Accuracy Standards

The cross-roller ring is manufactured with the accuracy and the dimensional tolerance according to Table 4 to Table 15.

Table 4: Rotational Accuracy of the Inner Ring of Model RU

Unit: μm

Model No.	Radial runout tolerance of the inner ring			Axial runout tolerance of the inner ring		
	Grade P5	Grade P4	Grade P2	Grade P5	Grade P4	Grade P2
RU42	4	3	2.5	4	3	2.5
RU66	5	4	2.5	5	4	2.5
RU85	5	4	2.5	5	4	2.5
RU124	5	4	2.5	5	4	2.5
RU148	6	5	2.5	6	5	2.5
RU178	6	5	2.5	6	5	2.5
RU228	8	6	5	8	6	5
RU297	10	8	5	10	8	5
RU445	15	12	7	15	12	7

Notes: For Model RU, grade P5 is standard rotational accuracy. (This is not indicated in the model number.)
For the rotational accuracy of a special type or other types not shown above, contact THK. (Unless otherwise specified, rotational accuracy grade 0 of models RB and RE will be applied.)

Table 5: Rotational Accuracy of the Outer Ring of Model RU

Unit: μm

Model No.	Radial runout tolerance of the outer ring			Axial runout tolerance of the outer ring		
	Grade P5	Grade P4	Grade P2	Grade P5	Grade P4	Grade P2
RU42	8	5	4	8	5	4
RU66	10	6	5	10	6	5
RU85	10	6	5	10	6	5
RU124	13	8	5	13	8	5
RU148	15	10	7	15	10	7
RU178	15	10	7	15	10	7
RU228	18	11	7	18	11	7
RU297	20	13	8	20	13	8
RU445	25	16	10	25	16	10

Notes: For model RU, grade P5 is standard rotational accuracy. (This is not indicated in the model number.)
For the rotational accuracy of a special type or other types not shown above, contact THK. (Unless otherwise specified, rotational accuracy grade 0 of models RB and RE will be applied.)

Table 6: Rotational Accuracy of the Inner Ring of Model RB

Unit: μm

Nominal dimension of the bearing inner diameter (d) (mm)		Radial runout tolerance of the inner ring					Axial runout tolerance of the inner ring				
		Grade 0	Grade PE6	Grade PE5	Grade PE4	Grade PE2	Grade 0	Grade PE6	Grade PE5	Grade PE4	Grade PE2
Above	Up to		Grade P6	Grade P5	Grade P4	Grade P2		Grade P6	Grade P5	Grade P4	Grade P2
18	30	13	8	4	3	2.5	13	8	4	3	2.5
30	50	15	10	5	4	2.5	15	10	5	4	2.5
50	80	20	10	5	4	2.5	20	10	5	4	2.5
80	120	25	13	6	5	2.5	25	13	6	5	2.5
120	150	30	18	8	6	2.5	30	18	8	6	2.5
150	180	30	18	8	6	5	30	18	8	6	5
180	250	40	20	10	8	5	40	20	10	8	5
250	315	50	25	13	10	(6)	50	25	13	10	(6)
315	400	60	30	15	12	(7)	60	30	15	12	(7)
400	500	65	35	18	14	(9)	65	35	18	14	(9)
500	630	70	40	20	16	(10)	70	40	20	16	(10)
630	800	80	(45)	(23)	(18)	(11)	80	(45)	(23)	(18)	(11)
800	1,000	90	(50)	(25)	(20)	(12)	90	(50)	(25)	(20)	(12)
1,000	1,250	100	(55)	(28)	(22)	—	100	(55)	(28)	(22)	—

Note: The values in parentheses are available only on special orders. Contact THK for details.

Table 7: Rotational Accuracy of the Outer Ring of Model RE

Unit: μm

Nominal dimension of the bearing outer diameter (D) (mm)		Radial runout tolerance of the outer ring					Axial runout tolerance of the outer ring				
		Grade 0	Grade PE6	Grade PE5	Grade PE4	Grade PE2	Grade 0	Grade PE6	Grade PE5	Grade PE4	Grade PE2
Above	Up to		Grade P6	Grade P5	Grade P4	Grade P2		Grade P6	Grade P5	Grade P4	Grade P2
30	50	20	10	7	5	2.5	20	10	7	5	2.5
50	80	25	13	8	5	4	25	13	8	5	4
80	120	35	18	10	6	5	35	18	10	6	5
120	150	40	20	11	7	5	40	20	11	7	5
150	180	45	23	13	8	5	45	23	13	8	5
180	250	50	25	15	10	7	50	25	15	10	7
250	315	60	30	18	11	7	60	30	18	11	7
315	400	70	35	20	13	8	70	35	20	13	8
400	500	80	40	23	15	(9)	80	40	23	15	(9)
500	630	100	50	25	16	(10)	100	50	25	16	(10)
630	800	120	60	30	20	(13)	120	60	30	20	(13)
800	1,000	120	75	(38)	(25)	(16)	120	75	(38)	(25)	(16)
1,000	1,250	120	(75)	(40)	(27)	(18)	120	(75)	(40)	(27)	(18)
1,250	1,600	120	(75)	(42)	(30)	(20)	120	(75)	(42)	(30)	(20)

Note: The values in parentheses are available only on special orders. Contact THK for details.

Table 8: Rotational Accuracy of the Inner Ring of Model RA and RA-C

Unit: μm

Nominal dimension of the bearing inner diameter (d) (mm)		Tolerance in radial runout and axial runout
Above	Up to	
40	65	13
65	80	15
80	100	15
100	120	20
120	140	25
140	180	25
180	200	30

Note: If higher accuracy than the above values is required for the inner ring in rotational accuracy for models RA and RA-C, contact THK.

Table 9: Rotational Accuracy of the Outer Ring of Model RA-C

Unit: μm

Nominal dimension of the bearing outer diameter (D) (mm)		Tolerance in radial runout and axial runout
Above	Up to	
65	80	13
80	100	15
100	120	15
120	140	20
140	180	25
180	200	25
200	250	30

Note: The rotational accuracy of the outer ring for Model RA-C indicates the value before separation.

Table 10: Rotational Accuracy of the Inner Ring of Model RAU

Unit: μm

Nominal dimension of the bearing inner diameter (d) (mm)		Radial runout tolerance of the inner ring				Axial runout tolerance of the 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

Note: The Model RAU (small-diameter, 5 mm thin type) is only available with Normal grade rotational accuracy (0).

Table 11: Rotational Accuracy of the Outer Ring of Model RAU

Unit: μm

Nominal dimension of the bearing outer diameter (D) (mm)		Radial runout tolerance of the outer ring			Axial runout tolerance of the outer ring		
Above	Or less	Grade 0	Grade P5	Grade P4	Grade 0	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

Note: Model RAU (small-diameter, 5 mm thin type) is only available with Normal grade rotational accuracy (0).

Table 12: Dimensional Tolerance of the Bearing Inner Diameter

Unit: μm

Nominal dimension of the bearing inner diameter (d) (mm)		Tolerance of dm[1]							
		Grades 0, P6, P5, P4, P2, and USP		Grade PE6		Grade PE5		Grade PE4 and PE2	
Above	Up to	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
—	18	0	–8	—	—	—	—	—	—
18	30	0	–10	0	–8	0	–6	0	–5
30	50	0	–12	0	–10	0	–8	0	–6
50	80	0	–15	0	–12	0	–9	0	–7
80	120	0	–20	0	–15	0	–10	0	–8
120	150	0	–25	0	–18	0	–13	0	–10
150	180	0	–25	0	–18	0	–13	0	–10
180	250	0	–30	0	–22	0	–15	0	–12
250	315	0	–35	0	–25	0	–18	—	—
315	400	0	–40	0	–30	0	–23	—	—
400	500	0	–45	0	–35	—	—	—	—
500	630	0	–50	0	–40	—	—	—	—
630	800	0	–75	—	—	—	—	—	—
800	1,000	0	–100	—	—	—	—	—	—
1,000	1,250	0	–125	—	—	—	—	—	—

[1] "dm" represents the arithmetic average of the maximum and minimum diameters obtained in measuring the bearing inner diameter at two points.

Notes: Standard inner diameter accuracy of models RAU, RA, RA-C, and RU is 0. For higher accuracy than 0, contact THK. For accuracy grades in bearing inner diameter with no values indicated in the table, the highest value among low accuracy grades applies.

Table 13: Dimensional Tolerance of the Bearing Outer Diameter

Unit: μm

Nominal dimension of the bearing outer diameter (D) (mm)		Tolerance of Dm[1]							
		Grades 0, P6, P5, P4, P2, and USP		Grade PE6		Grade PE5		Grade PE4 and PE2	
Above	Up to	Upper	Lower	Upper	Lower	Upper	Lower	Upper	Lower
18	30	0	–9	—	—	—	—	—	—
30	50	0	–11	0	–9	0	–7	0	–6
50	80	0	–13	0	–11	0	–9	0	–7
80	120	0	–15	0	–13	0	–10	0	–8
120	150	0	–18	0	–15	0	–11	0	–9
150	180	0	–25	0	–18	0	–13	0	–10
180	250	0	–30	0	–20	0	–15	0	–11
250	315	0	–35	0	–25	0	–18	0	–13
315	400	0	–40	0	–28	0	–20	0	–15
400	500	0	–45	0	–33	0	–23	—	—
500	630	0	–50	0	–38	0	–28	—	—
630	800	0	–75	0	–45	0	–35	—	—
800	1,000	0	–100	—	—	—	—	—	—
1,000	1,250	0	–125	—	—	—	—	—	—
1,250	1,600	0	–160	—	—	—	—	—	—

[1] "Dm" represents the arithmetic average of the maximum and minimum diameters obtained in measuring the bearing outer diameter at two points

Notes: Standard outer diameter accuracy of models RAU, RA, RA-C, and RU is 0. For higher accuracy than 0, contact THK. For accuracy grades in bearing outer diameter with no values indicated in the table, the highest value among low accuracy grades applies.

Table 14: Tolerance in the Width of the Inner and Outer Rings for Model RU

Unit: μm

Model No.	Tolerance of B	
	Upper	Lower
RU42	0	–75
RU66	0	–75
RU85	0	–75
RU124	0	–75
RU148	0	–75
RU178	0	–100
RU228	0	–100
RU297	0	–100
RU445	0	–150

Table 15: Tolerance in the Width of the Inner and Outer Rings (Common to All Grades) for Models RB and RE

Unit: μm

Nominal dimension of the bearing inner diameter (d) (mm)		Tolerance of B Applied to the inner ring of RB and the outer ring of RE		Tolerance of B1 Applied to the outer ring of RB and the inner ring of RE	
Above	Up to	Upper	Lower	Upper	Lower
18	30	0	–75	0	–100
30	50	0	–75	0	–100
50	80	0	–75	0	–100
80	120	0	–75	0	–100
120	150	0	–100	0	–120
150	180	0	–100	0	–120
180	250	0	–100	0	–120
250	315	0	–120	0	–150
315	400	0	–150	0	–200
400	500	0	–150	0	–200
500	630	0	–150	0	–200
630	800	0	–150	0	–200
800	1,000	0	–300	0	–400
1,000	1,250	0	–300	0	–400

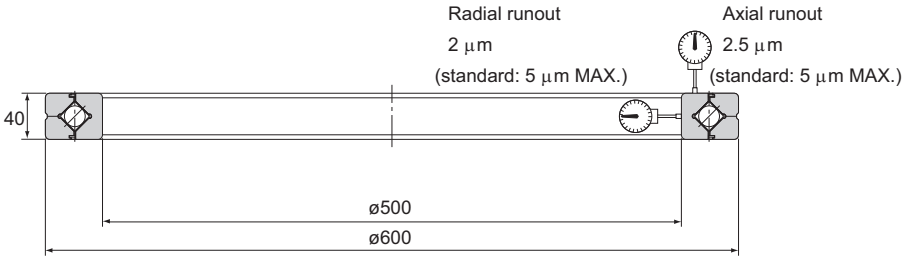
Tolerance in the Width of the Inner and Outer Rings for Models RAU, RA, and RA-C

All B and B1 types of models RAU, RA, and RA-C are manufactured with a tolerance of −0.120 to 0.

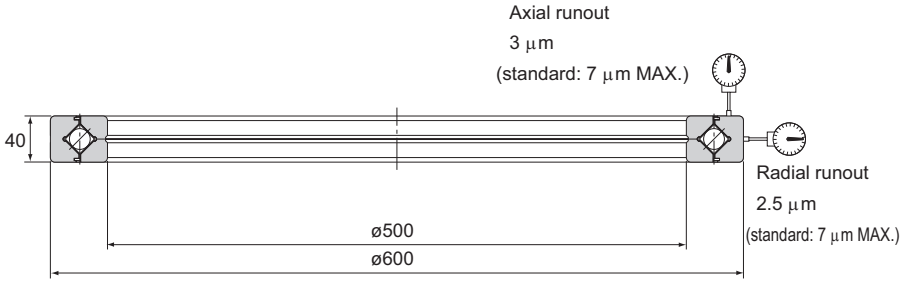
Accuracy Standards of the USP-Grade Series

Examples of Rotational Accuracy of the USP-Grade Series Cross-Roller Rings

The rotation accuracy of the USP-Grade Series achieves the ultra precision grade that surpasses the world's highest accuracy standards such as JIS Class 2, ISO Class 2, DIN P2, and AFBMA ABEC9.



Rotational Accuracy of the Inner Ring of Model RB50040CC0USP



Rotational Accuracy of the Outer Ring of Model RE50040CC0USP

Accuracy Standards

The USP-Grade Series RU, RB, and RE are manufactured with runout accuracies according to Table 16 and Table 17.

Table 16: Runout Accuracies of the USP-Grade Series of Model RU

Unit: μm

Model No.	Runout accuracy of the inner ring of Model RU		Runout accuracy of the outer ring of Model RU	
	Radial runout tolerance	Axial runout tolerance	Radial runout tolerance	Axial runout tolerance
RU42	2	2	3	3
RU66	2	2	3	3
RU85	2	2	3	3
RU124	2	2	3	3
RU148	2	2	4	4
RU178	2	2	4	4
RU228	2.5	2.5	4	4
RU297	3	3	5	5
RU445	4	4	7	7

Table 17: Runout Accuracies of the USP-Grade Series of Models RB and RE

Unit: μm

Nominal inner diameter (d) and outer diameter (D) (mm)		Runout accuracy of the inner ring of Model RB		Runout accuracy of the outer ring of Model RE	
Above	Up to	Radial runout tolerance	Axial runout tolerance	Radial runout tolerance	Axial runout tolerance
80	180	2.5	2.5	3	3
180	250	3	3	4	4
250	315	4	4	4	4
315	400	4	4	5	5
400	500	5	5	5	5
500	630	6	6	7	7
630	800	—	—	8	8