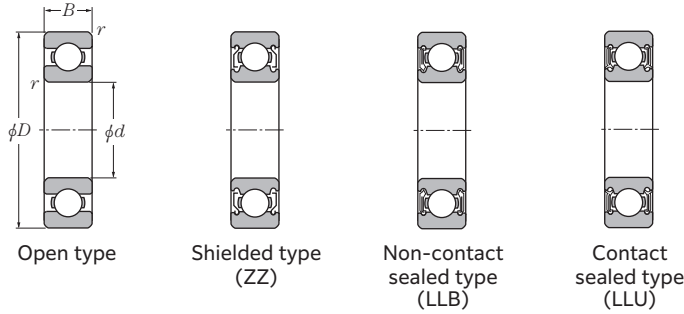
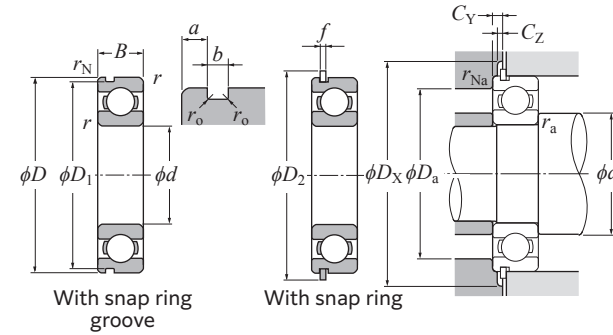


# Deep Groove Ball Bearings



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Dynamic equivalent radial load  
 $P_r = XF_r + YF_a$

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

Static equivalent radial load

$P_{Or} = 0.6F_r + 0.5F_a$   
 When  $P_{Or} < F_r$  use  $P_{Or} = F_r$ .

d 90–120 mm

d	Boundary dimensions					Basic load rating		Factor $f_0$	Grease Open type ZZ, LLB Z, LB	Allowable speed			Bearing number		
	mm					dynamic kN	static kN			Fatigue load limit kN $C_u$	Oil Open type Z, LB LLU	Open type	Shielded or sealed type <sup>2)</sup>		
	$d$	$D$	$B$	$r_{s \min}^{1)}$	$r_{Ns}$ Min.	$C_r$	$C_{Or}$						$C_u$	$f_0$	5 400
90	115	13	1	0.5	21.1	19.7	1.30	16.1	5 400	6 300	3 000	6818	ZZ	LLB	LLU
	125	18	1.1	0.5	36.5	31.5	2.05	16.5	5 100	6 000	2 900	6918	ZZ	LLB	LLU
	140	16	1	—	37.0	33.5	2.07	16.5	4 700	5 600	—	16018	—	—	—
	140	24	1.5	0.5	64.5	49.5	3.45	15.6	4 700	5 600	2 800	6018	ZZ	LLB	LLU
	160	30	2	0.5	106	71.5	5.00	14.5	4 000	4 700	2 600	6218	ZZ	LLB	LLU
	190	43	3	0.5	158	107	7.10	13.3	3 600	4 200	2 400	6318	ZZ	LLB	LLU
95	120	13	1	0.5	21.4	20.5	1.31	16.1	5 000	5 900	2 800	6819	ZZ	LLB	LLU
	130	18	1.1	0.5	37.5	33.5	2.10	16.6	4 800	5 700	2 800	6919	ZZ	LLB	LLU
	145	16	1	—	38.0	35.0	2.13	16.5	4 500	5 300	—	16019	—	—	—
	145	24	1.5	0.5	67.0	54.0	3.55	15.8	4 500	5 300	2 600	6019	ZZ	LLB	LLU
	170	32	2.1	0.5	121	82.0	5.55	14.4	3 700	4 400	2 500	6219	ZZ	LLB	LLU
	200	45	3	0.5	169	119	7.65	13.3	3 300	3 900	2 300	6319	ZZ	LLB	LLU
100	125	13	1	0.5	21.7	21.2	1.33	16.0	4 800	5 600	2 700	6820	ZZ	LLB	LLU
	140	20	1.1	0.5	45.5	39.5	2.44	16.4	4 500	5 300	2 600	6920	ZZ	LLB	LLU
	150	16	1	—	39.0	36.5	2.18	16.4	4 200	5 000	—	16020	—	—	—
	150	24	1.5	0.5	66.5	54.0	3.50	15.9	4 200	5 000	2 600	6020	ZZ	LLB	LLU
	180	34	2.1	0.5	135	93.0	6.15	14.4	3 500	4 200	2 300	6220	ZZ	LLB	LLU
	215	47	3	—	192	141	8.75	13.2	3 200	3 700	2 200	6320	ZZ	LLB	LLU
105	130	13	1	0.5	22.0	22.0	1.35	15.9	4 600	5 400	2 500	6821	ZZ	—	LLU
	145	20	1.1	0.5	47.0	42.0	2.52	16.5	4 300	5 100	2 500	6921	ZZ	LLB	LLU
	160	18	1	—	57.5	50.5	3.00	16.3	4 000	4 700	—	16021	—	—	—
	160	26	2	0.5	80.5	65.5	4.15	15.8	4 000	4 700	2 400	6021	ZZ	LLB	LLU
	190	36	2.1	0.5	147	105	6.75	14.4	3 400	4 000	2 300	6221	ZZ	LLB	LLU
	225	49	3	—	204	153	9.35	13.2	3 000	3 600	2 100	6321	ZZ	—	LLU
110	140	16	1	0.5	27.5	28.2	1.68	16.0	4 300	5 100	2 400	6822	ZZ	LLB	LLU
	150	20	1.1	0.5	48.5	44.5	2.60	16.6	4 100	4 800	2 400	6922	ZZ	LLB	LLU
	170	19	1	—	63.5	56.5	3.25	16.3	3 800	4 500	—	16022	—	—	—
	170	28	2	0.5	91.0	73.0	4.55	15.6	3 800	4 500	2 300	6022	ZZ	LLB	LLU
	200	38	2.1	0.5	160	117	7.35	14.3	3 200	3 800	2 200	6222	ZZ	LLB	LLU
	240	50	3	—	227	179	10.5	13.1	2 900	3 400	1 900	6322	ZZ	LLB	LLU
120	150	16	1	0.5	32.0	33.0	1.89	16.0	4 000	4 700	2 200	6824	ZZ	LLB	LLU
	165	22	1.1	0.5	59.0	54.0	3.05	16.5	3 800	4 400	2 100	6924	ZZ	—	LLU
	180	19	1	—	70.0	63.5	3.50	16.4	3 500	4 100	—	16024	—	—	—
	180	28	2	0.5	94.0	79.5	4.65	15.9	3 500	4 100	2 100	6024	ZZ	LLB	LLU

1) Smallest allowable dimension for chamfer dimension  $r$ . 2) This bearing number is for double sealed and double shielded type bearings, but single sealed and single shielded type are also available.

Bearing number	Snap ring groove dimensions				Snap ring dimensions				Installation-related dimensions						Mass <sup>5)</sup> kg
	mm				mm				mm						
	Groove / Snap ring <sup>3)</sup> (See drawings)	$D_1$ Max.	$a$ Max.	$b$ Min.	$r_o$ Max.	$D_2$ Max.	$f$ Max.	Min.	$d_a$ Max. <sup>4)</sup>	$D_a$ Max.	$D_X$ (approx.)	$C_Y$ Max.	$C_Z$ Min.	$r_{as}$ Max.	
N NR	112.6	2.1	1.3	0.4	120.7	1.12	95	96	110	122	2.9	1.2	1	0.5	0.285
N NR	122.6	3.3	1.3	0.4	130.7	1.12	96.5	99	118.5	132	4.1	1.2	1	0.5	0.554
—	—	—	—	—	—	—	95	—	135	—	—	1	—	—	0.848
N NR	135.23	3.71	3.1	0.6	149.7	2.82	98	102	132	152	6.1	2.9	1.5	0.5	1.02
N NR	155.22	4.9	3.1	0.6	169.7	2.82	99	109	151	172	7.3	2.9	2	0.5	2.15
N NR	183.64	5.69	3.5	0.6	202.9	3.1	103	118	177	205	8.4	3.1	2.5	0.5	4.91
N NR	117.6	2.1	1.3	0.4	125.7	1.12	100	101	115	127	2.9	1.2	1	0.5	0.3
N NR	127.6	3.3	1.3	0.4	135.7	1.12	101.5	104	123.5	137	4.1	1.2	1	0.5	0.579
—	—	—	—	—	—	—	100	—	140	—	—	1	—	—	0.885
N NR	140.23	3.71	3.1	0.6	154.7	2.82	103	109	137	157	6.1	2.9	1.5	0.5	1.08
N NR	163.65	5.69	3.5	0.6	182.9	3.1	106	116	159	185	8.4	3.1	2	0.5	2.62
N NR	193.65	5.69	3.5	0.6	212.9	3.1	108	125	187	215	8.4	3.1	2.5	0.5	5.67
N NR	122.6	2.1	1.3	0.4	130.7	1.12	105	106	120	132	2.9	1.2	1	0.5	0.313
N NR	137.6	3.3	1.9	0.6	145.7	1.7	106.5	110	133.5	147	4.7	1.7	1	0.5	0.785
—	—	—	—	—	—	—	105	—	145	—	—	1	—	—	0.91
N NR	145.24	3.71	3.1	0.6	159.7	2.82	108	110	142	162	6.1	2.9	1.5	0.5	1.15
N NR	173.66	5.69	3.5	0.6	192.9	3.1	111	122	169	195	8.4	3.1	2	0.5	3.14
N NR	208.6	5.69	3.5	1	227.8	3.1	113	133	202	230	8.4	3.1	2.5	0.5	7
N NR	127.6	2.1	1.3	0.4	135.7	1.12	110	111	125	137	2.9	1.2	1	0.5	0.33
N NR	142.6	3.3	1.9	0.6	150.7	1.7	111.5	115	138.5	152	4.7	1.7	1	0.5	0.816
—	—	—	—	—	—	—	110	—	155	—	—	1	—	—	1.2
N NR	155.22	3.71	3.1	0.6	169.7	2.82	114	119	151	172	6.1	2.9	2	0.5	1.59
N NR	183.64	5.69	3.5	0.6	202.9	3.1	116	125	179	205	8.4	3.1	2	0.5	3.7
N NR	217.0	6.5	4.5	1	237	3.5	118	134	212	239	9.6	3.5	2.5	0.5	8.05
N NR	137.6	2.5	1.9	0.6	145.7	1.7	115	118	135	147	3.9	1.7	1	0.5	0.515
N NR	147.6	3.3	1.9	0.6	155.7	1.7	116.5	120	143.5	157	4.7	1.7	1	0.5	0.849
—	—	—	—	—	—	—	115	—	165	—	—	1	—	—	1.46
N NR	163.65	3.71	3.5	0.6	182.9	3.1	119	126	161	185	6.4	3.1	2	0.5	1.96
N NR	193.65	5.69	3.5	0.6	212.9	3.1	121	132	189	215	8.4	3.1	2	0.5	4.36
N NR	232.0	6.5	4.5	1	252	3.5	123	149	227	254	9.6	3.5	2.5	0.5	9.54
N NR	147.6	2.5	1.9	0.6	155.7	1.7	125	128	145	157	3.9	1.7	1	0.5	0.555
N NR	161.8	3.7	1.9	0.6	171.5	1.7	126.5	132	158.5	173	5.1	1.7	1	0.5	1.15
—	—	—	—	—	—	—	125	—	175	—	—	1	—	—	1.56
N NR	173.66	3.71	3.5	0.6	192.9	3.1	129	136	171	195	6.4	3.1	2	0.5	2.07

3) Sealed and shielded bearings are also available. 4) This dimension applies to sealed and shielded bearings. 5) Does not include bearings with snap rings.