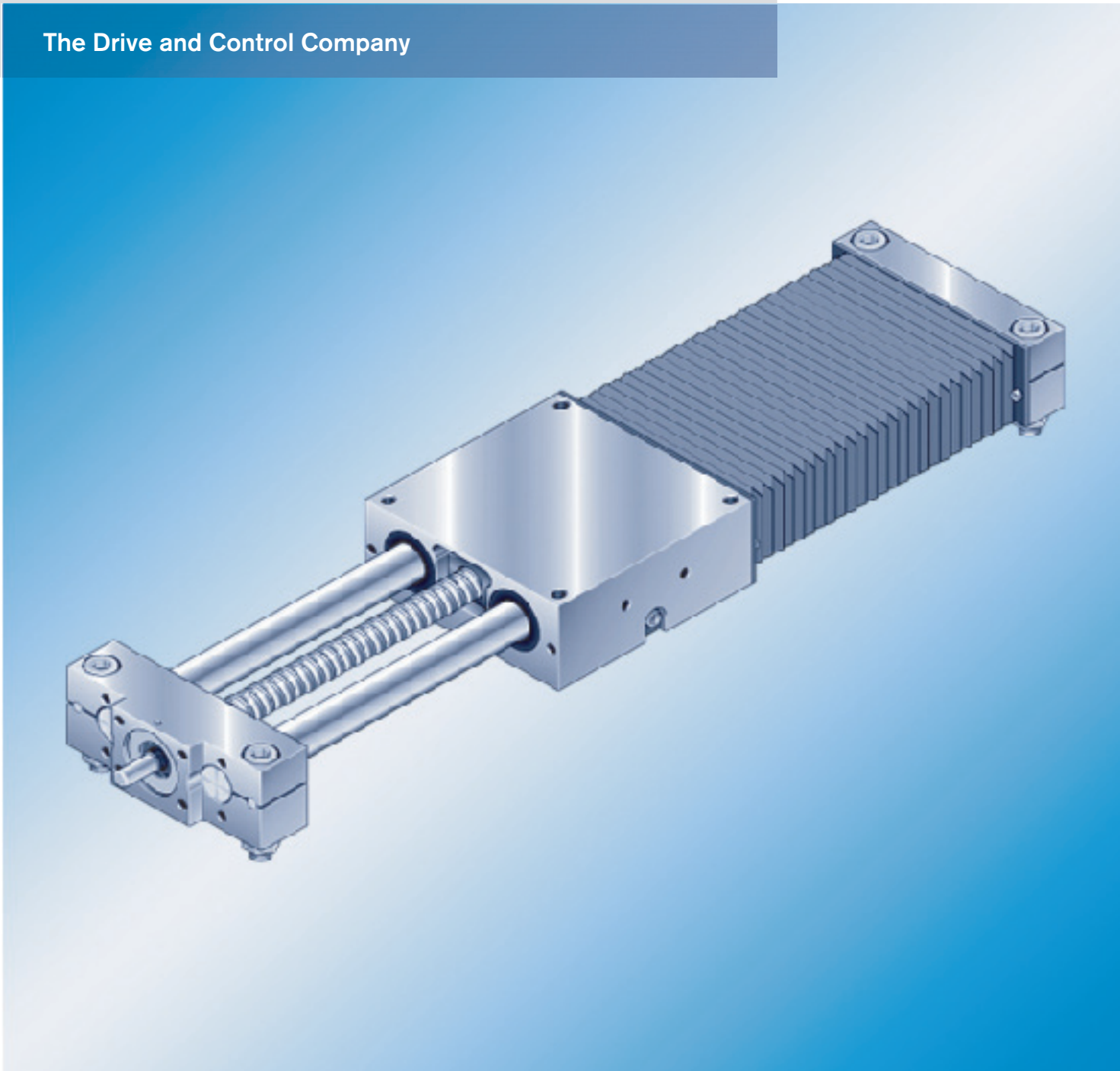
Rexroth
Bosch Group

Linear Motion Slides

The Drive and Control Company



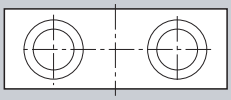
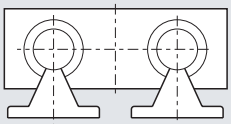
The Product Range

Linear Bushings and Shafts	Linear Bushings Linear Sets Shafts Shaft Support Rails, Shaft Support Blocks
	Ball Transfer Units
	Other Engineering Components
Profiled Rail Systems	Cam Roller Guides
	Ball Rail Systems
	Roller Rail Systems
Screw Drives	Precision Ball Screw Assemblies End Bearings and Housings
Linear Motion Systems	Linear Motion Slides
	Linear Modules Robotic Erector System Accessories
	Compact Slides
	Ball Rail Tables
	Components for Customized Positioning Systems
	Control Units Electrical Accessories, Fittings

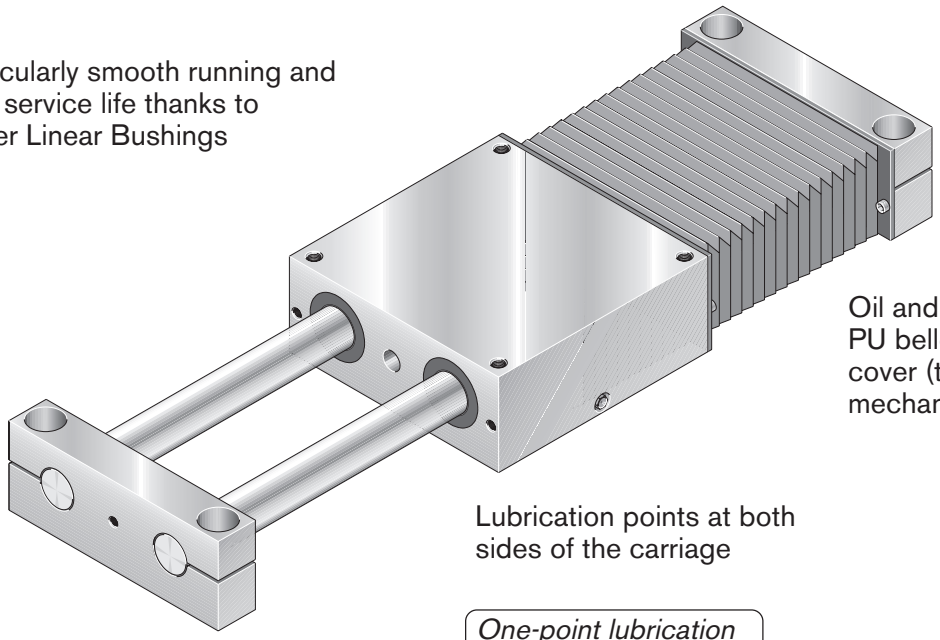
Linear Motion Slides

Linear Motion Slides

Product Overview

Linear Motion Slides:		
	closed type	- for cantilever-type installation
	open type	- for installation with shaft support shafts

Particularly smooth running and long service life thanks to Super Linear Bushings

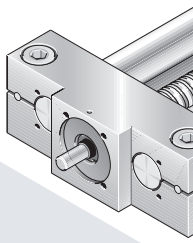


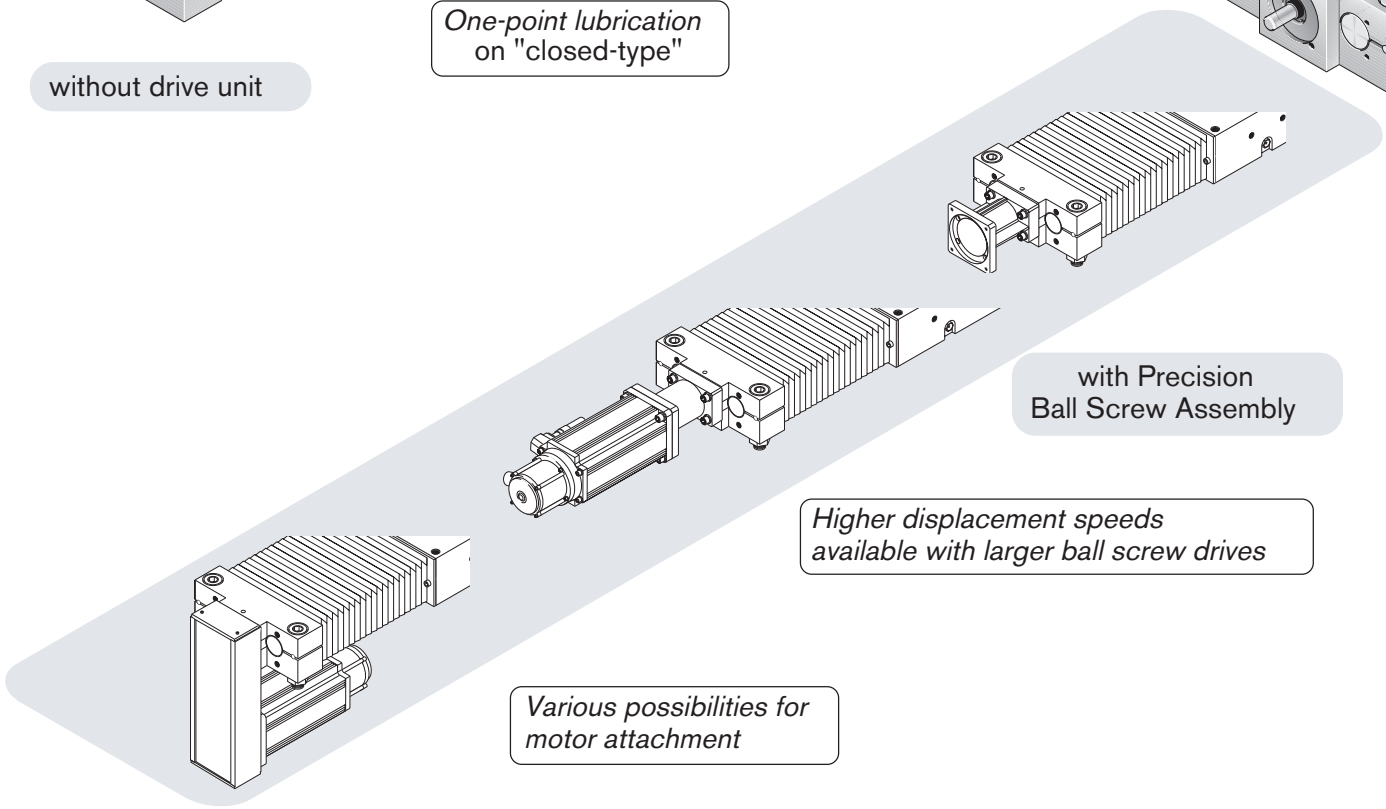
Oil and moisture-proof PU bellows-type protective cover (the last fold is mechanically clamped)

Lubrication points at both sides of the carriage

One-point lubrication on "closed-type"

without drive unit

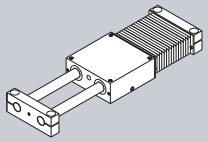
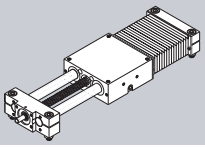
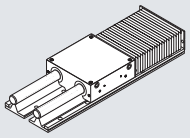
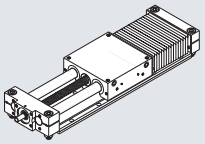


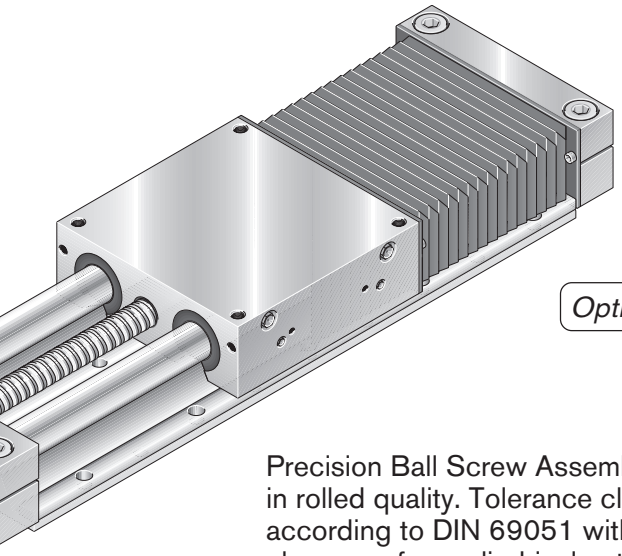


with Precision Ball Screw Assembly

Higher displacement speeds available with larger ball screw drives

Various possibilities for motor attachment

		without drive unit	with Ball Screw Drive
	Greater flexibility due to options. Ready for installation with different attachments		
			



Length as desired

Optimized shaft clamping force

Precision Ball Screw Assembly
in rolled quality. Tolerance class T7
according to DIN 69051 with
clearance-free cylindrical nut

Longer stroke for specified length

Linear Motion Slides

Types Available

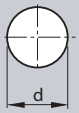
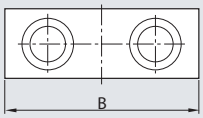
Type designation (size)

The linear motion slides are designated according to type and size.

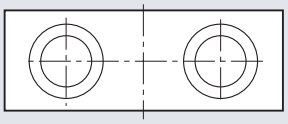
The term slide is used to describe a specific combination of type and size.

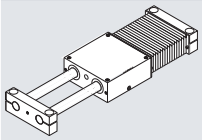
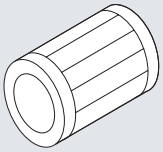
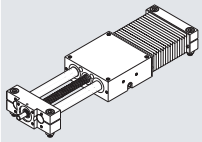
"Linear motion slide" is abbreviated to slide in the following tables.

Slide (Example) =	Type			Size	
	S	G	K	16-	100

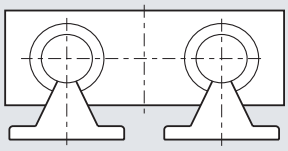
System	=	Linear Motion Slide (S)
Guideway	=	Closed-type linear bushing (G) Open-type linear bushing (O)
Drive unit	=	Without drive unit (O) Precision Ball Screw Assembly (K)
Dimensions of guideway	=	
Overall width	=	

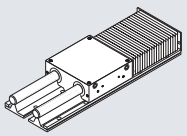
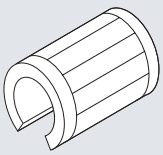
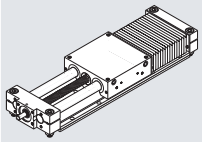
Linear Motion Slides Closed type



Type	Slide	Guideway	Drive unit	
SGO			 without drive unit	
SGK		Super Linear Bushing A closed type	 Precision Ball Screw Assembly	

Linear Motion Slides Open type



SOO			 without drive unit	
SOK		Super Linear Bushing A open type	 Precision Ball Screw Assembly	

Suitable load

(recommended value on the basis of past experience)

As far as the desired service life is concerned, loads of up to approximately 20% of the dynamic load and moment values (C, M_t, M_L) have proved acceptable.

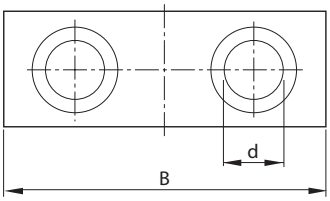
The following values may not be exceeded:

- the maximum permissible deflection
- the maximum permissible drive torque

Note on dynamic load capacities and moments:

The dynamic load capacities and moments are based on 100,000 m travel. However, a travel of just 50,000 m is often taken as a basis. If this is the case, for comparison purposes:

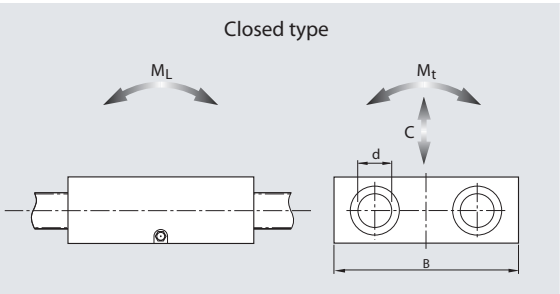
Multiply values C, M_t and M_L from the table by 1.26.

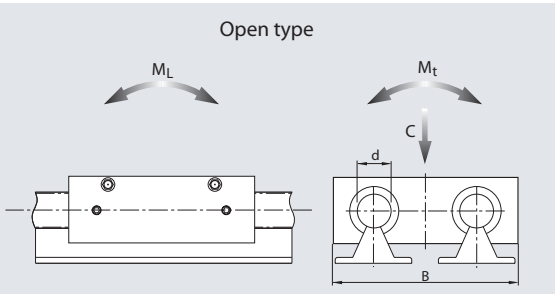


	Dynamic load capacity C (N) Size : d-B			
	12-85	16-100	20-130	25-160
Page 14	2500	3050	6040	11820
Page 18	2500	3050	6040	11820
Page 22	2850	3440	6100	11950
Page 24	2850	3440	6100	11950

Linear Motion Slides

Load Capacities and Moments





Size d-B	Dynamic load capacity C (N)	Dynamic moments M_t (Nm)	Dynamic moments M_L (Nm)	Dynamic load capacity C (N)	Dynamic moments M_t (Nm)	Dynamic moments M_L (Nm)
12-85	2500	52	57	2850	25	27
16-100	3050	82	87	3440	39	41
20-130	6040	217	229	6100	134	141
25-160	11820	520	549	11950	320	339

Note on dynamic load capacities and moments

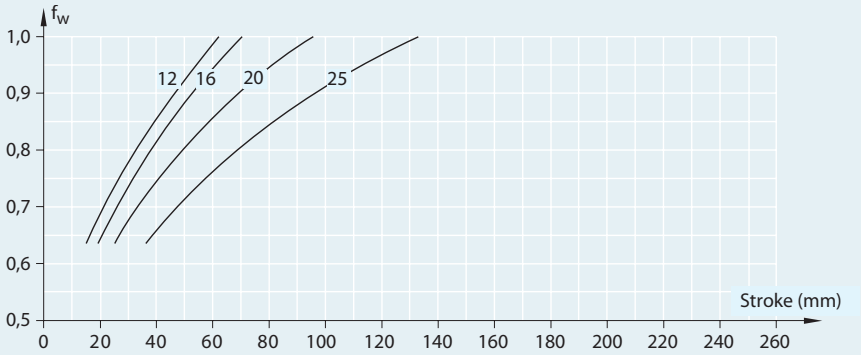
The dynamic load capacities and moments are based on 100,000 m travel. However, a travel of just 50,000 m is often taken as a basis. If this is the case, for comparison purposes:

Multiply values C, M_t and M_L from the table by 1.26.

Reduced load capacity in short-stroke applications

In short-stroke applications, the service life of the shaft is shorter than that of the Super Linear Bushings.

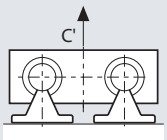
For this reason, the load capacities listed in the tables must be multiplied by the factor f_w.

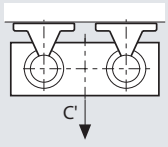


The load capacities of the open versions are reduced as follows under bottom-loading conditions:

Sizes 12 and 16 to 42%

Size 20 and 25 to 60%





Sizes 12 and 16
C' = 0.42 • C

Size 20 and 25
C' = 0.6 • C

Nominal service life

$$L = \left(\frac{C}{P}\right)^3 \cdot 10^5$$

$$L_h = \frac{L}{60 \cdot v_m}$$

L	nominal service life	(m)
L_h	nominal service life	(h)
C	dynamic capacity	(N)
P	equivalent dynamic load	(N)
v_m	average speed	(m)

General Information

Delivery conditions:

Assemblies without drive unit:

Delivered as separate parts. The carriage is mounted as a sub-assembly. The fixing screws are not included in the package.

Open Type SOO:

The Precision Steel Shafts are screwed to the Shaft Support Rails.

Assemblies with drive unit:

The Linear Motion Slides with ball screw drive (SGK and SOK) are delivered fully assembled and greased.

Length L:

The linear motion slides are built from standard components carried in stock. Timing belts, Ball Rails and ball screws are cut to length to suit each particular application. Therefore, Linear Motion Slides can be custom-designed and completed in a variety of lengths (infinitely variable).
Lengths exceeding the specified maximum L_{max} are available on request.

Permissible shaft deflection for the closed type:

Due to the use of Super Linear Bushings, higher shaft deflection is permissible than for conventional linear bearings. Selection of the length (L) and the size of slide should take account of the permissible shaft deflection (tan).

$$\tan_{max} = 8.72 \cdot 10^{-3} \mathrel{\hat{=}} 0.5$$

$$\tan \quad \tan_{max}$$

Maximum permissible drive torque M_{per}:

The values of M_{per} given in the graphs (see pages 10 to 13) are based on the following assumptions:

- Horizontal operation
- No radial load on the ball screw drive journal
- The torque rating of the coupling is not taken into account

The maximum permissible drive torque (see Technical Notes) is reduced for ball screw drives with keyway . The keyway produces a notch effect and reduces the effective diameter. (Information on side drive with timing belt available on request.)

Shafts for Linear Motion Slides without drive unit:

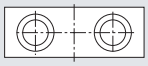
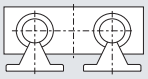
Linear Motion Slides are also available with:

- stainless steel shafts
- Resist steel shafts: zinc/iron coating with yellow chromating

For further details on Linear Bushings and Precision Steel Shafts, please ask for Catalog RA 99 004.

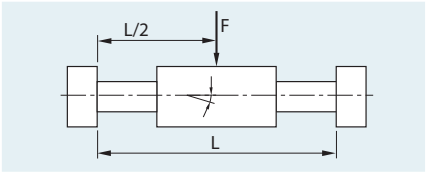
Linear Motion Slides — Size 12-85 / 16-100

Technical Notes

12-85	Slide	Ball screw d_o x P (mm)	Dynamic load capacity: Guide-way (N)	Dynamic load capacity: Fixed bearing (N)	Dynamic load capacity: Ball screw (N)	Dyn. moments: M_t (Nm)	Dyn. moments: M_L (Nm)	Moved mass (kg)	Slide mass L in mm (kg)	Maximum length L_{max} (mm)
Closed type 	SGO 12-85		2500			52	57	0.55	0.0018 • L + 0.80	1000
	SGK 12-85	8 x 2.5	2500	5280	2900	52	57	0.54	0.0021 • L + 0.92	1000
Open type 	SOO 12-85		2850			25	27	0.47	0.0035 • L + 0.47	4000
	SOK 12-85	8 x 2.5	2850	5280	2900	25	27	0.47	0.0040 • L + 0.82	1000

Note on dynamic load capacities and moments: refer to pages 7 and 8.

Permissible shaft deflection for closed version [1]:



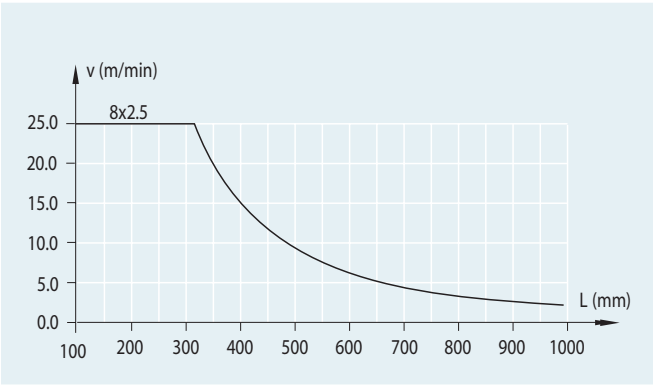
tan $\leq$ tan $_{max}$

$$\tan = F \cdot (L - 18) \cdot 1.376 \cdot 10^{-8}$$

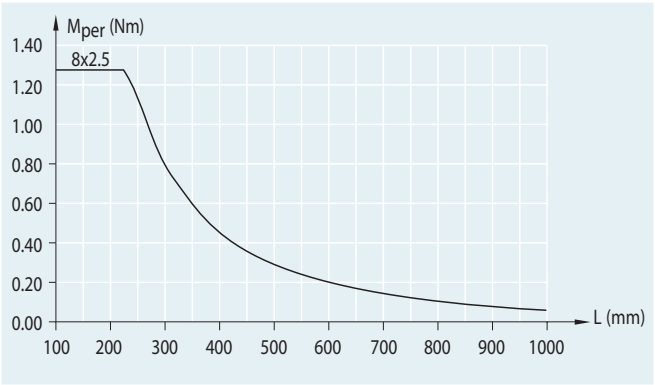
$$\tan_{max} = 8.72 \cdot 10^{-3}$$

tan	Shaft deflection	
F	External load	(N)
L	Dimension "L"	(mm)

Linear Motion Slides with Ball Screw Drive
Maximum speed



Maximum permissible drive torque [1]



Mass moment of inertia of linear motion slide:

$$J_S = (0.203 + 0.00 \cdot L + 0.158 \cdot m_{fr}) \cdot 10^{-6}$$

J_S	Reduced mass moment of inertia of linear motion drives with additional load on the drive journal	(kgm^2)
m_{fr}	Additional load	(kg)
L	Dimension "L"	(mm)

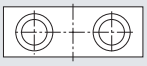
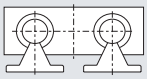
Frictional force, moment of friction:
without drive unit

	Frictional force (approx. N)
SGO 12-85	7
SOO 12-85	

with ball screw drive

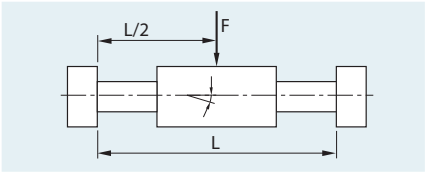
	Moment of friction (approx. Nm) 8 x 2.5
SGK 12-85	0.06
SOK 12-85	

[1] Also refer to "General Information"

16-100	Slide	Ball screw d_o x P (mm)	Dynamic load capacity			Dyn. moments		Moved mass	Slide mass L in mm (kg)	Maximum length L_{max} (mm)
			Guide-way (N)	Fixed bearing (N)	Ball screw (N)	M_t (Nm)	M_L (Nm)	(kg)		
Closed type 	SGO 16-100		3050			82	87	0.82	0.003 • L + 1.2	1500
	SGK 16-100	12 x 5	3050	5280	6500	82	87	0.80	0.004 • L + 1.4	1500
Open type 	SOO 16-100		3440			39	41	0.75	0.005 • L + 0.75	4000
	SOK 16-100	12 x 5	3440	5280	6500	39	41	0.76	0.006 • L + 1.3	1500

Note on dynamic load capacities and moments: refer to pages 7 and 8.

Permissible shaft deflection for closed version [1]:



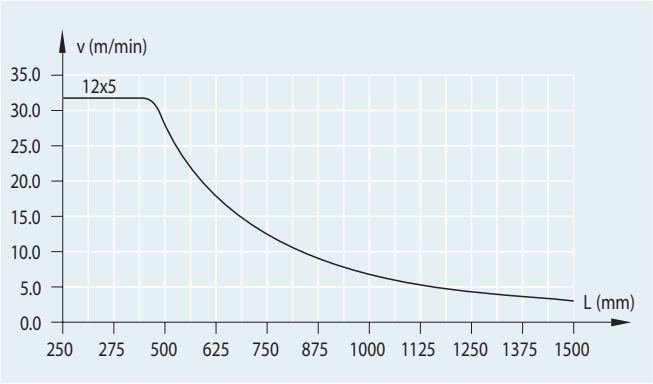
$\tan \quad \tan_{max}$

$$\tan = F \cdot (L - 21) \cdot 5.381 \cdot 10^{-9}$$

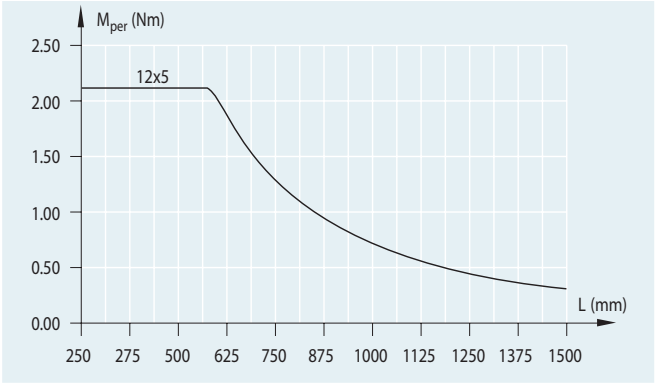
$$\tan_{max} = 8.72 \cdot 10^{-3}$$

tan	Shaft deflection	
F	External load	(N)
L	Dimension "L"	(mm)

Linear Motion Slides with Ball Screw Drive
Maximum speed



Maximum permissible drive torque [1]



Mass moment of inertia of linear motion slide:

$$J_S = (1.051 + 0.01 \cdot L + 0.633 \cdot m_{fr})) \cdot 10^{-6}$$

J_S	Reduced mass moment of inertia of linear motion drives with additional load on the drive journal	(kgm^2)
m_{fr}	Additional load	(kg)
L	Dimension "L"	(mm)

Frictional force, moment of friction:
without drive unit

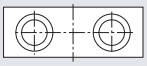
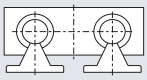
	Frictional force (approx. N)
SGO 16-100	9
SOO 16-100	

with ball screw drive

	Moment of friction (approx. Nm) 12 x 5
SGK 16-100	0.13
SOK 16-100	

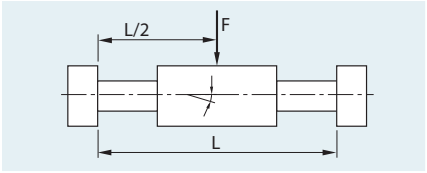
[1] Also refer to "General Information"

Technical Notes

20-130	Slide	Ball screw d_o x P (mm)	Dynamic load capacity Guide-way (N)	Fixed bearing (N)	Ball screw (N)	Dyn. moments M_t (Nm)	M_L (Nm)	Moved mass (kg)	Slide mass L in mm (kg)	Maximum length L_{max} (mm)
Closed type 	SGO 20-130		6040			217	229	1.8	0.005 • L + 2.6	2500
	SGK 20-130	16 x 5	6040	13400	12300	217	229	1.8	0.006 • L + 3.0	2500
		16 x 10			9600					
		16 x 16			7700					
Open type 	SOO 20-130		6100			134	141	1.6	0.008 • L + 1.6	4000
	SOK 20-130	16 x 5	6100	13400	12300	134	141	1.6	0.010 • L + 2.7	2500
		16 x 10			9600					
		16 x 16			7700					

Note on dynamic load capacities and moments: refer to pages 7 and 8.

Permissible shaft deflection for closed version [1]:



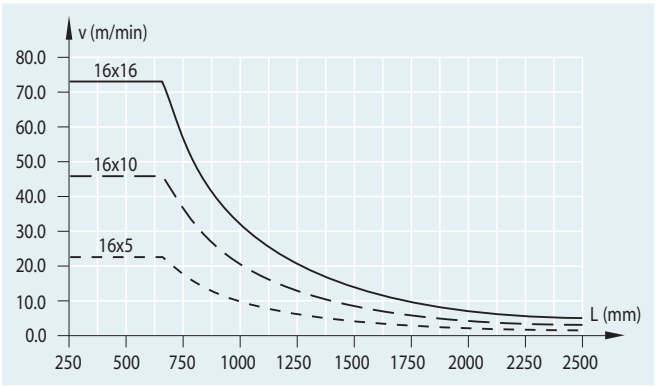
tan $\leq$ tan $_{max}$

$$\tan = F \cdot (L - 36) \cdot 2.932 \cdot 10^{-9}$$

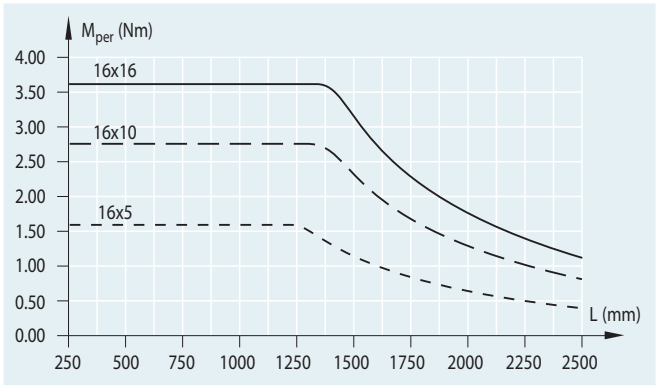
$$\tan_{max} = 8.72 \cdot 10^{-3}$$

tan	Shaft deflection	
F	External load	(N)
L	Dimension "L"	(mm)

Linear Motion Slides with Ball Screw Drive
Maximum speed



Maximum permissible drive torque [1]



Ball screw drive with keyway: maximum drive torque 3.2 Nm

Mass moment of inertia of linear motion slide:

$$J_S = (k1 + (k2 \cdot L) + (k3 \cdot m_{fr})) \cdot 10^{-6}$$

J_S	Reduced mass moment of inertia of linear motion drives with additional load on the drive journal	(kgm^2)
k1, k2, k3	Constants (see table)	
m_{fr}	Additional load	(kg)
L	Dimension "L"	(mm)

	Ball screw drive: d_o x P		
	16 x 5	16 x 10	16 x 16
k1 (kgmm ^{2})	3.238	6.692	13.878
k2 (kgmm)	0.039	0.039	0.039
k3 (mm ^{2})	0.633	2.533	6.485

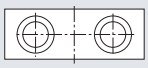
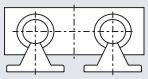
Frictional force, moment of friction:
without drive unit

	Frictional force (approx. N)
SGO 20-130	11
SOO 20-130	

with ball screw drive

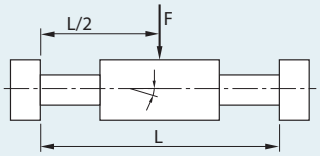
	Moment of friction (approx. Nm)		
	16 x 10	16 x 16	16 x 5
SGK 20-130	0.40	0.40	0.40
SOK 20-130			

[1] Also refer to "General Information"

25-160	Slide	Ball screw d_o x P (mm)	Dynamic load capacity			Dyn. moments		Moved mass	Slide mass L in mm (kg)	Maximum length L_{max} (mm)
			Guide-way (N)	Fixed bearing (N)	Ball screw (N)	M_t (Nm)	M_L (Nm)	(kg)		
Closed type 	SGO 25-160		11820			520	549	3.3	0.008 • L + 4.8	3000
	SGK 25-160	20 x 5	11820	17000	14300	520	549	3.3	0.011 • L + 5.5	3000
		20 x 20			12200					
		25 x 10			15800					
Open type 	SOO 25-160		11950			320	339	2.8	0.011 • L + 2.8	4000
	SOK 25-160	20 x 5	11950	17000	14300	320	339	2.9	0.015 • L + 5.0	3000
		20 x 20			12200					
		25 x 10			15800					

Note on dynamic load capacities and moments: refer to pages 7 and 8.

Permissible shaft deflection for closed version [1]:



tan $\leq$ $\tan_{max}$

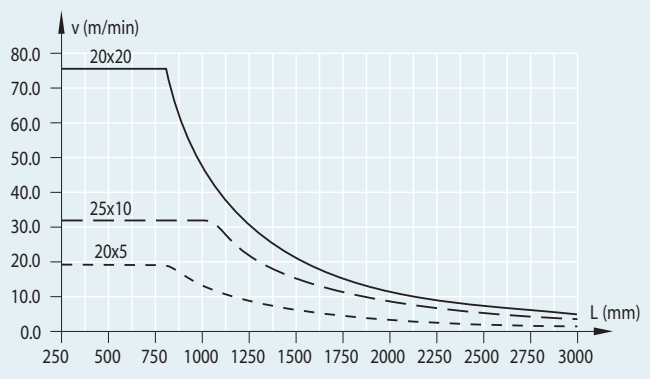
$$\tan = F \cdot (L - 43) \cdot 1.468 \cdot 10^{-9}$$

$$\tan_{max} = 8.72 \cdot 10^{-3}$$

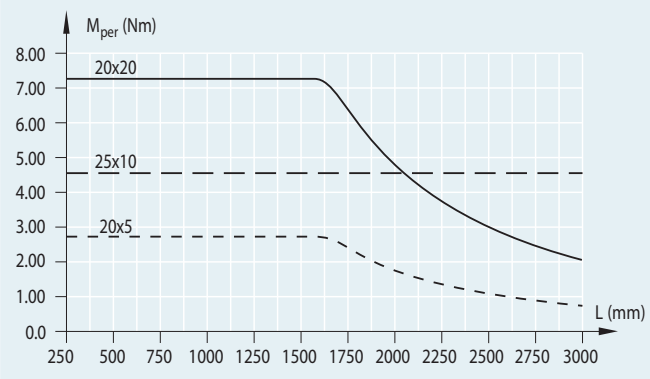
tan	Shaft deflection	
F	External load	(N)
L	Dimension "L"	(mm)

Linear Motion Slides with Ball Screw Drive

Max. speed



Max. permissible drive torque [1]



Ball screw drive with keyway: max. drive torque 4.5 Nm

Mass moment of inertia of linear motion slide:

$$J_S = (k1 + (k2 \cdot L) + (k3 \cdot m_{fr})) \cdot 10^{-6}$$

J_S	Reduced mass moment of inertia of linear motion drives with additional load on the drive journal	(kgm^2)
k1, k2, k3	Constants (see table)	
m_{fr}	Additional load	(kg)
L	Dimension "L"	(mm)

	Ball screw drive: d_o x P		
	20 x 5	20 x 20	25 x 10
k1 ($kgmm^2$)	8.216	39.990	23.575
k2 (kgmm)	0.100	0.100	0.256
k3 (mm^2)	0.633	10.132	2.533

Frictional force, moment of friction:

without drive unit

	Frictional force (approx. N)
SGO 25-160	14
SOO 25-160	

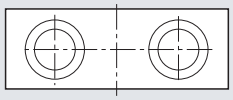
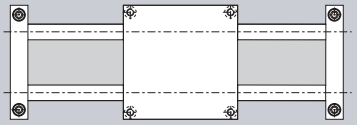
with ball screw drive

	Moment of friction (approx. Nm)		
	20 x 5	20 x 20	25 x 10
SGK 25-160	0.53	0.64	0.66
SOK 25-160			

[1] Also refer to "General Information"

Linear Motion Slides, Closed Type without Drive Unit

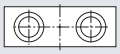
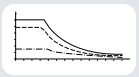
Components and Ordering SGO 12-85 to SGO 25-160

	Slide (do not use for order)	Part number 0260-X00-00, (....) mm	Type	Old Part Numbers The part numbers previously applicable are replaced by the number 0260.	
				Interchangeable with: 1040-..... *	
	SGO 12-85	0260-000-00	OA01	1040-712-00 : with end block A 1040-812-00 : with end block B	
	SGO 16-100	0260-100-00		1040-716-00 : with end block A 1040-816-00 : with end block B	
	SGO 20-130	0260-200-00		1040-720-00 : with end block A 1040-820-00 : with end block B	
	SGO 25-160	0260-300-00		1040-725-00 : with end block A 1040-825-00 : with end block B	

* For the end blocks, heights H_4, H_5 and H_6 and counterbore H_{13}, S_2 have been modified.

Order example

Ordering data		Description
Linear motion slide (Part number): 0260-200-00, 890 mm		Linear motion slide SGO 20-130 Length L = 890 mm
Type	= OA01	without drive unit
Guideway	= 01	with Precision Steel Shafts
Drive unit	= 02	with end block B
Carriage	= 01	with standard carriage
Cover	= 00	without bellows
Documentation	= 01	with maintenance instructions

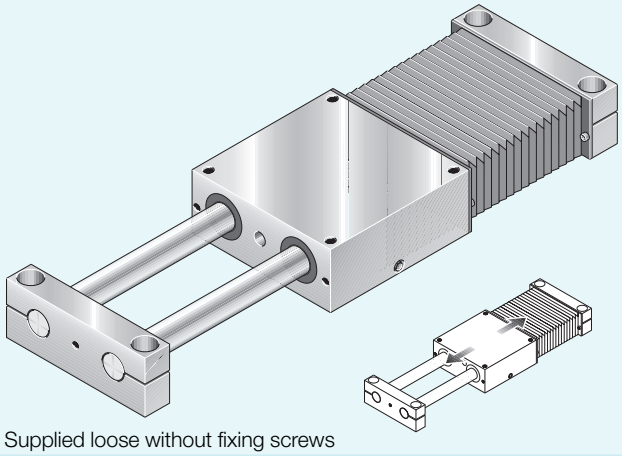
	Guideway = (..)			Drive unit = (..) (end block)		Carriage = (..)	Cover = (..)		Documentation = (..)
									
	Standard shafts	Stainless steel shafts	Shafts with STAR Resist coating	End block A	End block B	Standard	Polyurethane bellows		Maintenance instructions
							without	with	
	(01)	(02)	(03)	(01)	(02)	(01)	(00)	(01)	(01)

Linear Motion Slides, Closed Type without Drive Unit

Dimension Drawings SGO 12-85 to SGO 25-160

Linear Motion Slides

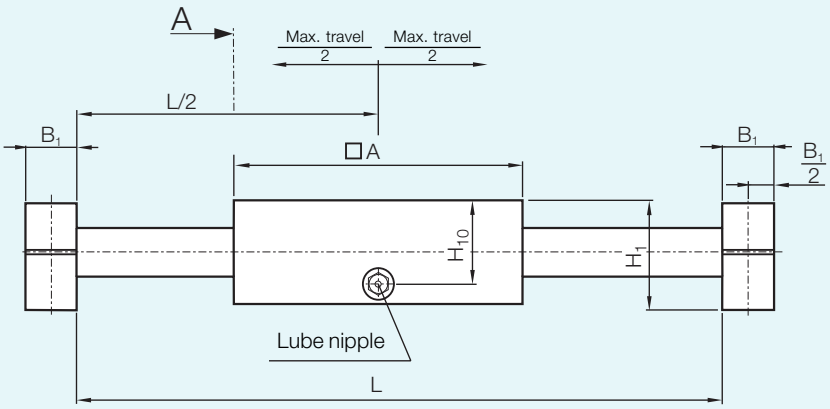
- Carriage (aluminum alloy)
- Four Super Linear Bushings; size 8: Standard Linear Bushings
- Four seals
- Two end blocks (aluminum alloy)
- Two Precision Steel Shafts, tolerance class h6
- With air pressure relief hole for bellows installation

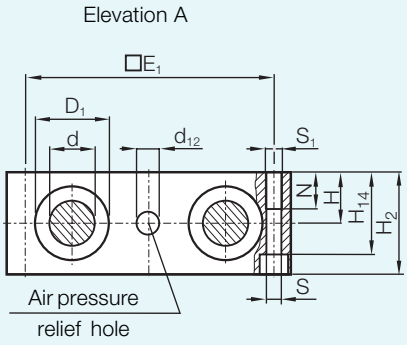


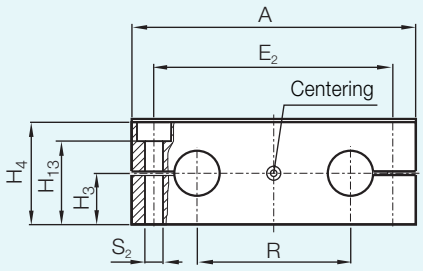
Supplied loose without fixing screws

End block A

For installations with fixed end blocks and moving carriage.

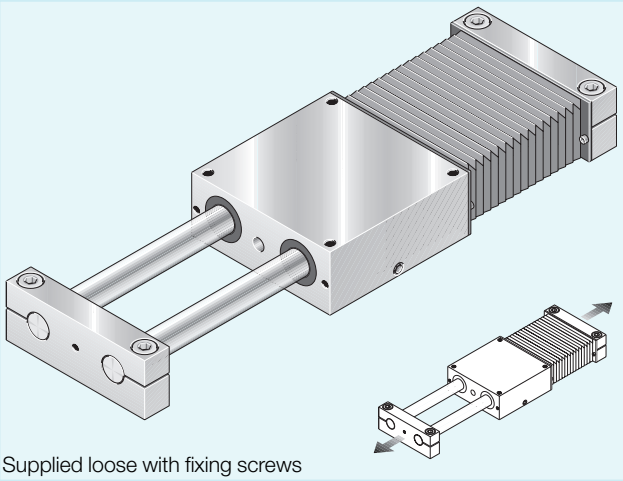






Slide	Dimensions (mm)													
	d h6	A	R	B_1	H ± 0.02	H_1	H_2	H_3 ± 0.015	H_4	H_{10}	H_{13}	H_{14}	D_1	
SGO 12-85	12	85	42	14	16	34	32	18	33	27	26.6	25	22	
SGO 16-100	16	100	54	18	18	38	36	20	37	31	28.6	29	26	
SGO 20-130	20	130	72	20	23	48	46	25	47	39	36.6	37.5	32	
SGO 25-160	25	160	88	25	28	58	56	30	57	48	44.6	45	40	

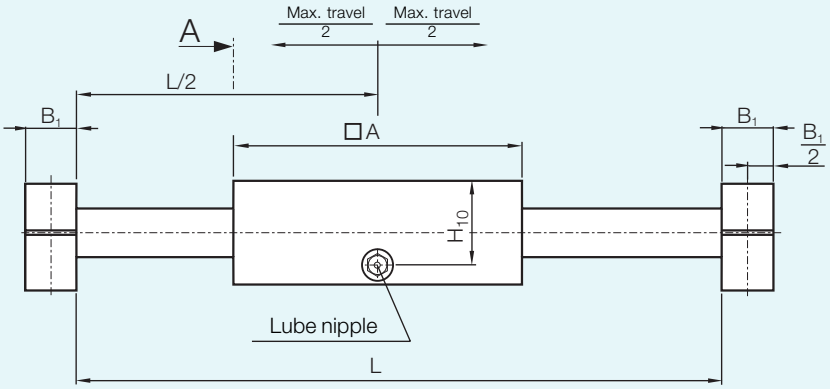
* For end block A only

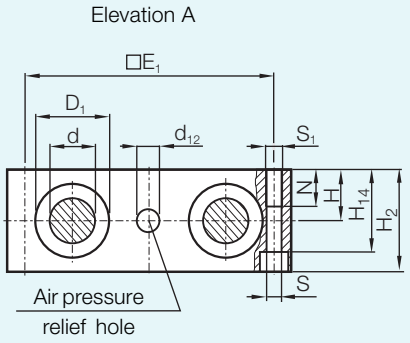


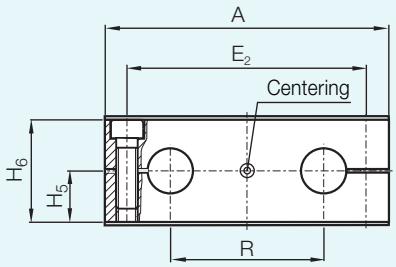
Supplied loose with fixing screws

End block B

For installations with fixed carriage and moving end blocks.

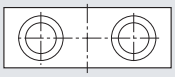
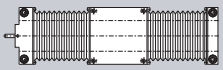
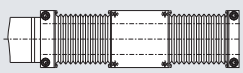
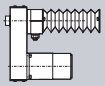
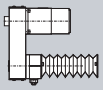
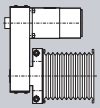
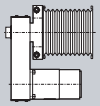






							End block B		Lube nipple	Air pressure relief hole	for bellows installation Length calculation
	E_1	E_2	S	S_1	S_2	N	H_5	H_6	DIN 3405	d_{12}	
	73	70	5.3	M 6	6.6	13	15	30	AM 6	10	$L = Travel_{max}$ x 1.33 + 122
	88	82	5.3	M 6	9.0	13	17	34	AM 6	12	$L = Travel_{max}$ x 1.33 + 137
	115	108	6.6	M 8	11.0	18	22	44	AM 6	14	$L = Travel_{max}$ x 1.30 + 168
	140	132	8.4	M 10	13.0	22	27	54	AM 8 x 1	16	$L = Travel_{max}$ x 1.24 + 199

Linear Motion Slides, Closed Type with Ball Screw Drive
Components and Ordering SGK 12-85 to SGK 25-160

	Slide	Part number 0261-X00-00, ... mm	Type = ...	Guideway = .. 	Drive unit = .. 									
				Standard shafts	Journal	Ball screw 8 x 2.5	12 x 5	16 x 5	16 x 10	16 x 16	20 x 5	20 x 20	25 x 10	
	SGK 12-85	0261-000-00	OF01	01	dia. 6	01								
	SGK 16-100	0261-100-00		01	dia. 6		01							
	SGK 20-130	0261-200-00		01	dia. 9			01	02	03				
					dia. 9 with keyway			04	05	06				
	SGK 25-160	0261-300-00		01	dia. 10						01	02	04	
					dia. 10 with keyway						05	06	08	
	SGK 12-85	0261-000-00	MF01 02.36.12	01	dia. 6	01								
	SGK 16-100	0261-100-00		01	dia. 6		01							
	SGK 20-130	0261-200-00		01	dia. 9			01	02	03				
	SGK 25-160	0261-300-00		01	dia. 10						01	02	04	
 RV01  RV02  RV03  RV04	SGK 25-160	0261-300-00	RV01 RV02 02.36.21	01	dia. 10						11	12	14	
			RV03 RV04 02.36.20	01	dia. 10						11	12	14	

* Version with end block B available upon request

Order example

Ordering data		Description
Linear Motion Slide	(Part number): 0261-100-00, 890 mm	Linear Motion Slide SGK 16-100, length (L) = 890 mm
Type	= MF01	with mount
Guideway	= 01	with Precision Steel Shaft
Drive Unit	= 01	ball screw 12 x 5
Carriage	= 01	with standard carriage
Motor Attachment	= 01	with assembly, motor attachment for MKD 41 B
Motor	= 10	with motor MKD 41 B
Cover	= 01	polyurethane bellows
1st Switch	= 15- R+ 250mm	mechanical switch, switch activation point: right + 250 mm
2nd Switch	= 11- R- 150mm	PNP NC, switch activation point: right - 150 mm
3rd Switch	= 15 R- 250mm	mechanical switch, switch activation point: right - 250 mm
Cable Duct	= 20, 500mm	cable duct 500 mm long (loose)
Socket-plug	= 17	Socket-plug supplied loose
Switching Cam	= 16	with switching cam on the switch side
Documentation	= 01	standard report

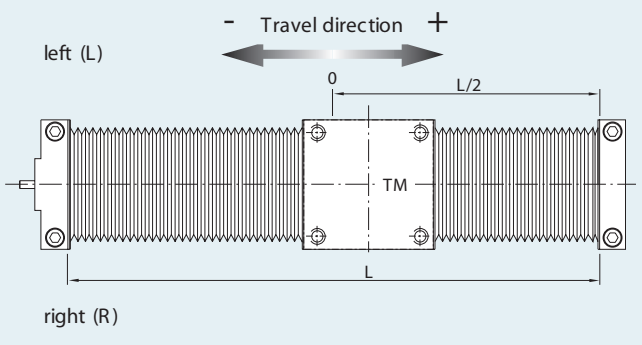
Carriage = (..)	Motor attachment = (..)			Motor=(..)	Cover = (..)		1st switch = (.. - . .....) mm 2nd switch = (.. - . ....) mm 3rd switch = (.. - . ....) mm Cable duct = (.. - . ....) mm Socket-plug = (..) Switching cam = (.)	Documentation = (..)	
Standard		*Mount	for Motor [1]	Motor Type	Polyurethane bellows			Standard report	Measurement report
	i =				without	with			
(01)		(00)		(00)	(00)	(01)	without switch, without cable duct (00) External switch: PNP NC (11 -. ....), PNP NO (13 -. ....), Mechanical (15 -. ....) External switching cam (16) External socket-plug (loose) (17) Cable duct (loose): Cable duct (20 - X....) Switch activation point: Switch type, Mounting side, Travel direction, Switching distance Type, Length in mm	(01)	(02)
(01)	1	(00)		(00)					
(01)		(00)		(00)					
(01)		(00)		(00)					(03)
(01)	1								
(01)	1								
(01)	1	(01)	MKD 41 B	(10)					
(01)	Servo Motor	(03)	MKD 41 B	(10)					
(01)	1	(10)	MKD 41 B	(10)					
	1.5	(12)	MKD 41 B	(10)					
(01)	1	(14)	MKD 41 B	(10)					
	1.5	(16)	MKD 41 B	(10)					

1) Pay attention to maximum torque

*Attachment can also be supplied without motor (enter "00" for motor on order)

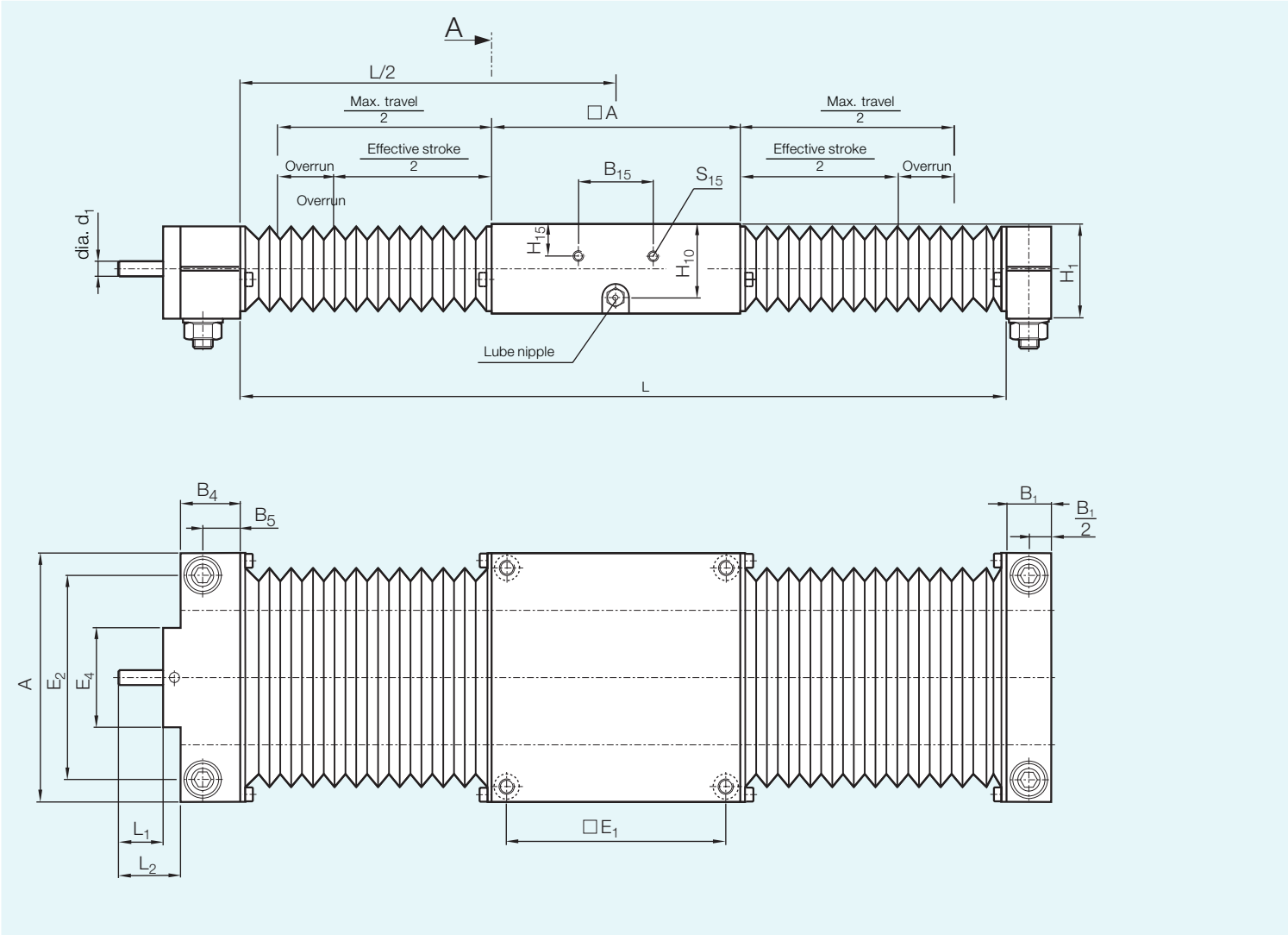
Determining the switch activation point

The switch activation point is to be taken from the data given on mounting side, travel direction and switching distance (see table above and order example on left).
Mounting side: The switches can be fitted on the left (L) or right (R) side of the slide.
Travel direction: The switches can be fitted on the minus (Ð) or plus (+) side of zero.
Switching distance: The switching distance is the distance between the carriage center (TM) and the zero point (0) when a switch is operated (given in mm).
See "Switch Installation" for more details on fitting switches, types of switch and fitting the cable duct.



Linear Motion Slides, Closed Type with Ball Screw Drive

Dimension Drawings SGK 12-85 to SGK 25-160

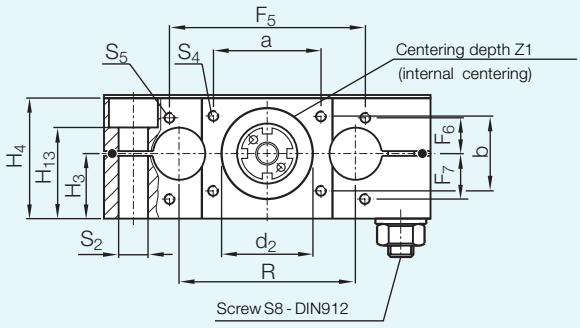


See page 31 for the motor attachment drawings.

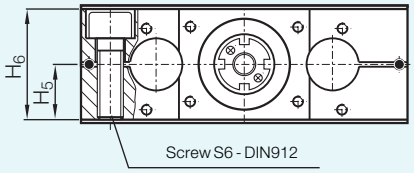
Slide	Drive journal Mounting geometry									for locating bracket				
	d_1 h7	d_2 h7	L_1	L_2	Z_1	E_4	a	b	S_4	F_5	F_6	F_7	S_5	
SGK 12-85	6	28	18	25	2.1	40	33	23	M4- 8 deep	53	9.5	11.5	M4 -8 deep	
SGK 16-100	6	28	18	25	2.1	40	33	23	M4- 8 deep	60	11	14	M4 -8 deep	
SGK 20-130	9	40	25	34.5	2.1	52	40	28	M6-12 deep	74	15.5	18.5	M5 -12 deep	
SGK 25-160	10	48	25	35.5	2.1	63	40	40	M6-12 deep	104	17.5	16.5	M5-12 deep	

Slide	Dimensions (mm)														
	d h6	A	R	B_1	B_4	B_5	H ± 0.02	H_1*	H_2	H_3 ± 0.015	H_4	H_{10}	H_{13}	H_{14}	D_1
SGK 12-85	12	85	42	14	24	17	16	34	32	18	33	27	26.6	25	22
SGK 16-100	16	100	54	18	24	15	18	38	36	20	37	31	28.6	29	26
SGK 20-130	20	130	72	20	29	19	23	48	46	25	47	39	36.6	37.5	32
SGK 25-160	25	160	88	25	33	20.5	28	58	56	30	57	48	44.6	45	40

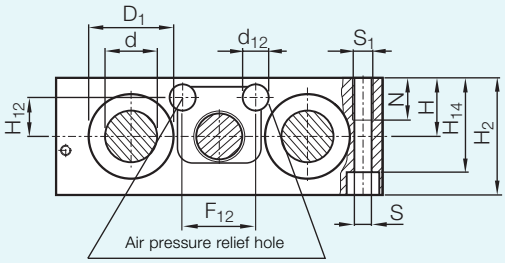
* For end block A only

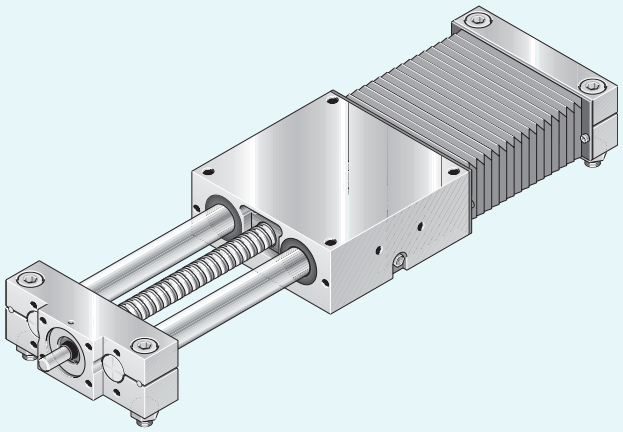


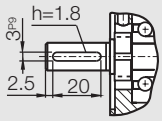
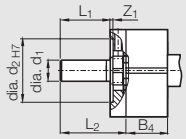
Version with end block B
available on request



Elevation A



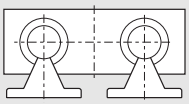
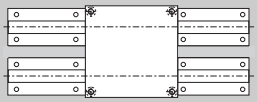


Ball Screw Journal		
Size	**with keyway**	**without keyway**
SGK 20-130		See Page 20
SGK 25-160		

for switching cam			Air pressure relief holes			for bellows installation length calculation
B_{15}	H_{15}	S_{15}	F_{12}	H_{12}	d_{12}	
30	13.5	M4-7 deep	16	10.4	6.8	$L = Travel_{max}$ x 1.33 + 122
30	13	M4-7 deep	24.4	12	8.5	$L = Travel_{max}$ x 1.33 + 137
64	23	M4-8 deep	37	15.5	10	$L = Travel_{max}$ x 1.30 + 168
64	26	M4-10 deep	40	18.5	12.5	$L = Travel_{max}$ x 1.24 + 199

							with end block B			Lube nipple	For modifications to the carriage, please ask for one of the following tables
E_1	E_2	S	S_1	S_2	S_8	N	S_6	H_5	H_6	DIN 3405	
73	70	5.3	M 6	6.6	M 6 x 35	13	M 6 x 22	15	30	AM 6	TB02-016-01
88	82	5.3	M 6	9	M 8 x 40	13	M 8 x 25	17	34	AM 6	TB02-016-02
115	108	6.6	M 8	11	M 10 x 55	18	M10 x 30	22	44	AM 6	TB02-016-03
140	132	8.4	M 10	13.0	M 12 x 40	22	M12 x 40	27	54	AM 8 x 1	TB02-016-04

Linear Motion Slides, Open Type without Drive Unit
Components and Ordering SOO 12-85 to SOO 25-160

	Slide (do not use for order)	Part number 0265-X00-00,....mm	Type	Old Part Numbers The part numbers previously applicable are replaced by the number 02..	
				Interchangeable with: 1045-…-..	
	**SOO 12-85**	0265-000-00		1045-112-00	
	SOO 16-100	0265-100-00*		1045-116-00	
	SOO 20-130	0265-200-00*	OA01	1045-120-00	
	SOO 25-160	0265-300-00*		1045-125-00	

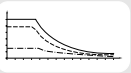
* The new carriages have a shoulder between the shaft supports (B_6, H_{18})

Slide	Dimensions (mm)										
	d h6	A	R	H ± 0.02	H_7	H_8	H_{18}	B_6	W	Angle α	D_1
SOO 12-85	12	85	42	18	40	30	-	-	6.5	66	22
SOO 16-100	16	100	54	22	48	35	3	15	9.0	68	26
SOO 20-130	20	130	72	25	57	42	3.5	12	9.0	55	32
SOO 25-160	25	160	88	30	66	51	2.5	15	11.5	57	40

Order example

Ordering data		Description
Linear Motion Slide (Part number): 0265-400-00, 890 mm		**Linear Motion Slide** SOO 30-180, Length L = 890 mm
Type	= OA01	without drive unit
Guideway	= 01	with Precision Steel Shafts
Carriage	= 01	with standard carriage
Cover	= 00	without bellows
Documentation	= 01	with maintenance instructions

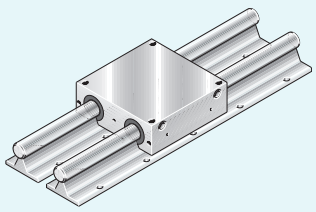
Dimension Drawings

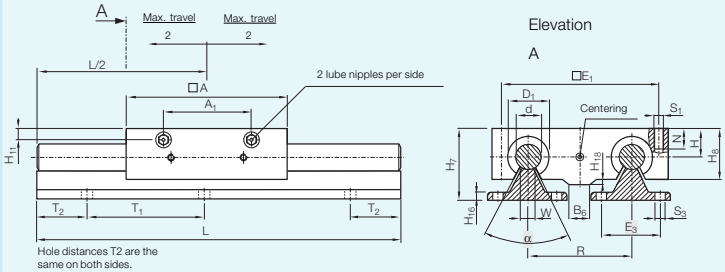
	Guideway = ..	Carriage = ..	Cover = ..		Documentation = ..
					
	Standard shafts	Stainless steel shafts	Shafts with STAR Resist coating	Standard	Polyurethane bellows		Maintenance instructions
					without	with	
	01	02	03	01	00	01	01

			Shaft support rail						Lube nipple			for bellows installation length calculation
E_1	S_1	N	H_{16}	H_{17}	S_3	E_3	T_1	T_2	A_1	H_{11}	DIN 3405	
73	M 6	13	5	6.5	4.5	29	75	min.15	57	7	AM 6	$L = Travel_{max} \times 1.33 + 122$
88	M 6	13	5	8.3	5.5	33	100	min.20	68	7.2	AM 6	$L = Travel_{max} \times 1.33 + 137$
115	M 8	18	6	9.8	6.6	37	100	min.20	94	7.2	AM 6	$L = Travel_{max} \times 1.30 + 168$
140	M 10	22	6	9.8	6.6	42	120	min.24	116	9.5	AM 8 x 1	$L = Travel_{max} \times 1.24 + 199$

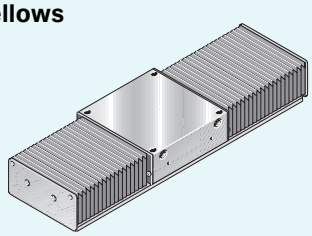
Linear Motion Slides

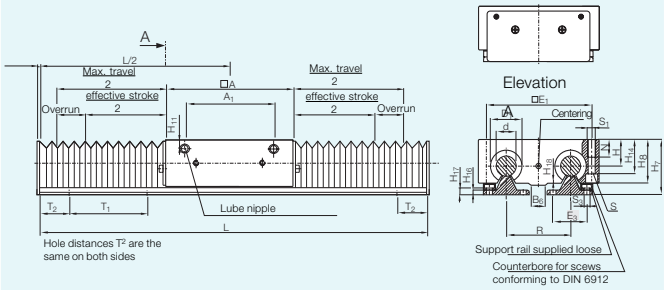
- Carriage (aluminum alloy)
- Four Super Linear Bushings
- Four seals
- Two Precision Steel Shafts, tolerance class h_6, with shaft support rails (aluminum alloy)



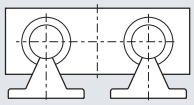
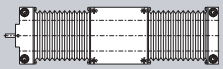
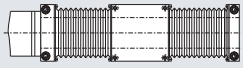
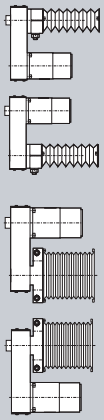


Version for bellows





Linear Motion Slides, Open Type with Ball Screw Drive
Components and Ordering SOK 12-85 to 25-160

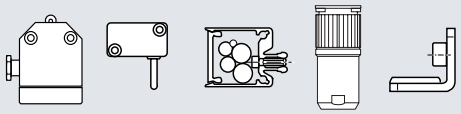
	Slide	Part number 0266-X00-00, (....) mm AND	Type = (.....)	Guideway = (..) 	Drive unit = (..) 									
				Standard shafts	Journal	Ball screw 8 x 2.5	12 x 5	16 x 5	16 x 10	16 x 16	20 x 5	20 x 20	25 x 10	
	SOK 12-85	0266-000-00	OF01	02	dia. 6	01								
	SOK 16-100	0266-100-00		02	dia. 6		01							
	SOK 20-130	0266-200-00		02	dia. 9			01	02	03				
					dia. 9 with keyway			04	05	06				
	SOK 25-160	0266-300-00		02	dia. 10						01	02	04	
					dia.10 with keyway						05	06	08	
	SOK 12-85	0266-000-00	MF01	02	dia. 6	01								
	SOK 16-100	0266-100-00		02	dia. 6		01							
	SOK 20-130	0266-200-00		02	dia. 9			01	02	03				
	SOK 25-160	0266-300-00		02	dia. 10						01	02	04	
 RV01 RV02 RV03 RV04	SOK 25-160	0266-300-00	RV01 RV02 02.36.21	02	dia. 10						11	12	14	
			RV03 RV04 02.36.20	02	dia. 10						11	12	14	

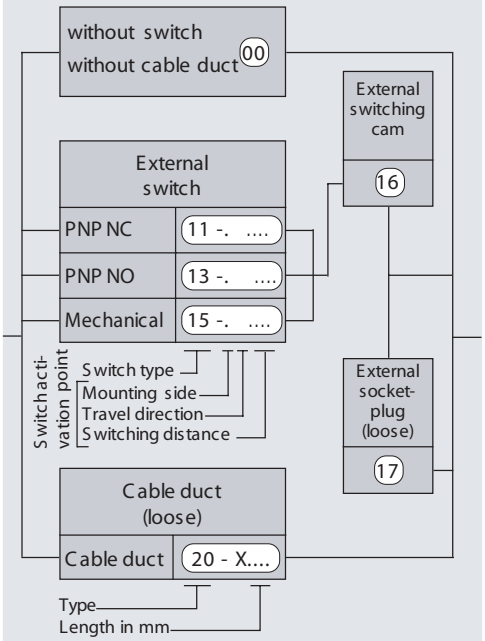
* Version with end block B available upon request

Order example

Ordering data		Description
Linear Motion Slide (Part number): 0266-200-00, 890 mm		Linear Motion Slide SOK 20-130, length (L) = 890 mm
Type	= MF01	with motor mount
Guideway	= 01	withPrecision Steel Shaft
Drive Unit	= 03	ball screw 16 x 16
Carriage	= 01	with standard carriage
Motor Attachment	= 01	with assembly, motor attachment for MKD 41 B
Motor	= 10	with motor MKD 41 B
Cover	= 01	polyurethane bellows
1st Switch	= 15- R+ 250mm	mechanical switch, switch activation point: right + 250 mm
2nd Switch	= 11- R- 150mm	PNP NC, switch activation point: right - 150 mm
3rd Switch	= 15 R- 250mm	mechanical switch, switch activation point: right - 250 mm
Cable Duct	= 20, 500mm	cable duct 500 mm long (loose)
Socket-plug	= 17	Socket-plug supplied loose
Switching Cam	= 16	with switching cam on the switch side
Documentation	= 01	standard report

Carriage = (..)	Motor attachment = (..)			Motor = (..)	Cover = (..)	1st switch = (.. - . ....) mm 2nd switch = (.. - . ....) mm 3rd switch = (.. - . ....) mm Cable duct = (.. - . ....) mm Socket-plug = (..) Switching cam = (..)	Documentation = (..)	
Standard	i =	*Mount	for Motor [1]	Motor Type	Polyurethane bellows: without	Polyurethane bellows: with	Standard report	Measurement report
(01)		(00)		(00)				
(01)	1	(00)		(00)				
(01)		(00)		(00)				(02)
(01)		(00)		(00)				
(01)	1							
(01)	1				(00)	(01)	(01)	(03)
(01)	1	(01)	MKD 41 B	(10)				
(01)	Servo Motor	(03)	MKD 41 B	(10)				
(01)	1	(10)	MKD 41 B	(10)				
	1.5	(12)	MKD 41 B	(10)				
(01)	1	(14)	MKD 41 B	(10)				
	1.5	(16)	MKD 41 B	(10)				



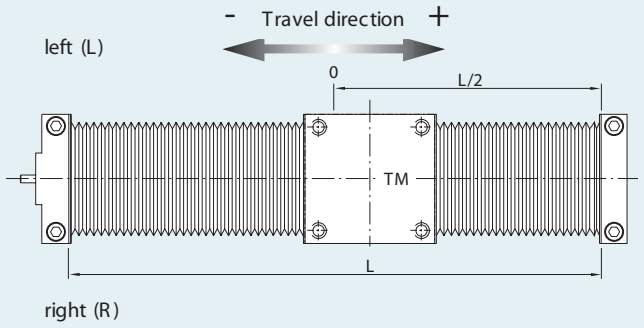


1) Pay attention to maximum torque

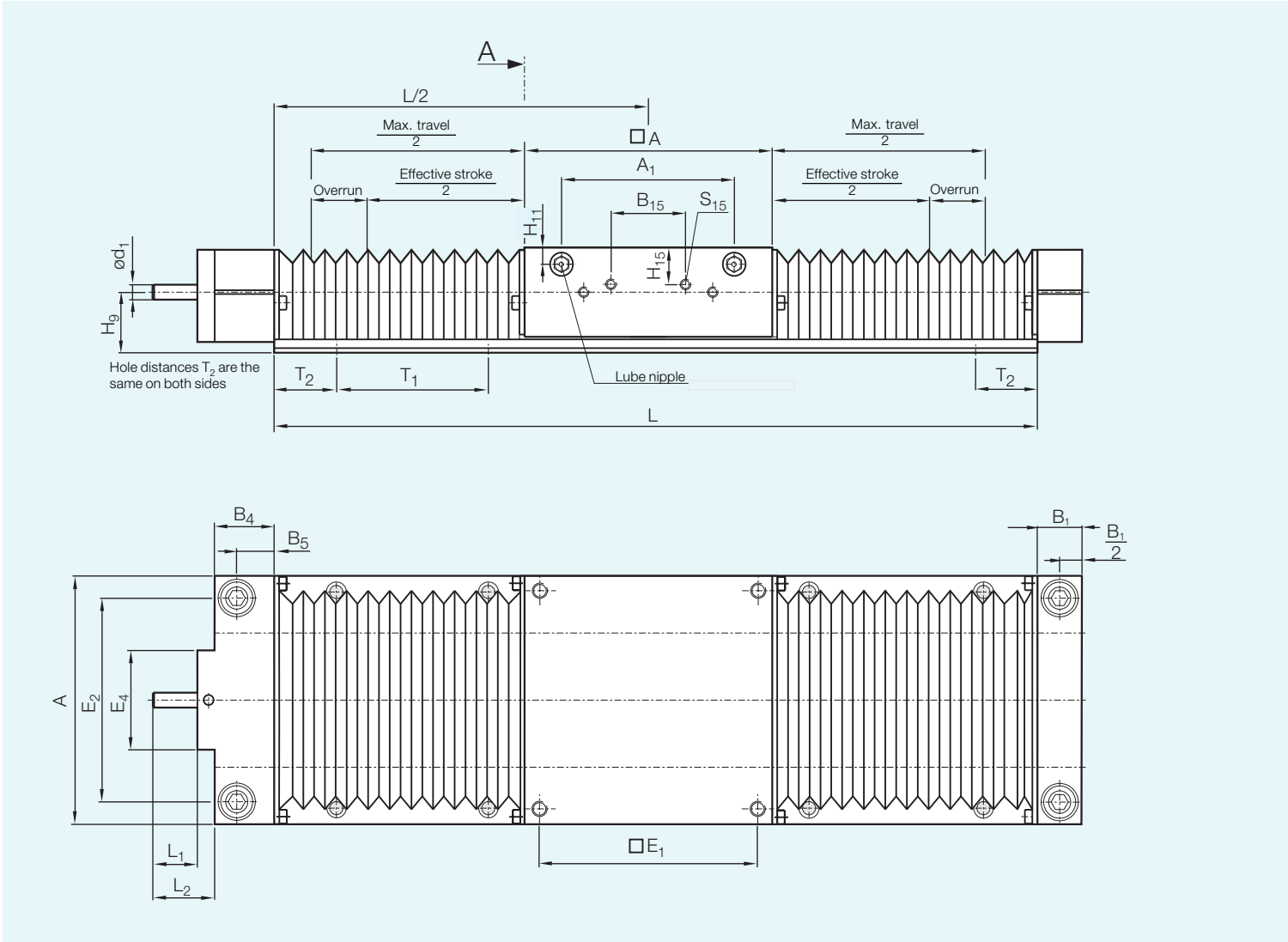
*Attachment can also be supplied without motor (enter "00" for motor on order)

Determining the switch activation point

The switch activation point is to be taken from the data given on mounting side, travel direction and switching distance (see table above and order example on left).
Mounting side: The switches can be fitted on the left (L) or right (R) side of the slide.
Travel direction: The switches can be fitted on the minus (-) or plus (+) side of zero.
Switching distance: The switching distance is the distance between the carriage center (TM) and the zero point (0) when a switch is operated (given in mm).
See "Switch Installation" for more details on fitting switches, types of switch and fitting the cable duct.



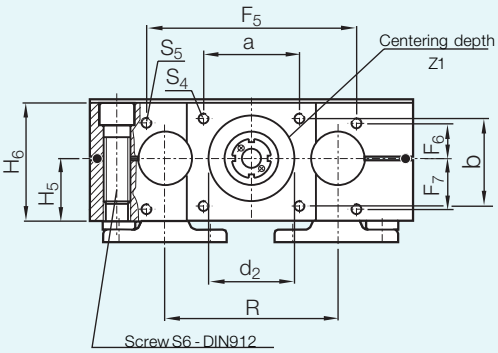
Linear Motion Slides, Open Type with Ball Screw Drive
Dimension Drawings SOK 12-85 to SOK 25-160



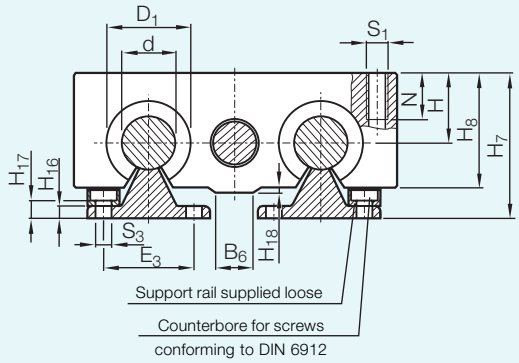
See page 31 for the motor attachment drawings.

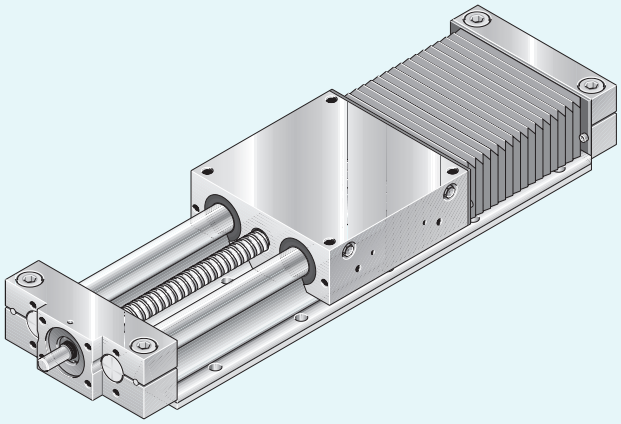
Slide	Drive journal Mounting geometry									for locating bracket			
	d_1 h7	d_2 h7	L_1	L_2	Z_1	E_4	a	b	S_4	F_5	F_6	F_7	S_5
SOK 12-85	6	28	18	25	2.1	40	33	23	M4 - 8 deep	53	9.5	11.5	M4- 8 deep
SOK 16-100	6	28	18	25	2.1	40	33	23	M4 - 8 deep	60	11	14	M4- 8 deep
SOK 20-130	9	40	25	34.5	2.1	52	40	28	M6 -12 deep	74	15.5	18.5	M5-12 deep
SOK 25-160	10	48	25	35.5	2.1	63	40	40	M5 -12 deep	104	17.5	16.5	M5-12 deep

Slide	Dimensions (mm)														
	d h6	A	R	B_1	B_4	B_5	H ± 0.02	H_5	H_6	H_7	H_8	H_9	H_{18}	B_6	D_1
SOK 12-85	12	85	42	14	24	17	18	15	30	40	30	22	-	-	22
SOK 16-100	16	100	54	18	24	15	22	17	34	48	35	26	3	15	26
SOK 20-130	20	130	72	20	29	19	25	22	44	57	42	32	3.5	12	32
SOK 25-160	25	160	88	25	33	20.5	30	27	54	66	51	36	2.5	15	40

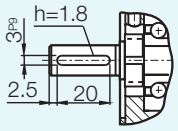
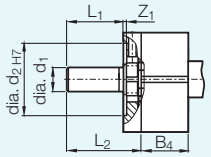


Elevation A





Ball Screw Journal

Size	with keyway	without keyway
SOK 20-130		See Page 26
SOK 25-160		

for switching cam			for bellows installation length calculation
B_{15}	H_{15}	S_{15}	
30	13.5	M4-7 deep	$L = Travel_{max} \times 1.33 + 122$
30	13	M4-7 deep	$L = Travel_{max} \times 1.33 + 137$
64	23	M4-8 deep	$L = Travel_{max} \times 1.30 + 168$
64	28	M4-10 deep	$L = Travel_{max} \times 1.24 + 199$

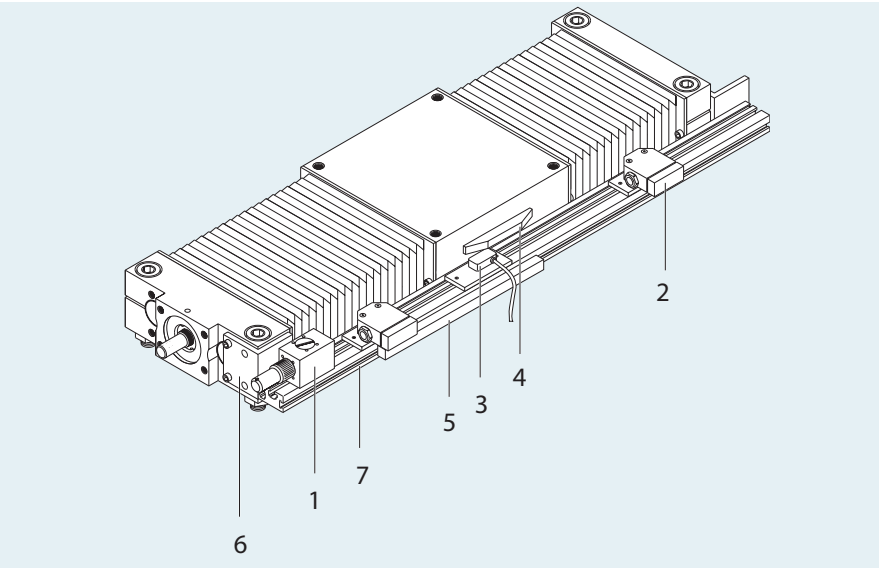
				Shaft support rail						Lube nipple			For modifications to the carriage, please ask for one of the following tables
E_1	E_2	S_1	N	H_{16}	H_{17}	E_3	S_3	T_1	T_2	A_1	H_{11}	DIN 3405	
73	70	M 6	13	5	6.5	29	4.5	75	min.15	57	7	AM 6	TB02-016-11
88	82	M 6	13	5	8.3	33	5.5	100	min.20	68	7.2	AM 6	TB02-016-12
115	108	M 8	18	6	9.8	37	6.6	100	min.20	94	7.2	AM 6	TB02-016-13
140	132	M 10	22	6	9.8	42	6.6	120	min.20	116	9.5	AM 8 x 1	TB02-016-14

Linear Motion Slides

Switch Mounting Arrangements

Overview of the changeover system

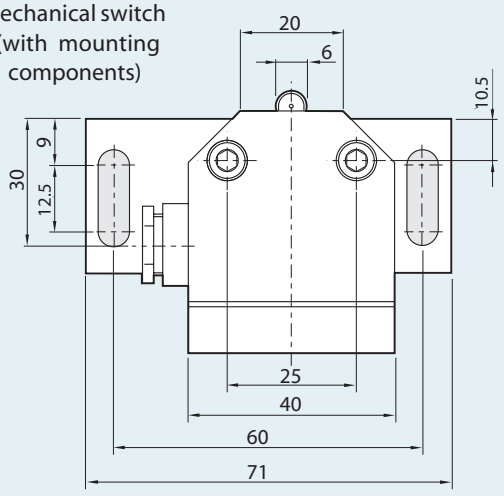
1 Socket and plug
2 Mechanical switch
(with mounting components)
3 Proximity switch
(with mounting components)
4 Switching cam
5 Cable duct (aluminum alloy)
6 Mounting bracket
7 Mounting profile



Mechanical switch (technical data)

R epeatability	= 0.05 mm
Permissible ambient temperature	= -5° C to +80° C
Enclosure	= DIN 40050 IP 67
Contact time	= < 2 ms
Insulation	= group C to VDE 0110
Rated voltage	= 250 V AC
Continuous current	= 5 A
Switching capacity at 220 V, 40-60 Hz	= cos = 0.8 at 2 A
Contact resistance when new	= < 240 m
Connection	= screw connection
Contact system	= single-pole switch
Switch system	= abrupt response

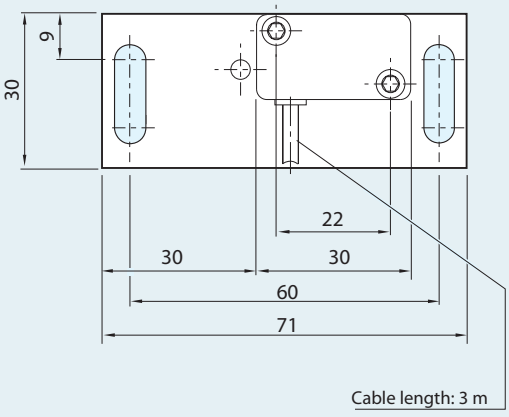
Mechanical switch (with mounting components)



Proximity switch (technical data)

Miniature circuit breakers with potted cable (3 x 0.14 mm ² Unitronic),	
Housing form	= NO
Minisensor	= Form A DIN 41635
Voltage	= 10...30 V DC
Residual ripple	= 10 %
Load	= 200 mA
No-load current	= 20 mA
Switching frequency	= max. 1500 Hz
Temperature-related shift in make point	= 4 m/°C
Output signal steepness	= 1V/ s
Repeatability of make point to EN 5008	= 0.1 mm

Proximity switch (with mounting components)

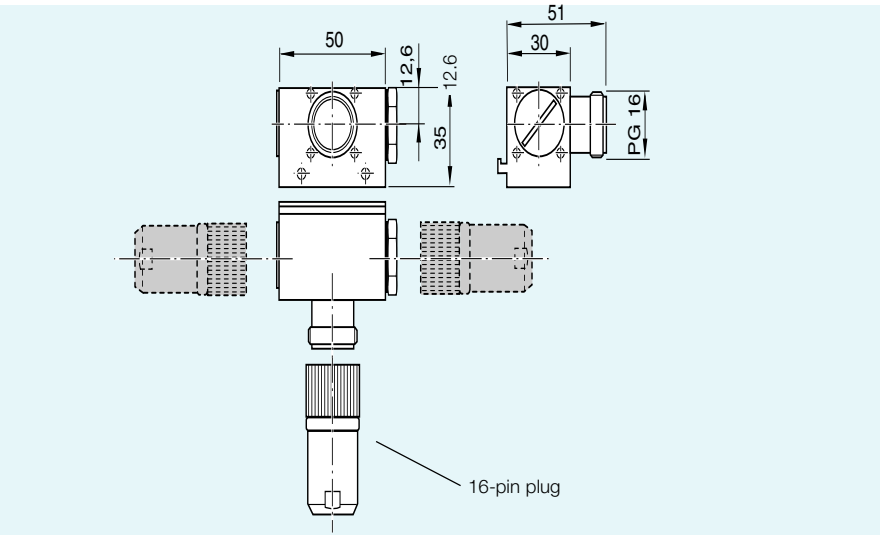


Socket and plug

- Fit the socket to the side with the most switches (see example on next page).

Socket and switch are not wired. The switch activation points can thus be optimized during start-up. A plug is provided.

The plug can be mounted in three directions (see figure).



Ordering the switches and mounting components

The part numbers are listed in the table below.
Mounting components can also be ordered individually.

Item		Size		
		12-85	16-100	20-130 / 25-160
1	**Socket-plug**		1414-000-61	
2	**Mech. switch with mounting components**		0236-203-01	
3	**Proximity switch**			
	- Mounting components without switch		0236-203-02	
	- PNP NC		8453-040-01	
	- NPN NC		8453-040-02	
	- PNP NO		8453-040-03	
	- NPN NO		8453-040-04	
4/6	**Switching cam + mount. bracket + mount. comp.**	0236-003-03	0236-103-03	0236-203-03
5	**Cable duct**		0396-620-07	
7	**Mounting profile**		0396-620-08	

Linear Motion Slides

Switch Mounting Arrangements - Tolerances

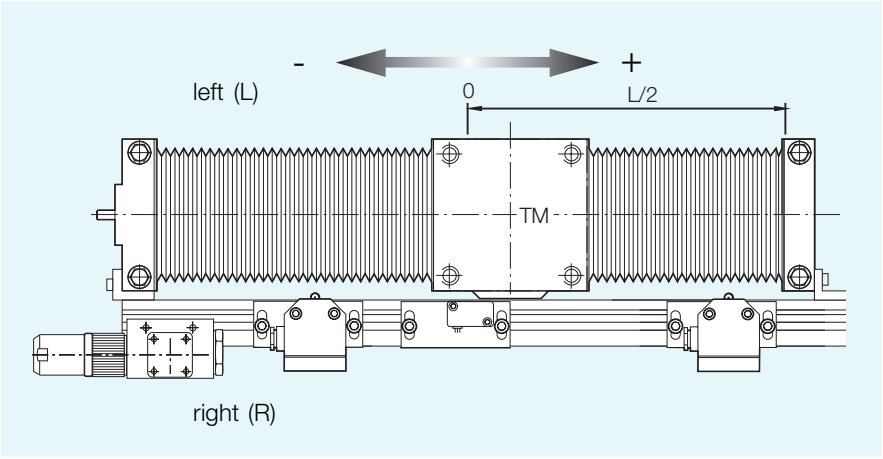
Fitting example

The switch position indicates the position of the carriage center after displacement. The zero point is in the center (L/2).

Maximum switching distance =
0.5 · (travel max.) – overrun

For safe operation of the linear motion slide the overrun must be longer than the braking distance.

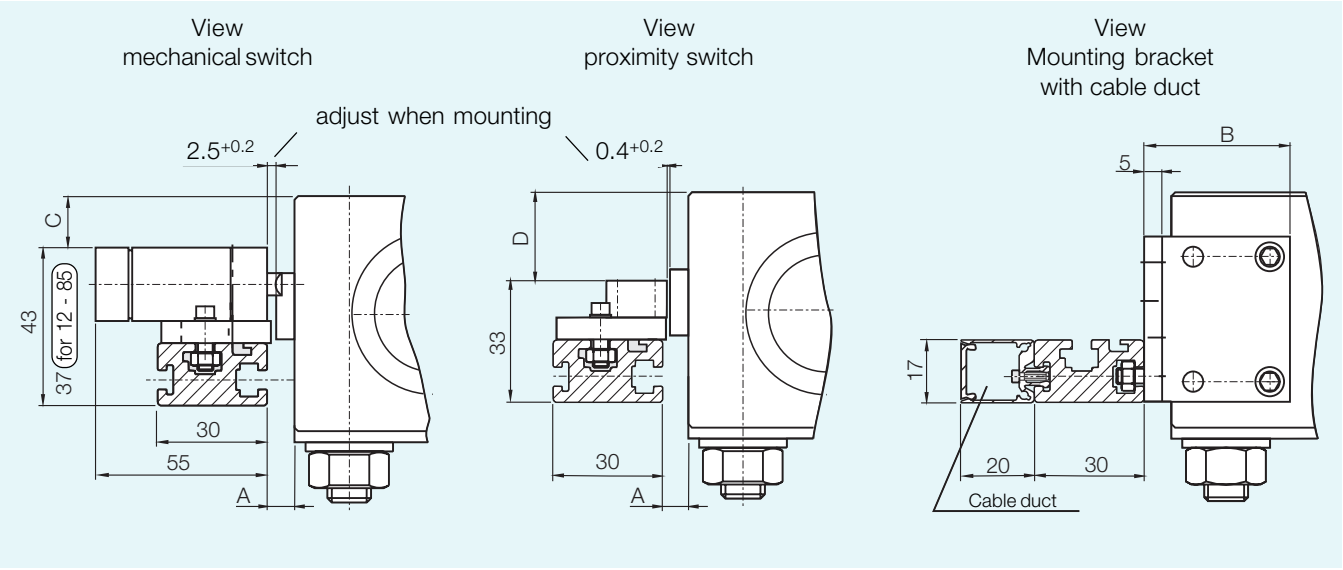
The acceleration distance may be taken as a guideline for the braking distance.



Recommended standard switch fittings:
- 2 mechanical switches
- 1 proximity switch

Slide mounting plates with switches into the groove and fix with the screws and square nuts.

Observe the minimum possible distance between switches:
mechanical-mechanical = 62 mm
mechanical-proximity = 49 mm
proximity-proximity = 35 mm
Here, the mounting plates must be mounted in mirror image.



The switch is mounted in the same way for all sizes:

The spacing for the mechanical and proximity switches must be adjusted when mounting the switch.

Depending on the relevant operating conditions (vibrations, center of switch stroke), the switch mounting profile may have to be supported.

Slide	Dim. A	Dim. B	Dim. C	Dim. D
SGK 12-85	5.5	27	+4	+0.5
SGK 16-100	5.5	30	+6	3.5
SGK 20-130	6.5	40	4	13.5
SGK 25-160	6.5	40	7	16.5

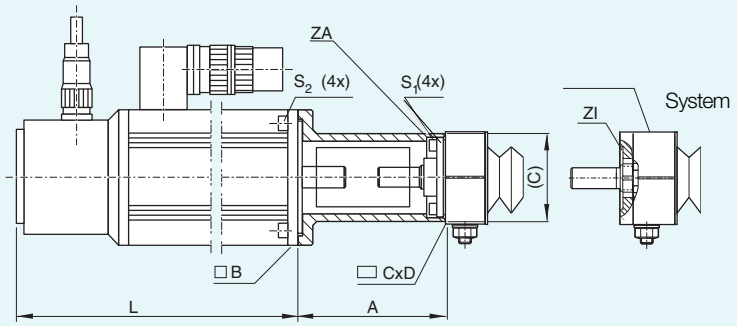
Slide	Dim. A	Dim. B	Dim. C	Dim. D
SOK 12-85	5.5	27	+2	1.5
SOK16-100	5.5	30	+2	7.5
SOK20-130	6.5	40	6	15.5
SOK25-160	6.5	40	9	18.5

Positive values (+) mean that the switch projects above the level of the slide housing.

Motor Attachment & Dimension Drawings
Closed/Open Type, Size 20-130 to 25-160

Functions of the motor mount in general

- Attachment of the motor to the linear motion slide
- Connection of the motor shaft to the drive shaft of the linear motion slide
- Enclosed housing for the coupling



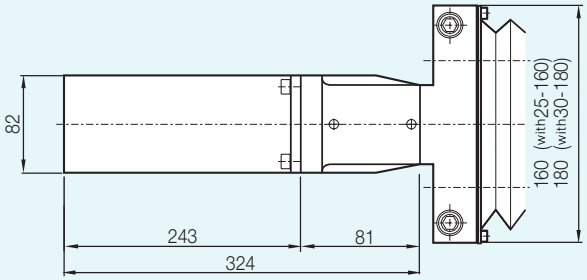
A = External centering for sizes 40 and 50
I = Internal centering for sizes 12, 16, 20, and 25

Part numbers and dimensions

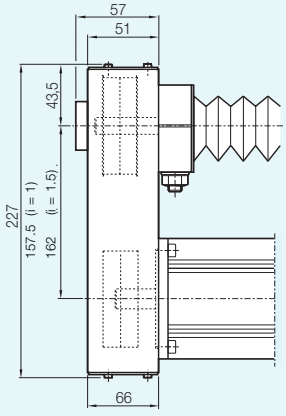
Linear motion slide	For motor attachment		Motor mount assembly with coupling (without motor)	Individual parts		Dimensions (mm)				Mounting screws DIN 912	
				Motor mount	Coupling						
	Motor type	Part number	Part number	Part number	Part number	A	B	C x D	L	S_1	S_2
SGK20-130	MKD 041 B	8611-010-03	0399-020-06	0396-020-84	8454-001-02	77.5	82	44 x 54	243	M6 x 40	M6 x 25
SGK25-160	MKD 041 B	8611-010-03	0399-020-08	0396-021-15	8454-001-04	81	100	53 x 62	243	M8 x 100	M8 x 25

02.36.12

Type MF01
Motor MKD 41 B with motor mount and coupling



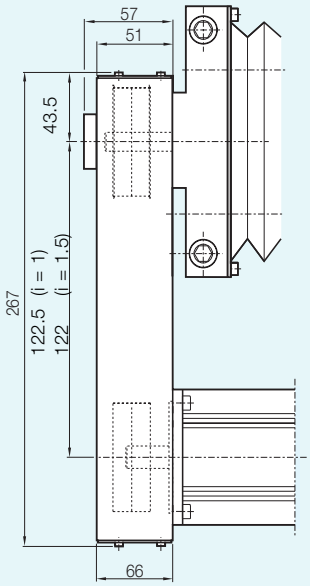
02.36.21



Type RV01/RV02
Motor MKD 41 B with side drive with timing belt
(shown with RV01 = bottom)

02.36.20

Type RV03 / RV04
Motor MKD 41 B with side drive with timing belt
(shown with RV04 = right)

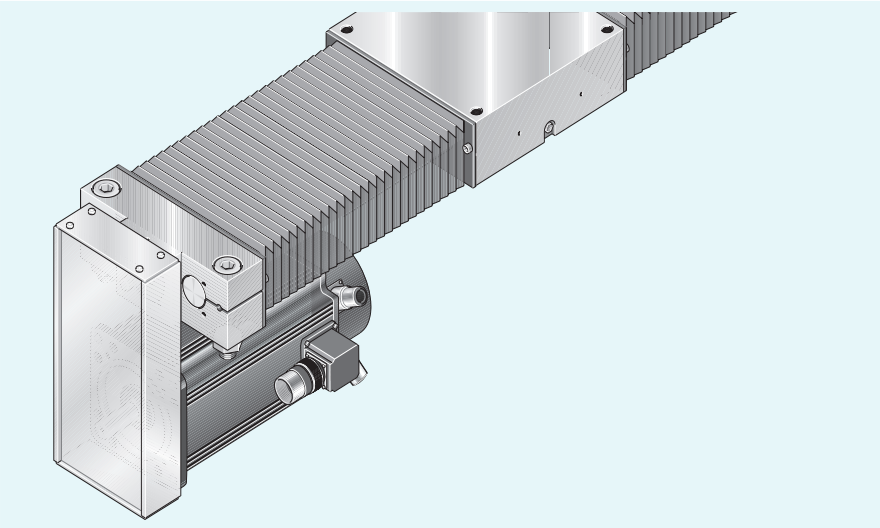


Linear Motion Slides

Motor Attachment for Side Drive with Timing Belt

On linear motion slides of sizes 25-160

On linear motion slides from size 25-160 on, the motor can be attached via a side drive with timing belt. The design of the side drive makes the total length of the linear motion slide shorter than it would be with motor mount and coupling.
The side drive can be mounted in four directions
– bottom (RV01)
– top (RV02)
– left (RV03)
– right (RV04)



Part numbers and dimensions

Linear motion slide	Side drive (mounting direction) RV	For motor attachment Motor type (Part number)	Reduction i	Side drive assembly (without motor) Part number	Dimensions (mm) A	A_1	A_2	B	B_1	H	L	Belt type	J_{red} * (kg cm²)
SGK 25-160 SOK 25-160	RV01 and RV02	MKD 41B-144 (8611-010-03)	1	0390-340-08	227	43.5	122.5	51	57	88		16AT5	2.4
			1.5	0390-340-09			122						0.82
	RV03 and RV04	MKD 41B-144 (8611-010-03)	1	0390-340-10	267	43.5	157.5	51	57	88		16AT5	2.5
			1.5	0390-340-11			162						0.84

* J_{red}: Reduced mass moment of inertia of side drive assembly on motor journal

Pre-tensioning force (F_V) will be indicated on delivery.

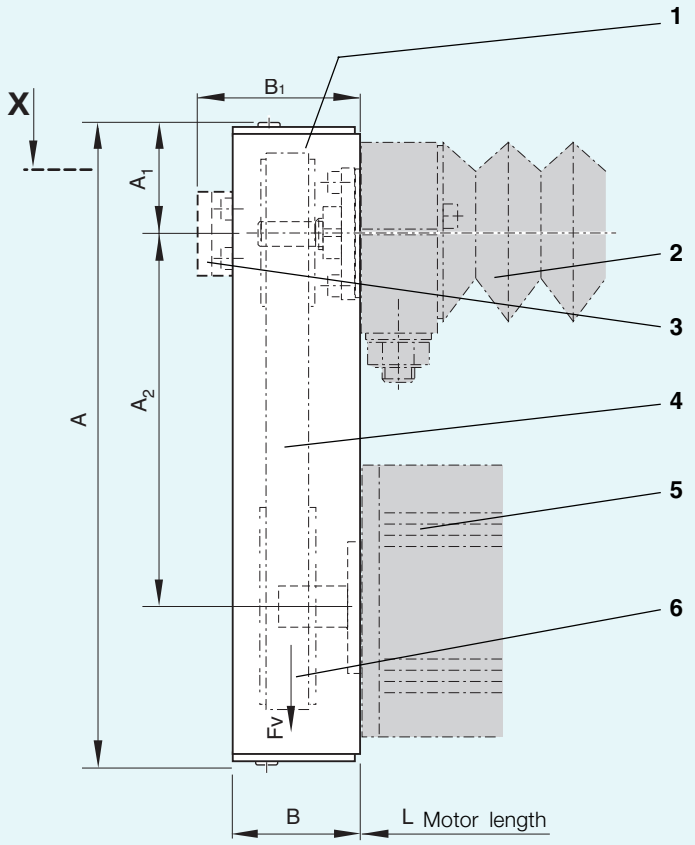
The following points must be noted when mounting a side drive with timing belt (mounting direction: left RV03 and right RV04):

- The side drive can only be mounted on the side of the Linear Motion Slide opposite to the switches.
- The switches must be mounted before the side drive.

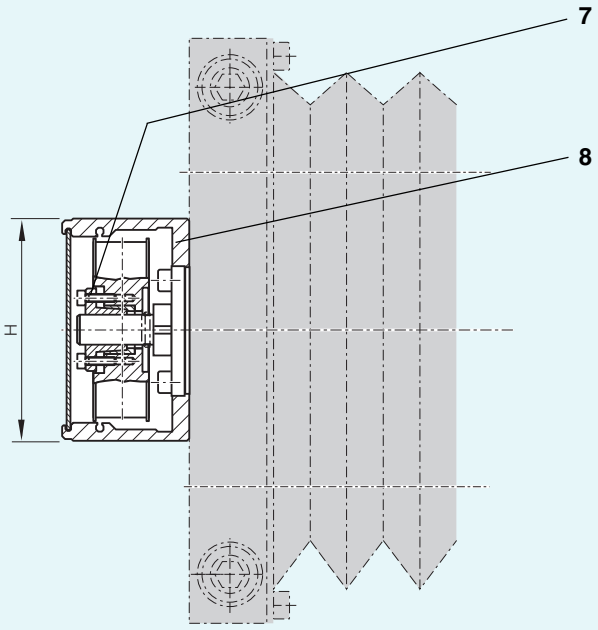
Detailed view

Side drive with timing belt

1 Compact, enclosed housing, provides belt protection and secures motor
2 Linear motion slide
3 On linear motion slides of sizes 25-160:
Ball screw journal with abutment
4 Timing belt drive with reduction:
– i = 1 : 1
– i = 1 : 1.5 (size 25-160)
5 AC servomotor
6 Pre-tensioning of the toothed belt:
Apply pre-tensioning force F_V to motor.



Elevation X



7 Attachment of wheels with clamping assemblies.
8 Drawn, anodized aluminum frame.

Useful Conversions

Length or Distance

1 meter (m)	=	39.37 inches (in)
1 inch (in)	=	25.4 millimeters (mm)
1 millimeter (mm)	=	0.03937 inches (in)
1 millimeter (mm)	=	0.001 meters (m)
1 micron (mm)	=	0.001 millimeters (mm)
1 micron (mm)	=	0.000040 inches (in) (40 millionths)
0.001 inch (in)	=	25.4 microns (mm)

For ce (Weight)

1 Pound (lb)	=	4.448 Newtons (N)
1 Kilogram (kg)	=	2.204 pounds (lb)

Moment (torque)

1 Newton-meter (Nm)	=	0.7375 foot pounds (Ft-lb)
1 Foot-pound (Ft-lb)	=	1.3558 Newton-meter (Nm)

Request for Quotation/Order

Bosch Rexroth Corporation
14001 South Lakes Drive
Charlotte, NC 28273
www.boschrexroth-us.com

Telephone (800) 438-5983
Telefax (704) 583-0523

Linear Motion Slides

Order example: Linear motion slide with linear bushings and shafts

Ordering data			Description
Linear motion slide (Part number): 0261-300-00, 1310 mm	SGK 25-160		Slide designation SGK, length = 1310 mm
Type	= MF01		with motor mount, mounted as in diagram MF01
Guideway	= 01		linear bushings and shafts
Drive unit	= 02		ball screw 20 x 20
Carriage	= 01		carriage
Motor attachment	= 01		with mount for motor MKD41B
Motor	= 08		motor MKD 41 B
Cover	= 01		polyurethane bellows
1st switch	= 15-R+	390 mm	mechanical switch, switch activation point: right + 390 mm
2nd switch	= 11-R–	290 mm	PNP NC, switch activation point: right – 290 mm
3rd switch	= 15-R–	390 mm	mechanical switch, switch activation point: right – 390 mm
Cable duct	= 20, 1200 mm		cable duct 1200 mm long (loose)
Socket-plug	= 17		socket-plug on switch side
Switching cam	= 16		for switch activation
Documentation	= 03		lead deviation chart for ball screw

To be filled in by the customer: Request for Quotation ☐ / Order ☐

Linear motion slide _____

(Part number): _____-_____-_____, length _____mm

Type = ☐☐☐☐

Guideway = ☐☐

Drive unit = ☐☐

Carriage = ☐☐

Motor attachment = ☐☐

Motor = ☐☐

Cover = ☐☐

1st switch = ☐☐ - + ☐☐☐☐ mm

2nd switch = ☐☐ - ± ☐☐☐☐ mm

3rd switch = ☐☐ - – ☐☐☐☐ mm

Cable duct = ☐☐ , ☐☐☐☐ mm

Socket-plug = ☐☐

Switching cam = ☐☐

Documentation = ☐☐

Components:

Motor mount

(Part number): _____-_____-_____

Coupling

(Part number): _____-_____-_____

Number of units

Purchase of:____**pcs.,** _____**monthly,** _____**annually, per order or** _____

Comments:

From

OEM ☐ **User** ☐ **Distributor** ☐

Company: _____ **Contact:** _____

Address: _____ **Position:** _____

_____ **Telephone:** _____

_____ **Fax:** _____

Rexroth
Bosch Group

Bosch Rexroth Corporation
Linear Motion and
Assembly Technologies
14001 South Lakes Drive
Charlotte, NC 28273
Telephone (800) 438-5983
Facsimile (704) 583-0523
www.boschrexroth-us.com

Bosch Rexroth Corporation
Corporate Headquarters
5150 Prairie Stone Parkway
Hoffman Estates, IL 60192-3707
Telephone (847) 645-3600
Facsimile (847) 645-6201

Bosch Rexroth Corporation
Industrial Hydraulics
2315 City Line Road
Bethlehem, PA 18017-2131
Telephone (610) 694-8300
Facsimile (610) 694-8467

Bosch Rexroth Corporation
Electric Drives and Controls
5150 Prairie Stone Parkway
Hoffman Estates, IL 60192-3707
Telephone (847) 645-3600
Facsimile (847) 645-6201

Bosch Rexroth Corporation
Pneumatics
1953 Mercer Road
Lexington, KY 40511-1021
Telephone (859) 254-8031
Facsimile (859) 281-3491

Bosch Rexroth Corporation
Mobile Hydraulics
1700 Old Mansfield Road
Wooster, OH 44691-0394
Telephone (330) 263-3300
Facsimile (330) 263-3333

RA 83 001
Printed in the United States