



The **NTN** ultra-thin section type ball bearings are bearings with an extremely thin design. There are three ultra-thin ball bearing types: radial, four-point contact, and angular. Bearing seals are available for all types.

Each bearing type has different characteristics to best support a wide range of applications.

1. Types and features

Table 1 shows the types and features of ultra-thin section type ball bearings, corresponding dimension series code, bearing cross section dimension, and inner diameter dimension range.

The dimension table (from C-62 to C-65) shows dimension series codes S and A, and H and J for bearings with seal.

Table 1 Types and features

	Types			Dimension series code	Bearing cross section dimension mm	Inner diameter dimension range mm
	Radial type	4-point contact type	Angular type			
					$\frac{D-d}{2} \times B$	d
Features	A deep groove is present in both the inner and outer rings of the bearing, allowing them to support radial and axial loads in either direction as well as the complex loads which result from the combination of these forces. Deep groove ball bearings are used in the most applications.	When inner and outer rings are loaded in the radial direction, the ball comes into contact with the inner and outer rings at four points. The bearings are generally suitable for two contact points under a simple axial load or a complex load with a large axial load.	Angular contact ball bearings have a straight line that runs through the point where each ball contacts the inner and outer rings at two points at 30° with respect to the radial direction. The bearings can receive a unidirectional axial load or a complex load of radial load and axial load. The ability to include an increased number of balls increases the load capacity of the bearing. These bearings are normally used in pairs for applications where it is necessary to control the axial movement via axial internal clearance or preload.	S	4.762 × 4.762	25.4 ~ 38.1
				A	6.35 × 6.35	50.8 ~ 304.8
				B	7.938 × 7.938	50.8 ~ 508
				C	9.525 × 9.525	101.6 ~ 762
				D	12.7 × 12.7	101.6 ~ 762
				F	19.05 × 19.05	101.6 ~ 1016
				G	25.4 × 25.4	101.6 ~ 1016
				With seal		
J	9.525 × 12.7	101.6 ~ 304.8				

2. Part number

K X A 050

- K**: Bore diameter No. The bearing bore diameter is represented in inches. 050 → 5 inch 042 → 4.25 inch
- X**: Dimension series code (see **Table 1**)
- A**: Type code
Code Type
R → Radial type
X → 4-point contact type
Y → Angular type
- 050**: Ultra-thin section type ball bearing

3. Accuracy and radial internal clearance

Tables 2 and **3** show the accuracy and radial internal clearance of ultra-thin section type ball bearings.

Table 2 Accuracy and radial internal clearance of radial type ball bearings

Bearing bore diameter No.	Tolerance and tolerance values					Radial internal clearance
	Mean bore diameter deviation Δd_{mp}	Mean outside diameter deviation ΔD_{mp}	Dimensional tolerance of inner ring and outer ring widths $\Delta B_s \Delta C_s$	Radial runout (Max.) Axial runout		
				Inner ring $K_{ia} S_{ia}$	Outer ring $K_{ea} S_{ea}$	
010	0	0	0	13	20	25 ~ 41
015	0	0		15	20	30 ~ 46
020	0	-13		20	25	30 ~ 61
025	0	-15				
030	0	0		25	30	41 ~ 71
035	0	-15				
040	0	-20				
042	0	0		36	41	51 ~ 86
045	0	-20				
047	0	0		30	41	61 ~ 107
050	0	-25				
055	0	-25				
060	0	-25				
065	0	0	41	46	71 ~ 122	
070	0	-30				
075	0	-30				
080	0	0	46	51	81 ~ 132	
090	0	-36				
100	0	0	51	51	91 ~ 142	
110	0	-36				
120	0	-41	51	51	102 ~ 152	
140	0	-41				
160	0	0	51	51	152 ~ 203	
180	0	-46				
200	0	-51	51	51	203 ~ 254	
250	0	-76				
300	0	-76				
350	0	0	51	51	102 ~ 127	
400	0	-102				

Table 3 Accuracy and radial internal clearance of four-point contact ball bearings/angular type ball bearings

Bearing bore diameter No.	Tolerance and tolerance values					Radial internal clearance (4-point contact type)
	Mean bore diameter deviation Δd_{mp}	Mean outside diameter deviation ΔD_{mp}	Dimensional tolerance of inner ring and outer ring widths $\Delta B_s \Delta C_s$	Radial runout (Max.) Axial runout		
				Inner ring $K_{ia} S_{ia}$	Outer ring $K_{ea} S_{ea}$	
010	0	0	0	7.5	10	25 ~ 38
015	0	0		10	10	30 ~ 43
020	0	-13		13	13	30 ~ 56
025	0	-15				
030	0	0		15	15	41 ~ 66
035	0	-15				
040	0	-20				
042	0	0		20	20	51 ~ 76
045	0	-20				
047	0	0		25	25	61 ~ 86
050	0	-25				
055	0	-25				
060	0	-25				
065	0	0	30	30	71 ~ 97	
070	0	-30				
075	0	-30				
080	0	0	36	36	81 ~ 107	
090	0	-36				
100	0	0	41	41	91 ~ 122	
110	0	-36				
120	0	-41	41	41	102 ~ 132	
140	0	-41				
160	0	0	46	46	112 ~ 142	
180	0	-41				
200	0	-46	46	46	122 ~ 152	
250	0	-76				
300	0	-76				
350	0	0	51	51	132 ~ 162	
400	0	-51				

4. Dimensional tolerance of shaft and housing bores

Table 4 shows the recommended tolerance of shaft and housing bores when using ultra-thin section type ball bearings.

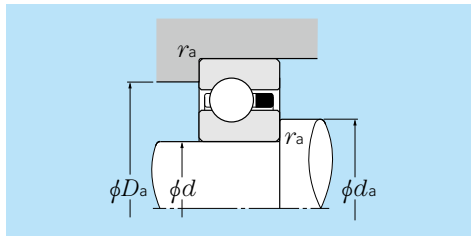


Table 4 Dimensional tolerance of shafts and housings unit: μm

Bearing bore diameter No.	For radial type ball bearings				For four-point contact type/ angular type ball bearings			
	Inner ring rotation		Outer ring rotation		Inner ring rotation		Outer ring rotation	
	Shaft	Housing	Shaft	Housing	Shaft	Housing	Shaft	Housing
010	+10 0	+13	-10 -20	-13	+10 0	+13	-10 -20	-13
015	+13 0	0	-13 -25	-25	+13 0	+13	-13 -25	-13
020						0		-25
025	+15 0	+15 0	-15 -30	-15 -30	+15 0		-15 -30	
030						+15 0		-15 -30
035								-15 -30
040	+20 0		-20 -40		+20 0		-20 -40	
042								
045		+20 0		-20 -40		+20 0		-20 -40
047								
050								
055	+25 0	+25 0	-25 -50	-25 -50	+25 0	+25 0	-25 -50	-25 -50
060								
065								
070								
075	+30 0	+30 0	-30 -60	-30 -60	+30 0	+30 0	-30 -60	-30 -60
080								
090								
100								
110	+35 0	+35 0	-35 -70	-35 -70	+35 0	+35 0	-35 -70	-35 -70
120								
140	+40 0	+40 0	-40 -80	-40 -80				
160	+45 0	+45 0	-45 -90	-45 -90	+40 0	+40 0	-40 -80	-40 -80
180								
200	+50 0	+50 0	-50 -100	-50 -100	+45 0	+45 0	-45 -90	-45 -90
250	+75 0	+75 0	-75 -150	-75 -150				
300								
350	+100 0	+100 0	-100 -200	-100 -200	+100 0	+100 0	-50 -100	-50 -100
400								

5. Installation-related dimensions of shafts and housings

Table 5 shows the installation-related dimensions of shafts and housings when using ultra-thin section type ball bearings.

Table 5 Installation-related dimensions of shafts and housings unit: mm

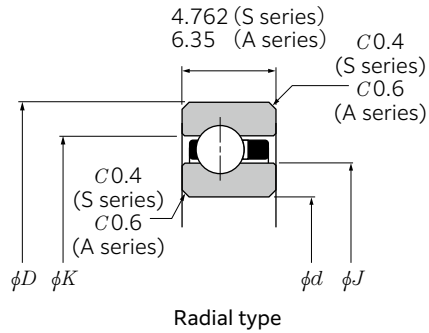
Dimension series code	$d_a \quad d+f$ (Max.) $d+e$ (Min.)		$D_a \quad d+h$ (Max.) $d+g$ (Min.)		r_{as} (Max.)
	e	f	g	h	
S	3.4	5.3	4.2	6.1	0.2
A	4.6	7.3	5.4	8.2	0.4
B	5.7	9.3	6.6	10.2	0.8
C	6.9	11.3	7.7	12.2	0.8
D	9.2	15.3	10.1	16.2	1.3
F	13.9	23.3	14.8	24.2	1.8
G	18.7	31.3	19.5	32.1	1.8
J,H ¹⁾	6.9	11.3	7.7	12.2	0.2

1) Bearings with seal

Ultra-Thin Section Type Ball Bearings

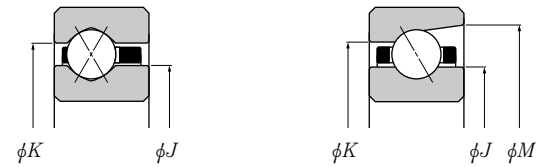


S series
A series



Radial type

Ultra-Thin Section Type Ball Bearings



4-point contact type

Angular type

d 25.4 ~ 304.8mm

Boundary dimensions mm		Radial type			4-point contact type					Angular type				
		Basic load rating dynamic	static	Fatigue load limit	Basic load rating dynamic	static	Basic load rating dynamic	static	Fatigue load limit	Basic load rating dynamic	static	Basic load rating dynamic	static	Fatigue load limit
d	D	kN			Radial		kN			Radial		kN		
		C_r	C_{0r}	C_u	C_r	C_{0r}	C_a	C_{0a}	C_u	C_r	C_{0r}	C_a	C_{0a}	C_u
25.4	34.925	2.75	1.94	0.084	2.40	1.66	3.15	5.05	0.181	2.91	2.21	3.80	6.70	0.147
38.1	47.625	3.10	2.60	0.112	2.71	2.23	3.55	6.75	0.243	3.35	3.10	4.40	9.35	0.205
50.8	63.5	5.00	4.30	0.186	4.35	3.70	5.70	11.2	0.400	5.25	4.95	6.90	14.9	0.325
63.5	76.2	5.40	5.20	0.224	4.70	4.45	6.15	13.5	0.485	5.65	5.95	7.45	18.1	0.395
76.2	88.9	5.75	6.10	0.263	5.00	5.25	6.55	15.9	0.570	6.05	7.00	7.95	21.2	0.465
88.9	101.6	6.05	7.00	0.300	5.25	6.00	6.90	18.2	0.655	6.35	8.00	8.35	24.3	0.530
101.6	114.3	6.35	7.85	0.325	5.50	6.80	7.25	20.6	0.710	6.65	9.05	8.75	27.4	0.580
107.95	120.65	6.50	8.30	0.335	5.60	7.15	7.40	21.7	0.730	6.80	9.55	8.95	29.0	0.595
114.3	127	6.60	8.75	0.345	5.75	7.55	7.55	22.9	0.750	6.95	10.1	9.15	30.5	0.610
120.65	133.35	6.75	9.20	0.350	5.85	7.95	7.70	24.1	0.765	7.10	10.6	9.30	32.0	0.625
127	139.7	6.85	9.65	0.360	5.95	8.35	7.85	25.2	0.785	7.20	11.1	9.50	33.5	0.640
139.7	152.4	7.10	10.5	0.375	6.15	9.10	8.10	27.6	0.820	7.45	12.1	9.80	37.0	0.665
152.4	165.1	7.35	11.4	0.390	6.35	9.85	8.35	29.9	0.855	7.70	13.2	10.1	40.0	0.695
165.1	177.8	7.55	12.3	0.405	6.55	10.6	8.60	32.0	0.885	7.90	14.2	10.4	43.0	0.720
177.8	190.5	7.75	13.2	0.420	6.70	11.4	8.80	34.5	0.915	8.10	15.2	10.7	46.0	0.745
190.5	203.2	7.95	14.1	0.435	6.85	12.2	9.05	37.0	0.945	8.30	16.2	10.9	49.0	0.770
203.2	215.9	8.10	15.0	0.445	7.05	13.0	9.25	38.0	0.975	8.50	17.3	11.2	52.5	0.790
228.6	241.3	8.45	16.8	0.470	7.35	14.5	9.65	44.0	1.03	8.90	19.3	11.7	58.5	0.835
254	266.7	8.80	18.6	0.495	7.60	16.0	10.0	48.5	1.08	9.20	21.4	12.1	65.0	0.880
279.4	292.1	8.10	20.3	0.520	7.90	17.6	10.4	53.5	1.13	9.55	23.4	12.6	71.0	0.920
304.8	317.5	9.40	22.1	0.540	8.15	19.1	10.7	58.0	1.18	9.85	25.5	13.0	77.5	0.960

Bearing number			Approx. dimension			Mass	
Radial type	4-point contact type	Angular type	mm			Radial type	Angular type
			J	K	M	4-point contact type (approx.)	
KRS010	KXS	KYS	29	31.4	32.6	0.012	0.011
KRS015	KXS	KYS	41.7	44.1	45.2	0.018	0.017
KRA020	KXA	KYA	55.5	58.8	60.3	0.048	0.045
KRA025	KXA	KYA	68.2	71.5	73	0.059	0.054
KRA030	KXA	KYA	80.9	84.2	85.7	0.068	0.064
KRA035	KXA	KYA	93.6	96.9	98.4	0.082	0.077
KRA040	KXA	KYA	106.3	109.6	111	0.09	0.086
KRA042	KXA	KYA	112.7	115.9	117.4	0.095	0.091
KRA045	KXA	KYA	119	122.3	123.7	0.1	0.095
KRA047	KXA	KYA	125.4	128.6	130.1	0.104	0.1
KRA050	KXA	KYA	131.7	135	136.4	0.109	0.104
KRA055	KXA	KYA	144.4	147.7	149.1	0.118	0.113
KRA060	KXA	KYA	157.1	160.4	161.8	0.13	0.127
KRA065	KXA	KYA	169.8	173.1	174.5	0.14	0.136
KRA070	KXA	KYA	182.5	185.8	187.1	0.15	0.145
KRA075	KXA	KYA	195.2	198.5	199.8	0.16	0.154
KRA080	KXA	KYA	207.9	211.2	212.5	0.172	0.163
KRA090	KXA	KYA	233.3	236.6	237.9	0.2	0.186
KRA100	KXA	KYA	258.7	262	263.2	0.227	0.204
KRA110	KXA	KYA	284.1	287.4	288.6	0.236	0.227
KRA120	KXA	KYA	309.5	312.8	314	0.254	0.245

Note: The upper two rows indicate the S series, and the other rows indicate the A series.

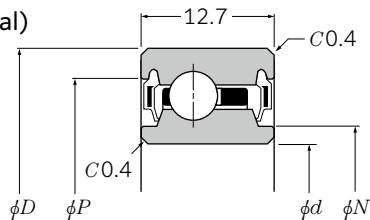
Special Application Bearings

Special Application Bearings

Ultra-Thin Section Type Ball Bearings



H series (with single-seal)
J series (with double-seal)

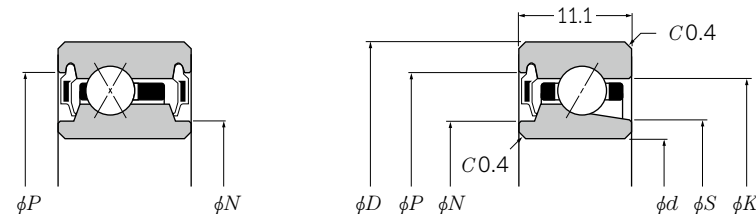


Radial type (with double-seal)

d 101.6 ~ 304.8mm

Boundary dimensions		Radial type			4-point contact type					Angular type				
mm		Basic load rating	static	Fatigue load limit	Basic load rating	static	dynamic	static	Fatigue load limit	Basic load rating	static	dynamic	static	Fatigue load limit
d	D	kN			kN		kN			kN		kN		
		Radial			Radial	Axial				Radial		Axial		
		C_r	C_{0r}	C_u	C_r	C_{0a}	C_a	C_{0a}	C_u	C_r	C_{0r}	C_a	C_{0a}	C_u
101.6	120.65	11.4	12.4	0.505	9.90	10.6	13.1	32.0	1.10	12.4	14.9	16.3	45.0	0.935
107.95	127	11.7	13.0	0.520	10.1	11.2	13.3	34.0	1.13	12.7	15.8	16.7	48.0	0.965
114.3	133.35	11.9	13.7	0.530	10.3	11.8	13.6	35.5	1.15	13.0	16.6	17.1	50.5	0.990
120.65	139.7	12.1	14.4	0.545	10.5	12.4	13.9	37.5	1.18	13.3	17.5	17.5	53.0	1.02
127	146.05	12.4	15.0	0.555	10.7	12.9	14.1	39.0	1.21	13.5	18.4	17.8	55.5	1.04
139.7	158.75	12.8	16.4	0.580	11.1	14.1	14.6	42.5	1.26	13.9	19.8	18.3	60.0	1.08
152.4	171.45	13.2	17.7	0.600	11.4	15.3	15.0	46.5	1.31	14.4	21.5	18.9	65.5	1.12
165.1	184.15	13.6	19.1	0.620	11.7	16.4	15.5	50.0	1.35	14.8	23.3	19.5	70.5	1.17
177.8	196.85	13.9	20.4	0.640	12.1	17.6	15.9	53.5	1.40	15.1	24.7	19.9	75.0	1.20
190.5	209.55	14.3	21.7	0.660	12.3	18.7	16.2	57.0	1.44	15.5	26.5	20.5	80.0	1.24
203.2	222.25	14.6	23.1	0.680	12.6	19.9	16.7	60.5	1.48	15.9	28.2	21.0	85.5	1.28
228.6	247.65	15.2	25.7	0.720	13.2	22.2	17.3	67.5	1.57	16.6	31.5	21.8	95.0	1.35
254	273.05	15.8	28.4	0.755	13.7	24.5	18.0	74.5	1.64	17.3	35.0	22.7	106	1.43
279.4	298.45	16.3	31.0	0.790	14.1	26.8	18.6	81.5	1.72	17.8	38.0	23.5	115	1.49
304.8	323.85	16.8	34.0	0.820	14.6	29.2	19.2	88.5	1.79	18.4	41.0	24.2	125	1.54

Ultra-Thin Section Type Ball Bearings



4-point contact type (with double-seal)

Angular type (with single-seal)

Bearing number			Approx. dimension				Mass	
Radial type	4-point contact type	Angular type	N	P	S	K	Radial type	Angular type
			mm				kg	
							4-point contact type (approx.)	
KRJ040LL	KXJ	KYH	105.5	115.9	106.2	113.6	0.249	0.222
KRJ042LL	KXJ	KYH	111.8	122.2	112.6	120	0.263	0.236
KRJ045LL	KXJ	KYH	118.2	128.6	119.1	126.3	0.277	0.254
KRJ047LL	KXJ	KYH	124.6	135	125.3	132.7	0.295	0.268
KRJ050LL	KXJ	KYH	130.9	141.3	131.7	139	0.308	0.281
KRJ055LL	KXJ	KYH	143.6	154	144.4	151.7	0.336	0.304
KRJ060LL	KXJ	KYH	156.3	166.7	157.1	164.4	0.367	0.331
KRJ065LL	KXJ	KYH	169	179.4	169.8	177.1	0.395	0.354
KRJ070LL	KXJ	KYH	181.7	192.1	182.4	189.8	0.422	0.381
KRJ075LL	KXJ	KYH	194.4	204.8	195.2	202.5	0.45	0.404
KRJ080LL	KXJ	KYH	207.1	217.5	207.9	215.2	0.481	0.431
KRJ090LL	KXJ	KYH	232.5	242.9	233.4	240.6	0.535	0.5
KRJ100LL	KXJ	KYH	257.9	268.3	258.8	266	0.594	0.531
KRJ110LL	KXJ	KYH	283.3	293.7	284.2	291.4	0.648	0.581
KRJ120LL	KXJ	KYH	308.7	319.1	309.7	316.8	0.708	0.63

Special Application Bearings

Special Application Bearings