SKF high-performance miniature ball screws – series SP

High-precision and low-noise miniature ball screws for automation and medical applications

Today’s automated equipment manufacturers need components and systems that offer high reliability, precision and repeatability with low noise. New SKF high-performance miniature ball screws do this while giving manufacturers a wide range of design flexibility.

Enabling precise positioning for miniature applications, these quiet-running miniature ball screws operate at high speeds with low friction and minimal service requirements. Robust and capable of handling high thrust loads, the screws are supplied in a wide range of types and available as customized solutions to meet any application requirement.
Optimized for your application

SKF high-performance miniature ball screws open up new design and performance options for equipment manufacturers. Designers can downsize machines, extend machine reliability, increase speed and output, and reduce noise for a wide range of applications.

Typical applications

- Dental milling machines
- Medical procedure machines
- Mini machine tools
- Engraving machines
- Glass grinding and drilling machines
- Robotic analyzers

Benefits

- Smooth running
- Low noise levels
- High speed capability
- Provides longer service
- Easy nut assembly
- Excellent repeatability
- High positioning accuracy
- Backlash elimination available

Optimized design features

1 New internal design

Balls are picked up smoothly for a new highly optimized ball recirculation path resulting in optimal performance through the new thread profile definition.

- Reduces tangential efforts on the recirculating balls
- Enables up to 2.4 times higher speed limits \( (n_d < 120,000) \)
- Reduces noise levels
- Enables smoother running
- Provides much longer service life

2 External interface

The series SP assortment offers easy mounting with a universal, threaded-nose design.

- Interchangeable with most existing standard solutions
- Lubrication hole and wiper housings are standard
- Customized axial play and backlash elimination available
- Same attachment as existing series SD

Benefits

- Smoother
  Lower noise levels suitable for medical, lab and office environments.

- More reliable
  Provides longer service compared to previous generation miniature ball screws.

- Faster
  Up to 7,500 r/min for \( d_0 = 16 \text{mm} \), and up to 15,000 r/min for \( d_0 = 8 \text{mm} \).
### Technical data

#### Table 1: Nominal diameter and lead (right hand)

<table>
<thead>
<tr>
<th>Nominal diameter</th>
<th>Lead (right hand)</th>
<th>Nut</th>
<th>Basic load ratings</th>
<th>Standard play on request</th>
<th>Reduced play on request</th>
<th>Inertia</th>
<th>Grease</th>
<th>Weight</th>
<th>Mass</th>
<th>Inertia</th>
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#### Table 2: Screw Nut Support bearings

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<th>Screw</th>
<th>Nut</th>
<th>Without wipers L&lt;sub&gt;1&lt;/sub&gt;&lt;sub&gt;≥0.3&lt;/sub&gt;</th>
<th>With wipers L&lt;sub&gt;1&lt;/sub&gt;</th>
<th>Tightening spanner (FACOM)</th>
<th>Screw length</th>
<th>d&lt;sub&gt;2&lt;/sub&gt;</th>
<th>d&lt;sub&gt;1&lt;/sub&gt;</th>
<th>Support bearings</th>
<th>Recommended thrust support bearings</th>
<th>Recommended support pillow blocks</th>
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<td>L</td>
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</table>

**Fig. 1**

**Fig. 2**
## Designation system

Complete rolled ball screw assembly

<table>
<thead>
<tr>
<th>Nut type</th>
<th>SP 12x4 R 330/390 G7 L - H + K <strong>/</strong> WPR STDPLAY</th>
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<tbody>
<tr>
<td>SP</td>
<td>High performance miniature screw, axial play</td>
</tr>
<tr>
<td>BP</td>
<td>High performance miniature screw, backlash elimination</td>
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</tbody>
</table>

### Nominal diameter x Lead [mm]

Hand
- **R** = Right

Threaded length / Total length [mm]

Lead precision G5, G7, G9

### Nut orientation

- Nut threaded nose towards shorter machined end of shaft (S)
- Nut threaded nose towards longer machined end of shaft (L)
- In case there is identical machining at both shaft ends (-)

### Machined end combination

See page 36 in the Ball screw catalogue (PUB 6971)

### Required lengths for A, S, U (both ends)

See page 36 in the Ball screw catalogue (PUB 6971)

### Options

- **WPR** = with wipers
- **NOWPR** = without wipers
- **STDPLAY** = standard axial play
- **REDPLAY** = reduced axial play