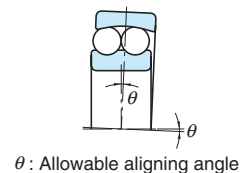


Self-aligning ball bearings

Self-aligning ball bearings have a spherical outer ring raceway, the center of whose curvature meets that of the bearing itself, so that the inner ring, balls and cage continue to rotate, aligning themselves if they have become misaligned within design limits.

This type of bearing is suitable when the displacement of the centers around which the shaft and housing rotate and shaft deflection are likely to occur.

Bearings with a tapered bore can easily be fit to the shaft with an adapter assembly.



Self-aligning ball bearings



Cylindrical bore



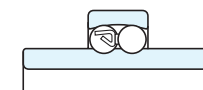
Tapered bore

Bore diameter **5 – 110 mm**



Sealed type

Bore diameter **10 – 110 mm**



Extended inner ring type

Bore diameter **20 – 60 mm**

Adapter assemblies



Bore diameter **17 – 100 mm**

Boundary dimensions	The dimensions of standard series are as specified in JIS B 1512.
Tolerances	As specified in JIS B 1514-1, class 0. (refer to Table 7-3 on pp. A 54 – A 57.)
Radial internal clearance	As specified in JIS B 1520. (refer to Table 10-6 on p. A 99.)
Recommended fits	Refer to Table 9-4 on pp. A 85, 86.
Standard cages	<ul style="list-style-type: none"> Staggered type pressed steel cage (application : all dimensional range of 12, 13, 112, 113, 22...2RS and 23...2RS series) Snap type pressed steel cage (application : all dimensional range of 22 series and those of No. 2300 thru 2316.) Copper alloy machined cage (application : bearings of No. 2317 thru 2322)
Allowable aligning angle	<ul style="list-style-type: none"> · 12 and 22 series 0.044 rad (2.5°) · 13 and 23 series 0.052 rad (3°) · 22...2RS and 23...2RS series 0.026 rad (1.5°)

Dynamic equivalent radial load

$$P_r = X F_r + Y F_a$$

$F_a / F_r \leq e$		$F_a / F_r > e$	
X	Y	X	Y
1	Y_1	0.65	Y_2

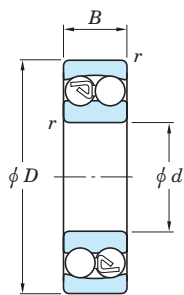
Static equivalent radial load

$$P_{0r} = F_r + Y_0 F_a$$

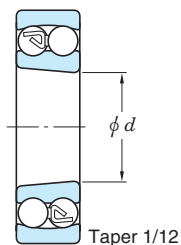
Refer to the bearing specification table for values of e , Y_1 , Y_2 and Y_0 .

Self-aligning ball bearings open type

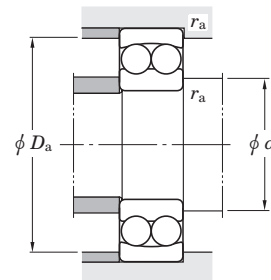
d 5 ~ (20) mm



Cylindrical bore



Tapered bore

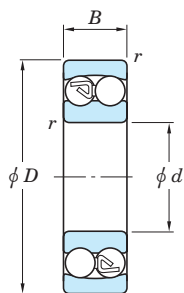


Boundary dimensions (mm)				Basic load ratings (kN)		Limiting speeds (min ⁻¹)		Bearing No.		Mounting dimensions (mm)			Con- stant e	Axial load factors			(Refer.) Mass (kg)	
d	D	B	$r_{min.}$	C_r	C_{0r}	Grease lub.	Oil lub.	Cylindrical bore	Tapered bore	d_a min.	D_a max.	r_a max.		Y_1	Y_2	Y_0	Cylindrical bore	Tapered bore
5	19	6	0.3	2.55	0.48	30 000	37 000	135	—	7	17	0.3	0.34	1.86	2.87	1.94	0.009	—
6	19	6	0.3	2.50	0.48	30 000	37 000	126	—	8	17	0.3	0.34	1.86	2.87	1.94	0.009	—
7	22	7	0.3	2.65	0.56	27 000	33 000	127	—	9	20	0.3	0.35	1.82	2.82	1.91	0.014	—
8	22	7	0.3	2.60	0.56	26 000	33 000	108	—	10	20	0.3	0.35	1.82	2.82	1.91	0.014	—
9	26	8	0.6	3.80	0.80	23 000	29 000	129	—	13	22	0.6	0.34	1.86	2.87	1.94	0.022	—
10	30	9	0.6	5.50	1.20	23 000	28 000	1200	—	14	26	0.6	0.33	1.92	2.97	2.01	0.034	—
	30	14	0.6	7.40	1.60	23 000	29 000	2200	—	14	26	0.6	0.59	1.07	1.65	1.12	0.047	—
	35	11	0.6	7.25	1.60	20 000	24 000	1300	—	14	31	0.6	0.34	1.85	2.87	1.94	0.058	—
	35	17	0.6	9.30	2.10	18 000	24 000	2300	—	14	31	0.6	0.59	1.07	1.66	1.13	0.085	—
12	32	10	0.6	5.60	1.25	21 000	26 000	1201	—	16	28	0.6	0.33	1.89	2.93	1.98	0.040	—
	32	14	0.6	7.65	1.75	21 000	26 000	2201	—	16	28	0.6	0.53	1.18	1.83	1.24	0.053	—
	37	12	1	9.40	2.15	18 000	22 000	1301	—	17	32	1	0.36	1.77	2.74	1.86	0.067	—
	37	17	1	9.70	2.30	16 000	22 000	2301	—	17	32	1	0.54	1.17	1.81	1.23	0.095	—
15	35	11	0.6	7.45	1.75	18 000	22 000	1202	—	19	31	0.6	0.33	1.90	2.95	2.00	0.049	—
	35	14	0.6	7.70	1.85	18 000	22 000	2202	—	19	31	0.6	0.50	1.27	1.97	1.33	0.060	—
	42	13	1	9.55	2.30	16 000	20 000	1302	—	20	37	1	0.34	1.86	2.88	1.95	0.094	—
	42	17	1	12.1	2.90	14 000	20 000	2302	—	20	37	1	0.50	1.27	1.96	1.33	0.114	—
17	40	12	0.6	7.90	2.00	16 000	20 000	1203	—	21	36	0.6	0.31	2.03	3.14	2.12	0.073	—
	40	16	0.6	9.80	2.40	16 000	20 000	2203	—	21	36	0.6	0.50	1.27	1.96	1.33	0.088	—
	47	14	1	12.5	3.20	14 000	17 000	1303	—	22	42	1	0.33	1.92	2.97	2.01	0.130	—
	47	19	1	14.5	3.60	13 000	18 000	2303	—	22	42	1	0.49	1.28	1.98	1.34	0.158	—
20	47	14	1	9.90	2.60	14 000	17 000	1204	1204K	25	42	1	0.29	2.16	3.35	2.27	0.120	0.118
	47	18	1	12.6	3.30	14 000	17 000	2204	2204K	25	42	1	0.48	1.31	2.02	1.37	0.140	0.136
	52	15	1.1	12.4	3.30	13 000	15 000	1304	1304K	26.5	45.5	1	0.30	2.12	3.28	2.22	0.163	0.161

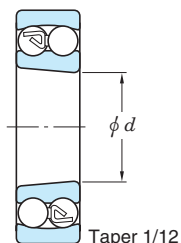
[Remark] Standard cage types used for the above bearings are described earlier in this section.

Self-aligning ball bearings
open type

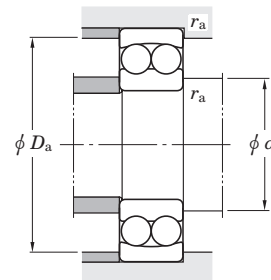
d (20) ~ 50 mm



Cylindrical bore



Tapered bore

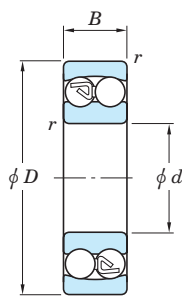


Boundary dimensions (mm)				Basic load ratings (kN)		Limiting speeds (min ⁻¹)		Bearing No.		Mounting dimensions (mm)			Con-stant e	Axial load factors			(Refer.) Mass (kg)	
d	D	B	$r_{min.}$	C_r	C_{0r}	Grease lub.	Oil lub.	Cylindrical bore	Tapered bore	d_a min.	D_a max.	r_a max.		Y_1	Y_2	Y_0	Cylindrical bore	Tapered bore
20	52	21	1.1	18.0	4.70	11 000	15 000	2304	2304K	26.5	45.5	1	0.49	1.29	2.00	1.35	0.209	0.205
	52	15	1	12.1	3.30	12 000	14 000	1205	1205K	30	47	1	0.28	2.28	3.52	2.39	0.141	0.138
25	52	18	1	12.6	3.50	12 000	15 000	2205	2205K	30	47	1	0.40	1.58	2.45	1.66	0.163	0.158
	62	17	1.1	18.0	5.00	9 900	12 000	1305	1305K	31.5	55.5	1	0.27	2.31	3.57	2.42	0.257	0.252
	62	24	1.1	24.4	6.60	9 400	13 000	2305	2305K	31.5	55.5	1	0.46	1.36	2.10	1.42	0.335	0.327
	62	20	1	15.6	4.65	10 000	12 000	2206	2206K	35	57	1	0.35	1.79	2.77	1.87	0.260	0.254
30	62	16	1	15.6	4.65	9 900	12 000	1206	1206K	35	57	1	0.25	2.55	3.94	2.67	0.220	0.216
	62	20	1	15.6	4.65	10 000	12 000	2206	2206K	35	57	1	0.35	1.79	2.77	1.87	0.260	0.254
	72	19	1.1	21.3	6.30	8 700	11 000	1306	1306K	36.5	65.5	1	0.26	2.40	3.72	2.52	0.387	0.381
	72	27	1.1	31.4	8.75	8 000	11 000	2306	2306K	36.5	65.5	1	0.44	1.44	2.23	1.51	0.500	0.489
35	72	17	1.1	15.8	5.10	8 500	10 000	1207	1207K	41.5	65.5	1	0.23	2.71	4.20	2.84	0.323	0.317
	72	23	1.1	21.6	6.60	8 500	10 000	2207	2207K	41.5	65.5	1	0.37	1.71	2.65	1.79	0.403	0.396
	80	21	1.5	25.1	7.85	7 600	9 300	1307	1307K	43	72	1.5	0.25	2.48	3.84	2.60	0.510	0.502
	80	31	1.5	39.4	11.3	7 100	9 800	2307	2307K	43	72	1.5	0.45	1.39	2.15	1.46	0.675	0.657
40	80	18	1.1	19.2	6.50	7 500	9 200	1208	1208K	46.5	73.5	1	0.22	2.83	4.38	2.97	0.417	0.411
	80	23	1.1	22.4	7.40	7 600	9 300	2208	2208K	46.5	73.5	1	0.33	1.92	2.96	2.01	0.505	0.494
	90	23	1.5	29.5	9.70	6 900	8 400	1308	1308K	48	82	1.5	0.25	2.57	3.98	2.69	0.715	0.704
	90	33	1.5	44.9	13.5	6 200	8 600	2308	2308K	48	82	1.5	0.43	1.47	2.27	1.54	0.925	0.903
45	85	19	1.1	21.8	7.35	7 000	8 500	1209	1209K	51.5	78.5	1	0.21	2.94	4.56	3.09	0.465	0.459
	85	23	1.1	23.3	8.15	7 000	8 500	2209	2209K	51.5	78.5	1	0.30	2.09	3.23	2.19	0.545	0.533
	100	25	1.5	38.1	12.7	6 100	7 500	1309	1309K	53	92	1.5	0.25	2.56	3.95	2.68	0.957	0.942
	100	36	1.5	54.4	16.7	5 600	7 700	2309	2309K	53	92	1.5	0.42	1.51	2.33	1.58	1.23	1.20
50	90	20	1.1	22.7	8.10	6 500	7 900	1210	1210K	56.5	83.5	1	0.21	3.07	4.76	3.22	0.525	0.515
	90	23	1.1	23.3	8.50	6 500	7 900	2210	2210K	56.5	83.5	1	0.27	2.33	3.61	2.45	0.590	0.577
	110	27	2	43.4	14.1	5 600	6 800	1310	1310K	59	101	2	0.23	2.70	4.17	2.83	1.21	1.19
	110	40	2	64.6	20.3	5 100	7 000	2310	2310K	59	101	2	0.40	1.56	2.41	1.63	1.64	1.60

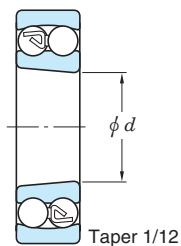
[Remark] Standard cage types used for the above bearings are described earlier in this section.

Self-aligning ball bearings open type

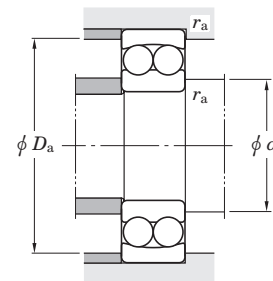
d 55 ~ (85) mm



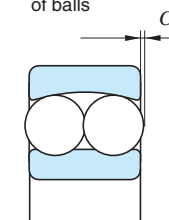
Cylindrical bore



Tapered bore



[Note] Protruding distance of balls



Balls of the following bearing protrude by C_1 from the bearing side.

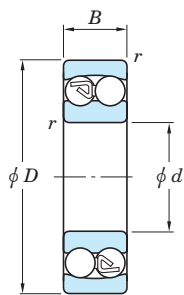
Bearing No.	C_1 (mm)
2216	0.2 (approx.)

Boundary dimensions (mm)				Basic load ratings (kN)		Limiting speeds (min ⁻¹)		Bearing No.		Mounting dimensions (mm)			Con-stant e	Axial load factors			(Refer.) Mass (kg)	
d	D	B	$r_{min.}$	C_r	C_{0r}	Grease lub.	Oil lub.	Cylindrical bore	Tapered bore	d_a min.	D_a max.	r_a max.		Y_1	Y_2	Y_0	Cylindrical bore	Tapered bore
55	100	21	1.5	26.8	10.0	5 800	7 100	1211	1211K	63	92	1.5	0.20	3.19	4.94	3.34	0.705	0.693
	100	25	1.5	26.8	10.0	5 800	7 100	2211	2211K	63	92	1.5	0.27	2.35	3.64	2.47	0.810	0.792
	120	29	2	51.3	17.9	5 000	6 200	1311	1311K	64	111	2	0.23	2.70	4.18	2.83	1.58	1.56
	120	43	2	75.3	24.0	4 600	6 400	2311	2311K	64	111	2	0.41	1.53	2.37	1.60	2.10	2.05
60	110	22	1.5	30.2	11.5	5 200	6 400	1212	1212K	68	102	1.5	0.19	3.37	5.22	3.53	0.900	0.885
	110	28	1.5	34.1	12.6	5 300	6 500	2212	2212K	68	102	1.5	0.28	2.26	3.49	2.36	1.09	1.07
	130	31	2.1	57.2	20.8	4 500	5 500	1312	1312K	71	119	2	0.22	2.91	4.50	3.05	1.96	1.93
	130	46	2.1	87.2	28.3	4 200	5 800	2312	2312K	71	119	2	0.39	1.62	2.51	1.70	2.60	2.53
65	120	23	1.5	31.0	12.5	4 800	5 800	1213	1213K	73	112	1.5	0.17	3.67	5.68	3.84	1.15	1.13
	120	31	1.5	43.5	16.4	4 900	5 900	2213	2213K	73	112	1.5	0.28	2.24	3.47	2.35	1.46	1.43
	140	33	2.1	61.7	22.9	4 300	5 200	1313	1313K	76	129	2	0.23	2.73	4.23	2.86	2.45	2.41
	140	48	2.1	95.8	32.5	3 800	5 300	2313	2313K	76	129	2	0.38	1.66	2.58	1.74	3.23	3.15
70	125	24	1.5	34.6	13.8	4 600	5 700	1214	—	78	117	1.5	0.18	3.48	5.38	3.64	1.26	—
	125	31	1.5	43.9	17.1	4 600	5 600	2214	—	78	117	1.5	0.26	2.42	3.74	2.53	1.52	—
	150	35	2.1	74.0	27.7	4 000	4 900	1314	—	81	139	2	0.22	2.84	4.40	2.98	2.99	—
	150	51	2.1	89.6	31.7	3 600	4 900	2314	—	81	139	2	0.35	1.82	2.82	1.91	4.23	—
75	130	25	1.5	38.8	15.7	4 300	5 300	1215	1215K	83	122	1.5	0.17	3.60	5.58	3.77	1.36	1.34
	130	31	1.5	44.2	17.8	4 300	5 300	2215	2215K	83	122	1.5	0.25	2.49	3.85	2.61	1.62	1.58
	160	37	2.1	78.9	29.9	4 000	4 900	1315	1315K	86	149	2	0.23	2.80	4.33	2.93	3.56	3.51
	160	55	2.1	103	36.8	3 400	4 600	2315	2315K	86	149	2	0.34	1.86	2.88	1.95	5.13	5.01
80	140	26	2	39.8	17.0	4 000	4 900	1216	1216K	89	131	2	0.16	3.90	6.03	4.08	1.67	1.64
	140	33	2	49.0	19.9	4 100	5 000	2216	2216K	89	131	2	0.26	2.42	3.75	2.54	2.01	1.97
	170	39	2.1	88.1	33.1	3 500	4 300	1316	1316K	91	159	2	0.22	2.90	4.49	3.04	4.18	4.12
	170	58	2.1	129	45.7	3 100	4 300	2316	2316K	91	159	2	0.34	1.87	2.90	1.96	6.10	5.96
85	150	28	2	49.2	20.8	3 800	4 600	1217	1217K	94	141	2	0.17	3.61	5.59	3.78	2.07	2.04

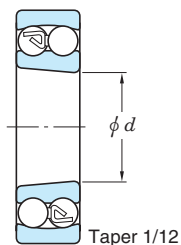
[Remark] Standard cage types used for the above bearings are described earlier in this section.

Self-aligning ball bearings
open type

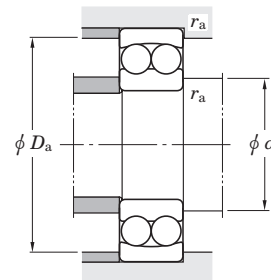
d (85) ~ 110 mm



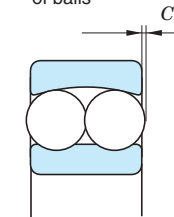
Cylindrical bore



Tapered bore



[Note] Protruding distance of balls



Balls of the following bearing protrude by C₁ from the bearing side.

Boundary dimensions (mm)				Basic load ratings (kN)		Limiting speeds (min ⁻¹)		Bearing No.		Mounting dimensions (mm)			Constant e	Axial load factors			(Refer.) Mass (kg)	
d	D	B	r _{min.}	C _r	C _{0r}	Grease lub.	Oil lub.	Cylindrical bore	Tapered bore	d _a min.	D _a max.	r _a max.		Y ₁	Y ₂	Y ₀	Cylindrical bore	Tapered bore
85	150	36	2	58.3	23.6	3 800	4 600	2217	2217K	94	141	2	0.25	2.49	3.85	2.61	2.52	2.46
	180	41	3	97.3	37.8	3 300	4 000	1317	1317K	98	167	2.5	0.22	2.93	4.53	3.07	4.98	4.91
	180	60	3	141	51.5	3 000	4 100	2317	2317K	98	167	2.5	0.35	1.82	2.82	1.91	7.05	6.89
90	160	30	2	56.8	23.4	3 500	4 300	1218	1218K	99	151	2	0.17	3.69	5.70	3.86	2.52	2.48
	160	40	2	67.7	27.2	3 500	4 300	2218	2218K	99	151	2	0.26	2.39	3.71	2.51	3.40	3.33
	190	43	3	116	44.4	3 100	3 800	1318	1318K	103	177	2.5	0.22	2.81	4.35	2.94	5.80	5.71
	190	64	3	153	57.9	2 800	3 900	2318	2318K	103	177	2.5	0.34	1.84	2.85	1.93	8.44	8.25
95	170	32	2.1	57.0	24.3	3 300	4 000	1219	1219K	106	159	2	0.17	3.63	5.62	3.80	3.10	3.05
	170	43	2.1	82.7	34.3	3 300	4 000	2219	2219K	106	159	2	0.26	2.43	3.76	2.55	4.10	4.00
	200	45	3	132	50.8	2 900	3 600	1319	1319K	108	187	2.5	0.23	2.73	4.23	2.86	6.69	6.59
	200	67	3	166	64.8	2 700	3 700	2319	2319K	108	187	2.5	0.35	1.82	2.82	1.91	9.79	9.57
100	180	34	2.1	69.0	29.7	3 100	3 800	1220	1220K	111	169	2	0.17	3.62	5.60	3.79	3.70	3.64
	180	46	2.1	80.9	34.0	3 100	3 800	2220	2220K	111	169	2	0.24	2.57	3.98	2.70	4.98	4.87
	215	47	3	143	57.3	2 800	3 400	1320	1320K	113	202	2.5	0.24	2.66	4.11	2.78	8.30	8.19
	215	73	3	183	73.4	2 400	3 400	2320	2320K	113	202	2.5	0.34	1.84	2.85	1.93	12.4	12.1
105	190	36	2.1	77.0	34.0	2 900	3 600	1221	—	116	179	2	0.18	3.56	5.51	3.73	4.37	—
	190	50	2.1	94.9	40.1	3 000	3 600	2221	—	116	179	2	0.26	2.43	3.76	2.55	6.07	—
	225	49	3	149	60.2	2 600	3 200	1321	—	118	212	2.5	0.23	2.73	4.22	2.86	10.0	—
	225	77	3	187	78.0	2 300	3 200	2321	—	118	212	2.5	0.36	1.75	2.71	1.83	14.3	—
110	200	38	2.1	80.2	35.2	2 800	3 400	1222	1222K	121	189	2	0.17	3.64	5.63	3.81	5.15	5.07
	200	53	2.1	120	48.9	2 800	3 400	2222	2222K	121	189	2	0.26	2.41	3.73	2.53	7.10	6.94
	240	50	3	150	63.2	2 400	3 000	1322	1322K	123	227	2.5	0.22	2.82	4.37	2.96	11.8	11.7
	240	80	3	200	85.7	2 200	3 000	2322	2322K	123	227	2.5	0.35	1.82	2.82	1.91	17.3	16.9

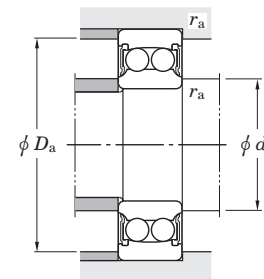
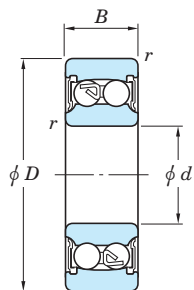
Bearing No.	C ₁ (mm)
1319	1.6
1320	2.5
1321	2.5
1322	2.6

(approx.)

[Remark] Standard cage types used for the above bearings are described earlier in this section.

Self-aligning ball bearings
sealed type

d 10 ~ 55 mm

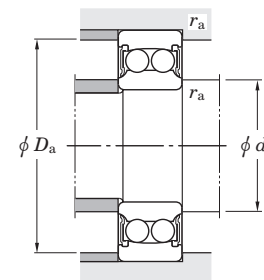
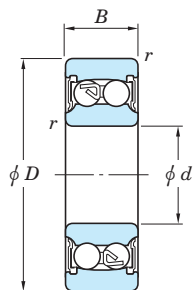


Boundary dimensions (mm)				Basic load ratings (kN)		Limiting speed (min ⁻¹)	Bearing No.	Mounting dimensions (mm)				Constant e	Axial load factors			(Refer.) Mass (kg)
d	D	B	$r_{min.}$	C_r	C_{Or}	Grease lub.		d_a min.	d_a max.	D_a max.	r_a max.		Y_1	Y_2	Y_0	
10	30	14	0.6	5.40	1.20	15 000	2200 2RS 2300 2RS	13.7	13.7	25	0.6	0.33	1.92	2.97	2.01	0.047
	35	17	0.6	7.25	1.60	13 000		15	15.7	30	0.6	0.34	1.85	2.87	1.94	0.085
12	32	14	0.6	5.60	1.25	14 000	2201 2RS 2301 2RS	15.2	15.2	27	0.6	0.33	1.89	2.93	1.98	0.053
	37	17	1	9.40	2.15	12 000		16.8	16.8	31	1	0.36	1.77	2.74	1.86	0.095
15	35	14	0.6	7.45	1.75	12 000	2202 2RS 2302 2RS	18.0	18.0	30	0.6	0.33	1.90	2.95	2.00	0.060
	42	17	1	9.55	2.30	11 000		20.0	20.0	36	1	0.34	1.86	2.88	1.95	0.114
17	40	16	0.6	7.90	2.00	11 000	2203 2RS 2303 2RS	20.2	20.2	35	0.6	0.31	2.03	3.14	2.12	0.088
	47	19	1	12.5	3.20	9 400		22.1	22.1	41	1	0.33	1.92	2.97	2.01	0.158
20	47	18	1	9.90	2.60	9 100	2204 2RS 2304 2RS	24.1	24.1	41	1	0.29	2.16	3.35	2.27	0.140
	52	21	1.1	12.4	3.35	8 300		26.2	26.2	45	1	0.30	2.12	3.28	2.22	0.209
25	52	18	1	12.1	3.30	7 900	2205 2RS 2305 2RS	29.4	29.4	46	1	0.28	2.28	3.52	2.39	0.163
	62	24	1.1	17.6	4.95	6 600		32	33.9	55	1	0.27	2.31	3.57	2.42	0.335
30	62	20	1	15.6	4.65	6 600	2206 2RS 2306 2RS	35.5	35.5	56	1	0.25	2.55	3.94	2.67	0.260
	72	27	1.1	21.3	6.30	5 800		37	37.8	65	1	0.26	2.40	3.72	2.52	0.500
35	72	23	1.1	15.8	5.10	5 700	2207 2RS 2307 2RS	40.9	40.9	65	1	0.23	2.71	4.20	2.84	0.403
	80	31	1.5	25.1	7.85	5 100		43.5	45.0	71.5	1.5	0.25	2.48	3.84	2.60	0.675
40	80	23	1.1	19.2	6.50	5 000	2208 2RS 2308 2RS	47	48.1	73	1	0.22	2.83	4.38	2.97	0.505
	90	33	1.5	29.5	9.70	4 600		48.5	49.6	81.5	1.5	0.25	2.57	3.98	2.69	0.925
45	85	23	1.1	21.8	7.35	4 600	2209 2RS 2309 2RS	52	52.4	78	1	0.21	2.94	4.56	3.09	0.545
	100	36	1.5	38.1	12.7	4 100		53.5	56.6	91.5	1.5	0.25	2.56	3.95	2.68	1.23
50	90	23	1.1	22.7	8.10	4 300	2210 2RS 2310 2RS	56.5	56.5	83	1	0.21	3.07	4.76	3.22	0.590
	110	40	2	43.4	14.1	3 700		60	62.5	100	2	0.23	2.70	4.17	2.83	1.64
55	100	25	1.5	26.8	10.0	3 900	2211 2RS 2311 2RS	63.5	63.5	91.5	1.5	0.20	3.19	4.94	3.34	0.810
	120	43	2	51.3	17.9	3 400		65	65	110	2	0.23	2.70	4.18	2.83	2.10

[Remark] Standard cage types used for the above bearings are described earlier in this section.

Self-aligning ball bearings
sealed type

d 60 ~ 110 mm

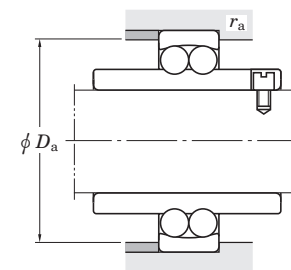
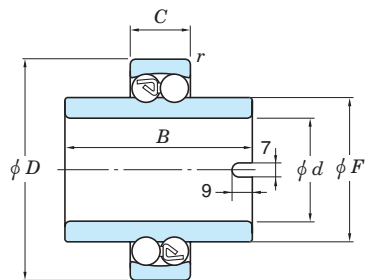


Boundary dimensions (mm)				Basic load ratings (kN)		Limiting speed (min ⁻¹)	Bearing No.	Mounting dimensions (mm)				Constant e	Axial load factors			(Refer.) Mass (kg)
d	D	B	$r_{min.}$	C_r	C_{0r}	Grease lub.		min. d_a	max. d_a	max. D_a	max. r_a		Y_1	Y_2	Y_0	
60	110	28	1.5	30.2	11.5	3 500	2212 2RS 2312 2RS	68.5	68.5	101.5	1.5	0.19	3.37	5.22	3.53	1.09
	130	46	2.1	57.1	20.8	3 000		72	72	118	2	0.22	2.91	4.50	3.05	2.60
65	120	31	1.5	31.0	12.5	3 200	2213 2RS 2313 2RS	73.5	75.5	111.5	1.5	0.17	3.67	5.68	3.84	1.46
	140	48	2.1	62.1	22.9	2 900		77	77	128	2	0.23	2.73	4.23	2.86	3.23
70	125	31	1.5	34.6	13.8	3 100	2214 2RS 2314 2RS	78.5	78.5	116.5	1.5	0.18	3.48	5.38	3.64	1.52
	150	51	2.1	74.1	27.7	2 600		82	82	138	2	0.22	2.84	4.40	2.98	4.23
75	130	31	1.5	38.8	15.7	2 900	2215 2RS 2315 2RS	83.5	83.5	121.5	1.5	0.17	3.60	5.58	3.77	1.62
	160	55	2.1	81.8	30.5	2 600		87	87	148	2	0.23	2.80	4.33	2.93	5.13
80	140	33	2	39.8	17.0	2 700	2216 2RS 2316 2RS	90	90	130	2	0.16	3.90	6.03	4.08	2.01
	170	58	2.1	88.4	33.1	2 300		92	92	158	2	0.22	2.90	4.49	3.04	6.10
85	150	36	2	49.2	20.8	2 500	2217 2RS	95	95	140	2	0.17	3.61	5.59	3.78	2.52
90	160	40	2	54.1	23.1	2 400	2218 2RS	100	100	150	2	0.17	3.69	5.70	3.86	3.40
95	170	43	2.1	60.8	26.8	2 200	2219 2RS	107	107	158	2	0.17	3.63	5.62	3.80	4.10
100	180	46	2.1	69.0	29.7	2 100	2220 2RS	112	112	168	2	0.17	3.62	5.60	3.79	4.98
105	190	50	2.1	77.0	34.0	2 000	2221 2RS	117	117	178	2	0.18	3.56	5.51	3.73	6.07
110	200	53	2.1	80.2	35.2	1 900	2222 2RS	122	122	188	2	0.17	3.64	5.63	3.81	7.10

[Remark] Standard cage types used for the above bearings are described earlier in this section.

Self-aligning ball bearings extended inner ring type

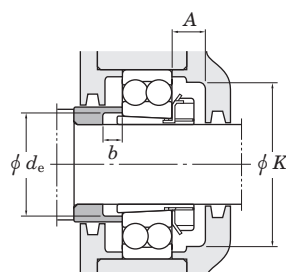
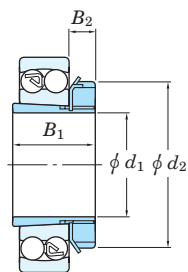
d 20 ~ 60 mm



Boundary dimensions (mm)						Basic load ratings (kN)		Limiting speeds (min ⁻¹)		Bearing No.	Mounting dimensions (mm)		Constant e	Axial load factors			(Refer.) Mass (kg)
d	D	B	C	F	$r_{min.}$	C_r	C_{0r}	Grease lub.	Oil lub.		D_a max.	r_a max.		Y_1	Y_2	Y_0	
20	47	40	14	29.2	1	9.90	2.60	14 000	17 000	11204 11304	42	1	0.29	2.16	3.35	2.27	0.191
	52	44	15	31.5	1.1	12.4	3.35	13 000	15 000		45.5	1	0.30	2.12	3.28	2.22	0.266
25	52	44	15	33.3	1	12.1	3.30	12 000	14 000	11205 11305	47	1	0.28	2.28	3.52	2.39	0.226
	62	48	17	38	1.1	17.6	4.95	9 900	12 000		55.5	1	0.27	2.31	3.57	2.42	0.445
30	62	48	16	40.1	1	15.6	4.65	9 900	12 000	11206 11306	57	1	0.25	2.55	3.94	2.67	0.360
	72	52	19	45	1.1	21.3	6.30	8 700	11 000		65.5	1	0.26	2.40	3.72	2.52	0.614
35	72	52	17	47.7	1.1	15.8	5.10	8 500	10 000	11207 11307	65.5	1	0.23	2.71	4.20	2.84	0.556
	80	56	21	51.7	1.5	25.1	7.85	7 600	9 300		72	1.5	0.25	2.48	3.84	2.60	0.821
40	80	56	18	54	1.1	19.2	6.50	7 500	9 200	11208 11308	73.5	1	0.22	2.83	4.38	2.97	0.733
	90	58	23	57.7	1.5	29.5	9.70	6 900	8 400		82	1.5	0.25	2.57	3.98	2.69	1.09
45	85	58	19	57.7	1.1	21.8	7.35	7 000	8 500	11209 11309	78.5	1	0.21	2.94	4.56	3.09	0.793
	100	60	25	63.9	1.5	38.1	12.7	6 100	7 500		92	1.5	0.25	2.56	3.95	2.68	1.40
50	90	58	20	62.7	1.1	22.7	8.10	6 500	7 900	11210 11310	83.5	1	0.21	3.07	4.76	3.22	0.875
	110	62	27	70.3	2	43.4	14.1	5 600	6 800		102	2	0.23	2.70	4.17	2.83	1.74
55	100	60	21	70.3	1.5	26.8	10.0	5 800	7 100	11211	93.5	1.5	0.20	3.19	4.94	3.34	1.16
60	110	62	22	78	1.5	30.2	11.5	5 200	6 400	11212	103.5	1.5	0.19	3.37	5.22	3.53	1.52

Adapter assemblies for self-aligning ball bearings

d_1 17 ~ (45) mm



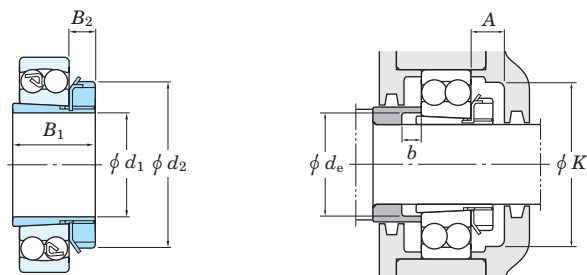
d_1 (45) ~ 75 mm

Boundary dimensions (mm)				Brg. bore d (mm)	Designations Bearing + adapter ass'y	Mounting dimensions (mm)				Mass Brg.+adapter ass'y (kg)	(Refer.)	
d_1	B_1	d_2	B_2			A min.	K min.	d_e min.	b min.		Adapter sleeve No.	Locknut No.
17	24	32	7	20	1204K+H204X	—	—	23	5	0.162	A204X	AN04
	28	32	7	20	2204K+H304X	—	—	24	5	0.185	A304X	AN04
	28	32	7	20	1304K+H304X	—	—	24	8	0.210	A304X	AN04
	31	32	7	20	2304K+H2304X	—	—	24	5	0.257	A2304X	AN04
20	26	38	8	25	1205K+H205X	15	45	28	5	0.218	A205X	AN05
	29	38	8	25	2205K+H305X	15	45	29	5	0.243	A305X	AN05
	29	38	8	25	1305K+H305X	15	45	29	6	0.337	A305X	AN05
	35	38	8	25	2305K+H2305X	15	45	29	5	0.424	A2305X	AN05
25	27	45	8	30	1206K+H206X	15	50	33	5	0.320	A206X	AN06
	31	45	8	30	2206K+H306X	15	50	34	5	0.368	A306X	AN06
	31	45	8	30	1306K+H306X	15	50	34	6	0.495	A306X	AN06
	38	45	8	30	2306K+H2306X	15	50	35	5	0.620	A2306X	AN06
30	29	52	9	35	1207K+H207X	17	58	38	5	0.462	A207X	AN07
	35	52	9	35	2207K+H307X	17	58	39	5	0.557	A307X	AN07
	35	52	9	35	1307K+H307X	17	58	39	7	0.663	A307X	AN07
	43	52	9	35	2307K+H2307X	17	58	40	5	0.843	A2307X	AN07
35	31	58	10	40	1208K+H208X	17	65	44	5	0.597	A208X	AN08
	36	58	10	40	2208K+H308X	17	65	44	5	0.696	A308X	AN08
	36	58	10	40	1308K+H308X	17	65	44	5	0.906	A308X	AN08
	46	58	10	40	2308K+H2308X	17	65	45	5	1.14	A2308X	AN08
40	33	65	11	45	1209K+H209X	17	72	49	5	0.701	A209X	AN09
	39	65	11	45	2209K+H309X	17	72	49	8	0.798	A309X	AN09
	39	65	11	45	1309K+H309X	17	72	49	5	1.21	A309X	AN09
	50	65	11	45	2309K+H2309X	17	72	50	5	1.51	A2309X	AN09
45	35	70	12	50	1210K+H210X	19	76	53	5	0.804	A210X	AN10
	42	70	12	50	2210K+H310X	19	76	54	10	0.896	A310X	AN10

Boundary dimensions (mm)				Brg. bore d (mm)	Designations Bearing + adapter ass'y	Mounting dimensions (mm)				Mass Brg.+adapter ass'y (kg)	(Refer.)	
d_1	B_1	d_2	B_2			A min.	K min.	d_e min.	b min.		Adapter sleeve No.	Locknut No.
45	42	70	12	50	1310K+H310X	19	76	54	5	1.51	A310X	AN10
	55	70	12	50	2310K+H2310X	19	76	56	5	1.98	A2310X	AN10
50	37	75	12	55	1211K+H211X	19	85	60	6	1.02	A211X	AN11
	45	75	12	55	2211K+H311X	19	85	60	11	1.16	A311X	AN11
	45	75	12	55	1311K+H311X	19	85	60	6	1.93	A311X	AN11
	59	75	12	55	2311K+H2311X	19	85	61	6	2.50	A2311X	AN11
55	38	80	13	60	1212K+H212X	20	90	61	5	1.25	A212X	AN12
	47	80	13	60	2212K+H312X	20	90	65	9	1.49	A312X	AN12
	47	80	13	60	1312K+H312X	20	90	65	5	2.35	A312X	AN12
	62	80	13	60	2312K+H2312X	20	90	66	5	3.04	A2312X	AN12
60	40	85	14	65	1213K+H213X	21	96	70	5	1.56	A213X	AN13
	50	85	14	65	2213K+H313X	21	96	70	8	1.92	A313X	AN13
	50	85	14	65	1313K+H313X	21	96	70	5	2.90	A313X	AN13
	65	85	14	65	2313K+H2313X	21	96	72	5	3.74	A2313X	AN13
65	43	98	15	75	1215K+H215X	23	110	80	5	2.09	A215X	AN15
	55	98	15	75	2215K+H315X	23	110	80	12	2.47	A315X	AN15
	55	98	15	75	1315K+H315X	23	110	80	5	4.40	A315X	AN15
	73	98	15	75	2315K+H2315X	23	110	82	5	6.12	A2315X	AN15
70	46	105	17	80	1216K+H216X	25	120	85	5	2.57	A216X	AN16
	59	105	17	80	2216K+H316X	25	120	86	12	3.06	A316X	AN16
	59	105	17	80	1316K+H316X	25	120	86	5	5.21	A316X	AN16
	78	105	17	80	2316K+H2316X	25	120	87	5	7.30	A2316X	AN16
75	50	110	18	85	1217K+H217X	27	128	90	6	3.11	A217X	AN17
	63	110	18	85	2217K+H317X	27	128	91	12	3.70	A317X	AN17
	63	110	18	85	1317K+H317X	27	128	91	6	6.15	A317X	AN17
	82	110	18	85	2317K+H2317X	27	128	94	6	8.41	A2317X	AN17

Adapter assemblies for self-aligning ball bearings

d_1 80 ~ 100 mm



Boundary dimensions (mm)				Brg. bore d (mm)	Designations Bearing + adapter assy	Mounting dimensions (mm)				Mass Brg.+adapter assy (kg)	(Refer.)	
d_1	B_1	d_2	B_2			A min.	K min.	d_e min.	b min.		Adapter sleeve No.	Locknut No.
80	52	120	18	90	1218K+ H218X	28	139	95	6	3.75	A218X	AN18
	65	120	18	90	2218K+ H318X	28	139	96	10	4.78	A318X	AN18
	65	120	18	90	1318K+ H318X	28	139	96	6	7.16	A318X	AN18
	86	120	18	90	2318K+ H2318X	28	139	99	6	9.95	A2318X	AN18
85	55	125	19	95	1219K+ H219X	29	145	101	7	4.47	A219X	AN19
	68	125	19	95	2219K+ H319X	29	145	102	9	5.62	A319X	AN19
	68	125	19	95	1319K+ H319X	29	145	102	7	8.21	A319X	AN19
	90	125	19	95	2319K+ H2319X	29	145	105	7	11.6	A2319X	AN19
90	58	130	20	100	1220K+ H220X	30	150	106	7	5.23	A220X	AN20
	71	130	20	100	2220K+ H320X	30	150	107	8	6.67	A320X	AN20
	71	130	20	100	1320K+ H320X	30	150	107	7	9.99	A320X	AN20
	97	130	20	100	2320K+ H2320X	30	150	110	7	14.4	A2320X	AN20
100	63	145	21	110	1222K+ H222X	32	170	116	7	7.10	A222X	AN22
	77	145	21	110	2222K+ H322X	32	170	117	6	9.23	A322X	AN22
	77	145	21	110	1322K+ H322X	32	170	117	9	14.0	A322X	AN22
	105	145	21	110	2322K+ H2322X	32	170	121	7	19.8	A2322X	AN22