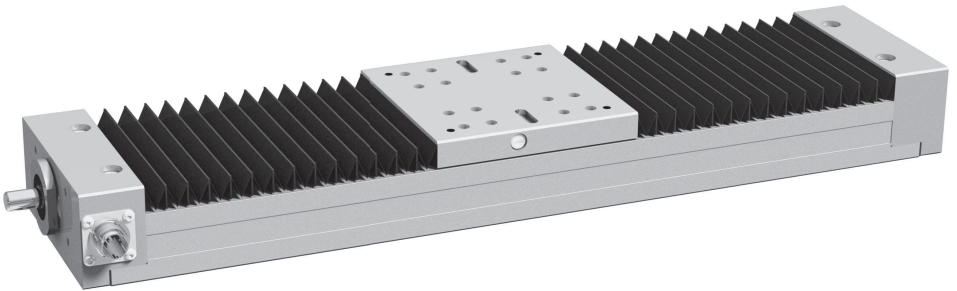



Translation of the original installation and maintenance instructions

## POSITIONING UNIT WITH BALL SCREW DRIVE



 Read the installation and maintenance instructions before carrying out any work!

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# 1 General information

## 1.1 Information about these assembly instructions

### Using the assembly instructions

These assembly instructions allow you to work safely and efficiently with the positioning unit throughout all phases of the positioning unit's service life. All warnings and instructions in these assembly instructions must be observed in order to ensure safe working conditions.

### Reading obligation

The operating/maintenance personnel are required to carefully read and understand these assembly instructions before starting any work.

### Storage location

The assembly instructions are an integral part of the positioning unit and must be kept readily available to the relevant personnel in the immediate vicinity of the positioning unit.

### Resale

If the positioning unit is resold to a third party, these assembly instructions must also be included.

### Applicable documents, regulations and provisions

In addition to these assembly instructions, the instructions, notes and signs on the positioning unit in the annex also apply. Attach any notes on technical changes to these assembly instructions. In addition, the local accident prevention regulations and general safety requirements for the area where the positioning unit is used apply.

### Figures in these assembly instructions

Figures contained in these assembly instructions are provided for basic understanding and may vary from the actual version of the positioning unit.

### Loss of the assembly instructions

If the assembly instructions are lost, request a replacement set immediately. Contact details Legal notice (See reverse side) .

## 1.2 Notes on use

### Instructions and steps

Steps to be performed by the operating personnel are shown consecutively. The sequence of steps must be observed.

Example:

- a) Step 1

### Lists

Lists without a mandatory sequence of steps are shown as a list preceded by a bullet point.

Example:

- Item 1
  - Item 1, subitem A
- Item 2

Lists with a mandatory sequence of steps are shown as a list preceded by numbers.

Example:

1. First
2. Second

### References to chapters/pages

References to specific chapters in which procedures and instructions are described are displayed as active links.

Example: see chapter *Information about these assembly instructions* [[▶ 5](#)].

### Illustrations

All figures and drawings in these assembly instructions are intended for general illustration purposes. They may vary from the actual design of the positioning unit.

### 1.3 Structure of the warnings

The warnings used in these assembly instructions are introduced by signal words that indicate the extent of the danger.

The warning symbol additionally indicates the type of hazard.

The following warnings are used in these assembly instructions:

#### **Danger level: Danger to life**



**⚠ DANGER**

#### **Danger to life!**

Consequences in case of non-compliance...

▶ Notes on prevention

A warning with this danger level indicates an imminent dangerous situation.

If the dangerous situation is not avoided, it will result in death or serious injury.

Follow the instructions in this warning to avoid the risk of death or serious personal injuries.

**Danger level: Risk of injury****⚠WARNING****Risk of injury!**

Consequences in case of non-compliance...

- ▶ Notes on prevention

A warning with this danger level indicates a potentially dangerous situation.

If the dangerous situation is not avoided, it may result in death or serious injury.

Follow the instructions in this warning to avoid the possible risk of death or serious personal injuries.

**Danger level: Personal injury****⚠CAUTION****Personal injury due to...**

Consequences in case of non-compliance...

- ▶ Notes on prevention

A warning with this danger level indicates a potentially dangerous situation.

If the dangerous situation is not avoided, it may result in minor or moderate injuries.

Follow the instructions in this warning to avoid personal injuries.

**Danger level: Property damage****NOTICE****Property damage due to...**

Consequences in case of non-compliance...

- ▶ Notes on prevention

A warning with this danger level indicates possible material damage.

If the situation is not avoided, material damage may occur.

Follow the instructions in this warning to avoid material damage.

**Note on working safely**



SAFETY INSTRUCTIONS
<p><b>Working safely during...!</b></p> <p>Carry out all work in compliance with the following safety instructions:</p> <ul style="list-style-type: none"> <li>▶ Notes on working safely</li> </ul>

This note contains important information and instructions for working safely during the following steps.

Follow the instructions in this note to avoid accidents and injuries.

**Note regarding useful information**



NOTE
<p>Note text...</p> <p>Consequences</p>

A note indicates additional information that is important for further processing or simplifies the described step.





**1.4 Symbols used**

Warnings in these assembly instructions are also marked with warning symbols.

**Warning symbols**

The following warning symbols are used in these assembly instructions:

Symbol	Meaning
	General warning message
	Warning of electrical voltage

Symbol	Meaning
	Warning of hand injuries
	Warning of heavy loads
	Warning of suspended load
	Warning of environmental pollution

## 1.5 Disclaimer

### Information in these assembly instructions

The information and warnings contained in these assembly instructions have been compiled taking into consideration the applicable standards, guidelines and regulations, the state of the art as well as our many years of experience. The scope of delivery or the design of the positioning unit may vary from the descriptions and figures provided here due to optional order items, the production of customized designs or the latest technical changes.

### Obligations

In addition to the contractually agreed obligations, the manufacturer's General Terms and Conditions of Business and Delivery apply. They are subject to the laws in force at the time when the contract is concluded.

### Technical changes

The date of issue of these assembly instructions applies. We reserve the right to make technical changes to the positioning unit within the scope of further development in order to improve its performance features and safety.

**Disclaimer in case of non-compliance**

The manufacturer is not liable for damage and accidents resulting from the following:

- Non-intended use (*Intended use* [► 14]) of the positioning unit
- Non-compliance with the information and instructions in these assembly instructions
- Work performed on or with the positioning unit by unqualified or unauthorized personnel
- Installation of non-original spare parts
- Unauthorized modifications without written acceptance by the manufacturer

## 1.6 Spare parts

Spare parts must be ordered from the manufacturer. See the reverse side for contact details.



### ⚠ CAUTION

#### **Incorrect or faulty spare parts.**

Risk of injury, risk of damage, malfunctions or total failure!

- ▶ Only use original spare parts from the manufacturer or spare parts approved by the manufacturer.
- ▶ If in doubt, contact the manufacturer.



### NOTE

If non-approved spare parts are used, all warranty, service, compensation and/or liability claims against the manufacturer or its agents, dealers and representatives will be invalidated.

For all requests for spare parts or when ordering spare parts, always provide the complete data on the type plate (*Type plate* [▶ 22]).

## 1.7 Warranty conditions

### Location

The warranty conditions are included in the purchase contract and the manufacturer's General Terms and Conditions.

### Basic information

The manufacturer or sales partner will make the final decision on a warranty claim after all defective parts have been returned or possibly after an on-site inspection. The replacement of defective parts does not extend the warranty period for the positioning unit. In case of modifications or significant repairs carried out by the operator or third parties without the written consent of the manufacturer or sales partner, the warranty claim will be completely invalidated.

## 1.8 Customer service and product monitoring

### Customer service

For problems and questions that cannot be solved using these assembly instructions and for technical information, please contact our customer service or sales partner; contact details (See reverse side) .

### Product monitoring

We aim to continuously improve our products and are also interested in any experience gathered when using the positioning unit.

We are happy to receive information about problems with the positioning unit, faults during operation and errors that occur.

Always notify the manufacturer in the event of actual or potential accidents.

## 1.9 Applicable documents

In addition to the information contained in these assembly instructions, the information contained in the following sources of information, in particular the safety instructions, must also be taken into consideration:

- Information on the type plate of the positioning unit
- Instructions for the assemblies used
- Instructions of the operator
- Safety data sheets of auxiliary and operating materials
- Local accident prevention regulations and regional regulations at the operating site of the positioning unit
- Data sheets of installed components

## 2 Safety

### 2.1 Introduction

This section provides an overview of all the important safety aspects for ensuring optimum protection of personnel and for safe and smooth operation.

Failure to observe the instructions and warnings in these assembly instructions can result in serious hazards.

Only those risks that have been determined based on a risk assessment can be considered in these assembly instructions. Risks that result from work conditions, the place of deployment and interfaces to foreign components must be determined and warnings must be supplemented accordingly.

### 2.2 Intended use

The positioning unit is solely intended for use in industrial applications.

The positioning unit is solely intended for installation in machines and is used to move, precisely position and transport light to medium loads.

The permissible values specified in the "*Technical data* [▶ 66]" chapter must be observed.

Any other use or use that goes beyond this is considered improper use.

### 2.3 Foreseeable misuse

Any use for a purpose other than the one specified in the *Intended use* [▶ 14] chapter is considered improper use.

Any use of the bridge module that goes beyond and/or deviates from the intended use can result in dangerous situations.

The risk of improper use or misuse is borne solely by the operating company.

Misuse occurs, for example, when

- The bridge is operated outside the limits specified in *Technical data* [▶ 66].
- Modifications are made to the bridge module.
- Safety devices are disabled.
- The bridge module is used in an explosion-protected area.

## 2.4 Responsibility of the operator

### Basic information

The owner of the bridge module is generally subject to the legal requirements concerning occupational safety, since the bridge module is intended for use in the commercial sector. In addition to the warnings in these assembly instructions, the safety, accident prevention and environmental protection regulations applicable to the area in which the bridge module is used must therefore also be observed.

### Risk assessment

The operating company must keep itself informed of the applicable health and safety regulations and carry out a risk assessment to determine any additional hazards arising from the specific working conditions at the place where the bridge module is used.

### Instructions

The operator must issue, implement, and document operating instructions based on the results of the risk assessment at the workplace.

During the entire time the bridge module is in use, the operating company is responsible for ensuring that the instructions it issues comply with the current legal requirements.

### Responsibilities

The operating company must regulate the responsibilities for work on or with the bridge module and designate a person responsible for its safe operation and for coordinating all related activities.

### Information flow

The operating company must ensure that all personnel working on or with the bridge module have read and understood these assembly instructions and other instructions. In addition, the operator must train the relevant personnel at regular intervals and inform them about the potential dangers.

### Personal protective equipment

The operator must provide the personnel with the required personal protective equipment.

### Safety requirements

If necessary, the operating company must ensure that the machine in which this bridge module is to be installed, or of which it is a component, complies with the basic safety requirements and provisions of all relevant directives before commissioning.

### Perfect working order

In order to keep the bridge module in perfect working order at all times, the operating company must ensure that the maintenance intervals specified in these assembly instructions are observed.

## 2.5 Personnel requirements

### 2.5.1 General personnel requirements

Only persons who reliably perform their work and whose ability to react is not influenced, e.g., by drugs, alcohol or medication, are permitted to work on or with the machine.

When selecting such personnel, the job-specific age requirements applicable at the location where the positioning unit is used must be observed.

### 2.5.2 Qualifications

Improper handling due to insufficient qualification can result in significant injuries.

- Have all activities performed out only by qualified personnel.
- Keep unqualified personnel away from the danger areas.

The following qualifications are specified in the assembly instructions for various areas of activity:

#### Qualified specialist personnel

Qualified specialist personnel can carry out the assigned work and independently identify and avoid potential hazards due to their specialist training, knowledge and experience as well as knowledge of the relevant standards and regulations.

#### Manufacturer (Service center)

Some work must only be carried out by the manufacturer's qualified personnel. Other personnel are not authorized to perform this work. Contact the manufacturer's service department to carry out the necessary work (see the Legal notice on the reverse side).

#### Instructed person (operator)

An instructed person has been informed by the operator about the tasks assigned to them and about possible dangers in the event of improper behavior.

### 2.5.3 Unauthorized personnel

Unauthorized personnel who do not meet the requirements described here are not aware of the dangers in the work area.

- Keep unauthorized personnel away from the work area.
- In case of doubt, address the personnel and direct them away from the work area.
- Stop working as long as unauthorized personnel are in the work area.

## 2.6 Personal protective equipment

Some work requires personnel to wear personal protective equipment to minimize health hazards. In addition to the personal protective equipment specified in these assembly instructions, the instructions posted in the work area must be observed. The following personal protective equipment must be worn depending on the work to be performed:

Symbols	Meaning
---------	---------



**Suitable protective clothing**

is close-fitting work clothing with low tear resistance, tight sleeves and no parts that stick out. It is primarily used to protect against being caught by moving machine parts. Do not wear rings, chains or other jewelry.



**Safety shoes**

are used to protect against heavy falling parts and slipping on slippery surfaces.



**Protective gloves**

are used to protect hands from friction, abrasions, punctures or deeper injuries, as well as from contact with hot surfaces.



**Hearing protection**

is used to protect hearing in case of potentially harmful noise levels.



**Safety goggles**

are used to protect the eyes from flying small parts, dust or compressed air.



**NOTE**

External visitors or employees from other departments must also wear personal protective equipment when entering the work area.

## 2.7 Residual risks

### 2.7.1 Note

The following section identifies residual risks that have been identified based on a risk assessment.



### SAFETY INSTRUCTIONS

#### Note on working safely!

Failure to observe the safety instructions, warnings and working instructions provided in these operating instructions may result in significant hazards.

- ▶ Always observe the safety instructions, warnings and handling instructions!
- ▶ Also observe the safety instructions provided in the other applicable documents!

### 2.7.2 Mechanical hazards

#### Moving parts of the positioning unit

Risk of injury between moving parts of the positioning unit!

Parts of the body can get trapped or crushed between moving parts of the positioning unit.

- Do not reach into moving parts of the positioning unit during operation. Do not handle moving parts of the positioning unit.
- Do not open covers during operation.
- Observe the lag time: make sure that no parts are moving before opening the covers.
- Wear close-fitting clothing and tie up long hair.

### 2.7.3 Hazards at the operating site

Operating the positioning unit at an unsuitable or insufficiently equipped operating site poses various hazards!

Safety deficiencies caused by work performed incorrectly due to inadequate lighting:

- Make sure that there is sufficient lighting at the workplace.
- Have defective lamps replaced immediately.

Sharp edges, corners and materials with sharp edges can cause abrasions and cuts on the skin::

- Exercise caution when working near sharp edges and corners and when handling materials with sharp edges.
- In case of doubt, wear protective gloves.

Contamination and objects lying around create sources of slipping and tripping:

- Always keep the work area clean.
- Remove items that are no longer needed.

- Mark tripping hazards with yellow and black marking tape.
- Remove any spilled liquids immediately.

Danger of short circuits due to unsuitable application area:

- Only operate the positioning unit indoors.
- Protect the positioning unit from moisture.

#### **2.7.4 Hazards due to noise**

The positioning unit itself does not emit any hazardous noise emissions. However, during operation in combination with the connected machines, noise levels may occur that could potentially lead to tinnitus or hearing loss.

- The emissions must be measured by the operator after the entire system has been assembled:
  - If the measured noise level is  $\geq 80$  dB(A), the operating company must make hearing protection available.
  - If the measured noise level is  $\geq 85$  dB(A), the operating company must make the use of hearing protection mandatory.

### **2.8 Environmental protection**

Danger to the environment due to the improper handling of environmentally hazardous substances, especially their incorrect disposal:

- Always follow the instructions provided below.
- If environmentally hazardous substances are accidentally released into the environment, take appropriate measures immediately. In case of doubt, notify the responsible authority of the damage.
- Collect, transport and store environmentally hazardous substances in suitable containers only.

The following environmentally hazardous substances are used:

#### **Lubricants**

Lubricants such as greases and oils contain toxic substances. They must not be released into the . They must be disposed of by a specialist disposal company in accordance with local applicable regulations.

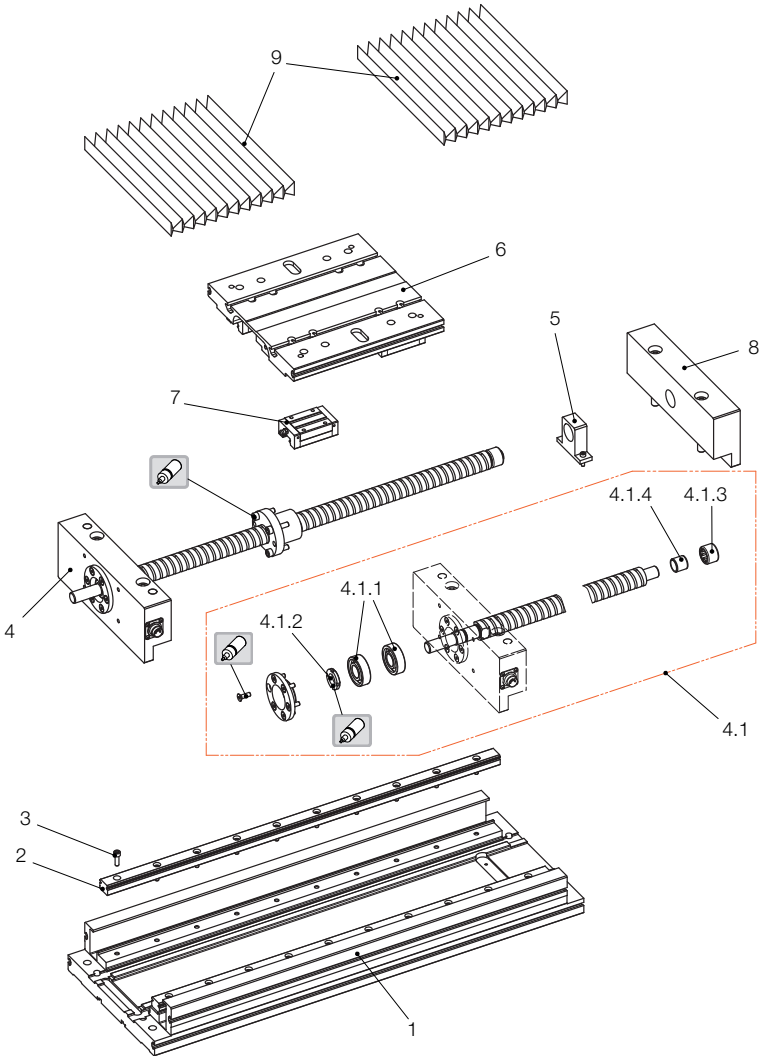
#### **Machine parts**

Replaced machine parts may, for example, be contaminated by grease and oil and therefore contain toxic substances. They must not be released into the environment. They must be disposed of by a specialist disposal company in accordance with local applicable regulations.

## 3 Structure and function

### 3.1 Product overview

The following exploded view shows a positioning unit in its maximum configuration. The actual scope of delivery may vary from this version.

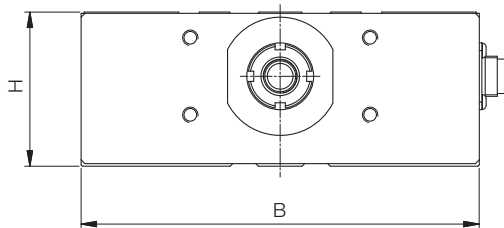


1	Base plate	4.1.1	Inner ring
2	Linear rail	5	Floating bearing block
3	Screw for linear rail	6	Carriage
4	End plate with ball screw drive	7	Guide carriage
4.1	Complete ball screw drive	8	End plate opposite the motor
4.1.1	Angular contact ball bearing	9	Bellows set
4.1.2	Lock nut	10	-
4.1.3	Loose bearing	11	-

### 3.2 Product description

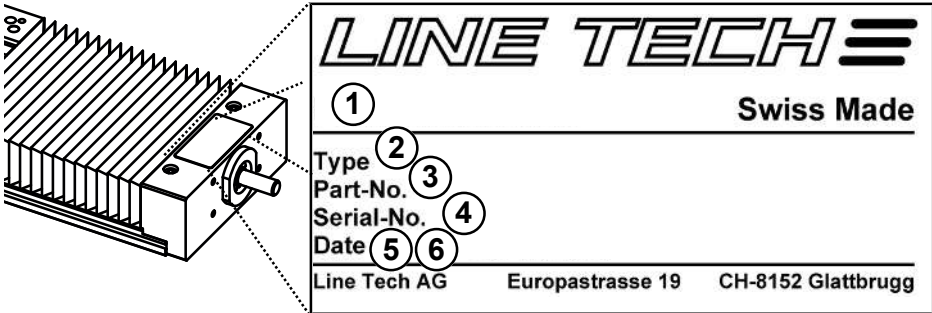
LINE TECH positioning units with ball screw drives are modular, ready-to-install linear carriages with drives. Sealed guide elements are used in all sizes and the guides and drives are protected against external influences such as contamination and chips, etc. by bellows. The base plates and carriages are made of an aluminum alloy and are manufactured using an extrusion process. The limit switches integrated into the base plate, in combination with motors and a control system, ensure correct positioning of the carriage and protect against overrun. The selected design results in very high performance with highly compact dimensions.

The following load ratings are achieved:



Positioning unit Type	Dimensions W x H [mm]	Load ratings	
		C <sub>0</sub> [kN]	C [kN]
PE1.4...	110 x 50	13.8	9.2
PE2.4...	155 x 60	42.5	29.3
PE3.4...	225 x 90	59.2	41.4
PE4.4...	310 x 105	230.5	161.9

### 3.3 Type plate



The following information is included on the type plate and makes it easy to identify the positioning unit:

- Description (1)
- Type designation (2)
- Part number (3)
- Serial number (4)
- Manufacturing date; calendar week/year (5)
- Repair date (6; if available)



#### NOTE

If problems occur with the positioning unit, provide the manufacturer or sales partner with the information on the type plate.

## 4 Transport

### 4.1 Safety



#### SAFETY INSTRUCTIONS

##### **Working safely while transporting the positioning unit!**

Carry out all work in compliance with the following safety instructions:

- ▶ Comply with the provisions listed in the *Safety* [▶ 14] chapter for all work performed on/with the positioning unit.
- ▶ Observe the instructions and personnel requirements as per the *Personnel requirements* [▶ 16] chapter.
- ▶ Provide suitable forklift trucks or lifting gear for transportation.
- ▶ Wear personal protective equipment (safety shoes, protective gloves and hard hat).



#### NOTICE

##### **Property damage due to improper transportation!**

Improper transportation may result in property damage.

- ▶ Do not expose the parts to be transported to hard shocks during transportation.
- ▶ Make sure there is sufficient free space during transport.
- ▶ Always provide support for positioning units longer than 700 mm during transportation.
- ▶ Use caution when lifting and setting down the machine.

## 4.2 Transport by forklift

### Conditions for transportation

Packages that are attached to pallets can be transported with a forklift under the following conditions:

- The forklift must be designed for the weight of the transport items.
- The item to be transported must be securely fastened to the pallet.
- The forklift driver is authorized to do this.

### Lifting packages

- a) Drive the forklift with the tines between or under the pallet's beams.
- b) Drive the tines in far enough that they protrude on the opposite side.
- c) Make sure that the pallet cannot tip if the center of gravity is eccentric. Observe the special information about the center of gravity on the packages.
- d) Lift the pallet with the transport unit and begin the transport.

## 4.3 Transport with the crane

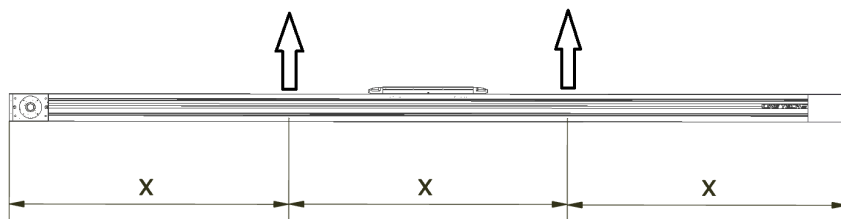


### **WARNING**

#### **Danger to life from suspended loads!**

Danger from falling or uncontrolled swinging parts.

- ▶ Never stand under suspended loads.
- ▶ Do not attach to protruding positioning unit parts or to eyelets on attached components. Make sure that the slings are securely fastened.
- ▶ Only use approved lifting gear and slings with sufficient load capacity.
- ▶ Transport may only be carried out by personnel trained for this purpose.



## Conditions for transportation

The positioning units or packages that are secured to pallets or packed in crates can be lifted and moved with a crane (for positioning units or packages that exceed a length of 9 meters, consult the manufacturer).

Ensure that

- the slings are designed for the weight to be lifted.
- the crane operator is authorized to do so.

## Lifting positioning units or packages

Lift positioning units or packages as follows:

- a) Ensure that the carriage is positioned approximately in the center.
- b) Attaching slings to positioning units or packages.
- c) Attach two lifting straps at equal distances ( $\frac{1}{3}$  /  $\frac{1}{3}$  /  $\frac{1}{3}$ ) and lift vertically.
- d) Do not choose an angle of attack that is too flat.
- e) Ensure that ropes and straps, etc. are not twisted and that the positioning units or packages are securely fastened.
- f) Lift the positioning units or packages and begin the transport operation.

## 4.4 Transport inspection and scope of delivery

### Transport inspection

Check that the delivery is complete and that there is no transport damage immediately upon receipt.

If there is any visible external transport damage, proceed as follows:

- Do not accept the delivery or only accept it with reservations.
- Record the extent of the damage on the transport documents or on the carrier's delivery document.
- Submit a complaint.



### NOTE

Report any defect as soon as it is detected. Claims for damages can only be made within the valid complaint periods.

### Scope of supply

Refer to the delivery document for the scope of delivery. The scope of delivery of the product includes:

- Positioning unit as specified in the order confirmation
- Assembly and maintenance instruction
- Additional and special accessories according to the order

## 4.5 Storage



### NOTICE

#### Property damage due to improper storage!

Improper storage may result in property damage.

- ▶ Always store the positioning unit in compliance with the following conditions.
- ▶ Use caution when lifting and setting down the machine.

If the positioning unit is not used for more than two months or is stored before installation, observe the following conditions:

- Make sure that the positioning unit is clean. Clean the positioning unit if necessary.
- Do not store outdoors.
- Store in a dry location that is free of dust.
- Do not expose to aggressive media.
- Protect from sunlight.
- Avoid mechanical vibrations.
- Store the positioning unit in a box that is well-padded.

## 5 Assembly

### 5.1 Safety



#### SAFETY INSTRUCTIONS

##### **Working safely while assembling the positioning unit!**

Carry out all work in compliance with the following safety instructions:

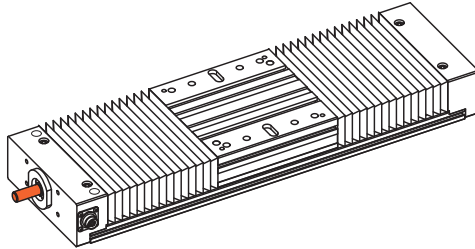
- ▶ Comply with the provisions listed in the *Safety* [▶ 14] chapter for all work performed on/with the positioning unit.
- ▶ All installation work must only be carried out by specially trained personnel (see the *Personnel requirements* [▶ 16] chapter).
- ▶ Work on electrical systems must only be carried out by qualified personnel (see the *Qualifications* [▶ 16] chapter).
- ▶ Wear protective equipment in accordance with local accident prevention regulations for all assembly work.
- ▶ Make sure that there is sufficient space for assembly before starting work.
- ▶ Make sure that the assembly area is tidy and clean! Components and tools that are loosely stacked on top of each other or lying around create a risk of accidents.
- ▶ If components have been removed or adjusted, ensure correct assembly, reinstall all fastening elements and observe the screw tightening torques.
- ▶ Do not stand under suspended loads.
- ▶ Observe the relevant environmental protection instructions. If environmentally hazardous substances are accidentally released into the environment, take appropriate measures immediately. In case of doubt, notify the responsible local authority of the damage.

## 5.2 Delivery configurations

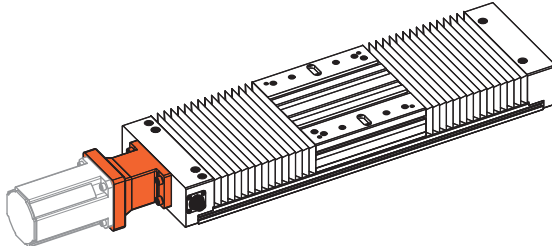
Positioning units with a ball screw drive can be supplied in various configurations and with different pre-installed motor mounts.

The following delivery configurations are possible:

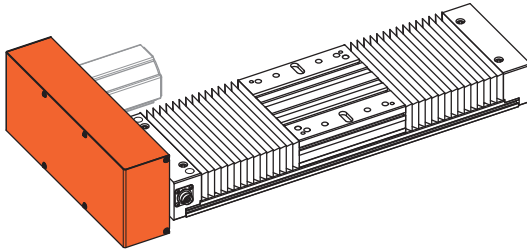
Delivery configuration 01 - Free spindle end



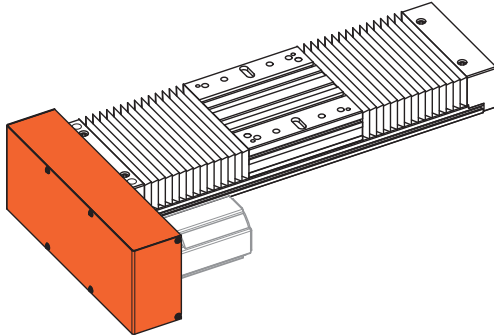
Delivery configuration 02 - With coupling and intermediate flange



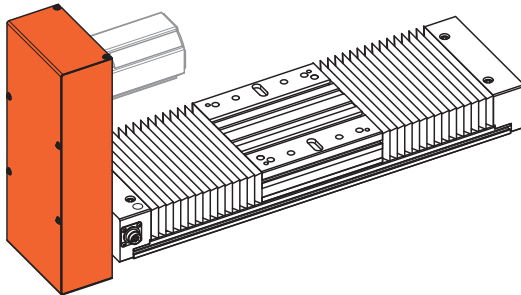
Delivery configuration 04 - Preparation for side motor mounting on the right



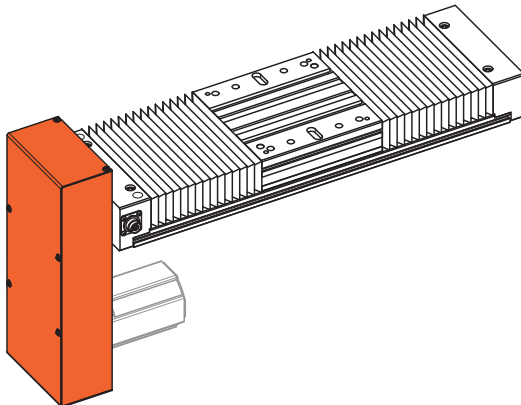
Delivery configuration 05 - Preparation for side motor mounting on the left



Delivery configuration 06 - Preparation for side motor mounting on the top



Delivery configuration 07 - Preparation for side motor mounting on the bottom



### 5.3 Permissible deflection

Positioning units can be installed as cantilevered structures. However, deflection must be taken into consideration, since this limits the possible load.

If the maximum permissible deflection is exceeded, the positioning units must be additionally supported.

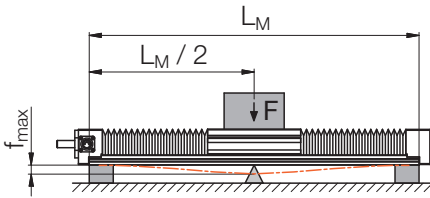
The maximum permissible deflection is limited by the maximum deflection angle of  $5^\circ$ . If this value is exceeded without support, it will affect the unit's service life.

If there are increased requirements for system accuracy, we recommend supporting the positioning units along their entire length.

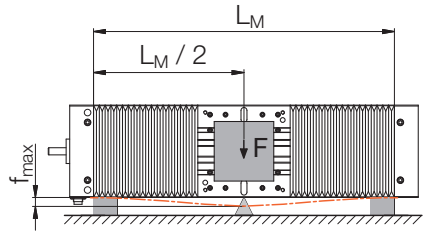
The following diagrams apply to:

- Fixed clamping (40 – 50 mm per side)
- 3 – 4 screws per side
- Fixed substructure
- Horizontal or upright installation position

Horizontal installation position

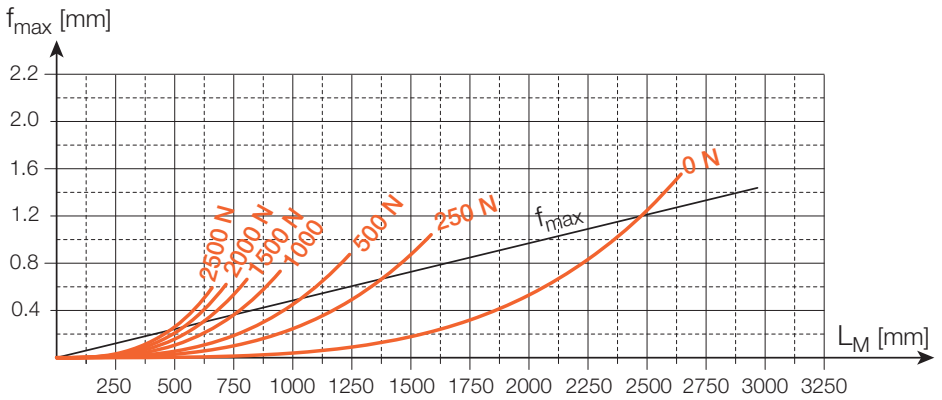


Upright installation position

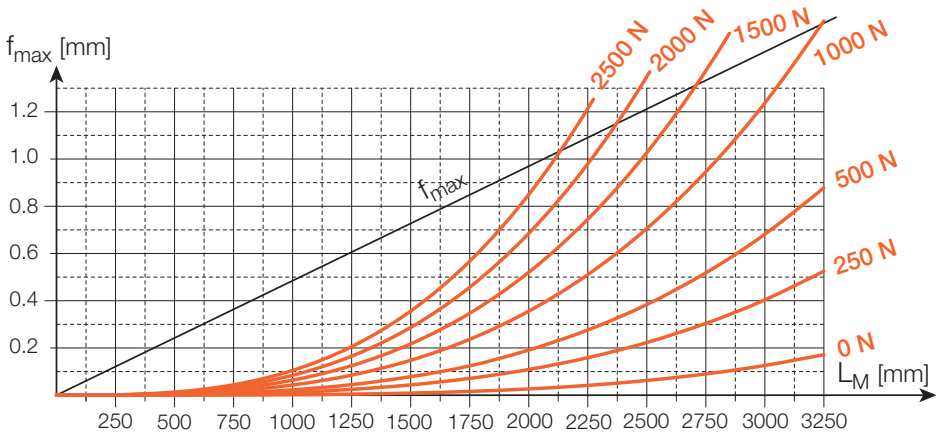


**Permissible deflection (1/2; for PE1... and PE2...)**

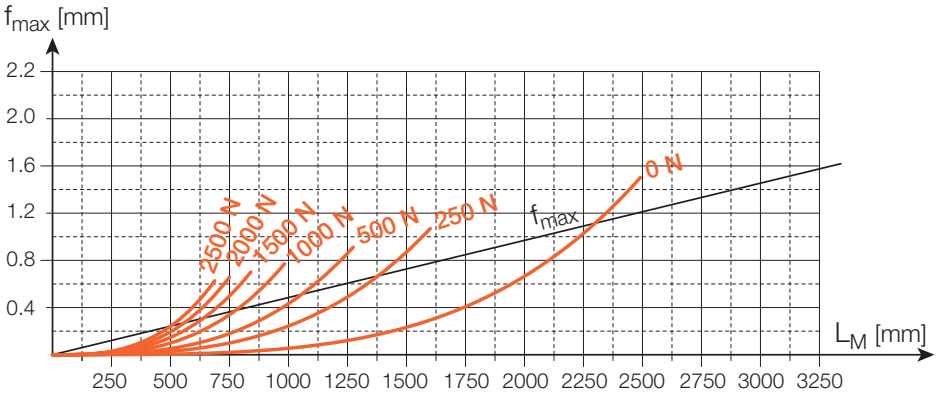
**PE1... horizontal**



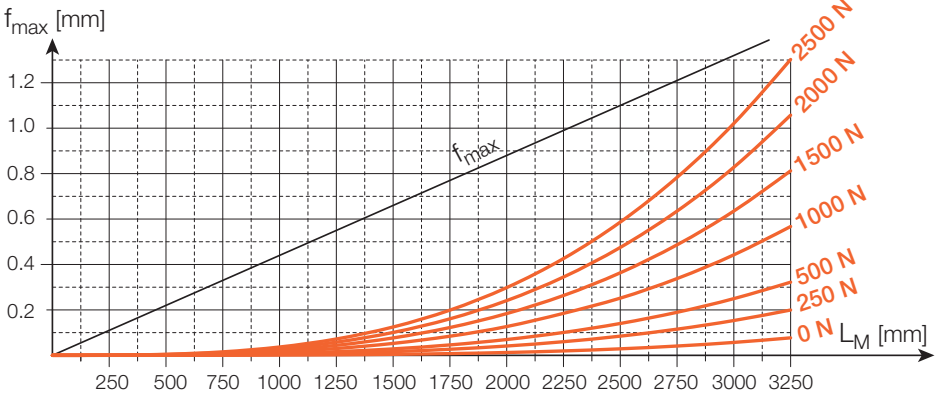
**PE1... upright**



**PE2... horizontal**

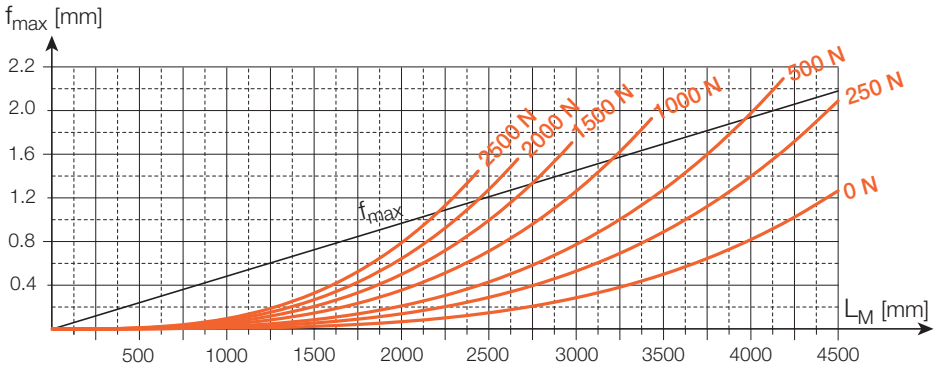


**PE2... upright**

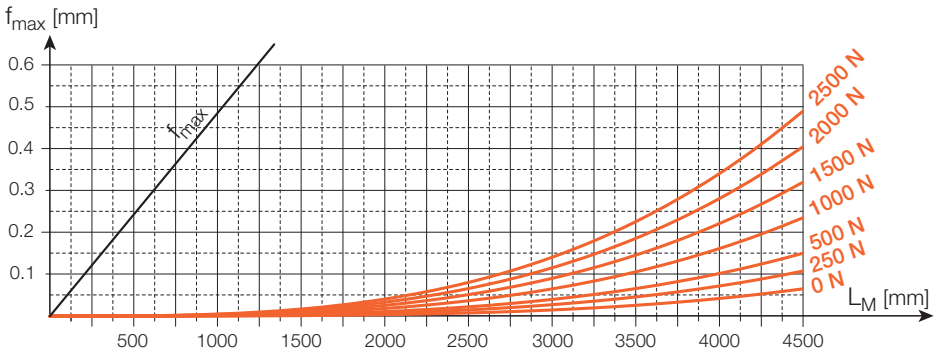


**Permissible deflection (2/2; for PE3... and PE4...)**

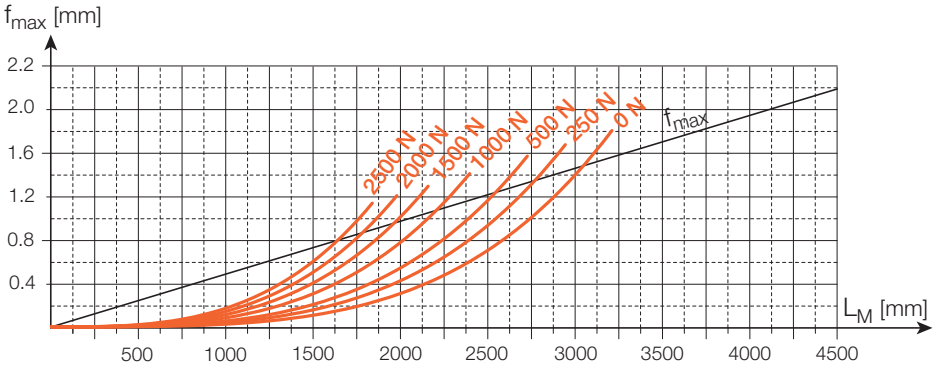
**PE3... horizontal**



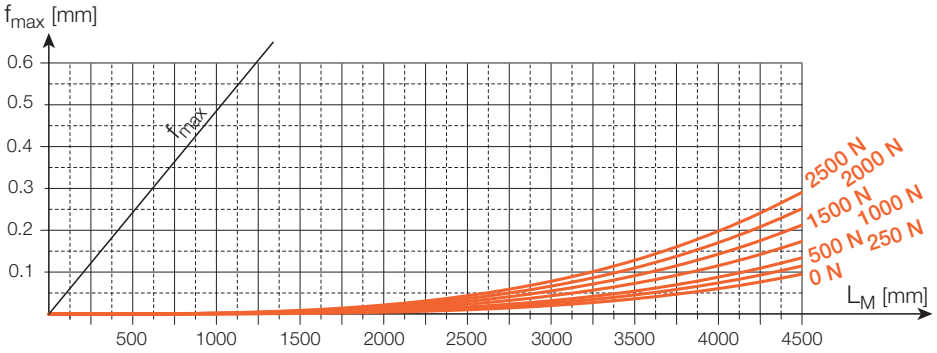
**PE3... upright**



**PE4... horizontal**



**PE4... upright**



## 5.4 Attaching the positioning unit

### 5.4.1 General information

Positioning units are attached from above or below using screws.

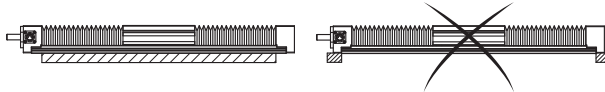


#### NOTICE

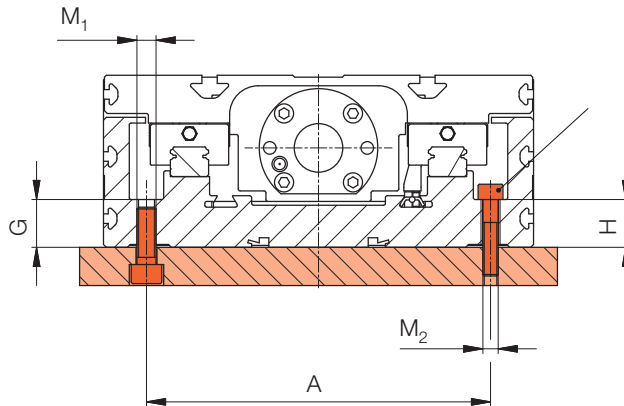
#### Property damage due to improper fastening!

If end plates are used as load-bearing elements, the positioning unit may be damaged.

- ▶ Only fasten or support the positioning unit on the base profile and not on the end plates.



### 5.4.2 Overview



Nominal size	Dimensions [mm]					
	A	G	H	M <sub>1</sub>	M <sub>2</sub>	Head
PE1...	86	6.5	6.5	M6	M4	ISO 4762
PE2...	130	10	10	M8	M6	ISO 4762
PE3...	180	25	25	M10	M8 <sup>1)</sup>	ISO 4762
PE4...	280	-	14.5	-	M12	ISO 4762

1) Max. screw length = 40 mm

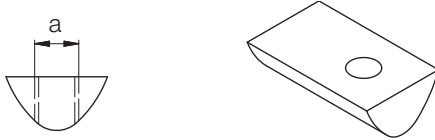
### 5.4.3 Attaching the positioning unit with sliding blocks

#### Usage

Sliding blocks with the corresponding groove width can be used to fasten attachments and extensions to the base profile or carriages.

#### Sliding block types

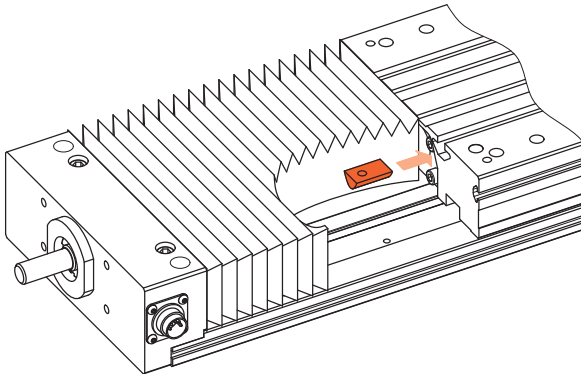
The type of sliding block to be used depends on the groove width:



Dimensions [mm]		The material
Groove width	a (thread)	
5	M3/M4/M5	Steel/stainless steel
8	M4/M5/M6/M8	Steel/stainless steel

When ordering sliding blocks, please specify the size, material, and connection thread (e.g., NS6 St M5).

#### Assembly



a) Push the sliding blocks into the corresponding groove.

## 5.5 Assembling limit switches

### 5.5.1 Overview of limit switch/reference switch installation

#### Function

The limit switches are required in combination with a control unit to limit the stroke (to prevent the carriage from overrunning) and determine a reference point for setting the zero point.

The positive and negative limit switches are preset at the factory to a nominal stroke of 0 to +5 mm.

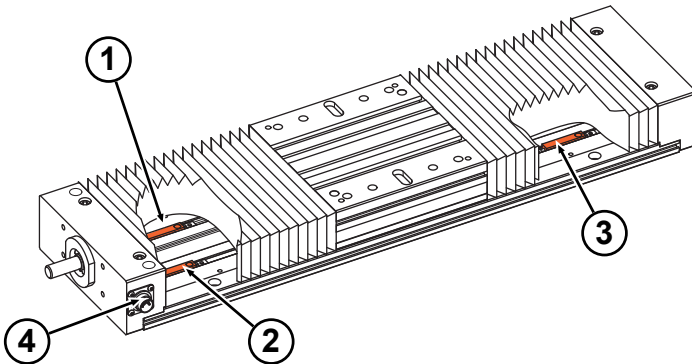
The following inductive limit switches are used as standard:

- PNP normally closed (PNP NC)
- Power supply: 10...30 V DC
- Current consumption without load: < 10 mA
- Load max. 200 mA

The following limit switches are also available on request:

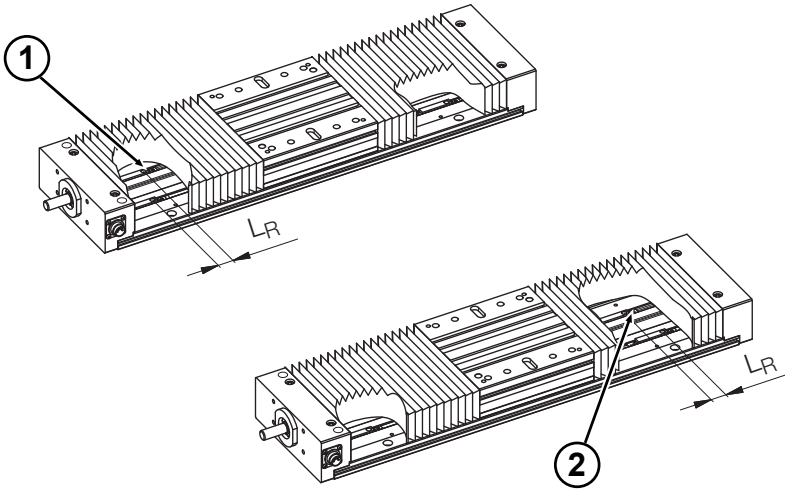
- PNP normally open (PNP NO)
- NPN normally closed (NPN NC)
- NPN normally open (NPN NO)
- Reed switches
- Mechanical switches

#### Overview



- |   |                           |   |                           |
|---|---------------------------|---|---------------------------|
| 1 | Reference switch          | 2 | Negative limit switch (-) |
| 3 | Positive limit switch (+) | 4 | Connector                 |

### Position reference switch



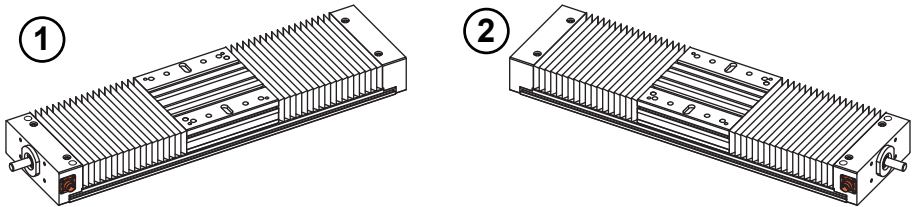
- 1 Reference switch at front (motor side)    2 Reference switch at rear (motor side)

Position reference switch ( $L_R$ );  $L_R = 20$  mm

## 5.5.2 Position of the limit switch connectors

### Position

The position of the limit switch connectors is shown in the following figure:

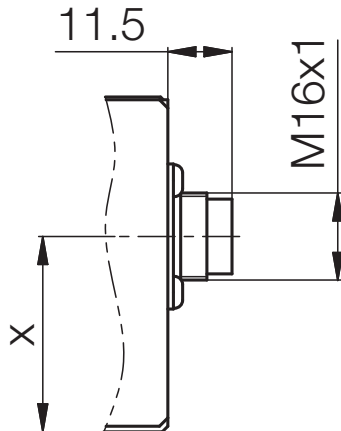


1 Left limit switch connectors

2 Right limit switch connectors

The reference point can be assigned to the positive (+) or negative (-) limit switch.

### Dimensions



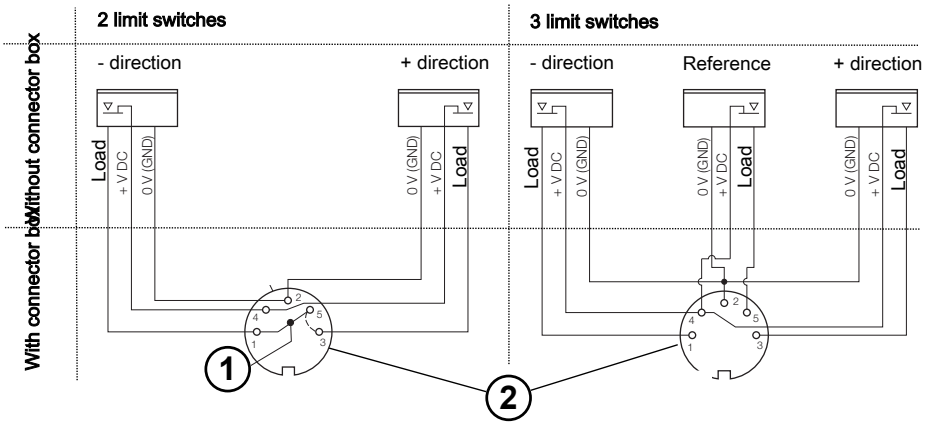
Size	x [mm]
PE1	26
PE2	35
PE3	52
PE4	49

### Special applications

Special applications often require a separate reference point switch, which is mounted between the positive and negative limit switches. The limit switch that is closer to the motor mounting (limit switch control interface) is referred to as the front limit switch.

## Connector pin assignment

The connector pin assignment when using a connector box is shown in the following diagram:



- |   |   |   |  |
|---|---|---|--|
| 1 | Reference point bridge  | 2 | SFV50 connector according to IEC 60130-9 |
|   | <ul style="list-style-type: none"> <li>– Reference point in negative (-) direction forward (motor side)<br/>Bridge pins 1 – 5</li> <li>– Reference point in positive (+) direction backward (motor opposite)<br/>Bridge pins 3 – 5</li> </ul> |   |  |

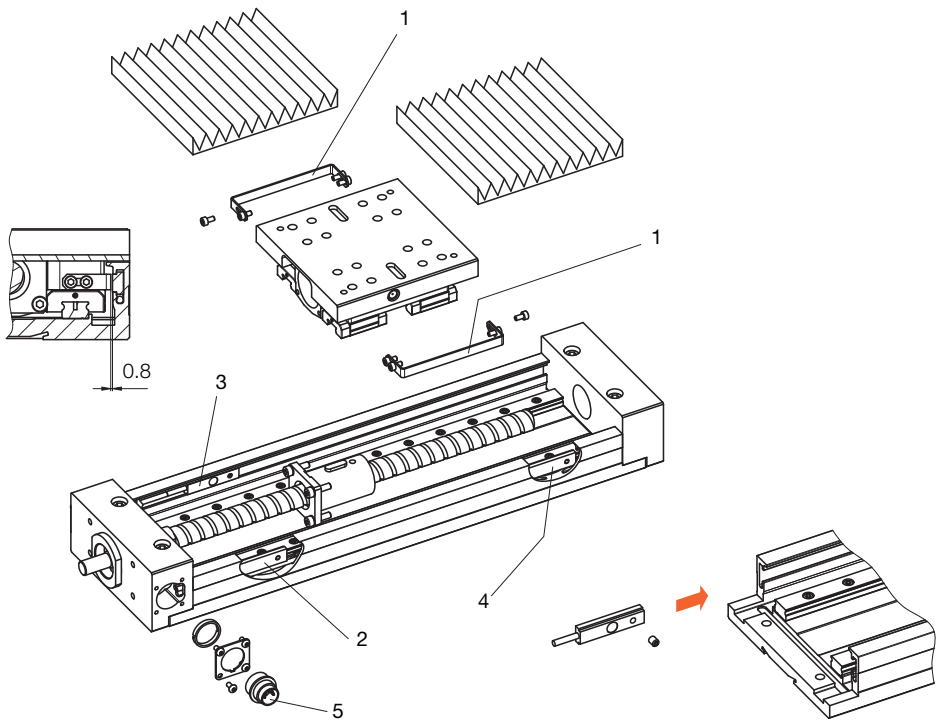
The individual pins are assigned as follows:

- Pin 1 = negative (-) direction (load)
- Pin 2 = 0 V (GND)
- Pin 3 = positive (+) direction (load)
- Pin 4 = +10...30 V DC
- Pin 5 = Reference (load)

Color code legend

- Load = black
- +V DC = brown
- 0 V (GND) = blue

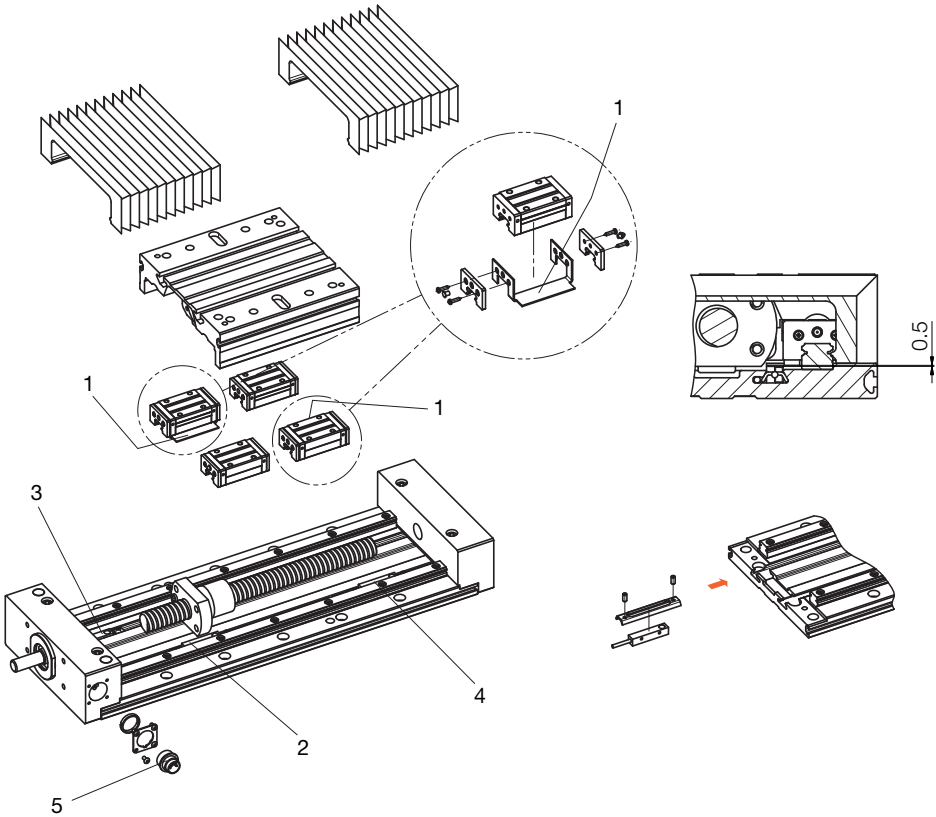
### 5.5.3 Limit switch mounting PE1



- |   |                       |   |                           |
|---|-----------------------|---|---------------------------|
| 1 | Limit switch trigger  | 2 | Negative limit switch (-) |
| 3 | Reference switch      | 4 | Positive limit switch (+) |
| 5 | Connector (incl. nut) |   |                           |

When installing the limit switch, observe the tightening torques for the screws (see *Tightening torques for screws* [▶ 68]).

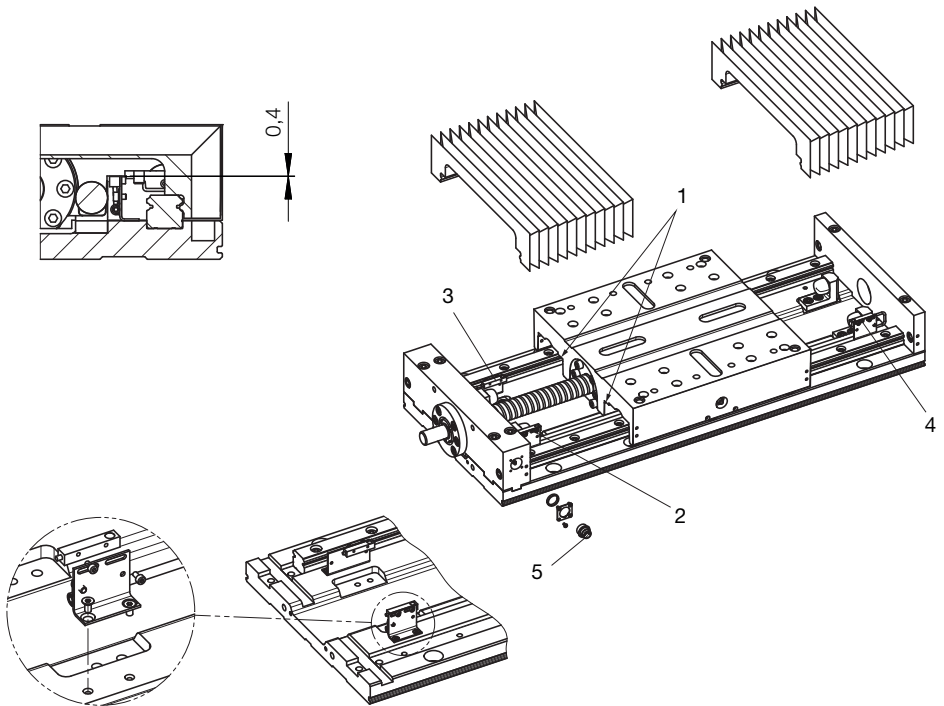
### 5.5.4 Limit switch mounting PE2 and PE3



- |   |                       |   |                           |
|---|-----------------------|---|---------------------------|
| 1 | Limit switch trigger  | 2 | Negative limit switch (-) |
| 3 | Reference switch      | 4 | Positive limit switch (+) |
| 5 | Connector (incl. nut) |   |                           |

When installing the limit switch, observe the tightening torques for the screws (see *Tightening torques for screws* [▶ 68]).

### 5.5.5 Limit switch mounting PE4



- |   |                       |   |                           |
|---|-----------------------|---|---------------------------|
| 1 | Limit switch trigger  | 2 | Negative limit switch (-) |
| 3 | Reference switch      | 4 | Positive limit switch (+) |
| 5 | Connector (incl. nut) |   |                           |

When installing the limit switch, observe the tightening torques for the screws (see *Tightening torques for screws* [▶ 68]).

## 5.6 Installing the motor and gearbox

### 5.6.1 General information



#### **⚠ DANGER**

##### **Danger due to electric shock!**

There is a risk of electric shock on contact with live components.

- ▶ Work on the electrical equipment must only be carried out by qualified electricians.
- ▶ De-energize the positioning unit before carrying out any work (disconnect the power plug).



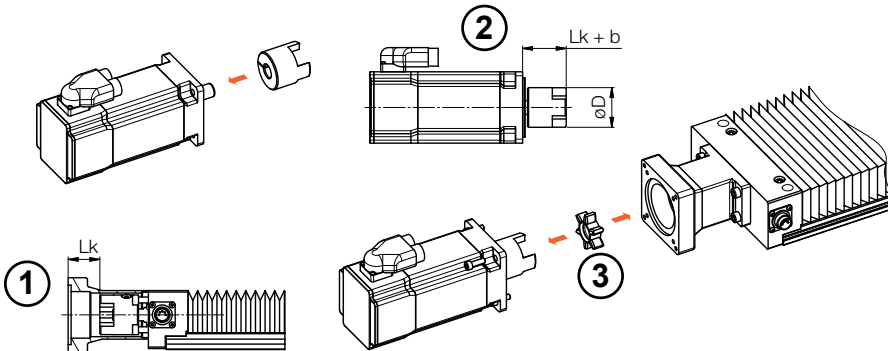
#### **NOTE**

Observe the information in the manufacturer's instructions regarding the motors and gearboxes to be installed.

### 5.6.2 Straight, with ball screw drive

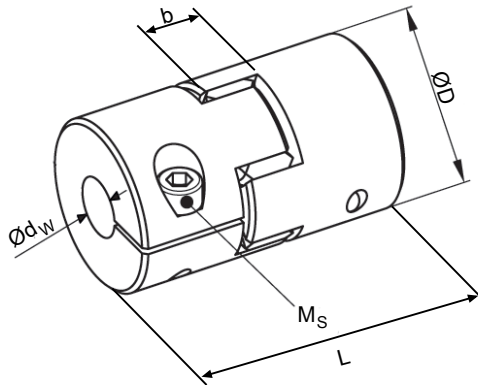
#### **Motor mounting**

Mount the motor as follows:



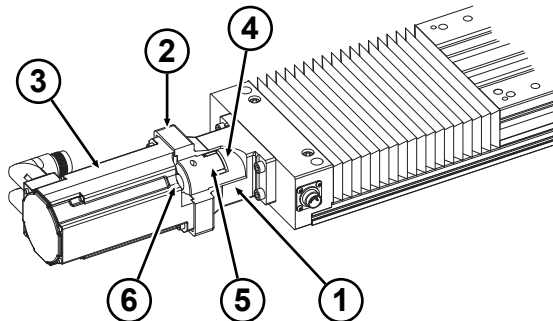
- a) Measure distance  $L_k$  on the unit (1).
- b) Attach the clamping hub to the motor mount at a distance of  $L_k + b$  (2). Observe the tightening torque of the clamping screw.
- c) Mount the pre-assembled motor with gear rim to the unit (3).

### Tightening torques of the clamping screw



Size	Dimensions [mm]				Clamping screw tightening torque [Nm]		Drive torque [Nm]	
	L	ØD	b	Ød	Type	M <sub>s</sub>	T <sub>N</sub>	T <sub>max</sub>
14	35	30	10	≤ 16	ISO 4762	1.34	6.3	25
19	66	40	12	≤ 20	ISO 4762	10.10	17.0	34
19	66	40	12	≤ 20	ISO 7380	7.20	17.0	34
24	78	55	14	≤ 28	ISO 4762	10.10	40.0	120

### Motor attachments and parts list

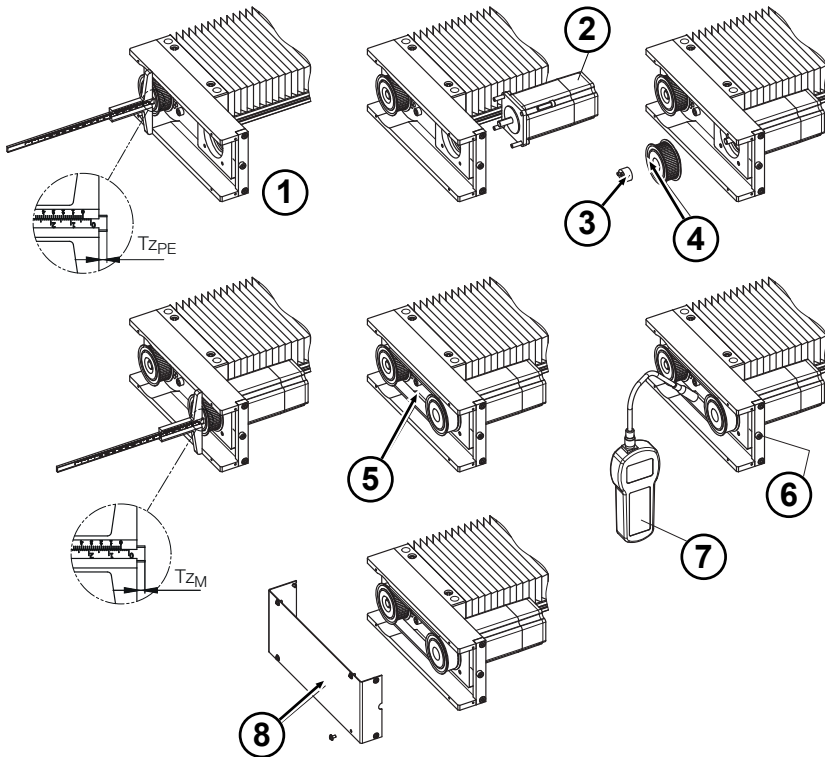


- |   |                     |   |                      |
|---|---------------------|---|----------------------|
| 1 | Intermediate flange | 2 | Motor plate          |
| 3 | Motor               | 4 | "PE" clamping hub    |
| 5 | Gear rim            | 6 | "Motor" clamping hub |

### 5.6.3 Side, with ball screw drive

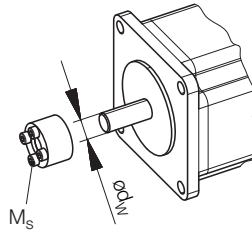
#### Motor mounting

Mount the motor as follows:



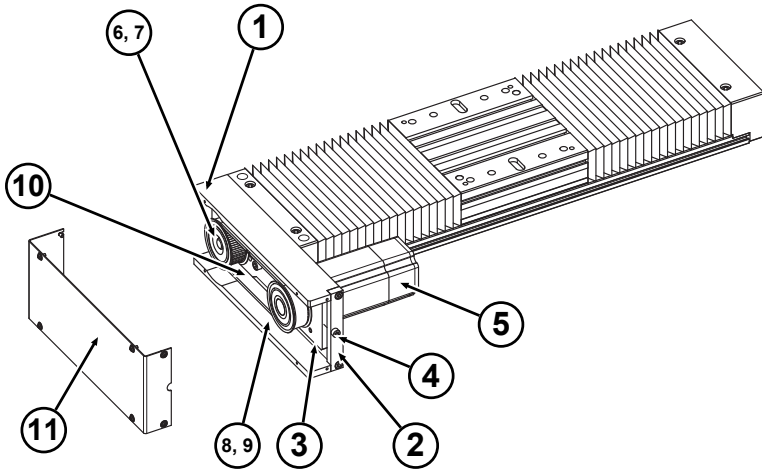
- Measure the assembly depth of the mounted  $Tz_{PE}$  toothed pulley on the unit. (1).
- Mount the motor (2) to the belt drive housing using the appropriate screws. Make sure that the screws are only tightened to the extent that the motor and motor plate can still be moved slightly.
- Mount the toothed pulley (4) on the motor side using the clamping set (3) at the same assembly depth ( $Tz_{PE} = Tz_M$ ).
- Insert the toothed belt (5) and tension it using the tensioning screw (6).
- Check the toothed belt tension using a frequency meter (7). Determine the adjustment frequency "f". (Refer to the instructions for the frequency meter used).
- Tighten the motor mounting screws to the specified tightening torques.
- Mount the cover plate (8).

### Tightening torques of the clamping screw



Motor shaft ødW [mm]	Type ISO 4762	Tightening torque M <sub>s</sub> [Nm]
ø5...ø12	M2.5 x 10	1.2
ø14, ø15	M3 x 16	2.1
ø16...ø19	M4 x 20	4.9
ø20, ø22	M5 x 20	10.0
ø24...ø32	M6 x 24	17.0

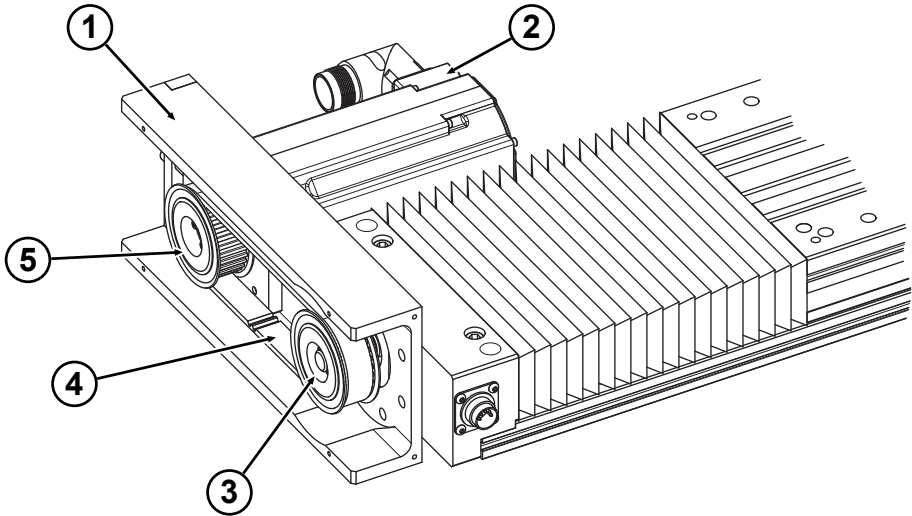
### Motor attachments and parts list, side, with ball screw drive



- |    |                               |    |                                 |
|----|-------------------------------|----|---------------------------------|
| 1  | Belt drive housing            | 2  | Belt tensioning plate           |
| 3  | Motor plate                   | 4  | Tensioning screw                |
| 5  | Motor                         | 6  | Positioning unit toothed pulley |
| 7  | Positioning unit clamping set | 8  | Motor toothed pulley            |
| 9  | Motor clamping set            | 10 | Toothed belt                    |
| 11 | Cover plate                   |    |                                 |

### 5.6.4 Calculation of the preload frequency

The preload frequency of the toothed belt tension can be calculated according to the following specifications:



- |   |  |   |              |
|---|--|---|--------------|
| 1 | Belt drive housing                                 | 2 | Motor        |
| 3 | Toothed pulley PE<br>Number of teeth = $z_{PE}$    | 4 | Toothed belt |
| 5 | Motor toothed pulley PE<br>Number of teeth = $z_M$ |   |              |

$\beta$  = Wrap angle [°]  
 $b$  = Belt width [mm]  
 $E$  = Center distance [mm]  
 $E_{eff}$  = Effective center distance [mm]  
 $f$  = Belt preload frequency [Hz]  
 $F_U$  = Circumferential force [N]  
 $F_{Uzu}$  = Permissible preload force [N]  
 $F_V$  = Preload force [N]  
 $L_F$  = Free drum length [m]  
 $L_R$  = Belt length [mm]

$M_M$  = Motor torque [Nm]  
 $m_{spec}$  = Specific toothed belt weight [kg/m]  
 $n_M$  = Motor speed [rpm]  
 $P$  = Power in [kW]  
 $t$  = Pitch [mm]  
 $v_M$  = Motor toothed pulley speed [m/s]  
 $z_M$  = Number of motor teeth [-]  
 $z_{KE}$  = Number of compact unit teeth [-]

Nominal size	Reduction ratio	Center distance	Number of teeth		Belt data				
					Length	Width	Pitch	Spec. weight	Max. perm. pre load force
$i$	$E$ [mm]	$Z_M$	$Z_{PE}$	$L_R$ [mm]	$b$ [mm]	$t$ [mm]	$m_{spec}$ [kg/m]	$F_{Pperm}$ [N]	
PE1...	1:1	135	36	36	450	15.0	5.0	0.065	330
	1:1.5	137.2	24	36	425	15.0	5.0	0.065	330
	1:2	133.6	24	48	450	15.0	5.0	0.065	330
PE2...	1:1	132.5	32	32	425	15.0	5.0	0.065	330
	1:1.5	136.9	32	48	475	15.0	5.0	0.065	330
	1:2	133.6	24	48	450	15.0	5.0	0.065	330
PE3...	1:1	175.0	40	40	550	15.0	5.0	0.065	330
	1:1.5	174.5	32	48	550	15.0	5.0	0.065	330
	1:2	172.5	27	54	550	15.0	5.0	0.065	330
PE4...	1:1	225.0	40	40	650	15.0	5.0	0.065	330
	1:1.5	224.5	36	54	675	15.0	5.0	0.065	330
	1:2	228.5	32	64	700	15.0	5.0	0.065	330

1. Wrap angle  $\beta$

$$\beta = 2 \cdot \arccos \cdot \left[ \frac{t \cdot (z_{PE} - z_M)}{2 \cdot \pi \cdot E} \right] [^\circ]$$

2. Effective center distance  $E_{eff}$

$$E_{eff} = \frac{1}{4} \cdot \left[ L_R - \frac{t}{2} \cdot (z_{PE} + z_M) + \sqrt{\left[ L_R - \frac{t}{2} \cdot (z_{PE} + z_M) \right]^2 - 2 \cdot \left[ \frac{t}{\pi} \cdot (z_{PE} - z_M) \right]^2} \right] [\text{mm}]$$

3. Power P

$$P = \frac{M_M \cdot n_M}{9.55 \cdot 10^3} [\text{kW}]$$

4. Motor toothed pulley speed  $v_M$

$$v_M = \frac{n_M \cdot z_M \cdot t}{60 \cdot 10^3} [\text{m/s}]$$

5. Circumferential force
- $F_U$

$$F_U = \frac{P \cdot 10^3}{v_M} \quad [\text{m/s}]$$

6. Inspection
- $F_U$

$$F_U \leq F_{Uzul}$$

7. Preload force
- $F_V$

$$F_V = F_U \cdot \sin \frac{\beta}{2} \cdot 0.61 \quad [\text{N}]$$

8. Free drum length
- $L_F$

$$L_F = \sqrt{E_{\text{eff}}^2 - \frac{(Z_{PE} - Z_M)^2}{4}} / 1000 \quad [\text{m}]$$

9. Belt preload frequency
- $f$

$$f = \sqrt{\frac{F_U}{4 \cdot m \cdot L_F^2}} \quad [\text{Hz}] \quad -0\% / +10\%$$

## 5.7 Mounting the cross table



### **⚠ DANGER**

#### **Danger due to electric shock!**

There is a risk of electric shock on contact with live components.

- ▶ Work on the electrical equipment must only be carried out by qualified electricians.
- ▶ De-energize the positioning unit before carrying out any work (disconnect the power plug).

### Accuracy

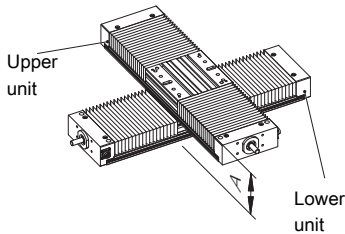
The standard accuracy for cross table mountings is 0.1 mm over a 300 mm stroke.

Dimension A [mm]		Upper unit							
		PE1		PE2		PE3		PE4	
Assembly type		A..	B..	A..	B..	A..	B..	A..	B..
Lower unit	PE1	100	116					Not possible	
	PE2	120	122	120	144			Not possible	
	PE3	On request		166	166	180	210	Not possible	
	PE4	On request				215	215	210	240

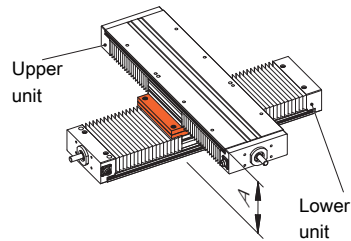
### Assembly types

Positioning units are also available as two-axis units (cross tables). A total of four mounting types are possible. Cross tables of mounting types AC and AD are mounted without an intermediate plate if they are the same size. Intermediate plates are required for all other mounting types. The individual positioning units must be ordered separately.

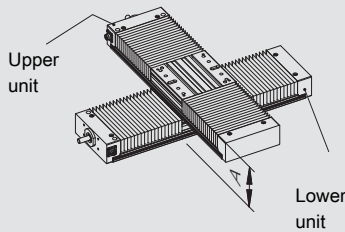
Assembly type AC



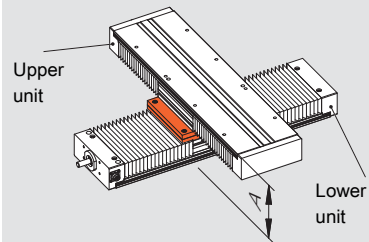
Assembly type BC



Assembly type AD

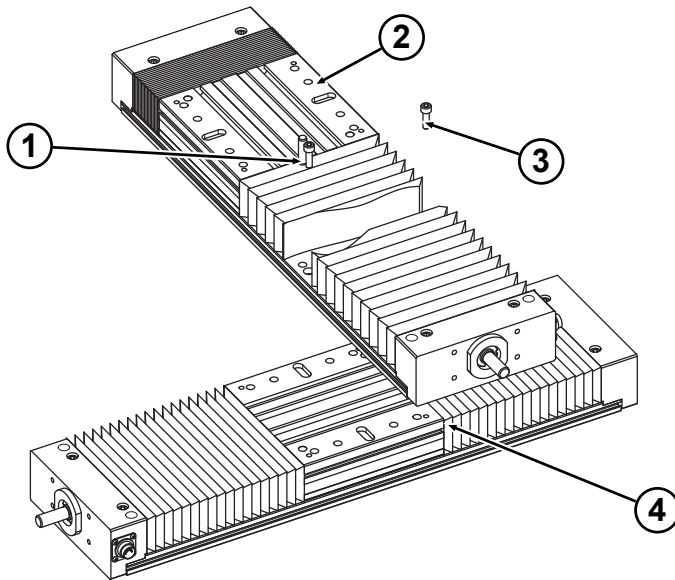


Assembly type BD



**Assembly type A**

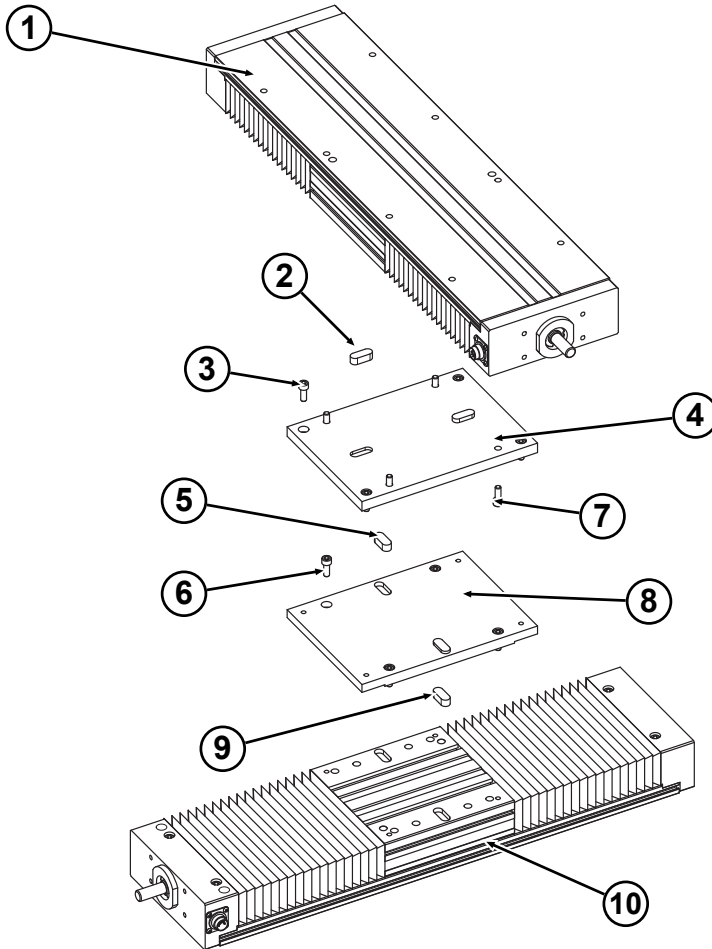
Assemble the cross table according to the following exploded view:



- |   |                         |   |            |
|---|-------------------------|---|------------|
| 1 | Cylinder pin (ISO 8743) | 2 | Upper unit |
| 3 | Screw ISO 4762          | 4 | Lower unit |

### Assembly type B

Assemble the cross table according to the following exploded view:



- |   |   |    |   |
|---|---|----|---|
| 1 | Upper unit                                      | 2  | Key DIN 6885 A<br>or cylindrical pin (ISO 8734) |
| 3 | Screw ISO 4762                                  | 4  | Upper unit spacer plate                         |
| 5 | Key DIN 6885 A<br>or cylindrical pin (ISO 8734) | 6  | Screw ISO 4762                                  |
| 7 | Screw ISO 4762                                  | 8  | Lower unit spacer plate                         |
| 9 | Key DIN 6885 A<br>or cylindrical pin (ISO 8734) | 10 | Lower unit                                      |

## 6 Operation

### 6.1 Safety



#### SAFETY INSTRUCTIONS


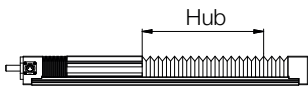
##### **Working safely while operating the positioning unit!**

All work must be carried out in compliance with the safety instructions listed below:

- ▶ Comply with the provisions listed in the *Safety* [▶ 14] chapter for all work performed on/with the positioning unit.
- ▶ Wear protective equipment in accordance with the accident prevention regulations at the operating site.
- ▶ Carry out all operating steps in accordance with the information in these assembly instructions.
- ▶ Before starting work, make sure that all covers and safety devices are installed and functioning properly.
- ▶ Never disable safety devices during operation.
- ▶ Keep the work area clean and tidy! Components and tools that are loosely stacked on top of each other or lying around create a risk of accidents.

## 6.2 Operating conditions

### Normal operating conditions

Normal operating conditions		
Ambient temperature	5°...80°C (non-condensing)	
	 °C	
Permissible operating temperature of components	Max. 80°C	(Excluding gearboxes/motors)
Travel speed	See <i>Technical data</i> [▶ 66]	
Load		
<b>Minimum stroke</b>	<b>Type</b>	<b>Minimum stroke</b>
	PE1	≥ 45mm
	PE2	≥ 55mm
	PE3	≥ 65mm
	PE4	≥ 105mm

### Special operating conditions

For applications in special operating conditions, such as moisture, dirt, dust (fiberglass and wood), aggressive atmospheres, extreme climatic conditions and/or strong temperature fluctuations, short strokes and others, contact LINE TECH AG before commissioning.

The specified maximum values refer to one domain. If several requirements are combined (temperature/speed/load), this must be taken into consideration in the design.

## 7 Maintenance

### 7.1 Safety



#### SAFETY INSTRUCTIONS

##### **Working safely during maintenance of the positioning units!**

Carry out all work in compliance with the following safety instructions:

- ▶ Comply with the provisions listed in the *Safety* [▶ 14] chapter for all work performed on/with the positioning units.
- ▶ All maintenance work must only be carried out by specially trained personnel (see the *Personnel requirements* [▶ 16] chapter).
- ▶ Work on electrical systems must only be carried out by qualified electricians (see the *Qualifications* [▶ 16] chapter).
- ▶ Wear protective equipment in accordance with local accident prevention regulations for all maintenance work.
- ▶ Before starting work, switch off the electrical supply and secure it against being switched on again.
- ▶ Make sure that there is sufficient space for assembly before starting work.
- ▶ Make sure that the assembly area is tidy and clean! Components and tools that are loosely stacked on top of each other or lying around create a risk of accidents.
- ▶ If components have been removed or adjusted, ensure correct assembly, reinstall all fastening elements and observe the screw tightening torques.
- ▶ Observe the specified maintenance intervals.
- ▶ Observe the relevant environmental protection instructions.

## 7.2 Repairs



### *NOTE*

Repairs to the positioning units are not considered maintenance work. They must only be carried out by trained specialist personnel or the manufacturer's service personnel.

## 7.3 Maintenance intervals

### 7.3.1 Notes

Carrying out

- the maintenance work prescribed on the following pages and
- of the maintenance work on purchased components in accordance with the relevant documentation

is required to ensure safe and smooth operation of the positioning unit.

The specified maintenance intervals are based on our many years of experience and knowledge. If excessive wear of wear parts is detected or if faults occur more frequently, the operator must shorten the time between two maintenance procedures in an appropriate manner.

Keep a maintenance log to verify that the prescribed maintenance work has been performed.



### *NOTE*

Verification that the required maintenance work has been carried out is a mandatory requirement for claiming any warranty services.

Contact the manufacturer if there are any doubts.

### 7.3.2 Maintenance schedule

Interval	Maintenance work	Description	Personnel
Daily	Check the positioning unit for externally visible damage.	<i>Check the positioning unit for externally visible damage</i> [▶ 58]	Specialist personnel
Every 3 months	Lubricate positioning unit	<i>Lubricating the positioning unit</i> [▶ 59]	Specialist personnel

## 7.4 Maintenance work

### 7.4.1 Check the positioning unit for externally visible damage

Daily or before each use

- a) Check the positioning unit for externally visible damage and defects.
- b) Visually check that externally attached fasteners, electrical cables and plug connections are in perfect working order.

If changes occur that put the safety of personnel and systems at risk, immediately shut down the positioning unit.

## 7.4.2 Lubricating the positioning unit

### Lubricants

The positioning units must only be lubricated with grease.

LINE TECH AG carries out the initial greasing procedure. The bearings used are generally maintenance-free and do not need to be relubricated under normal conditions.

LINE TECH AG recommends MICROLUBE GBU-Y 131 as the standard grease. When using other greases (third-party products), first check compatibility with the standard grease. Observe the safety data sheet.

For special operating conditions, please consult us regarding lubricant quantities. The values and information on lubricant quantities in the following table correspond to use under normal operating conditions.

Type	KGT d x p (mm)	Grease	Grease relubrication quantities		Lubrication point <sup>2) + 3)</sup>
			Ball screw (cm <sup>3</sup> )	Guide carriage (cm <sup>3</sup> ) Lubrication point <sup>1)</sup>	
PE1	16 x 5	Klüber MICROLUB E GBU-Y 131	-	1.00	0.40
	16 x 10		-	1.25	
	16 x 16		-	1.54	
PE2	20 x 5		1.00	-	3.00
	20 x 20		2.20		
PE3	25 x 5		1.40	-	4.00
	25 x 10		1.70		
	25 x 25		3.10		
PE4	32 x 5		2.00	-	4.00
	32 x 10		2.80		
	32 x 32		4.90		

The grease must be pressed in from both sides.

Relubricate the guides and ball screw according to the following table, depending on which value is reached first:

Type	KGT d x p (mm)	Operating interval (h)	Interval (months)	Running interval (km)
PE1	16 x 5	500	3 - 6	250
	16 x 10			500
	16 x 16			800
PE2	20 x 5	500	3 - 6	250
	20 x 20			1000
PE3	25 x 5	500	3 - 6	250
	25 x 10			500
	25 x 25			1 250
PE4	32 x 5	500	3 - 6	250
	32 x 10			500
	32 x 32			1600

### Lubrication (procedure)

Lubricate the positioning unit as follows:

- Lubricate the table part(s).
- When lubricating with a hand press, calculate the amount of grease per stroke.
- After lubricating, remove excess grease with a clean cloth.

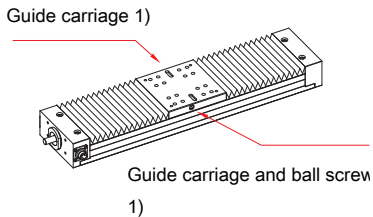
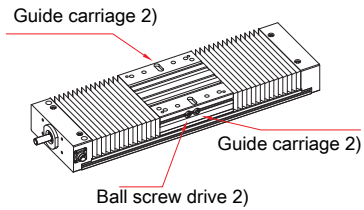
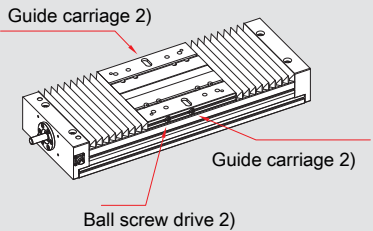
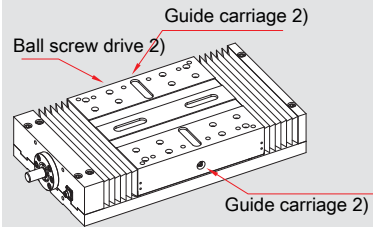
### Lubrication points

There are various grease nipples on the positioning unit. The following lubrication options are available:

<sup>1)</sup> Grease nipples according to DIN 3405-D

<sup>2)</sup> Grease nipples according to DIN 71412

To press in the lubricant, we recommend using the grease gun with item no.: ZPE.FETTPRESSE.03

**PE1..R..**

**PE2..R..**

**PE3..R..**

**PE4..R..**


## 7.5 Measures after completing the maintenance work

After completing the maintenance work and before switching the system on, carry out the following steps:

- Check that all previously loosened screw connections are tight.
- Check that all previously removed protective devices and covers have been properly reinstalled. Clean the work area and remove any substances that may have leaked, e.g., liquids, processing material or similar.
- Make sure that all tools, materials and other equipment that were used have been removed from the work area.
- Make sure that all safety equipment is in perfect working order.



### **⚠ DANGER**

#### **Danger to life due to premature reactivation!**

There is a risk of injury to personnel located in or reaching into the danger zone if the device is switched on again.

- ▶ Before switching the system back on, make sure that there are no personnel in the danger zone or reaching into the danger zone.

## 8 Faults

### 8.1 Safety



#### SAFETY INSTRUCTIONS

##### Work safely during troubleshooting!

Carry out all work in compliance with the following safety instructions:

- ▶ Comply with the provisions listed in the *Safety* [▶ 14] chapter for all work performed on/with the positioning unit.
- ▶ All troubleshooting work must only be carried out by specially trained personnel (see the *Personnel requirements* [▶ 16] chapter).
- ▶ Work on electrical systems must only be carried out by qualified personnel (see the *Qualifications* [▶ 16] chapter).
- ▶ Wear protective equipment in accordance with local accident prevention regulations for all troubleshooting work.
- ▶ Before starting work, switch off the electrical supply and secure it against being switched on again.
- ▶ Make sure that there is sufficient space for assembly before starting work.
- ▶ Make sure that the assembly area is tidy and clean! Components and tools that are loosely stacked on top of each other or lying around create a risk of accidents.
- ▶ If components have been removed or adjusted, ensure correct assembly, reinstall all fastening elements and observe the screw tightening torques.
- ▶ Observe the relevant environmental protection instructions.

### 8.2 Behavior if a fault represents a hazard

In general, the following applies:

- In case of faults that pose an immediate danger to people or property, switch off the machine immediately.
- Determine the cause of the fault and notify the person responsible at the operating site of the fault.
- If it is necessary to enter danger zones or reach into danger zones during troubleshooting work, secure the machine against being switched on again.
- Have the fault repaired by authorized qualified personnel.

### 8.3 Possible faults

Possible faults can be indicated by the following:

- Unusual noises
- Sluggish running
- Inaccuracies



#### NOTE

Contact LINE TECH AG service for troubleshooting (See reverse side) .

### 8.4 Measures after completing the troubleshooting work

After completing the troubleshooting work and before switching the machine back on, implement the following measures:

- a) Tighten all previously loosened screw connections.
- b) Make sure that any protective devices and covers that were previously removed are properly refitted.
- c) Make sure that all tools and work materials that were used have been removed from the work area.
- d) Clean the work area and remove any spilled substances, such as liquids, processing materials, or similar and dispose of them in an environmentally-friendly manner.
- e) Make sure that all safety equipment is properly installed and functional.



#### **⚠ DANGER**

##### **Danger to life due to premature reactivation!**

There is a risk of injury to personnel located in or reaching into the danger zone if the device is switched on again.

- ▶ Before switching the system back on, make sure that there are no personnel in the danger zone or reaching into the danger zone.

## 9 Disassembly and disposal

### 9.1 Safety



#### SAFETY INSTRUCTIONS

##### **Working safely when disassembling and disposing of the machine!**

All work must be carried out in compliance with the safety instructions listed below:

- ▶ Comply with the provisions listed in the *Safety* [▶ 14] chapter for all work performed on/with the positioning unit.
- ▶ The disassembly work must only be carried out by specially trained personnel (see the *Personnel requirements* [▶ 16] chapter).
- ▶ Work on electrical systems must only be carried out by qualified electricians (see the *Qualifications* [▶ 16] chapter).
- ▶ Wear protective equipment in accordance with local accident prevention regulations for all disassembly and disposal work.
- ▶ Before starting disassembly, switch off the electrical supply and permanently disconnect it.
- ▶ Make sure there is sufficient space before starting work.
- ▶ Make sure that the work area is tidy and clean. Components and tools that are loosely stacked on top of each other or lying around create a risk of accidents. Be careful when handling exposed components that have sharp edges.
- ▶ Disassemble components correctly. Note the high dead weight of some components. Use lifting equipment if necessary. Secure components so that they do not fall or fall over.
- ▶ Incorrect handling of environmentally hazardous substances, especially incorrect disposal, can cause considerable damage to the environment. If environmentally hazardous substances are accidentally released into the environment, immediately take measures and notify the responsible local authority of the damage.

### 9.2 Decommissioning and disassembly

To decommission the positioning unit:

- a) Switch off the power supply to the entire system and disconnect it from the power supply.
- b) If necessary, disconnect the pneumatic connections.

- c) Remove the positioning unit.
- d) Store the positioning unit (see chapter *Storage* [▶ 26]) or
- e) disassemble the positioning unit into assemblies in compliance with the applicable local environmental protection regulations.

### 9.3 Disposal



#### NOTICE

##### Environmental damage in case of incorrect disposal!

Lubricants and other auxiliary materials are subject to hazardous waste treatment and must only be disposed of by authorized specialist companies! Have disassembled components recycled:

- ▶ Scrap metals.
- ▶ Have plastic elements recycled.
- ▶ Sort the remaining components according to their material properties and dispose of them separately. The local authorities or specialist disposal companies can provide information regarding environmentally friendly disposal.

Pretreat and dispose of components according to the following table:

Components	Pretreatment	Disposal
Mechanical components	Clean	Scrap
Greases	Strip, clean	See safety data sheet
Oils	Drain, pump out	See safety data sheet

## 10 Technical data

### 10.1 General technical data

BM	Travel speed		Areas of inertia		Max. stroke	Bellows	Feed and friction force	Moving mass
	$V_{\max}$	$V_{\max}$	$I_y$	$I_z$				
Type	[m/s]	[m/s]	[cm <sup>4</sup> ]	[cm <sup>4</sup> ]	[mm]		[N]	[kg]
PE1.4...R...	1.6	<sup>2)</sup>	8.9	178.2	2,160	Without	10.00	1,100
					1,500	With	10.00	
PE2.4...R...	1.6	<sup>2)</sup>	9.7	513.7	2,570	Without	12.00	2,700
					2,000	With	12.00	
PE3.4...R...	1.6	<sup>2)</sup>	202.8	3,940.0	4,055	Without	15.00	5,470
					3,000	With	15.00	
PE4.4...R...	1.6	<sup>2)</sup>	125.1	8,560.0	3,785	Without	25.00	16,600
					3,000	With	25.00	

<sup>2)</sup>For spindle drives, this depends on the speed characteristic value or the spindle length and the corresponding critical speed.

## 10.2 Technical data of ball screw drive

LM	KGT	Axial load rating		Positioning accuracy	Repeat ability	Acceleration	Axial play		No load torque
		C <sub>0</sub>	C <sub>dyn</sub>				Type	Axial play	
Size	d x p [mm]	C <sub>0</sub> [N]	C <sub>dyn</sub> [N]	[μ / mm]	[mm]	a <sub>max</sub> [m/s <sup>2</sup> ]		[mm]	[Nm]
PE1...R. ...	16 x 5	4551	4327	52/300 <sup>2)</sup>	< 0.01 <sup>1)</sup>	10.0	V	---	0.100
	16 x 16						V	---	0.200
	16 x 16						V	---	0.320
PE2...R. ...	20 x 5	5705	4912	52/300 <sup>2)</sup>	< 0.01 <sup>1)</sup>	10.0	V	---	0.120
	20 x 20						V	---	0.400
PE3...R. ...	25 x 5	7308	6140	52/300 <sup>2)</sup>	< 0.01 <sup>1)</sup>	10.0	V	---	0.150
	25 x 10						V	---	0.300
	25 x 25						V	---	0.500
PE4...R. ...	32 x 5	11538	8947	52/300 <sup>2)</sup>	< 0.01 <sup>1)</sup>	10.0	V	---	0.200
	32 x 10						V	---	0.400
	32 x 32						V	---	1,220

d x p = spindle diameter x thread pitch

<sup>1)</sup> without considering reverse play

<sup>2)</sup> = also available with 23 μm / 300 mm as an option

V = preloaded

### 10.3 Tightening torques for screws

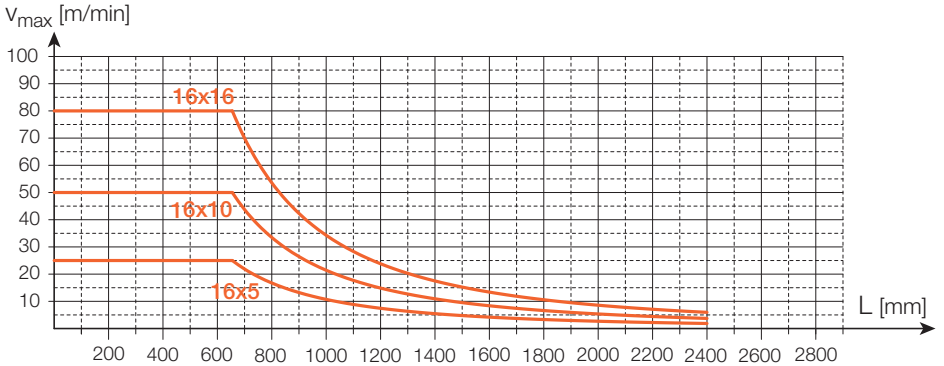
Screws of strength class 8.8 are used as standard. If other screws are used, they are specially marked. The tightening torques recommended by LINE TECH AG are defined in the following table.

Tightening torques $M_{A \max.}$ [Nm]						Friction factor for screws $\mu = 0.120$					
Screw acc. to	Material class	Thread size					M5	M6	M8	M10	M12
		M2	M2.5	M3	M4	M5					
ISO 4762 (DIN 912)	8.8	0.36	0.73	1.27	3.00	5.90	10.10	24.60	48.00	84.00	
ISO 4762 (DIN 912)	12.9	0.60	1.23	2.14	5.10	10.00	17.40	42.20	83.00	144.00	
ISO 47380	10.9	0.25	0.50	0.90	2.00	4.00	7.20	12.00	23.00	58.00	

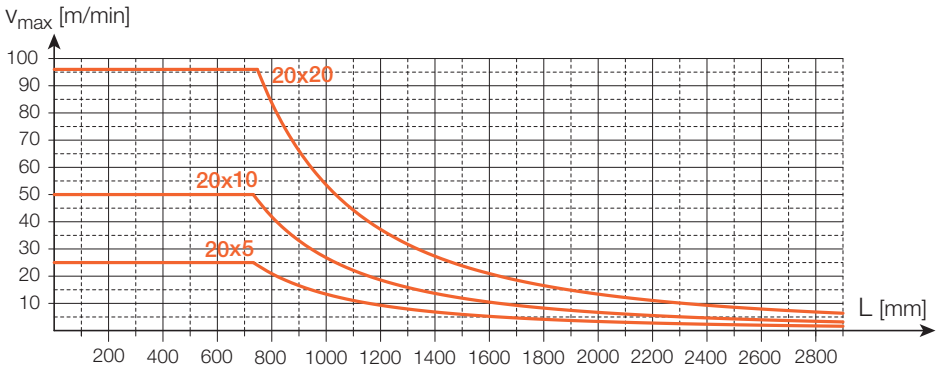
### 10.4 Permissible speeds

When driven by a ball screw, consider the speed characteristic value or spindle length and the corresponding critical speed as well as the motor speed.

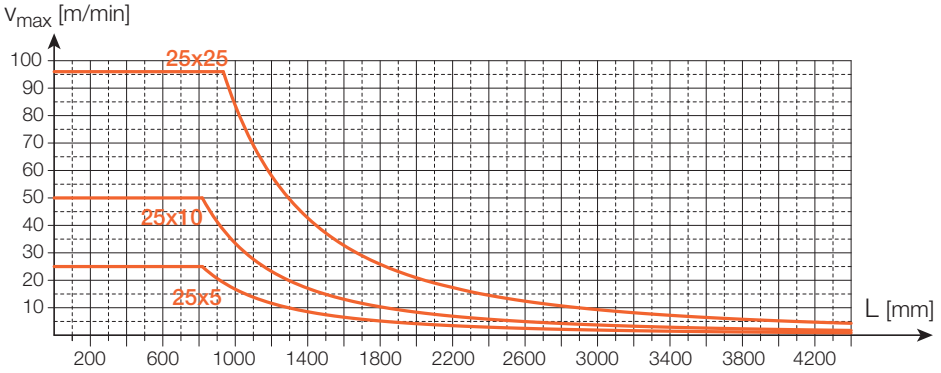
The following permissible speeds apply to the PE1... positioning unit with  $\varnothing 16$  x ball screw drive:



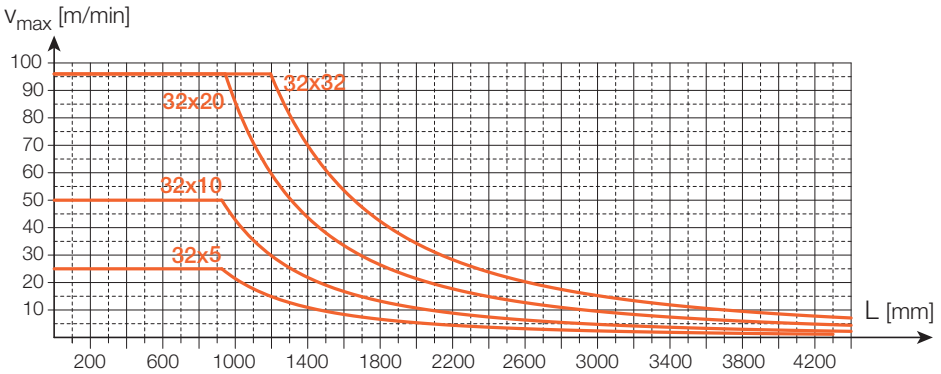
The following permissible speeds apply to the PE2... positioning unit with  $\varnothing 20$  x ball screw drive:



The following permissible speeds apply to the PE3... positioning unit with  $\varnothing 25$  x ball screw drive:

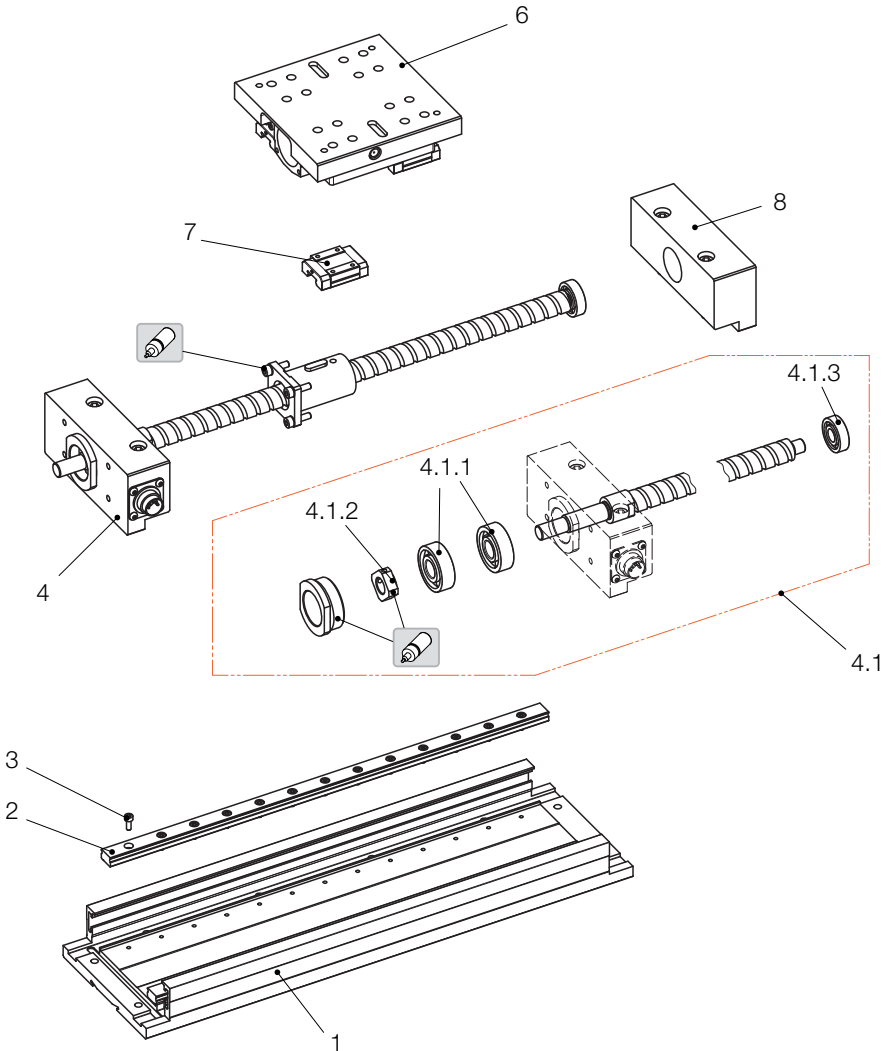


The following permissible speeds apply to the PE4... positioning unit with  $\varnothing 32$  x ball screw drive:



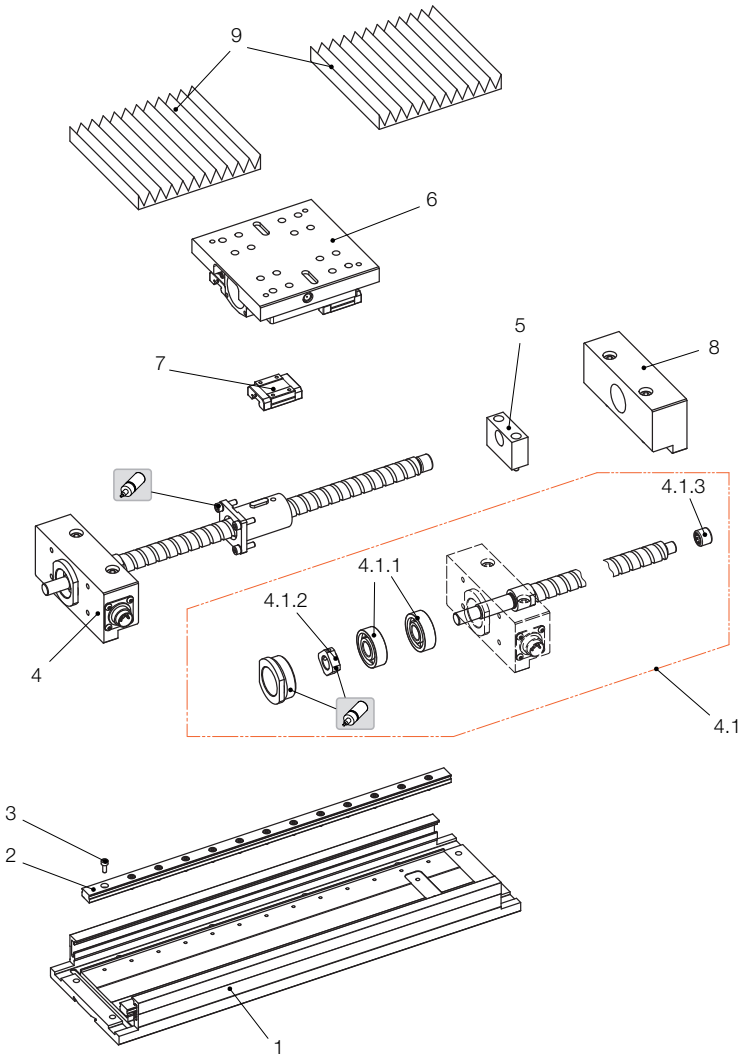
## 10.5 Positioning unit: technical data

### 10.5.1 Exploded view and parts list of positioning unit PE1.4...NR... with ball screw drive, without bellows



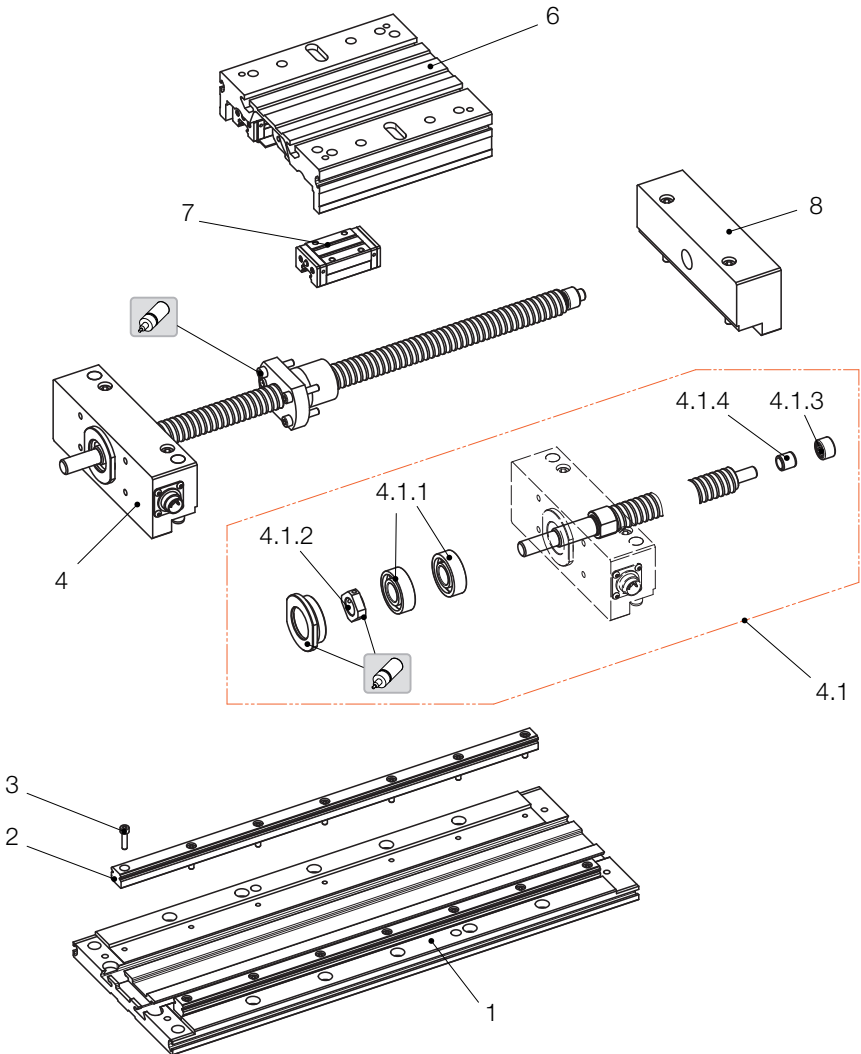
1	Base plate	5	-
2	Linear rail	6	Carriage
3	Screw for linear rail	7	Guide carriage
4	End plate with ball screw drive	8	End plate opposite the motor
4.1	Complete ball screw drive	9	-
4.1.1	Angular contact ball bearing	10	-
4.1.2	Lock nut	11	-
4.1.3	Loose bearing	12	-

### 10.5.2 Exploded view and parts list of positioning unit PE1.4...FR... with ball screw drive, with bellows



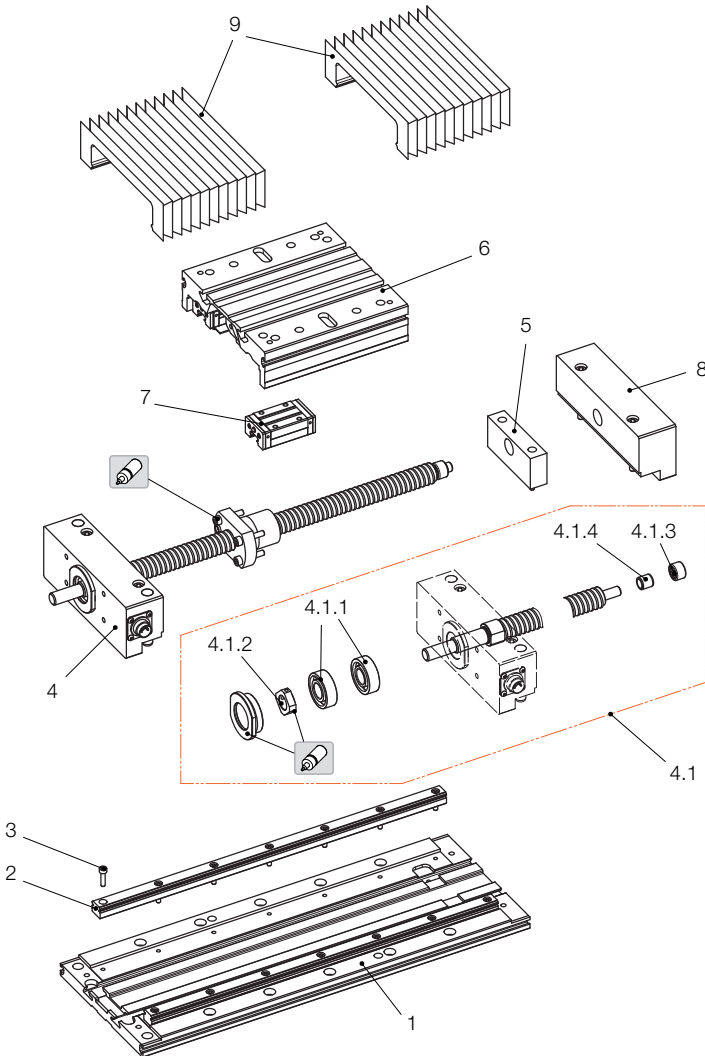
1	Base plate	5	Floating bearing block
2	Linear rail	6	Carriage
3	Screw for linear rail	7	Guide carriage
4	End plate with ball screw drive	8	End plate opposite the motor
4.1	Complete ball screw drive	9	Bellows set
4.1.1	Angular contact ball bearing	10	-
4.1.2	Lock nut	11	-
4.1.3	Loose bearing	12	-

### 10.5.3 Exploded view and parts list of positioning unit PE2.4...NR... with ball screw drive, without bellows



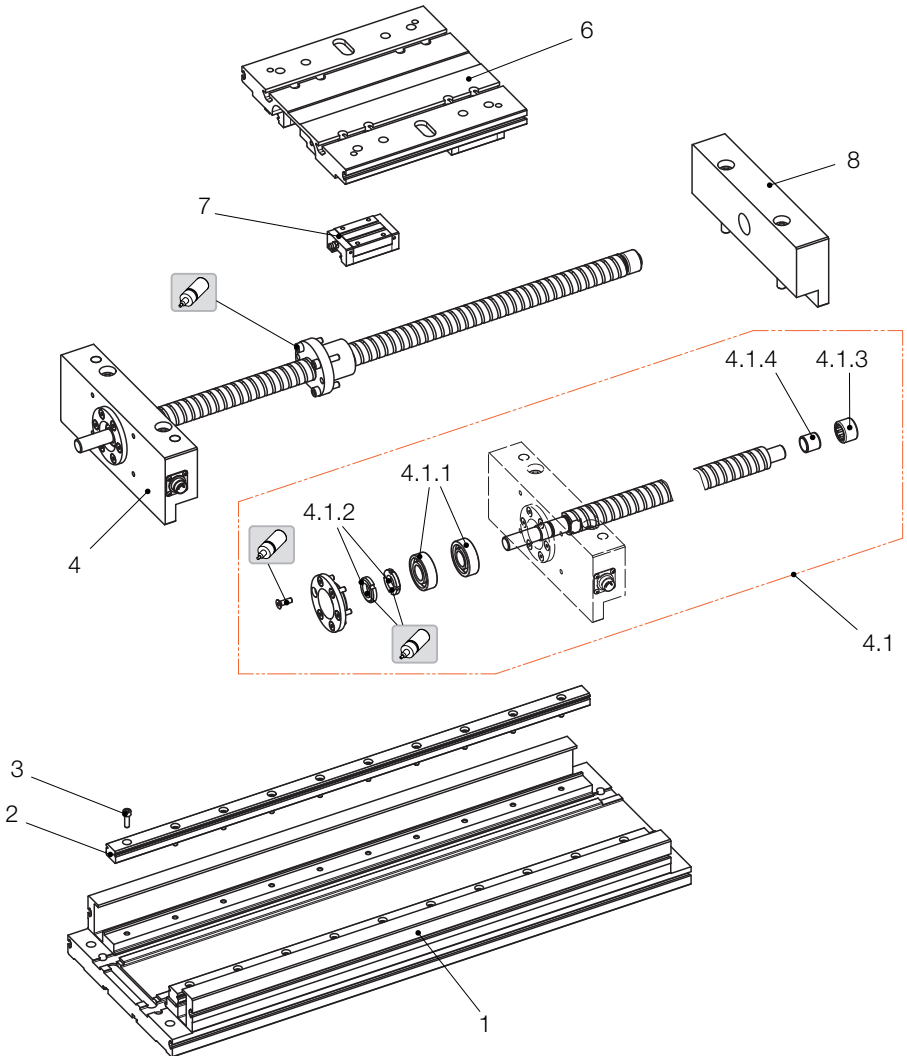
1	Base plate	4.1.4	Inner ring
2	Linear rail	5	-
3	Screw for linear rail	6	Carriage
4	End plate with ball screw drive	7	Guide carriage
4.1	Complete ball screw drive	8	End plate opposite the motor
4.1.1	Angular contact ball bearing	9	-
4.1.2	Lock nut	10	-
4.1.3	Loose bearing	11	-

### 10.5.4 Exploded view and parts list of positioning unit PE2.4...FR... with ball screw drive, with bellows



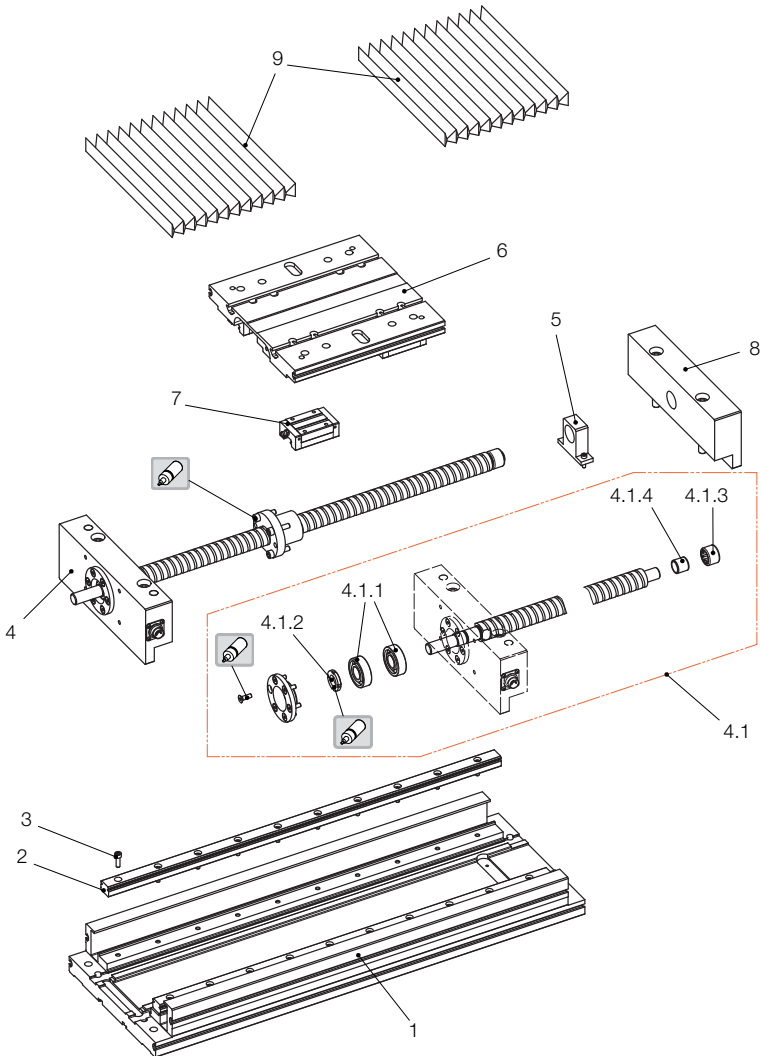
1	Base plate	4.1.4	Inner ring
2	Linear rail	5	Floating bearing block
3	Screw for linear rail	6	Carriage
4	End plate with ball screw drive	7	Guide carriage
4.1	Complete ball screw drive	8	End plate opposite the motor
4.1.1	Angular contact ball bearing	9	Bellows set
4.1.2	Lock nut	10	-
4.1.3	Loose bearing	11	-

### 10.5.5 Exploded view and parts list of positioning unit PE3.4...NR... with ball screw drive, without bellows



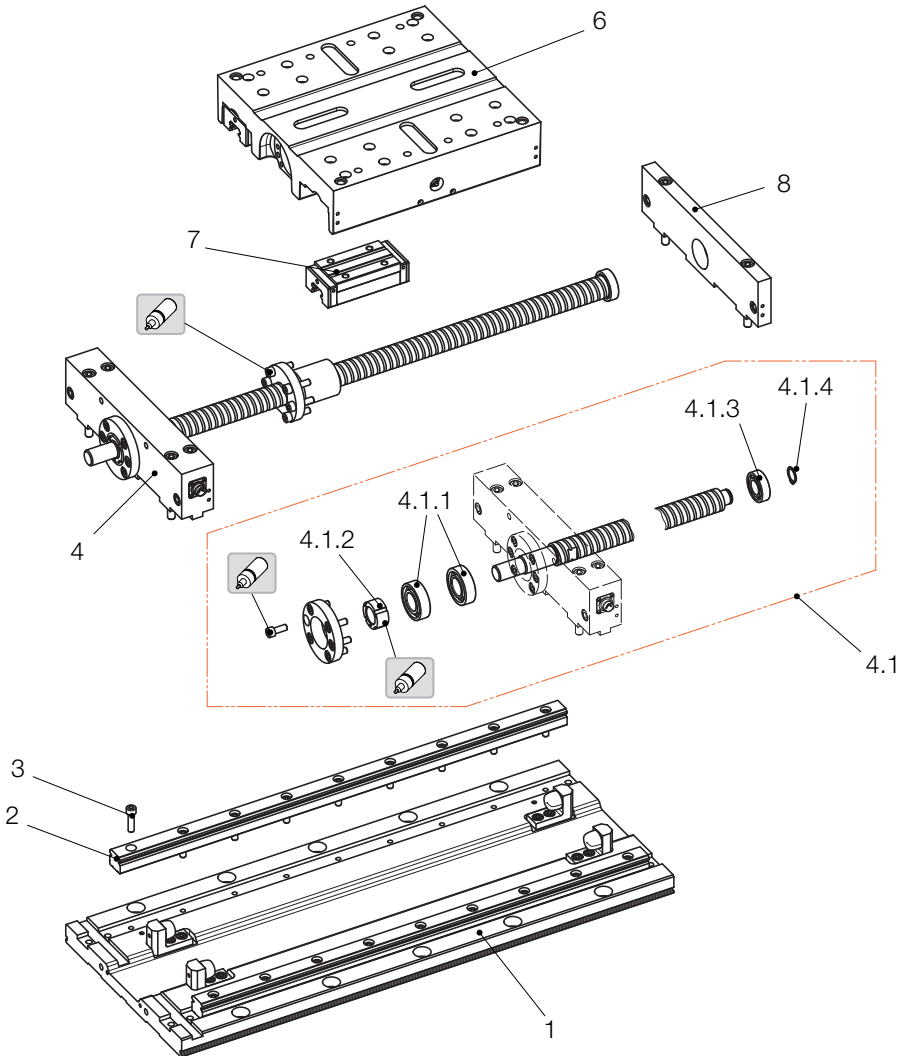
1	Base plate	4.1.4	Inner ring
2	Linear rail	5	-
3	Screw for linear rail	6	Carriage
4	End plate with ball screw drive	7	Guide carriage
4.1	Complete ball screw drive	8	End plate opposite the motor
4.1.1	Angular contact ball bearing	9	-
4.1.2	Lock nut	10	-
4.1.3	Loose bearing	11	-

### 10.5.6 Exploded view and parts list of positioning unit PE3.4...FR... with ball screw drive, with bellows



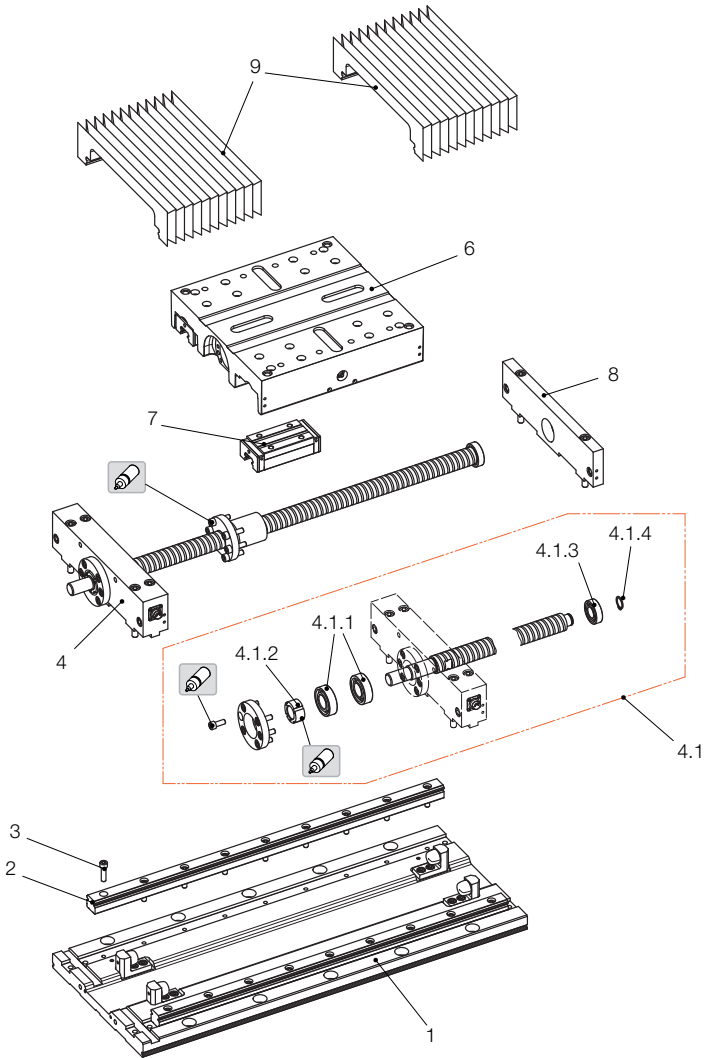
1	Base plate	4.1.4	Inner ring
2	Linear rail	5	Floating bearing block
3	Screw for linear rail	6	Carriage
4	End plate with ball screw drive	7	Guide carriage
4.1	Complete ball screw drive	8	End plate opposite the motor
4.1.1	Angular contact ball bearing	9	Bellows set
4.1.2	Lock nut	10	-
4.1.3	Loose bearing	11	-

### 10.5.7 Exploded view and parts list of positioning unit PE4.4...NR... with ball screw drive, without bellows



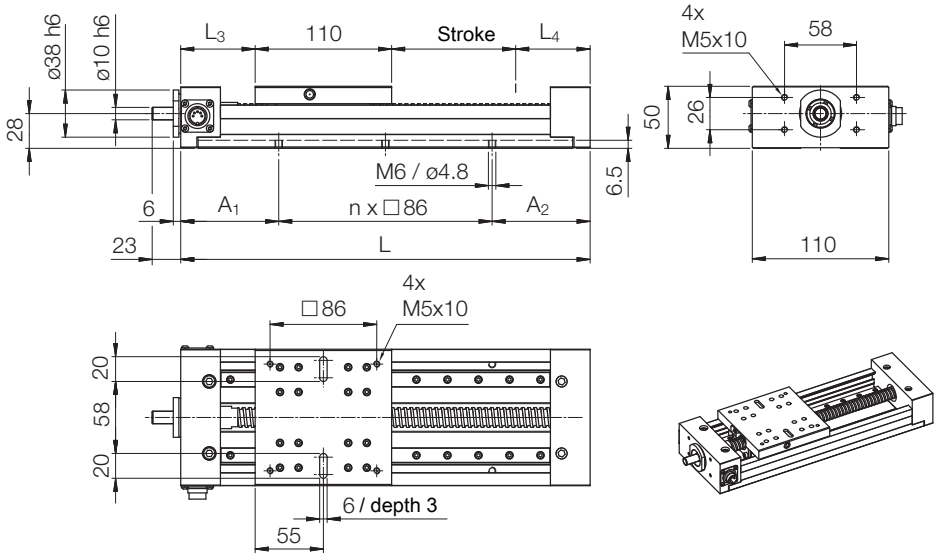
1	Base plate	4.1.4	Retaining ring
2	Linear rail	5	-
3	Screw for linear rail	6	Carriage
4	End plate with ball screw drive	7	Guide carriage
4.1	Complete ball screw drive	8	End plate opposite the motor
4.1.1	Angular contact ball bearing	9	-
4.1.2	Lock nut	10	-
4.1.3	Loose bearing	11	-

### 10.5.8 Exploded view and parts list of positioning unit PE4.4...FR... with ball screw drive, with bellows



1	Base plate	4.1.4	Retaining ring
2	Linear rail	5	-
3	Screw for linear rail	6	Carriage
4	End plate with ball screw drive	7	Guide carriage
4.1	Complete ball screw drive	8	End plate opposite the motor
4.1.1	Angular contact ball bearing	9	Bellows set
4.1.2	Lock nut	10	-
4.1.3	Loose bearing	11	-

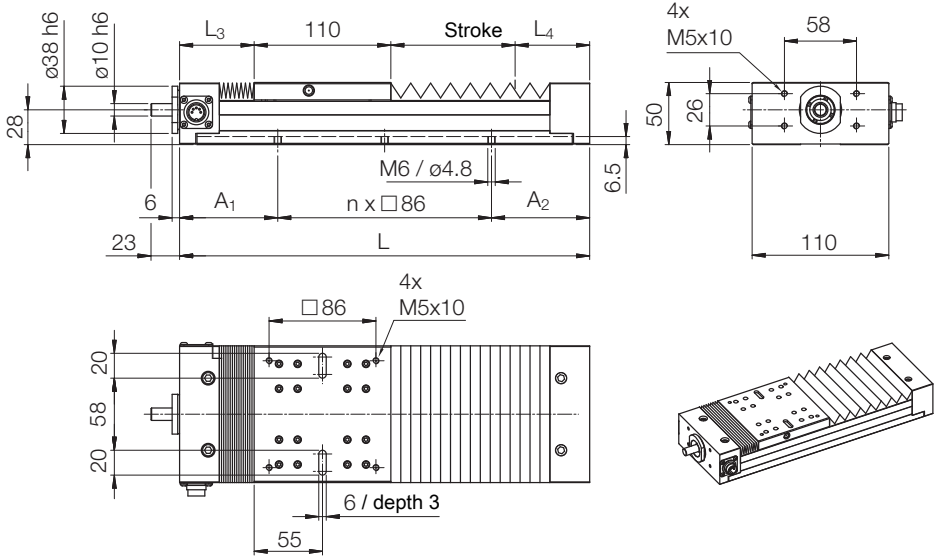
### 10.5.9 Dimensions of positioning unit PE1.4...NR...



**Nominal size  
designation PE1.4...NR...**
**Dimensions**

Stroke	L	L <sub>3</sub>	L <sub>4</sub>	n	A <sub>1</sub>	A <sub>2</sub>	Spindle length	Weight
[mm]	[mm]	[mm]	[mm]				[mm]	[kg]
50	255	47.5	47.5	2	41.5	41.5	225	3
125	330	47.5	47.5	2	79	79	275	3.5
195	400	47.5	47.5	3	71	71	350	4
270	475	47.5	47.5	4	65.5	65.5	483	4.5
345	550	47.5	47.5	5	60	60	558	5
415	620	47.5	47.5	6	52	52	628	5.5
485	690	47.5	47.5	7	44	44	698	5.9
560	765	47.5	47.5	7	81.5	81.5	773	6.4
635	840	47.5	47.5	8	76	76	848	6.9
705	910	47.5	47.5	9	68	68	918	7.4
780	985	47.5	47.5	10	62.5	62.5	993	7.9
850	1055	47.5	47.5	11	54.5	54.5	1063	8.4
925	1130	47.5	47.5	12	49	49	1138	8.9
995	1200	47.5	47.5	13	41	41	1208	9.4
1070	1275	47.5	47.5	13	78.5	78.5	1283	9.9
1140	1345	47.5	47.5	14	70.5	70.5	1353	10.3
1215	1420	47.5	47.5	15	65	65	1428	10.8
1285	1490	47.5	47.5	16	57	57	1498	11.3
1430	1635	47.5	47.5	18	43.5	43.5	1643	12.3
1575	1780	47.5	47.5	19	73	73	1788	13.3
1720	1925	47.5	47.5	21	59.5	59.5	1933	14.2
1865	2070	47.5	47.5	23	46	46	2078	15.2
2015	2220	47.5	47.5	24	78	78	2228	16.2
2160	2365	47.5	47.5	26	64.5	64.5	2373	17.2

### 10.5.10 Dimensions of positioning unit PE1.4...FR...



**Nominal size  
designation PE1.4...FR...**
**Dimensions**

Stroke	L	L <sub>3</sub>	L <sub>4</sub>	n	A <sub>1</sub>	A <sub>2</sub>	Spindle length	Weight
[mm]	[mm]	[mm]	[mm]				[mm]	[kg]
50	255	47.5	47.5	2	41.5	41.5	225	3
100	330	60	60	2	79	79	275	3.5
150	400	70	70	3	71	71	350	4
200	475	82.5	82.5	4	65.5	65.5	483	4.5
250	550	95	95	5	60	60	558	5
300	620	105	105	6	52	52	628	5.5
350	690	115	115	7	44	44	659	5.9
400	765	127.5	127.5	7	81.5	81.5	721	6.4
450	840	140	140	8	76	76	784	6.9
500	910	150	150	9	68	68	844	7.4
550	985	162.5	162.5	10	62.5	62.5	906	7.9
600	1055	172.5	172.5	11	54.5	54.5	973	8.4
650	1130	185	185	12	49	49	1029	8.9
700	1200	195	195	13	41	41	1089	9.4
750	1275	207.5	207.5	13	78.5	78.5	1151	9.9
800	1345	217.5	217.5	14	70.5	70.5	1211	10.3
850	1420	230	230	15	65	65	2474	10.8
900	1490	240	240	16	57	57	1334	11.3
1000	1635	262.5	262.5	18	43.5	43.5	1456	12.3
1100	1780	285	285	19	73	73	1579	13.3
1200	1925	307.5	307.5	21	59.5	59.5	1701	14.2
1300	2070	330	330	23	46	46	1824	15.2
1400	2220	355	355	24	78	78	1949	16.2
1500	2365	377.5	377.5	26	64.5	64.5	2071	17.2



**Nominal size  
designation PE2.4...NR...**
**Dimensions**

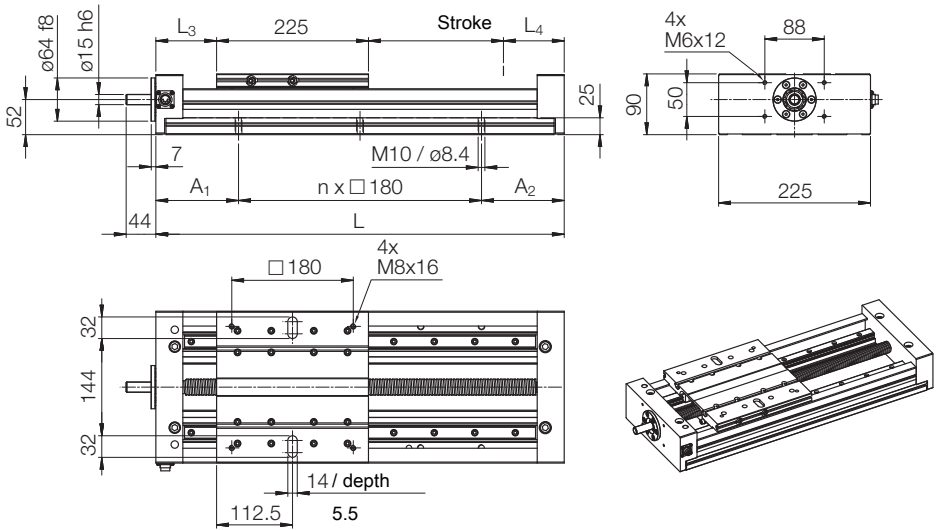
Stroke	L	L <sub>3</sub>	L <sub>4</sub>	n	A <sub>1</sub>	A <sub>2</sub>	Spindle length	Weight
[mm]	[mm]	[mm]	[mm]				[mm]	[kg]
50	330	62.5	62.5	1	100	100	343	9.8
115	395	62.5	62.5	2	67.5	67.5	408	10.3
175	455	62.5	62.5	2	97.5	97.5	468	10.8
240	520	62.5	62.5	3	65	65	533	11.3
305	585	62.5	62.5	3	97.5	97.5	598	11.8
370	650	62.5	62.5	4	65	65	663	12.3
435	715	62.5	62.5	4	97.5	97.5	728	12.8
500	780	62.5	62.5	5	65	65	793	13.3
565	845	62.5	62.5	5	97.5	97.5	858	14.0
630	910	62.5	62.5	6	65	65	923	14.5
695	975	62.5	62.5	6	97.5	97.5	988	15.0
760	1040	62.5	62.5	7	65	65	1053	15.5
825	1105	62.5	62.5	7	97.5	97.5	1118	16.0
890	1170	62.5	62.5	8	65	65	1183	16.5
955	1235	62.5	62.5	8	97.5	97.5	1248	17.0
1020	1300	62.5	62.5	9	65	65	1313	17.5
1080	1360	62.5	62.5	9	95	95	1373	18.0
1145	1425	62.5	62.5	10	62.5	62.5	1438	18.5
1210	1490	62.5	62.5	10	95	95	1503	19.0
1275	1555	62.5	62.5	11	62.5	62.5	1568	19.5
1535	1815	62.5	62.5	13	62.5	62.5	1828	21.5
1795	2075	62.5	62.5	15	62.5	62.5	2088	23.5
2050	2330	62.5	62.5	17	60	60	2343	25.5
2310	2590	62.5	62.5	19	60	60	2603	28.0
2570	2850	62.5	62.5	21	60	60	2863	30.0



**Nominal size  
designation PE2.4...FR...**
**Dimensions**

Stroke	L	L <sub>3</sub>	L <sub>4</sub>	n	A <sub>1</sub>	A <sub>2</sub>	Spindle length	Weight
[mm]	[mm]	[mm]	[mm]				[mm]	[kg]
50	330	62.5	62.5	1	100	100	343	9.8
100	395	70	70	2	67.5	67.5	408	10.3
150	455	75	75	2	97.5	97.5	468	10.8
200	520	82.5	82.5	3	65	65	533	11.3
250	585	90	90	3	97.5	97.5	598	11.8
300	650	97.5	97.5	4	65	65	640	12.3
350	715	105	105	4	97.5	97.5	697	12.8
400	780	112.5	112.5	5	65	65	754	13.3
450	845	120	120	5	97.5	97.5	811	14.0
500	910	127.5	127.5	6	65	65	870	14.5
550	975	135	135	6	97.5	97.5	927	15.0
600	1040	142.5	142.5	7	65	65	984	15.5
650	1105	150	150	7	97.5	97.5	1040	16.0
700	1170	157.5	157.5	8	65	65	1097	16.5
750	1235	165	165	8	97.5	97.5	1157	17.0
800	1300	172.5	172.5	9	65	65	1213	17.5
850	1360	177.5	177.5	9	95	95	1270	18.0
900	1425	185	185	10	62.5	62.5	1327	18.5
950	1490	192.5	192.5	10	95	95	1384	19.0
1000	1555	200	200	11	62.5	62.5	1441	19.5
1200	1815	230	230	13	62.5	62.5	1671	21.5
1400	2075	260	260	15	62.5	62.5	1901	23.5
1600	2330	287.5	287.5	17	60	60	2131	25.5
1800	2590	317.5	317.5	19	60	60	2358	28.0
2000	2850	347.5	347.5	21	60	60	2588	30.0

### 10.5.13 Dimensions of positioning unit PE3.4...NR...



**Nominal size  
designation PE3.4...NR...**
**Dimensions**

Stroke	L	L <sub>3</sub>	L <sub>4</sub>	n	A <sub>1</sub>	A <sub>2</sub>	Spindle length	Weight
[mm]	[mm]	[mm]	[mm]				[mm]	[kg]
40	405	70	70	1	112.5	112.5	429	17.5
105	470	70	70	2	55	55	494	19.0
175	540	70	70	2	90	90	564	20.5
240	605	70	70	2	122.5	122.5	629	22.0
310	675	70	70	3	67.5	67.5	699	23.5
380	745	70	70	3	102.5	102.5	769	25.5
445	810	70	70	3	135	135	834	27.0
515	880	70	70	4	80	80	904	28.5
585	950	70	70	4	115	115	974	30.0
650	1015	70	70	5	57.5	57.5	1039	31.5
785	1150	70	70	5	125	125	1174	35.0
925	1290	70	70	6	105	105	1314	38.0
1060	1425	70	70	7	82.5	82.5	1449	41.5
1195	1560	70	70	8	60	60	1584	44.5
1330	1695	70	70	8	127.5	127.5	1719	47.5
1605	1970	70	70	10	85	85	1994	54.5
1875	2240	70	70	11	130	130	2264	60.5
2150	2515	70	70	13	87.5	87.5	2539	67.0
2435	2800	70	70	15	50	50	2824	73.5
2695	3060	70	70	15	180	180	3084	79.5
2965	3330	70	70	17	135	135	3354	86.0
3240	3605	70	70	19	92.5	92.5	3629	92.5
3520	3885	70	70	21	52.5	52.5	3909	99.0
3785	4150	70	70	21	185	185	4174	105.5
4055	4420	70	70	23	140	140	4444	111.5



**Nominal size  
designation PE3.4...FR...**
**Dimensions**

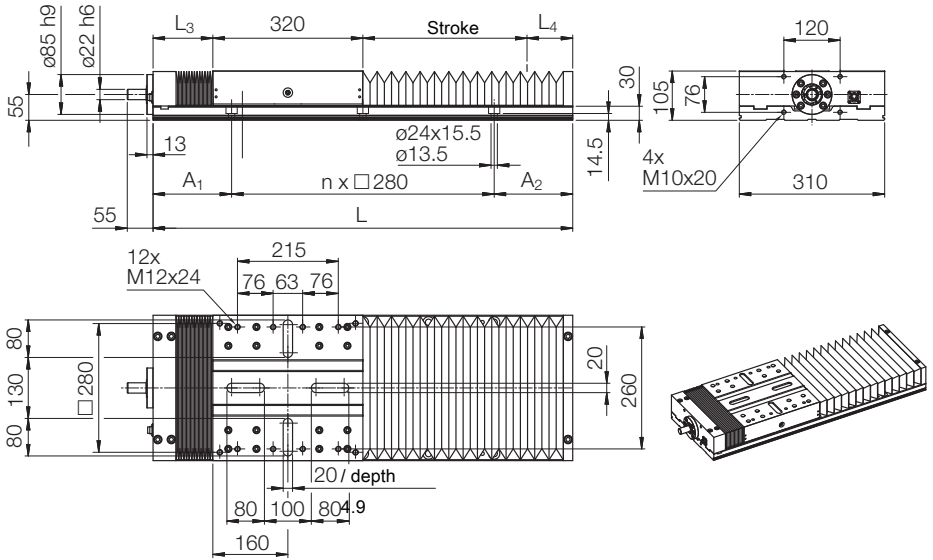
Stroke	L	L <sub>3</sub>	L <sub>4</sub>	n	A <sub>1</sub>	A <sub>2</sub>	Spindle length	Weight
[mm]	[mm]	[mm]	[mm]				[mm]	[kg]
40	405	70	70	1	112.5	112.5	429	17.5
105	470	70	70	2	55	55	494	19.0
175	540	70	70	2	90	90	564	20.5
240	605	70	70	2	122.5	122.5	629	22.0
310	675	70	70	3	67.5	67.5	699	23.5
380	745	70	70	3	102.5	102.5	769	25.5
445	810	70	70	3	135	135	834	27.0
515	880	70	70	4	80	80	904	28.5
585	950	70	70	4	115	115	974	30.0
650	1015	70	70	5	57.5	57.5	1039	31.5
785	1150	70	70	5	125	125	1174	35.0
925	1290	70	70	6	105	105	1314	38.0
1060	1425	70	70	7	82.5	82.5	1449	41.5
1195	1560	70	70	8	60	60	1584	44.5
1330	1695	70	70	8	127.5	127.5	1719	47.5
1605	1970	70	70	10	85	85	1994	54.5
1875	2240	70	70	11	130	130	2264	60.5
2150	2515	70	70	13	87.5	87.5	2539	67.0
2435	2800	70	70	15	50	50	2824	73.5
2695	3060	70	70	15	180	180	3084	79.5
2965	3330	70	70	17	135	135	3354	86.0
3240	3605	70	70	19	92.5	92.5	3629	92.5
3520	3885	70	70	21	52.5	52.5	3909	99.0
3785	4150	70	70	21	185	185	4174	105.5
4055	4420	70	70	23	140	140	4444	111.5



**Nominal size  
designation PE4.4...NR...**
**Dimensions**

Stroke	L	L <sub>3</sub>	L <sub>4</sub>	n	A <sub>1</sub>	A <sub>2</sub>	Spindle length	Weight
[mm]	[mm]	[mm]	[mm]				[mm]	[kg]
70	510	75	45	1	115	115	350	45
120	560	75	45	1	140	140	400	47
185	625	75	45	1	172.5	172.5	500	50
250	690	75	45	2	65	65	550	53
320	760	75	45	2	100	100	600	56
385	825	75	45	2	132.5	132.5	650	59
455	895	75	45	2	167.5	167.5	946	62
525	965	75	45	3	62.5	62.5	1016	65
590	1030	75	45	3	95	95	1081	68
660	1100	75	45	3	130	130	1151	71
795	1235	75	45	3	197.5	197.5	1286	77
930	1370	75	45	4	125	125	1421	83
1065	1505	75	45	4	192.5	192.5	1556	89
1310	1750	75	45	5	175	175	1801	100
1560	2000	75	45	6	160	160	2051	111
2055	2495	75	45	8	127.5	127.5	2546	133
2550	2990	75	45	9	235	235	3041	156
3045	3485	75	45	11	202.5	202.5	3536	178
3785	4225	75	45	13	292.5	292.5	4276	211

### 10.5.16 Dimensions of positioning unit PE4.4...FR...



**Nominal size  
designation PE4.4...FR...**
**Dimensions**

Stroke	L	L <sub>3</sub>	L <sub>4</sub>	n	A <sub>1</sub>	A <sub>2</sub>	Spindle length	Weight
[mm]	[mm]	[mm]	[mm]				[mm]	[kg]
50	510	75	85	1	115	115	350	45
100	560	75	85	1	140	140	400	47
150	625	75	92.5	1	172.5	172.5	500	50
200	690	75	100	2	65	65	550	53
250	760	75	110	2	100	100	600	56
300	825	75	117.5	2	132.5	132.5	650	59
350	895	75	127.5	2	167.5	167.5	700	62
400	965	75	137.5	3	62.5	62.5	750	65
450	1030	75	145	3	95	95	800	68
500	1100	75	155	3	130	130	1151	71
600	1235	75	172.5	3	197.5	197.5	1286	77
700	1370	75	190	4	125	125	1421	83
800	1505	75	207.5	4	192.5	192.5	1556	89
1000	1750	75	230	5	175	175	1801	100
1260	2000	75	255	6	160	160	2051	111
1600	2495	75	302.5	8	127.5	127.5	2546	133
2000	2990	75	350	9	235	235	3041	156
2400	3485	75	397.5	11	202.5	202.5	3536	178
3000	4225	75	467.5	13	292.5	292.5	4276	211

## 11 Declaration of Incorporation

### Declaration of Incorporation

according to EC Machinery Directive 2006/42/EC, Annex II 1. B  
(Translation of original Declaration of Incorporation)

#### Manufacturer

Line Tech AG  
Europastrasse 19  
CH-8152 Glattbrugg

#### Module name

Positioning unit with ball screw

#### Type designation

according to type plate (see *Type plate* [▶ 22])

#### Serial number

according to type plate (see *Type plate* [▶ 22])

#### Manufacturing date

according to type plate (see *Type plate* [▶ 22])

#### We hereby declare that

**the product specified below complies with the essential safety requirements of the Machinery Directive, including the amendments applicable at the time of the declaration, to the extent permitted by the scope of delivery, due to its design, construction and type in the version that we have launched on the market.**

**The following essential safety requirements of the Machinery Directive have been satisfied:**

- 1.1.2 Principles for the integration of safety
- 1.1.3 Materials and products
- 1.1.5 Design of the machine for handling
- 1.3.2 Risk of breakage during operation
- 1.3.3 Risks due to falling or ejected objects
- 1.3.4 Risks due to surfaces, edges and corners
- 1.3.7 Risks due to moving parts
- 1.3.9 Risk of uncontrolled movements
- 1.5.2 Static electricity
- 1.5.4 Assembly errors
- 1.5.5 Extreme temperature
- 1.5.6 Fire
- 1.5.8 Noise
- 1.5.13 Emission of hazardous materials and substances
- 1.6.1 Maintenance of the partly completed machinery
- 1.7.2 Warning of residual risks

The product is a partly completed machine as defined by the Machinery Directive. The product is solely intended for installation in a complete system.

**Relevant EU directives**

EC Directive as amended 2006/42/EC - Machinery Directive

EMC Directive as amended by 2014/30/EU - Electromagnetic compatibility

**Applied harmonized standards**

The machine complies with the safety requirements of the following harmonized standards:

DIN EN ISO 12100:03/2011: Safety of machinery - General principles for design - Risk assessment and risk reduction

### **Technical documentation**

The specific technical documentation in accordance with Annex VII, Part B has been compiled. The representative responsible for compiling the technical documentation undertakes to submit the documentation to the national authorities upon justified request. The documentation shall be submitted by post in paper form or on an electronic data carrier.

### **Documentation Officer**

Line Tech AG, Europastrasse 19, CH-8152 Glattbrugg

### **Commissioning**

The product may not be commissioned until it has been established that the machine in which the aforementioned product is installed complies with all the essential requirements of the Machinery Directive.



Daniel Rees  
(Head of Technology/Design)

LINE TECH AG  
Europastrasse 19  
CH-8152 Glattbrugg

Glattbrugg, October 2025

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# LINE TECH

Linear movements form the backbone of modern industrial production systems. LINE TECH AG has been providing linear technology solutions every day for over 25 years. LINE TECH AG is distinguished by a comprehensive range of components, linear and positioning systems coupled with the technical expertise of our employees.



Advanced services ranging from engineering to design, combined with flexible production, round off the product range and provide you, the customer, with a wide range of advantages.



## Proprietary products

LINE TECH's proprietary products include modular, ready-to-install linear axes:

- Linear modules
- Bridge modules
- Compact units
- Positioning units



## Systems / assemblies

Our engineering department develops customized solutions at the customer's request.



## Components

Commercial products supplement the range, including linear guides, drives, and components:

- Linear guides
- Toothed belt drives
- Roller linear guides
- Ball bushings and shafts
- Ball rollers
- Comprehensive range of accessories
- Megatorque motors
- Linear motors

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