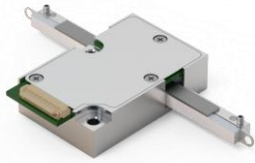# XLA-1 Series

Fast and compact linear actuator

The XLA micro linear actuators are world class in terms of weight, size and precision. The actuator is driven by the Crossfixx™ ultrasonic piezo motor, allowing an extremely compact design, variable speeds up to 400 mm/s and a total weight of less than 6 gram! The XLA-1 has an integrated encoder with a 1250, 312 or 78 nm resolution or open-loop. A wide range of rod lengths is available, allowing stroke lengths from 5 mm to 305 mm!

Key features

	closed-loop	open-loop
drive principle	patented Crossfixx™ ultrasonic piezo technology	
lifetime	> 600 km / typ. 12 million cycles	
input voltage	12 to 48 V	12 V
controller	external OEM controller required	integrated controller

Model code structure

actuator type	rod length (mm)	encoder resolution (nm)	FPC cable outlet (flexible printed cable)
XLA-1	-20	-OPEN	top side
		-1250	
		-312	
		-78	
	-30	same as for XLA-1-20	
	-40		
	-50		
	-60		
	-70		
	-80		
	-100		
	-120		
	-140		
	⋮		
	-300		
	-320		

Example: **XLA-1-40-312**

└ XLA-1 series linear actuator

└ Rod length of 40 mm

└ Closed-loop actuator with integrated encoder 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	< 48 V

Motion performance

			XLA-1 all rod lengths			unit	tolerance
			-1250	**-312**	**-78**	**Open-loop**		
LIMITS		type	software + mechanical			magnetic + mechanical		
ENCODER		type	optical, incremental			no encoder		
		grating period	80				µm	
		resolution	1250	312	78		nm	
		index	1 per full stroke					
		accuracy	± 5				µm	typ.
ACTUATOR	**positioning**	resolution = min. step size = min. incremental motion (MIM)	1250	350	80	20 – 50 µm (pulsed operation)	nm	typ.
		unidirectional repeatability	± 1250	± 350	± 80		nm	typ.
		bidirectional repeatability	± 2500	± 700	± 160		nm	typ.
	speed	max. speed	400			1000	mm/s	typ.
		min. speed	2 to 5			10	µm/s	typ.
		stability (at typical speed of 10 mm/s)	± 1			-	%	typ.
		point-to-point positioning time for a 1 mm step* 0 g load 100 g load	40 75			-	msec	typ.
		point-to-point positioning time 10 mm 1 mm 100 µm	100 40 30			-	msec	typ.

Mechanical properties

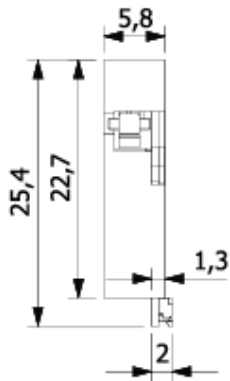|	XLA-1													unit	tolerance
	-20	**-30**	**-40**	**-50**	**-60**	**-70**	**-80**	**-100**	**-120**	**-140**	**-160**	**-180**	**-200**		
rod length														mm	± 0.1
dimensions	22.7 x 14.8 x 5.4													mm	± 0.1
stroke/ travel range	5	15	25	35	45	55	65	85	105	125	145	165	185	mm	± 0.1
mass	5.5	5.9	6.3	6.7	7.1	7.5	7.9	8.7	9.5	10.3	11.1	11.9	12.7	g	± 5%
holding force	1													N	min.
driving force	1													N	min.
actuator materials	aluminium (housing) stainless steel (rod and housing cover)														
cable type	Closed loop version: FPC, 12 core, 0.5 mm pitch with same side contacts Open loop version: FPC, 14 core, 0.5 mm pitch with opposite side contacts														

	XLA-1						unit	tolerance
	-220	**-240**	**-260**	**-280**	**-300**	**-320**		
rod length	-220	-240	-260	-280	-300	-320	mm	± 0.1
dimensions	22.7 x 14.8 x 5.4						mm	± 0.1
stroke/ travel range	205	225	245	265	285	305	mm	± 0.1
mass	13.5	14.3	15.1	15.9	16.7	17.5	g	± 5%
holding force	1						N	min.
driving force	1						N	min.
actuator materials	aluminium (housing) stainless steel (rod and housing cover)							
cable type	Closed loop version: FPC, 12 core, 0.5 mm pitch with same side contacts Open loop version: FPC, 14 core, 0.5 mm pitch with opposite side contacts							

Controller/software

The XLA-1 series actuators are compatible with all Xeryon controllers.

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

Two mounting options:
2x Ø1,7 THRU (top side)
2x M2 (bottom side)

ZIF connector: 12 core, pitch 0,5 mm

Top side

Bottom side

2x Ø1,4 $^{+0,03}_{0}$
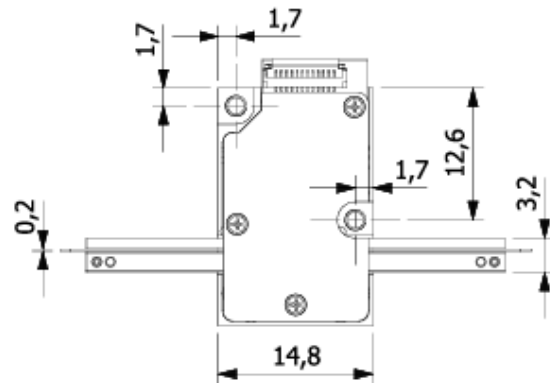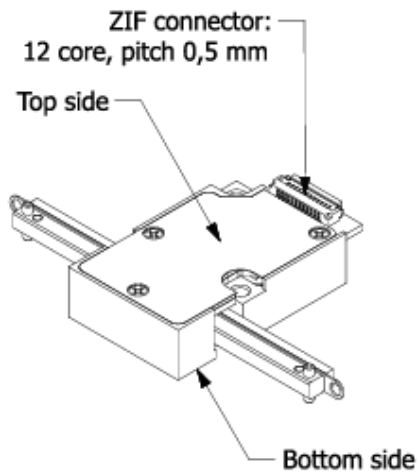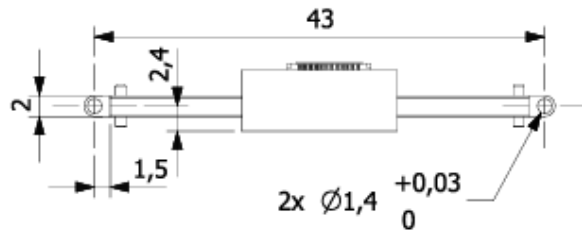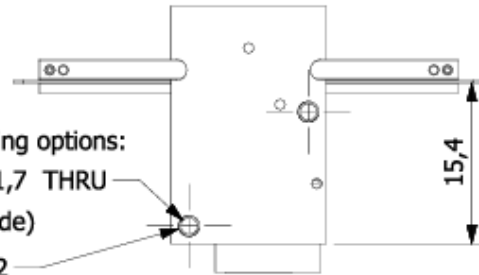
	max. tightening torque
M1,4	8 cNm
M1,6	16 cNm
M2	34 cNm