



The **NTN** ultra-thin section type ball bearings are bearings with an extremely thin design.

There are three ultra-thin ball bearing types: radial, 4-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

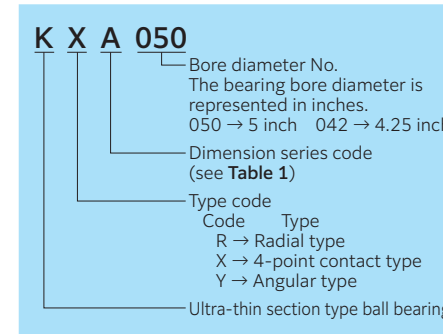
Table 1 shows the types and features of ultra-thin section type ball bearings, corresponding dimension series code, bearing cross section dimension, and bore diameter dimension range.

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	Bore 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
			H	9.525 × 11.1	101.6- 304.8
			J	9.525 × 12.7	101.6- 304.8
	With seal 				

2. Part number



3. Accuracy and radial internal clearance

Table 2 and **Table 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

Table 3 Accuracy and radial internal clearance of 4-point contact type/angular 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 $K_{ea} S_{ea}$
				Inner ring	Outer ring			
010	$\frac{0}{-10}$			13			25- 41	
015	$\frac{0}{-13}$	0		15	20		30- 46	
020		-13						
025	0			20	25		30- 61	
030	-15							
035		0			30			
040	0	-15		25			41- 71	
042	-20							
045		0			36			
047		-20						
050			0					
055	0	0	-125	30			51- 86	
060	-25	-25			41			
065								
070								
075	0	0						
080	-30	-30		41	46		61-107	
090								
100	0	0					71-122	
110	-36	-36						
120				46				
140	$\frac{0}{-41}$	$\frac{0}{-41}$					81-132	
160	0	0						
180	-46	-46					91-142	
200	$\frac{0}{-51}$	$\frac{0}{-51}$					102-152	
250	0	0	0					
300	-76	-76	-250	51			152-203	
350	0	0						
400	-102	-102					203-254	

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 4-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 0	-10 -20	-13 -25	+10 0	+13 0	-10 -20	-13 -25
015	+13 0		-13 -25		+13 0		-13 -25	
020	+15 0	+15 0	-15 -30	-15 -30	+15 0	+15 0	-15 -30	-15 -30
025			-15 -30		+15 0		-15 -30	
030	+20 0	+20 0	-20 -40	-20 -40	+20 0	+20 0	-20 -40	-20 -40
035			-20 -40		+20 0		-20 -40	
040	+25 0	+25 0	-25 -50	-25 -50	+25 0	+25 0	-25 -50	-25 -50
042			-25 -50		+25 0		-25 -50	
045	+30 0	+30 0	-30 -60	-30 -60	+30 0	+30 0	-30 -60	-30 -60
047			-30 -60		+30 0		-30 -60	
050	+35 0	+35 0	-35 -70	-35 -70	+35 0	+35 0	-35 -70	-35 -70
055			-35 -70		+35 0		-35 -70	
060	+40 0	+40 0	-40 -80	-40 -80	+40 0	+40 0	-40 -80	-40 -80
065			-40 -80		+40 0		-40 -80	
070	+45 0	+45 0	-45 -90	-45 -90	+45 0	+45 0	-45 -90	-45 -90
075			-45 -90		+45 0		-45 -90	
080	+50 0	+50 0	-50 -100	-50 -100	+50 0	+50 0	-50 -100	-50 -100
090			-50 -100		+50 0		-50 -100	
100	+75 0	+75 0	-75 -150	-75 -150	+75 0	+75 0	-75 -150	-75 -150
110			-75 -150		+75 0		-75 -150	
120	+100 0	+100 0	-100 -200	-100 -200	+100 0	+100 0	-50 -100	-50 -100
140			-100 -200		+100 0		-50 -100	
160	+100 0	+100 0	-100 -200	-100 -200	+100 0	+100 0	-50 -100	-50 -100
180			-100 -200		+100 0		-50 -100	
200	+100 0	+100 0	-100 -200	-100 -200	+100 0	+100 0	-50 -100	-50 -100
250			-100 -200		+100 0		-50 -100	
300	+100 0	+100 0	-100 -200	-100 -200	+100 0	+100 0	-50 -100	-50 -100
350			-100 -200		+100 0		-50 -100	
400	-100 -200	+100 0	-50 -100					

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.

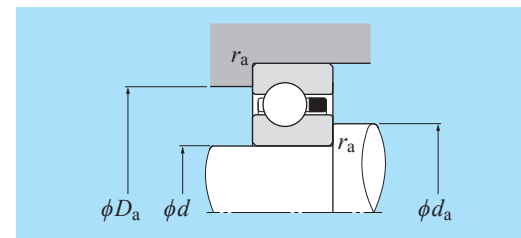


Table 5 Installation-related dimensions of shafts and housings unit: mm

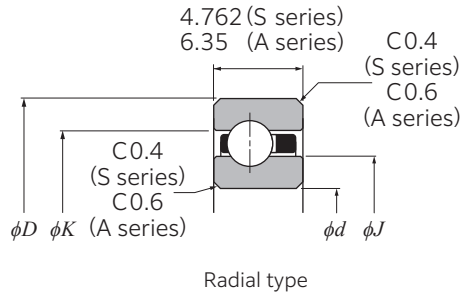
Dimension series code	d_a		D_a		r_{as} (Max.)
	$d + f$ (Max.) $d + e$ (Min.)	f	$d + h$ (Max.) $d + g$ (Min.)	h	
S	3.4	5.3	4.2	6.1	0.2
A	4.6	7.3	5.4	8.2	0.4
B	5.7	9.3	6.6	10.2	0.8
C	6.9	11.3	7.7	12.2	0.8
D	9.2	15.3	10.1	16.2	1.3
F	13.9	23.3	14.8	24.2	1.8
G	18.7	31.3	19.5	32.1	1.8
J,H ¹⁾	6.9	11.3	7.7	12.2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

1) Bearings with seal

Ultra-Thin Section Type Ball Bearings

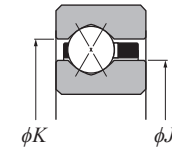


S series
A series

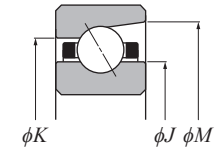


Radial type

Ultra-Thin Section Type Ball Bearings



4-point contact type



Angular type

d 25.4–304.8 mm

Boundary dimensions		Radial type			4-point contact type					Angular type				
mm		dynamic	static	Fatigue load limit	dynamic	static	dynamic	static	Fatigue load limit	dynamic	static	dynamic	static	Fatigue load limit
<i>d</i>	<i>D</i>	<i>C_r</i>	<i>C_{0r}</i>	<i>C_u</i>	<i>C_r</i>	<i>C_{0r}</i>	<i>C_a</i>	<i>C_{0a}</i>	<i>C_u</i>	<i>C_r</i>	<i>C_{0r}</i>	<i>C_a</i>	<i>C_{0a}</i>	<i>C_u</i>
		Radial			Radial		Axial			Radial		Axial		
		kN			kN		kN			kN		kN		
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			Reference dimensions			Mass	
Radial type	4-point contact type	Angular type	mm			Radial type	Angular type
			<i>J</i>	<i>K</i>	<i>M</i>	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.

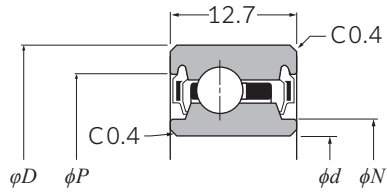
Special Application Bearings

Special Application Bearings

Ultra-Thin Section Type Ball Bearings



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

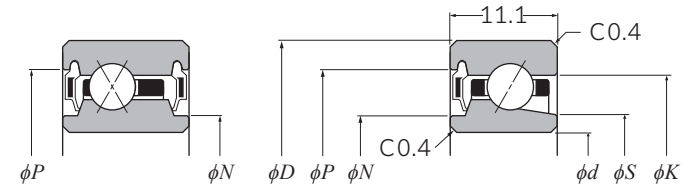


Radial type
(with double-seal)

d 101.6–304.8 mm

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
<i>d</i>	<i>D</i>	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN	kN
		Radial	Radial		Radial	Axial				Radial	Axial			
		<i>C_r</i>	<i>C_{0r}</i>	<i>C_u</i>	<i>C_r</i>	<i>C_{0r}</i>	<i>C_a</i>	<i>C_{0a}</i>	<i>C_u</i>	<i>C_r</i>	<i>C_{0r}</i>	<i>C_a</i>	<i>C_{0a}</i>	<i>C_u</i>
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			Reference dimensions				Mass	
Radial type	4-point contact type	Angular type	mm				Radial type	Angular type
			<i>N</i>	<i>P</i>	<i>S</i>	<i>K</i>	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