



● 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.

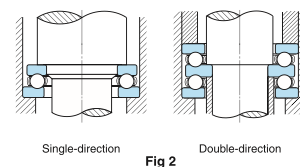
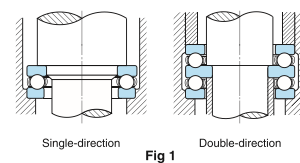
Table 1. Thrust Ball Bearings Series

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 <sup>(1)</sup>	—	—
Double-direction	TAM <sup>(2)</sup>	—	—
	TG <sup>(2)</sup>	—	—
	522	542	542U
	523	543	543U
	524	544	544U

Notes: <sup>(1)</sup> Series O is inch-dimensioned.  
<sup>(2)</sup> 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~



● Cage

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

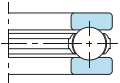


Fig 3. Polyamide

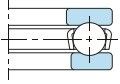


Fig 4. Pressed Steel

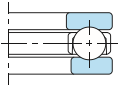


Fig 5. Machined

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<sup>-6</sup>)

Bore No.	Series	Series				Bore No.	Series	Series		Bore No.	Series
		511	512, 522	513, 523	514, 524			29	39		
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	—	—						

● 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<sub>a min</sub>: Minimum axial load (N)

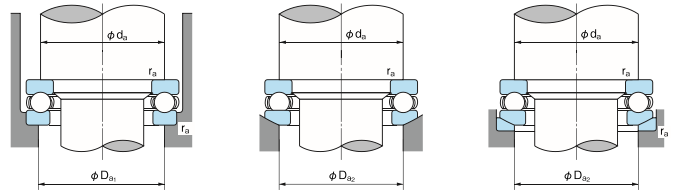
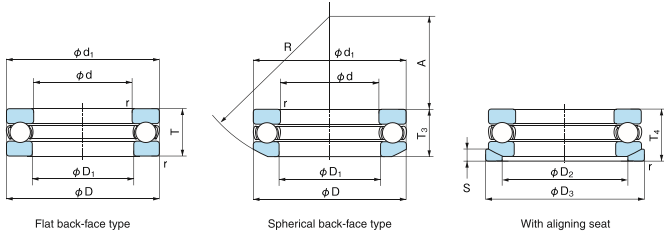
K: minimum axial factor see Table 4

n: Rotating speed (min<sup>-1</sup>)

C<sub>0a</sub>: Basic static load rating (N)

**Single-direction Thrust Ball Bearings**

Bore Diameter: 10~50mm

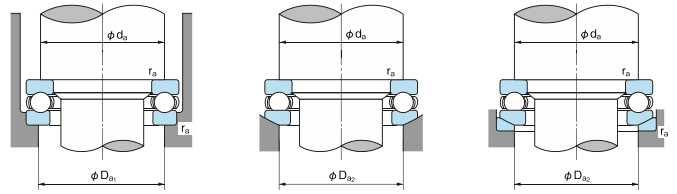
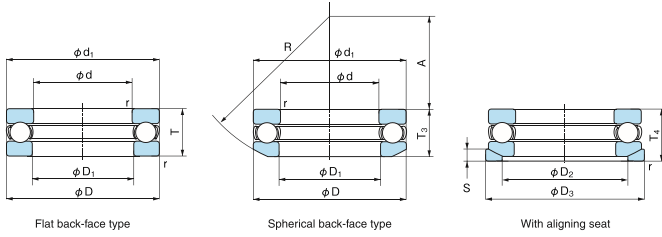


1N=0.102kgf

d	Boundary dimensions (mm)					Bearing No.			Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Limiting speed (min <sup>-1</sup> )		Dimensions (mm)							Abutment and fillet dimensions (mm)				Mass (kg) Reference			Bearing No.
	D	T	T <sub>3</sub>	T <sub>4</sub>	r (min)	Flat back-face type	Spherical back-face type	With aligning seat			Grease lubrication	Oil lubrication	D <sub>1</sub> (min)	d <sub>1</sub> (max)	D <sub>2</sub>	D <sub>3</sub>	S	R	A	d <sub>a</sub> (min)	D <sub>a1</sub> (max)	D <sub>a2</sub> (max)	r <sub>a</sub> (max)	Flat back-face type	Spherical back-face type	With aligning seat	
	10	24	9	—	—	0.3	51100	—			—	10000	14000	6800	10000	11	24	—	—	—	—	18	16	—	0.3	0.020	
12	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
	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
	30	9	—	—	0.3	51103	—	—	10800	18200	6000	9100	18	30	—	—	—	—	25	22	—	0.3	0.028	—	—	51103	
17	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
	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
20	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
25	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
	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
30	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
	52	12	—	—	0.6	51107	—	—	20400	44500	4000	6000	37	52	—	—	—	—	45	42	—	0.6	0.085	—	—	51107	
35	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
45	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
	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
50	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
	70	14	—	—	0.6	51110	—	—	28800	75500	3100	4700	52	70	—	—	—	—	62	58	—	0.6	0.160	—	—	51110	
50	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

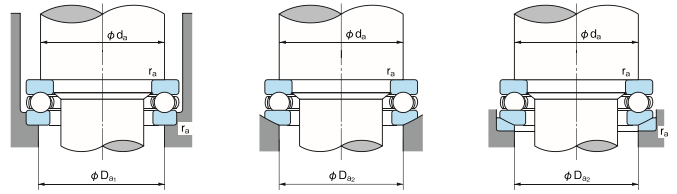
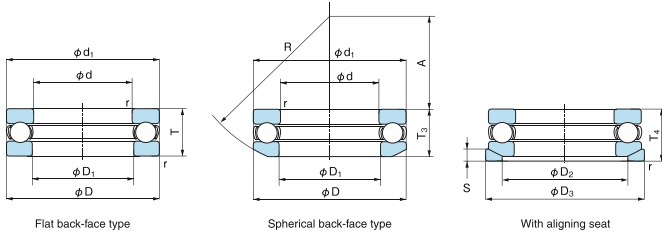


1N=0.102kgf

Boundary dimensions (mm)						Bearing No.			Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Limiting speed (min <sup>-1</sup> )		Dimensions (mm)						Abutment and fillet dimensions (mm)				Mass (kg) Reference			Bearing No.	
d	D	T	T <sub>3</sub>	T <sub>4</sub>	r (min)	Flat back-face type	Spherical back-face type	With aligning seat			Grease lubrication	Oil lubrication	D <sub>1</sub> (min)	d <sub>1</sub> (max)	D <sub>2</sub>	D <sub>3</sub>	S	R	A	d <sub>a</sub> (min)	D <sub>a1</sub> (max)	D <sub>a2</sub> (max)	r <sub>a</sub> (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

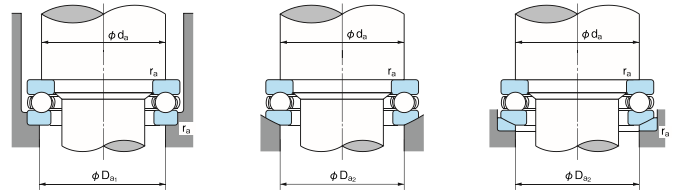
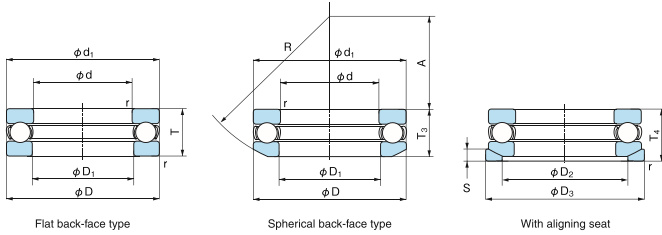


1N=0.102kgf

Boundary dimensions (mm)						Bearing No.			Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Limiting speed (min <sup>-1</sup> )		Dimensions (mm)						Abutment and fillet dimensions (mm)			Mass (kg) Reference			Bearing No.		
d	D	T	T <sub>3</sub>	T <sub>4</sub>	r (min)	Flat back-face type	Spherical back-face type	With aligning seat			Grease lubrication	Oil lubrication	D <sub>1</sub> (min)	d <sub>1</sub> (max)	D <sub>2</sub>	D <sub>3</sub>	S	R	A	d <sub>a</sub> (min)	D <sub>a1</sub> (max)	D <sub>a2</sub> (max)	r <sub>a</sub> (max)	Flat back-face type		Spherical back-face type	With aligning seat
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

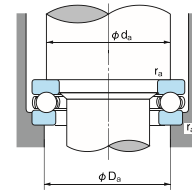
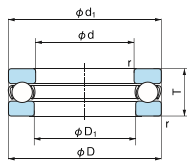


1N=0.102kgf

d	Boundary dimensions (mm)					Bearing No.			Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Limiting speed (min <sup>-1</sup> )		Dimensions (mm)						Abutment and fillet dimensions (mm)				Mass (kg) Reference			Bearing No.	
	D	T	T <sub>3</sub>	T <sub>4</sub>	r (min)	Flat back-face type	Spherical back-face type	With aligning seat			Grease lubrication	Oil lubrication	D <sub>1</sub> (min)	d <sub>1</sub> (max)	D <sub>2</sub>	D <sub>3</sub>	S	R	A	d <sub>a</sub> (min)	D <sub>a1</sub> (max)	D <sub>a2</sub> (max)	r <sub>a</sub> (max)	Flat back-face type	Spherical back-face type		With aligning seat
	200	250	37	—	—	1.1	51140	—			—	172000	675000	1000	1500	—	—	—	—	—	230	220	—	1	4.14		—
200	280	62	65.3	74	2	51240	53240	53240U	315000	1110000	720	1000	—	—	—	—	—	248	232	240	2	12.2	12.0	14.8	51240		
	340	110	118.4	130	4	51340	53340	53340U	625000	2380000	470	710	—	—	—	—	—	284	256	270	3	43.0	43.1	51.0	51340		
	220	270	37	—	—	1.1	51144	—	—	177000	740000	970	1400	—	—	—	—	250	240	—	1	4.51	—	—	51144		
220	300	63	65.6	75	2	51244	53244	53244U	325000	1210000	690	1000	—	—	—	—	—	268	252	260	2	13.5	13.0	16.2	51244		
	240	300	45	—	—	1.5	51148	—	—	228000	935000	830	1200	—	—	—	—	276	264	—	1.5	7.35	—	—	51148		
	340	78	81.6	92	2.1	51248	53248	53248U	430000	1730000	570	860	—	—	—	—	—	300	280	290	2	23.1	22.3	27.4	51248		
240	320	45	—	—	1.5	51152	—	—	232000	990000	800	1200	—	—	—	—	—	296	284	—	1.5	7.94	—	—	51152		
	360	79	82.8	93	2.1	51252	53252	53252U	445000	1880000	550	830	—	—	—	—	—	320	300	305	2	25.0	24.0	29.7	51252		
	260	350	53	—	—	1.5	51156	—	—	315000	1350000	700	1000	—	—	—	—	322	308	—	1.5	12.0	—	—	51156		
260	380	80	85	94	2.1	51256	53256	53256U	450000	1950000	530	800	—	—	—	—	—	340	320	325	2	27.0	26.2	32.3	51256		
	280	380	62	—	—	2	51160	—	—	370000	1660000	610	920	—	—	—	—	348	332	—	2	17.1	—	—	51160		
	300	420	95	100.5	112	3	51260	53260	53260U	585000	2720000	450	680	—	—	—	—	372	348	360	2.5	42.3	41.7	49.9	51260		
300	400	63	—	—	2	51164	—	—	380000	1760000	590	880	—	—	—	—	—	368	352	—	2	18.5	—	—	51164		
	320	440	95	100.5	112	3	51264	53264	53264U	595000	2830000	440	660	—	—	—	—	392	368	380	2.5	44.7	43.8	52.7	51264		
	340	420	64	—	—	2	51168	—	—	385000	1860000	570	850	—	—	—	—	388	372	—	2	19.9	—	—	51168		
340	460	96	100.3	113	3	51268	53268	53268U	600000	2940000	430	640	—	—	—	—	—	412	388	400	2.5	47.6	46.4	56.2	51268		
	360	440	65	—	—	2	51172	—	—	395000	1960000	550	820	—	—	—	—	408	392	—	2	20.4	—	—	51172		
	360	500	110	116.7	130	4	51272	53272	53272U	745000	3800000	380	570	—	—	—	—	444	416	430	3	69.0	67.7	81.5	51272		

**Single-direction Thrust Ball Bearings**  
**Series 2900**

Bore Diameter: 10~140mm

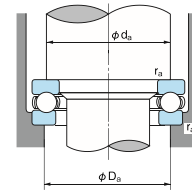
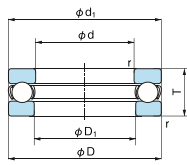


1N=0.102kgf

Boundary dimensions (mm)				Bearing No.	Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Limiting speed (min <sup>-1</sup> )		Dimensions (mm)		Abutment and fillet dimensions (mm)			Mass (kg) Reference	Bearing No.
d	D	T	r (min)				Grease lubrication	Oil lubrication	D <sub>1</sub> (min)	d <sub>1</sub> (max)	d <sub>a</sub> (min)	D <sub>a</sub> (max)	r <sub>a</sub> (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	2904½	18900	34500	4100	6100	22.2	42	34	30	0.6	0.085	2904½
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



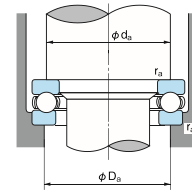
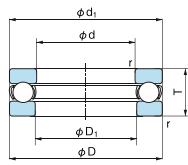
1N=0.102kgf

Boundary dimensions (mm)				Bearing No.	Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Limiting speed (min <sup>-1</sup> )		Dimensions (mm)		Abutment and fillet dimensions (mm)			Mass (kg) Reference	Bearing No.
d	D	T	r (min)				Grease lubrication	Oil lubrication	D <sub>1</sub> (min)	d <sub>1</sub> (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

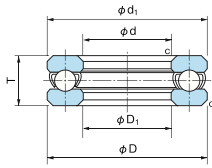


1N=0.102kgf

Boundary dimensions (mm)				Bearing No.	Basic dynamic load rating Ca (N)	Basic static load rating Coa (N)	Limiting speed (min <sup>-1</sup> )		Dimensions (mm)		Abutment and fillet dimensions (mm)			Mass (kg) Reference	Bearing No.
d	D	T	r (min)				Grease lubrication	Oil lubrication	D <sub>1</sub> (min)	d <sub>1</sub> (max)	d <sub>a</sub> (min)	D <sub>a</sub> (max)	r <sub>a</sub> (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	166.888	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

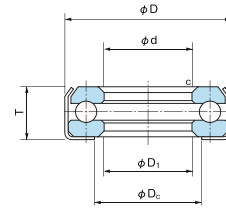


1N=0.102kgf

Boundary dimensions (mm)						Bearing No.	Basic dynamic load rating $C_a$ (N)	Basic static load rating $C_{0a}$ (N)	Mass (kg) Reference
d	D	T	c	D <sub>1</sub>	d <sub>1</sub>				
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



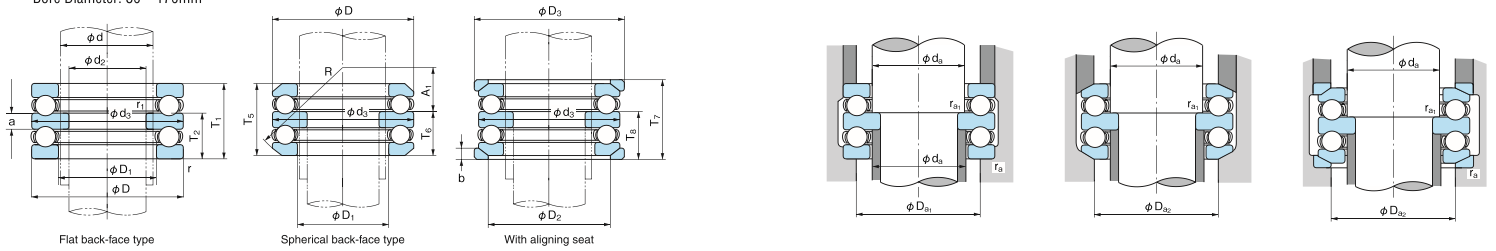
1N=0.102kgf

Boundary dimensions (mm)						Bearing No.	Basic dynamic load rating $C_a$ (N)	Basic static load rating $C_{0a}$ (N)	Mass (kg) Reference
d	D	T	c	D <sub>1</sub>	D <sub>c</sub>				
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: 80~170mm

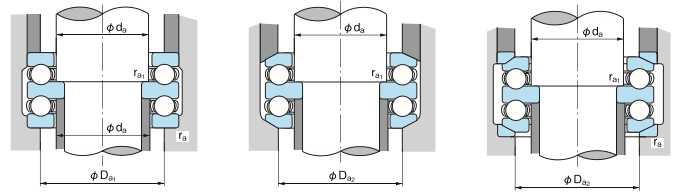
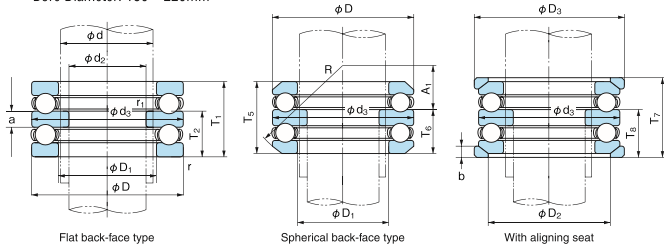


1N=0.102kgf

d	Boundary dimensions (mm)								Bearing No.			Basic dynamic load rating Ca (N)	Basic static load rating Co (N)	Limiting speed (min <sup>-1</sup> )		Dimensions (mm)											Abutment and fillet dimensions (mm)			Mass (kg) Reference			Bearing No.	
	d <sub>2</sub>	D	T <sub>1</sub>	T <sub>2</sub>	T <sub>3</sub>	r (min)	r <sub>1</sub> (min)	r <sub>2</sub> (min)	Flat back-face type	Spherical back-face type	With aligning seat			Grease lubrication	Oil lubrication	d <sub>3</sub> (max)	D <sub>1</sub> (min)	D <sub>2</sub>	D <sub>3</sub>	T <sub>2</sub>	T <sub>6</sub>	T <sub>8</sub>	a	b	A <sub>1</sub>	R	d <sub>s</sub> (min)	D <sub>s1</sub> (max)	D <sub>s2</sub> (max)	r <sub>s</sub> (max)	r <sub>s1</sub> (max)	Flat back-face type		Spherical back-face type
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	83	125	175	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	890	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 <sup>-1</sup> )		Dimensions (mm)										Abutment and fillet dimensions (mm)					Mass (kg) Reference			Bearing No.
d	d2	D	T1	T5	T7	r (min)	r1 (min)	Flat back-face type	Spherical back-face type	With aligning seat	Grease lubrication	Oil lubrication			d3 (max)	D1 (min)	D2	D3	T2	T6	T8	a	b	A1	R	da (min)	Da1 (max)	Da2 (max)	ra (max)	ra1 (max)	Flat back-face type	Spherical back-face type	With aligning seat	16.0	
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	



## Spherical Roller Thrust Bearings

Tolerance ..... Page 52  
 Preload ..... Page 95

Because there are many sliding surfaces in Spherical Roller Thrust Bearings (cage-to-guide-sleeve and roller-ends-to-rib), oil lubricant (not grease) should be used.

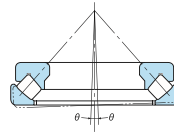
● **Aligning angle**

Maximum permissible misalignment angle is about 2° under general service conditions. If the aligning advantages of this bearing type are to be realized, care must be taken to provide clearance for parts in the surrounding structure.

● **Minimum axial load**

To prevent damage caused by sliding motion between the rollers and raceway, spherical roller thrust bearings must be subjected to a load more than the minimum load,  $F_{a \text{ min}}$ .

$$F_{a \text{ min}} = \frac{C_{0a}}{1000}$$

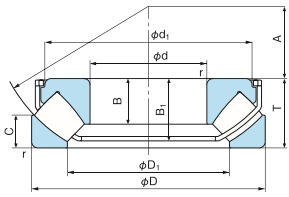


- The safety-factor "S<sub>0</sub>" must be over 4.

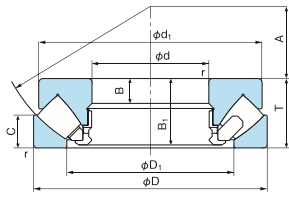


**Spherical Roller Thrust Bearings**

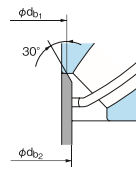
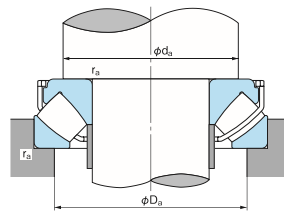
Bore Diameter: 60~130mm



Type EX



Type E



■ **Dynamic equivalent axial load**  
 $F_a = F_r \cdot 1.2F_r$   
 ■ **Static equivalent axial load**  
 $P_{0a} = F_a + 2.7F_r$   
 where,  $F_a$ : Axial load  
 $F_r$ : Radial load  
 However  $\frac{F_r}{F_a} \leq 0.55$   
 However  $F_r/F_a \leq 0.55$  must be satisfied

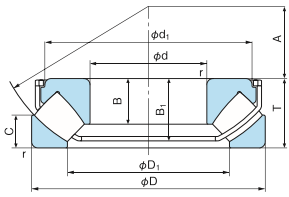
1N=0.102kgf

Boundary dimensions (mm)				Bearing No.	Basic dynamic load rating $C_a$ (N)	Basic static load rating $C_{0a}$ (N)	Limiting speed (min <sup>-1</sup> )		Reference Dimensions (mm)						Abutment and fillet dimensions (mm)			Spacer dimensions (mm)		Mass (kg) (Reference)	Bearing No.
d	D	T	r (min)				Grease lubrication	Oil lubrication	d <sub>1</sub>	D <sub>1</sub>	B	B <sub>1</sub>	C	A	d <sub>a</sub> (min)	D <sub>a</sub> (max)	r <sub>a</sub> (max)	db <sub>1</sub> (max)	db <sub>2</sub> (max)		
60	130	42	1.5	29412E	299000	890000	—	2800	123	89	15	39.5	20	38	91	108	1.5	—	—	2.75	29412E
	130	42	1.5	29412EX	350000	915000	1800	2800	113	87	27	37.1	20	38	91	108	1.5	66.0	66.0	2.50	29412EX
65	140	45	2	29413E	345000	1040000	—	2700	133	96	16	42.5	21	42	99	115	2.0	—	—	3.41	29413E
	140	45	2	29413EX	410000	1110000	1700	2700	123	93.5	29.5	40	21	42	99	115	2.0	72.0	72.0	3.20	29413EX
70	150	48	2	29414E	375000	1110000	—	2400	142	103	17	45.5	23	44	106	125	2.0	—	—	4.16	29414E
	150	48	2	29414EX	490000	1350000	1600	2400	128.3	98.4	32	42.7	23	44	106	125	2.0	75.5	77.5	3.82	29414EX
75	160	51	2	29415E	445000	1380000	—	2300	152	109	18	48	24	47	113	132	2.0	—	—	4.98	29415E
	160	51	2	29415EX	525000	1470000	1600	2300	140	105.6	34.5	45.6	24	47	113	132	2.0	82.5	82.5	4.70	29415EX
80	170	54	2.1	29416E	480000	1490000	—	2100	162	117	19	51	26	50	120	140	2.0	—	—	5.95	29416E
	170	54	2.1	29416EX	580000	1630000	1500	2100	149	113	36	48.2	26	50	120	140	2.0	88.0	88.0	5.60	29416EX
85	150	39	1.5	29317E	293000	990000	—	2700	143.5	114	13	37	19	50	115	135	1.5	—	—	2.87	29317E
	150	39	1.5	29317EX	365000	1060000	1600	2700	134	110.5	25	35	19	50	115	135	1.5	90.0	90.0	2.67	29317EX
	180	58	2.1	29417E	540000	1720000	—	2000	170	125	21	55	28	54	130	150	2.0	—	—	7.19	29417E
	180	58	2.1	29417EX	640000	1810000	1300	2000	158.2	120.5	37	50.6	28	54	130	150	2.0	94.0	94.0	6.69	29417EX
90	155	39	1.5	29318E	300000	1040000	—	2700	148.5	117	13	37	19	52	120	140	1.5	—	—	3.06	29318E
	155	39	1.5	29318EX	355000	1070000	1600	2700	135.2	116	23.8	35.1	19	52	120	140	1.5	95.0	95.0	2.75	29318EX
	190	60	2.1	29418E	620000	2020000	—	1900	180	132	22	57	29	56	135	157	2.0	—	—	8.28	29418E
	190	60	2.1	29418EX	710000	2080000	1300	1900	162	127	40.5	53	29	56	135	157	2.0	99.0	99.0	7.83	29418EX
100	170	42	1.5	29320E	355000	1260000	—	2500	163	129	14	40	20.8	58	130	150	1.5	—	—	3.91	29320E
	170	42	1.5	29320EX	435000	1400000	1500	2500	146.9	126	27	38.2	20.8	58	130	150	1.5	105.0	107.0	3.61	29320EX
	210	67	3	29420E	690000	2230000	—	1700	200	146	24	64	32	62	150	175	2.5	—	—	11.2	29420E
	210	67	3	29420EX	870000	2530000	1100	1700	181	139	44.5	59.6	32	62	150	175	2.5	108.0	110.0	10.6	29420EX
110	190	48	2	29322E	470000	1680000	—	2100	182	143	16	45.5	23	64	145	165	2.0	—	—	5.67	29322E
	190	48	2	29322EX	550000	1730000	1300	2100	165.1	140.6	30.9	44	23	64	145	165	2.0	116.0	117.0	5.22	29322EX
	230	73	3	29422E	845000	2820000	—	1500	220	162	26	69	35	69	165	190	2.5	—	—	14.7	29422E
	230	73	3	29422EX	1060000	3150000	950	1500	199.6	153.4	48	64.4	35	69	165	190	2.5	119.5	120.0	14.0	29422EX
120	210	54	2.1	29324E	565000	2030000	—	1900	200	159	18	51	26	70	160	180	2.0	—	—	7.90	29324E
	210	54	2.1	29324EX	670000	2160000	1100	1900	184.5	155	34.5	48.7	26	70	160	180	2.0	127.0	128.0	7.30	29324EX
	250	78	4	29424E	1030000	3450000	—	1400	236	174	29	74	37	74	180	205	3.0	—	—	18.5	29424E
	250	78	4	29424EX	1210000	3750000	900	1400	218	166.5	54	70.9	37	74	180	205	3.0	131.0	132.0	17.6	29424EX
130	225	58	2.1	29326E	665000	2420000	—	1800	215	171	19	55	28	76	170	195	2.0	—	—	9.45	29326E
	225	58	2.1	29326EX	770000	2440000	1000	1800	197.4	165.8	36.8	52.7	28	76	170	195	2.0	136.0	138.0	8.82	29326EX
	270	85	4	29426E	1140000	3850000	—	1200	255	189	31	81	41	81	195	225	3.0	—	—	23.5	29426E
	270	85	4	29426EX	1400000	4300000	850	1200	236.4	181	56	75	41	81	195	225	3.0	141.5	143.0	22.3	29426EX

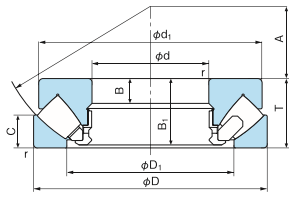
Note: For heavy load application,  $d_a$  should be large enough to support the shaft washer rib.

**Spherical Roller Thrust Bearings**

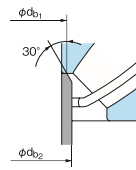
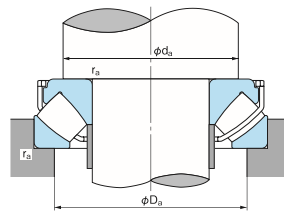
Bore Diameter: 140~240mm



Type EX



Type E



■ **Dynamic equivalent axial load**  
 $F_a = F_r \cdot 1.2Fr$   
 ■ **Static equivalent axial load**  
 $P_{0a} = F_a + 2.7Fr$   
 where,  $F_a$ : Axial load  
 $F_r$ : Radial load  
 However  $\frac{Fr}{Fa} \leq 0.55$   
 However  $Fr/Fa \leq 0.55$  must be satisfied

1N=0.102kgf

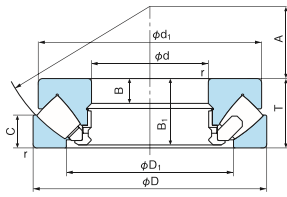
Boundary dimensions (mm)				Bearing No.	Basic dynamic load rating $C_a$ (N)	Basic static load rating $C_{0a}$ (N)	Limiting speed (min <sup>-1</sup> )		Reference Dimensions (mm)						Abutment and fillet dimensions (mm)			Spacer dimensions (mm)		Mass (kg) (Reference)	Bearing No.
d	D	T	r (min)				Grease lubrication	Oil lubrication	d <sub>1</sub>	D <sub>1</sub>	B	B <sub>1</sub>	C	A	d <sub>a</sub> (min)	D <sub>a</sub> (max)	r <sub>a</sub> (max)	db <sub>1</sub> (max)	db <sub>2</sub> (max)		
140	240	60	2.1	29328E	700000	2560000	—	1600	230	183	20	57	29	82	185	205	2.0	—	—	11.2	29328E
	240	60	2.1	29328EX	860000	2840000	950	1600	218.4	179	38.5	54.8	29	82	185	205	2.0	147.5	149.0	10.5	29328EX
	280	85	4	29428E	1200000	4050000	—	1200	268	199	31	81	41	86	205	235	3.0	—	—	24.6	29428E
	280	85	4	29428EX	1410000	4350000	850	1200	246	196	53.6	74.4	41	86	205	235	3.0	153.0	160.0	22.8	29428EX
150	215	39	1.5	29230E	335000	1390000	—	2100	208	178	14	37	19	82	179	196	1.5	—	—	4.60	29230E
	250	60	2.1	29330E	735000	2840000	—	1600	240	194	20	57	29	87	195	215	2.0	—	—	11.7	29330E
	300	90	4	29430E	1330000	4600000	—	1100	285	214	32	86	44	92	220	250	3.0	—	—	29.6	29430E
	300	90	4	29430EX	1630000	5150000	800	1100	265.4	207.5	58.5	80.8	44	92	220	250	3.0	163.0	169.0	27.8	29430EX
160	225	39	1.5	29232E	345000	1470000	—	2100	219	188	14	37	19	85	189	206	1.5	—	—	4.70	29232E
	270	67	3	29332E	880000	3400000	—	1400	260	208	23	64	32	92	210	235	2.5	—	—	15.5	29332E
	270	67	3	29332EX	1040000	3500000	850	1400	243.4	199.8	44	61.4	32	92	210	235	2.5	166.0	174.0	14.5	29332EX
	320	95	5	29432E	1510000	5350000	—	1000	306	229	34	91	45	99	230	265	4.0	—	—	35.9	29432E
320	95	5	29432EX	1820000	5750000	750	1000	283.8	222	62.5	85.7	45	99	230	265	4.0	174.5	181.0	33.4	29432EX	
170	240	42	1.5	29234E	390000	1700000	—	1900	233	198	15	40	20	92	201	218	1.5	—	—	6.00	29234E
	280	67	3	29334E	900000	3550000	—	1400	270	216	23	64	32	96	220	245	2.5	—	—	16.3	29334E
	340	103	5	29434E	1670000	5900000	—	950	324	243	37	99	50	104	245	285	4.0	—	—	44.0	29434E
180	250	42	1.5	29236E	420000	1900000	—	1900	243	208	15	40	21	95	211	228	1.5	—	—	6.30	29236E
	300	73	3	29336E	1020000	3950000	—	1300	290	232	25	69	35	103	235	260	2.5	—	—	20.7	29336E
	360	109	5	29436E	1950000	7000000	—	860	342	255	39	105	52	110	260	300	4.0	—	—	52.2	29436E
190	270	48	2	29238E	540000	2300000	—	1800	262	223	15	45	24	104	225	245	2.0	—	—	8.50	29238E
	320	78	4	29338E	1170000	4550000	—	1100	308	246	27	74	38	110	250	275	3.0	—	—	25.5	29338E
	380	115	5	29438E	2120000	7750000	—	800	360	271	41	111	55	117	275	320	4.0	—	—	61.4	29438E
200	280	48	2	29240E	550000	2410000	—	1800	271	236	15	45	24	108	235	255	2.0	—	—	9.08	29240E
	340	85	4	29340E	1350000	5250000	—	1000	325	261	29	81	41	116	265	295	3.0	—	—	32.0	29340E
	400	122	5	29440E	2350000	8450000	—	740	380	286	43	117	59	122	290	335	4.0	—	—	73.0	29440E
220	300	48	2	29244E	595000	2750000	—	1600	292	254	15	45	24	117	260	275	2.0	—	—	9.84	29244E
	360	85	4	29344E	1410000	5750000	—	1000	345	280	29	81	41	125	285	315	3.0	—	—	34.5	29344E
	420	122	6	29444E	2410000	8950000	—	720	400	308	43	117	58	132	310	355	5.0	—	—	74.2	29444E
240	340	60	2.1	29248E	890000	4000000	—	1300	330	283	19	57	30	130	285	305	2.0	—	—	17.1	29248E
	380	85	4	29348E	1410000	5850000	—	980	365	300	29	81	41	135	300	330	3.0	—	—	36.3	29348E
	440	122	6	29448E	2480000	9450000	—	720	420	326	43	117	59	142	330	375	5.0	—	—	83.0	29448E

Note: For heavy load application,  $d_a$  should be large enough to support the shaft washer.

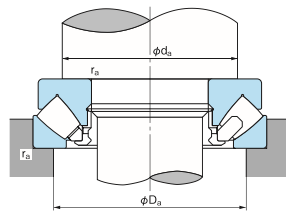


**Spherical Roller Thrust Bearings**

Bore Diameter: 260~460mm



Type E



■ **Dynamic equivalent axial load**  
 $F_a = F_a + 1.2F_r$   
 ■ **Static equivalent axial load**  
 $P_{0a} = F_a + 2.7F_r$   
 where,  $F_a$ : Axial load  
 $F_r$ : Radial load  
 However  $\frac{F_r}{F_a} \leq 0.55$   
 However  $\frac{F_r}{F_a} \leq 0.55$  must be satisfied

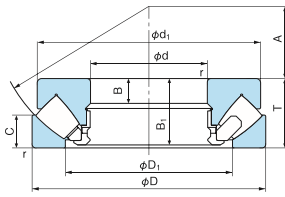
1N=0.102kgf

Boundary dimensions (mm)				Bearing No.	Basic dynamic load rating $C_a$ (N)	Basic static load rating $C_{0a}$ (N)	Limiting speed (min <sup>-1</sup> )		Reference Dimensions (mm)						Abutment and fillet dimensions (mm)			Spacer dimensions (mm)		Mass (kg) (Reference)	Bearing No.
d	D	T	r (min)				Grease lubrication	Oil lubrication	d <sub>1</sub>	D <sub>1</sub>	B	B <sub>1</sub>	C	A	d <sub>a</sub> (min)	D <sub>a</sub> (max)	r <sub>a</sub> (max)	db <sub>1</sub> (max)	db <sub>2</sub> (max)		
260	360	60	2.1	29252E	915000	4250000	—	1300	350	302	19	57	30	139	305	325	2.0	—	—	18.5	29252E
	420	95	5	29352E	1810000	7500000	—	860	405	329	32	91	45	148	330	365	4.0	—	—	51.5	29352E
	480	132	6	29452E	2940000	11600000	—	640	460	357	48	127	64	154	360	405	5.0	—	—	106	29452E
280	380	60	2.1	29256E	935000	4500000	—	1200	370	323	19	57	30	150	325	345	2.0	—	—	19.5	29256E
	440	95	5	29356E	1850000	7950000	—	840	423	348	32	91	46	158	350	390	4.0	—	—	54.0	29356E
	520	145	6	29456E	3450000	13500000	—	580	495	387	52	140	68	166	390	440	5.0	—	—	137	29456E
300	420	73	3	29260E	1220000	5850000	—	1000	405	353	21	69	38	162	355	380	2.5	—	—	31.0	29260E
	480	109	5	29360E	2310000	10000000	—	720	460	379	37	105	50	168	380	420	4.0	—	—	75.4	29360E
	540	145	6	29460E	3650000	14800000	—	540	515	402	52	140	70	175	410	460	5.0	—	—	146	29460E
320	440	73	3	29264E	1270000	6150000	—	980	430	372	21	69	38	172	375	400	2.5	—	—	32.8	29264E
	500	109	5	29364E	2370000	10600000	—	720	482	399	37	105	53	180	400	440	4.0	—	—	80.0	29364E
	580	155	7.5	29464E	4050000	16800000	—	480	555	435	55	149	75	191	435	495	6.0	—	—	179	29464E
340	460	73	3	29268E	1290000	6350000	—	950	445	395	21	69	37	183	395	420	2.5	—	—	34.5	29268E
	540	122	5	29368E	2850000	12400000	—	630	520	428	41	117	59	192	430	470	4.0	—	—	106	29368E
	620	170	7.5	29468E	4750000	19300000	—	430	590	462	61	164	82	201	465	530	6.0	—	—	228	29468E
360	500	85	4	29272E	1650000	8050000	—	830	485	423	25	81	44	194	420	455	3.0	—	—	50.4	29272E
	560	122	5	29372E	2900000	12900000	—	600	540	448	41	117	59	202	450	495	4.0	—	—	111	29372E
	640	170	7.5	29472E	4900000	20500000	—	410	610	480	61	164	82	210	485	550	6.0	—	—	234	29472E
380	520	85	4	29276E	1780000	8800000	—	800	505	441	27	81	42	202	440	475	3.0	—	—	52.8	29276E
	600	132	6	29376E	3400000	15300000	—	540	580	477	44	127	63	216	480	525	5.0	—	—	140	29376E
	670	175	7.5	29476E	5200000	22000000	—	400	640	504	63	168	85	230	510	575	6.0	—	—	263	29476E
400	540	85	4	29280E	1840000	9250000	—	800	526	460	27	81	42	212	460	490	3.0	—	—	55.1	29280E
	620	132	6	29380E	3550000	16300000	—	530	596	494	44	127	64	225	500	550	5.0	—	—	146	29380E
	710	185	7.5	29480E	5850000	25000000	—	360	680	534	67	178	89	236	540	610	6.0	—	—	314	29480E
420	580	95	5	29284E	2260000	11300000	—	700	564	489	30	91	46	225	490	525	4.0	—	—	74.9	29284E
	650	140	6	29384E	3900000	17900000	—	480	626	520	48	135	68	235	525	575	5.0	—	—	170	29384E
	730	185	7.5	29484E	6050000	26000000	—	360	700	556	67	178	89	244	560	630	6.0	—	—	325	29484E
440	600	95	5	29288E	2290000	11800000	—	660	585	508	30	91	49	235	510	545	4.0	—	—	79.0	29288E
	680	145	6	29388E	4050000	19000000	—	450	655	548	49	140	70	245	550	600	5.0	—	—	192	29388E
	780	206	9.5	29488E	6950000	30000000	—	300	745	588	74	199	100	260	595	670	8.0	—	—	421	29488E
460	620	95	5	29292E	2290000	11900000	—	660	605	530	30	91	46	245	530	570	4.0	—	—	80.9	29292E
	710	150	6	29392E	4600000	21700000	—	430	685	567	51	144	72	257	575	630	5.0	—	—	216	29392E
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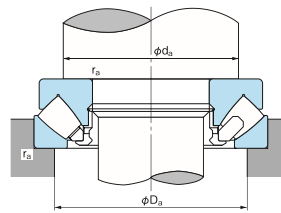
Note: For heavy load application,  $d_s$  should be large enough to support the shaft washer rib.

**Spherical Roller Thrust Bearings**

Bore Diameter: 480~530mm



Type E



■ **Dynamic equivalent axial load**  
 $F_a = F_r + 1.2F_r$   
 ■ **Static equivalent axial load**  
 $P_{0a} = F_a + 2.7F_r$   
 where,  $F_a$ : Axial load  
 $F_r$ : Radial load  
 However  $\frac{F_r}{F_a} \leq 0.55$   
 However  $F_r/F_a \leq 0.55$  must be satisfied

1N=0.102kgf

Boundary dimensions (mm)				Bearing No.	Basic dynamic load rating $C_a$ (N)	Basic static load rating $C_{0a}$ (N)	Limiting speed (min <sup>-1</sup> )		Reference Dimensions (mm)						Abutment and fillet dimensions (mm)			Spacer dimensions (mm)		Mass (kg) (Reference)	Bearing No.
d	D	T	r (min)				Grease lubrication	Oil lubrication	d <sub>1</sub>	D <sub>1</sub>	B	B <sub>1</sub>	C	A	d <sub>a</sub> (min)	D <sub>a</sub> (max)	r <sub>a</sub> (max)	db <sub>1</sub> (max)	db <sub>2</sub> (max)		
480	650	103	5	29296E	2530000	13200000	—	600	635	556	33	99	55	259	555	595	4.0	—	—	97.5	29296E
	730	150	6	29396E	4630000	21900000	—	410	705	590	51	144	72	270	595	650	5.0	—	—	224	29396E
	850	224	9.5	29496E	8250000	36000000	—	260	810	638	81	216	108	280	645	730	8.0	—	—	543	29496E
500	670	103	5	292/500E	2590000	13800000	—	600	654	574	33	99	55	268	575	615	4.0	—	—	101	292/500E
	750	150	6	293/500E	4700000	22600000	—	410	725	611	51	144	74	280	615	670	5.0	—	—	231	293/500E
	870	224	9.5	294/500E	8250000	35000000	—	250	830	661	81	216	107	290	670	750	8.0	—	—	559	294/500E
530	710	109	5	292/530E	2820000	15100000	—	540	692	612	35	105	57	288	615	653	4.0	—	—	106	292/530E

Note: For heavy load application,  $d_s$  should be large enough to support the shaft washer rib.