

Thrust Ball Bearings

Tolerance Page 52



● Design

Thrust Ball Bearings are made as single-direction and double-direction bearings. Single-direction Thrust Ball Bearings can sustain an axial load in only one direction, whereas Double-direction Thrust Ball Bearings can sustain bi-directional thrust load.

Both types of Thrust Ball Bearings cannot sustain a radial load.

Both Thrust Ball Bearings are available with aligning housing washers for mating with a housing having an aligning surface radius. Aligning seat washers with an aligning surface radius are also available for ease of design and mounting against a flat housing shoulder.

The Bearings with a polyamide cage are indicated suffix G at bearing number on package surface.

● Attention

- (1) Thrust Ball Bearings with flat housing washers do not permit any angular misalignment between shaft and housing, nor can they accommodate any error of angle between the support surfaces in the housing and on the shaft.
- (2) They are not suitable for high speed applications. Limiting speed are indicated in the dimension table.
- (3) The outside diameters of shaft washer and housing washer or center washer are the same, so clearance must be provided for the outside diameter of shaft washer or center washer by use of a step in the housing bore (See Fig.1). The outside diameter of the shaft washer or center washer of the bearings that are indicated in Table 2 are smaller than that of the housing washer, so no clearance step is required in the housing for the shaft (center) washer. See Fig.2.
- (4) Bearings with polyamide cage should be used less than 120°C.

Table 1. Thrust Ball Bearings Series

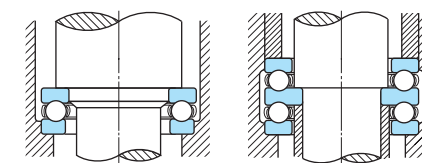
Type	Flat back-face type	Spherical back-face type	With aligning seat
Single-direction	511	—	—
	512	532	532U
	513	533	533U
	514	534	534U
	29	—	—
	39	—	—
	O ⁽¹⁾	—	—
	TAM ⁽²⁾	—	—
Double-direction	TG ⁽²⁾	—	—
	522	542	542U
	523	543	543U
	524	544	544U

Notes: ⁽¹⁾ Series O is inch-dimensioned.

⁽²⁾ Series TAM, TG is extra-small and miniature.

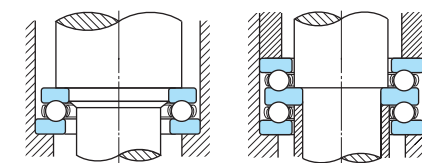
Table 2.

Bearing series	Bore diameter No.
511	28~
512, 522, 532, 542	26~
513, 523, 533, 543	22~
514, 524, 534, 544	17~



Single-direction Double-direction

Fig 1



Single-direction Double-direction

Fig 2

● Cage

Standard fitting cages are shown in Table 3. If other cages are necessary, please contact NACHI.

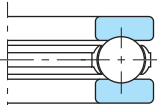


Fig 3. Polyamide

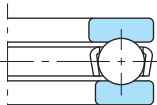


Fig 4. Pressed Steel

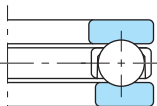


Fig 5. Machined

● Minimum axial load

When Thrust Ball Bearings are run at high speeds, the contact angle between the ball and the raceway in the radial plane is affected by the centrifugal force of the balls and the sliding movement between the balls and raceways are occurred. The sliding movement may cause damage as smearing. To prevent this damage, Thrust Ball Bearings must be subjected to a given load more than a minimum load from function (1) or (2).

Single-direction Thrust Ball Bearings can sustain only one direction axial load, so if bi-direction axial loads are present, Double-direction Thrust Ball Bearings must be used and preloaded by

a load more than the minimum load.

In case of a vertical axis, shaft weight often exceeds the minimum load. In this case, the acting load may be decreased by the external axial load acting in the opposite direction.

$$F_{a\min} = K \cdot n^2 \dots\dots\dots (1)$$

$$F_{a\min} = \frac{C_{0a}}{1000} \dots\dots\dots (2)$$

Use the larger result of (1) or (2)

$F_{a\min}$: Minimum axial load (N)

K: inimum axial factor see Table 4

n: Rotating speed (min⁻¹)

C_{0a} : Basic static load rating (N)

Table 3. Cage of Thrust Ball Bearings

Series	Diameter Number		
	Polyamide	Pressed Steel	Machined
511	00~07	08~52	56~72
512	01~07	00, 08~28	30~72
513	—	05~20	22~40
514	—	05~14	15~36
522	02~07	00, 08~28	30~44
523	—	05~20	22~40
524	—	05~14	15~36
532	01~07	00, 08~28	30~72
533	—	05~20	22~40
534	—	05~14	15~36
542	02~07	08~28	30~44
543	—	05~20	22~24
544	—	05~14	15~20
29	—	00~22	23~28
39	—	05~24	—
O	—	3~30	32~48
TAM	—	3~8(!)	—
TG	—	5~8(!)	—

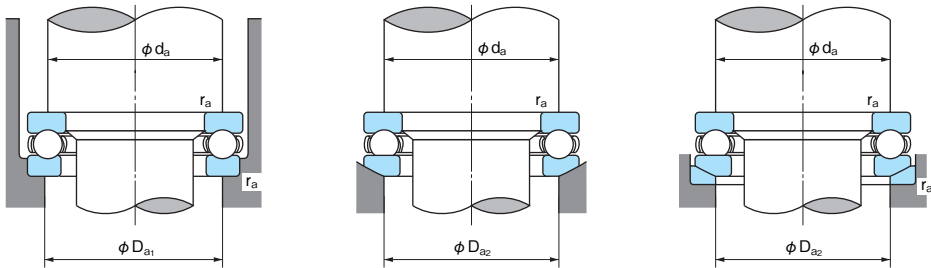
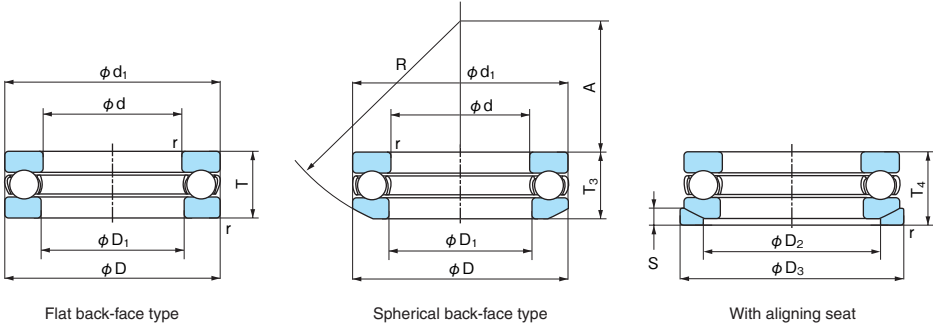
Remark: Basic load rating of dimension table are indicated in using cage of table 3.
Note: (!) Indicate bore diameter not bore number.

Table 4. Minimum axial factor K (× 10⁻⁶)

Series		Series		Series					
Bore No.	511	512, 522	513, 523	514, 524	Bore No.	29	39	Bore No.	0
00	1.03	1.55	—	—	00	1.55	—	3	1.34
01	1.26	1.92	—	—	01	1.92	—	4	3.62
02	1.56	3.36	—	—	02	2.64	—	5	4.65
03	1.84	4.09	—	—	03	3.30	—	6	6.40
04	3.42	7.33	—	—	04	3.82	—	7	7.76
05	7.19	13.1	20.4	43.8	04 1/2	6.41	—	8	9.24
06	9.36	17.2	33.1	81.4	05	7.51	14.2	9	11.6
07	11.2	32.8	58.3	128	06	9.72	28.9	10	16.5
08	20.4	49.7	97.2	221	07	20.1	52.3	11	19.0
09	24.6	57.9	138	316	08	25.1	81.0	12	23.0
10	29.3	66.8	211	440	09	31.6	140	13	21.0
11	44.6	133	326	656	10	46.1	209	14	31.3
12	64.7	160	375	956	11	54.4	284	15	42.1
13	72.0	179	428	1240	12	60.7	350	16	46.9
14	82.8	200	596	1580	13	86.0	426	17	75.0
15	94.3	222	808	1800	14	99.5	556	18	82.8
16	103	245	907	2230	15	114	704	19	110
17	116	359	1240	2740	16	152	927	20	121
18	187	528	1390	4320	17	172	1210	21	132
20	363	850	1850	4790	18	187	1580	22	176
22	423	1010	2740	8220	19	286	2010	23	204
24	488	1130	4130	9980	20	321	2090	24	223
26	648	1940	5140	16100	21	346	2390	26	350
28	782	2150	6330	16900	22	361	3220	28	395
30	886	2490	7140	25800	23	350	3940	30	431
32	997	2880	9960	30000	24	538	4500	32	580
34	1420	3940	11100	40100	25	498	—	36	1100
36	1540	4330	15800	46330	26	—	—	40	1730
38	2340	6290	23100	—	27	—	—	44	2840
40	2520	6880	29700	—	28	794	—	48	3690
44	3000	8130	—	—					
48	4900	15900	—	—					
52	5580	18400	—	—					
56	9800	20400	—	—					
60	14600	38000	—	—					
64	16400	41800	—	—					
68	18300	45700	—	—					
72	20300	75600	—	—					

Single-direction Thrust Ball Bearings

Bore Diameter: 10~50mm

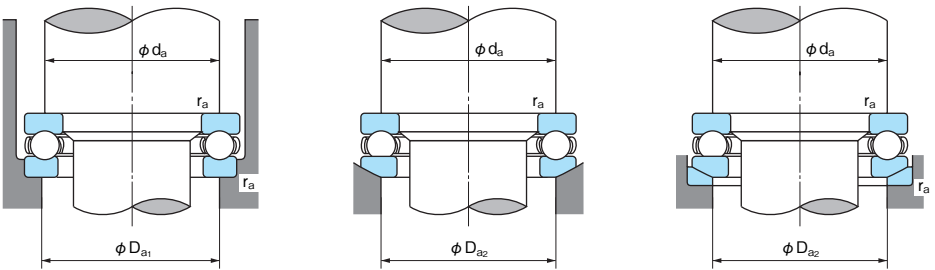
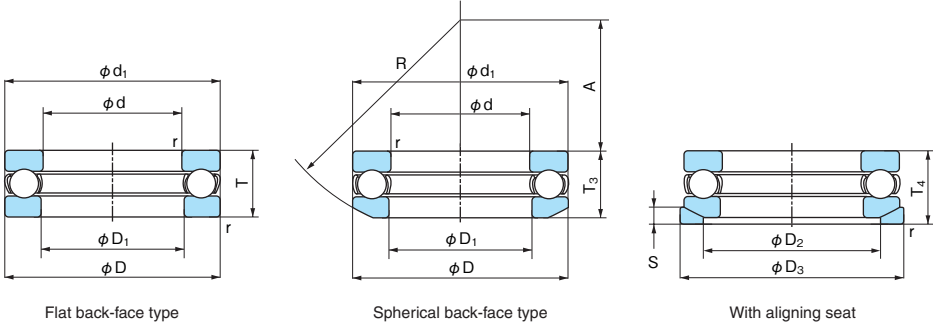


1N=0.102kgf

Boundary dimensions (mm)						Bearing No.			Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Limiting speed (min ⁻¹)			Dimensions (mm)						Abutment and fillet dimensions (mm)				Mass (kg) Reference			Bearing No.	
d	D	T	T ₃	T ₄	r (min)	Flat back-face type	Spherical back-face type	With aligning seal			Grease lubrication	Oil lubrication		D ₁ (min)	d ₁ (max)	D ₂	D ₃	S	R	A	da (min)	Da ₁ (max)	Da ₂ (max)	ra (max)	Flat back-face type	Spherical back-face type		With aligning seal
10	24	9	—	—	0.3	51100	—	—	10000	14000	6800	10000		11	24	—	—	—	—	—	18	16	—	0.3	0.020	—	—	51100
	26	11	11.6	13	0.6	51200	53200	53200U	12700	17100	5900	8800		12	26	18	28	3.5	22	8.5	20	16	18	0.6	0.030	0.029	0.036	51200
12	26	9	—	—	0.3	51101	—	—	10300	15400	6500	9800		13	26	—	—	—	—	—	20	18	—	0.3	0.022	—	—	51101
	28	11	11.4	13	0.6	51201	53201	53201U	13200	19000	5600	8500		14	28	20	30	3.5	25	11.5	22	18	20	0.6	0.034	0.033	0.041	51201
15	28	9	—	—	0.3	51102	—	—	10500	16800	6200	9400		16	28	—	—	—	—	—	23	20	—	0.3	0.024	—	—	51102
	32	12	13.3	15	0.6	51202	53202	53202U	16600	24800	5100	7600		17	32	24	35	4	28	12	25	22	24	0.6	0.046	0.048	0.061	51202
17	30	9	—	—	0.3	51103	—	—	10800	18200	6000	9100		18	30	—	—	—	—	—	25	22	—	0.3	0.028	—	—	51103
	35	12	13.2	15	0.6	51203	53203	53203U	17100	27300	4800	7300		19	35	26	38	4	32	16	28	24	26	0.6	0.053	0.055	0.070	51203
20	35	10	—	—	0.3	51104	—	—	14300	24700	5300	8000		21	35	—	—	—	—	—	29	26	—	0.3	0.040	—	—	51104
	40	14	14.7	17	0.6	51204	53204	53204U	22200	37500	4200	6300		22	40	30	42	5	36	18	32	28	30	0.6	0.082	0.080	0.100	51204
25	42	11	—	—	0.6	51105	—	—	19500	37000	4600	6900		26	42	—	—	—	—	—	35	32	—	0.6	0.059	—	—	51105
	47	15	16.7	19	0.6	51205	53205	53205U	27800	50500	3700	5600		27	47	36	50	5.5	40	19	38	34	36	0.6	0.120	0.125	0.160	51205
	52	18	19.8	22	1	51305	53305	53305U	35500	61500	3200	4900		27	52	38	55	6	45	21	41	36	38	1	0.180	0.185	0.225	51305
	60	24	26.4	29	1	51405	53405	53405U	55500	89500	2600	3900		27	60	42	62	8	50	19	46	39	42	1	0.340	0.350	0.420	51405
30	47	11	—	—	0.6	51106	—	—	20400	42000	4300	6500		32	47	—	—	—	—	—	40	37	—	0.6	0.068	—	—	51106
	52	16	17.8	20	0.6	51206	53206	53206U	29300	58000	3400	5200		32	52	42	55	5.5	45	22	43	39	42	0.6	0.150	0.160	0.195	51206
	60	21	22.6	25	1	51306	53306	53306U	42500	78500	2800	4200		32	60	45	62	7	50	22	48	42	45	1	0.270	0.270	0.325	51306
	70	28	30.1	33	1	51406	53406	53406U	72500	126000	2200	3300		32	70	50	75	9	56	20	54	46	50	1	0.530	0.530	0.680	51406
35	52	12	—	—	0.6	51107	—	—	20400	44500	4000	6000		37	52	—	—	—	—	—	45	42	—	0.6	0.085	—	—	51107
	62	18	19.9	22	1	51207	53207	53207U	39000	78000	2900	4400		37	62	48	65	7	50	24	51	46	48	1	0.220	0.220	0.290	51207
	68	24	25.6	28	1	51307	53307	53307U	55500	105000	2400	3700		37	68	52	72	7.5	56	24	55	48	52	1	0.390	0.390	0.475	51307
	80	32	34	37	1.1	51407	53407	53407U	87000	155000	1900	2900		37	80	58	85	10	64	23	62	53	58	1	0.790	0.790	0.950	51407
40	60	13	—	—	0.6	51108	—	—	26900	63000	3500	5300		42	60	—	—	—	—	—	52	48	—	0.6	0.120	—	—	51108
	68	19	20.3	23	1	51208	53208	53208U	47000	98500	2700	4100		42	68	55	72	7	56	28.5	57	51	55	1	0.270	0.270	0.340	51208
	78	26	28.5	31	1	51308	53308	53308U	69000	135000	2200	3300		42	78	60	82	8.5	64	28	63	55	60	1	0.550	0.570	0.690	51308
	90	36	38.2	42	1.1	51408	53408	53408U	112000	205000	1700	2600		42	90	65	95	12	72	26	70	60	65	1	1.14	1.13	1.38	51408
45	65	14	—	—	0.6	51109	—	—	27800	69000	3300	4900		47	65	—	—	—	—	—	57	53	—	0.6	0.150	—	—	51109
	73	20	21.3	24	1	51209	53209	53209U	47500	105000	2600	3900		47	73	60	78	7.5	56	26	62	56	60	1	0.320	0.320	0.410	51209
	85	28	30.1	33	1	51309	53309	53309U	80000	163000	2000	3000		47	85	65	90	10	64	25	69	61	65	1	0.690	0.680	0.850	51309
	100	39	42.4	46	1.1	51409	53409	53409U	129000	243000	1600	2400		47	100	72	105	12.5	80	29	78	67	72	1	1.47	1.50	1.80	51409
50	70	14	—	—	0.6	51110	—	—	28800	75500	3100	4700		52	70	—	—	—	—	—	62	58	—	0.6	0.160	—	—	51110
	78	22	23.5	26	1	51210	53210	53210U	48500	112000	2400	3600		52	78	62	82	7.5	64	32.5	67	61	62	1	0.390	0.380	0.480	51210
	95	31	34.3	37	1.1	51310	53310	53310U	96500	202000	1800	2700		52	95	72	100	11	72	28	77	68	72	1	1.00	1.00	1.25	51310
	110	43	45.6	50	1.5	51410	53410	53410U	148000	283000	1400	2100		52	110	80	115	14	90	35	86	74	80	1.5	1.99	1.97	2.40	51410

Single-direction Thrust Ball Bearings

Bore Diameter: 55~100mm

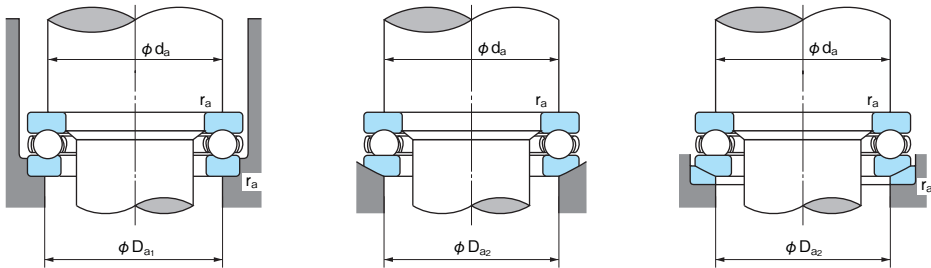
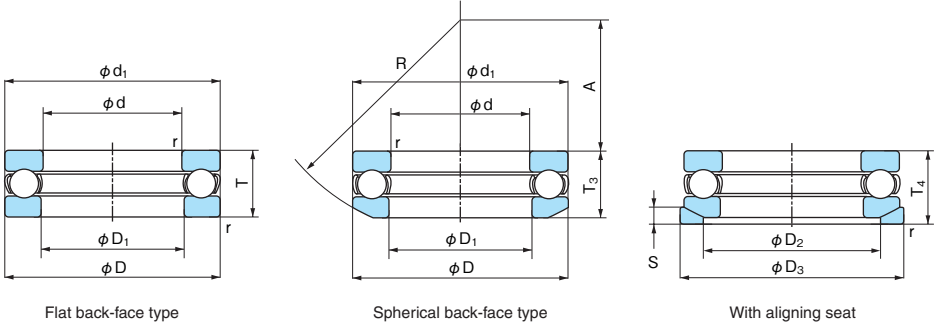


1N=0.102kgf

Boundary dimensions (mm)						Bearing No.			Basic dynamic load rating Ca (N)	Basic static load Coa (N)	Limiting speed (min ⁻¹)		Dimensions (mm)							Abutment and fillet dimensions (mm)				Mass (kg) Reference			Bearing No.
d	D	T	T ₃	T ₄	r (min)	Flat back-face type	Spherical back-face type	With aligning seat			Grease lubrication	Oil lubrication	D ₁ (min)	d ₁ (max)	D ₂	D ₃	S	R	A	da (min)	Da ₁ (max)	Da ₂ (max)	ra (max)	Flat back-face type	Spherical back-face type	With aligning seat	
55	78	16	—	—	0.6	51111	—	—	35000	93000	2800	4200	57	78	—	—	—	—	—	69	64	—	0.6	0.240	—	—	51111
	90	25	27.3	30	1	51211	53211	53211U	69500	159000	2100	3100	57	90	72	95	9	72	35	76	69	72	1	0.610	0.620	0.800	51211
	105	35	39.3	42	1.1	51311	53311	53311U	120000	246000	1600	2400	57	105	80	110	11.5	80	30	85	75	80	1	1.34	1.40	1.70	51311
	120	48	50.5	55	1.5	51411	53411	53411U	178000	360000	1300	1900	57	120	88	125	15.5	90	28	94	81	88	1.5	2.64	2.55	3.70	51411
60	85	17	—	—	1	51112	—	—	41500	113000	2600	3900	62	85	—	—	—	—	—	75	70	—	1	0.290	—	—	51112
	95	26	28	31	1	51212	53212	53212U	73500	179000	2000	3000	62	95	78	100	9	72	32.5	81	74	78	1	0.690	0.690	0.850	51212
	110	35	38.3	42	1.1	51312	53312	53312U	123000	267000	1600	2400	62	110	85	115	11.5	90	41	90	80	85	1	1.43	1.45	1.75	51312
	130	51	54	58	1.5	51412	53412	53412U	213000	435000	1200	1800	62	130	95	135	16	100	34	102	88	95	1.5	3.30	3.25	3.85	51412
65	90	18	—	—	1	51113	—	—	41500	117000	2400	3700	67	90	—	—	—	—	—	80	75	—	1	0.340	—	—	51113
	100	27	28.7	32	1	51213	53213	53213U	75000	189000	1900	2800	67	100	82	105	9	80	40	86	79	82	1	0.770	0.770	0.940	51213
	115	36	39.4	43	1.1	51313	53313	53313U	127000	287000	1500	2300	67	115	90	120	12.5	90	38.5	95	85	90	1	1.57	1.60	1.95	51313
	140	56	60.2	65	2	51413	53413	53413U	231000	495000	1100	1600	68	140	100	145	17.5	112	40	110	95	100	2	4.18	4.17	4.95	51413
70	95	18	—	—	1	51114	—	—	43000	127000	2400	3600	72	95	—	—	—	—	—	85	80	—	1	0.360	—	—	51114
	105	27	28.8	32	1	51214	53214	53214U	76000	199000	1800	2800	72	105	88	110	9	80	38	91	84	88	1	0.810	0.800	0.980	51214
	125	40	44.2	48	1.1	51314	53314	53314U	148000	340000	1400	2100	72	125	98	130	13	100	43	103	92	98	1	2.06	2.15	2.55	51314
	150	60	63.6	69	2	51414	53414	53414U	250000	555000	1000	1500	73	150	110	155	19.5	112	34	118	102	110	2	5.11	4.94	5.93	51414
75	100	19	—	—	1	51115	—	—	44500	136000	2200	3400	77	100	—	—	—	—	—	90	85	—	1	0.420	—	—	51115
	110	27	28.3	32	1	51215	53215	53215U	77500	209000	1800	2700	77	110	92	115	9.5	90	49	96	89	92	1	0.860	0.840	1.05	51215
	135	44	48.1	52	1.5	51315	53315	53315U	170000	395000	1200	1900	77	135	105	140	15	100	37	111	99	105	1.5	2.68	2.70	3.25	51315
	160	65	69	75	2	51415	53415	53415U	252000	560000	950	1400	78	160	115	165	21	125	42	126	109	115	2	6.35	6.25	7.60	51415
80	105	19	—	—	1	51116	—	—	44500	141000	2200	3300	82	105	—	—	—	—	—	95	90	—	1	0.430	—	—	51116
	115	28	29.5	33	1	51216	53216	53216U	78500	219000	1700	2600	82	115	98	120	10	90	46	101	94	98	1	0.950	0.930	1.16	51216
	140	44	47.6	52	1.5	51316	53316	53316U	176000	425000	1200	1800	82	140	110	145	15	112	50	116	104	110	1.5	2.82	2.85	3.45	51316
	170	68	72.2	78	2.1	51416	53416	53416U	270000	620000	900	1300	83	170	125	175	22	125	36	134	116	125	2	7.97	7.83	9.14	51416
85	110	19	—	—	1	51117	—	—	46000	150000	2100	3200	87	110	—	—	—	—	—	100	95	—	1	0.460	—	—	51117
	125	31	33.1	37	1	51217	53217	53217U	95500	264000	1600	2400	88	125	105	130	11	100	52	109	101	105	1	1.29	1.29	1.60	51217
	150	49	53.1	58	1.5	51317	53317	53317U	206000	490000	1100	1700	88	150	115	155	17.5	112	43	124	111	115	1.5	3.66	3.65	4.45	51317
	180	72	77	83	2.1	51417	53417	53417U	288000	685000	850	1200	88	177	130	185	23	140	47	142	123	130	2	9.30	9.20	10.9	51417
90	120	22	—	—	1	51118	—	—	59500	190000	1900	2900	92	120	—	—	—	—	—	108	102	—	1	0.680	—	—	51118
	135	35	38.5	42	1.1	51218	53218	53218U	116000	325000	1400	2100	93	135	110	140	13.5	100	45	117	108	110	1	1.77	1.78	2.22	51218
	155	50	54.6	59	1.5	51318	53318	53318U	213000	525000	1100	1600	93	155	120	160	18	112	40	129	116	120	1.5	3.88	3.84	4.70	51318
	190	77	81.2	88	2.1	51418	53418	53418U	305000	750000	790	1100	93	187	140	195	25.5	140	40	150	130	140	2	11.0	10.7	12.6	51418
100	135	25	—	—	1	51120	—	—	85000	268000	1700	2500	102	135	—	—	—	—	—	121	114	—	1	0.990	—	—	51120
	150	38	40.9	45	1.1	51220	53220	53220U	146000	410000	1300	1900	103	150	125	155	14	112	52	130	120	125	1	2.36	2.36	2.87	51220
	170	55	59.2	64	1.5	51320	53320	53320U	236000	595000	1000	1500	103	170	135	175	18	125	46	142	128	135	1.5	5.11	5.12	6.10	51320
	210	85	90	98	3	51420	53420	53420U	345000	895000	710	1000	103	205	155	220	27	160	50	166	144	155	2.5	14.7	14.5	17.2	51420

Single-direction Thrust Ball Bearings

Bore Diameter: 110~190mm

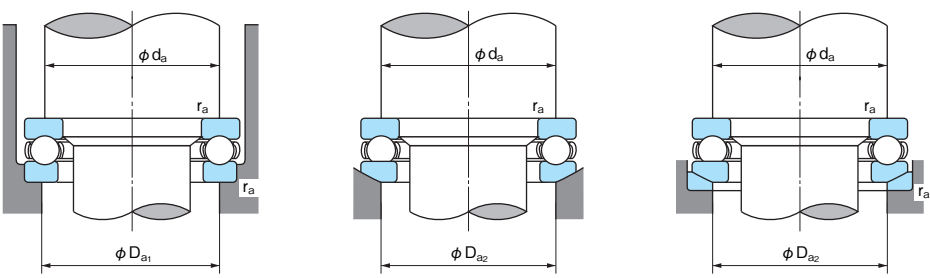
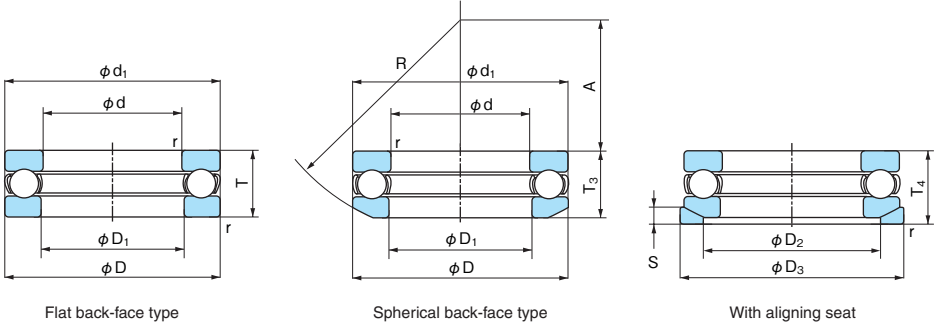


1N=0.102kgf

Boundary dimensions (mm)						Bearing No.			Basic dynamic load rating Ca (N)	Basic static load Coa (N)	Limiting speed (min ⁻¹)			Dimensions (mm)						Abutment and fillet dimensions (mm)				Mass (kg) Reference			Bearing No.	
d	D	T	T ₃	T ₄	r (min)	Flat back-face type	Spherical back-face type	With aligning seal			Grease lubrication	Oil lubrication		D ₁ (min)	d ₁ (max)	D ₂	D ₃	S	R	A	da (min)	Da ₁ (max)	Da ₂ (max)	ra (max)	Flat back-face type	Spherical back-face type		With aligning seal
110	145	25	—	—	1	51122	—	—	87000	288000	1600	2400		112	145	—	—	—	—	131	124	—	1	1.08	—	—	51122	
	160	38	40.2	45	1.1	51222	53222	53222U	152000	450000	1200	1900		113	160	135	165	14	125	65	140	130	135	1	2.57	2.53	3.00	51222
	190	63	67.2	72	2	51322	53322	53322U	267000	705000	880	1300		113	187	150	195	20.5	140	51	158	142	150	2	7.73	7.66	8.96	51322
	230	95	99.7	109	3	51422	53422	53422U	435000	1240000	640	960		113	225	170	240	29	180	59	182	158	170	2.5	19.8	19.4	22.9	51422
120	155	25	—	—	1	51124	—	—	89000	305000	1600	2400		122	155	—	—	—	—	141	134	—	1	1.16	—	—	51124	
	170	39	40.8	46	1.1	51224	53224	53224U	154000	470000	1200	1800		123	170	145	175	15	125	61	150	140	145	1	2.86	2.76	3.40	51224
	210	70	74.1	80	2.1	51324	53324	53324U	310000	870000	790	1100		123	205	165	220	22	160	63	174	156	165	2	10.6	10.4	12.4	51324
	250	102	107.3	118	4	51424	53424	53424U	455000	1340000	580	880		123	245	185	260	32	200	70	198	172	185	3	25.0	24.6	29.2	51424
130	170	30	—	—	1	51126	—	—	104000	350000	1300	2000		132	170	—	—	—	—	154	145	—	1	1.87	—	—	51126	
	190	45	47.9	53	1.5	51226	53226	53226U	203000	620000	1000	1500		133	187	160	195	17	140	67	166	154	160	1.5	4.10	4.03	4.91	51226
	225	75	80.3	86	2.1	51326	53326	53326U	330000	960000	730	1100		134	220	177	235	26	160	53	187	168	177	2	12.7	12.6	15.2	51326
	270	110	115.2	128	4	51426	53426	53426U	555000	1750000	540	810		134	265	200	280	38	200	58	214	186	200	3	31.4	30.4	36.7	51426
140	180	31	—	—	1	51128	—	—	107000	375000	1300	1900		142	178	—	—	—	—	164	156	—	1	2.03	—	—	51128	
	200	46	48.6	55	1.5	51228	53228	53228U	205000	650000	1000	1500		143	197	170	210	17	160	87	176	164	170	1.5	4.47	4.40	5.61	51228
	240	80	84.9	92	2.1	51328	53328	53328U	350000	1050000	680	1000		144	235	190	250	26	180	68	200	180	190	2	15.5	15.3	18.2	51328
	280	112	117	131	4	51428	53428	53428U	545000	1750000	520	780		144	275	206	290	38	225	83	224	196	206	3	33.9	32.9	39.9	51428
150	190	31	—	—	1	51130	—	—	109000	400000	1200	1900		152	188	—	—	—	—	174	166	—	1	2.16	—	—	51130	
	215	50	53.3	60	1.5	51230	53230	53230U	213000	650000	940	1400		153	212	180	225	20.5	160	79	189	176	180	1.5	5.74	5.60	7.28	51230
	250	80	83.7	92	2.1	51330	53330	53330U	360000	1130000	670	1000		154	245	200	260	26	200	89.5	210	190	200	2	16.3	16.0	19.1	51330
	300	120	125.9	140	4	51430	53430	53430U	615000	2010000	480	720		154	295	225	310	41	225	69	240	210	225	3	41.6	40.5	48.5	51430
160	200	31	—	—	1	51132	—	—	112000	425000	1200	1800		162	198	—	—	—	—	184	176	—	1	2.27	—	—	51132	
	225	51	54.7	61	1.5	51232	53232	53232U	223000	720000	900	1300		163	222	190	235	21	160	74	223	202	190	1.5	6.64	6.50	8.29	51232
	270	87	91.7	100	3	51332	53332	53332U	410000	1340000	610	920		164	265	215	280	29	200	77	226	204	215	2.5	21.0	20.5	24.5	51332
	320	130	135.3	150	5	51432	53432	53432U	680000	2410000	440	670		164	315	240	330	41.5	250	84	256	224	240	4	51.2	49.7	58.9	51432
170	215	34	—	—	1.1	51134	—	—	134000	510000	1100	1700		172	213	—	—	—	—	197	188	—	1	3.27	—	—	51134	
	240	55	58.7	65	1.5	51234	53234	53234U	261000	835000	840	1200		173	237	200	250	21.5	180	91	212	198	200	1.5	8.13	7.89	9.95	51234
	280	87	91.3	100	3	51334	53334	53334U	420000	1430000	600	900		174	275	220	290	29	225	105	230	210	220	2.5	22.0	21.3	25.7	51334
	340	135	141	156	5	51434	53434	53434U	755000	2730000	420	630		174	335	255	350	46	250	74	272	238	255	4	60.1	58.1	69.1	51434
180	225	34	—	—	1.1	51136	—	—	135000	525000	1100	1600		183	222	—	—	—	—	207	198	—	1	3.37	—	—	51136	
	250	56	58.2	66	1.5	51236	53236	53236U	266000	875000	810	1200		183	247	210	260	21.5	200	112	222	208	210	1.5	8.69	8.26	10.5	51236
	300	95	99.3	109	3	51336	53336	53336U	485000	1700000	550	820		184	295	240	310	32	225	91	252	228	240	2.5	28.2	27.0	32.0	51336
	360	140	148.3	164	5	51436	53436	53436U	785000	2980000	400	600		184	355	270	370	46.5	280	97	288	252	270	4	69.5	68.8	81.5	51436
190	240	37	—	—	1.1	51138	—	—	170000	655000	1000	1500		193	237	—	—	—	—	220	210	—	1	3.95	—	—	51138	
	270	62	65.7	73	2	51238	53238	53238U	310000	1060000	740	1100		194	267	230	280	23	200	98	238	222	230	2	11.7	11.5	14.0	51238
	320	105	111	121	4	51338	53338	53338U	570000	2100000	500	750		195	315	255	330	33	250	104	268	242	255	3	36.1	35.8	41.9	51338

Single-direction Thrust Ball Bearings

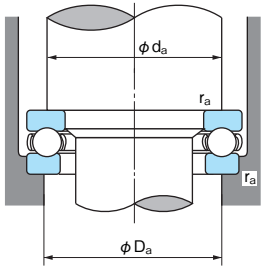
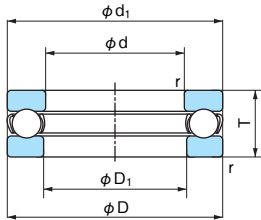
Bore Diameter: 200~360mm



1N=0.102kgf

Boundary dimensions (mm)						Bearing No.			Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Limiting speed (min ⁻¹)			Dimensions (mm)						Abutment and fillet dimensions (mm)				Mass (kg) Reference			Bearing No.	
d	D	T	T ₃	T ₄	r (min)	Flat back-face type	Spherical back-face type	With aligning seat			Grease lubrication	Oil lubrication		D ₁ (min)	d ₁ (max)	D ₂	D ₃	S	R	A	da (min)	Da ₁ (max)	Da ₂ (max)	ra (max)	Flat back-face type	Spherical back-face type		With aligning seat
200	250	37	—	—	1.1	51140	—	—	172000	675000	1000	1500		203	247	—	—	—	—	—	230	220	—	1	4.14	—	—	51140
	280	62	65.3	74	2	51240	53240	53240U	315000	1110000	720	1000		204	277	240	290	23	225	125	248	232	240	2	12.2	12.0	14.8	51240
	340	110	118.4	130	4	51340	53340	53340U	625000	2380000	470	710		205	335	270	350	38	250	92	284	256	270	3	43.0	43.1	51.0	51340
220	270	37	—	—	1.1	51144	—	—	177000	740000	970	1400		223	267	—	—	—	—	—	250	240	—	1	4.51	—	—	51144
	300	63	65.6	75	2	51244	53244	53244U	325000	1210000	690	1000		224	297	260	310	25	225	118	268	252	260	2	13.5	13.0	16.2	51244
240	300	45	—	—	1.5	51148	—	—	228000	935000	830	1200		243	297	—	—	—	—	—	276	264	—	1.5	7.35	—	—	51148
	340	78	81.6	92	2.1	51248	53248	53248U	430000	1730000	570	860		244	335	290	350	30	250	122	300	280	290	2	23.1	22.3	27.4	51248
260	320	45	—	—	1.5	51152	—	—	232000	990000	800	1200		263	317	—	—	—	—	—	296	284	—	1.5	7.94	—	—	51152
	360	79	82.8	93	2.1	51252	53252	53252U	445000	1880000	550	830		264	355	305	370	30	280	152	320	300	305	2	25.0	24.0	29.7	51252
280	350	53	—	—	1.5	51156	—	—	315000	1350000	700	1000		283	347	—	—	—	—	—	322	308	—	1.5	12.0	—	—	51156
	380	80	85	94	2.1	51256	53256	53256U	450000	1950000	530	800		284	375	325	390	31	280	143	340	320	325	2	27.0	26.2	32.3	51256
300	380	62	—	—	2	51160	—	—	370000	1660000	610	920		304	376	—	—	—	—	—	348	332	—	2	17.1	—	—	51160
	420	95	100.5	112	3	51260	53260	53260U	585000	2720000	450	680		304	415	360	430	34	320	164	372	348	360	2.5	42.3	41.7	49.9	51260
320	400	63	—	—	2	51164	—	—	380000	1760000	590	880		324	396	—	—	—	—	—	368	352	—	2	18.5	—	—	51164
	440	95	100.5	112	3	51264	53264	53264U	595000	2830000	440	660		325	435	380	450	36	320	157	392	368	380	2.5	44.7	43.8	52.7	51264
340	420	64	—	—	2	51168	—	—	385000	1860000	570	850		344	416	—	—	—	—	—	388	372	—	2	19.9	—	—	51168
	460	96	100.3	113	3	51268	53268	53268U	600000	2940000	430	640		345	455	400	470	36	360	199	412	388	400	2.5	47.6	46.4	56.2	51268
360	440	65	—	—	2	51172	—	—	395000	1960000	550	820		364	436	—	—	—	—	—	408	392	—	2	20.4	—	—	51172
	500	110	116.7	130	4	51272	53272	53272U	745000	3800000	380	570		365	495	430	510	43	360	172	444	416	430	3	69.0	67.7	81.5	51272

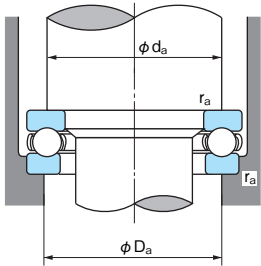
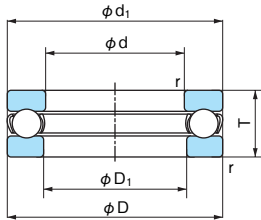
Single-direction Thrust Ball Bearings
Series 2900
Bore Diameter: 10~140mm



1N=0.102kgf

Boundary dimensions (mm)				Bearing No.	Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Limiting speed (min ⁻¹)			Dimensions (mm)		Abutment and fillet dimensions (mm)			Mass (kg) Reference	Bearing No.
d	D	T	r (min)				Grease lubrication	Oil lubrication		D1 (min)	d1 (max)	da (min)	Da (max)	ra (max)		
10	26	12	0.6	2900	12700	17100	5600	8400		10.2	26	19.6	16.4	0.6	0.035	2900
12	28	12	0.6	2901	13200	19000	5400	8100		12.2	28	21.6	18.4	0.6	0.037	2901
15	31	12	0.6	2902	14300	22800	5100	7700		15.2	31	25	21	0.6	0.041	2902
18	35	12	0.6	2903	14400	24700	4800	7300		18.2	35	28	25	0.6	0.045	2903
20	37	12	0.6	2904	14800	26600	4700	7100		20.2	37	30	27	0.6	0.055	2904
22	42	14	0.6	2904 1/2	18900	34500	4100	6100		22.2	42	34	30	0.6	0.085	2904 1/2
25	45	14	0.6	2905	19300	37000	3900	5900		25.2	45	37	33	0.6	0.093	2905
30	50	14	0.6	2906	20200	42000	3700	5600		30.2	50	42	38	0.6	0.107	2906
35	55	16	0.6	2907	29900	62000	3300	5000		35.2	55	47	43	0.6	0.137	2907
40	60	16	0.6	2908	31000	70000	3200	4800		40.2	60	52	48	0.6	0.150	2908
45	68	16	0.6	2909	32500	77500	3000	4500		45.2	68	59	54	0.6	0.199	2909
50	74	18	0.6	2910	38500	94000	2700	4100		50.2	74	64	60	0.6	0.255	2910
55	78	18	0.6	2911	40000	103000	2600	4000		55.2	78	69	64	0.6	0.270	2911
60	82	18	0.6	2912	40500	108000	2600	3900		60.2	82	73	69	0.6	0.275	2912
65	90	20	0.6	2913	47500	129000	2300	3500		65.2	90	80	75	0.6	0.374	2913
70	95	20	0.6	2914	49000	140000	2200	3400		70.2	95	85	80	0.6	0.400	2914
75	100	20	0.6	2915	51000	151000	2200	3300		75.2	100	90	85	0.6	0.425	2915
80	110	22	0.6	2916	57000	171000	2000	3000		80.2	110	98	92	0.6	0.600	2916
85	115	22	0.6	2917	59000	184000	1900	2900		85.2	115	103	97	0.6	0.640	2917
90	120	22	0.6	2918	59500	190000	1900	2900		90.2	120	108	102	0.6	0.670	2918
95	130	25	0.6	2919	75500	236000	1700	2600		95.2	130	116	109	0.6	0.795	2919
100	135	25	0.6	2920	78000	253000	1700	2500		100.2	135	121	114	0.6	0.930	2920
105	140	25	0.6	2921	78500	262000	1600	2500		105.2	140	126	119	0.6	1.02	2921
110	145	25	0.6	2922	78000	262000	1600	2400		110.2	145	131	124	0.6	1.15	2922
115	150	25	0.6	2923	73500	245000	1600	2400		115.2	150	136	129	0.6	1.25	2923
120	160	27	0.6	2924	94000	314000	1500	2200		120.2	160	144	136	0.6	1.35	2924
125	165	27	0.6	2925	85500	298000	1400	2200		125.3	165	149	141	0.6	1.48	2925
140	185	31	0.6	2928	106000	375000	1300	1900		140.3	185	167	158	0.6	2.33	2928

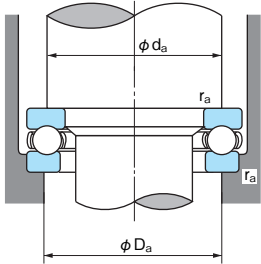
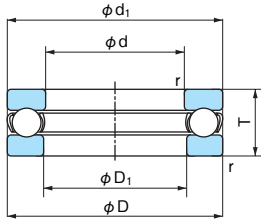
Single-direction Thrust Ball Bearings
Series 3900
Bore Diameter: 25~120mm



1N=0.102kgf

Boundary dimensions (mm)				Bearing No.	Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Limiting speed (min ⁻¹)			Dimensions (mm)		Abutment and fillet dimensions (mm)			Mass (kg) Reference	Bearing No.
d	D	T	r (min)				Grease lubrication	Oil lubrication		D1 (min)	d1 (max)	da (min)	Da (max)	ra (max)		
25	52	16	1	3905	27100	50500	3400	5200		25.2	52	42	36	1.0	0.147	3905
30	60	19	1	3906	38000	72500	2900	4400		30.2	60	49	43	1.0	0.237	3906
35	68	22	1	3907	50500	99000	2500	3800		35.2	68	56.5	48.5	1.0	0.346	3907
40	76	25	1	3908	61000	119000	2200	3400		40.2	76	63	55	1.0	0.486	3908
45	85	28	1	3909	79500	163000	2000	3000		45.2	85	71	61	1.0	0.684	3909
50	92	31	1	3910	97000	202000	1800	2800		50.2	92	77	67	1.0	0.889	3910
55	100	33	1	3911	110000	240000	1700	2600		55.2	100	83.5	73.5	1.0	1.114	3911
60	106	35	1.5	3912	119000	263000	1600	2400		60.2	106	89	79	1.5	1.293	3912
65	112	36	1.5	3913	128000	287000	1500	2300		65.2	112	95.5	83.5	1.5	1.443	3913
70	120	38	1.5	3914	143000	335000	1400	2200		70.2	120	102	90	1.5	1.767	3914
75	128	41	1.5	3915	159000	365000	1300	2000		75.2	128	108.5	96.5	1.5	2.132	3915
80	136	44	1.5	3916	183000	425000	1200	1900		80.2	136	115	101	1.5	2.606	3916
85	145	47	1.5	3917	207000	490000	1100	1700		85.2	145	122	108	1.5	3.157	3917
90	155	50	1.5	3918	232000	555000	1100	1600		90.2	155	131	115	1.5	3.907	3918
95	165	54	1.5	3919	253000	630000	1000	1500		95.2	165	139	123	1.5	4.810	3919
100	172	57	1.5	3920	250000	630000	980	1400		100.2	172	144	128	1.5	5.454	3920
105	180	60	2.5	3921	257000	670000	930	1400		105.2	180	153	137	2.5	6.354	3921
110	190	63	2.5	3922	293000	785000	880	1300		110.2	190	159	141	2.5	7.333	3922
115	200	66	2.5	3923	315000	870000	840	1200		115.2	200	167.5	147.5	2.5	8.526	3923
120	210	69	2.5	3924	325000	930000	800	1200		120.2	210	178	158	2.5	10.195	3924

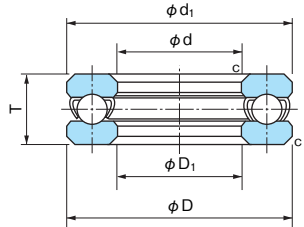
Single-direction Thrust Ball Bearings
Inch Series
Series O
Bore Diameter: 9.525~152.400mm



1N=0.102kgf

Boundary dimensions (mm)				Bearing No.	Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Limiting speed (min ⁻¹)			Dimensions (mm)		Abutment and fillet dimensions (mm)			Mass (kg) Reference	Bearing No.
d	D	T	r (min)				Grease lubrication	Oil lubrication		D ₁ (min)	d ₁ (max)	d _a (min)	D _a (max)	r _a (max)		
9.525	25.400	13.494	0.8	O - 3	11800	15200	5400	8100		9.925	24.606	19.1	15.9	0.8	0.036	O - 3
12.700	32.544	15.875	0.8	O - 4	18600	25100	4300	6500		13.097	31.750	24.6	20.6	0.8	0.077	O - 4
15.875	35.719	15.875	0.8	O - 5	19400	28300	4100	6200		16.272	34.925	27.8	23.8	0.8	0.086	O - 5
19.050	38.894	15.875	0.8	O - 6	21400	34500	4000	6000		19.447	38.100	29	26	0.8	0.095	O - 6
22.225	42.069	15.875	0.8	O - 7	21900	37500	3800	5800		22.622	41.275	34	30	0.8	0.100	O - 7
25.400	45.244	15.875	1.6	O - 8	22500	41000	3700	5500		25.797	44.450	37	33	0.8	0.110	O - 8
28.575	48.419	15.875	1.6	O - 9	24100	47000	3600	5400		28.972	47.625	40	37	0.8	0.128	O - 9
31.750	53.181	18.256	1.6	O -10	27900	54500	3200	4800		32.147	52.388	45	40	0.8	0.164	O -10
34.925	56.356	18.256	1.6	O -11	28600	58000	3100	4600		35.322	55.562	48	43	0.8	0.186	O -11
38.100	59.531	18.256	1.6	O -12	30500	66000	3000	4500		38.497	58.738	51	47	1	0.200	O -12
41.275	62.706	18.256	1.6	O -13	26700	63000	2900	4400		41.672	61.912	54	50	1	0.210	O -13
44.450	68.262	19.050	1.6	O -14	32500	77500	2700	4100		44.847	67.469	59	54	1	0.260	O -14
47.625	71.438	19.050	1.6	O -15	37500	89000	2700	4000		48.021	70.644	62	57	1	0.285	O -15
50.800	75.406	19.050	2.4	O -16	38000	94000	2600	3900		51.594	74.613	66	61	1	0.300	O -16
53.975	81.756	22.225	2.4	O -17	49500	118000	2300	3500		54.769	80.962	71	65	1.6	0.405	O -17
57.150	84.931	22.225	2.4	O -18	50500	125000	2300	3400		57.944	84.138	74	68	1.6	0.450	O -18
60.325	91.281	25.400	2.4	O -19	58000	145000	2000	3100		61.119	90.488	79	73	1.6	0.590	O -19
63.500	94.456	25.400	2.4	O -20	59500	152000	2000	3000		64.294	93.662	82	76	1.6	0.610	O -20
66.675	97.631	25.400	2.4	O -21	60500	160000	2000	3000		67.469	96.838	85	79	1.6	0.660	O -21
69.850	102.394	25.400	2.4	O -22	71500	179000	1900	2900		70.644	101.600	89	83	1.6	0.700	O -22
73.025	105.569	25.400	2.4	O -23	75500	199000	1900	2800		73.819	104.775	93	86	1.6	0.730	O -23
76.200	111.125	28.575	3.2	O -24	77000	209000	1700	2600		77.788	109.538	97	90	2	0.900	O -24
82.550	122.238	31.750	3.2	O -26	97500	252000	1600	2400		84.138	120.650	106	98	2	1.30	O -26
88.900	128.588	31.750	3.2	O -28	99000	266000	1500	2300		90.488	127.000	113	105	2	1.32	O -28
95.250	134.938	31.750	3.2	O -30	98500	289000	1500	2200		96.838	133.350	119	111	2	1.36	O -30
101.600	147.638	34.925	3.2	O -32	113000	310000	1300	2000		103.188	146.050	129	120	2	1.88	O -32
114.300	166.688	44.450	4.8	O -36	157000	435000	1100	1700		115.888	165.100	146	135	3	3.18	O -36
127.000	185.738	50.800	4.8	O -40	193000	545000	1000	1500		128.588	184.150	162	150	3	4.54	O -40
139.700	204.788	55.562	4.8	O -44	248000	715000	910	1300		141.288	203.200	179	166	3	5.90	O -44
152.400	220.662	60.325	4.8	O -48	269000	805000	830	1200		153.988	219.075	193	180	3	7.25	O -48

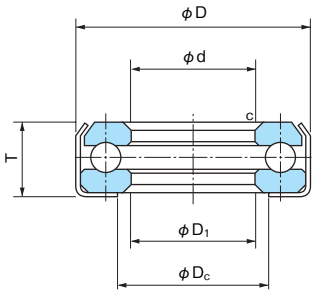
Extra Small and Miniature Thrust Ball Bearings
TAM Type
Bore Diameter: 3~8mm



1N=0.102kgf

Boundary dimensions (mm)						Bearing No.	Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Mass (kg) Reference
d	D	T	c	D1	d1				
3	8	3.5	0.2	3.2	8	3TAM8	1790	1720	0.6
4	9	4	0.2	4.1	9	4TAM9	1860	1970	0.8
5	10	4	0.3	5.1	10	5TAM10	1930	2220	0.9
6	12	4.5	0.3	6.2	12	6TAM12	1820	2220	1.7
7	14	4.5	0.3	7.2	14	7TAM14	2480	3140	2.3
8	16	5	0.3	8.2	16	8TAM16	3920	4990	3.4

Extra Small and Miniature Thrust Ball Bearings
TG Type (Banded)
Bore Diameter: 5~8mm

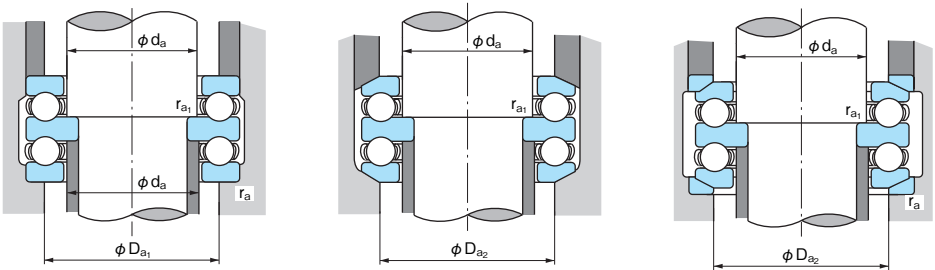
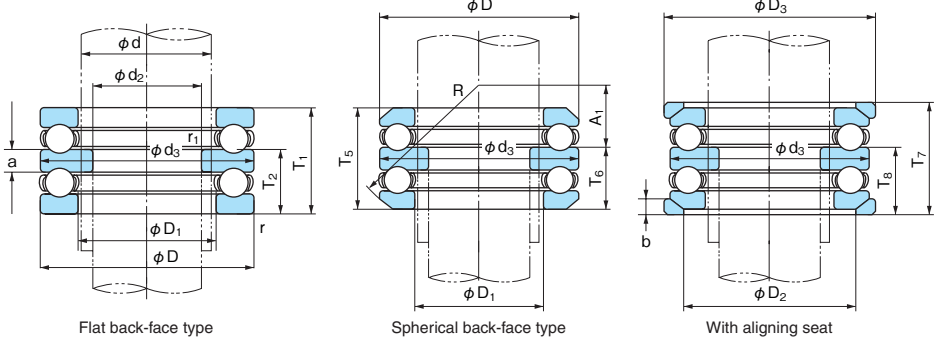


1N=0.102kgf

Boundary dimensions (mm)						Bearing No.	Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Mass (kg) Reference
d	D	T	c	D1	Dc				
5	10	4.2	0.3	5.1	5.8	5TG-10	2200	2710	1.3
6	12	4.7	0.5	6.2	7.2	6TG-12	2450	3450	2.2
7	14	4.7	0.5	7.2	8.2	7TG-14	3320	4890	3.0
8	16	5.2	0.5	8.2	9.2	8TG-16	4750	6650	4.0

Double-direction Thrust Ball Bearings

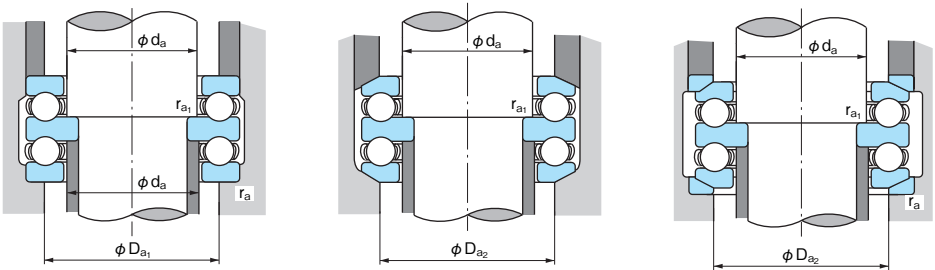
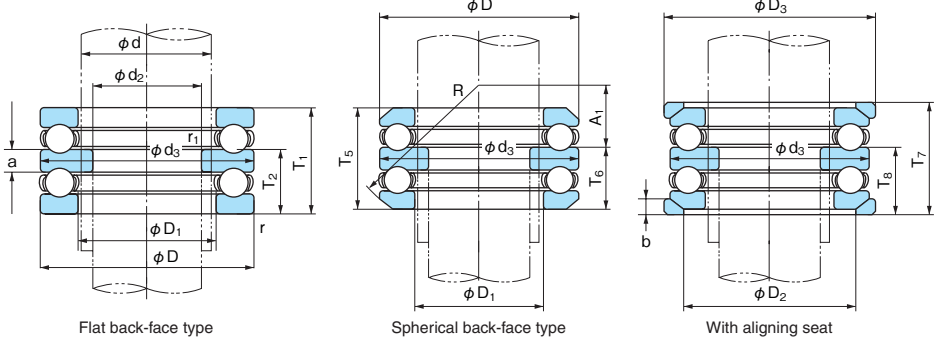
Bore Diameter: 15~75mm



1N=0.102kgf																																			
Boundary dimensions (mm)								Bearing No.			Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Limiting speed (min ⁻¹)		Dimensions (mm)												Abutment and fillet dimensions (mm)					Mass (kg) Reference			Bearing No.
d	d ₂	D	T ₁	T ₅	T ₇	r (min)	r ₁ (min)	Flat back-face type	Spherical back-face type	With aligning seat			Grease lubrication	Oil lubrication	d ₃ (max)	D ₁ (min)	D ₂	D ₃	T ₂	T ₆	T ₈	a	b	A ₁	R	d _a (min)	D _{a1} (max)	D _{a2} (max)	r _a (max)	r _{a1} (max)	Flat back-face type	Spherical back-face type	With aligning seat		
15	10	32	22	24.6	28	0.6	0.3	52202	54202	54202U	16600	24800	5100	7600	32	17	24	35	13.5	14.8	16.5	5	4	10.5	28	15	22	24	0.6	0.3	0.085	0.090	0.116	52202	
20	15	40	26	27.4	32	0.6	0.3	52204	54204	54204U	22200	37500	4200	6300	40	22	30	42	16	16.7	19	6	5	16	36	20	28	30	0.6	0.3	0.150	0.147	0.189	52204	
	20	47	28	31.4	36	0.6	0.3	52205	54205	54205U	27800	50500	3700	5600	47	27	36	50	17.5	19.2	21.5	7	5.5	16.5	40	25	34	36	0.6	0.3	0.230	0.241	0.305	52205	
	20	52	34	37.6	42	1	0.3	52305	54305	54305U	35500	61500	3200	4900	52	27	38	55	21	22.8	25	8	6	18	45	25	36	38	1	0.3	0.330	0.340	0.431	52305	
	15	60	45	49.8	55	1	0.6	52405	54405	54405U	55500	89500	2600	3900	60	27	42	62	28	30.4	33	11	8	15	50	25	39	42	1	0.6	0.630	0.650	0.796	52405	
	25	52	29	32.6	37	0.6	0.3	52206	54206	54206U	29300	58000	3400	5200	52	32	42	55	18	19.8	22	7	5.5	20	45	30	39	42	0.6	0.3	0.272	0.291	0.356	52206	
	25	60	38	41.2	46	1	0.3	52306	54306	54306U	42500	78500	2800	4200	60	32	45	62	23.5	25.1	27.5	9	7	19.5	50	30	42	45	1	0.3	0.490	0.495	0.607	52306	
	20	70	52	56.2	62	1	0.6	52406	54406	54406U	72500	126000	2200	3300	70	32	50	75	32	34.1	37	12	9	16	56	30	46	50	1	0.6	1.00	1.00	1.26	52406	
	30	62	34	37.8	42	1	0.3	52207	54207	54207U	39000	78000	2900	4400	62	37	48	65	21	22.9	25	8	7	21	50	35	46	48	1	0.3	0.420	0.431	0.550	52207	
	30	68	44	47.2	52	1	0.3	52307	54307	54307U	55500	105000	2400	3700	68	37	52	72	27	28.6	31	10	7.5	21	56	35	48	52	1	0.3	0.710	0.711	0.881	52307	
	25	80	59	63	69	1.1	0.6	52407	54407	54407U	87000	155000	1900	2900	80	37	58	85	36.5	38.5	41.5	14	10	18.5	64	35	53	58	1	0.6	1.44	1.43	1.78	52407	
	30	68	36	38.6	44	1	0.6	52208	54208	54208U	47000	98500	2700	4100	68	42	55	72	22.5	23.8	26.5	9	7	25	56	40	51	55	1	0.6	0.540	0.542	0.686	52208	
	30	78	49	54	59	1	0.6	52308	54308	54308U	69000	135000	2200	3300	78	42	60	82	30.5	33	35.5	12	8.5	23.5	64	40	55	60	1	0.6	1.06	1.10	1.33	52308	
	30	90	65	69.4	77	1.1	0.6	52408	54408	54408U	112000	205000	1700	2600	90	42	65	95	40	42.2	46	15	12	22	72	40	60	65	1	0.6	2.03	2.00	2.52	52408	
	35	73	37	39.6	45	1	0.6	52209	54209	54209U	47500	105000	2600	3900	73	47	60	78	23	24.3	27	9	7.5	23	56	45	56	60	1	0.6	0.620	0.617	0.796	52209	
	35	85	52	56.2	62	1	0.6	52309	54309	54309U	80000	163000	2000	3000	85	47	65	90	32	34.1	37	12	10	21	64	45	61	65	1	0.6	1.29	1.28	1.63	52309	
	35	100	72	78.8	86	1.1	0.6	52409	54409	54409U	129000	243000	1600	2400	100	47	72	105	44.5	47.9	51.5	17	12.5	23.5	80	45	67	72	1	0.6	2.71	2.76	3.40	52409	
	40	78	39	42	47	1	0.6	52210	54210	54210U	48500	112000	2400	3600	78	52	62	82	24	25.5	28	9	7.5	30.5	64	50	61	62	1	0.6	0.71	0.697	0.899	52210	
	40	95	58	64.6	70	1.1	0.6	52310	54310	54310U	96500	202000	1800	2700	95	52	72	100	36	39.3	42	14	11	23	72	50	68	72	1	0.6	1.86	1.92	2.37	52310	
	40	110	78	83.2	92	1.5	0.6	52410	54410	54410U	148000	283000	1400	2100	110	52	80	115	48	50.6	55	18	14	30	90	50	74	80	1.5	0.6	3.56	3.52	4.36	52410	
	45	90	45	49.6	55	1	0.6	52211	54211	54211U	69500	159000	2100	3100	90	57	72	95	27.5	29.8	32.5	10	9	32.5	72	55	69	72	1	0.6	1.12	1.14	1.54	52211	
	45	105	64	72.6	78	1.1	0.6	52311	54311	54311U	120000	246000	1600	2400	105	57	80	110	39.5	43.8	46.5	15	11.5	25.5	80	55	75	80	1	0.6	2.51	2.65	3.22	52311	
	45	120	87	92	101	1.5	0.6	52411	54411	54411U	178000	360000	1300	1900	120	57	88	125	53.5	56	60.5	20	15.5	22.5	90	55	81	88	1.5	0.6	4.70	4.55	5.64	52411	
	50	95	46	50	56	1	0.6	52212	54212	54212U	73500	179000	2000	3000	95	62	78	100	28	30	33	10	9	30.5	72	60	74	78	1	0.6	1.25	1.26	1.59	52212	
	50	110	64	70.6	78	1.1	0.6	52312	54312	54312U	123000	267000	1600	2400	110	62	85	115	39.5	42.8	46.5	15	11.5	36.5	90	60	80	85	1	0.6	2.68	2.76	3.39	52312	
	50	130	93	99	107	1.5	0.6	52412	54412	54412U	213000	435000	1200	1800	130	62	95	135	57	60	64	21	16	28	100	60	88	95	1.5	0.6	6.33	6.20	7.45	52412	
	55	100	47	50.4	57	1	0.6	52213	54213	54213U	75000	189000	1900	2800	100	67	82	105	28.5	30.2	33.5	10	9	38.5	80	65	79	82	1	0.6	1.36	1.35	1.72	52213	
	55	115	65	71.8	79	1.1	0.6	52313	54313	54313U	127000	287000	1500	2300	115	67	90	120	40	43.4	47	15	12.5	34.5	90	65	85	90	1	0.6	2.90	2.98	3.67	52313	
	50	140	101	109.4	119	2	1	52413	54413	54413U	231000	495000	1100	1600	140	68	100	145	62	66.2	71	23	17.5	34	112	65	95	100	2	1	8.03	8.01	9.67	52413	
	55	105	47	50.6	57	1	1	52214	54214	54214U	76000	199000	1800	2800	105	72	88	110	28.5	30.3	33.5	10	9	36.5	80	70	84	88	1	1	1.48	1.48	1.86	52214	
	55	125	72	80.4	88	1.1	1	52314	54314	54314U	148000	340000	1400	2100	125	72	98	130	44	48.2	52	16	13	39	100	70	92	98	1	1	3.90	4.08	4.92	52314	
	55	150	107	114.2	125	2	1	52414	54414	54414U	250000	555000	1000	1500	150	73	110	155	65.5	69.1	74.5	24	19.5	28.5	112	70	102	110	2	1	9.71	9.50	11.5	52414	
	60	110	47	49.6	57	1	1	52215	54215	54215U	77500	209000	1800	2700	110	77	92	115	28.5	29.8	33.5	10	9.5	47.5	90	75	89	92	1	1	1.57	1.53	1.96	52215	
	60	135	79	87.2	95	1.5	1	52315	54315	54315U	170000	395000	1200	1900	135	77	105	140	48.5	52.6	56.5	18	15	32.5	100	75	99	105	1.5	1	4.83	4.93	6.04	52315	
	60	160	115	123	135	2	1	52415	54415	54415U	252000	560000	950	1400	160	78	115	165	70.5	74.5	80.5	26	21	36.5	125	75	109	115	2	1	11.8	11.6	14.1	52415	

Double-direction Thrust Ball Bearings

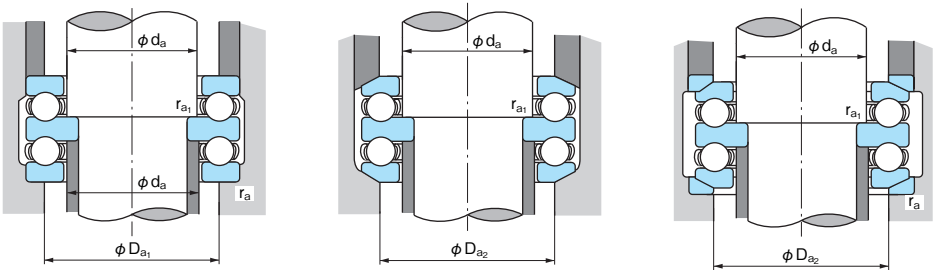
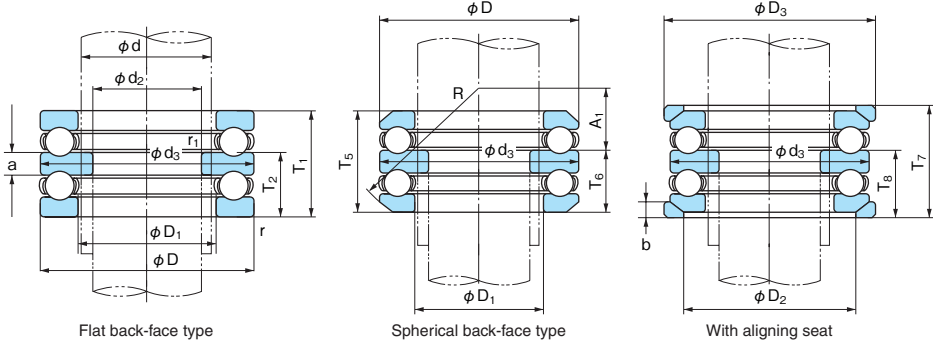
Bore Diameter: 80~170mm



1N=0.102kgf																																		
Boundary dimensions (mm)								Bearing No.			Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Limiting speed (min ⁻¹)		Dimensions (mm)										Abutment and fillet dimensions (mm)					Mass (kg) Reference			Bearing No.	
d	d ₂	D	T ₁	T ₅	T ₇	r (min)	r ₁ (min)	Flat back-face type	Spherical back-face type	With aligning seat			Grease lubrication	Oil lubrication	d ₃ (max)	D ₁ (min)	D ₂	D ₃	T ₂	T ₆	T ₈	a	b	A ₁	R	d _a (min)	D _{a1} (max)	D _{a2} (max)	r _a (max)	r _{a1} (max)	Flat back-face type	Spherical back-face type		With aligning seat
80	65	115	48	51	58	1	1	52216	54216	54216U	78500	219000	1700	2600	115	82	98	120	29	30.5	34	10	10	45	90	80	94	98	1	1	1.69	1.67	2.11	52216
	65	140	79	86.2	95	1.5	1	52316	54316	54316U	176000	425000	1200	1800	140	82	110	145	48.5	52.1	56.5	18	15	45.5	112	80	104	110	1.5	1	5.06	5.14	6.29	52316
	65	170	120	128.4	140	2.1	1	52416	54416	54416U	270000	620000	900	1300	170	83	125	175	73.5	77.7	83.5	27	22	30.5	125	80	116	125	2	1	14.0	13.7	16.5	52416
85	70	125	55	59.2	67	1	1	52217	54217	54217U	95500	264000	1600	2400	125	88	105	130	33.5	35.6	39.5	12	11	49.5	100	85	101	105	1	1	2.34	2.34	2.93	52217
	70	150	87	95.2	105	1.5	1	52317	54317	54317U	206000	490000	1100	1700	150	88	115	155	53	57.1	62	19	17.5	39	112	85	111	115	1.5	1	6.43	6.41	8.05	52317
	65	180	128	138	150	2.1	1.1	52417	54417	54417U	288000	685000	850	1200	179.5	88	130	185	78.5	83.5	89.5	29	23	40.5	140	85	123	130	2	1	17.5	17.3	20.7	52417
90	75	135	62	69	76	1.1	1	52218	54218	54218U	116000	325000	1400	2100	135	93	110	140	38	41.5	45	14	13.5	42	100	90	108	110	1	1	3.22	3.25	4.12	52218
	75	155	88	97.2	106	1.5	1	52318	54318	54318U	213000	525000	1100	1600	155	93	120	160	53.5	58.1	62.5	19	18	36.5	112	90	116	120	1.5	1	6.60	6.62	8.33	52318
	70	190	135	143.4	157	2.1	1.1	52418	54418	54418U	305000	750000	790	1100	189.5	93	140	195	82.5	86.7	93.5	30	25.5	34.5	140	90	130	140	2	1	19.6	19.1	23.0	52418
100	85	150	67	72.8	81	1.1	1	52220	54220	54220U	146000	410000	1300	1900	150	103	125	155	41	43.9	48	15	14	49	112	100	120	125	1	1	4.29	4.29	5.32	52220
	85	170	97	105.4	115	1.5	1	52320	54320	54320U	236000	595000	1000	1500	170	103	135	175	59	63.2	68	21	18	42	125	100	128	135	1.5	1	8.90	8.92	10.8	52320
	80	210	150	160	176	3	1.1	52420	54420	54420U	345000	895000	710	1000	209.5	103	155	220	91.5	96.5	104.5	33	27	43.5	160	100	144	155	2.5	1	26.6	26.2	32.0	52420
110	95	160	67	71.4	81	1.1	1	52222	54222	54222U	153000	450000	1200	1900	160	113	135	165	41	43.2	48	15	14	62	125	110	130	135	1	1	4.68	4.60	5.74	52222
	95	190	110	118.4	128	2	1	52322	54322	54322U	268000	705000	880	1300	189.5	113	150	195	67	71.2	76	24	20.5	47	140	110	142	150	2	1	13.8	13.7	16.3	52322
	90	230	166	—	—	3	1.1	52422	—	—	435000	1240000	640	960	229	113	—	—	101.5	—	—	37	—	—	—	110	158	—	2.5	1	34.9	—	—	52422
120	100	170	68	71.6	82	1.1	1.1	52224	54224	54224U	152000	470000	1200	1800	170	123	145	175	41.5	43.3	48.5	15	15	58.5	125	120	140	145	1	1	5.24	5.04	6.36	52224
	100	210	123	131.2	143	2.1	1.1	52324	54324	54324U	267000	870000	790	1100	209.5	123	165	220	75	79.1	85	27	22	58	160	120	156	165	2	1	17.2	16.9	21.0	52324
	95	250	177	—	—	4	1.5	52424	—	—	455000	1340000	580	880	249	123	—	—	108.5	—	—	40	—	—	—	120	172	—	3	1.5	44.2	—	—	52424
130	110	190	80	85.8	96	1.5	1.1	52226	54226	54226U	203000	620000	1000	1500	189.5	133	160	195	49	51.9	57	18	17	63	140	130	154	160	1.5	1	7.72	7.58	9.43	52226
	110	225	130	—	—	2.1	1.1	52326	—	—	330000	960000	730	1100	224	134	—	—	80	—	—	30	—	—	—	130	168	—	2	1	22.1	—	—	52326
	100	270	192	—	—	4	2	52426	—	—	555000	1750000	540	810	269	134	—	—	117	—	—	42	—	—	—	130	186	—	3	2	56.5	—	—	52426
140	120	200	81	86.2	99	1.5	1.1	52228	54228	54228U	205000	650000	1000	1500	199.5	143	170	210	49.5	52.1	58.5	18	17	83.5	160	140	164	170	1.5	1	8.93	8.79	11.3	52228
	120	240	140	—	—	2.1	1.1	52328	—	—	350000	1050000	680	1000	239	144	—	—	85.5	—	—	31	—	—	—	140	180	—	2	1	27.8	—	—	52328
	110	280	196	—	—	4	2	52428	—	—	545000	1750000	520	780	279	144	—	—	120	—	—	44	—	—	—	140	196	—	3	2	60.6	—	—	52428
150	130	215	89	95.6	109	1.5	1.1	52230	54230	54230U	213000	650000	940	1400	214.5	153	180	225	54.5	57.8	64.5	20	20.5	74.5	160	150	176	180	1.5	1	10.6	10.3	13.8	52230
	130	250	140	—	—	2.1	1.1	52330	—	—	360000	1130000	670	1000	249	154	—	—	85.5	—	—	31	—	—	—	150	190	—	2	1	29.2	—	—	52330
	120	300	209	—	—	4	2	52430	—	—	615000	2010000	480	720	299	153	—	—	127.5	—	—	46	—	—	—	150	210	—	3	2	73.9	—	—	52430
160	140	225	90	97.4	110	1.5	1.1	52232	54232	54232U	223000	720000	900	1300	224.5	163	190	235	55	58.7	65	20	21	70	160	160	186	190	1.5	1	12.2	11.9	15.6	52232
	140	270	153	—	—	3	1.1	52332	—	—	410000	1340000	610	920	269	164	—	—	93	—	—	33	—	—	—	160	204	—	2.5	1	37.7	—	—	52332
	130	320	226	—	—	5	2	52432	—	—	680000	2410000	440	670	319	164	—	—	138	—	—	50	—	—	—	160	224	—	4	2	90.3	—	—	52432
170	150	240	97	104.4	117	1.5	1.1	52234	54234	54234U	261000	835000	840	1200	239.5	173	200	250	59	62.7	69	21	21.5	87	180	170	198	200	1.5	1	15.2	14.7	19.1	52234
	150	280	153	—	—	3	1.1	52334	—	—	420000	1430000	600	900	279	174	—	—	93	—	—	33	—	—	—	170	214	—	2.5	1	39.8	—	—	52334
	135	340	236	—	—	5	2.1	52434	—	—	755000	2730000	420	630	339	174	—	—	143	—	—	50	—	—	—	170	238	—	4	2	108	—	—	52434

Double-direction Thrust Ball Bearings

Bore Diameter: 180~220mm



1N=0.102kgf																																		
Boundary dimensions (mm)								Bearing No.			Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Limiting speed (min ⁻¹)			Dimensions (mm)										Abutment and fillet dimensions (mm)					Mass (kg) Reference			Bearing No.
d	d ₂	D	T ₁	T ₅	T ₇	r (min)	r ₁ (min)	Flat back- face type	Spherical back-face type	With aligning seat			Grease lubrication	Oil lubrication		d ₃ (max)	D ₁ (min)	D ₂	D ₃	T ₂	T ₆	T ₈	a	b	A ₁	R	d _a (min)	D _{a1} (max)	D _{a2} (max)	r _a (max)	ra ₁ (max)	Flat back-face type	Spherical back-face type	
180	150	250	98	102.4	118	1.5	2	52236	54236	54236U	266000	875000	810	1200	249	183	210	260	59.5	61.7	69.5	21	21.5	108.5	200	180	208	210	1.5	2	16.0	15.2	19.9	52236
	150	300	165	—	—	3	2	52336	—	—	485000	1700000	550	820	299	184	—	—	101	—	—	37	—	—	—	180	228	—	2.5	2	50.9	—	—	52336
	140	360	245	—	—	5	3	52436	—	—	785000	2980000	400	600	359	184	—	—	148.5	—	—	52	—	—	—	180	252	—	4	2.5	126	—	—	52436
190	160	270	109	116.4	131	2	2	52238	54238	54238U	310000	1060000	740	1100	269	194	230	280	66.5	70.2	77.5	24	23	93.5	200	190	222	230	2	2	21.6	21.2	26.5	52238
	160	320	183	—	—	4	2	52338	—	—	570000	2100000	500	750	319	195	—	—	111.5	—	—	40	—	—	—	190	242	—	3	2	64.9	—	—	52338
200	170	280	109	115.6	133	2	2	52240	54240	54240U	315000	1110000	720	1000	279	204	240	290	66.5	69.8	78.5	24	23	120.5	225	200	232	240	2	2	22.7	22.3	28.0	52240
	170	340	192	—	—	4	2	52340	—	—	625000	2380000	470	710	339	205	—	—	117	—	—	42	—	—	—	200	256	—	3	2	77.8	—	—	52340
220	190	300	110	115.2	134	2	2	52244	54244	54244U	325000	1210000	690	1000	299	224	260	310	67	69.6	79	24	25	114	225	220	252	260	2	2	23.9	22.9	29.6	52244