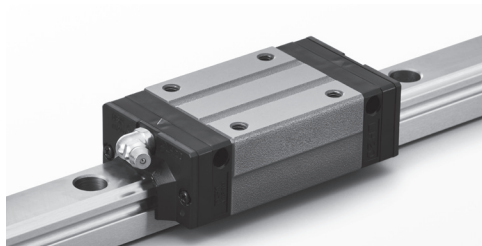


## A-5-1.2 VH Model



### 1. Features

#### (1) High-performance end seals

High-performance end seals with a multi-lip structure prevent the entry of various kinds of foreign matter.

#### (2) NSK K1-L™ lubrication unit (standard)

The outstanding lubrication support provided by NSK K1-L units further improves resistance to dust and durability. Additional NSK K1-L units can be mounted for specific usage conditions and environments.

#### (3) Tapped holes on rail bottom surface (optional)

In addition to standard mounting bolt holes (counterbores on the rail top surface), a specification for tapped holes on the rail bottom surface for enhanced dust resistance is available. (Refer to the dimension tables for details.)

#### (4) High self-aligning capability (rolling direction)

Similar to a DF arrangement of angular contact bearings, VH models offer large self-aligning capability with the internal intersection of the contact lines of the balls and grooves reducing moment rigidity.

This increases the capacity to absorb errors in installation.

#### (5) High vertical load carrying capacity

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

#### (6) High resistance against impact load

The bottom ball groove forms a Gothic arch and the center of the top and bottom grooves are offset as shown in Fig. 2.

Vertical load is generally carried by the top rows at two contact points, but with this design, the bottom rows also carry load when a large impact load is applied vertically as shown in Fig. 3. This assures high

resistance to impact load.

#### (7) High accuracy

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

#### (8) Interchangeable

Interchangeable rails and ball slides are available.

#### (9) Improve rating life dramatically

A new ball groove geometry is introduced utilizing NSK's state-of-the-art tribological and

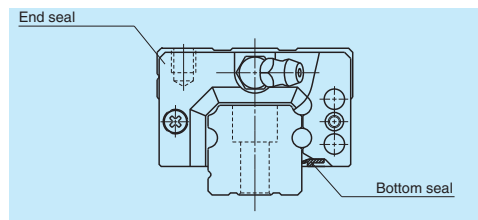


Fig. 1 VH Model

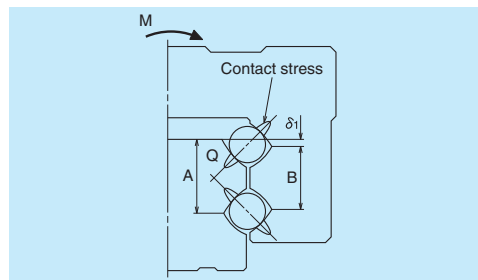


Fig. 2 Enlarged illustration of the offset Gothic arch groove

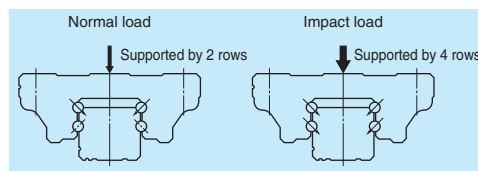


Fig. 3 When load is applied

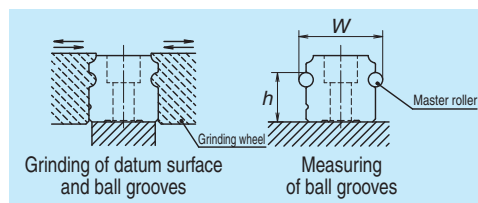


Fig. 4 Rail grinding and measuring

analytical technologies. Rating life is dramatically increased due to the optimized distribution of contact surface pressures.

Load rating capacity is 1.3 times higher than conventional products and life is doubled\*1.

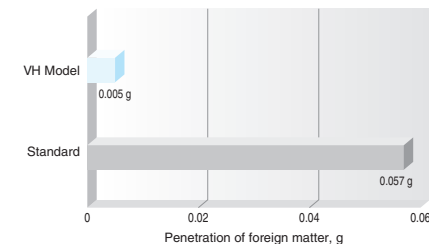
\*1: Representative values for model.

### ● Comparison with NSK standard products

**Level of fine contaminants reduced by 90% or more.** Results of dust resistance tests reveal that the entry of fine contaminants is reduced to less than one-tenth that of existing standard models due to improvements in sealing.

Test sample : VH30AN  
 Speed : 16.7 mm/sec  
 Contaminant : Graphite powder (average grain size: 0.037 mm) + Grease

(preload of 3 200 N)  
 Rail orientation : Horizontal (wall mount)  
 Speed : 400 mm/sec  
 Lubrication : AS2 grease (prepacked AS2 only)  
 Contaminant : Fine wood particles

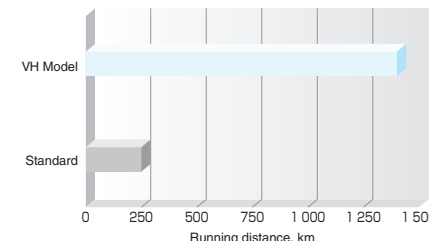


### Operating life under contaminated environments is more than 5 times longer

#### Durability test with rubber fragments

Extreme durability tests under contaminated environments using rubber fragments show that durability of the VH Model is more than five times longer than the existing standard model, as shown in the graph.

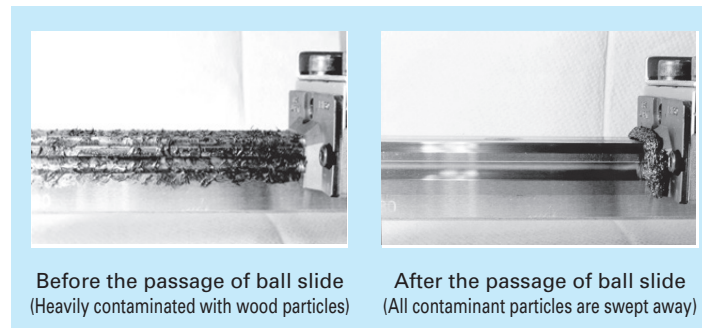
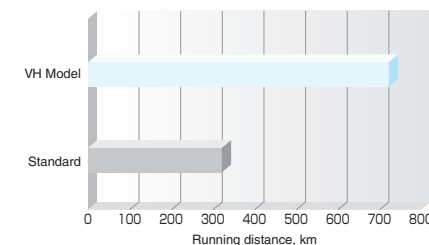
Test sample : VH30AN, preload code Z1 (preload of 245 N)  
 Rail orientation : Horizontal (wall mount)  
 Speed : 500 mm/sec  
 Lubrication : AS2 grease (prepacked AS2 only)  
 Contaminant : Rubber fragments



#### Durability test with fine wood particles

Extreme durability tests in a contaminated environment with fine wood particles show that durability of the VH Model is more than double that of the standard model, as shown in the graph.

Test sample : VH30AN



Before the passage of ball slide (Heavily contaminated with wood particles)

After the passage of ball slide (All contaminant particles are swept away)

The data shown in the catalog are the results of our tests, and no warranty is given to sealing performance in actual machine usage. Sealing performance is affected by usage environment and lubrication conditions. Dust covers and other measures to keep machinery free of dust are recommended.

2. Ball slide shape

Ball slide shape code	Shape/installation method	Type (Upper row, Rating: Lower row, Ball slide length)	
		High-load Standard	Super-high-load Long
AN BN		AN	BN
AL BL		AL	BL
EM GM		EM	GM

3. Accuracy and preload

(1) Running parallelism of ball slide

Table 1 Unit:  $\mu\text{m}$

Rail length (mm)	Preloaded assembly (not interchangeable)					Interchangeable type	
	Accuracy grade	Ultra precision P3	Super precision P4	High precision P5	Precision grade P6		Normal grade PN
over	or less						
– 50		2	2	2	4	5	5
50 – 80		2	2	3	4	5	5
80 – 125		2	2	3	4	5	5
125 – 200		2	2	3.5	5	6	6
200 – 250		2	2.5	4.5	6	7.5	7.5
250 – 315		2	2.5	5	6.5	8.5	8.5
315 – 400		2	3	5.5	7	9.5	9.5
400 – 500		2	3	6	7.5	11	11
500 – 630		2	3.5	6.5	8.5	12	12
630 – 800		2	4	7	9.5	13	13
800 – 1 000		2.5	4.5	7.5	10	15	15
1 000 – 1 250		3	5	8.5	12	16	16
1 250 – 1 600		3.5	5.5	9.5	13	17	17
1 600 – 2 000		4	6.5	11	14	19	19
2 000 – 2 500		4.5	7.5	12	16	21	21
2 500 – 3 150		5.5	8.5	13	18	23	23
3 150 – 4 000		6	9.5	14	19	25	25

(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 interchangeable type has Normal PC grade only.

• Tolerance of preloaded assembly

Table 2 Unit:  $\mu\text{m}$

Characteristics	Accuracy grade	Ultra precision P3	Super precision P4	High precision P5	Precision grade P6	Normal grade PN
Mounting height $H$		$\pm 8$	$\pm 10$	$\pm 20$	$\pm 40$	$\pm 80$
Variation of $H$ (All ball slides on a set of rails)		3	5	7	15	25
Mounting width $W_2$ or $W_3$		$\pm 10$	$\pm 15$	$\pm 25$	$\pm 50$	$\pm 100$
Variation of $W_2$ or $W_3$ (All ball slides on reference rail)		3	7	10	20	30
Running parallelism of surface C to surface A Running parallelism of surface D to surface B		Shown in Table 1, Fig. 5 and Fig. 6				

• Tolerance of interchangeable type: Normal grade PC

Table 3 Unit:  $\mu\text{m}$

Characteristics	Model No.	VH15, 20, 25, 30, 35	VH45, 55
Mounting height $H$		$\pm 20$	$\pm 30$
Variation of mounting height $H$		15 <sup>①</sup> 30 <sup>②</sup>	20 <sup>①</sup> 35 <sup>②</sup>
Mounting width $W_2$ or $W_3$		$\pm 30$	$\pm 35$
Variation of mounting width $W_2$ or $W_3$		25	30
Running parallelism of surface C to surface A Running parallelism of surface D to surface 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
With NSK K1-L lubrication unit		L3	L4	L5	L6	LN	LC
Preload	Fine clearance Z0	○	○	○	○	○	—
	Slight preload Z1	○	○	○	○	○	—
	Medium preload Z3	○	○	○	○	—	—
	Interchangeable type with fine clearance ZT	—	—	—	—	—	○
	Interchangeable type with slight preload ZZ	—	—	—	—	—	○

(4) Assembled accuracy

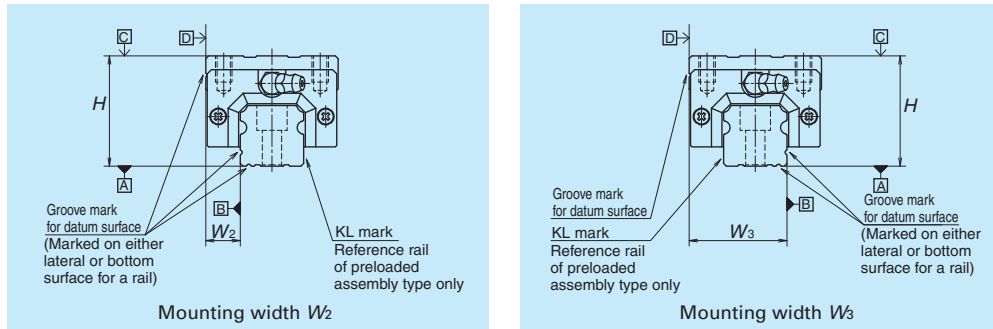


Fig. 5 Special high carbon steel

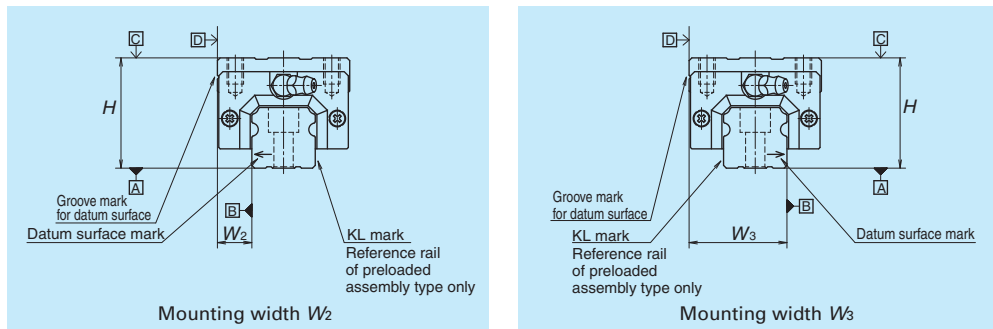


Fig. 6 Stainless steel

(5) Preload and rigidity

We offer five levels of preload: Slight preload Z1, Medium preload Z3 and Fine clearance Z0, while the interchangeable type offers Fine clearance ZT and Slight preload ZZ.

• Preload and rigidity of preloaded assembly

Table 5

Model No.	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	VH15 AN, EM	78	490	137	226	98	186
	VH20 AN, EM	147	835	186	335	137	245
	VH25 AN, AL, EM	196	1 270	206	380	147	284
	VH30 AN, AL	245	1 570	216	400	157	294
	VH30 EM	294	1 770	265	480	186	355
Super-high-load	VH35 AN, AL, EM	390	2 350	305	560	216	390
	VH45 AN, AL, EM	635	3 900	400	745	284	540
	VH55 AN, AL, EM	980	5 900	490	910	345	645
	VH15 BN, GM	98	685	196	345	137	284
	VH20 BN, GM	196	1 080	265	480	196	355
	VH25 BN, BL, GM	245	1 570	294	560	216	400
	VH30 BN, BL, GM	390	2 260	360	665	265	480
	VH35 BN, BL, GM	490	2 940	430	795	305	570
	VH45 BN, BL, GM	785	4 800	520	960	370	695
	VH55 BN, BL, GM	1 180	7 050	635	1 170	440	835

Note: Clearance for Fine clearance Z0 is 0 to 3 μm. Therefore, preload is zero.

However, Z0 of PN grade is 0 to 15 μm.

• Preload of interchangeable type

Table 6

Unit: μm

Model No.	Fine clearance ZT	Slight preload ZZ
	VH15	-4 to 15
VH20	-5 to 15	-5 to 0
VH25		-5 to 0
VH30		-7 to 0
VH35		-7 to 0
VH45		-7 to 0
VH55		-9 to 0

Note: Minus sign denotes that a value is an amount of preload (elastic deformation of balls).

4. Maximum rail length

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

Table 7 Length limitations of rails

Unit: mm

Model	Size	15	20	25	30	35	45	55
	Material							
VH	Special high carbon steel	2 000	3 960	3 960	4 000	4 000	3 990	3 960
	Stainless steel	1 800	3 500	3 500	3 500			

Note: Rails can be butted if user requirements exceed the rail length shown in the table. Please consult NSK.

5. Installation

(1) Permissible values of mounting error

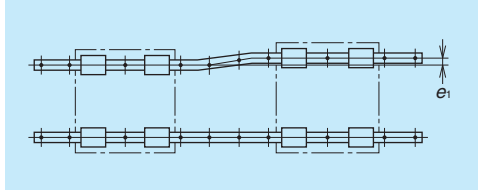


Fig. 7

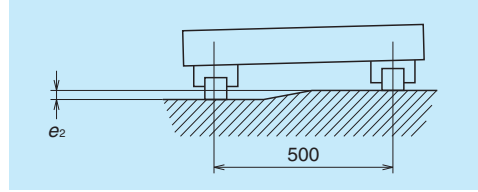


Fig. 8

Table 8

Unit:  $\mu\text{m}$

Value	Preload	Model No.						
		VH15	VH20	VH25	VH30	VH35	VH45	VH55
Permissible values for parallelism error of 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 for height error of two rails $e_2$	Z0, ZT	375 $\mu\text{m}/500\text{ mm}$						
	Z1, ZZ, Z3	330 $\mu\text{m}/500\text{ mm}$						

(2) Shoulder height of the mounting surface and corner radius r

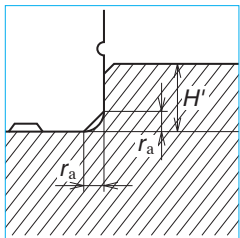


Fig. 9 Shoulder for the rail datum surface

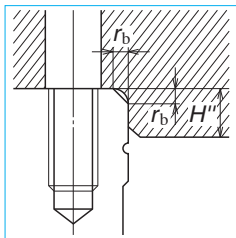


Fig. 10 Shoulder for the ball slide datum surface

Table 9

Unit: mm

Model No.	Corner radius (maximum)		Shoulder height	
	$r_a$	$r_b$	$H'$	$H''$
VH15	0.5	0.5	4	4
VH20	0.5	0.5	4.5	5
VH25	0.5	0.5	5	5
VH30	0.5	0.5	6	6
VH35	0.5	0.5	6	6
VH45	0.7	0.7	8	8
VH55	0.7	0.7	10	10

(3) Specification for tapped holes on a rail bottom surface

- Special high carbon steel is available for this specification.
- Applicable accuracy grades are precision grade (P6) and normal grades (PN and PC) only.
- The minimum rail length for production is 400 mm.
- The tapping pitch is the same as the pitch for regular mounting bolt holes. Please refer to the dimension table.

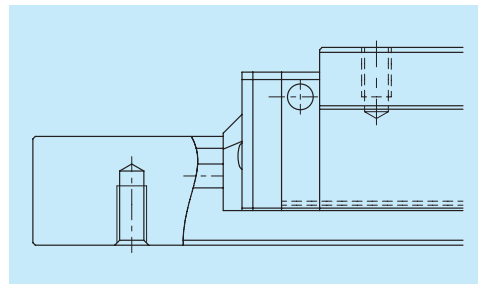


Fig. 11

6. Lubrication components

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

(1) Types of lubrication accessories

Fig. 12 and Table 10 show grease fittings and tube fittings.

We provide lubrication accessories with an extended thread body length (L) for the addition of dust-resistant accessories such as NSK K1-L lubrication units, double seals and protectors. We provide suitable lubrication accessories for special dust-resistant requirements upon request.

NSK can also provide extended length threads for ease of replenishment.

Please contact NSK if stainless lubrication accessories are required.

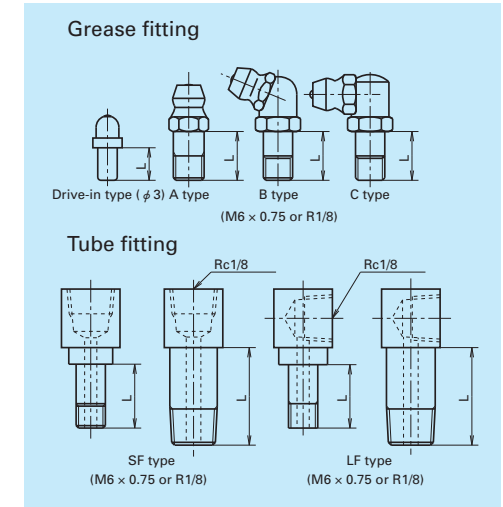


Fig. 12 Grease fitting and tube fitting

(2) Mounting position of lubrication accessories

The standard position for grease fittings is at the end face of the ball slide, but we can mount them on the side of the end cap as an option. (Fig. 13)

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

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

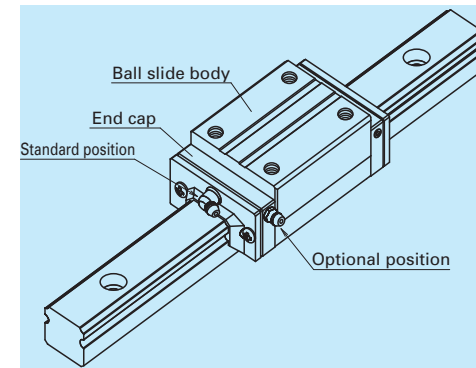


Fig. 13 Mounting position of lubrication accessories

Table 10

Unit: mm

Model No.	Dust-resistant specification	Dimension L		
		Grease fitting / Drive-in type	SF type	LF type
VH15	Standard*	10	-	-
	Double seal	**	-	-
	Protector	**	-	-
VH20	Standard*	12	-	-
	Double seal	18	-	-
	Protector	18	-	-
VH25	Standard*	12	15	16
	Double seal	18	23	24.5***
	Protector	18	17	18
VH30	Standard*	14	18	17.5
	Double seal	22	25	24.5
	Protector	22	19.5	19
VH35	Standard*	14	15	15
	Double seal	22	25	24.5
	Protector	22	21.5	22
VH45	Standard*	18	22	21.5
	Double seal	22	32	32
	Protector	28	28	30
VH55	Standard*	18	20	20
	Double seal	22	32	32
	Protector	28	28	30

\*) NSK K1-L units are mounted as a standard specification for VH models.

\*\*) A connector is required for grease fitting. Please contact NSK.

\*\*\*) Only available for AN and BN type ball slides.

7. Dust-resistant components

(1) Standard specification

Under normal applications, the VH model can be used without modification thanks to its dust resistance. To keep foreign matter from entering inside the ball slide, the VH model has an end seal on both ends and bottom seals at the bottom.

Two NSK K1-L lubrication units, one at each end, are installed as standard.

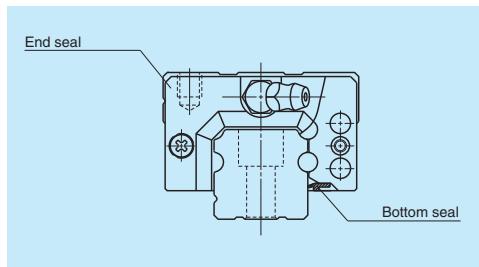


Fig. 14

Table 11 Seal friction per ball slide (maximum value)

Model	Size	Unit: N						
		15	20	25	30	35	45	55
VH		11	13	14	17	23	33	44

(2) Double seal and protector

For VH Models, double-seals and protectors can be installed only before shipping from the factory. Please consult with NSK when double seals or protectors are required.

Table 12 shows the ball slide length when a double seal set and a protector are installed.

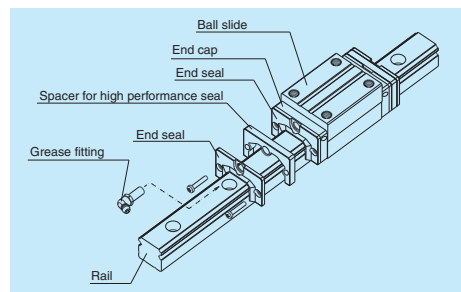


Fig. 15 Double seal

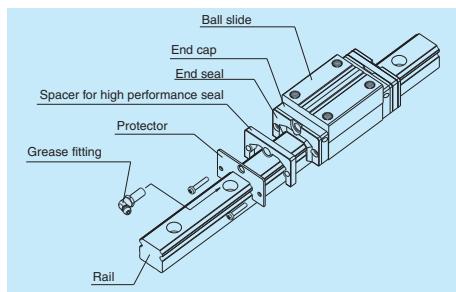


Fig. 16 Protector

Table 12 Dimensions with optional dust-resistant components installed

Unit: mm

Model No.	Ball slide length	Ball slide shape code	Ball slide length L		
			Standard	Double seal installation	Protector installation
VH15	Standard type	AN, EM	70.6	81.6	77
	Long type	BN, GM	89.6	100.6	96
VH20	Standard type	AN, EM	87.4	100.4	94.2
	Long type	BN, GM	109.4	122.4	116.2
VH25	Standard type	AN, AL, EM	97	110	104.4
	Long type	BN, BL, GM	125	138	132.4
VH30	Standard type	AN, AL, EM	104.4	120.4	114.8
	Long type	BN, BL, GM	143.4	159.4	153.8
VH35	Standard type	AN, AL, EM	128.8	144.8	139.2
	Long type	BN, BL, GM	162.8	178.8	173.2
VH45	Standard type	AN, AL, EM	161.4	180.4	174.2
	Long type	BN, BL, GM	193.4	212.4	206.2
VH55	Standard type	AN, AL, EM	185.4	204.4	198.2
	Long type	BN, BL, GM	223.4	242.4	236.2

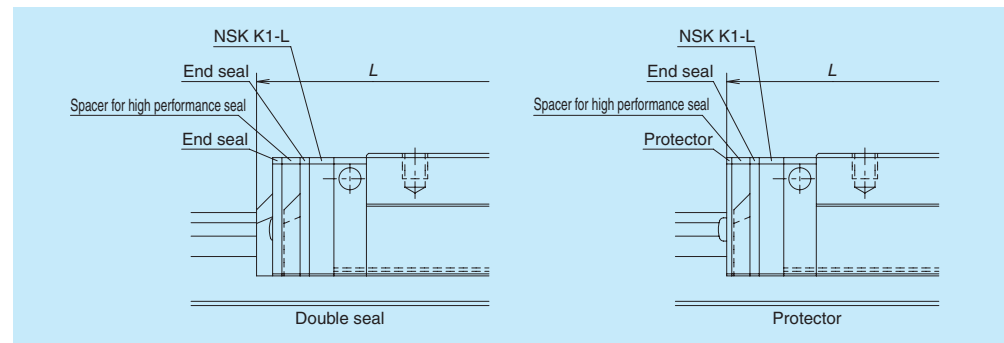


Fig. 17

(3) Caps to plug the rail mounting bolt hole

Table 13 Caps to plug rail bolt hole

Model No.	Bolt to secure rail	Cap reference No.	Quantity /case
VH15	M4	LG-CAP/M4	20
VH20	M5	LG-CAP/M5	20
VH25	M6	LG-CAP/M6	20
VH30, VH35	M8	LG-CAP/M8	20
VH45	M12	LG-CAP/M12	20
VH55	M14	LG-CAP/M14	20

(4) Inner seal

Inner seals are only available for the models shown below.

Table 14

Model	Model No.
VH	VH20, VH25, VH30, VH45, VH55

8. Design Precautions

Because the product is used under severe operating conditions that require high performance end seals, please inform NSK about your service conditions using the technical data sheet on page A152.



**8. Reference number**

A reference number (designation) is set and indicated on the specification drawing for an individual NSK linear guide when its specifications are finalized.

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**

**VH 30 1000 ANC 2 -\*\* L5 3**

Model name	Preload code (See page A137.)
Size	0: Z0, 1: Z1, 3: Z3
Rail length (mm)	Accuracy code (See Table 16.)
Ball slide shape code (See page A135.)	Design serial number
Material/surface treatment code (See Table 15.) C: Special high carbon steel (NSK standard), K: Stainless steel	Added to the reference number. Number of ball slides per rail

**(2) Reference number for interchangeable type**

**Ball slide** **VAH 30 ANC -\*\*LCZ**

Interchangeable ball slide model code VAH: VH Model interchangeable ball slide	Preload code T: Fine clearance. Z: Slight preload (See page A137.)
Size	Accuracy code (see Table 16) LC: Normal grade
Ball slide shape code (See page A135.)	Design serial number
Material/surface treatment code (See Table 15.)	Added to the reference number.

**Rail** **V1H30 1000 LCN -\*\* PC Z**

Interchangeable rail model code V1H: VH Model interchangeable rail	Preload code (See page A137.) T: Fine clearance. Z: Slight preload
Size	Accuracy code: PC PC: Normal grade is only available.
Rail length (mm)	Design serial number
Rail shape code: L L: Standard	Added to the reference number. *Butting rail specification
Material/surface treatment code (See Table 15.)	N: Non-butting. L: Butting specification

\*Please consult with NSK for butting rail specification.

When interchangeable rails and slides are assembled, reference number coding is the same as that for preloaded assemblies. However, only preload codes T (fine clearance) and Z (slight preload) may be used (Refer to Page A137.)

**Table 15 Material/surface treatment code**

Code	Description
C	Special high carbon steel (NSK standard) + counterbores on a rail top surface
K	Stainless steel + counterbores on a rail top surface
D	Special high carbon steel with surface treatment + counterbores on a rail top surface
H	Stainless steel with surface treatment + counterbores on a rail top surface
V	Special high carbon steel (NSK standard) + tapped holes on a rail bottom surface
W	Special high carbon steel with surface treatment + tapped holes on a rail bottom surface
Z	Other, special

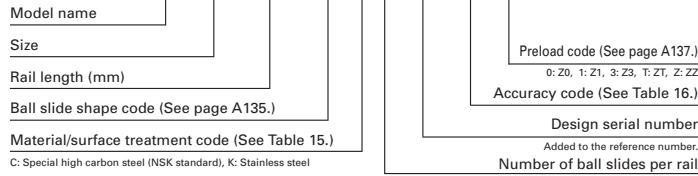
**Table 16 Accuracy code**

Accuracy	With NSK K1-L
Ultra precision grade	L3
Super precision grade	L4
High precision grade	L5
Precision grade	L6
Normal grade	LN
Normal grade (interchangeable type)	LC

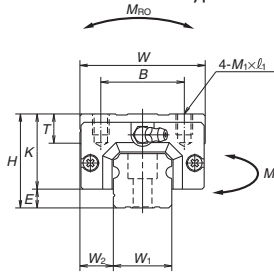
Note: Refer to page A38 for details on NSK K1-L lubrication units.

**9. Dimensions**  
**VH-AN (High-load / Standard)**  
**VH-BN (Super-high-load / Long)**

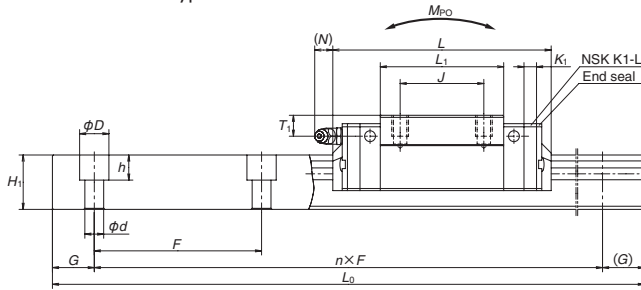
**VH 30 1000 ANC 2 -\*\* LC Z**



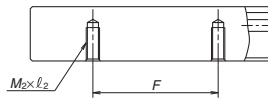
Front view of AN and BN type



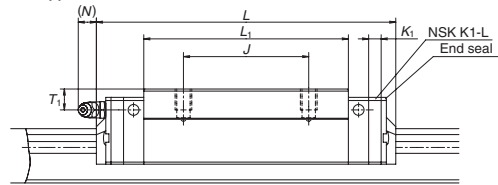
Side view of AN type



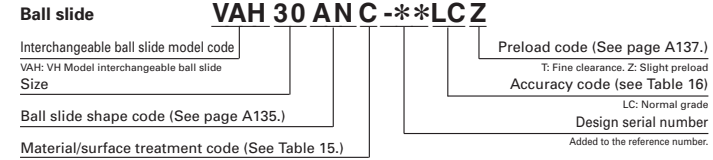
Specification for tapped holes on a rail bottom face



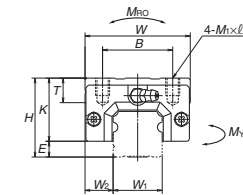
Side view of BN type



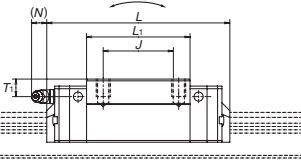
**Reference number for ball slide of interchangeable type**



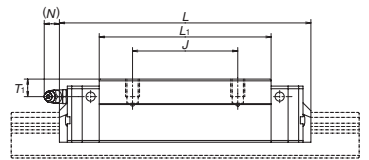
AN and BN types



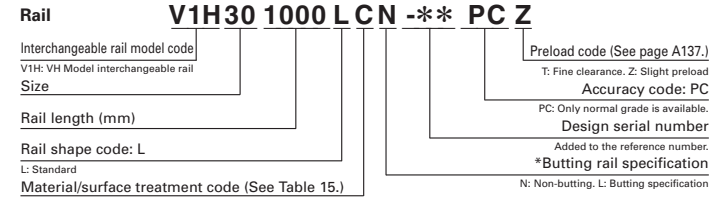
AN type



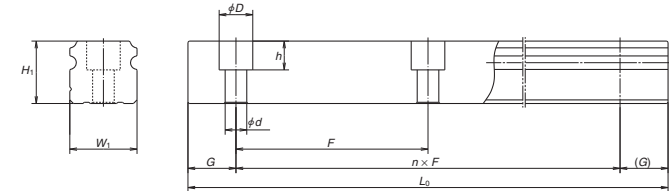
BN type



**Reference number for rail of interchangeable type**



\*Please consult with NSK for butting rail specification.



Unit: mm

Model No.	Assembly		Ball slide											Width	Height		
	Height	Width	Length	Mounting hole			Grease fitting					Width	Height				
				B	J	M × pitch × ℓ	L <sub>1</sub>	K	T	K <sub>1</sub>	Hole size					T <sub>1</sub>	N
<b>VH15AN</b>	28	4.6	9.5	34	70.6 ( 77)	26	26	M4×0.7×6	39	23.4	8	4.5	φ 3	8.5	1 ( 8.2)	15	15
<b>VH15BN</b>					89.6 ( 96)				58								
<b>VH20AN</b>	30	5	12	44	87.4 ( 94.2)	32	36	M5×0.8×6	50	25	12	4.5	M6×0.75	5	11.1 (12.3)	20	18
<b>VH20BN</b>					109.4 (116.2)				72								
<b>VH25AN</b>	40	7	12.5	48	97 (104.4)	35	35	M6×1×9	58	33	12	5	M6×0.75	10	9.6 (12.9)	23	22
<b>VH25BN</b>					125 (132.4)				86								
<b>VH30AN</b>	45	9	16	60	104.4 (114.8)	40	40	M8×1.25×10	59	36	14	5	M6×0.75	10	11.4 (14.2)	28	26
<b>VH30BN</b>					143.4 (153.8)				98								
<b>VH35AN</b>	55	9.5	18	70	128.8 (139.2)	50	50	M8×1.25×12	80	45.5	15	5.5	M6×0.75	15	10.9 (13.7)	34	29
<b>VH35BN</b>					162.8 (173.2)				114								
<b>VH45AN</b>	70	14	20.5	86	161.4 (174.2)	60	60	M10×1.5×17	105	56	17	6.5	Rc1/8	20	12.5 (14.1)	45	38
<b>VH45BN</b>					193.4 (206.2)				137								
<b>VH55AN</b>	80	15	23.5	100	185.4 (198.2)	75	75	M12×1.75×18	126	65	18	6.5	Rc1/8	21	12.5 (14.1)	53	44
<b>VH55BN</b>					223.4 (236.2)				164								

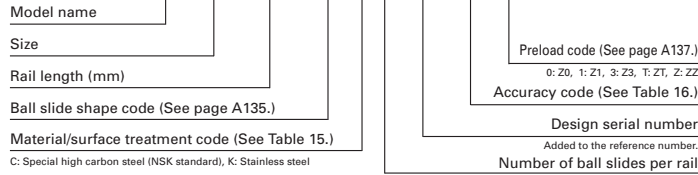
- Notes: 1) Figures inside ( ) apply when equipped with a protector.  
 2) VH models do not have a ball retainer. Note that balls will fall out when the ball slide is removed from the rail.  
 3) The external appearance of stainless steel ball slides differs slightly from that of carbon steel ball slides.

Pitch	Rail		G	Max. length L <sub>0max</sub> ( ) for stainless	Basic load ratings						Weight			
	Mounting bolt hole	Tapped hole			<sup>a)</sup> Dynamic		Static		Static moment (N-m)		Ball slide (kg)	Rail (kg/m)		
					[50km] C <sub>50</sub> (N)	[100km] C <sub>100</sub> (N)	C <sub>0</sub> (N)	M <sub>Ro</sub>	M <sub>Vo</sub>	M <sub>Vo</sub>				
60	4.5×7.5×5.3	M5×0.8×8	20	2 000 [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	M6×1×10	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	M6×1×12	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	M8×1.25×15	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	M8×1.25×17	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	M12×1.75×24	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	M14×2×24	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	

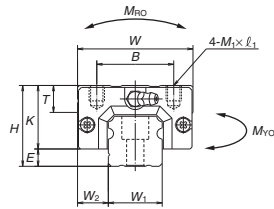
- 4) Basic load ratings comply with ISO standards (ISO 14728-1, 14728-2).  
 C<sub>50</sub>: the basic dynamic load rating for 50 km rated fatigue life C<sub>100</sub>: the basic dynamic load rating for 100 km rated fatigue life  
 The basic static load rating shows static permissible load.

VH-AL (High-load / Standard)  
VH-BL (Super-high-load / Long)

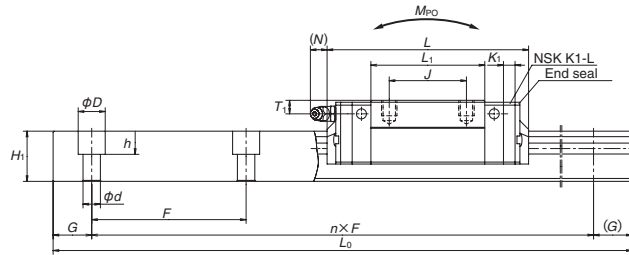
VH 30 1000 AL C 2 -\*\* LC Z



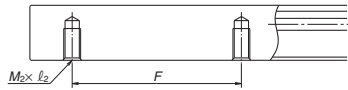
Front view of AL and BL type



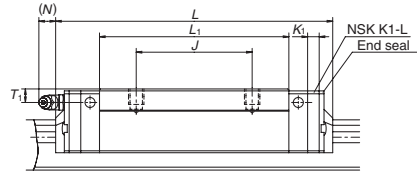
Side view of AL type



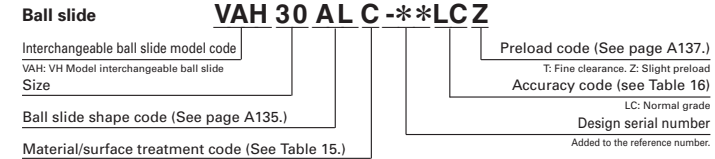
Specification for tapped holes on a rail bottom face



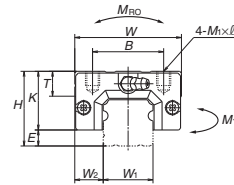
Side view of BL type



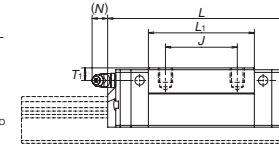
Reference number for ball slide of interchangeable type



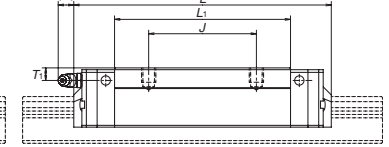
AL and BL types



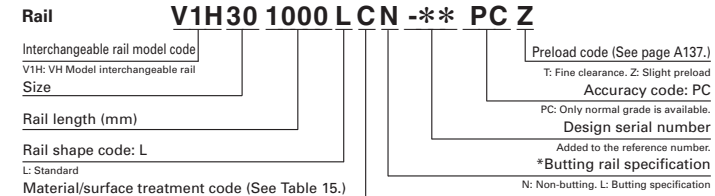
AL type



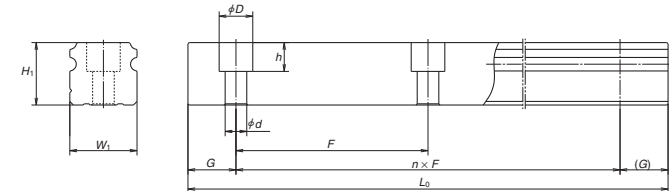
BL type



Reference number for rail of interchangeable type



\*Please consult with NSK for butting rail specification.



Unit: mm

Model No.	Assembly		Ball slide											Width	Height		
	Height	Width	Length	Mounting hole			Grease fitting					Width	Height				
				B	J	M x pitch x l	L <sub>1</sub>	K	T	K <sub>1</sub>	Hole size					T <sub>1</sub>	N
VH25AL VH25BL	36	7	12.5	48	97 (104.4) 125 (132.4)	35	35 50	M6x1x6	58 86	29	12	5	M6x0.75	6	9.6 (12.9)	23	22
VH30AL VH30BL	42	9	16	60	104.4 (114.8) 143.4 (153.8)	40	40 60	M8x1.25x8	59 98	33	14	5	M6x0.75	7	11.4 (14.2)	28	26
VH35AL VH35BL	48	9.5	18	70	128.8 (139.2) 162.8 (173.2)	50	50 72	M8x1.25x8	80 114	38.5	15	5.5	M6x0.75	8	10.9 (13.7)	34	29
VH45AL VH45BL	60	14	20.5	86	161.4 (174.8) 193.4 (206.2)	60	60 80	M10x1.5x10	105 137	46	17	6.5	Rc1/8	10	12.5 (14.1)	45	38
VH55AL VH55BL	70	15	23.5	100	185.4 (198.2) 223.4 (236.2)	75	75 95	M12x1.75x13	126 164	55	15	6.5	Rc1/8	11	12.5 (14.1)	53	44

Notes: 1) Figures inside ( ) apply when equipped with a protector.

2) VH models do not have a ball retainer. Note that balls will fall out when the ball slide is removed from the rail.

3) The external appearance of stainless steel ball slides differs slightly from that of carbon steel ball slides.

Rail		Basic load ratings										Weight		
Pitch	Mounting bolt hole	Tapped hole	G	Max. length L <sub>0max</sub> (L <sub>1</sub> ) for stainless	Dynamic		Static moment (N-m)				Ball slide (kg)	Rail (kg/m)		
					[50km]	[100km]	C <sub>0</sub>	M <sub>R0</sub>	M <sub>P0</sub>				M <sub>V0</sub>	
					C <sub>50</sub> (N)	C <sub>100</sub> (N)			One slide	Two slides			One slide	Two slides
60	7x11x9	M6x1x12	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	9x14x12	M8x1.25x15	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	
80	9x14x12	M8x1.25x17	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	14x20x17	M12x1.75x24	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	
120	16x23x20	M14x2x24	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

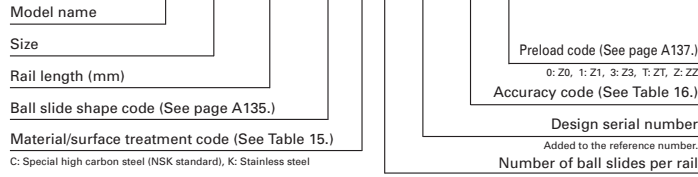
4) Basic load ratings comply with ISO standards (ISO 14728-1, 14728-2).

C<sub>50</sub>: the basic dynamic load rating for 50 km rated fatigue life C<sub>100</sub>: the basic dynamic load rating for 100 km rated fatigue life The basic static load rating shows static permissible load.

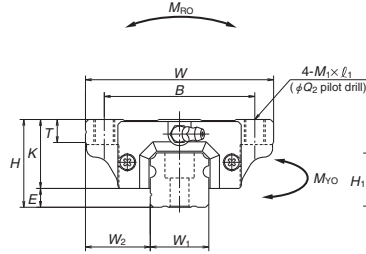


VH-EM (High-load / Standard)  
VH-GM (Super-high-load / Long)

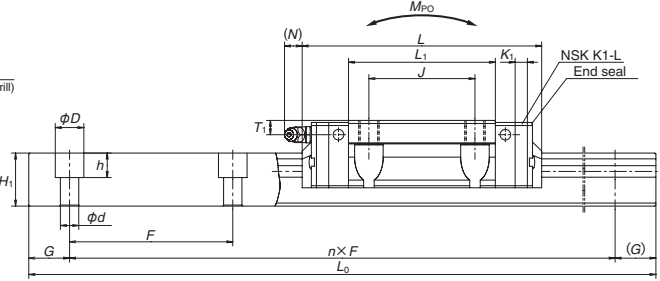
VH 30 1000 EMC 2 -\*\* LC Z



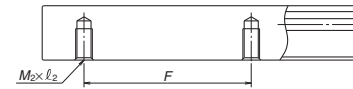
Front view of EM and GM type



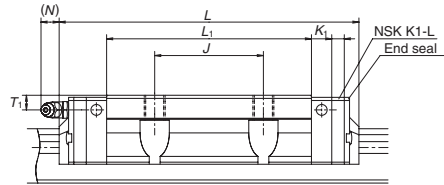
Side view of EM type



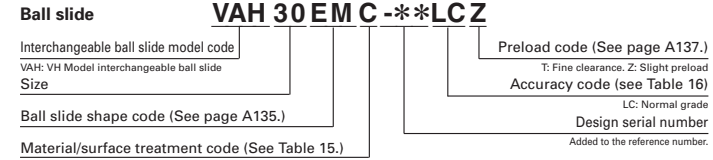
Specification for tapped holes on a rail bottom face



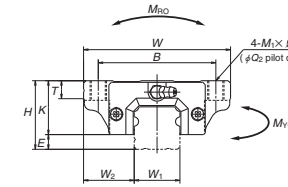
Side view of GM type



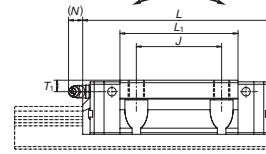
Reference number for ball slide of interchangeable type



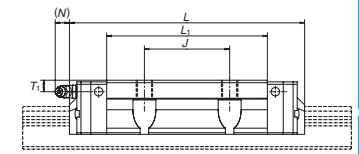
EM and GM types



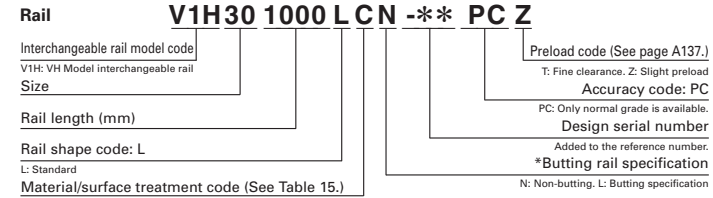
EM type



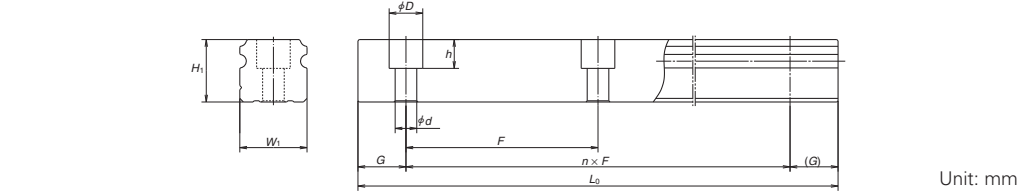
GM type



Reference number for rail of interchangeable type



\*Please consult with NSK for butting rail specification.



Unit: mm

Model No.	Assembly		Ball slide													Width	Height	
	Height	Width	Length	Mounting hole				Grease fitting					Width	Height				
				H	E	W <sub>2</sub>	W	L	B	J	Q <sub>1</sub> × l <sub>1</sub>	Q <sub>2</sub>			L <sub>1</sub>			K
VH15EM	24	4.6	16	47	70.6 ( 77 )	38	30	M5×0.8×7	4.4	39	19.4	8	4.5	φ3	4.5	1 ( 8.2 )	15	15
VH15GM					89.6 ( 96 )					58								
VH20EM	30	5	21.5	63	87.4 ( 94.2 )	53	40	M6×1×9.5	5.3	50	25	10	4.5	M6×0.75	5	11.1 (12.3)	20	18
VH20GM					109.4 (116.2)					72								
VH25EM	36	7	23.5	70	97 (104.4)	57	45	M8×1.25×10	6.8	58	29	11	5	M6×0.75	6	9.6 (12.9)	23	22
VH25GM					125 (132.4)			[M8×1.25×11.5]		86		[12]						
VH30EM	42	9	31	90	117.4 (127.8)	72	52	M10×1.5×12	8.6	72	33	11	5	M6×0.75	7	11.4 (14.2)	28	26
VH30GM					143.4 (153.8)			[M10×1.5×14.5]		98		[15]						
VH35EM	48	9.5	33	100	128.8 (139.2)	82	62	M10×1.5×13	8.6	80	38.5	12	5.5	M6×0.75	8	10.9 (13.7)	34	29
VH35GM					162.8 (173.2)					114								
VH45EM	60	14	37.5	120	161.4 (174.2)	100	80	M12×1.75×15	10.5	105	46	13	6.5	Rc1/8	10	12.5 (14.1)	45	38
VH45GM					193.4 (206.2)					137								
VH55EM	70	15	43.5	140	185.4 (198.2)	116	95	M14×2×18	12.5	126	55	15	6.5	Rc1/8	11	12.5 (14.1)	53	44
VH55GM					223.4 (236.2)					164								

- Notes: 1) Figures inside ( ) apply when equipped with a protector.  
2) Figures inside [ ] apply to stainless steel products.  
3) VH models do not have a ball retainer. Note that balls will fall out when the ball slide is removed from the rail.  
4) The external appearance of stainless steel ball slides differs slightly from that of carbon steel ball slides.

Pitch	Rail		G	Max. length L <sub>0max</sub> ( ) for stainless	Basic load ratings						Weight		
	Mounting bolt hole	Tapped hole			Dynamic		Static		Static moment (N-m)		Ball slide (kg)	Rail (kg/m)	
					[50km]	[100km]	C <sub>0</sub>	M <sub>RO</sub>	M <sub>PO</sub>	M <sub>VO</sub>			
60	4.5×7.5×5.3	M5×0.8×8	20	2 000 [1 800]	14 200	11 300	20 700	108	94.5	575	79.5	480	0.17
60	6×9.5×8.5	M6×1×10	20	3 960 [3 500]	23 700	18 800	32 500	219	185	1 140	155	955	0.45
60	7×11×9	M6×1×12	20	3 960 [3 500]	33 500	26 800	46 000	360	320	1 840	267	1 540	0.63
80	9×14×12	M8×1.25×15	20	4 000 [3 500]	47 000	37 500	63 000	600	505	3 150	425	2 650	1.2
80	9×14×12	M8×1.25×17	20	4 000	61 000	48 500	91 500	870	1 030	5 600	865	4 700	1.6
105	14×20×17	M12×1.75×24	22.5	3 990	62 500	49 500	80 500	950	755	4 500	630	3 800	1.7
120	16×23×20	M14×2×24	30	3 960	81 000	64 500	117 000	1 380	1 530	8 350	1 280	7 000	2.4
					107 000	84 500	140 000	2 140	1 740	9 750	1 460	8 150	3.0
					131 000	104 000	187 000	2 860	3 000	15 600	2 520	13 100	3.9
					158 000	125 000	198 000	3 600	3 000	16 300	2 510	13 700	5.0
					193 000	153 000	264 000	4 850	5 150	26 300	4 350	22 100	6.5

- 5) Basic load ratings comply with ISO standards (ISO 14728-1, 14728-2).  
C<sub>50</sub>: the basic dynamic load rating for 50 km rated fatigue life C<sub>100</sub>: the basic dynamic load rating for 100 km rated fatigue life  
The basic static load rating shows static permissible load.