

USER GUIDE FOR BALL SCREWS AND TRAPEZOIDAL SCREWS

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1. Transport, packaging, and storage

The screws are protected against corrosion and wrapped in foil. On customer's request, we can pack it in a wooden box or a cardboard box for transport. The ball screw spindle is sensitive to impact, radial loading, deflection under its own weight, which can lead to damage to the thread or bending of the spindle. For this reason, it should be protected from such stresses.

During transport and storage, ball and trapezoidal screws must also be protected from excessive vibration and dynamic forces, so the spindle must be properly secured. To avoid possible damage, the spindle must be placed on prisms at a distance of $\approx 2/9L$ from the two ends of the spindle, so that the spindle does not rest on the nut. The final storage location of the ball spindle shall be vibration-free. When properly stored, no maintenance other than updating the corrosion protection is required. The ball spindle may be stored vertically if its design permits.

2. Installation

The following aspects should be taken into account:

- 2.1. Cleanliness is an essential requirement for installation, especially for nuts without wipers.
- 2.2. The spindle and nut must be adjusted very accurately during installation to avoid radial forces.
- 2.3. The gripping surface of the nut must be perfectly flat or perpendicular to the spindle axis to avoid the nut being misaligned. This mounting angle error can severely reduce the life of a ball screw.
- 2.4. **Before installation, the customer must ensure proper lubrication.**
- 2.5. **Screwing off the nut from the spindle is prohibited!** The ball nut must not approach the ends of the spindle closer than the nominal diameter of the spindle. If it is necessary to unscrew the nut due to difficult mounting, please ask for our prior guidance.

3. Lubrication and maintenance:

Professional lubrication is essential for the long-lasting, smooth operation and quiet, precise running of a ball screw. The purpose of lubrication is to prevent overheating of working surfaces and to slow down wear and damage.

The same lubricating oils and greases are suitable for lubricating ball and trapezoidal screws as for ball bearings.

In addition to the operating parameters, the choice of lubricant must also take into account the environmental conditions. It is best to follow the factory lubrication specifications of the machine, but any lubricant manufacturer or distributor can give you a professional recommendation. If possible, it is advisable to match the lubricant to the lubricants of the other machine components.

The corrosion protection material should be removed from the ball screw before the first use.

3.1. Oil lubrication:

The advantage of oil lubrication is less heating, so it is suitable for higher speeds than grease lubrication.

The viscosity of the oil must be selected based on speed, load and temperature (see DIN 51517, DIN 51519). For practical applications, the ISO viscosity range VG 32 - VG 460 is suitable. Higher values correspond to lower speeds, higher loads, and higher temperatures and vice versa. For high loads, lubricating oil containing load capacity increasing additives is recommended.

3.2. Grease lubrication:

Grease lubrication is recommended for lower speeds and higher loads, and where it is difficult to replenish lubricant. At high speeds, the grease can overheat, causing rapid failure of the ball screw.

When determining the grease relubrication interval (approx. 200-500 operating hours), the operating conditions must also be considered:

- pollutants
- the load condition
- the operating temperature

The best results are

- for normal loads DIN 51825 K2K,
- at high loads are achieved with DIN 51818 NLGI 2. KP2K greases.

Attention should be paid to the manufacturers' specifications: e.g. solid additives such as graphite and molybdenum sulphide are not allowed.

The amount of lubricant applied must not exceed 50 % of the free space between the nut and the spindle.

4. Documentation of quality

Unless otherwise specified in the contract, all ball spindles comply with the requirements of ISO 3408-3 (DIN 69051-3 for old design ball spindles), as certified by a technical certificate. SZIMIKRON Ltd. maintains a quality management system regularly certified according to ISO 9001:2015 in the field of design, development, production, maintenance, repair, etc. of ball screws.

5. WARRANTY

A SZIMIKRON Kft guarantees the manufactured ball screws for a period of 12 months from the date of installation or use, up to a maximum of 18 months from the date of delivery, taking into account the lifetime calculated according to ISO 3408 or DIN 69051.

The warranty does not apply in cases where the failure is due to the fault of the Customer, in particular unauthorised repair, improper operation, incorrect installation, failure to maintain and failure to comply with the instructions for use described herein.