

POSITIONING UNITS
EXCERPT FROM MAIN CATALOGUE

V 11-15

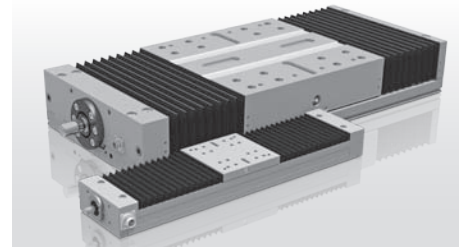


Table of contents

- Product overview _____ 146–147
- Design fundamentals / Lubrication / Maintenance _____ 148
- Profile cross-sections _____ 149–150
- Positioning unit with ball screw drive
 - Details for ball screw drive _____ 152
 - General technical details for positioning units _____ 153
 - Load ratings and torques _____ 154
- Rigidity and accuracy _____ 155
- Permissible speeds _____ 156
- Permissible deflection _____ 157–158

- **Positioning units with ball screw drive**
 - Designation system _____ 160–161
 - Information for selection » Motor mounting preparation _____ 162
 - Dimensions PE1.4...NR... (without protective covering) _____ 164
 - Dimensions PE1.4...FR... (with expansion bellows) _____ 165
 - Dimensions PE2.4...NR... (without protective covering) _____ 166
 - Dimensions PE2.4...FR... (with expansion bellows) _____ 167
 - Dimensions PE3.4...NR... (without protective covering) _____ 168
 - Dimensions PE3.4...FR... (with expansion bellows) _____ 169
 - Dimensions PE4.4...NR... (without protective covering) _____ 170
 - Dimensions PE4.4...FR... (with expansion bellows) _____ 171

- Limit switch; fitting / plug connector _____ 172–173
- Motor mounting straight with ball screw drive _____ 174–175
- Motor mounting side with ball screw drive _____ 176–177
- Attachment of positioning units _____ 178
- Attachment accessories; sliding blocks _____ 179
- Cross table mounting _____ 180
- Grease points _____ 181



PE

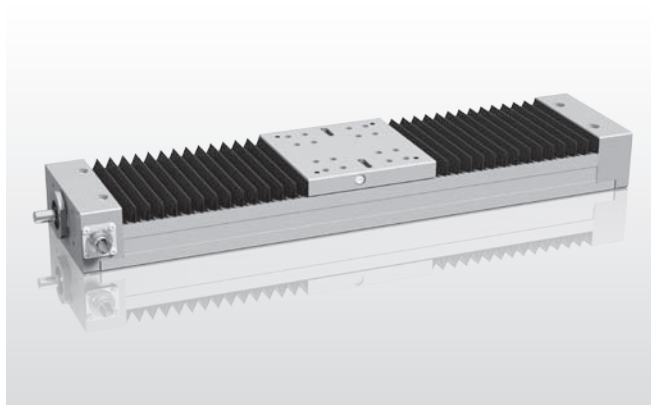
POSITIONING UNITS



Product overview

PE...R...

Positioning units with ball screw drive



PE





POSITIONING UNITS

Product overview

LINE TECH positioning units are precision, ready-to-install, modular linear systems with linear guides and ball screw drive for the highest levels of performance and precision. They are intended for applications having the strictest requirements of precision and loadability. Four sizes (PE1, PE2, PE3 and PE4) are currently available.

Advantages

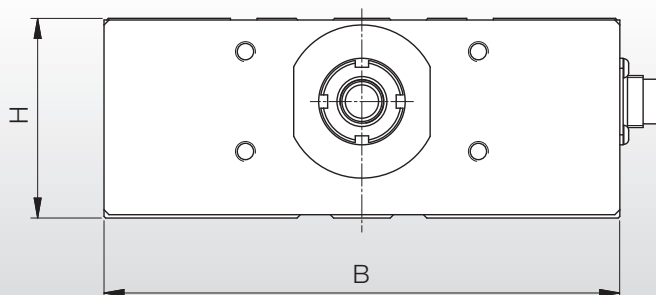
- Compact dimensions
- High-precision running characteristics together with highest load ratings and extreme rigidity
- Actuation by ball screw drive
- Simple motor mounting by centering and thread on driving head
- Design aligned to application possible

Structure

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

Customised options

- Motor mounting
- Limit switch
- Cross table mounting
- Multi-axis systems



Positioning unit Type	Dimensions B x H [mm]	Load ratings	
		C ₀ [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

PE

Please refer to pages 148 to 150 for load capacities.



POSITIONING UNITS

Design fundamentals / Lubrication / Maintenance

LINE TECH Positioning Units

LINE TECH positioning units with ball screw drive are of modular conception, ready to built-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 chip-pings) by expansion bellows.

The guides and drive are protected from external factors (such as dirt and chip-pings) 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.

Lubrication

LINE TECH positioning units are pre-lubricated with „Microlube GBU Y 131“. This quality grease offers outstanding properties for the guidance and screw drive elements as well.

Greasing should be carried out at regular intervals, depending on the load and area of operation. Lubrication is required every 500 operating hours on average.

All roller bearings are greased for life and thus do not require any maintenance. Correct and adequate lubrication can substantially prolong the life of positioning units.

Note: Also follow here the instructions on the grease points (page 181).

Maintenance

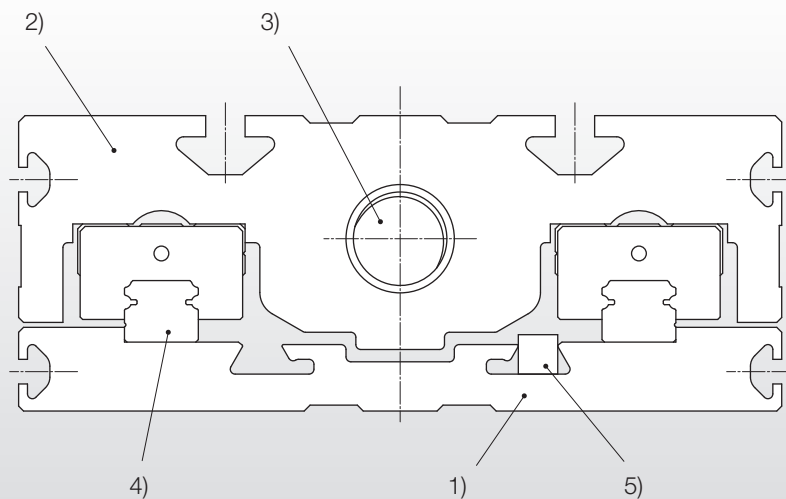
LINE TECH positioning units are maintenance-free (apart from the lubrication required).

Service temperature

The permissible operating temperature (between 5 and 80 °C) is determined by the synthetic materials used.

The specifications of the relevant manufacturers apply for motors and control units.

PE...R...
with ball screw drive



- 1) Base plate
- 2) Carriage
- 3) Ball screw drive
- 4) Linear guide
- 5) Limit switch

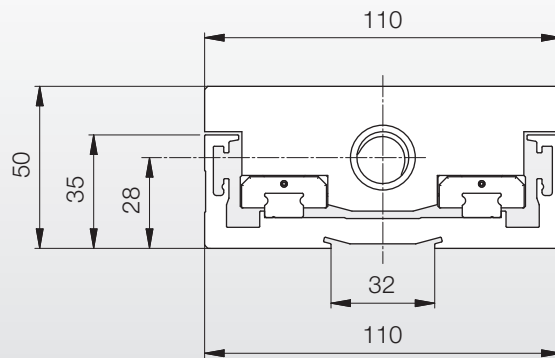


POSITIONING UNITS

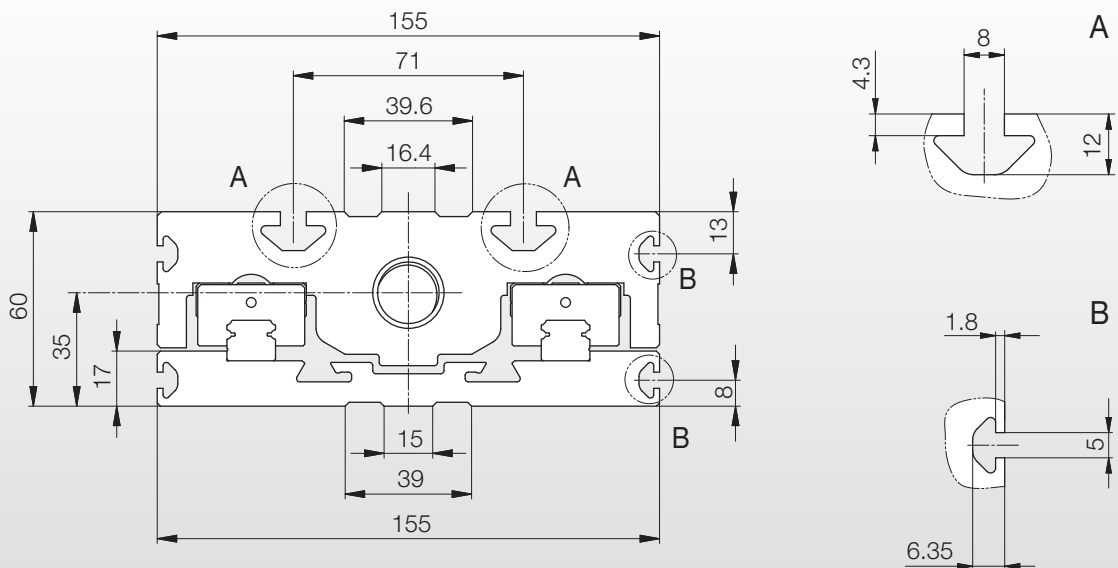


Profile cross-sections PE...R...

PE1...R...



PE2...R...



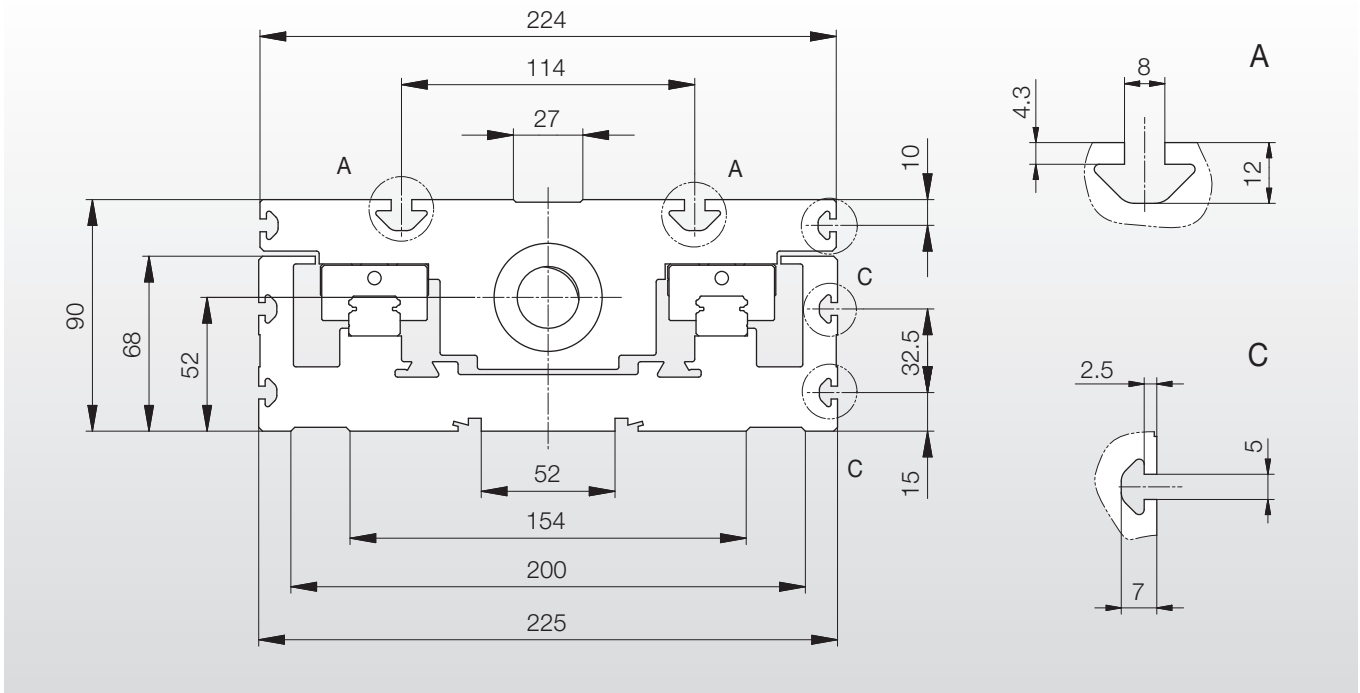
PE



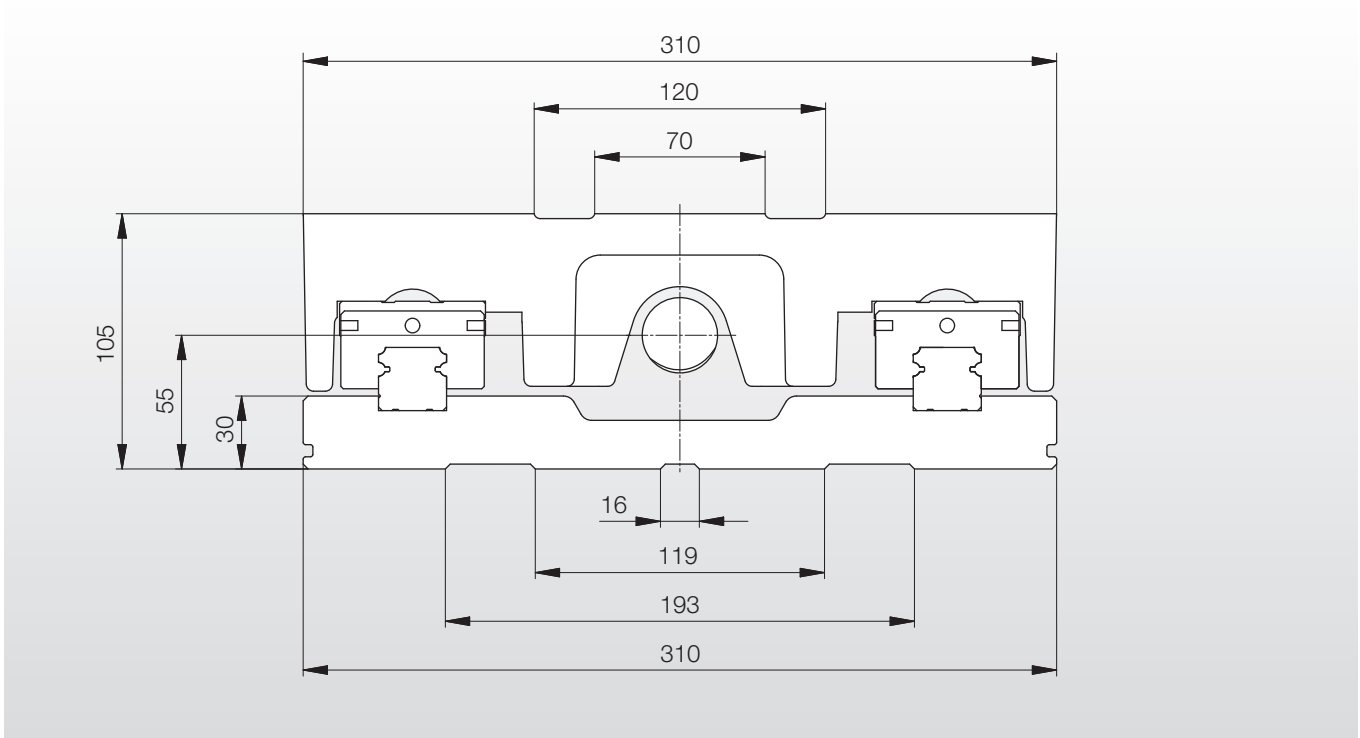
POSITIONING UNITS

Profile cross-sections PE...R...

PE3...R...

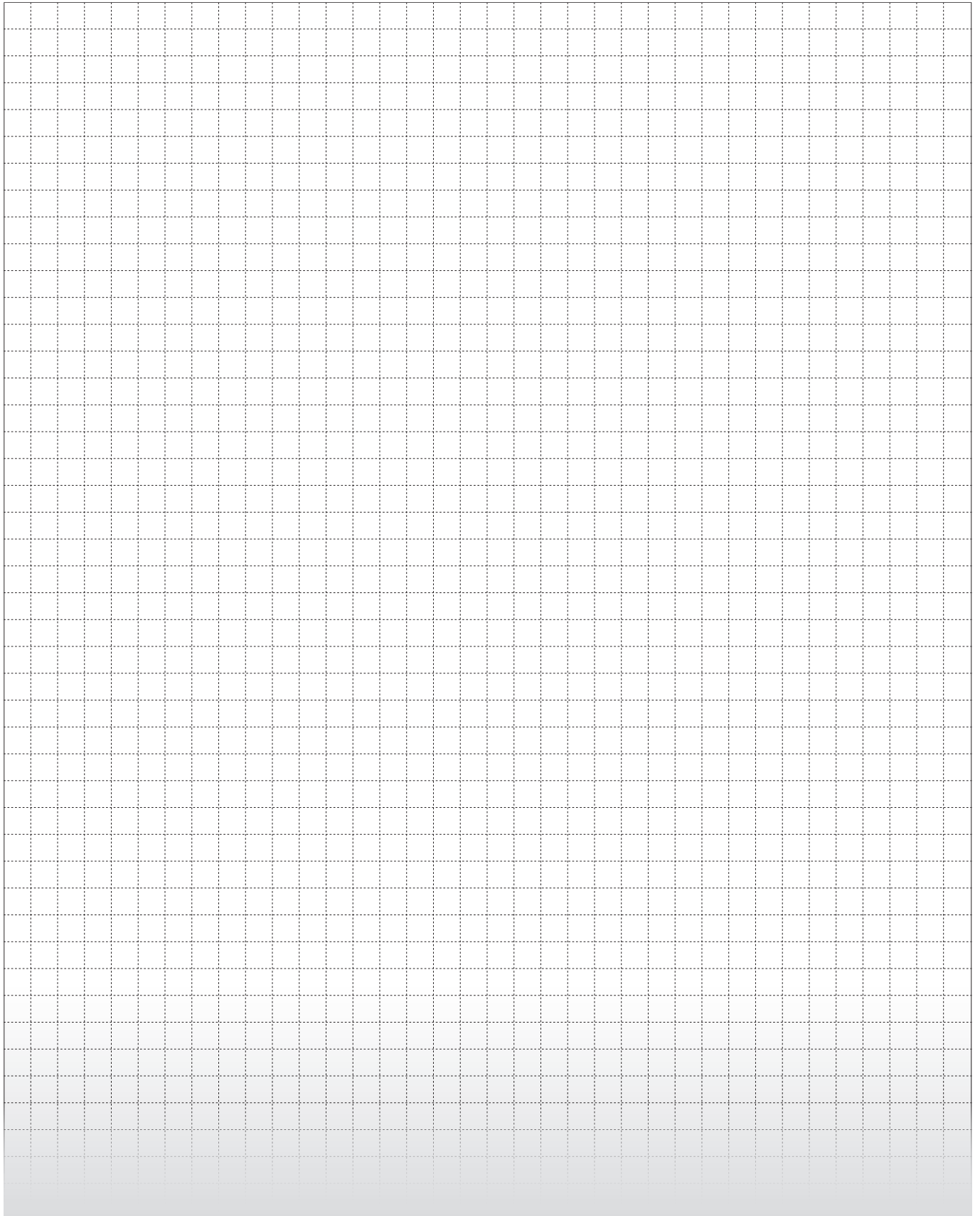


PE4...R...



PE

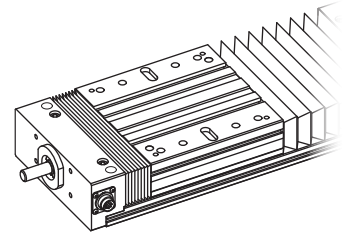




POSITIONING UNITS WITH WITH BALL SCREW DRIVE



Details for ball screw drive



Details for ball screw drive (BSD)

PE	BSD	Axial load rates		Positioning accuracy	Repeating accuracy	Acceleration	Axial play		Idle torque
		C_0 [N]	C_{dyn} [N]				Type	Axial play [mm]	
Size	d x p [mm]			[$\mu\text{m}/\text{mm}$]	[mm]	a_{max} [m/s^2]			[Nm]
PE1...R...	16 x 5						V	—	0.100
	16 x 10	4551	4327	52/300 ²⁾	< 0.01 ¹⁾	10.0	V	—	0.200
	16 x 16						V	—	0.320
PE2...R...	20 x 5	5705	4912	52/300 ²⁾	< 0.01 ¹⁾	10.0	V	—	0.120
	20 x 20						V	—	0.400
PE3...R...	25 x 5						V	—	0.150
	25 x 10	7308	6140	52/300 ²⁾	< 0.01 ¹⁾	10.0	V	—	0.300
	25 x 25						V	—	0.500
PE4...R...	32 x 5						V	—	0.200
	32 x 10	11538	8947	52/300 ²⁾	< 0.01 ¹⁾	10.0	V	—	0.400
	32 x 32						V	—	1.200

d x p = screw diameter x thread pitch

¹⁾ backlash not factored in

²⁾ also available with 23 μm / 300 mm

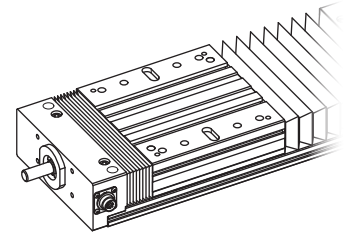
V = preloaded



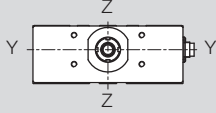
POSITIONING UNITS WITH WITH BALL SCREW DRIVE



General technical details for positioning units



General technical details for positioning units with ball screw drive

PE Type	Movement speed		Moments of inertia		Stroke max. [mm]	Expansion bellow	Feed and friction force F_V [N]	Moved mass m_b [kg]
	Guide v_{max} [m/s]	Drive v_{max} [m/s]						
			I_Y [cm ⁴]	I_Z [cm ⁴]				
PE1.4...R...	1.6	2)	8.9	178.2	2160	without	10.00	1.100
					1500	with	10.00	
PE2.4...R...	1.6	2)	9.7	513.7	2570	without	12.00	2.700
					2000	with	12.00	
PE3.4...R...	1.6	2)	202.8	3940.0	4055	without	15.00	5.470
					3000	with	15.00	
PE4.4...R...	1.6	2)	125.1	8560.0	3785	without	25.00	16.600
					3000	with	25.00	

²⁾ for ball screw drive, dependent on rotational speed characteristics, spindle length and relevant critical rotational speed.

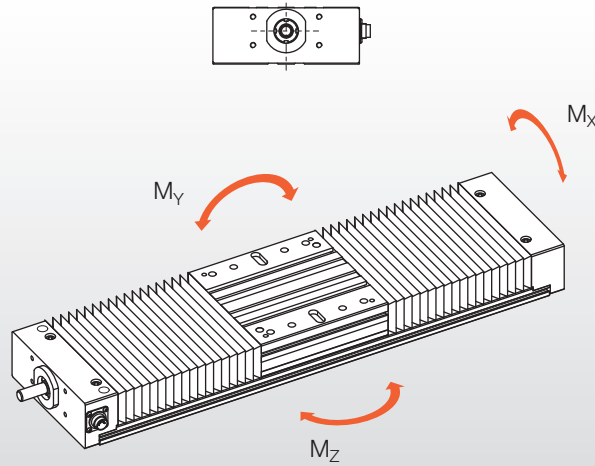


POSITIONING UNITS WITH WITH BALL SCREW DRIVE

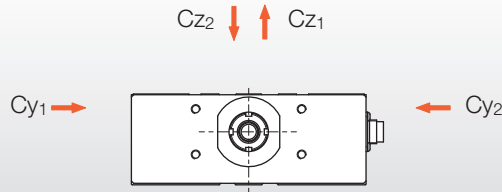
Load ratings and torques

PE...R...

Torques



Load ratings



Positioning unit Type	Maximum permissible force [kN]					Maximum permissible torque [Nm]					
	static			dynamic		static			dynamic		
	$C_{y_{0,1,2}}$	$C_{z_{0,1}}$	$C_{z_{0,2}}$	$C_{y_{1,2}}$	$C_{z_{1,2}}$	M_{x_0}	M_{y_0}	M_{z_0}	M_x	M_y	M_z
PE1.4...R...	13.8	13.8	13.8	9.2	9.2	422	380	380	281	253	253
PE2.4...R...	42.5	50.7	67.8	29.3	33.4	2457	2230	1872	1618	1469	1290
PE3.4...R...	59.2	70.5	94.0	41.4	46.8	4757	4617	3877	3157	3065	2691
PE4.4...R...	230.5	274.5	366.0	161.9	184.0	30195	26625	22365	20240	17547	15708

Note on dynamic load ratings and torques

The determination of dynamic load ratings and torques is based on a 50,000 m stroke. If comparative values must be

calculated for a 100,000 m stroke, the values for M_x , M_y , M_z and C must be divided by the factor 1.26.

Expedient load

With a view to serviceable life, loads of less than 20% of the dynamic load ratings have generally proved to be expedient.





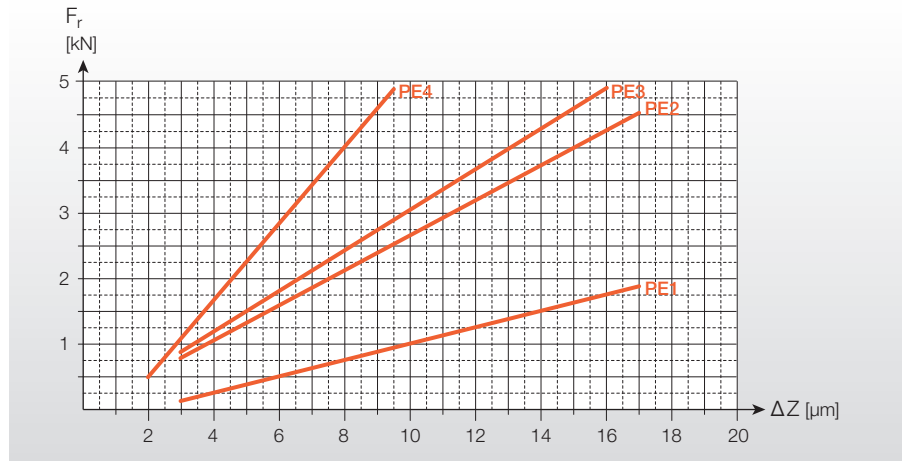
POSITIONING UNITS

Rigidity and accuracy

Rigidity

Rigidity values pertain to the linear guide – without factoring in the surrounding environment. The values given are based on standard linear guides with preload Z1 for the runner blocks.

At elevated rigidity requirements, we recommend linear guides with preload Z3.

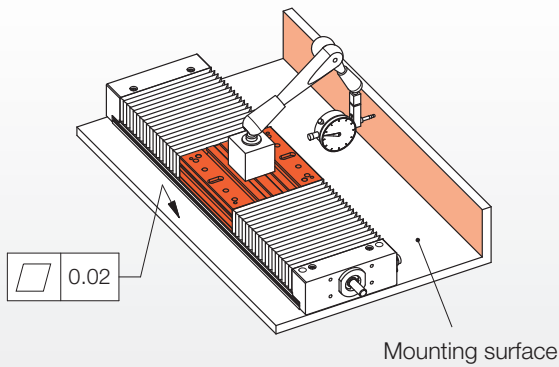


Accuracy

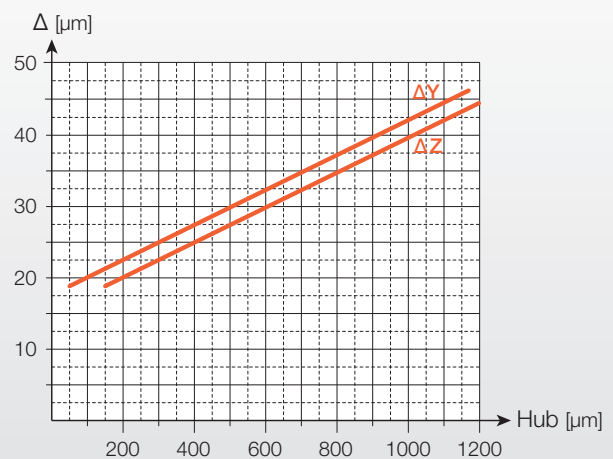
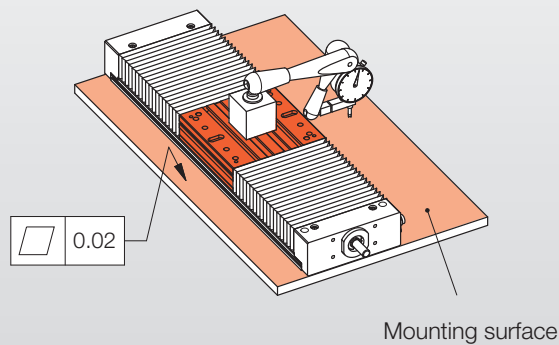
The precision of any linear system not only depends on the positioning and repeating accuracy but also on the track accuracy of the carriage. This accuracy can be seen in the following diagrams.

Also the mounting surface of the positioning unit has a great influence on the track accuracy since any inaccuracy of the mounting surface can hardly be compensated by the positioning unit itself.

Accuracy in Y-direction (ΔY)



Accuracy in Z-direction (ΔZ)



PE

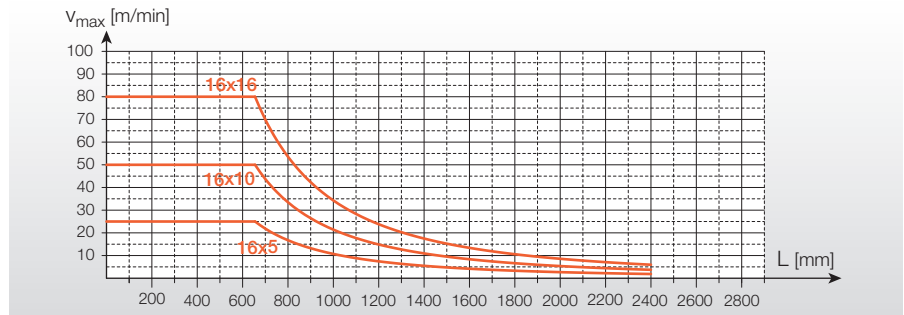


POSITIONING UNITS

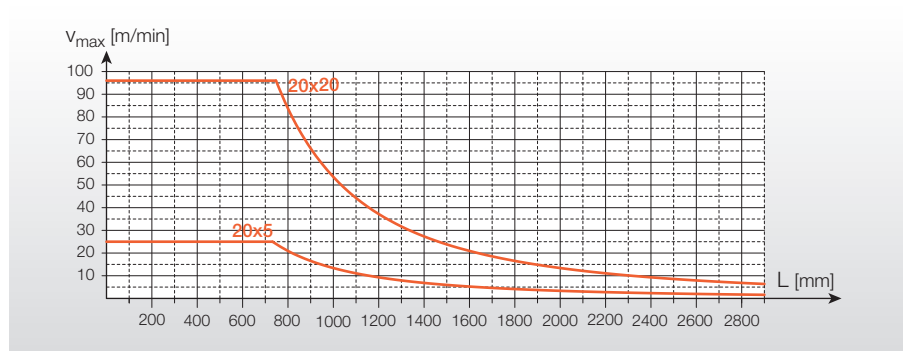
Permissible speeds

Permissible speeds...

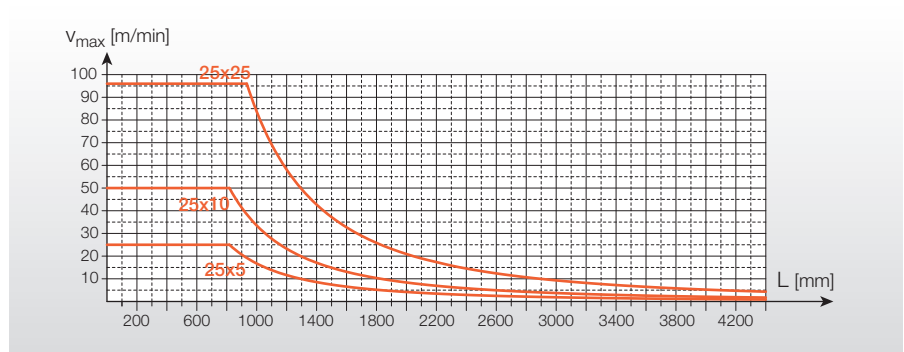
... for PE1... with ball screw drive $\varnothing 16 \times \dots$ ¹⁾



... for PE2... with ball screw drive $\varnothing 20 \times \dots$ ¹⁾



... for PE3... with ball screw drive $\varnothing 25 \times \dots$ ¹⁾



Caution:

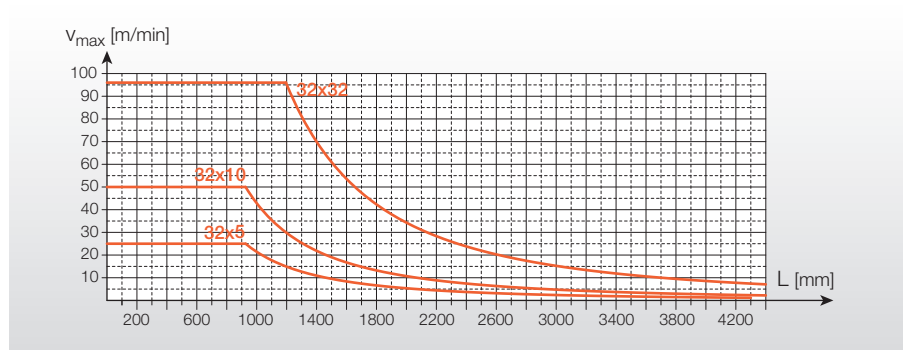
For ball screw drive, note the rotational speed characteristics, spindle length and relevant critical rotational speed.

Please also pay attention to the motor speeds.

¹⁾ greater accuracy on request

L = overall length of the positioning unit

... for PE4... with ball screw drive $\varnothing 32 \times \dots$ ¹⁾



PE



POSITIONING UNITS

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

Permissible deflection

Positioning units can be installed so as to be self-supporting. However, the deflection (which limits the possible load) must be taken into consideration.

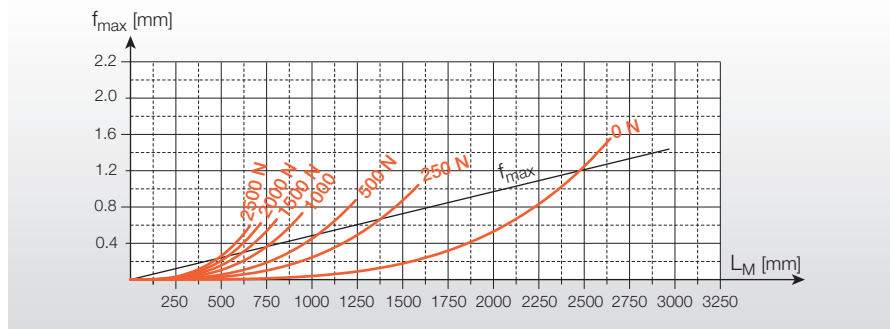
If the maximum permissible deflection is exceeded, the positioning units must have additional support.

The maximum permissible deflection is limited by the maximum deflection angle of 5'. Exceeding this value without support will have a negative effect on the unit's service life.

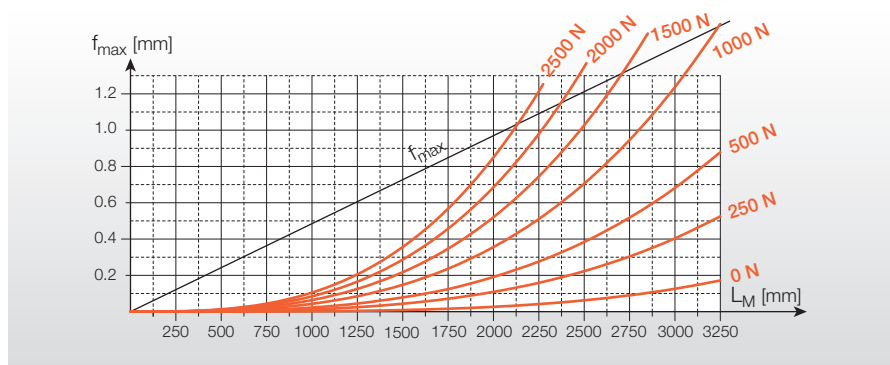
If increased demands are placed on system accuracy, we recommend supporting the positioning units along their entire length.

- The diagrams on the right apply for:
- Firm clamping (40–50 mm per side)
 - 3–4 screws per side
 - Solid substructure

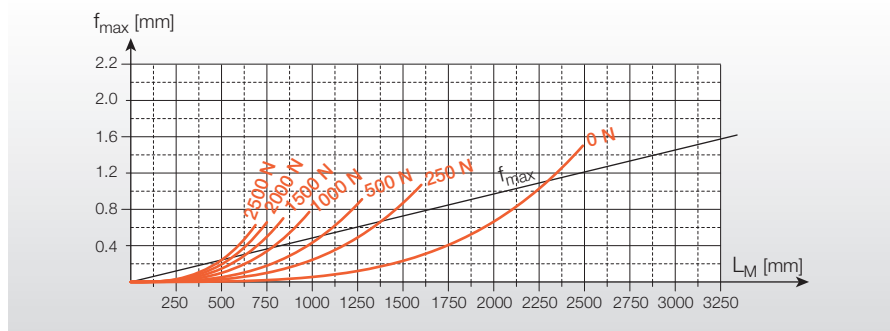
PE1... horizontal



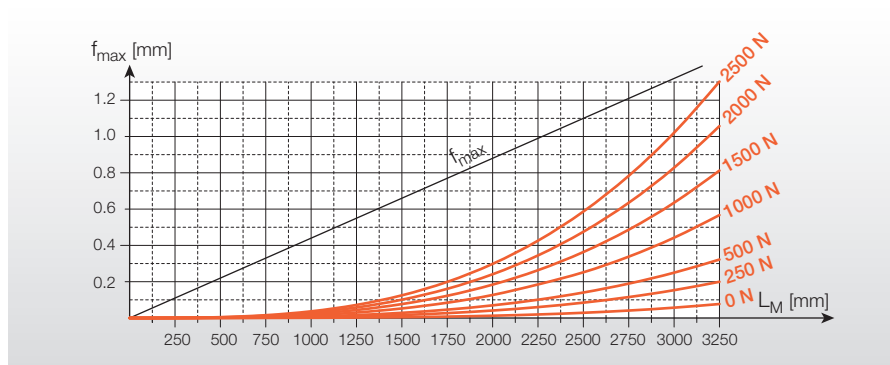
PE1... vertical



PE2... horizontal

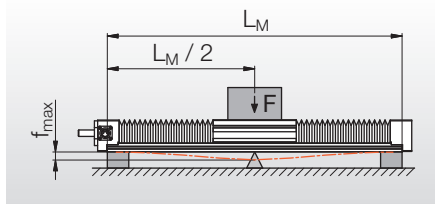


PE2... vertical

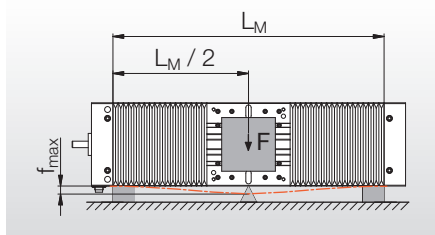


Mounting positions:

- horizontal



- vertical

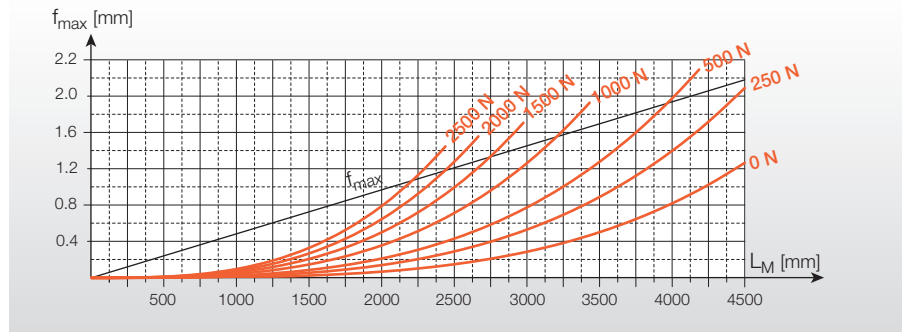




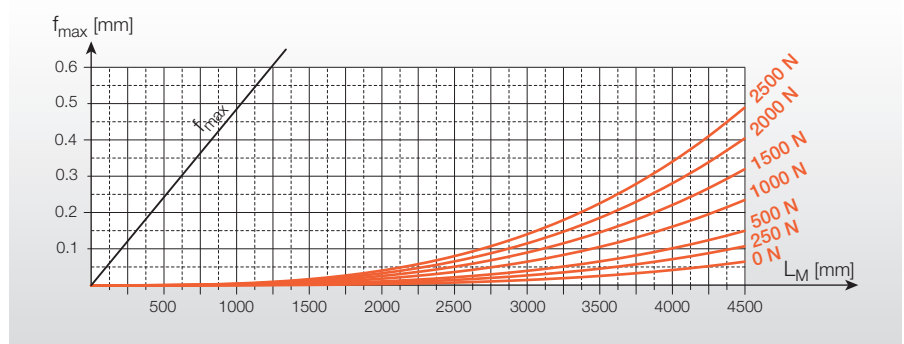
POSITIONING UNITS

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

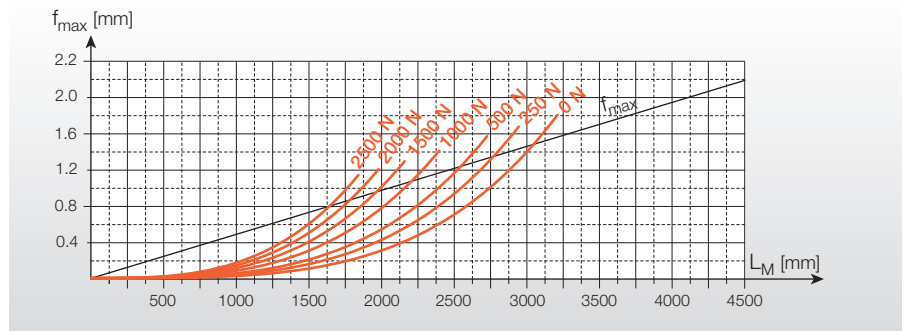
PE3... horizontal



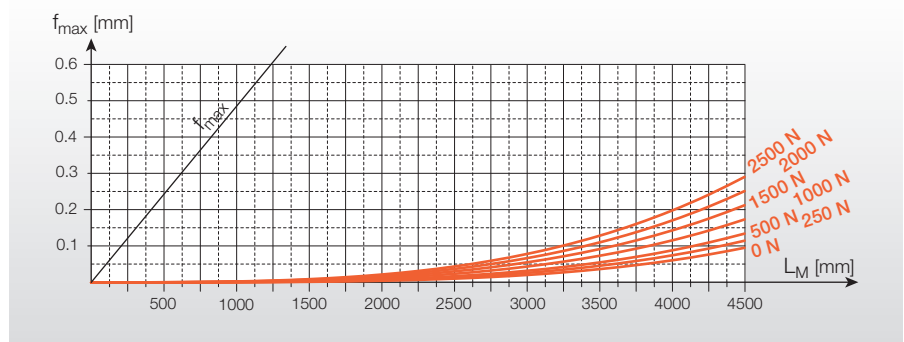
PE3... vertical



PE4... horizontal

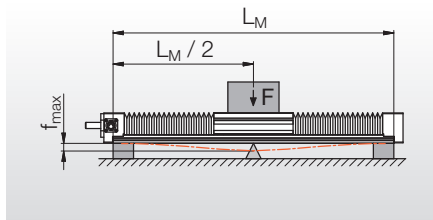


PE4... vertical

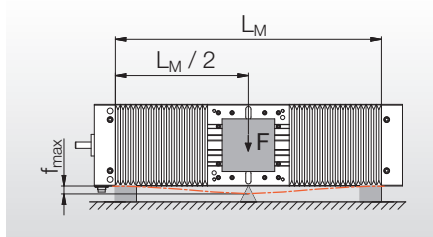


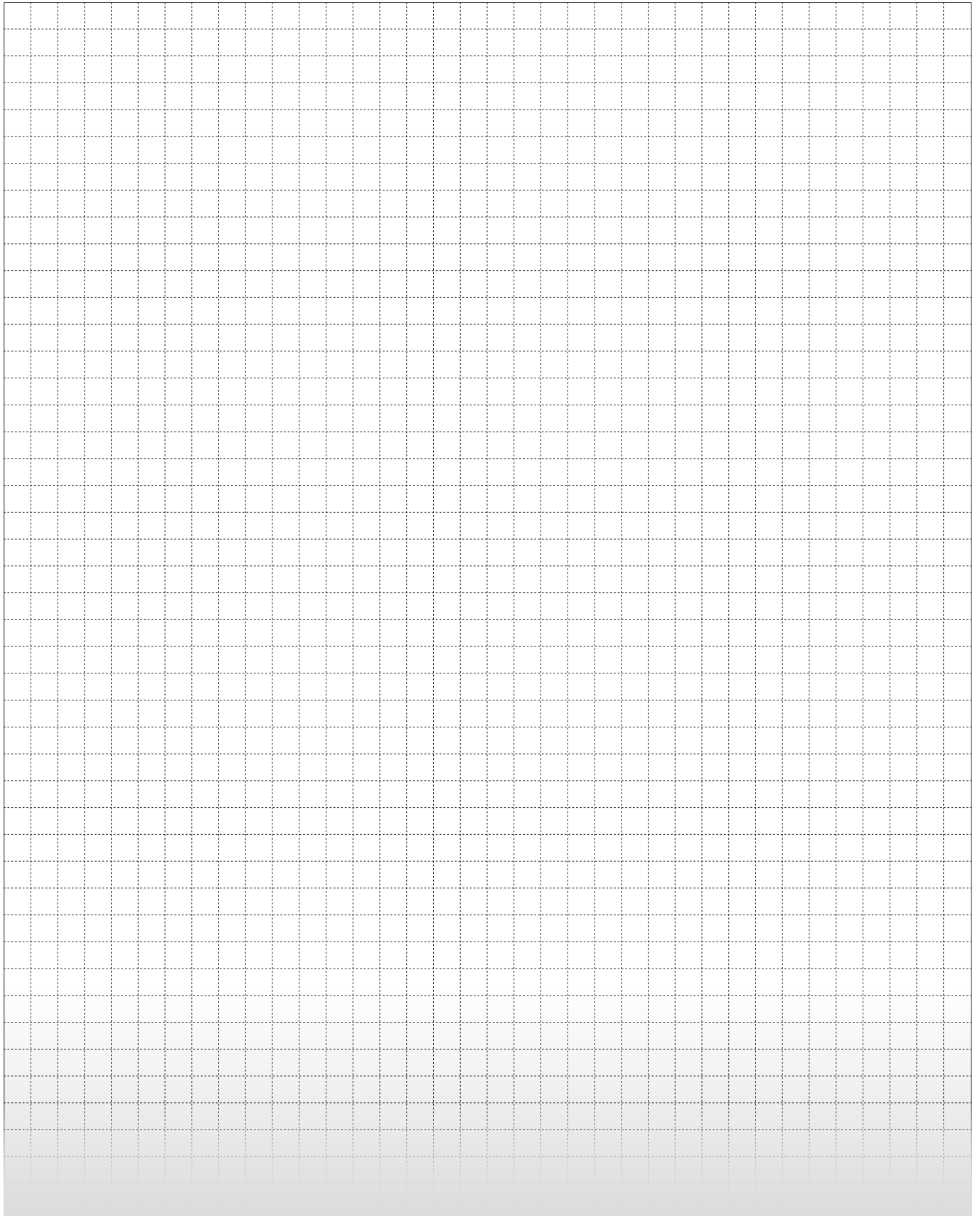
PE

Mounting positions:
- horizontal



- vertical







POSITIONING UNITS

Designation system

Positioning unit (designation example)

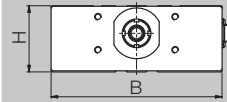
PE 2 . 4 . 0500 F R 005 . 1

Design

PE = positioning unit with linear guides

Size

- 1 = 110 mm carriage width
- 2 = 155 mm carriage width
- 3 = 225 mm carriage width
- 4 = 310 mm carriage width



Size	PE... B x H [mm]
1	110 x 50
2	155 x 60
3	225 x 90
4	310 x 105

Configuration

- 4 = 4 runner blocks (1 carriage)
- ... = special execution ¹⁾

Stroke in [mm]

Protective covering

- F = expansion bellows ***
- N = without protective covering

Drive

- R = rolled ball screw ***
- N = without drive

Stroke per revolution [mm]

- 005 / 010 / 016 = size 1; ball screw with a pitch of 5, 10 or 16 mm
- 005 / 020 = size 2; ball screw with a pitch of 5 or 20 mm
- 005 / 010 / 025 = size 3; ball screw with a pitch of 5, 10 or 25 mm
- 005 / 010 / 032 = size 4; ball screw with a pitch of 5, 10 or 32 mm
- ... = other pitch ¹⁾

Limit switches

- 0 = without limit switch
- 1 = 2 limit switches, reference point at front (drive side)
- 2 = 2 limit switches, reference point at rear (opposite drive side)
- 3 = 2 limit switches + additional reference switch at front (drive side)
- 4 = 2 limit switches + additional reference switch at rear (opposite drive side)

* seen from motor opposite side towards motor

** available for lateral motor mounting only

*** standard version

¹⁾ on request

PE



02 . 0 F - 1 7 V L S N

5 8 3 - - - → 583... = drawing type

Options

N = without options ***

Plug type

S = with limit switch plug ***

N = without plug

Mounting position limit switch plug ²⁾

L = limit switch plug mounting left ***

R = limit switch plug mounting right *

N = without plug

Preload ball screw drive (BSD)

V = BSD preloaded ***

N = without drive

Tolerance class ball screw drive (BSD)

7 = Tolerance class BSD: T7 (52 µm/300 mm) ***

5 = Tolerance class BSD: T5 (23 µm/300 mm)

N = without drive

Preload runner blocks

1 = Preload runner blocks: Z1 ***

3 = Preload runner blocks: Z3

Motor mounting

N = without motor mounting ***

F = mounting plate for standard motor

S = mounting plate for special motor

Reduction ³⁾

0 = without reduction (1:1) ***

1 = reduction 1:1.5 **

2 = reduction 1:2 **

(3 = reduction 1:2.5) **

Assembly stage

00 = without drive

01 = free spindle end ***

02 = with coupling and intermediate plate

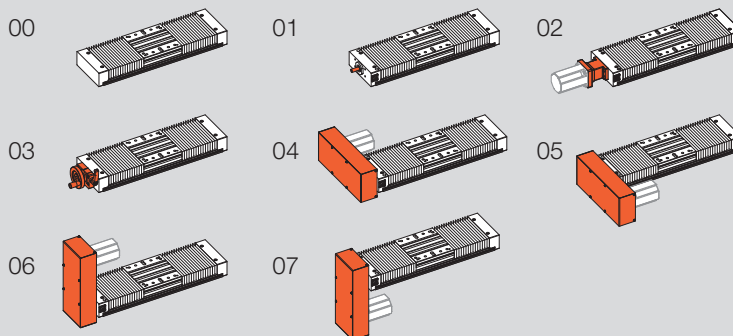
03 = with crank and clamp

04 = set up for lateral motor mounting right * ²⁾

05 = set up for lateral motor mounting left * ²⁾

06 = set up for lateral motor mounting top

07 = set up for lateral motor mounting bottom



²⁾ for motor mounting on the left or right side, the limit switch connector must be on the opposite side

³⁾ new designation system from 01.01.2015



POSITIONING UNITS WITH BALL SCREW DRIVE

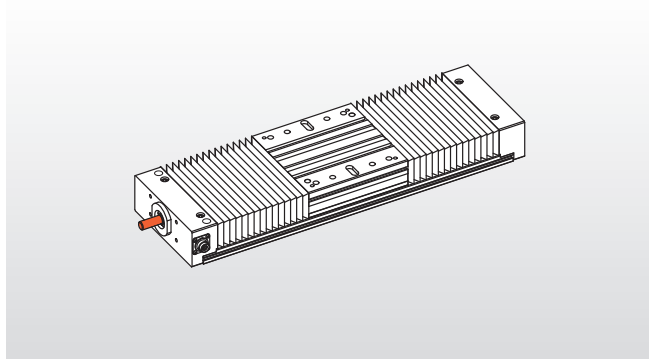
Information for selection » Motor mounting preparation

Motor fitting preparation – assembly stages with ball screw drive

LINE TECH positioning units with ball screw drive can be supplied with different motor mount preparations. Refer to pages 174 to 177 for dimensions.

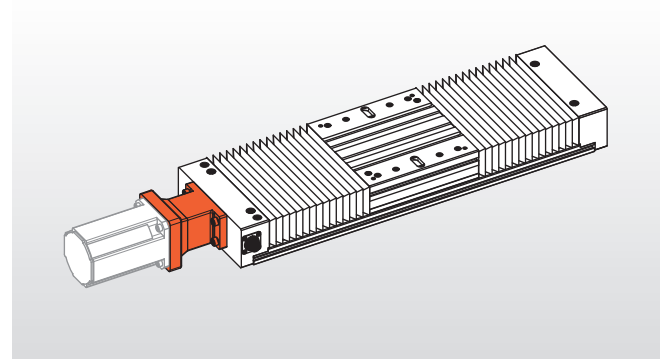
Assembly stage 01

Free spindle end



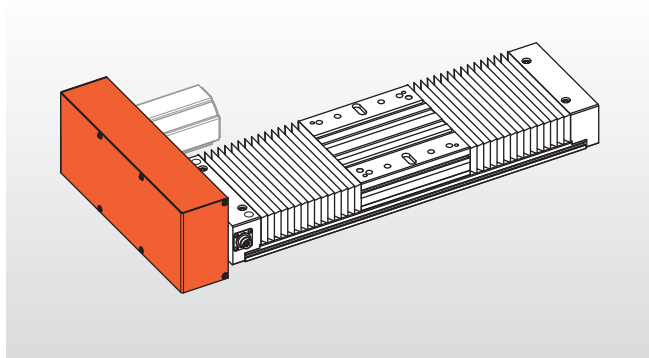
Assembly stage 02

With coupling and intermediate plate



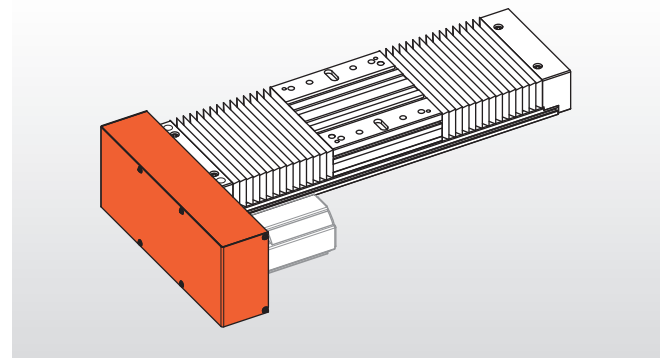
Assembly stage 04

Belt drive housing for lateral motor mounting right*



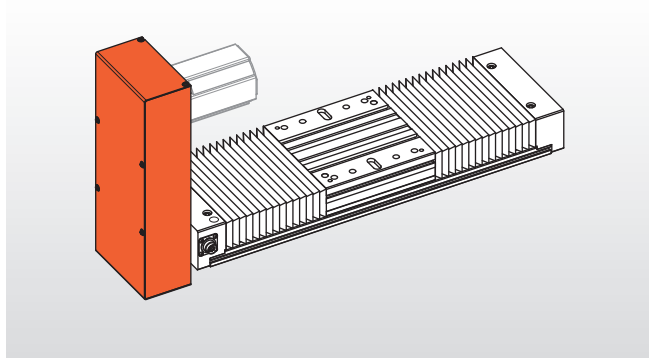
Assembly stage 05

Belt drive housing for lateral motor mounting left*



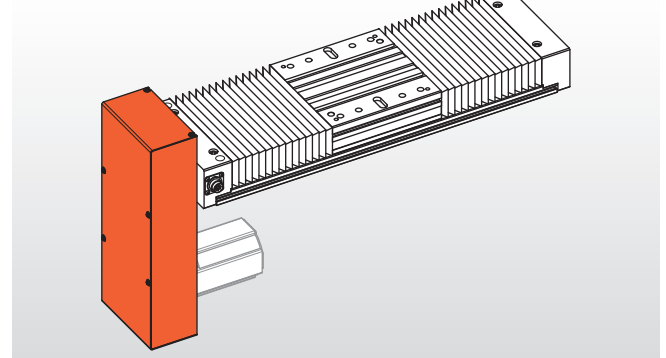
Assembly stage 06

Belt drive housing for lateral motor mounting top



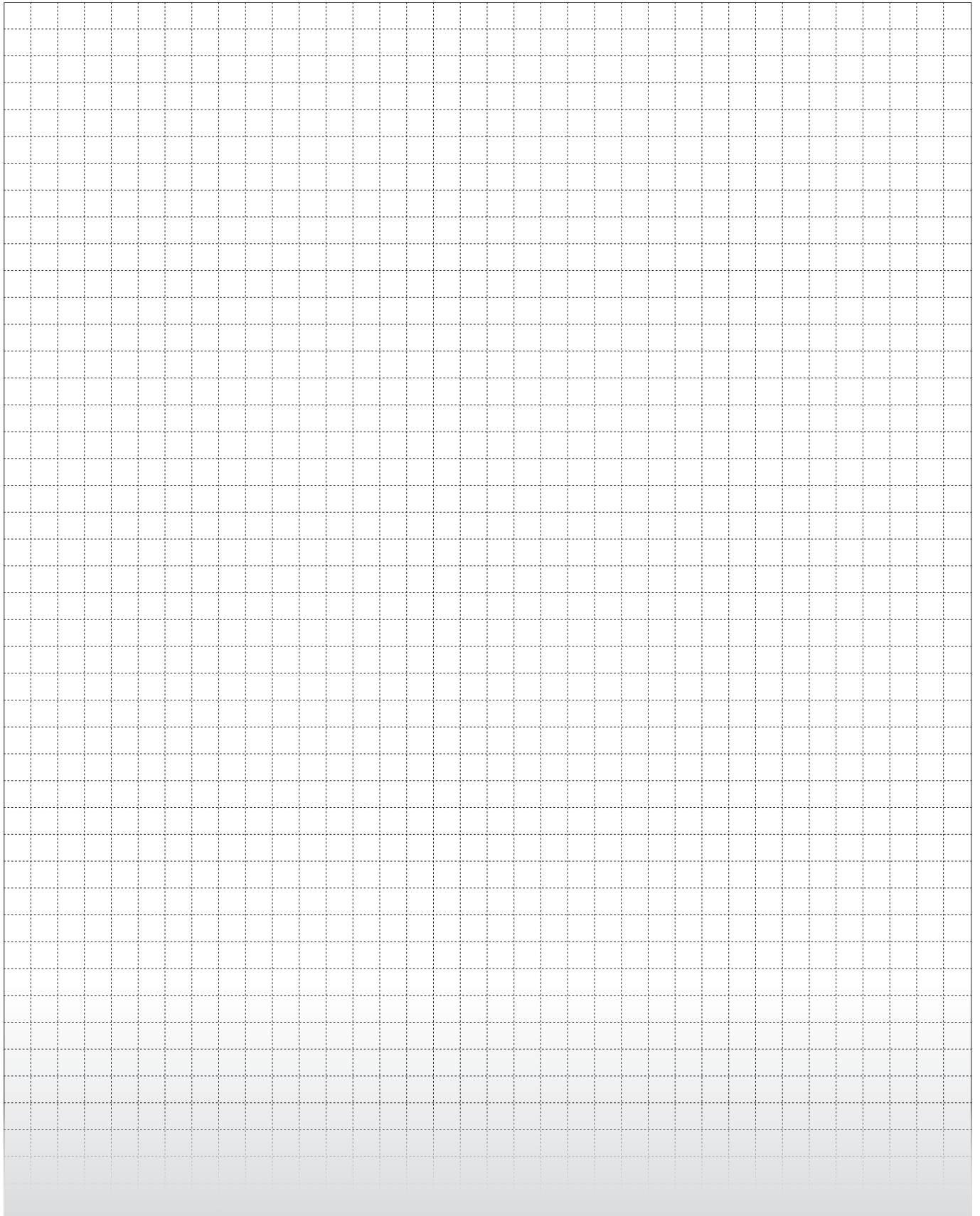
Assembly stage 07

Belt drive housing for lateral motor mounting bottom



* seen from motor opposite side towards motor

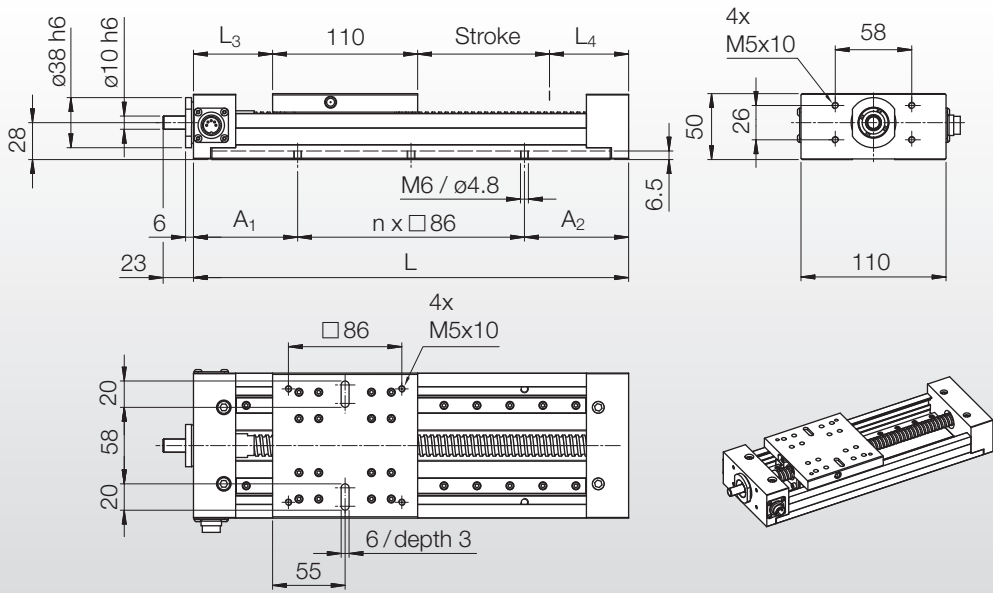






POSITIONING UNIT PE1.4...NR...

with ball screw drive, without protective covering



Nominal size		Dimensions							
Designation	Stroke [mm]	L [mm]	L ₃	L ₄	n	A ₁	A ₂	Ball screw length	Weight [kg]
PE1.4...NR...	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

CAD data is available from www.linetech.ch

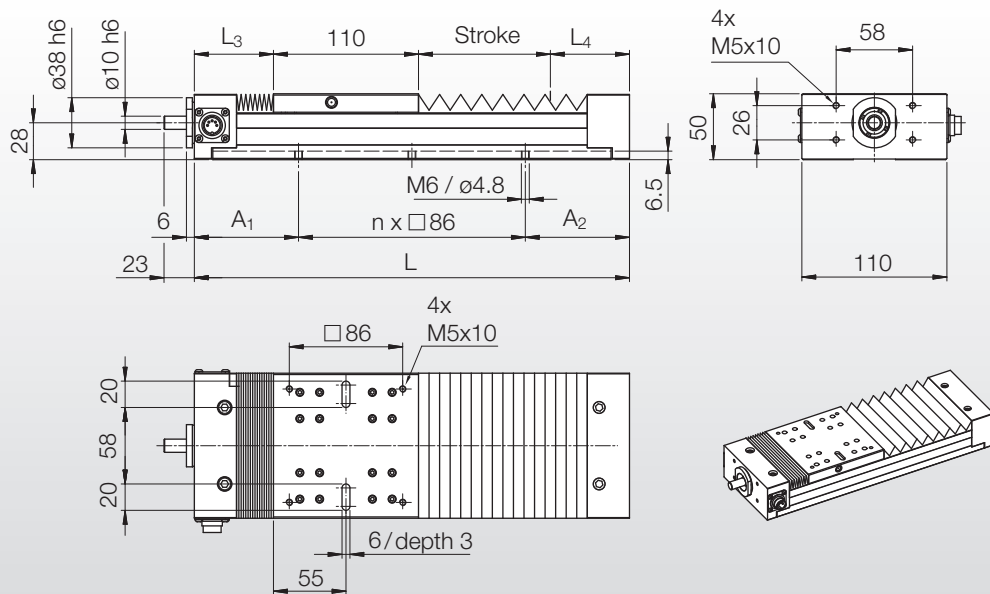


PE

POSITIONING UNIT PE1.4...FR...



with ball screw drive, with expansion bellows



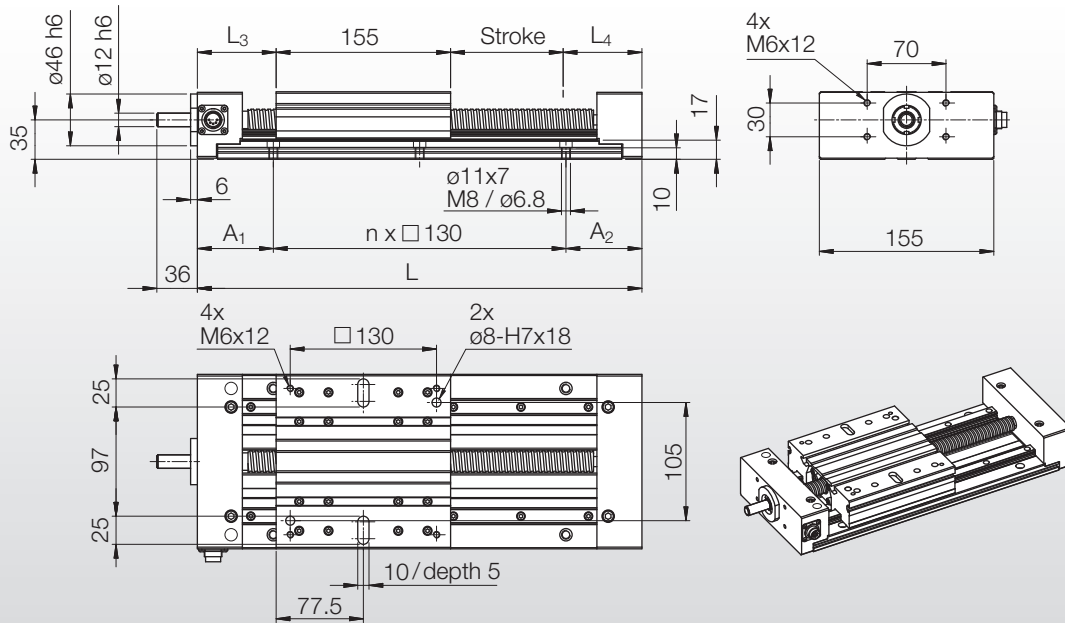
Nominal size		Dimensions							
Designation	Stroke [mm]	L [mm]	L ₃	L ₄	n	A ₁	A ₂	Ball screw length	Weight [kg]
PE1.4...FR...	50	255	47.5	47.5	2	41.5	41.5	225	3.0
	100	330	60	60	2	79	79	275	3.5
	150	400	70	70	3	71	71	350	4.0
	200	475	82.5	82.5	4	65.5	65.5	483	4.5
	250	550	95	95	5	60	60	558	5.0
	300	620	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	1274	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

CAD data is available from www.linotech.ch



POSITIONING UNIT PE2.4...NR...

with ball screw drive, without protective covering



Nominal size		Dimensions							
Designation	Stroke [mm]	L [mm]	L ₃	L ₄	n	A ₁	A ₂	Ball screw length	Weight [kg]
PE2.4...NR...	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

CAD data is available from www.linetech.ch

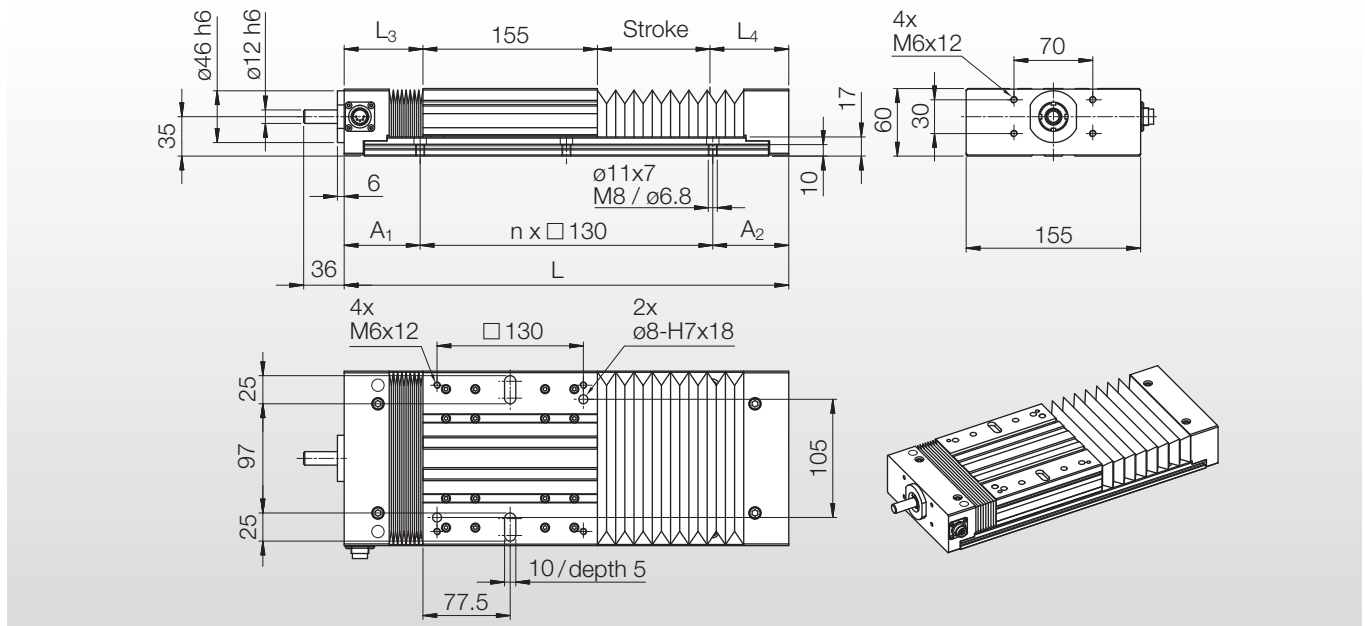


PE

POSITIONING UNIT PE2.4...FR...



with ball screw drive, with expansion bellows



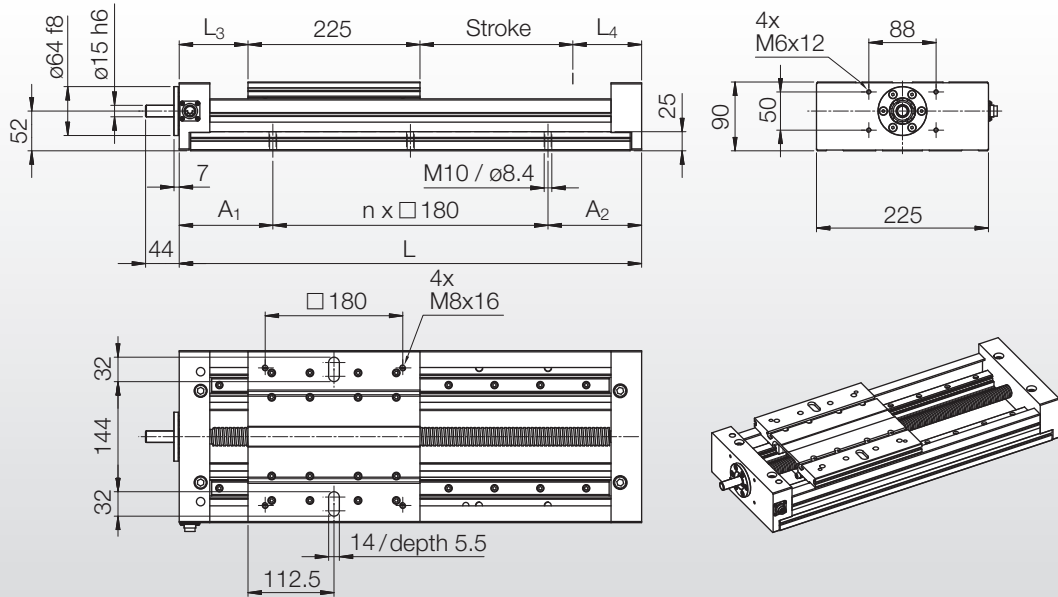
Nominal size		Dimensions							
Designation	Stroke [mm]	L [mm]	L ₃	L ₄	n	A ₁	A ₂	Ball screw length	Weight [kg]
PE2.4...FR...	50	330	62.5	62.5	1	100	100	343	9.8
	100	395	70	70	2	67.5	67.5	408	10.3
	150	455	75	75	2	97.5	97.5	468	10.8
	200	520	82.5	82.5	3	65	65	533	11.3
	250	585	90	90	3	97.5	97.5	598	11.8
	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

CAD data is available from www.linetech.ch



POSITIONING UNIT PE3.4...NR...

with ball screw drive, without protective covering



Nominal size		Dimensions							
Designation	Stroke [mm]	L [mm]	L ₃	L ₄	n	A ₁	A ₂	Ball screw length	Weight [kg]
PE3.4...NR...	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

CAD data is available from www.linetech.ch

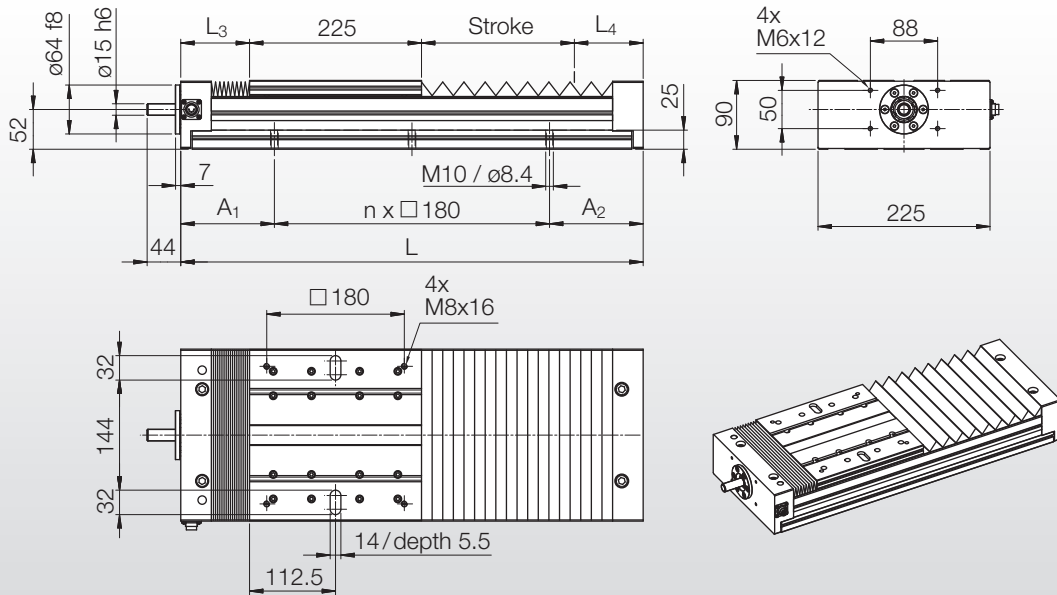


PE

POSITIONING UNIT PE3.4...FR...



with ball screw drive, with expansion bellows



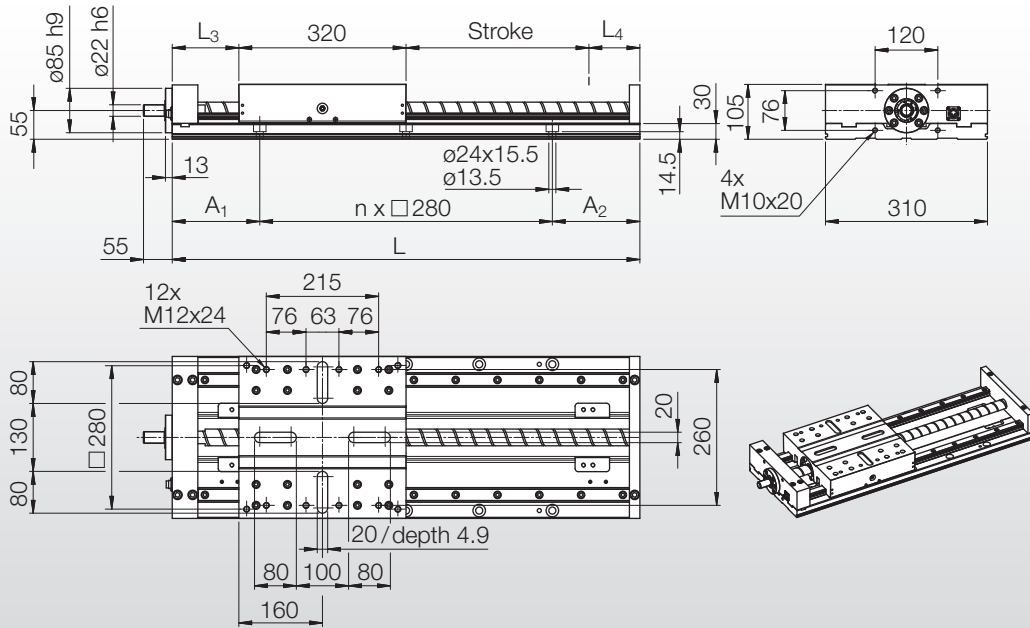
Nominal size		Dimensions							
Designation	Stroke [mm]	L [mm]	L ₃	L ₄	n	A ₁	A ₂	Ball screw length	Weight [kg]
PE3.4...FR...	50	405	65	65	1	112.5	112.5	429	17.5
	100	470	72.5	72.5	2	55	55	494	19.0
	150	540	82.5	82.5	2	90	90	564	20.5
	200	605	90	90	2	122.5	122.5	629	22.0
	250	675	100	100	3	67.5	67.5	699	23.5
	300	745	110	110	3	102.5	102.5	769	25.5
	350	810	117.5	117.5	3	135	135	798	27.0
	400	880	127.5	127.5	4	80	80	857	28.5
	450	950	137.5	137.5	4	115	115	916	30.0
	500	1015	145	145	5	57.5	57.5	975	31.5
	600	1150	162.5	162.5	5	125	125	1094	35.0
	700	1290	182.5	182.5	6	105	105	1212	38.0
	800	1425	200	200	7	82.5	82.5	1330	41.5
	900	1560	217.5	217.5	8	60	60	1449	44.5
	1000	1695	235	235	8	127.5	127.5	1567	47.5
	1200	1970	272.5	272.5	10	85	85	1804	54.5
	1400	2240	307.5	307.5	11	130	130	2036	60.5
	1600	2515	345	345	13	87.5	87.5	2273	67.0
	1800	2800	387.5	387.5	15	50	50	2529	73.5
	2000	3060	417.5	417.5	15	180	180	2747	79.5
	2200	3330	452.5	452.5	17	135	135	2983	86.0
	2400	3605	490	490	19	92.5	92.5	3220	92.5
	2600	3885	530	530	21	52.5	52.5	3467	99.0
	2800	4150	562.5	562.5	21	185	185	3694	105.5
	3000	4420	597.5	597.5	23	140	140	3926	111.5

CAD data is available from www.linetech.ch



POSITIONING UNIT PE4.4...NR...

with ball screw drive, without protective covering



Nominal size		Dimensions							
Designation	Stroke [mm]	L [mm]	L ₃	L ₄	n	A ₁	A ₂	Ball screw length	Weight [kg]
PE4.4...NR...	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

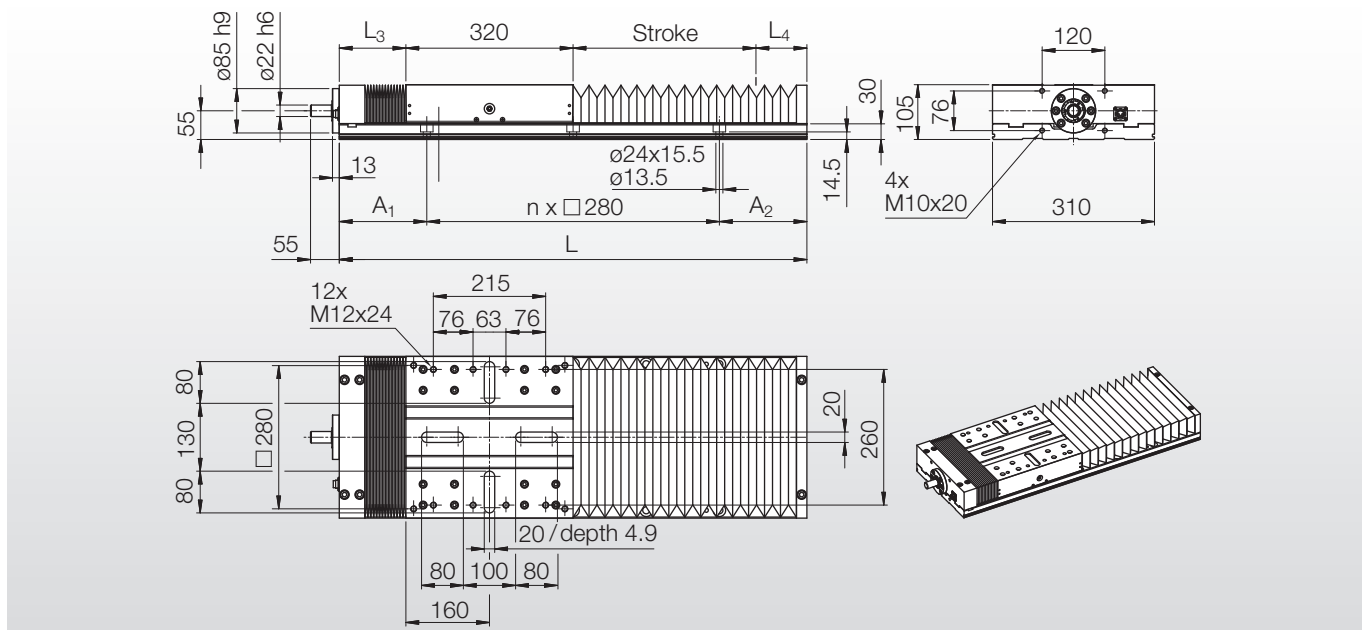
CAD data is available from www.linetech.ch



POSITIONING UNIT PE4.4...FR...



with ball screw drive, with expansion bellows



Nominal size		Dimensions							
Designation	Stroke [mm]	L [mm]	L ₃	L ₄	n	A ₁	A ₂	Ball screw length	Weight [kg]
PE4.4...FR...	50	510	85	55	1	115	115	350	45
	100	560	85	55	1	140	140	400	47
	150	625	92.5	62.5	1	172.5	172.5	500	50
	200	690	100	70	2	65	65	550	53
	250	760	110	80	2	100	100	600	56
	300	825	117.5	87.5	2	132.5	132.5	650	59
	350	895	127.5	97.5	2	167.5	167.5	700	62
	400	965	137.5	107.5	3	62.5	62.5	750	65
	450	1030	145	115	3	95	95	800	68
	500	1100	155	125	3	130	130	1151	71
	600	1235	172.5	142.5	3	197.5	197.5	1286	77
	700	1370	190	160	4	125	125	1421	83
	800	1505	207.5	177.5	4	192.5	192.5	1556	89
	1000	1750	230	200	5	175	175	1801	100
	1200	2000	255	225	6	160	160	2051	111
	1600	2495	302.5	272.5	8	127.5	127.5	2546	133
	2000	2990	350	320	9	235	235	3041	156
	2400	3485	397.5	367.5	11	202.5	202.5	3536	178
	3000	4225	467.5	437.5	13	292.5	292.5	4276	211

CAD data is available from www.linetech.ch



POSITIONING UNITS

Limit switch fitting

Limit switches

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.

LINE TECH employs the following standard inductive limit switches:

- PNP openers (PNP-NC)
Supply: 10...30 V DC
Current consumption off-load: < 10 mA
Load: max. 200 mA

On request the following non standard limit switches are available:

- PNP make type (PNP-NO)
- NPN break type (NPN-NC)
- NPN make type (NPN-NO)
- Reed switches
- Mechanical switches

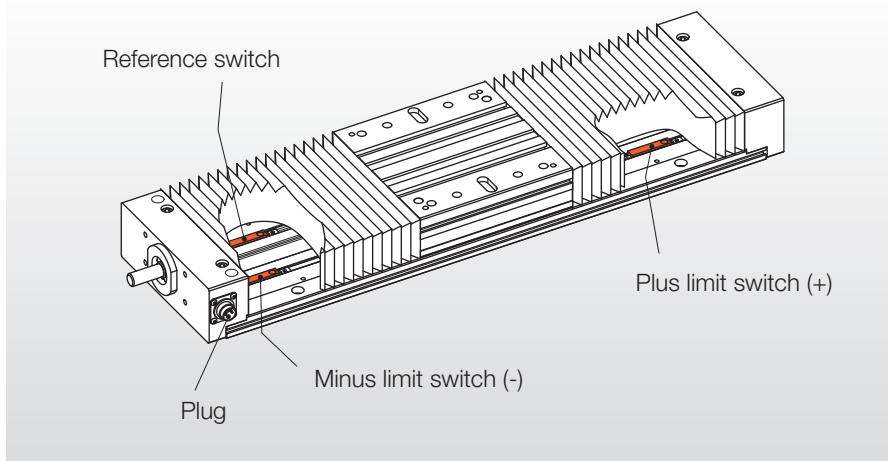
Note: At the factory the plus and minus limit switches are preset to a nominal stroke of 0 to +5 mm.

Fitting position of limit switches

The following diagrams show the mounting position of the limit switches. The reference position can be allocated either to the plus (+) or to the minus (-) limit switch.

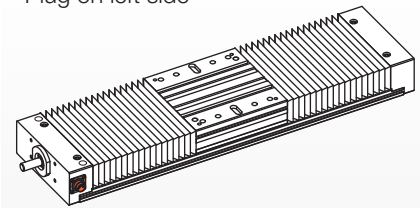
Special applications often require a separate reference point switch to be mounted between the positive and negative limit switches. The limit switch closest to the motor mounting (limit switch controller interface) is known as the forward limit switch.

Limit switches / reference switch mounting overview

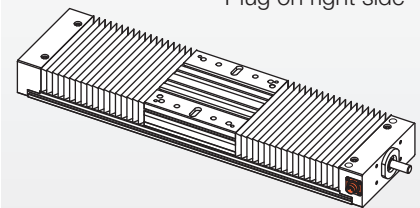


Connector add-on

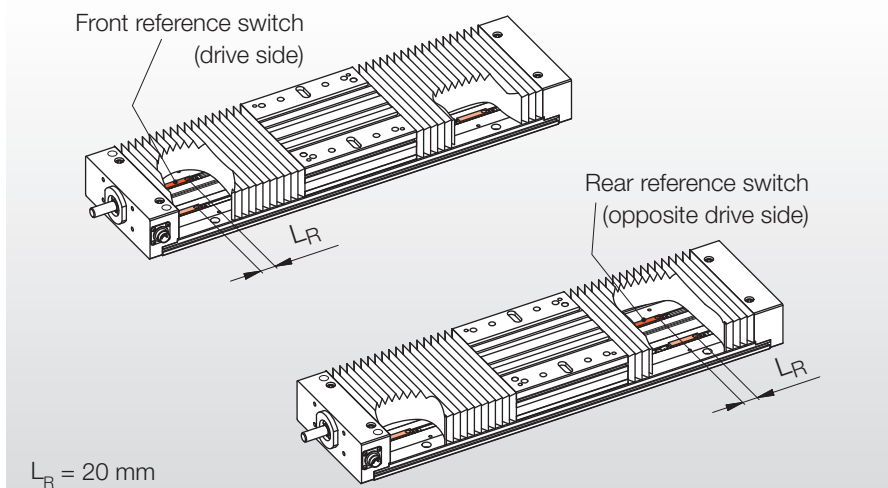
Plug on left side



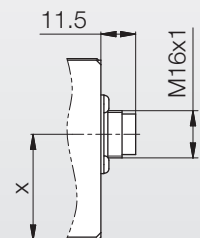
Plug on right side



Position of reference switch (L_R)



Dimensions



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

PE





Limit switch with plug connector

Plug connector

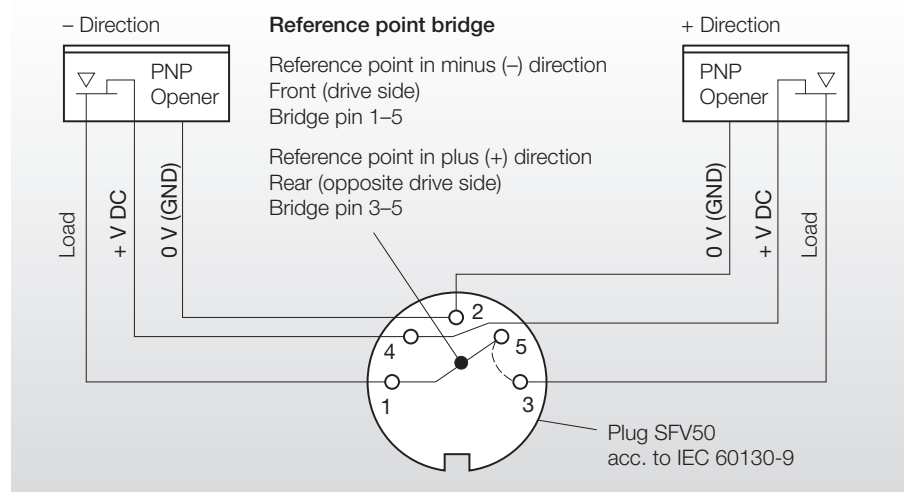
The connector pin assignment when using a limit switch plug is shown in the diagram on the right. The individual pins are assigned as follows:

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

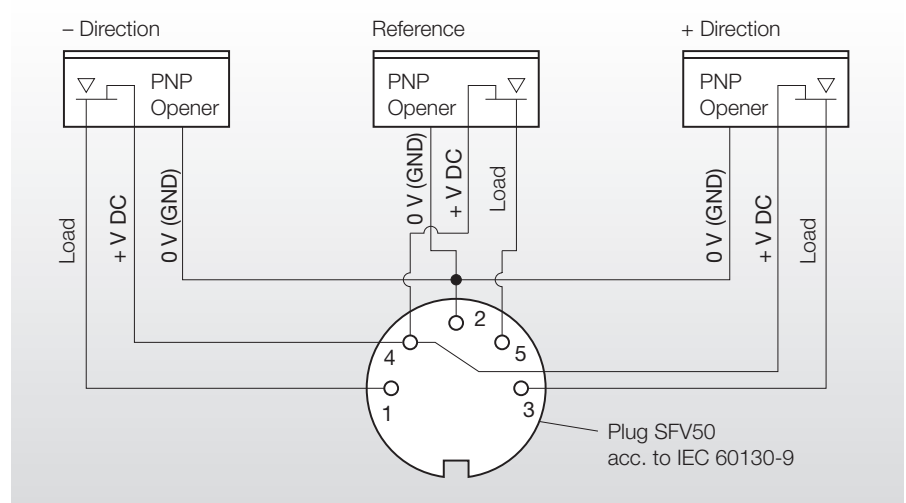
Colour code key for the diagrams:

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

Plug connector with reference point bridge



Plug connector with additional reference switch

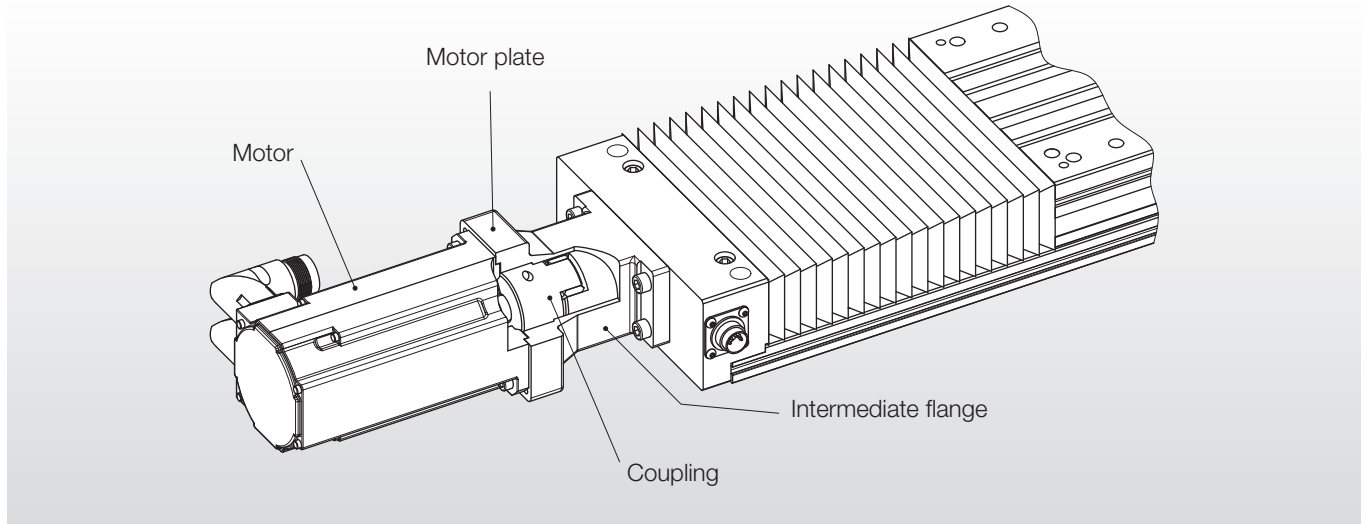




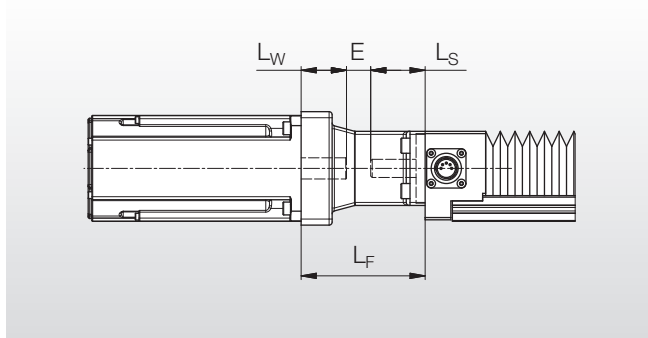
POSITIONING UNITS WITH WITH BALL SCREW DRIVE

Dimensions for motor mounting; straight fit

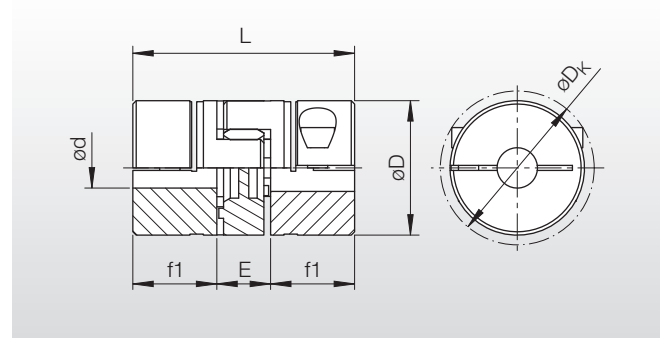
Straight motor mounting



Length of motor mounting



Coupling



Nominal size	Dimensions			Coupling when $L_W > f1$
	$L_F \pm 2$ [mm]	L_S [mm]	Weight * [kg]	
PE1...		23	0.460	Size 14
PE2...		36	0.500	Size 14
PE2...	$L_S + E + L_W$	36	0.580	Size 19
PE3...		44	0.990	Size 19
PE4...		55	1.120	Size 24

Size	Dimensions [mm]						Drive torque [Nm]	
	L	$\varnothing D$	$\varnothing d$	f1	E	$\varnothing D_K$	T_N	T_{max}
14	35	30	≤ 16	11	13	32.2	6.3	25
19	66	40	≤ 20	25	16	43	17	34
24	78	55	≤ 28	30	18	57	60	120

* flange including coupling

PE

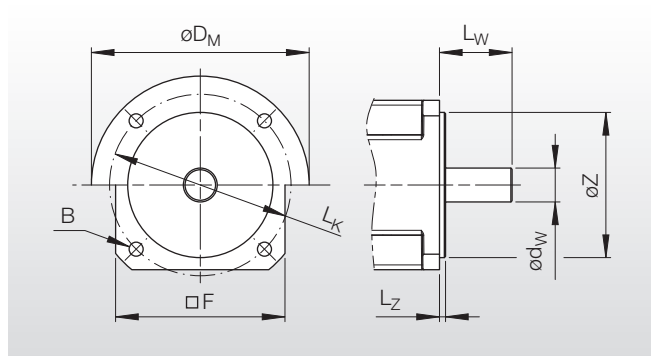




POSITIONING UNITS

Motor dimensions

Motor dimensions **



** the following dimensions

$\varnothing D_M$ _____ [mm] L_W _____ [mm]

B _____ [mm] $\varnothing d_W$ _____ [mm]

$\square F$ _____ [mm] L_Z _____ [mm]

L_K _____ [mm] $\varnothing Z$ _____ [mm]

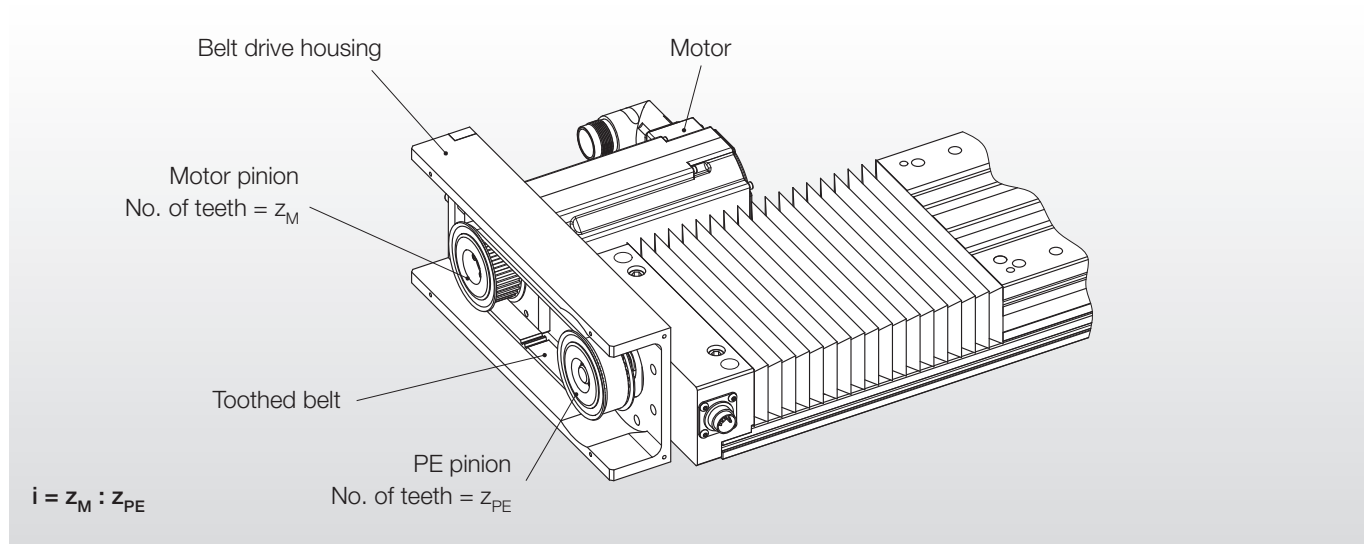
are required to determine the motor mounting.

POSITIONING UNITS WITH WITH BALL SCREW DRIVE



Dimensions for lateral motor fitting (1/2)

Lateral motor mounting



PE

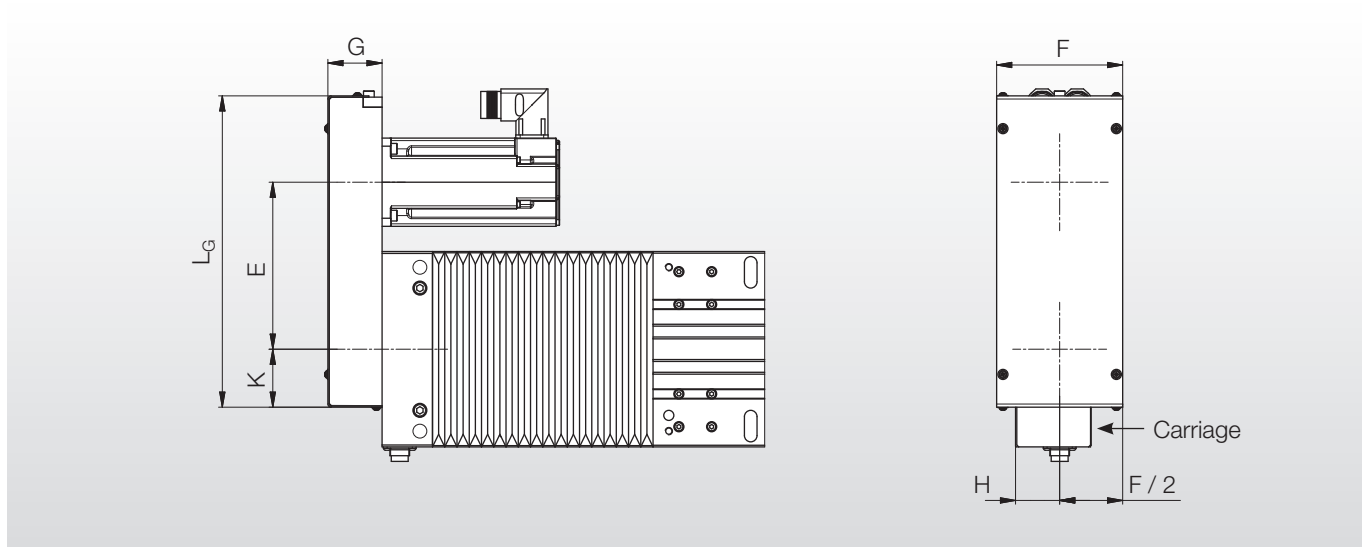


POSITIONING UNITS WITH WITH BALL SCREW DRIVE



Dimensions for lateral motor fitting (2/2)

Dimensions for lateral motor mounting



Nominal size	Dimensions [mm]							No. of teeth		Max.	Belt length	Weight
	i	E	F	G*	H	K	L _G	z _M	z _{LM}	ød _M	[mm]	[kg]
PE1...	1:1	133...137 (135)	90	43	28	42	215.5	36	36	ø19	450	1.200
	1:1.5	135.2...139.2 (137.2)	90	43	28	42	215.5	24	36	ø12	425	1.150
	1:2	131.5...135.5 (133.5)	100	43	28	46	247	24	48	ø12	450	1.700
PE2...	1:1	130...135 (132.5)						32	32	ø19	425	1.600
	1:1.5	131...139 (135)	100	43	35	46	247	32	48	ø19	475	1.800
	1:2	131.5...135.5 (133.5)						24	48	ø12	450	1.700
PE3...	1:1	171...179 (175)						40	40	ø22	550	2.700
	1:1.5	170.5...178.5 (174.5)	120	51	52	66	300	32	48	ø19	550	2.800
	1:2	168.5...176.5 (172.5)						27	54	ø15	550	2.700
PE4...	1:1	221...229 (225)						40	40	ø22	650	3.600
	1:1.5	220.5...228.5 (224.5)	150	60	55	71	360	36	54	ø20	675	3.400
	1:2	224.5...232.5 (228.5)						32	64	ø19	700	3.500

PE



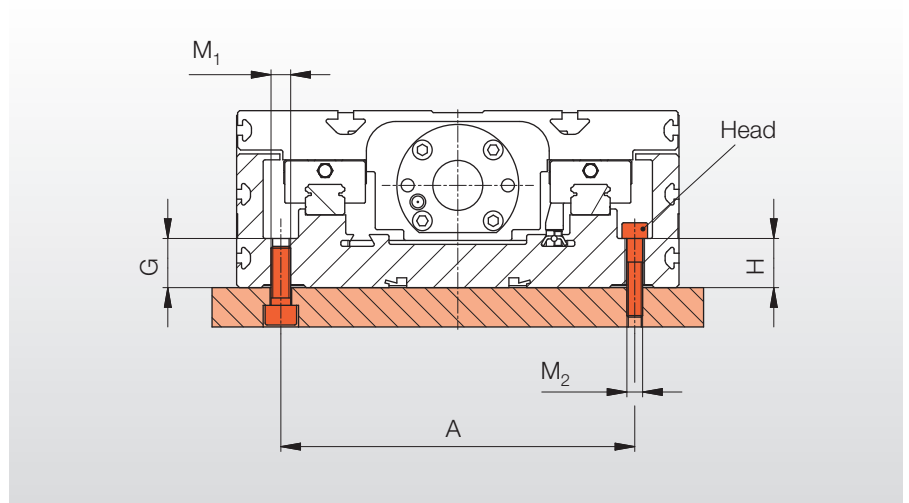
POSITIONING UNITS

Attachment of positioning units

Mounting options

Positioning units are attached from above or below.

Caution: Always screw on the positioning units along the entire length if possible.



Nominal size	Dimensions [mm]					
	A	G*	H	M ₁	M ₂	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 ¹⁾	ISO 4762
PE4...	□280	—	14.5	—	M12	ISO 4762

¹⁾ max. screw length = 40 mm

PE



POSITIONING UNITS

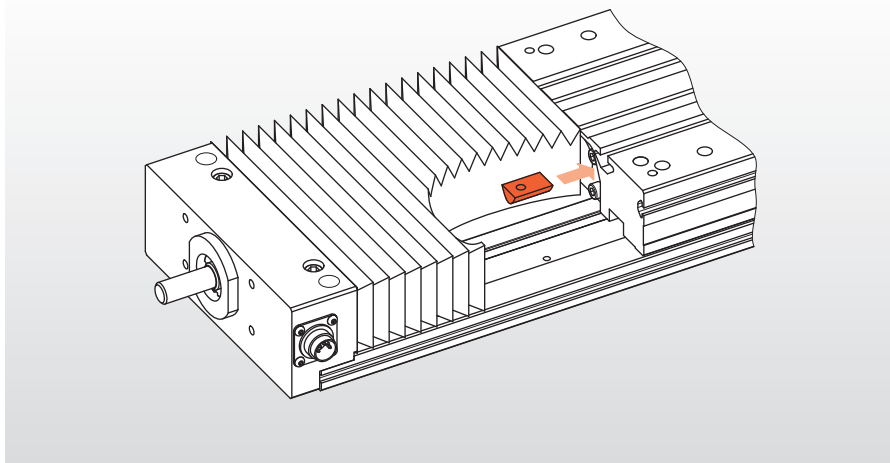


Attachment accessories; sliding blocks

Sliding blocks

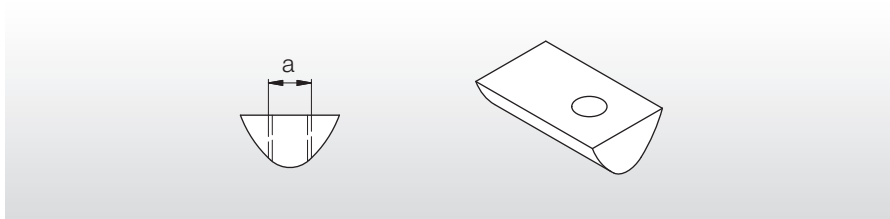
For sizes PE2 and PE3, the base plates and carriages have grooves. The positions and sizes of the grooves are shown in the relevant profile cross-sections (see pages 149 and 150).

Sizes PE1 and PE4 have no grooves.



Sliding block types NS5 and NS8 can be used in line with the groove width (see profile cross-sections, pages 149 to 150). Sliding blocks are available from LINE TECH. 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.



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

Order designation for sliding blocks

Examples: NS5 St M5

NS	5	St	M5
Sliding block NS			
Groove width		Thread size (dim. "a")	
5		M3 / M4 / M5	
8		M6 / M8	
		Material	
		St = steel	
		Inox = inox	

PE



POSITIONING UNITS

Cross table mountings

Cross tables

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 cross table mountings 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

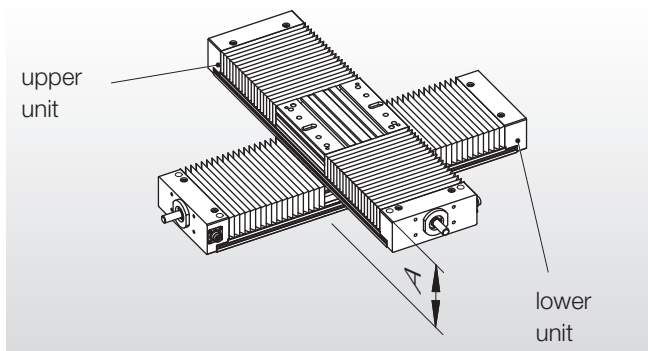
PE1 / PE2 / PE3 / PE4

Mounting type

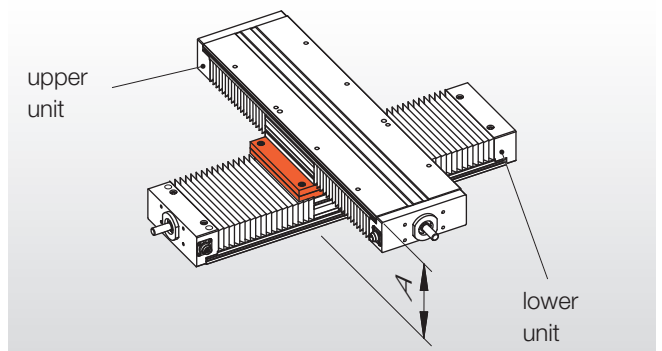
AC / AD / BC / BD

Dimension A [mm]	upper unit								
	PE1...		PE2...		PE3...		PE4...		
Mounting type	A...	B...	A...	B...	A...	B...	A...	B...	
lower unit	PE1...	100	116			not possible			
	PE2...	122	122	120	144	not possible			
	PE3...	on request		166	166	180	210	not possible	
	PE4...	on request				215	215	210	240

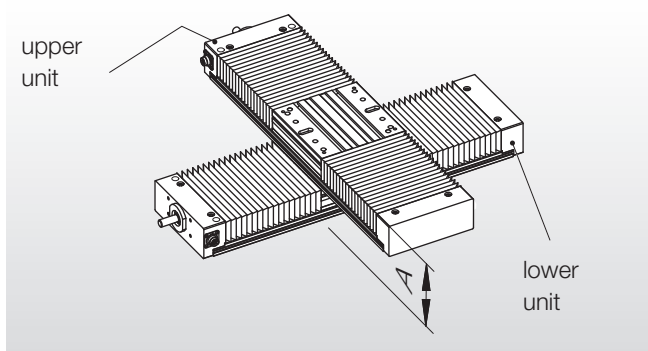
Mounting layout AC



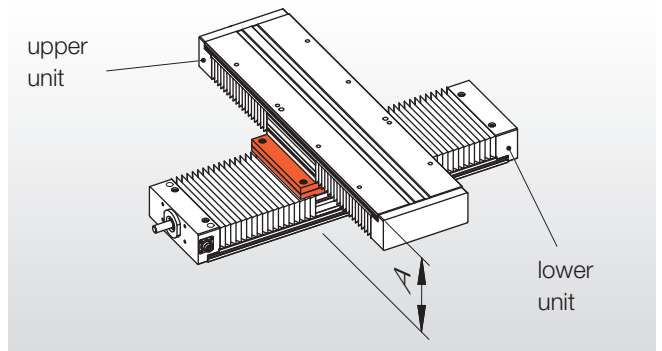
Mounting layout BC



Mounting layout AD



Mounting layout BD



PE

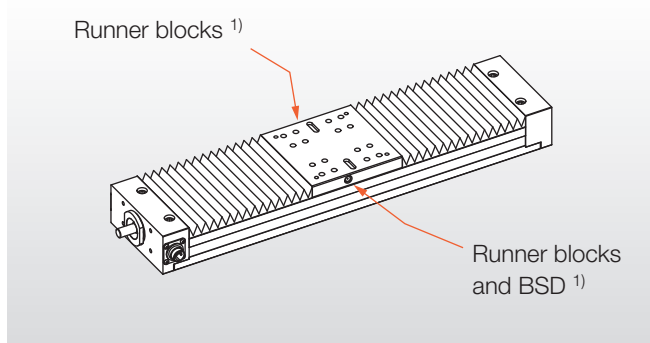


POSITIONING UNITS

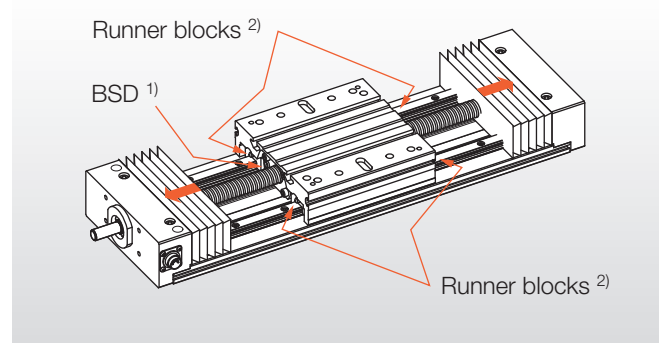


Grease points

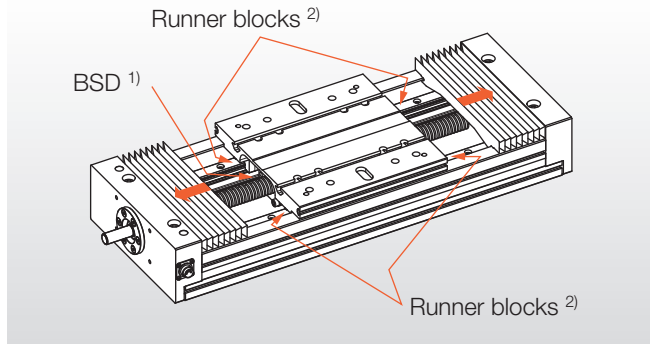
PE1..R..



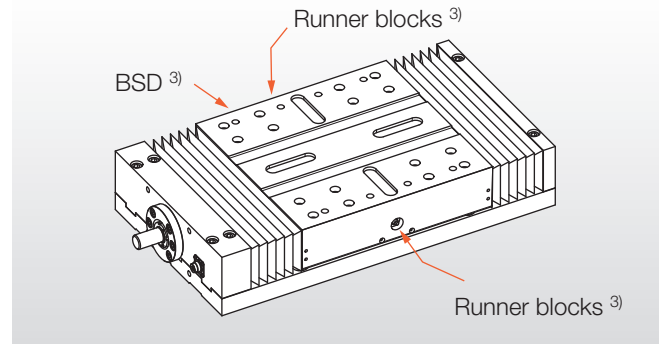
PE2..R..



PE3..R..



PE4..R..



Grease points

Lubrication positions on positioning units are not dependent on stroke. For sizes PE2 and PE3, the expansion bellows on the carriage must be loosened and pushed to the side before lubrication.

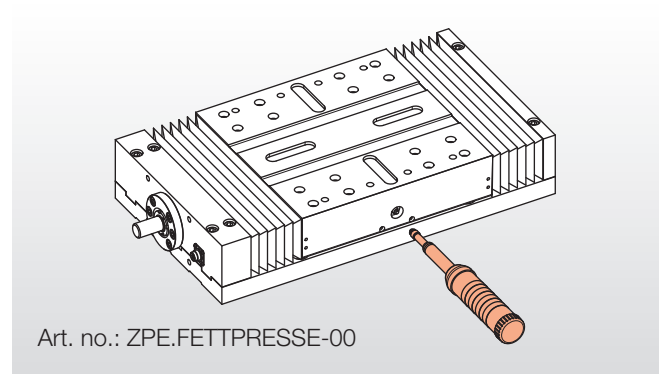
Different lubricating nipples are on the positioning unit carriages:

- 1) Lubricating nipple to DIN 3405
- 2) Lubrication nipples to DIN 3405 and DIN 71412
- 3) Lubricating nipple to DIN 71412

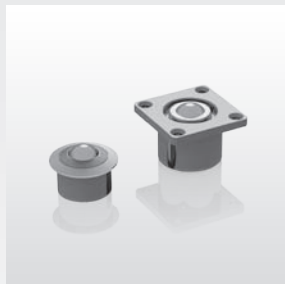
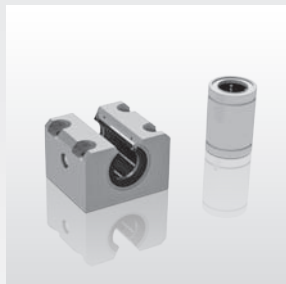
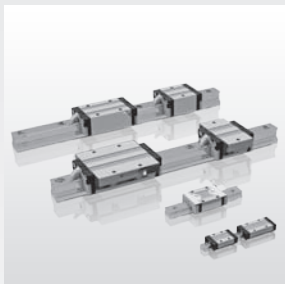
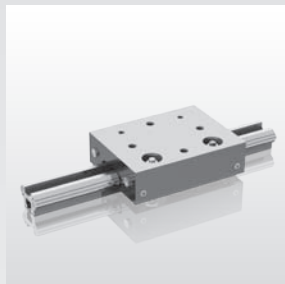
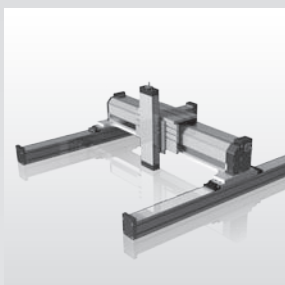
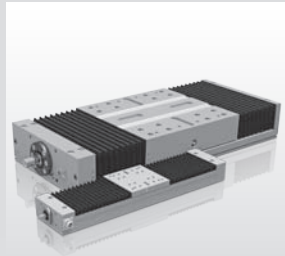
Standard grease

LINE TECH recommends the following grease for lubrication:
Microlube GBU Y 131

Grease gun



PE



© LINE TECH AG

The contents of this publication are protected by copyright held by the publisher and may not be reproduced in whole or in part unless permission is granted. Every care has been taken to ensure the accuracy of the information contained herein but no liability can be accepted for any loss or damage, whether direct, indirect or consequential, resulting from or in connection with the use of the information contained herein. This catalogue supersedes previous catalogues in which information differs from that contained herein. Information is subject to change as required by technological advancements.

Edition: 11-2015 E

LINE TECH AG
Europastrasse 19
8152 Glattbrugg
Switzerland

Phone +41 43 211 68 68
Fax +41 43 211 68 69

info@linetech.ch

Your LINE TECH representative: