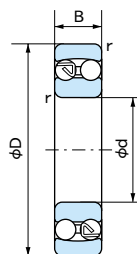
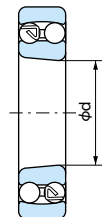


Self-aligning Ball Bearings

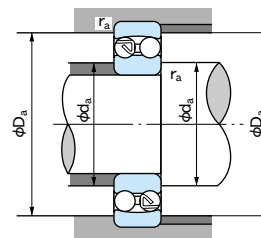
Bore Diameter : 10~60mm



Cylindrical bore



Tapered bore (Taper: 1/12)



• Dynamic equivalent radial load

$$Pr = XFr + YFa$$

$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	Y ₁	0.65	Y ₂

• Static equivalent radial load

$$Por = Fr + 0.68Y_2Fa$$

Values of Y₁, Y₂ and e from table

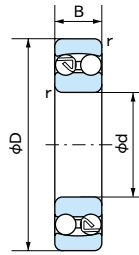
1N=0.102kgf

Boundary dimensions (mm)					Bearing No.		Basic dynamic load rating	Basic static load rating	Limiting speed (rpm)		Axial load factor			Constant	Abutment and fillet dimensions (mm)			Mass (kg)	Bearing No.
d	D	B	B ₁	r (min)	Cylindrical bore	Tapered bore	Cr (N)	Cor (N)	Grease lubrication	Oil lubrication	Y ₁	Y ₂	Y ₀	e	d _a (min)	D _a (min)	r _a (max)		
10	30	9	—	0.6	1200	—	5500	1200	23000	28000	1.92	2.97	2.01	0.33	14	26	0.6	0.034	1200
	30	14	—	0.6	2200	—	7400	1600	23000	28000	1.07	1.65	1.12	0.59	14	26	0.6	0.047	2200
12	32	10	—	0.6	1201	—	5600	1250	21000	26000	1.89	2.93	1.98	0.33	16	28	0.6	0.040	1201
	32	14	—	0.6	2201	—	7650	1750	21000	26000	1.18	1.83	1.24	0.53	16	28	0.6	0.053	2201
	37	12	—	1	1301	—	9400	2150	19000	23000	1.77	2.74	1.86	0.36	17	32	1.0	0.067	1301
	37	17	—	1	2301	—	9700	2300	17000	21000	1.17	1.81	1.23	0.54	17	32	1.0	0.095	2301
15	35	11	—	0.6	1202	—	7450	1750	18000	22000	1.90	2.95	2.00	0.33	19	31	0.6	0.049	1202
	35	14	—	0.6	2202	—	7700	1850	18000	22000	1.27	1.97	1.33	0.50	19	31	0.6	0.060	2202
	42	13	—	1	1302	—	9550	2300	16000	20000	1.86	2.88	1.95	0.34	20	37	1.0	0.094	1302
	42	17	—	1	2302	—	12100	2900	14000	18000	1.27	1.96	1.33	0.50	20	37	1.0	0.114	2302
17	40	12	—	0.6	1203	—	7900	2000	16000	20000	2.03	3.14	2.12	0.31	21	36	0.6	0.073	1203
	40	16	—	0.6	2203	—	9800	2400	16000	20000	1.27	1.96	1.33	0.50	21	36	0.6	0.088	2203
	47	14	—	1	1303	—	12500	3200	14000	17000	1.92	2.97	2.01	0.33	22	42	1.0	0.130	1303
	47	19	—	1	2303	—	14500	3600	12000	16000	1.28	1.98	1.34	0.49	22	42	1.0	0.158	2303
20	47	14	—	1	1204	1204K	9900	2600	13000	17000	2.16	3.35	2.27	0.29	25	42	1.0	0.120	1204
	47	18	—	1	2204	2204K	12600	3300	13000	17000	1.31	2.02	1.37	0.48	25	42	1.0	0.140	2204
	52	15	—	1.1	1304	1304K	12400	3300	12000	15000	2.12	3.28	2.22	0.30	26.5	45.5	1.0	0.163	1304
	52	21	—	1.1	2304	2304K	18000	4700	11000	14000	1.29	2.00	1.35	0.49	26.5	45.5	1.0	0.209	2304
25	52	15	—	1	1205	1205K	12100	3300	12000	14000	2.28	3.52	2.39	0.28	30	47	1.0	0.141	1205
	52	18	—	1	2205	2205K	12600	3300	12000	14000	1.58	2.45	1.66	0.40	30	47	1.0	0.163	2205
	62	17	—	1.1	1305	1305K	18000	5000	10000	13000	2.31	3.57	2.41	0.27	31.5	55.5	1.0	0.257	1305
	62	24	—	1.1	2305	2305K	24400	6600	10000	13000	1.36	2.10	1.42	0.46	31.5	55.5	1.0	0.335	2305
30	62	16	—	1	1206	1206K	15600	4650	10000	12000	2.55	3.94	2.67	0.25	35	47	1.0	0.220	1206
	62	20	—	1	2206	2206K	15600	4650	10000	12000	2.55	3.94	2.67	0.25	35	47	1.0	0.260	2206
	72	19	—	1.1	1306	1306K	21300	6300	9000	11000	2.40	3.72	2.52	0.26	36.5	65.5	1.0	0.387	1306
	72	27	—	1.1	2306	2306K	31400	8750	8000	10000	1.44	2.23	1.51	0.44	36.5	65.5	1.0	0.500	2306
35	72	17	—	1.1	1207	1207K	15800	5100	8600	10000	2.71	4.20	2.84	0.23	41.5	65.5	1.0	0.323	1207
	72	23	—	1.1	2207	2207K	21600	6600	8600	10000	1.71	2.65	1.79	0.37	41.5	65.5	1.0	0.403	2207
	80	21	—	1.5	1307	1307K	25100	7850	7900	9700	2.48	3.84	2.60	0.25	43	72	1.5	0.510	1307
	80	31	—	1.5	2307	2307K	39400	11300	7000	8800	1.39	2.15	1.46	0.45	43	72	1.5	0.675	2307
40	80	18	—	1.1	1208	1208K	19200	6500	7600	9300	2.83	4.38	2.97	0.22	46.5	73.5	1.0	0.417	1208
	80	23	—	1.1	2208	2208K	22400	7400	7600	9300	1.92	2.96	2.01	0.33	46.5	73.5	1.0	0.505	2208
	90	23	—	1.5	1308	1308K	29500	9700	7000	8500	2.57	3.98	2.69	0.25	48	82	1.5	0.715	1308
	90	33	—	1.5	2308	2308K	44900	13500	6200	7800	1.47	2.27	1.54	0.43	48	82	1.5	0.925	2308
45	85	19	—	1.1	1209	1209K	21800	7350	7000	8500	2.94	4.56	3.09	0.21	51.5	78.5	1.0	0.465	1209
	85	23	—	1.1	2209	2209K	23300	8150	7000	8500	2.09	3.23	2.19	0.30	51.5	78.5	1.0	0.545	2209
	100	25	—	1.5	1309	1309K	38100	12700	6200	7600	2.56	3.95	2.68	0.25	53	92	1.5	0.957	1309
	100	36	—	1.5	2309	2309K	54400	16700	5500	6900	1.51	2.33	1.58	0.42	53	92	1.5	1.230	2309
50	90	20	—	1.1	1210	1210K	22700	8100	6500	7900	3.07	4.76	3.22	0.21	56.5	83.5	1.0	0.525	1210
	90	23	—	1.1	2210	2210K	23300	8500	6500	7900	2.33	3.61	2.45	0.27	56.5	83.5	1.0	0.590	2210
	110	27	—	2	1310	1310K	43400	14100	5600	6900	2.70	4.17	2.83	0.23	59	101	2.0	1.210	1310
	110	40	—	2	2310	2310K	64600	20300	5000	6200	1.56	2.41	1.63	0.40	59	101	2.0	1.640	2310
55	100	21	—	1.5	1211	1211K	26800	10000	5800	7100	3.19	4.94	3.34	0.20	66	92	1.5	0.705	1211
	100	25	—	1.5	2211	2211K	26800	10000	5800	7100	3.19	4.94	3.34	0.20	66	92	1.5	0.810	2211
	120	29	—	2	1311	1311K	51300	17900	5100	6200	2.70	4.18	2.83	0.23	64	111	2.0	1.580	1311
	120	43	—	2	2311	2311K	75300	24000	4500	5700	1.53	2.37	1.60	0.41	64	111	2.0	2.100	2311
60	110	22	—	1.5	1212	1212K	30200	11500	5300	6400	3.37	5.22	3.53	0.19	68	102	1.5	0.900	1212
	110	28	—	1.5	2212	2212K	34100	12600	5300	6400	2.26	3.49	2.36	0.28	68	102	1.5	1.090	2212
	130	31	—	2.1	1312	1312K	57200	20800	4700	5700	2.91	4.50	3.05	0.22	71	119	2.0	1.960	1312
	130	46	—	2.1	2312	2312K	87200	28300	4100	5200	1.62	2.51	1.70	0.39	71	119	2.0	2.600	2312

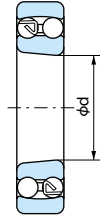
Note 1. Suffix K means with a tapered bore (1/12)
2. Dimension B₁ are a width of a ball assembly extends beyond a ring width envelope.

Self-aligning Ball Bearings

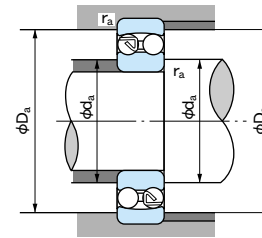
Bore Diameter : 65~110mm



Cylindrical bore



Tapered bore (Taper: 1/12)



• Dynamic equivalent radial load
 $Pr = XFr + YFa$

$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	Y ₁	0.65	Y ₂

• Static equivalent radial load
 $Por = Fr + 0.68Y_2Fa$
 Values of Y₁, Y₂ and e from table

1N=0.102kgf

Boundary dimensions (mm)					Bearing No.		Basic dynamic load rating	Basic static load rating	Limiting speed (rpm)		Axial load factor			Constant	Abutment and fillet dimensions (mm)			Mass (kg)	Bearing No.
d	D	B	B ₁	r (min)	Cylindrical bore	Tapered bore	Cr (N)	Cor (N)	Grease lubrication	Oil lubrication	Y ₁	Y ₂	Y ₀	e	d _a (min)	D _a (min)	r _a (max)		
65	120	23	—	1.5	1213	1213K	31000	12500	4800	5900	3.7	5.7	3.8	0.17	74	111	1.5	1.15	1213
	120	31	—	1.5	2213	2213K	43500	16400	4800	5900	2.3	3.5	2.4	0.28	74	111	1.5	1.46	2213
	140	33	—	2.1	1313	1313K	62000	22800	4300	5300	2.8	4.3	2.9	0.23	77	128	2	2.45	1313
	140	48	—	2.1	2313	2313K	96000	32500	3800	4800	1.5	2.4	1.7	0.38	77	128	2	3.23	2313
70	125	24	—	1.5	1214	—	34600	13800	4500	5600	3.5	5.3	3.6	0.18	79	116	1.5	1.26	1214
	125	31	—	1.5	2214	—	44000	17100	4500	5600	2.4	3.7	2.5	0.27	79	116	1.5	1.52	2214
	150	35	—	2.1	1314	—	74500	27700	4000	4900	2.8	4.4	3.0	0.22	82	138	2	2.99	1314
	150	51	—	2.1	2314	—	107000	37500	3500	4400	1.5	2.4	1.6	0.41	82	138	2	4.25	2314
75	130	25	—	1.5	1215	1215K	39000	15700	4300	5300	3.5	5.5	3.7	0.18	84	121	1.5	1.36	1215
	130	31	—	1.5	2215	2215K	44000	17800	4300	5300	2.5	3.9	2.6	0.25	84	121	1.5	1.62	2215
	160	37	—	2.1	1315	1315K	79000	30000	3700	4500	2.8	4.3	2.9	0.23	87	148	2	3.56	1315
	160	55	—	2.1	2315	2315K	121000	43000	3300	4100	1.5	2.4	1.6	0.41	87	148	2	5.17	2315
80	140	26	—	2	1216	1216K	39500	17000	4000	4900	3.9	6.0	4.1	0.16	90	130	2	1.67	1216
	140	33	—	2	2216	2216K	49000	19900	4000	4900	2.5	3.9	2.6	0.25	90	130	2	2.04	2216
	170	39	—	2.1	1316	1316K	88500	33000	3500	4200	2.9	4.6	3.1	0.21	92	158	2	4.18	1316
	170	58	—	2.1	2316	2316K	126000	45500	3100	3900	1.6	2.4	1.6	0.40	92	158	2	6.12	2316
85	150	28	—	2	1217	1217K	49000	20700	3700	4500	3.6	5.6	3.8	0.17	95	140	2	2.07	1217
	150	36	—	2	2217	2217K	58000	23500	3700	4500	2.5	3.9	2.6	0.25	95	140	2	2.52	2217
	180	41	—	3	1317	1317K	97500	38000	3200	4000	2.9	4.5	3.1	0.22	99	166	2.5	4.98	1317
	180	60	—	3	2317	2317K	140000	51000	2900	3600	1.7	2.7	1.8	0.37	99	166	2.5	7.17	2317
90	160	30	—	2	1218	1218K	57000	23400	3500	4200	3.8	5.8	3.9	0.17	100	150	2	2.52	1218
	160	40	—	2	2218	2218K	70000	28600	3500	4200	2.4	3.7	2.4	0.27	100	150	2	3.43	2218
	190	43	45	3	1318	1318K	116000	44500	3100	3700	2.8	4.3	2.9	0.23	104	176	2.5	5.80	1318
	190	64	—	3	2318	2318K	152000	57500	2700	3400	1.7	2.6	1.8	0.37	104	176	2.5	8.48	2318
95	170	32	—	2.1	1219	1219K	64000	27100	3200	4000	3.7	5.7	3.8	0.17	107	158	2	3.10	1219
	170	43	—	2.1	2219	2219K	83500	34500	3200	4000	2.3	3.6	2.4	0.27	107	158	2	4.18	2219
	200	45	48	3	1319	1319K	132000	50500	2900	3500	2.8	4.3	2.9	0.23	109	186	2.5	6.69	1319
	200	67	—	3	2319	2319K	164000	64000	2600	3200	1.7	2.7	1.8	0.37	109	186	2.5	9.80	2319
100	180	34	—	2.1	1220	1220K	69000	29700	3100	3700	3.6	5.6	3.8	0.17	112	68	2	3.70	1220
	180	46	—	2.1	2220	2220K	94000	38500	3100	3700	2.3	3.6	2.4	0.27	112	168	2	4.98	2220
	215	47	52	3	1320	1320K	143000	57000	2700	3300	2.7	4.1	2.8	0.24	114	201	2.5	8.30	1320
	215	73	—	3	2320	2320K	192000	79000	2400	3000	1.7	2.6	1.8	0.37	114	201	2.5	12.5	2320
105	190	36	—	2.1	1221	—	74500	32500	2900	3500	3.5	5.5	3.7	0.18	117	178	2	4.37	1221
	190	50	—	2.1	2221	—	109000	44500	2900	3500	2.3	3.5	2.4	0.28	117	178	2	6.06	2221
	225	49	54	3	1321	—	156000	64500	2500	3100	2.7	4.2	2.9	0.23	119	211	2.5	10.0	1321
	225	77	—	3	2321	—	205000	86500	2300	2800	1.7	2.6	1.7	0.38	119	211	2.5	14.3	2321
110	200	38	—	2.1	1222	1222K	88500	38500	2700	3300	3.4	5.3	3.6	0.18	122	188	2	5.15	1222
	200	53	—	2.1	2222	2222K	125000	52000	2700	3300	2.2	3.4	2.3	0.29	122	188	2	7.20	2222
	240	50	55	3	1322	1322K	165000	72000	2400	2900	2.8	4.3	2.9	0.23	124	226	2.5	11.8	1322
	240	80	—	3	2322	2322K	217000	94500	2100	2600	1.7	2.7	1.8	0.37	124	226	2.5	17.2	2322

Note 1. Suffix K means with a tapered bore (1/12)
 2. Dimension B₁ are the width of the ball assembly extends beyond the ring width envelope.