

Линейные направляющие и системы перемещения

Технические характеристики

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Standard slides

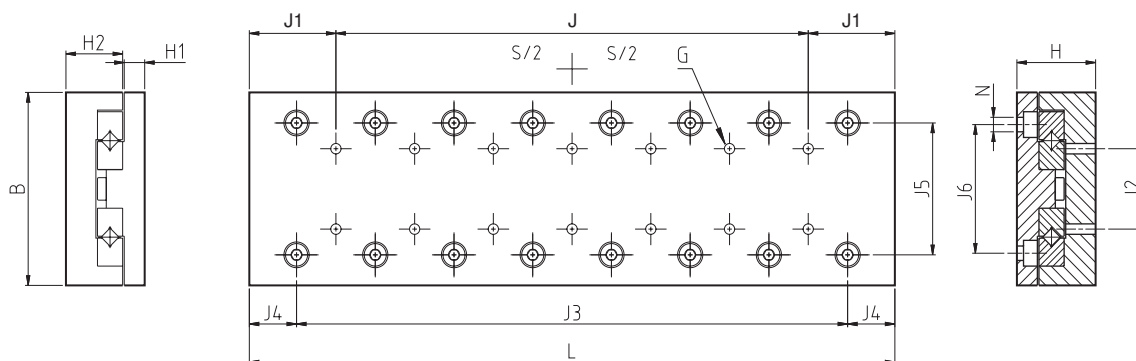


5 Positioning systems

Standard slides

GCL

Standard slides with crossed roller assemblies, steel version, for manual positioning



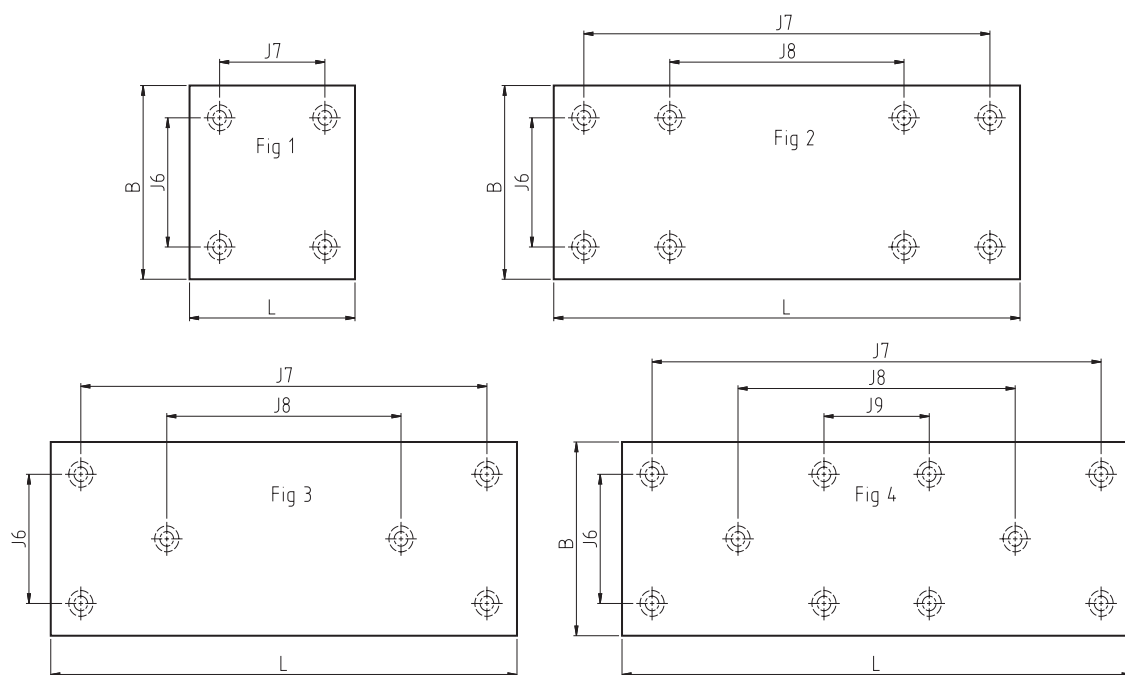
Designations	Dimensions			Stroke		G	H ₁	H ₂	J	J ₁	J ₂	J ₃	J ₄	J ₅
	B	H	L	S ₁ ¹⁾	S ₂ ¹⁾									
mm														
GCL 2030	40	21	35	18	–	M3	6.5	14.0	–	17.5	15	1×15	10	25
GCL 2045	40	21	50	30	–	M3	6.5	14.0	1×15	17.5	15	2×15	10	25
GCL 2060	40	21	65	40	46	M3	6.5	14.0	2×15	17.5	15	3×15	10	25
GCL 2075	40	21	80	50	60	M3	6.5	14.0	3×15	17.5	15	4×15	10	25
GCL 2090	40	21	95	60	75	M3	6.5	14.0	4×15	17.5	15	5×15	10	25
GCL 2105	40	21	110	70	90	M3	6.5	14.0	5×15	17.5	15	6×15	10	25
GCL 2120	40	21	125	80	105	M3	6.5	14.0	6×15	17.5	15	7×15	10	25
GCL 3050	60	28	55	30	–	M4	9.0	18.5	–	27.5	25	1×25	15	39
GCL 3075	60	28	80	45	55	M4	9.0	18.5	1×25	27.5	25	2×25	15	39
GCL 3100	60	28	105	60	80	M4	9.0	18.5	2×25	27.5	25	3×25	15	39
GCL 3125	60	28	130	75	105	M4	9.0	18.5	3×25	27.5	25	4×25	15	39
GCL 3150	60	28	155	90	130	M4	9.0	18.5	4×25	27.5	25	5×25	15	39
GCL 3175	60	28	180	105	155	M4	9.0	18.5	5×25	27.5	25	6×25	15	39
GCL 3200	60	28	205	130	180	M4	9.0	18.5	6×25	27.5	25	7×25	15	39
GCL 6100	100	45	110	60	70	M6	13	31.0	–	55.0	50	1×50	30	64
GCL 6150	100	45	160	95	120	M6	13	31.0	1×50	55.0	50	2×50	30	64
GCL 6200	100	45	210	130	170	M6	13	31.0	2×50	55.0	50	3×50	30	64
GCL 6250	100	45	260	165	220	M6	13	31.0	3×50	55.0	50	4×50	30	64
GCL 6300	100	45	310	200	270	M6	13	31.0	4×50	55.0	50	5×50	30	64
GCL 6400	100	45	410	280	370	M6	13	31.0	6×50	55.0	50	7×50	30	64

¹⁾ S₁ Standard stroke order designation, e.g. GCL 2030

S₂ Extended stroke order designation, e.g. GCL 2030/L

¹⁾ S₁ Standard stroke order designation, e.g. GCL 2030

S₂ Extended stroke order designation, e.g. GCL 2030/L



Designations	Dimensions						Load-carrying capacities		Weight
	J ₆	J ₇	J ₈	J ₉	Fig	N	with S ₁	with S ₂	GS
							C ₀	C ₀	
	mm						N	N	kg
GCL 2030	30	25	–	–	1	3.4	250	–	0.18
GCL 2045	30	40	–	–	1	3.4	360	–	0.26
GCL 2060	30	55	–	–	1	3.4	470	430	0.34
GCL 2075	30	70	40	–	2	3.4	580	540	0.42
GCL 2090	30	85	55	–	2	3.4	720	610	0.50
GCL 2105	30	100	70	–	2	3.4	830	720	0.58
GCL 2120	30	115	85	–	2	3.4	940	790	0.68
GCL 3050	40	35	–	–	1	4.5	2130	–	0.57
GCL 3075	40	60	–	–	1	4.5	3400	2980	0.80
GCL 3100	40	85	–	–	1	4.5	4680	3830	1.00
GCL 3125	40	110	–	–	1	4.5	5950	4680	1.30
GCL 3150	40	135	85	–	3	4.5	6800	5530	1.50
GCL 3175	40	160	110	–	3	4.5	8080	6380	1.70
GCL 3200	40	185	135	85	4	4.5	8930	7230	2.00
GCL 6100	60	90	–	–	1	6.6	11700	9750	3.10
GCL 6150	60	140	–	–	1	6.6	17550	15600	4.50
GCL 6200	60	190	90	–	3	6.6	23400	19500	5.90
GCL 6250	60	240	140	–	3	6.6	29250	23400	7.20
GCL 6300	60	290	190	–	3	6.6	35100	29250	8.60
GCL 6400	60	390	290	190	4	6.6	37050	29250	11.40

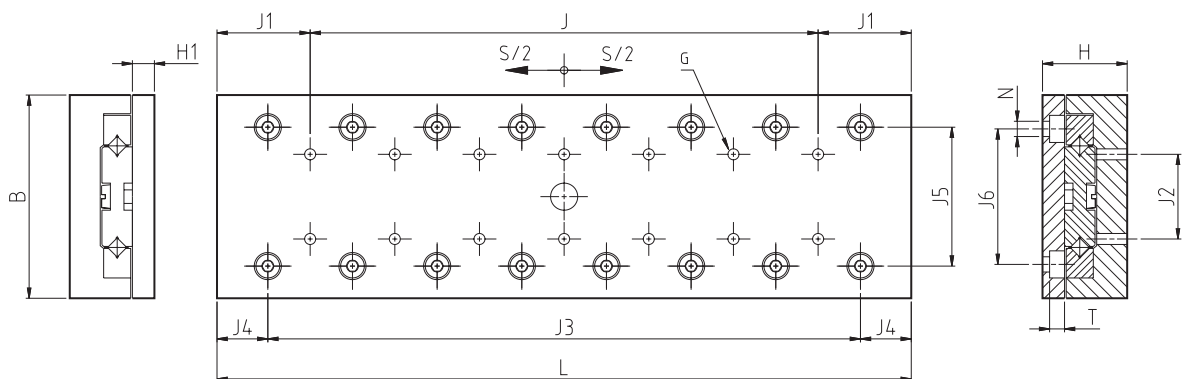
5 Positioning systems

Standard slides

GCLA

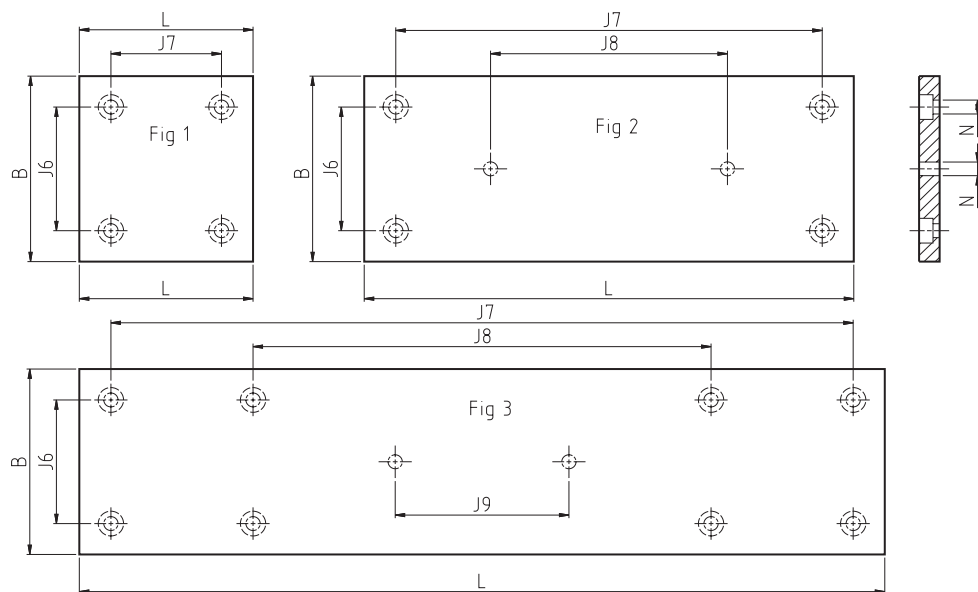
Standard slides with slide top and base made of black anodised aluminium, for manual positioning.

In other respects the design is similar to that of the GCL slides except for the slightly reduced height.



Designations	Dimensions			Stroke		G	H ₁	J	J ₁	J ₂	J ₃	J ₄	J ₅
	B	H	L	S ₁	S ₂ ¹⁾								
	mm												
GCLA 2030	40	21	35	15	–	M3	7.00	–	17.5	15	1×15	10	25
GCLA 2045	40	21	50	22	30	M3	7.00	1×15	17.5	15	2×15	10	25
GCLA 2060	40	21	65	30	45	M3	7.00	2×15	17.5	15	3×15	10	25
GCLA 2075	40	21	80	37	60	M3	7.00	3×15	17.5	15	4×15	10	25
GCLA 2090	40	21	95	45	75	M3	7.00	4×15	17.5	15	5×15	10	25
GCLA 2105	40	21	110	52	90	M3	7.00	5×15	17.5	15	6×15	10	25
GCLA 2120	40	21	125	60	105	M3	7.00	6×15	17.5	15	7×15	10	25
GCLA 3050	60	25	55	–	30	M4	8.25	–	27.5	25	1×25	15	41
GCLA 3075	60	25	80	37	55	M4	8.25	1×25	27.5	25	2×25	15	41
GCLA 3100	60	25	105	50	80	M4	8.25	2×25	27.5	25	3×25	15	41
GCLA 3125	60	25	130	62	105	M4	8.25	3×25	27.5	25	4×25	15	41
GCLA 3150	60	25	155	75	130	M4	8.25	4×25	27.5	25	5×25	15	41
GCLA 3175	60	25	180	87	155	M4	8.25	5×25	27.5	25	6×25	15	41
GCLA 3200	60	25	205	100	180	M4	8.25	6×25	27.5	25	7×25	15	41
GCLA 6100	100	40	110	50	70	M6	12.00	–	55.0	50	1×50	30	65
GCLA 6150	100	40	160	75	120	M6	12.00	1×50	55.0	50	2×50	30	65
GCLA 6200	100	40	210	100	170	M6	12.00	2×50	55.0	50	3×50	30	65
GCLA 6250	100	40	260	125	220	M6	12.00	3×50	55.0	50	4×50	30	65
GCLA 6300	100	40	310	150	270	M6	12.00	4×50	55.0	50	5×50	30	65
GCLA 6350	100	40	360	175	320	M6	12.00	5×50	55.0	50	6×50	30	65
GCLA 6400	100	40	410	200	370	M6	12.00	6×50	55.0	50	7×50	30	65

¹⁾ S₂ Extended stroke order designation, e.g. GCL 2030L



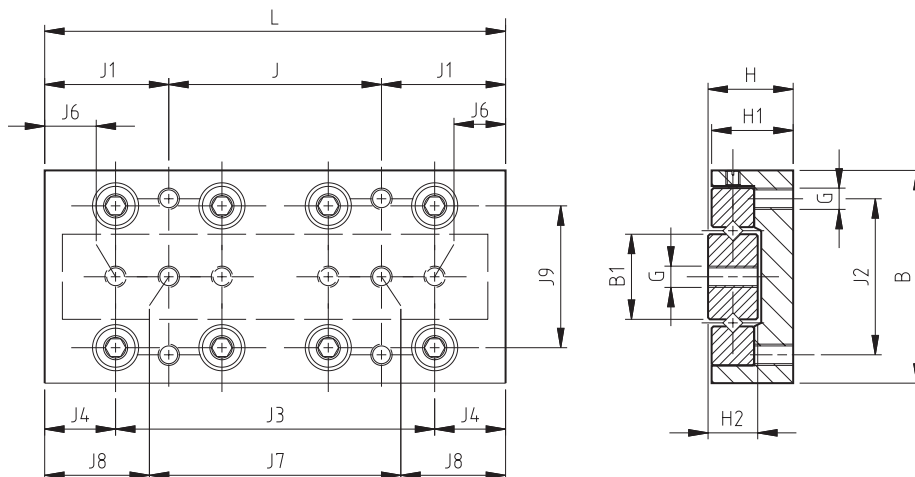
Designations	Dimensions						Load-carrying capacities		Weight
	J ₆	J ₇	J ₈	J ₉	Fig	N	with S ₁ C ₀	with S ₂ C ₀	GA
	mm						N	N	kg
GCLA 2030	30	25	-	-	1	3.8	250	-	0.10
GCLA 2045	30	40	-	-	1	3.8	400	360	0.14
GCLA 2060	30	55	-	-	1	3.8	540	430	0.19
GCLA 2075	30	70	-	-	1	3.8	650	540	0.23
GCLA 2090	30	85	45	-	2	3.8	790	610	0.28
GCLA 2105	30	100	50	-	2	3.8	940	720	0.32
GCLA 2120	30	115	30	-	2	3.8	1080	790	0.37
GCLA 3050	40	35	-	-	1	4.8	-	2130	0.29
GCLA 3075	40	60	-	-	1	4.8	3830	2980	0.43
GCLA 3100	40	85	-	-	1	4.8	5100	3830	0.57
GCLA 3125	40	110	-	-	1	4.8	6380	4680	0.70
GCLA 3150	40	135	75	-	2	4.8	7650	5530	0.84
GCLA 3175	40	160	86	-	2	4.8	8930	6380	0.97
GCLA 3200	40	185	55	-	2	4.8	10200	7230	1.10
GCLA 6100	60	90	-	-	1	6.8	11700	9750	1.60
GCLA 6150	60	140	-	-	1	6.8	19500	15600	2.40
GCLA 6200	60	190	100	-	2	6.8	25350	19500	3.10
GCLA 6250	60	240	80	-	2	6.8	33150	23400	3.90
GCLA 6300	60	290	150	-	2	6.8	39000	29250	4.70
GCLA 6350	60	340	200	80	3	6.8	44850	33150	5.40
GCLA 6400	60	390	230	90	3	6.8	52650	37050	6.20

5 Positioning systems

Standard slides/Slides, tables and compact cross tables

RM

Standard slides fitted with either cross roller rail guides or V-guided ball cages, for manual positioning; the opposing V-rails are screwed to a steel base plate. Slide top and bottom carry a standard pattern of mounting holes.



Designations	Dimensions			Stroke							
	B	H	L	S	B ₁	G	H ₁	H ₂	J	J ₁	
	mm										
RM 1020	20	8	25	12	7	M2.5	7.5	5	1×18	3.5	
RM 1030	20	8	35	18	7	M2.5	7.5	5	1×28	3.5	
RM 1040	20	8	45	25	7	M2.5	7.5	5	1×20	12.5	
RM 1050	20	8	55	32	7	M2.5	7.5	5	1×30	12.5	
RM 2060	30	12	65	40	12	M3	11.5	7	1×30	17.5	
RM 2075	30	12	80	50	12	M3	11.5	7	1×45	17.5	
RM 2090	30	12	95	60	12	M3	11.5	7	2×30	17.5	
RM 3100	40	16	105	60	16	M4	15.5	9	1×50	27.5	
RM 3125	40	16	130	75	16	M4	15.5	9	1×75	27.5	
RM 3150	40	16	155	90	16	M4	15.5	9	2×50	27.5	

continued

continued										
Designations	Dimensions								Load-carrying capacities	Weight
	J ₂	J ₃	J ₄	J ₅	J ₆	J ₇	J ₈	J ₉	C ₀	GS
	mm								N	kg
RM 1020	14	1×10	7.5	2×7.5	5	1×18	3.5	12.6	208	0.025
RM 1030	14	2×10	7.5	2×10	7.5	1×20	7.5	12.6	364	0.025
RM 1040	14	3×10	7.5	3×10	7.5	1×28	8.5	12.6	464	0.025
RM 1050	14	4×10	7.5	4×10	7.5	1×30	12.5	12.6	572	0.025
RM 2060	22	3×15	10	3×15	10	-	-	20	860	0.16
RM 2075	22	4×15	10	4×15	10	-	-	20	1032	0.19
RM 2090	22	5×15	10	5×15	10	-	-	20	1290	0.23
RM 3100	30	3×25	15	3×25	15	-	-	28.5	1904	0.46
RM 3125	30	4×25	15	4×25	15	-	-	28.5	2312	0.58
RM 3150	30	5×25	15	5×25	15	-	-	28.5	2856	0.69

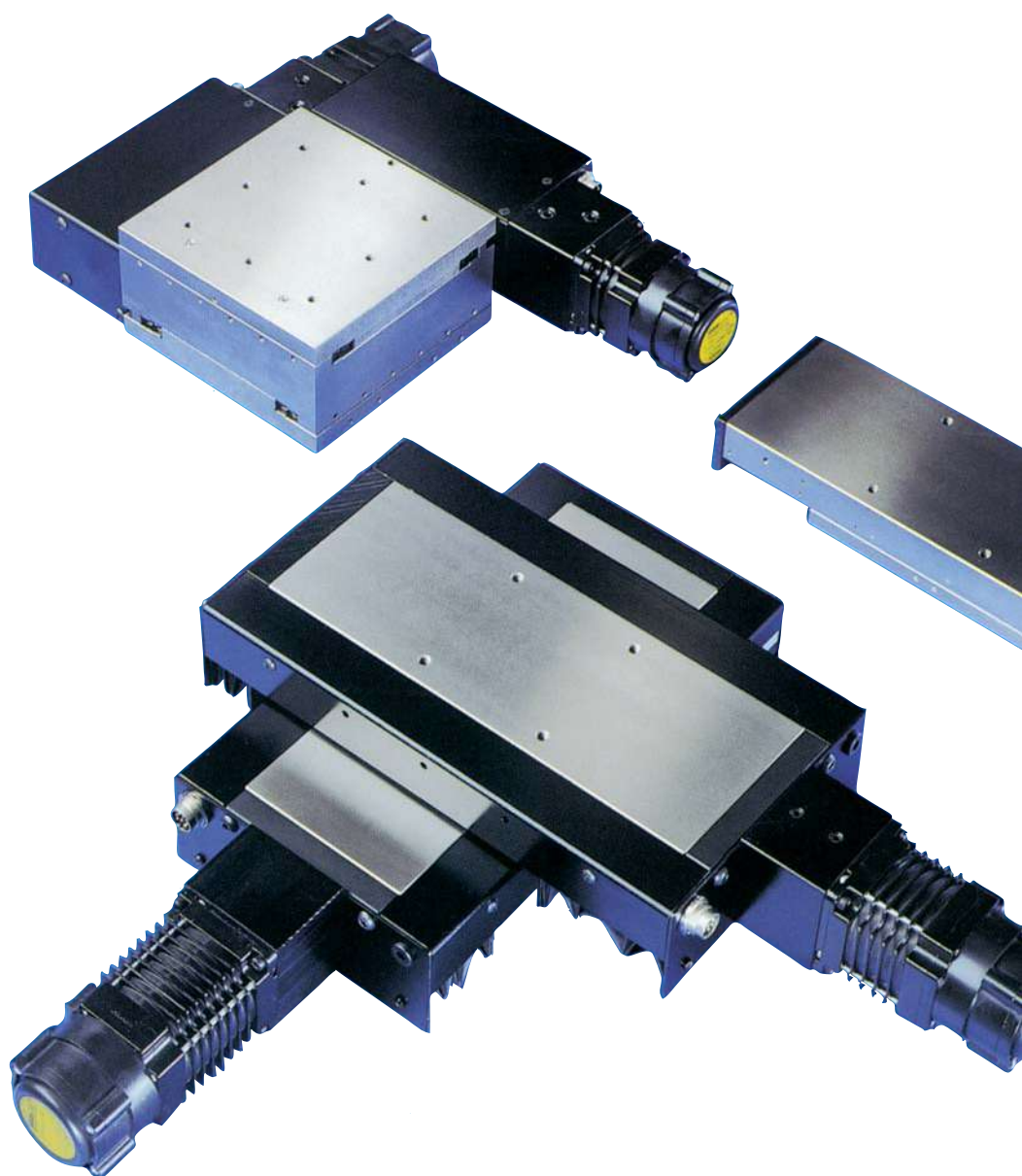
Standard slides

Ordering key

	GCLA		
Type:			
Standard slide with crossed roller assemblies of steel	GCL		
Standard slide with crossed roller assemblies of aluminium	GCLA		
Standard slide fitted with either cross roller guides or V-guided ball cages of steel	RM		
Size (see tables):			
.			1
.			2
.			3
.			6
Rail length [mm] (see tables):			
.			020 - 400

Example: GCLA 6 400

Slides and positioning tables



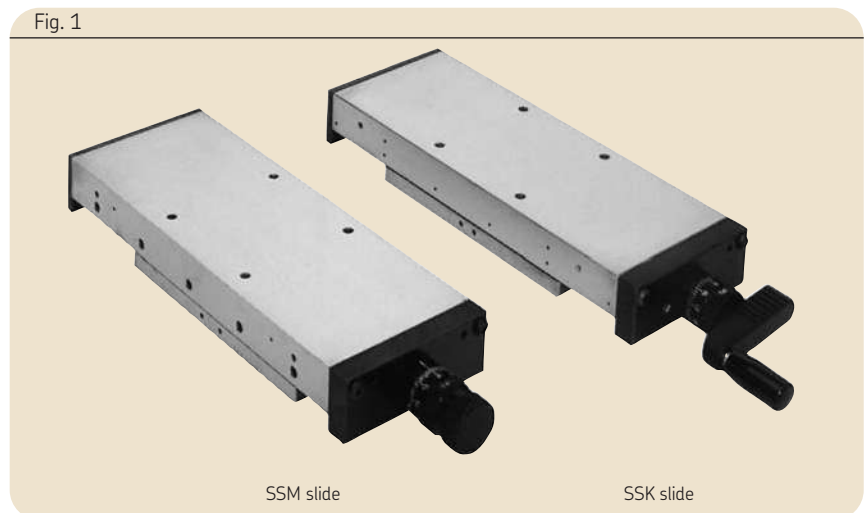
Positioning tables and slides

Dovetails slides

Dovetail tables (Fig. 1)
for manual operation
with micrometer knurl SSM
with crank handle SSK

- slide top longer than base plate
- stroke limited by end plates
- guide covered by the longer slide top
- hand operation by lead screw with play.

Fig. 1

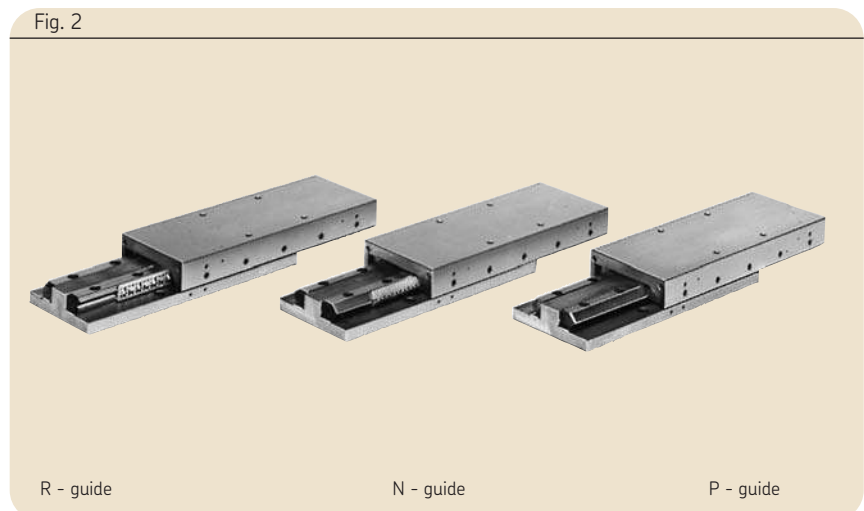


Precision slides

Rail guide systems (Fig. 2)
Precision slides are available as stan-
dard in three different rail guide sys-
tems:

- R - Crossed rollers
- N - Needle rollers
- P - Dry sliding liner

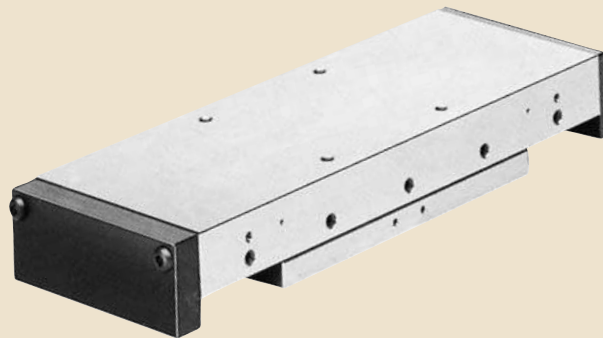
Fig. 2



**Precision slides (Fig. 3)
with endplates RE - NE- and PE-**

- slide top longer than base plate
- stroke limited by endplates
- guide covered by the longer slide top
- no drive

Fig. 3

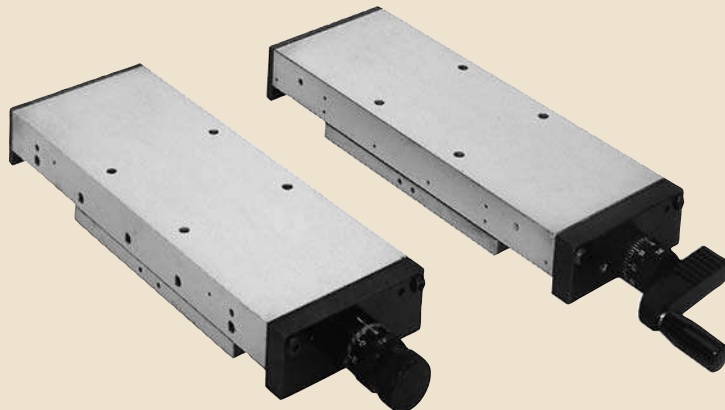


RE slide

**Precision tables (Fig. 4)
for manual operation with
micrometer knurl RSM-NSM-PSM
with hand crank RSK-NSK-PSK**

- slide top longer than base plate
- stroke limited by endplates
- guide covered by the longer slide top
- manual operation by lead screw with play.

Fig. 4



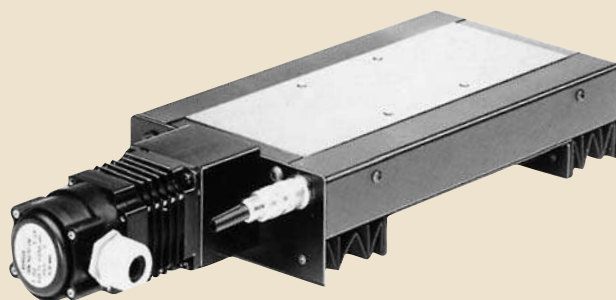
RSM slide

RSK slide

**Precision tables (Fig. 5)
for motor drive RSS-NSS-PSS**

- slide top longer than base plate
- strike limited by endplates
- guide covered by bellows
- for motor drive with high-precision planetary roller screw
- available with motor flange and coupling
- available with mechanical or inductive limit switch
- available with linear encoder
- available with motor and control unit

Fig. 5

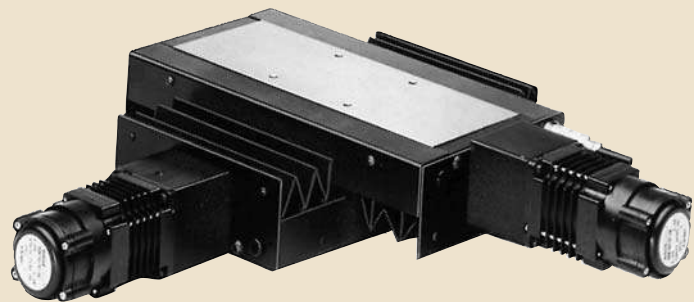


RSS slide

Precision cross tables (Fig. 6)
Precision tables for motor drive fitted to cross tables

- in assembly types KN, KU, KX

Fig. 6



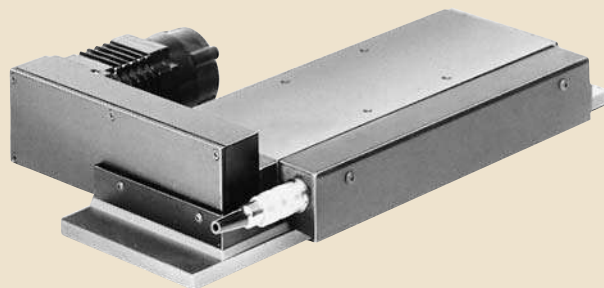
Assembly type KU

Precision tables (Fig. 7)
for motor drive, sealed
RSAS-NSAS-PSAS

Identical with the precision slides in
the RSS, NSS and PSS series, but

- guide sealed by additional base plate and wipers
- air supply for additional air locking
- motor fitting on side with 1:1 toothed belt drive.

Fig. 7



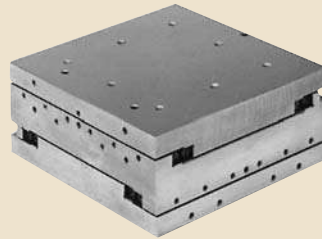
RSAS slide

Compact cross tables

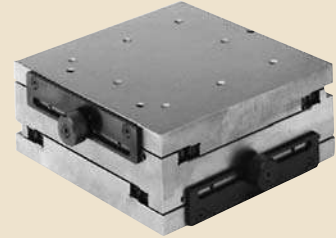
Compact cross tables (Fig. 9) open design T0

- two-coordinate cross table with equal strokes
- compact design
- crossed roller guides
- no drive
- can be provided with locking device

Fig. 9



Compact cross table T0

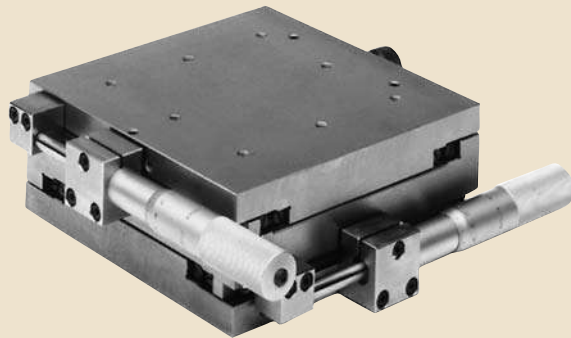


Compact cross table T0 with AR 3

Compact cross tables (Fig. 10) with micrometer attachment TS

- two-coordinate cross table with equal strokes
- compact design
- crossed roller guides
- with micrometers fitted in parallel to the side, spring loaded
- can be provided with locking device

Fig. 10



Compact cross table TS

Compact cross tables (Fig. 11) for motor drive TSS

- two-coordinate cross table with equal strokes
- compact design
- crossed roller guides
- for motor drive with high-precision planetary roller screw
- available with motor flange and clutch
- available with mechanical or inductive limit switches
- available with linear encoder
- available with motor and control unit

Fig. 11



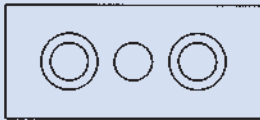
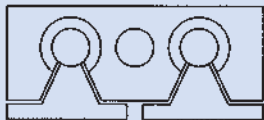
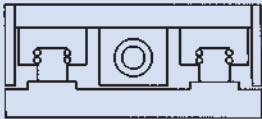
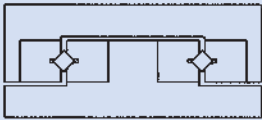
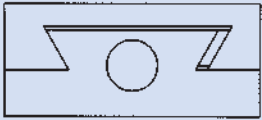
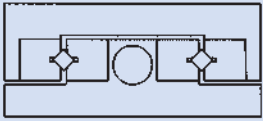
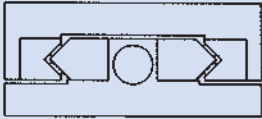
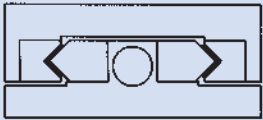
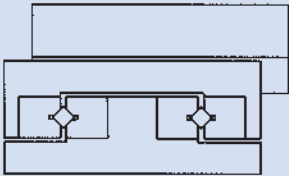
Compact cross table TSS

Selection of a suitable slide system

Slides or tables with suitable guidance systems are available in the SKF product range for nearly all positioning operations.

SKF slide and table guidance systems

Table 1

Catalogue No.	Description	Guide	Symbol
4218	Linear ball bearing	Linear ball bearings	 
4115	Profile rail slides	Profile rails	
4228	Standard slides	Crossed rollers	
	Dovetail slides	Dovetail	
		Crossed rollers	
4211	Precision slides	Needle rollers	
		Dry sliding liner	
	Compact cross tables	Crossed rollers	

Each of these types of guides has characteristic features which make them especially suited for particular guidance operations. It is not possible to give generally applicable rules for the selection of a table system as in most cases several factors have to be taken into account and weighed against one another.

The following criteria can be of considerable assistance in making a selection.

Selection assistance

The following are the most important criteria for the selection of a suitable slide or table system:

- stroke
- load-carrying capacity
- running accuracy
- speed
- acceleration
- preloading of guide
- stiffness
- friction
- stick slip
- damping
- sensitivity to dirt fallout
- relationship of stroke to overall length
- price

Table 2 on pages 10 and 11 shows the degree to which the various types of slides and tables fulfil the individual criteria. The last column indicates what is meant by 100 % fulfilment.

The degree of fulfilment by the “standard slides” is basically the same as that of the “precision slides with crossed roller guides”.

The following slide types are contained in this Catalogue:

- Remove space slides - S
- Precision slides
 - with crossed roller guides - R
 - with needle roller guides - N
 - with dry sliding liner guides - P
- Compact cross tables - T

The other SKF slides are shown in the catalogues listed in table 1.

Selection table for SKF positioning slides and tables

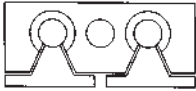
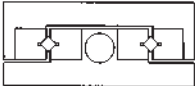
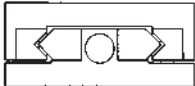
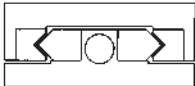
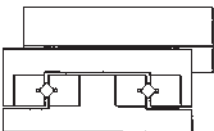
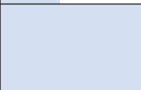
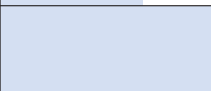
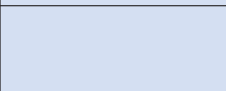
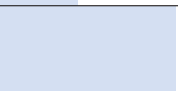
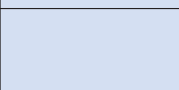
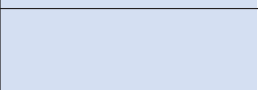
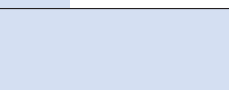
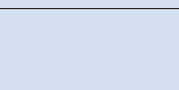
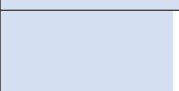
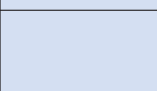
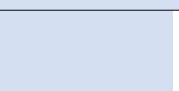
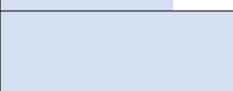
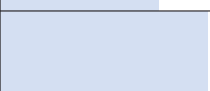
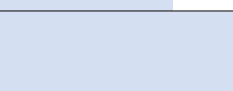
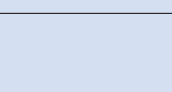
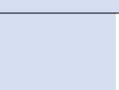
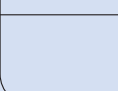
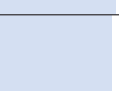
Table 2				
Assessment criteria	Slide design	Linear ball bearing slide	Profile rail slide	Dovetail slide
		 LZ	 LLB	 S
	Stroke			
	Load-carrying capacity			
	Running accuracy			
	Speed			
	Acceleration			
	Preloading of guide			
	Stiffness			
	Friction			
Stick slip				
Damping				
Sensitivity to dirt fallout				
Stroke/Overall length				
Price				

Table 2

Precision slides with:				Degree of Fulfilment 100 %
Crossed roller guides  R	Needle roller guides  N	Dry sliding liners  P	Compact cross table  T	
				$\geq 2,5 \text{ m}$
				$\geq 150 \text{ kN}$
				$\leq 3 \mu\text{m}/300 \text{ mm}$
				$\geq 200 \text{ m/min}$
				$\geq 150 \text{ m/m}^2$
				high
				high
				$\leq \mu 0,002$
				none
				high
				insensitive
				1 : 1
				low

Accuracies

The overall accuracy with which a given object can be positioned in space depends on a number of factors relating to the individual axes. These include:

- **Straightness** of the slide movement upwards and sideways
- **Rotation** of the slide movement through pitch and yaw angles
- **Perpendicularity** of the individual axes to one another
- Positioning accuracy in the direction of feed of the individual axes with the following characteristics:
 - Positioning tolerance
 - Width of backlash
 - Positioning variation
- **Temperature difference**

The straightness, rotation and perpendicularity properties of a slide or table are greatly influenced by the mechanical stability and stiffness of the guide and the slide components.

In combination with stable and high-precision slide parts, the crossed or needle roller guides in the SKF precision slides and compact cross tables ensure that assemblies are extremely precise.

The positioning accuracy of a table is influenced by the choice of drive type. All SKF tables can be fitted with preloaded planetary roller screws to obtain the best performance.

All accuracy data in this catalogue is valid only for an unloaded individual slide of standard quality P10 (the superior accuracies P5 and P2 can be obtained on request) which, with all of its attachment screws, is fastened to a 100 % flat surface, measured at constant room temperature.

In a multiaxis unit consisting of precision slides, the accuracies of the

individual slides add up either positively or negatively. There is also the elastic deformation of the unsupported and partly supported axes.

Information on the probable accuracies of a particular multiaxis unit, including one under load, can be obtained on request.

The values given in Table 1 for the X and Y axes apply only to compact cross tables.

Straightness

Definition according to VDI 2617, Sheet 3.

The definition and type of measurement of the straightness of movement of SKF slides is shown in Figs. 12 and 13. It is important to note that the data given in our catalogue does not apply to the table surface directly. Conditioned as they are by the measuring design (e. g. laser optics), all accuracy data relates to one point on the moving slide top which is located at a distance of "a" above the table (see Figs. 12 and 13).

Fig. 12

Straightness - Height

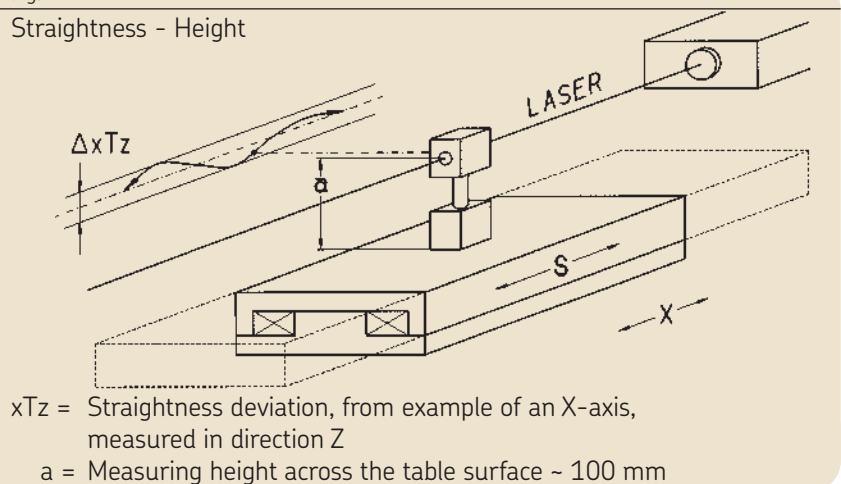
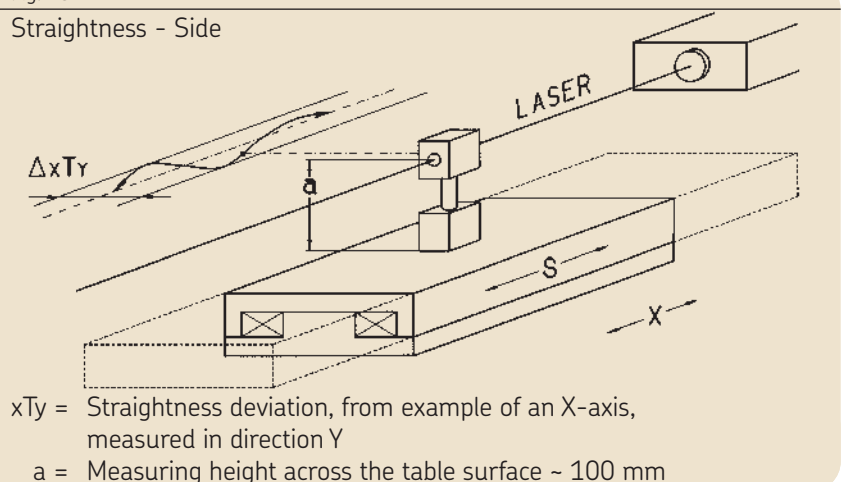


Fig. 13

Straightness - Side



Rotation

Definition according to VDI 2617, sheet 3.

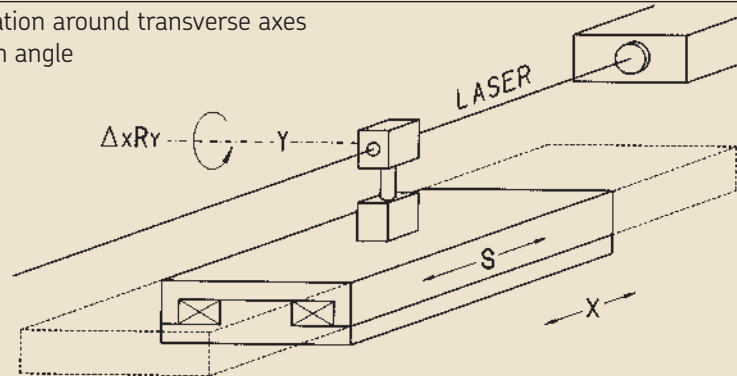
The definition and types of rotation during movement of slides are shown in Figs. 14 and 15.

Pitch Angle (Fig. 14)

Pitch angle indicates the maximum angular displacement of rotation around the horizontal transverse axis during slide movement. This angle is caused by the waviness in the straightness height plane (see also Fig. 16).

Fig. 14

Rotation around transverse axes
Pitch angle



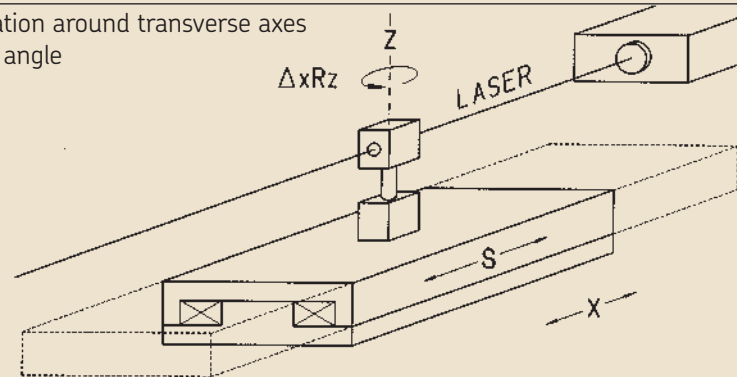
xRy = Pitch angle from example of the X-axis
(Rotation of the X-axis around the transverse Y-axis)

Yaw angle (Fig. 15)

Yaw angle indicates the maximum angular displacement of rotation around the vertical transverse axis during slide movement. This angle is caused by the waviness in the straightness - slide plane (see also Fig. 16).

Fig. 15

Rotation around transverse axes
Yaw angle

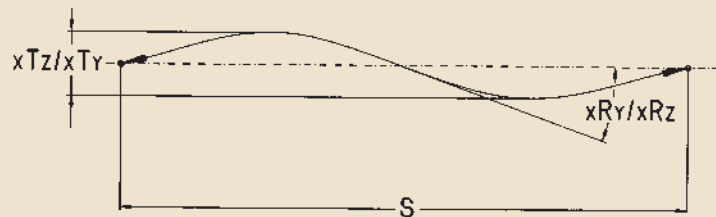


xRz = Yaw angle from example of the X-axis
(Rotation of the X-axis around transverse axis Z)

The relationship between straightness and rotation, from the example of an X axis, is shown in Fig. 16.

Fig. 16

Relationship between: Straightness-Height with pitch angle
Straightness-Side with yaw angle



xTz = Straightness deviation of the X-axis measured in direction Z
 xRy = Pitch angle of the X-axis around the Y direction

xTy = Straightness deviation of the X-axis measured in direction Y
 xRz = Yaw angle of the X-axis around direction Z

Perpendicularity

Definitions according to VDI 2617, sheet 3.

Perpendicularity given is only for cross tables consisting of precision slides or tables and for compact cross tables.

For SKF precision slides and compact cross tables made of standard material of P10 quality, maximum permissible values will be found as follows in Table 1 for

- Straightness-Height Tz
- Straightness-Side Ty
- Rotation R
- Perpendicularity W

(superior accuracies can be supplied on request).

Positioning accuracy

in the direction of feed

Definitions according to VDI/DGQ 3441.

1. Parameters for assessing positioning accuracy:

This accuracy is assessed with parameters ascertained separately for each axis (slide). Fig. 17 shows the relationship between the characteristics described below.

1.1 Positioning tolerance

Position tolerance is the guaranteed permissible total deviation of a slide in the direction of feed. The total deviation ascertained (positioning uncertainty P) must therefore be smaller than the permissible positioning tolerance.

1.2 Positioning uncertainty P (Fig. 18)

Positioning uncertainty is the total deviation ascertained. It is determined by taking account of the parameters of backlash width U, positioning variation Ps and positioning deviation Pa. In this way it covers the systematic and chance deviations.

1.3 Backlash width (Fig. 18)

Backlash width is a systematic deviation and is determined separately for each measuring position. It is the difference between the mean values of the measuring results from both starting directions.

1.4. Positioning variation Ps (Fig. 18)

Positioning variation describes the effect of chance deviations in each position. It is obtained statistically.

1.5. Positioning deviation (Fig. 18)

As a systematic deviation, positioning deviation is the maximum difference of the mean values for all positions.

Fig. 17

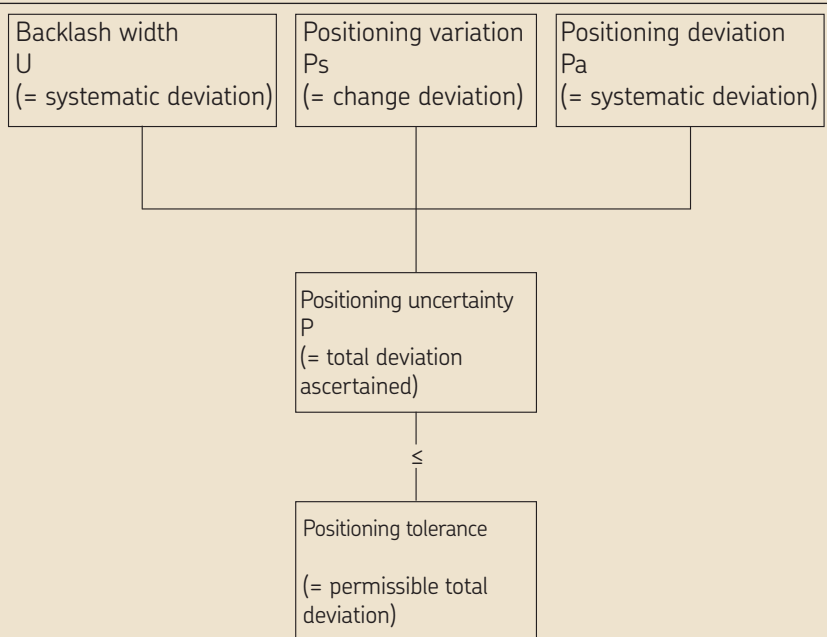
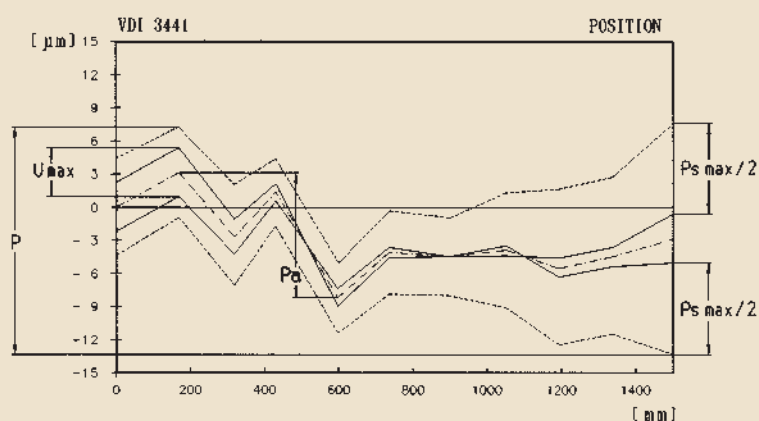


Fig. 18



2. Ascertaining the parameters

The parameters are ascertained by approaching several measuring points in the positioning range of the slide from each travel direction at least five times. Many measurements are obtained in this way. They give the deviation of each measuring point from the target positions prescribed by the control unit.

From these individual measurements, which are statistically assessed in accordance with VDI/DGQ 3441, the following parameters P, U, Ps and Pa are calculated and assessed in graph form (Fig. 18).

On request, all slides or table systems, which are delivered by SKF ex-works complete with motors and control units, can be measured by laser and the parameters per axis

statistically assessed and recorded in diagram and tables.

Depending on various drive and measuring systems, the maximum permissible values of

- positioning tolerance
- backlash width
- positioning variation

for the SKF precision slides and compact cross tables are shown in table 2.

Table 1

		Stroke [mm]				
Accuracy (P10)		100	200	300	400	500
Straightness-Height Tz	[µm]	5	6	7	8	9
Straightness-Side Ty	[µm]	4	4	5	5	5
Rotation R	[mrad]			0,1		
Perpendicularity W (only for cross tables)	[mrad]			0,03		

Table 2

		Stroke [mm]				
Drive design	Positioning accuracy [µm]	100	200	300	400	500
I	Positioning tolerance ¹⁾	28	35	43	45	47
	Backlash width U			4		
	Positioning variation Ps/2			8		
II	Positioning tolerance ¹⁾	16	23	31	33	35
	Backlash width U			4		
	Positioning variation Ps/2			2		
III	Positioning tolerance ¹⁾			3		
	Backlash width U			2		
	Positioning variation Ps/2			1		

¹⁾ = no compensation made for linear pitch error e (p)

3. Drive design

- I: Open bearing control circuit with five-phase stepping motor in full step operation, with 4 mm screw lead.
- II: Closed position control circuit with DC or AC motor and attached encoder (line number 500) with 4 mm screw lead and four-fold assessment by control unit.
- III: Closed bearing control circuit with DC or AC motor and linear measurement system LMS (20 µm period division) and five-fold interpolation and fourfold

assessment by the control unit. Superior accuracies can be obtained by changing the drive design, for example by:

- reducing screw lead
- increasing the grating number of the encoder
- increasing the interpolation of the linear measurement system signal
- using linear measurement systems with a small grating pitch
- compensating for linear pitch error in the control unit (only for I and II).

General tolerances

Unless otherwise indicated, general tolerances conforming to ISO 2768 -mk apply to all other slide dimensions.

Load-carrying capacity and life

Load-carrying capacity

Dovetail slides

The load rating C_{eff} indicated in the tables is the maximum permissible load F_{dyn} which may occur during movement. The indicated load rating C_o is the maximum permissible load F_{stat} which may occur when the slide is not moving.

However the values C_{eff} and C_o are valid only if the load F_{dyn} or F_{stat} is applied as a surface load vertically and centrally from above, and distributed across the surface $B \times L_2$ (slide width x length of the slide bottom). Reductions must be made if there are additional moment loads. Please call on us for assistance. The values C_{eff} and C_o given in the tables are valid for the standard GG25 material of slides. With aluminium slides both values must be reduced by 40 %.

Precision slides and compact cross tables

Calculation of load-carrying capacity is based on the principles laid down by ISO for the general calculation of rolling bearings. The dynamic load rating C_{eff} given in the Tables is used for the calculations of tables running under load. However the static load rating C_o should not be exceeded. The static load rating is defined as that the load which produces a maximum Hertz-calculated stress of 4 000 N/mm² in the area of contact between the rolling element and the raceways.

In order to ensure sufficient operating reliability, a safety factor S_o has already been included (according to type) in the C_o data in the catalogue tables as follows:

R-slides	$S_o = 3 - 6$
N-slides	$S_o = 6 - 15$
T-slides	$S_o = 4$

These factors need to be increased correspondingly when slides are subjected to shocks and when high de-

grees of running accuracy are required.

In general the values C_{eff} and C_o are valid only if the load is applied centrally as a surface load evenly distributed across the surface $B \times L_{TW}$ (slide width x effective cage length).

$$(1) \quad L_{10s} = c_1 \cdot \frac{5 \cdot 10^7}{S} \cdot \left(\frac{C_{eff}}{f_s \cdot F} \right)^{10/3}$$

or

$$(2) \quad L_{nh} = c_1 \cdot \frac{5 \cdot 10^7}{S \cdot n \cdot 60} \cdot \left(\frac{C_{eff}}{f_s \cdot F} \right)^{10/3}$$

Where

L_{10s} = rated life in double strokes from one end position to the other and back

L_{nh} = rated life in operating hours

C_{eff} = effective dynamic load rating of a slide

F = constant load vertically on the table surface, evenly distributed within area $B \times L_{TW}$

S = effective stroke

n = stroke frequency, min⁻¹ (Number of double strokes per min.)

c_1 = factor for reliability.
 $c_1 = 1$ for a reliability of 90 % probability, according to ISO recommendation. For higher reliabilities, please obtain the relevant c_1 values from the ball bearings or rail guides catalogue.

f_s = Factor for effective stroke length (as in table 3)

Reductions must be made if there are additional moment loads. Please call on us for assistance.

If the load is evenly distributed, as described above, the life of a rolling bearing slide can be determined from the following life equations:

Table 3

S/L_{TW}	f_s
0,2-0,3	1,6
0,3-0,5	1,4
0,5-0,7	1,2
0,7-1	1,1
>1	1

$$3) \quad L_{TW} = z \cdot t_1 \quad \text{or} \quad z \cdot t_2$$

In which

L_{TW} = load-bearing cage length

z = number of load-bearing rolling elements (see slide tables)

t_1 = pitch of rollers

t_2 = pitch of needle rollers (re t_1/t_2 , see pages 35-40).

Motor design and service life of screw

Precision slides and compact cross tables

$$(4) \quad M_V = \frac{1}{i} \cdot \left(M_S + \frac{F_A \cdot p}{5\,027} \right) [\text{Nm}] < M_N$$

$$(5) \quad n_M = \frac{6 \cdot 10^4 \cdot v \cdot i}{p} [1/\text{min}]$$

$$(6) \quad t_B = \frac{v}{a} [\text{s}] \quad \text{oder} \quad t_B = \frac{S_B}{500 \cdot v} [\text{s}]$$

$$(7) \quad S_B = 500 \cdot v \cdot t_B [\text{mm}]$$

$$(8) \quad t_G = 2 \cdot t_B + \frac{S - 2 S_B}{1\,000 \cdot v} [\text{s}]$$

$$(9) \quad J_T = \frac{m_T \cdot p_2}{3.95 \cdot 10^7} [\text{kgm}^2]$$

$$(10) \quad J_R = \frac{d_o^4 \cdot l}{1.3 \cdot 10^{12}} [\text{kgm}^2]$$

$$(11) \quad J = J_M + J_K + \frac{J_T + J_R}{i^2} [\text{kgm}^2]$$

$$(12) \quad M_B = \frac{J \cdot n_M}{7.64 \cdot t_B} [\text{Nm}]$$

$$(13) \quad M_M = M_B + M_V [\text{Nm}] < M_l < M_a$$

Determination of screw life

$$(14) \quad L_{ns} = \frac{p^4}{1.27 \cdot 10^8} \cdot \left(\frac{C_a}{M_V \cdot i} \right)^3 [\text{m}]$$

$$(15) \quad L_{10s} = \frac{p^4}{2.54 \cdot 10^5 \cdot S} \cdot \left(\frac{C_a}{M_V \cdot i} \right)^3 [\text{DH}]$$

$$(16) \quad L_{10h} = \frac{p^4}{1.52 \cdot 10^7 \cdot S \cdot n} \cdot \left(\frac{C_a}{M_V \cdot i} \right)^3 [\text{h}]$$

Where:

a = acceleration/deceleration [m/s^2]

C_a = dynamic load-carrying capacity of screw [N]

d_o = screw diameter (see page 64) [mm]

F_A = axial load in direction of feed [N]

i = poss. gear/belt transmission e. g. motor/screw speed

J = sum of moments of inertia [kgm^2]

J_K = moment of inertia of coupling elements, e. g. coupling, transmission [kgm^2]

J_M = moment of inertia of motor [kgm^2]

J_R = rotatory moment of inertia of screw [kgm^2]

l = screw length (see page 65) [mm]

L_{ns} = rated life of screw in m

L_{10s} = rated life of screw in number of double strokes

L_{10h} = rated life of screw in operating hours

M_a = max. permiss. slide driving torque

M_B = acceleration or braking torque [Nm]

M_l = max. permiss. dynamic torque of motor selected

M_M = max. motor torque required during acceleration [Nm]

M_N = Nominal torque of motor selected

M_S = slide idling speed torque

m_T = mass of linear moving parts [kg]

M_V = required motor torque at constant speed [Nm]

n = number of stroke movements from one end position to another and back [min^{-1}]

n_M = driving and motor speed [1/min]

p = screw lead (see page 64) [mm]

S = stroke [mm]

S_B = acceleration or braking distance [mm]

t_B = acceleration or braking time [s]

t_G = total time for one stroke [s]

v = feed rate [m/s]

Characteristic features, speeds, preloading and stiffness

Specific features

Dovetail slides

- robust guides
- high load-carrying capacity
- for high transverse accelerations which make use of guides with rolling elements impossible (e. g. vibrations, shocks).
- excellent vibration damping
- insensitive to dirt fallout
- low preload properties
- danger of stick slip

Precision slides with R-N-P guides

A feature common to all three kinds of precision slide guides are rail guides for limited strokes.

Depending on type, crossed or needle rollers, which serve as rolling elements are housed in plastic or aluminium cages and move between the rails.

For rail guides with dry sliding liners, one of the two rails is laminated with plain bearing material based on PTFE, and the liner surface is ground. A hardened and ground steel rail serves as the opposing sliding area.

R-rail guides with crossed roller assemblies

- robust guidance for most applications
- high load-carrying capacity
- excellent value for the price

N-rail guides with needle roller assemblies

- greater dynamic load-carrying capacity
- greater stiffness
- more suited to short strokes
- less sensitive to shocks

P-rail guides with dry sliding liners

- for high transverse accelerations which make use of guides with rolling elements impossible (e. g. vibrations, shocks).
- for high-frequency or extremely

short strokes

- good emergency running properties
- insensitive to dirt fallout
- very good vibration damping properties
- low preload properties

For selection of the slide system which best suits your special application, please see the chapter entitled "Choice of suitable slide system", pages 8 - 11.

Permissible speeds and accelerations

Dovetail slides

The dovetail slide permits speeds of up to 20 m/min with small loads and adequate lubrication.

Precision slides and compact cross tables

The guides with rolling elements and limited travel incorporated in the R-N- and T-slides can be used with travel speeds of up to 2 m/s and with accelerations of up to 10 m/s².

Depending on load, the dry sliding liners incorporated in the P-slides permit higher speeds and virtually unlimited accelerations.

If you wish to have even higher speeds and accelerations, please use SKF linear ball bearing and profile rail slides.

Preloading and Stiffness

Dovetail slides

The dovetail guide is aligned with an adjustable gib strip attached to one side of the slide top by means of matched pressure screws with zero play. Alignment is carried out at the factory and the pressure screws are afterwards secured with lacquer. While the stiffness of the dovetail guide can be increased by higher preloading of this adjustable gib strip, this drastically increases the friction factor of the slide and hence

the feed force required.

If a system with greater stiffness and hence greater accuracy is required, guides with rolling elements should be used. Slides form the "Precision slides" series have identical dimensions.

These slide types can be preloaded to a considerably greater extent without any great influence on feed forces.

Precision slides

Depending on guide and slide size, the R- and N-slides are preloaded exworks with preload screws mounted on one side of the slide top. The preload is around 3 % to 10 % of the static load rating.

Compact cross tables

Depending on guide and slide size, the T-slides are preloaded exworks with preload screws mounted on one side of the slide top. The preload is around 3 % to 5 % of the static load rating.

All slide systems

The stiffness of all slide systems can be increased in each individual case by greater preloads. However it should be borne in mind that:

- The size of the increase in stiffness is limited by the need to preserve the stability of the slide components. This applies in particular to the R-, N- and P-slides because of the need to preserve the stability of the slide top.
- Depending on the kind of load, stiffness also depends on deflection of the unsupported slide parts. Thus there can be an improvement if slides with a thick top are used.
- An increase in preloading is at the expense of ease of operation and even running.

Any change in preloading should be carried out only at our works.

Materials, operating temperatures, environment and friction

Materials

The slide components are manufactured as standard from the following materials:

Dovetail slides

- Slide top and base:
Standard: GG25 (cast iron)
On request: hardanodized aluminium
On request: GG25 chemically nickelplated, with PTFE coating as corrosion-resistant type.
- Endplates:
In black anodized aluminium

Precision slides and compact cross tables

- Guide rails:
Tool steel 90 MnCrV9 (1.2842) hardened
- Rolling elements:
Carbon chromium steel 100Cr6 (1.3505) hardened
- Cages:
 - R-slides dimension 50-200: plastic PA 12
 - R-slides dimension 300: aluminium
 - N-slides dimension 100 plastic PA 12
 - N-slides dimension 150-400: aluminium
 - T-slides: plastic PA 12
- Precision slides: top and base:
Standard: GG25 (cast iron)
On request: black anodized aluminium
- Compact cross tables: top and base:
Standard: GG25 chemically nickel-plated
On request: black anodized aluminium
- Other components for all systems: black anodized aluminium.

On request and when an order is being placed, slides can be made from other materials for precision slides and compact cross tables, e. g. stainless steel or acid-resistant or antimagnetic materials.

Permissible operating temperatures

S-, R-, N- and T-slides

Standard: -30 °C to +80 °C

P-slides

Standard: -40 °C to +80 °C

Dovetail slides only:

With special lubrication: -50 °C to +120 °C

Special ambient influences

Compact cross tables can also be specially designed for clean-room and high-vacuum applications

Friction

Dovetail slides

As with all slides, friction depends greatly on:

- load
- speed
- lubrication

With an average load, adequate lubrication, and a speed of > 0,2 m/min, a coefficient of friction of between 0,1 and 0,15 can be expected. At lower speeds stick slip occurs. To avoid this, slides with rolling element guides should be used, e. g. R-slides or dry sliding liners P-slides.

Precision slides and compact cross tables

All guides used operate without stick slip. The coefficient of friction of the R- and N-guides lies between 0,003 and 0,005 with standard light greasing.

For sealed slides of design RSAS-NSAS, the coefficients of friction are considerably greater, as the rubbing action of the wipers is added to the friction in the rail guide itself. These slides also have a high starting friction.

The coefficient of friction of the P-slides depends on load and speed.

For lubricated operating conditions it is:

- 0,08-0,15 for light loads and at low speeds (< 10 mm/min) and
- 0,04-0,0008 for average loads and higher speeds.

Lubrication and masses

Lubrication

Dovetail slides

Dovetail slides are provided with lubricating nipples on both sides on the bottom. The guide receives an adequate supply of oil from corresponding distribution holes and lubricating slots.

Oils with viscosities in the ISO VG 68-100 range or grease of Class 2 consistency with high-pressure additives should be used for lubrication.

Examples of oils:

- Shell Tonna 68
- Klüber Lamora Super Paladd 100

Examples of greases:

- SKF LGEM2
- Klüber Centoplex 2 EP

The slides are lightly lubricated exworks but should be lubricated before assembly and initial operation.

Precision slides and compact cross tables

The guides and screws of SKF precision slides are lightly greased exworks with SKF grease type LGMT2, a multipurpose lithium-based grease which also serves as protection against corrosion. It can be used in all standard applications.

For applications involving heavy loads, severe vibration, and high acceleration, we recommend use of a grease with high-pressure additives, for example, LGEP2. Light lubrication with oil in the ISO VG 15-30 range is of advantage only where special ease of operation is important (for example, measurement slides) along with minimal loads and speeds.

We use special greases for clean-room and vacuum applications (Klüber).

As regards lubricating intervals for slides, no exact figures can be indicated, as this depends on the particular application. Regular examination of the state of lubrication at the beginning of an operation will enable the relubrication intervals to be determined for the given application.

Masses

The figures for mass given in the tables are approximate values for slides made from the particular material.

The mass of slides made from special aluminium material is around 40 % lower.

Design and characteristic features

Dovetail slides and tables

General

The dovetail slide and table programme is based on a modular design. The dimensions of the dovetail slides are identical with those of the precision slides.

Information of the detailed design of the slides will be found in the tables entitled "Detailed design" on page 22.

The top and bottom have a square attachment hole pattern with dimensions $J \times J$ which should be adequate.

If the number of holes should prove insufficient, please use the extra drilling hole pattern ZB, pages 28-29.

There are threads in the upper part of the standard hole pattern. Please comply with the maximum permissible thread reach T_1 .

The bottom has recesses conforming to DIN 74 Form K for cylindrical screws to DIN 912.

Dovetail tables for manual operation (Fig. 19)

For dimensions, see tables on pages 24-26.

This range can be supplied in widths 50 to 300. The upper part in each case is longer than the lower part. The stroke is limited by endplates on both sides.

They have a lead screw with a bronze nut mounted in the lower part of the slide (axial clearance $< 0,05$ mm).

The screws are mounted in an assembly of preloaded angular-contact ball bearings in the thick front endplate.

Please note that it may be possible to attach a locking device to these slides (see page 27).

Type AR1

This range can be supplied in two different models:

- SSM- with micrometer knurl
- SSK - with crank handle

Fig. 19



SSM- with micrometer knurl

Vernier ring with spring preloading, easy to turn. One division equals
0,02 mm with B 50, 75, 100
0,01 mm with B 150, 200
0,05 mm with B 300

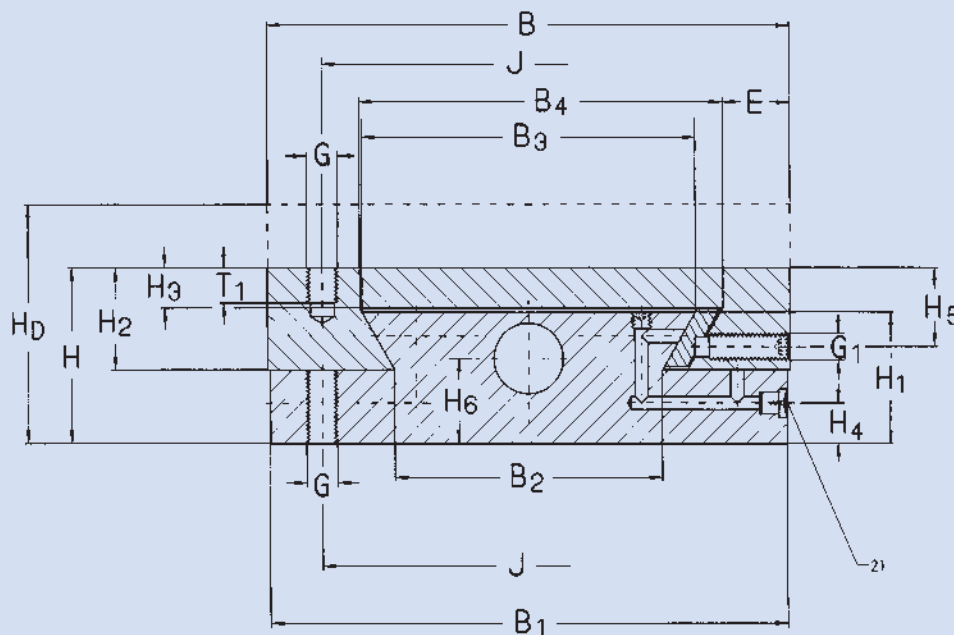
SSK- with crank handle

as SSM, but instead of knurled screw equipped with crank handle.

Table of dimensions

S. - Dovetail table: Detailed design B 50-300

(for product description, see page 21)



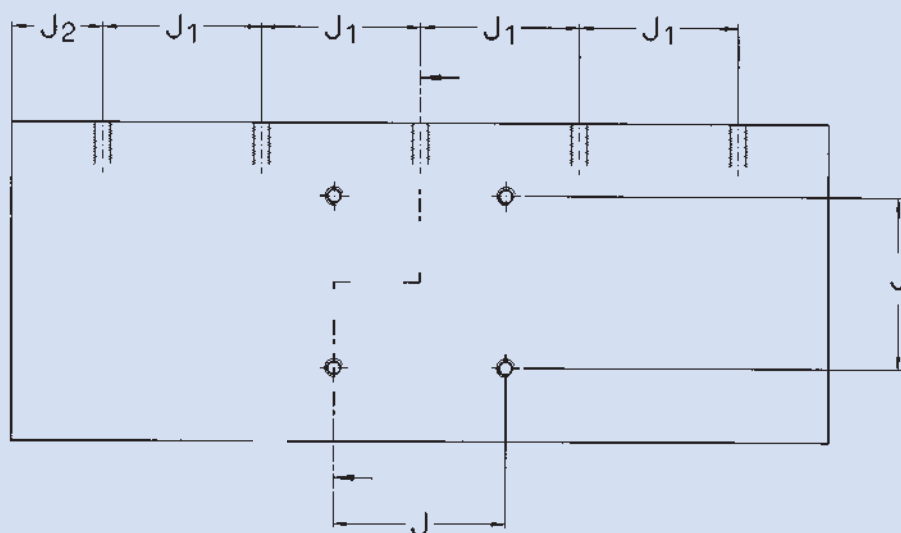
Dimensions

B	B ₁	H	H _D ¹⁾	B ₂	B ₃	B ₄	E	H ₁	H ₂
mm									
50	49	25	35	20,8	29,4	33,8	6,2	17,5	15
75	74	32	44	34,9	46,4	51,9	9,1	22,5	19,5
100	99	40	50	50,1	63,4	70,1	11,9	27,5	24
150	149	50	66	78,1	97,7	104,5	19,7	38	29
200	199	60	75	108	129,4	139,6	25,4	41,5	37
300	299	75	95	171,1	198,9	212,1	37,9	49	50

1) Only for "thick" top with DT T-slot; please see order codes

2) Tr-lubricating nipple conforming to D6 DIN 4305, on both sides, approximately centrally along length L₂

S. - Dovetail table with standard drill hole pattern



For possible additional drill hole patterns, please see pages 28-29.

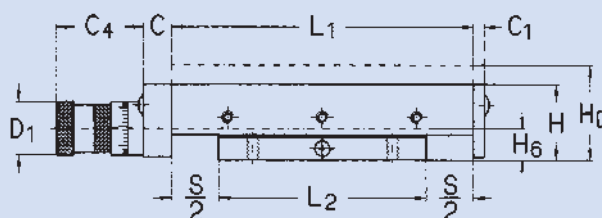
Dimensions

H ₃	H ₄	H ₅	H ₆	J	J ₁	J ₂	Recesses and Threads		T ₁	T ₂
							G	G ₁		
mm										
7	5	11,5	12,3	37	25	15	M4	M4	5	4,6
9	6,3	14,5	15	62	25	15	M4	M5	6	4,6
12	8	18,5	15,5	74	25	17,5	M6	M6	9	6,8
11,5	10,5	22	24	116	50	30	M8	M8	9	9
18	11,5	28	25	154	50	30	M8	M8	14	9
25	12,5	38	28	245	50	32,5	M10	M8	18	11

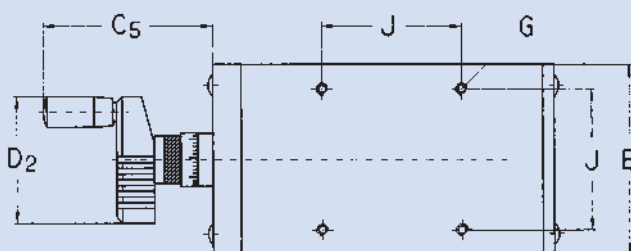
SS. - Dovetail positioning table for manual operation

B 50-75 (for product description, see page 21)

Design SSM



Design SSK



For detailed dimensions, see page 22

Dimensions																Load carrying capacity		Mass
B	H	H ₀ ¹⁾	L ₁	L ₂	Stroke S	C	C ₁	C ₄	C ₅	Screw Ø	D ₁	D ₂	G	H ₆	J	C _{eff}	C _o	GG
mm																N		kg
50	25	35	80	55	25	14	5	37,5	-	M6x1	23	-	M4	12,3	37	131	1 310	0,7
			130	105	25											250	2 500	1,2
			130	80	50											191	1 905	1,0
			180	130	50											310	3 100	1,5
			130	55	75											131	1 310	1,0
			180	105	75											250	2 500	1,3
			180	80	100											191	1 905	1,3
75	32	44	130	105	25	15	6	46	88	M10x1	30	71	M4	15	62	353	3 530	2,4
			180	155	25											521	5 210	3,2
			180	130	50											437	4 370	3,0
			230	180	50											605	6 050	3,3
			180	105	75											353	3 530	2,7
			230	155	75											521	5 210	3,5
			230	130	100											437	4 370	3,3
			280	180	100											605	6 050	4,1
			280	155	125											521	5 210	3,9
			280	130	150											437	4 370	3,7

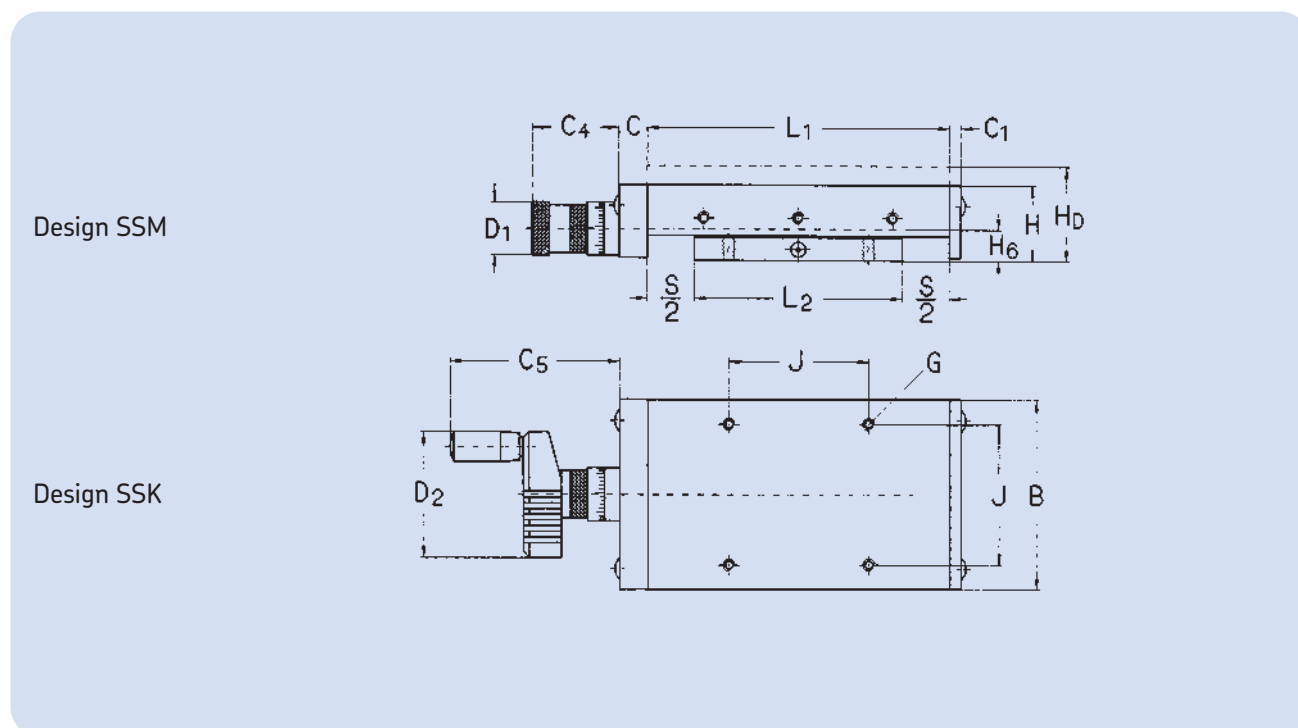
1) Only for slides with "thick" top and DT T-slots: please see order codes

For order designation: please see order codes, page 80.

Example of order: SSM 50.180.50

SS. - Dovetail positioning table for manual operation

B 100-150 (for product description, see page 21)



For detailed dimensions, see page 22

Dimensions																	Load carrying capacity		Mass
B	H	H _D ¹⁾	L ₁	L ₂	Stroke S	C	C ₁	C ₄	C ₅	Screw Ø	D ₁	D ₂	G	H ₆	J	C _{eff}	C _o	GG	
mm																	N		kg
100	40	50	210	160	50	15	6	46	88	M10x1	30	71	M6	15.5	74	675	6 750	5,7	
			310	260	50											1 100	10 970	8,6	
			310	210	100											886	8 860	7,9	
			410	310	100											1 310	13 080	10,6	
			310	160	150											675	6 750	7,1	
			410	260	150											1 100	10 970	9,9	
			410	210	200											886	8 860	9,1	
150	50	66	310	210	100	20	8	63	122	TR16x2	47	102	M8	24	116	1 345	13 460	15	
			510	410	100											2 630	26 280	25	
			510	310	200											1 985	19 870	27	
			610	410	200											2 630	26 280	27	
			610	310	300											1 985	19 870	24	
			810	510	300											3 270	32 690	34	
			810	410	400											2 630	26 280	30	

1) Only for slides with "thick" top and DT T-slots: please see order codes

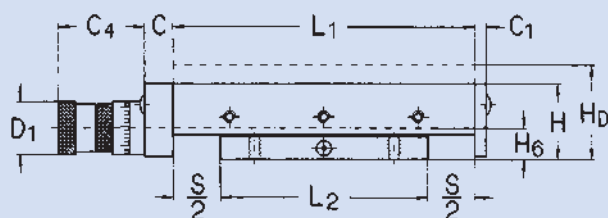
For order designation: please see order codes, page 80.

Example of order: SSM 50.180.50

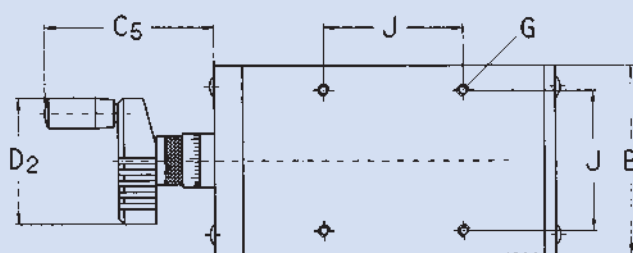
SS. - Dovetail positioning table for manual operation

B 200-300 (for product description, see page 21)

Design SSM



Design SSK



For detailed dimensions, see page 22

Dimensions																Load carrying capacity		Mass
B	H	H ₀ ¹⁾	L ₁	L ₂	Stroke S	C	C ₁	C ₄	C ₅	Screw Ø	D ₁	D ₂	G	H ₆	J	C _{eff}	C ₀	GG
mm																N		kg
200	60	75	310	210	100	20	8	63	122	TR16x2	47	102	M8	25	154	1 695	16 970	24
			510	410	100											3 315	33 130	41
			510	310	200											2 505	25 050	36
			610	410	200											3 315	33 130	45
			610	310	300											2 505	25 050	40
			810	510	300											4 120	41 210	56
			810	410	400											3 315	33 130	51
300	75	95	415	315	100	22	10	63	122	TR20x4	47	102	M10	28	245	3 615	36 130	64
			615	515	100											5 910	59 070	96
			615	415	200											4 760	47 600	87
			715	515	200											5 910	59 070	105
			715	415	300											4 760	47 600	95
			915	515	400											5 910	59 070	120
			915	415	500											4 760	47 600	112

1) Only for slides with "thick" top and DT T-slots: please see order codes, pages 80

For order designation: please see order codes, page 80.

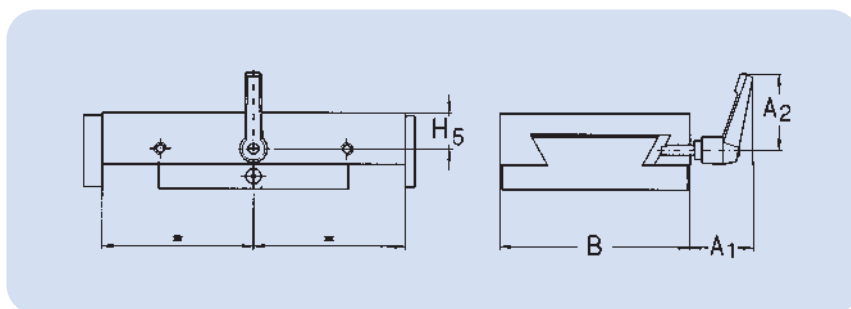
Example of order: SSK 200.810.300.DT

Accessories - dovetail slides

AR1 locking device for dovetail slides

The AR 1 locking device is a friction device which is fitted to the adjustment side of a slide assembly. Increased clamping is applied to the set rail by means of the clamping lever with a screw. This produces friction resistance.

The position of the clamping lever is set exworks so that the slide can be mounted on a base extending sideways without impairment of its clamping and unlocking operations.



Dimensions

B	A ₁	A ₂	H ₅
mm			
50	32	42	11,5
75	32	42	14,5
100	32	42	18,5
150	43	63	22
200	43	63	28
300	43	63	38

WG-WA mounting brackets

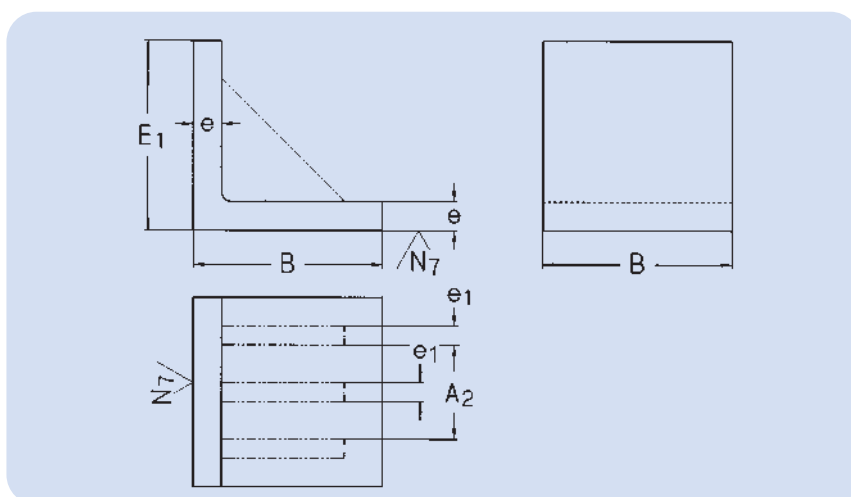
Designs:

WG made from GG25 or blackened steel according to dimensions

WA made from light metal alloy, surface protection on request at an extra charge.

For a precise definition of assembly of angle brackets for two or more axes, a drawing should be enclosed with the order.

Separate angle pieces do not have attachment holes provided.

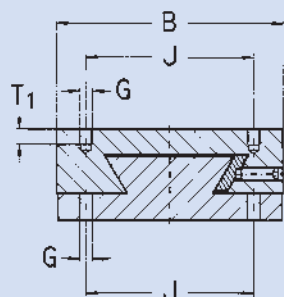


Type Dimensions

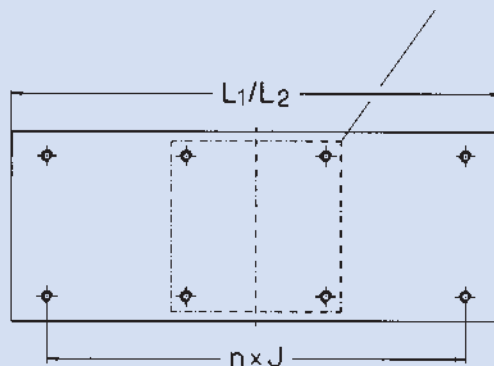
WG/WA	A ₂	B	E ₁	e	e ₁
mm					
50	-	50	50	10	10
75	-	75	75	12	10
100	-	100	100	15	10
150	50	150	150	18	12
150 H	50	150	250	18	12
200	90	200	200	20	12
200 H	90	200	330	20	12
300	175	300	300	25	15
300 H	175	300	520	25	15

For order designation: please see order codes, pages 80 and 81.

Additional drill hole pattern for dovetail slides and tables: top and bottom B 50-150 (for product description, see page 21)



Standard drill hole pattern available



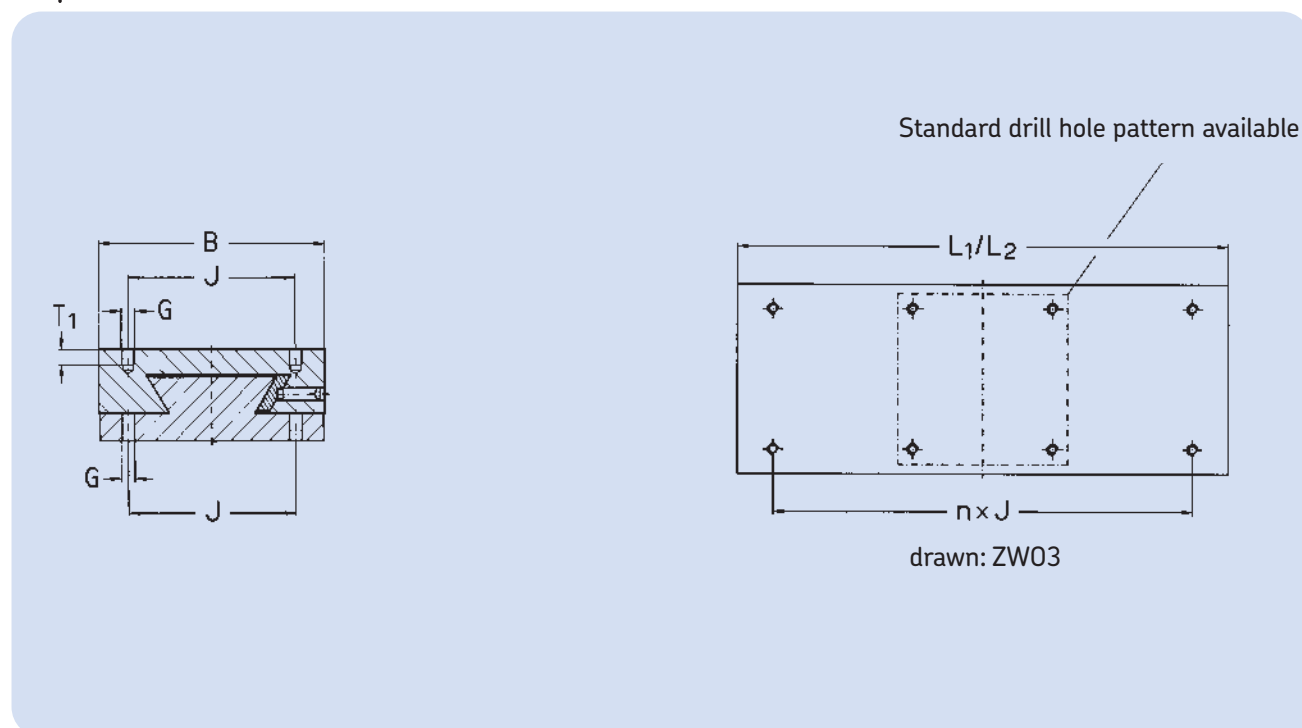
drawn: ZW03

Dimensions									Number
B	Top length $L_1^{1)}$	Bottom length $L_2^{1)}$	G	J	N	N_1	T_1	T_2	$n^{2)}$
mm									-
50	130	130	M4	37	4,5	8	6	4,6	3
50	180	-	M4	37	4,5	8	6	4,6	3
75	230	-	M4	62	4,5	8	6	4,6	3
75	280	-	M4	62	4,5	8	6	4,6	3
100	310	260	M6	74	6,6	11	9	6,8	3
100	310	310	M6	74	6,6	11	9	6,8	3
100	410	-	M6	74	6,6	11	9	6,8	5
150	510	410	M8	116	9	15	13	9	3
150	510	510	M8	116	9	15	13	9	3
150	610	-	M8	116	9	15	13	9	5
150	810	-	M8	116	9	15	13	9	5

1) Additional drill hole pattern not available
for the shorter lengths not shown here.
For order designation: please see order codes, page 81.

2) "n" denotes max. poss. number of pitches J in a particular top or bottom length.
Four holes are standard in each top and bottom (1xJ). 3xJ accordingly denotes 8 holes.
Example of order: ZBU5

Additional drill hole pattern for dovetail slides and tables: top and bottom B 200-300 (for product description, see page 21)



Dimensions							Number
B	Top length L ₁ ¹⁾	Bottom length L ₂ ¹⁾	G	J	T ₁	T ₂	n ²⁾
mm							-
200	510	510	M8	154	16	9	3
200	610	-	M8	154	16	9	3
200	810	-	M8	154	16	9	5
300	-	515	M10	245	18	11	1/2J + 1J + 1/2J
300	615	-	M10	245	18	11	1/2J + 1J + 1/2J
300	715	-	M10	245	18	11	1/2J + 1J + 1/2J
300	915	-	M10	245	18	11	3

1) Additional drill hole pattern not available for the shorter lengths not shown here.
For order designation: please see order codes, page 81.

2) "n" denotes max. poss. number of pitches J in a particular top or bottom length.
Four holes are standard in each top and bottom (1xJ). 3xJ accordingly denotes 8 holes.
Example of order: ZBU5

Precision slides and positioning tables

General

All precision slides and tables are available as standard with three different types of rail guide:

- **R-rail guides**

Slides of dimensions B 50-200: with rails from the SKF modular product range, crossed roller assemblies of series LWRE, and cage type LWAKE. This series, which has the same external dimensions as rail type LWR, is distinguished by:

- greater stiffness because of a greater roller diameter
- greater load-carrying capacity
- improved rolling behaviour

Slides of dimension B 300: with crossed roller assemblies of standard series LWR and cage type LWAL

- **N-rail guides**

Available for slides of dimension B 100-400: with rails from the SKF modular product range, needle roller assemblies of series LWRM/LWRV, and cage type LWHV or LWHW. This series, which has the same external dimensions, is distinguished by:

- enhanced stiffness
- enhanced load-carrying capacity.

- **P-rail guides**

Available for slides of dimension B 50-300: with rails from the SKF modular product range and dry sliding liner assemblies of the series LWRPM/LWRPV. This series, which has the same external dimensions, is distinguished by:

- resistance to shock
- suitability for short or high-frequency strokes

For information on additional characteristic features and selection criteria, please refer to the chapter "Selection of a suitable slide system", page 7.

The precision slide and table programme is designed as a modular system. This means that the individual parts of the various series constantly recur. Thus the top of a "precision slide with endplates" of dimension RE 100.260.50 is identical with both the top of a "precision table for manual operation" of dimension RSM 100.260.50, and with the top of a "precision table for motor drive" of dimension RSS 100.260.50.

The same applies to the other slide components such as the base, endplates, screws etc. Hence it is possible to make up on request other combinations of tops and bottoms other than those shown in the Tables.

The internal and external dimensions of the tops and bottoms used are therefore the same throughout all ranges, independently of the guidance system used. The external dimensions of the RS series are even identical with the dovetail slides of series SS (see pages 24-26).

Width B and length L_1 are therefore used as basic common characteristic values throughout the catalogue.

For information on all these identical and constantly recurring dimensions and the detailed design of the slides, please refer to the tables entitled "Detailed design", pages 34-39.

All tops and bottoms have as standard a square drill hole pattern of dimensions $J \times J$. If the number of holes should prove insufficient, please use the additional drill hole pattern ZB on pages 66-67.

The standard drill hole pattern has threaded holes in the top. Please note the maximum permissible thread depth T_1 .

The bottom has recesses conforming to DIN 74 Form K for cylindrical screws to DIN 912.

An attachment drill hole pattern can be provided to your specifications at an extra charge. However please make sure that the drill hole pattern which you want does not conflict either with the standard drill hole pattern or with the rail attachment holes.

Precision slides (Fig. 20)

with endplates RE - NE - PE

For dimensions, please see Tables on pages 40-43.

This range is available in the following designs and widths:

- RE (crossed roller guides) with widths B 50 to 300
- NE (needle roller guides) with widths B 100 to 300
- PE (dry sliding liner guides) with widths B 50 to 300.

The slide top is longer than the base. The stroke is limited by endplates on both sides. The slides are equipped with overrunning cages.

The front endplate C is thicker than the rear endplate C₁. This permits the retrofitting of cylinders, micrometers, probes and any other kind of drives.

Precision tables (Fig. 21)

for manual operation RS - NS - PS

For dimensions, please see Tables on pages 44-51.

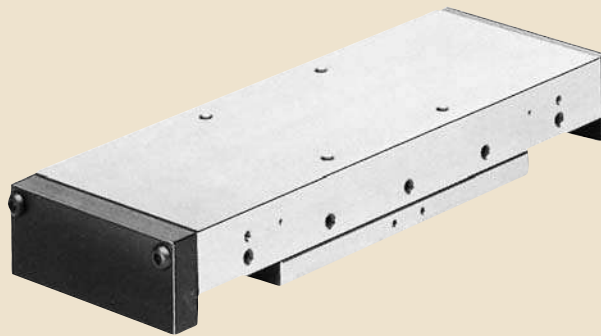
The design of this range is the same as that of the RE - NE - PE slides. However they have, in addition, a lead screw with bronze nut. It is mounted on the slide base (axial play < 0,05 mm).

The screw is supported by a set of preloaded angular contact ball bearings in the front, thick endplate. This range is available in the following designs and widths:

- RS (crossed roller guides) with widths B 50 to 300
- NS (needle roller guides) with widths B 100 to 300
- PS (dry sliding liner guides) with widths B 50 to 300

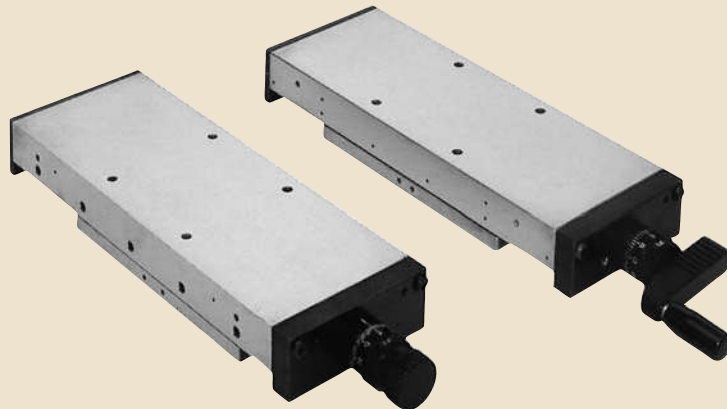
and also in two variants:

Fig. 20



RE slide

Fig. 21



RSM slide

RSK slide

RSM - NSM - PSM - slides with micrometer knurl

Vernier ring with spring preloading, easy to turn. A division corresponds to 0,01 mm (or 0,02 mm for B 50).

RSK - NSK - PSK - slides with hand crank

Similar to RSM - NSM - PSM, but instead of knurled screw a hand crank. Please note that it is possible to attach a locking device to these slides (see page 68, Type AR2).

Precision tables for motor drive RSS - NSS - PSS (Fig. 22)

For dimensions, please see tables on pages 52-59.

This range is available in the following designs and widths:

- RSS (crossed roller guides) with width B 50 to 300
- NSS (needle roller guides) with width B 100 to 400
- PSS (dry sliding liner guides) with width B 100 to 300.

The slide top is longer than the base. The stroke is limited by endplates on both sides. It should be noted that the nominal stroke "S" given in the tables is the maximum effective stroke between the endplates (buffers).

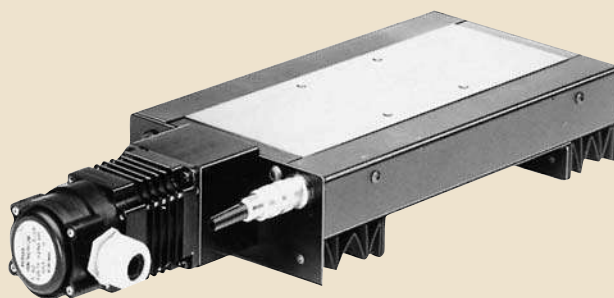
To avoid damage to the screw, this nominal stroke must not be fully used in operation the motor. The effective stroke, for example, between the limit switches must be selected by taking 5-20 mm less, depending on speed.

The slides are equipped with preloaded planetary roller screws which can be selected with various pitches (please see tables on pages 64-65). Drive screws are supported at the motor end by preloaded angular contact bearings in the table endplate.

These tables are provided with PUR polyester bellows as standard. As these bellows extend beyond the attachment surface of the bottom, a base plate GP can also be fitted. It can serve as:

- **Base plate** for standard assembly (slide bottom underneath)
- **Table plate** for overhead mounting (top above)
- **Intermediate plate** for cross table assembly with toothed belt plate drive

Fig. 22



RSS slide

For the dimensions of this GP base plate, please see table on page 74.

The bellows are overlapped on both sides by two cover sheets in the slide top. Limit and reference switches can be fitted under the right-hand side cover (see "Accessories" on page 69).

These slides can be equipped with standard motor flanges including torsion-proof couplings (see "Accessories" on pages 76 and 78)

If space restrictions require it, the standard motors can also be attached on the left or right side using a toothed belt drive (see "Accessories" on pages 77 and 79).

Attachment of a direct linear measurement system is also possible (see "Accessories" on page 74).

The individual slides can also be assembled in various ways as cross tables or multiaxis units (see in the section on "Accessories", "Cross table assembly" on pages 70-71 and "WG - WW mounting bracket" on page 68).

**Precision tables for motor drive,
sealed
RSAS - NSAS - PSAS (Fig. 23)**

For dimensions, see tables on pages 60-63.

This range is available in widths 100 to 300. The design of the tables is basically similar to that of the RSS-NSS-PSS slides. However, for better protection of screws and guides, wipers are fitted instead of bellows. These wipers seal the slide against a wiper plate mounted underneath. The wipers are also provided on one side of the wiper plate with an M-5 threaded connection for the injection of clean and dry air (max. 0,1 bar). The slides are 100 % dustproof.

These slide types are equipped as standard with a toothed belt drive which permits the mounting of a raised motor at the side.

Limit and reference switches can be fitted under the right-hand side cover plate (see under "Accessories", page 69).

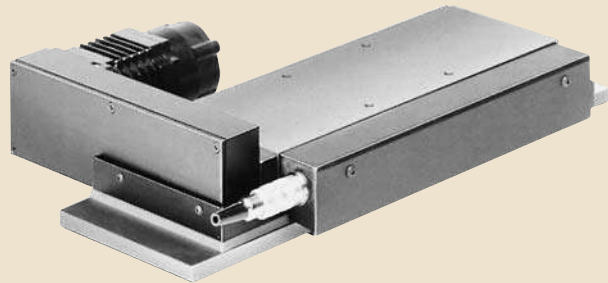
Attachment of a direct linear measurement system under the left-hand side cover plate is also possible (see "Accessories", page 74).

Standard motors

The standard motor flanges and toothed belt drives (pages 76-79) are matched to the standard motors used by us in various designs and dimensions.

The fitting of other motors by the customer is also possible. For this we need the exact motor dimensions in order to be able to make a special motor flange.

Fig. 23



RSAS slide

Fig. 24



For all standard motors we can also deliver, on request, the following which are matched to the motors:

- power units for stepping motors
- four-quadrant control including transformer for DC motors
- servo module for AC motors for use either as European card format or 19" rack.

Please ask for our separate documentation.

Control units (Fig. 24)

We can also deliver with the complete slide units, and on request, freely programmable CNC control units for one or several axes, depending on the application, for use as:

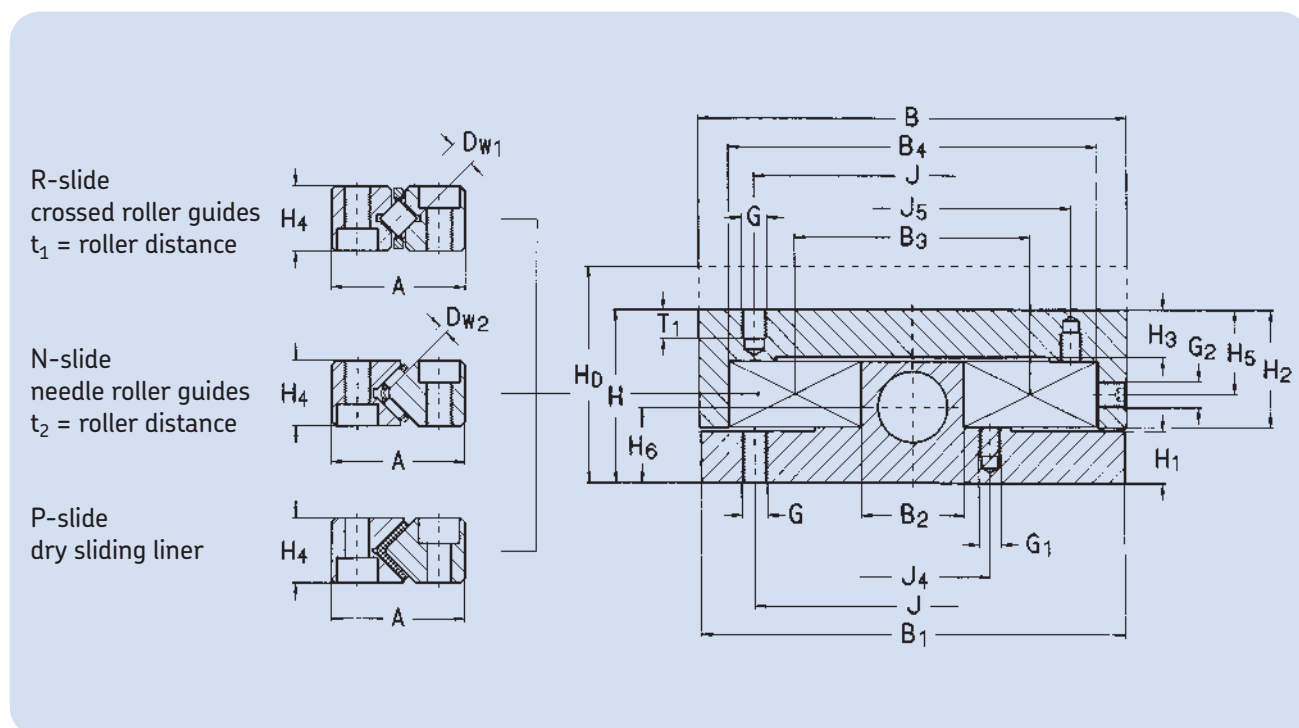
- linear path control
- continuous path control with circular interpolation

Please ask for our separate documentation.

Table of dimensions

R - N - P Precision slides: Detailed design B 50-100

(for product description page, see page 30)

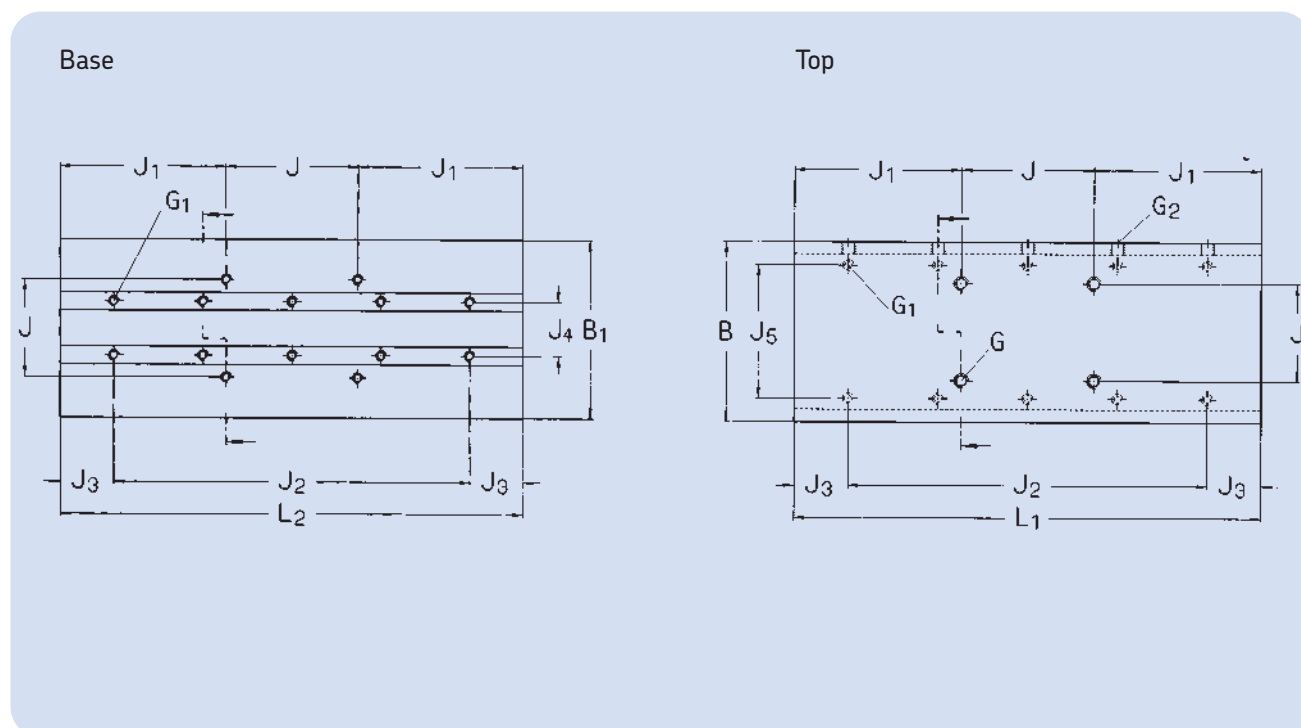


Dimensions

B	B ₁	D _{w1/t1}	D _{w2/t2}	H	H ₀ ¹⁾	A	B ₂	B ₃	B ₄	H ₁	H ₂	H ₃	H ₄	H ₅	H ₆
mm															
50	49	4/6,25	-	25	35	18	8,5	26,5	44,5	7,5	17	7	8	11,5	12,3
75	74	4/6,25	-	32	44	18	23	41	59	10,5	21	8,5	8	13	15
100	99	8/11	2/3,75	40	50	31	24	55	86	12	27,5	11	15	19,5	15,5

1) Only for "thick" D top

R - N - P Precision slides with standard drill hole pattern and rail attachment holes



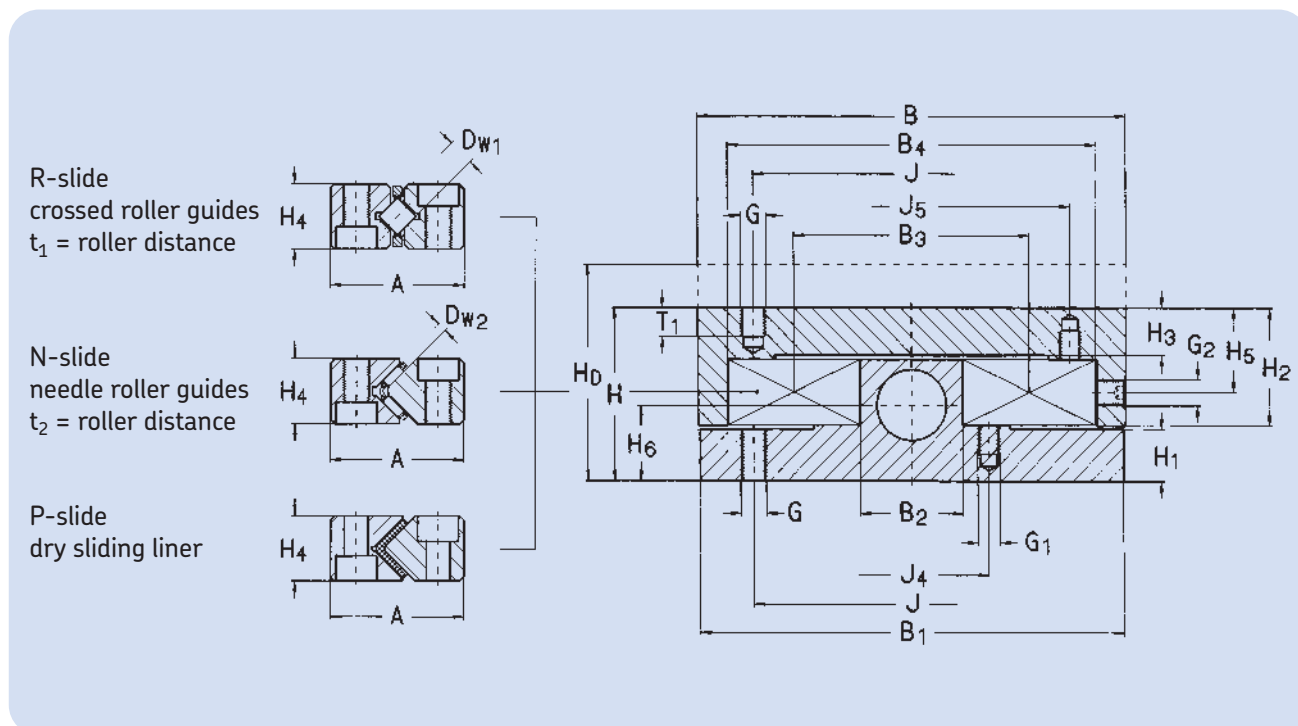
For possible additional drill hole patterns, see pages 66-67

Dimensions

		Holes in base and top						Recesses and threads				
L ₁	L ₂	J	J ₁	J ₂	J ₃	J ₄	J ₅	G	G ₁	G ₂	T ₁	T ₂
mm												
-	55	37	9	1x25	15	15,5	37,5	M4	M3	M3	6	4,6
80	80		21,5	2x25								
-	105		34	3x25								
130	-		46,5	4x25								
180	-		71,5	6x25								
-	105	62	21,5	3x25	15	30	52	M4	M3	M3	6	4,6
130	130		34	4x25								
-	155		46,5	5x25								
180	-		59	6x25								
230	-		84	8x25								
-	210	74	68	3x50	30	36	74	M6	M5	M6	9	6,8
260	260		93	4x50								
310	310		118	5x50								
360	-		143	6x50								
410	-		168	7x50								
460	-		193	8x50								

R - N - P Precision slides: detailed design B 150-200

(for product description page, see page 30)

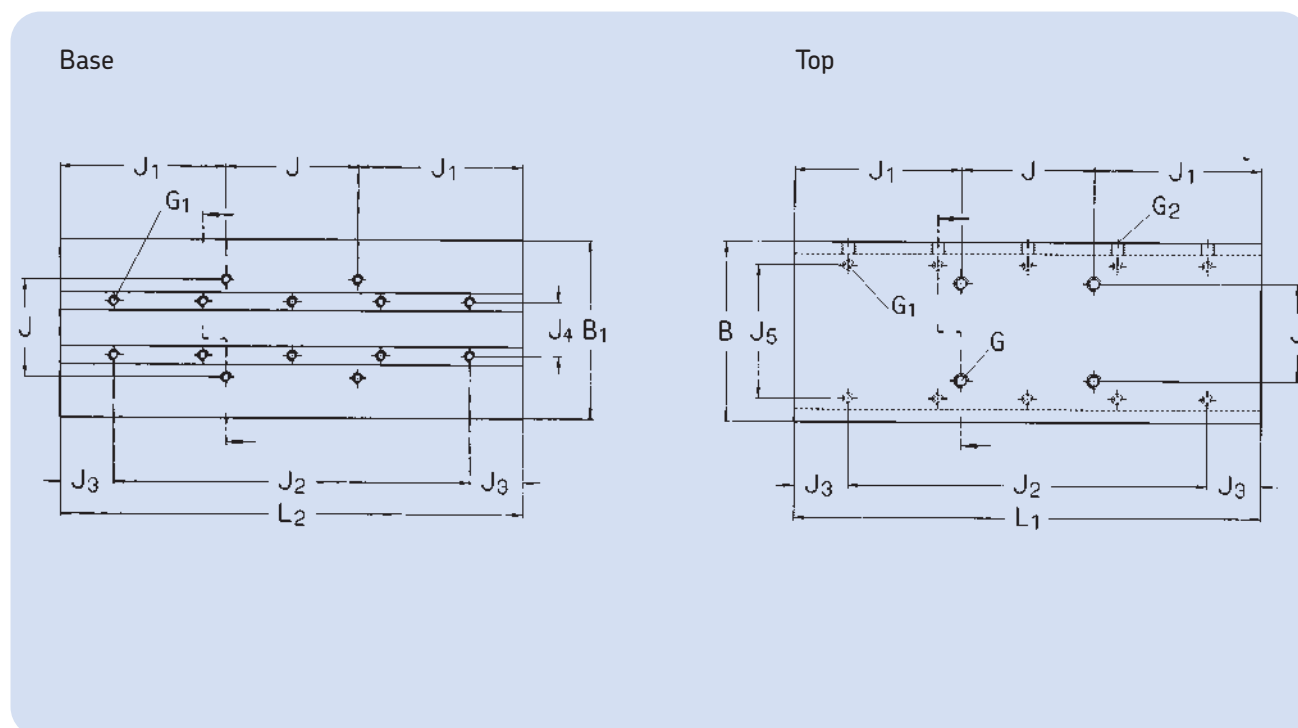


Dimensions

B	B ₁	D _{w1/t1}	D _{w2/t2}	H	H ₀ ¹⁾	A	B ₂	B ₃	B ₄	H ₁	H ₂	H ₃	H ₄	H ₅	H ₆
mm															
150	149	12/16	2/4,5	50	66	44	38	82	126	14	35,5	13	22	24,5	24
200	199	12/16	2/4,5	60	75	44	80	124	168	19,5	40	17	22	29	25

1) Only for "thick" D top

R - N - P Precision slides with standard drill hole pattern and rail attachment holes



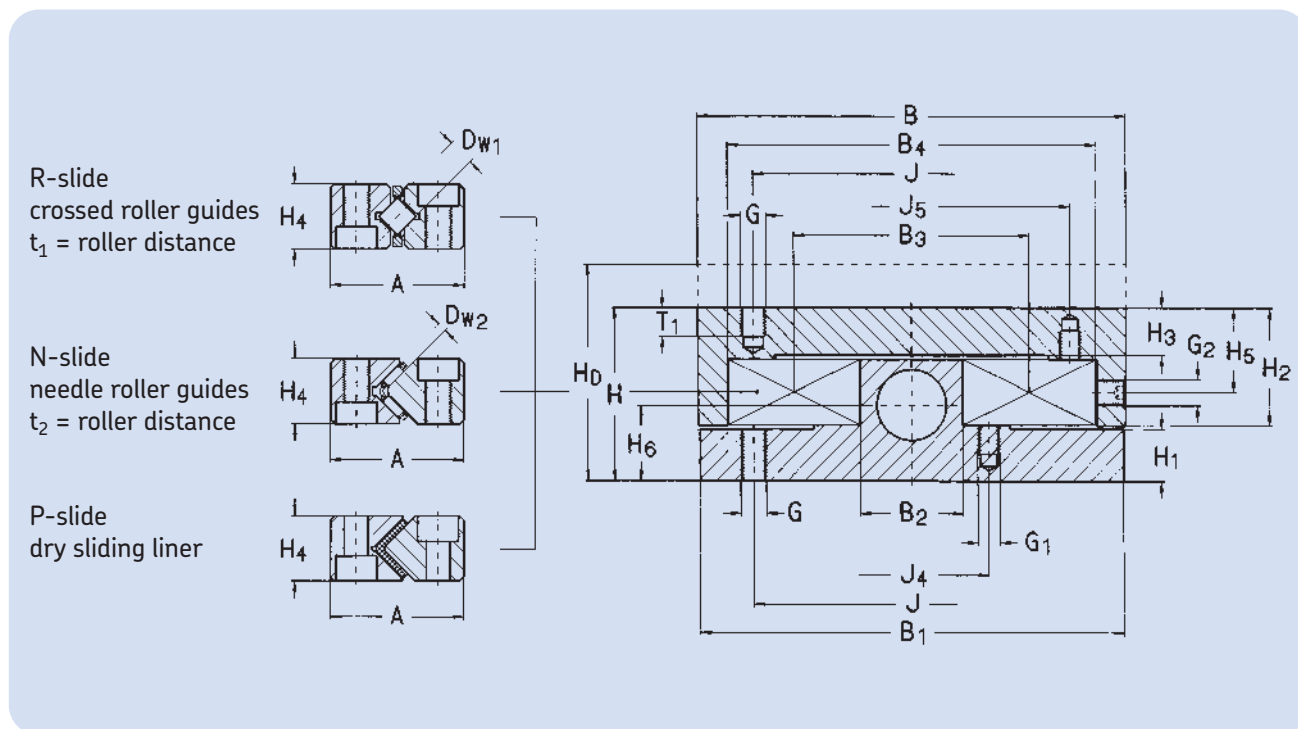
For possible additional drill hole patterns, see pages 66-67

Dimensions

L ₁	L ₂	Holes in base and top						Recesses and threads				
		J	J ₁	J ₂	J ₃	J ₄	J ₅	G	G ₁	G ₂	T ₁	T ₂
mm												
-	310	116	97	2x100	55	56	108	M8	M6	M8	13	9
410	410		147	3x100								
510	510		197	4x100								
610	-		247	5x100								
710	-		297	6x100								
810	-		347	7x100								
-	310	154	78	2x100	55	98	150	M8	M6	M8	16	9
410	410		128	3x100								
510	510		178	4x100								
610	-		228	5x100								
710	-		278	6x100								
810	-		328	7x100								
910	-		378	8x100								

R - N - P Precision slides: Detailed design B 300 - 400

(for product description page, see page 30)

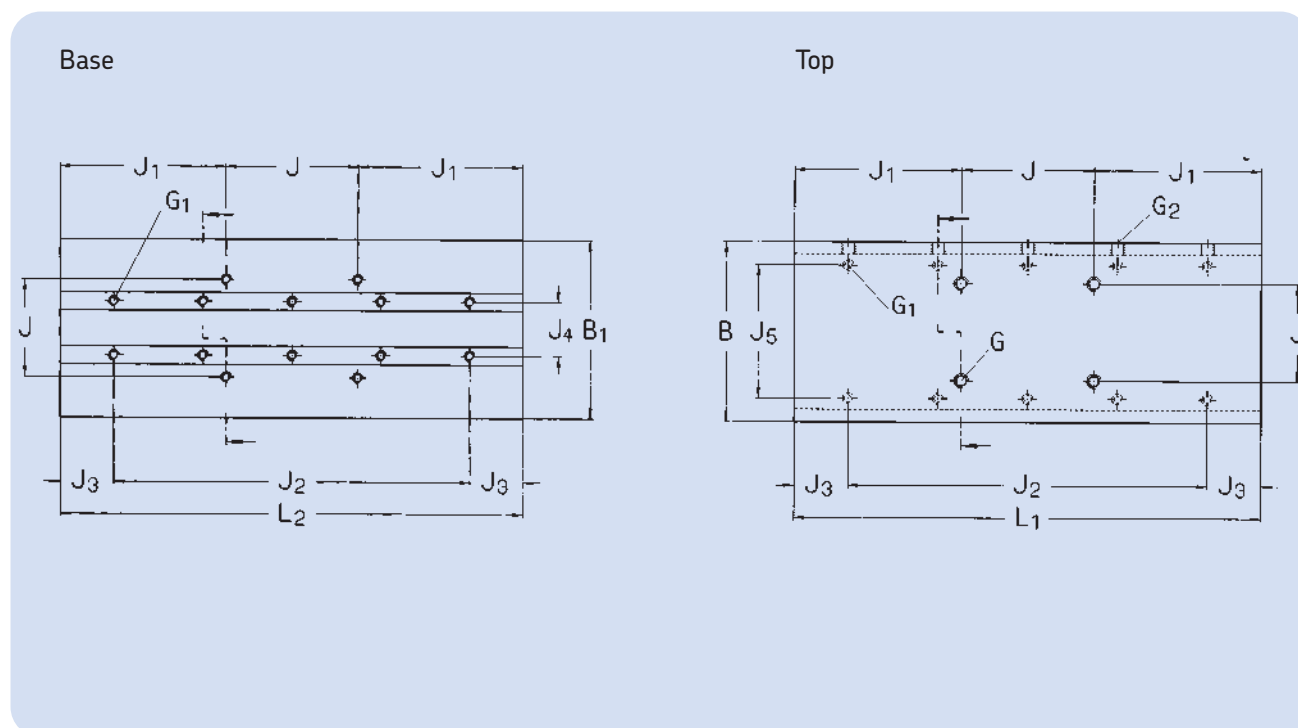


Dimensions

B	B ₁	D _{w1/t1}	D _{w2/t2}	H	H ₀ ¹⁾	A	B ₂	B ₃	B ₄	H ₁	H ₂	H ₃	H ₄	H ₅	H ₆
mm															
300	299	12/18	2,5/5,5	75	95	58	140	198	256	20	54,5	25	28	40	28
400	399	-	3/6	100	125	71	198	269	340	30	69	32	36	51	38

1) Only for "thick" D top

R - N - P Precision slides with standard drill hole pattern and rail attachment holes



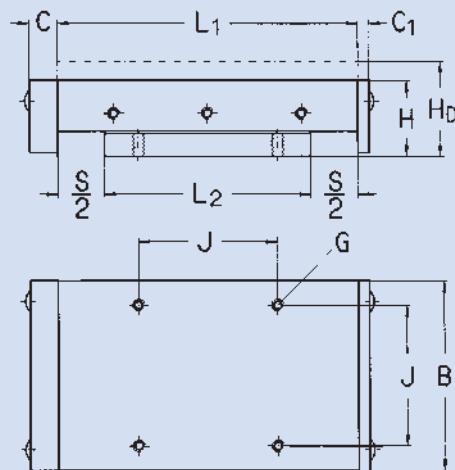
For possible additional drill hole patterns, see pages 66-67

Dimensions

L ₁	L ₂	Holes in base and top						Recesses and threads				
		J	J ₁	J ₂	J ₃	J ₄	J ₅	G	G ₁	G ₂	T ₁	T ₂
mm												
-	315	245	35	2x100	57,5	164	232	M10	M 8	M10	18	11
-	415		85	3x100								
515	515		135	4x100								
615	-		185	5x100								
715	-		235	6x100								
815	-		285	7x100								
915	-		335	8x100								
-	515	340	87,5	4x100	57,5	26	312	M12	M10	M12	24	13
615	615		137,5	5x100								
815	-		237,5	7x100								
1 015	-		337,5	9x100								

RE - NE - PE Precision slides with endplates B 50 - 75

(for product description, see page 31)



For detailed design, see pages 34-35

Dimensions											Load-carrying capacity							Mass	
B	H	H ₀ ¹⁾	L ₁	L ₂	Stroke S	C	C ₁	G	J		RE C _{eff}	C ₀	Z ²⁾	NE C _{eff}	C ₀	Z ²⁾	PE C _{eff}	C ₀	GG
mm											kN		-	kN		-	kN		kg
50	25	35	80	55	25	14	5	M4	37		6,2	1,7	8	-	-	-	0,1	0,95	0,6
			130	105	25						10,5	3,3	16				0,2	1,9	1
			130	80	50						8,4	2,5	12				0,15	1,4	0,9
			130	55	75						6,2	1,7	8				0,1	0,95	0,8
			180	105	75						10,5	3,3	16				0,2	1,9	1,2
			180	80	100						8,4	2,5	12				0,15	1,4	1,1
75	32	44	130	105	25	15	6	M4	62		10,5	3,4	16	-	-	-	0,2	1,9	2,1
			180	155	25						14,5	5,1	24				0,3	2,9	2,9
			180	130	50						12,5	4,25	20				0,25	2,4	2,7
			180	105	75						10,5	3,4	16				0,2	1,9	2,5
			230	155	75						14,5	5,1	24				0,3	2,9	3,3
			230	130	100						12,5	4,25	20				0,25	2,4	3,1
			230	105	125						10,5	3,4	16				0,2	1,9	2,9

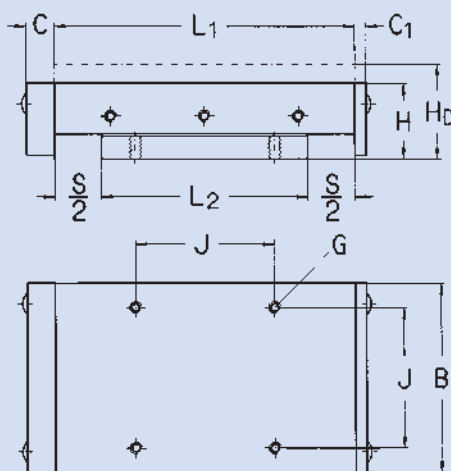
1) Only for "thick" top: see order codes

2) Number of load-bearing rolling elements per side
For order designation, please see page 80

Example of order: RE.50.130.50

RE - NE - PE Precision slides with endplates B 100 - 150

(for product description, see page 31)



For detailed design, see pages 34-37

Dimensions											Load-carrying capacity							Mass	
B	H	H _D ¹⁾	L ₁	L ₂	Stroke S	C	C ₁	G	J		RE C _{eff}	C ₀	Z ²⁾	NE C _{eff}	C ₀	Z ²⁾	PE C _{eff}	C ₀	GG
mm											kN		-	kN		-	kN		kg
100	40	50	260	210	50	15	6	M6	74		54,2	8,8	15	44,2	8,8	53	0,54	5,3	6,7
			310	260	50						67,9	10,9	20	52,5	10,9	66	0,68	6,4	8
			360	310	50						80,8	13	25	60,9	13	80	0,81	7,5	9,4
			310	210	100						48,5	8,8	13	44,2	8,8	53	0,54	5,3	7,3
			360	260	100						62,5	10,9	18	52,5	10,9	66	0,68	6,4	8,7
			410	310	100						73,1	13	22	60,9	13	80	0,81	7,5	10
			360	210	150						42,6	8,8	11	44,2	8,8	53	0,54	5,3	8
			410	260	150						54,2	10,9	15	52,5	10,9	66	0,68	6,4	9,4
			460	310	150						67,9	13	20	60,9	13	80	0,81	7,5	11
			460	260	200						48,5	10,9	13	52,5	10,9	66	0,68	6,4	10
150	50	66	410	310	100	20	8	M8	116		155	53	20	82,2	53,3	66	1,3	12,5	19
			510	410	100						202	71	28	103	66	88	1,8	16	25
			610	510	100						252	88	37	123	83,3	111	2,2	21	30
			510	310	200						131	53	16	82,2	53,3	66	1,3	12,5	22
			610	410	200						180	71	24	103	66	88	1,8	16	27
			710	510	200						230	88	33	123	83,3	111	2,2	21	32
			610	310	300						105	53	12	82,2	53,3	66	1,3	12,5	24
			710	410	300						156	71	20	103	66	88	1,8	16	29
			810	510	300						202	88	28	123	83,3	111	2,2	21	35
			810	410	400						131	71	16	103	66	88	1,8	16	32

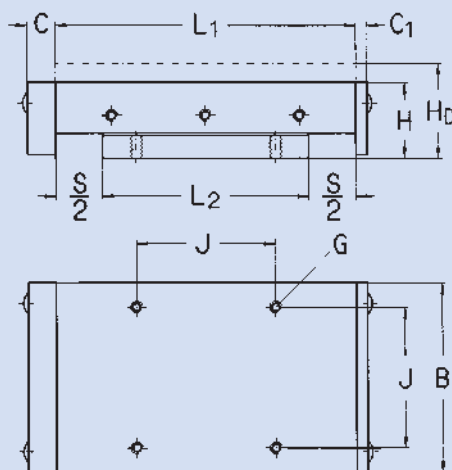
1) Only for "thick" top: see order codes

2) Number of load-bearing rolling elements per side
For order designation, please see page 80

Example of order: NE.100.310.100

RE - NE - PE Precision slides with endplates B 200

(for product description, see page 31)



For detailed design, see pages 36-37

Dimensions										Load-carrying capacity								Mass	
B	H	H _D ¹⁾	L ₁	L ₂	Stroke S	C	C ₁	G	J	RE C _{eff}	C _o	Z ²⁾	NE C _{eff}	C _o	Z ²⁾	PE C _{eff}	C _o	GG	
mm										kN		-	kN		-	kN		kg	
200	60	75	410	310	100	20	8	M8	154	156	53	20	82,2	49,5	66	1,3	12,5	31	
			510	410	100					202	71	28	103	66	88	1,8	16	39	
			610	510	100					252	88	37	123	83,3	111	2,2	21	48	
			510	310	200					131	53	16	82,2	49,5	66	1,3	12,5	35	
			610	410	200					180	71	24	103	66	88	1,8	16	43	
			710	510	200					230	88	33	123	83,3	111	2,2	21	52	
			610	310	300					105	53	12	82,2	49,5	66	1,3	12,5	38	
			710	410	300					156	71	20	103	66	88	1,8	18	47	
			810	510	300					202	88	28	123	83,3	111	2,2	21	55	
			810	410	400					131	53	16	103	66	88	1,8	16	51	
			910	510	400					180	71	24	123	83,3	111	2,2	21	59	

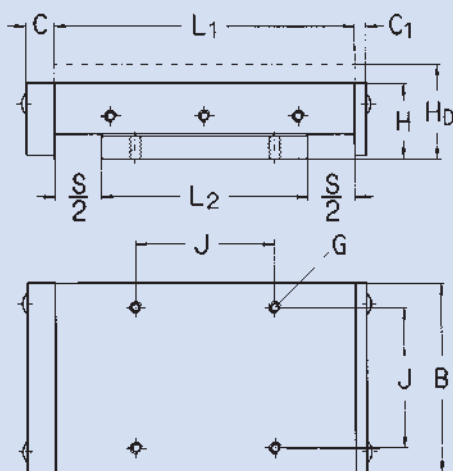
1) Only for "thick" top: see order codes

2) Number of load-bearing rolling elements per side
For order designation, please see page 80

Example of order: RE.200.510.200

RE - NE - PE Precision slides with endplates B 300

(for product description, see page 31)



For detailed design, see pages 38-39

Dimensions										Load-carrying capacity								Mass	
B	H	H _D ¹⁾	L ₁	L ₂	Stroke S	C	C ₁	G	J	RE C _{eff}	C ₀	Z ²⁾	NE C _{eff}	C ₀	Z ²⁾	PE C _{eff}	C ₀	GG	
mm										kN		-	kN		-	kN		kg	
300	75	95	515	415	100	22	10	M10	245	58	58	19	173	106	72	2,7	24	75	
			615	515	100					69	73	24	206	132	90	3,3	30	91	
			515	315	200					35	31	10	138	79,2	54	2	18	67	
			615	415	200					50	49	16	173	106	72	2,7	24	83	
			715	515	200					62	64	21	206	132	90	3,3	30	98	
			615	315	300					29	24	8	138	79,2	54	2	18	75	
			715	415	300					43	40	13	173	106	72	2,7	24	90	
			815	515	300					58	58	19	206	132	90	3,3	30	106	
			815	415	400					35	31	10	173	106	72	2,7	24	98	
			915	515	400					50	49	16	206	132	90	3,3	30	114	

1) Only for "thick" top: see order codes

2) Number of load-bearing rolling elements per side
For order designation, please see page 80

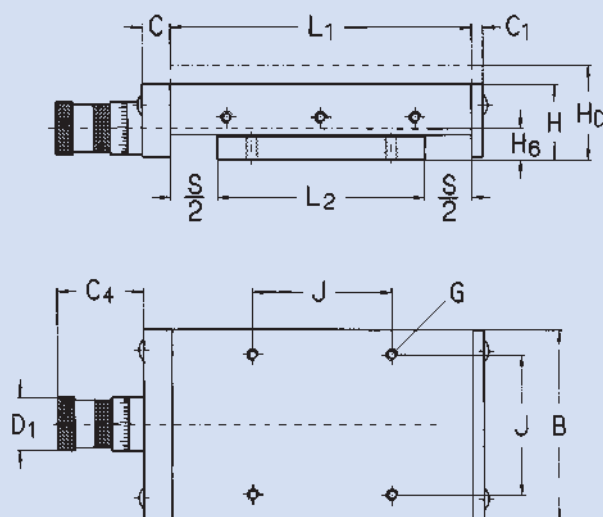
Example of order: NE.300.815.400

RS. - NS. - PS. Precision tables for manual operation

B 50 - 75 (for product description, see page 31)

Design

RSM
NSM
PSM



For detailed design, see pages 34-35

Dimensions

B	H	H ₀ ¹⁾	L ₁	L ₂	Stroke S	C	C ₁	C ₄	C ₅
mm									
50	25	35	80	55	25	14	5	37,5	
			130	105	25				
			130	80	50				
			130	55	75				
			180	105	75				
			180	80	100				
75	32	44	130	105	25	15	6	46	88
			180	155	25				
			180	130	50				
			180	105	75				
			230	155	75				
			230	130	100				
			230	105	125				

1) Only for "thick" top: see order codes

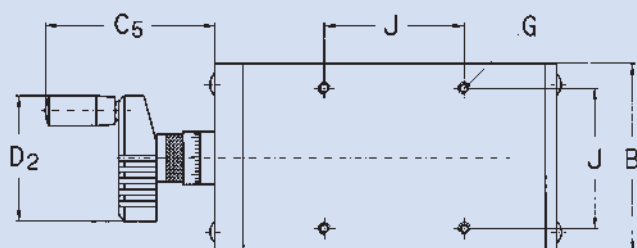
For order designation: please see order codes, page 80

Example of order: RSM 50.80.25

RS. - NS. - PS. Precision tables for manual operation

Design

RSK
NSK
PSK



Dimensions						Load-carrying capacity						Mass		
Ø Screw	D ₁	D ₂	G	H ₆	J	RS C _{eff}	C ₀	Z ²⁾	NS C _{eff}	C ₀	Z ²⁾	PS C _{eff}	C ₀	GG
mm						kN		-	kN		-	kN		kg
M6 x 1	23	-	M4	12,3	37	6,2	1,7	8	-	-	-	0,1	0,95	0,7
						10,5	3,3	16				0,2	1,9	1,1
						8,4	2,5	12				0,15	1,4	1
						6,2	1,7	8				0,1	0,95	0,9
						10,5	3,3	16				0,2	1,9	1,3
						8,4	2,5	12				0,15	1,4	1,2
M10 x 1	30	71	M4	15	62	10,5	3,4	16	-	-	-	0,2	1,9	2,2
						14,5	5,1	24				0,3	2,9	3
						12,5	4,25	20				0,25	2,4	2,8
						10,5	3,4	16				0,2	1,9	2,6
						14,5	5,1	24				0,3	2,9	3,4
						12,5	4,25	20				0,25	2,4	3,3
						10,5	3,4	16				0,2	1,9	3,1

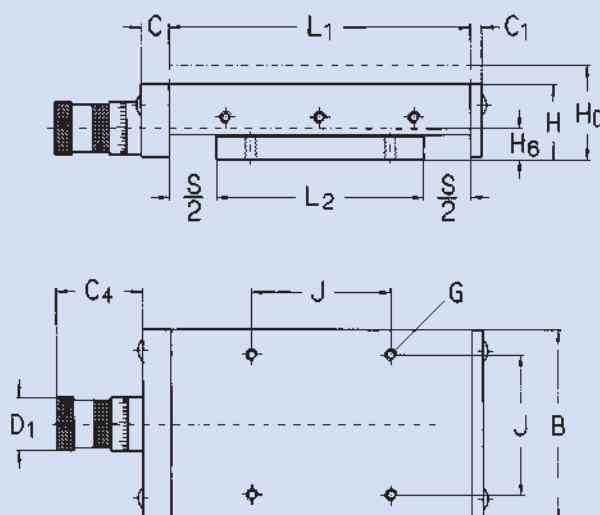
2) Number of load-bearing rolling elements per side

RS. - NS. - PS. Precision tables for manual operation

B 100 - 150 (for product description, see page 31)

Design

RSM
NSM
PSM



For detailed design, see pages 34-37

Dimensions

B	H	H ₀ ¹⁾	L ₁	L ₂	Stroke S	C	C ₁	C ₄	C ₅
mm									
100	40	50	260	210	50	15	6	46	88
			310	260	50				
			360	210	100				
			310	210	100				
			360	260	100				
			410	310	100				
			360	210	150				
			410	260	150				
			460	310	150				
			460	260	200				
150	50	66	410	310	100	20	8	63	122
			510	410	100				
			610	510	100				
			510	310	200				
			610	410	200				
			710	510	200				
			610	310	300				
			710	410	300				
			810	510	300				
			810	410	400				

1) Only for "thick" top: see order codes

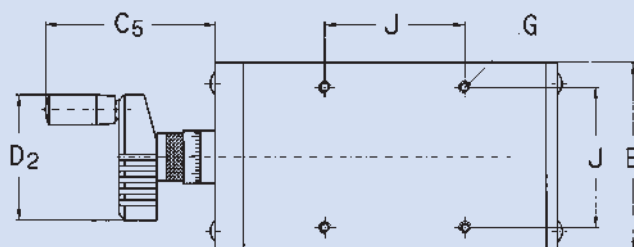
For order designation: please see order codes, page 80

Example of order: NSK.100.260.50

RS. - NS. - PS. Precision tables for manual operation

Design

RSK
NSK
PSK



Dimensions						Load-carrying capacity						Mass		
Ø Screw	D ₁	D ₂	G	H ₆	J	RS C _{eff}	C ₀	Z ²⁾	NS C _{eff}	C ₀	Z ²⁾	PS C _{eff}	C ₀	GG
mm						kN		-	kN		-	kN		kg
M10 x 1	30	71	M6	15.5	74	54,2	8,8	15	44,2	8,8	53	0,54	5,3	6,8
						67,9	10,9	20	52,5	10,9	66	0,68	6,4	8,2
						80,8	13	25	60,9	13	80	0,81	7,5	9,6
						48,5	8,8	13	44,2	8,8	53	0,54	5,3	7,5
						62,5	10,9	18	52,5	10,9	66	0,68	6,4	8,9
						73,1	13	22	60,9	13	80	0,81	7,5	10
						42,6	8,8	11	44,2	8,8	53	0,54	5,3	8,2
						54,2	10,9	15	52,5	10,9	66	0,68	6,4	9,6
						67,9	13	20	60,9	13	80	0,81	7,5	11
						48,5	10,9	13	52,5	10,9	66	0,68	6,4	10
Tr16 x 2	47	102	M8	24	116	155	53	20	82,2	53,3	66	1,3	12,5	20
						202	71	28	103	66	88	1,8	16	25
						252	88	37	123	83,3	111	2,2	21	30
						131	53	16	82,2	53,3	66	1,3	12,5	22
						180	71	24	103	66	88	1,8	16	28
						230	88	33	123	83,3	111	2,2	21	33
						105	53	182	82,2	53,3	66	1,3	12,5	25
						156	71	20	103	66	88	1,8	16	30
						202	88	28	123	83,3	111	2,2	21	36
						131	71	16	103	66	88	1,8	16	33

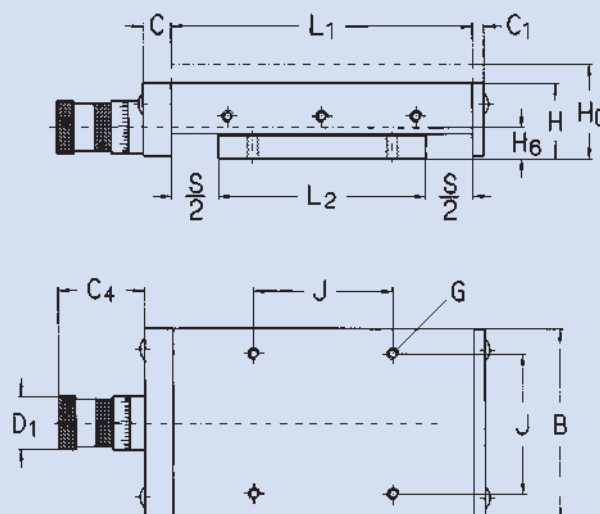
2) Number of load-bearing rolling elements per side

RS. - NS. - PS. Precision tables for manual operation

B 200 (for product description, see page 31)

Design

RSM
NSM
PSM



For detailed design, see pages 36-37

Dimensions

B	H	H ₀ ¹⁾	L ₁	L ₂	Stroke S	C	C ₁	C ₄	C ₅
mm									
200	60	75	410	310	100	20	8	63	122
			510	410	100				
			610	510	100				
			510	310	200				
			610	410	200				
			710	510	200				
			610	610	300				
			710	410	300				
			810	510	300				
			810	410	400				
			910	510	400				

1) Only for "thick" top: see order codes

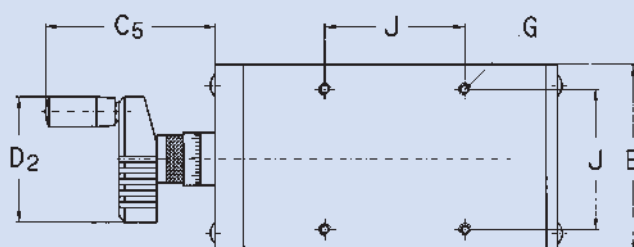
For order designation: please see order codes, page 81

Example of order: PSM 200.710.300.D

RS. - NS. - PS. Precision tables for manual operation

Design

RSK
NSK
PSK



Dimensions						Load-carrying capacity						Mass		
Ø Screw	D ₁	D ₂	G	H ₆	J	RS C _{eff}	C ₀	Z ²⁾	NS C _{eff}	C ₀	Z ²⁾	PS C _{eff}	C ₀	GG
mm						kN		-	kN		-	kN		kg
TR16 x 2	47	102	M8	25	154	156	53	20	82,2	49,5	66	1,3	12,5	31
						202	71	28	103	66	88	1,8	16	40
						252	88	37	123	83,3	111	2,2	21	48
						131	53	16	82,2	49,5	66	1,3	12,5	35
						180	71	24	103	66	88	1,8	16	44
						230	88	33	123	83,3	111	2,2	21	52
						105	53	12	82,2	49,5	66	1,3	12,5	39
						156	71	20	103	66	88	1,8	16	48
						202	88	28	123	83,3	111	2,2	21	56
						131	53	16	103	66	88	1,8	16	52
						180	71	24	123	83,3	111	2,2	21	60

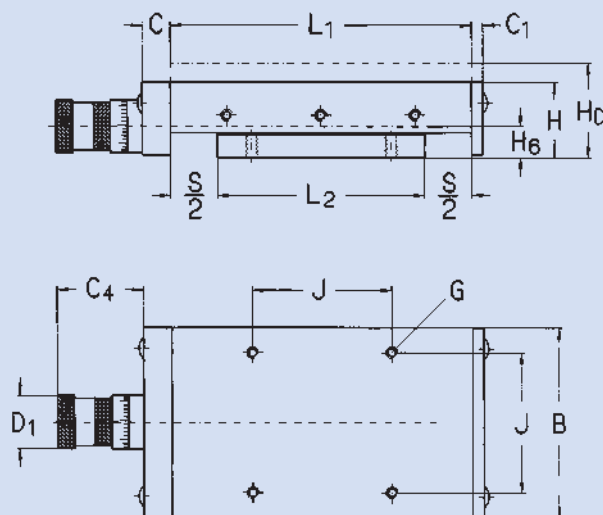
2) Number of load-bearing rolling elements per side

RS. - NS. - PS. Precision tables for manual operation

B 300 (for product description, see page 31)

Design

RSM
NSM
PSM



For detailed design, see pages 38-39

Dimensions

B	H	H ₀ ¹⁾	L ₁	L ₂	Stroke S	C	C ₁	C ₄	C ₅
mm									
300	75	95	515	415	100	22	10	63	122
			615	515	100				
			515	315	200				
			615	415	200				
			715	515	200				
			615	315	300				
			715	415	300				
			815	515	300				
			815	415	400				
			915	515	400				

1) Only for "thick" top: see order codes

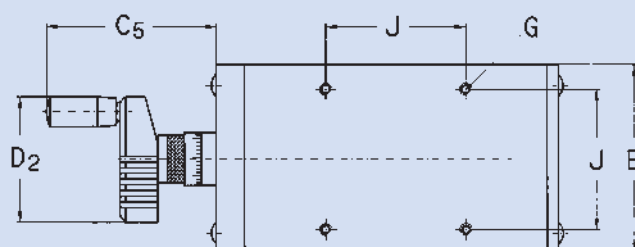
For order designation: please see order codes, page 80

Example of order: PSM 200.710.300.D

RS. - NS. - PS. Precision tables for manual operation

Design

RSK
NSK
PSK

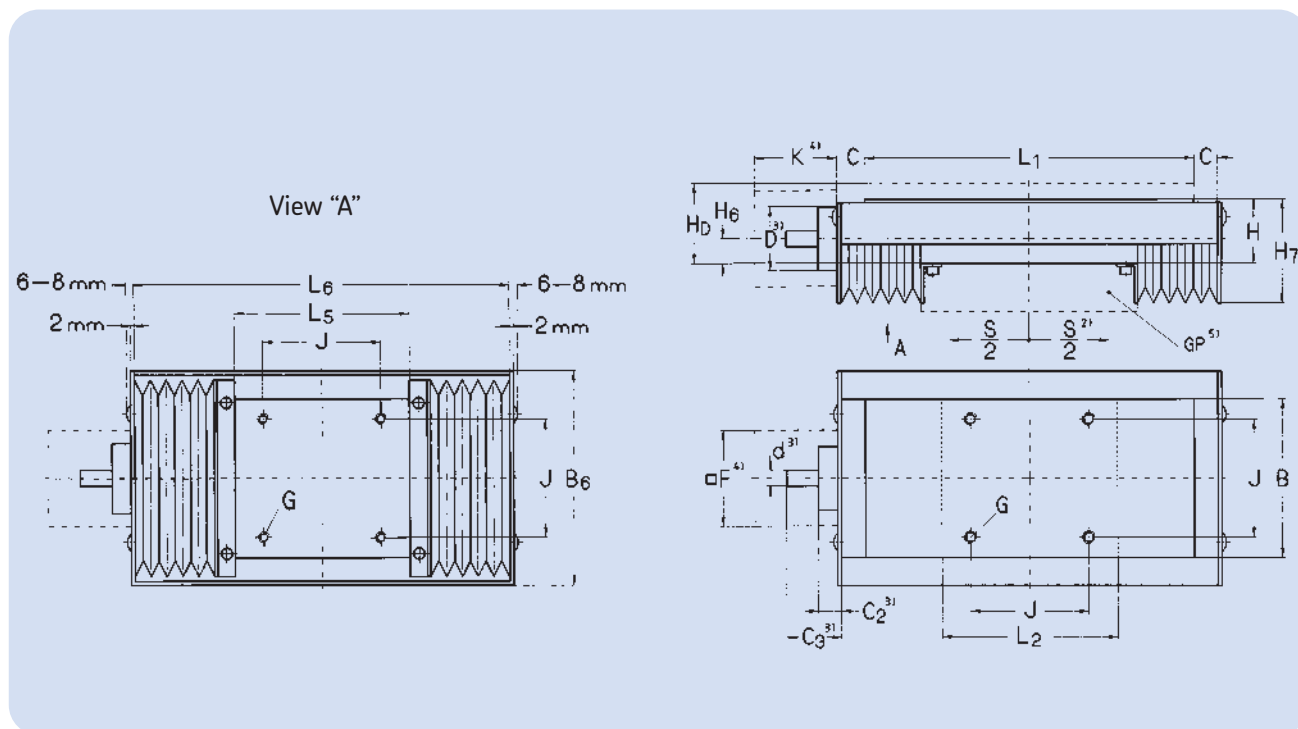


Dimensions						Load-carrying capacity						Mass		
Ø Screw	D ₁	D ₂	G	H ₆	J	RS C _{eff}	C ₀	Z ²⁾	NS C _{eff}	C ₀	Z ²⁾	PS C _{eff}	C ₀	GG
mm						kN		-	kN		-	kN		kg
TR20 x 4	47	102	M10	28	245	58	58	19	173	106	72	2,7	24	76
						69	73	24	206	132	90	3,3	30	92
						35	31	10	138	79,2	54	2	18	68
						50	49	16	173	106	72	2,7	24	84
						62	64	21	206	132	90	3,3	30	99
						29	24	8	138	79,2	54	2	18	76
						43	40	13	173	106	72	2,7	24	91
						58	58	19	206	132	90	3,3	30	107
						35	31	10	173	106	72	2,7	24	99
						50	49	16	206	132	90	3,3	30	115

2) Number of load-bearing rolling elements per side

RSS - NSS - PSS Precision tables for motor drive B 100

(for product description, see page 32)



For detailed design, see page 34

For screw selection, see page 64

Dimensions													
B	H	H _D ¹⁾	L ₁	L ₂	Nominal stroke S ²⁾	C	B ₆	G	H ₆	H ₇	J	L ₅	L ₆
mm													
100	40	50	260	210	50	15	164	M6	15,5	65	74	160	290
			310	260	50							210	340
			360	310	50							260	390
			310	210	100							160	340
			360	260	100							210	390
			410	310	100							260	440
			360	210	150							160	390
			410	260	150							210	440
			460	310	150							260	490
			460	260	200							210	490

1) Only for "thick" top: see order codes

2) Nominal stroke = max. stroke between the end stops.

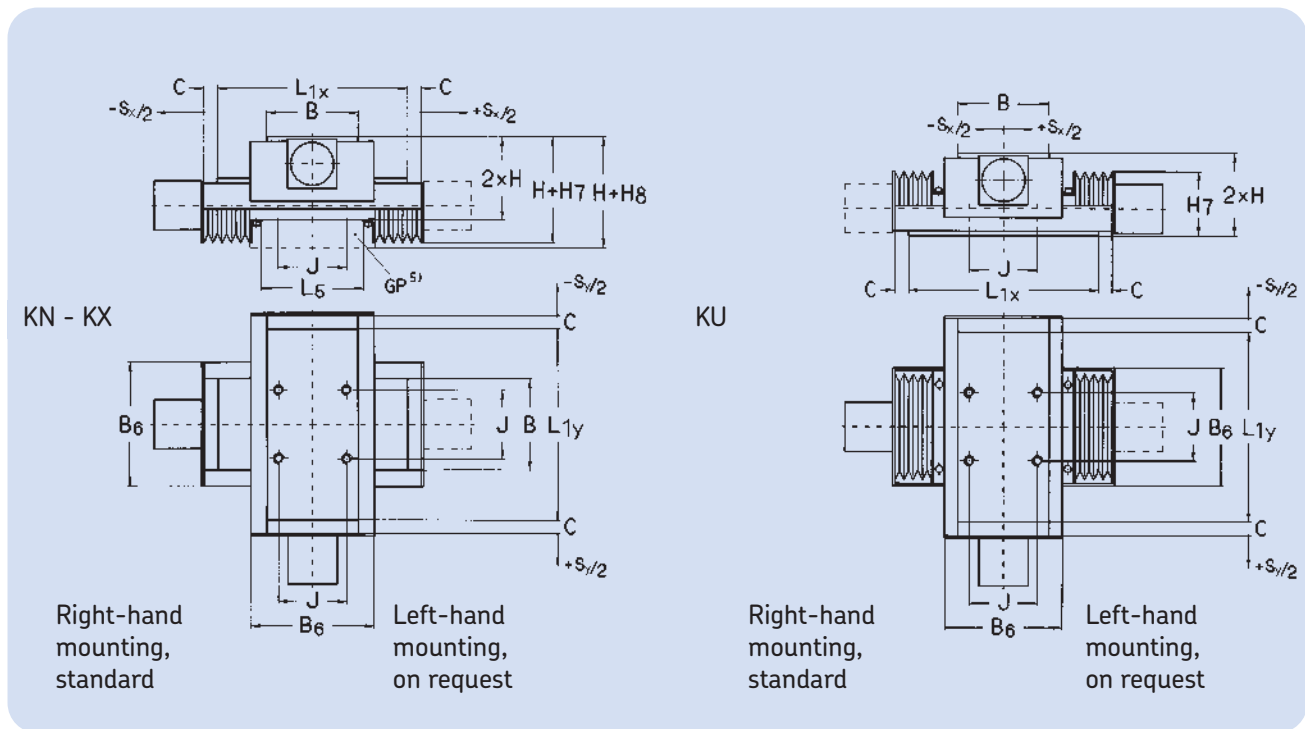
Effective stroke between the limit switches 5-20 mm shorter, depending on speed

3) For screw abutment dimensions, see page 65

4) For dimensions, see motor flange Table, pages 76 and 78

5) GP = base plate, see page 72

RSS - NSS - PSS Precision tables for motor drive



Load-carrying capacity						Masses ⁷⁾				Cross table assembly
RSS C_{eff}	C_o	$Z^{6)}$	NSS C_{eff}	C_o	$Z^{6)}$	PSS C_{eff}	C_o	GG	GO	Assembly type ⁸⁾ KN - KX
mm		-	kN		-	kN		kg		-
54,2	8,8	15	44,2	8,8	53	0,54	5,3	7,8	4,8	X
67,9	10,9	20	52,5	10,9	66	0,68	6,4	9,3	5,6	
80,8	13	25	60,9	13	80	0,81	7,5	11	6,5	
48,5	8,8	13	44,2	8,8	53	0,54	5,3	8,6	5,6	X
62,5	10,9	18	52,5	10,9	66	0,68	6,4	10	6,5	
73,1	13	22	60,9	13	80	0,81	7,5	12	7,3	
42,6	8,8	11	44,2	8,8	53	0,54	5,3	9,5	6,5	X
54,2	10,9	15	52,5	10,9	66	0,68	6,4	11	7,3	
67,9	13	20	60,9	13	80	0,81	7,5	13	8,2	
48,5	10,9	13	52,5	10,9	66	0,68	6,4	12	8,2	

6) Number of load-bearing rolling elements per side

7) GG = total mass of slide

GO = mass moved linearly with travelling slide top

For order designation: see order codes, page 80

8) X denotes: cannot be used for

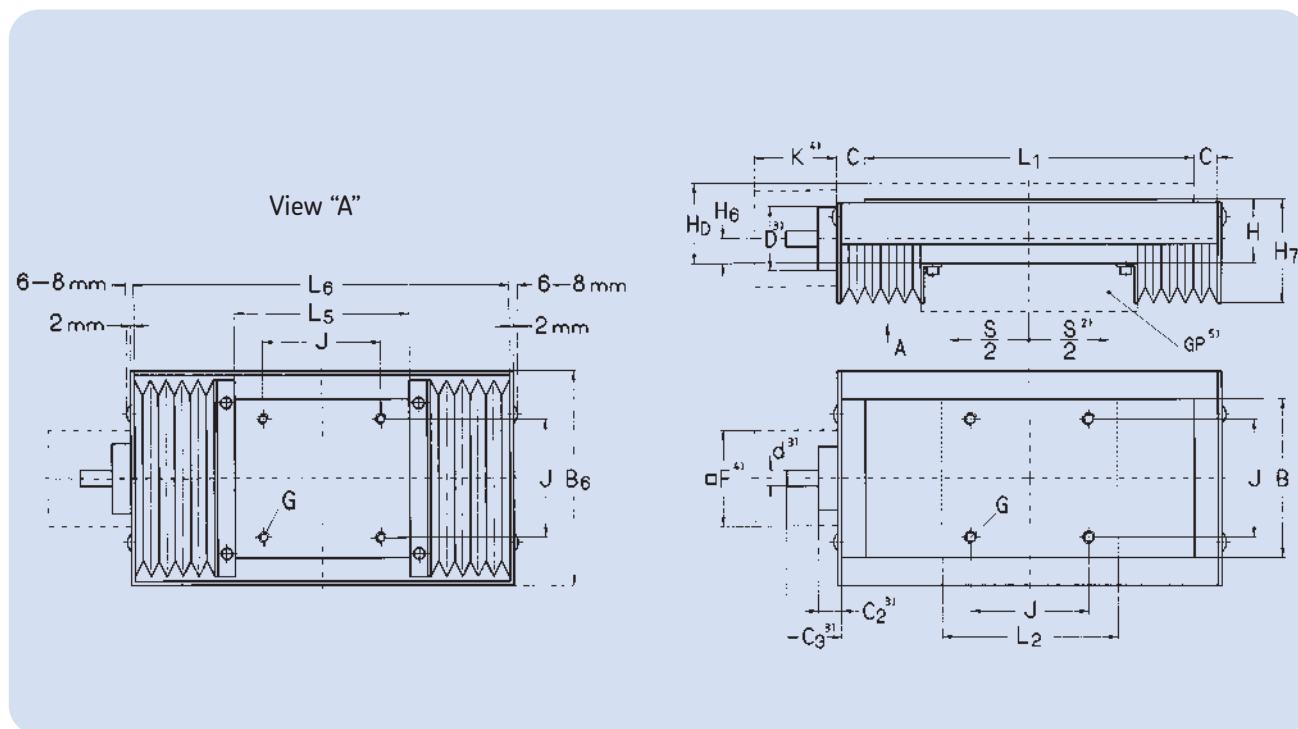
cross table assembly KU - KX: as Y-axis

cross table assembly KU: as X and Y-axis

Example of order: RSS 100.310.100.R0804

RSS - NSS - PSS Precision tables for motor drive B 150

(for product description, see page 32)



For detailed design, see page 36

For screw selection, see page 64

Dimensions													
B	H	H _D ¹⁾	L ₁	L ₂	Nominal stroke S ²⁾	C	B ₆	G	H ₆	H ₇	J	L ₅	L ₆
mm													
150	50	66	410	310	100	20	214	M8	24	75	116	250	450
			510	410	100							340	550
			610	510	100							440	650
			510	310	200							250	550
			610	410	200							340	650
			710	510	200							440	750
			610	310	300							250	650
			710	410	300							340	750
			810	510	300							440	850
			810	410	400							340	850

1) Only for "thick" top: see order codes

2) Nominal stroke = max. stroke between the end stops.

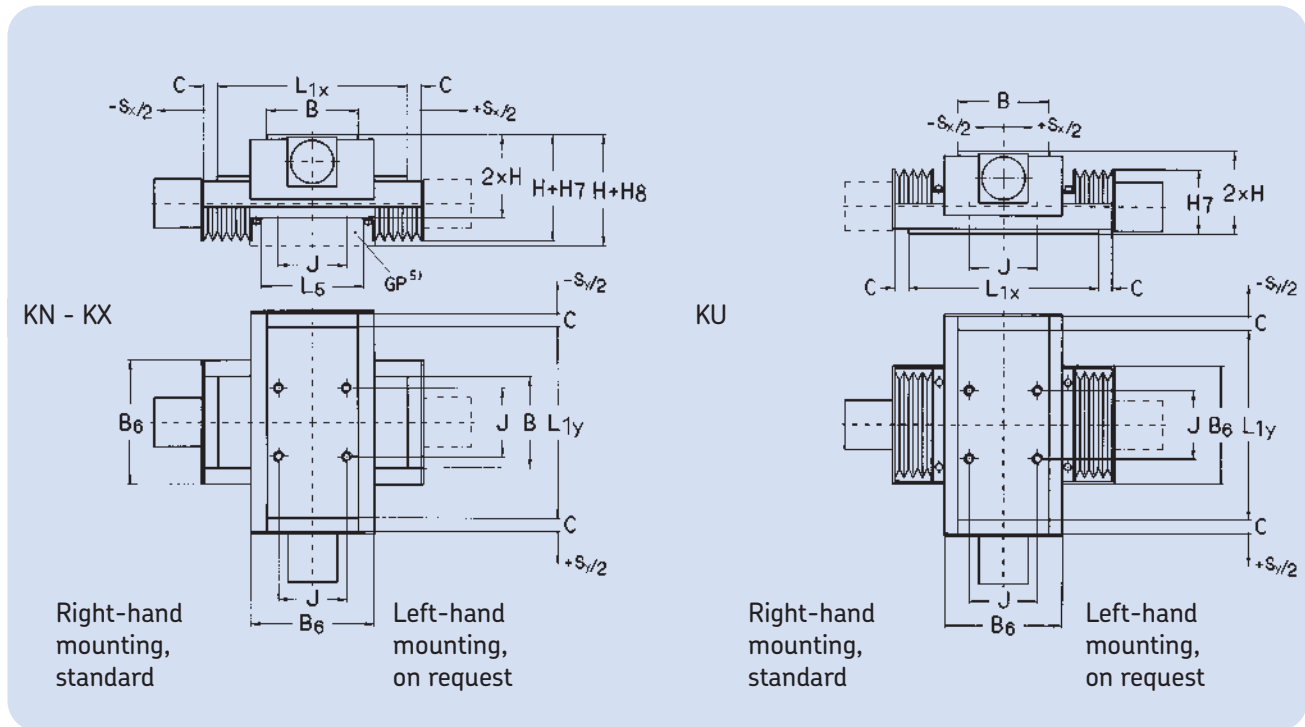
Effective stroke between the limit switches 5-20 mm shorter, depending on speed

3) For screw abutment dimensions, see page 65

4) For dimensions, see motor flange Table, pages 76 and 78

5) GP = base plate, see page 72

RSS - NSS - PSS Precision tables for motor drive



Load-carrying capacity								Masses ⁷⁾		Cross table assembly
RSS C _{eff}	C _o	Z ⁶⁾	NSS C _{eff}	C _o	Z ⁶⁾	PSS C _{eff}	C _o	GG	GO	Assembly type ⁸⁾ KN - KX
mm		-	kN		-	kN		kg		-
155	53	20	82,2	53,3	66	1,3	12,5	22	13	
202	71	28	103	66	88	1,8	16	27	16	
252	88	37	123	83,3	111	2,2	21	33	19	
131	53	16	82,2	53,3	66	1,3	12,5	25	16	
180	71	24	103	66	88	1,8	16	30	19	
230	88	33	123	83,3	111	2,2	21	36	22	
105	53	12	82,2	53,3	66	1,3	12,5	28	19	
156	71	20	103	66	88	1,8	16	33	22	
202	88	28	123	83,3	111	2,2	21	39	25	
131	71	16	103	66	88	1,8	16	36	25	

6) Number of load-bearing rolling elements per side

7) GG = total mass of slide

G0 = mass moved linearly with travelling slide top

For order designation: see order codes, page 80

8) X denotes: cannot be used for

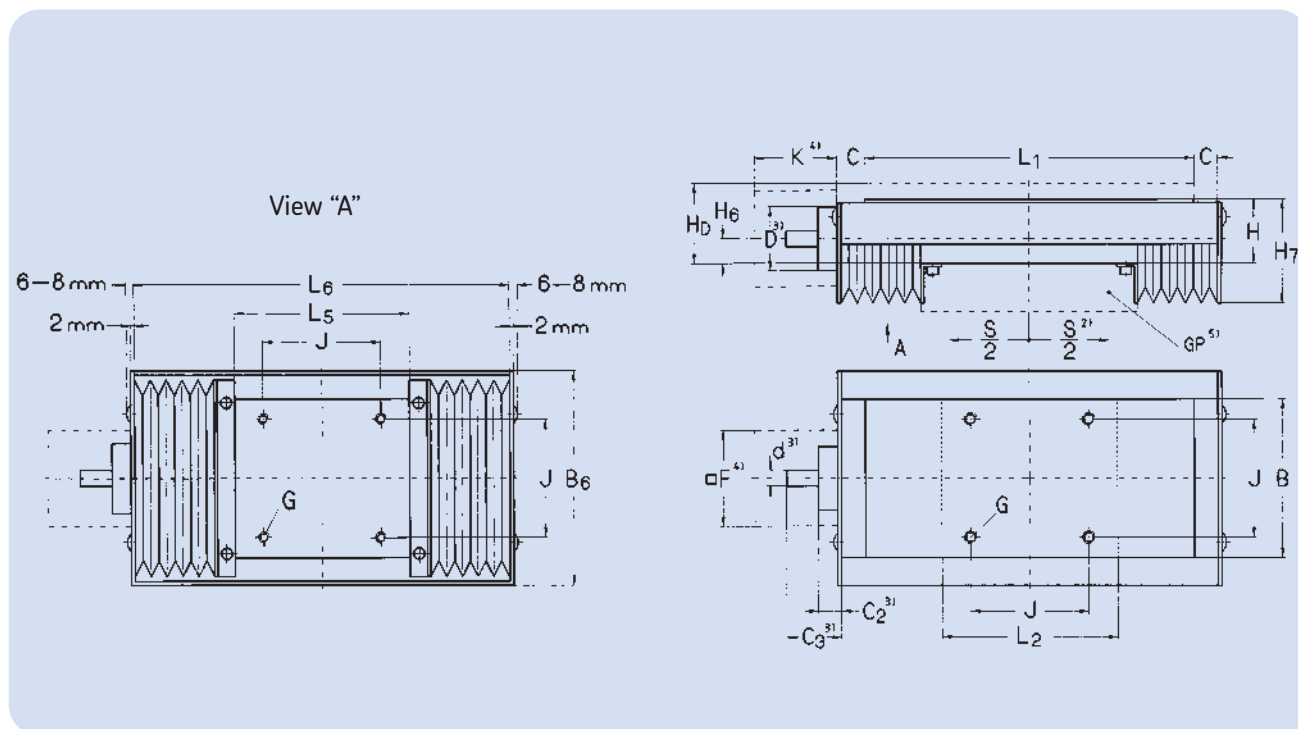
cross table assembly KU - KX: as Y-axis

cross table assembly KU: as X and Y-axis

Example of order: RSS 150.410.100.R1202

RSS - NSS - PSS Precision tables for motor drive B 200

(for product description, see page 32)



For detailed design, see page 36

For screw selection, see page 64

Dimensions													
B	H	H _D ¹⁾	L ₁	L ₂	Nominal stroke S ²⁾	C	B ₆	G	H ₆	H ₇	J	L ₅	L ₆
mm													
200	60	75	410	310	100	20	264	M8	25	85	154	250	450
			510	410	100							340	550
			610	510	100							420	650
			510	310	200							250	550
			610	410	200							340	650
			710	510	200							420	750
			610	310	300							250	650
			710	410	300							340	750
			810	510	300							420	850
			810	410	400							340	850
			910	510	400							420	950

1) Only for "thick" top: see order codes

2) Nominal stroke = max. stroke between the end stops.

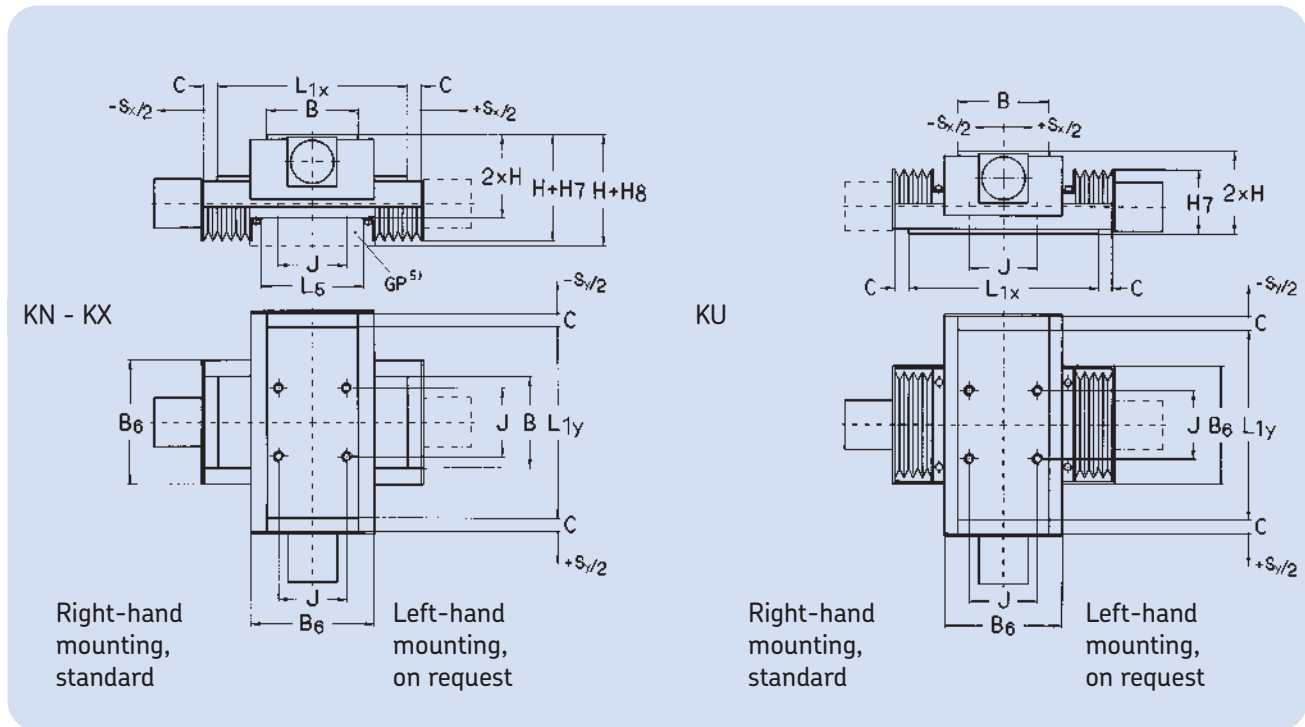
Effective stroke between the limit switches 5-20 mm shorter, depending on speed

3) For screw abutment dimensions, see page 65

4) For dimensions, see motor flange Table, pages 76 and 78

5) GP = base plate, see page 72

RSS - NSS - PSS Precision tables for motor drive



Load-carrying capacity						Masses ⁷⁾				Cross table assembly
RSS C _{eff}	C ₀	Z ⁶⁾	NSS C _{eff}	C ₀	Z ⁶⁾	PSS C _{eff}	C ₀	GG	GO	Assembly type ⁸⁾ KN - KX
mm		-	kN		-	kN		kg		-
156	53	20	82,2	49,5	66	1,3	12,5	34	19	X
202	71	28	103	33	88	1,8	16	43	23	
252	88	37	123	83,3	111	2,2	21	51	27	
131	53	16	82,2	49,5	66	1,3	12,5	38	23	X
180	71	24	103	66	88	1,8	16	47	28	
230	88	33	123	83,3	111	2,2	21	56	32	
105	53	12	82,2	49,5	66	1,3	12,5	42	28	X
156	71	20	103	66	88	1,8	16	51	32	
202	88	28	123	83,3	111	2,2	21	60	36	
131	53	16	103	66	88	1,8	16	56	36	
180	71	24	123	83,3	111	2,2	21	65	41	

6) Number of load-bearing rolling elements per side

7) GG = total mass of slide

GO = mass moved linearly with travelling slide top

For order designation: see order codes, page 80

8) X denotes: cannot be used for

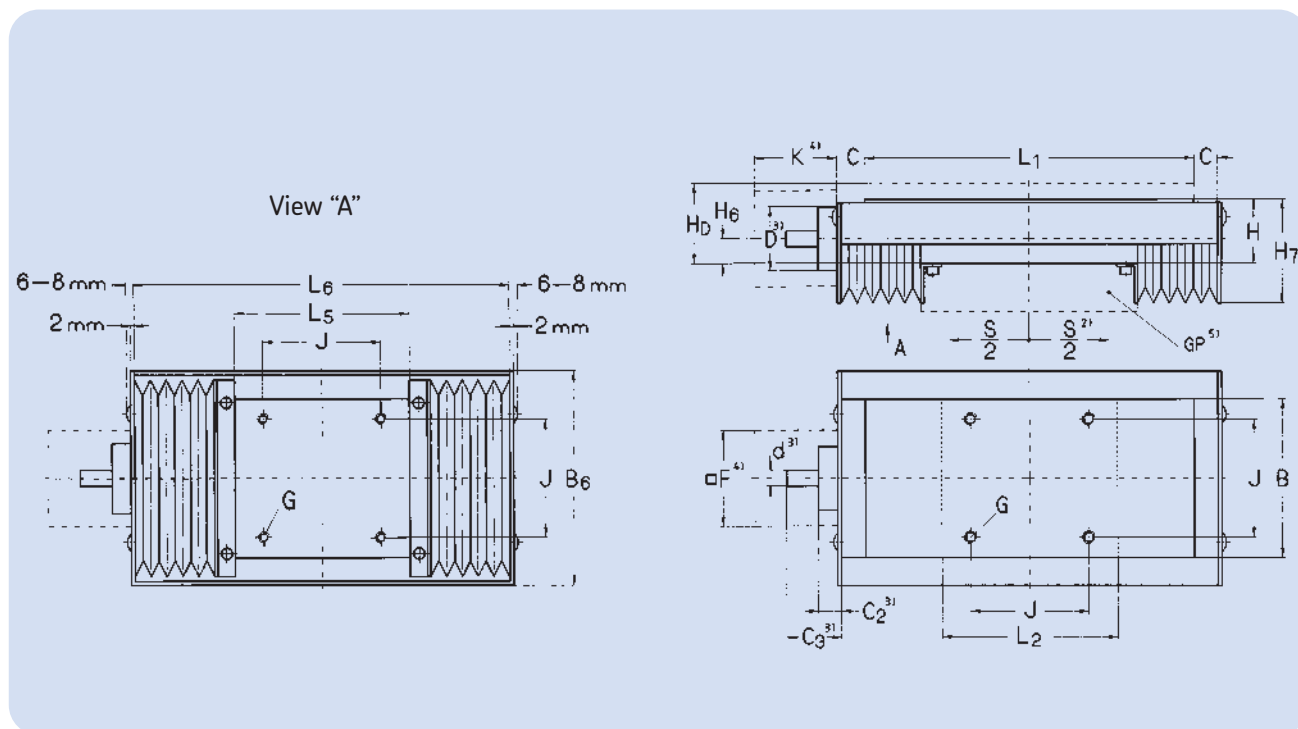
cross table assembly KU - KX: as Y-axis

cross table assembly KU: as X and Y-axis

Example of order: NSS 200.710.200.R1205

RSS - NSS - PSS Precision tables for motor drive

B 300 - 400 (for product description, see page 32)



For detailed design, see page 38
For screw selection, see page 64

Dimensions													
B	H	H _D ¹⁾	L ₁	L ₂	Nominal stroke S ²⁾	C	B ₆	G	H ₆	H ₇	J	L ₅	L ₆
mm													
300	75	95	515	415	100	22	364	M10	28	100	245	350	559
			615	515	100							435	659
			515	315	200							265	559
			615	415	200							350	659
			715	515	200							435	759
			615	315	300							265	659
			715	415	300							350	759
			815	515	300							435	859
			815	415	400							350	859
			915	515	400							435	959
400	100	125	615	515	100	30	464	M12	38	125	340	455	675
			815	615	200							535	875
			815	515	300							455	875
			1 015	615	400							535	1 075
			1 015	515	500							455	1 075

1) Only for "thick" top: see order codes

2) Nominal stroke = max. stroke between the end stops.

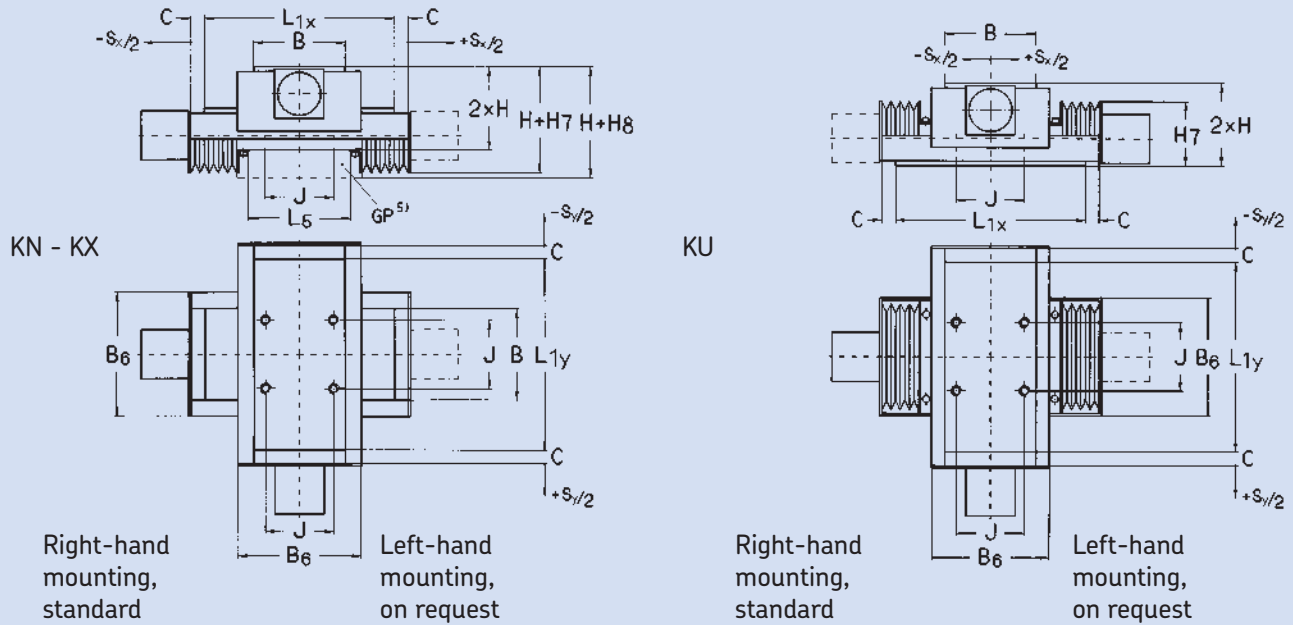
Effective stroke between the limit switches 5-20 mm shorter, depending on speed

3) For screw abutment dimensions, see page 65

4) For dimensions, see motor flange Table, pages 76 and 78

5) GP = base plate, see page 72

RSS - NSS - PSS Precision tables for motor drive



Load-carrying capacity								Masses ⁷⁾		Cross table assembly
RSS C _{eff}	C _o	Z ⁶⁾	NSS C _{eff}	C _o	Z ⁶⁾	PSS C _{eff}	C _o	GG	GO	Assembly type ⁸⁾ KN - KX
mm		-	kN		-	kN		kg		-
58	58	19	173	106	72	2,7	24	79	45	X
69	73	24	206	132	90	3,3	30	96	54	
35	31	10	138	79,2	54	2	18	71	46	
50	49	16	173	106	72	2,7	24	88	54	X
62	64	21	206	132	90	3,3	30	104	62	
29	24	8	138	79,2	54	2	18	80	54	
43	40	13	173	106	72	2,7	24	96	62	X
58	58	19	206	132	90	3,3	30	112	70	
35	31	10	173	106	72	2,7	24	104	71	X
50	49	16	206	132	90	3,3	30	121	79	
-	-	-	314	198	83	-		168	89	X
			362	238	100			210	116	
			314	198	83			195	116	X
			362	238	100			237	143	
			314	198	83			222	143	X

6) Number of load-bearing rolling elements per side

7) GG = total mass of slide

GO = mass moved linearly with travelling slide top

For order designation: see order codes, page 80

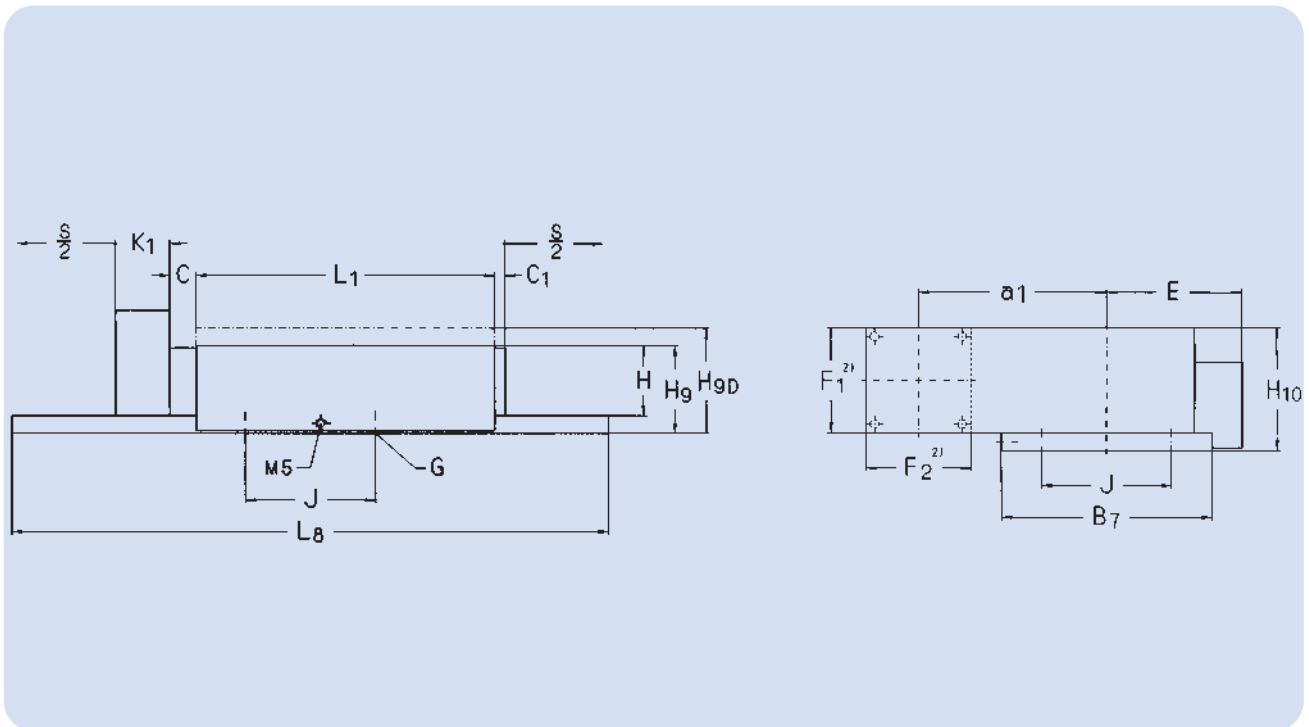
8) X denotes: cannot be used for

cross table assembly KU - KX: as Y-axis

cross table assembly KU: as X and Y-axis

Example of order: NSS 300.815.400.R1505

RSAS - NSAS - PSAS Precision tables for motor drive, sealed B 100 - 150 (for product description, see page 33)



For detailed dimensions, see pages 34 and 36
For screw selection, see page 64

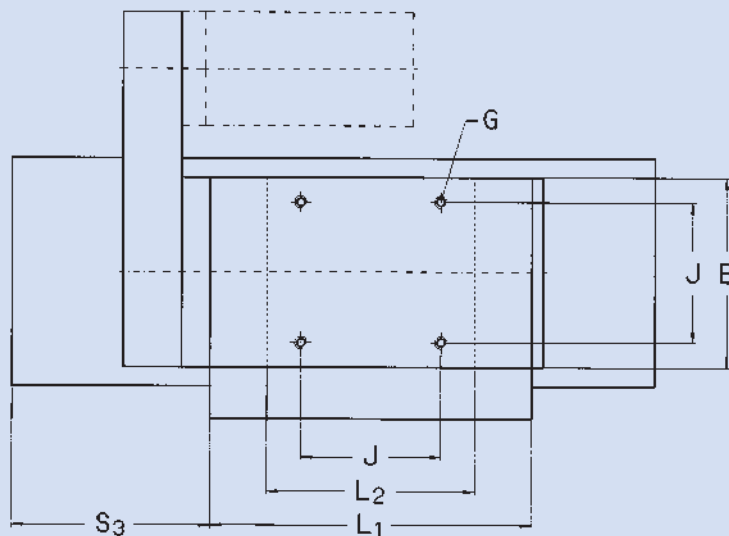
Dimensions					Nominal stroke S ¹⁾								
B	H	L ₁	L ₂	L ₈		a ₁	B ₇	C	C ₁	E	F ₁	F ₂	G
mm													
100	40	260	210	385	50	117	120	15	6	82	60	60	M6
		310	260	435	50								
		360	310	485	50								
		310	210	485	100								
		360	260	535	400								
		410	310	585	100								
		360	210	585	150								
		410	360	635	150								
		460	310	685	150								
		460	260	735	200								
150	50	410	310	600	100	154	170	20	8	107	85	85	M8
		510	410	700	100								
		610	510	800	100								
		510	310	800	200								
		610	410	900	200								
		710	510	1 000	300								
		610	310	1 000	300								
		710	410	1 100	300								
		810	510	1 200	300								

1) Nominal stroke = max. stroke between the end stops. Effective stroke between the limit switches 5-20 mm shorter, depending on speed
For order designation: please see order codes, page 80 Example of order: NSAS 100.360.150.R0804

RSAS - NSAS - PSAS Precision tables for motor drive, sealed

Standard motor attachment
with toothed belt drive
 $i = 1:1$
“Left-side” attachment type

Direct motor attachment also
possible for short strokes
with extended motor flange



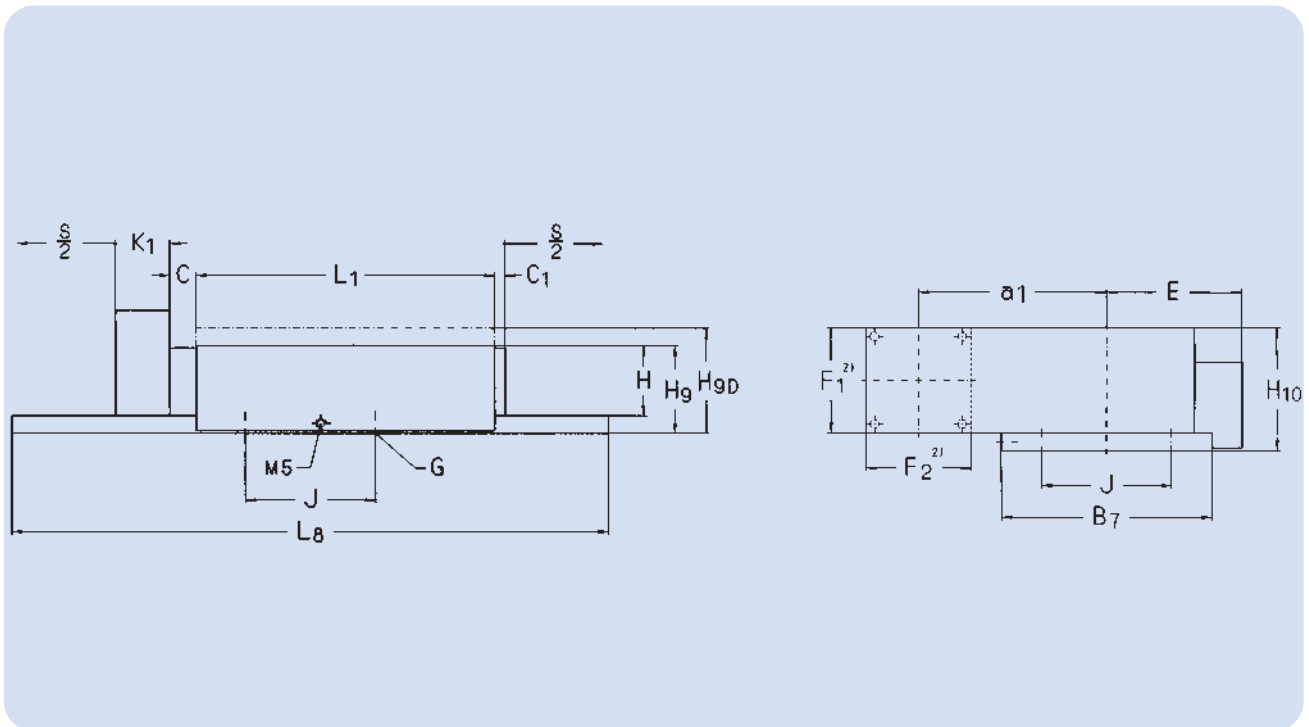
Dimensions						Load-carrying capacity						Masses ⁵⁾			
H ₉	H _{9D} ³⁾	H ₁₀	J	K ₁	S ₃	RSAS C _{eff}	C ₀	Z ⁴⁾	NSAS C _{eff}	C ₀	C ⁴⁾	PSAS C _{eff}	C ₀	GG	GD
mm						kN		-	kN		-	kN		kg	
50	60	70	74	34	84	54,2	8,8	15	44,2	8,8	53	0,54	5,3	12	5,6
					84	67,9	10,9	20	52,5	10,9	66	0,68	6,4	14	6,4
					84	80,8	13	25	60,9	13	80	0,81	7,5	16	7,4
					109	48,5	8,8	13	44,2	8,8	53	0,54	5,3	14	6,5
					109	62,5	10,9	18	52,5	10,9	66	0,68	6,4	16	7,3
					109	73,1	13	22	60,9	13	80	0,81	7,5	18	8,1
					134	42,6	8,8	11	44,2	8,8	53	0,54	5,3	16	7,3
					134	54,2	10,9	15	52,5	10,9	66	0,68	6,4	18	8,2
					134	67,9	13	20	60,9	13	80	0,81	7,5	20	9
					159	48,5	10,9	13	52,2	10,9	66	0,68	6,4	20	9
62	78	98	116	34	118	155	53	20	82,2	53,3	66	1,3	12,5	33	15
					118	202	71	28	103	66	88	1,8	16	40	18
					118	252	88	37	123	83,3	111	2,2	21	47	21
					168	131	53	16	82,2	53,3	66	1,3	12,5	39	18
					168	180	71	24	103	66	88	1,8	16	46	21
					168	230	88	33	123	83,3	111	2,2	21	54	24
					218	105	53	12	82,2	53,3	66	1,3	12,5	45	21
					218	156	71	20	103	66	88	1,8	16	53	24
					218	202	88	28	123	83,3	111	2,2	21	60	27

3) Only for “thick” bottom: see order codes

4) Number of load-bearing rolling elements per side

5) GG = total mass of slide; GO = mass moved linearly with travelling top

RSAS – NSAS – PSAS Precision tables for motor drive, sealed B 200 – 300 (for product description, see page 33)



For detailed dimensions, see pages 36 and 38
For screw selection, see page 64

Dimensions					Nominal stroke S ¹⁾								
B	H	L ₁	L ₂	L ₈		a ₁	B ₇	C	C ₁	E	F ₁	F ₂	G
mm													
200	60	410	310	600	100	184	220	20	8	132	85	60/85	M8
		510	410	700	100								
		610	510	800	100								
		510	310	800	200								
		610	410	900	200								
		710	510	1 000	200								
		610	310	1 000	300								
		710	410	1 100	300								
		810	510	1 200	300								
		810	410	1 300	400								
300	75	515	415	710	100	241	320	22	10	182	111	85/110	M10
		615	515	810	100								
		515	315	810	200								
		615	415	910	200								
		715	515	1 010	200								
		615	315	1 010	300								
		715	415	1 110	300								
		815	515	1 210	300								
		815	415	1 310	400								

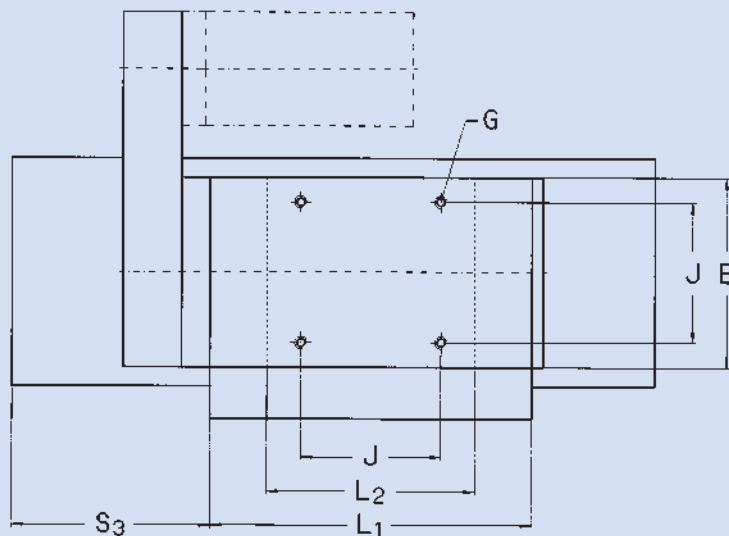
1) Nominal stroke = max. stroke between the end stops. Effective stroke between the limit switches 5-20 mm shorter, depending on speed
For order designation: please see order codes, page 80

Example of order: NSAS 200.710.200.R1205

RSAS - NSAS - PSAS Precision tables for motor drive, sealed

Standard motor attachment
with toothed belt drive
 $i = 1:1$
“Left-side” attachment type

Direct motor attachment also
possible for short strokes
with extended motor flange



Dimensions						Load-carrying capacity						Masses ⁵⁾			
H ₉	H _{9D} ³⁾	H ₁₀	J	K ₁	S ₃	RSAS C _{eff}	C ₀	Z ⁴⁾	NSAS C _{eff}	C ₀	C ⁴⁾	PSAS C _{eff}	C ₀	GG	GD
mm						kN		-	kN		-	kN		kg	
72	87	98	154	34	118	156	53	20	82,2	49,5	66	1,3	12,5	48	21
					118	202	71	28	103	66	88	1,8	16	59	25
					118	252	88	37	123	83,3	111	2,2	21	70	30
					168	131	53	16	82,2	49,5	66	1,3	12,5	57	26
					168	180	71	24	103	66	88	1,8	16	68	30
					168	230	88	33	123	83,3	111	2,2	21	79	34
					218	105	53	12	82,2	49,5	66	1,3	12,5	65	30
					218	156	71	20	103	66	88	1,8	16	76	34
					218	202	88	28	123	83,3	111	2,2	21	87	38
					268	131	53	16	103	66	88	1,8	16	85	39
91	111	128	245	42	124,5	58	58	19	173	106	72	2,7	24	112	50
					124,5	69	73	24	206	132	90	3,3	30	133	59
					174,5	35	31	10	138	79,2	54	2	18	108	50
					174,5	50	49	16	173	106	72	2,7	24	129	59
					174,5	62	64	21	206	132	90	3,3	30	149	67
					224,5	29	24	8	138	79,2	54	2	18	125	59
					224,5	43	40	13	173	106	72	2,7	24	145	67
					224,5	58	58	19	206	132	90	3,3	30	165	75
					274,5	35	31	10	173	106	72	2,7	24	161	75

3) Only for “thick” bottom: see order codes

4) Number of load-bearing rolling elements per side

5) GG = total mass of slide; GO = mass moved linearly with travelling top

Selection of screw for precision tables: RSS - NSS - PSS and RSAS - NSAS - PSAS B 100 - 400

Preloaded planetary roller screws are incorporated in these precision tables.

Accuracy class G5 ($v_{300p} = 23 \mu\text{m}$)

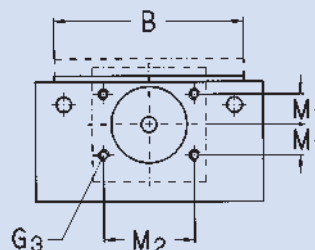
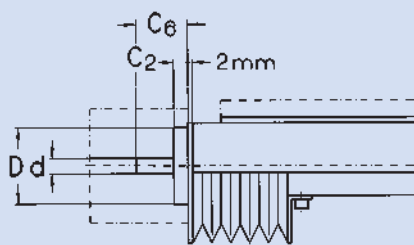
Dimensions		Screw $\emptyset$ d_o	Lead p	Load-carrying capacity ¹⁾ Spindle		Table driving torque				
B				C_a	C_{oa}	Idling speed ²⁾ M_{s1}	M_{s2}	M_{s3}	M_{s4}	Max. permiss. M_a
mm	-	mm		kN		Nm		N		
100	R0801	8	1	3,1	3	0,08	0,1	0,09	0,1	0,4
	R0802		2	3,6	4,3	0,09	0,12	0,11	0,14	1,2
	R0804		4	4,4	4,4	0,11	0,17	0,14	0,21	1,5
	R0805		5	4,4	4,2	0,12	0,2	0,16	0,24	1,5
150 + 200	R1202	12	2	3,7	4,6	0,21	0,26	0,23	0,28	1,2
	R1204		4	4,4	4,5	0,23	0,33	0,27	0,37	2,4
	R1205		5	4,8	4,7	0,24	0,36	0,3	0,41	3,1
300	R1502	15	2	5,5	7,6	0,29	0,37	0,32	0,4	2
	R1504		4	6,6	7,4	0,31	0,47	0,37	0,53	3,9
	R1505		5	7,2	7,7	0,32	0,52	0,4	0,6	5,1
400	R2002	20	2	10,9	21,8	0,42	0,54	0,46	0,58	5,8
	R2004		4	21,7	25	0,45	0,69	0,52	0,76	13
	R2005		5	27	26	0,46	0,76	0,55	0,85	17

1) With compressive load the screw should be checked for buckling

2) M_s = max. required driving torque at the screw for the unloaded table:
 M_{s1} for RSS- NSS slides
 M_{s2} for PSS slides
 M_{s3} for RSAS - NSAS slides
 M_{s4} for PSAS slides

Screw speeds for precision tables: RSS - NSS - PSS and RSAS - NSAS - PSAS

Screw abutment dimensions for precision tables: RSS - NSS - PSS B 100 - 400

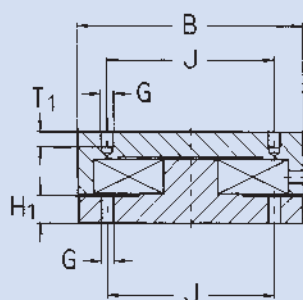


Screw type				Screw abutment dimensions						
	Stroke S	Screw length ¹⁾	Max. screw speed	C ₂	C ₆	d	D	G ₃	M ₁	M ₂
	mm		min ⁻¹	mm		h7	h7			
R08	50	145	12 000	6	17	5	30	2xM5	-	45
	100	195	11 000							
	150	245	6 400							
	200	295	4 200							
R12	100	220	8 500	9	28	10	47	4xM6	15	70
	200	320	6 000							
	300	420	3 200							
	400	520	2 000							
R15	100	225	6 600	9	34	10	55	4xM6	15	70
	200	325	7 300							
	300	425	3 900							
	400	525	2 400							
R20	100	445	4 700	12	34	12	68	4xM6	20	70
	200	445	4 700							
	300	445	4 600							
	400	545	2 900							
	500	645	2 000							

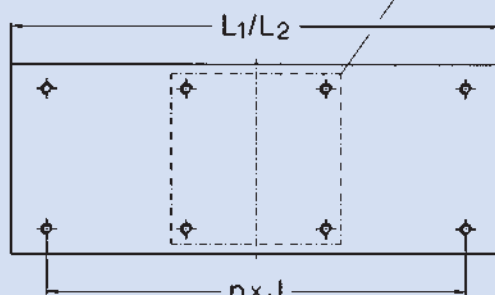
1) Total length of screw: for calculation of rotary moment of inertia, see page 17

Precision slides

ZB - Additional drill hole pattern: precision slides a. tables: top and bottom B 50 - 150 (for product description, see page 30)



Standard drill hole pattern available



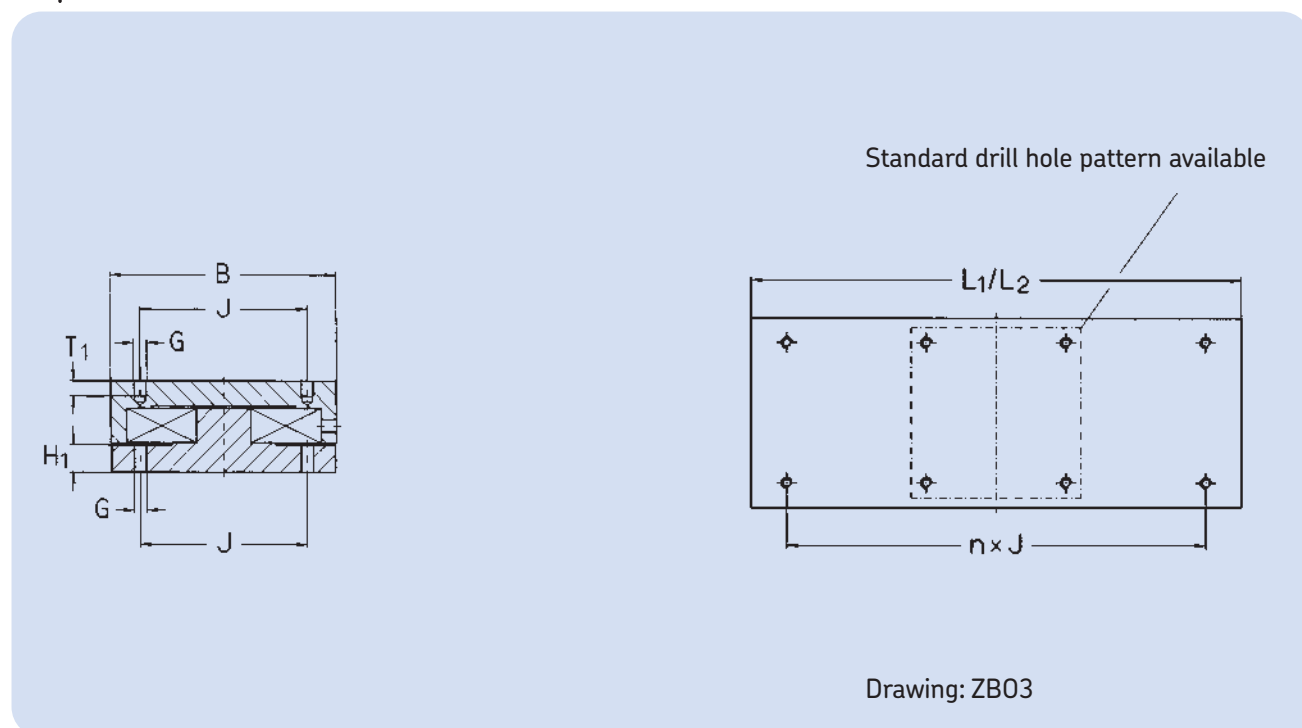
Drawing: ZB03

Dimensions								Number
B	Top length $L_1^{1)}$	Base length $L_2^{1)}$	G	H ₁	J	T ₁	T ₂	n ²⁾
mm								-
50	180	-	M4	7,5	37	6	4,6	3
75	230	-	M4	10,5	62	6	4,6	3
100	260 310 360 410 460	260 310 - - -	M6	12	74	9	6,8	3 3 3 5 5
150	410 510 610 710 810	410 510 - - -	M8	14	116	13	9	3 3 5 5 5

1) Additional drill hole pattern not available for the shorter lengths not shown here.
For order designation: please see order codes, page 80

2) "n" denotes max. poss. number of distances J of the particular top or bottom length.
Four holes are standard in each top and bottom (1xJ). 3xJ accordingly denotes 8 holes.
Example of order: ZBU3

ZB - Additional drill hole pattern: precision slides a. tables: top and bottom B 200 - 400 (for product description, see page 30)



Dimensions								Number
B	Top length $L_1^{1)}$	Base length $L_2^{1)}$	G	H_1	J	T_1	T_2	$n^{2)}$
mm								-
200	510	510	M8	19,5	154	16	9	3
	610	-						3
	710	-						3
	810	-						5
	910	-						5
300	615	-	M10	20	245	18	11	$1/2J + 1J + 1/2J$
	715	-						$1/2J + 1J + 1/2J$
	815	-						3
	915	-						3
400	815	-	M12	30	340	24	13	$1/2J + 1J + 1/2J$
	1 015	-						$1/2J + 1J + 1/2J$

1) Additional drill hole pattern not available
for the shorter lengths not shown here.
For order designation: please see order codes, page 80

2) "n" denotes max. poss. number of distances J of the particular top or bottom length.
Four holes are standard in each top and bottom (1xJ). 3xJ accordingly denotes 8 holes.
Example of order: ZB05

Locking device AR2 - Mounting bracket

AR2 locking device for precision slides and tables

The AR2 locking device is a friction device which is fitted to the side of a slide assembly. Friction resistance is produced by a knurled knob in the slide top through an auxiliary plate in the base. This avoids an additional load on the slide guidance system. An auxiliary deep-groove ball bearing between the knurled knob and the auxiliary plate prevents lateral movement by the slide as it is locked.

The AR2 locking device is available for the following slide and table types:

- precision slides with endplates RE .
- NE - PE
- precision tables with manual operation RSM - NSM - PSM and RSK - NSK - PSK

With these types, the clamping device is located on the left-hand side of the slide. However, with the drive switched on, the clamping device is not strong enough to prevent travel of the slide along the spindle.

WG-WA mounting brackets

Designs:

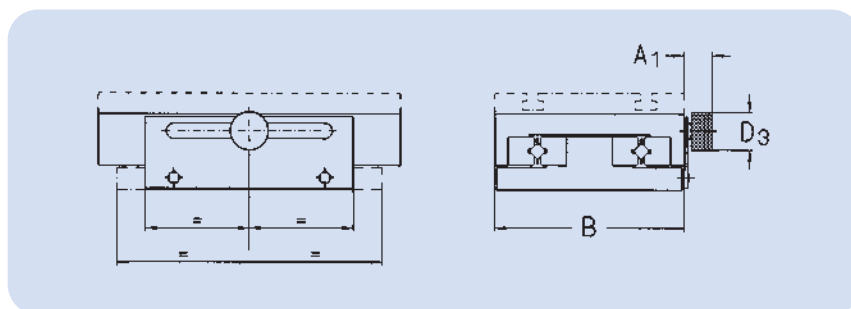
WG made from GG25 or blackened steel according to dimensions

WA made from light metal alloy. Surface protection on request at an extra charge.

For a precise definition of assembly of angle brackets for two or more axes, a drawing should be enclosed with the order.

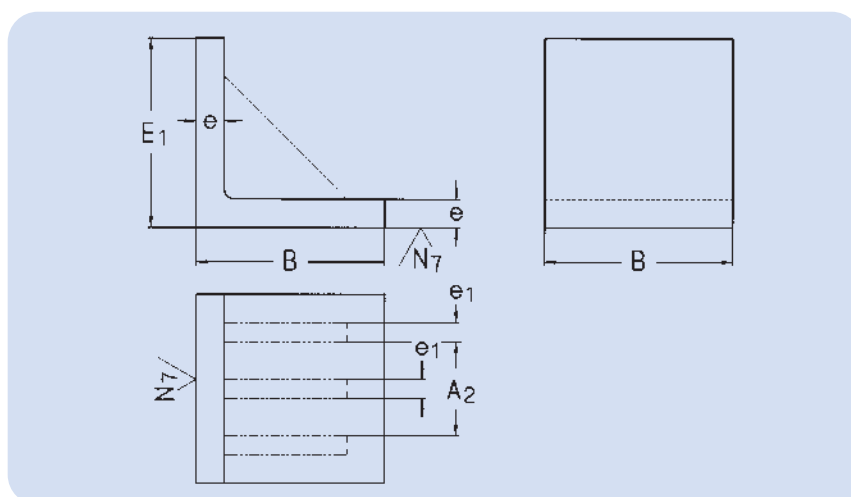
Separate angle pieces do not have attachment holes provided.

For order designation: please see order codes, page 80.



Dimensions

B	A ₁	D ₃
mm		
50	13	15
75	15	20
100	15	20
150	19	30
200	19	30
300	25	35



Type Dimensions

WG/WA	A ₂	B	E ₁	e	e ₁
mm					
50	-	50	50	10	10
75	-	75	75	12	10
100	-	100	100	15	10
150	50	150	150	18	12
150 H	50	150	250	18	12
200	90	200	200	20	12
200 H	90	200	330	20	12
300	175	300	300	25	15
300 H	175	300	520	25	15

Limit and reference switches

Attachment of limit and reference switches for precision tables

The slides of the series types RSS - NSS - PSS and RSAS - NSAS - PSAS can be equipped with integrated limit and reference switches.

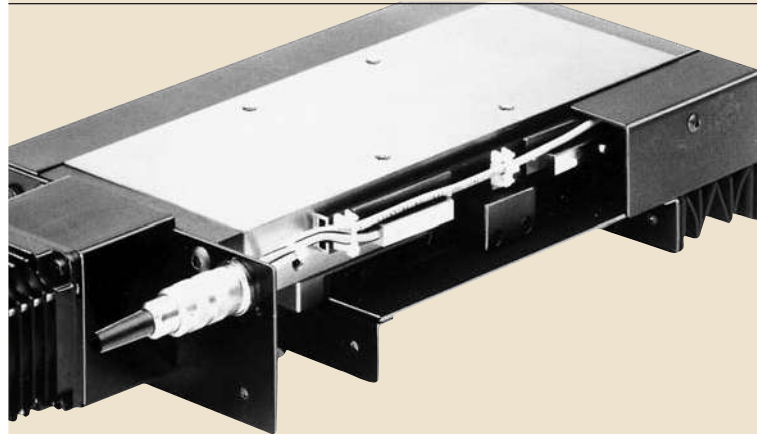
Limit switches

Two limit switches are fitted under the right-hand plate cover of the tabletop on a rail, 5 mm from the mechanical dead ends. They can be adjusted by approximately 20 mm, and are activated by a control cam in the middle of the base.

Reference switch

The reference switch is fitted under the same cover and on the same rail as the limit switch. It is 20 mm from the motorside limit switch and is adjustable by around ± 20 mm.

Fig. 25



End-switch attachment with inductive switches type EEI 2

A selection is possible from among:

- mechanical limit switches with 2 m free connection cable per switch
- mechanical limit switches, all wired into an 8-pin plug (IP64) on the motor side
- inductive limit or reference switches with 2 m free connection cable per switch
- inductive limit or reference switches all wired into an 8-pin plug (IP64) on the motor side.

Technical data	Mechanical switch	Inductive switch
Switch accuracy (at const. speed and temperature)	$\pm 0,1$ mm	$\pm 0,01$ mm
Supply voltage	AC: bis 250 V DC: bis 125 V	10 - 30 VDC
Max. switching current	AC: 500 mA DC: 400 mA	200 mA
Normally closed (NC) or normally open (NO)	no restrictions	NC or NO
Output type	-	PNP or NPN
Protection type	IP67	IP67
Design	DIN 41635 design B	Special design  8x40

Warning:

Unless otherwise indicated in the order, we use inductive switches as

- limit switch: PNP/NC
- reference switch: PNP/NO

For order designation: please see order codes, page 80.

Cross table assembly

KN - KX - KU cross table assembly

All slide and table types with the same width B are available readily mounted as cross tables in the central position, using the standard drill hold pattern.

Slides of different width B may also be assembled as cross tables on request, and subject to an examination of the design.

Assembly type KX (Fig. 28)

The long upper part of the lower X-axis is attached to the short base of the Y-axis above it.

Assembly type KU (Figs. 29 and 30)

The short base of the lower X-axis is fastened to the short base of the Y-axis above it.

Right-hand assembly

This means that, if the thick endplate or drive of the lower X-axis faces the observer, the thick endplate or drive of the upper Y-axis will be seen to the right.

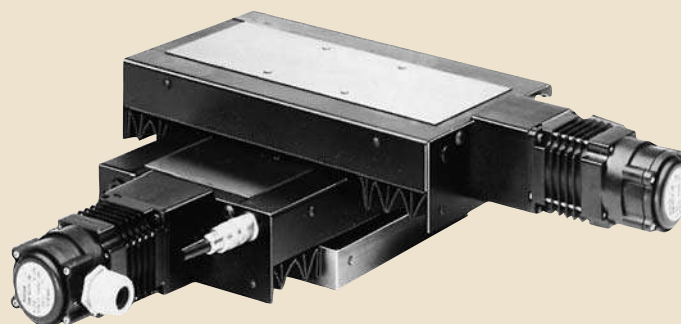
Left-hand assembly

This means that, if the thick endplate or drive of the lower X-axis faces the observer, the thick endplate or drive of the upper Y-axis will be seen to the left.

Travelling direction

Unless otherwise indicated, the travelling direction is marked "+" for the motorised slides delivered, including controls, if the shorter slide part moves away from its drive. See Figs. 26-30.

Fig. 26



Assembly type KN + GP

Fig. 27

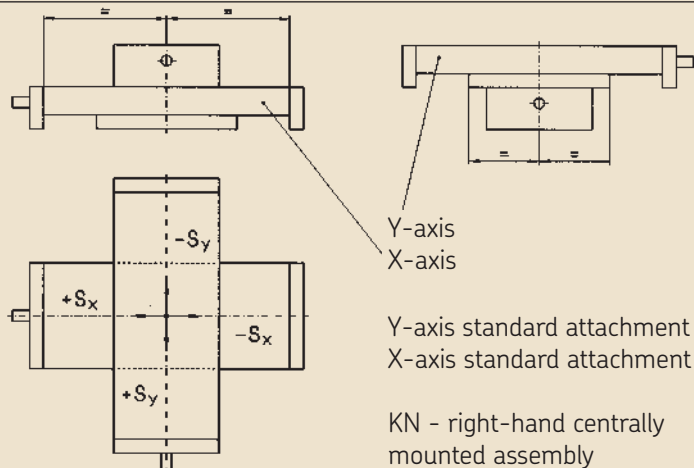
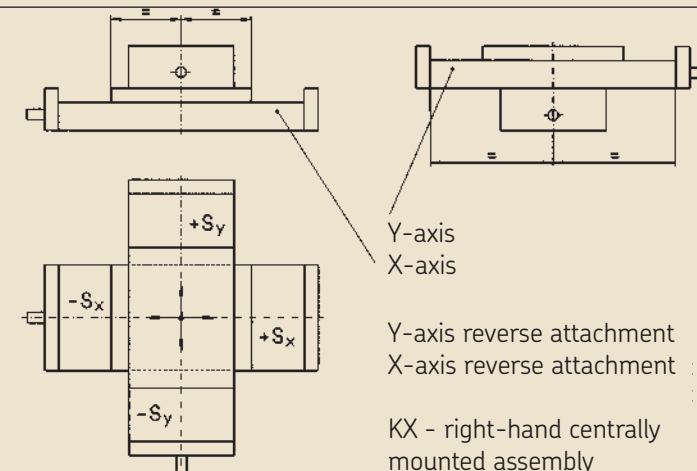


Fig. 28



Warning

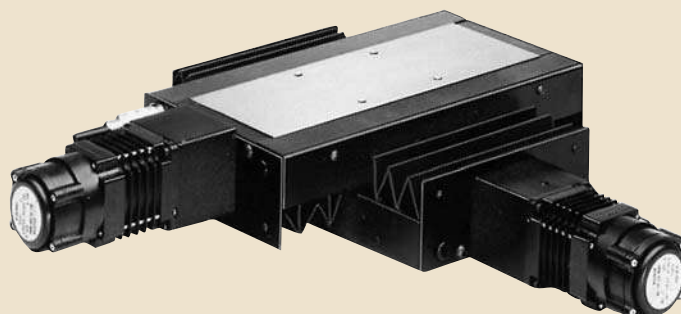
The use of toothed belt drives with the slide series RSS - NSS - PSS for cross table assembly is possible only under certain conditions.

A prior examination must be carried out to ensure that the motors do not collide with each other.

If the order contains no other indications beyond KN, KX or KU we deliver a "right-hand centrally mounted" assembly. For left-hand mounting, please indicate KNL, KSL or KUL with the order.

The slides may also be mounted offcentre corresponding to the length L_1 or L_2 by means of the additional drill hole pattern with distances $n \times J$. In that case, when ordering, please use "Figure 31" when entering dimensions X and Y.

Fig. 29



Assembly type KU

Fig. 30

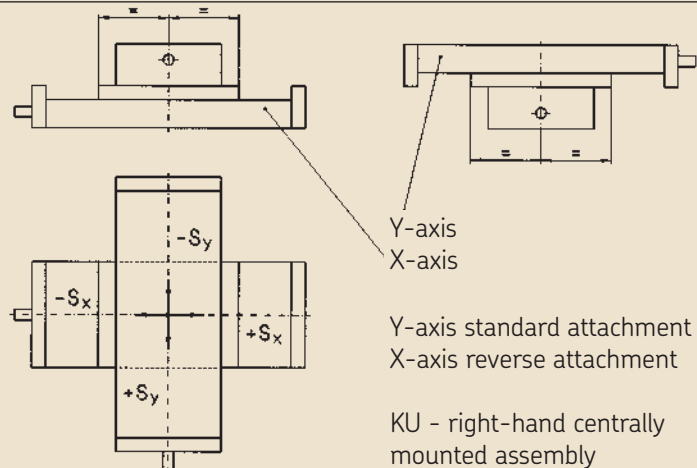
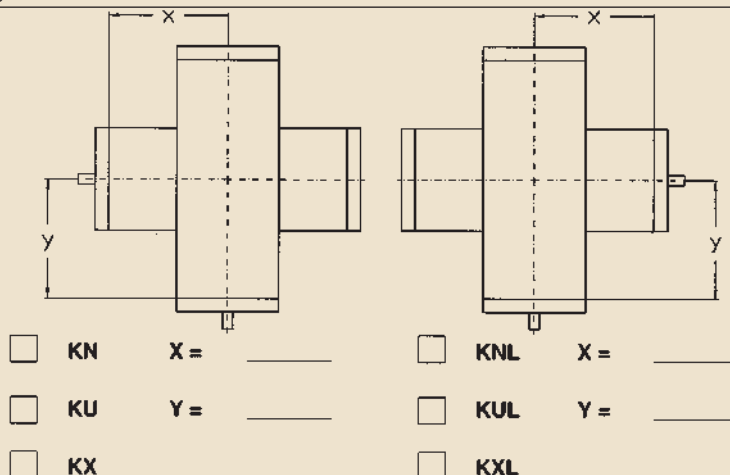


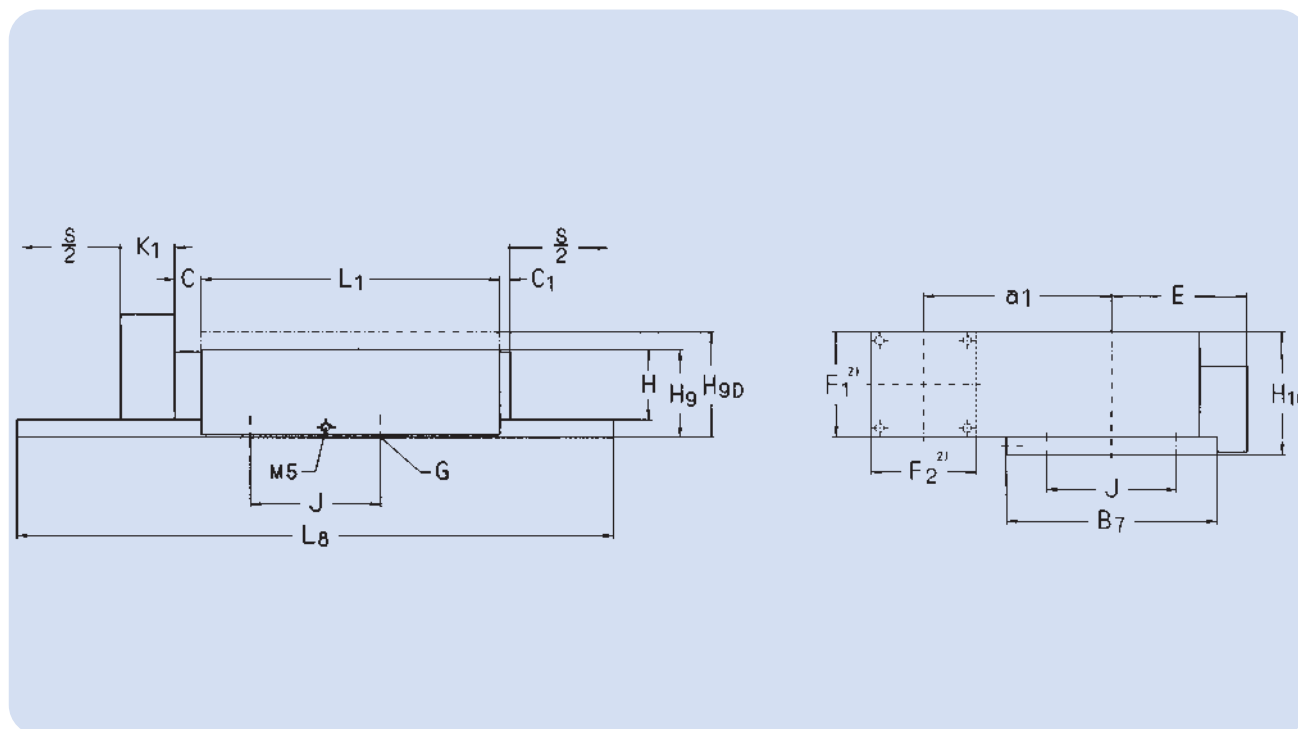
Fig. 31



For order designation: please see order codes, page 80.

GP - Base plate for precision tables RSS - NSS - PSS

B 100 - 400 (for product description, see page 32)



Dimensions

B	H	L ₂	B ₆	G	H ₈	H _{8D} ¹⁾	J	J ₉	L ₇	N	N ₁
mm										-	
100	40	210 260 310	164	M6	70	80	74	140	180 230 280	6.6	11
150	50	310 410 510	214	M8	80	96	116	190	270 360 460	9	15
200	60	310 410 510	264	M8	90	105	154	240	270 360 440	9	15
300	75	315 415 515	364	M10	105	125	245	335	285 370 455	11	18
400	100	515 615	464	M12	130	155	340	435	475 555	14	20

1) Only for "thick top"
For order designation: please order codes, page 82

Example for order: GP 200.310

DT slots

D - Thick top for precision slides and tables

All slides and tables shown in this catalogue can be supplied with a **thick top**.

Use of a thick top permits:

1. The fitting of standard T- or other slots and recesses according to the wishes of the customer.
2. With reverse attachment of a slide, the top is fastened on and remains stationary and does not have complete support. The thick top then serves to strengthen the base.
3. With cross table assembly KX, the thick top of the unsupported Y-axis serves to strengthen the base.

The height dimensions H_D of the slides with thick top can be obtained from the corresponding dimensional Table for each slide.

For order designation for D thick slide top: please see order codes, page 80

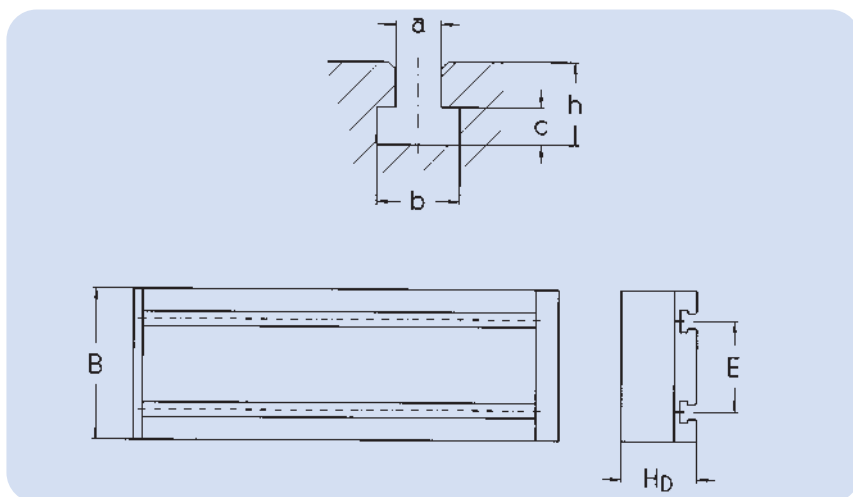
DT slots

All slides with a thick top can be additionally equipped with standard T-slots as in the adjacent table. In this design the standard hole pattern of the slide top is not applicable. The dimensions of the T-slots are according to DIN 787.

This enables use of:

T - tenon blocks conforming to DIN 508 or

T - grooving screws conforming to DIN 787.



Dimensions

Number of slots		E	H ₀	a	b	c	h
B	n						
mm		H8					
50	1	-	35	6	11	5	11
75	1	-	44	6	11	5	11
100	2	60	50	6	11	5	11
150	2	90	66	8	15	7	15
200	2	120	75	8	15	7	15
300	3	2x100	95	10	17	8	17
400	3	2x150	125	14	24	9	23

For order designation for T-slots: please see order codes, page 80

LMS - linear measurement system

LMS linear measurement system for precision slides

An incremental linear measurement system can be fitted to tables of series RSS - NSS - PSS and RSAS - NSAS - PSAS. The advantage of "direct" linear measurement over "indirect" rotary measurement through the lead screw and incremental shaft encoder attached to the motor may be described as follows. Direct linear measurement of a path avoids inaccuracies due to pitch error and thermal expansion of the screw, and elasticity and stiffness in the screw, nut and bearings.

Encapsulated systems of cross-sectional dimensions 46 x 18 can also be used. They can be connected to compressed air in order to create excess pressure in the measuring system, thereby preventing penetration by liquids and dust.

Fig. 32: shows attachment to the slide series RSS - NSS - PSS

Fig. 33: shows mounting in the sealed slide series RSAS - NSAS - PSAS

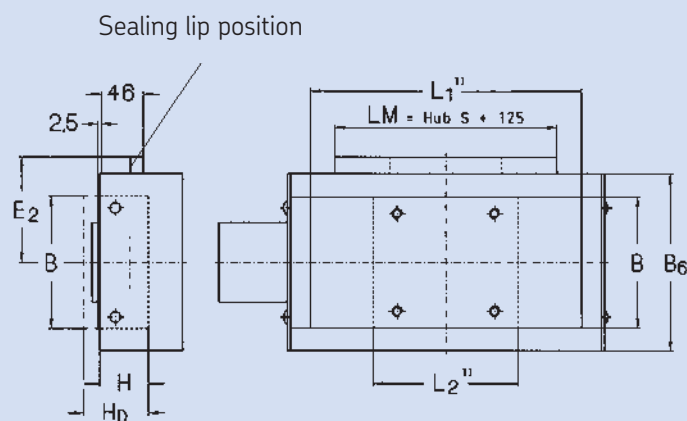
1) For dimensions, see pages 52-59

2) With dimensions 100 avoidance of overhang possible only by use of "thick" top.

3) For dimensions, see pages 60-63

4) For dimensions 300 and 400 the linear measurement system is mounted under the bellows cover.

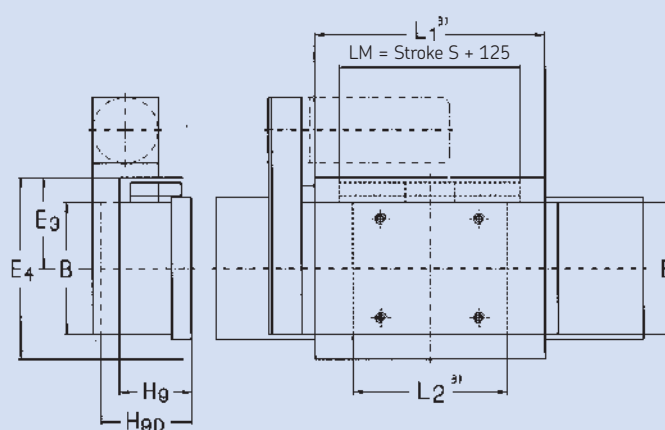
Fig. 32



Dimensions

B	B6	H	H ₀	E ₂
mm				
100	164	40 ²⁾	50	98
150	214	50	66	123
200	264	60	75	148
300	364	75	95	— ⁴⁾
400	464	100	125	— ⁴⁾

Fig. 33



Dimensions

B	H ₉	H _{9D}	E ₃	E ₄
mm				
100	50	60	82	164
150	62	78	107	214
200	72	87	132	264
300	91	111	182	364

LMS – linear measurement system for precision slides

Technical Data

Grating pitch: 20 µm

Recommended measurement steps:

Use of an X-fold interpolation mounted either directly in the reading head or in a subordinate EXE gives the following measuring steps with 4-fold control assessment:

Grating pitch		20 μm	
Interpolation	1 x	5 x	10 x
Measuring step	5 μm	1 μm	0,5 μm
Output signal	square signals + 5 V max. 100 mA		
Power supply			

Accuracy classes

Standard: ± 5 µm

On request: ± 3 µm

Reference tags

Standard in beginning and end area of nominal stroke, partly in middle position and “Abstandcodierung” possible

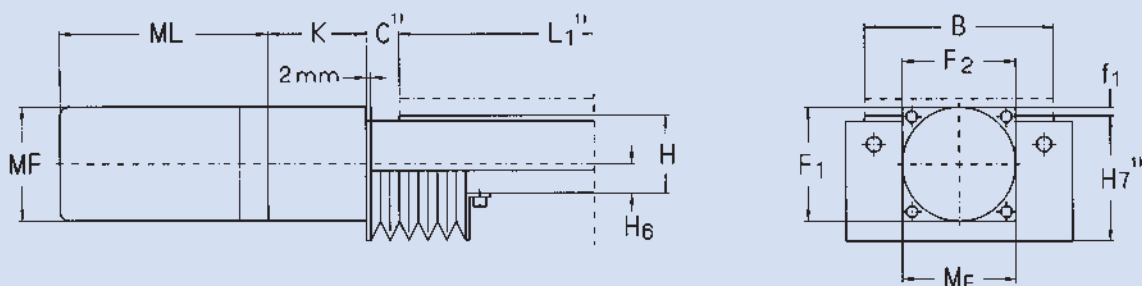
Connection cable

Standard: 3 m with 12-pin plug

On request: 0,3 m with mounting socket

For order designation: please see order codes, page 83

Standard motor attachment for precision tables of series RSS - NSS - PSS B 100 - 200 motor flange

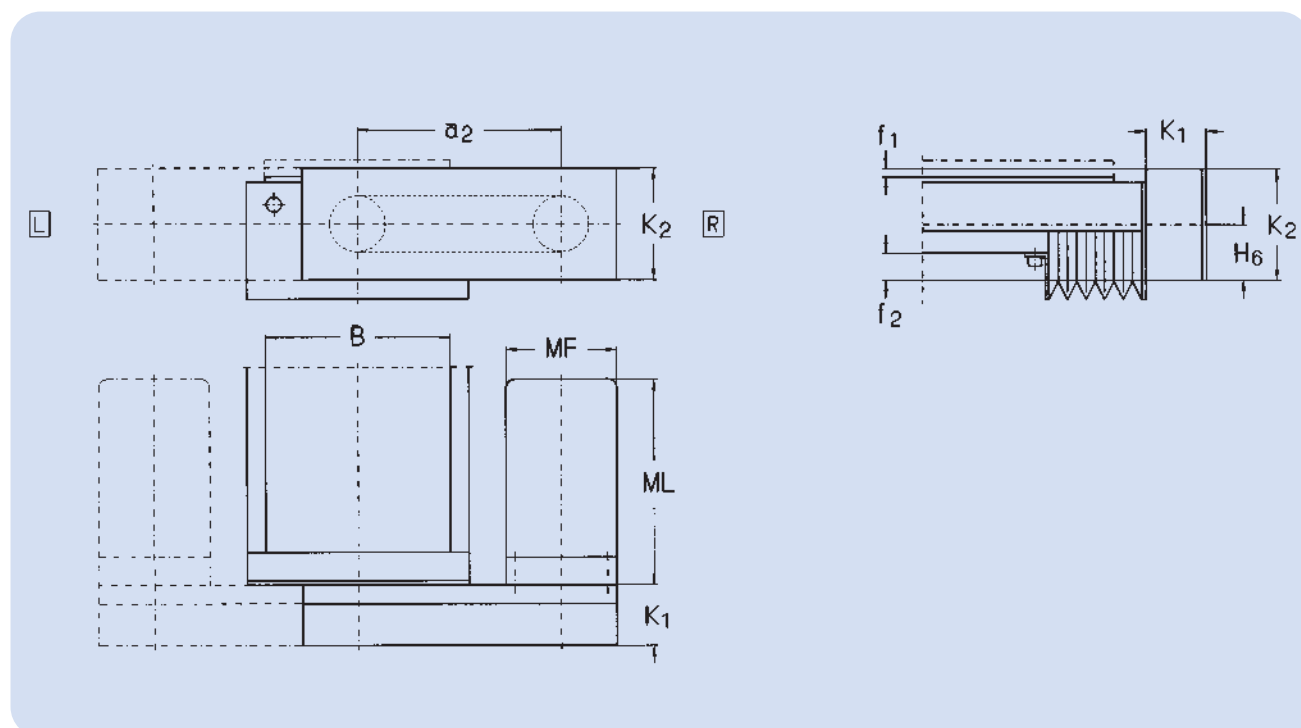


For product description, please see page 32

Dimensions			For motor ³⁾				Motor flange			
B	H	H ₆	Type	Size	MF	Order No.	F ₁	F ₂	K	f ₁
mm			-		mm	-	mm			
100	40	15,5	5Ph	VDRM60	60	MF01BER1	60	60	50	5,5
			DC	E 500	Ø 57	MF01BAU1	60	60	55	5,5
			AC	EBL2	55	MF01ENG1	55	60	54	5,5
150	50	24	5 Ph	VORDM60	60	MF03BER1	60	85	61	4
			5 Ph	VRDM90	86	MF03BER2	85	85	78	16,5
			DC	E 500	Ø 57	MF03BAU1	60	85	66	4
			DC	E 600	Ø 83	MF03BAU2	85	85	81	16,5
			AC	EBL2	55	MF03ENG1	60	85	65	4
200	60	25	5 Ph	VRDM60	60	MF03BER1	60	85	61	-
			5 Ph	VRDM90	86	MF03BER2	85	85	78	7,5
			DC	E 500	Ø 57	MF03BAU1	60	85	66	-
			DC	E 600	Ø 83	MF03BAU2	85	85	81	7,5
			AC	EBL2	55	MF03ENG1	60	85	65	-

1) For dimensions, see pages 52-59

Standard motor attachment for precision tables of series RSS - NSS - PSS B 100 - 200 toothed belt drive

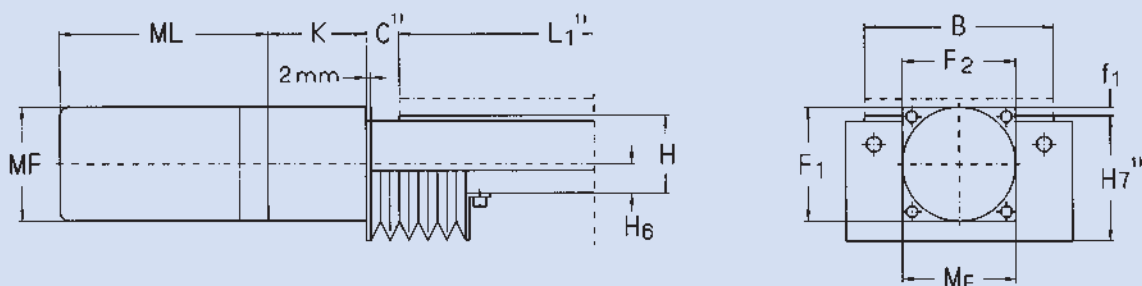


For product description, please see page 32

Dimensions		For motor ³⁾		Toothed belt drive					
B	Type	Size	MF	Order No.	K ₁	K ₂	a ₂	f ₁	f ₂
mm	-		mm	-	mm				
100	5 Ph	VDRM50	60	ZR01BER1	34	60	120	5,5	14,5
	DC	E 500	Ø 57	ZR01BAU1	34	60	120	5,5	14,5
	AC	EBL2	55	ZR01ENG1	34	60	120	5,5	14,5
150	5 Ph	VRDM60	60	ZR03BER1	34	60	155	4	6
	5 Ph	VRDM90	86	ZR03BER2	34	85	155	16,5	18,5
	DC	E 500	Ø 57	ZR03BAU1	34	60	155	4	6
	DC	E 600	Ø 83	ZR03BAU2	34	85	155	16,5	18,5
	AC	EBL2	55	ZR03ENG1	34	60	155	4	6
200	5 Ph	VRDM60	60	ZR03BER1	34	60	172,5	-	5
	5 Ph	VRDM90	86	ZR03BER2	34	85	182,5	7,5	17,5
	DC	E 500	Ø 57	ZR03BAU1	34	60	172,5	-	5
	DC	E 600	Ø 83	ZR03BAU2	34	85	182,5	7,5	17,5
	AC	EBL2	55	ZR03ENG1	34	60	172,5	-	5

1) For dimensions, see pages 52-59

Standard motor attachment for precision tables of series RSS - NSS - PSS B 300 - 400 motor flange

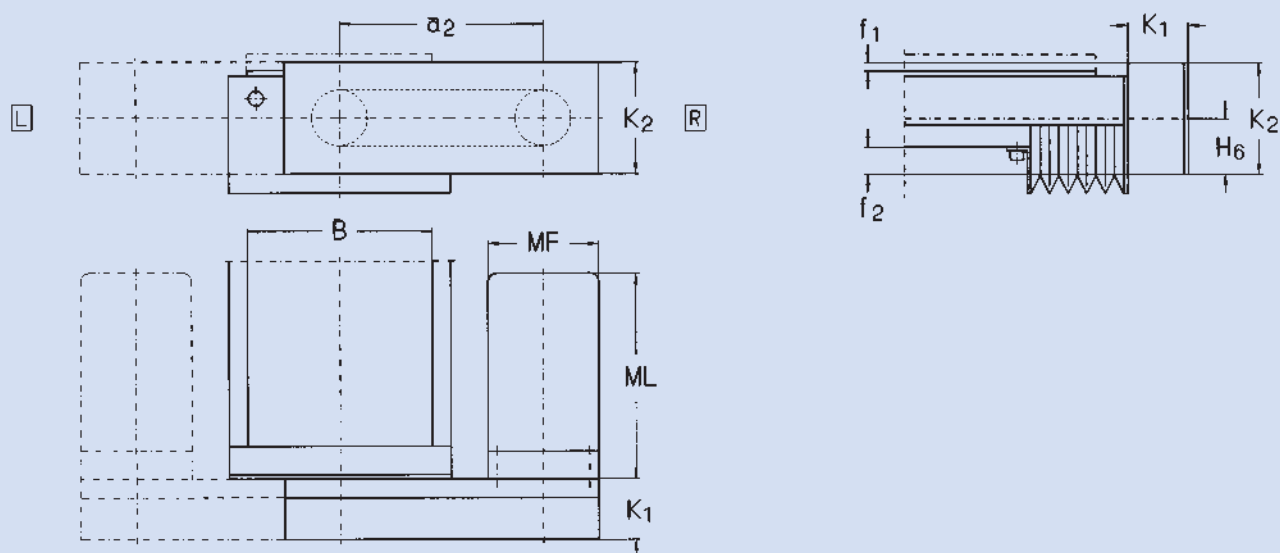


For product description, please see page 32

Dimensions			For motor ³⁾				Motor flange			
B	H	H ₆	Type	Size	MF	Order No.	F ₁	F ₂	K	f ₁
mm			-		mm	-	mm			
300	75	28	5 Ph	VRDM60	60	MF04BER1	60	85	68	-
300	75	28	5 Ph	VRDM90	86	MF04BER2	85	85	85	-
300	75	28	5 Ph	RDM110	110	MF04BER3	110	110	111	8
300	75	28	DC	E 500	Ø 57	MF04BAU1	60	85	73	-
300	75	28	DC	E 600	Ø 83	MF04BAU2	85	85	85	-
300	75	28	DC	E 700	Ø 102	MF04BAU3	110	110	95	8
300	75	28	AC	EBL2	55	MF04ENG1	60	85	72	-
300	75	28	AC	EBL3	92	MF04ENG2	85	85	85	-
300	75	28	AC	EBL4	105	MF04ENG3	110	110	95	8
400	100	38	5 Ph	VRDM90	86	MF05BER2	85	85	85	-
400	100	38	5 Ph	RDM110	110	MF05BER3	110	110	111	-
400	100	38	DC	E 600	Ø 83	MF05BAU2	85	85	85	-
400	100	38	DC	E 700	Ø 102	MF05BAU3	110	110	110	-
400	100	38	AC	EBL3	92	MF05ENG2	85	85	85	-
400	100	38	AC	EBL4	105	MF05ENG3	110	110	95	-

1) For dimensions, see pages 52-59

Standard motor attachment for precision tables of series RSS - NSS - PSS B 300 - 400 toothed belt drive



For product description, please see page 32

Dimensions		For motor ³⁾		Toothed belt drive					
B	Type	Size	MF	Order No.	K ₁	K ₂	a ₂	f ₁	f ₂
mm	-		mm	-	mm				
300	5 Ph	VRDM60	60	ZR04BER1	40	60	217,5	-	2
300	5 Ph	VRDM90	86	ZR04BER2	40	85	235	-	14
300	5 Ph	RDM110	110	ZR04BER3	40	110	250	8	27
300	DC	E 500	Ø 57	ZR04BAU1	40	60	217,5	-	2
300	DC	E 600	Ø 83	ZR04BAU2	40	85	235	-	14
300	DC	E 700	Ø 102	ZR04BAU3	40	110	250	8	27
300	AC	EBL2	55	ZR04ENG1	40	60	217,5	-	2
300	AC	EBL3	92	ZR04ENG2	40	85	235	-	14
300	AC	EBL4	105	ZR04ENG3	40	110	250	8	27
400	5 Ph	VRDM90	86	ZR05BER2	40	85	280	-	4,5
400	5 Ph	RDM110	110	ZR05BER3	40	110	295	-	17
400	DC	E 600	Ø 83	ZR05BAU2	40	85	280	-	4,5
400	DC	E 700	Ø 102	ZR05BAU3	40	110	295	-	17
400	AC	EBL3	92	ZR05ENG2	40	85	280	-	4,5
400	AC	EBL4	105	ZR05ENG3	40	110	295	-	17

1) For dimensions, see pages 52-59

Ordering codes

Order codes

The order codes show the complete designation system for SKF slides, tables and accessories.

Used consistently, this designation system will correctly identify every possible slide or table variant. We

therefore ask that the codes be used consistently.

Please take into account that only the type variants and dimension combinations shown in the Tables are possible.

For the designation of a slide or table system to be complete, it must have the proper type designation.

Please see type codes and, if accessories are involved, the order codes for accessories.

Type codes

1	2	3	.	4	.	5	.	6	.	7	8	9
---	---	---	---	---	---	---	---	---	---	---	---	---

Table page

1	N	- Precision slides with rail guide system, needle rollers	34 - 39
	P	- Precision slides with rail guide system, dry sliding liners	34 - 39
	R	- Precision slides with rail guide system, crossed rollers	34 - 39
	S	- Dovetail slides	22 - 23

2	E	- With endplates, only for precision slides	40 - 43
	SAS	- For motor drive, sealed, only for precision tables	60 - 63
	SK	- For manual operation, with hand crank: dovetail and precision tables	24 - 26 / 44 - 51
	SM	- For manual operation, with micrometer knurl: dovetail and compact cross tables	24 - 26 / 44 - 51
	SS	- For motor drive: precision tables and compact cross tables	52 - 59 / 84 - 85

3	Table width B
---	---------------

4	Length of top L ₁	- Dovetail and precision slides
---	------------------------------	---------------------------------

5	Nominal stroke S
---	------------------

6	Designation suffix if desired:		
	A	- Slides or tables made of aluminium, black anodized	
	D	- Slides with thick top: only for precision slides	
	DT	- Slides with thick top and T-slots: dovetail and precision slides	

7	Only for slides or tables for motor drive		
	R	- Preloaded planetary roller screw:	- For precision slides, see 64 - 65

8	Screw diameter
---	----------------

9	Screw lead
---	------------

Order codes for accessories

ZB - Additional drill hole pattern: dovetail and precision slides

ZB	1	2
----	---	---

Table page

1

0 - Additional drilling hole pattern in top
U - Additional drilling hole pattern in bottom

- For dovetail slides, see
- For precision slides, see

28 - 29
66 - 67

2

Number of distances n x J

DU - Viewing hole for compact cross tables

DU	1
----	---

1

Ø D₁ - Desired diameter of viewing hole
for max. possible Ø D₁, see table

72

AR - Locking device

AR	1	2
----	---	---

1

1 - Locking device for dovetail slides
2 - Locking device for precision slides

27
70

2

Slide width B

WG - WA - Mounting bracket

W	1	2
---	---	---

1

G - Mounting bracket of material GG25
A - Mounting bracket of light metal alloy

27 / 68

2

Type of mounting bracket

Order codes for accessories

Limit and reference switches for precision and compact cross tables

E	1	2	3	4 ¹⁾	/	5 ¹⁾
---	---	---	---	-----------------	---	-----------------

Table page

1	E	- Limit switch	- For precision slides, see	69
	R	- Reference switch		
2	M	- Mechanical switch		
	I	- Inductive switch		
3	1	- Switch with 2 m-long connection cable		
	2	- Switch with 8-pin plug cabled on motor side		
4	PNP ²⁾	- Output type		
	NPN ²⁾	- Output type		
5	NC ²⁾	- Normally closed		
	NO ²⁾	- Normally open		

1) Indication only for inductive switches

2) In the absence of indications, we deliver the inductive switches as limit switch PNP/NC and reference switch PNP/NO

KN - KU - KX cross table assembly for precision slides

K	1	2
---	---	---

1	N	- Assembly type: for definition, see page 70	70 - 71
	U	- Assembly type: for definition, see page 70	
	X	- Assembly type: for definition, see page 70	
2	-	- Standard mounting direction "on the right"	
	L	- Mounting direction "on the left"	

GP - Base plate for precision slides

GP	1	.	2
----	---	---	---

1	Slide width B	71
2	Length of bottom L ₂	

Order codes for accessories

MF - Motor flange for precision slides and compact cross tables

Table page

Order No.

- For precision slides, see

76 / 78

ZR - Toothed belt drive for precision slides

Order No.

.

1

Attachment direction

1

R

- on the right-hand side (standard)

L

- on the left-hand side

LMS - Linear measurement system for precision slides and compact cross tables

LMS

1

/

2

/

3

- For precision slides, see

74 - 75

1

20

- Grating pitch 20 µm

2

5 µm

- Accuracy class ±5 µm (standard)

3 µm

- Accuracy class ±3 µm

3

-

- Sine signal: output

1x

- Square wave signal: output

5x

- Square wave signal: output with five-fold interpolation

10x

- Square wave signal: output with ten-fold interpolation

1

-

2

-

3

4

1

Motor type

Options:

2

B

- With attached holding brake

3

MS

- DC motor with attached hollow shaft encoder

4

Encoder gratings:

500 / 1 000 / 1 250 / 2 500

Examples

ExamplesExample of order no. 1:

RSS 200.810.300.A.R1205
ZB05
ZBU3
EE12 PNP/NO
ER12 NPN/NC
MF03 BAU2
E 642 - MS 500

denotes: cross roller guided precision table for motor drive
width: $B = 200$ mm
top length $L_1 = 810$
nominal stroke $S = 300$
bottom length $L_2 = 510$
aluminium construction
preloaded planetary roller screw with 12 mm diameter and 5 mm lead

with:

- Additional drill hole pattern in top 5 x J
- Additional drill hole pattern in bottom 3 x J
- 2 inductive limit switches wired to 8-pin plug, with NPN connection type as opener
- 1 inductive reference switch wired to 8-pin plug, with NPN connection type as opener
- Motor flange and clutch for DC motor of design dimension E600
- Permanent magnet DC servo-motor with integral tachogenerator.
Nominal torque 0,72 Nm at 500 rpm

Example of order no. 2

TSS 160.100.R0802
2 x EEM1
2 x LMS 20 / 5 μ m / 5x
2 x MF01 BER 1

denotes: Width: $B = 160 \times 160$
Nominal stroke $S = 100 \times 100$
Preloaded roller screw drive with diameter of 8 mm and lead of 2 mm

with:

- 4 mechanical limit switches, each with 2 m of free cable
- 2 linear measurement systems:
grating pitch 20 μ m; accuracy class ± 5 μ m;
square-wave signal output with five-fold interpolation
- 2 motor flanges with coupling for 5-phase motor of design dimensions VRDM 60

Performance specification for selection of

- 85

Miniature profile rail guides



Technical data

In response to the market trend for increased performance with a minimum of mounting space, SKF has extended its product range by a miniature profile rail guide.

The close cooperation with numerous customers combined with SKF's experience has resulted in a miniature rail guide design that sets new standards.

SKF offers its customers an excellent technical advisory service on the spot as well as a vast modular range for the performance increase of machines and installations.

In total SKF offers seven rail sizes and fourteen different types of carriages.

Miniature profile rails are universally applicable and preferably used in automation technology, electronics production, medical engineering and the pneumatic industry (see Application examples, page 4).

Types of rails, carriages and systems

Size		LLMHS_TA Standard	LLMHS_LA Standard, long	LLMWS_TA Wide	LLMWS_LA Wide, long
7	Rail	LLMHR 7	LLMHR 7	-	-
	Carrier	LLMHC 7 TA	LLMHC 7 LA	-	-
	System	LLMHS 7 TA	LLMHS 7 LA	-	-
9	Rail	LLMHR 9	LLMHR 9	LLMWR 9	LLMWR 9
	Carrier	LLMHC 9 TA	LLMHC 9 LA	LLMWC 9 TA	LLMWC 9 LA
	System	LLMHS 9 TA	LLMHS 9 LA	LLMWS 9 TA	LLMWS 9 LA
12	Rail	LLMHR 12	LLMHR 12	LLMWR 12	LLMWR 12
	Carrier	LLMHC 12 TA	LLMHC 12 LA	LLMWC 12 TA	LLMWC 12 LA
	System	LLMHS 12 TA	LLMHS 12 LA	LLMWS 12 TA	LLMWS 12 LA
15	Rail	LLMHR 15	LLMHR 15	LLMWR 15	LLMWR 15
	Carrier	LLMHC 15 TA	LLMHC 15 LA	LLMWC 15 TA	LLMWC 15 LA
	System	LLMHS 15 TA	LLMHS 15 LA	LLMWS 15 TA	LLMWS 15 LA



Technical data

Structure:

Four-point contact ball recirculation system with identical load angles and 2 ball recirculation paths per carriage for unlimited stroke

Range:

Four different types (7, 9, 12, 15) comprising different widths and carriage lengths

Rail material:

Stainless steel 1.4034

Carriage material:

Stainless steel 1.4034 with return zones of POM

Ball material:

Stainless steel 1.4034

Sealing material:

Desmopan

Temperature range:

from -20 °C up to +80 °C

Speed:

up to 3 m/s max.

Acceleration:

up to 80 m/s² max.

Accuracy:

2 accuracy classes (P5, P1)

Stiffness:

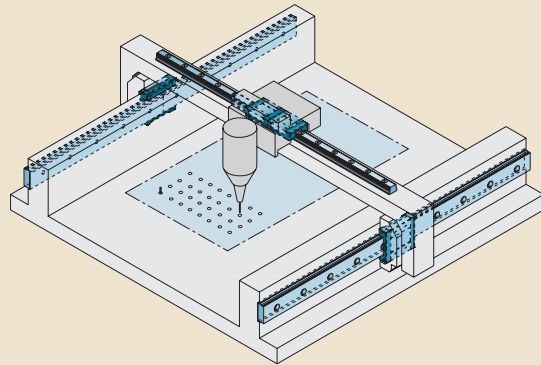
3 standard preload classes (T0, T1, T2)

Application examples

Electronics

PCB drilling and routing machine

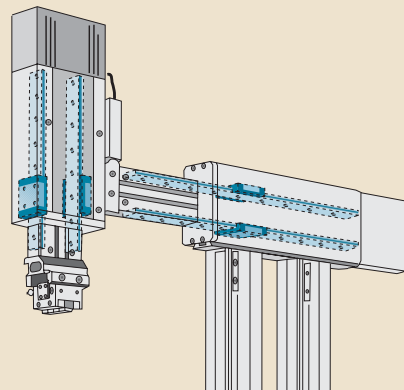
A flat-format and weight-saving design enables small machine dimensions. High power density results in shorter processing times.



Automation technology

Pick-and-place manipulators

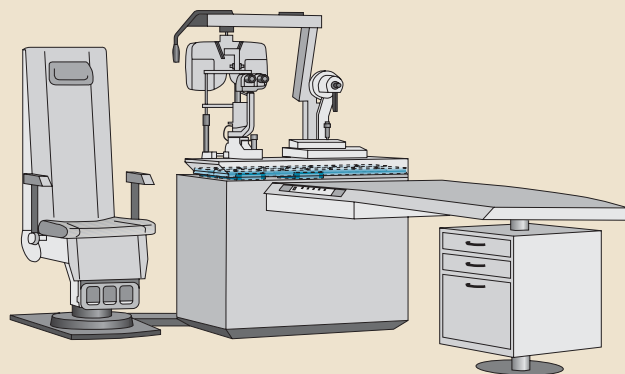
A low-mass guidance system coupled with aluminium profiles permits faster sequences of motion and higher cycle rates.



Medical equipment

Optical instruments

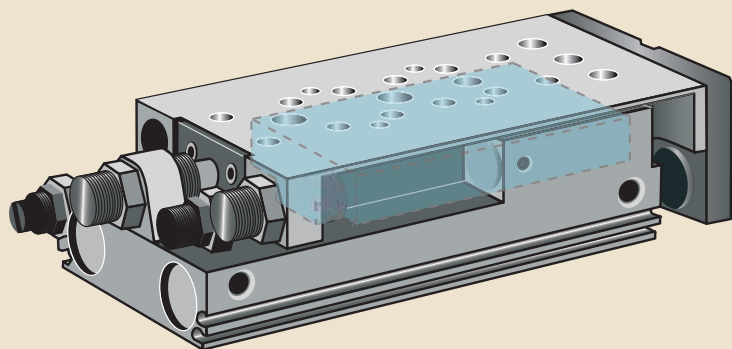
Ease of movement and corrosion-resistant materials ensure reliability in everyday use.



Pneumatic industry

Compact piston rod cylinder

High rigidity and load carrying capacity designed for long service life in "short stroke applications" (typical for pneumatic applications).



Product features

Maximum utilisation of mounting space

The compact design of the SKF miniature profile rail guides permits maximum performance on a minimum of mounting space. Dimensions and weights of machines and installations can be further reduced.

Rails

The rails are ground on all faces. The maximum rail lengths per piece are shown in the table opposite. SKF supplies the rails in lengths according to customer requirements. The distance measurement E (see Illustration page 11) is manufactured symmetrically, depending on the rail length.

Upon request, SKF can also supply special rails to customer drawings.

Carriages

A wide range of 14 different types of carriages, each available in three preload classes and with a choice between sealed and open types, permits optimum system designs tailored to the respective requirement profile.

Preload and stiffness

The determination of an appropriate preload renders the miniature profile rail guide suitable for widely varying operating conditions and changes the stiffness of the overall system. SKF recommends clearance-free systems (T0) for applications with constant load and low friction. For applications characterised by shock loads, vibration and alternating loads or torques, it is advisable to select a preloaded system (T1) and a (T2) system should be chosen for high torques and high stiffness.

Performance

For improved machinery performance, maximum speeds and accelerations under loads acting in all directions are possible. This permits more efficient processes and the reduction of cycle times.

Reliability

More than 90 years of SKF experience with rolling bearing geometry guarantee long product life. Maintenance

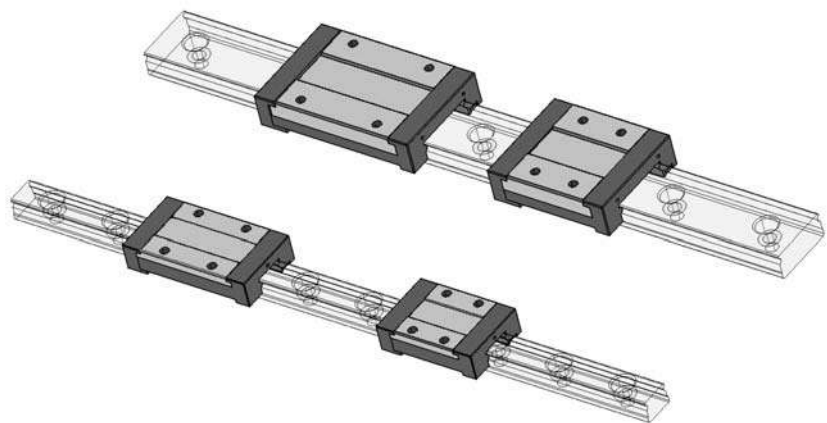
intervals are extended and the service life of machines and installations is increased.

Resistance

The use of stainless steel in combination with plastic components makes these guides universally applicable. The reliability in application engineering is increased and risks are eliminated.

Rail designation	Maximum rail length per piece*
LLMHR 7	1 000 mm
LLMHR 9 / LLMWR 9	1 000 mm
LLMHR 12 / LLMWR 12	1 000 mm
LLMHR 15 / LLMWR 15	1 000 mm

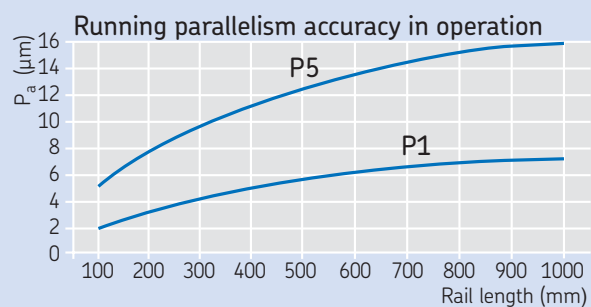
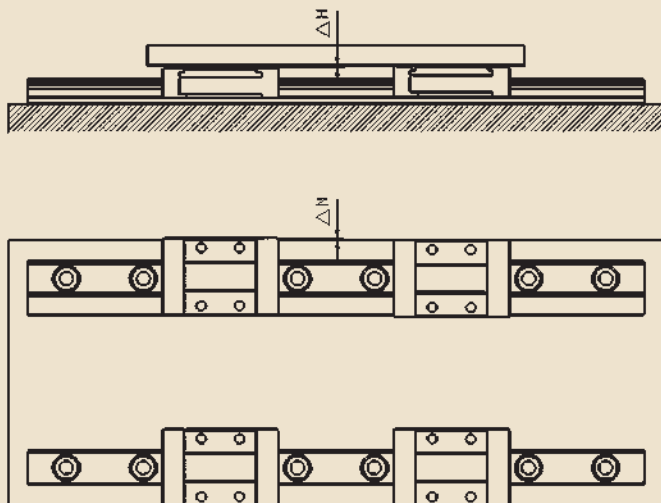
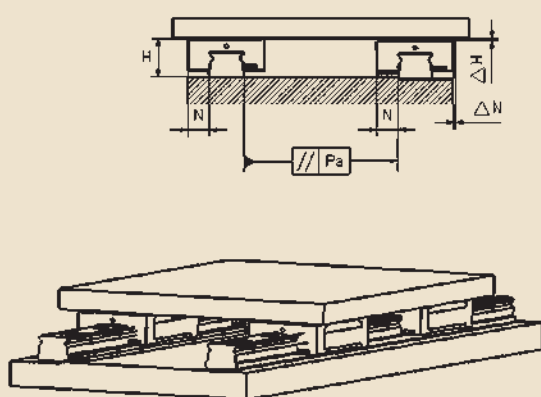
*For rail length > 1 000 mm, please contact SKF.



Preload class	Characteristics
T0	Clearance
T1	Light clearance up to light preload
T2	Preloaded system

further preload classes upon request

Accuracy



Dimension tolerances

	H (mm)	N (mm)
P1	±0,010	±0,015
P5	±0,020	±0,025

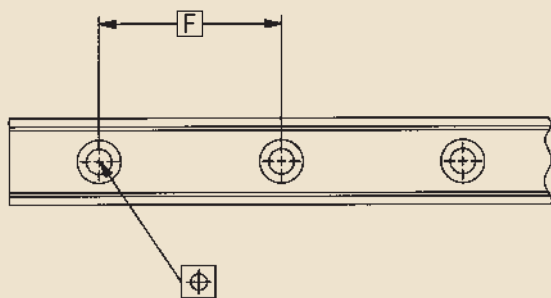
The tolerances apply over the entire guide length for any combination of carriage and rail.

Maximum tolerance for paired systems or carriages at identical rail position

	ΔH (mm)	ΔN (mm)
P1	0,007	0,007
P5	0,015	0,015

The dimensions ΔH and ΔN relate to the ideal centre of the carriage. Each dimension is derived from the mean value of two measured points with identical centre distance.

Distance tolerance



Position tolerance of rail attachment holes

⊕ ∅ 0,3

Load carrying capacity

Static load rating C_0

The static load rating C_0 is the load which corresponds to an arithmetical Hertzian Pressure of 4 200 MPa between raceway and balls. This pressure produces a permanent deformation of approximately 0,0001 of the ball diameter.

Static moments " M_A , M_B , M_C "

The permissible static moments correspond to a moment load that produces the same permanent deformation as in the static load rating C_0 .

Load direction

SKF miniature profile rail guides are designed to accommodate loads in all directions.

Dynamic load rating C

The dynamic load rating C is the constant load which gives a theoretical system life of 100 000 m of travel with a certainty of 90 %.

Life calculation

The life of a profile rail guide is defined as the total linear distance travelled before the appearance of the first signs of material fatigue on the raceways or rolling elements. Both in laboratory trials and in practice it is found that the life of apparently similar rail guides under completely identical operating conditions can differ. Calculation of the requisite bearing size therefore requires a clear statistic definition of the term bearing life. All references to dynamic load rating of profile rail guides apply to the basic rating life as covered by the ISO definition, in which life is understood as that operating period reached or exceeded by 90 % of a large group of identical bearings. The SKF life calculation is based on 100 000 metres of travel. Other calculation models assume merely 50 000 metres of travel. In such cases, the dynamic load ratings must be divided by a factor of 1,26 to ensure comparability with the SKF values.

Where the stroke length and frequency are constant it is often easier to calculate the basic rating life in hours of operation using the equation:

$$L_{10} = \left(\frac{C}{P} \right)^3$$

L_{10} = basic rating life, 10^5 m
 C = dynamic load rating, N
 P = equivalent dynamic bearing load, N

$$L_{10h} = \frac{50\,000\,000}{s \cdot n \cdot 60} \left(\frac{C}{P} \right)^3$$

L_{10h} = basic rating life, hours of operation
 s = stroke, mm
 n = frequency of stroke, min^{-1}
(number of movements from one end position to the other end and back again)

Permissible operating conditions

Permissible maximum load

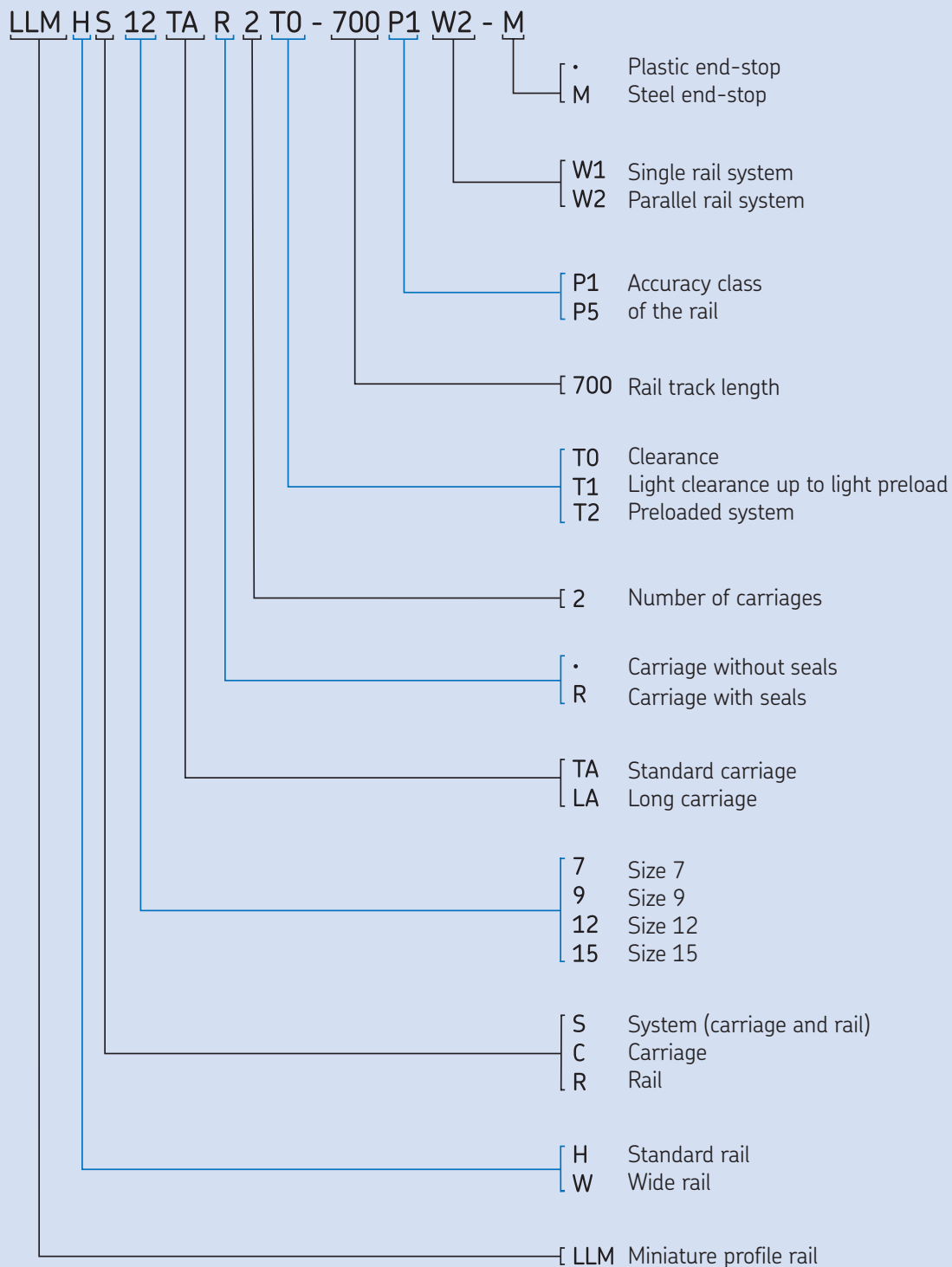
DIN 636, Part 2, stipulates that the calculation of bearing life is valid only when the equivalent dynamic loading of a profile rail guide does not exceed 0,5 C . Any higher loading leads to an imbalance of stress distribution which can have a negative effect on bearing life. Where such conditions prevail, the user should turn to SKF for recommendations and advice on bearing life calculation.

Requisite minimum load

In order to assure slip-free running of profile rail guides, they must be subjected to a certain minimum load. The general guideline is a minimum value of $P = 0,001 C$. The minimum load is of special importance in profile rail guides which operate at high speed or with high acceleration. In such cases, the inertia forces of the balls as well as the rolling friction in the lubricant can have an adverse effect on the rolling conditions in the guide and can lead to damaging slip conditions between the balls and raceways.

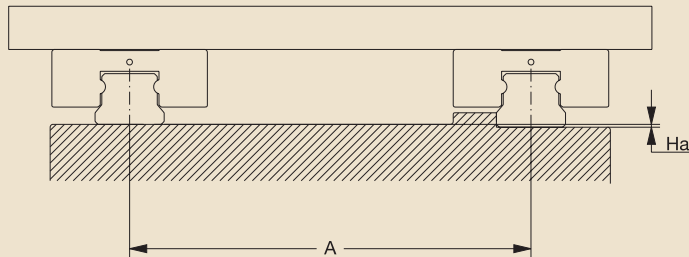
Order designation

The following designation system should be used for inquiries and orders.



Mounting details

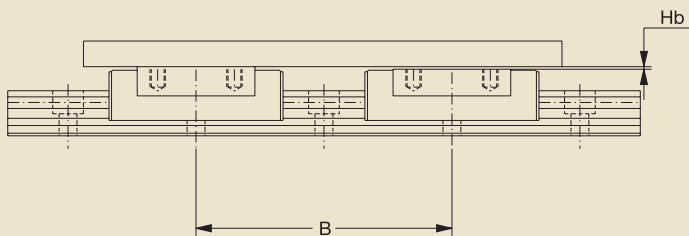
Permissible height deviation in transverse direction H_a



$$H_a = A \cdot Z$$

H_a = permissible height deviation (mm)
 A = distance of rails (mm)
 Z = calculation factor T_0 $3,0 \cdot 10^{-4}$
 T_1/T_2 $1,5 \cdot 10^{-4}$

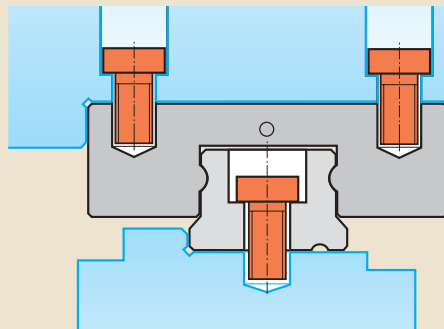
Permissible height deviation in longitudinal direction H_b



$$H_b = B \cdot 7 \cdot 10^{-5}$$

H_b = permissible height deviation (mm)
 B = distance of carriages (mm)

Ideal mounting arrangement



The illustration opposite shows the ideal mounting arrangement for miniature profile rail guides. Carriage and rail can be mounted at both sides, but their datum planes should be on the same side of the system. To ensure a neat abutment to the adjacent edges, these should feature a relief fillet.

Tightening torque of fixing bolts

Thread size	Maximum tightening torque Ncm
M 2	32
M 3	110
M 4	260
M 5	510

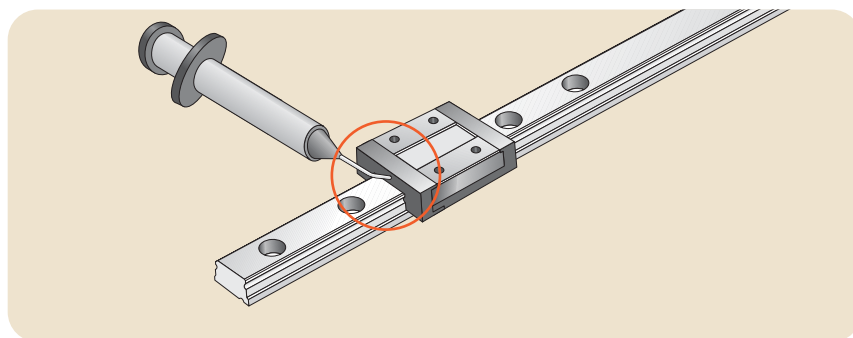
The opposite table shows the maximum tightening torques for fixing bolts depending on the thread size.

Lubrication

The relubrication intervals depend on the environmental conditions and the magnitude and type of load!

As the manufacturer is not familiar with the respective individual operating conditions, only tests carried out by the user or close observation can provide certainty about the appropriate relubrication intervals.

SKF miniature profile rails are pre-greased and are thus ready for use when delivered. The individual carriages can be relubricated through lubrication holes at the faces. Here, the relubrication intervals depend on the distance travelled as well as the cycles and environmental conditions.



Order designation	Size	
VM LLM 12	Standard 7, 9, 12,	Wide series 9 W, 12 W
VM LLM 15	15	15W

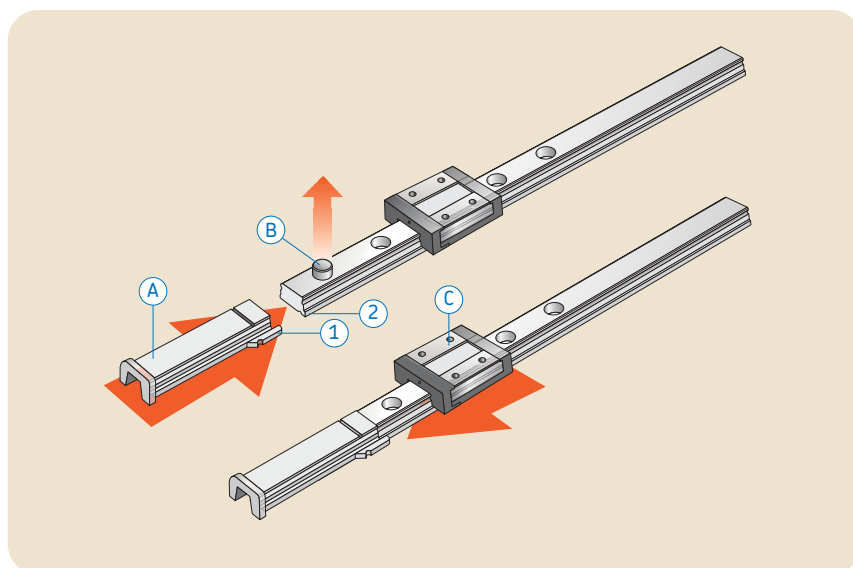
Carriages Mounting and dismounting

For dismounting the system pre-mounted by SKF, please observe the following instructions:

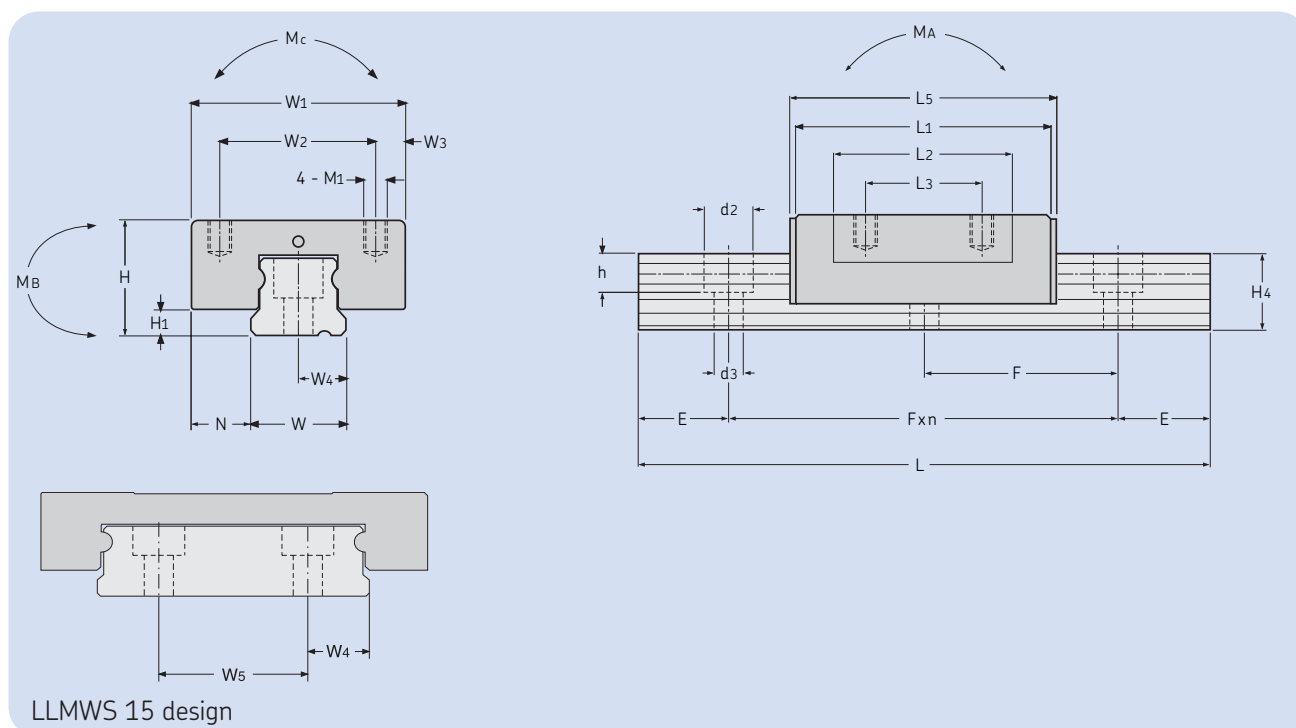
- Remove the end-stop ⑤ from the rail.
- Position side ① of the mounting rail ④ to the rail ② so that there is no misalignment or gap between rail and mounting rail.
- Slide the carriage ③ from the rail to the mounting rail and keep both rails in position while doing so.

For mounting the carriage onto the rail, please proceed in reverse order.

Attention: Please always use the enclosed mounting rail as the ball retention inside the carriage is not guaranteed otherwise.



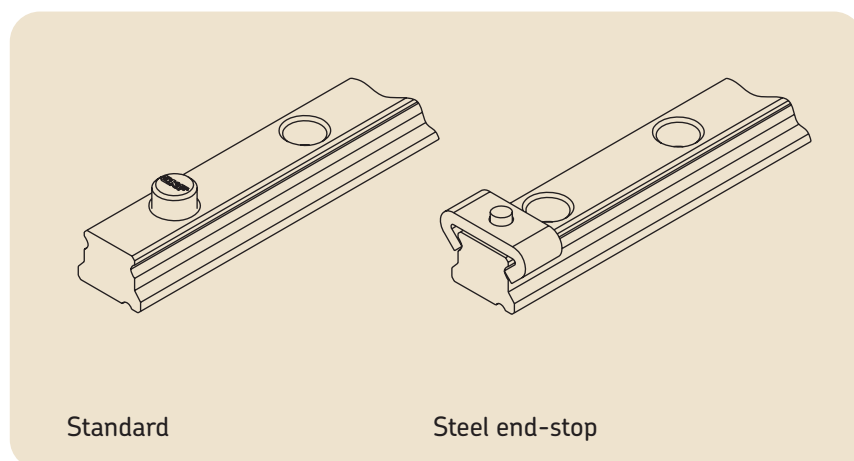
Carriage dimensions



Carriage dimensions

Designation	H (mm)	W ₁ (mm)	W ₃ (mm)	W ₂ (mm)	L ₁ (mm)	L ₂ (mm)	L ₃ (mm)	L ₅ (mm)	M ₁ (mm)	H ₁ (mm)	Weight (kg)
LLMHS 7 TA	8	17	2,5	12	22	16	8	23,5	M 2 x 2,5	1,5	0,01
LLMHS 7 LA					29,5	23,5	12	31			0,02
LLMHS 9 TA	10	20	2,5	15	30	21,5	10	32	M 3 x 3	2	0,02
LLMHS 9 LA					38,5	30	15	40,5			0,03
LLMWS 9 TA	12	30	4,5	21	36,5	28	12	40	M 3 x 3	2	0,04
LLMWS 9 LA			3,5	23	48,5	40	24	50,5			0,06
LLMHS 12 TA	13	27	3,5	20	33	23	15	36	M 3 x 3,5	3	0,03
LLMHS 12 LA					45	35	20	48			0,06
LLMWS 12 TA	14	40	6	28	42,5	32,5	15	45,5	M 3 x 3,5	3	0,08
LLMWS 12 LA					56	46	28	59			0,11
LLMHS 15 TA	16	32	3,5	25	41,5	29,5	20	44,5	M 3 x 4	4	0,06
LLMHS 15 LA					57,5	45,4	25	61,5			0,10
LLMWS 15 TA	16	60	7,5	45	51,2	42	20	55,5	M 4 x 4,5	4	0,15
LLMWS 15 LA					70,5	61,1	35	74,5			0,22

Accessories



In addition to the plastic end-stop which is fastened in the first and last rail hole, there is also an option for a steel end-stop that can be mounted in any hole. Order suffix – M.

Attention:
This does not serve as a limit stop.

Rail dimensions

Rail dimensions								Basic load rating		Static moments		
Designation	H ₄ (mm)	W (mm)	W ₄ (mm)	W ₅ (mm)	d ₃ x d ₂ x h (mm)	F (mm)	Weight (kg)	C (N)	Co (N)	M _A (Nm)	M _B (Nm)	M _C (Nm)
LLMHS 7 TA LLMHS 7 LA	4,8	7	3,5	-	2,5 x 4,5 x 2,5	15	0,19	860 1 400	1 670 2 700	4,9 7	4,9 7	5,2 9
LLMHS 9 TA LLMHS 9 LA	6,5	9	4,5	-	3,5 x 6 x 3,5	20	0,31	1 850 2 295	3 130 4 270	11,2 20,1	11,2 20,1	13,2 17,9
LLMWS 9 TA LLMWS 9 LA	7,5	18	9	-	3,5 x 6,0 x 4,5	30	0,96	2 200 2 820	3 800 5 680	14,2 30,2	14,2 30,2	30,4 45,1
LLMHS 12 TA LLMHS 12 LA	8,8	12	6	-	3,5 x 6 x 4,5	25	0,62	2 550 3 470	4 000 6 225	15 34,5	15 34,5	21,7 33,8
LLMWS 12 TA LLMWS 12 LA	8,8	24	12	-	4,5 x 8 x 4,5	40	1,40	3 300 4 150	5 780 8 000	30 55,8	30 55,8	69 95,6
LLMHS 15 TA LLMHS 15 LA	10,8	15	7,5	-	3,5 x 6 x 4,5	40	1,02	2 880 4 670	5 390 8 720	21 57	21 57	40,2 67,6
LLMWS 15 TA LLMWS 15 LA	10,8	42	9,5	23	4,5 x 8 x 4,5	40	2,95	3 890 5 830	7 060 10 600	40 94	40 94	148 225

LZM miniature slides



With the new LZM miniature slide product range SKF offers the ideal solution for linear motion applications for short strokes and compact boundary dimensions. The use of miniature slides has increased in medical applications, measurement technologies and micro mechanics & assembly.

The different LZM miniature slide components meet the highest precision standards. LZM miniature slides feature high running accuracy and smooth motion.

LZM miniature slides are manufactured with all stainless steel components. Optimised hardness enables long endurance life and high performance within compact boundary dimensions.

The new LZM miniature slides have been designed to ensure high system stiffness and precision guidance.

Running accuracies of 2 μm over a stroke of 100 mm are attainable depending on the particular application. Ease of installation is another advantage of the LZM miniature slides. Unlike cross roller systems using 4 rails and cages to be assembled on the production floor, the LZM slide provides a complete slide that can simply be bolted into place without the use of precision devices to set preload.

Every application provides new challenges for the modern designer. SKF will modify existing designs to meet your specific technical requirements.

Applications:

- Pneumatics
- Semi conductor manufacturing
- Medical
- Micro- and electronics assembly
- Measurement applications
- Fiber optics

Advantages:

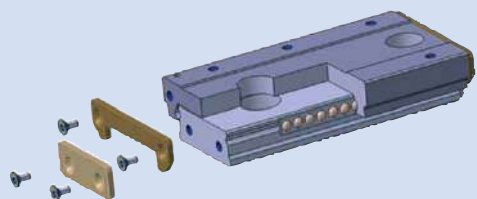
- Compact design
- High load carrying capacity
- Very good running accuracy
- Smooth running
- High stiffness
- Easy assembly

Technical data

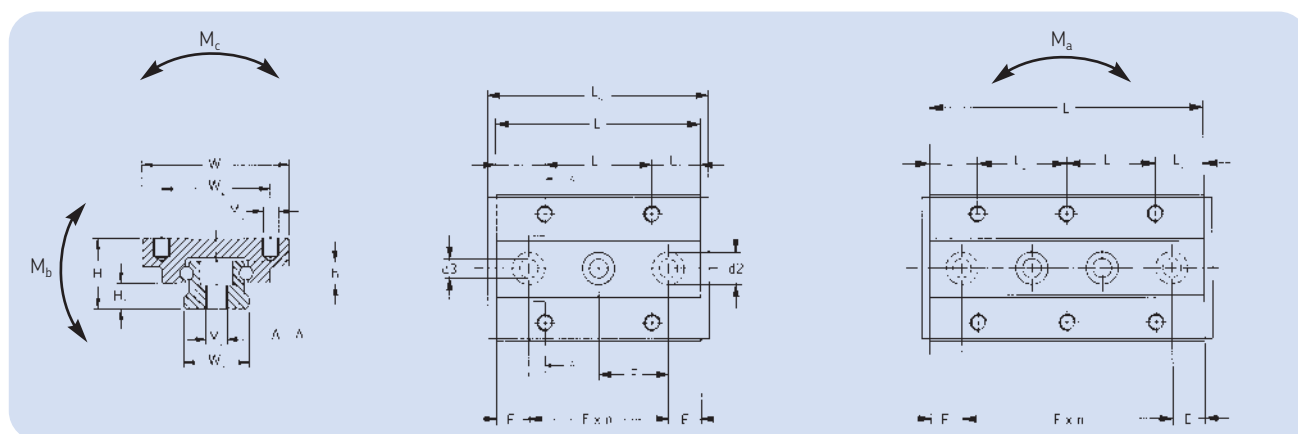
Structure	Four-point contact with identical load angles
Range	Four (4) sizes (7, 9, 12 and 15)
Temperature resistance	From -20 °C up to +80 °C
Speed	Up to 3 m/s
Acceleration	Up to 80 m/s ² (preloaded system)
Preload class	Three (3) preload classes (T0, T1 and T2) T0 = standard, light clearance T1 = light preload, very slight clearance T2 = medium preload, no clearance
Accuracy class	Two (2) accuracy classes (P1 and P5) P1 = high P5 = standard, for most applications
Lubrication	Slides are pre-lubricated with "Paraliq P460"

Material specifications

Carriage & rail	Steel 1.4034
Balls	Steel 1.4034
End piece	Plastic
Cage	Plastic



LZM miniature slides

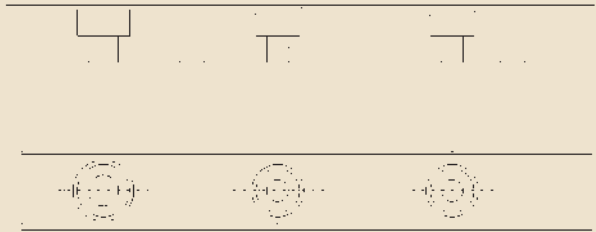


Type	W	W ₂	W ₃	L ₂	M ₁ x depth	d3 x d2 x h	H	H ₁	M ₂	F
	mm									
LZM HS 7	17	12	7	8	M2 x 2,5	2,5 x 4,5 x 2,5	8	2,35	M3	15
LZM HS 9	20	15	9	13	M3 x 3	3,5 x 6,0 x 3,5	10	3,55	M4	20
LZM HS 12	27	20	12	15	M3 x 3,5	3,5 x 6,0 x 4,5	13	4,7	M4	25
LZM HS 15	32	25	15	20	M3 x 4	3,5 x 6,0 x 4,5	16	6	M4	40

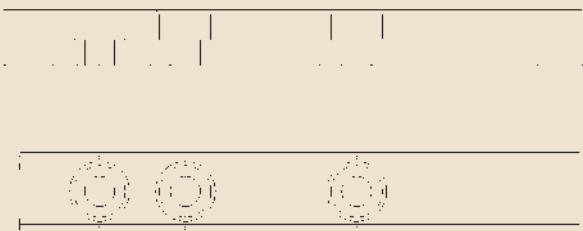
Type	L	L ₄	E	L ₁	max. stroke	Number of holes carriage rail		C	C ₀	Ma/Mb	Mc
	mm						-	N		Nm	
LZM HS 7	26	29	5,5	5	24	6	2	700	1 100	3,5	6
	34	37	9,5	5	34	8	2	900	1 400	5,5	7
	50	53	10	5	50	12	3	1 100	2 000	12	10
	66	69	10,5	5	66	16	4	1 400	2 700	21	14
LZM HS 9	32	35	8	9,5	28	4	2	1 200	1 800	7	12
	42	45	11	8	40	6	2	1 400	2 100	11	15
	55	58	7,5	8	54	8	3	1 900	3 400	18	19
	81	84	10,5	8	78	12	4	2 500	4 900	43	29
	94	97	7	8	92	14	5	2 700	5 500	57	33
LZM HS 12	37	40	6	11	32	4	2	2 200	3 300	11	21
	51	54	13	10,5	47	6	2	2 600	4 300	22	28
	66	69	8	10,5	62	8	3	3 000	5 300	36	36
	96	99	10,5	10,5	95	12	4	3 800	7 200	76	52
	126	129	13	10,5	122	16	6	4 700	9 700	131	68
LZM HS 15	52	56	6	12,5	50	4	2	2 800	3 900	25	42
	85	89	22,5	12,5	80	8	2	4 600	7 800	73	70
	105	109	12,5	12,5	102	10	3	5 100	9 100	106	84
	165	169	22,5	12,5	162	16	4	7 300	15 000	264	131

Order example: Miniatur slide unit Standard Size Length (L)
LZM HS 9 - 32

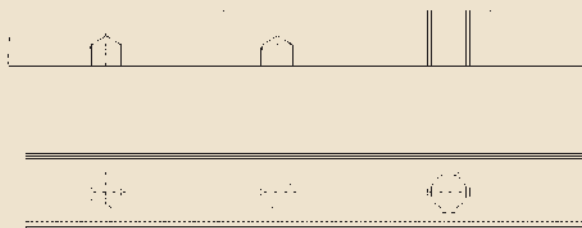
Special designs tailored to customer requirements



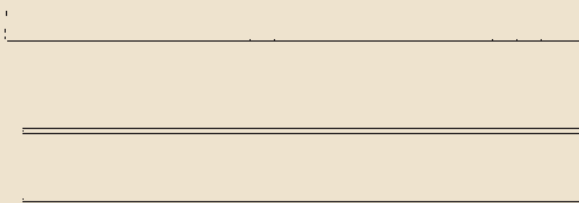
- different fastening holes (stepped holes) in terms of size and depth of holes relative to each other.



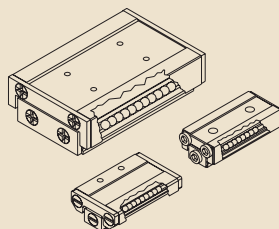
- variable hole distances



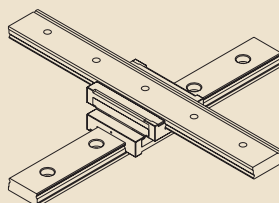
- blind holes and threads
- through holes or through threads



- without fixing bores for gluing of rail



- special design with limited stroke (without ball recirculation) according to customer request



- 90° cross arrangement in different sizes

Linear bearings and units



with SKF factory pre-
lubrication



The SKF factory pre-lubrication standard

SKF now offers pre-lubricated linear bearings as a standard greased at the factory. The pre-lubricated bearings will save assembly time by eliminating the need to grease the bearings. Due to factory calibrated grease fill, the reliability of the bearing will be improved. Using pre-lubricated bearings will reduce maintenance costs as well.

SKF linear ball bearings and units for shaft diameter 6 mm and greater are factory pre-lubricated¹⁾ by default²⁾. Due to the integrated grease reservoir and the use of SKF double-lip seals (2LS), most applications will not require relubrication because the theoretical relubrication interval exceeds the bearing life.

The linear bearings are lubricated with the high-performance SKF grease LGEP2.

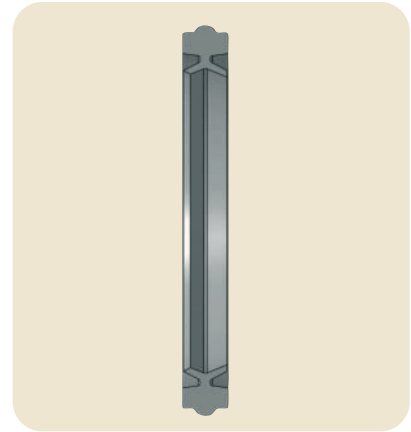
Our technical support as well as the technical handbook for linear bearings and units are available for further questions on the factory pre-lubrication.

Sealing

The double-lip seal ensures maintenance-free life for pre-lubricated bearings that operate under standard conditions. The integral seal has been designed specifically for linear bearings. The seal lips maintain full contact with the shaft while offering a superior sealing solution even when used with the shaft for the self-aligning linear bearings of the LBC series. The seals have also been optimized for low friction operation.

Lubricant

LGEP2 is an extreme pressure bearing grease from SKF for a wide range of industrial and automotive applications. Based on a lithium soap/mineral oil, the additives provide a good corrosion resistance and anti-wear protection. Special greases for food, clean room or high temperature environments are available upon request.



The double-lip sealing

¹⁾ as from July 2007

²⁾ linear ball bearings without factory pre-lubrication and preservative only can be ordered by using the suffix "/VT808", e.g. LBCR 20 A-2LS/VT808

Product overview - Linear bearings and units - Standard range

This catalogue covers SKF linear ball bearings, linear plain bearings and accessories that can be used to construct economic and simple linear guidance systems for a wide variety of applications. In cases where, for example, load conditions are such that these bearings and units cannot be used, other SKF linear guidance products and systems are available. For additional information regarding these other products and systems, contact your local SKF representative.

This publication includes series 1 and 3 linear ball bearings, manufactured to ISO 10285 and linear plain bearings with the same dimensions.

Series 1 linear ball bearings and units

Linear ball bearings (LBBR) in series 1 are compact and easy to mount. These bearings with or without seals are available in a standard version as well as a corrosion resistant version. Linear ball bearing units in this series, which include a bearing and housing, are available as single, or tandem units. Tandem units include duo and quadro versions.

Series 3 linear ball bearings and units

Series 3 linear ball bearings include the advanced cylindrical LBCR and LBCT design, the self-aligning LBCD and LBCF design and the LBHT design with extra high load carrying capacity. Any of the bearings in the ISO series 3 are available in a standard and corrosion resistant version,

with an integral double lip seal to provide maintenance-free operation under normal conditions. These linear ball bearings are interchangeable with all former SKF series 3 bearings.

Most series 3 linear bearing units are fitted as standard with self-aligning linear ball bearings to accommodate misalignment. Other designs are also available and can be found in the appropriate tables.

Series 3 linear plain bearings and units

LPAR and LPAT linear plain bearings are included in the series 3 size range.

NOTE: SKF linear ball bearings are coated with a corrosion inhibiting preservative. Before mounting non pre-greased linear bearings should be suitably lubricated.

Linear ball bearings

	Type	Size (mm)	Max load (N) dynamic / static	Comments	ISO series	Page No.
	LBBR	3 to 50	6 950 / 6 300		1	9
	LBCR	5 to 80	37 500 / 32 000		3	20
	LBCD	12 to 50	11 200 / 6 950	Self-aligning *	3	21
	LBCT	12 to 80	37 500 / 32 000		3	22
	LBCF	12 to 50	11 200 / 6 950	Self-aligning *	3	24
	LBHT	20 to 50	17 300 / 17 000		3	23

* Automatic compensation of shaft misalignments of up to max. ± 30 angular minutes.

Product overview - Linear bearings and units - Standard range

Linear plain bearings

	Type	Size (mm)	Max load (N) dynamic / static	Comments	ISO series	Page No.
	LPBR	12 to 50	10 800 / 38 000		1	11
	LPAR	5 to 80	29 000 / 100 000		3	28
	LPAT	12 to 80	29 000 / 100 000		3	28

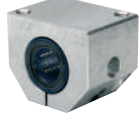
Linear bearing units

	LUHR	12 to 50	6 950 / 6 300	LBBR bearing	1	14
	LUJR	12 to 50	6 950 / 6 300	With shaft seals LBBR bearing	1	14
	LTBR	12 to 50	11 400 / 12 700	Tandem LBBR bearing	1	15
	LTDR	12 to 50	11 400 / 12 700	Duo LBBR bearing	1	16
	LQBR	12 to 50	18 600 / 25 500	Quadro LBBR bearing	1	17
	LUCR	8, 60, 80	37 500 / 32 000	LBCR bearing	3	31
	LUCD	12 to 50	11 200 / 6 950	LBCD bearing Self-aligning *	3	31

* Automatic compensation of shaft misalignments of up to max. ± 30 angular minutes.

Product overview - Linear bearings and units - Standard range

Linear bearing units

	Type	Size (mm)	Max load (N) dynamic / static	Comments	ISO series	Page No.
	LUCS	8, 60, 80	37 500 / 32 000	LBCR bearing	3	32
	LUCE	12 to 50	11 200 / 6 950	LBCD bearing Self-aligning *	3	32
	LUCT	60, 80	37 500 / 32 000	LBCT bearing	3	33
	LUCF	12 to 50	11 200 / 6 950	LBCF bearing Self-aligning *	3	33
	LUCT ... BH	20 to 50	17 300 / 17 000	LBHT bearing	3	34
	LUND	12 to 50	11 200 / 6 950	LBCD bearing Self-aligning *	3	35
	LUNE	12 to 50	11 200 / 6 950	LBCD bearing Self-aligning *	3	36
	LUNF	12 to 50	11 200 / 6 950	LBCF bearing Self-aligning *	3	37
	LVCR	12 to 80	37 500 / 32 000	LBCR bearing	3	38
	LTCD	12 to 50	18 300 / 14 000	Tandem LBCD bearing Self-aligning *	3	39
	LTCF	12 to 50	18 300 / 14 000	Tandem LBCF bearing Self-aligning *	3	40

* Automatic compensation of shaft misalignments of up to max. ± 30 angular minutes.

Product overview - Linear bearings and units - Standard range

Linear bearing units

	Type	Size (mm)	Max load (N) dynamic / static	Comments	ISO series	Page No.
	LQCR	8	1 290 / 1 420	Quadro LBCR bearing	3	41
	LQCD	12 to 50	30 000 / 28 000	Quadro LBCD bearing Self-aligning *	3	41
	LQCF	12 to 50	30 000 / 28 000	Quadro LBCF bearing Self-aligning *	3	42

Shaft blocks

	LSCS	8 to 80			1 / 3	44
	LSHS LSNS	12 to 50		LSHS ISO 1 LSNS ISO 3	1 / 3	45
	LEBS A LEAS ... A/B	12 to 50 8 to 50		Tandem LEBS A ISO 1 LEAS A/B ISO 3	1 / 3	46

Shafts and shaft supports

	LJ ...	3 to 80			1 / 3	53
	LRCB LRCC	12 to 80		LRCB (holes) LRCC (no holes)	3	47

Linear tables

	LZAU	12 to 50		Quadro "supported shaft" LBCF bearing	3	51
	LZBU ... A LZBU ... B	8 to 50		Quadro "A" = "moving unit" "B" = "moving shafts" LBCD bearing	3	49 50

* Automatic compensation of shaft misalignments of up to max. ± 30 angular minutes.

Linear ball bearings, ISO series 1

LBBR linear ball bearings

The LBBR is a patented SKF linear ball bearing that combines a plastic cage with hardened steel raceway segments to guide the ball sets. The bearing conforms to dimension series 1 according to ISO 10285.

The LBBR raceway segments have been designed to fully utilize the entire length of the load zone to increase bearing capacity and extend bearing service life.

The plastic cage has been redesigned to provide optimum performance. All ball recirculations are designed to offer no resistance to the cage on the running-in and runout

of the recirculation. The redesigned cage also accommodates larger balls to provide increased load capacity and service life.

The sealed variant is fitted with integral double lip seals. These seals have an inner lip to keep lubricant in the bearing; the outer lip acts like a wiper seal to keep contaminants out of the bearing.

Unsealed bearings are fitted with non-contacting shields to protect the bearing from large contaminant particles. LBBR linear ball bearings do not need to be secured axially in the housing provided the housing bore is sized correctly.

Stainless steel variant

LBBR linear ball bearings are also available with stainless steel balls and raceways for wet or corrosive environments. The stainless steel variant is identified by a HV6 suffix in the designation, e.g. LBBR 16-2LS/HV6. When used in combination with SKF stainless steel shafts, it is possible to create a guidance system made entirely of stainless steel.



Linear ball bearings – LBBR

- with raceway plates



Dimensions			No. of ball rows	Basic load ratings		Mass	Designations			
F _w	D	C		dyn. C	stat. C ₀		Linear ball bearings standard design	with 2 double lip seals	stainless steel standard design	with 2 double lip seals
mm			—	N		kg	—			
3	7	10	4	60	44	0,0007	LBBR 3 ²⁾	LBBR 3-2LS ²⁾	LBBR 3/HV6 ²⁾	LBBR 3-2LS/HV6 ²⁾
4	8	12	4	75	60	0,001	LBBR 4 ²⁾	LBBR 4-2LS ²⁾	LBBR 4/HV6 ²⁾	LBBR 4-2LS/HV6 ²⁾
5	10	15	4	170	129	0,002	LBBR 5 ²⁾	LBBR 5-2LS ²⁾	LBBR 5/HV6 ²⁾	LBBR 5-2LS/HV6 ²⁾
6	12	22 ¹⁾	4	335	270	0,006	LBBR 6A	LBBR 6A-2LS	LBBR 6A/HV6	LBBR 6A-2LS/HV6
8	15	24	4	490	355	0,007	LBBR 8	LBBR 8-2LS	LBBR 8/HV6	LBBR 8-2LS/HV6
10	17	26	5	585	415	0,011	LBBR 10	LBBR 10-2LS	LBBR 10/HV6	LBBR 10-2LS/HV6
12	19	28	5	695	510	0,012	LBBR 12	LBBR 12-2LS	LBBR 12/HV6	LBBR 12-2LS/HV6
14	21	28	5	710	530	0,013	LBBR 14	LBBR 14-2LS	LBBR 14/HV6	LBBR 14-2LS/HV6
16	24	30	5	930	630	0,018	LBBR 16	LBBR 16-2LS	LBBR 16/HV6	LBBR 16-2LS/HV6
20	28	30	6	1 160	800	0,021	LBBR 20	LBBR 20-2LS	LBBR 20/HV6	LBBR 20-2LS/HV6
25	35	40	7	2 120	1 560	0,047	LBBR 25	LBBR 25-2LS	LBBR 25/HV6	LBBR 25-2LS/HV6
30	40	50	8	3 150	2 700	0,070	LBBR 30	LBBR 30-2LS	LBBR 30/HV6	LBBR 30-2LS/HV6
40	52	60	8	5 500	4 500	0,130	LBBR 40	LBBR 40-2LS	LBBR 40/HV6	LBBR 40-2LS/HV6
50	62	70	9	6 950	6 300	0,18	LBBR 50	LBBR 50-2LS	LBBR 50/HV6	LBBR 50-2LS/HV6

The outside diameter tolerance of the linear ball bearings is such that no additional axial fixation is required when the bearings are fitted into a bore with a tolerance of J7 or J6.

Accessories for LBBR (shaft seals)



Appropriate special seals			
Dimensions			Designations
F _w	D	B ₁	
mm	—		
6	12	2	SP-6x12x2
8	15	3	SP-8x15x3
10	17	3	SP-10x17x3
12	19	3	SP-12x19x3
14	21	3	SP-14x21x3
16	24	3	SP-16x24x3
20	28	4	SP-20x28x4

Appropriate special seals			
Dimensions			Designations
F _w	D	B ₁	
mm	—		
25	35	4	SP-25x35x4
30	40	4	SP-30x40x4
40	52	5	SP-40x52x5
50	62	5	SP-50x62x5

¹⁾ Width 22 does not correspond to series 1 in ISO standard 10285.

²⁾ not factory pre-lubricated

Linear plain bearings, ISO series 1

LPBR linear plain bearings, which have the same dimensions as LBBR linear ball bearings, are made out of PAS-LX (Copolymeres Polyoxymethylen) with a special polyethylene to provide smooth, stick-slip-free operation. These linear plain bearings are self lubricating under normal conditions and require minimal maintenance. They have a high static load carrying capacity and are resistant to shock loads.

SKF recommends a light coating of lubricant during installation to improve the performance during the running-in period even if the bearings are to be used "lubricant-free".

LPBR linear plain bearings are intended for applications where there are heavy shock loads and/or vibrations or high accelerations and speeds when the bearing is unloaded. Under these operating conditions linear plain bearings provide longer service life than linear ball bearings. However, increased friction must be expected.



Linear plain bearings – LPBR

- closed design



LPBR

Dimensions				Basic load ratings			Mass	Designation
F_w	D -0,07	C	C_4	dyn. at 0,1 m/s C	4 m/s C	stat. C_0		Linear plain bearing
mm				N			kg	—
12	19,19	28	10	965	24	3 350	0,006	LPBR 12
14	21,21	28	12	1 370	34	4 750	0,007	LPBR 14
16	24,23	30	12	1 530	38	5 400	0,009	LPBR 16
20	28,24	30	13	2 080	52	7 350	0,011	LPBR 20
25	35,25	40	17	3 400	85	12 000	0,024	LPBR 25
30	40,27	50	20	4 800	120	17 000	0,033	LPBR 30
40	52,32	60	24	7 650	193	27 000	0,063	LPBR 40
50	62,35	70	27	10 800	270	38 000	0,088	LPBR 50

The outside diameter tolerance of the linear plain bearings is such that no additional axial fixation is required when the bearings are fitted into a bore with a tolerance of J7 or J6.

Accessories for LPBR (shaft seals)



SP

Appropriate special seals			
Dimensions			Designations
F_w	D	B_1	
mm	—		
12	19	3	SP-12x19x3
14	21	3	SP-14x21x3
16	24	3	SP-16x24x3
20	28	4	SP-20x28x4

Appropriate special seals			
Dimensions			Designations
F_w	D	B_1	
mm	—		
25	35	4	SP-25x35x4
30	40	4	SP-30x40x4
40	52	5	SP-40x52x5
50	62	5	SP-50x62x5

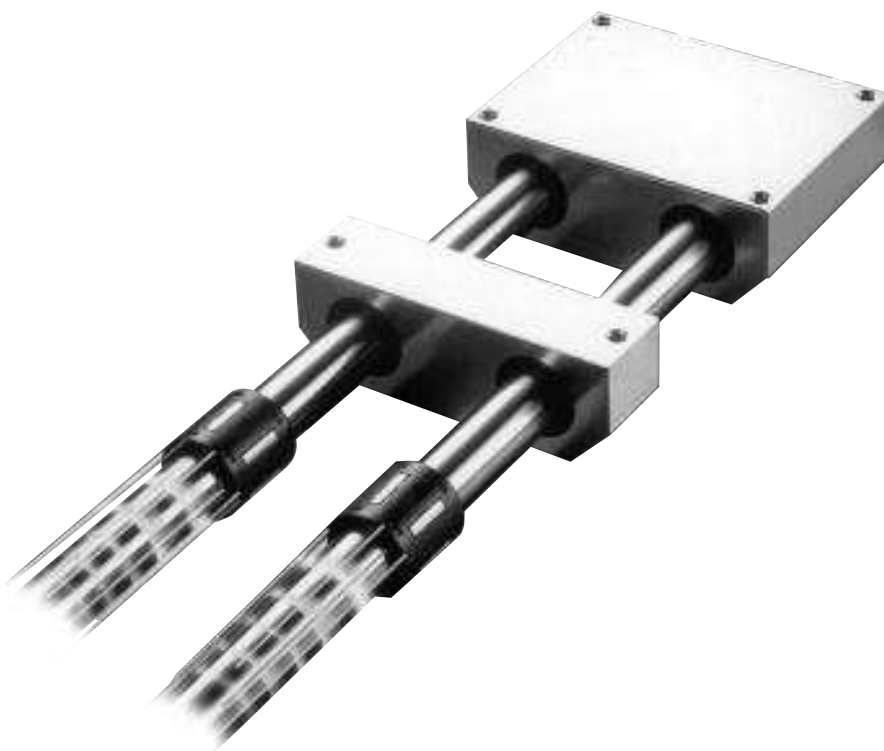
Linear bearing units, ISO series 1

Linear bearing units incorporating closed ISO series 1 bearings are available for applications where the shaft is only supported at each end. These cost-effective bearing units are extremely compact and can accommodate loads exceeding 25 000 N (e.g. LQBR 50-2LS; see also page 17).

The maximum permissible angular misalignment is 15 minutes of arc. When fitted with double lip seals, LBBR bearings enable these units to operate without relubrication, under normal operating conditions (see page 3).

For corrosive or wet environments, SKF recommends stainless steel shafting and either aluminium housings with stainless steel linear ball bearings e.g. LBBR 20-2LS/HV6 or aluminium housings fitted with plain bearings.

Shafting cut to length is available. For additional information, see the chapter "Precision shafts", page 52.



LUHR/LUJR linear bearing units consist of a housing of extruded aluminium and the compact LBBR linear ball bearing or the LPBR linear plain bearing of similar dimensions.

The LUHR design, for shaft diameters from 12 to 50 mm, is available fitted as standard with LBBR linear ball bearings with or without integrated seals or with LPBR linear plain bearings (designation LUHR ... PB).

For highly contaminated environments, extended LUJR linear bearing units are available. These incorporate LBBR linear ball bearings and two SP-type shaft seals. LUHR and LUJR linear bearing units cannot be relubricated.

LTBR tandem linear bearing units consist of a one-piece extruded aluminium housing and two LBBR linear ball bearings mounted one behind the other. These units are fitted with sealed bearings as standard and cannot be relubricated. They are particularly suitable for tables or slides of any width.

LTDR duo linear bearing units are characterised by an aluminium housing that contains two LBBR-2LS linear ball bearings in parallel. The space between the two bearings and the duo configuration permits easy fitting of a linear drive.

LQBR quadro linear bearing units – contain four (4) LBBR linear ball bearings within a sealed aluminium housing. The duo configuration and the space between the bearings permit the fitting of a linear drive. Duo and quadro linear bearing units based on LBBR linear ball bearings can be used to make compact, simple table configurations. For suitable shaft blocks (LEBS), see page 46.



LTDR



LQBR



LUJR



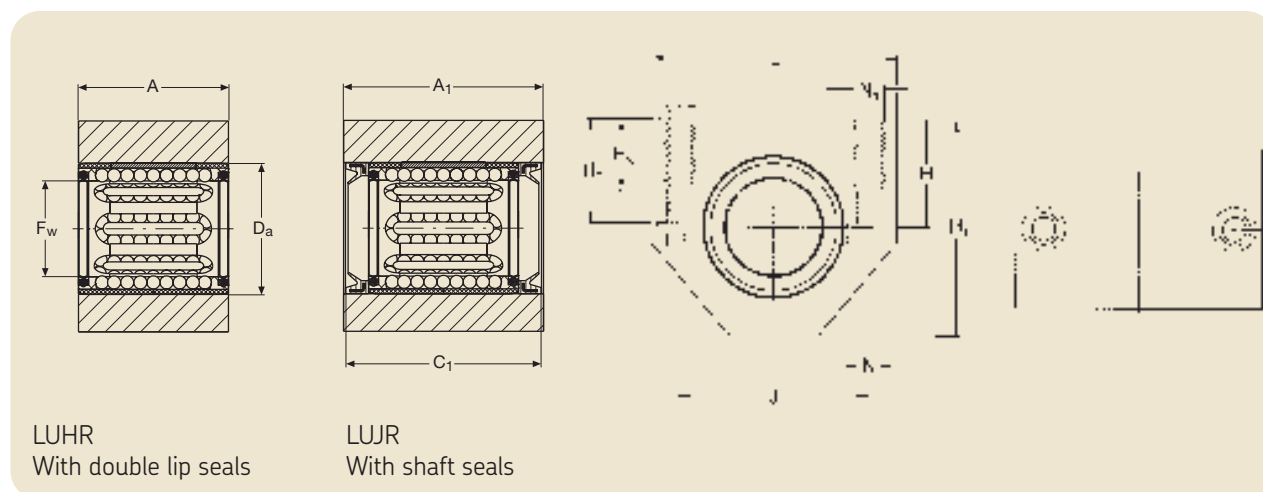
LUHR



LTBR

Linear bearing units – LUHR/LUJR

- with closed housing and LBBR linear ball bearings



Dimensions														Basic load ratings		Mass		Designations		
F _w	A	A ₁	C ₁	D _a	H ±0,01	H ₁	H ₂	H ₃	L	J	N ¹⁾	N ₁ ¹⁾	dyn. C	stat. C ₀	Design LUHR	LUJR	Linear bearing unit			
																	without seal	with double lip seal	with shaft seals	
mm														—	N	kg				
12	28	35	34	19	17	33	16	11	40	29	4,3	M 5	695	510	0,08	0,10	LUHR 12	LUHR 12-2LS	LUJR 12	
16	30	37	36	24	19	38	18	11	45	34	4,3	M 5	930	630	0,10	0,12	LUHR 16	LUHR 16-2LS	LUJR 16	
20	30	39	38	28	23	45	22	13	53	40	5,3	M 6	1 160	800	0,14	0,18	LUHR 20	LUHR 20-2LS	LUJR 20	
25	40	49	48	35	27	54	26	18	62	48	6,6	M 8	2 120	1 560	0,25	0,30	LUHR 25	LUHR 25-2LS	LUJR 25	
30	50	59	58	40	30	60	29	18	67	53	6,6	M 8	3 150	2 700	0,37	0,44	LUHR 30	LUHR 30-2LS	LUJR 30	
40	60	71	70	52	39	76	38	22	87	69	8,4	M 10	5 500	4 500	0,74	0,86	LUHR 40	LUHR 40-2LS	LUJR 40	
50	70	81	80	62	47	92	46	26	103	82	10,5	M 12	6 950	6 300	1,19	1,37	LUHR 50	LUHR 50-2LS	LUJR 50	

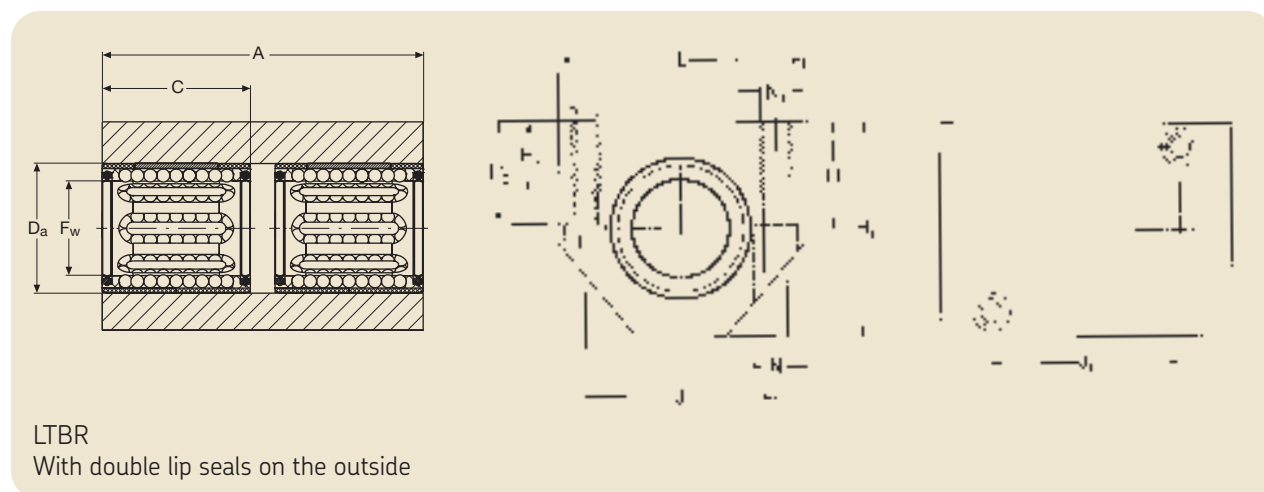
For suitable shaft blocks for these bearing units, designation LSHS, see page 45.

Linear bearing units of the LUHR design are also available fitted with LPBR linear plain bearings.
Designations: e. g. LUHR 20 PB.

¹⁾ For screws with internal hexagon to DIN 912 / ISO 4762.

Tandem linear bearing units – LTBR

- with closed housing and LBBR linear ball bearings



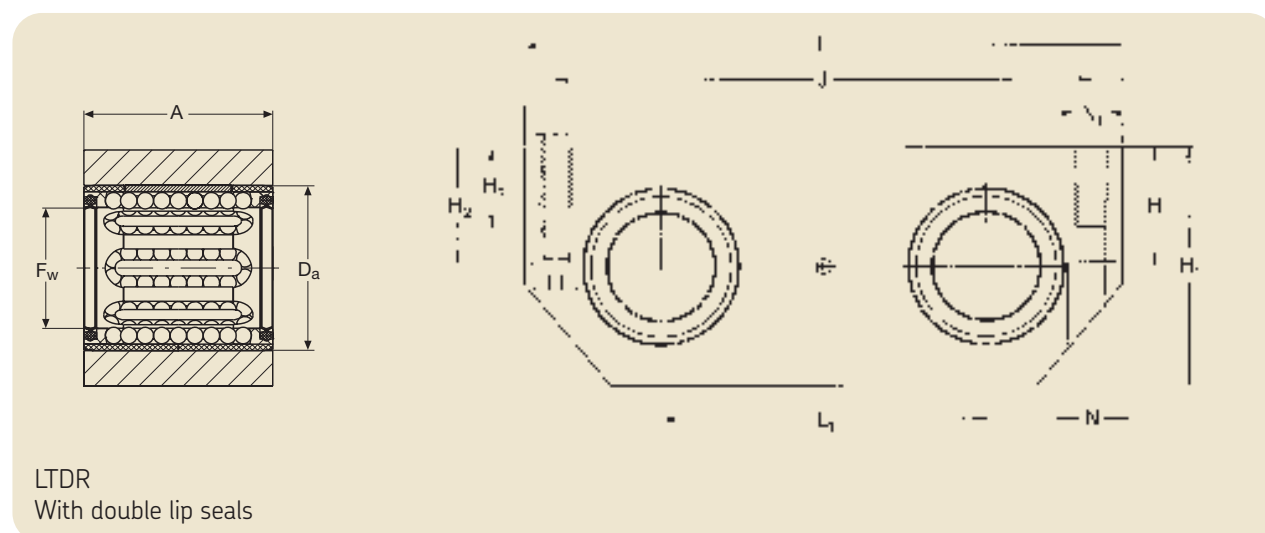
Dimensions														Basic load ratings		Mass	Designations
F _w	A	C	D _a	H ±0,01	H ₁	H ₂	H ₃	J	J ₁	L	N ¹⁾	N ₁ ¹⁾	C	C ₀			Linear bearing unit with double lip seals
mm																kg	
12	60	28	19	17	33	16	11	29	35	40	4,3	M 5	1 140	1 020	0,17		LTBR 12-2LS
16	65	30	24	19	38	18	11	34	40	45	4,3	M 5	1 530	1 270	0,22		LTBR 16-2LS
20	65	30	28	23	45	22	13	40	45	53	5,3	M 6	1 900	1 600	0,31		LTBR 20-2LS
25	85	40	35	27	54	26	18	48	55	62	6,6	M 8	3 450	3 150	0,54		LTBR 25-2LS
30	105	50	40	30	60	29	18	53	70	67	6,6	M 8	5 200	5 400	0,80		LTBR 30-2LS
40	125	60	52	39	76	38	22	69	85	87	8,4	M 10	9 000	9 000	1,57		LTBR 40-2LS
50	145	70	62	47	92	46	26	82	100	103	10,5	M 12	11 400	12 700	2,51		LTBR 50-2LS

For suitable shaft blocks for these bearing units, designation LSHS, see page 45.

¹⁾ For screws with internal hexagon to DIN 912 / ISO 4762.

Duo linear bearing units – LTDR

- with closed housing and LBBR linear ball bearing



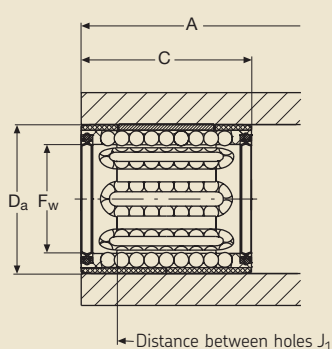
Dimensions												Basic load ratings		Mass	Designations
F_w	A	D_a	$H_{\pm 0,01}$	H_1	H_2	H_3	J	L	L_1	$N^{1)}$	$N_1^{1)}$	C	C_0		Linear bearing unit with double lip seals
mm												N		kg	
12	28	19	15	30	14	11	69	80	40	4,3	M 5	1 140	1 020	0,15	LTDR 12-2LS
16	30	24	17,5	35	16,5	11	86	96	52	4,3	M 5	1 530	1 270	0,22	LTDR 16-2LS
20	30	28	20	40	19	13	103	115	63	5,3	M 6	1 900	1 600	0,30	LTDR 20-2LS
25	40	35	25	50	24	18	123	136	75	6,6	M 8	3 450	3 150	0,58	LTDR 25-2LS
30	50	40	28	56	27	18	133	146	80	6,6	M 8	5 200	5 400	0,85	LTDR 30-2LS
40	60	52	35	70	34	22	166	184	97	8,4	M 10	9 000	9 000	1,56	LTDR 40-2LS
50	70	62	40	80	39	26	189	210	107	10,5	M 12	11 400	12 700	2,21	LTDR 50-2LS

For suitable shaft blocks for these bearing units, short designation LEBS ... A, see page 46.

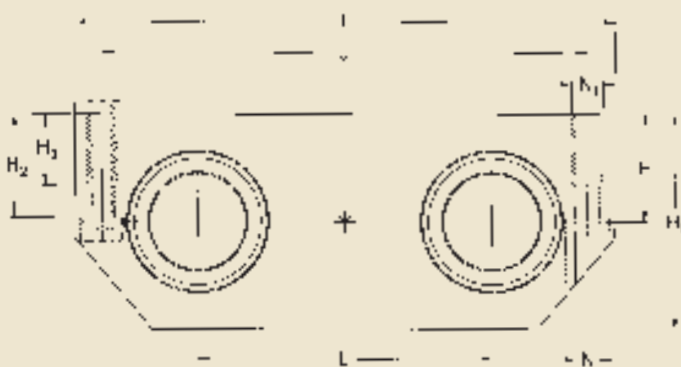
¹⁾ For screws with internal hexagon to DIN 912 / ISO 4762 at the centre (0,5 A) of the linear bearing unit.

Quadro linear bearing units – LQBR

- with closed housing and LBBR linear ball bearing

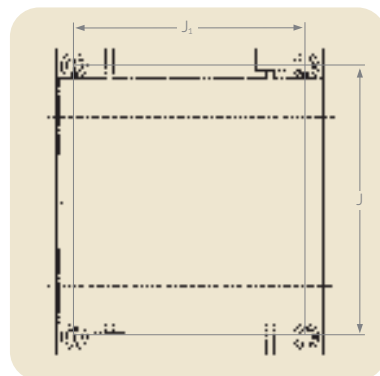


LQBR
With double lip seals on the outside



Dimensions														Basic load ratings		Mass	Designations
F_w	A	C	D_a	$H_{\pm 0,01}$	H_1	H_2	H_3	J	J_1	L	L_1	$N^{1)}$	$N_1^{1)}$	C	C_0	kg	Linear ball bearing unit with double lip seals
mm														N			—
12	70	28	19	15	30	14	11	69	59	80	40	4,3	M 5	1 860	2 040	0,38	LQBR 12-2LS
16	80	30	24	17,5	35	16,5	11	86	70	96	52	4,3	M 5	2 500	2 550	0,57	LQBR 16-2LS
20	85	30	28	20	40	19	13	103	73	115	63	5,3	M 6	3 100	3 200	0,82	LQBR 20-2LS
25	100	40	35	25	50	24	18	123	87	136	75	6,6	M 8	5 600	6 300	1,43	LQBR 25-2LS
30	130	50	40	28	56	27	18	133	117	146	80	6,6	M 8	8 500	10 800	2,15	LQBR 30-2LS
40	150	60	52	35	70	34	22	166	132	184	97	8,4	M 10	14 600	18 000	3,83	LQBR 40-2LS
50	175	70	62	40	80	39	26	189	154	210	107	10,5	M 12	18 600	25 500	5,40	LQBR 50-2LS

For suitable shaft blocks for these bearing units, designation LEBS ... A, see page 46.



¹⁾For 4 screws with internal hexagon to DIN 912 / ISO 4762.

Linear ball bearings, ISO series 3

LBC linear ball bearings, with their high load carrying capacity, are available for shaft diameters from 5 to 80 mm. As with all SKF linear ball bearings, they are available with a choice of seals or shields. 5 and 8 mm LBC linear ball bearings that are full contained within their housings, are self-retaining so that no additional axial location is required under normal operating conditions.

All LBC linear ball bearings are generally designed for grease lubrication. Sizes from 12-80 mm feature cages with a through-bored radial hole to accommodate a grease fitting, which provides longitudinal and axial fixation. Grease may be applied directly to the shaft or bearing via this hole. For the relubrication of LBHT linear ball bearings the housing must be provided with a grease distribution channel in the bore or housing. The grease is then forced onto the raceway between the load carrying plates. Information on the location of these attachment holes and grease fittings is shown on pages 25 and 26.

Stainless steel variant

LBC linear ball bearings are also available with stainless steel balls and raceways for wet or corrosive environments. The stainless steel variant is identified by adding a HV6 suffix to the designation e.g. LBCR 16-2LS/HV6. When used in combination with SKF stainless steel shafts, it is possible to create a guidance system made entirely of stainless steel.

LBCR linear ball bearings consist of a cage and raceway segments to guide the balls and either seals or shields. By virtue of their exceptionally long track length and the machined raceway oscillation, they are able to accommodate heavy loads.

LBCR linear ball bearings, with their optimised raceway segments and position for maximum load carrying capacity, can be mounted in closed as well as adjustable housings. When these bearings are mounted in a closed housing, the tolerance of the inscribed diameter of the ball set and hence the operating clearance is determined by the tolerance of the housing bore. When mounted in slotted housings the linear guides can be adjusted to provide either operating clearance or preload depending on the needs of the application. LBCR linear ball bearings must be located in the axial direction, for example via the grease fitting or a fixation pin.



LBCD linear ball bearings are a variant of the LBCR design. The primary feature of this bearing is its self-aligning capability that accommodates tilting of the whole bearing through an angle of ± 30 minutes of arc. This tilting feature compensates for misalignment, which may be caused by inaccuracies in fitting or manufacturing (housing bore diameter), or by significant bending of an unsupported shaft. The self-aligning feature cannot, however, compensate for two non-parallel shafts in an assembly. The cage, seals and shields have been optimized to accommodate the self-aligning feature so that the bearing and especially the shields or seals remain concentric with the shaft.

All other characteristics of the LBCR linear ball bearings are also valid for the self-aligning LBCD design. LBCD linear ball bearings must always be firmly fixed in the axial direction.

LBCT and LBHT linear ball bearings are used in applications where several shaft supports, or a continuous shaft support is needed to prevent shaft bending. Due to the open design of the LBCT bearing, one raceway segment is eliminated. However, this does not have a significant effect on its load carrying capacity. The raceway segments of the LBHT however, have been optimized so that it has the same number of raceway segments as a closed design bearing.

Both the LBCT and the LBHT are available for shaft diameters ranging from 20 to 50 mm. Unlike other open design linear ball bearings, these bearings feature a shoulder in the cage on each side of the opening which acts like a gap-type seal. Open designed LBCT/LBHT linear ball bearings must always be fixed to prevent axial and turning movements.

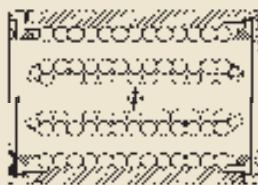
LBCF linear ball bearings are a self-aligning version of the LBCT design. These bearings are available in sizes ranging from 12 to 50 mm. LBCF linear ball bearings must always be fixed to prevent axial and turning movements.

Linear ball bearings – LBCR

- closed design



LBCR
With shields



LBCR
With double lip seals



Dimensions				No. of ball rows	Basic load ratings		Mass	Designations	
F_w	D	C	C_3		dyn. C	stat. C_0		Linear ball bearing with 2 shields	2 double lip seals
mm				—	N		kg		
5	12	22	12	4	280	210	0,005	LBCR 5 ¹⁾	LBCR 5- 2LS ¹⁾
8	16	25	14	4	490	355	0,009	LBCR 8	LBCR 8- 2LS
12	22	32	20	6	1 160	980	0,016	LBCR 12 A	LBCR 12 A-2LS
16	26	36	22	6	1 500	1 290	0,021	LBCR 16 A	LBCR 16 A-2LS
20	32	45	28	7	2 240	2 040	0,043	LBCR 20 A	LBCR 20 A-2LS
25	40	58	40	7	3 350	3 350	0,085	LBCR 25 A	LBCR 25 A-2LS
30	47	68	48	7	5 600	5 700	0,13	LBCR 30 A	LBCR 30 A-2LS
40	62	80	56	7	9 000	8 150	0,26	LBCR 40 A	LBCR 40 A-2LS
50	75	100	72	7	13 400	12 200	0,46	LBCR 50 A	LBCR 50 A-2LS
60	90	125	95	7	20 400	18 000	0,82	LBCR 60 A	LBCR 60 A-2LS
80	120	165	125	7	37 500	32 000	1,9	LBCR 80 A	LBCR 80 A-2LS

Upon request these bearings are available in stainless steel execution.

Designation: e.g. LBCR 20 A-2LS/HV6

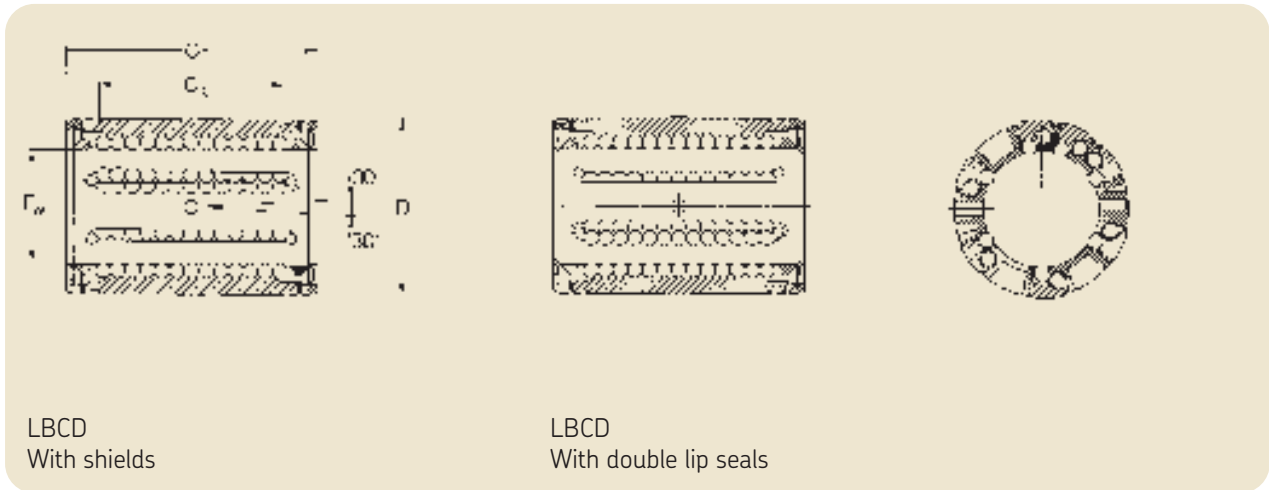
Linear ball bearings with one seal are available on request.

¹⁾ not factory pre-lubricated

For axial location and protection against relative motion see pages 25/26.

Linear ball bearings – LBCD

- self aligning and closed design



Dimensions				No. of ball rows	Basic load ratings		Mass	Designations	
F_w	D	C	C_3		dyn. C	stat C_0		Linear ball bearings with 2 shields	2 double lip seals
mm				—	N		kg		
12	22	32	20	6	1 080	815	0,015	LBCD 12 A	LBCD 12 A-2LS
16	26	36	22	6	1 320	865	0,020	LBCD 16 A	LBCD 16 A-2LS
20	32	45	28	7	2 000	1 370	0,042	LBCD 20 A	LBCD 20 A-2LS
25	40	58	40	7	2 900	2 040	0,083	LBCD 25 A	LBCD 25 A-2LS
30	47	68	48	7	4 650	3 250	0,13	LBCD 30 A	LBCD 30 A-2LS
40	62	80	56	7	7 800	5 200	0,26	LBCD 40 A	LBCD 40 A-2LS
50	75	100	72	7	11 200	6 950	0,44	LBCD 50 A	LBCD 50 A-2LS

Upon request these bearings are available in stainless steel execution.

Designation: e.g. LBCD 20 A-2LS/HV6

Linear ball bearings with one seal are available on request.

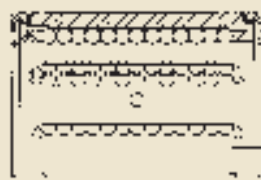
For axial location and protection against relative motion see pages 25/26.
Retaining rings according to DIN 471.

Linear ball bearings – LBCT

- open design



LBCT
With shields



LBCT
With double lip seals



Dimensions						No. of ball rows	Basic load ratings		Mass	Designations	
F_w	D	C	C_3	$E^{1)}$	α		dyn. C	stat. C_0		Linear ball bearing with 2 shields	2 double lip seals
mm					Deg.	—	N		kg		
12	22	32	20	7,6	78	5	1 160	980	0,013	LBCT 12 A	LBCT 12 A-2LS
16	26	36	22	10,4	78	5	1 500	1 290	0,017	LBCT 16 A	LBCT 16 A-2LS
20	32	45	28	10,8	60	6	2 240	2 040	0,036	LBCT 20 A	LBCT 20 A-2LS
25	40	58	40	13,2	60	6	3 350	3 350	0,071	LBCT 25 A	LBCT 25 A-2LS
30	47	68	48	14,2	50	6	5 600	5 700	0,114	LBCT 30 A	LBCT 30 A-2LS
40	62	80	56	18,7	50	6	9 000	8 150	0,23	LBCT 40 A	LBCT 40 A-2LS
50	75	100	72	23,6	50	6	13 400	12 200	0,39	LBCT 50 A	LBCT 50 A-2LS
60	90	125	95	29,6	54	6	20 400	18 000	0,72	LBCT 60 A	LBCT 60 A-2LS
80	120	165	125	38,4	54	6	37 500	32 000	1,67	LBCT 80 A	LBCT 80 A-2LS

Upon request these bearings are available in stainless steel execution.

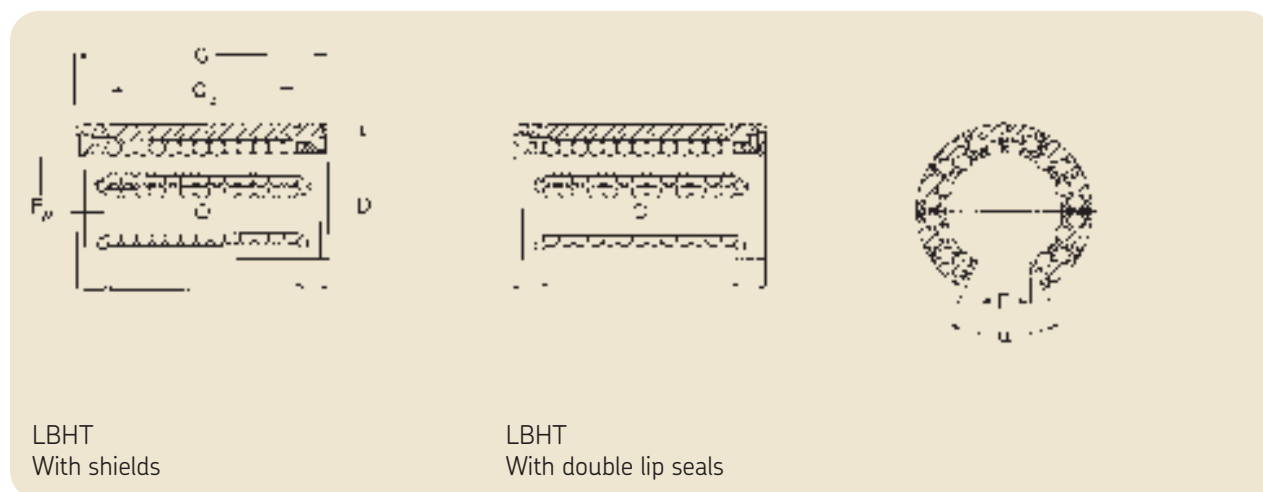
Designation: e.g. LBCT 20 A-2LS/HV6

Linear ball bearings with one seal are available on request.

¹⁾Smallest sector width for diameter F_w . For axial location and protection against relative motion see pages 25/26.

Linear ball bearings – LBHT

- open design, for heavy duty



Dimensions						No. of ball rows	Basic load ratings		Mass	Designations	
F_w	D	C	C_3	$E^{1)}$	α		dyn. C	stat. C_0		Linear ball bearing with 2 shields	2 double lip seals
mm					Deg.	—	N		kg		
20	32	45	28	10,8	60	8	2 650	2 650	0,043	LBHT 20 A	LBHT 20 A-2LS
25	40	58	40	13,2	60	9	4 900	5 100	0,095	LBHT 25 A	LBHT 25 A-2LS
30	47	68	48	14,2	50	10	7 200	8 000	0,16	LBHT 30 A	LBHT 30 A-2LS
40	62	80	56	18,7	50	10	11 600	11 400	0,33	LBHT 40 A	LBHT 40 A-2LS
50	75	100	72	23,6	50	10	17 300	17 000	0,56	LBHT 50 A	LBHT 50 A-2LS

Upon request these bearings are available in stainless steel execution.

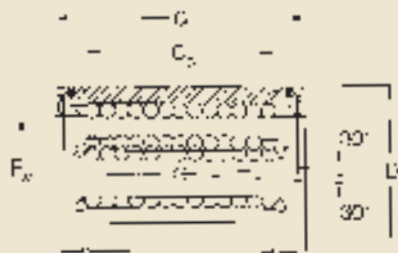
Designation: e.g. LBHT 20 A-2LS/HV6

Linear ball bearings with one seal are available on request.

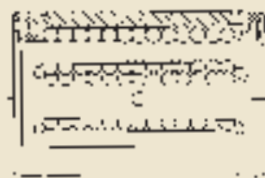
¹⁾ Smallest sector width for diameter F_w . For axial location and protection against relative motion see pages 25/26.

Linear ball bearings – LBCF

- self-aligning and open design



LBCF
With shields



LBCF
With double lip seals



Dimensions						No. of ball rows	Basic load ratings		Mass	Designations	
F _w	D	C	C ₃	E ¹⁾	α		dyn. C	stat. C ₀		Linear ball bearing with 2 shields	2 double lip seals
mm					Deg.	—	N		kg		
12	22	32	20	7,6	78	5	1 080	815	0,012	LBCF 12 A	LBCF 12 A-2LS
16	26	36	22	10,4	78	5	1 320	865	0,016	LBCF 16 A	LBCF 16 A-2LS
20	32	45	28	10,8	60	6	2 000	1 370	0,035	LBCF 20 A	LBCF 20 A-2LS
25	40	58	40	13,2	60	6	2 900	2 040	0,07	LBCF 25 A	LBCF 25 A-2LS
30	47	68	48	14,2	50	6	4 650	3 250	0,11	LBCF 30 A	LBCF 30 A-2LS
40	62	80	56	18,7	50	6	7 800	5 200	0,22	LBCF 40 A	LBCF 40 A-2LS
50	75	100	72	23,6	50	6	11 200	6 950	0,37	LBCF 50 A	LBCF 50 A-2LS

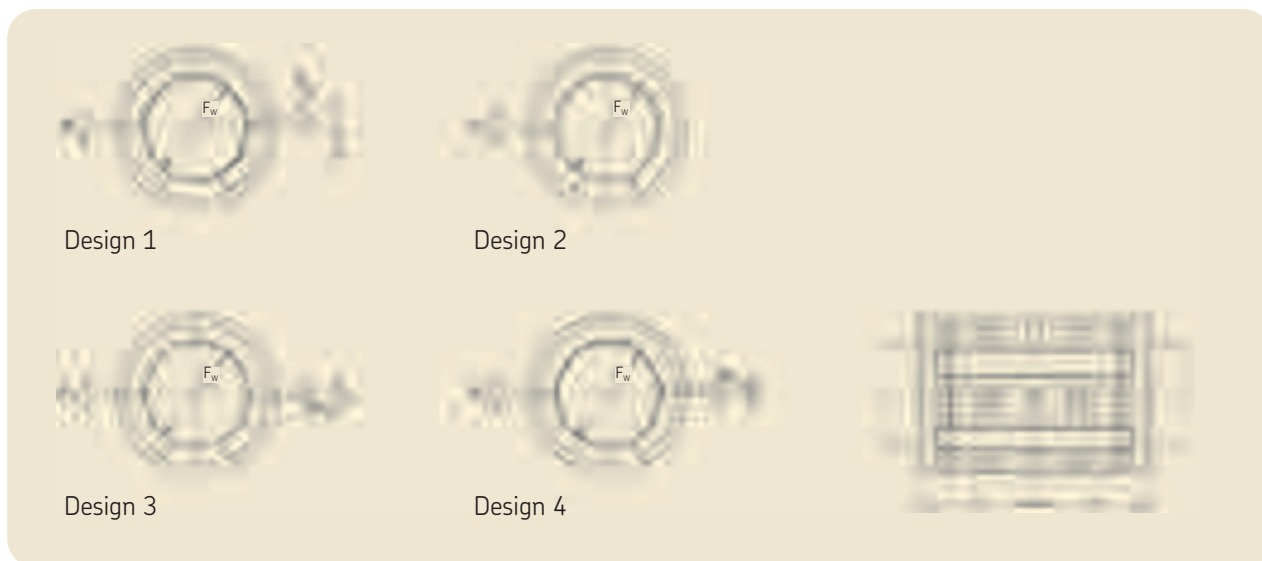
Upon request these bearings are available in stainless steel execution.
Designation: e.g. LBCF 20 A-2LS/HV6

Linear ball bearings with one seal are available on request.

¹⁾ Smallest sector width for diameter F_w. For axial location and protection against relative motion see pages 25/26.

Axial and rotational fixation

- for LBC and LPA linear bearings



Dimensions				Design ¹⁾	Appropriate grease nipples ²⁾	Grub screws ³⁾	Pins ⁴⁾
F_w	K_1 ⁷⁾	K_2 ⁸⁾	s				Diameter
mm							mm
5 ⁶⁾	-	-	-	-	-	-	-
8 ⁶⁾	-	-	-	-	-	-	-
12	3,0	3,0	-	1	VN-LHC 20	M 4	3
16	3,0	-	-	2	VN-LHC 20	M 4	3
20	3,0	-	-	2	VN-LHC 20	M 4	3
25	3,5	3,0	1,5	3	VN-LHC 40	M 5	3 / 3,5
30	3,5	3,0	2	4	VN-LHC 40	M 5	3 / 3,5
40	3,5	3,0	1,5	4	VN-LHC 40	M 5	3 / 3,5
50	4,5	5,0	2,5	4	VN-LHC 50	M 6	5 / 4,5
60	6,0	2,5	5	4	VN-LHC 80	M 8	6 ⁵⁾
80	8,0	2,5	5	4	VN-LHC 80	M 8	8 ⁵⁾

¹⁾ All linear plain bearings of Design 2

²⁾ Recommendations for holes to take grease nipples: see page 26.

³⁾ Grub screws according to DIN 417 and ISO 7435 or DIN 915 and ISO 4028.

⁴⁾ Straight pins according to DIN 7, slotted pins - DIN 1481 or grooved pins - DIN 1470 and DIN 1471.

⁵⁾ Grub screw according to DIN 551 / ISO 4766 or DIN 913 / ISO 4026.

⁶⁾ Linear ball bearings are self-retaining when mounted in housings of at least bearing length.

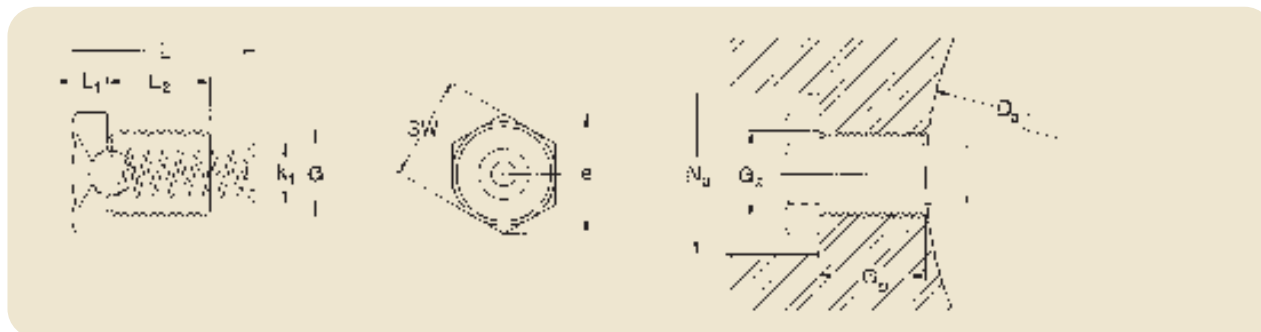
Retaining rings are required with shorter housings.

⁷⁾ For relubrication as well as location of linear bearing in SKF housings.

⁸⁾ Alternative bore hole for location in specific housings from other manufacturers.

Grease nipples

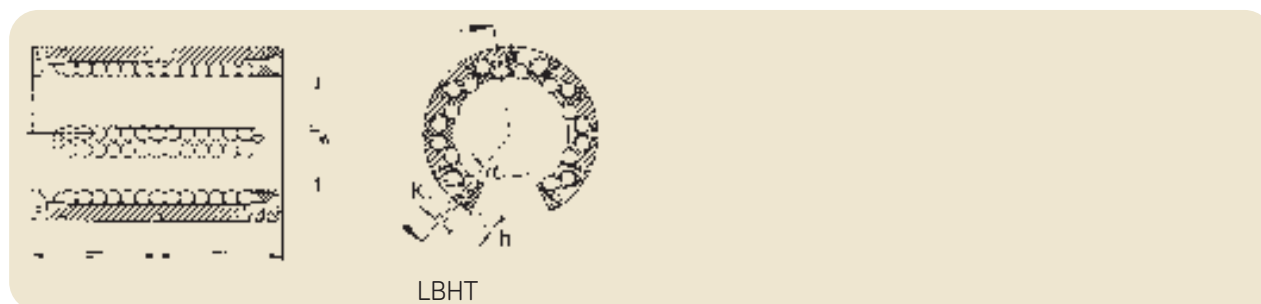
- for LBC and LPA linear bearings



Dimensions								Designations	Attachment dimensions			
Bearing	Grease nipple							Grease nipple	Housing			
F _w	G	L	L ₁	L ₂	k ₁	e	SW		D _a	G _a	G _b ±0,2	N _a
mm	—	mm						—	mm	—	mm	
12	M 4	7,7	1,5	3,5	3,0	5,5	5	VN-LHC 20	22	M 4	3,8	13
16	M 4	7,7	1,5	3,5	3,0	5,5	5	VN-LHC 20	26	M 4	3,8	13
20	M 4	7,7	1,5	3,5	3,0	5,5	5	VN-LHC 20	32	M 4	3,8	13
25	M 5	11,1	2,0	5,0	3,5	6,6	6	VN-LHC 40	40	M 5	5,2	15
30	M 5	11,1	2,0	5,0	3,5	6,6	6	VN-LHC 40	47	M 5	5,2	15
40	M 5	11,1	2,0	5,0	3,5	6,6	6	VN-LHC 40	62	M 5	5,2	15
50	M 6	14,8	2,5	7,0	4,5	7,8	7	VN-LHC 50	75	M 6	7,2	15
60	M 8	20,5	3,5	10,5	6	11,1	10	VN-LHC 80	90	M 8	11,2	18
80	M 8	20,5	3,5	10,5	6	11,1	10	VN-LHC 80	120	M 8	5,2	18

Axial and rotational fixation

- for LBHT linear ball bearings



Dimensions				Appropriate grub screws nach DIN 417 or DIN 915	Dimensions				Appropriate grub screws nach DIN 417 or DIN 915
F _w	K ₁	h	α ₁		F _w	K ₁	h	α ₁	
mm			degrees	—					
20	2,6 ± 0,05	1,3 ± 0,2	47°	M 4	50	4,1 ± 0,05	1,8 ± 0,3	39°	M 6
25	2,6 ± 0,05	1,3 ± 0,2	55° 12'	M 4					
30	3,6 ± 0,05	1,4 ± 0,2	39° 15'	M 5					
40	3,6 ± 0,05	1,4 ± 0,2	38° 51'	M 5					

Linear plain bearings, ISO series 3

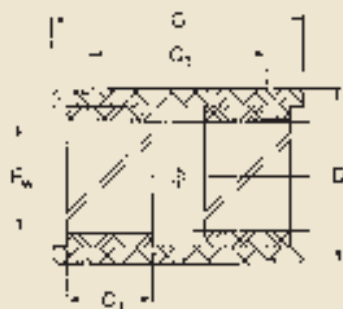
LPAR and LPAT linear plain bearings have the same external dimensions as LBC linear ball bearings. These bearings, which do not have seals or shields, are available in diameters ranging from 5 to 80 mm (LPAR) and from 12 to 80 mm (LPAT).

All variants, except for LPAR 5 and 8 can be relubricated. Bearings without a grease fitting should be held in place by a retaining ring (according to DIN 471) on either side of the bearing. Bearings with a grease fitting can be fixed via the grease fitting.



Linear plain bearings – LPAR/LPAT

- closed and open design



LPAR



LPAR
closed



LPAT
open

Dimensions							Basic load ratings			Mass		Designations	
F_w	D -0,05	C	C_3	C_4	$E^{1)}$	α	dyn. at 0,1 m/s C	4 m/s C	stat. C_0	Design closed	open	Linear plain bearing closed	open
mm						Deg.	N			kg		—	
5	12	22	12	7	-	-	280	7	980	0,003	-	LPAR 5	-
8	16	25	14	8	-	-	510	13	1 800	0,005	-	LPAR 8	-
12	22	32	20	10	7,6	78	965	24	3 350	0,012	0,008	LPAR 12	LPAT 12
16	26	36	22	12	10,4	78	1 530	38	5 400	0,016	0,012	LPAR 16	LPAT 16
20	32	45	28	15	10,8	60	2 400	60	8 300	0,03	0,023	LPAR 20	LPAT 20
25	40	58	40	20	13,2	60	4 000	100	14 000	0,06	0,045	LPAR 25	LPAT 25
30	47	68	48	23	14,2	50	5 500	137	19 300	0,09	0,07	LPAR 30	LPAT 30
40	62	80	56	25	18,7	50	8 000	200	28 000	0,20	0,15	LPAR 40	LPAT 40
50	75	100	72	30	23,6	50	12 000	300	41 500	0,34	0,26	LPAR 50	LPAT 50
60	90	125	95	35	29,6	54	16 600	415	60 000	0,63	0,46	LPAR 60	LPAT 60
80	120	165	125	45	38,4	54	29 000	720	100 000	1,50	1,10	LPAR 80	LPAT 80

¹⁾ Smallest sector width for diameter F_w .
For axial location and protection against relative motion see pages 25/26.

Linear bearing units, ISO series 3

A comprehensive range of linear ball bearing and plain bearing units are available. In addition to the basic design housing containing a single bearing, flanged units are also available as/or tandem and quadro units.

Linear bearing units consist of a light-weight, cast aluminium housing that has been optimized to provide high strength and stiffness. Due to their light weight, acceleration and inertia forces are kept to a minimum. LUC linear bearing units are available for shaft diameters ranging from 8 to 80 mm.

LUCD/LUCR linear bearing units offer a simple means of creating an economical linear guidance system. LUCD linear bearing units (for shaft diameters ranging from 12 to 80 mm) are normally supplied with a self-aligning LBCD shielded linear ball bearing. LUCR linear bearing units (for shaft diameters ranging from 8 to 80 mm) are supplied with a rigid LBCR shielded linear ball bearing. A grease fitting serves to retain the bearing axially and prevent it from turning. These units are also

available fitted with LPAR linear plain bearings (designation LUCR ... PA) on request. Units fitted with an 8 mm diameter LPAR linear plain bearing cannot be relubricated. Therefore, these bearings should be axially located with retaining rings. The designation of these units is:

LUCR/LUCR ... PA.



LQCR



LTCF



LUND



LUCF



LUCE



LVCR

LUCE/LUCS linear bearing units are similar in design to the LUCD/LUCR units but instead of a closed housing, these units have an open housing with an adjustment screw. These units are typically used for arrangements requiring zero clearance or preload.

LUCE/LUCD linear ball bearing units are supplied with self-aligning LBCD linear ball bearings. LUCS/LUCR linear ball bearing units are supplied with rigid LBCR linear ball bearings. These units are not available with linear plain bearings.

LUCF/LUCT linear bearing units are designed for applications where, because of heavy loads and/or long guidance lengths, the shaft must be supported either partially or along its entire length. For this reason, the housings as well as the bearings have an open design. In all other respects these units are similar to the closed LUCD/LUCR units. Open linear bearing units are available as standard with an LBCF self-aligning linear ball bearing or a rigid LBCT linear ball bearing.

For the 12 to 80 mm sizes, the bearing is retained axially by means of a grease fitting. Where high load carrying capacity or longer service life is required, LUCT units can also be supplied fitted with LBHT linear ball bearings in sizes ranging from 20 to 50 mm. (Designation: LUCT ... BH). These units can also be relubricated. Bearing units may also be supplied fitted with linear plain bearings (Designation LUCT ... PA).

LUN linear bearing units are supplied as standard with shielded or sealed self-aligning linear ball bearings. Three versions are available: closed (LUND), adjustable (LUNE) and open, adjustable (LUNF). They are suitable for shaft diameters from 12 to 50 mm.

In contrast to the LUC linear bearing unit described above, the ex-

truded aluminium housing envelops the linear ball bearing along its entire length. Two diagonally opposed attachment holes are provided on the underside of the housing to locate the bearing axially and to keep it from turning. These units can be relubricated.

LVCB flanged linear bearing units consist of a closed flanged cast iron housing fitted with a rigid LBCR linear ball bearing (12 to 80 mm). The bearing, sealed on both sides, is located axially by a dowel pin. The flange is machined on both faces to enable mounting on the front or rear in either direction. Flanged linear bearing units are not designed for relubrication.

LTC tandem linear bearing units consist of a solid extruded aluminium housing and two self-aligning linear ball bearings mounted one behind the other. A grease fitting is used to secure each bearing in position to prevent it from turning.

Tandem linear bearing units enable the construction of linear guidance systems such as tables of any required width. The housing can be attached to its supporting surface from below using socket head cap screws or from above via the two threaded holes in the housing. These tandem units are available in two versions: closed (LTCD) or open (LTCE). The linear ball bearings are supplied with one seal on the external end, as standard. Shaft diameters range from 12 to 50 mm.

LQC quadro linear bearing units consist of a one-piece aluminium housing with two bores arranged in parallel, each with two self-aligning linear ball bearings. The bearings are sealed on the external ends only. The bearings can be retained in position axially and also prevented from turning via the grease fitting. Except for

size 8 units, relubrication is possible. SKF quadro units are available in two versions: closed (LQCD) and open (LQCE).

Quadro units used in combination with LEAS tandem shaft blocks (closed design) or LRCB shaft supports (open design) makes it possible to create simple linear slides and tables. Details of tables are provided on pages 49 to 51 of this catalogue.

The LQC design is available for shaft sizes from 8 to 50 mm. An exception is the size 8 unit that is fitted with an LBCR 8 A-LS non self-aligning linear ball bearing (full designation LQCR 8 A-2LS). LQCE units are suitable for shaft diameters from 12 to 50 mm.

All quadro units can be attached to their support surface either with socket head cap screws inserted from below or via the threaded holes in the housing.

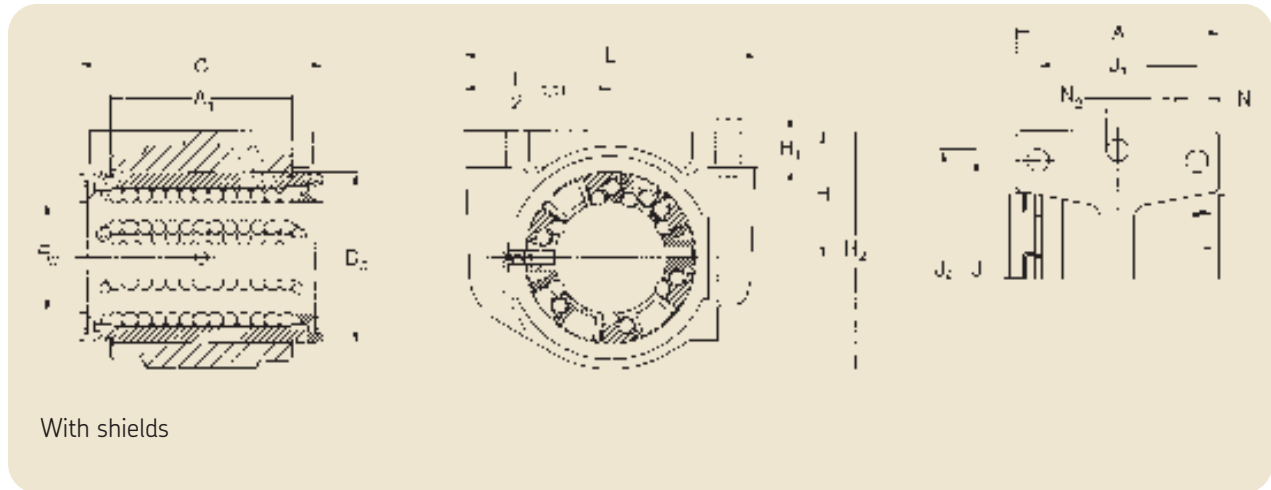
Note

All linear ball bearing units (12 to 50 mm) can be fitted with non-self-aligning linear ball bearings on request.

Linear bearing units – LUCR/LUCD

closed housing, can be relubricated

- LUCR version using LBCR bearing
- LUCD version using LBCD bearing, self-aligning



Dimensions														Basic load ratings		Mass	Designations	
F _w	A	A ₁	C	D _a	H _a ±0,01	H ₁	H ₂	J	J ₁	J ₂	L	N ²⁾	N ₂ ²⁾	dyn. C	stat. C ₀		Linear ball bearing unit with	
mm														N		kg	2 shields	2 double lip seals
8	27	14	25	16	15	5,5	28	25	20	35	45	3,2	5,3	490	355	0,028	LUCR 8 ¹⁾	LUCR 8-2LS ¹⁾
12	31	20	32	22	18	6	34,5	32	23	42	52	4,3	5,3	1 080	815	0,053	LUCD 12	LUCD 12-2LS
16	34,5	22	36	26	22	7	40,5	40	26	46	56	4,3	5,3	1 320	865	0,069	LUCD 16	LUCD 16-2LS
20	41	28	45	32	25	8	48	45	32	58	70	4,3	6,4	2 000	1 370	0,144	LUCD 20	LUCD 20-2LS
25	52	40	58	40	30	10	58	60	40	68	80	5,3	6,4	2 900	2 040	0,285	LUCD 25	LUCD 25-2LS
30	59	48	68	47	35	10	67	68	45	76	88	6,4	6,4	4 650	3 250	0,4	LUCD 30	LUCD 30-2LS
40	74	56	80	62	45	12	85	86	58	94	108	8,4	8,4	7 800	5 200	0,72	LUCD 40	LUCD 40-2LS
50	66	72	100	75	50	14	99	108	50	116	135	8,4	10,5	11 200	6 950	1,19	LUCD 50	LUCD 50-2LS
60	84	95	125	90	60	18	118	132	65	138	160	10,5	13	20 400	18 000	2,17	LUCR 60	LUCR 60-2LS
80	113	125	165	120	80	22	158	170	90	180	205	13	13	37 500	32 000	5,15	LUCR 80	LUCR 80-2LS

LUCD/LUCR bearing units are available on request in stainless steel execution.

Designation: e.g. LUCD/LUCR 20-2LS/HV6

LUCD linear ball bearing units can also be fitted with rigid linear ball bearings of type LBCR. Designation: e.g. LUCR 12-2LS.

LUCR/LUCD linear bearing units F_w 8-80 are also available fitted with linear plain bearings. Designation: e.g. LUCR 20 PA.

For suitable shaft blocks LSCS/LSNS for these bearing units, see pages 44/45.

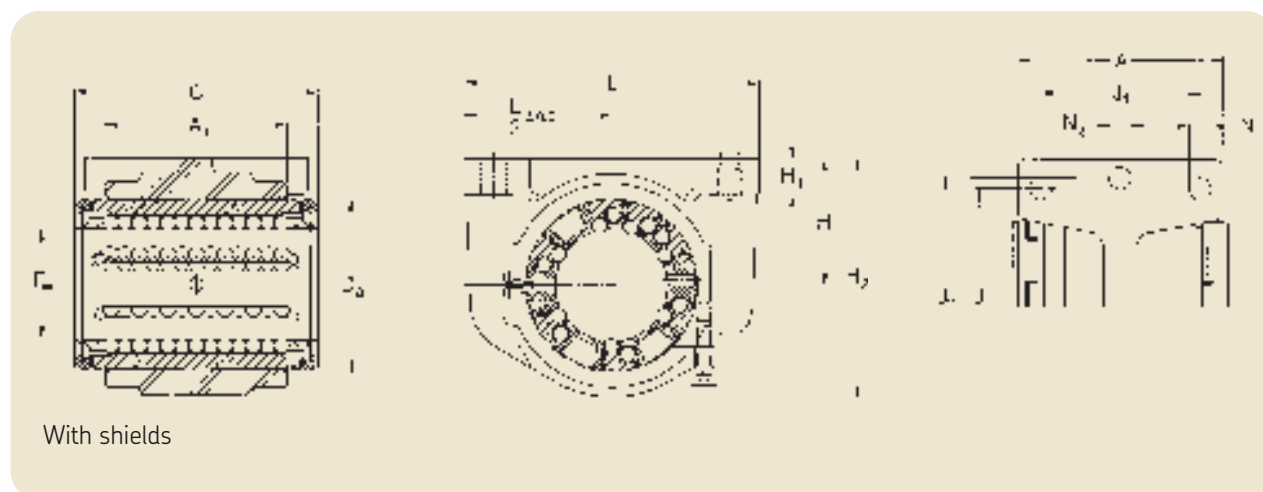
¹⁾ Linear ball bearings fitted to these units are secured with retaining rings according to DIN 471, cannot be relubricated, not self-aligning.

²⁾ For screws with internal hexagon to DIN 912 / ISO 4762

Linear bearing units – LUCS/LUCE

slotted housing, can be relubricated, clearance adjustable

- LUCS version using LBCR bearing,
- LUCE version using LBCD bearing, self-aligning



Dimensions															Basic load ratings		Mass	Designations	
F_w	A	A_1	C	D_a	$H_{\pm 0,01}$	H_1	H_2	J	J_1	J_2	L	$N^{(2)}$	$N_2^{(2)}$	C	dyn.	stat. C_0		Linear bearing unit with	
																		2 shields	2 double lip seals
mm														N		kg			
8	27	14	25	16	15	5,5	28	25	20	35	45	3,2	5,3	490	355	0,028	LUCS 8 ¹⁾	LUCS 8-2LS ¹⁾	
12	31	20	32	22	18	6	34,5	32	23	42	52	4,3	5,3	1 080	815	0,053	LUCE 12	LUCE 12-2LS	
16	34,5	22	36	26	22	7	40,5	40	26	46	56	4,3	5,3	1 320	865	0,069	LUCE 16	LUCE 16-2LS	
20	41	28	45	32	25	8	48	45	32	58	70	4,3	6,4	2 000	1 370	0,144	LUCE 20	LUCE 20-2LS	
25	52	40	58	40	30	10	58	60	40	68	80	5,3	6,4	2 900	2 040	0,285	LUCE 25	LUCE 25-2LS	
30	59	48	68	47	35	10	67	68	45	76	88	6,4	6,4	4 650	3 250	0,4	LUCE 30	LUCE 30-2LS	
40	74	56	80	62	45	12	85	86	58	94	108	8,4	8,4	7 800	5 200	0,72	LUCE 40	LUCE 40-2LS	
50	66	72	100	75	50	14	99	108	50	116	135	8,4	10,5	11 200	6 950	1,19	LUCE 50	LUCE 50-2LS	
60	84	95	125	90	60	18	118	132	65	138	160	10,5	13	20 400	18 000	2,17	LUCS 60	LUCS 60-2LS	
80	113	125	165	120	80	22	158	170	90	180	205	13	13	37 500	32 000	5,15	LUCS 80	LUCS 80-2LS	

Upon request LUCE/LUCS bearing units are available in stainless steel execution.

Designation: e.g. LUCE/LUCS 20-2LS/HV6

LUCE linear bearing units can also be fitted with rigid linear ball bearings of type LBCR ... A. Designation: e.g. LUCS 20-2LS.

For suitable shaft blocks LSCS/LSNS for these bearing units, see pages 44/45.

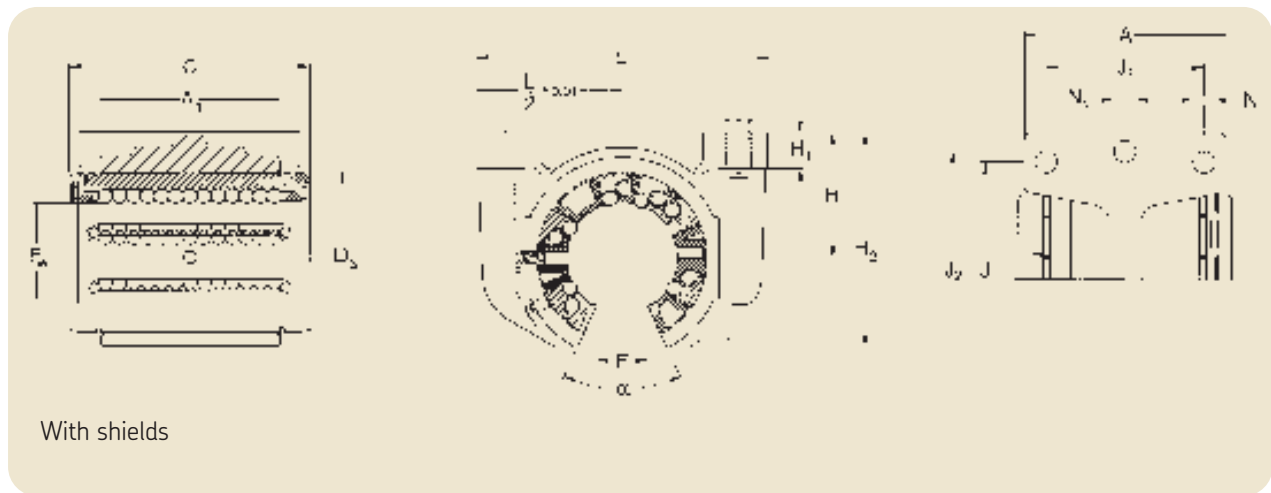
¹⁾ Linear ball bearings fitted to these units are secured with retaining rings according to DIN 471, cannot be relubricated, not self-aligning.

²⁾ For screws with internal hexagon to DIN 912 / ISO 4762.

Linear bearing units – LUCT/LUCF

open housing, can be relubricated, clearance adjustable

- LUCT version using LBCT bearing
- LUCF version using LBCF bearing, self-aligning



Dimensions																Basic load ratings		Mass	Designations	
F _w	A	A ₁	C	D _a	H ±0,01	H ₁	H ₂	J	J ₁	J ₂	L	N ²⁾	N ₂ ²⁾	E ¹⁾	α	dyn. C	stat. C ₀		Linear bearing unit with 2 shields	2 double lip seals
mm															Deg. N			kg	—	
12	31	20	32	22	18	6	28	32	23	42	52	4,3	5,3	7,6	78	1 080	815	0,046	LUCF 12	LUCF 12-2LS
16	34,5	22	36	26	22	7	35	40	26	46	56	4,3	5,3	10,4	78	1 320	865	0,061	LUCF 16	LUCF 16-2LS
20	41	28	45	32	25	8	42	45	32	58	70	4,3	6,4	10,8	60	2 000	1 370	0,124	LUCF 20	LUCF 20-2LS
25	52	40	58	40	30	10	51	60	40	68	80	5,3	6,4	13,2	60	2 900	2 040	0,251	LUCF 25	LUCF 25-2LS
30	59	48	68	47	35	10	60	68	45	76	88	6,4	6,4	14,2	50	4 650	3 250	0,374	LUCF 30	LUCF 30-2LS
40	74	56	80	62	45	12	77	86	58	94	108	8,4	8,4	18,7	50	7 800	5 200	0,63	LUCF 40	LUCF 40-2LS
50	66	72	100	75	50	14	88	108	50	116	135	8,4	10,5	23,6	50	11 200	6 950	1,04	LUCF 50	LUCF 50-2LS
60	84	95	125	90	60	18	105	132	65	138	160	10,5	13,0	29,6	54	20 400	18 000	2,0	LUCT 60	LUCT 60-2LS
80	113	125	165	120	80	22	140	170	90	180	205	13,0	13,0	38,4	54	37 500	32 000	5,0	LUCT 80	LUCT 80-2LS

Upon request LUCF/LUCT bearing units are available in stainless steel execution.

Designation: e.g. LUCF/LUCT 20-2LS/HV6

LUCF linear ball bearing units can also be fitted with rigid linear ball bearings of type LBCT ... A.

Designation: e.g. LUCT 20-2LS.

LUCF/LUCT linear bearing units F_w 12-80 are also available fitted with linear plain bearings.

Designation: e.g. LUCT 20 PA.

For suitable shaft supports for these bearing units, designation LRCB/LRCC, see page 47.

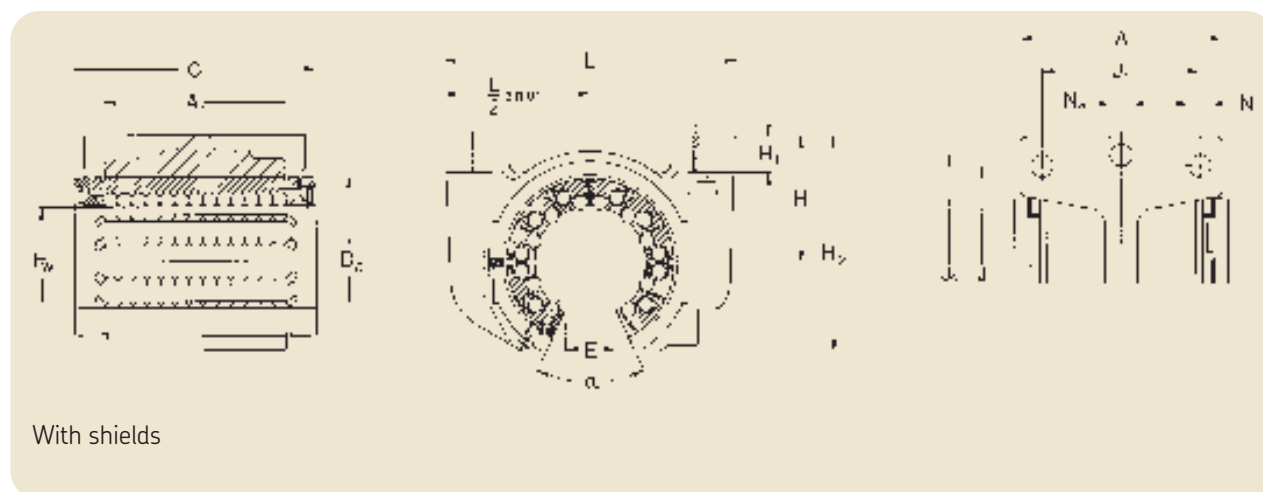
¹⁾ Minimum sector width at diameter F_w.

²⁾ For cylindrical screws with internal hexagon to DIN 912 / ISO 4762.

Linear bearing units – LUCT ... BH

open housing, can be relubricated, clearance adjustable

- LUCT version using LBHT bearing



Dimensions																Basic load ratings		Mass	Designations	
F _w	A	A ₁	C	D _a	H ±0,01	H ₁	H ₂	J	J ₁	J ₂	L	N ²⁾	N ₂ ²⁾	E ¹⁾	α	dyn. C	stat. C ₀		Linear bearings unit with 2 shields	2 double lip seals
mm																Deg. N	kg	—		
20	41	28	45	32	25	8	42	45	32	58	70	4,3	6,4	10,8	60	2 650	2 650	0,14	LUCT 20 BH	LUCT 20 BH-2LS
25	52	40	58	40	30	10	51	60	40	68	80	5,3	6,4	13,2	60	4 900	5 100	0,275	LUCT 25 BH	LUCT 25 BH-2LS
30	59	48	68	47	35	10	60	68	45	76	88	6,4	6,4	14,2	50	7 200	8 000	0,48	LUCT 30 BH	LUCT 30 BH-2LS
40	74	56	80	62	45	12	77	86	58	94	108	8,4	8,4	18,7	50	11 600	11 400	0,86	LUCT 40 BH	LUCT 40 BH-2LS
50	66	72	100	75	50	14	88	108	50	116	135	8,4	10,5	23,6	50	17 300	17 000	1,44	LUCT 50 BH	LUCT 50 BH-2LS

Upon request LUCT bearing units are available in stainless steel execution.

Designation: e.g. LUCT 20 BH-2LS/HV6

Suitable shaft supports, designation LRCB/LRCC, are available for these units. See page 47 for details.

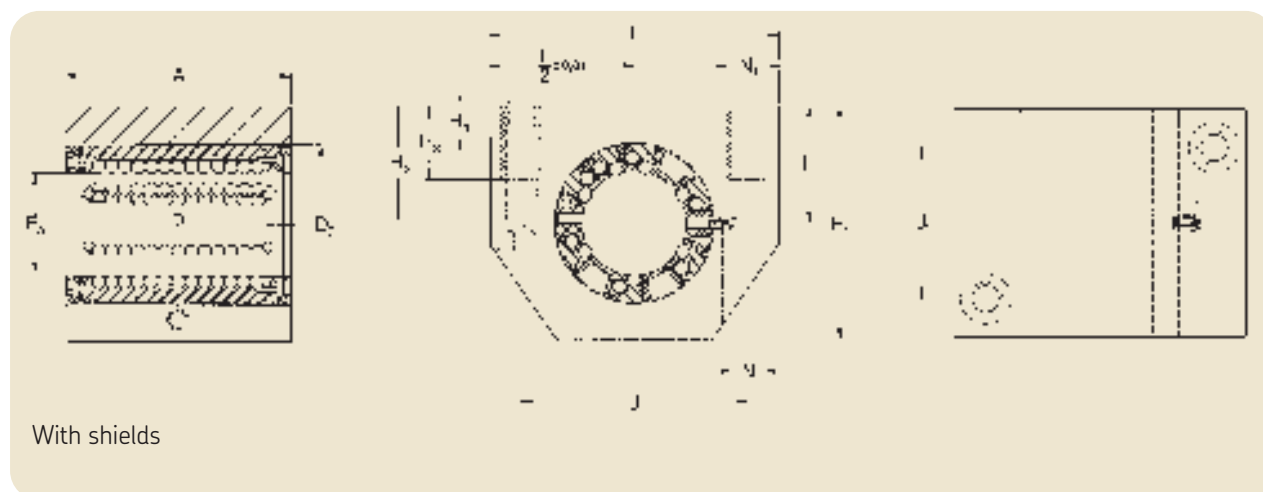
¹⁾ Smallest sector width at diameter F_w.

²⁾ For screws with internal hexagon to DIN 912 / ISO 4762.

Linear bearing units – LUND

closed housing, can be relubricated

- LUND version using LBCD bearing, self-aligning



Dimensions													Basic load ratings		Mass	Designations	
F _w	A	D _a	H ±0,01	H ₁	H ₂	H ₃	H ₄	J	J ₁	L	N ¹⁾	N ₁ ¹⁾	dyn. C	stat. C ₀		Linear bearing unit with 2 shields	2 double lip seals
mm													N		kg		
12	32	22	18	35	16,5	11	6	32	23	43	4,3	M 5	1 080	815	0,093	LUND 12	LUND 12-2LS
16	37	26	22	42	21	13	7	40	26	53	5,3	M 6	1 320	865	0,161	LUND 16	LUND 16-2LS
20	45	32	25	50	24	18	7,5	45	32	60	6,6	M 8	2 000	1 370	0,255	LUND 20	LUND 20-2LS
25	58	40	30	61	29	22	8,5	60	40	78	8,4	M 10	2 900	2 040	0,533	LUND 25	LUND 25-2LS
30	68	47	35	70	34	22	9,5	68	45	87	8,4	M 10	4 650	3 250	0,79	LUND 30	LUND 30-2LS
40	80	62	45	90	44	26	11	86	58	108	10,5	M 12	7 800	5 200	1,44	LUND 40	LUND 40-2LS
50	100	75	50	105	49	35	11	108	50	132	13,5	M 16	11 200	6 950	2,47	LUND 50	LUND 50-2LS

Upon request LUND bearing units are available in stainless steel execution.

Designation: e.g. LUND 20-2LS/HV6

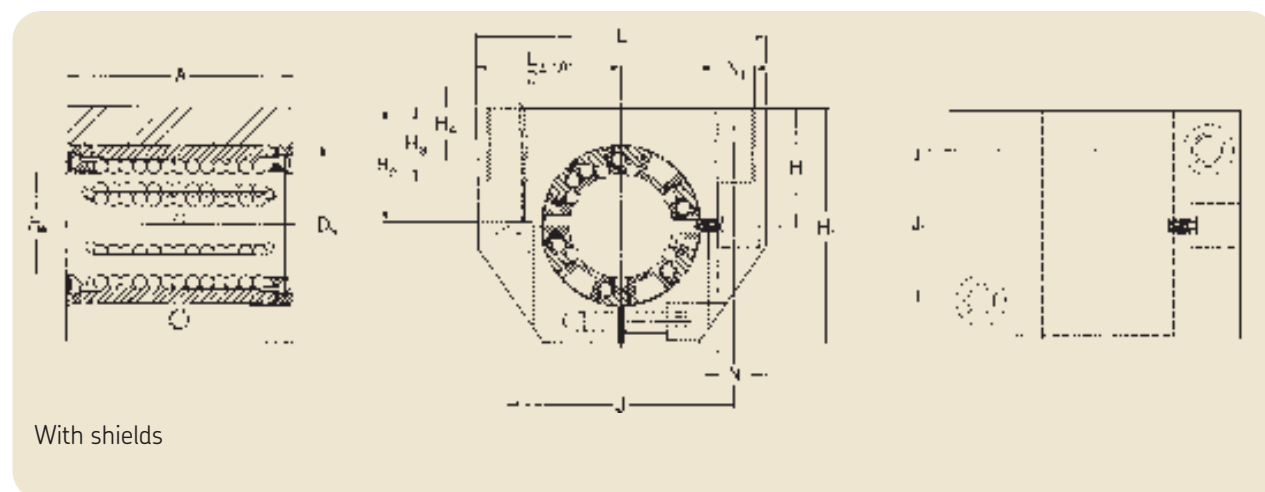
For suitable shaft blocks LSCS/LSNS for these bearing units, see pages 44/45.

¹⁾For screws with internal hexagon to DIN 912 / ISO 4762.

Linear bearing units – LUNE

slotted housing, can be relubricated, clearance adjustable

- LUNE version using LBCD bearing, self-aligning



Dimensions													Basic load ratings		Mass	Designations	
F _w	A	D _a	H ±0.01	H ₁	H ₂	H ₃	H ₄	J	J ₁	L	N ¹⁾	N ₁ ¹⁾	dyn. C	stat. C ₀		Linear bearing unit with 2 shields	2 double lip seals
mm													N		kg		
12	32	22	18	35	16,5	11	6	32	23	43	4,3	M 5	1 080	815	0,093	LUNE 12	LUNE 12-2LS
16	37	26	22	42	21	13	7	40	26	53	5,3	M 6	1 320	865	0,161	LUNE 16	LUNE 16-2LS
20	45	32	25	50	24	18	7,5	45	32	60	6,6	M 8	2 000	1 370	0,255	LUNE 20	LUNE 20-2LS
25	58	40	30	61	29	22	8,5	60	40	78	8,4	M 10	2 900	2 040	0,533	LUNE 25	LUNE 25-2LS
30	68	47	35	70	34	22	9,5	68	45	87	8,4	M 10	4 650	3 250	0,79	LUNE 30	LUNE 30-2LS
40	80	62	45	90	44	26	11	86	58	108	10,5	M 12	7 800	5 200	1,44	LUNE 40	LUNE 40-2LS
50	100	75	50	105	49	35	11	108	50	132	13,5	M 16	11 200	6 950	2,47	LUNE 50	LUNE 50-2LS

Upon request LUNE bearing units are available in stainless steel execution.

Designation: e.g. LUNE 20-2LS/HV6

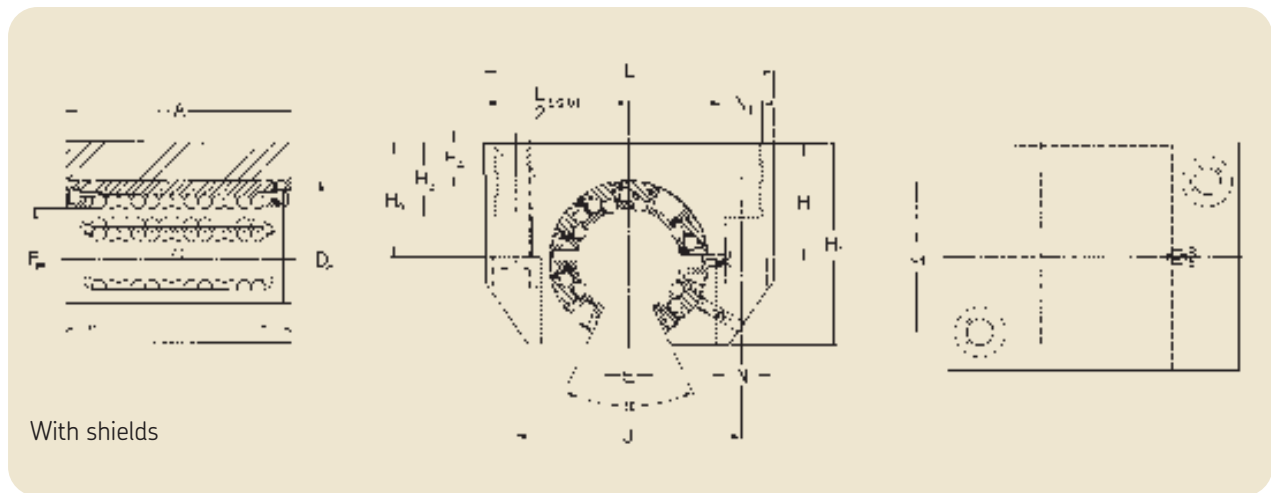
For suitable shaft blocks LSCS/LSNS for these bearing units, see pages 44/45.

¹⁾ For screws with internal hexagon to DIN 912 / ISO 4762.

Linear bearing units – LUNF

open housing, can be relubricated, clearance adjustable

- LUNF version using LBCF bearing, self-aligning



Dimensions														Basic load ratings		Mass	Designations	
F_w	A	D_a	H $\pm 0,01$	H_1	H_2	H_3	H_4	J	J_1	L	$N^{2)}$	$N_1^{2)}$	$E^{1)}$	α	dyn. C	stat. C_0		Linear bearing unit with 2 shields 2 double lip seals
mm													mm	Deg.	N		kg	
12	32	22	18	28	16,5	11	6	32	23	43	4,3	M 5	7,6	78	1 080	815	0,074	LUNF 12 LUNF 12-2LS
16	37	26	22	35	21	13	7	40	26	53	5,3	M 6	10,4	78	1 320	865	0,132	LUNF 16 LUNF 16-2LS
20	45	32	25	42	24	18	7,5	45	32	60	6,6	M 8	10,8	60	2 000	1 370	0,215	LUNF 20 LUNF 20-2LS
25	58	40	30	51	29	22	8,5	60	40	78	8,4	M 10	13,2	60	2 900	2 040	0,443	LUNF 25 LUNF 25-2LS
30	68	47	35	60	34	22	9,5	68	45	87	8,4	M 10	14,2	50	4 650	3 250	0,67	LUNF 30 LUNF 30-2LS
40	80	62	45	77	44	26	11	86	58	108	10,5	M 12	18,7	50	7 800	5 200	1,21	LUNF 40 LUNF 40-2LS
50	100	75	50	88	49	35	11	108	50	132	13,5	M 16	23,6	50	11 200	6 950	2,02	LUNF 50 LUNF 50-2LS

Upon request LUNF bearing units are available in stainless steel execution.

Designation: e.g. LUNF 20-2LS/HV6

Suitable shaft supports, designation LRCB/LRCC are available for these units. See page 47 for details.

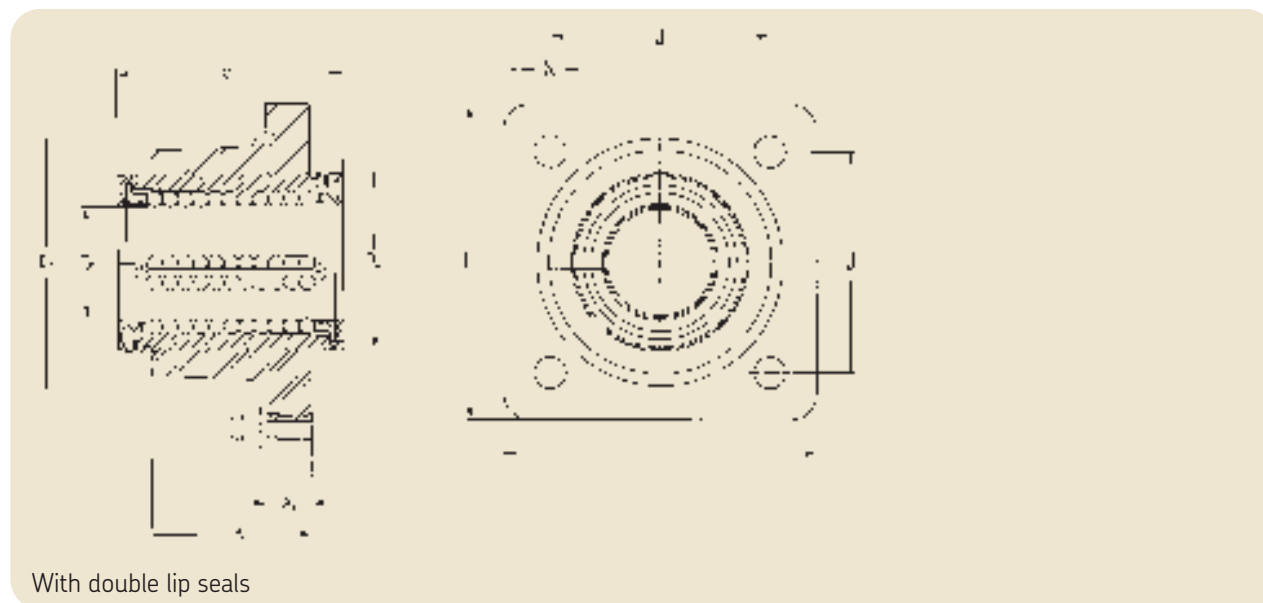
¹⁾ Smallest sector width at diameter F_w .

²⁾ For screws with internal hexagon to DIN 912 / ISO 4762.

Flanged linear bearing units – LVCR

closed housing

- LVCR using LBCR bearing



Dimensions									Basic load ratings		Mass	Designations
F_w	A	A_1	C	D_a	D_2	J	L	$N^{1)}$	dyn. C	stat. C_0		Linear bearing unit ²⁾ with 2 double lip seals
mm									N		kg	—
12	20	8	32	22	32	30	42	5,5	1 160	980	0,113	LVCR 12-2LS
16	22	8	36	26	38	35	50	5,5	1 500	1 290	0,161	LVCR 16-2LS
20	28	10	45	32	46	42	60	6,6	2 240	2 040	0,314	LVCR 20-2LS
25	40	12	58	40	58	54	74	6,6	3 350	3 350	0,655	LVCR 25-2LS
30	48	14	68	47	66	60	84	9	5 600	5 700	0,98	LVCR 30-2LS
40	56	16	80	62	90	78	108	11	9 000	8 150	1,91	LVCR 40-2LS
50	72	18	100	75	110	98	130	11	13 400	12 200	3,27	LVCR 50-2LS
60	95	22	125	90	135	120	160	13,5	20 400	18 000	5,92	LVCR 60-2LS
80	125	25	165	120	180	155	200	13,5	37 500	32 000	13,3	LVCR 80-2LS

Upon request LVCR bearing units are available in stainless steel execution.

Designation: e.g. LVCR 20-2LS/HV6

LVCR linear ball bearing units of sizes F_w 12-50 can also be fitted with linear bearings which are self-aligning

Designation: e.g. LVCD 12-2LS.

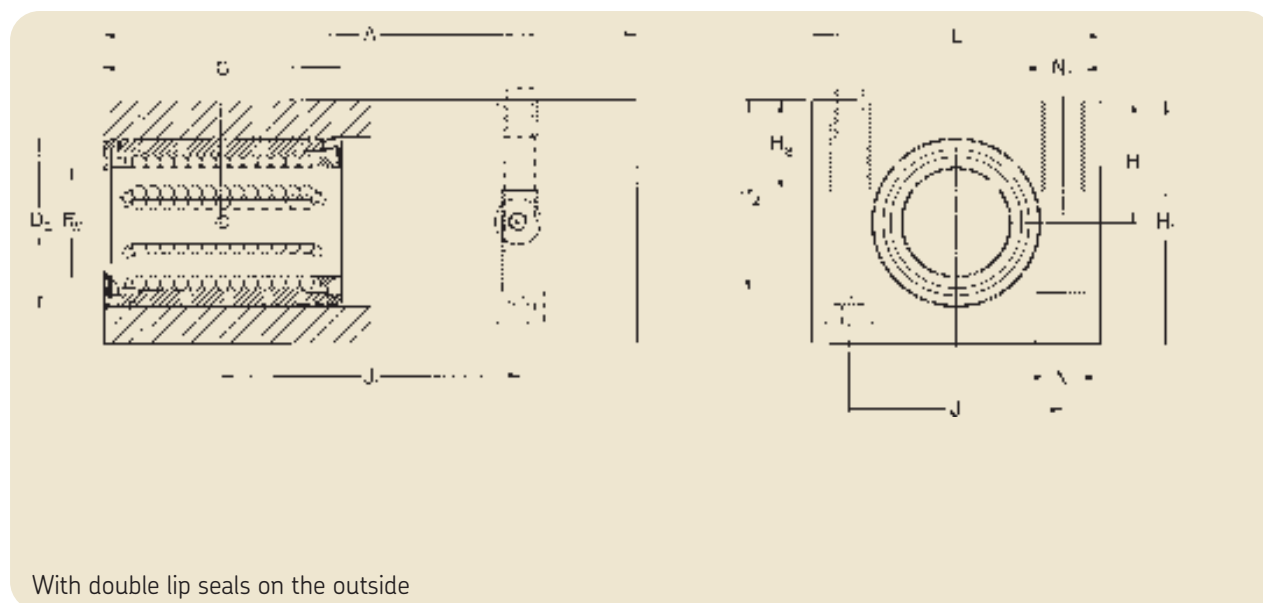
¹⁾ For screws with internal hexagon to DIN 912 / ISO 4762.

²⁾ Linear ball bearings fitted to these units are secured using pins according to DIN 1470. They are not designed for relubrication.

Tandem linear bearing units – LTCD

closed housing, can be relubricated

- LTCD version using LBCD bearing, self-aligning

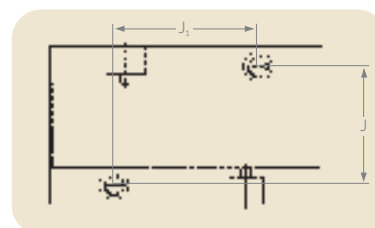


Dimensions													Basic load ratings		Mass	Designations
F _w	A	C	D _a	H ±0,01	H ₁	H ₂	H ₃	J	J ₁	L	N ⁽¹⁾	N ₁ ⁽¹⁾	dyn. C	stat. C ₀		Linear bearing unit with double lip seals
mm													—	N	kg	—
12	76	32	22	18	35	27	13	30	40	42	5,3	M 6	1 760	1 630	0,236	LTCD 12-2LS
16	84	36	26	22	41,5	33	13	36	45	50	5,3	M 6	2 160	1 730	0,372	LTCD 16-2LS
20	104	45	32	25	49,5	39,5	18	45	55	60	6,4	M 8	3 200	2 750	0,67	LTCD 20-2LS
25	130	58	40	30	59,5	47	22	54	70	74	8,4	M 10	4 750	4 150	1,236	LTCD 25-2LS
30	152	68	47	35	69,5	55	26	62	85	84	10,5	M 12	7 500	6 550	1,87	LTCD 30-2LS
40	176	80	62	45	89,5	71	34	80	100	108	13	M 16	12 700	10 400	3,55	LTCD 40-2LS
50	224	100	75	50	99,5	81	34	100	125	130	13	M 16	18 300	14 000	5,92	LTCD 50-2LS

Upon request LTCD bearing units are available in stainless steel execution.

Designation: e.g. LTCD 20-2LS/HV6

For suitable shaft blocks LSCS/LSNS for these bearing units, see pages 44/45.

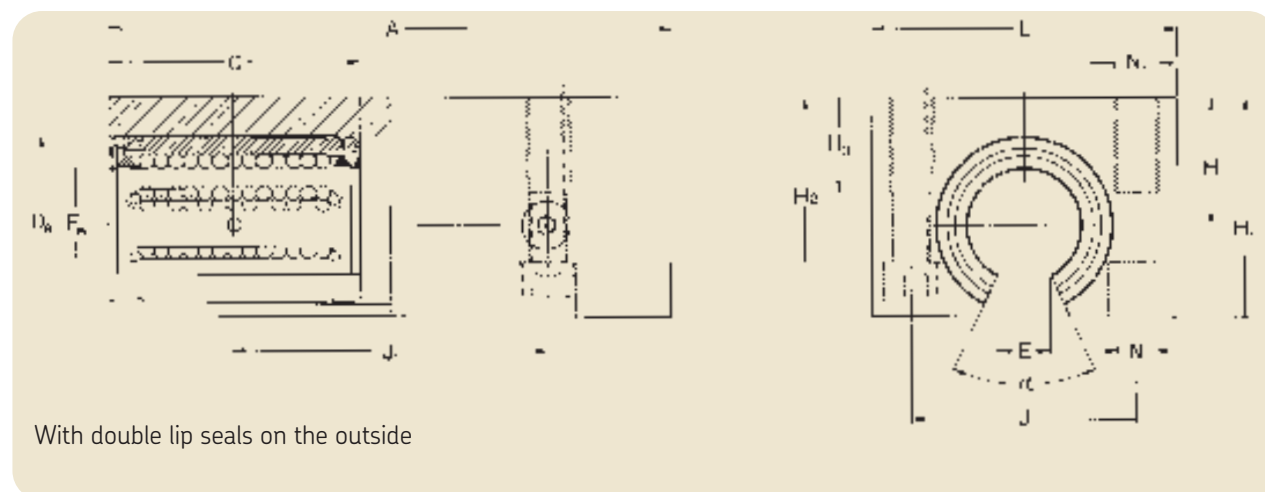


¹⁾ For 2 screws with internal hexagon to DIN 912 / ISO 4762.

Tandem linear bearing units – LTCF

open housing, can be relubricated.

- LTCF version using LBCF bearing, self-aligning

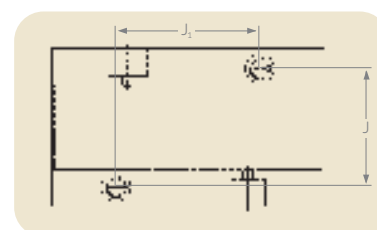


Dimensions															Basic load ratings		Mass	Designations
F_w	A	C	D_a	$H_{\pm 0,01}$	H_1	H_2	H_3	J	J_1	L	$N^{(2)}$	$N_1^{(2)}$	$E^{(1)}$	α	dyn. C	stat. C_0		Linear bearing unit with double lip seals
mm													mm	Deg. N			kg	
12	76	32	22	18	29	23,5	13	30	40	42	5,3	M 6	7,6	78	1 760	1 630	0,178	LTCF 12-2LS
16	84	36	26	22	35	28	13	36	45	50	5,3	M 6	10,4	78	2 160	1 730	0,284	LTCF 16-2LS
20	104	45	32	25	42	33,5	18	45	55	60	6,4	M 8	10,8	60	3 200	2 750	0,62	LTCF 20-2LS
25	130	58	40	30	51	40	22	54	70	74	8,4	M 10	13,2	60	4 750	4 150	0,966	LTCF 25-2LS
30	152	68	47	35	60	46,5	26	62	85	84	10,5	M 12	14,2	50	7 500	6 550	1,49	LTCF 30-2LS
40	176	80	62	45	77	61	34	80	100	108	13	M 16	18,7	50	12 700	10 400	2,81	LTCF 40-2LS
50	224	100	75	50	88	72	34	100	125	130	13	M 16	23,6	50	18 300	14 000	4,83	LTCF 50-2LS

Upon request LTCF bearing units are available in stainless steel execution.

Designation: e.g. LTCF 20-2LS/HV6

For suitable shaft supports for these bearing units, designation LRCB/LRCC, see page 47.



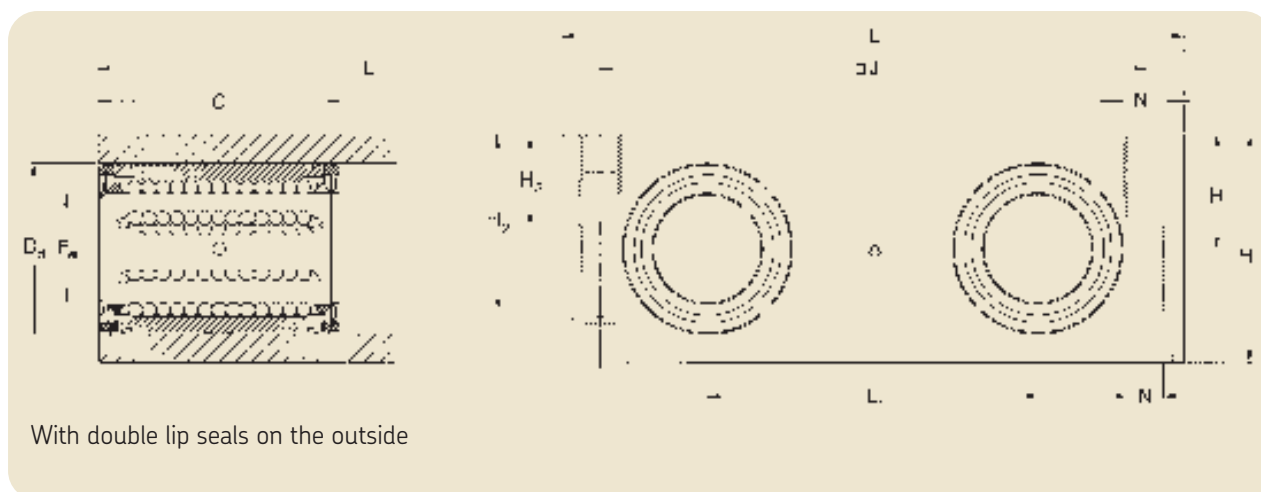
¹⁾ Smallest sector width at diameter F_w .

²⁾ For 2 screws with internal hexagon to DIN 912 / ISO 4762.

Quadro linear bearing units – LQCR/LQCD

closed housing, can be relubricated.

- LQCR version using LBCR bearing
- LQCD version using LBCD bearing, self-aligning

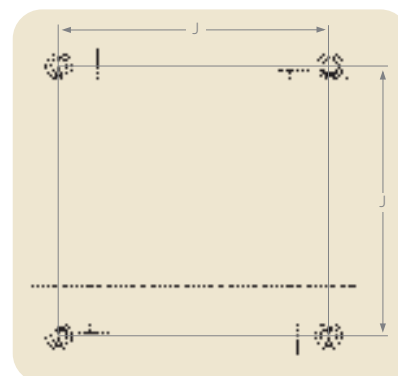


Dimensions												Basic load ratings		Mass	Designations
F_w	C	D_a	$H_{\pm 0,01}$	H_1	H_2	H_3	J	L	L_1	$N^{2)}$	$N_1^{2)}$	dyn. C	stat. C_0		Linear bearing unit with double lip seals
mm											—	N		kg	—
8	25	16	11,5	23	17,5	11	55	65	32	4,3	M 5	1 290	1 420	0,226	LQCR 8-2LS ¹⁾
12	32	22	16	32	25	13	73	85	42	5,3	M 6	2 850	3 250	0,492	LQCD 12-2LS
16	36	26	18	36	29	13	88	100	54	5,3	M 6	3 450	3 450	0,744	LQCD 16-2LS
20	45	32	23	46	37,5	18	115	130	72	6,6	M 8	5 200	5 500	1,68	LQCD 20-2LS
25	58	40	28	56	45	22	140	160	88	8,4	M 10	7 650	8 150	3,022	LQCD 25-2LS
30	68	47	32	64	50,5	26	158	180	96	10,5	M 12	12 200	12 900	4,27	LQCD 30-2LS
40	80	62	40	80	64	34	202	230	122	13,5	M 16	20 800	20 800	8,38	LQCD 40-2LS
50	100	75	48	96	80	34	250	280	152	13,5	M 16	30 000	28 000	14,99	LQCD 50-2LS

Upon request LQCR/LQCD bearing units are available in stainless steel execution.

Designation: e.g. LQCR/LQCD 20-2LS/HV6

For suitable shaft blocks for these bearing units, designation LEAS ... A and LEAS ... B, see page 46.

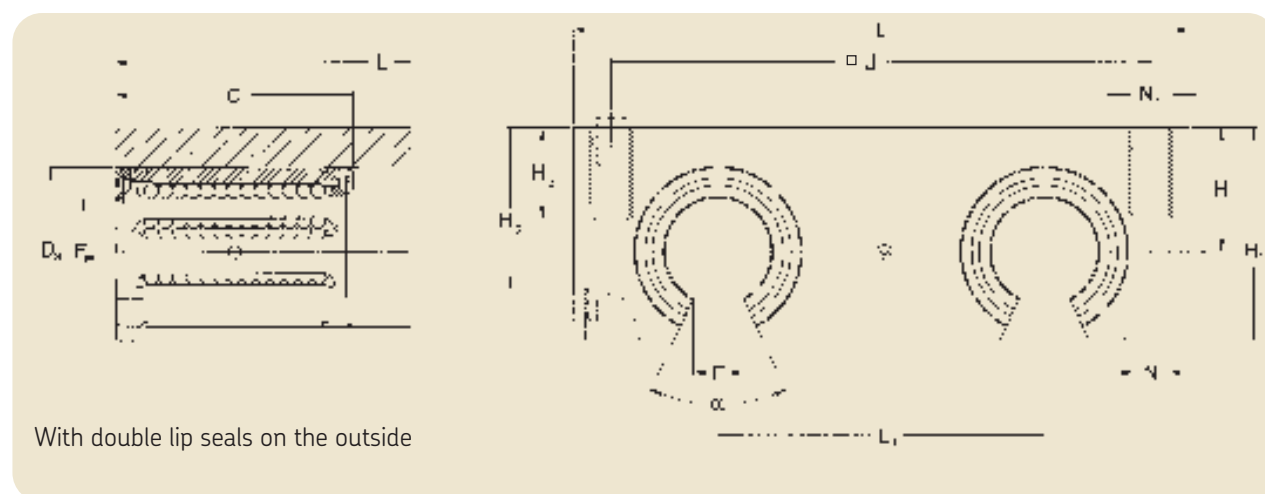


¹⁾ Unit with linear ball bearing not designed for re-greasing, non self-aligning.

²⁾ For 4 cylindrical screws with internal hexagon to DIN 912 / ISO 4762.

Quadro linear bearing units – LQCF

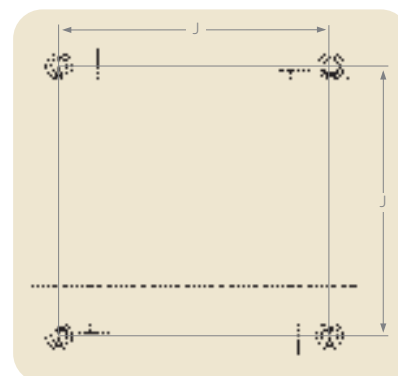
open housing, can be relubricated.
- LQCF version with LBCF bearing, self-aligning



Dimensions														Basic load ratings		Mass	Designations
F_w	C	D_a	H $\pm 0,01$	H_1	H_2	H_3	J	L	L_1	$N^{(2)}$	$N_1^{(2)}$	$E^{(1)}$	α	dyn. C	stat. C_0	kg	Linear bearing unit with double lip seals
mm												mm	Deg.	N			—
12	32	22	18	30	23,4	13	73	85	42	5,3	M 6	7,6	78	2 850	3 250	0,426	LQCF 12-2LS
16	36	26	22	35	28,4	13	88	100	54	5,3	M 6	10,4	78	3 450	3 450	0,698	LQCF 16-2LS
20	45	32	25	42	33,5	18	115	130	72	6,6	M 8	10,8	60	5 200	5 500	1,42	LQCF 20-2LS
25	58	40	30	51	40	22	140	160	88	8,4	M 10	13,2	60	7 650	8 150	2,572	LQCF 25-2LS
30	68	47	35	60	46,5	26	158	180	96	10,5	M 12	14,2	50	12 200	12 900	3,79	LQCF 30-2LS
40	80	62	45	77	61	34	202	230	122	13,5	M 16	18,7	50	20 800	20 800	7,8	LQCF 40-2LS
50	100	75	55	93	77	34	250	280	152	13,5	M 16	23,6	50	30 000	28 000	13,96	LQCF 50-2LS

Upon request LQCF bearing units are available in stainless steel execution.
Designation: e.g. LQCF 20-2LS/HV6

For suitable shaft supports for these bearing units, designation LRCB/LRCC, see page 47.



¹⁾ Smallest sector width at diameter F_w .

²⁾ For 4 cylindrical screws with internal hexagon to DIN 912 / ISO 4762.

Shaft carriers / shaft blocks

Among shaft carriers, a distinction is made between shaft blocks and shaft supports. Shaft blocks support the shaft only at its ends; shaft supports typically run the entire length of the shaft and therefore require the use of open linear bearing units.

LSCS shaft blocks are made of cast aluminium and designed to grip the end of the shaft. These blocks are supplied as standard with two holes drilled in the base for attachment. LSCS shaft blocks are suitable for shaft diameters ranging from 8 to 80 mm.

LSNS and LSHS shaft blocks are made of extruded aluminium. They can be attached by through bolts or they can be bolted, via threaded holes, directly to the support surface.

LSNS and LSHS shaft blocks are available for shaft diameters ranging from 12 to 50 mm.

LEBS/LEAS tandem shaft blocks

To match the duo and quadro linear bearing units with ISO series 1 linear ball bearings (LBBR), LEBS tandem shaft blocks are available in the "A" design, where the shaft block is fixed and the linear bearing moves axially. LEBS shaft blocks are available for shaft diameters ranging from 12 to 50 mm. For units with ISO series 3 linear ball bearings (LBC/LBHT) LEAS tandem shaft blocks are available in both the "A" and "B" design. The "B" design enables axial movement of the shafts through a fixed linear bearing unit. LEAS shaft blocks are available for shaft diameters ranging from 8 to 50 mm.

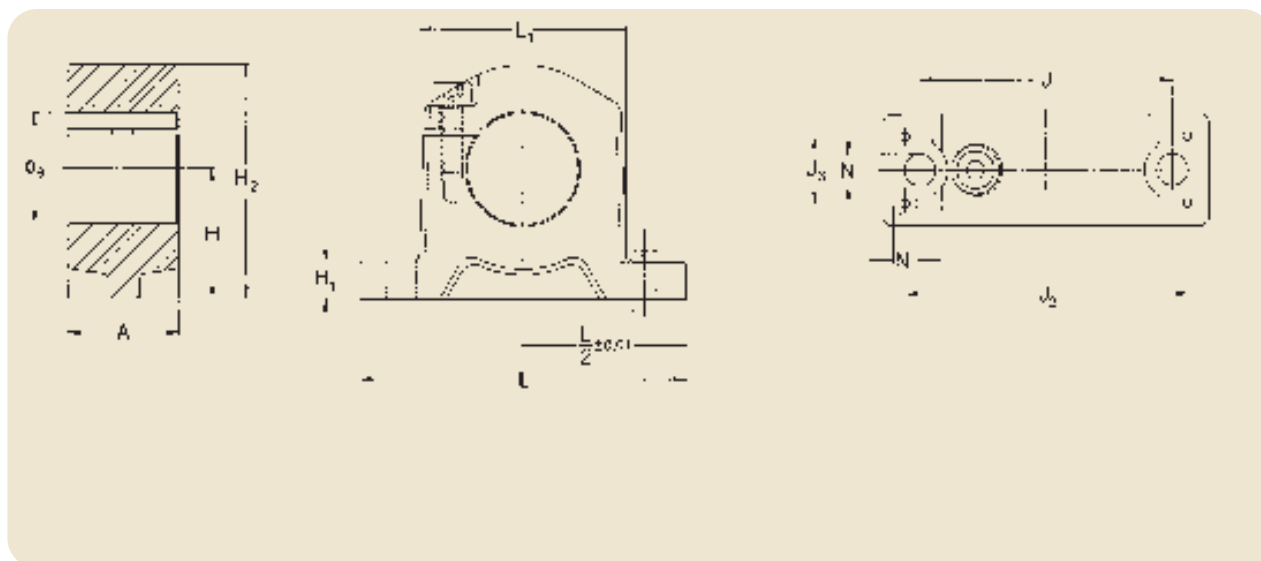
LRCB/LRCC shaft supports

For heavily loaded linear bearing units and/or long track lengths, SKF recommends the use of shaft supports to eliminate shaft bending. For these applications, continuous or at least partial support of the shaft is necessary. SKF offers shaft supports for shaft diameters ranging from 12 to 80 mm. There are two types of shaft support: the LRCB with predrilled holes and the LRCC without holes.

Note: Shaft supports require the use of open design linear bearing units.



Shaft blocks – LSCS

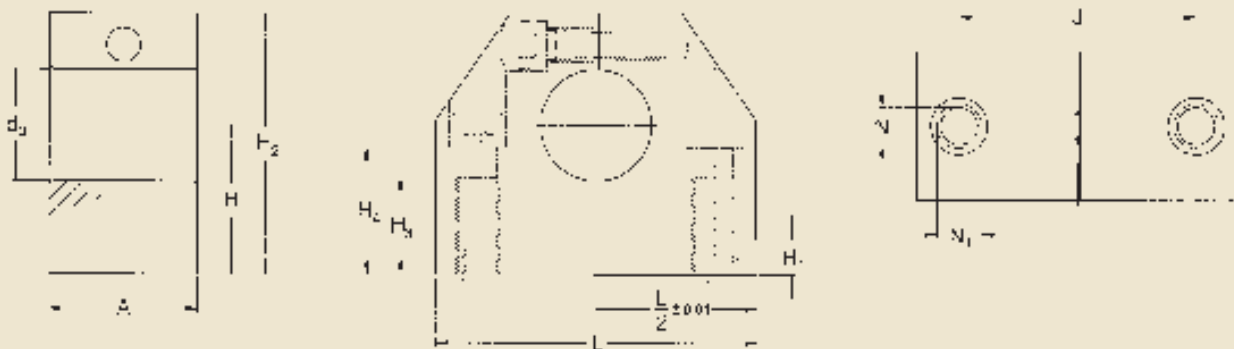


Dimensions												Mass	Designations
d_a	A	H $\pm 0,01$	H ₁	H ₂	J	J ₂	J ₃	L	L ₁	N ¹⁾	N ₂		Shaft block
mm												kg	—
8	10	15	5,5	25	25	35	5	45	19	4,3	2,7	0,012	LSCS 8
12	12	20	6	32,5	32	42	6	52	25	5,3	3,2	0,023	LSCS 12
16	15	20	7	35,5	40	46	7,5	56	31,8	5,3	4,3	0,034	LSCS 16
20	20	25	8	43,5	45	58	10	70	37	5,3	5,3	0,065	LSCS 20
25	28	30	10	53	60	68	16	80	48	6,4	6,4	0,14	LSCS 25
30	30	35	10	63	68	76	18	88	56	8,4	6,4	0,20	LSCS 30
40	36	45	12	81	86	94	22	108	71	10,5	8,4	0,47	LSCS 40
50	49	50	14	92,5	108	116	30	135	86	10,5	10,5	0,68	LSCS 50
60	62	60	18	112	132	138	40	160	105	13	13	1,29	LSCS 60
80	85	80	22	147,5	170	180	60	205	136	17	15	3,01	LSCS 80

¹⁾ For screws with internal hexagon to DIN 912 / ISO 4762.

Shaft blocks – LSNS/LSHS

in combination with linear ball bearings acc. to ISO series 1 and ISO series 3



Design versions

LSHS = Shaft blocks with ISO series 1 LBBR bearings

LSNS = Shaft blocks with ISO series 3 LBC/LBH bearings

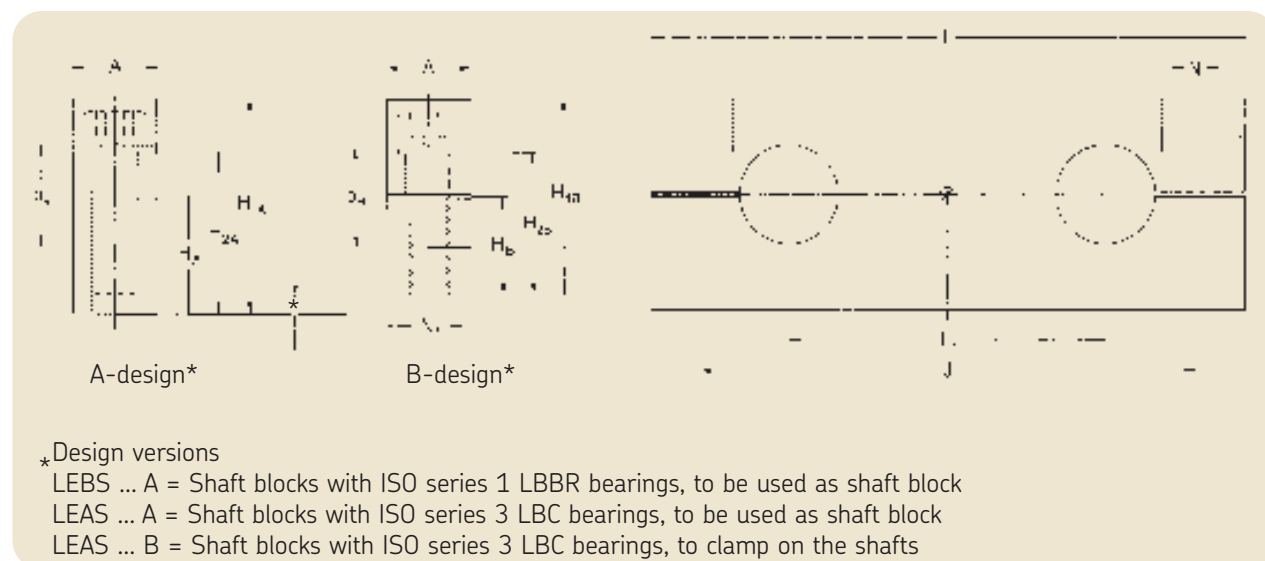
Dimensions											Mass	Designations
d_a	A	H $\pm 0,01$	H_1	H_2	H_3	H_4	J	$L^{2)}$	$N^{1)}$	$N_1^{1)}$		Shaft block
mm											kg	—
12	20	20	6	35	13	16,5	30	43	5,3	M 6	0,06	LSNS 12
16	24	25	7	42	18	21	38	53	6,6	M 8	0,11	LSNS 16
20	30	30	7,5	50	22	25	42	60	8,4	M 10	0,17	LSNS 20
25	38	35	8,5	61	26	30	56	78	10,5	M 12	0,34	LSNS 25
30	40	40	9,5	70	26	34	64	87	10,5	M 12	0,46	LSNS 30
40	48	50	11	90	34	44	82	108	13,5	M 16	0,90	LSNS 40
50	58	60	11	105	43	49	100	132	17,5	M 20	1,45	LSNS 50
12	18	19	—	33	13	16,5	27	40	5,3	M 6	0,05	LSHS 12
16	20	22	—	38	13	18	32	45	5,3	M 6	0,07	LSHS 16
20	24	25	—	45	18	21	39	53	6,6	M 8	0,11	LSHS 20
25	28	31	—	54	22	25	44	62	8,4	M 10	0,17	LSHS 25
30	30	34	—	60	22	29	49	67	8,4	M 10	0,22	LSHS 30
40	40	42	—	76	26	37	66	87	10,5	M 12	0,47	LSHS 40
50	50	50	—	92	34	44	80	103	13,5	M 16	0,82	LSHS 50

¹⁾ For screws with internal hexagon to DIN 912 / ISO 4762.

²⁾ Tolerance $L/2 \pm 0,01$ only by execution LSNS.

Tandem shaft blocks – LEAS/LEBS

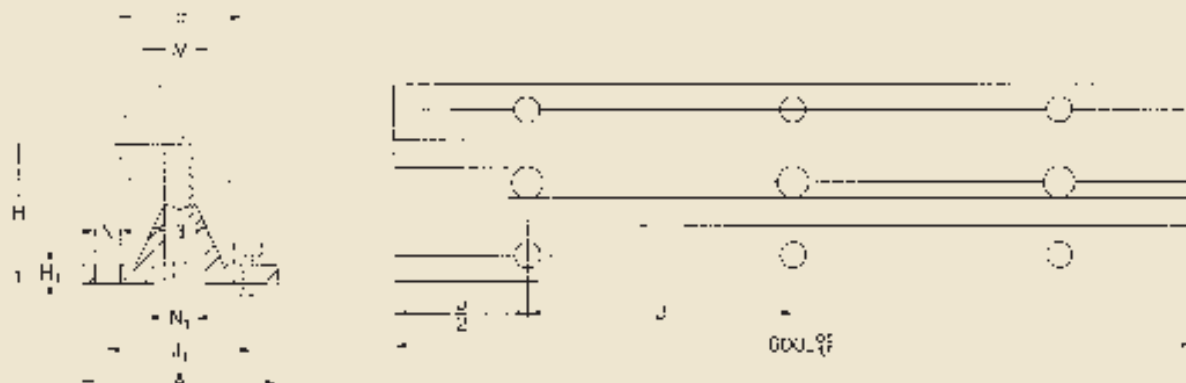
in combination with linear ball bearings and shafts acc. to ISO series 1 and ISO series 3



Dimensions													Mass		Designations		
ISO															Tandem shaft block		
													Design		Design		
d _a	A	H _A ±0,015	H _{1A}	H _{2A}	H _B ±0,015	H _{1B}	H _{2B}	J	L	L ₁	N ¹⁾	N ₁ ¹⁾	A	B	A	B	
mm											—		kg		—		
12	15	17	30	21,5	—	—	—	64	80	40	6,6	—	0,08	—	LEBS 12 A	—	1
16	15	19,5	35	26,5	—	—	—	80	96	52	6,6	—	0,11	—	LEBS 16 A	—	1
20	18	22	40	29	—	—	—	97	115	63	9	—	0,17	—	LEBS 20 A	—	1
25	20	27	50	36,5	—	—	—	115	136	75	11	—	0,28	—	LEBS 25 A	—	1
30	20	31	56	42,5	—	—	—	125	146	80	11	—	0,32	—	LEBS 30 A	—	1
40	25	38	70	54	—	—	—	160	184	97	13,5	—	0,63	—	LEBS 40 A	—	1
50	30	43	80	59	—	—	—	180	210	107	17,5	—	0,90	—	LEBS 50 A	—	1
8	12	12,5	23	16	11	22	15	52	65	32	5,5	M 5	0,04	0,04	LEAS 8 A	LEAS 8 B	3
12	14	18	32	23,5	14	28	19,5	70	85	42	6,6	M 6	0,09	0,07	LEAS 12 A	LEAS 12 B	3
16	18	20	36	26,5	17	34	23,5	82	100	54	9	M 8	0,14	0,13	LEAS 16 A	LEAS 16 B	3
20	20	25	46	32,5	21	42	28,5	108	130	72	11	M 10	0,25	0,22	LEAS 20 A	LEAS 20 B	3
25	25	30	56	40	26	52	36	132	160	88	13,5	M 12	0,47	0,44	LEAS 25 A	LEAS 25 B	3
30	25	35	64	48	29	58	42	150	180	96	13,5	M 12	0,62	0,56	LEAS 30 A	LEAS 30 B	3
40	30	44	80	59	36	72	51	190	230	122	17,5	M 16	1,15	1,00	LEAS 40 A	LEAS 40 B	3
50	30	52	96	75	44	88	67	240	280	152	17,5	M 16	1,70	1,52	LEAS 50 A	LEAS 50 B	3

¹⁾ For screws with internal hexagon to DIN 912 / ISO 4762.

Shaft supports – LRCB/LRCC



Design versions

LRCB = Shaft support with mounting holes

LRCC = Shaft support without mounting holes

Dimensions										Mass LRCB design	Designations		Shaft attachment ¹⁾
d	A	H ±0,02	H ₁	J	J ₁	M	N ¹⁾	N ₁ ¹⁾	β		Shaft support with bore holes	without bore holes	Screw
mm	mm								Deg.	kg	—	—	—
12	40	22	5	75	29	5,8	4,5	4,5	50	0,53	LRCB 12	LRCC 12	M 4x16
16	45	26	5	100	33	7	5,5	5,5	50	0,64	LRCB 16	LRCC 16	M 5x20
20	52	32	6	100	37	8,3	6,6	6,6	50	0,92	LRCB 20	LRCC 20	M 6x25
25	57	36	6	120	42	10,8	6,6	9	50	1,08	LRCB 25	LRCC 25	M 8x25
30	69	42	7	150	51	11	9	11	50	1,41	LRCB 30	LRCC 30	M 10x30
40	73	50	8	200	55	15	9	11	50	1,85	LRCB 40	LRCC 40	M 10x35
50	84	60	9	200	63	19	11	13,5	46	2,45	LRCB 50	LRCC 50	M 12x40
60	94	68	10	300	72	25	11	15,5	46	3,25	LRCB 60	LRCC 60	M 14x45
80	116	86	12	300	92	34	13,5	17,5	46	4,40	LRCB 80	LRCC 80	M 16x55

¹⁾ For screws with internal hexagon to DIN 912 / ISO 4762 without spring washers.

Quadro linear tables, non-driven

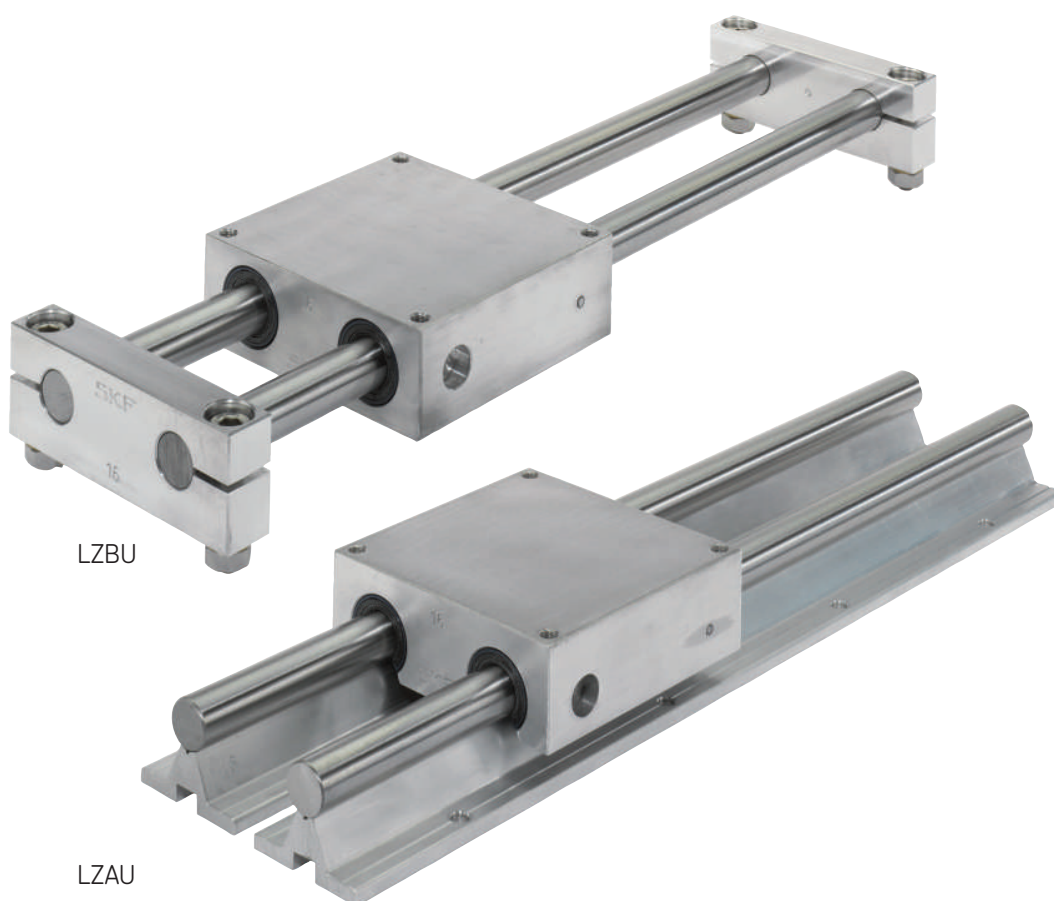
The closed LZBU quadro linear table consists of a closed quadro linear bearing unit, two tandem shaft blocks and two shafts of the required length. The bearing unit is fitted with four LBCD-LS self-aligning linear ball bearings, each sealed at one end. The LZBU-“A” design enables axial movement of the linear bearing unit, i.e. the shafts are fixed to the machine bed via LEAS-“A” shaft blocks. The LZBU-“B” design is provided with LEAS-“B” shaft blocks. This combination enables the shafts to travel with the shaft blocks in applications where the linear bearing unit is fixed.

LZBU quadro linear tables can be supplied in sizes ranging from 8 to 50 mm. Size 8 tables are not self-aligning

and are not designed for relubrication. The description of the closed quadro-linear table also applies to the combination of series 1 LQBR ... 2LS quadro linear bearing units with twin LEBS tandem shaft blocks and shafts (on special request only). Shaft diameters range from 12 to 50 mm.

The open LZAU quadro linear table comprises the open quadro-linear unit and two high precision shafts with shaft supports. The bearing unit is fitted with four LBCF-“A-LS” self-aligning linear ball bearings, each sealed on one end. The length of these tables is dictated by the distance between centres of the attachment

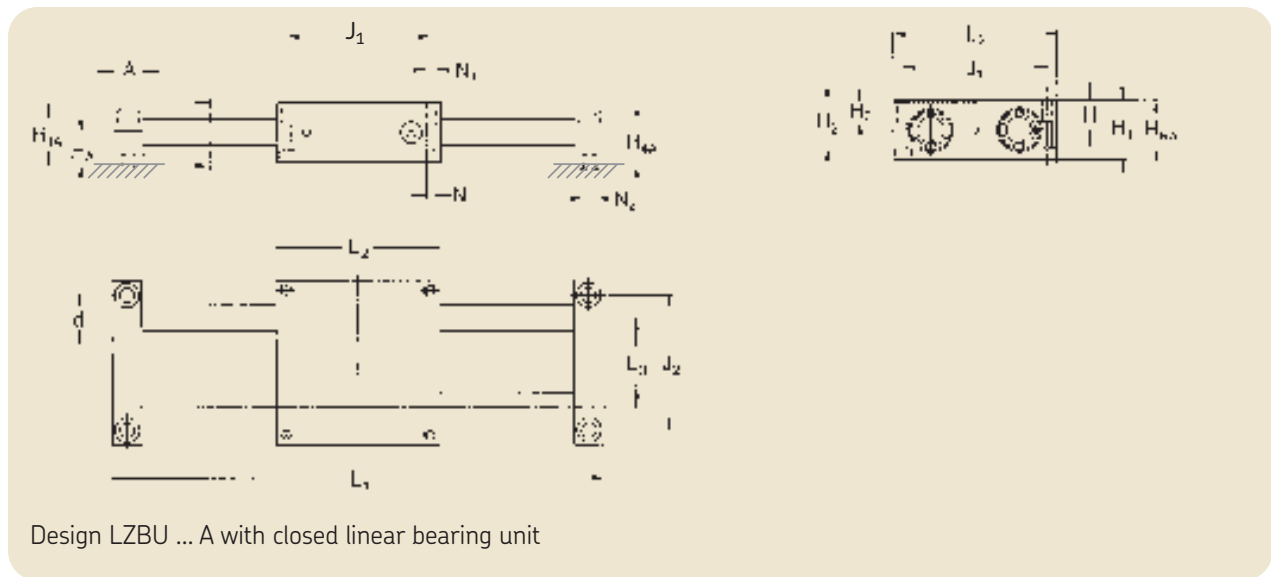
holes in the LRCB shaft supports. The total length should always be a multiple of this distance. LZAU are available in sizes ranging from 12 to 50 mm.



Quadro linear tables – LZBU ... A

- LZBU version with LQCD closed bearing units, LEAS-A* shaft blocks and shafts

* "A" design means fixed shafts and moving unit



Dimensions																		Load ratings ⁴⁾		Designations ¹⁾	
d	A	H _{RA} ± 0,03	H _A ± 0,015	H _{1A}	H _{2A}	H ± 0,01	H ₁	H ₂	H ₃	J ₁	J ₂	L ₁ ²⁾	L ₂	L ₃	N ³⁾	N ₁ ³⁾	N ₂ ³⁾	C	stat. C ₀		
mm																		–	mm	N	–
8	12	24	12,5	23	16	11,5	23	17,5	11	55	52	600	65	32	4,3	M 5	5,5	1 290	1 420	LZBU 8 A-2LS ⁵⁾	
12	14	34	18	32	23,5	16	32	25	13	73	70	900	85	42	5,3	M 6	6,6	2 850	3 250	LZBU 12 A-2LS	
16	18	38	20	37	26,5	18	36	29	13	88	82	1 500	100	54	5,3	M 6	9	3 450	3 450	LZBU 16 A-2LS	
20	20	48	25	46	32,5	23	46	37,5	18	115	108	1 800	130	72	6,6	M 8	11	5 200	5 500	LZBU 20 A-2LS	
25	25	58	30	56	40	28	56	45	22	140	132	1 800	160	88	8,4	M 10	13,5	7 650	8 150	LZBU 25 A-2LS	
30	25	67	35	64	48	32	64	50,5	26	158	150	2 400	180	96	10,5	M 12	13,5	12 200	12 900	LZBU 30 A-2LS	
40	30	84	44	80	59	40	80	64	34	202	190	3 000	230	122	13,5	M 16	17,5	20 800	20 800	LZBU 40 A-2LS	
50	30	100	52	96	75	48	96	80	34	250	240	3 000	280	152	13,5	M 16	17,5	30 000	28 000	LZBU 50 A-2LS	

¹⁾ The designation for an LZBU quadro-linear table with a shaft length of, for instance, 1 200 mm LZBU ...-2LS x 1200. Delivered as a kit of parts.

²⁾ Recommended maximal shaft length. On demand longer shaft lengths are available. The appropriate length tolerances of these shafts are according to DIN 7168 coarse series.

³⁾ Suitable Screws with internal hexagon according to DIN 912 / ISO 4762.

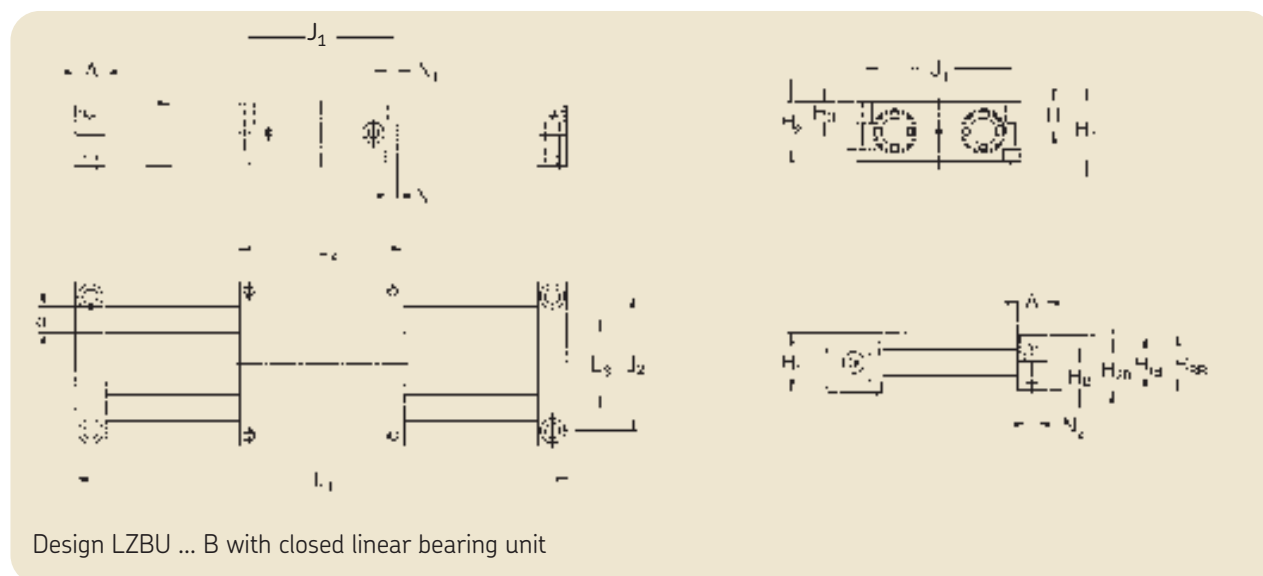
⁴⁾ Valid only for even loading of all four LBC ... A linear ball bearings. On delivery the deviation of the shaft must be considered and possibly the load rating revised.

⁵⁾ Units fitted with LBCR linear ball bearings are not designed for relubrication and are not self-aligning.

Quadro linear tables – LZBU ... B

- LZBU version with LQCD closed bearing units, LEAS-B* shaft blocks and shafts

* “B” design means fixed unit and moving shafts



Dimensions																		Load ratings ⁴⁾		Designations ¹⁾	
d	A	H _{RB} ± 0,03	H _B ± 0,015	H _{1B}	H _{2B} ± 0,01	H	H ₁	H ₂	H ₃	J ₁	J ₂	L ₁ ²⁾	L ₂	L ₃	N ³⁾	N ₁ ³⁾	N ₂ ³⁾	dyn C	stat. C ₀		
mm																		–	–	N	–
8	12	22,5	11	22	15	11,5	23	17,5	11	55	52	600	65	32	4,3	M 5	M 5	1 290	1 420	LZBU 8 B-2LS ⁵⁾	
12	14	30	14	28	19,5	16	32	25	13	73	70	900	85	42	5,3	M 6	M 6	2 850	3 250	LZBU 12 B-2LS	
16	18	35	17	34	23,5	18	36	29	13	88	82	1 500	100	54	5,3	M 6	M 8	3 450	3 450	LZBU 16 B-2LS	
20	20	44	21	42	28,5	23	46	37,5	18	115	108	1 800	130	72	6,6	M 8	M 10	5 200	5 500	LZBU 20 B-2LS	
25	25	54	26	52	36	28	56	45	22	140	132	1 800	160	88	8,4	M 10	M 12	7 650	8 150	LZBU 25 B-2LS	
30	25	61	29	58	42	32	64	50,5	26	158	150	2 400	180	96	10,5	M 12	M 12	12 200	12 900	LZBU 30 B-2LS	
40	30	76	36	72	51	40	80	64	34	202	190	3 000	230	122	13,5	M 16	M 16	20 800	20 800	LZBU 40 B-2LS	
50	30	92	44	88	67	48	96	80	34	250	240	3 000	280	152	13,5	M 16	M 16	30 000	28 000	LZBU 50 B-2LS	

¹⁾ The designation for an LZBU quadro-linear table with a shaft length of, for instance, 1 200 mm LZBU ...-2LS x 1200. Delivered as a kit of parts.

²⁾ Recommended maximal shaft length. On demand longer shaft lengths are available. The appropriate length tolerances of these shafts are according to DIN 7168 coarse series.

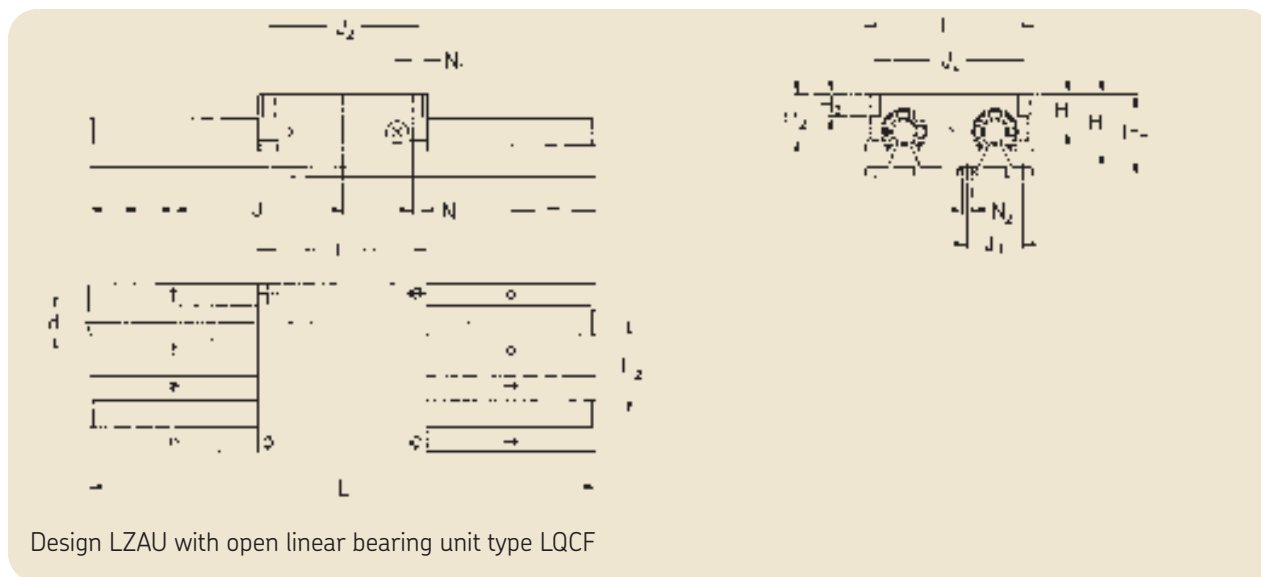
³⁾ Suitable Screws with internal hexagon according to DIN 912 / ISO 4762.

⁴⁾ Valid only for even loading of all four LBC ... A linear ball bearings. On delivery the deviation of the shaft must be considered and possibly the load rating revised.

⁵⁾ Units fitted with LBCR linear ball bearings are not designed for relubrication and are not self-aligning.

Quadro linear tables – LZAU

- LZAU version with LQCF open bearing units and supported shafts



Dimensions														Load ratings ⁴⁾		Designations ¹⁾
d	H _T ± 0,03	H	H ₁	H ₂	H ₃ ± 0,01	J ³⁾	J ₁	J ₂	L ₁	L ₂	N ²⁾	N ₁ ²⁾	N ₂ ²⁾	dyn C	stat. C ₀	
mm												–	mm	N		–
12	40	18	30	23,4	13	75	29	73	85	42	5,3	M 6	4,5	2 850	3 250	LZAU 12-2LS
16	48	22	35	28,4	13	100	33	88	100	54	5,3	M 6	5,5	3 450	3 450	LZAU 16-2LS
20	57	25	42	33,5	18	100	37	115	130	72	6,6	M 8	6,6	5 200	5 500	LZAU 20-2LS
25	66	30	51	40	22	120	42	140	160	88	8,4	M 10	6,6	7 650	8 150	LZAU 25-2LS
30	77	35	60	46,5	26	150	51	158	180	96	10,5	M 12	9	12 200	12 900	LZAU 30-2LS
40	95	45	77	61	34	200	55	202	230	122	13,5	M 16	9	20 800	20 800	LZAU 40-2LS
50	115	55	93	77	34	200	63	250	280	152	13,5	M 16	11	30 000	28 000	LZAU 50-2LS

Dimensions

Standard length

d L

mm	length increments in mm									
12-40	300	600	900	1 200	1 500	1 800	2 100	2 400	2 700	3 000
50	—	600	900	1 200	1 500	1 800	2 100	2 400	2 700	3 000

¹⁾ The designation for an LZAU quadro-linear table with a shaft length of, for instance, 600 mm LZAU ... -2LS x 600.
Delivered with shafts and shaft supports ready assembled.

²⁾ Suitable Screws with internal hexagon according to DIN 912 / ISO 4762.

³⁾ The separation is always arranged symmetrically to half the table length.

⁴⁾ Valid only for even loading of all four LBC ... A linear ball bearings.

Precision shafts

SKF precision shafts can be supplied either as solid or hollow shafts. Solid shafts are available in all dimensions required to fit SKF linear ball bearings; hollow shafts have a minimum outer diameter of 16 mm. They are induction hardened and ground (see table on next page). SKF shafts have exceptionally high dimensional stability and are designed for long service life.

The shaft ends of normal shaft production may deviate in hardness and dimension accuracy. For special applications, solid shafts of stainless steel or hard chromium plated shafts with a chromium coating of approximately 10 µm thickness can be supplied. Note that the surface of a

stainless steel shaft is not as hard as the surface of a shaft made of high-grade steel. The case depth may also be greater than indicated in the table and this may have an influence on the machinability of the shafts. Because of the benefits they offer, SKF precision shafts are not only used together with SKF linear ball bearings for linear guides, but are also used for other applications like axles or column sleeves.

Materials

SKF precision shafts are made from non-alloyed high-grade steels Cf53 (Material No.1.1213), Ck53 (Material No.1.1210), C60 (Material No.1.0601) and 100Cr6 (Material No.1.3505). The surface hardness is

between 60 and 64 HRC. Solid stainless steel shafts are made from X90CrMoV18 (Material No.1.4112) or X46Cr13 (Material No.1.4034). In this case the surface hardness lies between 52 and 56 HRC. Shafts made from other materials can be supplied to special order.

Surface finish

All SKF precision steel shafts have a surface roughness of max. R_a 0,3 µm.



Case hardening of SKF shafts

Shaft diameter		Hardness
over	incl	depth min
mm		mm
—	10	0,5
10	18	0,8
18	30	1,2
30	50	1,5
50	80	2,2
80	100	3,0

Tolerances

SKF precision steel shafts are machined to h6 or h7 tolerances. The accuracy of dimensions and form of these shafts can be found in the table on page 56. There may be slight deviations from the values provided in the tables for sections of the shaft that have been annealed. SKF precision steel shafts with diameters machined to tolerance h9 can be supplied to special order. Shafts cut to special lengths have a length tolerance to ISO 2768 medium class. The relevant values are provided in the adjacent table.

Shafts with radial holes

For linear guides requiring support, shafts with threaded radial holes are needed. These can be supplied by SKF. The radial holes may be either positioned to fit SKF shaft supports or as specified on the customer's drawings. However, SKF recommends using the guideline values provided in the adjacent table for thread size and depth. SKF shafts with radial holes are not annealed at the drilling position; the thread is cut in the case hardened and ground shaft to avoid any changes in hardness or dimensional accuracy.

Composite shafts

Composite shafts can be supplied to customer drawings, either with screwed joints or with "plug and socket" joints, depending on the application. Accurately centred trunnions and sockets provide smooth transitions at the butt joint. To enable correct assembly, the relative positions of the shaft sections and shaft ends are marked. Composite shafts should be fastened to a support at the butt joints, particularly when "plug and socket" joints are used. When drilling radial holes for the supports, drill as close as possible to the joint.

Note: the length of the shaft and the positioning of the supports should be determined so that any bending of the shaft will not cause a gap to form at the joint.

Length tolerances for shafts to ISO 2768 medium class

Nominal length		Deviation
over	incl	
mm		mm
—	120	± 0,3
120	400	± 0,5
400	1 000	± 0,8
1 000	2 000	± 1,2
2 000	4 000	± 2
4 000	8 000	± 3

Corrosion protection, packing

SKF precision steel shafts are treated with a rust inhibiting preservative that must be removed before the shafts are installed. Depending on size and quantity, they are supplied in cardboard or wooden boxes that offer maximum protection during transport.

Standard length of the shafts¹⁾

SKF precision steel shafts are available in following length

Shaft diameter	Maximal length ²⁾				
	LJM ³⁾	LJMH ³⁾	LJMS ³⁾	LJMR ³⁾	LJT ³⁾
mm	mm				
3 ⁴⁾				200	
4 ⁴⁾				200	
5	3 900	2 000	1 000	3 800	
6	3 900	3 900	3 900	3 800	
8	3 900	3 900	3 900	3 800	
10	6 200	6 200	3 900	3 800	
12	6 200	6 200	4 900	6 200	6 000
14	6 200	6 200	4 900	6 200	
16	6 200	6 200	4 900	6 200	6 000
20	6 200	6 200	4 900	6 200	6 000
25	6 200	6 200	4 900	6 200	6 000
30	6 200	6 200	4 900	6 200	6 000
40	6 200	6 200	4 900	6 200	6 000
50	6 200	6 200	4 900	6 200	6 000
60	6 200	6 200	4 900	6 200	6 000
80	6 200	6 200			6 000

¹⁾ Different diameters and length on request

²⁾ length tolerance ±10 % (based on maximum shaft length)

³⁾ for details see page 56/57

⁴⁾ only available as ESSC 2 see page 54

Shafting standard – ESSC



ESSC 1

cut with no chamfer only deburr

- length tolerance according to ISO 2768 medium class (see page 53)



ESSC 2

cut with chamfer

- length tolerance as ESSC 1



ESSC 3

cut with machined 25° chamfer and 90° front surfaces for limited length tolerance or chamfer according to customer specification

- length tolerance +/- 0,1 mm up to 3 000 mm total length



ESSC 4

cut with machined 25° chamfer, 90° front surfaces and one axial hole

- length tolerance as ESSC 3



ESSC 5

as ESSC 4 with two axial holes

Dimensions of front side thread
(ESSC 4 & ESSC 5)

Ø (d)	Thread (G)	Depth (L5)
5	-	-
8	M4	10
10	M4	10
12	M5	12,5
14	M5	12,5
16	M6	15
20	M8	20
25	M10	25
30	M10	25
40	M12	30
50	M16	40
60	M20	50
80	M24	60



ESSC 6

cut and chamfer as ESSC 2

- with radial holes for LRCB (see page 47)
- first radial hole with $J_x = J/2$
- H1 according to hardness depth

Dimensions of radial thread

Ø	Thread	G	G1	J	Jx
5	-	-	-	-	-
8	-	-	-	-	-
12	M4	5	8	75	37,5
16	M5	6	9,5	100	50
20	M6	7	13	100	50
25	M8	9	14	120	60
30	M10	11	18	150	75
40	M10	11	20	200	100
50	M12	13	23	200	100
60	M14	15	28	300	150
80	M16	16	33	300	150



ESSC 7

as ESSC 6

- radial holes with J and Jx according to customer specification

Ø	Thread	G	G1	J	Jx
5	-	-	-	-	-
8	-	-	-	-	-
12	M4	5	8	-	-
16	M5	6	9,5	-	-
20	M6	7	13	-	-
25	M8	9	14	-	-
30	M10	11	18	-	-
40	M10	11	20	-	-
50	M12	13	23	-	-
60	M14	15	28	-	-
80	M16	16	33	-	-



ESSC 8

cut and chamfer as ESSC 2

- Shaft is mounted on LRCB (see page 47)
- first radial hole with $J_x = J/2$
- H1 according to hardness depth

Ø	Thread	G	G1	J	Jx
5	-	-	-	-	-
8	-	-	-	-	-
12	M4	5	8	75	37,5
16	M5	6	9,5	100	50
20	M6	7	13	100	50
25	M8	9	14	120	60
30	M10	11	18	150	75
40	M10	11	20	200	100
50	M12	13	23	200	100
60	M14	15	28	300	150
80	M16	16	33	300	150



ESSC 9

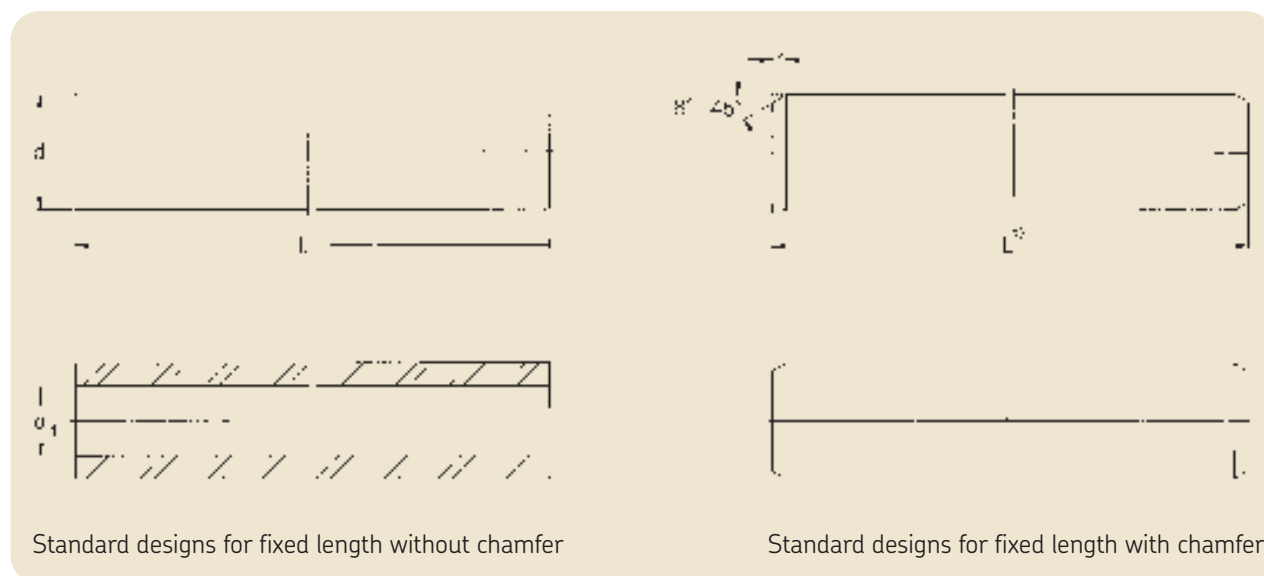
as ESSC 8

- Shaft is mounted on LRCC (see page 47)
- radial holes with J and Jx according to customer specification

Ø	Thread	G	G1	J	Jx
5	-	-	-	-	-
8	-	-	-	-	-
12	M4	5	8	-	-
16	M5	6	9,5	-	-
20	M6	7	13	-	-
25	M8	9	14	-	-
30	M10	11	18	-	-
40	M10	11	20	-	-
50	M12	13	23	-	-
60	M14	15	28	-	-
80	M16	16	33	-	-

ESSC 10, shaft according to customer specification / drawings

Precision shafts



Dimension			Mass		Moment of inertia		Cross sectional area		Designations				
			Solid shaft	Hollow shaft	Solid shaft	Hollow shaft	Solid shaft	Hollow shaft	Solid shafts of precision steel	Solid shafts of stainless steel		Solid shafts with high grade steel hard chromium	Hollow shaft high grade steel plated
d	d ₁	r _{min}							Cf53/Ck53	X90CrMoV18	X46Cr13	Cf53/Ck53	C60/100Cr6
mm			kg/m		cm ⁴		mm ²						
3	—	0,4	0,06	—	0,0004	—	7,1	—		LJMR 3			
4	—	0,4	0,1	—	0,0013	—	12,6	—		LJMR 4			
5	—	0,8	0,15	—	0,0031	—	19,6	—	LJM 5	LJMR 5	LJMS 5	LJMH 5	
6	—	0,8	0,22	—	0,0064	—	28,3	—	LJM 6	LJMR 6	LJMS 6	LJMH 6	
8	—	0,8	0,39	—	0,020	—	50,3	—	LJM 8	LJMR 8	LJMS 8	LJMH 8	
10	—	0,8	0,62	—	0,049	—	78,5	—	LJM 10	LJMR 10	LJMS 10	LJMH 10	
12	4	1	0,89	0,79	0,102	—	113	—	LJM 12	LJMR 12	LJMS 12	LJMH 12	LJT 12
14	—	1	1,21	—	0,189	—	154	—	LJM 14	LJMR 14	LJMS 14	LJMH 14	
16	7	1	1,58	1,28	0,322	0,310	201	163	LJM 16	LJMR 16	LJMS 16	LJMH 16	LJT 16
20	14	1,5	2,47	1,25	0,785	0,597	314	160	LJM 20	LJMR 20	LJMS 20	LJMH 20	LJT 20
25	16	1,5	3,86	2,35	1,92	1,64	491	305	LJM 25	LJMR 25	LJMS 25	LJMH 25	LJT 25
30	18	1,5	5,55	3,5	3,98	3,46	707	453	LJM 30	LJMR 30	LJMS 30	LJMH 30	LJT 30
40	28	2	9,86	4,99	12,6	9,96	1 260	685	LJM 40	LJMR 40	LJMS 40	LJMH 40	LJT 40
50	30	2	15,4	9,91	30,7	27,7	1 960	1 350	LJM 50	LJMR 50	LJMS 50	LJMH 50	LJT 50
60	36	2,5	22,2	14,2	63,6	57,1	2 830	1 920	LJM 60	LJMR 60	LJMS 60	LJMH 60	LJT 60
80	57	2,5	39,5	19,43	201	153	5 030	2 565	LJM 80			LJMH 80	LJT 80

Attention:

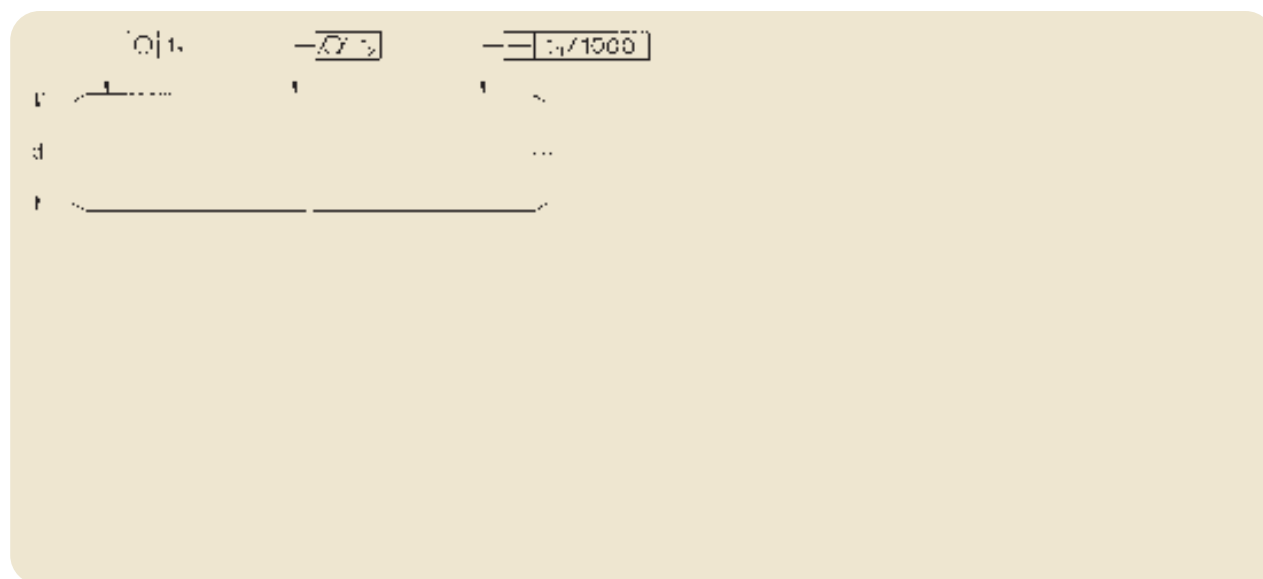
d₁ can deviate from the value quoted. Please enquire if necessary.

Different shaft diameters and types on request.

The static load capacity has to be decreased by 8 % and the dynamic load capacity by 18 % when using the non corrosi-on types (HV6) in conjunction with precision steel shafts made of stainless steel.

¹⁾ Shafts cut to special length with chamfered ends. The length tolerance of these shafts corresponds to LJM 20x1500 ESSC2 medium class. The designation for a shaft with 20 mm diameter cut to a length of 1,5 m is, for example, LJM 20x1500 ESSC2.

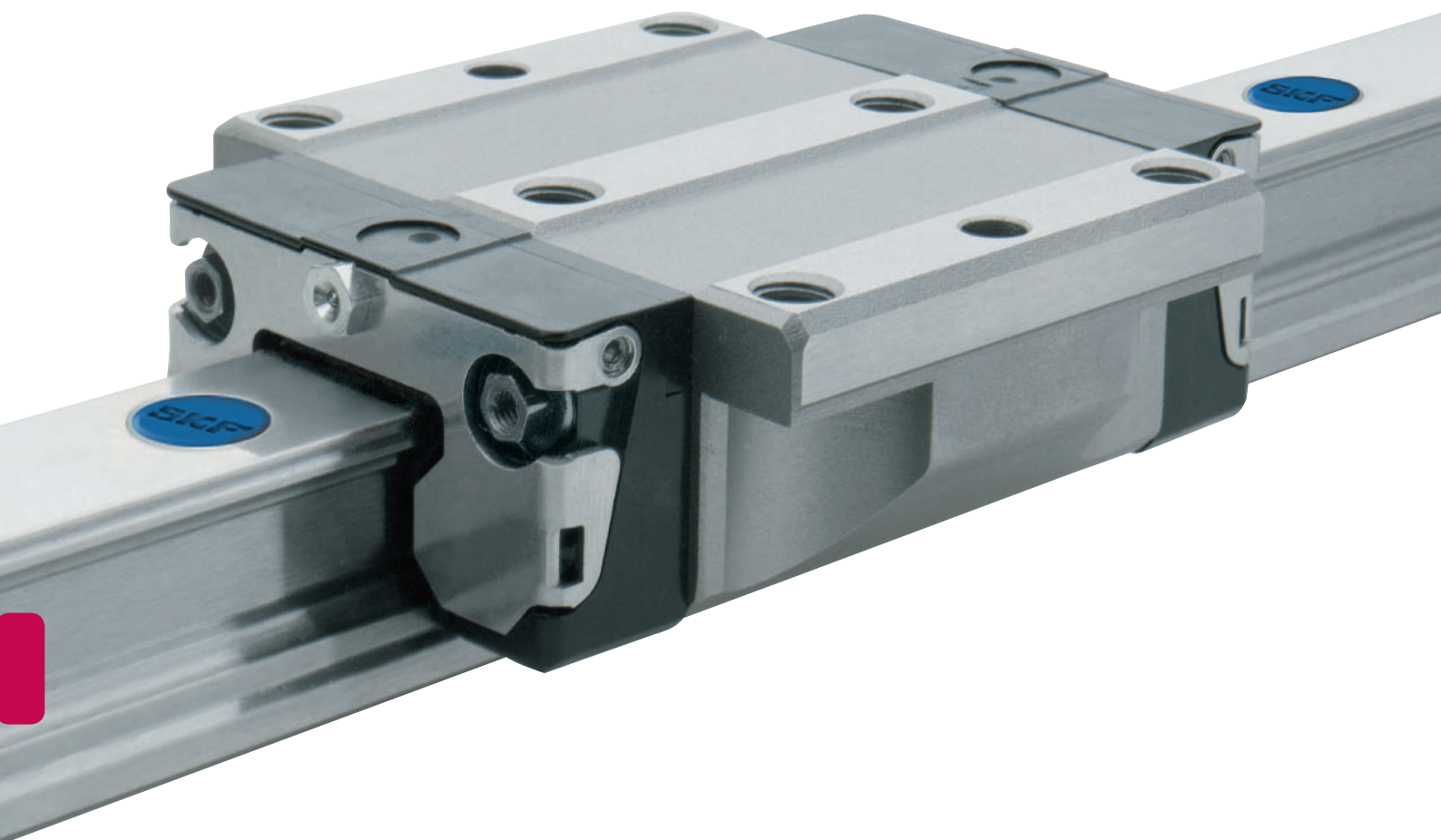
Precision shafts of high-grade steel



Shaft Nominal diameter	Accuracy of dimension and form Shafts to tolerance h6					Shafts to tolerance h7				
	Diameter deviation		Round- ness	Cylindri- city	Straight- ness ¹⁾	Diameter deviation		Round- ness	Cylindri- city	Straight ness ¹⁾
d	high	low	t ₁	t ₂	t ₃	high	low	t ₁	t ₂	t ₃
mm	μm									
3	0	-6	3	4	150	0	-10	4	6	150
4	0	-8	4	5	150	0	-12	5	8	150
5	0	-8	4	5	150	0	-12	5	8	150
6	0	-8	4	5	150	0	-12	5	8	150
8	0	-9	4	6	120	0	-15	6	9	120
10	0	-9	5	7	120	0	-15	7	10	120
12	0	-11	5	8	100	0	-18	8	11	100
14	0	-11	5	8	100	0	-18	8	11	100
16	0	-11	5	8	100	0	-18	8	11	100
20	0	-13	6	9	100	0	-21	9	13	100
25	0	-13	6	9	100	0	-21	9	13	100
30	0	-13	6	9	100	0	-21	9	13	100
40	0	-16	7	11	100	0	-25	11	16	100
50	0	-16	7	11	100	0	-25	11	16	100
60	0	-19	8	13	100	0	-30	13	19	100
80	0	-19	8	13	100	0	-30	13	19	100

¹⁾ Shafts with higher precision on request.

P profile rail guides LLR



Introduction

As the world's leading manufacturer of rolling bearings, SKF supplies practically every type of rolling bearing for rotary and linear movements. The standard profile rail guides produced by SKF are brought together in this catalogue. SKF profile rail guides are accuracy rolling bearings for linear movements and are therefore suitable for use in most types of machinery. With these profile rail guides it is possible for SKF to offer a guide system which achieves a good price/performance ratio.

Profile rail guides from SKF are available in many designs and sizes, and thanks to their unlimited stroke they can be adapted to any linear movement. They consist of a rail guide with ground raceways on which one or several guide carriages can

be moved with an unlimited stroke. The guide carriages are made of tempered bearing steel into which the hardened raceways of the ball circuits are inserted. Fixing holes in the attachment surfaces enable machine parts to be directly mounted onto the carriages. Fundamentally, profile rail guides constitute a coupled angular ball bearing in back-to-back arrangement and, depending on the application, are available in different preload classes. The raceways of the profile rail and of the carriage are arranged at an angle of 45°. As a result, the system has the same load capacity in the four main load directions as well as a high moment load capacity.

Depending on the load conditions and the required service life, a

selection can also be made between two design versions. In addition to the standard carriage length, a series with extended carriages is available which exhibits higher load rating. To meet the requirements of operating practice, a range of different guide systems is offered. Their main features are load capacity, screw connections to provide the fastening points on the carriage and the sectional height.

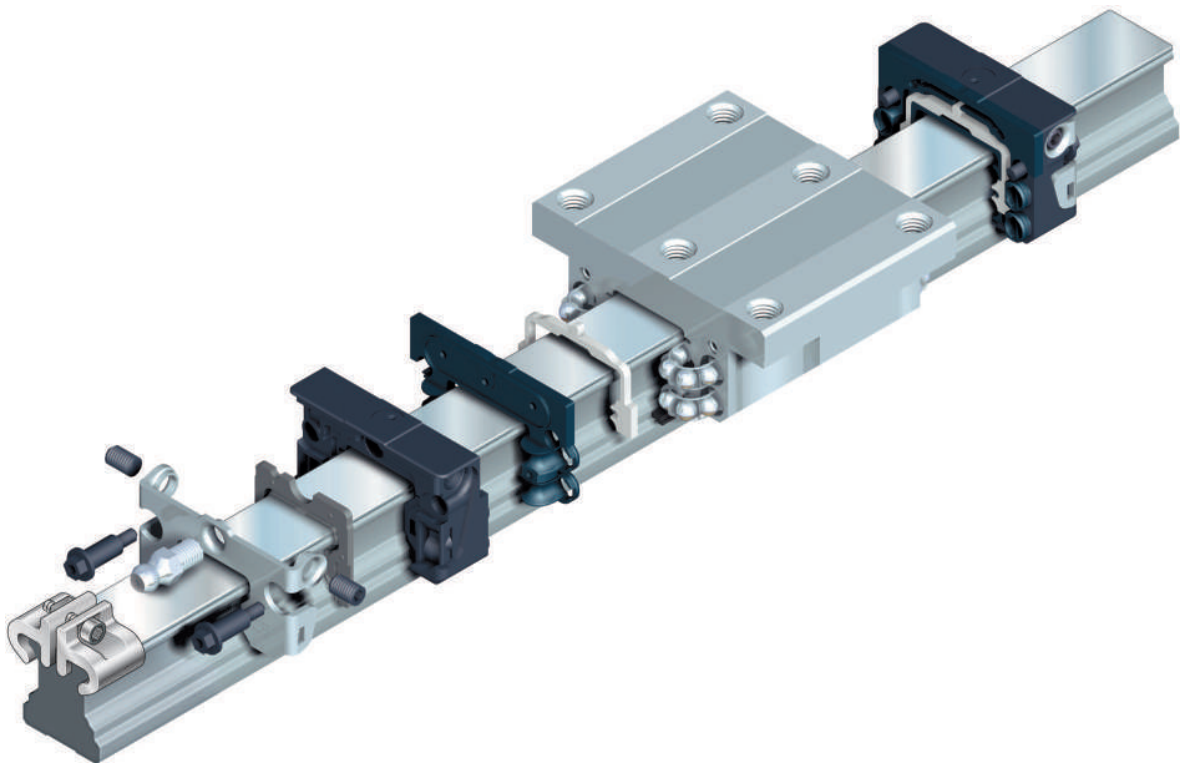
Thanks to the modular design of the systems, subsequent changes are not a problem. This catalogue brings together all the data which we feel is relevant.

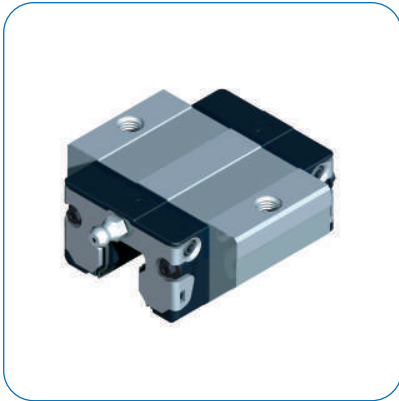
If you require additional information please get in touch with one of our sales companies.



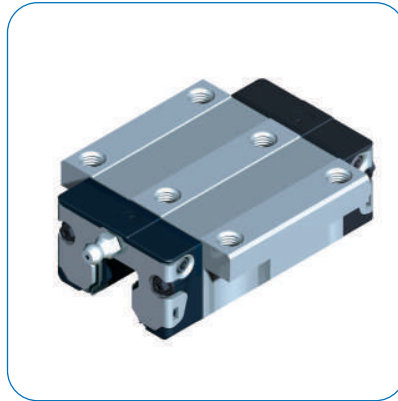
Product overview

- Carriages with and without ball chain
- High load capacities in all main directions and high moment load capacities
- High dynamic performances:
 $v = 5 \text{ m/s}$; $a_{\text{max}} = 500 \text{ m/s}^2$
- Low noise and smooth, light running due to optimised ball recirculation and ideal ball chain geometry
- Long term lubrication system
- Lube ports with metal threads on all sides.
- Full interchangeability due to standardised rail, with or without rail seal cover strip, for all carriage versions
- Various accuracy and preload classes
- Carriages can be screwed from above or below, depending on type.
- Improved stiffness under lift off and side loading conditions when additional mounting screws are used for the holes in the centre of the carriage
- Integrated all-round sealing through front and longitudinal seals
- Wide range of accessories
- Both grease and oil lubrication possible despite initial grease application
- Wide range of accessories
- Worldwide SKF service network
- Both sides of the guide rail can be used as reference edges

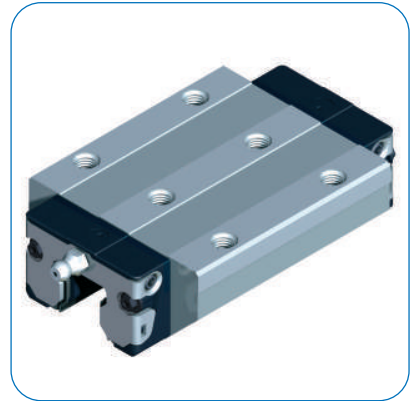




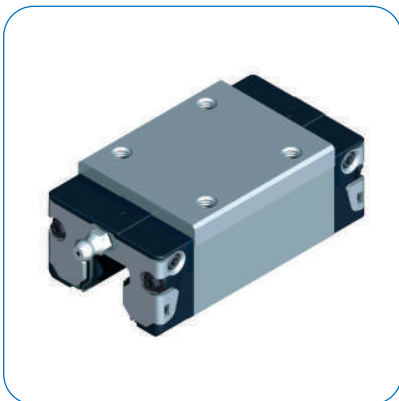
LLRHC xx SA
Flange short. Standard height.



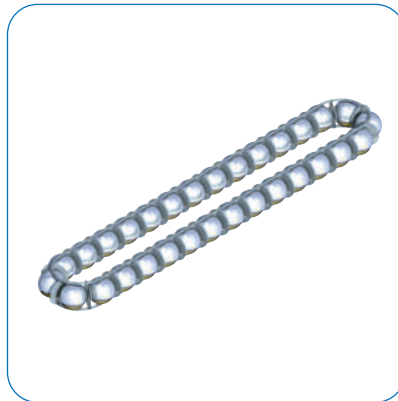
LLRHC xx A
Flange normal. Standard height.



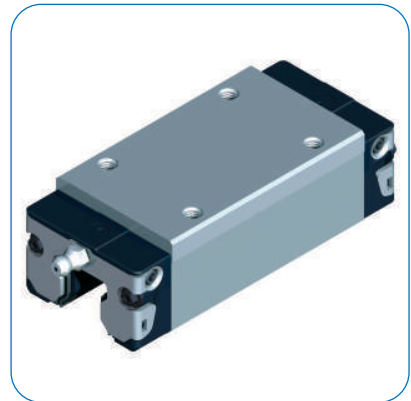
LLRHC xx LA
Flange long. Standard height.



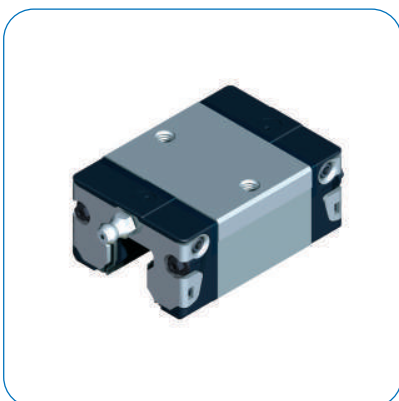
LLRHC xx R
Slim line normal. High.



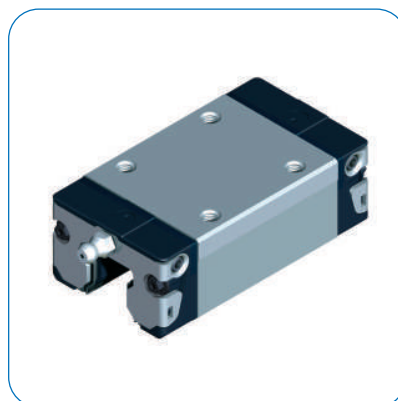
Ball chain
Optimises noise level and running behaviour



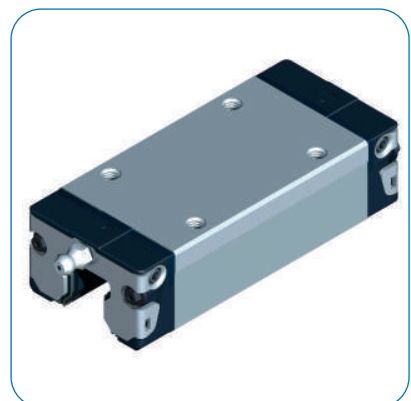
LLRHC xx LR
Slim line long. High.



LLRHC xx SU
Slim line short. Standard height.



LLRHC xx U
Slim line normal. Standard height.



LLRHC xx LU
Slim line long. Standard height.

Technical data

General information

The general technical data applies to all rail guides (all carriages and rails).

Special technical data is listed separately for the individual designs.

Preload classes

In view of the different user requirements, the ball rail guides can be supplied in four different preload classes.

So as not to reduce the service life, the preload should not amount to more than 1/3 of the bearing load F.

In general, the stiffness of the carriage increases according to the preload increase.

Guide systems with parallel rails

- In connection with the selected preload class the permissible deviation in parallelism of the rails must also be taken into account (see tables for the various designs).
- For the installation of rail guides in the accuracy class P5 we recommend the version with clearance T0 or the preload class T1 in order to avoid stresses owing to the tolerances.

Speed

$v_{\max}$: 5 m/s

Acceleration

$a_{\max}$: 500 m/s²

Only in the case of preloaded systems.

In the case of non-preloaded systems: $a_{\max} = 50 \text{ m/s}^2$

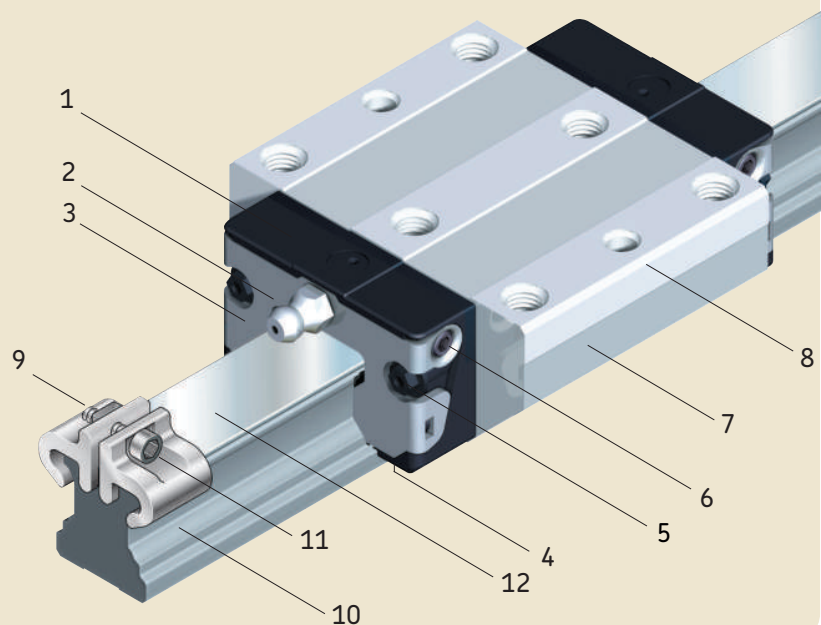
Temperature resistance

$t_{\max}$: 100 °C

This is a maximum value which is only permissible for a short time. In continuous operation a maximum temperature of 80 °C must not be exceeded.

Material specifications

- | | |
|------------------------------------|---|
| 1 Recirculation parts: POM (PA6.6) | 6 Thread pins: 1.4301 |
| 2 Lubrication nipple: carbon steel | 7 Balls: bearing steel |
| 3 Metal front plates: 1.4301 | 8 Housing: tempered steel |
| 4 Seals: TEE-E | 9 Cover strip retaining clamps: aluminium |
| 5 Flange screws: carbon steel | 10 Clamping screw and nut: 1.4301 |
| | 11 Rail: tempered steel |
| | 12 Cover strip: 1.4301 |

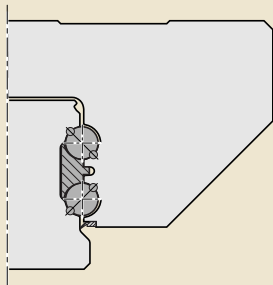


Friction

The friction coefficient μ of the ball rail guide is approx. 0,002 to 0,003 (not including the friction of the seal).

As a result of the design with 4 ball rows a 2-point contact exists for all load directions. This reduces friction to a minimum (Fig. 1).

Fig. 1



Seals

Seals should prevent the penetration of dirt and chips into the interior of the carriage in order to avoid premature failure.

Universal seal

Universal seals are installed as standard in SKF carriages.

They have a constant sealing effect on rails with and without cover strip.

In addition to efficient sealing, the design also provides for low friction.

For applications where low friction is required light-contact seals are available on request.

Front seal

Front seals can be ordered as accessories and are attached by the customer.

They are suitable for use in environments with fine dust or metal particles, as well as coolants or cutting fluids.

Note!

For extreme duty in environments with coarse dirt or metal particles, or where there is massive use of coolants or cutting fluids, Viton seals are available on request.

Viton seals have to be attached by the customer.

Scraper plates

Scraper plates can be ordered as accessories (have to be attached by the customer).

They are suitable for use in most environments where coarse dirt or chips are encountered.

Load rating

Definition of the basic dynamic load rating C

The radial load, constant in magnitude and direction, which a linear rolling bearing can in theory accommodate for a basic rating life represented by a travelled distance of 10^5 m (to DIN 636 Part 1).

The basic dynamic load ratings in the tables are generally 30 % higher than the values to DIN. They have been verified in tests.

Definition of the basic static load rating C₀

The static load in the direction of loading which corresponds to a calculated load in the centre of the most highly loaded contact point between the rolling element and both raceways (rail) at an osculation of $\leq 0,52, 4\ 200$ MPa.

Note:

At this load on the contact point a permanent total deformation of the rolling element and raceway occurs which corresponds to about 0,0001 times the rolling element diameter (to DIN 636 Part 2).

Definition and calculation of the basic rating life

The calculated life achievable with 90 % reliability for a single rolling bearing or a group of evidently identical rolling bearings running under identical conditions given the material generally used today of normal manufacturer's quality and usual operating conditions (to DIN 636 Part 1).

Basic rating life at constant speed

The basic rating life L or L_h can be calculated applying the formula (1), (2) or (3):

$$(1) L_{10} = \left(\frac{C}{P}\right)^3 10^5$$

$$(2) L_{10h} = \frac{L_{10}}{2 \times s \times n \times 60}$$

Basic rating life at changing speed

$$(3) L_{10h} = \frac{L_{10}}{60 \times v_m}$$

$$(4) v_m = \frac{t_1 \times v_1 + t_2 \times v_2 + \dots + t_n \times v_n}{100}$$

L_{10} = basic rating life (m)

L_{10h} = basic rating life (h)

C = basic dynamic load rating (N)

P = equivalent load (N)

s = stroke length (m)

n = stroke frequency (double strokes/min)

v_m = mean speed (m/min)

$v_1, v_2, \dots, v_n$ = travel speeds (m/min)

$t_1, t_2, \dots, t_n$ = time proportions for $v_1, v_2, \dots, v_n$ (%)

The formulae for calculating the service life of profile rail guides apply to a stroke length of $S \geq 2$ times the carriage length. At lower values the load rating is reduced. Please consult SKF.

Dynamic equivalent bearing load for calculation of the service life

For a fluctuating bearing load the dynamic equivalent loading F is calculated according to formula (5):

$$(5) F_m = \sqrt[3]{\frac{F_1^3 \times s_1 + F_2^3 \times s_2 + \dots + F_n^3 \times s_n}{s}}$$

F_m = constant mean load (N)

$F_1, F_2, \dots, F_n$ = constant loads during stroke lengths $s_1, + s_2 +, \dots, s_n$ (N)

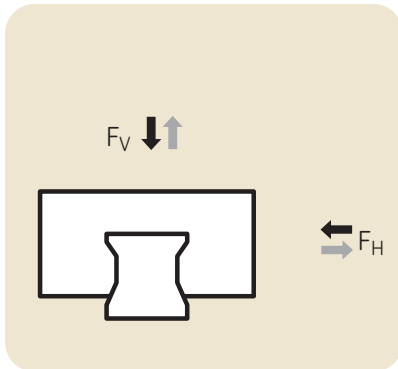
s = total stroke length ($s = s_1 + s_2 +, \dots, s_n$), during which loads $F_1, F_2 \dots F_n$ have an effect (mm)

- given a combined bearing load

Note on dynamic load capacities and moments

Determination of dynamic load capacities and moments is based on a travel life of 100 000 m. However, frequently this is determined on the basis of only 50 000 m. In this case for comparison: multiply values C , M_c and M_a by 1.26 in accordance with SKF tables.

For carriages with ball chain the permissible moments are reduced in accordance with the load ratings.



Dynamic equivalent bearing load

For a combined external load – vertical and horizontal – the dynamic equivalent load F is calculated by means of formula (6):

$$(6) F = |F_V| + |F_H|$$

dynamic equivalent load (N)

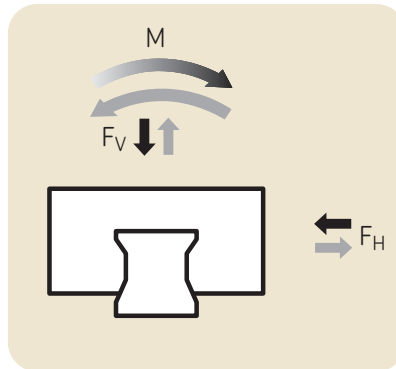
F_V = dynamic external load, vertical (N)

F_H = dynamic external load, horizontal (N)

Note: The design of the ball rail guide permits this simplified calculation.

Note:

If different load stages exist for F_V and F_H , F_V and F_H must be calculated individually using formula (5). An external load applied at any angle to the carriage must be divided into the proportions F_V and F_H . The amounts are then used in formula (6)



Dynamic equivalent bearing load

For a combined external load – vertical and horizontal – in combination with a torsional moment the dynamic equivalent load F can be calculated using formula (7):

$$(7) F = |F_V| + |F_H| + C \times \frac{|M|}{M_t}$$

F = dynamic equivalent load (N)

F_V, F_H = dynamic external loads (N)

M = dynamic torsional moment (Nm)

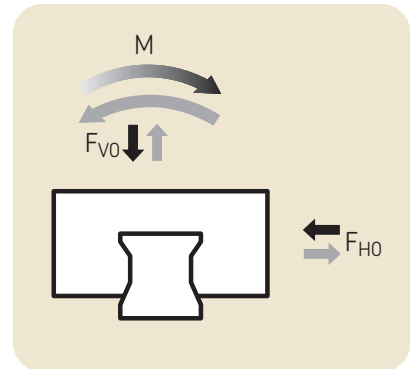
C = basic dynamic load rating (N)

M_t = dynamic permissible moment (Nm)

Formula (7) only applies if a single rail is used.

Note:

If different load stages exist for F_V and F_H , F_V and F_H must be calculated individually using formula (5). An external load applied at any angle to the carriage must be divided into the proportions F_V and F_H . The amounts are then used in formula (7).



Static equivalent bearing load

For a combined external static load – vertical and horizontal – in connection with a static torsional moment the static equivalent load F_0 can be calculated using formula (8).

The static equivalent load F_0 must not exceed the static load rating C_0 .

Formula (8) only applies if a single rail is used.

$$(8) F_0 = |F_{V0}| + |F_{H0}| + C_0 \times \frac{|M_0|}{M_{t0}}$$

F_0 = static equivalent load (N)

F_{V0}, F_{H0} = static external loads (N)

M_0 = static torsional moment (Nm)

C_0 = basic static load rating (N)

M_{t0} = static permissible moment (Nm)

Note:

An external load applied at any angle to the carriage must be divided into the proportions F_{V0} and F_{H0} . The amounts are then used in formula (8).

Accuracy

Accuracy classes

Accuracy classes and their tolerances

SKF profile rail guides are available in five accuracy classes. As shown in the adjacent illustration, the tolerances are defined for each accuracy class. The stated accuracy classes are available for almost all types of profile rail guides. For the designs which can be supplied please refer to the respective table on page 11.

Dimensional tolerance in height "H"

The dimensional tolerance in height "H" is the maximum deviation of the height "H" for the carriages on a profile rail (Fig. 2).

Dimensional tolerance in width "N"

The dimensional tolerance in width "N" is the maximum deviation of the "N" dimension for the carriages on a profile rail (Fig. 2).

- The "N" dimension designates the distance of the mounting surface of the profile rail from the ground side surface of the carriage.
- The accuracies stated are mean values and relate to the centre of the carriage.
- The tolerances should be checked again after the profile rail guide has been mounted on the machine bed.

Problem-free interchangeability through precision manufacture

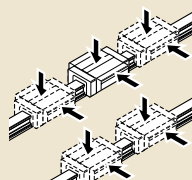
The rail and carriage are produced so precisely by SKF, especially in the ball raceway area, that each individual element can be exchanged at any time.

For example, a carriage can be used without any problems on different rails of the same size.

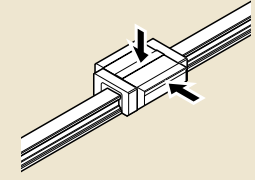
Conversely, various carriages can be used on one rail.

Fig. 1

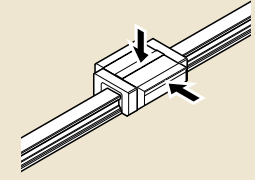
Accuracy class	Tolerance		Max. differences in dimension H and N on one rail	
	H (μm)	N (μm)	Δ H (μm)	Δ N (μm)
P5	± 100	± 40	30	30
P3	±40	±20	15	15
P1	±20	±10	7	7
P01	±10	±7	5	5
P001	±5	±5	3	3



Measured in the centre of the carriage:



For any combination of carriages and rails over the entire rail length



For different carriages at the same rail position

* Tolerances for the combination of different accuracy classes in respect of carriage and rail can be referred to on page 11.

Fig. 2

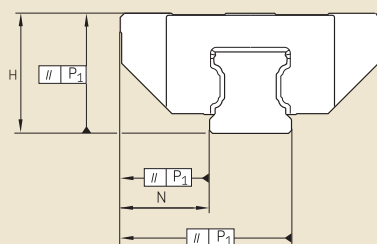
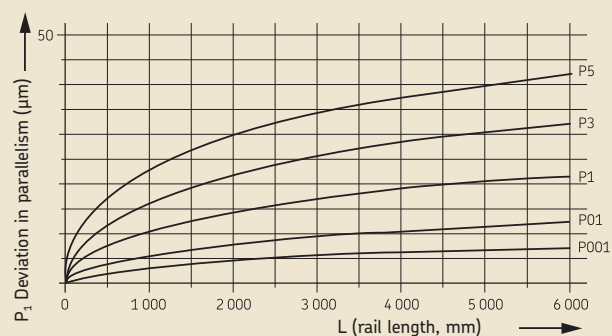


Fig. 3



Selection criteria for combination of accuracy classes

Carriages	Rails	P5 μm	P3 μm	P1 μm	P01 μm	P001 μm
P5	Tolerance dimension H (μm)	± 100	± 48	± 32	± 23	± 19
	Tolerance dimension N (μm)	± 40	± 28	± 22	± 20	± 19
	Max. difference of dimensions H and N on a rail (μm)	30	30	30	30	30
P3	Tolerance dimension H (μm)	± 88	± 40	± 23	± 23	± 19
	Tolerance dimension N (μm)	± 33	± 20	± 14	± 20	± 19
	Max. difference of dimensions H and N on a rail (μm)	15	15	15	15	15
P1	Tolerance dimension H (μm)	± 84	± 34	± 21	± 11	± 7
	Tolerance dimension N (μm)	± 28	± 16	± 10	± 8	± 7
	Max. difference of dimensions H and N on a rail (μm)	7	7	7	7	7
P01	Tolerance dimension H (μm)	± 83	± 33	± 19	± 10	± 6
	Tolerance dimension N (μm)	± 27	± 15	± 9	± 7	± 6
	Max. difference of dimensions H and N on a rail (μm)	5	5	5	5	5
P001	Tolerance dimension H (μm)	± 82	± 32	± 18	± 9	± 5
	Tolerance dimension N (μm)	± 26	± 14	± 8	± 6	± 5
	Max. difference of dimensions H and N on a rail (μm)	3	3	3	3	3

Recommendations for the combination of accuracy classes

Recommended for short strokes and small distances between the carriages:

Carriage in higher accuracy class than guide rail.

Recommended for long strokes and larger distances between the carriages:

Guide rail in higher accuracy class than carriage.

Running accuracy as selection criterion

By means of perfected ball entry and exit zones in the carriages of accuracy classes P1 and P001, a hitherto unattained running accuracy accompanied by extremely low pulsation is achieved.

This is particularly suitable for ultra-fine metal cutting operations, metrology, high-precision scanners, erosion techniques etc.

Preloading and stiffness

For perfect operating behaviour under various operating conditions in an extremely wide range of applications it is necessary to establish the suitable preload. In general, a slight to medium preload is enough for the majority of applications. For special applications in which high shock loads and vibration can occur it is advisable to use a higher preloading. The preload classes offered by SKF are categorised in Table 4.

Selection of the preload class

In the designs with clearance no preloading is achieved. Instead, there is clearance of between 1 and 10 µm between the carriage and rail. If two rails and more than one carriage per rail are used this clearance is in most cases equalised by parallelism tolerances.

Preload force referred to the basic dynamic load rating C_{dyn} of the respective carriage.

Example:

Carriage LLRHC 35 A

$C = 41\,900\text{ N}$

Preload $0,02 \times C = 838\text{ N}$

This carriage is preloaded with a basic load of approx. 838N.

Table 4

Versions and area of applications

T0 – Clearance

For particularly smooth-running guide systems with low friction and low external influences. Designs with clearance are only available in the accuracy classes P5 and P3.

T1 – Preload 0,02 C

For precise guide systems with low external load and high requirements in respect of overall stiffness.

T2 – Preload 0,08 C

For precise guide systems with high external load and high requirements in respect of overall stiffness; also recommended for single-rail systems. Above-average moment loads are absorbed without any significant elastic deformation. At only medium moment loads the overall stiffness is further improved.

T3 – Preload 0,13 C

For highly rigid guide systems such as precision machine tools or injection mould clamping units. Above-average loads and moments are absorbed with lowest-possible elastic deformation. Version with preload T3 only available in accuracy classes P1, P01 and P001.

Deflection as a function of preload class and carriage

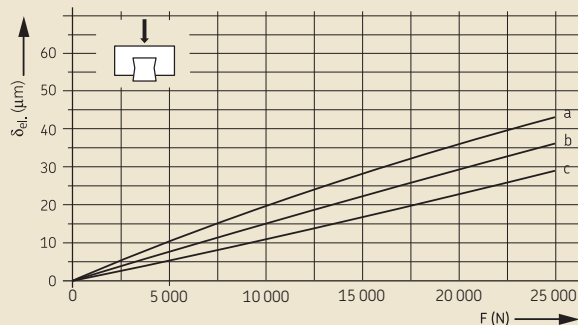
Example:

Carriage LLRHC 35 A,

a) Preload 0,02 C (T1)

b) Preload 0,08 C (T2)

c) Preload 0,13 C (T3)



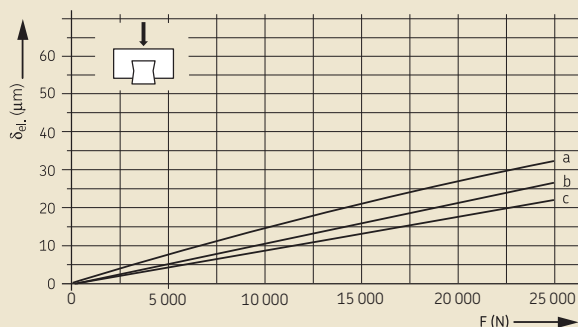
Example:

Carriage LLRHC 35 LA,

a) Preload 0,02 C (T1)

b) Preload 0,08 C (T2)

c) Preload 0,13 C (T3)



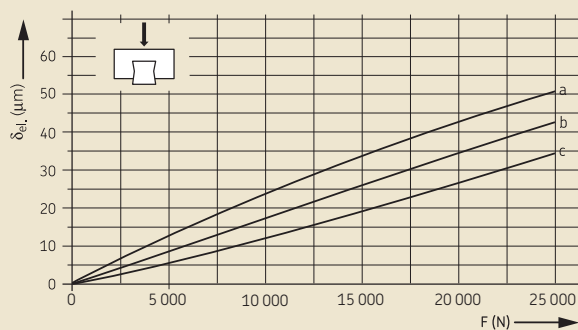
Example:

Carriage LLRHC 35 U,

a) Preload 0,02 C (T1)

b) Preload 0,08 C (T2)

c) Preload 0,13 C (T3)



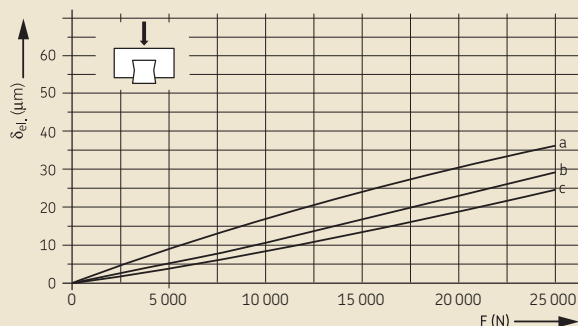
Example:

Carriage LLRHC 35 LU,

a) Preload 0,02 C (T1)

b) Preload 0,08 C (T2)

c) Preload 0,13 C (T3)



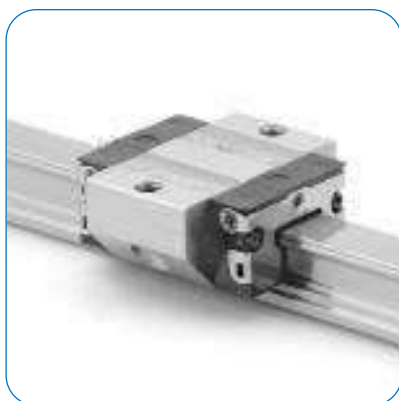
Legend

δ_{el} = elastic deformation

F = load

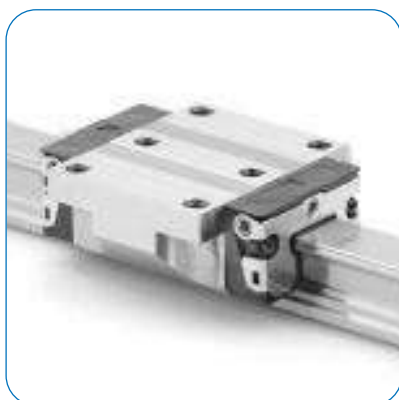
Carriages

Load ratings



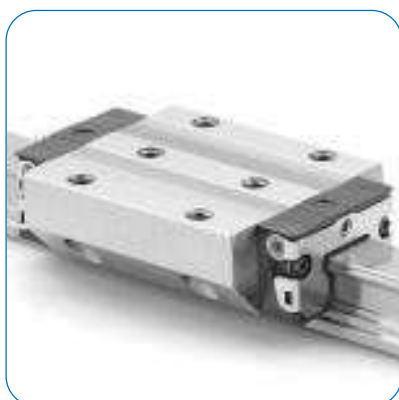
LLRHC xx SA (Flange short. Standard height.)

Size Design		15	20	25	30	35	45
ball chain	C (N)	5 900	12 400	14 000	22 100	29 300	–
no ball chain	C (N)	6 800	12 400	15 800	22 100	29 300	–
ball chain	C ₀ (N)	6 700	13 600	15 200	24 800	32 400	–
no ball chain	C ₀ (N)	8 100	13 600	18 200	24 800	32 400	–



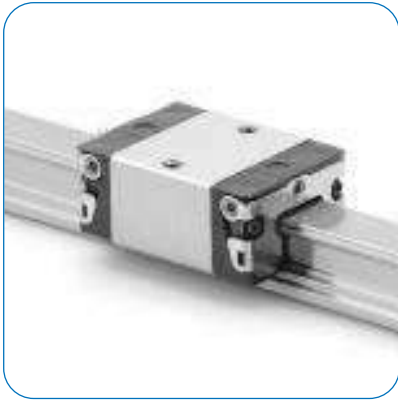
LLRHC xx A (Flange normal. Standard height.)

Size Design		15	20	25	30	35	45
ball chain	C (N)	7 280	17 400	21 300	29 300	41 900	63 300
no ball chain	C (N)	7 800	18 800	22 800	31 700	41 900	68 100
ball chain	C ₀ (N)	12 100	21 700	27 300	37 200	54 000	77 100
no ball chain	C ₀ (N)	13 500	24 400	30 400	41 300	54 000	85 700



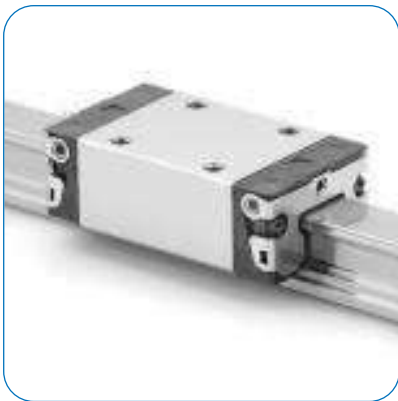
LLRHC xx LA (Flange long. Standard height.)

Size Design		15	20	25	30	35	45
ball chain	C (N)	9 000	23 100	27 500	38 000	53 000	81 900
no ball chain	C (N)	10 000	24 400	30 400	40 000	55 600	90 400
ball chain	C ₀ (N)	17 500	32 500	39 500	53 700	75 600	111 400
no ball chain	C ₀ (N)	20 200	35 200	45 500	57 800	81 000	128 500



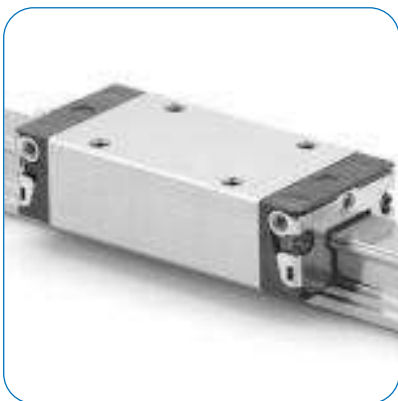
LLRHC xx SU (Slim line short. Standard height.)

Size Design		15	20	25	30	35	45
ball chain	C (N)	5 900	12 400	14 000	22 100	29 300	–
no ball chain	C (N)	6 800	12 400	15 800	22 100	29 300	–
ball chain	C ₀ (N)	6 700	13 600	15 200	24 800	32 400	–
no ball chain	C ₀ (N)	8 100	13 600	18 200	24 800	32 400	–



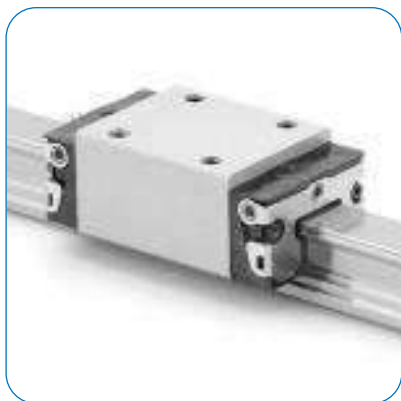
LLRHC xx U (Slim line normal. Standard height.)

Size Design		15	20	25	30	35	45
ball chain	C (N)	7 280	17 400	21 300	29 300	41 900	63 300
no ball chain	C (N)	7 800	18 800	22 800	31 700	41 900	68 100
ball chain	C ₀ (N)	12 100	21 700	27 300	37 200	54 000	77 100
no ball chain	C ₀ (N)	13 500	24 400	30 400	41 300	54 000	85 700



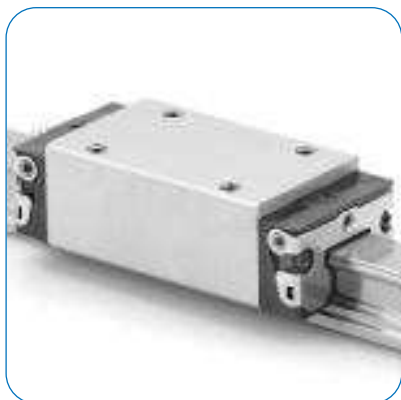
LLRHC xx LU (Slim line long. Standard height.)

Size Design		15	20	25	30	35	45
ball chain	C (N)	9 000	23 100	27 500	38 000	53 000	81 900
no ball chain	C (N)	10 000	24 400	30 400	40 000	55 600	90 400
ball chain	C ₀ (N)	17 500	32 500	39 500	53 700	75 600	111 400
no ball chain	C ₀ (N)	20 200	35 200	45 500	57 800	81 000	128 500



LLRHC xx R (Slim line normal. High.)

Size Design		15	25	30	35	45
ball chain	C (N)	7 280	21 300	29 300	41 900	63 300
no ball chain	C (N)	7 800	22 800	31 700	41 900	68 100
ball chain	C ₀ (N)	12 100	27 300	37 200	54 000	77 100
no ball chain	C ₀ (N)	13 500	30 400	41 300	54 000	85 700



LLRHC xx LR (Slim line long. High.)

Size Design		25	30	35	45
ball chain	C (N)	27 500	38 000	53 000	81 900
no ball chain	C (N)	30 400	40 000	55 600	90 400
ball chain	C ₀ (N)	39 500	53 700	75 600	111 400
no ball chain	C ₀ (N)	45 500	57 800	81 000	128 500

Note on dynamic load capacities and moments

Determination of dynamic load capacities and moments is based on a travel life of 100 000 m. However, frequently this is determined on the basis of only 50 000 m. In this case for comparison: multiply values C, M_c and M_A by 1.26 in accordance with SKF tables.

For carriages with ball chain the permissible moments are reduced in accordance with the load ratings.

Accuracy classes, dimensions and designations

Carriage LLRHC xx SA

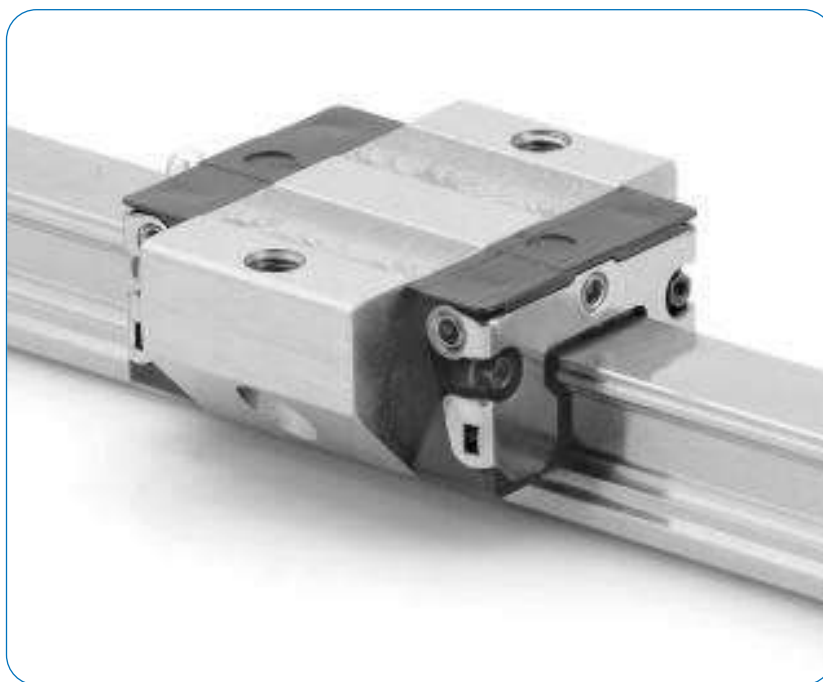
Flange short. Standard height.

For type designation see
designation system

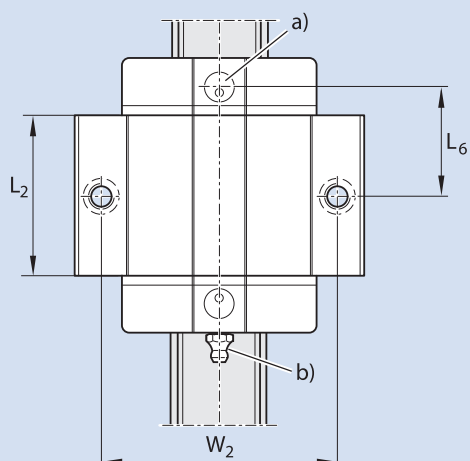
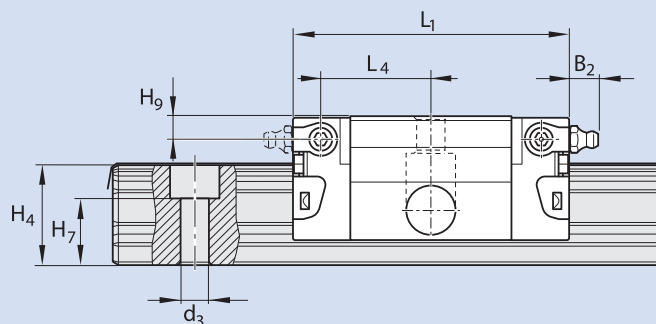
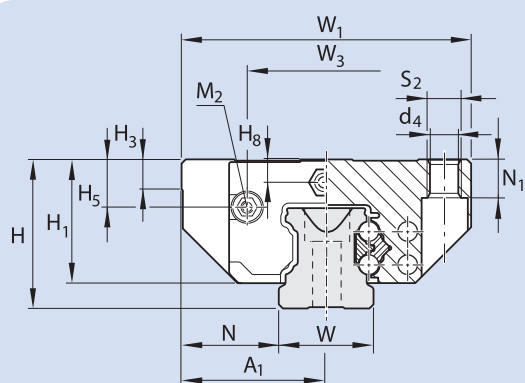
Dynamic values

Speed $v_{\max} = 5 \text{ m/s}$

Acceleration $a_{\max} = 500 \text{ m/s}^2$



Size	Accuracy class	Type designation incl. preload class	
		T0	T1
15	P5	LLRHC 15 SA T0 P5	LLRHC 15 SA T1 P5
	P3	LLRHC 15 SA T0 P3	LLRHC 15 SA T1 P3
20	P5	LLRHC 20 SA T0 P5	LLRHC 20 SA T1 P5
	P3	LLRHC 20 SA T0 P3	LLRHC 20 SA T1 P3
25	P5	LLRHC 25 SA T0 P5	LLRHC 25 SA T1 P5
	P3	LLRHC 25 SA T0 P3	LLRHC 25 SA T1 P3
30	P5	LLRHC 30 SA T0 P5	LLRHC 30 SA T1 P5
	P3	LLRHC 30 SA T0 P3	LLRHC 30 SA T1 P3
35	P5	LLRHC 35 SA T0 P5	LLRHC 35 SA T1 P5
	P3	LLRHC 35 SA T0 P3	LLRHC 35 SA T1 P3



- a) For O-ring
 Size 15: Ø 4 x 1,0 (mm)
 Size 20-35: Ø 5 x 1,0 (mm)
 Open lubrication hole as required.
 See additional elements:
 Mounting of lubrication adapter.
- b) Lubrication nipple size 15 and 20: Funnel-type nipple
 Type A – Thread size M3 x 5, DIN 3405
 B2 = 1,6 mm
 When using other nipples, the max. permissible screw depth of 5 mm must be observed!
 Size 25 to 35: M6 x 8, DIN 71412
 B2 = 9,5 mm
 When using other nipples, the max. permissible screw depth of 8 mm must be observed!
 Lubrication nipple supplied along with the rail guide (unmounted).
 Connection possible at all sides.
 If pin holes are needed, please refer to section "Mounting instructions".

Size	Dimensions (mm)																	
	W ₁	A ₁	W	N	L ₁	L ₂	H	H ₁	H ₄ ¹⁾	H ₄ ²⁾	H ₃	W ₂	W ₃	H ₅	L ₆	L ₄	H ₈	H ₉
15	47	23,5	15	16,0	44,7	25,7	24	19,90	16,30	16,20	5,0	38	24,55	6,70	16,25	17,85	3,20	3,20
20	63	31,5	20	21,5	57,3	31,9	30	25,35	20,75	20,55	6,0	53	32,50	7,30	22,95	22,95	3,35	3,35
25	70	35,0	23	23,5	67,0	38,6	36	29,90	24,45	24,25	7,5	57	38,30	11,50	25,35	26,50	5,50	5,50
30	90	45,0	28	31,0	75,3	45,0	42	35,35	28,55	28,35	7,0	72	48,40	14,60	28,80	30,50	6,05	6,05
35	100	50,0	34	33,0	84,9	51,4	48	40,40	32,15	31,85	8,0	82	58,00	17,35	32,70	34,20	6,90	6,90 ¹⁾

¹⁾ Dimension H₄ with cover strip.

²⁾ Dimension H₄ without cover strip

Size	Dimensions (mm)						Weight (kg)	Load ratings (N)		Moments (N _m)			
	N ₁	H ₇ ^{+0,5}	d ₄	S ₂	d ₃	M ₂		C dyn.	C ₀ stat.	M _C dyn.	M _{C0} stat.	M _A dyn.	M _B stat.
15	5,2	10,3	4,3	M5	4,4	M2,5-3,5 depth	0,15	5 400	8 100	52	80	19	28
20	7,7	13,2	5,3	M6	6,0	M3-5 depth	0,30	12 400	13 600	150	170	52	58
25	9,3	15,2	6,7	M8	7,0	M3-5 depth	0,50	15 900	18 200	230	260	82	94
30	11,0	17,0	8,5	M10	9,0	M3-5 depth	0,80	22 100	24 800	380	430	133	150
35	12,0	20,5	8,5	M10	9,0	M3-5 depth	1,20	29 300	32 400	640	700	200	220

Carriage LLRHC xx A

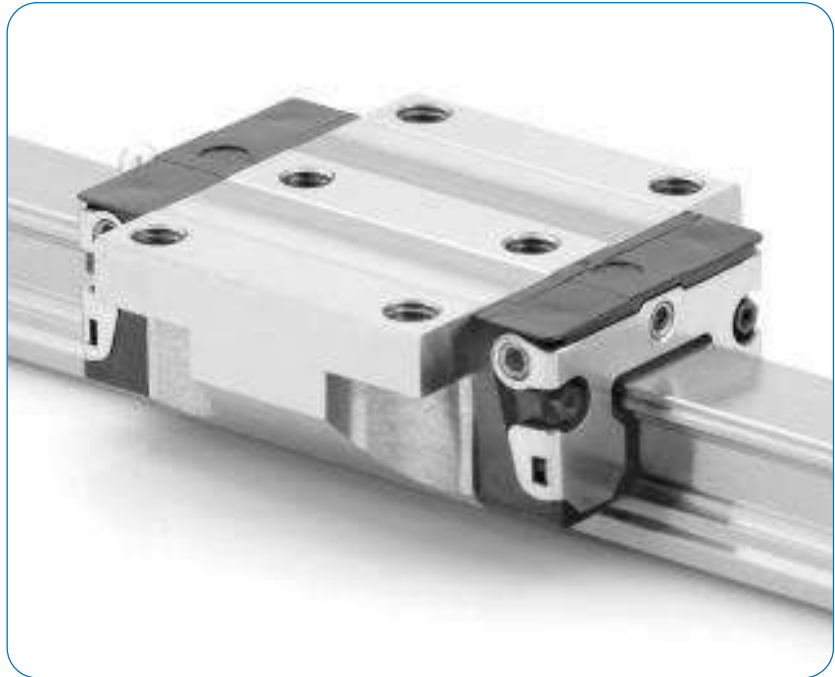
Flange normal. Standard height.

For type designation see
designation system

Dynamic values

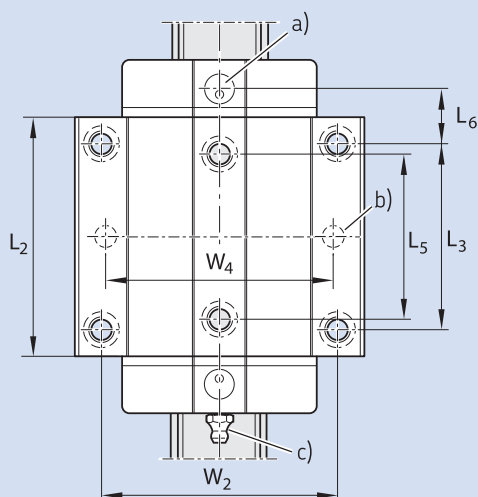
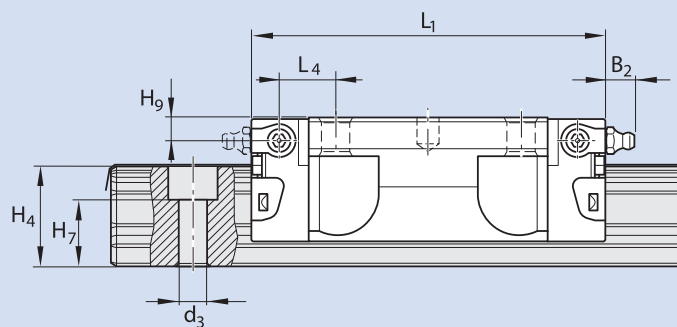
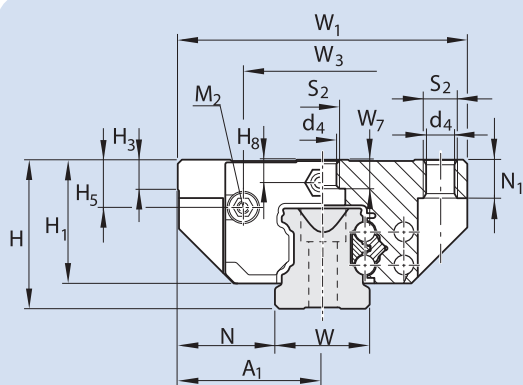
Speed $v_{\max} = 5 \text{ m/s}$

Acceleration $a_{\max} = 500 \text{ m/s}^2$



Size	Accuracy class	Type designation incl. preload class			
		T0	T1	T2	T3
15	P5	LLRHC 15 A T0 P5	LLRHC 15 A T1 P5	LLRHC 15 A T2 P5	
	P3	LLRHC 15 A T0 P3	LLRHC 15 A T1 P3	LLRHC 15 A T2 P3	
	P1		LLRHC 15 A T1 P1	LLRHC 15 A T2 P1	LLRHC 15 A T3 P1
	P01		LLRHC 15 A T1 P01	LLRHC 15 A T2 P01	LLRHC 15 A T3 P01
	P001		LLRHC 15 A T1 P001	LLRHC 15 A T2 P001	LLRHC 15 A T3 P001
20	P5	LLRHC 20 A T0 P5	LLRHC 20 A T1 P5	LLRHC 20 A T2 P5	
	P3	LLRHC 20 A T0 P3	LLRHC 20 A T1 P3	LLRHC 20 A T2 P3	
	P1		LLRHC 20 A T1 P1	LLRHC 20 A T2 P1	LLRHC 20 A T3 P1
	P01		LLRHC 20 A T1 P01	LLRHC 20 A T2 P01	LLRHC 20 A T3 P01
	P001		LLRHC 20 A T1 P001	LLRHC 20 A T2 P001	LLRHC 20 A T3 P001
25	P5	LLRHC 25 A T0 P5	LLRHC 25 A T1 P5	LLRHC 25 A T2 P5	
	P3	LLRHC 25 A T0 P3	LLRHC 25 A T1 P3	LLRHC 25 A T2 P3	
	P1		LLRHC 25 A T1 P1	LLRHC 25 A T2 P1	LLRHC 25 A T3 P1
	P01		LLRHC 25 A T1 P01	LLRHC 25 A T2 P01	LLRHC 25 A T3 P01
	P001		LLRHC 25 A T1 P001	LLRHC 25 A T2 P001	LLRHC 25 A T3 P001
30	P5	LLRHC 30 A T0 P5	LLRHC 30 A T1 P5	LLRHC 30 A T2 P5	
	P3	LLRHC 30 A T0 P3	LLRHC 30 A T1 P3	LLRHC 30 A T2 P3	
	P1		LLRHC 30 A T1 P1	LLRHC 30 A T2 P1	LLRHC 30 A T3 P1
	P01		LLRHC 30 A T1 P01	LLRHC 30 A T2 P01	LLRHC 30 A T3 P01
	P001		LLRHC 30 A T1 P001	LLRHC 30 A T2 P001	LLRHC 30 A T3 P001
35	P5	LLRHC 35 A T0 P5	LLRHC 35 A T1 P5	LLRHC 35 A T2 P5	
	P3	LLRHC 35 A T0 P3	LLRHC 35 A T1 P3	LLRHC 35 A T2 P3	
	P1		LLRHC 35 A T1 P1	LLRHC 35 A T2 P1	LLRHC 35 A T3 P1
	P01		LLRHC 35 A T1 P01	LLRHC 35 A T2 P01	LLRHC 35 A T3 P01
	P001		LLRHC 35 A T1 P001	LLRHC 35 A T2 P001	LLRHC 35 A T3 P001
45	P5	LLRHC 45 A T0 P5	LLRHC 45 A T1 P5	LLRHC 45 A T2 P5	
	P3	LLRHC 45 A T0 P3	LLRHC 45 A T1 P3	LLRHC 45 A T2 P3	
	P1		LLRHC 45 A T1 P1	LLRHC 45 A T2 P1	LLRHC 45 A T3 P1
	P01		LLRHC 45 A T1 P01	LLRHC 45 A T2 P01	LLRHC 45 A T3 P01
	P001		LLRHC 45 A T1 P001	LLRHC 45 A T2 P001	LLRHC 45 A T3 P001

bold text = standard range



- a) For O-ring
Size 15: $\varnothing 4 \times 1,0$ (mm)
Size 20-45: $\varnothing 5 \times 1,0$ (mm)
Open lubrication hole as required.
See additional elements: Mounting of lubrication adapter.
- b) Recommended position for pin holes (dimensions W4, see "Mounting instructions")
NB: For production-related reasons there may be pilot drill holes in the middle of the carriage. They are suitable for drilling..
- c) Lubrication nipple size 15 and 20: Funnel-type nipple
Type A – Thread size M3 x 5, DIN 3405
B2 = 1,6 mm
When using other nipples, the max. permissible screw depth of 5 mm must be observed!
- Size 25 to 45: M6 x 8, DIN 71412
B2 = 9,5 mm
When using other lubrication nipples, the max. permissible screw depth of 8 mm must be observed!
Lubrication nipple supplied with the rail guide (unmounted).
Connection possible at all sides.

Size	Dimensions (mm)																			
	W ₁	A ₁	W	N	L ₁	L ₂	H	H ₁	H ₄ ¹⁾	H ₄ ²⁾	H ₃	W ₂	L ₃	L ₅	W ₃	H ₅	L ₆	L ₄	H ₈	H ₉
15	47	23,5	15	16,0	58,2	39,2	24	19,90	16,30	16,20	5,0	38	30	26	24,55	6,70	8,00	9,6	3,20	3,20
20	63	31,5	20	21,5	75,0	49,6	30	25,35	20,75	20,55	6,0	53	40	35	32,50	7,30	11,80	11,8	3,35	3,35
25	70	35,0	23	23,5	86,2	57,8	36	29,90	24,45	24,25	7,5	57	45	40	38,30	11,50	12,45	13,6	5,50	5,50
30	90	45,0	28	31,0	97,7	67,4	42	35,35	28,55	28,35	7,0	72	52	44	48,40	14,60	14,00	15,7	6,05	6,05
35	100	50,0	34	33,0	110,5	77,0	48	40,40	32,15	31,85	8,0	82	62	52	58,00	17,35	14,50	16,0	6,90	6,90
45	120	60	45	37,5	137,6	97,0	60	50,30	40,15	39,85	10,0	100	80	60	69,80	20,90	17,30	19,3	8,20	8,20

¹⁾ Dimension H₄ with cover strip.

²⁾ Dimension H₄ without cover strip

Size	Dimensions (mm)							Weight	Load ratings (N)		Moments (N _m)			
	N ₁	W ₇ ^{+0.5}	H ₇ ^{+0.5}	d ₄	S ₂	d ₃	M ₂		C dyn.	C ₀ stat.	M _C dyn.	M _{C0} stat.	M _A dyn.	M _B stat.
15	5,2	4,4	10,3	4,3	M5	4,4	M2,5-3,5 depth	0,20	7 800	13 500	74	130	40	71
20	7,7	5,2	13,2	5,3	M6	6,0	M3-5 depth	0,45	18 800	24 400	240	310	130	165
25	9,3	7,0	15,2	6,7	M8	7,0	M3-5 depth	0,65	22 800	30 400	320	430	180	240
30	11,0	7,9	17,0	8,5	M10	9,0	M3-5 depth	1,10	31 700	41 300	540	720	290	380
35	12,0	10,2	20,5	8,5	M10	9,0	M3-5 depth	1,60	41 900	54 000	890	1 160	440	565
45	15,0	14,4	23,5	10,4	M12	14,0	M4-7 depth	3,00	68 100	85 700	1 830	2 310	890	1 130 ³⁾

Carriage LLRHC xx LA

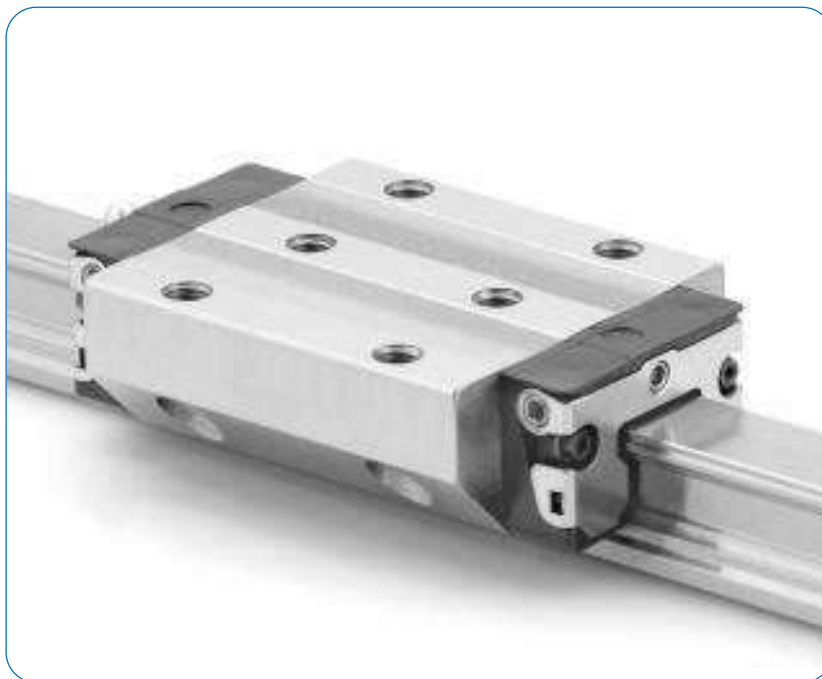
Flange long. Standard height.

For type designation see designation system

Dynamic values

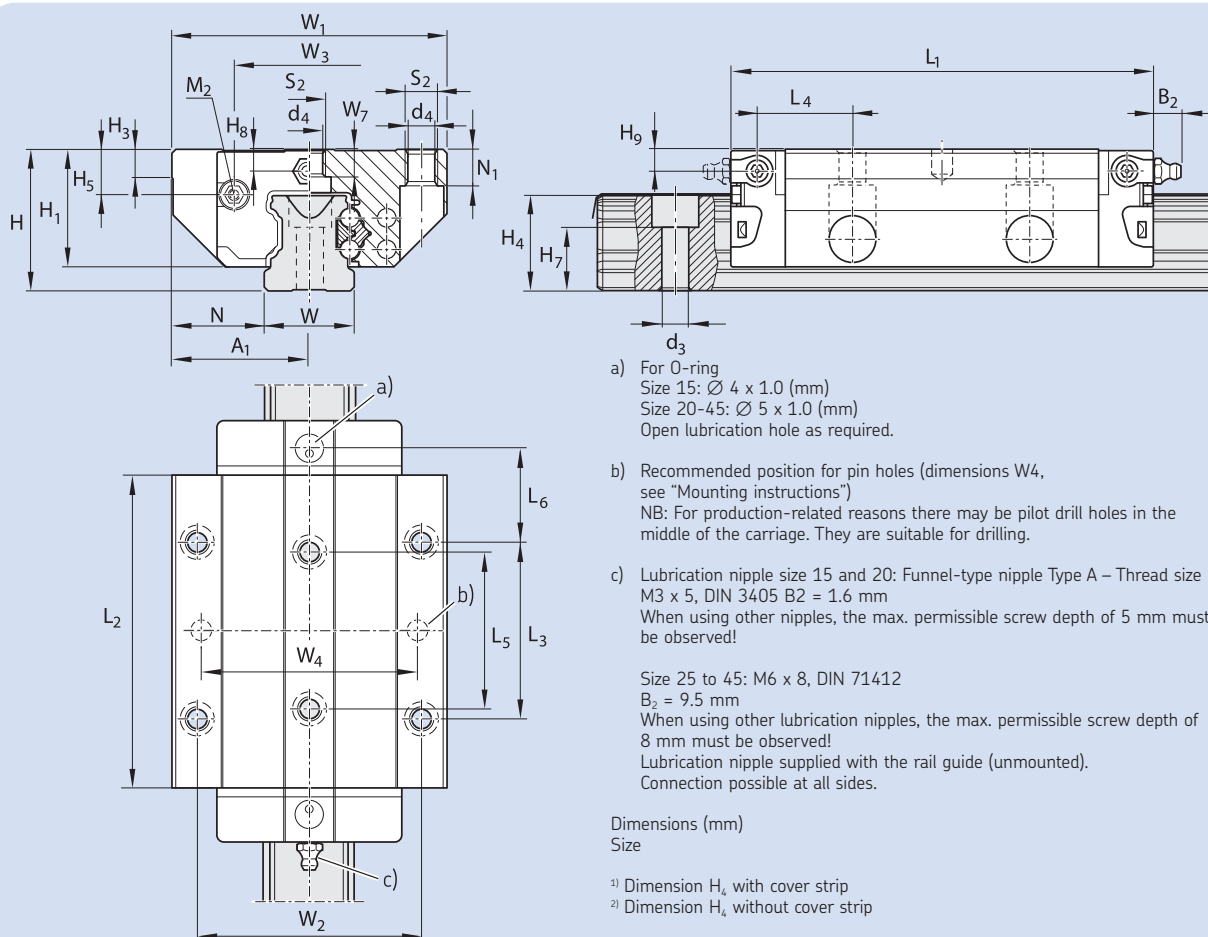
Speed $v_{\max} = 5 \text{ m/s}$

Acceleration $a_{\max} = 500 \text{ m/s}^2$



Size	Accuracy class	Type designation incl. preload class	T1	T2	T3
15	P5	LLRHC 15 LA T0 P5	LLRHC 15 LA T1 P5	LLRHC 15 LA T2 P5	
	P3	LLRHC 15 LA T0 P3	LLRHC 15 LA T1 P3	LLRHC 15 LA T2 P3	
	P1		LLRHC 15 LA T1 P1	LLRHC 15 LA T2 P1	LLRHC 15 LA T3 P1
	P01		LLRHC 15 LA T1 P01	LLRHC 15 LA T2 P01	LLRHC 15 LA T3 P01
	P001		LLRHC 15 LA T1 P001	LLRHC 15 LA T2 P001	LLRHC 15 LA T3 P001
20	P5	LLRHC 20 LA T0 P5	LLRHC 20 LA T1 P5	LLRHC 20 LA T2 P5	
	P3	LLRHC 20 LA T0 P3	LLRHC 20 LA T1 P3	LLRHC 20 LA T2 P3	
	P1		LLRHC 20 LA T1 P1	LLRHC 20 LA T2 P1	LLRHC 20 LA T3 P1
	P01		LLRHC 20 LA T1 P01	LLRHC 20 LA T2 P01	LLRHC 20 LA T3 P01
	P001		LLRHC 20 LA T1 P001	LLRHC 20 LA T2 P001	LLRHC 20 LA T3 P001
25	P5	LLRHC 25 LA T0 P5	LLRHC 25 LA T1 P5	LLRHC 25 LA T2 P5	
	P3	LLRHC 25 LA T0 P3	LLRHC 25 LA T1 P3	LLRHC 25 LA T2 P3	
	P1		LLRHC 25 LA T1 P1	LLRHC 25 LA T2 P1	LLRHC 25 LA T3 P1
	P01		LLRHC 25 LA T1 P01	LLRHC 25 LA T2 P01	LLRHC 25 LA T3 P01
	P001		LLRHC 25 LA T1 P001	LLRHC 25 LA T2 P001	LLRHC 25 LA T3 P001
30	P5	LLRHC 30 LA T0 P5	LLRHC 30 LA T1 P5	LLRHC 30 LA T2 P5	
	P3	LLRHC 30 LA T0 P3	LLRHC 30 LA T1 P3	LLRHC 30 LA T2 P3	
	P1		LLRHC 30 LA T1 P1	LLRHC 30 LA T2 P1	LLRHC 30 LA T3 P1
	P01		LLRHC 30 LA T1 P01	LLRHC 30 LA T2 P01	LLRHC 30 LA T3 P01
	P001		LLRHC 30 LA T1 P001	LLRHC 30 LA T2 P001	LLRHC 30 LA T3 P001
35	P5	LLRHC 35 LA T0 P5	LLRHC 35 LA T1 P5	LLRHC 35 LA T2 P5	
	P3	LLRHC 35 LA T0 P3	LLRHC 35 LA T1 P3	LLRHC 35 LA T2 P3	
	P1		LLRHC 35 LA T1 P1	LLRHC 35 LA T2 P1	LLRHC 35 LA T3 P1
	P01		LLRHC 35 LA T1 P01	LLRHC 35 LA T2 P01	LLRHC 35 LA T3 P01
	P001		LLRHC 35 LA T1 P001	LLRHC 35 LA T2 P001	LLRHC 35 LA T3 P001
45	P5	LLRHC 45 LA T0 P5	LLRHC 45 LA T1 P5	LLRHC 45 LA T2 P5	
	P3	LLRHC 45 LA T0 P3	LLRHC 45 LA T1 P3	LLRHC 45 LA T2 P3	
	P1		LLRHC 45 LA T1 P1	LLRHC 45 LA T2 P1	LLRHC 45 LA T3 P1
	P01		LLRHC 45 LA T1 P01	LLRHC 45 LA T2 P01	LLRHC 45 LA T3 P01
	P001		LLRHC 45 LA T1 P001	LLRHC 45 LA T2 P001	LLRHC 45 LA T3 P001

bold text = standard range



Size	Dimensions (mm)																			
	W ₁	A ₃	W	N	L ₁	L ₂	H	H ₁	H ₄ ⁽¹⁾	H ₄ ⁽²⁾	H ₃	W ₂	L ₃	L ₅	W ₃	H ₅	L ₆	L ₄	H ₈	H ₉
15	47	23,5	15	16,0	72,6	53,6	24	19,90	16,30	16,20	5,0	38	30	26	24,55	6,70	15,20	16,80	3,20	3,20
20	63	31,5	20	21,5	91,0	65,6	30	25,35	20,75	20,55	6,0	53	40	35	32,50	7,30	19,80	19,80	3,35	3,35
25	70	35,0	23	23,5	107,9	79,5	36	29,90	24,45	24,25	7,5	57	45	40	38,30	11,50	23,30	24,45	5,50	5,50
30	90	45,0	28	31,0	119,7	89,4	42	35,35	28,55	28,35	7,0	72	52	44	48,40	14,60	25,00	26,70	6,05	6,05
35	100	50,0	34	33,0	139,0	105,5	48	40,40	32,15	31,85	8,0	82	62	52	58,00	17,35	28,75	30,25	6,90	6,90
45	120	60,0	45	37,5	174,1	133,5	60	50,30	40,15	39,85	10,0	100	80	60	69,80	20,90	35,50	37,50	8,20	8,20

⁽¹⁾ Dimension H₄ with cover strip.

⁽²⁾ Dimension H₄ without cover strip

¹⁾ Dimension H₄ with cover strip.

²⁾ Dimension H₄ without cover strip

Size	Dimensions (mm)							Weight	Load ratings (N)		Moments (N _m)			
	N ₁	W ₇ ^{+0,5}	H ₇ ^{+0,5}	d ₄	S ₂	d ₃	M ₂	(kg)	C dyn.	C ₀ stat.	M _C dyn.	M _{C0} stat.	M _A dyn.	M _B stat.
15	5,2	4,4	10,3	4,3	M5	4,4	M2,5-3,5 depth	0,30	10 000	20 200	130	190	98	150
20	7,7	5,2	13,2	5,3	M6	6,0	M3-5 depth	0,55	24 400	35 200	310	450	225	330
25	9,3	7,0	15,2	6,7	M8	7,0	M3-5 depth	0,90	30 400	45 500	430	650	345	510
30	11,0	7,9	17,0	8,5	M10	9,0	M3-5 depth	1,50	40 000	57 800	690	1 000	495	715
35	12,0	10,2	20,5	8,5	M10	9,0	M3-5 depth	2,25	55 600	81 000	1 200	1 740	830	1 215
45	15,0	12,4	23,5	10,4	M12	14,0	M4-7 depth	4,30	90 400	128 500	2 440	3 470	1 700	2 425

Carriage LLRHC xx SU

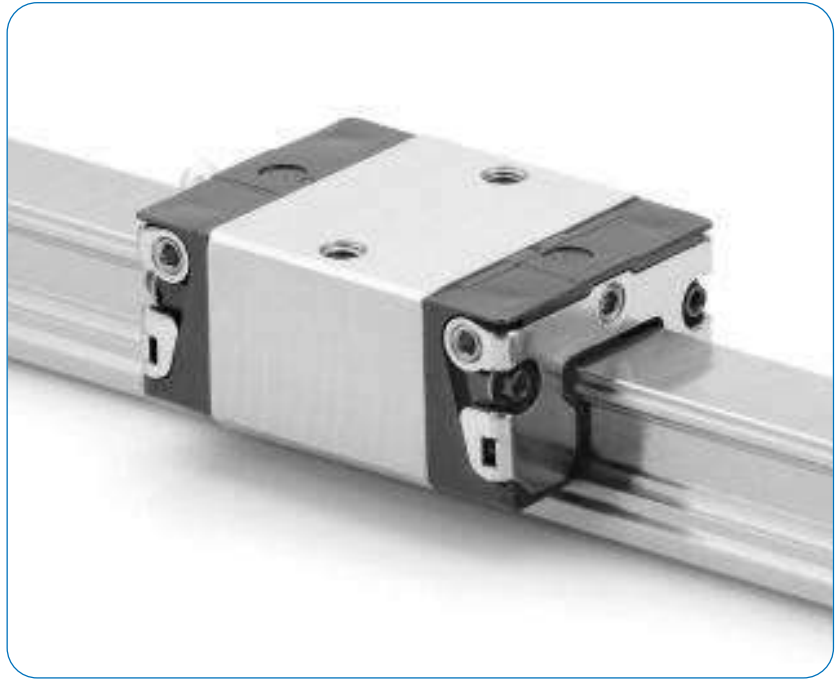
Slim line short. Standard height.

For type designation see
designation system

Dynamic values

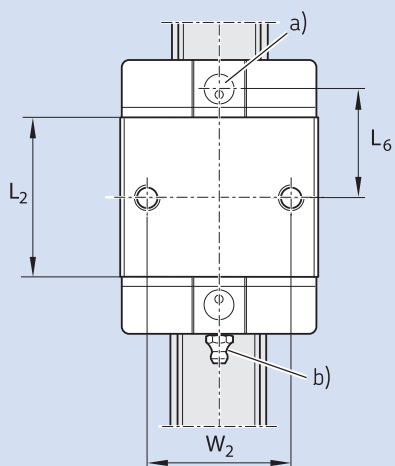
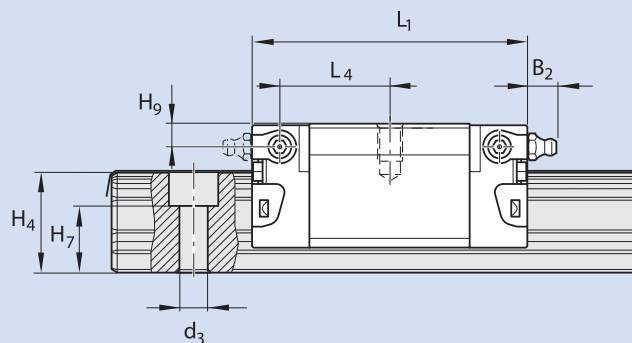
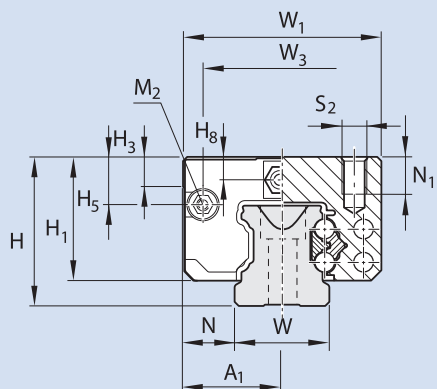
Speed $v_{\max} = 5 \text{ m/s}$

Acceleration $a_{\max} = 500 \text{ m/s}^2$



Size	Accuracy class	Type designation incl. preload class	
		T0	T1
15	P5	LLRHC 15 SU T0 P5	LLRHC 15 SU T1 P5
	P3	LLRHC 15 SU T0 P3	LLRHC 15 SU T1 P3
	P1	LLRHC 15 SU T0 P1	LLRHC 15 SU T1 P1
20	P5	LLRHC 20 SU T0 P5	LLRHC 20 SU T1 P5
	P3	LLRHC 20 SU T0 P3	LLRHC 20 SU T1 P3
	P1	LLRHC 20 SU T0 P1	LLRHC 20 SU T1 P1
25	P5	LLRHC 25 SU T0 P5	LLRHC 25 SU T1 P5
	P3	LLRHC 25 SU T0 P3	LLRHC 25 SU T1 P3
	P1	LLRHC 25 SU T0 P1	LLRHC 25 SU T1 P1
30	P5	LLRHC 30 SU T0 P5	LLRHC 30 SU T1 P5
	P3	LLRHC 30 SU T0 P3	LLRHC 30 SU T1 P3
	P1	LLRHC 30 SU T0 P1	LLRHC 30 SU T1 P1
35	P5	LLRHC 35 SU T0 P5	LLRHC 35 SU T1 P5
	P3	LLRHC 35 SU T0 P3	LLRHC 35 SU T1 P3
	P1	LLRHC 35 SU T0 P1	LLRHC 35 SU T1 P1

bold text = standard range



- a) For O-ring
Size 15: $\varnothing 4 \times 1,0$ (mm)
Size 20-35: $\varnothing 5 \times 1,0$ (mm)
Open lubrication hole as required.
- b) Lubrication nipple size 15 and 20: Funnel-type nipple
Type A – Thread size M3 x 5, DIN 3405
B2 = 1,6 mm
When using other nipples, the max. permissible screw depth of 5 mm must be observed!
- Size 25 to 35:
M6 x 8, DIN 71412
B2 = 9,5 mm
When using other lubrication nipples, the max. permissible screw depth of 8 mm must be observed!
Lubrication nipple supplied with the rail guide (unmounted).
Connection possible at all sides.
If pin holes are needed, please refer to section "Mounting instructions".

Size	Dimensions (mm)															
	W ₁	A ₁	W	N	L ₁	L ₂	H	H ₁	H ₄ ¹⁾	H ₄ ²⁾	H ₃	W ₂	W ₃	H ₅	L ₆	L ₄
15	34	17	15	9,5	44,7	25,7	24	19,90	16,30	16,20	5,0	26	24,55	6,70	16,25	17,85
20	44	22	20	12,0	57,3	31,9	30	25,35	20,75	20,55	6,0	32	32,50	7,30	22,95	22,95
25	48	24	23	12,5	67,0	38,6	36	29,90	24,45	24,25	7,5	35	38,30	11,50	25,35	26,50
30	60	30	28	16,0	75,3	45,0	42	35,35	28,55	28,35	7,0	40	48,40	14,60	28,80	30,50
35	70	35	34	18,0	84,9	51,4	48	40,40	32,15	31,85	8,0	50	58,00	17,35	32,70	34,20

¹⁾ Dimension H₄ with cover strip.

²⁾ Dimension H₄ without cover strip

Size	Dimensions (mm)					Weight (kg)	Load ratings (N)		Moments (N _m)			
	N ₁	H ₇ ^{+0,5}	S ₂	d ₃	M ₂		C dyn.	C ₀ stat.	M _C dyn.	M _{C0} stat.	M _A dyn.	M _B stat.
15	6,0	10,3	M4	4,4	M2,5-3,5 depth	0,10	5 400	8 100	52	80	19	28
20	7,5	13,2	M5	6,0	M3-5 depth	0,25	12 400	13 600	150	170	52	58
25	9,0	15,2	M6	7,0	M3-5 depth	0,35	15 900	18 200	230	260	82	94
30	12,0	17,0	M8	9,0	M3-5 depth	0,60	22 100	24 800	380	430	133	150
35	13,0	20,5	M8	9,0	M3-5 depth	0,90	29 300	32 400	640	700	200	220

Carriage LLRHC xx U

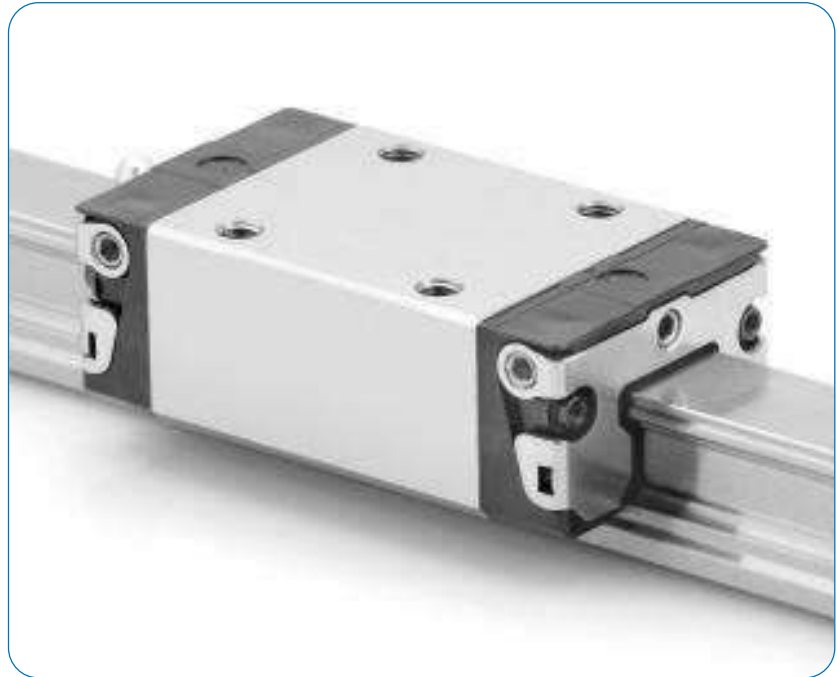
Slim line normal. Standard height.

For type designation see
designation system

Dynamic values

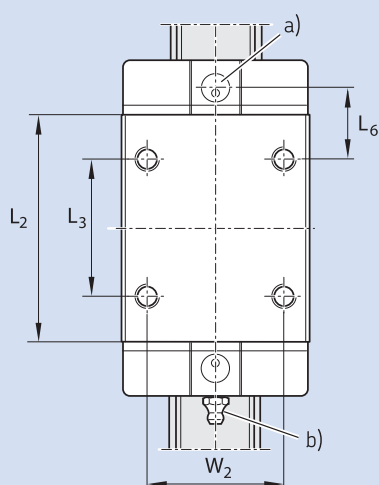
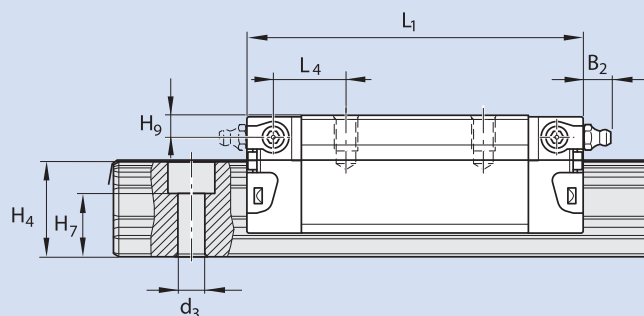
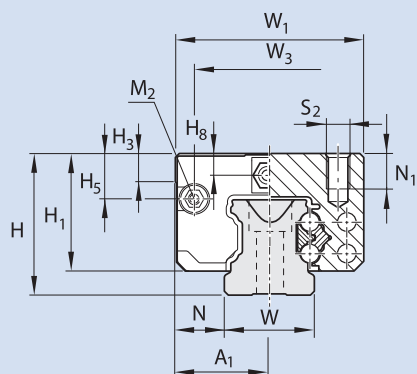
Speed $v_{\max} = 5 \text{ m/s}$

Acceleration $a_{\max} = 500 \text{ m/s}^2$



Size	Accuracy class	Type designation incl. preload class		
		T0	T1	T2
15	P5	LLRHC 15 U T0 P5	LLRHC 15 U T1 P5	LLRHC 15 U T2 P5
	P3	LLRHC 15 U T0 P3	LLRHC 15 U T1 P3	LLRHC 15 U T2 P3
	P1	LLRHC 15 U T0 P1	LLRHC 15 U T1 P1	LLRHC 15 U T2 P1
20	P5	LLRHC 20 U T0 P5	LLRHC 20 U T1 P5	LLRHC 20 U T2 P5
	P3	LLRHC 20 U T0 P3	LLRHC 20 U T1 P3	LLRHC 20 U T2 P3
	P1	LLRHC 20 U T0 P1	LLRHC 20 U T1 P1	LLRHC 20 U T2 P1
25	P5	LLRHC 25 U T0 P5	LLRHC 25 U T1 P5	LLRHC 25 U T2 P5
	P3	LLRHC 25 U T0 P3	LLRHC 25 U T1 P3	LLRHC 25 U T2 P3
	P1	LLRHC 25 U T0 P1	LLRHC 25 U T1 P1	LLRHC 25 U T2 P1
30	P5	LLRHC 30 U T0 P5	LLRHC 30 U T1 P5	LLRHC 30 U T2 P5
	P3	LLRHC 30 U T0 P3	LLRHC 30 U T1 P3	LLRHC 30 U T2 P3
	P1	LLRHC 30 U T0 P1	LLRHC 30 U T1 P1	LLRHC 30 U T2 P1
35	P5	LLRHC 35 U T0 P5	LLRHC 35 U T1 P5	LLRHC 35 U T2 P5
	P3	LLRHC 35 U T0 P3	LLRHC 35 U T1 P3	LLRHC 35 U T2 P3
	P1	LLRHC 35 U T0 P1	LLRHC 35 U T1 P1	LLRHC 35 U T2 P1
45	P5	LLRHC 45 U T0 P5	LLRHC 45 U T1 P5	LLRHC 45 U T2 P5
	P3	LLRHC 45 U T0 P3	LLRHC 45 U T1 P3	LLRHC 45 U T2 P3
	P1	LLRHC 45 U T0 P1	LLRHC 45 U T1 P1	LLRHC 45 U T2 P1

bold text = standard range



a) For O-ring
Size 15: $\varnothing 4 \times 1,0$ (mm)
Size 20-45: $\varnothing 5 \times 1,0$ (mm)
Open lubrication hole as required.

b) Lubrication nipple size 15 and 20: Funnel-type nipple
Type A – Thread size M3 x 5, DIN 3405
B2 = 1,6 mm
When using other nipples, the max. permissible screw depth of 5 mm must be observed!

Size 25 to 45:
M6 x 8, DIN 71412
B2 = 9,5 mm
When using other lubrication nipples, the max. permissible screw depth of 8 mm must be observed!
Lubrication nipple supplied with the rail guide (unmounted).
Connection possible at all sides.
If pin holes are needed, please refer to section "Mounting instructions".

Size	Dimensions (mm)																		
	W ₁	A ₁	W	N	L ₁	L ₂	H	H ₁	H ₄ ¹⁾	H ₄ ²⁾	H ₃	W ₂	L ₃	W ₃	H ₅	L ₆	L ₄	H ₈	H ₉
15	34	17	15	9,5	58,2	39,2	24	19,90	16,30	16,20	5,0	26	26	24,55	6,70	10,00	11,60	3,20	3,20
20	44	22	20	12,0	75,0	49,6	30	25,35	20,75	20,55	6,0	32	36	32,50	7,30	13,80	13,80	3,35	3,35
25	48	24	23	12,5	86,2	57,8	36	29,90	24,45	24,25	7,5	35	35	38,30	11,50	17,45	18,60	5,50	5,50
30	60	30	28	16,0	97,7	67,4	42	35,35	28,55	28,35	7,0	40	40	48,40	14,60	20,00	21,70	6,05	6,05
35	70	35	34	18,0	110,5	77,0	48	40,40	32,15	31,85	8,0	50	50	58,00	17,35	20,50	22,00	6,90	6,90
45	86	43	45	20,5	137,6	97,0	60	50,30	40,15	39,85	10,0	60	60	69,80	20,90	27,30	29,30	8,20	8,20

¹⁾ Dimension H₄ with cover strip.

²⁾ Dimension H₄ without cover strip

Size	Dimensions (mm)					Weight (kg)	Load ratings (N)		Moments (N _m)			
	N ₁	H ₇ ^{+0,5}	S ₂	d ₃	M ₂		C dyn.	C ₀ stat.	M _C dyn.	M _{C0} stat.	M _A dyn.	M _B stat.
15	6,0	10,3	M4	4,4	M2,5-3,5 depth	0,15	7 800	13 500	74	130	40	71
20	7,5	13,2	M5	6,0	M3-5 depth	0,35	18 800	24 400	240	310	130	165
25	9,0	15,2	M6	7,0	M3-5 depth	0,50	22 800	30 400	320	430	180	240
30	12,0	17,0	M8	9,0	M3-5 depth	0,85	31 700	41 300	540	720	290	380
35	13,0	20,5	M8	9,0	M3-5 depth	1,25	41 900	54 000	890	1 160	440	565
45	18,0	23,5	M10	14,0	M4-7 depth	2,40	68 100	85 700	1 830	2 310	890	1 130

Carriage LLRHC xx LU

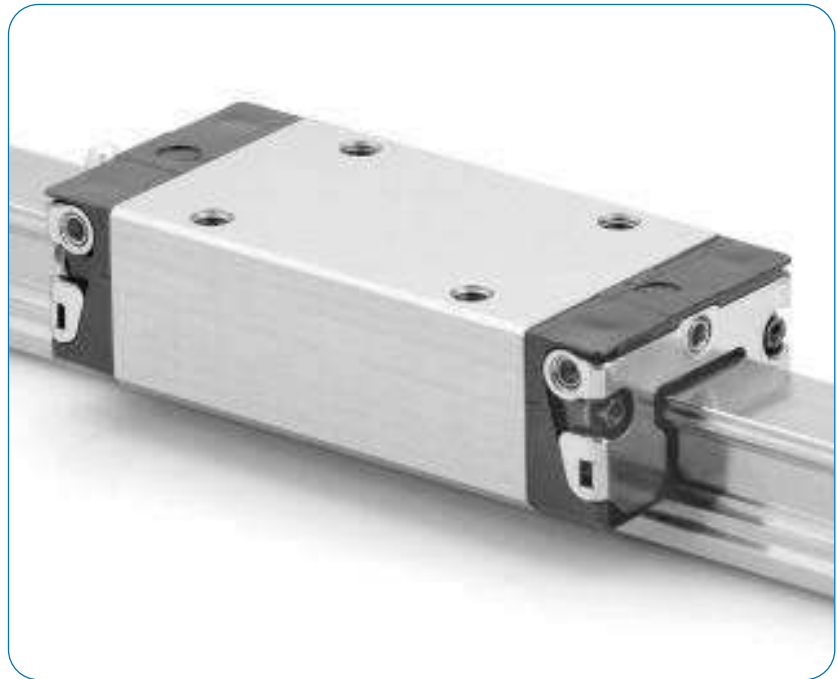
Slim line normal. Standard height.

For type designation see
designation system

Dynamic values

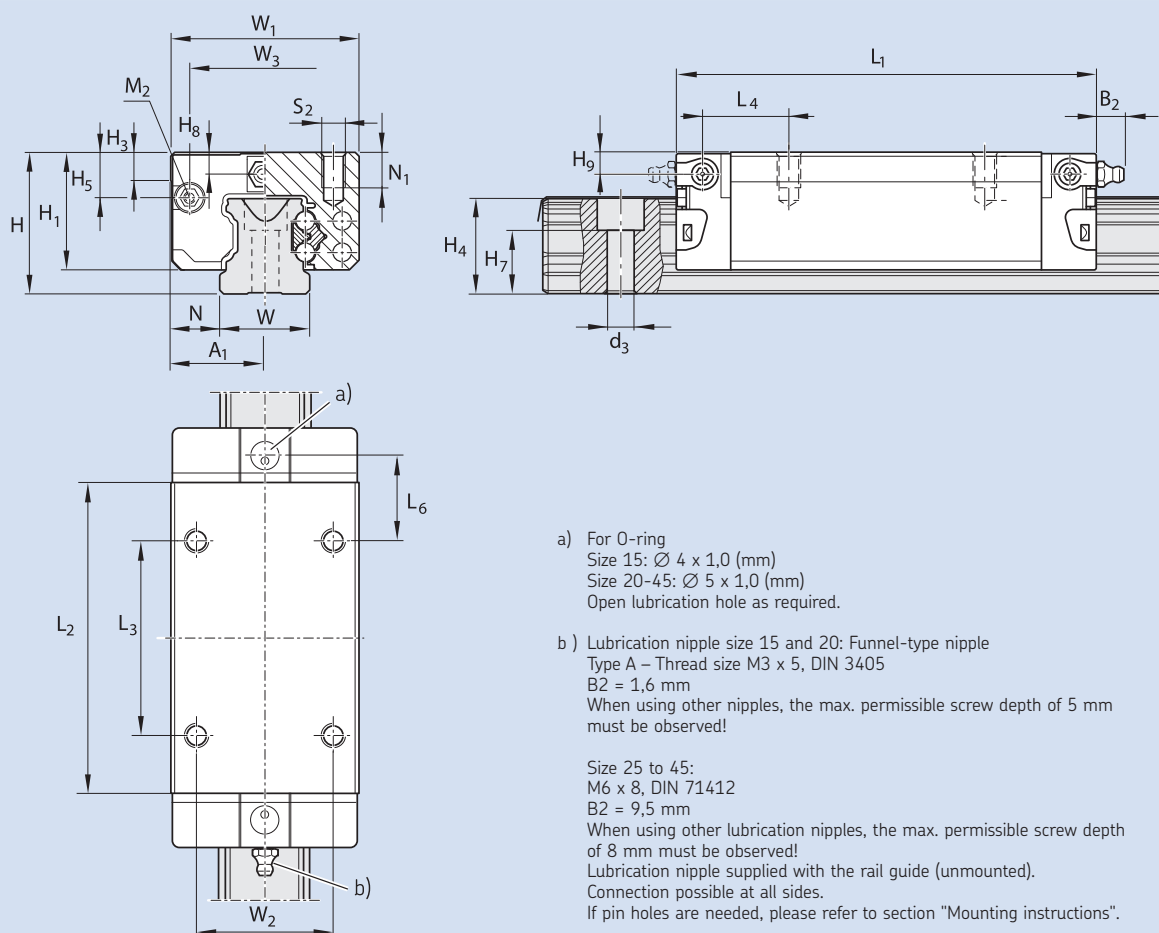
Speed $v_{\max} = 5 \text{ m/s}$

Acceleration $a_{\max} = 500 \text{ m/s}^2$



Size	Accuracy class	Type designation incl. preload class		
		T0	T1	T2
15	P5	LLRHC 15 LU T0 P5	LLRHC 15 LU T1 P5	LLRHC 15 LU T2 P5
	P3	LLRHC 15 LU T0 P3	LLRHC 15 LU T1 P3	LLRHC 15 LU T2 P3
	P1		LLRHC 15 LU T1 P1	LLRHC 15 LU T2 P1
20	P5	LLRHC 20 LU T0 P5	LLRHC 20 LU T1 P5	LLRHC 20 LU T2 P5
	P3	LLRHC 20 LU T0 P3	LLRHC 20 LU T1 P3	LLRHC 20 LU T2 P3
	P1		LLRHC 20 LU T1 P1	LLRHC 20 LU T2 P1
25	P5	LLRHC 25 LU T0 P5	LLRHC 25 LU T1 P5	LLRHC 25 LU T2 P5
	P3	LLRHC 25 LU T0 P3	LLRHC 25 LU T1 P3	LLRHC 25 LU T2 P3
	P1		LLRHC 25 LU T1 P1	LLRHC 25 LU T2 P1
30	P5	LLRHC 30 LU T0 P5	LLRHC 30 LU T1 P5	LLRHC 30 LU T2 P5
	P3	LLRHC 30 LU T0 P3	LLRHC 30 LU T1 P3	LLRHC 30 LU T2 P3
	P1		LLRHC 30 LU T1 P1	LLRHC 30 LU T2 P1
35	P5	LLRHC 35 LU T0 P5	LLRHC 35 LU T1 P5	LLRHC 35 LU T2 P5
	P3	LLRHC 35 LU T0 P3	LLRHC 35 LU T1 P3	LLRHC 35 LU T2 P3
	P1		LLRHC 35 LU T1 P1	LLRHC 35 LU T2 P1
45	P5	LLRHC 45 LU T0 P5	LLRHC 45 LU T1 P5	LLRHC 45 LU T2 P5
	P3	LLRHC 45 LU T0 P3	LLRHC 45 LU T1 P3	LLRHC 45 LU T2 P3
	P1		LLRHC 45 LU T1 P1	LLRHC 45 LU T2 P1

bold text = Standard range



Size	Dimensions (mm)																			
	W ₁	A ₁	W	N	L ₁	L ₂	H	H ₁	H ⁽¹⁾	H ₄ ⁽²⁾	H ₃	W ₂	L ₃	W ₃	H ₅	L ₆	L ₄	H ₈	H ₉	
15	34	17	15	9,5	72,6	53,6	24	19,90	16,30	16,20	5,0	26	26	24,55	6,70	17,20	18,80	3,20	3,20	
20	44	22	20	12,0	91,0	65,6	30	25,35	20,75	20,55	6,0	32	50	32,50	7,30	14,80	14,80	3,35	3,35	
25	48	24	23	12,5	107,9	79,5	36	29,90	24,45	24,25	7,5	35	50	38,30	11,50	20,80	21,95	5,50	5,50	
30	60	30	28	16,0	119,7	89,4	42	35,35	28,55	28,35	7,0	40	60	48,40	14,60	21,00	22,70	6,05	6,05	
35	70	35	34	18,0	139,0	105,5	48	40,40	32,15	31,85	8,0	50	72	58,00	17,35	23,75	25,25	6,90	6,90	
45	86	43	45	20,5	174,1	133,5	60	50,30	40,15	39,85	10,0	60	80	69,80	20,90	35,50	37,50	8,20	8,20	

¹⁾ Dimension H₄ with cover strip.

²⁾ Dimension H₄ without cover strip

Size	Dimensions (mm)					Weight (kg)	Load ratings (N)		Moments (N _m)		M _A dyn.	M _B stat.
	N ₁	H ₇ ^{+0,5}	S ₂	d ₃	M ₂		C dyn.	C ₀ stat.	M _C dyn.	M _{C0} stat.		
15	6,0	10,3	M4	4,4	M2,5-3,5 depth	0,20	10 000	20 200	130	190	98	150
20	7,5	13,2	M5	6,0	M3-5 depth	0,45	24 400	35 200	310	450	225	330
25	9,0	15,2	M6	7,0	M3-5 depth	0,65	30 400	45 500	430	650	345	510
30	12,0	17,0	M8	9,0	M3-5 depth	1,10	40 000	57 800	690	1 000	495	715
35	13,0	20,5	M8	9,0	M3-5 depth	1,70	55 600	81 000	1 200	1 740	830	1 215
45	18,0	23,5	M10	14,0	M4-7 depth	3,20	90 400	128 500	2 440	3 470	1 700	2 425

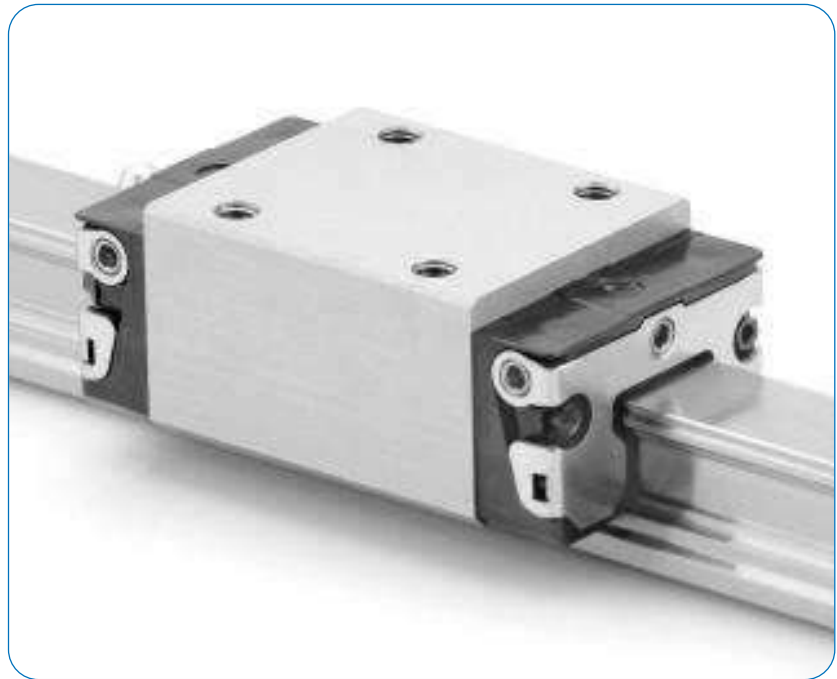
Carriage LLRHC xx R
Slim line normal. High.

For type designation see
designation system

Dynamic values

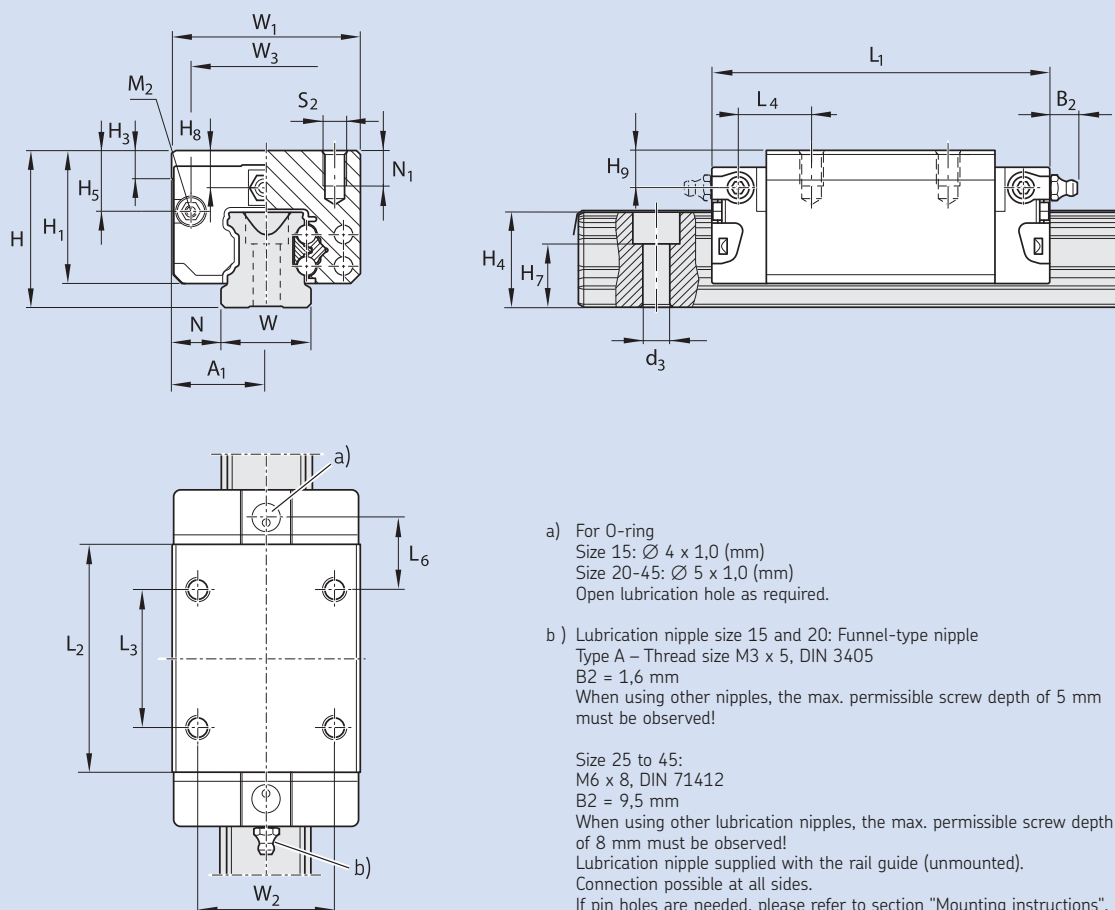
Speed $v_{\max} = 5 \text{ m/s}$

Acceleration $a_{\max} = 500 \text{ m/s}^2$



Size	Accuracy class	Type designation incl. preload class		
		T0	T1	T2
15	P5	LLRHC 15 R T0 P5	LLRHC 15 R T1 P5	LLRHC 15 R T2 P5
	P3	LLRHC 15 R T0 P3	LLRHC 15 R T1 P3	LLRHC 15 R T2 P3
	P1		LLRHC 15 R T1 P1	LLRHC 15 R T2 P1
25	P5	LLRHC 25 R T0 P5	LLRHC 25 R T1 P5	LLRHC 25 R T2 P5
	P3	LLRHC 25 R T0 P3	LLRHC 25 R T1 P3	LLRHC 25 R T2 P3
	P1		LLRHC 25 R T1 P1	LLRHC 25 R T2 P1
30	P5	LLRHC 30 R T0 P5	LLRHC 30 R T1 P5	LLRHC 30 R T2 P5
	P3	LLRHC 30 R T0 P3	LLRHC 30 R T1 P3	LLRHC 30 R T2 P3
	P1		LLRHC 30 R T1 P1	LLRHC 30 R T2 P1
35	P5	LLRHC 35 R T0 P5	LLRHC 35 R T1 P5	LLRHC 35 R T2 P5
	P3	LLRHC 35 R T0 P3	LLRHC 35 R T1 P3	LLRHC 35 R T2 P3
	P1		LLRHC 35 R T1 P1	LLRHC 35 R T2 P1
45	P5	LLRHC 45 R T0 P5	LLRHC 45 R T1 P5	LLRHC 45 R T2 P5
	P3	LLRHC 45 R T0 P3	LLRHC 45 R T1 P3	LLRHC 45 R T2 P3
	P1		LLRHC 45 R T1 P1	LLRHC 45 R T2 P1

bold text = Standard range



Size	Dimensions (mm)																		
	W ₁	A ₁	W	N	L ₁	L ₂	H	H ₁	H ₄ ¹⁾	H ₄ ²⁾	H ₃	W ₂	L ₃	W ₃	H ₅	L ₆	L ₄	H ₈	H ₉
15	34	17	15	9,5	58,2	39,2	28	23,90	16,30	16,20	5,0	26	26	24,55	10,70	10,00	11,60	7,20	7,20
25	48	24	23	12,5	86,2	57,8	40	33,90	24,45	24,25	7,5	35	35	38,30	15,50	17,45	18,60	9,50	9,50
30	60	30	28	16,0	97,7	67,4	45	38,35	28,55	28,35	7,0	40	40	48,40	17,60	20,00	21,70	9,05	9,05
35	70	35	34	18,0	110,5	77,0	55	47,40	32,15	31,85	8,0	50	50	58,00	24,35	20,50	22,00	13,90	13,90
45	86	43	45	20,5	137,6	97,0	70	60,30	40,15	39,85	10,0	60	60	69,80	30,90	27,30	29,30	18,20	18,20

¹⁾ Dimension H₄ with cover strip.

²⁾ Dimension H₄ without cover strip

Size	Dimensions (mm)					Weight (kg)	Load ratings (N)		Moments (N _m)		M _A dyn.	M _B stat.
	N ₁	H ₇ ^{+0,5}	S ₂	d ₃	M ₂		C dyn.	C ₀ stat.	M _C dyn.	M _{C0} stat.		
15	6,0	10,3	M4	4,4	M2,5-3,5 depth	0,20	7 800	13 500	74	130	40	71
25	9,0	15,2	M6	7,0	M3-5 depth	0,60	22 800	30 400	320	430	180	240
30	12,0	17,0	M8	9,0	M3-5 depth	0,95	31 700	41 300	540	720	290	380
35	13,0	20,5	M8	9,0	M3-5 depth	1,55	41 900	54 000	890	1 160	440	565
45	18,0	23,5	M10	14,0	M4-7 depth	3,00	68 100	85 700	1 830	2 310	890	1130

Carriage LLRHC xx LR

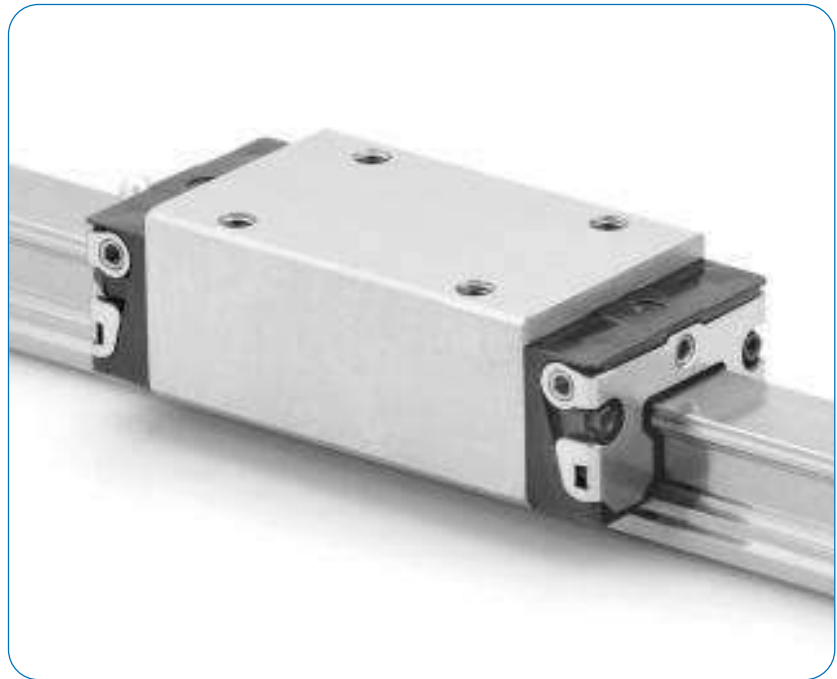
Slim line long. High.

For type designation see
designation system

Dynamic values

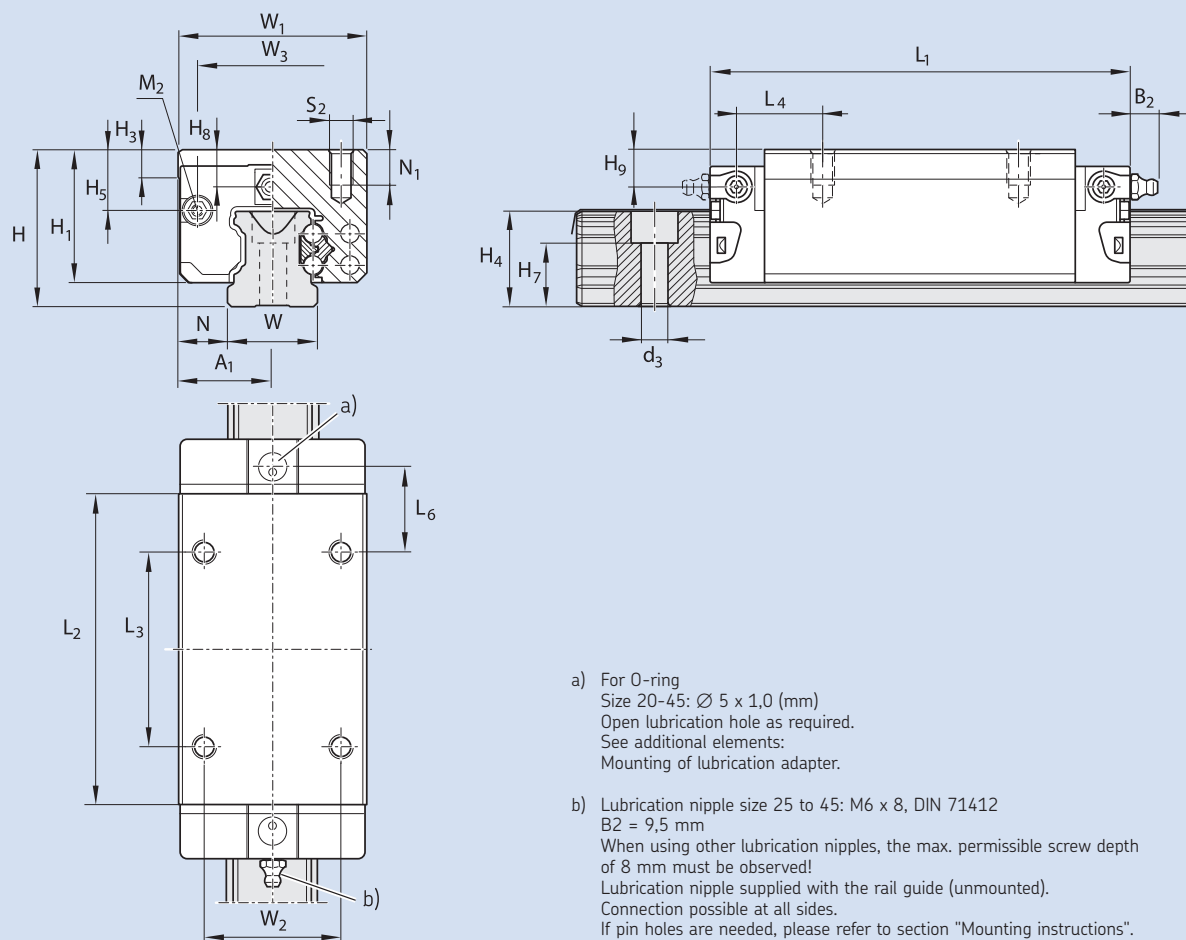
Speed $v_{\max} = 5 \text{ m/s}$

Acceleration $a_{\max} = 500 \text{ m/s}^2$



Size	Accuracy class	Type designation incl. preload class		
		T0	T1	T2
25	P5	LLRHC 25 LR T0 P5	LLRHC 25 LR T1 P5	LLRHC 25 LR T2 P5
	P3	LLRHC 25 LR T0 P3	LLRHC 25 LR T1 P3	LLRHC 25 LR T2 P3
	P1		LLRHC 25 LR T1 P1	LLRHC 25 LR T2 P1
30	P5	LLRHC 30 LR T0 P5	LLRHC 30 LR T1 P5	LLRHC 30 LR T2 P5
	P3	LLRHC 30 LR T0 P3	LLRHC 30 LR T1 P3	LLRHC 30 LR T2 P3
	P1		LLRHC 30 LR T1 P1	LLRHC 30 LR T2 P1
35	P5	LLRHC 35 LR T0 P5	LLRHC 35 LR T1 P5	LLRHC 35 LR T2 P5
	P3	LLRHC 35 LR T0 P3	LLRHC 35 LR T1 P3	LLRHC 35 LR T2 P3
	P1		LLRHC 35 LR T1 P1	LLRHC 35 LR T2 P1
45	P5	LLRHC 45 LR T0 P5	LLRHC 45 LR T1 P5	LLRHC 45 LR T2 P5
	P3	LLRHC 45 LR T0 P3	LLRHC 45 LR T1 P3	LLRHC 45 LR T2 P3
	P1		LLRHC 45 LR T1 P1	LLRHC 45 LR T2 P1

bold text = Standard range

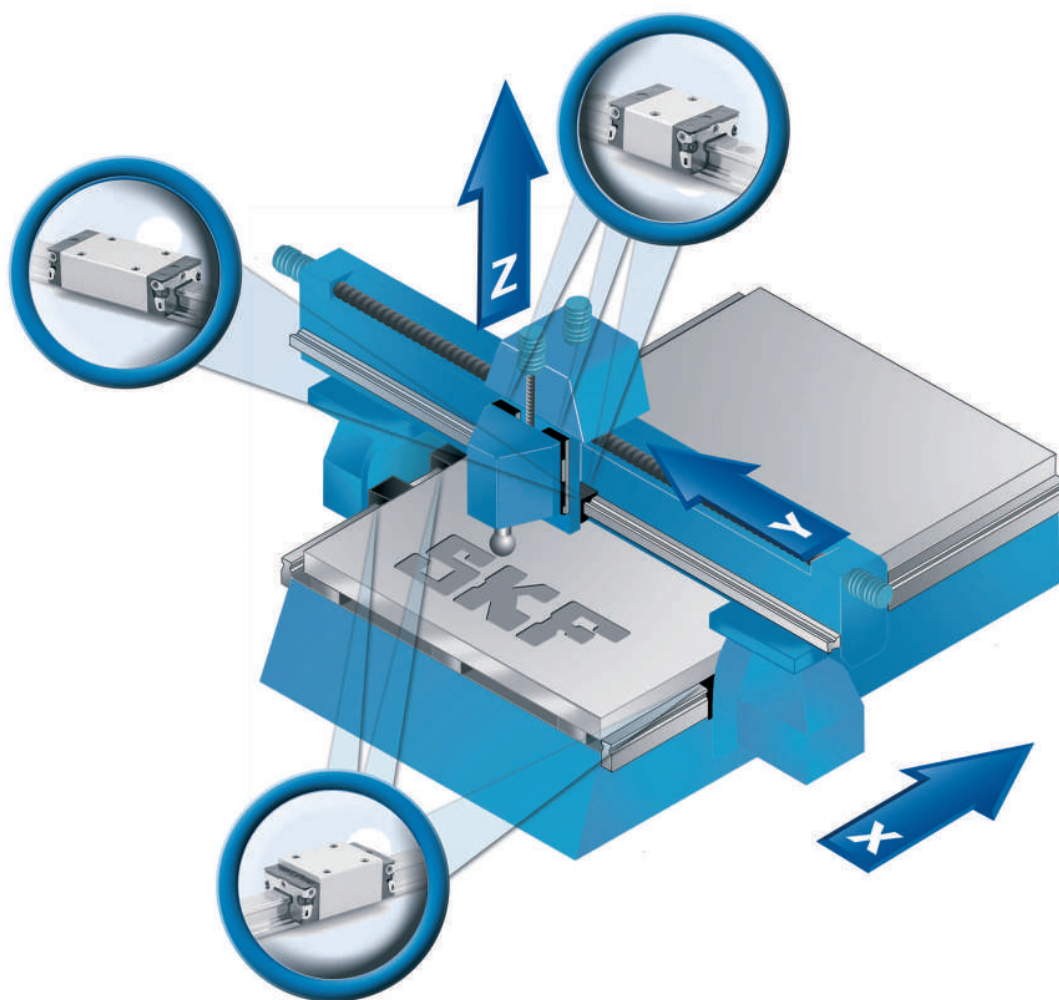


Size	Dimensions (mm)																			
	W ₁	A ₁	W	N	L ₁	L ₂	H	H ₁	H ₄ ¹⁾	H ₄ ²⁾	H ₃	W ₂	L ₃	W ₃	H ₅	L ₆	L ₄	H ₈	H ₉	
25	48	24	23	12,5	107,9	79,5	40	33,90	24,45	24,25	7,5	35	50	38,30	15,50	20,80	21,95	9,50	9,50	
30	60	30	28	16,0	119,7	89,4	45	38,35	28,55	28,35	7,0	40	60	48,40	17,60	21,00	22,70	9,05	9,05	
35	70	35	34	18,0	139,0	105,5	55	47,40	32,15	31,85	8,0	50	72	58,00	24,35	23,75	25,25	13,90	13,90	
45	86	43	45	20,5	174,1	133,5	70	60,30	40,15	39,85	10,0	60	80	69,80	30,90	35,50	37,50	18,20	18,20	

¹⁾ Dimension H₄ with cover strip.

²⁾ Dimension H₄ without cover strip

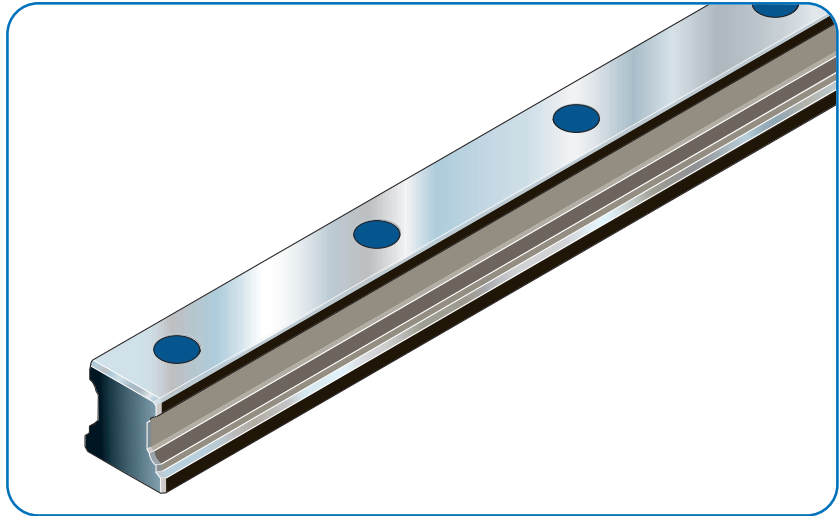
Size	Dimensions (mm)					Weight (kg)	Load ratings (N)		Moments (N _m)			
	N ₁	H ₇ ^{+0,5}	S ₂	d ₃	M ₂		C dyn.	C ₀ stat.	M _C dyn.	M _{C0} stat.	M _A dyn.	M _B stat.
25	9,0	15,2	M6	7,0	M3-5 depth	0,80	30 400	45 500	430	650	345	510
30	12,0	17,0	M8	9,0	M3-5 depth	1,20	40 000	57 800	690	1 000	495	715
35	13,0	20,5	M8	9,0	M3-5 depth	2,10	55 600	81 000	1 200	1 740	830	1 215
45	18,0	23,5	M10	14,0	M4-7 depth	4,10	90 400	128 500	2 440	3 470	1 700	2 425 ³⁾



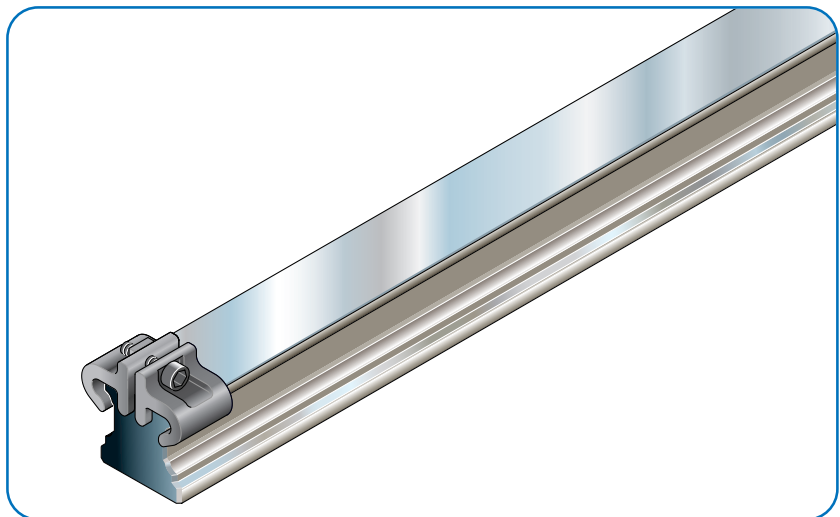
Standard rails

Product overview

Rails with protective caps made of plastics



Rails with cover strip and cover strip retaining clamps made of aluminium
- without end face threaded holes (not required)



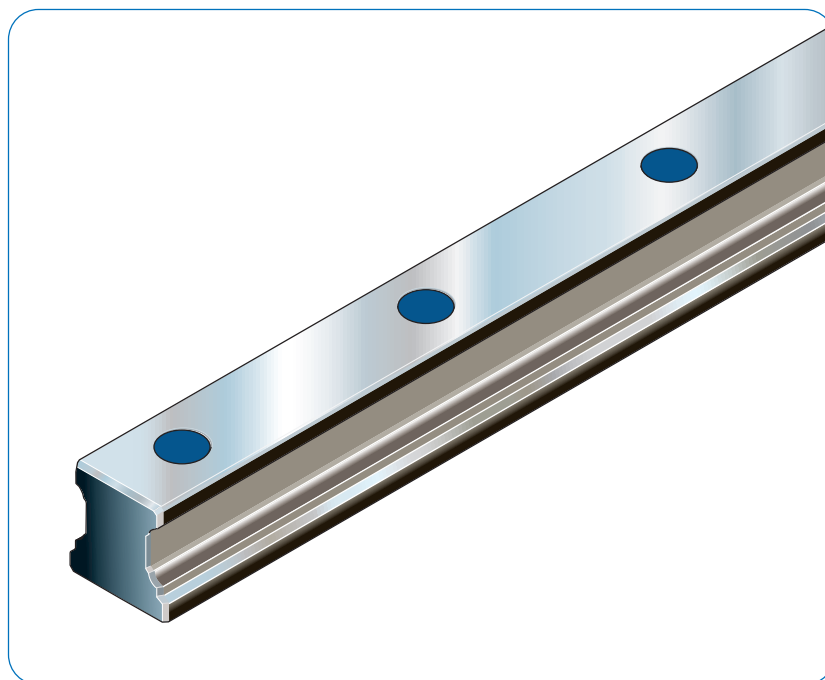
Accuracy classes, dimensions and designations

LLRHR rails

For mounting from above with plastic mounting caps (supplied).

Note

The rails can also be supplied in several parts.

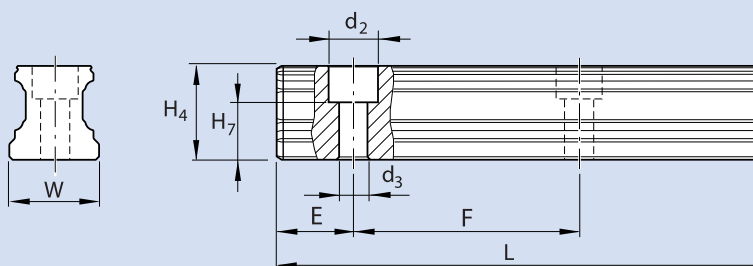


Type designation and rail lengths

Standard rail		Rail one-piece	Rail multi-piece	Pitch
Size	Accuracy	Designation	Designation	T [mm]
15	P5	LLRHR 15 - xxxx P5	LLRHR 15 - xxxx P5 A	60
	P3	LLRHR 15 - xxxx P3	LLRHR 15 - xxxx P3 A	
	P1	LLRHR 15 - xxxx P1	LLRHR 15 - xxxx P1 A	
	P01	LLRHR 15 - xxxx P01	LLRHR 15 - xxxx P01 A	
	P001	LLRHR 15 - xxxx P001	LLRHR 15 - xxxx P001 A	
20	P5	LLRHR 20 - xxxx P5	LLRHR 20 - xxxx P5 A	60
	P3	LLRHR 20 - xxxx P3	LLRHR 20 - xxxx P3 A	
	P1	LLRHR 20 - xxxx P1	LLRHR 20 - xxxx P1 A	
	P01	LLRHR 20 - xxxx P01	LLRHR 20 - xxxx P01 A	
	P001	LLRHR 20 - xxxx P001	LLRHR 20 - xxxx P001 A	
25	P5	LLRHR 25 - xxxx P5	LLRHR 25 - xxxx P5 A	60
	P3	LLRHR 25 - xxxx P3	LLRHR 25 - xxxx P3 A	
	P1	LLRHR 25 - xxxx P1	LLRHR 25 - xxxx P1 A	
	P01	LLRHR 25 - xxxx P01	LLRHR 25 - xxxx P01 A	
	P001	LLRHR 25 - xxxx P001	LLRHR 25 - xxxx P001 A	
30	P5	LLRHR 30 - xxxx P5	LLRHR 30 - xxxx P5 A	80
	P3	LLRHR 30 - xxxx P3	LLRHR 30 - xxxx P3 A	
	P1	LLRHR 30 - xxxx P1	LLRHR 30 - xxxx P1 A	
	P01	LLRHR 30 - xxxx P01	LLRHR 30 - xxxx P01 A	
	P001	LLRHR 30 - xxxx P001	LLRHR 30 - xxxx P001 A	
35	P5	LLRHR 35 - xxxx P5	LLRHR 35 - xxxx P5 A	80
	P3	LLRHR 35 - xxxx P3	LLRHR 35 - xxxx P3 A	
	P1	LLRHR 35 - xxxx P1	LLRHR 35 - xxxx P1 A	
	P01	LLRHR 35 - xxxx P01	LLRHR 35 - xxxx P01 A	
	P001	LLRHR 35 - xxxx P001	LLRHR 35 - xxxx P001 A	
45	P5	LLRHR 45 - xxxx P5	LLRHR 45 - xxxx P5 A	105
	P3	LLRHR 45 - xxxx P3	LLRHR 45 - xxxx P3 A	
	P1	LLRHR 45 - xxxx P1	LLRHR 45 - xxxx P1 A	
	P01	LLRHR 45 - xxxx P01	LLRHR 45 - xxxx P01 A	
	P001	LLRHR 45 - xxxx P001	LLRHR 45 - xxxx P001 A	

bold text = standard range

xxxx = rail length



Size	Dimensions (mm)			d ₂	d ₃	E _{1 min}	F	L _{max}	Weight kg/m
	W	H ₄	H ₇ ^{+0,5}						
15	15	16,20	10,3	7,4	4,4	10	60	4 000	1,4
20	20	20,55	13,2	9,4	6,0	10	60	4 000	2,4
25	23	24,25	15,2	11,0	7,0	10	60	4 000	3,2
30	28	28,35	17,0	15,0	9,0	12	80	4 000	5,0
35	34	31,85	20,5	15,0	9,0	12	80	4 000	6,8
45	45	39,85	23,5	20,0	14,0	16	105	4 000	10,5

The “E” dimension designates the distance from the rail end to the centre of the first attachment hole. If no customer-specific “E” dimension is provided with the order, the rails are produced according to the following formula:

$$E = \frac{L - (z - 1) \times F}{2}$$

E = Rail end dimension

F = Distance of attachment holes

L = Rail length

z = Number of attachment holes

The distance of the first and last attachment holes is mediated.

If several possibilities arise, the shorter “E” dimension will be produced!

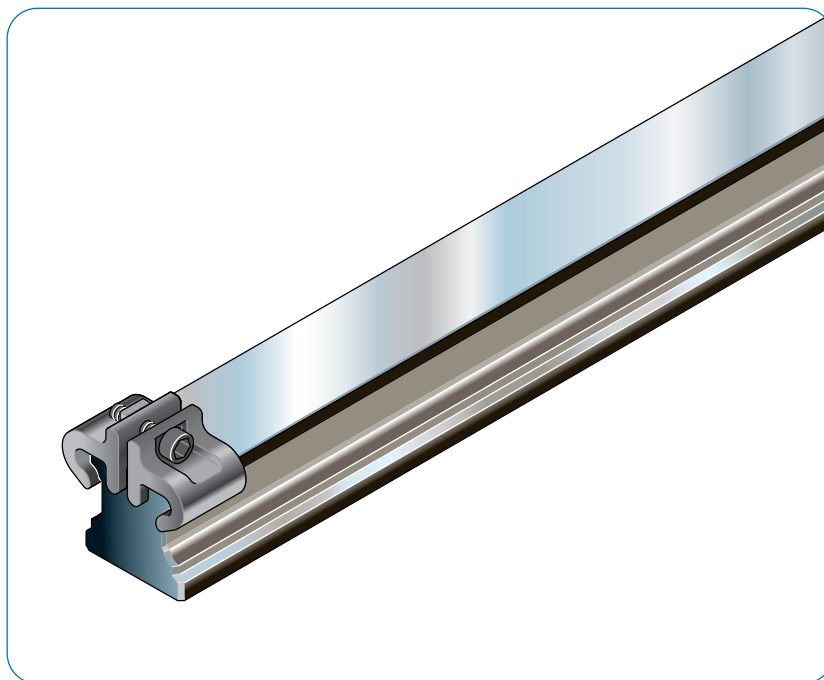
LLRHR D2 rails

For mounting from above with cover strip and strip retaining clamps.

- Robust cover strip retaining clamps made of aluminium
- Rail without end face threaded holes (not required for cover strip retaining clamps)

Note

The rails can also be supplied in several parts.

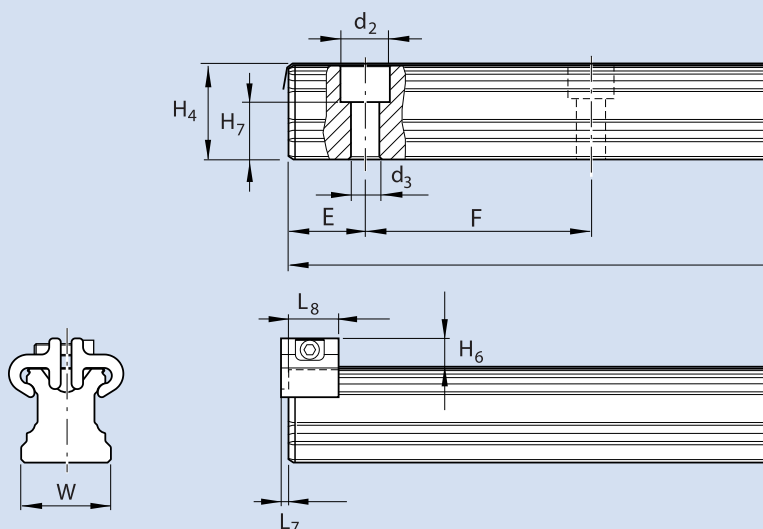


Type designation and rail lengths

Standard rail		Rail one-piece Designation	Rail multi-piece Designation	Pitch T [mm]
Size	Accuracy			
15	P5 D2	LLRHR 15 - xxxx P5 D2	LLRHR 15 - xxxx P5 A D2	60
	P3 D2	LLRHR 15 - xxxx P3 D2	LLRHR 15 - xxxx P3 A D2	
	P1 D2	LLRHR 15 - xxxx P1 D2	LLRHR 15 - xxxx P1 A D2	
	P01 D2	LLRHR 15 - xxxx P01 D2	LLRHR 15 - xxxx P01 A D2	
	P001 D2	LLRHR 15 - xxxx P001 D2	LLRHR 15 - xxxx P001 A D2	
20	P5 D2	LLRHR 20 - xxxx P5 D2	LLRHR 20 - xxxx P5 A D2	60
	P3 D2	LLRHR 20 - xxxx P3 D2	LLRHR 20 - xxxx P3 A D2	
	P1 D2	LLRHR 20 - xxxx P1 D2	LLRHR 20 - xxxx P1 A D2	
	P01 D2	LLRHR 20 - xxxx P01 D2	LLRHR 20 - xxxx P01 A D2	
	P001 D2	LLRHR 20 - xxxx P001 D2	LLRHR 20 - xxxx P001 A D2	
25	P5 D2	LLRHR 25 - xxxx P5 D2	LLRHR 25 - xxxx P5 A D2	60
	P3 D2	LLRHR 25 - xxxx P3 D2	LLRHR 25 - xxxx P3 A D2	
	P1 D2	LLRHR 25 - xxxx P1 D2	LLRHR 25 - xxxx P1 A D2	
	P01 D2	LLRHR 25 - xxxx P01 D2	LLRHR 25 - xxxx P01 A D2	
	P001	LLRHR 25 - xxxx P001 D2	LLRHR 25 - xxxx P001 A D2	
30	P5 D2	LLRHR 30 - xxxx P5 D2	LLRHR 30 - xxxx P5 A D2	80
	P3 D2	LLRHR 30 - xxxx P3 D2	LLRHR 30 - xxxx P3 A D2	
	P1 D2	LLRHR 30 - xxxx P1 D2	LLRHR 30 - xxxx P1 A D2	
	P01 D2	LLRHR 30 - xxxx P01 D2	LLRHR 30 - xxxx P01 A D2	
	P001 D2	LLRHR 30 - xxxx P001 D2	LLRHR 30 - xxxx P001 A D2	
35	P5 D2	LLRHR 35 - xxxx P5 D2	LLRHR 35 - xxxx P5 A D2	80
	P3 D2	LLRHR 35 - xxxx P3 D2	LLRHR 35 - xxxx P3 A D2	
	P1 D2	LLRHR 35 - xxxx P1 D2	LLRHR 35 - xxxx P1 A D2	
	P01 D2	LLRHR 35 - xxxx P01 D2	LLRHR 35 - xxxx P01 A D2	
	P001 D2	LLRHR 35 - xxxx P001 D2	LLRHR 35 - xxxx P001 A D2	
45	P5 D2	LLRHR 45 - xxxx P5 D2	LLRHR 45 - xxxx P5 A D2	105
	P3 D2	LLRHR 45 - xxxx P3 D2	LLRHR 45 - xxxx P3 A D2	
	P1 D2	LLRHR 45 - xxxx P1 D2	LLRHR 45 - xxxx P1 A D2	
	P01 D2	LLRHR 45 - xxxx P01 D2	LLRHR 45 - xxxx P01 A D2	
	P001 D2	LLRHR 45 - xxxx P001 D2	LLRHR 45 - xxxx P001 A D2	

bold text = standard range

xxxx = rail length



Size	Dimensions (mm)											Weight kg/m
	W	H ₄	H ₇	H ₆	L ₈	L ₇	d ₂	d ₃	E _{1 min}	F	L _{max}	
15	15	16,3	10,3	7,3	12,0	2,0	7,4	4,4	10	60	3 000	1,4
20	20	20,75	13,2	7,1	12,0	2,0	9,4	6,0	10	60	4 000	2,4
25	23	24,45	15,2	8,2	13,0	2,0	11,0	7,0	10	60	4 000	3,2
30	28	28,5	17,0	8,7	13,0	2,0	15,0	9,0	12	80	4 000	5,0
35	34	32,15	20,5	11,7	16,0	2,2	15,0	9,0	12	80	4 000	6,8
45	45	40,15	23,5	12,5	18,0	2,2	20,0	14,0	16	105	4 000	10,5

The “E” dimension designates the distance from the rail end to the centre of the first attachment hole. If no customer-specific “E” dimension is provided with the order, the rails are produced according to the following formula:

$$E = \frac{L - (z - 1) \times F}{2}$$

E = Rail end dimension

F = Distance of attachment holes

L = Rail length

z = Number of attachment holes

The distance of the first and last attachment holes is mediated.

If several possibilities arise, the shorter “E” dimension will be produced!

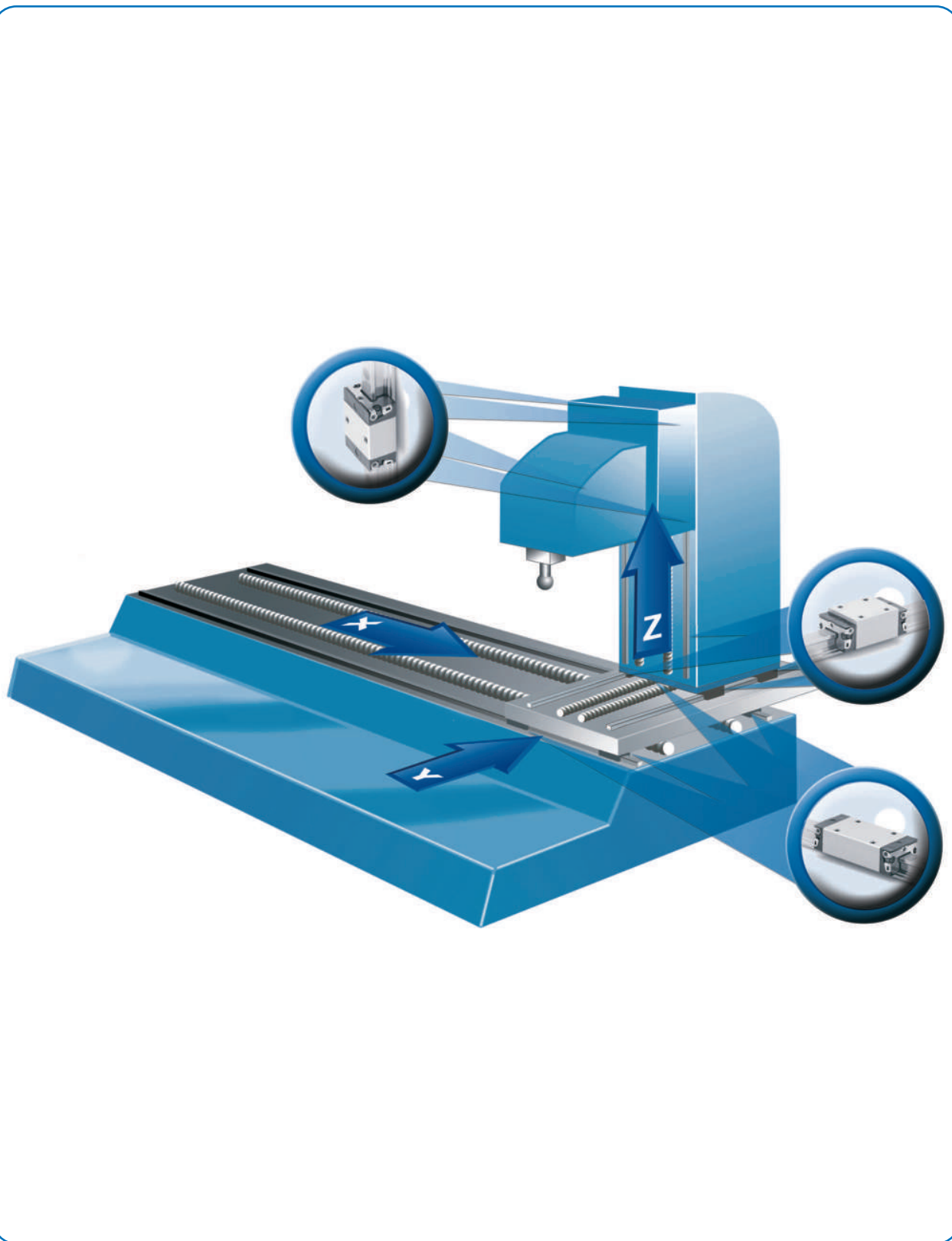
Ordering key

Type	LLRH																		
Bel lows (for bel lows only)*	B																		
Carriage (carriage only)*	C																		
Rail (rail only)*	R																		
System (carriage and rail)**	S																		
Accessories, if ordered separately*	Z																		
Carriage size (write relevant number)	15, 20, 25, 30, 35, 45	XX																	
Carriage type																			
Flange short, standard height	SA																		
Flange normal, standard height	A																		
Flange long, standard height	LA																		
Slim line short, standard height	SU																		
Slim line normal, standard height	U																		
Slim line long, standard height	LU																		
Slim line normal, high	R																		
Slim line long, high	LR																		
Carriage with ball retainer (If not selected - no code)																			
Yes	B																		
Number of carriages per rail	1, 2, 4, 6, ...	X																	
Preload class																			
Play																			
Light preload, 0,02 x C																			
Medium preload, 0,08 x C																			
Heavy preload, 0,13 x C																			
Rail length	80 mm - 4 000 mm (step in 1 mm)	XXXX																	
Precision class																			
Standard																			
Medium																			
High																			
Super																			
Ultra																			
No. of parallel mounted rail tracks in customized application (If not selected - no code)	2, 3, (write relevant number for "x")	Wx																	
Jointed rail track (If not selected - no code)																			
Yes	A																		
Bel lows (If not selected - no code)																			
System complete with bel lows																			
Kit, type 2 (carriage thru the end of the rail)*																			
Kit, type 4 (between two carriages)*																			
Cover strip																			
Ordered separately*																			
Guard type 2 (aluminium)*																			
Rail																			
Rail, if customized according to drawing number																			
Rail, with cover strip and cover strip guard type 2 (aluminium)																			
Distance between end face and first hole of the rail																			
"E" dimension to be calculated - see page 37 or 39																			
If no "E" specified the holes will be symmetric																			
Coating (If not selected - no code)																			
Duralloy, coated system (balls and tracks are not coated)																			
System, (carriage mounted on rail, acc. not mounted) (If not selected - no code)																			
Yes	M																		
Lubrication adapter, option for high carriages (If not selected - no code)																			
Yes	0																		
Sealing																			
Scraper plate																			
Two piece front seal																			
Seal kit, two piece front seal with scraper plate																			
Arbour for creating a sliding fit for the cover strip (If not selected - no code)																			
Yes	W																		

* When ordered separately (not in a system).

** System consisting of carriage and rail

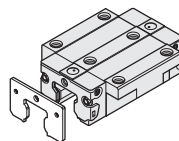
An key with all positions in fat blue fonts qualifies the product for the easy range concept (quick delivery).



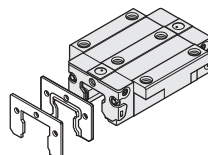
Accessories

Product overview

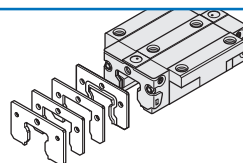
Scraper plate



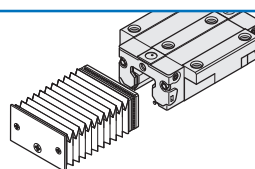
Two-piece front seal



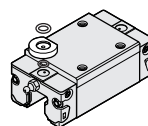
Sealing kit



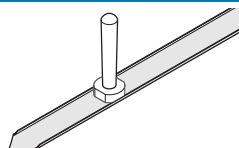
Bellows



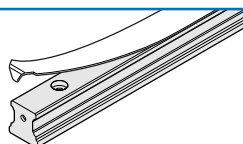
Lubrication adapter



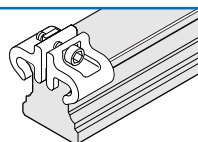
Expanding mandrel



Loose cover strip



Cover strip retaining clamps
made of aluminium



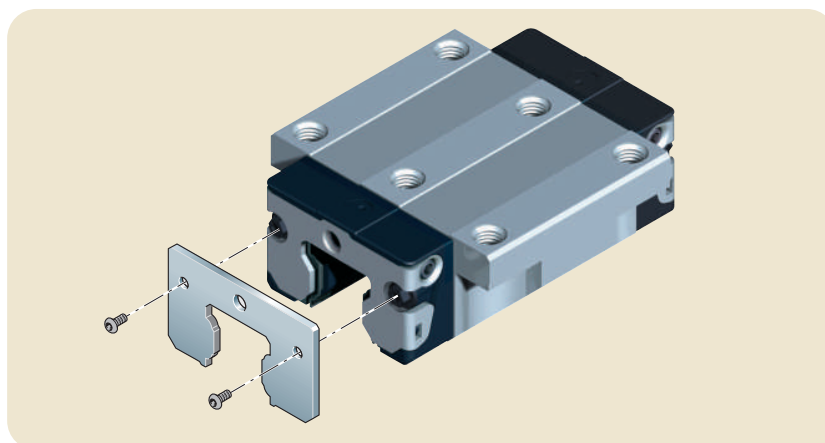
Standard carriages

Scraper plate

- Material: stainless spring steel to DIN EN 10088
- Condition: bright
- Precision design with 0,2 to 0,3 mm maximum gap measurement

Mounting:

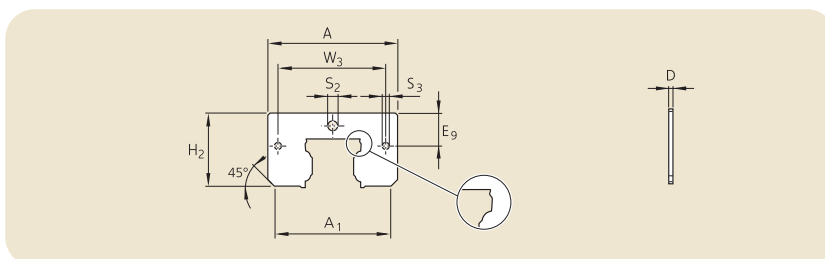
Fastening screws are supplied.
During mounting please ensure an even gap between the rail and scraper plate.



Scraper plate for rails with and without cover strip

Note:

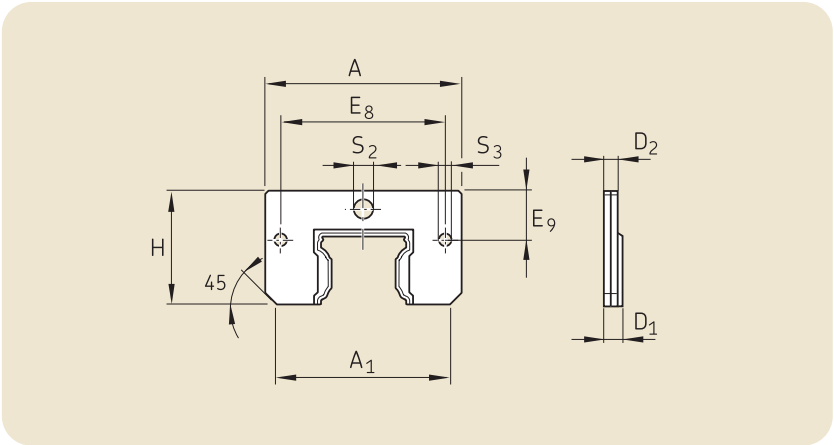
Use in combination with two-piece front seal kit LLRHZxxS3.



Size	Part numbers	Dimensions (mm)								Weight (g)
		A	A ₁	H ₂	W ₃	E ₉	S ₂	S ₃	D	
15	LLRHZ 15 S1	33	26,4	19,2	24,55	6,3	4,6	3,5	1,0	4
20	LLRHZ 20 S1	42	40,0	24,8	32,4	6,8	5,1	4	1,0	6
25	LLRHZ 25 S1	47	41,6	29,5	38,3	11,0	7	4	1,0	8
30	LLRHZ 30 S1	59	52,8	34,7	48,4	14,1	7	4	1,0	12
35	LLRHZ 35 S1	69	60,9	40,1	58,0	17,0	7	4	1,0	16
35*	LLRHZ 35 S1 CS	69	60,9	40,1	58,0	17,0	7	4	1,0	16
45	LLRHZ 45 S1	85	76,7	50,0	69,8	20,5	7	5	2,0	50
45*	LLRHZ 45 S1 CS	85	76,7	50,0	69,8	20,5	7	5	2,0	50

* Scraper plates in combination with cover strip

Two-piece front seal

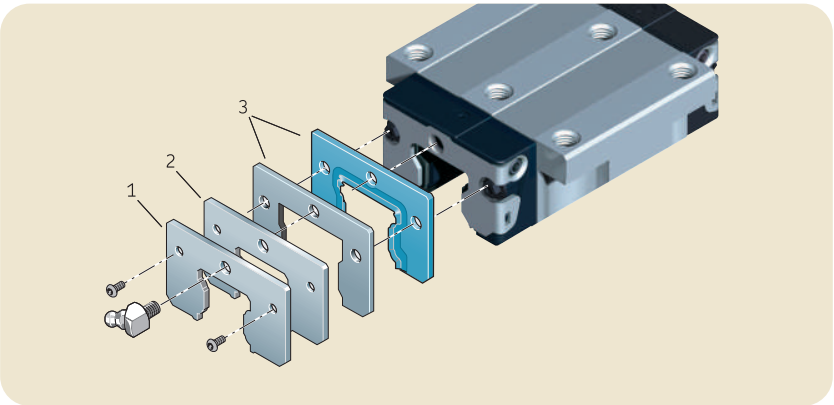


Size	Part numbers	Dimensions (mm)									Weight (g)
		A	A ₁	H ₂	W ₃	E ₉	S ₂	S ₃	D ₁	D ₂	
15	LLRHZ 15 S2	32	27	19,0	24,55	6,3	3,5	3,5	3,0	2,2	6
20	LLRHZ 20 S2	42	39	24,3	32,4	6,8	5,1	4	3,3	2,5	8
25	LLRHZ 25 S2	47	42	29,0	38,3	11,0	7	4	3,3	2,5	10
30	LLRHZ 30 S2	59	53	34,5	48,4	14,1	7	4	4,5	3,3	18
35	LLRHZ 35 S2	69	61	39,5	58,0	17,0	7	4	4,5	3,3	25
45	LLRHZ 45 S2	85	77	49,5	69,8	20,5	7	5	5,5	4,0	55

Seal kit

The seal kit consists of the following components:

- 1 Scraper plate
- 2 Support plate
- 3 Two-piece front seal



Size	Seal kit Designation
15	LLRHZ 15 S3
20	LLRHZ 20 S3
25	LLRHZ 25 S3
30	LLRHZ 30 S3
35	LLRHZ 35 S3
35 CS*	LLRHZ 35 S3 CS
45	LLRHZ 45 S3
45 CS*	LLRHZ 45 S3 CS

*Seal kit in combination with cover strip

Lubrication adapter

For high carriages:

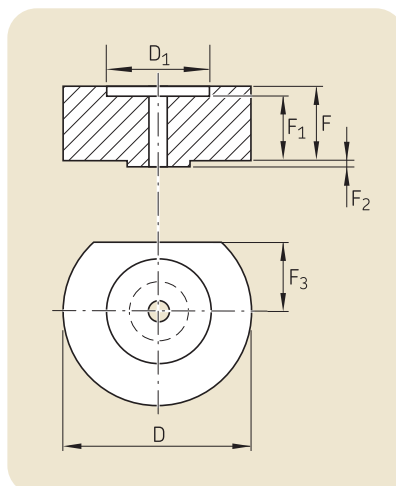
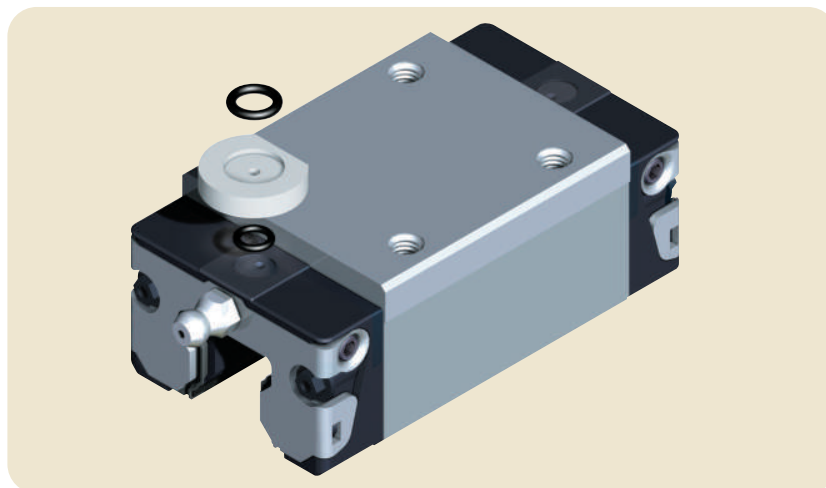
LLRHC_R

LLRHC_LR

- Material: plastic
- Contents: 1 piece

Mounting:

O-rings are supplied.



Type designations and dimensions

Size	Part numbers	Dimensions (mm)						
		D	D ₁	D ₂	F	F ₁	F ₂	F ₃
15	LLRHZ 15 0	12	6,2	3,4	3,70	3,10	0,50	3,20
25	LLRHZ 25 0	15	7,2	4,4	3,80	3,20	0,50	5,85
30	LLRHZ 30 0	16	7,2	4,4	2,80	2,20	0,50	6,10
35	LLRHZ 35 0	18	7,2	4,4	6,80	6,20	0,50	6,80
45	LLRHZ 45 0	20	7,2	4,4	9,80	9,20	0,50	8,30

Mounting of lubrication adapter

A lubrication adapter is necessary on high carriages if lubrication is to take place from the table part.

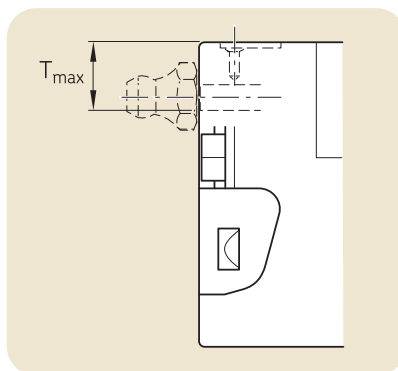
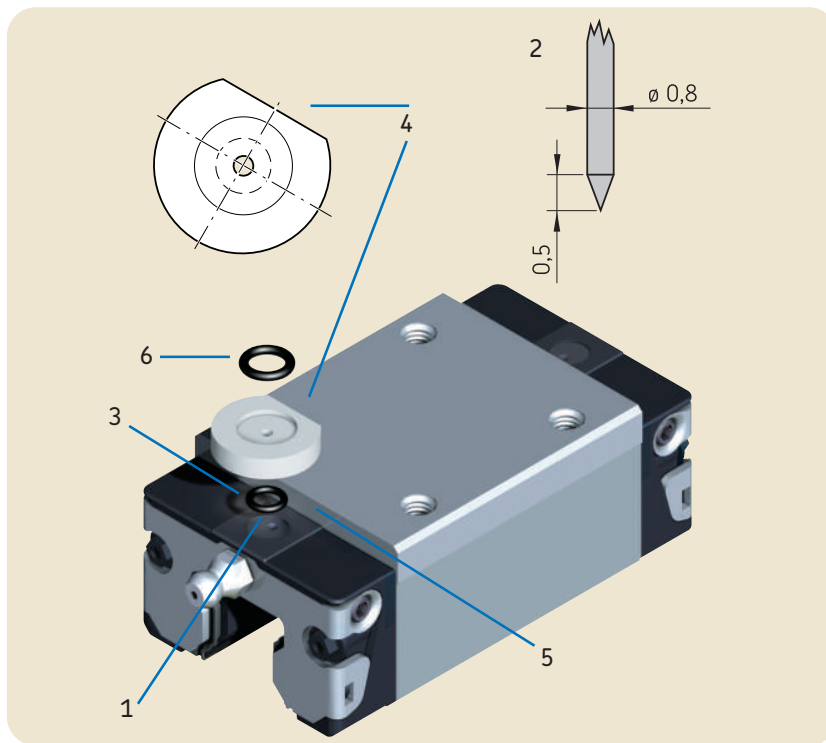
⚠ In the recess for the O-ring seal a further small recess (1) has been preformed. Do not drill this open. Risk of dirt incursion!

- Heat up metal tip (2) with a diameter of 0,8 mm.
- Carefully open the recess (1) with the metal tip and push through.
Observe maximum permissible depth $T_{\max}$ stated in the table!
- Insert O-ring seal (3) in the recess.
- Insert lubrication adapter at an angle in the recess and press the flattened side (4) onto the steel part (5). Use grease for fixing.
- Insert O-ring seal (6) in the lubrication adapter.

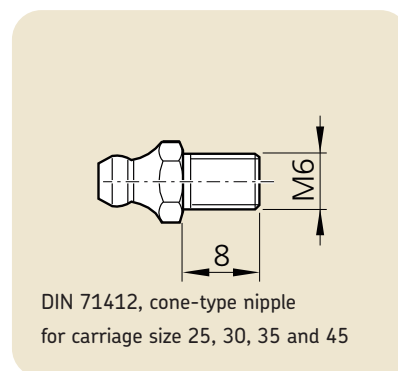
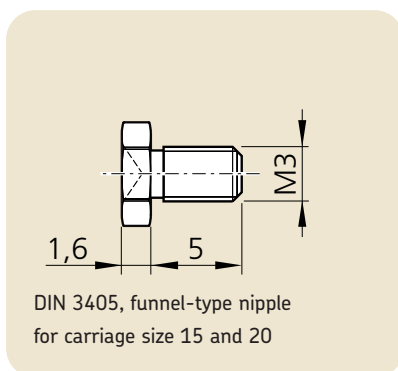
Size

Top lubrication opening: maximum permissible depth for penetration $T_{\max}$ (mm)

Size	Top lubrication opening: maximum permissible depth for penetration $T_{\max}$ (mm)
15	3,6
20	3,9
25	3,3
30	6,6
35	7,5
45	8,8



Lubrication nipple dimensions

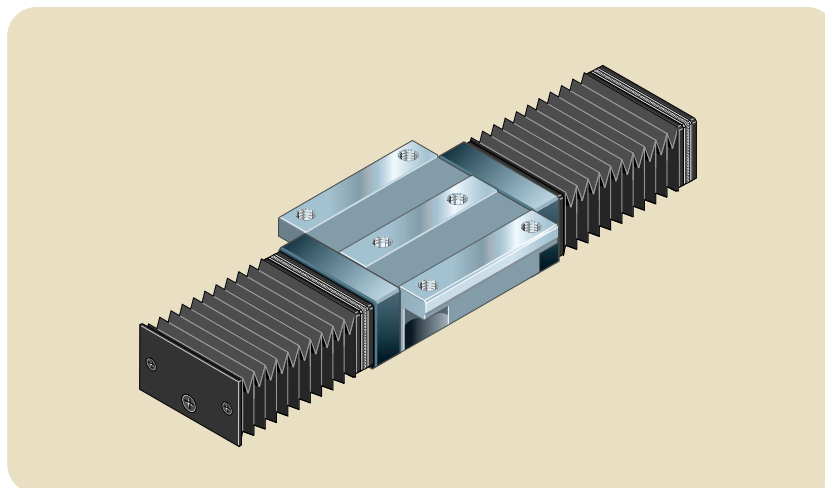


Bellows

Material:

Bellows are made out of polyester fabric with polyurethane coating
Adapter plates are made out of aluminium.

The lubrication nipple on the carriage can be used.



Size	 Type 2 with fastening plate for the carriage and end plate for the rail	 Type 4 with two fastening plates for the carriages	 Type 9 loose bellows (spare part)
15	LLRHB 15 B2 xx	LLRHB 15 B4 xx	LLRHB 15 xx
20	LLRHB 20 B2 xx	LLRHB 20 B4 xx	LLRHB 20 xx
25	LLRHB 25 B2 xx	LLRHB 25 B4 xx	LLRHB 25 xx
30	LLRHB 30 B2 xx	LLRHB 30 B4 xx	LLRHB 30 xx
35	LLRHB 35 B2 xx	LLRHB 35 B4 xx	LLRHB 35 xx
45	LLRHB 45 B2 xx	LLRHB 45 B4 xx	LLRHB 45 xx

xx = Number of folds

Mounting

The bellows are pre-mounted.
The fixing screws are supplied.

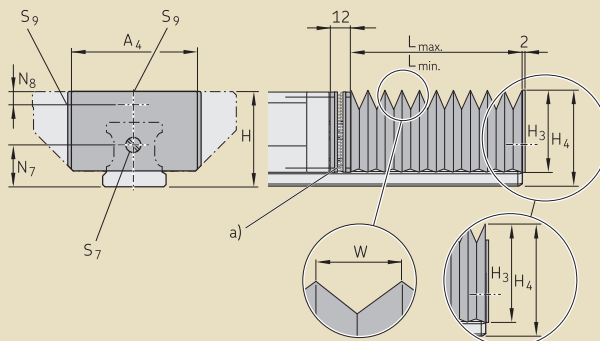
On type 2 in each case one thread M4-10 deep, 2 x 45° countersunk, must be inserted in the end face of the rail.

Size 25 - 45:

The lubrication nipple on the carriage can be used.

Size 15 and 20:

A drive-type lubrication nipple is supplied.



Calculation of the bellows

$$L_{\min} = L_{\max} - \text{Stroke}$$

$$L_{\max} = (\text{Stroke} + 30) \cdot U$$

$$\text{Number of folds} = \frac{L_{\max}}{W} + 2$$

L_A = Carriage length L_1 plus 2x12 mm for the fastening plates.

$L_{\max}$ = Bellows stretched

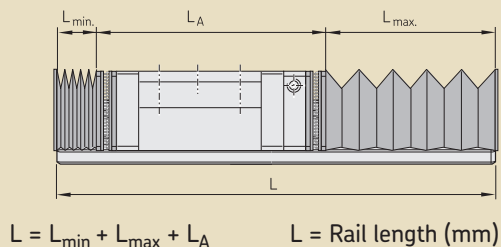
$L_{\min}$ = Bellows pushed together

Stroke = Stroke (mm)

U = Calculation factor

W = Maximum extension of folds

Calculation of the rail length



Dimensions of the bellows

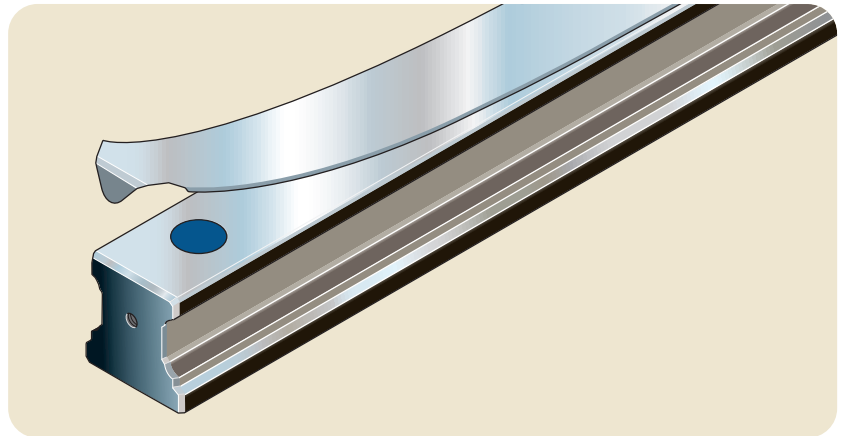
Size	Dimensions (mm)											Factor U
	A ₄	B ₃	H	H ₃	H ₄	N ₇	N ₈	S ₇	S ₈	S ₉	W	
15	45	11	24	26,5	31,5	11	3,4	M4	ø3	M3	19,9	1,18
20	42	12	30	24,0	29,2	13	3,5	M4	ø3	M3	10,3	1,33
25	45	12	36	28,5	35,0	15	6,0	M4	M6	M3	12,9	1,32
30	55	12	42	34,0	41,0	18	8,0	M4	M6	M6	15,4	1,25
35	64	12	48	39,0	47,0	22	8,0	M4	M6	M6	19,9	1,18
45	83	12	60	49,0	59,0	30	8,0	M4	M6	M6	26,9	1,13

Cover strip

Advantages of the cover strip

The cover strip can be simply clipped on and pulled off.

- This considerably simplifies and quickens mounting:
 - It is not necessary to close every single drill hole
 - It is not necessary to wait for the adhesive to set on adhesive strips.
- Multiple mounting and removal is possible (up to 4 times)



Designs/Functions

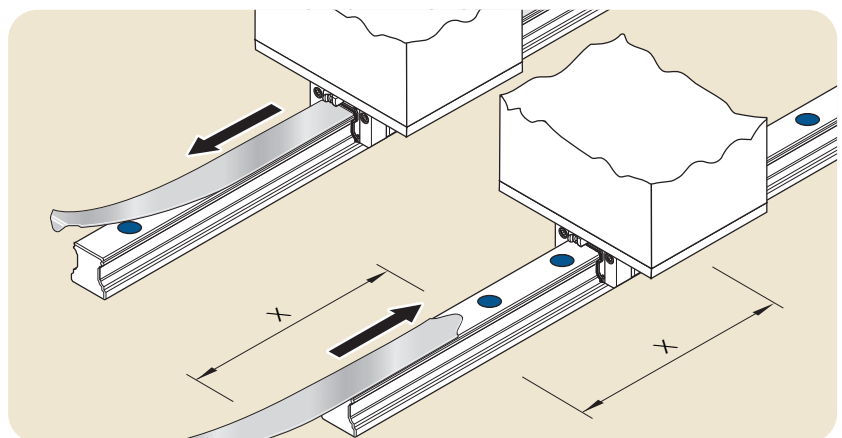
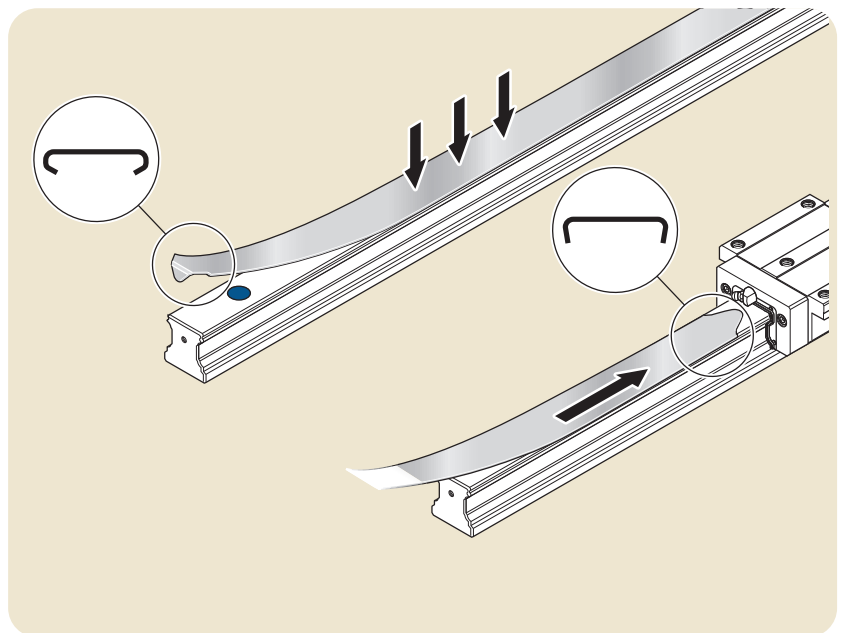
Cover strip with fixed seat (standard)

- The cover strip is clipped on before the carriages are mounted and stays firmly in place.

With an optionally available expanding mandrel for 0,15 mm cover strips or a special expanding tool for 0,3 mm cover strips a slide can also be retroactively created in order to remove a cover strip.

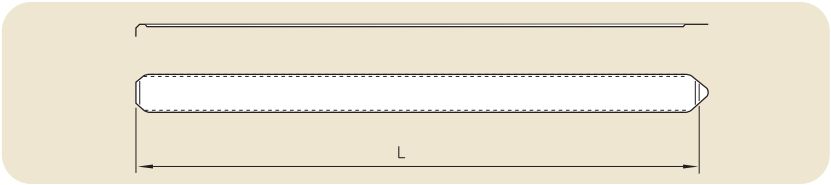
In particular, however, the slide length X can be optimally adapted to the specific application.

Please observe the precise mounting instructions!



Cover strip for initial mounting/
stock/replacement

For each guide rail length a match-
ing cover strip with fixed seat can be
supplied.

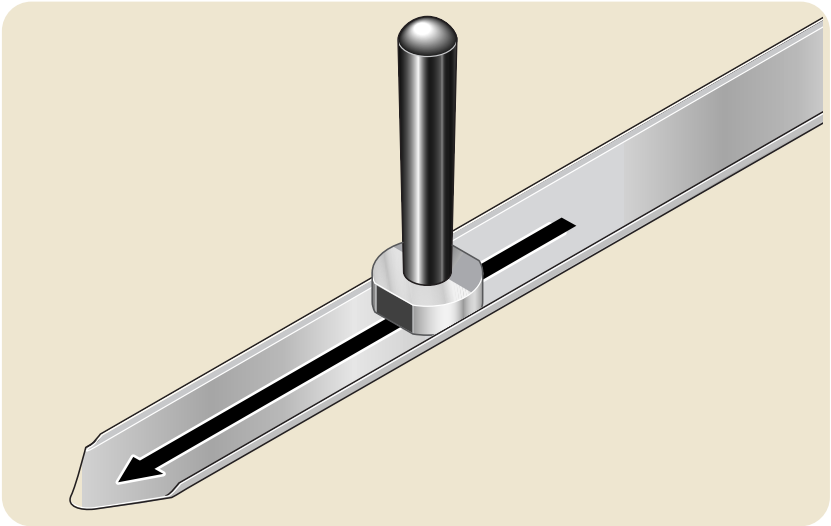


Ordering a standard cover strip
with fixed seat

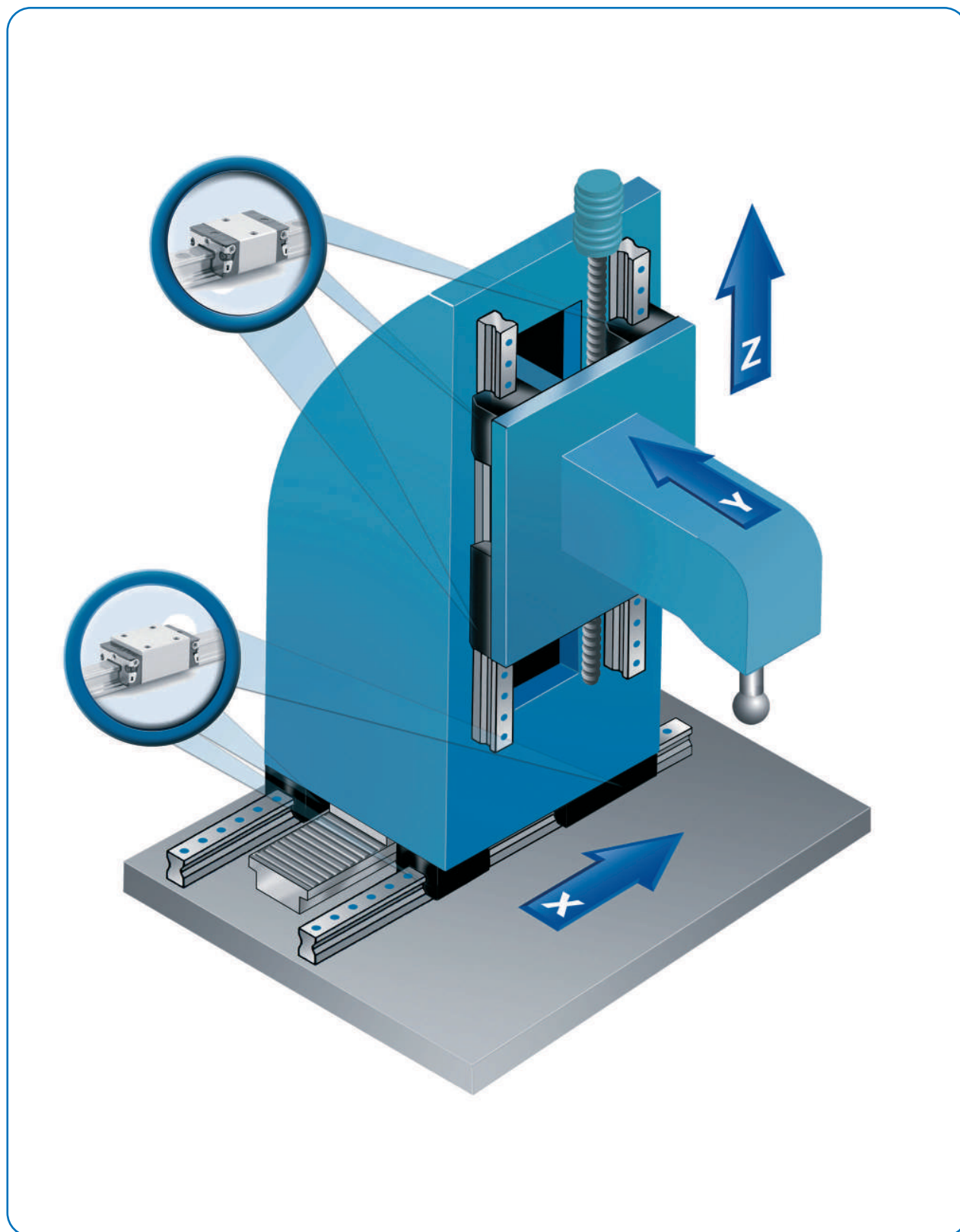
Example:
Rail Size 35,
Rail length L = 2 696 mm
LLRHZ 15 – 2 969 CS
(For order designation see
product table)

Size	Standard cover strips Order designation, length (mm)
15	LLRHZ 15 - xxx CS
20	LLRHZ 20 - xxx CS
25	LLRHZ 25 - xxx CS
30	LLRHZ 30 - xxx CS
35	LLRHZ 35 - xxx CS
45	LLRHZ 45 - xxx CS

Expanding mandrel to create a slide
on the cover strip



Size	Expanding mandrel Order designation
15	LLRHZ 15 W
20	LLRHZ 20 W
25	LLRHZ 25 W
30	LLRHZ 30 W
35	LLRHZ 35 W
45	LLRHZ 45 W



Cover strip retaining clamps

For guide rails without end-face threaded holes.

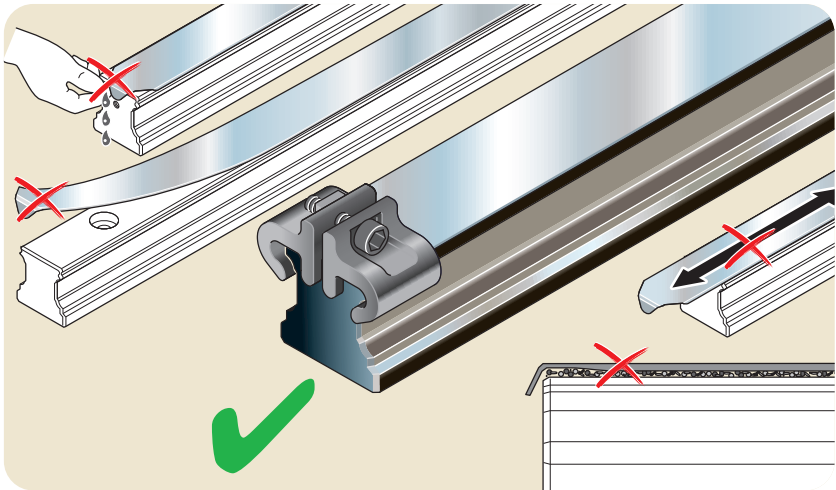
SKF recommends the use of cover strip retaining clamps. These can:

- prevent unintentional removal of the strip and incursion of dirt
- fix the cover strip in place

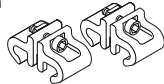
Materials:

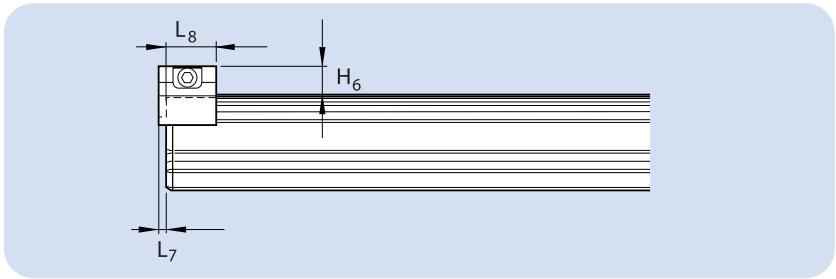
Retaining clamps made of aluminium, black anodised.

Clamping screw and nut made of corrosion-resistant steel.

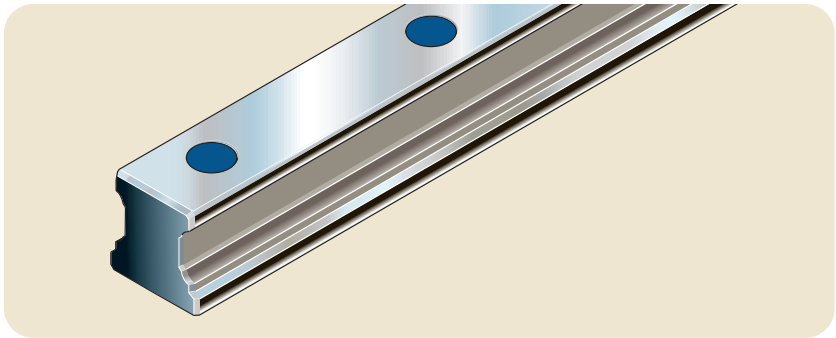


Order designations for cover strip retaining clamps

Size	Retaining clamps (2 pieces per unit) Order designation	Dimensions (mm)		
				
15	LLR 15 CSG	H ₆	L ₇	L ₈
20	LLR 20 CSG	7,3	2,0	12
25	LLR 25 CSG	7,1	2,0	12
30	LLR 30 CSG	8,2	2,0	13
35	LLR 35 CSG	8,7	2,0	13
45	LLR 45 CSG	11,7	2,2	16
		12,5	2,2	18



Plastic caps are supplied as standard if a cover strip has not been ordered.



Mounting instructions

General mounting instructions

General instructions

The following mounting instructions apply to all profile rail guides.

Please note, however, that differing specifications exist concerning the parallelism of the rails as well as the screwing and pinning of the carriages. These are therefore assigned to the individual versions.

Ball profile rail guides are high-quality products. Greatest possible care should be taken during transport and subsequent assembly. All steel parts have been oil-protected. The protection materials do not need to be removed if the recommended lubricants are used.

Detailed mounting instructions are available through your normal SKF contact.

Assembly examples

Rails:

Each rail has ground reference edges on both sides.

Options for lateral fixing:

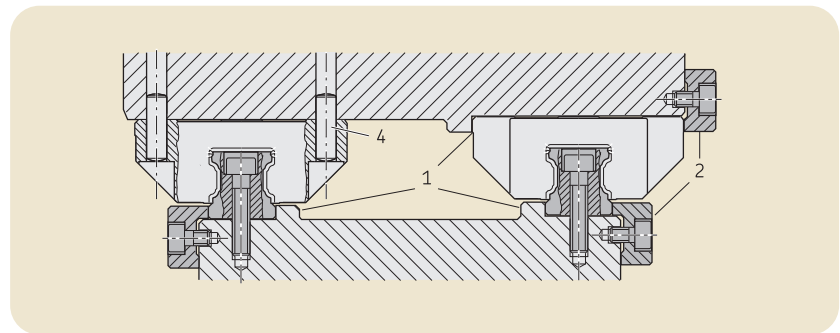
- 1 Stop edges
- 2 Clamp strips
- 3 Wedge strips

Note

The rail must have a chamfer to prevent the seal from being damaged. This is not the case for joint rail tracks

Rails without lateral fixing must be aligned straight and parallel during assembly, preferably using an auxiliary strip.

(Guide values for the permissible lateral force without additional lateral fixing can be obtained from the information for the individual versions).



Carriage:

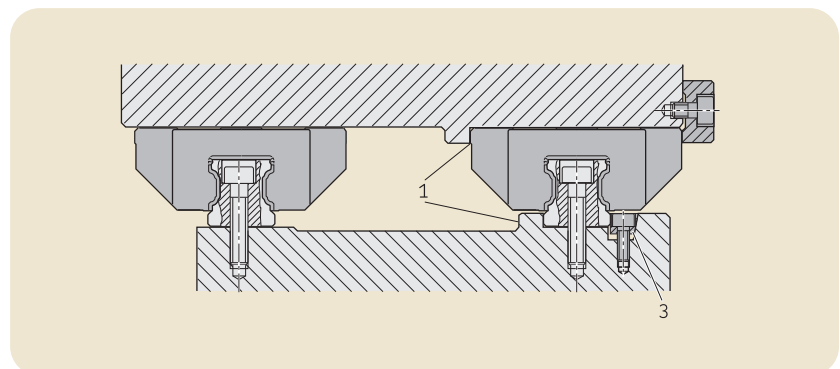
Each carriage has a ground reference edge on one side (<dimension H3 in the dimensional drawings).

Additional fixing options:

- 1 Reference edges
- 2 Retaining strips
- 3 Clamp strips
- 4 Pinning

Note

After being successfully mounted the carriage should move easily when pushed.



Stop edges, corner radii, screw sizes and tightening torques

Carriages made of steel, type A, LA

- Standard width

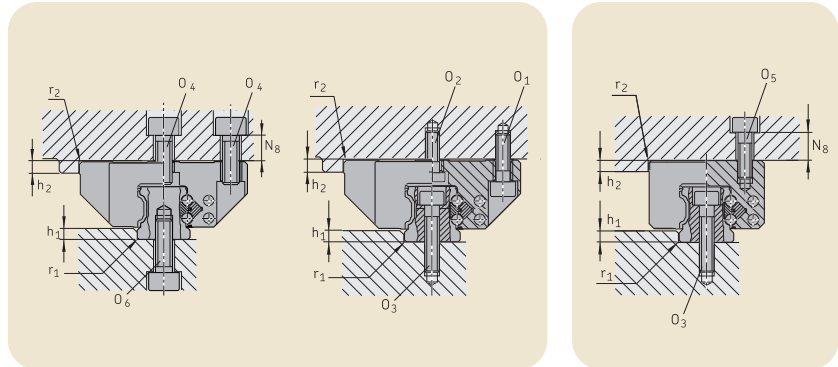
Rails

- Can be screwed from above

Carriages made of steel, type U, LU, R, LR

Rails

- Can be screwed from above



The combinations shown are examples. In principle all carriages can be combined with all rails.

Size	h_1 min. max.	r_1 max.	h_2 max.	r_2 max.	O_1 DIN 912 4 Pieces	$O_2^{2)}$ DIN 6912 2 Pieces	$O_4^{1)2)}$ DIN 912 6 Pieces	O_5 DIN 912 4 Pieces	O_3 DIN 912	O_6 DIN 912	N_8 (mm)
15	2,5 3,5	0,4	4	0,6	M4x12	M4x10	M5x12	M4x12	M4x20	M5x12	6
20	2,5 4,0	0,6	5	0,6	M5x16	M5x12	M6x16	M5x16	M5x25	M6x16	9
25	3,0 5,0	0,8	5	0,8	M6x20	M6x16	M8x20	M6x18	M6x30	M6x20	10
30	3,0 5,0	0,8	6	0,8	M8x25	M8x16	M10x20	M8x20	M8x30	M8x20	10
35	3,5 6,0	0,8	6	0,8	M8x25	M8x20	M10x25	M8x25	M8x35	M8x25	13
45	4,5 8,0	0,8	8	0,8	M10x30	M10x25	M12x30	M10x30	M12x45	M12x30	14

Dimensions and guide values for permissible lateral force without additional lateral fixing

	Screw strength class	Carriages	Rails
Carriages A, U, R	8.8	0,11 C	0,15 C ³⁾ 0,23 C
	12.9	0,18 C	0,22 C ³⁾ 0,35 C
Carriages LA, LU, LR	8.8	0,08 C	0,13 C ³⁾ 0,18 C
	12.9	0,14 C	0,18 C ³⁾ 0,26 C

¹⁾ If the carriage is fastened from above with only four O_4 screws:

- permissible lateral force 1/3 lower
- lower stiffness

²⁾ If the carriage is fastened with 6 screws:

Tighten the middle screws with a tightening torque for strength class 8.8

³⁾ If fastened with two O_2 screws and four O_1 screws

Tightening torques of the fixing screws in Nm

	M4	M5	M6	M8	M10	M12	M14	M16
	8.8	2,7	5,5	9,5	23	46	80	125
	12.9	4,6	9,5	16	39	77	135	215

Pinning

If the guide values for the permissible lateral force are exceeded (see table) the carriage must be additionally fixed by means of pinning or stop edges.

The recommended dimensions for the pin holes can be obtained from the drawings and table.

Usable pins:

- tapered pin (hardened) or
- straight pin DIN ISO 8734

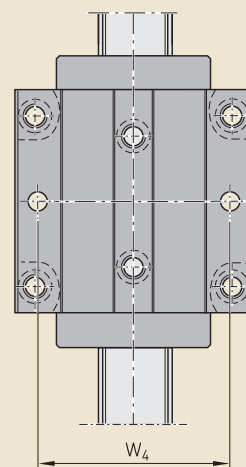
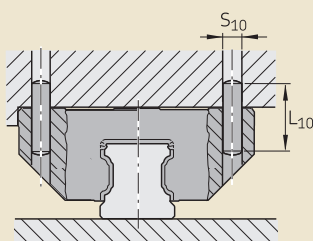
Instructions

For production-related reasons there may be pilot drill holes in the middle of the carriage at the recommended positions for pin holes ($\varnothing < S_{10}$). They are suitable for drilling.

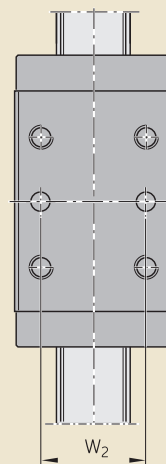
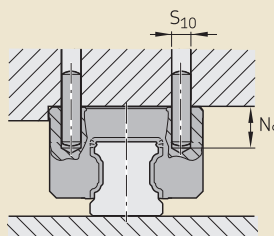
If necessary, the pinning must be carried out in a different position (e.g. middle lube port), but must not exceed the dimension L_3 in longitudinal direction (L_3 can be obtained from the dimension tables for the individual versions).

Keep to dimensions W_2 and W_4 !

Do not complete the pin holes until after mounting (see also general mounting instructions - available through your normal SKF contact).



Standard width A, LA



Slim line U, LU
Slim line high R, LR

Size	Dimensions (mm)				
	Tapered pin (hardened) or straight pin (DIN 6325)				
	S_{10}	L_{10}	W_2	W_4	N_9 (max)
15	4	18	26	38	6,0
20	5	24	32	53	7,5
25	6	32	35	55	9,0
30	8	36	40	70	12,0
35	8	40	50	80	13,0
45	10	50	60	98	18,0

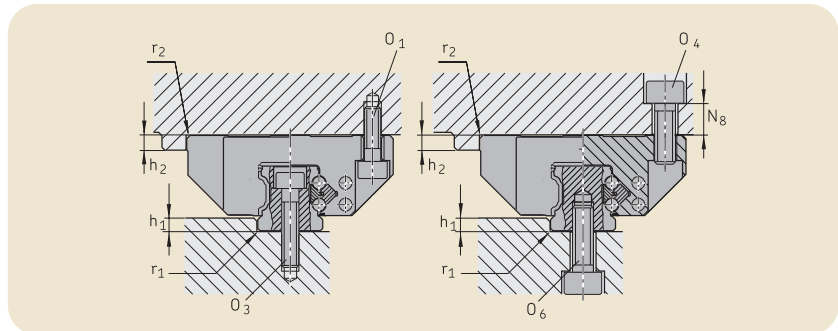
Stop edges, corner radii, screw sizes and tightening torques

Carriages SA

- Standard width, short

Rails

- Can be screwed from above

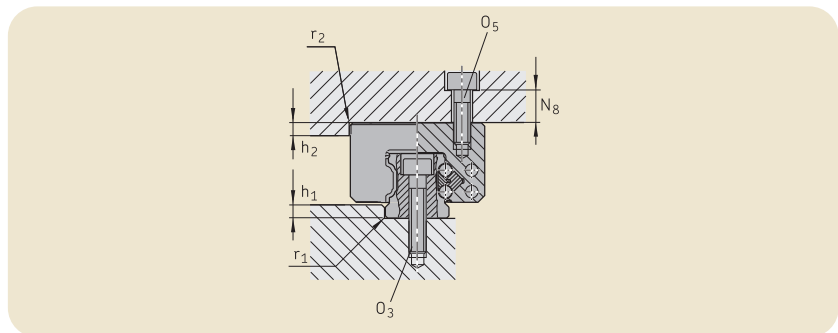


Carriages SU

- Slim line short

Rails

- Can be screwed from above



Note

The combinations shown are examples. In principle all carriages can be combined with all rails.

The screw connection for the carriages using 2 screws is completely adequate to withstand the maximum load. (See maximum load ability and moment loadability for the individual versions.)

Dimensions and guide values for permissible lateral force without additional lateral fixing

Size	h_1 min. (mm)	max. (mm)	r_1 max. (mm)	h_2 (mm)	r_2 max. (mm)	O_1 DIN 912 2 Pieces	O_4 DIN 912 2 Pieces	O_5 DIN 912 2 Pieces	O_3 DIN 912 (Rail)	O_6 DIN 912 (Rail)	N_8 (mm)
15	2,5	3,5	0,4	4	0,6	M4x12	M5x12	M4x12	M4x20	M5x12	6
20	2,5	4,0	0,6	5	0,6	M5x16	M6x16	M5x16	M5x25	M6x16	9
25	3,0	5,0	0,8	5	0,8	M6x20	M8x20	M6x18	M6x30	M6x20	10
30	3,0	5,0	0,8	6	0,8	M8x25	M10x20	M8x20	M8x30	M8x20	10
35	3,5	6,0	0,8	6	0,8	M8x25	M10x25	M8x25	M8x35	M8x25	13

Screw strength class	Carriages			Rails		
8.8	0,08 C	0,12 C	0,08 C	0,09 C	0,09 C	
12.9	0,13 C	0,21 C	0,13 C	0,15 C	0,15 C	

Tightening torques of the fixing screws in Nm

	M4	M5	M6	M8	M10	M12	M14	M16
8.8	2,7	5,5	9,5	23	46	80	125	195
12.9	4,6	9,5	16	39	77	135	215	340

Pinning

If the guide values for the permissible lateral force are exceeded (see table) the carriage must be additionally fixed by means of pinning or stop edges.

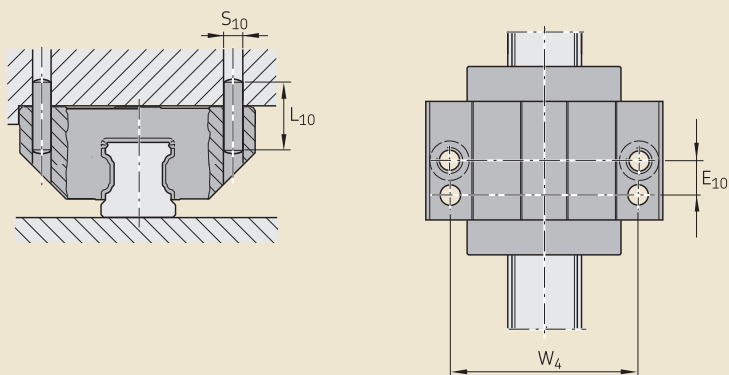
The recommended dimensions for the pin holes can be obtained from the drawings and table.

Usable pins:

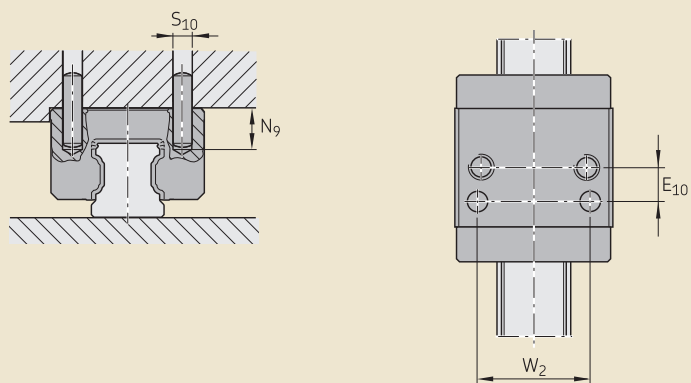
- tapered pin (hardened) or
- straight pin DIN ISO 8734

Instructions

For production-related reasons there may be pilot drill holes in the middle of the carriage at the recommended positions for pin holes ($\varnothing < S_{10}$). They are suitable for drilling.



Flange short, SA



Slim line, SU

Size	Dimensions (mm)		W_4	W_2	E_{10}	N_9 (max)
	S_{10}	L_{10}				
15	4	18	38	26	9	3,0
20	5	24	53	32	10	3,5
25	6	32	55	35	11	7,0
30	8	36	70	40	14	10,0
35	8	40	80	50	15	12,0

Tapered pin (hardened), straight pin (DIN 6325)

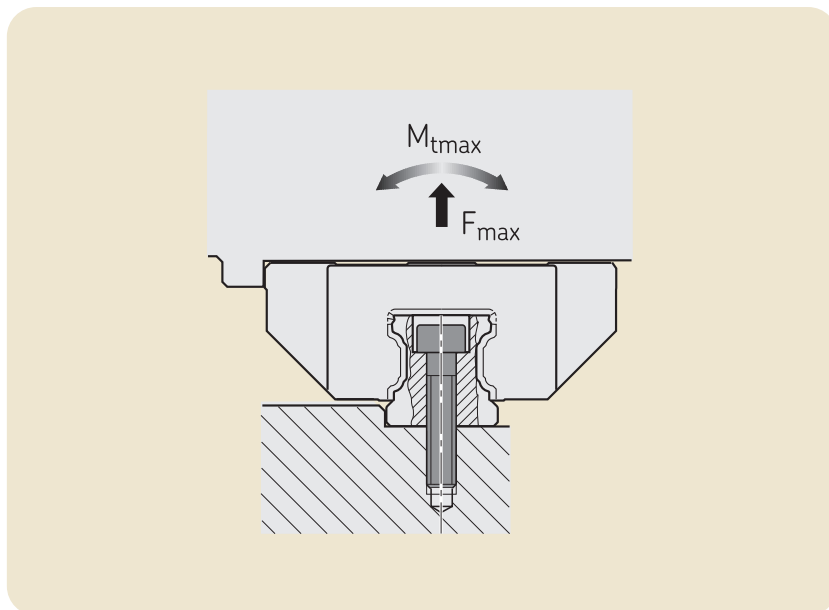
Loading of the screw connections between rail and substructure

The screw connections specified in the DIN 645-1 standard can become excessively loaded owing to the high performance capacity of the profile rail guides.

The screw connection between the guide rail and the substructure is critical. If the lift-off loads (F) or moments (M_t) are higher than the respective load values in the table, the screw connection must be recalculated separately.

The figures apply to the following conditions:

- Grade 12.9 fixings screws
- Screws tightened using a torque wrench
- Slightly oiled screws (for grade 8.8 screws approximately a reduction factor of 0,6 can be applied)



Lift-off loads and moment
Rail screwed from above

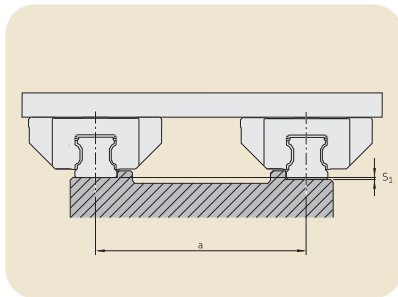
Carriage	LLRH--SA, LLRH--SU		LLRH--A, LLRH--U, LLRH--R		LLRH--LA, LLRH--LU, LLRH--LR	
Size	$F_{max.}$ (N)	$M_{t max.}$ (Nm)	$F_{max.}$ (N)	$M_{t max.}$ (Nm)	$F_{max.}$ (N)	$M_{t max.}$ (Nm)
15	6 040	41	7 050	47	8 060	54
20	10 000	90	11 700	106	13 400	121
25	14 600	154	17 100	180	19 500	205
30	-	360	32 400	420	37 100	480
35	27 500	440	32 100	510	36 700	580
45	-	-	78 100	1 680	89 300	1 920

Height deviation

The values for height deviation apply to all carriages.

Approximately 20 % higher values are permissible for the SA (standard width short) and SU (slim line short) carriages.

Given adherence to the permissible height deviation S_1 and S_2 , the influence on the service life is generally negligible.



Permissible height deviation in lateral direction

In the permissible height deviation S_1 , the tolerance for dimension H according to the table is already taken into account in "Technical Data".

$$S_1 = a \times Y$$

S_1 = Permissible height deviation (mm)

a = Distance between the rails (mm)

Y = Calculation factor

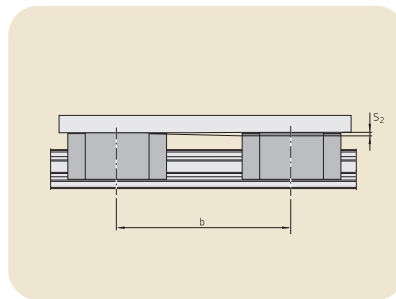
Permissible height deviation in longitudinal direction

For carriages

In the permissible height deviation S_2 the tolerance "maximum difference of dimension H on a rail" according to the table is already taken into account in "Technical Data".

Approximately 40 % higher values are permissible for SA and SU carriages.

On A-type carriages (standard width long), LU and LR approx. 30 % lower values are permissible.



Permissible height deviation S_2 on carriages

$$S_2 = b \times 4,3 \times 10^{-5}$$

S_2 = Permissible height deviation (mm)

b = Distance between the carriages (mm)

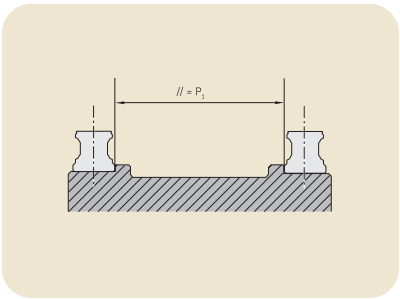
Calculation factor Y for carriages

Calculation factor	Preload class	T1	T2	T3
	up to approx. 10 μm clearance	Preload 0,02 C	Preload 0,08 C	Preload 0,13 C
Y	$4,3 \times 10^{-4}$	$2,8 \times 10^{-4}$	$1,7 \times 10^{-4}$	$1,2 \times 10^{-4}$

Parallelism of mounted rails measured on the rails and the carriages

The values for the deviation in parallelism P_1 apply to all carriages.

Approximately 20 % higher values are permissible for the SA and SU carriages.



Deviation in parallelism P_1 for carriages

Through the deviation in parallelism P_1 the preload is increased somewhat on one side.

If the table values are adhered to, the influence on the service life is generally negligible.

The values shown in the following table apply to applications in which highest precision is required.

For all other uses and for general mechanical engineering doubled values can be applied.

Size	Deviation in parallelism P_1 (mm) for high precision demands			
	T0 up to approx. 10 µm clearance	T1 Preload 0,02 C	T2 Preload 0,08 C	T3 Preload 0,13 C
15	0,015	0,009	0,005	0,004
20	0,018	0,011	0,006	0,004
25	0,019	0,012	0,007	0,005
30	0,021	0,014	0,009	0,006
35	0,023	0,015	0,010	0,007
45	0,028	0,019	0,012	0,009

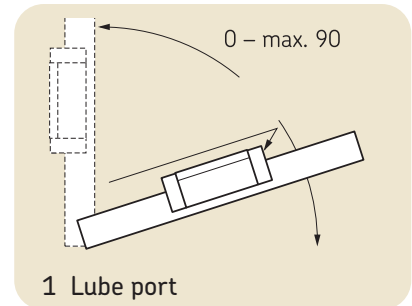
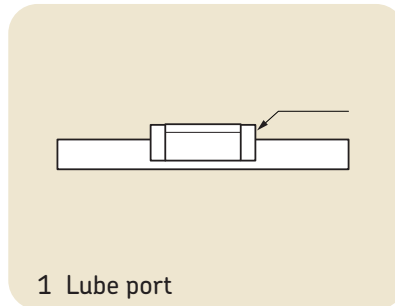
Maintenance and lubrication

As a function of the stroke length

Stroke > 2 × length of the carriage

- 1 lube port needs to be provided per carriage.
- Oil lubrication in accordance with ISO VG 220.

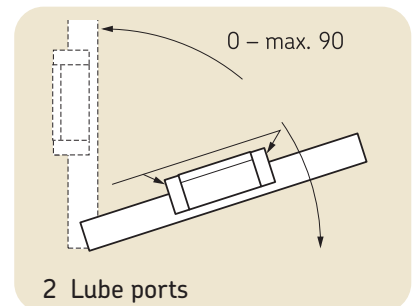
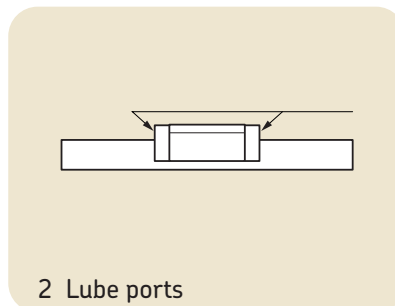
For lubrication quantities please refer to the next page.



Stroke < 2 × length of the carriage

- 2 lube ports need to be provided per carriage.
- Apply the prescribed lubricant quantity per lube port.
- Oil lubrication in accordance with ISO VG 220.

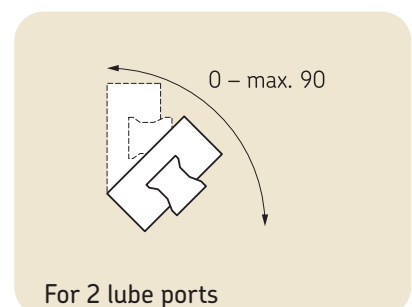
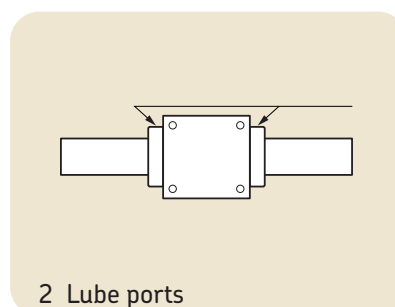
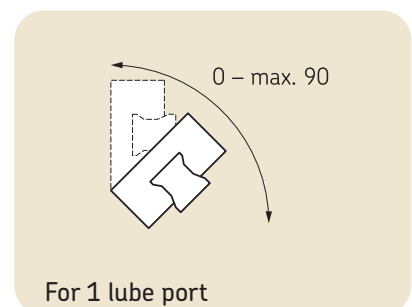
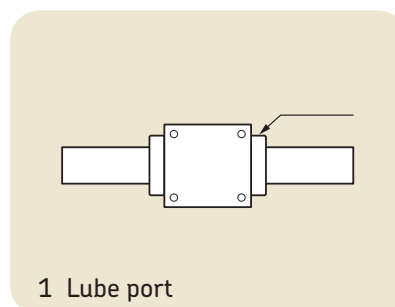
For lubrication quantities please refer to the next page.



Installation in inclined or side position (wall mounting)

Stroke > 2 × length of the carriage

- 1 lube port needs to be provided per carriage.
- Apply the lubricant quantity stated in the table with an impulse.
- If the lubricant quantity cannot be applied with an impulse, please consult SKF.



Maintenance

Dirt can drop and settle on exposed rails in particular. To maintain the function of seals and cover strips, such dirt must be regularly removed. For this purpose a "cleaning stroke" should be carried out over the entire length of travel at least twice a day, and at the latest after eight hours. Carry out a cleaning stroke each time before switching off the machine.

Lubrication

Grease lubrication

Initial lubrication of the carriage (basic lubrication)

No initial lubrication is required if the carriage has been greased at the factory.

The initial lubrication takes place with three times the part quantity stated in Table 1:

1. Grease the carriage with the first part quantity stated in table 1.
2. Move the carriage backwards and forwards with three double strokes along at least three times the carriage length.
3. Repeat step 1 and 2 twice.
4. Check whether a lubricating film is visible on the rail.

Ball rail guides are supplied in protected form. With basic greasing at the factory, both grease and oil lubrication is possible.

For lubrication we recommend lubricating grease to DIN 51825: – KP2K-20, consistency class NLGI 2 to DIN 51818. This can be obtained from SKF, see recommendation for lubricating greases.

Never start to use carriages without basic lubrication.

Observe the manufacturer's instructions, in particular instructions concerning incompatibilities.

⚠ Greases with a proportion of solid lubricant (such as graphite) should not be used!

Re-lubricating the carriage

When the re-lubrication interval according to Table 2 has been reached, the carriage must be lubricated with the lubricant quantity as stated in Table 1. Where such environmental influences as dirt, the use of coolants, vibration, shock loads etc. are encountered, we recommend that the re-lubrication intervals be shortened accordingly.

Longer re-lubrication intervals apply in the case of smaller loads.

Short stroke

Stroke < 2 × carriage length

- 2 lube ports need to be provided per carriage and lubricated in each case!

Stroke < 0,5 × carriage length

- 2 lube ports need to be provided per carriage and lubricated in each case!
- For each lubrication cycle move the carriage 2 × the carriage length. If this is not possible, please consult SKF.

Lubricant quantities as stated in Table 1 (re-lubrication). Apply the stated quantity for each lube port.

* NLGI 00 greases reduce the re-lubrication intervals to 75 % of the values stated in Table 2.

Table 1

Size	Grease lubrication Initial lubrication by customer Part quantity (cm³)	Re-lubrication Part quantity (cm³)
15	0,4 (x 3)	0,4 (x 2)
20	0,7 (x 3)	0,7 (x 2)
25	1,4 (x 3)	1,4 (x 2)
30	2,2 (x 3)	2,2 (x 2)
35	2,2 (x 3)	2,2 (x 2)
45	4,7 (x 3)	4,7 (x 2)

Table 2

Size	Grease lubrication Relubrication intervals under normal operating conditions, v ≤ 1 m/s	
	Travel (km) under load ≤ 0,15 C	≤ 0,3 C
15	5 000	1 200
20	5 000	1 200
25	10 000	2 400
30	10 000	2 400
35	10 000	2 400

Oil lubrication

Oil quantities for initial lubrication and re-lubrication

⚠ Apply the entire quantity of oil with a single lubrication impulse!

Carriages initially greased at the factory can also be re-lubricated with oil.

In the case of carriages which have not been initially greased at the factory, carry out the initial lubrication in accordance with Table 3.

If environmental influences such as dirt, use of coolants, vibration, shock loads etc. are encountered, we recommend that the re-lubrication intervals be shortened accordingly. Refer to Table 4.

Central oil lubrication

Oil quantities and lubrication impulses for central oil lubrication

Note:

Recommended waiting time between the impulses:
10 seconds.

For example size 45:
4 impulses with in each case 0,6 cm³ in 30 seconds.
Refer to Table 5.

Table 3

Size	Oil lubrication	
	Initial lubrication by customer Part quantity (cm ³)	Re-lubrication Part quantity (cm ³)
15	0,4 (x 2)	0,4
20	0,7 (x 2)	0,7
25	1,0 (x 2)	1,0
30	1,1 (x 2)	1,1
35	1,2 (x 2)	1,2
45	2,2 (x 2)	2,2

Table 4

Size	Oil lubrication	
	Re-lubrication intervals under normal operating conditions, v ≤ 1 m/s	
	Travel (km)	
	under load ≤ 0,15 C	≤ 0,3 C
15	2 500	600
20	2 500	600
25	5 000	1 200
30	5 000	1 200
35	5 000	1 200

Table 5

Size	Central oil lubrication	
	Oil quantities Impulse (cm ³)	Impulses per lubrication cycle Number of impulses
15	0,6	1
20	0,6	1
25	0,6	2
30	0,6	2
35	0,6	2
45	0,6	4

Linear motion standard range



About this publication

The encyclopedia of the linear motion

This publication introduces over 250 pages of information on all the standard products with clear tables to help the customer select and order the right solution and correct product.

How to handle

This publication consists of 3 chapters divided as follows:

- Guiding systems
- Driving systems
- Positioning systems

The chapters are arranged from the most simple, the guiding systems, through to the most complex, the positioning systems, which consists of parts of the other components.

Each linear solution is introduced by a overview, which makes it easy to select the right product.

Different subjects are contained in the separate chapters, starting with a brief general description followed by the specific ordering key and the drawings with the data tables.

If a subject is divided into several sections, the corresponding ordering key is located at the beginning of each section, followed by the pages with tables and pictures of that section (for example, on **page 19** and on **page 26**, there are two ordering keys for the Linear ball bearings but they belong to different families: compact series and standard series).

The composition of the ordering keys is not unambiguous, due to the structural difference of the products. Instead it follows the type of the individual product.

To determine the product code to be used on the order, do the following:

After identifying the type of product required by examining the relevant pages containing the main data, it is necessary to prepare the code for the order. This may consist of pre-set options, ordering key boxes already filled in (for example: type, colour, etc.) and options that can be selected from several items, empty boxes (for example: design, bearing, nut type, stroke, length, etc.).

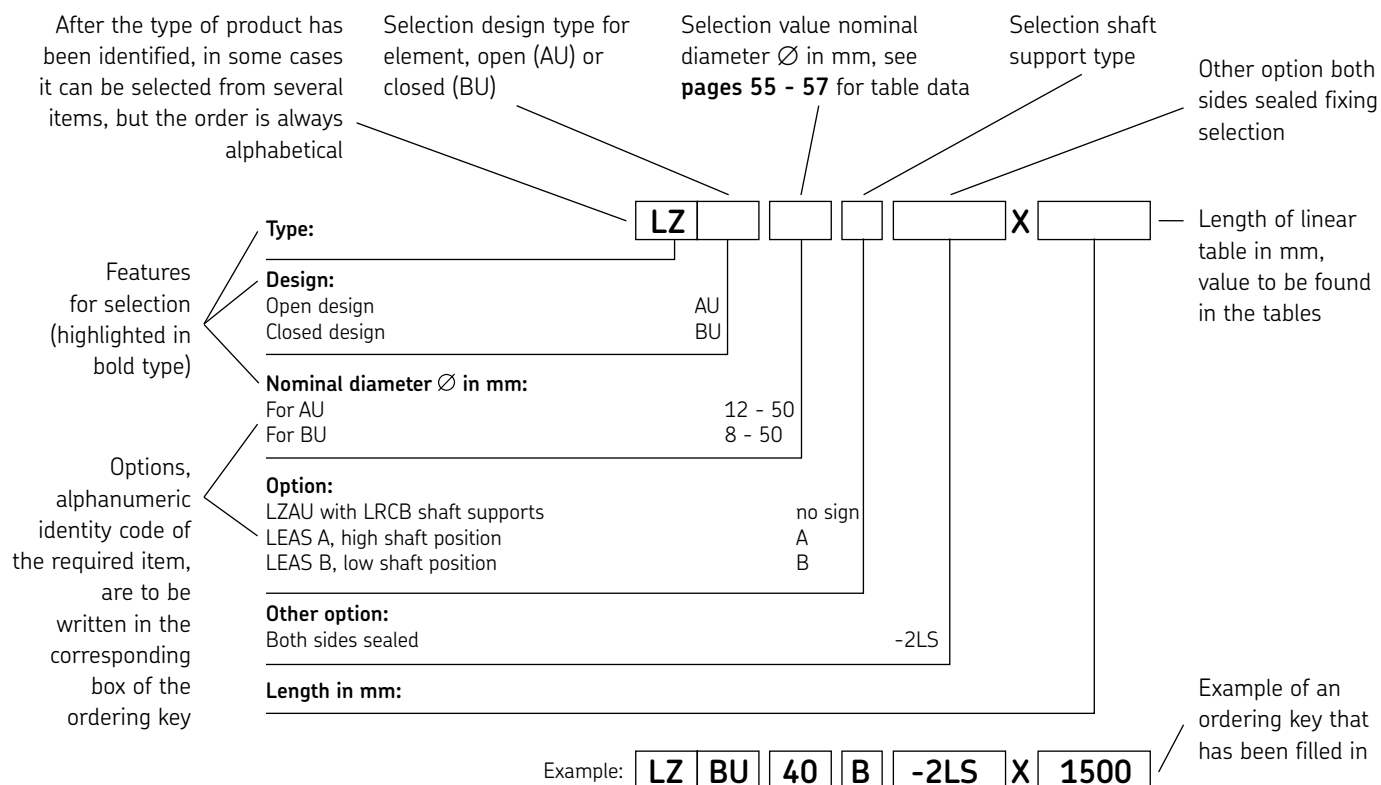
In the ordering key, the options are set out under the associated subjects, with the indication of the code or the information to be entered (with the measurement restrictions contained in the associated table). The sequence of the ordering key is defined by the thin guiding lines that select the corresponding box.

The individual ordering key may contain indications or special notes.

Examples are given at the end of each ordering key.

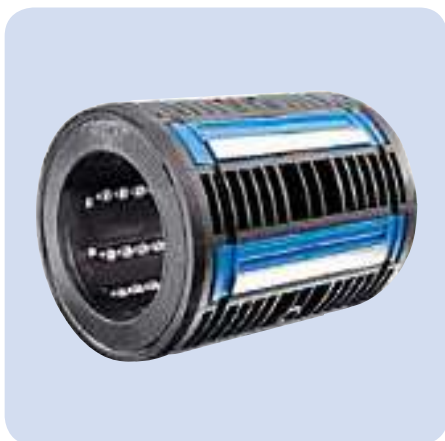
In the chapter for the actuators, the selection of the item's dynamic load/speed and motor option should be made by use of an additional table with several options located above the ordering key.

An example is given below to show how to prepare the order code for an LZ long linear table.





Light, steady and always on the run



The hummingbird is not only the world's smallest bird, but it is also the most stable, thanks to the incredible speed of its wings (eighty pulsations per second) that allow it to be suspended in flight, so allowing itself to feed on the delicious nectar from many of the flowers in Latin America.

Lightness and stability are among the features that have given SKF the inspiration to create lightweight linear

ball bearings which are capable of accommodating loads with the greatest efficiency.

The potential derived from such lightness is truly impressive.

Linear guides



Linear ball bearings (**fig. 1**), profile rail guides (**fig. 2**), miniature profile rail guides (**fig. 3**), precision rail guides (**fig. 4**): limited stroke, very high precision and performance capabilities.

Operating precision (table 1)
Comparison of the different positioning components and systems.



Table 1							
Operating precision (µm)	Linear guides			Ball & roller screws		Tables: driven and not driven	
0,1-1		Precision rail guides		Roller screws			
1-10							
10-100	Linear ball bearings	Profile rail guides	Standard slides		Ball screws	Linear motors	Standard drives or linear motors with all guiding systems
100-1 000							

Shaft guidings



Linear ball bearings (fig. 5, 6 and 7) are bushings with recirculating ball tracks which provide low friction movement and the possibility of unlimited stroke. With the range of linear ball bearings, plain bearings and accessories, it is possible to design and build economical and simple linear guidance systems to suit a wide range of applications. The bearings are available in two size ranges: the compact ISO 1 series and the heavy duty standard ISO 3 series (table 2).

N.B.:
SKF linear ball bearings and units for shaft diameter 6 mm and greater are factory prelubricated by default.
1) linear ball bearings without factory pre-lubrication and preservative only can be ordered by using the suffix "VT808", e.g. LBCR 20 A-2LS/VT808.

Table 2

		Type		Basic dynamic load rating	Stiffness	Speed	Precision
Linear ball bearings							
	Compact	LBBR					
	Standard	LBCR					
		LBCD					
		LBCT					
		LBCF					
		LBHT					
Linear plain bearings							
	Compact	LPBR					
	Standard	LPAR					
		LPAT					
Shafts							
		LJM		Standard CF 53			
		LJMH		Hard cromium plated			
		LJMR		Corrosion resistant			
		LJT		Hollow			
		LJMS		Corrosion resistant			

Compact series



LBBR

Compact linear ball bearings available in standard or corrosion resistant versions.



LUHR / LUJR

Linear ball bearing units with either integral seals or G-type seals mounted in the housing.

LTBR

Tandem linear ball bearing units with seals.



LTDR

Duo linear ball bearing units with seals.

LQBR

Quadro linear ball bearing units with seals.



LSHS

Shaft blocks for compact series.

LEBS and LEAS

Tandem shaft blocks suitable for LQBR and LQCD.

2 Linear guides

Shaft guidings

Standard series



LBCR

Closed linear ball bearings without self-aligning feature.

LBCT

Open linear ball bearings, not self-aligning.

LBHT

Heavy-load linear ball bearings, open type.

N.B.:

All LBC and LBH Linear ball bearings available in corrosion resistant!

LBCD

Self-aligning linear ball bearings, closed type.

LBCF

Self-aligning linear ball bearings, open type.

LUCD / LUCE

Self-aligning linear ball bearing units with adjustable preload.

LUCF

Open self-aligning linear ball bearing units with adjustable preload.



LUCT / BH

Heavy-load linear ball bearing units with adjustable preload.



LUND / LUNE

Self-aligning linear ball bearing units with adjustable preload

LUNF

Self-aligning linear ball bearing units, open type with adjustable preload.



LTCD / LTCF

Open or closed self-aligning tandem linear ball bearing units.



LQCD / LQCF

Open or closed self-aligning quadrolinear ball bearing units.



LVCR

Flanged linear ball bearing units.



LSCS

Standard shaft blocks suitable for use with all linear bearing units.

LSNS

Shaft blocks suitable for use with all linear bearing units.

2 Linear guides

Shaft guidings

Table 3

Type	Size	Max load dynamic	static	Comments	ISO serie
	mm	N			
LBBR	3 to 50	6 950	6 300		1
LBCR	5 to 80	37 500	32 000		3
LBCD	12 to 50	11 200	6 950	Self-aligning*	3
LBCT	12 to 80	37 500	32 000		3
LBCF	12 to 50	11 200	6 950	Self-aligning*	3
LBHT	20 to 50	17 300	17 000		3
LPBR	12 to 50	10 800	38 000		1
LPAR	5 to 80	29 000	100 000		3
LPAT	12 to 80	29 000	100 000		3
Linear bearing units					
LUHR	12 to 50	6 950	6 300	LBBR bearing	1
LWJR	12 to 50	6 950	6 300	With shaft seals LBBR bearing	1
LTBR	12 to 50	11 400	12 700	Tandem LBBR bearing	1
LTDR	12 to 50	11 400	12 700	Duo LBBR bearing	1
LQBR	12 to 50	18 600	25 500	Quadro LBBR bearing	1
LUCR	8, 60, 80	37 500	32 000	LBCR bearing	3
LUCD	12 to 50	11 200	6 950	LBCD bearing self-aligning*	3
LUCS	8, 60, 80	37 500	32 000	LBCR bearing	3
LUCE	12 to 50	11 200	6 950	LBCD bearing self-aligning*	3
LUCT	60, 80	37 500	32 000	LBCT bearing	3
LUCF	12 to 50	11 200	6 950	LBCF bearing self-aligning*	3
LUCT ... BH	20 to 50	17 300	17 000	LBHT bearing	3
LUND	12 to 50	11 200	6 950	LBCD bearing self-aligning*	3
LUNE	12 to 50	11 200	6 950	LBCD bearing self-aligning*	3
LUNF	12 to 50	11 200	6 950	LBCF bearing self-aligning*	3
LVCR	12 to 80	37 500	32 000	LBCR bearing	3
LTCD	12 to 50	18 300	14 000	Tandem LBCD bearing self-aligning*	3
LTCF	12 to 50	18 300	14 000	Tandem LBCF bearing self-aligning*	3
LQCR	8	1 290	1 420	Quadro LBCR bearing	3
LQCD	12 to 50	30 000	28 000	Quadro LBCD bearing self-aligning*	3
LQCF	12 to 50	30 000	28 000	Quadro LBCF bearing self-aligning*	3
Shaft blocks					
LSCS	8 to 80				
LSHS	12 to 50			LSHS	1
LSNS	12 to 50			LSNS	3
LEBS A	12 to 50			Tandem LEBS A	1
LEAS ... A/B	8 to 50			LEAS A/B	3
Shafts and shaft supports					
LJ ...	3 to 80				
LRCB	12 to 80			LRCB (holes)	3
LRCC	12 to 80			LRCC (no holes)	
Linear tables					
LZAU	12 to 50			Quadro "supported shaft" LBCF bearing	3
LZBU ... A	8 to 50			Quadro "A" = "moving unit" "A" = "moving unit"	3
LZBU ... B	8 to 50			"B" = "moving shafts" LBCD bearing	

* Automatic compensation of shaft misalignments of up to max. ± 30 angular minutes

Linear ball bearings/Linear bearing units

Ordering key

Type:

Bearing, units, shaft blocks:

Linear plain bearing
Linear ball bearing
Single unit, closed design
Tandem or duo unit
Quadro unit
Shaft block
Tandem shaft block

P
B
U
T
Q
S
E

Design (for seals on side see table at end page):

For P (12 - 50)

For B Closed design (3 - 50)

Non standard (12 - 50)

Non standard (12 - 50)

Standard (12 - 50)

For U With shaft seals (12 - 50)

Self-aligning, clearance adjustable, closed design, relubricatable (12 - 50)

Self-aligning, closed design, relubricatable (12 - 50)

Self-aligning, clearance adjustable, closed design, relubricatable (12 - 50)

For T (12 - 50); tandem unit
(12 - 50); duo unit

For Q (12 - 50)

For S (12 - 50)

For E (12 - 50)

BR
BR
BR
ER
HR
JR
CE
ND
NE
BR
DR
BR
HS
BS

Nominal diameter:

Ø in mm

Option(s):

Without seals

One side sealed

Both sides sealed

Only valid for LBBR:

Without seals, corrosion resistant

One side sealed, corrosion resistant

Both sides sealed, corrosion resistant

Only valid for LUBR, LUHR

Only valid for LEBS

no sign

-LS

2-LS

/HV6

-LS/HV6

-2LS/HV6

PB

A

Only valid for LBBR:

Cassettes of 4 pieces for LBBR Ø 3 - 5 only!

(CAS4)

Lubrication option:

Only preservative, no pre-lubrication (Ø 6 - 50)

/VT808

Example:

L B B R 4 -2LS/HV6

Seals on ... side(s)	LPBR	LBBR	LUBR	LUER	LUHR	LUJR	LUCE	LUND	LUNE	LTBR	LTDR	LQBR	LSHS	LEBS
No	×	×	×	×	×	×	×	×	×	×	×	×	×	×
One	–	×	×	×	×	×	×	×	×	×	×	×	–	–
Both	–	×	×	×	×	×	×	×	×	×	×	×	–	–
Other options	–	/HV6	PB	–	PB	–	–	–	–	–	–	–	–	A

2 Linear guides

Shaft guidings – compact series

LBBR ..

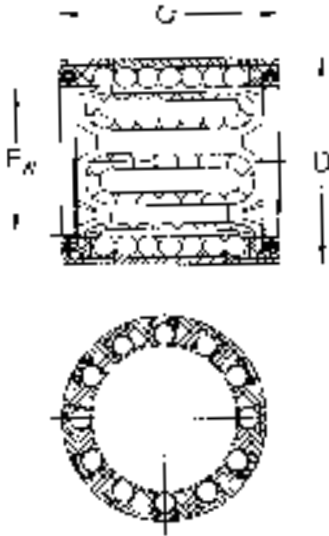
Compact series 1

Linear ball bearings

LBBR (without seals)

-LS with one seal

-2LS with two seals



Designations	Dimensions			Basic load ratings	
	F _w	D	C	dynamic C	static C ₀
	mm			N	
LBBR 3 (CAS4)*	3	7	10	60	44
LBBR 4 (CAS4)*	4	8	12	75	60
LBBR 5 (CAS4)*	5	10	15	170	129
LBBR 6A	6	12	22 ¹⁾	335	270
LBBR 8	8	15	24	490	355
LBBR 10	10	17	26	585	415
LBBR 12	12	19	28	695	510
LBBR 14	14	21	28	710	530
LBBR 16	16	24	30	930	630
LBBR 20	20	28	30	1 160	800
LBBR 25	25	35	40	2 120	1 560
LBBR 30	30	40	50	3 150	2 700
LBBR 40	40	52	60	5 500	4 500
LBBR 50	50	62	70	6 950	6 300

Example:
LBBR 4 (CAS4)
LBBR 20-LS
LBBR 50-2LS

* Without seal, 4 pieces, packed in cassette (only valid for sizes 3, 4, 5)
¹⁾ Width 22 does not correspond to series 1 in ISO standard 10285

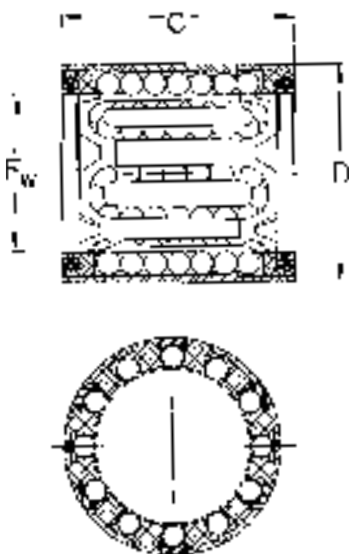
LBBR ../HV6

Compact series 1

Corrosion resistant bearings

/HV6 without seals

-2LS/HV6 with two seals



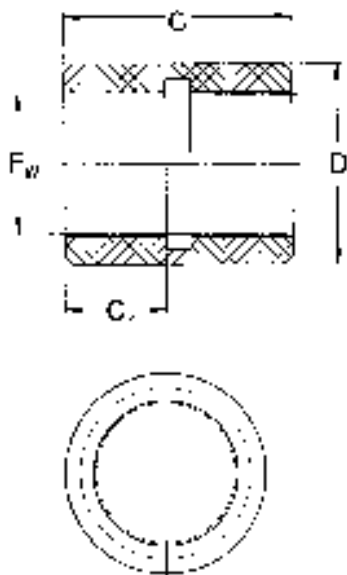
Designations	Dimensions			Basic load ratings	
	F _w	D	C	dynamic C	static C ₀
	mm			N	
LBBR 3/HV6 (CAS 4)*	3	7	10	60	44
LBBR 4/HV6 (CAS 4)*	4	8	12	75	60
LBBR 5/HV6 (CAS 4)*	5	10	15	170	129
LBBR 6A/HV6	6	12	22 ¹⁾	335	270
LBBR 8/HV6	8	15	24	490	355
LBBR 10/HV6	10	17	26	585	415
LBBR 12/HV6	12	19	28	695	510
LBBR 14/HV6	14	21	28	710	530
LBBR 16/HV6	16	24	30	930	630
LBBR 20/HV6	20	28	30	1 160	800
LBBR 25/HV6	25	35	40	2 120	1 560
LBBR 30/HV6	30	40	50	3 150	2 700
LBBR 40/HV6	40	52	60	5 500	4 500
LBBR 50/HV6	50	62	70	6 950	6 300

Example:
LBBR 4/HV6 (CAS4)
LBBR 50-2LS/HV6

* Without seal, 4 pieces, packed in cassette (only valid for sizes 3, 4, 5)
¹⁾ Width 22 does not correspond to series 1 in ISO standard 10285

LPBR ..

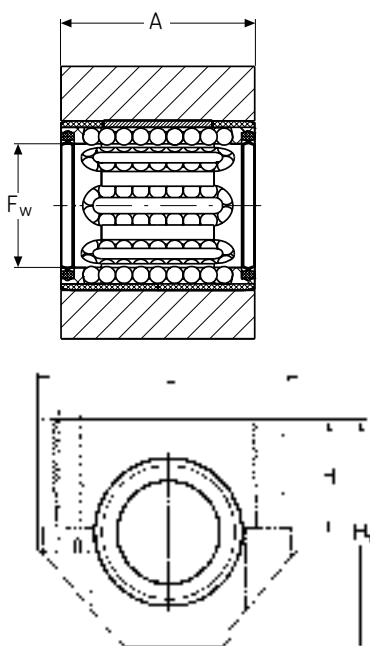
Linear plain bearings



Designations	Dimensions				Basic load ratings		static C_0
	F_w	D	C	C_4	dynamic C 0,1 m/s	C 4 m/s	
	mm				N		
LPBR 12	12	19,19	28	10	965	24	3 350
LPBR 16	16	24,23	30	12	1 530	38	5 400
LPBR 20	20	28,24	30	13	2 080	52	7 350
LPBR 25	25	35,25	40	17	3 400	85	12 000
LPBR 30	30	40,27	50	20	4 800	120	17 000
LPBR 40	40	52,32	60	24	7 650	193	27 000
LPBR 50	50	62,35	70	27	10 800	270	38 000

LUHR ..

Linear ball bearing units
LUHR (without seals)
-2LS with 2 seals



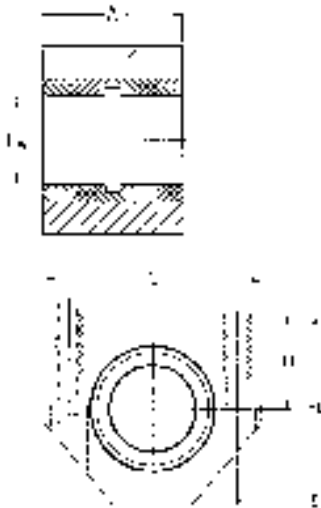
Designations	Dimensions					Basic load ratings	
	F_w	D	C	H $\pm 0,01$	H_1	dynamic C	static C_0
	mm					N	
LUHR 12	12	28	17	33	40	695	510
LUHR 16	16	30	19	38	45	930	630
LUHR 20	20	30	23	45	53	1 160	800
LUHR 25	25	40	27	54	62	2 120	1 560
LUHR 30	30	50	30	60	67	3 150	2 700
LUHR 40	40	60	39	76	87	5 500	4 500
LUHR 50	50	70	47	92	103	6 950	6 300
Example: LUHR 16 LUHR 30-2LS							

2 Linear guides

Shaft guidings – compact series

LUHR .. PB

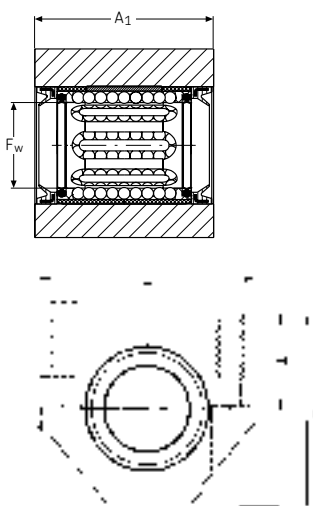
Linear plain bearing units without seals



Designations	Dimensions					Basic load ratings		static C_0
	F_w	A	$H_{\pm 0,01}$	H_1	L	dynamic C 0,1 m/s	C 4 m/s	
	mm					N		
LUHR 12 PB	12	28	17	33	40	965	24	3 350
LUHR 16 PB	16	30	19	38	45	1 530	38	5 400
LUHR 20 PB	20	30	23	45	53	2 080	52	7 350
LUHR 25 PB	25	40	27	54	62	3 400	85	12 000
LUHR 30 PB	30	50	30	60	67	4 800	120	17 000
LUHR 40 PB	40	60	39	76	87	7 650	193	27 000
LUHR 50 PB	50	70	47	92	103	10 800	270	38 000

LUJR ..

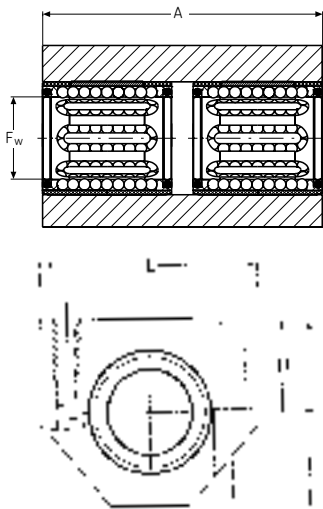
Linear ball bearing units with shaft seals



Designations	Dimensions					Basic load ratings	
	F_w	A	$H_{\pm 0,01}$	H_1	L	dynamic C	static C_0
	mm					N	
LUJR 12	12	35	17	33	40	695	510
LUJR 16	16	37	19	38	45	930	630
LUJR 20	20	39	23	45	53	1 160	800
LUJR 25	25	49	27	54	62	2 120	1 560
LUJR 30	30	59	30	60	67	3 150	2 700
LUJR 40	40	71	39	76	87	5 500	4 500
LUJR 50	50	81	47	92	103	6 950	6 300

LTBR ..

Tandem linear ball bearing units
LTBR (without seals)
-2LS with two seals



Designations	Dimensions					Basic load ratings	
	F _w	A	H ±0,01	H ₁	L	dynamic C	static C ₀
mm						N	
LTBR 12	12	60	17	33	40	1 140	1 020
LTBR 16	16	65	19	38	45	1 530	1 270
LTBR 20	20	65	23	45	53	1 900	1 600
LTBR 25	25	85	27	54	62	3 450	3 150
LTBR 30	30	105	30	60	67	5 200	5 400
LTBR 40	40	125	39	76	87	9 000	9 000
LTBR 50	50	145	47	92	103	11 400	12 700
Example: LTBR 16 LTBR 30-2LS							

LSHS ..

Shaft block for compact series



Designations	Dimensions				
	F _w	A	H ±0,01	H ₂	L
mm					
LSHS 12	12	18	19	33	40
LSHS 16	16	20	22	38	45
LSHS 20	20	24	25	45	53
LSHS 25	25	28	31	54	62
LSHS 30	30	30	34	60	67
LSHS 40	40	40	42	76	87
LSHS 50	50	50	50	92	103

2 Linear guides
Shaft guidings – compact series

LTDR ..
Duo linear ball bearing units
LTDR (without seals)
-2LS with four seals

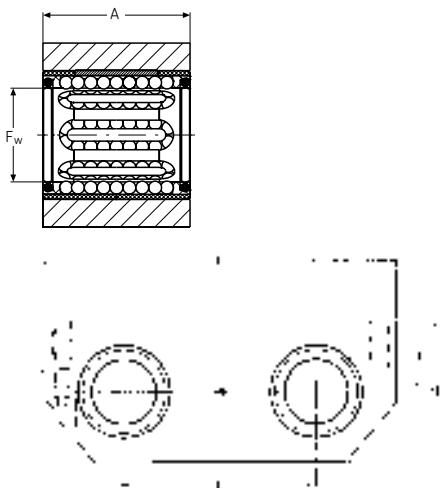


Table with 9 columns: Designations, Dimensions (Fw, A, H, H1, L, L1), and Basic load ratings (dynamic C, static C0). Rows list models LTDR 12 through LTDR 50, followed by an example section for LTDR 12 and LTDR 25-2LS.

LQBR ..
Quadro linear ball bearing units
LQBR (without seals)
-2LS with four seals

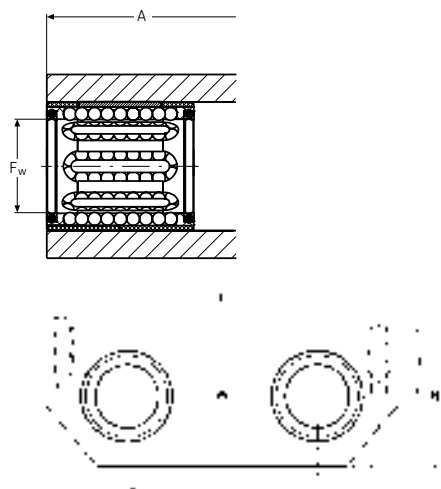
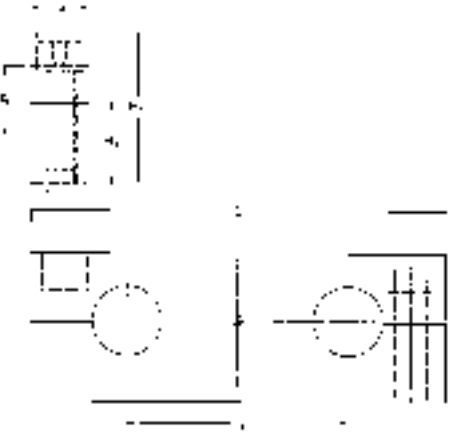


Table with 9 columns: Designations, Dimensions (Fw, A, H, H1, L, L1), and Basic load ratings (dynamic C, static C0). Rows list models LQBR 12 through LQBR 50, followed by an example section for LQBR 40 and LQBR 30-2LS.

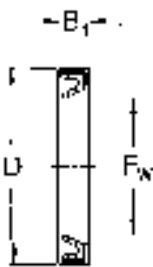
LEBS ..

Tandem shaft blocks suitable for LQBR and LTDR



Designations	Dimensions					
	D _a	A	H _A ±0,01	H ₁	L	L ₁
mm						
LEBS 12 A	12	15	17	30	80	40
LEBS 16 A	16	15	19,5	35	96	52
LEBS 20 A	20	18	22	40	115	63
LEBS 25 A	25	20	27	50	136	75
LEBS 30 A	30	20	31	56	146	80
LEBS 40 A	40	25	38	70	184	97
LEBS 50 A	50	30	43	80	210	107

Appropriate special seals



Designations	Dimensions		
	F _w	D	B ₁
mm			
SP-6×12×2	6	22	2
SP-8×15×3	8	15	3
SP-10×17×3	10	17	3
SP-12×19×3	12	19	3
SP-14×21×3	14	21	3
SP-16×24×3	16	24	3
SP-20×28×4	20	28	4
SP-25×35×4	25	35	4
SP-30×40×4	30	40	4
SP-40×52×5	40	52	5
SP-50×62×5	50	62	5

2 Linear guides

Shaft guidings – standard series

Ordering key

Type

Bearing, units, shaft blocks:

Linear plain bearing
Linear ball bearing
Single unit
Flanged unit
Tandem unit
Quadro unit
Shaft block
Tandem shaft block
Shaft support

P
B
U
V
T
Q
S
E
R

Design (for seals on side see table at end page):

For P { Closed design (5 - 80)
Open design (12 - 80)
For B* { Self-aligning, closed design (12 - 50)
Self-aligning, open design (12 - 50)
Closed design (5 - 80)
Open design (12 - 80)
Heavy load, open design (20 - 50)
For U { Self-aligning, closed design, relubricatable (12 - 50)
Self-aligning, radial adjustable, slotted design, relubricatable (12 - 50)
Self-aligning, clearance adjustable, open design, relubricatable (12 - 50)
Closed design, (relubricatable) (8 - 80)
Clearance adjustable, closed design, relubricatable (8 - 80)
Clearance adjustable, open design, relubricatable (12 - 80)
Self-aligning, clearance adjustable, closed design, relubricatable (12 - 50)
Self-aligning, clearance adjustable, slotted design, relubricatable (12 - 50)
Self-aligning, clearance adjustable, open design, relubricatable (12 - 50)

AR
AT
CD
CF
CR
CT
HT
CD
CE
CF
CR
CS
CT
ND
NE
NF

Nominal diameter:

Ø in mm

New bearing series* (for linear ball bearings only)

A

Option(s):

Without seals
One side sealed
Both sides sealed
For B* { Without seals, corrosion resistant (for linear ball bearings only)
One side sealed, corrosion resistant (for linear ball bearings only)
Both sides sealed, corrosion resistant (for linear ball bearings only)

no sign
-LS
-2LS
/HV6
-LS/HV6
-2LS/HV6

Other option:

Only valid for LUCR, LUCT:
With plain bearing, without seals
Only valid for LUCT:
With heavy-load bearing, without seals
With heavy-load bearing, both sides sealed
Only valid for LEAS:
Tandem shaft block, high shaft position
Tandem shaft block, low shaft position

PA
BH
BH-2LS
A
B

Lubrication option:

only preservative, no pre-lubrication (Ø 6 - 50)

/VT808

Example: **L** **U** **C** **T** **30** **BH-2LS**

Seals on ... side(s)	LPAR	LPAT	LBCD	LBCF	LBCR	LBCT	LBHT	LUCD	LUCE	LUCF	LUCR	LUCS	LUCT	LUND	LUNE	LUNF
No	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
One	–	–	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Both	–	–	×	×	×	×	×	×	×	×	×	×	×	×	×	×
Other options	–	–	–	–	–	–	–	–	–	–	PA	–	BH or PA	–	–	–

Ordering key (Continued)

Type	L						
Bearing, units, shaft blocks:							
Linear plain bearing	P						
Linear ball bearing	B						
Single unit	U						
Flanged unit	V						
Tandem unit	T						
Quadro unit	Q						
Shaft block	S						
Tandem shaft block	E						
Shaft support	R						
Design (for seals on side see table at end page):							
For V { Self-aligning, closed design (12 - 50)						CD	
For V { Closed design (12 - 80)						CR	
For T { Self-aligning, closed design, relubricatable (12 - 50)						CD	
For T { Self-aligning, open design, relubricatable (12 - 50)						CF	
For T { Closed design, relubricatable (12 - 50)						CR	
For T { Open design, relubricatable (12 - 50)						CT	
For Q { Self-aligning, closed design, relubricatable (12 - 50)						CD	
For Q { Self-aligning, open design, relubricatable (12 - 50)						CF	
For Q { Closed design, relubricatable (8 - 50)						CR	
For Q { Open design, relubricatable (12 - 50)						CT	
For S (8 - 80)						CS	
For S (12 - 50)						NS	
For E (8 - 50)						AS	
For R { Without bore holes (12 - 80)						CB	
For R { With bore holes (12 - 80)						CC	
Nominal diameter:							
Ø in mm							
Option(s):							
Without seals						no sign	
One side sealed						-LS	
Both sides sealed						-2LS	
Other option:							
Only valid for LUCR, LUCT:							
With plain bearing, without seals						PA	
Only valid for LUCT:							
With heavy-load bearing, without seals						BH	
With heavy-load bearing, both sides sealed						BH-2LS	
Only valid for LEAS:							
Tandem shaft block, high shaft position						A	
Tandem shaft block, low shaft position						B	
Lubrication option:							
only preservative, no pre-lubrication (Ø 6 - 50)							/VT808

Example: **L** **Q** **C** **R** **16** **-2LS**

Seals on ... side(s)	LVCD	LVCR	LTCD	LTCF	LTCR	LTCT	LQCD	LQCF	LQCR	LQCT	LSCS	LSNS	LEAS	LRCB	LRCC	LUNF
No	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×	×
One	×	×	×	×	×	×	×	×	×	×	-	-	-	-	-	×
Both	×	×	×	×	×	×	×	×	×	×	-	-	-	-	-	×
Other options	-	-	-	-	-	-	-	-	-	-	-	-	B or A	-	-	-

2 Linear guides

Shaft guidings – standard series, closed types

LBCD ..

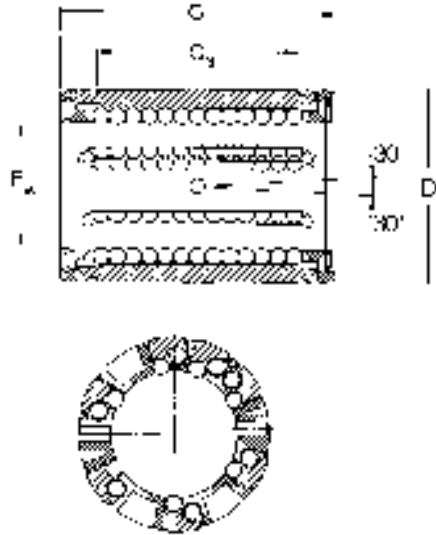
Standard series 3

Linear ball bearings self-aligning, closed type

LBCD ..A (without seals)

-LS with one seal

-2LS with two seals



Designations	Dimensions				Basic load ratings	
	F _w	D	C	C ₃	dynamic C	static C ₀
	mm				N	
LBCD 12 A	12	22	32	20	1 080	815
LBCD 16 A	16	26	36	22	1 320	865
LBCD 20 A	20	32	45	28	2 000	1 370
LBCD 25 A	25	40	58	40	2 900	2 040
LBCD 30 A	30	47	68	48	4 650	3 250
LBCD 40 A	40	62	80	56	7 800	5 200
LBCD 50 A	50	75	100	72	11 200	6 950
Example: LBCD 25 A LBCD 16 A-LS LBCD 40 A-2LS						

LBCR ..

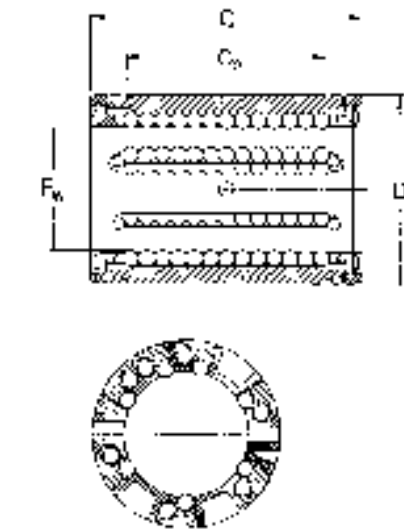
Standard series 3

Linear ball bearings, closed type

LBCR .. A (without seals)

-LS with one seal

-2LS with two seals



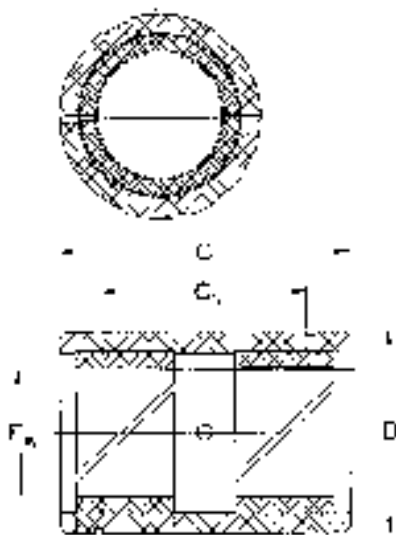
Designations	Dimensions				Basic load ratings	
	F _w	D	C	C ₃	dynamic C	static C ₀
	mm				N	
LBCR 5 A	5	22	22	12	280	210
LBCR 8 A	8	16	25	14	490	355
LBCR 12 A	12	22	32	20	1 160	980
LBCR 16 A	16	26	36	22	1 500	1 290
LBCR 20 A	20	32	45	28	2 240	2 040
LBCR 25 A	25	40	58	40	3 350	3 350
LBCR 30 A	30	47	68	48	5 600	5 700
LBCR 40 A	40	62	80	56	9 000	8 150
LBCR 50 A	50	75	100	72	13 400	12 200
LBCR 60 A	60	90	125	95	20 400	18 000
LBCR 80 A	80	120	165	125	37 500	32 000
Example: LBCR 30 A LBCR 80 A-LS LBCR 60 A-2LS						

N.B.:

All LBC.. A and LBH .. A Linear ball bearings available in corrosion resistant!

LPAR ..

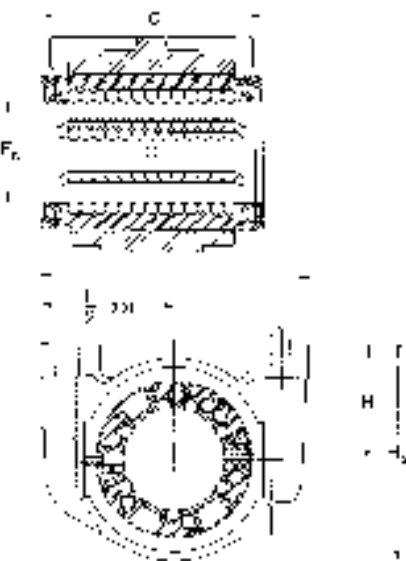
Linear plain bearings without seals, closed type



Designations	Dimensions				Basic load ratings		static C ₀
	F _w	D	C	C ₃	C 0,1 m/s	C 4 m/s	
	mm				N		
LPAR 5	5	22	22	12	280	7	980
LPAR 8	8	16	25	14	510	13	1 800
LPAR 12	12	22	32	20	965	24	3 350
LPAR 16	16	26	36	22	1 530	38	5 400
LPAR 20	20	32	45	28	2 400	60	8 300
LPAR 25	25	40	58	40	4 000	100	14 000
LPAR 30	30	47	68	48	5 500	137	19 300
LPAR 40	40	62	80	56	8 000	200	28 000
LPAR 50	50	75	100	72	12 000	300	41 500
LPAR 60	60	90	125	95	16 600	415	60 000
LPAR 80	80	120	165	125	290 000	720	100 000

LUCD ..

Single units, self-aligning, closed type,
relubricatable
LUCD (without seals)
-2LS with two seals



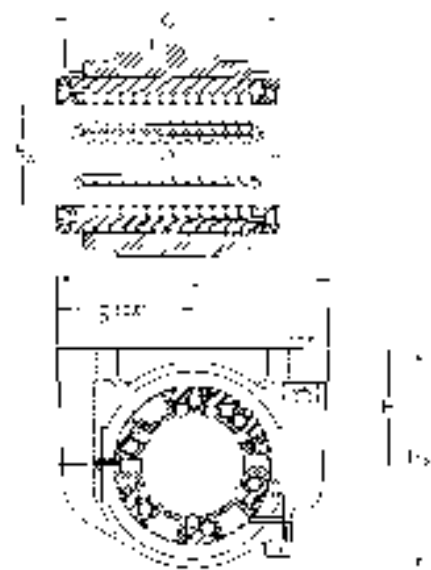
Designations	Dimensions					Basic load ratings	
	F _w	C	H ±0,01	H ₂	L	C dynamic	C ₀ static
	mm					N	
LUCD 12	12	32	18	34.5	52	1 080	815
LUCD 16	16	36	22	40.5	56	1 320	865
LUCD 20	20	45	25	48	70	2 000	1 370
LUCD 25	25	58	30	58	80	2 900	2 040
LUCD 30	30	68	35	67	88	4 650	3 250
LUCD 40	40	80	45	85	108	7 800	5 200
LUCD 50	50	100	50	99	135	11 200	6 950
Example: LUCD 40 LUCD 12-2LS							

2 Linear guides

Shaft guidings – standard series, closed types

LUCE ..

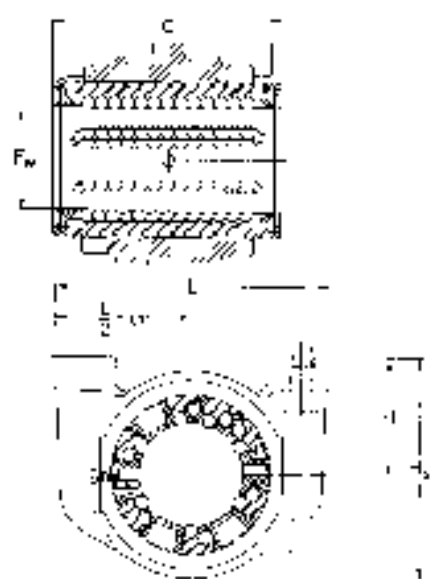
Single units, self-aligning, clearance adjustable, closed type, relubricatable
LUCE (without seals)
-2LS with two seals



Designations	Dimensions					Basic load ratings	
	F _w	C	H ±0,01	H ₂	L	dynamic C	static C ₀
mm						N	
LUCE 12	12	32	18	34,5	52	1 080	815
LUCE 16	16	36	22	40,5	56	1 320	865
LUCE 20	20	45	25	48	70	2 000	1 370
LUCE 25	25	58	30	58	80	2 900	2 040
LUCE 30	30	68	35	67	88	4 650	3 250
LUCE 40	40	80	45	85	108	7 800	5 200
LUCE 50	50	100	50	99	135	11 200	6 950
Example: LUCE 25 LUCE 50-2LS							

LUCR ..

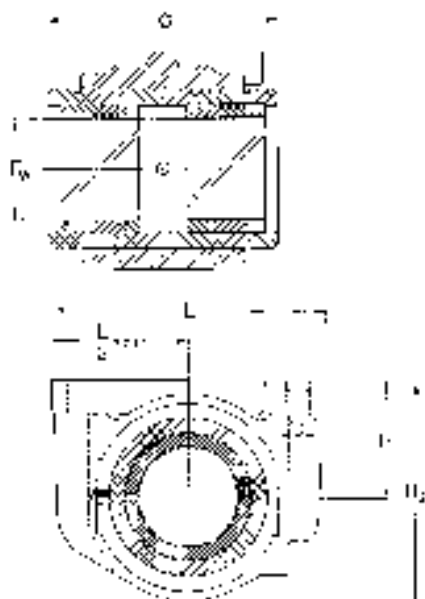
Single units, closed type, relubricatable
LUCR (without seals)
-2LS with two seals



Designations	Dimensions					Basic load ratings	
	F _w	C	H ±0,01	H ₂	L	dynamic C	static C ₀
mm						N	
LUCR 8*	8	25	15	28	45	365	285
LUCR 12	12	32	18	34,5	52	1 080	815
LUCR 16	16	36	22	40,5	56	1 320	865
LUCR 20	20	45	25	48	70	2 000	1 370
LUCR 25	25	58	30	58	80	2 900	2 040
LUCR 30	30	68	35	67	88	4 650	3 250
LUCR 40	40	80	45	85	108	7 800	5 200
LUCR 50	50	100	50	99	135	11 200	6 950
LUCR 60	60	125	60	118	560	20 400	18 000
LUCR 80	80	165	80	158	205	37 500	32 000
Example: LUCR 80 LUCR 8-2LS							
* Linear ball bearings fitted to these units are secured with snap rings according to DIN 471 and cannot be relubricated.							

LUCR .. PA

Single plain bearing units without seals, closed type

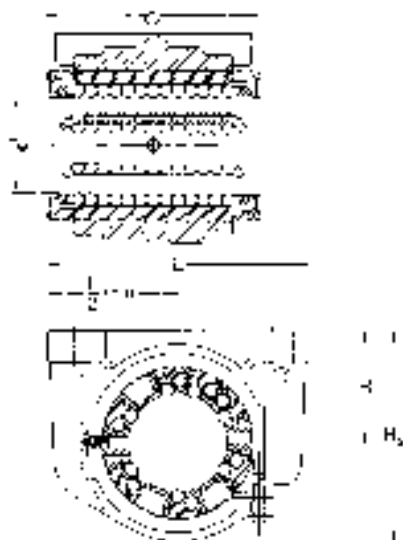


Designations	Dimensions					Basic load ratings		static C ₀
	F _w	C	H ±0,01	H ₂	L	dynamic C 0,1 m/s	C 4 m/s	
	mm					N		
LUCR 8 PA	8	25	15	28	45	510	13	1 800
LUCR 12 PA	12	32	18	34,5	52	965	24	3 350
LUCR 16 PA	16	36	22	40,5	56	1 530	38	5 400
LUCR 20 PA	20	45	25	48	70	2 400	60	8 300
LUCR 25 PA	25	58	30	58	80	4 000	100	14 000
LUCR 30 PA	30	68	35	67	88	5 500	137	19 300
LUCR 40 PA	40	80	45	85	108	8 000	200	28 000
LUCR 50 PA	50	100	50	99	135	12 000	300	41 500
LUCR 60 PA	60	125	60	118	160	16 600	415	60 000
LUCR 80 PA	80	165	80	158	205	29 000	720	100 000

Delivery time on request

LUCS ..

Single units, clearance adjustable, closed type, relubricatable
LUCS (without seals)
-2LS with two seals



Designations	Dimensions					Basic load ratings		static C ₀
	F _w	C	H ±0,01	H ₂	L	dynamic C	C 4 m/s	
	mm					N		
LUCS 8*	8	25	15	28	45	490		355
LUCS 12	12	32	18	34,5	52	1 160		980
LUCS 16	16	36	22	40,5	56	1 500		1 290
LUCS 20	20	45	25	48	70	2 240		2 040
LUCS 25	25	58	30	58	80	3 350		3 350
LUCS 30	30	68	35	67	88	5 600		5 700
LUCS 40	40	80	45	85	108	9 000		8 150
LUCS 50	50	100	50	99	135	13 400		12 200
LUCS 60	60	125	60	118	160	20 400		18 000
LUCS 80	80	165	80	158	205	37 500		32 000

Example:
LUCS 50
LUCS 60-2LS

* Linear ball bearings fitted to these units are secured with snap rings according to DIN 471 and cannot be relubricated.

2 Linear guides

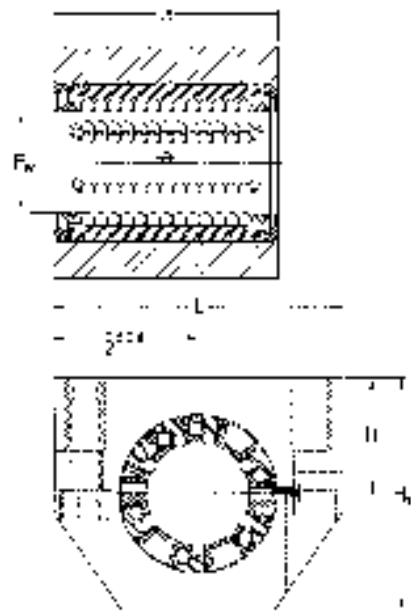
Shaft guidings – standard series, closed types

LUND ..

Single units, self-aligning, closed type, relubricatable

LUND (without seals)

-2LS with two seals



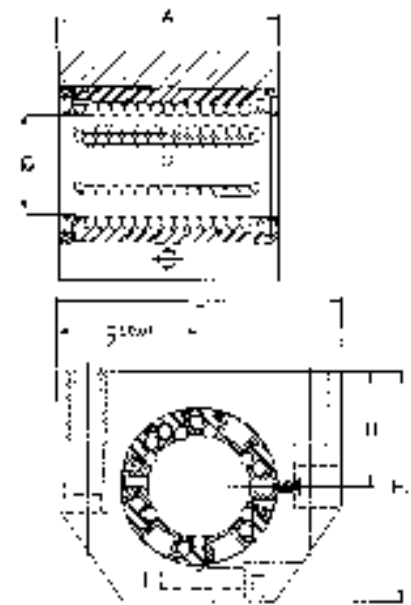
Designations	Dimensions					Basic load ratings	
	F _w	A	H ±0,01	H ₁	L	dynamic C	static C ₀
mm						N	
LUND 12	12	32	18	35	43	1 080	815
LUND 16	16	37	22	42	53	1 320	865
LUND 20	20	45	25	50	60	2 000	1 370
LUND 25	25	58	30	61	78	2 900	2 040
LUND 30	30	68	35	70	87	4 650	3 250
LUND 40	40	80	45	90	108	7 800	5 200
LUND 50	50	100	50	105	132	11 200	6 950
Example: LUND 12 LUND 30-2LS							

LUNE ..

Single units, self-aligning, clearance adjustable, closed type, relubricatable

LUNE (without seals)

-2LS with two seals



Designations	Dimensions					Basic load ratings	
	F _w	A	H ±0,01	H ₁	L	dynamic C	static C ₀
mm						N	
LUNE 12	12	32	18	35	43	1 080	815
LUNE 16	16	37	22	42	53	1 320	865
LUNE 20	20	45	25	50	60	2 000	1 370
LUNE 25	25	58	30	61	78	2 900	2 040
LUNE 30	30	68	35	70	87	4 650	3 250
LUNE 40	40	80	45	90	108	7 800	5 200
LUNE 50	50	100	50	105	132	11 200	6 950
Example: LUNE 40 LUNE 16-2LS							

LVCD ..

Flanged self-aligning units
LVCD (without seals)
-2LS with two seals



Designations	Dimensions					Basic load ratings	
	F _w	A	C	L	D ₂	dynamic	static
	mm					C	C ₀
						N	
LVCD 12	12	20	32	42	32	1 080	815
LVCD 16	16	22	36	50	38	1 320	865
LVCD 20	20	28	45	60	46	2 000	1 370
LVCD 25	25	40	58	74	58	2 900	2 040
LVCD 30	30	48	68	84	66	4 650	3 250
LVCD 40	40	56	80	108	90	7 800	5 200
LVCD 50	50	72	100	130	110	11 200	6 950
Example: LVCD 12 LVCD 30-2LS							

LVCR ..

Flanged units
LVCR (without seals)
-2LS with two seals



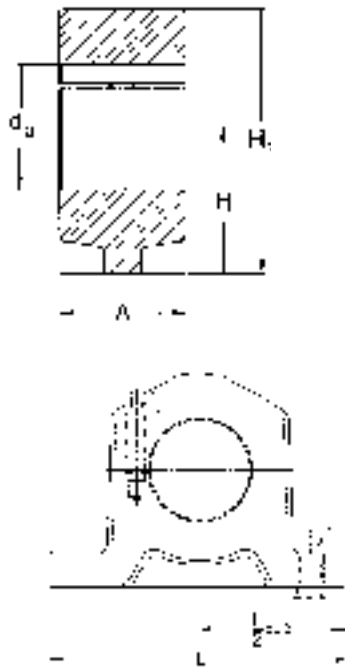
Designations	Dimensions					Basic load ratings	
	F _w	A	C	L	D ₂	dynamic	static
	mm					C	C ₀
						N	
LVCR 12	12	20	32	42	32	1 160	980
LVCR 16	16	22	36	50	38	1 500	1 290
LVCR 20	20	28	45	60	46	2 240	2 040
LVCR 25	25	40	58	74	58	3 350	3 350
LVCR 30	30	48	68	84	66	5 600	5 700
LVCR 40	40	56	80	108	90	9 000	8 150
LVCR 50	50	72	100	130	110	13 400	12 200
LVCR 60	60	95	125	160	135	20 400	18 000
LVCR 80	80	125	165	200	180	37 500	32 000
Example: LVCR 20 LVCR 60-2LS							
Delivery time on request							

2 Linear guides

Shaft guidings – standard series, closed types

LSCS ..

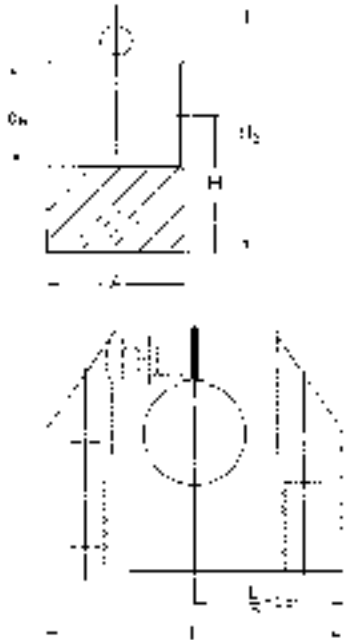
Shaft blocks



Designations	Dimensions				
	F _w	A	H ±0,01	H ₂	L
mm					
LSCS 8	8	10	15	25	45
LSCS 12	12	12	20	32,5	52
LSCS 16	16	15	20	35,5	56
LSCS 20	20	20	25	43,5	70
LSCS 25	25	28	30	53	80
LSCS 30	30	30	35	63	88
LSCS 40	40	36	45	81	108
LSCS 50	50	49	50	92,5	135
LSCS 60	60	62	60	112	160
LSCS 80	80	85	80	147,5	205

LSNS ..

Shaft blocks



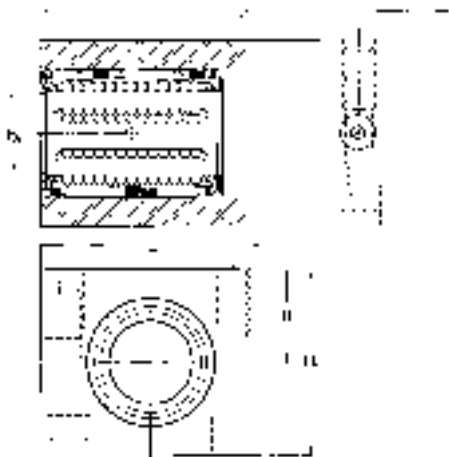
Designations	Dimensions				
	F _w	A	H ±0,01	H ₂	L
mm					
LSNS 12	12	20	20	35	43
LSNS 16	16	24	25	42	53
LSNS 20	20	30	30	50	60
LSNS 25	25	38	35	61	78
LSNS 30	30	40	40	70	87
LSNS 40	40	48	50	90	108
LSNS 50	50	58	60	105	132

LTCD ..

Tandem units, self-aligning, closed type, relubricatable

LTCD (without seals)

-2LS with two seals



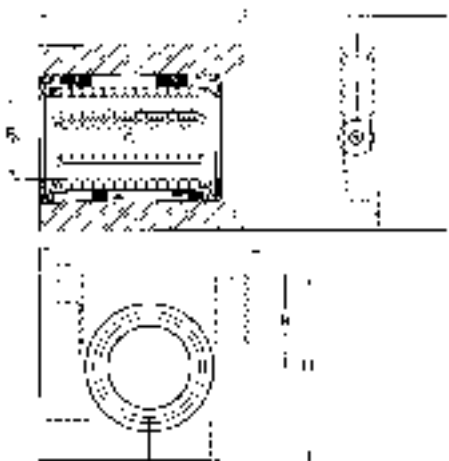
Designations	Dimensions					Basic load ratings	
	F_w	A	H $\pm 0,01$	H_1	L	dynamic C	static C_0
	mm					N	
LTCD 12	12	76	18	35	42	1 760	1 630
LTCD 16	16	84	22	41,5	50	2 160	1 730
LTCD 20	20	104	25	49,5	60	3 200	2 750
LTCD 25	25	130	30	59,5	74	4 750	4 150
LTCD 30	30	152	35	69,5	84	7 500	6 550
LTCD 40	40	176	45	89,5	108	12 700	10 400
LTCD 50	50	224	50	99,5	130	18 300	14 000
Example: LTCD 30 LTCD 12-2LS							

LTCR ..

Tandem units, closed type, relubricatable

LTCR (without seals)

-2LS with two seals



Designations	Dimensions					Basic load ratings	
	F_w	A	H $\pm 0,01$	H_1	L	dynamic C	static C_0
	mm					N	
LTCR 12	12	76	18	35	42	1 900	1 960
LTCR 16	16	84	22	41,5	50	2 450	2 600
LTCR 20	20	104	25	49,5	60	3 650	4 150
LTCR 25	25	130	30	59,5	74	5 500	6 700
LTCR 30	30	152	35	69,5	84	9 150	11 400
LTCR 40	40	176	45	89,5	108	15 000	16 300
LTCR 50	50	224	50	99,5	130	22 000	24 500
Example: LTCR 50 LTCR 20-2LS							

2 Linear guides

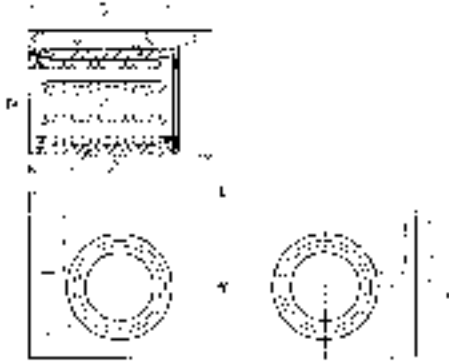
Shaft guidings – standard series, closed types

LQCD ..

Quadro units, self-aligning, closed type, relubricatable

LQCD (without seals)

-2LS with four seals



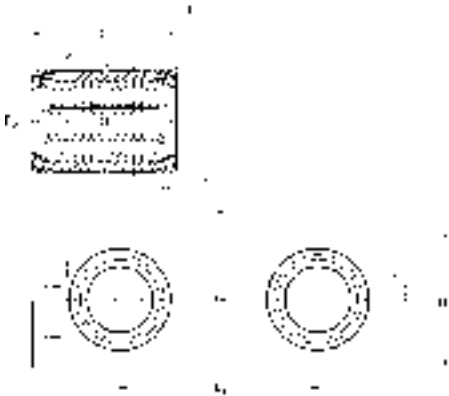
Designations	Dimensions					Basic load ratings	
	F _w	A	H ±0,01	H ₁	L	dynamic C 0,1 m/s	static C ₀
	mm					N	
LQCD 12	12	32	16	32	85	2 850	3 250
LQCD 16	16	36	18	36	100	3 450	3 450
LQCD 20	20	45	23	46	130	5 200	5 500
LQCD 25	25	58	28	56	160	7 650	8 150
LQCD 30	30	68	32	64	180	12 200	12 900
LQCD 40	40	80	40	80	230	20 800	20 800
LQCD 50	50	100	48	96	280	30 000	28 000
Example: LQCD 40 LQCD 16-2LS							

LQCR ..

Quadro units, closed type, relubricatable

LQCR (without seals)

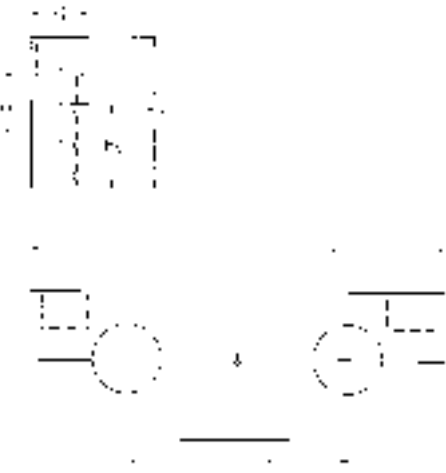
-2LS with four seals



Designations	Dimensions						Basic load ratings	
	F _w	C	H ±0,01	H ₁	L	L ₁	dynamic C	static C ₀
	mm						N	
LQCR 8	8	25	11,5	23	65	32	1 290	1 420
LQCR 12	12	32	16	32	85	42	3 100	4 000
LQCR 16	16	36	18	36	100	54	4 000	5 200
LQCR 20	20	45	23	46	130	72	6 000	8 300
LQCR 25	25	58	28	56	160	88	9 000	13 400
LQCR 30	30	68	32	64	180	96	14 800	22 800
LQCR 40	40	80	40	80	230	122	23 800	32 600
LQCR 50	50	100	48	96	280	152	35 400	48 800
Example: LQCR 25 LQCR 12-2LS								

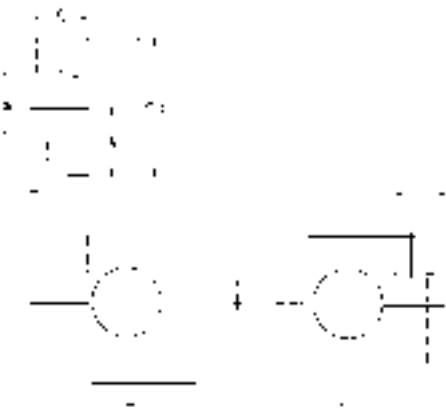
LEAS ..

Tandem shaft blocks, closed type, suitable for LQCD / LQCR
LEAS .. A high shaft position



Designations	Dimensions for types A and B				for type A		for type B	
	d _a	A	L	L ₁	H _A ±0,015	H _{1A}	H _B ±0,015	H _{1B}
	mm				N			
LEAS 8	8	12	65	32	12,5	23	11	22
LEAS 12	12	15	85	42	18	32	14	28
LEAS 16	16	18	100	54	20	37	17	34
LEAS 20	20	20	130	72	25	46	21	42
LEAS 25	25	25	160	88	30	56	26	52
LEAS 30	30	25	180	96	35	64	29	58
LEAS 40	40	30	230	122	44	80	36	72
LEAS 50	50	30	280	152	52	96	44	88
Example: LEAS 50 A LEAS 30 B								

LEAS .. B low shaft position



2 Linear guides

Shaft guidings – standard series, open types

LBCF ..

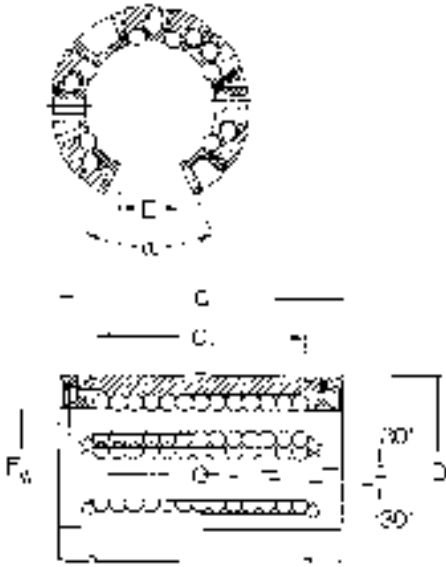
Standard series 3

Linear ball bearings, self-aligning, open type

LBCF..A (without seals)

-LS with one seal

-2LS with two seals



Designations	Dimensions						Basic load ratings	
	F _w	D	C	C ₃	E	α	dynamic C	static C ₀
	mm						deg. N	
LBCF 12 A	12	22	32	20	7,6	78	1 080	815
LBCF 16 A	16	26	36	22	10,4	78	1 320	865
LBCF 20 A	20	32	45	28	10,8	60	2 000	1 370
LBCF 25 A	25	40	58	40	13,2	60	2 900	2 040
LBCF 30 A	30	47	68	48	14,2	50	4 650	3 250
LBCF 40 A	40	62	80	56	18,7	50	7 800	5 200
LBCF 50 A	50	75	100	72	23,6	50	11 200	6 950

Example:
LBCF40 A
LBCF 25 A-LS
LBCF 16 A-2LS

LBCT ..

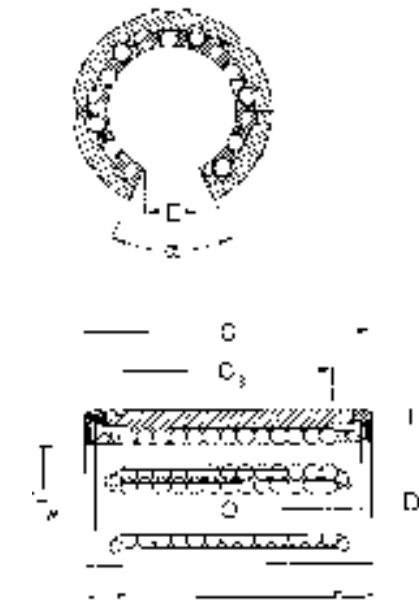
Standard series 3

Linear ball bearings, open type

LBCT.. A (without seals)

-LS with one seal

-2LS with two seals



Designations	Dimensions						Basic load ratings	
	F _w	D	C	C ₃	E	α	dynamic C	static C ₀
	mm						deg. N	
LBCT 12 A	12	22	32	20	7,6	78	1 160	980
LBCT 16 A	16	26	36	22	10,4	78	1 500	1 290
LBCT 20 A	20	32	45	28	10,8	60	2 240	2 040
LBCT 25 A	25	40	58	40	13,2	60	3 350	3 350
LBCT 30 A	30	47	68	48	14,2	50	5 600	5 700
LBCT 40 A	40	62	80	56	18,7	50	9 000	8 150
LBCT 50 A	50	75	100	72	23,6	50	13 400	12 220
LBCT 60 A	60	90	125	95	29,6	54	20 400	18 000
LBCT 80 A	80	120	165	125	38,4	54	37 500	32 000

Example:
LBCT 20 A
LBCT 80 A-LS
LBCT 50 A-2LS

N.B.:

All LBC.. A and LBH .. A Linear ball bearings available in corrosion resistant!

LBHT ..

Standard series 3

Heavy-load linear ball bearings, open type

LBHT.. A (without seals)

-LS with one seal

-2LS with two seals

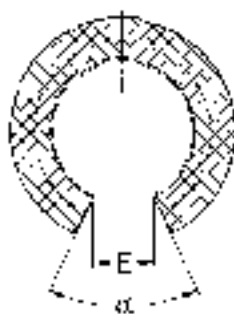


Designations	Dimensions						Basic load ratings	
	F _w	D	C	C ₃	E	α	dynamic	static
	mm					deg.	N	
LBHT 20 A	20	32	45	28	10,8	60	2 650	2 650
LBHT 25 A	25	40	58	40	13,2	60	4 900	5 100
LBHT 30 A	30	47	68	48	14,2	50	7 200	8 000
LBHT 40 A	40	62	80	56	18,7	50	11 600	11 400
LBHT 50 A	50	75	100	72	23,6	50	17 300	17 000
Example: LBHT 40 A LBHT 25 A-LS LBHT 20 A-2LS								

LPAT ..

Linear plain bearings, without seals, open

design



Designations	Dimensions						Basic load ratings	
	F _w	D	C	C ₃	E	α	dynamic	static
	mm						C 0,1 m/s	C 4 m/s
	mm						N	
LPAT 12	12	22	32	20	7,6	78	965	24
LPAT 16	16	26	36	22	10,4	78	1 530	38
LPAT 20	20	32	45	28	10,8	60	2 400	60
LPAT 25	25	40	58	40	13,2	60	4 000	100
LPAT 30	30	47	68	48	14,2	50	5 500	137
LPAT 40	40	62	80	56	18,7	50	8 000	200
LPAT 50	50	75	100	72	23,6	50	12 000	300
LPAT 60	60	90	125	95	29,6	54	16 600	415
LPAT 80	80	120	165	125	38,4	54	29 000	720

N.B.:

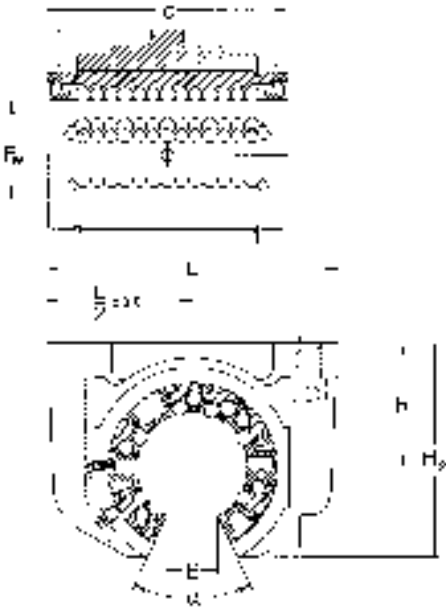
All LBC.. A and LBH .. A Linear ball bearings available in corrosion resistant!

2 Linear guides

Shaft guidings – standard series, open types

LUCF ..

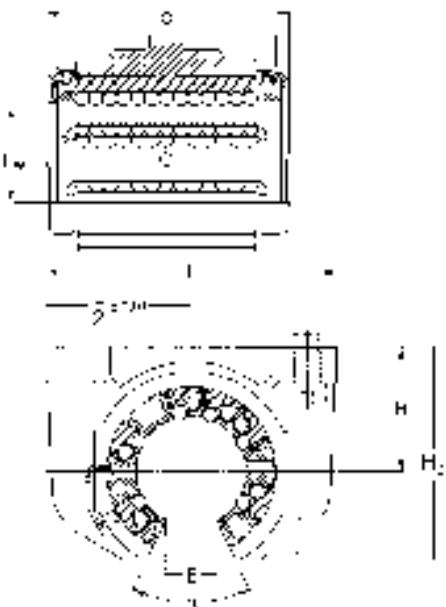
Single units, self-aligning, clearance adjustable, open type, relubricatable
LUCF (without seals)
-2LS with two seals



Designations	Dimensions							Basic load ratings	
	F _w	C	H ±0,01	H ₂	L	E	α	dynamic C	static C ₀
	mm						deg.	N	
LUCF 12	12	32	18	28	52	7,6	78	1 080	815
LUCF 16	16	36	22	35	56	10,4	78	1 320	865
LUCF 20	20	45	25	42	70	10,8	60	2 000	1 370
LUCF 25	25	58	30	51	80	13,2	60	2 900	2 040
LUCF 30	30	68	35	60	88	14,2	50	4 650	3 250
LUCF 40	40	80	45	77	108	18,7	50	7 800	5 200
LUCF 50	50	100	50	88	135	23,6	50	11 200	6 950
Example: LUCF 16 LUCF 30-2LS									

LUCT ..

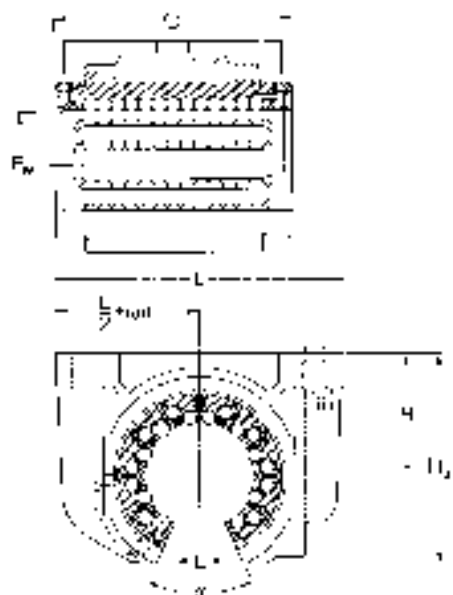
Single units, clearance adjustable, open type, relubricatable
LUCT (without seals)
-2LS with two seals



Designations	Dimensions							Basic load ratings	
	F _w	C	H ±0,01	H ₂	L	E	α	dynamic C	static C ₀
	mm						deg.	N	
LUCT 12	12	32	18	28	52	7,6	78	1 160	980
LUCT 16	16	36	22	35	56	10,4	78	1 500	1 290
LUCT 20	20	45	25	42	70	10,8	60	2 240	2 040
LUCT 25	25	58	30	51	80	13,2	60	3 350	3 350
LUCT 30	30	68	35	60	88	14,2	50	5 600	5 700
LUCT 40	40	80	45	77	108	18,7	50	9 000	8 150
LUCT 50	50	100	50	88	135	23,6	50	13 400	12 220
LUCT 60	60	125	60	105	160	29,6	54	20 400	18 000
LUCT 80	80	165	80	140	205	38,4	54	37 500	32 000
Example: LUCT 60 LUCT 80-2LS									

LUCT .. BH

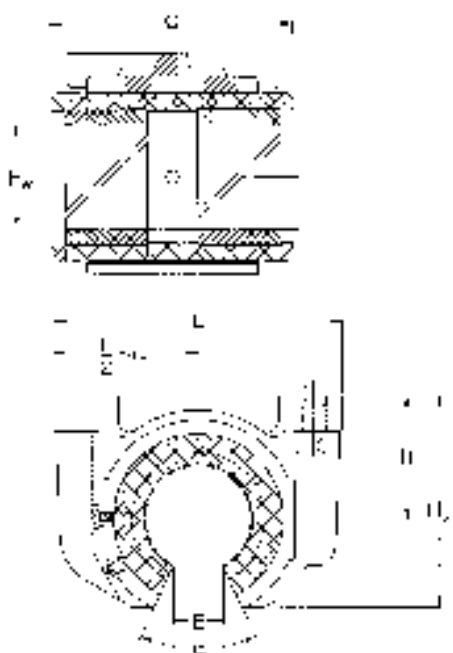
Single heavy load units, clearance adjustable, open type, relubricatable
LUCT.. BH (without seals)
-2LS with two seals



Designations	Dimensions							Basic load ratings	
	F _w	C	H ±0,01	H ₂	L	E	α	dynamic C	static C ₀
	mm						deg.	N	
LUCT 20 BH	20	45	25	42	70	10,8	60	2 650	2 650
LUCT 25 BH	25	58	30	51	80	13,2	60	4 900	5 100
LUCT 30 BH	30	68	35	60	88	14,2	50	7 200	8 000
LUCT 40 BH	40	80	45	77	108	18,7	50	11 600	11 400
LUCT 50 BH	50	100	50	88	135	23,6	50	17 300	17 000
Example: LUCT BH 30 LUCT BH 20-2LS									

LUCT .. PA

Single units without seals, open type



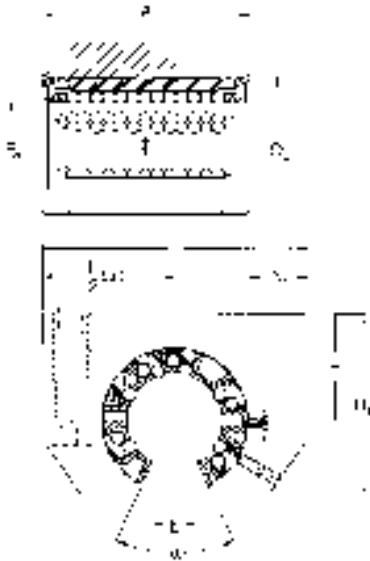
Designations	Dimensions							Basic load ratings		
	F _w	C	H	H ₂	L	E	α	dynamic C 0,1 m/s	C 4 m/s	static C ₀
	mm						deg.	N		
LUCT 12 PA	12	32	18	28	52	7,6	78	965	24	3 350
LUCT 16 PA	16	36	22	35	56	10,4	78	1 530	38	5 400
LUCT 20 PA	20	45	25	42	70	10,8	60	2 400	60	8 300
LUCT 25 PA	25	58	30	51	80	13,2	60	4 000	100	14 000
LUCT 30 PA	30	68	35	60	88	14,2	50	5 500	137	19 300
LUCT 40 PA	40	80	45	77	108	18,7	50	8 000	200	28 000
LUCT 50 PA	50	100	50	88	135	23,6	50	12 000	300	41 500
LUCT 60 PA	60	125	60	105	160	29,6	54	16 600	415	60 000
LUCT 80 PA	80	165	80	140	205	38,4	54	29 000	720	100 000

2 Linear guides

Shaft guidings – standard series, open types

LUNF ..

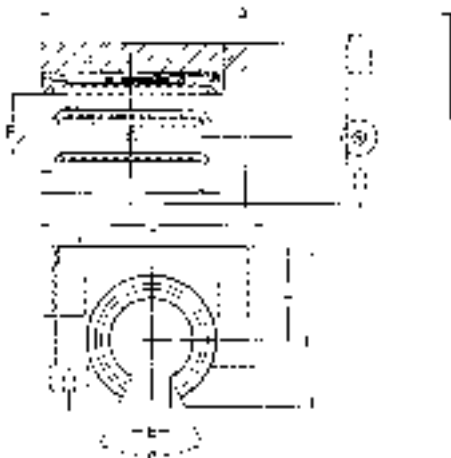
Single units, self-aligning, clearance adjustable, open type, relubricatable
LUNF (without seals)
-2LS with two seals



Designations	Dimensions							Basic load ratings	
	F _w	A	H ±0,01	H ₁	L	E	α	dynamic C	static C ₀
	mm						deg.	N	
LUNF 12	12	32	18	28	43	7,6	78	1 080	815
LUNF 16	16	37	22	35	53	10,4	78	1 320	865
LUNF 20	20	45	25	42	60	10,8	60	2 000	1 370
LUNF 25	25	58	30	51	78	13,2	60	2 900	2 040
LUNF 30	30	68	35	60	87	14,2	50	4 650	3 250
LUNF 40	40	80	45	77	108	18,7	50	7 800	5 200
LUNF 50	50	100	50	88	132	23,6	50	11 200	6 950
Example: LUNF 20 LUNF 16-2LS									

LTCF ..

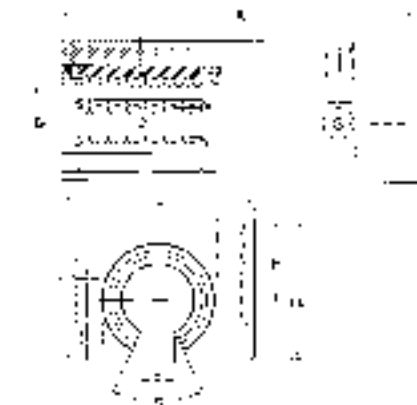
Tandem units, self-aligning, open type, relubricatable
LTCF (without seals)
-2LS with two seals



Designations	Dimensions							Basic load ratings	
	F _w	A	H ±0,01	H ₁	L	E	α	dynamic C	static C ₀
	mm						deg.	N	
LTCF 12	12	76	18	29	42	7,6	78	1 760	1 630
LTCF 16	16	84	22	35	50	10,4	78	2 160	1 730
LTCF 20	20	104	25	42	60	10,8	60	3 200	2 750
LTCF 25	25	130	30	51	74	13,2	60	4 750	4 150
LTCF 30	30	152	35	60	84	14,2	50	7 500	6 550
LTCF 40	40	176	45	77	108	18,7	50	12 700	10 400
LTCF 50	50	224	50	88	130	23,6	50	18 300	14 000
Example: LTCF 50 LTCF 12-2LS									

LTCT ..

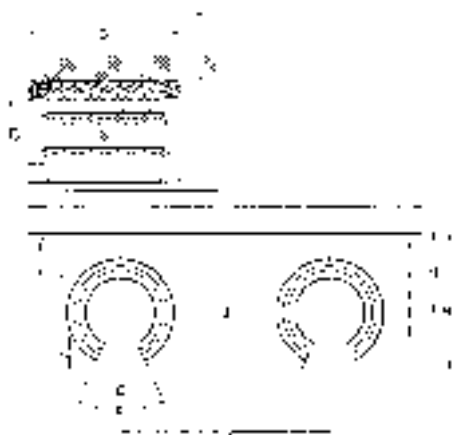
Tandem units, open type, relubricatable
LTCT (without seals)
-2LS with two seals



Designations	Dimensions							Basic load ratings	
	F _w	A	H	H ₁	L	E	α	dynamic	static
	mm						deg.	C	C ₀
LTCT 12	12	76	18	29	42	7,6	78	1 900	1 960
LTCT 16	16	84	22	35	50	10,4	78	2 450	2 600
LTCT 20	20	104	25	42	60	10,8	60	3 650	4 150
LTCT 25	25	130	30	51	74	13,2	60	5 500	6 700
LTCT 30	30	152	35	60	84	14,2	50	9 150	11 400
LTCT 40	40	176	45	77	108	18,7	50	15 000	16 300
LTCT 50	50	224	50	88	130	23,6	50	22 000	24 500
Example: LTCT 16 LTCT 30-2LS									

LQCF ..

Quadro units, self-aligning, open type,
relubricatable
LQCF (without seals)
-2LS with four seals



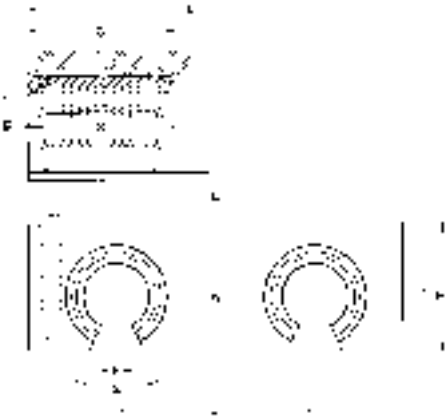
Designations	Dimensions								Basic load ratings	
	F _w	C	H ±0,01	H ₁	L	L ₁	E	α	dynamic	static
									C	C ₀
	mm							deg.	N	
LQCF 12	12	32	18	30	85	42	7,6	78	2 850	3 250
LQCF 16	16	36	22	35	100	54	10,4	78	3 450	3 450
LQCF 20	20	45	25	42	130	72	10,8	60	5 200	5 500
LQCF 25	25	58	30	51	160	88	13,2	60	7 650	8 150
LQCF 30	30	68	35	60	180	96	14,2	50	12 200	12 900
LQCF 40	40	80	45	77	230	122	18,7	50	20 800	20 800
Example: LQCF 12 LQCF 40-2LS										

2 Linear guides

Shaft guidings – standard series, open types

LQCT ..

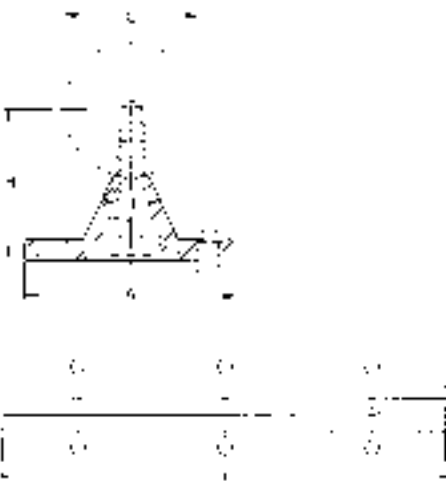
Quadro units, open type, relubricatable
LQCT (without seals)
-2LS with four seals



Designations	Dimensions								Basic load ratings	
	F _w	C	H ±0,01	H ₁	L	L ₁	E	α	C	C ₀
	mm								deg.	N
LQCT 12	12	32	18	30	85	42	7,6	78	3 100	4 000
LQCT 16	16	36	22	35	100	54	10,4	78	4 000	5 200
LQCT 20	20	45	25	42	130	72	10,8	60	6 000	8 300
LQCT 25	25	58	30	51	160	88	13,2	60	9 000	13 400
LQCT 30	30	68	35	60	180	96	14,2	50	15 000	22 800
LQCT 40	40	80	45	77	230	122	18,7	50	24 000	33 500
LQCT 50	50	100	55	93	280	152	23,6	50	35 500	49 000
Example: LQCT 42 LQCT 16-2LS										

LRCB ../LRCC ..

Shaft supports
LRCB with bore holes
LRCC without bore holes



Designations		Dimensions			
		d	A	H ±0,02	L
mm					
LRCB 12	LRCC 12	12	40	22	600
LRCB 16	LRCC 16	16	45	26	600
LRCB 20	LRCC 20	20	52	32	600
LRCB 25	LRCC 25	25	57	36	600
LRCB 30	LRCC 30	30	69	42	600
LRCB 40	LRCC 40	40	73	50	600
LRCB 50	LRCC 50	50	84	60	600
LRCB 60	LRCC 60	60	94	68	600
LRCB 80	LRCC 80	80	116	86	600
Example: LRCB 80 LRCC 80					

Precision shafts

SKF precision shafts (**fig. 8**) can be supplied either as solid or hollow shafts. The solid shafts are available in all dimensions required to fit SKF linear ball bearings; the hollow shafts have a minimum outside diameter of 16 mm.

They are induction hardened and ground (**see table on next page**). SKF shafts have exceptionally high dimensional stability and long service life.

Yet at the end of shafts of normal production length, deviations of hardness and dimensional stability can occur.

For special applications, solid shafts of stainless steel or hard chromium plated shafts having a chromium layer approximately 10 µm thick can be supplied. When using stainless steel shafts, please note that the surface is not as hard as that of shafts made of high-grade steel. The case depth may also be greater than indicated in **table 5** and this may have an influence on the machinability of the shafts.

Because of the benefits they offer, SKF precision shafts are not only used in combination with SKF linear ball bearings for linear guides, but also for other purposes, for instance axles or column sleeves.

Tolerances

SKF precision steel shafts are available as standard with a diameter machined to tolerance h6 or h7. Other tolerances are available on request. Shafts cut to special lengths have a length tolerance to DIN 7168 “medium”. The relevant values are given in **table 4**.

Shafts with radial holes

For linear guides requiring support, shafts with threaded radial holes are needed. These can be supplied by SKF. The radial holes can be positioned either in a way that they accommodate SKF shaft supports or as specified in the customer drawing.



Fig. 8

Table 4		
Nominal length		Deviation
over	incl.	
mm		
–	120	±0,3
120	400	±0,5
400	1 000	±0,8
1 000	2 000	±1,2
2 000	4 000	±2
4 000	8 000	±3

Length tolerances for shafts to DIN/ISO 2768 medium class

Table 5		
Shaft diameter		Hardness depth
over	incl.	min.
mm		
–	10	0,5
10	18	0,8
18	30	1,2
30	50	1,5
50	80	2,2
80	100	3

Case hardening of SKF shafts

2 Linear guides

Precision shafts

Composite shafts

Composite shafts can be supplied to customer drawings, either with screwed joints or with “plug and socket” joints, depending on the application.

Accurately centred trunnions and sockets guarantee smooth transitions at the butt joint. To ensure correct assembly, the relative positions of the shaft sections and of the shaft ends are marked. Composite shafts should be fastened to a support at the butt joints, particularly when these are of the “plug and socket” type. The radial holes should be positioned as closely to the joint as possible and the shaft length selected in a way that bending of the shaft will not result in a gap forming at the joint.

Materials

SKF precision steel shafts are available as shown in **tables 6** and **7**.

SKF precision shafts are made from the non-alloyed high-grade steels Cf53 (Material No.1.1213), Ck53 (Material No.1.1210), Ck60 (Material No.1.1221) and 100Cr6 (Material No.1.2067).

The surface hardness is between approximately 60 and 64 HRC. The solid shafts of stainless steel are made from the steel X90CrMoV18 (Material No.1.4112) or X46Cr13 (Material No.1.4034). In this case the surface hardness lies between approximately 52 and 56 HRC.

Shafts made from other materials can be supplied to special order.

Table 6

Designation	Type
LJM	Precision shaft, steel Ck53/Cf53, 60-64HRC, h6
LJMH	Hard chromium plated precision shaft, steel Ck53/Cf53, min. 60HRC, h7
LJMR	Precision shaft, corrosion resistant, X90CrMoV18, 52-56HRC, h6/h7
LJMS	Precision shaft, corrosion resistant, X46Cr13, 52-56HRC, h6/h7
LJT	Hollow shaft, high-grade steel, Ck60 or 100Cr6, 60-66HRC, h6/h7

Table 7

Standard length of the shafts ¹⁾ Shaft diameter	Dimensions Maximal length ²⁾				
	LJM ³⁾	LJMH ³⁾	LJMS ³⁾	LJMR ³⁾	LJT ³⁾
mm					
3 ⁴⁾				200	
4 ⁴⁾				200	
5	3 900	2 000	1 000	3 800	
6	3 900	3 900	3 900	3 800	
8	3 900	3 900	3 900	3 800	
10	6 200	6 200	3 900	3 800	
12	6 200	6 200	4 900	6 200	6 200
14	6 200	6 200	4 900	6 200	6 200
16	6 200	6 200	4 900	6 200	6 200
20	6 200	6 200	4 900	6 200	6 200
25	6 200	6 200	4 900	6 200	6 200
30	6 200	6 200	4 900	6 200	6 200
40	6 200	6 200	4 900	6 200	6 200
50	6 200	6 200	4 900	6 200	6 200
60	6 200	6 200	4 900	6 200	6 200
80	6 200	6 200		6 200	6 200

¹⁾ Different diameters and length on request

²⁾ Length tolerance $\pm 10\%$ (based on maximum shaft length)

³⁾ For details see page 51/52

⁴⁾ Only available as ESSC 2

Standard shaft lengths

Ordering key		LJ						/	
Type									
Designation type: Precision shaft, steel Ck53/Cf53, 60-64HRC, h6 Hard chromium plated precision shaft, steel Ck53/Cf53, min. 60HRC, h7 Precision shaft, corrosion resistant X90CrMoV18, 52-56HRC, h6/h7 Precision shaft, corrosion resistant, X46Cr13, 52-56HRC, h6/h7 Hollow shaft, high-grade steel, Ck60 or 100Cr6, 60-66HRC, h6/h7		M	MH	MR	MS	T			
Nominal diameter Ø (mm): See table 7, page 46									
Length (mm): See table 7, page 46									
End finishing: ESSC (1-10), see pages 48-50									
For ESSC 4 - 5: Front side axial thread × depth For ESSC 6 - 9: Distance between end face and first radial thread									
For ESSC 5: Front side axial thread × depth For ESSC 6 - 9: Distance between the radial threads									

M
MH
MR
MS
T

See table 7, page 46

See table 7, page 46

ESSC (1-10), see pages 48-50

For ESSC 6 - 9: Distance between end face and first radial thread

For ESSC 6 - 9: Distance between the radial threads

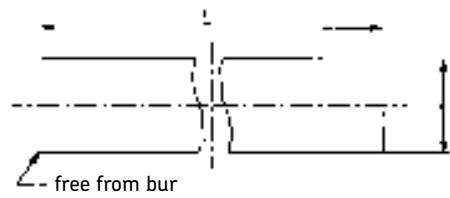
LJ	MR	40	1200	ESSC10
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2 Linear guides

Precision shafts

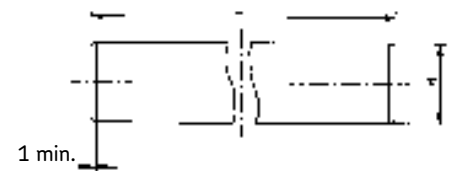
ESSC 1

Cut, without chamfer, only deburred
Length tolerance according to ISO 2768
medium class



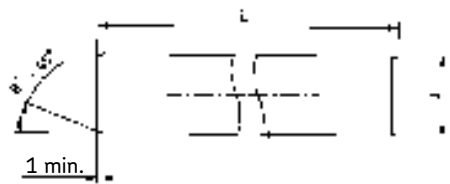
ESSC 2

Cut, with chamfer
Length tolerance as ESSC 1



ESSC 3

Cut, 25° machined chamfer, end faces cut
at right angles for limited length tolerance
or chamfered according to customer
specification
Length tolerance +/- 0,1 mm to a total
length of 3 000 mm



ESSC 4

Cut, 25° machined chamfer, end faces cut at
right angles, one front-side (axial) hole
Length tolerance as ESSC 3
(table 8)

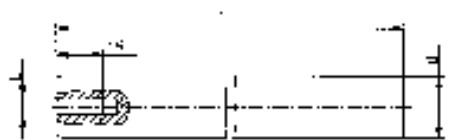


Table 8

Diameter Ø	Thread G	Depth L ₅
mm		mm
5		
8	M4	10
10	M4	10
12	M5	12,5
14	M5	12,5
16	M6	15
20	M8	20
25	M10	25
30	M10	25
40	M12	30
50	M16	40
60	M20	50
80	M24	60

ESSC 5

As ESSC 4 with two front side (axial) holes
(table 9)

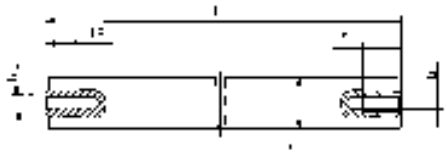


Table 9

Diameter Ø	Thread G	Depth L ₅
mm		mm
5		
8	M4	10
10	M4	10
12	M5	12,5
14	M5	12,5
16	M6	15
20	M8	20
25	M10	25
30	M10	25
40	M12	30
50	M16	40
60	M20	50
80	M24	60

ESSC 6

Cut and chamfered as ESSC 2

- with radial holes for LRCB
- first radial hole at $J_x = J/2$
- H1 according to hardening depth
(table 10)

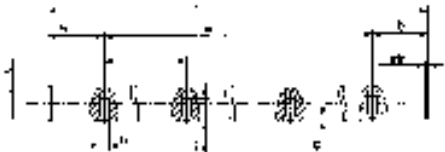


Table 10

Ø	Thread	G	G ₁	J	J _x
mm		mm			
5	—	—	—	—	—
8	—	—	—	—	—
12	M4	5	8	75	37,5
16	M5	6	9,5	100	50
20	M6	7	13	100	50
25	M8	9	14	120	60
30	M10	11	18	150	75
40	M10	11	20	200	100
50	M12	13	23	200	100
60	M14	15	28	300	150
80	M16	16	33	300	150

ESSC 7

As ESSC6

- radial holes with J and J_x according to customer specification
(table 11)

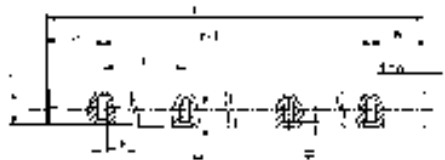


Table 11

Ø	Thread	G	G ₁	J	J _x
mm		mm			
5	—	—	—	—	—
8	—	—	—	—	—
12	M4	5	8	—	—
16	M5	6	9,5	—	—
20	M6	7	13	—	—
25	M8	9	14	—	—
30	M10	11	18	—	—
40	M10	11	20	—	—
50	M12	13	23	—	—
60	M14	15	28	—	—
80	M16	16	33	—	—

2 Linear guides
Precision shafts

ESSC 8

- Cut and chamfer as ESSC 2
- shaft mounted on LRCCB
 - first radial hole with $J_x = J/2$
 - H1 according to hardness depth (table 12)



Table 12

Ø	Thread	G	G ₁	J	J _x
mm		mm			
5	—	—	—	—	—
8	—	—	—	—	—
12	M4	5	8	75	37,5
16	M5	6	9,5	100	50
20	M6	7	13	100	50
25	M8	9	14	120	60
30	M10	11	18	150	75
40	M10	11	20	200	100
50	M12	13	23	200	100
60	M14	15	28	300	150
80	M16	16	33	300	150

ESSC 9

- As ESSC8
- shaft mounted on LRCC
 - radial holes with J and Jx according to customer specification (table 13)



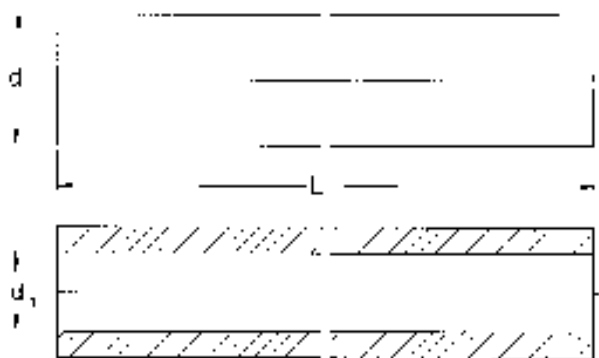
Table 13

Ø	Thread	G	G ₁	J	J _x
mm		mm			
5	—	—	—	—	—
8	—	—	—	—	—
12	M4	5	8	—	—
16	M5	6	9,5	—	—
20	M6	7	13	—	—
25	M8	9	14	—	—
30	M10	11	18	—	—
40	M10	11	20	—	—
50	M12	13	23	—	—
60	M14	15	28	—	—
80	M16	16	33	—	—

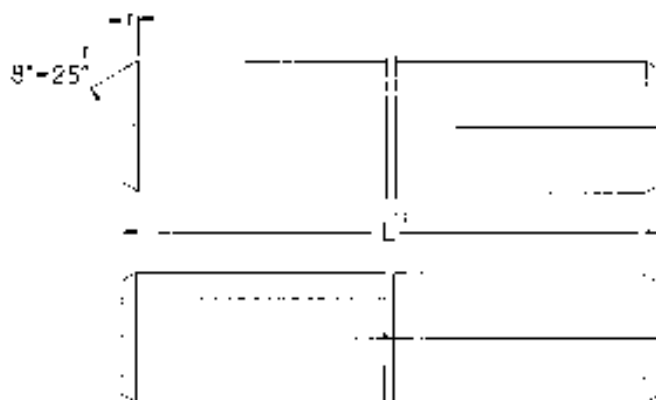
ESSC 10

- Shaft according to customer specification
- manufacture only according to customer drawing

Standard designs for fixed length without chamfer



Standard designs for fixed length with chamfer



1) Shafts cut to special length with chamfered ends. The length tolerance of these shafts corresponds to LJM 20×1 500 ESSC2 medium class. The designation for a shaft with 20 mm diameter cut to a length of 1,5 m is, for example, LJM 20×1 500 ESSC2.

Basic data for the various models for the precision shafts

Dimensions			Mass		Moment of inertia		Cross sectional area		Designations				
d	d ₁	r _{min}	Solid shaft	Hollow shaft	Solid shaft	Hollow shaft	Solid shaft	Hollow shaft	Solid shaft of precision steel	Solid shaft of stainless steel	Solid shafts with high grade steel hard chromium plated	Hollow shaft high grade steel	
mm			kg/m		cm ⁴		mm ²		Cf53/Ck53	X90CrMoV18	X46Cr13	Cf53/Ck53	Ck60/100Cr6
3	–	0,4	0,06	–	0,0004	–	7,1	–	–	LJMR 3	–	–	–
4	–	0,4	0,1	–	0,0013	–	12,6	–	–	LJMR 4	–	–	–
5	–	0,8	0,15	–	0,0031	–	19,6	–	LJM 5	LJMR 5	LJMS 5	LJMH 5	–
6	–	0,8	0,22	–	0,0064	–	28,3	–	LJM 6	LJMR 6	LJMS 6	LJMH 6	–
8	–	0,8	0,39	–	0,02	–	50,3	–	LJM 8	LJMR 8	LJMS 8	LJMH 8	–
10	–	0,8	0,62	–	0,049	–	78,5	–	LJM 10	LJMR 10	LJMS 10	LJMH 10	–
12	4	1	0,89	0,79	0,102	–	113	–	LJM 12	LJMR 12	LJMS 12	LJMH 12	LJT 12
14	–	1	1,21	–	0,189	–	154	–	LJM 14	LJMR 14	LJMS 14	LJMH 14	–
16	7	1	1,58	1,28	0,322	0,31	201	163	LJM 16	LJMR 16	LJMS 16	LJMH 16	LJT 16
20	14	1,5	2,47	1,25	0,785	0,597	314	160	LJM 20	LJMR 20	LJMS 20	LJMH 20	LJT 20
25	16	1,5	3,86	2,35	1,92	1,64	491	305	LJM 25	LJMR 25	LJMS 25	LJMH 25	LJT 25
30	18	1,5	5,55	3,5	3,98	3,46	707	453	LJM 30	LJMR 30	LJMS 30	LJMH 30	LJT 30
40	28	2	9,86	4,99	12,6	9,96	1 260	685	LJM 40	LJMR 40	LJMS 40	LJMH 40	LJT 40
50	30	2	15,4	9,91	30,7	27,7	1 960	1 350	LJM 50	LJMR 50	LJMS 50	LJMH 50	LJT 50
60	36	2,5	22,2	14,2	63,6	57,1	2 830	1 920	LJM 60	LJMR 60	LJMS 60	LJMH 60	LJT 60
80	57	2,5	39,5	19,43	201	153	5 030	2 565	LJM 80	–	–	LJMH 80	LJT 80

Attention:

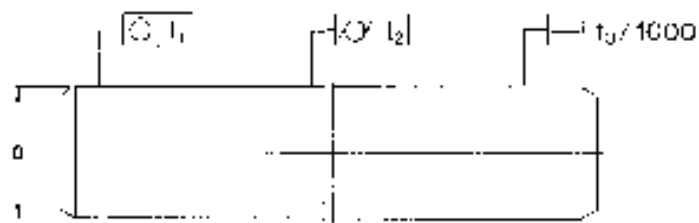
d₁ can deviate from the value quoted.

Different shaft diameters and types on request.

The static load capacity has to be decreased by 8% and the dynamic load capacity by 18% when using the non-rusting types (HV6) in conjunction with precision steel shafts made of stainless steel.

2 Linear guides

Precision shafts



Basic data for the various models for the precision shafts of high-grade steel

Shaft		Accuracy of dimension and form				Shafts to tolerance h7				
		Shafts to tolerance h6								
Nominal diameter	Diameter deviation	Roundness	Circularity	Straightness ¹⁾		Diameter deviation	Roundness	Circularity	Straightness ¹⁾	
d	high low	t ₁	t ₂	t ₃		high low	t ₁	t ₂	t ₃	
mm	µm									
3	0 -6	3	4	150		0 -10	4	6	150	
4	0 -8	4	5	150		0 -12	5	8	150	
5	0 -8	4	5	150		0 -12	5	8	150	
6	0 -8	4	5	150		0 -12	5	8	150	
8	0 -9	4	6	120		0 -15	6	9	120	
10	0 -9	5	7	120		0 -15	7	10	120	
12	0 -11	5	8	100		0 -18	8	11	100	
14	0 -11	5	8	100		0 -18	8	11	100	
16	0 -11	5	8	100		0 -18	8	11	100	
20	0 -13	6	9	100		0 -21	9	13	100	
25	0 -13	6	9	100		0 -21	9	13	100	
30	0 -13	6	9	100		0 -21	9	13	100	
40	0 -16	7	11	100		0 -25	11	16	100	
50	0 -16	7	11	100		0 -25	11	16	100	
60	0 -19	8	13	100		0 -30	13	19	100	
80	0 -19	8	13	100		0 -30	13	19	100	

¹⁾ Shafts with straightness 50 mm/1000 mm to order.

Linear ball bearing table without drive

LZBU quadro-linear tables (fig. 9)

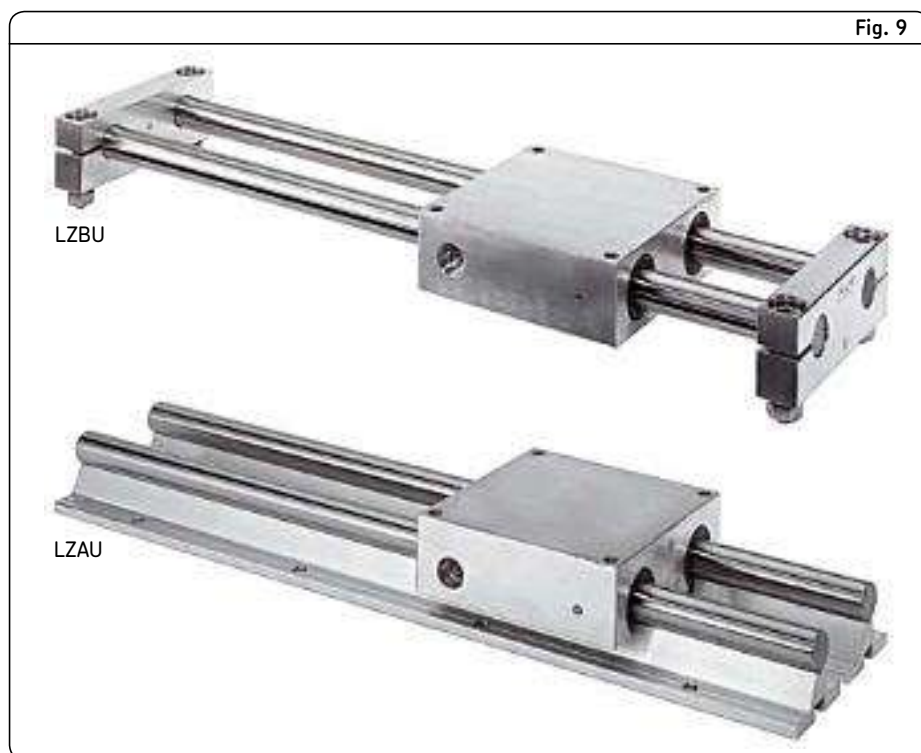
The closed LZBU quadro linear table consists of a closed quadro linear bearing unit, two tandem shaft blocks and two shafts of the required length.

The bearing unit is fitted with four LBCD-LS self-aligning linear ball bearings, each sealed at one end. The LZBU-“A” design enables axial movement of the linear bearing unit, i.e. the shafts are fixed to the machine bed via LEAS-“A” shaft blocks. The LZBU-“B” design is provided with LEAS-“B” shaft blocks. This combination enables the shafts to travel with the shaft blocks in applications where the linear bearing unit is fixed. LZBU quadro linear tables can be supplied in sizes ranging from 8 to 50 mm. Size 8 tables are not self-aligning and are not designed for relubrication.

The description of the closed quadro-linear table also applies to the combination of series 1 LQBR..2LS quadro linear bearing units with twin LEBS tandem shaft blocks and shafts (on special request only). Shaft diameters range from 12 to 50 mm.

LZAU quadro-linear tables

The open LZAU quadro linear table comprises the open quadro-linear unit and two high precision shafts with shaft



supports. The bearing unit is fitted with four LBCF-“A-LS” self-aligning linear ball bearings, each sealed on one end. The length of these tables is dictated by the distance between centres of the attachment holes in the LRCB shaft supports. The total length should always be a multiple of this distance. LZAU are available in sizes ranging from 12 to 50 mm.

2 Linear guides

Linear ball bearing table without drive

Ordering key

	LZ					X	
Type:							
Design:							
Open design							
Closed design							
Nominal diameter Ø in mm:							
For AU							
For BU							
Option:							
LZAU with LRCB shaft supports							
LEAS A, high shaft position							
LEAS B, low shaft position							
Other option:							
Both sides sealed							
Length in mm:							

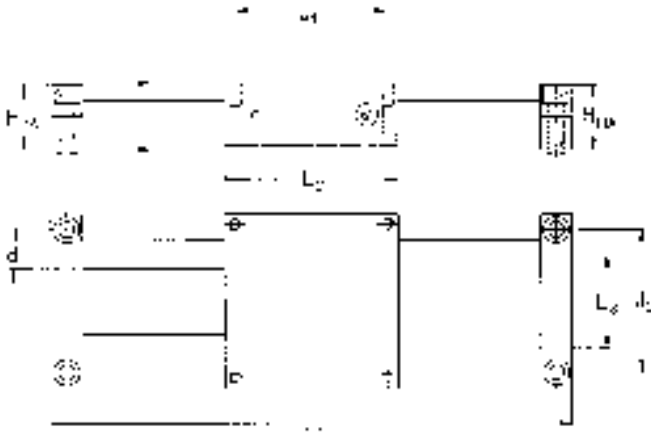
Example: L Z BU 40 B -2LS X 1500

LZBU .. A-2LS

Quadro linear tables, LZBU version with
LQCD closed bearing units, LEAS-A* shaft
blocks and shafts

* "A" design means fixed shafts and moving unit

Design LZBU ... A with closed linear bearing unit



Designations ¹⁾	Dimensions								Load ratings ³⁾	
	d	H _{RA} ±0,03	H _{1A}	L ₁ ²⁾	L ₂	L ₃	J ₁	J ₂	dynamic C	static C ₀
	mm								N	
LZBU 8 A-2LS ⁴⁾	8	24	23	600	65	32	55	52	1 290	1 420
LZBU 12 A-2LS	12	34	32	900	85	42	73	70	2 850	3 250
LZBU 16 A-2LS	16	38	37	1 500	100	54	88	82	3 450	3 450
LZBU 20 A-2LS	20	48	46	1 800	130	72	115	108	5 200	5 500
LZBU 25 A-2LS	25	58	56	1 800	160	88	140	132	7 650	8 150
LZBU 30 A-2LS	30	67	64	2 400	180	96	158	150	12 200	12 900
LZBU 40 A-2LS	40	84	80	3 000	230	122	202	190	20 800	20 800
LZBU 50 A-2LS	50	100	96	3 000	280	152	250	240	30 000	28 000

¹⁾ The designation for an LZBU quadro-linear table with a shaft length of, for instance, 1 200 mm LZBU ...-2LS×1 200. Delivered as a kit of parts.

²⁾ Recommended maximal shaft length. On demand longer shaft lengths are available. The appropriate length tolerances of these shafts are according to DIN 7168 coarse series.

³⁾ Valid only for even loading of all four LBC... A linear ball bearings. On delivery the deviation of the shaft must be considered and possibly the load rating revised.

⁴⁾ Units fitted with LBCR linear ball bearings are not designed for relubrication and are not self-aligning.

2 Linear guides

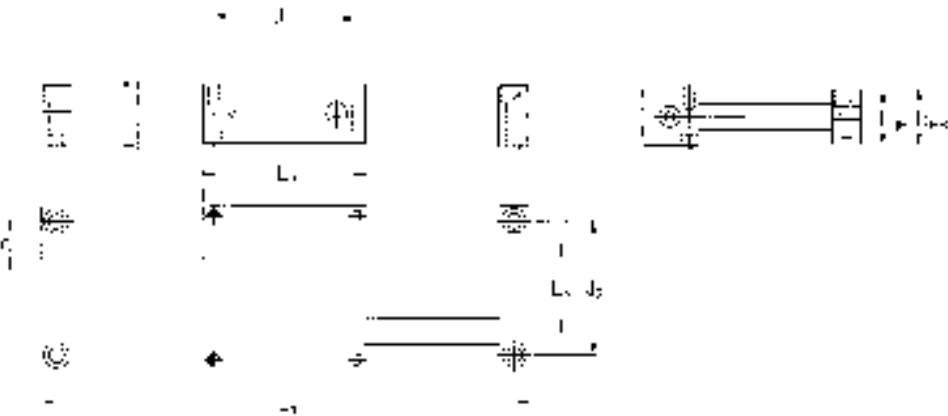
Linear ball bearing table without drive

LZBU .. B-2LS

Quadro linear tables, LZBU version with LQCD closed bearing units, LEAS-B* shaft blocks and shafts

* “B” design means fixed unit and moving shafts

Design LZBU ... B with closed linear bearing unit



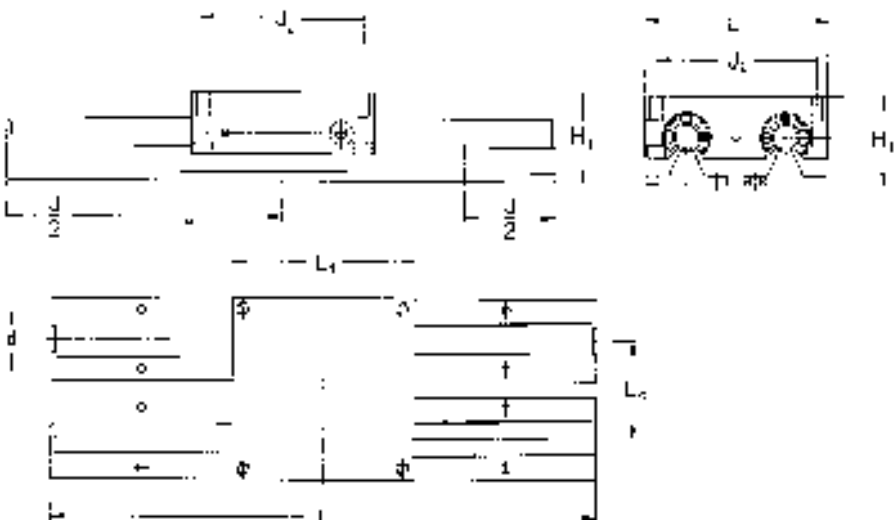
Designations ¹⁾	Dimensions								Load ratings ³⁾	
	d	H _{RB} ± 0,03	H _{1B}	L ₁ ²⁾	L ₂	L ₃	J ₁	J ₂	C dynamic	C ₀ static
	mm								N	
LZBU 8 B-2LS ⁴⁾	8	22,5	22	600	65	32	55	52	1 290	1 420
LZBU 12 B-2LS	12	30	28	900	85	42	73	70	2 850	3 250
LZBU 16 B-2LS	16	35	34	1 500	100	54	88	82	3 450	3 450
LZBU 20 B-2LS	20	44	42	1 800	130	72	115	108	5 200	5 200
LZBU 25 B-2LS	25	54	52	1 800	160	88	140	132	7 650	8 150
LZBU 30 B-2LS	30	61	58	2 400	180	96	158	150	12 200	12 900
LZBU 40 B-2LS	40	76	72	3 000	230	122	202	190	20 800	20 800
LZBU 50 B-2LS	50	92	88	3 000	280	152	250	240	30 000	28 000

¹⁾ The designation for an LZBU quadro-linear table with a shaft length of, for instance, 1 200 mm LZBU ...-2LS x 1 200. Delivered as a kit of parts.
²⁾ Recommended maximal shaft length. On demand longer shaft lengths are available. The appropriate length tolerances of these shafts are according to DIN 7168 coarse series.
³⁾ Valid only for even loading of all four LBC... A linear ball bearings. On delivery the deviation of the shaft must be considered and possibly the load rating revised.
⁴⁾ Units fitted with LBCR linear ball bearings are not designed for relubrication and are not self-aligning.

LZAU ...-2LS

Quadro linear tables, LZAU version with LQCF open bearing units and supported shafts

Design LZAU with open linear bearing unit type LQCF



Designations ¹⁾	Dimensions							Load ratings ³⁾	
	d	H _T ± 0,03	J ²⁾	L	L ₁	L ₂	J ₂	dynamic C	static C ₀
	mm							N	
LZAU 12-2LS	12	40	75	900	85	42	73	2 850	3 250
LZAU 16-2LS	16	48	100	1 500	100	54	88	3 450	3 450
LZAU 20-2LS	20	57	100	1 800	130	72	115	5 200	5 500
LZAU 25-2LS	25	66	120	1 800	160	88	140	7 650	8 150
LZAU 30-2LS	30	77	150	2 400	180	96	158	12 200	1 2900
LZAU 40-2LS	40	95	200	3 000	230	122	202	20 800	20 800
LZAU 50-2LS	50	115	200	3 000	280	152	250	30 000	28 000

¹⁾ The designation for an LZAU quadro-linear table with a shaft length of, for instance, 600 mm LZAU ... -2LS × 600. Delivered with shafts and shaft supports ready assembled.
²⁾ The separation is always arranged symmetrically to half the table length.
³⁾ Valid only for even loading of all four LBC... A linear ball bearings.

Dimensions Standard length										
d	L									
mm	Length increments in mm									
12 ÷ 40	300	600	900	1 200	1 500	1 800	2 100	2 400	2 700	3 000
50	–	600	900	1 200	1 500	1 800	2 100	2 400	2 700	3 000

2 Linear guides

Linear ball bearing table without drive

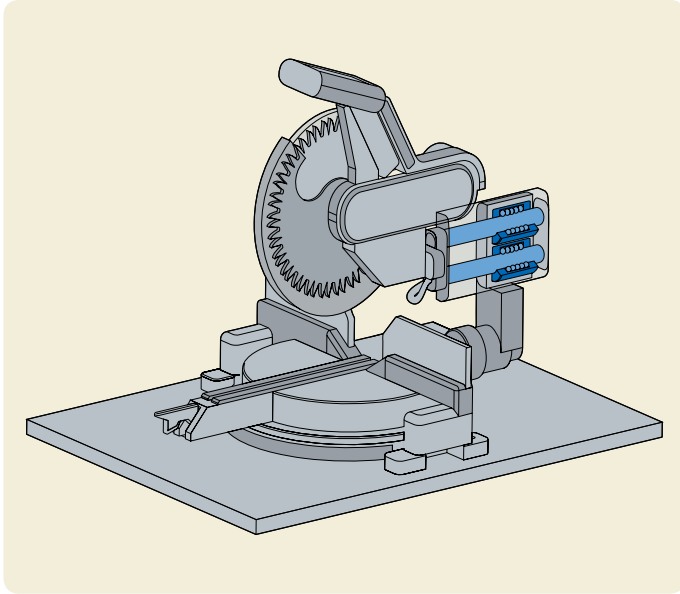
Applications

In response to our customer's ultimate need to produce more with less, SKF has

combined its knowledge and experience with the latest technology to develop solutions for your specific conditions. Whether your goal is to design equipment

that provides more customer value, or to increase overall profitability, with SKF experience and expertise, you're likely to find a real solution.

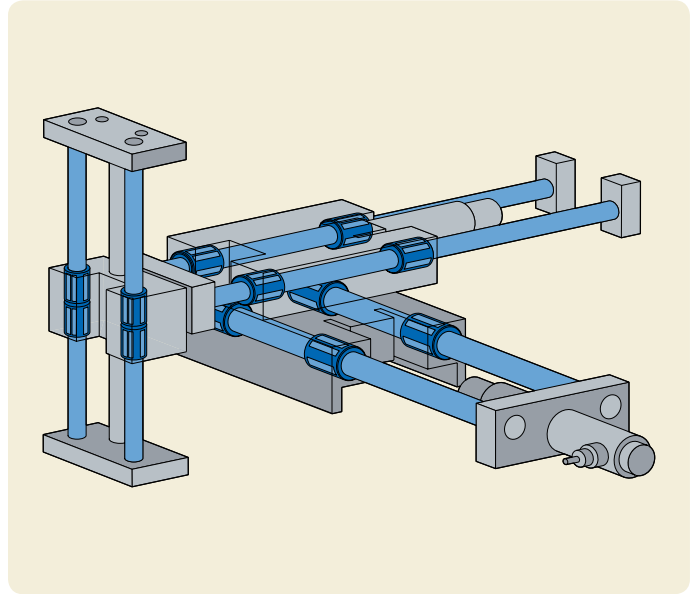
Portable tool



Components application

- a) Linear ball bearings
- b) Precision shafts

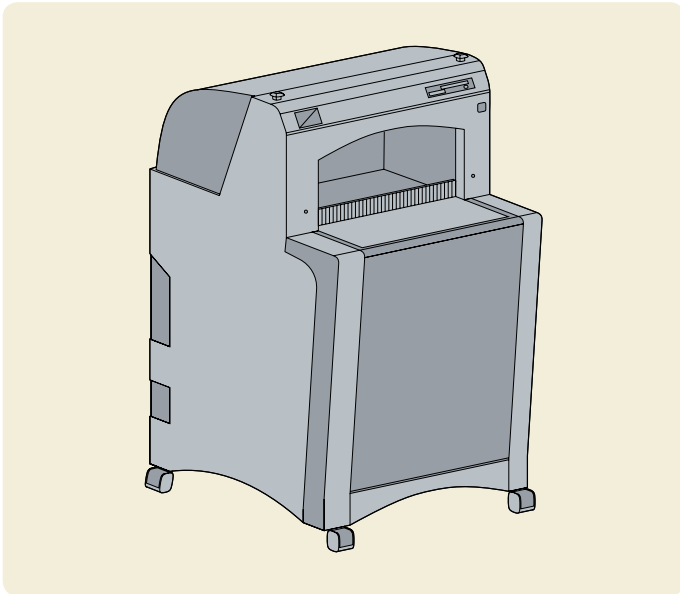
Pneumatic handling



Components application

- a) Linear ball bearings
- b) Precision shafts

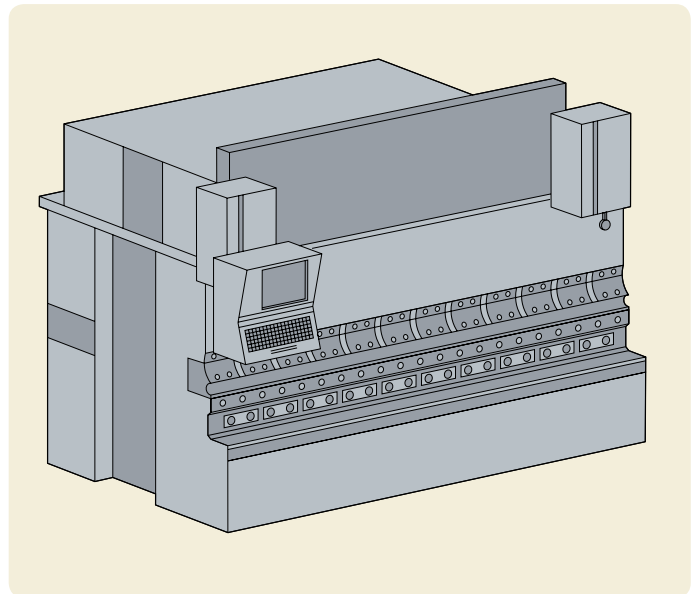
Bread slicing machine



Components application

- a) Linear ball bearings

Press brake



Components application

- a) Linear ball bearings
- b) Precision shafts
- c) Precision ball screws

LLT Profile rail guides

The productivity and economic success of a given application depends, to a large extent, on the quality of the selected linear components. Often, these components determine market acceptance and thus help the manufacturer obtain a competitive edge. The linear components have to be as adaptable as possible to precisely meet the application's requirements, ideally with standard components.

The new SKF profile rail guide series LLT (**fig. 10**) satisfies these market demands: available in a wide range of sizes, carriages and accessories as well as in various preload and accuracy classes, LLT profile rail guides can easily be adapted to individual application demands. In addition, these rail guides can operate at virtually unlimited stroke. This opens up almost any design option.

The range of possible applications includes material handling, plastic injection moulding, woodworking, printing, packaging and medical devices, to name a few. With such applications, the design of the LLT reveals its full capabilities:

SKF manufactures these profile rail guides in an X-arrangement with a 45° contact angle between the rolling elements and raceways. This design provides an equal load carrying capacity in all four main load directions and therefore greater design flexibility since all mounting positions are possible (**fig. 11**). Moreover, deviations in parallelism and height, which usually occur in multi-axis systems, can be compensated for more efficiently, resulting in reliable and smooth operation under a variety of operating conditions.

In addition, SKF offers a miniature profile rail guide series and a series of ready assembled and driven profile rail guide slides. Contact your SKF representative for additional information.



Fig. 10

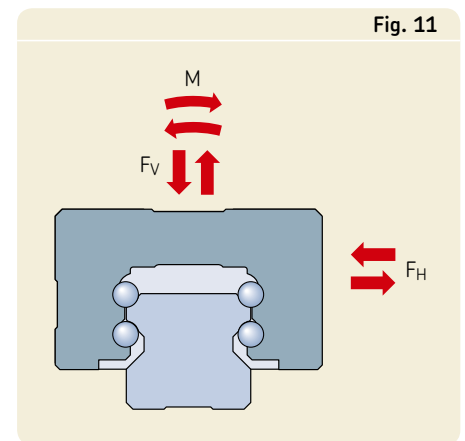


Fig. 11

Product overview

Fig. 12



LLTHC ... A

Flanged carriage, standard length, standard height.

Further information on [page 62](#).

Fig. 13



LLTHC ... R

Slim-line carriage, standard length, extended height.

Further information on [page 66](#).

Fig. 14



LLTHC ... U

Slim-line carriage, standard length, standard height.

Further information on [page 70](#).

Fig. 15



LLTHR Profile rail with blind holes

Further information on [page 76](#).

LLTHR Profile rail with standard holes

Further information on [page 74](#).

Fig. 16



LLTHC ... LA

Flanged carriage, extended length, standard height.

Further information on [page 64](#).

Fig. 17



LLTHC ... LR

Slim-line carriage, extended length, extended height.

Further information on [page 68](#).

Fig. 18



LLTHC ... SU

Slim-line carriage, short length, standard height.

Further information on [page 72](#).

Ordering key

Type code:

Carriage (carriage only) ¹⁾Rail (rail only)¹⁾System²⁾Accessories, (if order separately)¹⁾

LLTH

C

R

S

Z

Carriage Size:

15, 20, 25, 30, 35, 45

Carriage type:

Flanged carriage, standard length, standard height

A

Flanged carriage, extended length, standard height

LA

Slim-line carriage, short length, standard height

SU

Slim-line carriage, standard length, standard height

U

Slim-line carriage, standard length, extended height

R

Slim-line carriage, extended length, extended height

LR

Number of carriages per rail:

1, 2, 4, 6, ...

Preload classes:

Zero preload

T0

Light preload, 2% C

T1

Medium preload, 8% C

T2

Rail length:

80 mm up to maximum rail length (1 mm step)

Precision class:

Standard

P5

Medium

P3

High³⁾

P1

Joined rail track (if not selected – no code):

Yes

A

Bellows (if not selected – no code):

Bellows, system complete with bellows

B

Bellow Kit, type 2 (carriage thru the end of the rail)

B2

Bellow Kit, type 4 (between two carriages)

B4

Bellows, definition of number of folds:

Number of folds

xxx

Splitting of sections

/

No bellow in this section

-

Bellows material:

Standard material "PUR", (temperature resistance +90 °C)

Special material suitable for laser applications – self fading, (temperature resistance +160 °C)

LAS

Special material suitable for welding applications, (temperature resistance +260 °C)

WEL

Rail:

Rail, if customized according to drawing number

D

Rail with blind holes

D4

Distance between end face and first mounting hole of the rail:

If no "E" specified, the holes at both rail ends will be positioned equidistantly from either end of the rail

E = 0

"E" dimension to be specified, for calculation and minimum "E" dimension, see **page 75**

E = xx

System (Carriage mounted on rail, if not selected – no code):

Yes⁴⁾

M

Sealing

Scraper plate

S1

Seal kit, additional front seal with scraper plate

S3

Additional front seal

S7

¹⁾ When ordered separately (not in a system).²⁾ System can consist of one rail, one or more carriages and accessories.³⁾ P1 only available as system⁴⁾ If selected, accessories have to be ordered separately and will not be mounted. Refer to **page 78** to get more information about the accessories.

2 Linear guides
Profile rail guides

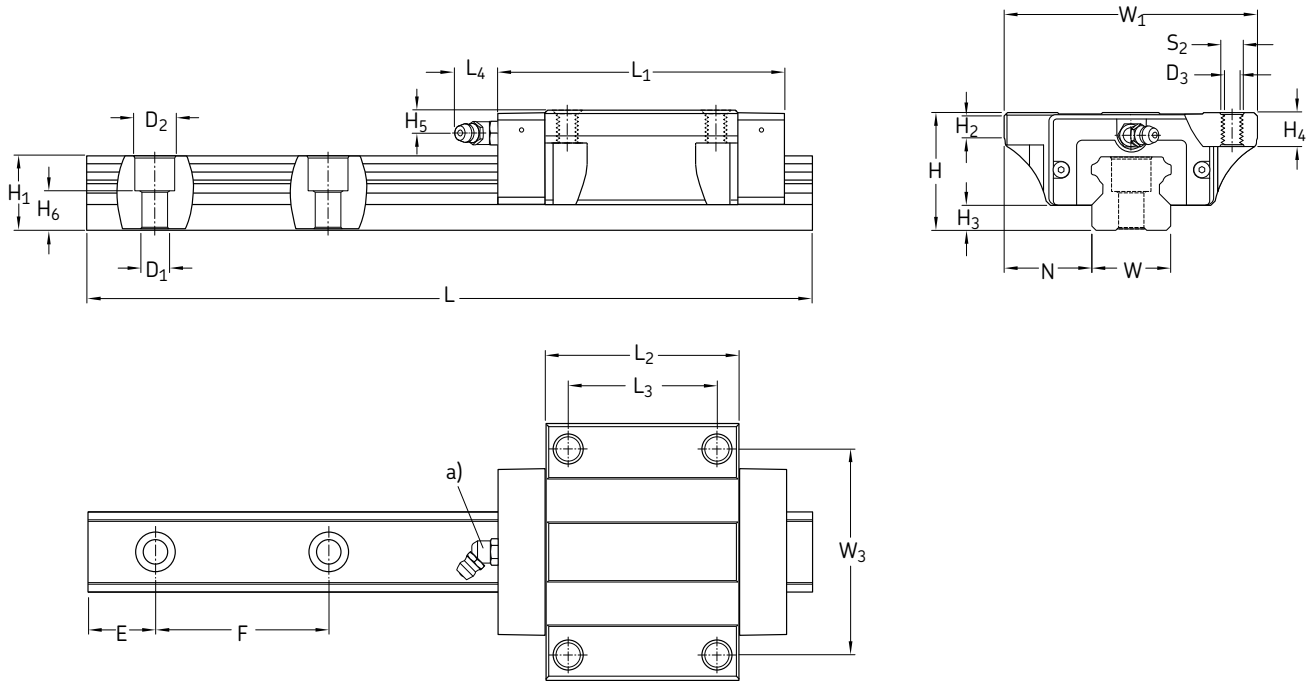
Carriage LLTHC .. A
Flanged carriage, standard length,
standard height (**fig. 19**)



Fig. 19

Size ¹⁾	Accuracy class ²⁾	Designation ³⁾		
		Preload class	T1	T2
–		T0		
		–		
15	P5	LLTHC 15 A T0 P5	LLTHC 15 A T1 P5	LLTHC 15 A T2 P5
	P3	LLTHC 15 A T0 P3	LLTHC 15 A T1 P3	LLTHC 15 A T2 P3
	► P1		LLTHC 15 A T1 P1	LLTHC 15 A T2 P1
20	P5	LLTHC 20 A T0 P5	LLTHC 20 A T1 P5	LLTHC 20 A T2 P5
	P3	LLTHC 20 A T0 P3	LLTHC 20 A T1 P3	LLTHC 20 A T2 P3
	► P1		LLTHC 20 A T1 P1	LLTHC 20 A T2 P1
25	P5	LLTHC 25 A T0 P5	LLTHC 25 A T1 P5	LLTHC 25 A T2 P5
	P3	LLTHC 25 A T0 P3	LLTHC 25 A T1 P3	LLTHC 25 A T2 P3
	► P1		LLTHC 25 A T1 P1	LLTHC 25 A T2 P1
30	P5	LLTHC 30 A T0 P5	LLTHC 30 A T1 P5	LLTHC 30 A T2 P5
	P3	LLTHC 30 A T0 P3	LLTHC 30 A T1 P3	LLTHC 30 A T2 P3
	► P1		LLTHC 30 A T1 P1	LLTHC 30 A T2 P1
35	P5	LLTHC 35 A T0 P5	LLTHC 35 A T1 P5	LLTHC 35 A T2 P5
	P3	LLTHC 35 A T0 P3	LLTHC 35 A T1 P3	LLTHC 35 A T2 P3
	► P1		LLTHC 35 A T1 P1	LLTHC 35 A T2 P1
45	P5	LLTHC 45 A T0 P5	LLTHC 45 A T1 P5	LLTHC 45 A T2 P5
	P3	LLTHC 45 A T0 P3	LLTHC 45 A T1 P3	LLTHC 45 A T2 P3
	► P1		LLTHC 45 A T1 P1	LLTHC 45 A T2 P1
¹⁾ Front seal appearance can slightly deviate per size.				
²⁾ ► P1 only available as system.				
³⁾ ■ Preferred range. For system designation, please refer to designation system on page 61.				

Carriage LLTHC „, A



a) For detailed informations on grease nipples, please refer to page 11 of reference catalogue "Profile rail guides LLT" 07061/3 EN.

Size	Assembly dimensions			Carriage dimensions										
	W ₁	N	H	H ₂	H ₃	L ₁	L ₂	L ₃	L ₄	W ₃	H ₄	H ₅	D ₃	S ₂
–	mm													
15	47	16	24	5,9	4,6	62	40	30	4,3	38	8	4,3	4,3	M5
20	63	21,5	30	6,9	5	72	50	40	15	53	9	5,7	5,2	M6
25	70	23,5	36	11	7	82	57	45	16,6	57	12	6,5	6,7	M8
30	90	31	42	9	9	100,4	67,4	52	14,6	72	11,5	8	8,5	M10
35	100	33	48	12,3	9,5	114	77	62	14,6	82	13	8	8,5	M10
45	120	37,5	60	12,3	14	135	96	80	14,6	100	15	8,5	10,4	M12

Size	Rail dimensions									Weight		Load ratings ¹⁾		Moments ¹⁾			
	W	H ₁	H ₆	F	D ₁	D ₂	E _{min} -0,75	E _{max} -0,75	L _{max} -1,5	Carriage	Rail	dynamic C	static C ₀	dynamic M _C	static M _{C0}	dynamic M _{A/B}	static M _{A0/B0}
–	mm									kg	kg/m	N		Nm			
15	15	14	8,5	60	4,5	7,5	10	50	3 920	0,21	1,4	8 400	15 400	56	103	49	90
20	20	18	9,3	60	6	9,5	10	50	3 920	0,4	2,3	12 400	24 550	112	221	90	179
25	23	22	12,3	60	7	11	10	50	3 920	0,57	3,3	18 800	30 700	194	316	155	254
30	28	26	13,8	80	9	14	12	70	3 944	1,1	4,8	26 100	41 900	329	528	256	410
35	34	29	17	80	9	14	12	70	3 944	1,6	6,6	34 700	54 650	535	842	388	611
45	45	38	20,8	105	14	20	16	90	3 917	2,7	11,3	59 200	91 100	1 215	1 869	825	1 270

¹⁾ Dynamic load capacities and moments are based on a travel life of 100 km. Please refer to publication 07061 for further details.

2 Linear guides
Profile rail guides

Carriage LLTHC .. LA
Flanged carriage, extended length,
standard height (fig. 20)

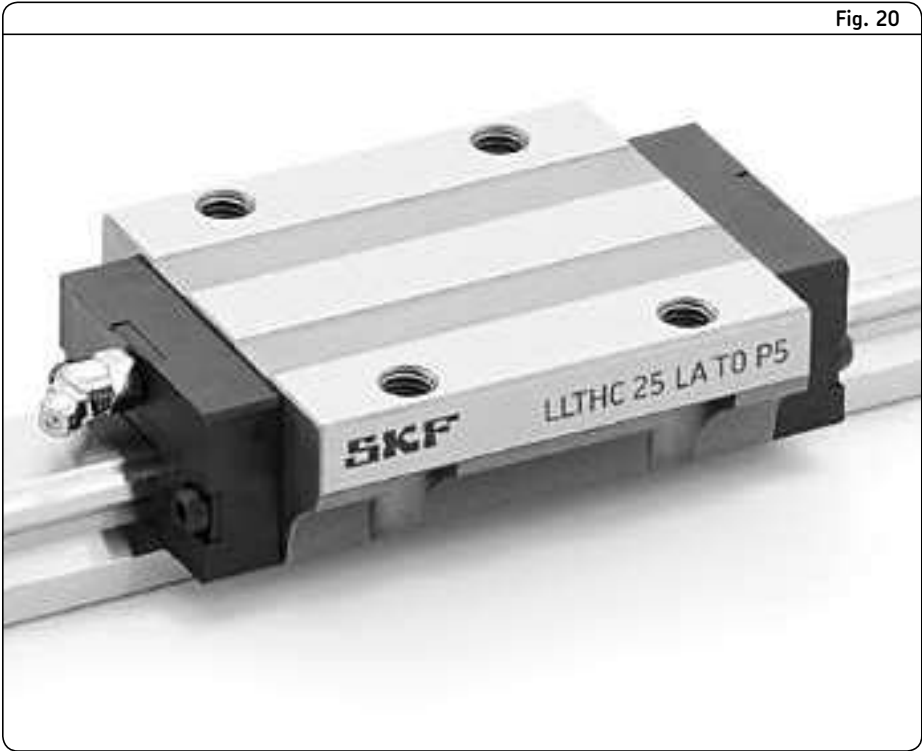
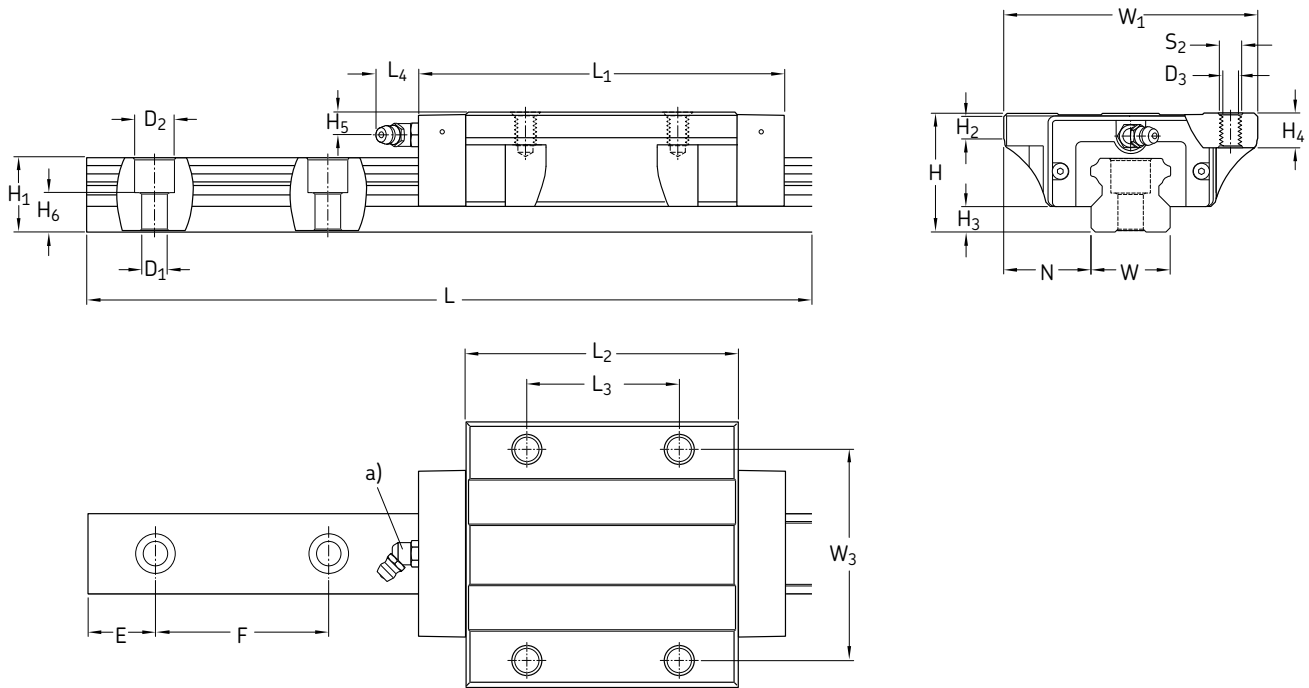


Fig. 20

Size ¹⁾	Accuracy class ²⁾	Designation ³⁾		
		Preload class	T1	T2
–		T0		
		–		
20	P5	LLTHC 20 LA T0 P5	LLTHC 20 LA T1 P5	LLTHC 20 LA T2 P5
	P3	LLTHC 20 LA T0 P3	LLTHC 20 LA T1 P3	LLTHC 20 LA T2 P3
	▶ P1		LLTHC 20 LA T1 P1	LLTHC 20 LA T2 P1
25	P5	LLTHC 25 LA T0 P5	LLTHC 25 LA T1 P5	LLTHC 25 LA T2 P5
	P3	LLTHC 25 LA T0 P3	LLTHC 25 LA T1 P3	LLTHC 25 LA T2 P3
	▶ P1		LLTHC 25 LA T1 P1	LLTHC 25 LA T2 P1
30	P5	LLTHC 30 LA T0 P5	LLTHC 30 LA T1 P5	LLTHC 30 LA T2 P5
	P3	LLTHC 30 LA T0 P3	LLTHC 30 LA T1 P3	LLTHC 30 LA T2 P3
	▶ P1		LLTHC 30 LA T1 P1	LLTHC 30 LA T2 P1
35	P5	LLTHC 35 LA T0 P5	LLTHC 35 LA T1 P5	LLTHC 35 LA T2 P5
	P3	LLTHC 35 LA T0 P3	LLTHC 35 LA T1 P3	LLTHC 35 LA T2 P3
	▶ P1		LLTHC 35 LA T1 P1	LLTHC 35 LA T2 P1
45	P5	LLTHC 45 LA T0 P5	LLTHC 45 LA T1 P5	LLTHC 45 LA T2 P5
	P3	LLTHC 45 LA T0 P3	LLTHC 45 LA T1 P3	LLTHC 45 LA T2 P3
	▶ P1		LLTHC 45 LA T1 P1	LLTHC 45 LA T2 P1
¹⁾ Front seal appearance can slightly deviate per size.				
²⁾ ▶ P1 only available as system.				
³⁾ ■ Preferred range. For system designation, please refer to designation system on page 61.				



a) For detailed informations on grease nipples, please refer to page 11 of reference catalogue "Profile rail guides LLT" 07061/3 EN.

Size	Assembly dimensions			Carriage dimensions										
	W ₁	N	H	H ₂	H ₃	L ₁	L ₂	L ₃	L ₄	W ₃	H ₄	H ₅	D ₃	S ₂
–	mm													–
20	63	21,5	30	6,9	5	88,2	66,2	40	15	53	9	5,7	5,2	M6
25	70	23,5	36	11	7	104,1	79,1	45	16,6	57	12	6,5	6,7	M8
30	90	31	42	9	9	125,4	92,4	52	14,6	72	11,5	8	8,5	M10
35	100	33	48	12,3	9,5	142,5	105,5	62	14,6	82	13	8	8,5	M10
45	120	37,5	60	12,3	14	167	128	80	14,6	100	15	8,5	10,4	M12

Size	Rail dimensions									Weight Carriage	Rail	Load ratings ¹⁾		Moments ¹⁾			
	W	H ₁	H ₆	F	D ₁	D ₂	E _{min} -0,75	E _{max} -0,75	L _{max} -1,5			dynamic C	static C ₀	dynamic M _C 	static M _{C0} 	dynamic M _{A/B} 	static M _{A0/B0} 
–	mm									kg	kg/m	N		Nm			
20	20	18	9,3	60	6	9,5	10	50	3 920	0,52	2,3	15 200	32 700	137	295	150	322
25	23	22	12,3	60	7	11	10	50	3 920	0,72	3,3	24 400	44 600	252	460	287	525
30	28	26	13,8	80	9	14	12	70	3 944	1,4	4,8	33 900	60 800	428	767	466	836
35	34	29	17	80	9	14	12	70	3 944	2	6,6	45 000	79 400	694	1 224	706	1 246
45	45	38	20,8	105	14	20	16	90	3 917	3,6	11,3	72 400	121 400	1 485	2 491	1 376	2 308

¹⁾ Dynamic load capacities and moments are based on a travel life of 100 km. Please refer to publication 07061 for further details.

2 Linear guides
Profile rail guides

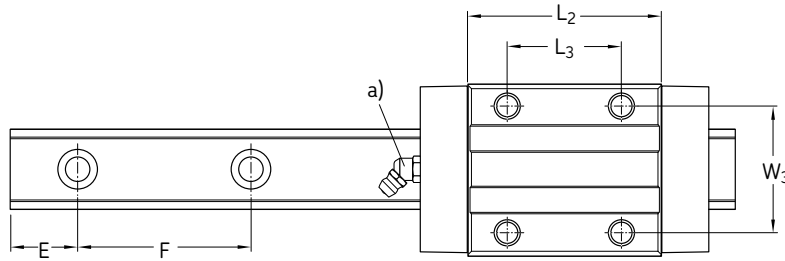
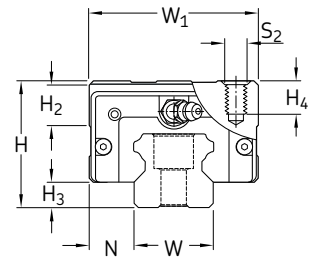
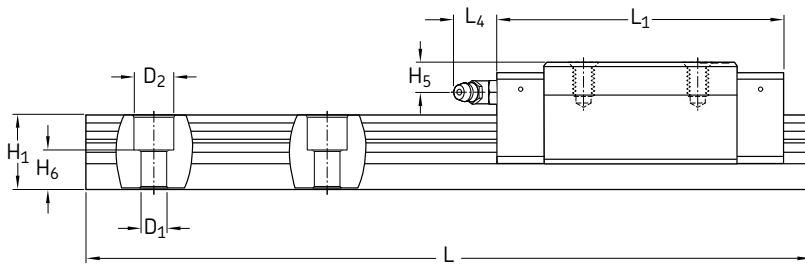
Carriage LLTHC .. R
Slim-line carriage, standard length,
extended height (fig. 21)



Fig. 21

Size ¹⁾	Accuracy class ²⁾	Designation ³⁾		
		Preload class	T1	T2
–		T0		
		–		
15	P5	LLTHC 15 R T0 P5	LLTHC 15 R T1 P5	LLTHC 15 R T2 P5
	P3	LLTHC 15 R T0 P3	LLTHC 15 R T1 P3	LLTHC 15 R T2 P3
	► P1		LLTHC 15 R T1 P1	LLTHC 15 R T2 P1
25	P5	LLTHC 25 R T0 P5	LLTHC 25 R T1 P5	LLTHC 25 R T2 P5
	P3	LLTHC 25 R T0 P3	LLTHC 25 R T1 P3	LLTHC 25 R T2 P3
	► P1		LLTHC 25 R T1 P1	LLTHC 25 R T2 P1
30	P5	LLTHC 30 R T0 P5	LLTHC 30 R T1 P5	LLTHC 30 R T2 P5
	P3	LLTHC 30 R T0 P3	LLTHC 30 R T1 P3	LLTHC 30 R T2 P3
	► P1		LLTHC 30 R T1 P1	LLTHC 30 R T2 P1
35	P5	LLTHC 35 R T0 P5	LLTHC 35 R T1 P5	LLTHC 35 R T2 P5
	P3	LLTHC 35 R T0 P3	LLTHC 35 R T1 P3	LLTHC 35 R T2 P3
	► P1		LLTHC 35 R T1 P1	LLTHC 35 R T2 P1
45	P5	LLTHC 45 R T0 P5	LLTHC 45 R T1 P5	LLTHC 45 R T2 P5
	P3	LLTHC 45 R T0 P3	LLTHC 45 R T1 P3	LLTHC 45 R T2 P3
	► P1		LLTHC 45 R T1 P1	LLTHC 45 R T2 P1
¹⁾ Front seal appearance can slightly deviate per size.				
²⁾ ► P1 only available as system.				
³⁾ ■ Preferred range. For system designation, please refer to designation system on page 61.				

Carriage LLTHC .. R



a) For detailed informations on grease nipples, please refer to page 11 of reference catalogue "Profile rail guides LLT" 07061/3 EN.

Size	Assembly dimensions			Carriage dimensions									
	W ₁	N	H	H ₂	H ₃	L ₁	L ₂	L ₃	L ₄	W ₃	H ₄	H ₅	S ₂
–	mm												
15	34	9,5	28	7,8	4,6	62	40	26	15	26	7,5	8,3	M4
25	48	12,5	40	12,2	7	82	57	35	16,6	35	10	10,5	M6
30	60	16	45	14,3	9	100,4	67,4	40	14,6	40	11,2	11	M8
35	70	18	55	18	9,5	114	77	50	14,6	50	17	15	M8
45	86	20,5	70	20,9	14	135	96	60	14,6	60	20,5	18,5	M10

Size	Rail dimensions									Weight		Load ratings ¹⁾		Moments ¹⁾			
	W	H ₁	H ₆	F	D ₁	D ₂	E _{min} -0,75	E _{max} -0,75	L _{max} -1,5	Carriage	Rail	dynamic C	static C ₀	dynamic M _C 	static M _{C0} 	dynamic M _{A/B} 	static M _{A0/B0} 
–	mm									kg	kg/m	N		Nm			
15	15	14	8,5	60	4,5	7,5	10	50	3 920	0,19	1,4	8 400	15 400	56	103	49	90
25	23	22	12,3	60	7	11	10	50	3 920	0,45	3,3	18 800	30 700	194	316	155	254
30	28	26	13,8	80	9	14	12	70	3 944	0,91	4,8	26 100	41 900	329	528	256	410
35	34	29	17	80	9	14	12	70	3 944	1,5	6,6	34 700	54 650	535	842	388	611
45	45	38	20,8	105	14	20	16	90	3 917	2,3	11,3	59 200	91 100	1 215	1 869	825	1 270

¹⁾ Dynamic load capacities and moments are based on a travel life of 100 km. Please refer to publication 07061 for further details.

2 Linear guides
Profile rail guides

Carriage LLTHC .. LR

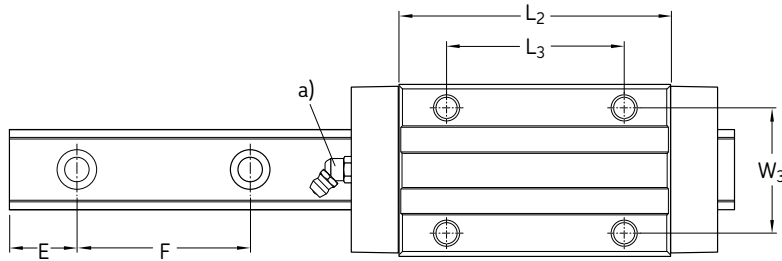
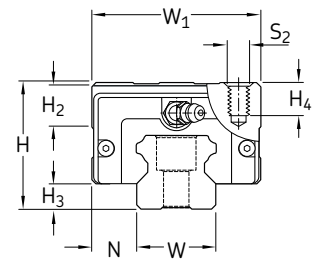
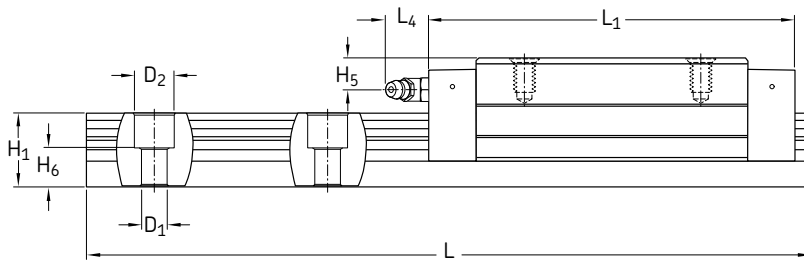
Slim-line carriage, extended length,
extended height (fig. 22)

Fig. 22



Size ¹⁾	Accuracy class ²⁾	Designation ³⁾		
		Preload class	T1	T2
–		T0		
		–		
20	P5	LLTHC 20 LR T0 P5	LLTHC 20 LR T1 P5	LLTHC 20 LR T2 P5
	P3	LLTHC 20 LR T0 P3	LLTHC 20 LR T1 P3	LLTHC 20 LR T2 P3
	▶ P1		LLTHC 20 LR T1 P1	LLTHC 20 LR T2 P1
25	P5	LLTHC 25 LR T0 P5	LLTHC 25 LR T1 P5	LLTHC 25 LR T2 P5
	P3	LLTHC 25 LR T0 P3	LLTHC 25 LR T1 P3	LLTHC 25 LR T2 P3
	▶ P1		LLTHC 25 LR T1 P1	LLTHC 25 LR T2 P1
30	P5	LLTHC 30 LR T0 P5	LLTHC 30 LR T1 P5	LLTHC 30 LR T2 P5
	P3	LLTHC 30 LR T0 P3	LLTHC 30 LR T1 P3	LLTHC 30 LR T2 P3
	▶ P1		LLTHC 30 LR T1 P1	LLTHC 30 LR T2 P1
35	P5	LLTHC 35 LR T0 P5	LLTHC 35 LR T1 P5	LLTHC 35 LR T2 P5
	P3	LLTHC 35 LR T0 P3	LLTHC 35 LR T1 P3	LLTHC 35 LR T2 P3
	▶ P1		LLTHC 35 LR T1 P1	LLTHC 35 LR T2 P1
45	P5	LLTHC 45 LR T0 P5	LLTHC 45 LR T1 P5	LLTHC 45 LR T2 P5
	P3	LLTHC 45 LR T0 P3	LLTHC 45 LR T1 P3	LLTHC 45 LR T2 P3
	▶ P1		LLTHC 45 LR T1 P1	LLTHC 45 LR T2 P1
¹⁾ Front seal appearance can slightly deviate per size.				
²⁾ ▶ P1 only available as system.				
³⁾ ■ Preferred range. For system designation, please refer to designation system on page 61.				

Carriage LLTHC .. LR



a) For detailed informations on grease nipples, please refer to page 11 of reference catalogue "Profile rail guides LLT" 07061/3 EN.

Size	Assembly dimensions			Carriage dimensions									
	W ₁	N	H	H ₂	H ₃	L ₁	L ₂	L ₃	L ₄	W ₃	H ₄	H ₅	S ₂
–	mm												
20	44	12	30	8,3	5	88,2	66,2	50	15	32	6,5	5,7	M5
25	48	12,5	40	12,2	7	104,1	79,1	50	16,6	35	10	10,5	M6
30	60	16	45	14,3	9	125,4	92,4	60	14,6	40	11,2	11	M8
35	70	18	55	18	9,5	142,5	105,5	72	14,6	50	17	15	M8
45	86	20,5	70	20,9	14	167	128	80	14,6	60	20,5	18,5	M10

Size	Rail dimensions									Weight Carriage	Rail	Load ratings ¹⁾		Moments ¹⁾			
	W	H ₁	H ₆	F	D ₁	D ₂	E _{min} -0,75	E _{max} -0,75	L _{max} -1,5			dynamic C	static C ₀	dynamic 	static 	dynamic 	static 
–	mm									kg	kg/m	N		Nm			
20	20	18	9,3	60	6	9,5	10	50	3 920	0,47	2,3	15 200	32 700	137	295	150	322
25	23	22	12,3	60	7	11	10	50	3 920	0,56	3,3	24 400	44 600	252	460	287	525
30	28	26	13,8	80	9	14	12	70	3 944	1,2	4,8	33 900	60 800	428	767	466	836
35	34	29	17	80	9	14	12	70	3 944	1,9	6,6	45 000	79 400	694	1 224	706	1 246
45	45	38	20,8	105	14	20	16	90	3 917	2,8	11,3	72 400	121 400	1 485	2 491	1 376	2 308

¹⁾ Dynamic load capacities and moments are based on a travel life of 100 km. Please refer to publication 07061 for further details.

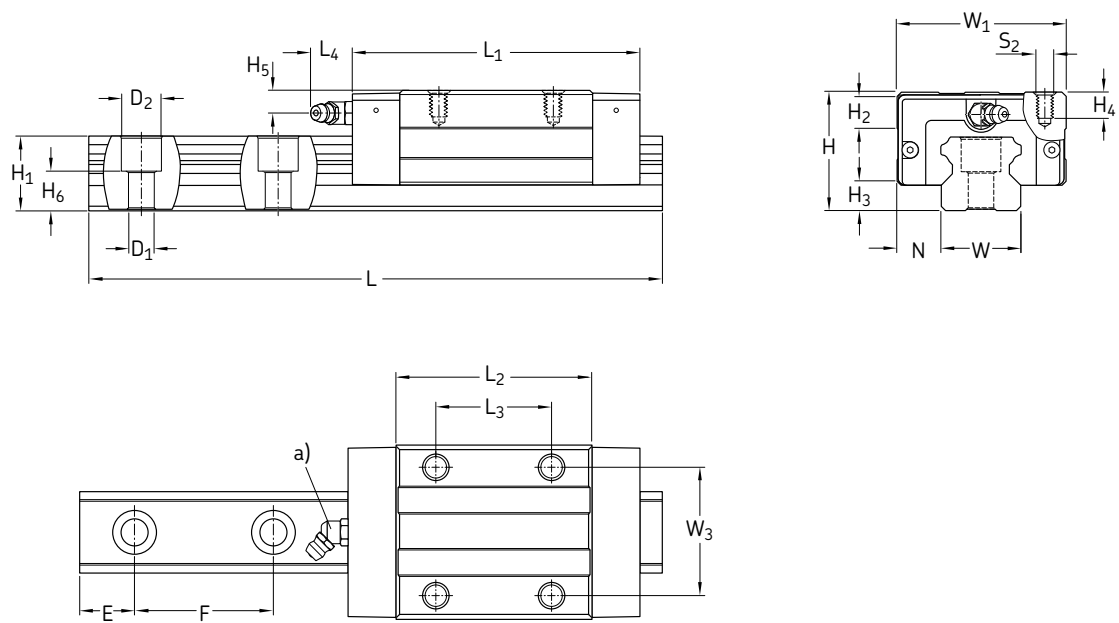
2 Linear guides
Profile rail guides

Carriage LLTHC .. U
Slim-line carriage, standard length,
standard height (**fig. 23**)



Fig. 23

Size ¹⁾	Accuracy class ²⁾	Designation ³⁾		
		Preload class	T1	T2
–		T0		
		–		
15	P5	LLTHC 15 U T0 P5	LLTHC 15 U T1 P5	LLTHC 15 U T2 P5
	P3	LLTHC 15 U T0 P3	LLTHC 15 U T1 P3	LLTHC 15 U T2 P3
	► P1		LLTHC 15 U T1 P1	LLTHC 15 U T2 P1
20	P5	LLTHC 20 U T0 P5	LLTHC 20 U T1 P5	LLTHC 20 U T2 P5
	P3	LLTHC 20 U T0 P3	LLTHC 20 U T1 P3	LLTHC 20 U T2 P3
	► P1		LLTHC 20 U T1 P1	LLTHC 20 U T2 P1
25	P5	LLTHC 25 U T0 P5	LLTHC 25 U T1 P5	LLTHC 25 U T2 P5
	P3	LLTHC 25 U T0 P3	LLTHC 25 U T1 P3	LLTHC 25 U T2 P3
	► P1		LLTHC 25 U T1 P1	LLTHC 25 U T2 P1
30	P5	LLTHC 30 U T0 P5	LLTHC 30 U T1 P5	LLTHC 30 U T2 P5
	P3	LLTHC 30 U T0 P3	LLTHC 30 U T1 P3	LLTHC 30 U T2 P3
	► P1		LLTHC 30 U T1 P1	LLTHC 30 U T2 P1
35	P5	LLTHC 35 U T0 P5	LLTHC 35 U T1 P5	LLTHC 35 U T2 P5
	P3	LLTHC 35 U T0 P3	LLTHC 35 U T1 P3	LLTHC 35 U T2 P3
	► P1		LLTHC 35 U T1 P1	LLTHC 35 U T2 P1
45	P5	LLTHC 45 U T0 P5	LLTHC 45 U T1 P5	LLTHC 45 U T2 P5
	P3	LLTHC 45 U T0 P3	LLTHC 45 U T1 P3	LLTHC 45 U T2 P3
	► P1		LLTHC 45 U T1 P1	LLTHC 45 U T2 P1
¹⁾ Front seal appearance can slightly deviate per size.				
²⁾ ► P1 only available as system.				
³⁾ ■ Preferred range. For system designation, please refer to designation system on page 61.				



a) For detailed informations on grease nipples, please refer to page 11 of reference catalogue "Profile rail guides LLT" 07061/3 EN.

Size	Assembly dimensions			Carriage dimensions									
	W ₁	N	H	H ₂	H ₃	L ₁	L ₂	L ₃	L ₄	W ₃	H ₄	H ₅	S ₂
–	mm												
15	34	9,5	24	4,2	4,6	62	40	26	4,3	26	3,8	4,3	M4
20	44	12	30	8,3	5	72	50	36	15	32	6,5	5,7	M5
25	48	12,5	36	8,2	7	82	57	35	16,6	35	6,5	6,5	M6
30	60	16	42	11,3	9	100,4	67,4	40	14,6	40	8,5	8	M8
35	70	18	48	11	9,5	114	77	50	14,6	50	10	8	M8
45	86	20,5	60	10,9	14	135	96	60	14,6	60	12	8,5	M10

Size	Rail dimensions									Weight		Load ratings ¹⁾		Moments ¹⁾			
	W	H ₁	H ₆	F	D ₁	D ₂	E _{min} -0,75	E _{max} -0,75	L _{max} -1,5	Carriage	Rail	dynamic C	static C ₀	dynamic M _C 	static M _{C0} 	dynamic M _{A/B} 	static M _{A0/B0}
–	mm									kg	kg/m	N		Nm			
15	15	14	8,5	60	4,5	7,5	10	50	3 920	0,17	1,4	8 400	15 400	56	103	49	90
20	20	18	9,3	60	6	9,5	10	50	3 920	0,26	2,3	12 400	24 550	112	221	90	179
25	23	22	12,3	60	7	11	10	50	3 920	0,38	3,3	18 800	30 700	194	316	155	254
30	28	26	13,8	80	9	14	12	70	3 944	0,81	4,8	26 100	41 900	329	528	256	410
35	34	29	17	80	9	14	12	70	3 944	1,2	6,6	34 700	54 650	535	842	388	611
45	45	38	20,8	105	14	20	16	90	3 917	2,1	11,3	59 200	91 100	1 215	1 869	825	1 270

¹⁾ Dynamic load capacities and moments are based on a travel life of 100 km. Please refer to publication 07061 for further details.

2 Linear guides
Profile rail guides

Carriage LLTHC .. SU
Slim-line carriage, short length,
standard height (**fig. 24**)

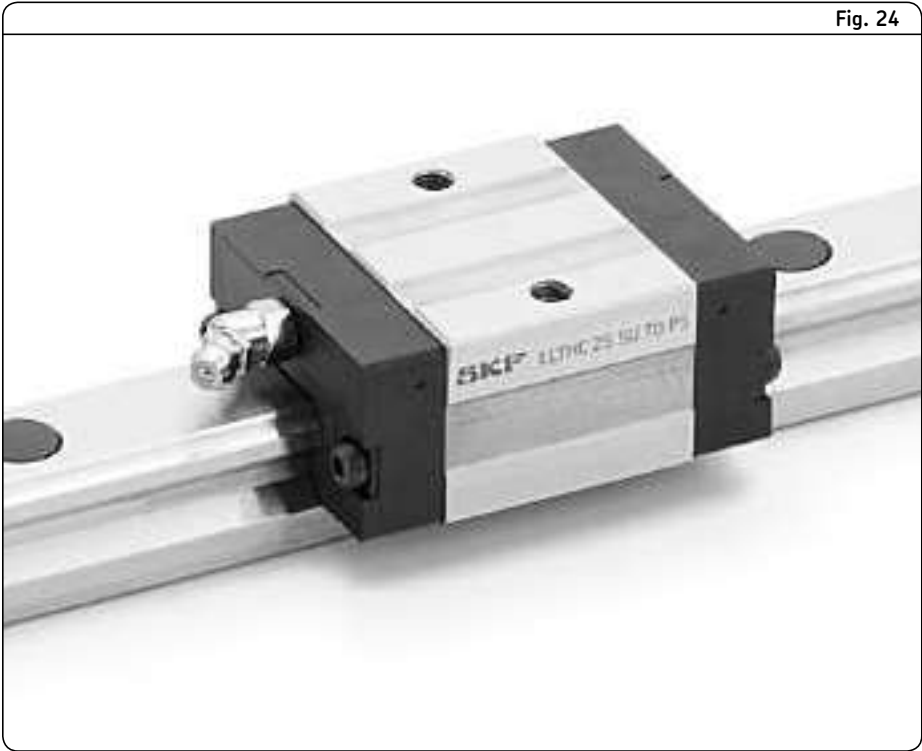
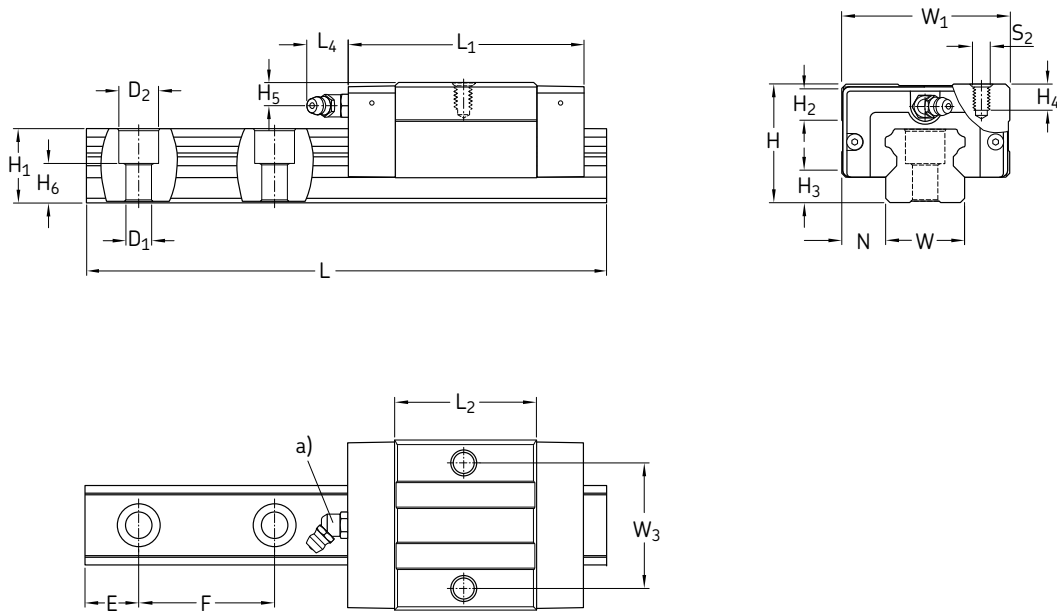


Fig. 24

Size ¹⁾	Accuracy class ²⁾	Designation ³⁾	
		Preload class	
		T0	T1
–		–	
15	P5	LLTHC 15 SU T0 P5	LLTHC 15 SU T1 P5
	P3	LLTHC 15 SU T0 P3	LLTHC 15 SU T1 P3
	► P1		LLTHC 15 SU T1 P1
20	P5	LLTHC 20 SU T0 P5	LLTHC 20 SU T1 P5
	P3	LLTHC 20 SU T0 P3	LLTHC 20 SU T1 P3
	► P1		LLTHC 20 SU T1 P1
25	P5	LLTHC 25 SU T0 P5	LLTHC 25 SU T1 P5
	P3	LLTHC 25 SU T0 P3	LLTHC 25 SU T1 P3
	► P1		LLTHC 25 SU T1 P1
30	P5	LLTHC 30 SU T0 P5	LLTHC 30 SU T1 P5
	P3	LLTHC 30 SU T0 P3	LLTHC 30 SU T1 P3
	► P1		LLTHC 30 SU T1 P1
35	P5	LLTHC 35 SU T0 P5	LLTHC 35 SU T1 P5
	P3	LLTHC 35 SU T0 P3	LLTHC 35 SU T1 P3
	► P1		LLTHC 35 SU T1 P1

¹⁾ Front seal appearance can slightly deviate per size.
²⁾ ► P1 only available as system.
³⁾ ■ Preferred range. For system designation, please refer to designation system on page 61.



a) For detailed informations on grease nipples, please refer to page 11 of reference catalogue "Profile rail guides LLT" 07061/3 EN.

Size	Assembly dimensions			Carriage dimensions								
	W ₁	N	H	H ₂	H ₃	L ₁	L ₂	L ₄	W ₃	H ₄	H ₅	S ₂
–	mm											
15	34	9,5	24	4,2	4,6	47,6	25,6	4,3	26	3,8	4,3	M4
20	44	12	30	8,3	5	54,1	32,1	15	32	6,5	5,7	M5
25	48	12,5	36	8,2	7	63,8	38,8	16,6	35	6,5	6,5	M6
30	60	16	42	11,3	9	78	45	14,6	40	8,5	8	M8
35	70	18	48	11	9,5	88,4	51,4	14,6	50	10	8	M8

Size	Rail dimensions									Weight		Load ratings ¹⁾		Moments ¹⁾		dynamic	static
	W	H ₁	H ₆	F	D ₁	D ₂	E _{min} -0,75	E _{max} -0,75	L _{max} -1,5	Carriage	Rail	dynamic C	static C ₀	dynamic M _C 	static M _{C0} 		
–	mm									kg	kg/m	N		Nm			
15	15	14	8,5	60	4,5	7,5	10	50	3 920	0,1	1,4	5 800	9 000	39	60	21	32
20	20	18	9,3	60	6	9,5	10	50	3 920	0,17	2,3	9 240	14 400	83	130	41	64
25	23	22	12,3	60	7	11	10	50	3 920	0,21	3,3	13 500	19 600	139	202	73	106
30	28	26	13,8	80	9	14	12	70	3 944	0,48	4,8	19 200	26 600	242	335	120	166
35	34	29	17	80	9	14	12	70	3 944	0,8	6,6	25 500	34 800	393	536	182	248

¹⁾ Dynamic load capacities and moments are based on a travel life of 100 km. Please refer to publication 07061 for further details.

2 Linear guides
Profile rail guides

LLTHR rails

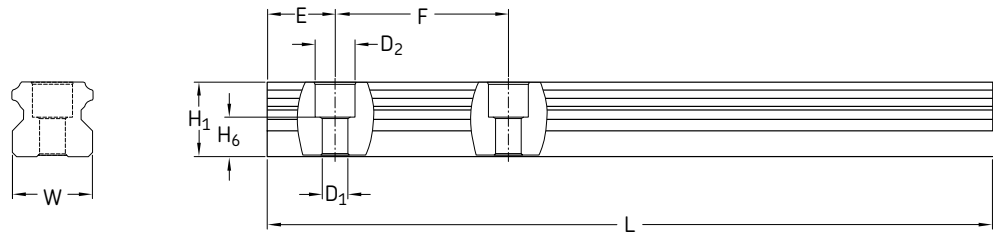
For mounting from above, supplied with protective plastic caps as standard (fig. 25).

Note:
If a rail length is required that exceeds the maximum length available, joined rails can be ordered. These rails are manufactured to match seamlessly to each other.



Standard rail size	Accuracy class ¹⁾	Designations ²⁾		Pitch
		One-piece rail	Multi-piece rail	
–		–		F mm
15	P5	LLTHR 15 – ... P5	LLTHR 15 – ... P5 A	60
	P3	LLTHR 15 – ... P3	LLTHR 15 – ... P3 A	
	▶ P1	LLTHR 15 – ... P1	LLTHR 15 – ... P1 A	
20	P5	LLTHR 20 – ... P5	LLTHR 20 – ... P5 A	60
	P3	LLTHR 20 – ... P3	LLTHR 20 – ... P3 A	
	▶ P1	LLTHR 20 – ... P1	LLTHR 20 – ... P1 A	
25	P5	LLTHR 25 – ... P5	LLTHR 25 – ... P5 A	60
	P3	LLTHR 25 – ... P3	LLTHR 25 – ... P3 A	
	▶ P1	LLTHR 25 – ... P1	LLTHR 25 – ... P1 A	
30	P5	LLTHR 30 – ... P5	LLTHR 30 – ... P5 A	80
	P3	LLTHR 30 – ... P3	LLTHR 30 – ... P3 A	
	▶ P1	LLTHR 30 – ... P1	LLTHR 30 – ... P1 A	
35	P5	LLTHR 35 – ... P5	LLTHR 35 – ... P5 A	80
	P3	LLTHR 35 – ... P3	LLTHR 35 – ... P3 A	
	▶ P1	LLTHR 35 – ... P1	LLTHR 35 – ... P1 A	
45	P5	LLTHR 45 – ... P5	LLTHR 45 – ... P5 A	105
	P3	LLTHR 45 – ... P3	LLTHR 45 – ... P3 A	
	▶ P1	LLTHR 45 – ... P1	LLTHR 45 – ... P1 A	

¹⁾ ▶ P1 only available as system.
²⁾ ■ Preferred range. For system designation, please refer to designation system on page 61.



Size	Dimensions									Weight
	W	H ₁	H ₆	D ₁	D ₂	E _{min} -0,75	E _{max} -0,75	F	L _{max} -1,5	
–	mm									kg/m
15	15	14	8,5	4,5	7,5	10	50	60	3 920	1,4
20	20	18	9,3	6	9,5	10	50	60	3 920	2,3
25	23	22	12,3	7	11	10	50	60	3 920	3,3
30	28	26	13,8	9	14	12	70	80	3 944	4,8
35	34	29	17	9	14	12	70	80	3 944	6,6
45	45	38	20,8	14	20	16	90	105	3 917	11,3

The “E” dimension designates the distance from the rail end to centre of the first attachment hole. If no customer-specific “E” dimension is provided with the order, the rails are produced according to the following formulae:

- Calculation of number of attachment holes in railguide:**
 - $$n_{\text{real}} = \frac{L}{F}$$

n_{real} = Real calculation value for number of hole distances
 L = Rail length
 F = Distance of attachment holes
 - Round down of n_{real} to n
 - $n + 1 = z$

z = Number of attachment holes in rail
- Determination of E-dimension based on z:**
 - $$E_{\text{real}} = \frac{[L - F \times (z - 1)]}{2}$$

E_{real} = Real calculation value for E-dimension
 E_{min} = Minimum E-dimension acc. to catalogue
- Comparison with catalogue value of E_{min} :**
 - If $E_{\text{real}} \geq E_{\text{min}}$ → Usage of E_{real} from formula (4)
 - If $E_{\text{real}} < E_{\text{min}}$ → Calculation of E_{real} acc. to formula (5)

$$(5) \quad E_{\text{real}} = \frac{[L - F \times (z - 2)]}{2}$$

2 Linear guides

Profile rail guides

LLTHR .. D4 rails

For mounting from below (fig. 26).

Note:

If a rail length is required that exceeds the maximum length available, joined rails can be ordered. These rails are manufactured to match seamlessly to each other.

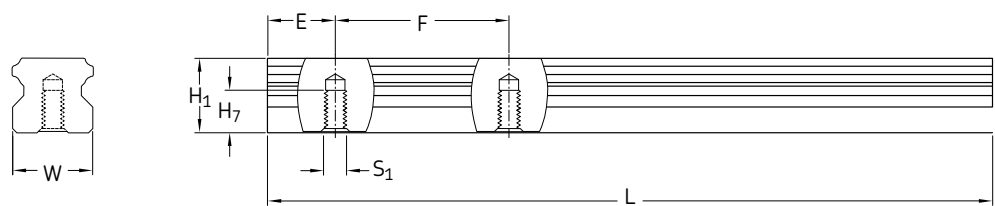
Fig. 26



Standard rail size	Accuracy class ¹⁾	Designations ²⁾		Pitch
		One-piece rail	Multi-piece rail	
–	–	–	–	F mm
15	P5 D4	LLTHR 15 – ... P5 D4	LLTHR 15 – ... P5 A D4	60
	P3 D4	LLTHR 15 – ... P3 D4	LLTHR 15 – ... P3 A D4	
	▶ P1 D4	LLTHR 15 – ... P1 D4	LLTHR 15 – ... P1 A D4	
20	P5 D4	LLTHR 20 – ... P5 D4	LLTHR 20 – ... P5 A D4	60
	P3 D4	LLTHR 20 – ... P3 D4	LLTHR 20 – ... P3 A D4	
	▶ P1 D4	LLTHR 20 – ... P1 D4	LLTHR 20 – ... P1 A D4	
25	P5 D4	LLTHR 25 – ... P5 D4	LLTHR 25 – ... P5 A D4	60
	P3 D4	LLTHR 25 – ... P3 D4	LLTHR 25 – ... P3 A D4	
	▶ P1 D4	LLTHR 25 – ... P1 D4	LLTHR 25 – ... P1 A D4	
30	P5 D4	LLTHR 30 – ... P5 D4	LLTHR 30 – ... P5 A D4	80
	P3 D4	LLTHR 30 – ... P3 D4	LLTHR 30 – ... P3 A D4	
	▶ P1 D4	LLTHR 30 – ... P1 D4	LLTHR 30 – ... P1 A D4	
35	P5 D4	LLTHR 35 – ... P5 D4	LLTHR 35 – ... P5 A D4	80
	P3 D4	LLTHR 35 – ... P3 D4	LLTHR 35 – ... P3 A D4	
	▶ P1 D4	LLTHR 35 – ... P1 D4	LLTHR 35 – ... P1 A D4	
45	P5 D4	LLTHR 45 – ... P5 D4	LLTHR 45 – ... P5 A D4	105
	P3 D4	LLTHR 45 – ... P3 D4	LLTHR 45 – ... P3 A D4	
	▶ P1 D4	LLTHR 45 – ... P1 D4	LLTHR 45 – ... P1 A D4	

¹⁾ ▶ P1 only available as system.

²⁾ ■ Preferred range. For system designation, please refer to designation system on page 61.



Size	Dimensions								Weight
	W	H ₁	H ₇	S ₁	E _{min} -0,75	E _{max} -0,75	F	L _{max} -1,5	
–	mm								kg/m
15	15	14	8	M5	10	50	60	3 920	1,4
20	20	18	10	M6	10	50	60	3 920	2,4
25	23	22	12	M6	10	50	60	3 920	3,4
30	28	26	15	M8	12	70	80	3 944	5,0
35	34	29	17	M8	12	70	80	3 944	6,8
45	45	38	24	M12	16	90	105	3 917	11,8

The “E” dimension designates the distance from the rail end to centre of the first attachment hole. If no customer-specific “E” dimension is provided with the order, the rails are produced according to the following formulae:

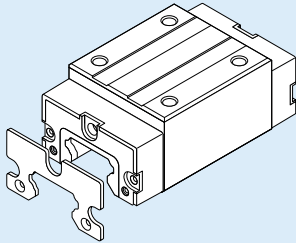
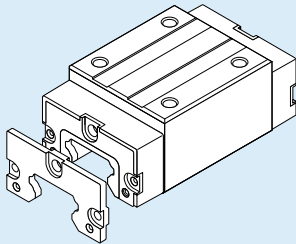
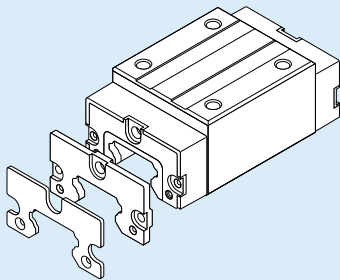
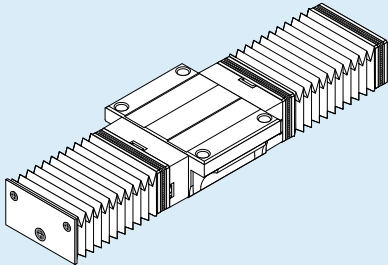
- Calculation of number of attachment holes in railguide:**
 - $$n_{\text{real}} = \frac{L}{F}$$

n_{real} = Real calculation value for number of hole distances
 L = Rail length
 F = Distance of attachment holes
 - Round down of n_{real} to n
 - $n + 1 = z$

z = Number of attachment holes in rail
- Determination of E-dimension based on z:**
 - $$E_{\text{real}} = \frac{[L - F \times (z - 1)]}{2}$$

E_{real} = Real calculation value for E-dimension
 E_{min} = Minimum E-dimension acc. to catalogue
- Comparison with catalogue value of E_{min} :**
 - If $E_{\text{real}} \geq E_{\text{min}}$ → Usage of E_{real} from formula (4)
 - If $E_{\text{real}} < E_{\text{min}}$ → Calculation of E_{real} acc. to formula (5)
- $$E_{\text{real}} = \frac{[L - F \times (z - 2)]}{2}$$

Accessories

Accessories		
Item name	Illustration ¹⁾	Purpose
Scraper plate		Scraper plates are spring-steel, non-contact components. They protect the front seal from, for example, coarse contaminants or hot metal chips.
Additional front seal		Additional front seals are contact seals that can be attached to the carriage end faces. They are single-lip seals consisting of special heavy-duty material and offer additional protection against liquids and smaller contaminants.
Seal kit		The seal kit consists of a metal scraper and an additional front seal. It is intended for applications involving exposure to coarse and fine dirt as well as liquids.
Bellows		Bellows protect the entire system against solid and liquid contaminants from above. They are suitable for highly contaminated environments like machining centres in the woodworking and metals industries.
¹⁾ Illustrations show size 35. Appearance can vary slightly depending on the size.		

Scraper plate

- Material: spring steel according to DIN EN 10088
- Appearance: black
- Designed with a specified maximum gap of 0,2 to 0,3 mm

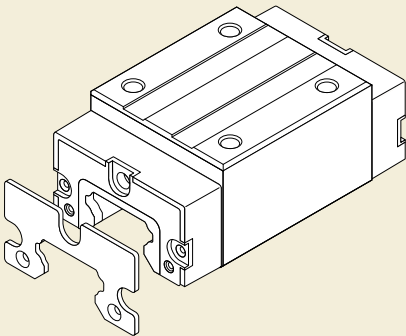
Mounting

Mounting screws are supplied as standard. When mounting, be sure there is an even space between the rail and scraper plate.

Note:

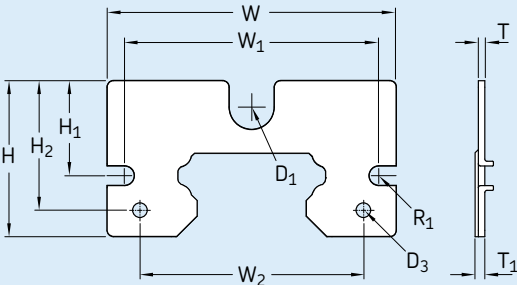
Can be ordered in combination with an additional front seal as a kit, using the designation LLTHZ ... S3.

Scraper plate



¹⁾ Illustrations show size 35. Appearance can vary slightly depending on the size.

Scraper plate



Size	Part designation	Dimensions										
		D ₁	D ₃ ¹⁾	R ₁	W	W ₁	W ₂	H	H ₁	H ₂	T	T ₁ max
–	–	mm										
15	LLTHZ 15 S1	3,6	–	1,75	31,6	25,8	–	18,5	12	–	1,5	1,8
20	LLTHZ 20 S1	5,5	–	1,75	42,6	35	–	24,2	14,8	–	1,5	1,8
25	LLTHZ 25 S1	5,5	–	2,25	46,6	39,6	–	27,7	16,8	–	1,5	1,8
30	LLTHZ 30 S1	6,5	–	1,75	57	50	–	30,4	19,3	–	1,5	1,8
35	LLTHZ 35 S1	6,5	3,4	2,25	67,3	59,2	52	36,3	22,1	30,1	1,5	1,8
45	LLTHZ 45 S1	6,5	3,4	2,75	83,3	72	67	44,2	27,5	38,3	1,5	1,8

¹⁾ If longer grease nipple and screws are needed, they are included.

2 Linear guides
Profile rail guides

Additional front seal

- Material: Elastomer
- Design: single-lip seal

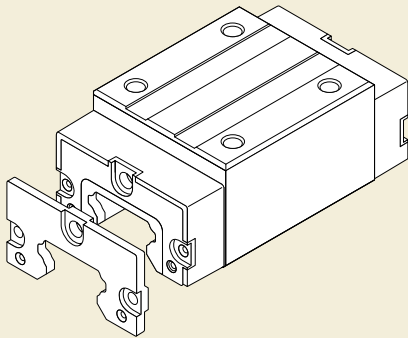
Mounting

Mounting screws are supplied as standard.

Note:

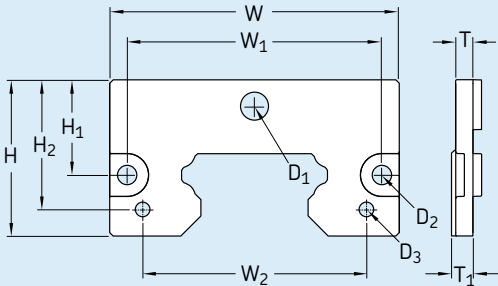
Can be ordered in combination with a scraper plate as a kit, using the designation LLTHZ ... S3.

Additional front seal



¹⁾ Illustrations show size 35. Appearance can vary slightly depending on the size.

Additional front seal



Size	Part designation	Dimensions										
		D ₁	D ₂	D ₃ ¹⁾	W	W ₁	W ₂	H	H ₁	H ₂	T	T ₁
–	–	mm										
15	LLTHZ 15 S7	3,6	3,4	–	31,6	25,8	–	18,5	12	–	3	4
20	LLTHZ 20 S7	5,5	3,4	–	42,6	35	–	24,2	14,8	–	3	4
25	LLTHZ 25 S7	5,5	4,5	–	46,6	39,6	–	27,7	16,8	–	3	4
30	LLTHZ 30 S7	6,5	3,4	–	57,9	50	–	31,5	19,3	–	4	5
35	LLTHZ 35 S7	6,5	4,5	3,4	67,3	59,2	52	36,3	22,1	30,1	4	5
45	LLTHZ 45 S7	6,5	5,5	3,4	83,3	72	67	44,2	27,5	38,3	4	5

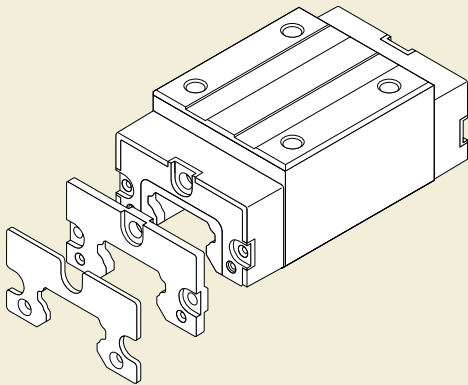
¹⁾ If longer grease nipple and screws are needed, they are included.

Seal kit

The seal kit consists of the following components:

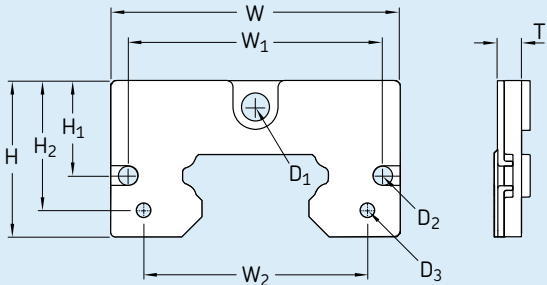
- Scraper plate
- Additional front seal

Seal kit



¹⁾ Illustrations show size 35. Appearance can vary slightly depending on the size.

Seal kit



Size	Part designation	Dimensions									
		D ₁	D ₂	D ₃ ¹⁾	W	W ₁	W ₂	H	H ₁	H ₂	T
–	–	mm									
15	LLTHZ 15 S3	3,6	3,4	–	31,6	25,8	–	18,5	12	–	4
20	LLTHZ 20 S3	5,5	3,4	–	42,6	35	–	24,2	14,8	–	4
25	LLTHZ 25 S3	5,5	4,5	–	46,6	39,6	–	27,7	16,8	–	4
30	LLTHZ 30 S3	6,5	3,4	–	57,9	50	–	31,5	19,3	–	5
35	LLTHZ 35 S3	6,5	4,5	3,4	67,3	59,2	52	36,3	22,1	30,1	5
45	LLTHZ 45 S3	6,5	5,5	3,4	83,3	72	67	44,2	27,5	38,3	5

¹⁾ If longer grease nipple and screws are needed, they are included.

Bellows

Temperature resistance

$t_{max} = 90\text{ }^{\circ}\text{C}$.
During continuous operation, the allowed temperature range is from -20 to $80\text{ }^{\circ}\text{C}$. Special materials for higher temperature resistance are available on request.

Material

Bellows are made of polyester fabric with a polyurethane coating. Adapter plates are made of aluminium.

Bellows kit contents (fig. 27)

- 1 Adapter plate
- 2 Grease nipple
- 3 Sealing ring
- 4 Set screw
- 5 Mounting screws
- 6 Bellows with all plates pre-assembled.

Note:
Rail ends need to be prepared with threaded holes

Fig. 27

Delivery scope

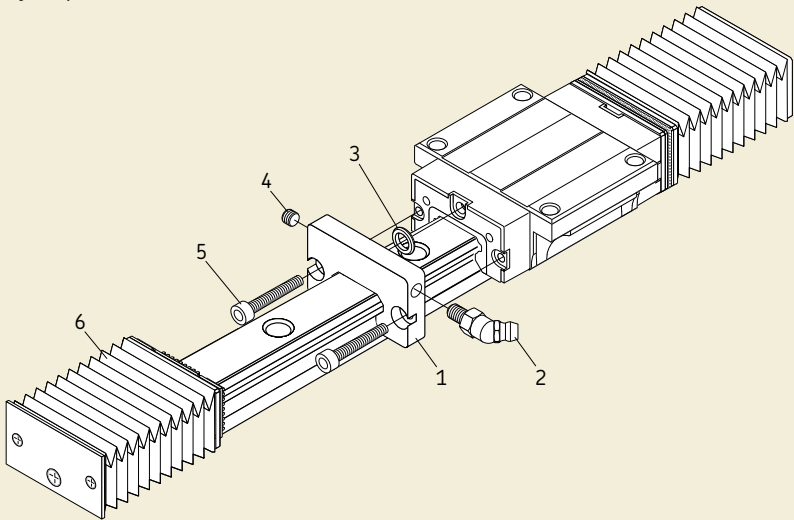
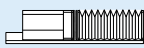
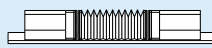


Table 14

Bellows designations¹⁾

Size	 Type 2 with fastening plate for the carriage and end plate for the rail	 Type 4 with two fastening plates for the carriages	 Type 9 loose bellows (spare part)
–	–	–	–
15	LLTHZ 15 B2 ..	LLTHZ 15 B4 ..	LLTHZ 15 ..
20	LLTHZ 20 B2 ..	LLTHZ 20 B4 ..	LLTHZ 20 ..
25	LLTHZ 25 B2 ..	LLTHZ 25 B4 ..	LLTHZ 25 ..
30	LLTHZ 30 B2 ..	LLTHZ 30 B4 ..	LLTHZ 30 ..
35	LLTHZ 35 B2 ..	LLTHZ 35 B4 ..	LLTHZ 35 ..
45	LLTHZ 45 B2 ..	LLTHZ 45 B4 ..	LLTHZ 45 ..

¹⁾ Replace “..” by number of folds per bellow.

Mounting

The bellows are partly pre-assembled. The mounting screws are supplied.

Note:

Prior to mounting, the grease nipples on the carriage must be removed.

For bellow arrangement type 2 (table 14), the end faces of the rails have to be equipped with threaded fixation holes.

Calculation of the bellows type 2¹⁾

$$n = \frac{L - L_A}{W_{4 \min} + W_{4 \max}} + 2$$

Calculation of the rail length

$$L = (n - 2) (W_{4 \min} + W_{4 \max}) + L_A$$

$$L_{\min} = n W_{4 \min}$$

$$L_{\max} = n W_{4 \max}$$

$$\text{Stroke} = n S_F$$

where

L_A = Carriage length L_1 (please refer to the dimension tables of the carriages) plus $2 \cdot 10$ mm for the adapter plates.

L = Rail length [mm]

$L_{\max}$ = Bellows stretched

$L_{\min}$ = Bellows pushed together

n = total number of folds per carriage side

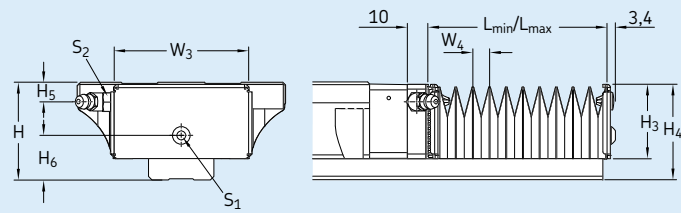
W_4 = maximum and minimum extension per fold

Stroke = Stroke [mm]

S_F = Stroke per fold (table 15)

Table 15

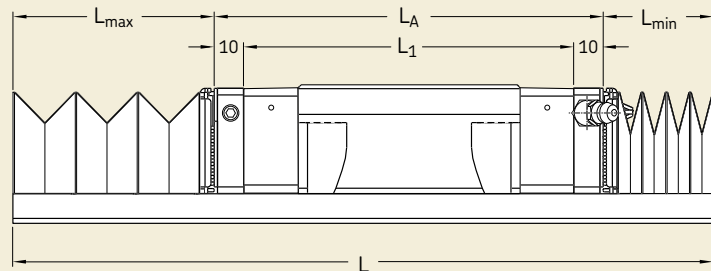
Dimensions of the bellows



Size	Dimensions											
	W_3	$H^1)$	$H^2)$	H_3	H_4	H_5	H_6	S_1	S_2	$W_{4 \min}$	$W_{4 \max}$	S_F
–	mm											
15	32	24	28	18,9	23,5	3,8	8,8	M4	M5	2,5	9,6	7,1
20	43	30	30	24,5	29,5	5,2	12	M4	M5	2,5	12	9,5
25	47	36	40	28	35	5,5	15,5	M4	M5	2,5	12	9,5
30	58	42	45	32	41	7	19	M4	M6	2,5	16,9	14,4
35	68	48	55	37	47	6,5	21,5	M4	M6	2,5	21	18,5
45	84	60	70	45	59	7,5	28,5	M4	M6	2,5	25,2	22,7

¹⁾ For carriages of type A, LA, U, SU

²⁾ For carriages of type R, LR



¹⁾ Calculation for maximum possible stroke.
Calculation of bellow type 4 on request, specifications on stroke length required.

2 Linear guides
Profile rail guides

Applications

In response to our customer’s ultimate need to produce more with less, SKF has

combined its knowledge and experience with the latest technology to develop solutions for your specific conditions. Whether your goal is to design equipment

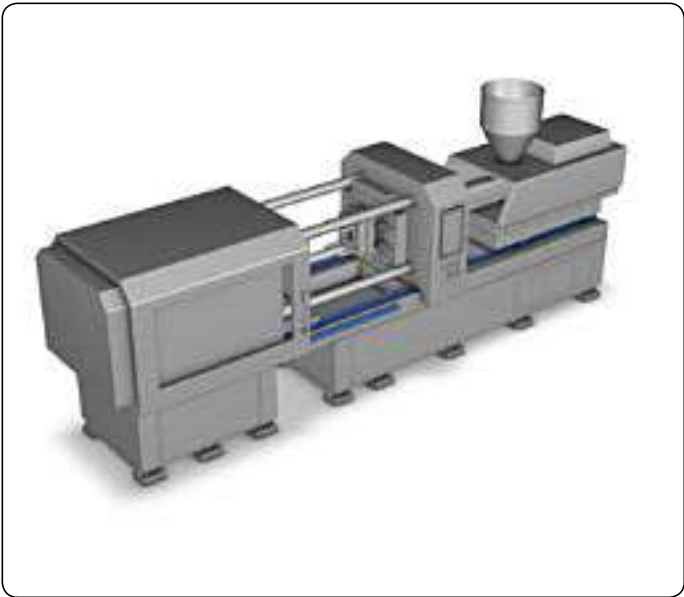
that provides more customer value, or to increase overall profitability, with SKF experience and expertise, you’re likely to find a real solution.

Woodworking



Components application
a) Profile rail guides
b) Precision ball screws

Plastic injection moulding



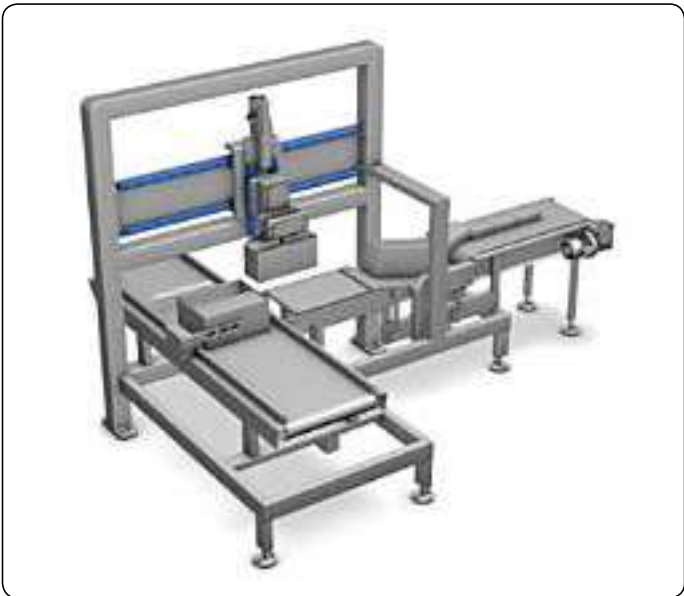
Components application
a) Profile rail guides

Handling



Components application
a) Profile rail guides

Packaging



Components application
a) Profile rail guides

Miniature profile rail guides

In response to the market trend for increased performance with a minimum of mounting space, SKF has extended its product range to miniature profile rail guides (**fig. 28**).

These linear guides are designed primarily for applications in precision mechanics, medical engineering, microassembly and the optics industry.

The close cooperation with numerous customers, combined with SKF's experience, has resulted in a range of miniature rail guides that set new standards. Especially when the mounting space is limited, SKF miniature profile rail guides are an excellent choice as they have a high load-carrying capacity combined with a compact design.

SKF offers its customers an excellent technical advisory service as well as a vast modular range to increase machine and installation performance.

SKF offers these profile rail guides in four sizes (7, 9, 12 and 15 mm) and various slide options to cover most application requirements.

Compact design: thanks to their simple structure, miniature profile rail guides are compact and economical. This small and lightweight product is very suitable for high-speed linear motion up to 3 m/s.

Long-life: gothic arch grooves at the raceway contacts enable the slide to sustain loads and moments from any direction. The raceway shape offers a large load capacity and a long lifetime due to the contact between the raceways and the balls.

Corrosion resistant: all parts of the system are made of stainless steel or plastic material and are thus resistant to corrosion.

Easy to maintain: oil holes in the end caps of the carriage make it easy to relubricate the system.

Structure: four-point contact ball recirculation system with identical load angles and 2 ball recirculation paths per carriage for unlimited stroke.

Range: four different types (7, 9, 12, 15) comprising different widths and carriage lengths (**fig. 29**).

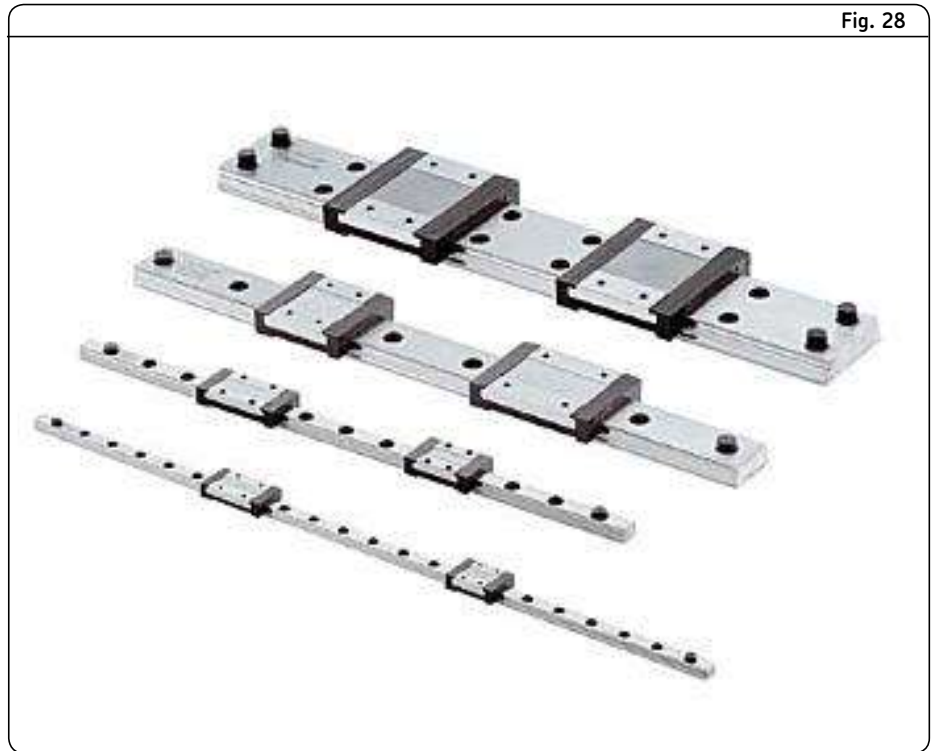


Fig. 28

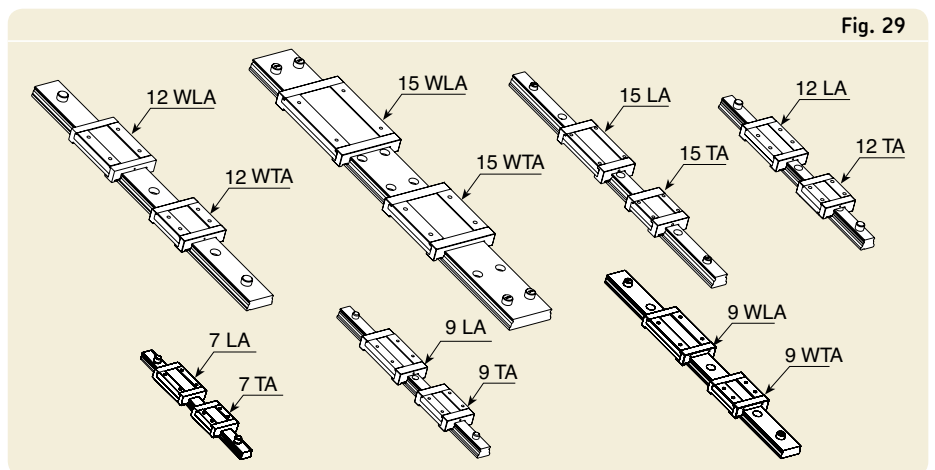


Fig. 29

2 Linear guides
Miniature profile rail guides

The preload possibilities for carriage are given in table 16, and the technical data in table 17.

Table 16

	T0*	T1*	T2*
TA	×	×	×
LA	×	×	×

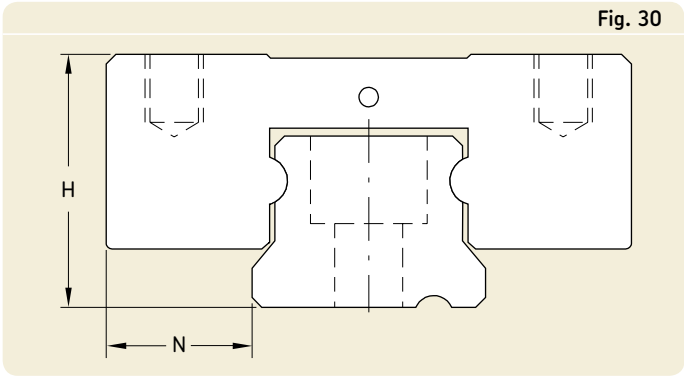
* T0 = standard – light preload
* T1 = medium preload
* T2 = heavy preload

Table 17

Rail material:	Stainless steel 1.4034
Carriage material:	Stainless steel 1.4034 with return zones of POM
Ball material:	Stainless steel 1.4034
Sealing material:	Desmopan
Temperature range:	from – 20 °C up to + 80 °C
Speed:	up to 3 m/s max.
Acceleration:	up to 80 m/s ² max.

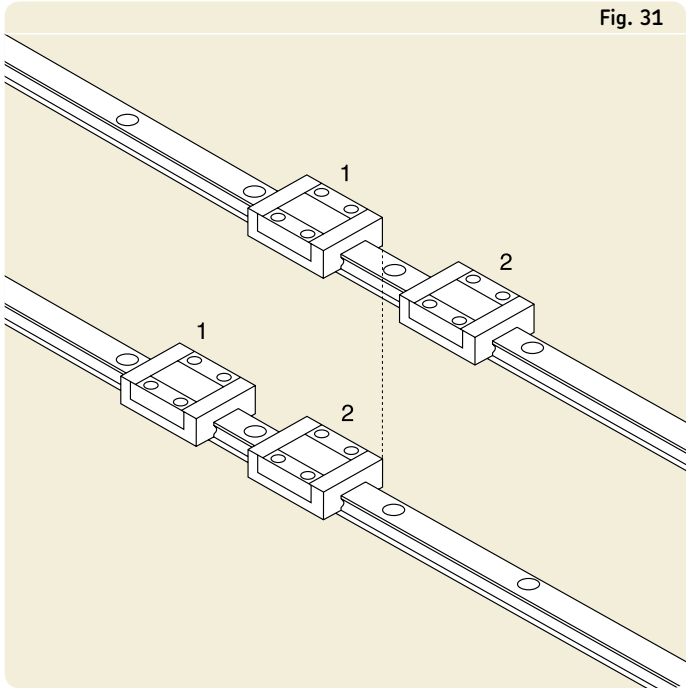
Preload possibilities for carriage

Technical data



System accuracy

The system accuracy (fig. 30) and the system tolerance (fig. 31) of different guidance systems are given in table 18.



System tolerance

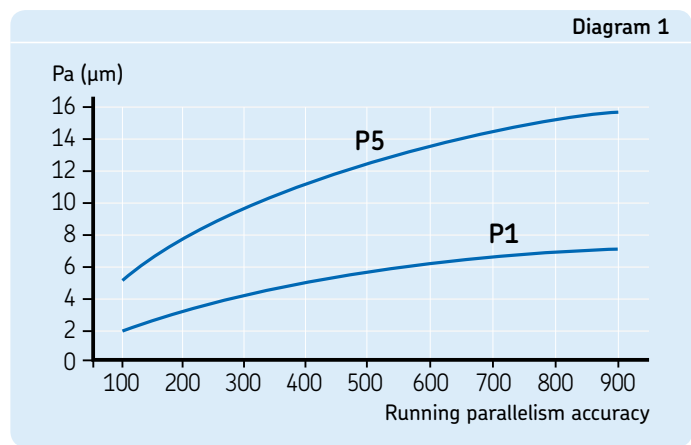
Table 18

Dimension		Class P1	P5
		µm	µm
H*	Dimension tolerance	± 10	± 20
N*	Dimension tolerance	± 15	± 25
ΔH ₁ **	Maximum tolerance for paired systems or carriages at identical rail position	± 7	± 15
ΔN**	Maximum tolerance for paired systems or carriages at identical rail position	± 7	± 15

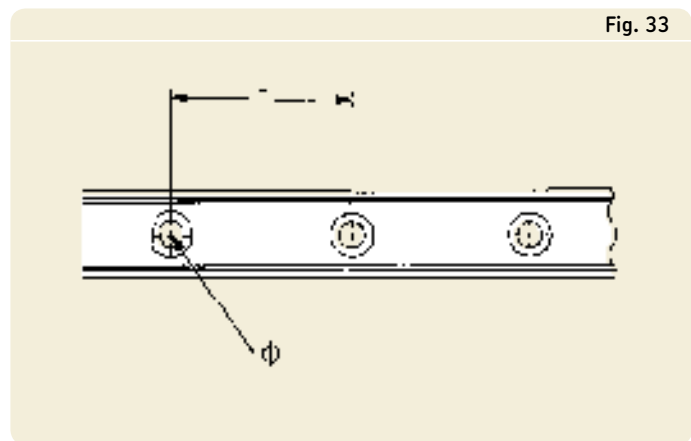
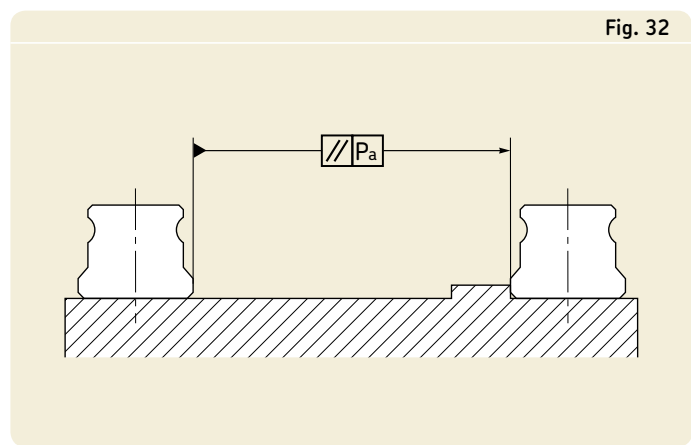
* The tolerances apply over the entire guide length for any combination of carriage and rail.
** The dimensions ΔH and ΔN relate to the ideal centre of the carriage. Each dimension is derived from the mean value of two measured points with identical centre distance.

System accuracy and tolerance of different guidance systems

The running parallelism accuracy in operation of paired systems are given in **diagram 1** and **fig. 32**.



The positioning (distance) tolerance of rail attachment holes can be seen in **figure 33**.



2 Linear guides
Miniature profile rail guides

Ordering key

LLM [] [] [] [] [] [] [] - [] [] [] [] E=0

Type

Rail type:
Standard rail H
Wide rail W

Product code:
System (rail + carriage) S
Rail R
Carriage C

Size:
7, 9, 12, 15

Carriage types:
Standard carriage TA
Long carriage LA

Option:
Carriage with seals R
Carriage without seal no sign

Number of carriages:
1, 2, C9, n

Preload:
Light clearance T0
Medium preload T1
Preloaded T2

Length of rail track:
Max 1 000 mm

Precision class:
Standard precision (suitable for most applications) P5
High precision P1

Number of rail track used in parallel:
One rail alone W1
Two rails in parallel W2

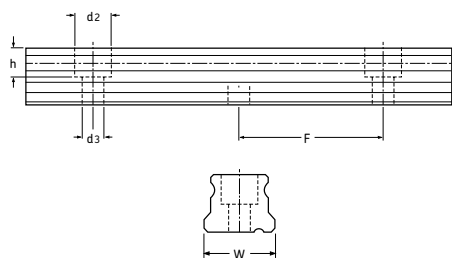
Auxiliary symbols:
Plastic end-stop no sign
Steel end-stop M

Distance between end face and the first hole (mm):
Symmetric holes standard E=0

Example: LLM H S 12 TA R 2 T0 - 700 P1 W2 M E=0

LLMHR

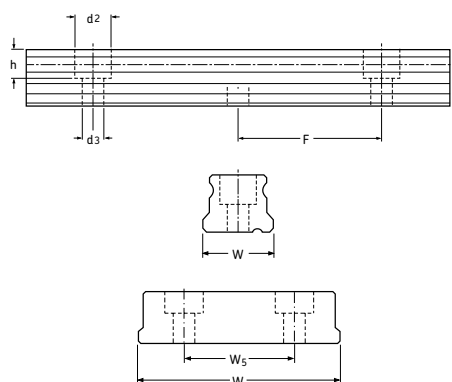
Standard rails



Designations	Dimensions					Max. length
	W	F	d ₂	d ₃	h	
	mm					
LLMHR 7	7	15	4,5	2,5	2,5	1 000
LLMHR 9	9	20	6	3,5	3,5	1 000
LLMHR 12	12	25	6	3,5	4,5	1 000
LLMHR 15	15	40	6	3,5	4,5	1 000

LLMWR

Wide rails

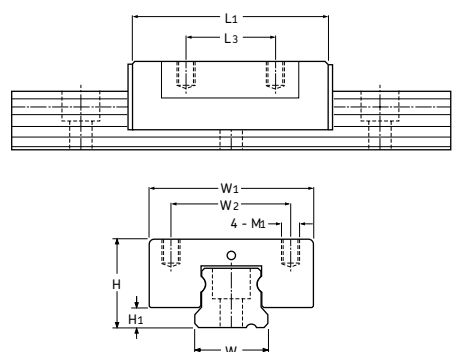


LLMWR .. 15 design

Designations	Dimensions						Max. length
	W	W ₅	F	d ₂	d ₃	h	
	mm						
LLMWR 9	18	0	30	6	3,5	4,5	1 000
LLMWR 12	24	0	40	8	4,5	4,5	1 000
LLMWR 15	42	23	40	8	4,5	4,5	1 000

LLMHC .. TA

Standard carriages

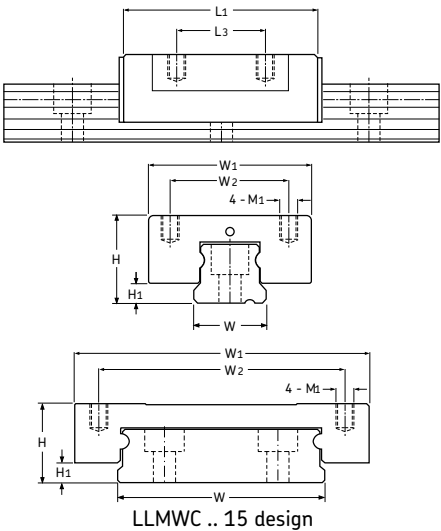


Designations	Dimensions								Load-carrying capacities	
	W	W ₁	W ₂	H	L ₁	L ₃	M ₁	H ₁	C	C ₀
	mm									
LLMHC 7 TA	7	17	12	8	22	8	M2×2,5	1,5	860	1 670
LLMHC 9 TA	9	20	15	10	30	10	M3×3	2	1 850	3 130
LLMHC 12 TA	12	27	20	13	33	15	M3×3,5	3	2 550	4 000
LLMHC 15 TA	15	32	25	16	41,5	20	M3×4	4	2 880	5 390

2 Linear guides
Miniature profile rail guides

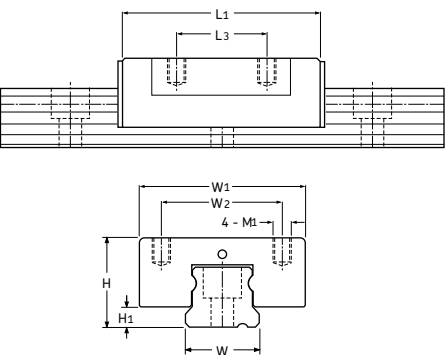
LLMWC .. TA

Carriages for wide rails



LLMHC .. LA

Long carriages



LLMWC .. LA

Long carriages for wide rails

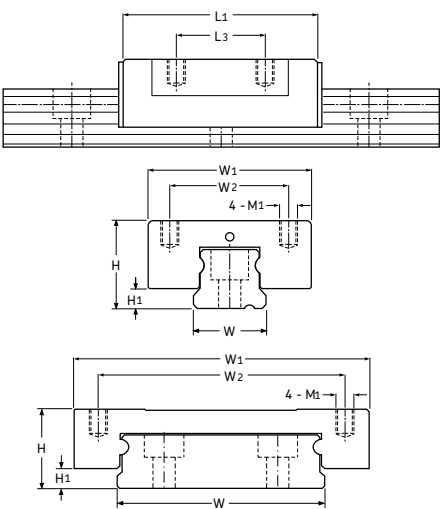


Table with 11 columns: Designations, Dimensions (W, W1, W2, H, L1, L3, M1, H1), and Load-carrying capacities (dynamic C, static C0). Rows include LLMWC 9 TA, LLMWC 12 TA, and LLMWC 15 TA.

Table with 11 columns: Designations, Dimensions (W, W1, W2, H, L1, L3, M1, H1), and Load-carrying capacities (dynamic C, static C0). Rows include LLMHC 7 LA, LLMHC 9 LA, LLMHC 12 LA, and LLMHC 15 LA.

Table with 11 columns: Designations, Dimensions (W, W1, W2, H, L1, L3, M1, H1), and Load-carrying capacities (dynamic C, static C0). Rows include LLMWC 9 LA, LLMWC 12 LA, and LLMWC 15 LA.

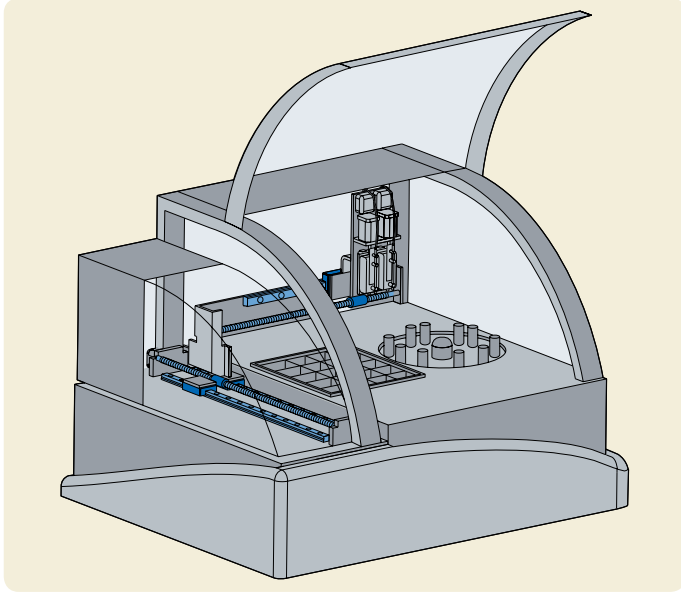
Applications

In response to our customer's ultimate need to produce more with less, SKF has

combined its knowledge and experience with the latest technology to develop solutions for your specific conditions. Whether your goal is to design equipment

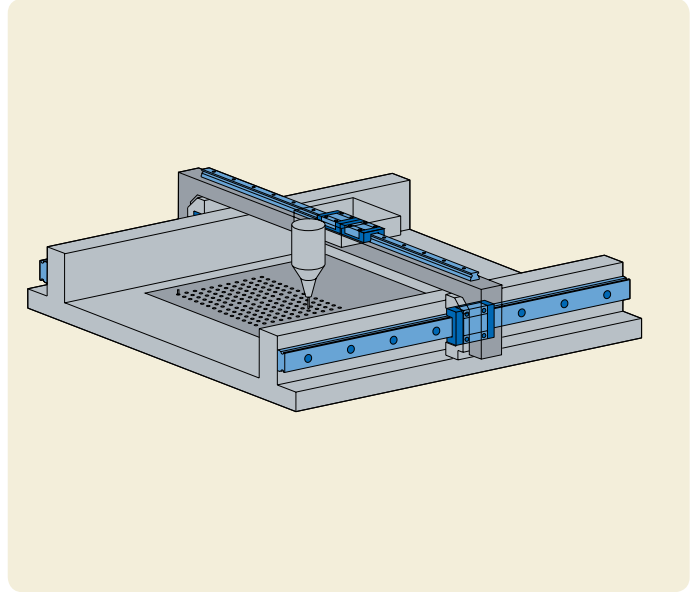
that provides more customer value, or to increase overall profitability, with SKF experience and expertise, you're likely to find a real solution.

Laboratory equipment



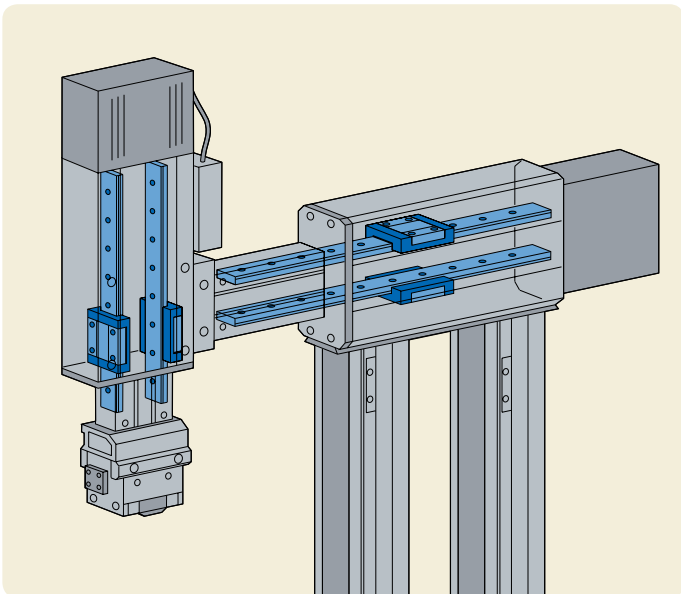
Components application
a) Miniature profile rail guides
b) Miniature ball screws
c) Miniature slides

PCB drilling and routing machine



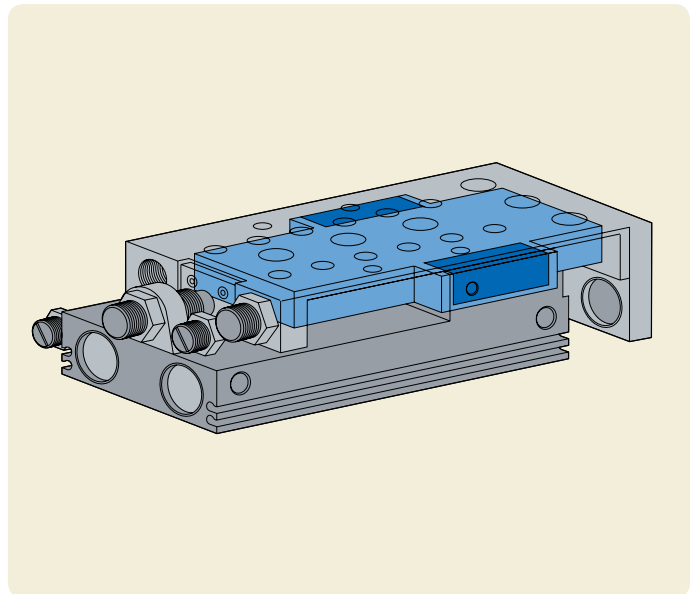
Components application
a) Miniature profile rail guides

Pick-and-place manipulators



Components application
a) Miniature profile rail guides

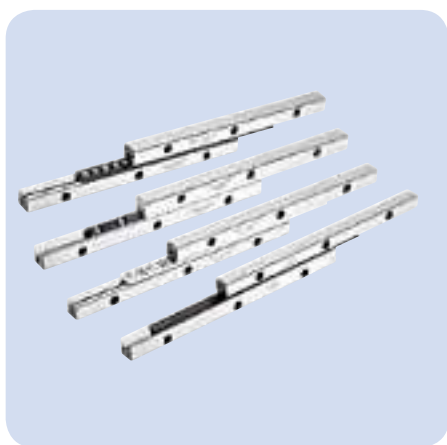
Pneumatic industry - Compact piston rod cylinder



Components application
a) Integrated miniature slides



More precision for more performance



Have you ever wondered how a bird's nest, which appears to be so fragile, can withstand the heaviest rain and strong winds? Birds can weave even the smallest twigs with great precision to form the supporting structure of the nest for the protection of their eggs and new-born chicks from the weather.

This small miracle of nature has given SKF the inspiration to create solutions to satisfy a wide variety of

requests for precision with micrometer accuracy products like precision rail guides, also available with a state-of-the-art anti-creep system. And precision slides are high quality tools for linear motion which are, ideally suited for uses in a wide range of applications where close tolerances are demanded.

SKF products are created to build the future.

Precision rail guides

Modular range rail guides

The modular range consists of a matrix range of rail guide modules which enable an individual choice of combinations of rails and rolling element assemblies. Different requirements for the guides do not call for changes in the design or mechanical environment. Selection of the adequate rail guide is made depending on the mechanical conditions of the application.

These operating requirements are covered by six different models (fig. 34) that may be defined as rail guides with:

- cross roller cages for the standard LWR series
- ball cages for the LWRB series
- cross roller cages for the optimised LWRE series
- cross roller cages with anti cage-creep system (ACSM) for the LWRE series
- needle roller cages for the LWRM/LWRV series and
- slide liners as raceways for the LWRPM/LWRPV series.

Precision rail guides are suitable for applications with limited strokes requiring high stiffness and positioning accuracy.

The modular range series of rails makes it possible to select internal design and/or rolling elements to suit application requirements without changing the envelope dimensions of the rails.

The modular rail range, which is completely interchangeable, is shown in table 19.

This range is suitable for applications with limited strokes requiring high stiffness and positioning accuracy.

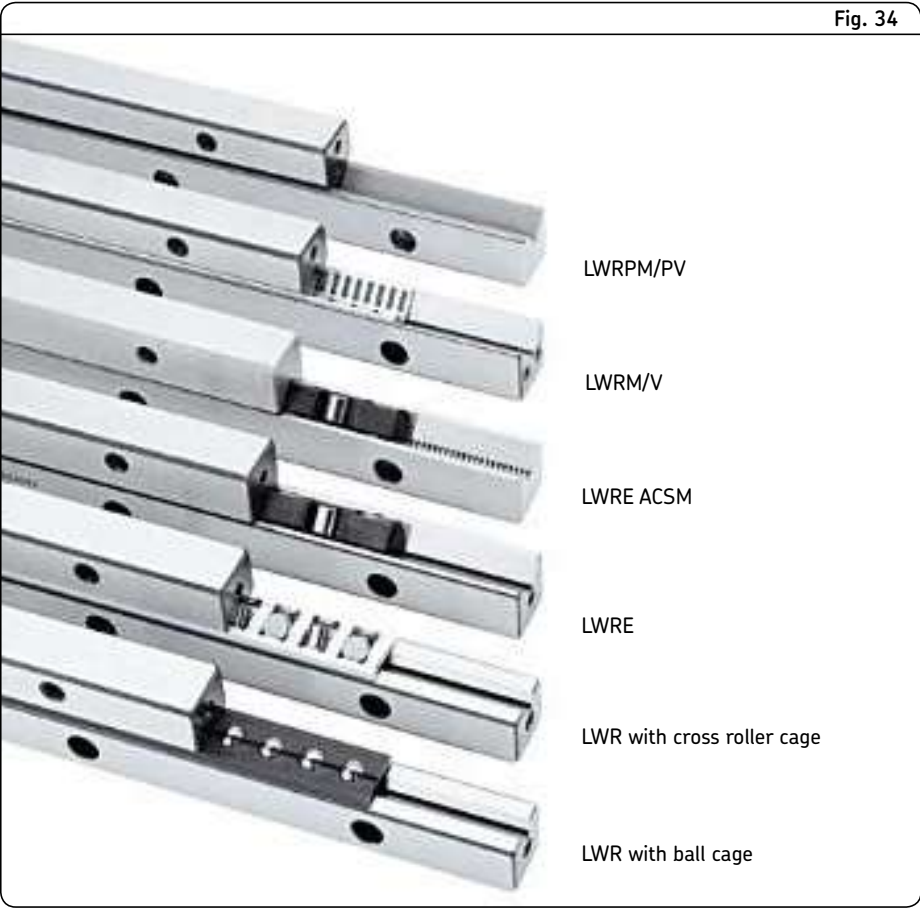


Fig. 34

Table 19

Modular range: interchangeable rail programme	Basic load rating	Speed	Noise	Stiffness	Precision
Cross rollers LWR					
Cross rollers LWRE					
Needle rollers					
Slide liners					

2 Linear guides

Precision rail guides

Anti cage-creep system (ACSM)

The ACSM system prevents the cage-creep effect. It is available for any product from the LWRE range.

The non-slip effect is achieved by an involute toothed cogwheel attached to the cage which is inside the LWRE ACSM rails during operation, thus retaining the cage in its defined position. (**fig. 35**).

This system reliably prevents so-called cage-creep and is mainly used in applications characterised by high rates of acceleration and speeds of travel as well as eccentric loads.

Integration of the ACSM system does not change the mounting dimensions of the LWRE rail guides. This enables LWRE rail guides with ACSM to be used in existing applications without changing the adjacent construction and thus significantly increasing the availability of these machinery elements. Apart from the ACSM system, the former version of ACS is still available. In this version the cogwheel is made of polymer and the stroke length can be specified.

LWRE rail guides with ACS system can be produced in longer sizes.

For further information please consult the SKF catalogue «precision rail guides», publication number 4183 EN.

Fig. 35



Design of an LWRE rail guide with ACSM

Ordering key

Type

Designation type:

Rail guide (sizes: 3/6/9/12/15/18/24)
 Rail guide (sizes: 1/2)
 Plastic ball-retaining cage (sizes: 1/2/3/6/9/12)
 Cross rollers in plastic cage (size: 3)
 Cross rollers in aluminium cage (sizes: 6/9/12)
 End stop for low load and horizontal mounting (sizes: 1/2/3/6/9/12/15/18/24)
 Special attachment screw (sizes: 3/4/6/9/12/15/18/24)

Rail guide (sizes: 3/4/6/9)
 Cross roller plastic cage (sizes: 3/4/6/9)
 End stop for general use (sizes: 3/4/6/9/2211)
 Special attachment screw (sizes: 3/4/6/9/2211)
 Rail guide for needle roller cage (sizes: 6/9)

Rail guide for needle roller cage (sizes: 6/9)
 Needle rollers in aluminium cage (sizes: 6/9)
 Needle rollers in polymer cage (sizes: 6/9)
 End stop with plastic wiper for general use (sizes: 6/9)
 End stop with plastic wiper for general use (sizes: 6/9)
 Special attachment screw (sizes: 6/9)

Rail guide (sizes: 3015/4020/5025/6030/7040/8050)
 Rail guide (sizes: 3015/4020/5025/6030/7040/8050)
 Needle rollers in aluminium cage (sizes: 10/15/20/25/30)
 Needle rollers in polymer cage (sizes: 10/15/20/25/30)
 End stop with wiper for general use (sizes: 3015/4020/5025/3060/7040/8050)
 End stop with wiper for general use (sizes: 3015/4020/5025/3060/7040/8050)
 Attachment screw (sizes: M3/M5/M6)

Size*:

Specific values are reported on designation type

Length rail guide (mm):

xxxx

Option:

For R { for size 3/6
 { for size 3/4/6
 anti cage-creep system ACSM
 For RE { anti cage-creep system ACSM for size 3/6
 { anti cage-creep system ACS
 { anti cage-creep system ACS for size 3/4/6

KIT
 KIT
 ACSM
 ACSM-KIT
 ACS
 ACS-KIT

*

Sizes 3/4/6 = 3 digits for length of rail; example: 050
 100

Size 9 = 4 digits for length of rail; example: 0300

Size 3015 = 3 digits for length of rail; example: 3015100
 3015150

Bigger sizes 4 digits for length of rail; example: 50250200

...

Example 1, rail guide: LW RE 6 350 ACSM

Example 2, cage: LW AKE 6 350

Example 3, end stop: LW ERE 6 x24

Example 4, screws: LW GD 6

N.B.:

For information about additional products and accessories, please contact SKF Customer Service.

- LWN / LWO (sizes 2025-, 2535-, 3045- and 3555-) - LWML series - LWF / LWG series (sizes 412-, 612-, 624-, 1024- and 1434-)

2 Linear guides

Precision rail guides

LWR../LWRB..

LWR rail guides are well-proven, limited-travel linear guides used in numerous applications. They consist of two identical rails where cross roller cages or ball cages are inserted, depending on the application and size.

LWR rail guides with cross roller cages are robust linear bearings with high load-carrying capacity. Their special characteristics make them suitable for a large proportion of linear bearing arrangements with limited travel.

LWRB rail guides with ball cage can be used to advantage where loads are light and easy running is required.

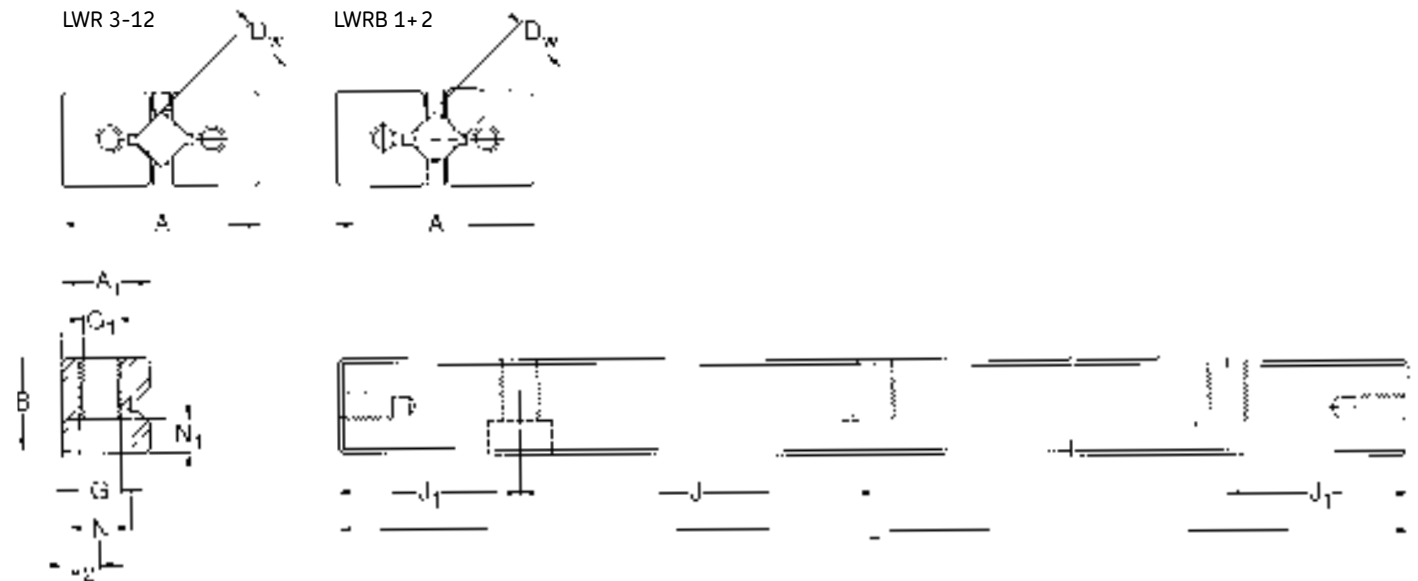
They are available for sizes 1 and 2. Because of the large number of possible combinations, all components of LWR/LWRB rail guides must be ordered separately, for example:

4 rails LWR
2 cross roller cages LWAL
8 end stops LWERA.

LWR .. KIT

The KIT package for the modular range is a unique service provided only by SKF.

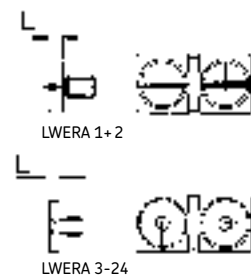
Rails



Ball and cross roller cages



End stops



Special attachment screw



LWR3/6.. KIT

4 rail guides LWR
2 cross roller cages LWAL/LWAK
8 end stops LWERA

Designations	Load ratings*		Stroke	Rail designations	Cage designations
	dynamic C	static C ₀			
	N		mm		
LWR 3050 KIT	999	1 120	26	LWR 3050	LWAK 3×7
LWR 3075 KIT	1 422	1 760	36	LWR 3075	LWAK 3×11
LWR 3100 KIT	1 811	2 400	46	LWR 3100	LWAK 3×15
LWR 3125 KIT	2 088	2 880	66	LWR 3125	LWAK 3×18
LWR 3150 KIT	2 442	3 520	76	LWR 3150	LWAK 3×22
LWR 3175 KIT	2 781	4 160	86	LWR 3175	LWAK 3×26
LWR 3200 KIT	3 110	4 800	96	LWR 3200	LWAK 3×30

* Load ratings for 10 rolling elements
Including 8 end stops LWERA 3

See page 96 for drawing

Designations	Load ratings*		Stroke	Rail designations	Cage designations
	dynamic C	static C ₀			
	N		mm		
LWR 6100 KIT	4 915	5 440	50	LWR 6100	LWAL 6×8
LWR 6150 KIT	6 744	8 160	78	LWR 6150	LWAL 6×12
LWR 6200 KIT	8 441	10 880	106	LWR 6200	LWAL 6×16
LWR 6250 KIT	10 045	13 600	134	LWR 6250	LWAL 6×20
LWR 6300 KIT	11 955	17 000	144	LWR 6300	LWAL 6×25
LWR 6350 KIT	13 422	19 720	172	LWR 6350	LWAL 6×29
LWR 6400 KIT	14 846	22 440	200	LWR 6400	LWAL 6×33

* Load ratings for 10 rolling elements
Including 8 end stops LWERA 6

See page 96 for drawing

2 Linear guides

Precision rail guides

LWRB 1

Designations	Dimensions															Load ratings* dynamic		static
	A	B	L	L ₁	J	J ₁	G	G ₁	N	N ₁	A ₁	D _W	U	U ₁	t	C	C ₀	
	mm						–	mm						N				
Rails																		
LWRB 1020	8,5	4	20		10	5	M2	1,7	3	1,4	3,9							
LWRB 1030	8,5	4	30		10	5	M2	1,7	3	1,4	3,9							
LWRB 1040	8,5	4	40		10	5	M2	1,7	3	1,4	3,9							
LWRB 1050	8,5	4	50		10	5	M2	1,7	3	1,4	3,9							
LWRB 1060	8,5	4	60		10	5	M2	1,7	3	1,4	3,9							
Ball cage																		
LWJK 1,588												1,588	3,5	0,5	2,2	410		580
End stop																		
LWERA 1			1	–														
* Load ratings for 10 rolling elements																		

See page 96
for drawing

LWRB 2

Designations	Dimensions																Load ratings*	
	A	B	L	L ₁	J	J ₁	G	G ₁	N	N ₁	A ₁	D _W	U	U ₁	t	dynamic	static	
																C	C ₀	
	mm																N	
Rails																		
LWRB 2030	12	6	30		15	7,5	M3	2,6	4,4	2	5,5							
LWRB 2045	12	6	45		15	7,5	M3	2,6	4,4	2	5,5							
LWRB 2060	12	6	60		15	7,5	M3	2,6	4,4	2	5,5							
LWRB 2075	12	6	75		15	7,5	M3	2,6	4,4	2	5,5							
LWRB 2090	12	6	90		15	7,5	M3	2,6	4,4	2	5,5							
LWRB 2105	12	6	105		15	7,5	M3	2,6	4,4	2	5,5							
LWRB 2120	12	6	120		15	7,5	M3	2,6	4,4	2	5,5							
Ball cage																		
LWJK 2												2	5	0,75	3	640	720	
End stop																		
LWERA 2			1,5	—														
* Load ratings for 10 rolling elements																		

See page 96
for drawing

LWR 3

Designations	Dimensions																Load ratings* dynamic static	
	A	B	L	L ₁	J	J ₁	G	G ₁	N	N ₁	A ₁	D _W	U	U ₁	t	C	C ₀	
	mm						–	mm						N				
Rails																		
LWR 3050	18	8	50		25	12,5	M4	3,3	6	3,2	8,2							
LWR 3075	18	8	75		25	12,5	M4	3,3	6	3,2	8,2							
LWR 3100	18	8	100		25	12,5	M4	3,3	6	3,2	8,2							
LWR 3125	18	8	125		25	12,5	M4	3,3	6	3,2	8,2							
LWR 3150	18	8	150		25	12,5	M4	3,3	6	3,2	8,2							
LWR 3175	18	8	175		25	12,5	M4	3,3	6	3,2	8,2							
LWR 3200	18	8	200		25	12,5	M4	3,3	6	3,2	8,2							
LWR 3250	18	8	250		25	12,5	M4	3,3	6	3,2	8,2							
LWR 3300	18	8	300		25	12,5	M4	3,3	6	3,2	8,2							
Roller cage																		
LWAK 3												3	7,5	1	5	1 320	1 600	
End stop																		
LWERA 3			2,5	–														
Special attachment screw																		
LWGD 3																		
* Load ratings for 10 rolling elements																		

See page 96
for drawing

LWR 6

Designations	Dimensions																Load ratings*	
	A	B	L	L ₁	J	J ₁	G	G ₁	N	N ₁	A ₁	D _W	U	U ₁	t	dynamic	static	
																C	C ₀	
	mm						–	mm								N		
Rails																		
LWR 6100	31	15	100		50	25	M6	5,2	9,5	5,2	14							
LWR 6150	31	15	150		50	25	M6	5,2	9,5	5,2	14							
LWR 6200	31	15	200		50	25	M6	5,2	9,5	5,2	14							
LWR 6250	31	15	250		50	25	M6	5,2	9,5	5,2	14							
LWR 6300	31	15	300		50	25	M6	5,2	9,5	5,2	14							
LWR 6350	31	15	350		50	25	M6	5,2	9,5	5,2	14							
LWR 6400	31	15	400		50	25	M6	5,2	9,5	5,2	14							
Roller cage																		
LWAL 6												6	14,8	2,7	9	5 850	6 800	
End stop																		
LWERA 6			3	–														
Special attachment screw																		
LWGD 6																		
* Load ratings for 10 rolling elements																		

See page 96
for drawing

2 Linear guides
Precision rail guides

LWR 9

Designations	Dimensions																Load ratings* dynamic static	
	A	B	L	L ₁	J	J ₁	G	G ₁	N	N ₁	A ₁	D _W	U	U ₁	t	C	C ₀	
	mm						–	mm						N				
Rails																		
LWR 90200	44	22	200		100	50	M8	6,8	11	6,2	20							
LWR 90300	44	22	300		100	50	M8	6,8	11	6,2	20							
LWR 90400	44	22	400		100	50	M8	6,8	11	6,2	20							
LWR 90500	44	22	500		100	50	M8	6,8	11	6,2	20							
LWR 90600	44	22	600		100	50	M8	6,8	11	6,2	20							
LWR 90700	44	22	700		100	50	M8	6,8	11	6,2	20							
Roller cage																		
LWAL 9												9	20	4	14	17 000	18 300	
End stop																		
LWERA 9			4	–														
Special attachment screw																		
LWGD 9																		
* Load ratings for 10 rolling elements																		

See page 96
for drawing

LWRE ..

LWRE rail guides are a logical development of the proven LWR rail guides.

Within the modular range system, the LWRE rail guides offer an outstanding price/performance ratio.

Alongside the familiar characteristics of the LWR series, the new LWRE rail guides offer the advantages of a fivefold increase in load-carrying capacity and a doubling of the stiffness, achieved through optimised internal geometry in conjunction with larger roller diameters.

LWRE rail guide can be used in a given design space, maintaining the same load-carrying capacity as the LWR.

The mounting and attachment dimensions of the LWRE 3, 6, 9 rail guides conform to those of all SKF modular range rail guides presented in this catalogue.

LWRE rail guides are optimised with large rollers and improved internal geometry providing high load-carrying capacity and stiffness. They are available with ACSM. As a standard rail guides with ACSM are delivered without end face holes. LWRE rail guides of size 2 are equipped with ball cages.

Because of the large number of possible combinations, all components of LWRE rail guides must be ordered separately, for example:

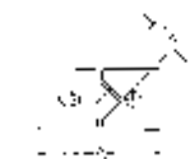
- 4 rail guides LWRE
- 2 cross roller cages LWAKE
- 8 end stops LWERE

LWRE .. KIT

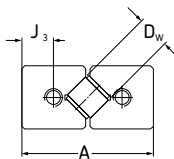
The KIT package for the modular range is a unique service provided only by SKF.

Rails

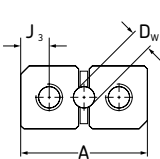
LWRE and LWRE ACS



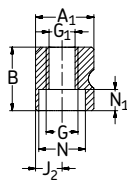
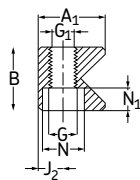
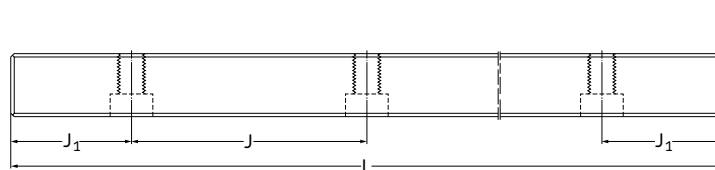
LWRE ACSM



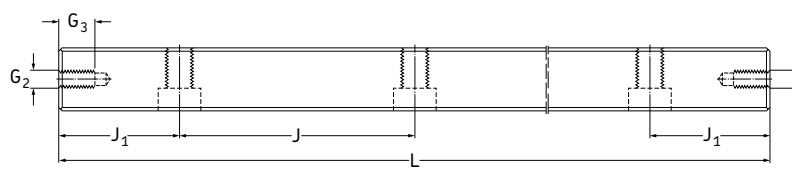
LWRB ACSM



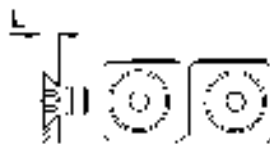
LWRE ACSM



LWRE, LWRE ACSM



End stops

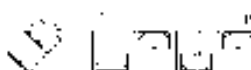


LWERE 3, 6, 9

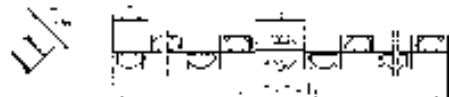


LWERE 4

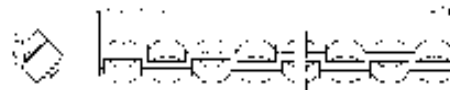
Cross roller cages



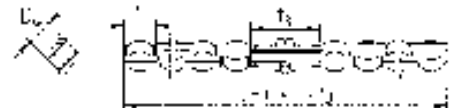
LWAKE 3, 6, 9



LWAKE 3, 6, 9 ACS

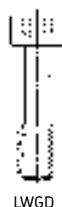


LWAKE 4

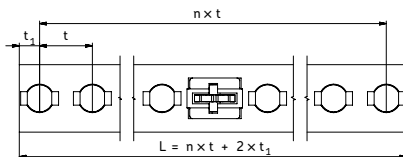
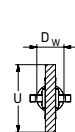


LWAKE 4 ACS

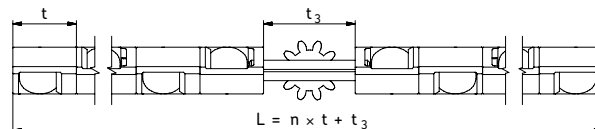
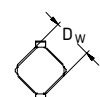
Special attachment screw



LWGD



LWJK 2 ACSM



LWAKE 3, 6, 9 ACSM

2 Linear guides

Precision rail guides

LWRE 3/6.. KIT

4 rail guides LWRE
2 cross roller LWAKE
8 end stops LWERE

Designations	Load ratings*		Stroke	Rail designations	Cage designations
	dynamic C	static C ₀			
	N		mm		
LWRE 3050 KIT	4 230	5 100	25	LWRE 3050	LWAKE 3×6
LWRE 3075 KIT	5 803	7 650	38	LWRE 3075	LWAKE 3×9
LWRE 3100 KIT	7 263	10 200	50	LWRE 3100	LWAKE 3×12
LWRE 3125 KIT	8 644	12 750	63	LWRE 3125	LWAKE 3×15
LWRE 3150 KIT	9 964	15 300	75	LWRE 3150	LWAKE 3×18
LWRE 3175 KIT	11 238	17 850	88	LWRE 3175	LWAKE 3×21
LWRE 3200 KIT	12 471	20 400	100	LWRE 3200	LWAKE 3×24

* Load ratings for 10 rolling elements
Including 8 end stops LWERE 3

See page 101 for drawing

Designations	Load ratings*		Stroke	Rail designations	Cage designations
	dynamic C	static C ₀			
	N		mm		
LWRE 6100 KIT	25 743	27 300	46	LWRE 6100	LWAKE 6×7
LWRE 6150 KIT	34 000	39 000	80	LWRE 6150	LWAKE 6×10
LWRE 6200 KIT	44 204	54 600	92	LWRE 6200	LWAKE 6×14
LWRE 6250 KIT	51 431	66 300	126	LWRE 6250	LWAKE 6×17
LWRE 6300 KIT	58 382	78 000	160	LWRE 6300	LWAKE 6×20
LWRE 6350 KIT	67 304	93 600	172	LWRE 6350	LWAKE 6×24
LWRE 6400 KIT	73 781	105 300	208	LWRE 6400	LWAKE 6×27

* Load ratings for 10 rolling elements
Including 8 end stops LWERE 6

See page 101 for drawing

LWRE 3/6.. ACS KIT

4 rail guides LWRE ACS
2 cross roller cages LWAKE
8 end stops LWERE

Designations	Load ratings*		Stroke	Rail designations	Cage designations
	dynamic C	static C ₀			
	N		mm		
LWRE 3050 ACS-KIT	4 230	5 100	20	LWRE 3050 ACS	LWAKE 3×6 ACS
LWRE 3075 ACS-KIT	5 294	6 800	30	LWRE 3075 ACS	LWAKE 3×6 ACS
LWRE 3100 ACS-KIT	6 300	8 500	45	LWRE 3100 ACS	LWAKE 3×10 ACS
LWRE 3125 ACS-KIT	7 731	11 050	62	LWRE 3125 ACS	LWAKE 3×13 ACS
LWRE 3150 ACS-KIT	9 090	13 600	79	LWRE 3150 ACS	LWAKE 3×16 ACS
LWRE 3175 ACS-KIT	9 964	15 300	94	LWRE 3175 ACS	LWAKE 3×18 ACS
LWRE 3200 ACS-KIT	11 653	18 700	100	LWRE 3200 ACS	LWAKE 3×22 ACS

* Load ratings for 10 rolling elements
Including 8 end stops LWERE 3

See page 101 for drawing

Designations	Load ratings*		Stroke	Rail designations	Cage designations
	dynamic C	static C ₀			
	N		mm		
LWRE 6100 ACS-KIT	22 826	23 400	37	LWRE 6100 ACS	LWAKE 6×6 ACS
LWRE 6150 ACS-KIT	31 318	35 100	71	LWRE 6150 ACS	LWAKE 6×9 ACS
LWRE 6200 ACS-KIT	39 196	46 800	105	LWRE 6200 ACS	LWAKE 6×12 ACS
LWRE 6250 ACS-KIT	49 056	62 400	117	LWRE 6250 ACS	LWAKE 6×16 ACS
LWRE 6300 ACS-KIT	56 093	74 100	151	LWRE 6300 ACS	LWAKE 6×19 ACS
LWRE 6350 ACS-KIT	65 107	89 700	163	LWRE 6350 ACS	LWAKE 6×23 ACS
LWRE 6400 ACS-KIT	71 640	101 400	197	LWRE 6400 ACS	LWAKE 6×26 ACS

* Load ratings for 10 rolling elements
Including 8 end stops LWERE 6

See page 101 for drawing

2 Linear guides
Precision rail guides

LWRE 3

Designations	Dimensions														Load ratings*	
	A	B	L	L ₁	J	J ₁	G	G ₁	N	N ₁	A ₁	D _W	t	C	dynamic	static
	mm						–	mm						N		
Rails																
LWRE 3050	18	8	50		25	12,5	M4	3,3	6	3,2	8,7					
LWRE 3075	18	8	75		25	12,5	M4	3,3	6	3,2	8,7					
LWRE 3100	18	8	100		25	12,5	M4	3,3	6	3,2	8,7					
LWRE 3125	18	8	125		25	12,5	M4	3,3	6	3,2	8,7					
LWRE 3150	18	8	150		25	12,5	M4	3,3	6	3,2	8,7					
LWRE 3175	18	8	175		25	12,5	M4	3,3	6	3,2	8,7					
LWRE 3200	18	8	200		25	12,5	M4	3,3	6	3,2	8,7					
Cross roller cage																
LWAKE 3												4	6,25	6 300		8 500
End stop																
LWERE 3			2	–												
Special attachment screw																
LWGD 3																
* Load ratings for 10 rolling elements																

See page 101
for drawing

LWRE 2211

Designations	Dimensions														Load ratings*		
	A	B	L	L ₁	J	J ₁	G	G ₁	N	N ₁	A ₁	D _W	t	t ₁	t ₂	C	C ₀
	mm						–	mm						N			
Rails																	
LWRE 22110080	22	11	80		40	20	M5	4,3	7,5	4,1	11			2,65	3,6		
LWRE 22110120	22	11	120		40	20	M5	4,3	7,5	4,1	11			2,65	3,6		
LWRE 22110160	22	11	160		40	20	M5	4,3	7,5	4,1	11			2,65	3,6		
LWRE 22110200	22	11	200		40	20	M5	4,3	7,5	4,1	11			2,65	3,6		
LWRE 22110240	22	11	240		40	20	M5	4,3	7,5	4,1	11			2,65	3,6		
LWRE 22110280	22	11	280		40	20	M5	4,3	7,5	4,1	11			2,65	3,6		
LWRE 22110320	22	11	320		40	20	M5	4,3	7,5	4,1	11			2,65	3,6		
LWRE 22110360	22	11	360		40	20	M5	4,3	7,5	4,1	11			2,65	3,6		
LWRE 22110400	22	11	400		40	20	M5	4,3	7,5	4,1	11			2,65	3,6		
Cross roller cage																	
LWAKE 3												4	6,25			6 300	8 500
End stop																	
LWERE 3			2	–													
* Load ratings for 10 rolling elements																	

See page 101
for drawing

LWRE 6

Designations	Dimensions													Load ratings*	
	A	B	L	L ₁	J	J ₁	G	G ₁	N	N ₁	A ₁	D _W	t	dynamic	static
														C	C ₀
	mm						–	mm						N	
Rails															
LWRE 6100	31	15	100		50	25	M6	5,2	9,5	5,2	15				
LWRE 6150	31	15	150		50	25	M6	5,2	9,5	5,2	15				
LWRE 6200	31	15	200		50	25	M6	5,2	9,5	5,2	15				
LWRE 6250	31	15	250		50	25	M6	5,2	9,5	5,2	15				
LWRE 6300	31	15	300		50	25	M6	5,2	9,5	5,2	15				
LWRE 6400	31	15	400		50	25	M6	5,2	9,5	5,2	15				
Cross roller cage															
LWAKE 6												8	11	34 000	39 000
End stop															
LWRE 6			3	–											
Special attachment screw															
LWGD 6															
* Load ratings for 10 rolling elements															

See page 101
for drawing

LWRE 9

Designations	Dimensions													Load ratings*	
	A	B	L	L ₁	J	J ₁	G	G ₁	N	N ₁	A ₁	D _W	t	dynamic	static
														C	C ₀
	mm						–	mm						N	
Rails															
LWRE 90200	44	22	200		100	50	M8	6,8	11	6,2	22				
LWRE 90300	44	22	300		100	50	M8	6,8	11	6,2	22				
LWRE 90400	44	22	400		100	50	M8	6,8	11	6,2	22				
LWRE 90500	44	22	500		100	50	M8	6,8	11	6,2	22				
LWRE 90600	44	22	600		100	50	M8	6,8	11	6,2	22				
LWRE 90700	44	22	700		100	50	M8	6,8	11	6,2	22				
Cross roller cage															
LWAKE 9												12	16	78 000	78 000
End stop															
LWRE 9			3	–											
Special attachment screw															
LWGD 9															
* Load ratings for 10 rolling elements															

See page 101
for drawing

2 Linear guides

Precision rail guides

LWRB 2..ACSM and LWRE 3/6/9..ACSM

Designations	Dimensions			Attachment holes					End face holes					
	A	B	A ₁	D _W	J	J ₁	J ₂	G	G ₁	N	N ₁	J ₃	G ₂	G ₃
	mm							–	mm				–	mm
LWRB 2 ACSM	12	6	5,5	2	15	7,5	2,5	M3	2,55	4,4	2	2,7	M2,5	3
LWRE 3 ACSM	18	8	8,7	4	25	12,5	3,5	M4	3,3	6	3,2	4	M3	6
LWRE 6 ACSM	31	15	15,2	8	50	25	6	M6	5,2	9,5	5,2	6,75	M5	9
LWRE 9 ACSM	44	22	21,7	12	100	50	9	M8	6,8	10,5	6,2	9,75	M6	9

See page 101

for drawing

LWJK 2 and LWAKE 3/6/9 ACSM

Designations	Dimensions			Load ratings*		Suitable rail guide
	D _W	t	t ₃	dynamic C	static C ₀	
	mm			N		
LWJK 2 ACSM	2	3,9	3,9	510	650	LWRB 2 ACSM
LWAKE 3 ACSM	4	6,25	9	5 040	8 160	LWRE 3 ACSM
LWAKE 6 ACSM	8	11	15,3	27 200	37 440	LWRE 6 ACSM
LWAKE 9 ACSM	12	16	22	62 400	74 880	LWRE 9 ACSM

* Load ratings for 10 rolling elements per row

See page 101 for drawing

LWRE 3.. ACSM KIT

4 rail guides LWRE ACSM
2 cross roller LWAKE ACSM

Designations	Load ratings*		Stroke	Rail designations	Cage designations
	dynamic	static			
	C	C ₀		4 pieces	2 pieces
	N		mm		
LWRE 3050 ACSM-KIT	2 940	4 080	20	LWRE 3050 ACSM	LWAKE 3×5 ACSM
LWRE 3075 ACSM-KIT	3 380	4 900	30	LWRE 3075 ACSM	LWAKE 3×6 ACSM
LWRE 3100 ACSM-KIT	5 040	8 160	45	LWRE 3100 ACSM	LWAKE 3×10 ACSM
LWRE 3125 ACSM-KIT	6 180	10 610	62	LWRE 3125 ACSM	LWAKE 3×13 ACSM
LWRE 3150 ACSM-KIT	7 270	13 060	79	LWRE 3150 ACSM	LWAKE 3×16 ACSM
LWRE 3175 ACSM-KIT	7 970	14 690	94	LWRE 3175 ACSM	LWAKE 3×18 ACSM

* Load ratings for 10 rolling elements per row

See page 101 for drawing

LWRE 6.. ACSM KIT

Designations	Load ratings*		Stroke	Rail designations	Cage designations
	dynamic	static			
	C	C ₀			
	N		mm		
LWRE 6100 ACSM-KIT	18 260	22 460	37	LWRE 6100 ACSM	LWAKE 6×6 ACSM
LWRE 6150 ACSM-KIT	25 050	33 700	71	LWRE 6150 ACSM	LWAKE 6×9 ACSM
LWRE 6200 ACSM-KIT	31 360	44 930	105	LWRE 6200 ACSM	LWAKE 6×12 ACSM
LWRE 6250 ACSM-KIT	39 240	59 900	117	LWRE 6250 ACSM	LWAKE 6×16 ACSM
LWRE 6300 ACSM-KIT	44 870	71 140	151	LWRE 6300 ACSM	LWAKE 6×19 ACSM
LWRE 6350 ACSM-KIT	52 090	86 110	163	LWRE 6350 ACSM	LWAKE 6×23 ACSM
LWRE 6400 ACSM-KIT	57 310	97 340	197	LWRE 6400 ACSM	LWAKE 6×26 ACSM

* Load ratings for 10 rolling elements per row

See page 101 for drawing

2 Linear guides

Precision rail guides

LWRE 3 ACS

Designations	Dimensions														Load ratings*	
															dynamic	static
	A	B	L	L ₁	J	J ₁	G	G ₁	N	N ₁	A ₁	D _W	t	t ₃	C	C ₀
	mm						–	mm							N	
Rails																
LWRE 3050 ACS	18	8	50		25	12,5	M4	3,3	6	3,2	8,7			9		
LWRE 3075 ACS	18	8	75		25	12,5	M4	3,3	6	3,2	8,7			9		
LWRE 3100 ACS	18	8	100		25	12,5	M4	3,3	6	3,2	8,7			9		
LWRE 3125 ACS	18	8	125		25	12,5	M4	3,3	6	3,2	8,7			9		
LWRE 3150 ACS	18	8	150		25	12,5	M4	3,3	6	3,2	8,7			9		
LWRE 3175 ACS	18	8	175		25	12,5	M4	3,3	6	3,2	8,7			9		
LWRE 3200 ACS	18	8	200		25	12,5	M4	3,3	6	3,2	8,7			9		
Cross roller cage																
LWAKE 3 ACS												4	6,25		6 300	8 500
End stop																
LWERE 3			2		–											
Special attachment screw																
LWGD 3																
* Load ratings for 10 rolling elements																

See page 101
for drawing

LWRE 2211 ACS

Designations	Dimensions														Load ratings*	
															dynamic	static
	A	B	L	J	J ₁	G	G ₁	N	N ₁	A ₁	D _W	t	t ₃	C	C ₀	
	mm					–	mm								N	
Rails																
LWRE 22110080 ACS	22	11	80	40	20	M5	4,3	7,5	4,1	11			9			
LWRE 22110120 ACS	22	11	120	40	20	M5	4,3	7,5	4,1	11			9			
LWRE 22110160 ACS	22	11	160	40	20	M5	4,3	7,5	4,1	11			9			
LWRE 22110200 ACS	22	11	200	40	20	M5	4,3	7,5	4,1	11			9			
LWRE 22110240 ACS	22	11	240	40	20	M5	4,3	7,5	4,1	11			9			
LWRE 22110280 ACS	22	11	280	40	20	M5	4,3	7,5	4,1	11			9			
LWRE 22110320 ACS	22	11	320	40	20	M5	4,3	7,5	4,1	11			9			
LWRE 22110360 ACS	22	11	360	40	20	M5	4,3	7,5	4,1	11			9			
LWRE 22110400 ACS	22	11	400	40	20	M5	4,3	7,5	4,1	11			9			
Cross roller cage																
LWAKE 3 ACS											4	6,25		6 300	8 500	
End stop																
LWERE 3																
* Load ratings for 10 rolling elements																

See page 101
for drawing

LWRE 6 ACS

Designations	Dimensions														Load ratings*	
	A	B	L	L ₁	J	J ₁	G	G ₁	N	N ₁	A ₁	D _W	t	t ₃	C	C ₀
	mm						–	mm						N		
Rails																
LWRE 6100 ACS	31	15	100		50	25	M6	5,2	9,5	5,2	15				15,3	
LWRE 6150 ACS	31	15	150		50	25	M6	5,2	9,5	5,2	15				15,3	
LWRE 6200 ACS	31	15	200		50	25	M6	5,2	9,5	5,2	15				15,3	
LWRE 6250 ACS	31	15	250		50	25	M6	5,2	9,5	5,2	15				15,3	
LWRE 6300 ACS	31	15	300		50	25	M6	5,2	9,5	5,2	15				15,3	
LWRE 6400 ACS	31	15	400		50	25	M6	5,2	9,5	5,2	15				15,3	
Cross roller cage																
LWAKE 6 ACS												8	11		34 000	39 000
End stop																
LWERE 6			3		–											
Special attachment screw																
LWGD 6																
* Load ratings for 10 rolling elements																

See page 101
for drawing

LWRE 9 ACS

Designations	Dimensions														Load ratings*		
															dynamic	static	
	A	B	L	L ₁	J	J ₁	G	G ₁	N	N ₁	A ₁	D _W	t	t ₃	C	C ₀	
	mm						–	mm								N	
Rails																	
LWRE 90200 ACS	44	22	200		100	50	M8	6,8	11	6,2	22				22		
LWRE 90300 ACS	44	22	300		100	50	M8	6,8	11	6,2	22				22		
LWRE 90400 ACS	44	22	400		100	50	M8	6,8	11	6,2	22				22		
LWRE 90500 ACS	44	22	500		100	50	M8	6,8	11	6,2	22				22		
LWRE 90600 ACS	44	22	600		100	50	M8	6,8	11	6,2	22				22		
LWRE 90700 ACS	44	22	700		100	50	M8	6,8	11	6,2	22				22		
Cross roller cage																	
LWAKE 9 ACS												12	16		78 000	78 000	
End stop																	
LWERE 9			3		–												
Special attachment screw																	
LWGD 9																	
* Load ratings for 10 rolling elements																	

See page 101
for drawing

2 Linear guides

Precision rail guides

LWRM ../LWRV ..

Guiding systems with high load carrying capacity and maximum stiffness.

Needle roller cages for LWRM/LWRV rail guides

LWHW needle roller cages are made out of aluminium which provide retention of the needle rollers. They are available for size 6 and 9 units.

When ordering, the appropriate cage length in mm must be stated after the cage designation, e. g: LWHW 10 × 225.

End stops for LWRM/LWRV rail guides.

End stops serve to restrict the drift of the needle roller cage from the loaded zone.

LWEARM and LWEARV end stops are fitted with a plastic wiper with a sealing lip serving to reduce the risk of contamination of the raceways.

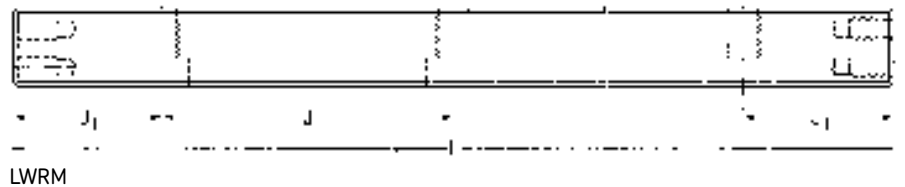
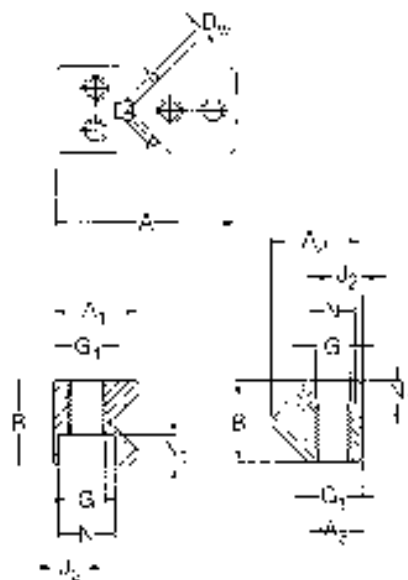
All end stops are supplied with the necessary attachment screws.

The mounting and attachment dimensions of the LWRM/LWRV rail guides conform to those of the other SKF modular range rail guides included in this catalogue.

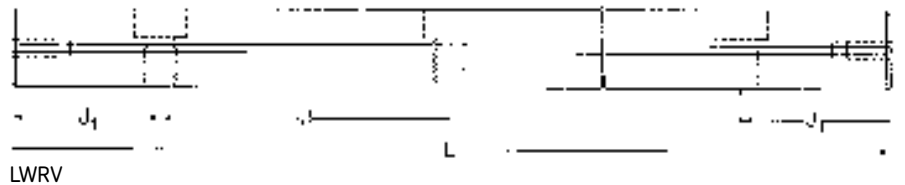
Because of the large number of possible combinations, all components of LWRM/LWRV rail guides must be ordered separately, for example:

- 2 rail guides LWRM
- 2 rail guides LWRV
- 2 needle roller assemblies LWHW
- 4 end stops LWEARM.

Rails

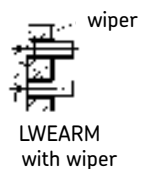
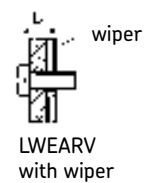


LWRM



LWRV

End stops



Needle roller cage



Special attachment screw



LWRM 6/LWRV 6

Designations	Dimensions																	Load ratings*	
	A	B	L	L ₁	J	J ₁	G	G ₁	N	N ₁	A ₁	A ₂	A ₃	D _W	U	t	dynamic	static	
																	C	C ₀	
	mm						–	mm									N		
Rails																			
LWRM/LWRV 6100	31	15	100		50	25	M6	5,2	9,5	5,2	17	18	11						
LWRM/LWRV 6150	31	15	150		50	25	M6	5,2	9,5	5,2	17	18	11						
LWRM/LWRV 6200	31	15	200		50	25	M6	5,2	9,5	5,2	17	18	11						
LWRM/LWRV 6250	31	15	250		50	25	M6	5,2	9,5	5,2	17	18	11						
LWRM/LWRV 6300	31	15	300		50	25	M6	5,2	9,5	5,2	17	18	11						
LWRM/LWRV 6400	31	15	400		50	25	M6	5,2	9,5	5,2	17	18	11						
Needle roller cage																			
LWHW 10														2	10	3,75	10 400	25 500	
End stops																			
LWEARM 6				–	6														
LWEARV 6				–	6														
Special attachment screw																			
LWGD 6																			
* For 10 needle rollers per row																			

See page 110
for drawing

LWRM 9/LWRV 9

Designations	Dimensions																	Load ratings*		
	A	B	L	L ₁	J	J ₁	G	G ₁	N	N ₁	A ₁	A ₂	A ₃	D _W	U	t	dynamic	static		
																	C	C ₀		
	mm							–			mm							N		
Rails																				
LWRM/LWRV 90200	44	22	200		100	50	M8	6,8	11	6,2	23,1	27	17							
LWRM/LWRV 90300	44	22	300		100	50	M8	6,8	11	6,2	23,1	27	17							
LWRM/LWRV 90400	44	22	400		100	50	M8	6,8	11	6,2	23,1	27	17							
LWRM/LWRV 90500	44	22	500		100	50	M8	6,8	11	6,2	23,1	27	17							
Needle roller cage																				
LWHW 15														2	15	4,5	16 300	45 000		
End stops																				
LWEARM 9				–	8,3															
LWEARV 9				–	8,3															
Special attachment screw																				
LWGD 9																				
* For 10 needle rollers per row																				

See page 110
for drawing

2 Linear guides

Precision rail guides

LWM ../LWV ..

These rail guides enable the design of linear guiding systems for heavy loads with maximum stiffness. The internal geometry is identical with that of the modular range rails of the LWRM/LWRV series. As the same needle roller cage is used, the load bearing characteristics are identical. The external dimensions of the LWM/LWV rail guides, however, differ slightly from those of the LWRM/LWRV modular range dimensions.

LWM/LWV rail guides are widely used in machine tools. LWM/LWV rail guides have as standard an attachment hole type 15, i.e. through hole with countersinking.

If attachment hole type 13 is ordered, corresponding threaded inserts are supplied along with the guide.

For new designs, LWRM/LWRV rail guides are recommended. These offer the advantage of being interchangeable with other rail guides of the modular range.

Needle roller cages for LWM/LWV rail guides

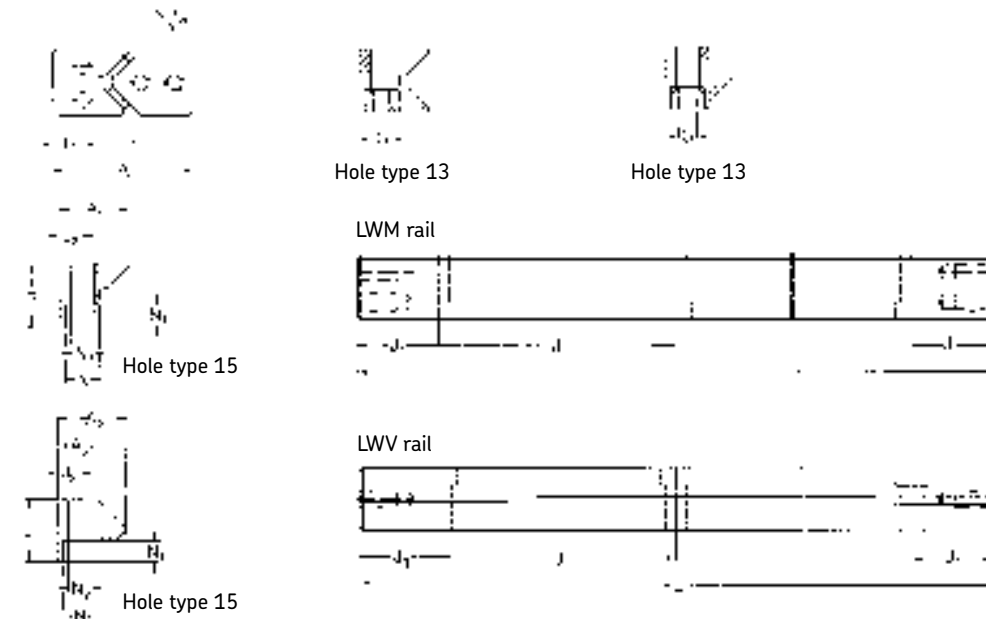
LWHW needle roller cages comprise an aluminium cage with needle rollers arranged at right angles to each other. The needle rollers are retained by the cage.

End stops for LWM/LWV rail guides

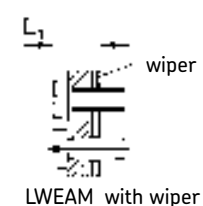
LWEAM and LWEAV end stops are fitted with a plastic wiper with sealing lip which serves to keep the track free from dirt.

All end pieces are supplied together with attachment screws.

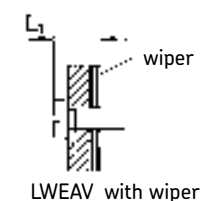
Rails



End stops

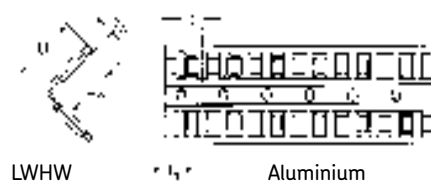


LWEAM with wiper



LWEAV with wiper

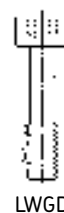
Needle roller cage



LWHW

Aluminium

Special attachment screw



LWGD

**LWM 3015 /
LWV 3015**

Designations	Dimensions																Load ratings*	
	A	B	L	L ₁	J ¹⁾	J _{1min} ²⁾	G	N	N ₁	N ₂	A ₁	A ₂	A ₃	D _W	U	t	dynamic	static
																	C	C ₀
	mm						–	mm									N	
Rails																		
LWM/LWV 3015100	30	15	100		40	15	M4	8,5	4,5	5,25	16	17,2	10,5					
LWM/LWV 3015150	30	15	150		40	15	M4	8,5	4,5	5,25	16	17,2	10,5					
LWM/LWV 3015200	30	15	200		40	15	M4	8,5	4,5	5,25	16	17,2	10,5					
LWM/LWV 3015300	30	15	300		40	15	M4	8,5	4,5	5,25	16	17,2	10,5					
LWM/LWV 3015400	30	15	400		40	15	M4	8,5	4,5	5,25	16	17,2	10,5					
Needle roller cage																		
LWHW10															2	10	3,75	10 400 25 500
End stops																		
LWEAM 3015				–	6													
LWEAV 3015				–	6													
Appropriate attachment screw																		
M4 DIN 84																		
* For 10 needle rollers per row																		
1) For lengths L < J + 2 – J _{1min} , J = 50 mm (except for LWM/LWV 3015)																		
2) J ₁ depends upon the rail length and is of the same size at each end of the rail: J ₁ = (L – ΣJ)/2																		

See page 112
for drawing

**LWM 4020 /
LWV 4020**

Designations	Dimensions																Load ratings*		
	A	B	L	L ₁	J ¹⁾	J _{1min} ²⁾	G	N	N ₁	N ₂	A ₁	A ₂	A ₃	D _W	U	t	C	C ₀	
	mm							–	mm								N		
Rails																			
LWM/LWV 4020100	40	20	100		80	15	M6	11,5	6,8	7,5	22,3	22	13,5						
LWM/LWV 4020150	40	20	150		80	15	M6	11,5	6,8	7,5	22,3	22	13,5						
LWM/LWV 4020200	40	20	200		80	15	M6	11,5	6,8	7,5	22,3	22	13,5						
LWM/LWV 4020300	40	20	300		80	15	M6	11,5	6,8	7,5	22,3	22	13,5						
LWM/LWV 4020400	40	20	400		80	15	M6	11,5	6,8	7,5	22,3	22	13,5						
Needle roller cage																			
LWHW 15															2	15	4,5	16 300 45 000	
End stops																			
LWEAM 4020				–	8,3														
LWEAV 4020				–	8,3														
Appropriate attachment screw																			
M6 DIN 84																			

* For 10 needle rollers per row

¹⁾ For lengths $L < J + 2 - J_{1min}$, $J = 50$ mm (except for LWM/LWV 3015)

²⁾ J_1 depends upon the rail length and is of the same size at each end of the rail: $J_1 = (L - \Sigma J)/2$

See page 112
for drawing

2 Linear guides

Precision rail guides

LWM 5025 / LWV 5025

Designations	Dimensions																	Load ratings*		
	A	B	L	L ₁	J ¹⁾	J _{1min} ²⁾	G	N	N ₁	N ₂	A ₁	A ₂	A ₃	D _W	U	t	dynamic	static		
																	C	C ₀		
	mm							–	mm							N				
Rails																				
LWM/LWV 50250100	50	25	100		80	20	M6	11,5	6,8	7,5	28	28	17							
LWM/LWV 50250200	50	25	200		80	20	M6	11,5	6,8	7,5	28	28	17							
LWM/LWV 50250300	50	25	300		80	20	M6	11,5	6,8	7,5	28	28	17							
LWM/LWV 50250400	50	25	400		80	20	M6	11,5	6,8	7,5	28	28	17							
LWM/LWV 50250500	50	25	500		80	20	M6	11,5	6,8	7,5	28	28	17							
Needle roller cage																				
LWHW 15														2	15	4,5	16 300	45 000		
End stops																				
LWEAM 5025				–	8,9															
LWEAV 5025				–	8,9															
Appropriate attachment screw																				
M6 DIN 84																				
* For 10 needle rollers per row																				
¹⁾ For lengths L < J + 2 – J _{1min} , J = 50 mm (except for LWM/LWV 3015)																				
²⁾ J ₁ depends upon the rail length and is of the same size at each end of the rail: J ₁ = (L – ΣJ)/2																				

See page 112
for drawing

LWM 6035 / LWV 6035

Designations	Dimensions																Load ratings*	
	A	B	L	L ₁	J ¹⁾	J _{1min} ²⁾	G	N	N ₁	N ₂	A ₁	A ₂	A ₃	D _W	U	t	dynamic	static
																	C	C ₀
	mm							–	mm							N		
Rails																		
LWM/LWV 60350200	60	35	200		100	20	M8	15	9	10	36	36	20					
LWM/LWV 60350300	60	35	300		100	20	M8	15	9	10	36	36	20					
LWM/LWV 60350400	60	35	400		100	20	M8	15	9	10	36	36	20					
LWM/LWV 60350500	60	35	500		100	20	M8	15	9	10	36	36	20					
LWM/LWV 60350600	60	35	600		100	20	M8	15	9	10	36	36	20					
LWM/LWV 60350700	60	35	700		100	20	M8	15	9	10	36	36	20					
LWM/LWV 60350800	60	35	800		100	20	M8	15	9	10	36	36	20					
LWM/LWV 60350900	60	35	900		100	20	M8	15	9	10	36	36	20					
LWM/LWV 60351000	60	35	1 000		100	20	M8	15	9	10	36	36	20					
Needle roller cage																		
LWHW 20														2,5	20	5,5	32 000	88 000
End stops																		
LWEAM 6035			–		8,9													
LWEAV 6035			–		8,9													
Appropriate attachment screw																		
M8 DIN 84																		
* For 10 needle rollers per row																		
¹⁾ For lengths L < J + 2 – J _{1min} , J = 50 mm (except for LWM/LWV 3015)																		
²⁾ J ₁ depends upon the rail length and is of the same size at each end of the rail: J ₁ = (L – ΣJ)/2																		

See page 112
for drawing

**LWM 7040/
LWV 7040**

Designations	Dimensions																	Load ratings*	
	A	B	L	L ₁	J ¹⁾	J _{1min} ²⁾	G	N	N ₁	N ₂	A ₁	A ₂	A ₃	D _W	U	t	C	C ₀	
	mm							–	mm							N			
Rails																			
LWM/LWV 70400200	70	40	200		100	20	M10	18,5	11	12,5	40	42	24						
LWM/LWV 70400300	70	40	300		100	20	M10	18,5	11	12,5	40	42	24						
LWM/LWV 70400400	70	40	400		100	20	M10	18,5	11	12,5	40	42	24						
LWM/LWV 70400500	70	40	500		100	20	M10	18,5	11	12,5	40	42	24						
LWM/LWV 70400600	70	40	600		100	20	M10	18,5	11	12,5	40	42	24						
LWM/LWV 70400700	70	40	700		100	20	M10	18,5	11	12,5	40	42	24						
LWM/LWV 70400800	70	40	800		100	20	M10	18,5	11	12,5	40	42	24						
LWM/LWV 70400900	70	40	900		100	20	M10	18,5	11	12,5	40	42	24						
LWM/LWV 70401000	70	40	1 000		100	20	M10	18,5	11	12,5	40	42	24						
Needle roller cage																			
LWHW 25															3	25	6	52 000 143 000	
End stops																			
LWEAM 7040			–		8,9														
LWEAV 7040			–		8,9														
Appropriate attachment screw																			
M10 DIN 84																			

* For 10 needle rollers per row

¹⁾ For lengths $L < J + 2 - J_{1min}$, $J = 50$ mm (except for LWM/LWV 3015)

²⁾ J_1 depends upon the rail length and is of the same size at each end of the rail: $J_1 = (L - \Sigma J)/2$

See page 112
for drawing

**LWM 8050/
LWV 8050**

Designations	Dimensions																	Load ratings*	
	A	B	L	L ₁	J ¹⁾	J _{1min} ²⁾	G	N	N ₁	N ₂	A ₁	A ₂	A ₃	D _W	U	t	C	C ₀	
	mm							–	mm							N			
Rails																			
LWM/LWV 80500200	80	50	200		100	20	M12	20	13	14	45	48,5	26						
LWM/LWV 80500300	80	50	300		100	20	M12	20	13	14	45	48,5	26						
LWM/LWV 80500400	80	50	400		100	20	M12	20	13	14	45	48,5	26						
LWM/LWV 80500500	80	50	500		100	20	M12	20	13	14	45	48,5	26						
LWM/LWV 80500600	80	50	600		100	20	M12	20	13	14	45	48,5	26						
LWM/LWV 80500700	80	50	700		100	20	M12	20	13	14	45	48,5	26						
LWM/LWV 80500800	80	50	800		100	20	M12	20	13	14	45	48,5	26						
LWM/LWV 80500900	80	50	900		100	20	M12	20	13	14	45	48,5	26						
LWM/LWV 80501000	80	50	1 000		100	20	M12	20	13	14	45	48,5	26						
Needle roller cage																			
LWHW 30															3,5	30	7	76 500 212 000	
End stops																			
LWEAM 8050			–		8,9														
LWEAV 8050			–		8,9														
Appropriate attachment screw																			
M12 DIN 84																			

* For 10 needle rollers per row

¹⁾ For lengths $L < J + 2 - J_{1min}$, $J = 50$ mm (except for LWM/LWV 3015)

²⁾ J_1 depends upon the rail length and is of the same size at each end of the rail: $J_1 = (L - \Sigma J)/2$

See page 112
for drawing

2 Linear guides

Precision rail guides

LWRPM ../LWRPV ..

LWRPM/LWRPV rail guides are linear guides for limited travel, fitted with Turcite-B®¹⁾ slide liners. Based on PTFE, this material is self-lubricating and offers excellent sliding properties.

The slide liners are bonded to the nonhardened LWRPM rail and subsequently ground to size. The LWRPV rail is hardened and ground. In order to avoid damage to the slide surface of the LWRPM rail, the leading edges of the LWRPV rails are slightly rounded. Otherwise, the dimensions of these rails are the same as those of the LWRV series.

LWRPM/LWRPV rail guides should be used where rail guides with rolling element assemblies are unsuitable due to external influences. Such applications

include those subjected to high transverse acceleration that may cause indentation of the rolling elements in the raceways, or where extremely short strokes are required. The unfavourable tribological conditions produced by such operation would give rise to race-way pitting in a rolling element rail guide.

The mounting and attachment dimensions of the LWRPM/LWRPV rail guides conform to those of all the SKF Modular Range rail guides included in this catalogue. LWRPM/LWRPV rail guides are characterised by:

- stick-slip-free operation
- smooth running
- good emergency running properties
- low wear and high reliability
- insensitivity to contamination
- excellent vibration damping properties

When ordering, the individual components of the rail guides must be specified separately, for example:

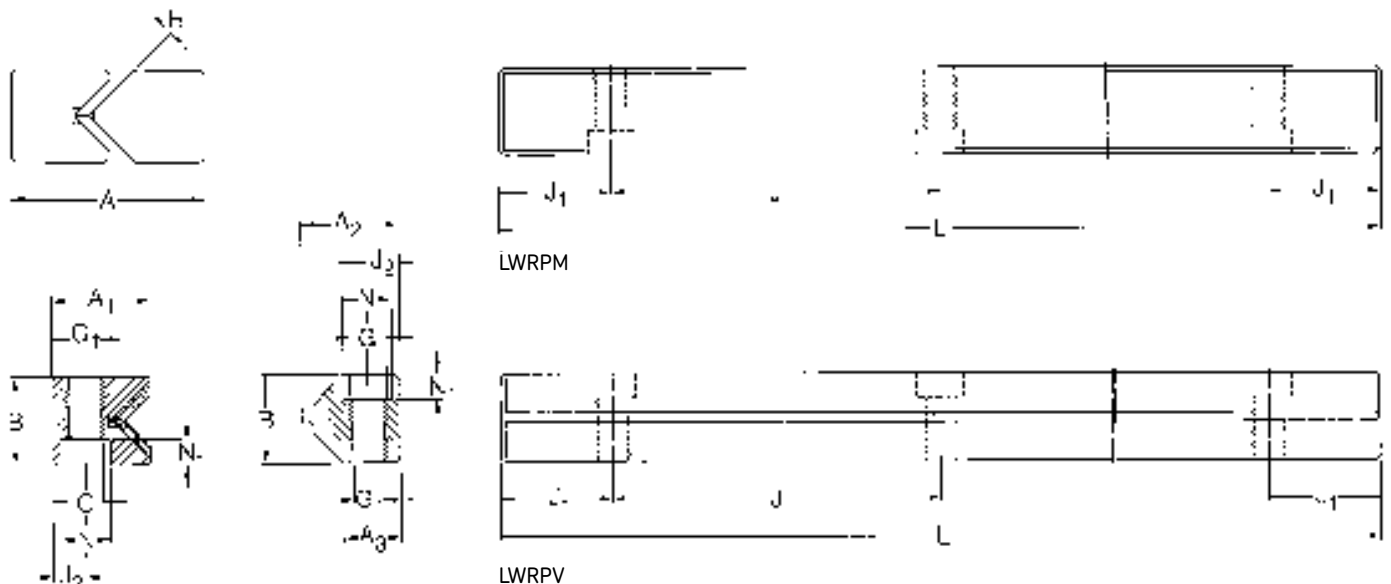
2 rails LWRPM 6300

2 rails LWRPV 6300

LWRPM rail guides are provided with the slide liners already bonded to the raceways. Due to their design rail guides of these series do not require the use of end stops. Separate ordering of the slide liners and end stops is not required.

¹⁾ Turcite-B® is a registered trademark of Busak & Shamban GmbH

Rails



LWRPM 3/6/9

Designations	Dimensions												Load ratings* dynamic
	A	B	A ₁	A ₂	A ₃	J	J ₁	J ₂	G	G ₃	N	N ₁	
	mm								–	mm			N
Rails													
LWRPM 3	18	8	9,5	–	–	25	12,5	3,5	M4	3,3	6	3,2	300/100 mm
LWRPM 6	31	15	16,6	–	–	50	25	6	M6	5,2	9,5	5,2	700/100 mm
LWRPM 9	44	22	23,1	–	–	100	50	9	M8	6,8	10,5	6,2	1 200/100 mm
* For a surface loading of approximately 1 N/mm ² (momentary loads of up to 6 N/mm ² are permissible).													

See page 116
for drawing

LWRPV 3/6/9

Designations	Dimensions												Load ratings* dynamic
	A	B	A ₁	A ₂	A ₃	J	J ₁	J ₂	G	G ₃	N	N ₁	
	mm								–	mm			N
Rails													
LWRPV 3	18	8	–	9,6	6,45	25	12,5	3,5	M4	3,3	6	3,2	–
LWRPV 6	31	15	–	17,8	10,8	50	25	6	M6	5,2	9,5	5,2	–
LWRPV 9	44	22	–	26,9	16,6	100	50	9	M8	6,8	10,5	6,2	–
* For a surface loading of approximately 1 N/mm ² (momentary loads of up to 6 N/mm ² are permissible).													

See page 116
for drawing

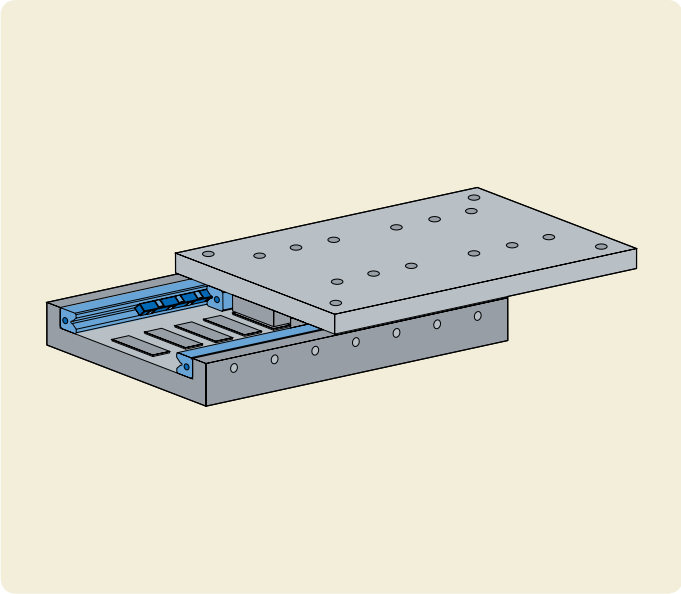
Applications

In response to our customer’s ultimate need to produce more with less, SKF has

combined its knowledge and experience with the latest technology to develop solutions for your specific conditions. Whether your goal is to design equipment

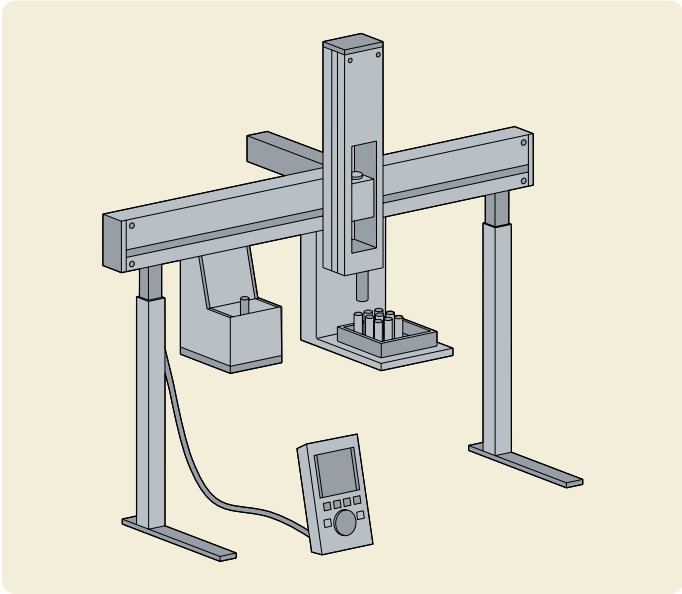
that provides more customer value, or to increase overall profitability, with SKF experience and expertise, you’re likely to find a real solution.

Linear motor table



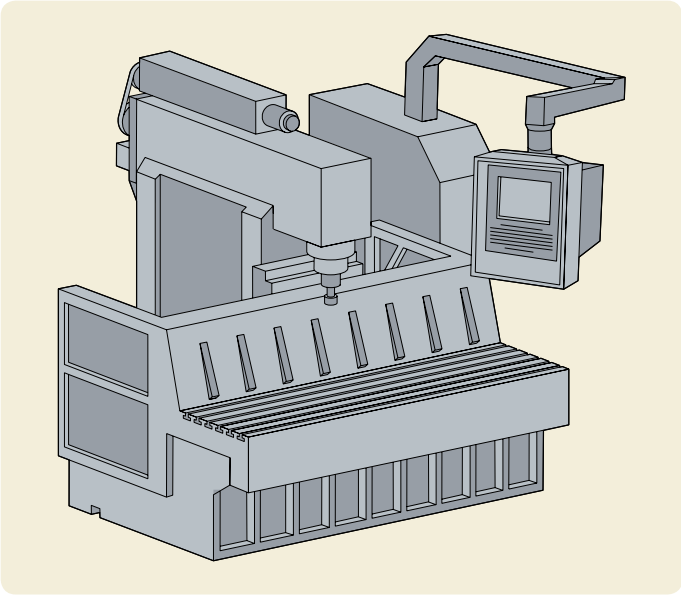
Components application
a) Precision rail guides

Gantry systems



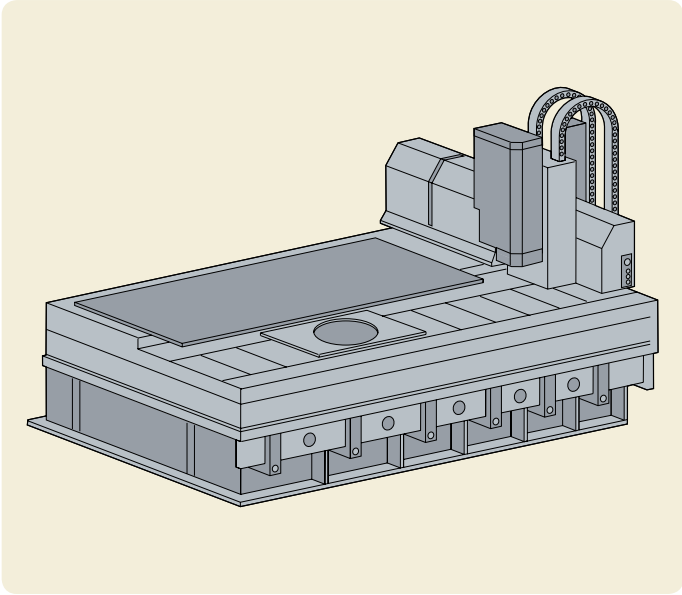
Components application
a) Precision rail guides

Machine tool



Components application
a) Precision rail guides

Stone/glass cutting



Components application
a) Precision rail guides



Some things are made to withstand the test of time



The thread of a cobweb is proportionally more resistant than any material ever invented by man – even a steel cable. Here we see just one of the wonders of nature which have inspired SKF to develop products that will last for many years to come.

Some screws, guidance systems and many other components bearing the name of SKF are made from stainless steel and are designed to withstand

a corrosive environment, at the same time providing the highest quality of performance with long-term reliability for all your applications.

With SKF, technology lasts.

Ball & roller screws

Ball screws and roller screws

SKF ball and roller screw assemblies are high-quality products, suitable for a wide range of applications where such screws are needed.

The high efficiency screw allows loads to be displaced by transforming rotary action into linear motion. The high efficiency screw has rolling elements, either balls or rollers, between the nut and the screw shaft.

In all types of ball screws – miniature, rolled and ground ball screws (figs. 1, 2 and 3) – the load is transmitted from the screw shaft to the nut through each ball. Several recirculating systems are available. To improve positioning accuracy, backlash can be reduced or eliminated.

Roller screws (fig. 4) are available in two non-competing designs which cover requirements beyond ball screw limitations.

Load transfer from the nut to the screw shaft through a number of threaded or grooved rollers results in a large number of strong contact points.

Operating precision (table 1)

Comparison of the different positioning components and systems is shown below .

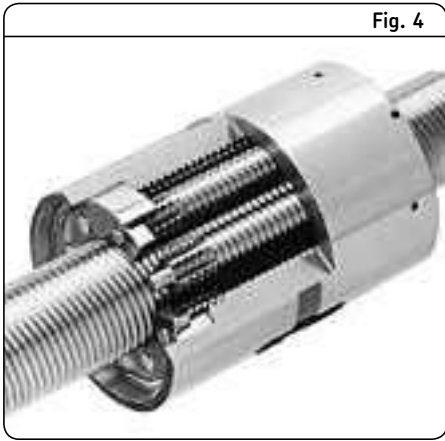
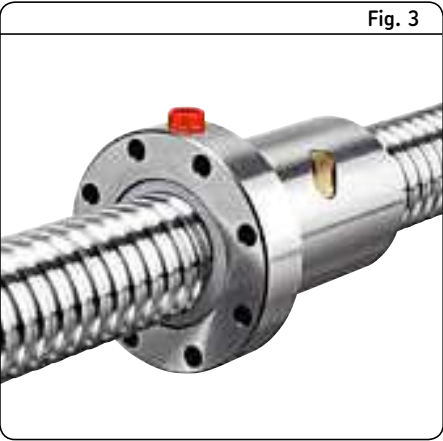
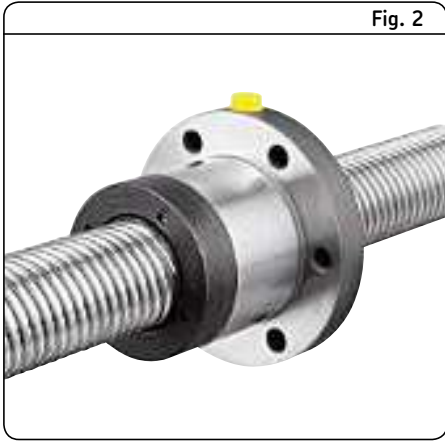
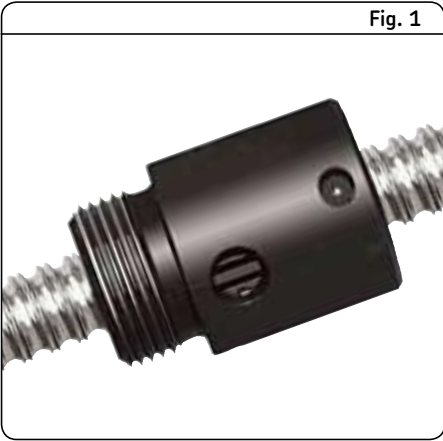


Table 1							
Operating precision (µm)	Linear guides			Ball & roller screws			Tables: driven and not driven
0,1-1		Precision rail guides		Roller screws			
1-10							
10-100	Linear ball bearings	Profile rail guides	Standard slides		Ball screws	Linear motors	Standard drives or linear motors with all guiding systems
100-1 000							

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Ball and roller screw

How to choose

In our wide range of products, you are sure to find the product that exactly fits your requirements:

- Miniature precision rolled ball screws (fig. 5), either with ball recirculation by integrated tube or with inserts, are very compact.
- Precision rolled ball screws (fig. 6) enable you to select the correct specifications: simple transport screws, very fast screws with long lead, or preloaded screws for more precision.
- Ground ball screws (fig. 3) for more rigidity and precision.
- Roller screws (fig. 7) and inverted roller screws (fig. 8) which provide strength far beyond the limits of ball screws for use in heavy loads, ultimate precision and rigidity, high speed and acceleration, and for use in very difficult environments.

Table 2 will help you make your selection.

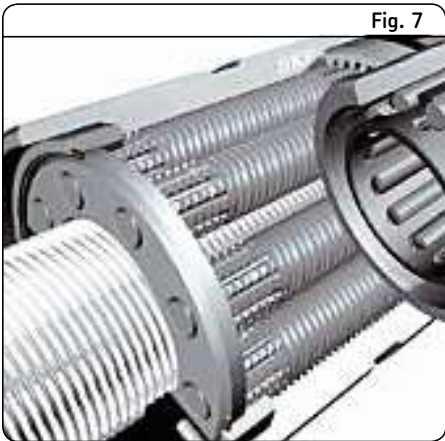
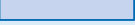
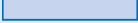
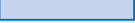
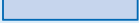
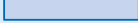


Table 2					
Type	Details	Basic dynamic load rating	Precision Ep (μ) on 300 mm	High duty cycles	Adverse environment (Spec. steel, pollution)
	SD/BD/SH Diameter Ø 6 to 16 mm	 Up to 7,6 kN	 G9 (130 μ) to G5 (23 μ)		 Good
	SX/BX, SN/BN/PN SND/BND/PND SL/TL, SLD/TL DIN standard Ø 16 to 63 mm	 Up to 95 kN	 G9 (130 μ) to G5 (23 μ)		 Satisfactory
	SKD, BKD, PKD, PGFM/PGF Ø 16 to 150 mm	 Up to 374 kN	 G5 (23 μ) to G1 (6 μ)		 Satisfactory
	SRC, SRF, BRC, BRF, PRU, PRK, HRC, HRP Ø 8 to 240 mm	 Up to 3 200 kN	 G5 (23 μ) to G1 (6 μ)		 Exceptional

Precision rolled ball screws

Complete assemblies

A complete range of accessories is available and can be delivered completely assembled. Just ask when ordering (fig. 9).

Service range

Quick service for precision rolled ball screws

For reduced delivery time, SKF operates quick service facilities in Europe and in North America, where standard screw shafts, nuts and accessories are stocked.



Fig. 9

Ball screw orders

Customers can order ball screws with the following options:

- Stock items of screws shafts and nuts, without machined ends. Nuts with axial play mounted on screw shaft, or on sleeve. Nuts with backlash elimination or with preload mounted on shaft
- Ball screw assemblies with shaft ends machined according to standard ends as defined in this catalogue
- Ball screw assemblies with shaft ends machined according to customer requirements: In this case, please send a drawing with all dimensional and tolerance requirements, and with all specifications written in English
- Complete ball screw assemblies, including accessories presented in this catalogue. Accessories already mounted on nut or shaft, or delivered separately

General rules

- | | |
|----------------------|--|
| Delivery time | • From a couple of days to maximum two weeks is possible for orders meeting the following conditions: |
| Quantity | • Maximum 5 pieces for types SX/BX - SN/BN/PN - SL/TL
• Maximum 15 pieces for types SH - SD/BD |
| Materials | • Both shafts and nuts should be made of standard steel (refer to our ball screw catalog). Neither stainless steel nor special treatments are accepted through this quick channel |
| Capabilities | • Standard nuts, including DIN nuts
• Screw shafts as per customer drawing (splines & special treatments are not possible)
• Preload by oversized balls accepted for BX - BN/BND - TL/TLD
• Rotating nut SLT/TLT types are excluded |

Available range

Diameters	Leads	Nut types	Precision classes	Accessories
From 6 to 63 mm	From 2 to 50 mm	Cylindrical and flanged with axial play, backlash elimination, or preload, SKF designs or DIN designs	G5 - G7 - G9	Flanges for nuts, and end bearing units for screw shafts

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Precision rolled ball screws

Ordering key

Nut type:

Table with 2 columns: Description and Code. Rows include Miniature screw, axial play, recirculation by inserts (SD), Miniature screw, backlash elimination, recirculation by inserts (BD), Miniature screw, axial play, recirculation by integrated tube (SH), Miniature screw, axial play, stainless steel (SDS), Miniature screw, backlash elimination, stainless steel (BDS), Miniature screw, axial play, stainless steel recirculation by integrated tube (SHS), Universal screw, axial play (SX), Universal screw, backlash elimination (BX), Precision screw, axial play, DIN nut (SND), Precision screw, backlash elimination, DIN nut (BND), Precision screw, preloaded, DIN nut (PND), Precision screw, axial play, cylindrical flange (SN), Precision screw, backlash elimination, cylindrical flange (BN), Precision screw, preloaded, cylindrical flange (PN), Long lead screw, axial play (SL), Long lead screw, backlash elimination (TL), Long lead screw, axial play, DIN nut (SLD), Long lead screw, backlash elimination, DIN nut (TLD), Rotating nut with axial play (SLT), Rotating nut with backlash elimination (TLT).

Nominal diameter x lead (mm)

Hand:

Table with 2 columns: Description and Code. Rows include Right (R), Left (on request) (L).

Threaded length / Total length (mm)

Lead precision:

G5, G7, G9

Nut orientation:

Nut threaded nose or nut flange towards shorter machined end of shaft (S)
Nut threaded nose or nut flange towards longer machined end of shaft (L)
In case of identical machining at both shaft ends (-)

Machined end combination:

See page 138-141

Required lengths for AA, SA, UA (both ends):

See page 138

/

Options:

With wipers
Without wipers
Safety ring (for miniature ball screws only)
Reduced axial play

WPR
NOWPR
RING
REDPLAY

Example: PND 32x5 R 330 / 380 G7 L - SA +K 30 / 20 NOWPR

Symbols, see page 191

3 Ball & roller screws

Precision rolled ball screws

SD/BD/SH - Miniature ball screws

Ball recirculation with composite inserts for SD, BD types. Threaded nose for easy mounting

SD: axial play

BD: backlash elimination by oversized balls

SH: ball recirculation through tube integrated in the nut.

Lead precision G5, G7 or G9

SX/BX - Universal ball screws

Ball recirculation with composite inserts, threaded nose for easy mounting

Accessories: see **pages 129 and 142–143**.

Steel inserts are optional

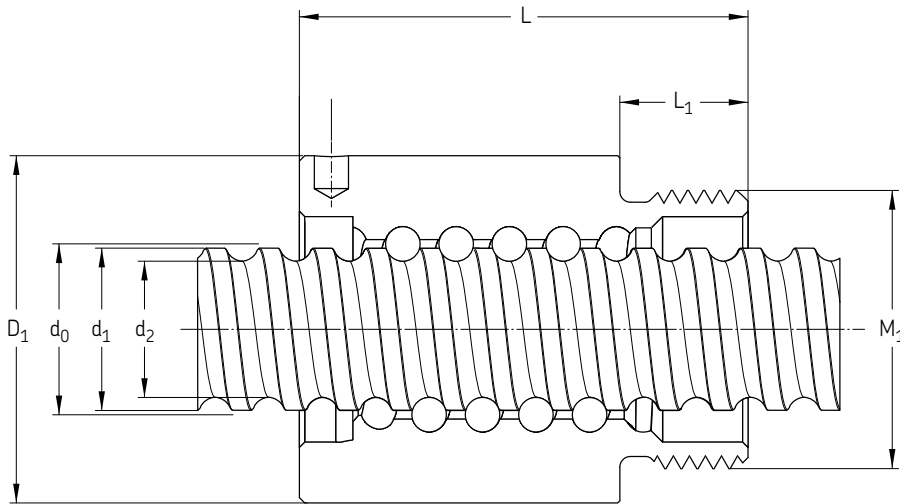
SX: axial play

BX: backlash elimination by oversized balls

Lead precision G5, G7 or G9

Designations	Nominal diameter	Lead	Dimensions Shaft		Nut				
	d ₀	P _h	d ₁	d ₂	L Max	L	L ₁	D ₁ h10	M ₁ 6g
mm									
SH 6×2R	6	2	6	4,7	1 000	20	7,5	16,5	M14×1
SD/BD 8×2,5R	8	2,5	7,6	6,3	1 000	23,5	7,5	17,5	M15×1
SD/BD 10×2R	10	2	9,5	8,3	1 000	22	7,5	19,5	M17×1
SH 10×3R	10	3	9,93	7,8	1 000	29	9	21	M18×1
SD/BD 10×4R	10	4	8,9	7,4	1 000	28	8	21	M18×1
SD/BD 12×2R	12	2	11,15	9,9	2 000	20	8	20	M18×1
SD/BD 12×4R	12	4	11,3	9,4	2 000	34	10	25,5	M20×1
SD/BD 12×5R	12	5	11,81	9,3	2 000	36	10	23	M20×1
SH 12,7×12,7R	12,7	12,7	13,04	10,2	2 000	50	12	29,5	M25×1,5
SD/BD 14×4R	14	4	13,7	11,9	2 000	30	8	27	M22×1,5
SD/BD 16×2R	16	2	15,5	14,3	2 000	27	12	29,5	M25×1,5
SD/BD 16×5R	16	5	15,2	12,7	2 000	42	12	32,5	M26×1,5
SD/BD 16×10R	16	10	15,23	12,6	2 000	46	12	32,5	M26×1,5
SX/BX 20×5R	20	5	19,4	16,7	4 700	54	14	38	M35×1,5
SX/BX 25×5R	25	5	24,65	21,7	4 700	69	19	43	M40×1,5
SX/BX 25×10R	25	10	24,64	20,5	4 700	84	19	43	M40×1,5
SX/BX 32×5R	32	5	31,58	28,7	5 700	64	19	52	M48×1,5
SX/BX 32×10R	32	10	31,95	27,8	5 700	95	19	54	M48×1,5
SX/BX 40×5R	40	5	39,56	36,7	5 700	65	19	60	M56×1,5
SX/BX 40×10R	40	10	39,36	34	5 700	105	24	65	M60×2
SX/BX 40×40R	40	40	38,34	34,2	5 700	121	24	65	M60×2
SX/BX 50×10R	50	10	49,65	44	5 700	135	29	78	M72×2
SX/BX 63×10R	63	10	62,78	57	5 700	135	29	93	M85×2

Symbols, see **page 191**



Designations	Basic load ratings		Support bearing Recommended thrust support bearings	Recommended support pillow block
	dynamic Ca	static C0a		
kN				
SH 6×2 R	1,9	2,2	-	-
SD/BD 8×2,5 R	2,2	2,7	-	-
SD/BD 10×2 R	2,5	3,6	-	-
SH 10×3 R	2,6	3,3	-	-
SD/BD 10×4 R	4,5	5,5	-	-
SD/BD 12×2 R	2,9	4,7	-	-
SD/BD 12×4 R	4,9	6,6	-	-
SD/BD 12×5 R	4,2	5,4	-	-
SH 12,7×12,7 R	6,6	8,9	-	-
SD/BD 14×4 R	6,0	9,1	-	-
SD/BD 16×2 R	3,3	6,2	FLBU 16/PLBU 16	BUF 16
SD/BD 16×5 R	7,6	10,7	FLBU 16/PLBU 16	BUF 16
SD/BD 16×10 R	10,7	17,2	FLBU 16/PLBU 16	BUF 16
SX/BX 20×5 R	14,0	23,8	PLBU 20/FLBU 20(**)	BUF 20
SX/BX 25×5 R	19,0	37,8	PLBU 25/FLBU 25	BUF 25
SX/BX 25×10 R	23,5	39,0	PLBU 25/FLBU 25	BUF 25
SX/BX 32×5 R	22,0	51,6	PLBU 32/FLBU 32	BUF 32
SX/BX 32×10 R	27,1	52,0	PLBU 32/FLBU 32/FLRBU 3(*)	BUF 32
SX/BX 40×5 R	24,3	65,6	PLBU 40/FLBU 40	BUF 40
SX/BX 40×10 R	61,5	124,1	PLBU 40/FLBU 40/FLRBU 4(*)	BUF 40
SX/BX 40×40 R	31,3	72,9	PLBU 40/FLBU 40	BUF 40
SX/BX 50×10 R	80,4	188,8	PLBU 50/FLBU 50/FLRBU 5(*)	BUF 50
SX/BX 63×10 R	91,2	248,3	PLBU 63/FLBU 63	BUF 63

* For high load applications, use FLRBU type. Please refer to end shaft and support bearing definitions, pages 188-190.

** For high load application, please contact SKF.

3 Ball & roller screws

Precision rolled ball screws

SDS/BDS/SHS - Miniature ball screws in stainless steel

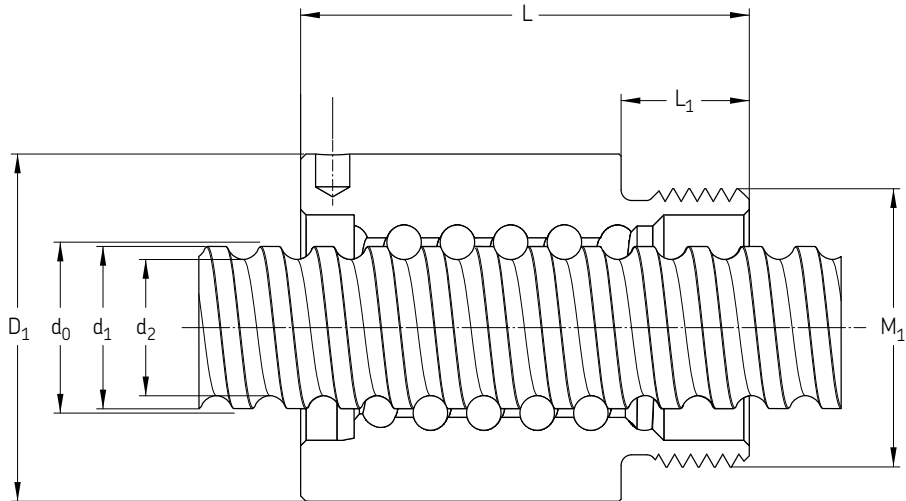
Ball recirculation with composite inserts for SDS, BDS types. Threaded nose for easy mounting

SDS: axial play

BDS: backlash elimination by oversized balls

SHS: ball recirculation through tube integrated in the nut

Standard lead precision G7 or G9.



Designations	Nominal diameter	Lead	Dimensions Shaft			Nut				Basic load ratings	
	d ₀	P _h	d ₁	d ₂	L Max	L	L ₁	D ₁ h10	M ₁ 6g	Ca dynamic	C _{0a} static
	mm									kN	
SHS 6×2 R	6	2	6	4,7	1 000	20	7,5	16,5	M14×1	1,2	1,1
SDS/BDS 8×2,5 R	8	2,5	7,6	6,3	1 000	23,5	7,5	17,5	M15×1	1,4	1,3
SDS/BDS 10×2 R	10	2	9,5	8,3	1 000	22	7,5	19,5	M17×1	1,6	1,8
SDS/BDS 12×2 R	12	2	11,15	9,9	2 000	20	8	20	M18×1	1,9	2,3
SDS/BDS 12×4 R	12	4	11,3	9,4	2 000	34	10	25,5	M20×1	3,1	3,3
SDS/BDS 12×5 R	12	5	11,81	9,3	2 000	36	10	23	M20×1	2,7	2,7
SDS/BDS 14×4 R	14	4	13,7	11,9	2 000	30	8	27	M22×1,5	3,8	4,6
SDS/BDS 16×2 R	16	2	15,5	14,3	2 000	27	12	29,5	M25×1,5	2,1	3,1
SDS/BDS 16×5 R	16	5	15,2	12,7	2 000	42	12	32,5	M26×1,5	4,8	5,4

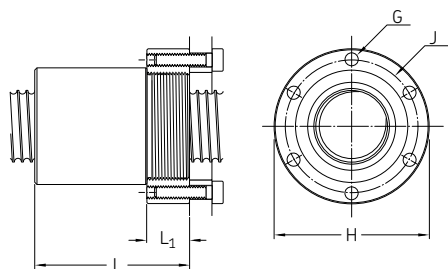
Designations	Support bearing	
	Recommended thrust support bearings	Recommended support pillow block
SHS 6×2 R	-	-
SDS/BDS 8×2,5 R	-	-
SDS/BDS 10×2 R	-	-
SDS/BDS 12×2 R	-	-
SDS/BDS 12×4 R	-	-
SDS/BDS 12×5 R	-	-
SDS/BDS 14×4 R	-	-
SDS/BDS 16×2 R	FLBU 16/PLBU 16 ¹⁾	BUF 16 ¹⁾
SDS/BDS 16×5 R	FLBU 16/PLBU 16 ¹⁾	BUF 16 ¹⁾

1) Support bearings with standard steel.

Accessories for SX/BX nuts

FHRF

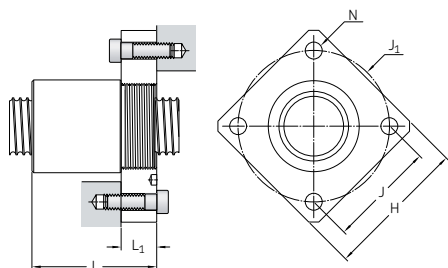
Round flange (for SX nuts only)



Designations	Nominal diameter	Lead	Dimensions				
	d_0	P_h	L	L_1 h14	G	J js12	H h12
mm							
FHRF 20	20	5	55	15	M5	44	52
FHRF 25	25	5	70	20	M6	50	60
FHRF25	25	10	88	20	M6	50	60
FHRF 32	32	5	70	20	M6	59	69
FHRF 32	32	10	96	20	M6	59	69
FHRF 40×5	40	5	70	20	M8	69	82
FHRF 40×10	40	10	111	25	M10	76	92
FHRF 40×10	40	40	122	25	M10	76	92
FHRF 50	50	10	136	30	M12	91	110
FHRF 63	63	10	136	30	M12	106	125

FHSF

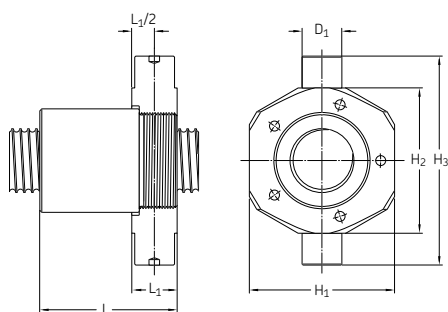
Square flange (for SX nuts only)



Designations	Nominal diameter	Lead	Dimensions					
	d_0	P_h	L	L_1 h14	H h14	J js12	J ₁	N
mm								
FHSF 20	20	5	55	15	60	45	63,6	6,6
FHSF 25	25	5	70	20	70	52	73,5	9
FHSF 25	25	10	88	20	70	52	73,5	9
FHSF 32	32	5	70	20	80	60	84,8	9
FHSF 32	32	10	96	20	80	60	84,8	9
FHSF 40×5	40	5	70	20	90	70	99	11
FHSF 40×10	40	10	111	25	100	78	110,3	13
FHSF 40×10	40	40	122	25	100	78	110,3	13
FHSF 50	50	10	136	30	120	94	133	15
FHSF 63	63	10	136	30	130	104	147	15

FHTF

Trunnion flange (for SX nuts only)



Designations	Nominal diameter	Lead	Dimensions					
	d_0	P_h	L	L_1	H_1 js16	H_2 h12	H_3 h12	D_1 h8
mm								
FHTF 20	20	5	57	17	55	56	80	15
FHTF 25	25	5	71	21	60	65	97	18
FHTF 25	25	10	86	21	60	65	97	18
FHTF 32	32	5	68	23	73	73	105	20
FHTF 32	32	10	99	23	73	73	105	20
FHTF 40×5	40	5	69	23	85	85	117	20
FHTF 40×10	40	10	108,5	27,5	98	98	140	25
FHTF 40×10	40	40	124,5	27,5	98	98	140	25
FHTF 50	50	10	139	33	120	120	162	30
FHTF 63	63	10	139	33	135	135	177	30

Symbols, see page 191

3 Ball & roller screws

Precision rolled ball screws

SND/BND - Precision ball screws

Ball recirculation with composite inserts, nut shape according to DIN standard. Steel inserts are optional

SND: axial play

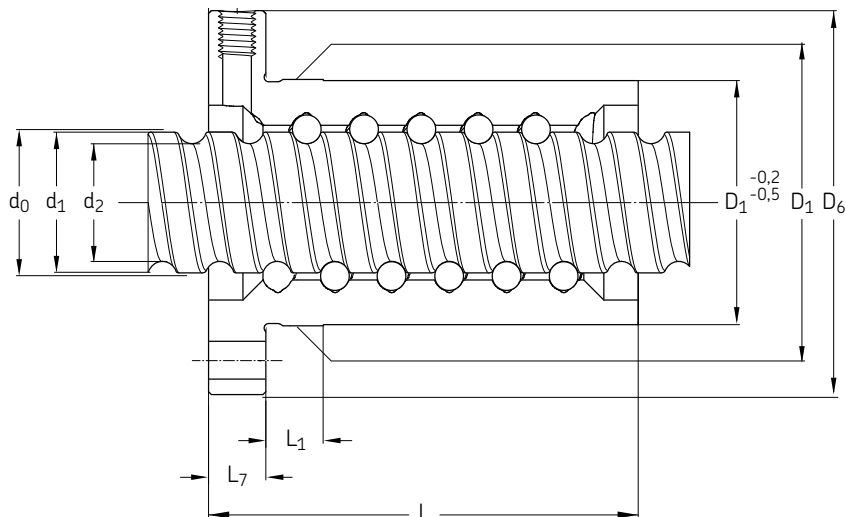
BND: backlash elimination by oversized balls

Lead precision G5, G7 or G9.

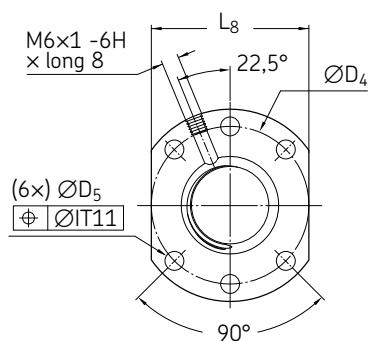
PND - Precision ball screws

Ball recirculation with composite inserts, nut shape according to DIN standard, preloaded for optimal rigidity. Steel inserts are optional

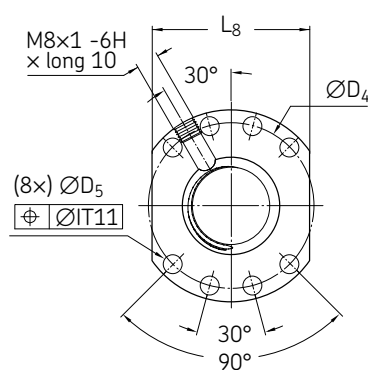
Lead precision G5, G7 or G9.



Designations	Nominal diameter	Lead	Dimensions Shaft		Nut								
	d_0	P_h	d_1	d_2	L Max	L	L_1	L_7	L_8 h13	D_1 g6	D_4	D_5 H13	D_6 h13
mm													
SND/BND 16×5 R	16	5	15,2	12,7	2 000	43,5	10	10	40	28	38	5,5	48
PND 16×5 R	16	5	15,2	12,7	2 000	48	10	10	40	28	38	5,5	48
SDD/BDD 16×10 R	16	10	15,23	12,6	2 000	47	37	10	40	28	38	5,5	48
GDD 16×10 R	16	10	15,23	12,6	2 000	87	77	10	40	28	38	5,5	48
SND/BND 20×5 R	20	5	19,4	16,7	4 700	44,5	10	10	44	36	47	6,6	58
PND 20×5 R	20	5	19,4	16,7	4 700	50	10	10	44	36	47	6,6	58
SND/BND 25×5 R	25	5	24,65	21,7	4 700	44,5	10	10	48	40	51	6,6	62
PND 25×5 R	25	5	24,65	21,7	4 700	62	10	10	48	40	51	6,6	62
SND/BND 25×10 R	25	10	24,64	20,5	4 700	75	10	10	48	40	51	6,6	62
PND 25×10 R	25	10	24,64	20,5	4 700	75	10	10	48	40	51	6,6	62
SND/BND 32×5 R	32	5	31,58	28,7	5 700	51,5	10	12	62	50	65	9	80
PND 32×5 R	32	5	31,58	28,7	5 700	74	10	12	62	50	65	9	80
SND/BND 32×10 R	32	10	31,95	27,8	5 700	64	10	12	62	50	65	9	80
PND 32×10 R	32	10	31,95	27,8	5 700	100	10	12	62	50	65	9	80
SND/BND 40×5 R	40	5	39,56	36,7	5 700	58,5	10	14	70	63	78	9	93
PND 40×5 R	40	5	39,56	36,7	5 700	88	10	14	70	63	78	9	93
SND/BND 40×10 R	40	10	39,36	34	5 700	91,0	20	14	70	63	78	9	93
PND 40×10 R	40	10	39,36	34	5 700	130	20	14	70	63	78	9	93
SND/BND 50×10 R	50	10	49,65	44	5 700	93,0	10	16	85	75	93	11	110
PND 50×10 R	50	10	49,65	44	5 700	151	10	16	85	75	93	11	110
SND/BND 63×10 R	63	10	62,78	57	5 700	95,0	10	18	95	90	108	11	125
PND 63×10 R	63	10	62,78	57	5 700	153	10	18	95	90	108	11	125



Design 1



Design 2

Designations	Basic load ratings		Number of circuits of balls	Design	Support bearing Recommended thrust support bearings	Recommended support pillow block
	dynamic C_a	static C_{0a}				
	kN		—			
SND/BND 16×5 R	7,8	10,7	3	1	FLBU 16/PLBU 16	BUF 16
PND 16×5 R	5,5	7,1	2×2	1	FLBU 16/PLBU 16	BUF 16
SDD/BDD 16×10 R	10,7	17,2	2×1,8	1	FLBU 16/PLBU 16	BUF 16
GDD 16×10 R	10,7	17,2	2×1,8	1	FLBU 16/PLBU 16	BUF 16
SND/BND 20×5 R	11,3	17,9	3	1	PLBU 20/FLBU 20	BUF 20
PND 20×5 R	8,0	11,9	2×2	1	FLBU 20/PLBU 20	BUF 20
SND/BND 25×5 R	12,7	22,7	3	1	PLBU 25/FLBU 25	BUF 25
PND 25×5 R	12,7	22,7	2×3	1	FLBU 25/PLBU 25	BUF 25
SND/BND 25×10 R	24,1	39,0	4	1	PLBU 25/FLBU 25	BUF 25
PND 25×10 R	13,3	19,5	2×2	1	FLBU 25/PLBU 25	BUF 25
SND/BND 32×5 R	19,0	41,3	4	1	PLBU 32/FLBU 32	BUF 32
PND 32×5 R	19,0	41,3	2×4	1	FLBU 32/PLBU 32	BUF 32
SND/BND 32×10 R	21,9	39,0	3	1	PLBU 32/FLBU 32	BUF 32
PND 32×10 R	21,9	39,0	2×3	1	FLBU 32/PLBU 32	BUF 32
SND/BND 40×5 R	25,6	65,6	5	2	PLBU 40/FLBU 40	BUF 40
PND 40×5 R	25,6	65,6	2×5	2	FLBU 40/PLBU 40	BUF 40
SND/BND 40×10 R	63,3	124,1	5	2	PLBU 40/FLBU 40/FLRBU 4 ^(*)	BUF 40
PND 40×5 R	52,2	99,3	2×4	2	FLBU 40/PLBU 40/FLRBU 4	BUF 40
SND/BND 50×10 R	71,3	157,3	5	2	PLBU 50/FLBU 50/FLRBU 5 ^(*)	BUF 50
PND 50×10 R	71,3	157,3	2×5	2	FLBU 50/PLBU 50/FLRBU 5	BUF 50
SND/BND 63×10 R	81,5	206,9	5	2	PLBU 63/FLBU 63	BUF 63
PND 63×10 R	81,5	206,9	2×5	2	FLBU 63/PLBU 63	BUF 63

* For high load applications, use FLRBU type. Please refer to end shaft and support bearing definitions, pages 188-190

3 Ball & roller screws

Precision rolled ball screws

SN/BN - Precision ball screws

Ball recirculation with composite inserts

Steel inserts are optional

SN: axial play

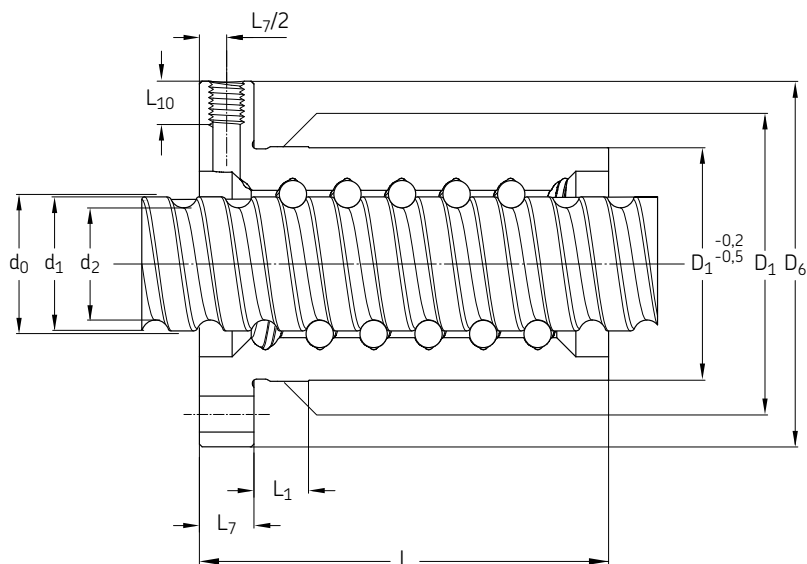
BN: backlash elimination by oversized balls

Lead precision G5, G7 or G9.

PN - Precision ball screws

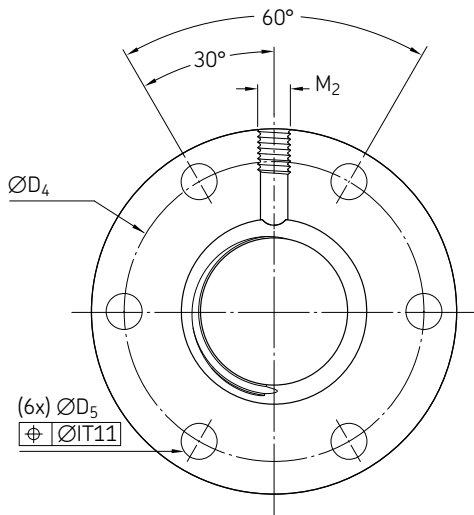
Ball recirculation with composite inserts, preloaded for optimal rigidity. Steel inserts are optional

Lead precision G5, G7 or G9.



Designations	Nominal diameter	Lead	Dimensions Shaft			Nut								
	d_0	P_h	d_1	d_2	L Max	L	L_1	L_7	M_2 6H	L_{10}	D_1 g6	D_4 js12	D_5 H13	D_6 h13
mm														
SN/BN 16×5 R	16	5	15,2	12,7	2 000	43,5	10	10	M6	8	28	38	6x5,5	48
PN 16×5 R	16	5	15,2	12,7	2 000	48	10	10	M6	8	28	38	6x5,5	48
SN/BN 20×5 R	20	5	19,4	16,7	4 700	44,5	10	10	M6	8	33	45	6x6,6	57
PN 20×5 R	20	5	19,4	16,7	4 700	50	10	10	M6	8	33	45	6x6,6	57
SN/BN 25×5 R	25	5	24,65	21,7	4 700	44,5	10	10	M6	8	38	50	6x6,6	62
PN 25×5 R	25	5	24,65	21,7	4 700	62	10	10	M6	8	38	50	6x6,6	62
SN/BN 25×10 R	25	10	24,64	20,5	4 700	75	10	10	M6	8	43	55	6x6,6	67
PN 25×10 R	25	10	24,64	20,5	4 700	75	10	10	M6	8	43	55	6x6,6	67
SN/BN 32×5 R	32	5	31,58	28,7	5 700	51,5	10	12	M6	8	45	58	6x6,6	70
PN 32×5 R	32	5	31,58	28,7	5 700	74	10	12	M6	8	45	58	6x6,6	70
SN/BN 32×10 R	32	10	31,95	27,8	5 700	64	10	12	M8×1	10	54	70	6x9	87
PN 32×10 R	32	10	31,95	27,8	5 700	100	10	12	M8×1	10	54	70	6x9	87
SN/BN 40×5 R	40	5	39,56	36,7	5 700	58,5	10	14	M6	8	53	68	6x6,6	80
PN 40×5 R	40	5	39,56	36,7	5 700	88	10	14	M6	8	53	68	6x6,6	80
SN/BN 40×10 R	40	10	39,36	34	5 700	91	20	14	M8×1	10	63	78	6x9	95
PN 40×5 R	40	10	39,36	34	5 700	126	20	14	M8×1	10	63	78	6x9	95
SN/BN 50×10 R	50	10	49,65	44	5 700	99	10	16	M8×1	10	72	90	6x11	110
PN 50×10 R	50	10	49,65	44	5 700	151	10	16	M8×1	10	72	90	6x11	110
SN/BN 63×10 R	63	10	62,78	57	5 700	101	10	18	M8×1	10	85	105	6x11	125
PN 63×10 R	63	10	62,78	57	5 700	153	10	18	M8×1	10	85	105	6x11	125

Symbols, see page 191



Designations	Basic load ratings		Number of circuits of balls	Support bearing Recommended thrust support bearings	Recommended support pillow block
	dynamic C_a	static C_{0a}			
	kN		–		
SN/BN 16×5 R	7,8	10,7	3	FLBU 16/PLBU 16	BUF 16
PN 16×5 R	5,5	7,1	2×2	FLBU 16/PLBU 16	BUF 16
SN/BN 20×5 R	11,3	17,9	3	PLBU 20/FLBU 20	BUF 20
PN 20×5 R	8,0	11,9	2×2	PLBU 20/FLBU 20	BUF 20
SN/BN 25×5 R	12,7	22,7	3	PLBU 25/FLBU 25	BUF 25
PN 25×5 R	12,7	22,7	2×3	PLBU 25/FLBU 25	BUF 25
SN/BN 25×10 R	24,1	39,0	4	PLBU 25/FLBU 25	BUF 25
PN 25×10 R	13,3	19,5	2×2	PLBU 25/FLBU 25	BUF 25
SN/BN 32×5 R	19,0	41,3	4	PLBU 32/FLBU 32	BUF 32
PN 32×5 R	19,0	41,3	2×4	PLBU 32/FLBU 32	BUF 32
SN/BN 32×10 R	21,9	39,0	3	PLBU 32/FLBU 32	BUF 32
PN 32×10 R	21,9	39,0	2×3	PLBU 32/FLBU 32	BUF 32
SN/BN 40×5 R	25,6	65,6	5	PLBU 40/FLBU 40	BUF 40
PN 40×5 R	25,6	65,6	2×5	PLBU 40/FLBU 40	BUF 40
SN/BN 40×10 R	63,3	124,1	5	PLBU 40/FLBU 40/FLRBU 4 ^(*)	BUF 40
PN 40×5 R	52,2	99,3	2×4	PLBU 40/FLBU 40/FLRBU 4 ^(*)	BUF 40
SN/BN 50×10 R	71,3	157,3	5	PLBU 50/FLBU 50/FLRBU 5 ^(*)	BUF 50
PN 50×10 R	71,3	157,3	2×5	PLBU 50/FLBU 50/FLRBU 5 ^(*)	BUF 50
SN/BN 63×10 R	81,5	206,9	5	PLBU 63/FLBU 63	BUF 63
PN 63×10 R	81,5	206,9	2×5	PLBU 63/FLBU 63	BUF 63

* For high load applications, use FLRBU type. Please refer to end shaft and support bearing definitions, pages 188-190

3 Ball & roller screws

Precision rolled ball screws

SL/TL - Long lead screws

Ball recirculation through the end faces of the nut.

SL: axial play

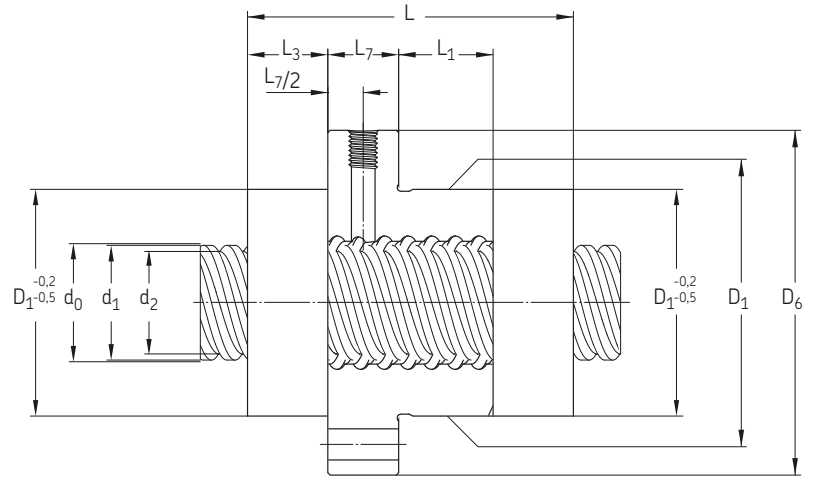
TL: backlash elimination.

SLD/TLD - Long lead ball screws

Ball recirculation through the end faces of the nut. Nut according to DIN standard.

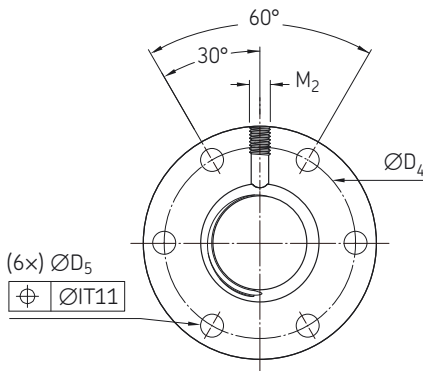
SLD: axial play

TLD: backlash elimination.

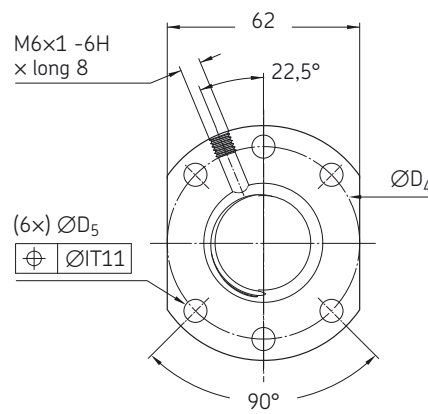


Designations	Nominal diameter	Lead	Dimensions Shaft		Nut									
					L	L	L ₁	L ₃	L ₇	D ₁	D ₄	D ₅	D ₆	M ₂
	d ₀	P _h	d ₁	d ₂	Max					g9	js12	H13		6H
mm														
SL/TL 25×20 R	25	20	24,29	21,7	4 700	66,8	18	17,6	15	48	60	6×6,6	73	M6
SL/TL 25×25 R	25	25	24,38	21,5	4 700	78,2	27	18,7	15	48	60	6×6,6	73	M6
SL/TL 32×20 R	32	20	30,06	27,4	5 700	67,4	18	17,9	15	56	68	6×6,6	80	M6
SL/TL 32×32 R	32	32	31,066	28,4	5 700	80,3	41	13	15	56	68	6×6,6	80	M6
SLD/TLD 32×32 R	32	32	31,066	28,4	5 700	80,3	41	13	15	50*	65	6×9	80	M6
SL/TL 32×40 R	32	40	29,58	26,9	5 700	54,8	17	12,2	15	53*	68	6×6,6	80	M6
SL/TL 40×20 R	40	20	37,77	35,1	5 700	87,3	38	18	15	63	78	6×9	95	M6
SL/TL 40×40 R	40	40	38,34	34,2	5 700	110,8	44	21,6	25	72	90	6×11	110	M8×1
SL/TL 50×50 R	50	50	49,14	43,4	5 700	134	60	25,5	25	85	105	6×11	125	M8×1

* Tolerance g6



SL/TL



SLD/TLD

Designations	SL		TL		Support bearing Recommended thrust support bearings	Recommended support pillow block
	Basic load ratings dynamic	static	Basic load ratings dynamic	static		
	C _a	C _{0a}	C _a	C _{0a}		
kN						
SL/TL 25 × 20 R	22,8	51,5	12,6	25,8	PLBU 25/FLBU 25	BUF 25
SL/TL 25 × 25 R	22,3	50,6	12,3	25,3	PLBU 25/FLBU 25	BUF 25
SL/TL 32 × 20 R	25,4	65,2	14,0	32,6	PLBU 32/FLBU 32/FLRBU 3 ^(*)	BUF 32
SL/TL 32 × 32 R	26,1	69,3	14,4	34,7	PLBU 32/FLBU 32/FLRBU 3 ^(*)	BUF 32
SLD/TLD 32 × 32 R	26,1	69,3	14,4	34,7	PLBU 32/FLBU 32/FLRBU 3 ^(*)	BUF 32
SL/TL 32 × 40 R	12,6	29,8	6,9	14,9	PLBU 32/FLBU 32	BUF 32
SL/TL 40 × 20 R	41,3	128,8	22,8	64,4	PLBU 40/FLBU 40	BUF 40
SL/TL 40 × 40 R	51,7	130,5	28,5	65,3	PLBU 40/FLBU 40/FLRBU 4 ^(*)	BUF 40
SL/TL 50 × 50 R	92,9	235,1	51,2	117,6	PLBU 50/FLBU 50/FLRBU 5 ^(*)	BUF 50
* For high load applications, use FLRBU type. Please refer to end shaft and support bearing definitions, pages 188-190						

* For high load applications, use FLRBU type. Please refer to end shaft and support bearing definitions, pages 188-190

3 Ball & roller screws

Precision rolled ball screws

Rotating nut

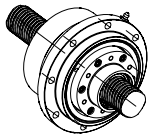
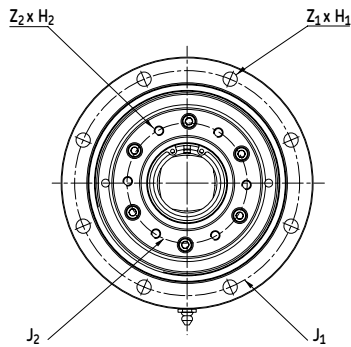
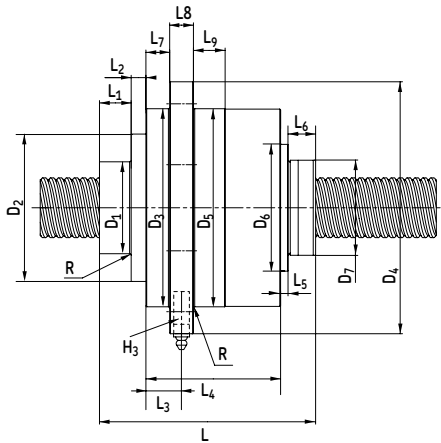
The nut rotates inside bearings and moves along the fixed long lead screw shaft.

The drive motor moves with the nut, so inertia and critical speed problems, associated with a long rotating shaft, are minimised (**figs. 10 and 11**).

Two versions are available:

SLT: rotating nut using ball screw with axial play

TLT: rotating nut using ball screw with backlash elimination.



Nominal diameter	Lead (right hand) P_h	Ball screw capacities				Bearing	
		SL Basic load ratings		TL Basic load ratings		Basic load ratings	
		C_a	C_{0a}	C_a	C_{0a}	C_a	C_{0a}
mm		kN					
25	20	39,2	97,0	21,6	48,5	61,8	56
	25	33,2	80,4	18,3	40,2	61,8	56
32	20	49,6	141,8	27,3	70,9	78	76,5
	32	32,2	88,6	17,3	44,3	78	76,5
	40	25,3	67,0	13,9	33,5	78	76,5
40	20	54,2	176,5	29,8	88,3	93,6	91,5
	40	51,7	130,5	28,5	65,3	114	118
50	50	92,9	235,1	51,2	117,6	156	166

Rotating nut inertia

Size	Inertia pulley support	Mass of rotating nut
	kgmm ²	kg
25 × 20	1 012	4,5
25 × 25	1 023	4,6
32 × 20	1 935	7,2
32 × 32	1 919	7,1
32 × 40	1 949	7,1
40 × 20	3 095	7,5
40 × 40	3 784	8,4
50 × 50	11 482	15,5

Rotating nut capacities

Size	Max transmissible torque	Max transmissible axial load
	Nm	kN
25 × 20	180	68,3
25 × 25	180	68,3
32 × 20	209	107
32 × 32	209	87,3
32 × 40	209	81,7
40 × 20	240	116
40 × 40	246	93,3
50 × 50	803	162

Fig. 10



Fig. 11



3

Designations $d_0 \times P_h$	Dimensions												
	D_1 h8	D_2	D_3	D_4	D_5 g6	D_6	D_7	R max	J_1	J_2	$Z_1 \times H_1$	$Z_2 \times H_2 \times$ useful length	H_3
	mm												
SLT/TLT 25 × 20 R	40	72,5	100	133	100	65	48	0,8	116	55	6 × Ø9	6 × M6 × 20	M6 × 1
SLT/TLT 25 × 25 R	40	72,5	100	133	100	65	48	0,8	116	55	6 × Ø9	6 × M6 × 20	M6 × 1
SLT/TLT 32 × 20 R	50	82	119,5	150	120	76	56	0,8	135	68	6 × Ø9	6 × M6 × 20	M6 × 1
SLT/TLT 32 × 32 R	50	82	119,5	150	120	76	50	0,8	135	68	6 × Ø9	6 × M6 × 20	M6 × 1
SLT/TLT 32 × 40 R	50	82	119,5	150	120	76	53	0,8	135	68	6 × Ø9	6 × M6 × 20	M6 × 1
SLT/TLT 40 × 20 R	58	93	125	159	125	80	63	0,8	142	75	8 × Ø9	6 × M6 × 20	M8 × 1
SLT/TLT 40 × 40 R	60	93	137	168	137	N/A	72	1,6	153	80	8 × Ø9	6 × M6 × 20	M8 × 1
SLT/TLT 50 × 50 R	70	120	170	210	170	110	85	1,6	190	106	8 × Ø11	6 × M8 × 30	M8 × 1

All tolerances js13 if not specified

Designations $d_0 \times P_h$	Dimensions									
	L	L_1	L_2	L_3	L_4	L_5	L_6	L_7	L_8	L_9
	mm									
SLT/TLT 25 × 20 R	121,2	15	12,4	19,9	74	2,9	16,9	12,4	15	15
SLT/TLT 25 × 25 R	126,3	15	12,4	19,9	74	2,9	22	12,4	15	15
SLT/TLT 32 × 20 R	132,9	20	3,8	27,5	89	2,2	17,9	20	15	20
SLT/TLT 32 × 32 R	126,8	20	3,8	27,5	89	2,2	11,8	20	15	20
SLT/TLT 32 × 40 R	125,9	20	3,8	27,5	89	2,2	10,9	20	15	20
SLT/TLT 40 × 20 R	136,7	20	9,3	22,5	85	4,7	17,7	15	15	20
SLT/TLT 40 × 40 R	159,6	47	8,8	19	83	0	20,8	11,5	15	20
SLT/TLT 50 × 50 R	163,5	20	15,5	25,4	100	4,5	23,5	15,7	20	25

Symbols, see page 191

3 Ball & roller screws

Precision rolled ball screws

Shaft end combinations for rolled ball screws

In the ordering key, shaft end machining is defined by:

- One letter for nominal diameter
 $d_0 < 16$ mm
- Two letters for nominal diameter
 $d_0 \geq 16$ mm

detailing the combination of two machined ends (see designation **page 124**).

Machined ends are detailed on **page 139** for nominal diameter $d_0 < 16$ mm and on **pages 140–141** for nominal diameter $d_0 \geq 16$ mm

S, SA and UA end machining types

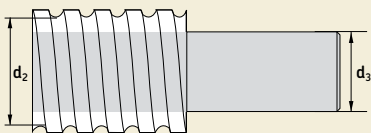
*) S and SA: end is machined to thread root diameter d_2 . It is possible for all screw shaft nominal diameters (**fig. 12**)

*) UA: end is machined to diameter d_3 under induction hardened layer. Any length is possible. UA end machining is available for ball screws with nominal diameter d_0 starting from 16 mm (**fig. 12**).

Diameter < 16 mm		Diameter ≥ 16 mm	
Order code	Two machined ends	Order code	Two machined ends
A (without length indication)	cut only	AA (without length indication)	cut only
A (+ length)	cut + annealed	BA	1A + 2A
B	1 + 2	FA ¹⁾	2A + 2A
F ¹⁾	2 + 2	GA ¹⁾	2A + 3A
G ¹⁾	2 + 3	HA	2A + 4A
H	2 + 4	JA	2A + 5A
J	2 + 5	MA	3A + 5A
M	3 + 5	SA ^{*)} (+ length)	end machined to root diameter d_2 , any possible length
S ^{*)} (+ length)	end machined to root diameter d_2 , any possible length	UA ^{*)} (+ length)	end machined to diameter d_3 under induction hardening, any possible lengths.
K	Keyway	K	Keyway
Z	end machined according to customer drawing on request	Z	end machined according to customer drawing on request

! 1) This mounting requires the greatest care to avoid compressing the screw shaft. Please contact SKF.

Fig. 12



Dimensions	Ø d ₂	Ø d ₃
mm		
6 × 2	4,7	
8 × 2,5	6,3	
10 × 2	8,3	
10 × 3	7,8	
10 × 4	7,4	
12 × 2	9,9	
12 × 4	9,4	
12 × 5	9,3	
12,7 × 12,7	10,2	
14 × 4	11,9	
16 × 2	14,3	12
16 × 5	12,7	9
16 × 10	12,6	9
20 × 5	16,7	14

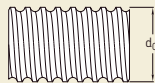
Dimensions	Ø d ₂	Ø d ₃
mm		
25 × 5	21,7	19
25 × 10	20,5	18
25 × 20	21,7	19
25 × 25	21,5	18
32 × 5	28,7	26
32 × 10	27,8	25
32 × 20	27,4	24
32 × 32	28,4	26
32 × 40	26,9	24
40 × 5	36,7	34
40 × 10	34,0	31
40 × 20	35,1	32
40 × 40	34,2	31
50 × 10	44,0	41
50 × 50	43,4	40
63 × 10	57,0	54

Symbols, see **page 191**

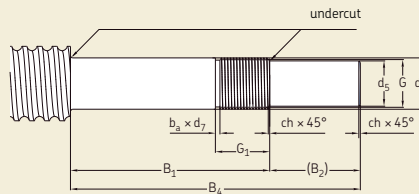
Standard end machining for nominal diameter < 16 mm

Special ends are machined according to customer drawing on request.

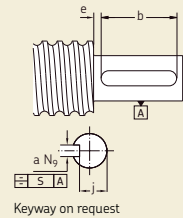
Type 1



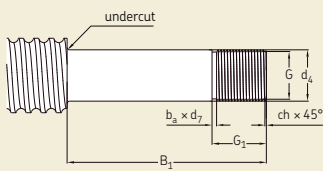
Type 2



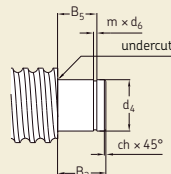
Keyway



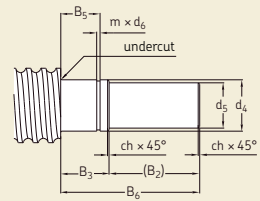
Type 3



Type 4



Type 5



For SD/BD/SH, SDS/BDS/SHS

Dimensions Size d ₀	d ₅	d ₄	B ₁	B ₂	B ₃	B ₄	B ₅	B ₆	G	G ₁	m	d ₆	ch	b _a	d ₇	a	b	e	j	S	Keyway
	h ₇	js ₇	js ₁₂		js ₁₂	js ₁₂	H ₁₁	js ₁₂	6g		+0,14 0	h ₁₁ /h ₁₂			h ₁₁	N9	+0,5 0				DIN 6885
6	3	4	22	10	7	32	5,4	17	M4×0,7	7	0,5	3,8	0,5	1,2	2,9						
8	4	5	24	12	7	36	5,6	19	M5×0,8	7,2	0,7	4,8	0,5	1,2	3,7						
10	5	6	26	12	9	38	6,7	21	M6×1	7,5	0,8	5,7	0,5	1,5	4,5						
12/12,7	6	8	38	12	10	50	7,8	22	M8×1	2,5	0,9	7,6	0,5	1,5	6,5	2	8	3	4,8	0,1	A2×2×8
14	8	10	40	16	12	56	9	28	M10×1,5	13,3	1,1	9,6	0,5	2,3	7,8	2	10	3	6,8	0,1	A2×2×10

Symbols, see page 191

3 Ball & roller screws

Precision rolled ball screws

Standard end machining for nominal diameter ≥ 16 mm

Standard shaft ends for ball screws with nominal diameter ≥ 16 mm have been developed to suit the SKF support bearings FLBU, PLBU and BUF.

These standard ends are the same for all screw types.

However, for the "SL/TL" long lead screw, an additional shoulder, part of the threaded length, will be machined to protect the

wiper and nut thread during assembly (both ends).

End bearing $\Rightarrow$ Machined end type

FLBU 2A or 3A

PLBU 2A or 3A

BUF 4A or 5A

For *SD/BD*, *SDS/BDS*, *SX/BX*, *SND/BND/PND*, *SN/BN/PN*

Dimensions																						Keyway to DIN6885	
Size	d ₅	d ₄	d ₁₁	d ₁₂	B ₁	B ₂	B ₃	B ₄	B ₅	B ₆	B ₇	d ₈	G	G ₁	m	d ₆	ch ₁	ch ₂	b _a	d ₇			
d ₀	h ₇	h ₆	h ₆	h ₇	js ₁₂		js ₁₂	js ₁₂	H ₁₁	js ₁₂			6g			+0,14 0	h ₁₁ / h ₁₂			h ₁₁	a ^{N9} × l × b fixed end (type 2A)	free end (type 5A)	
16	8	10	10	8	53	16	13	69	10	29	2	12,5	M10×0,75	17	1,1	9,6	0,5	0,5	1,2	8,8	A2×2×12	A2×2×12	
20	10	12	10	8	58	17	13	75	10	29	2	14,5	M12×1	18	1,1	9,6	0,5	0,5	1,5	10,5	A3×3×12	A2×2×12	
25	15	17	17	15	66	30	16	96	13	46	4,5	20	M17×1	22	1,1	16,2	0,5	0,5	1,5	15,5	A5×5×25	A5×5×25	
32	17	20	17	15	69	30	16	99	13	46	4,5	21,7	M20×1	22	1,1	16,2	0,5	0,5	1,5	18,5	A5×5×25	A5×5×25	
40	25	30	30	25	76	45	22	121	17,5	67	4,5	33,5	M30×1,5	25	1,6	28,6*	1	0,5	2,3	27,8	A8×7×40	A8×7×40	
50	30	35	30	25	84	55	22	139	17,5	67	4,5	35,5	M35×1,5	27	1,6	28,6*	1	0,5	2,3	32,8	A8×7×45	A8×7×40	
63	40	50	45	40	114	65	28	179	20,75	93	3	54	M50×1,5	32	1,85	42,5*	1,5	1	2,3	47,8	A12×8×50	A12×8×50	

* = d₆ h12

For *SL/TL* only

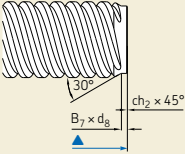
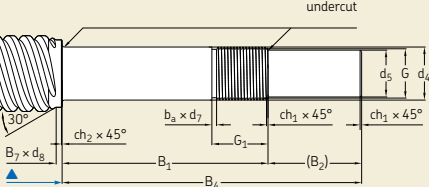
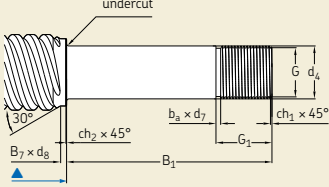
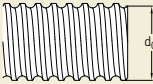
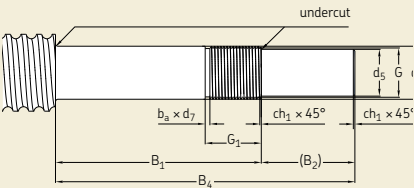
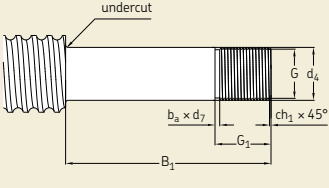
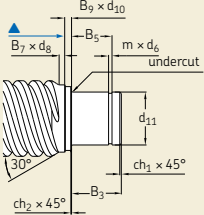
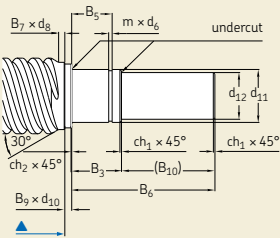
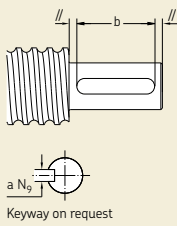
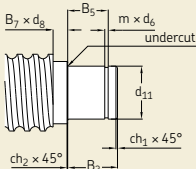
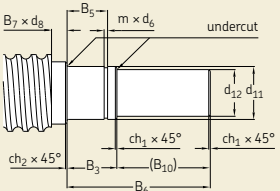
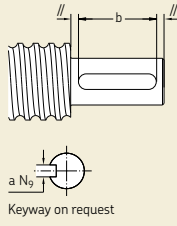
Dimensions																						Keyway to DIN6885			
Size	d ₅	d ₄	d ₁₀	d ₁₁	d ₁₂	B ₁	B ₂	B ₃	B ₄	B ₅	B ₆	B ₇	B ₉	d ₈	G	G ₁	m	d ₆	ch ₁	ch ₂	b _a	d ₇			
d ₀	h ₇	h ₆		h ₆	h ₇	js ₁₂		js ₁₂	js ₁₂	H ₁₁	js ₁₂				6g			+0,14 0	h ₁₁ / h ₁₂			h ₁₁	a ^{N9} × l × b fixed end (type 2A)	free end (type 5A)	
25×20	15	17	/	17	15	66	30	16	96	13	46	4,5	0	21,6	M17×1	22	1,1	16,2	0,5	0,5	1,5	15,5	A5×5×25	A5×5×25	
25×25	15	17	/	17	15	66	30	16	96	13	46	4,5	0	21,4	M17×1	22	1,1	16,2	0,5	0,5	1,5	15,5	A5×5×25	A5×5×25	
32×20	17	20	21,5	17	15	69	30	16	99	13	46	4,5	2	27,3	M20×1	22	1,1	16,2	0,5	0,5	1,5	18,5	A5×5×25	A5×5×25	
32×32	17	20	21,5	17	15	69	30	16	99	13	46	4,5	2	28,3	M20×1	22	1,1	16,2	0,5	0,5	1,5	18,5	A5×5×25	A5×5×25	
32×40	17	20	21,5	17	15	69	30	16	99	13	46	4,5	2	26,8	M20×1	22	1,1	16,2	0,5	0,5	1,5	18,5	A5×5×25	A5×5×25	
40×20	25	30	/	30	25	76	45	22	121	17,5	67	6,5	0	35,1	M30×1,5	25	1,6	28,6*	1	0,5	2,3	27,8	A8×7×40	A8×7×40	
40×40	25	30	/	30	25	76	45	22	121	17,5	67	6,5	0	34,1	M40×1,5	25	1,6	28,6*	1	0,5	2,3	27,8	A8×7×40	A8×7×40	
50×50	30	35	37	30	25	84	55	22	139	17,5	67	4,5	3	43,3	M35×1,5	27	1,6	28,6*	1	0,5	2,3	32,8	A8×7×45	A8×7×40	

* = d₆ h12

Symbols, see page 191

Standard machining ends for nominal diameter ≥ 16 mm

Shaft threaded length = total shaft length - ends length.

Type 1A For SL/TL only 	Type 2A For SL/TL only 	Type 3A For SL/TL only 
For other types 	For other types 	For other types 
Type 4A For SL/TL only 	Type 5A For SL/TL only 	Keyway For all types 
For other types 	For other types 	For all types 

▲ End of threaded screw length

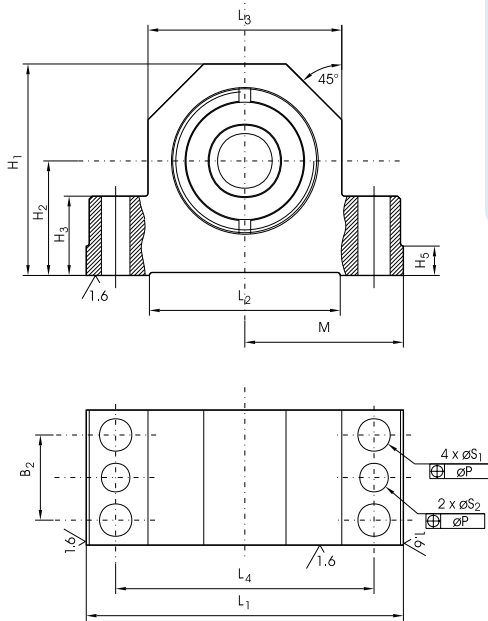
Symbols, see page 191

3 Ball & roller screws

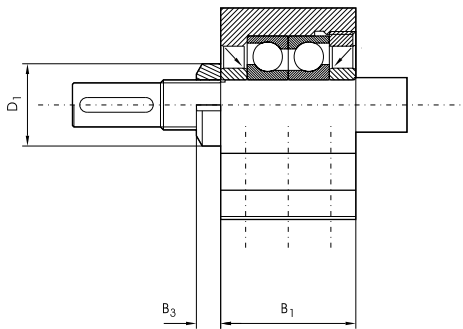
Precision rolled ball screws

PLBU support bearing

Accessories for screw shaft: fixed plummer housing with angular contact ball bearings (back-to-back arrangement).
Designed for standard end machining 2A or 3A

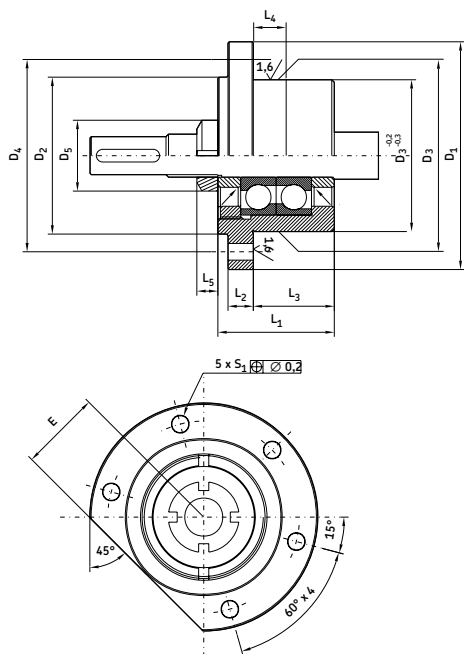


Designations	Dimensions								Basic load ratings	
	d ₀	B ₁	B ₂	H ₁	H ₂ JS8	L ₁	L ₄	S ₁ H12	C _a	C _{0a}
	mm								kN	
PLBU 16	16	37	23	58	32	86	68	9	12,2	12,8
PLBU 20	20	42	25	64	34	94	77	9	13,3	14,7
PLBU 25	25	46	29	72	39	108	88	11	27,9	31,9
PLBU 32	32	49	29	77	45	112	92	11	24,6	31,9
PLBU 40	40	53	32	98	58	126	105	13	41,9	59,6
PLBU 50	50	59	35	112	65	144	118	13	54,5	79,8
PLBU 63	63	85	40	130	65	190	160	13	128	196,1



FLBU support bearing

Accessories for screw shaft: axially locating flanged housing with angular contact ball bearings (back-to-back arrangement).
Designed for standard end machining 2A or 3A

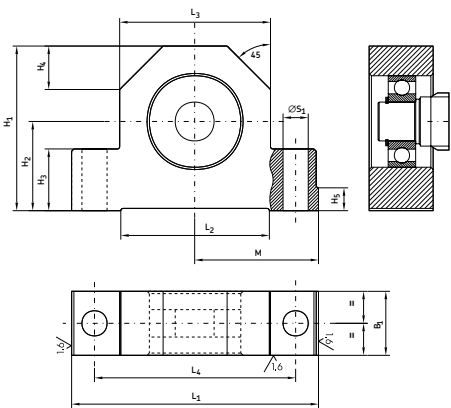


Designations	Dimensions							Basic load ratings	
	d ₀	D ₁	D ₃ h7	D ₄	L ₁	L ₃	S ₁ H13	C _a	C _{0a}
	mm							kN	
FLBU 16	16	76	47	63	37	22	6,6	12,2	12,8
FLBU 20	20	76	47	63	42	25	6,6	13,3	14,7
FLBU 25	25	90	60	76	46	32	6,6	27,9	31,9
FLBU 32	32	90	60	74	49	32	9	24,6	31,9
FLBU 40	40	120	80	100	53	32	11	41,9	59,6
FLBU 50	50	130	90	110	59	32	13	54,5	79,8
FLBU 63	63	165	124	146	85	43,5	13	128	196,1

Symbols, see [page 191](#)

BUF support bearing

Accessories for screw shaft: axially free pillow block with deep groove ball bearing.
 Designed for standard end machining 4A or 5A



Designations	Dimensions							Basic load ratings	
	d ₀	B ₁	H ₁	H ₂ js8	L ₁	L ₄	S ₁ H12	dynamic C _a	static C _{0a}
	mm							kN	
BUF 16	16	24	58	32	86	68	9	5,07	2,36
BUF 20	20	26	64	34	94	77	9	5,07	2,36
BUF 25	25	28	72	39	108	88	11	9,56	4,75
BUF 32	32	34	77	45	112	92	11	9,56	4,75
BUF 40	40	38	98	58	126	105	13	19,5	11,2
BUF 50	50	39	112	65	144	118	13	19,5	11,2
BUF 63	63	38	130	65	190	160	13	33,2	21,6

Symbols, see [page 191](#)

3 Ball & roller screws

Ground ball screws

Ground ball screws

SKF offers a wide range of ground ball screws (**figs. 13** and **14**) which should meet all your requirements.

- Flanged nut with internal preload, DIN standard
- Single nut with axial play, DIN standard
- Single nut preloaded, end flange
- Double nut preloaded, end flange

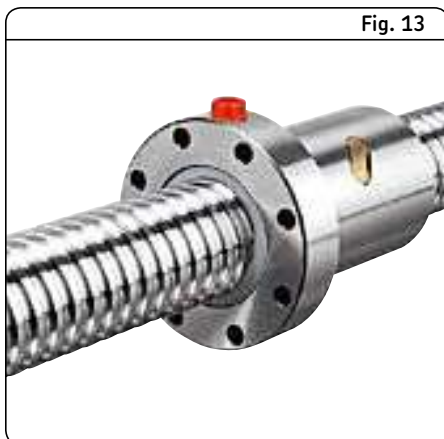


Fig. 13



Fig. 14

Ordering key

Nut type:

Nut with axial play, DIN standard flange	SKD
Nut with backlash elimination, DIN standard flange	BKD
Nut preloaded, DIN standard flange	PKD
Double nut preloaded, end flange	PGFM
Single nut preloaded, end flange	PGF

Nominal diameter × lead (mm)

Hand:

Right	R
Left (on request)	L

Number of circuits of balls

Threaded length / Total length (mm); (inch) for PGFM/PGF

Lead precision:

G5, G3, G1

Nut orientation:

Nut threaded nose or nut flange towards shorter machined end of shaft (S)
Nut threaded nose or nut flange towards longer machined end of shaft (L)
In case of identical machining at both shaft ends (–)

Machined end combination according to customer's drawing

Z

Wipers:

Always with wipers

Example: PKD 32×5 R 4 330 / 445 G1 L - HA +K WPR

3 Ball & roller screws

Ground ball screws

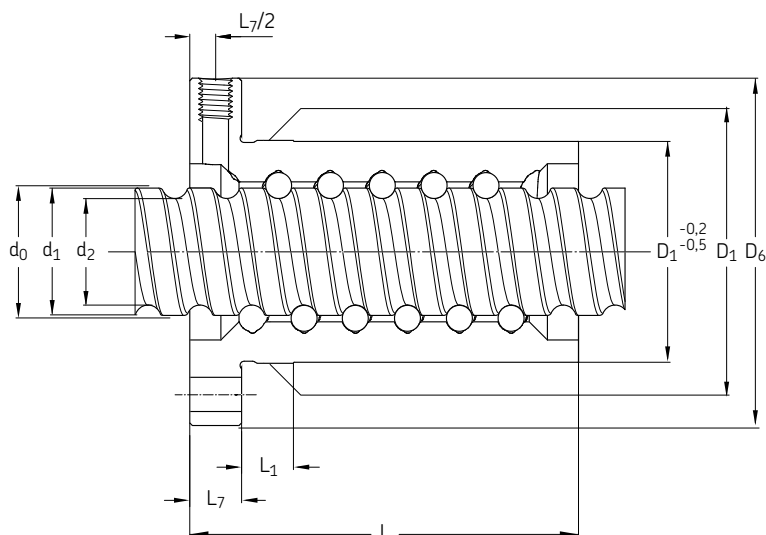
SKD/BKD

Single nut

SKD: nut with axial play

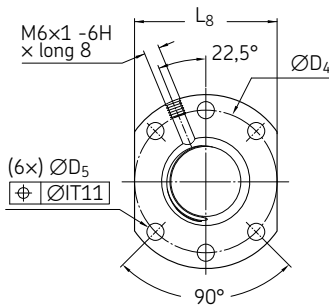
BKD: backlash elimination by oversized balls

Nut shape according to DIN standard

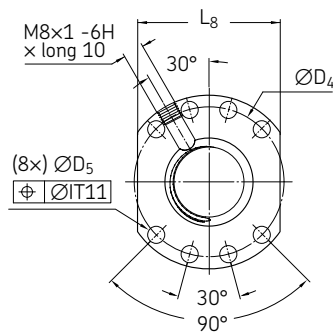


Designations	Nominal diameter	Lead	Dimensions									
	d_0	P_h	d_1	d_2	L	L_1	L_7	L_8 h13	D_1 g6	D_4	D_5 H13	D_6 h13
	mm											
SKD/BKD 16×5 R	16	5	15,35	12,7	43,5	10	10	40	28	38	5,5	48
SKD/BKD 20×5 R	20	5	19,5	16,7	44,5	10	10	44	36	47	6,6	58
SKD/BKD 25×5 R	25	5	24,5	21,7	44,5	10	10	48	40	51	6,6	62
SKD/BKD 25×10 R	25	10	24,7	20,6	75	10	10	48	40	51	6,6	62
SKD/BKD 32×5 R	32	5	31,5	28,7	51,5	10	12	62	50	65	9	80
SKD/BKD 32×10 R	32	10	31,95	27,8	64	10	12	62	50	65	9	80
SKD/BKD 40×5 R	40	5	39,5	36,7	58,5	10	14	70	63	78	9	93
SKD/BKD 40×10 R	40	10	39,4	34,1	91,0	20	14	70	63	78	9	93
SKD/BKD 50×5 R	50	5	49,5	46,7	57	10	16	85	75	93	11	110
SKD/BKD 50×10 R	50	10	49,4	44,1	93,0	10	16	85	75	93	11	110
SKD/BKD 63×5 R	63	5	62,5	59,7	64	10	18	95	90	108	11	125
SKD/BKD 63×10 R	63	10	62,4	57,1	95,0	10	18	95	90	108	11	125
SKD/BKD 80×10 R	80	10	80	75,2	121	12	20	110	105	125	13,5	145

Symbols, see page 191



Design 1



Design 2

Designations	Basic load ratings		Number of circuits of balls	Design	Support bearing Recommended thrust support bearings	Recommended support pillow block
	dynamic C_a	static C_{0a}				
	kN		–			
SKD/BKD 16×5 R	9,9	15,0	3	1	FLBU 16/PLBU 16	BUF 16
SKD/BKD 20×5 R	13,3	22,6	3	1	PLBU 20/FLBU 20	BUF 20
SKD/BKD 25×5 R	14,9	28,7	3	1	PLBU 25/FLBU 25	BUF 25
SKD/BKD 25×10 R	28,5	49,4	4	1	PLBU 25/FLBU 25	BUF 25
SKD/BKD 32×5 R	22,0	52,3	4	1	PLBU 32/FLBU 32	BUF 32
SKD/BKD 32×10 R	25,7	49,4	3	1	PLBU 32/FLBU 32	BUF 32
SKD/BKD 40×5 R	29,5	83,1	5	2	PLBU 40/FLBU 40	BUF 40
SKD/BKD 40×10 R	74,6	157,2	5	2	PLBU 40/FLBU 40/FLRBU 4 ^(*)	BUF 40
SKD/BKD 50×5 R	26,8	84,7	4	2		
SKD/BKD 50×10 R	83,4	199,4	5	2	PLBU 50/FLBU 50/FLRBU 5 ^(*)	BUF 50
SKD/BKD 63×5 R	29,3	106,9	4	2		
SKD/BKD 63×10 R	94,6	262,2	5	2	PLBU 63/FLBU 63	BUF 63
SKD/BKD 80×10 R	103,6	358,5	6	2		

* For high load applications, use FLRBU type. Please refer to end shaft and support bearing definitions, pages 188-190

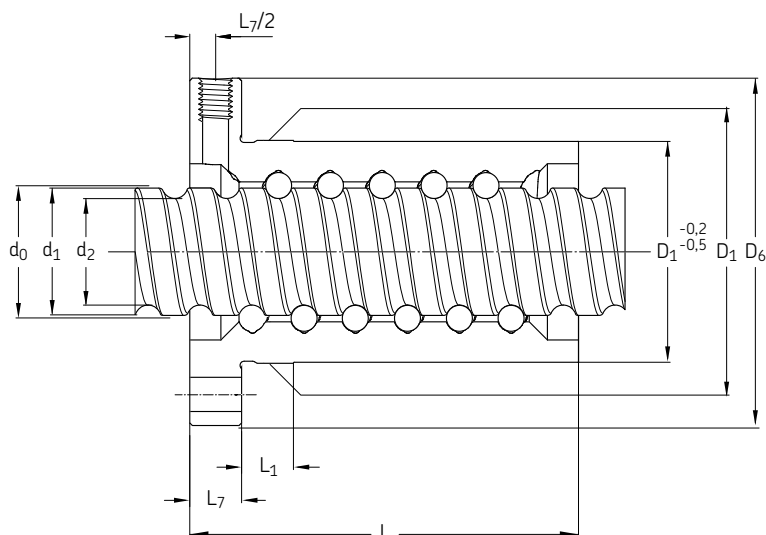
3 Ball & roller screws

Ground ball screws

PKD

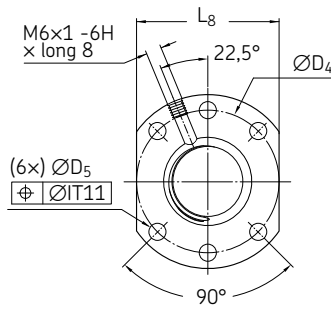
Flanged nut with preload

Nut shape according to DIN Standard

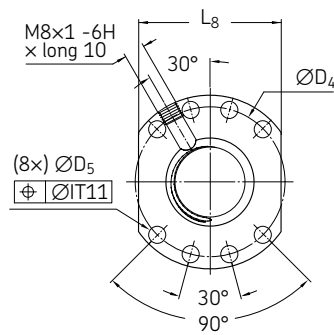


Designations	Nominal diameter	Lead	Dimensions									
	d_0	P_h	d_1	d_2	L	L_1	L_7	L_8 h13	D_1 g6	D_4	D_5 H13	D_6 h13
	mm											
PKD 16×5 R	16	5	15,35	12,7	48	10	10	40	28	38	5,5	48
PKD 20×5 R	20	5	19,5	16,7	50	10	10	44	36	47	6,6	58
PKD 25×5 R	25	5	24,5	21,7	62	10	10	48	40	51	6,6	62
PKD 25×10 R	25	10	24,7	20,6	75	10	10	48	40	51	6,6	62
PKD 32×5 R	32	5	31,5	28,7	74	10	12	62	50	65	9	80
PKD 32×10 R	32	10	31,95	27,8	100	10	12	62	50	65	9	80
PKD 40×5 R	40	5	39,5	36,7	88	10	14	70	63	78	9	93
PKD 40×10 R	40	10	39,4	34,1	130	20	14	70	63	78	9	93
PKD 50×5 R	50	5	49,5	46,7	89	10	16	85	75	93	11	110
PKD 50×10 R	50	10	49,4	44,1	151	10	16	85	75	93	11	110
PKD 63×5 R	63	5	62,5	59,7	89	10	18	95	90	108	11	125
PKD 63×10 R	63	10	62,4	57,1	153	10	18	95	90	108	11	125
PKD 80×20 R	80	20	80	68,6	264	25	25	130	125	145	13,5	165

Symbols, see page 191



Design 1



Design 2

Designations	Basic load ratings		Number of circuits of balls	Design	Support bearing Recommended thrust support bearings	Recommended support pillow block
	dynamic C_a	static C_{0a}				
	kN		—			
PKD 16×5 R	7,0	10,0	2×2	1	FLBU 16/PLBU 16	BUF 16
PKD 20×5 R	9,4	15,1	2×2	1	FLBU 20/PLBU 20	BUF 20
PKD 25×5 R	14,9	28,7	2×3	1	FLBU 25/PLBU 25	BUF 25
PKD 25×10 R	15,7	24,7	2×2	1	FLBU 25/PLBU 25	BUF 25
PKD 32×5 R	22,0	52,3	2×4	1	FLBU 32/PLBU 32	BUF 32
PKD 32×10 R	25,7	49,4	2×3	1	FLBU 32/PLBU 32	BUF 32
PKD 40×5 R	29,5	83,1	2×5	2	FLBU 40/PLBU 40	BUF 40
PKD 40×10 R	61,6	125,8	2×4	2	FLBU 40/PLBU 40/FLRBU4 ^(*)	BUF 40
PKD 50×5 R	26,8	84,7	2×4	2		
PKD 50×10 R	83,4	199,4	2×5	2	FLBU 50/PLBU 50/FLRBU5 ^(*)	BUF 50
PKD 63×5 R	29,3	106,9	2×4	2		
PKD 63×10 R	94,6	262,2	2×5	2	FLBU 63/PLBU 63	BUF 63
PKD 80×20 R	184,5	450,2	2×4	2		

* For high load applications, use FLRBU type. Please refer to end shaft and support bearing definitions, pages 188-190

3 Ball & roller screws

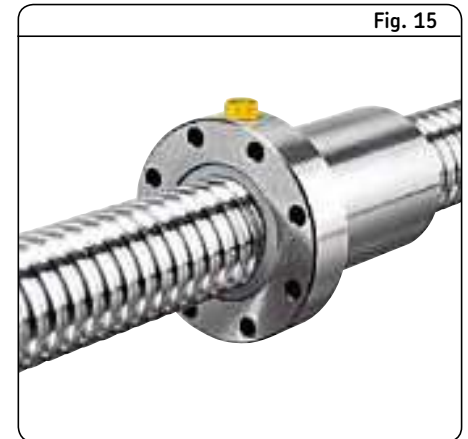
Ground ball screws

Precision ground screw (fig. 15)

Screw diameter from 0,5 to 6 inches. Lead from 0,1 to 1 inch. Any lead metric or inch possible on request. Flange position and holes pattern can be adjusted upon request. Screw bearing support units FLRBU, FLBU, PLBU or BUF are compatible.

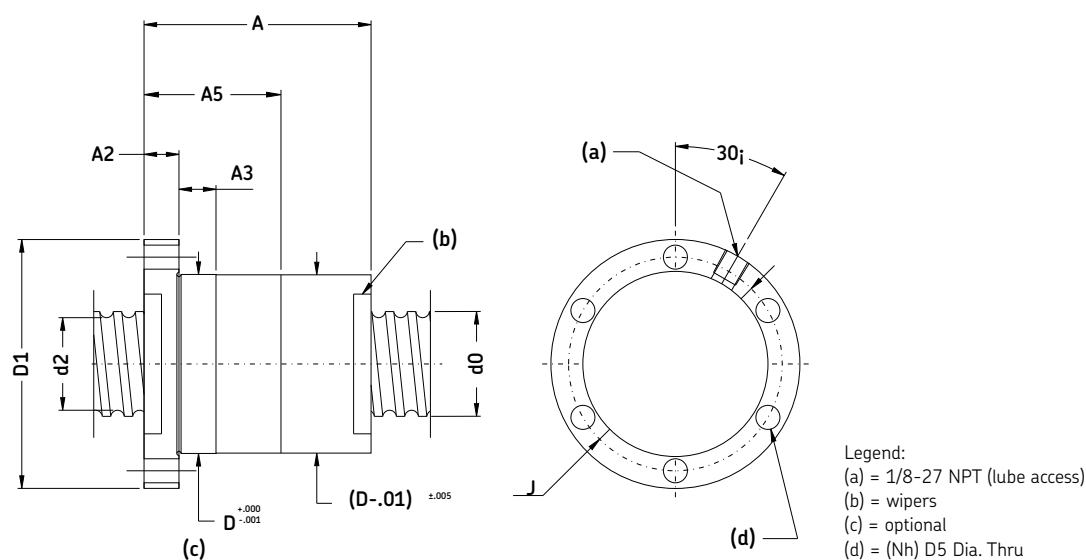
PGFM: double nut preloaded end flange

PGF: single nut preloaded end flange



Designations	Screw diameter	Lead	Locating diameter	Flange diameter	Bolt circle	Double nut length	Flange thickness	Single nut length	Basic load ratings	
									dynamic	static
	d ₀	P _h	D	D ₁	J	A	A ₂	A ₅	C _a	C _{oa}
	in								lbf	
PGFM 0,5×0,1	0,5	0,1	1	1,875	1,437	2,25	0,437	1,35	1 204	2 270
PGFM 0,5×0,2	0,5	0,2	1,25	2,1255	1,687	3,625	0,437	2,225	137	3 302
PGFM 0,625×0,1	0,625	0,1	1,125	2	1,562	2,25	0,437	1,35	1 327	2 867
PGFM 0,625×0,2	0,625	0,2	1,375	2,25	1,812	3,5	0,437	1,9	1 213	5 205
PGFM 0,625×0,25	0,625	0,25	1,625	2,5	2,062	3,937	0,437	2,187	1 124	6 220
PGFM 0,75×0,1	0,75	0,1	1,25	2,25	1,75	2,25	0,437	1,35	1 457	3 559
PGFM 0,75×0,2	0,75	0,2	1,562	2,562	2,062	3,5	0,437	1,9	1 573	6 416
PGFM 0,75×0,25	0,75	0,25	1,625	2,625	2,125	3,937	0,437	2,187	1 804	876
PGFM 0,875×0,2	0,875	0,2	1,687	2,687	2,187	3,5	0,437	1,9	16	89
PGFM 0,875×0,25	0,875	0,25	1,75	2,75	2,25	3,937	0,437	2,187	1 163	9 357
PGFM 1,0×0,1	1	0,1	1,625	2,625	2,125	2,312	0,5	1,412	1 626	4 752
PGFM 1,0×0,2	1	0,2	1,812	2,812	2,312	3,562	0,5	1,962	1 262	9 223
PGFM 1,0×0,25	1	0,25	2,125	3,125	2,625	4,312	0,5	2,312	1 908	12 572
PGFM 1,25×0,2	1,25	0,2	2,062	3,062	2,562	3,562	0,5	1,962	1 698	11 648
PGFM 1,25×0,25	1,25	0,25	2,125	3,125	2,625	4	0,5	2,25	1 848	14 366
PGFM 1,25×0,5	1,25	0,5	2,5	3,5	3	7,125	0,5	3,812	1 147	20 759
PGFM 1,5×0,2	1,5	0,2	2,312	3,312	2,812	3,687	0,625	2,087	166	1 472
PGFM 1,5×0,25	1,5	0,25	3,562	3,562	3,062	4,437	0,625	2,437	1 802	20 656
PGFM 1,5×0,5	1,5	0,5	3,25	4,5	3,875	7,375	0,625	3,875	163	3 624
PGFM 1,75×0,2	1,75	0,2	2,625	3,875	3,25	3,812	0,75	2,212	1 474	16 887
PGFM 1,75×0,25	1,75	0,25	2,875	4,125	3,5	4,562	0,75	2,5	1 418	24 274
PGFM 1,75×0,5	1,75	0,5	3,5	4,75	4,125	7,5	0,75	4	1 276	43 286
PGFM 1,75×0,75	1,75	0,75	3,5	4,75	4,125	10,125	0,875	4,875	1 129	4 365
PGFM 2,0×0,2	2	0,2	2,937	4,187	3,562	3,182	0,75	2,212	1 757	19 310
PGFM 2,0×0,25	2	0,25	3,125	4,375	3,75	4,562	0,75	2,562	1 964	27 890
PGFM 2,0×0,5	2	0,5	3,75	5,5	4,625	7,5	0,75	3,812	1 180	50 548
PGFM 2,0×0,75	2	0,75	3,75	5,5	4,625	10,125	0,875	4,875	24 057	50 350
PGFM 2,0×1,0	2	1,75	3,75	5,5	4,625	11	1,25	6	18 375	36 723
PGFM 2,0×0,25	2,25	0,25	3,312	5	4,187	4,562	0,75	2,562	10 456	31 504

Symbols, see page 191



Designations	Screw diameter	Lead	Locating diameter	Flange diameter	Bolt circle	Double nut length	Flange thickness	Single nut length	Basic load ratings	
									dynamic	static
	d ₀	P _h	D	D ₁	J	A	A ₂	A ₅	C _a	C _{0a}
	in								lbf	
PGFM 2,25 × 0,5	2,25	0,5	4,125	5,875	5	7,5	0,75	4	25 853	57 810
PGFM 2,25 × 0,75	2,25	0,75	4,125	5,875	5	10,125	0,875	4,875	25 749	57 631
PGFM 2,25 × 1,0	2,25	1	4,125	5,875	5	13	1,25	7	26 599	60 759
PGFM 2,5 × 0,25	2,5	0,25	3,625	5,375	4,5	4,562	0,75	2,562	11 089	35 996
PGFM 2,5 × 0,5	2,5	0,5	4,375	6,375	5,375	7,5	0,75	4	27 349	65 072
PGFM 2,5 × 0,75	2,5	0,75	4,375	6,375	5,375	10,125	0,875	4,875	28 208	68 325
PGFM 2,5 × 1,0	2,5	1	5,25	7,25	6,25	14,5	1,25	7	38 815	83 037
PGFM 3,0 × 0,25	3	0,25	4,125	6,15	5,125	4,687	0,875	2,687	11 880	43 226
PGFM 3,0 × 0,5	3	0,5	4,812	6,812	5,812	7,625	0,875	4,125	30 815	83 057
PGFM 3,0 × 0,75	3	0,75	5,75	7,75	6,75	11,375	0,875	6,125	43 353	102 706
PGFM 3,0 × 1,0	3	1	5,75	7,75	6,75	14,5	1,25	7,5	43 216	102 455
PGFM 3,5 × 0,5	3,5	0,5	5,375	7,375	6,375	7,75	1	4,25	32 975	97 605
PGFM 3,5 × 0,75	3,5	0,75	5,875	7,875	6,875	11,5	1	6,25	48 593	128 184
PGFM 3,5 × 1,0	3,5	1	6,5	8,5	7,5	14,75	1,25	7,75	62 805	150 171
PGFM 4,0 × 0,5	4	0,5	5,875	7,875	6,875	8	1,25	4,5	34 886	112 145
PGFM 4,0 × 0,75	4	0,75	6,75	8,75	7,75	11,75	1,25	6,5	51 693	147 601
PGFM 4,0 × 1,0	4	1	7	9	8	14,75	1,25	7,75	69 004	180 105
PGFM 5,0 × 0,5	5	0,5	6,75	8,75	7,75	8	1,25	4,5	38 194	141 214
PGFM 5,0 × 0,75	5	0,75	7,75	9,75	8,75	11,75	1,25	6,875	56 974	186 401
PGFM 5,0 × 1,0	5	1	8	10	9	14,75	1,25	7,75	77 221	230 571
PGFM 6,0 × 0,5	6	0,5	7,75	9,75	8,75	8	1,25	4,5	41 600	173 819
PGFM 6,0 × 0,75	6	0,75	8,75	10,75	9,75	11,75	1,25	6,5	61 435	225 174
PGFM 6,0 × 1,0	6	1	9	11	10	14,75	1,25	7,75	84 043	281 022

Symbols, see page 191

3 Ball & roller screws

Ball screws

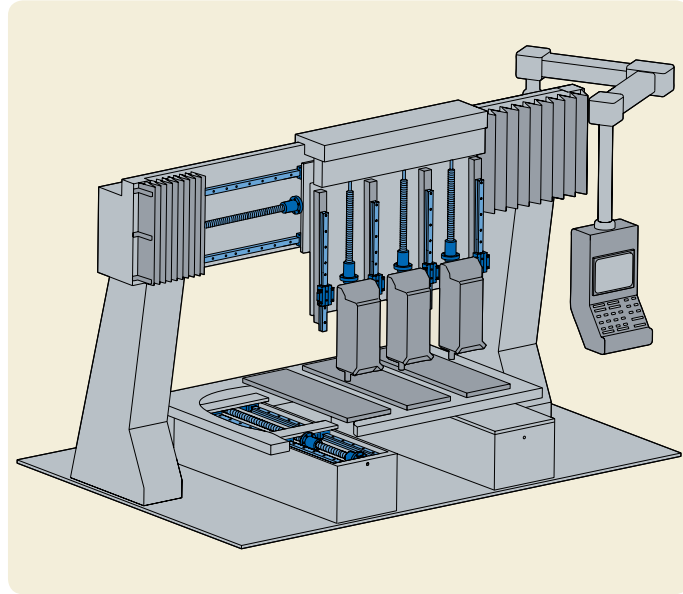
Applications

In response to our customer's ultimate need to produce more with less, SKF has

combined its knowledge and experience with the latest technology to develop solutions for your specific conditions. Whether your goal is to design equipment

that provides more customer value, or to increase overall profitability, with SKF experience and expertise, you are likely to find a real solution.

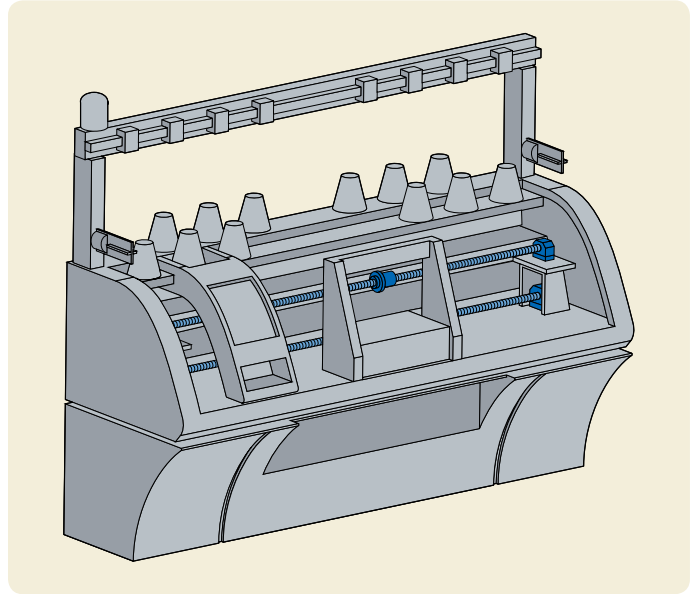
Machine tool



Components application

a) Ground ball screws

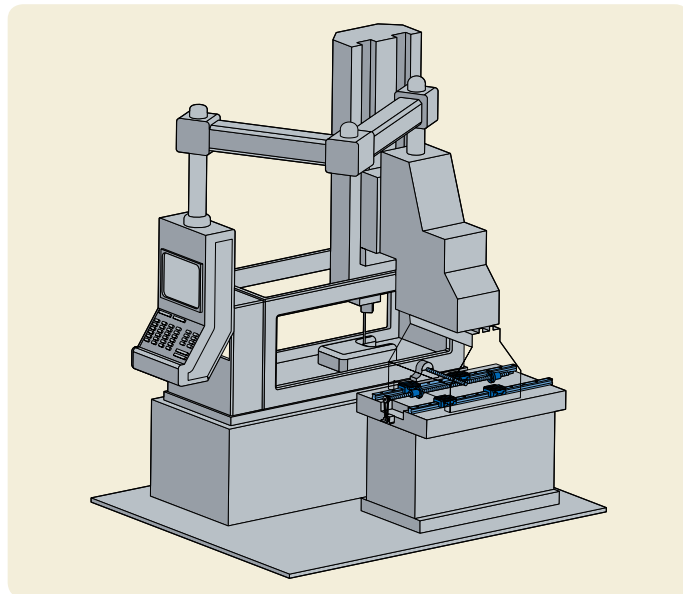
Textile machine



Components application

a) Precision rolled ball screws

Electroerosion

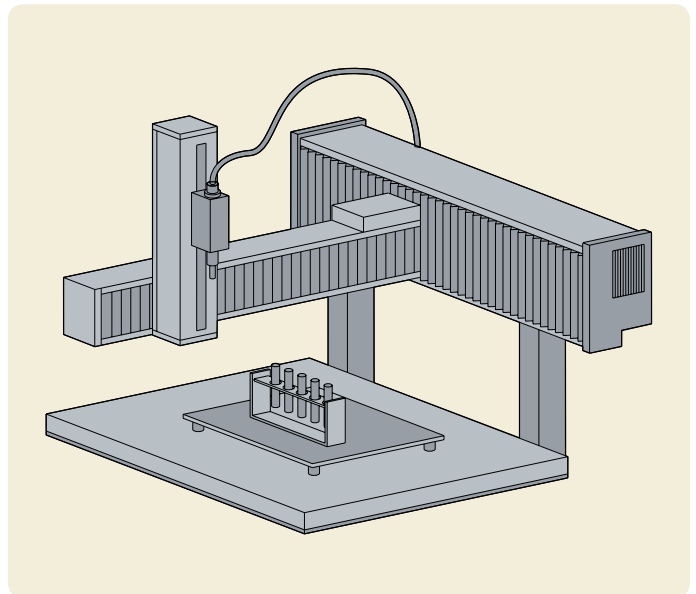


Components application

a) Precision rolled ball screws

b) Profile rail guides

Laboratory automation equipment



Components application

a) Miniature precision rolled ball screws

Roller screws

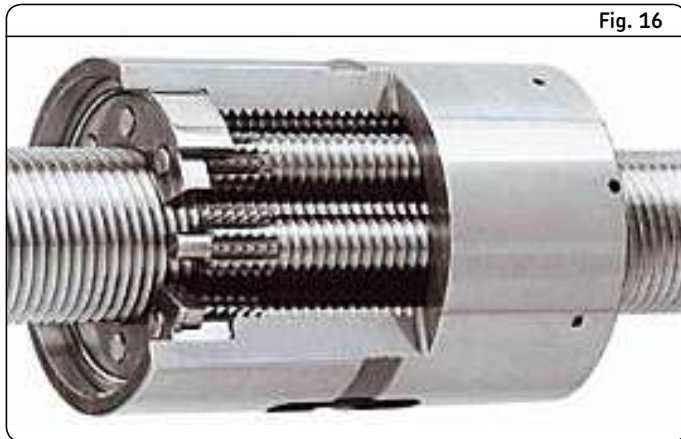
There are two non-competing designs to cover application requirements beyond ball screw limitations. Load transfers from the nut to the screw shaft through a number of threaded or grooved rollers: the resulting large number of contact points ensures a much higher load carrying capacity and a much longer service life than ball screws of similar size.

“SR” Planetary roller screws (fig. 16)

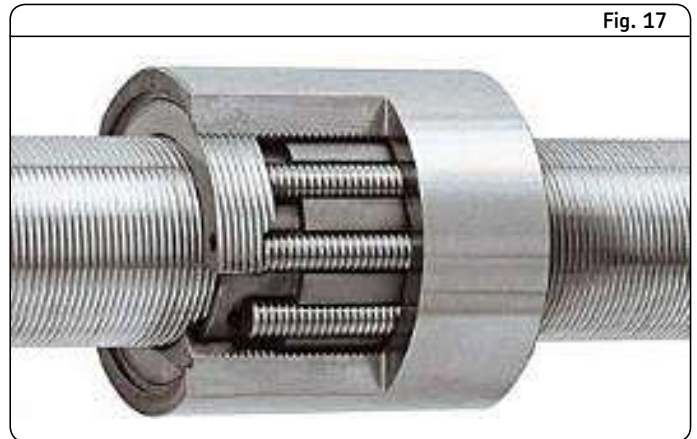
Non-recirculating rollers yield high speed and acceleration capabilities, exceptional reliability and resistance to adverse environments.

“SV” Recirculating roller screws (fig. 17)

Very fine lead of thread (0,6 mm) allows high positioning accuracy, repeatability and exceptional axial stiffness.



SR planetary roller screw



SV recirculating roller screw

Type	Features
SR	Higher static load carrying capacity up to 16 100 kN
SR	Higher dynamic load carrying capacity up to 3 200 kN
SR	Higher rotational speed - Ø 48 up to 3 000 rpm
SR	Higher acceleration up to 12 000 rad/sec ²
SR	Shock loads
SR	Adverse environments (dust, ice, sand)
SV	Small lead down to 0,6 mm
SR SV	Stainless steel optional



ISR inverted roller screw

Ten reasons for using roller screws

- High load ratings (SR)
- Very high rotational speed (SR)
- High acceleration and deceleration rates (SR)
- Long life at high cycle rates (SR)
- High reliability (SR-SV)
- Resistance to hostile environments (SR)
- Ability to accommodate shock loads (SR)
- Small displacements with very good repeatability (SV)
- Rotating nut when speed becomes critical (SR)
- Frequent removal of the nut from the screw shaft (all SR sizes, most SV sizes)

3 Ball & roller screws

Roller screws

Planetary roller screws (fig. 19)

Threaded rollers accomplish a pure rolling motion inside the nut.

Features

- Many strong contact surfaces for load distribution
- Non-recirculating rollers
- No weak point in the nut

Benefits

- Long service life from the high load carrying capacity
- Robust and shock resistant
- Exceptional reliability
- High speed & acceleration capabilities

Maximum speed

For screw assembly BRC + FLRBU, the maximum speed is defined by the product $n \times d_0$.

$$n \times d_0 < 160\,000 \text{ for BRC}$$

(n = rotational speed, in rpm)

(d_0 = outside diameter of screw shaft, mm)

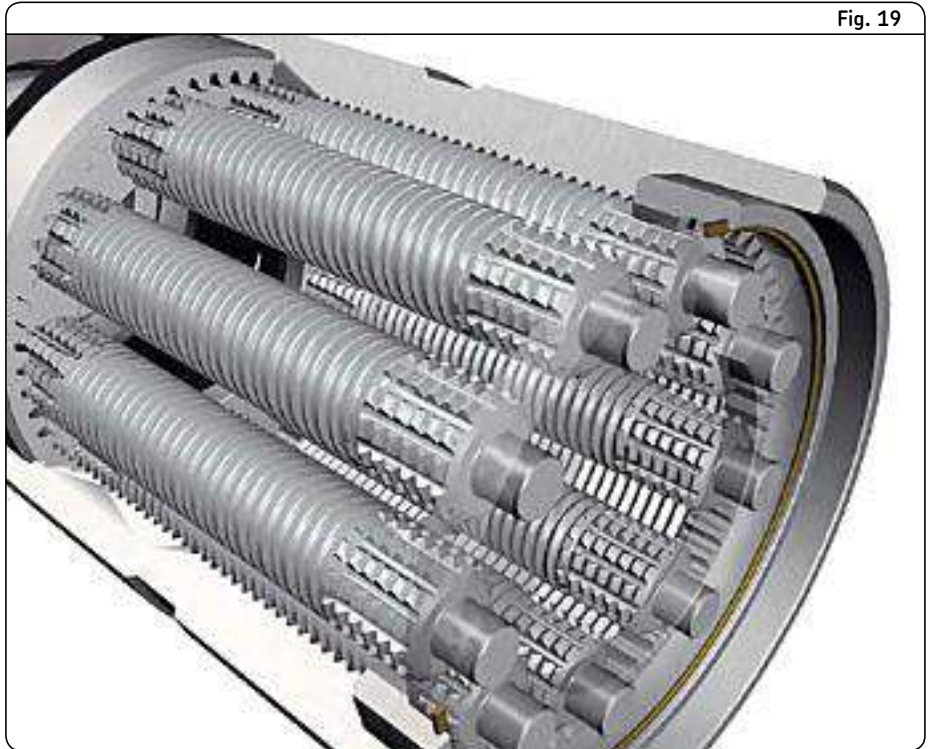


Fig. 19

Typical applications

The capacity to carry heavy loads for thousands of hours in the most arduous conditions makes planetary roller screws suitable for the most demanding applications. The nut can withstand shock loads and the timing mechanism is robust in harsh environments, at high speeds and at high accelerations. The possible long lead permits high linear speeds.

Application examples

- Heavy duty machine tool (forming and stamping presses and broaching machines)
- Injection moulding and blow moulding
- Factory automation process including spot welding, clamping, guns, etc...
- Test benches
- Steel industry
- Tyre industry
- Automatic handling
- Civil and military aircrafts, aerospace, defense, marine
- Nuclear industry
- Transportation industry
- Oil and gas

Recirculating roller screws (fig. 20)

Grooved rollers offer the unique combination of small lead, high load carrying capacity and high axial stiffness.

Features

- Many strong contact surfaces for load distribution
- Very small leads (down to 0,6 mm)
- No miniature parts

Benefits

- Long service life from the high load carrying capacity
- High positioning accuracy: fine resolution
- Exceptional reliability

Maximum speed

For screw assembly BVC + FLRBU, the maximum speed is defined by the product $n \times d_0$.

$$n \times d_0 < 20\,000 \text{ for BVC } \varnothing > 25$$

$$n \times d_0 < 30\,000 \text{ for BVC } \varnothing \leq 25$$

(n = rotational speed, in rpm)

d_0 = outside diameter of screw shaft, mm)



Fig. 20

Typical applications

Ultimate positioning accuracy can be obtained using the fine lead of SV/BV/PV recirculating roller screws.

Their great mechanical advantage minimizes input torque and increases positioning resolution. They can simplify a complete transmission design and improve its rigidity. They are often used in applications of advanced technology where reliable optimum performance is essential.

Application examples

- Grinding machines
- Laboratory equipment
- Paper-making
- Printing industry
- Telescopes
- Satellites
- Medical equipment
- Defense
- Oil and gas

Ordering key

Play or preload:

Axial play (standard range)
Preload by rollers to eliminate backlash
Nut preloaded for optimum rigidity
Ultra Power

S
B
P
H

Product:

Planetary roller screw
Recirculating roller screw

R
V

Nut type:

Cylindrical nut with axial play
Nut with central flange and axial play
Preloaded cylindrical nut
Preloaded nut with central flange
Off-centered flange (Ultra Power range only)

C
F
U
K
P

Nominal diameter × lead (mm)

Hand :

Right
Left (on request)

R
L

Threaded length, total length (mm)

Lead precision:

G1 - G3 - G5

Nut orientation:

This applies to flanged nuts of types SRF, PRK and PVK
Nut ground outer diameter with g6 tolerance oriented towards:
Shorter machined end
Longer machined end
For other types of nuts

S
L
-

Shaft ends:

To customer's drawing

Z

Wipers:

Wipers in the nut: mounted for SR, delivered separately for SVC
Without wipers
Nut without wiper recesses (non-standard SR only)

WPR
NOWPR
X

Example 1:

S	R	F	39	×	20	R	425	/	590	G1	L	Z	WPR
---	---	---	----	---	----	---	-----	---	-----	----	---	---	-----

Example 2:

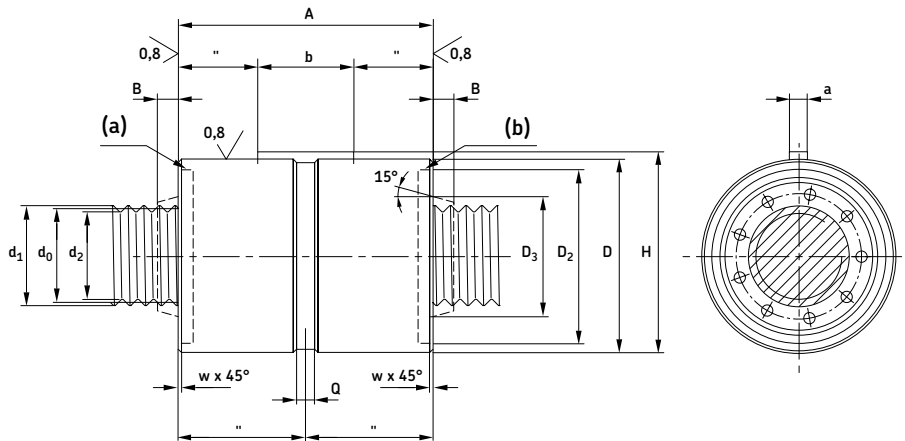
S	R	F	39	×	20	R	425	/	590	G5	L	Z	NOWPR
---	---	---	----	---	----	---	-----	---	-----	----	---	---	-------

3 Ball & roller screws

Roller screws

SRC/BRC - Range

Cylindrical nut with axial play/with backlash elimination



Legend:

(a) = wiper recess

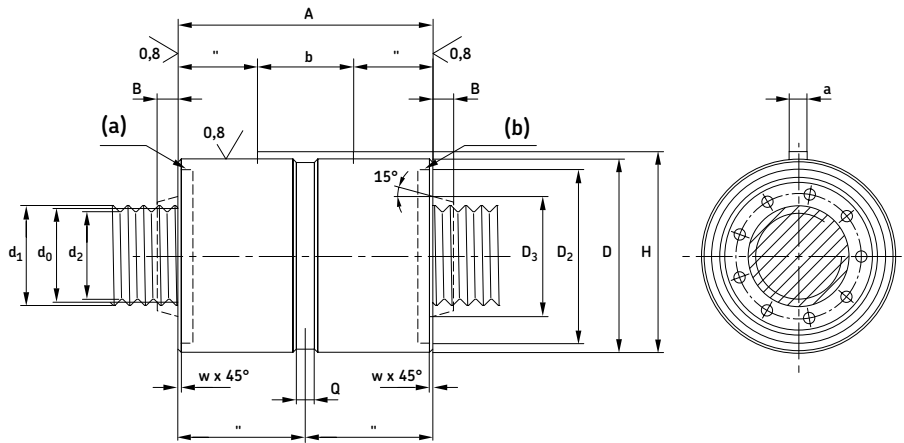
(b) = wiper on request

Symbols, see page 191

Designations	Dimensions													Basic load ratings		
	d ₀	P _h	l _{tp}	s _{ap}	d ₁	d ₂	D g6/H7	A h12	a h9	b	B	H	Q	C _a dynamic	C _{0a} static	
mm															kN	
SRC/BRC 8×1,6	8	1,6	500	0,02	8,2	7,5	21	31	3	10	–	22,3	5	7,4	13,4	
SRC/BRC 8×2	8	2	500	0,02	8,2	7,5	21	31	3	10	–	22,3	5	7,8	13,4	
SRC/BRC 8×4	8	4	500	0,02	8,4	7,3	25	44	4	12	3	26,5	5	11,24	19,59	
SRC/BRC 12×2	12	2	750	0,02	12,2	11,6	26	31	3	10	–	27,3	5	10,6	16	
SRC/BRC 12×5	12	5	750	0,02	12,4	11,3	30	44	4	12	3	31,5	5	17,73	26,71	
SRC/BRC 15×2	15	2	975	0,02	15,2	14,6	34	35	4	14	–	35,7	5	14,8	24,4	
SRC/BRC 15×5	15	5	975	0,02	15,4	14,3	35	50	4	16	3	36,5	5	25,95	43,59	
SRC/BRC 15×8	15	8	975	0,02	15,5	14	35	50	4	16	3	36,5	5	27,43	40,78	
SRC/BRC 20×6	20	6	1 300	0,02	20,4	19,3	40	50	4	16	4	41,5	5	26,83	44,86	
SRC/BRC 21×2	21	2	1400	0,02	21,2	20,6	45	64	5	20	4	47	5	41	82,8	
SRC/BRC 21×5	21	5	1 400	0,02	21,4	20,3	45	64	5	20	4	47	5	50,55	81,97	
SRC/BRC 21×6	21	6	1 400	0,02	21,4	20,3	45	64	5	20	4	47	5	52,77	82,18	
SRC/BRC 21×8	21	8	1 400	0,02	21,5	20	45	64	5	20	4	47	5	54,44	78,06	
SRC/BRC 21×10	21	10	1 400	0,04	21,8	19,7	45	64	5	20	4	47	5	59,24	83,01	
SRC/BRC 24×6	24	6	1 600	0,02	24,4	23,3	48	58	5	20	6	50	5	42,3	65,17	
SRC/BRC 24×12	24	12	1 600	0,04	24,8	22,7	48	58	5	20	6	50	5	47,65	62,34	
SRC/BRC 25×5	25	5	1 650	0,02	25,4	24,3	53	78	6	25	6	55,5	5	63,25	108,23	
SRC/BRC 25×10	25	10	1 650	0,04	25,8	23,7	53	78	6	25	6	55,5	5	72,63	105,31	
SRC/BRC 25×15	25	15	1 650	0,07	26,2	23,1	53	78	6	25	6	55,5	5	79,17	106,39	
SRC/BRC 30×5	30	5	2 000	0,02	30,4	29,3	64	85	6	32	7	66,5	5	91,98	178,32	
SRC/BRC 30×6	30	6	2 000	0,02	30,4	29,3	64	85	6	32	7	66,5	5	95	175,34	
SRC/BRC 30×10	30	10	2 000	0,04	30,8	28,7	64	85	6	32	7	66,5	5	106,32	174,36	
SRC/BRC 30×20	30	20	2 000	0,07	31,5	27,5	64	85	6	32	7	66,5	5	123,28	177,28	
SRC/BRC 36×6	36	6	2 400	0,02	36,4	35,3	68	80	5	25	8	70	5	90,45	179,39	
SRC/BRC 36×9	36	9	2 400	0,02	36,5	35,1	68	80	5	25	8	70	5	97,52	174,05	
SRC/BRC 36×12	36	12	2 400	0,04	36,8	34,7	68	80	5	25	8	70	5	106,6	181,1	
SRC/BRC 36×18	36	18	2 400	0,07	37,2	34,1	68	80	5	25	8	70	5	114,14	176,57	
SRC/BRC 36×24	36	24	2 400	0,07	37,5	33,5	68	80	5	25	8	70	5	123,6	184,38	
SRC/BRC 39×5	39	5	2 650	0,02	39,4	38,3	80	100	8	40	8	83	7	129,21	268,92	
SRC/BRC 39×10	39	10	2 650	0,04	39,8	37,7	80	100	8	40	8	83	7	152,62	270,93	
SRC/BRC 39×15	39	15	2 650	0,07	40,2	37,1	80	100	8	40	8	83	7	167,64	272,89	
SRC/BRC 39×20	39	20	2 650	0,07	40,5	36,5	80	100	8	40	8	83	7	172,82	260,89	
SRC/BRC 39×25	39	25	2 650	0,07	40,9	35,9	80	100	8	40	8	83	7	174,79	249	
SRC/BRC 44×8	44	8	3 000	0,04	44,4	43,2	80	90	6	32	8	82,5	7	130,48	261,47	
SRC/BRC 44×12	44	12	3 000	0,04	44,8	42,7	80	90	6	32	8	82,5	7	143,71	262,87	
SRC/BRC 44×18	44	18	3 000	0,07	45,2	42,1	80	90	6	32	8	82,5	7	157,74	264,94	
SRC/BRC 44×24	44	24	3 000	0,07	45,5	41,5	80	90	6	32	8	82,5	7	167,81	266,95	
SRC/BRC 44×30	44	30	3 000	0,07	45,9	40,9	80	90	6	32	8	82,5	7	165,86	246,44	

Continued

SRC/BRC - Range
(Continued)



Legend:

(a) = wiper recess

(b) = wiper on request

Symbols, see **page 191**

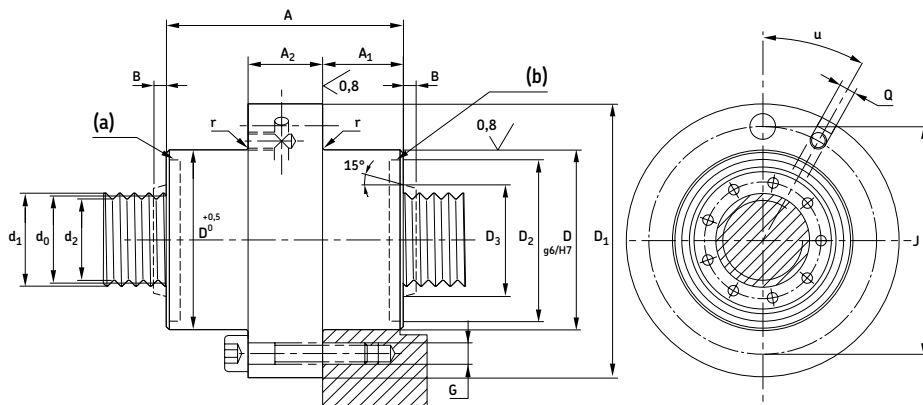
Designations	Dimensions													Basic load ratings	
	d ₀	P _h	l _{tp}	s _{ap}	d ₁	d ₂	D g6/H7	A h12	a h9	b	B	H	Q	C _a dynamic	C _{oa} static
	mm													kN	
SRC/BRC 48×5	48	5	3 300	0,02	48,4	47,3	100	127	8	45	9	103	7	198,08	481,53
SRC/BRC 48×8	48	8	3 300	0,04	48,6	47,1	100	127	8	45	9	103	7	218,43	470,61
SRC/BRC 48×10	48	10	3 300	0,04	48,8	46,7	100	127	8	45	9	103	7	231,54	475,11
SRC/BRC 48×15	48	15	3 300	0,07	49,2	46,1	100	127	8	45	9	103	7	257,75	486,36
SRC/BRC 48×20	48	20	3 300	0,07	49,5	45,5	100	127	8	45	9	103	7	265,69	462,27
SRC/BRC 48×25	48	25	3 300	0,07	49,9	44,9	100	127	8	45	9	103	7	285,86	491,04
SRC/BRC 56×12	56	12	4 000	0,04	56,8	54,7	100	112	8	40	9	103	7	212,17	433,12
SRC/BRC 56×24	56	24	4 000	0,07	57,5	53,5	100	112	8	40	9	103	7	242,22	419,15
SRC/BRC 56×36	56	36	4 000	0,07	58,3	52,3	100	112	8	40	9	103	7	258,33	424,24
SRC/BRC 60×10	60	10	4 250	0,04	60,8	58,7	122	152	10	45	9	125	10,5	338,57	779,69
SRC/BRC 60×15	60	15	4 250	0,07	61,2	58,1	122	152	10	45	9	125	10,5	373,06	782,69
SRC/BRC 60×20	60	20	4 250	0,07	61,5	57,5	122	152	10	45	9	125	10,5	394,97	785,66
SRC/BRC 64×12	64	12	4 600	0,04	64,8	62,7	115	129	8	45	11	118	7	296,38	763,3
SRC/BRC 64×18	64	18	4 600	0,07	65,2	62,1	115	129	8	45	11	118	7	316,72	725,56
SRC/BRC 64×24	64	24	4 600	0,07	65,5	61,5	115	129	8	45	11	118	7	328,93	689,62
SRC/BRC 64×30	64	30	4 600	0,07	65,9	60,9	115	129	8	45	11	118	7	318,15	619,84
SRC/BRC 64×36	64	36	4 600	0,07	66,3	60,3	115	129	8	45	11	118	7	309,12	589,38
SRC 75×10	75	10	5 500	0,04	75,8	73,7	150	191	10	63	10	153	10,5	504,86	1 486,68
SRC 75×15	75	15	5 500	0,07	76,2	73,1	150	191	10	63	10	153	10,5	561,29	1 491,3
SRC 75×20	75	20	5 500	0,07	76,5	72,5	150	191	10	63	10	153	10,5	572,26	1 495,87
SRC 80×12	80	12	6 000	0,04	80,8	78,7	140	156	10	63	12	143	10,5	410,27	1 163,16
SRC 80×18	80	18	6 000	0,07	81,2	78,1	140	156	10	63	12	143	10,5	455,94	1 167,63
SRC 80×24	80	24	6 000	0,07	81,5	77,5	140	156	10	63	12	143	10,5	485,8	1 172,06
SRC 80×36	80	36	6 000	0,07	82,3	76,3	140	156	10	63	12	143	10,5	442,89	999,09
SRC 80×42	80	42	6 000	0,07	82,7	75,7	140	156	10	63	12	143	10,5	425,64	932,95
SRC 99×20	99	20	7 500	0,07	100,5	96,5	200	260	16	100	12	204	15	924,86	3 090,44
SRC 100×24	100	24	8 000	0,07	101,5	97,5	180	195	10	63	12	183	10,5	655,81	1 825,82
SRC 120×24	120	24	8 000	0,07	121,5	117,5	220	240	16	100	12	224	15	915,02	3 027,05
SRC 120×25	120	25	8 000	0,07	121,8	116,9	240	280	16	100	12	244	15	1 127,43	4 037,97
SRC 150×25	150	25	7 200	0,07	151,9	146,9	320	400	32	160	13	327	15	1 596,53	6 816,05
SRC 150×36	150	36	7 200	0,07	152,3	146,3	280	305	16	100	13	284	15	1 156,92	4 108,09
SRC 180×30	180	30	5 000	0,07	182,3	176,3	420	515	32	160	13	427	20	1 962,34	9 069,02
SRC 210×30	210	30	3 700	0,07	212,3	206,3	480	550	40	200	20	489	20	2 295,6	11 375,26

3 Ball & roller screws

Roller screws

SRF/BRF - Range

Flanged nut with axial play/with backlash elimination



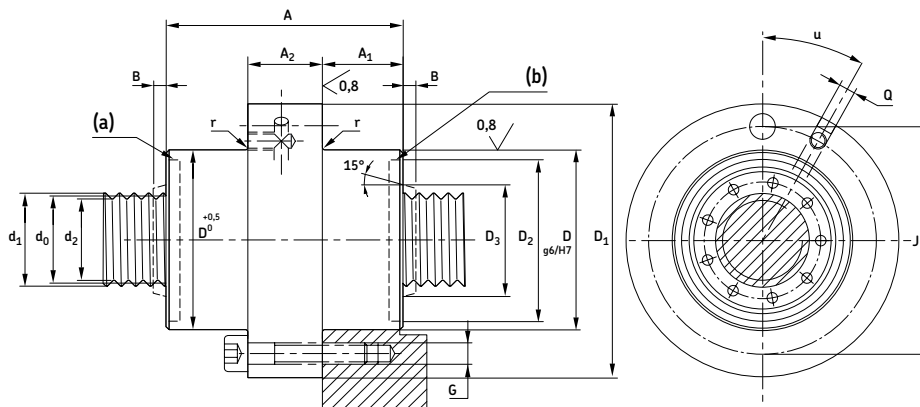
Legend:
(a) = wiper recess
(b) = wiper on request

Symbols, see page 191

Designations	Dimensions													Basic load ratings	
	Lead													dynamic	static
	d ₀	P _h	l _{tp}	s _{ap}	d ₁	d ₂	D	A _{h12}	D ₁	J _{js12}	G	Q	u		
	mm													[°]	kN
SRF/BRF 8×1,6	8	1,6	500	0,02	8,2	7,5	21	31	42	32	6×M4	M6	30	7,4	13,4
SRF/BRF 8×2	8	2	500	0,02	8,2	7,5	21	31	42	32	6×M4	M6	30	7,8	13,4
SRF/BRF 8×4	8	4	500	0,02	8,4	7,3	25	44	46	36	6×M4	M6	30	11,24	19,59
SRF/BRF 12×2	12	2	750	0,02	12,2	11,6	26	31	47	37	6×M4	M6	30	10,6	16
SRF/BRF 12×5	12	5	750	0,02	12,4	11,3	30	44	51	41	6×M4	M6	30	17,73	26,71
SRF/BRF 15×2	15	2	975	0,02	15,2	14,6	34	35	55	45	6×M4	M6	30	14,8	24,4
SRF/BRF 15×5	15	5	975	0,02	15,4	14,3	35	50	58	46	6×M5	M6	30	25,95	43,59
SRF/BRF 15×8	15	8	975	0,02	15,5	14	35	50	58	46	6×M5	M6	30	27,43	40,78
SRF/BRF 20×6	20	6	1 300	0,02	20,4	19,3	40	50	63	51	6×M5	M6	30	26,83	44,86
SRF/BRF 21×2	21	2	1 400	0,02	21,2	20,6	45	64	66	56	6×M5	M6	30	41	82,8
SRF/BRF 21×5	21	5	1 400	0,02	21,4	20,3	45	64	68	56	6×M5	M6	30	50,55	81,97
SRF/BRF 21×6	21	6	1 400	0,02	21,4	20,3	45	64	68	56	6×M5	M6	30	52,77	82,18
SRF/BRF 21×8	21	8	1 400	0,02	21,5	20	45	64	68	56	6×M5	M6	30	54,44	78,06
SRF/BRF 21×10	21	10	1 400	0,04	21,8	19,7	45	64	68	56	6×M5	M6	30	59,24	83,01
SRF/BRF 24×6	24	6	1 600	0,02	24,4	23,3	48	58	71	59	6×M5	M6	30	42,3	65,17
SRF/BRF 24×12	24	12	1 600	0,04	24,8	22,7	48	58	71	59	6×M5	M6	30	47,65	62,34
SRF/BRF 25×5	25	5	1 650	0,02	25,4	24,3	56	78	84	70	6×M6	M6	30	63,25	108,23
SRF/BRF 25×10	25	10	1 650	0,04	25,8	23,7	56	78	84	70	6×M6	M6	30	72,63	105,31
SRF/BRF 25×15	25	15	1 650	0,07	26,2	23,1	56	78	84	70	6×M6	M6	30	79,17	106,39
SRF/BRF 30×5	30	5	2 000	0,02	30,4	29,3	64	85	97	81	6×M8	M6	30	91,98	178,32
SRF/BRF 30×6	30	6	2 000	0,02	30,4	29,3	64	85	97	81	6×M8	M6	30	95	175,34
SRF/BRF 30×10	30	10	2 000	0,04	30,8	28,7	64	85	97	81	6×M8	M6	30	106,32	174,36
SRF/BRF 30×20	30	20	2 000	0,07	31,5	27,5	64	85	97	81	6×M8	M6	30	123,28	177,28
SRF/BRF 36×6	36	6	2 400	0,02	36,4	35,3	68	80	102	85	6×M8	M6	30	90,45	179,39
SRF/BRF 36×9	36	9	2 400	0,02	36,5	35,1	68	80	102	85	6×M8	M6	30	97,52	174,05
SRF/BRF 36×12	36	12	2 400	0,04	36,8	34,7	68	80	102	85	6×M8	M6	30	106,6	181,1
SRF/BRF 36×18	36	18	2 400	0,07	37,2	34,1	68	80	102	85	6×M8	M6	30	114,14	176,57
SRF/BRF 36×24	36	24	2 400	0,07	37,5	33,5	68	80	102	85	6×M8	M6	30	123,6	184,38
SRF/BRF 39×5	39	5	2 650	0,02	39,4	38,3	82	100	124	102	6×M10	M6	30	129,21	268,92
SRF/BRF 39×10	39	10	2 650	0,04	39,8	37,7	82	100	124	102	6×M10	M6	30	152,62	270,93
SRF/BRF 39×15	39	15	2 650	0,07	40,2	37,1	82	100	124	102	6×M10	M6	30	167,64	272,89
SRF/BRF 39×20	39	20	2 650	0,07	40,5	36,5	82	100	124	102	6×M10	M6	30	172,82	260,89
SRF/BRF 39×25	39	25	2 650	0,07	40,9	35,9	82	100	124	102	6×M10	M6	30	174,79	249
SRF/BRF 44×8	44	8	3 000	0,04	44,4	43,2	82	90	124	102	6×M10	M6	30	130,48	261,47
SRF/BRF 44×12	44	12	3 000	0,04	44,8	42,7	82	90	124	102	6×M10	M6	30	143,71	262,87
SRF/BRF 44×18	44	18	3 000	0,07	45,2	42,1	82	90	124	102	6×M10	M6	30	157,74	264,94
SRF/BRF 44×24	44	24	3 000	0,07	45,5	41,5	82	90	124	102	6×M10	M6	30	167,81	266,95
SRF/BRF 44×30	44	30	3 000	0,07	45,9	40,9	82	90	124	102	6×M10	M6	30	165,86	246,44

Continued

SRF/BRF - Range
(Continued)



Legend:
(a) = wiper recess
(b) = wiper on request

Symbols, see page 191

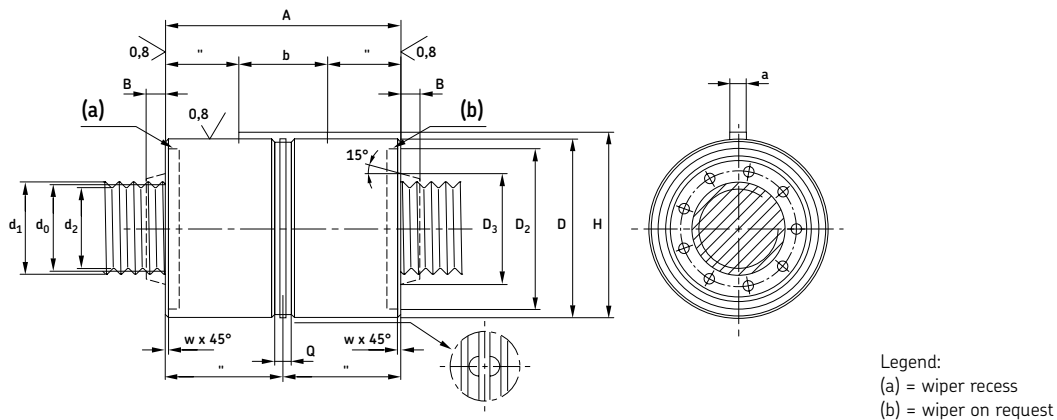
Designations	Dimensions				Lead									Basic load ratings	
	d ₀	P _h	l _{tp}	s _{ap}	d ₁	d ₂	D	A h12	D ₁	J js12	G	Q	u	C _a	C _{0a}
	mm													kN	
SRF/BRF 48×5	48	5	3 300	0,02	48,4	47,3	105	127	150	127	6×M12	M8×1	30	198,08	481,53
SRF/BRF 48×8	48	8	3 300	0,04	48,6	47,1	105	127	150	127	6×M12	M8×1	30	218,43	470,61
SRF/BRF 48×10	48	10	3 300	0,04	48,8	46,7	105	127	150	127	6×M12	M8×1	30	231,54	475,11
SRF/BRF 48×15	48	15	3 300	0,07	49,2	46,1	105	127	150	127	6×M12	M8×1	30	257,75	486,36
SRF/BRF 48×20	48	20	3 300	0,07	49,5	45,5	105	127	150	127	6×M12	M8×1	30	265,69	462,27
SRF/BRF 48×25	48	25	3 300	0,07	49,9	44,9	105	127	150	127	6×M12	M8×1	30	285,86	491,04
SRF/BRF 56×12	56	12	4 000	0,04	56,8	54,7	105	112	150	127	6×M12	M8×1	30	212,17	433,12
SRF/BRF 56×24	56	24	4 000	0,07	57,5	53,5	105	112	150	127	6×M12	M8×1	30	242,22	419,15
SRF/BRF 56×36	56	36	4 000	0,07	58,3	52,3	105	112	150	127	6×M12	M8×1	30	258,33	424,24
SRF/BRF 60×10	60	10	4 250	0,04	60,8	58,7	122	152	180	150	6×M16	M8×1	30	338,57	779,69
SRF/BRF 60×15	60	15	4 250	0,07	61,2	58,1	122	152	180	150	6×M16	M8×1	30	373,06	782,69
SRF/BRF 60×20	60	20	4 250	0,07	61,5	57,5	122	152	180	150	6×M16	M8×1	30	394,97	785,66
SRF/BRF 64×12	64	12	4 600	0,04	64,8	62,7	120	129	180	150	6×M16	M8×1	30	296,38	763,3
SRF/BRF 64×18	64	18	4 600	0,07	65,2	62,1	120	129	180	150	6×M16	M8×1	30	316,72	725,56
SRF/BRF 64×24	64	24	4 600	0,07	65,5	61,5	120	129	180	150	6×M16	M8×1	30	328,93	689,62
SRF/BRF 64×30	64	30	4 600	0,07	65,9	60,9	120	129	180	150	6×M16	M8×1	30	318,15	619,84
SRF/BRF 64×36	64	36	4 600	0,07	66,3	60,3	120	129	180	150	6×M16	M8×1	30	309,12	589,38
SRF 75×10	75	10	5 500	0,04	75,8	73,7	150	191	210	180	8×M16	M8×1	22,5	504,86	1 486,68
SRF 75×15	75	15	5 500	0,07	76,2	73,1	150	191	210	180	8×M16	M8×1	22,5	561,29	1 491,3
SRF 75×20	75	20	5 500	0,07	76,5	72,5	150	191	210	180	8×M16	M8×1	22,5	572,26	1 495,87
SRF 80×12	80	12	6 000	0,04	80,8	78,7	150	156	210	180	8×M16	M8×1	22,5	410,27	1 163,16
SRF 80×18	80	18	6 000	0,07	81,2	78,1	150	156	210	180	8×M16	M8×1	22,5	455,94	1 167,63
SRF 80×24	80	24	6 000	0,07	81,5	77,5	150	156	210	180	8×M16	M8×1	22,5	485,8	1 172,06
SRF 80×36	80	36	6 000	0,07	82,3	76,3	150	156	210	180	8×M16	M8×1	22,5	442,89	999,09
SRF 80×42	80	42	6 000	0,07	82,7	75,7	150	156	210	180	8×M16	M8×1	22,5	425,64	932,95
SRF 99×20	99	20	7 500	0,07	100,5	96,5	200	260	275	245	12×M16	M8×1	15	924,86	3 090,44
SRF 100×24	100	24	8 000	0,07	101,5	97,5	180	195	255	220	12×M16	M8×1	15	655,81	1 825,82
SRF 120×24	120	24	8 000	0,07	121,5	117,5	220	240	295	260	12×M16	M8×1	15	915,02	3 027,05
SRF 120×25	120	25	8 000	0,07	121,9	116,9	260	280	340	305	12×M16	M12	15	1 127,43	4 037,97
SRF 150×25	150	25	8 000	0,07	151,9	146,9	320	400	385	355	12×M18	M12	15	1 596,53	6 816,05
SRF 150×36	150	36	8 000	0,07	152,3	146,3	280	305	370	330	12×M16	M12	15	1 156,92	4 108,09
SRC 180×30	180	30	5 000	0,07	182,3	176,3	420	515	470	433	12×M22	M12	15	1 962,34	9 069,02
SRC 210×30	210	30	3 700	0,07	212,3	206,3	480	550	530	490	12×M24	M12	15	2 295,6	11 375,26

3 Ball & roller screws

Roller screws

PRU - Range

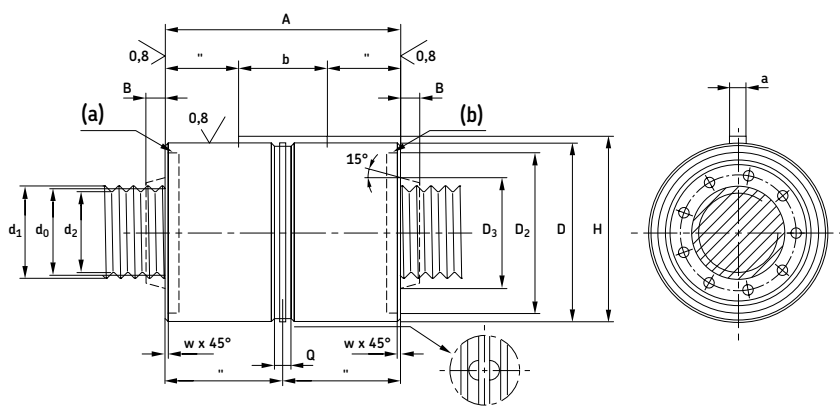
Cylindrical nut preloaded for optimum rigidity



Designations	Dimensions												Basic load ratings		Preload torque
	d ₀	P _h	l _{tp}	d ₁	d ₂	D g6/h7	A h12	a h9	b	B	H	Q	C _a	C _{0a}	T _{pr}
	mm												kN	Nm	
PRU 8×4	8	4	400	8,4	7,3	25	44	4	12	3	26,5	5	6,19	9,79	0,06-0,13
PRU 12×5	12	5	600	12,4	11,3	30	44	4	12	3	31,5	5	9,77	13,36	0,12-0,25
PRU 15×5	15	5	750	15,4	14,3	35	50	4	16	3	36,5	5	14,3	21,8	0,18-0,36
PRU 15×8	15	8	750	15,5	14	35	50	4	16	3	36,5	5	15,11	20,39	0,18-0,36
PRU 20×6	20	6	1 050	20,4	19,3	40	50	4	16	4	41,5	5	14,78	22,43	0,26-0,58
PRU 21×5	21	5	1 100	21,4	20,3	45	64	5	20	4	47	5	27,85	40,98	0,31-0,63
PRU 21×6	21	6	1 100	21,4	20,3	45	64	5	20	4	47	5	29,08	41,09	0,31-0,63
PRU 21×8	21	8	1 100	21,5	20	45	64	5	20	4	47	5	30	39,03	0,31-0,63
PRU 21×10	21	10	1 100	21,8	19,7	45	64	5	20	4	47	5	32,64	41,51	0,31-0,63
PRU 24×6	24	6	1 250	24,4	23,3	48	58	5	20	6	50	5	23,31	32,59	0,39-0,78
PRU 24×12	24	12	1 250	24,8	22,7	48	58	5	20	6	50	5	26,25	31,17	0,39-0,78
PRU 25×5	25	5	1 300	25,4	24,3	53	78	6	25	6	55,5	5	34,85	54,12	0,42-0,84
PRU 25×10	25	10	1 300	25,8	23,7	53	78	6	25	6	55,5	5	40,02	52,65	0,42-0,84
PRU 25×15	25	15	1 300	26,2	23,1	53	78	6	25	6	55,5	5	43,62	53,2	0,42-0,84
PRU 30×5	30	5	1 600	30,4	29,3	64	85	6	32	7	66,5	5	50,68	89,16	0,57-1,13
PRU 30×6	30	6	1 600	30,4	29,3	64	85	6	32	7	66,5	5	52,34	87,67	0,57-1,13
PRU 30×10	30	10	1 600	30,8	28,7	64	85	6	32	7	66,5	5	58,58	87,18	0,57-1,13
PRU 30×20	30	20	1 600	31,5	27,5	64	85	6	32	7	66,5	5	67,92	88,64	0,85-1,41
PRU 36×6	36	6	1 900	36,4	35,3	68	80	5	25	8	70	5	49,83	89,69	0,77-1,53
PRU 36×9	36	9	1 900	36,5	35,1	68	80	5	25	8	70	5	53,73	87,03	0,77-1,53
PRU 36×12	36	12	1 900	36,8	34,7	68	80	5	25	8	70	5	58,73	90,55	0,77-1,53
PRU 36×18	36	18	1 900	37,2	34,1	68	80	5	25	8	70	5	62,89	88,29	0,77-1,53
PRU 36×24	36	24	1 900	37,5	33,5	68	80	5	25	8	70	5	68,1	92,19	1,15-1,91

Continued

PRU - Range
(Continued)



Legend:
(a) = wiper recess
(b) = wiper on request

Designations	Dimensions												Basic load ratings		Preload torque
	d ₀	P _h	l _{tp}	d ₁	d ₂	D g6/H7	A h12	a h9	b	H	B	Q	C _a	C _{oa}	T _{pr}
	mm												kN		Nm
PRU 39×5	39	5	2 100	39,4	38,3	80	100	8	40	83	8	7	71,19	134,46	0,88-1,75
PRU 39×10	39	10	2 100	39,8	37,7	80	10	8	40	83	8	7	84,09	135,46	0,88-1,75
PRU 39×15	39	15	2 100	40,2	37,1	80	100	8	40	83	8	7	92,36	136,45	0,88-1,75
PRU 39×20	39	20	2 100	40,5	36,5	80	100	8	40	83	8	7	95,22	130,45	0,88-1,75
PRU 39×25	39	25	2 100	40,9	35,9	80	100	8	40	83	8	7	96,3	124,5	1,31-2,19
PRU 44×8	44	8	2 400	44,4	43,2	80	90	6	32	82,5	8	7	71,89	130,73	1,07-2,14
PRU 44×12	44	12	2 400	44,8	42,7	80	90	6	32	82,5	8	7	79,18	131,44	1,07-2,14
PRU 44×18	44	18	2 400	45,2	42,1	80	90	6	32	82,5	8	7	86,91	132,47	1,07-2,14
PRU 44×24	44	24	2 400	45,5	41,5	80	90	6	32	82,5	8	7	92,46	133,48	1,07-2,14
PRU 44×30	44	30	2 400	45,9	40,9	80	90	6	32	82,5	8	7	91,38	123,22	1,60-2,68
PRU 48×5	48	5	2 600	48,4	47,3	100	127	8	45	103	9	7	109,13	240,77	1,24-2,47
PRU 48×8	48	8	2 600	48,6	47,1	100	127	8	45	103	9	7	120,34	235,3	1,24-2,47
PRU 48×10	48	10	2 600	48,8	46,7	100	127	8	45	103	9	7	127,57	237,56	1,24-2,47
PRU 48×15	48	15	2 600	49,2	46,1	100	127	8	45	103	9	7	142,01	243,18	1,24-2,47
PRU 48×20	48	20	2 600	49,5	45,5	100	127	8	45	103	9	7	146,38	231,14	1,24-2,47
PRU 48×25	48	25	2 600	49,9	44,9	100	127	8	45	103	9	7	157,5	245,52	1,24-2,47
PRU 56×12	56	12	3 100	56,8	54,7	100	112	8	40	103	9	7	116,9	216,56	1,60-3,19
PRU 56×24	56	24	3 100	57,3	53,5	100	112	8	40	103	9	7	133,45	209,58	1,60-3,19
PRU 56×36	56	36	3 100	58,3	52,3	100	112	8	40	103	9	7	142,33	212,12	2,39-3,99
PRU 60×10	60	10	3 400	60,8	58,7	122	152	10	45	125	9	10,5	186,53	389,85	1,79-3,58
PRU 60×15	60	15	3 400	61,2	58,1	122	152	10	45	125	9	10,5	205,54	391,35	1,79-3,58
PRU 60×20	60	20	3 400	61,5	57,5	122	152	10	45	125	9	10,5	217,61	392,83	1,79-3,58
PRU 64×12	64	12	3 650	64,8	62,7	115	129	8	45	118	11	7	165,57	381,65	1,99-3,98
PRU 64×18	64	18	3 650	65,2	62,1	115	129	8	45	118	11	7	176,93	362,78	1,99-3,98
PRU 64×24	64	24	3 650	65,5	61,5	115	129	8	45	118	11	7	183,76	344,81	1,99-3,98
PRU 64×30	64	30	3 650	65,9	60,9	115	129	8	45	118	11	7	177,73	309,92	1,99-3,98
PRU 64×36	64	36	3 650	66,3	60,3	115	129	8	45	118	11	7	172,69	294,69	1,99-3,98

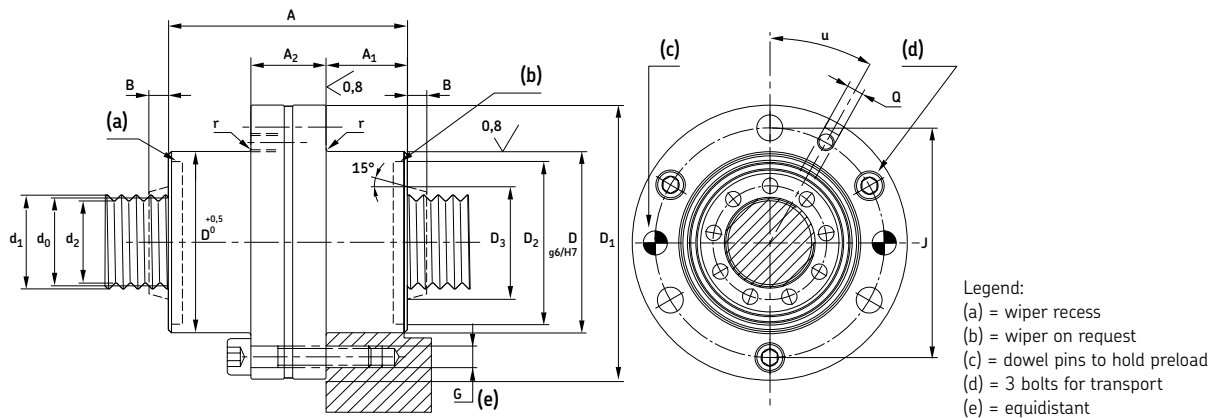
Symbols, see page 191

3 Ball & roller screws

Roller screws

PRK - Range

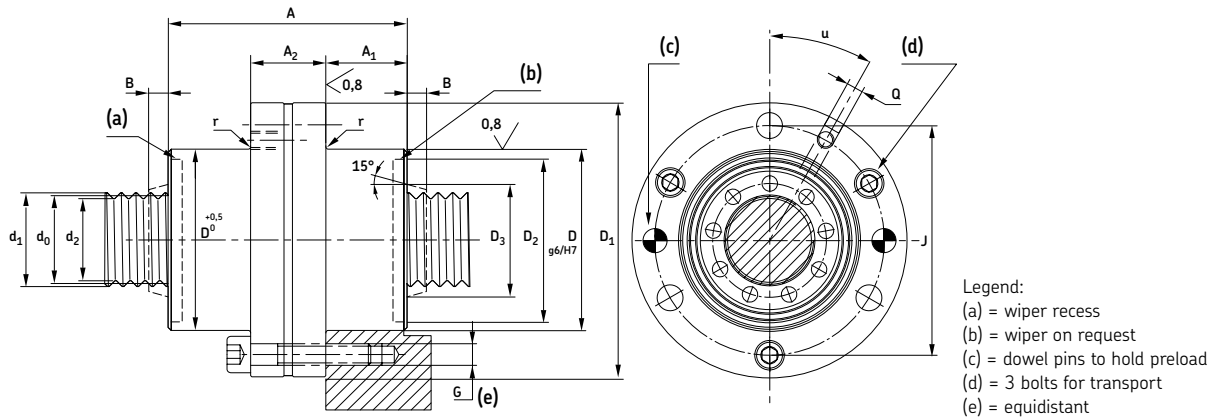
Flanged nut preloaded for optimum rigidity



Designations	Dimensions													Basic load ratings		Preload torque
	Lead													dynamic	static	
	d ₀	P _h	l _{tp}	d ₁	d ₂	D	A _{h12}	D ₁	B	J _{js12}	G	Q	u	C _a	C _{0a}	
	mm													[°]	kN	Nm
PRK 8×4	8	4	400	8,4	7,3	25	44	46	3	36	6×M4	M6	30	6,19	9,79	0,06-0,13
PRK 12×5	12	5	600	12,4	11,3	30	44	51	3	41	6×M4	M6	30	9,77	13,36	0,12-0,25
PRK 15×5	15	5	750	15,4	14,3	35	50	58	3	46	6×M5	M6	30	14,3	21,8	0,18-0,36
PRK 15×8	15	8	750	15,5	14	35	50	58	3	46	6×M5	M6	30	15,11	20,39	0,18-0,36
PRK 20×6	20	6	1 050	20,4	19,3	40	50	63	4	51	6×M5	M6	30	14,78	22,43	0,26-0,58
PRK 21×5	21	5	1 100	21,4	20,3	45	64	68	4	56	6×M5	M6	30	27,85	40,98	0,31-0,63
PRK 21×6	21	6	1 100	21	20,3	45	64	68	4	56	6×M5	M6	30	29,08	41,09	0,31-0,63
PRK 21×8	21	8	1 100	21	20	45	64	68	4	56	6×M5	M6	30	30	39,03	0,31-0,63
PRK 21×10	21	10	1 100	21,8	19,7	45	64	68	4	56	6×M5	M6	30	32,64	41,51	0,31-0,63
PRK 24×6	24	6	1 250	24,4	23,3	48	58	71	6	59	6×M5	M6	30	23,31	32,59	0,39-0,78
PRK 24×12	24	12	1 250	24,8	22,7	48	58	71	6	59	6×M5	M6	30	26,25	31,17	0,39-0,78
PRK 25×5	25	5	1 300	25,4	24,3	56	78	84	6	70	6×M6	M6	30	34,85	54,12	0,42-0,84
PRK 25×10	25	10	1 300	25,8	23,7	56	78	84	6	70	6×M6	M6	30	40,02	52,65	0,42-0,84
PRK 25×15	25	15	1 300	26,2	23,1	56	78	84	6	70	6×M6	M6	30	43,62	53,2	0,42-0,84
PRK 30×5	30	5	1 600	30,4	29,3	64	85	98	7	81	6×M8	M6	30	50,68	89,16	0,57-1,13
PRK 30×6	30	6	1 600	30,8	29,3	64	85	98	7	81	6×M8	M6	30	52,34	87,67	0,57-1,13
PRK 30×10	30	10	1 600	31,8	28,7	64	85	98	7	81	6×M8	M6	30	58,58	87,18	0,57-1,13
PRK 30×20	30	20	1 600	31,5	27,5	64	85	98	7	81	6×M8	M6	30	67,92	88,64	0,85-1,41
PRK 36×6	36	6	1 900	36,4	35,3	68	80	102	8	85	6×M8	M6	30	49,83	89,69	0,77-1,53
PRK 36×9	36	9	1 900	36,5	35,1	68	80	102	8	85	6×M8	M6	30	53,73	87,03	0,77-1,53
PRK 36×12	36	12	1 900	36,8	34,7	68	80	102	8	85	6×M8	M6	30	58,73	90,55	0,77-1,53
PRK 36×18	36	18	1 900	37,2	34,1	68	80	102	8	85	6×M8	M6	30	62,89	88,29	0,77-1,53
PRK 36×24	36	24	1 900	37,5	33,5	68	80	102	8	85	6×M8	M6	30	68,1	92,19	1,15-1,91

Continued

PRK - Range
(Continued)



Designations	Dimensions			Lead										Basic load ratings		Preload torque
	d ₀	P _h	l _{tp}	d ₁	d ₂	D	A	D ₁	B	J	G	Q	u	C _a	C _{0a}	T _{pr}
	mm													°	kN	Nm
PRK 39×5	39	5	2 100	39,4	38,3	82	100	124	8	102	6×M10	M6	30	71,19	134,46	0,88-1,75
PRK 39×10	39	10	2 100	39,8	37,7	82	100	124	8	102	6×M10	M6	30	84,09	135,46	0,88-1,75
PRK 39×15	39	15	2 100	40,2	37,1	82	100	124	8	102	6×M10	M6	30	92,36	136,45	0,88-1,75
PRK 39×20	39	20	2 100	40,5	36,5	82	100	124	8	102	6×M10	M6	30	95,22	130,45	0,88-1,75
PRK 39×25	39	25	2 100	40,9	35,9	82	100	124	8	102	6×M10	M6	30	96,3	124,5	1,31-2,19
PRK 44×8	44	8	2 400	44,4	43,2	82	90	124	8	102	6×M10	M6	30	71,89	130,73	1,07-2,14
PRK 44×12	44	12	2 400	44,8	42,7	82	90	124	8	102	6×M10	M6	30	79,18	131,44	1,07-2,14
PRK 44×18	44	18	2 400	45,2	42,1	82	90	124	8	102	6×M10	M6	30	86,91	132,47	1,07-2,14
PRK 44×24	44	24	2 400	45,5	41,5	82	90	124	8	102	6×M10	M6	30	92,46	133,48	1,07-2,14
PRK 44×30	44	30	2 400	45,9	40,9	82	90	124	8	102	6×M10	M6	30	91,38	123,22	1,60-2,68
PRK 48×5	48	5	2 600	48,4	47,3	105	127	150	9	127	6×M12	M8×1	30	109,13	240,77	1,24-2,47
PRK 48×8	48	8	2 600	48,6	47,1	105	127	150	9	127	6×M12	M8×1	30	120,34	235,3	1,24-2,47
PRK 48×10	48	10	2 600	48,8	46,7	105	127	150	9	127	6×M12	M8×1	30	127,57	237,56	1,24-2,47
PRK 48×15	48	15	2 600	49,2	46,1	105	127	150	9	127	6×M12	M8×1	30	142,01	243,18	1,24-2,47
PRK 48×20	48	20	2 600	49,5	45,5	105	127	150	9	127	6×M12	M8×1	30	146,38	231,14	1,24-2,47
PRK 48×25	48	25	2 600	49,9	44,9	105	127	150	9	127	6×M12	M8×1	30	157,5	245,52	1,24-2,47
PRK 56×12	56	12	3 100	56,8	54,7	105	112	150	9	127	6×M12	M8×1	30	116,9	216,56	1,60-3,19
PRK 56×24	56	24	3 100	57,5	53,5	105	112	150	9	127	6×M12	M8×1	30	133,45	209,58	1,60-3,19
PRK 56×36	56	36	3 100	58,3	52,3	105	112	150	9	127	6×M12	M8×1	30	142,33	212,12	2,39-3,99
PRK 60×10	60	10	3 400	60,8	58,7	122	152	180	9	150	6×M16	M8×1	30	186,53	389,85	1,79-3,58
PRK 60×15	60	15	3 400	61,2	58,1	122	152	180	9	150	6×M16	M8×1	30	205,54	391,35	1,79-3,58
PRK 60×20	60	20	3 400	61,5	57,5	122	152	180	9	150	6×M16	M8×1	30	217,61	392,83	1,79-3,58
PRK 64×12	64	12	3 650	64,8	62,7	120	129	180	11	150	6×M16	M8×1	30	165,57	381,65	1,99-3,98
PRK 64×18	64	18	3 650	65,2	62,1	120	129	180	11	150	6×M16	M8×1	30	176,93	362,78	1,99-3,98
PRK 64×24	64	24	3 650	65,5	61,5	120	129	180	11	150	6×M16	M8×1	30	183,76	344,81	1,99-3,98
PRK 64×30	64	30	3 650	65,9	60,9	120	129	180	11	150	6×M16	M8×1	30	177,73	309,92	1,99-3,98
PRK 64×36	64	36	3 650	66,3	60,3	120	129	180	11	150	6×M16	M8×1	30	172,69	294,69	1,99-3,98

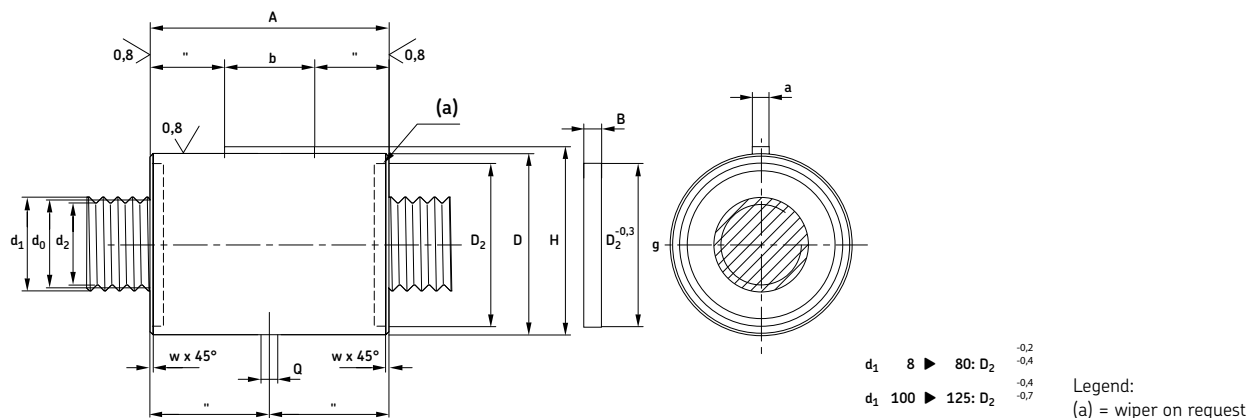
Symbols, see page 191

3 Ball & roller screws

Roller screws

SVC/BVC - Range

Cylindrical nut with axial play/with backlash elimination



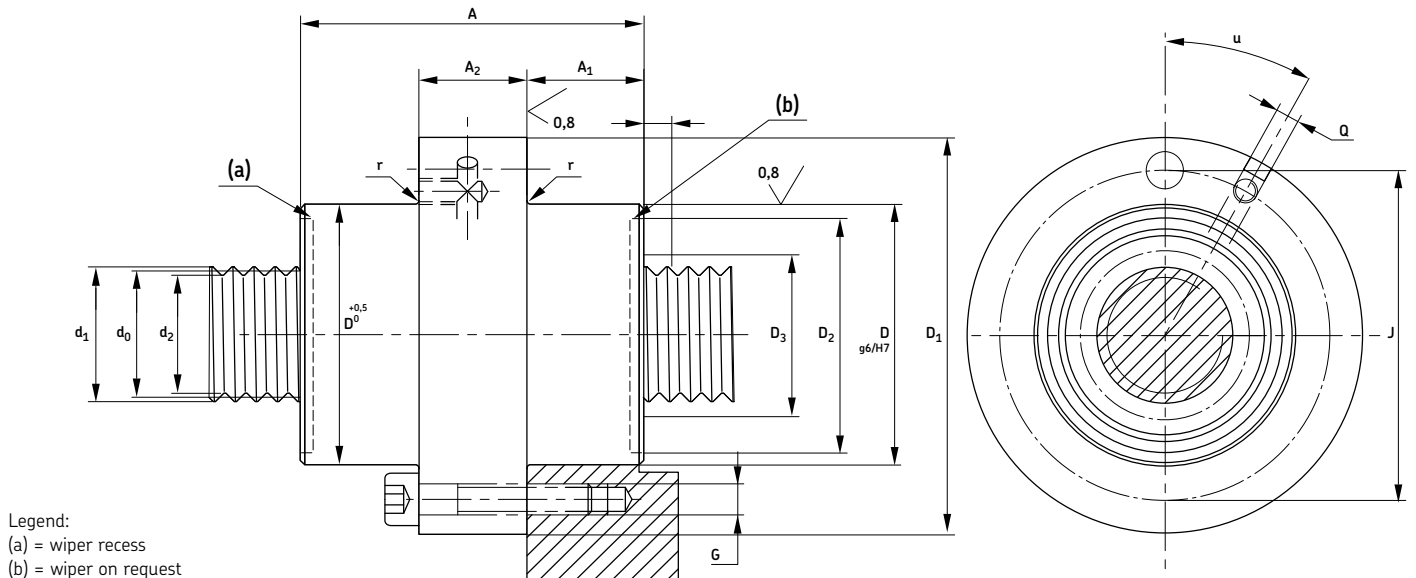
Designations	Dimensions														Basic load ratings	
	Lead														dynamic	static
	d ₁	P _h	l _{tp}	s _{ap}	d ₀	d ₂	D g6/H7	A* h12	A** h12	a h9	b	B	H	Q	C _a	C _{0a}
	mm														kN	
SVC/BVC 8 × 1	8	1	500	0,02	7,7	7,1	20	40	31	2	12	4	20,8	5	8,4	11
SVC/BVC 10 × 1	10	1	650	0,02	9,7	9,1	22	40	31	2	12	4	22,8	5	8,9	11,4
SVC/BVC 10 × 2	10	2	650	0,02	9,7	9,1	22	40	31	2	12	4	22,8	5	8,9	11,4
SVC/BVC 12 × 1	12	1	750	0,02	11,7	11,1	24	40	31	2	12	4	24,8	5	10,3	14
SVC/BVC 12 × 2	12	2	750	0,02	11,7	11,1	24	40	31	2	12	4	24,8	5	10,3	14
SVC/BVC 16 × 1	16	1	1 050	0,02	15,7	15,1	29	40	31	3	12	4	30,2	5	11,5	16,8
SVC/BVC 16 × 2	16	2	1 050	0,02	15,7	15,1	29	40	31	3	12	4	30,2	5	11,5	16,8
SVC/BVC 20 × 1	20	1	1 300	0,02	19,7	19,1	34	45	37	3	16	4	35,2	5	18,5	36,6
SVC/BVC 20 × 2	20	2	1 300	0,02	19,7	19,1	34	45	37	3	16	4	35,2	5	18,5	36,6
SVC/BVC 25 × 1	25	1	1 650	0,02	24,7	24,1	42	54	44	4	20	5	43,5	5	32,9	68,4
SVC/BVC 25 × 2	25	2	1 650	0,02	24,7	24,1	42	54	44	4	20	5	43,5	5	32,9	68,4
SVC/BVC 32 × 1	32	1	2 150	0,02	31,7	31,1	54	67	57	4	25	5	55,5	5	64,3	159,2
SVC/BVC 32 × 2	32	2	2 150	0,02	31,7	31,1	54	67	57	4	25	5	55,5	5	64,3	159,2
SVC/BVC 40 × 1	40	1	2 700	0,02	39,7	39,1	68	75	63	5	32	5	70	5	79,1	231,6
SVC/BVC 40 × 2	40	2	2 700	0,04	39,3	38,2	68	84	72	5	32	5	70	5	49,9	117,2
SVC/BVC 50 × 1	50	1	3 500	0,02	49,7	49,1	82	101	85	6	32	7	84,5	8	189,8	544,3
SVC/BVC 50 × 2	50	2	3 500	0,04	49,3	48,7	82	101	85	6	32	7	84,5	8	98,1	249,4
SVC 50 × 3	50	3	3 500	0,04	49,5	48,6	82	108	92	6	35	7	84,5	8	153	443,3
SVC 50 × 4	50	4	3 500	0,04	49,3	48,2	82	101	85	6	32	7	84,5	8	98,1	249,4
SVC 63 × 2	63	2	4 500	0,04	62,3	61,2	103	120	104	6	40	7	105,5	8	185,8	533,5
SVC 63 × 4	63	4	4 500	0,04	62,3	61,2	103	120	104	6	40	7	105,5	8	185,8	533,5
SVC 80 × 4	80	4	6 000	0,07	78,6	76,4	141	197	175	8	63	10	144	10	324,9	887,7
SVC 100 × 5	100	5	8 000	0,07	98,3	95,5	175	237	205	10	80	15	178	10	468,5	1 376,3
SVC 125 × 5	125	5	8 000	0,07	123,3	120,5	220	282	250	12	100	15	223	12	756	2 270

* With wiper recess
** Without wiper recess

Symbols, see page 191

SVF/BVF - Range

Flanged nuts with axial play/with backlash elimination



Designations	Dimensions			Lead										
	d ₁	P _h	l _{tp}	d ₀	d ₂	D g6/H7	A h12	D ₁	J js12	G	Q	u	C _a	C _{0a}
	mm											[°]		
SVF/BVF 8×1	8	1	500	7,7	7,1	22	40	43	33	6×M4	M6	30	8,4	11
SVF/BVF 10×1	10	1	650	9,7	9,1	22	40	43	33	6×M4	M6	30	8,9	11,4
SVF/BVF 10×2	10	2	650	9,7	9,1	22	40	43	33	6×M4	M6	30	8,9	11,4
SVF/BVF 12×1	12	1	750	11,7	11,1	25	40	46	36	6×M4	M6	30	10,3	14
SVF/BVF 12×2	12	2	750	11,7	11,1	25	40	46	36	6×M4	M6	30	10,3	14
SVF/BVF 16×1	16	1	1 050	15,7	15,1	30	40	51	41	6×M4	M6	30	11,5	16,8
SVF/BVF 16×2	16	2	1 050	15,7	15,1	30	40	51	41	6×M4	M6	30	11,5	16,8
SVF/BVF 20×1	20	1	1 300	19,7	19,1	35	45	58	46	6×M5	M6	30	18,5	36,6
SVF/BVF 20×2	20	2	1 300	19,7	19,1	35	45	58	46	6×M5	M6	30	18,5	36,6
SVF/BVF 25×1	25	1	1 650	24,7	24,1	45	54	68	56	6×M5	M6	30	32,9	68,4
SVF/BVF 25×2	25	2	1 650	24,7	24,1	45	54	68	56	6×M5	M6	30	32,9	68,4
SVF/BVF 32×1	32	1	2 150	31,7	31,1	56	67	84	70	6×M6	M6	30	64,3	159,2
SVF/BVF 32×2	32	2	2 150	31,7	31,1	56	67	84	70	6×M6	M6	30	64,3	159,2
SVF/BVF 40×1	40	1	2 700	39,7	39,1	68	75	102	85	6×M8	M6	30	79,1	231,6
SVF/BVF 40×2	40	2	2 700	39,3	38,2	68	84	102	85	6×M8	M6	30	49,9	117,2
SVF/BVF 50×1	50	1	3 500	49,7	49,1	82	101	124	102	6×M10	M6	30	189,8	544,3
SVF/BVF 50×2	50	2	3 500	49,3	48,7	82	101	124	102	6×M10	M6	30	98,1	249,4
SVF 50×3	50	3	3 500	49,5	48,6	82	108	124	102	6×M10	M6	30	153	443,3
SVF 50×4	50	4	3 500	49,3	48,2	82	101	124	102	6×M10	M6	30	98,1	249,4
SVF 63×2	63	2	4 500	62,3	61,2	105	120	150	127	6×M12	M8×1	30	185,8	533,5
SVF 63×4	63	4	4 500	62,3	61,2	105	120	150	127	6×M12	M8×1	30	185,8	533,5
SVF 80×4	80	4	6 000	78,6	76,4	140	197	200	170	8×M16	M8×1	22,5	324,9	887,7
SVF 100×5	100	5	8 000	98,4	95,5	180	237	240	210	10×M16	M8×1	15	468,5	1 376,3
SVF 125×5	125	5	8 000	123,3	120,5	220	282	310	270	12×M18	M8×1	15	756	2 770

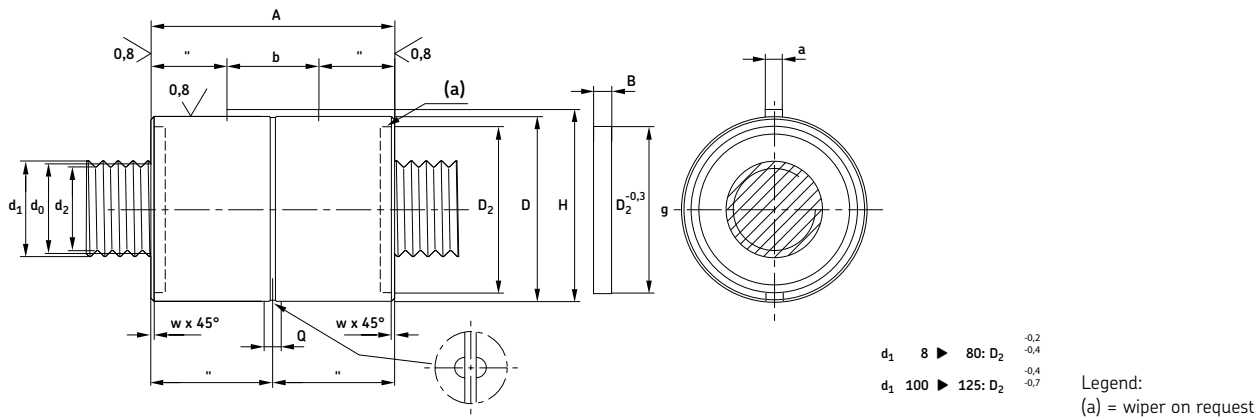
Symbols, see page 191

3 Ball & roller screws

Roller screws

PVU - Range

Cylindrical nut preloaded for optimum rigidity



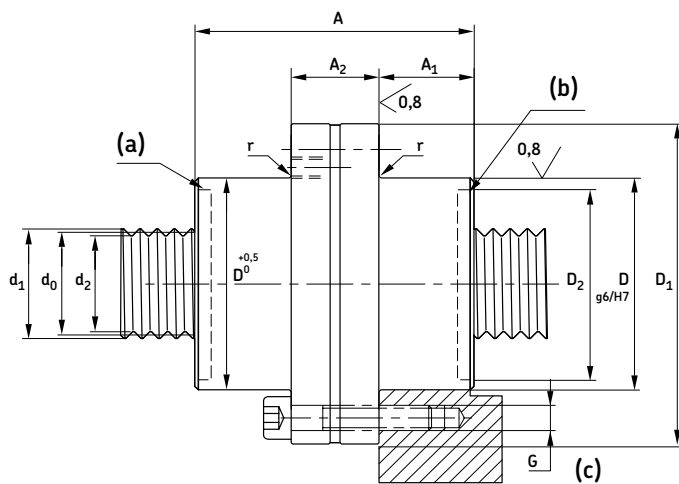
Designations	Dimensions														
	d ₀	d ₁	d ₂	D g6/H7	A* h12	A** h12	C _a	C _{0a}	B	w	a h9	b	H	Q	D ₂
	mm						kN		mm						
PVU 8×1	7,7	8	7,1	20	40	31	4,8	5,5	4	0,2	2	12	20,8	5	16,5
PVU 10×1	9,7	10	9,1	22	40	31	5,1	5,7	4	0,2	2	12	22,8	5	18,5
PVU 10×2	9,7	10	9,1	22	40	31	5,1	5,7	4	0,2	2	12	22,8	5	18,5
PVU 12×1	11,7	12	11,1	24	40	31	5,9	7	4	0,2	2	12	24,8	5	20,5
PVU 12×2	11,7	12	11,1	24	40	31	5,9	7	4	0,2	2	12	24,8	5	20,5
PVU 16×1	15,7	16	15,71	29	40	31	6,6	8,4	4	0,5	3	12	30,2	5	25
PVU 16×2	15,7	16	15,71	29	40	31	6,6	8,4	4	0,5	3	12	30,2	5	25
PVU 20×1	19,7	20	19,71	34	45	37	10,6	18,3	4	0,5	3	16	35,2	5	28,5
PVU 20×2	19,7	20	19,71	34	45	37	10,6	18,3	4	0,5	3	16	35,2	5	28,5
PVU 25×1	24,7	25	24,1	42	54	44	18,9	34,2	5	0,5	4	20	43,5	5	36
PVU 25×2	24,7	25	24,1	42	54	44	18,9	34,2	5	0,5	4	20	43,5	5	36
PVU 32×1	31,7	32	31,1	54	67	57	36,9	79,6	5	1	4	25	55,5	5	45
PVU 32×2	31,7	32	31,1	54	67	57	36,9	79,6	5	1	4	25	55,5	5	45
PVU 40×1	39,7	40	39,1	68	75	63	45,4	115,8	5	1	5	32	70	5	55
PVU 40×2	39,3	40	38,2	68	84	72	28,7	58,6	5	1	5	32	70	5	57
PVU 50×1	49,7	50	49,1	82	101	85	109	272,2	7	1	6	32	84,5	8	70
PVU 50×2	49,3	50	48,7	82	101	85	56,3	124,7	7	1	6	32	84,5	8	70
PVU 50×3	49,5	50	48,6	82	108	92	88	221,7	7	1,5	6	35	84,5	8	70
PVU 50×4	49,3	50	48,2	82	101	85	56,3	124,7	7	1	6	32	84,5	8	70
PVU 63×2	62,3	63	61,2	103	120	104	106,7	266,8	7	1	6	40	105,5	8	94
PVU 63×4	62,3	63	61,2	103	120	104	106,7	266,8	7	1	6	40	105,5	8	94
PVU 80×4	78,6	80	76,4	141	197	175	186,6	443,9	10	1,5	8	63	144	10	120
PVU 100×5	98,4	100	95,5	175	237	205	269,1	688,2	15	2	10	80	178	10	150
PVU 125×5	123,3	125	120,5	120	282	250	434	1 385	15	3	12	100	223	12	185

* With wiper recess
** Without wiper recess

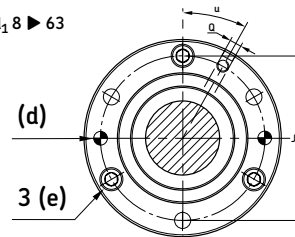
Symbols, see page 191

PVK - Range

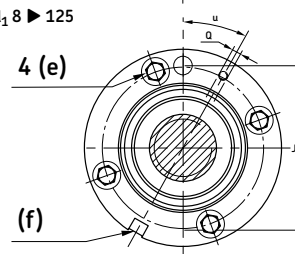
Flanged nut preloaded for optimum rigidity



PVK: d₁ 8 ▶ 63



PVK: d₁ 8 ▶ 125



Legend:
(a) = wiper recess
(b) = wiper on request
(c) = equidistant
(d) = dowel pins to hold preload
(e) = bolts for transport
(f) = key to hold preload

Designations	Dimensions												Basic load ratings		Preload torque
	Lead												dynamic	static	
	d ₁	P _h	l _{tp}	d ₀	d ₂	D	A _{h12}	D ₁	J _{js12}	G	Q	u	C _a	C _{oa}	T _{pr}
	mm												[°]	kN	Nm
PVK 8×1	8	1	400	7,7	7,1	22	40	43	33	6×M4	M6	30	4,8	5,5	0,02 - 0,08
PVK 10×1	10	1	500	9,7	9,1	22	40	43	33	6×M4	M6	30	5,1	5,7	0,03 - 0,10
PVK 10×2	10	2	500	9,7	9,1	22	40	43	33	6×M4	M6	30	5,1	5,7	0,03 - 0,10
PVK 12×1	12	1	600	11,7	11,1	25	40	46	36	6×M4	M6	30	5,9	7	0,05 - 0,15
PVK 12×2	12	2	600	11,7	11,1	25	40	46	36	6×M4	M6	30	5,9	7	0,05 - 0,15
PVK 16×1	16	1	825	15,7	15,1	30	40	51	41	6×M4	M6	30	6,6	8,4	0,10 - 0,20
PVK 16×2	16	2	825	15,7	15,1	30	40	51	41	6×M4	M6	30	6,6	8,4	0,10 - 0,20
PVK 20×1	20	1	1 050	19,7	19,1	35	45	58	46	6×M5	M6	30	10,6	18,3	0,18 - 0,32
PVK 20×2	20	2	1 050	19,7	19,1	35	45	58	46	6×M5	M6	30	10,6	18,3	0,20 - 0,35
PVK 25×1	25	1	1 300	24,7	24,1	45	54	68	56	6×M5	M6	30	18,9	34,2	0,35 - 0,65
PVK 25×2	25	2	1 300	24,7	24,1	45	54	68	56	6×M5	M6	30	18,9	34,2	0,40 - 0,70
PVK 32×1	32	1	1 700	31,7	31,1	56	67	84	70	6×M6	M6	30	36,9	79,6	0,50 - 0,95
PVK 32×2	32	2	1 700	31,7	31,1	56	67	84	70	6×M6	M6	30	36,9	79,6	0,50 - 0,95
PVK 40×1	40	1	2 150	39,7	39,1	68	75	102	85	6×M8	M6	30	45,4	115,8	0,70 - 1,40
PVK 40×2	40	2	2 150	39,3	38,2	68	84	102	85	6×M8	M6	30	28,7	58,6	0,70 - 1,40
PVK 50×1	50	1	2 800	49,7	49,1	82	101	124	102	6×M10	M6	30	109	272,2	1,20 - 2,50
PVK 50×2	50	2	2 800	49,3	48,7	82	101	124	102	6×M10	M6	30	56,3	124,7	1,20 - 2,50
PVK 50×3	50	3	2 800	49,5	48,6	82	108	124	102	6×M10	M6	30	88	221,7	1,20 - 2,50
PVK 50×4	50	4	2 800	49,3	48,2	82	101	124	102	6×M10	M6	30	56,3	124,7	1,20 - 2,50
PVK 63×2	63	2	3 600	62,3	61,2	105	120	150	127	6×M12	M8×1	30	106,7	266,8	1,80 - 3,20
PVK 63×4	63	4	3 600	62,3	61,2	105	120	150	127	6×M12	M8×1	30	106,7	266,8	2,00 - 3,50
PVK 80×4	80	4	4 000	78,6	76,4	140	197	200	170	8×M16	M8×1	22,5	186,6	443,9	3,00 - 5,50
PVK 100×5	100	5	4 000	98,4	95,5	180	237	240	210	10×M16	M8×1	15	269,1	688,2	4,50 - 7,50
PVK 125×5	125	5	4 000	123,3	120,5	220	282	310	270	12×M18	M8×1	15	434	1 385	7,00 - 10,0

Symbols, see page 191

3 Ball & roller screws

Roller screws

Ultra Power range

The SKF Ultra Power range (figs. 26 and 27) is designed for heavy loads and long service life.

High load capacity

A SKF Ultra Power range of planetary roller screws has been optimized to provide a capacity increase up to 60% over the standard roller screw with the same combination of diameter and lead, and, in addition, to reach the maximum possible service life within a compact space.

The maximum load should not be applied on the mounting bolts but on the flange.

For each screw size, the roller screw catalogue will display two different values for the dynamic load carrying capacity (C_a) according to the maximum load being applied. The catalogue also specifies a reference load F_a :

- The higher C_a value is valid for maximum application load $\leq F_a$
- The lower C_a value is valid for maximum application loads $> F_a$ and up to 80% of the lower C_a value (except for diameter 60, where maximum application loads should not exceed 50% of the lower C_a value)

Example

HRP 120 x 20

- Plastic injection application ($F \leq F_a$)
 - $F_{\max} = 320 \text{ kN}$
 - $C_a = 1\,550 \text{ kN}$
- Heavy press application ($F > F_a$)
 - $F_{\max} = 954 \text{ kN}$
 - $C_a = 1\,192 \text{ kN}$

Short strokes/oscillation performance

The kinematics of all SKF planetary roller screws provides continuous rolling of the working elements without recirculation.

They are highly reliable in high load applications with short strokes and rapid changes of direction.



Fig. 26

Designation

HRC: cylindrical nut

HRP: nut with off-centered flange

HRF: nut with centered flange

Fig. 27



Axial play

The Ultra Power range is available with axial end play lower than 0,07 mm (0,1 mm for screws with lead ≥ 40 mm).

Preload is not available.

Lead precision

Standard lead precision is G5.

Speed - Environment

All SKF planetary roller screws are rated to a maximum $n \times d_0$ value of 160 000. Their rollers are further controlled by planetary gears which help maintain rolling under extreme conditions of speed and/or contamination.

The rolling performance provides low noise operation. For maximum speed under heavy load, please contact SKF for advice.

Wipers

Standard version includes wipers (WPR in the designation). Screws can be delivered without wipers on request (NOWPR).

Lubrication

Because of the heavy loads and high duty cycles, special care must be given to the choice of lubricant. Please contact SKF for advice.

Applications

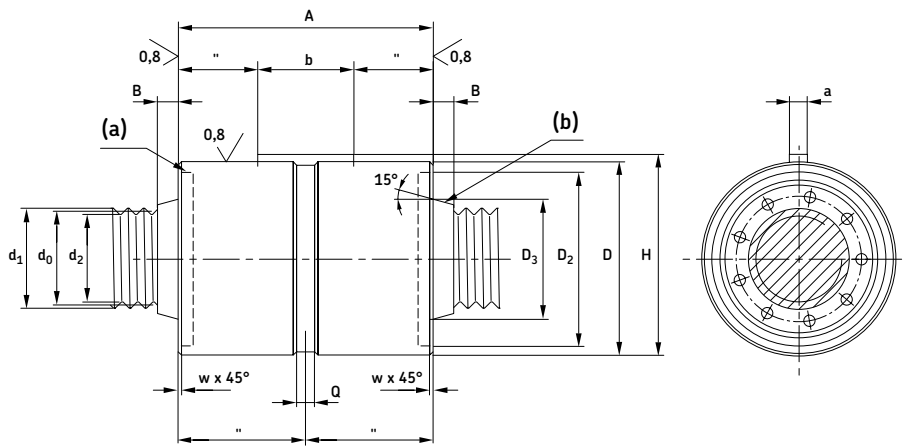
The Ultra Power range offers the power of hydraulic actuators combined with the precision and flexibility of electric control. Application examples include:

- Injection molding machines for plastic and rubber
- Presses
- Broaching machines
- Steel industry including casting & rolling
- Friction welding
- Hydro-electric plants
- Actuators.

3 Ball & roller screws

Roller screws

HRC - Range



Legend:
(a) = wiper recess
(b) = wiper

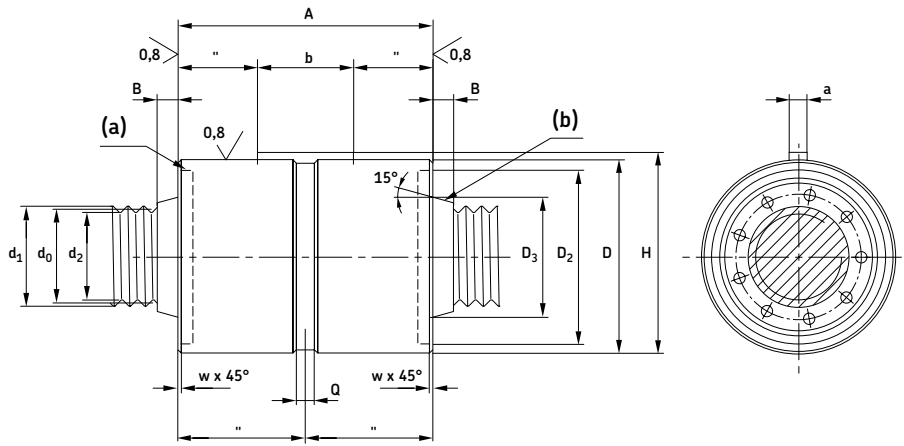
Designations	Dimensions													Basic load ratings			static
	d ₀	P _h	l _{tp}	d ₁	d ₂	D g6/H7	A h12	a h9	b	B	H	Q	F _a	C _a mol* ≤ F _a	C _a mol* > F _a	C _{0a}	
	mm												kN				
HRC 60×15	60	15	4 250	61,1	58,5	122	171	10	56	9	125	11	90	545	495	1 206	
HRC 60×20	60	20	4 250	61,3	56	122	171	10	56	9	125	11	90	568	516	1 181	
HRC 60×25	60	25	4 250	61,6	54,9	122	171	10	56	9	125	11	90	548	498	1 115	
HRC 60×30	60	30	4 250	61,8	53,8	122	171	10	56	9	125	11	90	547	497	1 105	
HRC 75×15	75	15	5 500	76,1	73,5	150	213	10	63	10	153	11	130	772	643	1 855	
HRC 75×20	75	20	5 500	76,4	71	150	213	10	63	10	153	11	130	781	651	1 842	
HRC 75×25	75	25	5 500	76,7	70	150	213	10	63	10	153	11	130	791	659	1 846	
HRC 75×30	75	30	5 500	76,9	68,9	150	213	10	63	10	153	11	130	788	657	1 815	
HRC 87×15	87	15	6 000	88,1	85,5	175	245	12	100	12	178	12	180	979	816	2 645	
HRC 87×20	87	20	6 000	88,4	83	175	245	12	100	12	178	12	180	982	818	2 589	
HRC 87×25	87	25	6 000	88,7	82	175	245	12	100	12	178	12	180	1 004	837	2 635	
HRC 87×30	87	30	6 000	89	81	175	245	12	100	12	178	12	180	1 003	836	2 599	
HRC 99×15	99	15	7 500	100,1	97,5	200	280	16	100	12	204	15	240	1 231	985	3 503	
HRC 99×20	99	20	7 500	100,4	95	200	280	16	100	12	204	15	240	1 263	1 010	3 556	
HRC 99×25	99	25	7 500	100,7	94	200	280	16	100	12	204	15	240	1 280	1 024	3 561	
HRC 99×30	99	30	7 500	101	93	200	280	16	100	12	204	15	240	1 281	1 025	3 520	
HRC 99×35	99	35	7 500	101,3	91,9	200	280	16	100	12	204	15	240	1 281	1 025	3 479	
HRC 112,5×15	112,5	15	7 500	113,6	111,1	230	300	16	100	12	234	15	290	1 425	1 140	4 327	
HRC 112,5×20	112,5	20	7 500	113,9	108,6	230	300	16	100	12	234	15	290	1 451	1 161	4 334	
HRC 112,5×25	112,5	25	7 500	114,2	107,5	230	300	16	100	12	234	15	290	1 393	1 114	4 006	
HRC 112,5×30	112,5	30	7 500	114,5	106,5	230	300	16	100	12	234	15	290	1 401	1 121	3 986	
HRC 112,5×35	112,5	35	7 500	114,8	105,5	230	300	16	100	12	234	15	290	1 408	1 126	3 967	
HRC 120×15	120	15	8 000	121,1	118,6	240	330	16	100	12	244	15	320	1 550	1 192	4 635	
HRC 120×20	120	20	8 000	121,4	116,1	240	330	16	100	12	244	15	320	1 590	1 223	4 697	
HRC 120×25	120	25	8 000	121,8	115,1	240	330	16	100	12	244	15	320	1 587	1 221	4 592	
HRC 120×30	120	30	8 000	122,1	114	240	330	16	100	12	244	15	320	1 616	1 243	4 656	
HRC 120×35	120	35	8 000	122,3	113	240	330	16	100	12	244	15	320	1 643	1 264	4 718	
HRC 120×40	120	40	8 000	122,6	112	240	330	16	100	12	244	15	320	1 655	1 273	4 726	

Continued

*mol = maximum operating load

Note: All other dimensions can be found in the SKF roller screws catalog. Please contact SKF.

HRC - Range
(Continued)



Legend:
(a) = wiper recess
(b) = wiper

Designations	Dimensions												Basic load ratings			static	
	Lead												dynamic	C _a mol* ≤ Fa	C _a mol* > Fa		C _{0a}
	d ₀	P _h	l _{tp}	d ₁	d ₂	D g6/H7	A h12	a h9	b	B	H	Q					
	mm												kN				
HRC 135 × 15	135	15	8 000	136,1	133,6	280	370	28	120	11,5	286	15	410	1 847	1 421	6 028	
HRC 135 × 20	135	20	8 000	136,5	131,1	280	370	28	120	11,5	286	15	410	1 862	1 432	5 941	
HRC 135 × 25	135	25	8 000	136,8	130,1	280	370	28	120	11,5	286	15	410	1 907	1 467	6 044	
HRC 135 × 30	135	30	8 000	137,1	129,1	280	370	28	120	11,5	286	15	410	1 908	1 468	5 957	
HRC 135 × 35	135	35	8 000	137,4	128	280	370	28	120	11,5	286	15	410	1 925	1 481	5 965	
HRC 135 × 40	135	40	8 000	137,7	127	280	370	28	120	11,5	286	15	410	1 914	1 472	5 847	
HRC 150 × 15	150	15	7 200	151,1	148,6	320	412	32	160	12,5	327	15	480	2 160	1 600	7 182	
HRC 150 × 20	150	20	7 200	151,5	146,1	320	412	32	160	12,5	327	15	480	2 199	1 629	7 190	
HRC 150 × 25	150	25	7 200	151,8	145,1	320	412	32	160	12,5	327	15	480	2 223	1 647	7 164	
HRC 150 × 30	150	30	7 200	152,1	144,1	320	412	32	160	12,5	327	15	480	2 255	1 670	7 208	
HRC 150 × 35	150	35	7 200	152,4	143,1	320	412	32	160	12,5	327	15	480	2 255	1 670	7 113	
HRC 150 × 40	150	40	7 200	152,7	142	320	412	32	160	12,5	327	15	480	2 265	1 678	7 086	
HRC 180 × 15	180	15	5 000	181,1	178,6	390	496	32	160	15	397	20	750	3 017	2 235	11 939	
HRC 180 × 20	180	20	5 000	181,5	176,1	390	496	32	160	15	397	20	750	3 066	2 271	11 907	
HRC 180 × 25	180	25	5 000	181,8	175,1	390	496	32	160	15	397	20	750	3 124	2 314	12 003	
HRC 180 × 30	180	30	5 000	182,1	174,1	390	496	32	160	15	397	20	750	3 131	2 319	11 842	
HRC 180 × 35	180	35	5 000	182,5	173,1	390	496	32	160	15	397	20	750	3 146	2 330	11 767	
HRC 180 × 40	180	40	5 000	182,8	172,1	390	496	32	160	15	397	20	750	3 200	2 370	11 949	
HRC 210 × 20	210	20	3 700	211,4	208,1	440	570	40	200	15	450	20	950	3 550	2 630	14 742	
HRC 210 × 30	210	30	3 700	212,1	207,2	440	570	40	200	15	450	20	950	3 611	2 675	14 570	
HRC 210 × 40	210	40	3 700	212,9	206,3	440	570	40	200	15	450	20	950	3 707	2 746	14 792	

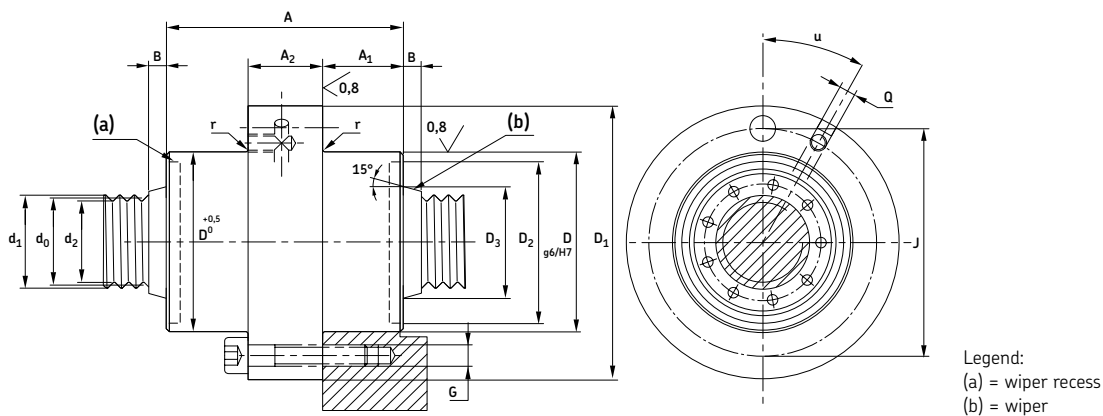
*mol = maximum operating load

Note: All other dimensions can be found in the SKF roller screws catalog. Please contact SKF.

3 Ball & roller screws

Roller screws

HRF - Range



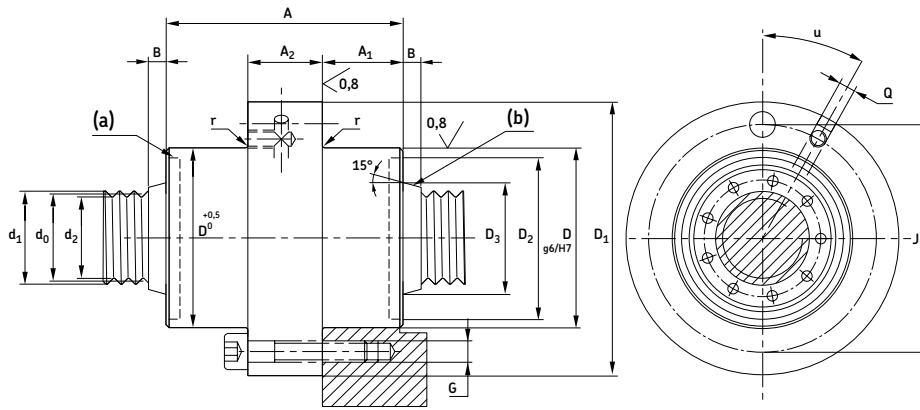
Designations	Dimensions			Lead										Basic load ratings			
	d ₀	P _h	l _{tp}	d ₁	d ₂	D g6/H7	A h12	A ₂	D ₁	J js12	B	G	Q	F _a	C _a mol* ≤ F _a	C _a mol* > F _a	C _{0a}
	mm													kN			
HRF 60×15	60	15	4 250	61,1	58,5	122	171	30	166	146	9	8×M12	M8×1	90	545	495	1 206
HRF 60×20	60	20	4 250	61,3	56	122	171	30	166	146	9	8×M12	M8×1	90	568	516	1 181
HRF 60×25	60	25	4 250	61,6	54,9	122	171	30	166	146	9	8×M12	M8×1	90	548	498	1 115
HRF 60×30	60	30	4 250	61,8	53,8	122	171	30	166	146	9	8×M12	M8×1	90	547	497	1 105
HRF 75×15	75	15	5 500	76,1	73,5	150	213	35	195	174	10	12×M12	M8×1	130	772	643	1 855
HRF 75×20	75	20	5 500	76,4	71	150	213	35	195	174	10	12×M12	M8×1	130	781	651	1 842
HRF 75×25	75	25	5 500	76,7	70	150	213	35	195	174	10	12×M12	M8×1	130	791	659	1 846
HRF 75×30	75	30	5 500	76,9	68,9	150	213	35	195	174	10	12×M12	M8×1	130	788	657	1 815
HRF 87×15	87	15	6 000	88,1	85,5	175	245	40	220	200	12	12×M12	M8×1	180	979	816	2 645
HRF 87×20	87	20	6 000	88,4	83	175	245	40	220	200	12	12×M12	M8×1	180	982	818	2 589
HRF 87×25	87	25	6 000	88,7	82	175	245	40	220	200	12	12×M12	M8×1	180	1 004	837	2 635
HRF 87×30	87	30	6 000	89	81	175	245	40	220	200	12	12×M12	M8×1	180	1 003	836	2 599
HRF 99×15	99	15	7 500	100,1	97,5	200	280	50	245	224	12	12×M12	M8×1	240	1 231	985	3 503
HRF 99×20	99	20	7 500	100,4	95	200	280	50	245	224	12	12×M12	M8×1	240	1 263	1 010	3 556
HRF 99×25	99	25	7 500	100,7	94	200	280	50	245	224	12	12×M12	M8×1	240	1 280	1 024	3 561
HRF 99×30	99	30	7 500	101	93	200	280	50	245	224	12	12×M12	M8×1	240	1 281	1 025	3 520
HRF 99×35	99	35	7 500	101,3	91,9	200	280	50	245	224	12	12×M12	M8×1	240	1 281	1 025	3 479
HRF 112,5×15	112,5	15	7 500	113,6	111,1	230	300	50	286	260	12	12×M16	M12×1,75	290	1 425	1 140	4 327
HRF 112,5×20	112,5	20	7 500	113,9	108,6	230	300	50	286	260	12	12×M16	M12×1,75	290	1 451	1 161	4 334
HRF 112,5×25	112,5	25	7 500	114,2	107,5	230	300	50	286	260	12	12×M16	M12×1,75	290	1 393	1 114	4 006
HRF 112,5×30	112,5	30	7 500	114,5	106,5	230	300	50	286	260	12	12×M16	M12×1,75	290	1 401	1 121	3 986
HRF 112,5×35	112,5	35	7 500	114,8	105,5	230	300	50	286	260	12	12×M16	M12×1,75	290	1 408	1 126	3 967
HRF 120×15	120	15	8 000	121,1	118,6	240	330	55	296	270	12	12×M16	M12×1,75	320	1 550	1 192	4 635
HRF 120×20	120	20	8 000	121,4	116,1	240	330	55	296	270	12	12×M16	M12×1,75	320	1 590	1 223	4 697
HRF 120×25	120	25	8 000	121,8	115,1	240	330	55	296	270	12	12×M16	M12×1,75	320	1 587	1 221	4 592
HRF 120×30	120	30	8 000	122,1	114	240	330	55	296	270	12	12×M16	M12×1,75	320	1 616	1 243	4 656
HRF 120×35	120	35	8 000	122,3	113	240	330	55	296	270	12	12×M16	M12×1,75	320	1 643	1 264	4 718
HRF 120×40	120	40	8 000	122,6	112	240	330	55	296	270	12	12×M16	M12×1,75	320	1 655	1 273	4 726

Continued

*mol = maximum operating load

Note: All other dimensions can be found in the SKF roller screws catalog. Please contact SKF.

HRF - Range
(Continued)



Legend:
(a) = wiper recess
(b) = wiper

Designations	Dimensions			Lead										Basic load ratings			
	d ₀	P _h	l _{tp}	d ₁	d ₂	D g6/H7	A h12	A ₂	D ₁	J js12	B	G	Q	F _a	C _a mol* ≤ Fa	C _a mol* > Fa	C _{0a}
	mm													kN			
HRF 135 × 15	135	15	8 000	136,1	133,6	280	370	60	345	315	11,5	12 × M18	M12 × 1,75	410	1 847	1 421	6 028
HRF 135 × 20	135	20	8 000	136,5	131,1	280	370	60	345	315	11,5	12 × M18	M12 × 1,75	410	1 862	1 432	5 941
HRF 135 × 25	135	25	8 000	136,8	130,1	280	370	60	345	315	11,5	12 × M18	M12 × 1,75	410	1 907	1 467	6 044
HRF 135 × 30	135	30	8 000	137,1	129,1	280	370	60	345	315	11,5	12 × M18	M12 × 1,75	410	1 908	1 468	5 957
HRF 135 × 35	135	35	8 000	137,4	128	280	370	60	345	315	11,5	12 × M18	M12 × 1,75	410	1 925	1 481	5 965
HRF 135 × 40	135	40	8 000	137,7	127	280	370	60	345	315	11,5	12 × M18	M12 × 1,75	410	1 914	1 472	5 847
HRF 150 × 15	150	15	7 200	151,1	148,6	320	412	70	385	355	12,5	12 × M18	M12 × 1,75	480	2 160	1 600	7 182
HRF 150 × 20	150	20	7 200	151,5	146,1	320	412	70	385	355	12,5	12 × M18	M12 × 1,75	480	2 199	1 629	7 190
HRF 150 × 25	150	25	7 200	151,8	145,1	320	412	70	385	355	12,5	12 × M18	M12 × 1,75	480	2 223	1 647	7 164
HRF 150 × 30	150	30	7 200	152,1	144,1	320	412	70	385	355	12,5	12 × M18	M12 × 1,75	480	2 255	1 670	7 208
HRF 150 × 35	150	35	7 200	152,4	143,1	320	412	70	385	355	12,5	12 × M18	M12 × 1,75	480	2 255	1 670	7 113
HRF 150 × 40	150	40	7 200	152,7	142	320	412	70	385	355	12,5	12 × M18	M12 × 1,75	480	2 265	1 678	7 086
HRF 180 × 15	180	15	5 000	181,1	178,6	390	496	90	470	433	15	12 × M22	M12 × 1,75	750	3 017	2 235	11 939
HRF 180 × 20	180	20	5 000	181,5	176,1	390	496	90	470	433	15	12 × M22	M12 × 1,75	750	3 066	2 271	11 907
HRF 180 × 25	180	25	5 000	181,8	175,1	390	496	90	470	433	15	12 × M22	M12 × 1,75	750	3 124	2 314	12 003
HRF 180 × 30	180	30	5 000	182,1	174,1	390	496	90	470	433	15	12 × M22	M12 × 1,75	750	3 131	2 319	11 842
HRF 180 × 35	180	35	5 000	182,5	173,1	390	496	90	470	433	15	12 × M22	M12 × 1,75	750	3 146	2 330	11 767
HRF 180 × 40	180	40	5 000	182,8	172,1	390	496	90	470	433	15	12 × M22	M12 × 1,75	750	3 200	2 370	11 949
HRF 210 × 20	210	20	3 700	211,4	208,1	440	570	100	530	490	15	12 × M24	M12 × 1,76	950	3 550	2 630	14 742
HRF 210 × 30	210	30	3 700	212,1	207,2	440	570	100	530	490	15	12 × M24	M12 × 1,77	950	3 611	2 675	14 570
HRF 210 × 40	210	40	3 700	212,9	206,3	440	570	100	530	490	15	12 × M24	M12 × 1,78	950	3 707	2 746	14 792

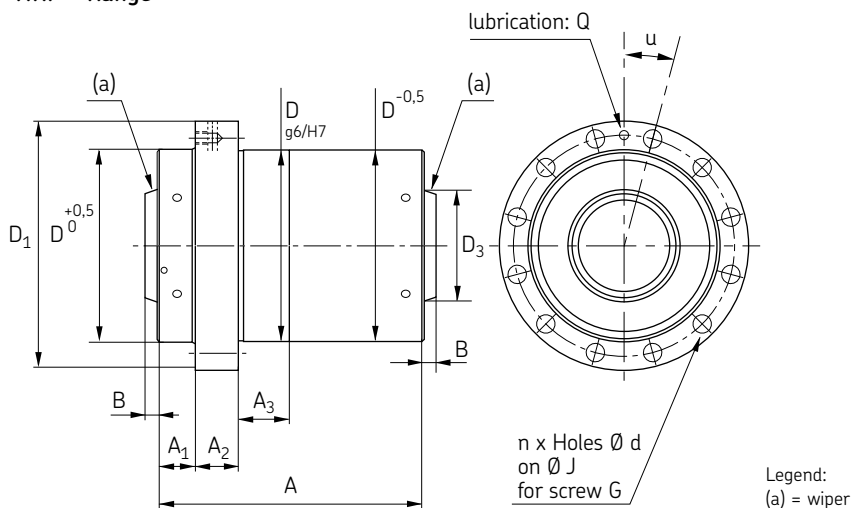
*mol = maximum operating load

Note: All other dimensions can be found in the SKF roller screws catalog. Please contact SKF.

3 Ball & roller screws

Roller screws

HRP - Range



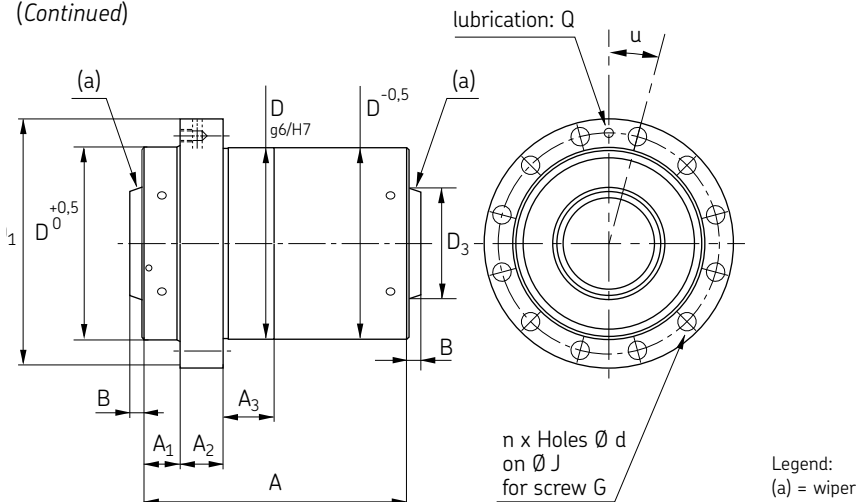
Designations	Dimensions			Lead										Basic load ratings			
	d_0	P_h	l_{tp}	d_1	d_2	D $\frac{g6}{H7}$	A $h12$	A_2	D_1	J $js12$	G	Q	F_a	C_a $mol^* \leq F_a$	C_a $mol^* > F_a$	C_{0a}	static
	mm													kN			
HRP 60×15	60	15	4 250	61,1	58,5	122	171	30	166	146	8×M12	M8×1	90	545	495	1 206	
HRP 60×20	60	20	4 250	61,3	56	122	171	30	166	146	8×M12	M8×1	90	568	516	1 181	
HRP 60×25	60	25	4 250	61,6	54,9	122	171	30	166	146	8×M12	M8×1	90	548	498	1 115	
HRP 60×30	60	30	4 250	61,8	53,8	122	171	30	166	146	8×M12	M8×1	90	547	497	1 105	
HRP 75×15	75	15	5 500	76,1	73,5	150	213	35	195	174	12×M12	M8×1	130	772	643	1 855	
HRP 75×20	75	20	5 500	76,4	71	150	213	35	195	174	12×M12	M8×1	130	781	651	1 842	
HRP 75×25	75	25	5 500	76,7	70	150	213	35	195	174	12×M12	M8×1	130	791	659	1 846	
HRP 75×30	75	30	5 500	76,9	68,9	150	213	35	195	174	12×M12	M8×1	130	788	657	1 815	
HRP 87×15	87	15	6 000	88,1	85,5	175	245	40	220	200	12×M12	M8×1	180	979	816	2 645	
HRP 87×20	87	20	6 000	88,4	83	175	245	40	220	200	12×M12	M8×1	180	982	818	2 589	
HRP 87×25	87	25	6 000	88,7	82	175	245	40	220	200	12×M12	M8×1	180	1 004	837	2 635	
HRP 87×30	87	30	6 000	89	81	175	245	40	220	200	12×M12	M8×1	180	1 003	836	2 599	
HRP 99×15	99	15	7 500	100,1	97,5	200	280	50	245	224	12×M12	M8×1	240	1 231	985	3 503	
HRP 99×20	99	20	7 500	100,4	95	200	280	50	245	224	12×M12	M8×1	240	1 263	1 010	3 556	
HRP 99×25	99	25	7 500	100,7	94	200	280	50	245	224	12×M12	M8×1	240	1 280	1 024	3 561	
HRP 99×30	99	30	7 500	101	93	200	280	50	245	224	12×M12	M8×1	240	1 281	1 025	3 520	
HRP 99×35	99	35	7 500	101,3	91,9	200	280	50	245	224	12×M12	M8×1	240	1 281	1 025	3 479	
HRP 112,5×15	112,5	15	7 500	113,6	111,1	230	300	50	286	260	12×M16	M12×1,75	290	1 425	1 140	4 327	
HRP 112,5×20	112,5	20	7 500	113,9	108,6	230	300	50	286	260	12×M16	M12×1,75	290	1 451	1 161	4 334	
HRP 112,5×25	112,5	25	7 500	114,2	107,5	230	300	50	286	260	12×M16	M12×1,75	290	1 393	1 114	4 006	
HRP 112,5×30	112,5	30	7 500	114,5	106,5	230	300	50	286	260	12×M16	M12×1,75	290	1 401	1 121	3 986	
HRP 112,5×35	112,5	35	7 500	114,8	105,5	230	300	50	286	260	12×M16	M12×1,75	290	1 408	1 126	3 967	
HRP 120×15	120	15	8 000	121,1	118,6	240	330	55	296	270	12×M16	M12×1,75	320	1 550	1 192	4 635	
HRP 120×20	120	20	8 000	121,4	116,1	240	330	55	296	270	12×M16	M12×1,75	320	1 590	1 223	4 697	
HRP 120×25	120	25	8 000	121,8	115,1	240	330	55	296	270	12×M16	M12×1,75	320	1 587	1 221	4 592	
HRP 120×30	120	30	8 000	122,1	114	240	330	55	296	270	12×M16	M12×1,75	320	1 616	1 243	4 656	
HRP 120×35	120	35	8 000	122,3	113	240	330	55	296	270	12×M16	M12×1,75	320	1 643	1 264	4 718	
HRP 120×40	120	40	8 000	122,6	112	240	330	55	296	270	12×M16	M12×1,75	320	1 655	1 273	4 726	

Continued

*mol = maximum operating load

Note: All other dimensions can be found in the SKF roller screws catalog. Please contact SKF.

HRP - Range (Continued)



Designations	Dimensions													Basic load ratings		
	Lead			d ₁	d ₂	D g6/H7	A h12	A ₂	D ₁	J js12	G	Q	Fa	dynamic	static	
	d ₀	P _h	l _{tp}											C _a mol* ≤ Fa	C _a mol* > Fa	C _{0a}
	mm													kN		
HRP 135×15	135	15	8 000	136,1	133,6	280	370	60	345	315	12×M18	M12×1,75	410	1 847	1 421	6 028
HRP 135×20	135	20	8 000	136,5	131,1	280	370	60	345	315	12×M18	M12×1,75	410	1 862	1 432	5 941
HRP 135×25	135	25	8 000	136,8	130,1	280	370	60	345	315	12×M18	M12×1,75	410	1 907	1 467	6 044
HRP 135×30	135	30	8 000	137,1	129,1	280	370	60	345	315	12×M18	M12×1,75	410	1 908	1 468	5 957
HRP 135×35	135	35	8 000	137,4	128	280	370	60	345	315	12×M18	M12×1,75	410	1 925	1 481	5 965
HRP 135×40	135	40	8 000	137,7	127	280	370	60	345	315	12×M18	M12×1,75	410	1 914	1 472	5 847
HRP 150×15	150	15	7 200	151,1	148,6	320	412	70	385	355	12×M18	M12×1,75	480	2 160	1 600	7 182
HRP 150×20	150	20	7 200	151,5	146,1	320	412	70	385	355	12×M18	M12×1,75	480	2 199	1 629	7 190
HRP 150×25	150	25	7 200	151,8	145,1	320	412	70	385	355	12×M18	M12×1,75	480	2 223	1 647	7 164
HRP 150×30	150	30	7 200	152,1	144,1	320	412	70	385	355	12×M18	M12×1,75	480	2 255	1 670	7 208
HRP 150×35	150	35	7 200	152,4	143,1	320	412	70	385	355	12×M18	M12×1,75	480	2 255	1 670	7 113
HRP 150×40	150	40	7 200	152,7	142	320	412	70	385	355	12×M18	M12×1,75	480	2 265	1 678	7 086
HRP 180×15	180	15	5 000	181,1	178,6	390	496	90	470	433	12×M22	M12×1,75	750	3 017	2 235	11 939
HRP 180×20	180	20	5 000	181,5	176,1	390	496	90	470	433	12×M22	M12×1,75	750	3 066	2 271	11 907
HRP 180×25	180	25	5 000	181,8	175,1	390	496	90	470	433	12×M22	M12×1,75	750	3 124	2 314	12 003
HRP 180×30	180	30	5 000	182,1	174,1	390	496	90	470	433	12×M22	M12×1,75	750	3 131	2 319	11 842
HRP 180×35	180	35	5 000	182,5	173,1	390	496	90	470	433	12×M22	M12×1,75	750	3 146	2 330	11 767
HRP 180×40	180	40	5 000	182,8	172,1	390	496	90	470	433	12×M22	M12×1,75	750	3 200	2 370	11 949
HRP 210×20	210	20	3 700	211,4	208,1	440	570	100	530	490	12×M24	M12×1,75	950	3 550	2 630	14 742
HRP 210×30	210	30	3 700	212,1	207,2	440	570	100	530	490	12×M24	M12×1,75	950	3 611	2 675	14 570
HRP 210×40	210	40	3 700	212,9	206,3	440	570	100	530	490	12×M24	M12×1,75	950	3 707	2 746	14 792

*mol = maximum operating load

Note: All other dimensions can be found in the SKF roller screws catalog. Please contact SKF.

3 Ball & roller screws

Roller screws

Rotating nut roller screws
(figs. 21 and 22)

With this design based on planetary roller screw technology, the nut rotates inside bearings. The electric motor drives the nut via a tension belt, and the nut assembly moves along the fixed screw shaft.

Features

- 72 series angular contact bearings are directly mounted on the nut outer diameter
- Bearings are preloaded in back-to-back arrangement in order to fully support the moment created by the belt tension
- 2 Nilos rings protect the bearings against pollution and permit lubrication for life
- Wipers are mounted at each end of the nut in the standard configuration for better protection against contamination
- The screw assembly is lubricated through a nipple mounted on the housing external diameter, with standard SKF LGEP2, or according to customer specifications
- Two versions are available:
 - SRR: with axial play
 - BRR: with backlash elimination

Benefits

- Compact solution ready for use in machinery
- Simplified engineering for machine builders
- Acceleration up to 12 000 rad/sec²
- Maximum speed $n \times d_0$ up to 160 000

Application examples

- Production processes in automotive industry (servo-presses, tube bending, forming, locking devices, etc.)
- Process in injection moulding industry (part ejection)

Fig. 21



Fig. 22



Designations	Lead Ph
	mm
SRR/BRR 25 x Ph-R5	5/10/15
SRR/BRR 30 x Ph-R5	5/10/15/20
SRR/BRR 39 x Ph-R5	5/10/15/20/25
SRR/BRR 48 x Ph-R5	5/10/15/20/25
SRR/BRR 60 x Ph-R5	5/10/15/20/25/30

Inverted roller screws (figs. 23 and 24)

The inverted roller screw represents a unique design variant of the planetary roller screw.

Features

- The compact inverted roller screw works on the same principle as a planetary roller screw, with the roller's rotation being synchronized with the threaded shaft through toothed rings
- Either nut or shaft can be rotated by an electric motor, the non rotating component thus acting as the push tube of an actuator.
- The application loads acting on the translating push tube transit through the planetary rollers to the rotating shaft or nut
- Toothed rings and guiding rings ensure the rolling motion and an even circumferential position of the rollers, to perfectly distribute the load and to eliminate any parasitic friction between rollers

Benefits

- Very small lead, down to 1,00 mm, while providing a high load carrying capacity and high axial stiffness
- High speed capability, identical to that of planetary roller screws
- Guiding and sealing functions easily integrated on smooth surface of nut or shaft resulting in high performance sealing
- Compactness attachment between electric rotor and screw components, and easy rotor integration
- Screw or nut directly used as push tube
- Long service life and increased reliability improving customer installation productivity
- Reduced requirements for electric motor torque to reach high load actuation
- Environmentally friendly solution

Typical applications

SKF compact inverted roller screws are designed to provide powerful electromechanical actuation where compactness and high load capability are prerequisites. The compact inverted roller screw, incorporated inside an electromechanical actuator, can advantageously replace hydraulic or pneumatic actuation, providing the benefits of electronic control.



SKF compact inverted roller screw view with electric motor and bearings



Application examples

- Factory automation
- Welding guns
- Oil and gas sub-sea equipment
- Aerospace

N.B.:

If you need more information, please contact SKF sales office.

3 Ball & roller screws

Roller screws service range

Roller screws service range

For reduced delivery time, SKF offers 3 options that are available for both types of planetary and recirculating roller screws.

1) Standard nuts in stock

Selected types of roller screw nuts are stocked to reduce the delivery time of roller screws. With such option, screw shafts are not stocked and will be manufactured on demand. Please see **pages 182-183**.

2) Standard nuts and screw shafts in stock

With this option, selected types of roller screw nuts already fitted on pre-machined shafts are stocked at the factory. Within the defined dimensions of the stocked screw shafts, ends can be machined according to customer requirements. This option allows for a delivery time that is further reduced compared to the first option with only standard nuts in stock, although with more limitations to the screw shafts dimensions. Please see **pages 184-185**.

3) Complete roller screw assemblies with flanged thrust bearing unit (fig. 25)

This is a further development of options with standard nuts and screw shafts in stock. With this option, the stocked screw shafts have been machined at one end, and fitted with a flanged thrust bearing unit (support bearing with angular contact ball bearings, also known as FLRBU). These assemblies for quick delivery are only available with the standard design of FLRBU bearing assortment (please refer to the SKF roller screw catalogue). Please see **pages 186-187**.



Fig. 25

Roller screws service range

General rules

Quantity	• Maximum 3 pieces for planetary and recirculating roller screws. • Maximum 5 pieces for service range option 2 with roller screw nuts and screw shafts in stock, premachined shafts for machining by the customer.
Materials	• Both shafts and nuts should be made of standard steel (refer to our latest roller screws catalogue). Neither stainless steel nor special treatments are accepted through this quick service channel.
Capabilities	• Standard nuts with axial play, backlash elimination or preload. • Standard machining: no spline, no hollow shaft, no radius in grinding operations. If there are such requirements, order cannot be accepted by the service channel. • Unless specified, tolerances will be according to class 5, ISO 3408-3 (see roller screws catalogue). • FLRBU thrust support bearings can be delivered from FLRBU 1 to FLRBU 6 sizes. • Lead precision: G5 according to ISO standard. • Lubrication: screw assemblies delivered with machined ends are greased with SKF LGEP2 (temperature range: -20 °C to +120 °C). Without end machining, they are only protected with rust inhibitor.
IMPORTANT	• Screws for nuclear, aerospace, military or medical applications are excluded. • Special documents such as conformity report cannot be included.

N.B.:
If you need more information, please contact SKF sales office.

3 Ball & roller screws

Roller screws service range

Service range option 1

Planetary roller screw standard nuts in stock

Nut in stock

Short delivery time possible

- Without machined ends
- With machined ends according to customer drawing

Nuts

- With axial play: SRC – SRF
- Preloaded for optimum rigidity: PRU – PRK

Lead	10		●	●	●	●	●
	5	●	●	●	●	●	●
		15	21	25	30	39	48

Nominal diameter

Capabilities

Machined ends:

- according to customer drawing (see general rules)

Screw dimensions:

- up to 1 500 mm maximum length
- up to 900 mm threaded length.



d ₀	P _h	N	C _a SRC/SRF	PRU/PRK	C _{0a} SRC/SRF	PRU/PRK
mm						
15	5	5	25,9	14,3	43,5	21,8
21	5	5	50,5	27,8	81,9	40,9
21	10	5	59,2	32,6	83,0	41,5
25	5	5	63,2	34,8	108,2	54,1
25	10	5	72,6	40,0	105,3	52,6
30	5	5	91,9	50,6	178,3	89,1
30	10	5	106,3	58,5	174,3	87,1
39	5	5	129,2	71,1	268,9	134,4
39	10	5	152,6	84,0	270,9	135,4
48	5	5	198,0	109,1	481,5	240,7
48	10	5	231,5	127,5	475,1	237,5

N.B.:
If you need more information, please contact SKF sales office.

Service range option 1

Recirculating roller screw standard nuts in stock

Nut in stock

Short delivery time possible

- Without machined ends
- With machined ends according to customer drawing

Nuts

- With axial play: SVC
- Preloaded for optimum rigidity: PVU – PVK

2

1

●

●

●

●

●

16

20

25

32

40

Nominal diameter

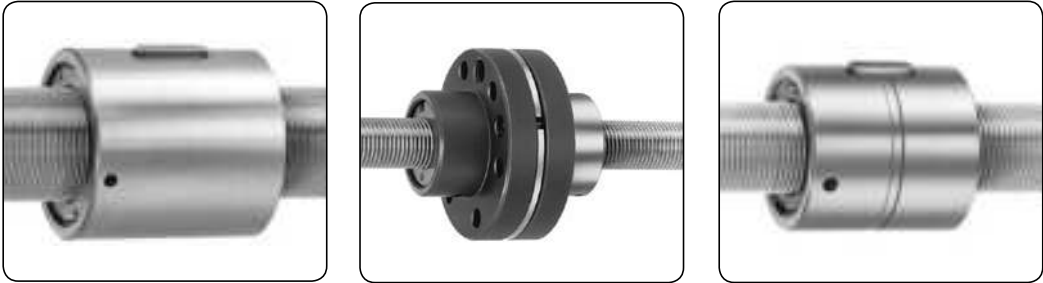
Capabilities

Machined ends:

- according to customer drawing (see general rules)

Screw dimensions:

- up to 1 500 mm maximum length
- up to 900 mm threaded length.



d ₀	P _h	N	C _a SVC	PVU/PVK	C _{0a} SVC	PVU/PVK
mm						
16	1	1	11,5	6,6	16,8	8,4
16	2	2	11,5	6,6	16,8	8,4
20	1	1	18,5	10,6	36,6	18,3
20	2	2	18,5	10,6	36,6	18,3
25	1	1	32,9	18,9	68,4	34,2
25	2	2	32,9	18,9	68,4	34,2
32	1	1	64,3	36,9	159,2	79,6
32	2	2	64,3	36,9	159,2	79,6
40	1	1	79,1	45,4	231,6	115,8
40	2	1	49,9	28,7	117,2	58,6

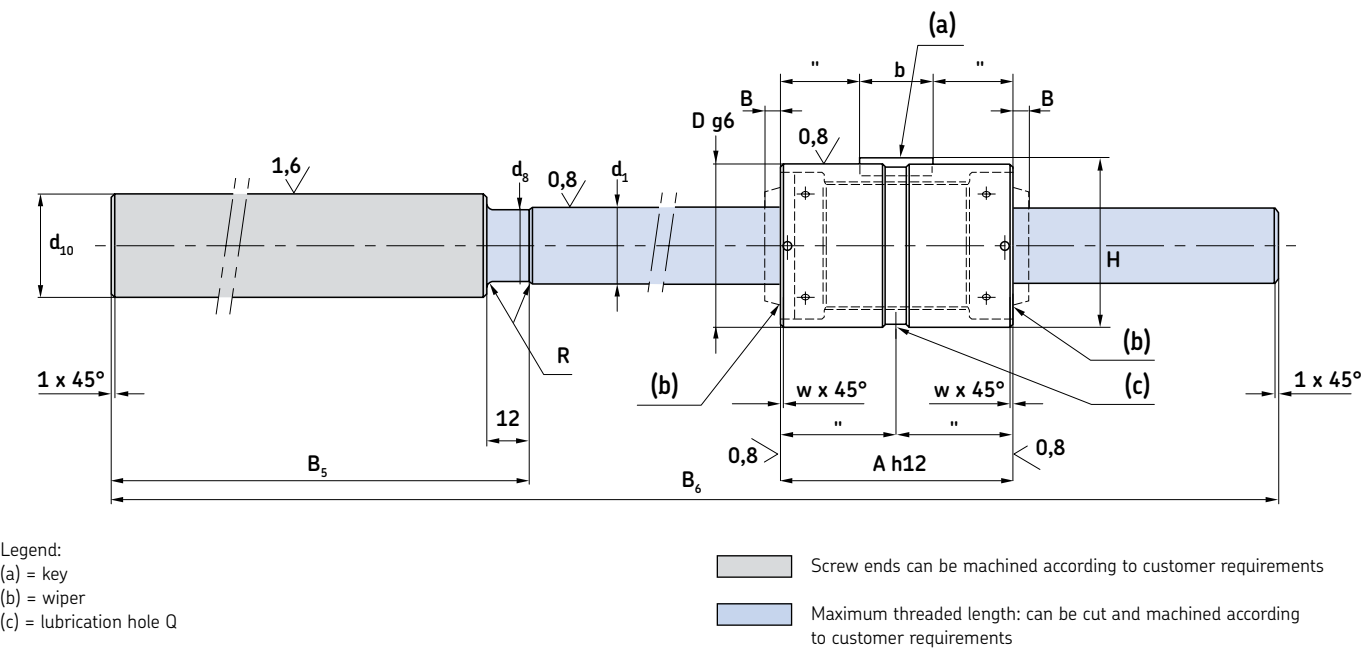
N.B.:

If you need more information, please contact SKF sales office.

3 Ball & roller screws
Roller screws service range

Service range option 2
Planetary roller screw nuts and screw shafts in stock

BRC - Range



Features

- Nut preloaded for backlash elimination: BRC
- Lead precision G5 according to ISO standard
- Preload torque measured at 50 rpm and using SKF LGEP2 lubricant

Capabilities for machined ends

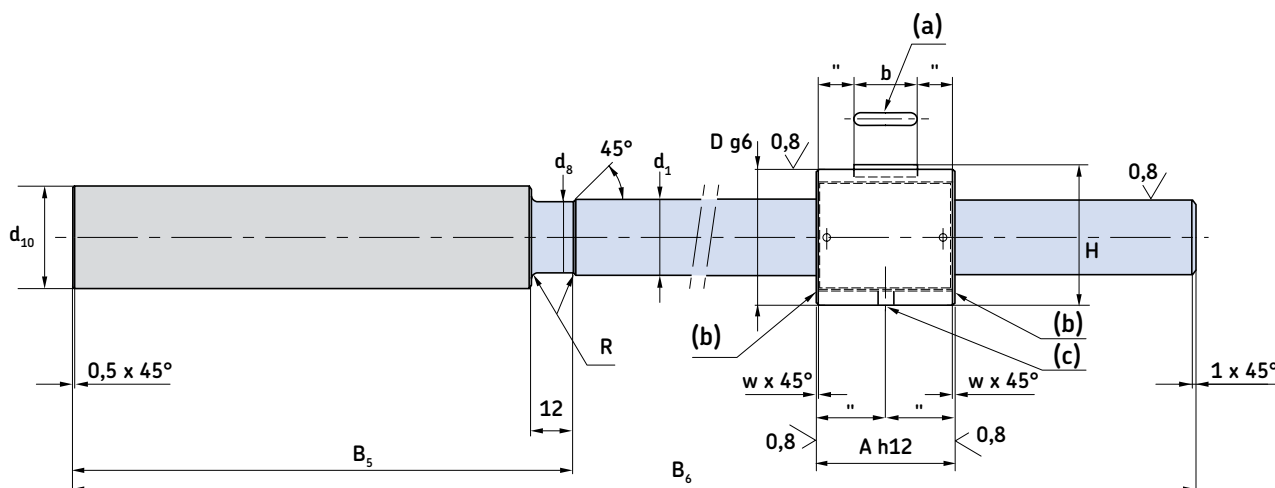
- Premachined shafts for machining by the customer. Maximum 5 pieces per order line
- According to customer drawing (see general rules). Maximum 3 pieces per order line.

Designations	Dimensions						Basic load ratings	
	d0	B6	d10	B5	D	A	dynamic Ca	static C0a
	mm						kN	
BRC 15×5-R5	15	400	25	115	35	50	25,9	43,5
BRC 21×5-R5	21	570	40	178	45	64	50,5	81,9
BRC 30×5-R5	30	800	50	213	64	85	91,9	178,3
BRC 39×5-R5	39	1 046	70	259	80	100	129,2	268,9

Symbols, see page 191

Service range option 2
Recirculating roller screw nuts and screw shafts in stock

BVC - Range



Legend:

(a) = key

(b) = no wiper

(c) = lubrication hole Q

■ Screw ends can be machined to customer requirements

■ Maximum threaded length: can be cut and machined to customer requirements

Features

- Nut preloaded for backlash elimination: BVC
- Lead precision G5 according to ISO standard
- Preload torque measured at 50 rpm and using SKF LGEP2 lubricant

Capabilities for machined ends

- Premachined shafts for machining by the customer. Maximum 5 pieces per order line
- According to customer drawing (see general rules). Maximum 3 pieces per order line.

Designations	Dimensions						Basic load ratings	
	d ₀	B ₆	d ₁₀	B ₅	D	A	dynamic C _a	static C _{0a}
	mm						kN	
BVC 20×1-R1	20	400	28	116	34	37	18,5	36,6
BVC 25×1-R1	25	500	33	159	42	44	32,9	68,4
BVC 32×1-R1	32	500	40	179	54	57	64,3	159,2

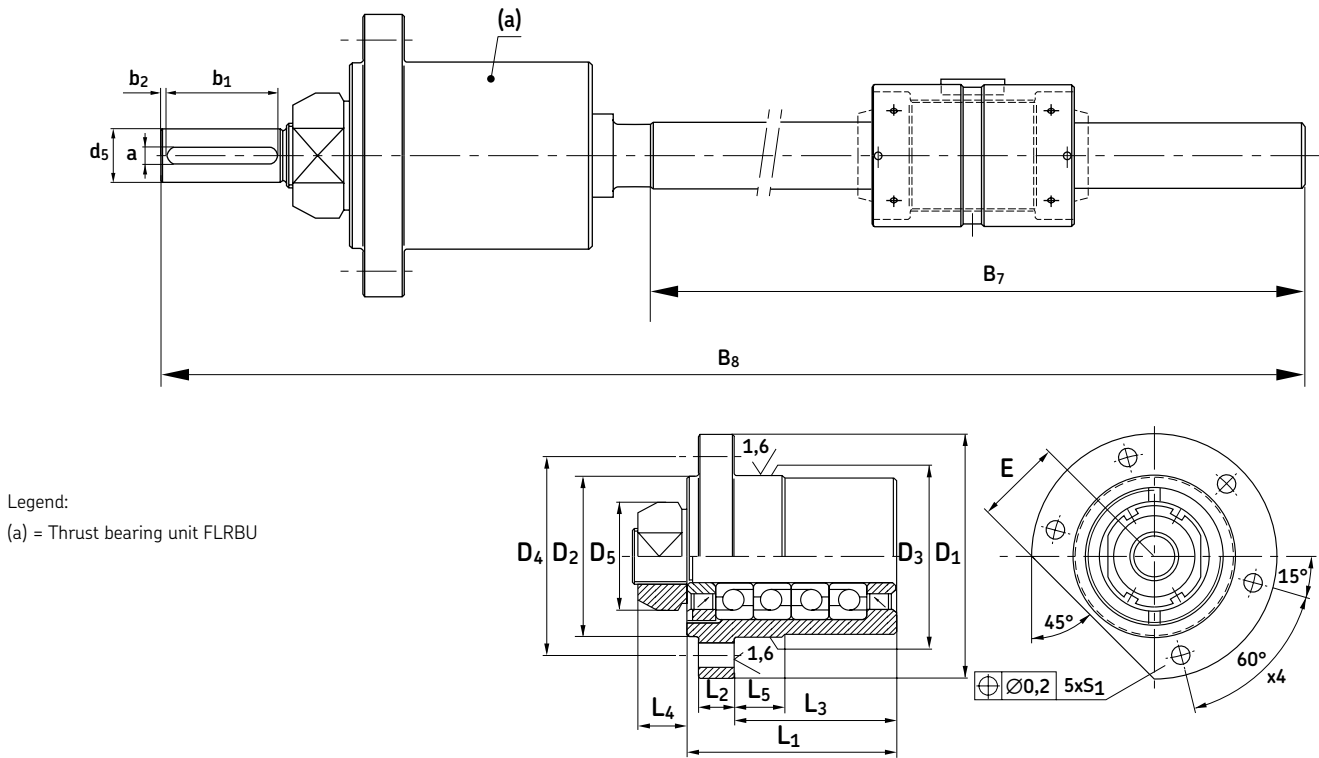
Symbols, see page 191

3 Ball & roller screws

Roller screws service range

Service range option 3

Complete planetary roller screw assemblies with FLRBU



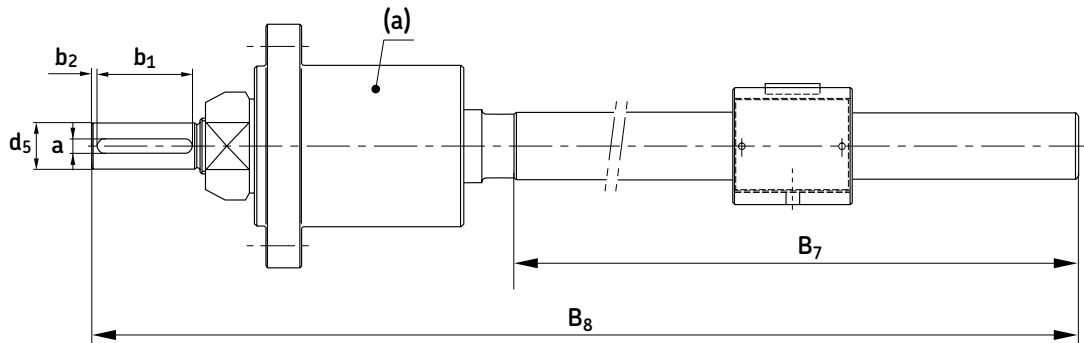
Legend:
(a) = Thrust bearing unit FLRBU

- Features**
- Nut preloaded for backlash elimination: BRC
 - Lead precision G5 according to ISO standard
 - Preload torque measured at 50 rpm and using SKF LGEP2 lubricant
 - Nut and thrust bearing unit cannot be modified
 - The flange of the thrust bearing unit is located on the KMT nut side

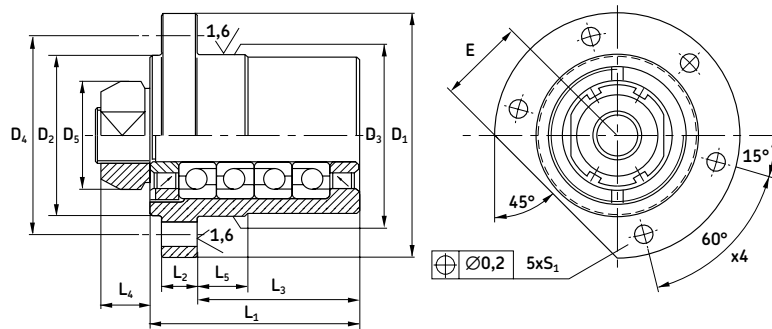
Designations	Dimensions														Basic load ratings	
	d ₀	B ₇	B ₈	L ₁	L ₂	L ₃	D ₁	D ₃	D ₄	E	d ₅ h7	a N9	b ₁ +0,5 0	b ₂	C _a	C _{0a}
	mm														kN	
FLRBU2/BRC 15×5-R5	15	285	398	46	10	32	90	60	76	32	15	5	25	2,0	27,9	31,9
FLRBU4/BRC 21×5-R5	21	392	568	77	13	60	90	60	74	32	20	6	40	2,5	40,1	63,8
FLRBU5/BRC 30×5-R5	30	587	798	89	16	68	120	80	100	44	30	8	45	2,5	74,2	119,2
FLRBU6/BRC 39×5-R5	39	787	1 044	110	20	82	140	100	120	54	40	12	55	4,0	109,4	188,4

Symbols, see [page 191](#)

Service range option 3
Complete recirculating roller screw assemblies with FLRBU



Legend:
(a) = Thrust bearing unit FLRBU



Features

- Nut preloaded for backlash elimination: BVC
- Lead precision G5 according to ISO standard
- Preload torque measured at 50 rpm and using SKF LGEP2 lubricant
- Nut and thrust bearing unit cannot be modified
- The flange of the thrust bearing unit is located on the KMT nut side

Designations	Dimensions														Basic load ratings	
	d ₀	B ₇	B ₈	L ₁	L ₂	L ₃	D ₁	D ₃	D ₄	E	d ₅ h7	a N9	b ₁ +0,5 0	b ₂	C _a	C _{0a}
	mm														kN	
FLRBU2/BVC 20×1-R1	20	284	397	46	10	32	90	60	76	32	15	5	25	2,0	27,9	31,9
FLRBU3/BVC 25×1-R1	25	341	497	77	13	60	90	60	74	32	17	5	35	2,0	40,1	63,8
FLRBU4/BVC 32×1-R1	32	321	497	89	16	68	120	80	100	44	20	6	40	2,5	74,2	119,2

Symbols, see **page 191**

3 Ball & roller screws

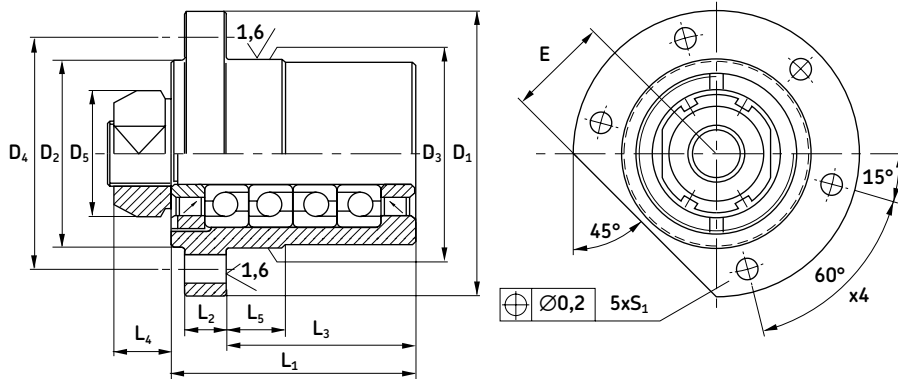
Roller screws

Accessories for roller screws

Flanged thrust bearing units FLRBU.

In standard version, the FLRBU thrust bearing units are assembled according to these drawings.

If you require a different assembly, please indicate it when ordering. These units are greased for life with SKF LGEP2.



Angular contact ball bearing (40°)

Designations Dimensions

High precision KMT nut

Attachment screw	Angular contact	Designation	Hook spanner	Tightening torque	Grub screws Size	Max. tightening torque
------------------	-----------------	-------------	--------------	-------------------	------------------	------------------------

L ₁	L ₂	L ₃	L ₄	D ₁	D ₂	D ₃ h7	D ₄	D ₅	S ₁ H13	E
----------------	----------------	----------------	----------------	----------------	----------------	----------------------	----------------	----------------	-----------------------	---

mm

Nm

FLRBU1	42	10	25	14	76	50	47	63	30	6,6	M6×25	27	KMT 1	HN 3	10	M5	4,5
FLRBU2	46	10	32	18	90	62	60	76	37	6,6	M6×25	32	KMT 3	HN 4	15	M6	8
FLRBU3	77	13	60	18	90	59	60	74	40	9	M8×25	32	KMT 4	HN 5	18	M6	8
FLRBU4	89	16	68	20	120	80	80	100	44	11	M10×30	44	KMT 5	HN 5	25	M6	8
FLRBU5	110	20	82	22	140	99	100	120	54	13	M12×40	54	KMT 7	HN 7	42	M6	8
FLRBU6	140	25	98,5	25	171	130	130	152	75	13	M12×40	67	KMT 10	HN 10	70	M8	18
FLRBU7	180	30	133,5	28	225	170	170	198	95	17,5	M16×55	87	KMT 13	HN 14	100	M8	18
FLRBU8	235	35	179	32	285	219	220	252	125	22	M20	115	KMT 18	HN 18	160	M10	35

Flanged bearing unit designations

Bearing designations

Quantity of bearings

Basic load ratings

Max preload torque at 50 rpm*

Axial rigidity

Tilt rigidity

C_a

C_{0a}

kN

Nm

N/μm

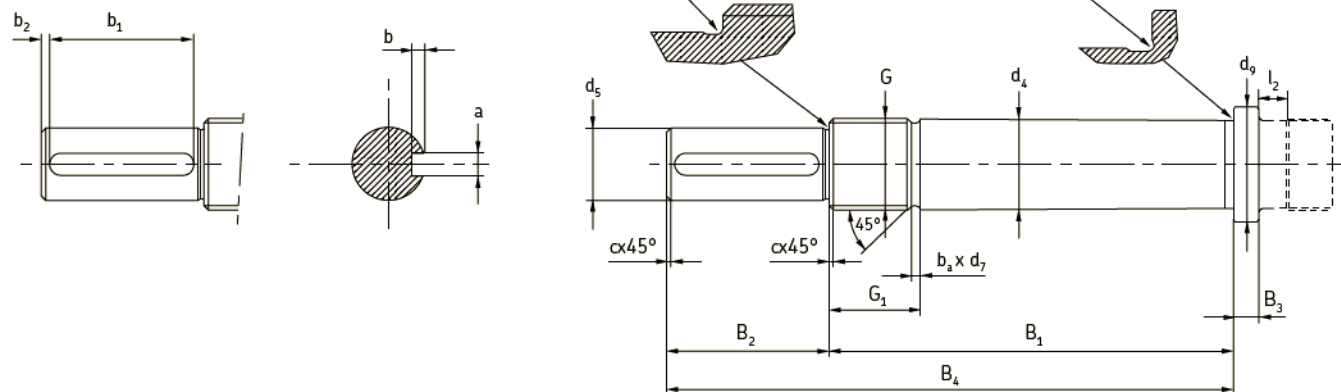
Nm/mrad

FLRBU1	7201 BEGBP	2	13,3	14,7	0,10	150	40
FLRBU2	7303 BEGBP	2	27,9	31,9	0,25	190	51
FLRBU3	7204 BEGBP	4	40,1	63,8	0,25	400	140
FLRBU4	7305 BEGBP	4	74,2	119,2	1,10	450	160
FLRBU5	7307 BEGBP	4	109,4	188,4	1,10	600	715
FLRBU6	7310 BEGBP	4	208,8	392,3	1,50	750	1 000
FLRBU7	7313 BEGBP	4	305,3	615,4	2,00	1 250	3 200
FLRBU8	7318 BEGBP	4	473,1	1123	2,30	1 500	7 500

* Preload torque measured at 50 rpm and using SKF LGEP2 lubricant

Symbols, see page 191

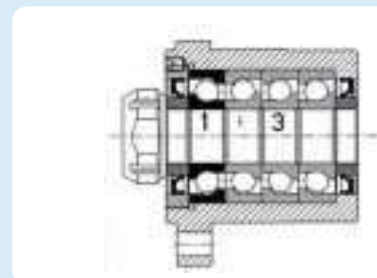
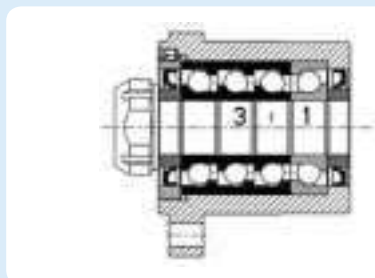
End machining for FLRBU



Designations	Dimensions																	
	d ₄	d ₅	d ₉	B ₁	B ₂	B ₄	B ₃	G	G ₁	c	b _a	d ₇	R _a	R _b	a	b	b ₁	b ₂
	h ₆	h ₇		js12		js12		6g				h11			N9	+0,100 0	+0,5 0	
	mm																	
FLRBU1	12	10	17	58	20	78	5	M12×1	17	0,5	1,5	10,5	0,4	0,4	3	1,8	16	1,5
FLRBU2	17	15	23	66	30	96	5	M17×1	22	0,5	1,5	15,5	0,6	0,6	5	3,0	25	2,0
FLRBU3	20	17	27	97	40	137	7	M20×1	22	0,5	1,5	18,5	0,6	0,6	5	3,0	35	2,0
FLRBU4	25	20	34	112	45	157	7	M25×1,5	25	0,5	2,3	22,8	0,6	0,6	6	3,5	40	2,5
FLRBU5	35	30	45	134	55	189	10	M35×1,5	26	1	2,3	32,8	0,6	0,6	8	4,0	45	2,5
FLRBU6	50	40	62	168	65	233	12	M50×1,5	31	1	2,3	47,8	0,8	0,8	12	5,0	55	4,0
FLRBU7	65	60	78	210	100	310	18	M65×2	32	1	3,0	62,2	1,2	1,0	18	7,0	90	2,5
FLRBU8	90	85	108	270	120	390	25	M90×2	39	1	3,0	87,2	1,6	1,2	25	9,0	100	5,0
SR/BR/PR				SV/BV/PV														
Ph ≤ 8 mm, l ₂ ≥ 12 mm				Valid for lead Ph = 1, for 40×2, 50×2, 63×2														
Ph > 8 mm, l ₂ ≥ 1,4 Ph				l ₂ ≥ 12 mm														
				All others l ₂ ≥ 14 mm														

Other possible bearing arrangement

In case of load acting mainly in one direction, we recommend the following thrust bearing units:



	C _a	C _{0a}	C _a	C _{0a}
	kN			
FLRBU1 (*) : No other possible arrangement (1+1)		-	-	-
FLRBU2 (*) : No other possible arrangement (1+1)		-	-	-
FLRBU3	53,3	95,7	24,7	31,9
FLRBU4	98,6	178,8	45,7	59,6
FLRBU5	145,3	282,6	67,3	94,2
FLRBU6	277,3	588,6	128,5	196,2
FLRBU7	405,5	923,1	187,9	307,7
FLRBU8	628,3	1684,6	291,2	561,5

3 Ball & roller screws

Roller screws

Thrust bearing units for the standard roller screw range

Flanged thrust bearing	Suitable for SRC, SRF, BRC & BRF			Suitable for PRU & PRK		
FLRBU1	SR 8×4			PR 8×4 PR 12×5 PR 15×5	PR 15×8	
FLRBU2	SR 12×5 SR 15×5 SR 20×6	SR 15×8		PR 20×6 PR 21×5 PR 24×6	PR 21×6 PR 24×12	PR 21×8
FLRBU3	SR 24×6			PR 21×10 PR 25×5	PR 25×10	PR 25×15
FLRBU4	SR 21×5 SR 21×10 SR 24×12 SR 25×5	SR 21×6 SR 25×10	SR 21×8 SR 25×15	PR 30×5 PR 30×20 PR 36×6 PR 36×18 PR 39×5	PR 30×6 PR 36×9 PR 36×24	PR 30×10 PR 36×12
FLRBU5	SR 30×5 SR 36×6 SR 36×18	SR 30×6 SR 36×9	SR 30×10 SR 36×12	PR 44×8 PR 39×10 PR 39×25 PR 44×18 PR 48×5 PR 56×12	PR 44×12 PR 39×15 PR 44×24 PR 48×8	PR 39×20 PR 44×30
FLRBU6	SR 30×20 SR 36×24 SR 39×5 SR 39×20 SR 44×8 SR 44×24 SR 48×5 SR 48×15 SR 56×12	SR 39×10 SR 39×25 SR 44×12 SR 44×30 SR 48×8	SR 39×15 SR 44×18 SR 48×10	PR 48×10 PR 48×25 PR 56×24 PR 60×10 PR 64×12 PR 64×30	PR 48×15 PR 56×36 PR 60×15 PR 64×18 PR 64×36	PR 48×20 PR 60×20 PR 64×24
FLRBU7	SR 48×15 SR 56×24 SR 64×12	SR 48×20 SR 56×36 SR 64×18	SR 48×25 SR 64×24			
FLRBU8	SR 60×10 SR 75×10 SR 80×12 SR 80×36	SR 60×15 SR 80×18 SR 80×42	SR 60×20 SR 80×24			

Flanged thrust bearing	Suitable for SVC, BVC, SVF & BVF		Suitable for PVU & PVK		
FLRBU1	SV 8×1 SV 10×1 SV 12×1 SV 16×1	SV 8×2 SV 10×2 SV 12×2 SV 16×2	PV 8×1 PV 12×1 PV 16×2	PV 10×1 PV 12×2 PV 20×1	PV 16×1 PV 20×2
FLRBU2	SV 20×1	SV 20×2	PV 25×1	PV 25×2	
FLRBU3	SV 25×1	SV 25×2	PV 32×1 PV 40×2 PV 40×1	PV 32×2	
FLRBU4	SV 32×1 SV 40×2	SV 32×2	PV 50×2	PV 50×4	
FLRBU5	SV 40×1		PV 50×1	PV 50×3	
FLRBU6	SV 50×2 SV 50×1 SV 63×2	SV 50×4 SV 50×3 SV 63×4	PV 63×2 PV 80×4	PV 63×4	
FLRBU7	SV 80×4		PV 100×5		
FLRBU8	SV 100×5				

Symbols, see page 191

Symbols

C_{req}	N	Required load rating		c	μm	Travel compensation - the difference between the specified travel and the nominal travel. Its value is always defined by the customer: if not specified it will be assumed to be zero. (The specified travel can also be defined by the specified lead multiplied by the number of revolutions)
C_a	kN	The dynamic load rating (L10 life) is such that 90 % of a sufficiently large sample of identical screws can be expected to attain or exceed 1 million revolutions under this constant centrally acting pure axial load without fatigue (flaking).		d_o	mm	Nominal
C_{oa}	kN	The static load rating is that axial constant centrally acting load which produces a total permanent deformation of one raceway and roller of 0,0001 of the diameter of the curved surface of the roller.		d_1	mm	Outside
				d_2	mm	Root
				d_b	mm	Bore
F	N	Axial load		e_p	μm	Tolerance of actual mean travel, l_m relative to specified travel l_s
F_c	N	Compression load		f	-	Factors
F_m	N	Constant mean axial load		g	m/s^2	Acceleration of gravity: 9,8
F_{pr}	N	The preload force between a nut half (or nut) and the shaft		l	mm	Length
F_q	N	The squeeze load applied to two nut halves (or nuts) by the housing or fixing bolts		l_o	mm	Nominal travel - the nominal lead multiplied by the number of revolutions
H_v	-	Vickers hardness		l_1	mm	Threaded length
I	kgm^2	Inertia		l_e	mm	Excess travel - at each end of the threaded length a distance l_e is subtracted to leave l_u the useful travel. The specified lead precision does not apply to the lengths l_e . $l_u = l_1 - 2 l_e$
I_L	kgm^2	Inertia of load		l_m	mm	Actual mean travel. The curve is the result of measurements at 20 °C of the screw shaft. l_m is the line which fits the curve by the method of least squares
I_M	kgm^2	Inertia of motor		l_s	mm	Specified travel
I_{nn}	kgm^2	Inertia of nut when turning nut		l_{tp}	mm	Maximum total length
I_{ns}	kgm^2	Inertia of rollers when turning shaft		l_u	mm	Useful travel - the length of thread which is subject to the specified lead precision
I_s	kgmm^2/m	Inertia of screw shaft per metre		m	kg	Mass
L	10^6 revs	Life		m_L	kg	Mass of the load
L_{10}	10^6 revs	Basic life rating, millions of revolutions		m_n	kg	Mass of the nut
L_{10h}	hours	Basic life rating, operating hours		m_s	kg/m	Mass of the screw shaft per metre
M	μm	Maximum difference between mean travels of screws in a matched set		n	rpm	Rotational speed
N	-	Number of thread starts on the screw shaft		n_{cr}	rpm	Critical speed
N_r	-	Standard number of rollers		n_p	rpm	Maximum permissible speed
N_{max}	-	Maximum number of rollers		s_{ap}	mm	Maximum axial play
P	W	Power		t	μm	Manufacturing tolerance
P_h	mm	Lead		v	μm	Travel variation - the band width or the distance between the two straight lines parallel to the actual mean travel which enclose the curve
R	$\text{N}/\mu\text{m}$	Rigidity		v_{300}	μm	The bandwidth over any 300 mm section of the useful travel. v_{300a} and v_{300p} are actual and permissible values
R_n	$\text{N}/\mu\text{m}$	Nut rigidity	including deflection of: • the nut body • rollers/nut contact • rollers/screw shaft contact • length of screw shaft in contact with rollers	v_u	μm	The bandwidth over the useful travel. v_{ua} and v_{up} are actual and permissible values
R_{ng}	$\text{N}/\mu\text{m}$	Minimum guaranteed nut rigidity		δ	μm	Deflection
R_{nr}	$\text{N}/\mu\text{m}$	Reference nut rigidity		α	$^\circ$	Helix angle of the screw shaft thread
R_s	$\text{N}/\mu\text{m}$	Screw shaft rigidity		λ	$^\circ$	Friction angle
R_t	$\text{N}/\mu\text{m}$	Total rigidity		μ	-	Coefficient of friction $\tan \lambda = \mu$
T	Nm	Torque		μ_{st}	-	Coefficient of friction when starting
T_B	Nm	Brake torque		μ_F	-	Coefficient of friction for bearing
T_{dt}	Nm	Total torque at constant speed		σ	MPa	Nominal axial stress
T_f	Nm	Torque from friction in support bearings, motor, seals, etc		σ_p	MPa	Real axial stress
T_{pe}	Nm	Torque for play elimination		σ_t	MPa	Total stress
T_{pr}	Nm	Preload torque		τ	MPa	Nominal shear stress
T_{st}	Nm	Starting torque		τ_p	MPa	Real shear stress
T_t	Nm	Total torque		η	-	Theoretical direct efficiency
U	mm	Stroke length		η'	-	Theoretical indirect efficiency
V	h^{-1}	Strokes per hour		η_p	-	Real direct efficiency
W	h/day	Hours per day	life calculation	η'_p	-	Real indirect efficiency
X	days/year	Days per year		θ	$^\circ$	Angle of twist
Y	years	Years		$\dot{\omega}$	rad/s^2	Angular acceleration
Z_s	cc	Grease quantity for screw shaft		Ω	$\text{mm} \times \text{rpm}$	Speed quotient, $n_p \times d_o$
Z_n	cc	Grease quantity for nut				

3 Ball & roller screws

Roller screws

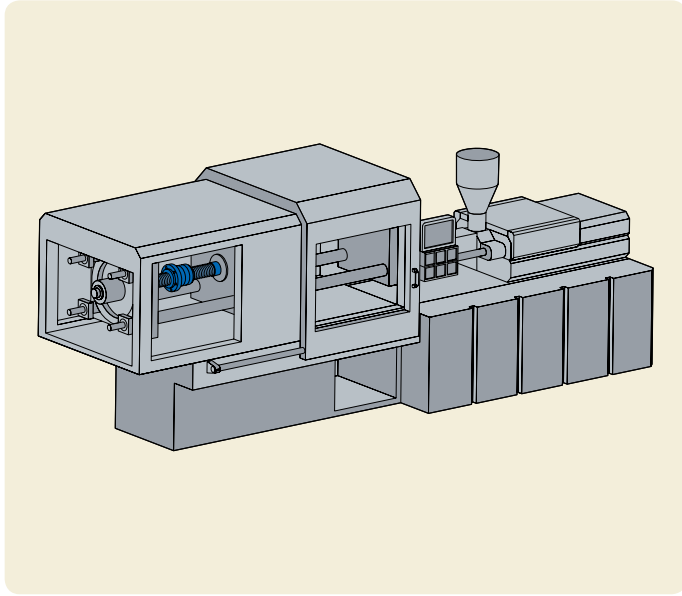
Applications

In response to our customer's ultimate need to produce more with less, SKF has

combined its knowledge and experience with the latest technology to develop solutions for your specific conditions. Whether your goal is to design equipment

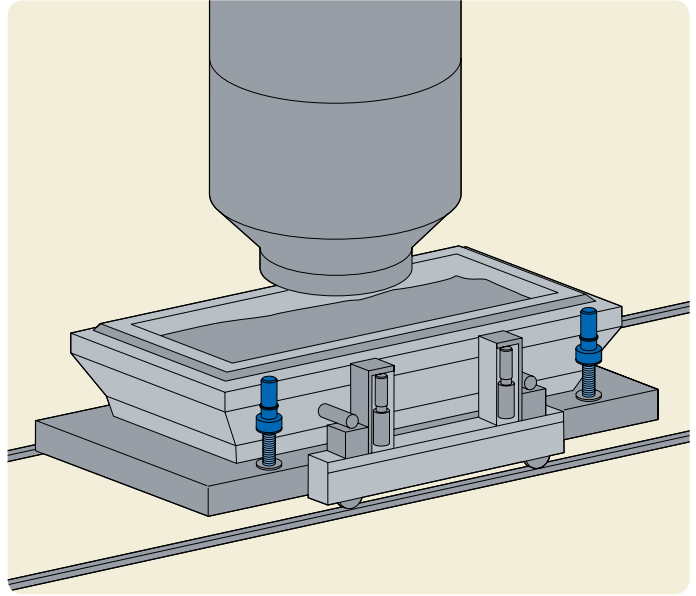
that provides more customer value, or to increase overall profitability, with SKF experience and expertise, you're likely to find a real solution.

Plastic injection molding



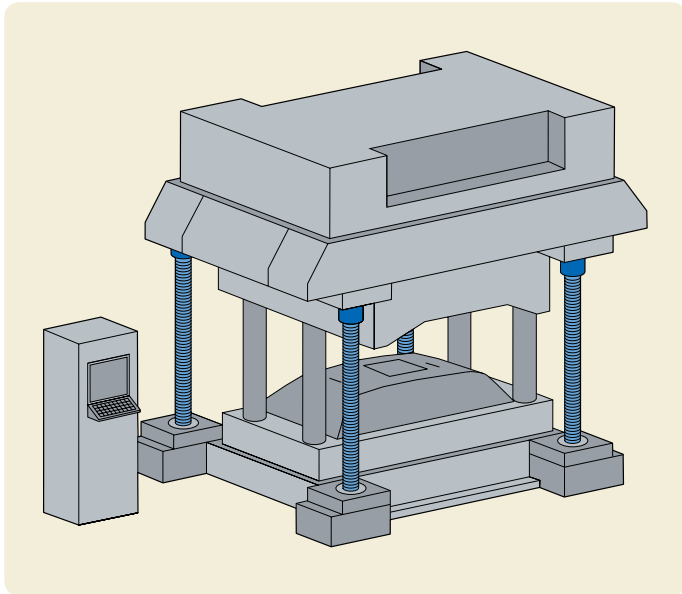
Components application
a) Planetary roller screws

Metals industry



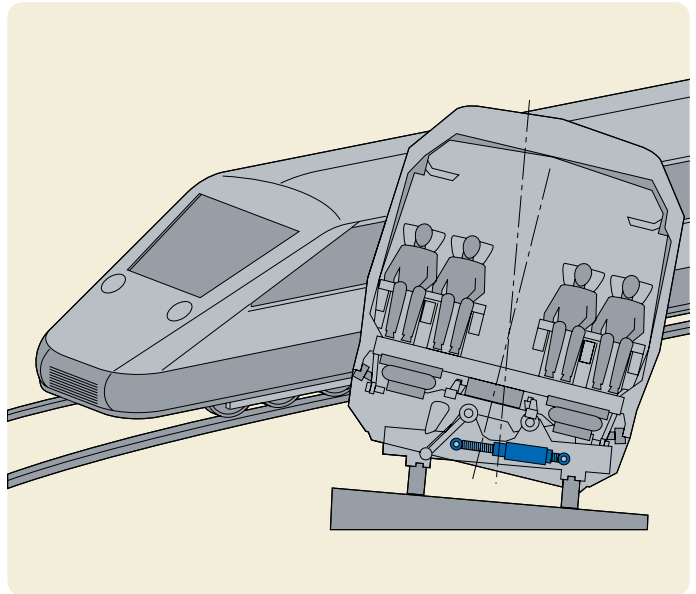
Components application
a) Planetary roller screws

Forming and stamping press



Components application
a) Recirculating roller screws

Tilting train



Components application
a) Planetary roller screws



The highest power lies beneath the smallest things



An ant can lift up to thirty times and transport up to fifty times its own weight.

It's the power of such small things that has inspired SKF to create solutions with reduced dimensions yet endowed with great potential for your applications.

Behind compactness and decreased weight lies high performance which will lead to greater precision and

efficiency, while reducing cycle times to a minimum.

Miniature profile rail guides, miniature linear ball bearings, miniature ball screws, miniature slides – small units that can be placed almost anywhere, but always of the highest quality, is what you expect from SKF.

Tables: driven and not driven

General

Positioning systems are compact and economic complete solutions. The assortment ranges from compact slides without drives through to highly dynamic, multi-axis systems with linear motor drive. SKF offers the following positioning systems:

Miniature slides (**fig. 1**),
Standard slides (**fig. 2**),
Dovetail slides (**fig. 3**),
Compact cross tables (**fig. 4**),
Precision slides without drive (**fig. 5**),
Linear ball bearing slides (**fig. 6**),
Profile rail slides (**fig. 7**).

LZM miniature slides

With the new LZM miniature slide SKF offers the ideal solution for linear motion applications for short strokes and compact boundary dimensions. The use of miniature slides has increased in medical applications, measurement technologies, pneumatics, micro mechanics and micro electronics assembly, semiconductor manufacturing and fibre optics. The different miniature

slide components meet the highest precision standards; LZM miniature slides feature high running accuracy and smooth motion. The LZM are manufactured with all stainless steel components. Optimised hardness enables long endurance life and high performance within compact boundary dimensions. The miniature slides have been designed to ensure high system stiffness and precision guidance. Running accuracies of 2 µm over a stroke of 100 mm are attainable depending on the particular application. Ease of installation is another advantage of the LZM miniature slides. Unlike cross roller systems using 4 rails and cages to be assembled on the production floor, the LZM slide provides a complete slide that can simply be bolted into place without the use of precision devices to set preload. Every application provides new challenges for the modern designer. SKF will modify existing designs to meet your specific technical requirements.

Advantages for LZM miniature slides:

- Compact design
- High carrying capacity



Fig. 1

- Very good running accuracy
- Smooth running
- High stiffness
- Easy assembly

For dimensions, see table on **page 201**.

Operating precision (table 1)

Comparison of the different positioning components and systems.

Operating precision (µm)	Linear guides				Ball & roller screws		Tables: driven and not driven
0,1-1		Precision rail guides			Roller screws		
1-10			Profile rail guides	Standard slides			
10-100	Linear ball bearings				Ball screws	Linear motors	Standard drives or linear motors with all guiding systems
100-1 000							

Fig. 2



GCL standard slides

Slide top and base of steel. The slides are provided with standard patterns of mounting holes. The slide top carries tapped holes, the base plate counterbored holes for cylindrical screws to DIN 912. The slides are fitted with SKF precision rail guides with crossed roller units. Internal stops serve as stroke limit.

For dimensions, see table on **page 204**.

GCLA standard slides

Slide top and base of black anodised aluminium. In other respects, the design corresponds to that of the GCL slides except that they are lower in height.

For dimensions, see table on **page 206**.

RM standard slides

Especially small design. Slide top of steel, guidance via SKF precision rails with double-sided centre rail and crossed roller units. Internal stops serve as stroke limits.

For dimensions, see table on **page 208**.

Fig. 3



SSM and SSK dovetail slides

Slide top and base of grey cast iron. The slides are provided with standard patterns of mounting holes. Top and base plate both carry tapped holes. The slides have a lead screw drive. The SSM design has a micrometer knurl with vernier ring, while the SSK design is fitted with a hand crank. Both designs are fitted with a lateral locking device.

For dimensions, see table on **page 210**.

Fig. 4



TO and TS compact cross tables

Table top, centre and base of black anodised aluminium with central viewing hole. The slides are fitted with SKF precision rail guides incorporating crossed roller units. The TO design does not have a drive but is provided with one lateral locking device per axis. The TS design has a micrometer attachment that is springloaded in one direction. In addition, one lateral locking device is fitted per axis.

For dimensions, see table on **page 213**.

Fig. 5



RSM and RSK precision slides

Slide top and base of grey cast iron. The slides are provided with standard patterns of mounting holes. The slide top carries tapped holes, the base plate counterbored holes for cylindrical screws to DIN 912. They are fitted with SKF precision rail guides incorporating crossed roller units. The slides have a lead screw drive. The RSM design has a micrometer knurl with a vernier ring, while the RSK design is fitted with a hand crank.

For dimensions, see table on **page 214**.

Fig. 6



LZBB and LZAB linear ball bearing slides

The slides are fitted with SKF linear ball bearings of ISO series 3. They are driven via SKF rolled thread ball screws attached on both sides. The slides are protected by bellows. The LZBB design has a closed housing. Shafts are attached on both sides in shaft blocks which also incorporate the bolt holes for attaching the slide. The LZAB design has an open housing. Shafts are attached over the entire length by shaft supports to prevent shaft deflection with large strokes or high loads. The slide is attached via the bolt holes in the two shaft supports.

For principal dimensions, see table on **pages 217-218**.

Fig. 7



LTB profile rail guide slides with ball screw drive

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

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..

For principal dimensions, see table on **pages 220-230**.

Fig. 8



LTS profile rail guide slides with linear motor

These profile rail guide slides are equipped with brushless AC motors.

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.

For principal dimensions, see table on **pages 233-237**.

Complete systems

On special demand, SKF designs and manufactures complete systems, either from SKF standard components or special solutions, that are exactly tailored to the respective application.

The different specifications are given in **table 2**.

5 Tables: driven and not driven
General

Table 2				
Type	Precision	Load-carrying capacity	Dynamic capabilities	Speed
Miniature slides				
Standard slides				
Dovetail slides				
Compact cross tables				
Precision slides without drive				
Precision slides with drive				
Linear ball bearing slides				
Profile rail slides				
Complete systems				

5 Tables: driven and not driven
Miniature slides

Miniature slides

LZM

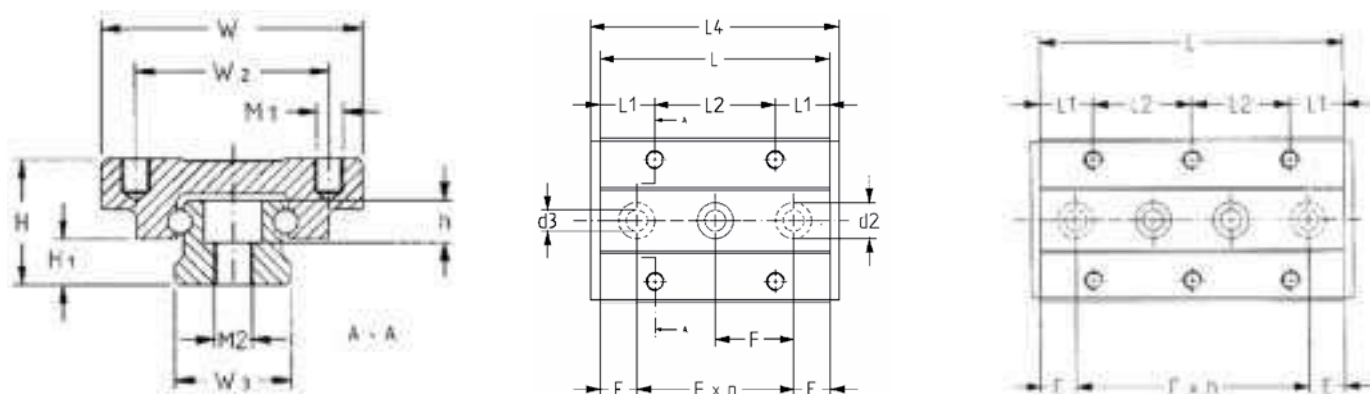
Ordering key

	LZM	HS		×	
Type					
Carriage:					
Standard	HS				
Size:					
17 mm	7				
20 mm	9				
27 mm	12				
32 mm	15				
Length (mm):					
See table					

Example: LZM HS 15 × 165

LZM

Main dimensions for miniature slide units



Designations	Dimensions									
	W	W ₂	W ₃	L ₂	M ₁ ×depth	d ₃ ×d ₂ ×h	H	H ₁	M ₂	F
	mm								–	mm
LZM HS 7	17	12	7	8	M2×2,5	2,5×4,5×2,5	8	2,35	M3	15
LZM HS 9	20	15	9	13	M3×3	3,5×6×3,5	10	3,55	M4	20
LZM HS 12	27	20	12	15	M3×3,5	3,5×6×4,5	13	4,7	M4	25
LZM HS 15	32	25	15	20	M3×4	3,5×6×4,5	16	6,0	M4	40

Designations	Dimensions				Max. stroke	Number of holes		Load-carrying capacities			
	L	L ₄	E	L ₁		Carriage	Rail	C	C ₀	M _a /M _b	M _c
	mm					n		N		Nm	
LZM HS 7	26	29	5,5	5	24	6	2	1 000	1 700	3,5	6
	34	37	9,5	5	34	8	2	1 100	2 100	5,5	7
	50	53	10	5	50	12	3	1 500	3 100	12	10
	66	69	10,5	5	66	16	4	1 800	4 100	21	14
LZM HS 9	32	35	8	9,5	28	4	2	1 600	2 700	7	12
	42	45	11	8	40	6	2	1 900	3 400	11	15
	55	58	7,5	8	54	8	3	2 300	4 300	18	19
	81	84	10,5	8	78	12	4	3 000	6 500	43	29
	94	97	7	8	92	14	5	3 300	7 400	57	33
LZM HS 12	37	40	6	11	32	4	2	2 500	3 800	11	21
	51	54	13	10,5	47	6	2	3 100	5 300	22	28
	66	69	8	10,5	62	8	3	3 600	6 700	36	36
	96	99	10,5	10,5	95	12	4	4 700	9 700	76	52
	126	129	13	10,5	122	16	6	5 700	12 600	131	68
LZM HS 15	52	56	6	12,5	50	4	2	3 800	6 200	25	42
	85	89	22,5	12,5	80	8	2	5 400	10 400	73	70
	105	109	12,5	12,5	102	10	3	6 200	12 500	106	84
	165	169	22,5	12,5	162	16	4	8 400	19 500	264	131



No speed limit here



Can you believe that, if a human being could race at a speed proportional to that of a butterfly in full flight, he or she would reach 34 000 kilometres per hour?

It's only a hypothesis of course, but enough to inspire us to create tools able to surmount practically any limit including that of speed.

For example, the SKF linear motor slides, which are at their best where

conventional slides have reached their limit, combine unbelievable speed with high precision.

Similarly, rotating ball nuts, thanks to the fixed screw, are capable of overcoming the critical speeds usually associated with ball screws, and can reach a speed rating of 90 000 Nd.

With SKF, maximum speed is an everyday norm.

Standard slides

GCL, GCLA, RM

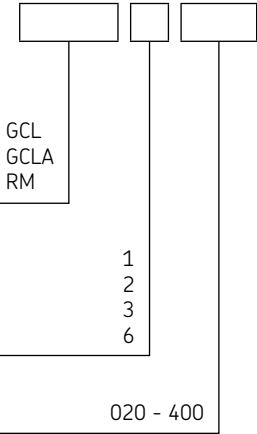
Ordering key

Type:

- Standard slide with crossed roller assemblies of steel
- Standard slide with crossed roller assemblies of aluminium
- Standard slide fitted with either cross roller guides or V-guided ball cages of steel

Size (see tables):

Rail length (mm) (see tables):



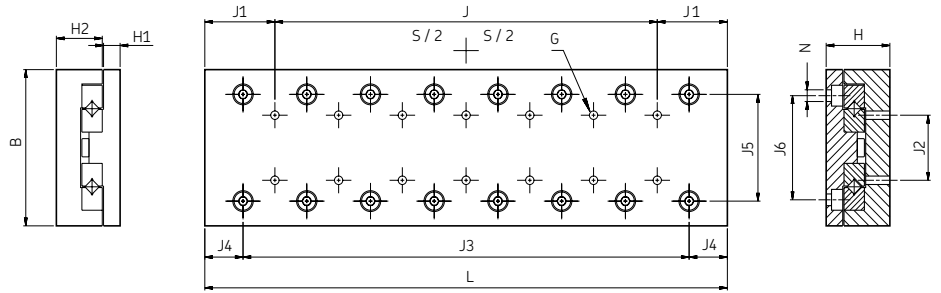
Example: **GCLA** **6** **400**

5 Tables: driven and not driven

Standard slides

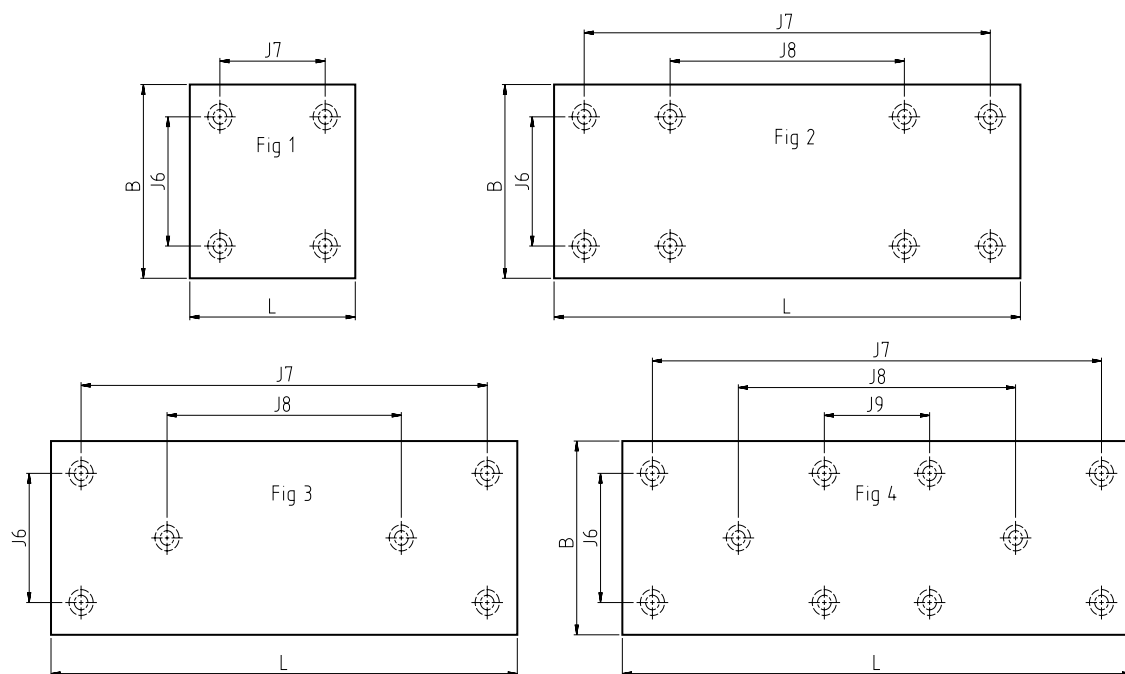
GCL

Standard slides with crossed roller assemblies, steel version, for manual positioning.



Designations	Dimensions			Stroke		G	H ₁	H ₂	J	J ₁	J ₂	J ₃	J ₄	J ₅
	B	H	L	S ₁ ¹⁾	S ₂ ¹⁾									
	mm					–	mm							
GCL 2030	40	21	35	18	–	M3	6,5	14	–	17,5	15	1×15	10	25
GCL 2045	40	21	50	30	–	M3	6,5	14	1×15	17,5	15	2×15	10	25
GCL 2060	40	21	65	40	46	M3	6,5	14	2×15	17,5	15	3×15	10	25
GCL 2075	40	21	80	50	60	M3	6,5	14	3×15	17,5	15	4×15	10	25
GCL 2090	40	21	95	60	75	M3	6,5	14	4×15	17,5	15	5×15	10	25
GCL 2105	40	21	110	70	90	M3	6,5	14	5×15	17,5	15	6×15	10	25
GCL 2120	40	21	125	80	105	M3	6,5	14	6×15	17,5	15	7×15	10	25
GCL 3050	60	28	55	30	–	M4	9	18,5	–	27,5	25	1×25	15	39
GCL 3075	60	28	80	45	55	M4	9	18,5	1×25	27,5	25	2×25	15	39
GCL 3100	60	28	105	60	80	M4	9	18,5	2×25	27,5	25	3×25	15	39
GCL 3125	60	28	130	75	105	M4	9	18,5	3×25	27,5	25	4×25	15	39
GCL 3150	60	28	155	90	130	M4	9	18,5	4×25	27,5	25	5×25	15	39
GCL 3175	60	28	180	105	155	M4	9	18,5	5×25	27,5	25	6×25	15	39
GCL 3200	60	28	205	130	180	M4	9	18,5	6×25	27,5	25	7×25	15	39
GCL 6100	100	45	110	60	70	M6	13	31	–	55	50	1×50	30	64
GCL 6150	100	45	160	95	120	M6	13	31	1×50	55	50	2×50	30	64
GCL 6200	100	45	210	130	170	M6	13	31	2×50	55	50	3×50	30	64
GCL 6250	100	45	260	165	220	M6	13	31	3×50	55	50	4×50	30	64
GCL 6300	100	45	310	200	270	M6	13	31	4×50	55	50	5×50	30	64
GCL 6400	100	45	410	280	370	M6	13	31	6×50	55	50	7×50	30	64

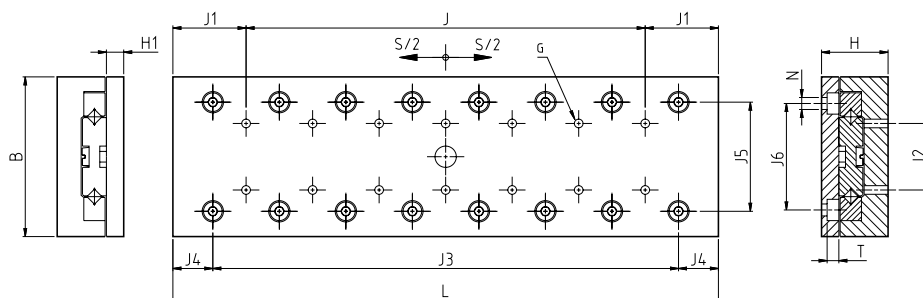
¹⁾ S₁ Standard stroke order designation. e.g. GCL 2030
S₂ Extended stroke order designation. e.g. GCL 2030L



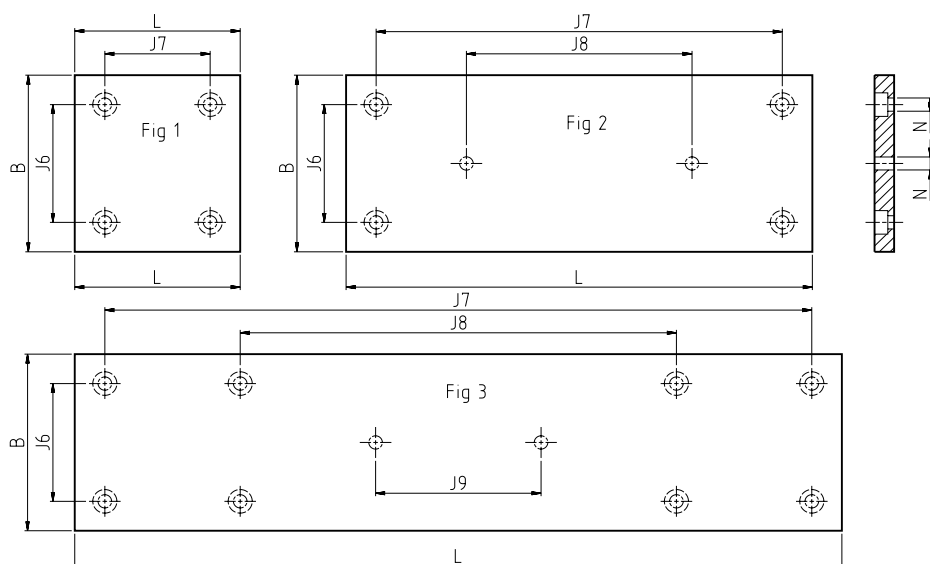
Designations	Dimensions				Fig.	N	Load-carrying capacities		Weight G ₅
	J ₆	J ₇	J ₈	J ₉			with S ₁ C ₀	with S ₂ C ₀	
	mm						N		kg
GCL 2030	30	25	–	–	1	3,4	250	–	0,18
GCL 2045	30	40	–	–	1	3,4	360	–	0,26
GCL 2060	30	55	–	–	1	3,4	470	430	0,34
GCL 2075	30	70	40	–	2	3,4	580	540	0,42
GCL 2090	30	85	55	–	2	3,4	720	610	0,5
GCL 2105	30	100	70	–	2	3,4	830	720	0,58
GCL 2120	30	115	85	–	2	3,4	940	790	0,68
GCL 3050	40	35	–	–	1	4,5	480	–	0,57
GCL 3075	40	60	–	–	1	4,5	800	720	0,8
GCL 3100	40	85	–	–	1	4,5	1 040	880	1
GCL 3125	40	110	–	–	1	4,5	1 360	1 120	1,3
GCL 3150	40	135	85	–	3	4,5	1 600	1 280	1,5
GCL 3175	40	160	110	–	3	4,5	1 920	1 520	1,7
GCL 3200	40	185	135	85	4	4,5	2 080	1 680	2
GCL 6100	60	90	–	–	1	6,6	2 380	2 040	3,1
GCL 6150	60	140	–	–	1	6,6	3 740	3 060	4,5
GCL 6200	60	190	90	–	3	6,6	4 760	4 080	5,9
GCL 6250	60	240	140	–	3	6,6	6 120	5 100	7,2
GCL 6300	60	290	190	–	3	6,6	7 140	6 120	8,6
GCL 6400	60	390	290	190	4	6,6	7 820	6 120	11,4

Standard slides

Standard slides with slide top and base made of black anodised aluminium, for manual positioning.
In other respects the design is similar to that of the GCL slides except for the slightly reduced height.



¹⁾ S₂ Extended stroke order designation. e.g. GCL 2030L



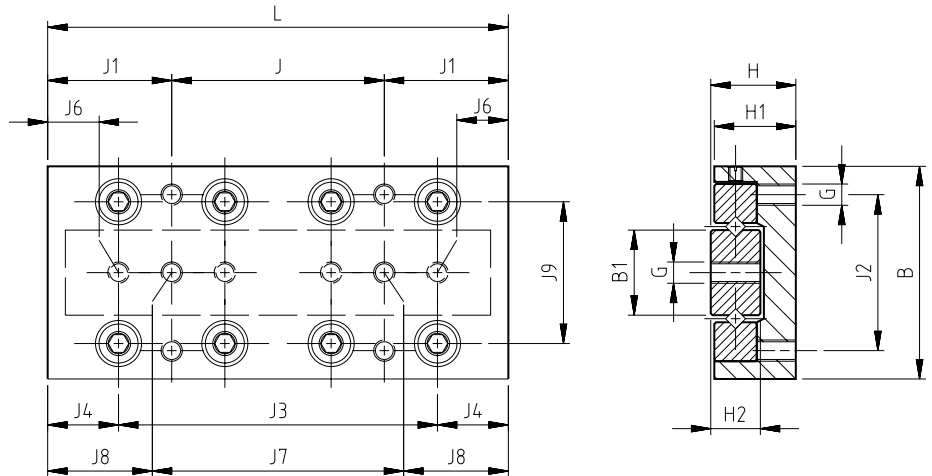
Designations	Dimensions					N	Load-carrying capacities		Weight
	J ₆	J ₇	J ₈	J ₉	Fig.		with S ₁	with S ₂	G ₅
	mm				n.		C ₀	C ₀	kg
GCLA 2030	30	25	–	–	1	3,8	430	–	0,1
GCLA 2045	30	40	–	–	1	3,8	688	602	0,14
GCLA 2060	30	55	–	–	1	3,8	946	774	0,19
GCLA 2075	30	70	–	–	1	3,8	1 204	946	0,23
GCLA 2090	30	85	45	–	2	3,8	1 376	1 113	0,28
GCLA 2105	30	100	50	–	2	3,8	1 634	1 290	0,32
GCLA 2120	30	115	30	–	2	3,8	1 892	1 376	0,37
GCLA 3050	40	35	–	–	1	4,8	–	952	0,29
GCLA 3075	40	60	–	–	1	4,8	1 496	1 224	0,43
GCLA 3100	40	85	–	–	1	4,8	2 040	1 632	0,57
GCLA 3125	40	110	–	–	1	4,8	2 448	1 904	0,7
GCLA 3150	40	135	75	–	2	4,8	2 992	2 312	0,84
GCLA 3175	40	160	86	–	2	4,8	3 536	2 584	0,97
GCLA 3200	40	185	55	–	2	4,8	4 080	2 992	1,1
GCLA 6100	60	90	–	–	1	6,8	4 320	3 780	1,6
GCLA 6150	60	140	–	–	1	6,8	6 480	5 400	2,4
GCLA 6200	60	190	100	–	2	6,8	8 640	6 480	3,1
GCLA 6250	60	240	80	–	2	6,8	10 800	8 100	3,9
GCLA 6300	60	290	150	–	2	6,8	13 500	9 720	4,7
GCLA 6350	60	340	200	80	3	6,8	15 660	11 340	5,4
GCLA 6400	60	390	230	90	3	6,8	17 820	12 420	6,2

5 Tables: driven and not driven

Standard slides

RM

Standard slides fitted with either cross roller rail guides or V-guided ball cages, for manual positioning; the opposing V-rails are screwed to a steel base plate. Slide top and bottom carry a standard pattern of mounting holes



Designations	Dimensions			Stroke						
	B	H	L	S	B ₁	G	H ₁	H ₂	J	J ₁
	mm					–	mm			
RM 1020	20	8	25	12	7	M2,5	7,5	5	1×18	3,5
RM 1030	20	8	35	18	7	M2,5	7,5	5	1×28	3,5
RM 1040	20	8	45	25	7	M2,5	7,5	5	1×20	12,5
RM 1050	20	8	55	32	7	M2,5	7,5	5	1×30	12,5
RM 2060	30	12	65	40	12	M3	11,5	7	1×30	17,5
RM 2075	30	12	80	50	12	M3	11,5	7	1×45	17,5
RM 2090	30	12	95	60	12	M3	11,5	7	2×30	17,5
RM 3100	40	16	105	60	16	M4	15,5	9	1×50	27,5
RM 3125	40	16	130	75	16	M4	15,5	9	1×75	27,5
RM 3150	40	16	155	90	16	M4	15,5	9	2×50	27,5

Continued

Designations	Dimensions									Load-carrying capacities C ₀	Weight G ₅
	J ₂	J ₃	J ₄	J ₅	J ₆	J ₇	J ₈	J ₉			
	mm									N	kg
RM 1020	14	1×10	7,5	2×7,5	5	1×18	3,5	12,6	208		0,025
RM 1030	14	2×10	7,5	2×10	7,5	1×20	7,5	12,6	364		0,025
RM 1040	14	3×10	7,5	3×10	7,5	1×28	8,5	12,6	464		0,025
RM 1050	14	4×10	7,5	4×10	7,5	1×30	12,5	12,6	572		0,025
RM 2060	22	3×15	10,0	3×15	10	–	–	20,0	860		0,16
RM 2075	22	4×15	10,0	4×15	10	–	–	20,0	1032		0,19
RM 2090	22	5×15	10,0	5×15	10	–	–	20,0	1290		0,23
RM 3100	30	3×25	15,0	3×25	15	–	–	28,5	1904		0,46
RM 3125	30	4×25	15,0	4×25	15	–	–	28,5	2312		0,58
RM 3150	30	5×25	15,0	5×25	15	–	–	28,5	2856		0,69

Slides, tables and compact cross tables

SSM / SSK, T0 / TS, RSM / RSK

Ordering key

Type: Precision slides with rail guide system, crossed rollers Dovetail slides Compact cross tables with rail guide system, crossed rollers	R S T					
Versions: Only valid for dovetail tables: For manual operation, with micrometer knurl For manual operation, with hand crank Only valid for precision tables: For manual operation, with micrometer knurl For manual operation, with hand crank Only valid for compact cross tables: For manual operation, without drive For manual operation, with micrometer knurl	SM SK SM SK O S					
Table width B (mm) (see tables):		50 - 300				
Length L₁ or dimension Sx Sy (mm): L ₁ for dovetail and precision slides Sx Sy for compact cross tables			80 - 1010 025, 050, 100			
Nominal stroke S (mm) (not for compact cross tables): See tables						
Designation suffix if desired: Slides or tables made of aluminium, black anodised Slides with thick top: only for precision slides Slides with thick top and T-slots: dovetail and precision slides Locking device for dovetail slides (standard) Locking device for precision slides and tables Locking device for compact cross tables (standard)					A D DT AR1 AR2 AR3	

Example 1:	R	SK	75	-	080	-	025	
Example 2:	S	SM	300	-	1010	-	500	AR1
Example 3:	S	SK	50	-	080	-	025	AR1
Example 4:	T	O	085	-	050	-		AR3

5 Tables: driven and not driven

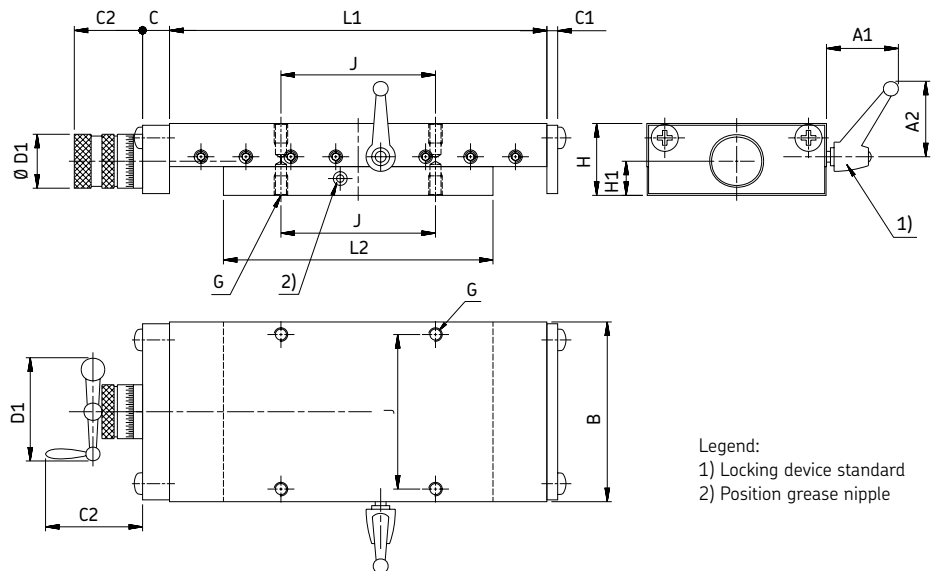
Dovetail slides

Dovetail slides

SSM / SSK

SSM - with micrometer ring with spring preloading, allowing easy turning. One division equals 0,02 mm.

SSK - as SSM, but instead of knurled screw equipped with crank handle.

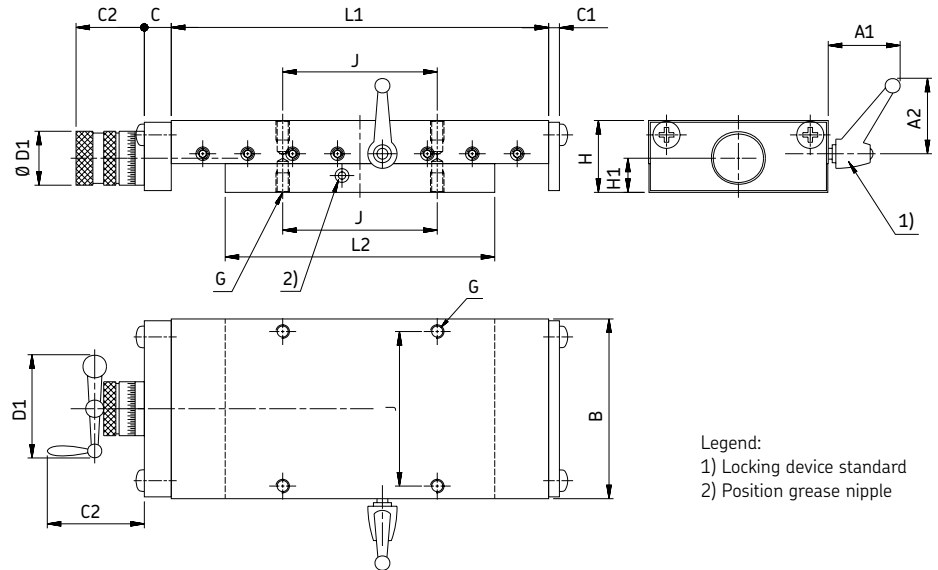


Designations	Dimensions				Stroke								Screw				Weight	
	B	H	L ₁	L ₂	S	A ₁	A ₂	C	C ₁	C ₂	D ₁	H ₁	Ø	J	G	GG		
	mm																—	kg
SSM-50.080.025	50	25	80	50	25	37	42	19	6	31	23,5	12,3	M6×1	37	M4	0,7		
SSK-50.080.025	50	25	80	25	25	37	42	19	6	51	47	12,3	M6×1	37	M4	0,7		
SSM-50.130.025	50	25	130	25	25	37	42	19	6	31	23,5	12,3	M6×1	37	M4	1,2		
SSK-50.130.025	50	25	130	25	25	37	42	19	6	51	47	12,3	M6×1	37	M4	1,2		
SSM-50.130.050	50	25	130	50	50	37	42	19	6	31	23,5	12,3	M6×1	37	M4	1		
SSK-50.130.050	50	25	130	50	50	37	42	19	6	51	47	12,3	M6×1	37	M4	1		
SSM-50.155.050	50	25	155	50	50	37	42	19	6	31	23,5	12,3	M6×1	37	M4	1,3		
SSK-50.155.050	50	25	155	50	50	37	42	19	6	51	47	12,3	M6×1	37	M4	1,3		
SSM-50.155.075	50	25	155	75	75	37	42	19	6	31	23,5	12,3	M6×1	37	M4	1,2		
SSK-50.155.075	50	25	155	75	75	37	42	19	6	51	47	12,3	M6×1	37	M4	1,2		
SSM-50.180.075	50	25	180	75	75	37	42	19	6	31	23,5	12,3	M6×1	37	M4	1,4		
SSK-50.180.075	50	25	180	75	75	37	42	19	6	51	47	12,3	M6×1	37	M4	1,4		
SSM-50.205.100	50	25	205	100	100	37	42	19	6	31	23,5	12,3	M6×1	37	M4	1,7		
SSK-50.205.100	50	25	205	100	100	37	42	19	6	51	47	12,3	M6×1	37	M4	1,7		
SSM-75.105.025	75	32	105	75	25	38	42	21	6	38	30	15	M10×1	62	M5	1,9		
SSK-75.105.025	75	32	105	75	25	38	42	21	6	54	47	15	M10×1	62	M5	1,9		
SSM-75.155.050	75	32	155	100	50	38	42	21	6	38	30	15	M10×1	62	M5	2,6		
SSK-75.155.050	75	32	155	100	50	38	42	21	6	54	47	15	M10×1	62	M5	2,6		
SSM-75.205.050	75	32	205	150	50	38	42	21	6	38	30	15	M10×1	62	M5	3,4		
SSK-75.205.050	75	32	205	150	50	38	42	21	6	54	47	15	M10×1	62	M5	3,4		
SSM-75.155.075	75	32	155	75	75	38	42	21	6	38	30	15	M10×1	62	M5	2,3		
SSK-75.155.075	75	32	155	75	75	38	42	21	6	54	47	15	M10×1	62	M5	2,3		
SSM-75.180.075	75	32	180	100	75	38	42	21	6	38	30	15	M10×1	62	M5	2,8		
SSK-75.180.075	75	32	180	100	75	38	42	21	6	54	47	15	M10×1	62	M5	2,8		
SSM-75.205.100	75	32	205	100	100	38	42	21	6	38	30	15	M10×1	62	M5	3		
SSK-75.205.100	75	32	205	100	100	38	42	21	6	54	47	15	M10×1	62	M5	3		
SSM-75.255.100	75	32	255	150	100	38	42	21	6	38	30	15	M10×1	62	M5	3,8		
SSK-75.255.100	75	32	255	150	100	38	42	21	6	54	47	15	M10×1	62	M5	3,8		
SSM-75.305.150	75	32	305	150	150	38	42	21	6	38	30	15	M10×1	62	M5	4,2		
SSK-75.305.150	75	32	305	150	150	38	42	21	6	54	47	15	M10×1	62	M5	4,2		

Continued

SSM / SSK

(Continued)



Legend:
1) Locking device standard
2) Position grease nipple

Designations	Dimensions				Stroke				Screw				Weight			
	B	H	L ₁	L ₂	S	A ₁	A ₂	C	C ₁	C ₂	D ₁	H ₁	Ø	J	G	GG
	mm															kg
SSM-100.160.050	100	40	160	100	50	40	45	21	6	38	30	19	M10×1	74	M6	4,4
SSK-100.160.050	100	40	160	100	50	40	45	21	6	54	47	19	M10×1	74	M6	4,4
SSM-100.260.050	100	40	260	200	50	40	45	21	6	38	30	19	M10×1	74	M6	7,2
SSK-100.260.050	100	40	260	200	50	40	45	21	6	54	47	19	M10×1	74	M6	7,2
SSM-100.210.100	100	40	210	100	100	40	45	21	6	38	30	19	M10×1	74	M6	5,1
SSK-100.210.100	100	40	210	100	100	40	45	21	6	54	47	19	M10×1	74	M6	5,1
SSM-100.310.100	100	40	310	200	100	40	45	21	6	38	30	19	M10×1	74	M6	7,9
SSK-100.310.100	100	40	310	200	100	40	45	21	6	54	47	19	M10×1	74	M6	7,9
SSM-100.310.150	100	40	310	150	150	40	45	21	6	38	30	19	M10×1	74	M6	7,1
SSK-100.310.150	100	40	310	150	150	40	45	21	6	54	47	19	M10×1	74	M6	7,1
SSM-100.410.150	100	40	410	250	150	40	45	21	6	38	30	19	M10×1	74	M6	10
SSK-100.410.150	100	40	410	250	150	40	45	21	6	54	47	19	M10×1	74	M6	10
SSM-100.410.200	100	40	410	200	200	40	45	21	6	38	30	19	M10×1	74	M6	9,2
SSK-100.410.200	100	40	410	200	200	40	45	21	6	54	47	19	M10×1	74	M6	9,2
SSM-100.510.200	100	40	510	300	200	40	45	21	6	38	30	19	M10×1	74	M6	12,1
SSK-100.510.200	100	40	510	300	200	40	45	21	6	54	47	19	M10×1	74	M6	12,1
SSM-150.310.100	150	50	310	200	100	45	62	28	8	53	47	24	Tr16×2	130	M8	15,4
SSK-150.310.100	150	50	310	200	100	45	62	28	8	92	103	24	Tr16×2	130	M8	15,4
SSM-150.510.100	150	50	510	400	100	45	62	28	8	53	47	24	Tr16×2	130	M8	26
SSK-150.510.100	150	50	510	400	100	45	62	28	8	92	103	24	Tr16×2	130	M8	26
SSM-150.410.200	150	50	410	200	200	45	62	28	8	53	47	24	Tr16×2	130	M8	17,8
SSK-150.410.200	150	50	410	200	200	45	62	28	8	92	103	24	Tr16×2	130	M8	17,8
SSM-150.610.200	150	50	610	400	200	45	62	28	8	53	47	24	Tr16×2	130	M8	28,5
SSK-150.610.200	150	50	610	400	200	45	62	28	8	92	103	24	Tr16×2	130	M8	28,5
SSM-150.510.300	150	50	510	200	300	45	62	28	8	53	47	24	Tr16×2	130	M8	20,2
SSK-150.510.300	150	50	510	200	300	45	62	28	8	92	103	24	Tr16×2	130	M8	20,2
SSM-150.710.300	150	50	710	400	300	45	62	28	8	53	47	24	Tr16×2	130	M8	30,9
SSK-150.710.300	150	50	710	400	300	45	62	28	8	92	103	24	Tr16×2	130	M8	30,9
SSM-150.710.400	150	50	710	300	400	45	62	28	8	53	47	24	Tr16×2	130	M8	28
SSK-150.710.400	150	50	710	300	400	45	62	28	8	92	103	24	Tr16×2	130	M8	28
SSM-150.810.400	150	50	810	400	400	45	62	28	8	53	47	24	Tr16×2	130	M8	33,3
SSK-150.810.400	150	50	810	400	400	45	62	28	8	92	103	24	Tr16×2	130	M8	33,3

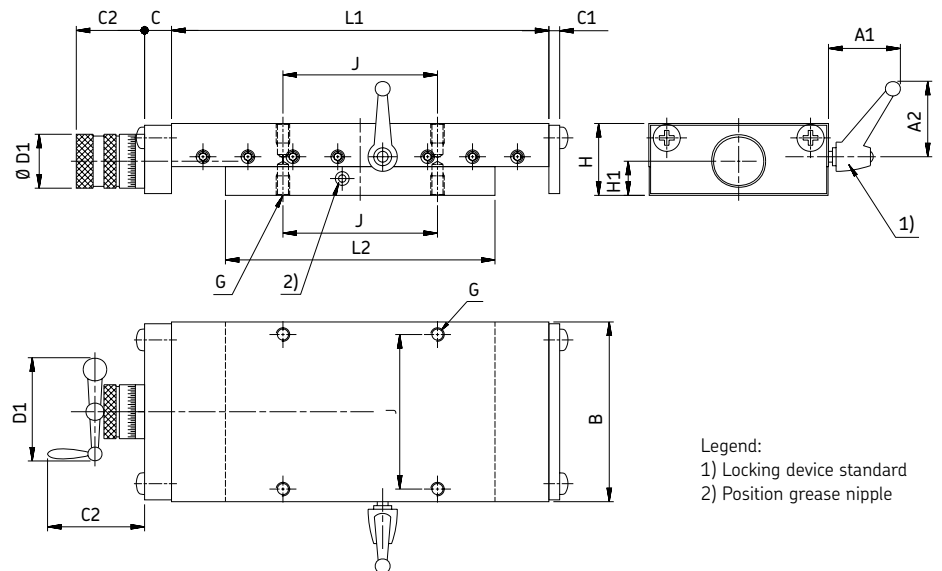
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5 Tables: driven and not driven

Dovetail slides

SSM / SSK

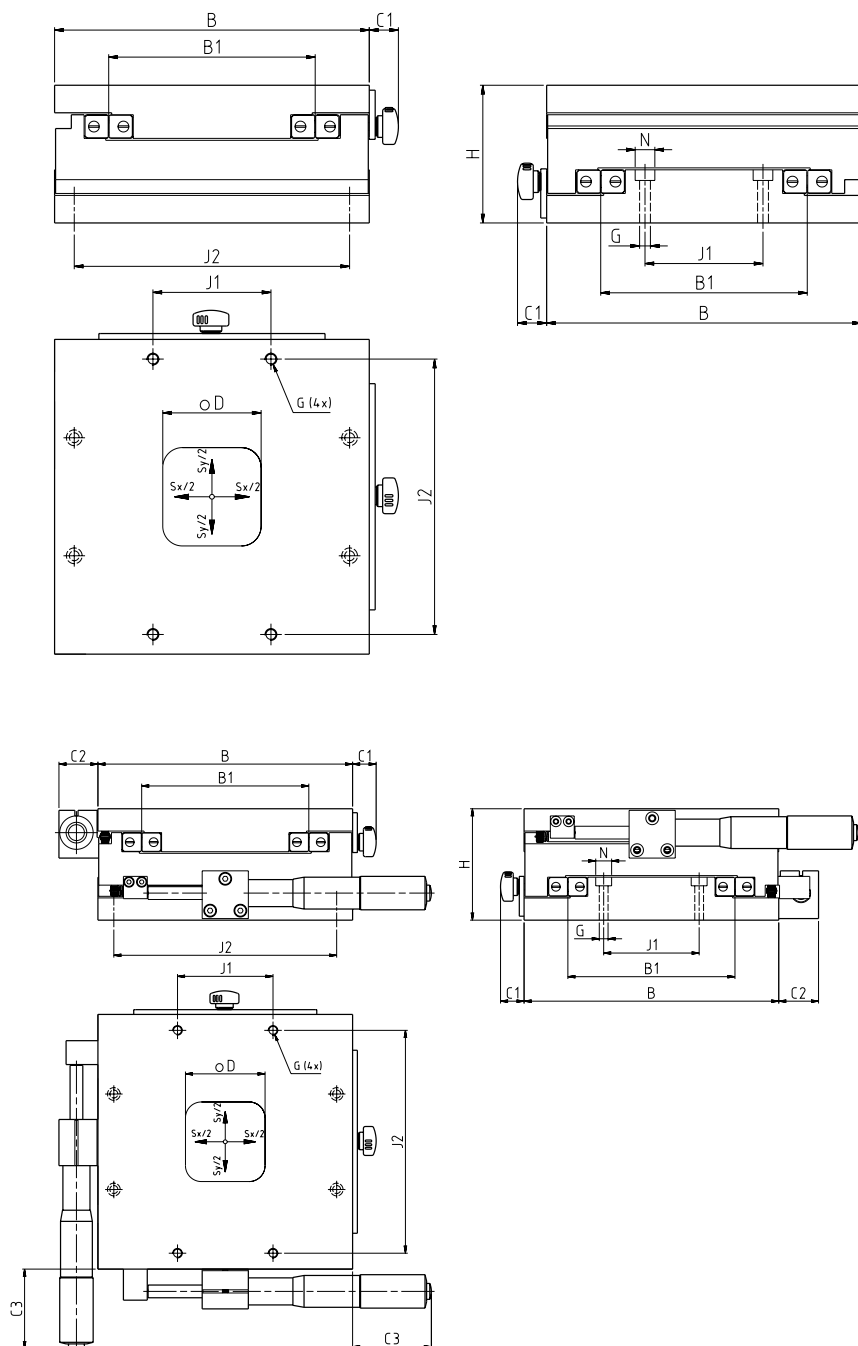
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Designations	Dimensions				Stroke							Screw					Weight	
	B	H	L ₁	L ₂	S	A ₁	A ₂	C	C ₁	C ₂	D ₁	H ₁	Ø	J	G	GG		
	mm															–	kg	
SSM-200.310.100	200	60	310	200	100	45	62	28	8	53	47	25	Tr16×2	170	M8	24,7		
SSK-200.310.100	200	60	310	200	100	45	62	28	8	92	103	25	Tr16×2	170	M8	24,7		
SSM-200.410.100	200	60	410	300	100	45	62	28	8	53	47	25	Tr16×2	170	M8	33,2		
SSK-200.410.100	200	60	410	300	100	45	62	28	8	92	103	25	Tr16×2	170	M8	33,2		
SSM-200.510.200	200	60	510	300	200	45	62	28	8	53	47	25	Tr16×2	170	M8	37,2		
SSK-200.510.200	200	60	510	300	200	45	62	28	8	92	103	25	Tr16×2	170	M8	37,2		
SSM-200.610.200	200	60	610	400	200	45	62	28	8	53	47	25	Tr16×2	170	M8	45,7		
SSK-200.610.200	200	60	610	400	200	45	62	28	8	92	103	25	Tr16×2	170	M8	45,7		
SSM-200.610.300	200	60	610	300	300	45	62	28	8	53	47	25	Tr16×2	170	M8	41,1		
SSK-200.610.300	200	60	610	300	300	45	62	28	8	92	103	25	Tr16×2	170	M8	41,1		
SSM-200.710.300	200	60	710	400	300	45	62	28	8	53	47	25	Tr16×2	170	M8	49,6		
SSK-200.710.300	200	60	710	400	300	45	62	28	8	92	103	25	Tr16×2	170	M8	49,6		
SSM-200.710.400	200	60	710	300	400	45	62	28	8	53	47	25	Tr16×2	170	M8	45		
SSK-200.710.400	200	60	710	300	400	45	62	28	8	92	103	25	Tr16×2	170	M8	45		
SSM-200.810.400	200	60	810	400	400	45	62	28	8	53	47	25	Tr16×2	170	M8	53,5		
SSK-200.810.400	200	60	810	400	400	45	62	28	8	92	103	25	Tr16×2	170	M8	53,5		
SSM-300.410.100	300	75	410	300	100	55	74	20	10	80	66	34,5	Tr20×4	260	M10	64,6		
SSK-300.410.100	300	75	410	300	100	55	74	20	10	146	125	34,5	Tr20×4	260	M10	64,6		
SSM-300.510.100	300	75	510	400	100	55	74	20	10	80	66	34,5	Tr20×4	260	M10	80,7		
SSK-300.510.100	300	75	510	400	100	55	74	20	10	146	125	34,5	Tr20×4	260	M10	80,7		
SSM-300.510.200	300	75	510	300	200	55	74	20	10	80	66	34,5	Tr20×4	260	M10	72,4		
SSK-300.510.200	300	75	510	300	200	55	74	20	10	146	125	34,5	Tr20×4	260	M10	72,4		
SSM-300.610.200	300	75	610	400	200	55	74	20	10	80	66	34,5	Tr20×4	260	M10	88,6		
SSK-300.610.200	300	75	610	400	200	55	74	20	10	146	125	34,5	Tr20×4	260	M10	88,6		
SSM-300.710.300	300	75	710	400	300	55	74	20	10	80	66	34,5	Tr20×4	260	M10	96,4		
SSK-300.710.300	300	75	710	400	300	55	74	20	10	146	125	34,5	Tr20×4	260	M10	96,4		
SSM-300.810.400	300	75	810	400	400	55	74	20	10	80	66	34,5	Tr20×4	260	M10	104,3		
SSK-300.810.400	300	75	810	400	400	55	74	20	10	146	125	34,5	Tr20×4	260	M10	104,3		
SSM-300.1010.500	300	75	1 010	500	500	55	74	20	10	80	66	34,5	Tr20×4	260	M10	128,3		
SSK-300.1010.500	300	75	1 010	500	500	55	74	20	10	146	125	34,5	Tr20×4	260	M10	128,3		

Compact cross tables

T0 / TS



Designations	Dimensions		Stroke										Load-carrying capacities	Weight	
	B	H	Sx Sy	B ₁	C ₁	C ₂	C ₃	D	N		G	J ₁	J ₂	C ₀	GA
	mm										–	mm		N	kg
T0 085	85	40	50	48	16	–	–	22	Ø 4,2 / Ø 8×4,5 (4 x)		M5	20	70	3 400	0,8
TS 085	85	40	25	48	16	22,5	33	22	–		M5	20	70	4 200	1,1
T0 160	160	70	100	105	15	–	–	50	Ø 5 / Ø 10×5,5 (4 x)		M6	60	140	12 400	4
TS 160	160	70	50	105	15	25	50	50	–		M6	60	140	15 600	4,8

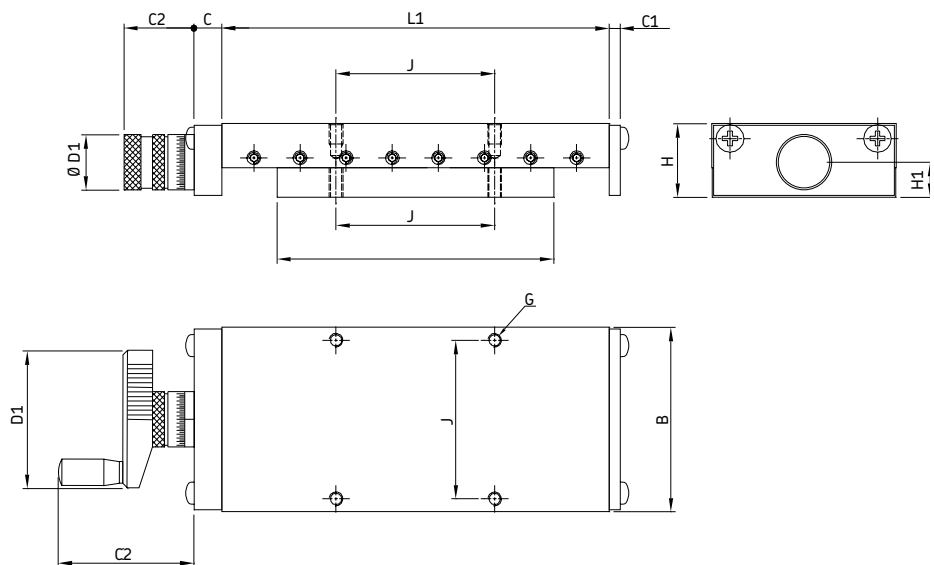
5 Tables: driven and not driven

Precision slides

Precision slides

RSM / RSK

Precision tables for manual operation with micrometer knurl RSM, with hand crank RSK



Designations	Dimensions				Stroke				Screw						Load-carrying capacities		Weight
	B	H	L ₁	L ₂	S	C	C ₁	C ₂	D ₁	H ₁	Ø	J	G	N	C ₀	GG	
	mm												–	mm	kg	kg	
RSM50.080.025	50	25	80	55	25	14	5	37,5	23	12,3	M6×1	37	M4	4,5	1,7	0,7	
RSM50.130.025	50	25	130	105	25	14	5	37,5	23	12,3	M6×1	37	M4	4,5	3,3	1,1	
RSM50.130.050	50	25	130	80	50	14	5	37,5	23	12,3	M6×1	37	M4	4,5	2,5	1	
RSM50.130.075	50	25	130	55	75	14	5	37,5	23	12,3	M6×1	37	M4	4,5	1,7	0,9	
RSM50.180.075	50	25	180	105	75	14	5	37,5	23	12,3	M6×1	37	M4	4,5	3,3	1,3	
RSM50.180.100	50	25	180	80	100	14	5	37,5	23	12,3	M6×1	37	M4	4,5	2,5	1,2	
RSM75.130.025	75	32	130	105	25	15	6	46	30	15	M10×1	62	M4	4,5	3,4	2,2	
RSK75.130.025	75	32	130	105	25	15	6	88	71	15	M10×1	62	M4	4,5	3,4	2,2	
RSM75.180.050	75	32	180	130	50	15	6	46	30	15	M10×1	62	M4	4,5	5,1	3	
RSK75.180.050	75	32	180	130	50	15	6	88	71	15	M10×1	62	M4	4,5	5,1	3	
RSM75.180.025	75	32	180	150	50	15	6	46	30	15	M10×1	62	M4	4,5	4,25	2,8	
RSK75.180.025	75	32	180	150	50	15	6	88	71	15	M10×1	62	M4	4,5	4,25	2,8	
RSM75.180.075	75	32	180	105	75	15	6	46	30	15	M10×1	62	M4	4,5	3,4	2,6	
RSK75.180.075	75	32	180	105	75	15	6	88	71	15	M10×1	62	M4	4,5	3,4	2,6	
RSM75.230.075	75	32	230	155	75	15	6	46	30	15	M10×1	62	M4	4,5	5,1	3,4	
RSK75.230.075	75	32	230	155	75	15	6	88	71	15	M10×1	62	M4	4,5	5,1	3,4	
RSM75.230.075	75	32	230	130	100	15	6	46	30	15	M10×1	62	M4	4,5	4,25	3,3	
RSK75.230.075	75	32	230	130	100	15	6	88	71	15	M10×1	62	M4	4,5	4,25	3,3	
RSM75.230.075	75	32	230	105	125	15	6	46	30	15	M10×1	62	M4	4,5	3,4	3,1	
RSK75.230.075	75	32	230	105	125	15	6	88	71	15	M10×1	62	M4	4,5	3,4	3,1	

Continued

RSM / RSK

(Continued)

Designations	Dimensions			Stroke				Screw							Load-carrying capacities		Weight
	B	H	L ₁	L ₂	S	C	C ₁	C ₂	D ₁	H ₁	Ø	J	G	N	C ₀	GG	
	mm													–	mm	kg	
RSM100.260.050	100	40	260	210	50	15	6	46	30	15,5	M10×1	74	M6	6,6	8,8	6,8	
RSK100.260.050	100	40	260	210	50	15	6	88	71	15,5	M10×1	74	M6	6,6	8,8	6,8	
RSM100.310.050	100	40	310	260	50	15	6	46	30	15,5	M10×1	74	M6	6,6	10,9	8,2	
RSK100.310.050	100	40	310	260	50	15	6	88	71	15,5	M10×1	74	M6	6,6	10,9	8,2	
RSM100.360.050	100	40	360	310	50	15	6	46	30	15,5	M10×1	74	M6	6,6	13	9,6	
RSK100.360.050	100	40	360	310	50	15	6	88	71	15,5	M10×1	74	M6	6,6	13	9,6	
RSM100.310.100	100	40	310	210	100	15	6	46	30	15,5	M10×1	74	M6	6,6	8,8	7,5	
RSK100.310.100	100	40	310	210	100	15	6	88	71	15,5	M10×1	74	M6	6,6	8,8	7,5	
RSM100.360.100	100	40	360	260	100	15	6	46	30	15,5	M10×1	74	M6	6,6	10,9	8,9	
RSK100.360.100	100	40	360	260	100	15	6	88	71	15,5	M10×1	74	M6	6,6	10,9	8,9	
RSM100.410.100	100	40	410	310	100	15	6	46	30	15,5	M10×1	74	M6	6,6	13	10	
RSK100.410.100	100	40	410	310	100	15	6	88	71	15,5	M10×1	74	M6	6,6	13	10	
RSM100.360.150	100	40	360	210	150	15	6	46	30	15,5	M10×1	74	M6	6,6	8,8	8,2	
RSK100.360.150	100	40	360	210	150	15	6	88	71	15,5	M10×1	74	M6	6,6	8,8	8,2	
RSM100.410.150	100	40	410	260	150	15	6	46	30	15,5	M10×1	74	M6	6,6	10,9	9,6	
RSK100.410.150	100	40	410	260	150	15	6	88	71	15,5	M10×1	74	M6	6,6	10,9	9,6	
RSM100.460.150	100	40	460	310	150	15	6	46	30	15,5	M10×1	74	M6	6,6	13	11	
RSK100.460.150	100	40	460	310	150	15	6	88	71	15,5	M10×1	74	M6	6,6	13	11	
RSM100.460.200	100	40	460	260	200	15	6	46	30	15,5	M10×1	74	M6	6,6	10,9	10	
RSK100.460.200	100	40	460	260	200	15	6	88	71	15,5	M10×1	74	M6	6,6	10,9	10	
RSM150.410.100	150	50	410	310	100	20	8	63	47	24	Tr16×2	116	M8	9	53	20	
RSK150.410.100	150	50	410	310	100	20	8	122	102	24	Tr16×2	116	M8	9	53	20	
RSM150.510.100	150	50	510	410	100	20	8	63	47	24	Tr16×2	116	M8	9	71	25	
RSK150.510.100	150	50	510	410	100	20	8	122	102	24	Tr16×2	116	M8	9	71	25	
RSM150.610.100	150	50	610	510	100	20	8	63	47	24	Tr16×2	116	M8	9	88	30	
RSK150.610.100	150	50	610	510	100	20	8	122	102	24	Tr16×2	116	M8	9	88	30	
RSM150.510.200	150	50	510	310	200	20	8	63	47	24	Tr16×2	116	M8	9	53	22	
RSK150.510.200	150	50	510	310	200	20	8	122	102	24	Tr16×2	116	M8	9	53	22	
RSM150.610.200	150	50	610	410	200	20	8	63	47	24	Tr16×2	116	M8	9	71	28	
RSK150.610.200	150	50	610	410	200	20	8	122	102	24	Tr16×2	116	M8	9	71	28	
RSM150.710.200	150	50	710	510	200	20	8	63	47	24	Tr16×2	116	M8	9	88	33	
RSK150.710.200	150	50	710	510	200	20	8	122	102	24	Tr16×2	116	M8	9	88	33	
RSM150.610.300	150	50	610	310	300	20	8	63	47	24	Tr16×2	116	M8	9	53	25	
RSK150.610.300	150	50	610	310	300	20	8	122	102	24	Tr16×2	116	M8	9	53	25	
RSM150.710.300	150	50	710	410	300	20	8	63	47	24	Tr16×2	116	M8	9	71	30	
RSK150.710.300	150	50	710	410	300	20	8	122	102	24	Tr16×2	116	M8	9	71	30	
RSM150.810.300	150	50	810	510	300	20	8	63	47	24	Tr16×2	116	M8	9	88	36	
RSK150.810.300	150	50	810	510	300	20	8	122	102	24	Tr16×2	116	M8	9	88	36	
RSM150.810.400	150	50	810	410	400	20	8	63	47	24	Tr16×2	116	M8	9	71	33	
RSK150.810.400	150	50	810	410	400	20	8	122	102	24	Tr16×2	116	M8	9	71	33	

5 Tables: driven and not driven
Linear ball bearing table with drive

Linear ball bearing table with drive

LZAB, LZBB

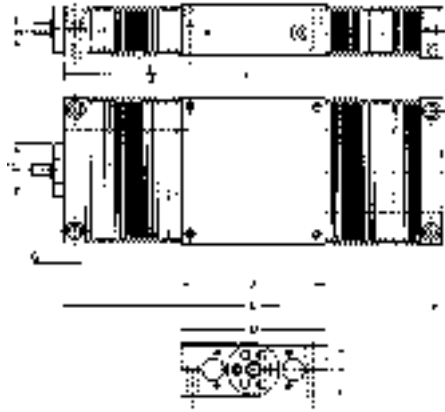
Ordering key

	LZ		-		-		-	K	
Type									
Design:									
Open design	AB								
Closed design	BB								
Slide width B (mm):									
See tables									
Total length of slide unit L (mm):									
See tables									
Screw Ø (mm) - screw lead (mm):									
Screw Ø 12 - screw lead 05	1205								
Screw Ø 16 - screw lead 05	1605								
Screw Ø 20 - screw lead 05	2005								
Screw Ø 25 - screw lead 05	2505								
Screw Ø 25 - screw lead 10	2510								

Example: LZ AB - 230 - 1060 - K 1205

LZBB (On request)

Linear ball bearing slides with closed housing and ball screw



Designations	Dimensions			Nominal Stroke*		Screw data			
	B	H	L	S ₁	S ₂	n _{max}	d ₁	D	C ₁
	mm					1/min	mm		
LZBB 100.336.K1205	100	38	336	120	195	5 100	6	38	24
LZBB 100.636.K1205	100	38	636	310	495	3 450	6	38	24
LZBB 100.936.K1205	100	38	936	495	795	1 600	6	38	24
LZBB 100.1236.K1205	100	38	1 236	685	1 095	920	6	38	24
LZBB 100.1536.K1205	100	38	1 536	875	1 395	600	6	38	24
LZBB 130.340.K1605	130	48	340	115	165	3 800	10	47	28
LZBB 130.640.K1605	130	48	640	330	465	3 800	10	47	28
LZBB 130.940.K1605	130	48	940	545	765	2 150	10	47	28
LZBB 130.1240.K1605	130	48	1 240	755	1 065	1 250	10	47	28
LZBB 130.1540.K1605	130	48	1 540	970	1 365	800	10	47	28
LZBB 130.1840.K1605	130	48	1 840	1 185	1 665	560	10	47	28
LZBB 160.410.K2005	160	58	410	145	195	3 050	12	55	36
LZBB 160.650.K2005	160	58	650	325	435	3 050	12	55	36
LZBB 160.1010.K2005	160	58	1 010	595	795	2 450	12	55	36
LZBB 160.1250.K2005	160	58	1 250	780	1 035	1 600	12	55	36
LZBB 160.1610.K2005	160	58	1 610	1 050	1 395	960	12	55	36
LZBB 160.1850.K2005	160	58	1 850	1 230	1 635	730	12	55	36
LZBB 180.350.K2005	180	67	350	80	115	3 050	12	55	36
LZBB 180.650.K2005	180	67	650	300	415	3 050	12	55	36
LZBB 180.950.K2005	180	67	950	515	715	2 800	12	55	36
LZBB 180.1250.K2005	180	67	1 250	740	1 015	1 600	12	55	36
LZBB 180.1550.K2005	180	67	1 550	960	1 315	1 050	12	55	36
LZBB 180.1850.K2005	180	67	1 850	1 175	1 615	730	12	55	36
LZBB 180.2150.K2005	180	67	2 150	1 400	1 915	540	12	55	36
LZBB 180.2450.K2005	180	67	2 450	1 620	2 215	420	12	55	36
LZBB 230.460.K2505	230	84	460	120	165	2 450	14	68	36
LZBB 230.660.K2505	230	84	660	275	365	2 450	14	68	36
LZBB 230.1060.K2505	230	84	1 060	580	765	2 450	14	68	36
LZBB 230.1260.K2505	230	84	1 260	730	965	2 050	14	68	36
LZBB 230.1660.K2505	230	84	1 660	1 035	1 365	1 200	14	68	36
LZBB 230.1860.K2505	230	84	1 860	1 185	1 565	940	14	68	36
LZBB 230.2260.K2505	230	84	2 260	1 490	1 965	640	14	68	36
LZBB 230.2460.K2505	230	84	2 460	1 640	2 165	540	14	68	36
LZBB 230.2860.K2505	230	84	2 860	1 945	2 565	400	14	68	36
LZBB 230.460.K2510	230	84	460	120	165	2 450	14	68	36
LZBB 230.660.K2510	230	84	660	275	365	2 450	14	68	36
LZBB 230.1060.K2510	230	84	1 060	580	765	2 450	14	68	36
LZBB 230.1260.K2510	230	84	1 260	730	965	2 050	14	68	36
LZBB 230.1660.K2510	230	84	1 660	1 035	1 365	1 200	14	68	36
LZBB 230.1860.K2510	230	84	1 860	1 185	1 565	940	14	68	36
LZBB 230.2260.K2510	230	84	2 260	1 490	1 965	640	14	68	36
LZBB 230.2460.K2510	230	84	2 460	1 640	2 165	540	14	68	36
LZBB 230.2860.K2510	230	84	2 860	1 945	2 565	400	14	68	36

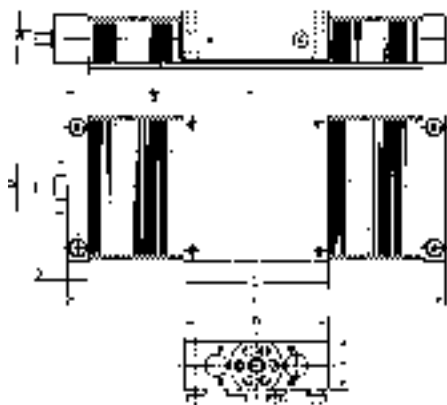
* Maximum stroke between end stops: S₁ with bellows (standard version), S₂ without bellows (special version)

5 Tables: driven and not driven

Linear ball bearing table with drive

LZAB (On request)

Linear ball bearing slides with open housing and ball screw



Designations	Dimensions			Nominal Stroke*		Screw data			
	B	H	L	S ₁	S ₂	n _{max}	d ₁	D	C ₁
	mm					1/min	mm		
LZAB 100.336.K1205	100	48	336	115	195	5 100	6	38	24
LZAB 100.636.K1205	100	48	636	295	495	3 450	6	38	24
LZAB 100.936.K1205	100	48	936	475	795	1 600	6	38	24
LZAB 100.1236.K1205	100	48	1 236	655	1 095	920	6	38	24
LZAB 100.1536.K1205	100	48	1 536	835	1 395	600	6	38	24
LZAB 130.340.K1605	130	57	340	110	165	3 800	10	47	28
LZAB 130.640.K1605	130	57	640	320	465	3 800	10	47	28
LZAB 130.940.K1605	130	57	940	530	765	2 150	10	47	28
LZAB 130.1240.K1605	130	57	1 240	740	1 065	1 250	10	47	28
LZAB 130.1540.K1605	130	57	1 540	950	1 365	800	10	47	28
LZAB 130.1840.K1605	130	57	1 840	1 155	1 665	560	10	47	28
LZAB 160.410.K2005	160	66	410	140	195	3 050	12	55	36
LZAB 160.650.K2005	160	66	650	320	435	3 050	12	55	36
LZAB 160.1010.K2005	160	66	1 010	585	795	2 450	12	55	36
LZAB 160.1250.K2005	160	66	1 250	765	1 035	1 600	12	55	36
LZAB 160.1610.K2005	160	66	1 610	1 035	1 395	960	12	55	36
LZAB 160.1850.K2005	160	66	1 850	1 210	1 635	730	12	55	36
LZAB 180.350.K2005	180	77	350	85	115	3 050	12	55	36
LZAB 180.650.K2005	180	77	650	320	415	3 050	12	55	36
LZAB 180.950.K2005	180	77	950	550	715	2 800	12	55	36
LZAB 180.1250.K2005	180	77	1 250	785	1 015	1 600	12	55	36
LZAB 180.1550.K2005	180	77	1 550	1 020	1 315	1 050	12	55	36
LZAB 180.1850.K2005	180	77	1 850	1 250	1 615	730	12	55	36
LZAB 180.2150.K2005	180	77	2 150	1 485	1 915	540	12	55	36
LZAB 180.2450.K2005	180	77	2 450	1 720	2 215	420	12	55	36
LZAB 230.460.K2505	230	95	460	120	165	2 450	14	68	36
LZAB 230.660.K2505	230	95	660	275	365	2 450	14	68	36
LZAB 230.1060.K2505	230	95	1 060	580	765	2 450	14	68	36
LZAB 230.1260.K2505	230	95	1 260	730	965	2 050	14	68	36
LZAB 230.1660.K2505	230	95	1 660	1 035	1 365	1 200	14	68	36
LZAB 230.1860.K2505	230	95	1 860	1 185	1 565	940	14	68	36
LZAB 230.2260.K2505	230	95	2 260	1 490	1 965	640	14	68	36
LZAB 230.2460.K2505	230	95	2 460	1 640	2 165	540	14	68	36
LZAB 230.2860.K2505	230	95	2 860	1 945	2 565	400	14	68	36
LZAB 230.460.K2510	230	95	460	120	365	2 450	14	68	36
LZAB 230.660.K2510	230	95	660	275	365	2 450	14	68	36
LZAB 230.1060.K2510	230	95	1 060	580	765	2 450	14	68	36
LZAB 230.1260.K2510	230	95	1 260	730	965	2 050	14	68	36
LZAB 230.1660.K2510	230	95	1 660	1 035	1 365	1 200	14	68	36
LZAB 230.1860.K2510	230	95	1 860	1 185	1 565	940	14	68	36
LZAB 230.2260.K2510	230	95	2 260	1 490	1 965	640	14	68	36
LZAB 230.2460.K2510	230	95	2 460	1 640	2 165	540	14	68	36
LZAB 230.2860.K2510	230	95	2 860	1 945	2 565	400	14	68	36

* Maximum stroke between end stops: S₁ with bellows (standard version); S₂ without bellows (special version)

LTB with screw drive

LTB		.		.			.		.	
-----	--	---	--	---	--	--	---	--	---	--

Width of table:

Width of bottom part (see dimension specifications)

110 to 400

Length of table:

L₁ length of bottom part (see dimension specifications)

150 to 2860

Driving possibilities:

No preload

No preload

Preloaded

Preloaded

SH
SX
TN
TI

Screw diameter:

12 to 40

Screw lead:

05 to 40

Covers:

Without cover

With bellows

With steel cover

With steel cover and adapter plate

BL
SC
SCAP

Precision class:

Medium precision

High precision

P5
P2

Preferred range:

N

Example:

LTB	235	.	0880	.	TN	25	05	.	BL	.	P2
-----	-----	---	------	---	----	----	----	---	----	---	----

Profile rail guide slides, preferred range

LTB

SKF profile rail guide slides LTB of the preferred range are a cost-effective alternative to the in-house production. The LTB preferred range shows 2 widths in 3 lengths each and can be delivered in 2 weeks. The slides are equipped with preloaded profile rails and preloaded ball screw, with bellows covers and end switches.

Designations

LTB110.230.TN1205.BL.P2/V
LTB110.350.TN1205.BL.P2/V
LTB170.340.TN1605.BL.P2/V
LTB170.520.TN1605.BL.P2/V
LTB170.700.TN1605.BL.P2/V
LTB235.520.TN2505.BL.P2/V
LTB235.700.TN2505.BL.P2/V
LTB235.880.TN2505.BL.P2/V

5 Tables: driven and not driven

Profile rail guide slides

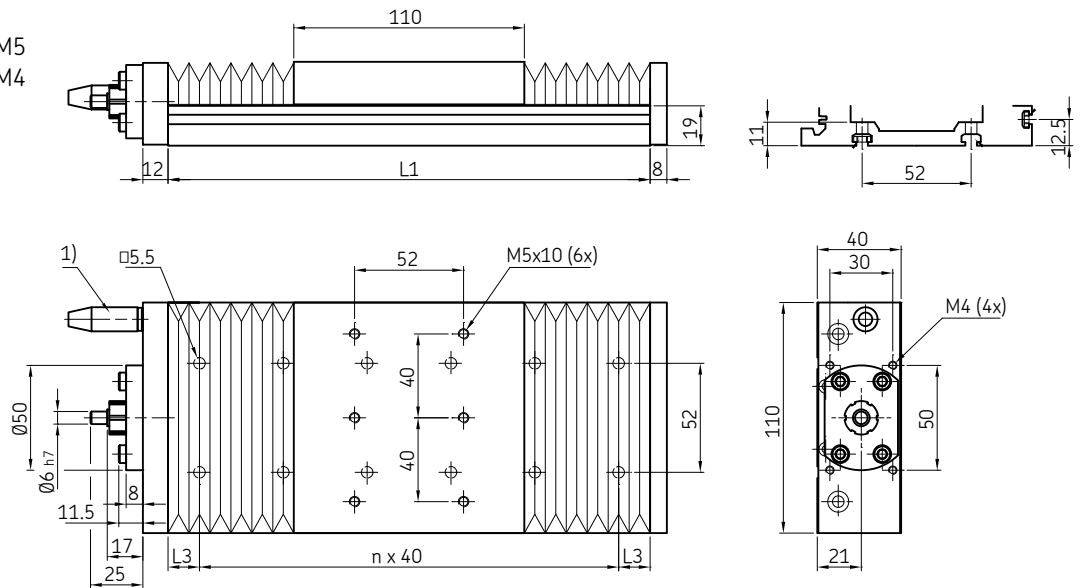
LTB110.L1.SD/TN12xx-BL:

Slides with ball screw drive, with or without bellows

T slots in bottom part:

Slot 1: for square nut DIN 562 M5

Slot 2: for square nut DIN 562 M4



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

Direction of travel: - ↔ +

Length				Screw data				Weight ⁽⁴⁾	
L1	L3	n	KN ⁽²⁾	Stroke ⁽³⁾		SD1205	TN1205+1210	G _A	G ₀
mm		—		S1	S2	n _{max}	n _{max}	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	15	12	✓	225	390	4 160	7 500	3,1	0,8
550		13		250	430	4 160	6 370	3,3	
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	

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

T slots in bottom part:
Slot 1: for square nut DIN 562 M5
Slot 2: for square nut DIN 562 M4

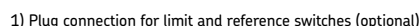


- 3) Suitable as top axis for central cross table mounting
- 4) Maximum stroke between end stops
- 5) G_A = Total mass of slide
 G_0 = Linear moving mass of slide top

Profile rail guide slides

Slides with ball screw drive, with or without bellows

Slot 2: for square nut DIN 562 M4



Direction of travel: - $\longleftrightarrow$ +

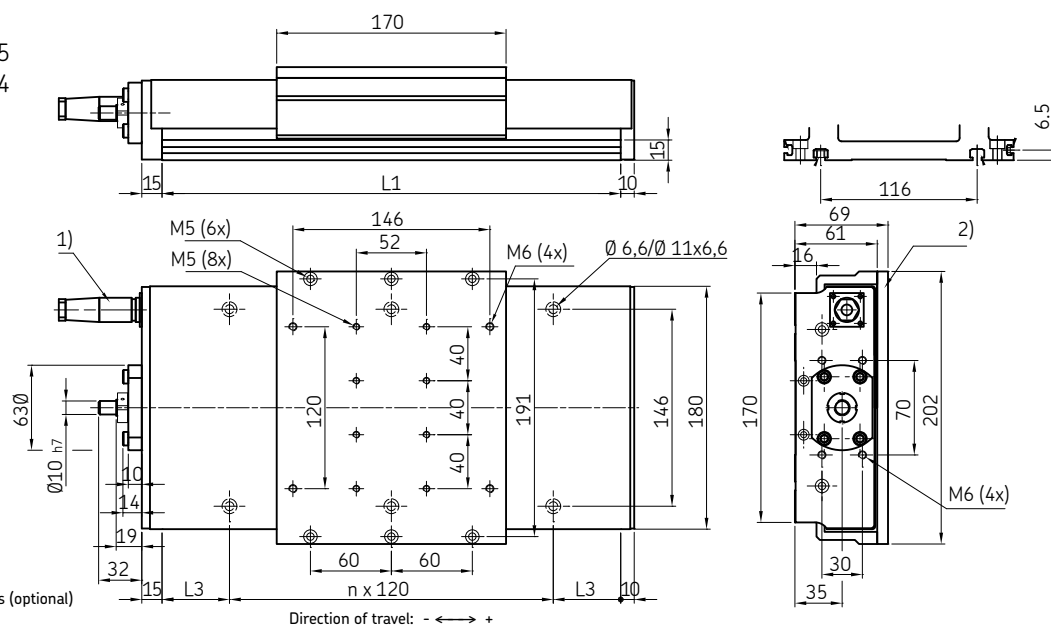
G_0 = Linear moving mass of slide top

LTB170.L1.SD/TN16xx-SC:
Slides with ball screw drive and steel cover

T slots in bottom part:

Slot 1: for square nut DIN 562 M5

Slot 2: for square nut DIN 562 M4



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

2) Adapter plate available on request

Length				Screw data					Weight ⁵⁾	
L1	L3	n	KN ³⁾	Stroke ⁴⁾ S	SD1605 n _{max}	TN1605 n _{max}	TN1610 n _{max}	TN1616 n _{max}	G _A	G ₀
mm		–		mm	1/min				kg	
220	50	1	✓	40	3 120	5 620	5 620	5 620	6,9	
280	20	2		100	3 120	5 620	5 620	5 620	7,7	
340	50	2		160	3 120	5 620	5 620	5 620	8,4	
400	20	3	✓	220	3 120	5 620	5 620	5 620	9,2	
460	50	3	✓	280	3 120	5 620	5 620	5 620	9,9	
520	20	4		340	3 120	5 620	5 620	5 620	10,7	
580	50	4		400	3 120	5 620	5 620	5 620	11,5	
640	20	5	✓	460	3 120	5 620	5 620	5 620	12,2	
700	50	5	✓	520	3 120	5 620	5 620	5 620	13,0	
760	20	6		580	3 120	4 670	4 670	4 670	13,8	
820	50	6		640	3 120	3 900	3 900	3 900	14,5	
880	20	7	✓	700	3 120	3 300	3 300	3 300	15,3	
940	50	7	✓	760	2 830	2 830	2 830	2 830	16,0	3,3
1 000	20	8		820	2 460	2 460	2 460	2 460	16,8	
1 060	50	8		880	2 150	2 150	2 150	2 150	17,6	
1 120	20	9	✓	940	1 900	1 900	1 900	1 900	18,3	
1 180	50	9	✓	1 000	1 690	1 690	1 690	1 690	19,1	
1 240	20	10		1 060	1 510	1 510	1 510	1 510	19,9	
1 300	50	10		1 120	1 360	1 360	1 360	1 360	20,6	
1 360	20	11	✓	1 180	1 230	1 230	1 230	1 230	21,4	
1 420	50	11	✓	1 240	1 120	1 120	1 120	1 120	22,1	
1 480	20	12		1 300	1 020	1 020	1 020	1 020	22,9	
1 540	50	12		1 360	930	930	930	930	23,7	
1 600	20	13	✓	1 420	860	860	860	860	24,4	

3) Suitable as top axis for central cross table mounting

4) Maximum stroke between end stops

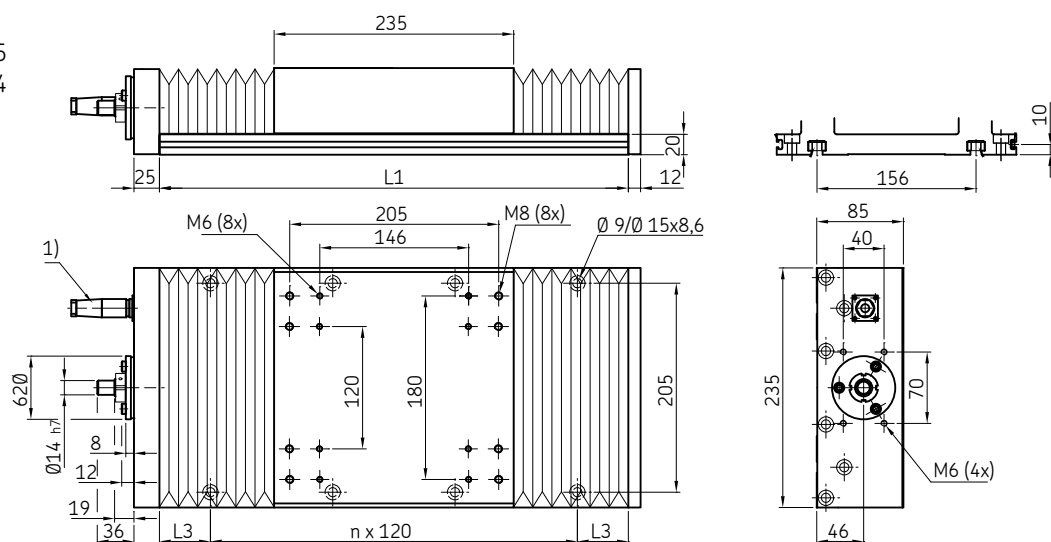
5) G_A = Total mass of slide

G₀ = Linear moving mass of slide top

Profile rail guide slides

Slides with ball screw drive, with or without bellows

Slot 2: for square nut DIN 562 M4



Direction of travel: - $\longleftrightarrow$ +

Length				Screw data							
				Stroke ³⁾		SX2505	TN2505	SX2510	TN2510+2520+2525	Weight ⁴⁾	
L1	L3	n	KN ²⁾	S1	S2	n _{max}	n _{max}	n _{max}	n _{max}	G _A	G ₀
mm		–		mm		1/min				kg	
280	20	2		25	35	2 000	3 600	2 000	3 600	14,5	5,9
340	50	2		75	95	2 000	3 600	2 000	3 600	15,9	
400	20	3	✓	125	155	2 000	3 600	2 000	3 600	17,2	
460	50	3	✓	175	215	2 000	3 600	2 000	3 600	18,6	
520	20	4		225	275	2 000	3 600	2 000	3 600	20,0	
580	50	4		270	335	2 000	3 600	2 000	3 600	21,3	
640	20	5	✓	325	395	2 000	3 600	2 000	3 600	22,7	
700	50	5	✓	375	455	2 000	3 600	2 000	3 600	24,1	
760	20	6		425	515	2 000	3 600	2 000	3 600	25,4	
820	50	6		475	575	2 000	3 600	2 000	3 600	26,8	
880	20	7	✓	525	635	2 000	3 600	2 000	3 600	28,1	
940	50	7	✓	575	695	2 000	3 600	2 000	3 600	29,5	
1 000	20	8		625	755	2 000	3 600	2 000	3 600	30,9	
1 060	50	8		680	815	2 000	3 600	2 000	3 600	32,2	
1 120	20	9	✓	730	875	2 000	3 390	2 000	3 390	33,6	
1 180	50	9	✓	780	935	2 000	3 010	2 000	3 010	34,9	
1 240	20	10		825	995	2 000	2 690	2 000	2 690	36,3	
1 300	50	10		875	1 055	2 000	2 410	2 000	2 410	37,7	
1 360	20	11	✓	925	1 115	2 000	2 180	2 000	2 180	39,0	
1 420	50	11	✓	980	1 175	1 990	1 980	1 880	1 980	40,4	
1 480	20	12		1 030	1 235	1 810	1 800	1 710	1 800	41,8	
1 540	50	12		1 080	1 295	1 660	1 650	1 570	1 650	43,1	
1 600	20	13	✓	1 130	1 355	1 530	1 520	1 440	1 520	44,5	

G_0 = Linear moving mass of slide top

LTB235.L1.SX/TN/TL25xx-BL
(Continued)
4

Length				Screw data						Weight ⁴⁾	
L1	L3	n	KN ²⁾	Stroke ³⁾		SX2505	TN2505	SX2510	TN2510+2520+2525	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	5,9
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	
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

5 Tables: driven and not driven

Profile rail guide slides

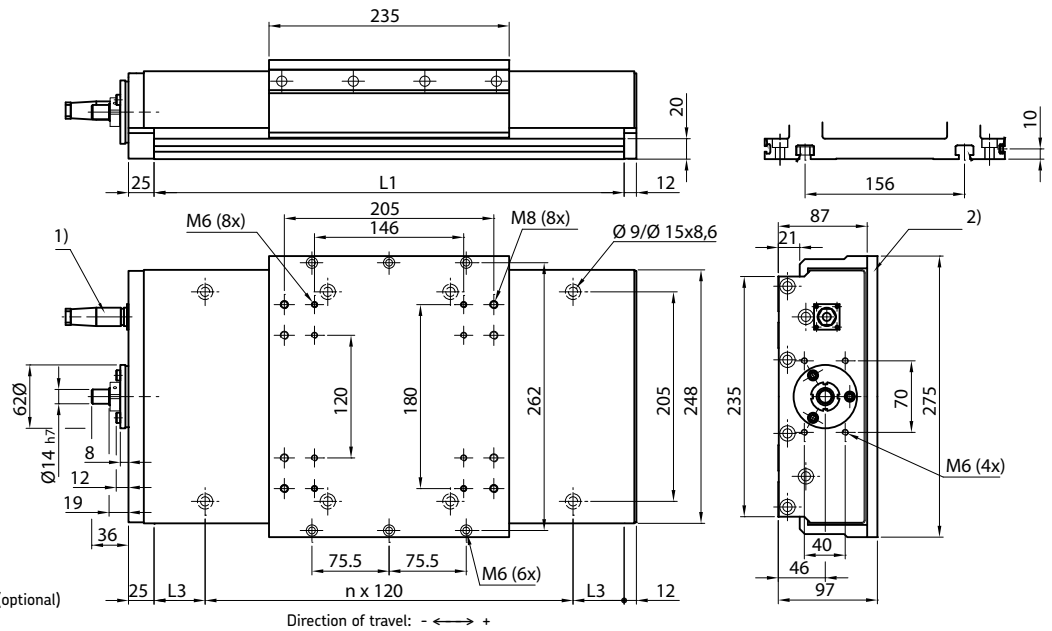
LTB235.L1.SX/TN/TL25xx-SC:

Slides with ball screw drive and steel cover

T slots in bottom part:

Slot 1: for square nut DIN 562 M5

Slot 2: for square nut DIN 562 M4



Length				Screw data					Weight ⁵⁾	
L1	L3	n	KN ³⁾	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	

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

LTB235.L1.SX/TN/TL25xx-SC
(Continued)

Length				Screw data					Weight ⁵⁾	
L1	L3	n	KN ³⁾	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	8,5
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	
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	

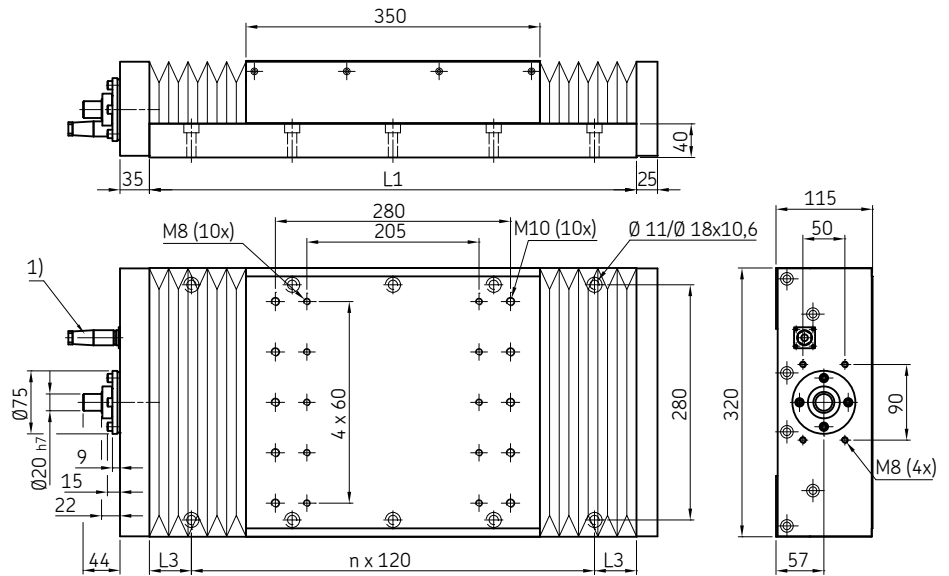
3) Suitable as top axis for central cross table mounting
 4) Maximum stroke between end stops
 5) G_A = Total mass of slide
 G₀ = Linear moving mass of slide top

5 Tables: driven and not driven

Profile rail guide slides

LTB320.L1.SX/TN/TL32xx-BL:

Slides with ball screw drive, with or without bellows



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

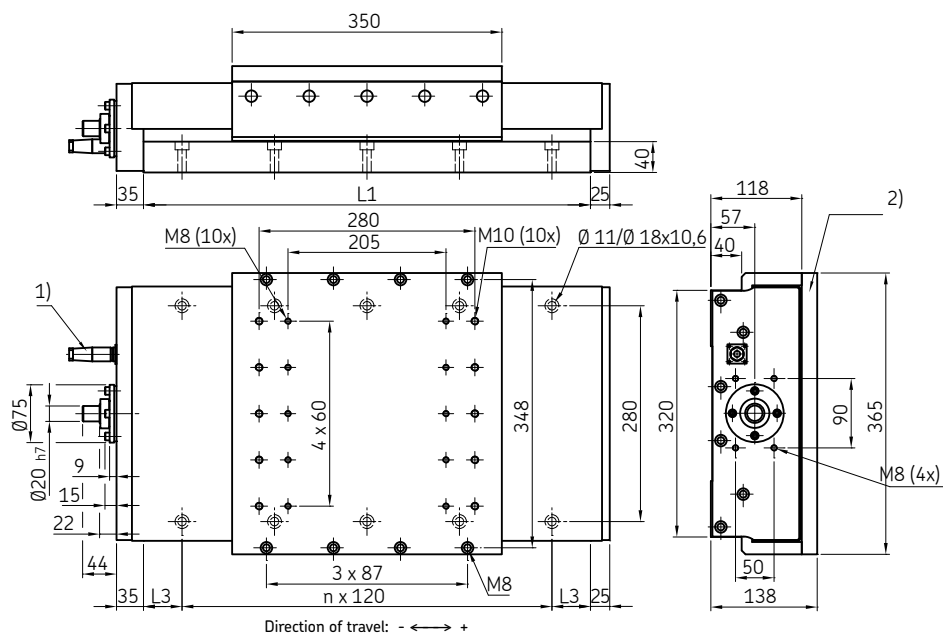
Direction of travel: - ↔ +

Length					Screw data					Weight ³⁾	
L1	L3	n	Stroke ²⁾		SX3205	TN3205	SX3210	TN3210	TN3220+3232+3240	G _A	G ₀
mm		–	mm	S2	n _{max}	n _{max}	n _{max}	n _{max}	n _{max}	kg	
580		4	185	220	1 560	2 810	1 560	2 810	2 810	43,5	
700		5	290	340	1 560	2 810	1 560	2 810	2 810	48,5	
820		6	390	460	1 560	2 810	1 560	2 810	2 810	53,4	
940		7	500	580	1 560	2 810	1 560	2 810	2 810	58,4	
1 060		8	600	700	1 560	2 810	1 560	2 810	2 810	63,3	
1 180		9	710	820	1 560	2 810	1 560	2 810	2 810	68,2	
1 300		10	810	940	1 560	2 810	1 560	2 810	2 810	73,2	
1 420		11	915	1 060	1 560	2 810	1 560	2 810	2 810	78,1	
1 540		12	1 015	1 180	1 560	2 610	1 560	2 520	2 520	83,1	
1 660	50	13	1 125	1 300	1 560	2 180	1 560	2 100	2 100	88,0	13,3
1 780		14	1 225	1 420	1 560	1 850	1 560	1 780	1 780	92,9	
1 900		15	1 335	1 540	1 560	1 590	1 440	1 530	1 530	97,9	
2 020		16	1 435	1 660	1 380	1 380	1 250	1 330	1 330	102,8	
2 140		17	1 540	1 780	1 210	1 200	1 090	1 160	1 160	107,8	
2 260		18	1 645	1 900	1 070	1 060	970	1 030	1 030	112,7	
2 380		19	1 750	2 020	950	950	860	910	910	117,7	
2 500		20	1 850	2 140	850	850	770	820	820	122,6	
2 620		21	1 960	2 260	760	760	690	740	740	127,5	
2 740		22	2 060	2 380	690	690	630	670	670	132,5	
2 860		23	2 165	2 500	630	630	570	600	600	137,4	

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

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

LTB320.L1.SX/TN/TL32xx-SC:
Slides with ball screw drive and steel cover



Length			Screw data							
			Stroke ³⁾	SX3205	TN3205	SX3210	TN3210	TN3220+3232+3240	Weight ⁴⁾	
L1	L3	n	S	n _{max}	n _{max}	n _{max}	n _{max}	n _{max}	G _A	G ₀
mm		–	mm	1/min					kg	
580	50	4	220	1 560	2 810	1 560	2 810	2 810	62,9	30,4
700		5	340	1 560	2 810	1 560	2 810	2 810	68,3	
820		6	460	1 560	2 810	1 560	2 810	2 810	73,8	
940		7	580	1 560	2 810	1 560	2 810	2 810	79,2	
1 060		8	700	1 560	2 810	1 560	2 810	2 810	84,6	
1 180		9	820	1 560	2 810	1 560	2 810	2 810	90,0	
1 300		10	940	1 560	2 810	1 560	2 810	2 810	95,5	
1 420		11	1 060	1 560	2 810	1 560	2 810	2 810	100,9	
1 540		12	1 180	1 560	2 610	1 560	2 520	2 520	106,3	
1 660		13	1 300	1 560	2 180	1 560	2 100	2 100	111,7	
1 780		14	1 420	1 560	1 850	1 560	1 780	1 780	117,2	
1 900		15	1 540	1 560	1 590	1 440	1 530	1 530	122,6	
2 020		16	1 660	1 380	1 380	1 250	1 330	1 330	128,0	
2 140		17	1 780	1 210	1 200	1 090	1 160	1 160	133,5	
2 260		18	1 900	1 070	1 060	970	1 030	1 030	138,9	
2 380	19	2 020	950	950	860	910	910	144,3		
2 500	20	2 140	850	850	770	820	820	149,7		
2 620	21	2 260	760	760	690	740	740	155,2		
2 740	22	2 380	690	690	630	670	670	160,6		
2 860	23	2 500	630	630	570	600	600	166,0		

3) Maximum stroke between end stops

4) G_A = Total mass of slide

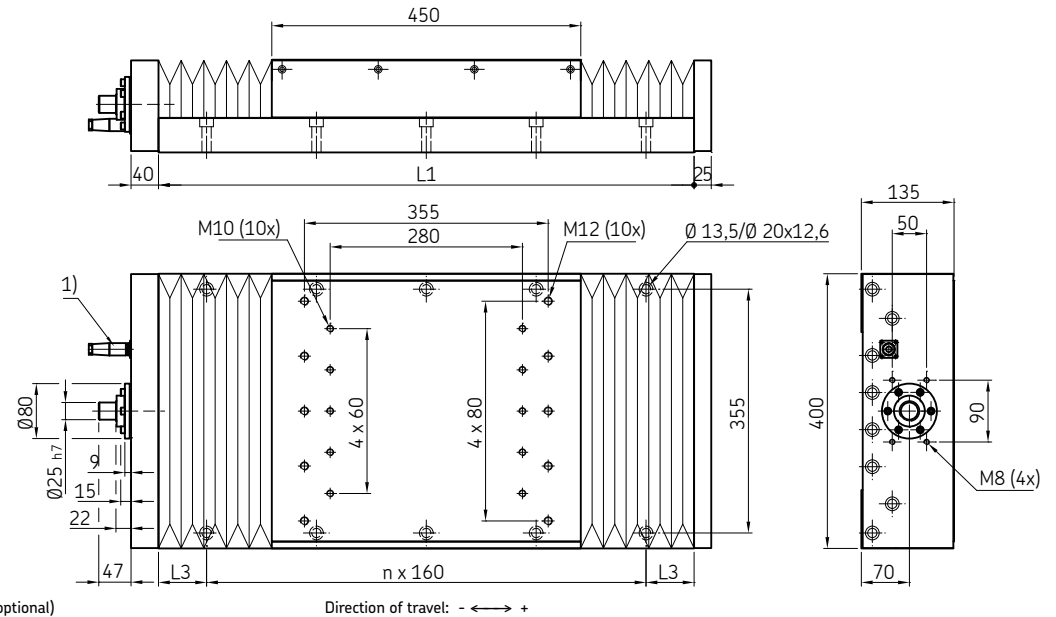
G₀ = Linear moving mass of slide top

5 Tables: driven and not driven

Profile rail guide slides

LTB400.L1.SX/TN/TL40xx-BL:

Slides with ball screw drive, with or without bellows



Length			Stroke ²⁾		Screw data					Weight ³⁾	
L1	L3	n	S1	S2	SX4005	TN4005	SX4010	TN4010	TN4020+4040	G _A	G ₀
mm		–	mm		n _{max}	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)

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

5 Tables: driven and not driven
Profile rail guide slides

LTS with linear motor drive

Ordering key	LTS		.		.	1FN3	-		-		.	
Type												
Slide width: Width of bottom part (see dimension specifications)	154/182/212											
Slide length: L ₁ length of bottom part (see dimension specifications)	280 to 1960											
Linear motor size: 1FN3-	1FN3											
Code for Slide width:												
154	050											
182	100											
212	150											
Motor length:												
154	1K/2K											
182	1K/2K/3K											
212	1K/2K/3K											
Covers:												
With bellows	BL											
Without cover	-											

Example: LTS 154 . 1900 . 1FN3 - 050 - 2K . BL

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

Refer to table for further technical details.

Customer benefits:

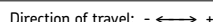
- High dynamics and stiffness in a closed loop system
- Good synchronous characteristics
- High acceleration capacity
- High speeds achievable
- Friction and wear-free drive

Table: Linear motor 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 FN	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 FMAX	v _{MAX, FMAX}	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							

Profile rail guide slides

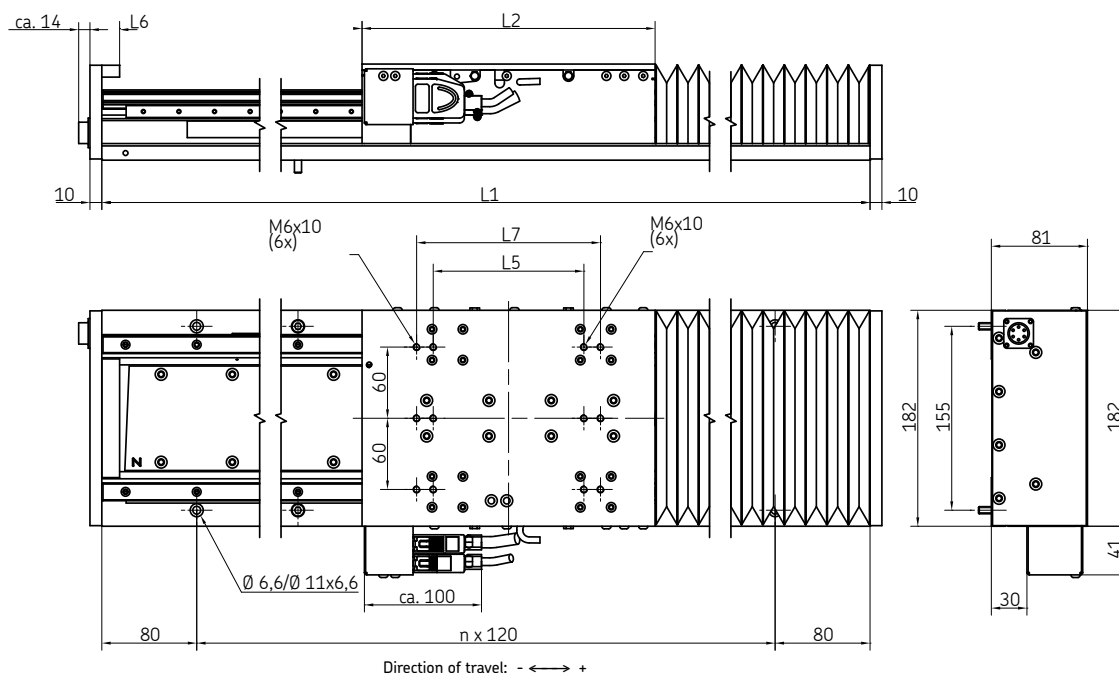
Slides with linear motor drive, with or without bellows



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						
		Stroke ¹⁾							Stroke ¹⁾							Stroke ¹⁾						
L1	n	G ₀ ²⁾	L2	L5	L6	S1	S2	G ₀ ³⁾	L2	L5	L7	S1	S2	G ₀ ³⁾	L2	L5	L7	S1	S2	G ₀ ³⁾		
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	1 058					711	935					637	848			
1 360	10	24,1				881	1 178					801	1 073					726	968			
1 480	11	26,1				971	1 298					890	1 193					816	1 088			
1 600	12	28,2				1 060	1 418					980	1 313					905	1 208			
1 720	13	30,2				1 150	1 538					1 075	1 433					995	1 328			
1 840	14	32,2				1 239	1 658					1 165	1 553					1 084	1 448			
1 960	15	34,3				1 328	1 778					1 254	1 673					1 173	1 568			

1) Operating stroke

S1 with bellows

S2 without bellows

2) G₀ = 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)

Profile rail guide slides

Slides with linear motor drive, with or without bellows



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)

4

4

Distance (inlet switch – block length bellows)



Integration means efficiency



Bees represent what is probably the most eloquent example of a society within the natural world. They exhibit a primordial model of social caste with subdivision of role, as well as full control over defence, labour and even reproduction.

Small organisational wonders of this kind have provided inspiration to SKF in the creation of solutions which transcend single components,

resulting in complete units and systems incorporating a wide range of products, to meet the requirements of each individual customer.

With SKF, even the smallest things become great.

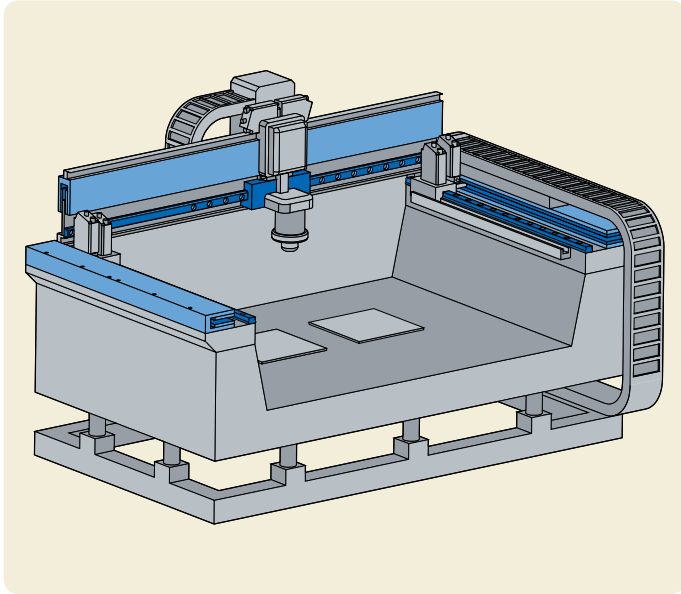
Applications

In response to our customer's ultimate need to produce more with less, SKF has

combined its knowledge and experience with the latest technology to develop solutions for your specific conditions. Whether your goal is to design equipment

that provides more customer value, or to increase overall profitability, with SKF experience and expertise you're likely to find a real solution.

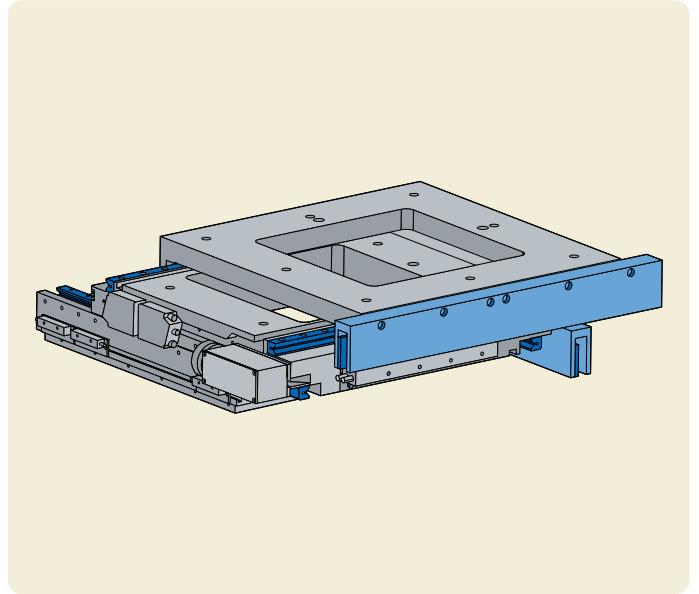
Inspection machine for electronics



Components application

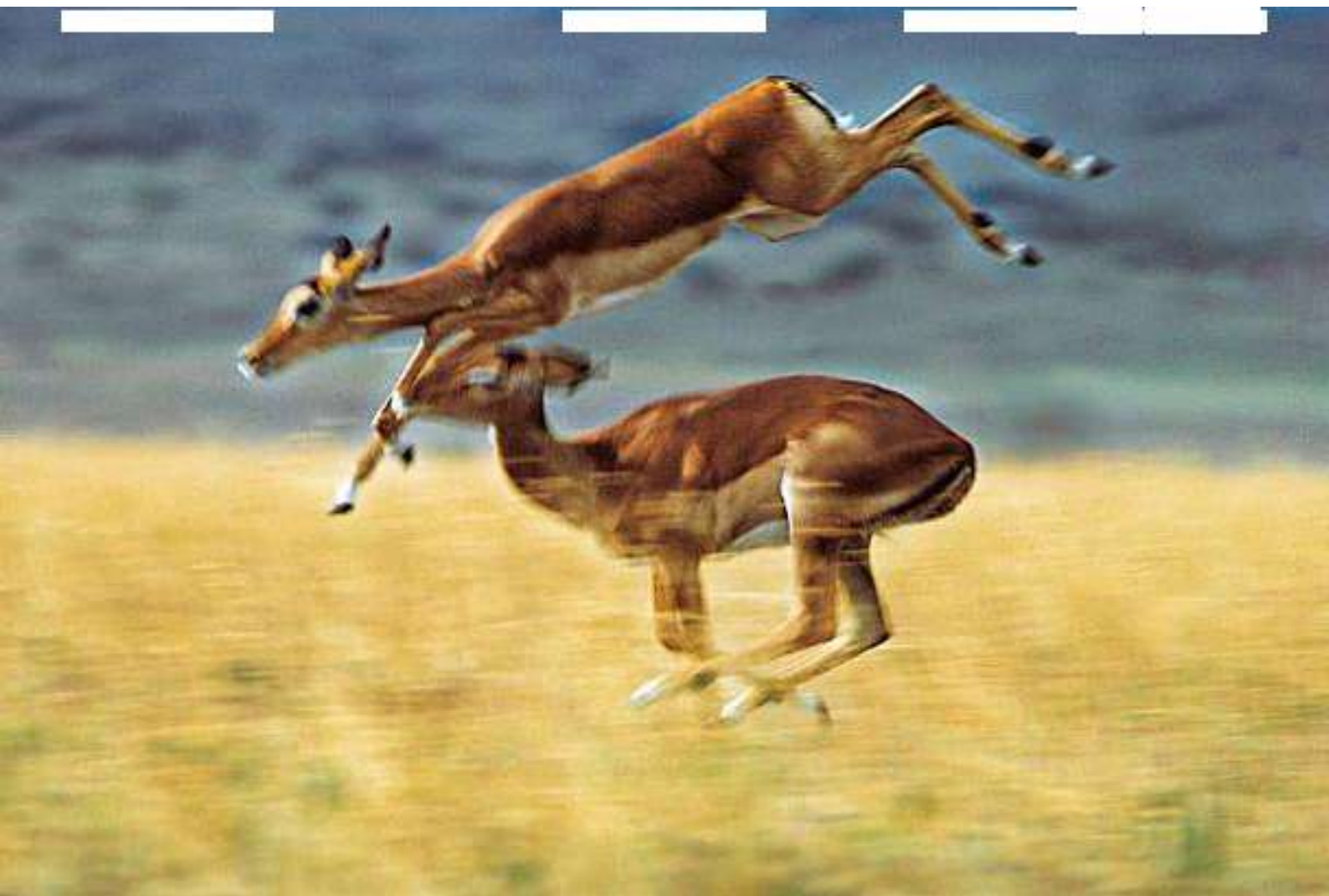
- a) Profile rail guides
- b) Linear motors

Testing and 3D measurement machine



Components application

- a) Precision rail guides
- b) Linear motors



There's no power without performance



Most people think of the cheetah as the fastest animal because it can reach a speed of 100 kilometres per hour and can accelerate up to 70 in 2 seconds. Certainly this is amazing, but the cheetah doesn't possess the stamina of the gazelle which can race at 100 kilometres per hour for several minutes.

SKF has drawn inspiration from this meeting of power with performance.

Tools like the compact electro-mechanical cylinders combine the features of high acceleration, speed, compact dimensions, reliability and long duration.

With SKF, your applications will run properly for many years to come.

Customized solutions

Standard plug & play electromechanical cylinder

SKF cylinders using SKF planetary roller screws are expanding the limits of linear cylinders. They are designed for long life, high acceleration and high force applications. The cylinders use brushless servo-motor technology, with an in-line direct drive as standard. The high performance electromechanical cylinder consists of an SKF planetary roller screw directly driven through a coupling by a brushless motor. The roller screw converts rotary motion into linear movement.

Benefits

- The power of hydraulics
- The velocity of pneumatics

More information is available in **publication 5338**.



Compact electromechanical cylinder

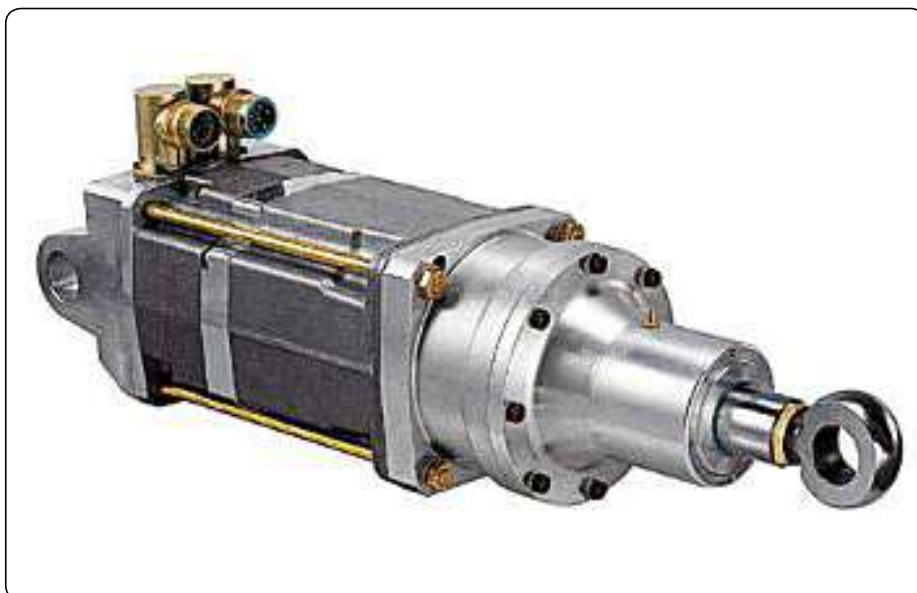
Compact for all applications:

This product range provides high power density in a small package. Approximately 40 % smaller than standard electromechanical cylinders, there is the added advantage of reduced weight. Ideal for fixed and robot mounted applications. Whatever the requirement, CEMC cylinders provide a compact and dynamic solution, maximum performance and value through high availability, productivity and consequent low costs through the life of the product.

Benefits

- High power and reliability
- Compact and dynamic solution

More information is available in **publication 5338**.



Complete systems for positioning

On special demand, SKF designs and manufactures complete systems, either from SKF standard components or special solutions that are exactly tailored to the respective application.



Linear motor tables

The compact cross tables with linear motor drive are high-precision positioning units, equipped with ironless linear motor and precision cross roller rail guides with patented Anti cage creeping System (ACS). They are available in aluminium and cast iron and are ideally suited for wafer processing and measurements applications. The electrical stroke is set with optical limit switches, integrated in the length measurement system.





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