Designing the Housing and the Presser Flange

Since the cross-roller ring is a compact, thin device, special consideration must be given to the rigidity of the housing and the presser flange.
In types with a separable outer ring, insufficient strength in the housing, presser flange, or the presser bolt will result in the inability to evenly hold the inner or outer ring, or the deformation of the cross-roller ring when a moment load is applied. Consequently, the contact area of the rollers will become uneven, causing performance to deteriorate significantly.
Fig. 2 shows examples of installing the cross-roller ring.

Housing

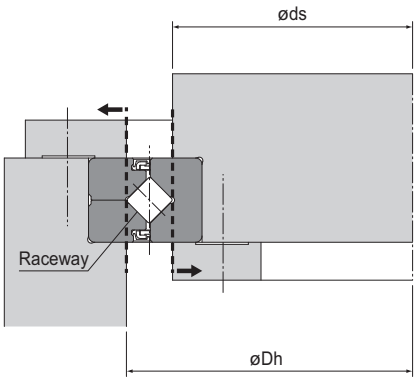
When designing the thickness of the housing, in general, make sure it is at least 60% of the cross-sectional height of the cross-roller ring.

$$\text{Housing thickness } T = \frac{D-d}{2} \times 0.6 \text{ or greater}$$

(D: outer diameter of the outer ring; d: inner diameter of the inner ring)
If greater stiffness is desired, both the thickness of the housing and the fitting tolerance must be considered. Please contact THK when making such considerations.

● Shoulder Design

When designing the shoulder, ensure that the shaft shoulder diameter (øds) and the housing shoulder diameter (øDh) are outside the raceway area.
If the shoulder dimensions are within the raceway area, then an uneven load may apply, resulting in a faulty rotation.
For the shoulder dimensions, see the corresponding dimensional table.



● Tapped Hole for Ring Removal

By including tapped holes for inner and outer ring removal (Fig. 1), it becomes possible to remove the rings without damaging the cross roller ring. Avoid pushing the inner ring when removing the outer ring, or vice versa.

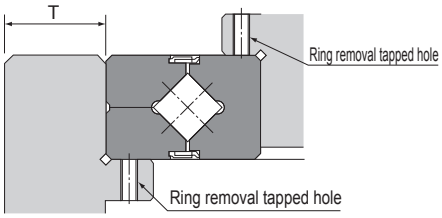
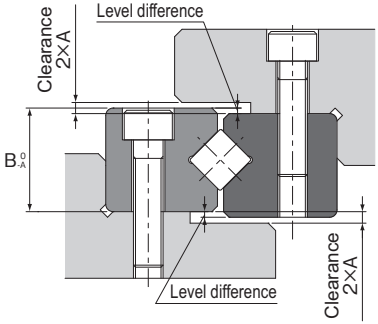


Fig. 1

● Level Difference between the Inner and Outer Rings

Since there is a level difference between the inner and outer rings of the cross-roller ring, it is necessary to provide a clearance in the housing. The clearance must be at least twice the tolerance A of the width dimension. For the tolerance A of the width dimension, see the accuracy standard (see pages **A18-12** to **A18-16**).



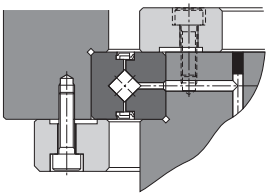
Model No.	Width dimension
RB	$B1_{-A}^{0}$
RE	
RA, RAU	$B_{-A}^{0} = B1_{-A}^{0}$
RA-C	
RU	B_{-A}^{0}

Note: For models RB and RE, refer to the tolerance of the width dimension of B1.

Assembly Examples

Fig. 2 and Fig. 3 show examples of installing the cross-roller ring.

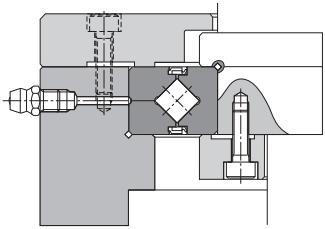
Example of Assembling Model RE



a. Outer ring rotating in the swiveling unit

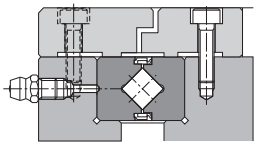
A heavy part is mounted after the inner and outer rings are secured.

Example 1 of Assembling Model RB



b. Inner ring rotating in the swiveling unit (with seals attached)

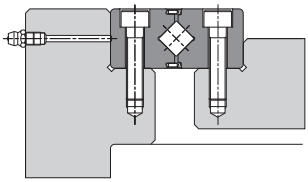
Example 2 of Assembling Model RB



c. Inner and outer rings secured in the same direction in the swiveling unit (with seals attached)

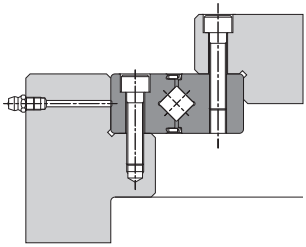
Fig. 2: Examples of Assembling Models RE and RB

Example 1 of Assembling Model RU



d. Inner and outer rings secured in the same direction in the swiveling unit (with seals attached)

Example 2 of Assembling Model RU



e. Inner and outer rings secured in the same direction in the swiveling unit (with seals attached)

Fig. 3: Examples of Assembling Model RU

Presser Flange and Presser Bolt

When determining the thickness of the presser flange (F) or the clearance of the flange section (S), refer to the dimensions indicated below as a guide.

As for the number of the presser bolts, the greater the number of the bolts, the more stable the system becomes. As a guide, however, it is normally appropriate to use the number of bolts indicated in Table 3 and arrange them equidistantly.

$F = B \times 0.5$ to $B \times 1.2$

$H = B_{-0.1}^{0}$

$S = 0.5$ mm

Even if the shaft and the housing are made of a lightweight alloy, a steel-based material is recommended for the presser flange. When assembling Model RU, use the mounting holes or tapped holes built on the inner and outer rings (Model RU does not require a presser flange).

When tightening the presser bolts, firmly secure them using a torque wrench or the like so that they will not loosen. Table 4 shows tightening torques for the housing and presser flanges made of typical steel materials with medium hardness.

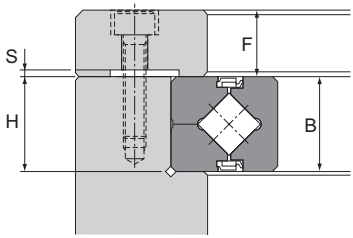


Table 3: Number of Presser Bolts and Bolt Sizes for Models RB and RE

Unit: mm

Outer diameter of the outer ring (D)		No. of bolts	Bolt size (reference value)
Above	Up to		
—	100	8 or more	M3 to M5
100	200	12 or more	M4 to M8
200	500	16 or more	M5 to M12
500	—	24 or more	M12 or thicker

Note: Please contact THK regarding the number of presser bolts and bolt sizes for models RAU, RA, and RA-C.

Table 4: Bolt Tightening Torque

Unit: N·m

Screw model No.	Tightening torque	Screw model No.	Tightening torque
M2	0.6	M8	30
M2.3	0.8	M10	70
M2.6	1.2	M12	120
M3	2	M16	200
M4	4	M20	390
M5	9	M22	530
M6	14		

Surface Treatment

(1) If the cross-roller ring requires surface treatment, contact THK.
(2) For the details of the surface treatment, see B**0-20** on the general catalog.
(3) Note that in the case of standard Model RU and special models, it is difficult to provide surface treatment to mounting holes built on the inner and outer rings, lubrication holes, etc., and a treated film may not be formed on these areas.
(4) Product accuracy (dimensional accuracy, rotational accuracy) is only guaranteed prior to surface treatment.