



XLA-1 series

Precise and compact linear actuator

The XLA-1 combines ultra-compact design, high precision, and powerful performance. Driven by the CrossFixx™ ultrasonic piezo motor, it offers speeds up to 1000 mm/s, submicron resolution, and up to 1 N of force - all in a unit weighing under 10 g. Stroke lengths range from 5 to 145 mm.

KEY FEATURES

drive principle	patented Crossfixx™ ultrasonic piezo technology
lifetime	> 1000 km / typ. 20 million cycles
control principle	closed-loop position control
controller	XD-OEM (external)

MODEL CODE STRUCTURE

actuator type	rod length (mm)	encoder resolution (nm)
XLA-1	-20	-1250
		-312
		-78
	-30	same as for XLA-1-20
	-40	
	-50	
	-60	
	-70	
	-80	
	-100	
	-120	
	-140	
	-160	

Example: XLA-1-40-312

- XLA-1 series linear actuator
- Rod length of 40 mm
- Encoder feedback with a resolution of 312 nm

ENVIRONMENTAL COMPATIBILITY

temperature range	-30°C to +70°C
humidity range	20% to 90% RH (non-condensing)
heat dissipation (motor only)	< 1 W
internal operation voltage	60 V

MOTION PERFORMANCE

		XLA-1 all rod lengths			unit	tolerance
		-1250	-312	-78		
ENCODER	type	optical, incremental				
	grating period	79.8 318			µm LPI	
	resolution rounded effective	1250 1248.035	312 312.009	78 78.002	nm	
	index	1 per full stroke				
ACTUATOR	positioning	resolution = min. step size = min. incremental motion (MIM)	1250	350	80	nm typ.
		unidirectional repeatability	± 1250	± 350	± 80	nm typ.
		bidirectional repeatability	± 2500	± 700	± 160	nm typ.
	speed	max. speed	400			mm/s typ.
		min. speed	2 to 5			µm/s typ.
		stability (at typical speed of 10 mm/s)	± 1			% typ.
		point-to-point positioning time	10 mm 1 mm 100 µm	75 30 20	125 70 60	msec typ.

¹ conditions: settling within bidirectional repeatability range, <50 g horizontal payload, communication delay not taken into account

Note: a detailed description of the technical terms used in this datasheet can be found on the Terminology page of our website.

MECHANICAL PROPERTIES

	XLA-1											unit	tolerance
rod length	-20	-30	-40	-50	-60	-70	-80	-100	-120	-140	-160	mm	± 0.1
dimensions	22.7 x 14.8 x 5.4											mm	± 0.1
stroke / travel range	5	15	25	35	45	55	65	85	105	125	145	mm	± 0.2
mass	5.9	6.3	6.7	7.2	7.6	8.0	8.4	9.2	10.1	10.9	11.7	g	± 5%
max. acceleration	993	662	497	397	331	284	248	199	166	142	124	m/s ²	typ.
holding force	1											N	min.
driving force ¹	1											N	min.
actuator materials	housing rod cover	blank aluminum stainless steel rail with ceramic traction surface stainless steel											
cable type	FFC 305 mm, 12 core, 0.5 mm pitch with opposite side contacts 50 000 bending cycles at radius 10 mm (min.) (Molex 15266-0138)												
bearing type	unidirectionally preloaded ball bearing with overload protection												

¹ for vertical lifting applications, consider 1/3 of the specified driving force as max. advised payload

CONTROLLER/SOFTWARE

The XLA-1 series actuators are compatible with the XD-OEM controller.

Controlling of the stage is done with:

- Easy-to-use Windows interface
- LabVIEW interface program (compiled program or source)
- MATLAB interface script
- C++ and Python libraries

DRAWING

XLA-1-40 assy F11

