

## 1. General description

Recent decades have seen high-precision Mahr MarMotion rotary stroke bearings for linear and rotary motion extend their area of application from the pressing tool sector to include general mechanical engineering, precision mechanical and optical engineering and a wide range of specialized fields.

In the course of this development work, Mahr has devised computation formulae based on the company's long experience and supported by close cooperation with various technical colleges and universities. This expertise helps designers to optimize the rotary stroke bearing for a particular application. This results in excellent guiding accuracy, optimum reliability and long service life.

The rotary stroke bearings manufactured with great precision by Mahr mean that the user can be sure that components are interchangeable. The MarMotion high-precision rotary stroke bearing can therefore be considered an integral part of the mechanical and design elements.

## Features

The main features of the MarMotion high-precision rotary stroke bearings are as follows:

### Maximum guiding accuracy

The MarMotion high-precision rotary stroke bearing offers high guiding accuracy for both linear and rotary movements. This is guaranteed by the micro-finished running faces of shafts and bushes, whose accuracy of form in terms of roundness and cylindricity lies within 1/3 of ISO tolerance class IT 3. The exclusive use of grade 5, sorting class P0 steel balls (DIN 5401 or ISO 3290) also contributes to the high degree of guiding accuracy.

### Backlash-free guiding

There is no backlash whatsoever in the guide because the balls are preloaded under a tension of a few  $\mu\text{m}$  between the shaft and the bush. Optimum preloading is ensured in the factory by pairing the shaft, ball cage and bush. This simplifies the process of fitting the rotary stroke bearing.

### Smooth running

The MarMotion high-precision rotary stroke bearing ensures both maximum guiding accuracy and very low friction. A pure contact rolling motion of the balls on the micro-finished running faces ensures very low friction. The coefficient of friction lies between 0.001 and 0.008 and ensures smooth running.

### High loading capacity and guiding rigidity

The dense arrangement of the balls and the high form and dimensional accuracy of the balls and bearing faces provide a large number of contact points, thereby ensuring uniform distribution of the load in the guide. The designer can make optimum use of the available space. The functional reliability of the guide is significantly increased.

### Rapid movements, high acceleration

The low friction rolling action in the MarMotion high-precision rotary stroke bearing enables rapid movements and high acceleration. The low inertia forces of plastic cages make these particularly well suited for high-frequency linear and rotary movements.

### Long service life

Careful selection and heat treatment of the materials used, coupled with top quality bearing faces, means that the MarMotion high-precision rotary stroke bearings are particularly resistant to abrasion.

### Minimum maintenance

In most cases, a thin film of lubricant is sufficient for several months' continuous operation. The outlay required for maintenance during operation is minimal.

### Interchangeability

All individual components are interchangeable. This is due to continuous quality control, the exclusive use of balls of sorting group P0, and the machining of shafts and bushes to a high standard of precision. This ensures problem-free continuous operation.

### Special designs

The extensive range of MarMotion high-precision rotary stroke bearings offers appropriate solutions for many different applications. We can also manufacture special designs for particular applications and requirements on the basis of workpiece drawings. Using alternative materials can also open up new possibilities.