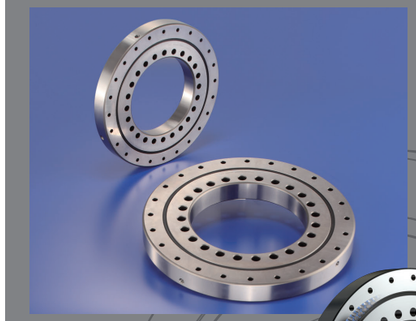
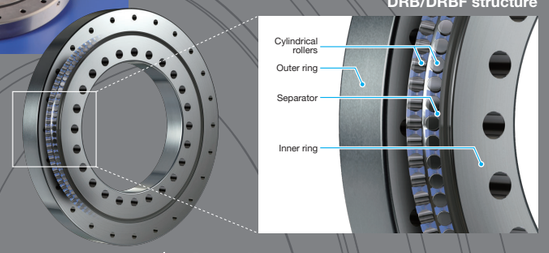


Double Row Angular Contact Roller Bearings
DRB/DRBF: An Introduction

Double Row Angular Contact Roller Bearings have a large number of cylindrical rollers with a large contact area with the raceway and an excellent load capacity, between the inner and outer rings arranged in two rows of raceways. This provides higher rigidity and lower torque than the High Rigidity Type Crossed Roller Bearings.

DRB/DRBF structure



1 Super high rigidity

Component rigidity is high because both the inner and outer rings have a solid one-piece construction, and the use of a double row raceway in the rear mating structure further increases rigidity.

2 High accuracy

The integrated structure (non split) constructed in both inner and outer rings helps avoid installation errors, yielding extra-high-rigidity and high-accuracy guiding performance without affecting the housing accuracy.

3 Smooth rotation

Since separators are incorporated between the cylindrical rollers for smooth rotation, these bearings are suitable for applications where rotational speed is comparatively high.

4 Contributing to miniaturization

The mounting holes in both inner and outer rings facilitate installation to your machines and equipment. Further, it is less subject to peripheral structures such as the housing or fixing plate and provides super high rigidity and high-accuracy guidance.

■Example of manufacturing dimensions

Boundary dimensions mm			Basic dynamic load rating *C* N	Basic static load rating *Co* N
Inner ring bore diameter	Outside dia. of outer ring	Width		
160	295	35	60 300	167 000
210	380	40	108 000	313 000
350	540	50	235 000	725 000

◎This is a special order product; if needed please contact IKO.

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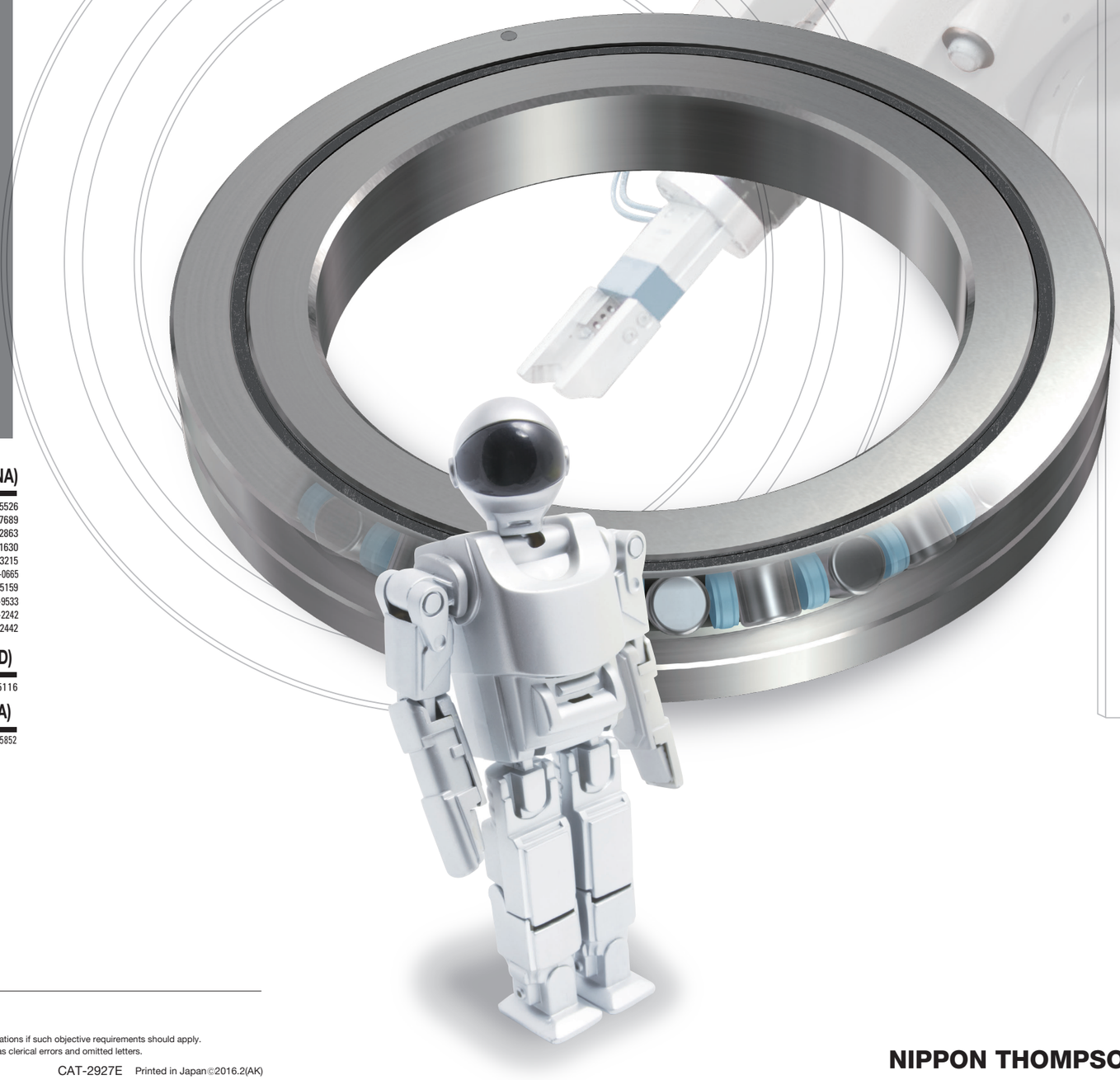
Innovation, Know-how & Originality

Constant Innovation For The Rotating World

IKO
Crossed Roller Bearings

Crossed Roller Bearings



Oil Minimum
IKO Gentle to The Earth

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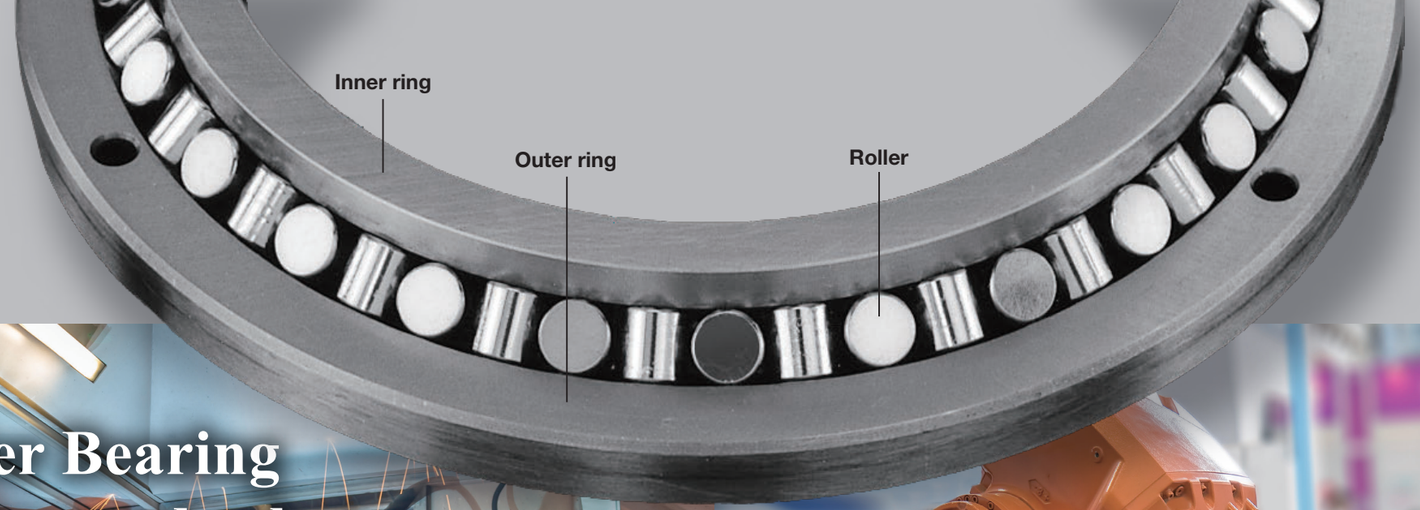
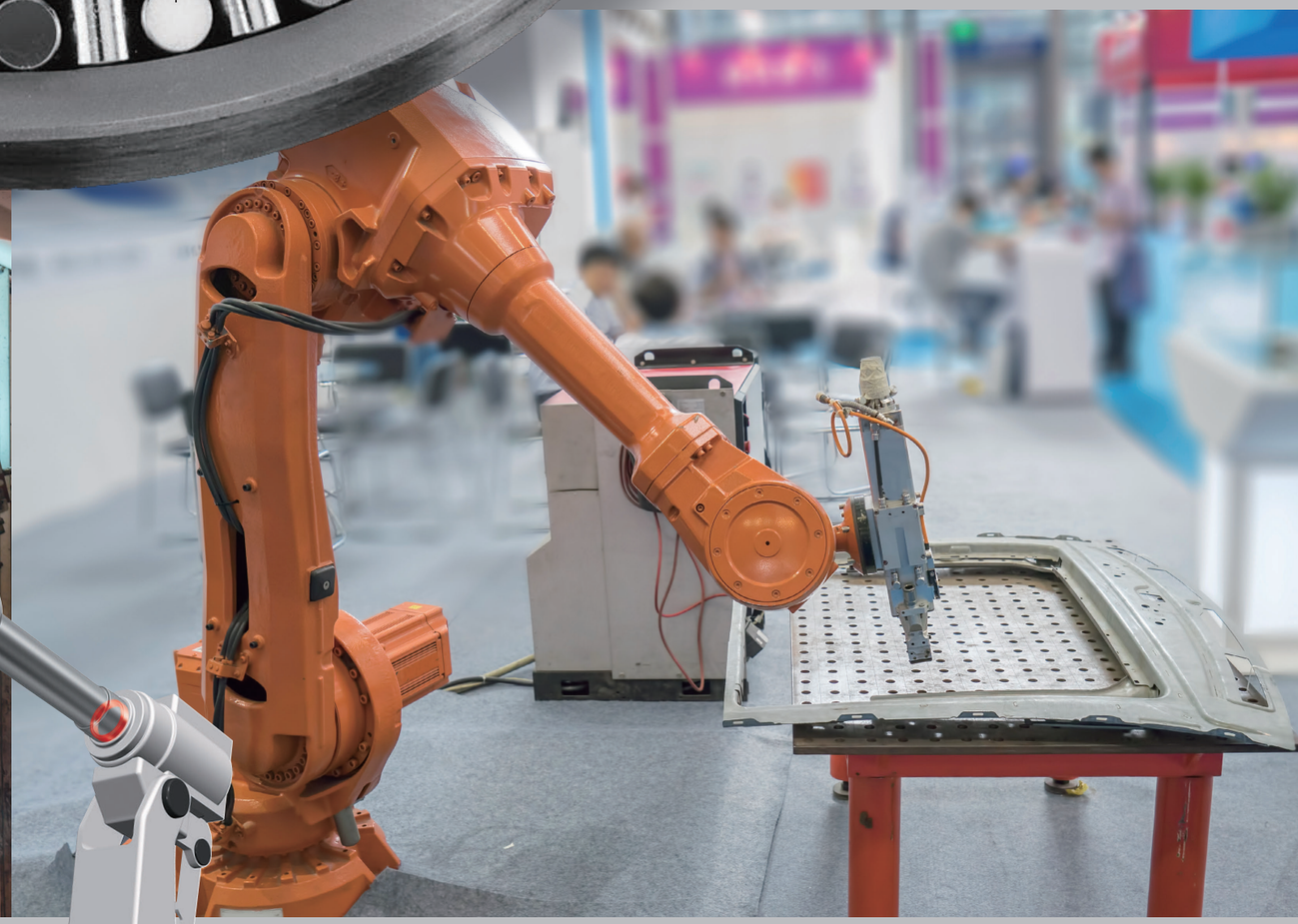


【What are Crossed Roller Bearings?】

Crossed Roller Bearings are compact bearings with their rollers alternately crossed at right angles to each other between inner and outer rings.
With their roller orthogonal array structure, they provide optimum performance when supporting a robot's wrist rotation.

The Crossed Roller Bearing
A necessity for advanced robots.



【What do robots have to do with Crossed Roller Bearings?】

Robots are currently working across a range of fields including medical robots and industrial robots for welding or part pickup.
These robots are evolving towards higher functions, higher performance, and higher quality,
which require high performance bearings to support their movement.
For example, the bearings supporting the swing of the arm-type robot in the figure at the right must withstand
the high load derived from high speed operation and complex motion.
Furthermore, they must not only stand up to this severe load, but also require high accuracy to enable precise motion.
Crossed Roller Bearings were created to be used in this demanding robot-specific environment.

CRB
Crossed Roller Bearings

At this time, robots are working in diverse applications, including medicine, welding, component pickup and more.

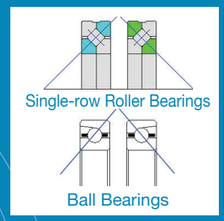
Why are Crossed Roller Bearings the best choice for robots?

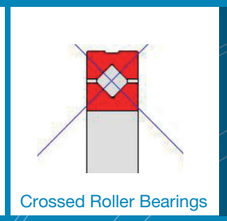
IKO's Crossed Roller Bearing's quality.

CRB
Crossed Roller Bearings

Compact

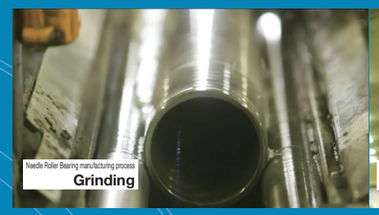
The orthogonal array of rollers reduces the cross sectional area of rear-mounted 45° contact angle roller bearings or single row ball bearings by half. This compact design allows you to more effectively utilize space in your application.





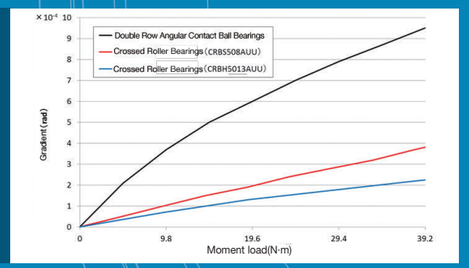
Quality

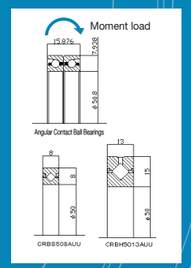
With IKO's manufacturing know-how and rigorous quality standards, supported by many years of experience with roller type bearings, highly accurate Crossed Roller Bearings can be produced.

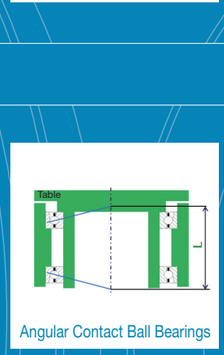


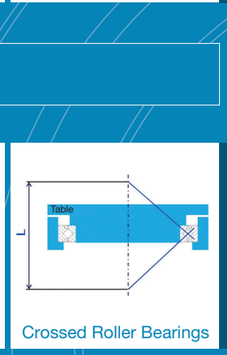
High Rigidity

The figure at right is a cross-section of a rotating turntable. The application point distance from the time moment load is 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.





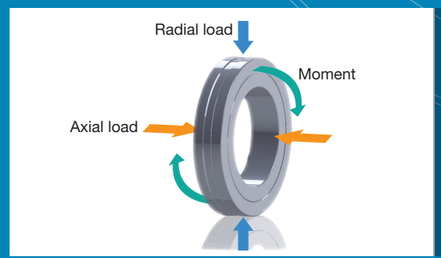




Because of the line contact structure, when using rollers for the bearing inner rolling elements, rigidity is greatly improved compared to ball type bearings. For example, rigidity is increased 3 to 4 times while achieving more compact cross-section dimensions compared to a double row Angular Contact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

Usability

The orthogonal array of rollers allows the bearing to handle complex loads simultaneously from any direction, which makes assembly possible without needing to worry about load direction.

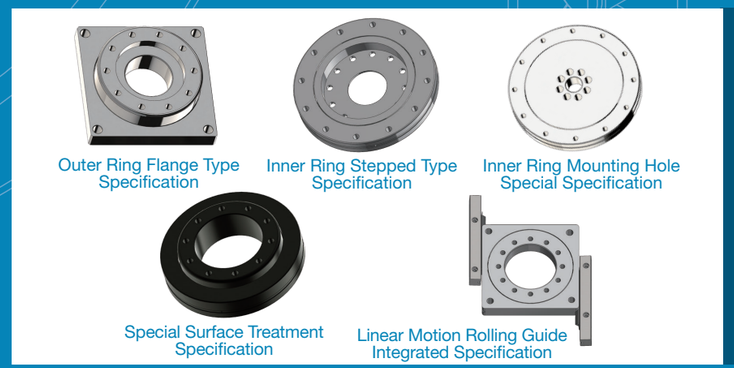


Diversity

IKO Crossed Roller Bearings are available in a wide variety of types. For machine tools, large robots, and general industrial equipment, optimal types are 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 slim 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 is also available, with mounting holes to simplify the mating housing structure.

Flexibility

With the multi-model production enabled by IKO's unique flexibility, we offer Crossed Roller Bearings with individual specifications customized to customers' usage applications. We have a solid record of production for a wide variety of special products with shapes, sizes, surface treatments etc. that are not available in standard products; feel free to contact IKO when needing assistance with special applications that stock products can't handle.



Lineup

Offering superior performance for state-of-the-art devices, optimal for components requiring precision and smooth movement.

CRB
Crossed Roller Bearings

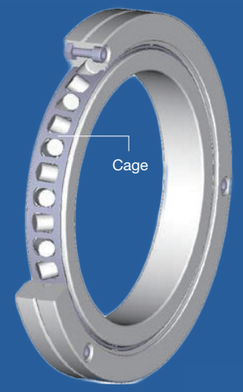
Standard Type Crossed Roller Bearings

The outer ring is made of two split pieces, which are bolted together to prevent separation during transportation or mounting. So handling is easy. A wide variety of sizes enables support for multiple applications. Because the outer ring is split, it is mainly used with a fixed outer ring and rotating inner ring.

CRB

Full Complement Split Outer Ring Crossed Roller Bearings. Optimal for heavy loads at low speeds since they have a large load capacity.

Variation					
Size	Shaft dia. 30-800 mm				
Seal	Yes		None		
Clearance	T1 (Preload)	C1 (Slight)	C2 (Medium)	No symbol (Normal)	
Accuracy class	Class 0	Class 6	Class 5	Class 4	Class 2
Accuracy → High					



CRBC

Split Outer Ring Crossed Roller Bearings with Cage. Suited for applications with high rotational speed due to their low friction coefficient.

Variation					
Size	Shaft dia. 30-800 mm				
Seal	Yes		None		
Clearance	T1 (Preload)	C1 (Slight)	C2 (Medium)	No symbol (Normal)	
Accuracy class	Class 0	Class 6	Class 5	Class 4	Class 2
Accuracy → High					

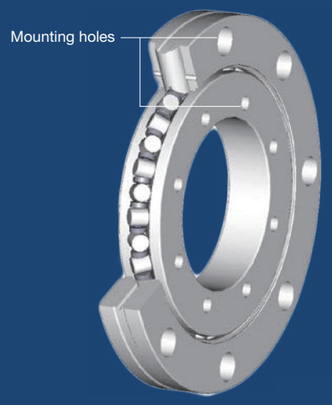
High Rigidity Type Crossed Roller Bearings

Both inner and outer rings have a solid one-piece construction (non-separable). Therefore, high accuracy and high rigidity are achieved, and mounting errors can be minimized. Separators are incorporated between cylindrical rollers for smooth rotation.

CRBH•••A

The integrated structure of the inner and outer rings allow these Crossed Roller Bearings to provide both compactness and high rigidity. They are suited for applications with high rotational speed due to their smooth rotation.

Variation					
Size	Shaft dia. 20-300 mm				
Seal	Yes		None		
Clearance	T1 (Preload)	C1 (Slight)	C2 (Medium)	No symbol (Normal)	
Accuracy class	Class 0	Class 6	Class 5	Class 4	Class 2
Accuracy → High					



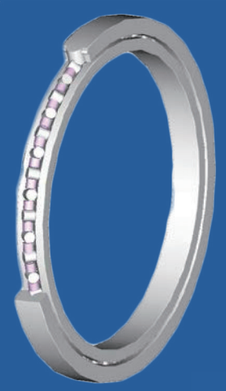
CRBF•••A

Crossed Roller Bearings with mounting holes on both the inner and outer rings facilitate installation into your machines and equipment. The mounting holes make them less dependent upon peripheral structures such as the housing or fixing plate, so surrounding parts of the bearing can be made compact.

Variation					
Size	Shaft dia. 10-115 mm				
Seal	Yes		None		
Clearance	T1 (Preload)	C1 (Slight)	C2 (Medium)	No symbol (Normal)	
Accuracy class	Class 0	Class 6	Class 5	Class 4	Class 2
Accuracy → High					

Slim and Super Slim Type Crossed Roller Bearings

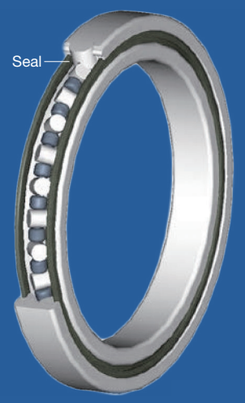
Slim Crossed Roller Bearings have integrated inner and outer rings (non-separable), a small outside diameter when compared to the bore diameter, and a narrow width. They help make machines or equipment more compact and lightweight.



CRBT•••A

Super Slim Type Crossed Roller Bearings are extremely compact bearings with 5.5 mm sectional height and 5 mm width.

Variation					
Size	Shaft dia. 20-50 mm				
Seal	Yes		None		
Clearance	T1 (Preload)	C1 (Slight)	C2 (Medium)	No symbol (Normal)	
Accuracy class	Class 0	Class 6	Class 5	Class 4	Class 2
Accuracy → High					



CRBS

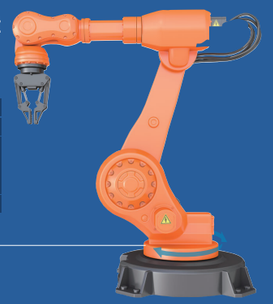
Slim Type Crossed Roller Bearings offer a wide variety of sizes, with cage, separator, or full complement interior specifications that can be modified to suit a wide range of applications.

Variation					
Size	Shaft dia. 50-200 mm				
Seal	Yes		None		
Clearance	T1 (Preload)	C1 (Slight)	C2 (Medium)	No symbol (Normal)	
Accuracy class	Class 0	Class 6	Class 5	Class 4	Class 2
Accuracy → High					

Examples of use

Heavy-duty transport robot

Structure	Vertical articulation
Location used	Base swivel part
Required performance	Used in the area receiving the highest load; this application requires not only high load capacity but also compactness.
Model used	Standard Type Crossed Roller Bearing CRB

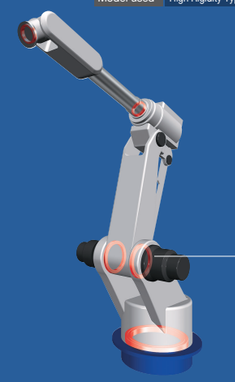


Pick-up robot

Structure	Horizontal articulation
Location used	Joint swivel part
Required performance	Smooth, high speed movement is required to achieve high tact.
Model used	High Rigidity Type Crossed Roller Bearing CRBH···A

Welding robot

Structure	Vertical articulation
Location used	Joint swivel part
Required performance	Accurate positioning is a must, requiring high-rigidity bearings with high rotational accuracy and low deflection.
Model used	Mounting Holed Type High Rigidity Crossed Roller Bearing CRBF···A



Examples of use

Transport robot

Structure	Horizontal articulation
Location used	Joint swivel part
Required performance	For high rigidity, compactness, and use avoiding oil, corrosion-resistance without the use of anti-rust oil was required.
Model used	Special Surface Treatment Specification Slim Type Crossed Roller Bearing CRBS