
The competitive manufacturers are provided for a convenient source of unit substitution. They can be considered interchangeable in most instances, but for special applications, please consult NSK Engineering. NSK assumes no liability with respect to errors or omissions.

NSK	THK	THOMSON		SKF	BOSCH - REXROTH (STAR)	INA
		Old	New			
NH	HSR (SHS)	CG	511	LLRHS/LLTHS	R16 ¹	KUVE##/KWVE##/TKVD## ^{#2}
NS	SR (SSR)			LLRHS	R161	KUVE##/KWVE##/TKVD## ^{#2}
LW	HRW				R1671	KUVE##-WKWVE##-W/TKVD##-W
PU	RSR	CD	TSR-Z	LLMHS	R0442/R0444	KUEM##/KWEM##/TKDM##
PF	RSR W	LLMWS	TSR-WZ	LLMWS	R0441/R0443	KUFM##-W/KWFM##-W/TKDM##-W

² See Slider and Rail Section for Exact Series for INA

NSK	THK	THOMSON	SKF	BOSCH - REXROTH (STAR)	INA
Number indicated rail width	Same as NSK	Same as NSK with the exception of the CD series	Same as NSK	See Table	Same as NSK

3. LINEAR GUIDE SLIDER STYLES ## SIZE (BALL WIDTH)

NSK	THK		THOMSON		SKF	BOSCH - REXROTH (STAR)	INA
	Common	Less Common	Old	New			
NAH##AN	HSR##R (SHS##R/V)	HSR##TR/TRX/CR	CG##CE	511H##E	LLRHC##R/U (20,45)	R1621	KWVE##-B-H
NAH##BN	HSR##LR (SHS##LR/LN)	HSR##HTR/HR	CG##DE	511H##F	LLRHC##LR	R1624	KWVE##-B-HL
NAH##EM	HSR##A/B/CA/CB (SHS##C)	HSR##TA	CG##AA	511H##A	LLRHC##A	R1651	KWVE##-B
NAH##GM	HSR##HA/LA/HB/LB (SHS##LC)	HSR##HTA/HTB	CG##BA	511H##B	LLRHC##LA	R1653	KWVE##-BL
NAH##AL	(SHS##V)			511H##C (25,30,35)	LLRHC##U (25,30,35)	R1622 (except R1622-1)	KWVE##-B-S
NAH##BL	(SHS##LV)			511H##D (25,30,35)		R1623	KWVE##-B-SL
NAS##EM	SR##TB (SSR##XTB)					R1693	
NAS##AL	SR##W (SSR##XW)	SR##TX/WY (SSR##XWY)			LLRHC15U	R1694/R1622-1	
NAS##CL	SR##V (SSR##XV)	SR##SX/VY (SSR##XVY)			LLRHC##SU (15,30,35)	R1662/R1666/R1664	KWVE##-B-ESC
NAS##JM	SR##SB				LLRHC##SA	R1663	KWVE##-B-EC
LAW##EL	HRW##CA/CR					R1671	KWVE##-W
PAU##AR	RSR07M/RSR07N				LLMHC##TA		KWEM##-
PAU##TR	RSR05M/##N (5,9)	RSR09KM/RSR12VM			LLMHC##TA	R0442	KWEM##-
PAU##UR	RSR12N					R0444	KWEM##-L
PAU##AL	RSR15VM						KWEM##-
PAE##AR	RSR05WM/##WN (5,12,15)	RSR12WVM/RSR15WVN			LLMWC##TA	R0443	KWEM##-W
PAE##TR	RSR07WM/##WN (7,9)	RSR09WVM			LLMWC##TA	R0441	KWEM##-WL

4 - LINEAR GUIDE RAIL LENGTH (MM) ## = SIZE (RAIL WIDTH) XXXX = LENGTH

NSK	THK	THOMSON		SKF	BOSCH - REXROTH (STAR)	INA
		old	New			
N1H##XXXXZ	HSR##+XXXXL	RG##NLXXXX	521H##A+XXXX	LLRHR##xXXXXP5	R1605-###-XXX ¹	TKVD##-##/XXXX ²
N1S##XXXXZ	SR##+XXXXL			LLRHR##xXXXXP5	R1605-###-XXX ¹	TKVD##-##/XXXX ²
L1W##XXXXZ	HRW##+XXXXL				R1605-###-XXX	TKVD##-W-##/XXXX
P1U##XXXXZ	RSR##+XXXXL	RD##HLXXXX	TSR##Z+XXXX	LLMHR##xXXXXP5	R0445-###-XXX	TKDM##-##/XXX
P1E##XXXXZ	RSR##W+XXXXL		TSR##WZ+XXXX	LLMWR##xXXXXP5	R0455-###-XXX	

¹ See Slider Section for Exact Series for Bosch - Rexroth (STAR)

² See Slider and Rail Section for Exact Series for INA

5 - SLIDERS

The number following the carriage style equals the number of carriages per rail.

6 - ACCURACY CLASS

NSK	THK	THOMSON	SKF	BOSCH - REXROTH (STAR)	INA
PC (interchangeable)	BLANK	N	P5	4- (N)	G3
P6	H	H	P3	3- (H)	
P5	P	P	P1	2- (P)	G2
P4	SP	S	P01	1- (XP/SP)	G1
P3	UP	U	P001	9- (UP)	

7 - PRELOAD

NSK (Matched Assembly)	THK	THOMSON		SKF	BOSCH - REXROTH (STAR)	INA
		old	New			
T or Z0	BLANK	A	0	T0	-#9#	
Z or Z1	C1	B	1	T1	-#1#	V1
Z2	C1	B	1	T1	-#2#	V2
H or Z3	C0	C	2	T2	-#3#	V3
Z4	C0	C	3	T3		V4

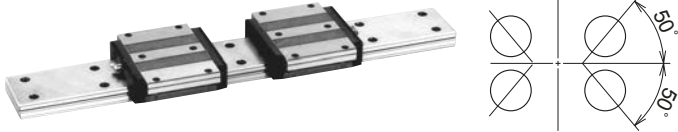
8 - SEALS

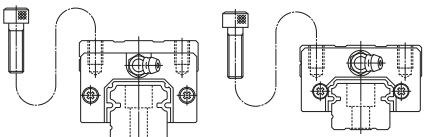
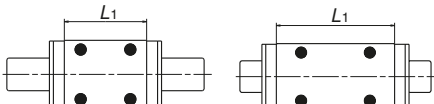
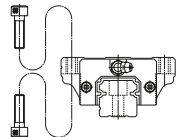
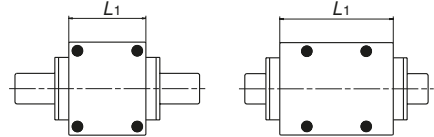
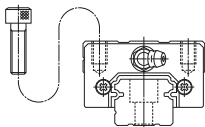
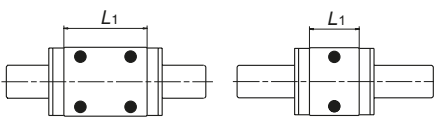
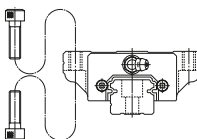
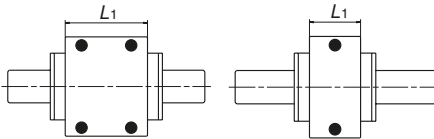
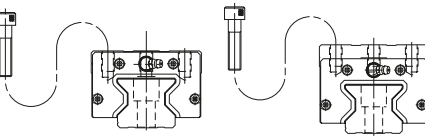
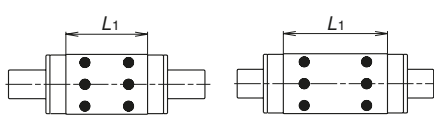
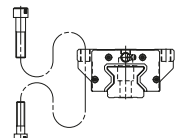
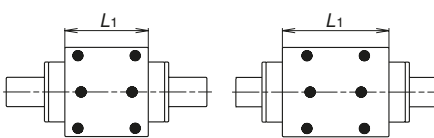
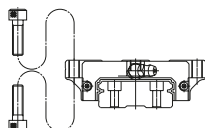
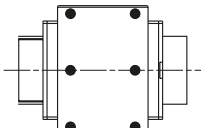
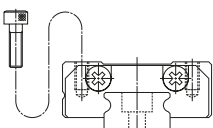
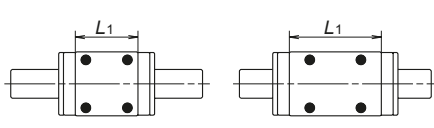
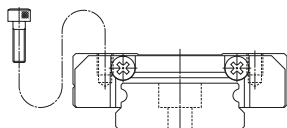
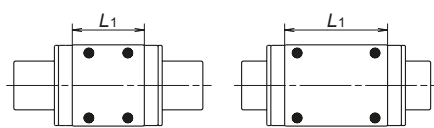
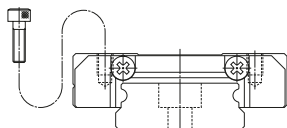
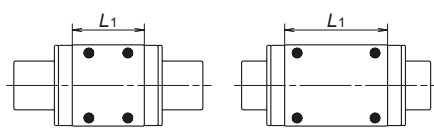
NSK	THK	THOMSON		SKF	BOSCH - REXROTH (STAR)	INA
		old	New			
Standard (End Seals)	UU-End Seals			Standard	Standard	-10 or -20 or -22
Standard (Side Seals)	SS-Side Seals+End Seals	LDS		Standard	Standard	-10 or -20 or -22
-P (Protector)	ZZ-End, Side, Inner Seals and Scraper	ZZ	Z	S1	None	Separate Part Numbers
-D (Double End Seals)	DD-Double End, Side, and Inner Seals	DD	W	S2	None	
-DP (Double End Seals, Protector)	KK-Double End, Side, Inner Seals and Scraper	KK	WZ	S3	None	

LUBRICATION SYSTEMS

NSK	THK	THOMSON	SKF
-K1™	QZ	LL	Standard
External to the Slider	External to the Slider	External to the Slider	Internal Foam Insert

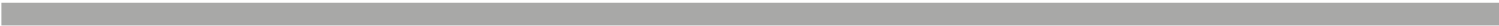
TYPES OF LINEAR GUIDES

Series	Features	
NH Series	 • Replaces the old LH series, size 15-65; Dimensionally equivalent to LH • NSK basic series • General versatility for heavy-duty applications • Large load carrying capacity against vertical direction • Stainless steel is available (#15-30). • Suitable for high speed applications.	
NS Series	 • Replaces the old LS series; Dimensionally equivalent to LS • Compact designed NSK basic series • General versatility for fine application • Large load carrying capacity against vertical direction • Stainless steel is available (#15-35). • Suitable for high speed applications.	
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	
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)	

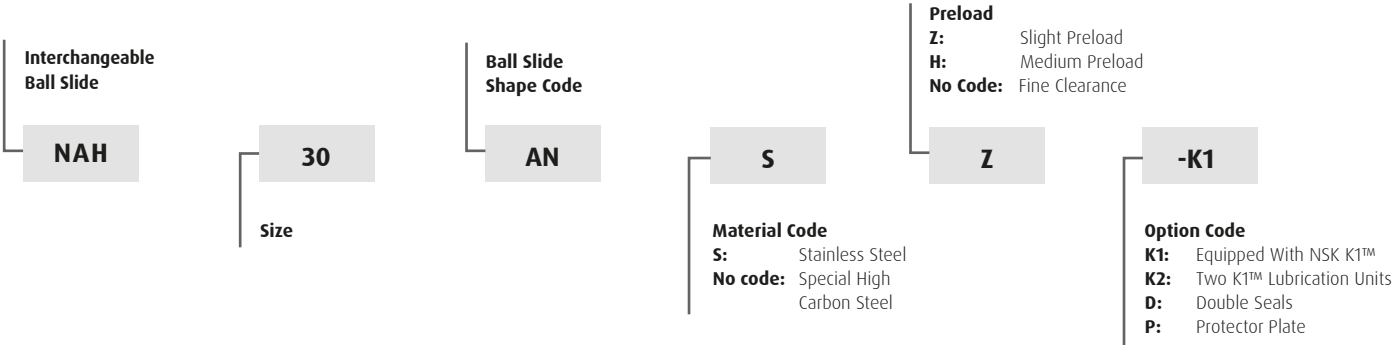
Ball Slide Model				Size & Preload		Dimension Table
AN, BN	AL, BL	AN, AL	BN, BL	Size	Preload	
				NH	Slight preload ZZ	Page I-9 - I-14
EM, GM		EM, GM				
				NS	Slight preload ZZ	Page I-17 - I-20
AL, CL		AL, CL				
				Size	Preload	Table
EM, JM		EM, JM				
				RA15 RA20 RA25 RA30 RA35 RA45 RA55 RA65	Medium preload Z	Page I-35 - I-40
AL, BL		AL, AN				
				Size	Preload	Table
EM, GM		EM, GM				
				LW17 LW21 LW27 LW35 LW50	Slight preload ZZ	Page I-31 - I-32
EL		EL				
				Size	Preload	Table
AL, TR, UR, BL		AL, TR				
				PU05 PU07 PU09 PU12 PU15	Maximum clearance 3 μm ZT	Page I-23 - I-24
AR, TR, UR, BR		AR, TR				
				Size	Preload	Table
AR, TR, UR, BR		AR, TR				
				PE05 PE07 PE09 PE12 PE15	Maximum clearance 3 μm ZT	Page I-27 - I-28
AR, TR, UR, BR		AR, TR				

LINEAR GUIDES: NH SERIES

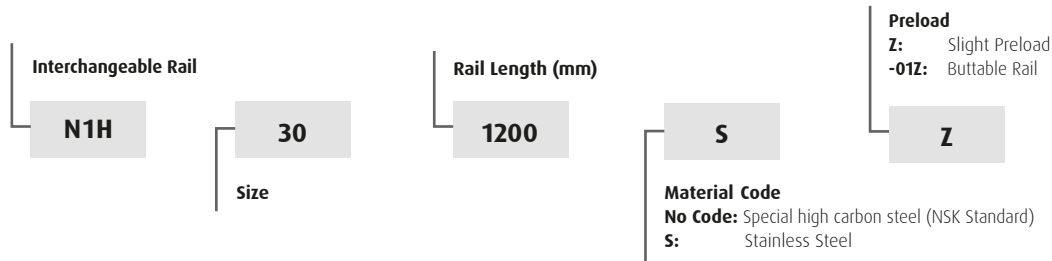
(REPLACEMENT FOR THE LH SERIES, SIZE 15-65)



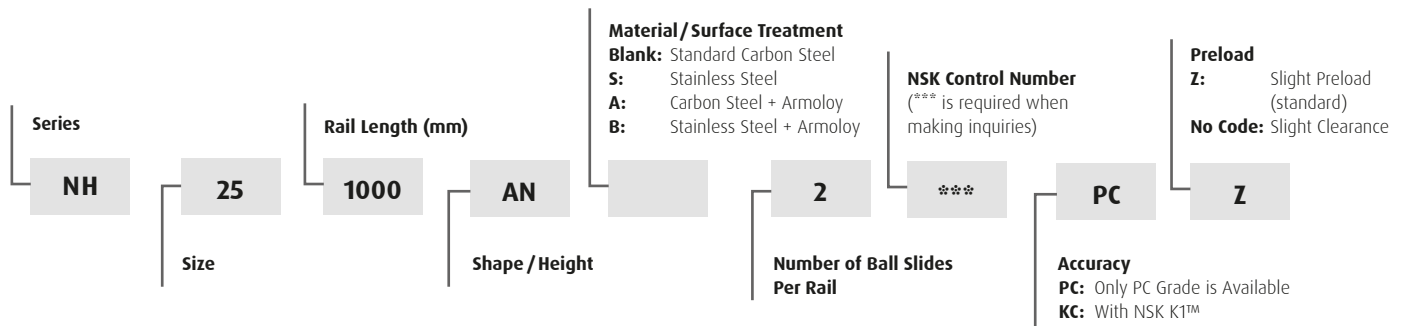
PART NUMBER EXAMPLE FOR BALL SLIDE ONLY



REFERENCE PART NUMBER FOR RAIL ONLY



REFERENCE PART NUMBER FOR INTERCHANGEABLE ASSEMBLY (BALL SLIDE + RAIL)



PLASTIC CAP FOR RAIL MOUNTING HOLE

Linear Guide Model No.	Rail Mounting Bolt Size	Cap. No. for Rail Mounting Hole
NH15	M4	L45800004-003
NH20	M5	L45800005-003
NH25	M6	L45800006-003
NH30	M8	L45800008-003
NH35	M8	L45800008-003
NH45	M12	L45800012-003
NH55	M14	L45800014-003
NH65	M16	L45800016-003

BRASS CAP FOR RAIL MOUNTING HOLE

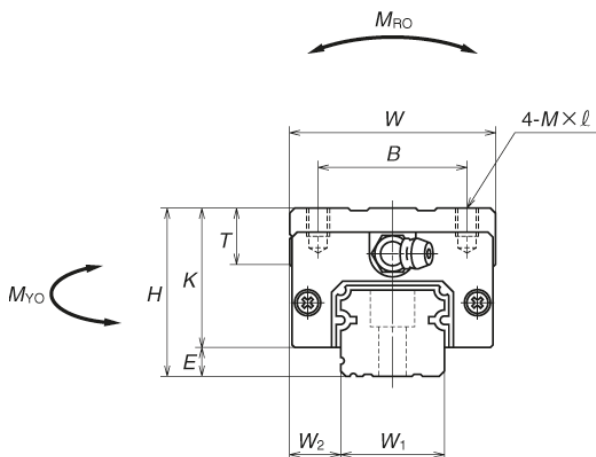
Linear Guide Model No.	Rail Mounting Bolt Size	Cap. No. for Rail Mounting Hole
NH20	M5	L45800005-004
NH25	M6	L45800006-004
NH30	M8	L45800008-004
NH35	M8	L45800008-004
NH45	M12	L45800012-004

LINEAR GUIDES: NH SERIES

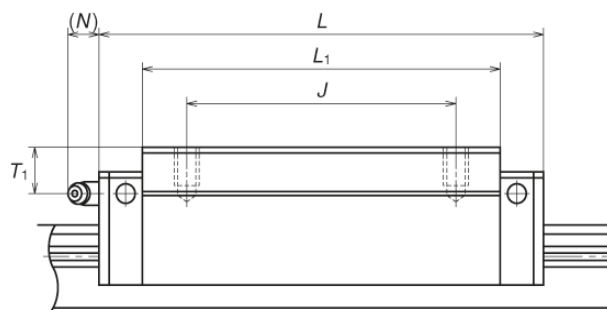
(REPLACEMENT FOR THE LH SERIES)

BALL SLIDE MODELS: AN, BN

FRONT VIEW OF AN AND BN TYPES



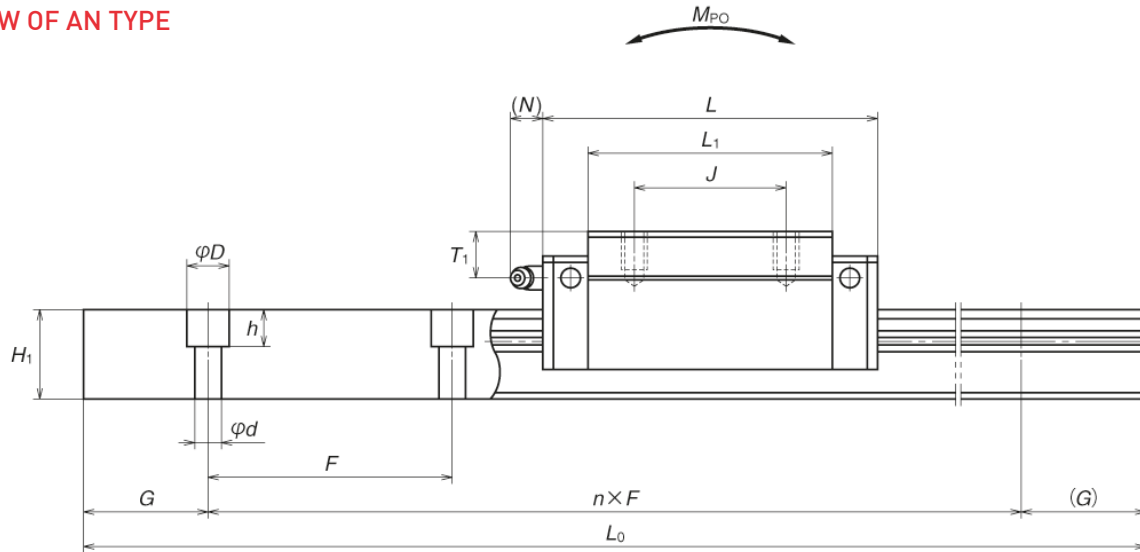
SIDE VIEW OF BN TYPE



Model No.	Assembly			Ball slide												
	Height			Width	Length	Mounting hole						Grease fitting			Width	Height
												Hole size				
	H	E	W ₂	W	L	B	J	M×Pitch×ℓ	L ₁	K	T		T ₁	N	W ₁	H ₁
NH15AN NH15BN	28	4.6	9.5	34	55 74	26	26	M4×0.7×6	39 58	23.4	8	∅3	8.5	3.3	15	15
NH20AN NH20BN	30	5	12	44	69.8 91.8	32	36 50	M5×0.8×6	50 72	25	12	M6×0.75	5	11	20	18
NH25AN NH25BN	40	7	12.5	48	79 107	35	35 50	M6×1×9	58 86	33	12	M6×0.75	10	11	23	22
NH30AN NH30BN	45	9	16	60	85.6 124.6	40	40 60	M8×1.25×10	59 98	36	14	M6×0.75	10	11	28	26
NH35AN NH35BN	55	9.5	18	70	109 143	50	50 72	M8×1.25×12	80 114	45.5	15	M6×0.75	15	11	34	29
NH45AN NH45BN	70	14	20.5	86	139 171	60	60 80	M10×1.5×17	105 137	56	17	Rc1/8	20	13	45	38
NH55AN NH55BN	80	15	23.5	100	163 201	75	75 95	M12×1.75×18	126 164	65	18	Rc1/8	21	13	53	44
NH65AN NH65BN	90	16	31.5	126	193 253	76	70 120	M16×2×20	147 207	74	23	Rc1/8	19	13	63	53

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

SIDE VIEW OF AN TYPE



Unit: mm

Rail				Basic load rating								Weight	
Pitch F	Mounting bolt hole d×D×h	G (reference)	Max. length L _{0max} () for stainless	2)Dynamic		Static C ₀ (N)	Static moment (N·m)				Ball slide (kg)	Rail (kg/m)	
				[50km] C ₅₀ (N)	[100km] C ₁₀₀ (N)		M _{Ro}	M _{Po}		M _{Vo}			
								(One slide)	(Two slides)	(One slide)	(Two slides)		
60	4.5×7.5×5.3	20	2 980 (1 800)	14 200	11 300	20 700	108	94.5	575	79.5	480	0.18	1.6
				18 100	14 400	32 000	166	216	1 150	181	965	0.26	
60	6×9.5×8.5	20	3 960 (3 500)	23 700	18 800	32 500	219	185	1 140	155	955	0.33	2.6
				30 000	24 000	50 500	340	420	2 230	355	1 870	0.48	
60	7×11×9	20	3 960 (3 500)	33 500	26 800	46 000	360	320	1 840	267	1 540	0.55	3.6
				45 500	36 500	71 000	555	725	3 700	610	3 100	0.82	
80	9×14×12	20	4 000 (3 500)	41 000	32 500	51 500	490	350	2 290	292	1 920	0.77	5.2
				61 000	48 500	91 500	870	1 030	5 600	865	4 700	1.3	
80	9×14×12	20	4 000	62 500	49 500	80 500	950	755	4 500	630	3 800	1.5	7.2
				81 000	64 500	117 000	1 380	1 530	8 350	1 280	7 000	2.1	
105	14×20×17	22.5	3 990	107 000	84 500	140 000	2 140	1 740	9 750	1 460	8 150	3.0	12.3
				131 000	104 000	187 000	2 860	3 000	15 600	2 520	13 100	3.9	
120	16×23×20	30	3 960	158 000	125 000	198 000	3 600	3 000	16 300	2 510	13 700	4.7	16.9
				193 000	153 000	264 000	4 850	5 150	26 300	4 350	22 100	6.1	
150	18×26×22	35	3 900	239 000	190 000	281 000	6 150	4 950	27 900	4 150	23 400	7.7	24.3
				310 000	246 000	410 000	8 950	10 100	51 500	8 450	43 500	10.8	

2) The basic load rating comply with the ISO standard. (ISO14728-1 and ISO14728-2)

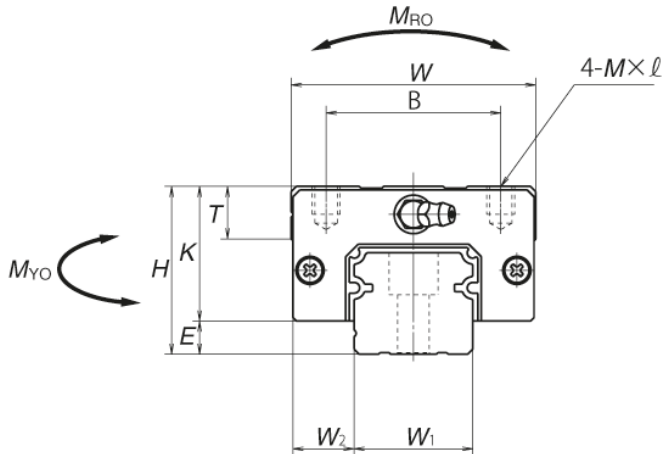
C₅₀: the basic dynamic load rating for 50 km rating fatigue life, C₁₀₀: the basic dynamic load rating for 100 km rating fatigue life
The basic static load rating shows static permissible load.

LINEAR GUIDES: NH SERIES

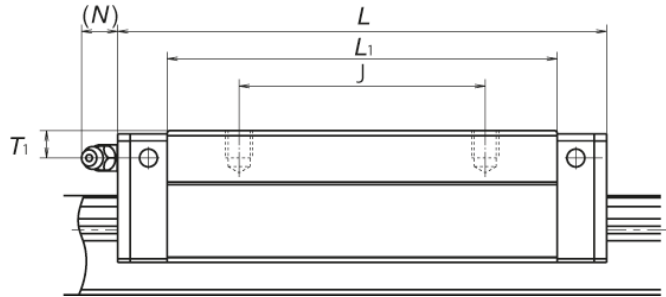
(REPLACEMENT FOR THE LH SERIES)

BALL SLIDE MODELS: AL, BL

FRONT VIEW OF AL AND BL TYPES



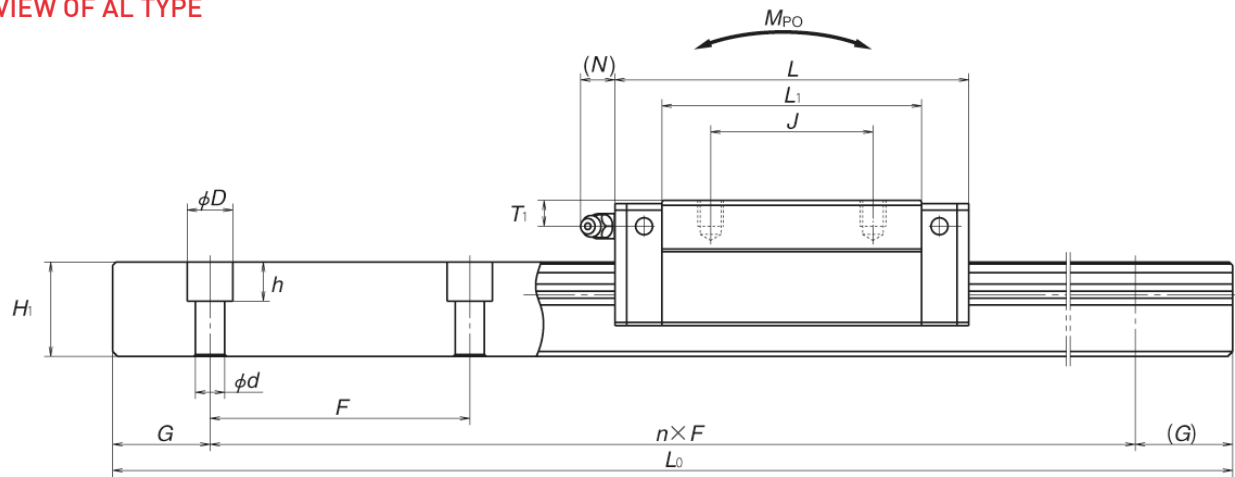
SIDE VIEW OF BL TYPE



Model No.	Assembly			Ball slide													
	Height			Width	Length	Mounting hole						Grease fitting			Width		
												Hole size					
	H	E	W ₂	W	L	B	J	M×Pitch×	L ₁	K	T		T ₁	N	W ₁	H ₁	
NH25AL NH25BL	36	7	12.5	48	79 107	35	35 50	M6×1×6	58 86	29	12	M6×0.75	6	11	23	22	
NH30AL NH30BL	42	9	16	60	85.6 124.6	40	40 60	M8×1.25×8	59 98	33	14	M6×0.75	7	11	28	26	
NH35AL NH35BL	48	9.5	18	70	109 143	50	50 72	M8×1.25×8	80 114	38.5	15	M6×0.75	8	11	34	29	
NH45AL NH45BL	60	14	20.5	86	139 171	60	60 80	M10×1.5×10	105 137	46	17	Rc1/8	10	13	45	38	
NH55AL NH55BL	70	15	23.5	100	163 201	75	75 95	M12×1.75×13	126 164	55	15	Rc1/8	11	13	53	44	

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

SIDE VIEW OF AL TYPE



Unit: mm

Rail				Basic load rating								Weight	
Pitch F	Mounting bolt hole d×D×h	G (reference)	Max. length L _{0max} () for stainless	2)Dynamic		Static	Static moment (N·m)				Ball slide (kg)	Rail (kg/m)	
				[50km] C ₅₀ (N)	[100km] C ₁₀₀ (N)	C ₀ (N)	M _{R0}	M _{P0}		M _{Y0}			
								(One slide)	(Two slides)	(One slide)			(Two slides)
60	7×11×9	20	3 960 (3 500)	33 500 45 500	26 800 36 500	46 000 71 000	360 555	320 725	1 840 3 700	267 610	1 540 3 100	0.46 0.69	3.6
80	9×14×12	20	4 000 (3 500)	41 000 61 000	32 500 48 500	51 500 91 500	490 870	350 1 030	2 290 5 600	292 865	1 920 4 700	0.69 1.16	5.2
80	9×14×12	20	4 000	62 500 81 000	49 500 64 500	80 500 117 000	950 1 380	755 1 530	4 500 8 350	630 1 280	3 800 7 000	1.2 1.7	7.2
105	14×20×17	22.5	3 990	107 000 131 000	84 500 104 000	140 000 187 000	2 140 2 860	1 740 3 000	9 750 15 600	1 460 2 520	8 150 13 100	2.2 2.9	12.3
120	16×23×20	30	3 960	158 000 193 000	125 000 153 000	198 000 264 000	3 600 4 850	3 000 5 150	16 300 26 300	2 510 4 350	13 700 22 100	3.7 4.7	16.9

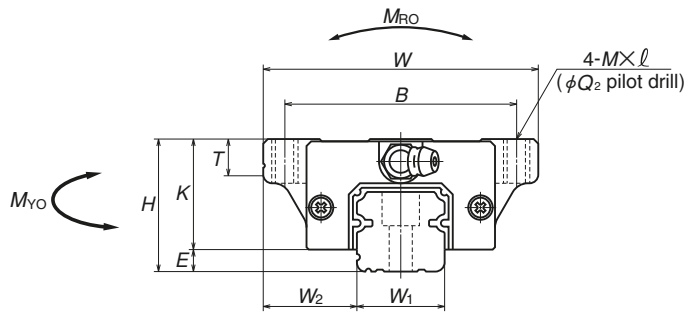
2) The basic load rating comply with the ISO standard. (ISO14728-1 and ISO14728-2)
C₅₀: the basic dynamic load rating for 50 km rating fatigue life, C₁₀₀: the basic dynamic load rating for 100 km rating fatigue life
The basic static load rating shows static permissible load.

LINEAR GUIDES: NH SERIES

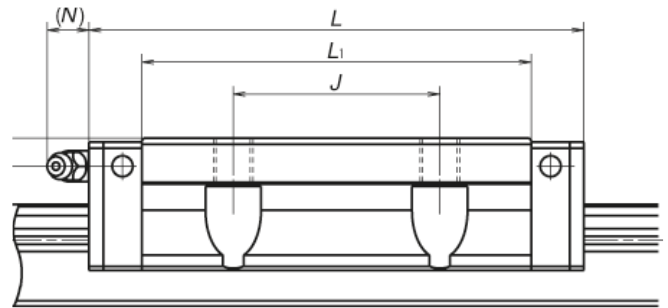
(REPLACEMENT FOR THE LH SERIES)

BALL SLIDE MODELS: EM, GM

FRONT VIEW OF EM AND GM TYPES



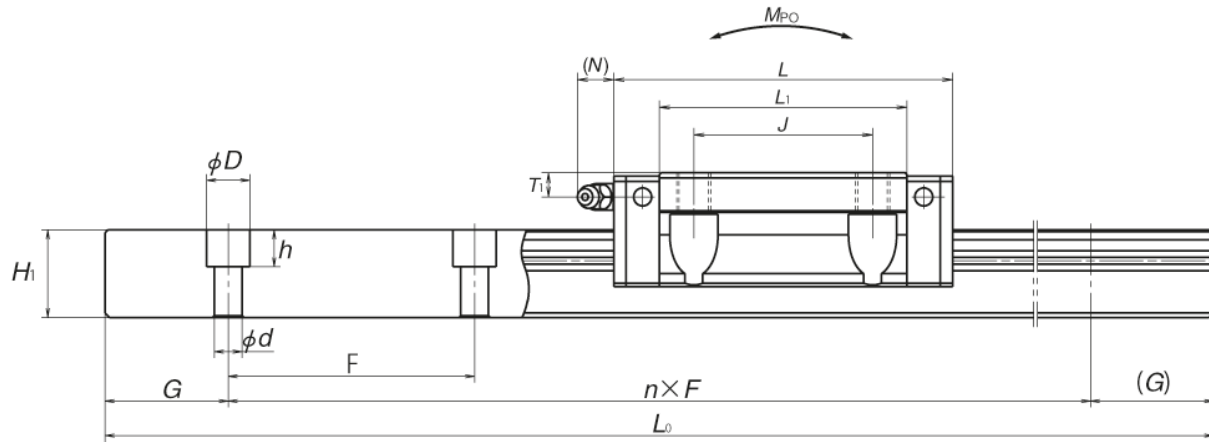
SIDE VIEW OF GM TYPE



Model No.	Assembly			Ball slide													
	Height	E	W ₂	Width	Length	Mounting hole				L ₁	K	T	Grease fitting			Width	Height
						B	J	M×Pitch×ℓ	Q ₂				Hole size	T ₁	N		
NH15EM NH15GM	24	4.6	16	47	55 74	38	30	M5×0.8×7	4.4	39 58	19.4	8	∅3	4.5	3.3	15	15
NH20EM NH20GM	30	5	21.5	63	69.8 91.8	53	40	M6×1×9.5	5.3	50 72	25	10	M6×0.75	5	11	20	18
NH25EM NH25GM	36	7	23.5	70	79 107	57	45	M8×1.25×10 (M8×1.25×11.5)	6.8	58 86	29	11 (12)	M6×0.75	6	11	23	22
NH30EM NH30GM	42	9	31	90	98.6 124.6	72	52	M10×1.5×12 (M10×1.5×14.5)	8.6	72 98	33	11 (15)	M6×0.75	7	11	28	26
NH35EM NH35GM	48	9.5	33	100	109 143	82	62	M10×1.5×13	8.6	80 114	38.5	12	M6×0.75	8	11	34	29
NH45EM NH45GM	60	14	37.5	120	139 171	100	80	M12×1.75×15	10.5	105 137	46	13	Rc1/8	10	13	45	38
NH55EM NH55GM	70	15	43.5	140	163 201	116	95	M14×2×18	12.5	126 164	55	15	Rc1/8	11	13	53	44
NH65EM NH65GM	90	16	53.5	170	193 253	142	110	M16×2×24	14.6	147 207	74	23	Rc1/8	19	13	63	53

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

SIDE VIEW OF EM TYPE



Unit: mm

Rail				Basic load rating								Weight	
Pitch F	Mounting bolt hole d×D×h	G (reference)	Max. length l _{omax} () for stainless	3)Dynamic		Static	Static moment (N·m)				Ball slide (kg)	Rail (kg/m)	
				[50km] C ₅₀ (N)	[100km] C ₁₀₀ (N)	C ₀ (N)	M _{Ro}	M _{Po}		M _{Yo}			
								(One slide)	(Two slides)	(One slide)			(Two slides)
60	4.5×7.5×5.3	20	2 980 (1 800)	14 200 18 100	11 300 14 400	20 700 32 000	108 166	94.5 216	575 1 150	79.5 181	480 965	0.17 0.25	1.6
60	6×9.5×8.5	20	3 960 (3 500)	23 700 30 000	18 800 24 000	32 500 50 500	219 340	185 420	1 140 2 230	155 355	955 1 870	0.45 0.65	2.6
60	7×11×9	20	3 960 (3 500)	33 500 45 500	26 800 36 500	46 000 71 000	360 555	320 725	1 840 3 700	267 610	1 540 3 100	0.63 0.93	3.6
80	9×14×12	20	4 000 (3 500)	47 000 61 000	37 500 48 500	63 000 91 500	600 870	505 1 030	3 150 5 600	425 865	2 650 4 700	1.2 1.6	5.2
80	9×14×12	20	4 000	62 500 81 000	49 500 64 500	80 500 117 000	950 1 380	755 1 530	4 500 8 350	630 1 280	3 800 7 000	1.7 2.4	7.2
105	14×20×17	22.5	3 990	107 000 131 000	84 500 104 000	140 000 187 000	2 140 2 860	1 740 3 000	9 750 15 600	1 460 2 520	8 150 13 100	3 3.9	12.3
120	16×23×20	30	3 960	158 000 193 000	125 000 153 000	198 000 264 000	3 600 4 850	3 000 5 150	16 300 26 300	2 510 4 350	13 700 22 100	5 6.5	16.9
150	18×26×22	35	3 900	239 000 310 000	190 000 246 000	281 000 410 000	6 150 8 950	4 950 10 100	27 900 51 500	4 150 8 450	23 400 43 500	10 14.1	24.3

3) The basic load rating comply with the ISO standard. (ISO14728-1 and ISO14728-2)

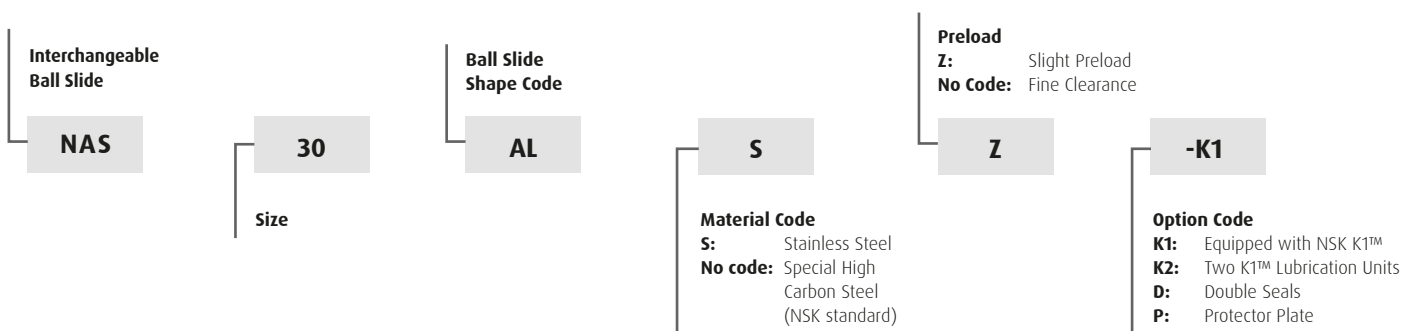
C₅₀: the basic dynamic load rating for 50 km rating fatigue life, C₁₀₀: the basic dynamic load rating for 100 km rating fatigue life
The basic static load rating shows static permissible load.

LINEAR GUIDES: NS SERIES

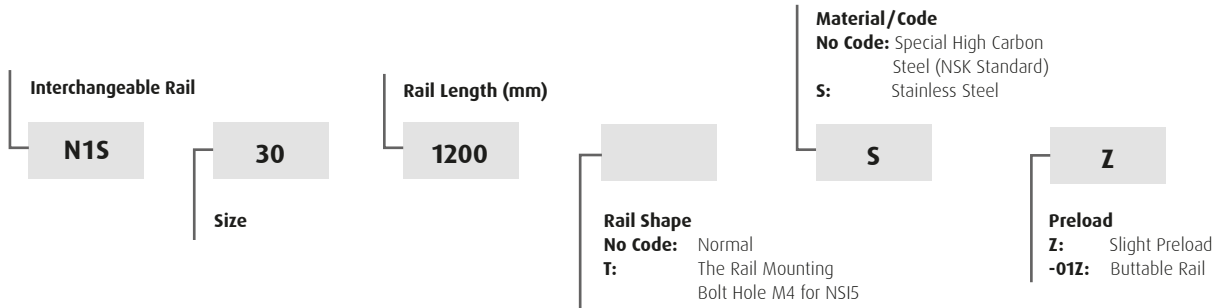
(REPLACEMENT FOR THE LS SERIES)



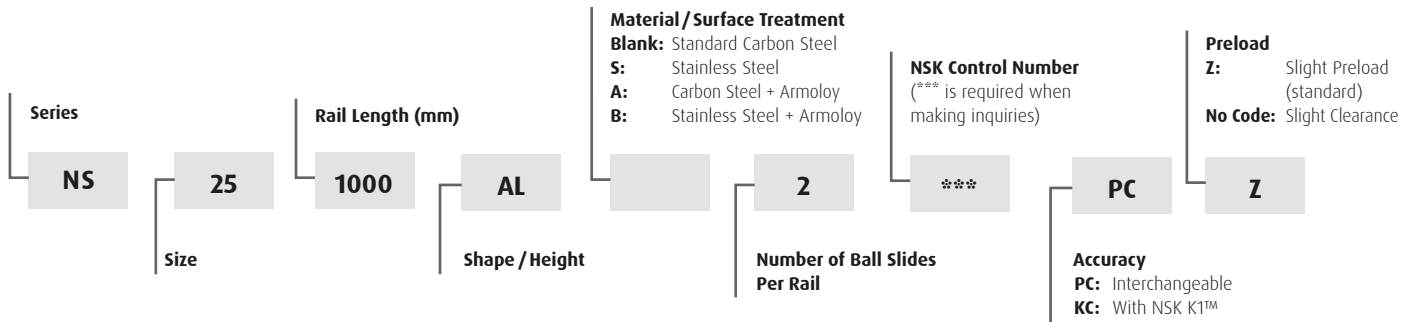
PART NUMBER EXAMPLE FOR BALL SLIDE ONLY



REFERENCE PART NUMBER FOR RAIL ONLY



REFERENCE PART NUMBER FOR ASSEMBLY (BALL SLIDE + RAIL)



PLASTIC CAP FOR RAIL MOUNTING HOLE

Linear Guide Model No.	Rail Mounting Bolt Size	Cap. No. for Rail Mounting Hole
NS15	M3	L45800003-003
NS20	M5	L45800005-003
NS25	M6	L45800006-003
NS30	M6	L45800006-003
NS35	M8	L45800008-003

BRASS CAP FOR RAIL MOUNTING HOLE

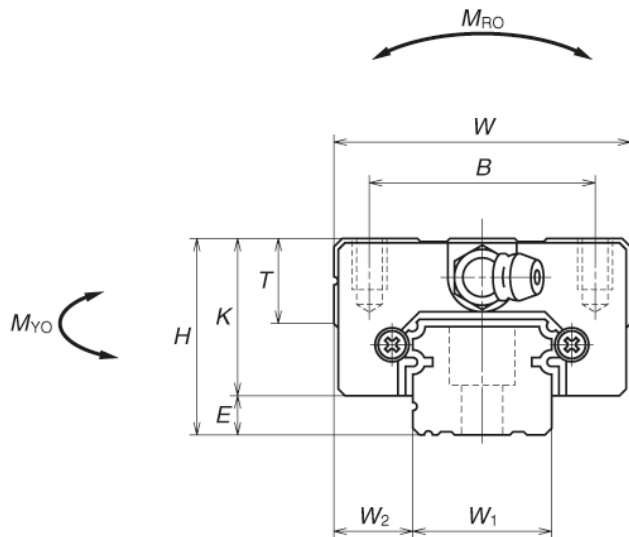
Linear Guide Model No.	Rail Mounting Bolt Size	Cap. No. for Rail Mounting Hole
NS20	M5	L45800005-004
NS25	M6	L45800006-004
NS30	M6	L45800006-004
NS35	M8	L45800008-004

LINEAR GUIDES: NS SERIES

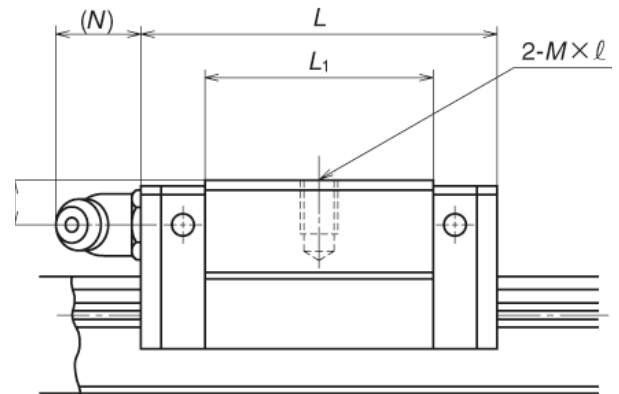
(REPLACEMENT FOR THE LS SERIES)

BALL SLIDE MODELS: CL, AL

FRONT VIEW OF AL AND CL TYPES



SIDE VIEW OF CL TYPE



Model No.	Assembly			Ball slide												Width	Height	
	Height			Width	Length	Mounting hole						Grease fitting			Width			Height
						B	J	M×Pitch× $\angle$				L ₁	K	T				
NS15CL NS15AL	24	4.6	9.5	34	40.4 56.8	26	— 26	M4×0.7×6	23.6 40	19.4	10	∅3	6	3	15	12.5		
NS20CL NS20AL	28	6	11	42	47.2 65.2	32	— 32	M5×0.8×7	30 48	22	12	M6×0.75	5.5	11	20	15.5		
NS25CL NS25AL	33	7	12.5	48	59.6 81.6	35	— 35	M6×1×9	38 60	26	12	M6×0.75	7	11	23	18		
NS30CL NS30AL	42	9	16	60	67.4 96.4	40	— 40	M8×1.25×12	42 71	33	13	M6×0.75	8	11	28	23		
NS35CL NS35AL	48	10.5	18	70	77 108	50	— 50	M8×1.25×12	49 80	37.5	14	M6×0.75	8.5	11	34	27.5		

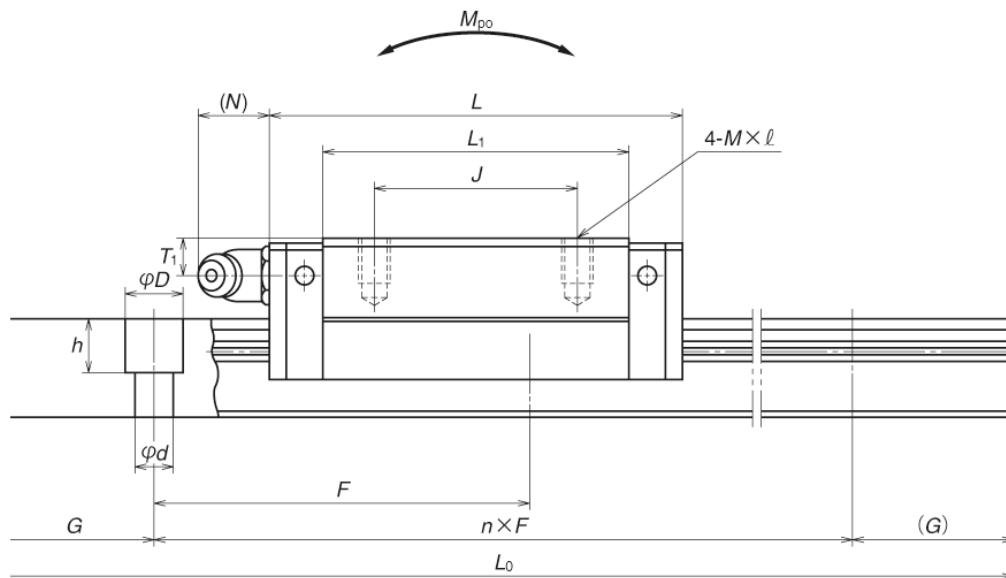
Notes: 1) External appearance of stainless steel ball slides differs from those of carbon steel ball slides.

2) The basic load rating comply with the ISO standard. (ISO14728-1 and ISO14728-2)

C₅₀: the basic dynamic load rating for 50 km rating fatigue life, C₁₀₀: the basic dynamic load rating for 100 km rating fatigue life

The basic static load rating shows static permissible load.

SIDE VIEW OF AL TYPE



Unit: mm

Rail				Basic load rating								Weight	
Pitch	Mounting bolt hole d×D×h	G (reference)	Max. length L _{0max} () for stainless	2)Dynamic		Static	Static moment (N·m)				Ball slide	Rail	
F				[50km]	[100km]	C ₀ (N)	M _{Ro}	M _{po}		M _{vo}			
				C ₅₀ (N)	C ₁₀₀ (N)			(One slide)	(Two slides)	(One slide)	(Two slides)		(kg)
60	*3.5×6×4.5 4.5×7.5×5.3	20	2 920 (1 700)	7 250 11 200	5 750 8 850	9 100 16 900	45.5 84.5	24.5 77	196 470	20.5 64.5	165 395	0.14 0.20	1.4
60	6×9.5×8.5	20	3 960 (3 500)	10 600 15 600	8 400 12 400	13 400 23 500	91.5 160	46.5 133	330 755	39 111	279 630	0.19 0.28	2.3
60	7×11×9	20	3 960 (3 500)	17 700 26 100	14 000 20 700	20 800 36 500	164 286	91 258	655 1 470	76 217	550 1 230	0.34 0.51	3.1
80	7×11×9	20	4 000 (3 500)	24 700 38 000	19 600 30 000	29 600 55 000	282 520	139 435	1 080 2 650	116 365	905 2 220	0.58 0.85	4.8
80	9×14×12	20	4 000 (3 500)	34 500 52 500	27 300 42 000	40 000 74 500	465 865	220 695	1 670 4 000	185 580	1 400 3 350	0.86 1.3	7.0

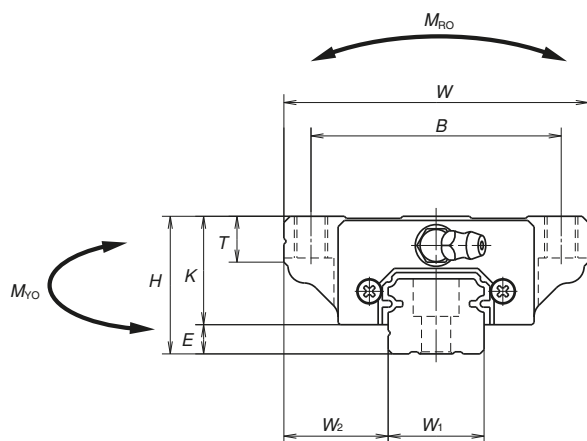
*) Standard rail mounting bolt hole for NS15 is specified as hole for M3 (3.5 x 6 x 4.5).
Please contact NSK to request a different hole for M4 (4.5 x 7.5 x 5.3).

LINEAR GUIDES: NS SERIES

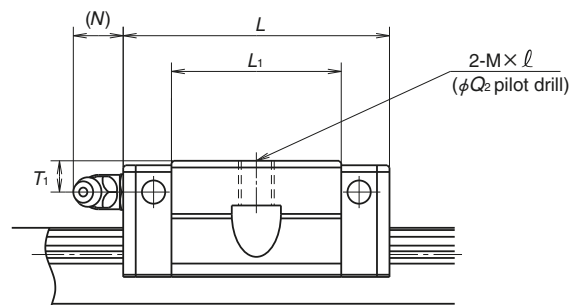
(REPLACEMENT FOR THE LS SERIES)

BALL SLIDE MODELS: JM, EM

FRONT VIEW OF JM AND EM TYPES



SIDE VIEW OF JM TYPE

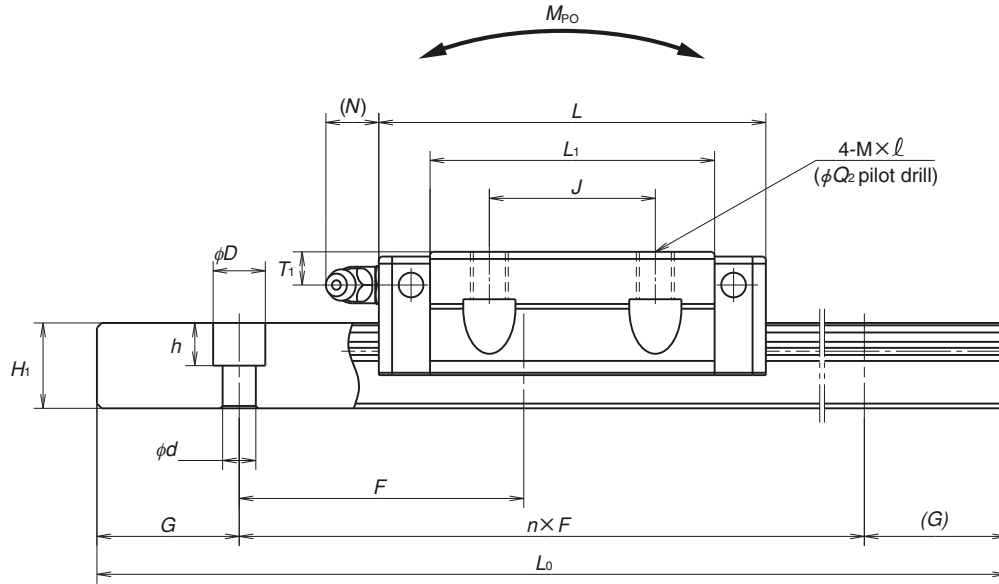


Model No.	Assembly			Ball slide														Width W ₁		Height H ₁
	Height H	E	W ₂	Width W	Length L	Mounting hole				L ₁	K	T	Grease fitting							
						B	J	M×Pitch×ℓ	Q ₂				Hole size	T ₁	N					
NS15JM NS15EM	24	4.6	18.5	52	40.4 56.8	41	— 26	M5×0.8×7	4.4	23.6 40	19.4	8	∅3	6	3	15	12.5			
NS20JM NS20EM	28	6	19.5	59	47.2 65.2	49	— 32	M6×1×9 (M6×1×9.5)	5.3	30 48	22	10	M6×0.75	5.5	11	20	15.5			
NS25JM NS25EM	33	7	25	73	59.6 81.6	60	— 35	M8×1.25×10 (M8×1.25×11.5)	6.8	38 60	26	11 (12)	M6×0.75	7	11	23	18			
NS30JM NS30EM	42	9	31	90	67.4 96.4	72	— 40	M10×1.5×12 (M10×1.5×14.5)	8.6	42 71	33	11 (15)	M6×0.75	8	11	28	23			
NS35JM NS35EM	48	10.5	33	100	77 108	82	— 50	M10×1.5×13 (M10×1.5×14.5)	8.6	49 80	37.5	12 (15)	M6×0.75	8.5	11	34	27.5			

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

2) Parenthesized dimensions are for items made of stainless steel.

SIDE VIEW OF EM TYPE



Unit: mm

Rail				Basic load rating								Weight	
Pitch	Mounting bolt hole d×D×h	G (reference)	Max. length L _{0max} () for stainless	3)Dynamic		Static	Static moment (N·m)				Ball slide	Rail	
F				[50km]	[100km]	C ₀ (N)	M _{R0}	M _{PO}		M _{VO}			
				C ₅₀ (N)	C ₁₀₀ (N)			(One slide)	(Two slides)	(One slide)	(Two slides)		(kg)
60	*3.5×6×4.5 4.5×7.5×5.3	20	2 920 (1 700)	7 250	5 750	9 100	45.5	24.5	196	20.5	165	0.17	1.4
				11 200	8 850	16 900	84.5	77	470	64.5	395	0.26	
60	6×9.5×8.5	20	3 960 (3 500)	10 600	8 400	13 400	91.5	46.5	330	39	279	0.24	2.3
				15 600	12 400	23 500	160	133	755	111	630	0.35	
60	7×11×9	20	3 960 (3 500)	17 700	14 000	20 800	164	91	655	76	550	0.44	3.1
				26 100	20 700	36 500	286	258	1 470	217	1 230	0.66	
80	7×11×9	20	4 000 (3 500)	24 700	19 600	29 600	282	139	1 080	116	905	0.76	4.8
				38 000	30 000	55 000	520	435	2 650	365	2 220	1.2	
80	9×14×12	20	4 000 (3 500)	34 500	27 300	40 000	465	220	1 670	185	1 400	1.2	7
				52 500	42 000	74 500	865	695	4 000	580	3 350	1.7	

3) The basic load rating comply with the ISO standard. (ISO14728-1 and ISO14728-2)

C₅₀: the basic dynamic load rating for 50 km rating fatigue life, C₁₀₀: the basic dynamic load rating for 100 km rating fatigue life

The basic static load rating shows static permissible load.

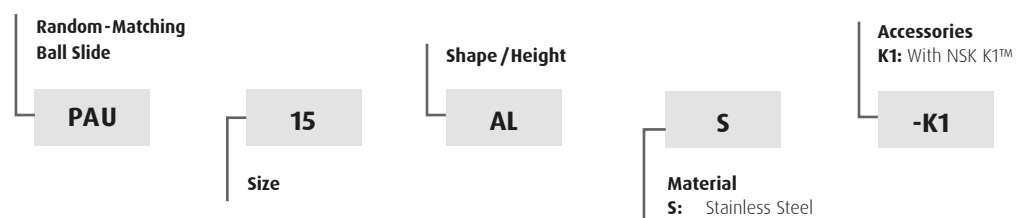
*) Standard rail mounting bolt hole for NS15 is specified as hole for M3 (3.5 x 6 x 4.5).

Please contact NSK to request a different hole for M4 (4.5 x 7.5 x 5.3).

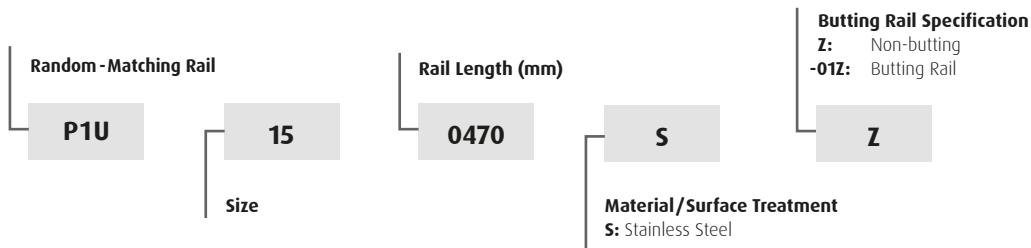
LINEAR GUIDES: PU SERIES



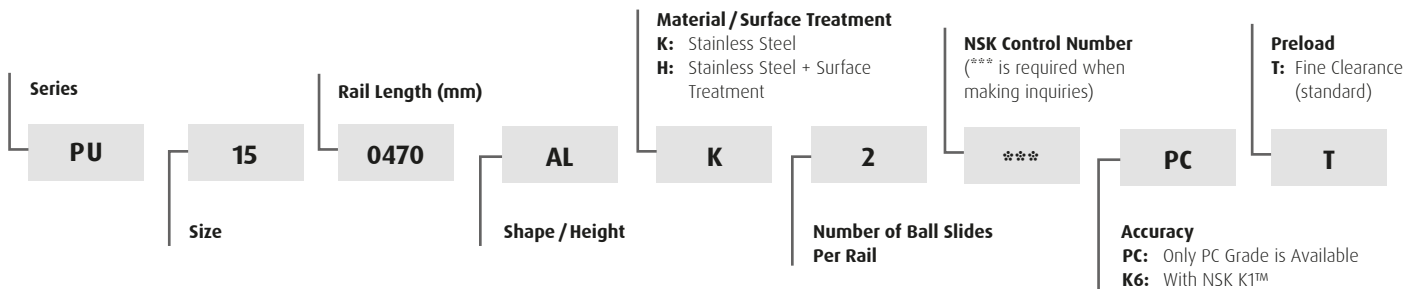
PART NUMBER EXAMPLE FOR BALL SLIDE ONLY



REFERENCE PART NUMBER FOR RAIL ONLY



REFERENCE PART NUMBER FOR ASSEMBLY (BALL SLIDE + RAIL)



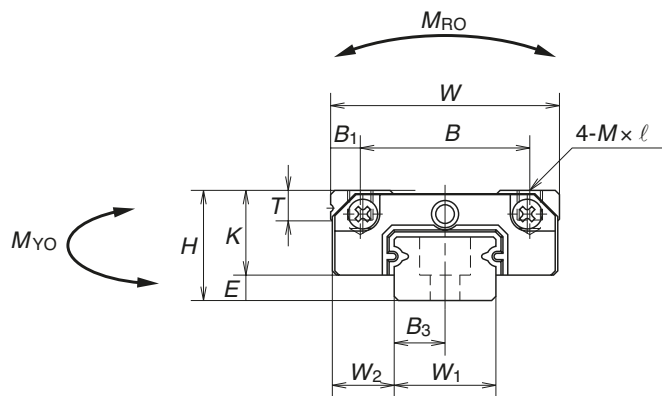
PLASTIC CAP FOR RAIL MOUNTING HOLE

Linear Guide Model No.	Rail Mounting Bolt Size	Cap. No. for Rail Mounting Hole
PU09, PU12, PU15, PE09	M3	L45800003-003

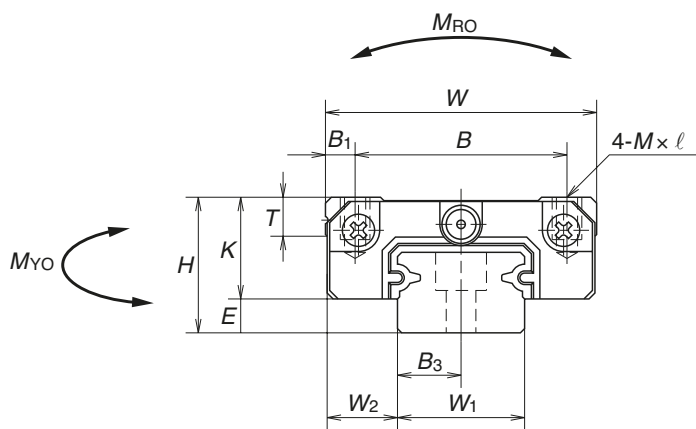
LINEAR GUIDES: PU SERIES

BALL SLIDE MODELS: TR, AR, AL, UR, BL

FRONT VIEW



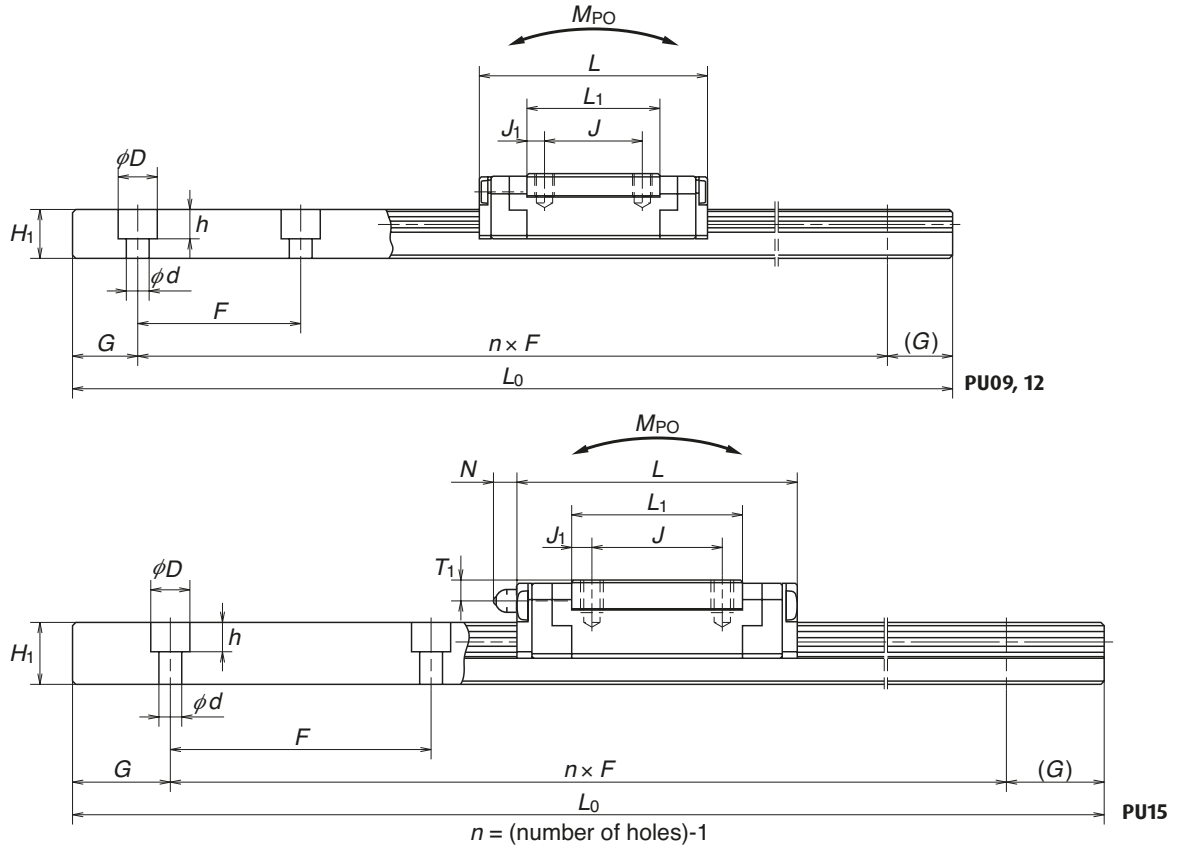
PU09, 12



PU15

Model No.	Assembly			Ball Slide												
	Height	E	W ₂	Width	Length	Mounting Hole			B ₁	L ₁	J ₁	K	T	Grease Fitting		
	H			W	L	B	J	M x pitch x l						Mounting Hole Size	T ₁	N
PU09TR PU09UR	10	2.2	5.5	20	30.0 41.0	15	10 16	M3×0.5×3	2.5	19.6 30.6	4.8 7.3	7.8	2.6	—	—	—
PU12TR PU12UR	13	3.0	7.5	27	35.0 48.7	20	15 20	M3×0.5×3.5	3.5	20.4 34.1	2.7 7.1	10.0	3.4	—	—	—
PU15AL PU15BL	16	4.0	8.5	32	43.0 61.0	25	20 25	M3×0.5×5	3.5	26.2 44.2	3.1 9.6	12.0	4.4	∅3	3.2	(3.6)

SIDE VIEW



Unit: mm

Rail							Basic Load Rating					Ball Diameter		Weight	
Width	Height	Pitch	Mounting Bolt Hole $d \times D \times h$	B_3	G	Max Length (Single Rail) L_{0max}	Dynamic	Static	Static Moment			D_w	Ball Slide (g)	Rail (g/100 mm)	
W_1	H_1	F					C (N)	C_0 (N)	M_{R0} (N·m)	M_{P0} (N·m)	M_{Y0} (N·m)				
9	5.5	20	3.5×6×4.5	4.5	7.5	600	1490 2100	2150 3500	10.0 16.4	6.1 15.6	6.1 15.6	1.5875	16 25	35	
12	7.5	25	3.5×6×4.5	6.0	10.0	800	2830 4000	3500 5700	21.7 35.0	11.4 28.3	11.4 28.3	2.3812	32 53	65	
15	9.5	40	3.5×6×4.5	7.5	15.0	1000	5550 8100	6600 11300	49.5 54.5	25.6 69.5	25.6 69.5	3.1750	59 100	105	

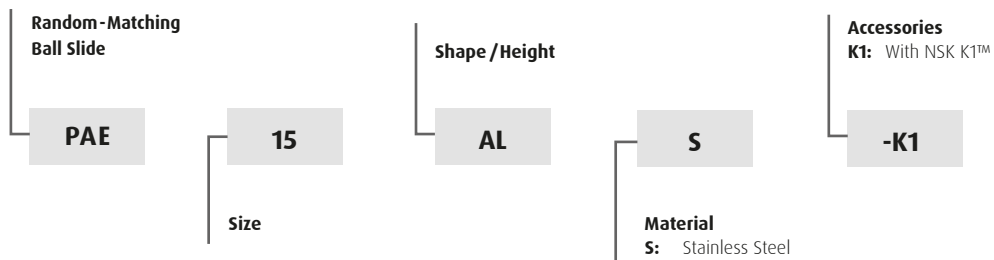
Note: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.

To convert C to C_{100} for a 100-km fatigue life, divide C by 1.26.

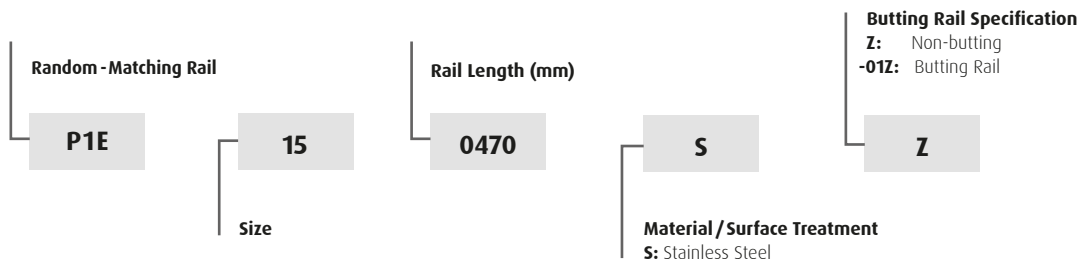
LINEAR GUIDES: PE SERIES



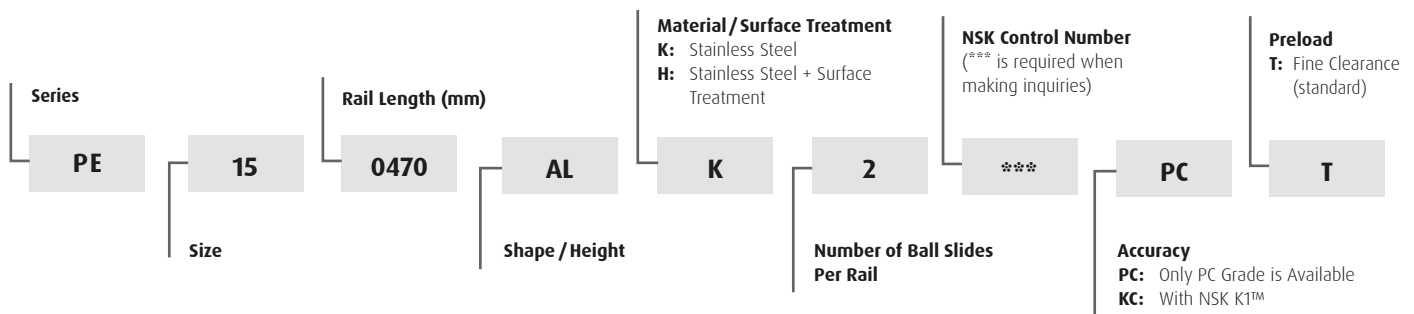
PART NUMBER EXAMPLE FOR BALL SLIDE ONLY



REFERENCE PART NUMBER FOR RAIL ONLY



REFERENCE PART NUMBER FOR ASSEMBLY (BALL SLIDE + RAIL)



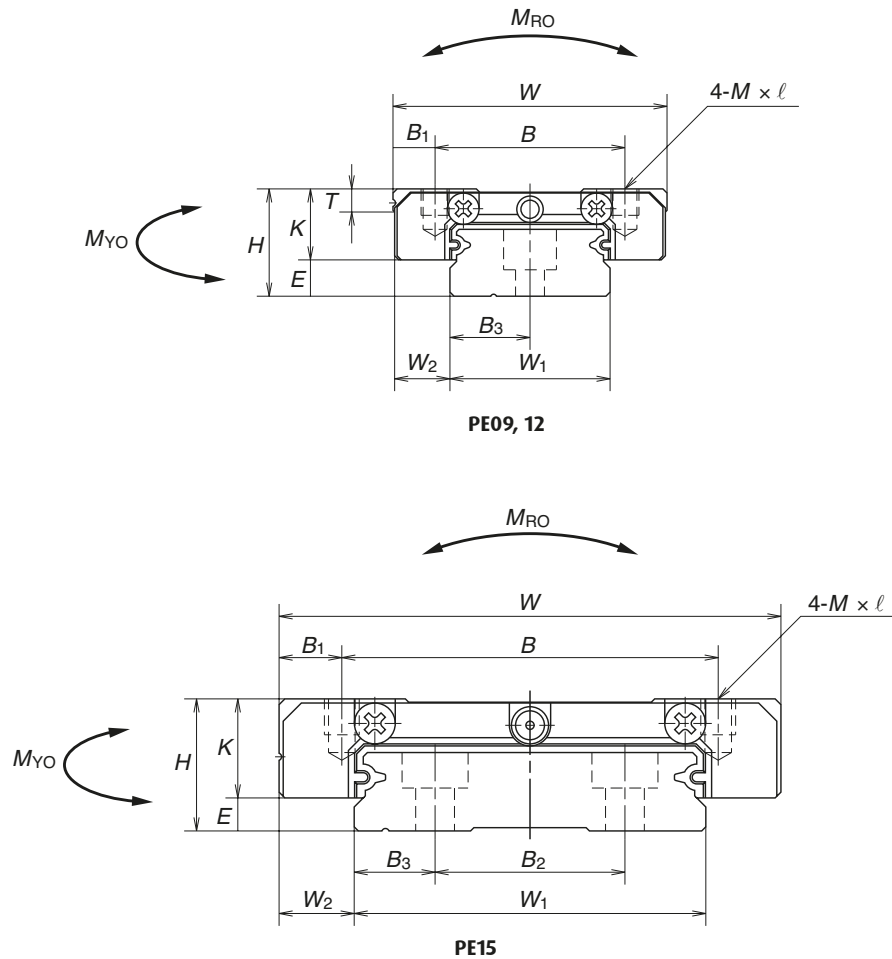
PLASTIC CAP FOR RAIL MOUNTING HOLE

Linear Guide Model No.	Rail Mounting Bolt Size	Cap. No. for Rail Mounting Hole
PU09, PU12, PU15, PE09	M3	L45800003-003

LINEAR GUIDES: PE SERIES

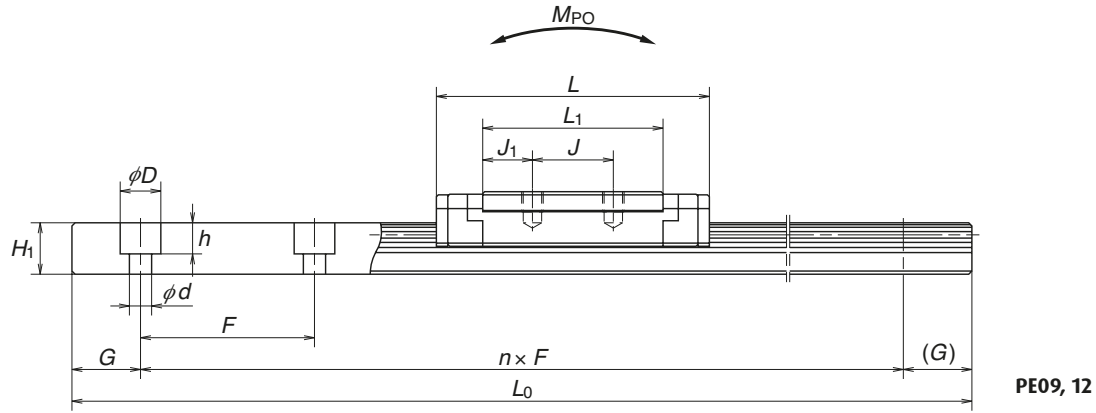
BALL SLIDE MODELS: AR, TR, UR, BR

FRONT VIEW

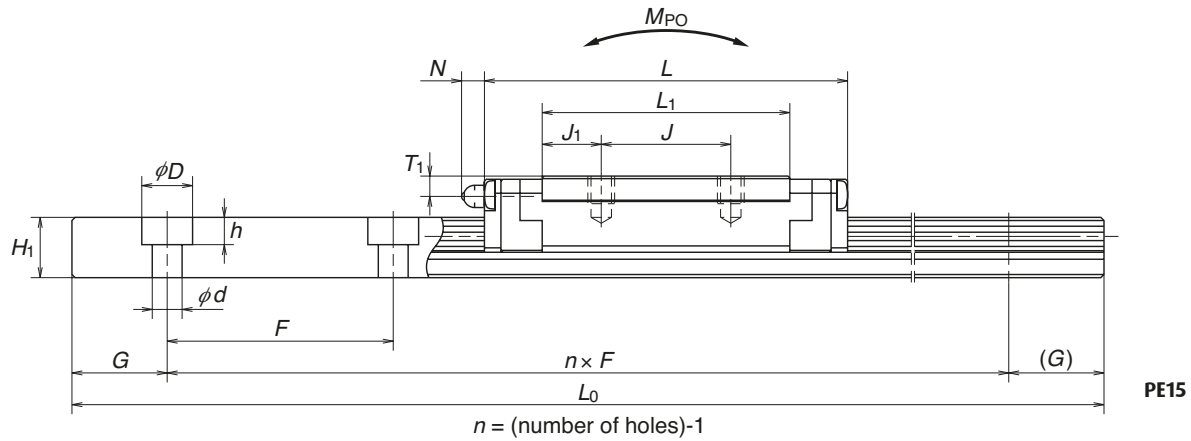


Model No.	Assembly			Ball Slide												
	Height	E	W ₂	Width	Length	Mounting Hole			B ₁	L ₁	J ₁	K	T	Grease Fitting		
						B	J	M x pitch x l						Mounting Hole Size	T ₁	N
PE09TR PE09UR	12	4	6	30	39.8 51.2	21 23	12 24	M3×0.5×3	4.5 3.5	26.6 38.0	7.3 7.0	8.0	2.8	—	—	—
PE12AR PE12BR	14	4	8	40	45.0 60.0	28	15 28	M3×0.5×4	6.0	31.0 46.0	8.0 9.0	10.0	3.2	—	—	—
PE15AR PE15BR	16	4	9	60	56.6 76.0	45	20 35	M4×0.7×4.5	7.5	38.4 57.8	9.2 11.4	12.0	4.1	∅3	3.2	(3.3)

SIDE VIEW



PE09, 12



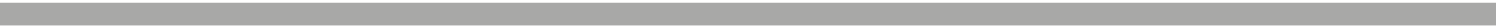
PE15

Unit: mm

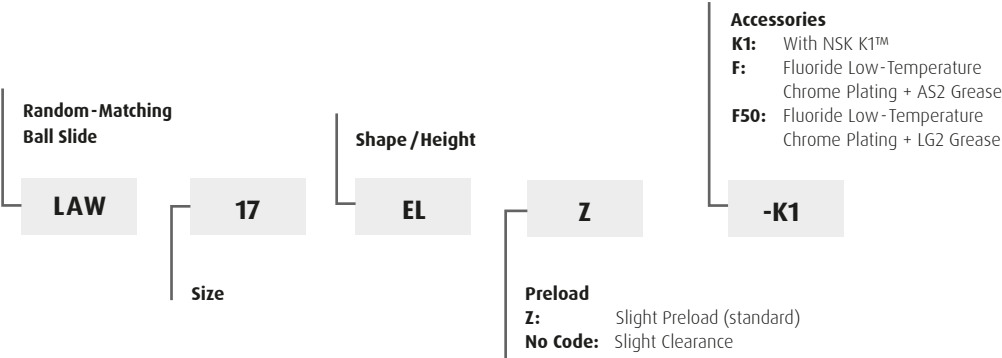
Rail								Basic Load Rating					Ball Diameter	Weight	
Width	Height		Pitch	Mounting Bolt			Max Length (Single Rail)	Dynamic	Static	Static Moment				Ball Slide	Rail
W ₁	H ₁		F	Hole d x D x h			B ₃	G	L _{0max}	C (N)	C ₀ (N)	M _{R0} (N·m)	M _{P0} (N·m)		
18	7.5	—	30	3.5×6×4.5	9.0	10	800	3000 4000	4500 6700	36.5 54.5	17.3 37.5	17.3 37.5	2.000	35 50	95
24	8.5	—	40	4.5×8×4.5	12.0	15	1000	4350 5800	6350 9550	70.5 106.0	29.3 63.5	29.3 63.5	2.381	66 98	140
42	9.5	23	40	4.5×8×4.5	9.5	15	1200	7600 10300	10400 16000	207.0 320.0	59.0 135.0	59.0 135.0	3.175	140 211	275

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 C100 for a 100-km fatigue life, divide C by 1.26.

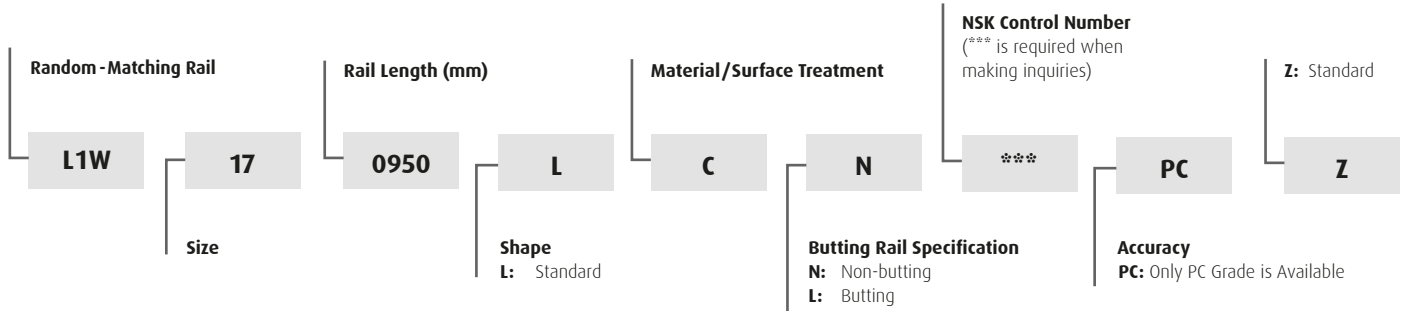
LINEAR GUIDES: LW SERIES



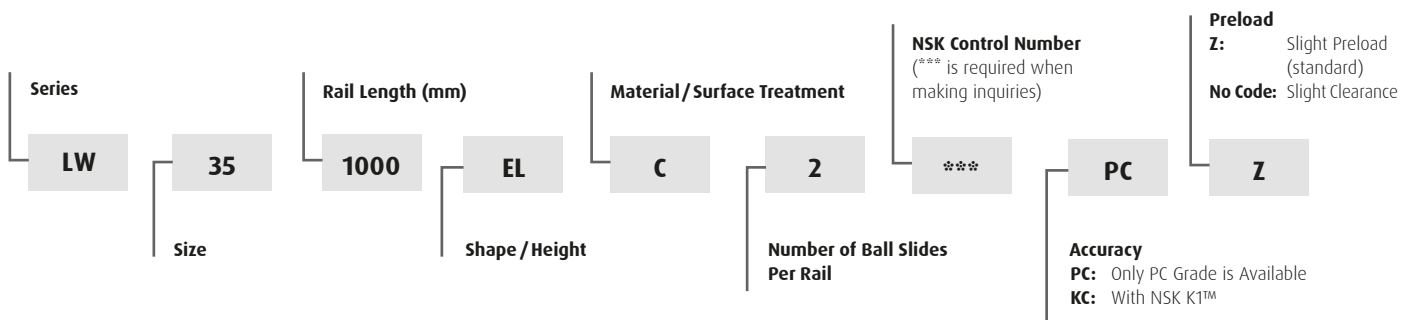
PART NUMBER EXAMPLE FOR BALL SLIDE ONLY



REFERENCE PART NUMBER FOR RAIL ONLY



REFERENCE PART NUMBER FOR ASSEMBLY (BALL SLIDE + RAIL)



PLASTIC CAP FOR RAIL MOUNTING HOLE

Linear Guide Model No.	Rail Mounting Bolt Size	Cap. No. for Rail Mounting Hole
LW17	M4	L45800004-003
LW21	M4	L45800004-003
LW27	M4	L45800004-003
LW35	M6	L45800006-003
LW50	M8	L45800008-003

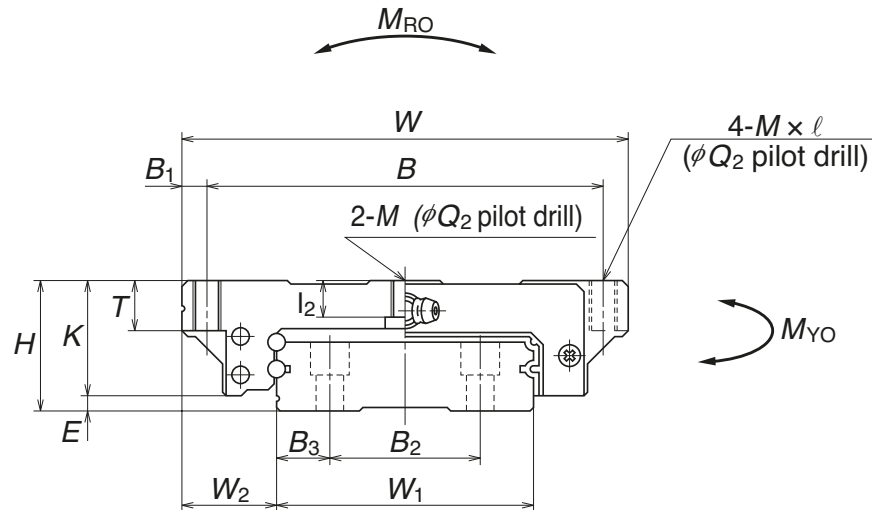
BRASS CAP FOR RAIL MOUNTING HOLE

Linear Guide Model No.	Rail Mounting Bolt Size	Cap. No. for Rail Mounting Hole
LW17	M4	L45800004-004
LW21	M4	L45800004-004
LW27	M4	L45800004-004
LW35	M6	L45800006-004
LW50	M8	L45800008-004

LINEAR GUIDES: LW SERIES

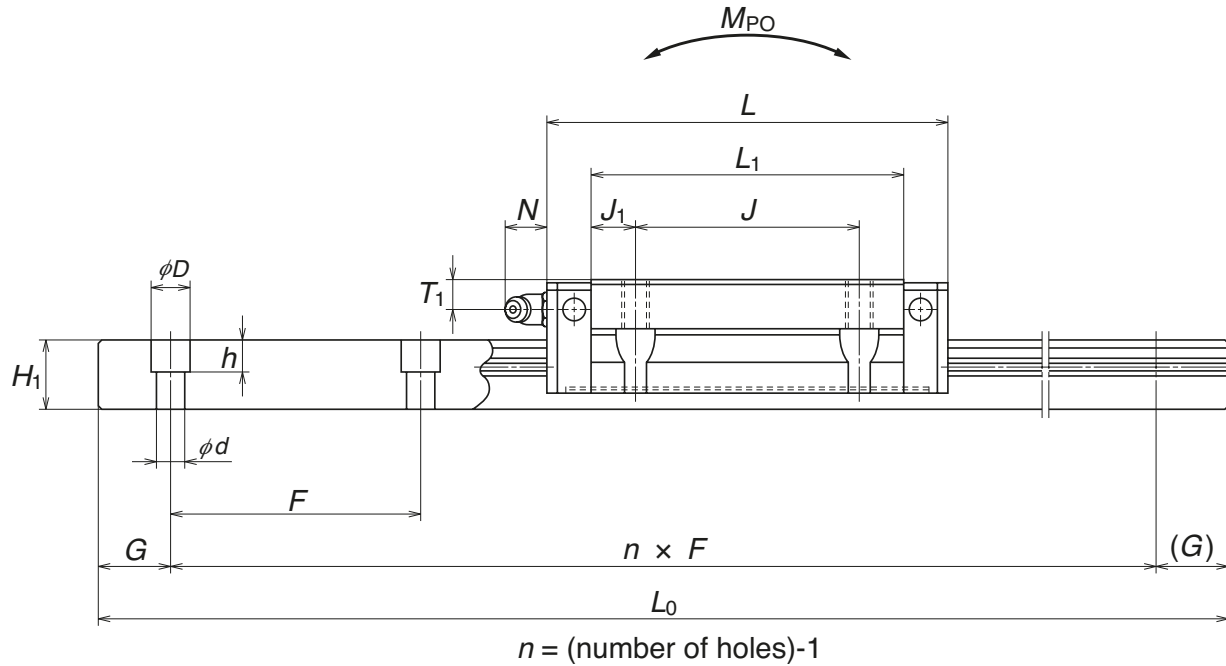
BALL SLIDE MODEL: EL

FRONT VIEW OF EL TYPE



Model No.	Assembly			Ball Slide															
	Height			Width	Length	Mounting Hole											Grease Fitting		
						B	J	M x pitch x ℓ	ℓ ₂	Q ₂							B ₁	L ₁	J ₁
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	Ø3	4.0	3	
LW21EL	21	3.0	15.5	68	58.8	60	29	M5×0.8×8	3.7	4.4	4.0	41	6.0	18.0	8	M6×0.75	4.5	11	
LW27EL	27	4.0	19.0	80	74.0	70	40	M6×1×10	6.0	5.3	5.0	56	8.0	23.0	10	M6×0.75	6.0	11	
LW35EL	35	4.0	25.5	120	108.0	107	60	M8×1.25×14	9.0	6.8	6.5	84	12.0	31.0	14	M6×0.75	8.0	11	
LW50EL	50	4.5	36.0	162	140.6	144	80	M10×1.5×18	14.0	8.6	9.0	108	14.0	45.5	18	Rc1/8	14.0	14	

SIDE VIEW OF EL TYPE



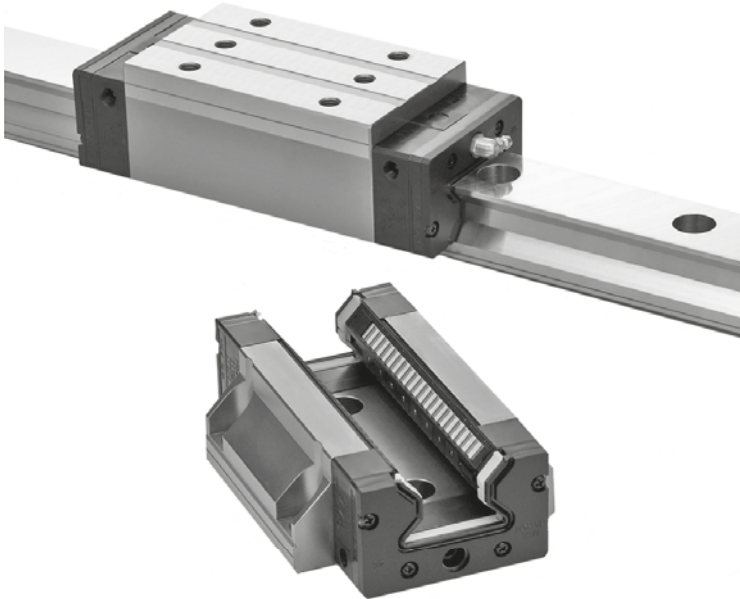
Unit: mm

Rail								Basic Load Rating					Ball Diameter	Weight	
Width	Height		Pitch	Mounting Bolt Hole d x D x h		G (recommended)	Max length (Single Rail) L _{0max}	Dynamic	Static	Static Moment					
W ₁	H ₁		B ₂					F	B ₃	C (N)	C ₀ (N)	M _{R0} (N·m)	M _{P0} (N·m)	M _{Y0} (N·m)	D _w
33	8.7	18	40	4.5×7.5×5.3	7.5	15	1000	5600	11300	135	44.0	37	2.381	0.2	2.1
37	10.5	22	50	4.5×7.5×5.3	7.5	15	1600	6450	13900	185	65.5	55	2.381	0.3	2.9
42	15.0	24	60	4.5×7.5×5.3	9.0	20	2000	12800	26900	400	171.0	143	3.175	0.5	4.7
69	19.0	40	80	7×11×9	14.5	20	2400	33000	66500	1690	645.0	545	4.762	1.5	9.6
90	24.0	60	80	9×14×12	15.0	20	3000	61500	117000	1530	1530.0	1280	6.350	4.0	15.8

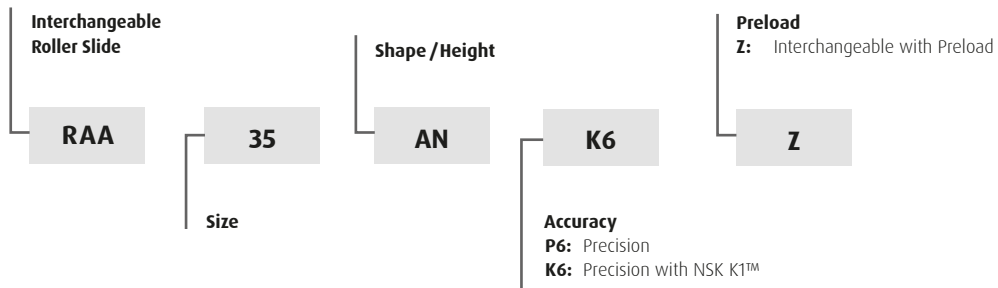
Note: Basic dynamic load rating C is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.

To convert C to C_{100} for a 100-km fatigue life, divide C by 1.26.

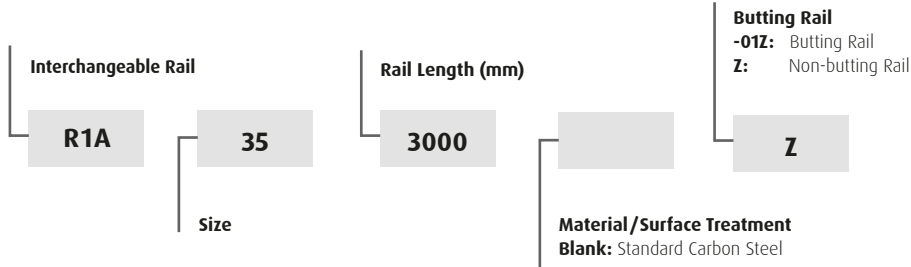
LINEAR GUIDES: RA SERIES



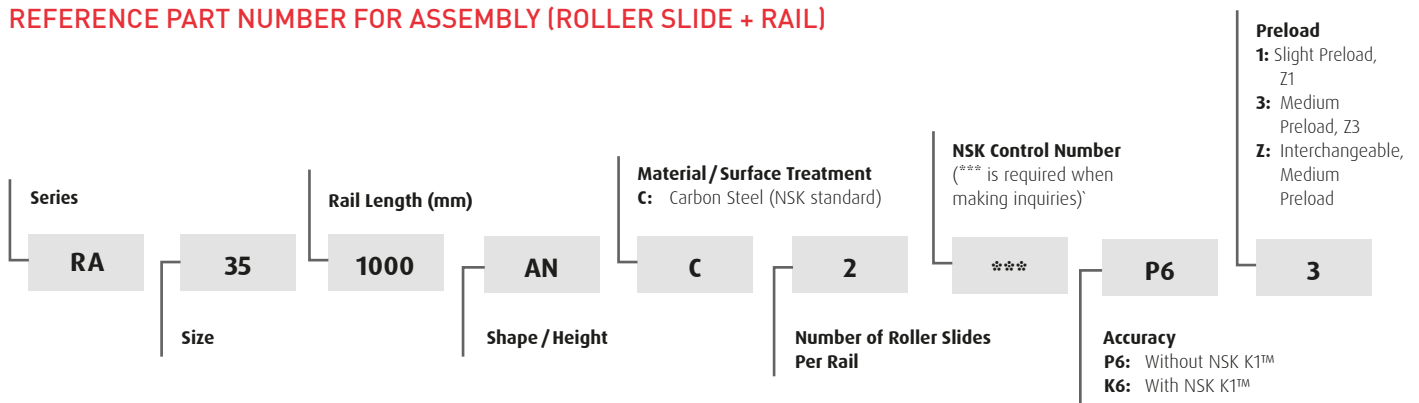
PART NUMBER EXAMPLE FOR ROLLER SLIDE ONLY



REFERENCE PART NUMBER FOR RAIL ONLY



REFERENCE PART NUMBER FOR ASSEMBLY (ROLLER SLIDE + RAIL)



PLASTIC CAP FOR RAIL MOUNTING HOLE

Linear Guide Model No.	Rail Mounting Bolt Size	Cap. No. for Rail Mounting Hole
RA25	M6	L45800006-003
RA30	M8	-003
RA35	M8	L45800008-003
RA45	M12	L45800012-003
RA55	M14	L45800014-003
RA65	M16	L45800016-003

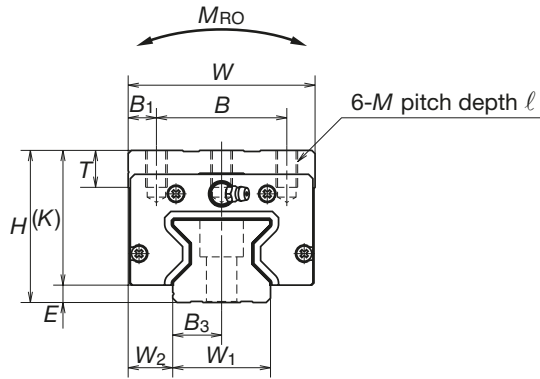
BRASS CAP FOR RAIL MOUNTING HOLE

Linear Guide Model No.	Rail Mounting Bolt Size	Cap. No. for Rail Mounting Hole
RA25	M6	L45800006-004
RA30	M8	L45800008-004
RA35	M8	L45800008-004
RA45	M12	L45800012-004
RA55	M14	L45800014-004
RA65	M16	L45800016-004

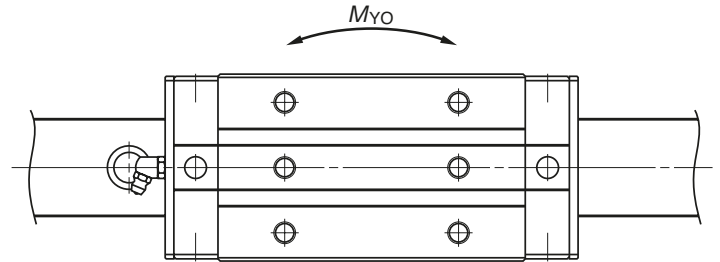
LINEAR GUIDES: RA SERIES

ROLLER SLIDE MODELS: AN, BN

FRONT VIEW OF AN AND BN TYPES

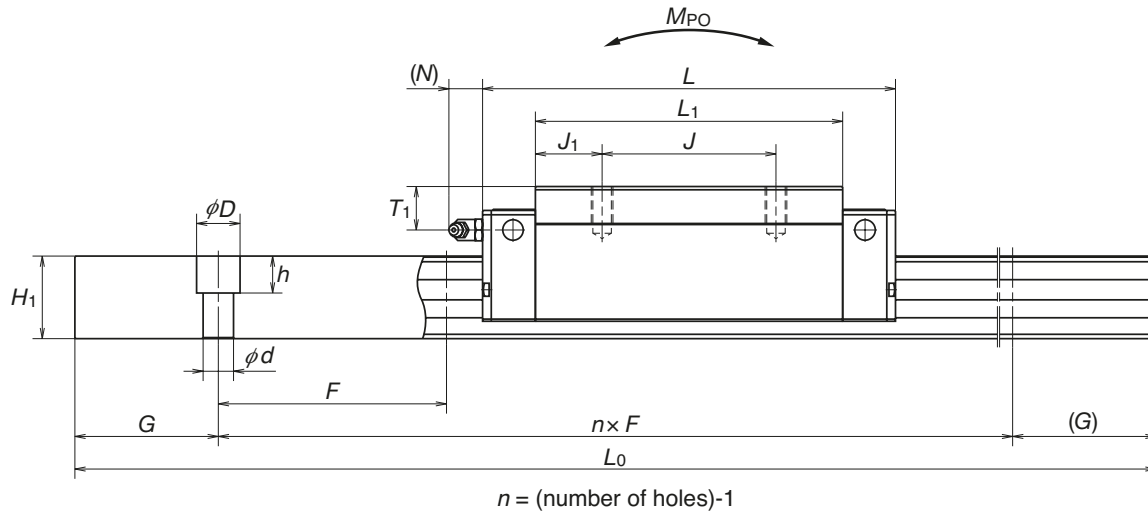


UPPER VIEW OF AN AND BN TYPES



Model No.	Assembly			Roller Slide												
	Height			Width	Length	Mounting Hole								Grease Fitting		
														Mounting Hole Size	T ₁	N
RA15AN RA15BN	28	4	9.5	34	70.0 85.4	26	26	M4×0.7×6	-	44.8 60.2	-	24	8	Ø3	8	3
RA20AN RA20BN	30	5	12	44	86.5 106.3	32	36 50	M5×0.8×6	-	57.5 77.3	-	25	12	Ø3	4	3
RA25AN RA25BN	40	5.0	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	16.0	60	110.8 135.4	40	40 60	M8×1.25×11	10.0	74.0 98.6	17.00 19.30	39	14	M6×0.75	10	11
RA35AN RA35BN	55	6.5	18.0	70	123.8 152.0	50	50 72	M8×1.25×12	10.0	83.2 111.4	16.60 19.70	49	15	M6×0.75	15	11
RA45AN RA45BN	70	8.0	20.5	86	154.0 190.0	60	60 80	M10×1.5×17	13.0	105.4 141.4	22.70 30.70	62	17	Rc1/8	14	14
RA55AN RA55BN	80	9.0	23.5	100	184.0 234.0	75	75 95	M12×1.75×18	12.5	128.0 178.0	26.50 41.50	71	18	Rc1/8	21	14
RA65AN RA65BN	90	13.0	31.5	126	228.4 302.5	76	70 120	M16×2×20	25.0	155.4 229.5	42.70 54.75	77	22	Rc1/8	19	14

SIDE VIEW OF AN AND BN TYPES



Unit: mm

Rail							Basic Load Rating					Weight	
Width	Height	Pitch	Mounting Bolt Hole d x D x h			Max Length (Single Rail) L _{0max}	Dynamic	Static	Static Moment				
W ₁	H ₁	F					B ₃	G	C (N)	C ₀ (N)	M _{R0} (N•m)	M _{P0} (N•m)	M _{Y0} (N•m)
15	16.3	60 (30)	4.5×7.5×5.3	-	20	2000	10300 13000	27500 37000	260 350	210 375	210 375	0.21 0.30	1.6
20	20.8	60 (30)	6×9.5×8.5	-	20	3000	19200 24000	52500 70000	665 890	505 900	505 900	0.38 0.50	2.6
23	24.0	30.0	7×11×9	11.5	20.0	3000	29200 35400	72700 92900	970 1240	760 1240	760 1240	0.60 0.91	3.4
28	28.0	40.0	9×14×12	14.0	20.0	3500	38900 47600	93500 121000	1670 2170	1140 1950	1140 1950	1.00 1.30	4.9
34	31.0	40.0	9×14×12	17.0	20.0	3500	53300 67400	129000 175000	2810 3810	1800 3250	1800 3250	1.60 2.10	6.8
45	38.0	52.5	14×20×17	22.5	22.5	3500	92800 116000	229000 305000	6180 8240	4080 7150	4080 7150	3.00 4.10	10.9
53	43.5	60.0	16×23×20	26.5	30.0	3500	129000 168000	330000 462000	10200 14300	7060 13600	7060 13600	4.90 6.70	14.6
63	55.0	75.0	18×26×22	31.5	35.0	3500	210000 288000	504000 756000	19200 28700	12700 28600	12700 28600	9.30 12.20	22.0

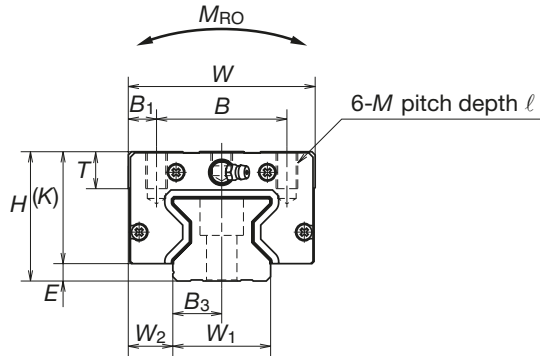
Note: Basic load rating complies with ISO standards (ISO14728-1, ISO14728-2).

If above basic dynamic load rating (100-km rating) is converted into 50-km rating, use the following formula: $C_{50 \text{ km}} = 1.23 \times C_{100 \text{ km}}$.

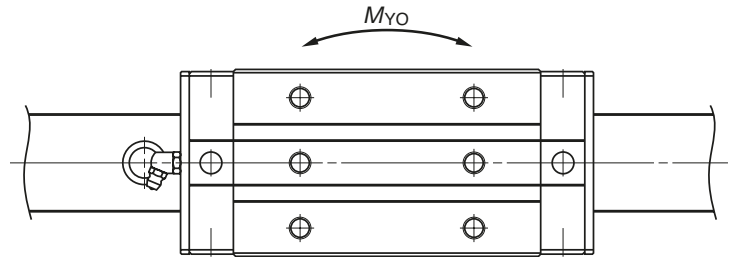
LINEAR GUIDES: RA SERIES

ROLLER SLIDE MODELS: AL, BL

FRONT VIEW OF AL AND BL TYPES

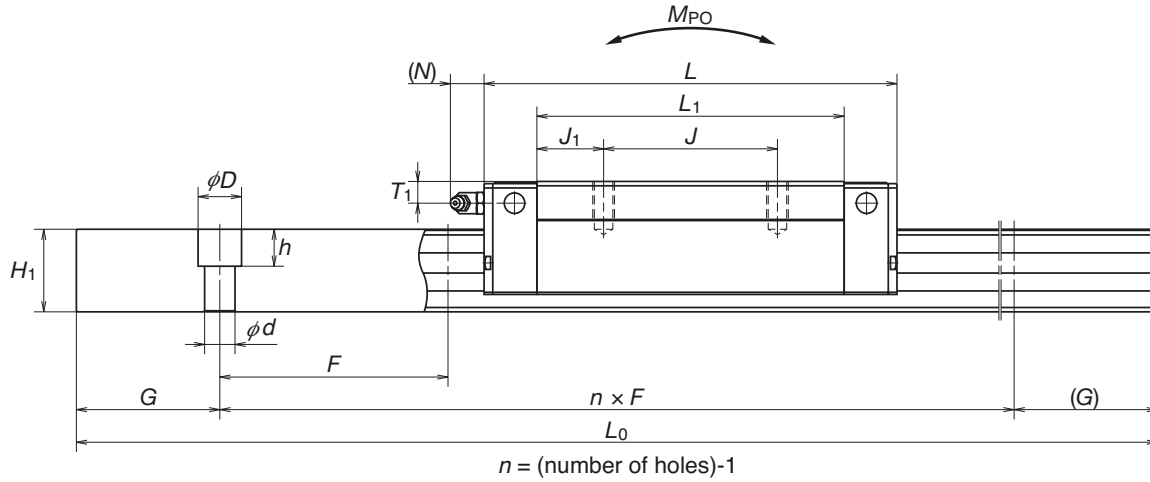


UPPER VIEW OF AL AND BL TYPES



Model No.	Assembly			Roller Slide												
	Height	E	W ₂	Width	Length	Mounting Hole			B ₁	L ₁	J ₁	K	T	Grease Fitting		
						B	J	M x pitch x l						Mounting Hole Size	T ₁	N
RA15AL RA15BL	24	4	9.5	34	70.0 85.4	26	26	M4×0.7×5.5	-	44.8 60.2	-	20	8	Ø3	4	3
RA25AL RA25BL	36	5.0	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	16.0	60	110.8 135.4	40	40 60	M8×1.25×11	10.0	74.0 98.6	17.00 19.30	36	14	M6×0.75	7	11
RA35AL RA35BL	48	6.5	18.0	70	123.8 152.0	50	50 72	M8×1.25×12	10.0	83.2 111.4	16.60 19.70	42	15	M6×0.75	8	11
RA45AL RA45BL	60	8.0	20.5	86	154.0 190.0	60	60 80	M10×1.5×16	13.0	105.4 141.4	22.70 30.70	52	17	Rc1/8	10	14
RA55AL RA55BL	70	9.0	23.5	100	184.0 234.0	75	75 95	M12×1.75×18	12.5	128.0 178.0	26.50 41.50	61	18	Rc1/8	11	14

SIDE VIEW OF AL AND BL TYPES



Unit: mm

Rail							Basic Load Rating					Weight	
Width	Height	Pitch	Mounting Bolt Hole d x D x h	B ₃	G	Max Length (Single Rail) L _{0max}	Dynamic	Static	Static Moment				
W ₁	H ₁	F					C (N)	C ₀ (N)	M _{RO} (N·m)	M _{PO} (N·m)	M _{YO} (N·m)	Roller slide (kg)	Rail (kg/m)
15	16.3	60 (30)	4.5×7.5×5.3	-	20	2000	10300 13000	27500 37000	260 350	210 375	210 375	0.17 0.25	1.6
23	24	30.0	7×11×9	11.5	20.0	3000	29200 35400	72700 92900	970 1240	760 1240	760 1240	0.45 0.80	3.4
28	28	40.0	9×14×12	14.0	20.0	3500	38900 47600	93500 121000	1670 2170	1140 1950	1140 1950	0.85 1.10	4.9
34	31	40.0	9×14×12	17.0	20.0	3500	53300 67400	129000 175000	2810 3810	1800 3250	1800 3250	1.20 1.70	6.8
45	38	52.5	14×20×17	22.5	22.5	3500	92800 116000	229000 305000	6180 8240	4080 7150	4080 7150	2.50 3.40	10.9
53	43.5	60.0	16×23×20	26.5	30.0	3500	129000 168000	330000 462000	10200 14300	7060 13600	7060 13600	4.10 5.70	14.6

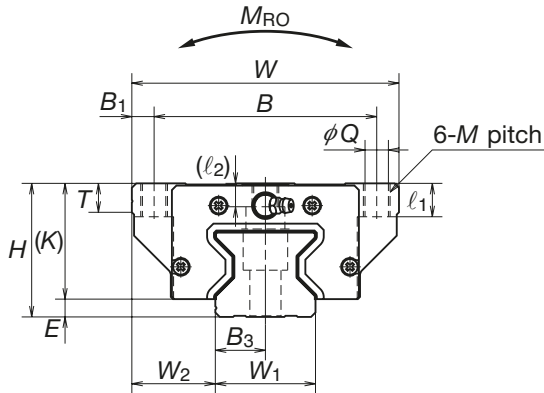
Note: Basic load rating complies with ISO standards (ISO14728-1, ISO14728-2).

If above basic dynamic load rating (100-km rating) is converted into 50-km rating, use the following formula: $C_{50\text{ km}} = 1.23 \times C_{100\text{ km}}$.

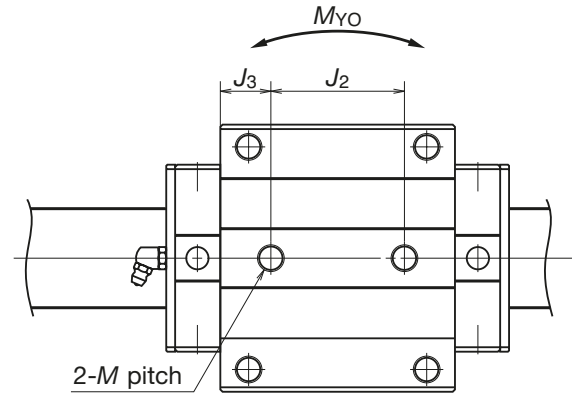
LINEAR GUIDES: RA SERIES

ROLLER SLIDE MODELS: EM, GM

FRONT VIEW OF EM AND GM TYPES

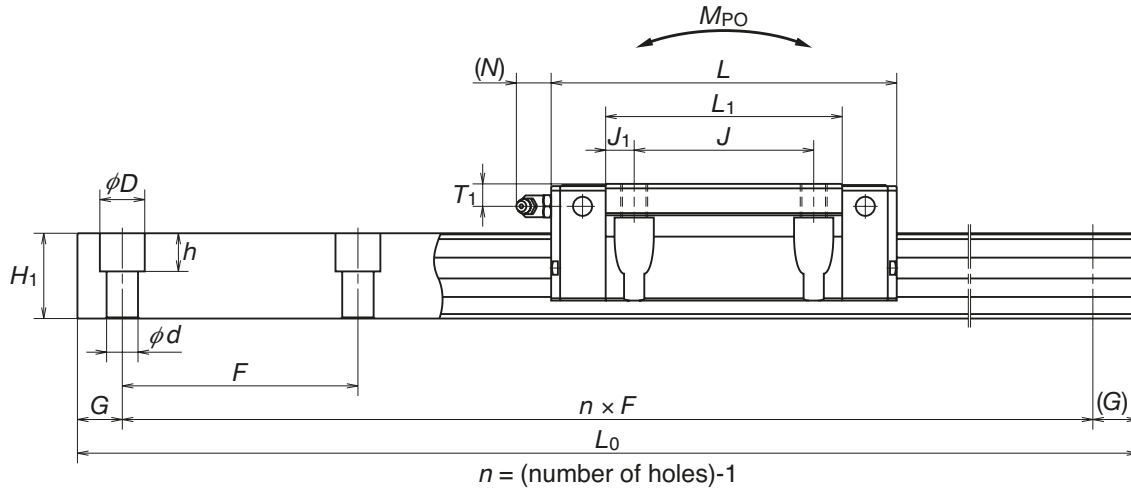


UPPER VIEW OF EM AND GM TYPES



Model No.	Assembly			Roller Slide															Grease Fitting		
	Height			Width	Length	Mounting Hole															
	H			E	W ₂	W	L	B	J	J ₂								M x pitch x ℓ ₁ (ℓ ₂)	Q x ℓ ₁ (ℓ ₂)	B ₁	L ₁
RA15EM RA15GM	24	4	16.0	47	-	-	-	-	M5×0.8×8.5 (6.5)	-	-	44.8 60.2	-	-	20	8	Ø3	4	3		
RA20EM RA20GM	30	5	21.5	63	-	-	-	-	M6×1×9.5 (8)	-	-	57.5 77.3	-	-	25	10	Ø3	4	3		
RA25EM RA25GM	36	5.0	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	31.0	90	110.8 135.4	72	52	44	M10×1.5×12 (12.5)	8.6×12 (12.5)	9.0	74.0 98.6	11.00 23.30	15.00 27.30	36	11	M6×0.75	7	11		
RA35EM RA35GM	48	6.5	33.0	100	123.8 152.0	82	62	52	M10×1.5×13 (7)	8.6×13 (7)	9.0	83.2 111.4	10.60 24.70	15.60 29.70	42	12	M6×0.75	8	11		
RA45EM RA45GM	60	8.0	37.5	120	154.0 190.0	100	80	60	M12×1.75×15 (10.5)	10.5×15 (10.5)	10.0	105.4 141.4	12.70 30.70	22.70 40.70	52	13	Rc1/8	10	14		
RA55EM RA55GM	70	9.0	43.5	140	184.0 234.0	116	95	70	M14×2×18 (13)	12.5×18 (13)	12.0	128.0 178.0	16.50 41.50	29.00 54.00	61	15	Rc1/8	11	14		
RA65EM RA65GM	90	13.0	53.5	170	228.4 302.5	142	110	82	M16×2×24 (13)	14.6×24 (13)	14.0	155.4 229.5	22.70 59.75	36.70 73.75	77	22	Rc1/8	19	14		

SIDE VIEW OF EM AND GM TYPES



Unit: mm

Rail							Basic Load Rating					Weight	
Width	Height	Pitch	Mounting Bolt Hole d x D x h	B ₃	G	Max Length (Single Rail) L _{0max}	Dynamic C (N)	Static C ₀ (N)	Static Moment			Roller slide (kg)	Rail (kg/m)
W ₁	H ₁	F							M _{RO} (N·m)	M _{PO} (N·m)	M _{YO} (N·m)		
15	16.3	60 (30)	4.5×7.5×5.3	-	20	2000	10300 13000	27500 37000	260 350	210 375	210 375	0.21 0.28	1.6
20	20.8	60 (30)	6×9.5×8.5	-	20	3000	19200 24000	52500 70000	665 890	505 900	505 900	0.45 0.65	2.6
23	24.0	30.0	7×11×9	11.5	20.0	3000	29200 35400	72700 92900	970 1240	760 1240	760 1240	0.80 1.10	3.4
28	28.0	40.0	9×14×12	14.0	20.0	3500	38900 47600	93500 121000	1670 2170	1140 1950	1140 1950	1.30 1.70	4.9
34	31.0	40.0	9×14×12	17.0	20.0	3500	53300 67400	129000 175000	2810 3810	1800 3250	1800 3250	1.70 2.30	6.8
45	38.0	52.5	14×20×17	22.5	22.5	3500	92800 116000	229000 305000	6180 8240	4080 7150	4080 7150	3.20 4.30	10.9
53	43.5	60.0	16×23×20	26.5	30.0	3500	129000 168000	330000 462000	10200 14300	7060 13600	7060 13600	5.40 7.50	14.6
63	55.0	75.0	18×26×22	31.5	35.0	3500	210000 288000	504000 756000	19200 28700	12700 28600	12700 28600	12.20 16.50	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: $C_{50\text{ km}} = 1.23 \times C_{100\text{ km}}$

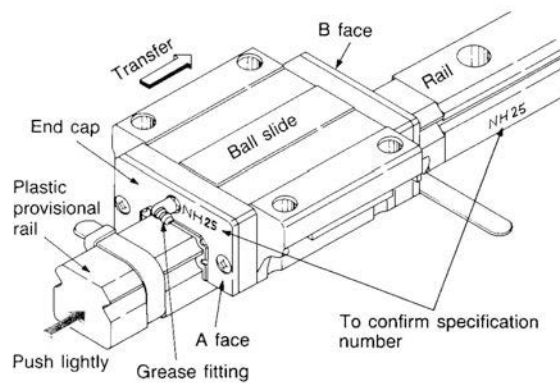
ASSEMBLY AND MOUNTING

ASSEMBLY

Interchangeable ball slides are shipped on (disposable) plastic provisional rails as shown in Fig I.1.

1. Wipe off anticorrosive oil from the rail.
2. All NSK slides come prepacked with Alvania 2 (AS2) grease for quick installation.
3. Align the rail with the bottom and side faces of the provisional rail while pushing the provisional rail lightly against the rail, slide the ball slide on the rail (Fig I.1).

Fig I.1 Assembly of Ball Slide with Rail



MOUNTING METHOD

Shoulder Height and Corner Shape at Mounting Face

When utilizing the reference surface to secure rail or ball slides to machine components the components must have the mounting face height (H' , H'') and corner chamfer (r) dimensions as listed in table below and illustrated in Figs. I.2 and I.3, to avoid interference.

Shoulder Height and Corner Shape at Mounting Face

Product No.	Radius of corner r (max)	Shoulder Height of Rail H'	Shoulder Height of Ball Slide H''
15	0.5	4.0	4.5
20	0.5	4.5	5.0
25	0.5	5.0	5.0
30	0.5	6.0	6.0
35	0.5	6.0	6.0
45	0.7	8.0	8.0
55	0.7	10.0	10.0
65	1.0	11.0	11.0

Fig I.2 Rail Datum Face Mounting Part

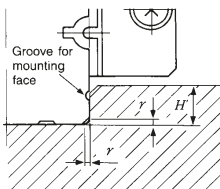
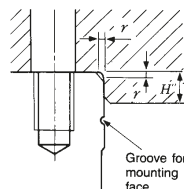


Fig I.3 Ball Slide Datum Face Mounting Part

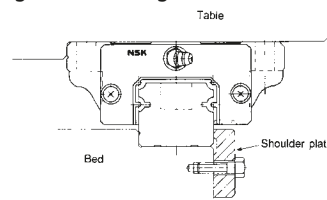


MOUNTING PROCEDURE

For Cases where Datum Surface Exists on the Bed

1. Lightly tighten the rail mounting bolts and then use the shoulder plate to secure rail datum surface against bed mounting surface (See Fig. I.4).
2. Tighten rail mounting bolts to their recommended torque value (see table below). Tighten the bolts in an order which enables the wrench to help push the rail against the mounting surface (see Fig. I.5 for example).

Fig I.4 Positioning of Rail

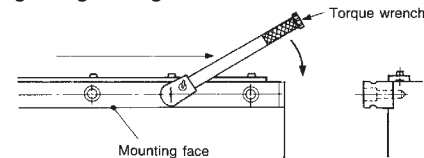


Recommended Torque for Rail Mounting Bolt (Case of Thermally Refined Bolt) unit: kgf · cm

Bolt Nominal No.	Torque	Bolt Nominal No.	Torque
M3	10.8	M10	440
M4	25.0	M12	770
M5	52.0	M14	1240
M6	88.0	M16	2000
M8	220.0	--	--

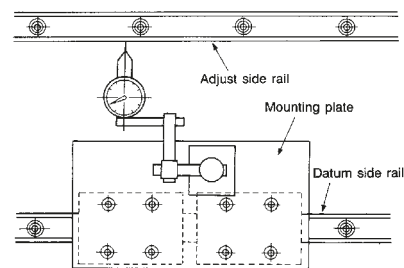
[1 kg · cm = 0.8681 lb in]

Fig I.5 Tightening Direction



3. Mount the adjust side rail, as shown in Fig. I.6, while checking rail parallelism. For the jig shown in Fig. I.6, stability will be improved by mounting it to a ball slide.

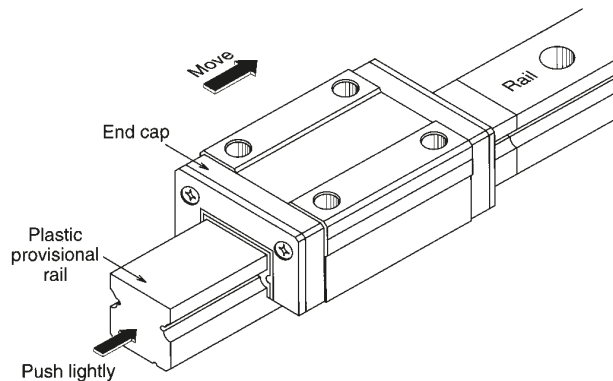
Fig I.6 Parallelism Measurement with Jigs



4. If dowel pins are being used they should be installed at this step.
5. Position the ball slides at specified intervals and mount the table gently.
6. Tighten ball slide mounting bolts of datum side while pushing the table so that the table and ball slide mounting reference surfaces are in contact.

INDICATION OF INSTALLED STANDARD SIDE

The datum face of each rail is indicated by a groove in the datum face or by an arrow mark on the end or top surface of the rail.



Lubrication

Grease Lubrication

NSK linear guides are packed with Alvania 2 (AS2) grease and can be used as delivered. The replenishment frequency is recommended to be once a year, but adjust the interval depending on the operational conditions.

To Change Direction of Grease Fitting

1. Remove the grease fitting with a wrench.
2. Wind some sealing tape on the thread of the fitting, then insert it and tighten. Be careful not to over torque when tightening into the side of the plastic bearing end cap.

Change of Fitting Position in Front/Back Direction

1. Remove the plug from the grease fitting mounting hole face B shown in Fig. I.1 with a hexagonal wrench.
2. Remove the grease fitting from face A and screw into hole face B.
3. In place of the removed fitting, insert the plug into the hole in the face A.

Change Grease Fitting Position to Side Surface

To mount the grease fitting on the end cap side face, or on the ball slide face, please consult NSK.

Oil Lubrication

Oil piping can be connected to the tapped hole from where the grease fitting was removed. The recommended lubrication oil supply quantity per ball slide per hour Q is given by the following formula, where N is the rail width number.

$$Q = \frac{N \text{ (ml/hr)}}{150} \dots \dots \dots (5)$$

Using NH45 as an example, N=45, and

$$Q = \frac{45}{150} = 0.3 \text{ (ml/hr)}$$

Model	PU Series (all models)	PU12, 15
High-Carbon Steel		
Stainless Steel		

Notes on Usage

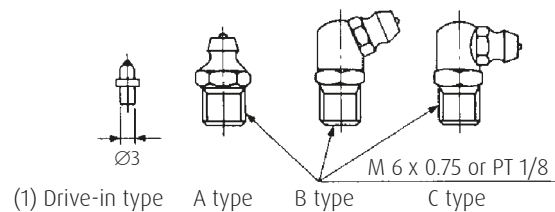
Separately packaged ball slide is mounted on a plastic temporary axis (disposable) as shown at left.

1. Wipe rust preventative oil from the rail.
2. Product is ready for immediate use. Comes prepacked with Alvania 2 (AS2) grease.
3. Note the groove mark which identifies the datum faces of ball slide and rail above.
4. Align the rail with the bottom and side faces of the provisional rail while pushing the provisional rail lightly against the rail, slide the ball slide on the rail (Fig I.1).

Grease Fittings for NSK Ball Slides

Type	Linear Guide Model #	Grease Fitting Part #	Thread Spec.
Drive	NH15, NS15, LW17	L50010000-301	Dia. 3mm
A	NS, NS 20, 25, 30, 25	L50000000-001	M6X0.75MM
B	NS, NS 20, 25, 30, 25	L50100000-001	M6X0.75MM
C	NS, NS 20, 25, 30, 25 LW 21, 27, 35	L50200000-001	M6X0.75MM
A	NH 45, 55, 65	L50003000-001	PT 1/8
B	NH 45, 55, 65	L50103000-001	PT 1/8
C	NH 45, 55, 65, LW 50	L50203000-001	PT 1/8

Shape of Grease Fitting

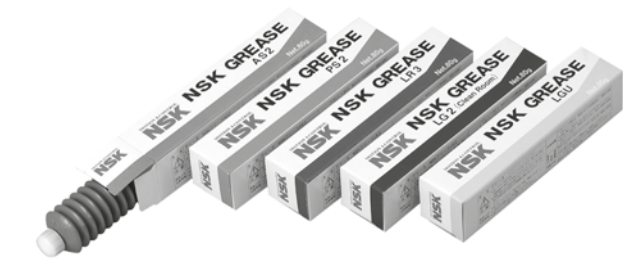


(1) Applies only to model No. NH15, NS15 and LW17.

GREASE

NSK GREASE UNIT

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



Grease in a bellows tube

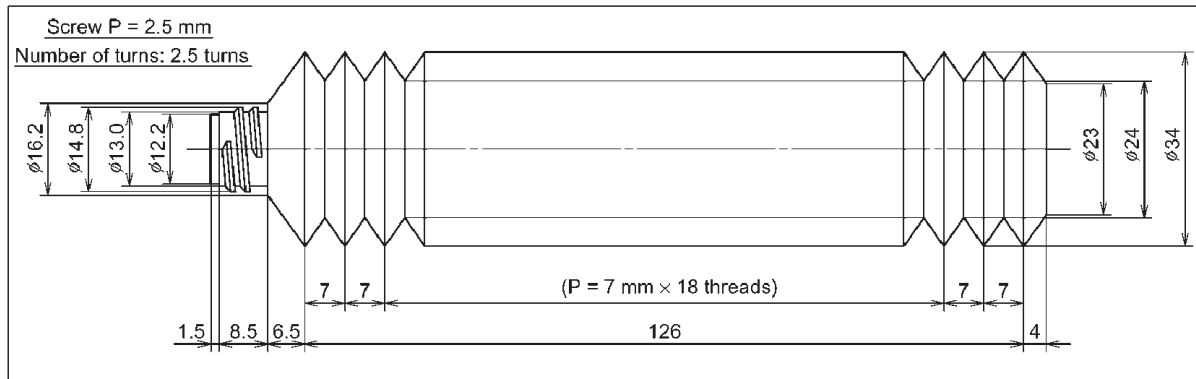


COMPOSITION OF NSK GREASE UNIT

Components and grease types are shown below.

Name		(tube type)	Reference Number
NSK Grease (80 g in a 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 Hand Grease Pump Unit Straight nozzle NSK HGP NZ1 -- (One nozzle is provided with the hand pump.)			NSK HGP
Grease nozzle (used with the 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

NSK GREASES (80 G IN A BELLOWS TUBE)



NSK MANUAL GREASE PUMP UNIT

NSK Hand Grease Pump Unit

(Reference number: NSK HGP)

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 the grease in bellows tube.
- Remaining grease Can be confirmed through slit on the tube.
- Several nozzles Five types of nozzles to choose from.

Specifications

- Spout volume..... 0.35 g/stroke
- Mass of main body..... 393 g
- Overall length About 200 mm
- Overall width About 200 mm
- Grease tube outer diameter $\varnothing 38.1$
- Accessory..... Several nozzles for a unique application can be attached

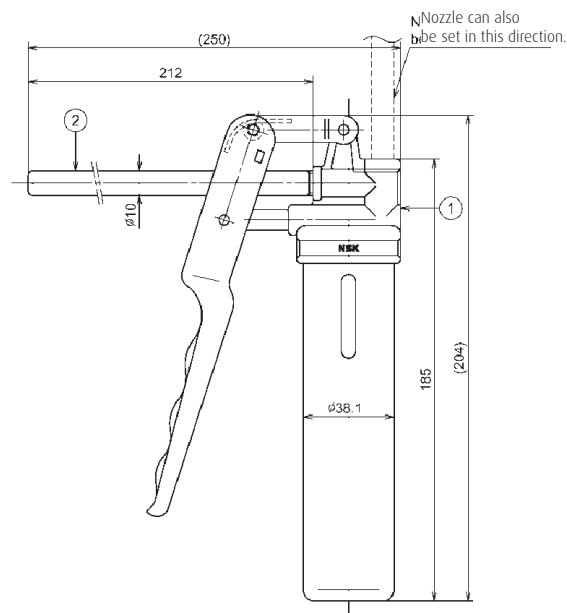


Fig I.7 NSK Hand Grease Pump with NSK straight nozzle

GREASE (CONT.)

NOZZLES

Nozzles that can be attached to NSK Hand Grease Pump

Name	Designation Code	Use	Dimensions
NSK straight nozzle	NSK HGP NZ1	Can be used with grease fitting A, B, and C under JIS B1575 standard.	
NSK chuck nozzle	NSK HGP NZ2	Can be used with grease fitting A, B, and C under JIS B1575 standard.	
NSK fitting nozzle	NSK HGP NZ3	Dedicated for the drive-in grease fitting.	
NSK point nozzle	NSK HGP NZ4	Used for linear guides and ball screws which do not have grease fitting. Used to supply grease directly to the ball grooves, or through the opening of ball slide or ball slide to inside.	
NSK flexible nozzle	NSK HGP NZ5	Tip of nozzle is flexible to supply grease in the areas where hand cannot reach.	
NSK flexible extension pipe	NSK HGP NZ6	Flexible extension pipe connects the grease pump and the nozzle.	
NSK straight extension pipe	NSK HGP NZ7	Straight extension pipe connects the grease pump and the nozzle.	

GREASE LUBRICANT FOR LINEAR GUIDES AND BALL SCREWS

Type	Thickener	Base Oil	Base Oil Kinematic Viscosity cSt (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 operation.
LR3	Lithium type	Synthetic oil	30	-30 ~130	For ball screws at high speed, medium load.
LG2	Lithium type	Mineral oil + synthetic hydrocarbon oil	30	-20~70	For clean environment.
NF2	Urea composite type	Synthetic oil + mineral oil	27	-40~100	For fretting resistance.

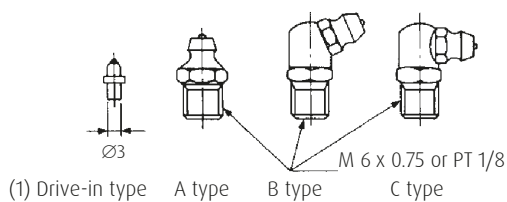
GREASE NOZZLE USED FOR NSK LINEAR GUIDE

Linear Guide Model	Tap Hole for Grease Fitting	Standard Grease Fitting	Straight Nozzle NZ1	Chuck Nozzles (two) NZ	Drive-in Nipple Nozzles NZ3	Point Nozzle NZ4	Flexible Nozzle NZ5
NS15	Ø3	Drive-in type			o		
NS20~35	M6 x 0.75	B type	o	o			o
NH15	Ø3	Drive-in type			o		
NH20~35	M6 x 0.75	B type	o	o			o
NH45~85	PT1 / 8	B type	o	o			o
LW17	Ø3	Drive-in type			o		
LW21~35	M6 x 0.75	B type	o	o			
LW50	PT/18	B type	o	o			o
PU09~15	-	None (1)				o (2)	o
PE09~15	-	None (1)				o (2)	

1) PU and PE Series: Apply grease directly to ball groove, etc. using a point nozzle.

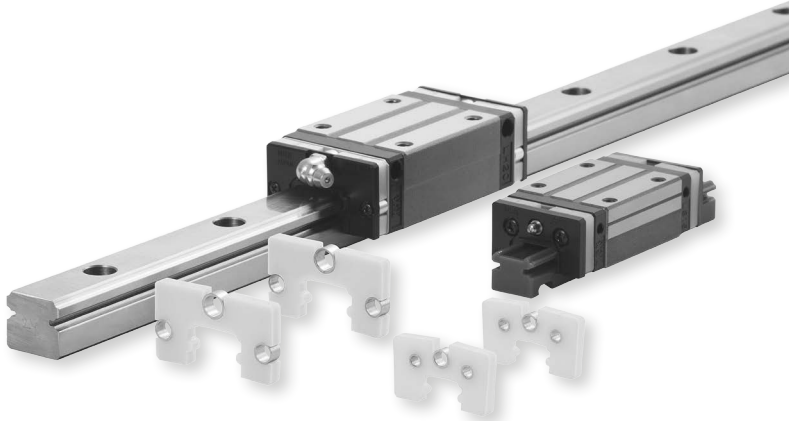
2) NS20, NS25, NH20: Use straight nozzle. (Point nozzle tip cannot be used because it interferes with the rail top surface).

FIGURES OF GREASE FITTINGS



K1™ MAINTENANCE-FREE LUBRICATION SYSTEM

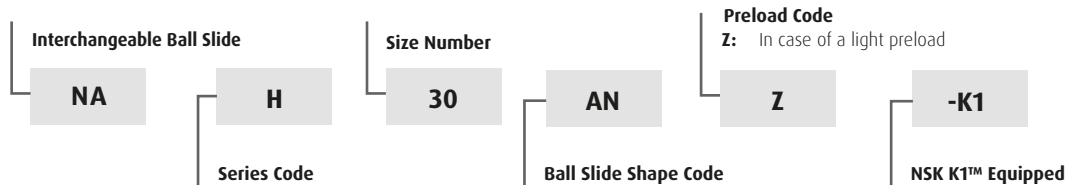
K1™ MAINTENANCE-FREE LUBRICATION SYSTEM



K1™ IDENTIFICATION NUMBER

Refer to the following numbering system when ordering.

Example:



The NSK K1™'s distinctive capabilities as a compact and efficient oil-impregnated lubrication unit greatly increases the performance of the Linear Guide. The K1™ Lubrication Unit is available in two types, one for industrial applications and one for food and medical devices where cleanliness and safety are paramount.

FEATURES

Long-term, Maintenance-Free Usage.

In mechanical environments where lubrication is difficult to apply, long-term running efficiency is maintained by using the NSK K1™ in combination with grease.

Prevention of Oil-Related Environmental Pollution.

In locations where oil greatly affects the environment, or in mechanisms with severe hygiene restrictions, sufficient lubrication is provided using the NSK K1™ in combination with grease.

Effective in Environments where the Lubricant is Washed Away.

In facilities where mechanisms are washed down with water, or subject to severe environmental conditions, long service life is ensured by using the NSK K1™ in combination with grease. Especially effective under hygienic conditions where oil must not be dispersed.

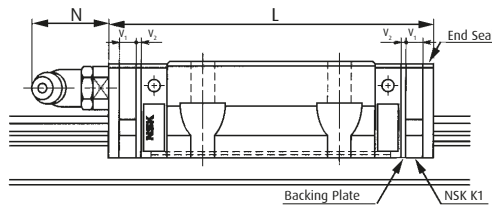
Maintains Efficiency in Dusty Environments.

In environments where oil and grease-absorbing dust is produced, long-term efficiency is maintained by using the NSK K1™ in combination with grease.

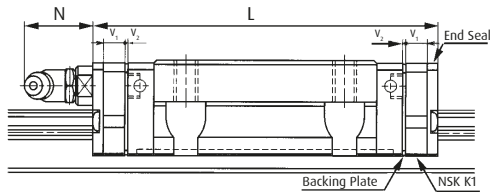
INTERCHANGEABLE LINEAR GUIDE DIMENSIONS - NH, NS, LW, PU, PE, RA SERIES

Unit: mm

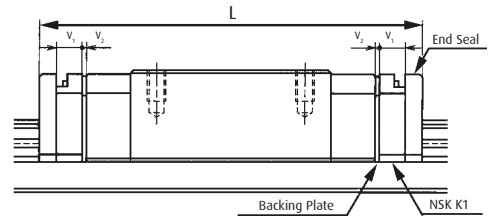
NH/NS Series



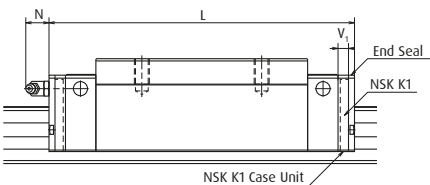
LW Series



PU/PE Series



RA Series



Interchangeable Ball/Roller Slide Size Code	Ball/Roller Slide Form			Standard Ball/Roller Slide Length	Ball/Roller Slide Length with two NSK K1™ L	Thickness of NSK K1™ V ₁	Thickness of Backing Plate V ₂	Grease Fitting Projection N
NAH15	AN	EM		55.0	65.6	4.5	0.8	5
	BN	GM		74.0	84.6			
NAH20	AN	EM		69.8	80.4	4.5	0.8	14
	BN	GM		91.8	102.4			
NAH25	AN	AL	EM	79.0	90.6	5.0	0.8	14
	BN	BL	GM	107.0	118.6			
NAH30	AN	AL		85.6	97.6	5.0	1.0	14
	BN	BL	GM	124.6	136.6			
NAH35	AN	AL	EM	109.0	122.0	5.5	1.0	14
	BN	BL	GM	143.0	156.0			
NAH45	AN	AL	EM	139.0	154.0	6.5	1.0	15
	BN	BL	GM	171.0	186.0			
NAH55	AN	AL	EM	163.0	178.0	6.5	1.0	15
	BN	BL	GM	201.0	216.0			
NAH65	AN	EM		193.0	211.0	8.0	1.0	16
	BN	GM		253.0	271.0			
NAS15	AL	EM		56.8	66.4	4.0	0.8	5
	CL	JM		40.4	50.0			
NAS20	AL	EM		65.2	75.8	4.5	0.8	14
	CL	JM		47.2	57.8			
NAS25	AL	EM		81.6	92.0	4.5	0.8	14
	CL	JM		59.6	70.0			
NAS30	AL	EM		96.4	108.4	5.0	1.0	14
	CL	JM		67.4	79.4			
NAS35	AL	EM		108.0	121.0	5.5	1.0	14
	CL	JM		77.0	90.0			
LAW17	EL			51.4	61.6	4.5	0.6	5
LAW21	EL			58.8	71.4	5.5	0.8	13
LAW27	EL			74.0	86.6	5.5	0.8	13
LAW35	EL			108.0	123.0	6.5	1.0	13
LAW50	EL			140.6	155.6	6.5	1.0	14
PAU09	TR	UR		30.0	36.4	2.7	0.5	-
PAU12	TR	UR		35.2	42.2	3.0	0.5	-
PAU15	AL	BL		43.0	51.2	3.5	0.6	-
PAE09	TR	UR		39.8	46.8	3.0	0.5	-
PAE12	AR	BR		45.0	53.0	3.5	0.5	-
PAE15	AR	BR		56.6	66.2	4.0	0.8	-
RA25	AN	AL	EM	97.5	107.5	5.0	3.3	11
	BN	BL	GM	115.5	125.5			
RA30	AN	AL	EM	110.8	122.8	6.0	3.6	11
	BN	BL	GM	135.4	147.4			
RA35	AN	AL	EM	123.8	136.8	6.5	3.6	11
	BN	BL	GM	152.0	165.0			
RA45	AN	AL	EM	154.0	168.0	7.0	4.2	14
	BN	BL	GM	190.0	204.0			
RA55	AN	AL	EM	184.0	198.0	7.0	4.2	14
	BN	BL	GM	234.0	248.0			
RA65	AN	EM		228.4	243.4	7.5	5.5	14
	BN	GM		302.5	317.5			