

# LINEAR MOTION

## Precision Ballscrews

### Lubrication

To ensure the optimum performance of the ballscrew, the correct lubricant and lubrication method for the relevant operating conditions should be selected.

### Amount of lubricant

Insufficient lubricant causes poor lubrication, whereas an excessive amount of lubricant generates heat and increases resistance. It is therefore important to determine the optimum amount of lubricant for the relevant operating conditions.

### Grease

The appropriate amount of grease is normally approximately 1/3 of the volume of the space within the nut.

### Oil

The table below gives guidelines for the amount of oil. Please note, however, that the amount of oil depends on the stroke, type of oil used, and operating conditions (e.g., need to prevent heat generation).

**Guidelines for the amount of oil** (interval: 3min)

Shaft Diameter (mm)	Amount of Oil (cm <sup>3</sup> )
16 - 18	0.07
20 - 25	0.10
28 - 32	0.15
36 - 40	0.25

### Handling

As friction is reduced to a very low level in the ballscrew, when it is held upright, the nut can easily fall off the screw shaft.

Please be aware of this when holding the ballscrew upright. If the nut is not in place, the balls will also fall off, which may damage the ball circulation mechanism including the return pipe. Should the nut be detached from the screw shaft, contact our technical department.

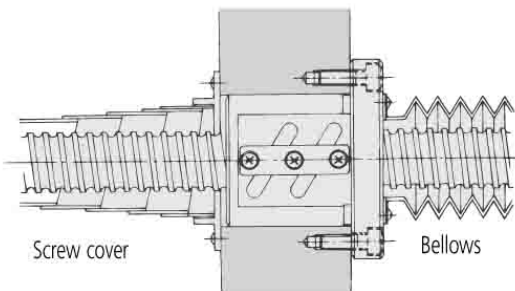
Some ballscrews have exposed ball circulation mechanisms (return pipe, end cap), so be very careful to avoid dents and similar impacts.

### Contamination Protection

Dust and foreign matter that enter the ballscrew may cause accelerated wear and breakage, as with rolling bearings. Therefore, where contamination by dust and foreign matter (e.g., cutting chips) is likely, screw shafts must always be completely covered with contamination protection devices such as bellows or screw covers. If the ballscrew is used in an atmosphere free from foreign matter but with suspended dust, the labyrinth seal (for Precision Ballscrews) and brush seal (for Rolled Ballscrews) can be used in place of contamination protection devices. When placing an order, be sure to specify the model number.

The labyrinth seal is designed to maintain a clearance between the seal and screw-shaft raceway, so that torque does not develop and no heat is generated. However, its effect in contamination protection is limited.

In ballscrews other than the large-lead and super-lead types, there is no difference in nut dimensions between those with and without a seal.



Contamination Protection Cover

### Installation

When attaching the ballscrew to a machine, do not detach the nut from the screw shaft. If it is necessary to detach the nut, apply a sleeve with a bore approximately 1 mm smaller than the screw-shaft thread minor diameter so as to prevent balls from falling off. Although the thread of the ballscrew is hardened and finished by grinding, forcible driving of a part onto the screw shaft or into the nut may cause an indentation in the raceway. When assembling parts on the screw shaft and nut, take care not to apply excessive force to the shaft and nut.

Misalignment between the screw-shaft supported portion and the nut exerts an unnatural force on the ballscrew, resulting in problems such as heavy rotation. Similar symptoms appear when the nut and the shaft supported portion are tilted. These problems accelerate wear on the ballscrew, which may significantly decrease its service life. Therefore, in terms of the mounting accuracy, pay close attention to misalignment and tilt. Upon completion of mounting, the ballscrew must be checked by moving it over the entire stroke to ensure that there is no problem with its operation.

In designing your ballscrew system, make sure that no radial load or moment is exerted on the ballscrew. Remember that a radial load or moment may significantly decrease the service life and cause malfunctions.

