

Developed for precision positioning tables, supporting cutting-edge equipment, including semiconductor manufacturing and medical devices

2 Reference number

Reference numbers will be used as reference before finalizing all specifications. Please specify the reference number, except design serial number, to identify the product when ordering, requesting estimates, or inquiring about specifications from NSK.

2.1 Preloaded assembly type

Example: **PU 15 0470 AL K 2 -** P5 1**

Series name

Size

Rail length (mm)

Ball slide shape code

Material/surface treatment code K: Stainless steel
H: Stainless steel + surface treatment

Preload code 0: Fine clearance (Z0), 1: Slight preload (Z1)

Accuracy code P4: Super precision, P5: High precision, P6: Precision, PN: Normal (with NSK K1) K4: Super precision, K5: High precision, K6: Precision, KN: Normal

Design serial number

Number of ball slides per rail

2.2 Random-matching type

(1) Reference number for rail and ball slide assembly

Example: **PU 15 0470 AL K 2 -** PC T**

Series name

Size

Rail length (mm)

Ball slide shape code

Material/surface treatment code K: Stainless steel
H: Stainless steel + surface treatment

Preload code T: Fine clearance (ZT)

Accuracy code PC: Normal (with NSK K1) KC: Normal

Design serial number

Number of ball slides per rail

(2) Reference number for ball slide of random-matching type

Example: **PAU 15 AL S - K**

Random-matching ball slide series code
PAU: PU Series random-matching ball slide
PAE: PE Series random-matching ball slide

Size

Option code -K: Equipped with NSK K1

Material code S: Stainless steel

Ball slide shape code

NSK Linear Guide™ Miniature PU Series/PE Series

(3) Reference number for rail of random-matching type

Example: **P1U 15 0470 R K N -** PC T**

Random-matching rail series code
P1U: PU Series random-matching rail
P1E: PE Series random-matching rail

Size

Rail length (mm)

Rail shape code
S: PU09-12, R: PU05-15 PE05-07-09-12, P: PE15

Preload code T: Fine clearance (ZT)

Accuracy code PC: Normal

Design serial number

Butting specification (*) N: non-butting rails, L: Butting specification

Material/surface treatment K: Stainless steel
H: Stainless steel + surface treatment

(*) Please consult NSK for butting rail specification.

3 Accuracy standard

We offer the following accuracy grades: Super precision grade P4, High precision grade P5, Precision grade P6, and Normal grade PN for preloaded assembly type, and Normal grade PC for random-matching type.

Table 1 Tolerance of preloaded assembly Unit: μm

Characteristics	Accuracy grade			
	Super precision P4	High precision P5	Precision grade P6	Normal grade PN
Mounting height <i>H</i>	±10	±15	±20	±40
Variation of <i>H</i> (All ball slides on a set of rails)	5	7	15	25
Mounting width <i>W</i> ₂ or <i>W</i> ₃	±15	±20	±30	±50
Variation of <i>W</i> ₂ or <i>W</i> ₃ (All ball slides on reference rail)	7	10	20	20
Running parallelism of surface C to surface A	Shown in Table 3, Fig. 3, Fig. 4			
Running parallelism of surface D to surface B				

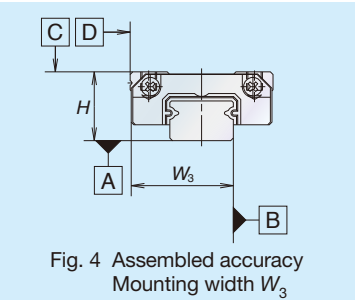
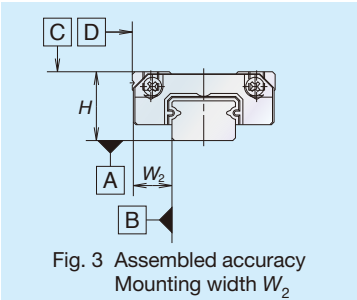
Table 2 Tolerance of random-matching type: Normal grade PC Unit: μm

Characteristics	Accuracy grade	Normal grade
		PC
Mounting height <i>H</i>		±20
Variation of mounting height <i>H</i>		15① 30②
Mounting width <i>W</i> ₂ or <i>W</i> ₃		±20
Variation of mounting width <i>W</i> ₂ or <i>W</i> ₃		20
Running parallelism of surface C to surface A		Shown in Table 3, Fig. 3, Fig. 4
Running parallelism of surface D to surface B		

①Variation on the same rail
②Variation on multiple rails

Table 3 Running parallelism of ball slide Unit: μm

Rail length (mm)	Accuracy grade		Preloaded assembly type				Random-matching type
	over	or less	P4	P5	P6	PN	PC
		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



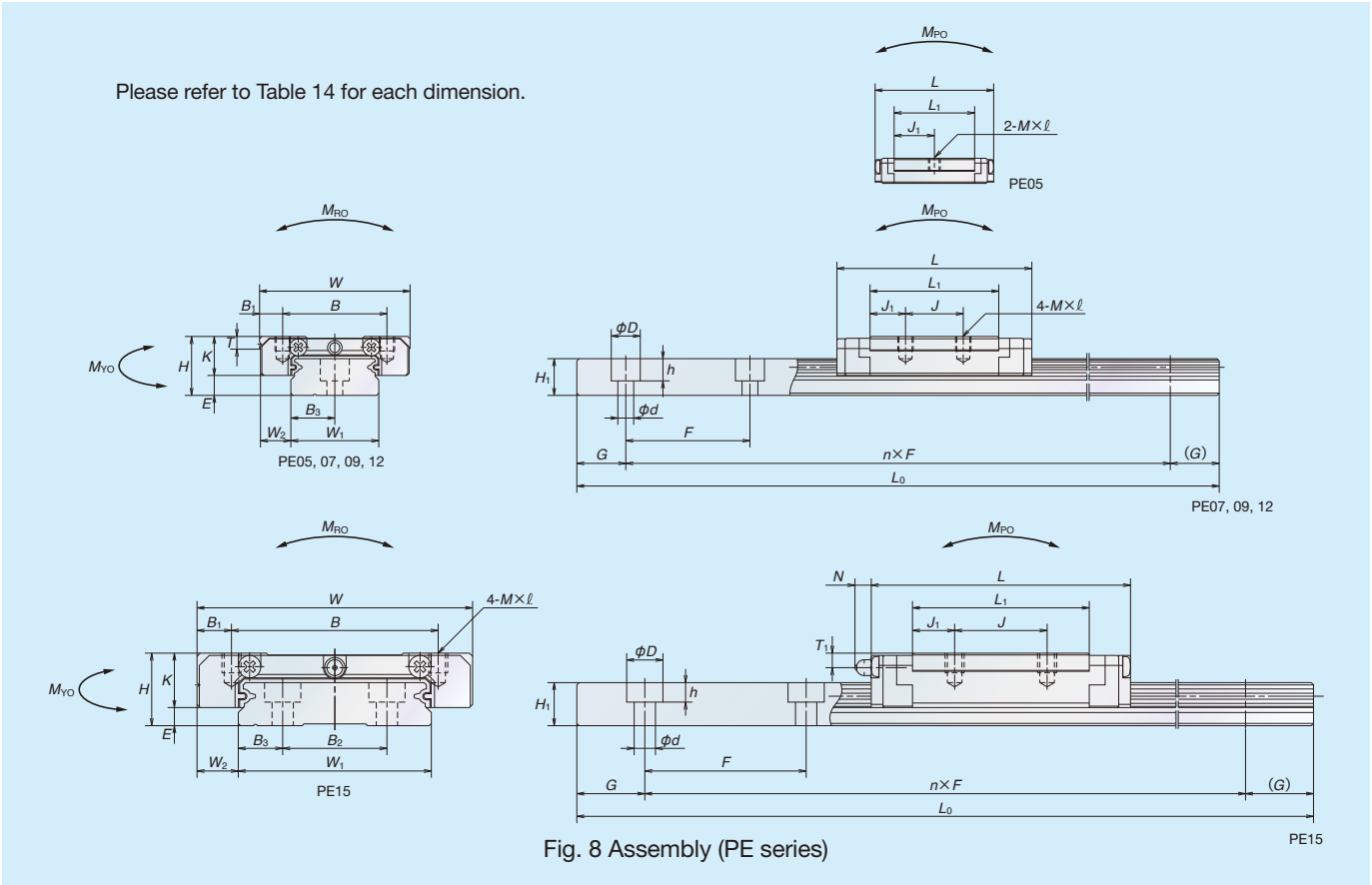
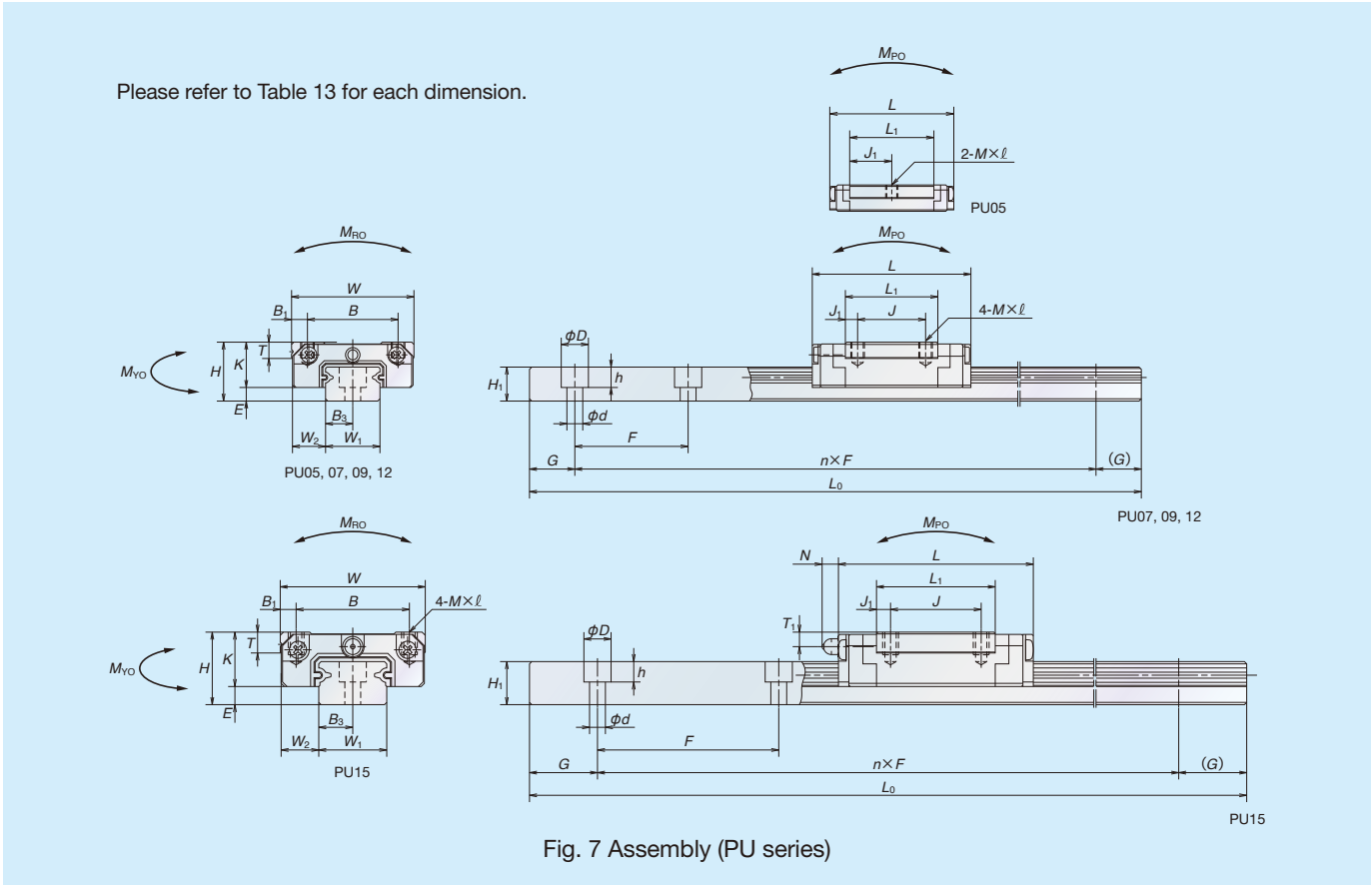


Table 13 Dimensions (PU series)

Model No.	Random- matching type	Assembly			Ball slide													Rail								Basic load rating (*2)								Ball diameter	Weight																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
		Height			Width	Length	Mounting hole								Oil hole			Width	Height	Pitch	Mounting bolt hole		G	Maximum length	Dynamic	Static	Static moment (N·m)					Ball slide	Rail																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		

○: Random-matching type is available.

(*1) Drive-In grease fitting for ∅3 is available to PU15.

(*2) Basic dynamic load rating is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.

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

To fix rails of PU05TR, use M2 × 0.4 cross-recessed pan head machine screw for precision instrument.

(JCIS 10-70 No. 0 pan head machine screw No. 1)

(JCIS: Japanese Camera Industrial Standard)

Table 14 Dimensions (PE series)

Model No.	Random- matching type	Assembly			Ball slide													Rail								Basic load rating (*4)								Ball diameter	Weight			
		Height			Width	Length	Mounting hole								Oil hole			Width	Height		Pitch	Mounting bolt hole		G	Maximum length	Dynamic	Static	Static moment (N-m)					Ball slide		Rail			
									$M \times \text{Pitch} \times \ell$						Hole diameter	T_1	N											C (N)	C_0 (N)	M_{RO}	M_{PO}					M_{YO}		
																															one slide					two slides in close contact	one slide	two slides in close contact
H	E	W_2	W	L	B	J	$M \times \text{Pitch} \times \ell$	B_1	L_1	J_1	K	T	Hole diameter	T_1	N	W_1	H_1	B_2	F	$d \times D \times h$	B_3	(Reference)	$L_{0\max}$	C (N)	C_0 (N)	M_{RO}	one slide	two slides in close contact	one slide	two slides in close contact	D_w	(g)	(g/100 mm)					
PE05AR	—	6.5	1.4	3.5	17	24.1	13	—	$M2.5 \times 0.45 \times 1.5$	2	16.4	8.2	5.1	2.5	$\varnothing 0.9$	1.3	—	10	4	—	20	$3 \times 5 \times 1.6$	5	7.5	150	690	1 160	6.00	2.75	17.5	2.75	17.5	1	7	34			
PE07TR	—	9	2	5.5	25	31.1	19	10	$M3 \times 0.5 \times 2.8$	3	20.8	5.4	7	3	$\varnothing 1.9$	1.9	—	14	5.2	—	30	$3.5 \times 6 \times 3.2$	7	10	600	1 580	2 350	16.7	7.20	46.0	7.20	46.0	1.5875	19	55			
PE09TR	○	12	4	6	30	39.8	21	12	$M3 \times 0.5 \times 3$	4.5	26.6	7.3	8	2.8	$\varnothing 2$	2.3	—	18	7.5	—	30	$3.5 \times 6 \times 4.5$	9	10	800	3 000	4 500	36.5	17.3	113	17.3	113	2	35	95			
PE09UR						51.2	23	24		3.5	38	7	8	2.8												2.3	—	18	7.5	—	30	3.5 × 6 × 4.5				9	10	800
PE12AR	○	14	4	8	40	45	28	15	$M3 \times 0.5 \times 4$	6	31	8	10	3.2	$\varnothing 2.5$	2.7	—	24	8.5	—	40	$4.5 \times 8 \times 4.5$	12	15	1 000	4 350	6 350	70.5	29.3	180	29.3	180	2.3812	66	140			
PE12BR						60	28	28			6	46	9	10												3.2	2.7	—	24	8.5	—	40				4.5 × 8 × 4.5	12	15
PE15AR	○	16	4	9	60	56.6	45	20	$M4 \times 0.7 \times 4.5$	7.5	38.4	9.2	12	4.1	$\varnothing 3$ (*3)	3.2	(3.3)	42	9.5	23	40	$4.5 \times 8 \times 4.5$	9.5	15	1 200	7 600	10 400	207	59.0	370	59.0	370	3.175	140	275			
PE15BR						76	45	35			7.5	57.8	11.4	12												4.1	3.2	(3.3)	42	9.5	23	40				4.5 × 8 × 4.5	9.5	15

○: Random-matching type is available.

(*3) Drive-In grease fitting for ∅3 is available to PE15.

(*4) Basic dynamic load rating is a load that allows for a 50-km rating fatigue life and is a vertical and constant load on the ball slide mounting surface.

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

To fix rails of PE05AR, use M2.5 × 0.45 cross-recessed pan head machine screw for precision instrument.

(JCIS 10-70 No. 0 pan head machine screw No. 3)

(JCIS: Japanese Camera Industrial Standard)