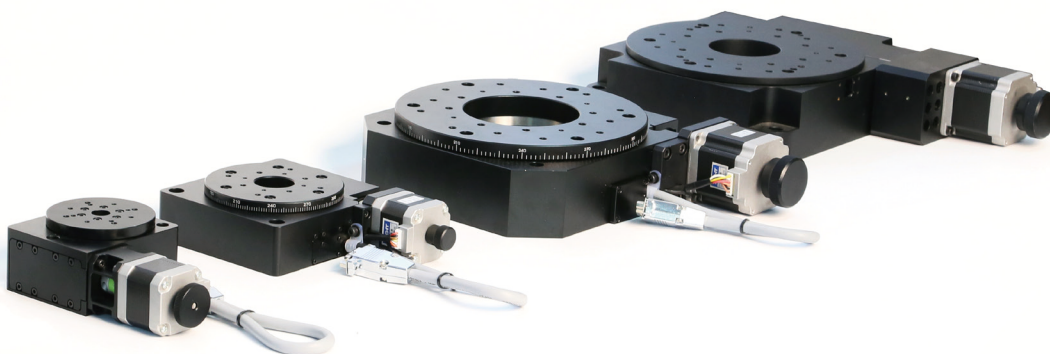




## Description:

The TBR series stages are designed to meet the requirements of high precision, high rigidity, and high repeatability in industrial automation fields. The worm gears in the TBR series are made of tin bronze, offering excellent wear-resistant performance. The matched worm is made of stainless steel, treated with high-frequency quenching, providing high hardness and rigidity.

A fine crossed-roller ring constitutes the main part of the guiding mechanism, offering high strength, high load capacity, and long-term durability. These stages can be operated horizontally, vertically, and even inverted. Higher motion accuracy is ensured by the finely designed inner shaft structure.

Standard TBR series products employ worm gears with a higher transmission ratio, resulting in higher meshing accuracy but slower rotation speeds. The TBRF version runs faster than the standard TBR series by using a set of worm gears with a smaller transmission ratio.

## Features:

- **Excellent Wear Resistance:** Achieved through tin bronze worm gears.
- **High Hardness and Rigidity:** Provided by stainless steel worms treated with high-frequency quenching techniques.
- **Robust Guiding Mechanism:** Fine crossed-roller ring offers high strength, high loading capability, and good durability for horizontal, vertical, and inverted operations.
- **Smooth Running and Minimal Backlash:** Ensured by a gap-adjustment mechanism and high-meshing-accuracy worm gear/worm.
- **Motor Options:** Standard with two-phase stepping motors; optional servo motors from various brands.
- **Ease of Operation:** Equipped with a built-in origin-point sensor.

## Naming rules:

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

### Series code:

TBR: worm gear made of wear-resistant tin bronze, high precise, aluminum alloy, crossed-roller ring.  
TBRF: high speed, wear-resistant tin bronze, high precision, aluminum alloy, crossed-roller ring.

### Position of motor mounting:

None(default):right side  
L: left side  
N: Special model(Table sizeφ60mm)

### Sensor position:

None (default): built-in  
SSxx: Externally installed, xx: angle range

### Table diameter:

60:φ59mm  
75:φ75mm  
100:φ102mm  
200:φ196mm

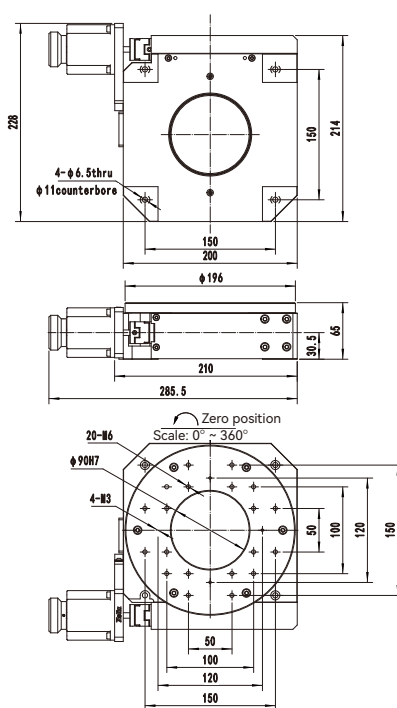
### Motor type:

None (default): standard two phase stepping motors  
ASP1: Panasonic 100W Ac servo motor  
ASY2: Yaskawa 200W AC servo motor  
P1: Panasonic 100w motor mounting plate and shaft coupling  
Series code:  
TBR: worm gear made of wear-resistant tin bronze, high precise, aluminum alloy, crossed-roller ring.

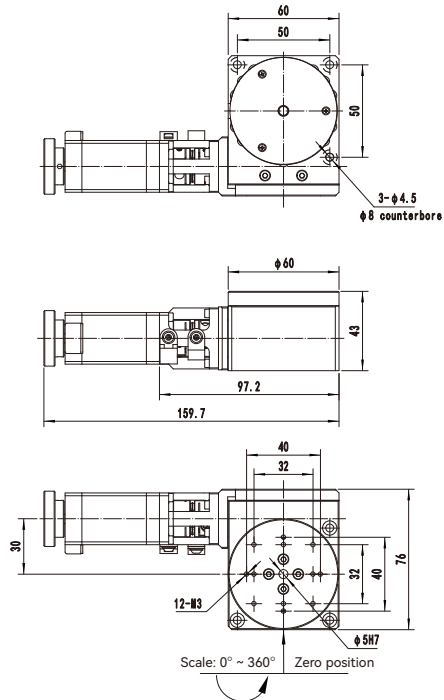
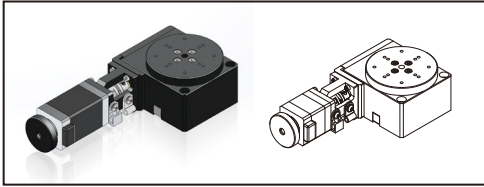
## Selection chart:

| Model                     |                                       | TBR60N                                                 | TBR60L                                            | TBR100                                            | TBR200                           | TBRF60L                                           | TBRF75L                                                                                                        |
|---------------------------|---------------------------------------|--------------------------------------------------------|---------------------------------------------------|---------------------------------------------------|----------------------------------|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------|
| Mechanical specifications | Angle range(° )                       | 360                                                    |                                                   |                                                   |                                  |                                                   |                                                                                                                |
|                           | Table diameter(mm)                    | φ 60                                                   | φ 59                                              | φ 102                                             | φ 196                            | φ 60 φ 75                                         | φ 75                                                                                                           |
|                           | Transmission mechanism                | worm gear and worm                                     |                                                   |                                                   |                                  |                                                   |                                                                                                                |
|                           | Worm Gear Ratio                       | 110: 1                                                 | 180: 1                                            |                                                   |                                  | 60: 1                                             |                                                                                                                |
|                           | Worm gear material                    | Durable tin bronze worm gear                           |                                                   |                                                   |                                  |                                                   |                                                                                                                |
|                           | Worm material and process technology  | Steel, high frequency quenched                         |                                                   |                                                   |                                  |                                                   |                                                                                                                |
|                           | Guide mechanism                       | Crossed-roller ring                                    | Angular contact ball bearing                      | Crossed-roller ring                               |                                  |                                                   |                                                                                                                |
|                           | Main body material, surface treatment | Black anodized aluminum alloy                          |                                                   |                                                   |                                  |                                                   |                                                                                                                |
|                           | Weight(Kg)                            | 0.8                                                    | 0.7                                               | 2                                                 | 7                                | 1.1                                               | 1.4                                                                                                            |
|                           | Shaft coupling(OD - OD1-OD2)(mm)      | 19-04-05                                               | 19-04-05                                          | 20-05-05                                          | 25-6.35-6.35                     | 19-05-05                                          | 19-05-05                                                                                                       |
| Accuracy specifications   | Step/half step resolution(° )         | ≈0.016/0.008                                           | 0.01/0.005                                        |                                                   |                                  | 0.03/0.015                                        | 0.03/0.015                                                                                                     |
|                           | Highest speed(° /s)*                  | 32.7                                                   | 20                                                |                                                   |                                  | 60                                                |                                                                                                                |
|                           | Repositioning accuracy(° )            | ≤±0.01                                                 | ≤±0.005                                           |                                                   |                                  | ≤±0.015                                           |                                                                                                                |
|                           | Backlash(° )                          | ≤0.05                                                  | ≤0.01                                             | ≤0.005                                            | ≤0.005                           | ≤0.02                                             |                                                                                                                |
|                           | Static parallelism(mm)                | ≤0.1                                                   | ≤0.08                                             | ≤0.1                                              | ≤0.1                             | ≤0.08                                             |                                                                                                                |
|                           | Static clearance(μm)                  | ≤26                                                    | ≤8                                                | ≤6                                                | ≤12                              | ≤20                                               | ≤25                                                                                                            |
|                           | End jump(Axial runout)(μm)            | ≤40                                                    |                                                   |                                                   |                                  |                                                   |                                                                                                                |
|                           | Radial runout(μm)                     | ≤25                                                    |                                                   | ≤30                                               | ≤45                              | ≤25                                               |                                                                                                                |
| Electrical specifications | Motor brand(specification)            | Shinano(28 stepping motor)                             | Jigocheng(28 stepping motor)                      | Jigocheng(42 stepping motor)                      | Jigocheng(57 stepping motor)     | Shinano(28 stepping motor)                        | Shinano(42 stepping motor)                                                                                     |
|                           | Model of motor                        | STP-28D3003-1210, two-phase                            | 28BYG003-C, two-phase                             | 42M-1.8D-C-10, two-phase                          | 57M-1.8D-C, two-phase            | STP-28D3003-1210, two-phase                       | SST43D2126-10, two-phase                                                                                       |
|                           | Step angle(° )                        | 1.8                                                    |                                                   |                                                   |                                  |                                                   |                                                                                                                |
|                           | Insulation resistance                 | Over 100M Ω /Min                                       |                                                   |                                                   |                                  |                                                   |                                                                                                                |
|                           | Insulation strength                   | 500V AC 1 minute. None abnormal                        |                                                   |                                                   |                                  |                                                   |                                                                                                                |
|                           | Insulation level                      | ULB Level                                              |                                                   |                                                   |                                  |                                                   |                                                                                                                |
|                           | Weight(Kg)                            | 0.11                                                   | 0.14                                              | 0.28                                              | 0.6                              | 0.11                                              | 0.29                                                                                                           |
|                           | Voltage(V)                            | 2.93                                                   | 3.3                                               | 2.8                                               | 2.88                             | 2.93                                              | 2.8                                                                                                            |
|                           | Current                               | 1.3A/phase                                             | 1.0A/phase                                        | 1.7A/phase                                        | 2.4A/phase                       | 1.3A/phase                                        | 1.7A/phase                                                                                                     |
|                           | Resistance                            | 2.25±10%Ω / phase                                      | 3.3±10%Ω /phase                                   | 1.5±10%Ω /phase                                   | 1.2±10%Ω / phase                 | 2.25±10%Ω / phase                                 | 1.65±10%Ω /phase                                                                                               |
|                           | Electrical inductance                 | 1.25mH/phase                                           | 2.5±20% mH/phase                                  | 3.2mH/phase                                       | 4.0mH/phase                      | 1.25mH/phase                                      | 3.6mH/phase                                                                                                    |
|                           | Holding torque                        | 0.156N.m                                               | 0.1N.m                                            | 0.43N.m                                           | 1.0N.m                           | 0.156N.m                                          | 0.456N.m                                                                                                       |
|                           | Braking torque                        | 0.0032N.m (reference value)                            | 0.005N.m (reference value)                        | 0.0018N.m (reference value)                       | 0.04N.m (reference value)        | 0.0032N.m (reference value )                      | 0.005N.m (reference value)                                                                                     |
|                           | Rotor inertia                         | 17g.cm <sup>2</sup>                                    | 11g.cm <sup>2</sup>                               | 57g.cm <sup>2</sup>                               | 260g.cm                          | 17g.cm <sup>2</sup>                               | 56g.cm <sup>2</sup>                                                                                            |
|                           | Operation temperature                 | 0~+50℃                                                 | -10~+50℃                                          |                                                   | -20~+50℃                         | 0~+50℃                                            |                                                                                                                |
|                           | Motor operating temperature range     | 80℃ Max                                                |                                                   |                                                   |                                  |                                                   |                                                                                                                |
|                           | Driver brand and model(optional)      | Moons, SR2                                             |                                                   |                                                   | Moons, SR4                       | Moons, SR2                                        |                                                                                                                |
| Electrical specifications | Type of plug for stage                | DB9(pin)                                               |                                                   |                                                   |                                  |                                                   |                                                                                                                |
|                           | Type of cable for stage               | High flexibility cable                                 |                                                   |                                                   |                                  |                                                   |                                                                                                                |
|                           | Length of connection cable(m)         | 0.2                                                    |                                                   |                                                   |                                  |                                                   |                                                                                                                |
|                           | Position-limit sensors(built-in)      | None                                                   |                                                   |                                                   |                                  |                                                   |                                                                                                                |
|                           | Origin-point sensors(built-in)        | 1×GP1S09xHCPI(Japan SHARP)                             |                                                   | 1×PM-L25(SUNX, Japan)                             |                                  | 1×GP1S09xHCPI(Japan SHARP)                        |                                                                                                                |
|                           | Sensor voltage                        | DC5-24V±10%                                            |                                                   |                                                   |                                  |                                                   |                                                                                                                |
|                           | Current consumption(mA)               | <60(total)                                             |                                                   | <15(total)                                        |                                  | <60(total)                                        |                                                                                                                |
|                           | Control output                        | NMOS open leakage electrode outputDC5-24V 8mA or less. | NPN open controller output DC5 ~ 24V 50mA or less | NPN open controller output DC5 ~ 24V 50mA or less |                                  | NPN open controller output DC5 ~ 24V 50mA or less | NMOS open leakage electrode outputDC5-24V 8mA or less. Residual voltage 0.3V or less(when load current is 2mA) |
|                           | Status of output ports                | DC5 ~ 24V 50mA or less                                 | NPN open controller output DC5 ~ 24V 50mA or less | Output ON when sensor is blocked                  | Output ON when sensor is blocked | Output ON when sensor is blocked                  | Output ON when sensor is blocked                                                                               |
|                           | Maximum load capacity                 | Horizontal direction(Kg)                               | 5                                                 |                                                   | 20                               | 40                                                | 10                                                                                                             |
| Vertical direction(kg)    |                                       | 2                                                      |                                                   | 5                                                 | 10                               | 4                                                 | 5                                                                                                              |
| Inverted direction(Kg)    |                                       | 5                                                      |                                                   |                                                   | 10                               | 4                                                 | 5                                                                                                              |

\*Note: Highest speed is measured under zero-load conditions with the motor running at 600 RPM.



TBRF60L



TBRF75L

