

# CROSSED ROLLER BEARINGS

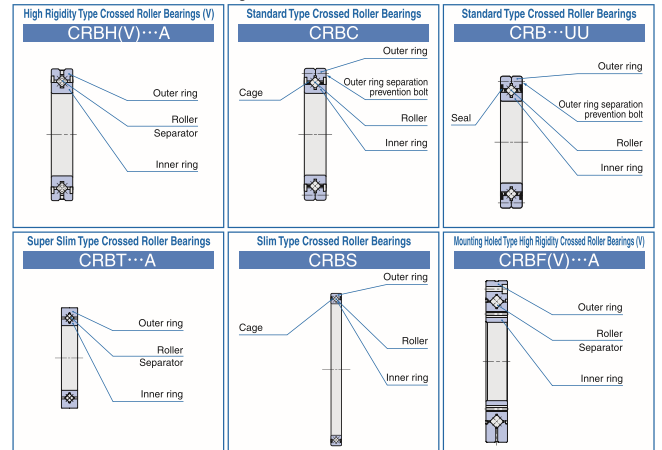
- High Rigidity Type Crossed Roller Bearings (V)
- Standard Type Crossed Roller Bearings
- Super Slim Type Crossed Roller Bearings
- Slim Type Crossed Roller Bearings
- Mounting Holed Type High Rigidity Crossed Roller Bearings (V)



## Structure and Features

**IKO** Crossed Roller Bearings are compact bearings with their rollers alternately crossed at right angles to each other between inner and outer rings. They can take loads from any directions at the same time such as radial, thrust and moment loads. The rollers make line-contact with raceway surfaces, and, therefore, elastic deformation due to bearing loads is very small. These bearings are widely used in the rotating parts of industrial robots, machine tools, medical equipment, etc., which require compactness, high rigidity and high rotational accuracy. In addition, bearings made of stainless steel or those with inner and outer rings provided with mounting holes are also available on request. Please contact **IKO**.

### Structure of Crossed Roller Bearings



Crossed Roller Bearings are available in the types shown in Table 1.

Table 1 Crossed Roller Bearing Type

| Type   | With Cage   | With Separator | Full complement |
|--|-------------|----------------|-----------------|
| High Rigidity Type Crossed Roller Bearings (V)<br>CRBH(V)                | Open type   | —              | CRBH(V) ··· A   |
|  | Sealed type | —              | CRBH(V) ··· AUU |
| Standard Type Crossed Roller Bearings<br>CRBC, CRB                       | Open type   | CRBC           | —               |
|  | Sealed type | CRBC ··· UU    | —               |
| Super Slim Type Crossed Roller Bearings<br>CRBT                          | Open type   | —              | CRBT ··· A      |
| Slim Type Crossed Roller Bearings<br>CRBS                                | Open type   | CRBS           | —               |
|  | Sealed type | —              | CRBS ··· AUU    |
| Mounting Holed Type High Rigidity Crossed Roller Bearings (V)<br>CRBF(V) | Open type   | —              | CRBF(V) ··· A   |
|  | Sealed type | —              | CRBF(V) ··· AUU |

High Rigidity Type Crossed Roller Bearings

Both inner and outer rings have a solid one-piece construction. Therefore, high accuracy and high rigidity are achieved, and mounting errors can be minimized. As separators are incorporated between the cylindrical rollers for smooth rotation, these bearings are suitable for applications where rotational speed is comparatively high.

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.

Super Slim Type Crossed Roller Bearings

This Type is extremely compact bearing having 5.5mm of sectional height and 5mm of width. Separators are incorporated between Cylindrical rollers for smooth rotation. These compactness, lightness and smoothness contribute downsizing of the machine and saving driving power.

Slim Type Crossed Roller Bearings

These bearings are slim bearings having a small outside diameter, in comparison with the bore diameter, and a narrow width. The type with cage and the type with separator provide smooth rotation and are suitable for applications where rotational speed is comparatively high.

Mounting Holed Type High Rigidity Crossed Roller Bearings

Mounting holes are prepared on outer ring and inner ring providing easy mounting together with high rigidity and high accuracy.

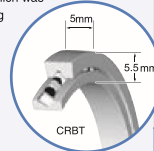
High Rigidity Type Crossed Roller Bearings V Mounting Holed Type High Rigidity Crossed Roller Bearings V

While the basic performance is on a level with that of High Rigidity Crossed Roller Bearings and Mounting Holed Type High Rigidity Crossed Roller Bearings, the establishment of a dedicated production site and the revision of design and manufacturing processes have enabled cost reductions and shortened lead times. This product contributes to machinery/equipment cost reductions and shorter delivery times.

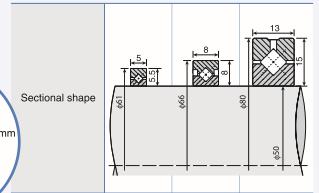
Features of Super Slim Type Crossed Roller Bearing CRBT

The world's thinnest roller type!  
Very low cross sectional height of 5.5 mm

The cross sectional height is reduced by 69% in comparison with CRBS, which was the thinnest before (bearing bore diameter 50 mm). The width is also as small as 5 mm and the cross sectional area is reduced by 43% in comparison with conventional products.



Comparison of bearing bore diameter 50 mm



Significant weight saving by 38% in comparison with conventional types was realized

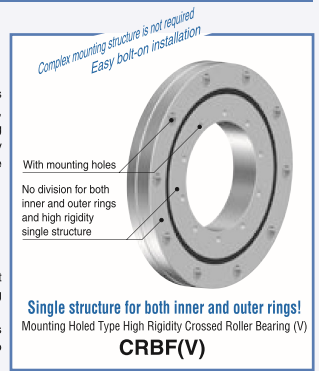
Weight reduction is thoroughly pursued. The mass ratio is 0.38 and significant weight saving was realized in comparison with conventional slim type CRBS (bearing bore diameter 50 mm).

| Series              | Super Slim CRBT505A | Slim CRBS508 | High rigidity CRBH5013A |
|---------------------|---------------------|--------------|-------------------------|
| Outer diameter mm   | 61                  | 66           | 80                      |
| Width mm            | 5                   | 8            | 13                      |
| Sectional height mm | 5.5                 | 8            | 15                      |
| C <sub>0</sub> N    | 2280                | 4900         | 17300                   |
| C <sub>0</sub> N    | 3200                | 6170         | 20900                   |
| Mass g              | 32.3                | 84           | 290                     |
| Compared with CRBH  | 0.11                | 0.29         | 1.00                    |
| Compared with CRBS  | 0.38                | 1.00         | 3.45                    |

Features of Mounting Holed Type High Rigidity Crossed Roller Bearing (V) CRBF(V)

High rigidity and high accuracy

The single structure to reduce the mounting errors is adopted for both inner and outer rings. Further, mounting holes for direct fixing on mating mounting surface are available. So high rigidity and high accuracy guide can be easily realized, being less subject to the structure of the housing and the accuracy.



Contributing to miniaturization

It can be easily mounted to a device with bolts without need for housing and fixing plate, so surrounding parts of the bearing can be made compact. Further, it allows for reduction of the number of parts and assembly processes, which contributes to miniaturization and weight saving of devices.

Single structure for both inner and outer rings!  
Mounting Holed Type High Rigidity Crossed Roller Bearing (V)  
CRBF(V)

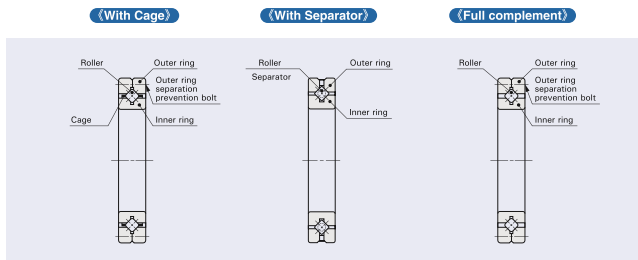
**Internal Structures and Shapes**

Various types are lined up in Crossed Roller Bearing series, including the type with cage, the type with separator, open type, sealed type, etc...

**Roller guide method**

Crossed Roller Bearings include the type with cage, type with separator and full complement type. The type with cage and the type with separator have a small coefficient of friction and are suitable for com-

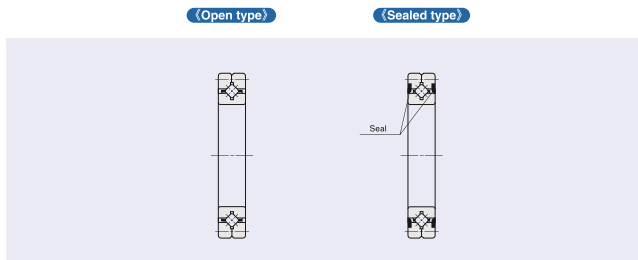
paratively high speed rotations, while the full complement type is suitable for heavy load applications at low speed rotations.



**Seal structure**

Crossed Roller Bearings include the open type and sealed type. The sealed type bearing incorporates seals made of special synthetic rubber that have

excellent sealing performance against dust and dirt penetration and grease leakage. However, excess grease may be discharged during initial operations.



**Identification number**

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

**Examples of identification number**

| Example   | Model code | Dimensions | Supplemental code | Classification symbol |
|-----------|------------|------------|-------------------|-----------------------|
| Example 1 | CRBHV      | 150 25     | A UU C1           | P6                    |
| Example 2 | CRBC       | 150 25     | UU C1             | P6                    |
| Example 3 | CRBT       | 30 5       | A C1              |                       |
| Example 4 | CRBS       | 150 8      | A UU C1           |                       |
| Example 5 | CRBFV      | 115 28     | A D UU C1         | RP6                   |

| Model code  |   |
|-------------|---|
| CRBH(V)···A | High Rigidity Type Crossed Roller Bearing (V) (With separator)                |
| CRBC        | Standard Type Crossed Roller Bearing (With cage)                              |
| CRB         | Standard Type Crossed Roller Bearing (Full complement)                        |
| CRBT···A    | Super Slim Type Crossed Roller Bearing (With separator)                       |
| CRBS        | Slim Type Crossed Roller Bearing (With cage)                                  |
| CRBS···A    | Slim Type Crossed Roller Bearing (With separator)                             |
| CRBS···V    | Slim Type Crossed Roller Bearing (Full complement)                            |
| CRBF(V)···A | Mounting Holed Type High Rigidity Crossed Roller Bearing (V) (With separator) |

| Dimension   |  |
|---|--|
| The dimension indicates the bore diameter of the bearing. (unit : mm) |  |
| The dimension indicates the bearing width. (unit : mm)                |  |

| Supplemental code - 1 <sup>(1)</sup> |  |
|--------------------------------------|--|
| T                                    | With female threaded mounting holes on the inner ring  |
| No symbol                            | With counter-bored mounting holes on both inner ring and outer ring in the same direction.     |
| D                                    | With counter-bored mounting holes on both inner ring and outer ring in the opposite direction. |

Note<sup>(1)</sup> Applicable to Mounting Holed Type High Rigidity Crossed Roller Bearing (V).

| Supplemental code - 2 |                      |
|-----------------------|----------------------|
| No symbol             | Open type            |
| UU                    | Sealed type          |
| U                     | One side sealed type |

For application, please see table 2.

| Supplemental code - 3 |                  |
|-----------------------|------------------|
| T1                    | T1 clearance     |
| C1                    | C1 clearance     |
| C2                    | C2 clearance     |
| No symbol             | Normal clearance |

For application, please see table 3.

| Classification symbol |                             |
|-----------------------|-----------------------------|
| No symbol             | Accuracy class 0            |
| P6                    | Accuracy class 6            |
| P5                    | Accuracy class 5            |
| P4                    | Accuracy class 4            |
| P2                    | Accuracy class 2            |
| RP6                   | Rotational accuracy class 6 |
| RP5                   | Rotational accuracy class 5 |
| RP4                   | Rotational accuracy class 4 |
| RP2                   | Rotational accuracy class 2 |

For application, please see table 4.

Rotational accuracy class—classes specifying accuracy standards for only rotational accuracy (radial runout, axial runout).

J  
CRBH  
CRBC  
CRB  
CRBT  
CRBS  
CRBF

Table 2 Seal Specification

| Model code    | No Symbol | UU | U |
|---------------|-----------|----|---|
| CRBH(V) ... A | ○         | ○  | — |
| CRBC          | ○         | ○  | ○ |
| CRB           | ○         | ○  | ○ |
| CRBT ... A    | ○         | —  | — |
| CRBS          | ○         | —  | — |
| CRBS ... A    | —         | ○  | ○ |
| CRBS ... V    | ○         | ○  | ○ |
| CRBF(V) ... A | ○         | ○  | — |

Table 3 Clearance Specification

| Model code    | T1 | C1 | C2 | No Symbol |
|---------------|----|----|----|-----------|
| CRBH(V) ... A | ○  | ○  | ○  | —         |
| CRBC          | ○  | ○  | ○  | —         |
| CRB           | ○  | ○  | ○  | —         |
| CRBT ... A    | —  | ○  | —  | —         |
| CRBS          | ○  | ○  | —  | ○         |
| CRBS ... A    | ○  | ○  | —  | ○         |
| CRBS ... V    | ○  | ○  | —  | ○         |
| CRBF(V) ... A | ○  | ○  | ○  | —         |

Table 4 Accuracy Class

| Model code    | No Symbol | P6 RP6 | P5 RP5 | P4 RP4 | P2 RP2 |
|---------------|-----------|--------|--------|--------|--------|
| CRBH(V) ... A | ○         | ○      | ○      | ○      | ○      |
| CRBC          | ○         | ○      | ○      | ○      | ○      |
| CRB           | ○         | ○      | ○      | ○      | ○      |
| CRBT ... A    | ○         | —      | —      | —      | —      |
| CRBS          | ○         | —      | —      | —      | —      |
| CRBS ... A    | ○         | —      | —      | —      | —      |
| CRBS ... V    | ○         | —      | —      | —      | —      |
| CRBF(V) ... A | ○         | ○      | ○      | ○      | ○      |

**Dynamic Equivalent Load**

The direction of basic dynamic load rating of Crossed Roller Bearing is the radial direction. When a load in any direction other than the direction of basic dynamic load rating or a complex load is applied, calculate the dynamic equivalent load to calculate the rating life.

$$P_d = X \left( F_r + \frac{2M}{D_{pw}} \right) + Y F_a \quad \dots \dots \dots (1)$$

where,  $P_d$ : Dynamic equivalent radial load, N  
 $F_r$ : Radial load, N  
 $F_a$ : Axial load, N  
 $M$ : Moment, N-mm  
 $D_{pw}$ : Pitch circle diameter of roller set, mm

$$\left( D_{pw} \approx \frac{d+D}{2} \right)$$

$X$ : Radial load factor (Refer to Table 5).  
 $Y$ : Axial load factor (Refer to Table 5).

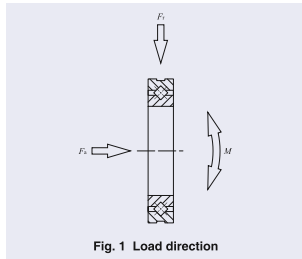


Table 5 Radial load factor and axial load factor

| Conditions                             | X    | Y    |
|--|------|------|
| $\frac{F_a}{F_r + 2M/D_{pw}} \leq 1.5$ | 1    | 0.45 |
| $\frac{F_a}{F_r + 2M/D_{pw}} > 1.5$    | 0.67 | 0.67 |

**Static Equivalent Load**

The direction of basic static load rating of Crossed Roller Bearing is the radial direction. When a load in any direction other than the direction of basic static load rating or a complex load is applied, calculate the static equivalent load to calculate the static safety factor.

$$P_{0r} = F_r + \frac{2M}{D_{pw}} + 0.44 F_a \quad \dots \dots \dots (2)$$

where,  $P_{0r}$ : Static equivalent radial load, N  
 $F_r$ : Radial load, N  
 $F_a$ : Axial load, N  
 $M$ : Moment, N-mm  
 $D_{pw}$ : Pitch circle diameter of roller set, mm

$$\left( D_{pw} \approx \frac{d+D}{2} \right)$$

**Accuracy**

The accuracy of Crossed Roller Bearings, Super Slim Type Crossed Roller Bearings, Slim Type Crossed Roller Bearings and Mounting Holed Type High Rigidity Crossed Roller Bearings is shown below in Table 6 - 10.2.

Rigidity Crossed Roller Bearings is shown below in Table 6 - 10.2.

Bearings with special accuracy are also options. Please consult **IKO**.

Table 6 Tolerances and allowable values of inner rings and tolerances of outer ring width

| Nominal bore diameter<br>mm | $\Delta d_{img}^{(1)}$<br>Single plane mean bore dia. deviation |     |      |     |      |     |      |     |         |     | $\Delta b_s$<br>Deviation of a single inner ring width |     |      |     | $\Delta c_s^{(2)}$<br>Deviation of a single outer ring width |     |         |     | $K_{i2}$<br>Radial run-out of assembled bearing inner ring |     |      |     | $S_{i2}$<br>Assembled bearing inner ring face run-out with raceway |     |      |     |    |     |
|-----------------------------|---|-----|------|-----|------|-----|------|-----|---------|-----|--|-----|------|-----|--|-----|---------|-----|--|-----|------|-----|--|-----|------|-----|----|-----|
|                             | Class 0   |     | P6   |     | P5   |     | P4   |     | Class 0 |     | P6   |     | P5   |     | P4   |     | Class 0 |     | P6   |     | P5   |     | P4   |     | P2   |     |    |     |
|                             | High  | Low | High | Low | High | Low | High | Low | High    | Low | High   | Low | High | Low | High   | Low | High    | Low | High   | Low | High | Low | High   | Low | High | Low |    |     |
| 18                          | 30  | 0   | -10  | 0   | -8   | 0   | -6   | 0   | -5      | 0   | -75  | 0   | -100 | 13  | 8  | 4   | 3       | 2.5 | 13   | 8   | 4    | 3   | 2.5  | 13  | 8    | 4   | 3  | 2.5 |
| 30                          | 50  | 0   | -12  | 0   | -10  | 0   | -8   | 0   | -6      | 0   | -75  | 0   | -100 | 15  | 10   | 5   | 4       | 2.5 | 15   | 10  | 5    | 4   | 2.5  | 15  | 10   | 5   | 4  | 2.5 |
| 50                          | 80  | 0   | -15  | 0   | -12  | 0   | -9   | 0   | -7      | 0   | -75  | 0   | -100 | 20  | 10   | 5   | 4       | 2.5 | 20   | 10  | 5    | 4   | 2.5  | 20  | 10   | 5   | 4  | 2.5 |
| 80                          | 120   | 0   | -20  | 0   | -15  | 0   | -10  | 0   | -8      | 0   | -75  | 0   | -100 | 25  | 13   | 6   | 5       | 2.5 | 25   | 13  | 6    | 5   | 2.5  | 25  | 13   | 6   | 5  | 2.5 |
| 120                         | 150   | 0   | -25  | 0   | -18  | 0   | -13  | 0   | -10     | 0   | -100   | 0   | -120 | 30  | 18   | 8   | 6       | 2.5 | 30   | 18  | 8    | 6   | 2.5  | 30  | 18   | 8   | 6  | 2.5 |
| 150                         | 180   | 0   | -25  | 0   | -18  | 0   | -13  | 0   | -10     | 0   | -100   | 0   | -120 | 30  | 18   | 8   | 6       | 2.5 | 30   | 18  | 8    | 6   | 2.5  | 30  | 18   | 8   | 6  | 2.5 |
| 180                         | 250   | 0   | -30  | 0   | -22  | 0   | -15  | 0   | -12     | 0   | -100   | 0   | -120 | 40  | 20   | 10  | 8       | 5   | 40   | 20  | 10   | 8   | 5  | 40  | 20   | 10  | 8  | 5   |
| 250                         | 315   | 0   | -35  | 0   | -25  | 0   | -18  | 0   | -12     | 0   | -120   | 0   | -150 | 50  | 25   | 13  | 10      | 7   | 50   | 25  | 13   | 10  | 7  | 50  | 25   | 13  | 10 | 7   |
| 315                         | 400   | 0   | -40  | 0   | -30  | 0   | -23  | 0   | -12     | 0   | -150   | 0   | -200 | 60  | 30   | 15  | 12      | 8   | 60   | 30  | 15   | 12  | 8  | 60  | 30   | 15  | 12 | 8   |
| 400                         | 500   | 0   | -45  | 0   | -35  | 0   | -23  | 0   | -12     | 0   | -150   | 0   | -200 | 65  | 35   | 18  | 14      | 10  | 65   | 35  | 18   | 14  | 10   | 65  | 35   | 18  | 14 | 10  |
| 500                         | 630   | 0   | -50  | 0   | -40  | 0   | -23  | 0   | -12     | 0   | -150   | 0   | -200 | 70  | 40   | 20  | 16      | 12  | 70   | 40  | 20   | 16  | 12   | 70  | 40   | 20  | 16 | 12  |
| 630                         | 800   | 0   | -75  | 0   | -50  | 0   | -23  | 0   | -12     | 0   | -150   | 0   | -200 | 80  | 50   | 25  | 20      | 15  | 80   | 50  | 25   | 20  | 15   | 80  | 50   | 25  | 20 | 15  |

Notes(1) For accuracy class P2 and other classes without a numerical description, the highest grade numerical value among the lower accuracy classes in the same nominal bore diameter range is applied.  
 (2) For High Rigidity Type Crossed Roller Bearings (V), the tolerances for deviation of a single inner ring width are applicable to those of a single outer ring width.  
 Remark The accuracy specified in this table is not applicable to Mounting Holed Type High Rigidity Crossed Roller Bearings (V), Slim Type Crossed Roller Bearings and Super Slim Type Crossed Roller Bearings.

Table 7 Tolerances and allowable values of outer ring

| Nominal outside diameter<br>mm | $\Delta D_{img}^{(1)}$<br>Single plane mean outside dia. deviation |     |      |     |      |     |      |     |         |     | $K_{o2}$<br>Radial run-out of assembled bearing outer ring |     |      |     | $S_{o2}$<br>Assembled bearing outer ring face run-out with raceway |     |         |     |      |     |      |     |      |     |      |     |
|--------------------------------|--|-----|------|-----|------|-----|------|-----|---------|-----|--|-----|------|-----|--|-----|---------|-----|------|-----|------|-----|------|-----|------|-----|
|                                | Class 0  |     | P6   |     | P5   |     | P4   |     | Class 0 |     | P6   |     | P5   |     | P4   |     | Class 0 |     | P6   |     | P5   |     | P4   |     | P2   |     |
|                                | High   | Low | High | Low | High | Low | High | Low | High    | Low | High   | Low | High | Low | High   | Low | High    | Low | High | Low | High | Low | High | Low | High | Low |
| 30                             | 50   | 0   | -11  | 0   | -9   | 0   | -7   | 0   | -6      | 0   | 20   | 10  | 7    | 5   | 2.5  | 20  | 10      | 7   | 5    | 2.5 | 20   | 10  | 7    | 5   | 2.5  |     |
| 50                             | 80   | 0   | -13  | 0   | -11  | 0   | -9   | 0   | -7      | 0   | 25   | 13  | 8    | 5   | 4  | 25  | 13      | 8   | 5    | 4   | 25   | 13  | 8    | 5   | 4    |     |
| 80                             | 120  | 0   | -15  | 0   | -13  | 0   | -10  | 0   | -8      | 0   | 35   | 18  | 10   | 6   | 5  | 35  | 18      | 10  | 6    | 5   | 35   | 18  | 10   | 6   | 5    |     |
| 120                            | 150  | 0   | -18  | 0   | -15  | 0   | -11  | 0   | -9      | 0   | 40   | 20  | 11   | 7   | 5  | 40  | 20      | 11  | 7    | 5   | 40   | 20  | 11   | 7   | 5    |     |
| 150                            | 180  | 0   | -25  | 0   | -18  | 0   | -13  | 0   | -10     | 0   | 45   | 23  | 13   | 8   | 5  | 45  | 23      | 13  | 8    | 5   | 45   | 23  | 13   | 8   | 5    |     |
| 180                            | 250  | 0   | -30  | 0   | -20  | 0   | -15  | 0   | -11     | 0   | 50   | 25  | 15   | 10  | 7  | 50  | 25      | 15  | 10   | 7   | 50   | 25  | 15   | 10  | 7    |     |
| 250                            | 315  | 0   | -35  | 0   | -25  | 0   | -18  | 0   | -13     | 0   | 60   | 30  | 18   | 11  | 7  | 60  | 30      | 18  | 11   | 7   | 60   | 30  | 18   | 11  | 7    |     |
| 315                            | 400  | 0   | -40  | 0   | -28  | 0   | -20  | 0   | -12     | 0   | 70   | 35  | 20   | —   | —  | 70  | 35      | 20  | —    | —   | 70   | 35  | 20   | —   | —    |     |
| 400                            | 500  | 0   | -45  | 0   | -33  | 0   | -23  | 0   | -12     | 0   | 80   | 40  | 23   | —   | —  | 80  | 40      | 23  | —    | —   | 80   | 40  | 23   | —   | —    |     |
| 500                            | 630  | 0   | -50  | 0   | -38  | 0   | -28  | 0   | -12     | 0   | 100  | 50  | 25   | —   | —  | 100 | 50      | 25  | —    | —   | 100  | 50  | 25   | —   | —    |     |
| 630                            | 800  | 0   | -75  | 0   | -45  | 0   | -30  | 0   | -12     | 0   | 120  | 60  | 30   | —   | —  | 120 | 60      | 30  | —    | —   | 120  | 60  | 30   | —   | —    |     |
| 800                            | 1000   | 0   | -100 | 0   | -60  | 0   | -35  | 0   | -12     | 0   | 120  | 75  | 35   | —   | —  | 120 | 75      | 35  | —    | —   | 120  | 75  | 35   | —   | —    |     |
| 1000                           | 1030   | 0   | -125 | 0   | -70  | 0   | -40  | 0   | -12     | 0   | 120  | 75  | 35   | —   | —  | 120 | 75      | 35  | —    | —   | 120  | 75  | 35   | —   | —    |     |

Notes(1) For accuracy class P2 and other classes without a numerical description, the highest grade numerical value among the lower accuracy classes in the same nominal bore diameter range is applied.  
 (2) P4 and P2 apply to High Rigidity Type Crossed Roller Bearings (V). For Standard Type Crossed Roller Bearings, the tolerance values for P5 are applicable to P4 and P2.  
 Remark The accuracy specified in this table is not applicable to Mounting Holed Type High Rigidity Crossed Roller Bearings (V), Slim Type Crossed Roller Bearings and Super Slim Type Crossed Roller Bearings.

1N=0.102kgf=0.2248lbs.  
 1mm=0.03937inch



**Table 8 Tolerances and allowable values of Super Slim Type Crossed Roller Bearings** unit:  $\mu\text{m}$

| Nominal bore diameter<br>mm | $\Delta_{Dmp}$<br>Single plane mean bore dia. deviation |     |      |     | $\Delta_{Dmp}$<br>Single plane mean outside dia. deviation |     |      |     | $\Delta_{B_2}$ and $\Delta_{C_3}$<br>Deviations of a single inner ring width and outer ring width |     |      |     | $K_{\alpha}$ and $S_{\alpha}$<br>Radial and axial run-out of assembled bearing inner ring |     |      |     | $K_{\alpha}$ and $S_{\alpha}$<br>Radial and axial run-out of assembled bearing outer ring |     |      |     |
|-----------------------------|---|-----|------|-----|--|-----|------|-----|---|-----|------|-----|---|-----|------|-----|---|-----|------|-----|
|                             | High  | Low | High | Low | High   | Low | High | Low | High  | Low | High | Low | High  | Low | High | Low | High  | Low | High | Low |
| 20                          | 0   | -10 | 0    | -11 | 0  | -11 | 0    | -75 | 13  | 20  |      |     |   |     |      |     |   |     |      |     |
| 30                          | 0   | -10 | 0    | -11 | 0  | -11 | 0    | -75 | 13  | 20  |      |     |   |     |      |     |   |     |      |     |
| 40                          | 0   | -12 | 0    | -13 | 0  | -13 | 0    | -75 | 15  | 25  |      |     |   |     |      |     |   |     |      |     |
| 50                          | 0   | -12 | 0    | -13 | 0  | -13 | 0    | -75 | 15  | 25  |      |     |   |     |      |     |   |     |      |     |

**Table 9 Tolerances and allowable values of Slim Type Crossed Roller Bearings** unit:  $\mu\text{m}$

| Nominal bore diameter<br>mm | $\Delta_{Dmp}$<br>Single plane mean bore dia. deviation |     |      |     | $\Delta_{Dmp}$<br>Single plane mean outside dia. deviation |     |      |      | $\Delta_{B_2}$ and $\Delta_{C_3}$<br>Deviations of a single inner ring width and outer ring width |     |      |     | $K_{\alpha}$ and $S_{\alpha}$<br>Radial and axial run-out of assembled bearing inner ring |     |      |     | $K_{\alpha}$ and $S_{\alpha}$<br>Radial and axial run-out of assembled bearing outer ring |     |      |     |
|-----------------------------|---|-----|------|-----|--|-----|------|------|---|-----|------|-----|---|-----|------|-----|---|-----|------|-----|
|                             | High  | Low | High | Low | High   | Low | High | Low  | High  | Low | High | Low | High  | Low | High | Low | High  | Low | High | Low |
| 50                          | 0   | -15 | 0    | -13 | 0  | -13 | 0    | -127 | 13  | 13  |      |     |   |     |      |     |   |     |      |     |
| 60                          | 0   | -15 | 0    | -13 | 0  | -13 | 0    | -127 | 13  | 13  |      |     |   |     |      |     |   |     |      |     |
| 70                          | 0   | -15 | 0    | -15 | 0  | -15 | 0    | -127 | 15  | 15  |      |     |   |     |      |     |   |     |      |     |
| 80                          | 0   | -20 | 0    | -15 | 0  | -15 | 0    | -127 | 15  | 15  |      |     |   |     |      |     |   |     |      |     |
| 90                          | 0   | -20 | 0    | -15 | 0  | -15 | 0    | -127 | 15  | 15  |      |     |   |     |      |     |   |     |      |     |
| 100                         | 0   | -20 | 0    | -15 | 0  | -15 | 0    | -127 | 15  | 15  |      |     |   |     |      |     |   |     |      |     |
| 110                         | 0   | -20 | 0    | -20 | 0  | -20 | 0    | -127 | 20  | 20  |      |     |   |     |      |     |   |     |      |     |
| 120                         | 0   | -25 | 0    | -20 | 0  | -20 | 0    | -127 | 20  | 20  |      |     |   |     |      |     |   |     |      |     |
| 130                         | 0   | -25 | 0    | -25 | 0  | -25 | 0    | -127 | 25  | 25  |      |     |   |     |      |     |   |     |      |     |
| 140                         | 0   | -25 | 0    | -25 | 0  | -25 | 0    | -127 | 25  | 25  |      |     |   |     |      |     |   |     |      |     |
| 150                         | 0   | -25 | 0    | -25 | 0  | -25 | 0    | -127 | 25  | 25  |      |     |   |     |      |     |   |     |      |     |
| 160                         | 0   | -25 | 0    | -25 | 0  | -25 | 0    | -127 | 25  | 25  |      |     |   |     |      |     |   |     |      |     |
| 170                         | 0   | -25 | 0    | -30 | 0  | -30 | 0    | -127 | 25  | 25  |      |     |   |     |      |     |   |     |      |     |
| 180                         | 0   | -30 | 0    | -30 | 0  | -30 | 0    | -127 | 30  | 30  |      |     |   |     |      |     |   |     |      |     |
| 190                         | 0   | -30 | 0    | -30 | 0  | -30 | 0    | -127 | 30  | 30  |      |     |   |     |      |     |   |     |      |     |
| 200                         | 0   | -30 | 0    | -30 | 0  | -30 | 0    | -127 | 30  | 30  |      |     |   |     |      |     |   |     |      |     |

**Table 10.1 Tolerances and allowable values of inner rings of Mounting Holed Type High Rigidity Crossed Roller Bearings (V)** unit:  $\mu\text{m}$

| Nominal bore diameter<br>mm | $\Delta_{Dmp}$<br>Single plane mean bore dia. deviation |     |     |        |      |     |      |     | $\Delta_{B_2}$<br>Deviation of a single inner ring width |     | $K_{\alpha}$<br>Radial run-out of assembled bearing inner ring |    |    |    | $S_{\alpha}$<br>Assembled bearing inner ring face run-out with raceway |         |    |    |    |    |
|-----------------------------|---|-----|-----|--------|------|-----|------|-----|--|-----|--|----|----|----|--|---------|----|----|----|----|
|                             | Class 0<br>RP6-2  | P6  | P5  | P4, P2 | High | Low | High | Low | Class 0  | P2  | Class 0  | P6 | P5 | P4 | P2   | Class 0 | P6 | P5 | P4 | P2 |
| 20                          | 0   | -8  | -6  | -5     | -75  | 13  | 8    | 4   | 3  | 2.5 | 13   | 8  | 4  | 3  | 2.5  |         |    |    |    |    |
| 30                          | 0   | -8  | -6  | -5     | -75  | 15  | 10   | 5   | 4  | 2.5 | 15   | 10 | 5  | 4  | 2.5  |         |    |    |    |    |
| 35                          | 0   | -12 | -8  | -6     | -75  | 15  | 10   | 5   | 4  | 2.5 | 15   | 10 | 5  | 4  | 2.5  |         |    |    |    |    |
| 50                          | 0   | -10 | -8  | -6     | -75  | 20  | 10   | 5   | 4  | 2.5 | 20   | 10 | 5  | 4  | 2.5  |         |    |    |    |    |
| 65                          | 0   | -12 | -9  | -7     | -75  | 25  | 13   | 6   | 5  | 2.5 | 25   | 13 | 6  | 5  | 2.5  |         |    |    |    |    |
| 80                          | 0   | -15 | -10 | -8     | -75  | 25  | 13   | 6   | 5  | 2.5 | 25   | 13 | 6  | 5  | 2.5  |         |    |    |    |    |
| 100                         | 0   | -15 | -10 | -8     | -75  | 30  | 18   | 8   | 6  | 2.5 | 30   | 18 | 8  | 6  | 2.5  |         |    |    |    |    |

**Table 10.2 Tolerances and allowable values of outer rings of Mounting Holed Type High Rigidity Crossed Roller Bearings (V)** unit:  $\mu\text{m}$

| Nominal outside diameter<br>mm | $\Delta_{Dmp}$<br>Single plane mean outside dia. deviation |     |     |        |      |     |      |     | $\Delta_{C_3}$<br>Deviation of a single outer ring width |     | $K_{\alpha}$<br>Radial run-out of assembled bearing outer ring |    |    |    | $S_{\alpha}$<br>Assembled bearing outer ring face run-out with raceway |         |    |    |    |    |
|--------------------------------|--|-----|-----|--------|------|-----|------|-----|--|-----|--|----|----|----|--|---------|----|----|----|----|
|                                | Class 0<br>RP6-2   | P6  | P5  | P4, P2 | High | Low | High | Low | Class 0  | P2  | Class 0  | P6 | P5 | P4 | P2   | Class 0 | P6 | P5 | P4 | P2 |
| 50                             | 0  | -13 | -11 | -9     | -75  | 20  | 10   | 7   | 5  | 2.5 | 20   | 10 | 7  | 5  | 2.5  |         |    |    |    |    |
| 60                             | 0  | -13 | -11 | -9     | -75  | 25  | 13   | 8   | 5  | 4   | 25   | 13 | 8  | 5  | 4  |         |    |    |    |    |
| 80                             | 0  | -15 | -13 | -10    | -75  | 25  | 13   | 8   | 5  | 4   | 25   | 13 | 8  | 5  | 4  |         |    |    |    |    |
| 95                             | 0  | -15 | -13 | -10    | -75  | 35  | 18   | 10  | 6  | 5   | 35   | 18 | 10 | 6  | 5  |         |    |    |    |    |
| 120                            | 0  | -18 | -15 | -11    | -75  | 35  | 18   | 10  | 6  | 5   | 35   | 18 | 10 | 6  | 5  |         |    |    |    |    |
| 140                            | 0  | -18 | -15 | -11    | -75  | 40  | 20   | 11  | 7  | 5   | 40   | 20 | 11 | 7  | 5  |         |    |    |    |    |
| 150                            | 0  | -25 | -18 | -13    | -75  | 40  | 20   | 11  | 7  | 5   | 40   | 20 | 11 | 7  | 5  |         |    |    |    |    |
| 165                            | 0  | -25 | -18 | -13    | -75  | 45  | 23   | 13  | 8  | 5   | 45   | 23 | 13 | 8  | 5  |         |    |    |    |    |
| 180                            | 0  | -30 | -20 | -15    | -75  | 45  | 23   | 13  | 8  | 5   | 45   | 23 | 13 | 8  | 5  |         |    |    |    |    |
| 210                            | 0  | -30 | -20 | -15    | -75  | 50  | 25   | 15  | 10   | 7   | 50   | 25 | 15 | 10 | 7  |         |    |    |    |    |

**Clearance**

The radial internal clearances of Crossed Roller Bearings, Super Slim Type Crossed Roller Bearings, Slim Type Crossed Roller Bearings and Mounting Holed Type High Rigidity Crossed Roller Bearings (V) are shown below in Table 11.1-11.4.

**Table 11.1 Radial internal clearances** unit:  $\mu\text{m}$

| Nominal bore diameter<br>mm | Radial internal clearance |      |      |      |      |      |      |  |
|-----------------------------|---------------------------|------|------|------|------|------|------|--|
|                             | T1                        | C1   |      | C2   |      |      |      |  |
| Over                        | Incl.                     | Min. | Max. | Min. | Max. | Min. | Max. |  |
| 30                          | -10                       | 0    | 0    | 10   | 10   | 10   | 20   |  |
| 40                          | -10                       | 0    | 0    | 10   | 10   | 10   | 20   |  |
| 50                          | -10                       | 0    | 0    | 10   | 10   | 10   | 25   |  |
| 65                          | -10                       | 0    | 0    | 15   | 15   | 15   | 30   |  |
| 80                          | -10                       | 0    | 0    | 15   | 15   | 15   | 35   |  |
| 100                         | -15                       | 0    | 0    | 15   | 15   | 15   | 35   |  |
| 120                         | -15                       | 0    | 0    | 20   | 20   | 20   | 45   |  |
| 140                         | -15                       | 0    | 0    | 20   | 20   | 20   | 50   |  |
| 160                         | -15                       | 0    | 0    | 20   | 20   | 20   | 50   |  |
| 200                         | -20                       | 0    | 0    | 25   | 25   | 25   | 60   |  |
| 250                         | -20                       | 0    | 0    | 25   | 25   | 25   | 60   |  |
| 315                         | -25                       | 0    | 0    | 30   | 30   | 30   | 70   |  |
| 400                         | -30                       | 0    | 0    | 40   | 40   | 40   | 85   |  |
| 500                         | -30                       | 0    | 0    | 50   | 50   | 50   | 100  |  |
| 630                         | -30                       | 0    | 0    | 60   | 60   | 60   | 120  |  |
| 710                         | -40                       | 0    | 0    | 70   | 70   | 70   | 140  |  |

Remark This table is not applicable to Super Slim Type Crossed Roller Bearings, Slim Type Crossed Roller Bearings and Mounting Holed Type High Rigidity Crossed Roller Bearings (V).

**Table 11.2 Radial internal clearances for Super Slim Type Crossed Roller Bearings** unit:  $\mu\text{m}$

| Nominal bore diameter<br>mm | Radial internal clearance<br>C1 |      |
|-----------------------------|---------------------------------|------|
|                             | Min.                            | Max. |
| 20                          | 0                               | 15   |
| 30                          | 0                               | 15   |
| 40                          | 0                               | 15   |
| 50                          | 0                               | 15   |

**Table 11.3 Radial internal clearances of Slim Type Crossed Roller Bearings** unit:  $\mu\text{m}$

| Nominal bore diameter<br>mm | Radial internal clearance |      |      |        |      |      |
|-----------------------------|---------------------------|------|------|--------|------|------|
|                             | T1                        | C1   |      | Normal |      |      |
|                             | Min.                      | Max. | Min. | Max.   | Min. | Max. |
| 50                          | -8                        | 0    | 0    | 15     | 30   | 56   |
| 60                          | -8                        | 0    | 0    | 15     | 30   | 56   |
| 70                          | -8                        | 0    | 0    | 15     | 30   | 56   |
| 80                          | -8                        | 0    | 0    | 15     | 41   | 66   |
| 90                          | -8                        | 0    | 0    | 15     | 41   | 66   |
| 100                         | -8                        | 0    | 0    | 15     | 41   | 66   |
| 110                         | -8                        | 0    | 0    | 15     | 41   | 66   |
| 120                         | -8                        | 0    | 0    | 15     | 51   | 76   |
| 130                         | -8                        | 0    | 0    | 15     | 51   | 76   |
| 140                         | -8                        | 0    | 0    | 15     | 51   | 76   |
| 150                         | -8                        | 0    | 0    | 15     | 51   | 76   |
| 160                         | -10                       | 0    | 0    | 20     | 51   | 76   |
| 170                         | -10                       | 0    | 0    | 20     | 51   | 76   |
| 180                         | -10                       | 0    | 0    | 20     | 61   | 86   |
| 190                         | -10                       | 0    | 0    | 20     | 61   | 86   |
| 200                         | -10                       | 0    | 0    | 20     | 61   | 86   |

Table 11.4 Radial internal clearances of Mounting Holed Type High Rigidity Crossed Roller Bearings (V)

| d<br>Nominal bore diameter<br>mm |       | Radial internal clearance<br>unit: $\mu\text{m}$ |      |      |      |      |      |      |      |
|----------------------------------|-------|--|------|------|------|------|------|------|------|
| Over                             | Incl. | T1   |      | C1   |      | C2   |      | Min. | Max. |
|                                  |       | Min.   | Max. | Min. | Max. | Min. | Max. |      |      |
| —                                | 20    | -10  | 0    | 0    | 10   | 10   | 20   |      |      |
| 20                               | 25    | -10  | 0    | 0    | 10   | 10   | 20   |      |      |
| 25                               | 35    | -10  | 0    | 0    | 10   | 10   | 25   |      |      |
| 35                               | 65    | -10  | 0    | 0    | 15   | 15   | 30   |      |      |
| 65                               | 80    | -10  | 0    | 0    | 15   | 15   | 35   |      |      |
| 80                               | 95    | -15  | 0    | 0    | 15   | 15   | 35   |      |      |
| 95                               | 110   | -15  | 0    | 0    | 20   | 20   | 45   |      |      |
| 110                              | 125   | -15  | 0    | 0    | 20   | 20   | 50   |      |      |

**Fit**

The standard fits of Crossed Roller Bearings are shown in Table 12.1, and recommended fits for Slim Type Crossed Roller Bearings with normal clearances are shown in Table 12.2. For Super Slim Type Crossed Roller Bearings, it is recommended to use a slight interference fit adjusted to the actual measured dimensions. For large bearings, fit based on the actual measured dimensions of the bearings is recommended, and fit allowance should be chosen as small as possible in accordance with the tolerance class given in Table 12.1. When complex loads or shock loads are applied or when high rotational accuracy and rigidity of the bearing are required, it is recommended to use a slight interference fit adjusted to the actual measured dimensions for both inner and outer rings.

For the interference fit, the radial internal clearance after the fit decreases by approximately 70% to 90% of the interference amount. To avoid excessive pre-load due to fit, it is recommended to use a slight interference fit adjusted to the actual measured dimensions for both T1 and C1 clearances.

Table 12.1 Recommended fits for Crossed Roller Bearings under normal load

| Radial internal clearance | Tolerance class          |              |                          |                   |
|---------------------------|--------------------------|--------------|--------------------------|-------------------|
|                           | Inner ring rotating load |              | Outer ring rotating load |                   |
|                           | Shaft                    | Housing bore | Shaft                    | Housing bore      |
| C1 clearance              | h5                       | H7           | g5                       | J7 <sup>(1)</sup> |
| C2 clearance              | j5                       | H7           | g5                       | J7 <sup>(1)</sup> |

Note<sup>(1)</sup> It is recommended that a slight interference fit adjusted to the actual measured dimensions of the bearing is used.

Table 12.2 Recommended fits for Slim Type Crossed Roller Bearings with normal clearances  
(Dimensional tolerances of shaft and housing bore) unit:  $\mu\text{m}$

| d<br>Nominal bore diameter<br>mm | Inner ring rotating load |     |              |     | Outer ring rotating load |     |              |     |
|----------------------------------|--------------------------|-----|--------------|-----|--------------------------|-----|--------------|-----|
|                                  | Shaft                    |     | Housing bore |     | Shaft                    |     | Housing bore |     |
|                                  | High                     | Low | High         | Low | High                     | Low | High         | Low |
| 50                               | +15                      | 0   | +13          | 0   | -15                      | -30 | -13          | -25 |
| 60                               | +15                      | 0   | +13          | 0   | -15                      | -30 | -13          | -25 |
| 70                               | +15                      | 0   | +15          | 0   | -15                      | -30 | -15          | -30 |
| 80                               | +20                      | 0   | +15          | 0   | -20                      | -40 | -15          | -30 |
| 90                               | +20                      | 0   | +15          | 0   | -20                      | -40 | -15          | -30 |
| 100                              | +20                      | 0   | +15          | 0   | -20                      | -40 | -15          | -30 |
| 110                              | +20                      | 0   | +20          | 0   | -20                      | -40 | -20          | -40 |
| 120                              | +25                      | 0   | +20          | 0   | -25                      | -50 | -20          | -40 |
| 130                              | +25                      | 0   | +25          | 0   | -25                      | -50 | -25          | -50 |
| 140                              | +25                      | 0   | +25          | 0   | -25                      | -50 | -25          | -50 |
| 150                              | +25                      | 0   | +25          | 0   | -25                      | -50 | -25          | -50 |
| 160                              | +25                      | 0   | +25          | 0   | -25                      | -50 | -25          | -50 |
| 170                              | +25                      | 0   | +30          | 0   | -25                      | -50 | -30          | -60 |
| 180                              | +30                      | 0   | +30          | 0   | -30                      | -60 | -30          | -60 |
| 190                              | +30                      | 0   | +30          | 0   | -30                      | -60 | -30          | -60 |
| 200                              | +30                      | 0   | +30          | 0   | -30                      | -60 | -30          | -60 |

**Allowable rotational speed**

Allowable rotational speeds of Crossed Roller Bearings are affected by mounting and operating conditions. The values in general operation are shown in Table 13.

Table 13  $d_{gr}n$  values<sup>(1)</sup> of Crossed Roller Bearings

| Type                        | Lubricant   | Grease | Oil     |
|-----------------------------|-------------|--------|---------|
|                             |             | 75 000 | 150 000 |
| With cage or with separator | Open type   | 75 000 | 150 000 |
|                             | Sealed type | 60 000 | —       |
| Full complement             | Open type   | 50 000 | 75 000  |
|                             | Sealed type | 40 000 | —       |

Note<sup>(1)</sup>  $d_{gr}n$  value =  $d_m \times n$   
where,  $d_m$ : Mean value of bearing bore and outside diameters, mm  
 $n$ : Number of rotations per minute, min<sup>-1</sup>

**Rotational torque**

Rotational torque of IKO Crossed Roller Bearings are lower than that of plain bearings and the difference between the static torque and the dynamic (kinetic) torque is small. Therefore, these bearings minimize power consumption and operating temperature rise of machinery and increase the overall efficiency of machines.

The rotational torque is affected by many factors, but the following equations can be used expediently.

$$T = \mu P_{0r} \frac{D_{pw}}{2}$$

where,  $T$ : Rotational torque, N·mm  
 $\mu$ : Friction coefficient (Approx. 0.010)  
 $P_{0r}$ : Static equivalent radial load, N  
 $D_{pw}$ : Pitch circle diameter, mm

$$\left( D_{pw} \approx \frac{d + D}{2} \right)$$

**Lubrication**

These bearings are generally lubricated with grease. Grease is supplied through the clearance between the inner ring and the outer ring. Grease specification is shown in Table 14. ALVANIA GREASE EP2 (SHOWA SHELL SEKIYU K.K) is prepacked as the lubricating grease. For bearings without prepacked grease, supply grease or oil for use. Operating without grease or oil will increase the wear of the rolling contact surfaces and cause a short bearing life.

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 IKO.

Table 14 Bearings with prepacked grease

| Model code    | Seal specification       |                     |                             |
|---------------|--------------------------|---------------------|-----------------------------|
|               | Open type<br>(No symbol) | Sealed type<br>(UU) | One side sealed type<br>(U) |
| CRBH(V) ... A | ×                        | ○                   | —                           |
| CRBC          | ×                        | ○                   | ×                           |
| CRB           | ×                        | ○                   | ×                           |
| CRBT ... A    | ○                        | —                   | —                           |
| CRBS          | ×                        | —                   | —                           |
| CRBS ... A    | —                        | ○                   | ×                           |
| CRBS ... V    | ×                        | ○                   | ×                           |
| CRBF(V) ... A | ×                        | ○                   | —                           |

**Oil Hole**

For Crossed Roller Bearings, oil holes and oil grooves can be provided on bearing rings if requested. Not applicable to the Super Slim Type. 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. High Rigidity Type Crossed Roller Bearings (V) and Mounting Holed Type High Rigidity Type Crossed Roller Bearings (V) have an oil groove and two oil holes on the outer ring as standard. Table 15 shows availability of oil holes for each bearing type.

Table 15 Oil holes

| Bearing type  | Oil hole code |      |      |                  |
|---------------|---------------|------|------|------------------|
|               | /nOH          | /nOG | -nOH | -nOG             |
| CRBH(V) ... A | ○             | ○    | —    | — <sup>(1)</sup> |
| CRBC          | ○             | ○    | ○    | ○                |
| CRB           | ○             | ○    | ○    | ○                |
| CRBT ... A    | —             | —    | —    | —                |
| CRBS          | ○             | —    | ○    | —                |
| CRBS ... A    | ○             | —    | ○    | —                |
| CRBS ... V    | ○             | —    | ○    | —                |
| CRBF(V) ... A | —             | —    | —    | — <sup>(1)</sup> |

Notes<sup>(1)</sup> CRBH(V) ... A and CRBF(V) ... A are provided with an oil groove and two oil holes on the outer ring.  
Remark n denotes the number of oil holes not exceeding 4. For one oil hole, number is not indicated.  
When preparing multiple oil holes, please contact IKO.

**Example 1** When the inner ring has 4 oil holes  
CRBC 10020 / 4OH C1

4 Oil holes  
In inner ring

**Example 2** When the outer ring has a single oil hole  
CRBC 10020 - OH C1

1 Oil hole  
In outer ring

**Operating Temperature Range**

The operating temperature range for Crossed Roller Bearings is  $-20^{\circ}\text{C} \sim +120^{\circ}\text{C}$ . However, the maximum allowable temperature for types with separator and with seal is  $+110^{\circ}\text{C}$ , and  $+100^{\circ}\text{C}$  when they are continuously operated.

**Mounting**

When the rigidity of the mounting parts is not sufficient, stress concentration will occur at the contact area between the rollers and raceways, and the bearing performance will be deteriorated significantly. Therefore, it is necessary to carefully examine the rigidity of housing and the strength of fixing bolts when a large moment will be applied. The shoulder height diameters ( $d_s$  and  $D_s$ ) that are related to mounting should certainly satisfy the values shown in the dimension tables. When these dimensions are incorrect, deformations of inner and outer rings will occur and the bearing performance will be deteriorated remarkably.

**1. Other than Mounting Holed Type High Rigidity Crossed Roller Bearings (V)**

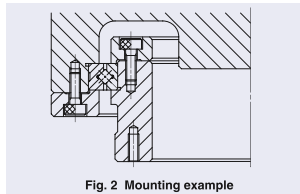


Fig. 2 Mounting example

① The inner and outer rings should be securely fixed in the axial direction by using fixing plates, etc. Recommended thickness of the fixing plate is 1/2 or more of the bearing width  $B$ . The dimensions in the axial direction of the housing bore and the fixing

plates should be determined to get a secure fixing while considering the dimension of bearing width which is given a minus tolerance. (See Fig.2)

- ② The depth of the housing bore is recommended to be equal to or larger than the bearing width.
- ③ Separation prevention bolts for the outer ring of Standard Type Crossed Roller Bearings are provided to prevent separation of two halves of the outer ring during transportation or mounting. When mounting, they should be loosened slightly.
- ④ High Rigidity Type Crossed Roller Bearings (V), Super Slim Type Crossed Roller Bearings and Slim Type Crossed Roller Bearings have a plug for hole for inserting rollers. When mounting the bearings, locate the plug at a position that is not included in the maximum loading zone. The plug location can be found by the pin pressed at the side of the outer ring.

**2. Mounting Holed Type High Rigidity Crossed Roller Bearings (V)**

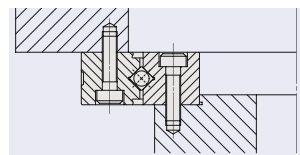


Fig.3 Example of direct mounting to the mating surface of Mounting Holed Type High Rigidity Crossed Roller Bearings (V)

① Mounting Holed Type High Rigidity Crossed Roller Bearings (V) can be mounted directly to the mounting surface by fixing bolts. (See Fig. 3)

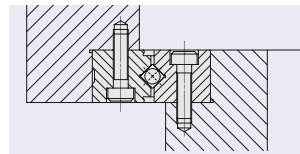


Fig.4 Example of mounting to the housing of Mounting Holed Type High Rigidity Crossed Roller Bearings (V)

- ② If large number of radial load and/or moment is expected, it is recommended to prepare flange part. (See Fig.4)
- ③ Mounting Holed Type High Rigidity Crossed Roller Bearings (V) have a plug for hole for inserting cylindrical rollers. When mounting the bearings, locate the plug at a position that is not included in the maximum loading zone. The plug location can be found by the pin pressed at the side of the outer ring.

**Tightening torque of mounting bolts**

The standard tightening torque values for Mounting Holed Type High Rigidity Crossed Roller Bearings (V) mounting bolts are shown in Table 16. When machines or equipment are subjected to severe vibration, shock, large fluctuating load, or moment load, the bolts should be tightened with a torque 1.2 to 1.5 times higher than the standard torque values shown. If the mating member material is cast iron or aluminum, reduce the tightening torque depending on the strength characteristics of the mating member material.

Please do not tighten with too much torque as abnormal frictional torque or short life may occur.

Table 16 Tightening torque of mounting bolts

| Bolt size | Tightening torque N · m |
|-----------|-------------------------|
| M3 × 0.5  | 1.7                     |
| M4 × 0.7  | 4.0                     |
| M5 × 0.8  | 7.9                     |
| M8 × 1.25 | 32                      |

Above values are for Carbon steel bolt (Strength division 12.9)

**Double Row Angular Contact Roller Bearing**

We manufacture Double Row Angular Contact Roller Bearings to order.

If needed, please contact **IKO**.

Double Row Angular Contact Roller Bearings have a large number of cylindrical rollers with a large contact area with a raceway and an excellent load capability, between the inner and outer rings arranged in a double row of raceways. This underpins even higher rigidity and lower torque than High Rigidity Type Crossed Roller Bearings (V).

The mounting holes in both inner and outer rings facilitate installation to your machines and equipment. Further, the integrated structure (non split) constructed in both inner and outer rings can avoid installation errors, yielding extra-high-rigidity and high-accuracy guiding performance without being affected by other peripheral structures such as housing or pressure plate.

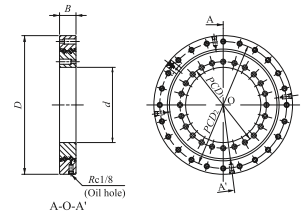
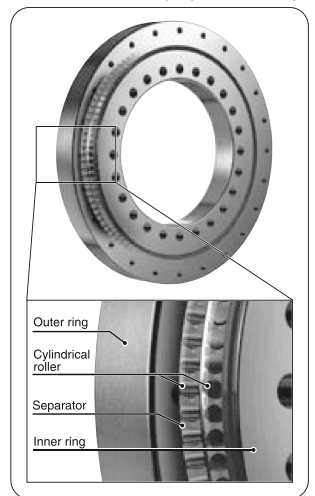


Fig. 5 Manufacturing example

Table 17 Example of manufacturing dimensions

| Boundary dimensions mm |     |     |                  |                    | Basic dynamic load rating | Basic static load rating |
|------------------------|-----|-----|------------------|--------------------|---------------------------|--------------------------|
| $d$                    | $D$ | $B$ | $r_{\text{max}}$ | $P_{CD}, P_{CD_2}$ | $C$<br>N                  | $C_0$<br>N               |
| 160                    | 295 | 35  | 2                | 184 270            | 60 300                    | 167 000                  |
| 210                    | 380 | 40  | 2.5              | 240 350            | 108 000                   | 313 000                  |
| 350                    | 540 | 50  | 2.5              | 385 505            | 235 000                   | 725 000                  |

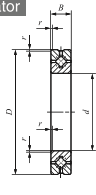
Structure of Double-acting Angular Roller Bearing



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CROSSED ROLLER BEARINGS

High Rigidity Type Crossed Roller Bearings (V) Open Type/With Separator  
Sealed Type/With Separator

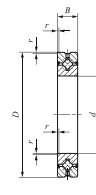


CRBH(V) ... A

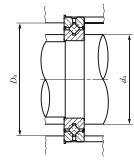
Shaft dia. 20 – 300mm

| Shaft dia. mm | Identification number                                    |                  | Mass (Ref.) kg | Boundary dimensions mm |     |    |                                 |
|---------------|--|------------------|----------------|------------------------|-----|----|---------------------------------|
|               | High Rigidity Type Crossed Roller Bearings (V) Open Type | Seald Type       |                | d                      | D   | B  | r <sub>min</sub> <sup>(1)</sup> |
| 20            | CRBH 208 A   | CRBH 208 A UU    | 0.04           | 20                     | 36  | 8  | 0.3                             |
| 25            | CRBH 258 A   | CRBH 258 A UU    | 0.05           | 25                     | 41  | 8  | 0.3                             |
| 30            | CRBHV 3010 A   | CRBHV 3010 A UU  | 0.12           | 30                     | 55  | 10 | 0.3                             |
| 35            | CRBHV 3510 A   | CRBHV 3510 A UU  | 0.13           | 35                     | 60  | 10 | 0.3                             |
| 40            | CRBHV 4010 A   | CRBHV 4010 A UU  | 0.15           | 40                     | 65  | 10 | 0.3                             |
| 45            | CRBHV 4510 A   | CRBHV 4510 A UU  | 0.16           | 45                     | 70  | 10 | 0.3                             |
| 50            | CRBHV 5013 A   | CRBHV 5013 A UU  | 0.29           | 50                     | 80  | 13 | 0.6                             |
| 60            | CRBHV 6013 A   | CRBHV 6013 A UU  | 0.33           | 60                     | 90  | 13 | 0.6                             |
| 70            | CRBHV 7013 A   | CRBHV 7013 A UU  | 0.38           | 70                     | 100 | 13 | 0.6                             |
| 80            | CRBHV 8016 A   | CRBHV 8016 A UU  | 0.74           | 80                     | 120 | 16 | 0.6                             |
| 90            | CRBHV 9016 A   | CRBHV 9016 A UU  | 0.81           | 90                     | 130 | 16 | 0.6                             |
| 100           | CRBHV 10020 A  | CRBHV 10020 A UU | 1.45           | 100                    | 150 | 20 | 0.6                             |
| 110           | CRBHV 11020 A  | CRBHV 11020 A UU | 1.56           | 110                    | 160 | 20 | 0.6                             |
| 120           | CRBHV 12025 A  | CRBHV 12025 A UU | 2.62           | 120                    | 180 | 25 | 1                               |
| 130           | CRBHV 13025 A  | CRBHV 13025 A UU | 2.82           | 130                    | 190 | 25 | 1                               |
| 140           | CRBHV 14025 A  | CRBHV 14025 A UU | 2.96           | 140                    | 200 | 25 | 1                               |
| 150           | CRBHV 15025 A  | CRBHV 15025 A UU | 3.16           | 150                    | 210 | 25 | 1                               |
| 200           | CRBHV 20025 A  | CRBHV 20025 A UU | 4.0            | 200                    | 260 | 25 | 1                               |
| 250           | CRBHV 25025 A  | CRBHV 25025 A UU | 4.97           | 250                    | 310 | 25 | 1.5                             |
| 300           | CRBH 30025 A   | CRBH 30025 UU    | 5.29           | 300                    | 360 | 25 | 1.5                             |

Note<sup>(1)</sup> Minimum allowable single value of chamfer dimension r  
 Remarks1. The outer ring has an oil groove and two oil holes.  
 2. No grease is prepacked for Open Type. Perform proper lubrication. Grease is prepacked for Sealed Type.  
 3. If one side sealed type are needed, please contact **IKO**.



CRBH(V) ... AUU



| Mounting dimensions mm |                | Basic dynamic load rating | Basic static load rating |
|------------------------|----------------|---------------------------|--------------------------|
| d <sub>2</sub>         | D <sub>2</sub> | C                         | C <sub>0</sub>           |
|                        |                | N                         | N                        |
| 24                     | 31             | 2 910                     | 2 430                    |
| 29                     | 36             | 3 120                     | 2 810                    |
| 36.5                   | 48.5           | 7 600                     | 8 370                    |
| 41.5                   | 53.5           | 7 900                     | 9 130                    |
| 46.5                   | 58.5           | 8 610                     | 10 600                   |
| 51.5                   | 63.5           | 8 860                     | 11 300                   |
| 56                     | 74             | 17 300                    | 20 900                   |
| 66                     | 84             | 18 800                    | 24 300                   |
| 76                     | 94             | 20 100                    | 27 700                   |
| 88                     | 112            | 32 100                    | 43 400                   |
| 98                     | 122            | 33 100                    | 46 800                   |
| 110                    | 140            | 50 900                    | 72 200                   |
| 120                    | 150            | 52 400                    | 77 400                   |
| 132                    | 168            | 73 400                    | 108 000                  |
| 142                    | 178            | 75 900                    | 115 000                  |
| 152                    | 188            | 81 900                    | 130 000                  |
| 162                    | 198            | 84 300                    | 138 000                  |
| 212                    | 248            | 92 300                    | 169 000                  |
| 262                    | 298            | 102 000                   | 207 000                  |
| 312                    | 348            | 112 000                   | 245 000                  |

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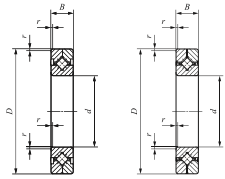


**CROSSED ROLLER BEARINGS**

Standard Type Crossed Roller Bearings

Open Type/With Cage    Open Type/Full Complement Type

Sealed Type/With Cage    Sealed Type/Full Complement Type

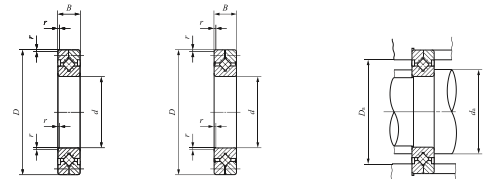


CRBC                      CRBC- UU

Shaft dia. 30 – 200mm

| Shaft dia. mm | Identification number |               |                 |              | Mass (Ref.) kg | Boundary dimensions mm |     |    |
|---------------|-----------------------|---------------|-----------------|--------------|----------------|------------------------|-----|----|
|               | With Cage             |               | Full complement |              |                | d                      | D   | B  |
|               | Open Type             | Sealed Type   | Open Type       | Sealed Type  |                |                        |     |    |
| 30            | CRBC 3010             | CRBC 3010 UU  | CRB 3010        | CRB 3010 UU  | 0.12           | 30                     | 55  | 10 |
| 40            | CRBC 4010             | CRBC 4010 UU  | CRB 4010        | CRB 4010 UU  | 0.15           | 40                     | 65  | 10 |
| 50            | CRBC 5013             | CRBC 5013 UU  | CRB 5013        | CRB 5013 UU  | 0.29           | 50                     | 80  | 13 |
| 60            | CRBC 6013             | CRBC 6013 UU  | CRB 6013        | CRB 6013 UU  | 0.33           | 60                     | 90  | 13 |
| 70            | CRBC 7013             | CRBC 7013 UU  | CRB 7013        | CRB 7013 UU  | 0.38           | 70                     | 100 | 13 |
| 80            | CRBC 8016             | CRBC 8016 UU  | CRB 8016        | CRB 8016 UU  | 0.74           | 80                     | 120 | 16 |
| 90            | CRBC 9016             | CRBC 9016 UU  | CRB 9016        | CRB 9016 UU  | 0.81           | 90                     | 130 | 16 |
| 100           | CRBC 10020            | CRBC 10020 UU | CRB 10020       | CRB 10020 UU | 1.45           | 100                    | 150 | 20 |
| 110           | CRBC 11020            | CRBC 11020 UU | CRB 11020       | CRB 11020 UU | 1.56           | 110                    | 160 | 20 |
| 120           | CRBC 12025            | CRBC 12025 UU | CRB 12025       | CRB 12025 UU | 2.62           | 120                    | 180 | 25 |
| 130           | CRBC 13025            | CRBC 13025 UU | CRB 13025       | CRB 13025 UU | 2.82           | 130                    | 190 | 25 |
| 140           | CRBC 14025            | CRBC 14025 UU | CRB 14025       | CRB 14025 UU | 2.96           | 140                    | 200 | 25 |
| 150           | CRBC 15025            | CRBC 15025 UU | CRB 15025       | CRB 15025 UU | 3.16           | 150                    | 210 | 25 |
|               | CRBC 15030            | CRBC 15030 UU | CRB 15030       | CRB 15030 UU | 5.3            | 150                    | 230 | 30 |
| 200           | CRBC 20025            | CRBC 20025 UU | CRB 20025       | CRB 20025 UU | 4.0            | 200                    | 260 | 25 |
|               | CRBC 20030            | —             | CRB 20030       | —            | 6.7            | 200                    | 280 | 30 |
|               | CRBC 20035            | —             | CRB 20035       | —            | 9.58           | 200                    | 295 | 35 |

Note(1) Minimum allowable single value of chamfer dimension r  
 Remarks1. No oil hole is provided.  
 2. No grease is prepacked for Open Type. Perform proper lubrication. Grease is prepacked for Sealed Type.



CRB                                      CRB- UU

| r <sub>min</sub> <sup>(1)</sup> | Mounting dimensions mm |                | CRBC                          |   | CRB                           |   |
|---------------------------------|------------------------|----------------|-------------------------------|---|-------------------------------|---|
|                                 | d <sub>a</sub>         | D <sub>a</sub> | Basic dynamic load rating C N | Basic static load rating C <sub>0</sub> N | Basic dynamic load rating C N | Basic static load rating C <sub>0</sub> N |
| 0.3                             | 34                     | 44             | 3 830                         | 4 130                                     | 5 290                         | 6 350                                     |
| 0.3                             | 44                     | 54             | 4 280                         | 5 140                                     | 5 980                         | 8 040                                     |
| 0.6                             | 55                     | 71             | 10 700                        | 12 600                                    | 14 200                        | 18 400                                    |
| 0.6                             | 64                     | 81             | 11 600                        | 14 600                                    | 15 400                        | 21 500                                    |
| 0.6                             | 75                     | 91             | 12 300                        | 16 700                                    | 17 000                        | 25 500                                    |
| 0.6                             | 86                     | 107            | 18 200                        | 25 500                                    | 24 300                        | 37 500                                    |
| 1                               | 98                     | 118            | 19 400                        | 28 600                                    | 25 900                        | 42 100                                    |
| 1                               | 108                    | 134            | 31 500                        | 45 100                                    | 39 400                        | 61 100                                    |
| 1                               | 118                    | 144            | 33 500                        | 50 700                                    | 41 200                        | 66 700                                    |
| 1.5                             | 132                    | 164            | 47 700                        | 70 500                                    | 59 900                        | 95 400                                    |
| 1.5                             | 140                    | 172            | 49 200                        | 74 800                                    | 61 000                        | 99 800                                    |
| 1.5                             | 151                    | 183            | 50 700                        | 79 200                                    | 64 100                        | 108 000                                   |
| 1.5                             | 160                    | 192            | 53 800                        | 87 700                                    | 65 000                        | 113 000                                   |
| 1.5                             | 166                    | 202            | 69 200                        | 108 000                                   | 85 900                        | 144 000                                   |
| 2                               | 208                    | 239            | 60 200                        | 110 000                                   | 75 300                        | 148 000                                   |
| 2                               | 218                    | 262            | 108 000                       | 178 000                                   | 133 000                       | 234 000                                   |
| 2                               | 221                    | 274            | 137 000                       | 215 000                                   | 168 000                       | 282 000                                   |

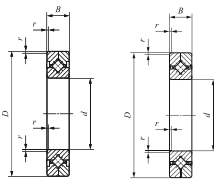
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**CROSSED ROLLER BEARINGS**

Standard Type Crossed Roller Bearings

Open Type/With Cage    Open Type/Full Complement Type

Sealed Type/With Cage    Sealed Type/Full Complement Type



CRBC 25025    CRBC 25025UU  
CRBC 30025    CRBC 30025UU

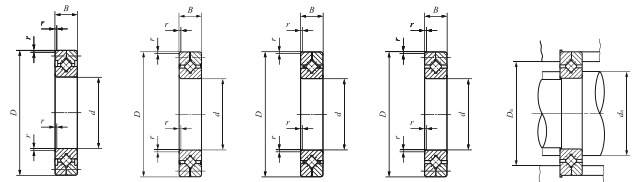
Shaft dia. 250 — 800mm

| Shaft dia.<br>mm | Identification number |               |                 |              | Mass<br>(Ref.)<br>kg | Boundary dimensions<br>mm |       |     |
|------------------|-----------------------|---------------|-----------------|--------------|----------------------|---------------------------|-------|-----|
|                  | With Cage             |               | Full complement |              |                      | d                         | D     | B   |
|                  | Open Type             | Sealed Type   | Open Type       | Sealed Type  |                      |                           |       |     |
| 250              | CRBC 25025            | CRBC 25025 UU | CRB 25025       | CRB 25025 UU | 4.97                 | 250                       | 310   | 25  |
|                  | CRBC 25030            | —             | CRB 25030       | —            | 8.1                  | 250                       | 330   | 30  |
|                  | CRBC 25040            | —             | CRB 25040       | —            | 14.8                 | 250                       | 355   | 40  |
| 300              | CRBC 30025            | CRBC 30025 UU | CRB 30025       | CRB 30025 UU | 5.88                 | 300                       | 360   | 25  |
|                  | CRBC 30035            | —             | CRB 30035       | —            | 13.4                 | 300                       | 395   | 35  |
|                  | CRBC 30040            | —             | CRB 30040       | —            | 17.2                 | 300                       | 405   | 40  |
| 400              | CRBC 40035            | —             | CRB 40035       | —            | 14.5                 | 400                       | 480   | 35  |
|                  | CRBC 40040            | —             | CRB 40040       | —            | 23.5                 | 400                       | 510   | 40  |
|                  | CRBC 40070            | —             | CRB 40070       | —            | 72.4                 | 400                       | 580   | 70  |
| 500              | CRBC 50040            | —             | CRB 50040       | —            | 26.0                 | 500                       | 600   | 40  |
|                  | CRBC 50050            | —             | CRB 50050       | —            | 41.7                 | 500                       | 625   | 50  |
|                  | CRBC 50070            | —             | CRB 50070       | —            | 86.1                 | 500                       | 680   | 70  |
| 600              | CRBC 60040            | —             | CRB 60040       | —            | 30.6                 | 600                       | 700   | 40  |
|                  | CRBC 60070            | —             | CRB 60070       | —            | 102                  | 600                       | 780   | 70  |
|                  | CRBC 600120           | —             | CRB 600120      | —            | 274                  | 600                       | 870   | 120 |
| 700              | CRBC 70045            | —             | CRB 70045       | —            | 46.5                 | 700                       | 815   | 45  |
|                  | CRBC 70070            | —             | CRB 70070       | —            | 115                  | 700                       | 880   | 70  |
|                  | CRBC 700150           | —             | CRB 700150      | —            | 478                  | 700                       | 1 020 | 150 |
| 800              | CRBC 80070            | —             | CRB 80070       | —            | 109                  | 800                       | 950   | 70  |
|                  | CRBC 800100           | —             | CRB 800100      | —            | 247                  | 800                       | 1 030 | 100 |

Note(1) Minimum allowable single value of chamfer dimension r

Remarks1. No oil hole is provided.

2. No grease is prepacked for Open Type. Perform proper lubrication. Grease is prepacked for Sealed Type.

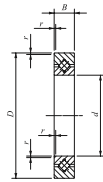


CRBC 25025    CRB 25025UU    CRBC    CRB  
CRBC 30025    CRB 30025UU

| Mounting dimensions mm          | CRBC                        |   | CRB                         |   |
|---------------------------------|-----------------------------|---|-----------------------------|---|
|                                 | Basic dynamic load rating C | Basic static load rating C <sub>0</sub> | Basic dynamic load rating C | Basic static load rating C <sub>0</sub> |
| r <sub>min</sub> <sup>(1)</sup> | d <sub>a</sub>              | D <sub>a</sub>                          | C                           | C <sub>0</sub>                          |
| 2.5                             | 259                         | 290                                     | 67 200                      | 136 000                                 |
| 2.5                             | 265                         | 310                                     | 116 000                     | 208 000                                 |
| 2.5                             | 271                         | 330                                     | 179 000                     | 299 000                                 |
| 2.5                             | 310                         | 341                                     | 73 800                      | 162 000                                 |
| 2.5                             | 318                         | 372                                     | 163 000                     | 299 000                                 |
| 2.5                             | 321                         | 381                                     | 194 000                     | 351 000                                 |
| 2.5                             | 414                         | 457                                     | 133 000                     | 300 000                                 |
| 2.5                             | 423                         | 483                                     | 222 000                     | 455 000                                 |
| 2.5                             | 430                         | 532                                     | 470 000                     | 811 000                                 |
| 2.5                             | 517                         | 573                                     | 212 000                     | 497 000                                 |
| 2.5                             | 531                         | 592                                     | 247 000                     | 561 000                                 |
| 2.5                             | 530                         | 633                                     | 536 000                     | 1 020 000                               |
| 3                               | 621                         | 676                                     | 231 000                     | 581 000                                 |
| 3                               | 630                         | 734                                     | 591 000                     | 1 230 000                               |
| 3                               | 643                         | 817                                     | 1 250 000                   | 2 210 000                               |
| 3                               | 730                         | 785                                     | 250 000                     | 681 000                                 |
| 3                               | 731                         | 834                                     | 630 000                     | 1 390 000                               |
| 3                               | 751                         | 953                                     | 1 660 000                   | 3 010 000                               |
| 4                               | 831                         | 907                                     | 417 000                     | 1 090 000                               |
| 4                               | 840                         | 972                                     | 936 000                     | 2 040 000                               |

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Super Slim Type Crossed Roller Bearings **Open Type/With Separator**

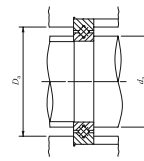


CRBT...A

Shaft dia. 20 – 50mm

| Shaft dia.<br>mm | Identification number | Mass (Ref.)<br>g | Boundary dimensions<br>mm |    |   |                                 | Mounting dimensions<br>mm |                | Basic dynamic load rating<br>C<br>N |
|------------------|-----------------------|------------------|---------------------------|----|---|---------------------------------|---------------------------|----------------|-------------------------------------|
|                  |                       |                  | d                         | D  | B | r <sub>min</sub> <sup>(1)</sup> | d <sub>g</sub>            | D <sub>g</sub> |                                     |
| 20               | <b>CRBT 205 A</b>     | 14.8             | 20                        | 31 | 5 | 0.15                            | 22.5                      | 27             | 1 400                               |
| 30               | <b>CRBT 305 A</b>     | 20.7             | 30                        | 41 | 5 | 0.15                            | 32.5                      | 37             | 1 770                               |
| 40               | <b>CRBT 405 A</b>     | 26.5             | 40                        | 51 | 5 | 0.15                            | 42.5                      | 47             | 2 000                               |
| 50               | <b>CRBT 505 A</b>     | 32.3             | 50                        | 61 | 5 | 0.15                            | 52.5                      | 57             | 2 280                               |

Note<sup>(1)</sup> Minimum allowable single value of chamfer dimension r.  
 Remarks1. No oil hole is provided.  
 2. Grease is prepacked.



| Basic static load rating<br>C <sub>0</sub><br>N |
|---|
| 1 290   |
| 1 970   |
| 2 520   |
| 3 200   |

**CROSSED ROLLER BEARINGS**

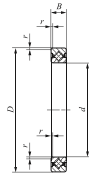
Slim Type Crossed Roller Bearings

Open Type/With Cage

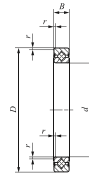
Open Type/Full Complement Type

Sealed Type/With Separator

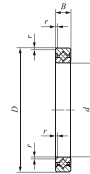
Sealed Type/Full Complement Type



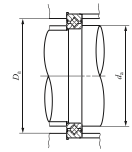
CRBS



CRBS...AUU  
...VUU



CRBS...V



Shaft dia. 50 – 200mm

| Shaft dia.<br>mm | Identification number  |                              |                 |                 |                  | Mass (Ref.)<br>g |
|------------------|------------------------|------------------------------|-----------------|-----------------|------------------|------------------|
|                  | With Cage<br>Open Type | With Separator<br>Seald Type | Full complement |                 | Mass (Ref.)<br>g |                  |
|                  |                        |                              | Open Type       | Seald Type      |                  |                  |
| 50               | CRBS 508               | CRBS 508 A UU                | CRBS 508 V      | CRBS 508 V UU   | 84               |                  |
| 60               | CRBS 608               | CRBS 608 A UU                | CRBS 608 V      | CRBS 608 V UU   | 94               |                  |
| 70               | CRBS 708               | CRBS 708 A UU                | CRBS 708 V      | CRBS 708 V UU   | 108              |                  |
| 80               | CRBS 808               | CRBS 808 A UU                | CRBS 808 V      | CRBS 808 V UU   | 122              |                  |
| 90               | CRBS 908               | CRBS 908 A UU                | CRBS 908 V      | CRBS 908 V UU   | 135              |                  |
| 100              | CRBS 1008              | CRBS 1008 A UU               | CRBS 1008 V     | CRBS 1008 V UU  | 152              |                  |
| 110              | CRBS 1108              | CRBS 1108 A UU               | CRBS 1108 V     | CRBS 1108 V UU  | 163              |                  |
| 120              | CRBS 1208              | CRBS 1208 A UU               | CRBS 1208 V     | CRBS 1208 V UU  | 184              |                  |
| 130              | CRBS 1308              | CRBS 1308 A UU               | CRBS 1308 V     | CRBS 1308 V UU  | 199              |                  |
| 140              | CRBS 1408              | CRBS 1408 A UU               | CRBS 1408 V     | CRBS 1408 V UU  | 205              |                  |
| 150              | CRBS 1508              | CRBS 1508 A UU               | CRBS 1508 V     | CRBS 1508 V UU  | 220              |                  |
| 160              | CRBS 16013             | CRBS 16013 A UU              | CRBS 16013 V    | CRBS 16013 V UU | 620              |                  |
| 170              | CRBS 17013             | CRBS 17013 A UU              | CRBS 17013 V    | CRBS 17013 V UU | 675              |                  |
| 180              | CRBS 18013             | CRBS 18013 A UU              | CRBS 18013 V    | CRBS 18013 V UU | 710              |                  |
| 190              | CRBS 19013             | CRBS 19013 A UU              | CRBS 19013 V    | CRBS 19013 V UU | 740              |                  |
| 200              | CRBS 20013             | CRBS 20013 A UU              | CRBS 20013 V    | CRBS 20013 V UU | 780              |                  |

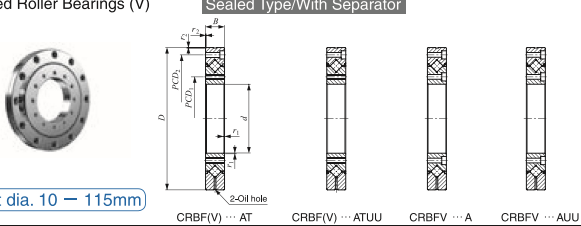
Note(1) Minimum allowable single value of chamfer dimension r  
 (2) No grease is prepacked. Perform proper lubrication.  
 (3) Grease is prepacked.  
 Remark No oil hole is provided.

| Boundary dimensions<br>mm |     |    |                                 | Mounting<br>dimensions mm |                | CRBS <sup>(2)</sup><br>With cage    |   | CRBS...AUU <sup>(3)</sup><br>With Separator |   | CRBS...V <sup>(2)</sup><br>Full complement |   |
|---------------------------|-----|----|---------------------------------|---------------------------|----------------|-------------------------------------|---|---|---|--|---|
| d                         | D   | B  | r <sub>min</sub> <sup>(1)</sup> | d <sub>a</sub>            | D <sub>a</sub> | Basic dynamic load rating<br>C<br>N | Basic static load rating<br>C <sub>0</sub><br>N | Basic dynamic load rating<br>C<br>N         | Basic static load rating<br>C <sub>0</sub><br>N | Basic dynamic load rating<br>C<br>N        | Basic static load rating<br>C <sub>0</sub><br>N |
| 50                        | 66  | 8  | 0.4                             | 54                        | 61             | 4 900                               | 6 170   | 4 680                                       | 5 810   | 6 930                                      | 9 800   |
| 60                        | 76  | 8  | 0.4                             | 64                        | 71             | 5 350                               | 7 310   | 5 350                                       | 7 310   | 7 600                                      | 11 700  |
| 70                        | 86  | 8  | 0.4                             | 74                        | 81             | 5 740                               | 8 440   | 5 740                                       | 8 440   | 8 190                                      | 13 600  |
| 80                        | 96  | 8  | 0.4                             | 84                        | 91             | 6 130                               | 9 590   | 6 130                                       | 9 590   | 8 790                                      | 15 500  |
| 90                        | 106 | 8  | 0.4                             | 94                        | 101            | 6 490                               | 10 700  | 6 490                                       | 10 700  | 9 310                                      | 17 400  |
| 100                       | 116 | 8  | 0.4                             | 104                       | 111            | 6 850                               | 11 900  | 6 530                                       | 11 100  | 9 850                                      | 19 300  |
| 110                       | 126 | 8  | 0.4                             | 114                       | 121            | 7 160                               | 13 000  | 6 850                                       | 12 300  | 10 300                                     | 21 200  |
| 120                       | 136 | 8  | 0.4                             | 124                       | 131            | 7 530                               | 14 100  | 7 070                                       | 13 000  | 10 900                                     | 23 000  |
| 130                       | 146 | 8  | 0.4                             | 134                       | 141            | 7 860                               | 15 300  | 7 270                                       | 13 800  | 11 200                                     | 24 600  |
| 140                       | 156 | 8  | 0.4                             | 144                       | 151            | 8 060                               | 16 400  | 7 510                                       | 14 900  | 11 700                                     | 26 800  |
| 150                       | 166 | 8  | 0.4                             | 154                       | 161            | 8 350                               | 17 500  | 7 810                                       | 16 000  | 12 100                                     | 28 700  |
| 160                       | 186 | 13 | 0.6                             | 166                       | 179            | 20 300                              | 39 900  | 19 400                                      | 37 700  | 26 900                                     | 58 200  |
| 170                       | 196 | 13 | 0.6                             | 176                       | 189            | 20 900                              | 42 200  | 20 000                                      | 39 900  | 27 800                                     | 61 600  |
| 180                       | 206 | 13 | 0.6                             | 186                       | 199            | 21 500                              | 44 600  | 21 900                                      | 45 700  | 28 600                                     | 65 200  |
| 190                       | 216 | 13 | 0.6                             | 196                       | 209            | 22 100                              | 46 900  | 22 900                                      | 49 200  | 29 300                                     | 68 600  |
| 200                       | 226 | 13 | 0.6                             | 206                       | 219            | 22 500                              | 49 300  | 23 300                                      | 51 600  | 30 000                                     | 72 200  |

J  
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**CROSSED ROLLER BEARINGS**

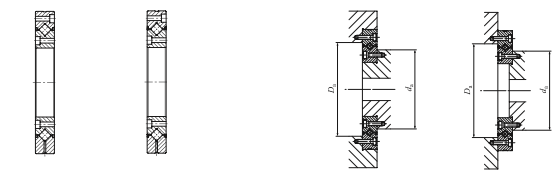
Mounting Holed Type High Rigidity **Open Type/With Separator**  
 Crossed Roller Bearings (V) **Sealed Type/With Separator**



Shaft dia. 10 – 115mm

| Shaft dia.<br>mm | Identification number |                   | Mass<br>(Ref.)<br>kg | Boundary dimensions<br>mm |     |    |                                  |                                  |
|------------------|-----------------------|-------------------|----------------------|---------------------------|-----|----|----------------------------------|----------------------------------|
|                  | Open Type             | Sealed Type       |                      | d                         | D   | B  | r <sub>1min</sub> <sup>(1)</sup> | r <sub>2min</sub> <sup>(1)</sup> |
| 10               | CRBF 108 AT           | CRBF 108 AT UU    | 0.12                 | 10                        | 52  | 8  | 0.3                              | 0.3                              |
| 20               | CRBFV 2012 AT         | CRBFV 2012 AT UU  | 0.31                 | 20                        | 70  | 12 | 0.3                              | 0.3                              |
| 25               | CRBFV 2512 AT         | CRBFV 2512 AT UU  | 0.40                 | 25                        | 80  | 12 | 0.6                              | 0.6                              |
| 35               | CRBFV 3515 AT         | CRBFV 3515 AT UU  | 0.66                 | 35                        | 95  | 15 | 0.6                              | 0.6                              |
| 55               | CRBFV 5515 AT         | CRBFV 5515 AT UU  | 0.96                 | 55                        | 120 | 15 | 0.6                              | 0.6                              |
| 80               | CRBFV 8022 AT         | CRBFV 8022 AT UU  | 2.63                 | 80                        | 165 | 22 | 0.6                              | 1                                |
|                  | CRBFV 8022 A          | CRBFV 8022 A UU   | 2.60                 |                           |     |    |                                  |                                  |
|                  | CRBFV 8022 AD         | CRBFV 8022 AD UU  | 2.60                 |                           |     |    |                                  |                                  |
| 90               | CRBFV 9025 AT         | CRBFV 9025 AT UU  | 4.83                 | 90                        | 210 | 25 | 1.5                              | 1.5                              |
|                  | CRBFV 9025 A          | CRBFV 9025 A UU   | 4.67                 |                           |     |    |                                  |                                  |
|                  | CRBFV 9025 AD         | CRBFV 9025 AD UU  | 4.67                 |                           |     |    |                                  |                                  |
| 115              | CRBFV 11528 AT        | CRBFV 11528 AT UU | 6.81                 | 115                       | 240 | 28 | 1.5                              | 1.5                              |
|                  | CRBFV 11528 A         | CRBFV 11528 A UU  | 6.63                 |                           |     |    |                                  |                                  |
|                  | CRBFV 11528 AD        | CRBFV 11528 AD UU | 6.63                 |                           |     |    |                                  |                                  |

Note<sup>(1)</sup> Minimum allowable single value of chamfer diameter r<sub>1</sub> and r<sub>2</sub>.  
 Remarks 1. The outer ring has an oil groove and two oil holes.  
 2. No grease is prepacked for Open Type. Perform proper lubrication. Grease is prepacked for Sealed Type.  
 3. If one side sealed type are needed, please contact **IKO**.



| Mounting holes mm |  | Mounting holes mm |  | Mounting dimensions mm |                | Basic dynamic load rating<br>C<br>N | Basic static load rating<br>C <sub>0</sub><br>N |
|-------------------|--|-------------------|--|------------------------|----------------|-------------------------------------|---|
| PCD <sub>1</sub>  | Inner ring Mounting holes                      | PCD <sub>2</sub>  | Outer ring Mounting holes                      | d <sub>a</sub>         | D <sub>a</sub> |                                     |   |
| 16                | 4-M3 through                                   | 42                | 6-φ3.4 through<br>φ6.5 counter bore depth 3.3  | 24                     | 31             | 2 910                               | 2 430   |
| 28                | 6-M3 through                                   | 57                | 6-φ3.4 through<br>φ6.5 counter bore depth 3.3  | 36.5                   | 48.5           | 7 600                               | 8 370   |
| 35                | 6-M3 through                                   | 67                | 6-φ3.4 through<br>φ6.5 counter bore depth 3.3  | 46.5                   | 58.5           | 8 610                               | 10 600  |
| 45                | 8-M4 through                                   | 83                | 8-φ4.5 through<br>φ8 counter bore depth 4.4    | 56                     | 74             | 17 300                              | 20 900  |
| 65                | 8-M5 through                                   | 105               | 8-φ5.5 through<br>φ9.5 counter bore depth 5.4  | 76                     | 94             | 20 100                              | 27 700  |
| 97                | 10-M5 through                                  | 148               | 10-φ5.5 through<br>φ9.5 counter bore depth 5.4 | 107                    | 137            | 51 100                              | 72 000  |
|                   | 10-φ5.5 through<br>φ9.5 counter bore depth 5.4 |                   |  |                        |                |                                     |   |
| 112               | 12-M8 through                                  | 187               | 12-φ9 through<br>φ14 counter bore depth 12     | 132                    | 168            | 73 400                              | 108 000   |
|                   | 12-φ9 through<br>φ14 counter bore depth 12     |                   |  |                        |                |                                     |   |
| 139               | 12-M8 through                                  | 217               | 12-φ9 through<br>φ14 counter bore depth 13.5   | 162                    | 198            | 84 300                              | 138 000   |
|                   | 12-φ9 through<br>φ14 counter bore depth 13.5   |                   |  |                        |                |                                     |   |