



## XRT-U 系列 --- 具有小运动误差的紧凑型旋转平台



XRT-U 是一个由超声波压电马达驱动的紧凑型精密旋转平台。Xeryon 的超声波压电马达确保您高速、长寿命和无噪音运行。这使得 XRT-U 是最先进的旋转平台，用于广泛的精密定位应用或测量应用，如显微 CT、光学显微镜、电子显微镜（真空和非磁性）。精密滚珠轴承可使您获得接近空气轴承的运动误差值，但体积更小且成本更低。XRT-U 有三种尺寸并且具有不同的选项，运用现有的接口板很容易将其堆叠到 Xeryon 线性平台上。

### 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 <sup>-6</sup> mbar)	non-magnetic materials*
XRT-U	-30	-109	-HV	-NM
	-40	-49		
	-60	-3		

\* full ceramic bearings and stainless steel bolts (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

### 1. Specifications dependant on the encoder resolution (x = diameter)

		XRT-U-x-109	XRT-U-x-49	XRT-U-x-19	XRT-U-x-3	unit	tolerance
ENCODER	type	optical, incremental					
	resolution	109 22.5 6250	49 10.1 2810	19 3.92 1090	3 0.62 170	μrad arcsec μ°	
	index	1 per rev.					
	accuracy	± 0.017				%	typ.
STAGE positioning	resolution = min. step size = min incremental motion (MIM)	125 25 7100	50 10 2800	25 5 1400	15 3 860	μrad arcsec μ°	typ.
	unidirectional repeatability	± 125 ± 25 ± 7100	± 50 ± 10 ± 2800	± 25 ± 5 ± 1400	± 15 ± 3 ± 860	μrad arcsec μ°	typ.
	bidirectional repeatability	± 250 ± 50 ± 14200	± 100 ± 20 ± 5600	± 50 ± 10 ± 2800	± 30 ± 6 ± 1720	μrad arcsec μ°	typ.

### 2. Specifications dependant on the diameter

		XRT-U-30-series	XRT-U-40-series	XRT-U-60-series	unit	tolerance	
STAGE	speed	max. speed	720	540	360	°/s	typ.
		min. speed	0.008	0.006	0.004	°/s	typ.
		stability	1			%	typ.
		point-to-point positioning time	0 kgmm <sup>2</sup> inertia 10 kgmm <sup>2</sup> inertia	300 500		msec msec	typ.
	error motion (p-p)	radial at 7 mm above top surface	1	2	5	μm	max.
		axial in centre	0.5	1	2.5	μm	max.
		tilt (wobble)	50	100	250	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.

### 3. Exact counts per revolution in function of encoder resolution and rotor diameter

		rotor diameter (mm)		
		30	40	60
Resolution (μrad)	109	57600	86400	64800
	49	144000	135000	129600
	19	360000	345600	324000
	3	1843200	2764800	2073600

## Mechanical properties

		XRT-U-30-series	XRT-U-40-series	XRT-U-60-series	unit	tolerance
dimensions		40 x 35 x 21	50 x 46 x 21	70 x 70 x 34	mm	± 0.1
rotor diameter		32	43	65	mm	± 0.1
aperture		7	12.7	25.4	mm	± 0.1
mass (w/o connector)		82	130	450	g	± 5%
load capacity (payload limitation)	inertia	100	200	2500	kgmm <sup>2</sup>	max.
	mass*	0.5	1	5	kg	
load capacity (bearing force limitation)	axial	25	35	100	N	max.
	radial	25	35	100	N	
	tilt	0.15	0.2	1	Nm	
holding torque		7	10	45	mNm	min.
driving torque		14	20	90	mNm	min.
stage material	rotor housing	stainless steel AISI316 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

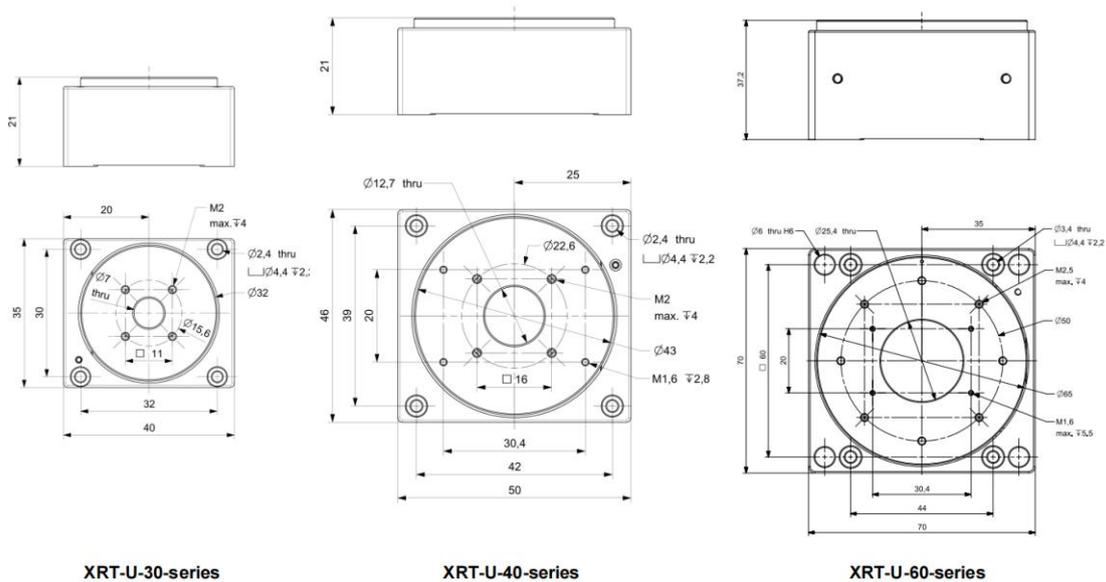
\*\* extension cables available or shorter cable on request

## Controller/software

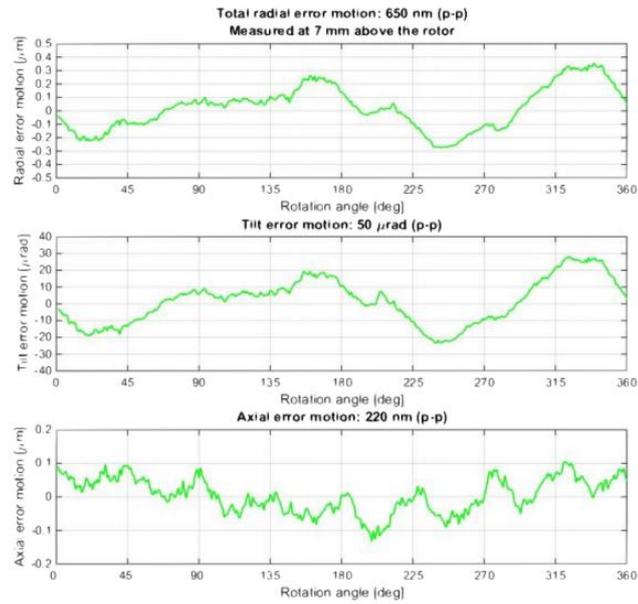
The XRT-U series rotation stages are compatible with all Xeryon controllers. Controlling of the stage is done with:

- 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: 13/01/2020. All specifications are subject to change without prior notice.