

Profile Rail Guide Slides





The SKF brand now stands for more than ever before, and means more to you as a valued customer.

While SKF maintains its leadership as the hallmark of quality bearings throughout the world, new dimensions in technical advances, product support and services have evolved SKF into a truly solutions-oriented supplier, creating greater value for customers.

These solutions encompass ways to bring greater productivity to customers, not only with breakthrough application-specific products, but also through leading-edge design simulation tools and consultancy services, plant asset efficiency maintenance programmes, and the industry's most advanced supply management techniques.

The SKF brand still stands for the very best in rolling bearings, but it now stands for much more.

**SKF – the knowledge
engineering company**

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General

SKF profile rail guide slides are state-of-the-art slides with high load carrying capacity and high accuracy.

Sizes

SKF profile rail guide slides with ball screw drive are available in widths of 110, 170, 235, 320 and 400 mm.

SKF profile rail guide slides with linear motor drive can be supplied in widths of 154, 182 and 212 mm.

Drives

SKF profile rail guide slides are available with ball screw drive and linear motor drive.

Cover

The profile rail guide slides can be supplied in three different versions: without cover, with bellows and with steel cover (ball screw drive only).

Precision classes

The profile rail guide slides can be supplied in different precision classes depending on the respective application demands:

P5, P2, (ball screw drive)

P2 (linear motor drive)

Customer benefits

- Modular and compact design
- Variants having high load carrying capacity and stiffness
- Wide variety of drive options, providing the optimum solution for any application
- Different covers to suit the ambient conditions
- Cost optimization due to selection of required precision class

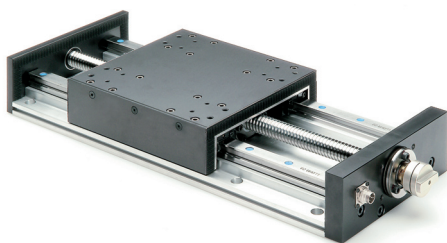
Guide

SKF profile rail guide slides are equipped with a pair of profile rails fitted with a total of four carriages (with the exception of size 212 with linear motor 1FN3-150-3K which has six carriages).

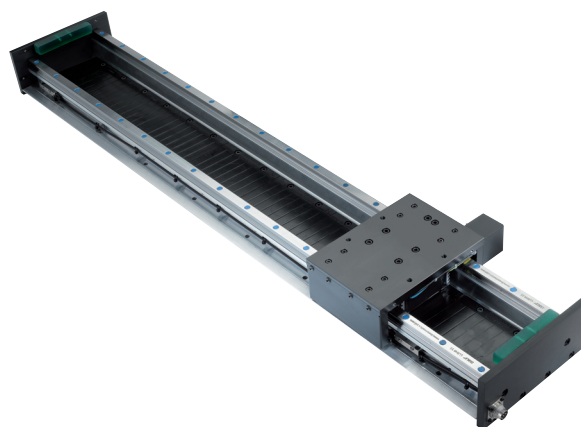
Customer benefit

- Profile rail guide with high load carrying capacity and stiffness

Refer to table 1 for further technical information.

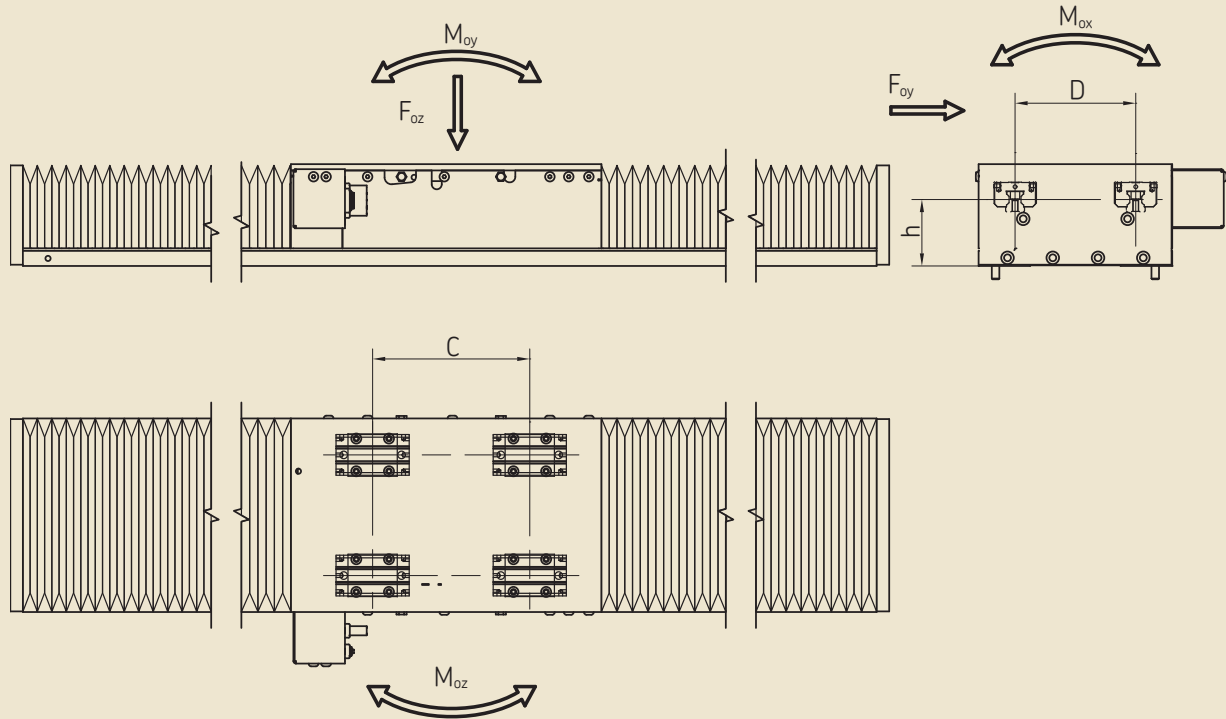


Profile rail guide slide with ball screw drive



Profile rail guide slide with linear motor

Load carrying capacity of slides



Type	Precision class	Load rating per carriage			No. carr. ¹⁾			Maximum static load per slide ²⁾				
Size		C_{dyn}	C_0	z	C	D	$h^{3)}$	F_{oz}	F_{oy}	M_{ox}	M_{oy}	M_{oz}
		N		-	mm			N		Nm		
LTB 110.L1.SD/TN	P5 - P2	2 295	4 270	4	69	81	23	17 080	8 540	690	580	290
LTB 170.L1.SD/TN	P5 - P2	7 800	13 500	4	92	116	35	54 000	27 000	3 130	2 480	1 240
LTB 235.L1.SX/TN/TL	P5 - P2	18 800	24 400	4	140	156	46	97 600	48 800	7 610	6 830	3 410
LTB 320.L1.SX/TN/TL	P5 - P2	22 800	30 400	4	221	220	70	121 600	60 800	13 370	13 430	6 710
LTB 400.L1.SX/TN/TL	P5 - P2	41 900	54 000	4	270	270	77	216 000	108 000	29 160	29 160	14 580
LTS 154.L1.1FN3-050-1K	P2	5 400	8 100	4	72	96	53	31 670	16 200	1 520	1 140	1 140
LTS 154.L1.1FN3-050-2K	P2	7 800	13 500	4	125	96	53	52 540	27 000	2 522	3 284	3 284
LTS 182.L1.1FN3-100-1K	P2	5 400	8 100	4	72	124	53	30 940	16 200	1 918	1 114	1 114
LTS 182.L1.1FN3-100-2K	P2	7 800	13 500	4	125	124	53	51 090	27 000	3 168	3 193	3 193
LTS 182.L1.1FN3-100-3K	P2	10 000	20 200	4	185	124	53	76 430	40 400	4 739	7 070	7 070
LTS 212.L1.1FN3-150-1K	P2	5 400	8 100	4	72	154	56,5	30 220	16 200	2 327	1 088	1 088
LTS 212.L1.1FN3-150-2K	P2	10 000	20 200	4	125	154	56,5	76 430	40 400	5 885	4 777	4 777
LTS 212.L1.1FN3-150-3K	P2	10 000	20 200	6	225	154	56,5	114 650	60 600	8 828	8 599	8 599

Table 1: Load carrying capacity of slides

¹⁾ Number of carriages

²⁾ Loads F_{oz} and F_{oy} apply under central load, but not to slides with steel cover (data available on request)

Moments M_{ox} and M_{oz} apply under pure moment load (without force), but not to slides with steel cover (data available on request)

³⁾ Distance up to the middle of the rail

Drive: Slides with ball screw drive

These slides are equipped with precision rolled thread ball screw drives.

Screws SD and SX have a nut with internal ball recirculation. The axial clearance of this version is 0.1 mm maximum. These screws are the standard for precision class P5 slides.

Screws TN and TL are fitted with an internally preloaded nut. TL screws have long leads and are therefore suitable for high speed motion. They are used for precision class P2 slides.

Customer benefits:

- Robust drive
- Suitable for high axial forces
- Can be fitted with manual drive as well as servo motor or stepper motor
- Attachment via motor flange or indirect tooth belt drive.

Refer to table 2 for further technical information.

Slide Type	Precision class	Screw					Load rating ²⁾		Slide drive torque	
		Type	Nominal Ø	Lead	Lead accuracy ¹⁾		dynamic	static	idling	max. per- missible
		Size	d _o	p	acc. to ISO	V _{300p}	C _a	C _{oa}	M _s	M _a
			mm			µm/300 mm	N		Nm	
LTB 110	P5	SD1205	12	5	G9	87	3 100	5 100	0,17	2,6
	P2	TN1205	12	5	G7	40	6 060	7 100	0,27	2,6
	P2	TN1210	12	10	G7	40	3 730	3 550	0,30	2,6
LTB 170	P5	SD1605	16	5	G9	87	5 200	8 700	0,33	5,8
	P2	TN1605	16	5	G7	40	10 710	12 720	0,48	8,4
	P2	TN1610	16	10	G7	40	10 710	12 720	0,52	12,0
	P2	TN1616	16	16	G7	40	6 590	6 360	0,55	12,0
LTB 235	P5	SX2505	25	5	G9	87	15 600	31 000	0,49	20,6
	P5	SX2510	25	10	G9	87	18 800	31 000	0,49	32,9
	P2	TN2505	25	5	G7	40	12 700	22 440	0,79	14,9
	P2	TN2510	25	10	G7	40	12 700	22 440	0,89	29,8
	P2	TL2520	25	20	G7	40	12 700	22 440	0,86	32,9
	P2	TL2525	25	25	G7	40	7 820	11 220	0,87	32,9
LTB 320	P5	SX3205	32	5	G9	87	17 800	50 400	0,81	33,4
	P5	SX3210	32	10	G9	87	27 500	55 000	0,82	72,9
	P2	TN3205	32	5	G7	40	14 210	30 960	1,21	20,5
	P2	TN3210	32	10	G7	40	23 390	40 960	1,42	54,3
	P2	TL3220	32	20	G7	40	23 390	40 960	1,28	96,0
	P2	TL3232	32	32	G7	40	14 400	20 480	1,35	86,9
	P2	TL3240	32	40	G7	40	14 400	20 480	1,36	96,0
LTB 400	P5	SX4005	40	5	G9	87	19 500	63 100	1,01	41,8
	P5	SX4010	40	10	G9	87	29 000	64 000	1,03	84,9
	P2	TN4005	40	5	G7	40	20 350	59 580	1,61	39,3
	P2	TN4010	40	10	G7	40	29 000	64 000	2,43	84,9
	P2	TL4020	40	20	G7	40	29 000	64 000	1,61	169,7
	P2	TL4040	40	40	G7	40	25 500	35 120	1,66	186,3

Table 2: Ball screw technical details

¹⁾ Lead accuracy G5 with V_{300p}=23 µm / 300 mm available on request.

²⁾ Value indicated = minimum load rating of either screw or locating bearing

Drive: Slides with linear motor drive

These profile rail guide slides are equipped with brushless AC motors and work as follows:

- The coil system (primary part) is located in the moving upper part of the slide.
- The magnetic rail (secondary part) is mounted at the bottom of the slide.

- Three-phase AC synchronous motors with electronic commutation
- Linear encoder integrated in the slide
- Two inductive limit switches

Customer benefits:

- High dynamics and stiffness in a closed loop system
- Good synchronous characteristics

- High acceleration capacity
- High speeds achievable
- Friction and wear-free drive

Refer to table 3 for further technical details.

For slides:			LTS 154.L1.		LTS 182.L1.		LTS 212.L1.			
Motor size	1FN3-		050-1K	050-2K	100-1K	100-2K	100-3K	150-1K	150-2K	150-3K
Boundary conditions:										
DC link voltage	U _{ZK}	V	515	515	515	515	515	515	515	515
Max. winding temperature	T _{P,MAX}	°C	120	120	120	120	120	120	120	120
Rated data:										
Rated force	F _N	N	85	170	170	340	510	260	515	775
Rated current	I _N	A	1,3	2,1	2,0	4,1	6,1	3,3	6,6	9,9
Max. speed at F _N	v _{MAX, FN}	m/s	8,3	6,6	6,6	6,6	6,6	7,0	7,0	7,0
Rated power loss	P _{V, FN}	W	30	60	50	90	140	60	130	190
Maximum ratings:										
Maximum force	F _{MAX}	N	320	640	680	1 350	2 030	1 030	2 060	3 100
Maximum current	I _{MAX}	A	7,7	12,6	12,5	25,1	37,6	20,2	40,4	60,6
Max. speed at F _{MAX}	v _{MAX, F MAX}	m/s	2,6	2,0	2,2	2,1	2,1	2,4	2,3	2,3
Max. elect. power consumption	P _{EL, MAX}	W	1 930	3 500	3 200	6 360	9 520	4 840	9 600	14 360
Stall force	F ₀	N	60	120	120	240	359	183	366	549
Stall current	I ₀	A	1,0	1,5	1,4	2,9	4,3	2,3	4,6	7,0
Physical constants:										
Force constant at 20 °C	k _{F,20}	N/A	65	80	83	83	83	79	79	79
Motor constant at 20 °C	k _{M,20}	N/W ⁻²	17,9	25,1	29,6	41,8	51,2	38,3	54,2	66,4
Phase resistance at 20 °C	R _{KL,20}	Ohm	8,7	6,7	5,3	2,7	1,8	2,8	1,4	0,9
Phase inductance	L _{KI}	mH	92,6	72,9	68,4	35,4	23,9	39,8	20,6	13,9
Attractive force	F _A	N	730	1 460	1 460	2 910	4 370	2 180	4 370	6 550
Pole width	t _M	mm	15	15	15	15	15	15	15	15
Cogging force	F _{COG}	N	6	10	14	20	30	21	31	46
Frictional force of guide	F _R	N	31	37	33	41	49	35	49	73
Technical data linear encoder:										
Signal output			sinus signal, 1 Vss							
Grading rate			20 µm							
Precision class			±5 µm							
Technical data limit switches:										
Arrangement			2 inductive switches located on the side, adjustable by 50 mm							
Type			PNP-NC							

Table 3: Linear motor technical details

Cover

SKF profile rail guide slides are available as follows:

- With bellows made of oil and water-resistant polyurethane fibre material on both sides. The carriages and ball screw nut are additionally protected by wipers (with the exception of the SD series). The screw bearings are also sealed.
- Without cover for applications that are not exposed to dirt. The carriages, ball screw nut and bearings are sealed as they are in the bellows version. The effective stroke is, of course, longer than in the bellows version.
- With steel cover (LTB version only), made of corrosion-resistant sheet steel, for applications with extreme exposure to dirt from above or for those applications where shock impact on the cover cannot be ruled out. The effective stroke is as long as in the coverless version.

Precision classes

The precision shown in Diagram 1 applies to a single slide in clamped condition on an ideal plane clamping surface.

Straightness defined as in VDI 2617 sheet 3.

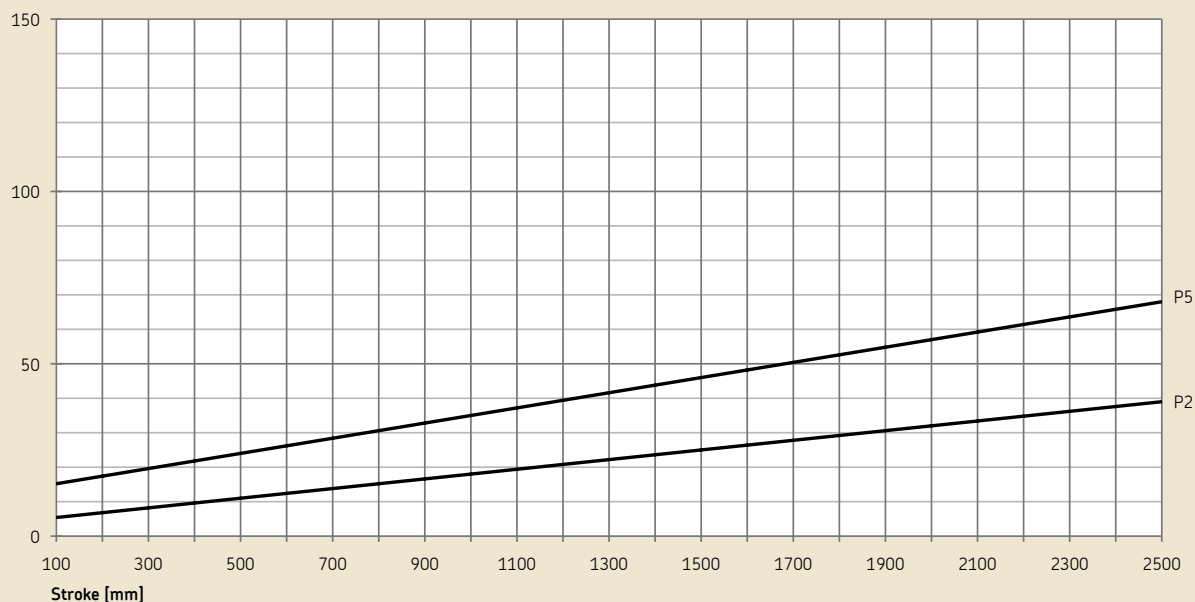


Diagram 1: Precision

Stroke

The strokes S1 (with bellows), S2 (without bellows) and S (with steel cover) given in the LTB dimensional tables are the maximum travel distances between the mechanical end stops. Depending on the speed and the moving mass, the operating stroke must be correspondingly reduced. The overrun on both sides must be larger than the length of the brake path of the drive. The value of $2 \times p$ (screw lead) can be considered to be a reliable guideline value. The standard pre-setting of the electrical stroke corresponds to the mechanical stroke minus 10 mm on both sides. This value can be individually adjusted.

The maximum electrical stroke is indicated in the LTS dimensional table. The limit switches can be adjusted by 50 mm on each side. This will reduce the stroke accordingly.

Materials

As standard, the slide components are made of anodized aluminium. On request the bottom part and the top part are also available in steel.

Permissible operating temperatures

Slides with ball screw drive:
-20 °C to +80 °C constant temperature

Slides with linear motor drive:
0 °C to + 55 °C constant temperature.

Lubrication

The guides and slide screw are supplied with SKF all-purpose grease LGEP2.

The carriages and the screw nut can be relubricated. For further information please refer to the operating instructions. The slides can be fitted with a central lubricating connection on request. In this case, five lube ports are provided in the side plate. (Not possible for carriages with steel cover.) Relubrication intervals depending on operating conditions: 20 - 200 km or after 1 year at the latest.

Load carrying capacity and life

For exact dimensioning and design of SKF profile rail guide slides and drives, please contact SKF. In order to provide the required data correctly, please fill in the specification sheet on page 24.

Accessories

Limit and reference switches

Slides with ball screw drive are fitted with inductive limit switches as standard. These are integrated in the slide and connected via a central plug connection on the screw bearing plate (see dimensional tables). Inductive reference switches are available on request.

Slides with linear motor drive are fitted with 2 limit switches PNP/NC as standard.

Cross table assembly

Individual slides can be mounted to form a cross table. Please note the details in the corresponding column of the dimensional tables.

Linear encoder

As standard, slides with linear motor drive are equipped with an open linear encoder on the side. For further information please refer to table 3.

On request slides with ball screw drive can be also supplied with an encapsulated linear encoder. This is fitted externally on the side of the slide.

Motor flange

Slides with ball screw drive can be equipped with a motor flange and coupling on request. When ordering please indicate the motor manufacturer, model and type.

Indirect toothed belt drive

If space is restricted, an indirect drive using a toothed belt may be the best choice. The motor can be mounted on either the right or left hand side. Standard transmission ratio 1:1.

Motors

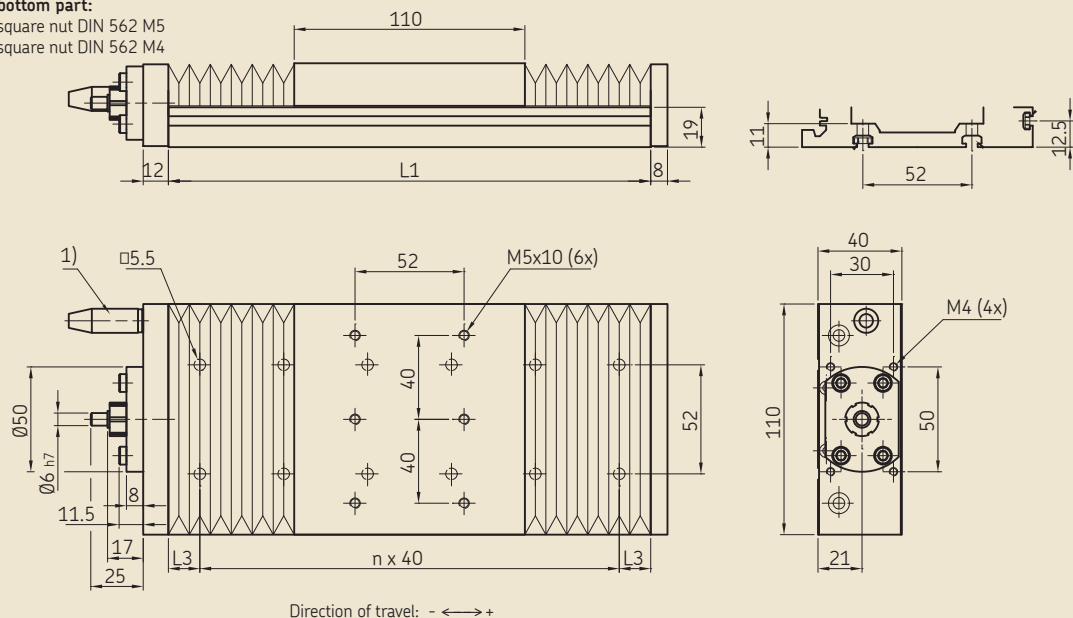
Slides with ball screw drive can be equipped with stepper motors or servo motors on request.

Motor control units and control components

The following components are available for controlling the motors:

- Servo module
- Point-to-point or continuous path control

Further information available on request or in the offer as submitted.

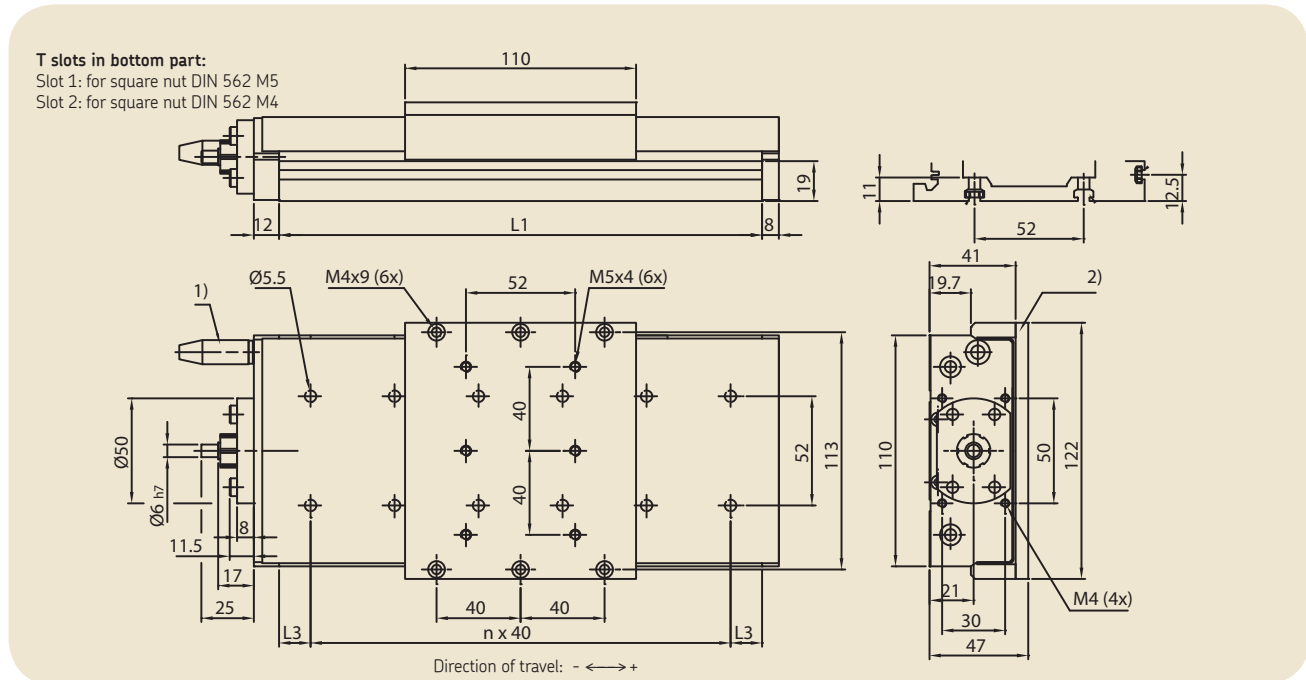


Length				Screw data					
			2)	Stroke ³⁾		SD1205	TN1205+1210	Weight ⁴⁾	
L1	L3	n	KN	S1	S2	n _{max}	n _{max}	G _A	G ₀
mm		-		mm		1/min		kg	
150		3		10	30	4 160	7 500	1,7	
190		4	✓	35	70	4 160	7 500	1,6	
230		5		60	110	4 160	7 500	1,8	
270		6	✓	80	150	4 160	7 500	2,0	
310		7		105	190	4 160	7 500	2,2	
350		8	✓	130	230	4 160	7 500	2,4	
390		9		155	270	4 160	7 500	2,6	
430		10	✓	180	310	4 160	7 500	2,7	
470		11		205	350	4 160	7 500	2,9	
510		12	✓	225	390	4 160	7 500	3,1	
550	15	13		250	430	4 160	6 370	3,3	0,8
590		14	✓	275	470	4 160	5 420	3,5	
630		15		300	510	4 160	4 670	3,6	
670		16	✓	325	550	3 900	4 060	3,8	
710		17		350	590	3 420	3 570	4,0	
750		18	✓	375	630	3 030	3 160	4,2	
790		19		395	670	2 700	2 810	4,4	
830		20	✓	420	710	2 420	2 520	4,5	
870		21		445	750	2 180	2 280	4,7	
910		22	✓	470	790	1 980	2 060	4,9	
950		23		495	830	1 800	1 880	5,1	

4) G_A = Total mass of slide
 G_0 = Linear moving mass of slide top

LTB 110.L1.SD/TN12xx-SC:

Slides with ball screw drive and steel cover



¹⁾ Plug connection for limit and reference switches (optional)

²⁾ Adapter plate available on request

Length			Screw data				Weight ⁵⁾	
L1	L3	n	³⁾ KN	Stroke ⁴⁾ S	SD1205 n _{max}	TN1205+1210 n _{max}	G _A	G ₀
mm		-		mm	1/min		kg	
150		3		30	4 160	7 500	2,0	
190		4	✓	70	4 160	7 500	2,2	
230		5		110	4 160	7 500	2,4	
270		6	✓	150	4 160	7 500	2,6	
310		7		190	4 160	7 500	2,8	
350		8	✓	230	4 160	7 500	3,0	
390		9		270	4 160	7 500	3,2	
430		10	✓	310	4 160	7 500	3,4	
470		11		350	4 160	7 500	3,6	
510		12	✓	390	4 160	7 500	3,8	
550	15	13		430	4 160	6 370	4,0	0,9
590		14	✓	470	4 160	5 420	4,2	
630		15		510	4 160	4 670	4,4	
670		16	✓	550	3 900	4 060	4,6	
710		17		590	3 420	3 570	4,8	
750		18	✓	630	3 030	3 160	5,0	
790		19		670	2 700	2 810	5,2	
830		20	✓	710	2 420	2 520	5,4	
870		21		750	2 180	2 280	5,6	
910		22	✓	790	1 980	2 060	5,8	
950		23		830	1 800	1 880	6,0	

³⁾ Suitable as top axis for central cross table mounting

⁴⁾ Maximum stroke between end stops

⁵⁾ G_A = Total mass of slide
 G₀ = Linear moving mass of slide top

Slot 1: for square nut DIN 562 M5
Slot 2: for square nut DIN 562 M4



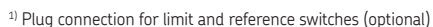
2,3

4) G_A = Total mass of slide
 G_0 = Linear moving mass of slide top



5) G_A = Total mass of slide
 G_0 = Linear moving mass of slide top

Slot 1: for square nut DIN 562 M5
Slot 2: for square nut DIN 562 M4

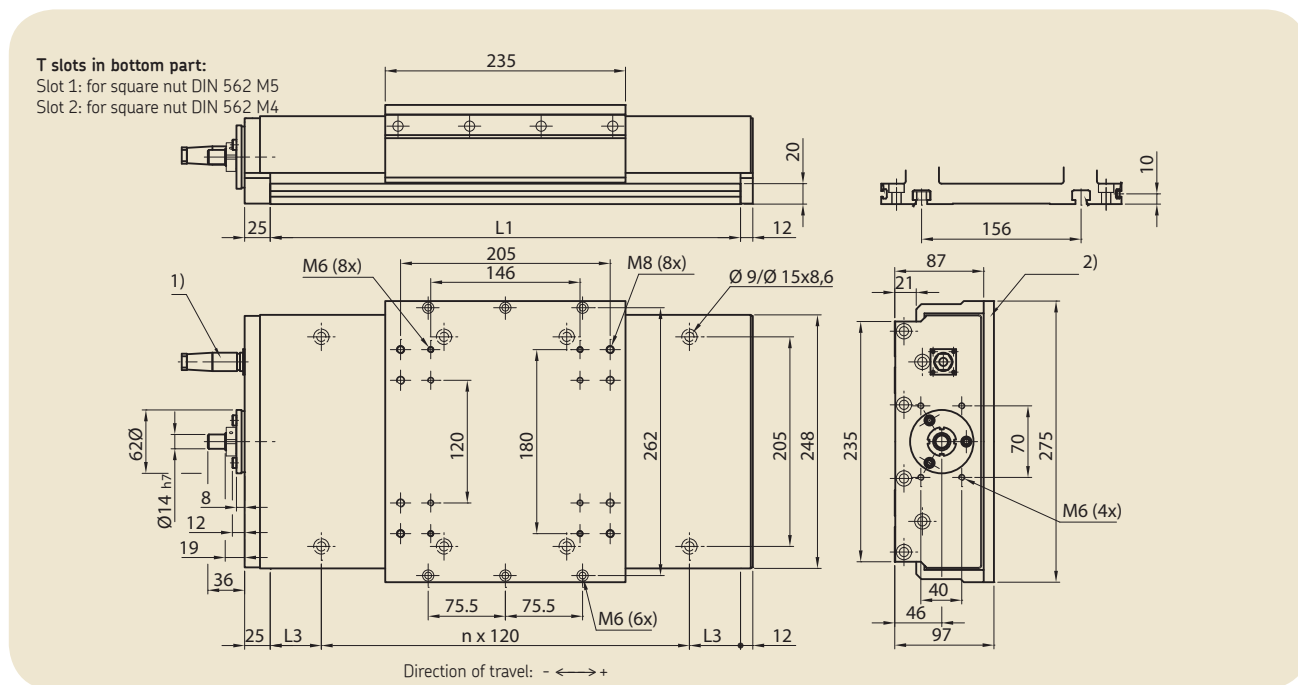
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Length			2) KN	Stroke ³⁾		Screw data				Weight ⁴⁾	
L1	L3	n		S1	S2	SX2505 n _{max}	TN2505 n _{max}	SX2510 n _{max}	TN2510+2520+2525 n _{max}	G _A	G ₀
mm		-		mm		1/min				kg	
1 660	50	13	✓	1 180	1 415	1 410	1 400	1 330	1 400	45,8	
1 720	20	14		1 230	1 475	1 300	1 290	1 230	1 290	47,2	
1 780	50	14		1 280	1 535	1 210	1 200	1 140	1 200	48,6	
1 840	20	15	✓	1 335	1 595	1 120	1 120	1 060	1 120	49,9	
1 900	50	15	✓	1 380	1 655	1 050	1 040	990	1 040	51,3	
1 960	20	16		1 430	1 715	980	970	920	970	52,7	
2 020	50	16		1 480	1 775	920	910	870	910	54,0	
2 080	20	17	✓	1 530	1 835	860	860	810	860	55,4	
2 140	50	17	✓	1 580	1 895	810	800	760	800	56,7	
2 200	20	18		1 635	1 955	760	760	720	760	58,1	
2 260	50	18		1 685	2 015	720	720	680	720	59,5	5,9
2 320	20	19	✓	1 735	2 075	680	680	640	680	60,8	
2 380	50	19	✓	1 785	2 135	640	640	610	640	62,2	
2 440	20	20		1 835	2 195	610	610	580	610	63,6	
2 500	50	20		1 880	2 255	580	580	550	580	64,9	
2 560	20	21	✓	1 930	2 315	550	550	520	550	66,3	
2 620	50	21	✓	1 985	2 375	520	520	490	520	67,6	
2 680	20	22		2 035	2 435	500	500	470	500	69,0	
2 740	50	22		2 085	2 495	480	470	450	470	70,4	
2 800	20	23	✓	2 135	2 555	450	450	430	450	71,7	
2 860	50	23	✓	2 185	2 615	430	430	410	430	73,1	

2) Suitable as top axis for central cross table mounting

3) Maximum stroke between end stops:
S1 with bellows (standard version)
S2 without bellows (special version)4) G_A = Total mass of slide
G₀ = Linear moving mass of slide top

LTB 235.L1.SX/TN/TL25xx-SC: Slides with ball screw drive and steel cover



¹⁾ Plug connection for limit and reference switches (optional)

²⁾ Adapter plate available on request

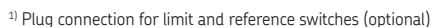
Length			Screw data						Weight ⁵⁾	
L1	L3	n	³⁾ KN	Stroke ⁴⁾ S	SX2505 n _{max}	TN2505 n _{max}	SX2510 n _{max}	TN2510+2520+2525 n _{max}	G _A	G ₀
mm		-		mm	1/min				kg	
280	20	2		35	2 000	3 600	2 000	3 600	18,1	
340	50	2		95	2 000	3 600	2 000	3 600	19,6	
400	20	3	✓	155	2 000	3 600	2 000	3 600	21,1	
460	50	3	✓	215	2 000	3 600	2 000	3 600	22,7	
520	20	4		275	2 000	3 600	2 000	3 600	24,2	
580	50	4		335	2 000	3 600	2 000	3 600	25,7	
640	20	5	✓	395	2 000	3 600	2 000	3 600	27,3	
700	50	5	✓	455	2 000	3 600	2 000	3 600	28,8	
760	20	6		515	2 000	3 600	2 000	3 600	30,3	
820	50	6		575	2 000	3 600	2 000	3 600	31,8	
880	20	7	✓	635	2 000	3 600	2 000	3 600	33,4	
940	50	7	✓	695	2 000	3 600	2 000	3 600	34,9	8,5
1 000	20	8		755	2 000	3 600	2 000	3 600	36,4	
1 060	50	8		815	2 000	3 600	2 000	3 600	37,9	
1 120	20	9	✓	875	2 000	3 390	2 000	3 390	39,5	
1 180	50	9	✓	935	2 000	3 010	2 000	3 010	41,0	
1 240	20	10		995	2 000	2 690	2 000	2 690	42,5	
1 300	50	10		1 055	2 000	2 410	2 000	2 410	44,1	
1 360	20	11	✓	1 115	2 000	2 180	2 000	2 180	45,6	
1 420	50	11	✓	1 175	1 990	1 980	1 880	1 980	47,1	
1 480	20	12		1 235	1 810	1 800	1 710	1 800	48,6	
1 540	50	12		1 295	1 660	1 650	1 570	1 650	50,2	
1 600	20	13	✓	1 355	1 530	1 520	1 440	1 520	51,7	

Length			3) KN	Screw data					Weight ⁵⁾	
L1	L3	n		Stroke ⁴⁾ S	SX2505 n _{max}	TN2505 n _{max}	SX2510 n _{max}	TN2510+2520+2525 n _{max}	G _A	G ₀
mm		-		mm	1/min				kg	
1 660	50	13	✓	1 415	1 410	1 400	1 330	1 400	53,2	
1 720	20	14		1 475	1 300	1 290	1 230	1 290	54,7	
1 780	50	14		1 535	1 210	1 200	1 140	1 200	56,3	
1 840	20	15	✓	1 595	1 120	1 120	1 060	1 120	57,8	
1 900	50	15	✓	1 655	1 050	1 040	990	1 040	59,3	
1 960	20	16		1 715	980	970	920	970	60,9	
2 020	50	16		1 775	920	910	870	910	62,4	
2 080	20	17	✓	1 835	860	860	810	860	63,9	
2 140	50	17	✓	1 895	810	800	760	800	65,4	
2 200	20	18		1 955	760	760	720	760	67,0	
2 260	50	18		2 015	720	720	680	720	68,5	8,5
2 320	20	19	✓	2 075	680	680	640	680	70,0	
2 380	50	19	✓	2 135	640	640	610	640	71,5	
2 440	20	20		2 195	610	610	580	610	73,1	
2 500	50	20		2 255	580	580	550	580	74,6	
2 560	20	21	✓	2 315	550	550	520	550	76,1	
2 620	50	21	✓	2 375	520	520	490	520	77,7	
2 680	20	22		2 435	500	500	470	500	79,2	
2 740	50	22		2 495	480	470	450	470	80,7	
2 800	20	23	✓	2 555	450	450	430	450	82,2	
2 860	50	23	✓	2 615	430	430	410	430	83,8	

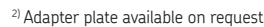
3) Suitable as top axis for central cross table mounting

4) Maximum stroke between end stops

5) G_A = Total mass of slide
G₀ = Linear moving mass of slide top

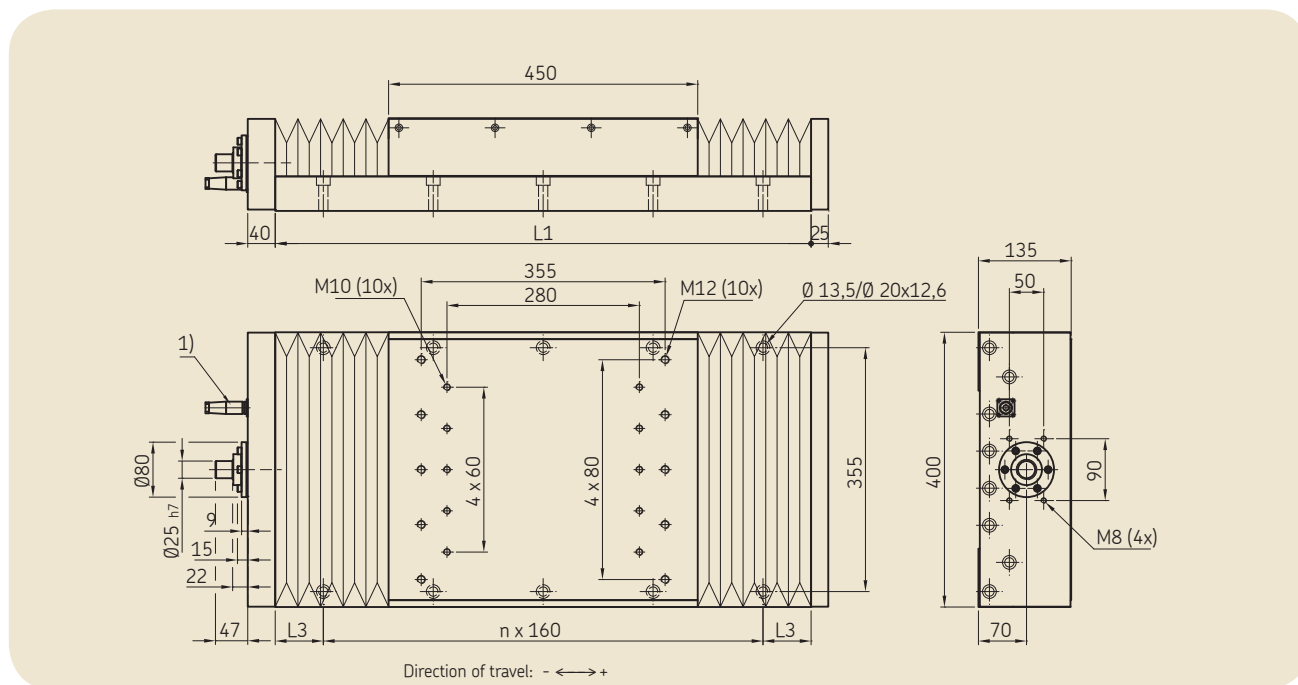


5) G_A = Total mass of slide
 G_0 = Linear moving mass of slide top



4) G_A = Total mass of slide
 G_0 = Linear moving mass of slide top

LTB 400.L1.SX/TN/TL40xx-BL: Slides with ball screw drive, with or without bellows

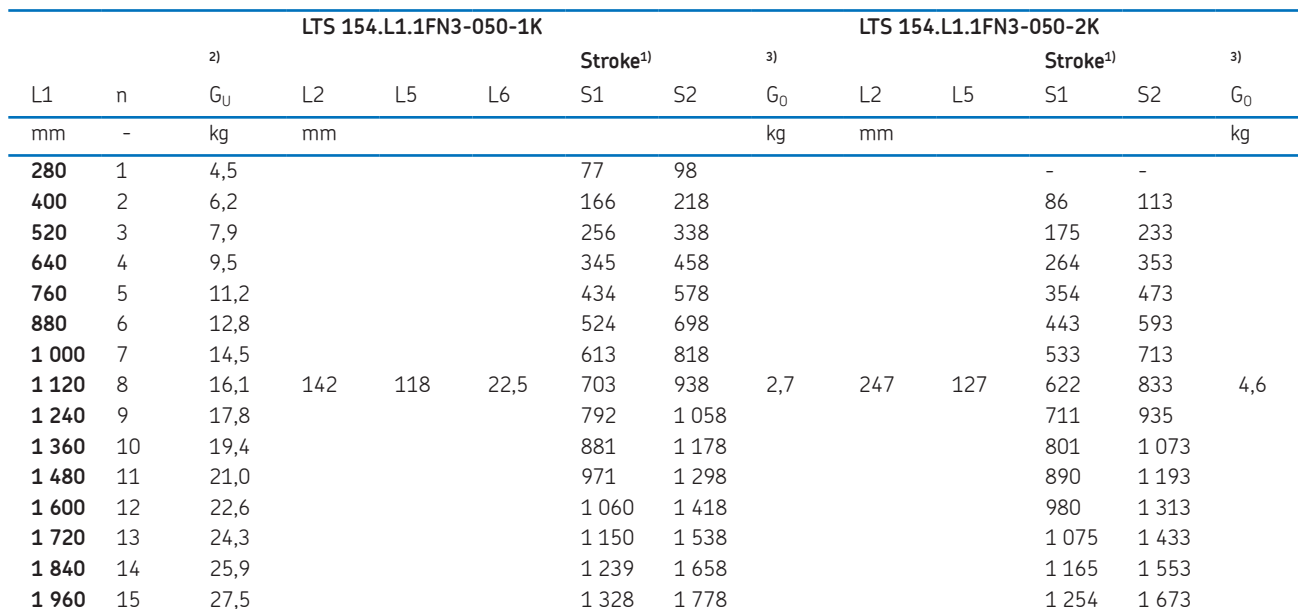


¹⁾ Plug connection for limit and reference switches (optional)

Length			Screw data							Weight ³⁾	
L1	L3	n	Stroke ²⁾		SX4005	TN4005	SX4010	TN4010	TN404020+4040	G _A	G ₀
mm		-	S1	S2	n _{max}	n _{max}	n _{max}	n _{max}		kg	
620		3	135	160	1 250	2 250	1 250	2 250	2 250	77,0	
780		4	275	320	1 250	2 250	1 250	2 250	2 250	87,7	
940		5	420	480	1 250	2 250	1 250	2 250	2 250	98,4	
1 100		6	560	640	1 250	2 250	1 250	2 250	2 250	109,1	
1 260		7	700	800	1 250	2 250	1 250	2 250	2 250	119,8	
1 420		8	850	960	1 250	2 250	1 250	2 250	2 250	130,5	
1 580		9	990	1 120	1 250	2 250	1 250	2 250	2 250	141,2	
1 740	70	10	1 130	1 280	1 250	2 250	1 250	2 250	2 250	151,9	25,2
1 900		11	1 270	1 440	1 250	2 150	1 250	1 980	1 980	162,6	
2 060		12	1 410	1 600	1 250	1 780	1 250	1 630	1 630	173,3	
2 220		13	1 555	1 760	1 250	1 490	1 250	1 370	1 370	184,0	
2 380		14	1 695	1 920	1 250	1 270	1 180	1 160	1 160	194,7	
2 540		15	1 835	2 080	1 090	1 090	1 010	1 000	1 000	205,4	
2 700		16	1 975	2 240	950	950	880	870	870	216,1	
2 860		17	2 125	2 400	840	830	770	760	760	226,8	

²⁾ Maximum stroke between end stops
S1 with bellows (standard version)
S2 without bellows (special version)

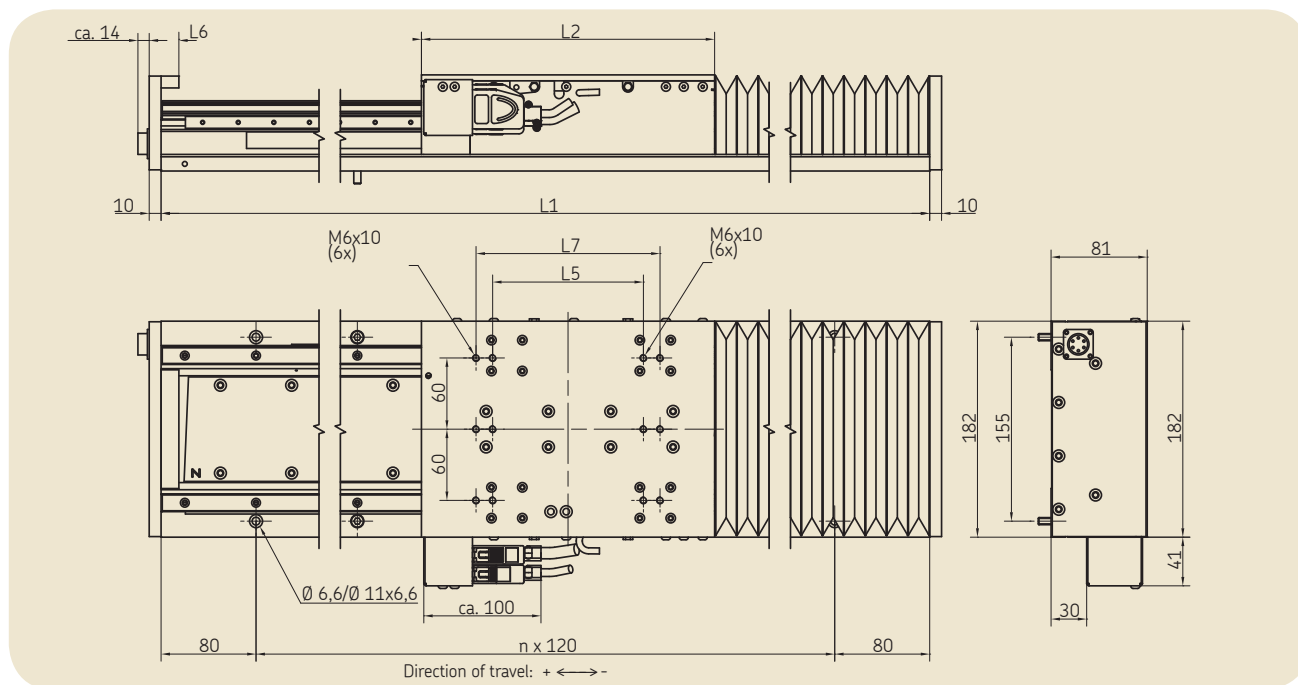
⁵⁾ G_A = Total mass of slide
G₀ = Linear moving mass of slide top



The operating stroke is defined as the maximum stroke between the limit switches.

Distance limit switch – end plate	20 mm (LTS without bellows)
Distance limit switch – end buffer	7,5 mm (LTS without bellows)
Distance limit switch – block length bellows	10 mm (LTS with bellows)

LTS 182.L1.1FN3-100-xK: Slides with linear motor drive, with or without bellows



Length		LTS 182.L1.1FN3-100-1K							LTS 182.L1.1FN3-100-2K							LTS 182.L1.1FN3-100-3K						
		2)					Stroke ¹⁾	3)					Stroke ¹⁾	3)					Stroke ¹⁾	3)		
L1	n	G _U	L2	L5	L6	S1	S2	G ₀	L2	L5	L7	S1	S2	G ₀	L2	L5	L7	S1	S2	G ₀		
mm	-	kg	mm				kg		mm				kg		mm				kg			
280	1	5,5				77	98					-	-					-	-			
400	2	7,6				166	218					86	113					-	-			
520	3	9,7				256	338					175	233					101	128			
640	4	11,8				345	458					264	353					190	248			
760	5	13,8				434	578					354	473					279	368			
880	6	15,9				524	698					443	593					369	488			
1 000	7	17,9				613	818					533	713					458	608			
1 120	8	20,0	142	118	22,5	703	938	3,7	247	127	155	622	833	6,1	352	127	155	548	728	8,6		
1 240	9	22,0				792	1058					711	935					637	848			
1 360	10	24,1				881	1178					801	1073					726	968			
1 480	11	26,1				971	1298					890	1193					816	1088			
1 600	12	28,2				1060	1418					980	1313					905	1208			
1 720	13	30,2				1150	1538					1075	1433					995	1328			
1 840	14	32,2				1239	1658					1165	1553					1084	1448			
1 960	15	34,3				1328	1778					1254	1673					1173	1568			

¹⁾ Operating stroke
S1 with bellows
S2 without bellows

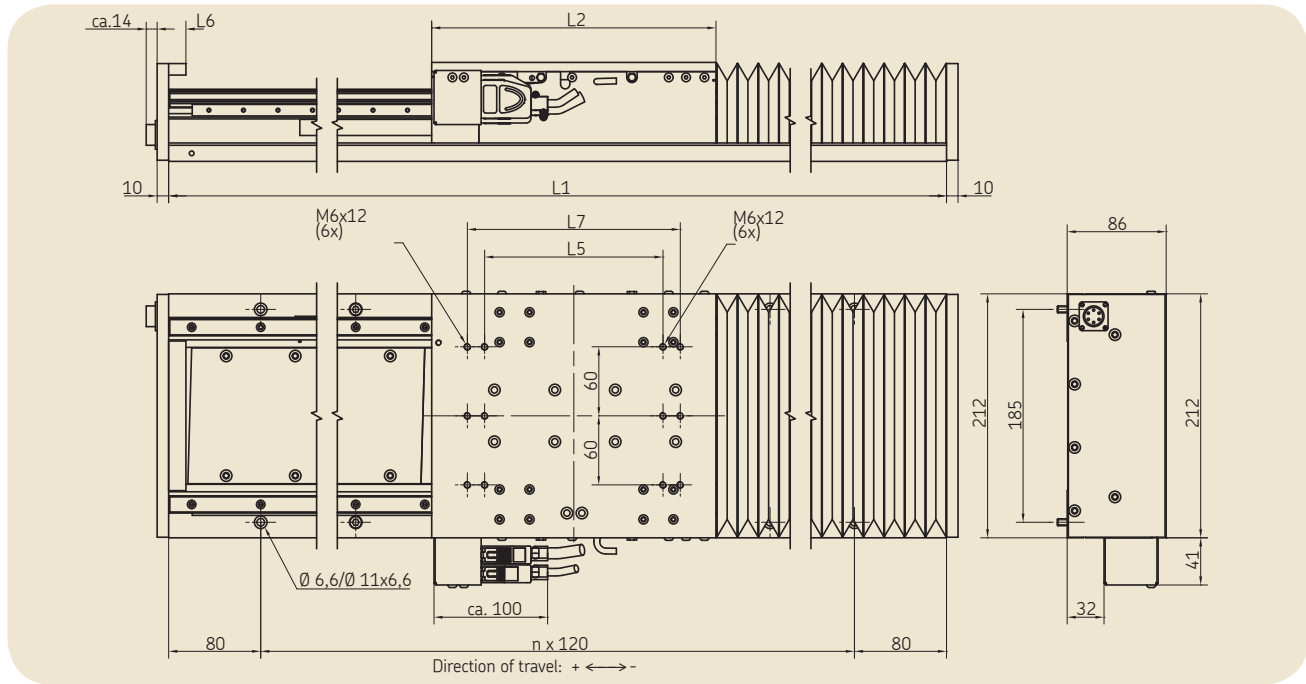
²⁾ G_U = Stationary mass of slide bottom
³⁾ G₀ = Linear moving mass of slide top

The operating stroke is defined as the maximum stroke between the limit switches.

Distance limit switch – end plate 20 mm (LTS without bellows)
Distance limit switch – end buffer 7,5 mm (LTS without bellows)
Distance limit switch – block length bellows 10 mm (LTS with bellows)

LTS 212.L1.1FN3-150-xK:

Slides with linear motor drive, with or without bellows



Length		LTS 212.L1.1FN3-150-1K							LTS 212.L1.1FN3-150-2K							LTS 212.L1.1FN3-150-3K						
		2)					Stroke ¹⁾	3)					Stroke ¹⁾	3)					Stroke ¹⁾	3)		
L1	n	G _U	L2	L5	L6	S1	S2	G ₀	L2	L5	L7	S1	S2	G ₀	L2	L5	L7	S1	S2	G ₀		
mm	-	kg						kg						kg						kg		
280	1	7,2				77	98					-	-					-	-			
400	2	10,1				166	218					86	113					-	-			
520	3	12,9				256	338					175	233					101	128			
640	4	15,7				345	458					264	353					190	248			
760	5	18,5				434	578					354	473					279	368			
880	6	21,3				524	698					443	593					369	488			
1 000	7	24,1				613	818					533	713					458	608			
1 120	8	26,9	142	118	22,5	703	938	4,6	247	155	185	622	833	8,2	352	155	185	548	728	11,9		
1 240	9	29,7				792	1058					711	935					637	848			
1 360	10	32,5				881	1178					801	1073					726	968			
1 480	11	35,2				971	1298					890	1193					816	1088			
1 600	12	38,0				1060	1418					980	1313					905	1208			
1 720	13	40,8				1150	1538					1075	1433					995	1328			
1 840	14	43,6				1239	1658					1165	1553					1084	1448			
1 960	15	46,3				1328	1778					1254	1673					1173	1568			

1) Operating stroke

S1 with bellows

S2 without bellows

2) G_U = Stationary mass of slide bottom

3) G₀ = Linear moving mass of slide top

The operating stroke is defined as the maximum stroke between the limit switches.

Distance limit switch – end plate

20 mm (LTS without bellows)

Distance limit switch – end buffer

7,5 mm (LTS without bellows)

Distance limit switch – block length bellows

10 mm (LTS with bellows)

Specification sheet for the selection of profile rail guide slides

1. Customer

Company

Street

Post code City

Name

Country

Job title

Phone

Name

Fax

Job title

Email

Name

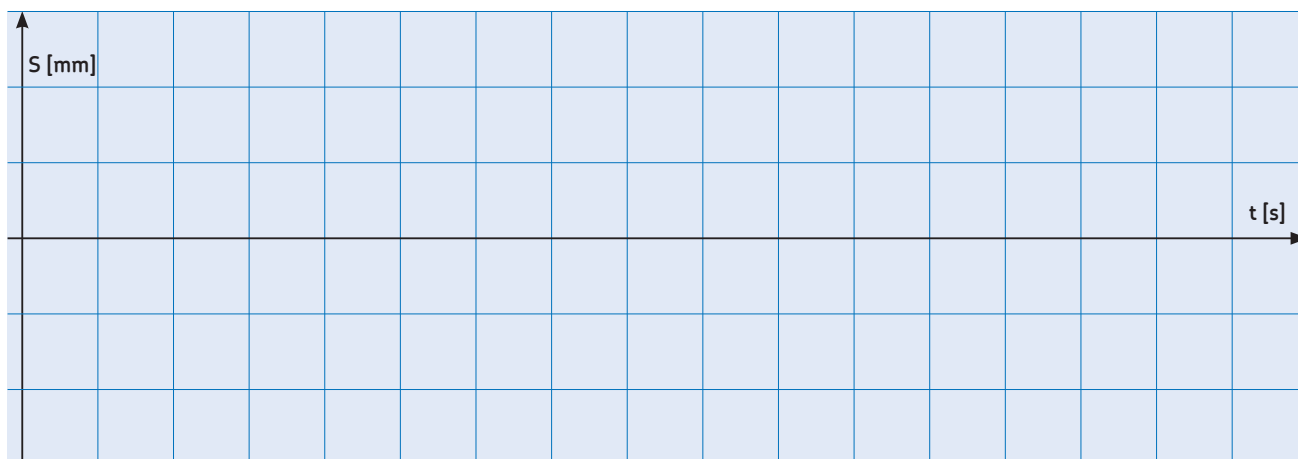
Job title

2. Application

Description

Implied demand

- | | | |
|--|-------------------------------|---------------------|
| 3. Number of axes | | |
| 4. Multi-axis arrangement (refer to page 27) | | |
| 5. Effective stroke | | |
| 6. Loads | Additional moving mass | [kg] |
| | Additional force | [N] |
| | Direction of force +/- X | [mm] |
| | Direction of force +/- Y | [mm] |
| | Direction of force +/- Z | [mm] |
| 7. Speed | Maximum | [m/s] |
| | Minimum | [m/s] |
| | Speed consistency | [%] |
| 8. Acceleration | Maximum | [m/s ²] |
| 9. Mode of operation | Percentage duty cycle | [%] |
| | Length of one operating cycle | [s] |

[illegible]

- 10. Specific life time** Operating hours per day [h]
- Required life time [h]

		X	Y	Z
11. Accuracy	Running accuracy Side T_y	[$\mu\text{m}/\text{Hub}$]		
	Running accuracy Height T_z	[$\mu\text{m}/\text{Hub}$]		
	Pitch angle / yaw angle	[mrad]		
	Absolute positioning accuracy	[μm]		
	Repeat accuracy	[μm]		
	Positioning resolution	[μm]		
12. Environment	Contamination			
	Temperature range	[$^{\circ}\text{C}$]		
13. Installation space	X-/Y-Z direction	[mm]		
14. Accessories	Motor			
	Cabling			
	Energy chain			
	Servo control			
	Linear path control			
	Continuous path control			
	Interfaces			
	Options			

15. Notes

Examples of possible axes configurations

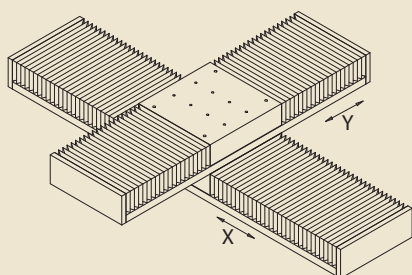


Bild 1: Cross table X/Y

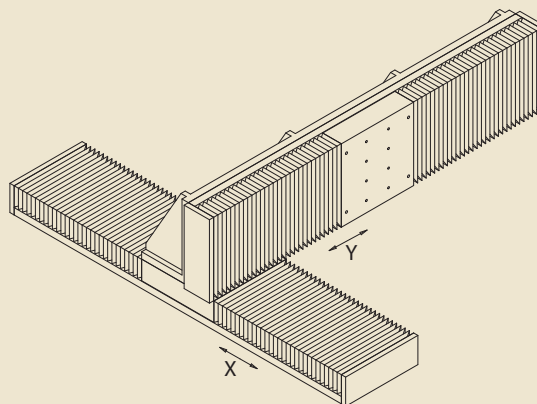


Bild 2: Gantry X/Y

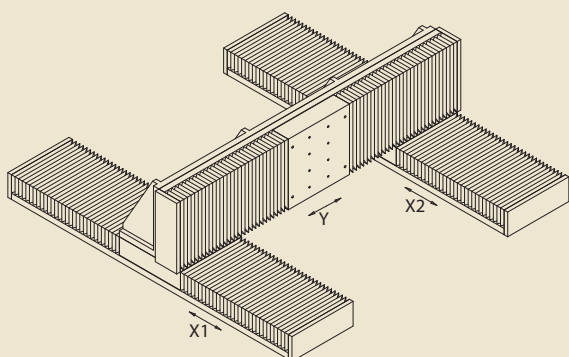


Bild 3: H-Gantry X1/X2 + Y

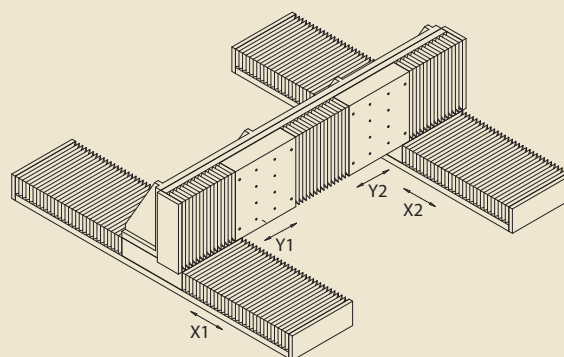


Bild 4: H-Gantry X1/X2 + Y1/Y2

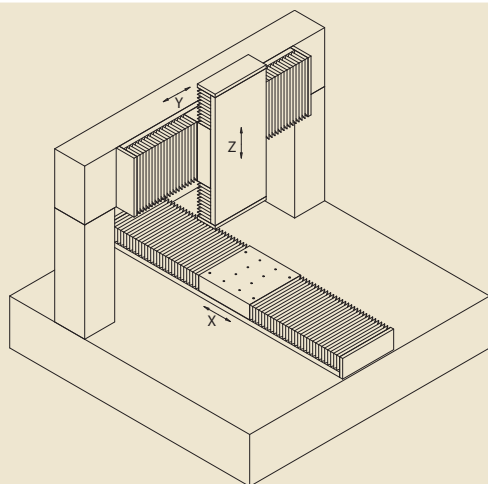


Bild 5: Single axis X + cross table Y/Z

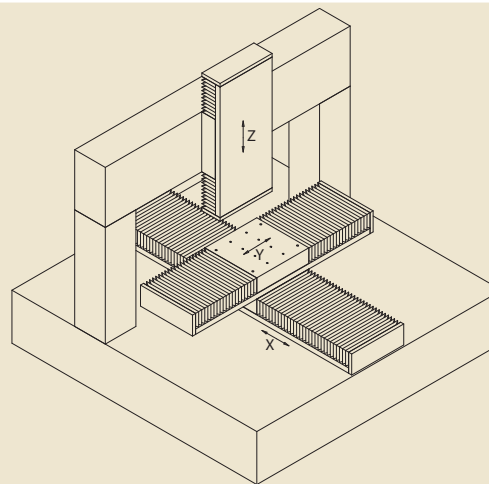


Bild 6: Cross table X/Y + single axis Z

Order code LTB

Slide designation

LTB 235 . 1600 . SX2505 - BL - P5

Slide width: refer to dimensional tables
110 to 400 width of bottom part

Slide length: refer to dimensional tables
150 to 2 860 L1 length of bottom part

Ball screw drive: refer to table 2 for further information
SD no preload
SX no preload
TN preloaded
TL preloaded
12 to 40 screw diameter
05 to 40 screw lead

Cover: refer to page 8 for further information
BL with bellows
– without cover
SC with steel cover
SCAP with steel cover and adapter plate

Precision class of slide: see page 8 for further information
P5, P2

Order code LTS

Slide designation

LTS 154 . 1900 . 1FN3-050-1K. BL

Slide width: 154/ 182/ 212	refer to dimensional tables width of bottom part
Slide length: 280 bis 1 960	refer to dimensional tables L1 length of bottom part
Linear motor size: 1FN3-	refer to page 7 for further information
Cover: BL –	refer to page 8 for further information with bellows without cover

For linear motor slides, the following additional details are required:

- Moving mass
- Possibly applied additional forces
- Maximum and minimum speeds;
maximum acceleration
- Percentage duty cycle (description of operating cycle)
- Requirements of linear encoder:
output signal, positioning resolution or signal period and precision class
- Information on motor control

Please fill in the specification sheet on pages 24 to 26 and return it to us.

SKF – the knowledge engineering company

From the company that invented the self-aligning ball bearing more than 100 years ago, SKF has evolved into a knowledge engineering company that is able to draw on five technology platforms to create unique solutions for its customers. These platforms include bearings, bearing units and seals, of course, but extend to other areas including: lubricants and lubrication systems, critical for long bearing life in many applications; mechatronics that combine mechanical and electronics knowledge into systems for more effective linear motion and sensorized solutions; and a full range of services, from design and logistics support to conditioning monitoring and reliability systems.

Though the scope has broadened, SKF continues to maintain the world's leadership in the design, manufacture and marketing of rolling bearings, as well as complementary products such as radial seals. SKF also holds an increasingly important position in the market for linear motion products, high-precision aerospace bearings, machine tool spindles and plant maintenance services.

The SKF Group is globally certified to ISO 14001, the international standard for environmental management, as well as OHSAS 18001, the health and safety management standard. Individual divisions have been approved for quality certification in accordance with ISO 9001 and other customer specific requirements.

With over 100 manufacturing sites worldwide and sales companies in 70 countries, SKF is a truly international corporation. In addition, our distributors and dealers in some 15 000 locations around the world, an e-business marketplace and a global distribution system put SKF close to customers for the supply of both products and services. In essence, SKF solutions are available wherever and whenever customers need them. Overall, the SKF brand and the corporation are stronger than ever. As the knowledge engineering company, we stand ready to serve you with world-class product competencies, intellectual resources, and the vision to help you succeed.

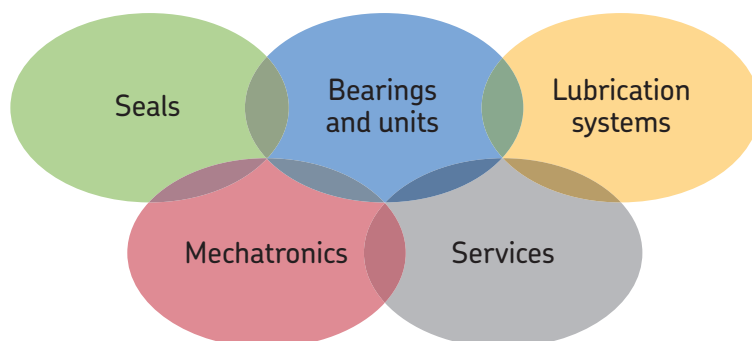


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Evolving by-wire technology

SKF has a unique expertise in fast-growing by-wire technology, from fly-by-wire, to drive-by-wire, to work-by-wire. SKF pioneered practical fly-by-wire technology and is a close working partner with all aerospace industry leaders. As an example, virtually all aircraft of the Airbus design use SKF by-wire systems for cockpit flight control.

SKF is also a leader in automotive by-wire technology, and has partnered with automotive engineers to develop two concept cars, which employ SKF mechatronics for steering and braking. Further by-wire development has led SKF to produce an all-electric forklift truck, which uses mechatronics rather than hydraulics for all controls.





Harnessing wind power

The growing industry of wind-generated electric power provides a source of clean, green electricity. SKF is working closely with global industry leaders to develop efficient and trouble-free turbines, providing a wide range of large, highly specialized bearings and condition monitoring systems to extend equipment life of wind farms located in even the most remote and inhospitable environments.



Working in extreme environments

In frigid winters, especially in northern countries, extreme sub-zero temperatures can cause bearings in railway axleboxes to seize due to lubrication starvation. SKF created a new family of synthetic lubricants formulated to retain their lubrication viscosity even at these extreme temperatures. SKF knowledge enables manufacturers and end user customers to overcome the performance issues resulting from extreme temperatures, whether hot or cold. For example, SKF products are at work in diverse environments such as baking ovens and instant freezing in food processing plants.



Developing a cleaner cleaner

The electric motor and its bearings are the heart of many household appliances. SKF works closely with appliance manufacturers to improve their products' performance, cut costs, reduce weight, and reduce energy consumption. A recent example of this cooperation is a new generation of vacuum cleaners with substantially more suction. SKF knowledge in the area of small bearing technology is also applied to manufacturers of power tools and office equipment.



Maintaining a 350 km/h R&D lab

In addition to SKF's renowned research and development facilities in Europe and the United States, Formula One car racing provides a unique environment for SKF to push the limits of bearing technology. For over 50 years, SKF products, engineering and knowledge have helped make Scuderia Ferrari a formidable force in F1 racing. (The average racing Ferrari utilizes more than 150 SKF components.) Lessons learned here are applied to the products we provide to automakers and the aftermarket worldwide.



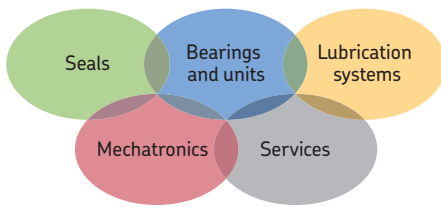
Delivering Asset Efficiency Optimization

Through SKF Reliability Systems, SKF provides a comprehensive range of asset efficiency products and services, from condition monitoring hardware and software to maintenance strategies, engineering assistance and machine reliability programmes. To optimize efficiency and boost productivity, some industrial facilities opt for an Integrated Maintenance Solution, in which SKF delivers all services under one fixed-fee, performance-based contract.



Planning for sustainable growth

By their very nature, bearings make a positive contribution to the natural environment, enabling machinery to operate more efficiently, consume less power, and require less lubrication. By raising the performance bar for our own products, SKF is enabling a new generation of high-efficiency products and equipment. With an eye to the future and the world we will leave to our children, the SKF Group policy on environment, health and safety, as well as the manufacturing techniques, are planned and implemented to help protect and preserve the earth's limited natural resources. We remain committed to sustainable, environmentally responsible growth.



The Power of Knowledge Engineering

Drawing on five areas of competence and application-specific expertise amassed over more than 100 years, SKF brings innovative solutions to OEMs and production facilities in every major industry worldwide. These five competence areas include bearings and units, seals, lubrication systems, mechatronics (combining mechanics and electronics into intelligent systems), and a wide range of services, from 3-D computer modelling to advanced condition monitoring and reliability and asset management systems. A global presence provides SKF customers uniform quality standards and worldwide product availability.

SKF Linearsysteme GmbH, www.linearmotion.skf.com, lin.sales@skf.com

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