Quick delivery and affordable cost Crossed Roller Bearings are now available from IKO.

We offer Crossed Roller Bearings with individual specifications customized to our customers’ usages and applications. We have abundant manufacturing experience of special specification products so if you have any requirement for a special product application, please contact IKO.

Crossed Roller Bearings are compact bearings with their rollers alternately crossed at right angles to each other between an inner and outer ring. This allows them to sustain loads such as radial, thrust and moment from any direction at the same time. The rollers make line-contact with raceway surfaces, thus elastic deformation due to bearing loads is very small.

CRBHV / CRBFV Features

- **High Rigidity / High Accuracy**
  Both inner and outer rings have solid one-piece construction that minimizes mounting errors and allows these bearings to easily achieve high rigidity and high accuracy.
  Separators incorporated between the cylindrical rollers allow for smooth rotation, making them suitable for applications with comparatively high rotational speed.

- **Quick Delivery / Very Affordable**
  CRBHV/CRBFV are manufactured at a dedicated site. This newly developed site allowed us to shorten lead-times and reduce production cost by making improvements to the whole processes from design to manufacturing. With our continued efforts to support our customers, we now offer these bearings with excellent cost value. This product will contribute to cost reductions and shorter production lead time when integrated into various machines we incorporate.

- **Special models for your applications**
  We offer Crossed Roller Bearings with individual specifications customized to our customers’ usages and applications. We have abundant manufacturing experience of special specification products so if you have any requirement for a special product application, please contact IKO.

IKO Crossed Roller Bearings

IKO Crossed Roller Bearings are compact bearings with their rollers alternately crossed at right angles to each other between an inner and outer ring. This allows them to sustain loads such as radial, thrust and moment from any direction at the same time. The rollers make line-contact with raceway surfaces, thus elastic deformation due to bearing loads is very small.
IKO Crossed Roller Bearing advantages.

Compact
The orthogonal array of rollers makes it possible to simultaneously receive complex loads from various directions with just a single bearing. When compared to opposed mounting single row roller or ball bearings, the contact area can be reduced thus contributing to compactness and space-saving equipment.

High Rigidity
The figure at right is a cross-section of a rotating turntable. The application point distance from the time a moment load applied to the turntable is L, and the allowable moment load of the bearing is proportional to application point distance L. If increasing application point distance L to increase the moment rigidity of the turntable, two Angular Contact Ball Bearings are required. Because of the need for distance between the bearings, the equipment size increases as well. However, even a single Crossed Roller Bearing can increase application point distance L, keeping equipment compact and improving moment rigidity.

Easy Mounting
Mounting Holed Type High Rigidity Crossed Roller Bearings feature mounting holes to allow direct mounting to the mounting surface without requiring the use of a housing or pressure plate as with conventional Crossed Roller Bearings. It is recommended to use a housing for applications with large loads or moments.

Quality
Many years of experience with roller type bearings allows IKO the ability to produce highly accurate Crossed Roller Bearings due to our manufacturing know-how and rigorous quality standards.

Diversity
IKO Crossed Roller Bearings are available in a wide variety of types. For machine tools, large robots, medical, and general industrial equipment, optimal types are CRBH/CRBHV, with its inner and outer ring combined integral structure, and CRB/CRBC, with outer rings split in two in the axial direction. For electric and electronic automated equipment such as small/medium robotic joints or semiconductors, the Slim Type CRBS with its small cross-sectional dimension works best. For even smaller precision equipment, the Super Slim Type CRBT is optimal with its minimized cross-sectional area. The high rigidity CRBF/CRBFV is also available, with mounting holes to simplify the mating with the housing structure.

Flexibility
IKO’s unique flexibility and diverse production allows us to offer customized Crossed Roller Bearings to fit the customers’ applications. IKO has a sound record of producing a wide variety of special products with non-standard shapes, sizes, surface treatments and other unique features. Please contact IKO when your application requires certain special features that are not on our stock products.
**IKO Crossed Roller Bearings application examples.**

High performance and compact IKO Crossed Roller Bearings had been integrated into various machines and devices, resulting in improved efficiency, reliability and compactness. Here are some great examples of Crossed Roller Bearings in action:

**Robot**

- Increasingly a number of customers are switching out conventional ball bearings with IKO Crossed Roller Bearings on their robots in order to reduce size and weight.

**Medical equipment**

- Many various of IKO Crossed Roller Bearings, including those with special specifications, are available for applications requiring smooth operation with high rotational accuracy. Some are designed to be used in environments where rust prevention oil is not allowed or in medical equipment.

**Robot**

- Pick-up robot
- Location used: Horizontal articulation
- Joint swivel part

**Medical equipment**

- X-Ray Diagnostic Equipment
- Location used: C-Type Arm Operation
- X-Ray Detector Rotors

**Robot**

- Androids
- Location used: Welded Robots
- Splitter

**Medical equipment**

- Welding robot
- Location used: Vertical articulation
- Rotator
- Welder Electric Grendizer

**Robot**

- Welding robot
- Location used: Compact Weld Generator
- Systema

**Medical equipment**

- Compact Weld Generator
- Location used: Compact Weld Generator
- Systema

**Robot**

- DD Motor
- Location used: Motor Drive Motor
- Output Shaft

**Medical equipment**

- Power Generating Windmills
- Location used: Output Shaft

**Robot**

- Windmills
- Location used: Direct Drive Motor
- Output Shaft

**Medical equipment**

- Marine Antenna
- Location used: Marine Parabola Antenna Base swivel part

**Robot**

- Marine Antenna
- Location used: Marine Parabola Antenna Base swivel part

**Medical equipment**

- Security Camera
- Location used: Movable Security Camera Camera Drive Parts

**Robot**

- Security Camera
- Location used: Movable Security Camera Camera Drive Parts

Crossed Roller Bearings are ideally suited for robotics, so IKO proposes using them in the following applications:

**Marine Antenna**

- Marine antennas are constantly battered by strong winds. The support for these antennas require bearings that are very rigid to be able to stand up to these winds. IKO High Rigidity Crossed Roller Bearings are ideal for this application.

**Security Camera**

- Security cameras move horizontally and vertically nonstop all year round. Extreme reliability is required for this continuous compound operation. IKO Crossed Roller Bearings can receive complex loads from multiple directions, making them ideal for use in security cameras.
CRBHV / CRBFV Structure

**Outer ring**
**Roller**
**Separator**
**Inner ring**

**CRBHV**
Variation

<table>
<thead>
<tr>
<th>Size</th>
<th>Shaft dia. 30-250 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seal</td>
<td>Yes</td>
</tr>
</tbody>
</table>

**CRBFV**
Variation

<table>
<thead>
<tr>
<th>Size</th>
<th>Shaft dia. 35-115 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seal</td>
<td>Yes</td>
</tr>
</tbody>
</table>

Notes:
1. Sizes with a shaft diameter greater than 120mm are scheduled to be produced starting December 2016.

Identification number

The identification number of Crossed Roller Bearings consists of a model code, dimensions, any supplemental codes and a classification symbol. Examples are shown below.

**Example → CRBFV 35 15 A T UU C1 RP6**

CRBHV Accuracy

### Table 1: Tolerance and allowance of inner ring

<table>
<thead>
<tr>
<th>D (Nominal bore diameter)</th>
<th>Deviation of mean bore diameter in a single plane</th>
<th>dmp˚</th>
<th>Db</th>
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<tbody>
<tr>
<td>30 35</td>
<td>-12 -10 -10 -8 -6 -4 -2 0 2 4 5 7 9 11</td>
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<td>30 25 20 15 10 5 4 2 0 2 4</td>
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</tr>
</tbody>
</table>

CRBFV Accuracy

### Table 2: Tolerance and allowance of outer ring

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<thead>
<tr>
<th>D (Nominal bore diameter)</th>
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<tr>
<td>30 35</td>
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<td>10 7 5 2 0 2 4 6 8</td>
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<td>30 25 20 15 10 5 4 2 0 2</td>
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</tr>
</tbody>
</table>

### Table 3: Tolerance and allowance of inner ring

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<td>30 25 20 15 10 5 4 2 0 2</td>
<td>30 25 20 15 10 5 4 2 0 2</td>
</tr>
</tbody>
</table>

### Table 4: Tolerance and allowance of outer ring

<table>
<thead>
<tr>
<th>D (Nominal bore diameter)</th>
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<td>30 25 20 15 10 5 4 2 0 2</td>
<td>30 25 20 15 10 5 4 2 0 2</td>
</tr>
</tbody>
</table>

Notes:
- Sizes with a small diameter greater than 60mm are scheduled to be produced starting December 2016.
Lubrication

These bearings are generally lubricated with grease. Grease is supplied by applying a grease gun nozzle to various locations on the periphery of the clearance between the inner ring and the outer ring. Grease is packed into sealed types (UU) only.

For bearings without prepacked grease, supply grease or oil before use. Operating without lubrication will increase the wear on the rolling contact surfaces and lead to short bearing life. For the sealed type, be careful with pressure when applying grease so that the seals do not come off. When using a special grease, carefully examine the grease properties and contents such as base oil viscosity and extreme pressure additives. In this case, please contact [Koyo].

Oil groove

For Crossed Roller Bearings, oil holes and oil grooves are provided on bearing rings on request. When an oil hole is required on the outer ring, attach "OH" before the clearance symbol in the identification number. When an oil hole and an oil groove are required on the outer ring, attach "OG" at the same place in the identification number.

For an oil hole on the inner ring, attach "OH", and for an oil hole and an oil groove on the inner ring, attach "OG", at the same place in the identification number. CRBFHV and CRBFVFV have an oil groove and two oil holes on the outer ring as standard. The table below shows availability of oil holes for each bearing type.

Allowable rotational speed

The allowable rotational speed of CRBFHV / CRBFVFV is affected by mounting and operating conditions. The table below can be used as a guide for $n_{rpm}$ under general operating conditions.

Operating Temperature Range

The permissible temperature range of CRBFHV / CRBFVFV is -20°C to +110°C. However, for continuous use, keep the temperature at 100°C or below.