Series of interchangeable products that enable random matching between rails and ball slides. Miniature PU and PE series support diverse applications, from semiconductor manufacturing devices to medical equipment.
**Easy-to-handle, lightweight design. NSK Miniature Linear Guide provides smoother motion with unprecedented lightness.**

The new generation PU series/PE series inherit the outstanding lineage of the NSK miniature linear guides LU series/LE series. Resin ball recirculation components improve dynamic friction characteristics and create smoother motion with reduced noise intensity. High performance features enhanced dust-proofing, low dust generation, and high corrosion resistance. The new design supports a wide variety of applications.

Ergonomic, gentler tone and low dust generation. NSK Linear Guides Miniature PU Series (Interchangeable with the LU Series)

Ideal for wide, single-rail applications. NSK Linear Guides Miniature PE Series (Interchangeable with the LE Series)

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**Features**

1. **Motion performance**
   Newly designed recirculation component facilitates smooth circulation of steel balls.

2. **Lightweight**
   The ball slide is fabricated to be approximately 20% lighter than conventional models by the application of resin to a part of its body.

3. **Reduced noise intensity**
   Resin components applied in ball circulating circuits reduce collision noise between steel balls.

4. **Low dust generation**
   The structure of the ball slide is designed to prevent dust generation.

5. **Excellent dust-proofing**
   The labyrinth structure adopted for the side of the rails and the inner walls of the ball slide allows effects equivalent to an under seal.

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

7. **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.

8. **Long-term maintenance-free**
   Equipped with NSK K1™ Lubrication unit realizes long-term, maintenance-free use.

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

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**New**

Smoother motion with resin recirculation circuits. Gentler tone and low dust generation.

**NSK Linear Guides Miniature PU Series**

**PE Series**
2 Reference number

Reference numbers will be used as reference before finalizing all specifications. These numbers indicate outline specifications. Please specify the reference number, except design serial number, to identify the product when ordering, requesting estimates, or inquiring about specifications from NSK. The reference number is a set number for a single rail. For multiple rails, at least two sets of reference numbers are required.

2.1 Preloaded assembly type

Example: **PU 15 0470 AL K 2 -8-8 P5 1-II**

- **Series name:** PU 15 0470 AL K 2
- **Size:** P1
- **Rail length (mm):** 15
- **Ball slide shape code:** 0470 K 2
- **Mounting width (mm):** ±20
- **Material code:** S: Stainless steel, H: Stainless steel + surface treatment
- **Design serial number:** 8
- **Number of ball slides per rail:** 5

(1) Please note that the appropriate design number will be inserted into the reference number and the tag end code (-II) will be omitted.

2.2 Interchangeable type

(1) Reference number for rail and ball slide assembly

Example: **PU 15 0470 AL K 2 -8-8 PC T-II**

- **Series name:** PU 15 0470 AL K 2
- **Size:** P1
- **Rail length (mm):** 15
- **Ball slide shape code:** 0470 K 2
- **Mounting width (mm):** ±20
- **Material code:** S: Stainless steel, H: Stainless steel + surface treatment
- **Design serial number:** 8
- **Number of ball slides per rail:** 5

(2) Reference number for ball slide of interchangeable type

Example: **PA U 15 AL S-K**

- **Single ball slide code:** PA
- **Series name:** PU, PE
- **Size:** 15
- **Material code:** S: Stainless steel
- **Ball slide shape code:** AL

(1) Please note that the appropriate design number will be inserted into the reference number and the tag end code (-II) will be omitted.

3 Accuracy standard

We offer the following product 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 interchangeable type.

#### Table 1 Accuracy standard for preloaded assembly types

<table>
<thead>
<tr>
<th>Item</th>
<th>Accuracy grade</th>
<th>Super precision P4</th>
<th>High precision P5</th>
<th>Precision P6</th>
<th>Normal PN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting height H</td>
<td>±15 ppm</td>
<td>±10 μm</td>
<td>±20 μm</td>
<td>±40 μm</td>
<td>±60 μm</td>
</tr>
<tr>
<td>Variation of Mounting height H</td>
<td>5 μm</td>
<td>7 μm</td>
<td>10 μm</td>
<td>20 μm</td>
<td>30 μm</td>
</tr>
<tr>
<td>Running parallelism of face C against face A</td>
<td>Refer to Table 3, Fig. 3, Fig. 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

#### Table 2 Accuracy standard for interchangeable type

<table>
<thead>
<tr>
<th>Item</th>
<th>Accuracy grade</th>
<th>Normal PC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mounting height H</td>
<td>±20 μm</td>
<td></td>
</tr>
<tr>
<td>Variation of Mounting height H</td>
<td>15 μm</td>
<td></td>
</tr>
<tr>
<td>Running parallelism of face C against face A</td>
<td>Refer to Table 3, Fig. 3, Fig. 4</td>
<td></td>
</tr>
</tbody>
</table>

For cutting-edge precision positioning table, from semiconductor manufacturing devices to medical equipment. —NSK Linear Guides Miniature PU Series/PE Series
4 Preload and rigidity

We offer three levels of preload: Slight preload (Z1) and Fine clearance (Z0), along with interchangeable types of Fine clearance (ZT). Values for preload and rigidity of the preloaded assembly types are shown in Tables 4 and 5.

5 Applications

- Smoother motion and low dust generation
- Liquid crystal manufacturing and printed circuit board manufacturing devices
- Lightweight and low dust generation
- Semiconductor manufacturing devices (mounter, die bonder, and exposure device)
- Gentle tone and excellent dust proof features
- Medical machinery and various precision devices

6 Height and corner configuration of the mount face

Figs. 5, 6 and Tables 8, 9 show the shoulder height and corner radius dimensions, when fixing the linear guide horizontally by pushing it onto the shoulder (projected portion from the mount face) of the bed or table.

7 Lubrication

Selection of grease: Table 10 below shows grease that is suitable for the PU series/PE series. We specify PS2 as the standard grease for NSK miniature linear guides.

8 Dust proofing

Side seal: Provided to both sides of the ball slide as a standard feature.
Bottom seal function: A labyrinth structure of the ball slide bottom face functions as sealing effect.

9 Dimensions when attaching NSK K1 (PU series)

10 Dimensions when attaching NSK K1 (PE series)

Table 10 Grease list

Table 11 Dimensions when attaching NSK K1 (PU series)

Table 12 Dimensions when attaching NSK K1 (PE series)

For use when attaching NSK K1: ["Standard ball slide length"] + ["Thickness of single NSK K1"] + ["Thickness of protection cover"] + ["Numbers of NSK K1"] + ["Thickness of protection cover", V ≤ 2]
### Table 10 Dimensions (PU series)

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Assembly</th>
<th>Width</th>
<th>Length</th>
<th>Mounting tap hole</th>
<th>Ball slide</th>
<th>Rail</th>
<th>Basic load rating (*)</th>
<th>Ball slide diameter</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>PU05TR</td>
<td>6  1</td>
<td>3.5</td>
<td>12</td>
<td>19.4</td>
<td>—</td>
<td>—</td>
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<td></td>
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<tr>
<td></td>
<td>600</td>
<td>210</td>
<td>520</td>
<td>775</td>
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<td>1</td>
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<tr>
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<td>1000</td>
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<td>23</td>
<td></td>
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<tr>
<td>PU09TR</td>
<td>10 2.2</td>
<td>5.5</td>
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<td>15</td>
<td>10</td>
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<td>35</td>
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<tr>
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<td>3500</td>
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<td>65</td>
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<tr>
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<td>8.5</td>
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<tr>
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<td>1000</td>
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<td>6000</td>
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<td>26</td>
<td>3.175</td>
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<td>105</td>
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</table>

Table 11 Dimensions (PE series)

<table>
<thead>
<tr>
<th>Model No.</th>
<th>Assembly</th>
<th>Width</th>
<th>Length</th>
<th>Mounting tap hole</th>
<th>Ball slide</th>
<th>Rail</th>
<th>Basic load rating (*)</th>
<th>Ball slide diameter</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
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<td>110</td>
<td>40</td>
<td>3.175</td>
<td>59</td>
<td>105</td>
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<tr>
<td>PE07TR</td>
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<td>105</td>
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<tr>
<td>PE12AR</td>
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<td>100</td>
<td>100</td>
<td>1.5875</td>
<td>59</td>
<td>105</td>
</tr>
</tbody>
</table>

Fig. 7 Assembly (PU series)

Fig. 8 Assembly (PE series)

Please refer to Table 13 for each part dimension.

Please refer to Table 14 for each part dimension.
9.2 Interchangeable type

(1) Ball slide of interchangeable types

Please refer to Table 13 for each part dimension.

![Image 1](image1.png)

Fig. 9 Ball slide of interchangeable types (PU series)

Please refer to Table 14 for each part dimension.

![Image 2](image2.png)

Fig. 10 Ball slide of interchangeable types (PE series)

(2) Rail of interchangeable types

Please refer to Table 13 for each part dimension.

![Image 3](image3.png)

Fig. 11 Rail of interchangeable types (PU series)

Please refer to Table 14 for each part dimension.

![Image 4](image4.png)

Fig. 12 Rail of interchangeable types (PE series)

10 Interchangeability with LU series/LE series

The PU series/PE series is designed to be interchangeable with the LU series/LE series for its mounting dimensions and load ratings\(^*(*)\).

Refer to Figs. 7, 8 and Tables 13, 14 for more details.

\(^*\) Not including load rating of PU05 and PE05.

Handling precautions

(1) Resin parts such as the end cap may become damaged when struck or hit.
(2) Maximum operating temperature must be 80˚C or below. Exceeding this limit may damage resin parts.
(3) Maximum operating temperature must be 50˚C (max. momentary 80˚C) when attaching NSK K1\(^*\). Also, avoid exposure to organic solvents with a degreasing effect. Do not immerse in kerosene or rust preventative oil (with kerosene ingredients).
(4) Handling of interchangeable types

① Interchangeable ball slide will be delivered with a provisional rail (inserting fixture).
② Be sure to use the provisional rail when removing ball slide(s) from a rail.
③ Do not remove the ball slide from provisional rail until inserting into a rail.