

A-5-1.1 SH Series



(1) Features

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.

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.

3. Low dust generation

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

4. High self-aligning capability (rolling direction)

Same as the DF combination in angular contact bearings, self-aligning capability is high because the cross point of the contact lines of balls and grooves comes inside, reducing moment rigidity. This increases the capacity to absorb errors in installation.

5. High load carrying capacity to vertical direction

The contact angle is set at 50 degrees, increasing load carrying capacity as well as rigidity in vertical direction.

6. High resistance against impact load

The bottom ball groove is formed in Gothic arch and the center of the top and bottom grooves are offset as shown in Fig. 2. The vertical load is generally carried by the top rows, where balls are contacting at two points. Because of this design, the bottom rows will carry load when a large impact load is applied vertically as shown in Fig. 3. This assures high resistance to the impact load.

7. High accuracy

As showing in Fig. 4, fixing the master rollers is easy thanks to the Gothic arch groove. This makes easy and accurate measuring of ball grooves.

8. Fast delivery

Lineup of random-matching rails and ball slides supports and facilitates fast delivery.

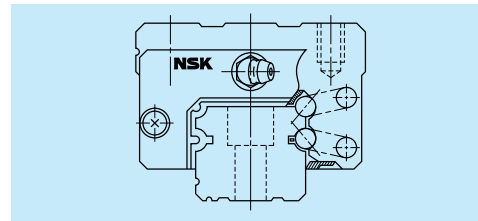


Fig. 1 SH Series

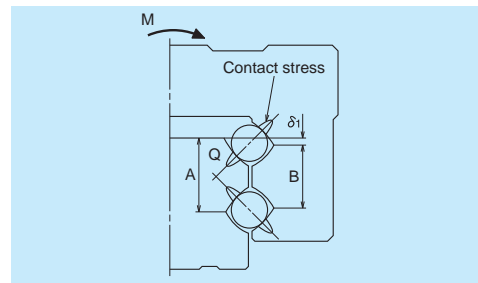


Fig. 2 Enlarged illustration of the offset Gothic arch groove

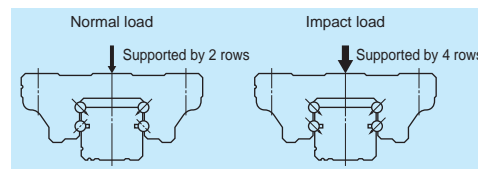


Fig. 3 When load is applied

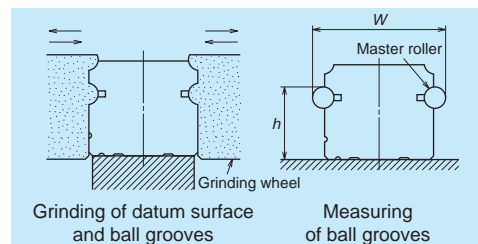


Fig. 4 Rail grinding and measuring

(2) Ball slide shape

Ball slide Model	Shape/installation method	Type	
		High-load type	Super-high-load type
AN BN		AN 	BN
AL BL		AL 	BL
EL GL		EL 	GL
FL HL		FL 	HL
EM GM		EM 	GM

(3) Accuracy and preload

1. Running parallelism of ball slide

Table 1

Unit: μm

Rail over all length (mm) over or less	Preloaded assembly (not random matching)						Random-matching type
	Ultra precision P3	Super precision P4	High precision P5	Precision grade P6	Normal grade PN	Normal grade PC	
- 50	2	2	2	4.5	6	6	
50 - 80	2	2	3	5	6	6	
80 - 125	2	2	3.5	5.5	6.5	6.5	
125 - 200	2	2	4	6	7	7	
200 - 250	2	2.5	5	7	8	8	
250 - 315	2	2.5	5	8	9	9	
315 - 400	2	3	6	9	11	11	
400 - 500	2	3	6	10	12	12	
500 - 630	2	3.5	7	12	14	14	
630 - 800	2	4.5	8	14	16	16	
800 - 1000	2.5	5	9	16	18	18	
1000 - 1250	3	6	10	17	20	20	
1250 - 1600	4	7	11	19	23	23	
1600 - 2000	4.5	8	13	21	26	26	
2000 - 2500	5	10	15	22	29	29	
2500 - 3150	6	11	17	25	32	32	
3150 - 4000	9	16	23	30	34	34	

2. Accuracy standard

The preloaded assembly has five accuracy grades; Ultra precision P3, Super precision P4, High precision P5, Precision P6 and Normal PN grades, while the random-matching type has Normal PC grade.

• Tolerance of preloaded assembly

Table 2

Unit: μm

Characteristics	Accuracy grade	Ultra precision P3	Super precision P4	High precision P5	Precision grade P6	Normal grade PN
Mounting height H		± 10	± 10	± 20	± 40	± 80
Variation of H (All ball slides on a set of rails)		3	5	7	15	25
Mounting width W_2 or W_3		± 15	± 15	± 25	± 50	± 100
Variation of W_2 or W_3 (All ball slides on reference rail)		3	7	10	20	30
Running parallelism of face C to face A	Shown in Table 1, Fig. 5 and Fig. 6					
Running parallelism of face D to face B	Shown in Table 1, Fig. 5 and Fig. 6					

• Tolerance of random-matching type; Normal grade, PC

Table 3

Unit: μm

Characteristics	Model No.	SH15, 20, 25, 30, 35	SH45, 55
Mounting height H		± 20	± 30
Variation of mounting height H		15 ^① 30 ^②	20 ^① 35 ^②
Mounting width W_2 or W_3		± 30	± 35
Variation of mounting width W_2 or W_3		25	30
Running parallelism of face C to face A	See Table 1, Fig. 5 and Fig. 6		
Running parallelism of face D to face B	See Table 1, Fig. 5 and Fig. 6		

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

3. Combinations of accuracy and preload

Table 4

		Accuracy grade					
		Ultra precision	Super precision	High precision	Precision grade	Normal grade	Normal grade
Without NSK K1 lubrication unit		P3	P4	P5	P6	PN	PC
With NSK K1 lubrication unit		K3	K4	K5	K6	KN	KC
Preload	Fine clearance Z0	○	○	○	○	○	—
	Slight preload Z1	○	○	○	○	○	—
	Medium preload Z3	○	○	○	○	—	—
	Random-matching type with slight preload ZZ	—	—	—	—	—	○

4. Assembled accuracy

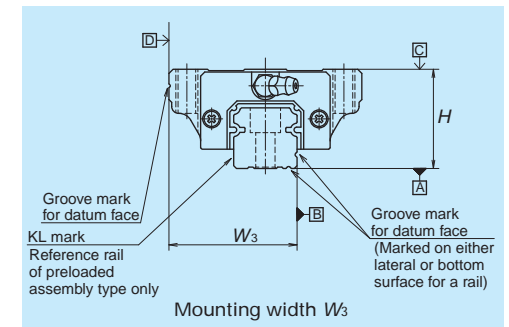
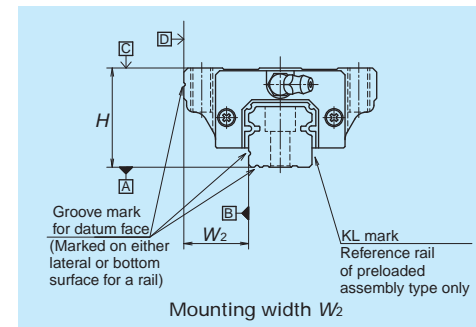


Fig. 5 Special high carbon steel

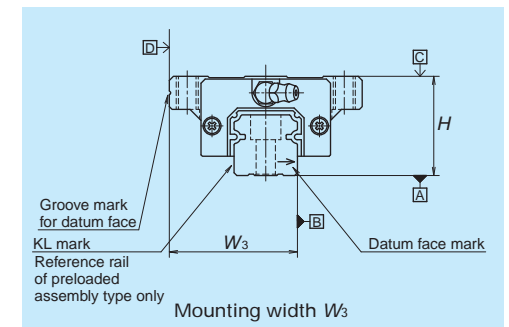
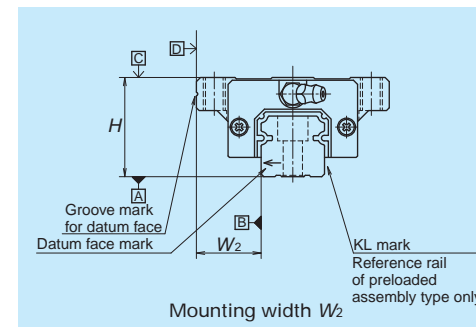


Fig. 6 Stainless steel

5. Preload and rigidity

We offer four levels of preload: slight preload Z1, medium preload Z3 and fine clearance Z0, along with random-matching type of slight preload ZZ. Values for preload and rigidity of the preloaded assembly are shown in Table 5. Rigidities are for the median of the preload range.

• Preload and rigidity of preloaded assembly

Table 5

Model No.	Preload (N)		Rigidity (N/ μ m)				
	Slight preload (Z1)	Medium preload (Z3)	Vertical direction		Lateral direction		
			Slight preload (Z1)	Medium preload (Z3)	Slight preload (Z1)	Medium preload (Z3)	
High-load 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	1180	186	343	137	255
	SH30 AN, AL	245	1470	196	363	137	265
	SH30 EL, FL, EM	294	1670	245	441	176	323
	SH35 AN, AL, EL, FL, EM	390	2160	294	529	205	382
	SH45 AN, AL, EL, FL, EM	635	3700	397	727	283	529
Super-high-load type	SH55 AN, AL, EL, FL, EM	930	5600	482	891	336	635
	SH15 BN, GL, HL, GM	98	637	186	333	137	264
	SH20 BN, GL, HL, GM	196	1080	235	421	186	343
	SH25 BN, BL, GL, HL, GM	245	1570	284	529	196	382
	SH30 BN, BL, GL, HL, GM	343	2160	333	627	235	451
	SH35 BN, BL, GL, HL, GM	490	2840	411	755	284	529
	SH45 BN, BL, GL, HL, GM	785	4600	515	944	367	686
	SH55 BN, BL, GL, HL, GM	1180	6750	631	1148	440	817

Note: Clearance for fine clearance Z0 is 0 to 3 μ m. Therefore, preload is zero.

However, Z0 of PN grade is 0 to 15 μ m.

• Clearance and preload of random-matching type

Table 6

unit: μ m

Model No.	Slight preload ZZ
SH15	-4 - 0
SH20	-5 - 0
SH25	-5 - 0
SH30	-7 - 0
SH35	-7 - 0
SH45	-7 - 0
SH55	-8 - 0

(4) Available length of rail

Table 7 shows the limitations of rail length (maximum length). However, the limitations vary by accuracy grade.

Table 7 Length limitation of rails

Unit : mm

Series	Size Material	15	20	25	30	35	45	55
		SH	Special high carbon steel	2000	3960	3960	4000	4000
	Stainless steel	1800	3500	3500	3500			

Note: Rails can be butted if user requirement exceeds the rail length shown in the Table. Please consult NSK.

(5) Installation

1. Permissible values of mounting error

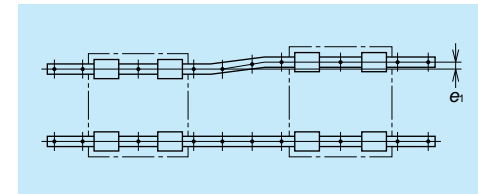


Fig. 7

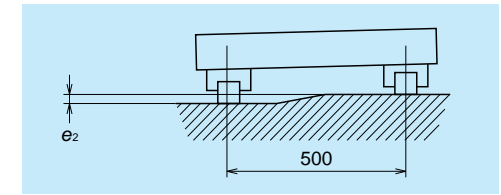


Fig. 8

Table 8

Unit : μ m

Value	Preload	Model No.						
		SH15	SH20	SH25	SH30	SH35	SH45	SH55
Permissible values of parallelism in two rails e_1	Z0, ZT	22	30	40	45	55	65	80
	Z1, ZZ	18	20	25	30	35	45	55
	Z3	13	15	20	25	30	40	45
Permissible values of parallelism (height) in two rails e_2	Z0, ZT	375 μ m/500 mm						
	Z1, ZZ, Z3	330 μ m/500 mm						

2. Shoulder height of the mounting face and corner radius

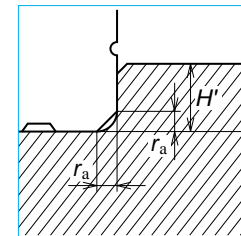


Fig. 9 Shoulder for the rail datum face

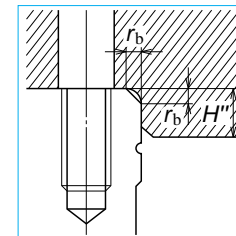


Fig. 10 Shoulder for the ball slide datum face

Table 9

Unit : mm

Model No.	Corner radius (maximum)		Shoulder height	
	r_a	r_b	H'	H''
SH 15	0.5	0.5	4	4
SH 20	0.5	0.5	4.5	5
SH 25	0.5	0.5	5	5
SH 30	0.5	0.5	6	6
SH 35	0.5	0.5	6	6
SH 45	0.7	0.7	8	8
SH 55	0.7	0.7	10	10

(6) Lubrication components

Refer to page A38 and D13 for the lubrication of linear guides.

1. Types of lubrication accessories

Figure 11 and Table 10 show grease fittings and tube fittings.

We provide lubrication accessories with extended thread body length (L) for the addition of dust proof accessories such as NSK K1 lubrication unit, double seal and protector.

We provide a suitable lubrication accessory for the special requirement on dust proof accessories.

Consult NSK for a lubrication accessory with extended length of thread body for your convenience of replenishing lubricant.

Please ask NSK for stainless lubrication accessories.

2. Mounting position of lubrication accessories

The standard position of grease fittings is the end face of ball slide. We mount them on a side of end cap for an option. (Fig. 12)

Please consult NSK for installation of grease or tube fittings to the ball slide body or side of end cap.

When using a piping unit with thread of $M6 \times 1$, you require a connector to connect to a grease fitting mounting hole with $M6 \times 0.75$. The connector is available from NSK.

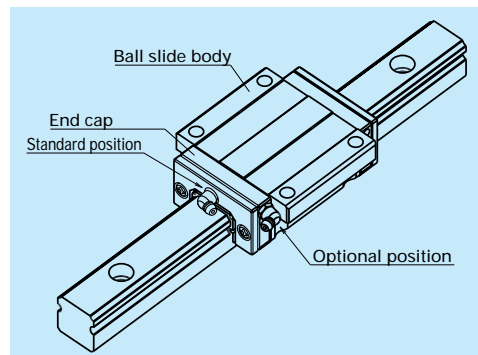


Fig. 12 Mounting position of lubrication accessories

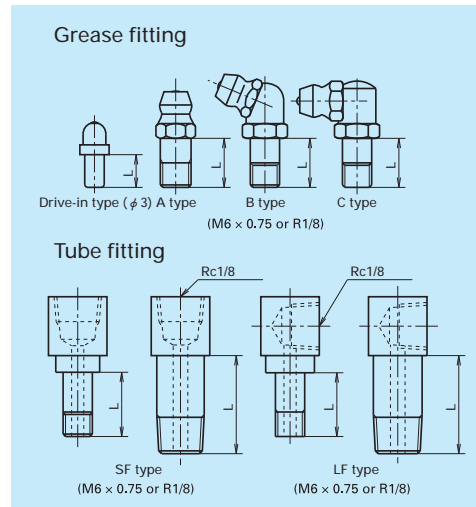


Fig. 11 Grease fitting and tube fitting

Model No.	Dust proof specification	Grease fitting	Tube fitting
		Thread body length L	Thread body length L
SH15	Standard	5	-
	With NSK K1	10	-
	Double seal	*	-
	Protector	*	-
SH20	Standard	5	-
	With NSK K1	12	-
	Double seal	10	-
	Protector	10	-
SH25	Standard	5	6**
	With NSK K1	12	11**
	Double seal	10	9**
	Protector	10	9**
SH30	Standard	5	6
	With NSK K1	14	13
	Double seal	12	11
	Protector	12	11
SH35	Standard	5	6
	With NSK K1	14	13
	Double seal	12	11
	Protector	12	11
SH45	Standard	8	17
	With NSK K1	18	21.5
	Double seal	14	17
	Protector	14	17
SH55	Standard	8	17
	With NSK K1	18	21.5
	Double seal	14	17
	Protector	14	17

*) Please contact NSK as a connector is required.
 **) Only available for AN and BN type ball slides.

(7) Dust proof components

1. Standard specification

To keep foreign matters from entering inside the ball slide, SH Series has an end seal on both ends, and bottom seals at the bottom.

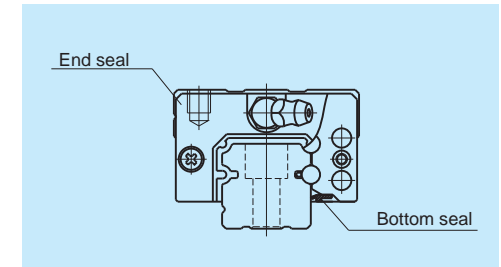


Fig. 13

Table 11 Seal friction per ball slide (maximum value)

Series	Size	Unit : N						
		15	20	25	30	35	45	55
SH		8	9	10	10	12	17	22

2. NSK K1™

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

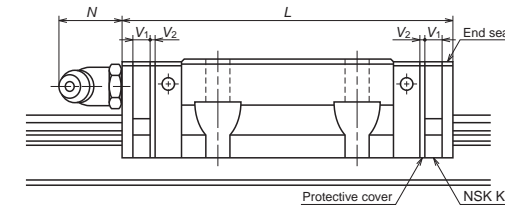


Table 12

Unit: mm

Model No.	Ball slide length	Ball slide model	Standard ball slide length	Ball slide length installed with two NSK K1 L	Per NSK K1 thickness V_1	Protective cover thickness V_2	Protruding area of the grease fitting N
SH15	Standard	AN, EL, FL, EM	55	65.6	4.5	0.8	(5)
	Long	BN, GL, HL, GM	74	84.6			
SH20	Standard	AN, EL, FL, EM	69.8	80.4	4.5	0.8	(14)
	Long	BN, GL, HL, GM	91.8	102.4			
SH25	Standard	AN, AL, EL, FL, EM	79.0	90.6	5.0	0.8	(14)
	Long	BN, BL, GL, HL, GM	107	118.6			
SH30	Standard	AN, AL	85.6	97.6	5.0	1.0	(14)
	Flange type	EL, FL, EM	98.6	110.6			
SH35	Standard	AN, AL, EL, FL, EM	109	122	5.5	1.0	(14)
	Long	BN, BL, GL, HL, GM	143	156			
SH45	Standard	AN, AL, EL, FL, EM	139	154	6.5	1.0	(15)
	Long	BN, BL, GL, HL, GM	171	186			
SH55	Standard	AN, AL, EL, FL, EM	163	178	6.5	1.0	(15)
	Long	BN, BL, GL, HL, GM	201	216			

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

3. Double seal

Use a double seal set as showing in Table 13, when installing an extra seal to completed standard products. (Fig. 14)

When installing a grease fitting after the installation of double seals, a connector is required.

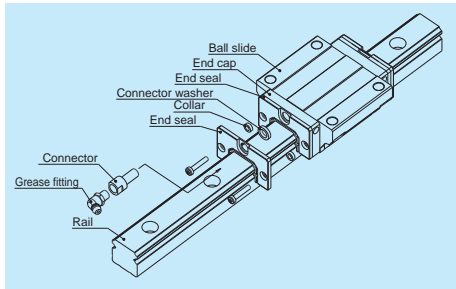


Fig. 14 Double seal

Table 13 Double-seal set

Model No.	Reference No.		Increased thickness V_1
	Without connector	With connector	
SH15	LH15WS-01	*	2.5
SH20	LH20WS-01	LH20WSC-01	2.5
SH25	LH25WS-01	LH25WSC-01	2.8
SH30	LH30WS-01	LH30WSC-01	3.6
SH35	LH35WS-01	LH35WSC-01	3.6
SH45	LH45WS-01	LH45WSC-01	4.3
SH55	LH55WS-01	LH55WSC-01	4.3

4. Protector

Use a protector set as showing Table 14, when installing a protector to completed standard products. (Fig.15)

When installing a grease fitting after the installation of protectors, a connector is required.

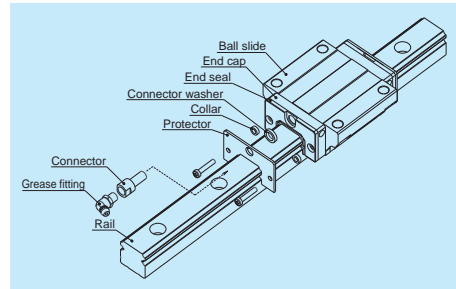


Fig. 15 Protector

Table 14 Protector set

Model No.	Reference No.		Increased thickness V_2
	Without connector	With connector	
SH15	LH15PT-01	*	2.7
SH20	LH20PT-01	LH20PTC-01	2.9
SH25	LH25PT-01	LH25PTC-01	3.2
SH30	LH30PT-01	LH30PTC-01	4.2
SH35	LH35PT-01	LH35PTC-01	4.2
SH45	LH45PT-01	LH45PTC-01	4.9
SH55	LH55PT-01	LH55PTC-01	4.9

*) For installation of a connector to a drive-in type grease fitting, contact NSK.

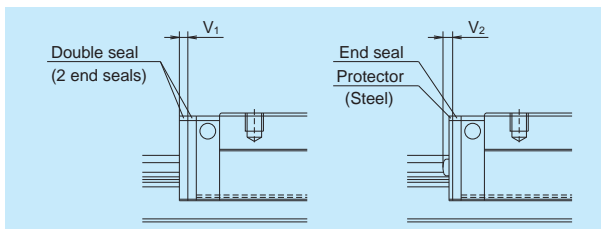


Fig. 16

5. Cap to cover the bolt hole for rail mounting

Table 15 Caps to cover rail bolt hole

Model No.	Bolt to secure rail	Cap reference No.	Quantity /case
SH15	M4	LG-CAP/M4	20
SH20	M5	LG-CAP/M5	20
SH25	M6	LG-CAP/M6	20
SH30, SH35	M8	LG-CAP/M8	20
SH45	M12	LG-CAP/M12	20
SH55	M14	LG-CAP/M14	20

7. Bellows

Use a bellows fastener kit as showing Table 17, when installing bellows to completed standard products. A bellows fastener kit is supplied with one of bellows fastener, two of M1 set screws, two of M2 set screws, and two collars for M2 set screw.

6. Inner seal

Inner seal can be manufactured for models shown below.

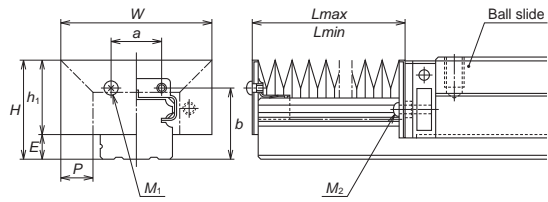
Table 16

Series	Model No.
SH	SH20, SH25, SH30, SH35, SH45, SH55

Table 17 Bellows fastener kit reference No.

Model No.	Kit reference No.
SH20	LH20FS-01
SH25	LH25FS-01
SH30	LH30FS-01
SH35	LH35FS-01
SH45	LH45FS-01
SH55	LH55FS-01

Dimension tables of bellows
SH Series



Bellows reference number

J A H 20 N 08

Bellows

A: Bellows for the ends
B: Middle bellows

N: High type L: Low type

For SH and LH series

Number of BL (fold number)

Size number of linear guide

Fig. 17 Dimensions of bellows

Table 18 Dimensions of bellows

Unit: mm

Model No.	H	h ₁	E	W	P	a	b	BL minimum length	M ₁ Tap x depth	M ₂ Tap x depth
JAH20N	29.5	24.5	5	48	10	13	22	17	M3x5	M2.5x16
JAH25L	35	28	7	51	10	16	26	17	M3x5	M3x18
JAH25N	39	32		61	15					
JAH30L	41	32	9	60	12	18	31	17	M4x6	M4x22
JAH30N	44	35		66	15					
JAH35L	47	37.5	9.5	72	15	24	34	17	M4x6	M4x23
JAH35N	54	44.5		82	20					
JAH45L	59	45	14	83	15	32	44.5	17	M5x8	M5x28
JAH45N	69	55		103	25					
JAH55L	69	54	15	101	20	40	50.5	17	M5x8	M5x30
JAH55N	79	64		121	30					

Table 19 Numbers of folds (BL) and lengths of bellows

Unit: mm

Model No.	Number of BL	2	4	6	8	10	12	14	16	18	20
		L _{min}	34	68	102	136	170	204	238	272	306
JAH20N	Stroke	106	212	318	424	530	636	742	848	954	1060
	L _{max}	140	280	420	560	700	840	980	1120	1260	1400
JAH25L	Stroke	106	212	318	424	530	636	742	848	954	1060
	L _{max}	140	280	420	560	700	840	980	1120	1260	1400
JAH25N	Stroke	176	352	528	704	880	1056	1232	1408	1584	1760
	L _{max}	210	420	630	840	1050	1260	1470	1680	1890	2100
JAH30L	Stroke	134	268	402	536	670	804	938	1072	1206	1340
	L _{max}	168	336	504	672	840	1008	1176	1344	1512	1680
JAH30N	Stroke	176	352	528	704	880	1056	1232	1408	1584	1760
	L _{max}	210	420	630	840	1050	1260	1470	1680	1890	2100
JAH35L	Stroke	176	352	528	704	880	1056	1232	1408	1584	1760
	L _{max}	210	420	630	840	1050	1260	1470	1680	1890	2100
JAH35N	Stroke	246	492	738	984	1230	1476	1722	1968	2214	2460
	L _{max}	280	560	840	1120	1400	1680	1960	2240	2520	2800
JAH45L	Stroke	176	352	528	704	880	1058	1232	1408	1584	1760
	L _{max}	210	420	630	840	1050	1260	1470	1680	1890	2100
JAH45N	Stroke	316	632	948	1264	1580	1896	2212	2528	2844	3160
	L _{max}	350	700	1050	1400	1750	2100	2450	2800	3150	3500
JAH55L	Stroke	246	492	738	984	1230	1476	1722	1968	2214	2460
	L _{max}	280	560	840	1120	1400	1680	1960	2240	2520	2800
JAH55N	Stroke	386	772	1158	1544	1930	2316	2702	3088	3474	3860
	L _{max}	420	840	1260	1680	2100	2520	2940	3360	3780	4200

Remarks: Values of odd numbers BL (3, 5, 7, ...) can be obtained by adding two values of even number BLs on both sides, then dividing the sum by two.

Note: We recommend using SH Series in a clean environment in order to utilize their full range of capabilities.

SH Series

(8) Reference number

Reference numbers shall be set to individual NSK linear guide when its specifications are finalized, and it is indicated on its specification drawing.

Please specify the reference number, except design serial number, to identify the product when ordering, requiring estimates, or inquiring about specifications from NSK.

1. Reference number for preloaded assembly

SH 30 1000 ANC 2 - P5 3**

Series name	SH	30	1000	ANC	2	-**	P5	3
Size								
Rail length (mm)								
Ball slide shape code (See page A116)								
Material/surface treatment code (See Table 20)								
								Preload code (See page A118)
								Accuracy code (See Table 21)
								Design serial number
								Added to the reference number.
								Number of ball slides per rail

2. Reference number for random-matching type

SAH 30 ANC -PCZ**

Random-matching ball slide series code	SAH	30	ANC	-**	PC	Z
SAH : SH Series random-matching ball slide						
Size						
Ball slide shape code (See page A116)						
Material/surface treatment code (See Table 20)						
						Preload code
						Z: Slight preload only (See page A118)
						Accuracy code : PC
						PC: Normal grade is only available
						Design serial number
						Added to the reference number.

Rail L1H30 1200 LCN - PC Z**

Random-matching rail series code	L1H	30	1200	LCN	-**	PC	Z
L1H : LH/SH Series random-matching rail							
Size							
Rail length (mm)							
Rail shape code: L							
L : Standard							
Material/surface treatment code (See Table 20)							
							Preload code
							Z: Slight preload only (See page A118)
							Accuracy code : PC
							PC: Normal grade is only available
							Design serial number
							Added to the reference number.
							*Butting rail specification
							N: Non-butting. L: Butting specification

*Please consult with NSK for butting rail specification.

Reference number for assembly of random-matching ball slide and rail is the same as the coding of preloaded assembly. However, preload code is slight preload "Z" (Refer to page A118).

Table 20 Material/surface treatment code

Code	Description
C	Special high carbon steel (NSK standard)
K	Stainless steel (SH15 to SH30 only)
D	Special high carbon steel with surface treatment
H	Stainless steel with surface treatment
Z	Other, special

Table 21 Accuracy code

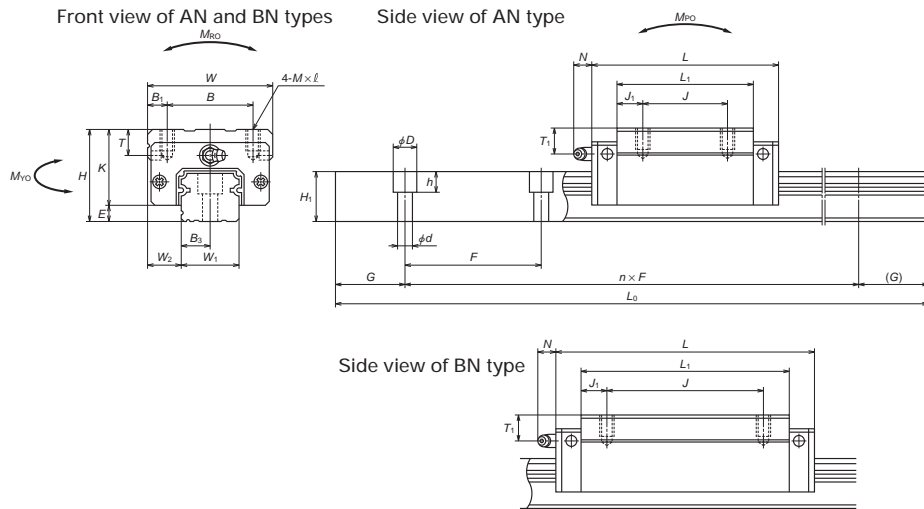
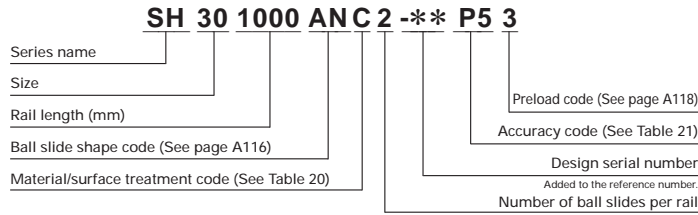
Accuracy	Standard (Without NSK K1)	With NSK K1
Ultra precision grade	P3	K3
Super precision grade	P4	K4
High precision grade	P5	K5
Precision grade	P6	K6
Normal grade	PN	KN
Normal grade (random-matching type)	PC	KC

Note: Refer to Page A38 for NSK K1 lubrication unit.

(9) Dimensions

SH-AN (High-load type)

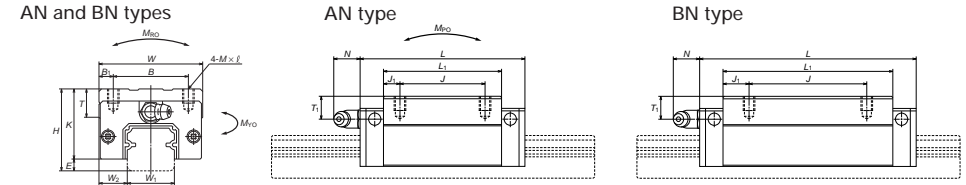
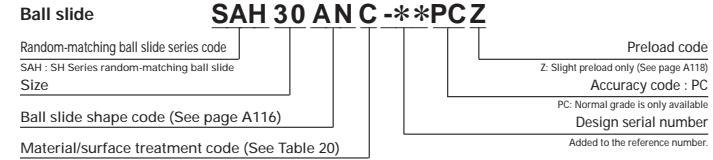
SH-BN (Super-high-load type)



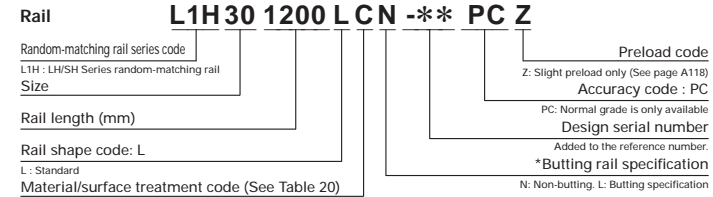
Model No.	Assembly				Ball slide											
	Height H	E	W ₂	Width W	Length L	Mounting hole			B ₁	L ₁	J ₁	K	T	Grease fitting		
						B	J	M×pitch×ℓ						Hole size	T ₁	N
SH15AN SH15BN	28	4.6	9.5	34	55 74	26	26	M4×0.7×6	4	39 58	6.5 16	23.4	8	φ 3	8.5	3.3
SH20AN SH20BN	30	5	12	44	69.8 91.8	32	36 50	M5×0.8×6	6	59 72	7 11	25	12	M6×0.75	5	11
SH25AN SH25BN	40	7	12.5	48	79 107	35	35 50	M6×1×9	6.5	58 86	11.5 18	33	12	M6×0.75	10	11
SH30AN SH30BN	45	9	16	60	85.6 124.6	40	40 60	M8×1.25×10	10	59 98	9.5 19	36	14	M6×0.75	10	11
SH35AN SH35BN	55	9.5	18	70	109 143	50	50 72	M8×1.25×12	10	80 114	15 21	45.5	15	M6×0.75	15	11
SH45AN SH45BN	70	14	20.5	86	139 171	60	60 80	M10×1.5×17	13	105 137	22.5 28.5	56	17	Rc1/8	20	13
SH55AN SH55BN	80	15	23.5	100	163 201	75	75 95	M12×1.75×18	12.5	126 164	25.5 34.5	65	18	Rc1/8	21	13

Remarks: 1) The external appearance of stainless steel ball slides differs from those of standard material ball slide.
A129

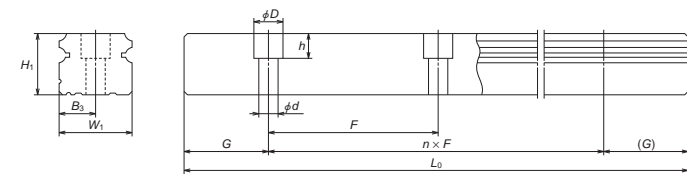
Reference number for ball slide of random-matching type



Reference number for rail of random-matching type



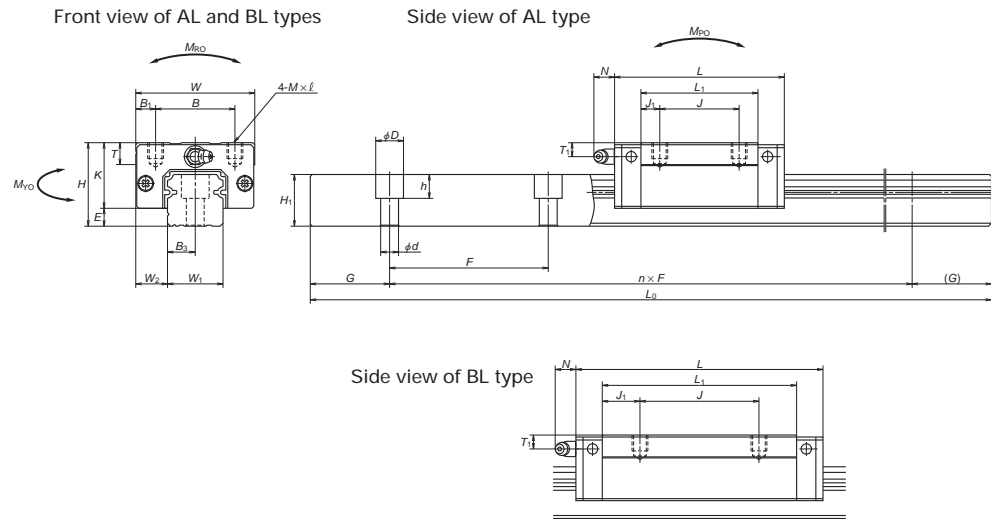
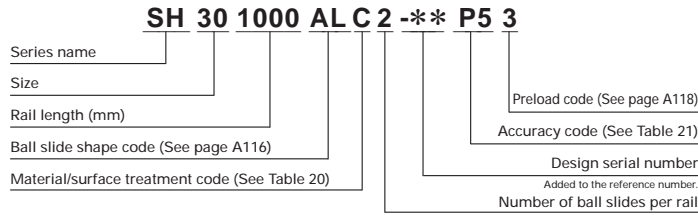
*Please consult with NSK for butting rail specification.



Rail													Basic load rating					Ball dia.	Weight	
Width	Height	Pitch	Mounting bolt hole	B ₃	G	Max. length L _{max}	Dynamic C	Static C ₀	Static moment			D _w	Ball slide (kg)	Rail (kg/m)						
W ₁	H ₁	F	d×D×h	(reference)	() for stainless	(N)	(N)	M _{ro}	M _{po}	M _{vo}										
15	15	60	4.5×7.5×5.3	7.5	20	2 000 (1 800)	10 100 13 400	18 800 28 200	98 147	87 193	73 162	3.175	0.18 0.26	1.6						
20	18	60	6×9.5×8.5	10	20	3 960 (3 500)	16 300 21 600	29 600 44 500	199 298	167 360	141 305	3.968	0.33 0.48	2.6						
23	22	60	7×11×9	11.5	20	3 960 (3 500)	22 400 32 000	37 500 62 500	295 490	246 615	207 515	4.762	0.55 0.82	3.6						
28	26	80	9×14×12	14	20	4 000 (3 500)	31 000 46 000	51 500 91 500	490 870	365 1 060	305 885	5.556	0.77 1.3	5.2						
34	29	80	9×14×12	17	20	4 000	47 500 61 500	80 500 117 000	950 1 380	780 1 600	655 1 340	6.35	1.5 2.1	7.2						
45	38	105	14×20×17	22.5	22.5	3990	76 500 94 500	128 000 175 000	1 970 2 680	1 550 2 760	1 300 2 320	7.937	3.0 3.9	12.3						
53	44	120	16×23×20	26.5	30	3960	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						

2) 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. A130

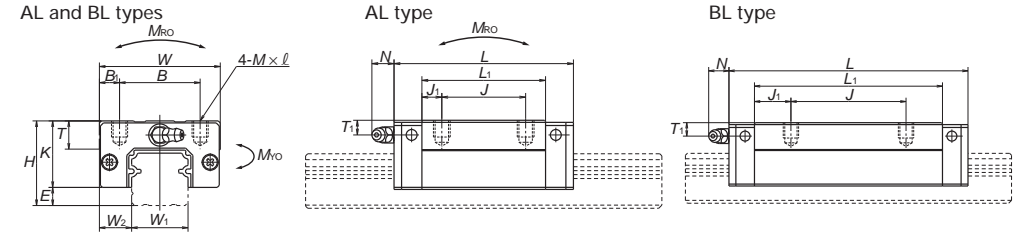
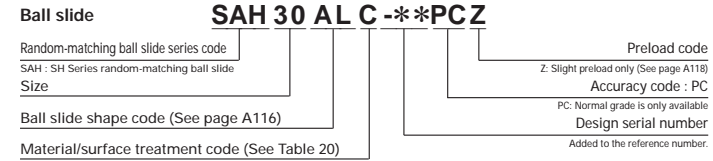
SH-AL (High-load type)
SH-BL (Super-high-load type)



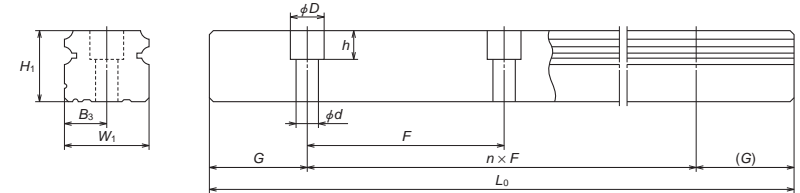
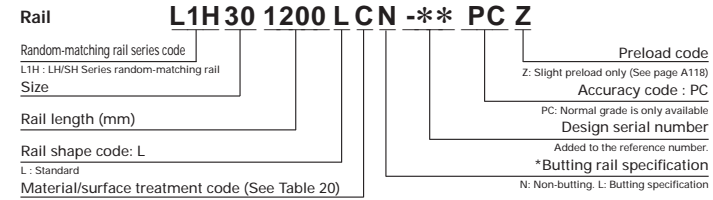
Model No.	Assembly			Ball slide												
	Height H	E	W ₂	Width W	Length L	Mounting hole						Grease fitting				
						B	J	M×pitch×l	B ₁	L ₁	J ₁	K	T	Hole size	T ₁	N
SH25AL SH25BL	36	7	12.5	48	79 107	35	35 50	M6×1×6	6.5	58 86	11.5 18	29	12	M6×0.75	6	11
SH30AL SH30BL	42	9	16	60	85.6 124.6	40	40 60	M8×1.25×8	10	59 98	9.5 19	33	14	M6×0.75	7	11
SH35AL SH35BL	48	9.5	18	70	109 143	50	50 72	M8×1.25×8	10	80 114	15 21	38.5	15	M6×0.75	8	11
SH45AL SH45BL	60	14	20.5	86	139 171	60	60 80	M10×1.5×10	13	105 137	22.5 28.5	46	17	Rc1/8	10	13
SH55AL SH55BL	70	15	23.5	100	163 201	75	75 95	M12×1.75×13	12.5	126 164	25.5 34.5	55	15	Rc1/8	11	13

Remarks: 1) The external appearance of stainless steel ball slides differs from those of standard material ball slide.

Reference number for ball slide of random-matching type



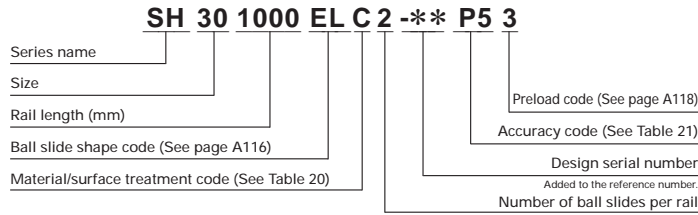
Reference number for rail of random-matching type



Rail							Basic load rating					Ball dia.	Weight	
Width W ₁	Height H ₁	Pitch F	Mounting bolt hole d×D×h	B ₃	G (reference)	Max. length L _{max} () for stainless	Dynamic C (N)	Static C ₀ (N)	Static moment			D _w	Ball slide (kg)	Rail (kg/m)
									M _{ro}	M _{po}	M _{vo}			
23	22	60	7×11×9	11.5	20	3 960 (3 500)	22 400 32 000	37 500 62 500	295 490	246 615	207 515	4.762	0.46 0.69	3.6
28	26	80	9×14×12	14	20	4 000 (3 500)	31 000 46 000	51 500 91 500	490 870	365 1 060	305 885	5.556	0.69 1.16	5.2
34	29	80	9×14×12	17	20	4 000	47 500 61 500	80 500 117 000	950 1 380	780 1 600	655 1 340	6.35	1.2 1.7	7.2
45	38	105	14×20×17	22.5	22.5	3990	76 500 94 500	128 000 175 000	1 970 2 680	1 550 2 760	1 300 2 320	7.937	3.0 3.9	12.3
53	44	120	16×23×20	26.5	30	3960	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

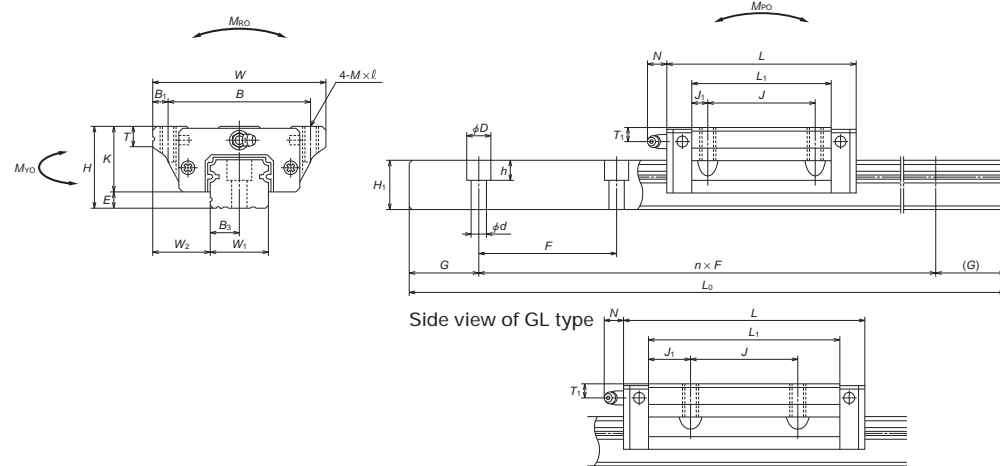
2) The basic dynamic load rating is a load that furnishes 50 km rating fatigue life; it is a vertical and constant load to the ball slide mounting surface. When converting the basic dynamic load rating C to the dynamic load rating C₁₀₀ for 100 km rating fatigue life, divide the C by 1.26.

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

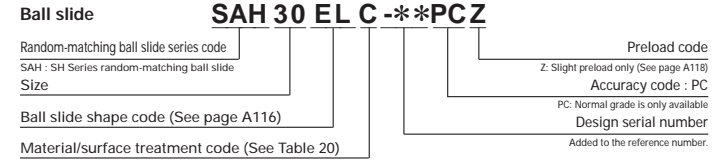


Front view of EL and GL types

Side view of EL type



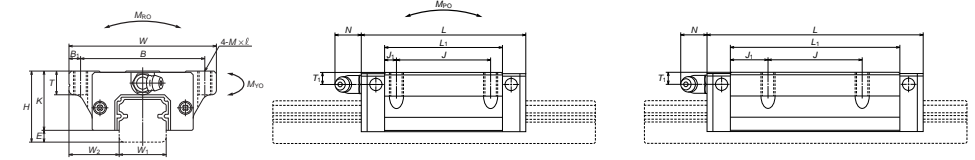
Reference number for ball slide of random-matching type



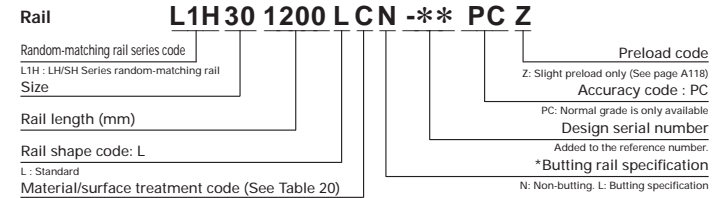
EL and GL types

EL type

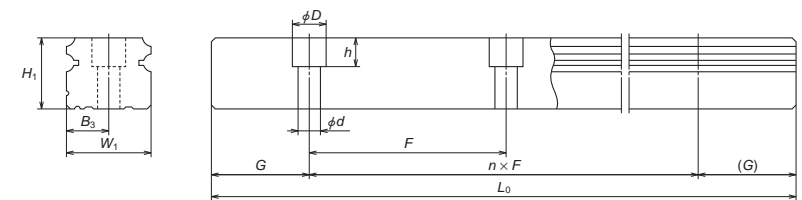
GL type



Reference number for rail of random-matching type



*Please consult with NSK for butting rail specification.



Model No.	Assembly				Ball slide											
	Height H	E	W ₂	Width W	Length L	Mounting hole			B ₁	L ₁	J ₁	K	T	Grease fitting		
						B	J	Mxpitchxℓ						Hole size	T ₁	N
SH15EL SH15GL	24	4.6	16	47	55 74	38	30	M5x0.8x8	4.5	39 58	4.5 14	19.4	8	φ 3	4.5	3.3
SH20EL SH20GL	30	5	21.5	63	69.8 91.8	53	40	M6x1x10	5	50 72	5 16	25	10	M6x0.75	5	11
SH25EL SH25GL	36	7	23.5	70	79 107	57	45	M8x1.25x16 (M8x1.25x12)	6.5	58 86	6.5 20.5	29	11 (12)	M6x0.75	6	11
SH30EL SH30GL	42	9	31	90	98.6 124.6	72	52	M10x1.5x18 (M10x1.5x15)	9	72 98	10 23	33	11 (15)	M6x0.75	7	11
SH35EL SH35GL	48	9.5	33	100	109 143	82	62	M10x1.5x20	9	80 114	9 26	38.5	12	M6x0.75	8	11
SH45EL SH45GL	60	14	37.5	120	139 171	100	80	M12x1.75x24	10	105 137	12.5 28.5	46	13	Rc1/8	10	13
SH55EL SH55GL	70	15	43.5	140	163 201	116	95	M14x2x28	12	126 164	15.5 34.5	55	15	Rc1/8	11	13

Remarks: 1) Parenthesized dimensions are applicable to stainless steel products.

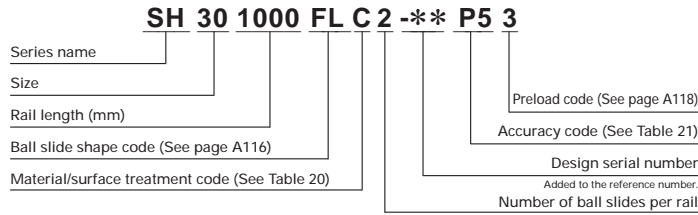
2) The external appearance of stainless steel ball slides differs from those of standard material ball slide.

Unit: mm

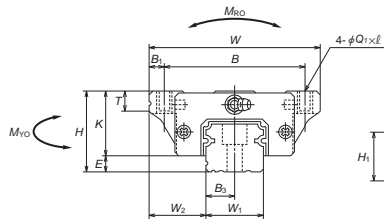
Rail							Basic load rating					Ball dia. D _w	Weight	
Width W ₁	Height H ₁	Pitch F	Mounting bolt hole d x D x h	B ₃	G (reference)	Max. length L _{dmax} () for stainless	Dynamic C (N)	Static C ₀ (N)	Static moment M _{ro} (N·m)				Ball slide (kg)	Rail (kg/m)
15	15	60	4.5x7.5x5.3	7.5	20	2 000 (1 800)	10 100 13 400	18 800 28 200	98 147	87 193	73 162	3.175	0.17 0.25	1.6
20	18	60	6x9.5x8.5	10	20	3 960 (3 500)	16 300 21 600	29 600 44 500	199 298	167 360	141 305	3.968	0.45 0.65	2.6
23	22	60	7x11x9	11.5	20	3 960 (3 500)	22 400 32 000	37 500 62 500	295 490	246 615	207 515	4.762	0.63 0.93	3.6
28	26	80	9x14x12	14	20	4 000 (3 500)	35 500 46 000	63 000 91 500	600 870	540 1 060	450 885	5.556	1.2 1.6	5.2
34	29	80	9x14x12	17	20	4 000	47 500 61 500	80 500 117 000	950 1 380	780 1 600	655 1 340	6.35	1.7 2.4	7.2
45	38	105	14x20x17	22.5	22.5	3 990	76 500 94 500	128 000 175 000	1 970 2 680	1 550 2 760	1 300 2 320	7.937	3.0 3.9	12.3
53	44	120	16x23x20	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

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.

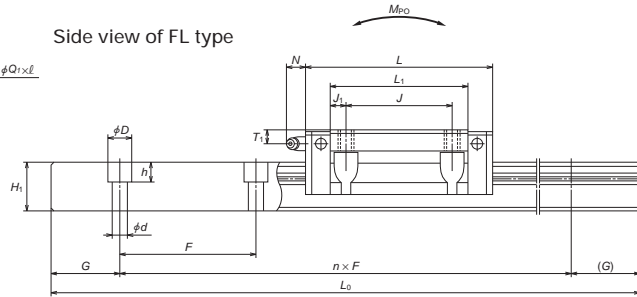
SH-FL (High-load type)
SH-HL (Super-high-load type)



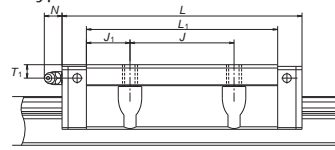
Front view of FL and HL types



Side view of FL type



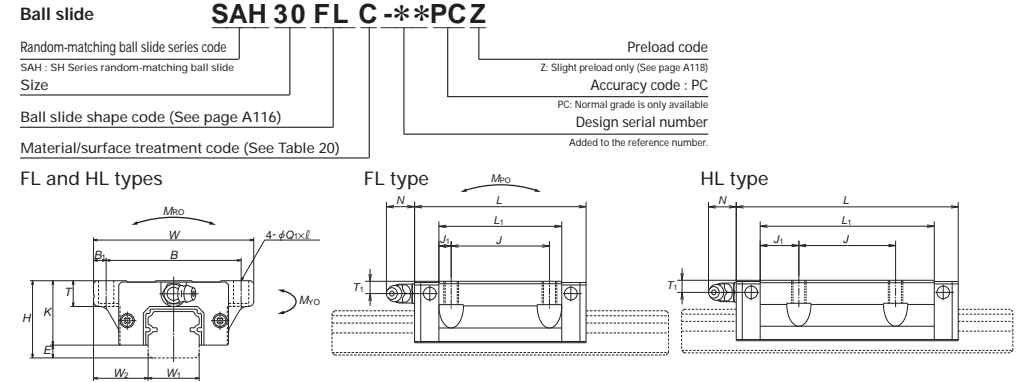
Side view of HL type



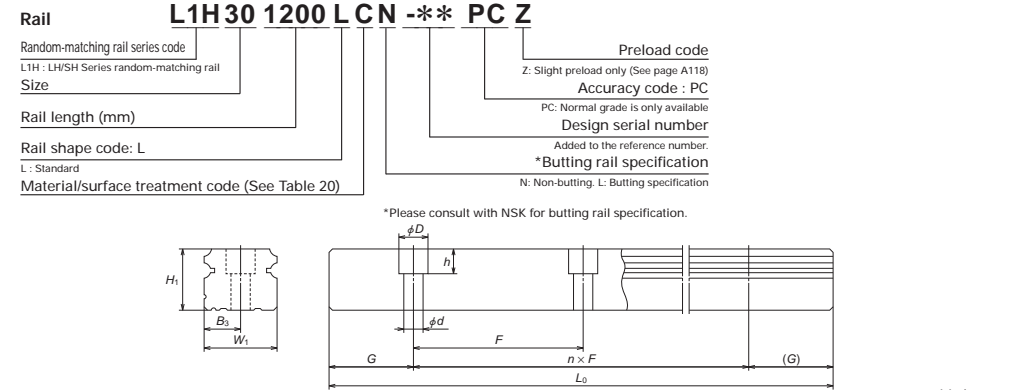
Model No.	Assembly				Ball slide											
	Height H	E	W ₂	Width W	Length L	Mounting hole			B ₁	L ₁	J ₁	K	T	Grease fitting		
						B	J	Q ₁ ×ℓ						Hole size	T ₁	N
SH15FL SH15HL	24	4.6	16	47	55 74	38	30	4.5×7	4.5	39 58	4.5 14	19.4	8	φ 3	4.5	3.3
SH20FL SH20HL	30	5	21.5	63	69.8 91.8	53	40	6×9.5	5	50 72	5 16	25	10	M6×0.75	5	11
SH25FL SH25HL	36	7	23.5	70	79 107	57	45	7×10(7×11.5)	6.5	58 86	6.5 20.5	29	11 (12)	M6×0.75	6	11
SH30FL SH30HL	42	9	31	90	98.6 124.6	72	52	9×12(9×14.5)	9	72 98	10 23	33	11 (15)	M6×0.75	7	11
SH35FL SH35HL	48	9.5	33	100	109 143	82	62	9×13	9	80 114	9 26	38.5	12	M6×0.75	8	11
SH45FL SH45HL	60	14	37.5	120	139 171	100	80	11×15	10	105 137	12.5 28.5	46	13	Rc1/8	10	13
SH55FL SH55HL	70	15	43.5	140	163 201	116	95	14×18	12	126 164	15.5 34.5	55	15	Rc1/8	11	13

Remarks: 1) Parenthesized dimensions are applicable to stainless steel products.
2) The external appearance of stainless steel ball slides differs from those of standard material ball slide.

Reference number for ball slide of random-matching type



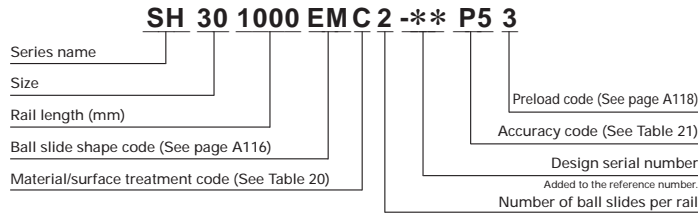
Reference number for rail of random-matching type



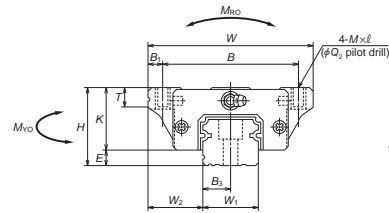
Rail							Basic load rating					Ball dia. D _w	Weight	
Width W ₁	Height H ₁	Pitch F	Mounting bolt hole d×D×h	B ₃	G (reference)	Max. length L _{0max} () for stainless	Dynamic C (N)	Static C ₀ (N)	Static moment				Ball slide (kg)	Rail (kg/m)
									M _{RO} (N·m)	M _{PO} (N·m)	M _{VO} (N·m)			
15	15	60	4.5×7.5×5.3	7.5	20	2000 (1800)	10100 13400	18800 28200	98 147	87 193	73 162	3.175	0.17 0.25	1.6
20	18	60	6×9.5×8.5	10	20	3960 (3500)	16300 21600	29600 44500	199 298	167 360	141 305	3.968	0.45 0.65	2.6
23	22	60	7×11×9	11.5	20	3960 (3500)	22400 32000	37500 62500	295 490	246 615	207 515	4.762	0.63 0.93	3.6
28	26	80	9×14×12	14	20	4000 (3500)	35500 46000	63000 91500	600 870	540 1060	450 885	5.556	1.2 1.6	5.2
34	29	80	9×14×12	17	20	4000	47500 61500	80500 117000	950 1380	780 1600	655 1340	6.35	1.7 2.4	7.2
45	38	105	14×20×17	22.5	22.5	3990	76500 94500	128000 175000	1970 2680	1550 2760	1300 2320	7.937	3 3.9	12.3
53	44	120	16×23×20	26.5	30	3960	113000 140000	181000 247000	3300 4550	2640 4800	2210 4050	9.525	5 6.5	16.9

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.

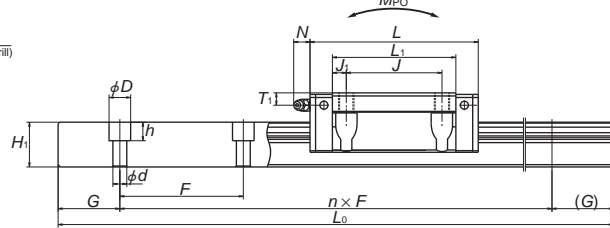
SH-EM (High-load type)
SH-GM (Super-high-load type)



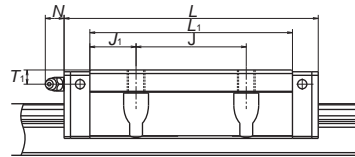
Front view of EM and GM types



Side view of EM type



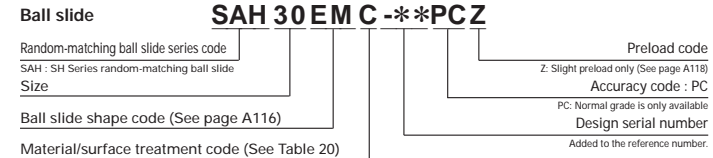
Side view of GM type



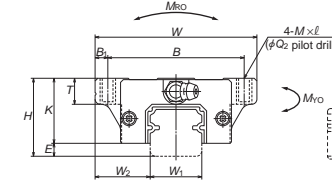
Model No.	Assembly				Ball slide												
	Height H	E	W ₂	Width W	Length L	Mounting hole							Grease fitting				
						B	J	M x pitch x l	Q ₂	B ₁	L ₁	J ₁	K	T	Hole size	T ₁	N
SH15EM SH15GM	24	4.6	16	47	55 74	38	30	M5x0.8x7	4.4	4.5	39 58	4.5 14	19.4	8	phi 3	4.5	3.3
SH20EM SH20GM	30	5	21.5	63	69.8 91.8	53	40	M6x1x9.5	5.3	5	50 72	5 16	25	10	M6x0.75	5	11
SH25EM SH25GM	36	7	23.5	70	79 107	57	45	M8x1.25x10 (M8x1.25x11.5)	6.8	6.5	58 86	6.5 20.5	29	11 (12)	M6x0.75	6	11
SH30EM SH30GM	42	9	31	90	98.6 124.6	72	52	M10x1.5x12 (M10x1.5x14.5)	8.6	9	72 98	10 23	33	11 (15)	M6x0.75	7	11
SH35EM SH35GM	48	9.5	33	100	109 143	82	62	M10x1.5x13	8.6	9	80 114	9 26	38.5	12	M6x0.75	8	11
SH45EM SH45GM	60	14	37.5	120	139 171	100	80	M12x1.75x15	10.5	10	105 137	12.5 28.5	46	13	Rc1/8	10	13
SH55EM SH55GM	70	15	43.5	140	163 201	116	95	M14x2x18	12.5	12	126 164	15.5 34.5	55	15	Rc1/8	11	13

Remarks: 1) Parenthesized dimensions are applicable to stainless steel products.
2) The external appearance of stainless steel ball slides differs from those of standard material ball slide.

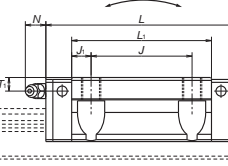
Reference number for ball slide of random-matching type



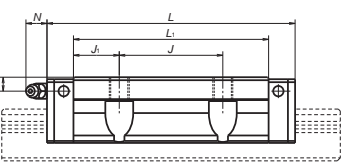
EM and GM types



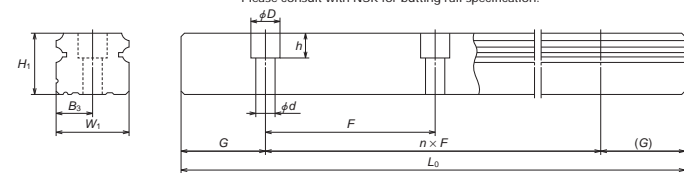
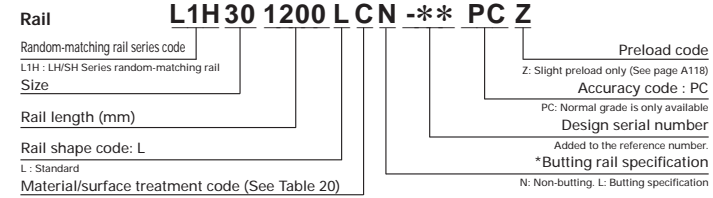
EM type



GM type



Reference number for rail of random-matching type



Rail							Basic load rating					Ball dia.	Weight	
Width W ₁	Height H ₁	Pitch F	Mounting bolt hole d x D x h	B ₃	G (reference)	Max. length L _{0max} () for stainless	Dynamic C (N)	Static C ₀ (N)	Static moment			D _w	Ball slide (kg)	Rail (kg/m)
									M _{Ro}	M _{po}	M _{Vo}			
15	15	60	4.5x7.5x5.3	7.5	20	2000 (1800)	10100 13400	18800 28200	98 147	87 193	73 162	3.175	0.17 0.25	1.6
20	18	60	6x9.5x8.5	10	20	3960 (3500)	16300 21600	29600 44500	199 298	167 360	141 305	3.968	0.45 0.65	2.6
23	22	60	7x11x9	11.5	20	3960 (3500)	22400 32000	37500 62500	295 490	246 615	207 515	4.762	0.63 0.93	3.6
28	26	80	9x14x12	14	20	4000 (3500)	35500 46000	63000 91500	600 870	540 1060	450 885	5.556	1.2 1.6	5.2
34	29	80	9x14x12	17	20	4000	47500 61500	80500 117000	950 1380	780 1600	655 1340	6.35	1.7 2.4	7.2
45	38	105	14x20x17	22.5	22.5	3990	76500 94500	128000 175000	1970 2680	1550 2760	1300 2320	7.937	3 3.9	12.3
53	44	120	16x23x20	26.5	30	3960	113000 140000	181000 247000	3300 4550	2640 4800	2210 4050	9.525	5 6.5	16.9

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.