

NSK S1™ Series Precision Linear Guides

Series of interchangeable products enables fast delivery.

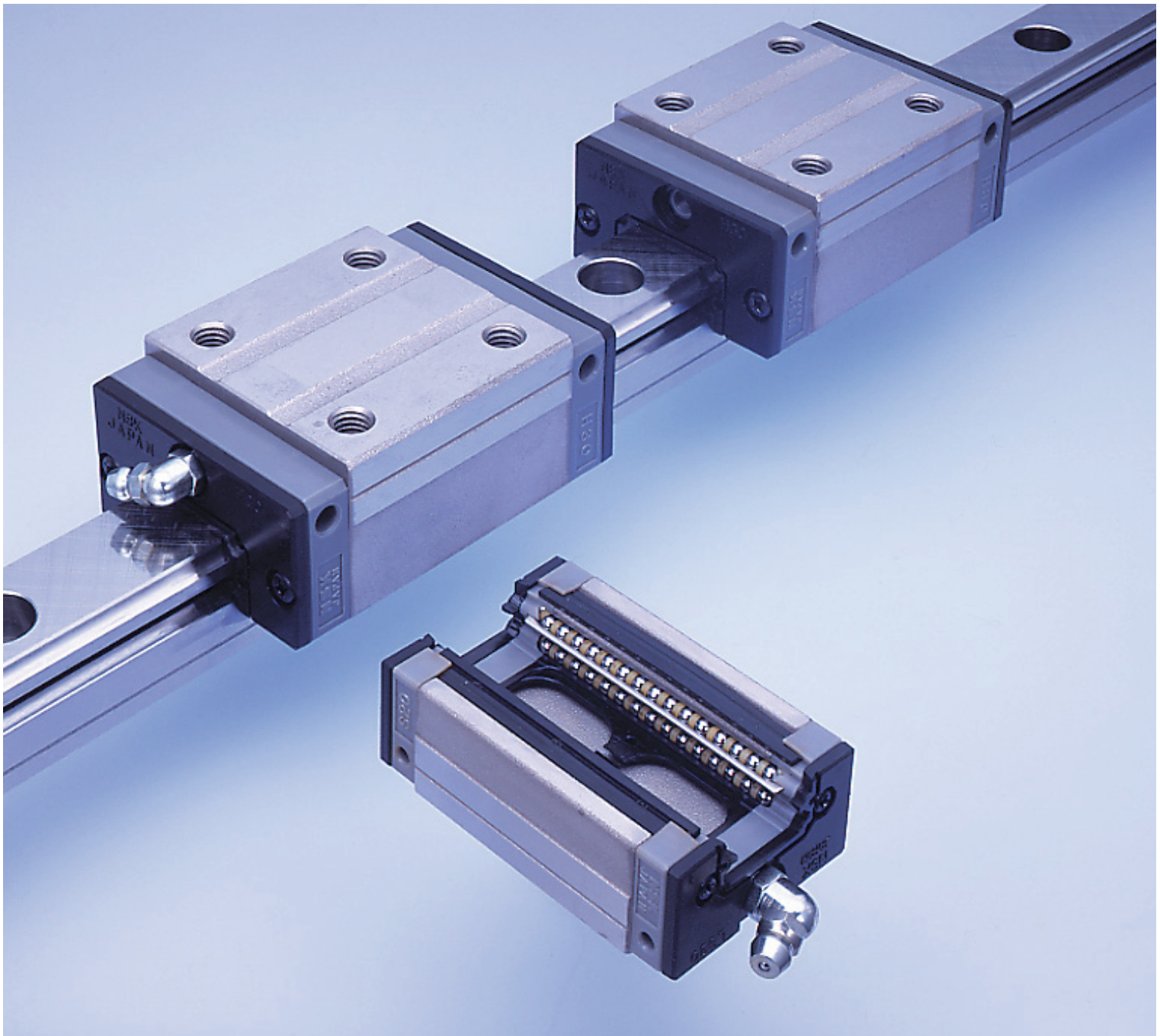
A new guide way system for machinery ensures environmental compatibility and high performance. Its quiet, smooth operation is friendly to both the workplace and the environment.

Extended series

Low noise

Smoother motion

Patent Pending

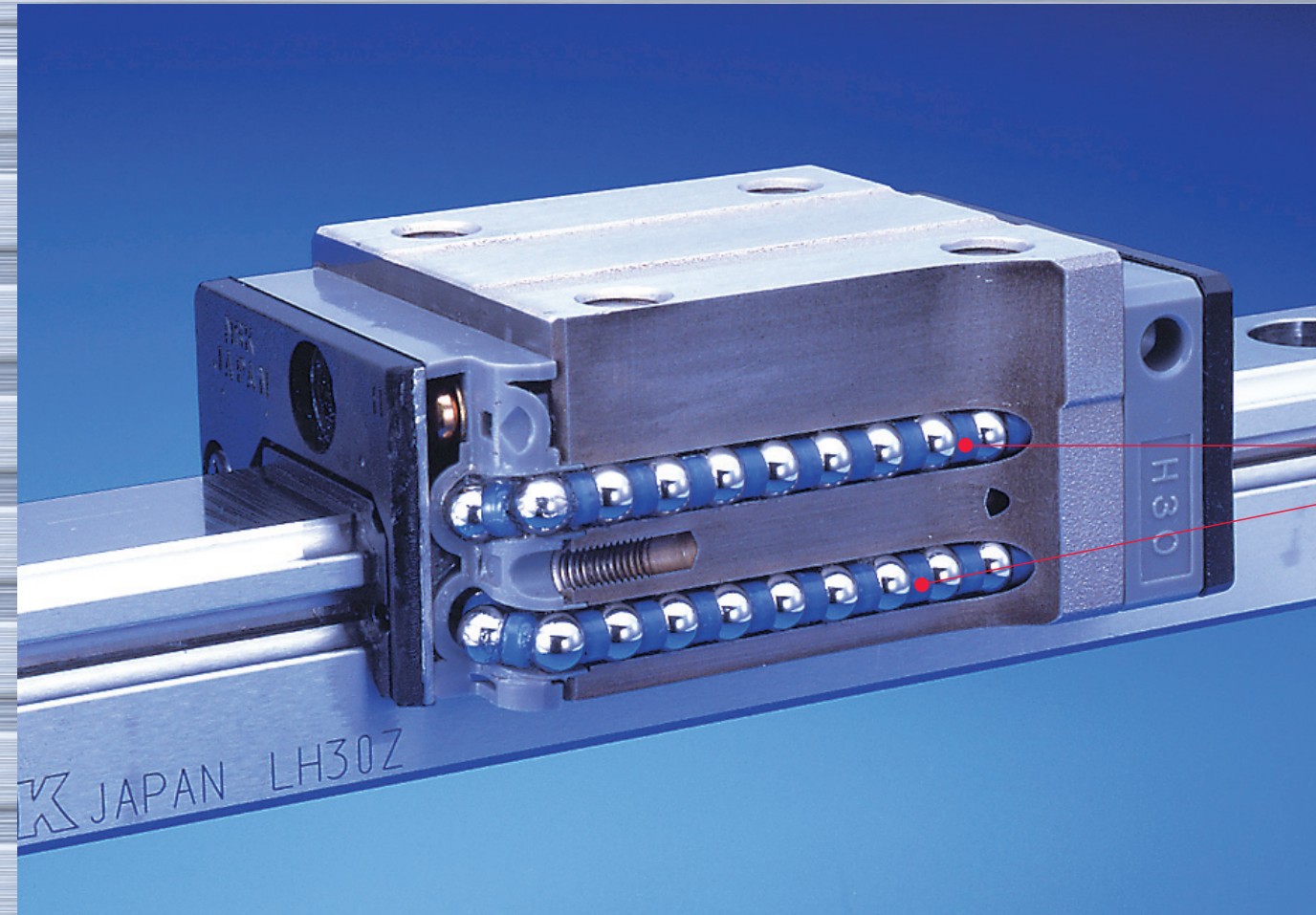


The NSK S1™ Series meets the demand for smoother, silent motion

The popular series has been updated and expanded into a complete lineup with a new series of interchangeable products!

The NSK S1™ Series Linear Guide features resin retainers between the balls to prevent collision and rubbing.

Ball groove construction is standard in the LH and LS Series.

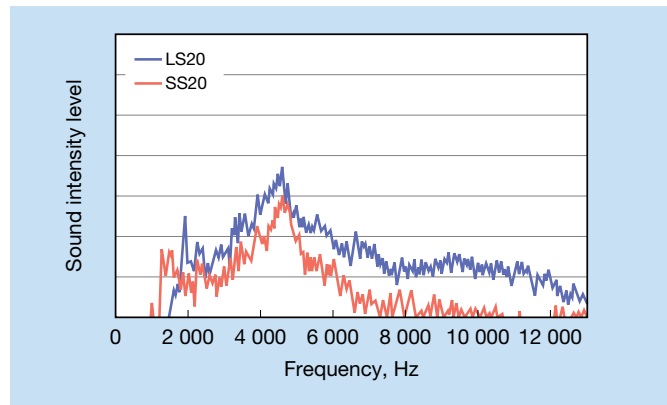
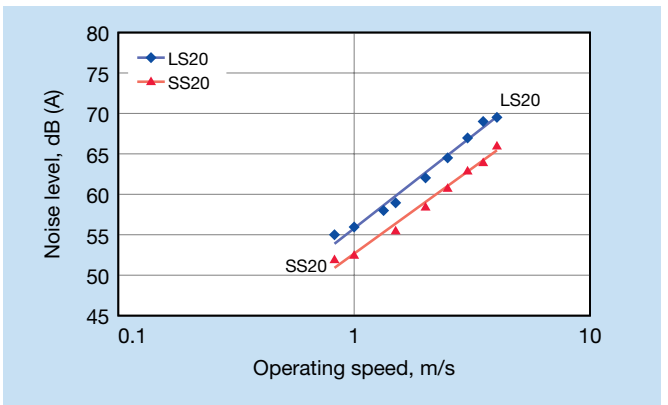
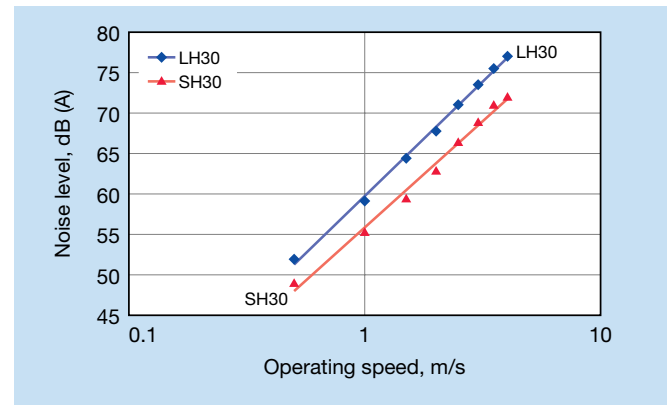


Resin retaining piece

Feature 1 Lower noise and gentler tone

Incorporating a retainer piece and optimizing the circulation path enables steel ball circulation stability and the prevention of ball collision, resulting in noise reduction by 5 dB (A) or more than that of conventional NSK products. In addition, contributing to sound improvement (human-friendly sound quality) with lower noise levels, especially in the high-frequency range.

Lower noise and gentler tone



Test conditions: Oil lubrication (VG68)
 Locate a microphone at 500 mm above the sample (both for LH30 and LS20)
 *Noise level depends on the microphone location.
 Noise level drops by approximately 6 dB (A) when the distance from the microphone is doubled.

Feature 2 Smoother motion

Improved steel ball circulation stability, free of interference between the balls improves dynamic friction characteristics, resulting in smooth and stable motion, which is especially effective for low speed motion.

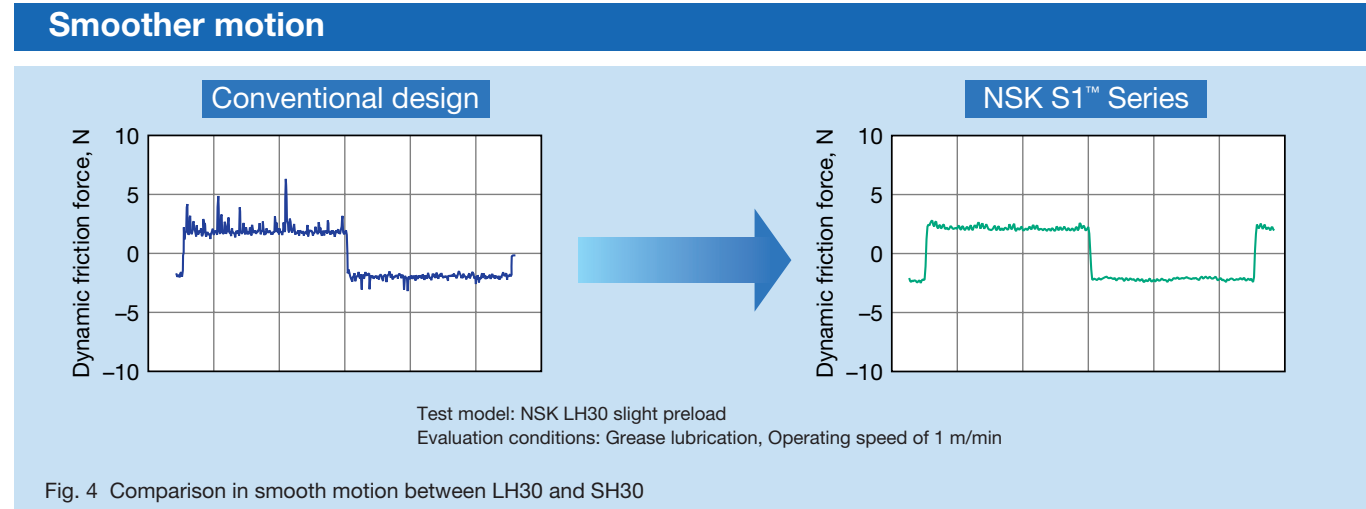


Fig. 4 Comparison in smooth motion between LH30 and SH30

Feature 3 Low dust generation

A resin retaining piece, which prevents steel balls collision, features effective low dust generation characteristics compared to conventional products.

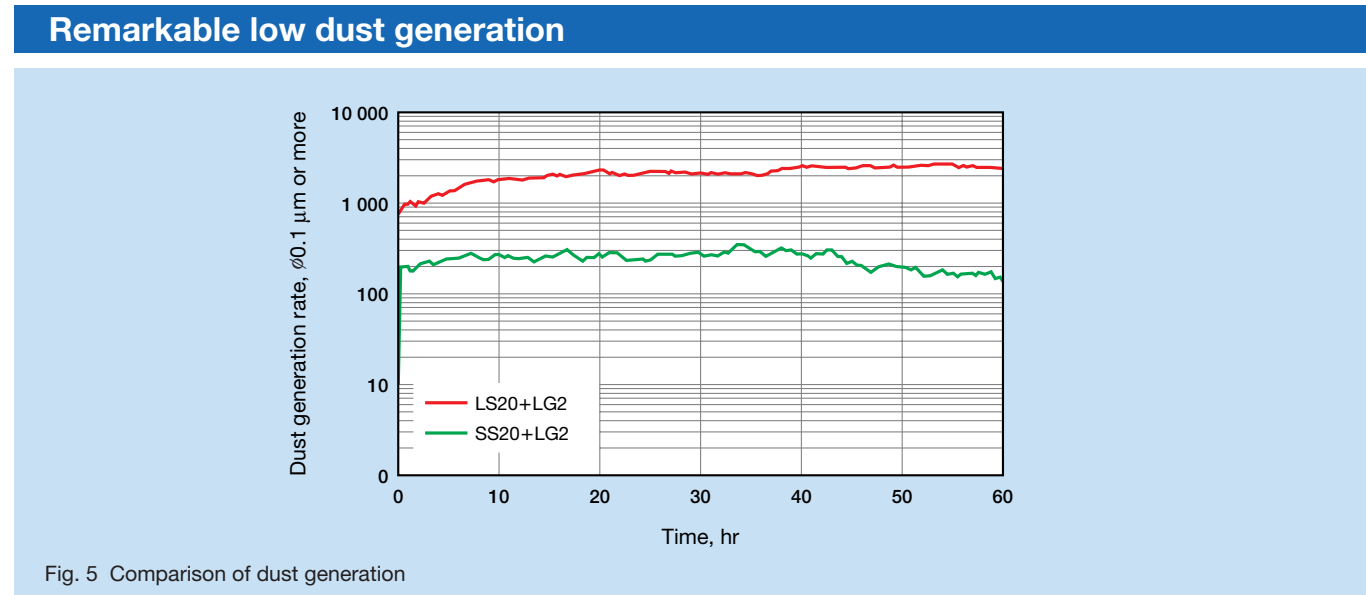


Fig. 5 Comparison of dust generation

Feature 4 Fast delivery

Lineup of interchangeable rails and ball slides in the series supports random matching and facilitates fast delivery.

1. Accuracy

The preloaded assembly types products have four accuracy grades; Ultra precision P3, Super precision P4, High precision P5 and Precision P6, while the interchangeable types have a regular class PC.

Table 1 shows the accuracy standard for the preloaded assembly type of the SH Series and SS Series, while Table 2 shows the accuracy standard for the interchangeable types.

Table 1 Accuracy grade for the preloaded assembly type

Item	Accuracy grade	Unit: μm			
		Ultra precision P3	Super precision P4	High precision P5	Precision P6
Mounting height: H		± 10	± 10	± 20	± 40
Variation of mounting height: H (All slides on a pair or rails)		3	5	7	15
Mounting width dimension: W_2 or: W_3		± 15	± 15	± 25	± 50
Variation of mounting width dimension: $W_2(s)$ or: $W_3(s)$ (All slides on datum rails)		3	7	10	20
Running parallelism of face C against face A Running parallelism of face D against face B		Shown in Table 3			

Table 2 Accuracy grade for the interchangeable type

Item	Accuracy grade	Normal interchangeable types
		PC
Mounting height: H		± 20
Variation of mounting height: H (one rail)		15
Variation of mounting height: H (multiple rails)		30
Assembly width dimension: W_2 or: W_3		± 30
Variation of assembly width dimension: $W_2(s)$ or: $W_3(s)$ (All slides on datum rails)		25
Running parallelism of face C against face A Running parallelism of face D against face B		Shown in Table 3

Table 3 Running parallelism tolerance

Rail length (mm)	Preload assembly types				Interchangeable types
	Ultra precision P3	Super precision P4	High precision P5	Precision P6	Normal interchangeable type PC
over 50	2	2	2	4.5	6
50–80	2	2	3	5	6
80–125	2	2	3.5	5.5	6.5
125–200	2	2	4	6	7
200–250	2	2.5	5	7	8
250–315	2	2.5	5	8	9
315–400	2	3	6	9	11
400–500	2	3	6	10	12
500–630	2	3.5	7	12	14
630–800	2	4.5	8	14	16
800–1 000	2.5	5	9	16	18
1 000–1 250	3	6	10	17	20
1 250–1 600	4	7	11	19	23
1 600–2 000	4.5	8	13	21	26
2 000–2 500	5	10	15	22	29
2 500–3 150	6	11	17	25	32
3 150–4 000	9	16	23	30	34

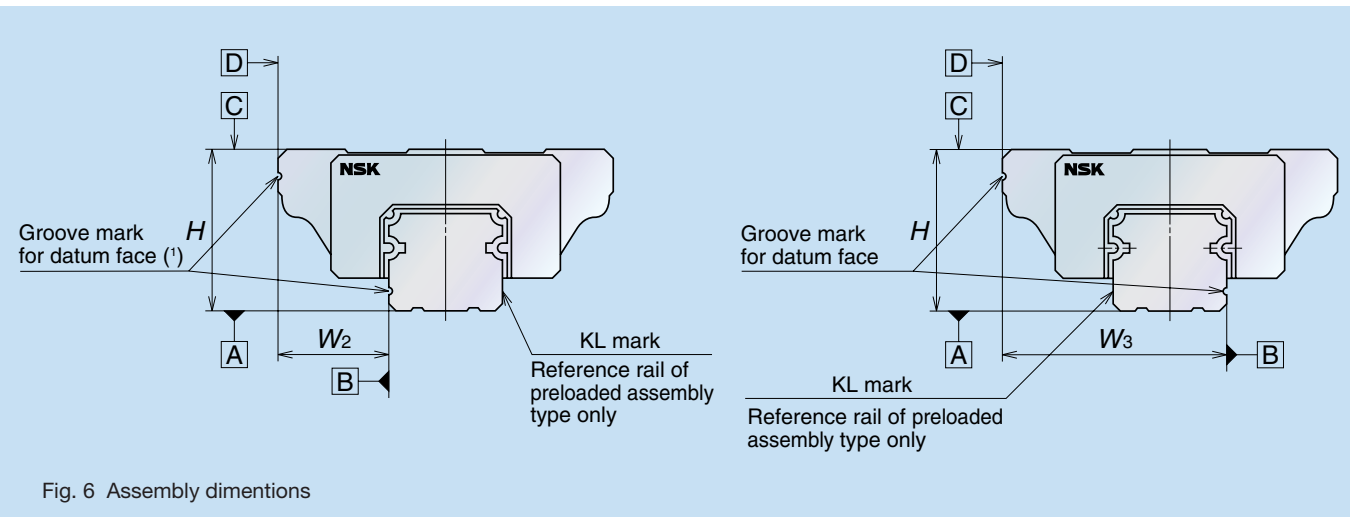


Fig. 6 Assembly dimensions

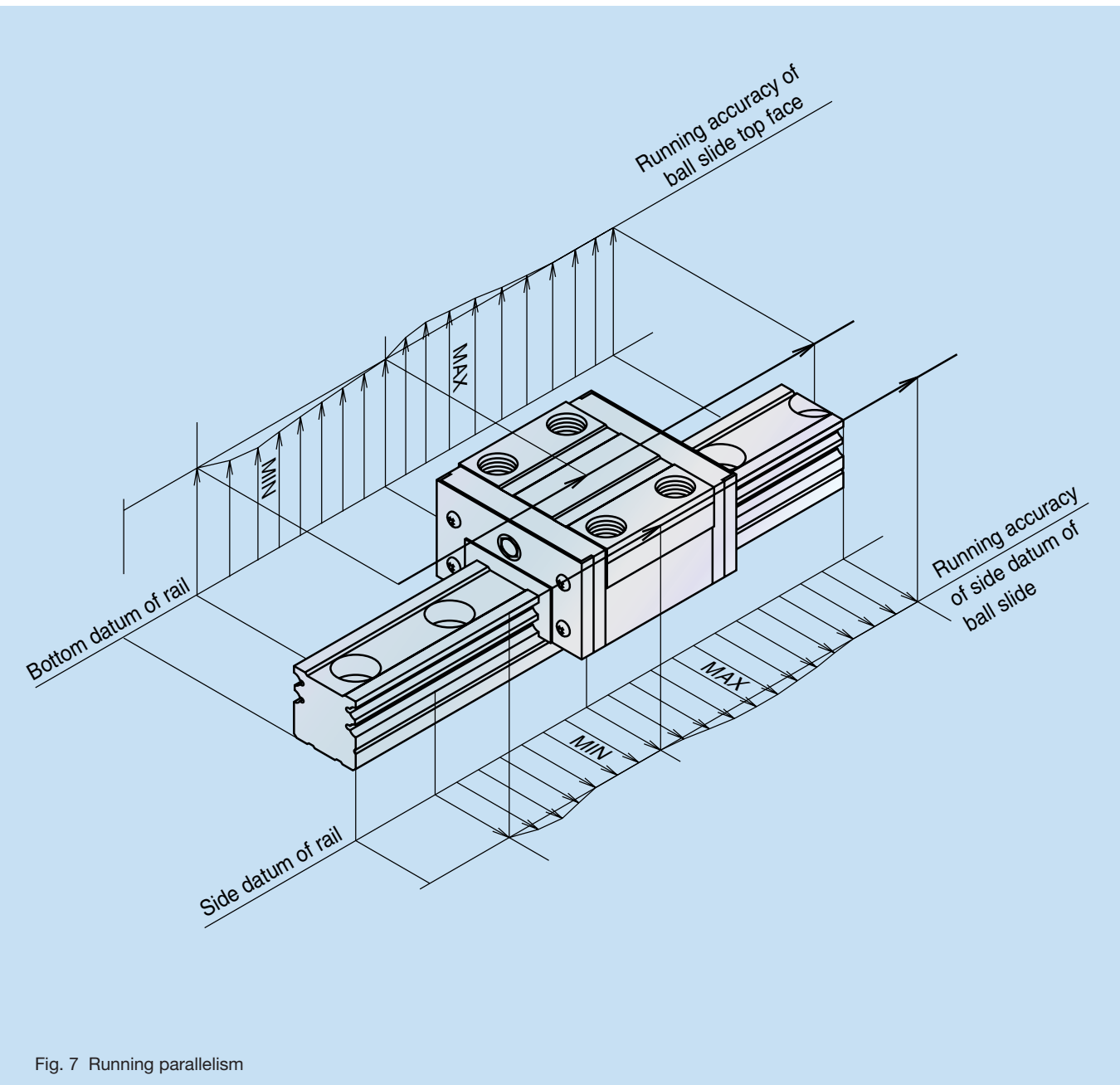


Fig. 7 Running parallelism

2. Preload and rigidity

We offer three levels of preload: Medium preload (Z3), Slight preload (Z1) and Fine clearance (Z0), along with interchangeable types of Fine clearance

(ZZ). Values for preload and rigidity of the SH and SS Series are shown in Tables 4 and 5.

Table 4 Preload and rigidity of the SH Series

Model	Preload (N)		Rigidity (N/μm)				
	Slight preload (Z1)	Medium preload (Z3)	Vertical direction		Lateral direction		
			Slight preload (Z1)	Medium preload (Z3)	Slight preload (Z1)	Medium preload (Z3)	
High load capacity type	SH15 AN, EL, FL, EM	78	441	127	215	88	166
	SH20 AN, EL, FL, EM	147	784	157	274	127	225
	SH25 AN, AL, EL, FL, EM	196	1 180	186	343	137	255
	SH30 AN, AL	245	1 470	196	363	137	265
	SH30 EL, FL, EM	294	1 670	245	441	176	323
	SH35 AN, AL, EL, FL, EM	390	2 160	294	529	205	382
	SH45 AN, EL, FL, EM	635	3 700	397	727	283	529
Ultra high load capacity type	SH55 AN, EL, FL, EM	930	5 600	482	891	336	635
	SH15 BN, GL, HL, GM	98	637	186	333	137	264
	SH20 BN, GL, HL, GM	196	1 080	235	421	186	343
	SH25 BN, BL, GL, HL, GM	245	1 570	284	529	196	382
	SH30 BN, BL, GL, HL, GM	343	2 160	333	627	235	451
	SH35 BN, BL, GL, HL, GM	490	2 840	411	755	284	529
	SH45 BN, GL, HL, GM	785	4 600	515	944	367	686
SH55 BN, GL, HL, GM	1 180	6 750	631	1 148	440	817	

Note: Because the clearance value for Fine clearance (Z0) is 0–3μm, the preload value is zero.

Table 5 Preload and rigidity of the SS Series

Model	Preload (N)		Rigidity (N/μm)				
	Slight preload (Z1)	Medium preload (Z3)	Vertical direction		Lateral direction		
			Slight preload (Z1)	Medium preload (Z3)	Slight preload (Z1)	Medium preload (Z3)	
High load capacity type	SS15 AL, EL, FL, EM	69	392	118	216	88	157
	SS20 AL, EL, FL, EM	88	490	147	255	108	186
	SS25 AL, EL, FL, EM	147	833	196	353	137	255
	SS30 AL, EL, FL, EM	245	1 370	245	441	176	323
	SS35 AL, EL, FL, EM	294	1 860	284	539	205	392
Medium load capacity type	SS15 CL, JL, KL, JM	39	245	69	127	49	88
	SS20 CL, JL, KL, JM	59	343	88	157	59	118
	SS25 CL, JL, KL, JM	98	588	108	206	78	147
	SS30 CL, JL, KL, JM	147	882	127	235	98	176
	SS35 CL, JL, KL, JM	196	1 180	166	304	117	225

Note: Because the clearance value for Fine clearance (Z0) is 0–3μm, the preload value is zero.

Preload value of SH and SH Series interchangeable types are shown in Table 6.

Table 6 Preload and rigidity of the interchangeable types

Model	Slight preload ZZ	Model	Slight preload ZZ
SH15	-4-0	SS15	-4-0
SH20	-5-0	SS20	-4-0
SH25	-5-0	SS25	-5-0
SH30	-7-0	SS30	-5-0
SH35	-7-0	SS35	-8-0
SH45	-7-0		
SH55	-8-0		

unit: μm

Negative values indicate preload volume (elastic deformation of balls).

3. Reference number

This number comprises codes and numbers which indicate key specifications, and is generated when the customer and NSK have defined specifications.

Example: SH 30 1000 AN C 2 - ** PC Z - II

Series name
Size
Rail length (mm)
Ball slide shape/height
Material/surface treatment
C: Special high carbon steel (NSK standard)
K: Stainless steel
D: Special high carbon steel + Surface treatment
H: Stainless steel + Surface treatment

*-II: Use two rails as a set
Default: One rail use

Preload
Accuracy grade
*Design serial number
Number of ball slides per rail

*Please note that we assign the design number, and omit the last code (II) that indicates a use of two rails as a set to finalize the reference number as product identification.

3.1 Combination of accuracy and preload

		Accuracy grade				
		Ultra super precision	Super precision	Precision	High	Normal interchangeable type
Without NSK K1 lubrication unit		P3	P4	P5	P6	PC
With NSK K1 lubrication unit		K3	K4	K5	K6	KC
Preload	Fine clearance Z0	○	○	○	○	—
	Slight preload Z1	○	○	○	○	—
	Medium preload Z3	○	○	○	○	—
	Interchangeable preload ZZ	—	—	—	—	○

○: Available

3.2 Material/surface treatment code

Code	Description
C	Special high carbon steel (NSK standard)
K	Stainless steel
D	Special high carbon steel with surface treatment
H	Stainless steel with surface treatment

3.3 Reference number for rail of interchangeable types

For regular rails (non-jointed rail)

Example: L1 S 15 1000 L C N T** PC Z

Interchangeable rail code
Series name
Size
Rail length (mm)
Shape code
(L: Standard, LS15 mounting hole for M3 specification, T: LS15 mounting hole for M4 specification)
Material/surface treatment code (See Table 3.2)

Preload code
(Z: Slight preload)
Accuracy code: PC
(PC grade is only available)
Design serial number
(T: Domestic standard, K: Domestic semi-standard, B: International user standard)
*Butting rail specification
(N: Non-butting, L: Butting specification)

*Please consult with NSK for butting rail specification.

3.4 Reference number for ball slide of interchangeable types

Example: S A H 30 AN S Z

Interchangeable ball slide
Series name
Size

Preload Z: Slight preload
S: Stainless steel
No code: Special high carbon steel (NSK standard)
Ball slide shape/height

4. Application examples

- Applications that require lower noise levels and a lower level of vibration
Instruments, printers, medical equipment, office machines, etc.
- Applications that require smoother motion
Electric wire cutting discharge machines, scanners and pattern generators and steppers.

Handling Precautions

1. **Temperature range** Maximum operating temperature: 50°C
Maximum momentary temperature: 80°C
2. **Usage conditions** We recommend using “NSK S1™ Series” products in a clean environment in order to utilize their full range of capabilities.
3. **Handling of interchangeable types**
 - ① Interchangeable ball slide will be delivered with a provisional rail (inserting fixture).
 - ② Do not remove the ball slide from provisional rail until inserting into a rail.
 - ③ Be sure to use the provisional rail when removing ball slide(s) from a rail.

Dimensions of SH Series

SH-AN (High load type) / SH-BN (Super high load type)

Reference number

Example: **SH 35 0840 AN C 2 - ** PN 0 - II**

Series name: SH
 Size: 35
 Rail length (mm): 0840
 Ball slide shape/height: AN
 Material/surface treatment: C
 Number of ball slides per rail: 2
 Accuracy code: **
 Design serial number: PN
 Preload code: 0
 II: Use two rails as a set (Default: One rail use)

*Please note that we assign the design number, and omit the last code (II) that indicates a use of two rails as a set to finalize the reference number as product identification.

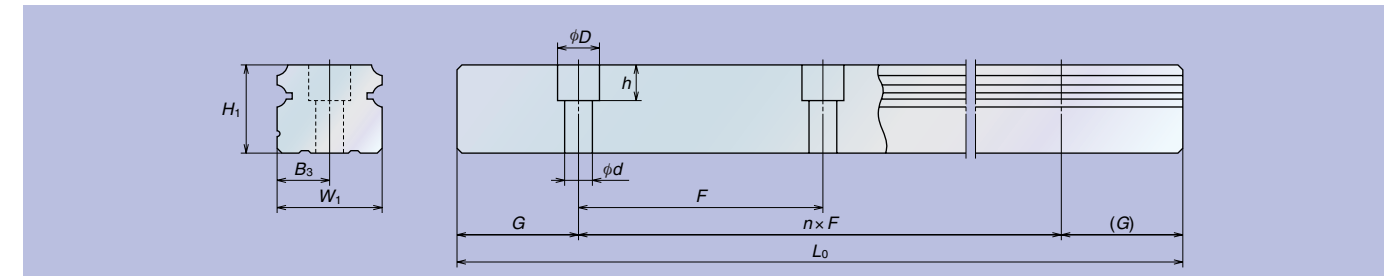
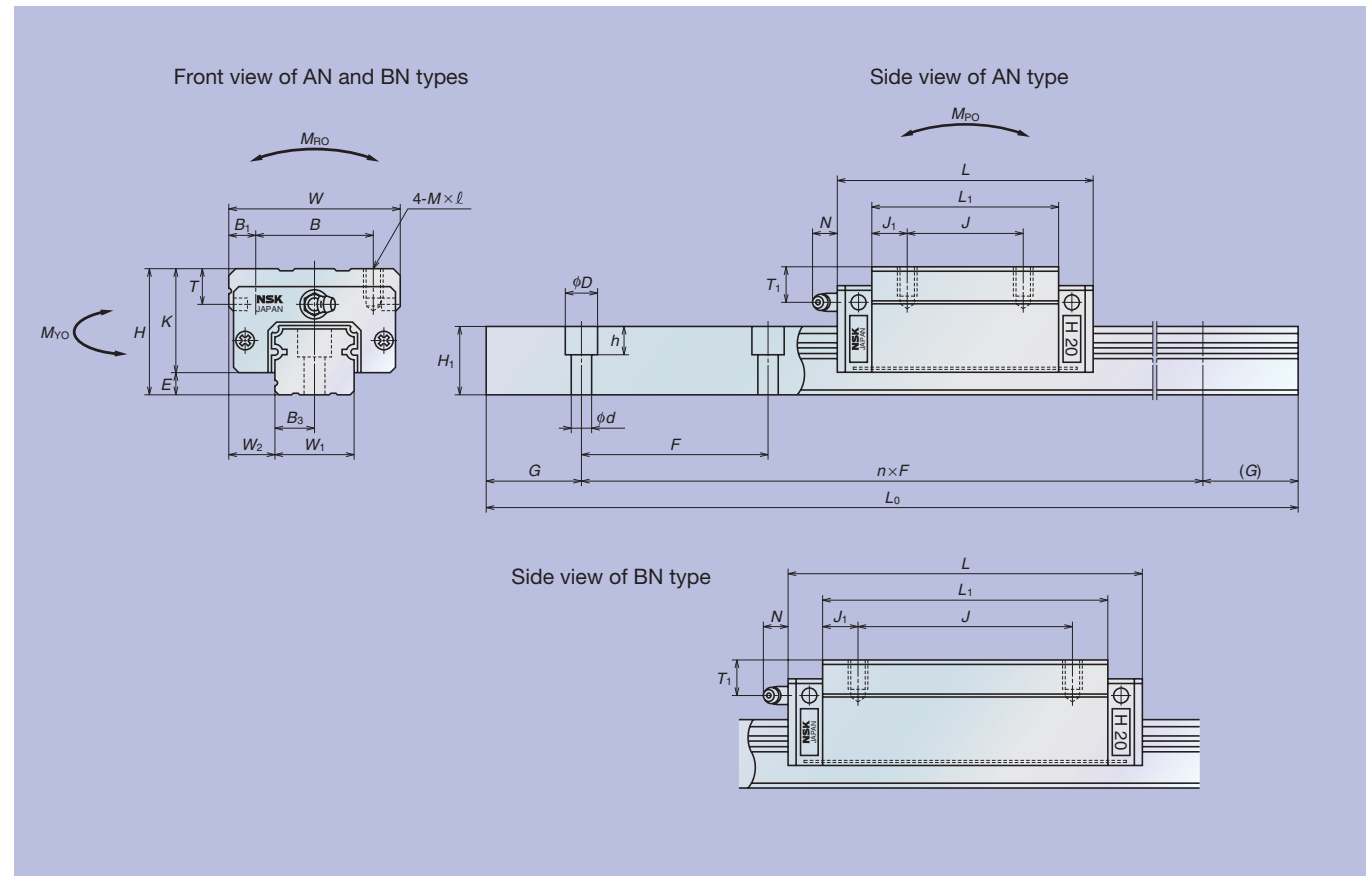
Reference number for rail of interchangeable types

For regular rails (non-jointed rail)

Example: **L1 H 30 1200 L C N T** PC Z**

Interchangeable rail code: L1
 Series name: H
 Size: 30
 Rail length (mm): 1200
 Shape code: L
 Material/surface treatment code: C
 Butting rail specification: N
 Design serial number: T**
 Accuracy code: PC
 Preload code: Z

*Please consult with NSK for butting rail specification.

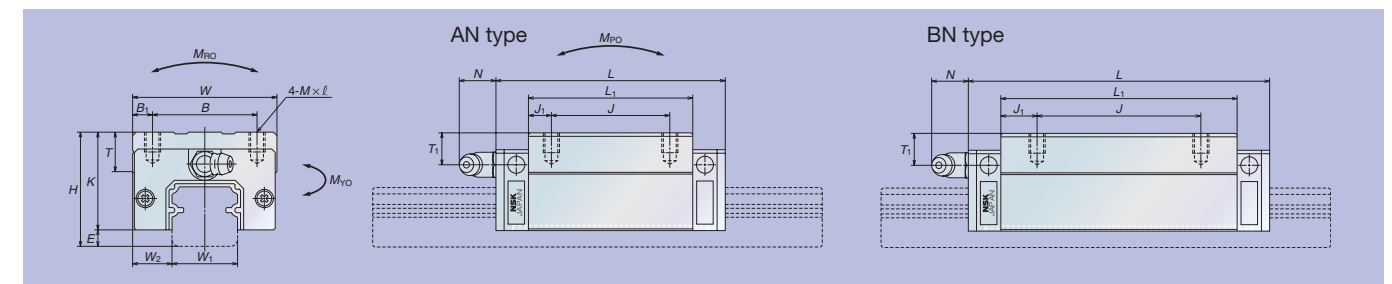


Reference number for ball slide of interchangeable types

Example: **S A H 30 AN S Z**

Interchangeable ball slide: SAH
 Series name: 30
 Size: AN
 Preload: S
 Ball slide shape/height: Z

Preload Z: Slight preload
 S: Stainless steel
 No code: Special high carbon steel (NSK standard)



Model No.	Assembly			Ball slide											Rail						Basic load rating					Ball diameter D _w	Weight					
	Height H	E	W ₂	Width W	Length L	Mounting hole					B ₁	L ₁	J ₁	K	T	Grease fitting			Width W ₁	Height H ₁	Pitch F	Mounting bolt hole d × D × h	B ₃	G (recommended)	Max. length L _{omax} () for stainless		Dynamic C (N)	Static C ₀ (N)	Static moment			Ball slide (kg)
						B	J	M × pitch × l	Hole size	T ₁						N	M _{RO} (N·m)	M _{PO} (N·m)								M _{YO} (N·m)						
SH15AN SAH15AN SH15BN SAH15BN	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	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	
SH20AN SAH20AN SH20BN SAH20BN	30	5	12	44	69.8 91.8	32	36	M5×0.8×6	6	50 72	7 11	25	12	M6×0.75	5	11	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	
SH25AN SAH25AN SH25BN SAH25BN	40	7	12.5	48	79 107	35	35	M6×1×9	6.5	58 86	11.5 18	33	12	M6×0.75	10	11	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	
SH30AN SAH30AN SH30BN SAH30BN	45	9	16	60	85.6 124.6	40	40	M8×1.25×10	10	59 98	9.5 19	36	14	M6×0.75	10	11	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	
SH35AN SAH35AN SH35BN SAH35BN	55	9.5	18	70	109 143	50	50	M8×1.25×12	10	80 114	15 21	45.5	15	M6×0.75	15	11	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	
SH45AN SAH45AN SH45BN SAH45BN	70	14	20.5	86	139 171	60	60	M10×1.5×17	13	105 137	22.5 28.5	56	17	Rc1/8	20	13	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	
SH55AN SAH55AN SH55BN SAH55BN	80	15	23.5	100	163 201	75	75	M12×1.75×18	12.5	126 164	25.5 34.5	65	18	Rc1/8	21	13	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	

The basic dynamic load rating is a load that furnishes 50 km rating fatigue life; it is a vertical and constant load to the ball slide mounting surface. When converting the basic dynamic load rating C to the dynamic load rating C₁₀₀ for 100 km rating fatigue life, divide the C by 1.26

SH-AL (High load type) / SH-BL (Super high load type)

Reference number

Example: **SH 35 0840 AL C 2 - ** PN 0 - II**

Series name: SH
 Size: 35
 Rail length (mm): 0840
 Ball slide shape/height: AL
 Material/surface treatment: C
 Number of ball slides per rail: 2
 Accuracy code: **
 Design serial number: PN
 Preload code: 0
 Rail use: II

*-II: Use two rails as a set
 Default: One rail use
 Preload code: 0: Z0
 1: Z1
 3: Z3
 (See page 6)
 Accuracy code (See page 4)
 * Design serial number

* Please note that we assign the design number, and omit the last code (II) that indicates a use of two rails as a set to finalize the reference number as product identification.

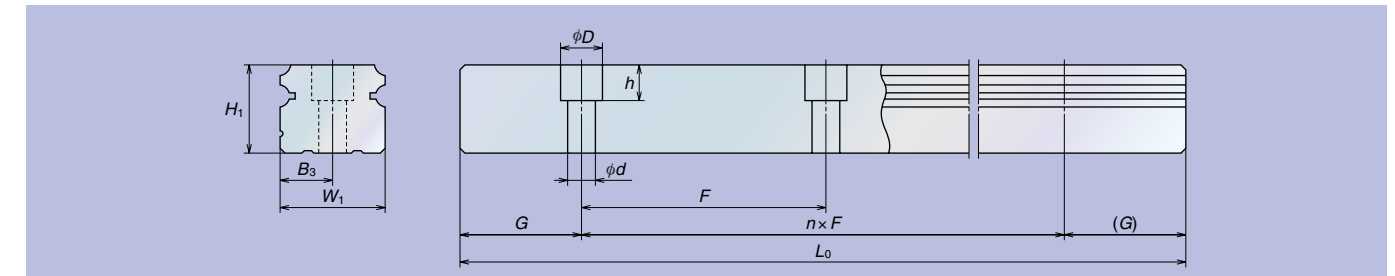
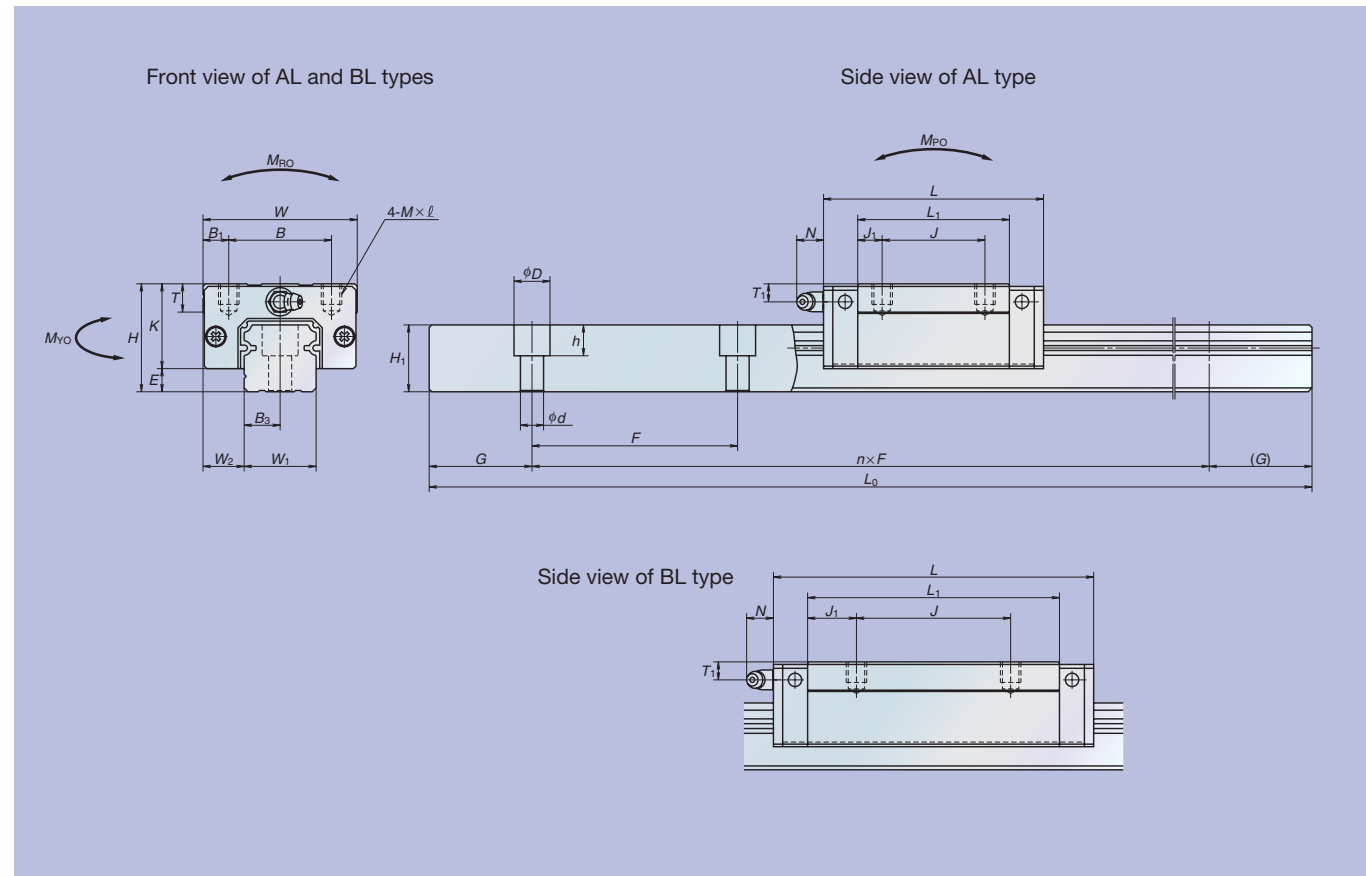
Reference number for rail of interchangeable types

For regular rails (non-jointed rail)

Example: **L1 H 30 1200 L C N T** PC Z**

Interchangeable rail code: L1
 Series name: H
 Size: 30
 Rail length (mm): 1200
 Shape code: L
 Material/surface treatment code: C
 Design serial number: N
 Butting rail specification: T**
 Accuracy code: PC
 Preload code: Z

* Butting rail specification
 (N: Non-butting, L: Butting specification)
 * Please consult with NSK for butting rail specification.

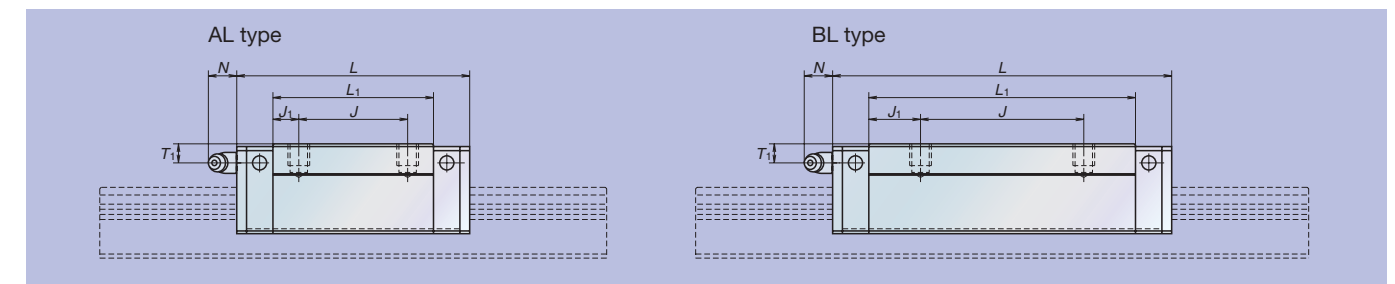


Reference number for ball slide of interchangeable types

Example: **S A H 30 AL S Z**

Interchangeable ball slide: SAH
 Series name: 30
 Size: AL
 Material/surface treatment: S
 Preload: Z

S: Stainless steel
 No code: Special high carbon steel (NSK standard)
 Ball slide shape/height: Z



Model No.	Assembly			Ball slide										Rail							Basic load rating					Ball diameter D _w	Weight				
	Height H	E	W ₂	Width W	Length L	Mounting hole				B ₁	L ₁	J ₁	K	T	Grease fitting			Width W ₁	Height H ₁	Pitch F	Mounting bolt hole d x D x h	B ₃	G (recommended)	Max. length L _{omax} () for stainless	Dynamic C (N)		Static C ₀ (N)	Static moment			Ball slide (kg)
						B	J	M x pitch x l	Hole size						T ₁	N	M _{RO} (N·m)									M _{PO} (N·m)		M _{YO} (N·m)			
SH25AL SAH25AL	36	7	12.5	48	79	35	35	M6 x 1 x 6	6.5	58	11.5	29	12	M6 x 0.75	6	11	23	22	60	7 x 11 x 9	11.5	20	3 960 (3 500)	22 400	37 500	295	246	207	4.762	0.55	3.6
SH25BL SAH25BL					107	50				86	18												32 000	62 500	490	615	515	0.82			
SH30AL SAH30AL	42	9	16	60	85.6	40	40	M8 x 1.25 x 8	10	59	9.5	33	14	M6 x 0.75	7	11	28	26	80	9 x 14 x 12	14	20	4 000 (3 500)	31 000	51 500	490	365	305	5.556	0.77	5.2
SH30BL SAH30BL					124.6	60				98	19												46 000	91 500	870	1 060	885	1.3			
SH35AL SAH35AL	48	9.5	18	70	109	50	50	M8 x 1.25 x 8	10	80	15	38.5	15	M6 x 0.75	8	11	34	29	80	9 x 14 x 12	17	20	4 000	47 500	80 500	950	780	655	6.35	1.5	7.2
SH35BL SAH35BL					143	72				114	21												61 500	117 000	1 380	1 600	1 340	2.1			

The basic dynamic load rating is a load that furnishes 50 km rating fatigue life; it is a vertical and constant load to the ball slide mounting surface. When converting the basic dynamic load rating C to the dynamic load rating C₁₀₀ for 100 km rating fatigue life, divide the C by 1.26

SH-EL (High load type) / SH-GL (Super high load type)

Reference number

Example: **SH 35 0840 EL C 2 - ** PN 0 - II**

Series name: SH
 Size: 35
 Rail length (mm): 0840
 Ball slide shape/height: EL
 Material/surface treatment: C
 Number of ball slides per rail: 2

*-II: Use two rails as a set
 Default: One rail use

Preload code: 0: Z0
 1: Z1
 3: Z3
 (See page 6)

Accuracy code (See page 4): **

* Design serial number: PN 0

* Please note that we assign the design number, and omit the last code (II) that indicates a use of two rails as a set to finalize the reference number as product identification.

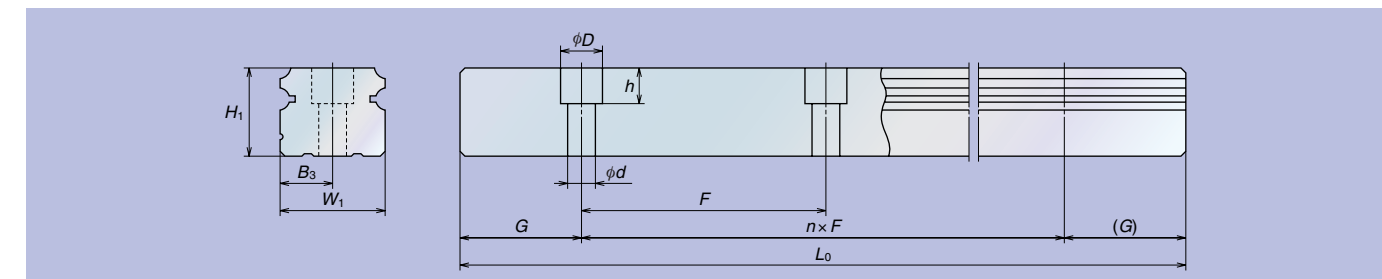
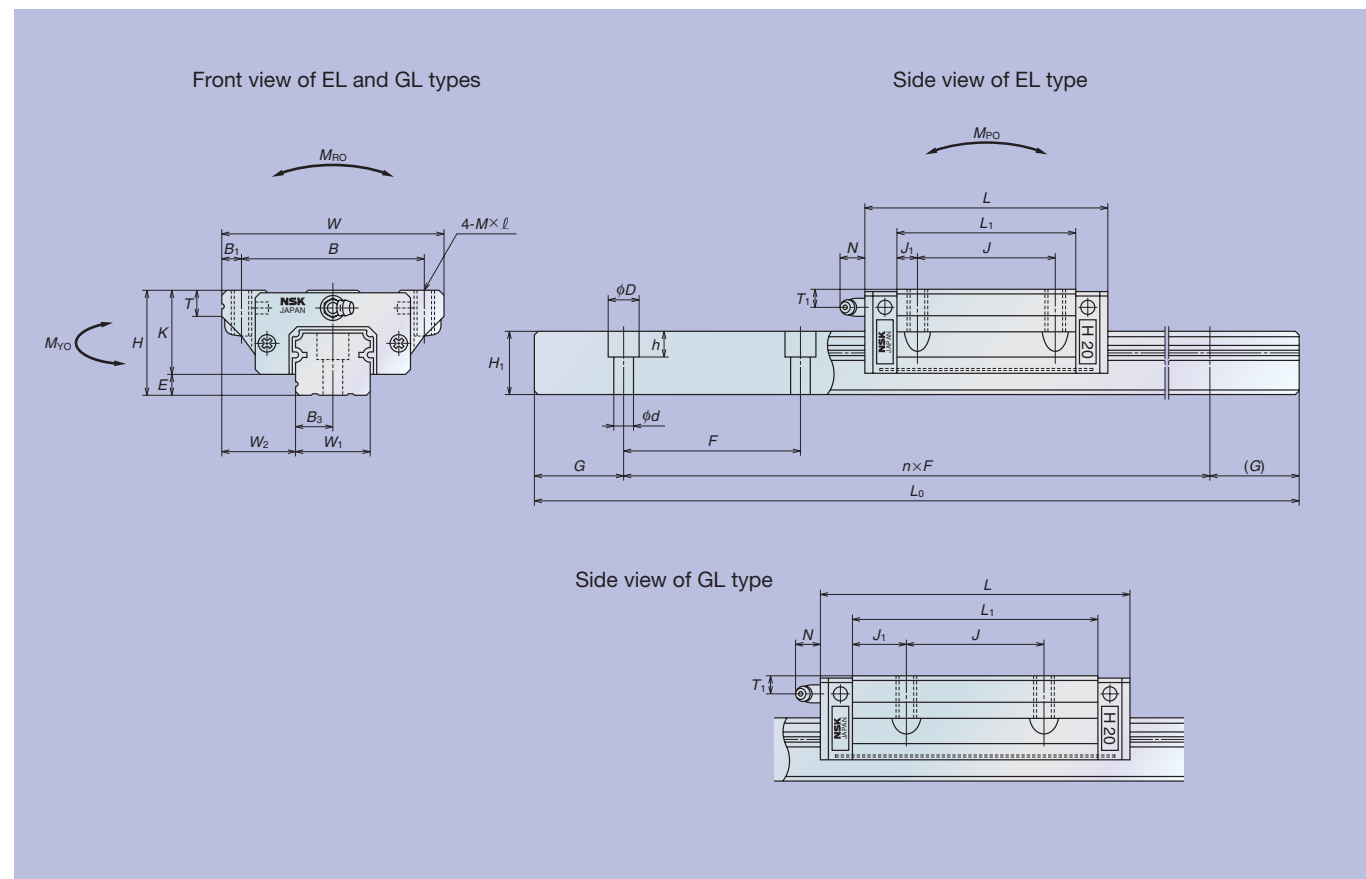
Reference number for rail of interchangeable types

For regular rails (non-jointed rail)

Example: **L1 H 30 1200 L C N T** PC Z**

Interchangeable rail code: L1
 Series name: H
 Size: 30
 Rail length (mm): 1200
 Shape code (L: Standard): L
 Material/surface treatment code (See Table 3.2): C
 *Butting rail specification (N: Non-butting, L: Butting specification): N
 Preload code (Z: Slight preload): Z
 Accuracy code: PC
 Design serial number (T: Domestic standard, K: Domestic semi-standard, B: International user standard): T**

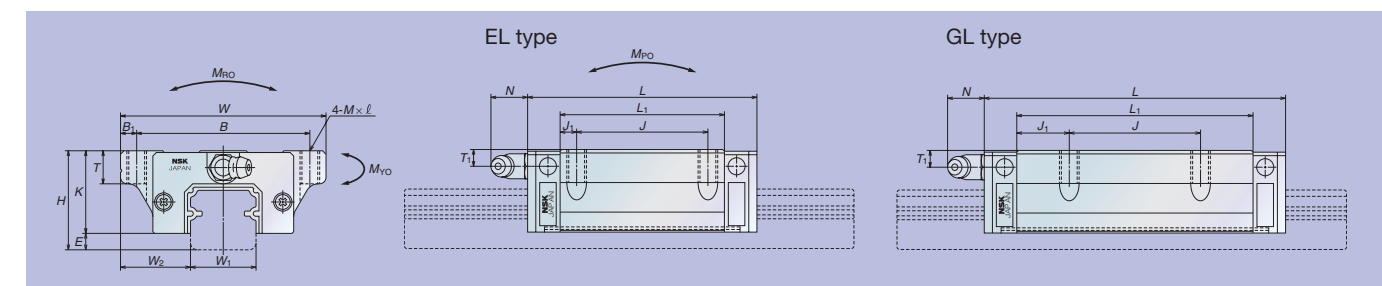
* Please consult with NSK for butting rail specification.



Reference number for ball slide of interchangeable types

Example: **S A H 30 EL S Z**

Interchangeable ball slide: SAH
 Series name: 30
 Size: EL
 Preload Z: Slight preload
 S: Stainless steel
 No code: Special high carbon steel (NSK standard)
 Ball slide shape/height: S Z



Model No.	Assembly			Ball slide											Rail					Basic load rating					Ball diameter D _w	Weight					
	Height H	E	W ₂	Width W	Length L	Mounting hole					Grease fitting			Width W ₁	Height H ₁	Pitch F	Mounting bolt hole d x D x h	B ₃	G (recommended)	Max. length L _{omax} () for stainless	Dynamic C (N)	Static C ₀ (N)	Static moment			Ball slide (kg)	Rail (kg/m)				
						B	J	M x pitch x l	B ₁	L ₁	J ₁	K	T										Hole size	T ₁				N	M _{Ro} (N·m)	M _{PO} (N·m)	M _{YO} (N·m)
SH15EL SAH15EL SH15GL SAH15GL	24	4.6	16	47	55 74	38	30	M5×0.8×8	4.5	39 58	4.5 14	19.4	8	∅3	4.5	3.3	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
SH20EL SAH20EL SH20GL SAH20GL	30	5	21.5	63	69.8 91.8	53	40	M6×1×10	5	50 72	5 16	25	10	M6×0.75	5	11	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
SH25EL SAH25EL SH25GL SAH25GL	36	7	23.5	70	79 107	57	45	M8×1.25×16 (M8×1.25×12)	6.5	58 86	6.5 20.5	29	11 (12)	M6×0.75	6	11	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
SH30EL SAH30EL SH30GL SAH30GL	42	9	31	90	98.6 124.6	72	52	M10×1.5×18 (M10×1.5×15)	9	72 98	10 23	33	11 (15)	M6×0.75	7	11	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
SH35EL SAH35EL SH35GL SAH35GL	48	9.5	33	100	109 143	82	62	M10×1.5×20	9	80 114	9 26	38.5	12	M6×0.75	8	11	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
SH45EL SAH45EL SH45GL SAH45GL	60	14	37.5	120	139 171	100	80	M12×1.75×24	10	105 137	12.5 28.5	46	13	Rc1/8	10	13	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
SH55EL SAH55EL SH55GL SAH55GL	70	15	43.5	140	163 201	116	95	M14×2×28	12	126 164	15.5 34.5	55	15	Rc1/8	11	13	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

Dimensions in () are applicable to stainless steel products.

The basic dynamic load rating is a load that furnishes 50 km rating fatigue life; it is a vertical and constant load to the ball slide mounting surface. When converting the basic dynamic load rating C to the dynamic load rating C₁₀₀ for 100 km rating fatigue life, divide the C by 1.26

Dimensions of SH Series

SH-FL, SH-EM (High load type) / SH-HL, SH-GM (Super high load type)

Reference number

Example: **SH 35 0840 FL C 2 - ** PN 0 - II**

Series name: SH
 Size: 35
 Rail length (mm): 0840
 Ball slide shape/height: FL
 Material/surface treatment: C
 Number of ball slides per rail: 2
 Accuracy code: **
 Design serial number: PN
 Preload code: 0
 Material/surface treatment code: II

* -II: Use two rails as a set
 Default: One rail use

Preload code: 0: Z0
 1: Z1
 3: Z3
 (See page 6)

Accuracy code (See page 4)

* Design serial number

* Please note that we assign the design number, and omit the last code (II) that indicates a use of two rails as a set to finalize the reference number as product identification.

Reference number for rail of interchangeable types

For regular rails (non-jointed rail)

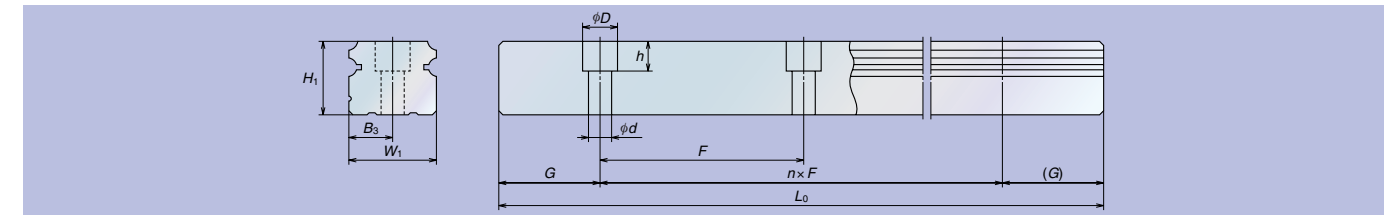
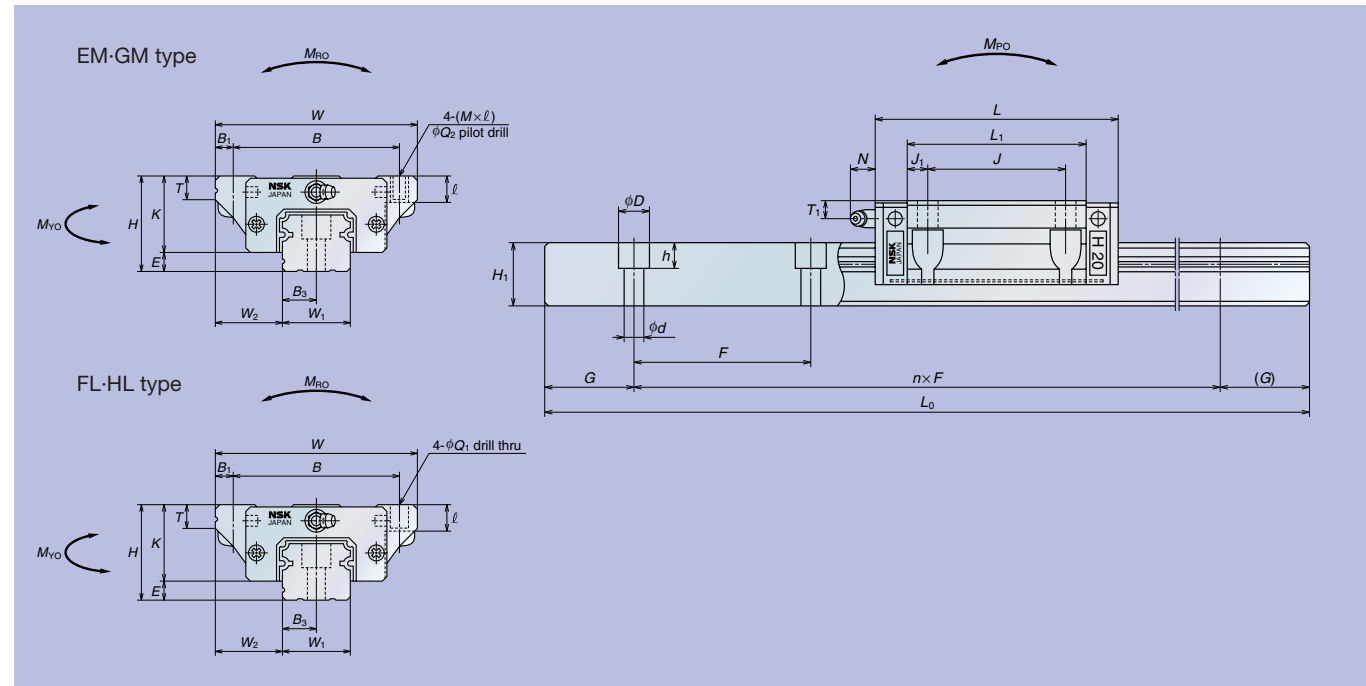
Example: **L1 H 30 1200 L C N T ** PC Z**

Interchangeable rail code: L1
 Series name: H
 Size: 30
 Rail length (mm): 1200
 Shape code: L
 Material/surface treatment code: C
 Design serial number: N
 Accuracy code: T
 Preload code: **
 Material/surface treatment code: PC
 Preload code: Z

Preload code (Z: Slight preload)
 Accuracy code: PC (PC grade is only available)
 Design serial number (T: Domestic standard, K: Domestic semi-standard, B: International user standard)

* Butting rail specification (N: Non-butting, L: Butting specification)

* Please consult with NSK for butting rail specification.

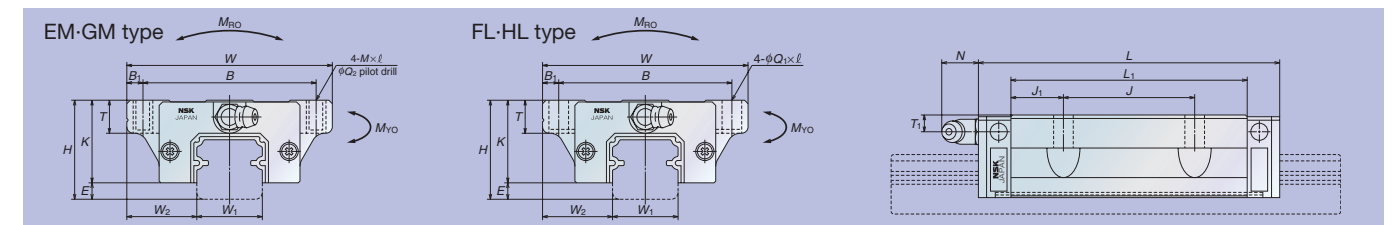


Reference number for ball slide of interchangeable types

Example: **S A H 30 FL S Z**

Interchangeable ball slide: SAH
 Series name: 30
 Size: FL
 Preload code: S
 Ball slide shape/height: Z

Preload Z: Slight preload
 S: Stainless steel
 No code: Special high carbon steel (NSK standard)



Model No.	Assembly			Ball slide											Rail					Basic load rating					Ball diameter D_w	Weight						
	Height H	E	W_2	Width W	Length L	Mounting hole				B_1	L_1	J_1	K	T	Grease fitting			Width W_1	Height H_1	Pitch F	Mounting bolt hole $d \times D \times h$	B_3	G (recommended)	Max. length L_{omax} () for stainless		Dynamic C (N)	Static C_0 (N)	Static moment			Ball slide (kg)	Rail (kg/m)
						B	J	$Q_1 \times \ell$ $M \times \text{pitch} \times \ell$	Q_2						Hole size	T_1	N								M_{RO} (N·m)			M_{PO} (N·m)	M_{YO} (N·m)			
SH15FL SAH15FL SH15EM SAH15EM SH15HL SAH15HL SH15GM SAH15GM	24	4.6	16	47	55 74	38	30	4.5×7 M5×0.8×7 4.5×7 M5×0.8×7	— 4.4 — 4.4	4.5	39 14	4.5	19.4	8	$\phi 3$	4.5	3.3	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
SH20FL SAH20FL SH20EM SAH20EM SH20HL SAH20HL SH20GM SAH20GM	30	5	21.5	63	69.8 91.8	53	40	6×9.5 M6×1.0×9.5 6×9.5 M6×1.0×9.5	— 5.3 — 5.3	5	50 16	5	25	10	M6×0.75	5	11	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
SH25FL SAH25FL SH25EM SAH25EM SH25HL SAH25HL SH25GM SAH25GM	36	7	23.5	70	79 107	57	45	7×10 (7×11.5) M8×1.25×10 (M8×1.2×11.5) 7×10 (7×11.5) M8×1.25×10 (M8×1.2×11.5)	— 6.8 — 6.8	6.5	58 20.5	6.5	29 11 (12)	11	M6×0.75	6	11	23	22	60	7×11×9	11.5	20	3 960 (3 500)	22 400 32 000	37 500 65 500	295 490	246 615	207 515	4.762	0.63 0.93	3.6
SH30FL SAH30FL SH30EM SAH30EM SH30HL SAH30HL SH30GM SAH30GM	42	9	31	90	98.6 124.6	72	52	9×12 (9×14.5) M10×1.5×12 (M10×1.5×14.5) 9×12 (9×14.5) M10×1.5×12 (M10×1.5×14.5)	— 8.6 — 8.6	9	72 23	9	33 11 (15)	15	M6×0.75	7	11	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
SH35FL SAH35FL SH35EM SAH35EM SH35HL SAH35HL SH35GM SAH35GM	48	9.5	33	100	109 143	82	62	9×13 M10×1.5×13 9×13 M10×1.5×13	— 8.6 — 8.6	9	80 26	9	38.5 12	12	M6×0.75	8	11	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
SH45FL SAH45FL SH45EM SAH45EM SH45HL SAH45HL SH45GM SAH45GM	60	14	37.5	120	139 171	100	80	11×15 M12×1.75×15 11×15 M12×1.75×15	— 10.5 — 10.5	10	105 28.5	10	46 13	13	Rc1/8	10	13	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 3.9	12.3
SH55FL SAH55FL SH55EM SAH55EM SH55HL SAH55HL SH55GM SAH55GM	70	15	43.5	140	163 201	116	95	14×18 M14×2.0×18 14×18 M14×2.0×18	— 12.5 — 12.5	12	126 34.5	12	55 15	15	Rc1/8	11	13	53	44	120	16×23×20	26.5	30	3 990	113 000 140 000	181 000 247 000	3 000 4 550	2 640 4 800	2 210 4 050	9.525	5 6.5	16.9

Dimensions in () are applicable to stainless steel products.

The basic dynamic load rating is a load that furnishes 50 km rating fatigue life; it is a vertical and constant load to the ball slide mounting surface. When converting the basic dynamic load rating C to the dynamic load rating C_{100} for 100 km rating fatigue life, divide the C by 1.26

SS-AL (High load type) / SS-CL (medium load type)

Reference number

Example: **SS 35 0840 AL C 2 - ** PN 0 - II**

Series name: SS
 Size: 35
 Rail length (mm): 0840
 Ball slide shape/height: AL
 Material/surface treatment: C
 Number of ball slides per rail: 2

*-II: Use two rails as a set
 Default: One rail use
 Preload code: 0: Z0
 1: Z1
 3: Z3
 (See page 6)
 Accuracy code (See page 4)
 * Design serial number

* Please note that we assign the design number, and omit the last code (II) that indicates a use of two rails as a set to finalize the reference number as product identification.

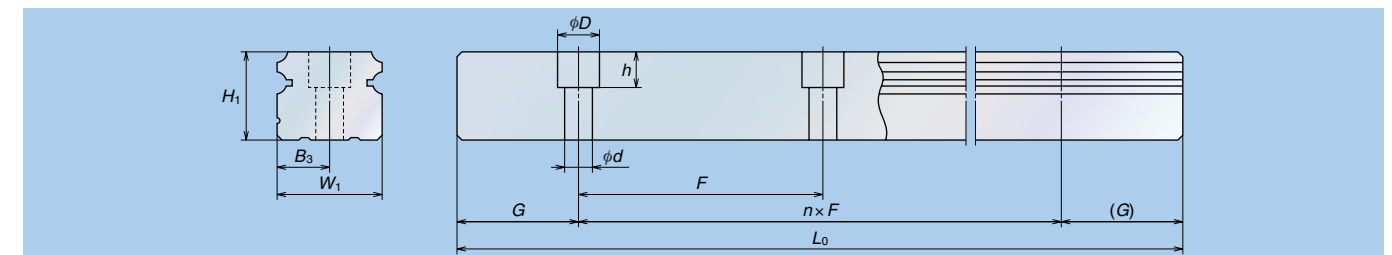
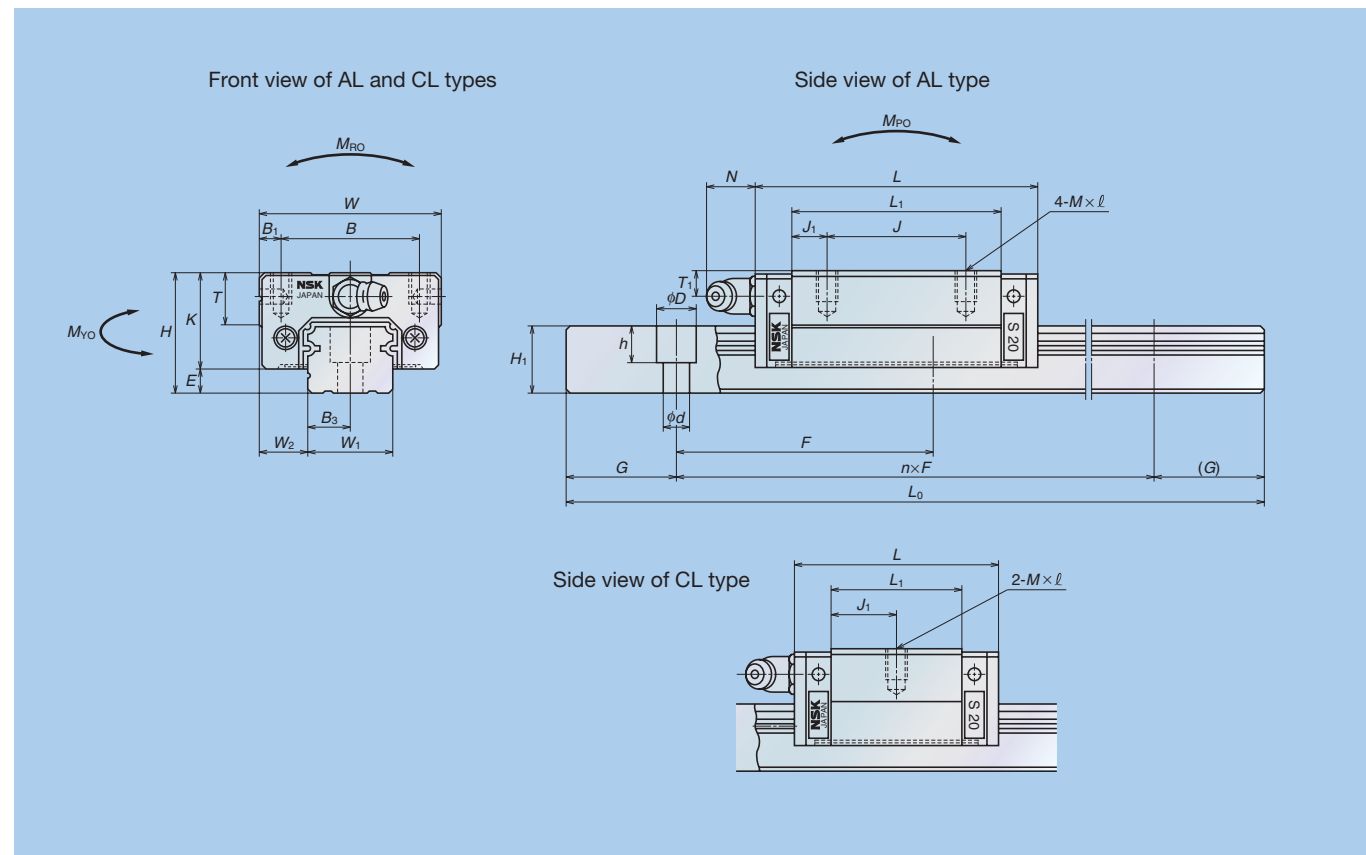
Reference number for rail of interchangeable types

For regular rails (non-jointed rail)

Example: **L1 S 15 1000 L C N T** PC Z**

Interchangeable rail code: L1
 Series name: S
 Size: 15
 Rail length (mm): 1000
 Shape code: L
 Material/surface treatment code (See Table 3.2): C
 Design serial number: N
 Butting rail specification: T**
 Accuracy code: PC
 Preload code: Z

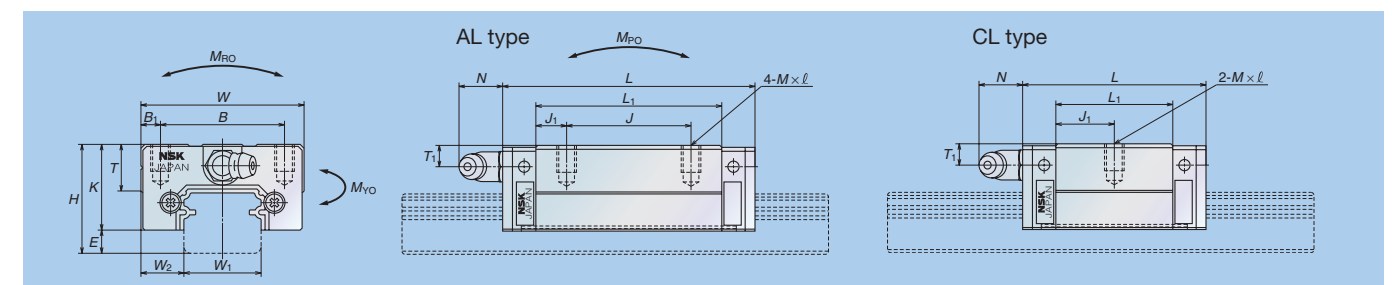
(Z: Slight preload)
 Accuracy code: PC (PC grade is only available)
 Design serial number (T: Domestic standard, K: Domestic semi-standard, B: International user standard)
 * Butting rail specification (N: Non-butting, L: Butting specification)
 * Please consult with NSK for butting rail specification.



Reference number for ball slide of interchangeable types

Example: **S A S 30 AL S Z**

Interchangeable ball slide: SAS
 Series name: S
 Size: 30
 Ball slide shape/height: AL
 Preload: Z
 S: Stainless steel
 No code: Special high carbon steel (NSK standard)



Model No.	Assembly			Ball slide													Rail					Basic load rating					Ball diameter D _w	Weight			
	Height H	E	W ₂	Width W	Length L	Mounting hole					Grease fitting			Width W ₁	Height H ₁	Pitch F	Mounting bolt hole d x D x h	B ₃	G (recommended)	Max. length L _{omax} () for stainless	Dynamic C (N)	Static C ₀ (N)	Static moment			Ball slide (kg)		Rail (kg/m)			
						B	J	M x pitch x l	B ₁	L ₁	J ₁	K	T										Hole size	T ₁	N				M _{RO} (N·m)	M _{PO} (N·m)	M _{YO} (N·m)
SS15CL SAS15CL	24	4.6	9.5	34	40.4	26	—	M4 x 0.7 x 6	4	23.6	11.8	19.4	10	φ3	6	3	15	12.5	60	3.5 x 6 x 4.5 4.5 x 7.5 x 5.3	7.5	20	2 000 (1 700)	4 900 7 900	7 800 15 600	39 78	21 74	18 62	2.778	0.14 0.2	1.4
SS15AL SAS15AL																															
SS20CL SAS20CL	28	6	11	42	47.2	32	—	M5 x 0.8 x 7	5	30	15	22	12	M6 x 0.75	5.5	11	20	15.5	60	6 x 9.5 x 8.5	10	20	3 960 (3 500)	7 250 11 100	11 800 21 800	80 149	40 124	34 104	3.175	0.19 0.28	2.3
SS20AL SAS20AL																															
SS25CL SAS25CL	33	7	12.5	48	59.6	35	—	M6 x 1 x 9	6.5	38	19	26	12	M6 x 0.75	7	11	23	18	60	7 x 11 x 9	11.5	20	3 960 (3 500)	12 700 17 900	20 800 33 500	164 266	96 242	81 203	3.968	0.34 0.51	3.1
SS25AL SAS25AL																															
SS30CL SAS30CL	42	9	16	60	67.4	40	—	M8 x 1.25 x 12	10	42	21	33	13	M6 x 0.75	8	11	28	23	80	7 x 11 x 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
SS30AL SAS30AL																															
SS35CL SAS35CL	48	10.5	18	70	77	50	—	M8 x 1.25 x 12	10	49	24.5	37.5	14	M6 x 0.75	8.5	11	34	27.5	80	9 x 14 x 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
SS35AL SAS35AL																															

* SS15 mounting bolt hole is applicable to M3 (3.5 x 6 x 4.5) and M4 (4.5 x 7.5 x 5.3).
 The basic dynamic load rating is a load that furnishes 50 km rating fatigue life; it is a vertical and constant load to the ball slide mounting surface.
 When converting the basic dynamic load rating C to the dynamic load rating C₁₀₀ for 100 km rating fatigue life, divide the C by 1.26

SS-EL (High load type) / SS-JL (Medium load type)

Reference number

Example: **SS 35 0840 EL C 2 - ** PN 0 - II**

Series name: SS
 Size: 35
 Rail length (mm): 0840
 Ball slide shape/height: EL
 Material/surface treatment: C
 Number of ball slides per rail: 2

*-II: Use two rails as a set
 Default: One rail use

Preload code: 0: Z0
 1: Z1
 3: Z3
 (See page 6)

Accuracy code (See page 4): **

* Design serial number: PN 0

* Please note that we assign the design number, and omit the last code (II) that indicates a use of two rails as a set to finalize the reference number as product identification.

Reference number for rail of interchangeable types

For regular rails (non-jointed rail)

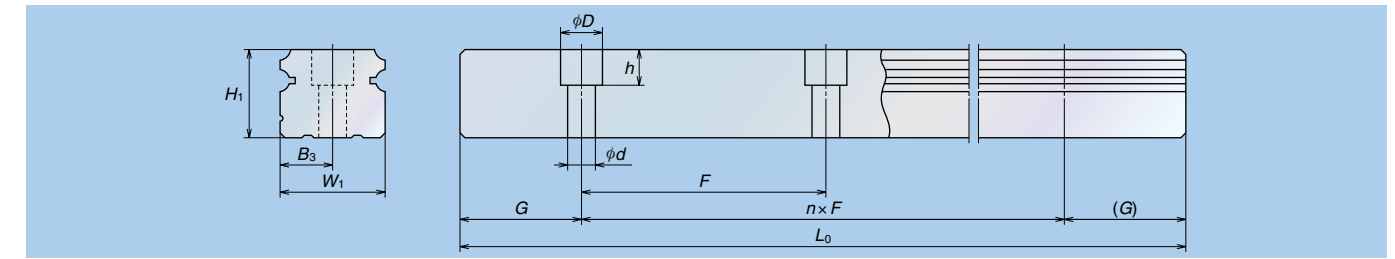
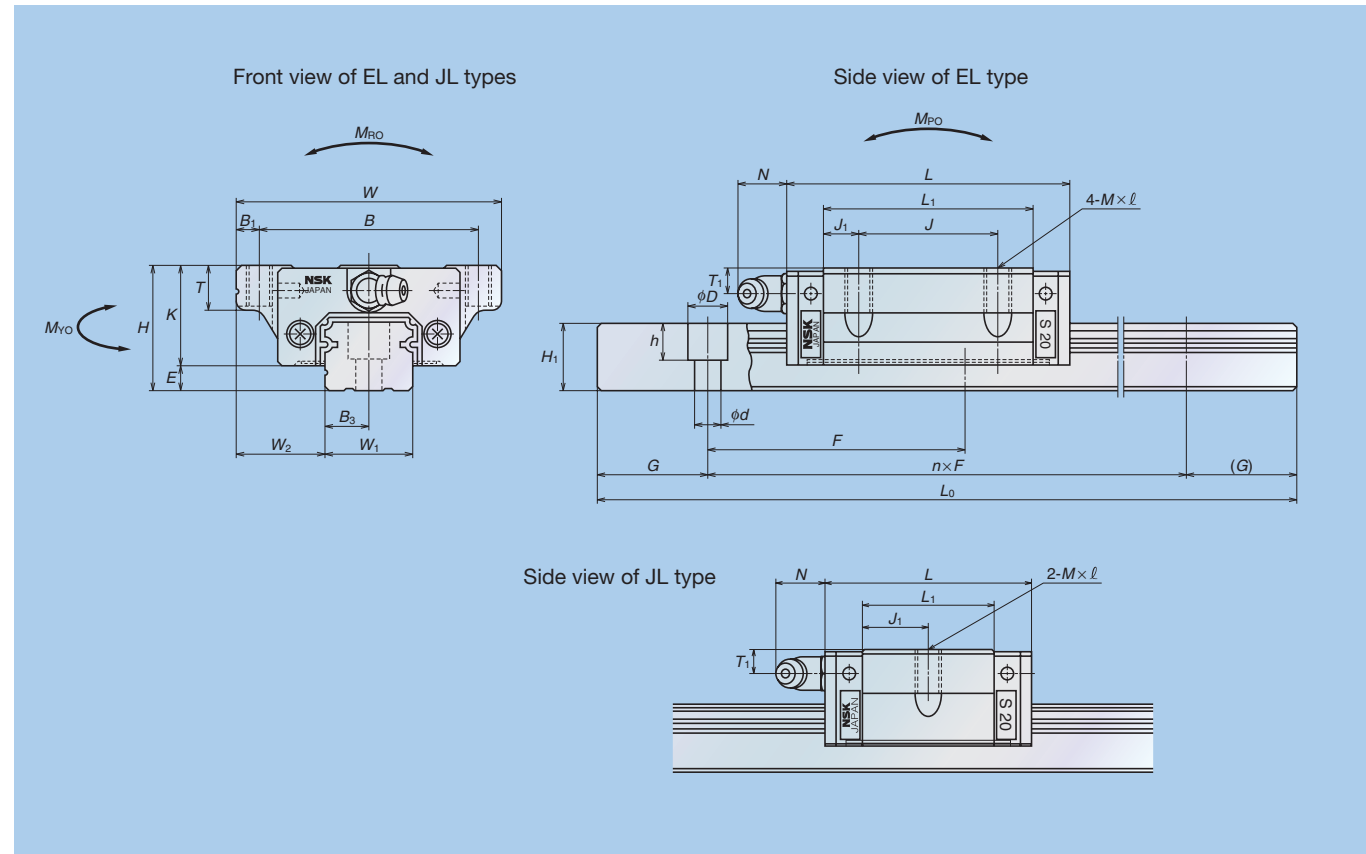
Example: **L1 S 15 1000 L C N T** PC Z**

Interchangeable rail code: L1
 Series name: S
 Size: 15
 Rail length (mm): 1000
 Shape code: L
 Material/surface treatment code (See Table 3.2): C
 Design serial number: N
 Butting rail specification: T**
 Accuracy code: PC
 Preload code: Z

(L: Standard LS15 mounting hole for M3 specification, T: LS15 mounting hole for M4 specification)

(T: Domestic standard, K: Domestic semi-standard, B: International user standard)

* Please consult with NSK for butting rail specification.

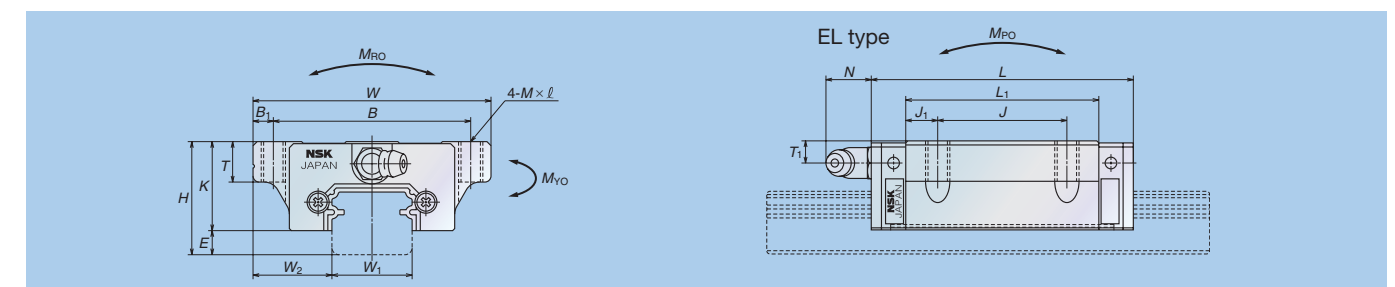


Reference number for ball slide of interchangeable types

Example: **S A S 30 EL S Z**

Interchangeable ball slide: SAS
 Series name: S
 Size: 30
 Ball slide shape/height: EL
 Preload: Z

S: Stainless steel
 No code: Special high carbon steel (NSK standard)



Model No.	Assembly			Ball slide											Rail					Basic load rating					Ball diameter D _w	Weight					
	Height H	E	W ₂	Width W	Length L	Mounting hole					Grease fitting			Width W ₁	Height H ₁	Pitch F	Mounting bolt hole d x D x h	B ₃	G (recommended)	Max. length L _{omax} () for stainless	Dynamic C (N)	Static C ₀ (N)	Static moment			Ball slide (kg)	Rail (kg/m)				
						B	J	M x pitch x l	B ₁	L ₁	J ₁	K	T										Hole size	T ₁				N	M _{RO} (N·m)	M _{PO} (N·m)	M _{YO} (N·m)
SS15JL SS15EL SAS15EL	24	4.6	18.5	52	40.4 56.8	41	— 26	M5 x 0.8 x 6	5.5	23.6 40	11.8 7	19.4	8	phi 3	6	3	15	12.5	60	* 3.5 x 6 x 4.5 4.5 x 7.5 x 5.3	7.5	20	2 000 (1 700)	4 900 7 900	7 800 15 600	39 78	21 74	18 62	2.778	0.17 0.26	1.4
SS20JL SS20EL SAS20EL	28	6	19.5	59	47.2 65.2	49	— 32	M6 x 1 x 10	5	30 48	15 8	22	10	M6 x 0.75	5.5	11	20	15.5	60	6 x 9.5 x 8.5	10	20	3 960 (3 500)	7 250 11 100	11 800 21 800	80 149	40 124	34 104	3.175	0.24 0.35	2.3
SS25JL SS25EL SAS25EL	33	7	25	73	59.6 81.6	60	— 35	M8 x 1.25 x 12	6.5	38 60	19 12.5	26	11 (12)	M6 x 0.75	7	11	23	18	60	7 x 11 x 9	11.5	20	3 960 (3 500)	12 700 17 900	20 800 33 500	164 266	96 242	81 203	3.968	0.44 0.66	3.1
SS30JL SS30EL SAS30EL	42	9	31	90	67.4 96.4	72	— 40	M10 x 1.5 x 18 (M10 x 1.5 x 15)	9	42 71	21 15.5	33	11 (15)	M6 x 0.75	8	11	28	23	80	7 x 11 x 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
SS35JL SS35EL SAS35EL	48	10.5	33	100	77 108	82	— 50	M10 x 1.5 x 20 (M10 x 1.5 x 15)	9	49 80	24.5 15	37.5	12 (15)	M6 x 0.75	8.5	11	34	27.5	80	9 x 14 x 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

Dimensions in () are applicable to stainless steel products.

* SS15 mounting bolt hole is applicable to M3 (3.5 x 6 x 4.5) and M4 (4.5 x 7.5 x 5.3).

The basic dynamic load rating is a load that furnishes 50 km rating fatigue life; it is a vertical and constant load to the ball slide mounting surface. When converting the basic dynamic load rating C to the dynamic load rating C₁₀₀ for 100 km rating fatigue life, divide the C by 1.26

Dimensions of SS Series

SS-FL, SS-EM (High load type) / SS-KL, SS-JM (Medium load type)

Reference number

Example: **SS 35 0840 FL C 2 - ** PN 0 - II**

Series name: SS
 Size: 35
 Rail length (mm): 0840
 Ball slide shape/height: FL
 Material/surface treatment: C
 Number of ball slides per rail: 2
 Accuracy code: **
 Design serial number: PN
 Preload code: 0
 II: Use two rails as a set (Default: One rail use)

*Please note that we assign the design number, and omit the last code (II) that indicates a use of two rails as a set to finalize the reference number as product identification.

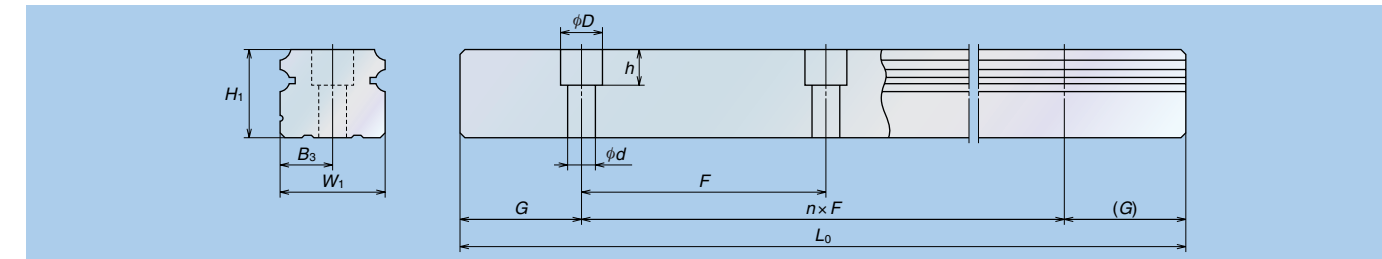
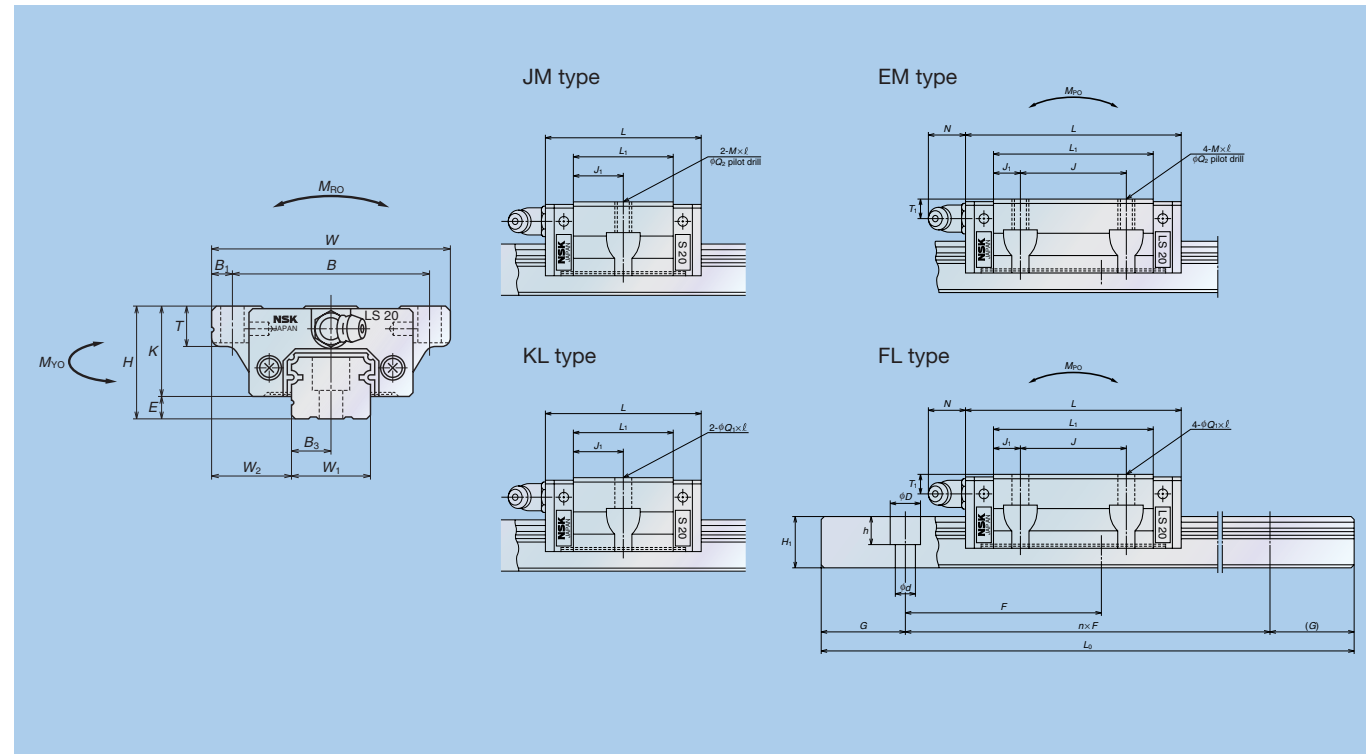
Reference number for rail of interchangeable types

For regular rails (non-jointed rail)

Example: **L1 S 15 1000 L C N T ** PC Z**

Interchangeable rail code: L1
 Series name: S
 Size: 15
 Rail length (mm): 1000
 Shape code: L
 Material/surface treatment code: C
 Butting rail specification: N
 Design serial number: T
 Accuracy code: **
 Preload code: PC
 Z: Slight preload

*Please consult with NSK for butting rail specification.



Reference number for ball slide of interchangeable types

Example: **S A S 30 FL S Z**

Interchangeable ball slide: SAS
 Series name: S
 Size: 30
 Ball slide shape/height: FL
 Preload Z: Slight preload
 S: Stainless steel
 No code: Special high carbon steel (NSK standard)

Model No.	Assembly			Ball slide													Rail					Basic load rating					Ball diameter		Weight														
	Height	E	W ₂	Width	Length	Mounting hole			B ₁	L ₁	J ₁	K	T	Grease fitting			Width	Height	Pitch	Mounting bolt hole	B ₃	G (recommended)	Max. length L _{omax} () for stainless	Static moment			D _w	Ball slide (kg)	Rail (kg/m)														
						H	E	W ₂						B	J	Q ₁ x l								Q ₂	Hole size	T ₁				N	C (N)	C ₀ (N)	M _{RO} (N·m)	M _{PO} (N·m)	M _{VO} (N·m)								
SS15KL SAS15KL	24	4.6	18.5	52	40.4	41	—	4.5 x 7	4.4	5.5	23.6	11.8	19.4	8	ø3	6	3	15	12.5	60	3.5 x 6 x 4.5	7.5	20	2 000	4 900	7 800	39	21	18	2.778	0.17	1.4											
SS15FL SAS15FL					56.8			26																									4.5 x 7	4.4	40	7	4.5 x 7.5 x 5.3	(1 700)	7 900	15 600	78	74	62
SS15EM SAS15EM					56.8			26																									M5 x 0.8 x 7	4.4	40	7	4.5 x 7.5 x 5.3	(1 700)	7 900	15 600	78	74	62
SS15EM SAS15EM					56.8			26																									M5 x 0.8 x 7	4.4	40	7	4.5 x 7.5 x 5.3	(1 700)	7 900	15 600	78	74	62
SS20KL SAS20KL	28	6	19.5	59	47.2	49	—	5.5 x 9 (5.5 x 9.5)	5.3	5	30	15	22	10	M6 x 0.75	5.5	11	20	15.5	60	6 x 9.5 x 8.5	10	20	3 960	7 250	11 800	80	40	34	3.175	0.24	2.3											
SS20JM SAS20JM					65.2			32																									M6 x 1.0 x 9	5.3	48	8	6 x 9.5 x 8.5	(3 500)	11 100	21 800	149	124	104
SS20FL SAS20FL					65.2			32																									5.5 x 9 (5.5 x 9.5)	5.3	48	8	6 x 9.5 x 8.5	(3 500)	11 100	21 800	149	124	104
SS20EM SAS20EM					65.2			32																									M6 x 1.0 x 9	5.3	48	8	6 x 9.5 x 8.5	(3 500)	11 100	21 800	149	124	104
SS25KL SAS25KL	33	7	25	73	59.6	60	—	7 x 10 (7 x 11.5)	6.8	6.5	38	19	26	11	M6 x 0.75	7	11	23	18	60	7 x 11 x 9	11.5	20	3 960	12 700	20 800	164	96	81	3.968	0.44	3.1											
SS25JM SAS25JM					81.6			35																									M8 x 1.25 x 10	6.8	60	12.5	7 x 11 x 9	(3 500)	17 900	33 500	266	242	203
SS25FL SAS25FL					81.6			35																									7 x 10 (7 x 11.5)	6.8	60	12.5	7 x 11 x 9	(3 500)	17 900	33 500	266	242	203
SS25EM SAS25EM					81.6			35																									M8 x 1.25 x 10	6.8	60	12.5	7 x 11 x 9	(3 500)	17 900	33 500	266	242	203
SS30KL SAS30KL	42	9	31	90	67.4	72	—	9 x 12 (9 x 14.5)	8.6	9	42	21	33	11	M6 x 0.75	8	11	28	23	80	7 x 11 x 9	14	20	4 000	18 700	29 600	282	153	128	4.762	0.76	4.8											
SS30JM SAS30JM					96.4			40																									M10 x 1.5 x 12	8.6	71	15.5	7 x 11 x 9	(3 500)	27 300	50 500	480	415	350
SS30FL SAS30FL					96.4			40																									9 x 12 (9 x 14.5)	8.6	71	15.5	7 x 11 x 9	(3 500)	27 300	50 500	480	415	350
SS30EM SAS30EM					96.4			40																									M10 x 1.5 x 12	8.6	71	15.5	7 x 11 x 9	(3 500)	27 300	50 500	480	415	350
SS35KL SAS35KL	48	10.5	33	100	77	82	—	9 x 13 (9 x 14.5)	8.6	9	49	24.5	12	M6 x 0.75	8.5	11	34	27.5	80	9 x 14 x 12	17	20	4 000	26 000	40 000	465	234	196	5.556	1.2	7												
SS35JM SAS35JM					108			50																								M10 x 1.5 x 13	8.6	80	15	9 x 14 x 12	(3 500)	38 000	68 500	800	620	520	
SS35FL SAS35FL					108			50																								9 x 13 (9 x 14.5)	8.6	80	15	9 x 14 x 12	(3 500)	38 000	68 500	800	620	520	
SS35EM SAS35EM					108			50																								M10 x 1.5 x 13	8.6	80	15	9 x 14 x 12	(3 500)	38 000	68 500	800	620	520	

Dimensions in () are applicable to stainless steel products.

* SS15 mounting bolt hole is applicable to M3 (3.5 x 6 x 4.5) and M4 (4.5 x 7.5 x 5.3).
 The basic dynamic load rating is a load that furnishes 50 km rating fatigue life; it is a vertical and constant load to the ball slide mounting surface.
 When converting the basic dynamic load rating C to the dynamic load rating C₁₀₀ for 100 km rating fatigue life, divide the C by 1.26

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