MOTION & CONTROL™
NSK

LINEAR GUIDES
STANDARD ITEMS

Precision Machine Components

Linear Guides Standard Items

Content

As one of the world's leading manufacturers of rolling bearings, linear technology components and steering systems, we can be found on almost every continent – with production facilities, sales offices and technology centres – because our customers appreciate short decision-making channels, prompt deliveries and local service.

The NSK company

NSK commenced operations as the first Japanese manufacturer of rolling bearings back in 1916. Ever since, we have been continuously expanding and improving not only our product portfolio but also our range of services for various industrial sectors. In this context, we develop technologies in the fields of rolling bearings, linear systems, components for the automotive industry and mechatronic systems. Our research and production facilities in Europe, Americas and Asia are linked together in a global technology network. Here we concentrate not only on the development of new technologies, but also on the continuous optimisation of quality – at every process stage.

Among other things, our research activities include product design, simulation applications using a variety of analytical systems and the development of different steels and lubricants for rolling bearings.

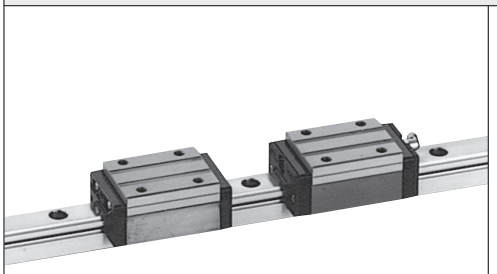
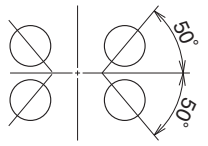
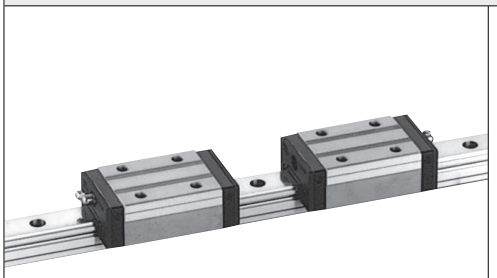
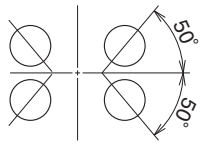
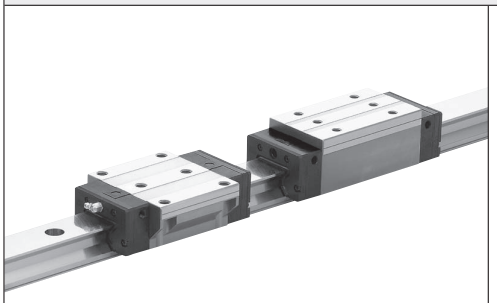
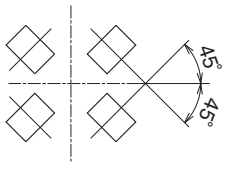
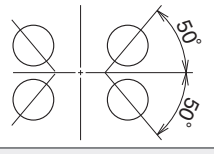
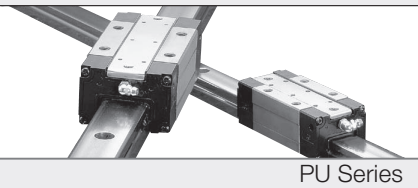
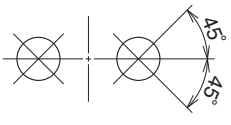
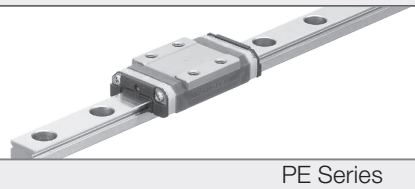
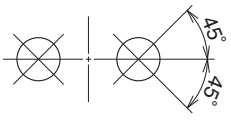
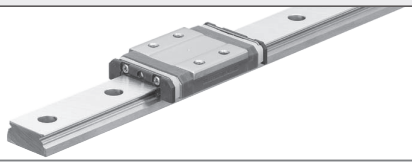
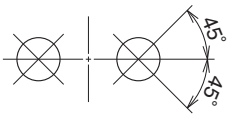
Partnership based on trust – and trust based on quality

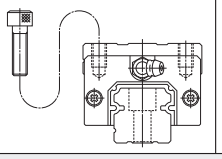
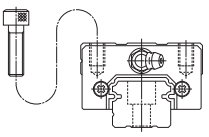
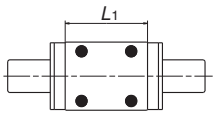
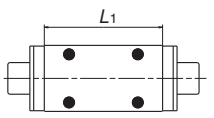
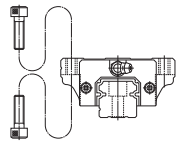
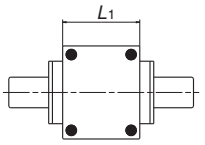
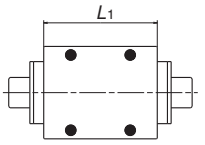
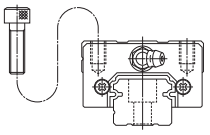
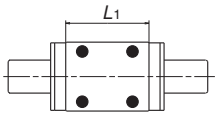
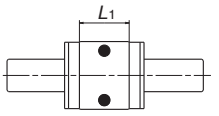
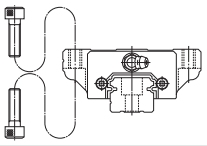
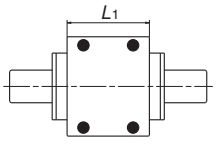
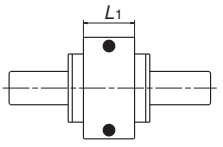
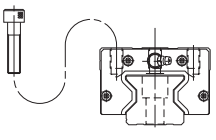
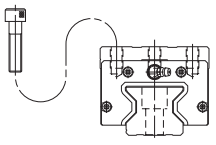
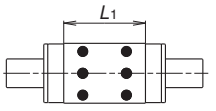
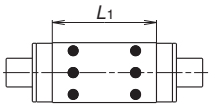
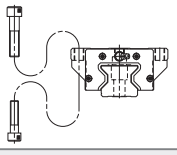
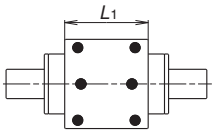
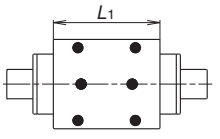
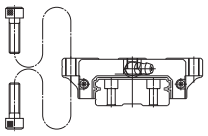
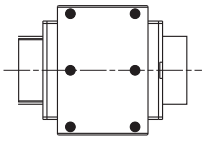
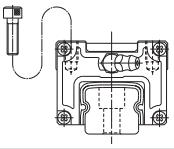
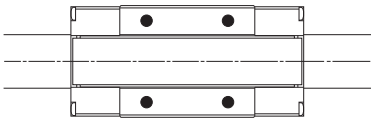
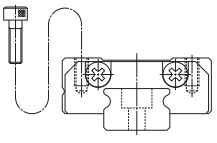
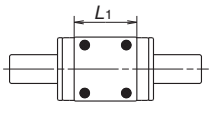
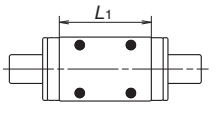
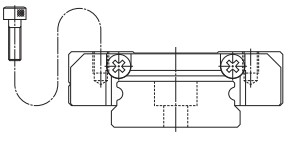
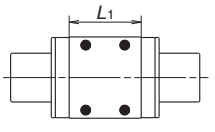
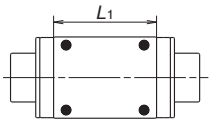
Total Quality by NSK: The synergies of our global network of NSK Technology Centres. Just one example of how we meet our requirements for high quality.

NSK is one of the leading companies with a long tradition in patent applications for machine parts. In our worldwide research centres, we not only concentrate on the development of new technologies, but also on the continual improvement of quality based on the integrated technology platform of tribology, material technology, analysis and mechatronics.

More about NSK at www.nskeurope.com or call us on +44 (0) 1636 605 123

Types of Linear Guides

Series	Features
LH/SH Series  	LH Series • NSK basic series • General versatility for heavy-duty applications • Large load carrying capacity against vertical direction Stainless steel is available (#15–30). SH Series • Silent and smooth featured LH incorporated with retainer piece
LS/SS Series  	LS Series • Compact designed NSK basic series • General versatility for fine application • Large load carrying capacity against vertical direction Stainless steel is available (#15–35). SS Series • Silent and smooth featured LS incorporated with retainer piece
RA Series  	• A roller guide with super high load capacity and rigidity • Super high accuracy and smooth motion • Highly dust proof and maintenance free
LW Series  	• Wide rail type linear guide • Ideal for use of single rail • Large load carrying capacity against vertical direction
TS Series  	• Low price linear guide best fit for transportation equipments • Long-term maintenance free by regularly equipped NSK K1
PU Series  	• Lightweight designed miniature linear guide • Reduced noise and smooth motion • High corrosion resistance (stainless steel)
PE Series  	• Lightweight designed wide rail miniature linear guide • Ideal for use of single rail • Reduced noise and smooth motion • High corrosion resistance (stainless steel)

Ball slide model				Size & Preload		Dimension table
AN, BN	AL, BL	AN, AL	BN, BL	Size	Preload	
				LH/SH15 LH/SH20 LH/SH25 LH/SH30 LH/SH35 LH/SH45 LH/SH55 LH65	Slight preload ZZ	Page 14-17 22-27
EM, GM		EM	GM			
						
AL, CL		AL	CL	Size	Preload	
				LS/SS15 LS/SS20 LS/SS25 LS/SS30 LS/SS35	Slight preload ZZ	Page 15-18 25-28
EM, JM		EM	JM			
						
AL , BL	AN, BN	AL, AN	BL, BN	Size	Preload	
				RA15 RA20 RA25 RA30 RA35 RA45 RA55 RA65	Medium preload Z	Page 29-34
EM, GM		EM	GM			
						
EL		EL		Size	Preload	
				LW17 LW21 LW27 LW35 LW50	Slight preload ZZ	Page 35-36
AN		AN		Size	Preload	
				TS15 TS20 TS25 TS30 TS35	Maximum clearance 60 µm S	Page 37-38
AL, TR, UR, BL		AL, TR	BL, UR	Size	Preload	
				PU05 PU07 PU09 PU12 PU15	Maximum clearance 3 µm ZT	Page 39-40
AR, TR, UR, BR		AR, TR	BR, UR	Size	Preload	
				PE05 PE07 PE09 PE12 PE15	Maximum clearance 3 µm ZT	Page 41-42

Accuracy

Accuracy Standard

• Table 1, Figure 1 and Figure 2 show accuracy characteristics.

Table 1 Definition of accuracy

Characteristics	Definition (Figures 1, 2)
Mounting height *H*	Distance from A (rail bottom datum face) to C (ball slide top face)
Variation of *H*	Variation of *H* in ball slides assembled to the rails of a set of linear guides
Mounting width W_2 or W_3	Distance from B (rail side datum face) to D (ball slide side datum face). Applicable only to the reference linear guide.
Variation of W_2 or W_3	Difference of the width (W_2 or W_3) between the assembled ball slides, which are installed in the same rail. Applicable only to the reference linear guide.
Running parallelism of ball slide, face C to face A	Variation of C (ball slide top face) to A (rail bottom datum face) when ball slide is moving
Running parallelism of ball slide, face D to face B	Variation of D (ball slide side datum face) to B (rail side datum face) when ball slide is moving

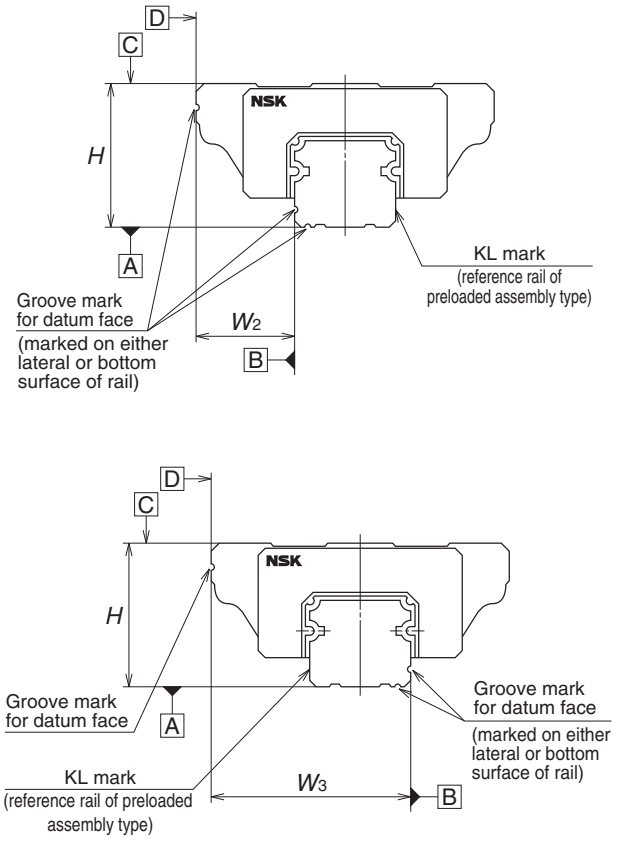


Fig. 1 Assembled accuracy (height and width)

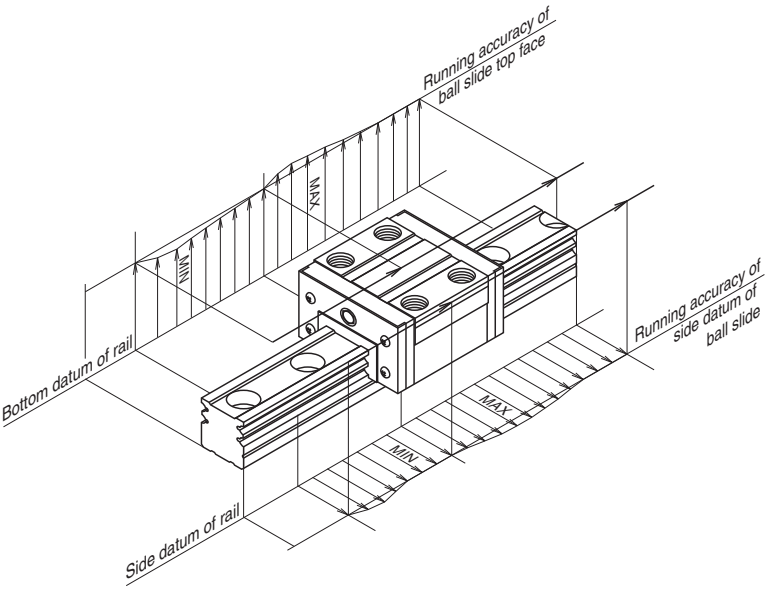


Fig. 2 Running parallelism of ball slide

Assembly dimension tolerance of random-matching type

Unit: μm

Series	LH/SH Series		LS/SS Series	RA Series	LW Series	TS Series	PU/PE Series
Size	15 – 35	45 – 65	15 – 35	15 – 65	17 – 50	15 – 35	05 – 15
Mounting height *H*	±20	±30	±20	±20	±20	±100	±20
Variation of mounting height *H*	15*1 30*2	20*1 30*2	15*1 30*2	15*1 30*2	15*1 30*2	–	15*1 30*2
Mounting width W_2 or W_3	±30	±35	±30	±25	±30	–	±20
Variation of Mounting width W_2 or W_3	25	30	25	20	25	–	20

*1 Variation of mounting height *H* is specified on one rail.
*2 Variation of mounting height *H* is specified on multiple rails.

Running parallelism tolerance of random-matching type: A//C or B//D

Unit: μm

Rail length (mm) over or under	LH/SH Series LS/SS Series LW Series PU/PE Series	RA Series	TS Series
– 50	6	4.5	Max. 100
50 – 80	6	5	
80 – 125	6.5	5.5	
125 – 200	7	6	
200 – 250	8	7	
250 – 315	9	8	
315 – 400	11	9	
400 – 500	12	10	
500 – 630	14	12	
630 – 800	16	14	
800 – 1 000	18	16	
1 000 – 1 250	20	17	
1 250 – 1 600	23	19	
1 600 – 2 000	26	21	
2 000 – 2 500	29	22	
2 500 – 3 150	32	25	
3 150 – 4 000	34	30	

Available rail length (max. length)

Unit: mm

Series	LH/SH Series		LS/SS Series		RA Series	TS Series	PU Series	PE Series
Size	Std. steel	Stainless	Std. steel	Stainless	Std. steel	Std. steel	Stainless	Stainless
05	–	–	–	–	–	–	210	150
07	–	–	–	–	–	–	375	600
09	–	–	–	–	–	–	600	800
12	–	–	–	–	–	–	800	1 000
15	2 000	1 800	2 000	1 800	2 000	1 960	1 000	1 200
20	3 960	3 500	3 960	3 500	3 000	2 920	–	–
25	3 960	3 500	3 960	3 500	3 000	4 000	–	–
30	4 000	3 500	4 000	3 500	3 500	4 040	–	–
35	4 000	–	4 000	3 500	3 500	4 040	–	–
45	3 990	–	–	–	3 500	–	–	–
55	3 960	–	–	–	3 500	–	–	–
65	3 900	–	–	–	3 500	–	–	–

LW Series	
Size	Std. steel
17	1 000
21	1 600
27	2 000
35	2 400
50	3 000

NSK PH-Series (Precision accuracy grade / Random matching)

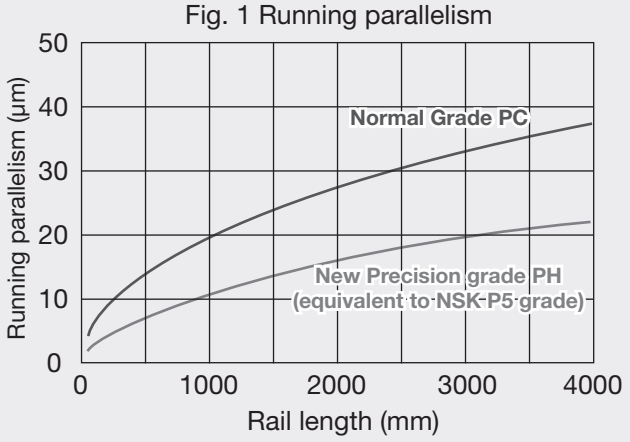
Line-up of Random-matching

Series	Size	Ball slide model								Accuracy		Preload		Grease choice/ Surface treatment
		AN	AL	BN	BL	CL	EM	GM	JM	Precision grade PH	Normal grade PC	Medium grade H	Slight grade Z	
LH	15	○		○			○	○		○	○	○	○	○
	20	○		○			○	○		○	○	○	○	○
	25	○	○	○	○		○	○		○	○	○	○	○
	30	○	○	○	○		○	○		○	○	○	○	○
	35	○	○	○	○		○	○		○	○	○	○	○
	45	○	○	○	○		○	○		○	○	○	○	○
SH	15	○		○			○	○		○	○	○	○	
	20	○		○			○	○		○	○	○	○	
	25	○	○	○	○		○	○		○	○	○	○	
	30	○	○	○	○		○	○		○	○	○	○	
	35	○	○	○	○		○	○		○	○	○	○	
	45	○	○	○	○		○	○		○	○	○	○	
LS	15		○			○	○		○	○	○	○	○	○
	20		○			○	○		○	○	○	○	○	○
	25		○			○	○		○	○	○	○	○	○
	30		○			○	○		○	○	○	○	○	○
	35		○			○	○		○	○	○	○	○	○
SS	15		○			○	○		○	○	○		○	
	20		○			○	○		○	○	○		○	
	25		○			○	○		○	○	○		○	
	30		○			○	○		○	○	○		○	
	35		○			○	○		○	○	○		○	

Accuracy

Running parallelism of PH grade is equivalent to P5 grade of NSK matched rail / ball slide assembly. Accuracy grade (running parallelism) can be specifi ed as PH or PC. Assembly accuracy of PH grade is shown below.

Fig. 1 Running parallelism



Unit:(μm)

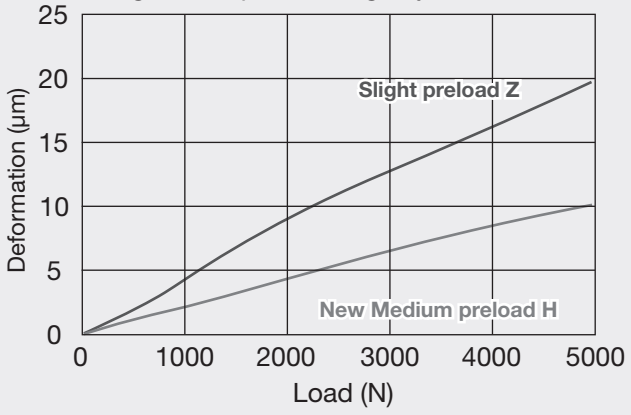
Accuracy characteristics \ Size		#15~35	#45
Mounting height H	Allowance	±20	±30
	Variation	①15 ②30	①20 ②35
Mounting width W2 or W3	Allowance	±30	±35
	Variation	20	20
Running parallelism		Refer to Fig. 1	

Note: 1) Variation on the same rail 2) Variation on multiple rails

Preload and rigidity

The preload can be specified as H (medium) or Z (slight).

Fig. 2 Compression rigidity of LH35AN



Part number

Part number for ball slide only

Example: LAH 25 AN H **

Series
LAH: LH Series
SAH: SH Series
LAS: LS Series
SAS: SS Series

Size
Shape/height AN, AL, BN, BL, CL, EM, GM, JM
Preload Z: Slight preload, H Medium preload
NSK control number

Part number for rail only

Example: L1H 25 0520 L C N *** PH Z

Series
L1H: LH, SH Series
L1S: LS, SS Series

Size
Rail length (mm)
Shape (L: Standard)
Material: Carbon steel
Butting rail specification N: Non-butting, L: Butting
NSK control number
Accuracy grade PH: Precision grade
PC: Normal grade
Preload Z: Slight preload
(Common rail for sight or medium preload)

Part number for assembly

Example: LH 25 0520 AN C 2 *** PH H

Series
LH, SH, LS, SS

Size
Rail length (mm)
Shape/height AN, AL, BN, BL, CL, EM, GM, JM
Material C: Carbon steel
Number of ball slides per rail
NSK control number
Accuracy grade PH: Precision grade
PC: Normal grade
Preload Z: Slight preload
H: Medium preload

Accessories

Double Seal and Protector

- Double seal (a combination of two end seals) to enhance seal function.
- Protector (a steel plate added on end seal) to prevent high temperature fine particles, such as welding spatter and other foreign matter, from entering the ball slide.
- When a double seal or protector is installed, the ball slide becomes longer by the sizes shown in Tables 2 and 3.
- When attaching a grease fitting to the end-cap after the double seal or protector is equipped, a connector, shown in Fig. 3, is required. Please specify the connector set when ordering.

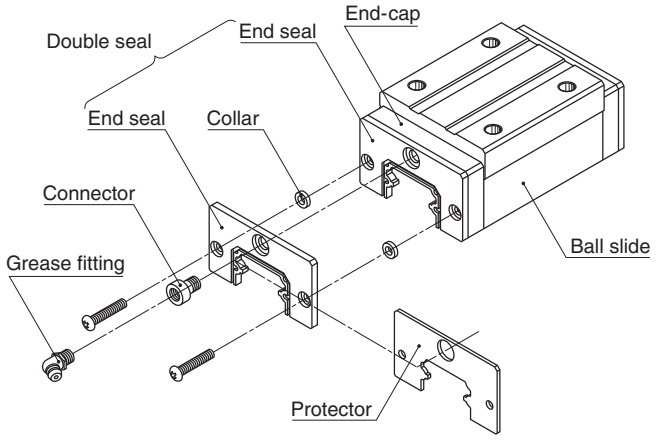


Fig. 3

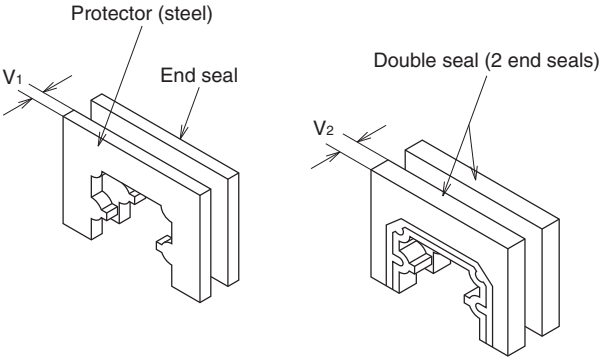


Fig. 4

Table 2 Double-seal set

Unit: mm

Model No.	Part No.		Increased thickness V_2
	Without connector	With connector	
LH/SH15	LH15WS-01	***	2.5
LH/SH20	LH20WS-01	LH20WSC-01	2.5
LH/SH25	LH25WS-01	LH25WSC-01	2.8
LH/SH30	LH30WS-01	LH30WSC-01	3.6
LH/SH35	LH35WS-01	LH35WSC-01	3.6
LH/SH45	LH45WS-01	LH45WSC-01	4.3
LH/SH55	LH55WS-01	LH55WSC-01	4.3
LH65	LH65WS-01	LH65WSC-01	4.9
LS/SS15	LS15WS-01	***	2.8
LS/SS20	LS20WS-01	LS20WSC-01	2.5
LS/SS25	LS25WS-01	LS25WSC-01	2.8
LS/SS30	LS30WS-01	LS30WSC-01	3.6
LS/SS35	LS35WS-01	LS35WSC-01	3.6
LW17	LW17WS-01	***	2.6
LW21	LW21WS-01	LW21WSC-01	2.8
LW27	LW27WS-01	LW27WSC-01	2.5
LW35	LW35WS-01	LW35WSC-01	3
LW50	LW50WS-01	LW50WSC-01	3.6

*** Consult with NSK when attaching a connector to a drive-in type grease fitting.

Unit: mm

Model No.	Part No.		Increased thickness V_1
	Without connector	With connector	
LH/SH15	LH15PT-01	***	2.7
LH/SH20	LH20PT-01	LH20PTC-01	2.9
LH/SH25	LH25PT-01	LH25PTC-01	3.2
LH/SH30	LH30PT-01	LH30PTC-01	4.2
LH/SH35	LH35PT-01	LH35PTC-01	4.2
LH/SH45	LH45PT-01	LH45PTC-01	4.9
LH/SH55	LH55PT-01	LH55PTC-01	4.9
LH65	LH65PT-01	LH65PTC-01	5.5
LS/SS15	LS15PT-01	***	3
LS/SS20	LS20PT-01	LS20PTC-01	2.7
LS/SS25	LS25PT-01	LS25PTC-01	3.2
LS/SS30	LS30PT-01	LS30PTC-01	4.2
LS/SS35	LS35PT-01	LS35PTC-01	4.2
LW17	LW17PT-01	***	3.2
LW21	LW21PT-01	LW21PTC-01	3.2
LW27	LW27PT-01	LW27PTC-01	2.9
LW35	LW35PT-01	LW35PTC-01	3.6
LW50	LW50PT-01	LW50PTC-01	4.2

Cap to Cover Bolt Hole for Rail Mounting

- After the rail is mounted to the machine base, a cap is used to cover the bolt hole to prevent foreign matter from clogging up the hole or from entering the ball slide (Fig. 5).
- The cap for the bolt hole is made of synthetic resin, which is superb in its resistance to oil and wear.
- Table 4 shows sizes of the bolts for each model number as well as reference numbers of caps.
- To insert a cap into the rail bolt hole, use a flat tool (Fig. 6). Pound the cap gradually until its top becomes flush with the rail top face.

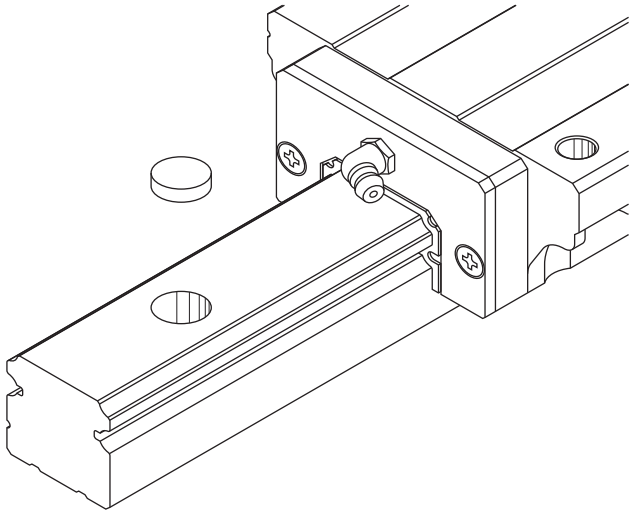


Fig. 5

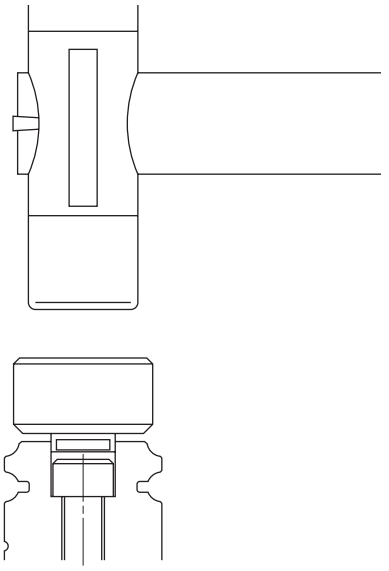
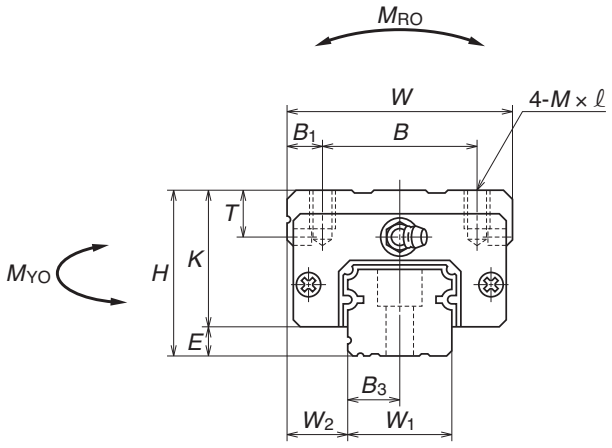


Fig. 6

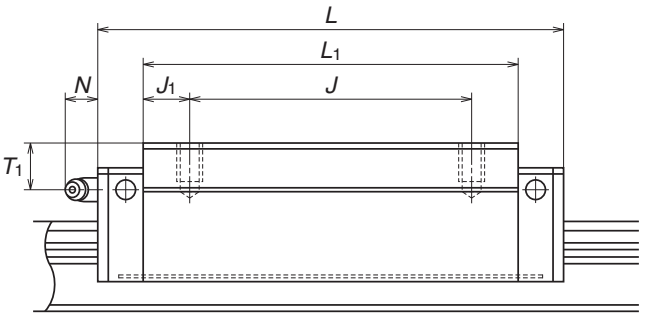
Model No.	Bolt to secure rail	Cap Part No.	Quantity /case
SS15 (for M3) LS15 (for M3) PU09 (TR, UR) PU12 (TR, UR) PU15 PE09 (TR, UR)	M3	LG-CAP/M3	20
SH15 SS15 (for M4) LH15 LS15 (for M4) RA15 LW17 LW21 LW27 TS15	M4	LG-CAP/M4	20
SH20 SS20 LH20 LS20 RA20 TS20	M5	LG-CAP/M5	20
SH25 SS25 SS30 LH25 LS25 LS30 RA25 LW35 TS25	M6	LG-CAP/M6	20
SH30 SH35 SS35 LH30 LH35 LS35 RA30 RA35 LW50 TS30 TS35	M8	LG-CAP/M8	20
LH45 RA45	M12	LG-CAP/M12	20
LH55 RA55	M14	LG-CAP/M14	20
LH65 RA65	M16	LG-CAP/M16	20

Ball Slide Models: AL, AN, BL, BN

Front view of AL and AN, BL and BN types



Side view of BN type



Model No.	Assembly			Ball slide												
	Height			Width	Length	Mounting hole			B_1	L_1	J_1	K	T	Grease fitting		
	H	E	W_2	W	L	B	J	M × pitch × ℓ						Mounting hole size	T_1	N
LH15AN	28	4.6	9.5	34	55	26	26	M4×0.7×6	4	39	6.5	23.4	8	ϕ3	8.5	3.3
LH15BN					74					58	16					
LH20AN	30	5	12	44	69.8	32	36	M5×0.8×6	6	50	7	25	12	M6×0.75	5	11
LH20BN					91.8		50			72	11					
LH25AL	36	7	12.5	48	79	35	35	M6×1×6	6.5	58	11.5	29	12	M6×0.75	6	11
LH25AN	40							M6×1×9				33			10	
LH25BL	36				107		50	M6×1×6		86	18	29			6	
LH25BN	40							M6×1×9				33			10	
LH30AL	42	9	16	60	85.6	40	40	M8×1.25×8	10	59	9.5	33	14	M6×0.75	7	11
LH30AN	45							M8×1.25×10				36			10	
LH30BL	42				124.6		60	M8×1.25×8		98	19	33			7	
LH30BN	45							M8×1.25×10				36			10	
LH35AL	48	9.5	18	70	109	50	50	M8×1.25×8	10	80	15	38.5	15	M6×0.75	8	11
LH35AN	55							M8×1.25×12				45.5			15	
LH35BL	48				143		72	M8×1.25×8		114	21	38.5			8	
LH35BN	55							M8×1.25×12				45.5			15	
LH45AN	70	14	20.5	86	139	60	60	M10×1.5×17	13	105	22.5	56	17	Rc1/8	20	13
LH45BN					171		80			137	28.5					
LH55AN	80	15	23.5	100	163	75	75	M12×1.75×18	12.5	126	25.5	65	18	Rc1/8	21	13
LH55BN					201		95			164	34.5					
LH65AN	90	16	31.5	126	193	76	70	M16×2×20	25	147	38.5	74	23	Rc1/8	19	13
LH65BN					253		120			207	43.5					

Note 1: External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

Part number for ball slide only

Example: LAH 25 AN S Z – K

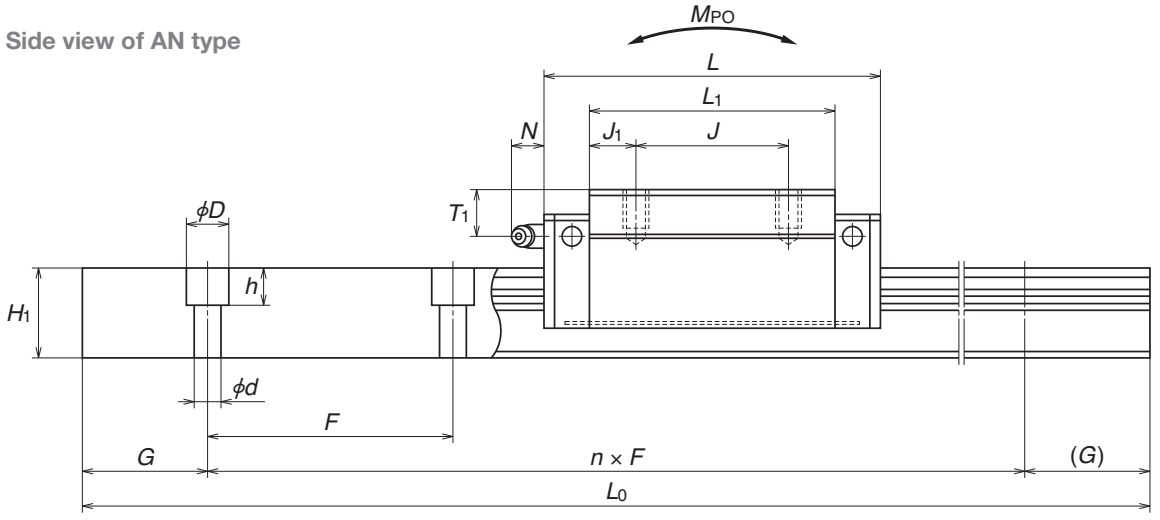
- LAH: Random-matching ball slide
- 25: Size
- AN: Shape/height
- S: Stainless steel (LH15 to LH30 only) / No code: Carbon steel
- Z: Preload Z: Slight preload / Preload H: Medium preload
- K: Accessories
  - K: With NSK K1
  - F: Fluoride low-temperature chrome plating + AS2 grease
  - F50: Fluoride low-temperature chrome plating + LG2 grease

Part number for rail only

Example: L1H 25 1000 L C N *** PC Z

- L1H: Random-matching rail
- 25: Size
- 1000: Rail length (mm)
- L: Shape (L: Standard)
- C: Material/surface treatment
- N: Butting rail specification (N: Non-butting L: Butting)
- ***: NSK control number (*** is required when making inquiries)
- PC: Accuracy grade (PC: Normal grade, PH: Precision grade)
- Z: Preload (Z: Slight preload (standard))

Side view of AN type



n = (number of holes)-1

Unit: mm

Rail							Basic load rating					Ball diameter	Weight	
Width	Height	Pitch	Mounting bolt hole			Max. length (Single rail)	Dynamic	Static	Static moment				Ball slide	Rail
W_1	H_1	F	$d \times D \times h$	B_3	G	L_{0max} ( ) for stainless	C (N)	C_0 (N)	M_{R0} (N·m)	M_{P0} (N·m)	M_{Y0} (N·m)	D_W	(kg)	(kg/m)
15	15	60	4.5×7.5×5.3	7.5	20	2 000 (1 800)	10 800 14 600	20 700 32 000	108 166	95 216	80 181	3.175	0.18 0.26	1.6
20	18	60	6×9.5×8.5	10	20	3 960 (3 500)	17 400 23 500	32 500 50 500	219 340	185 420	155 355	3.968	0.33 0.48	2.6
23	22	60	7×11×9	11.5	20	3 960 (3 500)	25 600 34 500	46 000 71 000	360 555	320 725	267 610	4.762	0.46 0.55 0.69 0.82	3.6
28	26	80	9×14×12	14	20	4 000 (3 500)	31 000 46 000	51 500 91 500	490 870	350 1 030	292 865	5.556	0.69 0.77 1.16 1.3	5.2
34	29	80	9×14×12	17	20	4 000	47 500 61 500	80 500 117 000	950 1 380	755 1 530	630 1 280	6.350	1.2 1.5 1.7 2.1	7.2
45	38	105	14×20×17	22.5	22.5	3 990	81 000 99 000	140 000 187 000	2 140 2 860	1 740 3 000	1 460 2 520	7.937	3.0 3.9	12.3
53	44	120	16×23×20	26.5	30	3 960	119 000 146 000	198 000 264 000	3 600 4 850	3 000 5 150	2 510 4 350	9.525	4.7 6.1	16.9
63	53	150	18×26×22	31.5	35	3 900	181 000 235 000	281 000 410 000	6 150 8 950	4 950 10 100	4 150 8 450	11.906	7.7 10.8	24.3

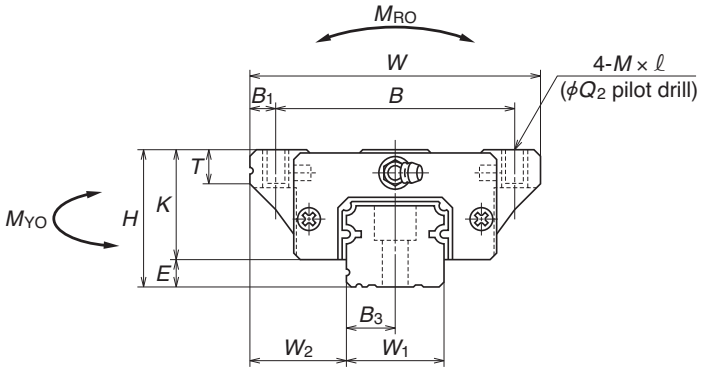
Note 2: Basic dynamic load rating *C* is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.
To convert *C* to C_{100} for a 100-km fatigue life, divide *C* by 1.26.

Part number for assembly (ball slide + rail)

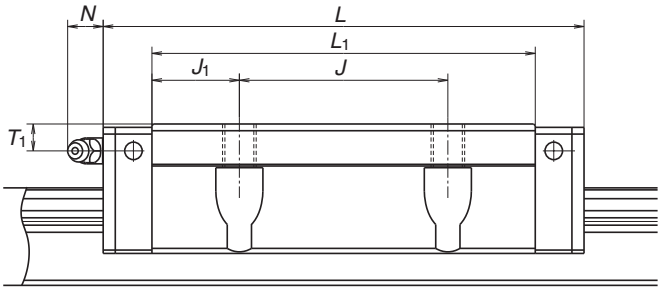
Example:

LH 25 1000 AN C 2 * PC Z**

- LH — Series
- 25 — Size
- 1000 — Rail length (mm)
- AN — Shape/height
- C — Material/surface treatment
  C: Carbon steel (NSK standard)
  K: Stainless steel
  D: Carbon steel + surface treatment
  H: Stainless steel + surface treatment
- 2 — Number of ball slides per rail
- *** — NSK control number
  (*** is required when making inquiries)
- PC — Accuracy grade
  PC: Normal grade, KC: PC with NSK K1
  PH: Precision grade, KH: PH with NSK K1
- Z — Preload Z: Slight preload
  Preload H: Medium preload



Side view of GM type



Model No.	Assembly			Ball slide														
	Height			Width	Length	Mounting hole									Grease fitting			
	H	E	W_2	W	L	B	J	$Q_1 \times \ell$ $M \times$ pitch $\times \ell$	Q_2	B_1	L_1	J_1	K	T	Mounting hole size	T_1	N	
LH15EM	24	4.6	16	47	55	38	30	M5×0.8×7	4.4	4.5	39	4.5	19.4	8	φ3	4.5	3.3	
LH15GM					74						58	14						
LH20EM	30	5	21.5	63	69.8	53	40	M6×1×9.5	5.3	5	50	5	25	10	M6×0.75	5	11	
LH20GM					91.8						72	16						
LH25EM	36	7	23.5	70	79	57	45	M8×1.25×10	6.8	6.5	58	6.5	29	11	M6×0.75	6	11	
LH25GM					107			(M8×1.25×11.5)			86	20.5		(12)				
LH30EM	42	9	31	90	98.6	72	52	M10×1.5×12	8.6	9	72	10	33	11	M6×0.75	7	11	
LH30GM					124.6			(M10×1.5×14.5)			98	23		(15)				
LH35EM	48	9.5	33	100	109	82	62	M10×1.5×13	8.6	9	80	9	38.5	12	M6×0.75	8	11	
LH35GM					143						114	26						
LH45EM	60	14	37.5	120	139	100	80	M12×1.75×15	10.5	10	105	12.5	46	13	Rc1/8	10	13	
LH45GM					171						137	28.5						
LH55EM	70	15	43.5	140	163	116	95	M14×2×18	12.5	12	126	15.5	55	15	Rc1/8	11	13	
LH55GM					201						164	34.5						
LH65EM	90	16	53.5	170	193	142	110	M16×2×24	14.6	14	147	18.5	74	23	Rc1/8	19	13	
LH65GM					253						207	48.5						

Note 1: Parenthesized dimensions are for items made of stainless steel.
Note 2: External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

Part number for ball slide only

Example: LAH 25 EM S Z – K

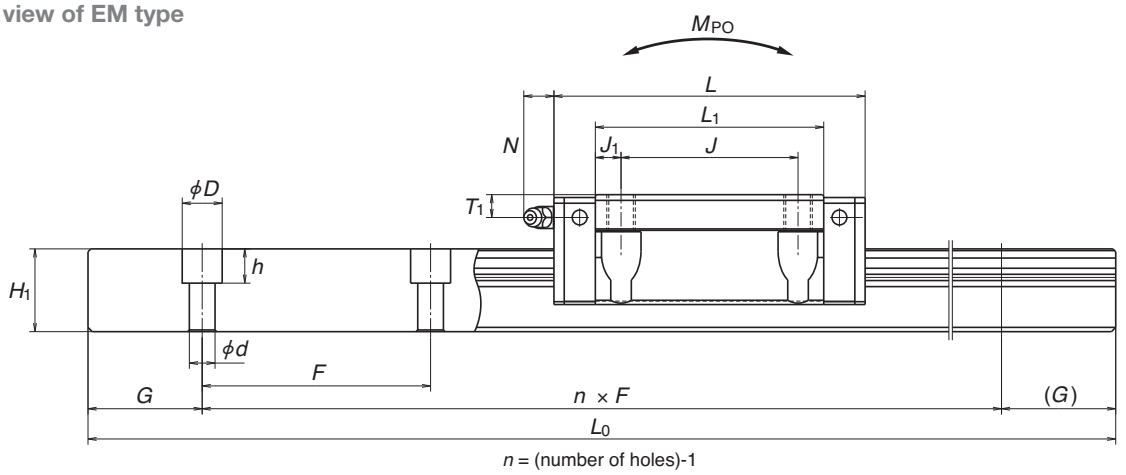
- LAH: Random-matching ball slide
- 25: Size
- EM: Shape/height
- S: Stainless steel (LH15 to LH30 only) / No code: Carbon steel
- Z: Preload Z: Slight preload / Preload H: Medium preload
- K: Accessories — K: With NSK K1; F: Fluoride low-temperature chrome plating + AS2 grease; F50: Fluoride low-temperature chrome plating + LG2 grease

Part number for rail only

Example: L1H 25 1000 L C N *** PC Z

- L1H: Random-matching rail
- 25: Size
- 1000: Rail length (mm)
- L: Shape (L: Standard)
- C: Material/surface treatment
- N: Butting rail specification — N: Non-butting L: Butting
- ***: NSK control number (*** is required when making inquiries)
- PC: Accuracy grade — PC: Normal grade; PH: Precision grade
- Z: Preload — Z: Slight preload (standard)

Side view of EM type



n = (number of holes)-1

Unit: mm

Rail							Basic load rating					Ball diameter	Weight	
Width	Height	Pitch	Mounting bolt hole			Max. length (Single rail)	Dynamic	Static	Static moment				Ball slide	Rail
W_1	H_1	F	$d \times D \times h$	B_3	G	L_{0max} ( ) for stainless	C (N)	C_0 (N)	M_{R0} (N·m)	M_{P0} (N·m)	M_{Y0} (N·m)	D_W	(kg)	(kg/m)
15	15	60	4.5×7.5×5.3	7.5	20	2 000 (1 800)	10 800 14 600	20 700 32 000	108 166	94.5 216	79.5 181	3.175	0.17 0.25	1.6
20	18	60	6×9.5×8.5	10	20	3 960 (3 500)	17 400 23 500	32 500 50 500	219 340	185 420	155 355	3.968	0.45 0.65	2.6
23	22	60	7×11×9	11.5	20	3 960 (3 500)	25 600 34 500	46 000 71 000	360 555	320 725	267 610	4.762	0.63 0.93	3.6
28	26	80	9×14×12	14	20	4 000 (3 500)	35 500 46 000	63 000 91 500	600 870	505 1 030	425 865	5.556	1.2 1.6	5.2
34	29	80	9×14×12	17	20	4 000	47 500 61 500	80 500 117 000	950 1 380	755 1 530	630 1 280	6.35	1.7 2.4	7.2
45	38	105	14×20×17	22.5	22.5	3 990	81 000 99 000	140 000 187 000	2 140 2 860	1 740 3 000	1 460 2 520	7.937	3 3.9	12.3
53	44	120	16×23×20	26.5	30	3 990	119 000 146 000	198 000 264 000	3 600 4 850	3 000 5 150	2 510 4 350	9.525	5 6.5	16.9
63	53	150	18×26×22	31.5	35	3 900	181 000 235 000	281 000 410 000	6 150 8 950	4 950 10 100	4 150 8 450	11.906	10 14.1	24.3

Note 3: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface. To convert C to C_{100} for a 100-km fatigue life, divide C by 1.26.

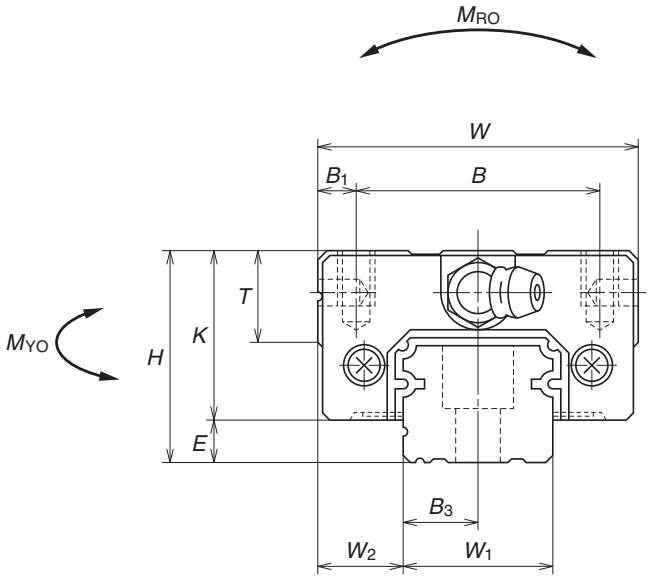
Part number for assembly (ball slide + rail)

Example:

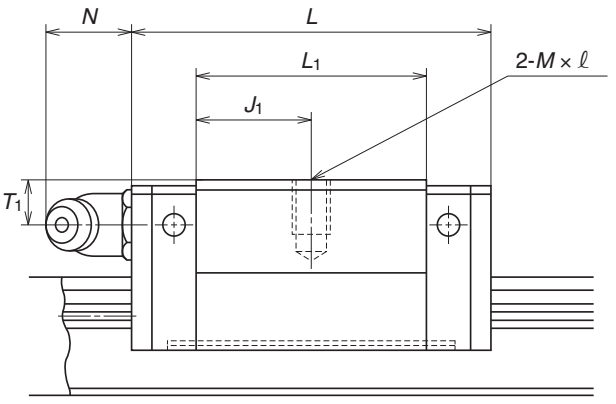
LH 25 1000 EM C 2 * PC Z**

- LH — Series
- 25 — Size
- 1000 — Rail length (mm)
- EM — Shape/height
- C — Material/surface treatment
  C: Carbon steel (NSK standard)
  K: Stainless steel
  D: Carbon steel + surface treatment
  H: Stainless steel + surface treatment
- 2 — Number of ball slides per rail
- *** — NSK control number
  (*** is required when making inquiries)
- PC — Accuracy grade
  PC: Normal grade, KC: PC with NSK K1
  PH: Precision grade, KH: PH with NSK K1
- Z — Preload Z: Slight preload
  Preload H: Medium preload

Front view of AL and CL types



Side view of CL type



Model No.	Assembly			Ball slide													
	Height			Width	Length	Mounting hole								Grease fitting			
	H	*E*	W_2	*W*	*L*	*B*	*J*	*M* × pitch × ℓ	B_1	L_1	J_1	*K*	*T*	Mounting hole size	T_1	*N*	
LS15CL	24	4.6	9.5	34	40.4	26	—	M4×0.7×6	4	23.6	11.8	19.4	10	ϕ3	6	3	
LS15AL					56.8		26			40	7						
LS20CL	28	6	11	42	47.2	32	—	M5×0.8×7	5	30	15	22	12	M6×0.75	5.5	11	
LS20AL					65.2		32			48	8						
LS25CL	33	7	12.5	48	59.6	35	—	M6×1×9	6.5	38	19	26	12	M6×0.75	7	11	
LS25AL					81.6		35			60	12.5						
LS30CL	42	9	16	60	67.4	40	—	M8×1.25×12	10	42	21	33	13	M6×0.75	8	11	
LS30AL					96.4		40			71	15.5						
LS35CL	48	10.5	18	70	77	50	—	M8×1.25×12	10	49	24.5	37.5	14	M6×0.75	8.5	11	
LS35AL					108		50			80	15						

Note 1: External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

Part number for ball slide only

Example: LAS 25 AL S Z – K

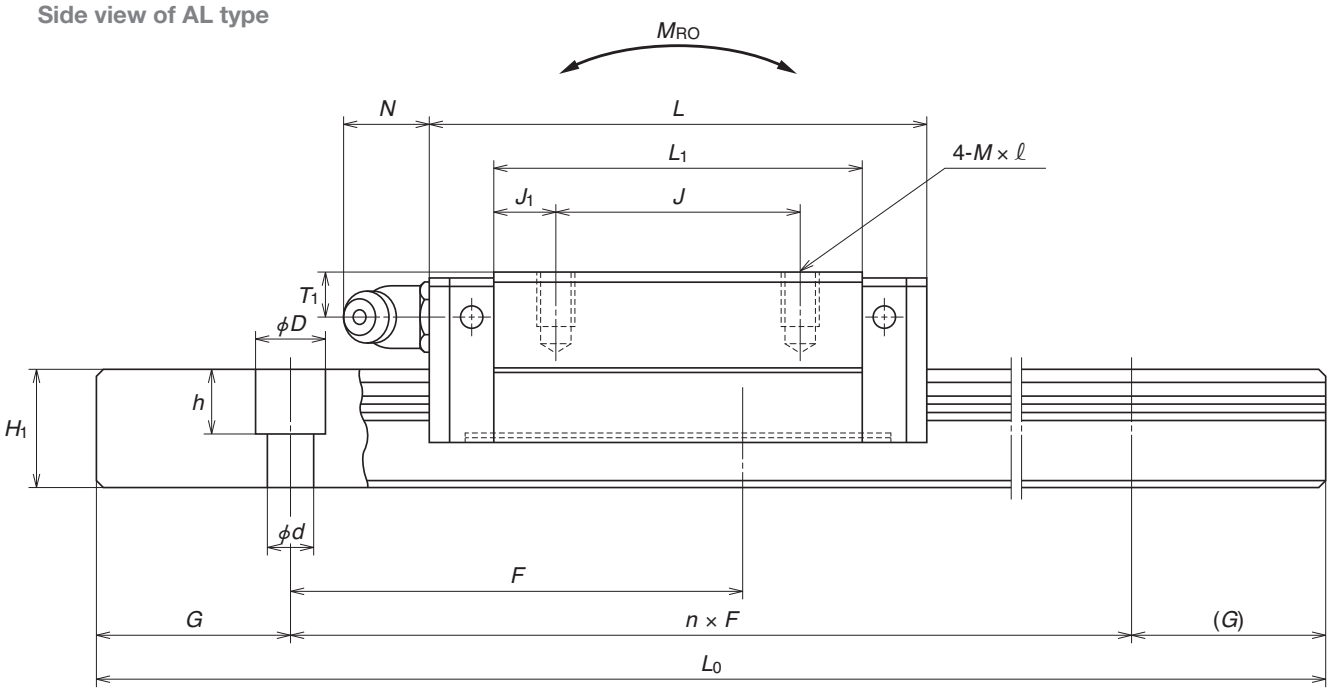
- LAS: Random-matching ball slide
- 25: Size
- AL: Shape/height
- S: Stainless steel; No code: Carbon steel (NSK standard)
- Z: Preload Z: Slight preload; H: Preload H: Medium preload
- K: Accessories — K: With NSK K1; F: Fluoride low-temperature chrome plating + AS2 grease; F50: Fluoride low-temperature chrome plating + LG2 grease

Part number for rail only

Example: L1S 25 1000 L C N *** PC Z

- L1S: Random-matching rail
- 25: Size
- 1000: Rail length (mm)
- L: Shape (L: Standard, LS15 mounting hole for M3 specification; T: LS15 mounting hole for M4 specification)
- C: Material/surface treatment
- N: Butting rail specification — N: Non-butting; L: Butting
- ***: NSK control number (*** is required when making inquiries)
- PC: Accuracy grade — PC: Normal grade; PH: Precision grade
- Z: Preload — Z: Slight preload (standard)

Side view of AL type



n = (number of holes)-1

Unit: mm

Rail							Basic load rating					Ball diameter	Weight	
Width	Height	Pitch	Mounting bolt hole			Max. length (Single rail)	Dynamic	Static	Static moment				Ball slide	Rail
W_1	H_1	F	$d \times D \times h$	B_3	G	L_{0max} ( ) for stainless	C (N)	C_0 (N)	M_{R0} (N·m)	M_{P0} (N·m)	M_{Y0} (N·m)	D_W	(kg)	(kg/m)
15	12.5	60	*3.5×6×4.5 4.5×7.5×5.3	7.5	20	2 000 (1 700)	5 400 8 350	9 100 16 900	45.5 84.5	24.5 77	20.5 64.5	2.778	0.14 0.20	1.4
20	15.5	60	6×9.5×8.5	10	20	3 960 (3 500)	7 900 11 700	13 400 23 500	91.5 160	46.5 133	39 111	3.175	0.19 0.28	2.3
23	18	60	7×11×9	11.5	20	3 960 (3 500)	12 700 18 800	20 800 36 500	164 286	91 258	76 217	3.968	0.34 0.51	3.1
28	23	80	7×11×9	14	20	4 000 (3 500)	18 700 28 800	29 600 55 000	282 520	139 435	116 365	4.762	0.58 0.85	4.8
34	27.5	80	9×14×12	17	20	4 000 (3 500)	26 000 40 000	40 000 74 500	465 865	220 695	185 580	5.556	0.86 1.3	7.0

Note 2: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.
To convert C to C_{100} for a 100-km fatigue life, divide C by 1.26.
*Standard mounting hole of LS15 rail is for M3 bolts (Hole size: 3.5×6×4.5).
If you require mounting hole for M4 bolts (Hole size: 4.5×7.5×5.3), please specify when ordering.

Part number for assembly (ball slide + rail)

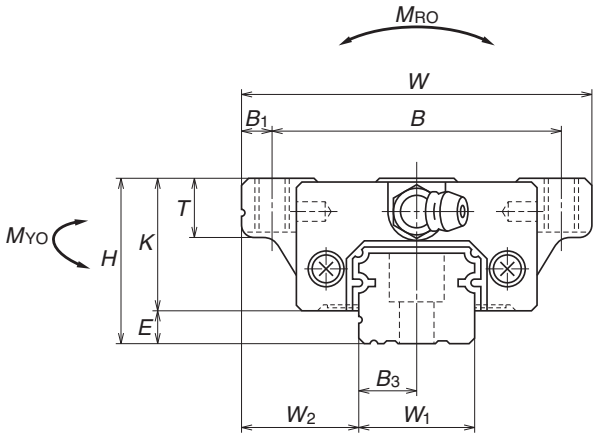
Example:

LS 25 1000 AL C 2 * PC Z**

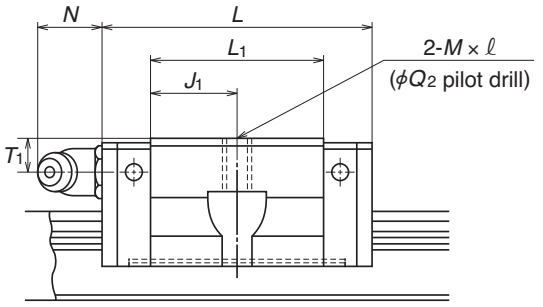
- LS — Series
- 25 — Size
- 1000 — Rail length (mm)
- AL — Shape/height
- C — Material/surface treatment
  C: Carbon steel (NSK standard)
  K: Stainless steel
  D: Carbon steel + surface treatment
  H: Stainless steel + surface treatment
- 2 — Number of ball slides per rail
- *** — NSK control number
  (*** is required when making inquiries)
- PC — Accuracy grade
  PC: Normal grade, KC: PC with NSK K1
  PH: Precision grade, KH: PH with NSK
- Z — Preload Z: Slight preload
  Preload H: Medium preload

Ball Slide Models: JM, EM

Front view of JM and EM types



Side view of JM type



Model No.	Assembly			Ball slide														
	Height			Width	Length	Mounting hole									Grease fitting			
	H	E	W_2	W	L	B	J	$Q_1 \times \ell$	Q_2	B_1	L_1	J_1	K	T	Mounting hole size	T_1	N	
LS15JM **LS15EM**	24	4.6	18.5	52	40.4 56.8	41	— 26	M5×0.8×7	4.4	5.5	23.6 40	11.8 7	19.4	8	φ3	6	3	
LS20JM **LS20EM**	28	6	19.5	59	47.2 65.2	49	— 32	M6×1×9 (M6×1×9.5)	5.3	5	30 48	15 8	22	10	M6×0.75	5.5	11	
LS25JM **LS25EM**	33	7	25	73	59.6 81.6	60	— 35	M8×1.25×10 (M8×1.25×11.5)	6.8	6.5	38 60	19 12.5	26	11 (12)	M6×0.75	7	11	
LS30JM **LS30EM**	42	9	31	90	67.4 96.4	72	— 40	M10×1.5×12 (M10×1.5×14.5)	8.6	9	42 71	21 15.5	33	11 (15)	M6×0.75	8	11	
LS35JM **LS35EM**	48	10.5	33	100	77 108	82	— 50	M10×1.5×13 (M10×1.5×14.5)	8.6	9	49 80	24.5 15	37.5	12 (15)	M6×0.75	8.5	11	

Note 1: Parenthesized dimensions are for items made of stainless steel.
Note 2: External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

Part number for ball slide only

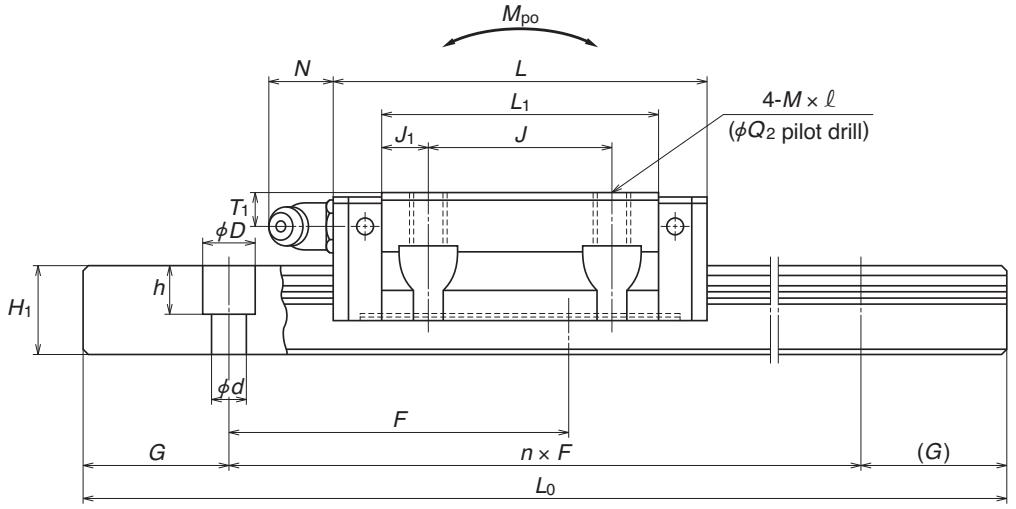
Example: LAS 25 EM S Z – K

- LAS: Random-matching ball slide
- 25: Size
- EM: Shape/height
- S: Stainless steel; No code: Carbon steel (NSK standard)
- Z: Preload Z: Slight preload; H: Preload H: Medium preload
- K: Accessories — K: With NSK K1; F: Fluoride low-temperature chrome plating + AS2 grease; F50: Fluoride low-temperature chrome plating + LG2 grease

Part number for rail only

Example: L1S 25 1000 L C N *** PC Z

- L1S: Random-matching rail
- 25: Size
- 1000: Rail length (mm)
- L: Shape (L: Standard, LS15 mounting hole for M3 specification; T: LS15 mounting hole for M4 specification)
- C: Material/surface treatment
- N: Butting rail specification — N: Non-butting L: Butting
- ***: NSK control number (*** is required when making inquiries)
- PC: Accuracy grade — PC: Normal grade; PH: Precision grade
- Z: Preload — Z: Slight preload (standard)



n = (number of holes)-1

Unit: mm

Rail							Basic load rating					Ball diameter	Weight	
Width	Height	Pitch	Mounting bolt hole			Max. length (Single rail)	Dynamic	Static	Static moment				Ball slide	Rail
W_1	H_1	F	$d \times D \times h$	B_3	G	L_{0max} ( ) for stainless	C (N)	C_0 (N)	M_{R0} (N·m)	M_{P0} (N·m)	M_{Y0} (N·m)	D_W	(kg)	(kg/m)
15	12.5	60	*3.5×6×4.5 4.5×7.5×5.3	7.5	20	2 000 (1 700)	5 400 8 350	9 100 16 900	45.5 84.5	24.5 77	20.5 64.5	2.778	0.17 0.26	1.4
20	15.5	60	6×9.5×8.5	10	20	3 960 (3 500)	7 900 11 700	13 400 23 500	91.5 160	46.5 133	39 111	3.175	0.24 0.35	2.3
23	18	60	7×11×9	11.5	20	3 960 (3 500)	12 700 18 800	20 800 36 500	164 286	91 258	76 217	3.968	0.44 0.66	3.1
28	23	80	7×11×9	14	20	4 000 (3 500)	18 700 28 800	29 600 55 000	282 520	139 435	116 365	4.762	0.76 1.2	4.8
34	27.5	80	9×14×12	17	20	4 000 (3 500)	26 000 40 000	40 000 74 500	465 865	220 695	185 580	5.556	1.2 1.7	7

Note 3: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.
To convert C to C_{100} for a 100-km fatigue life, divide C by 1.26.
*Standard mounting hole of LS15 rail is for M3 bolts (Hole size: 3.5×6×4.5). If you require mounting hole for M4 bolts (Hole size: 4.5×7.5×5.3), please specify when ordering.

Part number for assembly (ball slide + rail)

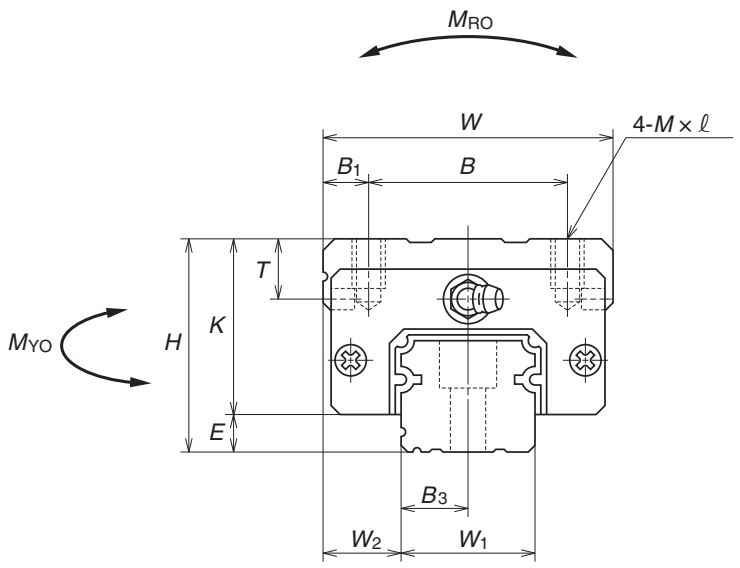
Example:

LS 25 1000 EM C 2 *** PC Z

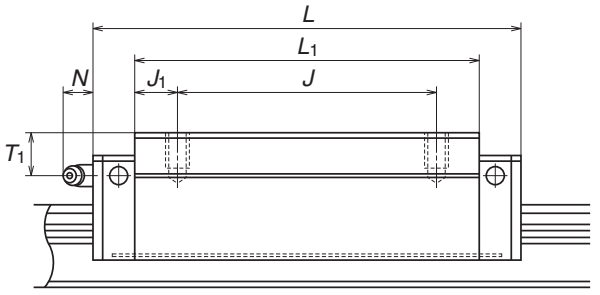
- LS: Series
- 25: Size
- 1000: Rail length (mm)
- EM: Shape/height
- C: Material/surface treatment
  - C: Carbon steel (NSK standard)
  - K: Stainless steel
  - D: Carbon steel + surface treatment
  - H: Stainless steel + surface treatment
- 2: Number of ball slides per rail
- ***: NSK control number (*** is required when making inquiries)
- PC: Accuracy grade
  - PC: Normal grade, KC: PC with NSK K1
  - PH: Precision grade, KH: PH with NSK K1
- Z: Preload Z: Slight preload, Preload H: Medium preload

Ball Slide Models: AN, BN

Front view of AN and BN types



Side view of BN type



Model No.	Assembly			Ball slide												
	Height			Width	Length	Mounting hole								Grease fitting		
	H	*E*	W_2	*W*	*L*	*B*	*J*	*M* × pitch × ℓ	B_1	L_1	J_1	*K*	*T*	Mounting hole size	T_1	*N*
SH15AN SH15BN	28	4.6	9.5	34	55 74	26	26	M4×0.7×6	4	39 58	6.5 16	23.4	8	ϕ3	8.5	3.3
SH20AN SH20BN	30	5	12	44	69.8 91.8	32	36 50	M5×0.8×6	6	50 72	7 11	25	12	M6×0.75	5	11
SH25AN SH25BN	40	7	12.5	48	79 107	35	35 50	M6×1×9	6.5	58 86	11.5 18	33	12	M6×0.75	10	11
SH30AN SH30BN	45	9	16	60	85.6 124.6	40	40 60	M8×1.25×10	10	59 98	9.5 19	36	14	M6×0.75	10	11
SH35AN SH35BN	55	9.5	18	70	109 143	50	50 72	M8×1.25×12	10	80 114	15 21	45.5	15	M6×0.75	15	11
SH45AN SH45BN	70	14	20.5	86	139 171	60	60 80	M10×1.5×17	13	105 137	22.5 28.5	56	17	Rc1/8	20	13
SH55AN SH55BN	80	15	23.5	100	163 201	75	75 95	M12×1.75×18	12.5	126 164	25.5 34.5	65	18	Rc1/8	21	13

Note 1: External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

Part number for ball slide only

Example: SAH 25 AN S Z–K

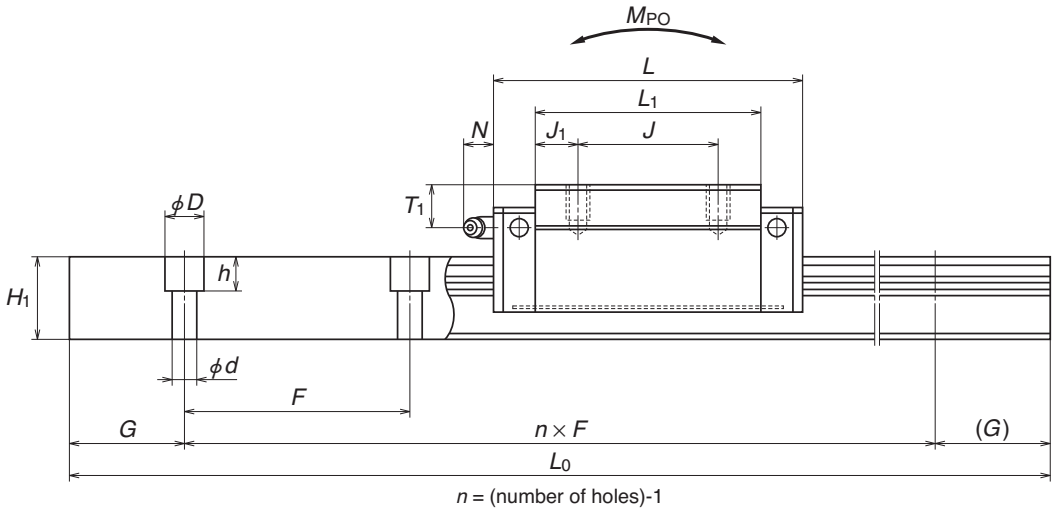
- SAH: Random-matching ball slide
- 25: Size
- AN: Shape/height
- S: Stainless steel (SH15 to SH30 only) No code: Carbon steel (NSK standard)
- Z: Preload Z: Slight preload Preload H: Medium preload
- K: Accessories K: With NSK K1 F: Fluoride low-temperature chrome plating + AS2 grease F50: Fluoride low-temperature chrome plating + LG2 grease

Part number for rail only

Example: L1H 25 1000 L C N *** PC Z

- L1H: Random-matching rail
- 25: Size
- 1000: Rail length (mm)
- L: Shape (L: Standard)
- C: Material/surface treatment
- N: Butting rail specification N: Non-butting L: Butting
- ***: NSK control number (*** is required when making inquiries)
- PC: Accuracy grade PC: Normal grade PH: Precision grade
- Z: Preload Z: Slight preload (standard)

Side view of AN type



n = (number of holes)-1

Unit: mm

Rail							Basic load rating					Ball diameter	Weight	
Width	Height	Pitch	Mounting bolt hole			Max. length (Single rail)	Dynamic	Static	Static moment				Ball slide	Rail
W_1	H_1	F	$d \times D \times h$	B_3	G	L_{0max} ( ) for stainless	C (N)	C_0 (N)	M_{R0} (N·m)	M_{P0} (N·m)	M_{Y0} (N·m)	D_W	(kg)	(kg/m)
15	15	60	4.5×7.5×5.3	7.5	20	2 000 (1 800)	10 100 13 400	18 800 28 200	98 147	87 193	73 162	3.175	0.18 0.26	1.6
20	18	60	6×9.5×8.5	10	20	3 960 (3 500)	16 300 21 600	29 600 44 500	199 298	167 360	141 305	3.968	0.33 0.48	2.6
23	22	60	7×11×9	11.5	20	3 960 (3 500)	22 400 32 000	37 500 62 500	295 490	246 615	207 515	4.762	0.55 0.82	3.6
28	26	80	9×14×12	14	20	4 000 (3 500)	31 000 46 000	51 500 91 500	490 870	365 1 060	305 885	5.556	0.77 1.3	5.2
34	29	80	9×14×12	17	20	4 000	47 500 61 500	80 500 117 000	950 1 380	780 1 600	655 1 340	6.35	1.5 2.1	7.2
45	38	105	14×20×17	22.5	22.5	3 990	76 500 94 500	128 000 175 000	1 970 2 680	1 550 2 760	1 300 2 320	7.937	3.0 3.9	12.3
53	44	120	16×23×20	26.5	30	3 960	113 000 140 000	181 000 247 000	3 300 4 550	2 640 4 800	2 210 4 050	9.525	4.7 6.1	16.9

Note 2: Basic dynamic load rating *C* is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.
To convert *C* to C_{100} for a 100-km fatigue life, divide *C* by 1.26.

Part number for assembly (ball slide + rail)

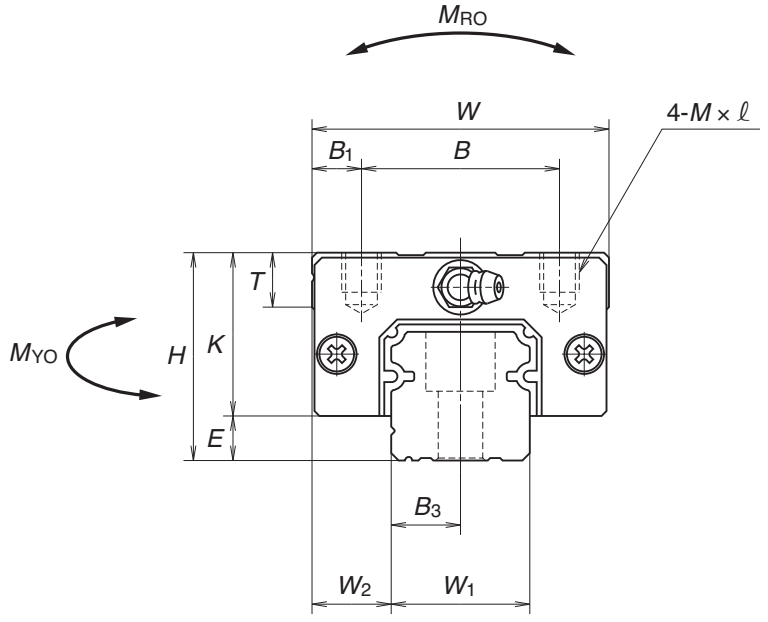
Example:

SH 25 1000 AN C 2 * PC Z**

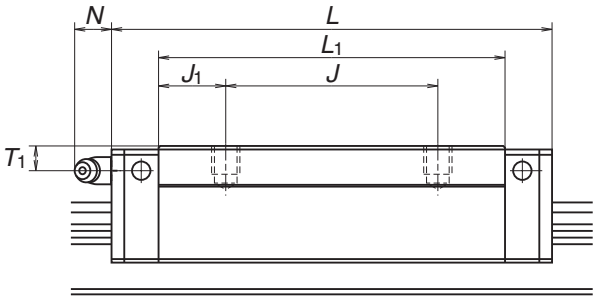
- SH — Series
- 25 — Size
- 1000 — Rail length (mm)
- AN — Shape/height
- C — Material/surface treatment
  C: Carbon steel (NSK standard)
  K: Stainless steel
  D: Carbon steel + surface treatment
  H: Stainless steel + surface treatment
- 2 — Number of ball slides per rail
- *** — NSK control number
  (*** is required when making inquiries)
- PC — Accuracy grade
  PC: Normal grade, KC: PC with NSK K1
  PH: Precision grade, KH: PH with NSK K1
- Z — Preload Z: Slight preload
  Preload H: Medium preload

Ball Slide Models: AL, BL

Front view of AL and BL types



Side view of BL type



Model No.	Assembly			Ball slide												
	Height			Width	Length	Mounting hole								Grease fitting		
	H	*E*	W_2	*W*	*L*	*B*	*J*	*M* × pitch × ℓ	B_1	L_1	J_1	*K*	*T*	Mounting hole size	T_1	*N*
SH25AL **SH25BL**	36	7	12.5	48	79 107	35	35 50	M6×1×6	6.5	58 86	11.5 18	29	12	M6×0.75	6	11
SH30AL **SH30BL**	42	9	16	60	85.6 124.6	40	40 60	M8×1.25×8	10	59 98	9.5 19	33	14	M6×0.75	7	11
SH35AL **SH35BL**	48	9.5	18	70	109 143	50	50 72	M8×1.25×8	10	80 114	15 21	38.5	15	M6×0.75	8	11

Note 1: External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

Part number for ball slide only

Example: SAH 25 AL S Z – K

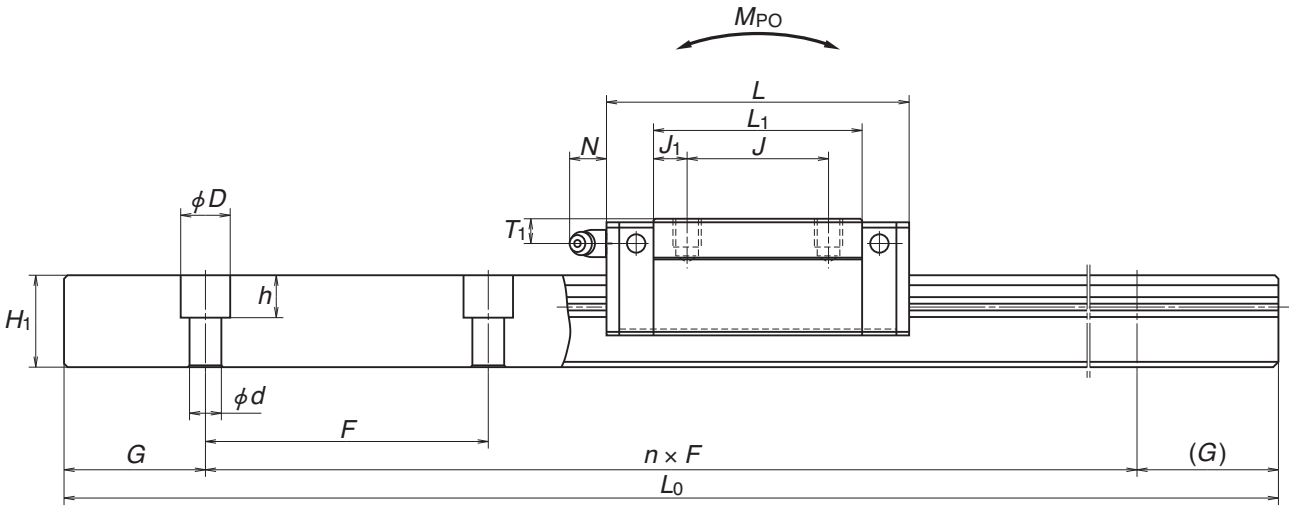
- SAH: Random-matching ball slide
- 25: Size
- AL: Shape/height
- S: Stainless steel (SH15 to SH30 only) No code: Carbon steel (NSK standard)
- Z: Preload Z: Slight preload Preload H: Medium preload
- K: Accessories K: With NSK K1 F: Fluoride low-temperature chrome plating + AS2 grease F50: Fluoride low-temperature chrome plating + LG2 grease

Part number for rail only

Example: L1H 25 1000 L C N *** PC Z

- L1H: Random-matching rail
- 25: Size
- 1000: Rail length (mm)
- L: Shape (L: Standard)
- C: Material/surface treatment
- N: Butting rail specification N: Non-butting L: Butting
- ***: NSK control number (*** is required when making inquiries)
- PC: Accuracy grade PC: Normal grade PH: Precision grade
- Z: Preload Z: Slight preload (standard)

Side view of AL type



n = (number of holes)-1

Unit: mm

Rail							Basic load rating					Ball diameter	Weight	
Width	Height	Pitch	Mounting bolt hole			Max. length (Single rail)	Dynamic	Static	Static moment				Ball slide	Rail
W_1	H_1	F	$d \times D \times h$	B_3	G	L_{0max} ( ) for stainless	C (N)	C_0 (N)	M_{R0} (N·m)	M_{P0} (N·m)	M_{Y0} (N·m)	D_W	(kg)	(kg/m)
23	22	60	7×11×9	11.5	20	3 960 (3 500)	22 400 32 000	37 500 62 500	295 490	246 615	207 515	4.762	0.46 0.69	3.6
28	26	80	9×14×12	14	20	4 000 (3 500)	31 000 46 000	51 500 91 500	490 870	365 1 060	305 885	5.556	0.69 1.16	5.2
34	29	80	9×14×12	17	20	4 000	47 500 61 500	80 500 117 000	950 1 380	780 1 600	655 1 340	6.35	1.2 1.7	7.2

Note 2: Basic dynamic load rating *C* is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.
To convert *C* to C_{100} for a 100-km fatigue life, divide *C* by 1.26.

Part number for assembly (ball slide + rail)

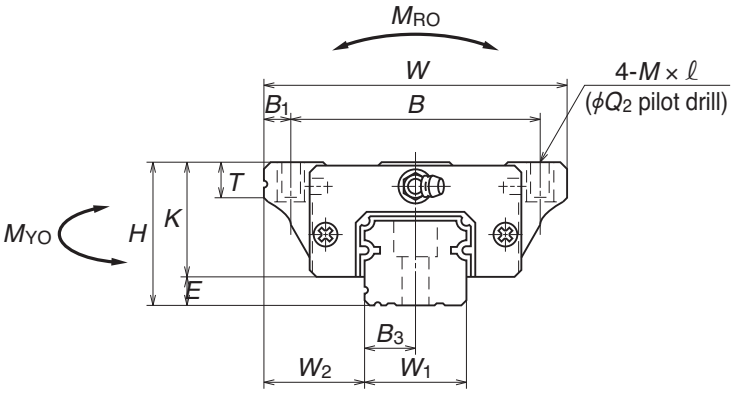
Example:

SH 25 1000 AL C 2 * PC Z**

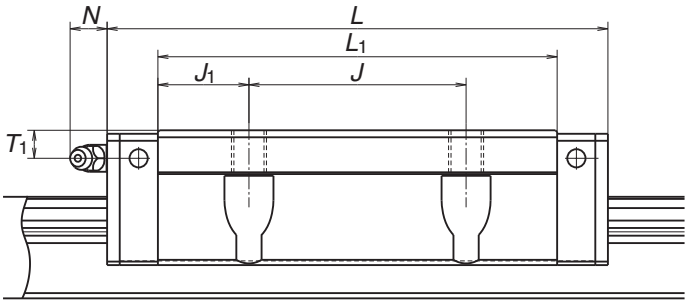
- SH: Series
- 25: Size
- 1000: Rail length (mm)
- AL: Shape/height
- C: Material/surface treatment
  C: Carbon steel (NSK standard)
  K: Stainless steel
  D: Carbon steel + surface treatment
  H: Stainless steel + surface treatment
- 2: Number of ball slides per rail
- ***: NSK control number
  (*** is required when making inquiries)
- PC: Accuracy grade
  PC: Normal grade, KC: PC with NSK K1
  PH: Precision grade, KH: PH with NSK K1
- Z: Preload Z: Slight preload
  Preload H: Medium preload

Ball Slide Models: EM, GM

Front view of EM and GM types



Side view of GM type



Model No.	Assembly			Ball slide													
	Height			Width	Length	Mounting hole				B_1	L_1	J_1	K	T	Grease fitting		
	H	E	W_2	W	L	B	J	$Q_1 \times \ell$ $M \times$ pitch $\times \ell$	Q_2						Mounting hole size	T_1	N
SH15EM **SH15GM**	24	4.6	16	47	55 74	38	30	M5×0.8×7	4.4	4.5	39 58	4.5 14	19.4	8	ϕ3	4.5	3.3
SH20EM **SH20GM**	30	5	21.5	63	69.8 91.8	53	40	M6×1×9.5	5.3	5	50 72	5 16	25	10	M6×0.75	5	11
SH25EM **SH25GM**	36	7	23.5	70	79 107	57	45	M8×1.25×10 (M8×1.25×11.5)	6.8	6.5	58 86	6.5 20.5	29	11 (12)	M6×0.75	6	11
SH30EM **SH30GM**	42	9	31	90	98.6 124.6	72	52	M10×1.5×12 (M10×1.5×14.5)	8.6	9	72 98	10 23	33	11 (15)	M6×0.75	7	11
SH35EM **SH35GM**	48	9.5	33	100	109 143	82	62	M10×1.5×13	8.6	9	80 114	9 26	38.5	12	M6×0.75	8	11
SH45EM **SH45GM**	60	14	37.5	120	139 171	100	80	M12×1.75×15	10.5	10	105 137	12.5 28.5	46	13	Rc1/8	10	13
SH55EM **SH55GM**	70	15	43.5	140	163 201	116	95	M14×2×18	12.5	12	126 164	15.5 34.5	55	15	Rc1/8	11	13

Note 1: Dimensions in parentheses are for items made of stainless steel.
Note 2: External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

Part number for ball slide only

Example: SAH 25 EM S Z – K

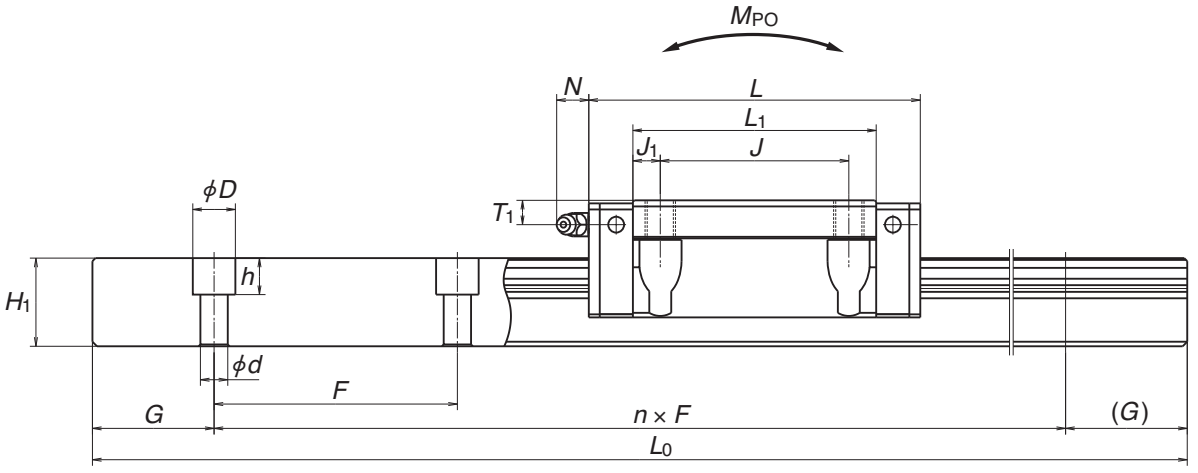
- SAH: Random-matching ball slide
- 25: Size
- EM: Shape/height
- S: Stainless steel (SH15 to SH30 only) No code: Carbon steel (NSK standard)
- Z: Preload Z: Slight preload Preload H: Medium preload
- K: Accessories
  - K: With NSK K1
  - F: Fluoride low-temperature chrome plating + AS2 grease
  - F50: Fluoride low-temperature chrome plating + LG2 grease

Part number for rail only

Example: L1H 25 1000 L C N *** PC Z

- L1H: Random-matching rail
- 25: Size
- 1000: Rail length (mm)
- L: Shape (L: Standard)
- C: Material/surface treatment
- N: Butting rail specification N: Non-butting L: Butting
- ***: NSK control number (*** is required when making inquiries)
- PC: Accuracy grade PC: Normal grade PH: Precision grade
- Z: Preload Z: Slight preload (standard)

Side view of EM type



n = (number of holes)-1

Unit: mm

Rail							Basic load rating					Ball diameter	Weight	
Width	Height	Pitch	Mounting bolt hole			Max. length (Single rail)	Dynamic	Static	Static moment				Ball slide	Rail
W_1	H_1	F	$d \times D \times h$	B_3	G	L_{0max} ( ) for stainless	C (N)	C_0 (N)	M_{R0} (N·m)	M_{P0} (N·m)	M_{Y0} (N·m)	D_W	(kg)	(kg/m)
15	15	60	4.5×7.5×5.3	7.5	20	2 000 (1 800)	10 100 13 400	18 800 28 200	98 147	87 193	73 162	3.175	0.17 0.25	1.6
20	18	60	6×9.5×8.5	10	20	3 960 (3 500)	16 300 21 600	29 600 44 500	199 298	167 360	141 305	3.968	0.45 0.65	2.6
23	22	60	7×11×9	11.5	20	3 960 (3 500)	22 400 32 000	37 500 62 500	295 490	246 615	207 515	4.762	0.63 0.93	3.6
28	26	80	9×14×12	14	20	4 000 (3 500)	35 500 46 000	63 000 91 500	600 870	540 1 060	450 885	5.556	1.2 1.6	5.2
34	29	80	9×14×12	17	20	4 000	47 500 61 500	80 500 117 000	950 1 380	780 1 600	655 1 340	6.35	1.7 2.4	7.2
45	38	105	14×20×17	22.5	22.5	3 990	76 500 94 500	128 000 175 000	1 970 2 680	1 550 2 760	1 300 2 320	7.937	3.0 3.9	12.3
53	44	120	16×23×20	26.5	30	3 960	113 000 140 000	181 000 247 000	3 300 4 550	2 640 4 800	2 210 4 050	9.525	5.0 6.5	16.9

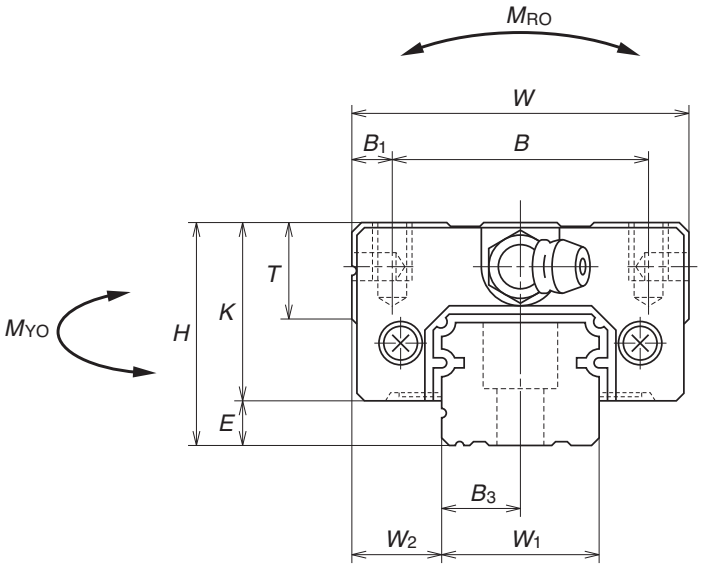
Note 3: Basic dynamic load rating *C* is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.
To convert *C* to C_{100} for a 100-km fatigue life, divide *C* by 1.26.

Part number for assembly (ball slide + rail)

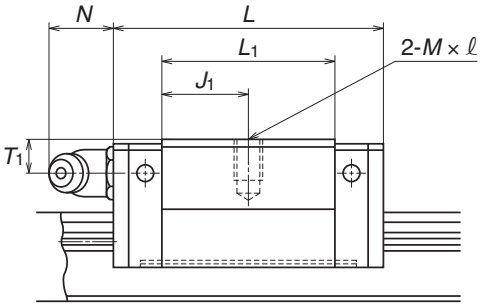
Example:

SH 25 1000 EM C 2 *** PC Z

- SH: Series
- 25: Size
- 1000: Rail length (mm)
- EM: Shape/height
- C: Material/surface treatment
  C: Carbon steel (NSK standard)
  K: Stainless steel
  D: Carbon steel + surface treatment
  H: Stainless steel + surface treatment
- 2: Number of ball slides per rail
- ***: NSK control number
  (*** is required when making inquiries)
- PC: Accuracy grade
  PC: Normal grade, KC: PC with NSK K1
  PH: Precision grade, KH: PH with NSK K1
- Z: Preload Z: Slight preload
  Preload H: Medium preload



Side view of CL type



Model No.	Assembly			Ball slide													
	Height			Width	Length	Mounting hole								Grease fitting			
	H	E	W_2	W	L	B	J	M × pitch × ℓ	B_1	L_1	J_1	K	T	Mounting hole size	T_1	N	
SS15CL SS15AL	24	4.6	9.5	34	40.4 56.8	26	– 26	M4×0.7×6	4	23.6 40	11.8 7	19.4	10	ϕ3	6	3	
SS20CL SS20AL	28	6	11	42	47.2 65.2	32	– 32	M5×0.8×7	5	30 48	15 8	22	12	M6×0.75	5.5	11	
SS25CL SS25AL	33	7	12.5	48	59.6 81.6	35	– 35	M6×1×9	6.5	38 60	19 12.5	26	12	M6×0.75	7	11	
SS30CL SS30AL	42	9	16	60	67.4 96.4	40	– 40	M8×1.25×12	10	42 71	21 15.5	33	13	M6×0.75	8	11	
SS35CL SS35AL	48	10.5	18	70	77 108	50	– 50	M8×1.25×12	10	49 80	24.5 15	37.5	14	M6×0.75	8.5	11	

Note 1: External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

Part number for ball slide only

Example:

SAS 25 AL S Z – K

- SAS: Random-matching ball slide
- 25: Size
- AL: Shape/height
- S: Stainless steel (SS15 to SS35 only) No code: Carbon steel (NSK standard)
- Z: Preload Z: Slight preload Preload H: Medium preload
- K: Accessories K: With NSK K1 F: Fluoride low-temperature chrome plating + AS2 grease F50: Fluoride low-temperature chrome plating + LG2 grease

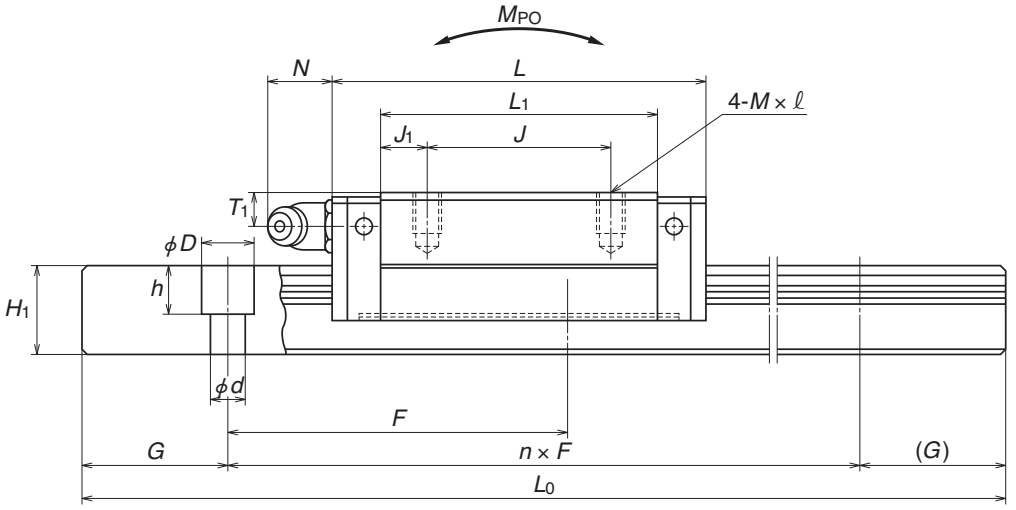
Part number for rail only

Example:

L1S 25 1000 L C N * PC Z**

- L1S: Random-matching rail
- 25: Size
- 1000: Rail length (mm)
- L: Shape (L: Standard, LS15 mounting hole for M3 specification T: LS15 mounting hole for M4 specification)
- C: Material/surface treatment
- N: Butting rail specification N: Non-butting L: Butting
- ***: NSK control number (*** is required when making inquiries)
- PC: Accuracy grade PC: Normal grade PH: Precision grade
- Z: Preload Z: Slight preload (standard)

Side view of AL type



n = (number of holes)-1

Unit: mm

Rail							Basic load rating					Ball diameter	Weight	
Width	Height	Pitch	Mounting bolt hole			Max. length (Single rail)	Dynamic	Static	Static moment				Ball slide	Rail
W_1	H_1	F	$d \times D \times h$	B_3	G	L_{0max} ( ) for stainless	C (N)	C_0 (N)	M_{R0} (N·m)	M_{P0} (N·m)	M_{Y0} (N·m)	D_W	(kg)	(kg/m)
15	12.5	60	*3.5×6×4.5 4.5×7.5×5.3	7.5	20	2 000 (1 700)	4 900 7 900	7 800 15 600	39 78	21.1 73.5	17.7 61.5	2.778	0.14 0.2	1.4
20	15.5	60	6×9.5×8.5	10	20	3 960 (3 500)	7 250 11 100	11 800 21 800	80 149	40.5 124	34 104	3.175	0.19 0.28	2.3
23	18	60	7×11×9	11.5	20	3 960 (3 500)	12 700 17 900	20 800 33 500	164 266	96.5 242	81 203	3.968	0.34 0.51	3.1
28	23	80	7×11×9	14	20	4 000 (3 500)	18 700 27 300	29 600 50 500	282 480	153 415	128 350	4.762	0.58 0.85	4.8
34	27.5	80	9×14×12	17	20	4 000 (3 500)	26 000 38 000	40 000 68 500	465 800	234 620	196 520	5.556	0.86 1.3	7

Note 2: Basic dynamic load rating *C* is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.
To convert *C* to C_{100} for a 100-km fatigue life, divide *C* by 1.26.
*Standard mounting hole of SS15 rail is for M3 bolts (Hole size: 3.5×6×4.5).
If you require mounting hole for M4 bolts (Hole size: 4.5×7.5×5.3), please specify when ordering.

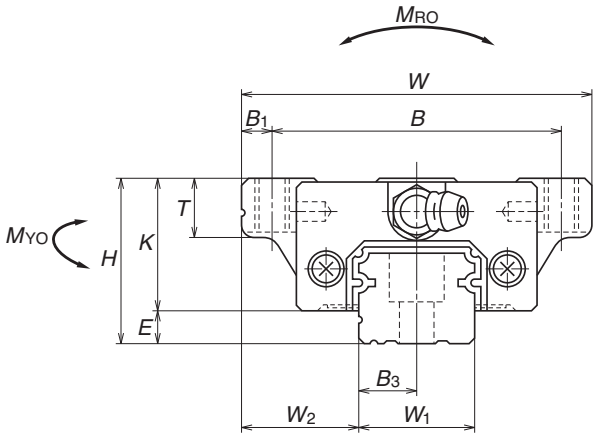
Part number for assembly (ball slide + rail)

Example:

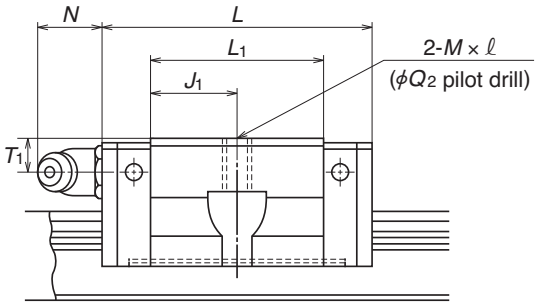
SS 25 1000 AL C 2 * PC Z**

- SS: Series
- 25: Size
- 1000: Rail length (mm)
- AL: Shape/height
- C: Material/surface treatment
  C: Carbon steel (NSK standard)
  K: Stainless steel
  D: Carbon steel + surface treatment
  H: Stainless steel + surface treatment
- 2: Number of ball slides per rail
- ***: NSK control number
  (*** is required when making inquiries)
- PC: Accuracy grade
  PC: Normal grade, KC: PC with NSK K1
  PH: Precision grade, KH: PH with NSK K1
- Z: Preload Z: Slight preload
  Preload H: Medium preload

Front view of JM and EM types



Side view of JM type



Model No.	Assembly			Ball slide														
	Height			Width	Length	Mounting hole									Grease fitting			
	H	E	W_2	W	L	B	J	$Q_1 \times \ell$ $M \times$ pitch $\times \ell$	Q_2	B_1	L_1	J_1	K	T	Mounting hole size	T_1	N	
SS15JM **SS15EM**	24	4.6	18.5	52	40.4 56.8	41	– 26	M5×0.8×7	4.4	5.5	23.6 40	11.8 7	19.4	8	ϕ3	6	3	
SS20JM **SS20EM**	28	6	19.5	59	47.2 65.2	49	– 32	M6×1×9 (M6×1×9.5)	5.3	5	30 48	15 8	22	10	M6×0.75	5.5	11	
SS25JM **SS25EM**	33	7	25	73	59.6 81.6	60	– 35	M8×1.25×10 (M8×1.25×11.5)	6.8	6.5	38 60	19 12.5	26	11 (12)	M6×0.75	7	11	
SS30JM **SS30EM**	42	9	31	90	67.4 96.4	72	– 40	M10×1.5×12 (M10×1.5×14.5)	8.6	9	42 71	21 15.5	33	11 (15)	M6×0.75	8	11	
SS35JM **SS35EM**	48	10.5	33	100	77 108	48	– 50	M10×1.5×13 (M10×1.5×14.5)	8.6	9	49 80	24.5 15	37.5	12 (15)	M6×0.75	8.5	11	

Note 1: Dimensions in parentheses are for items made of stainless steel.
Note 2: External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

Part number for ball slide only

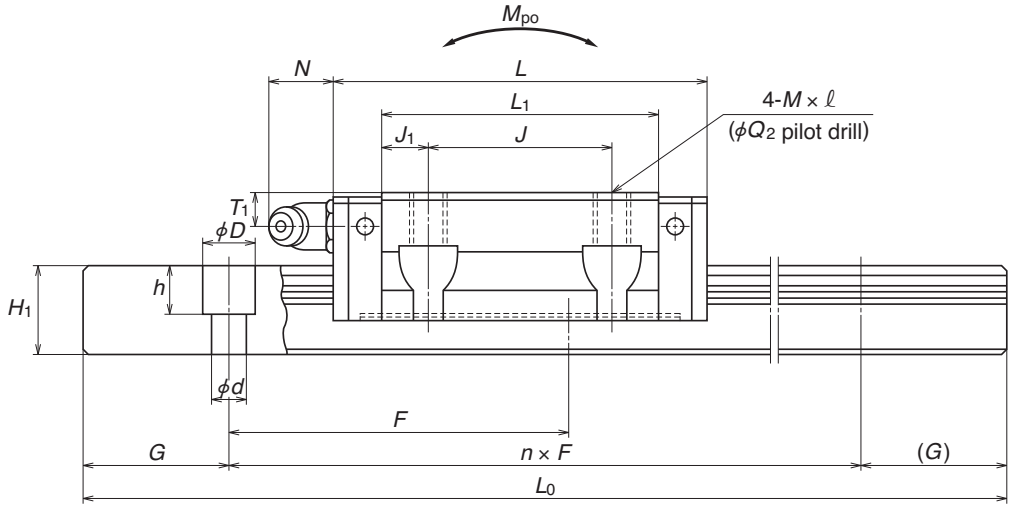
Example: SAS 25 EM S Z – K

- SAS: Random-matching ball slide
- 25: Size
- EM: Shape/height
- S: Stainless steel (SS15 to SS35 only) No code: Carbon steel (NSK standard)
- Z: Preload Z: Slight preload Preload H: Medium preload
- K: Accessories K: With NSK K1 F: Fluoride low-temperature chrome plating + AS2 grease F50: Fluoride low-temperature chrome plating + LG2 grease

Part number for rail only

Example: L1S 25 1000 L C N *** PC Z

- L1S: Random-matching rail
- 25: Size
- 1000: Rail length (mm)
- L: Shape (L: Standard, LS15 mounting hole for M3 specification T: LS15 mounting hole for M4 specification)
- C: Material/surface treatment
- N: Butting rail specification N: Non-butting L: Butting
- ***: NSK control number (*** is required when making inquiries)
- PC: Accuracy grade PC: Normal grade PH: Precision grade
- Z: Preload Z: Slight preload (standard)



n = (number of holes)-1

Unit: mm

Rail							Basic load rating					Ball diameter	Weight	
Width	Height	Pitch	Mounting bolt hole			Max. length (Single rail)	Dynamic	Static	Static moment				Ball slide	Rail
W_1	H_1	F	$d \times D \times h$	B_3	G	L_{0max} ( ) for stainless	C (N)	C_0 (N)	M_{R0} (N·m)	M_{P0} (N·m)	M_{Y0} (N·m)	D_W	(kg)	(kg/m)
15	12.5	60	*3.5×6×4.5 4.5×7.5×5.3	7.5	20	2 000 (1 700)	4 900 7 900	7 800 15 600	39 78	21.1 73.5	17.7 61.5	2.778	0.17 0.26	1.4
20	15.5	60	6×9.5×8.5	10	20	3 960 (3 500)	7 250 11 100	11 800 21 800	80 149	40.5 124	34 104	3.175	0.24 0.35	2.3
23	18	60	7×11×9	11.5	20	3 960 (3 500)	12 700 17 900	20 800 33 500	164 266	96.5 242	81 203	3.968	0.44 0.66	3.1
28	23	80	7×11×9	14	20	4 000 (3 500)	18 700 27 300	29 600 50 500	282 480	153 415	128 350	4.762	0.76 1.2	4.8
34	27.5	80	9×14×12	17	20	4 000 (3 500)	26 000 38 000	40 000 68 500	465 800	234 620	196 520	5.556	1.2 1.7	7

Note 3: Basic dynamic load rating *C* is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.
To convert *C* to C_{100} for a 100-km fatigue life, divide *C* by 1.26.
*Standard mounting hole of SS15 rail is for M3 bolts (Hole size: 3.5×6×4.5).
If you require mounting hole for M4 bolts (Hole size: 4.5×7.5×5.3), please specify when ordering.

Part number for assembly (ball slide + rail)

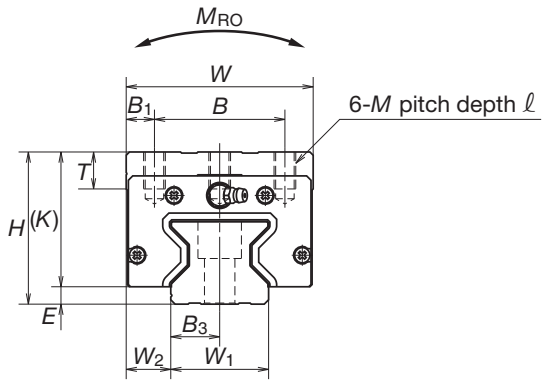
Example:

SS 25 1000 EM C 2 *** PC Z

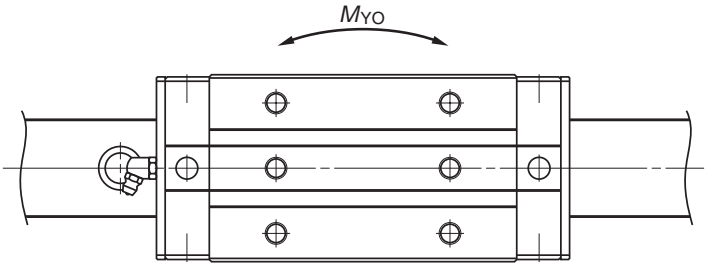
- SS — Series
- 25 — Size
- 1000 — Rail length (mm)
- EM — Shape/height
- C — Material/surface treatment
  C: Carbon steel (NSK standard)
  K: Stainless steel
  D: Carbon steel + surface treatment
  H: Stainless steel + surface treatment
- 2 — Number of ball slides per rail
- *** — NSK control number
  (*** is required when making inquiries)
- PC — Accuracy grade
  PC: Normal grade, KC: PC with NSK K1
  PH: Precision grade, KH: PH with NSK K1
- Z — Preload Z: Slight preload
  Preload H: Medium preload

Roller Slide Models: AN, BN

Front view of AN and BN types



Upper view of AN and BN types



Model No.	Assembly			Roller slide												
	Height			Width	Length	Mounting hole							Grease fitting			
	H	*E*	W_2	*W*	*L*	*B*	*J*	*M* × pitch × ℓ	B_1	L_1	J_1	*K*	*T*	Mounting hole size	T_1	*N*
RA25AN **RA25BN**	40	5	12.5	48	97.5 115.5	35	35 50	M6×1×9	6.5	65.5 83.5	15.25 16.75	35	12	M6×0.75	10	11
RA30AN **RA30BN**	45	6.5	16	60	110.8 135.4	40	40 60	M8×1.25×11	10	74 98.6	17 19.3	38.5	14	M6×0.75	10	11
RA35AN **RA35BN**	55	6.5	18	70	123.8 152	50	50 72	M8×1.25×12	10	83.2 111.4	16.6 19.7	48.5	15	M6×0.75	15	11
RA45AN **RA45BN**	70	8	20.5	86	154 190	60	60 80	M10×1.5×17	13	105.4 141.4	22.7 30.7	62	17	Rc1/8	14	14
RA55AN **RA55BN**	80	9	23.5	100	184 234	75	75 95	M12×1.75×18	12.5	128 178	26.5 41.5	71	18	Rc1/8	21	14
RA65AN **RA65BN**	90	13	31.5	126	228.4 302.5	76	70 120	M16×2×20	25	155.4 229.5	42.7 54.75	77	22	Rc1/8	19	14

Part number for roller slide only

Example: RAA 25 AN P6 Z

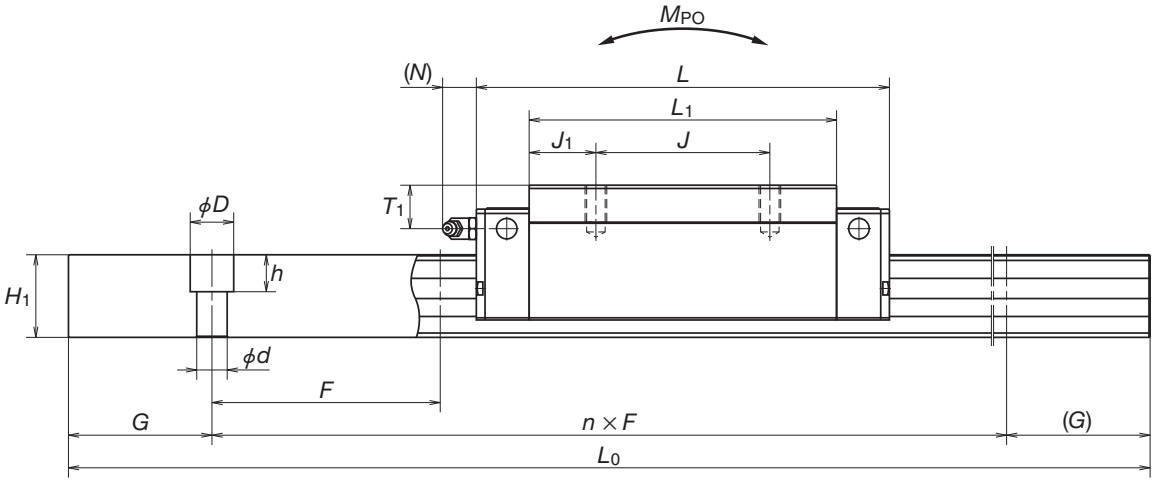
- RAA: Random-matching roller slide
- 25: Size
- AN: Shape/height
- P6: Accuracy: P6 (only P6 grade is available) K6 (with NSK K1)
- Z: Preload Z: Medium preload (standard)

Part number for rail only

Example: R1A 25 1000 L C N *** P6 Z

- R1A: Random-matching rail
- 25: Size
- 1000: Rail length (mm)
- L: Shape (L: Standard)
- C: Material/surface treatment
- N: Butting specification N: Non-butting L: Butting
- ***: NSK control number (*** is required when making inquiries)
- P6: Accuracy: P6 (only P6 grade is available)
- Z: Preload Z: Medium preload (standard)

Side view of AN and BN types



n = (number of holes)-1

Unit: mm

Rail							Basic load rating					Weight	
Width	Height	Pitch	Mounting bolt hole			Max. length (Single rail)	Dynamic	Static	Static moment			Roller slide	Rail
W_1	H_1	F	$d \times D \times h$	B_3	G	L_{0max}	C (N)	C_0 (N)	M_{R0} (N·m)	M_{P0} (N·m)	M_{Y0} (N·m)	(kg)	(kg/m)
23	24	30	7×11×9	11.5	20	3 000	29 200 35 400	72 700 92 900	970 1 240	760 1 240	760 1 240	0.60 0.91	3.4
28	28	40	9×14×12	14	20	3 500	38 900 47 600	93 500 121 000	1 670 2 170	1 140 1 950	1 140 1 950	1.0 1.3	4.9
34	31	40	9×14×12	17	20	3 500	53 300 67 400	129 000 175 000	2 810 3 810	1 800 3 250	1 800 3 250	1.6 2.1	6.8
45	38	52.5	14×20×17	22.5	22.5	3 500	92 800 116 000	229 000 305 000	6 180 8 240	4 080 7 150	4 080 7 150	3.0 4.1	10.9
53	43.5	60	16×23×20	26.5	30	3 500	129 000 168 000	330 000 462 000	10 200 14 300	7 060 13 600	7 060 13 600	4.9 6.7	14.6
63	55	75	18×26×22	31.5	35	3 500	210 000 288 000	504 000 756 000	19 200 28 700	12 700 28 600	12 700 28 600	9.3 12.2	22.0

Note: Basic load rating complies with ISO standards (ISO14728-1, ISO14728-2).
If above basic dynamic load rating (100-km rating) is converted into 50-km rating, use the following formula: $C_{50\,km} = 1.23 \times C_{100\,km}$.

Part number for assembly (roller slide + rail)

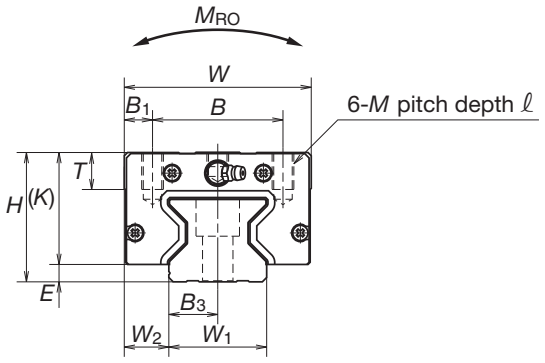
Example:

RA 25 1000 AN C 2 * P6 Z**

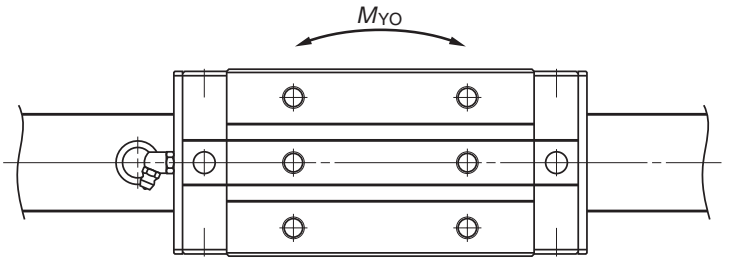
- RA: Series
- 25: Size
- 1000: Rail length (mm)
- AN: Shape/height
- C: Material/surface treatment
  C: Carbon steel (NSK standard)
  D: Carbon steel + surface treatment
- 2: Number of roller slides per rail
- ***: NSK control number
  (*** is required when making inquiries)
- P6: Accuracy: P6 (only P6 grade is available)
  K6 (with NSK K1)
- Z: Preload Z: Medium preload (standard)

Roller Slide Models: AL, BL

Front view of AL and BL types



Upper view of AL and BL types



Model No.	Assembly			Roller slide												
	Height			Width	Length	Mounting hole							Grease fitting			
	H	*E*	W_2	*W*	*L*	*B*	*J*	*M* × pitch × ℓ	B_1	L_1	J_1	*K*	*T*	Mounting hole size	T_1	*N*
RA25AL **RA25BL**	36	5	12.5	48	97.5 115.5	35	35 50	M6×1×8	6.5	65.5 83.5	15.25 16.75	31	12	M6×0.75	6	11
RA30AL **RA30BL**	42	6.5	16	60	110.8 135.4	40	40 60	M8×1.25×11	10	74 98.6	17 19.3	35.5	14	M6×0.75	7	11
RA35AL **RA35BL**	48	6.5	18	70	123.8 152	50	50 72	M8×1.25×12	10	83.2 111.4	16.6 19.7	41.5	15	M6×0.75	8	11
RA45AL **RA45BL**	60	8	20.5	86	154 190	60	60 80	M10×1.5×16	13	105.4 141.4	22.7 30.7	52	17	Rc1/8	10	14
RA55AL **RA55BL**	70	9	23.5	100	184 234	75	75 95	M12×1.75×18	12.5	128 178	26.5 41.5	61	18	Rc1/8	11	14

Part number for roller slide only

Example: RAA 25 AL P6 Z

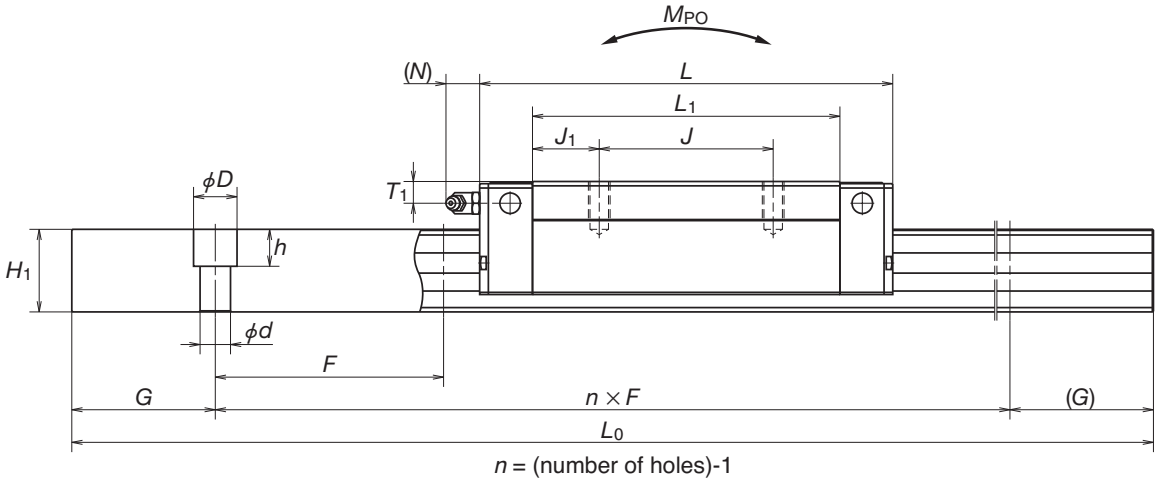
- RAA: Random-matching roller slide
- 25: Size
- AL: Shape/height
- P6: Accuracy: P6 (only P6 grade is available) K6 (with NSK K1)
- Z: Preload Z: Medium preload (standard)

Part number for rail only

Example: R1A 25 1000 L C N *** P6 Z

- R1A: Random-matching rail
- 25: Size
- 1000: Rail length (mm)
- L: Shape (L: Standard)
- C: Material/surface treatment
- N: Butting specification N: Non-butting L: Butting
- ***: NSK control number (*** is required when making inquiries)
- P6: Accuracy: P6 (only P6 grade is available)
- Z: Preload Z: Medium preload (standard)

Side view of AL and BL types



Unit: mm

Rail							Basic load rating					Weight	
Width	Height	Pitch	Mounting bolt hole			Max. length (Single rail)	Dynamic	Static	Static moment			Roller slide	Rail
W_1	H_1	F	$d \times D \times h$	B_3	G	L_{0max}	C (N)	C_0 (N)	M_{R0} (N·m)	M_{P0} (N·m)	M_{Y0} (N·m)	(kg)	(kg/m)
23	24	30	7×11×9	11.5	20	3 000	29 200 35 400	72 700 92 900	970 1 240	760 1 240	760 1 240	0.45 0.80	3.4
28	28	40	9×14×12	14	20	3 500	38 900 47 600	93 500 121 000	1 670 2 170	1 140 1 950	1 140 1 950	0.85 1.1	4.9
34	31	40	9×14×12	17	20	3 500	53 300 67 400	129 000 175 000	2 810 3 810	1 800 3 250	1 800 3 250	1.2 1.7	6.8
45	38	52.5	14×20×17	22.5	22.5	3 500	92 800 116 000	229 000 305 000	6 180 8 240	4 080 7 150	4 080 7 150	2.5 3.4	10.9
53	43.5	60	16×23×20	26.5	30	3 500	129 000 168 000	330 000 462 000	10 200 14 300	7 060 13 600	7 060 13 600	4.1 5.7	14.6

Note: Basic load rating complies with ISO standards (ISO14728-1, ISO14728-2).
If above basic dynamic load rating (100-km rating) is converted into 50-km rating, use the following formula: $C_{50\,km} = 1.23 \times C_{100\,km}$.

Part number for assembly (roller slide + rail)

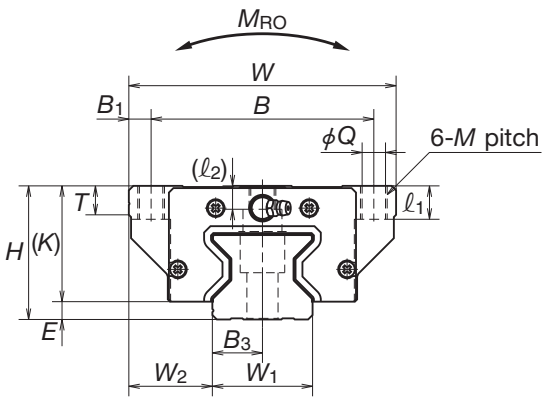
Example:

RA 25 1000 AL C 2 * P6 Z**

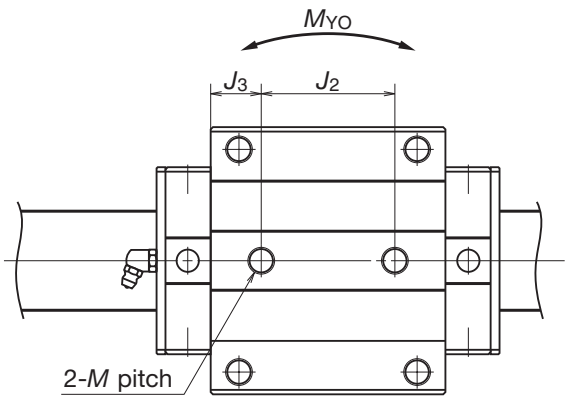
- RA — Series
- 25 — Size
- 1000 — Rail length (mm)
- AL — Shape/height
- C — Material/surface treatment
  C: Carbon steel (NSK standard)
  D: Carbon steel + surface treatment
- 2 — Number of roller slides per rail
- *** — NSK control number
  (*** is required when making inquiries)
- P6 — Accuracy: P6 (only P6 grade is available)
  K6 (with NSK K1)
- Z — Preload Z: Medium preload (standard)

Roller Slide Models: EM, GM

Front view of EM and GM types



Upper view of EM and GM types



Model No.	Assembly			Roller slide															
	Height			Width	Length	Mounting hole											Grease fitting		
	H	E	W_2	W	L	B	J	J_2	M × pitch × ℓ_1 (ℓ_2)	Q × ℓ_1 (ℓ_2)	B_1	L_1	J_1	J_3	K	T	Mounting hole size	T_1	N
RA25EM **RA25GM**	36	5	23.5	70	97.5 115.5	57	45	40	M8×1.25×10 (11)	6.8×10 (11)	6.5	65.5 83.5	10.25 19.25	12.75 21.75	31	11	M6×0.75	6	11
RA30EM **RA30GM**	42	6.5	31	90	110.8 135.4	72	52	44	M10×1.5×12 (12.5)	8.6×12 (12.5)	9	74 98.6	11 23.3	15 27.3	35.5	11	M6×0.75	7	11
RA35EM **RA35GM**	48	6.5	33	100	123.8 152	82	62	52	M10×1.5×13 (7)	8.6×13 (7)	9	83.2 111.4	10.6 24.7	15.6 29.7	41.5	12	M6×0.75	8	11
RA45EM **RA45GM**	60	8	37.5	120	154 190	100	80	60	M12×1.75×15 (10.5)	10.5×15 (10.5)	10	105.4 141.4	12.7 30.7	22.7 40.7	52	13	Rc1/8	10	14
RA55EM **RA55GM**	70	9	43.5	140	184 234	116	95	70	M14×2×18 (13)	12.5×18 (13)	12	128 178	16.5 41.5	29 54	61	15	Rc1/8	11	14
RA65EM **RA65GM**	90	13	53.5	170	228.4 302.5	142	110	82	M16×2×24 (18.5)	14.6×24 (18.5)	14	155.4 229.5	22.7 59.75	36.7 73.75	77	22	Rc1/8	19	14

Part number for roller slide only

Example: **RAA 25 EM P6 Z**

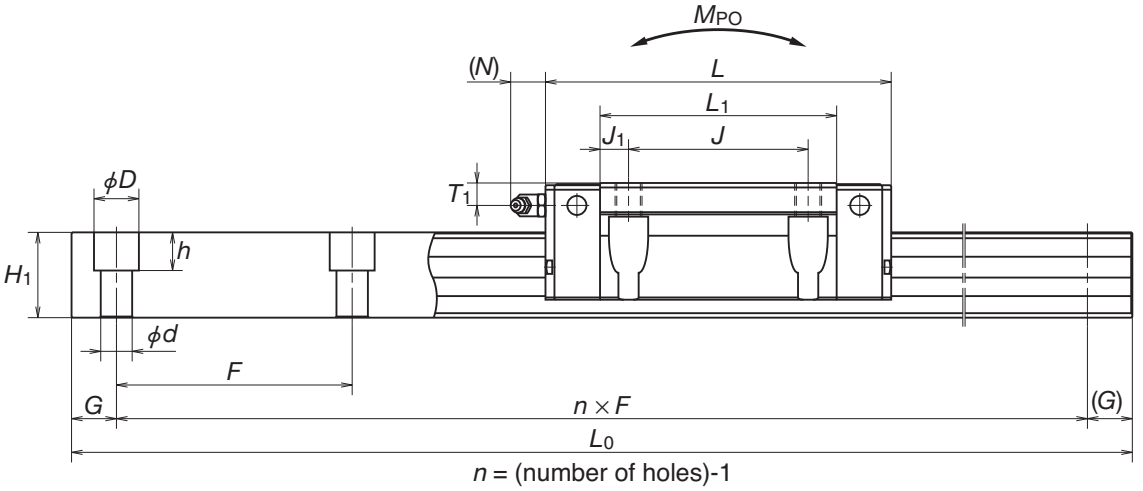
- RAA: Random-matching roller slide
- 25: Size
- EM: Shape/height
- P6: Accuracy: P6 (only P6 grade is available) K6 (with NSK K1)
- Z: Preload Z: Medium preload (standard)

Part number for rail only

Example: **R1A 25 1000 L C N *** P6 Z**

- R1A: Random-matching rail
- 25: Size
- 1000: Rail length (mm)
- L: Shape (L: Standard)
- C: Material/surface treatment
- N: Butting specification N: Non-butting L: Butting
- ***: NSK control number (*** is required when making inquiries)
- P6: Accuracy: P6 (only P6 grade is available)
- Z: Preload Z: Medium preload (standard)

Side view of EM and GM types



Unit: mm

Rail							Basic load rating					Weight	
Width	Height	Pitch	Mounting bolt hole			Max. length (Single rail)	Dynamic	Static	Static moment			Roller slide	Rail
W_1	H_1	F	$d \times D \times h$	B_3	G	L_{0max}	C (N)	C_0 (N)	M_{R0} (N·m)	M_{P0} (N·m)	M_{Y0} (N·m)	(kg)	(kg/m)
23	24	30	7×11×9	11.5	20	3 000	29 200 35 400	72 700 92 900	970 1 240	760 1 240	760 1 240	0.80 1.1	3.4
28	28	40	9×14×12	14	20	3 500	38 900 47 600	93 500 121 000	1 670 2 170	1 140 1 950	1 140 1 950	1.3 1.7	4.9
34	31	40	9×14×12	17	20	3 500	53 300 67 400	129 000 175 000	2 810 3 810	1 800 3 250	1 800 3 250	1.7 2.3	6.8
45	38	52.5	14×20×17	22.5	22.5	3 500	92 800 116 000	229 000 305 000	6 180 8 240	4 080 7 150	4 080 7 150	3.2 4.3	10.9
53	43.5	60	16×23×20	26.5	30	3 500	129 000 168 000	330 000 462 000	10 200 14 300	7 060 13 600	7 060 13 600	5.4 7.5	14.6
63	55	75	18×26×22	31.5	35	3 500	210 000 288 000	504 000 756 000	19 200 28 700	12 700 28 600	12 700 28 600	12.2 16.5	22.0

Note: Basic load rating complies with ISO standards (ISO14728-1, ISO14728-2).
If above basic dynamic load rating (100-km rating) is converted into 50-km rating, use the following formula: $C_{50\,km} = 1.23 \times C_{100\,km}$.

Part number for assembly (roller slide + rail)

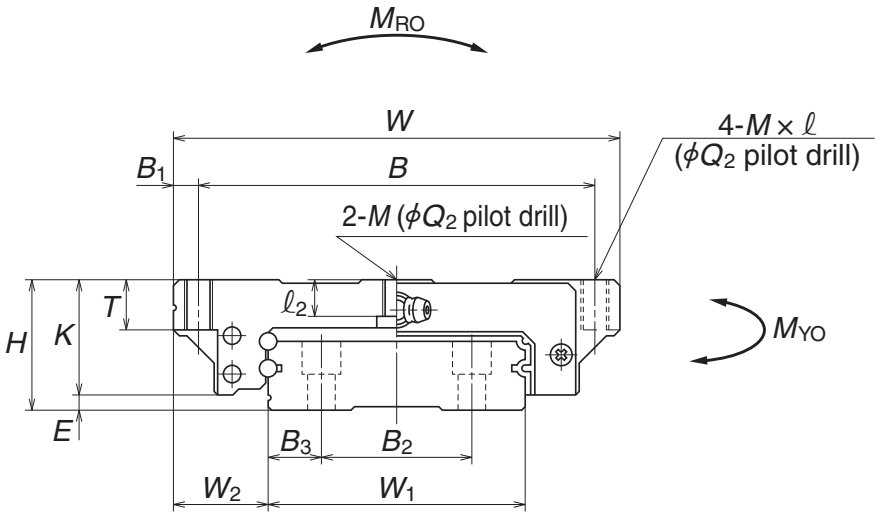
Example:

RA 25 1000 EM C 2 * P6 Z**

- RA — Series
- 25 — Size
- 1000 — Rail length (mm)
- EM — Shape/height
- C — Material/surface treatment
  C: Carbon steel (NSK standard)
  D: Carbon steel + surface treatment
- 2 — Number of roller slides per rail
- *** — NSK control number
  (*** is required when making inquiries)
- P6 — Accuracy: P6 (only P6 grade is available)
  K6 (with NSK K1)
- Z — Preload Z: Medium preload (standard)

Ball Slide Model: EL

Front view of EL type



Model No.	Assembly			Ball slide														
	Height			Width	Length	Mounting hole										Grease fitting		
	H	E	W_2	W	L	B	J	M × pitch × ℓ	ℓ_2	Q_2	B_1	L_1	J_1	K	T	Hole size	T_1	N
LW17EL	17	2.5	13.5	60	51.4	53	26	M4×0.7×6	3.2	3.3	3.5	35	4.5	14.5	6	ϕ3	4	3
LW21EL	21	3	15.5	68	58.8	60	29	M5×0.8×8	3.7	4.4	4	41	6	18	8	M6×0.75	4.5	11
LW27EL	27	4	19	80	74	70	40	M6×1×10	6	5.3	5	56	8	23	10	M6×0.75	6	11
LW35EL	35	4	25.5	120	108	107	60	M8×1.25×14	9	6.8	6.5	84	12	31	14	M6×0.75	8	11
LW50EL	50	4.5	36	162	140.6	144	80	M10×1.5×18	14	8.6	9	108	14	45.5	18	Rc1/8	14	14

Note: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.
To convert C to C_{100} for a 100-km fatigue life, divide C by 1.26.

Part number for ball slide only

Example:

LAW 17 EL Z – K

- LAW: Random-matching ball slide
- 17: Size
- EL: Shape/height
- Z: Preload — Z: Slight preload (standard)
- K: Accessories — K: With NSK K1; F: Fluoride low-temperature chrome plating + AS2 grease; F50: Fluoride low-temperature chrome plating + LG2 grease

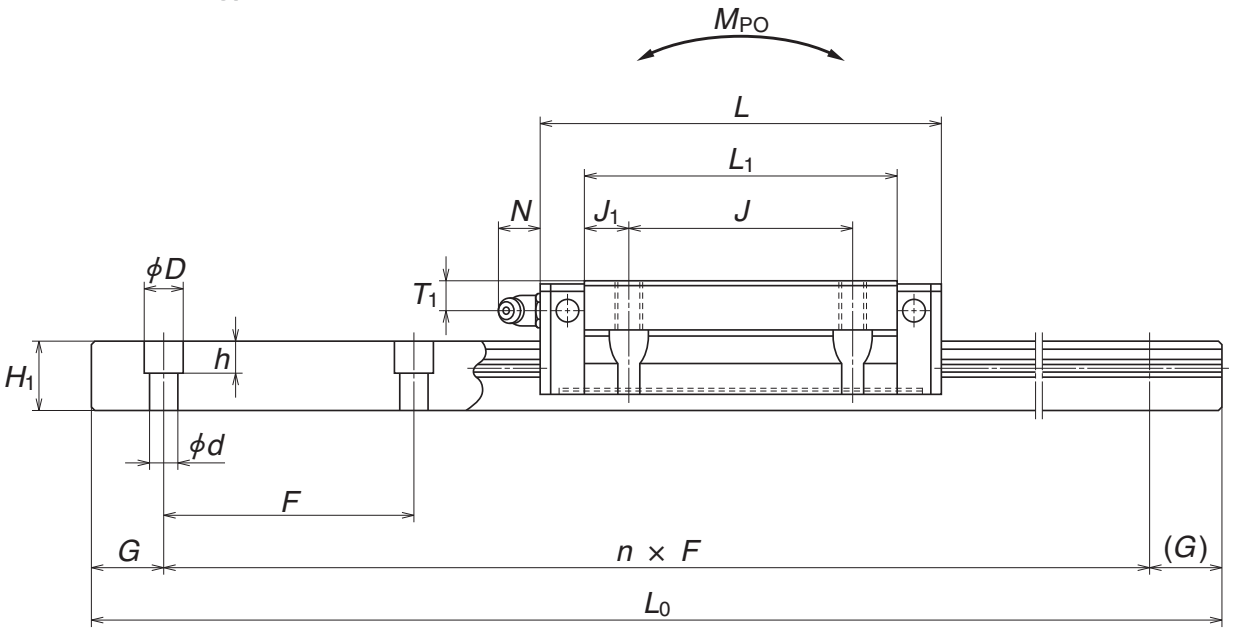
Part number for rail only

Example:

L1W 17 0950 L C N * PC Z**

- L1W: Random-matching rail
- 17: Size
- 0950: Rail length (mm)
- L: Shape (L: Standard)
- C: Material/surface treatment
- N: *Butting rail specification — N: Non-butting L: Butting
- ***: NSK control number (*** is required when making inquiries)
- PC: Accuracy: PC (only PC grade is available)
- Z: Preload — Z: Slight preload (standard)

Side view of EL type



n = (number of holes)-1

Unit: mm

Rail								Basic load rating					Ball diameter	Weight	
Width	Height		Pitch	Mounting bolt hole		G (recommended)	Max. length (Single rail)	Dynamic	Static	Static moment				Ball slide	Rail
W_1	H_1	B_2	F	$d \times D \times h$	B_3		L_{0max}	C (N)	C_0 (N)	M_{R0} (N·m)	M_{P0} (N·m)	M_{Y0} (N·m)	D_W	(kg)	(kg/m)
33	8.7	18	40	4.5×7.5×5.3	7.5	15	1 000	5 600	11 300	135	44	37	2.381	0.2	2.1
37	10.5	22	50	4.5×7.5×5.3	7.5	15	1 600	6 450	13 900	185	65.5	55	2.381	0.3	2.9
42	15	24	60	4.5×7.5×5.3	9	20	2 000	12 800	26 900	400	171	143	3.175	0.5	4.7
69	19	40	80	7×11×9	14.5	20	2 400	33 000	66 500	1 690	645	545	4.762	1.5	9.6
90	24	60	80	9×14×12	15	20	3 000	61 500	117 000	3 900	1 530	1 280	6.350	4.0	15.8

Part number for assembly (ball slide + rail)

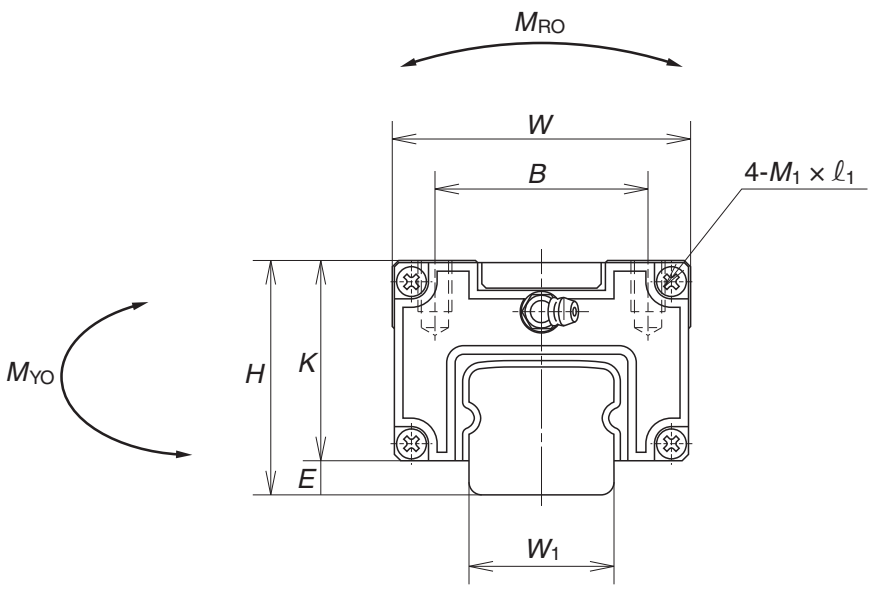
Example:

LW 35 1000 EL C 2 * PC Z**

- LW: Series
- 35: Size
- 1000: Rail length (mm)
- EL: Shape/height
- C: Material/surface treatment
- 2: Number of ball slides per rail
- ***: NSK control number (*** is required when making inquiries)
- PC: Accuracy: PC (only PC grade is available) KC (with NSK K1)
- Z: Preload Z: Slight preload (standard)

Ball Slide Model: AN

Front view



Model No.	Assembly		Ball slide										Width	Height	Pitch	
	Height		Width	Length	Tapped hole			L_1	K	Grease fitting						
	$H^{\pm 0.1}$	E	W	L	B	J	$M_1 \times$ pitch $\times \ell_1$			Screw size	T_1	N	W_1	H_1	F	
TS15AN	28	3	34	72.2	26	26	M4×0.7×6	39	25	ϕ3	6.5	(5)	15	14	120	
TS20AN	30	3	44	87	32	36	M5×0.8×8	50	27	M6 × 0.75	6.5	(14)	20	15	120	
TS25AN	40	4	48	100	35	35	M6×1×9	58	36	M6 × 0.75	9.5	(14)	23	20	120	
TS30AN	45	6.5	60	115	40	40	M8×1.25×10	70	38.5	M6 × 0.75	9.5	(14)	28	25	160	
TS35AN	55	8	70	135.8	50	50	M8×1.25×12	81.8	47	M6 × 0.75	12	(14)	34	30	160	

Note 1: TS series does not have a ball retainer. Be aware that balls fall out when the ball slide is withdrawn from the rail.
Note 2: Consult with NSK when using a TS series in a single rail configuration.

Part number for ball slide only

Example: TAS 30 AN – F

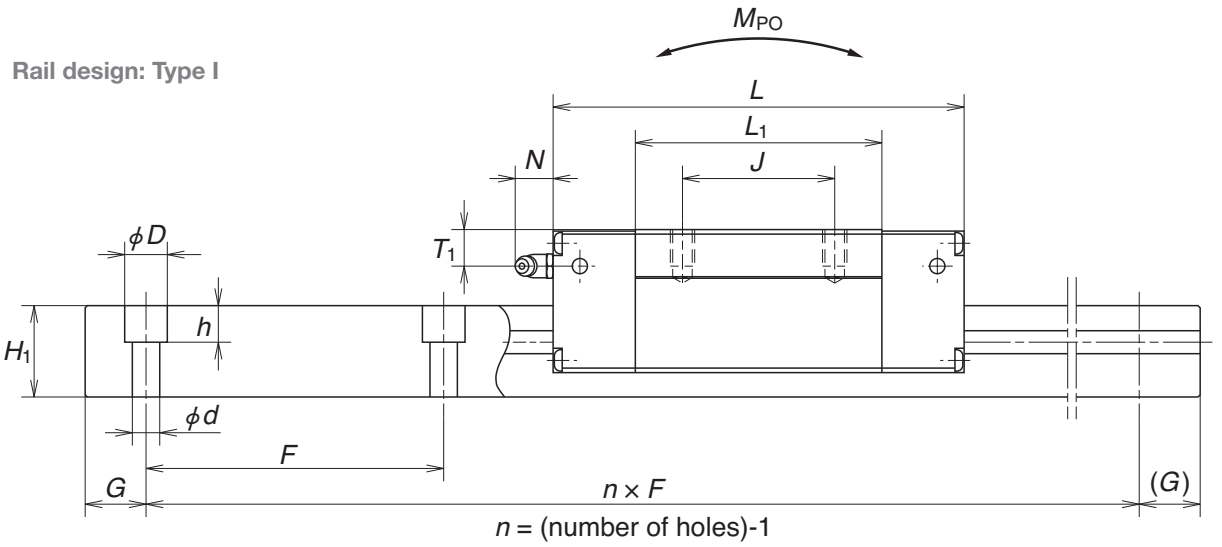
- TAS: Random-matching ball slide
- 30: Size
- AN: Shape/height
- F: Accessories
  - F: Fluoride low-temperature chrome plating + AS2 Grease
  - F50: Fluoride low-temperature chrome plating + LG2 Grease

Part number for rail only

Example: T1S 30 2400 L P N *** PL S

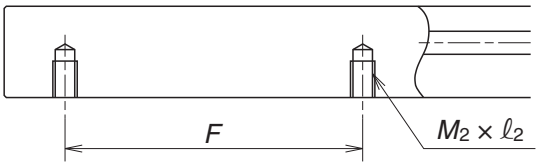
- T1S: Random-matching rail
- 30: Size
- 2400: Rail length (mm)
- L: Material/surface treatment
- P: Butting rail code
  - N: Non-butting
  - L: Butting
- N: NSK control number (*** is required when making inquiries)
- PL: Accuracy grade
  - PL: Normal grade for transportation
- S: Preload
  - S: Clearance of 60 μm or less

Rail design: Type I



n = (number of holes)-1

Rail design: Type II (optional)



Unit: mm

Rail				Basic load rating					Ball diameter	Mass	
Mounting hole		G	Max. length	Dynamic	Static	Allowable static moment load				Ball	Rail
Type I $d \times D \times h$	Type II $M_2 \times$ pitch $\times \ell_2$	(recomm-ended)	(Single rail) L_{0max}	C (N)	C_0 (N)	M_{R0} (N·m)	M_{P0} (N·m)	M_{Y0} (N·m)	D_W	slide (kg)	(kg/m)
4.5×7.5×5.3	M4×0.7×6	20	1 960	9 800	11 800	92	64	64	3.968	0.21	1.5
6×9.5×8.5	M5×0.8×8	20	2 920	15 700	19 100	196	137	137	4.762	0.37	2.1
7×11×9	M6×1×9	20	4 000	21 800	26 000	320	217	217	5.556	0.47	3.4
9×14×12	M8×1.25×12	20	4 040*	31 000	37 500	565	395	395	6.350	0.77	5.3
9 ×14×12	M8×1.25×12	20	4 040*	46 500	53 000	970	635	635	7.937	1.3	7.7

Note 3: Basic dynamic load rating *C* is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.
To convert *C* to C_{100} for a 100-km fatigue life, divide *C* by 1.26.
*Maximum length of fluoride low-temperature chrome plated products is 4 000 (G=80).

Part number for assembly (ball slide + rail)

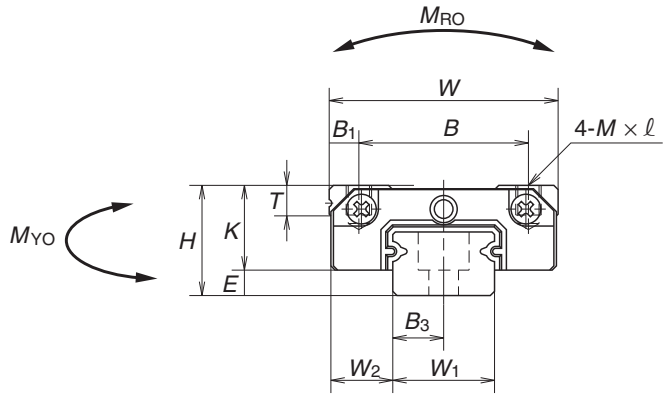
Example:

TS 30 2400 AN P 2 * PL S**

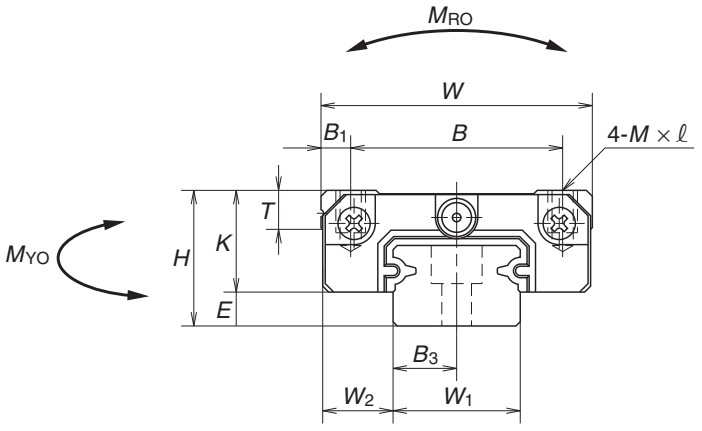
- Series
- Size
- Rail length (mm)
- Shape/height
- Surface treatment/rails design code
  - P: No surface treatment/Counterbores on the top face of rail (Type I)
  - V: No surface treatment/Tapped holes on the bottom face of rail (Type II Option)
  - R: Fluoride low-temperature chrome plating/Counterbores on the top face of rail (Type I)
  - W: Fluoride low-temperature chrome plating/ Tapped holes on the bottom face of rail (Type II Option)
- Number of ball slides per rail
- NSK control number (*** is required when making inquiries)
- Accuracy grade PL: Normal grade for transportation
- Preload S: Clearance of 60 μm or less

Ball Slide Models: TR, AR, AL, UR, BL

Front view



PU09, 12



PU15

Model No.	Assembly			Ball slide												
	Height			Width	Length	Mounting hole							Grease fitting			
	H	E	W_2	W	L	B	J	M × pitch × ℓ	B_1	L_1	J_1	K	T	Mounting hole size	T_1	N
PU09TR	10	2.2	5.5	20	30	15	10	M3×0.5×3	2.5	19.6	4.8	7.8	2.6	—	—	—
PU09UR					41		16			30.6	7.3					
PU12TR	13	3	7.5	27	35	20	15	M3×0.5×3.5	3.5	20.4	2.7	10	3.4	—	—	—
PU12UR					48.7		20			34.1	7.05					
PU15AL	16	4	8.5	32	43	25	20	M3×0.5×5	3.5	26.2	3.1	12	4.4	ϕ3	3.2	(3.6)
PU15BL					61		25			44.2	9.6					

Note: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.
To convert C to C_{100} for a 100-km fatigue life, divide C by 1.26.

Part number for ball slide only

Example: PAU 15 AL S - K

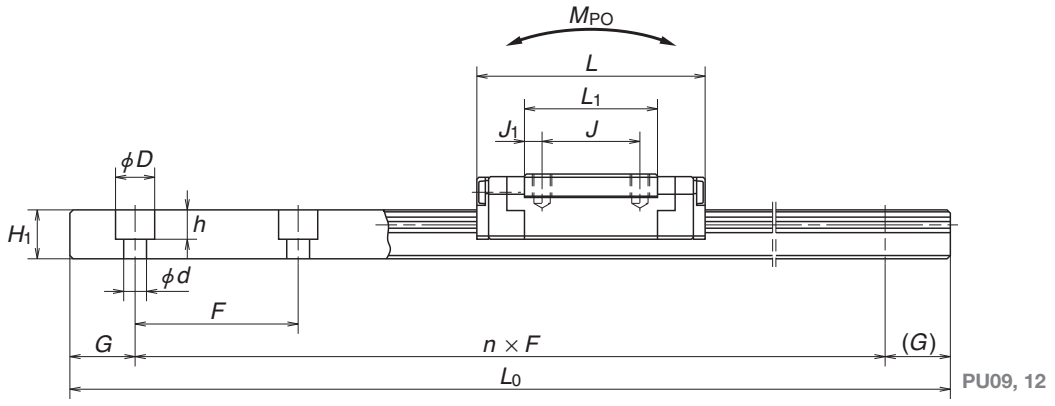
- PAU: Random-matching ball slide
- 15: Size
- AL: Shape/height
- S: Stainless steel
- K: Accessories K: With NSK K1

Part number for rail only

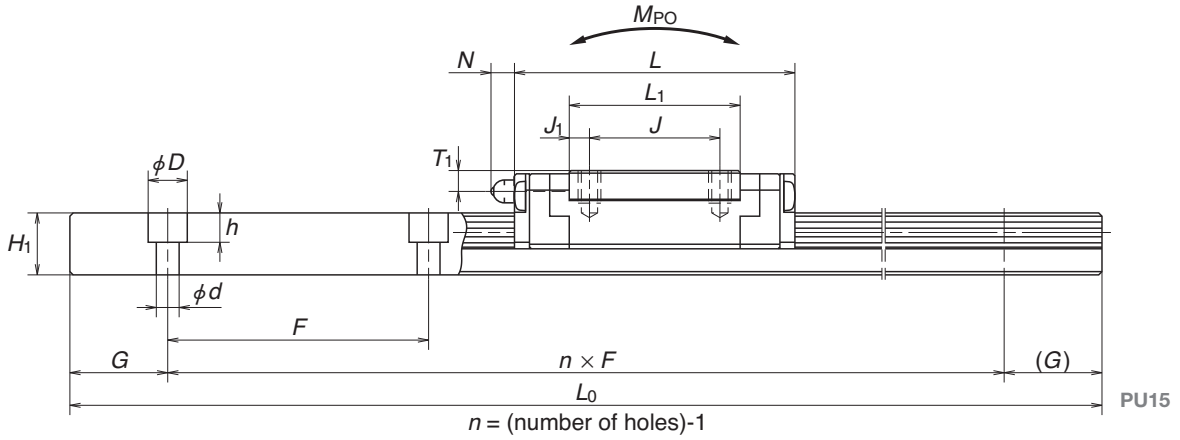
Example: P1U 15 0470 R K N *** PC T

- P1U: Random-matching rail
- 15: Size
- 0470: Rail length (mm)
- R: Shape (S: PU09·12, R: PU05·07·15)
- K: Material/surface treatment
- N: Butting rail specification N: Non-butting L: Butting
- ***: NSK control number (*** is required when making inquiries)
- PC: Accuracy: PC (only PC grade is available)
- T: Preload T: Fine clearance (standard)

Side view



PU09, 12



PU15

n = (number of holes)-1

Unit: mm

Rail							Basic load rating					Ball diameter	Weight	
Width	Height	Pitch	Mounting bolt hole			Max. length (Single rail)	Dynamic	Static	Static moment				Ball slide	Rail (g/100 mm)
W_1	H_1	F	$d \times D \times h$	B_3	G	L_{0max}	C (N)	C_0 (N)	M_{R0} (N·m)	M_{P0} (N·m)	M_{Y0} (N·m)	D_W	(g)	
9	5.5	20	3.5×6×4.5	4.5	7.5	600	1 490	2 150	10	6.1	6.1	1.5875	16	35
							2 100	3 500	16.4	15.6	15.6		25	
12	7.5	25	3.5×6×4.5	6	10	800	2 830	3 500	21.7	11.4	11.4	2.3812	32	65
							4 000	5 700	35	28.3	28.3		53	
15	9.5	40	3.5×6×4.5	7.5	15	1 000	5 550	6 600	49.5	25.6	25.6	3.175	59	105
							8 100	11 300	54.5	69.5	69.5		100	

Part number for assembly (ball slide + rail)

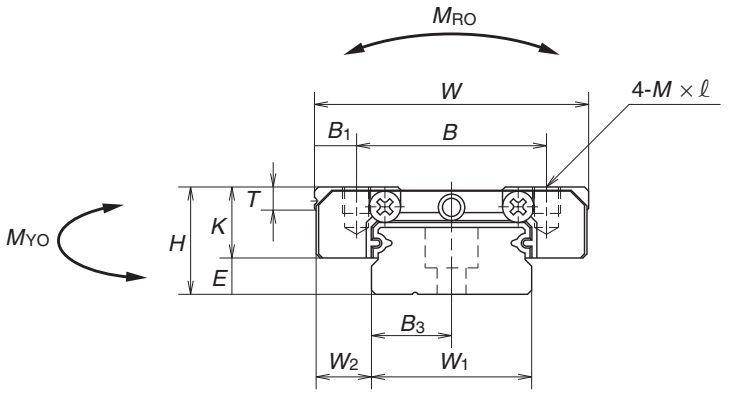
Example:

PU 15 0470 AL K 2 – ** PC T

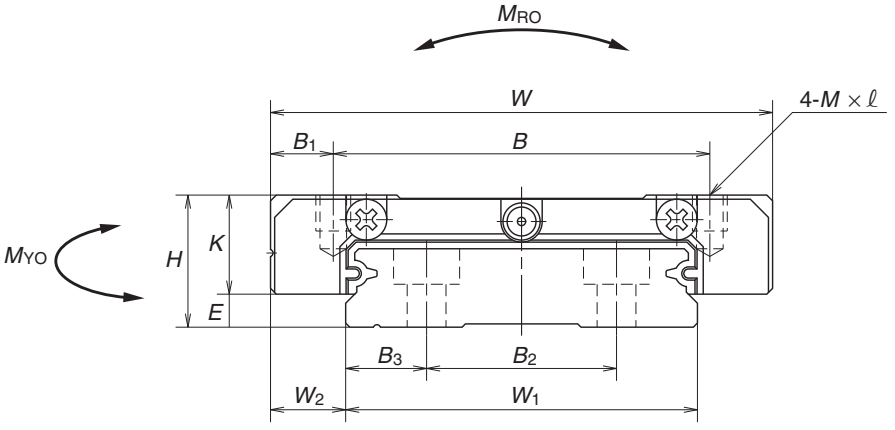
- PU: Series
- 15: Size
- 0470: Rail length (mm)
- AL: Shape/height
- K: Material/surface treatment
  K: Stainless steel
  H: Stainless steel + surface treatment
- 2: Number of ball slides per rail
- **: NSK control number
  (** is required when making inquiries)
- PC: Accuracy: PC (only PC grade is available)
  KC (with NSK K1)
- T: Preload T: Fine clearance (standard)

Ball Slide Models: AR, TR, UR, BR

Front view



PE09, 12



PE15

Model No.	Assembly			Ball slide													
	Height			Width	Length	Mounting hole								Grease fitting			
	H	E	W_2	W	L	B	J	$M \times$ pitch $\times \ell$	B_1	L_1	J_1	K	T	Mounting hole size	T_1	N	
PE09TR	12	4	6	30	39.8	21	12	M3×0.5×3	4.5	26.6	7.3	8	2.8	—	—	—	
PE09UR					51.2	23	24		3.5	38	7						
PE12AR	14	4	8	40	45	28	15	M3×0.5×4	6	31	8	10	3.2	—	—	—	
PE12BR					60		28			46	9						
PE15AR	16	4	9	60	56.6	45	20	M4×0.7×4.5	7.5	38.4	9.2	12	4.1	ϕ3	3.2	(3.3)	
PE15BR					76		35			57.8	11.4						

Note: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.
To convert C to C_{100} for a 100-km fatigue life, divide C by 1.26.

Part number for ball slide only

Example: PAE 15 AL S - K

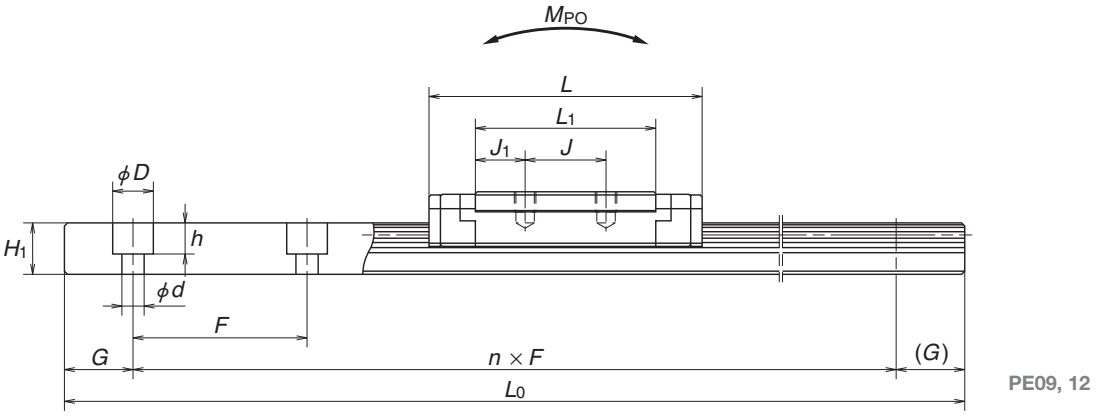
- PAE: Random-matching ball slide
- 15: Size
- AL: Shape/height
- S: Stainless steel
- K: Accessories K: With NSK K1

Part number for rail only

Example: P1E 15 0470 R K N *** PC T

- P1E: Random-matching rail
- 15: Size
- 0470: Rail length (mm)
- R: Shape (S: PE05·07·09·12, R: PE15)
- K: Material/surface treatment
- N: Butting rail specification N: Non-butting L: Butting
- ***: NSK control number (*** is required when making inquiries)
- PC: Accuracy: PC (only PC grade is available)
- T: Preload T: Fine clearance (standard)

Side view



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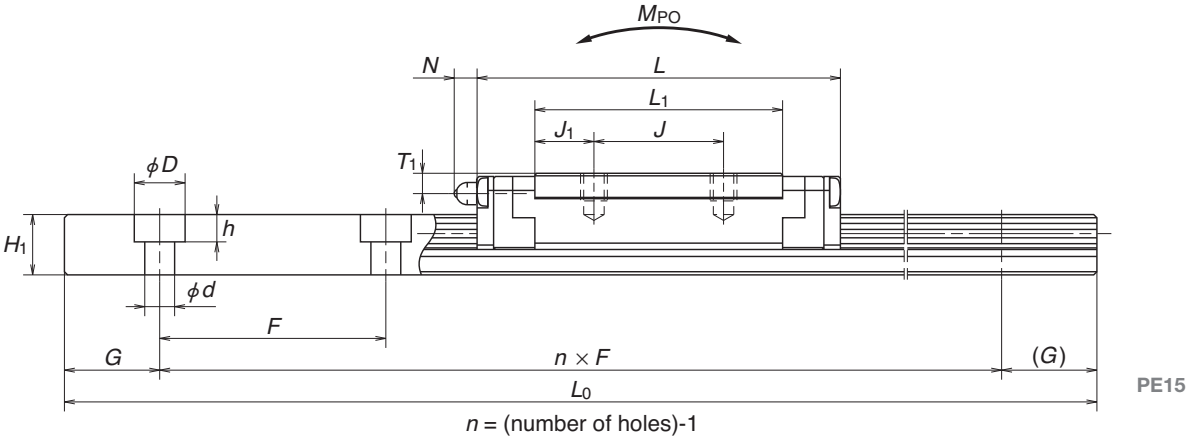


PE15

n = (number of holes)-1

Unit: mm

Rail								Basic load rating					Ball diameter	Weight	
Width	Height		Pitch	Mounting bolt hole			Max. length (Single rail)	Dynamic	Static	Static moment				Ball slide	Rail
W_1	H_1	B_2	F	$d \times D \times h$	B_3	G	L_{0max}	C (N)	C_0 (N)	M_{R0} (N·m)	M_{P0} (N·m)	M_{Y0} (N·m)	D_W	(g)	(g/100 mm)
18	7.5	—	30	3.5×6×4.5	9	10	800	3 000	4 500	36.5	17.3	17.3	2	35	95
								4 000	6 700	54.5	37.5	37.5		50	
24	8.5	—	40	4.5×8×4.5	12	15	1 000	4 350	6 350	70.5	29.3	29.3	2.3812	66	140
								5 800	9 550	106	63.5	63.5		98	
42	9.5	23	40	4.5×8×4.5	9.5	15	1 200	7 600	10 400	207	59	59	3.175	140	275
								10 300	16 000	320	135	135		211	

Part number for assembly (ball slide + rail)

Example:

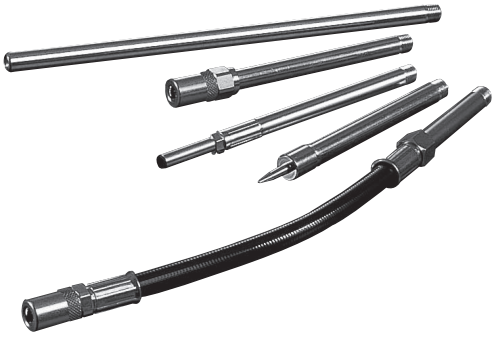
PE 15 0470 AL K 2 – ** PC T

- PE — Series
- 15 — Size
- 0470 — Rail length (mm)
- AL — Shape/height
- K — Material/surface treatment
  K: Stainless steel
  H: Stainless steel + surface treatment
- 2 — Number of ball slides per rail
- ** — NSK control number
  (** is required when making inquiries)
- PC — Accuracy: PC (only PC grade is available)
  KC (with NSK K1)
- T — Preload T: Fine clearance (standard)

NSK Grease Unit

Grease in bellows tube

Supply grease to linear guides and ball screws by manual type hand grease pump.
Install grease in bellows tube pump.
Several types of grease (80 g) are available.

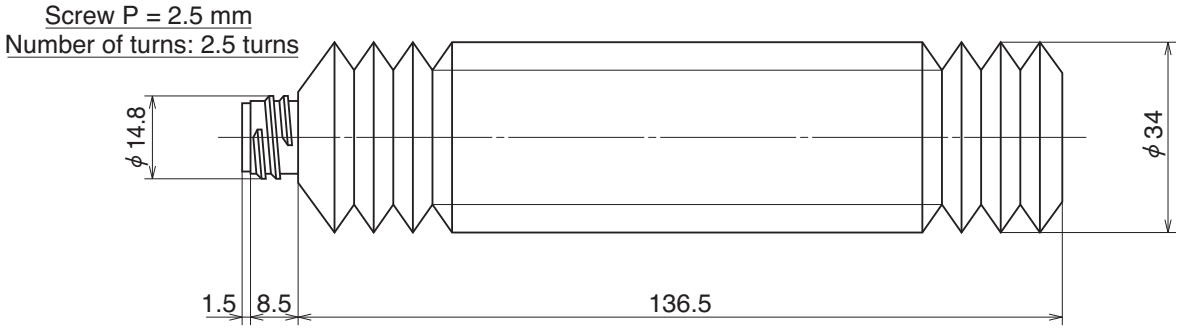


1. Composition of NSK Grease Unit

Components and grease types are shown below.

NSK Grease Unit	Name	(tube type)	Part number
NSK Grease (80 g in bellows tube)	NSK Grease AS2	(Brown)	NSK GRS AS2
	NSK Grease PS2	(Orange)	NSK GRS PS2
	NSK Grease LR3	(Green)	NSK GRS LR3
	NSK Grease LG2	(Blue)	NSK GRS LG2
	NSK Grease LGU	(Yellow)	NSK GRS LGU
	NSK Grease NF2	(Gray)	NSK GRS NF2
NSK Hand Grease Pump Unit			
NSK Hand Grease Pump (Straight nozzle NSK HGP NZ1 – One nozzle is provided with hand pump.)			NSK HGP
Grease nozzle (used with hand grease pump)			
	NSK straight nozzle		NSK HGP NZ1
	NSK chuck nozzle		NSK HGP NZ2
	NSK drive fitting nozzle		NSK HGP NZ3
	NSK point nozzle		NSK HGP NZ4
	NSK flexible nozzle		NSK HGP NZ5
	NSK flexible extension pipe		NSK HGP NZ6
	NSK straight extension pipe		NSK HGP NZ7

2. NSK Greases (80 g in bellows tube)



Bellows tube

3. NSK Manual Grease Pump Unit

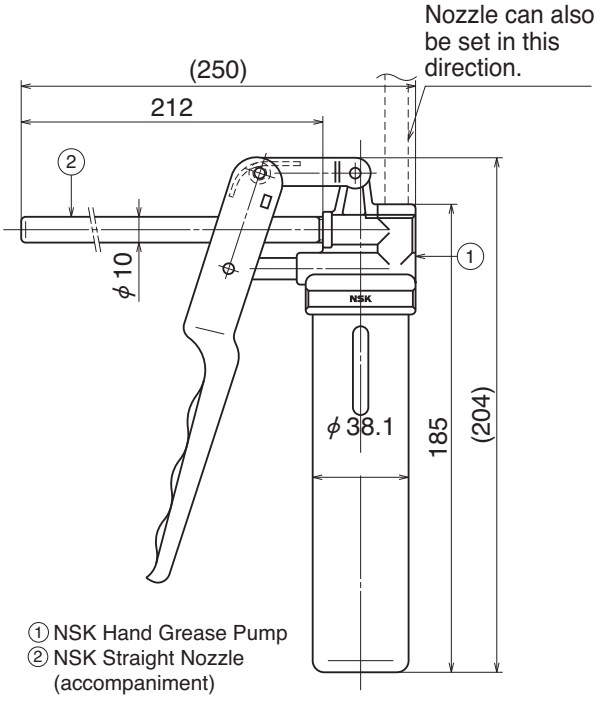
1) NSK Hand Grease Pump Unit
Part number: NSK HGP

(1) Features

- Light-weight ····· Can be operated by one hand, yet there is no worry of making a mistake.
- Inserting by high pressure ··· Insert at 15 Mpa.
- No leaking ····· Does not leak when held upside down.
- Easy to change grease ····· Simply attach grease in bellows tube.
- Remaining grease ····· Can be confirmed through slit on tube.
- Several nozzles ····· Five types of nozzles to choose from.

(2) Specifications

- Spout volume ····· 0.33cc / shot
- Grease tube outer diameter ··· ϕ38.1
- Accessories ····· Several nozzles for unique application can be attached.



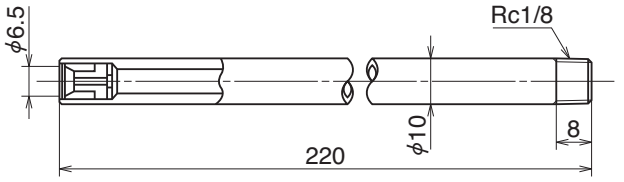
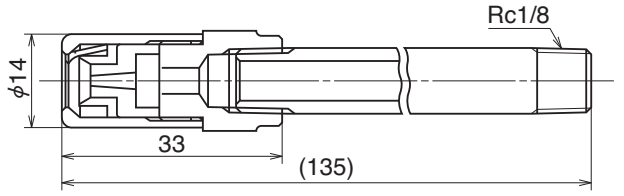
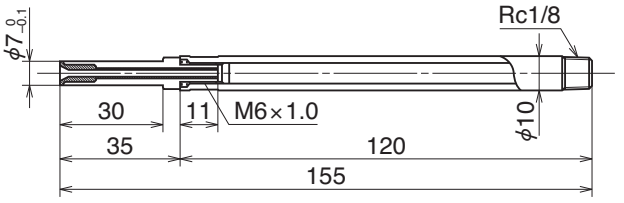
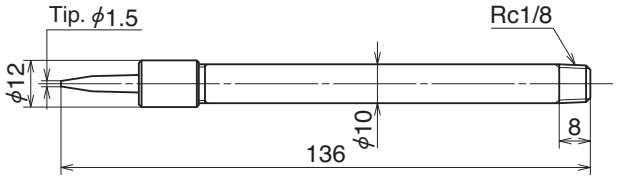
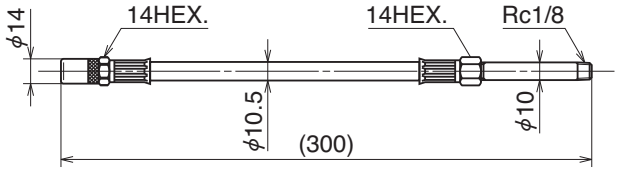
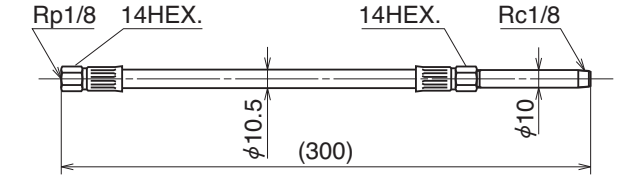
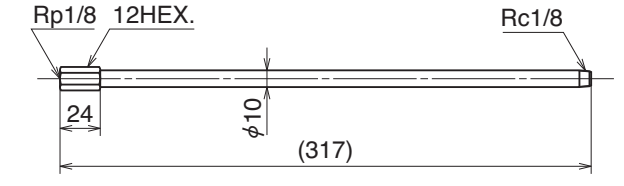
NSK Hand grease pump with NSK straight nozzle

▶ For lubrication, see page 50.

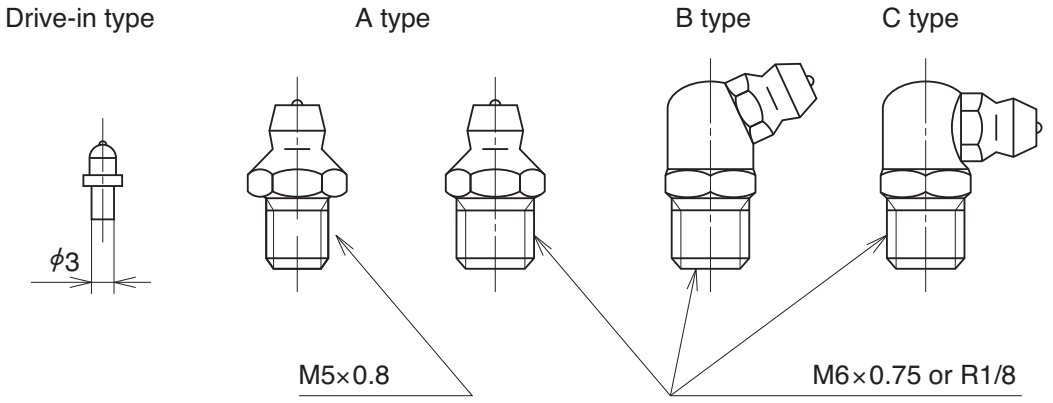
NSK Grease Unit

2) Nozzles

Nozzles that can be attached to NSK Hand Grease Pump

Name	Part number	Applicable grease fitting	Dimensions
NSK straight nozzle	NSK HGP NZ1	A, B, C	
NSK chuck nozzle	NSK HGP NZ2	A, B, C	
NSK fitting nozzle	NSK HGP NZ3	Drive-in type	
NSK point nozzle	NSK HGP NZ4	For non-grease fitting	
NSK flexible nozzle	NSK HGP NZ5	A, B, C	
NSK flexible extension pipe	NSK HGP NZ6	N / A	
NSK straight extension pipe	NSK HGP NZ7	N / A	

Grease fittings



Grease fittings used for Linear Guides

Linear guide	Size	Tap hole for grease fitting	Standard grease fitting	Straight nozzle **NZ1**	Chuck nozzles (two) **NZ2**	Drive-in nipple nozzle **NZ3**	Point nozzle **NZ4**	Flexible nozzle **NZ5**
LH / SH Series	15	ϕ3	Drive-in type			○		
	20, 25, 30, 35	M6×0.75	B type	○	○*1			○
	45, 55	Rc1/8	B type	○	○			○
LS / SS Series	15	ϕ3	Drive-in type			○		
	20, 25, 30, 35	M6×0.75	B type	○	○*1			○
RA Series	15, 20	ϕ3	Drive-in type			○		
	25, 30, 35	M6×0.75	B type	○	○*1			○
	45, 55, 65	Rc1/8	B type	○	○			○
LW Series	17	ϕ3	Drive-in type			○		
	21, 27, 35	M6×0.75	B type	○	○*1			○
	50	Rc1/8	B type	○	○			○
TS Series	15	ϕ3	Drive-in type			○		
	20, 25, 30, 35	M6×0.75	B type	○	○*1			○
PU Series	05, 07, 09, 12	—	—				○*2	
	15	ϕ3	Drive-in type			○		
PE Series	05, 07, 09, 12	—	—				○*2	
	15	ϕ3	Drive-in type			○		

*1 If using a chuck nozzle, avoid interference with plate and rail.
*2 PU and PE Series: Apply grease directly to ball groove, etc. using point nozzle.

NSK Grease Unit

Lubricating method – grease – for Linear Guides.
Use a grease lubrication most suitable to condition requirements and purpose to optimize functions of the Linear Guides.
In general, lubricants with low base oil kinematic viscosity are used for high-speed operation, in which thermal expansion has a large impact, and in low temperatures.
Lubrication with high base oil kinematic viscosity is used for oscillating operations, low speeds and high temperatures.
The following are lubrication methods using grease.

Grease Lubrication

Grease lubrication is widely used because it does not require a special oil supply system or piping.
Grease lubricants made by NSK are:

- Various types of grease in bellows tubes that can be instantly attached to a grease pump;
- NSK Grease Unit that consists of a hand grease pump and various nozzles. These are compact and easy to use.

NSK Grease Lubricants

The following table shows the marketed general grease widely used for Linear Guides, for specific uses, conditions and purposes.

Grease lubricant for linear guides

Type	Thickener	Base oil	Base oil kinematic viscosity mm^2/s (40°C)	Range of use temperature (°C)	Purpose
AS2	Lithium type	Mineral oil	130	–10 – 110	For general use at high load.
PS2	Lithium type	Synthetic oil + mineral oil	15	–50 – 110	For low-temperature and high frequency operations.
LR3	Lithium type	Synthetic oil	30	–30 – 130	For high speed, medium load.
LG2	Lithium type	Synthetic oil + synthetic hydrocarbon oil	30	–20 – 70	For clean environments.
LGU	Diurea	Synthetic hydrocarbon oil	100	–30 – 120	For clean environments.
NF2	Urea composite type	Synthetic oil + mineral oil	27	–40 – 100	For fretting resistance.

How to Replenish Grease

Use grease fitting if exclusive grease supply component is not used. Supply required amount through grease fitting by a grease gun (pump).
Wipe off old grease and accumulated dust before supplying new grease. If grease fitting is not used, apply grease directly to the rail. Remove the seal if possible, and move a ball slide a few strokes so the grease permeates into the ball slide. A hand grease pump, an exclusive and easy lubrication device for Linear Guides is available at NSK.

Volume of Grease to be Replenished

Once grease is replenished, another supply is not required for a long time. But under some operational conditions, it is necessary to periodically replenish grease. The following are replenishing methods.

• When there is an exclusive grease supply system and the volume from the spout can be controlled, the criterion is:

All at once, replenish the amount that fills about 50% of the internal space of the ball slide. This method eliminates waste of grease and is efficient.
The following tables show internal spaces of ball slider for reference.

• When replenishing using a grease gun:

Use a grease gun and fill the inside of the ball slide with grease. Supply grease until it comes out from the ball slide area. Move ball slide by hand while filling them with grease so the grease permeates all areas. Do not operate the machine immediately after replenishing. Always try the system a few times to spread the grease throughout the system and to remove excess grease. Trial operations are necessary because the resistance to sliding force greatly increases immediately after replenishment (full-pack state) and may cause problems. The agitating resistance of grease is accountable for this phenomenon. Wipe off excess grease that accumulates at end of rail and screw shaft after trial runs so the grease does not move to other areas.

Intervals of Checks and Replenishment

Although the grease is of high quality, it gradually deteriorates and its lubrication function diminishes.
Also, the grease in the ball slide is gradually removed by stroke movement. In some environments, the grease becomes dirty, and foreign objects may enter. Grease should be replenished depending on frequency of use.
The following is a guide of grease replenishment intervals for Linear Guides.

Intervals of checks and replenishments for grease lubrication

Intervals of checks	Items to check	Intervals of replenishment
3–6 months	Dirt, foreign matter such as cutting chips	Usually once per year. Every 3 000 km for material handling system that travels more than 3 000 km per year. Replenish if checking results warrant it necessary.

Note 1: As a general rule, do not mix greases of different brands. Grease structure may be destroyed if greases of different thickeners are mixed. Even when greases have the same thickener, different additives in them may have an adverse effect on each other.
Note 2: Grease viscosity varies by temperature. Viscosity is particular high in winter due to low temperatures. Pay attention to increases in Linear Guides sliding resistance in such conditions.

NSK Grease Unit

Linear Guide

Inside space of ball slide of linear guide

LH, LS Series

Unit: cm^3

Series / Model No.	LH		LS	
	High load type	Ultra-high load type	Medium load type	High load type
15	3	4	2	3
20	6	8	3	4
25	9	13	5	8
30	13	20	8	12
35	22	30	12	19
45	47	59	—	—
55	80	100	—	—
65	139	186	—	—
85	—	336	—	—

SH, SS Series

Unit: cm^3

Series / Model No.	SH		SS	
	High load type	Ultra-high load type	Medium load type	High load type
15	2	3	1.5	2
20	5	7	3	4
25	9	12	5	7
30	11	17	7	11
35	20	27	11	17
45	42	53	—	—
55	73	93	—	—

RA Series

Unit: cm^3

Series / Model No.	RA	
	High load type	Ultra-high load type
25	3	3.5
30	5	6
35	6	8
45	10	13
55	15	20
65	33	42

LW Series

Unit: cm^3

Series / Model No.	LW
17	3
21	3
27	7
35	24
50	52

TS Series

Unit: cm^3

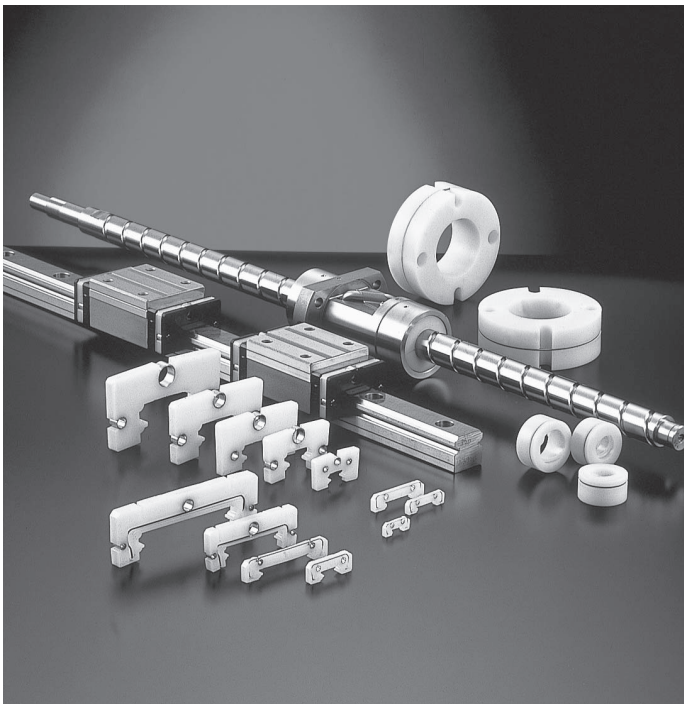
Series / Model No.	TS
15	2
20	3
25	6
30	9
35	15

PU, PE Series

Unit: cm^3

Series / Model No.	PU		PE	
	Standard type	High load type	Standard type	High load type
09	0.2	0.3	0.4	0.5
12	0.3	0.4	0.5	0.7
15	0.8	1.1	1.2	1.6

NSK K1 Lubrication Unit



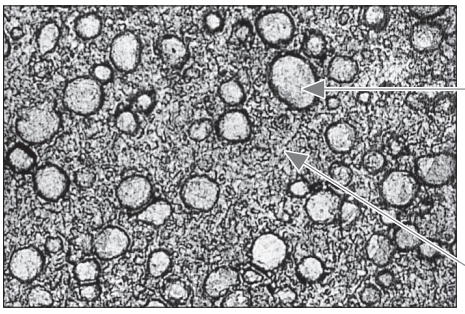
NSK K1 lowers machine operating costs and reduces impact on the environment.

What is “long-term, maintenance-free operation”?

Linear guides equipped with NSK K1 do not require maintenance for five years or up to 50 000 km operational distance.

What is the NSK K1 Lubrication Unit?

NSK K1 is a lubrication device that combines oil and resin in a single unit. The porous resin in the unit contains a large amount of lubrication oil. Positioned close to the rail, NSK K1 constantly supplies fresh oil, which seeps from the resin, lubricating the rail surface.



Enlarged surface of NSK K1 Lubrication Unit

Polyolefin

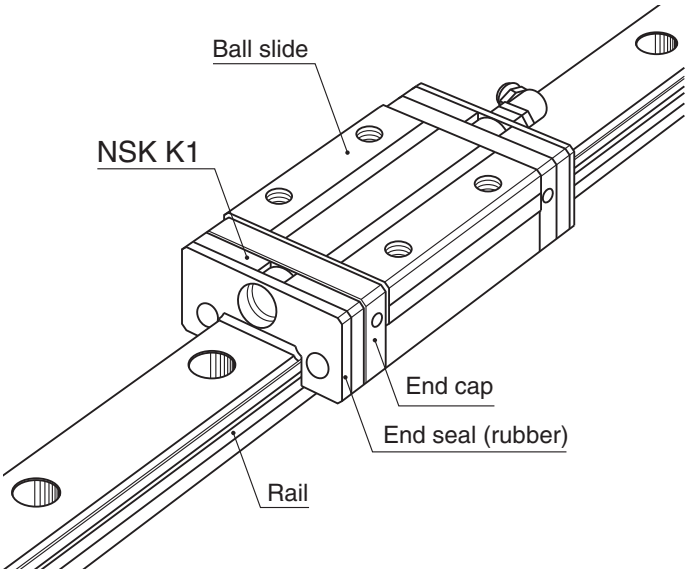
Unlike vinyl chloride products, polyolefin does not produce dioxin. Polyolefin is also being increasingly used at supermarkets for food wrapping.

Lubrication oil

This mineral oil-based oil has a viscosity of 100 cSt.

Remarkable sealing capacity with new material: NSK K1 Lubrication Unit

- NSK K1 lubrication unit (referred to as NSK K1 hereafter) equipped with linear guide is an outstanding new lubrication material.
- Newly developed porous synthetic resin contains a large volume of lubricant oil that seeps out and enhances lubricating function.
- Simply install NSK K1 inside a standard end seal (rubber).



1. Features

Compact and efficient lubrication unit.

1) Long-term maintenance is not required

Used with grease, the lubrication function lasts for a long time. Ideal for systems/environments in which replenishing is difficult.

▼

For automotive component processing lines, etc.

2) Does not pollute the environment

A very small volume of grease combined with NSK K1 can provide sufficient lubrication. NSK K1 is suitable for clean environment applications.

▼

Food processing, medical equipment, liquid crystal displays, semiconductor manufacturing equipment, etc.

3) Good for applications where lubricant is washed away

Used with grease, machine life is prolonged even when the machine is washed entirely using water or in environments where the machine is exposed to rain or wind.

▼

Food processing equipment, housing, construction machines, etc.

4) Maintains efficiency in dusty environments

In environments where oil- and grease-absorbing dust is produced, long-term efficiency in lubrication and prevention from foreign inclusions is maintained by using NSK K1 in combination with grease.

▼

Woodworking machines, etc.

Note: Stainless steel linear guides and ball screws should be considered for use in corrosive environments or other environments where rusting is a potential problem.

2. Precautions for handling

To maintain high functionality of the NSK K1 Seal, observe the following precautions.

1) Temperature range in use

Maximum temperature in use: 50°C
Momentary maximum temperature in use: 80°C

2) Chemicals that should not come into contact with seal

Do not leave NSK K1 in organic solvent, white kerosene such as hexane, thinner that removes oil, or rust preventive oil that contains white kerosene.

Note: Water-type cutting oil, oil-type cutting oil, grease such as mineral-type AS2 and ester-type PS2 do not damage NSK K1.

2. NSK K1™

Table 12 shows the dimension of linear guides equipped with the NSK K1.

Table 12

Unit : mm

Model No.	Ball slide length	Ball slide model	Standard ball slide length	Ball slide length installed with two NSK K1 L	Per NSK K1 thickness V_1	Protective cover thickness V_2	Protruding area of the grease fitting N
LH08	Standard	AN	24	31	3	0.5	—
LH10	Standard	AN	31	40	4	0.5	—
LH12	Standard	AN	45	54	4	0.5	(4)
LH15	Standard	AN, EL, FL, EM	55	65.6	4.5	0.8	(5)
	Long	BN, GL, HL, GM	74	84.6			
LH20	Standard	AN, EL, FL, EM	69.8	80.4	4.5	0.8	(14)
	Long	BN, GL, HL, GM	91.8	102.4			
LH25	Standard	AL, AN, EL, FL, EM	79.0	90.6	5.0	0.8	(14)
	Long	BL, BN, GL, HL, GM	107	118.6			
LH30	Standard	AL, AN	85.6	97.6	5.0	1.0	(14)
	Flange type	EL, FL, EM	98.6	110.6			
	Long	BL, BN, GL, HL, GM	124.6	136.6			
LH35	Standard	AL, AN, EL, FL, EM	109	122	5.5	1.0	(14)
	Long	BL, BN, GL, HL, GM	143	156			
LH45	Standard	AL, AN, EL, FL, EM	139	154	6.5	1.0	(15)
	Long	BL, BN, GL, HL, GM	171	186			
LH55	Standard	AL, AN, EL, FL, EM	163	178	6.5	1.0	(15)
	Long	BL, BN, GL, HL, GM	201	216			
LH65	Standard	AN, EL, FL, EM	193	211	8.0	1.0	(16)
	Long	BN, GL, HL, GM	253	271			

Note: 1) NSK K1 for food and medical equipments are available for LH12 to LH35.
2) Ball slide length equipped with NSK K1 = (Standard ball slide length) + (Thickness of NSK K1, V_1 × Number of NSK K1) + (Thickness of the protective cover, V_2 × 2)

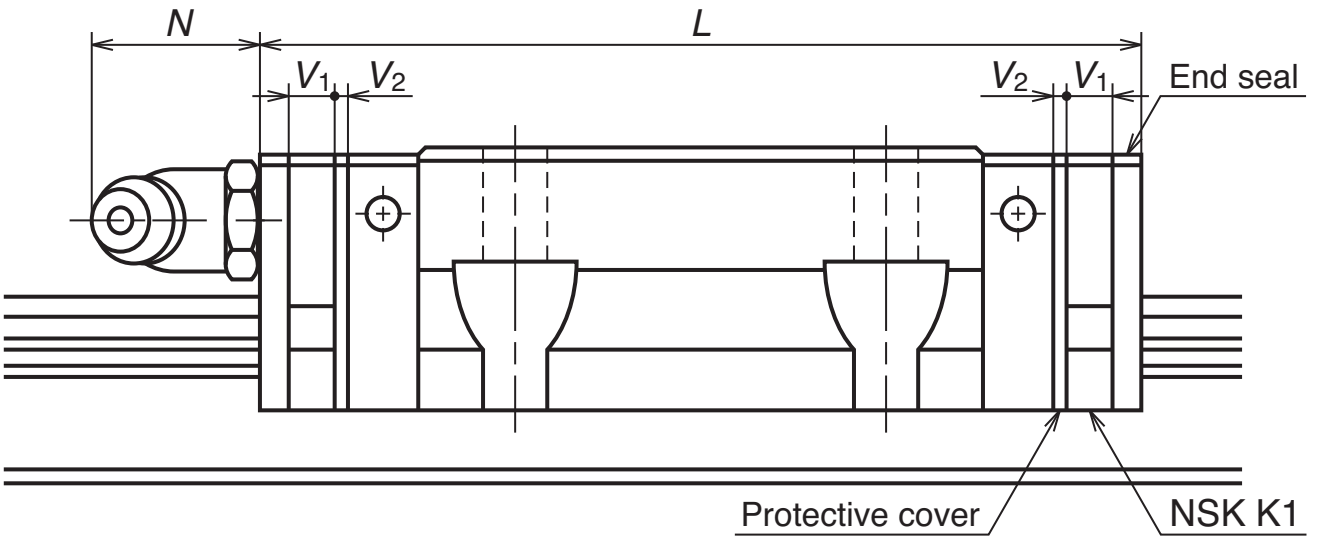
2. NSK K1™

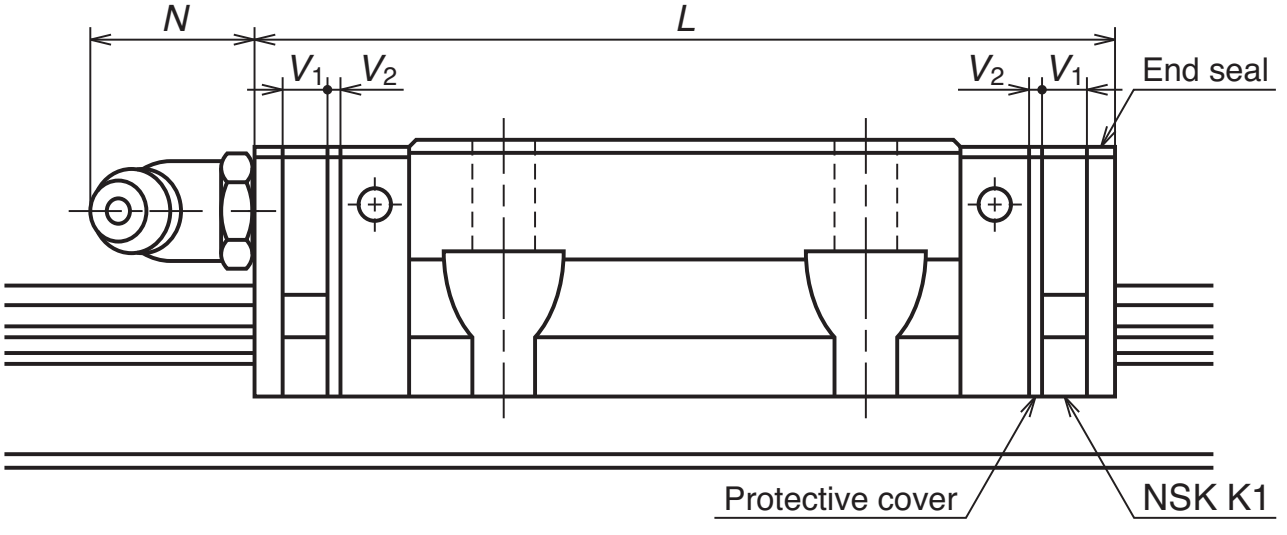
Table 12 shows the dimension of linear guides equipped with the NSK K1.

Table 12

Model No.	Ball slide length	Ball slide model	Standard ball slide length	Ball slide length installed with two NSK K1 L	Per NSK K1 thickness V_1		
LS15	Standard	AL, EL, FL, EM	56.8	66.4	4.0	0.8	(5)
	Short	CL, JL, KL, JM	40.4	50			
LS20	Standard	AL, EL, FL, EM	65.2	75.8	4.5	0.8	(14)
	Short	CL, JL, KL, JM	47.2	57.8			
LS25	Standard	AL, EL, FL, EM	81.6	92.2	4.5	0.8	(14)
	Short	CL, JL, KL, JM	59.6	70.2			
LS30	Standard	AL, EL, FL, EM	96.4	108.4	5.0	1.0	(14)
	Short	CL, JL, KL, JM	67.4	79.4			
LS35	Standard	AL, EL, FL, EM	108	121	5.5	1.0	(14)
	Short	CL, JL, KL, JM	77	90			

Note: Ball slide length equipped with NSK K1 = (Standard ball slide length) + (Thickness of NSK K1, V_1 × Number of NSK K1) + (Thickness of the protective cover, V_2 × 2)


N
L
V1
V2
V2
V1
End seal
Protective cover
NSK K1


N
L
V1
V2
V2
V1
End seal
Protective cover
NSK K1

2. NSK K1™

Table 12 shows the dimension of linear guides equipped with the NSK K1.

Table 12

(Unit : mm)

Model No.	Ball slide length	Ball slide model	Standard ball slide length	Ball slide length installed with two NSK K1 L	Per NSK K1 thickness V_1	Protective cover thickness V_2	Protruding area of the grease fitting N
LW17	Standard	EL	51.4	61.6	4.5	0.6	(5)
LW21	Standard	EL	58.8	71.4	5.5	0.8	(13)
LW27	Standard	EL	74	86.6	5.5	0.8	(13)
LW35	Standard	EL	108	123	6.5	1.0	(13)
LW50	Standard	EL	140.6	155.6	6.5	1.0	(14)

Note: NSK K1 for food and medical equipments are available for LW17 to LW35.

2. NSK K1™

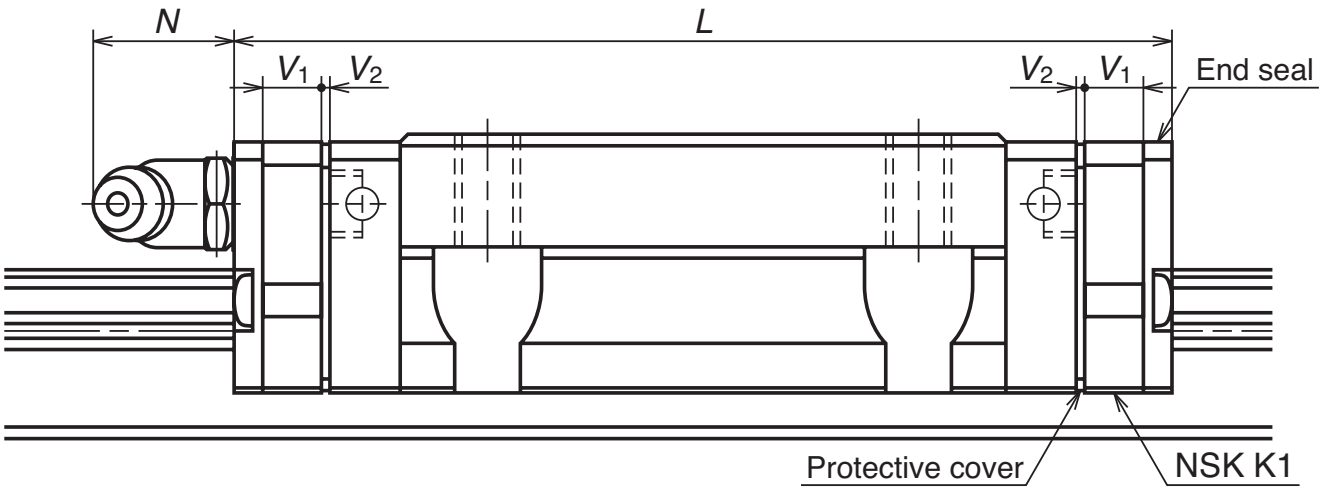
Table 10 shows the dimension of linear guides equipped with the NSK K1.

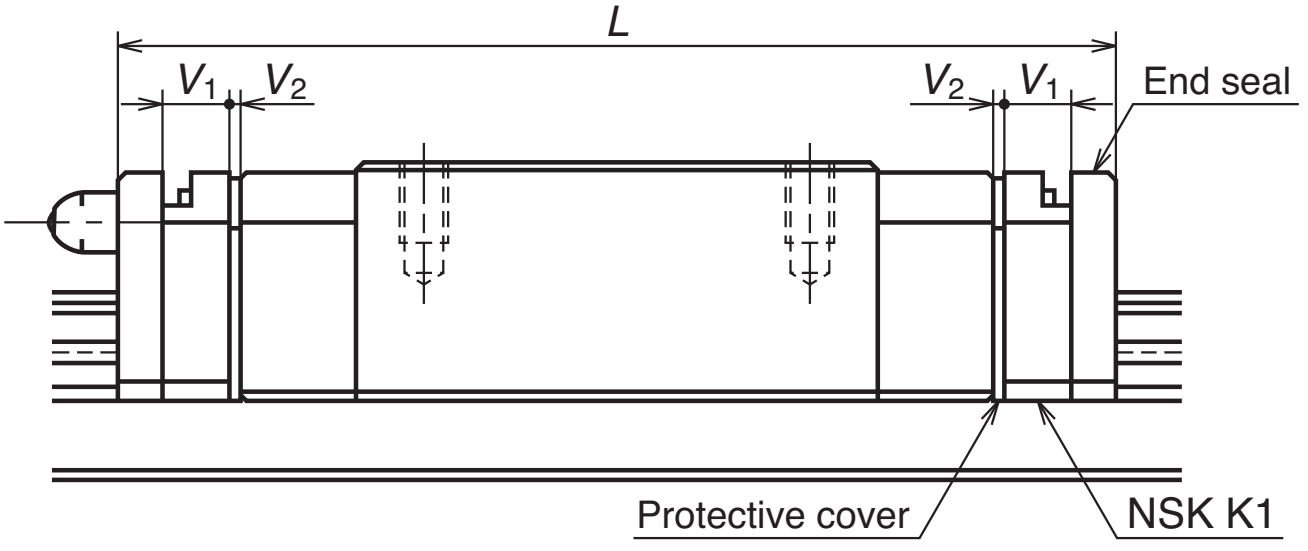
Table 10

Unit: mm

Model No.	Ball slide length	Ball slide model	Standard ball slide length	Ball slide length equipped with two NSK K1 L	Thickness of NSK K1, V_1	Thickness of protective cover, V_2
PU05	Standard	TR	19.4	24.4	2	0.5
PU07	Standard	AR	23.4	29.4	2.5	0.5
PU09	Standard	TR	30	36.4	2.7	0.5
	Long	UR	41	47.4		
PU12	Standard	TR	35	42	3	0.5
	Long	UR	48.7	55.7		
PU15	Standard	AL	43	51.2	3.5	0.6
	Long	BL	61	69..2		

Note: Ball slide length equipped with NSK K1 =
(Standard ball slide length) + (Thickness of NSK K1, V_1 × Number of NSK K1) +
(Thickness of the protective cover V_2 × 2)


N
L
V1
V2
V2
V1
End seal
Protective cover
NSK K1


L
V1
V2
V2
V1
End seal
Protective cover
NSK K1

2. NSK K1™

Table 10 shows the dimension of linear guides equipped with the NSK K1.

Table 10

Unit: mm

Model No.	Ball slide length	Ball slide model	Standard ball slide length	Ball slide length equipped with two NSK K1 L	Thickness of NSK K1, V_1	Thickness of protective cover, V_2
PE05	Standard	AR	24.1	28.9	2	0.4
PE07	Standard	TR	31.1	37.1	2.5	0.5
PE09	Standard	TR	39.8	46.8	3	0.5
	Long	UR	51.2	58.2		
PE12	Standard	AR	45	53	3.5	0..5
	Long	BR	60	68		
PE15	Standard	AR	56.6	66.2	4	0.8
	Long	BR	76	85.6		

Note: Ball slide length equipped with NSK K1 =
(Standard ball slide length) + (Thickness of NSK K1, V_1 × Number of NSK K1) +
(Thickness of the protective cover V_2 × 2)

2. NSK K1™

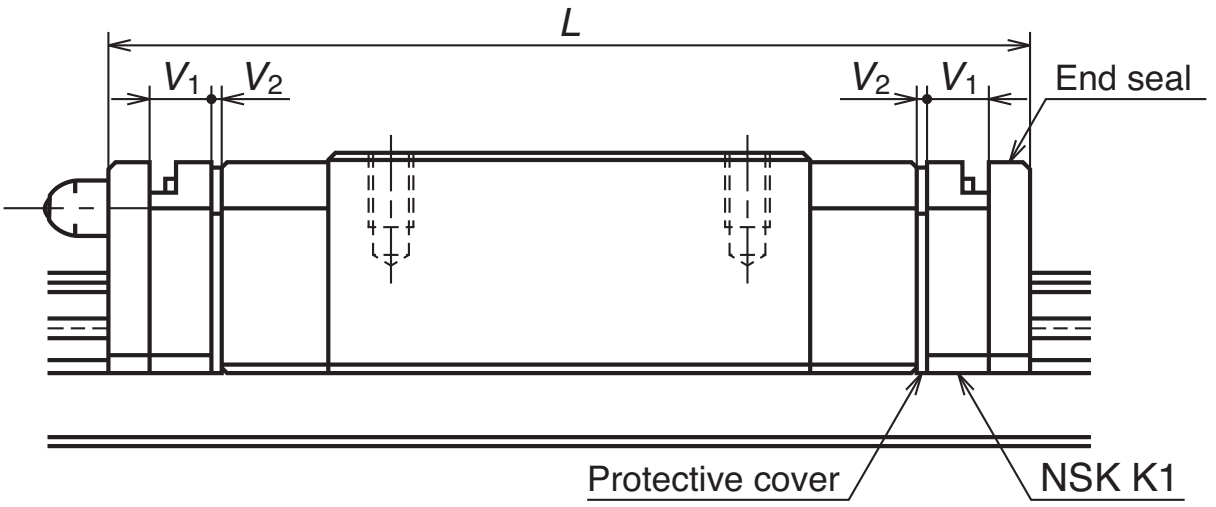
Table 12 shows the dimension of linear guides equipped with the NSK K1.

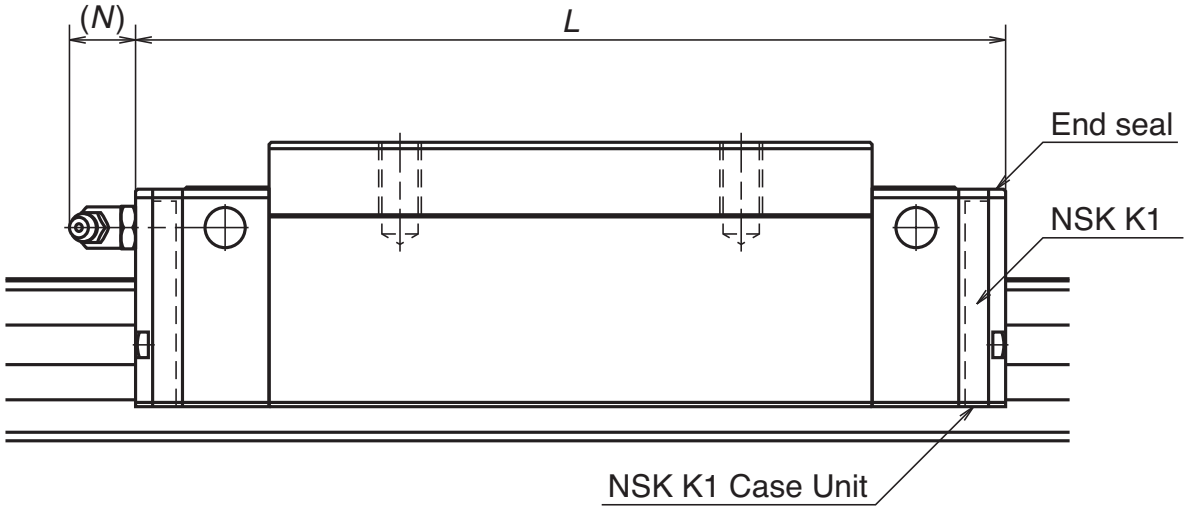
Table 12

Unit: mm

Model No.	Roller slide length	Roller slide model	Standard roller slide length	Roller slide length installed with NSK K1 Case Unit L	Per NSK K1 case unit thickness	Protruding area of the grease fitting N
RA15	Standard	AN, AL, EM	70	79	4.5	(3)
	Long	BN, BL, GM	85.4	94.4		
RA20	Standard	AN, EM	86.5	95.5	4.5	(3)
	Long	BN, GM	106.3	115.3		
RA25	Standard	AN, AL,EM	97.5	107.5	5	(11)
	Long	BN, BL, GM	115.5	125.5		
RA30	Standard	AN, AL, EM	110.8	122.8	6	(11)
	Long	BN, BL, GM	135.4	147.4		
RA35	Standard	AN, AL, EM	123.8	136.8	6.5	(11)
	Long	BN, BL, GM	152	165		
RA45	Standard	AN, AL, EM	154	168	7	(14)
	Long	BN, BL, GM	190	204		
RA55	Standard	AN, AL, EM	184	198	7	(14)
	Long	BN, BL, GM	234	248		
RA65	Standard	AN, EM	228.4	243.4	7.5	(14)
	Long	BN, GM	317.5	317.5		

Roller slide length equipped with NSK K1 case unit=
(Standard roller slide length) + (Thickness of NSK K1 case unit × Number of NSK K1 case unit)


L
V1
V2
V2
V1
End seal
Protective cover
NSK K1


(N)
L
End seal
NSK K1
NSK K1 Case Unit

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