

X-LDA-AE Series Datasheet



- 25, 75, 150 mm travel options
- Up to 0.8 m/s speed and up to 4 g acceleration
- High repeatability (200 nm) and accuracy (1 μm), with 20 nm minimum incremental move
- One digital input and two digital outputs
- Direct position measurement from 1 nm resolution linear encoder
- Non-contact ironless linear motor for high precision, high dynamic performance & zero backlash
- Built-in controller; daisy-chains with other Zaber products
- Technical Article - Linear Motors: Overview and Selection Process

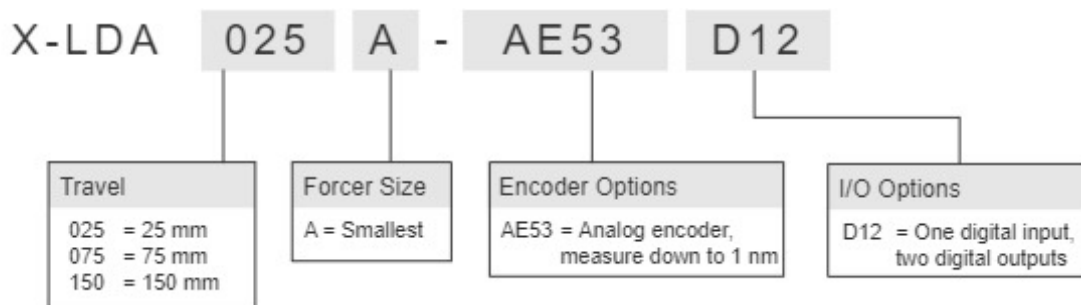
X-LDA-AE Series Overview

Zaber's X-LDA-AE Series devices are computer-controlled, motorized linear stages delivering high speed, precision, and reliability in a compact package. A centrally mounted linear encoder results in up to 1 μm position accuracy and consistent movement steps down to 20 nm. X-LDA-AE devices feature non-cogging ironless linear motors, providing high speed and acceleration capabilities. Both the drive and encoder are non-contact, and have no moving cables, resulting in an extremely robust system.

X-LDA-AE devices are stand-alone units requiring only a standard 48 V power supply. They connect to the RS-232 port or USB port of any computer, and 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-LDA-AE Series is designed to be 'plug and play' and very easy to set up and operate. X-LDA-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-LDA-AE>

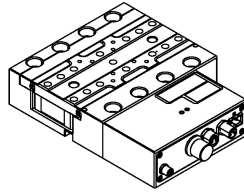
X-LDA-AE Series Part Numbering



X-LDA-AE Series Drawings

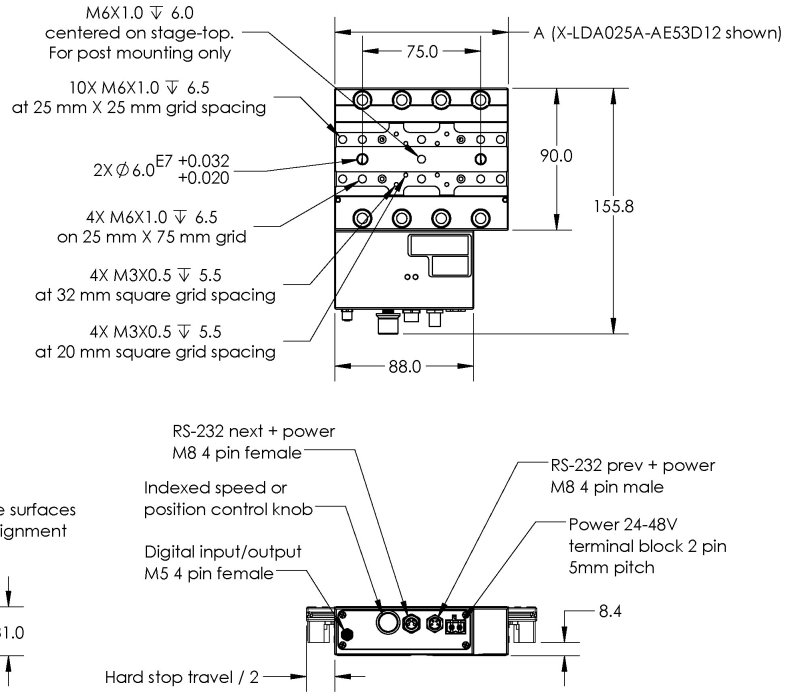
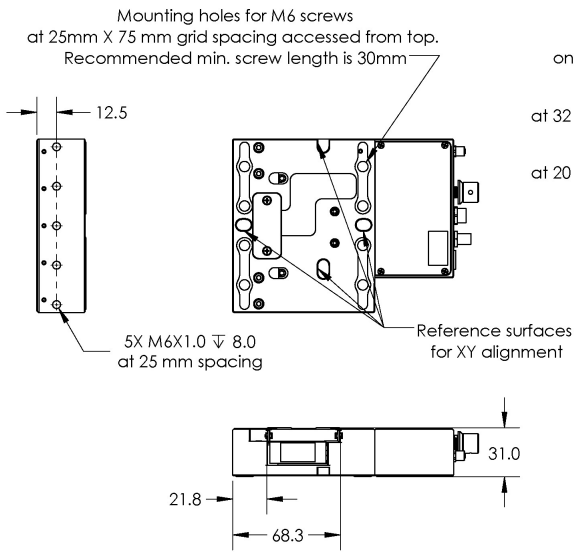
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X-LDA-AE Direct Drive Linear Stage
dimensions in mm



Model Number*	Nominal Travel	Hard Stop Travel	A
X-LDA025A-AE53D12	25.0	36.0	110.0
X-LDA075A-AE53D12	75.0	81.0	155.0
X-LDA150A-AE53D12	150.0	156.0	230.0

*See product page for complete list of available models at www.zaber.com



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X-LDA-AE Series Specifications

Specification	Value	Alternate Unit
Built-in Controller	Yes	
Accuracy (unidirectional)	1.5 μm	0.000059"
Repeatability	< 0.2 μm	< 0.000008"
Minimum Incremental Move	20 nm	
Maximum Speed	800 mm/s	31.496"/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	16 N	3.6 lb
Maximum Continuous Thrust	6 N	1.3 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 Cantilever Load	500 N-cm	708.1 oz-in
Guide Type	Crossed-Roller Bearing	
Typical Velocity Stability	$\pm 0.33\%$ at 100 mm/s with a 1.0 kg payload	
Yaw	0.005°	0.087 mrad
Power Supply	48 VDC	
Power Plug	2-pin screw terminal	
Maximum Current Draw	3000 mA	
Motor Type	Moving Magnet Track Linear Motor	
Force Constant	3.7 N/A	0.8 lbs/A
Limit or Home Sensing	Optical Index Mark	
Manual Control	Indexed knob with push switch	
Axes of Motion	1	
LED Indicators	Yes	
Mounting Interface	M6 threaded holes	
Digital Input	1	

Specification	Value	Alternate Unit
Digital Output	2	
Operating Temperature Range	0 to 50 °C	
RoHS Compliant	Yes	
CE Compliant	Yes	
Vacuum Compatible	No	

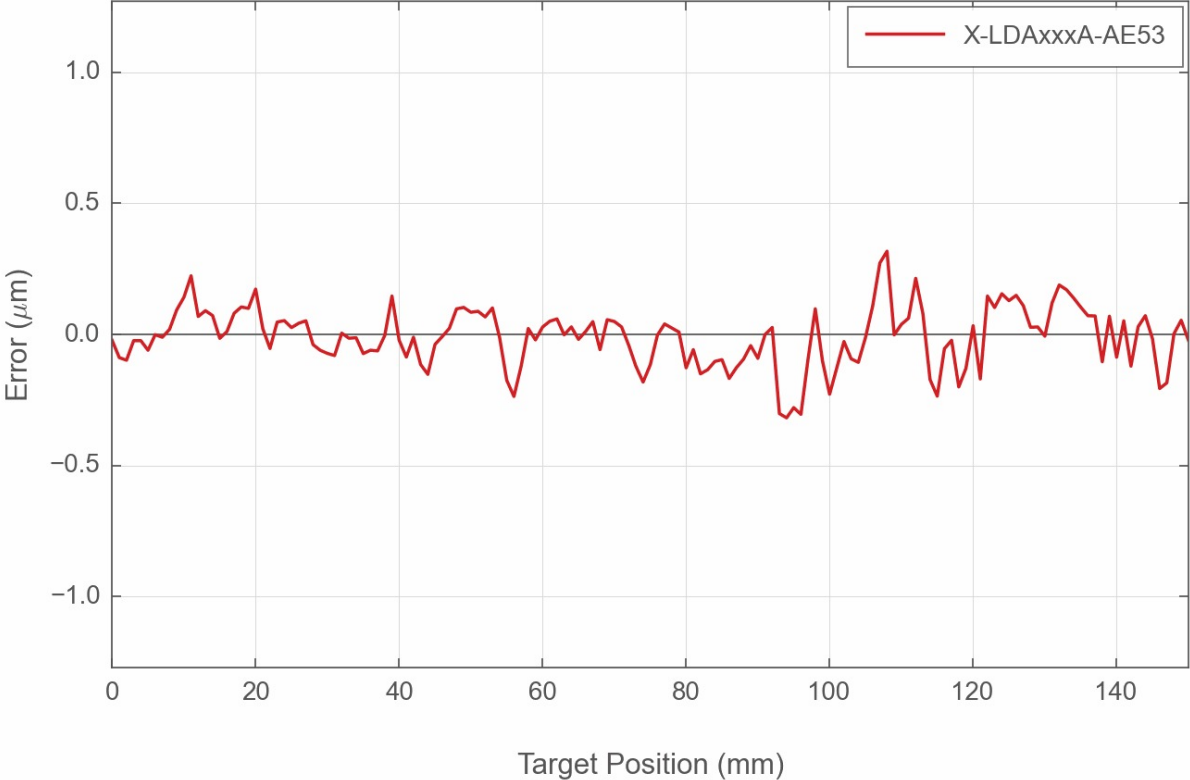
Part Number	Travel Range	Maximum Acceleration	Vertical Runout	Horizontal Runout
X-LDA025A-AE53D12	25 mm (0.984")	78.5 m/s ² (8.00 g)	< 4 μm (< 0.000157")	< 4 μm (< 0.000157")
X-LDA075A-AE53D12	75 mm (2.953")	44.1 m/s ² (4.50 g)	< 8 μm (< 0.000315")	< 6 μm (< 0.000236")
X-LDA150A-AE53D12	150 mm (5.905")	24.5 m/s ² (2.50 g)	< 15 μm (< 0.000591")	< 10 μm (< 0.000394")

Part Number	Pitch	Roll	Stiffness in Pitch	Stiffness in Roll
X-LDA025A-AE53D12	0.006° (0.105 mrad)	0.005° (0.087 mrad)	500 N-m/° (35 μrad/N-m)	500 N-m/° (35 μrad/N-m)
X-LDA075A-AE53D12	0.016° (0.279 mrad)	0.007° (0.122 mrad)	1000 N-m/° (17 μrad/N-m)	600 N-m/° (29 μrad/N-m)
X-LDA150A-AE53D12	0.02° (0.349 mrad)	0.015° (0.262 mrad)	3000 N-m/° (6 μrad/N-m)	700 N-m/° (25 μrad/N-m)

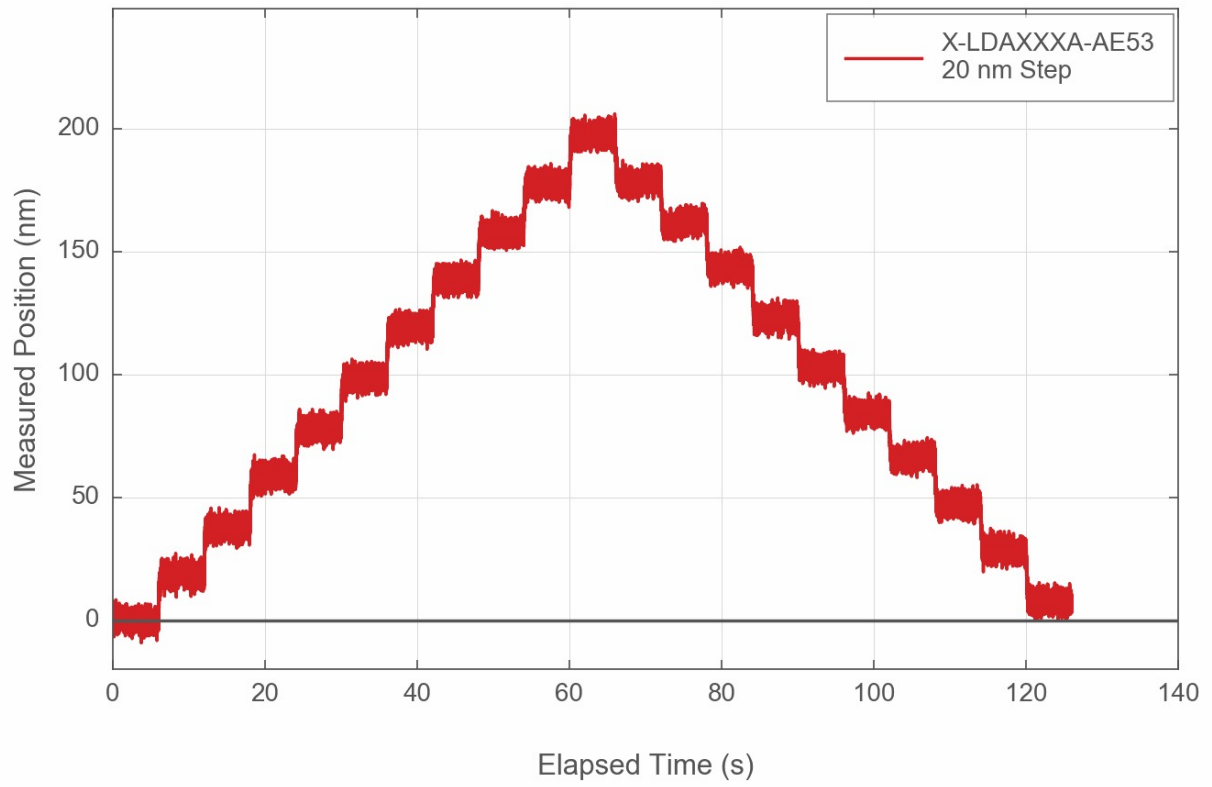
Part Number	Stiffness in Yaw	Moving Mass	Weight
X-LDA025A-AE53D12	400 N-m/° (44 μrad/N-m)	0.29 kg (0.638 lbs)	0.91 kg (2.006 lb)
X-LDA075A-AE53D12	900 N-m/° (19 μrad/N-m)	0.43 kg (0.946 lbs)	1.26 kg (2.778 lb)
X-LDA150A-AE53D12	1750 N-m/° (10 μrad/N-m)	0.67 kg (1.474 lbs)	1.81 kg (3.990 lb)

X-LDA-AE Series Charts

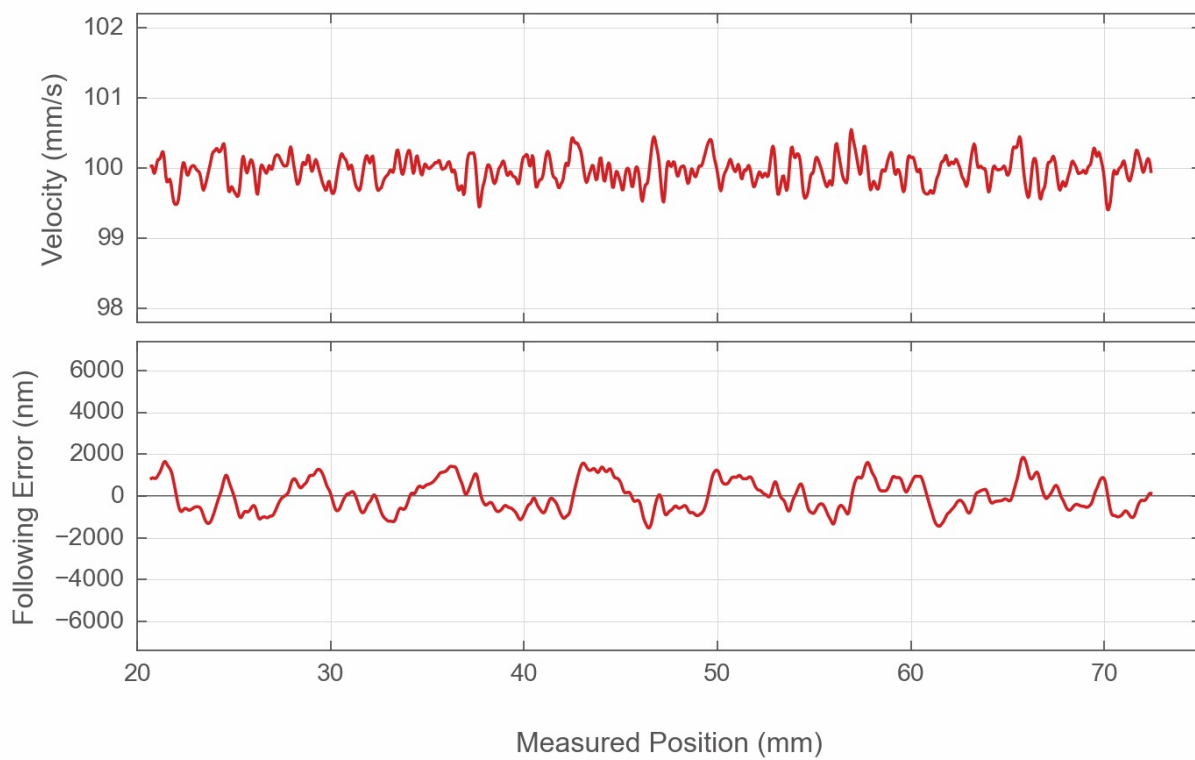
Typical Accuracy



Typical Minimum Incremental Move



Velocity Stability and Following Error



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