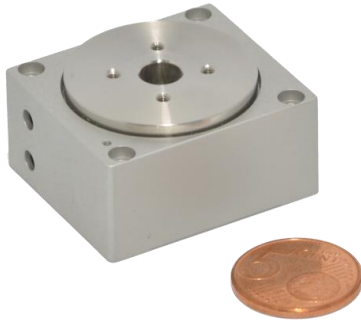


XRT-U series

Compact rotation stage with a small error motion



The XRT-U is a compact and precise rotation stage driven by an ultrasonic piezo motor. Xeryon's ultrasonic piezo motor ensures you high speeds, long lifetime and noiseless operation. This makes the XRT-U a state-of-the-art rotary stage for a broad range of precision positioning applications or metrology applications such as micro-CT, optical microscopy, electron microscopy (vacuum and non-magnetic). The precision ball bearings allow you to achieve error motion values close to air bearing stages, but in a smaller volume and at a lower cost. The XRT-U is available in two sizes and with different options. Stacking onto a Xeryon linear stage is easily done with available interface plates.

Key features

drive principle	patented Crossfixx™ ultrasonic piezo technology
bearings	precision ball bearings
lifetime	> 1 million rev.
control principle	closed-loop position control
operating voltage	20 to 48 V

Model code structure

stage type	approx. rotor diameter (mm)	encoder resolution (μrad)	optional	
			vacuum compatibility (10 ⁻⁶ mbar)	non-magnetic materials*
XRT-U	-30	-109	-HV	-NM
	-40	-73		
		-3		

* full ceramic bearings, copper alloy rotor and stainless steel bolts (A2/A4)

Environmental compatibility

temperature range	-30°C to +70°C
humidity range	20% to 90% RH (non-condensing)
heat dissipation (motor only)	< 1 W
mounting surface flatness	< 5 μm

Motion performance

		XRT-U-30-109	XRT-U-40-73	XRT-U-40-3	unit	tolerance	
ENCODER	type	optical, incremental					
	counts per rev.	57600	86400	1800000			
	resolution	109	73	3.49	μrad		
		22.5	15	0.72	arcsec		
		6250	4167	200	μ°		
index	1 per rev.						
accuracy	± 0.017		± 0.013	%	typ.		
STAGE	positioning	resolution = min. step size = min. incremental motion (MIM)	125 25 7100	75 15 4300	25 5 1400	μrad arcsec μ°	typ.
		unidirectional repeatability	± 125 ± 25 ± 7100	± 75 ± 15 ± 4300	± 25 ± 5 ± 1400	μrad arcsec μ°	typ.
		bidirectional repeatability	± 250 ± 50 ± 14200	± 150 ± 30 ± 8600	± 50 ± 10 ± 2800	μrad arcsec μ°	typ.
	speed	max. speed	720	540		%/s	typ.
		min. speed	0.008	0.006		%/s	typ.
		stability	1			%	typ.
		point-to-point positioning time	0 kgmm ² inertia 10 kgmm ² inertia	300 500		msec msec	typ.
	error motion (p-p)	radial at 7 mm above top surface	1		μm	max.	
		axial in centre	0.5		μm	max.	
		tilt (wobble)	50		μrad	max.	

* for a 1° step and settling within bidirectional repeatability range

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

Mechanical properties

		XRT-U-30-109	XRT-U-40-73	XRT-U-40-3	unit	tolerance
dimensions		40 x 35 x 21	50 x 46 x 21		mm	± 0.1
rotor diameter		32	43		mm	± 0.1
aperture		7	12.7	7	mm	± 0.1
mass (w/o connector)		82	130		g	± 5%
load capacity (payload limitation)	inertia	100	200		kgmm ²	max.
	mass*	0.5	1		kg	
load capacity (bearing force limitation)	axial	25	35		N	max.
	radial	25	35		N	
	tilt	0.15	0.2		Nm	
holding torque		7	10		mNm	min.
driving torque		14	20		mNm	min.
stage material	rotor housing	stainless steel AISI316 or copper alloy (-NM) anodised aluminium				
cable length**		1.5			m	± 0.1
connector (stage to controller)		1x 15-pin D-sub HD male				

* assuming a solid cylindrical payload of dia. 40 mm

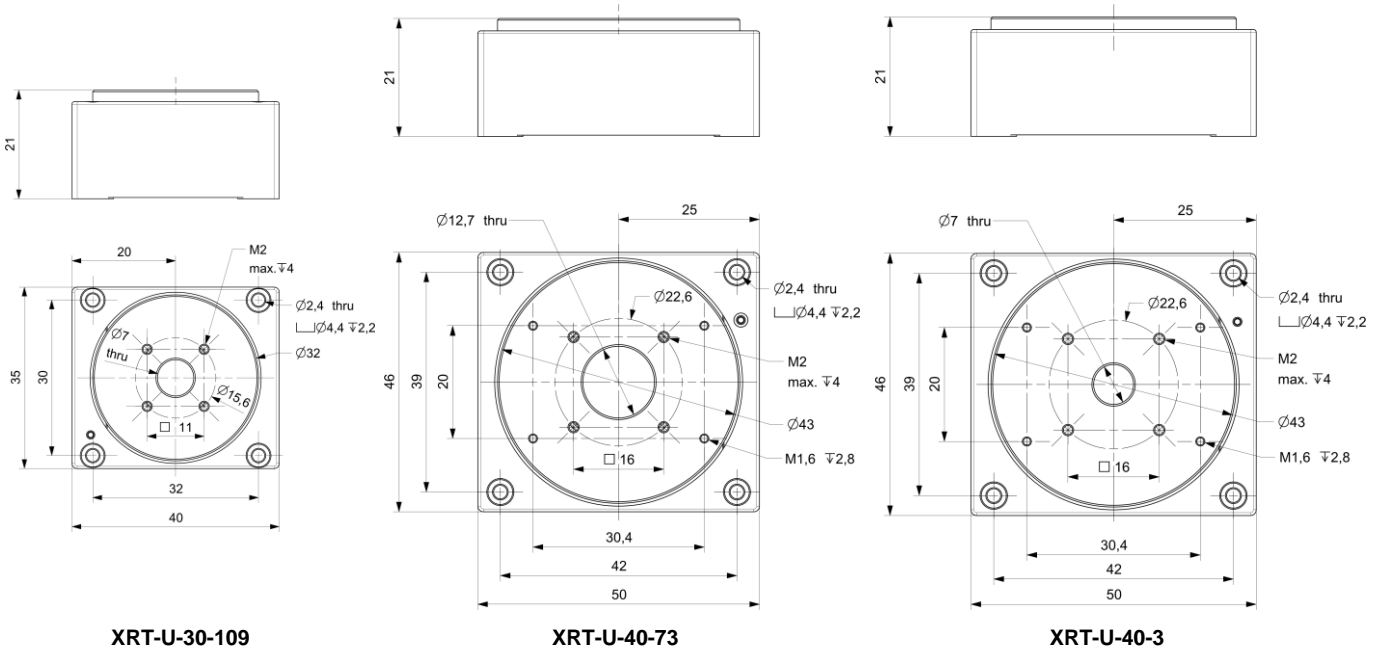
** extension cables available or shorter cable on request

Controller/software

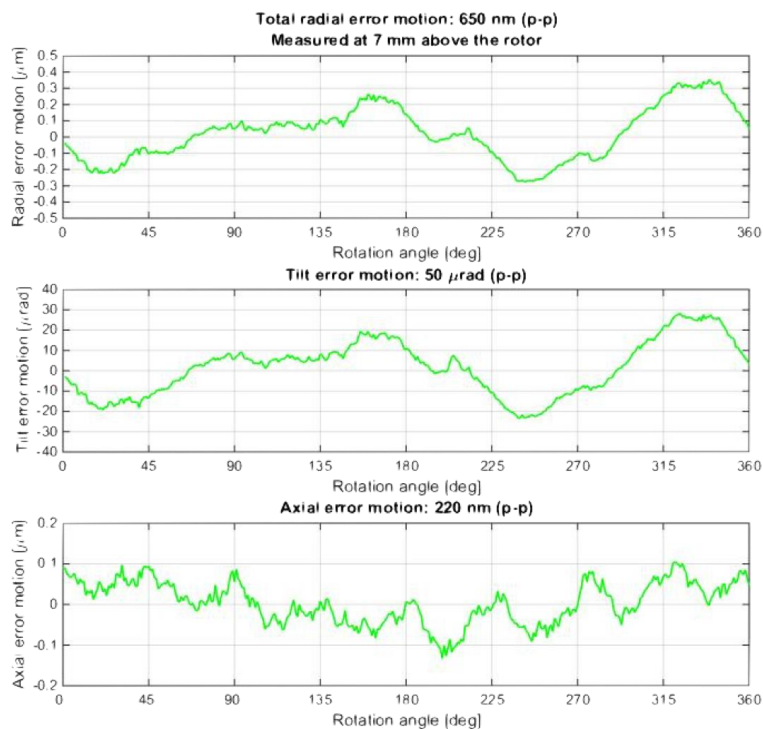
The XRT-U series rotation stages are compatible with all Xeryon controllers. Controlling of the stage is done with:

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

Drawings



Measurement data



Typical measurement of the error motion of an XRT-U-30 rotation stage.

Last updated: 21/10/2019. All specifications are subject to change without prior notice.