High Rigidity Type Crossed Roller Bearing V

CRBFV

Mounting Holed Type High Rigidity Crossed Roller Bearing V

CRB HV

New Product
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.

CRBHVG / 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, and making them suitable for applications with comparatively high rotational speed.

- **Quick Delivery / Very Affordable**
  CRBHVG / 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 or 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.

Because of the line contact structure of Crossed Roller Bearings, when using rollers for the bearing inner rolling elements, rigidity is greatly improved compared to ball type bearings. For example, rigidity is increased 3 to 4 times while achieving more compact cross-section dimensions compared to a double row Angular Contact Ball Bearing.

Easy Mounting

Mounting Holed Type 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/CRBH, 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 Slime 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.

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.

Flexibility

Mounting Holed Type Crossed Roller Bearing Mounting Example

- Direct Mounting Method
- Housing Mounting Method

Outer Ring Flange Type Specification
Inner Ring Stepped Type Specification
Inner Ring Mounting Hole Special Specification
Special Surface Treatment Specification
Linear Motion Rolling Guide Integrated Specification

Ball Bearings
Crossed Roller Bearings
Angular Contact Ball Bearings

Needle Roller Bearing manufacturing process
Grinding
Inspection

Cyclic testing of Crossed Roller Bearings
Ball Bearing
Crossed Roller Bearing
Angular Contact Ball Bearing

Single-row Roller Bearings
Multiple Angular Contact Ball Bearings
Crossed Roller Bearings (CRBS508AUU)
Crossed Roller Bearings (CRBH5013AUU)
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:

<table>
<thead>
<tr>
<th>Structure</th>
<th>Location used</th>
<th>Bearing type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robot</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>Androids</td>
<td><img src="androids.png" alt="Androids" /></td>
<td>![Crossed Roller Bearings](crossed_roller Bearings.png)</td>
</tr>
<tr>
<td>Welding robot</td>
<td><img src="welding_robot.png" alt="Welding robot" /></td>
<td>![Crossed Roller Bearings](crossed_roller Bearings.png)</td>
</tr>
<tr>
<td>Medical equipment</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>X-Ray Diagnostic Equipment</td>
<td><img src="x-ray_diagnostic_equipment.png" alt="X-Ray Diagnostic Equipment" /></td>
<td>![Crossed Roller Bearings](crossed_roller Bearings.png)</td>
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<tr>
<td>Motor</td>
<td>High rotational accuracy. IKO Crossed Roller Bearings also have a proven track record for use on Theta-Axis Rotary Drive units. A key attribute is IKO’s ability and flexibility to accommodate special shapes such as flanges and steps.</td>
<td></td>
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<tr>
<td>DD Motor</td>
<td><img src="dd_motor.png" alt="DD Motor" /></td>
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<td>Machine tools</td>
<td>Bearings supporting rotation often need minimal deflection even when operating in tough environments. High Rigidity IKO Crossed Roller Bearings provide minimal deflection and are especially suited for use in machine tools.</td>
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<td>Machine Tool Tables</td>
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<td>![Crossed Roller Bearings](crossed_roller Bearings.png)</td>
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<tr>
<td>Windmills</td>
<td>Bearings in windmills are forced to work in harsh environments. They need to stand up to moment loads caused by the wind as well as high rotational speed. It is in the harsh environments that IKO Crossed Roller Bearings show their true potential.</td>
<td></td>
</tr>
<tr>
<td>Power Generating Windmills</td>
<td><img src="power_generating_windmills.png" alt="Power Generating Windmills" /></td>
<td>![Crossed Roller Bearings](crossed_roller Bearings.png)</td>
</tr>
<tr>
<td>Security Camera</td>
<td>Security cameras move horizontally and vertically nonstop all year round. Extreme reliability is required for this continuous compound operation. IKO Crossed Roller Bearings are ideal for this application.</td>
<td></td>
</tr>
<tr>
<td>Marine Antenna</td>
<td>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.</td>
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</tr>
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IKO Crossed Roller Bearings are ideally suited for robotics, so IKO proposes using them in the following applications:

- **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.
- **Androids**
- **Welding robot**
- **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.
- **X-Ray Diagnostic Equipment**
- **Motor**: High rotational accuracy. IKO Crossed Roller Bearings also have a proven track record for use on Theta-Axis Rotary Drive units. A key attribute is IKO’s ability and flexibility to accommodate special shapes such as flanges and steps.
- **DD Motor**
- **Machine tools**: Bearings supporting rotation often need minimal deflection even when operating in tough environments. High Rigidity IKO Crossed Roller Bearings provide minimal deflection and are especially suited for use in machine tools.
- **Machine Tool Tables**
- **Windmills**: Bearings in windmills are forced to work in harsh environments. They need to stand up to moment loads caused by the wind as well as high rotational speed. It is in the harsh environments that IKO Crossed Roller Bearings show their true potential.
- **Power Generating Windmills**
- **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 are ideal for this application.
- **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.

**CRBHV CRBFV**
CRBHV / CRBFV Structure

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 Т UU C1 RP6

Table 1  Tolerance and allowance of inner ring

<table>
<thead>
<tr>
<th>Accuracy class</th>
<th>CRBHV</th>
<th>CRBFV</th>
</tr>
</thead>
<tbody>
<tr>
<td>P6</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P5</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P4</td>
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<tr>
<td>P3</td>
<td></td>
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<tr>
<td>P2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>P0</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Notes:
1) Sizes with a shaft diameter greater than 120mm are scheduled to be produced starting December 2016.
2) Sizes with a shaft diameter greater than 80mm are scheduled to be produced starting December 2017.

Accuracy

Table 2  Tolerance and allowance of outer ring

<table>
<thead>
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<th>Accuracy class</th>
<th>CRBHV</th>
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<td>P3</td>
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<td></td>
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<tr>
<td>P1</td>
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</tr>
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Notes:
1) Sizes with a shaft diameter greater than 120mm are scheduled to be produced starting December 2016.
2) Sizes with a shaft diameter greater than 80mm are scheduled to be produced starting December 2017.

Classification symbol

Notes:
- CRBFV: A,ea
- CRBHV: C,ia

Table 3  Tolerance and allowance of outer ring

Rotation accuracy class ··· classes specifying accuracy standards for only rotational accuracy (radial runout / axial runout)
CRBHVs are high rigidity crossed roller bearings designed for applications requiring high precision and high rigidity. They are characterized by their ability to provide both high rigidity and high maneuverability, making them suitable for use in a variety of applications, including precision machinery and automation equipment.

### Lubrication

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

For bearings without prepacked grease, supply grease or oil before use. Operating without lubrication will increase 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 ALVINIA.

### Oil groove

For Crossed Roller Bearings, oil holes and oil grooves can be 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 groove is 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 "OHG" at the same place in the identification number. CRBHV and CRBFV 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 permissible temperature range of CRBHVs / CRBFVs is -20 °C +110 °C. However, for continuous use, keep the temperature at 100 °C or below.

### Operating Temperature Range

<table>
<thead>
<tr>
<th>Bearing Type</th>
<th>Operating Temperature Range</th>
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<tbody>
<tr>
<td>CRBHVs / CRBFVs</td>
<td>-20 °C to +110 °C</td>
</tr>
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### Notes

- CRBHVs / CRBFVs are high precision with a level of rigidity 10 times higher than regular crossed roller bearings.
- CRBHVs / CRBFVs are designed for continuous operation.
- CRBHVs / CRBFVs are suitable for use in environments with high humidity and corrosive atmospheres.
- CRBHVs / CRBFVs are designed for use with through-holes in the inner ring for lubrication.
- CRBHVs / CRBFVs are designed for use with bore diameters of 8 through 35 mm.