X-DMQ12L-AE55D12 Datasheet

- 12 mm travel and 26 N peak thrust
- Up to 1400 mm/s speed, 25 Hz full-travel cycling
- Direct position measurement from 1 nm resolution linear encoder
- One digital input and two digital outputs
- Built-in controller; daisy-chains with other Zaber products
- Technical Article - Linear Motors: Overview and Selection Process

X-DMQ-AE Series Overview

Zaber's X-DMQ-AE Series devices are computer-controlled, direct-drive voice coil driven, linear stages with high acceleration and precision capabilities in a compact size. They are stand-alone units requiring only a standard 24 V or 48 V power supply.

The innovative moving-coil actuator design has a very flat force-vs-position profile for applications requiring smooth force output throughout travel. The technology also allows for a minimal moving mass for rapid acceleration, and no exposed moving cables for a high duty-cycle. The force output allows the light carriage to reach speeds up to 1400 mm/s within the 12mm travel.
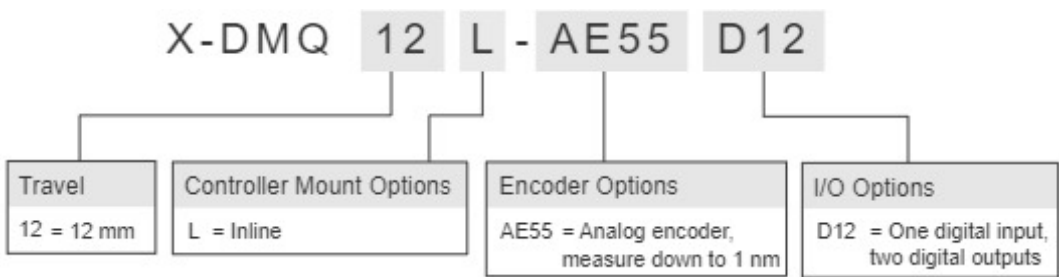
The built-in analog linear encoder is interpolated to 1 nm resolution and allows closed-loop servo

control of position and velocity. Switch to force control mode for applications requiring direct control of the force output of the stage instead of position or velocity based control.

Like all of Zaber's products, the X-DMQ-AE Series is designed to be 'plug and play' and very easy to set up and operate. 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.

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

X-DMQ-AE Series Part Numbering & Options

Travel	Controller Mount Options	Encoder Options	I/O Options
12 = 12 mm	L = Inline	AE55 = Analog encoder, measure down to 1 nm	D12 = One digital input, two digital outputs

X-DMQ **12** **L** - AE55 **D12**

X-DMQ12L-AE55D12 Drawings

• X-DMQ-AE.png (Drawing for the X-DMQ-AE)

X-DMQ12L-AE55D12 Specifications

Built-in Controller	
Travel Range	12 mm (0.472")
Accuracy (unidirectional)	4 µm (0.000157")
Repeatability	< 0.5 µm (< 0.000020")
Minimum Incremental Move	200 nm
Maximum Acceleration	245 m/s2 (24.97 g)
Maximum Speed	1400 mm/s (55.118"/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	26 N (5.8 lb)
Maximum Continuous Thrust	12 N (2.7 lb)
Communication Interface	RS-232
Communication Protocol	Zaber ASCII (Default)
Data Cable Connection	Locking 4-pin M8
Maximum Centered Load	100 N (22.4 lb)
Maximum Moment (Roll)	320 N-cm (453.2 oz-in)
Maximum Moment (Pitch)	120 N-cm (169.9 oz-in)
Maximum Moment (Yaw)	120 N-cm (169.9 oz-in)
Guide Type	Crossed-Roller Bearing
Vertical Runout	< 6 µm (< 0.000236")
Horizontal Runout	< 5 µm (< 0.000197")
Typical Velocity Stability	± 4.7% at 10 mm/s with a 0.38 kg payload
Pitch	0.01° (0.174 mrad)
Roll	0.01° (0.174 mrad)
Yaw	0.01° (0.174 mrad)
Stiffness in Pitch	50 N-m/° (349 µrad/N-m)
Stiffness in Roll	70 N-m/° (249 µrad/N-m)
Stiffness in Yaw	85 N-m/° (205 µrad/N-m)
Power Supply	24-48 VDC

| Built-in Controller	
Power Plug	2-pin screw terminal
Maximum Current Draw	1000 mA
Motor Type	Voice Coil Linear Actuator
Force Constant	12.6 N/A (2.8 lbs/A)
Mechanical Drive System	Moving Coil, Direct Drive
Limit or Home Sensing	Optical Index Mark
Manual Control	Yes
Axes of Motion	1
LED Indicators	Yes
Mounting Interface	M6 and M3 threaded holes
Moving Mass	0.095 kg (0.209 lbs)
Digital Input	1
Digital Output	2
Operating Temperature Range	0-50 °C
RoHS Compliant	Yes
CE Compliant	Yes
Vacuum Compatible	No
Weight	0.8 kg (1.764 lb)

X-DMQ-AE Series Charts

Typical Velocity Stability and Following Error
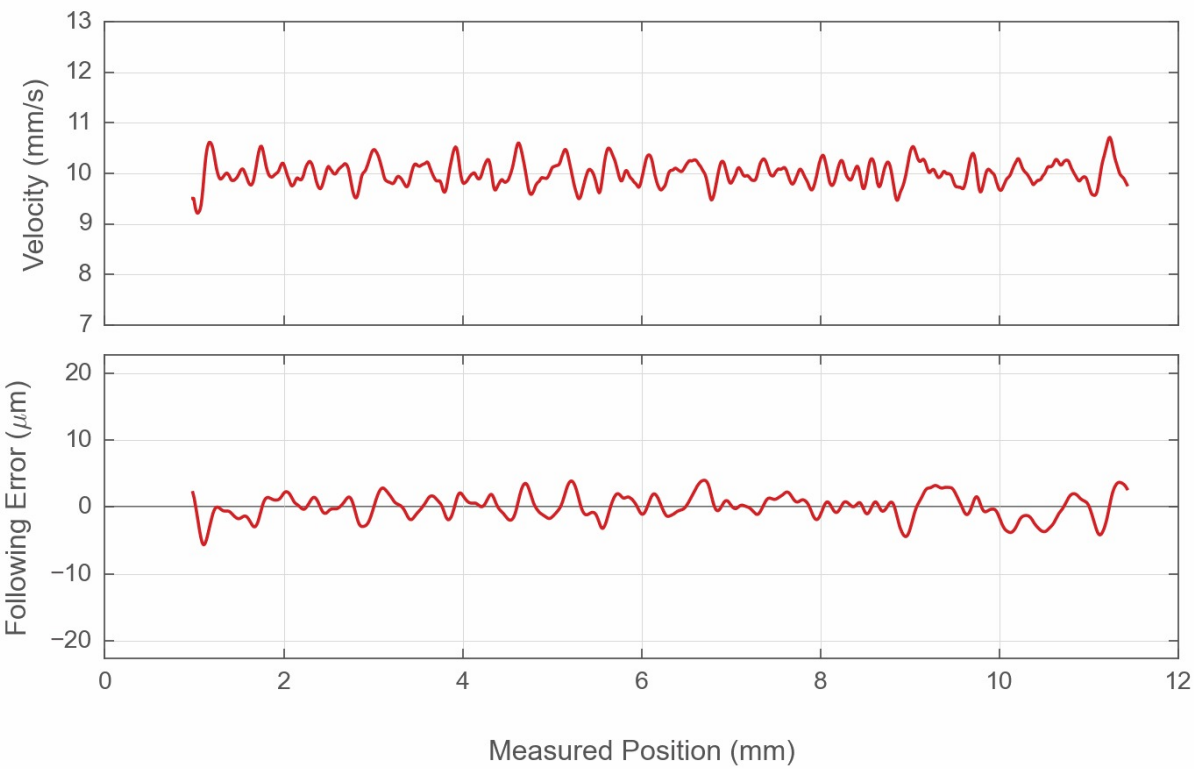
Typical Accuracy
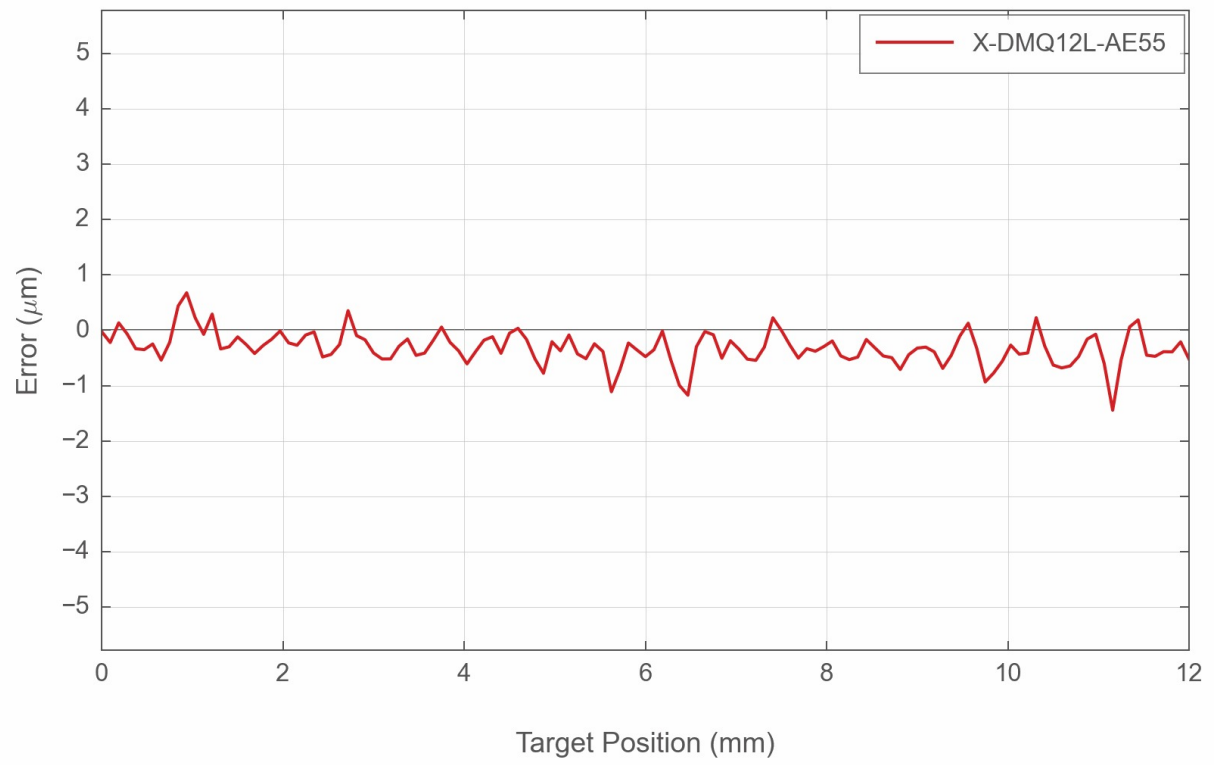
Typical Force Over Travel
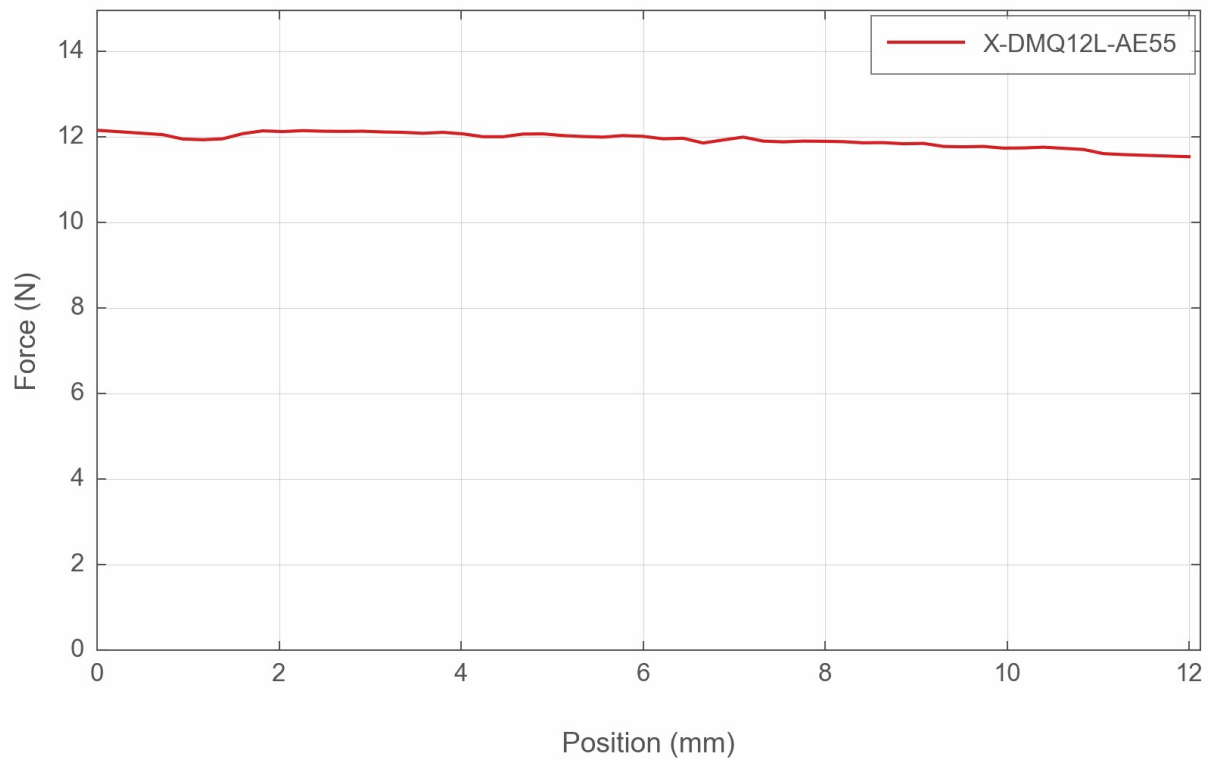
Contact

Email: 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