Ball Bearings
Shield and Seal Types

CAT.No.3015-5/E

CAT.No.3015-5/E 25.12.00 IP/IP

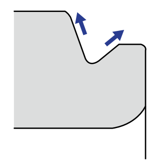
Ball Bearings

Shield and Seal Types

Modern machinery is becoming smaller and more compact.
As a result, the use of integral seals or shields on ball bearings enables machinery designers to achieve their downsizing goals while also extending maintenance intervals.

1 Dynamic seal groove results in excellent performance〔all types〕

A V-shaped groove is cut around the circumference of the inner ring and acts as the dynamic surface for the seal or shield. Due to centrifugal force, the outer surface of the v acts to keep out dirt; the inner surface of the v acts to seal in the grease.

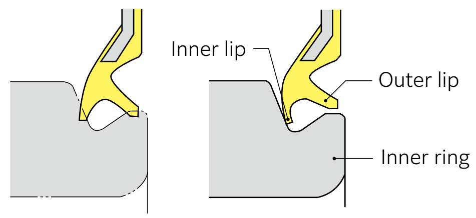


2 Rust resistant shield〔ZZ spec〕

Shields are simple metallic devices and result in low torque characteristics. Shields have a corrosion resistant coating to ensure long life when exposed to the elements.

3 Double-lip seal adjusts for wear〔LLU spec〕

The inner lip of a double-lip seal is pressed against the inside surface of the V-groove; the outer lip is spread open by the elastic force of rubber to create a small gap between the outer lip and the inner ring. Should the inner lip wear, the contact pressure will decrease; however, the outer lip will get closer to the inner ring. In effect, a constant degree of sealing will be maintained.



Bearing Design and Features

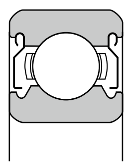
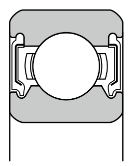
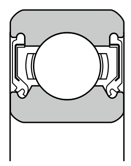
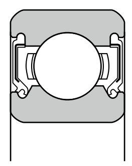
Non-contact shield type (ZZ)

Non-contact seal type (LLB)

Contact seal type (LLU)

Low torque contact type (LLH)

Table 1 Bearing design and features

Types and codes		Non-contact shield type	Non-contact seal type	Contact seal type	Low torque contact type
		ZZ	LLB	LLU	LLH
Construction					
		• Metal shield plate is affixed to the outer ring; the inner ring incorporates a V-groove and labyrinth clearance.	• The outer ring incorporates synthetic rubber molded to a steel plate; seal edge is aligned with V-groove along inner ring surface with labyrinth clearance.	• The outer ring incorporates synthetic rubber molded to a steel plate; seal edge contacts V-groove along inner ring surface.	• Basic construction is the same as LLU-type, but specially designed lip on the edge of the seal prevents foreign matter penetration; low torque construction.
Performance comparison	Torque	Low	Low	Higher	Medium
	Dust proofing	Good	Better than ZZ-type	Excellent	Much better than LLB-type
	Water proofing	Poor	Poor	Very good	Good
	High speed capacity	Same as open type	Same as open type	Limited by contact seals	Much better than LLU-type
	Allowable temp. range[1]	Depends on lubricant	-20 to 120 ℃	-20 to 110 ℃	-20 to 120 ℃

1) Please consult **NTN** Engineering about applications which exceed the allowable temperature range of products listed on this table.

Note: This chart lists double shielded and double sealed bearings, but single shielded (Z) and single sealed (LB, LU, LH) are also available. Grease lubrication should be used with single shielded and single sealed bearings.

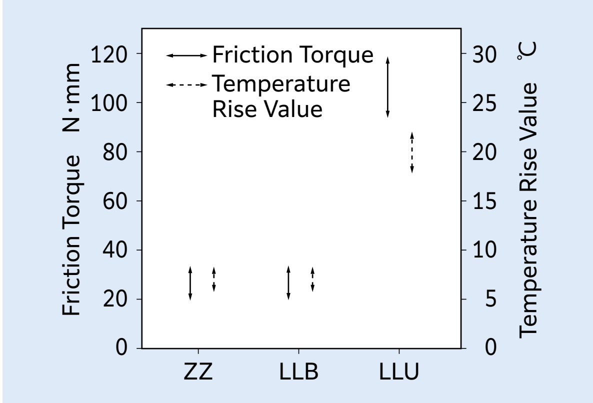
Performance Test Results

Friction Torque and Temperature Rise Test

[Test Conditions]

- Bearing: 6305
- Grease: Alvania grease S3 (3.5 g filling)
- Rotational speed: 1 800 min^{-1}
- Time: 20 minutes
- Load: Radial load 29 N
- Quantity tested: 5 pcs. each

[Test Results]



Note: The temperature rise value will vary depending on the heat dissipation conditions. In actual use, the temperature will be lower than the above value due to heat dissipation from the housing.

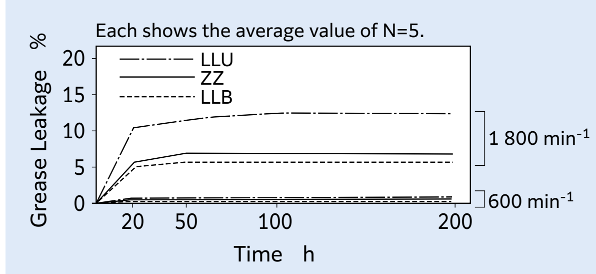
Fig. 1 Friction torque and temperature rise

Grease Leakage Test

[Test Conditions]

- Bearing: 6305
- Grease: Alvania grease S3 (3.5 g filling)
- Rotational speed: 1 800 min^{-1}, 600 min^{-1}
- Ambient temperature: 80 ℃
- Time: 200 hours
- Quantity tested: 5 pcs. each

[Test Results]



Note: The larger grease leakage with the LLU at 1 800 min^{-1} is due to bearing temperature rise.

Fig. 2 Grease leakage

Dust Test

[Test Conditions]

- Bearing: 6305
- Grease: Alvania grease S3 (3.5 g filling)
- Rotational speed: 1 800 min^{-1}
- Load: Radial load 29 N
- Volume of testing machine: 40 liters
- Dust: Oxidized ferrous powder (2 kg) + (1 kg) mixture
- Test time: 1 hour

Table 2 Test results

Seal type \ No.	1	2	3	4	Average
ZZ	2.5	2	2	2.5	2.25
LLB	2.5	3	2.5	2.5	2.62
LLU	3	3	3	3	3.00

Ratings 3: Complete absence of dust
2: Slight presence of dust observed
1: Presence of dust clearly observed

Muddy Water Splash Test

[Test Conditions]

- Bearing: 6304
- Grease: Alvania grease S3 (2 g filling)
- Rotational speed: 3 000 min^{-1}
- Muddy water: 5 wt% of class 8 of JIS Z 8901 Kanto loam powder
- Muddy water flow: 30ml/min
- Test time: 10 cycles 240 hours (1 cycle: 3 hours of spraying and 21 hours of drying)

Table 3 Test results

Seal type \ No.	1	2	3	4	5	Average
LLB	2	1	1	2	2	1.6
LLU	3	2	2	4	3	2.8

Ratings 4: No penetration whatsoever
3: Very slight penetration of muddy water is apparent
2: Some penetration of muddy water is apparent
1: Considerable penetration of muddy water is apparent

Operating Life of Pre-lubricating Grease

The operating life of filled grease is influenced by many factors: operating conditions, temperature, atmosphere, etc. There is even a considerable difference by grease brands. Keeping this in mind, **Fig.3** presents a scale for determining grease life. It is based on actual and experimental data; and applies to high-quality grease used in ball bearings under normal operating conditions.
As the operating temperature increases, the grease life, of course, becomes shorter. Although not accurate for all greases, **Fig.3** is valid, in general guidelines, for operating temperatures up to 80 ℃; for operating temperatures over 80 ℃. Operating life decreases to about two-thirds for every 10 ℃ over 80 ℃.

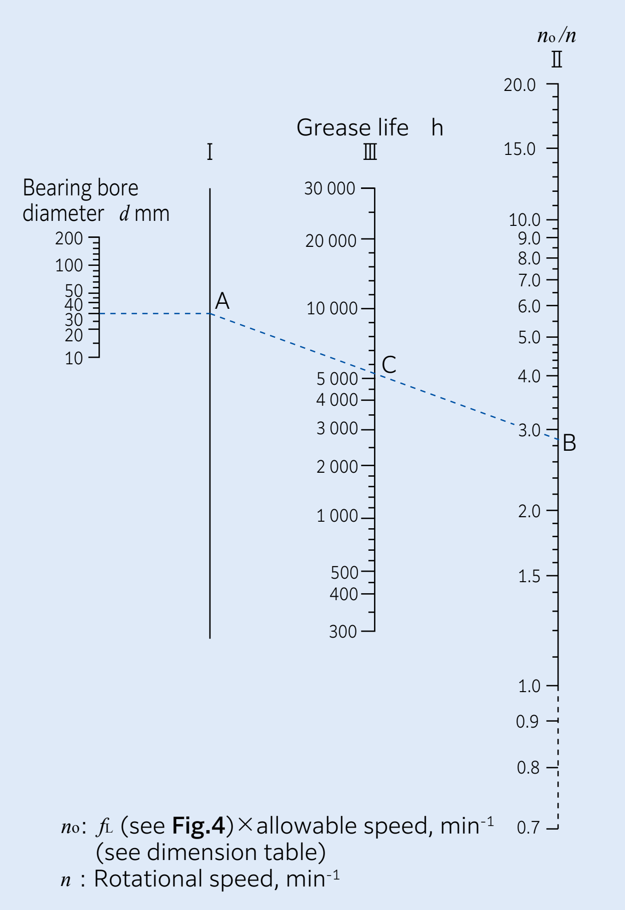


Fig. 3 Diagram for grease life

[Example]Find the grease life for deep groove ball bearing 6206, with a radial load of 2.0 kN, rotational speed at 3 600 min^{-1}

The Allowable rotational speed from dimensions tables for bearing 6206 is 11 000 min^{-1}. From **Fig.4** C_r/P_r = 21.6/2.0 kN = 10.8, f_L = 0.96. Allowable rotational speed n_o for 2.0 kN radial load is:

$$n_o = 0.96 \times 11\,000 = 10\,560 \text{ min}^{-1}$$

$$\text{Therefore, } \frac{n_o}{n} = \frac{10\,560}{3\,600} = 2.93$$

The point where vertical line Ⅰ intersects a horizontal line drawn from the point equivalent of d = 30 for the bearing bore shown in **Fig.3** shall be point A. Find intersection point C where vertical line Ⅲ intersects the straight line formed by joining point B (n_o/n = 2.93) with A by a straight line Ⅱ. It shows that grease life in this case is approximately 5 500 hours.

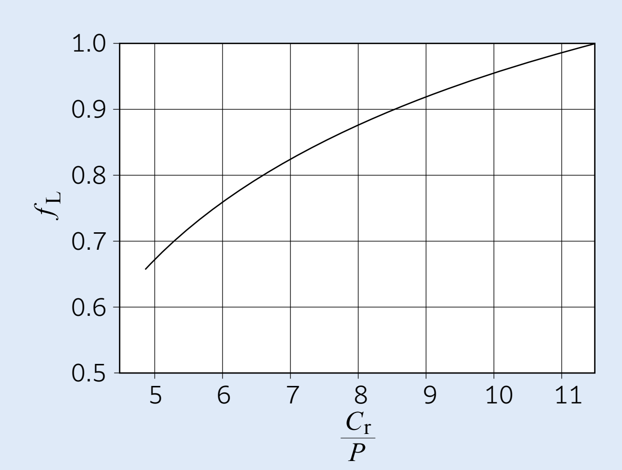


Fig. 4 Value of adjustment factor f_L depends on bearing load

Note that the performance of ball bearings shield and seal types is affected by operating conditions and grease type. The following conditions, please contact **NTN** Engineering.

- Use under high or low temperature
- Low torque is required
- High speeds are required
- Grease leakage must be avoided
- Use under other special conditions

Fatigue Load Limit (C_u)

The fatigue load limit is the applied load on a bearing that results in just reaching the fatigue stress limit at the maximum loaded raceway contact. This depends on the bearing type, internal specifications, quality, and material strength. In ISO 281:2007, 1.5 GPa is recommended as the fatigue stress limit corresponding to C_u for bearings made of commonly used high quality material and good manufacturing quality. Values for the fatigue load limit with respect to the **NTN** bearing numbers are provided in the dimensional table. The life modification factor, a_{ISO}, should be evaluated considering the fatigue load limit. For details see catalog "Ball and Roller Bearings (CAT. No.2203/E) section 3.4 Modified rating life".

Bearing Fits

General standards of bearing fits for each condition of use are shown in **Table 4** through **Table 6**.

Table 4 Tolerance class of shafts commonly used for deep groove ball bearings (Classes 0 and 6)

Conditions		Shaft diameter (mm) Over	Incl.	Shaft tolerance class	Remarks
Rotating Inner ring load or Load of undermind direction	Light load[1] or Fluctuating load	—	18	h5	When greater accuracy is required js6 and k6, may be substituted for js5 and k5.
		18	100	js6	
		100	200	k6	
	Normal load[1]	—	18	js5	—
		18	100	k5	
		100	140	m5	
		140	200	m6	
Inner ring static load	Inner ring must move easily over shaft	Overall shaft diameter		g6	When greater accuracy is required use g5. For large bearings, f6 will suffice for to facilitate movement.
	Inner does not have to move easily over shaft	Overall shaft diameter		h6	When greater accuracy is required use h5.
Center axial load		Overall shaft diameter		js6	Generally, shaft and inner rings are not fixed using resultant fits.

1) Standards for light loads and normal loads
Light loads : dynamic equivalent radial load ≤ $0.05C_r$
Normal loads : $0.05C_r$ < dynamic equivalent radial load ≤ $0.10C_r$
Note: All values and fits listed in the above tables are for solid steel shafts.

Table 5 Tolerance class of housing bore commonly used for deep groove ball bearings (Classes 0 and 6)

Conditions: Housing	Load types, etc.		Outer ring axial direction movement[3]	Housing bore tolerance class	Remarks
Single housing or Split housing	Static outer ring load	All types of loads	Yes	H7	G7 can be used for large bearings or bearings with large temperature differential between the outer ring and housing.
		Light load[1] or normal load[1]	Yes	H8	—
		Shaft and inner ring become hot	Easily	G7	F7 can be used for large bearings or bearings with large temperature differential between the outer ring and housing.
Single housing		Requires precise rotation under light or normal loads	As a rule, cannot move.	K6	—
			Yes	JS6	—
		Requires low noise operation	Yes	H6	—
	Indeterminate load	Light load or normal load	Yes	JS7	If high accuracy is required, JS6 and K6 are used in place of JS7 and K7.
		Normal load or heavy load[1]	As a rule, cannot move.	K7	
		High impact load	No	M7	—
	Rotating outer ring load	Light load or fluctuating load	No	M7	—
		Normal load or heavy load	No	N7	Primarily applies to ball bearings.
		Heavy load or large impact load with thin wall housing[2]	No	P7	—

1) Standards for light loads, normal loads, and heavy loads
Light loads : dynamic equivalent radial load ≤ $0.05C_r$
Normal loads : $0.05C_r$ < dynamic equivalent radial load ≤ $0.10C_r$
Heavy loads : $0.10C_r$ < dynamic equivalent radial load
2) The axial direction needs to be secured because the outer ring may move in the shaft direction, causing problems, depending on the use (Example: planetary gear, etc.).
3) Indicates whether or not outer ring axial movement is possible with non-separable type bearings.
Note: 1 All values and fits listed in the above tables are for cast iron or steel housings.
2 If only a center axial load is applied to the bearing, select a tolerance class that provides clearance for the outer ring in the radial direction.

Table 6 Fits for electric motor bearings

Bearing type	Shaft fits: Shaft diameter (mm) Over	Incl.	Tolerance class	Housing fits: Housing bore diameter	Tolerance class
Deep groove ball bearings	—	18	j5	All sizes	H6 or J6
	18	100	k5		
	100	160	m6		

Accuracy

Table 7 Inner rings

Unit: μm

Nominal bearing bore diameter d mm Over	Incl.	Deviation of mean bore diameter in a single plane Δ_{dmp} Class 0 Upper	Class 0 Lower	Class 6 Upper	Class 6 Lower	Class 5 Upper	Class 5 Lower	Class 4[1)] Upper	Class 4[1)] Lower	Variation of bore diameter in a single plane V_{dsp} Bearing series 68, 69 Class 0 Max.	Class 6	Class 5	Class 4	Bearing series 60 Class 0 Max.	Class 6	Class 5	Class 4	Bearing series 62, 63 Class 0 Max.	Class 6	Class 5	Class 4
2.5	10	0	−8	0	−7	0	−5	0	−4	10	9	5	4	8	7	4	3	6	5	4	3
10	18	0	−8	0	−7	0	−5	0	−4	10	9	5	4	8	7	4	3	6	5	4	3
18	30	0	−10	0	−8	0	−6	0	−5	13	10	6	5	10	8	5	4	8	6	5	4
30	50	0	−12	0	−10	0	−8	0	−6	15	13	8	6	12	10	6	5	9	8	6	5
50	80	0	−15	0	−12	0	−9	0	−7	19	15	9	7	19	15	7	5	11	9	7	5
80	120	0	−20	0	−15	0	−10	0	−8	25	19	10	8	25	19	8	6	15	11	8	6
120	150	0	−25	0	−18	0	−13	0	−10	31	23	13	10	31	23	10	8	19	14	10	8
150	180	0	−25	0	−18	0	−13	0	−10	31	23	13	10	31	23	10	8	19	14	10	8

Nominal bearing bore diameter d mm Over	Incl.	Variation of mean bore diameter V_{dmp} Class 0 Max.	Class 6	Class 5	Class 4	Radial runout of inner ring of assembled bearing K_{ia} Class 0 Max.	Class 6	Class 5	Class 4	Perpendicularity of inner ring face with respect to the bore S_d Class 5 Max.	Class 4	Axial runout of inner ring of assembled bearing S_{ia} Class 5 Max.	Class 4	Deviation of a single inner ring width Δ_{Bs} Class 0, Class 6 Upper	Class 0, Class 6 Lower	Class 5, Class 4 Upper	Class 5, Class 4 Lower	Variation of inner ring width V_{Bs} Class 0 Max.	Class 6	Class 5	Class 4
2.5	10	6	5	3	2	10	6	4	2.5	7	3	7	3	0	−120	0	−40	15	15	5	2.5
10	18	6	5	3	2	10	7	4	2.5	7	3	7	3	0	−120	0	−80	20	20	5	2.5
18	30	8	6	3	2.5	13	8	4	3	8	4	8	4	0	−120	0	−120	20	20	5	2.5
30	50	9	8	4	3	15	10	5	4	8	4	8	4	0	−120	0	−120	20	20	5	3
50	80	11	9	5	3.5	20	10	5	4	8	5	8	5	0	−150	0	−150	25	25	6	4
80	120	15	11	5	4	25	13	6	5	9	5	9	5	0	−200	0	−200	25	25	7	4
120	150	19	14	7	5	30	18	8	6	10	6	10	7	0	−250	0	−250	30	30	8	5
150	180	19	14	7	5	30	18	8	6	10	6	10	7	0	−250	0	−250	30	30	8	5

1) The dimensional difference Δds of the measured bore diameter applied to Class 4 is the same as the tolerance of dimensional difference Δdmp of the mean bore diameter within a plane. However, the dimensional difference is applied to bearing series 60, 62 and 63 for Class 4.

Table 8 Outer rings

Unit: μm

Nominal bearing outside diameter D mm Over	Incl.	Deviation of mean outside diameter in a single plane Δ_{Dmp} Class 0 Upper	Class 0 Lower	Class 6 Upper	Class 6 Lower	Class 5 Upper	Class 5 Lower	Class 4[2)] Upper	Class 4[2)] Lower	Variation of outside diameter in a single plane[3)] V_{Dsp} Bearing series 62, 63 Class 0 Max.	Bearing series 60,62,63 Class 6 Max.	Variation of mean outside diameter V_{Dmp} Class 0 Max.	Class 6	Class 5	Class 4	Radial runout of outer ring of assembled bearing K_{ea} Class 0 Max.	Class 6	Class 5	Class 4
18	30	0	−9	0	−8	0	−6	0	−5	10	9	7	6	3	2.5	15	9	6	4
30	50	0	−11	0	−9	0	−7	0	−6	12	10	8	7	4	3	20	10	7	5
50	80	0	−13	0	−11	0	−9	0	−7	16	13	10	8	5	3.5	25	13	8	5
80	120	0	−15	0	−13	0	−10	0	−8	20	16	11	10	5	4	35	18	10	6
120	150	0	−18	0	−15	0	−11	0	−9	26	20	14	11	6	5	40	20	11	7
150	180	0	−25	0	−18	0	−13	0	−10	30	25	19	14	7	5	45	23	13	8
180	250	0	−30	0	−20	0	−15	0	−11	38	30	23	15	8	6	50	25	15	10
250	315	0	−35	0	−25	0	−18	0	−13	—	—	26	19	9	7	60	30	18	11

Nominal bearing outside diameter D mm Over	Incl.	Perpendicularity of outer ring outside surface with respect to the face S_D Class 5 Max.	Class 4	Axial runout of outer ring of assembled bearing S_{ea} Class 5 Max.	Class 4	Deviation of a single outer ring width Δ_{Cs} All classes	Variation of outer ring width V_{Cs} Class 0 Max.	Class 6	Class 5	Class 4
18	30	8	4	8	5	Depends on tolerance of Δ_{Bs} in relation to d of the same bearing	Depends on tolerance of V_{Bs} in relation to d of the same bearing		5	2.5
30	50	8	4	8	5				5	2.5
50	80	8	4	10	5				6	3
80	120	9	5	11	6				8	4
120	150	10	5	13	7				8	5
150	180	10	5	14	8				8	5
180	250	11	7	15	10				10	7
250	315	13	8	18	10				11	7

2) The dimensional difference ΔDs of the measured outside diameter applied to Class 4 is the same as the tolerance of dimensional difference ΔDmp of the mean outside diameter within a plane. However, the dimensional difference is applied to bearing series 60, 62 and 63 for Class 4.
3) Applies to cases where snap rings are not installed on the bearings.

Radial Internal Clearance

Table 9 Radial internal clearance

Unit: μm

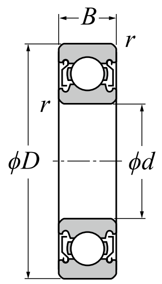
Nominal bearing bore diameter d mm Over	Incl.	C2 Min.	C2 Max.	CN Min.	CN Max.	C3 Min.	C3 Max.	C4 Min.	C4 Max.	C5 Min.	C5 Max.
6	10	0	7	2	13	8	23	14	29	20	37
10	18	0	9	3	18	11	25	18	33	25	45
18	24	0	10	5	20	13	28	20	36	28	48
24	30	1	11	5	20	13	28	23	41	30	53
30	40	1	11	6	20	15	33	28	46	40	64
40	50	1	11	6	23	18	36	30	51	45	73
50	65	1	15	8	28	23	43	38	61	55	90
65	80	1	15	10	30	25	51	46	71	65	105
80	100	1	18	12	36	30	58	53	84	75	120
100	120	2	20	15	41	36	66	61	97	90	140
120	140	2	23	18	48	41	81	71	114	105	160
140	160	2	23	18	53	46	91	81	130	120	180
160	180	2	25	20	61	53	102	91	147	135	200

Table 10 Radial internal clearance of bearings for electric motor

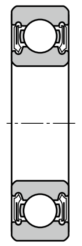
Unit: μm

Nominal bearing bore diameter d mm Over	Incl.	CM Min.	CM Max.
10 (incl.)	18	4	11
18	24	5	12
24	30	5	12
30	40	9	17
40	50	9	17
50	65	12	22
65	80	12	22
80	100	18	30
100	120	18	30
120	140	24	38
140	160	24	38
160	180	—	—

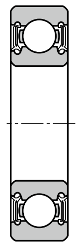
Dimension Table



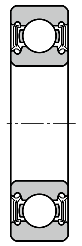
Shield type (ZZ)



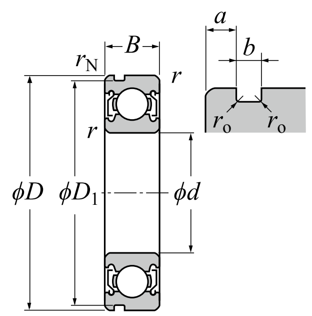
Non-contact seal type (LLB)



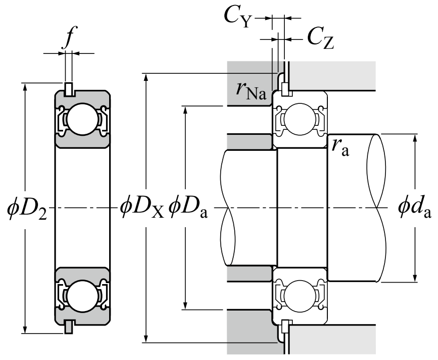
Contact seal type (LLU)



Low torque contact type (LLH)



With snap ring groove



With snap ring

Dynamic equivalent radial load

$P_r = XF_r + YF_a$

$\frac{f_0 \cdot F_a}{C_{0r}}$	e	$\frac{F_a}{F_r} \leq e$ X	$\frac{F_a}{F_r} \leq e$ Y	$\frac{F_a}{F_r} > e$ X	$\frac{F_a}{F_r} > e$ Y
0.172	0.19	1	0	0.56	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				1.31
3.45	0.38				1.15
5.17	0.42				1.04
6.89	0.44				1.00

Static equivalent radial load

$P_{0r} = 0.6F_r + 0.5F_a$

When,

$P_{0r} < F_r$ use $P_{0r} = F_r$.

d 10-20 mm

Boundary dimensions (mm) d	D	B	$r_{s\,min}$ 1)	r_{Ns} Min.	Basic load rating dynamic (kN) C_r	static (kN) C_{0r}	Fatigue load limit (kN) C_u	Factor f_0	Allowable speed (min⁻¹) Grease lubrication ZZ,LLB / Z,LB	Oil lubrication Z,LB	LLH / LH	LLU / LU	Bearing number	Shielded or sealed type 2) (See drawings)			
10	19	5	0.3	—	2.03	0.925	0.072	14.8	32 000	38 000	—	24 000	**6800**	**ZZ**	**LLB**	**LLU**	—
	22	6	0.3	0.3	2.99	1.27	0.099	14.0	30 000	36 000	25 000	21 000	**6900**	**ZZ**	**LLB**	**LLU**	**LLH**
	26	8	0.3	—	5.05	1.96	0.138	12.4	29 000	34 000	25 000	21 000	**6000**	**ZZ**	**LLB**	**LLU**	**LLH**
	30	9	0.6	0.5	5.65	2.39	0.182	13.2	25 000	30 000	21 000	18 000	**6200**	**ZZ**	**LLB**	**LLU**	**LLH**
	35	11	0.6	0.5	9.10	3.50	0.273	11.4	23 000	27 000	20 000	16 000	**6300**	**ZZ**	**LLB**	**LLU**	**LLH**
12	21	5	0.3	—	2.12	1.04	0.080	15.3	29 000	35 000	—	20 000	**6801**	**ZZ**	**LLB**	**LLU**	—
	24	6	0.3	0.3	3.20	1.46	0.115	14.5	27 000	32 000	22 000	19 000	**6901**	**ZZ**	**LLB**	**LLU**	**LLH**
	28	8	0.3	—	5.65	2.39	0.182	13.2	26 000	30 000	21 000	18 000	**6001JRX**	**ZZ**	**LLB**	**LLU**	**LLH**
	32	10	0.6	0.5	6.75	2.75	0.214	12.7	22 000	26 000	20 000	16 000	**6201**	**ZZ**	**LLB**	**LLU**	**LLH**
	37	12	1	0.5	10.8	4.20	0.325	11.1	20 000	24 000	19 000	15 000	**6301**	**ZZ**	**LLB**	**LLU**	**LLH**
15	24	5	0.3	—	2.30	1.26	0.091	15.8	26 000	31 000	—	17 000	**6802**	**ZZ**	**LLB**	**LLU**	—
	28	7	0.3	0.3	4.05	2.00	0.157	14.8	24 000	28 000	—	16 000	**6902**	**ZZ**	**LLB**	**LLU**	—
	32	9	0.3	0.3	6.20	2.84	0.199	13.9	22 000	26 000	18 000	15 000	**6002**	**ZZ**	**LLB**	**LLU**	**LLH**
	35	11	0.6	0.5	8.60	3.60	0.279	12.7	19 000	23 000	18 000	15 000	**6202**	**ZZ**	**LLB**	**LLU**	**LLH**
	42	13	1	0.5	12.7	5.45	0.425	12.3	17 000	21 000	15 000	12 000	**6302**	**ZZ**	**LLB**	**LLU**	**LLH**
17	26	5	0.3	—	2.47	1.46	0.102	16.1	24 000	28 000	—	15 000	**6803**	**ZZ**	**LLB**	**LLU**	—
	30	7	0.3	0.3	5.15	2.58	0.202	14.7	22 000	26 000	—	14 000	**6903JRX**	**ZZ**	**LLB**	**LLU**	—
	35	10	0.3	0.3	7.55	3.35	0.243	13.6	20 000	24 000	16 000	14 000	**6003**	**ZZ**	**LLB**	**LLU**	**LLH**
	40	12	0.6	0.5	10.6	4.60	0.355	12.8	18 000	21 000	15 000	12 000	**6203**	**ZZ**	**LLB**	**LLU**	**LLH**
	47	14	1	0.5	15.0	6.55	0.510	12.2	16 000	19 000	14 000	11 000	**6303**	**ZZ**	**LLB**	**LLU**	**LLH**
20	32	7	0.3	0.3	4.45	2.47	0.185	15.5	21 000	25 000	—	13 000	**6804JR**	**ZZ**	**LLB**	**LLU**	—
	37	9	0.3	0.3	7.05	3.70	0.288	14.7	19 000	23 000	—	12 000	**6904**	**ZZ**	**LLB**	**LLU**	—
	42	12	0.6	0.5	10.4	5.05	0.355	13.9	18 000	21 000	13 000	11 000	**6004**	**ZZ**	**LLB**	**LLU**	**LLH**
	47	14	1	0.5	14.2	6.65	0.505	13.2	16 000	18 000	12 000	10 000	**6204**	**ZZ**	**LLB**	**LLU**	**LLH**
	52	15	1.1	0.5	17.6	7.90	0.615	12.4	14 000	17 000	12 000	10 000	**6304**	**ZZ**	**LLB**	**LLU**	**LLH**

1) Smallest allowable dimension for chamfer dimension r.

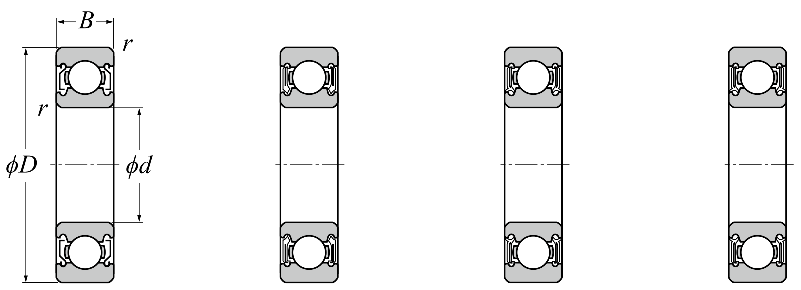
2) This bearing number is for double sealed and double shielded type bearings, but single sealed and single shielded type are also available.

Bearing Number Groove (See drawings)	Snap ring (See drawings)	Snap ring groove dimensions (mm) D_1 Max.	a Max.	b Min.	r_o Max.	Snap ring dimensions (mm) D_2 Max.	f Max.	Installation-related dimensions (mm) d_a Min.	d_a Max.	D_a Max.	D_X (approx.)	C_Y Max.	C_Z Min.	r_{as} Max.	r_{Nas} Max.	Mass 3) (kg) (approx.)
—	—	—	—	—	—	—	—	12	12.5	17	—	—	—	0.3	—	0.005
N	**NR**	20.8	1.05	0.8	0.2	24.8	0.7	12	13	20	25.5	1.5	0.7	0.3	0.3	0.009
—4)	—4)	—	—	—	—	—	—	12	13.5	24	—	—	—	0.3	—	0.019
N	**NR**	28.17	2.06	1.35	0.4	34.7	1.12	14	16	26	35.5	2.9	1.2	0.6	0.5	0.032
N	**NR**	33.17	2.06	1.35	0.4	39.7	1.12	14	17	31	40.5	2.9	1.2	0.6	0.5	0.053
—	—	—	—	—	—	—	—	14	14.5	19	—	—	—	0.3	—	0.006
N	**NR**	22.8	1.05	0.8	0.2	26.8	0.7	14	15	22	27.5	1.5	0.7	0.3	0.3	0.011
NX2	**NX2RX3**	26.44	2.2	0.9	0.3	32.7	0.85	14	16	26	33.4	2.8	0.9	0.3	0.3	0.021
N	**NR**	30.15	2.06	1.35	0.4	36.7	1.12	16	17	28	37.5	2.9	1.2	0.6	0.5	0.037
N	**NR**	34.77	2.06	1.35	0.4	41.3	1.12	17	18.5	32	42	2.9	1.2	1	0.5	0.06
—	—	—	—	—	—	—	—	17	17.5	22	—	—	—	0.3	—	0.007
N	**NR**	26.7	1.3	0.95	0.25	30.8	0.85	17	17.5	26	31.5	1.9	0.9	0.3	0.3	0.016
N	**NR**	30.15	2.06	1.35	0.4	36.7	1.12	17	19	30	37.5	2.9	1.2	0.3	0.3	0.03
N	**NR**	33.17	2.06	1.35	0.4	39.7	1.12	19	20	31	40.5	2.9	1.2	0.6	0.5	0.045
N	**NR**	39.75	2.06	1.35	0.4	46.3	1.12	20	23	37	47	2.9	1.2	1	0.5	0.082
—	—	—	—	—	—	—	—	19	19.5	24	—	—	—	0.3	—	0.008
N	**NR**	28.7	1.3	0.95	0.25	32.8	0.85	19	20	28	33.5	1.9	0.9	0.3	0.3	0.018
N	**NR**	33.17	2.06	1.35	0.4	39.7	1.12	19	21	33	40.5	2.9	1.2	0.3	0.3	0.039
N	**NR**	38.1	2.06	1.35	0.4	44.6	1.12	21	23	36	45.5	2.9	1.2	0.6	0.5	0.066
N	**NR**	44.6	2.46	1.35	0.4	52.7	1.12	22	25	42	53.5	3.3	1.2	1	0.5	0.115
N	**NR**	30.7	1.3	0.95	0.25	34.8	0.85	22	22.5	30	35.5	1.9	0.9	0.3	0.3	0.019
N	**NR**	35.7	1.7	0.95	0.25	39.8	0.85	22	24	35	40.5	2.3	0.9	0.3	0.3	0.036
N	**NR**	39.75	2.06	1.35	0.4	46.3	1.12	24	26	38	47	2.9	1.2	0.6	0.5	0.069
N	**NR**	44.6	2.46	1.35	0.4	52.7	1.12	25	28	42	53.5	3.3	1.2	1	0.5	0.106
N	**NR**	49.73	2.46	1.35	0.4	57.9	1.12	26.5	28.5	45.5	58.5	3.3	1.2	1	0.5	0.144

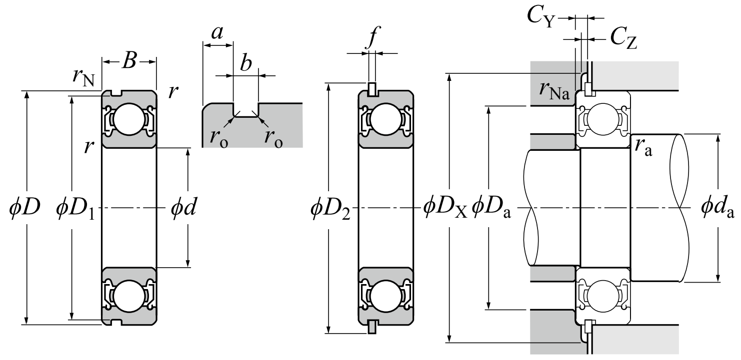
3) Does not include bearings with snap rings.

4) Manufactured with bearing number **SC0039**. For details, please contact **NTN** Engineering.

Dimension Table



Shield type (ZZ)　　Non-contact seal type (LLB)　　Contact seal type (LLU)　　Low torque contact type (LLH)



With snap ring groove　　With snap ring

Dynamic equivalent radial load

$P_r = XF_r + YF_a$

$\frac{f_0 \cdot F_a}{C_{0r}}$	e	$\frac{F_a}{F_r} \leq e$ X	$\frac{F_a}{F_r} \leq e$ Y	$\frac{F_a}{F_r} > e$ X	$\frac{F_a}{F_r} > e$ 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	0	0.56	1.45
2.07	0.34				1.31
3.45	0.38				1.15
5.17	0.42				1.04
6.89	0.44				1.00

Static equivalent radial load

$P_{0r} = 0.6F_r + 0.5F_a$

When, $P_{0r} < F_r$ use $P_{0r} = F_r$.

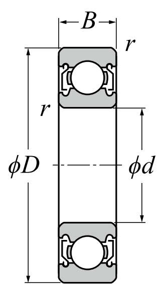
d 22-35 mm

Boundary dimensions (mm) d	D	B	$r_{s\,min}$ 1)	r_{Ns} Min.	Basic load rating (kN) dynamic C_r	static C_{0r}	Fatigue load limit (kN) C_u	Factor f_0	Allowable speed min⁻¹ Grease lubrication ZZ,LLB / Z,LB	Oil lubrication Z,LB	LLH / LH	LLU / LU	Bearing number	Shielded or sealed type 2) (See drawings)			
22	44	12	0.6	0.5	10.4	5.05	0.395	13.9	17 000	20 000	13 000	10 000	**60/22**	**ZZ**	**LLB**	**LLU**	**LLH**
	50	14	1	0.5	14.3	6.80	0.500	13.5	14 000	17 000	12 000	9 700	**62/22**	**ZZ**	**LLB**	**LLU**	**LLH**
	56	16	1.1	0.5	20.4	9.25	0.725	12.4	13 000	15 000	11 000	9 200	**63/22**	**ZZ**	**LLB**	**LLU**	**LLH**
25	37	7	0.3	0.3	4.75	2.95	0.208	16.1	18 000	21 000	—	10 000	**6805JR**	**ZZ**	**LLB**	**LLU**	—
	42	9	0.3	0.3	7.80	4.55	0.345	15.4	16 000	19 000	11 700	9 800	**6905**	**ZZ**	**LLB**	**LLU**	**LLH**
	47	12	0.6	0.5	11.2	5.85	0.380	14.5	15 000	18 000	11 000	9 400	**6005**	**ZZ**	**LLB**	**LLU**	**LLH**
	52	15	1	0.5	15.5	7.85	0.550	13.9	13 000	15 000	11 000	8 900	**6205**	**ZZ**	**LLB**	**LLU**	**LLH**
	62	17	1.1	0.5	23.5	10.9	0.855	12.6	12 000	14 000	9 700	8 100	**6305**	**ZZ**	**LLB**	**LLU**	**LLH**
28	52	12	0.6	0.5	13.8	7.40	0.580	14.5	14 000	16 000	10 000	8 400	**60/28**	**ZZ**	**LLB**	**LLU**	**LLH**
	58	16	1	0.5	19.8	9.75	0.720	13.4	12 000	14 000	9 700	8 100	**62/28**	**ZZ**	**LLB**	**LLU**	**LLH**
	68	18	1.1	0.5	29.6	14.0	1.10	12.4	11 000	13 000	8 900	7 400	**63/28**	**ZZ**	**LLB**	**LLU**	**LLH**
30	42	7	0.3	0.3	5.20	3.65	0.244	16.5	15 000	18 000	10 500	8 800	**6806JR**	**ZZ**	**LLB**	**LLU**	**LLH**
	47	9	0.3	0.3	8.00	5.00	0.365	15.8	14 000	17 000	10 000	8 400	**6906**	**ZZ**	**LLB**	**LLU**	**LLH**
	55	13	1	0.5	14.7	8.30	0.650	14.8	13 000	15 000	9 200	7 700	**6006**	**ZZ**	**LLB**	**LLH**	**LLU**
	62	16	1	0.5	21.6	11.3	0.795	13.8	11 000	13 000	8 800	7 300	**6206**	**ZZ**	**LLB**	**LLU**	**LLH**
	72	19	1.1	0.5	29.5	15.0	1.14	13.3	10 000	12 000	7 900	6 600	**6306**	**ZZ**	**LLB**	**LLU**	**LLH**
32	58	13	1	0.5	13.1	8.05	0.615	15.4	12 000	15 000	8 700	7 200	**60/32**	**ZZ**	**LLB**	**LLU**	**LLH**
	65	17	1	0.5	23.0	11.6	0.840	13.6	11 000	12 000	8 400	7 100	**62/32**	**ZZ**	**LLB**	**LLU**	**LLH**
	75	20	1.1	0.5	33.0	16.9	1.30	13.1	9 500	11 000	7 700	6 500	**63/32**	**ZZ**	**LLB**	**LLU**	**LLH**
35	47	7	0.3	0.3	5.45	4.05	0.268	16.4	13 000	16 000	—	7 600	**6807JR**	**ZZ**	**LLB**	**LLU**	—
	55	10	0.6	0.5	10.6	6.85	0.495	15.8	12 000	15 000	8 500	7 100	**6907**	**ZZ**	**LLB**	**LLU**	**LLH**
	62	14	1	0.5	17.7	10.3	0.805	14.8	12 000	14 000	8 200	6 800	**6007**	**ZZ**	**LLB**	**LLU**	**LLH**
	72	17	1.1	0.5	28.4	15.3	1.09	13.8	9 800	11 000	7 600	6 300	**6207**	**ZZ**	**LLB**	**LLU**	**LLH**
	80	21	1.5	0.5	37.0	19.1	1.47	13.1	8 800	10 000	7 300	6 000	**6307**	**ZZ**	**LLB**	**LLU**	**LLH**

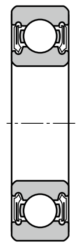
Bearing Number Groove / Snap ring (See drawings)		Snap ring groove dimensions (mm) D_1 Max.	a Max.	b Min.	r_o Max.	Snap ring dimensions (mm) D_2 Max.	f Max.	Installation-related dimensions (mm) d_a Min.	d_a Max.	D_a Max.	D_X (approx.)	C_Y Max.	C_Z Min.	r_{as} Max.	r_{Nas} Max.	Mass 3) (kg) (approx.)
N	**NR**	41.75	2.06	1.35	0.4	48.3	1.12	26	26.5	40	49	2.9	1.2	0.6	0.5	0.074
N	**NR**	47.6	2.46	1.35	0.4	55.7	1.12	27	29.5	45	56.5	3.3	1.2	1	0.5	0.117
N	**NR**	53.6	2.46	1.35	0.4	61.7	1.12	28.5	31	49.5	62.5	3.3	1.2	1	0.5	0.176
N	**NR**	35.7	1.3	0.95	0.25	39.8	0.85	27	28	35	40.5	1.9	0.9	0.3	0.3	0.022
N	**NR**	40.7	1.7	0.95	0.25	44.8	0.85	27	29	40	45.5	2.3	0.9	0.3	0.3	0.042
N	**NR**	44.6	2.06	1.35	0.4	52.7	1.12	29	30.5	43	53.5	2.9	1.2	0.6	0.5	0.08
N	**NR**	49.73	2.46	1.35	0.4	57.9	1.12	30	32	47	58.5	3.3	1.2	1	0.5	0.128
N	**NR**	59.61	3.28	1.9	0.6	67.7	1.7	31.5	35	55.5	68.5	4.6	1.7	1	0.5	0.232
N	**NR**	49.73	2.06	1.35	0.4	57.9	1.12	32	34	48	58.5	2.9	1.2	0.6	0.5	0.098
N	**NR**	55.6	2.46	1.35	0.4	63.7	1.12	33	35.5	53	64.5	3.3	1.2	1	0.5	0.171
N	**NR**	64.82	3.28	1.9	0.6	74.6	1.7	34.5	38.5	61.5	76	4.6	1.7	1	0.5	0.284
N	**NR**	40.7	1.3	0.95	0.25	44.8	0.85	32	33	40	45.5	1.9	0.9	0.3	0.3	0.026
N	**NR**	45.7	1.7	0.95	0.25	49.8	0.85	32	34	45	50.5	2.3	0.9	0.3	0.3	0.048
N	**NR**	52.6	2.08	1.35	0.4	60.7	1.12	35	37	50	61.5	2.9	1.2	1	0.5	0.116
N	**NR**	59.61	3.28	1.9	0.6	67.7	1.7	35	39	57	68.5	4.6	1.7	1	0.5	0.199
N	**NR**	68.81	3.28	1.9	0.6	78.6	1.7	36.5	43	65.5	80	4.6	1.7	1	0.5	0.36
N	**NR**	55.6	2.08	1.35	0.4	63.7	1.12	37	39	53	64.5	2.9	1.2	1	0.5	0.129
N	**NR**	62.6	3.28	1.9	0.6	70.7	1.7	37	40	60	71.5	4.6	1.7	1	0.5	0.226
N	**NR**	71.83	3.28	1.9	0.6	81.6	1.7	38.5	43.5	68.5	83	4.6	1.7	1	0.5	0.382
N	**NR**	45.7	1.3	0.95	0.25	49.8	0.85	37	38	45	50.5	1.9	0.9	0.3	0.3	0.029
N	**NR**	53.7	1.7	0.95	0.25	57.8	0.85	39	40	51	58.5	2.3	0.9	0.6	0.5	0.074
N	**NR**	59.61	2.08	1.9	0.6	67.7	1.7	40	42	57	68.5	3.4	1.7	1	0.5	0.155
N	**NR**	68.81	3.28	1.9	0.6	78.6	1.7	41.5	45	65.5	80	4.6	1.7	1	0.5	0.288
N	**NR**	76.81	3.28	1.9	0.6	86.6	1.7	43	47	72	88	4.6	1.7	1.5	0.5	0.457

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.

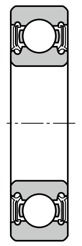
3) Does not include bearings with snap rings.



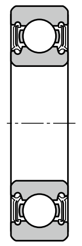
Shield type
(ZZ)



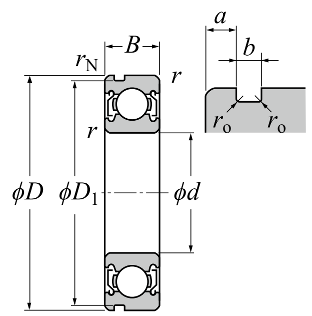
Non-contact
seal type
(LLB)



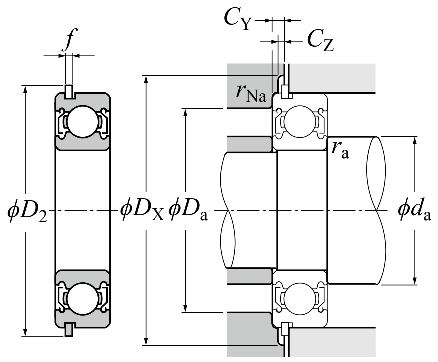
Contact seal
type
(LLU)



Low torque
contact type
(LLH)



With snap ring
groove



With snap ring

Dynamic equivalent radial load
$P_r = XF_r + YF_a$

$\frac{f_0 \cdot F_a}{C_{0r}}$	e	$\frac{F_a}{F_r} \leq e$		$\frac{F_a}{F_r} > e$	
		X	Y	X	Y
0.172	0.19	1	0	0.56	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				1.31
3.45	0.38				1.15
5.17	0.42				1.04
6.89	0.44				1.00

Static equivalent radial load
$P_{0r} = 0.6F_r + 0.5F_a$
When,
$P_{0r} < F_r$ use $P_{0r} = F_r$.

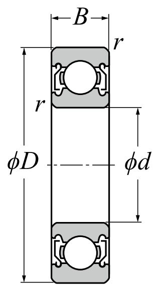
d 40-60 mm

Boundary dimensions (mm)					Basic load rating (kN) dynamic	static	Fatigue load limit (kN)	Factor	Allowable speed min^{-1} Grease lubrication		Oil lubrication		Bearing number	Shielded or sealed type 2) (See drawings)			
d	D	B	$r_{s\,min}$ 1)	r_{Ns} Min.	C_r	C_{0r}	C_u	f_0	ZZ,LLB Z,LB	Z,LB	LLH LH	LLU LU					
40	52	7	0.3	0.3	5.65	4.40	0.291	16.3	12 000	14 000	8 000	6 700	**6808JR**	**ZZ**	**LLB**	**LLU**	**LLH**
	62	12	0.6	0.5	13.5	8.90	0.645	15.8	11 000	13 000	7 500	6 300	**6908**	**ZZ**	**LLB**	**LLU**	**LLH**
	68	15	1	0.5	18.6	11.5	0.890	15.2	10 000	12 000	7 300	6 100	**6008**	**ZZ**	**LLB**	**LLU**	**LLH**
	80	18	1.1	0.5	32.5	17.8	1.24	14.0	8 700	10 000	6 700	5 600	**6208**	**ZZ**	**LLB**	**LLU**	**LLH**
	90	23	1.5	0.5	45.0	24.0	1.83	13.2	7 800	9 200	6 400	5 300	**6308**	**ZZ**	**LLB**	**LLU**	**LLH**
45	58	7	0.3	0.3	5.95	4.95	0.325	16.1	11 000	12 000	—	5 900	**6809JR**	**ZZ**	**LLB**	**LLU**	—
	68	12	0.6	0.5	14.5	10.4	0.730	16.1	9 800	12 000	—	5 600	**6909**	**ZZ**	**LLB**	**LLU**	—
	75	16	1	0.5	23.2	15.1	1.16	15.3	9 200	11 000	6 500	5 400	**6009**	**ZZ**	**LLB**	**LLU**	**LLH**
	85	19	1.1	0.5	36.0	20.4	1.60	14.1	7 800	9 200	6 200	5 200	**6209**	**ZZ**	**LLB**	**LLU**	**LLH**
	100	25	1.5	0.5	58.5	32.0	2.50	13.1	7 000	8 200	5 600	4 700	**6309**	**ZZ**	**LLB**	**LLU**	**LLH**
50	65	7	0.3	0.3	7.30	6.10	0.405	16.1	9 600	11 000	—	5 300	**6810JR**	**ZZ**	**LLB**	**LLU**	—
	72	12	0.6	0.5	14.9	11.2	0.765	16.3	8 900	11 000	6 100	5 100	**6910**	**ZZ**	**LLB**	**LLU**	**LLH**
	80	16	1	0.5	24.2	16.6	1.24	15.5	8 400	9 800	6 000	5 000	**6010**	**ZZ**	**LLB**	**LLU**	**LLH**
	90	20	1.1	0.5	39.0	23.2	1.82	14.4	7 100	8 300	5 700	4 700	**6210**	**ZZ**	**LLB**	**LLU**	**LLH**
	110	27	2	0.5	68.5	38.5	2.99	13.2	6 400	7 500	5 000	4 200	**6310**	**ZZ**	**LLB**	**LLU**	**LLH**
55	72	9	0.3	0.3	9.75	8.10	0.540	16.2	8 700	10 000	—	4 800	**6811JR**	**ZZ**	**LLB**	**LLU**	—
	80	13	1	0.5	17.7	13.3	0.915	16.2	8 200	9 600	5 500	4 600	**6911**	**ZZ**	**LLB**	**LLU**	**LLH**
	90	18	1.1	0.5	31.5	21.2	1.62	15.3	7 700	9 000	—	4 500	**6011**	**ZZ**	**LLB**	**LLU**	—
	100	21	1.5	0.5	48.0	29.2	2.29	14.3	6 400	7 600	—	4 300	**6211**	**ZZ**	**LLB**	**LLU**	—
	120	29	2	0.5	79.5	45.0	3.50	13.2	5 800	6 800	—	3 900	**6311**	**ZZ**	**LLB**	**LLU**	—
60	78	10	0.3	0.3	12.7	10.6	0.705	16.3	8 000	9 400	—	4 400	**6812**	**ZZ**	**LLB**	**LLU**	—
	85	13	1	0.5	18.2	14.3	0.965	16.4	7 600	8 900	—	4 300	**6912**	**ZZ**	**LLB**	**LLU**	—
	95	18	1.1	0.5	32.5	23.2	1.73	15.6	7 000	8 300	—	4 100	**6012**	**ZZ**	**LLB**	**LLU**	—
	110	22	1.5	0.5	58.0	36.0	2.83	14.3	6 000	7 000	4 500	3 800	**6212**	**ZZ**	**LLB**	**LLU**	**LLH**
	130	31	2.1	0.5	90.5	52.0	4.10	13.2	5 400	6 300	—	3 600	**6312**	**ZZ**	**LLB**	**LLU**	—

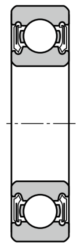
1) Smallest allowable dimension for chamfer dimension r.
2) This bearing number is for double sealed and double shielded type bearings, but single sealed and single shielded type are also available.

Bearing Number Groove (See drawings)	Snap ring (See drawings)	Snap ring groove dimensions (mm) D_1 Max.	a Max.	b Min.	r_o Max.	Snap ring dimensions (mm) D_2 Max.	f Max.	Installation-related dimensions (mm) d_a Min.	d_a Max.	D_a Max.	D_X (approx.)	C_Y Max.	C_Z Min.	r_{as} Max.	r_{Nas} Max.	Mass 3) (kg) (approx.)
N	**NR**	50.7	1.3	0.95	0.25	54.8	0.85	42	43	50	55.5	1.9	0.9	0.3	0.3	0.033
N	**NR**	60.7	1.7	0.95	0.25	64.8	0.85	44	45	58	65.5	2.3	0.9	0.6	0.5	0.11
N	**NR**	64.82	2.49	1.9	0.6	74.6	1.7	45	47	63	76	3.8	1.7	1	0.5	0.19
N	**NR**	76.81	3.28	1.9	0.6	86.6	1.7	46.5	51	73.5	88	4.6	1.7	1	0.5	0.366
N	**NR**	86.79	3.28	2.7	0.6	96.5	2.46	48	54	82	98	5.4	2.5	1.5	0.5	0.63
N	**NR**	56.7	1.3	0.95	0.25	60.8	0.85	47	48	56	61.5	1.9	0.9	0.3	0.3	0.04
N	**NR**	66.7	1.7	0.95	0.25	70.8	0.85	49	51	64	72	2.3	0.9	0.6	0.5	0.128
N	**NR**	71.83	2.49	1.9	0.6	81.6	1.7	50	52.5	70	83	3.8	1.7	1	0.5	0.237
N	**NR**	81.81	3.28	1.9	0.6	91.6	1.7	51.5	55.5	78.5	93	4.6	1.7	1	0.5	0.398
N	**NR**	96.8	3.28	2.7	0.6	106.5	2.46	53	61.5	92	108	5.4	2.5	1.5	0.5	0.814
N	**NR**	63.7	1.3	0.95	0.25	67.8	0.85	52	54	63	68.5	1.9	0.9	0.3	0.3	0.052
N	**NR**	70.7	1.7	0.95	0.25	74.8	0.85	54	55.5	68	76	2.3	0.9	0.6	0.5	0.132
N	**NR**	76.81	2.49	1.9	0.6	86.6	1.7	55	57.5	75	88	3.8	1.7	1	0.5	0.261
N	**NR**	86.79	3.28	2.7	0.6	96.5	2.46	56.5	60	83.5	98	5.4	2.5	1	0.5	0.454
N	**NR**	106.81	3.28	2.7	0.6	116.6	2.46	59	68.5	101	118	5.4	2.5	2	0.5	1.07
N	**NR**	70.7	1.7	0.95	0.25	74.8	0.85	57	59	70	76	2.3	0.9	0.3	0.3	0.083
N	**NR**	77.9	2.1	1.3	0.4	84.4	1.12	60	61.5	75	86	2.9	1.2	1	0.5	0.18
N	**NR**	86.79	2.87	2.7	0.6	96.5	2.46	61.5	64	83.5	98	5	2.5	1	0.5	0.388
N	**NR**	96.8	3.28	2.7	0.6	106.5	2.46	63	67	92	108	5.4	2.5	1.5	0.5	0.601
N	**NR**	115.21	4.06	3.1	0.6	129.7	2.82	64	74	111	131.5	6.5	2.9	2	0.5	1.37
N	**NR**	76.2	1.7	1.3	0.4	82.7	1.12	62	64.5	76	84	2.5	1.2	0.3	0.3	0.106
N	**NR**	82.9	2.1	1.3	0.4	89.4	1.12	65	66.5	80	91	2.9	1.2	1	0.5	0.193
N	**NR**	91.82	2.87	2.7	0.6	101.6	2.46	66.5	69	88.5	103	5	2.5	1	0.5	0.414
N	**NR**	106.81	3.28	2.7	0.6	116.6	2.46	68	75	102	118	5.4	2.5	1.5	0.5	0.783
N	**NR**	125.22	4.06	3.1	0.6	139.7	2.82	71	80.5	119	141.5	6.5	2.9	2	0.5	1.73

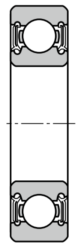
3) Does not include bearings with snap rings.



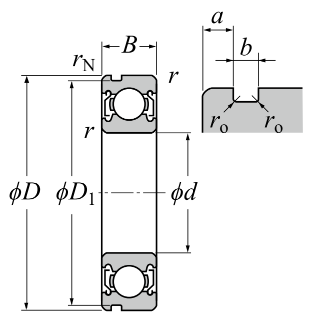
Shield type
(ZZ)



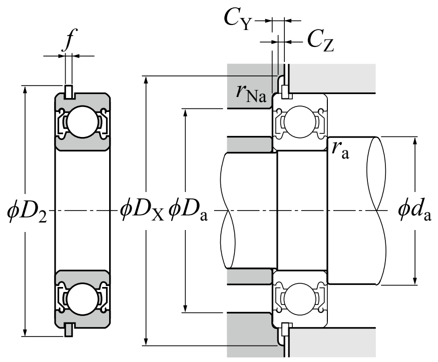
Non-contact
seal type
(LLB)



Contact seal
type
(LLU)



With snap ring
groove



With snap ring

Dynamic equivalent radial load
$P_r = XF_r + YF_a$

$\frac{f_0 \cdot F_a}{C_{0r}}$	e	$\frac{F_a}{F_r} \leq e$		$\frac{F_a}{F_r} > e$	
		X	Y	X	Y
0.172	0.19	1	0	0.56	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				1.31
3.45	0.38				1.15
5.17	0.42				1.04
6.89	0.44				1.00

Static equivalent radial load
$P_{0r} = 0.6F_r + 0.5F_a$
When,
$P_{0r} < F_r$ use $P_{0r} = F_r$.

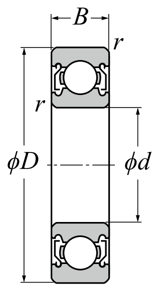
d 65-85 mm

Boundary dimensions (mm)					Basic load rating (kN) dynamic	static	Fatigue load limit (kN)	Factor	Allowable speed min^{-1} Grease lubrication	Oil lubrication		Bearing number			
				r_{Ns}					ZZ,LLB	Z,LB	LLU		Shielded or sealed type 2) (See drawings)		
d	D	B	$r_{s\,min}$ 1)	Min.	C_r	C_{0r}	C_u	f_0	Z,LB		LU				
65	85	10	0.6	0.5	12.8	11.0	0.730	16.2	7 400	8 700	4 100	**6813**	**ZZ**	**LLB**	**LLU**
	90	13	1	0.5	19.3	16.1	1.07	16.6	7 000	8 200	4 000	**6913**	**ZZ**	**LLB**	**LLU**
	100	18	1.1	0.5	34.0	25.2	1.83	15.8	6 500	7 700	3 900	**6013**	**ZZ**	**LLB**	**LLU**
	120	23	1.5	0.5	63.5	40.0	3.15	14.4	5 500	6 500	3 600	**6213**	**ZZ**	**LLB**	**LLU**
	140	33	2.1	0.5	103	60.0	4.60	13.2	4 900	5 800	3 300	**6313**	**ZZ**	**LLB**	**LLU**
70	90	10	0.6	0.5	13.4	11.9	0.795	16.1	6 900	8 100	3 800	**6814**	**ZZ**	**LLB**	**LLU**
	100	16	1	0.5	26.3	21.2	1.45	16.3	6 500	7 700	3 700	**6914**	**ZZ**	**LLB**	**LLU**
	110	20	1.1	0.5	42.0	31.0	2.30	15.6	6 100	7 100	3 600	**6014**	**ZZ**	**LLB**	**LLU**
	125	24	1.5	0.5	69.0	44.0	3.45	14.5	5 100	6 000	3 400	**6214**	**ZZ**	**LLB**	**LLU**
	150	35	2.1	0.5	115	68.0	5.10	13.2	4 600	5 400	3 100	**6314**	**ZZ**	**LLB**	**LLU**
75	95	10	0.6	0.5	13.9	12.9	0.855	16.0	6 400	7 600	3 600	**6815**	**ZZ**	**LLB**	**LLU**
	105	16	1	0.5	27.0	22.6	1.52	16.5	6 100	7 200	3 500	**6915**	**ZZ**	**LLB**	**LLU**
	115	20	1.1	0.5	44.0	33.5	2.44	15.8	5 700	6 700	3 300	**6015**	**ZZ**	**LLB**	**LLU**
	130	25	1.5	0.5	73.5	49.5	3.80	14.7	4 800	5 600	3 200	**6215**	**ZZ**	**LLB**	**LLU**
	160	37	2.1	0.5	126	77.0	5.55	13.2	4 300	5 000	2 900	**6315**	**ZZ**	**LLB**	**LLU**
80	100	10	0.6	0.5	14.0	13.3	0.885	16.0	6 000	7 100	3 400	**6816**	**ZZ**	**LLB**	**LLU**
	110	16	1	0.5	27.6	24.0	1.59	16.6	5 700	6 700	3 200	**6916**	**ZZ**	**LLB**	**LLU**
	125	22	1.1	0.5	53.0	40.0	2.91	15.6	5 300	6 200	3 100	**6016**	**ZZ**	**LLB**	**LLU**
	140	26	2	0.5	80.5	53.0	3.95	14.6	4 500	5 300	3 000	**6216**	**ZZ**	**LLB**	**LLU**
	170	39	2.1	0.5	136	86.5	6.05	13.3	4 000	4 700	2 700	**6316**	**ZZ**	**LLB**	**LLU**
85	110	13	1	0.5	20.7	19.0	1.26	16.2	5 700	6 700	3 100	**6817**	**ZZ**	**LLB**	**LLU**
	120	18	1.1	0.5	35.5	29.6	1.99	16.4	5 400	6 300	3 000	**6917**	**ZZ**	**LLB**	**LLU**
	130	22	1.1	0.5	55.0	43.0	3.00	15.8	5 000	5 900	2 900	**6017**	**ZZ**	**LLB**	**LLU**
	150	28	2	0.5	92.0	64.0	4.60	14.7	4 200	5 000	2 800	**6217**	**ZZ**	**LLB**	**LLU**
	180	41	3	0.5	147	97.0	6.55	13.3	3 800	4 500	2 600	**6317**	**ZZ**	**LLB**	**LLU**

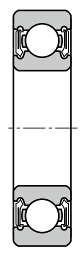
Bearing Number		Snap ring groove dimensions (mm)				Snap ring dimensions (mm)		Installation-related dimensions (mm)								Mass 3) (kg)
Groove / Snap ring (See drawings)		D_1	a	b	r_o	D_2	f	d_a		D_a	D_X	C_Y	C_Z	r_{as}	r_{Nas}	
		Max.	Max.	Min.	Max.	Max.	Max.	Min.	Max.	Max.	(approx.)	Max.	Min.	Max.	Max.	(approx.)
N	**NR**	82.9	1.7	1.3	0.4	89.4	1.12	69	70	81	91	2.5	1.2	0.6	0.5	0.128
N	**NR**	87.9	2.1	1.3	0.4	94.4	1.12	70	71.5	85	96	2.9	1.2	1	0.5	0.206
N	**NR**	96.8	2.87	2.7	0.6	106.5	2.46	71.5	74	93.5	108	5	2.5	1	0.5	0.421
N	**NR**	115.21	4.06	3.1	0.6	129.7	2.82	73	80.5	112	131.5	6.5	2.9	1.5	0.5	0.99
N	**NR**	135.23	4.9	3.1	0.6	149.7	2.82	76	86	129	152	7.3	2.9	2	0.5	2.08
N	**NR**	87.9	1.7	1.3	0.4	94.4	1.12	74	75.5	86	96	2.5	1.2	0.6	0.5	0.137
N	**NR**	97.9	2.5	1.3	0.4	104.4	1.12	75	77.5	95	106	3.3	1.2	1	0.5	0.334
N	**NR**	106.81	2.87	2.7	0.6	116.6	2.46	76.5	80.5	103.5	118	5	2.5	1	0.5	0.604
N	**NR**	120.22	4.06	3.1	0.6	134.7	2.82	78	85	117	136.5	6.5	2.9	1.5	0.5	1.07
N	**NR**	145.24	4.9	3.1	0.6	159.7	2.82	81	92.5	139	162	7.3	2.9	2	0.5	2.52
N	**NR**	92.9	1.7	1.3	0.4	99.4	1.12	79	80	91	101	2.5	1.2	0.6	0.5	0.145
N	**NR**	102.6	2.5	1.3	0.4	110.7	1.12	80	82.5	100	112	3.3	1.2	1	0.5	0.353
N	**NR**	111.81	2.87	2.7	0.6	121.6	2.46	81.5	85.5	108.5	123	5	2.5	1	0.5	0.649
N	**NR**	125.22	4.06	3.1	0.6	139.7	2.82	83	90.5	122	141.5	6.5	2.9	1.5	0.5	1.18
N	**NR**	155.22	4.9	3.1	0.6	169.7	2.82	86	99	149	172	7.3	2.9	2	0.5	3.02
N	**NR**	97.9	1.7	1.3	0.4	104.4	1.12	84	85	96	106	2.5	1.2	0.6	0.5	0.154
N	**NR**	107.6	2.5	1.3	0.4	115.7	1.12	85	88	105	117	3.3	1.2	1	0.5	0.373
N	**NR**	120.22	2.87	3.1	0.6	134.7	2.82	86.5	91.5	118.5	136.5	5.3	2.9	1	0.5	0.854
N	**NR**	135.23	4.9	3.1	0.6	149.7	2.82	89	95.5	131	152	7.3	2.9	2	0.5	1.4
N	**NR**	163.65	5.69	3.5	0.6	182.9	3.1	91	105	159	185	8.4	3.1	2	0.5	3.59
N	**NR**	107.6	2.1	1.3	0.4	115.7	1.12	90	91	105	117	2.9	1.2	1	0.5	0.27
N	**NR**	117.6	3.3	1.3	0.4	125.7	1.12	91.5	94	113.5	127	4.1	1.2	1	0.5	0.536
N	**NR**	125.22	2.87	3.1	0.6	139.7	2.82	91.5	97	123.5	141.5	5.3	2.9	1	0.5	0.89
N	**NR**	145.24	4.9	3.1	0.6	159.7	2.82	94	103	141	162	7.3	2.9	2	0.5	1.79
N	**NR**	173.66	5.69	3.5	0.6	192.9	3.1	98	112	167	195	8.4	3.1	2.5	0.5	4.23

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.

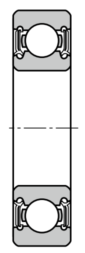
3) Does not include bearings with snap rings.



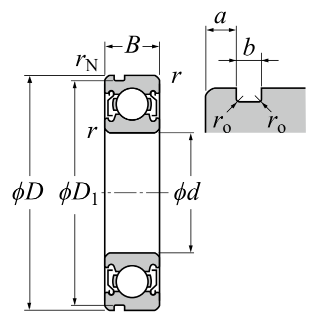
Shield type
(ZZ)



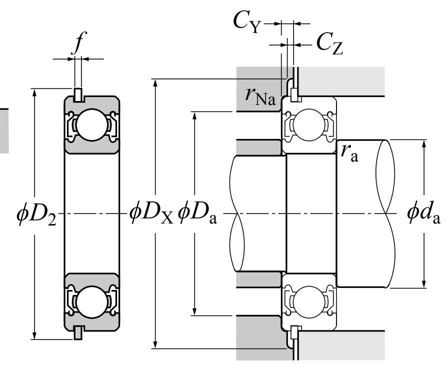
Non-contact
seal type
(LLB)



Contact seal
type
(LLU)



With snap ring
groove



With snap ring

Dynamic equivalent radial load
$P_r = XF_r + YF_a$

$\frac{f_0 \cdot F_a}{C_{0r}}$	e	$\frac{F_a}{F_r} \leq e$ X	Y	$\frac{F_a}{F_r} > e$ X	Y
0.172	0.19	1	0	0.56	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				1.31
3.45	0.38				1.15
5.17	0.42				1.04
6.89	0.44				1.00

Static equivalent radial load
$P_{0r} = 0.6F_r + 0.5F_a$
When,
$P_{0r} < F_r$ use $P_{0r} = F_r$.

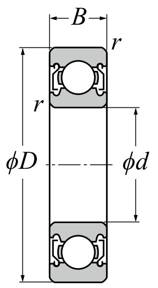
d 90-120 mm

Boundary dimensions mm					Basic load rating dynamic kN	static	Fatigue load limit kN	Factor	Allowable speed min^{-1} Grease lubrication ZZ,LLB Z,LB	Oil lubrication Z,LB	LLU LU	Bearing number Shielded or sealed type[2] (See drawings)			
d	D	B	$r_{s\,min}$[1]	r_{Ns} Min.	C_r	C_{0r}	C_u	f_0							
90	115	13	1	0.5	21.1	19.7	1.3	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	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	7.1	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	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	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	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	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	28	2	0.5	94.0	79.5	4.65	15.9	3 500	4 100	2 100	**6024**	**ZZ**	**LLB**	**LLU**

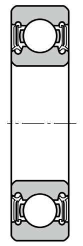
1) Smallest allowable dimension for chamfer dimension r.
2) This bearing number is for double sealed and double shielded type bearings, but single sealed and single shielded type are also available.

Bearing Number Groove / Snap ring (See drawings)		Snap ring groove dimensions mm D_1 Max.	a Max.	b Min.	r_o Max.	Snap ring dimensions mm D_2 Max.	f Max.	Installation-related dimensions mm d_a Min.	d_a Max.	D_a Max.	D_X (approx.)	C_Y Max.	C_Z Min.	r_{as} Max.	r_{Nas} Max.	Mass[3] kg (approx.)
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
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
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
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
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
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
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

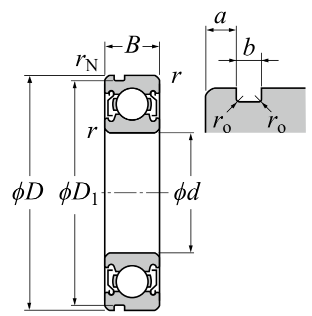
3) Does not include bearings with snap rings.



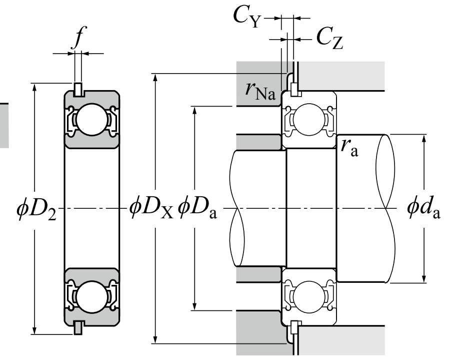
Shield type (ZZ)



Contact seal type (LLU)



With snap ring groove



With snap ring

Dynamic equivalent radial load

$P_r = XF_r + YF_a$

$\frac{f_0 \cdot F_a}{C_{0r}}$	e	$\frac{F_a}{F_r} \leq e$		$\frac{F_a}{F_r} > e$	
		X	Y	X	Y
0.172	0.19	1	0	0.56	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				1.31
3.45	0.38				1.15
5.17	0.42				1.04
6.89	0.44				1.00

Static equivalent radial load

$P_{0r} = 0.6F_r + 0.5F_a$

When,

$P_{0r} < F_r$ use $P_{0r} = F_r$.

d 120-170 mm

Boundary dimensions (mm)					Basic load rating (kN) dynamic	static	Fatigue load limit (kN)	Factor	Allowable speed (min⁻¹) Grease lubrication	Oil lubrication		Bearing number	Shielded or sealed type 2) (See drawings)	
d	D	B	$r_{s\,min}$ 1)	r_{Ns} Min.	C_r	C_{0r}	C_u	f_0	ZZ / Z	Z	LLU / LU			
120	215	40	2.1	—	172	131	7.95	14.4	2 900	3 400	2 000	**6224**	**ZZ**	**LLU**
	260	55	3	—	229	185	10.5	13.5	2 600	3 100	1 700	**6324**	**ZZ**	**LLU**
130	165	18	1.1	0.5	41.0	41.0	2.25	16.1	3 700	4 300	2 000	**6826**	**ZZ**	**LLU**
	180	24	1.5	0.5	72.0	67.5	3.65	16.5	3 500	4 100	1 900	**6926**	**ZZ**	**LLU**
	200	33	2	0.5	118	101	5.70	15.8	3 200	3 800	1 900	**6026**	**ZZ**	**LLU**
	230	40	3	—	185	146	8.55	14.5	2 700	3 100	1 800	**6226**	**ZZ**	**LLU**
140	175	18	1.1	0.5	42.5	44.5	2.35	16.0	3 400	4 000	1 900	**6828**	**ZZ**	**LLU**
	190	24	1.5	0.5	74.0	71.5	3.70	16.6	3 200	3 800	1 800	**6928**	**ZZ**	**LLU**
	210	33	2	—	122	109	5.85	15.9	3 000	3 500	1 800	**6028**	**ZZ**	**LLU**
	250	42	3	—	184	150	8.40	14.8	2 500	2 900	1 600	**6228**	**ZZ**	**LLU**
150	190	20	1.1	0.5	53.0	55.0	2.80	16.1	3 100	3 700	1 700	**6830**	**ZZ**	**LLU**
	210	28	2	—	94.0	90.5	4.55	16.5	3 000	3 500	1 700	**6930**	**ZZ**	**LLU**
	225	35	2.1	—	139	126	6.55	15.9	2 800	3 200	1 700	**6030**	**ZZ**	**LLU**
	270	45	3	—	195	168	9.05	15.1	2 300	2 700	1 500	**6230**	**ZZ**	**LLU**
160	200	20	1.1	0.5	53.5	57.0	2.82	16.1	2 900	3 400	1 600	**6832**	**ZZ**	**LLU**
	220	28	2	—	96.5	96.0	4.65	16.6	2 800	3 300	1 600	**6932**	**ZZ**	**LLU**
	240	38	2.1	—	158	144	7.30	15.9	2 600	3 000	1 600	**6032**	**ZZ**	**LLU**
170	215	22	1.1	—	66.5	70.5	3.35	16.1	2 700	3 200	—	**6834**	**ZZ**	—
	230	28	2	—	95.0	95.5	4.50	16.5	2 600	3 100	—	**6934**	**ZZ**	—
	260	42	2.1	—	187	172	8.55	15.8	2 400	2 800	—	**6034**	**ZZ**	—

Bearing Number Groove / Snap ring (See drawings)		Snap ring groove dimensions (mm) D_1 Max.	a Max.	b Min.	r_o Max.	Snap ring dimensions (mm) D_2 Max.	f Max.	Installation-related dimensions (mm) d_a Min.	d_a Max.	D_a Max.	D_X (approx.)	C_Y Max.	C_Z Min.	r_{as} Max.	r_{Nas} Max.	Mass 3) (kg) (approx.)
N	**NR**	217.0	6.5	4.5	1	227.8	3.1	131	143	204	230	9.2	3.1	2	0.5	5.15
—	—	—	—	—	—	—	—	133	162	247	—	—	—	2.5	—	12.4
N	**NR**	161.8	3.3	1.9	0.6	171.5	1.7	136.5	139.5	158.5	173	4.7	1.7	1	0.5	0.8
N	**NR**	176.8	3.7	1.9	0.6	186.5	1.7	138	144	172	188	5.1	1.7	1.5	0.5	1.52
N	**NR**	193.65	5.69	3.5	0.6	212.9	3.1	139	148	191	215	8.4	3.1	2	0.5	3.16
N	**NR**	222.0	6.5	4.5	1	242	3.5	143	158	217	244	9.6	3.5	2.5	0.5	5.82
N	**NR**	171.8	3.3	1.9	0.6	181.5	1.7	146.5	150	168.5	183	4.7	1.7	1	0.5	0.85
N	**NR**	186.8	3.7	1.9	0.6	196.5	1.7	148	154	182	198	5.1	1.7	1.5	0.5	1.62
—	—	—	—	—	—	—	—	149	158	201	—	—	—	2	—	3.35
N	**NR**	242.0	6.5	4.5	1	262	3.5	153	173	237	264	9.6	3.5	2.5	0.5	7.57
N	**NR**	186.8	3.3	1.9	0.6	196.5	1.7	156.5	161	183.5	198	4.7	1.7	1	0.5	1.16
—	—	—	—	—	—	—	—	159	167	201	—	—	—	2	—	2.47
—	—	—	—	—	—	—	—	161	169	214	—	—	—	2	—	4.08
—	—	—	—	—	—	—	—	163	188	257	—	—	—	2.5	—	9.41
N	**NR**	196.8	3.3	1.9	0.6	206.5	1.7	166.5	171	193.5	208	4.7	1.7	1	0.5	1.23
—	—	—	—	—	—	—	—	169	178	211	—	—	—	2	—	2.61
—	—	—	—	—	—	—	—	171	183	229	—	—	—	2	—	5.05
—	—	—	—	—	—	—	—	176.5	182	208.5	—	—	—	1	—	1.63
—	—	—	—	—	—	—	—	179	188	221	—	—	—	2	—	2.74
—	—	—	—	—	—	—	—	181	196	249	—	—	—	2	—	6.76

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.

3) Does not include bearings with snap rings.

NTN corporation

◀ Sales Network