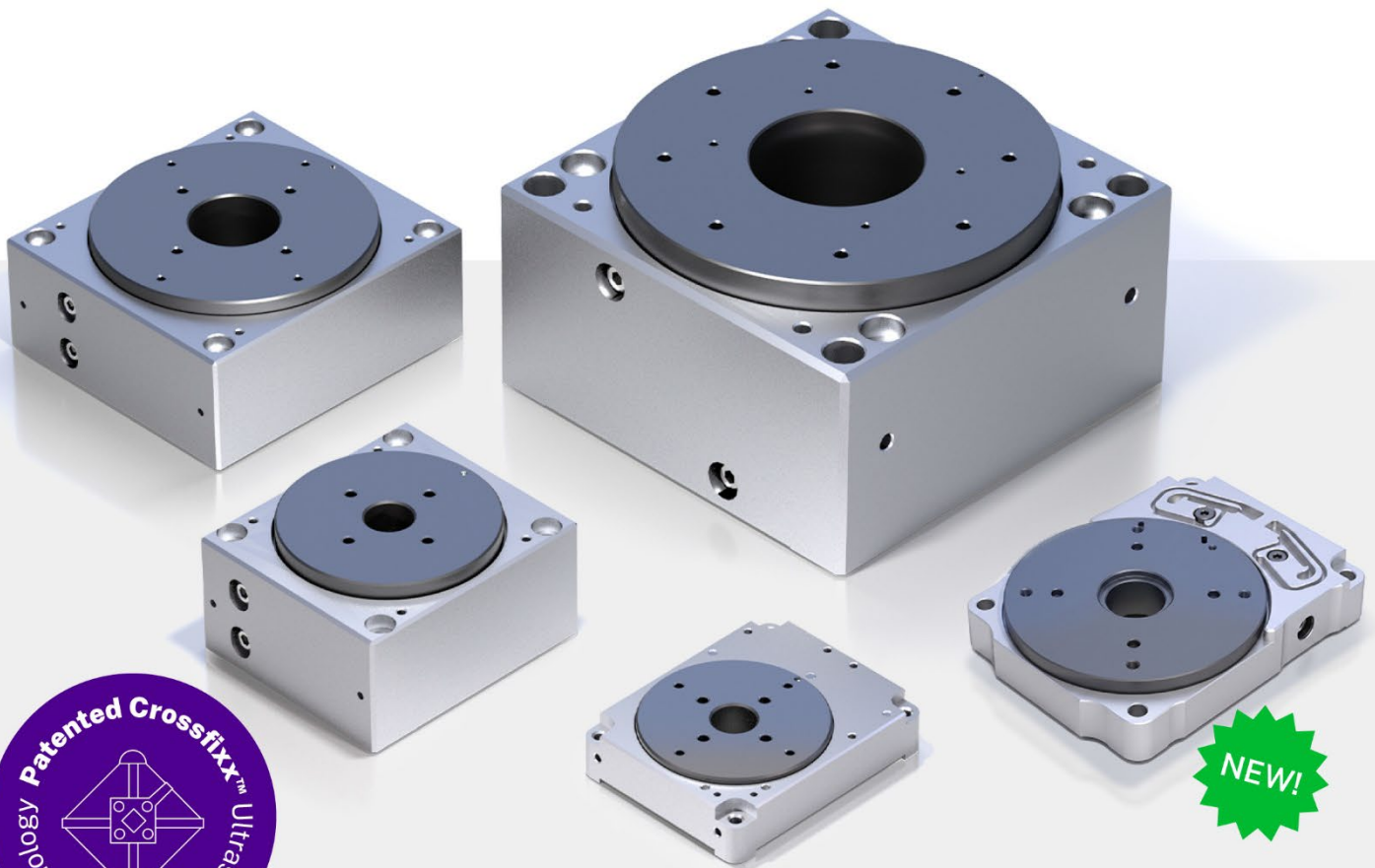
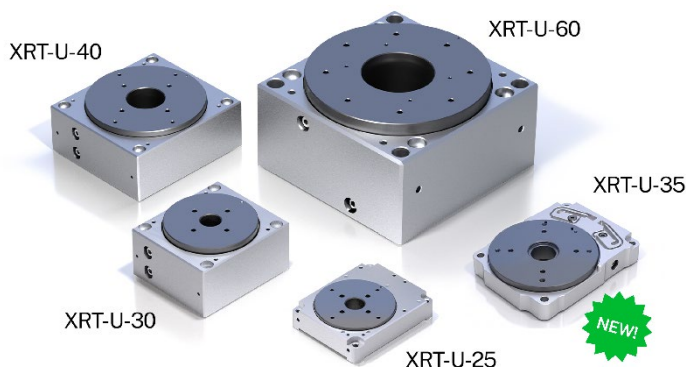


XRT-U SERIES



Disclaimer: The product images shown may be for illustration purposes only and may not be an exact representation of the product.

**Compact, Fast,
Precise & Durable**



XRT-U SERIES

Precise and compact rotation stages

The XRT-U is a compact high-precision 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 and metrology applications. The precision ball bearings allow you to achieve low error motion values. The XRT-U is available in five sizes and with different options. Stacking onto a Xeryon linear stage is easily done directly on the top plate or with available interface plates.

KEY FEATURES

Drive Principle	Patented Crossfixx™ Ultrasonic Piezo Technology
Bearings	Precision ball bearings
Lifetime	>500 km / typ. 10 million rev.
Control Principle	Closed-loop position control

MODEL CODE STRUCTURE

BASE SPECIFICATION			OPTIONAL		CONNECTOR/CABLE	
Stage Type	Approx. Rotor Diameter (Mm)	Encoder Resolution (µrad)	Vacuum Compatibility	Dual Motor	Connector Type	Cable Length
XRT-U	-25	• 1000	-HV (10-6 mbar) -UHV (10-9 mbar)	-2M optional	see tables below	
	-30	• 100		not possible		
	-35	• 3		2M as standard		
	-40	• 109		not possible		
	-60	• 49 • 19 • 3		not possible		

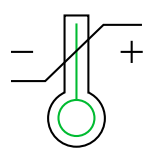
CONNECTOR OPTION	stage environment		
	standard	-HV	-UHV
-C0 (OEM) ²	15p Molex Pico-Clasp (501330-1500)	not recommended	
-C1 (scientific)	15p D-sub HD male	15p D-sub LD female	
-C2	12p Fischer (S 103 Z062-130+)		not possible

CABLE LENGTH OPTION	length
-L25	25 cm
-L50	50 cm
-L150 (standard)	150 cm
-L300	300 cm

EXAMPLE: XRT-U-35-100-HV-C1-L150

- XRT-U series rotation stage
- Rotor diameter of 35 mm (approx.)
- Encoder feedback with a resolution of 100 µrad
- Vacuum compatibility (HV)
- D-sub connector option (C1)
- Cable length of 150 cm

ENVIRONMENTAL COMPATIBILITY



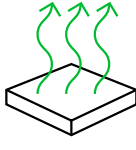
Temperature Range

-30°C to +70°C



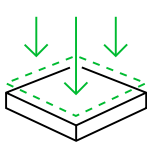
Humidity Range

20% to 90% RH (non-condensing)



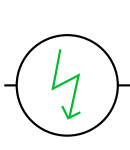
Heat Dissipation (Motor Only)

< 1 W (XRT-U-30/40)
< 1 W (XRT-U-25 single motor)
< 2 W (XRT-U-25 dual motor/XRTU-35)
< 5 W (XRT-U-60)



Mounting Surface Flatness

< 20 µm



Internal Operation Voltage

48-60 V

MOTION PERFORMANCE

Specifications dependent on the encoder resolution

XRT-U-25/30/35					Unit	Tolerance	
Resolution		-1000	-100	-3			
	Type	Optical, Incremental					
	Rounded Resolutions	1000	100	3	μrad		
	Effective Resolutions	872.6 180 50000	102.66 21.17 5882.4	3 0.62 171.8	μrad arcsec μ°		
	Index	1 per rev					
STAGE	Positioning	= Min Incremental Motion (Mim)	1000 206 57296	100 21 5730	3 0.62 172	μrad arcsec μ°	typ.
		Unidirectional Repeatability	± 100 ± 250 ± 60.000	± 10 ± 25 ± 6.000	± 3 ± 4 ± 6	μrad arcsec μ°	typ.
		Bidirectional Repeatability	± 100 ± 250 ± 60.000	± 10 ± 25 ± 6.000	± 3 ± 4 ± 6	μrad arcsec μ°	typ.

Specifications dependent on the encoder resolution

XRT-U-40/60						Unit	Tolerance	
Resolution		-109	-49	-19	-3			
ENCODER	Type	optical, incremental						
	Effective Resolutions	109 22.5 6250	49 10.1 2810	19 3.92 1090	3 0.62 170	μrad arcsec μ°		
	Index	1 per rev.						
STAGE	Positioning	= 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.

Specifications dependent on the encoder resolution

			XRT-U-25	XRT-U-30	XRT-U-35	XRT-U-40	XRT-U-60	unit	tolerance
STAGE	Speed	Max. Speed	1440	720	1080	540	360	°/s	typ.
		Min. Speed	0.01	0.01	0.01	0.006	0.004	°/s	typ.
		Stability	10					%	typ.
		Point-To-Point Positioning Time ¹	0 Kgmm ² Inertia 65 Kgmm ² Inertia	30 150				msec	typ.
		Max. Acceleration	12	12	15	10	10	x10 ³ rad /s ²	typ.
	Error Motion (P-P)	Radial At 7 Mm Above Top Surface	5	1	2	2	5	µm	max.
		Axial In Centre	2.5	0.5	1	1	2.5	µm	max.
		Tilt (Wobble)	250	50	100	100	250	µrad	max.
	Operation Duty Cycle (For -HV/-UHV Only)			50				%	max.
				120				sec	max.

¹ for a 1° step and settling within bidirectional repeatability range, communication delay not taken into account

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

		XRT-U-25	XRT-U-30	XRT-U-35	XRT-U-40	XRT-U-60
Resolution (µrad)	1000	7200	7200	4520	N/A	N/A
	109	N/A	N/A	N/A	86400	64800
	100	61200	61200	63280	N/A	N/A
	49	N/A	N/A	N/A	135000	129600
	19	N/A	N/A	N/A	345600	324000
	3	2095200	2095200	2092760	2764800	2073600

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-25	XRT-U-30	XRT-U-35	XRT-U-40	XRT-U-60	unit	tolerance
Dimensions		37.5 x 30 x 8.9	40 x 35 x 21	47 x 36 x 9	50 x 46 x 21	70 x 70 x 38.6	mm	± 0.1
Rotor Diameter		27	32	35.9	43	65	mm	± 0.1
Aperture		6.35 H7	7 H7	8 H7	13.5	25.4	mm	+0/+0.0 5
Rotation Range		> 360° (unlimited)						
Mass (W/O Connector)		24	80	50	124	489	g	± 5%
Load Capacity (Payload Limitation)	inertia mass ¹	50 0.1	300 0.5	500	400 1	2500 5	kgmm ² kg	max.
Load Capacity (Bearing Force Limitation)	axial radial tilt	10 10 0.05	25 25 0.15	To be determined	35 35 0.2	100 100 1	N N Nm	max.
Driving Torque ²		9.5 (single motor) 19 (dual motor)	15	22.5 (single motor) 40 (dual motor)	20	90	mNm	min.
Holding Torque		9.5 (single motor) 19 (dual motor)	15	22.5 (single motor) 45 (dual motor)	20	90	mNm	min.
Stage Materials	rotor housing bearing fasteners	stainless steel AISI304 or AISI316 blank aluminium stainless steel; stainless steel grade A4						
Cable	type	shielded cable, PFA insulation and PU sheat (standard) shielded cable, PFA insulation w/o sheat (-HV and -UHV)			2x shielded cable, PFA insulation and sheat (standard/-HV) ³ 2x shielded cable, PFA insulation w/o sheat (-UHV) ²			
	diameter	Ø3.4 (standard) Ø2.1 (-HV and -UHV)			Ø1.7 (standard and -HV) Ø1.4 (-UHV)		mm	± 0.2

¹assuming a solid cylindrical payload of dia. 40 mm

² max. advised unbalanced load in applications with an horizontal rotational axis is 1/3 of the specified driving torque

³ XRT-U-40-109 stages have a single cable

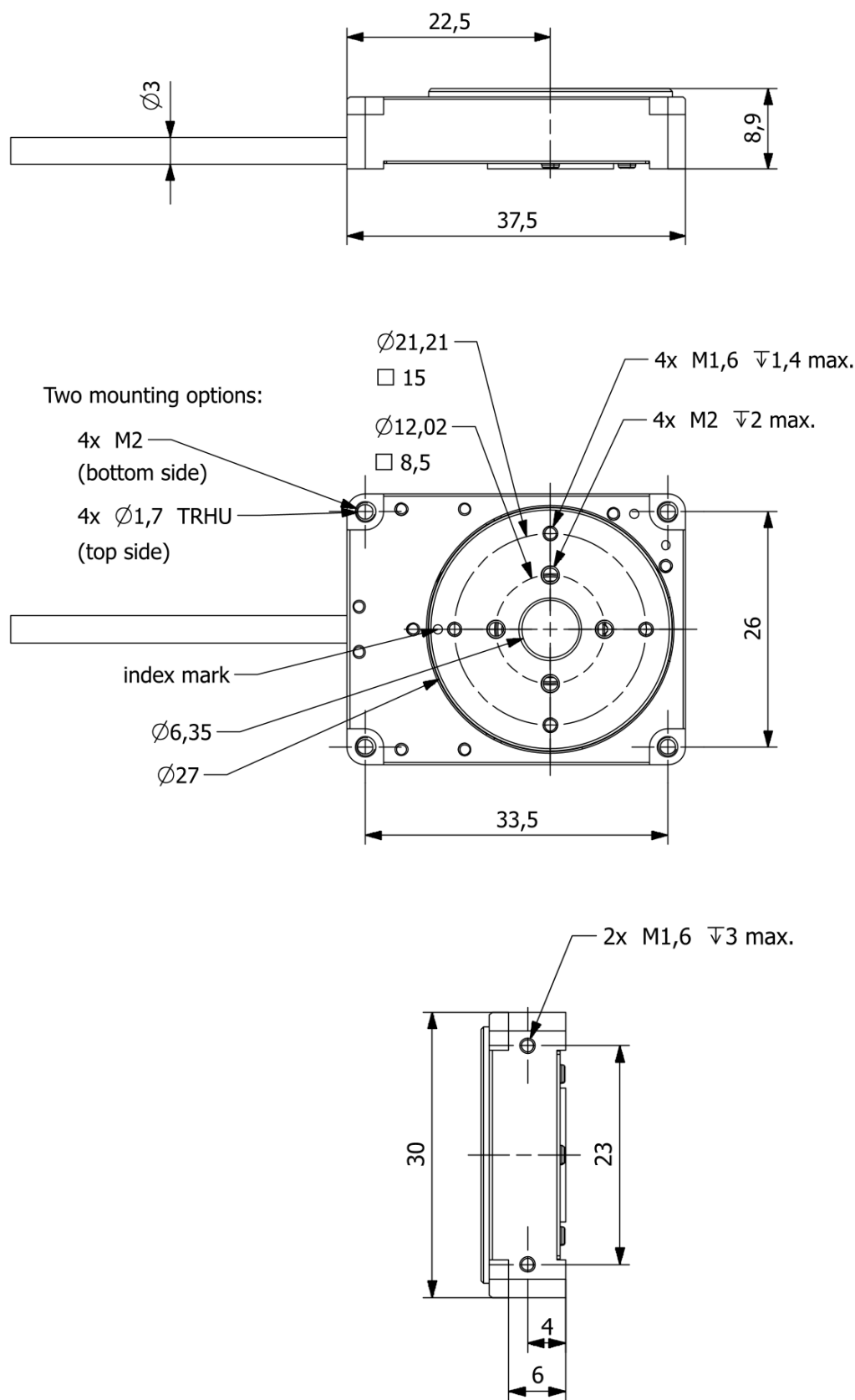
CONTROLLER / SOFTWARE

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

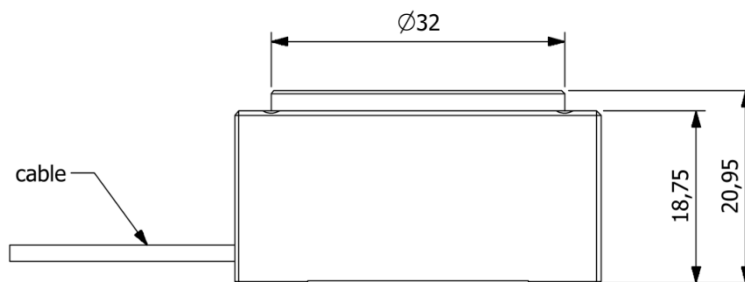
- Easy-to-use Windows interface
- LabVIEW interface program (compiled program or source)
- MATLAB interface script
- C++ and Python libraries

DRAWING

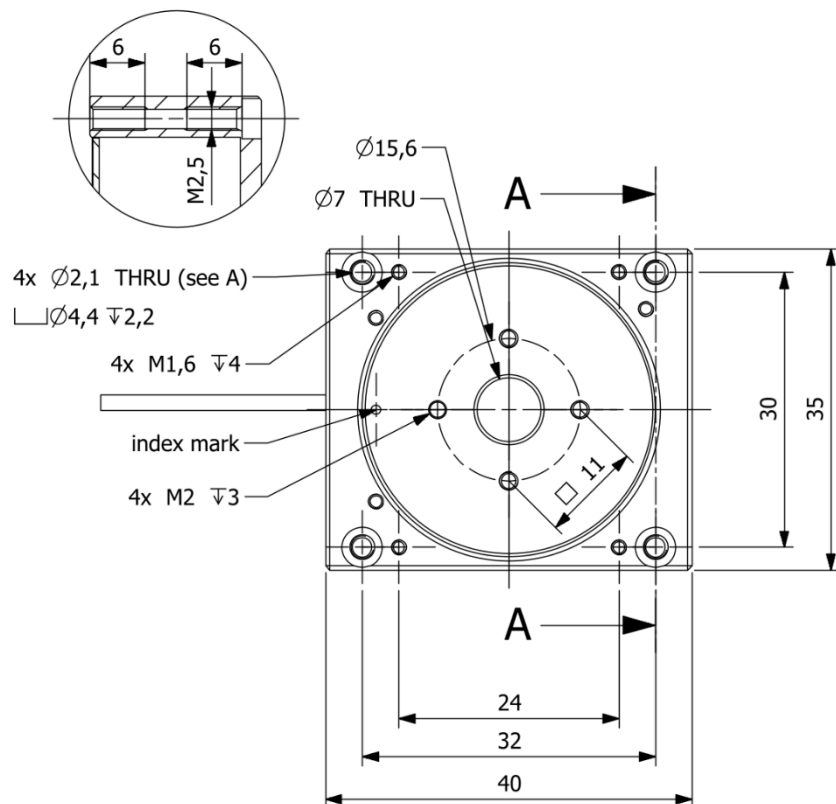
XRT-U-25-assy A2



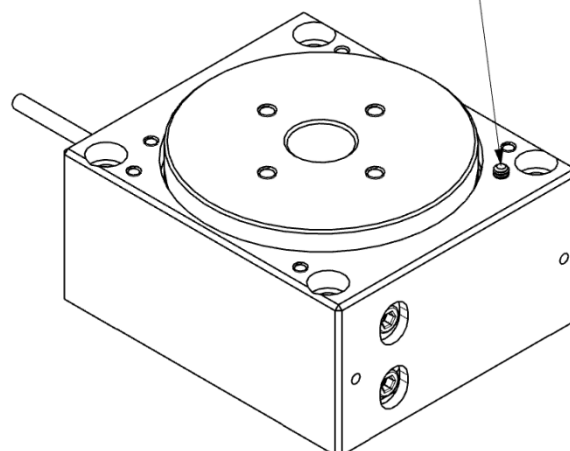
XRT-U-30-assy 01



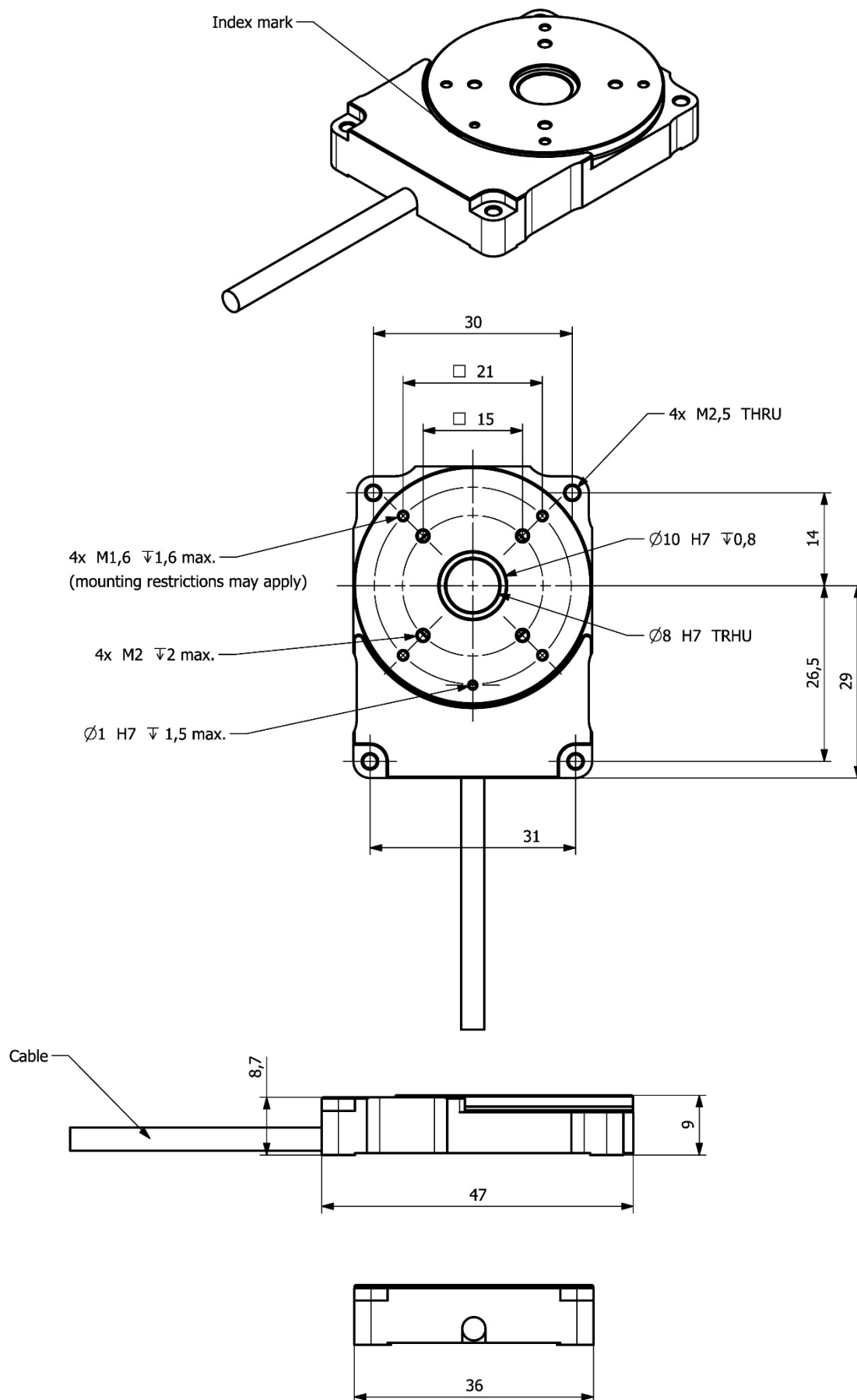
detail cross section A:



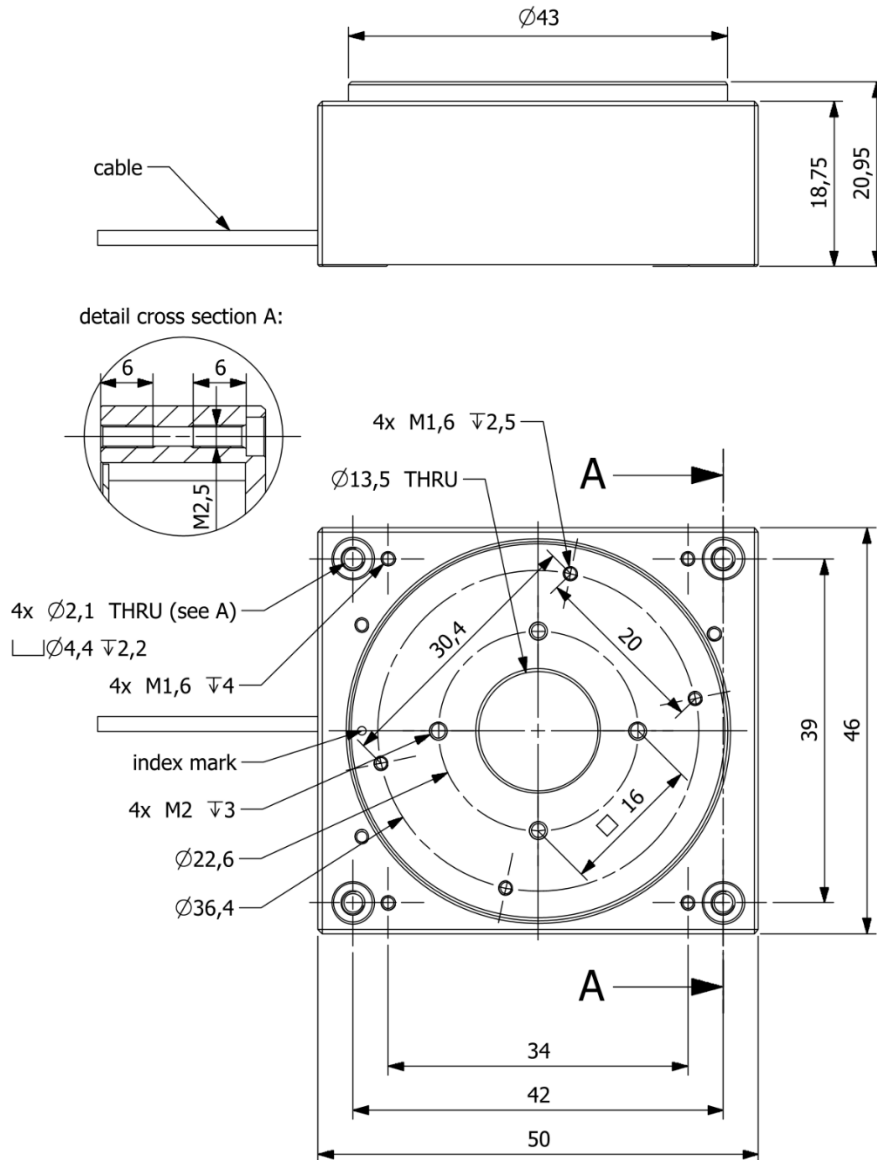
bolt end can protrude up to 1 mm
with respect to body surface



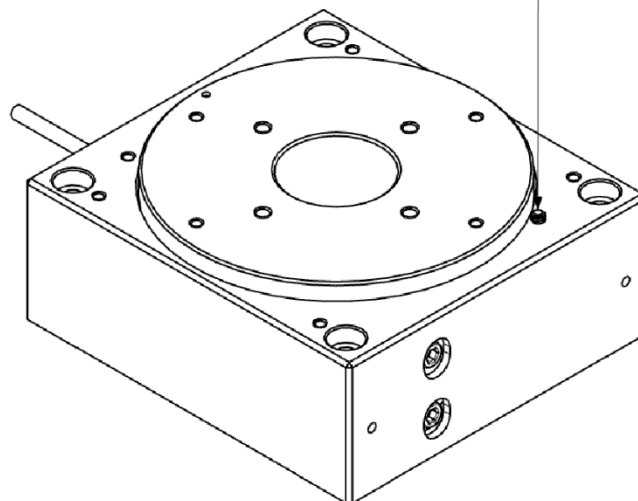
XRT-U-35-assy A1



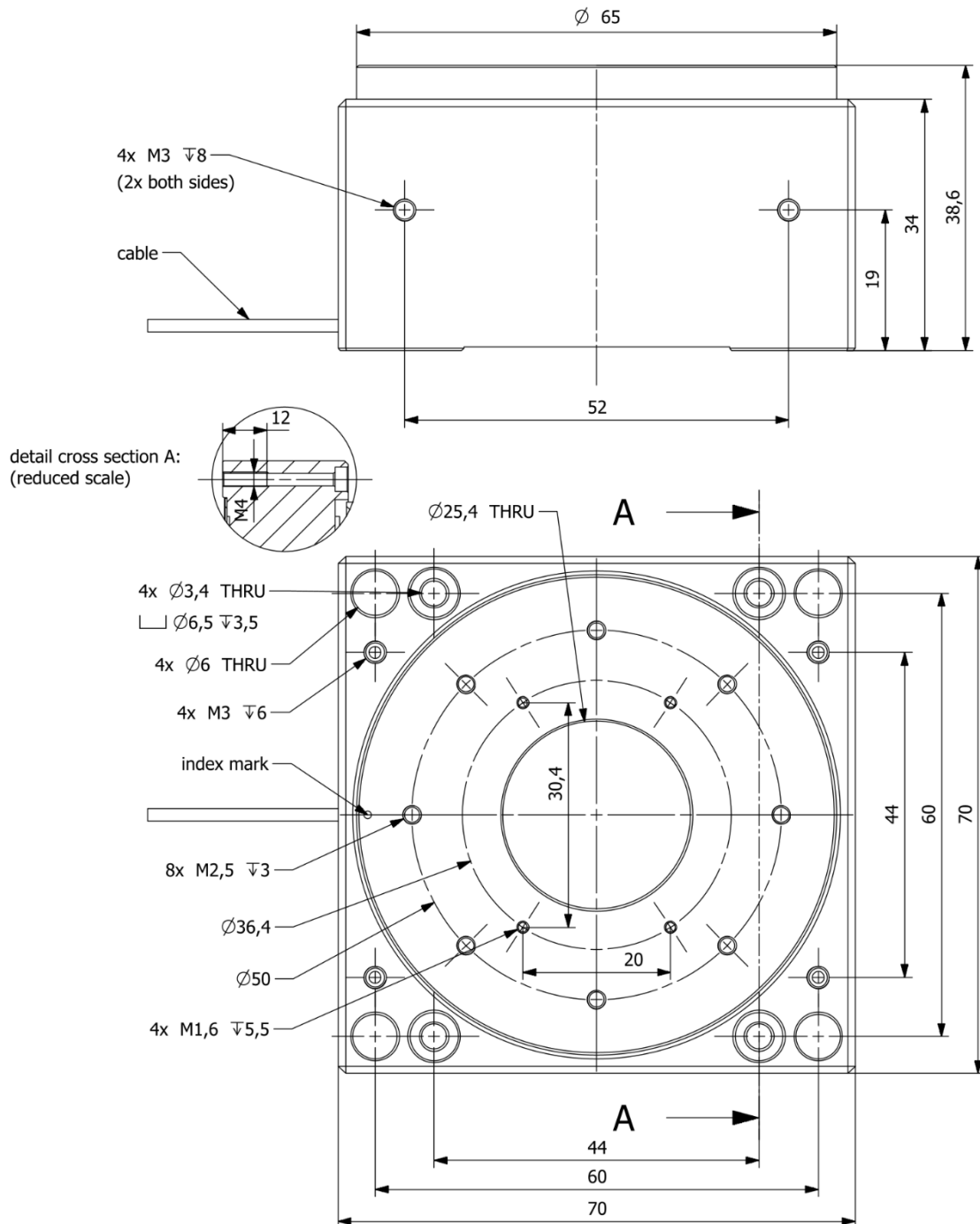
XRT-U-40-assy M1



bolt end can protrude up to 1 mm
with respect to body surface



XRT-U-60-assy F7



recommended flatness of
mounting surfaces: 20 μm max.

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