# Installation and maintenance

## Installation and maintance of ball screw drives

### Installation
Ball screw drives are precision machine components; their installation requires specialist knowledge and suitable measuring facilities. Alignment errors can generally not be felt when the screw drive is turned by hand, due to the low friction. Radial or eccentric forces must be taken up by external guides. Ball screw drives can absorb only axial forces. To avoid damage to the ball screw drive, limit switches and end stops must be installed in the machine.

### Cover
Dirt that occurs during installation should be removed with paraffin, oil or petrol. Cold cleaners and paint solvents are not permitted. Ball screw drives must be protected against dust, chips, etc. even if equipped with wipers. Possible protective measures include:

– Bellows (suitable only for vertical installation without additional guide).

– Spiral spring cover.

– Telescopic tubes or sleeves (these take up a lot of axial space).

We also offer fully-protected complete systems:

– NEFF KGT-KOKON ball screw drives with self-closing cover strips (see p. 55)

– NEFF WIESEL mechanical linear drive units with integrated guide systems in encapsulated aluminium profile. Please contact us for further information.

### Lubrication
Proper lubrication is important for the achievement of the calculated service lifetime of a ball screw drive, to prevent excessive warming, and to ensure smooth, quiet running. The same lubricants are used for the ball screw drives as for roller bearings.

### Oil-mist lubrication
In the case of central lubrication with oil mist, note that only ball screw nuts without wipers may be used.

### Oil lubrication
The oil supply should not exceed the volume lost via the wipers; otherwise use recirculating-oil lubrication.
Oil types: Viscosity 25 to 100 $mm^2/s$ at 100°C.

### Grease lubrication
Add grease as appropriate to the volume lost via the wipers (under normal operating conditions, it is sufficient to add grease every 200 to 300 hours). Experience shows that one-time lubrication for the service lifetime is not sufficient because of the seepage of grease.

**Grease type:** Roller bearing grease without solid lubricant shares. Fuchs Lubritech URETHYN E/M1 roller bearing grease in accordance with NLGI1 DIN ISO 2137 is used for the initial grease filling in the factory. For higher loads, use a grease with NGLI2 in accordance with DIN ISO 2137. You will find detailed information on the required quantities of grease in the Internet at www.neffaa.de

### Operating temperature
The permissible operating temperature range for ball screw drives is between –30°C and +80°C, up to 110°C. for brief periods. A pre-condition for this is correct lubrication.
The torque may increase by a factor of up to 10 at temperatures below –20°C.

## Installation and maintenance of trapezoidal screw drives

### Installation
Trapezoidal screw drives must be aligned carefully during installation – if suitable measuring equipment is not available, the screw drive should be turned through its entire length by hand before the drive unit is attached. Variations in the amount of force required and/or marks on the external diameter of the screw indicate alignment errors between the spindle axis and guide. In this case, the relevant mounting bolts should first be loosened and the screw drive should be turned through by hand. If the amount of force required is now constant throughout, the appropriate components should be aligned, otherwise the alignment error should be localised by loosening further mounting bolts.

### Cover
By virtue of their design, trapezoidal screw drives are less sensitive to dirt than ball screw drives, particularly at low speeds (manual operation).

Never the less motion drives, especially with plastic nuts, in particular require protection against dirt in the same way as ball screw drives.

### Lubrication

### Oil lubrication
Used only in special cases for trapezoidal screw drives.

### Grease lubrication
The usual lubrication method for trapezoidal screw drives. Lubrication intervals are governed by operating conditions; it is advisable to clean the screw before greasing especially at use of heavy-duty lubricating machines.

### Operating temperature
This depends on the type of nut used, the lubrication conditions and the user's requirements. Please consult us in the case of temperatures above 100°C (plastic nuts 70°C).

### Wear
This can be checked manually: if the axial backlash with a single-start screw drive is more than $^1/_4$ of the lead, the nut should be replaced.