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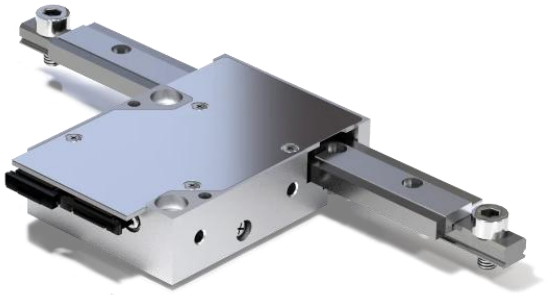


XLA-10 series

Precise and compact linear actuator

The XLA-10 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 10 N of force - all in a unit weighing under 50 g. Stroke lengths range from 15 to 150 mm.. Its stackable design is ideal for space-constrained setups.

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-10	-55	-1250
		-312
		-78
	-70	same as for XLA-10-55
	-85	
	-100	
	-115	
	-130	
	-145	
	-160	
	-175	
	-190	

Example: **XLA-10-55-312**

- XLA-10 series linear actuator
- Rod length of 55 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)	< 10 W
internal operation voltage	120 V

MOTION PERFORMANCE

			XLA-10 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.
ACTUATOR 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		105 65 60	msec	typ.
	operation duty cycle		50 120			% sec	max.

[1] conditions: settling within bidirectional repeatability range, <200 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-10										unit	tole-rance
rod length		-55	-70	-85	-100	-115	-130	-145	-160	-175	-190	mm	± 0.1
dimensions		43 x 30 x 11.5										mm	± 0.1
stroke / travel range		15	30	45	60	75	90	105	120	135	150	mm	± 0.3
mass		48.5	50.9	53.3	55.7	58.2	60.5	62.9	65.3	67.7	70.2	g	± 5%
max. acceleration		967	758	623	529	459	406	364	329	301	277	m/s^2	typ.
holding force		10										N	± 1
driving force[1]		10										N	± 1
actuator materials	housing rod cover	blank aluminum steel rail, glass fibre-reinforced rod, ceramic traction surface stainless steel											
cable type	encoder	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)											
	motor	FFC 305 mm, 4 core, 1 mm pitch with same side contacts 50 000 bending cycles at radius 10 mm (min.) (Molex 15267-0721)											
bearing type		recirculating ball linear guide with end seal and lubrication storage light preload (clearance +0 to -0.5 µm)											

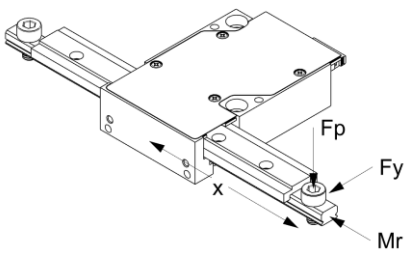
[1] for vertical lifting applications, consider 1/3 of the specified driving force as max. advised payload

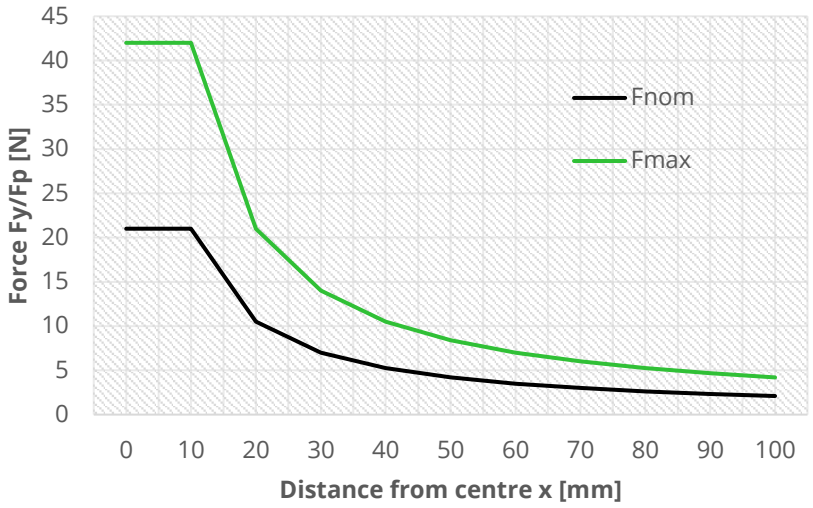
LOAD RATING OF LINEAR GUIDE

In order to guarantee the lifetime specification and to maintain smooth rolling behaviour, the moment load applied to the actuator rod should remain within the following specifications:

- The tilt moment is limited to 0.21 Nm (nominal) and 0.42 Nm (maximal). When translated into forces Fy and Fp acting on the rod end at a distance x from the actuator centre, the following load curves are obtained.
- The twisting moment Mr applied to the rod is limited to 0.25 Nm (nominal) and 0.50 Nm (maximal).

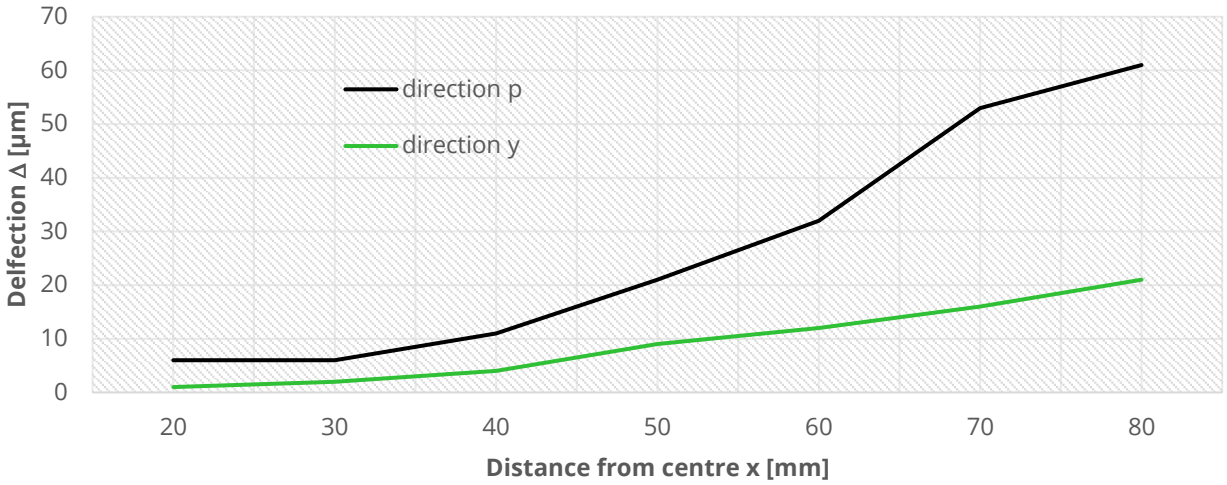
The actuator body is in these cases fixed while the load is applied to one end of the rod. Long-term operation is allowed at load ratings up to the nominal value, while operating at the maximal value is only advised for short periods of time.





ROD DEFLECTION UNDER LOAD

When applying a load to an actuator, the rod end will deflect. Since the linear guide inside the actuator body has no or minimal play, most of this deflection is caused by elastic bending of the rod. The table below shows measured values of this deflection under a load of 1 N applied in two directions (see above figure).



CONTROLLER/SOFTWARE

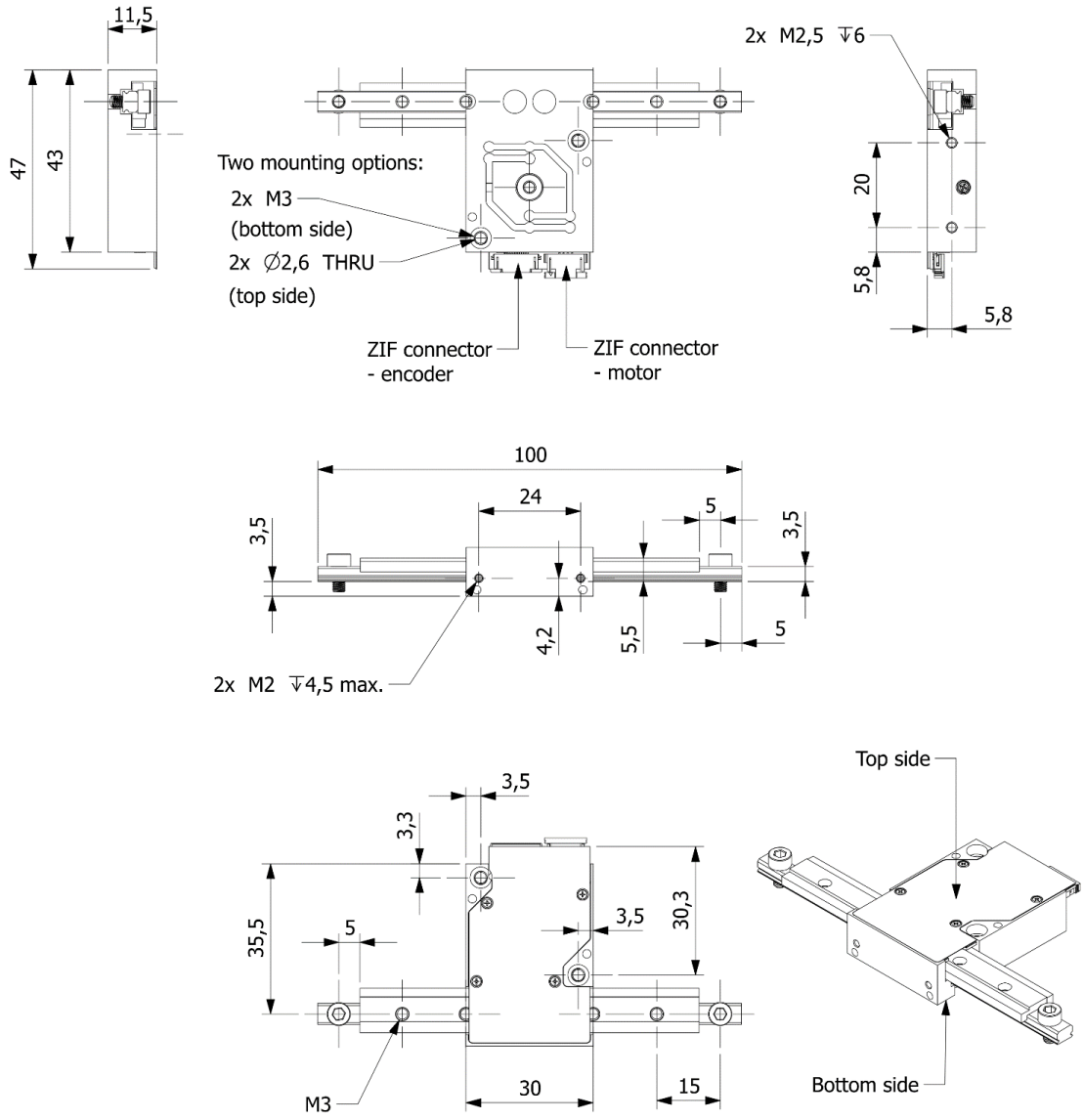
The XLA-10 actuators are compatible with the XD-OEM controller.

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

DRAWINGS (STEP-FILES ARE AVAILABLE ON OUR WEBSITE)

XLA-10-100 assy A2



	max. tightening torque
M1,6	16 cNm
M2	34 cNm
M2,5	60 cNm
M3	120 cNm