



## Deep-groove Ball Bearings

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Because of their versatility, Single-row, Deep-groove Ball Bearings are the most popular of all the ball bearing types. NACHI Deep-groove Ball Bearings are available in a wide range of series defined by the JIS (ISO) standard dimension plan and are also made to meet specialized dimension and configuration requirements. NACHI Deep-groove Ball Bearings are manufactured in both standard precision grade

(ISO Grade 0 -ABEC Grade 1) as well as in high-precision grades. Table 1 shows common, standard configurations of Single-row Deep-groove Ball Bearings. Table 2 next page shows a comparison of general characteristics of seal and shield designs for Single-row, Deep-groove Ball bearings.

**Table 1. Standard Configuration of Single-row, Deep-groove Ball Bearings**

Configuration	Design	Cross section
Open (no seals, shields)	Consists of inner and outer rings, balls, and cage.	 Open
Shield	One or two steel shields provide labyrinth clearance	 Z ZZ ZE ZZE
(1)Sealed or shielded Bearings	Non-contact Rubber Seal(2)	One or two non-contact rubber seals provide labyrinth clearance  NK 2NK NKE 2NKE
	Contact Rubber Seal(2)	One or two contact rubber seals in contact with inner ring  NSL 2NSL NSE 2NSE
Snap-ring Groove in Outer Ring	N : with snap-ring groove in outer ring. NR: with groove and snap ring in outer ring. (Use of snap ring allows easy mounting and simplified housing design.) Sealed or shielded bearings are also available, contact NACHI for more information.	 N NR

Notes: (1) One seal or shield type bearings may have a seal groove on the other side.  
 Seals or shields for two seal or two shield bearings have the same marks as one seal or one shield bearings.  
 (2) NKE seals are blue and NSE seals are brown

Table 2. Comparison of Seal and Shield Characteristics

Characteristics	Shield (Z, ZE)	Non-contact Rubber Seal (NK, NKE)	Contact Rubber Seal (MSL, NSE)
Friction torque	Low	Low	Higher than NK, NKE, Z and ZE
High speed	Excellent	Excellent	Good (There is some limitation)
Grease sealing	Good	Better than Z, ZE	Excellent at low speed ①The grease may leak from the bearing at high speeds and high temperature. ②The grease may leak in case of outer ring rotation.
Dust proof	Good	Better than Z, ZE	Excellent (Can be used in severe dust environments)
Water proof	unsuitable	unsuitable	Excellent
Recommended operation temperature range for standard filled grease	-25~120°C	-25~120°C	-25~120°C

### ● Load rating

The values for basic dynamic load rating (Cr) and basic static load rating (Cor) given in the dimension table are for inner rings, outer rings and ball bearings of bearing steel with normal heat treatment.

(4) When a bearing is mounted on a shaft (into a housing), force should only be applied to the side face of the inner (outer) ring.

(5) The sealed or shielded bearings should not be washed or heated before mounting.

(6) It should be noted that mounting errors such as misalignment of the bearing rings cause an appreciable increase in noise level.

(7) The bearings must always be subjected to a minimum load to prevent sliding movements occurring between the balls and the raceways.

### ● Attention

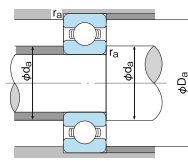
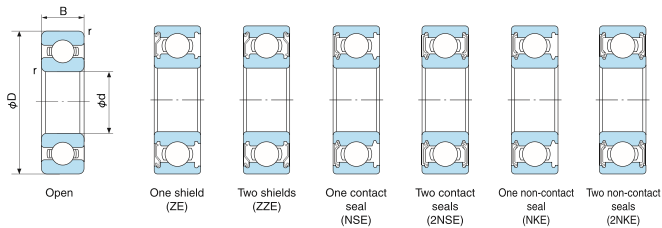
(1) Deep-groove Ball Bearings can sustain radial, axial or composite loads. However when excessive axial load is applied, please consult with NACHI.

(2) Because sealed or shielded bearings are designed for inner ring rotating applications, the filled grease may leak when they are used with a high speed outer ring rotating condition. In such a case, please contact NACHI.

(3) When bearings with contact rubber seals are used in a severe operating condition such as high speed or high temperature, the filled grease may leak. In such a case, a design change or another kind of grease is required.

**Deep-groove Ball Bearings**

Bore Diameter: 10~25mm



**Dynamic equivalent radial load**  
Pr=XFr+YFa

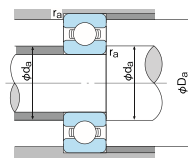
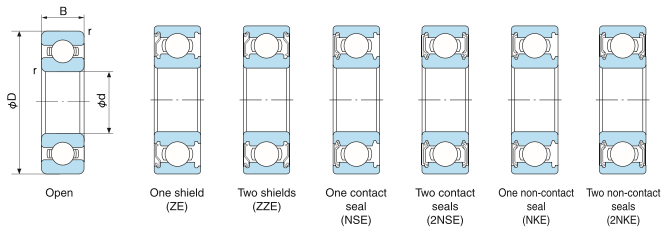
**Static equivalent radial load**  
Larger value of following to be used:  
Por=0.6Fr+0.5Fa  
Por=Fr

10Fa Cor	e	-Fa Fr ≤ e		-Fa Fr > e	
		X	Y	X	Y
0.172	0.19				2.30
0.345	0.22	1	0	0.56	1.99
0.689	0.26				1.71
1.03	0.28				1.55
1.38	0.30	1	0	0.56	1.45
2.07	0.34				1.31
3.45	0.38				1.15
5.17	0.42	1	0	0.56	1.04
6.89	0.44				1.00

Boundary dimensions (mm)				Bearing No.							Basic dynamic load rating Cr (N)	Basic static load rating Cor (N)	Factor fo	Limiting speed (min <sup>-1</sup> )			Abutment and fillet dimensions (mm)			Mass (kg)	Bearing No.	
d	D	B	r (min)	Open type	Shield type		Contact seal type		Non-contact seal type					Grease lubrication		Oil lubrication		da (min)	Da (max)			ra (max)
					Open type, ZE, ZZE,NKE,2NKE	NSE, 2NSE	NSE, 2NSE	Open type, ZE	Open type, ZE	Open type, ZE				Open type, ZE	Open type, ZE	Open type, ZE	Open type, ZE	Open type, ZE	Open type, ZE			Open type, ZE
10	19	5	0.3	6800	6800ZE	6800ZZE	6800NSE	6800-2NSE	6800NKE	6800-2NKE	2120	985	14.2	37000	24000	38000	12	17	0.3	0.005	6800	
	22	6	0.3	6900	6900ZE	6900ZZE	6900NSE	6900-2NSE	6900NKE	6900-2NKE	2490	1130	14.0	33000	22000	36000	12	20	0.3	0.009	6900	
	26	8	0.3	6000	6000ZE	6000ZZE	6000NSE	6000-2NSE	6000NKE	6000-2NKE	4550	1970	12.4	30000	22000	36000	12	24	0.3	0.019	6000	
	30	9	0.6	6200	6200ZE	6200ZZE	6200NSE	6200-2NSE	6200NKE	6200-2NKE	5100	2390	13.2	25000	18000	30000	15	25	0.6	0.032	6200	
12	35	11	0.6	6300	6300ZE	6300ZZE	6300NSE	6300-2NSE	6300NKE	6300-2NKE	8100	3450	11.3	23000	17000	27000	15	30	0.6	0.053	6300	
	21	5	0.3	6801	6801ZE	6801ZZE	6801NSE	6801-2NSE	6801NKE	6801-2NKE	1920	1040	15.3	32000	20000	39000	14	19	0.3	0.006	6801	
	24	6	0.3	6901	6901ZE	6901ZZE	6901NSE	6901-2NSE	6901NKE	6901-2NKE	2700	1320	14.5	30000	20000	36000	14	22	0.3	0.011	6901	
	28	8	0.3	6001	6001ZE	6001ZZE	6001NSE	6001-2NSE	6001NKE	6001-2NKE	5100	2390	13.2	28000	18000	32000	14	26	0.3	0.023	6001	
15	32	10	0.6	6201	6201ZE	6201ZZE	6201NSE	6201-2NSE	6201NKE	6201-2NKE	6800	3050	12.3	22000	17000	28000	17	27	0.6	0.037	6201	
	37	12	1	6301	6301ZE	6301ZZE	6301NSE	6301-2NSE	6301NKE	6301-2NKE	9750	4250	11.2	20000	16000	24000	18	31	1.0	0.060	6301	
	24	5	0.3	6802	6802ZE	6802ZZE	6802NSE	6802-2NSE	6802NKE	6802-2NKE	2080	1260	15.8	28000	17000	34000	17	22	0.3	0.007	6802	
	28	7	0.3	6902	6902ZE	6902ZZE	6902NSE	6902-2NSE	6902NKE	6902-2NKE	4300	2250	14.3	26000	17000	31000	17	26	0.3	0.016	6902	
17	32	8	0.3	16002	-	-	-	-	-	-	5600	2840	13.9	24000	-	28000	20	27	0.3	0.025	16002	
	32	9	0.3	6002	6002ZE	6002ZZE	6002NSE	6002-2NSE	6002NKE	6002-2NKE	5600	2840	13.9	24000	15000	28000	17	30	0.3	0.032	6002	
	35	11	0.6	6202	6202ZE	6202ZZE	6202NSE	6202-2NSE	6202NKE	6202-2NKE	7650	3700	13.1	20000	15000	24000	20	30	0.6	0.045	6202	
	42	13	1	6302	6302ZE	6302ZZE	6302NSE	6302-2NSE	6302NKE	6302-2NKE	11400	5400	12.3	17000	13000	21000	21	36	1.0	0.082	6302	
20	26	5	0.3	6803	6803ZE	6803ZZE	6803NSE	6803-2NSE	6803NKE	6803-2NKE	2630	1570	16.1	26000	15000	30000	19	24	0.3	0.008	6803	
	30	7	0.3	6903	6903ZE	6903ZZE	6903NSE	6903-2NSE	6903NKE	6903-2NKE	4600	2550	14.7	24000	15000	29000	19	28	0.3	0.018	6903	
	35	8	0.3	16003	-	-	-	-	-	-	6000	3250	14.3	22000	-	26000	22	30	0.3	0.032	16003	
	35	10	0.3	6003	6003ZE	6003ZZE	6003NSE	6003-2NSE	6003NKE	6003-2NKE	6000	3250	14.3	22000	14000	26000	19	33	0.3	0.039	6003	
22	40	12	0.6	6203	6203ZE	6203ZZE	6203NSE	6203-2NSE	6203NKE	6203-2NKE	9550	4800	13.1	18000	12000	21000	22	35	0.6	0.065	6203	
	47	14	1	6303	6303ZE	6303ZZE	6303NSE	6303-2NSE	6303NKE	6303-2NKE	13600	6550	12.3	16000	11000	19000	23	41	1.0	0.115	6303	
	32	7	0.3	6804	6804ZE	6804ZZE	6804NSE	6804-2NSE	6804NKE	6804-2NKE	4000	2640	15.5	22000	13000	26000	22	30	0.3	0.019	6804	
	37	9	0.3	6904	6904ZE	6904ZZE	6904NSE	6904-2NSE	6904NKE	6904-2NKE	6350	3700	14.8	19000	12000	23000	22	35	0.3	0.036	6904	
25	42	8	0.3	16004	-	-	-	-	-	-	7900	4500	14.5	18000	-	21000	25	37	0.3	0.050	16004	
	42	12	0.6	6004	6004ZE	6004ZZE	6004NSE	6004-2NSE	6004NKE	6004-2NKE	9400	5000	13.9	18000	11000	21000	24	38	0.6	0.070	6004	
	47	14	1	6204	6204ZE	6204ZZE	6204NSE	6204-2NSE	6204NKE	6204-2NKE	12800	6600	13.1	16000	11000	18000	26	41	1.0	0.106	6204	
	52	15	1.1	6304	6304ZE	6304ZZE	6304NSE	6304-2NSE	6304NKE	6304-2NKE	15900	7900	12.4	14000	10000	17000	27	45	1.1	0.144	6304	
25	50	14	1	62/22	62/22ZE	62/22ZZE	62/22NSE	62/22-2NSE	62/22NKE	62/22-2NKE	13900	6950	13.1	14000	9700	17000	28	44	1.0	0.120	62/22	
	56	16	1.1	63/22	63/22ZE	63/22ZZE	63/22NSE	63/22-2NSE	63/22NKE	63/22-2NKE	18400	9250	12.4	13000	9500	16000	29	49	1.0	0.176	63/22	
	37	7	0.3	6805	6805ZE	6805ZZE	6805NSE	6805-2NSE	6805NKE	6805-2NKE	4300	2940	16.0	18000	10000	22000	27	35	0.3	0.022	6805	
	42	9	0.3	6905	6905ZE	6905ZZE	6905NSE	6905-2NSE	6905NKE	6905-2NKE	7000	4500	15.3	16000	10000	20000	27	40	0.3	0.042	6905	
25	47	8	0.3	16005	-	-	-	-	-	-	6950	4600	15.6	15000	-	18000	30	42	0.3	0.060	16005	
	47	12	0.6	6005	6005ZE	6005ZZE	6005NSE	6005-2NSE	6005NKE	6005-2NKE	10100	5850	14.5	15000	9500	18000	29	43	0.6	0.079	6005	
	52	15	1	6205	6205ZE	6205ZZE	6205NSE	6205-2NSE	6205NKE	6205-2NKE	14000	7900	13.9	13000	9000	16000	31	46	1.0	0.128	6205	
	62	17	1.1	6305	6305ZE	6305ZZE	6305NSE	6305-2NSE	6305NKE	6305-2NKE	23600	12100	12.2	12000	8100	14000	32	55	1.0	0.232	6305	

**Deep-groove Ball Bearings**

Bore Diameter: 28~50mm



■ **Dynamic equivalent radial load**  
 $P_r = X F_r + Y F_a$

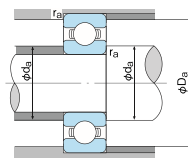
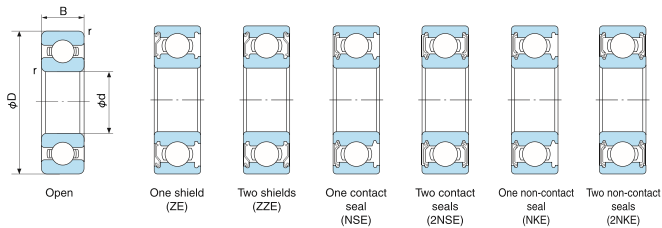
■ **Static equivalent radial load**  
 Larger value of following to be used:  
 $P_{0r} = 0.6 F_r + 0.5 F_a$   
 $P_{0r} = F_r$

$\frac{f_0 F_a}{C_{or}}$	e	$\frac{F_a}{F_r} \leq e$		$\frac{F_a}{F_r} > e$	
		X	Y	X	Y
0.172	0.19				2.30
0.345	0.22	1	0	0.56	1.99
0.689	0.26				1.71
1.03	0.28				1.55
1.38	0.30	1	0	0.56	1.45
2.07	0.34				1.31
3.45	0.38				1.15
5.17	0.42	1	0	0.56	1.04
6.89	0.44				1.00

Boundary dimensions (mm)				Bearing No.								Basic dynamic load rating Cr (N)	Basic static load rating Cor (N)	Factor $f_0$	Limiting speed (min <sup>-1</sup> )				Abutment and fillet dimensions (mm)			Mass (kg)	Bearing No.
d	D	B	r (min)	Open type		Shield type		Contact seal type		Non-contact seal type					Grease lubrication		Oil lubrication		d <sub>a</sub> (min)	D <sub>a</sub> (max)	r <sub>a</sub> (max)		
				Open type, ZE, ZZE, NKE, 2NKE	NSE, 2NSE	Open type, ZE																	
28	58	16	1	62/28	62/28ZE	62/28ZZE	62/28NSE	62/28-2NSE	62/28NKE	62/28-2NKE	17900	9750	13.1	12000	8200	14000	34	52	1.0	0.175	62/28		
	68	18	1.1	63/28	63/28ZE	63/28ZZE	63/28NSE	63/28-2NSE	63/28NKE	63/28-2NKE	26800	14000	12.4	11000	7500	13000	35	61	1.0	0.287	63/28		
	42	7	0.3	6806	6806ZE	6806ZZE	6806NSE	6806-2NSE	6806NKE	6806-2NKE	5350	3800	16.4	15000	9000	18000	32	40	0.3	0.026	6806		
	47	9	0.3	6906	6906ZE	6906ZZE	6906NSE	6906-2NSE	6906NKE	6906-2NKE	7250	5000	15.8	14000	8500	17000	32	45	0.3	0.045	6906		
30	55	9	0.3	16006	—	—	—	—	—	—	9950	6550	15.4	13000	—	15000	35	50	0.3	0.085	16006		
	55	13	1	6006	6006ZE	6006ZZE	6006NSE	6006-2NSE	6006NKE	6006-2NKE	13200	8300	14.8	13000	8000	15000	35	50	1.0	0.117	6006		
	62	16	1	6206	6206ZE	6206ZZE	6206NSE	6206-2NSE	6206NKE	6206-2NKE	19500	11300	13.9	11000	7500	13000	36	56	1.0	0.199	6206		
	72	19	1.1	6306	6306ZE	6306ZZE	6306NSE	6306-2NSE	6306NKE	6306-2NKE	26700	15000	13.2	10000	6700	12000	37	65	1.0	0.346	6306		
32	65	17	1	62/32	62/32ZE	62/32ZZE	62/32NSE	62/32-2NSE	62/32NKE	62/32-2NKE	22400	13100	13.6	11000	7100	12000	38	59	1.0	0.230	62/32		
	75	20	1.1	63/32	63/32ZE	63/32ZZE	63/32NSE	63/32-2NSE	63/32NKE	63/32-2NKE	30000	16200	12.7	9500	6500	11000	39	68	1.0	0.382	63/32		
	47	7	0.3	6807	6807ZE	6807ZZE	6807NSE	6807-2NSE	6807NKE	6807-2NKE	4750	3800	16.4	14000	7600	16000	37	45	0.3	0.029	6807		
	55	10	0.6	6907	6907ZE	6907ZZE	6907NSE	6907-2NSE	6907NKE	6907-2NKE	10400	7150	15.6	12000	7500	15000	39	51	0.6	0.073	6907		
35	62	9	0.3	16007	—	—	—	—	—	—	11700	8150	15.6	12000	—	14000	40	57	0.6	0.110	16007		
	62	14	1	6007	6007ZE	6007ZZE	6007NSE	6007-2NSE	6007NKE	6007-2NKE	16000	10300	14.8	12000	6800	14000	40	57	1.0	0.156	6007		
	72	17	1.1	6207	6207ZE	6207ZZE	6207NSE	6207-2NSE	6207NKE	6207-2NKE	25700	15300	13.8	9800	6300	11000	42	65	1.0	0.288	6207		
	80	21	1.5	6307	6307ZE	6307ZZE	6307NSE	6307-2NSE	6307NKE	6307-2NKE	33500	19200	13.2	8800	6000	10000	44	71	1.5	0.457	6307		
40	52	7	0.3	6808	6808ZE	6808ZZE	6808NSE	6808-2NSE	6808NKE	6808-2NKE	5950	4900	16.2	12000	6700	14000	42	50	0.3	0.033	6808		
	62	12	0.6	6908	6908ZE	6908ZZE	6908NSE	6908-2NSE	6908NKE	6908-2NKE	13700	9950	15.8	11000	6300	13000	44	58	0.6	0.108	6908		
	68	9	0.3	16008	—	—	—	—	—	—	11100	8550	16.1	10000	—	12000	45	63	0.3	0.125	16008		
	68	15	1	6008	6008ZE	6008ZZE	6008NSE	6008-2NSE	6008NKE	6008-2NKE	16800	11500	15.3	10000	6100	12000	45	63	1.0	0.194	6008		
45	80	18	1.1	6208	6208ZE	6208ZZE	6208NSE	6208-2NSE	6208NKE	6208-2NKE	29100	17900	14.0	8700	5600	10000	47	73	1.0	0.366	6208		
	90	23	1.5	6308	6308ZE	6308ZZE	6308NSE	6308-2NSE	6308NKE	6308-2NKE	40500	24100	13.2	7800	5300	9200	49	81	1.5	0.633	6308		
	58	7	0.3	6809	6809ZE	6809ZZE	6809NSE	6809-2NSE	6809NKE	6809-2NKE	5350	4900	16.1	11000	6000	13000	47	56	0.3	0.040	6809		
	68	12	0.6	6909	6909ZE	6909ZZE	6909NSE	6909-2NSE	6909NKE	6909-2NKE	14100	10900	16.1	10000	5600	12000	49	64	0.6	0.122	6909		
50	75	10	0.6	16009	—	—	—	—	—	—	12900	10500	16.2	9200	—	11000	52	68	0.6	0.170	16009		
	75	16	1	6009	6009ZE	6009ZZE	6009NSE	6009-2NSE	6009NKE	6009-2NKE	20900	15200	15.3	9200	5400	11000	50	70	1.0	0.246	6009		
	85	19	1.1	6209	6209ZE	6209ZZE	6209NSE	6209-2NSE	6209NKE	6209-2NKE	32500	20500	14.1	7800	5300	9300	52	78	1.0	0.407	6209		
	100	25	1.5	6309	6309ZE	6309ZZE	6309NSE	6309-2NSE	6309NKE	6309-2NKE	53000	32000	13.1	7000	4800	8200	54	91	1.5	0.833	6309		
50	65	7	0.3	6810	6810ZE	6810ZZE	6810NSE	6810-2NSE	6810NKE	6810-2NKE	6400	5800	16.1	10000	5300	12000	52	63	0.3	0.052	6810		
	72	12	0.6	6910	6910ZE	6910ZZE	6910NSE	6910-2NSE	6910NKE	6910-2NKE	14500	11700	16.1	9500	5300	11000	54	68	0.6	0.125	6910		
	80	10	0.6	16010	—	—	—	—	—	—	16100	13100	16.1	8500	—	10000	57	73	0.6	0.180	16010		
	90	16	1	6010	6010ZE	6010ZZE	6010NSE	6010-2NSE	6010NKE	6010-2NKE	21800	16600	15.6	8500	5000	10000	55	75	1.0	0.264	6010		
50	90	20	1.1	6210	6210ZE	6210ZZE	6210NSE	6210-2NSE	6210NKE	6210-2NKE	35000	23200	14.4	7100	4800	8600	57	83	1.0	0.463	6210		
	110	27	2	6310	6310ZE	6310ZZE	6310NSE	6310-2NSE	6310NKE	6310-2NKE	62000	38000	13.1	6400	4300	7500	60	100	2.0	1.07	6310		

**Deep-groove Ball Bearings**

Bore Diameter: 55~80mm



■ **Dynamic equivalent radial load**  
 $P_r = X F_r + Y F_a$

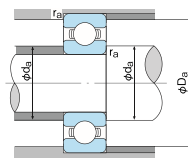
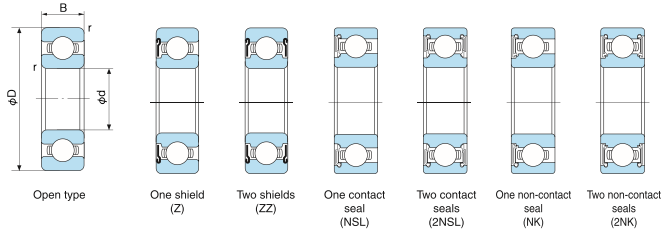
■ **Static equivalent radial load**  
 Larger value of following to be used:  
 $P_0 = 0.6 F_r + 0.5 F_a$   
 $P_0 = F_r$

$\frac{f_0 F_a}{C_{or}}$	e	$\frac{F_a}{F_r} \leq e$		$\frac{F_a}{F_r} > e$	
		X	Y	X	Y
0.172	0.19				2.30
0.345	0.22	1	0	0.56	1.99
0.689	0.26				1.71
1.03	0.28				1.55
1.38	0.30	1	0	0.56	1.45
2.07	0.34				1.31
3.45	0.38				1.15
5.17	0.42	1	0	0.56	1.04
6.89	0.44				1.00

Boundary dimensions (mm)				Bearing No.							1N=0.102kgf			Limiting speed (min <sup>-1</sup> )				Abutment and fillet dimensions (mm)			Mass (kg)	Bearing No.
d	D	B	r (min)	Open type	Shield type		Contact seal type		Non-contact seal type		Basic dynamic load rating Cr (N)	Basic static load rating Cor (N)	Factor f <sub>0</sub>	Grease lubrication		Oil lubrication		d <sub>a</sub> (min)	D <sub>a</sub> (max)	r <sub>a</sub> (max)		
										Open type, ZE, ZZE, NKE, 2NKE				NSE, 2NSE	Open type, ZE							
55	72	9	0.3	6811	6811Z	6811ZZ	—	—	—	—	8800	8100	16.2	8700	—	10000	57	70	0.3	0.083	6811	
	80	13	1	6911	6911Z	6911ZZ	—	—	—	—	16000	13200	16.2	8200	—	9600	60	75	1.0	0.177	6911	
	90	11	0.6	16011	—	—	—	—	—	—	15200	13500	16.5	7700	—	9000	62	83	0.6	0.260	16011	
	90	18	1.1	6011	6011ZE	6011ZZE	6011NSE	6011-2NSE	6011NKE	6011-2NKE	28300	21300	15.4	7700	4500	9000	61	84	1.0	0.384	6011	
	100	21	1.5	6211	6211ZE	6211ZZE	6211NSE	6211-2NSE	6211NKE	6211-2NKE	43500	29300	14.4	6400	4300	7700	64	91	1.5	0.607	6211	
	120	29	2	6311	6311ZE	6311ZZE	6311NSE	6311-2NSE	6311NKE	6311-2NKE	71500	44500	13.1	5800	4000	6800	65	110	2.0	1.37	6311	
60	78	10	0.3	6812	6812Z	6812ZZ	—	—	—	—	11500	10600	16.3	8000	—	9500	62	76	0.3	0.106	6812	
	85	13	1	6912	6912Z	6912ZZ	—	—	—	—	15200	13500	16.5	7600	—	9000	65	80	1.0	0.191	6912	
	95	11	0.6	16012	—	—	—	—	—	—	16200	14300	16.5	7100	—	8500	67	88	0.6	0.280	16012	
	95	18	1.1	6012	6012ZE	6012ZZE	6012NSE	6012-2NSE	6012NKE	6012-2NKE	29400	23200	15.5	7100	4100	8500	66	89	1.0	0.418	6012	
	110	22	1.5	6212	6212ZE	6212ZZE	6212NSE	6212-2NSE	6212NKE	6212-2NKE	52500	36000	14.3	6000	3800	7100	69	101	1.5	0.783	6212	
	130	31	2.1	6312	6312ZE	6312ZZE	6312NSE	6312-2NSE	6312NKE	6312-2NKE	82000	52000	13.2	5400	3600	6300	72	118	2.0	1.70	6312	
65	85	10	0.6	6813	6813Z	6813ZZ	—	—	—	—	11900	11500	16.2	7500	—	8700	69	81	0.6	0.125	6813	
	90	13	1	6913	6913Z	6913ZZ	—	—	—	—	17400	16000	16.5	7100	—	8500	70	85	1.0	0.200	6913	
	100	11	0.6	16013	—	—	—	—	—	—	20500	18600	16.4	6700	—	8000	72	93	0.6	0.300	16013	
	100	18	1.1	6013	6013ZE	6013ZZE	6013NSE	6013-2NSE	6013NKE	6013-2NKE	30500	25200	15.7	6700	4000	8000	71	94	1.0	0.438	6013	
	120	23	1.5	6213	6213ZE	6213ZZE	6213NSE	6213-2NSE	6213NKE	6213-2NKE	57000	40000	14.4	5500	3600	6500	74	111	1.5	0.990	6213	
	140	33	2.1	6313	6313ZE	6313ZZE	6313NSE	6313-2NSE	6313NKE	6313-2NKE	92500	59500	13.2	4900	3400	6000	77	128	2.0	2.08	6313	
70	90	10	0.6	6814	6814Z	6814ZZ	—	—	—	—	12100	11900	16.1	7000	—	8100	74	86	0.6	0.135	6814	
	100	16	1	6914	6914Z	6914ZZ	—	—	—	—	23700	21100	16.3	6500	—	7700	75	95	1.0	0.327	6914	
	110	13	0.6	16014	—	—	—	—	—	—	26800	23600	16.2	6100	—	7100	77	103	0.6	0.433	16014	
	110	20	1.1	6014	6014ZE	6014ZZE	6014NSE	6014-2NSE	6014NKE	6014-2NKE	38000	31000	15.6	6100	3600	7100	76	104	1.0	0.607	6014	
	125	24	1.5	6214	6214ZE	6214ZZE	6214NSE	6214-2NSE	6214NKE	6214-2NKE	62000	44000	14.4	5100	3400	6300	79	116	1.5	1.07	6214	
	150	35	2.1	6314	6314ZE	6314ZZE	6314NSE	6314-2NSE	6314NKE	6314-2NKE	104000	68000	13.2	4600	3200	5400	82	138	2.0	2.52	6314	
75	95	10	0.6	6815	6815Z	6815ZZ	—	—	—	—	12500	12800	16.0	6500	—	7600	79	91	0.6	0.145	6815	
	105	16	1	6915	6915Z	6915ZZ	—	—	—	—	20800	19700	16.5	6200	—	7200	80	100	1.0	0.345	6915	
	115	13	0.6	16015	—	—	—	—	—	—	27600	25300	16.4	5700	—	6700	82	108	0.6	0.457	16015	
	115	20	1.1	6015	6015ZE	6015ZZE	6015NSE	6015-2NSE	6015NKE	6015-2NKE	39500	33500	15.7	5700	3400	6700	81	109	1.0	0.645	6015	
	130	25	1.5	6215	6215ZE	6215ZZE	6215NSE	6215-2NSE	6215NKE	6215-2NKE	66000	49500	14.7	4800	3200	5600	84	121	1.5	1.18	6215	
	160	37	2.1	6315	6315ZE	6315ZZE	6315NSE	6315-2NSE	6315NKE	6315-2NKE	113000	77000	13.2	4300	2900	5000	87	148	2.0	3.02	6315	
80	100	10	0.6	6816	6816Z	6816ZZ	—	—	—	—	12700	13300	15.9	6000	—	7100	84	96	0.6	0.155	6816	
	110	16	1	6916	6916Z	6916ZZ	—	—	—	—	27600	25300	16.4	5700	—	6700	85	105	1.0	0.363	6916	
	125	14	0.6	16016	—	—	—	—	—	—	32000	29600	16.4	5300	—	6300	87	118	0.6	0.597	16016	
	125	22	1.1	6016	6016Z	6016ZZ	—	—	—	—	47500	39500	15.6	5300	—	6300	86	119	1.0	0.855	6016	
	140	26	2	6216	6216Z	6216ZZ	6216NSL	6216-2NSL	6216NK	6216-2NK	72500	53000	14.6	4500	3000	5300	90	130	2.0	1.40	6216	
	170	39	2.1	6316	6316Z	6316ZZ	6316NSL	6316-2NSL	6316NK	6316-2NK	123000	86500	13.2	4000	2800	4800	92	158	2.0	3.59	6316	

**Deep-groove Ball Bearings**

Bore Diameter: 85~110mm



■ **Dynamic equivalent radial load**  
 $P_r = X F_r + Y F_a$

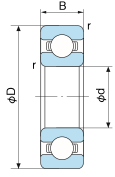
■ **Static equivalent radial load**  
 Larger value of following to be used:  
 $P_{0r} = 0.6 F_r + 0.5 F_a$   
 $P_{0r} = F_r$

$\frac{f_0 F_a}{C_{or}}$	e	$\frac{F_a}{F_r} \leq e$	$\frac{F_a}{F_r} > e$
		X	Y
0.172	0.19		2.30
0.345	0.22	1	1.99
0.689	0.26		1.71
1.03	0.28		1.55
1.38	0.30	1	1.45
2.07	0.34		1.31
3.45	0.38		1.15
5.17	0.42	1	1.04
6.89	0.44		1.00

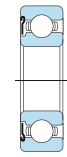
Boundary dimensions (mm)				Bearing No.						1N=0.102kgf				Limiting speed (min <sup>-1</sup> )				Abutment and fillet dimensions (mm)			Mass (kg)	Bearing No.
d	D	B	r (min)	Open type	Shield type		Contact seal type		Non-contact seal type		Basic dynamic load rating Cr (N)	Basic static load rating Cor (N)	Factor f <sub>0</sub>	Grease lubrication		Oil lubrication	d <sub>a</sub> (min)	D <sub>a</sub> (max)	r <sub>a</sub> (max)			
														Open type, Z, ZZ, NK, 2NK	NSL, 2NSL	Open type, Z						
85	110	13	1	6817	6817Z	6817ZZ	—	—	—	—	18700	19000	16.2	5700	—	6700	90	105	1.0	0.265	6817	
	120	18	1.1	6917	6917Z	6917ZZ	—	—	—	—	32000	29600	16.4	5400	—	6300	91	113	1.0	0.517	6917	
	130	14	0.6	16017	—	—	—	—	—	—	31500	29800	16.4	5000	—	6000	92	123	0.6	0.626	16017	
	130	22	1.1	6017	6017Z	6017ZZ	—	—	—	—	49500	43000	15.7	5000	—	6000	91	124	1.1	0.895	6017	
	150	28	2	6217	6217Z	6217ZZ	6217NSL	6217-2NSL	6217NK	6217-2NK	84000	62000	14.5	4300	2800	5000	95	140	2.0	1.79	6217	
	180	41	3	6317	6317Z	6317ZZ	6317NSL	6317-2NSL	6317NK	6317-2NK	133000	96500	13.3	3800	2600	4500	99	166	2.5	4.23	6317	
90	115	13	1	6818	6818Z	6818ZZ	—	—	—	—	19000	19700	16.1	5400	—	6300	95	110	1.0	0.280	6818	
	125	18	1.1	6918	6918Z	6918ZZ	—	—	—	—	33000	31500	16.4	5100	—	6000	96	119	1.0	0.540	6918	
	140	16	1	16018	—	—	—	—	—	—	41500	39500	16.3	4800	—	5600	99	131	1.0	0.848	16018	
	140	24	1.5	6018	6018Z	6018ZZ	—	—	—	—	58000	49500	15.6	4800	—	5600	97	133	1.5	1.17	6018	
	160	30	2	6218	6218Z	6218ZZ	6218NSL	6218-2NSL	6218NK	6218-2NK	96000	71500	14.5	4000	2600	4800	100	150	2.0	2.15	6218	
	190	43	3	6318	6318Z	6318ZZ	6318NSL	6318-2NSL	6318NK	6318-2NK	143000	107000	13.3	3600	2400	4300	104	176	2.5	4.91	6318	
95	120	13	1	6819	6819Z	6819ZZ	—	—	—	—	19300	20500	16.0	5000	—	6000	100	115	1.0	0.298	6819	
	130	18	1.1	6919	6919Z	6919ZZ	—	—	—	—	33500	33500	16.5	4800	—	5700	101	124	1.0	0.567	6919	
	145	16	1	16019	—	—	—	—	—	—	41000	39500	16.4	4600	—	5300	104	136	1.0	0.885	16019	
	145	24	1.5	6019	6019Z	6019ZZ	—	—	—	—	60500	54000	15.8	4500	—	5300	102	138	1.5	1.22	6019	
	170	32	2.1	6219	6219Z	6219ZZ	6219NSL	6219-2NSL	6219NK	6219-2NK	109000	81500	14.4	3800	2600	4500	107	158	2.0	2.62	6219	
	200	45	3	6319	6319Z	6319ZZ	6319NSL	6319-2NSL	6319NK	6319-2NK	153000	118000	13.3	3300	2400	3900	109	186	2.5	5.67	6319	
100	125	13	1	6820	6820Z	6820ZZ	—	—	—	—	19600	21200	16.0	4800	—	5600	105	120	1.0	0.311	6820	
	140	20	1.1	6920	6920Z	6920ZZ	—	—	—	—	42500	36500	16.5	4500	—	5300	106	134	1.0	0.771	6920	
	150	16	1	16020	—	—	—	—	—	—	37500	39500	16.4	4300	—	5300	109	141	1.0	0.910	16020	
	150	24	1.5	6020	6020Z	6020ZZ	—	—	—	—	60000	54000	15.9	4300	—	5300	107	143	1.5	1.26	6020	
	180	34	2.1	6220	6220Z	6220ZZ	6220NSL	6220-2NSL	6220NK	6220-2NK	122000	93000	14.4	3600	2400	4300	112	168	2.0	3.14	6220	
	215	47	3	6320	6320Z	6320ZZ	6320NSL	6320-2NSL	6320NK	6320-2NK	173000	141000	13.2	3200	2200	3700	114	201	2.5	7.00	6320	
105	130	13	1	6821	—	—	—	—	—	—	19900	21900	15.9	4800	—	5600	110	125	1.0	0.325	6821	
	145	20	1.1	6921	—	—	—	—	—	—	42500	42000	16.4	4300	—	5300	111	139	1.0	0.793	6921	
	160	18	1	16021	—	—	—	—	—	—	37500	50500	16.4	4000	—	4800	114	151	1.0	1.20	16021	
	160	26	2	6021	6021Z	6021ZZ	—	—	—	—	72500	65500	15.8	4000	—	4800	113	152	2.0	1.60	6021	
	190	36	2.1	6221	6221Z	6221ZZ	—	—	—	—	133000	104000	14.3	3400	—	4000	117	178	2.0	3.76	6221	
	225	49	3	6321	6321Z	6321ZZ	—	—	—	—	184000	153000	13.2	3000	—	3600	119	211	2.5	8.05	6321	
110	140	16	1	6822	—	—	—	—	—	—	27300	29400	16.9	4300	—	5300	115	135	1.0	0.510	6822	
	150	20	1.1	6922	—	—	—	—	—	—	38000	38500	16.4	4300	—	5000	116	144	1.0	0.830	6922	
	170	19	1	16022	—	—	—	—	—	—	44000	45000	16.5	3800	—	4500	119	161	1.0	1.46	16022	
	170	28	2	6022	6022Z	6022ZZ	—	—	—	—	84500	73000	15.5	3800	—	4500	118	162	2.0	1.97	6022	
	200	38	2.1	6222	6222Z	6222ZZ	—	—	—	—	144000	117000	14.3	3200	—	3800	122	188	2.0	4.36	6222	
	240	50	3	6322	6322Z	6322ZZ	—	—	—	—	205000	179000	13.1	2900	—	3400	124	226	2.5	9.54	6322	

**Deep-groove Ball Bearings**

Bore Diameter: 120~170mm



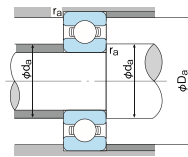
Open type



One shield (Z)



Two shields (ZZ)



■ **Dynamic equivalent radial load**  
Pr=XFr+YFa

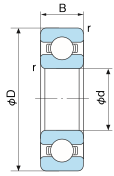
■ **Static equivalent radial load**  
Larger value of following to be used:  
Por=0.6Fr+0.5Fa  
Por=Fr

10Fa Cor	e	Fa Fr		Fa Fr	
		X	Y	X	Y
0.172	0.19				2.30
0.345	0.22	1	0	0.56	1.99
0.689	0.26				1.71
1.03	0.28				1.55
1.38	0.30	1	0	0.56	1.45
2.07	0.34				1.31
3.45	0.38				1.15
5.17	0.42	1	0	0.56	1.04
6.89	0.44				1.00

Boundary dimensions (mm)				Bearing No.						Factor fo	Limiting speed (min <sup>-1</sup> )			Abutment and fillet dimensions (mm)			Mass (kg)	Bearing No.
d	D	B	r (min)	Open type	Shield type	Contact seal type	Non-contact seal type	Basic dynamic load rating Cr (N)	Basic static load rating Cor (N)		Grease lubrication		Oil lubrication	da (min)	Da (max)	ra (max)		
Open type, Z, ZZ		NSL, 2NSL	Open type, Z															
120	150	16	1	6824	—	—	—	28300	31500	16.0	4000	—	4800	125	145	1.0	0.549	6824
	165	22	1.1	6924	—	—	—	53000	54000	16.5	3800	—	4600	126	159	1.0	1.13	6924
	180	19	1	16024	—	—	—	48000	50000	16.4	3600	—	4300	129	171	1.0	1.80	16024
	180	28	2	6024	6024Z	6024ZZ	—	88000	79500	15.7	3600	—	4300	128	172	2.0	2.67	6024
	215	40	2.1	6224	6224Z	6224ZZ	—	145000	118000	14.4	2900	—	3400	132	203	2.0	5.15	6224
	260	55	3	6324	6324Z	6324ZZ	—	207000	185000	13.6	2600	—	3100	134	246	2.5	14.6	6324
130	165	18	1.1	6826	—	—	—	37000	41000	16.1	3700	—	4400	136	158	1.0	0.790	6826
	180	24	1.5	6926	—	—	—	65000	67000	16.4	3500	—	4200	137	173	1.5	1.78	6926
	200	22	1.1	16026	—	—	—	55000	59500	16.3	3200	—	3800	144	186	1.0	2.69	16026
	200	33	2	6026	6026Z	6026ZZ	—	106000	101000	15.7	3200	—	3800	138	192	2.0	3.92	6026
	230	40	3	6226	6226Z	6226ZZ	—	167000	146000	14.5	2700	—	3200	144	216	2.5	5.82	6226
	280	58	4	6326	6326Z	6326ZZ	—	229000	214000	13.6	2400	—	2800	148	262	3.0	18.2	6326
140	175	18	1.1	6828	—	—	—	38000	44500	16.0	3400	—	4000	146	169	1.0	0.840	6828
	190	24	1.5	6928	—	—	—	66500	71000	16.5	3200	—	3800	147	183	1.5	1.90	6928
	210	22	1.1	16028	—	—	—	56000	62000	16.2	3000	—	3500	154	196	1.0	2.86	16028
	210	33	2	6028	6028Z	6028ZZ	—	110000	109000	15.9	3000	—	3600	148	202	2.0	4.15	6028
	250	42	3	6228	6228Z	6228ZZ	—	166000	150000	14.8	2500	—	2900	154	236	2.5	7.47	6228
	300	62	4	6328	6328Z	6328ZZ	—	253000	246000	13.6	2200	—	2600	158	282	3.0	21.8	6328
150	190	20	1.1	6830	—	—	—	47500	54500	16.1	3200	—	3800	156	184	1.0	1.20	6830
	210	28	2	6930	—	—	—	85500	87000	16.4	3000	—	3500	158	202	2.0	2.64	6930
	225	24	1.1	16030	—	—	—	76500	82500	16.5	2800	—	3200	164	211	1.0	3.58	16030
	225	35	2.1	6030	6030Z	6030ZZ	—	126000	126000	15.9	2800	—	3200	159	216	2.0	4.48	6030
	270	45	3	6230	6230Z	6230ZZ	—	176000	168000	15.2	2300	—	2700	164	256	2.5	9.41	6230
	320	65	4	6330	—	—	—	274000	284000	13.9	2100	—	2400	168	302	3.0	26.2	6330
160	200	20	1.1	6832	—	—	—	48500	56500	16.0	2900	—	3400	166	194	1.0	1.30	6832
	220	28	2	6932	—	—	—	87500	95500	16.5	2800	—	3300	168	212	2.0	3.01	6932
	240	38	2.1	6032	—	—	—	137000	135000	15.9	2600	—	3000	169	231	2.0	5.89	6032
	290	48	3	6232	6232Z	6232ZZ	—	185000	186000	15.4	2100	—	2500	174	276	2.5	14.3	6232
	340	68	4	6332	—	—	—	278000	287000	13.9	1900	—	2300	178	322	3.0	28.6	6332
	170	215	22	1.1	6834	—	—	—	60000	70500	16.1	2700	—	3200	177	208	1.0	1.85
230		28	2	6934	—	—	—	86000	95000	16.4	2600	—	3100	178	222	2.0	3.17	6934
260		42	2.1	6034	—	—	—	161000	160000	15.7	2400	—	2800	179	251	2.0	7.92	6034
310		52	4	6234	—	—	—	212000	224000	15.3	2000	—	2400	188	292	3.0	17.5	6234
360		72	4	6334	—	—	—	325000	355000	13.6	1800	—	2100	188	342	3.0	34.0	6334

**Deep-groove Ball Bearings**

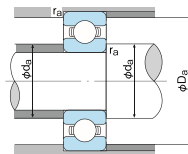
Bore Diameter: 180~280mm



Open type



Open type  
(Machined cage)



■ **Dynamic equivalent radial load**  
Pr=XFr+YFa

■ **Static equivalent radial load**  
Larger value of following to be used:  
Por=0.6Fr+0.5Fa  
Por=Fr

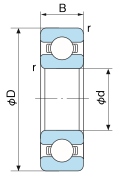
f <sub>0</sub> F <sub>a</sub> Cor	e	F <sub>a</sub> /F <sub>r</sub> ≤ e		F <sub>a</sub> /F <sub>r</sub> > e	
		X	Y	X	Y
0.172	0.19				2.30
0.345	0.22	1	0	0.56	1.99
0.689	0.26				1.71
1.03	0.28				1.55
1.38	0.30	1	0	0.56	1.45
2.07	0.34				1.31
3.45	0.38				1.15
5.17	0.42	1	0	0.56	1.04
6.89	0.44				1.00

Boundary dimensions (mm)				Bearing No.						Basic dynamic load rating Cr (N)	Basic static load rating Cor (N)	Factor f <sub>0</sub>	Limiting speed (min <sup>-1</sup> )			Abutment and fillet dimensions (mm)			Mass (kg)	Bearing No.
d	D	B	r (min)	Open type	Shield type	Contact seal type	Non-contact seal type	Grease lubrication	Oil lubrication				da (min)	Da (max)	ra (max)					
Open type		NSL, 2NSL														Open type				
180	225	22	1.1	6836	-	-	-	-	-	60500	73000	16.0	2600	-	3000	187	218	1.0	2.02	6836
	250	33	2	6936	-	-	-	-	-	106000	117000	16.5	2400	-	2900	188	242	2.0	4.68	6936
	280	46	2.1	6036	-	-	-	-	-	174000	180000	15.8	2300	-	2700	189	271	2.0	10.3	6036
	320	52	4	6236	-	-	-	-	-	227000	242000	15.1	1900	-	2200	198	302	3.0	18.3	6236
	380	75	4	6336	-	-	-	-	-	325000	360000	13.9	1700	-	2000	198	362	3.0	41.9	6336
190	240	24	1.5	6838	-	-	-	-	-	73000	88000	16.1	2400	-	2900	198	232	1.5	2.60	6838
	260	33	2	6938	-	-	-	-	-	108000	123000	16.4	2300	-	2700	198	252	2.0	4.90	6938
	290	46	2.1	6038	-	-	-	-	-	188000	200000	15.7	2100	-	2500	199	281	2.0	10.8	6038
	340	55	4	6238	-	-	-	-	-	255000	282000	15.1	1800	-	2100	208	322	3.0	23.0	6238
	400	78	5	6338	-	-	-	-	-	355000	415000	14.1	1600	-	1900	212	378	4.0	48.2	6338
200	250	24	1.5	6840	-	-	-	-	-	74000	91000	15.9	2300	-	2700	208	242	1.5	2.70	6840
	280	38	2.1	6940	-	-	-	-	-	130000	146000	16.5	2200	-	2600	209	271	2.0	6.88	6940
	310	51	2.1	6040	-	-	-	-	-	202000	222000	15.8	2000	-	2400	209	301	2.0	13.9	6040
	360	58	4	6240	-	-	-	-	-	268000	310000	15.2	1700	-	2000	218	342	3.0	28.2	6240
	420	80	5	6340	-	-	-	-	-	380000	445000	13.9	1500	-	1800	222	398	4.0	54.6	6340
220	270	24	1.5	6844	-	-	-	-	-	76500	98000	15.9	2100	-	2400	228	262	1.5	2.98	6844
	300	38	2.1	6944	-	-	-	-	-	132000	154000	16.4	2000	-	2300	229	291	2.0	7.45	6944
	340	56	3	6044	-	-	-	-	-	214000	248000	15.9	1800	-	2200	230	330	2.5	18.4	6044
	400	65	4	6244	-	-	-	-	-	310000	375000	15.1	1500	-	1800	238	382	3.0	37.0	6244
240	300	28	2	6848	-	-	-	-	-	98500	127000	15.9	1900	-	2200	250	291	2.0	4.60	6848
	320	38	2.1	6948	-	-	-	-	-	154000	186000	16.3	1800	-	2100	249	311	2.0	8.02	6948
	360	56	3	6048	-	-	-	-	-	222000	268000	16.1	1700	-	2000	250	350	2.5	19.6	6048
	440	72	4	6248	-	-	-	-	-	340000	430000	15.2	1200	-	1500	258	322	3.0	49.9	6248
260	320	28	2	6852	-	-	-	-	-	101000	136000	15.8	1700	-	2000	269	311	2.0	4.95	6852
	360	46	2.1	6952	-	-	-	-	-	204000	254000	16.4	1600	-	1900	269	351	2.0	13.4	6952
	400	65	4	6052	-	-	-	-	-	252000	320000	16.1	1500	-	1800	272	388	3.0	29.3	6052
	480	80	5	6252	-	-	-	-	-	400000	540000	15.1	1100	-	1400	282	458	4.0	67.5	6252
280	350	33	2	6856	-	-	-	-	-	133000	177000	16.1	1600	-	1900	290	341	2.0	7.35	6856
	380	46	2.1	6956	-	-	-	-	-	209000	270000	16.3	1500	-	1800	289	371	2.0	14.3	6956
	420	65	4	6056	-	-	-	-	-	286000	350000	16.1	1400	-	1600	293	405	3.0	31.0	6056
	500	80	5	6256	-	-	-	-	-	400000	550000	15.3	1000	-	1300	302	478	4.0	71.0	6256



**Deep-groove Ball Bearings**

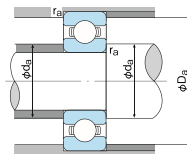
Bore Diameter: 300~320mm



Open type



Open type  
(Machined cage)



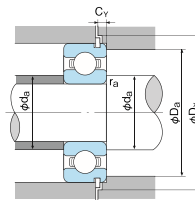
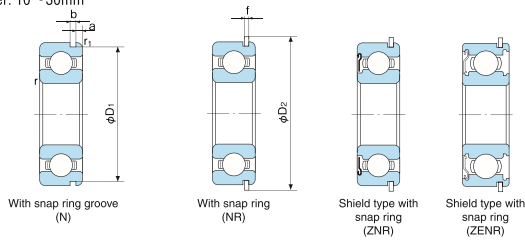
■ **Dynamic equivalent radial load**  
 $P_r = X F_r + Y F_a$

■ **Static equivalent radial load**  
 Larger value of following to be used:  
 $P_{0r} = 0.6 F_r + 0.5 F_a$   
 $P_{0r} = F_r$

$f_0 F_a / Cor$	e	$-F_a / F_r \leq e$		$-F_a / F_r > e$	
		X	Y	X	Y
0.172	0.19				2.30
0.345	0.22	1	0	0.56	1.99
0.689	0.26				1.71
1.03	0.28				1.55
1.38	0.30	1	0	0.56	1.45
2.07	0.34				1.31
3.45	0.38				1.15
5.17	0.42	1	0	0.56	1.04
6.89	0.44				1.00

Boundary dimensions (mm)				Bearing No.						Basic dynamic load rating Cr (N)	Basic static load rating Cor (N)	Factor $f_0$	Limiting speed (min <sup>-1</sup> )			Abutment and fillet dimensions (mm)			Mass (kg)	Bearing No.		
d	D	B	r (min)	Open type	Shield type		Contact seal type		Non-contact seal type				Grease lubrication		Oil lubrication		d <sub>a</sub> (min)	D <sub>a</sub> (max)			r <sub>a</sub> (max)	
															Open type	NSL, 2NSL						Open type
300	380	38	2.1	6860	—	—	—	—	—	—	166000	219000	16.0	1500	—	1700	311	369	2.0	10.4	6860	
	420	56	3	6960	—	—	—	—	—	—	269000	370000	16.5	1400	—	1600	311	409	2.5	22.8	6960	
	460	74	4	6060	—	—	—	—	—	—	355000	490000	15.0	1300	—	1500	313	447	3.0	43.8	6060	
	540	85	5	6260	—	—	—	—	—	—	465000	670000	15.2	950	—	1200	322	518	4.0	88.6	6260	
320	400	38	2.1	6864	—	—	—	—	—	—	164000	218000	15.9	1400	—	1600	330	389	2.0	10.9	6864	
	440	56	3	6964	—	—	—	—	—	—	266000	370000	16.4	1300	—	1500	331	429	2.5	24.1	6964	
	480	74	4	6064	—	—	—	—	—	—	340000	470000	15.3	1200	—	1400	333	467	3.0	46.1	6064	

**Deep-groove Ball Bearings**  
 With snap ring groove / With snap ring / Shield type with snap ring  
 Bore Diameter: 10~30mm



Dynamic equivalent radial load  
 $P_r = XFr + YFa$

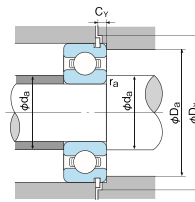
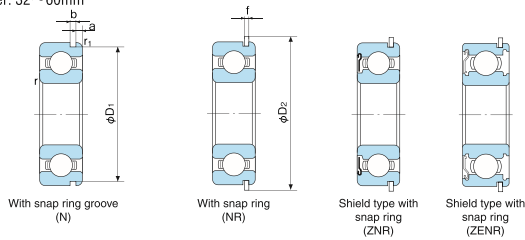
Static equivalent radial load  
 Larger value of following to be used:  
 $P_0 = 0.6Fr + 0.5Fa$   
 $P_0 = Fr$

$f_0 Fa$ Cor	e	$\frac{Fa}{Fr}$	X	Y	$\frac{Fa}{Fr}$	$\frac{Fa}{Fr}$	$\frac{Fa}{Fr}$
0.172	0.19						2.30
0.345	0.22	1	0	0.56			1.99
0.689	0.26						1.71
1.03	0.28						1.55
1.38	0.30	1	0	0.56			1.45
2.07	0.34						1.31
3.45	0.38						1.15
5.17	0.42	1	0	0.56			1.04
6.89	0.44						1.00

Boundary dimensions (mm)				Dimensions of snap ring groove and snap ring (mm)					Bearing No. (1)			Basic dynamic load rating Cr (N)			Basic static load rating Cor (N)			Factor fo			Limiting speed (min <sup>-1</sup> )		Abutment and fillet dimensions (mm)					Mass (kg)		Bearing No.
d	D	B	r	r1	D1	a	b	D2	f												Grease lubrication	Oil lubrication	da	Da	Dx	ra	Cy			
10	22	6	0.3	0.3	20.8	1.05	0.8	24.8	0.7	6900N	6900NR	6900ZENR	2490	1130	14.0	33000	38000	12	20	25.5	0.3	1.5	0.010							6900N
	30	9	0.6	0.5	28.17	2.06	1.35	34.7	1.12	6200N	6200NR	6200ZENR	5100	2390	13.2	25000	30000	15	25	35.5	0.6	2.9	0.032							6200N
	35	11	0.6	0.5	33.17	2.06	1.35	39.7	1.12	6300N	6300NR	6300ZENR	8100	3450	11.3	23000	27000	15	30	40.5	0.6	2.9	0.053							6300N
12	24	6	0.3	0.3	22.8	1.05	0.8	26.8	0.7	6901N	6901NR	6901ZENR	2700	1320	14.5	30000	36000	14	22	27.5	0.3	1.5	0.012							6901N
	28	8	0.3	0.3	26.7	1.35	0.93	31	0.85	6001N	6001NR	6001ZENR	5100	2390	13.5	28000	32000	14	26	31.5	0.3	1.9	0.024							6001N
	32	10	0.6	0.5	30.15	2.06	1.35	36.7	1.12	6201N	6201NR	6201ZENR	6800	3050	12.3	22000	28000	17	27	37.5	0.6	2.9	0.037							6201N
	37	12	1	0.5	34.77	2.06	1.35	41.3	1.12	6301N	6301NR	6301ZENR	9750	4250	11.2	20000	24000	18	31	42	1	2.9	0.060							6301N
15	28	7	0.3	0.3	26.7	1.3	0.95	30.8	0.85	6902N	6902NR	6902ZENR	4300	2250	14.3	26000	31000	17	26	31.5	0.3	1.8	0.017							6902N
	32	9	0.3	0.3	30.15	2.06	1.35	36.7	1.12	6002N	6002NR	6002ZENR	5600	2840	13.9	24000	28000	17	30	37.5	0.3	2.9	0.033							6002N
	35	11	0.6	0.5	33.17	2.06	1.35	39.7	1.12	6202N	6202NR	6202ZENR	7650	3700	13.1	20000	24000	20	30	40.5	0.6	2.9	0.045							6202N
	42	13	1	0.5	39.75	2.06	1.35	46.3	1.12	6302N	6302NR	6302ZENR	11400	5400	12.3	17000	21000	21	36	47	1	2.9	0.082							6302N
17	30	7	0.3	0.3	28.7	1.3	0.95	32.8	0.85	6903N	6903NR	6903ZENR	4600	2550	14.7	24000	29000	19	28	33.5	0.3	1.8	0.019							6903N
	35	10	0.3	0.3	33.17	2.06	1.35	39.7	1.12	6003N	6003NR	6003ZENR	6000	3250	14.3	22000	26000	19	33	40.5	0.3	2.9	0.041							6003N
	40	12	0.6	0.5	38.1	2.06	1.35	44.6	1.12	6203N	6203NR	6203ZENR	9550	4800	13.1	18000	21000	22	35	45.5	0.6	2.9	0.065							6203N
	47	14	1	0.5	44.6	2.46	1.35	52.7	1.12	6303N	6303NR	6303ZENR	13600	6550	12.3	16000	19000	23	41	53.5	1	3.3	0.115							6303N
20	32	7	0.3	0.3	30.7	1.3	0.95	34.8	0.85	6804N	6804NR	6804ZENR	4000	2640	15.5	22000	26000	22	30	35.5	0.3	1.8	0.020							6804N
	37	9	0.3	0.3	35.7	1.7	0.95	39.8	0.85	6904N	6904NR	6904ZENR	6350	3700	14.8	19000	23000	22	35	40.5	0.3	2.3	0.037							6904N
	42	12	0.6	0.5	39.75	2.06	1.35	46.3	1.12	6004N	6004NR	6004ZENR	9400	5000	13.9	18000	21000	24	38	47	0.6	2.9	0.069							6004N
	47	14	1	0.5	44.6	2.46	1.35	52.7	1.12	6204N	6204NR	6204ZENR	12800	6600	13.1	16000	18000	26	41	53.5	1	3.3	0.106							6204N
	52	15	1.1	0.5	49.73	2.46	1.35	57.9	1.12	6304N	6304NR	6304ZENR	15900	7900	12.4	14000	17000	27	45	58.5	1	3.3	0.144							6304N
22	50	14	1	0.5	47.6	2.46	1.35	55.7	1.12	62/22N	62/22NR	62/22ZENR	13900	6950	13.1	14000	17000	28	44	56.5	1	3.3	0.120							62/22N
	56	16	1.1	0.5	53.6	2.46	1.35	61.7	1.12	63/22N	63/22NR	63/22ZENR	18400	9250	12.4	13000	16000	29	49	62.5	1	3.3	0.176							63/22N
25	37	7	0.3	0.3	35.7	1.3	0.95	39.8	0.85	6805N	6805NR	6805ZENR	4300	2940	16.0	18000	22000	27	35	40.5	0.3	1.8	0.023							6805N
	42	9	0.3	0.3	40.7	1.7	0.95	44.8	0.85	6905N	6905NR	6905ZENR	7000	4500	15.3	16000	20000	27	40	45.5	0.3	2.3	0.044							6905N
	47	12	0.6	0.5	44.6	2.06	1.35	52.7	1.12	6005N	6005NR	6005ZENR	10100	5850	14.5	15000	18000	29	43	53.5	0.6	2.9	0.078							6005N
	52	15	1	0.5	49.73	2.46	1.35	57.9	1.12	6205N	6205NR	6205ZENR	14000	7900	13.9	13000	16000	31	46	58.5	1	3.3	0.128							6205N
	62	17	1.1	0.5	59.61	3.28	1.9	67.7	1.7	6305N	6305NR	6305ZENR	23600	12100	12.2	12000	14000	32	55	68.5	1	4.6	0.232							6305N
28	58	16	1	0.5	55.6	2.46	1.35	63.7	1.12	62/28N	62/28NR	62/28ZENR	17900	9750	13.1	12000	14000	34	52	64.5	1	3.3	0.175							62/28N
	68	18	1.1	0.5	64.82	3.28	1.9	74.6	1.7	63/28N	63/28NR	63/28ZENR	26800	14000	12.4	11000	13000	35	61	76	1	4.6	0.287							63/28N
30	42	7	0.3	0.3	40.7	1.3	0.95	44.8	0.85	6806N	6806NR	6806ZENR	5350	3800	16.4	15000	18000	32	40	45.5	0.3	1.8	0.027							6806N
	47	9	0.3	0.3	45.7	1.7	0.95	49.8	0.85	6906N	6906NR	6906ZENR	7250	5000	15.8	14000	17000	32	45	50.5	0.3	2.3	0.047							6906N
	55	13	1	0.5	52.6	2.08	1.35	60.7	1.12	6006N	6006NR	6006ZENR	13200	8300	14.8	13000	15000	35	50	61.5	1	2.9	0.113							6006N
	62	16	1	0.5	59.61	3.28	1.9	67.7	1.7	6206N	6206NR	6206ZENR	19500	11300	13.9	11000	13000	36	56	68.5	1	4.6	0.199							6206N
	72	19	1.1	0.5	68.81	3.28	1.9	78.6	1.7	6306N	6306NR	6306ZENR	26700	15000	13.2	10000	12000	37	65	80	1	4.6	0.346							6306N

Note: (1) Bearing No. ZE means one shield type, two shields type is also available.  
 Remark: Dimensions of snap ring groove and snap ring are shown on pages 45 to 48.

**Deep-groove Ball Bearings**  
 With snap ring groove / With snap ring / Shield type with snap ring  
 Bore Diameter: 32~60mm



Dynamic equivalent radial load  
 $P_r = XFr + YFa$

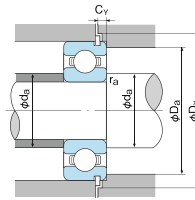
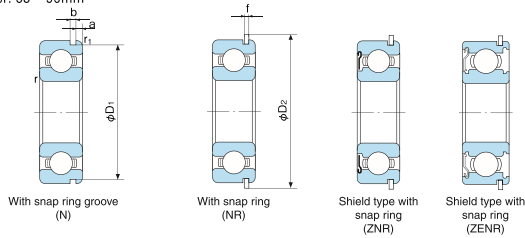
Static equivalent radial load  
 Larger value of following to be used:  
 $P_{0r} = 0.6Fr + 0.5Fa$   
 $P_{0r} = Fr$

$f_0 Fa$ Cor	e	$\frac{Fa}{Fr} \leq e$	$\frac{Fa}{Fr} > e$	X	Y	X	Y
0.172	0.19						2.30
0.345	0.22	1	0	0.56			1.99
0.689	0.26						1.71
1.03	0.28						1.55
1.38	0.30	1	0	0.56			1.45
2.07	0.34						1.31
3.45	0.38						1.15
5.17	0.42	1	0	0.56			1.04
6.89	0.44						1.00

Boundary dimensions (mm)				Dimensions of snap ring groove and snap ring (mm)					Bearing No. (1)			Basic dynamic load rating Cr (N)	Basic static load rating Cor (N)	Factor fo	Limiting speed (min <sup>-1</sup> )		Abutment and fillet dimensions (mm)					Mass (kg)	Bearing No.	
d	D	B	r	r1	D1	a	b	D2	f				Grease lubrication	Oil lubrication	da	Da	Dx	ra	Cy					
(min)	(min)	(min)	(min)	(max)	(max)	(min)	(max)	(max)	(max)						(min)	(max)	(min)	(max)	(max)					
32	65	17	1	0.5	62.6	3.28	1.9	70.7	1.7	62/32N	62/32NR	62/32ZNR	22400	13100	13.6	11000	12000	38	59	71.5	1	4.6	0.230	62/32N
	75	20	1.1	0.5	71.83	3.28	1.9	81.6	1.7	63/32N	63/32NR	63/32ZNR	30000	16200	12.7	9500	11000	39	68	83	1	4.6	0.382	63/32N
	47	7	0.3	0.3	45.7	1.3	0.95	49.8	0.85	6807N	6807NR	6807ZENR	4750	3800	16.4	14000	16000	37	45	50.5	0.3	1.8	0.030	6807N
	55	10	0.6	0.5	53.7	1.7	0.95	57.8	0.85	6907N	6907NR	6907ZENR	10400	7150	15.6	12000	15000	39	51	58.5	0.6	2.3	0.075	6907N
35	62	14	1	0.5	59.61	2.08	1.9	67.7	1.7	6007N	6007NR	6007ZENR	16000	10300	14.8	12000	14000	40	57	68.5	1	3.4	0.150	6007N
	72	17	1.1	0.5	68.81	3.28	1.9	78.6	1.6	6207N	6207NR	6207ZENR	25700	15300	13.8	9800	11000	42	65	80	1	4.6	0.288	6207N
	80	21	1.5	0.5	76.81	3.28	1.9	86.6	1.6	6307N	6307NR	6307ZENR	33500	19100	13.2	8800	10000	44	71	88	1.5	4.6	0.457	6307N
	52	7	0.3	0.3	50.7	1.3	0.95	54.8	0.85	6808N	6808NR	6808ZENR	5950	4900	16.2	12000	14000	42	50	55.5	0.3	1.8	0.034	6808N
	62	12	0.6	0.5	60.7	1.7	0.95	64.8	0.85	6908N	6908NR	6908ZENR	13700	9950	15.8	11000	13000	44	58	65.5	0.6	2.3	0.110	6908N
40	68	15	1	0.5	64.82	2.49	1.9	74.6	1.7	6008N	6008NR	6008ZENR	16800	11500	15.3	10000	12000	45	63	76	1	3.8	0.186	6008N
	80	18	1.1	0.5	76.81	3.28	1.9	86.6	1.7	6208N	6208NR	6208ZENR	29100	17900	14.0	8700	10000	47	73	88	1	4.6	0.366	6208N
	90	23	1.5	0.5	86.79	3.28	2.7	96.5	2.46	6308N	6308NR	6308ZENR	40500	24100	13.2	7800	9200	49	81	98	1.5	5.9	0.633	6308N
	58	7	0.3	0.3	56.7	1.3	0.95	60.8	0.85	6809N	6809NR	6809ZENR	5350	4900	16.1	11000	13000	47	56	61.5	0.3	1.8	0.042	6809N
	68	12	0.6	0.5	66.7	1.7	0.95	70.8	0.85	6909N	6909NR	6909ZENR	14100	10900	16.1	10000	12000	49	64	72	0.6	2.3	0.124	6909N
45	75	16	1	0.5	71.83	2.49	1.9	81.6	1.7	6009N	6009NR	6009ZENR	20900	15200	15.3	9200	11000	50	70	83	1	3.8	0.239	6009N
	85	19	1.1	0.5	81.81	3.28	1.9	91.6	1.7	6209N	6209NR	6209ZENR	32500	20500	14.1	7800	9300	52	78	93	1	4.6	0.407	6209N
	100	25	1.5	0.5	96.8	3.28	2.7	106.5	2.46	6309N	6309NR	6309ZENR	53000	32000	13.1	7000	8200	54	91	108	1.5	5.4	0.833	6309N
	65	7	0.3	0.3	63.7	1.3	0.95	67.8	0.85	6810N	6810NR	6810ZENR	6400	5800	16.1	10000	12000	52	63	68.5	0.3	1.8	0.054	6810N
	72	12	0.6	0.5	70.7	1.7	0.95	74.8	0.85	6910N	6910NR	6910ZENR	14500	11700	16.1	9500	11000	54	68	76	0.6	2.3	0.127	6910N
50	80	16	1	0.5	76.81	2.49	1.9	86.6	1.7	6010N	6010NR	6010ZENR	21800	16600	15.6	8500	10000	55	75	88	1	3.8	0.252	6010N
	90	20	1.1	0.5	86.79	3.28	2.7	96.5	2.46	6210N	6210NR	6210ZENR	35000	23200	14.4	7100	8600	57	83	98	1	5.4	0.463	6210N
	110	27	2	0.5	106.81	3.28	2.7	116.6	2.46	6310N	6310NR	6310ZENR	62000	38100	13.1	6400	7500	60	100	118	2	5.4	1.07	6310N
	72	9	0.3	0.3	70.7	1.7	0.95	74.8	0.85	6811N	6811NR	6811ZENR	8900	8100	16.2	8700	10000	57	70	76	0.3	2.3	0.085	6811N
	80	13	1	0.5	77.9	2.1	1.3	84.4	1.12	6911N	6911NR	6911ZENR	16000	13200	16.2	8200	9600	60	75	86	1	2.9	0.180	6911N
55	90	18	1.1	0.5	86.79	2.87	2.7	96.5	2.46	6011N	6011NR	6011ZENR	28300	21300	15.4	7700	9000	61	84	98	1	5	0.375	6011N
	100	21	1.5	0.5	96.8	3.28	2.7	106.5	2.46	6211N	6211NR	6211ZENR	43500	29300	14.4	6400	7700	64	91	108	1.5	5.4	0.607	6211N
	120	29	2	0.5	115.21	4.06	3.1	129.7	2.82	6311N	6311NR	6311ZENR	71500	44500	13.1	5800	6800	65	110	131.5	2	6.5	1.37	6311N
	78	10	0.3	0.3	76.2	1.7	1.3	82.7	1.12	6812N	6812NR	6812ZENR	11500	10600	16.3	8000	9500	62	76	84	0.3	2.5	0.110	6812N
	85	13	1	0.5	82.9	2.1	1.3	89.4	1.12	6912N	6912NR	6912ZENR	15200	13500	16.5	7600	9000	65	80	91	1	2.9	0.195	6912N
60	95	18	1.1	0.5	91.82	2.87	2.7	101.6	2.46	6012N	6012NR	6012ZENR	29400	23200	15.5	7100	8500	66	89	103	1	5	0.403	6012N
	110	22	1.5	0.5	106.81	3.28	2.7	116.6	2.46	6212N	6212NR	6212ZENR	52500	36000	14.3	6000	7100	69	101	118	1.5	5.4	0.783	6212N
	130	31	2.1	0.5	125.22	4.06	3.1	139.7	2.82	6312N	6312NR	6312ZENR	82000	52000	13.2	5400	6300	72	118	141.5	2	6.5	1.70	6312N

Note: (1) Bearing No. ZE means one shield type, two shields type is also available.  
 Remark: Dimensions of snap ring groove and snap ring are shown on pages 45 to 48.

**Deep-groove Ball Bearings**  
 With snap ring groove / With snap ring / Shield type with snap ring  
 Bore Diameter: 65~90mm



Dynamic equivalent radial load  
 $P_r = X F_r + Y F_a$

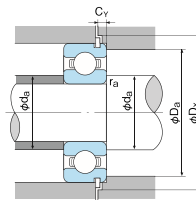
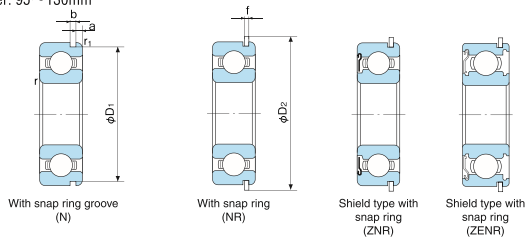
Static equivalent radial load  
 Larger value of following to be used:  
 $P_{or} = 0.6 F_r + 0.5 F_a$   
 $P_{or} = F_r$

$f_0 F_a$ Cor	e	$\frac{F_a}{F_r} \leq e$		$\frac{F_a}{F_r} > e$	
		X	Y	X	Y
0.172	0.19				2.30
0.345	0.22	1	0	0.56	1.99
0.689	0.26				1.71
1.03	0.28				1.55
1.38	0.30	1	0	0.56	1.45
2.07	0.34				1.31
3.45	0.38				1.15
5.17	0.42	1	0	0.56	1.04
6.89	0.44				1.00

Boundary dimensions (mm)				Dimensions of snap ring groove and snap ring (mm)					Bearing No. (*)			Basic dynamic load rating $C_r$ (N)	Basic static load rating $C_0$ (N)	Factor $f_0$	Limiting speed (min <sup>-1</sup> )		Abutment and fillet dimensions (mm)					Mass (kg)	Bearing No.	
d	D	B	r (min)	r <sub>1</sub> (min)	D <sub>1</sub> (max)	a (max)	b (min)	D <sub>2</sub> (max)	f (max)							Grease lubrication	Oil lubrication	d <sub>a</sub> (min)	D <sub>a</sub> (max)	D <sub>x</sub> (min)	r <sub>a</sub> (max)			C <sub>y</sub> (max)
65	85	10	0.6	0.5	82.9	1.7	1.3	89.4	1.12	6813N	6813NR	6813ZNR	11900	11500	16.2	7500	8700	69	81	91	0.6	2.5	0.130	6813N
	90	13	1	0.5	87.9	2.1	1.3	94.4	1.12	6913N	6913NR	6913ZNR	17400	16000	16.5	7100	8500	70	85	96	1	2.9	0.210	6913N
	100	18	1.1	0.5	96.8	2.87	2.7	106.5	2.46	6013N	6013NR	6013ZENR	30500	25200	15.7	6700	8000	71	94	108	1	5	0.413	6013N
	120	23	1.5	0.5	115.21	4.06	3.1	129.7	2.82	6213N	6213NR	6213ZENR	57000	40000	14.4	5500	6500	74	111	131.5	1.5	6.5	0.990	6213N
	140	33	2.1	0.5	135.23	4.9	3.1	149.7	2.82	6313N	6313NR	6313ZENR	92500	59500	13.2	4900	6000	77	128	152	2	7.3	2.08	6313N
70	90	10	0.6	0.5	87.9	1.7	1.3	94.4	1.12	6814N	6814NR	6814ZNR	12100	11900	16.1	7000	8100	74	86	96	0.6	2.5	0.140	6814N
	100	16	1	0.5	97.9	2.5	1.3	104.4	1.12	6914N	6914NR	6914ZNR	23700	21100	16.3	6500	7700	75	95	106	1	3.3	0.332	6914N
	110	20	1.1	0.5	106.81	2.87	2.7	116.6	2.46	6014N	6014NR	6014ZENR	38000	31000	15.6	6100	7100	76	104	118	1	5	0.580	6014N
	125	24	1.5	0.5	120.22	4.06	3.1	134.7	2.82	6214N	6214NR	6214ZENR	62000	44000	14.4	5100	6300	79	116	136.5	1.5	6.5	1.07	6214N
	150	35	2.1	0.5	145.24	4.9	3.1	159.7	2.82	6314N	6314NR	6314ZENR	104000	68000	13.2	4600	5400	82	138	162	2	7.3	2.52	6314N
75	95	10	0.6	0.5	92.9	1.7	1.3	99.4	1.12	6815N	6815NR	6815ZNR	12500	12800	16.0	6500	7600	79	91	101	0.6	2.5	0.150	6815N
	105	16	1	0.5	102.6	2.5	1.3	110.7	1.12	6915N	6915NR	6915ZNR	20800	19700	16.5	6200	7200	80	100	112	1	3.3	0.350	6915N
	115	20	1.1	0.5	111.81	2.87	2.7	121.6	2.46	6015N	6015NR	6015ZENR	39500	33500	15.7	5700	6700	81	109	123	1	5	0.615	6015N
	130	25	1.5	0.5	125.22	4.06	3.1	139.7	2.82	6215N	6215NR	6215ZENR	66000	49500	14.7	4800	5600	84	121	141.5	1.5	6.5	1.18	6215N
	160	37	2.1	0.5	155.22	4.9	3.1	169.7	2.82	6315N	6315NR	6315ZENR	113000	77000	13.2	4300	5000	87	148	172	2	7.3	3.02	6315N
80	100	10	0.6	0.5	97.9	1.7	1.3	104.4	1.12	6816N	6816NR	6816ZNR	12700	13300	15.9	6000	7100	84	96	106	0.6	2.5	0.160	6816N
	110	16	1	0.5	107.6	2.5	1.3	115.7	1.12	6916N	6916NR	6916ZNR	27600	25300	16.4	5700	6700	85	105	117	1	3.3	0.370	6916N
	125	22	1.1	0.5	120.22	2.87	3.1	134.7	2.82	6016N	6016NR	6016ZENR	47500	39500	15.6	5300	6300	86	119	136.5	1	5.3	0.825	6016N
	140	26	2	0.5	135.23	4.9	3.1	149.7	2.82	6216N	6216NR	6216ZENR	72500	53000	14.6	4500	5300	90	130	152	2	7.3	1.40	6216N
	170	39	2.1	0.5	163.65	5.69	3.5	182.9	3.1	6316N	6316NR	6316ZENR	123000	86500	13.2	4000	4800	92	158	185	2	8.4	3.59	6316N
85	110	13	1	0.5	107.6	2.1	1.3	115.7	1.12	6817N	6817NR	6817ZNR	18700	19000	16.2	5700	6700	90	105	117	1	2.9	0.272	6817N
	120	18	1.1	0.5	117.6	3.3	1.3	125.7	1.12	6917N	6917NR	6917ZNR	32000	29600	16.4	5400	6300	91	113	127	1	4.1	0.524	6917N
	130	22	1.1	0.5	125.22	2.87	3.1	139.7	2.82	6017N	6017NR	6017ZENR	49500	43000	15.7	5000	6000	91	124	141.5	1	5.3	0.863	6017N
	150	28	2	0.5	145.24	4.9	3.1	159.7	2.82	6217N	6217NR	6217ZENR	84000	62000	14.5	4300	5000	95	140	162	2	7.3	1.79	6217N
	180	41	3	0.5	173.66	5.69	3.5	192.9	3.1	6317N	6317NR	6317ZENR	133000	96500	13.3	3800	4500	99	166	195	2.5	8.4	4.23	6317N
90	115	13	1	0.5	112.6	2.1	1.3	120.7	1.2	6818N	6818NR	6818ZNR	19000	19700	16.1	5400	6300	95	110	122	1	2.9	0.288	6818N
	125	18	1.1	0.5	122.6	3.3	1.3	130.7	1.12	6918N	6918NR	6918ZNR	33000	31500	16.4	5100	6000	96	119	132	1	4.1	0.549	6918N
	140	24	1.5	0.5	135.23	3.71	3.1	149.7	2.82	6018N	6018NR	6018ZENR	58000	49500	15.6	4800	5600	97	133	152	1.5	6.1	1.13	6018N
	160	30	2	0.5	155.22	4.9	3.1	169.7	2.82	6218N	6218NR	6218ZENR	96000	71500	14.5	4000	4800	100	150	172	2	7.3	2.15	6218N
	190	43	3	0.5	183.64	5.69	3.5	202.9	3.1	6318N	6318NR	6318ZENR	143000	107000	13.3	3600	4300	104	176	205	2.5	8.4	4.91	6318N

Note: (\*) Bearing No. ZE means one shield type, two shields type is also available.  
 Remark: Dimensions of snap ring groove and snap ring are shown on pages 45 to 48.

**Deep-groove Ball Bearings**  
 With snap ring groove / With snap ring / Shield type with snap ring  
 Bore Diameter: 95~130mm



**Dynamic equivalent radial load**  
 $P_r = X F_r + Y F_a$

**Static equivalent radial load**  
 Larger value of following to be used:  
 $P_{or} = 0.6 F_r + 0.5 F_a$   
 $P_{or} = F_r$

$f_0 F_a$ Cor	e	$\frac{F_a}{F_r} \leq e$		$\frac{F_a}{F_r} > e$	
		X	Y	X	Y
0.172	0.19				2.30
0.345	0.22	1	0	0.56	1.99
0.689	0.26				1.71
1.03	0.28				1.55
1.38	0.30	1	0	0.56	1.45
2.07	0.34				1.31
3.45	0.38				1.15
5.17	0.42	1	0	0.56	1.04
6.89	0.44				1.00

Boundary dimensions (mm)				Dimensions of snap ring groove and snap ring (mm)					Bearing No. (*)			Basic dynamic load rating $C_r$ (N)	Basic static load rating $C_{or}$ (N)	Factor $f_0$	Limiting speed (min <sup>-1</sup> )		Abutment and fillet dimensions (mm)					Mass (kg)	Bearing No.	
d	D	B	r (min)	r <sub>1</sub> (min)	D <sub>1</sub> (max)	a (max)	b (min)	D <sub>2</sub> (max)	f (max)	Grease lubrication	Oil lubrication				d <sub>a</sub> (min)	D <sub>a</sub> (max)	D <sub>x</sub> (min)	r <sub>a</sub> (max)	C <sub>y</sub> (max)					
95	120	13	1	0.5	117.6	2.1	1.3	125.7	1.12	6819N	6819NR	6819ZNR	19300	20500	16.0	5000	6000	100	115	127	1	2.9	0.307	6819N
	130	18	1.1	0.5	127.6	3.3	1.3	135.7	1.12	6919N	6919NR	6919ZNR	33500	33500	16.5	4800	5700	101	124	137	1	4.1	0.576	6919N
	145	24	1.5	0.5	140.23	3.71	3.1	154.7	2.82	6019N	6019NR	6019ZNR	60500	54000	15.8	4500	5300	102	138	157	1.5	6.1	1.16	6019N
	170	32	2.1	0.5	163.65	5.69	3.5	182.9	3.1	6219N	6219NR	6219ZNR	109000	81500	14.4	3800	4500	107	158	185	2	8.4	2.62	6219N
	200	45	3	0.5	193.65	5.69	3.5	212.9	3.1	6319N	6319NR	6319ZNR	153000	118000	13.3	3300	3900	109	186	215	2.5	8.4	5.67	6319N
100	125	13	1	0.5	122.6	2.1	1.3	130.7	1.12	6820N	6820NR	6820ZNR	19600	21200	16.0	4800	5600	105	120	132	1	2.9	0.320	6820N
	140	20	1.1	0.5	137.6	3.3	1.9	145.7	1.7	6920N	6920NR	6920ZNR	37000	36500	16.5	4500	5300	106	134	147	1	4.7	0.780	6920N
	150	24	1.5	0.5	145.24	3.71	3.1	159.7	2.82	6020N	6020NR	6020ZNR	60000	54000	15.9	4300	5300	107	143	162	1.5	6.1	1.20	6020N
	180	34	2.1	0.5	173.66	5.69	3.5	192.9	3.1	6220N	6220NR	6220ZNR	122000	93000	14.4	3600	4300	112	168	195	2	8.4	3.14	6220N
105	130	13	1	0.5	127.6	2.1	1.3	135.7	1.12	6821N	6821NR	6821ZNR	19900	21900	15.9	4800	5600	110	125	137	1	2.9	0.335	6821N
	145	20	1.1	0.5	142.6	3.3	1.9	150.7	1.7	6921N	6921NR	6921ZNR	42500	42000	16.4	4300	5300	111	139	152	1	4.7	0.803	6921N
	160	26	2	0.5	155.22	3.71	3.1	169.7	2.82	6021N	6021NR	6021ZNR	72500	65500	15.8	4000	4800	113	152	172	2	6.1	1.54	6021N
	190	36	2.1	0.5	183.64	5.69	3.5	202.9	3.1	6221N	6221NR	6221ZNR	133000	104000	14.3	3400	4000	117	178	205	2	8.4	3.76	6221N
110	140	16	1	0.5	137.6	2.5	1.9	145.7	1.7	6822N	6822NR	6822ZNR	27300	29400	16.9	4300	5300	115	135	147	1	3.9	0.526	6822N
	150	20	1.1	0.5	147.6	3.3	1.9	155.7	1.7	6922N	6922NR	6922ZNR	38000	38500	16.4	4300	5000	116	144	157	1	4.7	0.846	6922N
	170	28	2	0.5	163.65	3.71	3.5	182.9	3.1	6022N	6022NR	6022ZNR	84500	73000	15.5	3800	4500	118	162	185	2	6.4	1.91	6022N
	200	38	2.1	0.5	193.65	5.69	3.5	212.9	3.1	6222N	6222NR	6222ZNR	144000	117000	14.3	3200	3800	122	188	215	2	8.4	4.36	6222N
120	150	16	1	0.5	147.6	2.5	1.9	155.7	1.7	6824N	6824NR	6824ZNR	28300	31500	16.0	4000	4800	125	145	157	1	3.9	0.567	6824N
	165	22	1.1	0.5	161.8	3.7	1.9	171.5	1.7	6924N	6924NR	6924ZNR	53000	54000	16.5	3800	4600	126	159	173	1	5.1	1.15	6924N
	180	28	2	0.5	173.66	3.71	3.5	192.9	3.1	6024N	6024NR	6024ZNR	88000	79500	15.7	3600	4300	128	172	195	2	6.4	2.36	6024N
130	165	18	1.1	0.5	161.8	3.3	1.9	171.5	1.7	6826N	6826NR	6826ZNR	37000	41000	16.1	3700	4400	136	158	173	1	4.7	0.815	6826N
	180	24	1.5	0.5	176.8	3.7	1.9	186.5	1.7	6926N	6926NR	6926ZNR	65000	67000	16.4	3500	4200	137	173	188	1.5	5.1	1.81	6926N
	200	33	2	0.5	193.65	5.69	3.5	212.9	3.1	6026N	6026NR	6026ZNR	106000	101000	15.7	3200	3800	138	192	215	2	8.4	3.60	6026N

Note: (\*) Bearing No. ZE means one shield type, two shields type is also available.  
 Remark: Dimensions of snap ring groove and snap ring are shown on pages 45 to 48.