Miniature Stroke Rotary Bushing

Micro Size and Super Precision

Miniature Stroke Rotary Bushing is a very compact linear motion rolling guide with a low sectional height and can achieve both rotary motion and reciprocating motion in the axial direction at the same time. Including the smallest model having a shaft diameter of 2mm, this series features smooth motion with low frictional resistance and is used in micro mechanisms of machines and equipment requiring precise rotation and linear motion such as measuring instruments, IC manufacturing machines and precision equipment.

Rotary and linear motion

Steel balls held in a retainer are assembled into an outer ring having a cylindrical bore raceway, so linear motion as well as rotary movement can be achieved.

Extremely accurate

The outer ring and shaft are precisely super-finished after heat treatment. The assembled set, which consists of an outer ring, shaft and very precise steel balls held in a retainer, is set to zero or minimal preload. So extremely accurate operation can be achieved both in rotary and linear motion.

Very smooth movement

All parts are precisely finished and assembled to obtain an optimal preload. This series offers very smooth and stable movement as well as high accuracy with low frictional resistance.

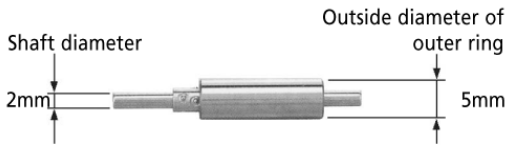
Extremely compact size

Very small diameter steel balls are assembled in a very thin walled outer ring. So the assembled set is extremely compact in sectional height. The smallest size model has a shaft diameter of 2mm and an outside diameter of outer ring of 5mm.

Rotary and Linear Motion

Steel balls held in a retainer are assembled into an outer ring having a cylindrical bore raceway, so linear motion as well as rotary movement can be achieved.

Smallest Size Miniature Stroke Rotary Bushing



Accuracy

The accuracy of a Miniture Stroke Rotary Bushing is shown below.

Table 1 Accuracy

Outside diameter of outer ring (mm) over	incl.	Tolerance of outside diameter of outer ring μm high	low	Max. radial runout of outside diameter of outer ring μm	Tolerance of length of outer ring and shaft mm
3	6	0	–5	8	±0.1
6	10	0	–6		
10	18	0	–8		
18	30	0	–9	9	

Table 2 Selection codes and dimensional tolerances

Selection code	Tolerance of outer ring bore μm 上	下	Tolerance of inscribed circle diameter μm 上	下	Tolerance of shaft diameter μm 上	下
M1	–1	–3	–1	–3	–0	–1
M2	–2	–4	–2	–4	–1	–2
M3	–3	–5	–3	–5	–2	–3

Basic static load rating

The basic static load rating is defined as the static radial load that gives a prescribed constant contact stress at the centre of the contact area between the rolling element and raceway receiving the maximum load. The load rating of Miniature Stroke Rotary Bushing is given for the case when the steel balls assembled in a retainer are positioned within the outer ring raceway without escaping from it and equally share an applied load.

Fit

Miniature Stroke Rotary Bushing is set to minimal preload condition to obtain high operating accuracy. For Miniature Stroke Bushing with shaft, a slight clearance between the outer ring and the housing is recommended to avoid any undesirable influence on the inscribed circle diameter. Also, when assembling the outer ring, ball cage and shaft, select the outer ring and shaft which have the same selection code and match them to a ball cage.

Precaution for Use

1. The outer ring should have a clearance fit in the housing. When the outer ring must be fixed in the axial direction to the housing, use a stop ring, etc. at the end of the outer ring or use synthetic adhesive.

2. For assembly, the outer ring is fixed in the housing bore at first, then the shaft is inserted into the ball cage. As the shaft is inserted, the ball cage moves in the axial direction in the outer ring. The ball cage must be located at the correct position after assembly. A convenient way of locating the ball cage is to shift the position of the ball cage prior to assembly to the inserting direction for the distance of 1/2 of the inserting distance of the shaft.

3. When inserting the shaft into a ball cage, be careful not to damage the steel balls and raceways by twisting the shaft or applying a shock load.

4. Miniature Stroke Rotary Bushing can be used with oil or grease lubrication. When lubricating with grease, the grease is usually lightly smeared on the raceways of the shaft and outer ring. A good quality lithium-soap base grease is recommended.

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