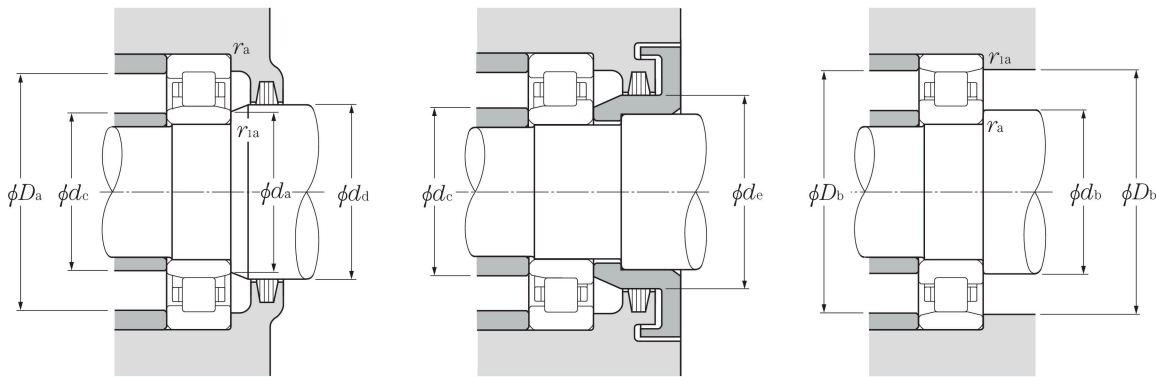


d 20 ~ 40mm

d	Boundary dimensions				Basic load ratings				Limiting speeds ¹⁾		Bearing numbers ²⁾			
	D	B	$r_{s\ min}^{(3)}$	$r_{is\ min}^{(3)}$	dynamic		static		grease	oil	type	type	type	type
					C_r	C_{or}	C_r	C_{or}						
20	47	14	1	0.6	25.7	22.6	2 620	2 310	15 000	18 000	NU204E	NJ	NUP	—
	47	18	1	0.6	30.5	28.3	3 100	2 890	14 000	16 000	NU2204E	NJ	NUP	—
	52	15	1.1	0.6	31.5	26.9	3 200	2 740	13 000	15 000	NU304E	NJ	NUP	—
	52	21	1.1	0.6	42.0	39.0	4 300	3 950	12 000	14 000	NU2304E	NJ	NUP	—
25	47	12	0.6	0.3	15.1	14.1	1 540	1 430	16 000	19 000	NU1005	NJ	NUP	N
	52	15	1	0.6	29.3	27.7	2 990	2 830	13 000	15 000	NU205E	NJ	NUP	—
	52	18	1	0.6	35.0	34.5	3 550	3 550	11 000	13 000	NU2205E	NJ	NUP	—
	62	17	1.1	1.1	41.5	37.5	4 250	3 800	11 000	13 000	NU305E	NJ	NUP	—
	62	24	1.1	1.1	57.0	56.0	5 800	5 700	9 700	11 000	NU2305E	NJ	NUP	—
	80	21	1.5	1.5	46.5	40.0	4 750	4 050	8 500	10 000	NU405	NJ	NUP	N
30	55	13	1	0.6	19.7	19.6	2 000	2 000	14 000	16 000	NU1006	NJ	NUP	N
	62	16	1	0.6	39.0	37.5	4 000	3 800	11 000	13 000	NU206E	NJ	NUP	—
	62	20	1	0.6	49.0	50.0	5 000	5 100	9 700	11 000	NU2206E	NJ	NUP	—
	72	19	1.1	1.1	53.0	50.0	5 400	5 100	9 300	11 000	NU306E	NJ	NUP	—
	72	27	1.1	1.1	74.5	77.5	7 600	7 900	8 300	9 700	NU2306E	NJ	NUP	—
	90	23	1.5	1.5	62.5	55.0	6 400	5 600	7 300	8 500	NU406	NJ	NUP	N
35	62	14	1	0.6	22.6	23.2	2 310	2 360	12 000	15 000	NU1007	NJ	NUP	N
	72	17	1.1	0.6	50.5	50.0	5 150	5 100	9 500	11 000	NU207E	NJ	NUP	—
	72	23	1.1	0.6	61.5	65.5	6 300	6 650	8 500	10 000	NU2207E	NJ	NUP	—
	80	21	1.5	1.1	71.0	71.0	7 200	7 200	8 100	9 600	NU307E	NJ	NUP	—
	80	31	1.5	1.1	99.0	109	10 100	11 100	7 200	8 500	NU2307E	NJ	NUP	—
	100	25	1.5	1.5	75.5	69.0	7 700	7 050	6 400	7 500	NU407	NJ	NUP	N
40	68	15	1	0.6	27.3	29.0	2 780	2 950	11 000	13 000	NU1008	NJ	NUP	N
	80	18	1.1	1.1	43.5	43.0	4 450	4 350	9 400	11 000	NU208	NJ	NUP	N
	80	18	1.1	1.1	55.5	55.5	5 700	5 650	8 500	10 000	NU208E	NJ	NUP	—
	80	23	1.1	1.1	58.0	62.0	5 950	6 300	8 500	10 000	NU2208	NJ	NUP	N
	80	23	1.1	1.1	72.5	77.5	7 400	7 900	7 600	8 900	NU2208E	NJ	NUP	—
	90	23	1.5	1.5	58.5	57.0	6 000	5 800	8 000	9 400	NU308	NJ	NUP	N
	90	23	1.5	1.5	83.0	81.5	8 500	8 300	7 200	8 500	NU308E	NJ	NUP	—
	90	33	1.5	1.5	82.5	88.0	8 400	8 950	7 000	8 200	NU2308	NJ	NUP	N
	90	33	1.5	1.5	114	122	11 600	12 500	6 400	7 500	NU2308E	NJ	NUP	—
	110	27	2	2	95.5	89.0	9 750	9 100	5 700	6 700	NU408	NJ	NUP	N

1) This value achieved with machined cages; when pressed cages are used, 80% of this value is acceptable.
 2) Production switched to E type only for bearing number for which there is no standard form.
 3) Minimal allowable dimension for chamfer dimension r or r_1 .



Dynamic equivalent radial load

$$P_r = F_r$$

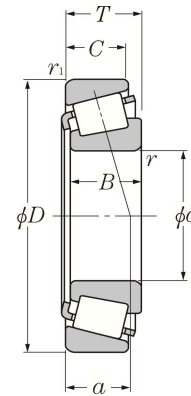
Static equivalent radial load

$$P_{0r} = F_r$$

type	Dimensions			Abutment and fillet dimensions									Mass		
	mm			mm									kg		
NF	F_w	E_w	J	d_a min	d_b min	d_c max	d_d min	d_e min	D_a max	D_b max	D_b min ⁴⁾	r_{as} max	r_{1as} max	type NU (approx.)	type N
—	26.5	—	29.5	24	—	26	29	32	42	—	—	1	0.6	0.122	—
—	26.5	—	29.5	24	—	26	29	32	42	—	—	1	0.6	0.158	—
—	27.5	—	31.1	24	—	27	30	33	45.5	—	—	1	0.6	0.176	—
—	27.5	—	31.1	24	—	27	30	33	45.5	—	—	1	0.6	0.242	—
—	30.5	41.5	32.7	27	29	30	32	33	43	45	42.5	0.6	0.3	0.092	0.091
—	31.5	—	34.5	29	—	31	34	37	47	—	—	1	0.6	0.151	—
—	31.5	—	34.5	29	—	31	34	37	47	—	—	1	0.6	0.186	—
—	34	—	38	31.5	—	33	37	40	55.5	—	—	1	1	0.275	—
—	34	—	38	31.5	—	33	37	40	55.5	—	—	1	1	0.386	—
NF	38.8	62.8	43.6	33	33	38	41	46	72	72	64	1.5	1.5	0.55	0.536
—	36.5	48.5	38.9	34	35	35	38	39.5	50	51	49.5	1	0.6	0.13	0.128
—	37.5	—	41.1	34	—	37	40	44	57	—	—	1	0.6	0.226	—
—	37.5	—	41.1	34	—	37	40	44	57	—	—	1	0.6	0.297	—
—	40.5	—	44.9	36.5	—	40	44	48	65.5	—	—	1	1	0.398	—
—	40.5	—	44.9	36.5	—	40	44	48	65.5	—	—	1	1	0.58	—
NF	45	73	50.5	38	38	44	47	52	82	82	74	1.5	1.5	0.751	0.732
—	42	55	44.6	39	40	41	44	45	57	58	56	1	0.6	0.179	0.176
—	44	—	48	39	—	43	46	50	65.5	—	—	1	0.6	0.327	—
—	44	—	48	39	—	43	46	50	65.5	—	—	1	0.6	0.455	—
—	46.2	—	51	41.5	—	45	48	53	72	—	—	1.5	1	0.545	—
—	46.2	—	51	41.5	—	45	48	53	72	—	—	1.5	1	0.78	—
NF	53	83	59	43	43	52	55	61	92	92	84	1.5	1.5	0.99	0.965
—	47	61	49.8	44	45	46	49	50.5	63	64	62	1	0.6	0.22	0.217
NF	50	70	54.2	46.5	46.5	49	52	56	73.5	73.5	72	1	1	0.378	0.37
—	49.5	—	53.9	46.5	—	49	52	56	73.5	—	—	1	1	0.426	—
—	50	70	54.2	46.5	46.5	49	52	56	73.5	73.5	72	1	1	0.49	0.48
—	49.5	—	53.9	46.5	—	49	52	56	73.5	—	—	1	1	0.552	—
NF	53.5	77.5	58.4	48	48	51	55	60	82	82	80	1.5	1.5	0.658	0.643
—	52	—	57.6	48	—	51	55	60	82	—	—	1.5	1.5	0.754	—
—	53.5	77.5	58.4	48	48	51	55	60	82	82	80	1.5	1.5	0.951	0.932
—	52	—	57.6	48	—	51	55	60	82	—	—	1.5	1.5	1.06	—
NF	58	92	64.8	49	49	57	60	67	101	101	93	2	2	1.3	1.27

4) Does not apply to side of the outer ring rib of type **NF** bearings.

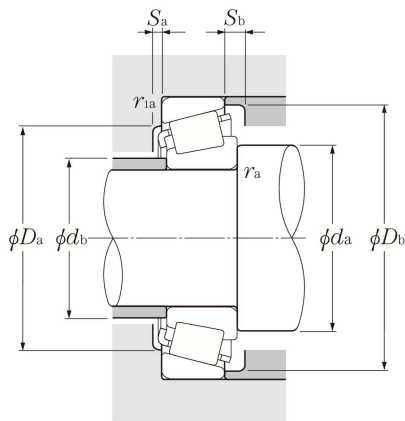
Metric series



d 15 ~ 30mm

d	Boundary dimensions						Basic load ratings				Limiting speeds		Bearing numbers
	D	T	B	C	$r_{s \min}^{1)}$	$r_{is \min}^{1)}$	dynamic kN	static C_{or}	dynamic kgf	static C_{or}	grease min^{-1}	oil min^{-1}	
15	42	14.25	13	11	1	1	23.2	20.8	2 370	2 120	9 900	13 000	4T-30302
17	40	13.25	12	11	1	1	20.5	20.3	2 090	2 070	9 900	13 000	4T-30203
	40	17.25	16	14	1	1	27.3	28.3	2 790	2 880	9 900	13 000	4T-32203
	40	17.25	16	14	1	1	26.2	28.2	2 670	2 870	9 900	13 000	4T-32203R ²⁾
	47	15.25	14	12	1	1	28.9	26.3	2 940	2 680	9 000	12 000	4T-30303
20	42	15	15	12	0.6	0.6	24.9	27.9	2 540	2 840	9 500	13 000	4T-32004X
	47	15.25	14	12	1	1	28.2	28.7	2 870	2 930	8 800	12 000	4T-30204
	47	19.25	18	15	1	1	36.5	39.5	3 700	4 000	8 800	12 000	4T-32204
	52	16.25	16	13	1.5	1.5	35.5	34.0	3 600	3 450	8 000	11 000	4T-30304A
	52	16.25	16	12	1.5	1.5	31.0	31.0	3 150	3 150	7 600	10 000	4T-30304CA
52	22.25	21	18	1.5	1.5	46.5	48.5	4 750	4 950	8 000	11 000	4T-32304	
22	44	15	15	11.5	0.6	0.6	27.0	31.5	2 760	3 250	8 900	12 000	4T-320/22X
25	47	15	15	11.5	0.6	0.6	27.8	33.5	2 830	3 450	7 900	11 000	4T-32005X
	47	17	17	14	0.6	0.6	32.5	40.5	3 300	4 150	8 000	11 000	4T-33005
	52	16.25	15	13	1	1	31.5	34.0	3 200	3 450	7 300	9 800	4T-30205
	52	19.25	18	16	1	1	42.0	47.0	4 300	4 800	7 300	9 800	4T-32205
	52	19.25	18	15	1	1	38.0	43.0	3 850	4 400	7 300	9 800	4T-32205R ²⁾
	52	19.25	18	15	1	1	38.0	46.5	3 900	4 750	7 100	9 400	4T-32205C
	52	19.25	18	15	1	1	34.5	42.0	3 500	4 250	7 100	9 400	4T-32205CR ²⁾
	52	22	22	18	1	1	47.5	57.5	4 850	5 850	7 300	9 800	4T-33205
	62	18.25	17	15	1.5	1.5	48.5	47.5	4 950	4 850	6 700	8 900	4T-30305
	62	18.25	17	14	1.5	1.5	41.5	41.5	4 250	4 250	6 400	8 500	4T-30305C
62	18.25	17	13	1.5	1.5	40.5	43.5	4 150	4 450	5 900	7 800	4T-30305D	
62	25.25	24	20	1.5	1.5	61.5	64.5	6 250	6 600	6 700	8 900	4T-32305	
28	52	16	16	12	1	1	33.0	40.5	3 400	4 150	7 300	9 700	4T-320/28X
	58	24	24	19	1	1	58.0	69.5	5 950	7 100	6 700	8 900	4T-332/28
30	55	17	17	13	1	1	37.5	46.0	3 800	4 700	6 900	9 200	4T-32006X
	55	20	20	16	1	1	42.5	54.0	4 300	5 500	6 900	9 200	4T-33006
	62	17.25	16	14	1	1	43.5	48.0	4 450	4 900	6 300	8 400	4T-30206
	62	21.25	20	17	1	1	54.5	64.0	5 600	6 550	6 300	8 400	4T-32206
	62	21.25	20	17	1	1	50.0	60.0	5 100	6 100	6 100	8 100	4T-32206C
	62	25	25	19.5	1	1	65.0	77.0	6 600	7 850	6 300	8 400	4T-33206
72	20.75	19	16	1.5	1.5	60.0	61.0	6 100	6 200	5 700	7 600	4T-30306	

1) Minimal allowable dimension for chamfer dimension r or r_1 .
 2) This bearing does not incorporate the subunit dimensions.



Equivalent radial load dynamic

$$P_r = X F_r + Y F_a$$

$\frac{F_a}{F_r} \leq e$		$\frac{F_a}{F_r} > e$	
X	Y	X	Y
1	0	0.4	Y_2

static

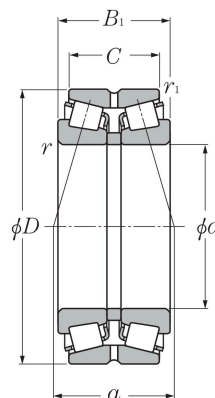
$$P_{or} = 0.5 F_r + Y_0 F_a$$

When $P_{or} < F_r$ use $P_{or} = F_r$

For values of e , Y_2 and Y_0 see the table below.

Dimensions series to ISO	Abutment and fillet dimensions										Load center mm	Constant e	Axial load factors		Mass kg (approx.)
	d_a min	d_b max	D_a mm		D_b min	S_a min	S_b min	r_{as} max	r_{1as} max	Y_2			Y_0		
2FB	20.5	22	36.5	35	38	2	3	1	1	9.5	0.29	2.11	1.16	0.098	
2DB	22.5	23	34.5	33	37	2	2	1	1	9.5	0.35	1.74	0.96	0.08	
2DD	22.5	23	34.5	33	37	2	3	1	1	11.5	0.31	1.92	1.06	0.102	
	22.5	22	34.5	33	36.5	2	3	1	1	11	0.35	1.74	0.96	0.104	
2FB	22.5	24	41.5	40	42	3	3.5	1	1	10.5	0.29	2.11	1.16	0.134	
3CC	24.5	25	37.5	36	39	3	3	0.6	0.6	10.5	0.37	1.60	0.88	0.097	
2DB	25.5	27	41.5	40	44	2	3	1	1	11.5	0.35	1.74	0.96	0.127	
2DD	25.5	26	41.5	39	43	2	4	1	1	12.5	0.33	1.81	1.00	0.16	
2FB	28.5	28	43.5	42.5	47.5	3	3	1.5	1.5	10.5	0.30	2.00	1.10	0.176	
	28.5	27.5	43.5	39.5	48	3	4	1.5	1.5	13.5	0.55	1.10	0.60	0.17	
2FD	28.5	27	43.5	43	47	3	4	1.5	1.5	14	0.30	2.00	1.10	0.245	
3CC	26.5	27	39.5	38	41	3	3.5	0.6	0.6	11	0.40	1.51	0.83	0.106	
4CC	29.5	30	42.5	40	44	3	3.5	0.6	0.6	12	0.43	1.39	0.77	0.114	
2CE	29.5	29	42.5	40	43.5	3	3	0.6	0.6	11	0.29	2.07	1.14	0.13	
3CC	30.5	31	46.5	44	48	2	3	1	1	12.5	0.37	1.60	0.88	0.154	
2CD	30.5	31	46.5	43	49.5	2	4	1	1	14	0.36	1.67	0.92	0.187	
	30.5	31	46.5	43	48	2	4	1	1	13.5	0.37	1.60	0.88	0.181	
5CD	30.5	30	46.5	42	49	2	4	1	1	16	0.58	1.03	0.57	0.19	
	30.5	30	46.5	42	49	2	4	1	1	16	0.55	1.10	0.60	0.19	
2DE	30.5	30	46.5	43	49	4	4	1	1	14	0.35	1.71	0.94	0.217	
2FB	33.5	34	53.5	52	57	3	3	1.5	1.5	13	0.30	2.00	1.10	0.272	
	33.5	34	53.5	48	58	3	4	1.5	1.5	16	0.55	1.10	0.60	0.264	
7FB	33.5	34	53.5	45.5	58.5	3	5	1.5	1.5	20	0.83	0.73	0.40	0.284	
2FD	33.5	32	53.5	52	57	3	5	1.5	1.5	16	0.30	2.00	1.10	0.381	
4CC	33.5	33	46.5	45	49	3	4	1	1	12.5	0.43	1.39	0.77	0.146	
2DE	33.5	34	52.5	49	55	5	5	1	1	15.5	0.34	1.77	0.97	0.293	
4CC	35.5	35	49.5	48	52	3	4	1	1	13.5	0.43	1.39	0.77	0.166	
2CE	35.5	35.5	49.5	46.5	52	3	4	1	1	13	0.29	2.06	1.13	0.201	
3DB	35.5	37	56.5	53	57	2	3	1	1	13.5	0.37	1.60	0.88	0.241	
3DC	35.5	37	56.5	52	58	2.5	4	1	1	15.5	0.37	1.60	0.88	0.301	
5DC	35.5	35	56.5	49	59.5	2	5	1	1	18.5	0.56	1.07	0.59	0.294	
2DE	35.5	36	56.5	53	59	5	5.5	1	1	16	0.34	1.76	0.97	0.344	
2FB	38.5	40	63.5	62	66	3	4.5	1.5	1.5	15	0.31	1.90	1.05	0.408	

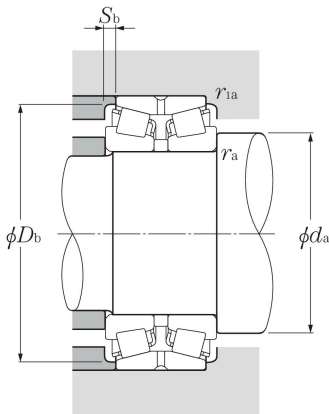
Back-to-back arrangement



d 40 ~ 70mm

d	Boundary dimensions					dynamic kN	Basic load ratings			Limiting speeds	
	D	B ₁	C	r _{s min} ¹⁾	r _{is min} ¹⁾		static kgf	dynamic kgf	static min ⁻¹	grease	oil
40	80	45	37.5	1.5	0.6	105	134	10 700	13 700	4 100	5 500
	80	55	43.5	1.5	0.6	136	187	13 900	19 100	4 100	5 500
	90	56	39.5	2	0.6	132	171	13 500	17 400	3 200	4 200
	90	56	45.5	2	0.6	157	204	16 000	20 800	3 700	4 900
45	85	47	37.5	1.5	0.6	116	157	11 800	16 000	3 700	4 900
	85	55	43.5	1.5	0.6	141	200	14 300	20 400	3 700	4 900
	100	60	41.5	2	0.6	165	218	16 800	22 200	2 800	3 800
	100	60	49.5	2	0.6	191	251	19 500	25 600	3 300	4 400
50	90	49	39.5	1.5	0.6	132	186	13 500	18 900	3 400	4 500
	90	55	43.5	1.5	0.6	150	218	15 300	22 200	3 400	4 500
	110	64	43.5	2.5	0.6	194	260	19 800	26 600	2 600	3 500
	110	64	51.5	2.5	0.6	227	305	23 200	31 000	3 000	4 000
55	110	90	71.5	2.5	0.6	315	465	32 000	47 500	3 000	4 000
	100	51	41.5	2	0.6	160	221	16 300	22 600	3 100	4 100
	100	60	48.5	2	0.6	186	269	18 900	27 400	3 100	4 100
	120	70	49	2.5	0.6	226	305	23 100	31 500	2 400	3 100
60	120	70	57	2.5	0.6	266	360	27 100	36 500	2 700	3 700
	120	97	76	2.5	0.6	370	550	37 500	56 000	2 700	3 700
	110	53	43.5	2	0.6	180	249	18 300	25 400	2 800	3 800
	110	66	54.5	2	0.6	223	330	22 700	33 500	2 800	3 800
65	130	74	51	3	1	258	350	26 300	36 000	2 200	2 900
	130	74	59	3	1	310	420	31 500	43 000	2 500	3 400
	130	104	81	3	1	420	625	42 500	64 000	2 500	3 400
	120	56	46.5	2	0.6	211	295	21 500	30 000	2 600	3 500
70	120	73	61.5	2	0.6	273	410	27 800	42 000	2 600	3 500
	140	79	53	3	1	297	410	30 500	41 500	2 000	2 700
	140	79	63	3	1	350	475	35 500	48 500	2 300	3 100
	140	108	84	3	1	470	700	47 500	71 500	2 300	3 100
70	125	59	48.5	2	0.6	225	325	23 000	33 000	2 400	3 200
	125	74	61.5	2	0.6	285	440	29 000	45 000	2 400	3 200
	150	83	57	3	1	330	460	33 500	46 500	1 900	2 500
	150	83	67	3	1	395	545	40 000	55 500	2 200	2 900
150	116	92	3	1	530	805	54 000	82 500	2 200	2 900	

1) Minimum allowable dimension for chamfer dimension r or r_1 .



Equivalent radial load dynamic

$$P_r = XF_r + YF_a$$

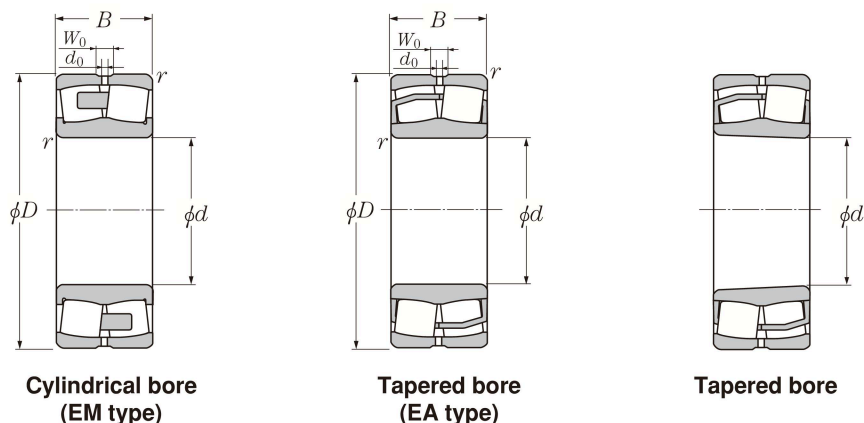
$\frac{F_a}{F_r} \leq e$		$\frac{F_a}{F_r} > e$	
X	Y	X	Y
1	Y ₁	0.67	Y ₂

static

$$P_{0r} = F_r + Y_0 F_a$$

For values of e , Y_2 and Y_0 see the table below.

Bearing numbers	Abutment and fillet dimensions					Load center mm <i>a</i>	Constant <i>e</i>	Axial load factors			Mass kg (approx.)
	<i>d_a</i> min	<i>D_b</i> min	<i>S_b</i> min	<i>r_{as}</i> max	<i>r_{las}</i> max			<i>Y₁</i>	<i>Y₂</i>	<i>Y₀</i>	
4T-430208X	48.5	75	3.5	1.5	0.6	38.5	0.37	1.80	2.68	1.76	0.929
4T-432208X	48.5	75	5.5	1.5	0.6	43	0.37	1.80	2.68	1.76	1.18
4T-430308DX	50	86.5	8	2	0.6	64.5	0.83	0.82	1.22	0.80	1.56
4T-430308	50	82	5	2	0.6	44.5	0.35	1.96	2.91	1.91	1.61
4T-430209	53.5	80	4.5	1.5	0.6	42	0.40	1.67	2.48	1.63	1.04
4T-432209	53.5	81	5.5	1.5	0.6	46	0.40	1.67	2.48	1.63	1.27
* 4T-430309DX	55	96	9	2	0.6	70	0.83	0.82	1.22	0.80	2.11
4T-430309	55	93	5	2	0.6	47.5	0.35	1.96	2.91	1.91	2.11
4T-430210	58.5	85	4.5	1.5	0.6	44.5	0.42	1.61	2.39	1.57	1.18
432210U	58.5	85	5.5	1.5	0.6	47.5	0.42	1.61	2.39	1.57	1.36
4T-430310DX	62	105	10	2	0.6	75	0.83	0.82	1.22	0.80	2.65
4T-430310	62	102	6	2	0.6	51	0.35	1.96	2.91	1.91	2.72
432310U	62	102	9	2	0.6	62.5	0.35	1.96	2.91	1.91	3.98
4T-430211X	65	94	4.5	2	0.6	47	0.40	1.67	2.48	1.63	1.55
432211U	65	95	5.5	2	0.6	51	0.40	1.67	2.48	1.63	1.85
4T-430311DX	67	113	10.5	2	0.6	83	0.83	0.82	1.22	0.80	3.42
430311XU	67	111	6.5	2	0.6	55.5	0.35	1.96	2.91	1.91	3.48
432311U	67	111	10.5	2	0.6	66.5	0.35	1.96	2.91	1.91	5.05
4T-430212X	70	103	4.5	2	0.6	49.5	0.40	1.67	2.48	1.63	1.99
432212U	70	104	5.5	2	0.6	56	0.40	1.67	2.48	1.63	2.49
4T-430312DX	74	124	11.5	2.5	1	88.5	0.83	0.82	1.22	0.80	4.22
430312U	74	120	7.5	2.5	1	59.5	0.35	1.96	2.91	1.91	4.31
432312U	74	120	11.5	2.5	1	71	0.35	1.96	2.91	1.91	6.29
4T-430213X	75	113	4.5	2	0.6	53.5	0.40	1.67	2.48	1.63	2.49
432213U	75	115	5.5	2	0.6	61.5	0.40	1.67	2.48	1.63	3.33
4T-430313DX	79	133	13	2.5	1	94.5	0.83	0.82	1.22	0.80	5.16
430313XU	79	130	8	2.5	1	64	0.35	1.96	2.91	1.91	5.32
432313U	79	130	12	2.5	1	74.5	0.35	1.96	2.91	1.91	7.55
4T-430214	80	118	5	2	0.6	57	0.42	1.61	2.39	1.57	2.67
432214U	80	119	6	2	0.6	64.5	0.42	1.61	2.39	1.57	3.56
4T-430314DX	84	142	13	2.5	1	101	0.83	0.82	1.22	0.80	6.23
430314XU	84	140	8	2.5	1	67	0.35	1.96	2.91	1.91	6.37
432314U	84	140	12	2.5	1	80.5	0.35	1.96	2.91	1.91	9.28

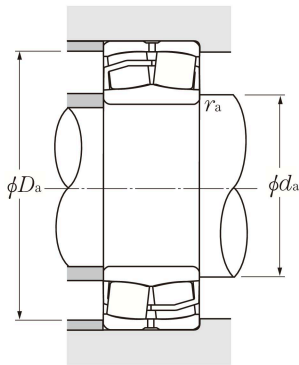


d 25 ~ 60mm

Boundary dimensions				Basic load ratings				Limiting speeds ¹⁾		Bearing numbers ⁴⁾	
mm				dynamic	static	dynamic	static	min ⁻¹		cylindrical bore	tapered ²⁾ bore
d	D	B	r _{s min} ³⁾	C _r kN	C _{or}	C _r kgf	C _{or}	grease	oil		
25	52	18	1	57.3	46.1	5 840	4 700	10 400	13 000	*22205EAD1	*22205EAKD1
	52	18	1	57.3	46.1	5 840	4 700	10 400	13 000	*22205EMD1	*22205EMKD1
30	62	20	1	75.7	64.5	7 720	6 580	8 800	11 000	*22206EAD1	*22206EAKD1
	62	20	1	75.7	64.5	7 720	6 580	8 800	11 000	*22206EMD1	*22206EMKD1
35	72	23	1.1	100	92	10 200	9 380	7 500	9 400	*22207EAD1	*22207EAKD1
	72	23	1.1	100	92	10 200	9 380	7 500	9 400	*22207EMD1	*22207EMKD1
40	80	23	1.1	116	105	11 800	10 700	6 800	8 500	*22208EAD1	*22208EAKD1
	80	23	1.1	110	98	11 200	10 000	6 800	8 500	*22208EMD1	*22208EMKD1
	90	23	1.5	88	90	8 950	9 150	4 900	6 400	21308C	21308CK
	90	33	1.5	169	152	17 200	15 500	5 400	6 600	*22308EAD1	*22308EAKD1
	90	33	1.5	169	152	17 200	15 500	5 400	6 600	*22308EMD1	*22308EMKD1
45	85	23	1.1	121	113	12 300	11 500	6 100	7 700	*22209EAD1	*22209EAKD1
	85	23	1.1	116	106	11 800	10 800	6 100	7 700	*22209EMD1	*22209EMKD1
	100	25	1.5	102	106	10 400	10 800	4 400	5 700	21309C	21309CK
	100	36	1.5	206	187	21 000	19 100	4 600	5 700	*22309EAD1	*22309EAKD1
	100	36	1.5	206	187	21 000	19 100	4 600	5 700	*22309EMD1	*22309EMKD1
50	90	23	1.1	130	124	13 300	12 600	5 700	7 200	*22210EAD1	*22210EAKD1
	90	23	1.1	125	117	12 700	11 900	5 700	7 200	*22210EMD1	*22210EMKD1
	110	27	2	118	127	12 000	12 900	4 000	5 200	21310C	21310CK
	110	40	2	250	232	25 400	23 700	4 300	5 300	*22310EAD1	*22310EAKD1
	110	40	2	250	232	25 400	23 700	4 300	5 300	*22310EMD1	*22310EMKD1
55	100	25	1.5	155	148	15 800	15 100	5 300	6 700	*22211EAD1	*22211EAKD1
	100	25	1.5	148	140	15 100	14 300	5 300	6 700	*22211EMD1	*22211EMKD1
	120	29	2	145	163	14 800	16 600	3 700	4 800	21311	21311K
	120	43	2	296	274	30 200	28 000	3 900	4 800	*22311EAD1	*22311EAKD1
	120	43	2	296	274	30 200	28 000	3 900	4 800	*22311EMD1	*22311EMKD1
60	110	28	1.5	187	181	19 100	18 400	4 800	6 000	*22212EAD1	*22212EAKD1
	110	28	1.5	179	171	18 300	17 400	4 800	6 000	*22212EMD1	*22212EMKD1
	130	31	2.1	167	191	17 100	19 500	3 400	4 400	21312	21312K
	130	46	2.1	340	319	34 700	32 600	3 600	4 600	*22312EAD1	*22312EAKD1
	130	46	2.1	340	319	34 700	32 600	3 600	4 600	*22312EMD1	*22312EMKD1

1) Bearing part numbers with * are ULTAGE Series and have outer ring oil holes and oil groove as standard.

2) "K" indicates bearings have tapered bore with a taper ratio of 1: 12. 3) Smallest allowable dimension for chamfer dimension r.



Equivalent radial load dynamic

$$P_r = X F_r + Y F_a$$

$\frac{F_a}{F_r} \leq e$		$\frac{F_a}{F_r} > e$	
X	Y	X	Y
1	Y_1	0.67	Y_2

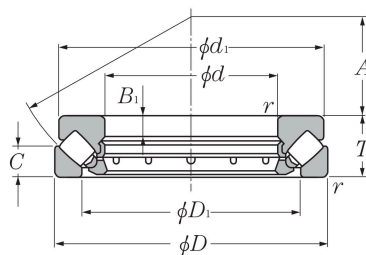
static

$$P_{or} = F_r + Y_0 F_a$$

For values of e , Y_2 and Y_0 see the table below.

Abutment and fillet dimensions mm					Constant	Axial load factors			Mass (approx.) kg	
W_0	d_0	d_a min	D_a max	r_{as} max	e	Y_1	Y_2	Y_0	cylindrical bore	tapered bore
3	1.5	30	46	1	0.34	2	2.98	1.96	0.173	0.169
3	1.5	30	46	1	0.34	2	2.98	1.96	0.174	0.171
4	2	36	56	1	0.31	2.15	3.2	2.1	0.278	0.272
4	2	36	56	1	0.31	2.15	3.2	2.1	0.281	0.275
5	2	42	65	1.1	0.31	2.21	3.29	2.16	0.438	0.43
5	2	42	65	1.1	0.31	2.21	3.29	2.16	0.442	0.433
5	2.5	47	73	1.1	0.27	2.47	3.67	2.41	0.528	0.518
5	2.5	47	73	1.1	0.27	2.47	3.67	2.41	0.529	0.519
6	3	48.5	81.5	1.5	0.26	2.55	3.8	2.5	0.705	0.694
6	3	49	81	1.5	0.36	1.87	2.79	1.83	1.02	1
6	3	49	81	1.5	0.36	1.87	2.79	1.83	1.03	1.01
6	2.5	52	78	1.1	0.26	2.64	3.93	2.58	0.572	0.561
6	2.5	52	78	1.1	0.26	2.64	3.93	2.58	0.577	0.566
6	3	53.5	91.5	1.5	0.26	2.6	3.87	2.54	0.927	0.912
6	3	54	91	1.5	0.36	1.9	2.83	1.86	1.37	1.34
6	3	54	91	1.5	0.36	1.9	2.83	1.86	1.38	1.35
6	2.5	57	83	1.1	0.24	2.84	4.23	2.78	0.614	0.602
6	2.5	57	83	1.1	0.24	2.84	4.23	2.78	0.616	0.604
6	3	60	100	2	0.26	2.64	3.93	2.58	1.21	1.19
7	3.5	61	99	2	0.36	1.87	2.79	1.83	1.82	1.79
7	3.5	61	99	2	0.36	1.87	2.79	1.83	1.84	1.8
6	3	64	91	1.5	0.23	2.95	4.4	2.89	0.83	0.814
6	3	64	91	1.5	0.23	2.95	4.4	2.89	0.827	0.811
6	3	65	110	2	0.25	2.69	4	2.63	1.71	1.69
8	3.5	66	109	2	0.36	1.87	2.79	1.83	2.31	2.26
8	3.5	66	109	2	0.36	1.87	2.79	1.83	2.34	2.29
7	3	69	101	1.5	0.24	2.84	4.23	2.78	1.14	1.12
7	3	69	101	1.5	0.24	2.84	4.23	2.78	1.15	1.13
7	4	72	118	2	0.25	2.69	4	2.63	2.1	2.07
9	4	72	118	2.1	0.35	1.95	2.9	1.91	2.86	2.8
9	4	72	118	2.1	0.35	1.95	2.9	1.91	2.91	2.85

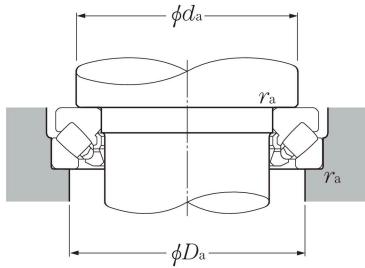
Note: For the bearings other than **ULTAGE Series**, outer rings with oil inlets and oil grooves can also be made based on your request. In this case, supplementary suffix "D1" is added after a bearing number. Example: **22312EMD1**



d 60 ~ 160mm

Boundary dimensions	mm			dynamic kN	Basic load ratings		dynamic kgf	static	Limiting speeds min ⁻¹	Bearing numbers	Dimensions			
	d	D	T		C _a	C _{oa}					oil	D ₁	d ₁	B ₁
60	130	42	1.5	283	805	28 900	82 000	2 600	29412	89	123	15	20	38
65	140	45	2	330	945	33 500	96 500	2 400	29413	96	133	16	21	42
70	150	48	2	365	1 040	37 000	106 000	2 200	29414	103	142	17	23	44
75	160	51	2	415	1 190	42 500	122 000	2 100	29415	109	152	18	24	47
80	170	54	2.1	460	1 380	47 000	141 000	1 900	29416	117	162	19	26	50
85	150	39	1.5	265	820	27 000	84 000	2 300	29317	114	143.5	13	19	50
	180	58	2.1	490	1 480	50 000	151 000	1 800	29417	125	170	21	28	54
90	155	39	1.5	285	915	29 100	93 500	2 300	29318	117	148.5	13	19	52
	190	60	2.1	545	1 680	56 000	172 000	1 700	29418	132	180	22	29	56
100	170	42	1.5	345	1 160	35 500	118 000	2 100	29320	129	163	14	20.8	58
	210	67	3	685	2 130	69 500	217 000	1 500	29420	146	200	24	32	62
110	190	48	2	445	1 500	45 000	152 000	1 800	29322	143	182	16	23	64
	230	73	3	845	2 620	86 500	267 000	1 400	29422	162	220	26	35	69
120	210	54	2.1	535	1 770	54 500	181 000	1 600	29324	159	200	18	26	70
	250	78	4	975	3 050	99 000	310 000	1 300	29424	174	236	29	37	74
130	225	58	2.1	615	2 100	62 500	215 000	1 500	29326	171	215	19	28	76
	270	85	4	1 080	3 550	110 000	360 000	1 200	29426	189	255	31	41	81
140	240	60	2.1	685	2 360	70 000	241 000	1 400	29328	183	230	20	29	82
	280	85	4	1 110	3 750	114 000	385 000	1 200	29428	199	268	31	41	86
150	215	39	1.5	340	1 340	34 500	136 000	1 800	29230	178	208	14	19	82
	250	60	2.1	675	2 390	68 500	243 000	1 400	29330	194	240	20	29	87
	300	90	4	1 280	4 350	131 000	445 000	1 100	29430	214	285	32	44	92
160	225	39	1.5	360	1 460	36 500	149 000	1 700	29232	188	219	14	19	86
	270	67	3	820	2 860	84 000	292 000	1 300	29332	208	260	24	32	92
	320	95	5	1 500	5 150	153 000	525 000	1 000	29432	229	306	34	45	99

1) Smallest allowable dimension for chamfer dimension r.



Equivalent bearing load

dynamic

$$P_a = F_a + 1.2F_r$$

static

$$P_{0a} = F_a + 2.7F_r$$

$$\text{when } \frac{F_r}{F_a} \leq 0.55$$

Abutment and fillet dimensions			Mass
d_a	mm	r_{as}	kg
min	D_a max	max	(approx.)
90	108	1.5	2.78
100	115	2	3.44
105	125	2	4.19
115	132	2	5.07
120	140	2	6.09
115	135	1.5	2.94
130	150	2	7.2
120	140	1.5	3.08
135	157	2	8.38
130	150	1.5	3.94
150	175	2.5	11.5
145	165	2	5.78
165	190	2.5	15
160	180	2	7.92
180	205	3	18.6
170	195	2	9.76
195	225	3	23.7
185	205	2	11.4
205	235	3	25.2
179	196	1.5	4.56
195	215	2	12
220	250	3	30.5
189	206	1.5	4.88
210	235	2.5	15.9
230	265	4	37

Thrust Ball Bearings

Thrust Needle Roller Bearings

Thrust Ball Bearings B511□□ SB511□□
B512□□

RoHS

The raceway plates and the retainer come apart easily. Take care when opening the product package.

Material: Steel SUJ2
Stainless Steel SUS440C Equivalent
Bearing Accuracy: JIS B 1514 Class 0

Thrust Needle Roller Bearings BA□□□□

Thrust Needle Roller with Retainer

Thrust Washer

RoHS

*Thrust washer may have a slight distortion when delivered, but it becomes flat when axial load of at least 200N is applied concentrically.

Material: SUJ2 Equivalent
Bearing Accuracy: JIS B 1514 Class 0 Compliant

Part Number	Steel	Stainless Steel	d	D	D1 (min)	T	r (min)	Basic Load Rating				Allowable Rotational Speed rpm (Reference)	Relative Dimensions			Mass (g) (Reference)		Unit Price	
								Ca (Dynamic) kN	Coa (Static) kN	Ca (Dynamic) kN	Coa (Static) kN		Ds (min)	dh (max)	R (max)	Steel	Stainless Steel	Steel	Stainless Steel
								Ca (Dynamic) kN	Coa (Static) kN	Ca (Dynamic) kN	Coa (Static) kN		Ds (min)	dh (max)	R (max)	Steel	Stainless Steel	Steel	Stainless Steel
B51100	SB51100	10	24	11	9	0.3	10.1	14	5	6.96	6700	18	16	0.3	19	21	-	-	
B51200	-	10	26	12	11	0.6	12.8	17.1	-	-	6000	20	16	0.6	28	-	-	-	
B51101	SB51101	12	26	13	9	0.3	10.4	15.4	5.15	7.7	6700	18	18	0.3	21	23	-	-	
B51201	-	12	28	14	11	0.6	13.3	19	-	-	5600	22	18	0.6	31	-	-	-	
B51102	SB51102	15	28	16	9	0.3	10.6	16.8	5.25	8.38	6300	23	20	0.3	23	24	-	-	
B51202	-	15	32	17	12	0.6	16.7	24.8	-	-	5000	25	22	0.6	43	-	-	-	
B51103	SB51103	17	30	18	9	0.3	11.4	19.5	5.39	9.07	6000	25	22	0.3	25	26	-	-	
B51203	-	17	35	19	12	0.6	17.3	27.3	-	-	4800	28	24	0.6	50	-	-	-	
B51104	SB51104	20	35	21	10	0.3	15.1	26.6	7.11	12.36	5300	29	26	0.3	37	40	-	-	
B51204	-	20	40	22	14	0.6	22.5	37.5	-	-	4300	32	28	-	77	-	-	-	
B51105	SB51105	25	42	26	11	0.6	19.7	37	9.76	18.63	4800	35	32	-	56	60	-	-	
B51205	-	25	47	27	15	0.6	28	50.5	-	-	3800	38	34	0.6	111	-	-	-	
B51106	SB51106	30	47	32	11	0.6	20.6	42	10.2	21.08	4300	40	37	-	64	69	-	-	
B51206	-	30	52	32	16	0.6	29.5	58	-	-	3400	43	39	-	137	-	-	-	

kgf=Nx0.101972

Part Number	Thrust Needle Roller with Retainer						Thrust Washer x2				Allowable Rotational Speed rpm (Reference)	Mass (g) (Reference)	Basic Dynamic Load Rating Ca kN	Basic Static Load Rating Coa kN	Unit Price
	d	D	B	F	F1	d1	D1	B1							
BA0414	4	14	13	5	4	4	14	14	5200	2.7	4.4	8			
BA0515	5	15	14	6	5	5	15	15	5200	2.8	4.75	9.2			
BA0619	6	19	18	7	6	6	19	19	4700	5	6.8	15.5			
BA0821	8	21	20	9	8	8	21	21	4500	6	7.8	19.4			
BA1024	10	24	23	12	10	10	24	24	4200	9	9.2	25.5			
BA1226	12	26	25	14	12	12	26	26	3700	10	9.9	29.0			
BA1528	15	28	27	17	15	15	28	28	3200	12	11.3	36.0			
BA1730	17	30	29	19	17	17	30	30	3000	15	13.1	39.5			
BA2035	20	35	34	22	20	20	35	35	2500	21	14.7	58.0			
BA2542	25	42	41	29	25	25	42	42	2100	24	16.3	70.0			
BA3047	30	47	46	34	30	30	47	47	1800	-	-	-			

kgf=Nx0.101972

Ordering Example

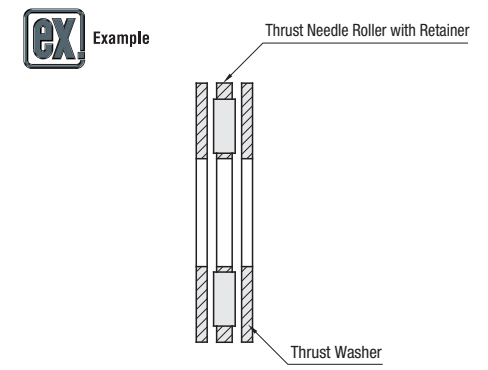
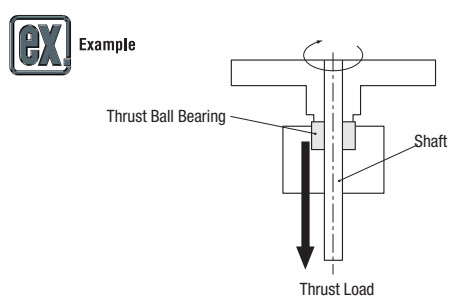
Part Number

B51200
SB51100

Ordering Example

Part Number

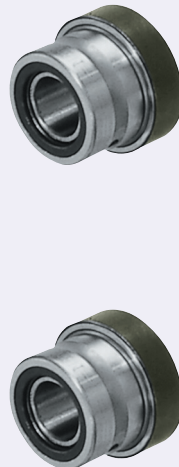
BA0515



Needle Roller Bearings with Thrust Ball Bearings / Needle Roller Bearings with Thrust Roller Bearings With Inner Ring

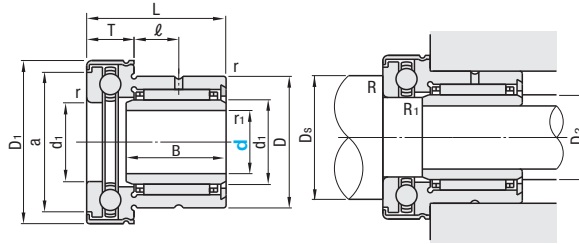
One-Way Clutches

Needle Roller Bearings

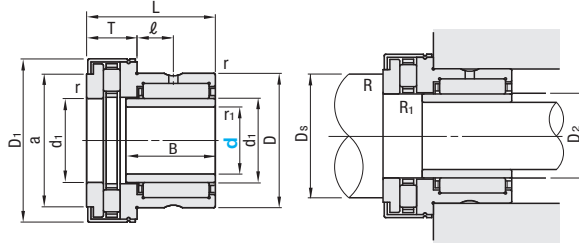


RoHS

NKXZ (With Thrust Ball Bearings)



NKXRZ (With Thrust Roller Bearings)



The model number of this product is determined based on the inner diameter of the detachable inner ring. This may cause a disparity in the model number of the similar products by other companies. Please make sure to check the catalog dimensions when you place an order.

Features


- Dust cover is provided on the thrust bearing side to prevent intrusion of dirt and lubricant leakage.
- With its ability to sustain radial and axial loads simultaneously, NKXZ is suitable for the compact design to use on fixed shaft ends. The NKXRZ has better performance against axial loads.

Recommended Fits

Shaft	Housing
k6	K6

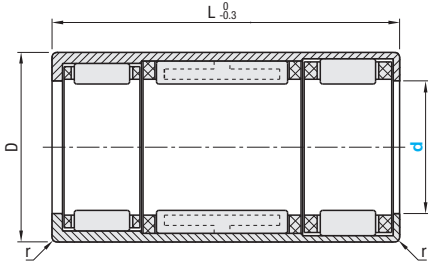
Material: SUJ2 Equivalent
Accessory: Cover
Bearing Accuracy: JIS B 1514 Class 0 Compliant

Features: Bearings are on both ends of the clutch to support radial loads.




RoHS

BHFL



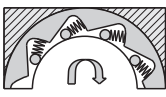
One-Way Clutch Structure

During Lock-up



Shaft torque is transmitted to the housing during lock-up.

During Free Running



Shaft torque is not transmitted to the housing during free running.

Recommended Fits

Shaft	Housing	
	Steel	Light Metal
h5(h6)	N6(N7)	R6(R7)

*When applied torque is smaller than half the allowable torque, tolerance in () can be applied.

Material: SPCC

Note the mounting direction as the clutch will lock in one direction and free-spin in the other.

Part Number	Type	d	D	B	L	T	r (min)	r1 (min)	d1	D1	l	a	Radial				Axial				Allowable Rotational Speed rpm (Reference)	Relative Dimensions				Mass (g) (Reference)	Unit Price
													Basic Dynamic Load Rating CrkN	Basic Static Load Rating CorkN	Basic Dynamic Load Rating CakN	Basic Static Load Rating CpakN	Ds	D2	R	R1							
													CrkN	CorkN	CakN	CpakN	(min)	(min)	(max)	(max)							
7	19	19	16	23	9	0.3	10	25.2	6.5	19.7	6.2	7.8	10.0	14.0	7200	18	9	0.3	40.9								
9	21	21	16	23	9	0.3	12	27.2	6.5	21.7	9	11	10.3	15.4	6600	20	11	0.3	46								
12	24	24	17	25	10	0.3	15	29.2	8	23.7	10.7	12.7	10.5	16.8	5700	23	14	0.3	54.6								
14	26	26	17	25	10	0.3	17	31.2	8	25.7	11.9	15	10.8	18.2	5100	25	16	0.3	64.5								
17	30	30	20	30	11	0.3	20	36.2	10.5	30.7	16.4	23.8	14.3	24.7	4500	29	19	0.3	103.5								
20	37	37	20	30	11	0.3	25	43.2	9.5	37.7	18.8	30.5	19.6	37.5	3600	35	22	0.3	159.5								
25	42	42	20	30	11	0.3	30	48.2	9.5	42.7	22.6	36	20.4	42.0	3000	40	27	0.3	180.8								
30	47	47	20	30	11	0.6	35	53.2	9.0	47.7	24.3	41.5	21.2	47.0	2700	45	32	0.6	207								
35	52	52	25	35	12	0.6	40	61.2	10	55.7	26	47	27	63	2400	52	37	0.6	252.2								
40	58	58	25	35	12	0.6	45	66.5	9	60.5	27.5	53	28	69	2100	57	42	0.6	315.8								
45	62	62	25	35	14	0.6	50	71.5	10	65.5	38	74	29	75	1900	62	48	0.6	370.8								
50	72	72	40	47	17	1	60	86.5	12	80.5	42	90	41.5	113	1600	75	55	1	542								

Part Number	Type	d	D	B	L	T	r (min)	r1 (min)	d1	D1	l	a	Radial				Axial				Allowable Rotational Speed rpm (Reference)	Relative Dimensions				Mass (g) (Reference)	Unit Price
													Basic Dynamic Load Rating CrkN	Basic Static Load Rating CorkN	Basic Dynamic Load Rating CakN	Basic Static Load Rating CpakN	Ds	D2	R	R1							
													CrkN	CorkN	CakN	CpakN	(min)	(min)	(max)	(max)							
12	24	24	16	23	9	0.3	15	29.2	6.5	23.7	10.7	12.7	14.4	28.5	7800	25	14	0.3	52.6								
14	26	26	17	25	10	0.3	17	31.2	8	25.7	11.9	15	15.9	33.5	7200	27	16	0.3	62.5								
17	30	30	20	30	11	0.3	20	36.2	10.5	30.7	16.4	23.8	24.9	53	6000	32	19	0.3	97.5								
20	37	37	20	30	11	0.3	25	43.2	9.5	37.7	18.8	30.5	33.5	76	5100	39	22	0.3	152.5								
25	42	42	20	30	11	0.3	30	48.2	9.5	42.7	22.6	36	35.5	86	4500	44	27	0.3	173.8								
30	47	47	20	30	11	0.6	35	53.2	9	47.7	24.3	41.5	39	101	3900	49	32	0.6	204								
35	52	52	25	35	12	0.6	40	61.2	10	55.7	26	47	56	148	3600	56	37	0.6	258.2								
40	58	58	25	35	12	0.6	45	66.5	9	60.5	27.5	53	59	163	3000	61	42	0.6	310.8								
45	62	62	25	35	14	0.6	50	71.5	10	65.5	38	74	61	177	2800	66	48	0.6	358.8								

Ordering Example Part Number
NKXZ20
NKXRZ17

Part Number	Type	d	D	L	r (min)	Allowable Torque N·m	Allowable Rotational Speed		Mass (g)	Unit Price
							During Shaft Rotation rpm	During Outer Race Rotation rpm		
BHFL	6	10	15	22	0.3	1.76	23000	13000	4	
BHFL	8	12	22			3.15	17000	12000	7	
BHFL	10	14	22			5.3	14000	11000	8	
BHFL	12	18	22			12.2	11000	8000	18	
BHFL	14	20	26	0.3	17.3	9500	8000	20		
BHFL	16	22			20.5	8500	7500	22		
BHFL	18	24			24.1	7500	7500	25		
BHFL	20	26			28.5	7000	6500	27		
BHFL	25	32	30	0.3	66	5500	5500	44		
BHFL	30	37			90	4500	4500	51		
BHFL	35	42			121	3900	3900	58		

Ordering Example Part Number
BHFL10

