

# INNER RINGS

- Inner Rings for Shell Type Needle Roller Bearings
- Inner Rings for General Usage



## Structure and Features

IKO Inner Rings are heat-treated and finished by grinding to a high degree of accuracy. In the case of needle roller bearings, normally, the shafts are heat-treated and finished by grinding, and used as the raceway surfaces. However, when it is impossible to make shaft surfaces according to the specified surface hardness or surface roughness, inner rings are used.

Inner rings include those for Shell Type Needle Roller Bearings and those for general use and are available in a variety of dimensions. When shafts move axially or seals are used adjacent to bearings, wide inner rings can be selected.

Inner rings can also be used economically as bushings without requiring any additional machining.

## Types

For Inner Rings, the types shown in Table 1 are available.

Table 1.1 Inner Rings for Shell Type Needle Roller Bearings

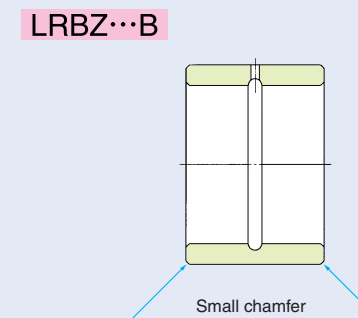
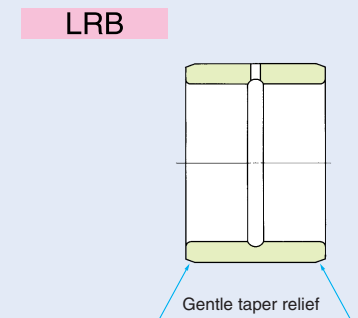
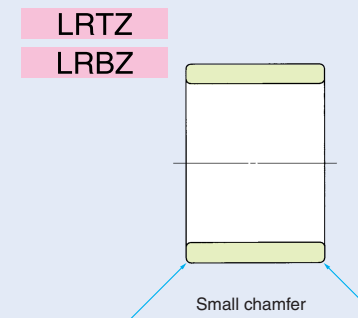
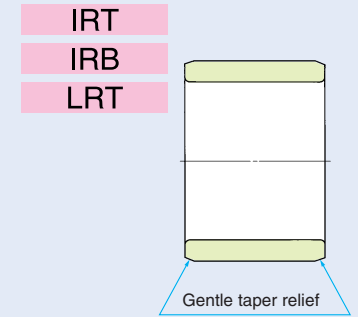
Series		Model codes of assembled bearings
Metric series	IRT	TA...Z, TLA...Z TAM, TLAM, YT, YTL
Inch series	IRB	BA...Z, BHA...Z BAM, BHAM, YB, YBH

Remark For Inner Rings for Shell Type Needle Roller Bearings with Seal, please consult IKO.

Table 1.2 Inner Rings for General Usage

Series		Model codes of assembled bearings
Metric series	LRT	RNA 49, RNA 69 RNA 48, TAF, TR RNAF, NAX, NBX
	LRTZ	RNA 49...UU, RNA 69...UU GTR
Inch series	LRB	BR
	LRBZ...B	BR...UU
	LRBZ	GBR, GBR...UU

### Shapes of Inner Rings

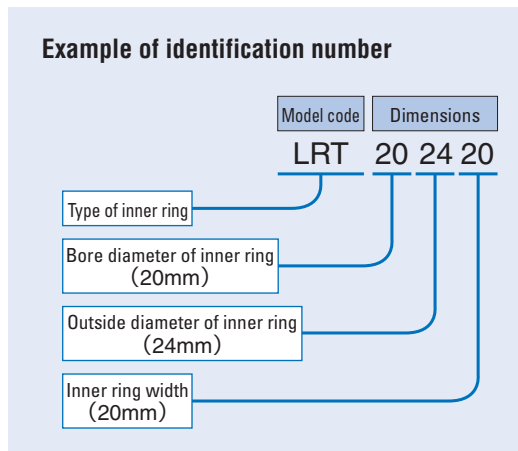


H

IRT  
IRB  
LRT  
LRB

## Identification number

The identification number of Inner Rings consists of a model code and dimensions. An example is shown below.



## Accuracy

Dimensional accuracy of Inner Rings is based on Table 2. Inner Rings for Shell Type Needle Roller Bearings are manufactured so that exact radial internal clearances can be obtained when assembled with Shell Type Needle Roller Bearings. Inner Rings for General Usage produce CN clearance when used in the assembled bearings shown in Table 1.2. LRB and LRBZ...B models produce the radial internal clearances shown in Table 4 on page D5. When clearances other than CN clearance or accuracy other than Class 0 are required, please consult

Table 2 Tolerances for inner ring

Model code	Tolerance
IRT LRT, LRTZ LRBZ	JIS Class 0 (See the table 12, page A31)
IRB	Based on Table 3
LRB LRBZ...B	Based on Table 4

Remark Tolerances of outside diameter of inner ring are based on Table 5.

Table 3 Tolerances of IRB

Nominal inside diameter of inner ring mm		$\Delta d_{mp}$ Single plane mean bore diameter deviation		$\Delta B_s$ Deviation of a single inner ring width		$K_{ia}$ Radial runout of assembled bearing inner ring
Over	Incl.	High	Low	High	Low	Max.
2.5	10	0	-13	0	-250	10
10	18	0	-13	0	-250	10
18	30	0	-13	0	-250	13
30	50	0	-13	0	-250	15
50	80	0	-13	0	-250	20

Table 4 Tolerances of LRB,LRBZ...B

Nominal inside diameter of inner ring mm		$\Delta d_{mp}$ Single plane mean bore diameter deviation		$\Delta B_s$ Deviation of a single inner ring width		$K_{ia}$ Radial runout of assembled bearing inner ring
Over	Incl.	High	Low	High	Low	Max.
-	19.050	0	-10	0	-130	10
19.050	30.162	0	-13	0	-130	13
30.162	50.800	0	-13	0	-130	15
50.800	82.550	0	-15	0	-130	20
82.550	120.650	0	-20	0	-130	25

Table 5 Tolerances of outside diameter of inner ring unit:  $\mu m$

Model code	Tolerance
IRT	g5
IRB	0 ~ -13
LRT, LRTZ, LRBZ	Based on Table 6
LRB, LRBZ...B	Based on Table 7

Table 7 Tolerances of outside diameters of LRB and LRBZ...B unit:  $\mu m$

Nominal outside diameter of inner ring mm		Tolerance	
Over	Incl.	High	Low
-	18.034	-13	-23
18.034	25.908	-18	-30
25.908	30.226	-23	-36
30.226	35.052	-23	-38
35.052	50.038	-25	-41
50.038	80.010	-28	-46
80.010	100.076	-32	-56
100.076	102.108	-37	-66

## Fit

The recommended fits between Inner Rings and shafts are shown in Table 22 on page A42.

## Oil Hole

The number of oil holes is shown in Table 8. When Inner Rings with an oil hole are especially required for a model without an oil hole, attach an "OH" to the end of the identification number when ordering. Example: LRT 202420 OH For Inner Rings with multiple oil holes, please consult .

Table 8 Number of oil holes

Bearing type		Bore diameter of inner ring $d$ mm	Number of oil holes	
For Shell Type Needle Roller Bearings	Metric series	IRT	0	
	Inch series	IRB	0	
For General Usage	Metric series	LRT	0	
		LRTZ	0	
	Inch series	LRB	$d \leq 76.200$	1
			$76.200 < d$	2
		LRBZ...B		1
	LRBZ		0	

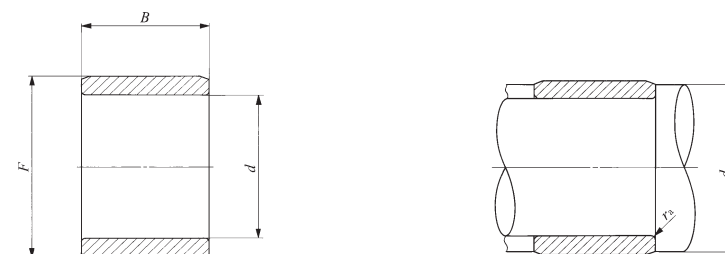
Remark Inner rings with an oil hole are provided with an oil groove.

Table 6 Tolerances of outside diameters for LRT, LRTZ and LRBZ (When the clearance is CN clearance)

$d$ Bore diameter of inner ring mm	Outside diameter of inner ring mm																								$d$ Bore diameter of inner ring mm																			
	3 < F ≤ 6												6 < F ≤ 10												10 < F ≤ 18		18 < F ≤ 30		30 < F ≤ 50		50 < F ≤ 80		80 < F ≤ 120		120 < F ≤ 180		180 < F ≤ 250		250 < F ≤ 315		315 < F ≤ 400		400 < F ≤ 500	
	Over	Incl.	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High	Low	Over	Incl.																
-	24	-10	-27	-7	-23	-4	-18	0	-12	0	-12	0	-12	0	-12	0	-12	0	-12	0	-12	0	-12	0	-12	0	24	24																
24	30							0	-12	+5	-4															24	30																	
30	40							0	-12	0	-9															30	40																	
40	50									-5	-19															40	50																	
50	65													0	-11											50	65																	
65	80													-10	-21											65	80																	
80	100													-10	-26											80	100																	
100	120																									100	120																	
120	140																									120	140																	
140	160																									140	160																	
160	180																									160	180																	
180	200																									180	200																	
200	225																									200	225																	
225	250																									225	250																	
250	280																									250	280																	
280	315																									280	315																	
315	355																									315	355																	
355	400																									355	400																	
400	450																									400	450																	
450	500																									450	500																	

**INNER RINGS**

Inner Rings for Shell Type Needle Roller Bearings **Inch Series**



IRB

Shaft dia. 15.875 – 63.500mm

Shaft dia. mm (inch)	Identification number	Mass (Ref.) g	Boundary dimensions mm(inch)			Standard mounting dimensions mm <sup>(1)</sup>			Assembled bearings		
			d	F	B	d <sub>a</sub> Min.	d <sub>a</sub> Max.	r <sub>as</sub> max. Max.	BA...Z (BAM)	BHA...Z (BHAM)	YB YBH
15.875 (5/8)	IRB 1014	33	15.875 (5/8)	22.225 (7/8)	22.60	20.7	21.2	0.6	BA 1414Z	—	—
	IRB 1016	37.5	15.875 (5/8)	22.225 (7/8)	25.78	20.7	21.2	0.6	BA 1416Z	BHA 1416Z	YB 1416
	IRB 1022	51.5	15.875 (5/8)	22.225 (7/8)	35.30	20.7	21.2	0.6	BA 1422Z	—	—
17.462 (11/16)	IRB 1110	25.5	17.462 (11/16)	23.812 (15/16)	16.25	22.3	22.8	0.6	BA 1510Z	—	—
	IRB 1116	40.5	17.462 (11/16)	23.812 (15/16)	25.78	22.3	22.8	0.6	BA 1516Z	—	—
19.050 (3/4)	IRB 128	22	19.050 (3/4)	25.400 (1 )	13.08	23.9	24.4	0.6	BA 168Z	BHA 168Z	YB 168 YBH 168
	IRB 1212	33	19.050 (3/4)	25.400 (1 )	19.43	23.9	24.4	0.6	BA 1612Z	BHA 1612Z	YB 1612 YBH 1612
	IRB 1214	38.5	19.050 (3/4)	25.400 (1 )	22.60	23.9	24.4	0.6	BA 1614Z	—	—
	IRB 1216	43.5	19.050 (3/4)	25.400 (1 )	25.78	23.9	24.4	0.6	BA 1616Z	BHA 1616Z	YB 1616 YBH 1616
	IRB 1220	54.5	19.050 (3/4)	25.400 (1 )	32.13	23.9	24.4	0.6	BA 1620Z	—	—
20.638 (13/16)	IRB 1316	34	20.638 (13/16)	25.400 (1 )	25.78	24.9	24.9	0.6	BA 1616Z	BHA 1616Z	YB 1616 YBH 1616
22.225 (7/8)	IRB 148	25	22.225 (7/8)	28.575 (1 1/8)	13.08	27	27.5	0.6	BA 188Z	—	YB 188
	IRB 1412	37.5	22.225 (7/8)	28.575 (1 1/8)	19.43	27	27.5	0.6	BA 1812Z	BHA 1812Z	YB 1812
	IRB 1416	50	22.225 (7/8)	28.575 (1 1/8)	25.78	27	27.5	0.6	BA 1816Z	BHA 1816Z	YB 1816
	IRB 1420	62.5	22.225 (7/8)	28.575 (1 1/8)	32.13	27	27.5	0.6	BA 1820Z	BHA 1820Z	—
25.400 (1)	IRB 168	28.5	25.400 (1 )	31.750 (1 1/4)	13.08	30	30.7	0.6	BA 208Z	—	—
	IRB 1610	35.5	25.400 (1 )	31.750 (1 1/4)	16.25	30	30.7	0.6	BA 2010Z	—	YB 2010
	IRB 1612	42.5	25.400 (1 )	31.750 (1 1/4)	19.43	30	30.7	0.6	BA 2012Z	—	YB 2012
	IRB 1616	56	25.400 (1 )	31.750 (1 1/4)	25.78	30	30.7	0.6	BA 2016Z	BHA 2016Z	YB 2016
	IRB 1620	70	25.400 (1 )	31.750 (1 1/4)	32.13	30	30.7	0.6	BA 2020Z	—	—
	IRB 168-1	36.5	25.400 (1 )	33.338 (1 3/8)	13.08	30	32.1	0.6	BA 218Z	—	—
	IRB 1610-1	45.5	25.400 (1 )	33.338 (1 3/8)	16.25	30	32.1	0.6	BA 2110Z	—	—
IRB 1612-1	54.5	25.400 (1 )	33.338 (1 3/8)	19.43	30	32.1	0.6	BA 2112Z	—	—	

Note<sup>(1)</sup> Maximum allowable fillet corner radius of shaft  
Remark No oil hole is provided.

Shaft dia. mm (inch)	Identification number	Mass (Ref.) g	Boundary dimensions mm(inch)			Standard mounting dimensions mm <sup>(1)</sup>			Assembled bearings		
			d	F	B	d <sub>a</sub> Min.	d <sub>a</sub> Max.	r <sub>as</sub> max. Max.	BA...Z (BAM)	BHA...Z (BHAM)	YB YBH
28.575 (1 1/8)	IRB 188	31.5	28.575 (1 1/8)	34.925 (1 3/8)	13.08	33.2	33.9	0.6	BA 228Z	—	YB 228
	IRB 1812	47	28.575 (1 1/8)	34.925 (1 3/8)	19.43	33.2	33.9	0.6	BA 2212Z	BHA 2212Z	YB 2212
	IRB 1816	62.5	28.575 (1 1/8)	34.925 (1 3/8)	25.78	33.2	33.9	0.6	BA 2216Z	BHA 2216Z	—
31.750 (1 1/4)	IRB 1820	78	28.575 (1 1/8)	34.925 (1 3/8)	32.13	33.2	33.9	0.6	BA 2220Z	—	YB 2220
	IRB 2010	43	31.750 (1 1/4)	38.100 (1 1/2)	16.25	37	37.1	0.6	BA 2410Z	—	—
	IRB 2014	60	31.750 (1 1/4)	38.100 (1 1/2)	22.60	37	37.1	0.6	BA 2414Z	—	YB 2414
34.925 (1 3/8)	IRB 2016	68.5	31.750 (1 1/4)	38.100 (1 1/2)	25.78	37	37.1	0.6	BA 2416Z	—	YB 2416
	IRB 2020	85.5	31.750 (1 1/4)	38.100 (1 1/2)	32.13	37	37.1	0.6	BA 2420Z	—	YB 2420
	IRB 2210	47	34.925 (1 3/8)	41.275 (1 5/8)	16.25	40.2	40.2	0.6	BA 2610Z	—	YB 2610
36.512 (1 1/16)	IRB 2220	93.5	34.925 (1 3/8)	41.275 (1 5/8)	32.13	40.2	40.2	0.6	BA 2620Z	—	—
	IRB 2316	99	36.512 (1 1/16)	44.450 (1 3/4)	25.78	42.5	43.2	0.6	BA 2816Z	—	—
38.100 (1 1/2)	IRB 2412	62	38.100 (1 1/2)	44.450 (1 3/4)	19.43	43.3	43.4	0.6	BA 2812Z	—	—
	IRB 2416	81	38.100 (1 1/2)	44.450 (1 3/4)	25.78	43.3	43.4	0.6	BA 2816Z	—	YB 2816
	IRB 2424	121	38.100 (1 1/2)	44.450 (1 3/4)	38.48	43.3	43.4	0.6	BA 2824Z	BHA 2824Z	—
	IRB 248-1	64	38.100 (1 1/2)	47.625 (1 7/8)	13.08	44.5	45.5	1	BA 308Z	—	—
41.275 (1 5/8)	IRB 2410-1	79.5	38.100 (1 1/2)	47.625 (1 7/8)	16.25	44.5	45.5	1	BA 3010Z	—	—
	IRB 2616	136	41.275 (1 5/8)	50.800 (2 )	25.78	47.5	48.5	1	BA 3216Z	—	—
42.862 (1 11/16)	IRB 2628	235	41.275 (1 5/8)	50.800 (2 )	44.83	47.5	48.5	1	BAW 3228Z	—	—
	IRB 2720	146	42.862 (1 11/16)	50.800 (2 )	32.13	48.5	49.5	0.6	BA 3220Z	—	—
47.625 (1 7/8)	IRB 3016	100	47.625 (1 7/8)	53.975 (2 1/8)	25.78	52.9	52.9	0.6	BA 3416Z	—	—
	IRB 3024	149	47.625 (1 7/8)	53.975 (2 1/8)	38.48	52.9	52.9	0.6	BA 3424Z	—	—
57.150 (2 1/4)	IRB 3616	183	57.150 (2 1/4)	66.675 (2 5/8)	25.78	63.5	64.5	1	BA 4216Z	—	—
63.500 (2 1/2)	IRB 4016	131	63.500 (2 1/2)	69.850 (2 3/4)	25.78	68.7	68.8	0.6	BA 4416Z	—	—
	IRB 4020	164	63.500 (2 1/2)	69.850 (2 3/4)	32.13	68.7	68.8	0.6	BA 4420Z	—	—

Note<sup>(1)</sup> Maximum allowable fillet corner radius of shaft  
Remark No oil hole is provided.