# Installation Guide
# Slider Mounting Kit

## PLF01 / PLL01

ENG

# Content

# 1 General information

## 1.1 Introduction

This manual includes instructions for the assembly of accessories for LinMot linear motors. The document is intended for electricians, mechanics, service technicians, and warehouse staff.
Read this manual before using the product and observe the general safety instructions and those in the relevant section at all times.
Keep these operating instructions in an accessible place and make them available to the personnel assigned.

## 1.2 Explanation of symbols

Triangular warning signs warn of danger.

Round command symbols tell what to do.

## 1.3 Qualified personnel

All work such as installation, commissioning, operation and service of the product may only be carried out by qualified personnel.
The personnel must have the necessary qualifications for the corresponding activity and be familiar with the installation, commissioning, operation and service of the product. The manual and in particular the safety instructions must be carefully read, understood and observed.

## 1.4 Liability

NTI AG (as manufacturer of LinMot and MagSpring products) excludes all liability for damages and expenses caused by incorrect use of the products. This also applies to false applications, which are caused by NTI AG's own data and notes, for example in the course of sales, support or application activities. It is the responsibility of the user to check the data and information provided by NTI AG for correct applicability in terms of safety. In addition, the entire responsibility for safety-related product functionality lies exclusively with the user.Product warranties are void if products are used with stators, sliders, servo drives or cables not manufactured by NTI AG unless such use was specifically approved by NTI AG.
NTI AG’s warranty is limited to repair or replacement as stated in our standard warranty policy as described in our "terms and conditions" previously supplied to the purchaser of our equipment (please request copy of same if not otherwise available). Further reference is made to our general terms and conditions.

## 1.5 Copyright

# 2 Safety instructions

**Contusions**
Sliders contain neodynium magnets and have a strong attractive force.
Careless handling could cause fingers or skin to become pinched between two sliders.
This may lead to contusions, bruises, and bone fractures.
When handling sliders, wear thick protective gloves and keep a minimum distance between sliders. Refer to the "Minimum distance from slider" section for minimum distance.

To reduce the risk of injury, never more than one slider should be held or transported by the same person without packaging.

**Pacemaker / Implanted heart defibrillator**
Sliders could affect the functioning of pacemakers and implanted heart defibrillators. For the duration of a strong approach to a magnetic field, these devices switch into test mode and will not function properly.

- If you wear one of those devices keep the following minimum distances between the pacemaker / defibrillator and slider:
  - Min. 250 mm (10") for slider Ø 27 mm and 28 mm (PL01-27 / 28 / PL10-28)
  - Min. 150 mm (6") for slider Ø 19 mm and 20 mm (PL01-19 / 20)
  - Min. 100 mm (4") for slider Ø 12 mm (PL01-12)
- Inform others who wear these devices to comply with these minimum distances!

**Caution - Risk of Electric Shock !**
Before working, make sure that there are no high voltages.

**Fast-moving machine parts**
The sliders of LinMot linear motors are fast-moving machine parts. All necessary precautions must be taken to prevent persons approaching the moving elements during operation (provide covers, guards, etc.).

**Automatic restart**
The motors can start automatically under certain cricumstances!
If necessary, a corresponding warning symbol must be provided and protection against entering the hazardous area or a suitable safe electronic disconnection must be provided!

**Risk of injury due to a defect or fault**
For areas where a defect or fault can result in substantial property damage or even serious personal injury, additional external precautions must be taken or devices must be installed to ensure safe operation even if a defect or fault occurs (eg. suitable safe electronic disconnection, mechanical interlocks, barriers, etc.).

**Magnetic field**
Magnets integrated in the sliders produce a strong magnetic field. They could damage TVs, laptops, computer hard drives, credit and ATM cards, data storage media, mechanical watches, hearing aids, and speakers.

- Keep magnets away from devices and objects that could be damaged by strong magnetic fields.
- For the above mentioned objects, keep a minimum distance as described in the "Pacemaker / implanted defibrillator" section.
- For non-anti-magnetic watches, keep the double minimum distance.

**Combustibility**
When machining magnets, the drilling dust could easily ignite.
Machining the sliders and the magnets they contain is not permitted.

**Burn hazard**
The sliders of LinMot motors can reach temperatures of 80 °C, which may cause burns upon contact.

**Grounding**
All metal parts that are exposed to contact during any user operation or servicing and likely to become energized shall be reliably connected to the means for grounding.

**Mechanical handling**
Neodymium magnets are brittle and heat-sensitive.
Machining the sliders and the magnets they contain is not permitted.

- Colliding magnets could crack. Sharp splinters could be catapulted for several meters and cause eye injury.
- By machining the sliders, heat would result which demagnetises the magnets.

**Slider**
Linear motor sliders consist of a high-precision, thin-walled stainless steel tube in which the neodymium magnets are housed. The LinMot sliders should be handled with care.
Avoid contact with other sliders or iron parts as this can damage the magnets and the slider surface. Do not grip the sliders with pliers, as this can also damage the surface. Do not use sliders which are already damaged on the surface (scratches, deformation, etc.). This can cause further damage to the stator.

**Effects on people**
According to the current level of knowledge, magnetic fields of permanent magnets do not have a measurable positive or negative effect on people. It is unlikely that permanent magnets constitute a health risk, but it cannot be ruled out entirely.

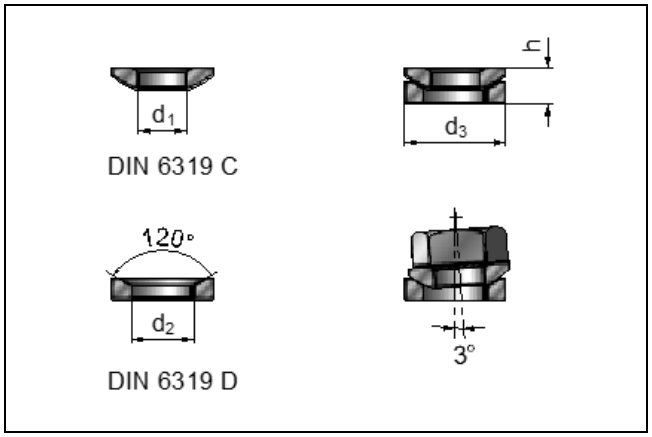
- For your own safety, avoid constant contact with magnets.
- Store large magnets at least one meter away from your body.

**Temperature resistance**
Keep slider away from unshielded flame or heat.
Temperature above 120°C will cause demagnetization.

# 3 Technical data

## 3.1 Fixed bearing

Slider mounting kit consists of a spring washer, a pair of spherical washers, and a pair of. It allows the slider to be fixed in the direction of motion. It also helps to compensate for radial and angle offset.



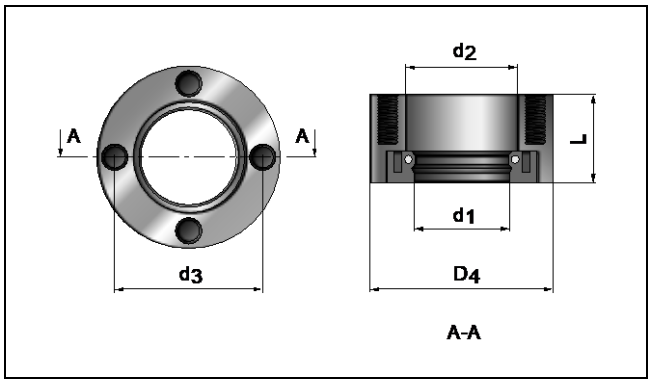

**Specifications**

| | |
|---|---|
| Spherical washer: | DIN 6319 C |
| Conical seat: | DIN 6319 D |
| Spring washer: | DIN 2093 A |

| Item | Material | Slider | Thread | d1 | d2 | d3 | h | Item-No. |
|---|---|---|---|---|---|---|---|---|
| PLF01-12 | Steel case hardened | 12mm | M5 | 5.2mm (0,20in) | 6.0mm (0.24in) | 10.5mm (0.41in) | 3.2mm (0.13in) | 0150-3085 |
| PLF01-12-Ni | Steel nickel plated | 12mm | M5 | 5.2mm (0,20in) | 6.0mm (0.24in) | 10.5mm (0.41in) | 3.2mm (0.13in) | 0150-3573 |
| PLF01-20 | Steel case hardened | 20mm | M8 | 8.4mm (0.33in) | 9.6mm (0.38in) | 17mm (0.67in) | 5.5mm (0.22in) | 0150-3083 |
| PLF01-20-SS | Stainless steel 1.4301 | 19mm 20mm | M8 | 8.4mm (0.33in) | 9.6mm (0.38in) | 17mm (0.67in) | 5.5mm (0.22in) | 0150-3296 |
| PLF01-28 | Steel case hardened | 28mm | M10 | 10.5mm (0.41in) | 12mm (0.47in) | 21mm (0.83in) | 6.5mm (0.26in) | 0150-3087 |
| PLF01-28-SS | Stainless steel 1.4301 | 27mm 28mm | M10 | 10.5mm (0.41in) | 12mm (0.47in) | 21mm (0.83in) | 6.5mm (0.26in) | 0150-3297 |

## 3.2 Floating bearing

The Slider is mounted in a rubber ring as a floating bearing. The floating bearing compensates for angular and axial displacement and length tolerance.




**Material**

| | |
|---|---|
| Housing: | Stainless steel 1.4305 |
| Bearing: | Nitrile butadiene rubber |
| | Spring steel DIN17223 |

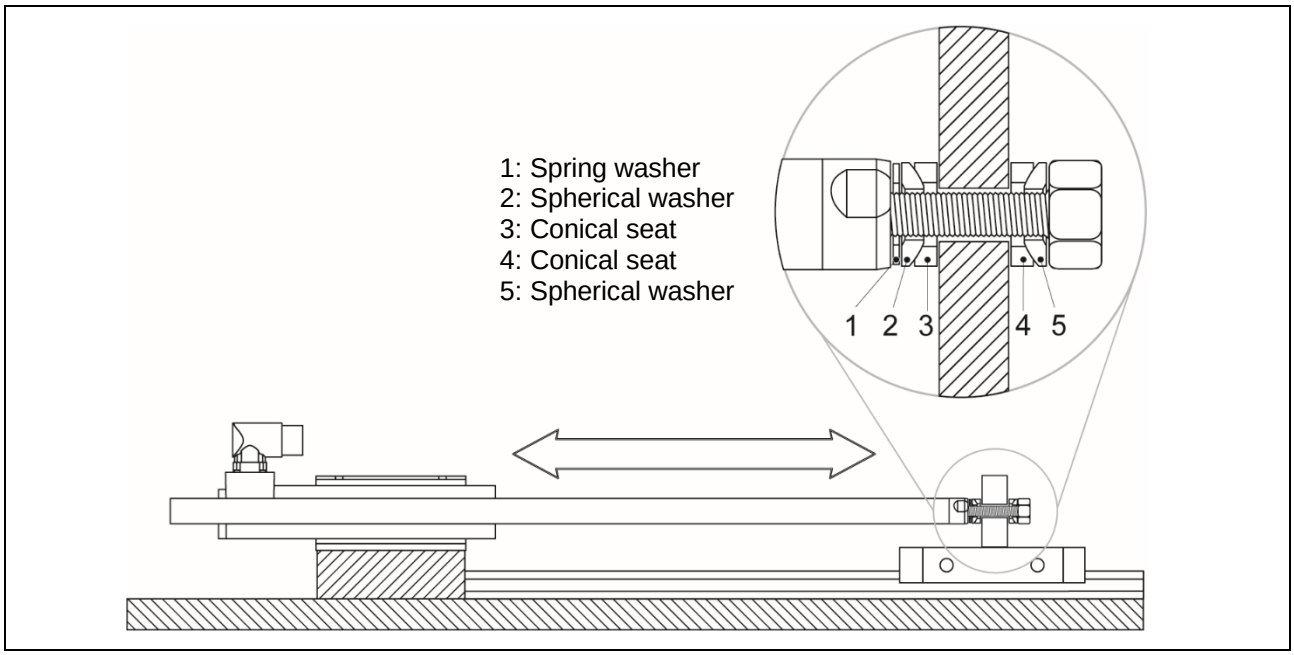
| Item | Slider | Thread | d1 | d2 | d3 | D4 | L | Item-No. |
|---|---|---|---|---|---|---|---|---|
| PLL02-12 | 12mm | - | 12mm (0.47in) | Rubber ring | - - | 22mm* (0.87in)* | 6.6mm* (0.26in)* | 0150-3111 |
| PLL01-19 | 19mm | M5 | 20mm (0.79in) | 23mm (0.90in) | 30mm (1.18in) | 37mm (1.46in) | 20mm (0.79in) | 0150-3335 |
| PLL01-20 | 20mm | M5 | 20mm (0.79in) | 23mm (0.90in) | 30mm (1.18in) | 37mm (1.46in) | 20mm (0.79in) | 0150-3084 |
| PLL01-27 | 27mm | M5 | 28mm (1.10in) | 32mm (1.26in) | 40mm (1.57in) | 48mm (1.89in) | 20mm (0.79in) | 0150-3294 |
| PLL01-28 | 28mm | M5 | 28mm (1.10in) | 32mm (1.26in) | 40mm (1.57in) | 48mm (1.89in) | 20mm (0.79in) | 0150-3094 |

** Mounting hole for rubber ring*

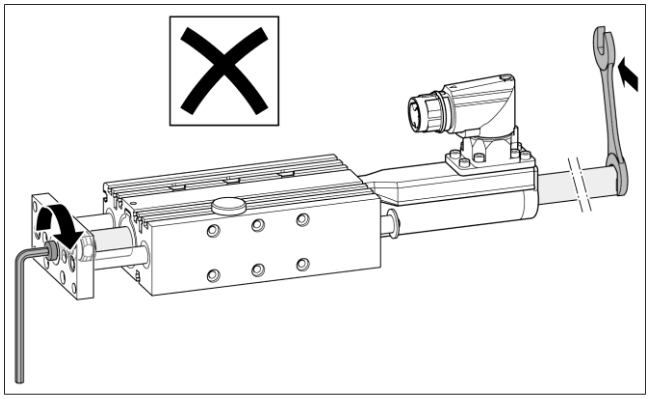
# 4 Mounting

## 4.1 Fixed bearing

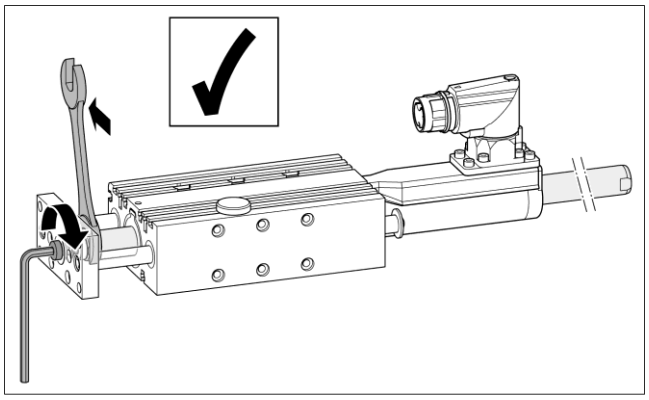
The fixed bearing mounting kit allows the slider to be mounted with the linear guided load. A large through hole for the fixing screw ensures that the slider is mounted without clearance in the event of radial and/or angular misalignment.




When attaching the load, the wrench for tightening the load must be used only on the load-facing side of the slider. Avoid torsional stress on slider (note the following figures).



**Incorrect attachment**

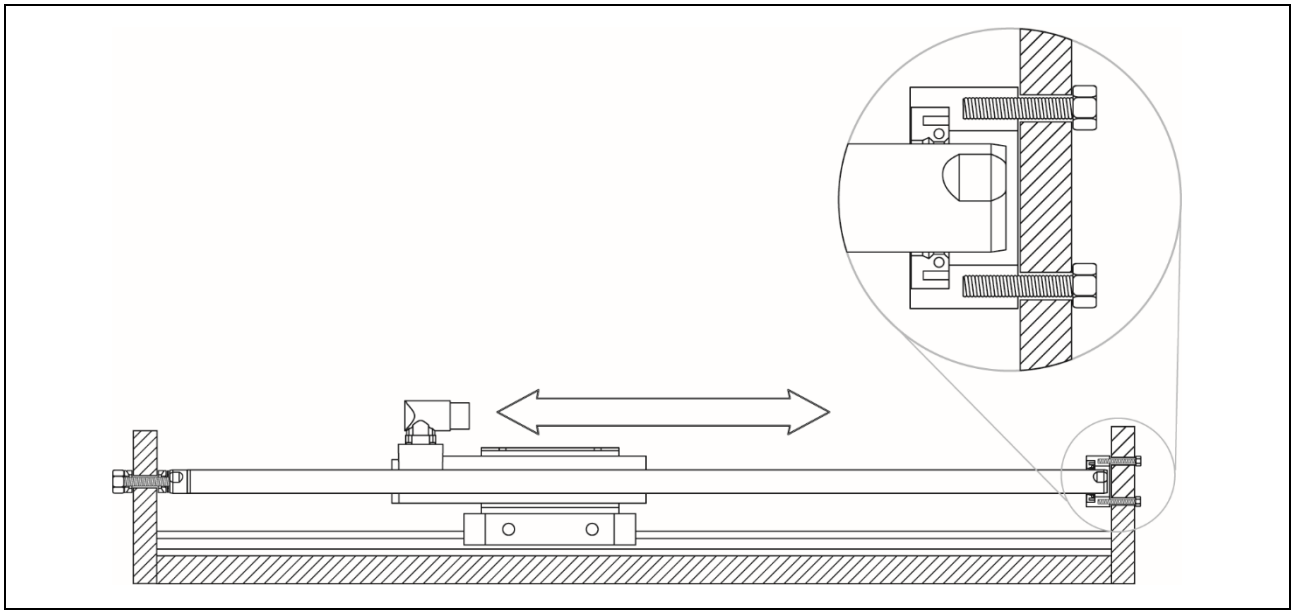


**Correct attachment**

| Slider | Thread | Max. torque for screw (Dry) |
|---|---|---|
| 12 mm | M 5 | 5.2 Nm |
| 20 mm | M 8 | 22.5 Nm |
| 28 mm | M 10 | 42 Nm |

## 4.2 Floating bearing

In order to prevent overdetermination of the slider bearing arrangement, one end of the slider is fixed by means of a fixed bearing and the other by means of a floating bearing. The floating bearing is mounted with four fixing screws.



## 4.3 «Moving stator» installation

In the "Moving stator" installation type, the slider is permanently installed and the stator is the moving part (see figure in section 4.2). The load is attached directly to the stator, which is guided by a linear bearing. In order to compensate for an over-determined bearing and misalignment, the slider is fixed on one side in a fixed bearing by means of a spherical axial bearing. On the opposite side, the slider is mounted in a floating bearing. LinMot offers a complete mounting kit consisting of a floating bearing and a fixed bearing.

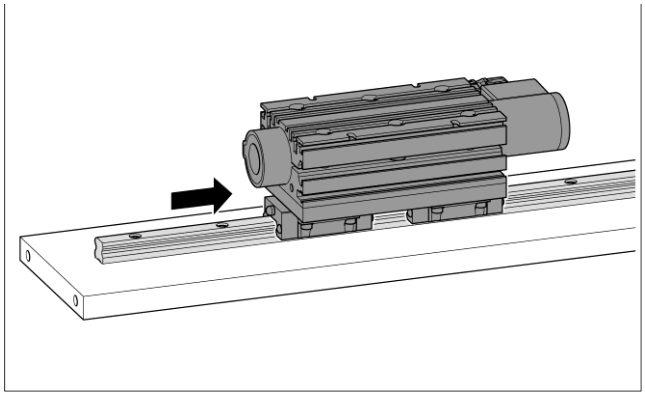
**Ordering information**

| Item | Description | Item-No. |
|---|---|---|
| PLM01-20-MK | Mounting kit for PL01-20 slider consisting of:<br>1 Fixed bearing (0150-3083)<br>1 Floating bearing (0150-3084)<br>1 Hexagon socket head screw * DIN 912 / M8, L=35 mm<br>4 Hexagon socket head screw * DIN 912 / M5, L=20 mm | 0150-3079 |
| PLM01-28-MK | Mounting kit for PL01-28 slider consisting of:<br>1 Fixed bearing (0150-3087)<br>1 Floating bearing (0150-3094)<br>1 Hexagon socket head screw * DIN 912 / M10, L=35 mm<br>4 Hexagon socket head screw * DIN 912 / M5, L=20 mm | 0150-3095 |
| ** for use with 12 mm (1/2 in) thick mounting plates* | | |

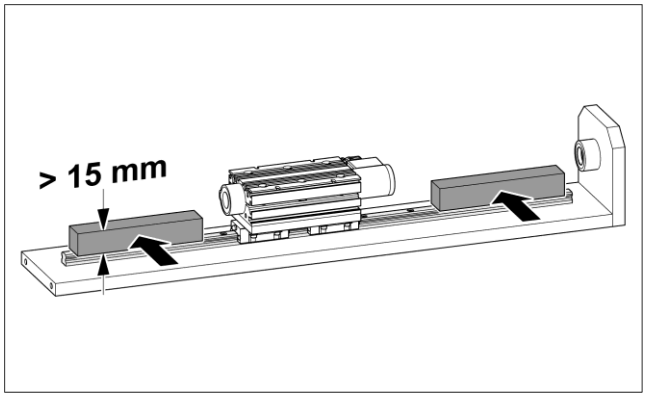
### 4.3.1 Assembling instruction

Please attend to the safety instructions in chapter 2 during the assembling!

If moving stator application is used, the minimum bending radius of the motor cable should be adhered to. See chapter « Motor cables », section « Technical data » in the installation guide of the corresponding linear motor.

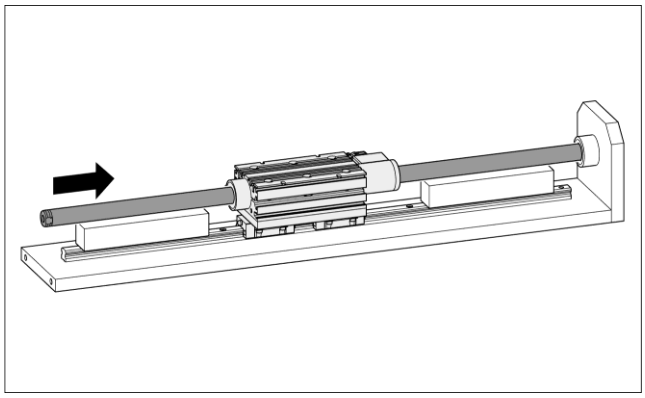


**1. Mount stator to its support bearing.**

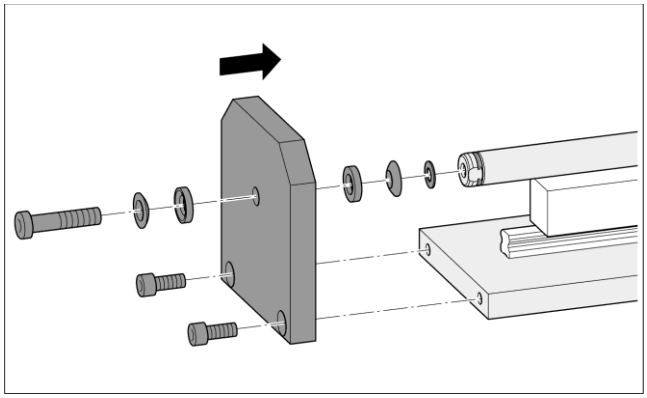



**2. Placing a spacer.**

Put a spacer (wood, plastic, aluminium with thickness 15 mm) between slider and linear guide. The spacer prevents injuries to the hands and damage to the slider surface!

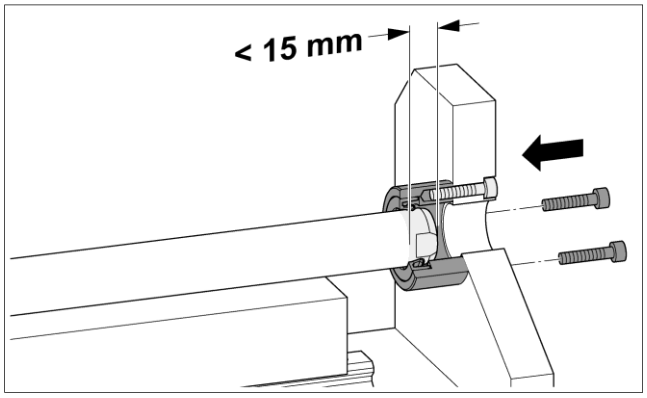


**3. Insert slider into stator.**



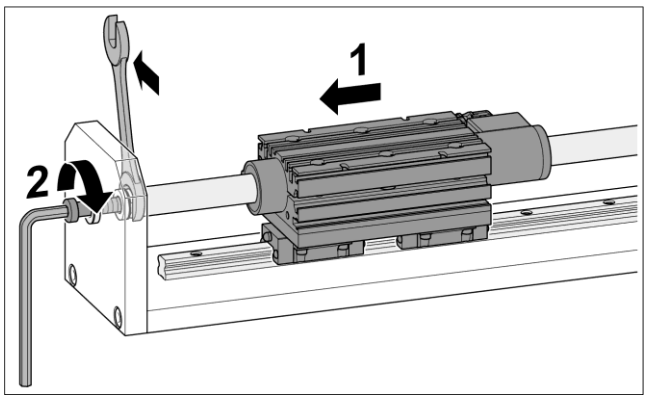
**4. Installing the slider using the fixed bearing**
The fixed bearing is screwed to the front end of the slider.

Do not tighten the screw yet!

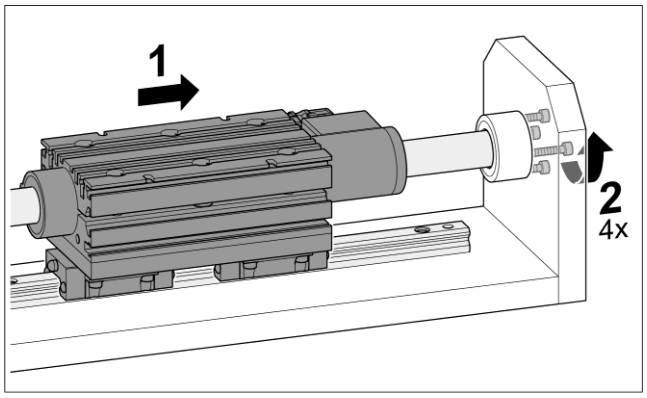



**5. Mount floating bearing**

Do not tighten the screw!
The slider is allowed to extend into the floating bearing no more than 15 mm!




**6. Move stator (back end) to the fixed end of slider, center slider in stator and tighten the screw.**




7. **Move stator (front side) to the floating bearing and tighten screws.**

After the installation of the slider a safety label must be placed close to the slider.

# ALL LINEAR MOTION FROM A SINGLE SOURCE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