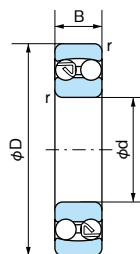
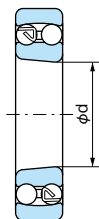


Self-aligning Ball Bearings

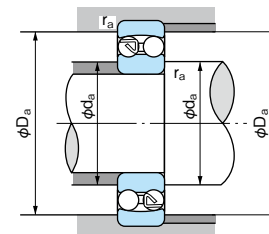
Bore Diameter: 10~40mm



Cylindrical bore



Tapered bore (Taper: 1/12)



Dynamic equivalent radial load

$$P_r = XFr + YFa$$

$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	Y_1	0.65	Y_2

Static equivalent radial load

$$P_{0r} = Fr + Y_0Fa$$

Values of e, Y_1 , Y_2 and Y_0 from table.

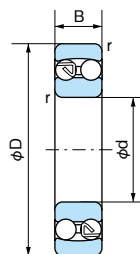
1N=0.102kgf

d	Boundary dimensions (mm)				Bearing No.		Basic dynamic load rating C_r (N)	Basic static load rating C_{0r} (N)	Limiting speed (min^{-1})		Axial load factor			Constant e	Abutment and fillet dimensions (mm)			Mass (kg) (Reference) Cylindrical bore	Bearing No.
	D	B	B_1	r (min)	Cylindrical bore	Tapered bore			Grease lubrication	Oil lubrication	Y_1	Y_2	Y_0		d_a (min)	D_a (max)	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	29000	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	18000	22000	1.77	2.74	1.86	0.36	17	32	1.0	0.067	1301
	37	17	—	1	2301	—	9700	2300	16000	22000	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	20000	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	13000	18000	1.28	1.98	1.34	0.49	22	42	1.0	0.158	2303
20	47	14	—	1	1204	1204K	9900	2600	14000	17000	2.16	3.35	2.27	0.29	25	42	1.0	0.120	1204
	47	18	—	1	2204	2204K	12600	3300	14000	17000	1.31	2.02	1.37	0.40	25	42	1.0	0.140	2204
	52	15	—	1.1	1304	1304K	12400	3300	13000	15000	2.12	3.28	2.22	0.30	26.5	42.5	1.0	0.163	1304
	52	21	—	1.1	2304	2304K	18000	4700	11000	15000	1.29	2.00	1.35	0.49	26.5	42.5	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	15000	1.58	2.45	1.66	0.40	30	47	1.0	0.163	2205
	62	17	—	1.1	1305	1305K	18000	5000	9900	12000	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	9400	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	9900	12000	2.55	3.94	2.67	0.25	35	57	1.0	0.220	1206
	62	20	—	1	2206	2206K	15500	4600	10000	12000	1.79	2.77	1.87	0.35	35	57	1.0	0.260	2206
	72	19	—	1.1	1306	1306K	21300	6300	8700	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	11000	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	8500	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	8500	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	7600	9300	2.48	3.84	2.60	0.25	43	72	1.5	0.510	1307
	80	31	—	1.5	2307	2307K	39400	11300	7100	9800	1.39	2.15	1.46	0.45	43	72	1.5	0.675	2307
40	80	18	—	1.1	1208	1208K	19200	6500	7500	9200	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	6900	8400	2.57	3.98	2.69	0.25	48	82	1.5	0.715	1308
	90	33	—	1.5	2308	2308K	44900	13500	6200	8600	1.47	2.27	1.54	0.43	48	82	1.5	0.925	2308

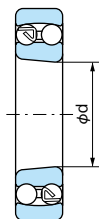
Remarks: 1. Suffix K means with a tapered bore (1/12)
 2. Dimension B1 is the width of the ball assembly extends beyond the ring width dimension.

Self-aligning Ball Bearings

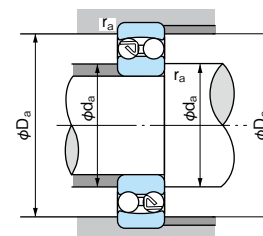
Bore Diameter: 45~80mm



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

$$P_{or} = Fr + Y_0 Fa$$

Values of e, Y_1 , Y_2 and Y_0 from table.

1N=0.102kgf

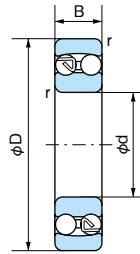
d	Boundary dimensions (mm)				Bearing No.		Basic dynamic load rating Cr (N)	Basic static load rating Cor (N)		Limiting speed (min ⁻¹)		Axial load factor			Constant e	Abutment and fillet dimensions (mm)			Mass (kg) (Reference) Cylindrical bore	Bearing No.
	D	B	B ₁	r (min)	Cylindrical bore	Tapered bore				Grease lubrication	Oil lubrication	Y ₁	Y ₂	Y ₀		d _a (min)	D _a (max)	r _a (max)		
	45	85	19	—	1.1	1209				1209K	21800	7350	7000	8500		2.94	4.56	3.09		
	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	6100	7500	2.56	3.95	2.68	0.25	53	92	1.5	0.957	1309	
	100	36	—	1.5	2309	2309K	54400	16700	5600	7700	1.51	2.33	1.58	0.42	53	92	1.5	1.23	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	6800	2.70	4.17	2.83	0.23	59	101	2.0	1.21	1310	
	110	40	—	2	2310	2310K	64600	20300	5100	7000	1.56	2.41	1.63	0.40	59	101	2.0	1.64	2310	
55	100	21	—	1.5	1211	1211K	26800	10000	5800	7100	3.19	4.94	3.34	0.20	63	92	1.5	0.705	1211	
	100	25	—	1.5	2211	2211K	26600	10000	5800	7100	2.35	3.64	2.47	0.27	63	92	1.5	0.810	2211	
	120	29	—	2	1311	1311K	51300	17900	5000	6200	2.70	4.18	2.83	0.23	64	111	2.0	1.58	1311	
	120	43	—	2	2311	2311K	75300	24000	4600	6400	1.53	2.37	1.60	0.41	64	111	2.0	2.10	2311	
60	110	22	—	1.5	1212	1212K	30200	11500	5200	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	6500	2.26	3.49	2.36	0.28	68	102	1.5	1.09	2212	
	130	31	—	2.1	1312	1312K	57200	20800	4500	5500	2.91	4.50	3.05	0.22	71	119	2.0	1.96	1312	
	130	46	—	2.1	2312	2312K	87200	28300	4200	5800	1.62	2.51	1.70	0.39	71	119	2.0	2.60	2312	
65	120	23	—	1.5	1213	1213K	31000	12500	4800	5800	3.67	5.68	3.84	0.17	73	112	1.5	1.15	1213	
	120	31	—	1.5	2213	2213K	43500	16400	4900	5900	2.24	3.47	2.35	0.28	73	112	1.5	1.46	2213	
	140	33	—	2.1	1313	1313K	61700	22900	4300	5200	2.73	4.23	2.86	0.23	76	129	2.0	2.45	1313	
	140	48	—	2.1	2313	2313K	95800	32500	3800	5300	1.66	2.58	1.74	0.38	76	129	2.0	3.23	2313	
70	125	24	—	1.5	1214	—	34600	13800	4600	5700	3.48	5.38	3.64	0.18	78	117	1.5	1.26	1214	
	125	31	—	1.5	2214	—	43900	17100	4600	5600	2.42	3.74	2.53	0.26	78	117	1.5	1.52	2214	
	150	35	—	2.1	1314	—	74000	27700	4000	4900	2.84	4.40	2.98	0.22	81	139	2.0	2.99	1314	
	150	51	—	2.1	2314	—	89600	31700	3600	4900	1.82	2.82	1.91	0.35	81	139	2.0	4.23	2314	
75	130	25	—	1.5	1215	1215K	38800	15700	4300	5300	3.60	5.58	3.77	0.17	83	122	1.5	1.36	1215	
	130	31	—	1.5	2215	2215K	44200	17800	4300	5300	2.49	3.85	2.61	0.25	83	122	1.5	1.62	2215	
	160	37	—	2.1	1315	1315K	78900	29900	4000	4900	2.80	4.33	2.93	0.23	86	149	2.0	3.56	1315	
	160	55	—	2.1	2315	2315K	103000	36800	3400	4600	1.86	2.88	1.95	0.34	86	149	2.0	5.13	2315	
80	140	26	—	2	1216	1216K	39800	17000	4000	4900	3.90	6.03	4.08	0.16	89	131	2.0	1.67	1216	
	140	33	—	2	2216	2216K	49000	19900	4700	5000	2.42	3.75	2.54	0.26	89	131	2.0	2.01	2216	
	170	39	—	2.1	1316	1316K	88100	33100	3500	4300	2.90	4.49	3.04	0.22	91	159	2.0	4.18	1316	
	170	58	—	2.1	2316	2316K	129000	45700	3100	4300	1.87	2.90	1.96	0.34	91	159	2.0	6.10	2316	

Remarks: 1. Suffix K means with a tapered bore (1/12)

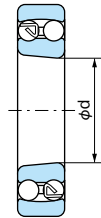
2. Dimension B1 is the width of the ball assembly extends beyond the ring width dimension.

Self-aligning Ball Bearings

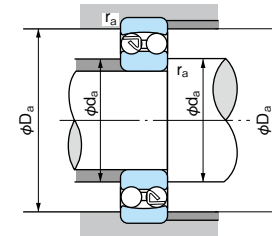
Bore Diameter: 85~110mm



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

$$P_{0r} = Fr + Y_0 Fa$$

Values of e, Y₁, Y₂ and Y₀ from table.

1N=0.102kgf

d	Boundary dimensions (mm)				Bearing No.		Basic dynamic load rating Cr (N)	Basic static load rating Cor (N)		Limiting speed (min ⁻¹)		Axial load factor			Constant e	Abutment and fillet dimensions (mm)			Mass (kg) (Reference) Cylindrical bore	Bearing No.
	D	B	B ₁	r (min)	Cylindrical bore	Tapered bore				Grease lubrication	Oil lubrication	Y ₁	Y ₂	Y ₀		d _a (min)	D _a (max)	r _a (max)		
	85	150	28	—	2	1217				1217K	49200	20800	3800	4600		3.61	5.59	3.78		
	150	36	—	2	2217	2217K	58300	23600	3800	4600	2.49	3.85	2.61	0.25	94	141	2	2.52	2217	
	180	41	—	3	1317	1317K	97300	37800	3300	4000	2.93	4.53	3.07	0.22	98	167	2.5	4.98	1317	
	180	60	—	3	1317	1317K	141000	51500	3000	4100	1.82	2.82	1.91	0.35	98	167	2.5	7.05	2317	
90	160	30	—	2	1218	1218K	56800	23400	3500	4300	3.69	5.70	3.86	0.17	99	151	2	2.52	1218	
	160	40	—	2	2218	2218K	67700	27200	3500	4300	2.39	3.71	2.51	0.26	99	151	2	3.40	2218	
	190	43	—	3	1318	1318K	116000	44400	3100	3800	2.81	4.35	2.94	0.22	103	177	2.5	5.80	1318	
	190	64	—	3	2318	2318K	153000	57900	2800	3900	1.84	2.85	1.93	0.34	103	177	2.5	8.44	2318	
95	170	32	—	2.1	1219	1219K	57000	24300	3300	4000	3.63	5.62	3.80	0.17	106	159	2	3.10	1219	
	170	43	—	2.1	2219	2219K	82700	34300	3300	4000	2.43	3.76	2.55	0.26	106	159	2	4.10	2219	
	200	45	48.2	3	1319	1319K	132000	50800	2900	3600	2.73	4.23	2.86	0.23	108	187	2.5	6.69	1319	
	200	67	—	3	2319	2319K	166000	64800	2700	3700	1.82	2.82	1.91	0.35	108	187	2.5	9.79	2319	
100	180	34	—	2.1	1220	1220K	69000	29700	3100	3800	3.62	5.60	3.79	0.17	111	169	2	3.70	1220	
	180	46	—	2.1	2220	2220K	80900	34000	3100	3800	2.57	3.98	2.70	0.24	111	169	2	4.98	2220	
	215	47	52	3	1320	1320K	143000	57300	2800	3400	2.66	4.11	2.78	0.24	113	202	2.5	8.30	1320	
	215	73	—	3	2320	2320K	183000	73400	2400	3400	1.84	2.85	1.93	0.34	113	202	2.5	12.4	2320	
105	190	36	—	2.1	1221	—	77000	34000	2900	3600	3.56	5.51	3.73	0.18	116	179	2	4.37	1221	
	190	50	—	2.1	2221	—	94900	40100	3000	3600	2.43	3.76	2.55	0.26	116	179	2	6.07	2221	
	225	49	54	3	1321	—	149000	60200	2600	3200	2.73	4.22	2.86	0.23	118	212	2.5	10.0	1321	
	225	77	—	3	2321	—	187000	78000	2300	3200	1.75	2.71	1.83	0.36	118	212	2.5	14.3	2321	
110	200	38	—	2.1	1222	1222K	80200	35200	2800	3400	3.64	5.63	3.81	0.17	121	189	2	5.15	1222	
	200	53	—	2.1	2222	2222K	120000	48900	2800	3400	2.41	3.73	2.53	0.26	121	189	2	7.10	2222	
	240	50	55.2	3	1322	1322K	150000	63200	2400	3000	2.82	4.37	2.96	0.22	123	227	2.5	11.8	1322	
	240	80	—	3	2322	2322K	200000	85700	2200	3000	1.82	2.82	1.91	0.35	123	227	2.5	17.3	2322	

Remarks: 1. Suffix K means with a tapered bore (1/12)
 2. Dimension B1 is the width of the ball assembly extends beyond the ring width dimension.