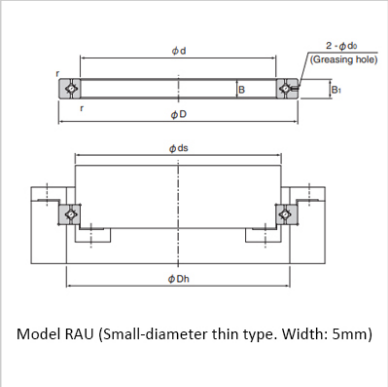
Crossed Roller Bearing

RAU slim thin section crossed roller bearing-50



Model RAU (Small-diameter thin type. Width: 5mm)

| | |
|---|---|
| Shaft diameter | **50** |
| Model No. | RAU5005 |
| Main dimensions | |
| Inner diameter | **50** |
| Outer diameter | 61 |
| Roller pitch circle diameter | 54.7 |
| Width | **5** |
| Greasing hole d0 | 1 |
| rmin | 0.15 |
| Shoulder dimensions | |
| ds(max) | 52.5 |
| Dh (min) | 57 |
| Basic load rating | |
| C kN | 2.43 |
| C0 kN | 3.49 |
| Mass | |
| g | 32 |

## Micro Cross-Roller Ring RAU

### Model composition

Model Number Coding

RAU5008 UU CC0 P4 B

Model No.

Seal symbol*
No symbol: Without seals
UU: Seals attached on both ends
U: Seal attached on one end (marked side)
UT: Seal attached on one end (unmarked side)

Radial clearance symbol
CC0: Negative clearance (preload)
C0: Positive clearance (no preload)

Accuracy symbol
No symbol: Normal grade (grade 0)
P6: Rotational accuracy grade 6
P5: Rotational accuracy grade 5
P4: Rotational accuracy grade 4

Accuracy target symbol
No symbol: Rotational accuracy of the inner ring
R: Rotational accuracy of the outer ring
B: Rotational accuracy of both the inner ring and outer ring

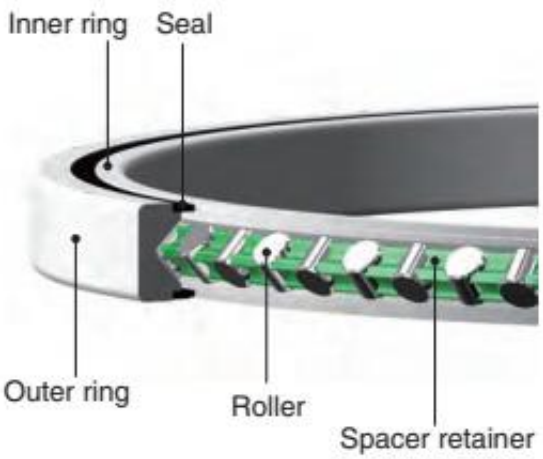
Considerations for model RAU (Small-diameter thin type. Width: 5mm)
*Seals are not available.* The only radial clearance available is C0.* The only accuracy available is normal grade (grade 0).

For a compact and lightweight system

Micro Cross-Roller Ring with inner diameter of 10 mm and outer diameter of 21 mm

More compact than a conventional angular contact ball bearing

Spacer retainer enables smooth movement and high rotation accuracy.




## Structure

In the RAU, the rollers travel on the V-shaped raceways ground into the inner and outer rings.

Alternating rollers are arrayed orthogonally so that one bearing can support loads and moments in any direction.

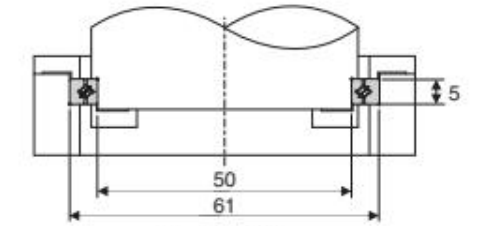
Also, because of the integrated structure, the RAU can be used for either inner ring or outer ring rotation.

Fig. 1 Structure of Cross Roller-Ring Model RAU

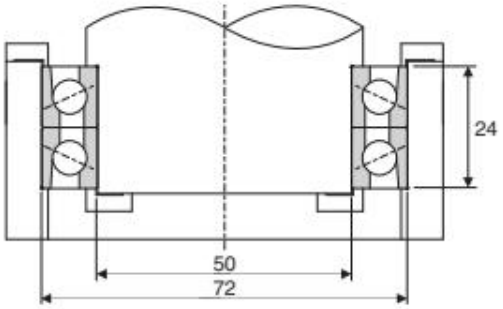
### 1. Compact and Rigid

The RAU is more compact and lighter weight than a double row angular contact ball bearing. It is also more rigid, even though it is made as compact as possible.

●Comparison, 50 mm inner diameter

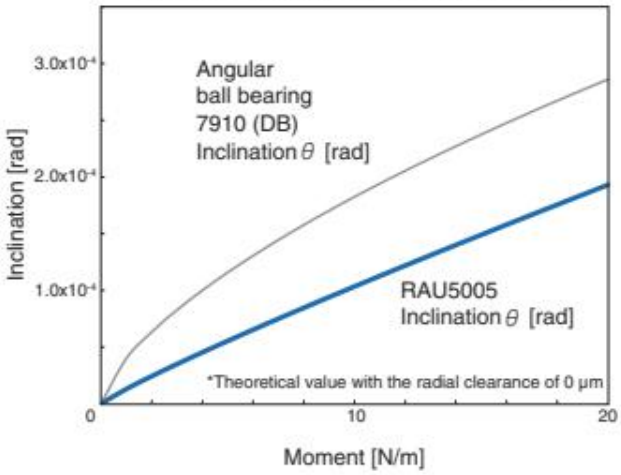



Model RAU




Angular ball bearing

Moment Rigidity Comparison




Comparison of cross-sectional area and mass

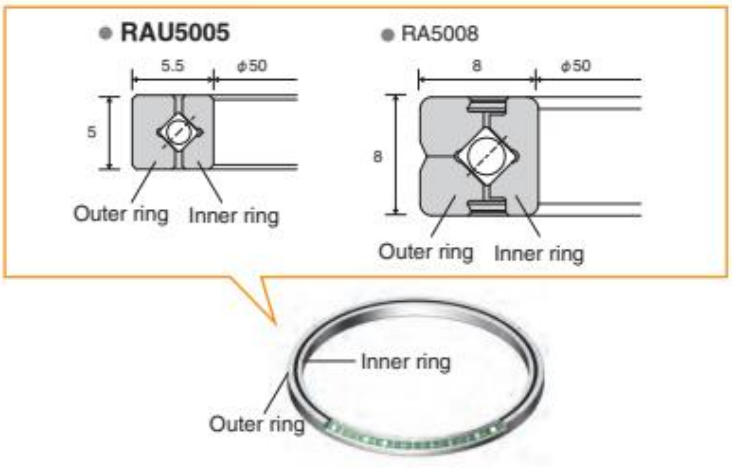
| Model No. | RAU5005 | 7910 (DB) |
|---|---|---|
| Cross-sectional area | 27.5mm² | 264mm² |
| Mass | 32g | 260g |

## 2. Light Weight

The cross-sectional area of the model RAU is 57% smaller than theCross-Roller Ring model RA, which was previously the thinnest ever. This enables further weight reduction. The line-up also includes other models

whose inner diameters are the smallest to date: 10, 15, 20, 30, and 40mm.

●Comparison of cross section and mass, 50 mm inner diameter




| Model No. | RAU5005 | RA5008 |
|---|---|---|
| Cross-sectional area | 27.5mm² | 64mm² |
| Mass | 32g | 80g |

# Accuracy standards

## Rotational accuracy

- Rotational Accuracy of the Inner Ring

Unit: μm

| Nominal dimension of bearing inner diameter (d) (mm) | | Radial runout tolerance of inner ring | | | | Axial runout tolerance of inner ring | | | |
|---|---|---|---|---|---|---|---|---|---|
| Above | Or less | Grade 0 | Grade P6 | Grade P5 | Grade P4 | Grade 0 | Grade P6 | Grade P5 | Grade P4 |
| — | 18 | 10 | — | — | — | 10 | — | — | — |
| 18 | 40 | 13 | — | — | — | 13 | — | — | — |
| 40 | 65 | 13 | 10 | 5 | 4 | 13 | 10 | 5 | 4 |
| 65 | 80 | 15 | 10 | 5 | 4 | 15 | 10 | 5 | 4 |
| 80 | 100 | 15 | 13 | 6 | 5 | 15 | 13 | 6 | 5 |
| 100 | 120 | 20 | 13 | 6 | 5 | 20 | 13 | 6 | 5 |
| 120 | 140 | 25 | 18 | 8 | 6 | 25 | 18 | 8 | 6 |
| 140 | 180 | 25 | 18 | 8 | 6 | 25 | 18 | 8 | 6 |
| 180 | 200 | 30 | 20 | 10 | 8 | 30 | 20 | 10 | 8 |

- Rotational Accuracy of the Outer Ring

Unit: μm

| Nominal dimension of bearing outer diameter (D) (mm) | | Radial runout tolerance of outer ring | | | Axial runout tolerance of outer ring | | |
|---|---|---|---|---|---|---|---|
| Above | Or less | Grade 0 | Grade P5 | Grade P4 | Grade P6 | Grade P5 | Grade P4 |
| — | 65 | 13 | — | — | 13 | — | — |
| 65 | 80 | 13 | 8 | 5 | 13 | 8 | 5 |
| 80 | 100 | 15 | 10 | 6 | 15 | 10 | 6 |
| 100 | 120 | 15 | 10 | 6 | 15 | 10 | 6 |
| 120 | 140 | 20 | 11 | 7 | 20 | 11 | 7 |
| 140 | 180 | 25 | 11 | 7 | 25 | 11 | 7 |
| 180 | 200 | 25 | 15 | 10 | 25 | 15 | 10 |
| 200 | 250 | 30 | 15 | 10 | 30 | 15 | 10 |

- The rotational accuracy of model RAU (Small-diameter thin type. Width: 5mm) is only available in normal grade (grade 0).

## Dimensional accuracy

Unit: μm

| Basic dimension d, D [mm] | | Bearing inner diameter: Dimensional tolerance of dm | | Bearing outer diameter: Dimensional tolerance of Dm | | Bearing width: Dimensional tolerance of B, B1 | |
|---|---|---|---|---|---|---|---|
| Above | Or less | Upper limit | Lower limit | Upper limit | Lower limit | Upper limit | Lower limit |
| — | 18 | 0 | -8 | — | — | 0 | -120 |
| 18 | 30 | 0 | -10 | 0 | -9 | 0 | -120 |
| 30 | 50 | 0 | -12 | 0 | -11 | 0 | -120 |
| 50 | 80 | 0 | -15 | 0 | -13 | 0 | -120 |
| 80 | 120 | 0 | -20 | 0 | -15 | 0 | -120 |
| 120 | 150 | 0 | -25 | 0 | -18 | 0 | -120 |
| 150 | 180 | 0 | -25 | 0 | -25 | 0 | -120 |
| 180 | 250 | 0 | -30 | 0 | -30 | 0 | -120 |

- dm and Dm represent the arithmetic averages of the maximum and minimum diameters obtained by measuring the inner and outer diameters of the bearing at two points.

## Radial clearance standard

Unit: μm

| Roller Pitch circle diameter (dp) [mm] | | CC0 | | C0 | |
|---|---|---|---|---|---|
| Above | Or less | Min. | Max. | Min. | Max. |
| — | 18 | — | — | 0 | 15 |
| 18 | 30 | — | — | 0 | 15 |
| 30 | 50 | — | — | 0 | 15 |
| 50 | 80 | -8 | 0 | 0 | 15 |
| 80 | 120 | -8 | 0 | 0 | 15 |
| 120 | 140 | -8 | 0 | 0 | 15 |
| 140 | 160 | -8 | 0 | 0 | 15 |
| 160 | 180 | -10 | 0 | 0 | 20 |
| 180 | 200 | -10 | 0 | 0 | 20 |
| 200 | 225 | -10 | 0 | 0 | 20 |