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-DMA10A-AE55ZJ2T17Q Datasheet



• The DMA objective focus stage is a high-performance, direct-drive solution for microscope system builders and OEMs requiring rapid, accurate focus for high-magnification imaging.
• The DMA is ideal for demanding, high-accuracy imaging applications including:

Spatial Biology: Rapid Z-stacking for high-throughput spatial workflows.
Digital Pathology & Cell Morphology: High-speed tile scanning with fast objective focusing.
Drug Discovery: Reliable 24/7 operation for high content screening campaigns.
Optical Metrology & Semiconductor Inspection: Precision positioning with 1 nm resolution optical encoders.
• Technical Highlights:

Exceptional Precision: Achieve 50 nm repeatability and 10 nm minimum incremental moves at one-third the cost of piezo alternatives.
High Throughput: Maximize imaging efficiency with sub-15 ms move and settle times.
Reliable Performance: Ensure long-term reliability with a non-contact direct-drive motor and 1 nm resolution linear encoder.
Compact Footprint: Integrate easily into tight spaces with a 77 mm x 100 mm x 30.5 mm package, including the controller.
Extended Travel: Utilize 10 mm of travel, higher than industry standard for this class.
Adjustable Counterbalance: Accommodate payloads up to 1 kg with a user-tunable magnetic counterbalance.

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• The DMA-AEZ series is also available for use with MCC Family controllers, enabling coordinated multi-axis motion, flexible communication options and additional I/O capabilities.

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X-DMA10A-AE55ZJ2T17Q Overview

Features for streamlining initial prototyping to production:

Plug-and-Play Architecture: Start moving in minutes with a built-in controller and a simple two-cable setup.
No-Code Optimization: Use the Zaber Launcher Oscilloscope & Servo Tuning to maximize throughput without writing a single line of code.
Easy Synchronization: Connect with third-party hardware and sensors via integrated I/O and encoder outputs.
Developer-Friendly API: Integrate quickly using a modern, open-source API with sample code for Python, C#, C++, and more.
Simplified Topology: Daisy-chain with XY stages and other modules using a single data/power cable to eliminate the "cable nest."
Instant Availability: Accelerate timelines with transparent pricing, downloadable CAD files, and shipping in less than one week.
Rapid Support: Stay on schedule with one-business-day response times from our technical support team.

[For more information visit: https://www.zaber.com/products/vertical-stages/X-DMA-AEZ?part=X-DMA10A-AE55ZJ2T17Q](https://www.zaber.com/products/vertical-stages/X-DMA-AEZ?part=X-DMA10A-AE55ZJ2T17Q)

X-DMA10A-AE55ZJ2T17Q Part Numbering & Options

Part number: X-DMA10A-AE55ZJ2T17Q

X-DMA 10 A - AE55 ZJ2 T17Q

Travel
10 — 10 mm (this part)

Forcer Size
A — Smallest (this part)

Encoder Options
AE55 — Analog encoder, measure down to 1 nm (this part)

Counterbalance Options
ZJ2 — Medium force adjustable magnetic counterbalance (this part)

I/O Options
T17 — Two digital inputs, one digital output, one analog input
T17Q — Interpolated RS422 encoder output, two digital inputs, one digital output, one analog input (this part)

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X-DMA10A-AE55ZJ2T17Q Drawings

• X-DMA-AEZ (Drawing for the X-DMA-AEZ)

• View all drawings and documents at zaber.com

X-DMA10A-AE55ZJ2T17Q Specifications

Overview

Specification	Value
Built-in Controller	Yes
Travel Range	10 mm (0.394 ")
Manual Control	No
Axes of Motion	1
LED Indicators	Yes
Weight	0.53 kg (1.168 lb)

Positioning Performance

Specification	Value
Accuracy (unidirectional)	8 µm (0.000315 ")
Repeatability	<0.05 µm (<0.000002 ")
Minimum Incremental Move	10 nm
Flatness of Travel	<3 µm (<0.000118 ")
Straightness of Travel	<3 µm (<0.000118 ")
Pitch Error	0.01 ° (0.174 mrad)
Roll Error	0.005 ° (0.087 mrad)
Yaw Error	0.005 ° (0.087 mrad)

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Load Performance

Specification	Value
Peak Thrust	15 N (3.4 lb)
Maximum Continuous Thrust	5 N (1.1 lb)
Maximum Moment (Pitch)	3 N·m (2.2 lb·ft)
Maximum Moment (Roll)	10 N·m (7.38 lb·ft)
Maximum Moment (Yaw)	3 N·m (2.214 lb·ft)
Stiffness (Pitch)	180 N·m/°
Stiffness (Roll)	320 N·m/°
Stiffness (Yaw)	135 N·m/°
Counterbalance Payload Range	2.5-10 N

Speed

Specification	Value
Maximum Acceleration	20 m/s2 (2.04 g)
Maximum Speed	365 mm/s (14.37 "/s)
Minimum Speed	0.61 nm/s
Speed Resolution	0.61 nm/s
Typical Move and Settle Time (100 nm move, < 15 nm, 250 g load)	<15 ms
Typical Move and Settle Time (250 nm move, < 15 nm, 250 g load)	<15 ms

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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Encoder Output Type	Interpolated relative quadrature signal with differential RS422 levels

Motor

Specification	Value
Motor Type	Moving magnet voice coil
Force Constant	2.26 N/A (0.5 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	48 VDC
Power Plug	2-pin screw terminal
Maximum Current Draw	3750 mA

Analog & Digital I/O

Specification	Value
Digital Input	2
Digital Output	1
Analog Input	1

Mechanical

Specification	Value
Counterbalance Type	Adjustable magnetic
Guide Type	Anti-creep crossed roller bearing
Mounting Interface	M3 and M6 threaded holes
Moving Mass	0.175 kg (0.385 lbs)

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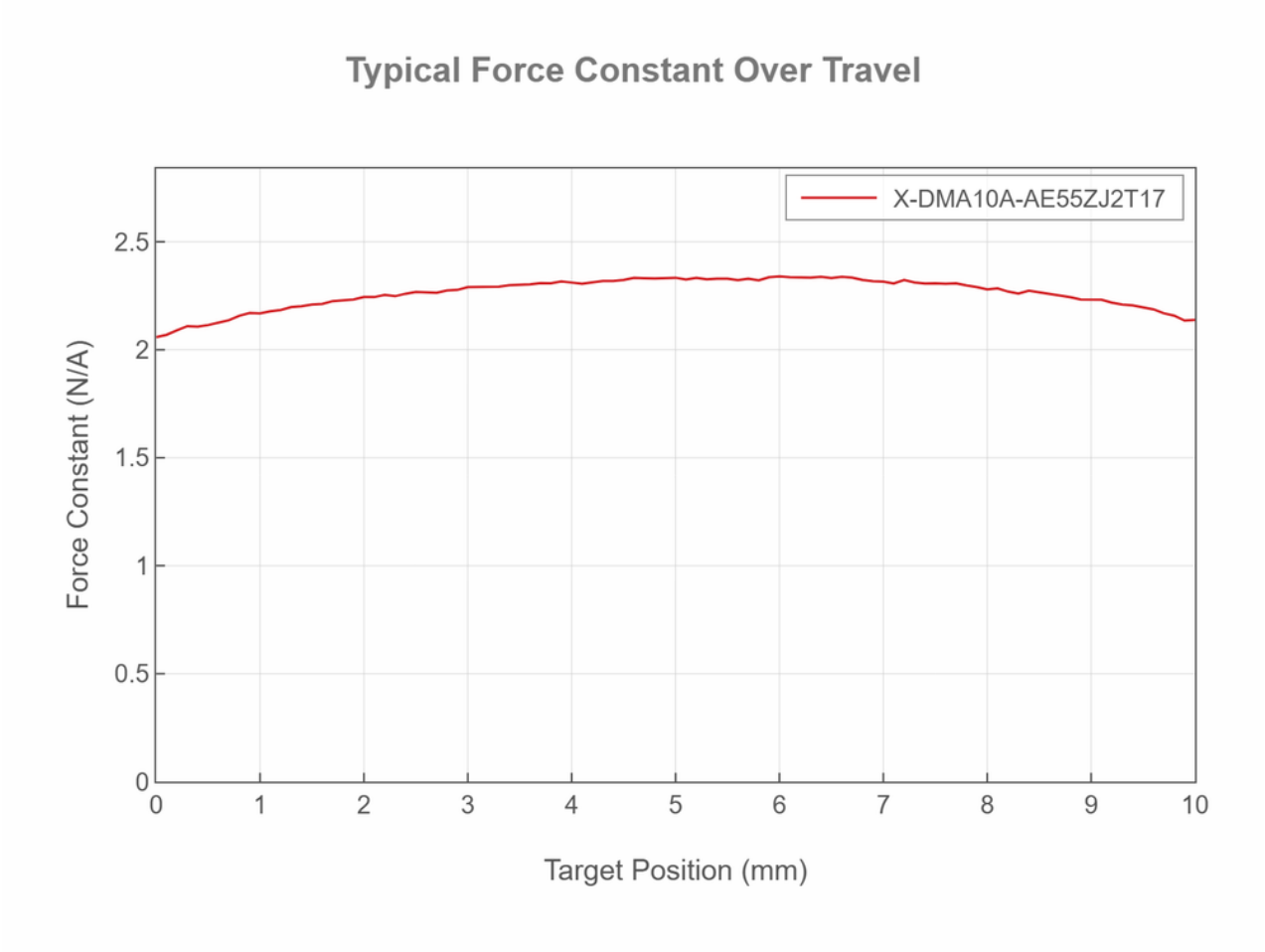
Environmental & Compliance

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

X-DMA10A-AE55ZJ2T17Q Charts

X DMA10A AE55ZJ2T17 Typical Force Constant Over Travel



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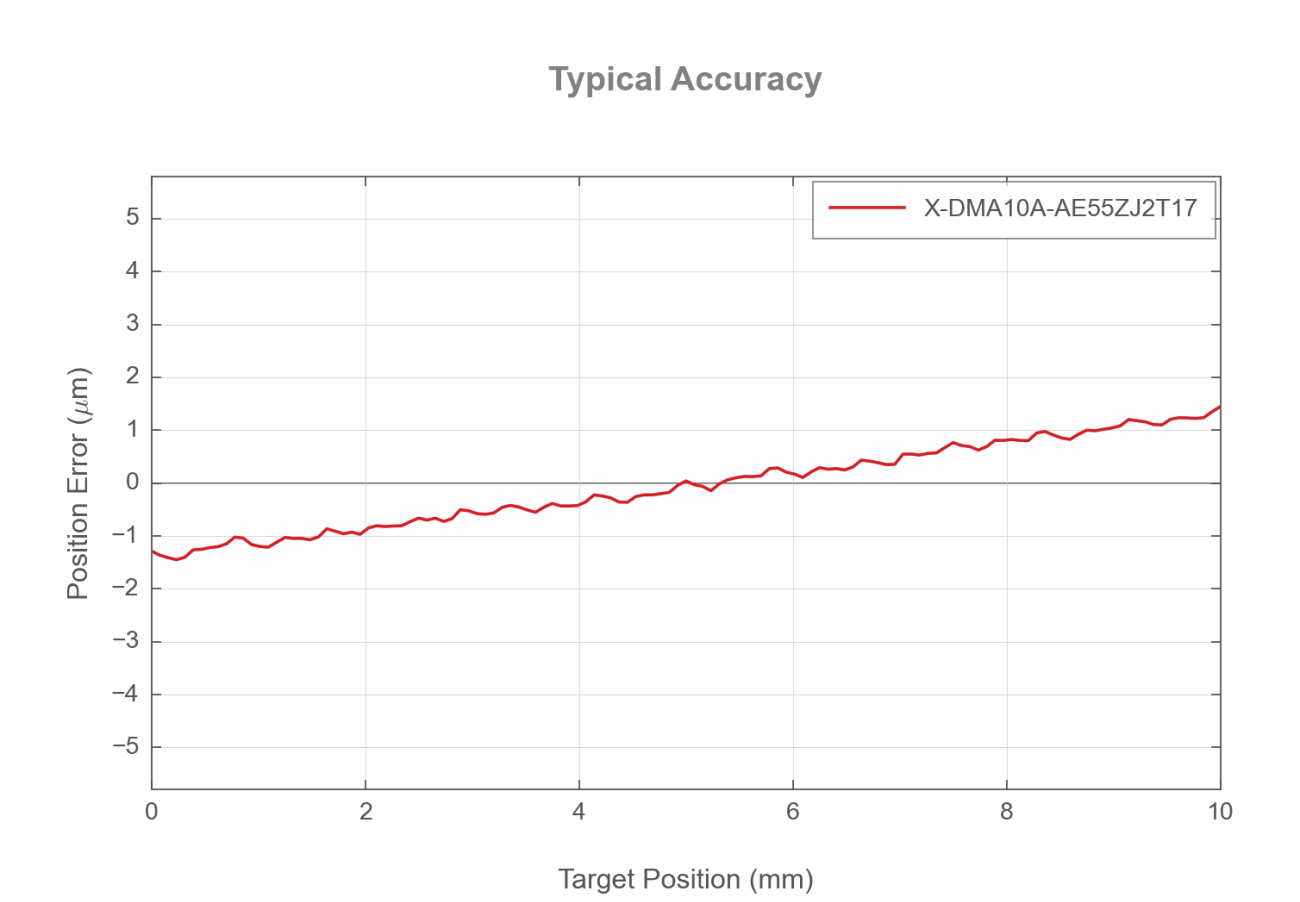
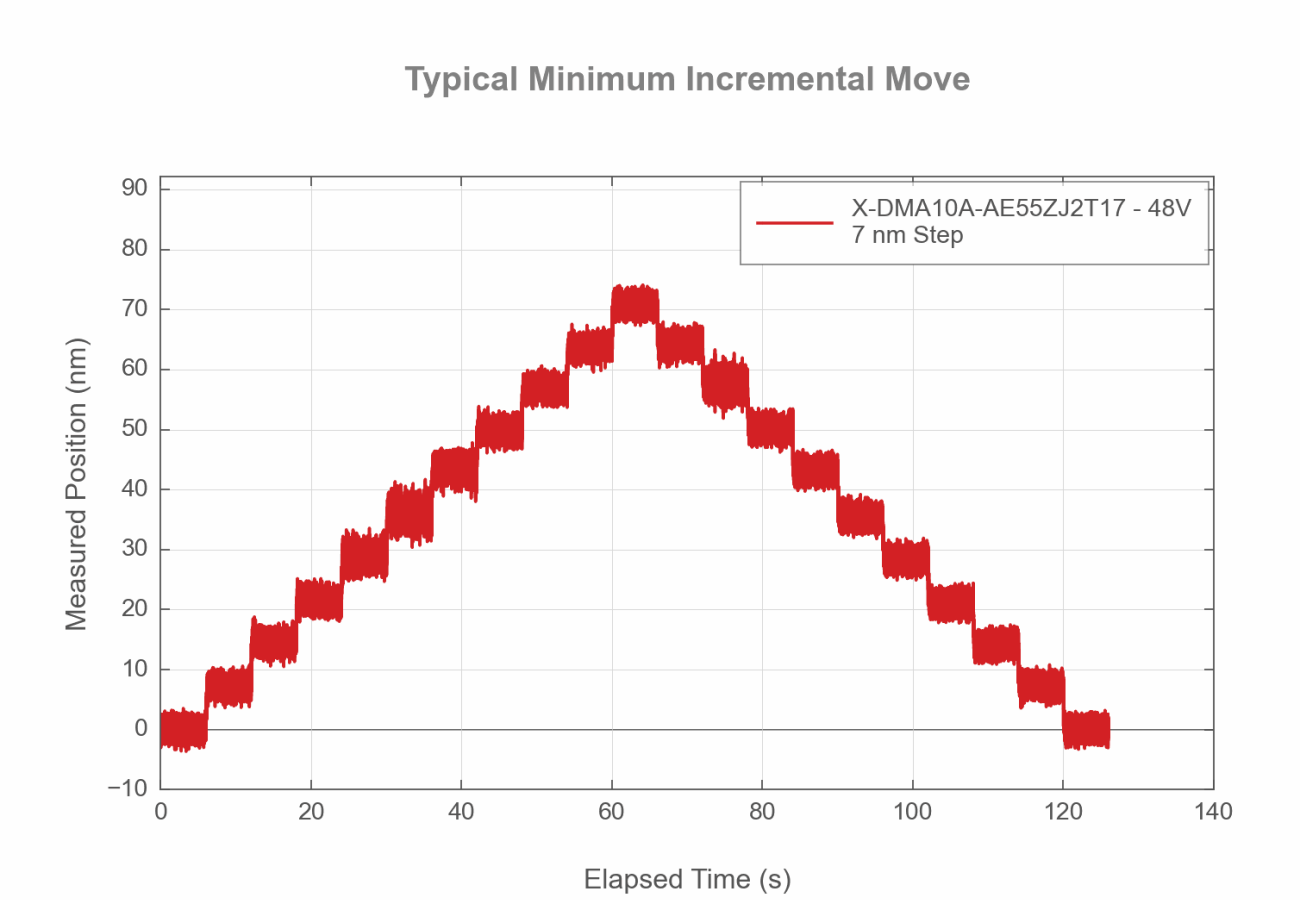
X DMA10A AE55ZJ2T17 Typical Accuracy



X DMA10A AE55ZJ2T17 Typical Minimum Incremental Move



Contact

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