

KOYO



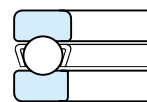
Thrust ball bearings

Thrust ball bearings are divided into single and double direction types. The former is able to accommodate axial load in one direction, while the latter is able to accommodate it in both directions.

Neither is suitable for applications that involve radial load or high-speed rotation.

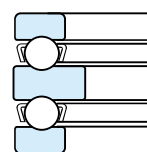
Bearings whose housing race back face is spherical (with a spherical back face or aligning seat race) are designed with a self-aligning capability and can accommodate the effects of inaccurate mounting.

Single direction thrust ball bearings



Bore diameter **10 – 360** mm

Double direction thrust ball bearings

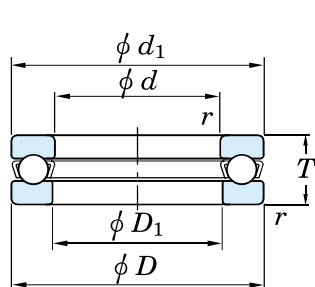


Bore diameter **10 – 190** mm

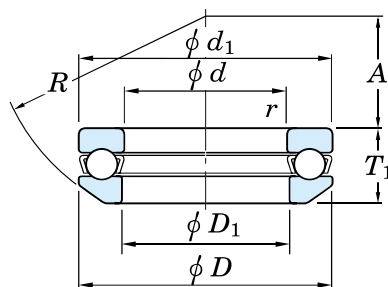
Boundary dimensions	As specified in JIS B 1512.																																																																																
Tolerances	As specified in JIS B 1514-2. (refer to Table 7-9 on p. A 74.)																																																																																
Recommended fits	Refer to Table 9-8 on p. A 98.																																																																																
Standard cages	<ul style="list-style-type: none"> • Pressed cage (supplementary code : //) • Copper alloy or carbon steel machined cage (supplementary code : FY or FC) • Polyamide resin molded cage (supplementary code : MG) 																																																																																
Application of standard cages																																																																																	
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Required minimum axial load	A certain degree of load is necessary in order for bearings to operate satisfactorily. (refer to p. A 116.)																																																																																
Allowable misalignment	Misalignment not allowed. (for flat back face type.)																																																																																
Equivalent axial load	Dynamic equivalent axial load $P_a = F_a$ Static equivalent axial load $P_{0a} = F_a$																																																																																

Single direction thrust ball bearings

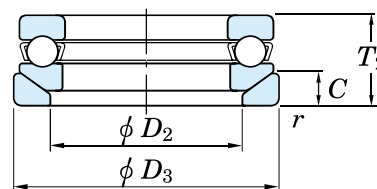
d 10 ~ (40) mm



With flat back faces



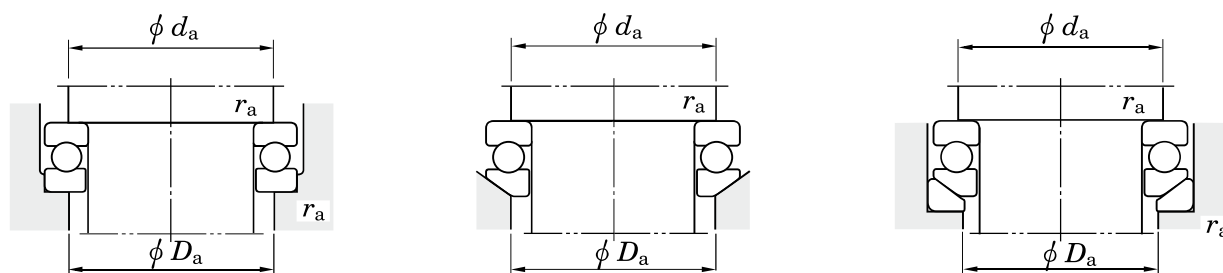
With spherical back face



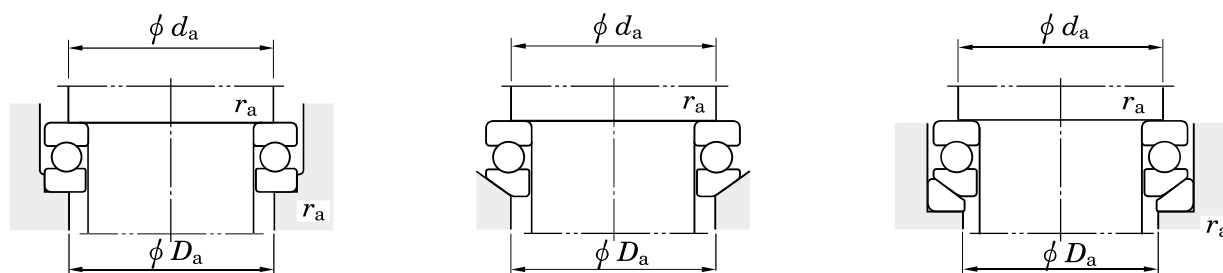
With aligning seat race

Boundary dimensions (mm)						Basic load ratings (kN)		Fatigue load limit (kN)	Limiting speeds (min ⁻¹)		Bearing No.	
d	D	T	T_1	T_2	$r_{min.}$	C_a	C_{0a}	C_u	Grease lub.	Oil lub.	With flat back faces	With spherical back face
10	24	9	—	—	0.3	12.5	14.0	0.630	6 500	10 000	51100	—
	26	11	11.6	13	0.6	15.8	17.1	0.770	5 700	8 800	51200	53200
12	26	9	—	—	0.3	12.9	14.0	0.690	6 500	10 000	51101	—
	28	11	11.4	13	0.6	16.5	19.0	0.860	5 400	8 300	51201	53201
15	28	9	—	—	0.3	13.2	15.4	0.760	6 100	9 400	51102	—
	32	12	13.3	15	0.6	20.8	24.8	1.10	4 900	7 500	51202	53202
17	30	9	—	—	0.3	13.5	18.2	0.820	6 100	9 400	51103	—
	35	12	13.2	15	0.6	21.5	27.3	1.25	4 900	7 500	51203	53203
20	35	10	—	—	0.3	17.8	24.7	1.10	5 100	7 900	51104	—
	40	14	14.7	17	0.6	27.9	37.7	1.70	3 900	6 000	51204	53204
25	42	11	—	—	0.6	24.4	37.2	1.70	4 400	6 800	51105	—
	47	15	16.7	19	0.6	34.6	50.4	2.30	3 600	5 500	51205	53205
	52	18	19.8	22	1	44.7	61.4	2.75	3 100	4 800	51305	53305
	60	24	26.4	29	1	69.5	89.4	4.05	2 600	4 000	51405	53405
30	47	11	—	—	0.6	25.5	42.2	1.90	4 300	6 600	51106	—
	52	16	17.8	20	0.6	36.7	58.2	2.65	3 400	5 200	51206	53206
	60	21	22.6	25	1	53.5	78.7	3.55	2 700	4 200	51306	53306
	70	28	30.1	33	1	91.0	126	5.70	2 200	3 400	51406	53406
35	52	12	—	—	0.6	25.5	47.2	2.00	3 900	6 000	51107	—
	62	18	19.9	22	1	48.9	78.2	3.55	2 900	4 500	51207	53207
	68	24	25.6	28	1	69.3	105	4.75	2 400	3 700	51307	53307
	80	32	34	37	1.1	109	155	7.00	1 900	2 900	51407	53407
40	60	13	—	—	0.6	33.6	62.8	2.85	3 400	5 300	51108	—
	68	19	20.3	23	1	58.7	98.3	4.45	2 700	4 200	51208	53208
	78	26	28.5	31	1	86.6	135	6.05	2 100	3 300	51308	53308

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



With aligning seat race	Dimensions (mm)							Mounting dimensions (mm)			(Refer.) Mass (kg)		
	d_1 max.	D_1 min.	D_2	D_3	A	R	C	d_a min.	D_a max.	r_a max.	With flat back faces	With spherical back face	With aligning seat race
— 53200U	24 26	11 12	— 18	— 28	— 8.5	— 22	— 3.5	18 20	16 16	0.3 0.6	0.020 0.030	— 0.029	— 0.037
— 53201U	26 28	13 14	— 20	— 30	— 11.5	— 25	— 3.5	20 22	18 18	0.3 0.6	0.022 0.034	— 0.031	— 0.043
— 53202U	28 32	16 17	— 24	— 35	— 12	— 28	— 4	23 25	20 22	0.3 0.6	0.024 0.046	— 0.048	— 0.062
— 53203U	30 35	18 19	— 26	— 38	— 16	— 32	— 4	25 28	22 24	0.3 0.6	0.028 0.053	— 0.055	— 0.070
— 53204U	35 40	21 22	— 30	— 42	— 18	— 36	— 5	29 32	26 28	0.3 0.6	0.040 0.082	— 0.080	— 0.100
— 53205U	42 47	26 27	— 36	— 50	— 19	— 40	— 5.5	35 38	32 34	0.6 0.6	0.059 0.120	— 0.120	— 0.152
53305U	52	27	38	55	21	45	6	41	36	1	0.180	0.180	0.224
53405U	60	27	42	62	19	50	8	46	39	1	0.340	0.350	0.442
— 53206U	47 52	32 32	— 42	— 55	— 22	— 45	— 5.5	40 43	37 39	0.6 0.6	0.068 0.150	— 0.160	— 0.193
53306U	60	32	45	62	22	50	7	48	42	1	0.270	0.270	0.326
53406U	70	32	50	75	20	56	9	54	46	1	0.530	0.530	0.660
— 53207U	52 62	37 37	— 48	— 65	— 24	— 50	— 7	45 51	42 46	0.6 1	0.090 0.220	— 0.220	— 0.277
53307U	68	37	52	72	24	56	7.5	55	48	1	0.390	0.400	0.484
53407U	80	37	58	85	23	64	10	62	53	1	0.790	0.790	0.960
— 53208U	60 68	42 42	— 55	— 72	— 28.5	— 56	— 7	52 57	48 51	0.6 1	0.120 0.270	— 0.270	— 0.340
53308U	78	42	60	82	28	64	8.5	63	55	1	0.550	0.570	0.690

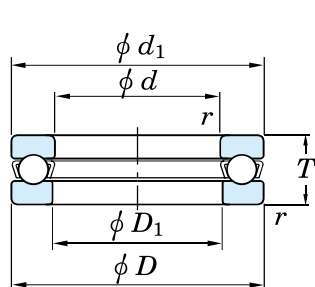


With aligning seat race	Dimensions (mm)							Mounting dimensions (mm)			(Refer.) Mass (kg)		
	d_1 max.	D_1 min.	D_2	D_3	A	R	C	d_a min.	D_a max.	r_a max.	With flat back faces	With spherical back face	With aligning seat race
53408U	90	42	65	95	26	72	12	70	60	1	1.14	1.12	1.37
—	65	47	—	—	—	—	—	57	53	0.6	0.150	—	—
53209U	73	47	60	78	26	56	7.5	62	56	1	0.320	0.310	0.397
53309U	85	47	65	90	25	64	10	69	61	1	0.690	0.680	0.850
53409U	100	47	72	105	29	80	12.5	78	67	1	1.47	1.50	1.82
—	70	52	—	—	—	—	—	62	58	0.6	0.160	—	—
53210U	78	52	62	82	32.5	64	7.5	67	61	1	0.390	0.380	0.480
53310U	95	52	72	100	28	72	11	77	68	1	1.00	1.01	1.24
53410U	110	52	80	115	35	90	14	86	74	1.5	1.99	1.97	2.38
—	78	57	—	—	—	—	—	69	64	0.6	0.240	—	—
53211U	90	57	72	95	35	72	9	76	69	1	0.610	0.620	0.770
53311U	105	57	80	110	30	80	11.5	85	75	1	1.34	1.41	1.69
53411U	120	57	88	125	28	90	15.5	94	81	1.5	2.64	2.57	3.10
—	85	62	—	—	—	—	—	75	70	1	0.290	—	—
53212U	95	62	78	100	32.5	72	9	81	74	1	0.690	0.690	0.850
53312U	110	62	85	115	41	90	11.5	90	80	1	1.43	1.47	1.78
53412U	130	62	95	135	34	100	16	102	88	1.5	3.51	3.44	4.13
—	90	67	—	—	—	—	—	80	75	1	0.340	—	—
53213U	100	67	82	105	40	80	9	86	79	1	0.770	0.750	0.930
53313U	115	67	90	120	38.5	90	12.5	95	85	1	1.57	1.61	1.95
53413U	140	68	100	145	40	112	17.5	110	95	2	4.47	4.47	5.28
—	95	72	—	—	—	—	—	85	80	1	0.360	—	—
53214U	105	72	88	110	38	80	9	91	84	1	0.810	0.800	0.990
53314U	125	72	98	130	43	100	13	103	92	1	2.06	2.15	2.56
53414U	150	73	110	155	34	112	19.5	118	102	2	5.48	5.38	6.37

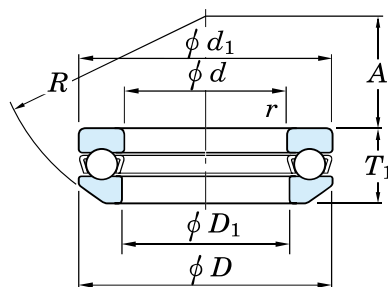
B 341

Single direction thrust ball bearings

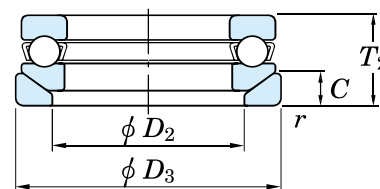
d 75 ~ (120) mm



With flat back faces



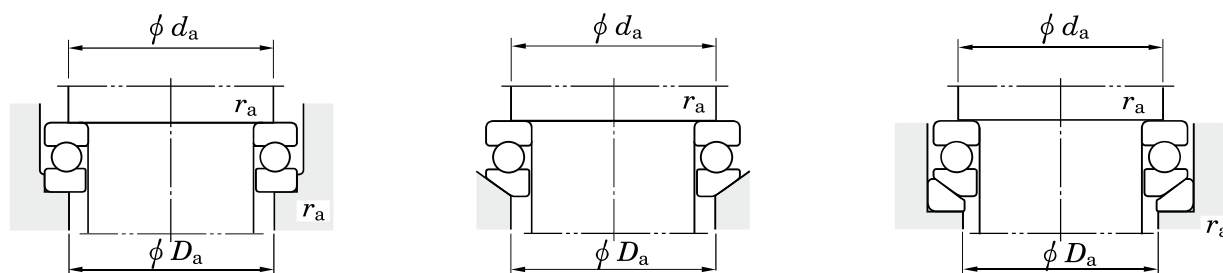
With spherical back face



With aligning seat race

Boundary dimensions (mm)						Basic load ratings (kN)		Fatigue load limit (kN)	Limiting speeds (min ⁻¹)		Bearing No.	
d	D	T	T_1	T_2	$r_{min.}$	C_a	C_{0a}	C_u	Grease lub.	Oil lub.	With flat back faces	With spherical back face
75	100	19	—	—	1	55.5	136	6.15	2 200	3 400	51115	—
	110	27	28.3	32	1	96.7	209	9.40	1 800	2 700	51215	53215
	135	44	48.1	52	1.5	192	339	15.0	1 200	1 900	51315	53315
	160	65	69	75	2	315	560	23.3	880	1 350	51415	53415
80	105	19	—	—	1	55.8	141	6.35	2 100	3 300	51116	—
	115	28	29.5	33	1	98.1	218	9.85	1 700	2 600	51216	53216
	140	44	47.6	52	1.5	200	368	15.8	1 200	1 800	51316	53316
	170	68	72.2	78	2.1	337	621	25.1	810	1 250	51416	53416
85	110	19	—	—	1	57.4	150	6.80	2 100	3 200	51117	—
	125	31	33.1	37	1	119	264	11.6	1 500	2 300	51217	53217
	150	49	53.1	58	1.5	232	419	17.5	1 100	1 700	51317	53317
	180	72	77	83	2.1	384	753	29.5	780	1 200	51417	53417
90	120	22	—	—	1	74.6	190	8.40	1 900	2 900	51118	—
	135	35	38.5	42	1.1	146	326	13.9	1 400	2 100	51218	53218
	155	50	54.6	59	1.5	242	454	18.5	1 000	1 600	51318	53318
	190	77	81.2	88	2.1	409	826	31.5	710	1 100	51418	53418
100	135	25	—	—	1	106	268	11.2	1 600	2 500	51120	—
	150	38	40.9	45	1.1	183	410	16.6	1 200	1 900	51220	53220
	170	55	59.2	64	1.5	296	595	23.2	940	1 450	51320	53320
	210	85	90	98	3	460	983	35.7	620	950	51420	53420
110	145	25	—	—	1	109	288	11.5	1 600	2 400	51122	—
	160	38	40.2	45	1.1	191	450	17.6	1 200	1 800	51222	53222
	190	63	67.2	72	2	334	704	25.9	810	1 250	51322	53322
	230	95	—	—	3	474	1 070	37.1	550	850	51422	—
120	155	25	—	—	1	111	305	11.9	1 500	2 300	51124	—

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

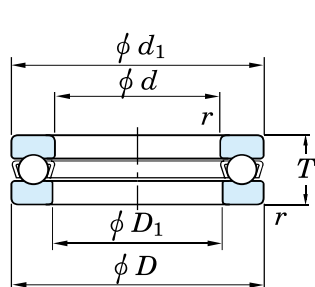


With aligning seat race	Dimensions (mm)							Mounting dimensions (mm)			(Refer.) Mass (kg)		
	d_1 max.	D_1 min.	D_2	D_3	A	R	C	d_a min.	D_a max.	r_a max.	With flat back faces	With spherical back face	With aligning seat race
—	100	77	—	—	—	—	—	90	85	1	0.420	—	—
53215U	110	77	92	115	49	90	9.5	96	89	1	0.860	0.850	1.06
53315U	135	77	105	140	37	100	15	111	99	1.5	2.68	2.72	3.27
53415U	160	78	115	165	42	125	21	125	110	2	6.75	6.64	7.87
—	105	82	—	—	—	—	—	95	90	1	0.430	—	—
53216U	115	82	98	120	46	90	10	101	94	1	0.950	0.930	1.15
53316U	140	82	110	145	50	112	15	116	104	1.5	2.82	2.86	3.43
53416U	170	83	125	175	36	125	22	133	117	2	7.97	7.84	9.22
—	110	87	—	—	—	—	—	100	95	1	0.460	—	—
53217U	125	88	105	130	52	100	11	109	101	1	1.29	1.28	1.57
53317U	150	88	115	155	43	112	17.5	124	111	1.5	3.66	3.63	4.44
53417U	177	88	130	185	47	140	23	141	124	2	9.29	9.20	10.8
—	120	92	—	—	—	—	—	108	102	1	0.680	—	—
53218U	135	93	110	140	45	100	13.5	117	108	1	1.77	1.77	2.19
53318U	155	93	120	160	40	112	18	129	116	1.5	3.88	3.87	4.71
53418U	187	93	140	195	40	140	25.5	149	131	2	11.0	10.7	12.6
—	135	102	—	—	—	—	—	121	114	1	0.990	—	—
53220U	150	103	125	155	52	112	14	130	120	1	2.36	2.34	2.84
53320U	170	103	135	175	46	125	18	142	128	1.5	5.11	5.10	6.05
53420U	205	103	155	220	50	160	27	165	145	2.5	14.6	14.5	17.4
—	145	112	—	—	—	—	—	131	124	1	1.08	—	—
53222U	160	113	135	165	65	125	14	140	130	1	2.57	2.50	3.06
53322U	187	113	150	195	51	140	20.5	158	142	2	7.72	7.63	8.90
—	225	113	—	—	—	—	—	181	159	2.5	19.8	—	—
—	155	122	—	—	—	—	—	141	134	1	1.16	—	—

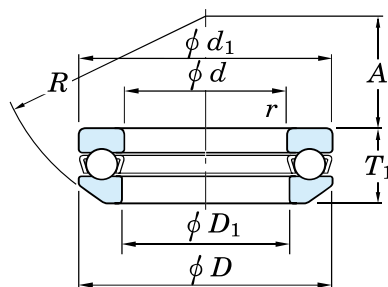
B 343

Single direction thrust ball bearings

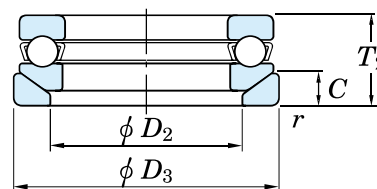
d (120) ~ (180) mm



With flat back faces



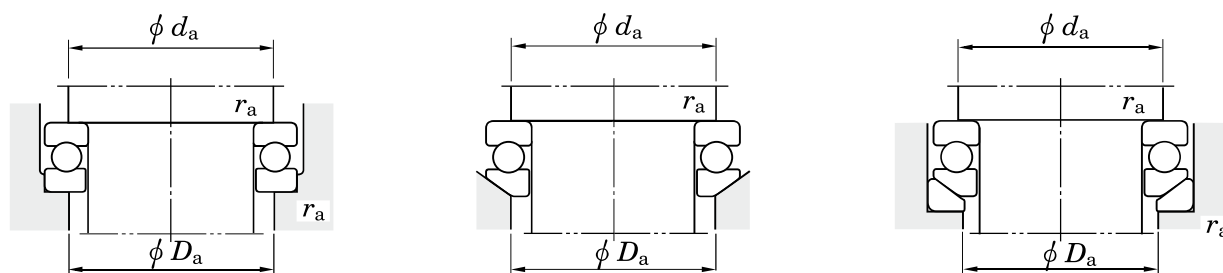
With spherical back face



With aligning seat race

d	Boundary dimensions (mm)					Basic load ratings (kN)		Fatigue load limit (kN)	Limiting speeds (min ⁻¹)		Bearing No.	
	D	T	T_1	T_2	$r_{min.}$	C_a	C_{0a}	C_u	Grease lub.	Oil lub.	With flat back faces	With spherical back face
120	170	39	40.8	46	1.1	192	470	17.7	1 100	1 700	51224	53224
	210	70	74.1	80	2.1	389	869	30.5	710	1 100	51324	53324
	250	102	—	—	4	601	1 460	48.5	520	800	51424	—
130	170	30	—	—	1	130	350	13.0	1 300	2 000	51126	—
	190	45	47.9	53	1.5	254	620	22.2	970	1 500	51226	53226
	225	75	80.3	86	2.1	413	958	32.5	650	1 000	51326	53326
	270	110	—	—	4	623	1 540	49.0	490	750	51426	—
140	180	31	—	—	1	133	375	13.5	1 200	1 900	51128	—
	200	46	48.6	55	1.5	234	650	19.6	940	1 450	51228	53228
	240	80	84.9	92	2.1	458	1 130	36.9	620	950	51328	53328
	280	112	—	—	4	650	1 680	52.2	450	700	51428	—
150	190	31	—	—	1	137	400	13.9	1 200	1 900	51130	—
	215	50	53.3	60	1.5	266	652	21.8	840	1 300	51230	53230
	250	80	83.7	92	2.1	451	1 130	36.0	580	900	51330	53330
	300	120	—	—	4	711	1 910	57.4	420	650	51430	—
160	200	31	—	—	1	140	425	14.4	1 200	1 800	51132	—
	225	51	54.7	61	1.5	279	718	23.4	810	1 250	51232	53232
	270	87	91.7	100	3	512	1 340	41.3	550	850	51332	53332
	320	130	—	—	5	852	2 410	70.3	390	600	51432	—
170	215	34	—	—	1.1	168	510	16.7	1 100	1 700	51134	—
	240	55	58.7	65	1.5	326	834	26.3	750	1 150	51234	53234
	280	87	91.3	100	3	579	1 570	47.4	520	800	51334	53334
	340	135	—	—	5	943	2 730	77.2	360	550	51434	—
180	225	34	—	—	1.1	168	525	16.7	1 000	1 600	51136	—
	250	56	58.2	66	1.5	332	874	26.9	710	1 100	51236	53236
	300	95	99.3	109	3	578	1 580	46.2	490	750	51336	53336

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

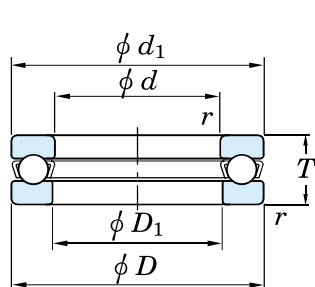


With aligning seat race	Dimensions (mm)							Mounting dimensions (mm)			(Refer.) Mass (kg)		
	d_1 max.	D_1 min.	D_2	D_3	A	R	C	d_a min.	D_a max.	r_a max.	With flat back faces	With spherical back face	With aligning seat race
53224U	170	123	145	175	61	125	15	150	140	1	2.86	2.81	3.46
53324U	205	123	165	220	63	160	22	173	157	2	10.6	10.4	12.4
—	245	123	—	—	—	—	—	196	174	3	25.0	—	—
—	170	132	—	—	—	—	—	154	146	1	1.87	—	—
53226U	187	133	160	195	67	140	17	166	154	1.5	4.09	3.98	4.88
53326U	220	134	177	235	53	160	26	186	169	2	13.0	12.7	15.2
—	265	134	—	—	—	—	—	212	188	3	31.4	—	—
—	178	142	—	—	—	—	—	164	156	1	2.02	—	—
53228U	197	143	170	210	87	160	17	176	164	1.5	4.46	4.35	5.89
53328U	235	144	190	250	68	180	26	199	181	2	15.5	15.1	18.0
—	275	144	—	—	—	—	—	222	198	3	33.9	—	—
—	188	152	—	—	—	—	—	174	166	1	2.15	—	—
53230U	212	153	180	225	79	160	20.5	189	176	1.5	5.64	5.45	7.14
53330U	245	154	200	260	89.5	200	26	209	191	2	16.3	15.7	18.8
—	295	154	—	—	—	—	—	238	212	3	41.6	—	—
—	198	162	—	—	—	—	—	184	176	1	2.28	—	—
53232U	222	163	190	235	74	160	21	199	186	1.5	6.53	6.09	7.90
53332U	265	164	215	280	77	200	29	225	205	2.5	21.0	21.0	23.4
—	315	164	—	—	—	—	—	254	226	4	51.2	—	—
—	213	172	—	—	—	—	—	197	188	1	3.25	—	—
53234U	237	173	200	250	91	180	21.5	212	198	1.5	8.12	7.69	9.83
53334U	275	174	220	290	105	225	29	235	215	2.5	22.0	22.0	24.5
—	335	174	—	—	—	—	—	270	240	4	60.0	—	—
—	222	183	—	—	—	—	—	207	198	1	3.39	—	—
53236U	247	183	210	260	112	200	21.5	222	208	1.5	8.68	8.08	10.4
53336U	295	184	240	310	91	225	32	251	229	2.5	28.1	26.9	29.9

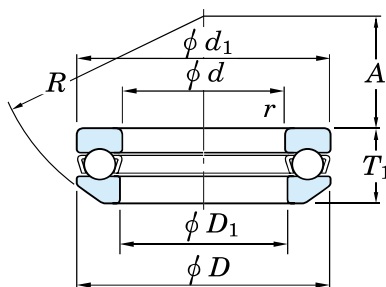
B 345

Single direction thrust ball bearings

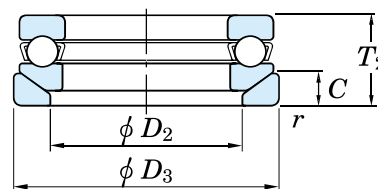
d (180) ~ 360 mm



With flat back faces



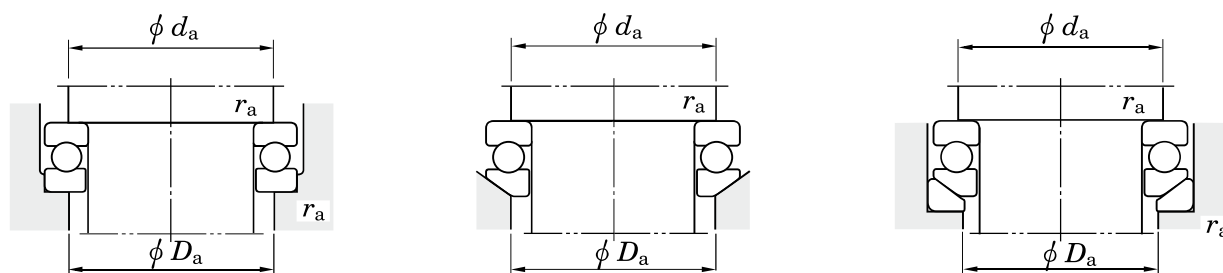
With spherical back face



With aligning seat race

Boundary dimensions (mm)						Basic load ratings (kN)		Fatigue load limit (kN)	Limiting speeds (min ⁻¹)		Bearing No.	
d	D	T	T_1	T_2	$r_{min.}$	C_a	C_{0a}	C_u	Grease lub.	Oil lub.	With flat back faces	With spherical back face
180	360	140	—	—	5	928	2 730	75.1	320	500	51436	—
190	240	37	—	—	1.1	213	655	20.2	970	1 500	51138	—
	270	62	65.7	73	2	385	1 060	31.4	650	1 000	51238	53238
	320	105	111	121	4	679	1 950	55.3	440	680	51338	53338
200	250	37	—	—	1.1	215	675	20.4	940	1 450	51140	—
	280	62	65.3	74	2	392	1 110	32.2	620	950	51240	53240
	340	110	118.4	130	4	745	2 220	61.1	420	650	51340	53340
220	270	37	—	—	1.1	221	740	21.3	880	1 350	51144	—
	300	63	65.6	75	2	428	1 310	36.6	580	900	51244	53244
240	300	45	—	—	1.5	301	1 020	28.0	750	1 150	51148	—
	340	78	81.6	92	2.1	553	1 800	47.8	520	800	51248	53248
260	320	45	—	—	1.5	289	990	26.2	710	1 100	51152	—
	360	79	82.8	93	2.1	556	1 880	48.1	490	750	51252	53252
280	350	53	—	—	1.5	411	1 430	36.4	640	900	51156	—
300	380	62	—	—	2	454	1 610	39.4	540	810	51160	—
	420	95	100.5	112	3	713	2 600	61.9	400	600	51260	53260
320	400	63	—	—	2	474	1 760	41.9	540	810	51164	—
	440	95	100.5	112	3	721	2 710	62.9	400	600	51264	53264
340	420	64	—	—	2	483	1 860	43.1	500	770	51168	—
	460	96	100.3	113	3	730	2 830	63.8	380	570	51268	53268
360	440	65	—	—	2	493	1 960	44.3	500	720	51172	—
	500	110	116.7	130	4	876	3 500	76.1	340	500	51272	53272

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

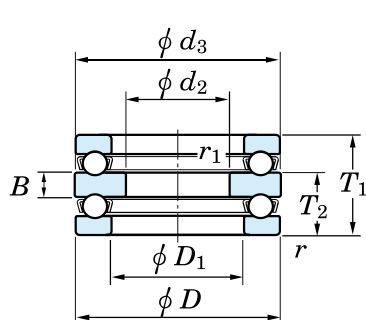


With aligning seat race	Dimensions (mm)							Mounting dimensions (mm)			(Refer.) Mass (kg)		
	d_1 max.	D_1 min.	D_2	D_3	A	R	C	d_a min.	D_a max.	r_a max.	With flat back faces	With spherical back face	With aligning seat race
—	355	184	—	—	—	—	—	286	254	4	69.5	—	—
—	237	193	—	—	—	—	—	220	210	1	3.95	—	—
53238U	267	194	230	280	98	200	23	238	222	2	11.7	11.2	13.9
53338U	315	195	255	330	104	250	33	266	244	3	36.0	36.3	39.7
—	247	203	—	—	—	—	—	230	220	1	4.13	—	—
53240U	277	204	240	290	125	225	23	248	232	2	12.2	11.6	14.8
53340U	335	205	270	350	92	250	38	282	258	3	42.9	42.7	46.7
—	267	223	—	—	—	—	—	250	240	1	4.50	—	—
53244U	297	224	260	310	118	225	25	268	252	2	13.5	12.6	15.9
—	297	243	—	—	—	—	—	276	264	1.5	7.38	—	—
53248U	335	244	290	350	122	250	30	299	281	2	23.1	20.9	25.6
—	317	263	—	—	—	—	—	296	284	1.5	7.93	—	—
53252U	355	264	305	370	152	280	30	319	301	2	25.0	22.6	28.5
—	347	283	—	—	—	—	—	322	308	1.5	12.0	—	—
—	376	304	—	—	—	—	—	348	332	2	17.5	—	—
53260U	415	304	360	430	164	320	34	371	349	2.5	42.5	39.5	48.0
—	396	324	—	—	—	—	—	368	352	2	19.0	—	—
53264U	435	325	380	450	157	320	36	391	369	2.5	45.0	42.0	52.0
—	416	344	—	—	—	—	—	388	372	2	20.5	—	—
53268U	455	345	400	470	199	360	36	411	389	2.5	48.0	45.0	55.0
—	436	364	—	—	—	—	—	408	392	2	21.5	—	—
53272U	495	365	430	510	172	360	43	443	417	3	70.0	65.0	82.0

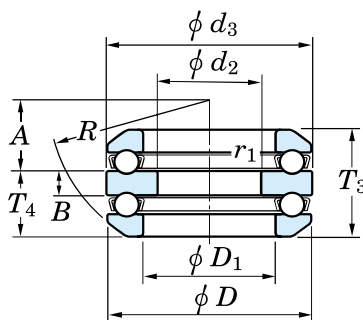
B 347

Double direction thrust ball bearings

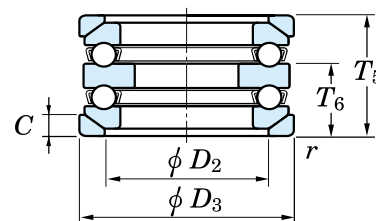
d_2 10 ~ (50) mm



With flat back faces



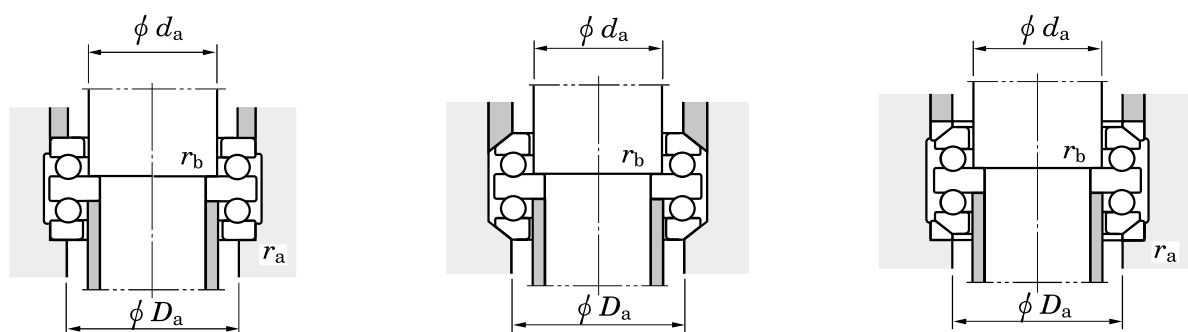
With spherical back faces



With aligning seat races

Boundary dimensions (mm)							Basic load ratings (kN)		Fatigue load limit (kN) C_u	Limiting speeds (min^{-1}) Grease lub. Oil lub.		Bearing No.		
d_2	D	T_1	T_3	T_5	$r_{\text{min.}}$	$r_{1\text{ min.}}$	C_a	C_{0a}				With flat back faces	With spherical back faces	With aligning seat races
10	32	22	24.6	28	0.6	0.3	20.8	24.8	1.10	4 900	7 500	52202	54202	54202U
15	40	26	27.4	32	0.6	0.3	27.9	37.7	1.70	3 900	6 000	52204	54204	54204U
	60	45	49.8	55	1	0.6	69.5	89.4	4.05	2 600	4 000	52405	54405	54405U
20	47	28	31.4	36	0.6	0.3	34.6	50.4	2.30	3 600	5 500	52205	54205	54205U
	52	34	37.6	42	1	0.3	44.7	61.4	2.75	3 100	4 800	52305	54305	54305U
	70	52	56.2	62	1	0.6	91.0	126	5.70	2 200	3 400	52406	54406	54406U
25	52	29	32.6	37	0.6	0.3	36.7	54.3	2.65	3 400	5 200	52206	54206	54206U
	60	38	41.2	46	1	0.3	53.5	78.7	3.55	2 700	4 200	52306	54306	54306U
	80	59	63	69	1.1	0.6	109	155	7.00	1 900	2 900	52407	54407	54407U
30	62	34	37.8	42	1	0.3	48.9	83.8	3.55	2 900	4 500	52207	54207	54207U
	68	36	38.6	44	1	0.6	58.7	98.3	4.45	2 700	4 200	52208	54208	54208U
	68	44	47.2	52	1	0.3	69.3	105	4.75	2 400	3 700	52307	54307	54307U
	78	49	54	59	1	0.6	86.6	135	6.05	2 100	3 300	52308	54308	54308U
	90	65	69.4	77	1.1	0.6	141	205	9.25	1 700	2 600	52408	54408	54408U
35	73	37	39.6	45	1	0.6	59.7	105	4.75	2 600	4 000	52209	54209	54209U
	85	52	56.2	62	1	0.6	100	163	7.40	1 900	3 000	52309	54309	54309U
	100	72	78.8	86	1.1	0.6	162	242	10.9	1 500	2 300	52409	54409	54409U
40	78	39	42	47	1	0.6	60.6	111	5.05	2 300	3 600	52210	54210	54210U
	95	58	64.6	70	1.1	0.6	121	186	9.10	1 800	2 700	52310	54310	54310U
	110	78	83.2	92	1.5	0.6	185	283	12.8	1 400	2 100	52410	54410	54410U
45	90	45	49.6	55	1	0.6	86.7	159	7.20	2 100	3 200	52211	54211	54211U
	105	64	72.6	78	1.1	0.6	149	246	11.1	1 600	2 400	52311	54311	54311U
	120	87	92	101	1.5	0.6	223	359	16.2	1 200	1 900	52411	54411	54411U
50	95	46	50	56	1	0.6	92.0	179	8.05	1 900	3 000	52212	54212	54212U
	110	64	70.6	78	1.1	0.6	154	267	12.1	1 500	2 300	52312	54312	54312U
	130	93	99	107	1.5	0.6	267	397	19.7	1 100	1 700	52412	54412	54412U

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

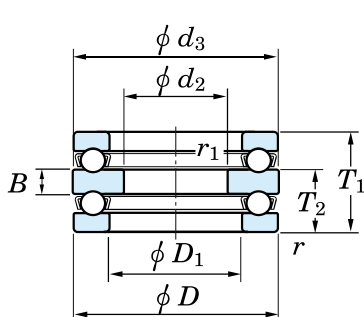


		Dimensions (mm)										Mounting dimensions (mm)				(Refer.) Mass (kg)	
d_3 max.	D_1 min.	D_2	D_3	T_2	T_4	T_6	A	R	B	C	d_a min.	D_a max.	r_a max.	r_b max.	With flat back faces	With aligning seat races	
32	17	24	35	13.5	14.8	16.5	10.5	28	5	4	15	24	0.6	0.3	0.085	0.118	
40	22	30	42	16	16.7	19	16	36	6	5	20	30	0.6	0.3	0.150	0.190	
60	27	42	62	28	30.4	33	15	50	11	8	25	42	1	0.6	0.630	0.804	
47	27	36	50	17.5	19.2	21.5	16.5	40	7	5.5	25	36	0.6	0.3	0.230	0.304	
52	27	38	55	21	22.8	25	18	45	8	6	25	38	1	0.3	0.330	0.428	
70	32	50	75	32	34.1	37	16	56	12	9	30	50	1	0.6	1.00	1.25	
52	32	42	55	18	19.8	22	20	45	7	5.5	30	42	0.6	0.3	0.270	0.346	
60	32	45	62	23.5	25.1	27.5	19.5	50	9	7	30	45	1	0.3	0.490	0.602	
80	37	58	85	36.5	38.5	41.5	18.5	64	14	10	35	58	1	0.6	1.44	1.79	
62	37	48	65	21	22.9	25	21	50	8	7	35	48	1	0.3	0.420	0.544	
68	42	55	72	22.5	23.8	26.5	25	56	9	7	40	55	1	0.6	0.540	0.680	
68	37	52	72	27	28.6	31	21	56	10	7.5	35	52	1	0.3	0.710	0.898	
78	42	60	82	30.5	33	35.5	23.5	64	12	8.5	40	60	1	0.6	1.06	1.34	
90	42	65	95	40	42.2	46	22	72	15	12	40	65	1	0.6	2.03	2.55	
73	47	60	78	23	24.3	27	23	56	9	7.5	45	60	1	0.6	0.620	0.784	
85	47	65	90	32	34.1	37	21	64	12	10	45	65	1	0.6	1.29	1.62	
100	47	72	105	44.5	47.9	51.5	23.5	80	17	12.5	45	72	1	0.6	2.91	3.42	
78	52	62	82	24	25.5	28	30.5	64	9	7.5	50	62	1	0.6	0.710	0.890	
95	52	72	100	36	39.3	42	23	72	14	11	50	72	1	0.6	1.86	2.35	
110	52	80	115	48	50.6	55	30	90	18	14	50	80	1.5	0.6	3.56	4.39	
90	57	72	95	27.5	29.8	32.5	32.5	72	10	9	55	72	1	0.6	1.12	1.44	
105	57	80	110	39.5	43.8	46.5	25.5	80	15	11.5	55	80	1	0.6	2.51	3.21	
120	57	88	125	53.5	56	60.5	22.5	90	20	15.5	55	88	1.5	0.6	4.70	5.62	
95	62	78	100	28	30	33	30.5	72	10	9	60	78	1	0.6	1.25	1.57	
110	62	85	115	39.5	42.8	46.5	36.5	90	15	11.5	60	85	1	0.6	2.68	3.37	
130	62	95	135	57	60	64	28	100	21	16	60	95	1.5	0.6	6.33	7.60	

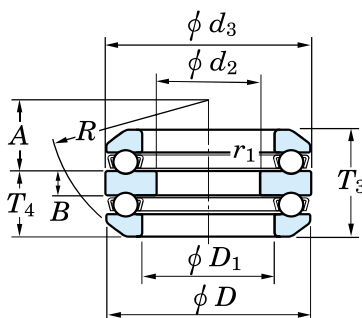
B 349

Double direction thrust ball bearings

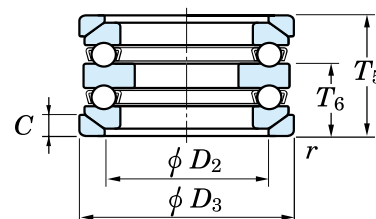
d_2 (50) ~ 95 mm



With flat back faces



With spherical back faces

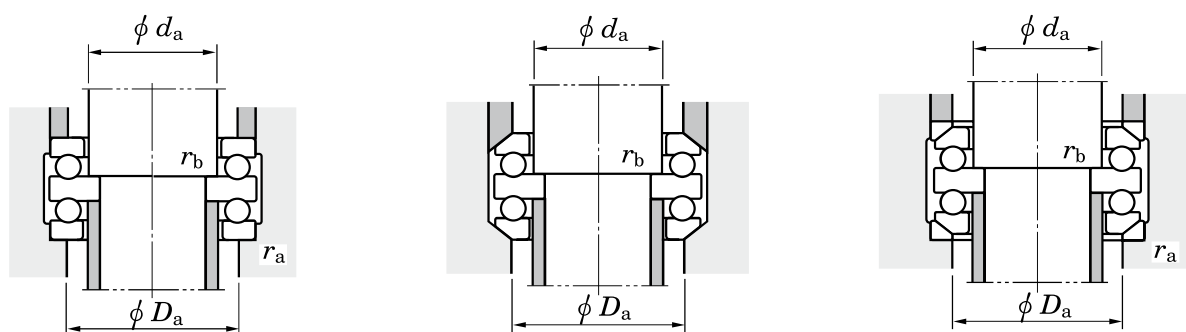


With aligning seat races

Boundary dimensions (mm)							Basic load ratings (kN)		Fatigue load limit (kN)	Limiting speeds (min ⁻¹)		Bearing No.		
d_2	D	T_1	T_3	T_5	$r_{\min.}$	$r_{1\min.}$	C_a	C_{0a}	C_u	Grease lub.	Oil lub.	With flat back faces	With spherical back faces	With aligning seat races
50	140	101	109.4	119	2	1	290	493	22.0	1 000	1 600	52413	54413	54413U
55	100	47	50.4	57	1	0.6	93.6	189	8.50	1 900	2 900	52213	54213	54213U
	105	47	50.6	57	1	1	95.2	189	8.95	1 800	2 800	52214	54214	54214U
	115	65	71.8	79	1.1	0.6	159	287	13.0	1 400	2 200	52313	54313	54313U
	125	72	80.4	88	1.1	1	167	339	13.1	1 300	2 000	52314	54314	54314U
	150	107	114.2	125	2	1	312	553	23.8	940	1 450	52414	54414	54414U
60	110	47	49.6	57	1	1	96.7	209	9.40	1 800	2 700	52215	54215	54215U
	135	79	87.2	95	1.5	1	192	396	15.0	1 200	1 900	52315	54315	54315U
	160	115	123	135	2	1	315	560	23.3	880	1 350	52415	54415	54415U
65	115	48	51	58	1	1	98.1	218	9.85	1 700	2 600	52216	54216	54216U
	140	79	86.2	95	1.5	1	200	424	15.8	1 200	1 800	52316	54316	54316U
	170	120	128.4	140	2.1	1	337	621	25.1	810	1 250	52416	54416	54416U
	180	128	138	150	2.1	1.1	384	753	29.5	780	1 200	52417	54417	54417U
70	125	55	59.2	67	1	1	119	251	11.6	1 500	2 300	52217	54217	54217U
	150	87	95.2	105	1.5	1	232	489	17.5	1 100	1 700	52317	54317	54317U
	190	135	143.4	157	2.1	1.1	409	826	31.5	710	1 100	52418	54418	54418U
75	135	62	69	76	1.1	1	146	326	13.9	1 400	2 100	52218	54218	54218U
	155	88	97.2	106	1.5	1	242	524	18.5	1 000	1 600	52318	54318	54318U
80	210	150	160	176	3	1.1	460	983	35.7	620	950	52420	54420	54420U
85	150	67	72.8	81	1.1	1	183	410	16.6	1 200	1 900	52220	54220	54220U
	170	97	105.4	115	1.5	1	296	596	23.2	940	1 450	52320	54320	54320U
90	230	166	—	—	3	1.1	474	1 070	37.1	550	850	52422	—	—
95	160	67	71.4	81	1.1	1	191	431	17.6	1 200	1 800	52222	54222	54222U
	190	110	118.4	128	2	1	334	754	25.9	810	1 250	52322	54322	54322U
	250	177	—	—	4	1.5	601	1 460	48.5	520	800	52424	—	—

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

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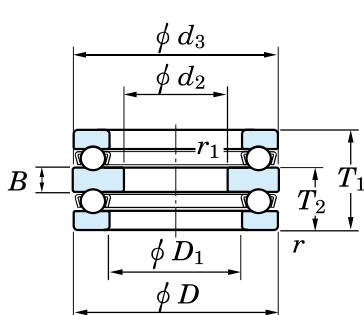


	Dimensions (mm)											Mounting dimensions (mm)				(Refer.) Mass (kg)	
	d_3 max.	D_1 min.	D_2	D_3	T_2	T_4	T_6	A	R	B	C	d_a min.	D_a max.	r_a max.	r_b max.	With flat back faces	With aligning seat races
	140	68	100	145	62	66.2	71	34	112	23	17.5	65	100	2	1	8.03	9.72
	100	67	82	105	28.5	30.2	33.5	38.5	80	10	9	65	82	1	0.6	1.36	1.70
	105	72	88	110	28.5	30.3	33.5	36.5	80	10	9	70	88	1	1	1.48	1.84
	115	67	90	120	40	43.4	47	34.5	90	15	12.5	65	90	1	0.6	2.90	3.66
	125	72	98	130	44	48.2	52	39	100	16	13	70	98	1	1	3.90	4.78
	150	73	110	155	65.5	69.1	74.5	28.5	112	24	19.5	70	110	2	1	9.71	11.6
	110	77	92	115	28.5	29.8	33.5	47.5	90	10	9.5	75	92	1	1	1.57	1.96
	135	77	105	140	48.5	52.6	56.5	32.5	100	18	15	75	105	1.5	1	4.83	6.08
	160	78	115	165	70.5	74.5	80.5	36.5	125	26	21	75	115	2	1	11.8	14.3
	115	82	98	120	29	30.5	34	45	90	10	10	80	98	1	1	1.69	2.09
	140	82	110	145	48.5	52.1	56.5	45.5	112	18	15	80	110	1.5	1	5.06	6.36
	170	83	125	175	73.5	77.7	83.5	30.5	125	27	22	80	125	2	1	14.0	16.6
	179.5	88	130	185	78.5	83.5	89.5	40.5	140	29	23	85	130	2	1	17.5	19.7
	125	88	105	130	33.5	35.6	39.5	49.5	100	12	11	85	105	1	1	2.34	2.90
	150	88	115	155	53	57.1	62	39	112	19	17.5	85	115	1.5	1	6.43	8.03
	189.5	93	140	195	82.5	86.7	93.5	34.5	140	30	25.5	90	140	2	1	19.6	22.8
	135	93	110	140	38	41.5	45	42	100	14	13.5	90	110	1	1	3.22	4.07
	155	93	120	160	53.5	58.1	62.5	36.5	112	19	18	90	120	1.5	1	6.60	8.44
	209.5	103	155	220	91.5	96.5	104.5	43.5	160	33	27	100	155	2.5	1	26.6	32.0
	150	103	125	155	41	43.9	48	49	112	15	14	100	125	1	1	4.29	5.25
	170	103	135	175	59	63.2	68	42	125	21	18	100	135	1.5	1	8.90	10.8
	229	113	—	—	101.5	—	—	—	—	37	—	110	170	2.5	1	34.9	—
	160	113	135	165	41	43.2	48	62	125	15	14	110	135	1	1	4.68	5.66
	189.5	113	150	195	67	71.2	76	47	140	24	20.5	110	150	2	1	13.8	16.3
	249	123	—	—	108.5	—	—	—	—	40	—	120	185	3	1.5	44.2	—

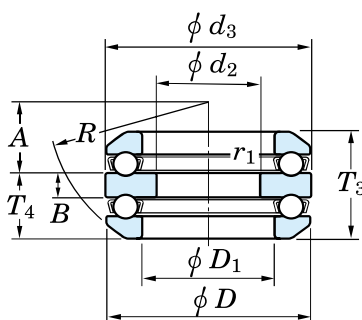
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Double direction thrust ball bearings

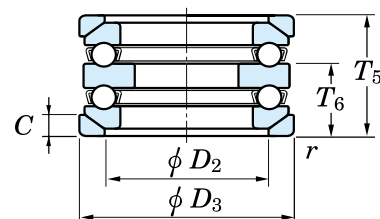
d_2 100 ~ 190 mm



With flat back faces



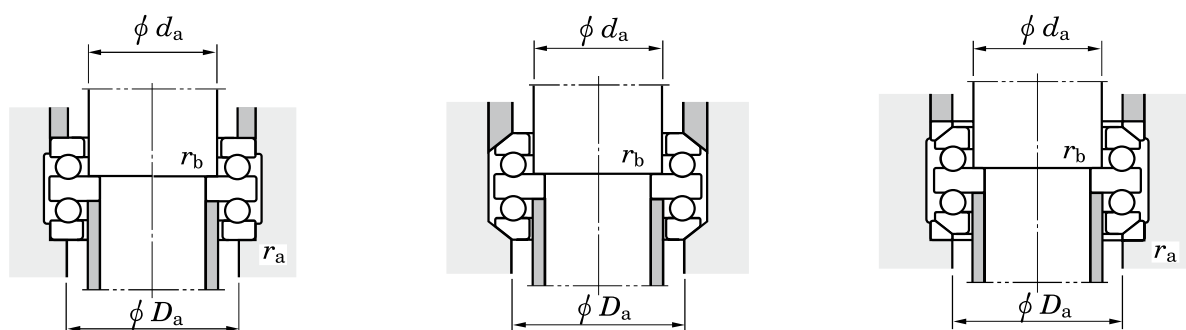
With spherical back faces



With aligning seat races

Boundary dimensions (mm)							Basic load ratings (kN)		Fatigue load limit (kN)	Limiting speeds (min ⁻¹)		Bearing No.		
d_2	D	T_1	T_3	T_5	$r_{\min.}$	$r_{1\min.}$	C_a	C_{0a}	C_u	Grease lub.	Oil lub.	With flat back faces	With spherical back faces	With aligning seat races
100	170	68	71.6	82	1.1	1.1	192	472	17.7	1 100	1 700	52224	54224	54224U
	210	123	131.2	143	2.1	1.1	389	931	30.5	710	1 100	52324	54324	54324U
	270	192	—	—	4	2	623	1 540	49.0	490	750	52426	—	—
110	190	80	85.8	96	1.5	1.1	254	622	22.2	970	1 500	52226	54226	54226U
	225	130	—	—	2.1	1.1	413	1 030	32.5	650	1 000	52326	—	—
	280	196	—	—	4	2	650	1 680	52.2	450	700	52428	—	—
120	200	81	86.2	99	1.5	1.1	234	669	19.6	940	1 450	52228	54228	54228U
	240	140	—	—	2.1	1.1	458	1 130	36.9	620	950	52328	—	—
	300	209	—	—	4	2	711	1 910	57.4	420	650	52430	—	—
130	215	89	95.6	109	1.5	1.1	266	768	21.8	840	1 300	52230	54230	54230U
	250	140	—	—	2.1	1.1	451	1 200	36.0	580	900	52330	—	—
	320	226	—	—	5	2	852	2 410	70.3	390	600	52432	—	—
135	340	236	—	—	5	2.1	943	2 730	77.2	360	550	52434	—	—
140	225	90	97.4	110	1.5	1.1	279	803	23.4	810	1 250	52232	54232	54232U
	270	153	—	—	3	1.1	512	1 570	41.3	550	850	52332	—	—
	360	245	—	—	5	3	928	2 730	75.1	320	500	52436	—	—
150	240	97	104.4	117	1.5	1.1	326	874	26.3	750	1 150	52234	54234	54234U
	250	98	102.4	118	1.5	2	332	986	26.9	710	1 100	52236	54236	54236U
	280	153	—	—	3	1.1	579	1 570	47.4	520	800	52334	—	—
	300	165	—	—	3	2	578	1 580	46.2	490	750	52336	—	—
160	270	109	116.4	131	2	2	385	1 010	31.4	650	1 000	52238	54238	54238U
	320	183	—	—	4	2	679	1 950	55.3	440	680	52338	—	—
170	280	109	115.6	133	2	2	392	1 110	32.2	620	950	52240	54240	54240U
	340	192	—	—	4	2	745	2 220	61.1	420	650	52340	—	—
190	300	110	115.2	134	2	2	428	1 310	36.6	580	900	52244	54244	54244U

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



Dimensions (mm)											Mounting dimensions (mm)				(Refer.) Mass (kg)	
d_3 max.	D_1 min.	D_2	D_3	T_2	T_4	T_6	A	R	B	C	d_a min.	D_a max.	r_a max.	r_b max.	With flat back faces	With aligning seat races
170	123	145	175	41.5	43.3	48.5	58.5	125	15	15	120	145	1	1	5.24	6.44
209.5	123	165	220	75	79.1	85	58	160	27	22	120	165	2	1	17.2	22.9
269	134	—	—	117	—	—	—	—	42	—	130	200	3	2	56.5	—
189.5	133	160	195	49	51.9	57	63	140	18	17	130	160	1.5	1	7.72	9.29
224	134	—	—	80	—	—	—	—	30	—	130	177	2	1	22.1	—
279	144	—	—	120	—	—	—	—	44	—	140	206	3	2	60.6	—
199.5	143	170	210	49.5	52.1	58.5	83.5	160	18	17	140	170	1.5	1	8.31	10.5
239	144	—	—	85.5	—	—	—	—	31	—	140	190	2	1	27.8	—
299	154	—	—	127.5	—	—	—	—	46	—	150	225	3	2	73.9	—
214.5	153	180	225	54.5	57.8	64.5	74.5	160	20	20.5	150	180	1.5	1	10.6	13.6
249	154	—	—	85.5	—	—	—	—	31	—	150	200	2	1	29.2	—
319	164	—	—	138	—	—	—	—	50	—	160	240	4	2	90.3	—
339	174	—	—	143	—	—	—	—	50	—	170	255	4	2	108	—
224.5	163	190	235	55	58.7	65	70	160	20	21	160	190	1.5	1	12.2	14.6
269	164	—	—	93	—	—	—	—	33	—	160	215	2.5	1	37.7	—
359	184	—	—	148.5	—	—	—	—	52	—	180	270	4	2.5	126	—
239.5	173	200	250	59	62.7	69	87	180	21	21.5	170	200	1.5	1	15.2	17.8
249	183	210	260	59.5	61.7	69.5	108.5	200	21	21.5	180	210	1.5	2	15.9	19.6
279	174	—	—	93	—	—	—	—	33	—	170	220	2.5	1	39.6	—
299	184	—	—	101	—	—	—	—	37	—	180	240	2.5	2	50.9	—
269	194	220	280	66.5	70.2	77.5	93.5	200	24	23	190	230	2	2	21.6	25.2
319	195	—	—	111.5	—	—	—	—	40	—	190	255	3	2	64.9	—
279	204	240	290	66.5	69.8	78.5	120.5	225	24	23	200	240	2	2	22.7	27.3
339	205	—	—	117	—	—	—	—	42	—	200	270	3	2	77.8	—
299	224	260	310	67	69.6	79	114	225	24	25	220	260	2	2	23.9	29.5

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