Zaber Technologies Inc.
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X-RDQ150-AE57D12 Datasheet



- Contactless direct drive motor for high speed silent operation and long lifetime applications
- 0.01 arc second encoder resolution for optimal accuracy and repeatability
- Top speed up to 450 RPM and peak torque up to 5.8 Nm
- Minimum step size down to 1 µrad
- 50.8 mm (2") rotating aperture with 10 kg centered load capacity
- Built-in controller; daisy-chains with other Zaber products

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X-RDQ150-AE57D12 Overview

Zaber's X-RDQ-AE Series products are motorized rotation stage devices suitable for high precision positioning and scanning applications. The integrated rotary encoder allows for top speeds of 450 RPM while maintaining consistent step sizes down to 1 µrad. The ironless direct drive motor provides high acceleration and smooth motion while minimizing heat generation to improve repeatability. Both the drive and the encoder are non-contact and have no moving cables, resulting in a high lifetime system. Optional metric stage top provides convenient mounting and adjustable hard stops are available for limited travel applications to improve payload crash prevention.

These stages are stand-alone units requiring only a standard 48 V power supply. They connect to the 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. Like all of Zaber's products, the X-RDQ-AE Series is designed to be 'plug and play' and very easy to set up and operate. X-RDQ-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/rotary-stages/X-RDQ-AE?part=X-RDQ150-AE57D12

X-RDQ150-AE57D12 Part Numbering & Options

Part number: X-RDQ150-AE57D12

X-RDQ150-AE57D12

Rotation Stage Diameter
150 — 150 mm (this part)

Encoder Options
AE57 — Analog encoder, measure down to 0.01 arc seconds (this part)

I/O Options
D12 — One digital input, two digital outputs (this part)

X-RDQ150-AE57D12 Drawings

- Drawing-for-the-X-RDQ150-AE (Drawing for the X-RDQ150-AE)
- View all drawings and documents at zaber.com

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X-RDQ150-AE57D12 Specifications

Overview

Specification	Value
Built-in Controller	Yes
Range	+/-360 °
Manual Control	Yes
LED Indicators	Yes
Weight	3.225 kg (7.11 lb)

Positioning Performance

Specification	Value
Accuracy (unidirectional)	0.006 ° (0.1047 mrad)
Minimum Incremental Move	0.0000573 ° (1 µrad)
Repeatability	<0.0001 ° (<0.002 mrad)
Radial Error Motion	+/-3 µm (+/-0.000118 ")
Axial Error Motion	<3 µm (<0.000118 ")
Tilt Error Motion	+/-0.0014 ° (+/-24.43 µrad)

Load Performance

Specification	Value
Maximum Torque	5.8 N·m (4.28 lb·ft)
Maximum Continuous Torque	2 N·m (1.476 lb·ft)
Maximum Centered Load	100 N (22.4 lb)

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Maximum Moment (Tilt)	4 N·m (2.952 lb·ft)
Stiffness (Tilt)	1300 N·m/°

Speed

Specification	Value
Maximum Speed	2700 °/s (45 rpm)
Minimum Speed	0.0000027778 °/s (0.048 µrad/s)

Encoder & Sensing

Specification	Value
Encoder Type	Direct Reading Optical Encoder
Encoder Count Size	0.0000027778 °/count (0.01 arcseconds/count)
Limit or Home Sensing	Optical Index Mark

Motor

Specification	Value
Motor Type	Moving Magnet Track Rotary Motor (3 phase)
Motor Rotor Inertia	0.00513 kg·m2
Torque Constant	0.65 N·m/A (0.48 lb·ft/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

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Maximum Current Draw	3750 mA

Analog & Digital I/O

Specification	Value
Digital Input	1
Digital Output	2

Mechanical

Specification	Value
Stage Top Dimension	70 mm (2.756 ")
Bearing Plane Offset	16.5 mm (0.65 ")
Aperture Diameter	50.8 mm (2 ")
Mechanical Drive System	Direct Drive
Mounting Interface	M3 and M6 Threaded Holes and M6 Mounting Holes

Environmental & Compliance

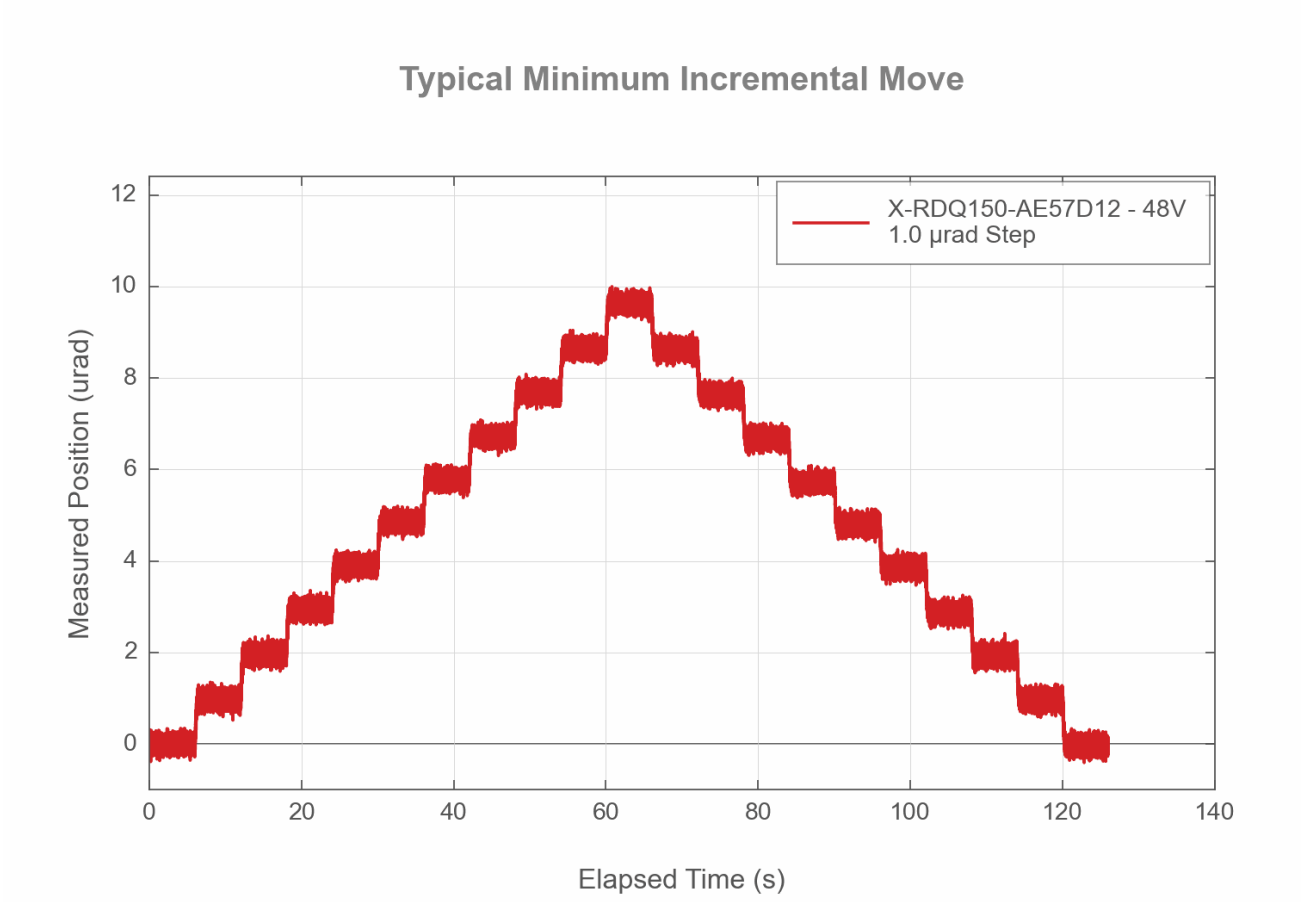
Specification	Value
Operating Temperature Range	0-40 °C
CE Compliant	Yes
Vacuum Compatible	No

X-RDQ150-AE57D12 Charts

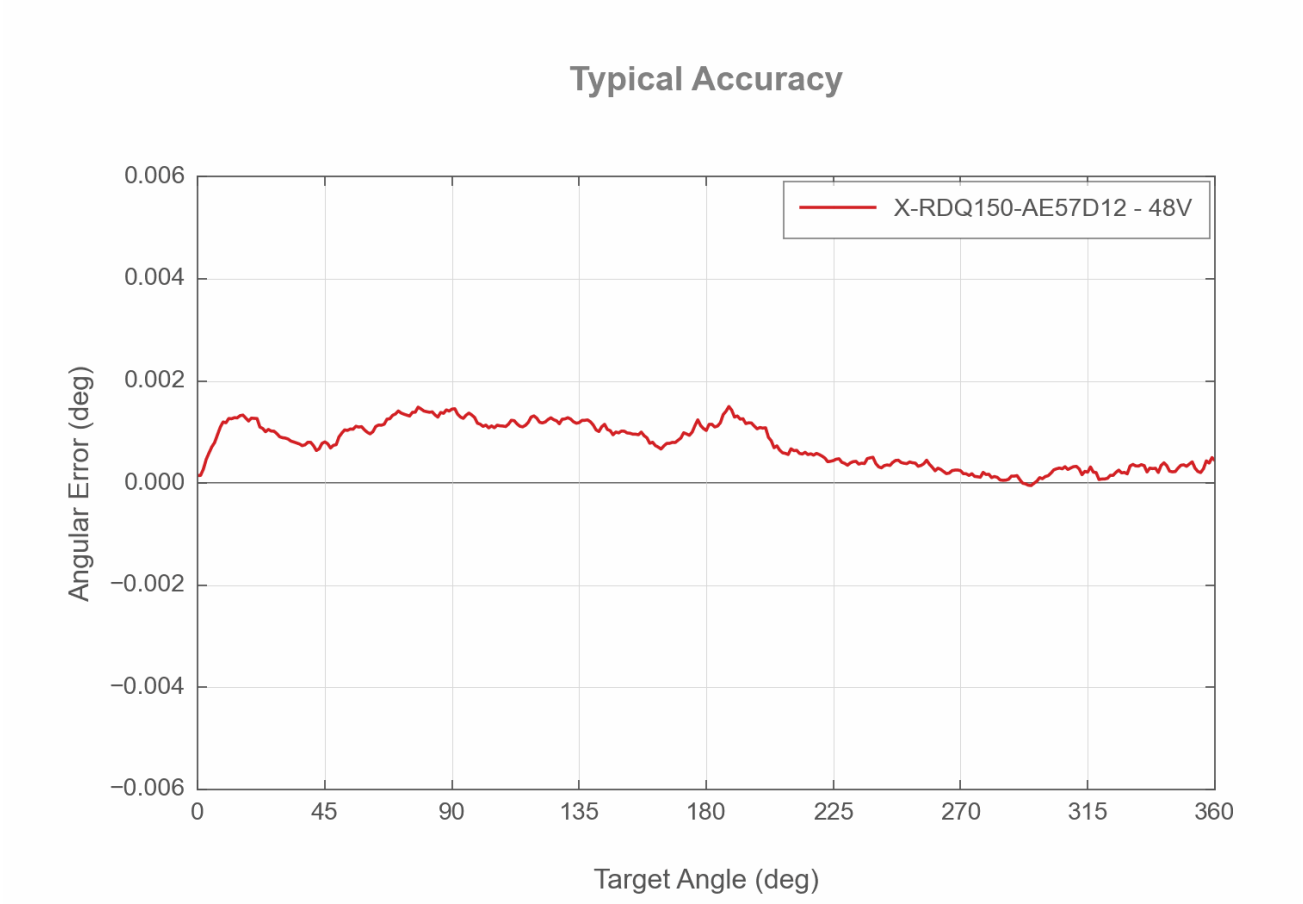
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X RDQ150 AE57D12 Typical Minimum Incremental Move



X RDQ150 AE57D12 Typical Accuracy 143200 1



Contact

Email: contact@zaber.com

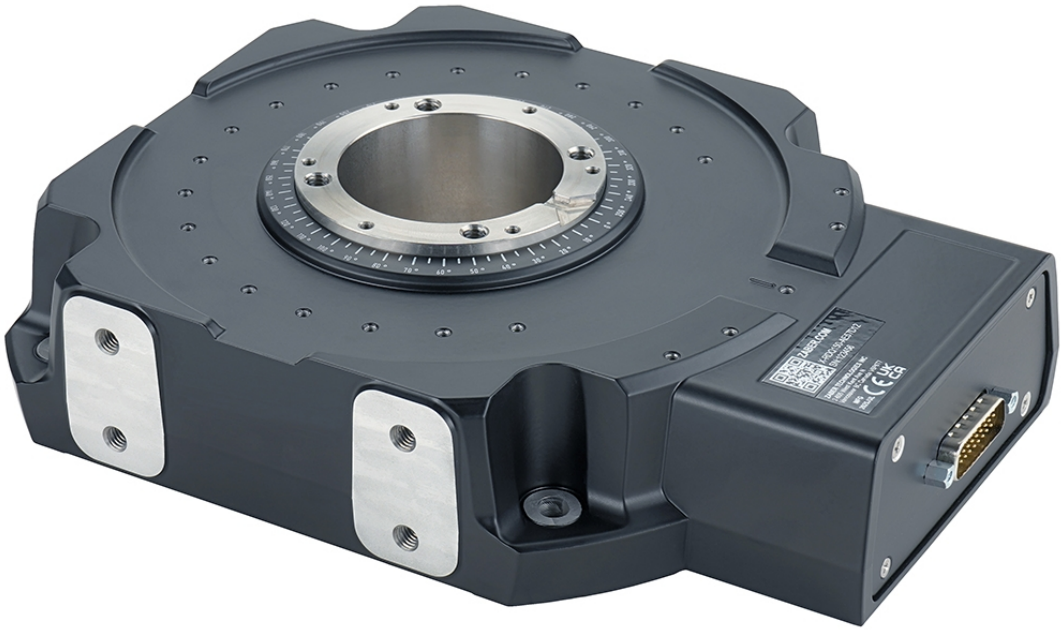
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RDQ150-AE57T10A Datasheet



- Contactless direct drive motor for high speed silent operation and long lifetime applications
- 0.01 arc second encoder resolution for optimal accuracy and repeatability
- Top speed up to 450 RPM and peak torque up to 7.8 Nm
- Minimum step size down to 0.2 µrad
- 50.8 mm (2") rotating aperture with 10 kg centered load capacity
- With AutoDetect, the MCC controller configures its settings automatically for the connected peripheral

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RDQ150-AE57T10A Overview

Zaber's RDQ-AE Series products are motorized rotation stage devices suitable for high precision positioning and scanning applications. The integrated rotary encoder allows for top speeds of 450 RPM while maintaining consistent step sizes down to 0.2 µrad. The ironless direct drive motor provides high acceleration and smooth motion while minimizing heat generation to improve repeatability. Both the drive and the encoder are non-contact and have no moving cables, resulting in a high lifetime system. Optional metric stage top provides convenient mounting and adjustable hard stops are available for limited travel applications to improve payload crash prevention.

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

For more information visit: https://www.zaber.com/products/rotary-stages/RDQ-AE?part=RDQ150-AE57T10A

RDQ150-AE57T10A Part Numbering & Options

Part number: RDQ150-AE57T10A

RDQ 150 - AE57 T10A

Rotation Stage Diameter
150 — 150 mm (this part)

Encoder Options
AE57 — Analog encoder, measure down to 0.01 arc seconds (this part)

Connector
T10A — D-sub 26 panel mount connector with Auto Detect (this part)

RDQ150-AE57T10A Drawings

- Drawing-for-the-RDQ150-AE (Drawing for the RDQ150-AE)
- View all drawings and documents at zaber.com

RDQ150-AE57T10A Specifications

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Overview

Specification	Value
Built-in Controller	No
Recommended Controller	MCC (48 V) Recommended
Range	+/-360 °
Weight	3.187 kg (7.026 lb)

Positioning Performance

Specification	Value
Accuracy (unidirectional)	0.006 ° (0.1047 mrad)
Minimum Incremental Move	0.0000115 ° (0.2 µrad)
Repeatability	<0.0001 ° (<0.002 mrad)
Radial Error Motion	+/-3 µm (+/-0.000118 ")
Axial Error Motion	<3 µm (<0.000118 ")
Tilt Error Motion	+/-0.0014 ° (+/-24.43 µrad)

Load Performance

Specification	Value
Maximum Torque	7.8 N·m (5.756 lb·ft)
Maximum Continuous Torque	2 N·m (1.476 lb·ft)
Maximum Centered Load	100 N (22.4 lb)
Maximum Moment (Tilt)	4 N·m (2.952 lb·ft)
Stiffness (Tilt)	1300 N·m/°

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Speed

Specification	Value
Maximum Speed	2700 °/s (45 rpm)
Minimum Speed	0.0000027778 °/s (0.048 µrad/s)

Encoder & Sensing

Specification	Value
Encoder Type	Direct Reading Optical Encoder
Encoder Count Size	0.0000027778 °/count (0.01 arcseconds/count)
Encoder Resolution	16200 CPR (648 states/rev)
Limit or Home Sensing	Optical Index Mark

Motor

Specification	Value
Motor Type	Moving Magnet Track Rotary Motor (3 phase)
Motor Rated Current	3000 mA
Motor Winding Resistance	2.4 ohms line-to-line
Motor Winding Inductance	0.34 mH line-to-line
Motor Connection	D-sub 26
Motor Rotor Inertia	0.00513 kg·m2
Torque Constant	0.65 N·m/A (0.48 lb·ft/A)

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Mechanical

Specification	Value
Stage Top Dimension	70 mm (2.756 ")
Bearing Plane Offset	16.5 mm (0.65 ")
Aperture Diameter	50.8 mm (2 ")
Mechanical Drive System	Direct Drive
Mounting Interface	M3 and M6 Threaded Holes and M6 Mounting Holes

Environmental & Compliance

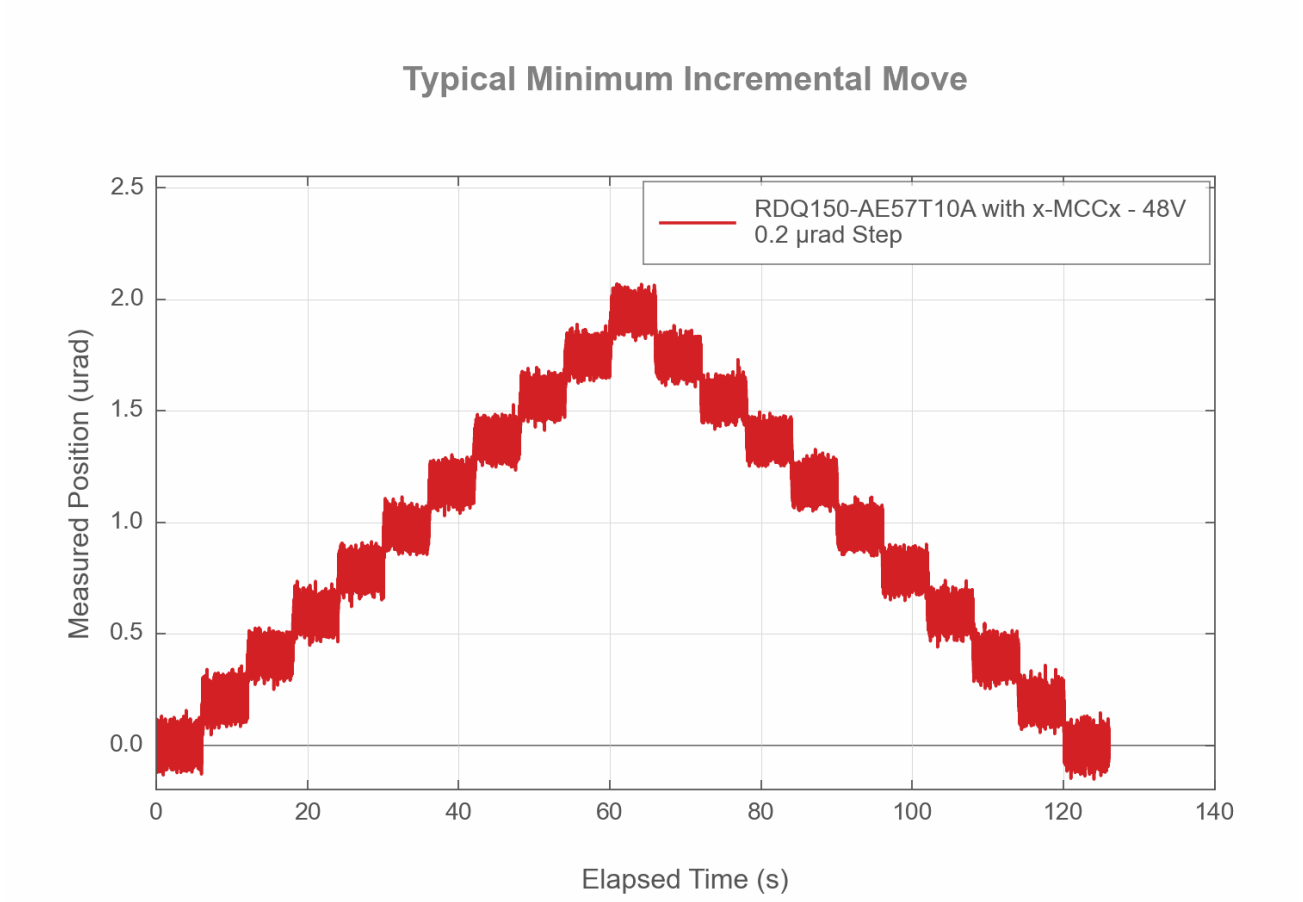
Specification	Value
Operating Temperature Range	0-40 °C
CE Compliant	Yes
Vacuum Compatible	No

RDQ150-AE57T10A Charts

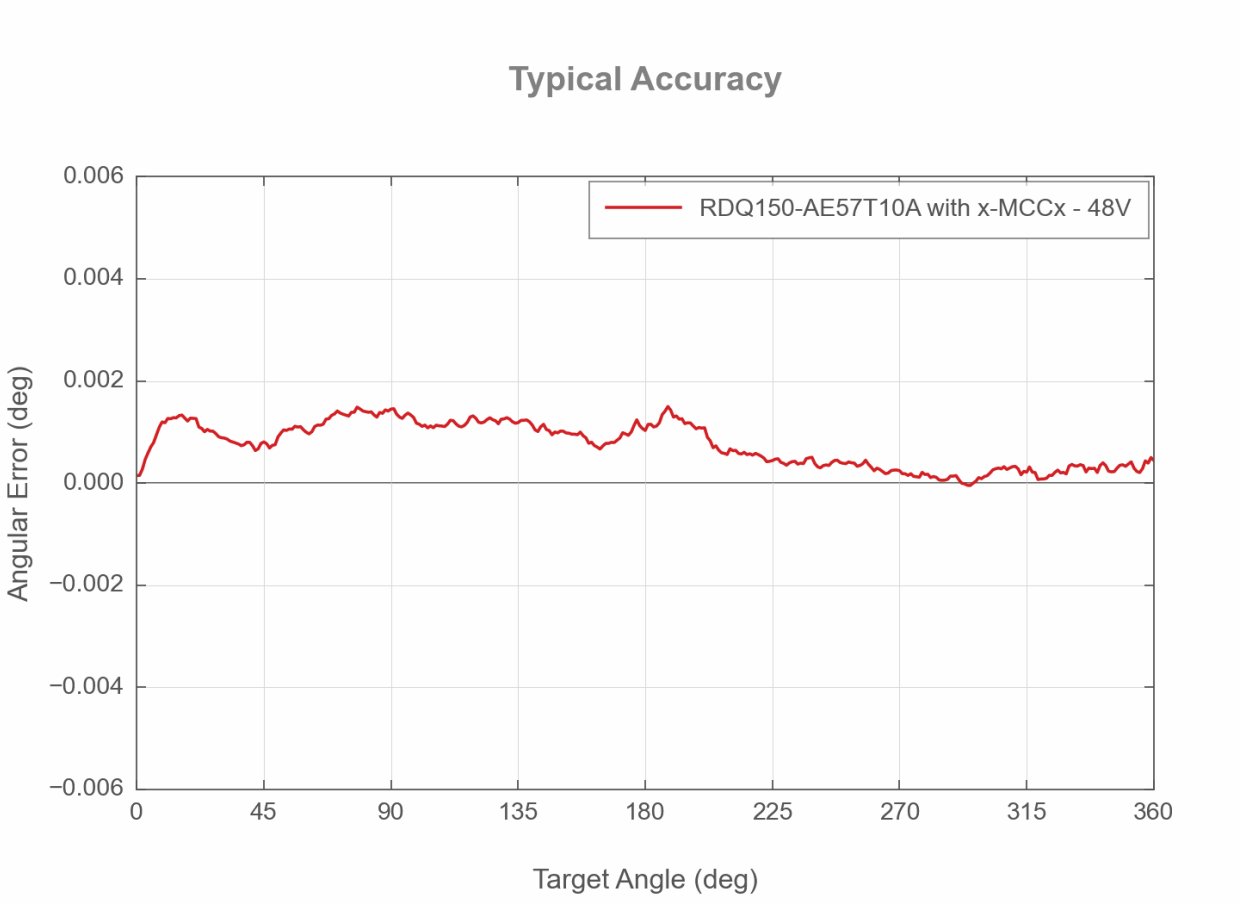
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RDQ150 AE57T10A Typical Minimum Incremental Move



RDQ150 AE57T10A Typical Accuracy 143200 1



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