

# POSITIONING UNIT WITH BALL SCREW

ASSEMBLY AND MAINTENANCE INSTRUCTIONS (ENGLISH)





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These instructions contain standard illustrations, so representations may deviate from the original. The scope of delivery for special designs, options or technical changes may differ from the explanations described here. We reserve the right to make changes for the purposes of technical improvement.

Despite taking great care when creating these assembly and maintenance instructions, printing errors cannot be excluded. We are grateful for any information alerting us to errors or poorly formulated/represented information in this document. All rights reserved. No part of these instructions may be reproduced or may be processed, duplicated or distributed in any form using electronic means without the written consent of LINE TECH AG.

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#### General

#### Warranty:

LINE TECH AG warrants compliance with the specifications expressly agreed upon in the confirmation and in general the execution of the order with the due care customary in the industry. The warranty covers the function of the positioning unit and includes all defects that are demonstrably due to manufacturing or material defects.

#### Warranty period:

The warranty period (factory warranty) is twelve months from the date of delivery according to the general terms and conditions of sale and delivery, provided a longer period has not been agreed upon.

#### Warranty exclusion:

Excluded from the warranty are defects and faults for which LINE TECH AG is not responsible, such as natural wear, force majeure, improper handling, interventions on the part of the customer or third parties, excessive and improper use, unsuitable operating equipment, extreme environmental conditions and non-compliance with assembly, operating and maintenance instructions. Any warranty claims shall expire in such cases.

LINE TECH AG is only liable for customer damages that are directly related to the breach of contractual obligations and that have been caused by LINE TECH AG due to gross negligence. The liability for slight negligence on the part of LINE TECH AG or for actions of auxiliary persons commissioned by LINE TECH AG is excluded to the legally permitted extent. In no case is LINE TECH AG liable for direct or indirect consequential damages or third party damages. The exclusion or limitation of liability of LINE TECH AG also apply for the personal liability of its employees, workers, representatives and vicarious agents.

#### 2. Use in Accordance with the Regulations

LINE TECH positioning units with ball screw (BSD) are linear systems suitable for the highest requirements in terms of performance and precision. The positioning unit with ball screw (incomplete machine in the sense of the Machinery Directive 2006/42/EC) is intended to be installed in machines and is used exclusively to move heavy loads with the highest precision requirements.

Positioning units with ball screws (BSD) can be installed in any position (horizontal, vertical or overhead). All relevant technical safety and accident prevention regulations, including DIN EN ISO 12100 (machine safety), as well as all documentation enclosed with the product, such as instructions, etc., must be observed when installing the incomplete machine in a complete machine.

The positioning unit with ball screw may only be used in accordance with the intended use provided by LINE TECH AG. Any other use beyond this is considered improper. The manufacturer is not liable for any personal injury and/or property damage that results from said improper use. The risk is borne solely by the user. The assembly and maintenance instructions prescribed by the manufacturer must be observed to ensure use in accordance with the regulations. Only qualified specialist personnel may carry out the commissioning, assembly, maintenance and repair work.

In general, LINE TECH positioning units are intended for linear movement as occurs during positioning, processing, transporting, palletising, loading, unloading, clamping, tensioning, testing, measuring, handling and manipulating workpieces or tools. In the process, the type-specific load data from the respective catalogue documents or supplementary technical calculations from LINE TECH are to be taken into consideration.

#### 3. Use Not in Accordance with the Regulations

Use in application areas with special operating conditions, such as in the presence of moisture, dirt, dust (fibre glass and wood), aggressive atmospheres, potentially explosive environments, extreme climatic conditions and/ or extreme temperature fluctuations, short-stroke and others are not consider proper and intended use. For special solutions, please contact LINE TECH AG.





#### 4. Declaration of incorporation

#### Declaration of incorporation

within the meaning of the EC Machinery Directive 2006/42/EC, annex II B

The manufacturer

Line Tech AG Europastrasse 19 8152 Glattbrugg

hereby declares that for the incomplete machine

Designation: Positioning unit with ball screw (PE)

Material number: according to the nameplate LINE TECH AG

these basic requirements of the Machinery Directive 2006/42/EC have been applied and complied with:

- 1.1.2 Principles for the integration of safety
- 1.1.3 Materials and products
- 1.1.5 Machine design with respect to handling
- 1.3.2 Risk of breakage during operation
- 1.3.3 Risks from falling or ejected objects
- 1.3.4 Risks from surfaces, edges and corners
- 1.3.7 Risks from moving parts
- 1.3.9 Risk of uncontrolled movements
- 1.5.1 Electrical power supply
- 1.5.2 Static electricity
- 1.5.4 Assembly error
- 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 incomplete machine
- 1.7.2 Warning of residual risks

Furthermore, it is stated that the specific technical documentation has been prepared according to annex VII part B. These will be transmitted to market surveillance authorities in the form of paper documents/in electronic form upon request.

Compliance with the provisions of additional EU guidelines, standards or specifications:

- EN ISO 12100:2010 Safety of Machinery - General Principles for Design -

Risk assessment and risk reduction

The incomplete machine may then first be put into operation once it has been determined that the machine in which the incomplete machine is to be installed meets the provisions of the EC Machinery Directive 2006/42/EC, if relevant under this guideline.

The following person is authorised to compile the relevant technical documentation:

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Glattbrugg, 05 Nov. 2020

Michael Schilbach Technical Sales Manager

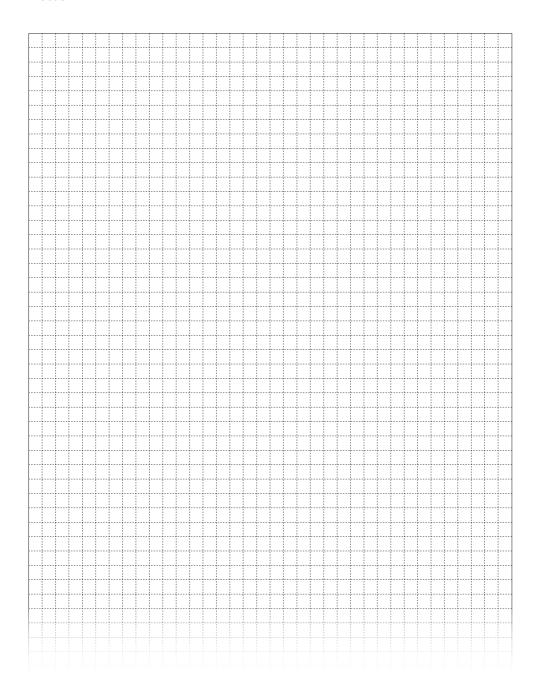
M. Shilhad

Rolf Bünzli

Head of Quality Management



# Notes





#### 5. Safety, References, Symbols

#### 5.1 Safety Instructions

The following safety and hazard instructions are for your personal protection, the protection of third parties and the protection of the positioning unit. They must therefore be observed.

The following pictograms are used in these assembly and maintenance instructions as safety and hazard instructions:



#### DANGER

Indicates an imminent danger. Failure to observe this notice may result in death or serious injury.



#### WARNING

Indicates a potential hazardous situation. If this information is ignored, it could result in property damage or physical injury.



#### CAUTION

Indicates a possible hazard. Ignoring this information may result in injuries, such as punctures, cuts and crushing, etc. Make sure any sources of hazards are secured.



#### CAUTION

Indicates a possible hazard. Ignoring this information may lead to eye injuries. Wear protective goggles.



#### CAUTION

Indicates a possible hazard. De-energise the module. Secure the power supply from unintentional or unauthorised commissioning.



#### CAUTION

Indicates a possible hazard. Ignoring this information may lead to skin burns. Avoid skin contact and wear protective gloves.



#### Note

Indicates general information and work recommendations.

#### 5.2 Identification of references

References are made to repeated or further information as follows:

⇒ 2.1 Reference to section 2.1 ⇒ □ 5.1.1 Reference to image 5.1.1 (image 1 in section 5.1)

## 5.3 Symbols



Commissioning



Assembly



Travel speed



Securing with adhesive (Observe the safety data sheet)



Maintenance



RPM



Tightening torque



Screw



Thermometer



Excerpt from the LINE TECH AG product catalogue

www.linetech.ch



#### 6. Transport

#### 6.1 Transport, packaging and storage

The mechanics of positioning units can be damaged from heavy impacts and bending, which can greatly impair its function. Axes with a length of more than 700 mm must always be supported during transport. In order to avoid transport damage, LINE TECH AG positioning units are sufficiently packaged and protected against slipping and vibrations.

For storage, the positioning unit should be placed in a well-padded sturdy crate and sufficiently protected against moisture, dirt and aggressive atmosphere.

#### 6.2 Scope of delivery

The scope of delivery of the product includes:

- Positioning unit (PE) according to the order confirmation
- Assembly and maintenance instructions
- Additional and special accessories according to the order

#### 7. Positioning unit (PE) with ball screw (BSD)

#### 7.1 Product overview

PE...R...
Positioning units with ball screw





LINE TECH positioning units with ball screw are of modular conception, ready to build-in linear slide units with drive. Sealed guide elements in all sizes are employed. The guides and drive are protected from external factors (such as dirt and chippings) by expansion bellows. The base plates and carriages are made of an aluminium alloy and the extrusion process is used for manufacturing.

Limit switches integrated in the base plate, in conjunction with motors and a controller, ensure correct positioning of the carriage and provide protection against overrun.

The selected design provides for a high level of performance with the most compact dimensions.







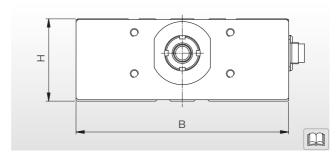
#### Design

- Compact aluminium base profile
- Ready-to-install positioning units in any length
- Carriages made of aluminium



Positioning units can be installed and assembled by qualified personnel using these assembly and maintenance instructions.

The units must not be opened under any circumstances. If a unit is opened, safe operation can no longer be guaranteed!



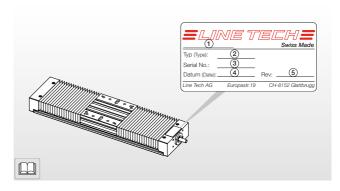
Positioning unit	Dimensions	Load ratings			
Туре	W x H [mm]	C <sub>0</sub> [kN]	C [kN]		
PE1.4	100 x 50	13.8	9.2		
PE2.4	155 x 60	42.5	29.3		
PE3.4	225 x 90	59.2	41.4		
PE4.4	310 x 105	230.5	161.9		

### 7.2 Nameplate "Ordering of spare parts and accessories"



The following information is to be taken from the nameplate in order to get a clear identification of the unit. This information is to be given to the manufacturer immediately if there are problems with the positioning unit:

- 1. Name of the unit
- 2. Type designation
- 3. Serial number
- 4. Date of production (calendar week/year)
- 5. Date of repair (If available)





### 7.3 Tightening torques for screws



Screws of the strength class 8.8 are used by default. If other screws are used, these are specially labelled.

The tightening torques recommended by LINE TECH AG are defined in the table below.

Tightening torque $M_{A \text{ max.}}$ [Nm] Friction factor for screws $\mu = 0.120$												
Screw	Material	Thread	Thread size									
according to	class	M2	M2.5	МЗ	M4	М5	M6	M8	M10	M12		
ISO 4762	8.8	0.36	0.73	1.27	3.00	5.90	10.10	24.60	48.00	84.00		
ISO 4762	12.9	0.60	1.23	2.14	5.10	10.00	17.40	42.20	83.00	144.00		
ISO 7380-1	10.9	0.25	0.50	0.90	2.00	4.00	7.20	12.00	23.00	58.00		

#### 8. Design and assembly of positioning units with ball screw

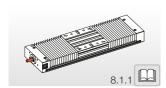
#### 8.1 Assembly design versions with different motor mountings



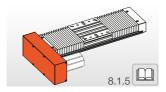
LINE TECH positioning units with ball screw can be delivered in various design versions and with different prepared motor mountings > 13

Dimensions for positioning units PE1, PE2, PE3 and PE4 > 9.1 - 9.8

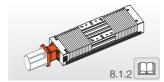
Assembly stage 01 Free spindle end



Assembly stage 05 Set up for lateral motor mounting left



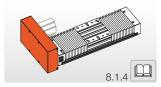
Assembly stage 02 With coupling and intermediate flange



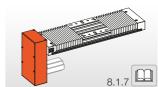
Assembly stage 06 Set up for lateral motor mounting top



Assembly stage 04
Set up for lateral motor mounting right



Assembly stage 07 Set up for lateral motor mounting bottom





## 8.2 Technical data for ball screw (BSD)





PE	BSD	Axial rating		Positioning accuracy	Repeating accuracy	Accelera- tion	Axia	al play	Idle torque
Size	dxp	C <sub>0</sub>	C <sub>dyn</sub>			a <sub>max</sub>	Туре	Axial play	
	[mm]	[N]	[N]	[µm/mm]	[mm]	[m/s <sup>2</sup> ]		[mm]	[Nm]
	16 x 5					10.0	V	_	0.100
PE1R	16 x 16	4 551	4327	52/300 <sup>2)</sup>	< 0.01 1)		V	_	0.200
	16 x 16						V	_	0.320
DEO D	20 x 5	5705 4912	4012	52 (200 2)	< 0.01.1)	10.0	V	_	0.120
1 LZ	20 x 20		027000			V	_	0.400	
	25 x 5				< 0.01 1)		٧	_	0.150
PE3R	25 x 10	7 308	6 140	52/300 <sup>2)</sup>		10.0	٧	_	0.300
	25 x 25						V	_	0.500
	32 x 5						V	_	0.200
PE4R	32 x 10	11538	8947	52/300 <sup>2)</sup>	< 0.01 1)	10.0	٧	_	0.400
	32 x 32						V	-	1,200

 $d \times p =$  screw diameter  $\times x$  thread pitch





www.linetech.ch

<sup>1)</sup> backlash not factored in

 $<sup>^{2)}</sup>$  = also available with 23  $\mu m$  / 300 mm

V = preloaded



## 8.3 General technical details for positioning units





PE	Movement speed				Stroke max.	Expansion bellow	Feed and friction force	Moved mass
Туре	V <sub>max</sub>	V <sub>max</sub>	l <sub>Y</sub>	I <sub>Z</sub>			F <sub>V</sub>	m <sub>b</sub>
	[m/s]	[m/s]	[cm <sup>4</sup> ]	[cm <sup>4</sup> ]	[mm]		[N]	[kg]
PE1.4R	1.6	2)	8.9	178.2	2160	without	10.00	1.100
PE1.4R	1.0	,	0.9	170.2	1 500	with	10.00	1.100
PE2.4R	1.6	2)	9.7	513.7	2570	without	12.00	2.700
FL2.4n	1.0	_,	9.1	513.7	2000	with	12.00	2.700
PE3.4R	1.6	2)	202.8	3940.0	4055	without	15.00	5.470
FE3.4n	1.0	_,	202.0	3940.0	3000	with	15.00	5.470
PE4.4R	1.6	2)	125.1	8560.0	3785	without	25.00	16 600
FE4.4D	1.6	2)			3000	with	25.00	16.600

<sup>2)</sup> for spindle drive, dependent on rotational speed characteristics, spindle length and corresponding critical rotational speed

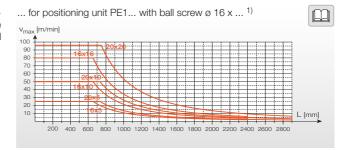


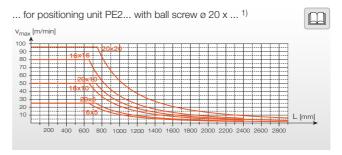


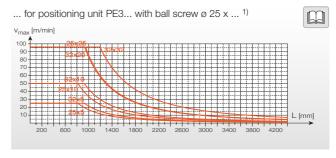
#### 8.4 Permissible speeds

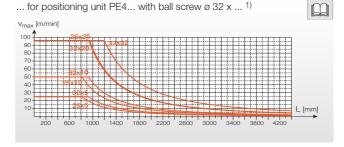


For ball screw drive, note the rotational speed characteristics, spindle length and relevant critical rotational speed as well as engine speed









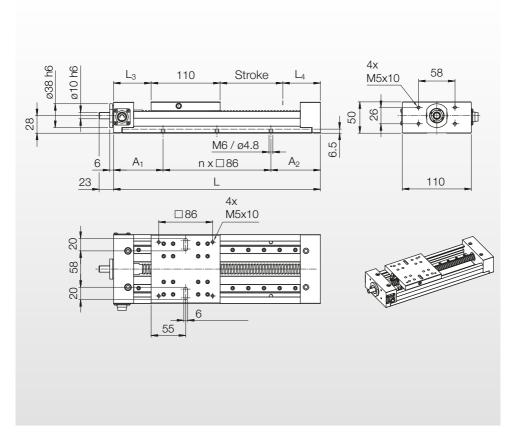
## Legend:

Greater accuracy on request
 L = overall length of the positioning unit



- 9. Dimensions, exploded views and parts lists
- 9.1 Dimensions, positioning unit PE1.4...NR... with ball screw, without bellows





CAD data is available from www.linetech.ch







Nominal size		Dimen	sions						
Designation	Stroke [mm]	L [mm]	L <sub>3</sub> [mm]	L <sub>4</sub> [mm]	n	A <sub>1</sub>	$A_2$	Spindle length [mm]	Weight [kg]
PE1.4NR	50	255	47.5	47.5	2	41.5	41.5	225	3.0
	125	330	47.5	47.5	2	79	79	275	3.5
	195	400	47.5	47.5	3	71	71	350	4.0
	270	475	47.5	47.5	4	65.5	65.5	483	4.5
	345	550	47.5	47.5	5	60	60	558	5.0
	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

9.1.2



## 9.1.1 Parts list for exploded view



Assembly of attachments according to the corresponding chapters > 11 / 12 / 13
LINE TECH recommends ordering the superordinate assemblies
Ordering spare parts and accessories requires the information from the nameplate > 7.2

Position	Designation	Position	Designation
1	Base plate	5	-
2	Linear rail	6	Carriage
3	Screw on linear rail	7	Runner blocks
4	End plate with ball screw	8	End plate on the motor side
4.1	Complete ball screw	9	Bellows set
4.1.1	Angular contact ball bearings	10	-
4.1.2	Lock nut	11	-
4.1.3	Floating bearing	12	-



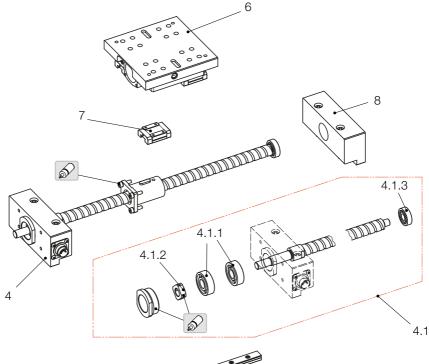
## 9.1.2 Setup and assembly of the positioning unit (exploded view)

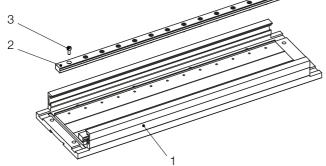














Initial lubrication: Quantity corresponds to 2x relubrication amount (Pos.: 7/4.1) = 18.1



Tightening torque of screws 7.3



# 9.2 Dimensions, positioning unit PE1.4...FR... with ball screw, with bellows

4x ø10 h6 Stroke 58  $L_3$ 110 M5x10 6.5 M6/ø4.8  $A_1$ n x □ 86  $A_2$ 6 23 L 110 4x M5x10 □86 0 58 0 20 6 55

CAD data is available from www.linetech.ch





Nominal size		Dimen	sions						
Designation	Stroke [mm]	L [mm]	L <sub>3</sub> [mm]	L <sub>4</sub> [mm]	n	A <sub>1</sub>	A <sub>2</sub>	Spindle length [mm]	Weight [kg]
PE1.4FR	50	255	47.5	47.5	2	41.5	41.5	225	3.0
	100	330	60	60	2	79	79	275	3.5
	150	400	70	70	3	71	71	350	4.0
	200	475	82.5	82.5	4	65.5	65.5	483	4.5
	250	550	95	95	5	60	60	558	5.0
	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

9.2.2



## 9.2.1 Parts list for exploded view



Assembly of attachments according to the corresponding chapters > 11 / 12 / 13

LINE TECH recommends ordering the superordinate assemblies

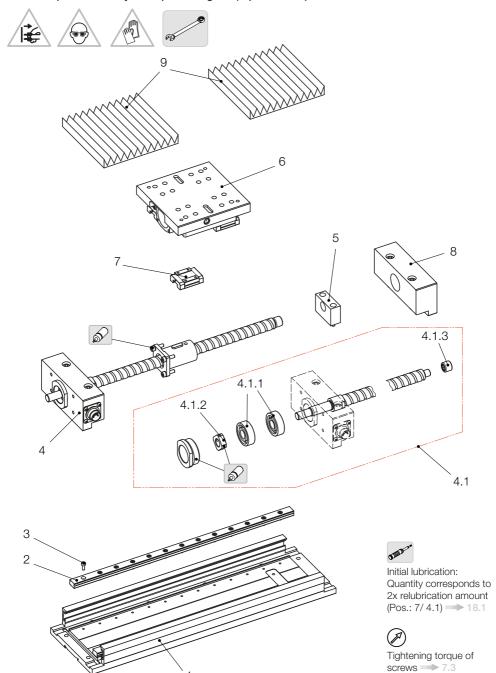
Ordering spare parts and accessories requires the information from the nameplate > 7.2

Position	Designation	Position	Designation
1	Base plate	5	Floating bearing support
2	Linear rail	6	Carriage
3	Screw on linear rail	7	Runner blocks
4	End plate with ball screw	8	End plate on the motor side
4.1	Complete ball screw	9	Bellows set
4.1.1	Angular contact ball bearings	10	-
4.1.2	Lock nut	11	-
4.1.3	Floating bearing	12	-





## 9.2.2 Setup and assembly of the positioning unit (exploded view)

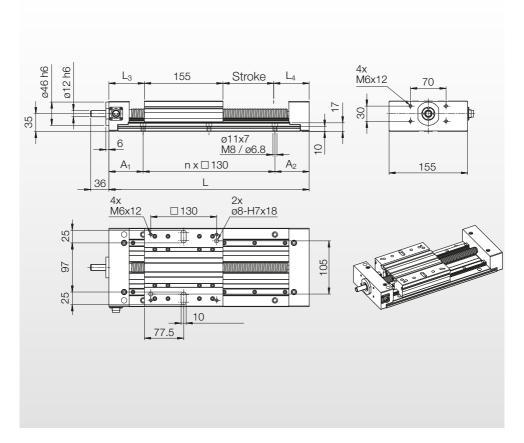




# 9.3 Dimensions of positioning unit PE2.4...NR...

with ball screw, without bellows





CAD data is available from www.linetech.ch





Nominal size		Dimen	sions						
Designation	Stroke [mm]	L [mm]	L <sub>3</sub> [mm]	L <sub>4</sub> [mm]	n	A <sub>1</sub>	A <sub>2</sub>	Spindle length [mm]	Weight [kg]
PE2.4NR	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
	1100	1380	62.5	62.5	9	105	105	1393	18.0
	1145	1425	62.5	62.5	10	62.5	62.5	1438	18.5
	1220	1500	62.5	62.5	10	100	100	1513	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

9.3.2



### 9.3.1 Parts list for exploded view



Assembly of attachments according to the corresponding chapters > 11 / 12 / 13
LINE TECH recommends ordering the superordinate assemblies
Ordering spare parts and accessories requires the information from the nameplate > 7.2

Position	Designation	Position	Designation
1	Base plate	4.1.4	Inner ring
2	Linear rail	5	-
3	Screw on linear rail	6	Carriage
4	End plate with ball screw	7	Runner blocks
4.1	Complete ball screw	8	End plate opposite the drive side
4.1.1	Angular contact ball bearings	9	-
4.1.2	Lock nut	10	-
4.1.3	Floating bearing	11	-



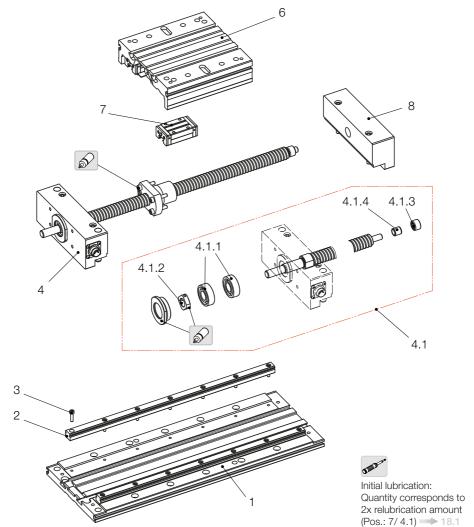
## 9.3.2 Setup and assembly of the positioning unit (exploded view)









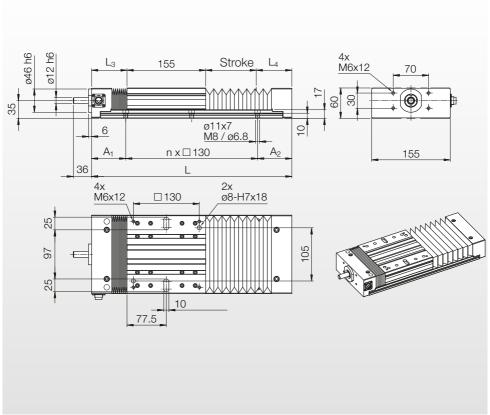


Tightening torque of screws > 7.3



# 9.4 Dimensions of positioning unit PE2.4...FR... with ball screw, with bellows





CAD data is available from www.linetech.ch





Nominal size		Dimen	sions						
Designation	Stroke [mm]	L [mm]	L <sub>3</sub> [mm]	L <sub>4</sub> [mm]	n	A <sub>1</sub>	$A_2$	Spindle length [mm]	Weight [kg]
PE2.4FR	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	1380	187.5	187.5	9	105	105	1293	18.0
	900	1425	185	185	10	62.5	62.5	1327	18.5
	950	1500	197.5	197.5	10	100	100	1396	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



9.4.2



### 9.4.1 Parts list for exploded view

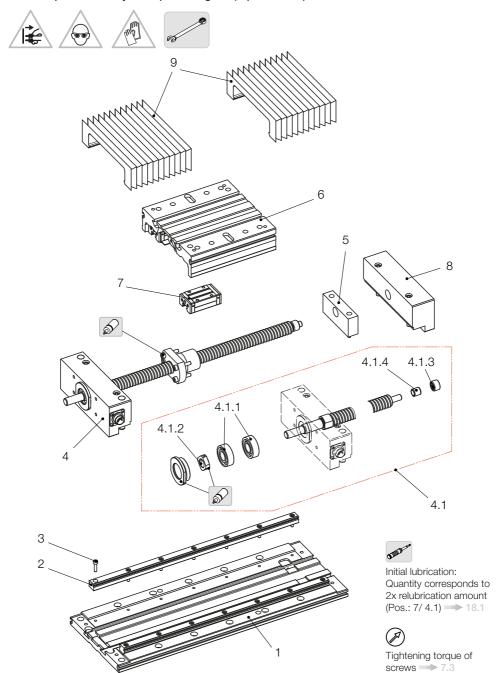


Assembly of attachments according to the corresponding chapters > 11 / 12 / 13
LINE TECH recommends ordering the superordinate assemblies
Ordering spare parts and accessories requires the information from the nameplate > 7.2

Position	Designation	Position	Designation
1	Base plate	4.1.4	Inner ring
2	Linear rail	5	Floating bearing support
3	Screw on linear rail	6	Carriage
4	End plate with ball screw	7	Runner blocks
4.1	Complete ball screw	8	End plate opposite the drive side
4.1.1	Angular contact ball bearings	9	Bellows set
4.1.2	Lock nut	10	-
4.1.3	Floating bearing	11	-



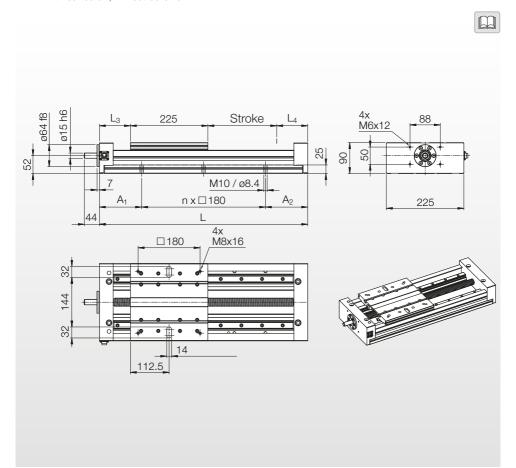
## 9.4.2 Setup and assembly of the positioning unit (exploded view)





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

with ball screw, without bellows



CAD data is available from www.linetech.ch







Nominal size		Dimensions							
Designation	Stroke [mm]	L [mm]	L <sub>3</sub> [mm]	L <sub>4</sub> [mm]	n	A <sub>1</sub>	A <sub>2</sub>	Spindle length [mm]	Weight [kg]
PE3.4NR	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

9.5.2



## 9.5.1 Parts list for exploded view



Assembly of attachments according to the corresponding chapters > 11 / 12 / 13
LINE TECH recommends ordering the superordinate assemblies
Ordering spare parts and accessories requires the information from the nameplate > 7.2

Position	Designation	Position	Designation
1	Base plate	4.1.4	Inner ring
2	Linear rail	5	-
3	Screw on linear rail	6	Carriage
4	End plate with ball screw	7	Runner blocks
4.1	Complete ball screw	8	End plate opposite the drive side
4.1.1	Angular contact ball bearings	9	-
4.1.2	Lock nut	10	-
4.1.3	Floating bearing	11	-



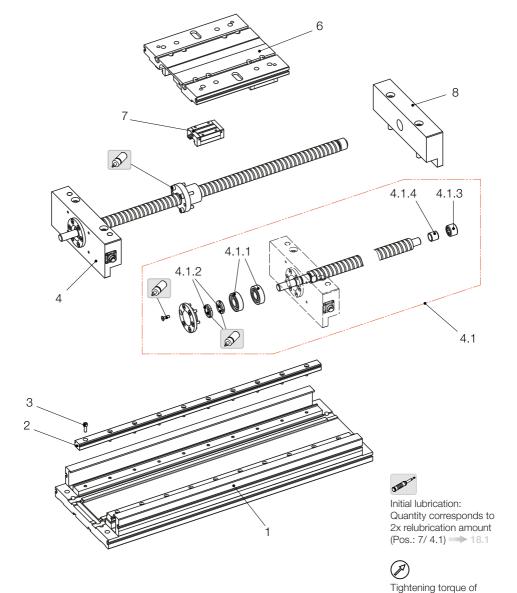
## 9.5.2 Setup and assembly of the positioning unit (exploded view)









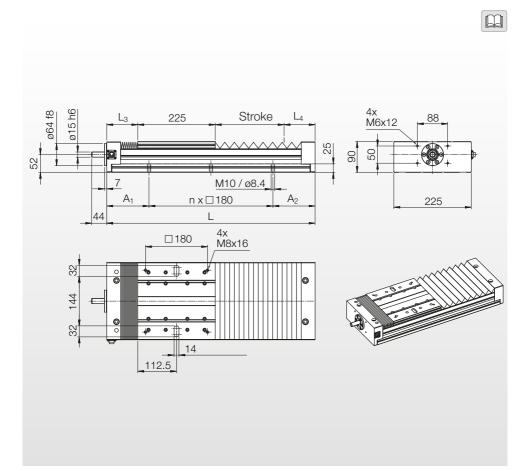


screws 7.3



# 9.6 Dimensions of positioning unit PE3.4...FR...

with ball screw, with bellows



CAD data is available from www.linetech.ch







Nominal size		Dimen	sions						
Designation	Stroke [mm]	L [mm]	L <sub>3</sub> [mm]	L <sub>4</sub> [mm]	n	A <sub>1</sub>	A <sub>2</sub>	Spindle length [mm]	Weight [kg]
PE3.4FR	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



9.6.2



## 9.6.1 Parts list for exploded view



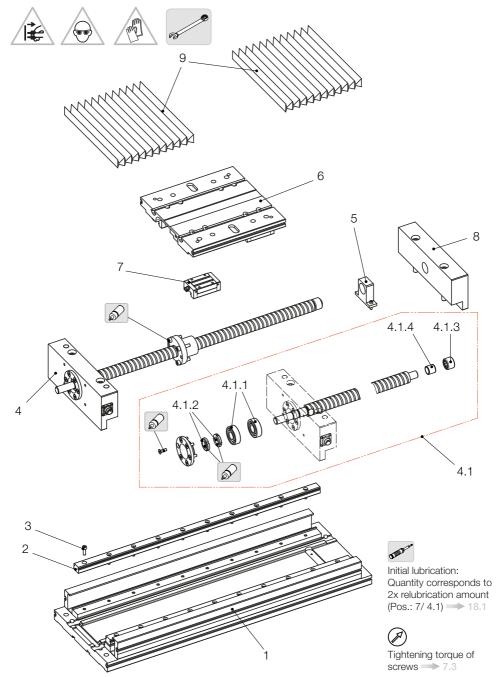
Assembly of attachments according to the corresponding chapters > 11 / 12 / 13
LINE TECH recommends ordering the superordinate assemblies
Ordering spare parts and accessories requires the information from the nameplate > 7.2

Position	Designation	Position	Designation
1	Base plate	4.1.4	Inner ring
2	Linear rail	5	Floating bearing support
3	Screw on linear rail	6	Carriage
4	End plate with ball screw	7	Runner blocks
4.1	Complete ball screw	8	End plate opposite the drive side
4.1.1	Angular contact ball bearings	9	Bellows set
4.1.2	Lock nut	10	-
4.1.3	Floating bearing	11	-





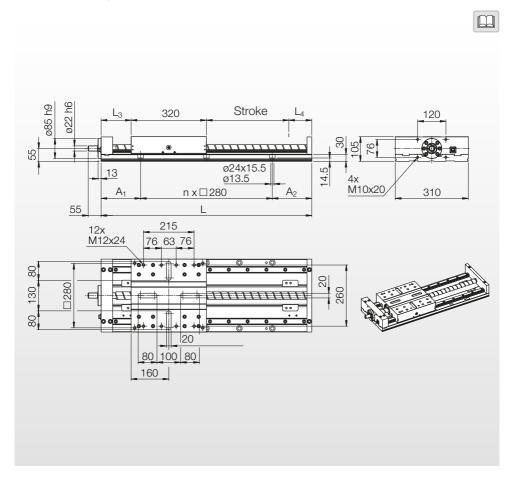






## 9.7 Dimensions of positioning unit PE4.4...NR...

with ball screw, with bellows



CAD data is available from www.linetech.ch





Nominal size		Dimen	sions						
Designation	Stroke [mm]	L [mm]	L <sub>3</sub> [mm]	L <sub>4</sub> [mm]	n	A <sub>1</sub>	A <sub>2</sub>	Spindle length [mm]	Weight [kg]
PE4.4NR	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

9.7.2



#### 9.7.1 Parts list for exploded view



Assembly of attachments according to the corresponding chapters > 11 / 12 / 13
LINE TECH recommends ordering the superordinate assemblies
Ordering spare parts and accessories requires the information from the nameplate > 7.2

Position	Designation	Position	Designation
1	Base plate	4.1.4	Circlip
2	Linear rail	5	-
3	Screw on linear rail	6	Carriage
4	End plate with ball screw	7	Runner blocks
4.1	Complete ball screw	8	End plate opposite the drive side
4.1.1	Angular contact ball bearings	9	-
4.1.2	Lock nut	10	-
4.1.3	Floating bearing	11	-



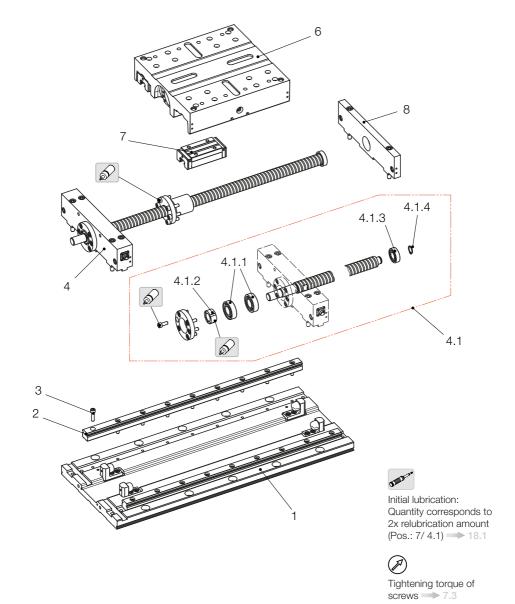
### 9.7.2 Setup and assembly of the positioning unit (exploded view)







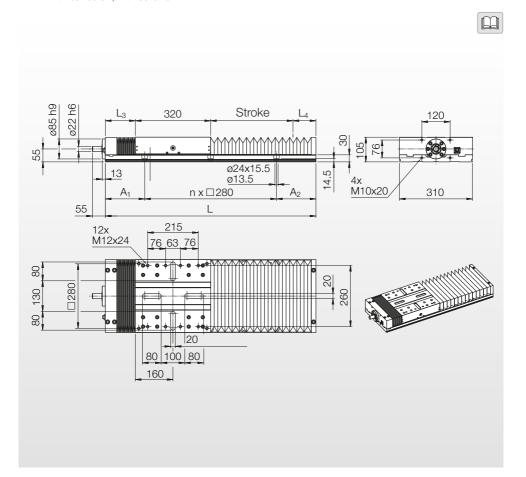






### 9.8 Dimensions of positioning unit PE4.4...FR...

with ball screw, with bellows



CAD data is available from www.linetech.ch





Nominal size		Dimensions							
Designation	Stroke [mm]	L [mm]	L <sub>3</sub> [mm]	L <sub>4</sub> [mm]	n	A <sub>1</sub>	A <sub>2</sub>	Spindle length [mm]	Weight [kg]
PE4.4FR	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

9.8.2



#### 9.8.1 Parts list for exploded view



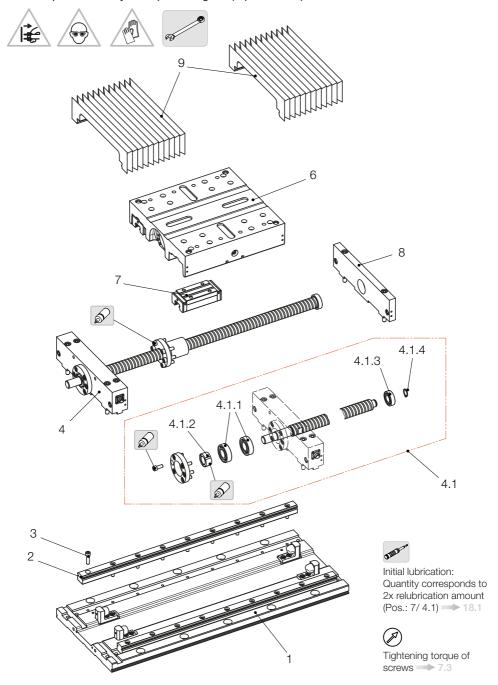
Assembly of attachments according to the corresponding chapters > 11 / 12 / 13
LINE TECH recommends ordering the superordinate assemblies
Ordering spare parts and accessories requires the information from the nameplate > 7.2

Position	Designation	Position	Designation
1	Base plate	4.1.4	Circlip
2	Linear rail	5	-
3	Screw on linear rail	6	Carriage
4	End plate with ball screw	7	Runner blocks
4.1	Complete ball screw	8	End plate opposite the drive side
4.1.1	Angular contact ball bearings	9	Bellows set
4.1.2	Lock nut	10	-
4.1.3	Floating bearing	11	-





### 9.8.2 Setup and assembly of the positioning unit (exploded view)





#### 10. Deflection of the positioning units (PE)

#### 10.1 Permitted deflection (1/2; for PE1... and PE2...)



#### Permissible deflection

Positioning units can be installed so as to be self-supporting. However, the deflection must be noted in the process, as this limits the possible load.

If the maximum permissible deflection is exceeded, the positioning units must have additional support.

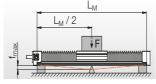
The maximum permissible deflection is limited by the maximum deflection angle of 5'. If this value is exceed without support, it will affect the service life.

If increased demands are placed on system accuracy, we recommend supporting the positioning unit along its entire length.

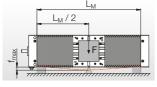
The following diagrams apply for:

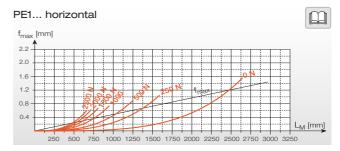
- fixed clamping (40–50 mm per side)
- 3-4 screws per side
- fixed substructure

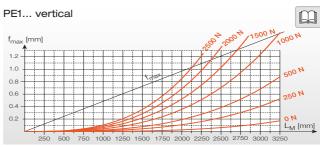
### Mounting position: horizontal

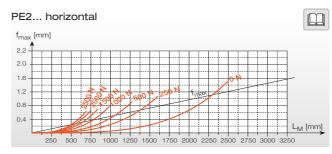


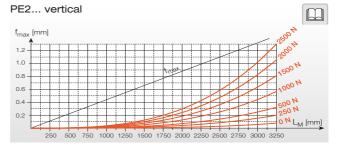
#### Mounting position: vertical







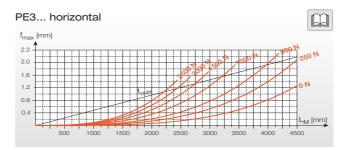


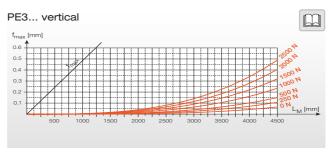


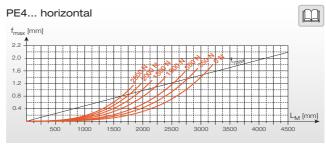


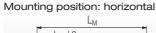
#### 10.2 Permitted deflection (2/2; for PE3... and PE4...)

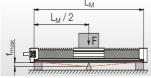




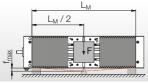


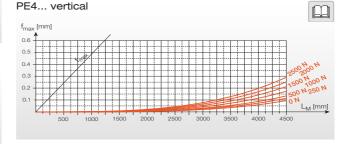






Mounting position: vertical







#### 11. Fastening accessories

#### 11.1 Attachment of positioning units







#### Caution:

The end plates may not be used as supporting elements. Always screw on the positioning units along the entire length if possible.



The aluminium base profile is the main supporting body of the unit. This must be supported across the entire length if possible.

### Mounting options

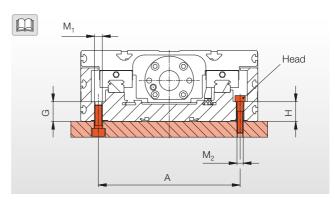
Positioning units are attached from above or below.







The screws are to be secured with Loctite. For the recommended tightening torques  $M_A$ , see  $\longrightarrow 7.3$ 



Nominal size	Dimensions [mm]						
	А	G	Н	M <sub>1</sub>	$M_2$	Head	
PE1	□ 86	6.5	6.5	M6	M4	DIN 4762	
PE2	□ 130	10	10	M8	M6	DIN 4762	
PE3	<u> </u>	25	25	M10	M8 <sup>1)</sup>	DIN 4762	
PE4	280	-	14.5	-	M12	DIN 4762	

<sup>1)</sup> max. screw length = 40 mm



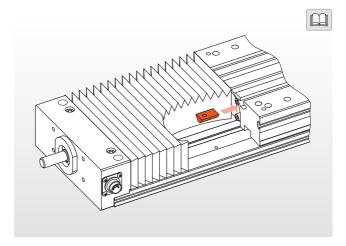


#### 11.2 Attachment accessories; sliding blocks



For sizes PE2 and PE3, the base plates and carriages have grooves.

Sizes PE1 and PE4 have no grooves.



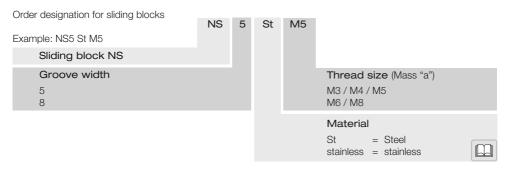
Sliding block types NS5 and NS6 can be used in line with the groove width.

Size, material and connection thread as per the following order system (e.g. NS5 St M5) must be defined as the order number.

The available types are listed opposite. The sliding blocks pursuant to the following table can be ordered from LINE TECH AG.



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



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#### 12. Limit switch

#### 12.1 Limit switches / reference switch mounting overview







#### Limit switch

The limit switches are used in conjunction with a control unit to limit the stroke (prevent overrunning of the carriage) and to define the reference position.

At the factory the plus and minus limit switches are preset to a nominal stroke of 0 to +5 mm

LINE TECH employs the following standard inductive limit switches:

- PNP normally closed Supply: 10...30 V DC

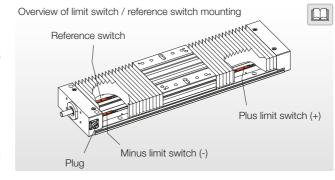
Current consumption off-load:

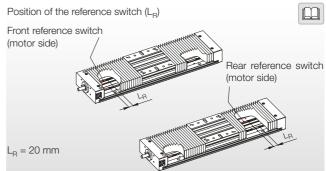
< 10 mA

Load mx. 200 mA

On request the following non standard limit switches are available:

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







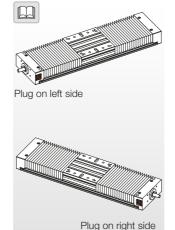


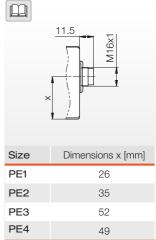




The installation position of the limit switches. is evident from the following images. The reference point can be assigned to the positive (+) or the negative limit switch (-).

Special applications often require a separate reference point switch to be mounted between the positive and negative limit switches. The limit switch closest to the motor mounting (limit switch controller interface) is known as the forward limit switch.









#### 12.2 Limit switch with plug connector overview



The plug pin assignment when using a limit switch plug is shown in the diagram below.

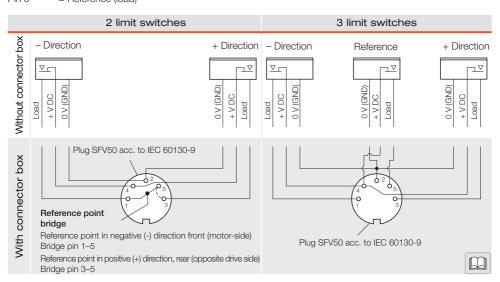
The individual pins are assigned as follows: Colour code key for the diagrams below:

 Pin 1
 = negative (-) direction (load)
 Load
 = black

 Pin 2
 = 0 V (GND)
 +V DC
 = brown

 Pin 3
 = Positive (+) direction (load)
 0 V (GND)
 = blue

Pin 4 = +10...30 V DC Pin 5 = Reference (load)





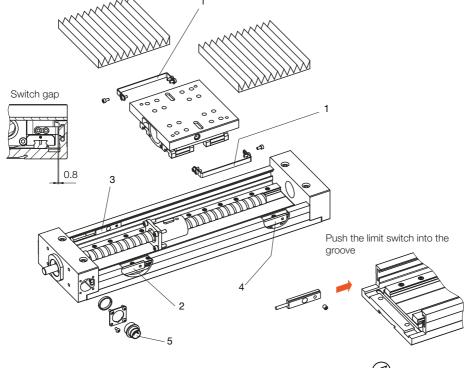
### 12.2.2 Limit switch mounting PE1 (exploded view)













Tightening torque of screws 7.3

12.2.1 Parts list for exploded view



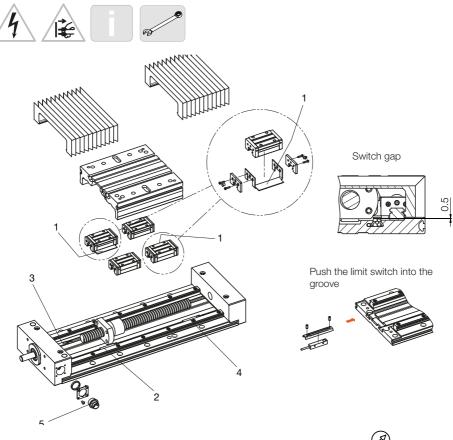


Ordering spare parts and accessories requires the information from the nameplate > 7.2

Position	Designation	Position	Designation
1	Limit switch actuation	4	Plus limit switch (+)
2	Minus limit switch (-)	5	Plug (including nut)
3	Reference switch	6	-



### 12.2.3 Limit switch mounting PE2 and PE3 (exploded view)



12.2.4 Parts list for exploded view





Ordering spare parts and accessories requires the information from the nameplate >> 7.2

Position	Designation	Position	Designation
1	Limit switch actuation	4	Plus limit switch (+)
2	Minus limit switch (-)	5	Plug (including nut)
3	Reference switch	6	-

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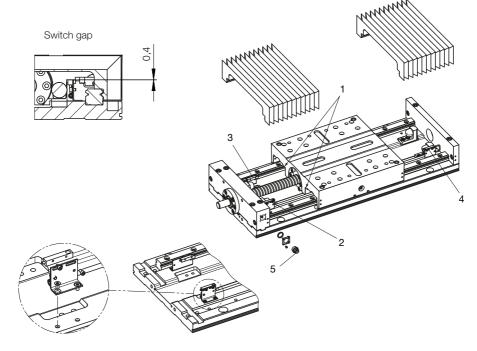
### 12.2.5 Limit switch mounting PE4 (exploded view)













Tightening torque of screws 7.3

12.2.6 Parts list for exploded view





Ordering spare parts and accessories requires the information from the nameplate >> 57.2

Position	Designation	Position	Designation
1	Limit switch trigger edge	4	Plus limit switch (+)
2	Minus limit switch (-)	5	Plug (including nut)
3	Reference switch	6	-

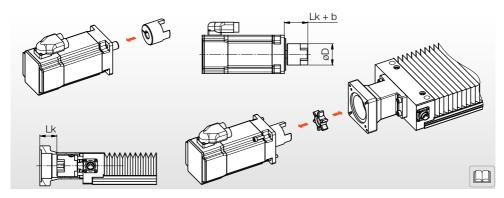


#### 13. Motor mounting

#### 13.1 Motor mounting straight, with ball screw



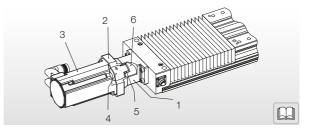
Note the motor manufacturer's operating instructions prior to mounting a motor



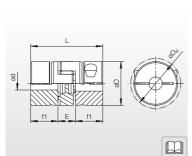
- 1) Measure the spacing of the Lk on the unit
- 2) Attach the clamping hub to the motor mounting in the spacing Lk + b. Tightening torque of the clamping screw > 13.1.2
- 3) Attach the premounted motor with gear ring to the unit

#### 13.1.1 Motor attachments and parts list, straight with ball screw

Position	Designation				
1	Intermediate flange				
2	Motor plate				
3	Engine				
4	"Motor" clamping hub				
5	Sprocket				
6	"PE" clamping hub				



#### 13.1.2 Coupling: tightening torque of the clamping screws



Tig	Tightening torque of the clamping screws									
Size	Dimensions [mm]				Tightening torque of the clamping screw [Nm]		Drive torque [Nm]			
Si	L	øD	ød	f1	Е	$\emptyset D_k$	Туре	$M_{\rm S}$	$T_N$	$T_{\rm max}$
14	35	30	≤16	11	13	32.2	ISO 4762	1.34	6.3	25
19	66	40	≤20	25	16	43	ISO 4762	10.10	17.0	34
19	66	40	≤20	25	16	43	ISO 7380	7.20	17.0	34
24	78	55	≤28	30	18	57	ISO 4762	10.10	60.0	120



#### 13.2 Motor mounting lateral, with ball screw



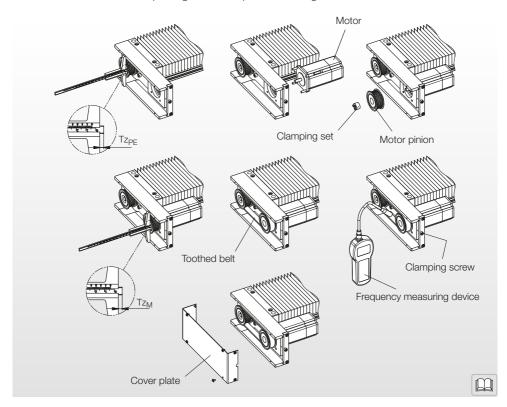








Note the motor manufacturer's operating instructions prior to mounting a motor



- 1) Measure the mounting depth of the mounted pinion Tz<sub>I,M</sub> at the unit.
- 2) Mount the motor on the belt drive housing with the corresponding screws.

  Ensure that the screws are tightened so that the motor and the motor plate can still be moved easily.
- 3) Mount the pinion on the motor side using a clamping set (tightening torques of the clamping screws  $\implies$  13.2.1) in the same mounting depth ( $Tz_{PF} = Tz_{M}$ ).
- 4) Insert the toothed belt and tighten using the clamping screw. The toothed belt tension is checked using a frequency measuring device. The adjustment frequency "f" can be determined according to the calculation > 13.3. Please also note the operating instructions of the frequency measuring device used.
- 5) Tighten the screws of the motor mounting according to the tightening torques > 7.3.
- 6) Mount the cover plate.



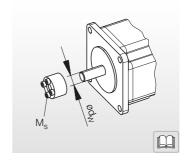


### 13.2.1 Tightening torque of the clamping screws

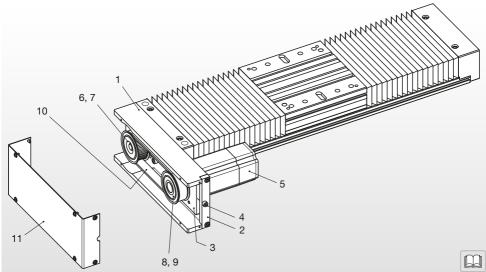




Tightening torque of the clamping screws							
Motor shaft	Type	Tightening torque					
ød <sub>W</sub>		$M_S$					
[mm]	ISO 4762	[Nm]					
ø5ø12	M2.5 x 10	1.20					
ø14, ø15	M3 x 16	2.10					
ø16ø19	M4 x 20	4.90					
ø20, ø22	M5 x 20	10.00					
ø24ø32	M6 x 24	17.00					



### 13.2.2 Motor attachments and parts list, lateral with ball screw



Position	Designation	Position	Designation
1	Belt drive housing	7	Clamping set positioning unit
2	Belt clamping plate	8	Motor pinion
3	Motor plate	9	Motor clamping set
4	Clamping screw	10	Toothed belt
5	Motor	11	Cover plate
6	Pinion positioning unit		



#### 13.3 Calculation of the preload frequency

B = Wrap angle [°]

b = Belt width [mm] E = Axle base [mm]

E<sub>eff</sub> = Effective axle base [mm]

f = Preload frequency of the belt [Hz]

F<sub>U</sub> = Circumferential force [N] F<sub>Uzul</sub> = Permissible preload force [N]

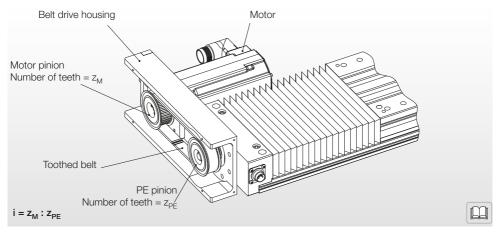
 $F_{V}$  = Preload force [N]  $F_{F}$  = Free span length [m]  $F_{F}$  = Belt length [mm]  $M_M$  = Motor torque [Nm]

m<sub>spec</sub> = Specific toothed belt weight [kg/m]

 $\begin{array}{ll} n_{M} & = \text{ Engine speed [rpm]} \\ P & = \text{ Power in [kW]} \\ t & = \text{ Division [mm]} \end{array}$ 

 $v_M$  = Speed of the motor pinion [m/s]  $z_M$  = Number of teeth of the motor [-]

 $z_{PE}$  = Number of teeth of the positioning unit [-]



					Belt data				
Nominal size	Reduc- tion	Axle base	No. teet		Length	Width	Divi- sion	Spec. Weight	Max. permissible preload force
	i	E [mm]	$z_{M}$	$Z_{\text{PE}}$	L <sub>R</sub> [mm]	b [mm]	t [mm]	m <sub>spec</sub> [kg/m]	F <sub>Vzul</sub> [N]
	1:1	132.5	32	32	425	15.0	5.0	0.065	330
PE1	1:1.5	137.2	24	36	425	15.0	5.0	0.065	330
	1:2	133.5	24	48	450	15.0	5.0	0.065	330
	1:1	132.5	32	32	425	15.0	5.0	0.065	330
PE2	1:1.5	135.0	32	48	475	15.0	5.0	0.065	330
	1:2	133.5	24	48	450	15.0	5.0	0.065	330
	1:1	175.0	40	40	550	15.0	5.0	0.065	330
PE3	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	48	32	575	15.0	5.0	0.065	330
	1:1.5	224.5	32	48	550	15.0	5.0	0.065	330
	1:2	228.5	27	48	550	15.0	5.0	0.065	330



1) Wrap angle B

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

2) Effective axle base Eoff

$$\mathsf{E}_{\mathsf{eff}} = \frac{1}{4} \cdot \left[ \mathsf{L}_{\mathsf{R}} - \frac{\mathsf{t}}{2} \cdot (\mathsf{z}_{\mathsf{PE}} + \mathsf{Z}_{\mathsf{M}}) + \sqrt{\left[\mathsf{L}_{\mathsf{R}} - \frac{\mathsf{t}}{2} \cdot (\mathsf{z}_{\mathsf{PE}} + \mathsf{z}_{\mathsf{M}})\right]^2 - 2 \cdot \left[\frac{\mathsf{t}}{\pi} \cdot (\mathsf{z}_{\mathsf{PE}} - \mathsf{z}_{\mathsf{M}})\right]^2} \right] \quad [\mathsf{mm}]$$

Power P 3)

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

Speed of the motor pinion v<sub>M</sub> 4)

$$v_{M} = \frac{n_{M} \cdot z_{M} \cdot t}{60 \cdot 10^{3}} \text{ [m/s]}$$

5) Circumferential force F

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

6) Review F

$$F_U \leq F_{Uzul}$$

Preload force F<sub>v</sub> 7)

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

8)

Free span length 
$$L_F$$

$$L_F = \sqrt{Eeff}^2 - \frac{(z_{PE} - z_M)^2}{4} / 1000 \quad [m]$$

Preload frequency of the belt f 9)

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



#### 14. Cross table

#### 14.1 Assembly



LINE TECH positioning units are also available as 2-axle units (cross table). A total of four mounting types are possible. The designation system opposite applies.

Assembly layout AC and AD cross tables are mounted without an intermediate plate if the same size. Intermediate plates are required for all other assembly types.

The individual positioning units must be ordered separately.

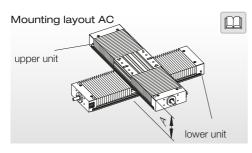
#### Accuracy

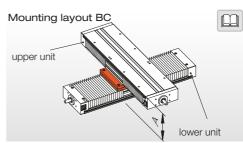
Standard accuracy for mounting cross tables is 0.1 mm/300 mm stroke.

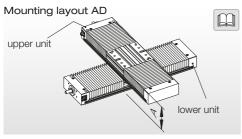
Greater accuracy on request.

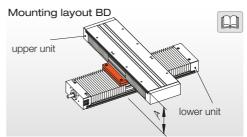
Designation system	KM	PE2	/	PE2	AC
Cross table mounting					
Abbreviation for lower axis					
PE1 / PE2 / PE3 / PE4					
Abbreviation for upper axis					
PE1 / PE2 / PE3 / PE4					
Mounting type					
AC / AD / BC / BD					

Dimensions A [mm]		Upper unit							
Alimin		PE1	PE2		PE3		PE3		
Mounting type		Α	В	A	В	A	В	Α	В
	PE1	100	116			not p	ossible		
lower	PE2	122	122	120	144		not p	ossible	
unit	PE3	on request		166	166	180	210	not po	ossible
	PE4		on re	quest		215	215	210	240



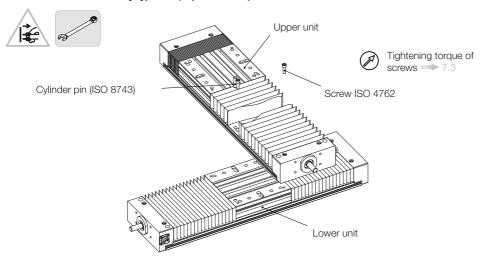


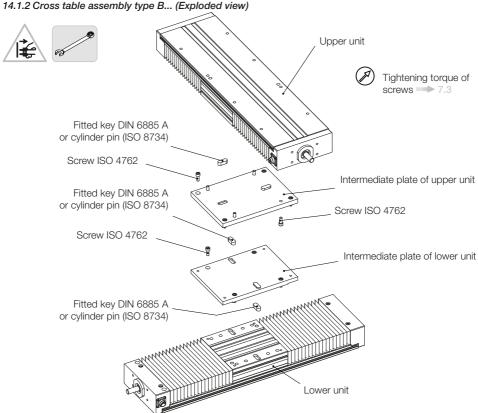






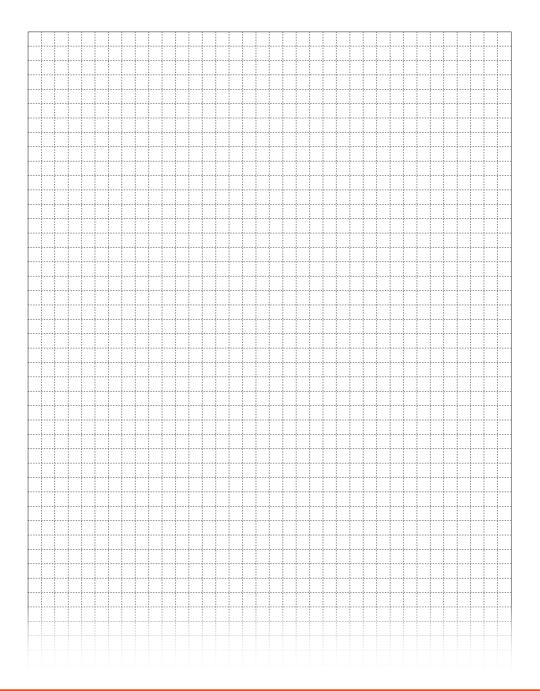
#### 14.1.1 Cross table assembly type A... (Exploded view)







### Notes





#### 15. Commissioning

#### 15.1 Operating conditions



Contact LINE TECH AG prior to commissioning for application areas with special operating conditions, such as in the presence of moisture, dirt, dust (fibre glass and wood), aggressive atmospheres, extreme climatic conditions and/or extreme temperature fluctuations, shortstroke and others.

Before commissioning the unit, check that the mounting means of the installed axis match the manufacturer's specifications with respect to the mass and acceleration and that they are secured.

Normal operating conditions						
Ambient temperature	5°C 80°C	°C				
Movement speed	≤ m/s	V				
Rotational speed of the ball screw						
Load						
Minimal stroke	Type	Minimal stroke				
	PE1	≥ 45 mm				
Stroke	PE2	≥ 55 mm				
	PE3	≥ 65 mm				
<u>-</u>	PE4	≥ 105 mm				

#### 15.2 Electrically connect the PE

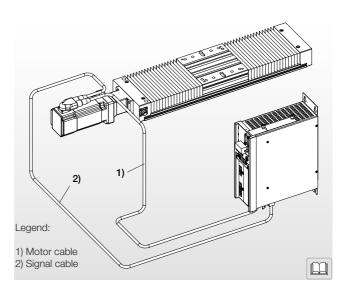






Observe the safety regulations when working on electrical systems! The AC/DC supply must be connected by a qualified electrician.

Install the power cables and signal cables so that they are spatially separated! Do not install the product near devices that generate strong electromagnetic fields. This could impair the function. Observe the documentation of the controller used.













Check the EMERGENCY OFF switch prior to the first test run! Note the technical data about the positioning units with ball screw > 8.2 - 8.4

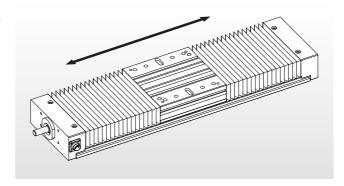
Carry out a trial run only in the installed state combined with linear guides.

Check the internal protective equipment.

Check all screw connections to ensure they are tight.

Carry out the entire stroke at a low speed.

Check the setting and function of the limit switch 12.2



#### 16. Operation



The positioning unit with ball screw may only be used in accordance with the intended use provided by LINE TECH AG

The positioning unit with ball screw may only be operated under operating conditions that are approved by the manufacturer  $\implies$  15.1

The positioning unit must be checked for externally visible damage and defects. Externally attached mounting means, electrical cables and plug connections must be visually checked to ensure they are in a flawless condition.

If changes occur that put the safety of people and systems at risk, these are to be taken out of operation immediately.

#### 17. Decommissioning











Disconnect the machine/system from the mains supply. To secure the machine from being switched on again without authorisation, actuate the emergency stop and attach the warning sign "Machine/system disconnected from mains supply".

During disassembly, watch out for falling parts on modules that are installed overhead or in a vertical position. The decommissioning work must be done only by qualified specialists while complying with all relevant safety regulations.

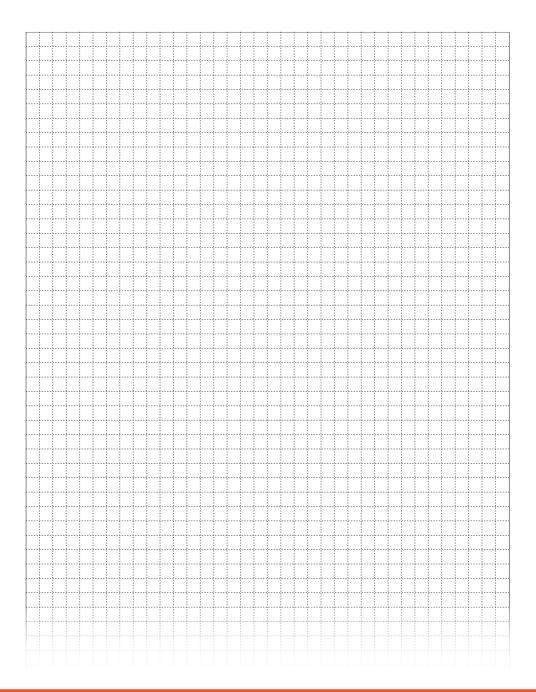
Remove the drive from the unit.

Unscrew the positioning unit from the machine/system





### Notes





#### 18. Maintenance - Service - Upkeep

#### 18.1 Lubricant Quantities, Lubrication Points, Lubrication Interval



The initial greasing is performed by LINE TECH AG. The bearings used are usually maintenance-free and do not have to be re-lubricated under normal conditions.

The positioning units may only be lubricated with grease. LINE TECH AG recommends MICROLUBE GBU-Y 131 as a standard grease. If using other greases (other brands), the compatibility with the standard grease must be checked first. Observe the safety data sheet.

In the event of special operating conditions, inquire about the lubricant quantities. Values and information about lubricant quantities can be found in the adjacent table, corresponding to use under normal operating conditions.

There are grease nipples on both sides of the carriage parts. It is sufficient if the amount of grease is pressed in from one side only.

Type	BSD	Grease	Grease relubrications					
				Runner bloc	cks (cm³)			
	d x P (mm)		Ball screw (cm <sup>3</sup> )	Grease point 1)	Grease point 2) + 3)			
	16 x 5		-	1.00				
PE1	16 x 10		-	1.25	0.40			
	16 x 16		-	1.54				
PE2	20 x 5	Klüber	1.00		1.50 (per carriage)			
PE2	20 x 20		2.20	-				
	25 x 5	Microlube	1.40		0.00			
PE3	25 x 10	GBU-Y 131	1.70	=	2.00 (per carriage)			
	25 x 25		3.10		(per carrage)			
DE 4	32 x 5		2.00		00.00			
PE4	32 x 10		2.80	-	20.00 (per side)			
	32 x 32		4.90					





Depending on which value is reached first, the linear guides and the ball screw are to be relubricated according to the adjacent table

Туре	BSD d x P (mm)	Operating interval (h)	Time interval (months)	Running interval (km)	
	16 x 5	•		250	
PE1	16 x 10	500	3 - 6	500	
	16 x 16			800	
PE2	20 x 5	500	3 - 6	250	
PEZ	20 x 20	500	3 - 0	1 000	
	25 x 5			250	
PE3	25 x 10	500	3 - 6	500	
	25 x 25			1 250	
	32 x 5			250	
PE4	32 x 10	500	3 - 6	500	
	32 x 32			1600	











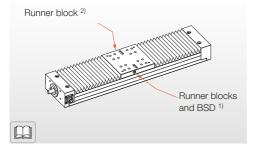


The lubrication positions of the positioning units are stroke-independent. For sizes PE2 and PE3, the bellows on the carriage must be loosened and pushed aside before lubrication.

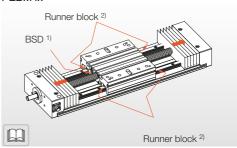
Various grease nipples are present on the positioning units:

- 1) Grease nipple according to DIN 3405-D
- 2) Grease nipple according to DIN 3402 and DIN 71412
- 3) Grease nipple according to DIN 71412

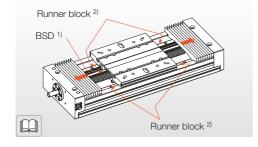
PE1..R..



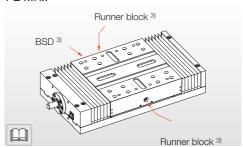
PE2..R..



PE3..R..

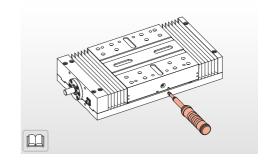


PE4..R..



For pressing in the lubricant, we recommend the grease gun with the item number:

ZPE.GREASEGUN-00



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# LINE TECH=

Linear movements are the backbone of modern, industrial production systems. LINE TECH AG has been involved in linear technology solutions for more than 20 years. A comprehensive range of components as well as linear and positioning systems, combined with the specialist expertise of our employees, is the stand-out benefit of LINE TECH AG.

Matured services, from engineering to design, in conjunction with flexible production, complement the product offering, thereby offering customers a high level of benefit.

### In-house products

In-house products from LINE TECH are modular, ready-to-install linear axles:

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

### Systems / Assemblies

Our engineering team develops tailor-made solutions in accordance with customer requirements.

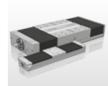
#### Components

Trade products complement the product offering with linear guides, drives and components:

- Linear guides
- Ball screws
- Roller linear guides
- Ball bushings and shafts
- Ball casters
- Extensive range of accessories
- Megatorque motors
- Linear motors

























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