

Fig. 1

1. Features

(1) Ideal for use of single rail

The PE Series linear guides are miniature and wide rail type. Thanks to the wide rail, load carrying capacity is high against moment load from rolling direction.

(2) Motion performance

Newly designed recirculation component facilitates smooth circulation of steel balls.

(3) Lightweight

The ball slide is fabricated to be approximately 20% lighter than that of the LE Series by the application of resin to a part of its body.

(4) Reduced noise intensity

Resin components applied in ball circulating circuits reduce collision noise between steel balls and the inner wall of circulating circuits.

(5) Low dust generation

The structure is designed to prevent dust generation.

(6) Excellent dust-proofing

It is designed to minimize the clearance between the side of rails and the inner walls of the slide, and prevent foreign matters from entering the ball slide.

(7) High corrosion resistance

High corrosion-resistant martensite stainless steel incorporated as a standard feature provides excellent resistance to corrosion.

(8) Easy to handle

Safety design includes a retainer that prevents steel balls from dropping out of the ball slide even when the slide is removed from the rail.

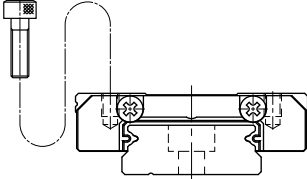
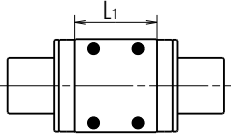
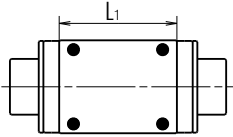
(9) Long-term maintenance-free

Equipped with NSK K1 Lubrication Unit realizes long-term, maintenance-free use.

(10) Fast delivery

Lineup of random-matching rails and ball slides in the series supports random matching and facilitates fast delivery. (PE09 to PE15)

2. Ball slide shape

Ball slide Model	Shape/installation method	Type (Upper row, Rating: Lower row, Ball slide length)	
		Standard type	High-load type
		Standard	Long
AR TR UR BR		AR, TR 	UR, BR 

3. Accuracy and preload

(1) Running parallelism of ball slide

Table 1

Unit: μm

Rail length (mm)		Preloaded assembly type (not random matching)				Random-matching type
		Super precision P4	High precision P5	Precision grade P6	Normal grade PN	Normal grade PC
over	or less					
-	50	2	2	4.5	6	6
50	- 80	2	3	5	6	6
80	- 125	2	3.5	5.5	6.5	6.5
125	- 200	2	4	6	7	7
200	- 250	2.5	5	7	8	8
250	- 315	2.5	5	8	9	9
315	- 400	3	6	9	11	11
400	- 500	3	6	10	12	12
500	- 630	3.5	7	12	14	14
630	- 800	4.5	8	14	16	16
800	- 1 000	5	9	16	18	18
1 000	- 1 250	6	10	17	20	20

(2) Accuracy standard

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

Table 2 shows the accuracy standard for the preloaded assembly type while Table 3 shows the accuracy standard for the random-matching types.

› Tolerance of preloaded assembly

Table 2

Unit: μm

Characteristics	Accuracy grade	Super precision P4	High precision P5	Precision grade P6	Normal grade PN
Mounting height H		± 10	± 15	± 20	± 40
Variation of H (All ball slides on a set of rails)		5	7	15	25
Mounting width W_2 or W_3		± 15	± 20	± 30	± 50
Variation of W_2 or W_3 (All ball slides on reference rail)		7	10	20	30
Running parallelism of surface C to surface A Running parallelism of surface D to surface B		Shown in Table 1 and Fig. 2			

› Tolerance of random-matching type: Normal grade PC

Table 3

Unit: μm

Characteristics	Model No.
Mounting height H	± 20
Variation of mounting height H	15① 30②
Mounting width W_2 or W_3	± 20
Variation of mounting width W_2 or W_3	20
Running parallelism of surface C to surface A Running parallelism of surface D to surface B	Shown in Table 1 and Fig. 2

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

(3) Assembled accuracy

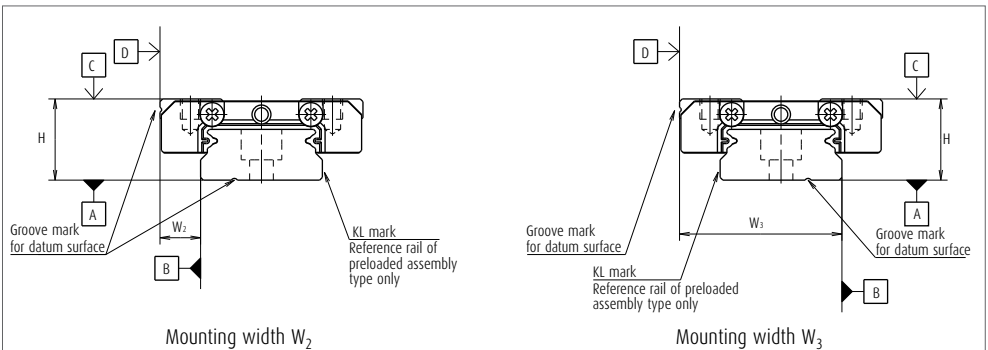


Fig. 2

(4) Preload and rigidity

We offer three levels of preload: Slight preload Z1 and Fine clearance Z0, along with random-matching type of Fine clearance ZT. Values for preload and rigidity of the preloaded assembly types are shown in **Table 4**. Rigidities are for the median of the preload range.

› Preload and rigidity of preloaded assembly

Table 4

Model No.		Preload (N)	Rigidity (N/μm)
		Slight preload (Z1)	Slight preload (Z1)
Standard type	PE05AR	0 - 28	45
	PE07TR	0 - 29	46
	PE09TR	0 - 37	61
	PE12AR	0 - 40	63
	PE15AR	0 - 49	66
High-load type	PE09UR	0 - 54	86
	PE12BR	0 - 59	97
	PE15BR	0 - 75	114

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

› Clearance of random-matching typ

Table 5

Unit: μm

Model No.		Fine clearance ZT
Standard type	PE09TR	3 or less
	PE12AR	3 or less
	PE15AR	3 or less
High-load type	PE09UR	5 or less
	PE12BR	5 or less
	PE15BR	5 or less

4. Maximum rail length

Table 6 shows the limitations of rail length. However, the limitations vary by accuracy grades.

Table 6 Length limitation of rails

Unit: mm

Series	Material \ Size	05	07	09	12	15
		PE	Stainless steel	150	600	800

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

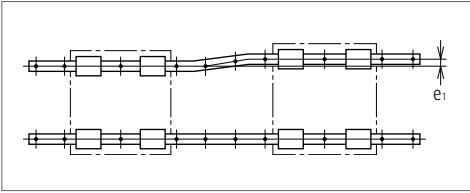


Fig. 3

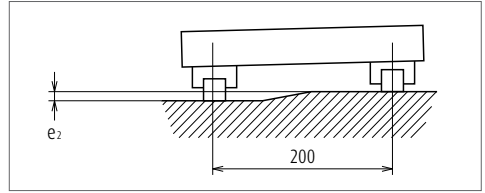


Fig. 4

Table 7

Unit: μm

Value	Preload	Model No.				
		PE05	PE07	PE09	PE12	PE15
Permissible values of parallelism in two rails e_1	Z0, ZT	10	12	15	18	22
	Z1	5	7	10	13	17
Permissible values of parallelism (height) in two rails e_2	Z0, ZT	50 $\mu\text{m}/200\text{ mm}$				
	Z1	35 $\mu\text{m}/200\text{ mm}$				

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

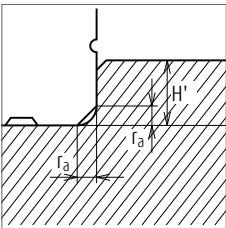


Fig. 5 Shoulder for the rail datum surface

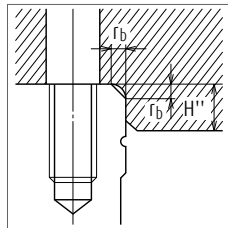


Fig. 6 Shoulder for the ball slide datum surface

Table 8

Unit: mm

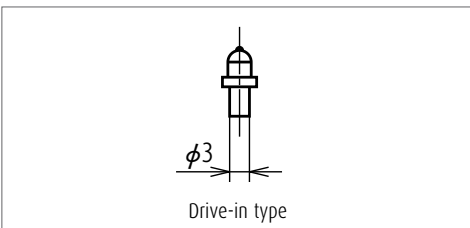
Model No.	Corner radius (maximum)		Shoulder height	
	r_a	r_b	H'	H''^*
PE05	0.2	0.2	1.1	2.5
PE07	0.2	0.3	1.7	3
PE09	0.3	0.3	3.5	2.8
PE12	0.3	0.3	3.5	3.2
PE15	0.3	0.5	3.5	4.1

*) H'' is the minimum recommended value based on the dimension T in dimension table.

6. Lubrication accessory

Model of PE15 can select drive-in type grease fitting as an option.

For the model of PE05 to PE12, apply grease directly to the ball grooves of rail using a point nozzle.



7. Dust-proof components

(1) Standard specification

End seal: Provided to both ends of the ball slide as a standard feature.

Seal friction per standard ball slide is shown in **Table 9**.

Table 9 Seal friction per ball slide (maximum value)

Unit: N

Series \ Size	05	07	09	12	15
PE	0.4	0.4	0.8	1	1.2

(2) NSK K1 lubrication unit

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

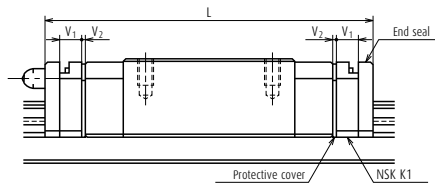


Table 10

Unit: mm

Model No.	Ball slide length	Ball slide model	Standard ball slide length	Ball slide length equipped with two NSK K1 L	Thickness of NSK K1, V ₁	Thickness of protective cover, V ₂
PE05	Standard	AR	24.1	28.9	2	0.4
PE07	Standard	TR	31.1	37.1	2.5	0.5
PE09	Standard	TR	39.8	46.8	3	0.5
PE09	Long	UR	51.2	58.2	3	0.5
PE12	Standard	AR	45	53	3.5	0.5
PE12	Long	BR	60	68	3.5	0.5
PE15	Standard	AR	56.6	66.2	4	0.8
PE15	Long	BR	76	85.6	4	0.8

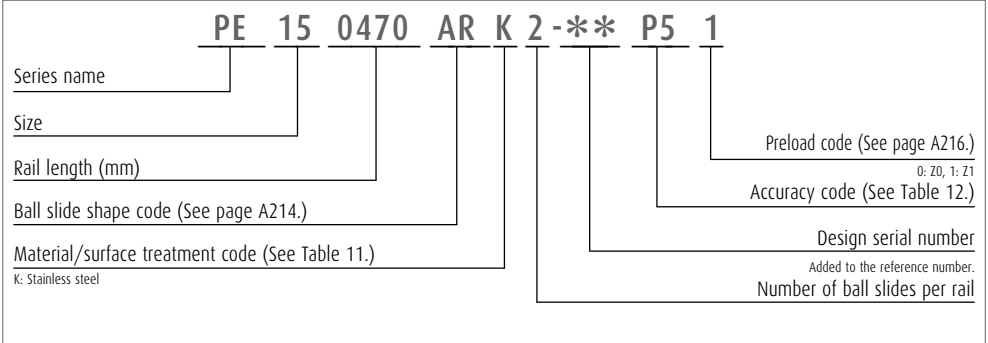
Note Ball slide length equipped with NSK K1 =
(Standard ball slide length) + (Thickness of NSK K1, V₁ × Number of NSK K1) +
(Thickness of the protective cover V₂ × 2)

8. Reference number

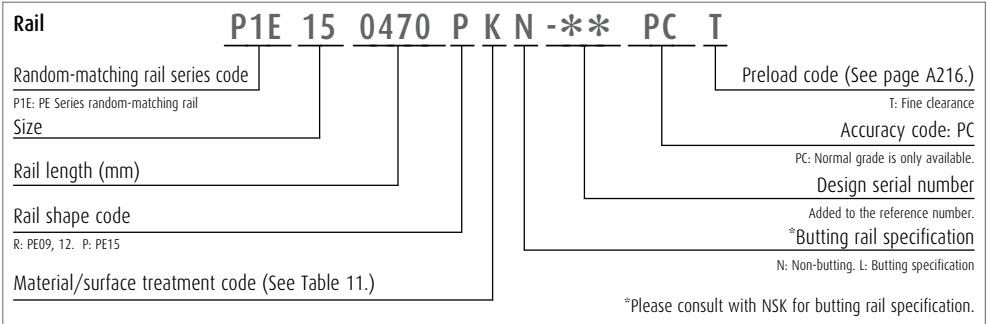
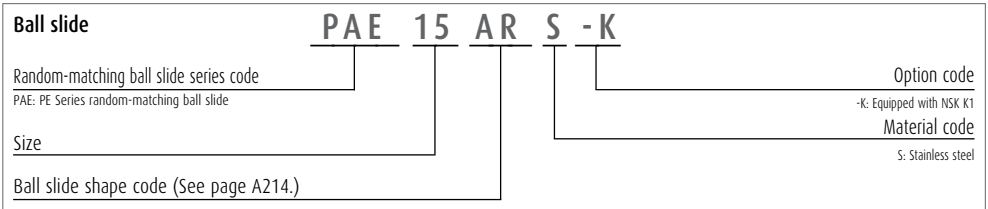
Reference numbers shall be set to individual NSK linear guide when its specifications are finalized, and it is indicated on its specification drawing.

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



(2) Reference number for random-matching type



Reference number coding for the assembly of random-matching type is the same as that of the preloaded assembly. However, only preload code of "Fine clearance T" is available (refer to page A216).

Table 11 Material/surface treatment code

Code	Description
K	Stainless steel
H	Stainless steel with surface treatment
Z	Other, special

Table 12 Accuracy code

Accuracy	Standard (Without NSK K1)	With NSK K1	With NSK K1 for food and medical equipment
Super precision grade	P4	K4	F4
High precision grade	P5	K5	F5
Precision grade	P6	K6	F6
Normal grade	PN	KN	FN
Normal grade (random-matching type)	PC	KC	FC

Note Refer to pages A38 and A61 for NSK K1 lubrication unit.