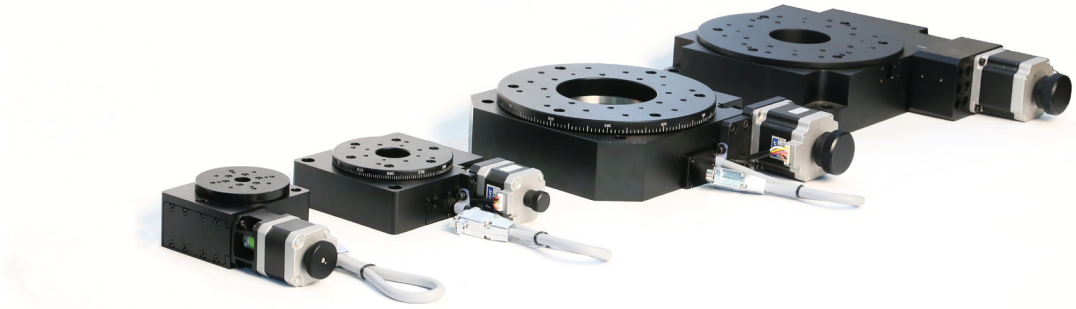
TBR and TBRF series motorized rotation stages



Description:

TBR series motorized rotation stages are designed by Zolix for meeting the strict requirements of high precision, high rigidity and high repetition rate for operation and being suitable for the applications of industrial automation fields. The worm gears used in TBF family are made of tin bronze which presents excellent wear-resistant performance. The matched worms are made of stainless steel and treated with high-frequency quench and provide high hardness and high rigidity. Good appearance comes from main body materials of black anodic-oxidation hard aluminum alloy. Fine cross-roller collar constitutes main part of guiding mechanism and present high strength, high loading capability and long-term durability. This series products can be operated horizontally, vertically and even inverted. Higher motion accuracy is guaranteed by fine-designed inner shaft structure. Generally this series of motorized rotation stages are suitable for being integrated with other equipment or operated in automatic production lines which locate in complex application situation and need higher long-term durability.

Standard TBR series products employ worm gear/worm with higher transmission ratio which result in higher meshing accuracy but slower rotation speed. TBRF version is faster than standard TBR series by using a set of worm gear/worm which has smaller transmission ratio to guarantee higher rotation speed. TBRF series has higher rigidity and rotates faster with relative lower meshing accuracy. This is a family of products to be used in applications which require higher speed, higher wear-resistant performance but lower operation speed.

Main characteristics:

- Excellent wear-resistance contributed by materials of tin bronze of worm gears
- High hardness and rigidity from qualified stainless steel of worm treated with high-frequency quench techniques
- The main part in guiding mechanism is fine cross-roller collar which offers high strength, high loading capability and good durability in different application status of being operated horizontally, vertically and inverted
- A set of gap-adjustment mechanism is added to ensure smooth running and smaller backlash, based on employed high-meshing-accuracy worm gear/worm
- Two-phase stepping motors are standard; servo motors with different brands are optional
- Built-in origin-point sensor can be operated easily

Naming rules:

TBR 200 (L)(-ASP2)(-SSxx)

- TBR — Series code: TBR: worm gear made of wear-resistant tin bronze, high precise, aluminum alloy, cross-roller collar
- 200 — Diameter of tables: 60: Φ59mm; 100: Φ102mm; 200: Φ196mm
- (L) — Position of motor mounting: None (default): right side; L: left side
- (-ASP2) — Type of motor: None (default): two-phase stepping motors; ASP1: Panasonic 100W AC servo motor; ASY2: Yaskawa 200W AC servo motor; P1: Installation plate and shaft coupling of Panasonic 100W AC servo motor; Y2: Installation plate and shaft coupling of Yaskawa 200W AC servo motor
- (-SSxx) — Position of sensors: None (default): built-in; SSxx: Externally installed, xx: angle range

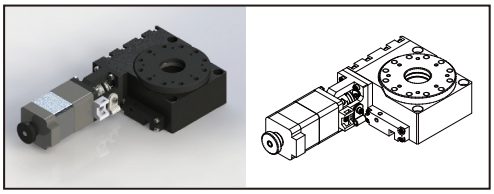
Selection chart:

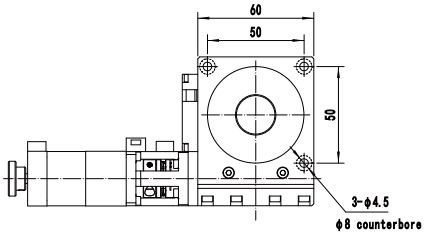
Model number		TBR60L	TBR100	TBR200	TBRF60L	TBRF75L
Mechanical specifications	Table dimensions(mm)	Φ59	Φ102	Φ196	Φ60	Φ75
	Rotation angle range (°)	360				
	Worm gear/worm transmission ratio	180:1			60:1	
	Guides (guiding mechanism)	Angular-contact bearing	Cross-roller collar			
	Materials of worm gear	Wear-resistant tin bronze				
	Materials and treatment techniques of worm	Stainless steel, surface quench				
	Main body materials and surface treatments	Black anodic-oxidation 2024 aluminum-alloy				
	Weight (Kg)	0.7	2	7	1.1	1.4
	Shaft coupling (external diameter-diameter of aperture 1-diameter of aperture 2) (mm)	19-4-5	20-5-5	25-6.35-6.35	19-5-5	19-5-5
Accuracy specifications	Step resolution (μm)	0.01			0.03	
	8-fine-subdivision resolution (°)	0.00125			0.00375	
	Highest speed (°/s) *	20			60	
	Positioning accuracy (°)	≤0.05			≤0.1	
	Repositioning accuracy (°)	≤±0.005			≤±0.015	
	Static clearance (μm)	≤8	≤6	≤12	≤20	≤25
	Backward rotation clearance (°)	≤0.01	≤0.005	≤0.005	≤0.02	≤0.02
	Static parallelism (mm)	≤0.08	≤0.1		≤0.08	
	Axial runout (μm)	≤40				
	Radial runout (μm)	≤25	≤30	≤45	≤25	
Electrical specifications	Motor (stepping angle 1.8°)	Two-phase 28	Two-phase 42	Two-phase 57	Two-phase 28	Two-phase 42
	Working current (A)	1.0	1.7	2.4	1.3	1.7
	Torque of motor (N·m)	0.1	0.42	1	0.156	0.456
	Model number of motor	28BYG003-C	42M-1.8D-C-10	57M-1.8D-C	STP-28D3003-1210	SST43D2126-10
	Model number of stepping driver (optional)	Moons, SR2		Moons, SR4	Moons, SR2	
	Type of plugs for stages	1*DB9 (pin)				
	Type of cables for stages	High flexible cables (Helukabel, Germany)				
	Length of cables for stages (m)	0.2				
	Position-limit sensors (built-in)	None. (Externally installed optional)				
	Origin-point sensors (built-in)	1*GP1S09xHCPI (Sharp, Japan)	1*PM-L25 (SUNX, Japan)		1*GP1S09xHCPI (Sharp, Japan)	
	Voltage of power supply for sensors (V)	5 to 24V DC ±10%				
	Consuming current (mA)	<60 (total)	<15 (total)		<60 (total)	
	Output for control	NPN open-collector output	NPN open-collector output		NPN open-collector output	
	Status of output ports	output ON when sensor is blocked				
Operating load	Horizontal direction (Kg)	5	20	40	10	15
	Invert direction (Kg)	2	5	10	4	5
	Vertical direction (Kg)	2	5	10	4	5

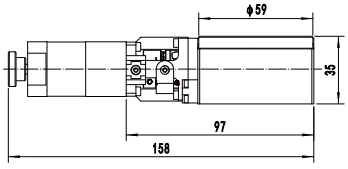
* Highest speed is measured with the conditions of zero-load and motors being worked at 600rpm

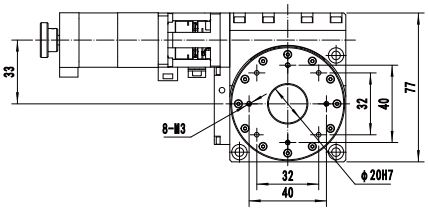
Dimensions:

TBR60L

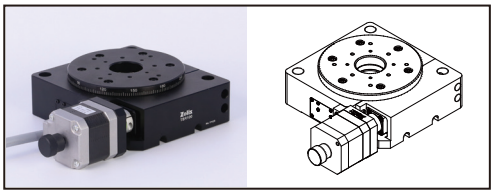


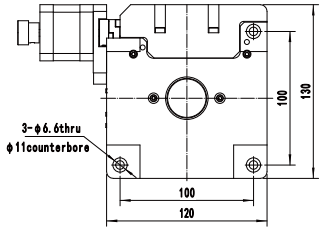


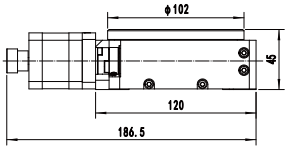


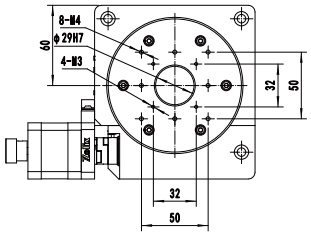


TBR100

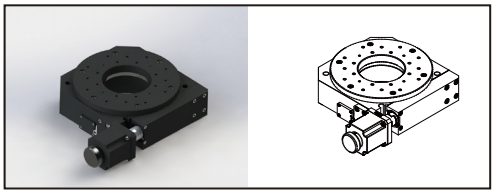


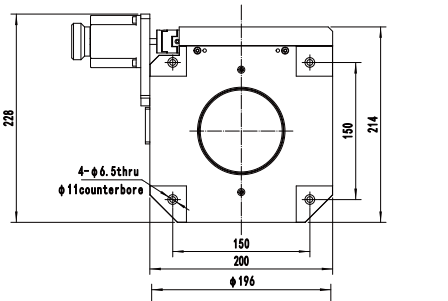


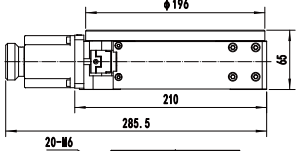


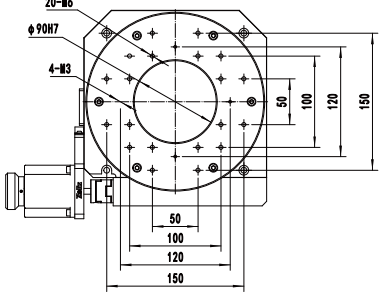


TBR200

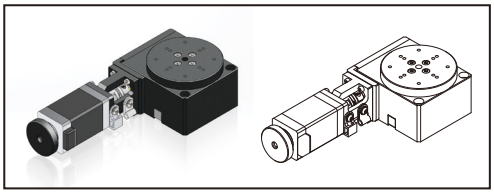


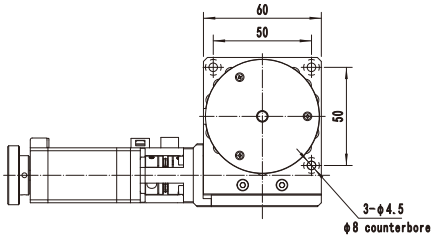


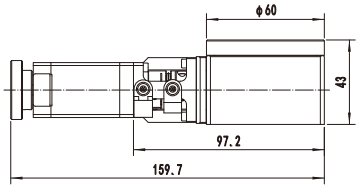


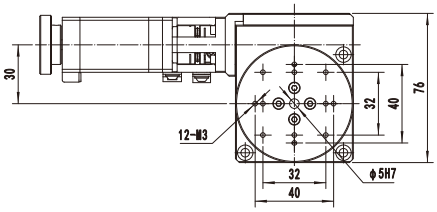


TBRF60L

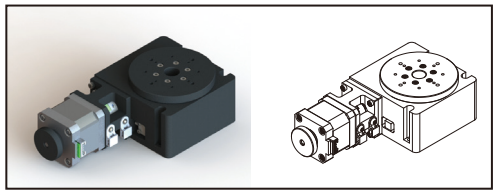


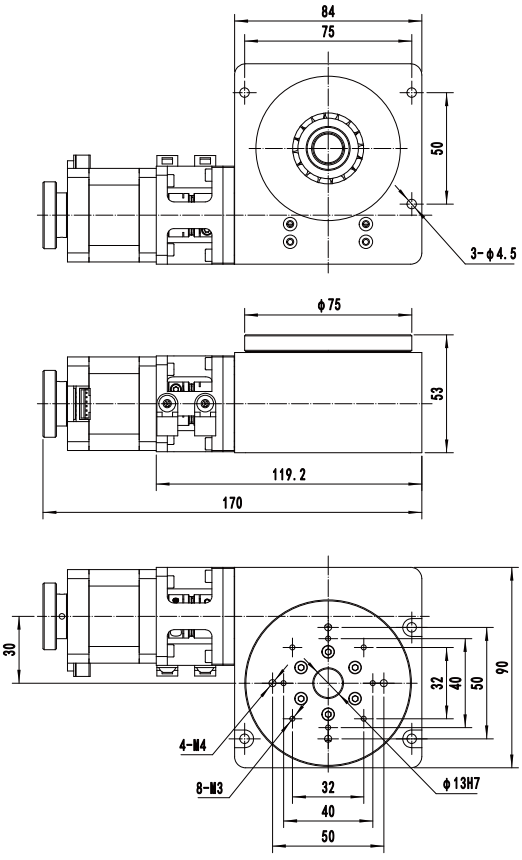






TBRF75L





TBRF200