Zaber Technologies Inc.
#2 - 605 West Kent Ave.
Vancouver, BC

1-604-569-3780 *Direct*
1-888-276-8033 *Toll Free*
1-604-648-8033 *Fax*

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

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X-DMQ12L-AE55D12 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.

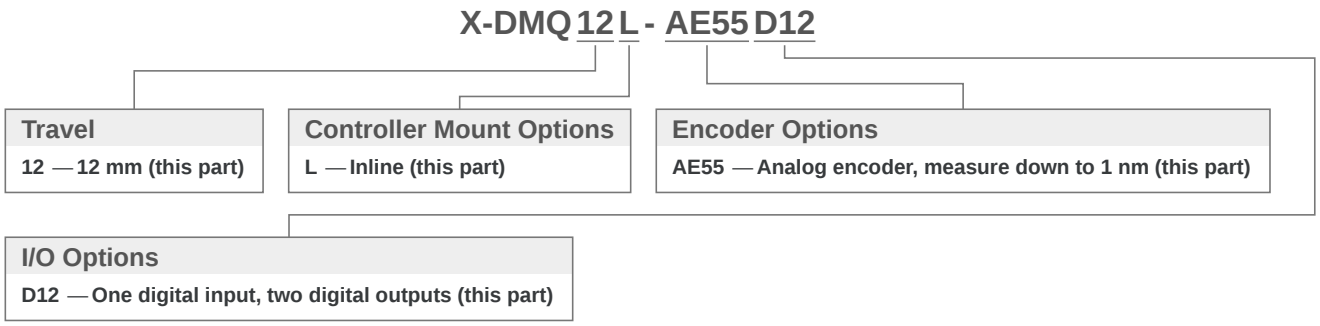
The built-in analog linear encoder is interpolated to 1 nm resolution and allows closed-loop servo control of position and velocity. Switch to force control mode for applications requiring direct control of the force output of the stage instead of position or velocity based control.

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?part=X-DMQ12L-AE55D12

X-DMQ12L-AE55D12 Part Numbering & Options

Part number: X-DMQ12L-AE55D12



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X-DMQ12L-AE55D12 Drawings

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

• View all drawings and documents at zaber.com

X-DMQ12L-AE55D12 Specifications

Overview

Specification	Value
Built-in Controller	Yes
Travel Range	12 mm (0.472 ")
Manual Control	Yes
Axes of Motion	1
LED Indicators	Yes
Weight	0.8 kg (1.764 lb)

Positioning Performance

Specification	Value
Accuracy (unidirectional)	4 µm (0.000157 ")
Repeatability	<0.5 µm (<0.00002 ")
Minimum Incremental Move	200 nm
Flatness of Travel	<6 µm (<0.000236 ")
Straightness of Travel	<5 µm (<0.000197 ")
Pitch Error	0.01 ° (0.174 mrad)
Roll Error	0.01 ° (0.174 mrad)
Yaw Error	0.01 ° (0.174 mrad)

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Load Performance

Specification	Value
Peak Thrust	26 N (5.8 lb)
Maximum Continuous Thrust	12 N (2.7 lb)
Maximum Centered Load	100 N (22.4 lb)
Maximum Moment (Pitch)	1.2 N·m (0.9 lb·ft)
Maximum Moment (Roll)	3.2 N·m (2.362 lb·ft)
Maximum Moment (Yaw)	1.2 N·m (0.886 lb·ft)
Stiffness (Pitch)	50 N·m/°
Stiffness (Roll)	70 N·m/°
Stiffness (Yaw)	85 N·m/°

Speed

Specification	Value
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
Typical Velocity Stability	± 4.7% at 10 mm/s with a 0.38 kg payload

Encoder & Sensing

Specification	Value
Encoder Type	Linear analog encoder
Encoder Count Size	1 nm
Limit or Home Sensing	Optical Index Mark

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Motor

Specification	Value
Motor Type	Voice Coil Linear Actuator
Force Constant	12.6 N/A (2.8 lbs/A)

Power and Communication

Specification	Value
Communication Interface	RS-232
Communication Protocol	Zaber ASCII (Default)
Data Cable Connection	Locking 4-pin M8
Power Supply	24-48 VDC
Power Plug	2-pin screw terminal
Maximum Current Draw	1000 mA

Analog & Digital I/O

Specification	Value
Digital Input	1
Digital Output	2

Mechanical

Specification	Value
Guide Type	Crossed-Roller Bearing
Mechanical Drive System	Moving Coil, Direct Drive
Mounting Interface	M6 and M3 threaded holes
Moving Mass	0.095 kg (0.209 lbs)

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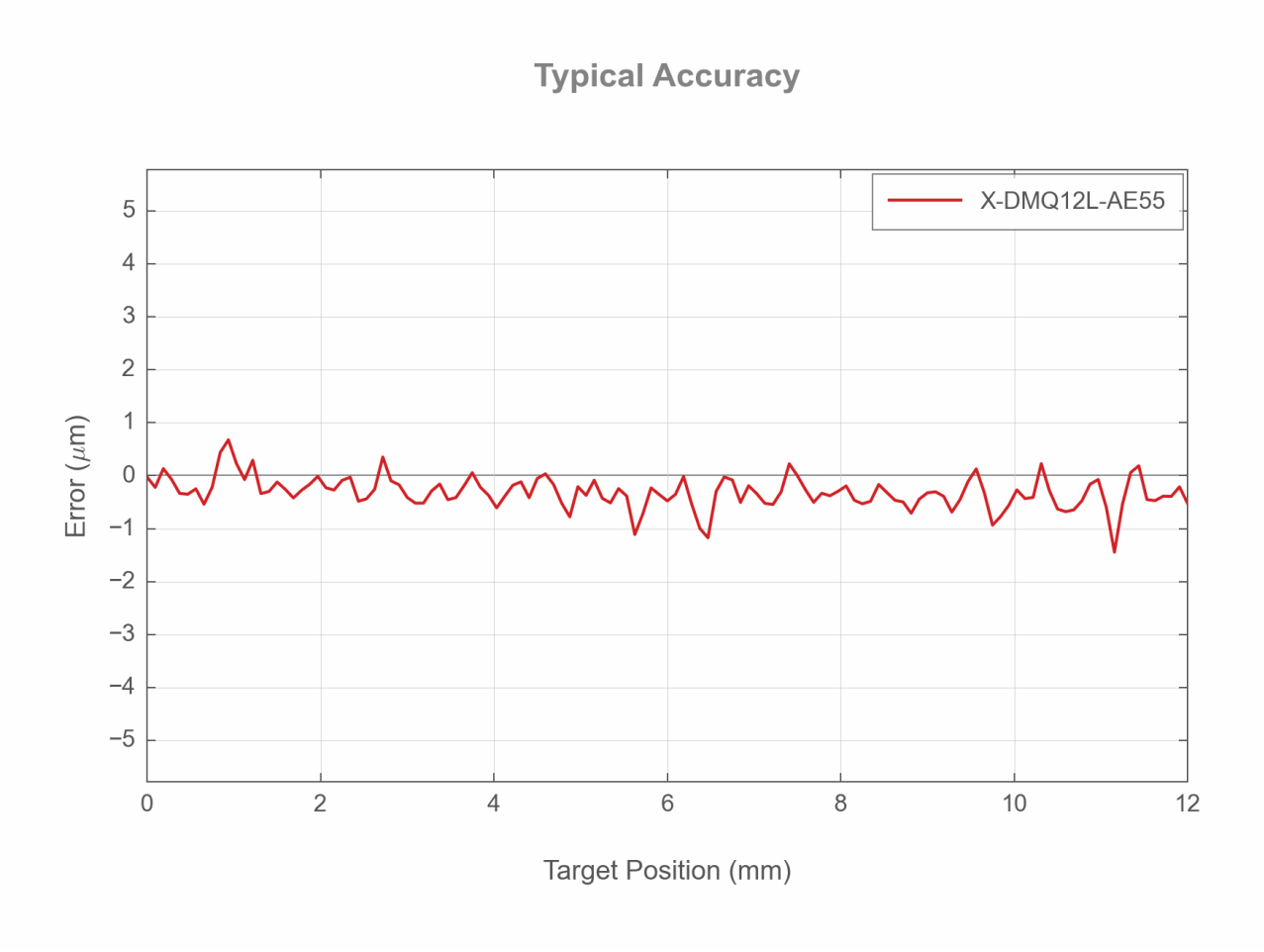
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Environmental & Compliance

Specification	Value
Operating Temperature Range	0-50 °C
CE Compliant	Yes
Vacuum Compatible	No

X-DMQ12L-AE55D12 Charts

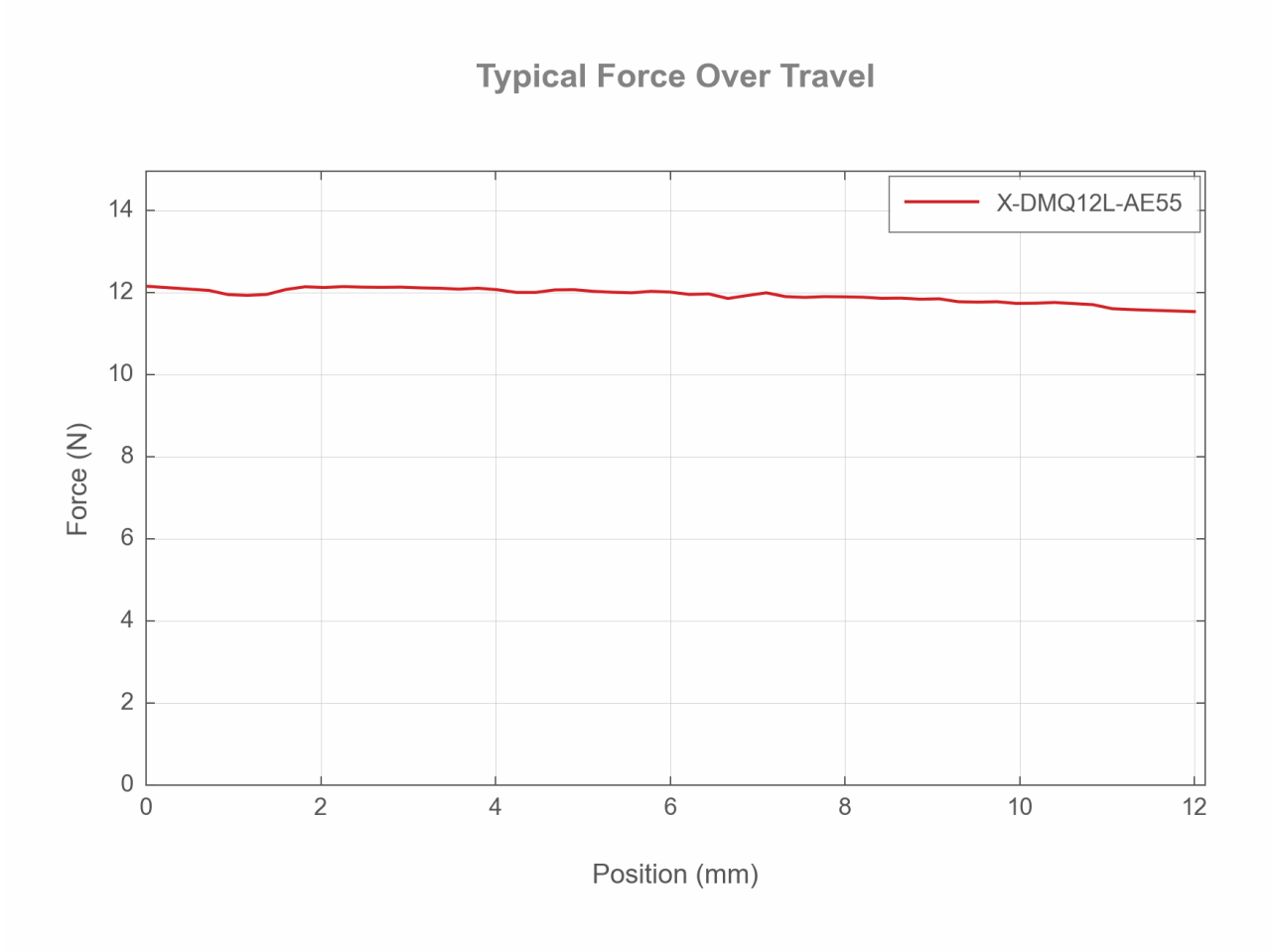
X DMQ12L AE55 Typical Accuracy



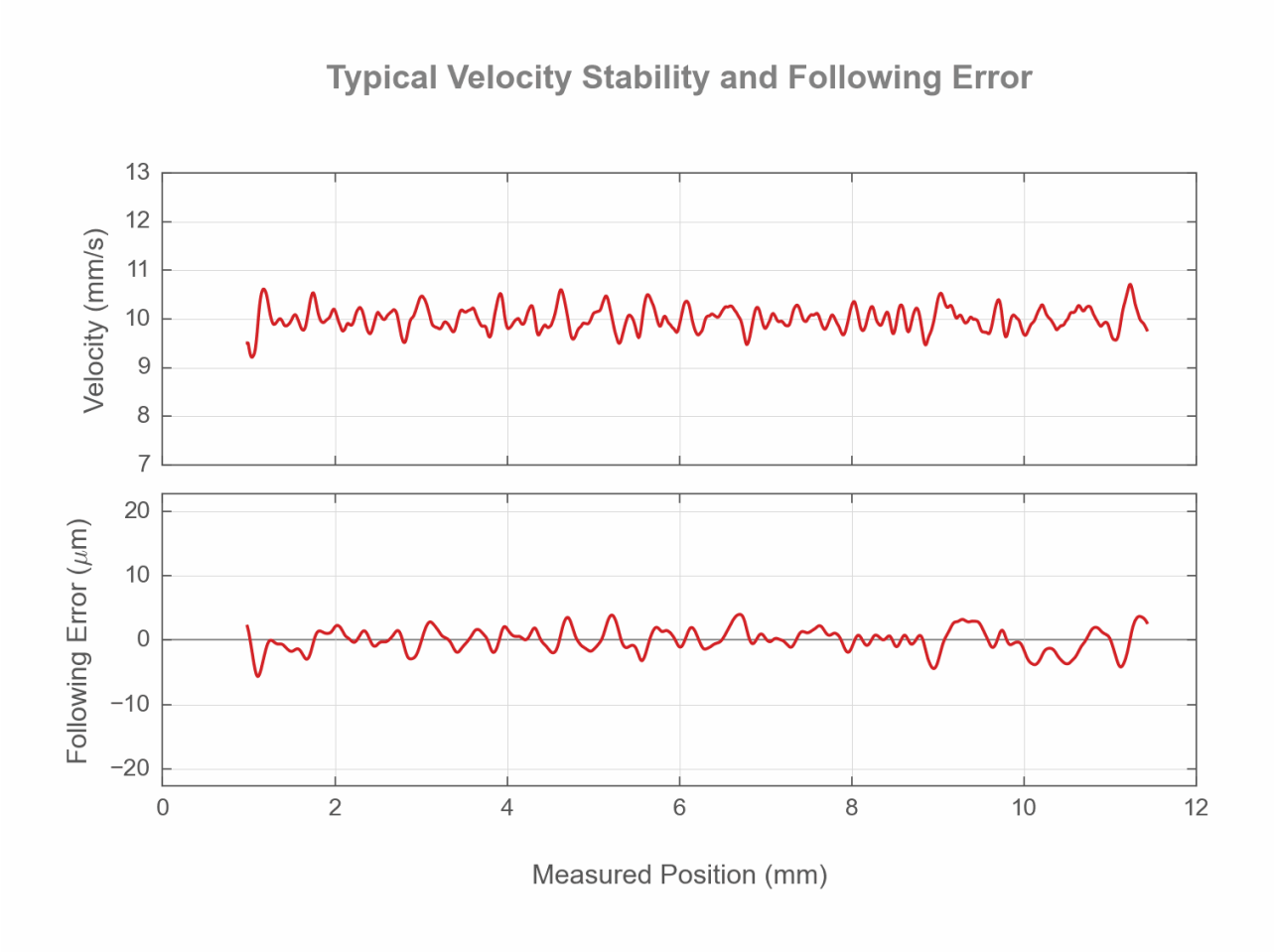
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X DMQ12L AE55 Typical Force Over Travel



Typical Velocity Stability And Following Error



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DMQ12L-AE55T10A 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
- Designed for use with MCC controllers for coordinated multi-axis motion
- With AutoDetect, Zaber controllers automatically configure settings for the connected peripheral
- Technical Article - Linear Motors: Overview and Selection Process

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DMQ12L-AE55T10A Overview

Zaber's DMQ-AE Series devices are computer-controlled, motorized linear stages with high acceleration, precision, and accuracy in a compact package. At only 30 mm tall, they are excellent when a low profile is required. 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.

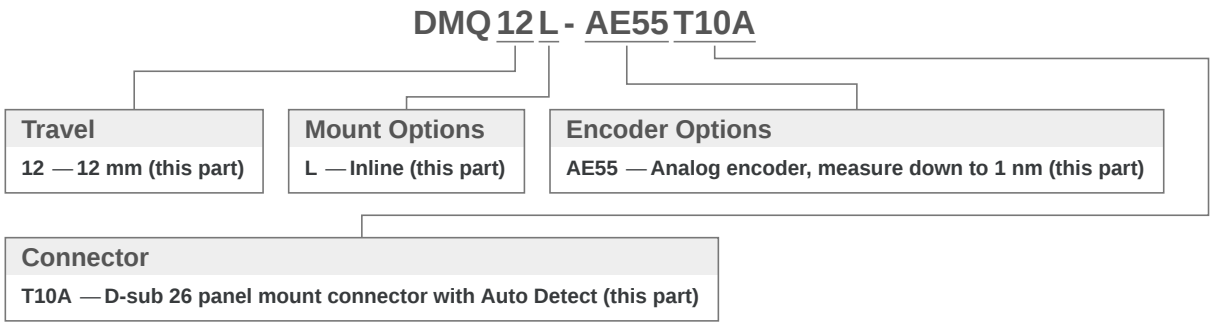
The built-in analog linear encoder is interpolated to 1 nm resolution and allows closed-loop servo control of position and velocity. Switch to force control mode for applications requiring direct control of the force output of the stage instead of position or velocity based control.

The stages are designed to connect directly to our MCC controllers using a single cable. Set-up is easy with AutoDetect; once connected, the controller will automatically detect and configure the DMQ-AE.

For more information visit: https://www.zaber.com/products/linear-stages/DMQ-AE?part=DMQ12L-AE55T10A

DMQ12L-AE55T10A Part Numbering & Options

Part number: DMQ12L-AE55T10A



DMQ12L-AE55T10A Drawings

- DMQ-AE.png (Drawing for the DMQ-AE)
- View all drawings and documents at zaber.com

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DMQ12L-AE55T10A Specifications

Overview

Specification	Value
Built-in Controller	No
Recommended Controller	MCC (48 V) Recommended
AutoDetect	Yes
Travel Range	12 mm (0.472 ")
Axes of Motion	1
LED Indicators	Yes
Weight	0.8 kg (1.764 lb)

Positioning Performance

Specification	Value
Accuracy (unidirectional)	4 µm (0.000157 ")
Repeatability	<0.5 µm (<0.00002 ")
Minimum Incremental Move	200 nm
Flatness of Travel	<6 µm (<0.000236 ")
Straightness of Travel	<5 µm (<0.000197 ")
Pitch Error	0.01 ° (0.174 mrad)
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Load Performance

Specification	Value
Peak Thrust	26 N (5.8 lb)
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Maximum Centered Load	100 N (22.4 lb)
Maximum Moment (Pitch)	1.2 N·m (0.9 lb·ft)
Maximum Moment (Roll)	3.2 N·m (2.362 lb·ft)
Maximum Moment (Yaw)	1.2 N·m (0.886 lb·ft)
Stiffness (Pitch)	50 N·m/°
Stiffness (Roll)	70 N·m/°
Stiffness (Yaw)	85 N·m/°

Speed

Specification	Value
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
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Specification	Value
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Encoder Count Size	1 nm
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Motor

Specification	Value
Motor Type	Voice Coil Linear Actuator
Motor Connection	D-sub 26
Force Constant	12.6 N/A (2.8 lbs/A)

Mechanical

Specification	Value
Guide Type	Crossed-Roller Bearing
Mechanical Drive System	Moving Coil, Direct Drive
Mounting Interface	M6 and M3 threaded holes
Moving Mass	0.095 kg (0.209 lbs)

Environmental & Compliance

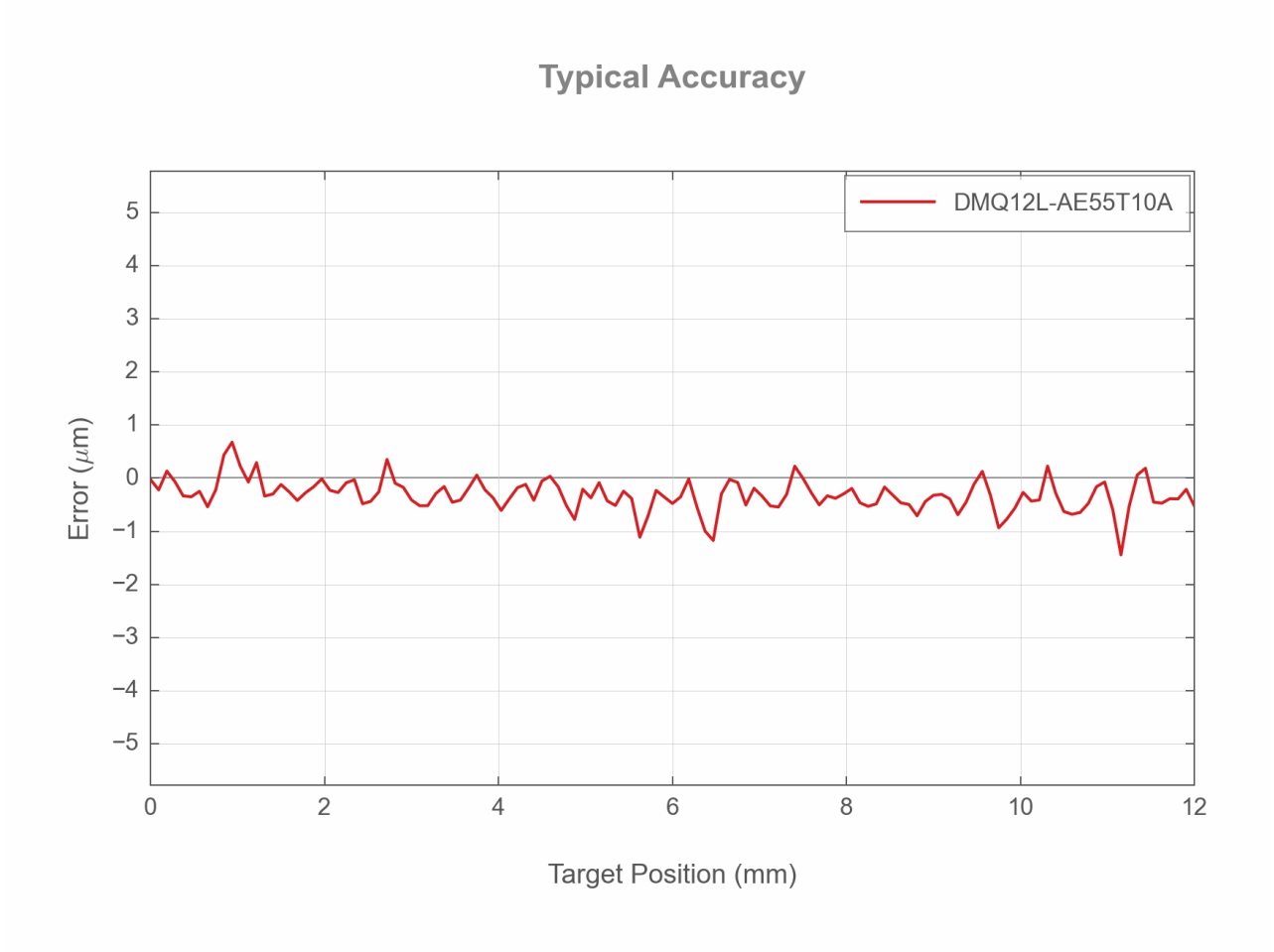
Specification	Value
Operating Temperature Range	0-50 °C
CE Compliant	Yes
Vacuum Compatible	No

DMQ12L-AE55T10A Charts

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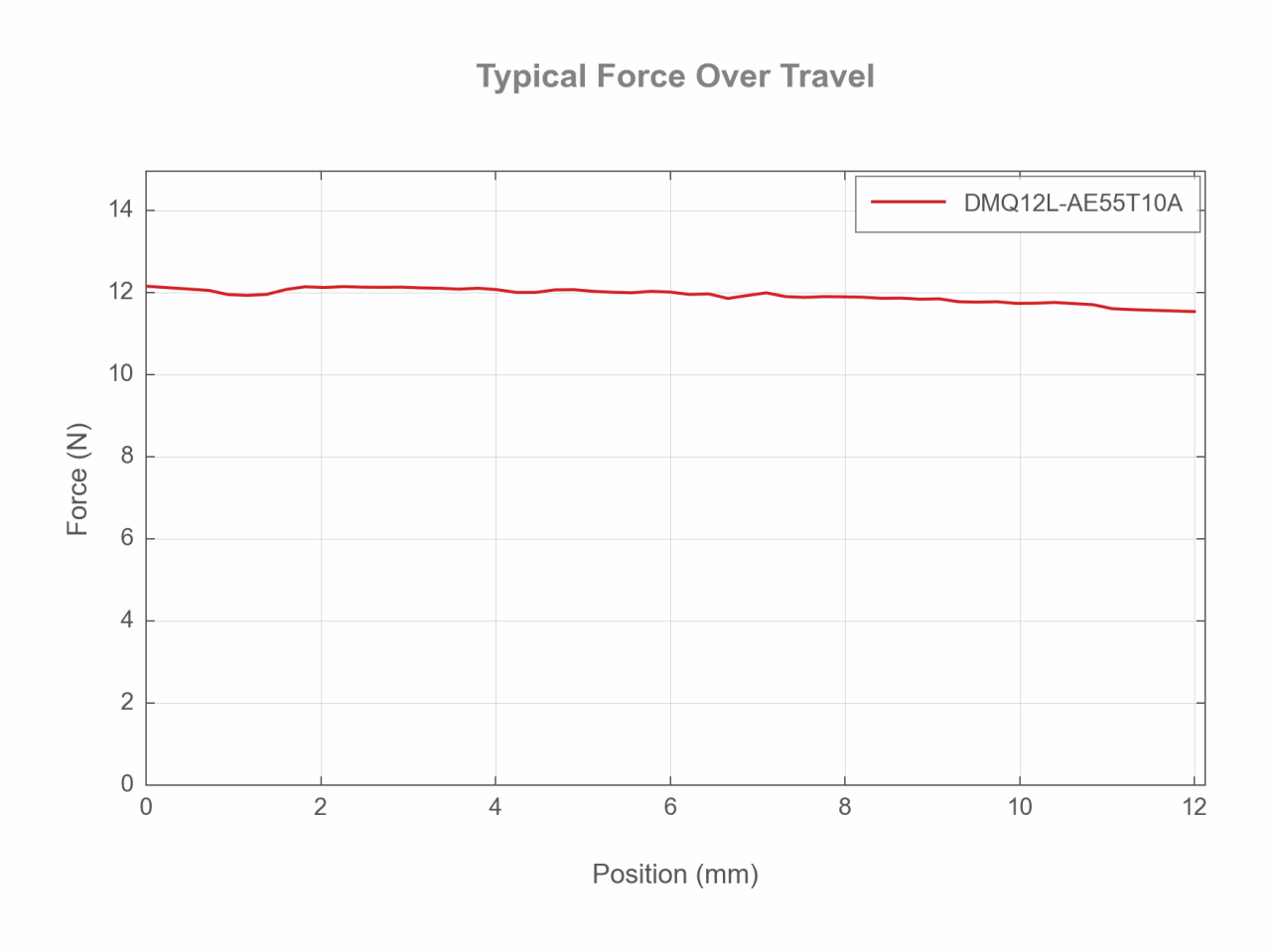
DMQ12L AE55T10A Typical Accuracy



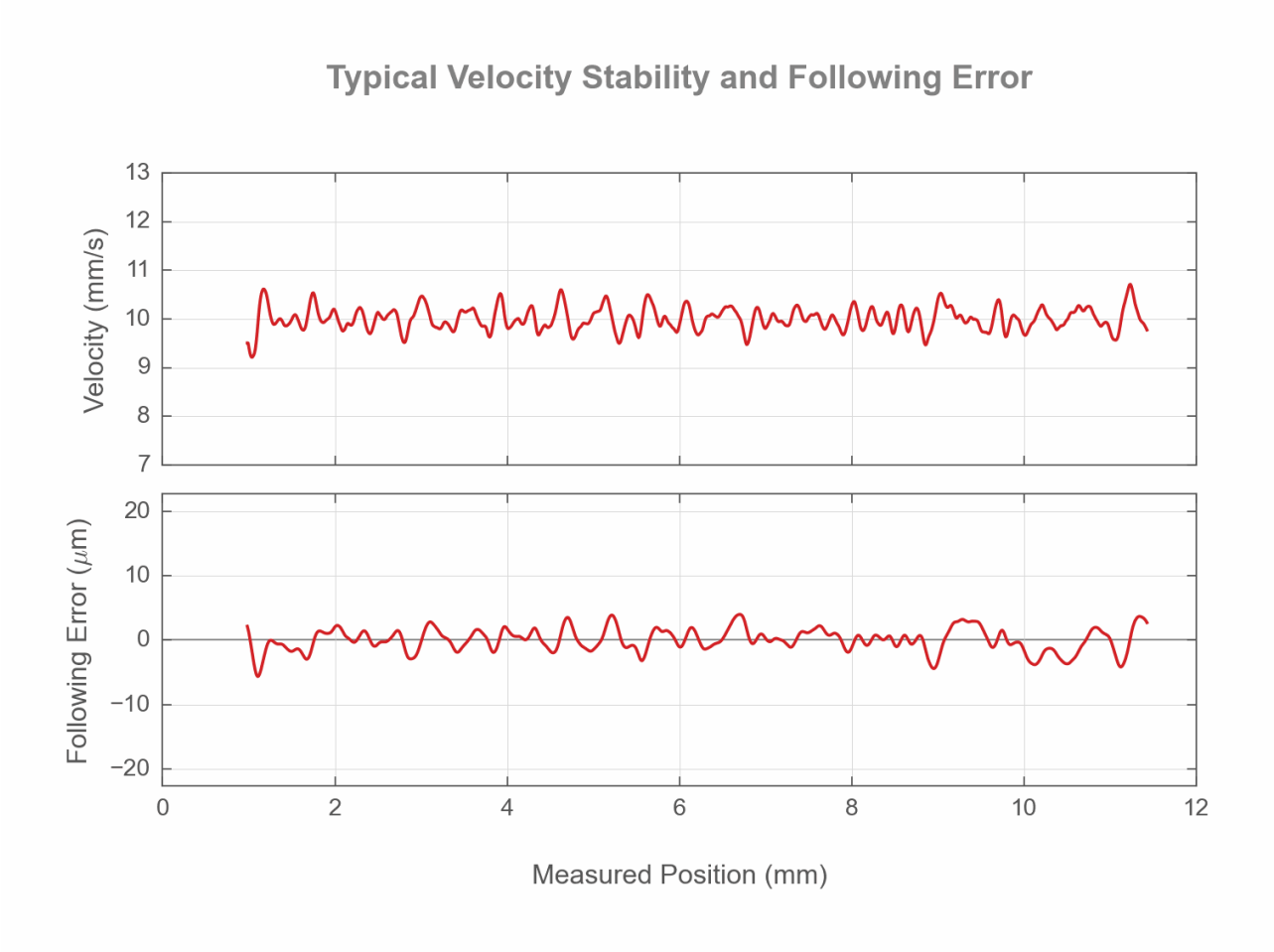
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DMQ12L AE55T10A Typical Force Over Travel



Typical Velocity Stability And Following Error



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