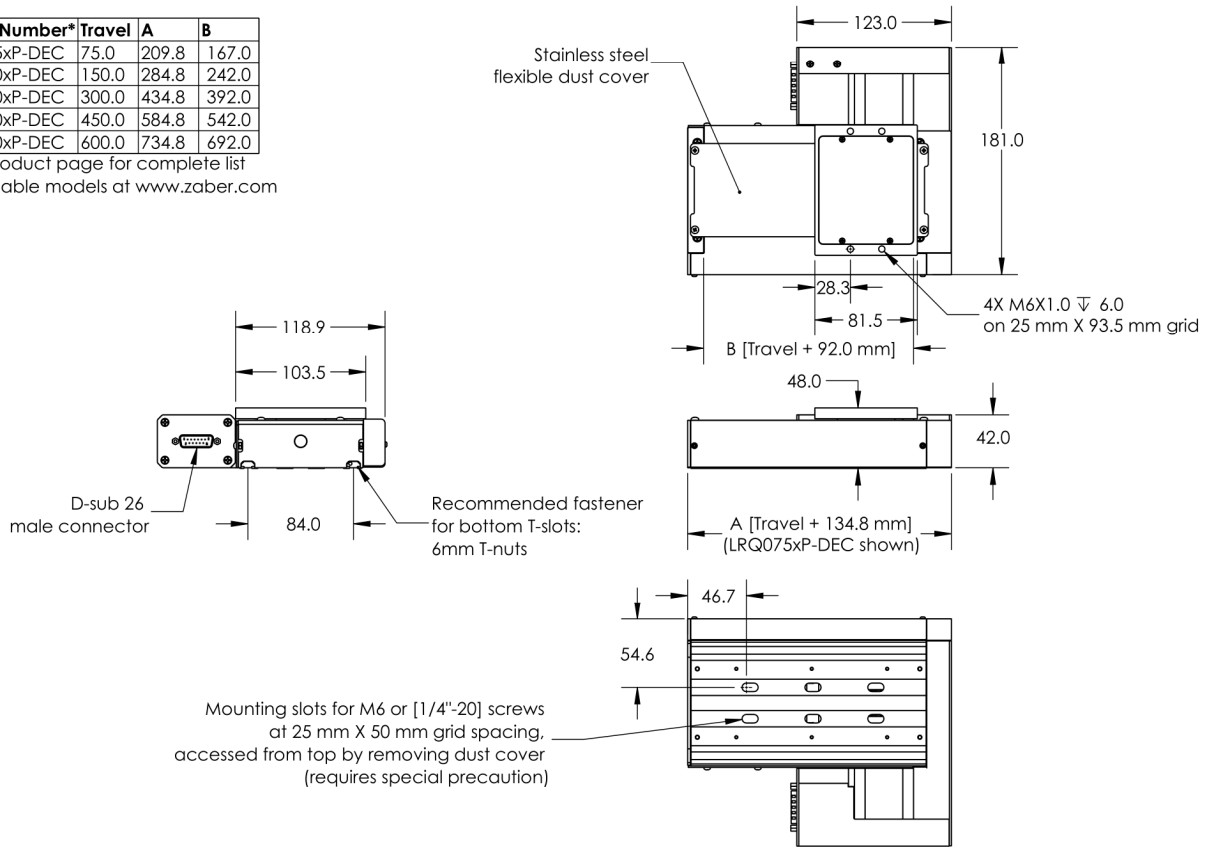
ZABER

LRQxP-DEC Motorized Linear Stage
dimensions in mm



Model Number*	Travel	A	B
LRQ075xP-DEC	75.0	209.8	167.0
LRQ150xP-DEC	150.0	284.8	242.0
LRQ300xP-DEC	300.0	434.8	392.0
LRQ450xP-DEC	450.0	584.8	542.0
LRQ600xP-DEC	600.0	734.8	692.0

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



DWG 1445 R01A

Specifications

Specification	Value	Alternate Unit
Built-in Controller	No	
Recommended Controller	X-MCC (48 V) Recommended	
AutoDetect	Yes	
Encoder Type	Linear quadrature encoder	
Encoder Resolution	50 nm	
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/°	27 μ rad/N · m
Stiffness in Roll	1850 N · m/°	9 μ rad/N · m
Stiffness in Yaw	665 N · m/°	26 μ rad/N · m
Motor Steps Per Rev	200	
Motor Type	Stepper (2 phase)	
Motor Rated Current	2300 mA/phase	
Motor Winding Resistance	1 ohms/phase	
Inductance	2.2 mH/phase	
Motor Connection	D-sub 26	
Default Resolution	1/64 of a step	

Specification	Value	Alternate Unit
Limit or Home Sensing	Magnetic home sensor	
Axes of Motion	1	
Mounting Interface	M6 and M3 threaded holes	
Operating Temperature Range	0 to 50 ° C	
Vacuum Compatible	No	
RoHS Compliant	Yes	
CE Compliant	Yes	

Comparison

Part Number	Microstep Size (Default Resolution)	Travel Range	Accuracy (unidirectional)	Repeatability
LRQ075AL-DE51CT10A	0.09921875 µm	75 mm (2.953")	10 µm (0.000394")	< 2.5 µm (< 0.000098")
LRQ075BL-DE51CT10A	0.49609375 µm	75 mm (2.953")	13 µm (0.000512")	< 3.5 µm (< 0.000138")
LRQ075HL-DE51CT10A	0.1953125 µm	75 mm (2.953")	13 µm (0.000512")	< 3 µm (< 0.000118")
LRQ150AL-DE51CT10A	0.09921875 µm	150 mm (5.905")	10 µm (0.000394")	< 2.5 µm (< 0.000098")
LRQ150BL-DE51CT10A	0.49609375 µm	150 mm (5.905")	13 µm (0.000512")	< 3.5 µm (< 0.000138")
LRQ150HL-DE51CT10A	0.1953125 µm	150 mm (5.905")	13 µm (0.000512")	< 3 µm (< 0.000118")
LRQ300AL-DE51CT10A	0.09921875 µm	300 mm (11.811")	10 µm (0.000394")	< 2.5 µm (< 0.000098")
LRQ300BL-DE51CT10A	0.49609375 µm	300 mm (11.811")	13 µm (0.000512")	< 3.5 µm (< 0.000138")
LRQ300HL-DE51CT10A	0.1953125 µm	300 mm (11.811")	13 µm (0.000512")	< 3 µm (< 0.000118")
LRQ450AL-DE51CT10A	0.09921875 µm	450 mm (17.716")	10 µm (0.000394")	< 2.5 µm (< 0.000098")
LRQ450BL-DE51CT10A	0.49609375 µm	450 mm (17.716")	13 µm (0.000512")	< 3.5 µm (< 0.000138")
LRQ450HL-DE51CT10A	0.1953125 µm	450 mm (17.716")	13 µm (0.000512")	< 3 µm (< 0.000118")
LRQ600AL-DE51CT10A	0.09921875 µm	600 mm (23.622")	10 µm (0.000394")	< 2.5 µm (< 0.000098")
LRQ600BL-DE51CT10A	0.49609375 µm	600 mm (23.622")	13 µm (0.000512")	< 3.5 µm (< 0.000138")
LRQ600HL-DE51CT10A	0.1953125 µm	600 mm (23.622")	13 µm (0.000512")	< 3 µm (< 0.000118")
LRQ075AP-DE51CT10A	0.09921875 µm	75 mm (2.953")	10 µm (0.000394")	< 2.5 µm (< 0.000098")
LRQ075BP-DE51CT10A	0.49609375 µm	75 mm (2.953")	13 µm (0.000512")	< 3.5 µm (< 0.000138")
LRQ075HP-DE51CT10A	0.1953125 µm	75 mm (2.953")	13 µm (0.000512")	< 3 µm (< 0.000118")

Part Number	<u>Microstep Size</u> (Default Resolution)	<u>Travel Range</u>	<u>Accuracy</u> (unidirectional)	<u>Repeatability</u>
LRQ150AP-DE51CT10A	0.09921875 μm	150 mm (5.905")	10 μm (0.000394")	< 2.5 μm (< 0.000098")
LRQ150BP-DE51CT10A	0.49609375 μm	150 mm (5.905")	13 μm (0.000512")	< 3.5 μm (< 0.000138")
LRQ150HP-DE51CT10A	0.1953125 μm	150 mm (5.905")	13 μm (0.000512")	< 3 μm (< 0.000118")
LRQ300AP-DE51CT10A	0.09921875 μm	300 mm (11.811")	10 μm (0.000394")	< 2.5 μm (< 0.000098")
LRQ300BP-DE51CT10A	0.49609375 μm	300 mm (11.811")	13 μm (0.000512")	< 3.5 μm (< 0.000138")
LRQ300HP-DE51CT10A	0.1953125 μm	300 mm (11.811")	13 μm (0.000512")	< 3 μm (< 0.000118")
LRQ450AP-DE51CT10A	0.09921875 μm	450 mm (17.716")	10 μm (0.000394")	< 2.5 μm (< 0.000098")
LRQ450BP-DE51CT10A	0.49609375 μm	450 mm (17.716")	13 μm (0.000512")	< 3.5 μm (< 0.000138")
LRQ450HP-DE51CT10A	0.1953125 μm	450 mm (17.716")	13 μm (0.000512")	< 3 μm (< 0.000118")
LRQ600AP-DE51CT10A	0.09921875 μm	600 mm (23.622")	10 μm (0.000394")	< 2.5 μm (< 0.000098")
LRQ600BP-DE51CT10A	0.49609375 μm	600 mm (23.622")	13 μm (0.000512")	< 3.5 μm (< 0.000138")
LRQ600HP-DE51CT10A	0.1953125 μm	600 mm (23.622")	13 μm (0.000512")	< 3 μm (< 0.000118")

Part Number	<u>Backlash</u>	<u>Maximum Speed</u>	<u>Minimum Speed</u>	<u>Speed Resolution</u>
LRQ075AL-DE51CT10A	< 5 μm (< 0.000197")	54 mm/s (2.126"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)
LRQ075BL-DE51CT10A	< 6.5 μm (< 0.000256")	270 mm/s (10.630"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
LRQ075HL-DE51CT10A	< 6.5 μm (< 0.000256")	110 mm/s (4.331"/s)	0.000119 mm/s (0.000005"/s)	0.000119 mm/s (0.000005"/s)
LRQ150AL-DE51CT10A	< 5 μm (< 0.000197")	54 mm/s (2.126"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)
LRQ150BL-DE51CT10A	< 6.5 μm (< 0.000256")	270 mm/s (10.630"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
LRQ150HL-DE51CT10A	< 6.5 μm (< 0.000256")	110 mm/s (4.331"/s)	0.000119 mm/s (0.000005"/s)	0.000119 mm/s (0.000005"/s)
LRQ300AL-DE51CT10A	< 5 μm (< 0.000197")	54 mm/s (2.126"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)
LRQ300BL-DE51CT10A	< 6.5 μm (< 0.000256")	270 mm/s (10.630"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
LRQ300HL-DE51CT10A	< 6.5 μm (< 0.000256")	110 mm/s (4.331"/s)	0.000119 mm/s (0.000005"/s)	0.000119 mm/s (0.000005"/s)
LRQ450AL-DE51CT10A	< 5 μm (< 0.000197")	54 mm/s (2.126"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)

Part Number	<u>Backlash</u>	<u>Maximum Speed</u>	<u>Minimum Speed</u>	<u>Speed Resolution</u>
LRQ450BL-DE51CT10A	< 6.5 μm (< 0.000256")	270 mm/s (10.630"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
LRQ450HL-DE51CT10A	< 6.5 μm (< 0.000256")	110 mm/s (4.331"/s)	0.000119 mm/s (0.000005"/s)	0.000119 mm/s (0.000005"/s)
LRQ600AL-DE51CT10A	< 5 μm (< 0.000197")	54 mm/s (2.126"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)
LRQ600BL-DE51CT10A	< 6.5 μm (< 0.000256")	270 mm/s (10.630"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
LRQ600HL-DE51CT10A	< 6.5 μm (< 0.000256")	110 mm/s (4.331"/s)	0.000119 mm/s (0.000005"/s)	0.000119 mm/s (0.000005"/s)
LRQ075AP-DE51CT10A	< 5 μm (< 0.000197")	40 mm/s (1.575"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)
LRQ075BP-DE51CT10A	< 6.5 μm (< 0.000256")	270 mm/s (10.630"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
LRQ075HP-DE51CT10A	< 6.5 μm (< 0.000256")	110 mm/s (4.331"/s)	0.000119 mm/s (0.000005"/s)	0.000119 mm/s (0.000005"/s)
LRQ150AP-DE51CT10A	< 5 μm (< 0.000197")	54 mm/s (2.126"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)
LRQ150BP-DE51CT10A	< 6.5 μm (< 0.000256")	270 mm/s (10.630"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
LRQ150HP-DE51CT10A	< 6.5 μm (< 0.000256")	110 mm/s (4.331"/s)	0.000119 mm/s (0.000005"/s)	0.000119 mm/s (0.000005"/s)
LRQ300AP-DE51CT10A	< 5 μm (< 0.000197")	54 mm/s (2.126"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)
LRQ300BP-DE51CT10A	< 6.5 μm (< 0.000256")	270 mm/s (10.630"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
LRQ300HP-DE51CT10A	< 6.5 μm (< 0.000256")	110 mm/s (4.331"/s)	0.000119 mm/s (0.000005"/s)	0.000119 mm/s (0.000005"/s)
LRQ450AP-DE51CT10A	< 5 μm (< 0.000197")	54 mm/s (2.126"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)
LRQ450BP-DE51CT10A	< 6.5 μm (< 0.000256")	270 mm/s (10.630"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
LRQ450HP-DE51CT10A	< 6.5 μm (< 0.000256")	110 mm/s (4.331"/s)	0.000119 mm/s (0.000005"/s)	0.000119 mm/s (0.000005"/s)
LRQ600AP-DE51CT10A	< 5 μm (< 0.000197")	54 mm/s (2.126"/s)	0.000061 mm/s (0.000002"/s)	0.000061 mm/s (0.000002"/s)
LRQ600BP-DE51CT10A	< 6.5 μm (< 0.000256")	270 mm/s (10.630"/s)	0.000303 mm/s (0.000012"/s)	0.000303 mm/s (0.000012"/s)
LRQ600HP-DE51CT10A	< 6.5 μm (< 0.000256")	110 mm/s (4.331"/s)	0.000119 mm/s (0.000005"/s)	0.000119 mm/s (0.000005"/s)

Part Number	<u>Peak Thrust</u>	<u>Back-driving Force</u>	<u>Maximum Continuous Thrust</u>	<u>Vertical Runout</u>
LRQ075AL-DE51CT10A	230 N (51.6 lb)	Non-back-driving	100 N (22.4 lb)	< 20 μm (< 0.000787")
LRQ075BL-DE51CT10A	150 N (33.6 lb)	106 N (23.8 lb) (± 30%)	100 N (22.4 lb)	< 20 μm (< 0.000787")

Part Number	Peak Thrust	Back-driving Force	Maximum Continuous Thrust	Vertical Runout
LRQ075HL-DE51CT10A	500 N (112.1 lb)	106 N (23.8 lb) (± 30%)	200 N (44.9 lb)	< 20 µm (< 0.000787")
LRQ150AL-DE51CT10A	230 N (51.6 lb)	Non-back-driving	100 N (22.4 lb)	< 25 µm (< 0.000984")
LRQ150BL-DE51CT10A	150 N (33.6 lb)	106 N (23.8 lb) (± 30%)	100 N (22.4 lb)	< 25 µm (< 0.000984")
LRQ150HL-DE51CT10A	500 N (112.1 lb)	106 N (23.8 lb) (± 30%)	200 N (44.9 lb)	< 25 µm (< 0.000984")
LRQ300AL-DE51CT10A	230 N (51.6 lb)	Non-back-driving	100 N (22.4 lb)	< 35 µm (< 0.001378")
LRQ300BL-DE51CT10A	150 N (33.6 lb)	106 N (23.8 lb) (± 30%)	100 N (22.4 lb)	< 35 µm (< 0.001378")
LRQ300HL-DE51CT10A	500 N (112.1 lb)	106 N (23.8 lb) (± 30%)	200 N (44.9 lb)	< 35 µm (< 0.001378")
LRQ450AL-DE51CT10A	230 N (51.6 lb)	Non-back-driving	100 N (22.4 lb)	< 45 µm (< 0.001772")
LRQ450BL-DE51CT10A	150 N (33.6 lb)	106 N (23.8 lb) (± 30%)	100 N (22.4 lb)	< 45 µm (< 0.001772")
LRQ450HL-DE51CT10A	500 N (112.1 lb)	106 N (23.8 lb) (± 30%)	200 N (44.9 lb)	< 45 µm (< 0.001772")
LRQ600AL-DE51CT10A	230 N (51.6 lb)	Non-back-driving	100 N (22.4 lb)	< 75 µm (< 0.002953")
LRQ600BL-DE51CT10A	150 N (33.6 lb)	106 N (23.8 lb) (± 30%)	100 N (22.4 lb)	< 75 µm (< 0.002953")
LRQ600HL-DE51CT10A	500 N (112.1 lb)	106 N (23.8 lb) (± 30%)	200 N (44.9 lb)	< 75 µm (< 0.002953")
LRQ075AP-DE51CT10A	230 N (51.6 lb)	Non-back-driving	100 N (22.4 lb)	< 20 µm (< 0.000787")
LRQ075BP-DE51CT10A	150 N (33.6 lb)	136 N (30.5 lb) (± 30%)	100 N (22.4 lb)	< 20 µm (< 0.000787")
LRQ075HP-DE51CT10A	500 N (112.1 lb)	136 N (30.5 lb) (± 30%)	200 N (44.9 lb)	< 20 µm (< 0.000787")
LRQ150AP-DE51CT10A	230 N (51.6 lb)	Non-back-driving	100 N (22.4 lb)	< 25 µm (< 0.000984")
LRQ150BP-DE51CT10A	150 N (33.6 lb)	136 N (30.5 lb) (± 30%)	100 N (22.4 lb)	< 25 µm (< 0.000984")
LRQ150HP-DE51CT10A	500 N (112.1 lb)	136 N (30.5 lb) (± 30%)	200 N (44.9 lb)	< 25 µm (< 0.000984")
LRQ300AP-DE51CT10A	230 N (51.6 lb)	Non-back-driving	100 N (22.4 lb)	< 35 µm (< 0.001378")
LRQ300BP-DE51CT10A	150 N (33.6 lb)	136 N (30.5 lb) (± 30%)	100 N (22.4 lb)	< 35 µm (< 0.001378")
LRQ300HP-DE51CT10A	500 N (112.1 lb)	136 N (30.5 lb) (± 30%)	200 N (44.9 lb)	< 35 µm (< 0.001378")
LRQ450AP-DE51CT10A	230 N (51.6 lb)	Non-back-driving	100 N (22.4 lb)	< 45 µm (< 0.001772")

Part Number	Peak Thrust	Back-driving Force	Maximum Continuous Thrust	Vertical Runout
LRQ450BP-DE51CT10A	150 N (33.6 lb)	136 N (30.5 lb) (± 30%)	100 N (22.4 lb)	< 45 µm (< 0.001772")
LRQ450HP-DE51CT10A	500 N (112.1 lb)	136 N (30.5 lb) (± 30%)	200 N (44.9 lb)	< 45 µm (< 0.001772")
LRQ600AP-DE51CT10A	230 N (51.6 lb)	Non-back-driving	100 N (22.4 lb)	< 75 µm (< 0.002953")
LRQ600BP-DE51CT10A	150 N (33.6 lb)	136 N (30.5 lb) (± 30%)	100 N (22.4 lb)	< 75 µm (< 0.002953")
LRQ600HP-DE51CT10A	500 N (112.1 lb)	136 N (30.5 lb) (± 30%)	200 N (44.9 lb)	< 75 µm (< 0.002953")

Part Number	Horizontal Runout	Pitch	Roll	Yaw
LRQ075AL-DE51CT10A	< 20 µm (< 0.000787")	0.025° (0.436 mrad)	0.01° (0.174 mrad)	0.02° (0.349 mrad)
LRQ075BL-DE51CT10A	< 20 µm (< 0.000787")	0.025° (0.436 mrad)	0.01° (0.174 mrad)	0.02° (0.349 mrad)
LRQ075HL-DE51CT10A	< 20 µm (< 0.000787")	0.025° (0.436 mrad)	0.01° (0.174 mrad)	0.02° (0.349 mrad)
LRQ150AL-DE51CT10A	< 20 µm (< 0.000787")	0.03° (0.523 mrad)	0.015° (0.262 mrad)	0.02° (0.349 mrad)
LRQ150BL-DE51CT10A	< 20 µm (< 0.000787")	0.03° (0.523 mrad)	0.015° (0.262 mrad)	0.02° (0.349 mrad)
LRQ150HL-DE51CT10A	< 20 µm (< 0.000787")	0.03° (0.523 mrad)	0.015° (0.262 mrad)	0.02° (0.349 mrad)
LRQ300AL-DE51CT10A	< 30 µm (< 0.001181")	0.034° (0.593 mrad)	0.015° (0.262 mrad)	0.03° (0.523 mrad)
LRQ300BL-DE51CT10A	< 30 µm (< 0.001181")	0.034° (0.593 mrad)	0.015° (0.262 mrad)	0.03° (0.523 mrad)
LRQ300HL-DE51CT10A	< 30 µm (< 0.001181")	0.034° (0.593 mrad)	0.015° (0.262 mrad)	0.03° (0.523 mrad)
LRQ450AL-DE51CT10A	< 40 µm (< 0.001575")	0.04° (0.698 mrad)	0.025° (0.436 mrad)	0.04° (0.698 mrad)
LRQ450BL-DE51CT10A	< 40 µm (< 0.001575")	0.04° (0.698 mrad)	0.025° (0.436 mrad)	0.04° (0.698 mrad)
LRQ450HL-DE51CT10A	< 40 µm (< 0.001575")	0.04° (0.698 mrad)	0.025° (0.436 mrad)	0.04° (0.698 mrad)
LRQ600AL-DE51CT10A	< 60 µm (< 0.002362")	0.045° (0.785 mrad)	0.035° (0.611 mrad)	0.04° (0.698 mrad)
LRQ600BL-DE51CT10A	< 60 µm (< 0.002362")	0.045° (0.785 mrad)	0.035° (0.611 mrad)	0.04° (0.698 mrad)
LRQ600HL-DE51CT10A	< 60 µm (< 0.002362")	0.045° (0.785 mrad)	0.035° (0.611 mrad)	0.04° (0.698 mrad)
LRQ075AP-DE51CT10A	< 20 µm (< 0.000787")	0.025° (0.436 mrad)	0.01° (0.174 mrad)	0.02° (0.349 mrad)
LRQ075BP-DE51CT10A	< 20 µm (< 0.000787")	0.025° (0.436 mrad)	0.01° (0.174 mrad)	0.02° (0.349 mrad)

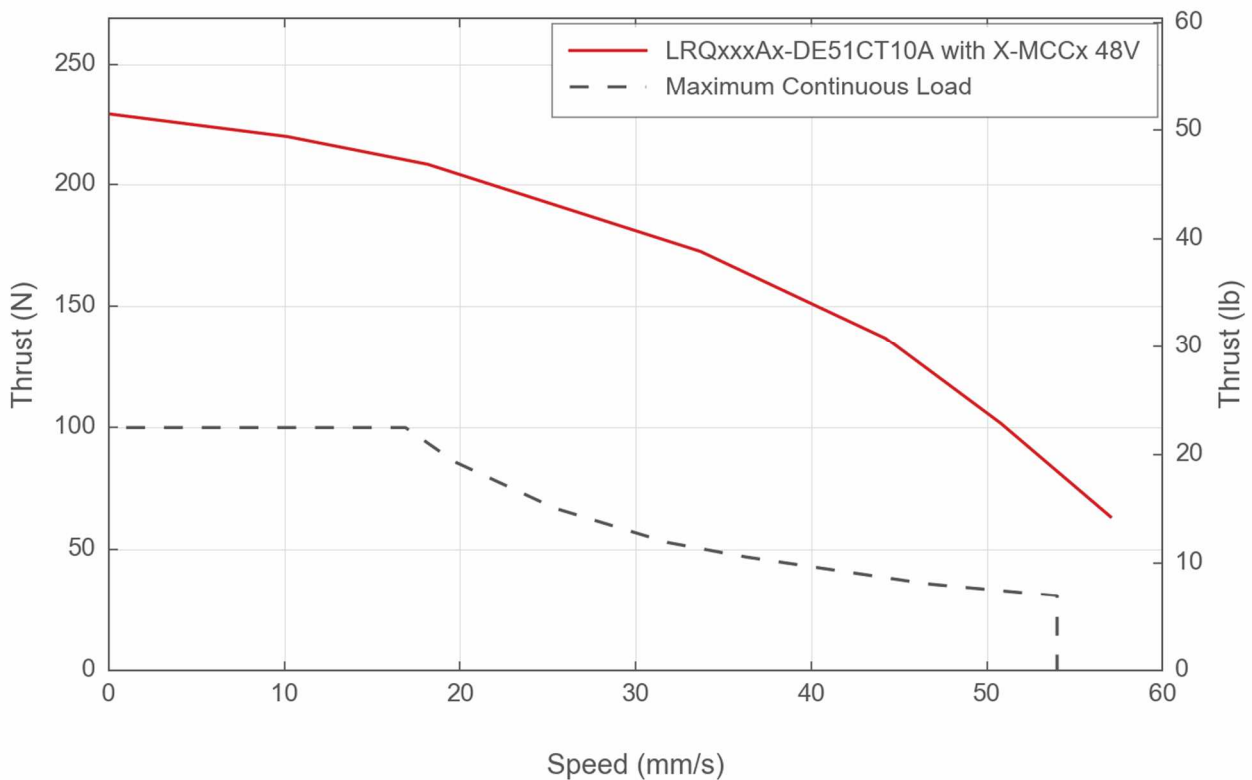
Part Number	<u>Horizontal Runout</u>	<u>Pitch</u>	<u>Roll</u>	<u>Yaw</u>
LRQ075HP-DE51CT10A	< 20 μm (< 0.000787")	0.025° (0.436 mrad)	0.01° (0.174 mrad)	0.02° (0.349 mrad)
LRQ150AP-DE51CT10A	< 20 μm (< 0.000787")	0.03° (0.523 mrad)	0.015° (0.262 mrad)	0.02° (0.349 mrad)
LRQ150BP-DE51CT10A	< 20 μm (< 0.000787")	0.03° (0.523 mrad)	0.015° (0.262 mrad)	0.02° (0.349 mrad)
LRQ150HP-DE51CT10A	< 20 μm (< 0.000787")	0.03° (0.523 mrad)	0.015° (0.262 mrad)	0.02° (0.349 mrad)
LRQ300AP-DE51CT10A	< 30 μm (< 0.001181")	0.034° (0.593 mrad)	0.015° (0.262 mrad)	0.03° (0.523 mrad)
LRQ300BP-DE51CT10A	< 30 μm (< 0.001181")	0.034° (0.593 mrad)	0.015° (0.262 mrad)	0.03° (0.523 mrad)
LRQ300HP-DE51CT10A	< 30 μm (< 0.001181")	0.034° (0.593 mrad)	0.015° (0.262 mrad)	0.03° (0.523 mrad)
LRQ450AP-DE51CT10A	< 40 μm (< 0.001575")	0.04° (0.698 mrad)	0.025° (0.436 mrad)	0.04° (0.698 mrad)
LRQ450BP-DE51CT10A	< 40 μm (< 0.001575")	0.04° (0.698 mrad)	0.025° (0.436 mrad)	0.04° (0.698 mrad)
LRQ450HP-DE51CT10A	< 40 μm (< 0.001575")	0.04° (0.698 mrad)	0.025° (0.436 mrad)	0.04° (0.698 mrad)
LRQ600AP-DE51CT10A	< 60 μm (< 0.002362")	0.045° (0.785 mrad)	0.035° (0.611 mrad)	0.04° (0.698 mrad)
LRQ600BP-DE51CT10A	< 60 μm (< 0.002362")	0.045° (0.785 mrad)	0.035° (0.611 mrad)	0.04° (0.698 mrad)
LRQ600HP-DE51CT10A	< 60 μm (< 0.002362")	0.045° (0.785 mrad)	0.035° (0.611 mrad)	0.04° (0.698 mrad)

Part Number	<u>Linear Motion Per Motor Rev</u>	<u>Mechanical Drive System</u>	<u>Weight</u>
LRQ075AL-DE51CT10A	1.27 mm (0.050")	Precision lead screw	2.47 kg (5.445 lb)
LRQ075BL-DE51CT10A	6.35 mm (0.250")	Precision lead screw	2.47 kg (5.445 lb)
LRQ075HL-DE51CT10A	2.5 mm (0.098")	Precision ball screw	2.47 kg (5.445 lb)
LRQ150AL-DE51CT10A	1.27 mm (0.050")	Precision lead screw	2.89 kg (6.371 lb)
LRQ150BL-DE51CT10A	6.35 mm (0.250")	Precision lead screw	2.89 kg (6.371 lb)
LRQ150HL-DE51CT10A	2.5 mm (0.098")	Precision ball screw	2.89 kg (6.371 lb)
LRQ300AL-DE51CT10A	1.27 mm (0.050")	Precision lead screw	3.73 kg (8.223 lb)
LRQ300BL-DE51CT10A	6.35 mm (0.250")	Precision lead screw	3.73 kg (8.223 lb)
LRQ300HL-DE51CT10A	2.5 mm (0.098")	Precision ball screw	3.73 kg (8.223 lb)
LRQ450AL-DE51CT10A	1.27 mm (0.050")	Precision lead screw	4.57 kg (10.075 lb)
LRQ450BL-DE51CT10A	6.35 mm (0.250")	Precision lead screw	4.57 kg (10.075 lb)
LRQ450HL-DE51CT10A	2.5 mm (0.098")	Precision ball screw	4.57 kg (10.075 lb)
LRQ600AL-DE51CT10A	1.27 mm (0.050")	Precision lead screw	5.37 kg (11.839 lb)
LRQ600BL-DE51CT10A	6.35 mm (0.250")	Precision lead screw	5.37 kg (11.839 lb)
LRQ600HL-DE51CT10A	2.5 mm (0.098")	Precision ball screw	5.37 kg (11.839 lb)
LRQ075AP-DE51CT10A	1.27 mm (0.050")	Precision lead screw	2.64 kg (5.820 lb)
LRQ075BP-DE51CT10A	6.35 mm (0.250")	Precision lead screw	2.64 kg (5.820 lb)
LRQ075HP-DE51CT10A	2.5 mm (0.098")	Precision ball screw	2.64 kg (5.820 lb)
LRQ150AP-DE51CT10A	1.27 mm (0.050")	Precision lead screw	3.06 kg (6.746 lb)

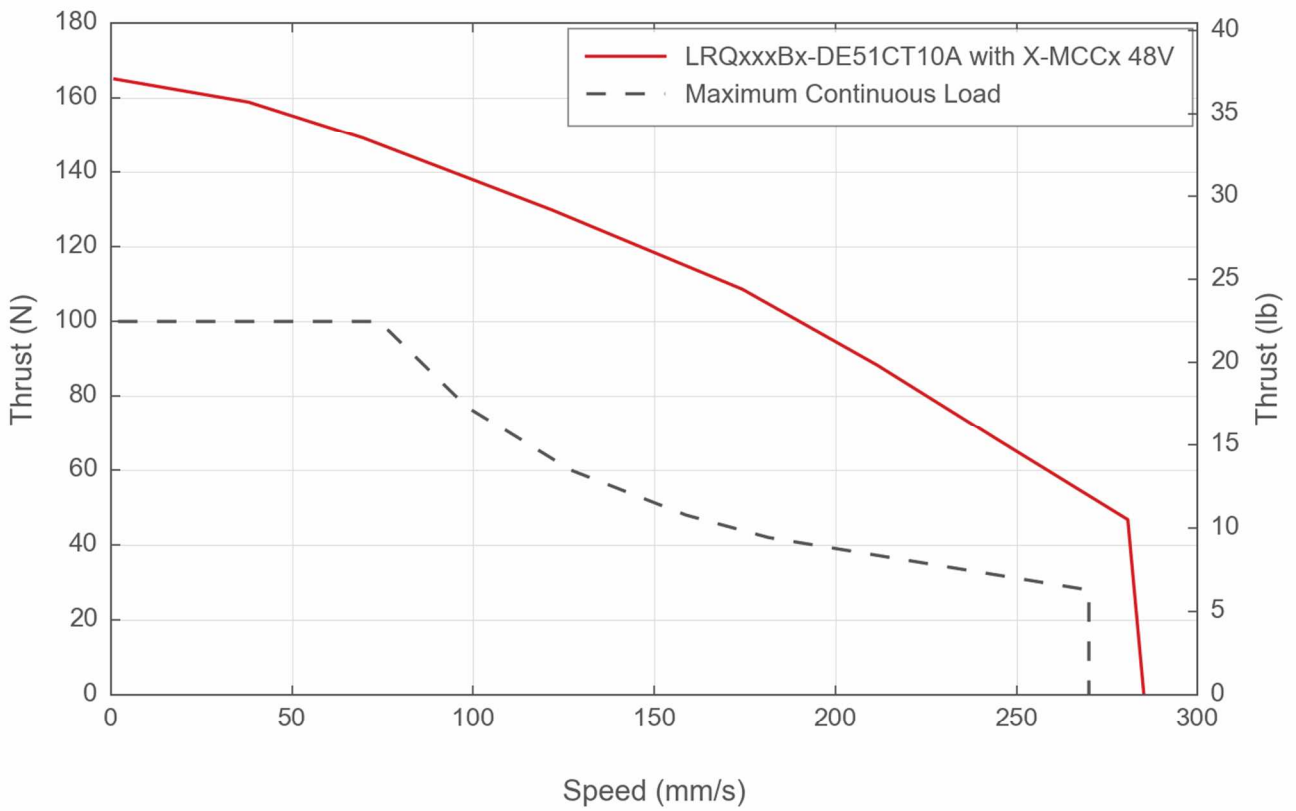
Part Number	Linear Motion Per Motor Rev	Mechanical Drive System	Weight
LRQ150BP-DE51CT10A	6.35 mm (0.250")	Precision lead screw	3.06 kg (6.746 lb)
LRQ150HP-DE51CT10A	2.5 mm (0.098")	Precision ball screw	3.06 kg (6.746 lb)
LRQ300AP-DE51CT10A	1.27 mm (0.050")	Precision lead screw	3.91 kg (8.620 lb)
LRQ300BP-DE51CT10A	6.35 mm (0.250")	Precision lead screw	3.91 kg (8.620 lb)
LRQ300HP-DE51CT10A	2.5 mm (0.098")	Precision ball screw	3.91 kg (8.620 lb)
LRQ450AP-DE51CT10A	1.27 mm (0.050")	Precision lead screw	4.74 kg (10.450 lb)
LRQ450BP-DE51CT10A	6.35 mm (0.250")	Precision lead screw	4.74 kg (10.450 lb)
LRQ450HP-DE51CT10A	2.5 mm (0.098")	Precision ball screw	4.74 kg (10.450 lb)
LRQ600AP-DE51CT10A	1.27 mm (0.050")	Precision lead screw	5.54 kg (12.214 lb)
LRQ600BP-DE51CT10A	6.35 mm (0.250")	Precision lead screw	5.54 kg (12.214 lb)
LRQ600HP-DE51CT10A	2.5 mm (0.098")	Precision ball screw	5.54 kg (12.214 lb)

Charts and Notes

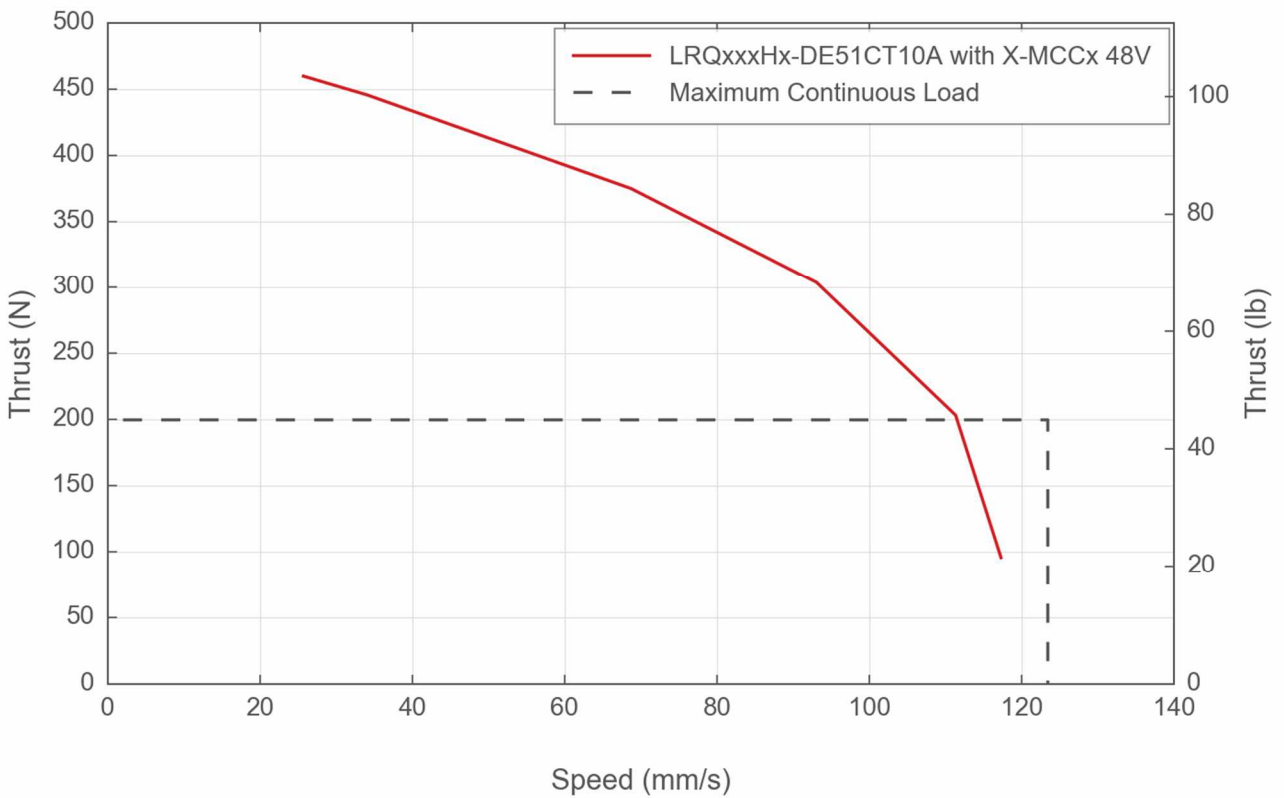
Thrust Speed Performance



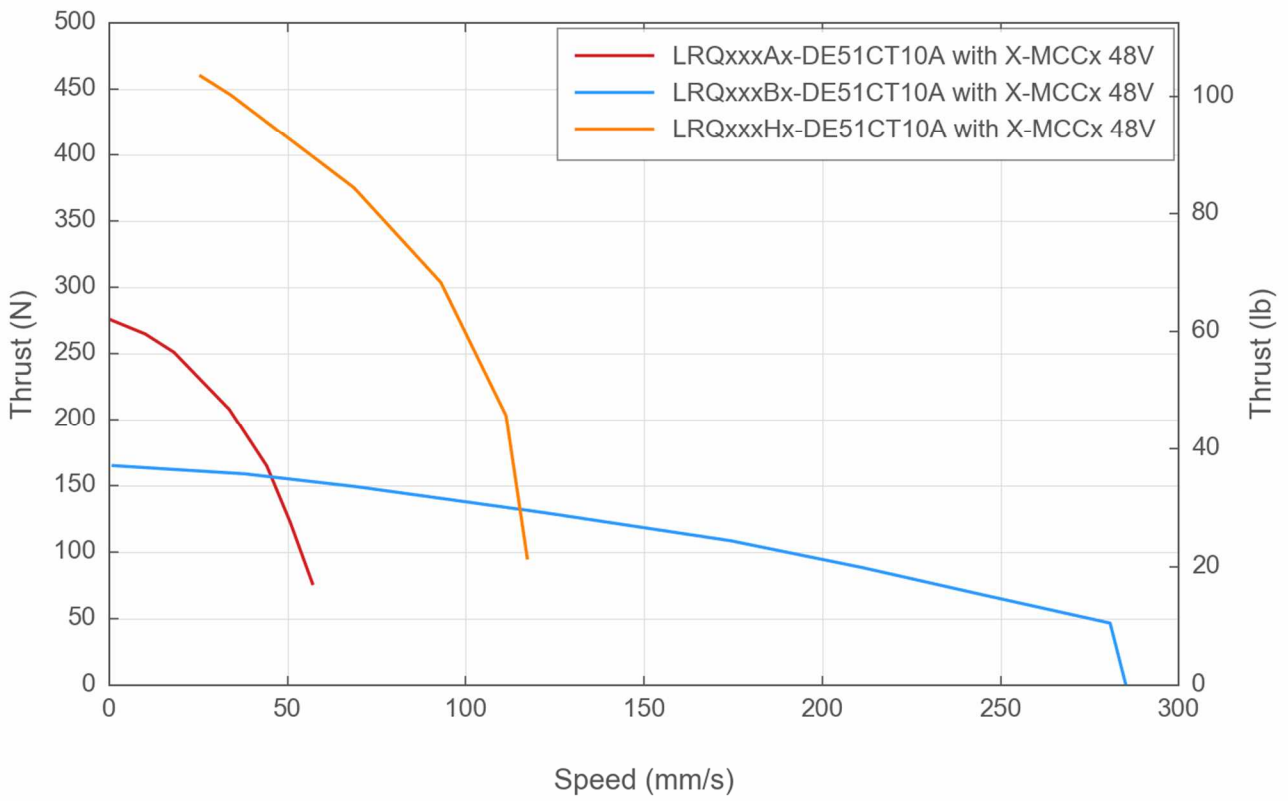
Thrust Speed Performance



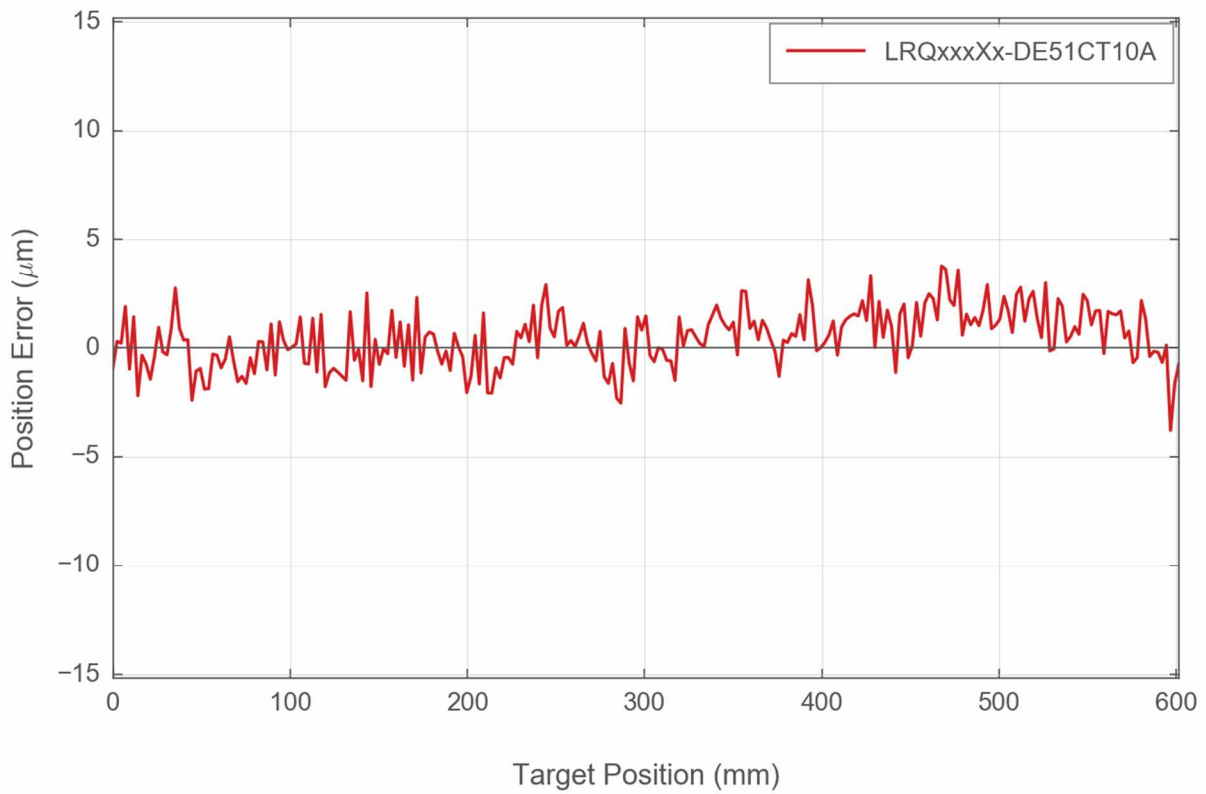
Thrust Speed Performance



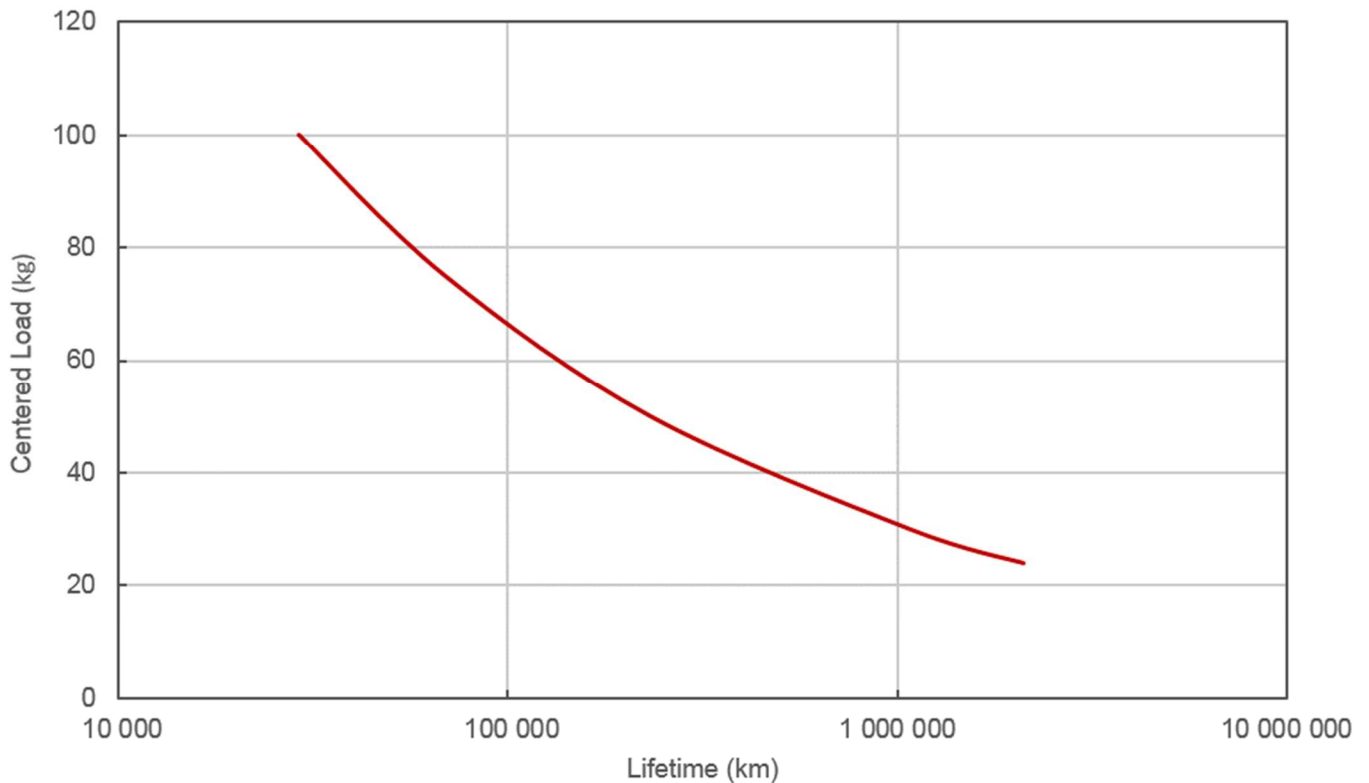
Thrust Speed Performance



Typical Accuracy



LRQ Linear Bearing Lifetime



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