High-speed and Low-noise Ball Screws
BSS Series

Quiet and compact, with unparalleled high speed performance. Reduced-noise BSS Series ball screws for an extensive range of uses, from machine tools to transportation equipment.
BSS Series—Next-generation ball screws with quiet, high-speed performance in a compact size, the result of joining NSK’s advanced technology with an innovative recirculation method

A new series has joined the NSK ball screws lineup that delivers unrivaled precision. Developed with the advanced technology NSK has gained over years of earning customer trust with proven performance, this series represents a groundbreaking achievement in reduced noise and high-speed operation in an amazingly compact size. The quiet performance is especially appreciated in machine tools, medical equipment, semiconductor-manufacturing equipment, LCD manufacturing equipment, and chip mounting equipment.

Features

Quieter by 6 dB; nearly silent in typical applications
The average noise level is reduced by more than 6 dB compared with our conventional products. At low-speed rotation, the ball screws are nearly silent, while the lowest noise level is achieved at high-speed rotation*.

*Noise level measured with a microphone at a distance of 400 mm.

High-speed operation of up to 180 000 d·n
Realizes high-speed operation at a maximum of d·n 180 000—outstanding for ball screws and far surpassing the 100 000 d·n maximum performance of conventional return tube type products. For high lead ball screws, high-speed operation at over 200 m/min is also possible. Allowable maximum rotational speed is 5 000 min⁻¹. Please consult NSK if maximum rotational speed exceed 5 000 min⁻¹ or d·n exceed 180 000.

30% smaller
The external diameter of the ball nut is 30% smaller than our conventional models. Compact configurations are possible for low-profile XY tables as well as for other devices and equipment.

Grease fitting provided as standard equipment
The ball screws with shaft diameters of less than φ25 are standardly equipped with a grease fitting (M5 × 0.8). Lubrication ports are provided in 2 places to facilitate maintenance. The ball screws can be easily connected to an integrated lubrication system.

Application

Combinations of shaft diameter and lead of the high-speed and low-noise ball screws are shown in the table.

<table>
<thead>
<tr>
<th>Shaft diameter</th>
<th>5</th>
<th>10</th>
<th>12</th>
<th>16</th>
<th>20</th>
<th>25</th>
<th>30</th>
<th>32</th>
<th>40</th>
<th>45</th>
<th>50</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lead</td>
<td>8</td>
<td>10</td>
<td>12</td>
<td>16</td>
<td>20</td>
<td>25</td>
<td>30</td>
<td>32</td>
<td>40</td>
<td>45</td>
<td>50</td>
</tr>
</tbody>
</table>

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30% smaller

High-speed, extremely low noise

Specifications

Recirculation method
A new internal ball recirculation method is applied for simpler, more compact ball nuts.

Preload and axial play
Adopts oversized ball preload, suitable for compact devices. Axial play can be selected from less than or equal to 0.005 mm (code S), 0.050 mm (code N). For more information, please see the general catalog of precision machine components.

Sealing
Adopts a new compact design high performance sealing. Minimal grease scattering contributes to maintenance of a clean environment.

Options
- Optional NSK K1™ lubrication unit, molded from resin and impregnated with lubrication oil, supplies fresh oil onto ball rolling surfaces, ensuring long-term, maintenance-free usage. Please contact NSK when using NSK K1.
- Please contact NSK about hollow shaft ball screws that are compatible with the forced cooling of the shaft center, which are effective for stabilizing positioning accuracy and shortening the warm-up period.
### Dimensions of BSS Series

**High-speed and Low-noise Ball Screws BSS Series**

<table>
<thead>
<tr>
<th>Model No.</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
</tr>
</thead>
<tbody>
<tr>
<td>BSS1010-2E 10</td>
<td>2</td>
<td>1</td>
<td>970</td>
<td>3</td>
<td>010</td>
<td>77</td>
<td>32</td>
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<tr>
<td>BSS1510-3E 10</td>
<td>3</td>
<td>5</td>
<td>460</td>
<td>10</td>
<td>200</td>
<td>181</td>
<td>43</td>
</tr>
<tr>
<td>BSS2010-3E 10</td>
<td>3</td>
<td>8</td>
<td>790</td>
<td>18</td>
<td>500</td>
<td>268</td>
<td>45</td>
</tr>
<tr>
<td>BSS2510-4E 10</td>
<td>4</td>
<td>5</td>
<td>720</td>
<td>20</td>
<td>300</td>
<td>220</td>
<td>40</td>
</tr>
<tr>
<td>BSS3010-6E 10</td>
<td>5</td>
<td>3</td>
<td>900</td>
<td>20</td>
<td>400</td>
<td>300</td>
<td>30</td>
</tr>
<tr>
<td>BSS3610-6E 10</td>
<td>6</td>
<td>4</td>
<td>1100</td>
<td>20</td>
<td>500</td>
<td>400</td>
<td>40</td>
</tr>
<tr>
<td>BSS4010-6E 10</td>
<td>7</td>
<td>5</td>
<td>1200</td>
<td>20</td>
<td>600</td>
<td>500</td>
<td>50</td>
</tr>
</tbody>
</table>

**Note:**
- The table values are theoretical and derived from elastic displacement between screw grooves and balls when axial load is applied to a ball nut for which preload is set at 3% of the basic dynamic load rating (Ca).
- Rigidity values are theoretical and derived from elastic displacement between screw grooves and balls when axial load is applied to a ball nut for which preload is set at 3% of the basic dynamic load rating (Ca).