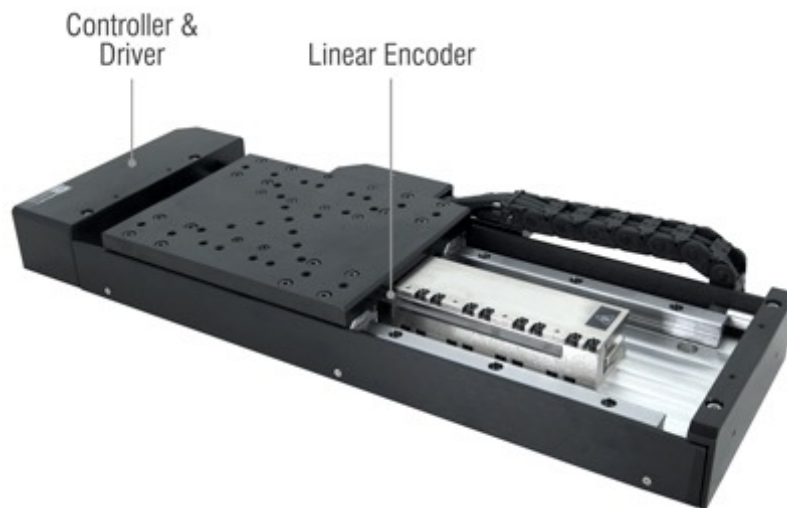


## X-LDQ-AE Series Datasheet



- 75, 150, 300, 450, 600 and 1000 mm travel
- Up to 1.5 m/s speed and up to 2 g acceleration
- Up to 2.5  $\mu\text{m}$  accuracy over 1000 mm travel
- Minimum incremental move of 50 nm
- Zero backlash
- One digital input and two digital outputs
- Integrated linear encoder provides high accuracy closed loop servo positioning
- Built-in controller; daisy-chains with other Zaber products
- Technical Article - Linear Motors: Overview and Selection Process

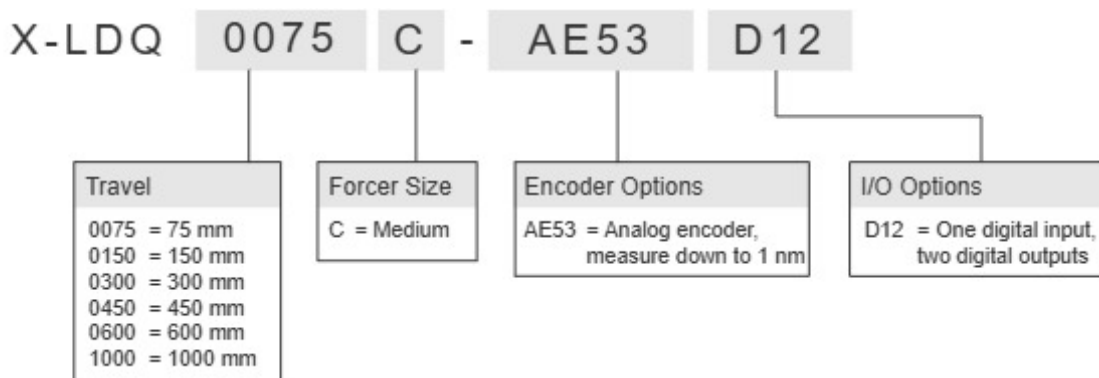
## X-LDQ-AE Series Overview

Zaber's X-LDQ-AE Series devices are computer-controlled, motorized linear motor stages with high precision and speed capabilities. They are stand-alone units requiring only a standard 48 V power supply. The built-in controller and linear encoder allows pre-tuned closed-loop servo positioning with adjustable tuning parameters. 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. The X-LDQ-AE's innovative design allows speeds up to 1.5 m/s and minimum incremental move of 50 nm. Like all of Zaber's products, the X-LDQ-AE Series is designed to be 'plug and play' and very easy to set up and operate. X-LDQ-AE devices also include a digital input and two digital outputs for interfacing with external systems. An event-driven trigger system allows devices to be programmed for stand-alone operation based on I/O, time, or movement stimuli.

For more information visit: <https://www.zaber.com/products/linear-stages/X-LDQ-AE>

## X-LDQ-AE Series Part Numbering & Options



## X-LDQ-AE Series Drawings

- [X-LDQ-AE \(Drawing for the X-LDQ-AE\)](#)

## X-LDQ-AE Series Specifications

| <b>Built-in Controller</b> |   |
|----------------------------|---|
| Accuracy (unidirectional)  | 2.5 $\mu\text{m}$ (0.000098")                 |
| Repeatability              | < 0.3 $\mu\text{m}$ (< 0.000012")             |
| Minimum Incremental Move   | 50 nm   |
| Maximum Acceleration       | 39.24 m/s <sup>2</sup> (4.00 g)               |
| Maximum Speed              | 1500 mm/s (59.055"/s)                         |
| Minimum Speed              | 0.61 nm/s                                     |
| Speed Resolution           | 0.61 nm/s                                     |
| Encoder Type               | Linear analog encoder                         |
| Encoder Count Size         | 1 nm  |
| Peak Thrust                | 40 N (9.0 lb)                                 |
| Maximum Continuous Thrust  | 35 N (7.8 lb)                                 |
| Communication Interface    | RS-232  |
| Communication Protocol     | Zaber ASCII (Default)                         |
| Data Cable Connection      | Locking 4-pin M8                              |
| Maximum Centered Load      | 200 N (44.9 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)                           |
| Typical Velocity Stability | $\pm 0.54\%$ at 100 mm/s with a 5 kg payload  |
| Stiffness in Pitch         | 8000 N-m/ $^{\circ}$ (2 $\mu\text{rad/N-m}$ ) |
| Stiffness in Roll          | 3800 N-m/ $^{\circ}$ (5 $\mu\text{rad/N-m}$ ) |
| Stiffness in Yaw           | 4000 N-m/ $^{\circ}$ (4 $\mu\text{rad/N-m}$ ) |
| Power Supply               | 24-48 VDC                                     |
| Power Plug                 | 2-pin screw terminal                          |
| Maximum Current Draw       | 3000 mA                                       |
| Motor Type                 | Moving Coil Linear Motor                      |
| Force Constant             | 15.8 N/A (3.5 lbs/A)                          |
| Guide Type                 | Recirculating Ball Linear Guide               |
| Limit or Home Sensing      | Optical Index Mark                            |
| Manual Control             | Indexed knob with push switch                 |

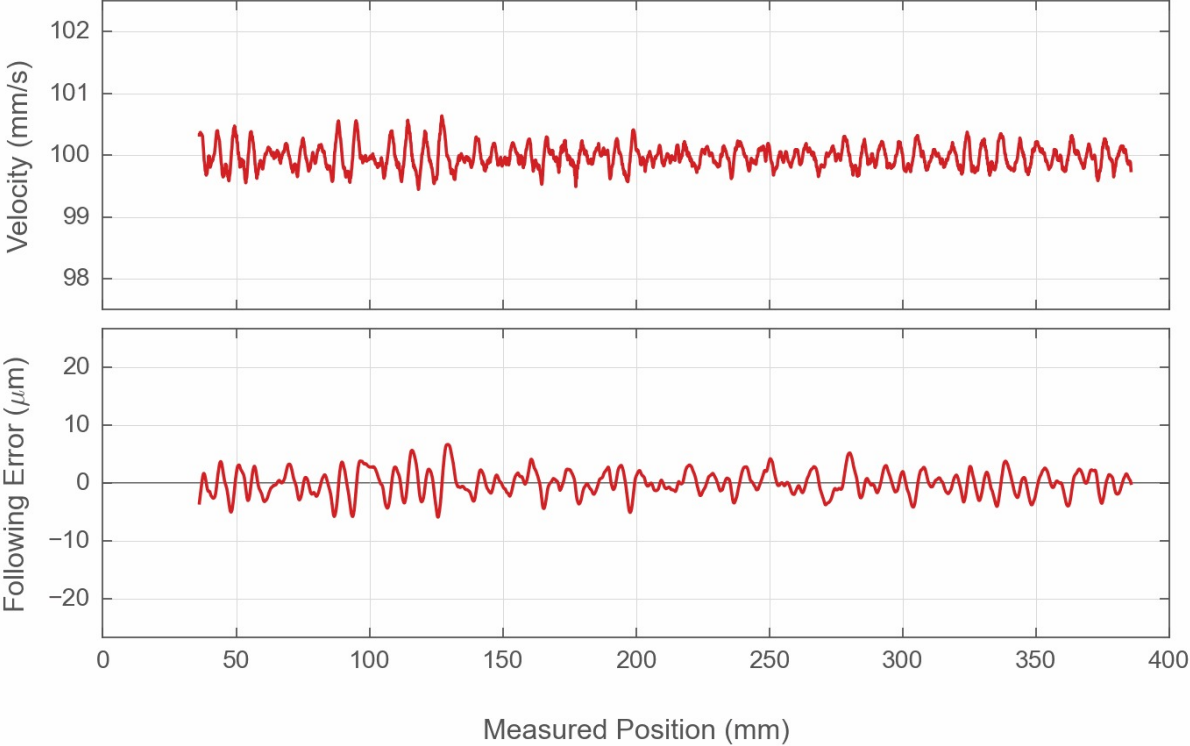
| <b>Built-in Controller</b>  |                    |
|-----------------------------|--------------------|
| Axes of Motion              | 1                  |
| LED Indicators              | Yes                |
| Mounting Interface          | M6 threaded holes  |
| Moving Mass                 | 1.5 kg (3.300 lbs) |
| Digital Input               | 1                  |
| Digital Output              | 2                  |
| Operating Temperature Range | 0 to 50 °C         |
| CE Compliant                | Yes                |
| Vacuum Compatible           | No                 |

| <b>Part Number</b> | <b>Travel Range</b>  | <b>Vertical Runout</b>   | <b>Horizontal Runout</b> | <b>Pitch</b>           |
|--------------------|----------------------|--------------------------|--------------------------|------------------------|
| X-LDQ0075C-AE53D12 | 75 mm (2.953")       | < 20 µm<br>(< 0.000787") | < 6 µm<br>(< 0.000236")  | 0.008°<br>(0.140 mrad) |
| X-LDQ0150C-AE53D12 | 150 mm (5.905")      | < 25 µm<br>(< 0.000984") | < 12 µm<br>(< 0.000472") | 0.015°<br>(0.262 mrad) |
| X-LDQ0300C-AE53D12 | 300 mm<br>(11.811")  | < 35 µm<br>(< 0.001378") | < 25 µm<br>(< 0.000984") | 0.03°<br>(0.523 mrad)  |
| X-LDQ0450C-AE53D12 | 450 mm<br>(17.716")  | < 40 µm<br>(< 0.001575") | < 30 µm<br>(< 0.001181") | 0.05°<br>(0.873 mrad)  |
| X-LDQ0600C-AE53D12 | 600 mm<br>(23.622")  | < 60 µm<br>(< 0.002362") | < 50 µm<br>(< 0.001968") | 0.05°<br>(0.873 mrad)  |
| X-LDQ1000C-AE53D12 | 1000 mm<br>(39.370") | < 70 µm<br>(< 0.002756") | < 70 µm<br>(< 0.002756") | 0.06°<br>(1.047 mrad)  |

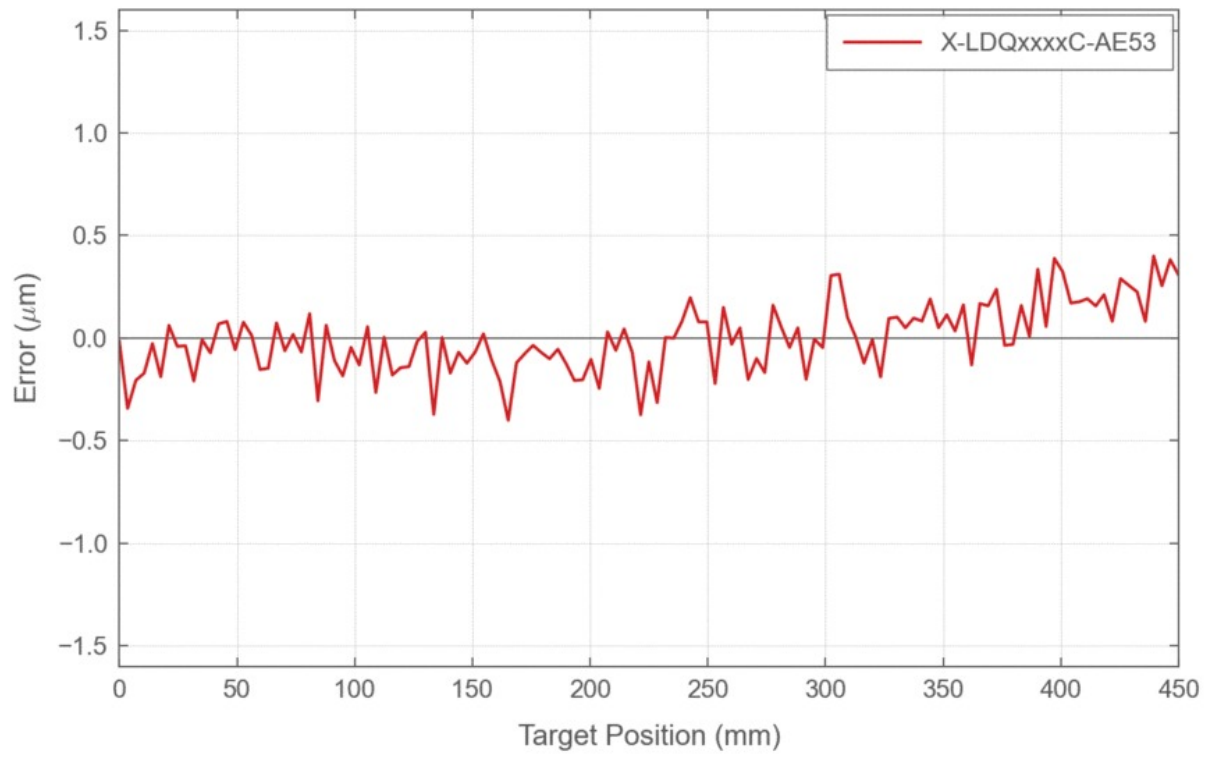
| <b>Part Number</b> | <b>Roll</b>         | <b>Yaw</b>          | <b>Weight</b>       |
|--------------------|---------------------|---------------------|---------------------|
| X-LDQ0075C-AE53D12 | 0.005° (0.087 mrad) | 0.02° (0.349 mrad)  | 6.4 kg (14.110 lb)  |
| X-LDQ0150C-AE53D12 | 0.008° (0.140 mrad) | 0.025° (0.436 mrad) | 7.3 kg (16.094 lb)  |
| X-LDQ0300C-AE53D12 | 0.015° (0.262 mrad) | 0.03° (0.523 mrad)  | 9.4 kg (20.723 lb)  |
| X-LDQ0450C-AE53D12 | 0.02° (0.349 mrad)  | 0.035° (0.611 mrad) | 10.9 kg (24.030 lb) |
| X-LDQ0600C-AE53D12 | 0.04° (0.698 mrad)  | 0.04° (0.698 mrad)  | 13.2 kg (29.101 lb) |
| X-LDQ1000C-AE53D12 | 0.06° (1.047 mrad)  | 0.06° (1.047 mrad)  | 18.6 kg (41.006 lb) |

X-LDQ-AE Series Charts

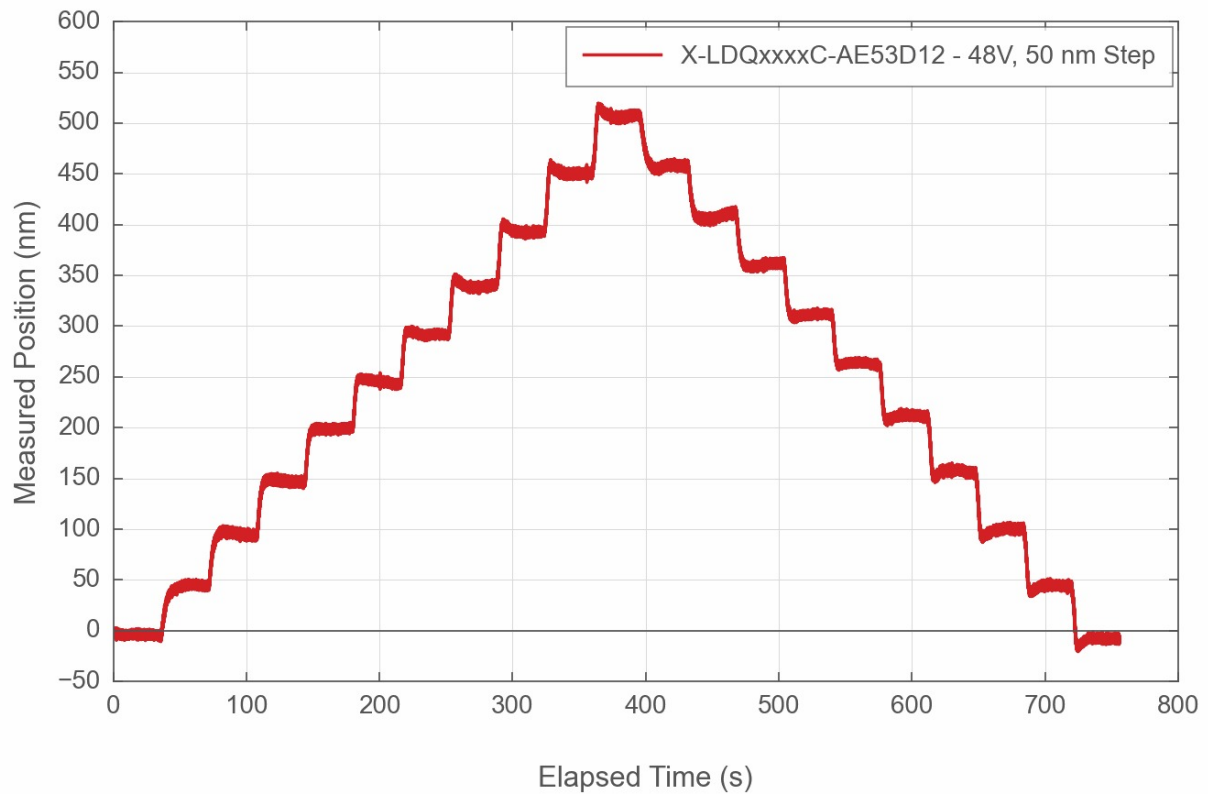
Typical Velocity Stability and Following Error



## Typical Accuracy



## Typical Minimum Incremental Move



## Contact

Email: [contact@zaber.com](mailto:contact@zaber.com)

Phone (toll free Canada/USA): 1-888-276-8033

Phone (direct): 1-604-569-3780

Fax: 1-604-648-8033

Zaber Technologies Inc.

#2 - 605 West Kent Ave. N.

Vancouver, British Columbia

Canada, V6P 6T7

<https://www.zaber.com>