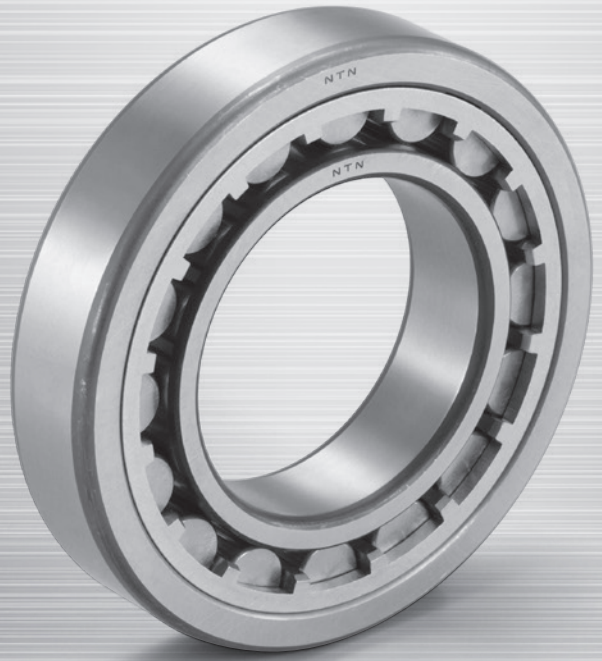
Cylindrical Roller Bearings



Cylindrical roller bearing

E Type cylindrical roller bearing

Double-row cylindrical roller bearing

1. Types, design features, and characteristics

Cylindrical roller bearings can accommodate heavy radial loads due to the line contact formed between their rolling elements and raceways. These bearings are also suitable for high speed applications since the rollers are guided by either inner or outer ring ribs. Cylindrical roller bearings are separable, allowing them to be easily installed and disassembled even when interference fits are required.

Among the various types of cylindrical roller bearings, E type and EA type have a high load capacity while maintaining standard boundary dimensions. HT type has a large axial load capacity, and HL type provides extended fatigue life in poor lubrication conditions. Multiple row bearing arrangements are also available.

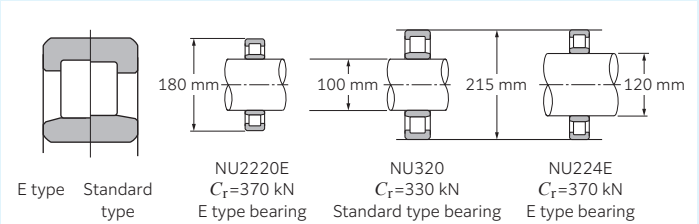
For extremely heavy load applications, the non-separable full complement SL type bearing offers special advantages. For SL type and four-row cylindrical roller bearings, see section "C. Special Application Bearings".

Table 1 shows the various types and characteristics of single row cylindrical roller bearings. **Table 2** shows the characteristics of non-standard type cylindrical roller bearings.

Table 1 Cylindrical roller bearing types and characteristics

Type code	Design	Characteristics
NU type N type	 NU type N type	● NU type outer rings have two ribs. The outer ring, roller, and cage assembly can be separated from the inner ring. N type inner rings have two ribs. The inner ring, roller, and cage assembly can be separated from the outer ring. ● Unable to accommodate any axial loading. ● This is widely used as the floating side bearing in a fixed-float arrangement.
NJ type NF type	 NJ type  NF type	● NJ type has two ribs on the outer ring, a single rib on the inner ring; NF type has a single rib on the outer ring, and two ribs on the inner ring. ● Can receive single direction axial loads. ● When there is no distinction between the fixed side and floating side bearing, these types can be used as a pair in close proximity.
NUP type NH type (NJ + HJ)	 NUP type  NH type	● NUP type has a collar ring attached to the ribless side of the inner ring; NH type is NJ type with an L type collar ring attached. All of these collar rings are separable, and therefore it is necessary to fix the inner ring axially. ● Can accommodate axial loads in either direction. ● Widely used as the shaft's fixed-side bearing.

Table 2 Non-standard type cylindrical roller bearing characteristics

Designation	Characteristics
E type and EA type Cylindrical roller bearing	● Boundary dimensions are the same as the standard type, but the diameter, length and number of the rollers have been increased, resulting in higher load capacity. ● Identified by the addition of "E" to the end of the basic roller number. ● Enables compact design due increased load rating. ● Rollers' inscribed circle diameter differs from the standard type rollers and therefore cannot be interchanged. ● EA type bearings are ULTAGE™ series[1].  Note: In the dimension tables, both E type and EA type are listed.
Cylindrical roller bearing for axial loads (HT type)	● Can accommodate larger axial loads than the standard type due to improved geometry of the rib roller end surface. ● Please consult **NTN** Engineering concerning necessary considerations, such as load, lubricant, and installation conditions.
Double-row cylindrical roller bearing	● NN type and NNU type are available. ● Widely used for applications requiring thin-walled bearings, such the main shafts of machine tools, rolling machine rollers, and in printing equipment. ● Internal radial clearance is adjusted for the spindle of machine tools by pressing the tapered bore of the inner ring on a tapered shaft. Remarks: For precision bearings for machine tools, see the special catalog "**Precision Rolling Bearings (CAT. No. 2260/E)**".

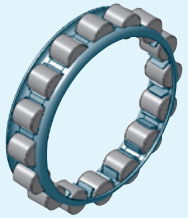
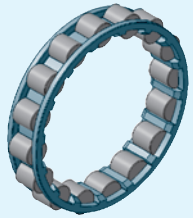
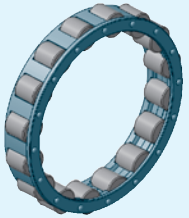
1) ULTAGE™ series cylindrical roller bearings are the products developed to meet the demands of "long operating life", "improved load capability", and "higher speed" that are required for various industrial machinery. For details, see the special catalog "**ULTAGE™ series Cylindrical Roller Bearings (CAT. No. 3037/E)**".

2. Standard cage type

Table 3 shows the standard cage types for cylindrical roller bearings.

The basic load ratings listed in the dimension charts correspond to use of the standard cages listed in **Table 3**. The basic load ratings listed in the dimension tables are for standard configurations. These ratings can change when a different cage type and number of rolling elements is utilized.

Table 3 Standard cage types

Cage type / Bearing series	Resin cage	Pressed cage	Machined cage	
			Single type	Studded double type
				
NU10	—	—	—	1005 to 10/500
NU2 NU2E NU2EA	— — 204EA to 219EA	208 to 230 — —	232 to 240 220E to 240E —	244 to 264 — —
NU22 NU22E NU22EA	— — 2204EA to 2218EA	2208 to 2230 — —	2232 to 2240 2219E to 2240E —	2244 to 2264 — —
NU3 NU3E NU3EA	— — 304EA to 315EA	308 to 324 — —	326 to 330 316E to 332E —	332 to 356 — —
NU23 NU23E NU23EA	— — 2304EA to 2315EA	2308 to 2320 — —	2322 to 2330 2316E to 2332E —	2332 to 2356 — —
NU4	—	405 to 416	—	—

Note: 1. Within the same bearing series, cage type is constant regardless of the cylindrical roller bearing type (NJ, NUP, N, NF).
2. For high speed and other special applications, machined cages can be manufactured when necessary. Consult **NTN** Engineering.
3. Among EA type bearings that use resin cages as standard, certain varieties use pressed cages. Consult **NTN** Engineering.
4. Although machined cages are the standard for two-row cylindrical roller bearings, resin cages may also be used in some of these bearings for machine tool applications.

3. Allowable misalignment

Edge loading due to misalignment under general load conditions should be avoided to prevent premature bearing failure, The maximum allowable misalignment based on bearing series can be found below. The values apply when the bearings are to be used as the floating side of NU and N types. For NJ, NUP, and NH types that are to be used for the fixed side, consult **NTN** Engineering. Depending on the magnitude of the axial load, the edge loading may exceed recommended limits, which could lead to a reduction in bearing life.

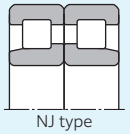
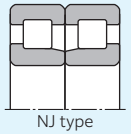
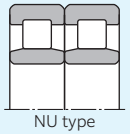
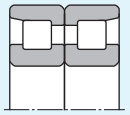
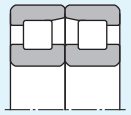
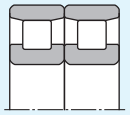
- Bearing series 0 or 1 ····· 1/1 000
- Bearing series 2 ····· 1/2 000
- Bearing series 0, 1, and 2 single-row ULTAGE™ series ····· 1/500
- Double-row cylindrical roller bearings[1)] ····· 1/2 000

1) Does not include high precision bearings for machine tool main shaft applications.

4. Combinations of cylindrical roller bearings

Table 4 shows the representative combinations of bearings.

Table 4 Combination type

Back-to-back arrangement (DB)	Face-to-face arrangement (DF)	Symmetrical parts arrangement (D2)
 NJ type	 NJ type	 NU type
 NF type	 NF type	 N type

Note: 1. Bearings are manufactured in a set so that two bearings receive a load evenly; therefore, they must be assembled together with identically numbered bearings and not mixed with other arrangements.
2. Triplex arrangements of bearings are also available. Consult **NTN** Engineering for details.

5. Tolerance of inscribed circle diameter and circumscribed circle diameter of rollers of interchangeable cylindrical roller bearings

Table 5 Tolerance of inscribed circle diameter and circumscribed circle diameter of rollers of interchangeable cylindrical roller bearings

Unit: μm

Nominal bore diameter d mm		Dimensional tolerance of roller inscribed circle diameter Δ_{Fw}		Dimensional tolerance of roller circumscribed circle diameter Δ_{Ew}	
Over	Incl.	Upper	Lower	Upper	Lower
17[1)]	20	+10	0	0	−10
20	50	+15	0	0	−15
50	120	+20	0	0	−20
120	200	+25	0	0	−25
200	250	+30	0	0	−30
250	315	+35	0	0	−35
315	400	+40	0	0	−40
400	500	+45	0	0	−45

1) 17 mm is included in this dimensional division.
Note: Interchangeable cylindrical roller bearings are bearings having the same number in the group. The bearing function is not impaired even if an outer ring is combined with an inner ring with rollers or an inner ring is combined with an outer ring with rollers.

6. Allowable speed of cylindrical roller bearing ULTAGE™ series

As the rotational speed of the bearing increases, the temperature of the bearing also increases because of the friction heat produced inside the bearing. Operation at excessive temperatures will significantly deteriorate the lubricant performance, causing abnormal temperature rises and seizure. Factors affecting the allowable speed of bearings are as follows.

(1) Bearing type
(2) Bearing size
(3) Lubrication (grease lubrication, circulating lubrication, oil lubrication, etc.)
(4) Bearing internal clearance (bearing internal clearance during operation)
(5) Bearing load
(6) Shaft and housing accuracy

The allowable speed specified in the bearing dimension table is the reference speed limit which allows for satisfactory heat dissipation and lubrication conditions before adversely affecting the bearing. The allowable speed of ULTAGE™ series cylindrical roller bearings specified in the catalog is defined as follows.

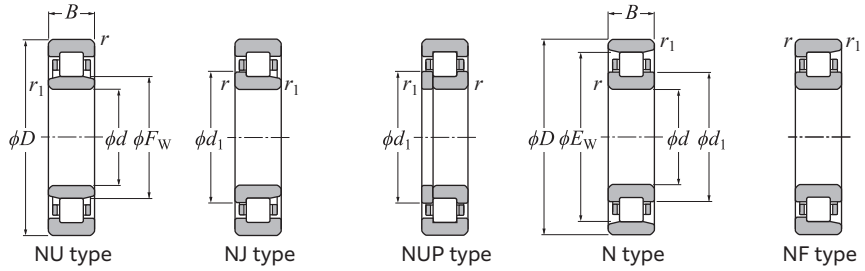
[Oil lubrication]
The allowable speed for oil lubrication is the speed at which the outer ring temperature reaches 80 °C with room temperature spindle oil (lubrication oil viscosity: ISO VG32) supplied at 1 liter/min under an operating load of 5 % of the basic static load rating C_{0r}.

[Grease lubrication]
The allowable speed for grease lubrication is the speed at which the outer ring temperature reaches 80 °C with lithium-based grease (consistency: NLGI3) filled 20 to 30 % of the free space under an operating load of 5 % of the basic static load rating C_{0r}.

In either of the lubrication methods, the bearing temperature rise differs if the usage condition (operating load, rotational speed pattern, lubricating condition, etc.) is different; therefore, the bearings must be selected with sufficient allowable speed as specified in the catalog.

If 80 % of the allowable speed specified in the dimension table is exceeded or the bearing is used under vibration or impact conditions, please consult **NTN** Engineering.

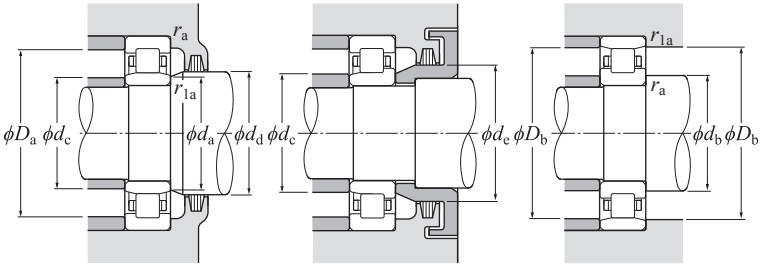
See section "9. Allowable speed" for the definition of the allowable speed of the cylindrical roller bearings that are not part of the ULTAGE™ series.



d 20–45 mm

Boundary dimensions mm					Basic load rating kN		Fatigue load limit kN	Allowable speed [2] min^{-1}		Bearing number [3] [4] [5]				
d	D	B	$r_{s\,min}$ [1]	$r_{1s\,min}$ [1]	dynamic C_r	static C_{0r}	C_u	Grease lubrication	Oil lubrication	NU type	NJ type	NUP type	N type	NF type
20	47	14	1	0.6	32.5	24.7	3.00	15 000	21 600	∗NU204EA	NJ	NUP	N	NF
	47	18	1	0.6	38.5	31.0	3.75	14 000	19 200	∗NU2204EA	NJ	NUP	N	NF
	52	15	1.1	0.6	37.5	26.9	3.25	13 000	18 000	∗NU304EA	NJ	NUP	N	NF
	52	21	1.1	0.6	49.5	39.0	4.75	12 000	16 800	∗NU2304EA	NJ	NUP	N	NF
25	47	12	0.6	0.3	16.7	14.1	1.72	16 000	19 000	NU1005	NJ	NUP	N	—
	52	15	1	0.6	34.5	27.7	3.40	13 000	18 000	∗NU205EA	NJ	NUP	N	NF
	52	18	1	0.6	41.5	34.5	4.25	11 000	15 600	∗NU2205EA	NJ	NUP	N	NF
	62	17	1.1	1.1	49.0	37.5	4.55	11 000	15 600	∗NU305EA	NJ	NUP	N	NF
	62	24	1.1	1.1	67.5	56.0	6.85	9 700	13 200	∗NU2305EA	NJ	NUP	N	NF
	80	21	1.5	1.5	51.5	40.0	4.85	8 500	10 000	NU405	NJ	NUP	N	NF
30	55	13	1	0.6	21.8	19.6	2.39	14 000	16 000	NU1006	NJ	NUP	N	—
	62	16	1	0.6	46.0	37.5	4.55	11 000	15 600	∗NU206EA	NJ	NUP	N	NF
	62	20	1	0.6	58.0	50.0	6.10	9 700	13 200	∗NU2206EA	NJ	NUP	N	NF
	72	19	1.1	1.1	63.0	50.0	6.15	9 300	13 200	∗NU306EA	NJ	NUP	N	NF
	72	27	1.1	1.1	88.0	77.5	9.45	8 300	11 600	∗NU2306EA	NJ	NUP	N	NF
	90	23	1.5	1.5	69.5	55.0	6.70	7 300	8 500	NU406	NJ	NUP	N	NF
35	62	14	1	0.6	25.1	23.2	2.82	12 000	15 000	NU1007	NJ	NUP	N	—
	72	17	1.1	0.6	59.5	50.0	6.10	9 500	13 200	∗NU207EA	NJ	NUP	N	NF
	72	23	1.1	0.6	73.0	65.5	7.95	8 500	12 000	∗NU2207EA	NJ	NUP	N	NF
	80	21	1.5	1.1	83.5	71.0	8.65	8 100	11 500	∗NU307EA	NJ	NUP	N	NF
	80	31	1.5	1.1	117	109	13.3	7 200	10 200	∗NU2307EA	NJ	NUP	N	NF
	100	25	1.5	1.5	83.5	69.0	8.40	6 400	7 500	NU407	NJ	NUP	N	NF
40	68	15	1	0.6	30.5	29.0	3.55	11 000	13 000	NU1008	NJ	NUP	N	—
	80	18	1.1	1.1	48.5	43.0	5.25	9 400	11 000	∗∗NU208	NJ	NUP	N	NF
	80	18	1.1	1.1	66.0	55.5	6.75	8 500	12 000	∗NU208EA	NJ	NUP	N	NF
	80	23	1.1	1.1	64.5	62.0	7.55	8 500	10 000	∗∗NU2208	NJ	NUP	N	—
	80	23	1.1	1.1	85.5	77.5	9.45	7 600	10 700	∗NU2208EA	NJ	NUP	N	NF
	90	23	1.5	1.5	65.0	57.0	6.95	8 000	9 400	∗∗NU308	NJ	NUP	N	NF
	90	23	1.5	1.5	98.5	81.5	9.95	7 200	10 200	∗NU308EA	NJ	NUP	N	NF
	90	33	1.5	1.5	91.5	88.0	10.7	7 000	8 200	∗∗NU2308	NJ	NUP	N	—
	90	33	1.5	1.5	135	122	14.9	6 400	9 000	∗NU2308EA	NJ	NUP	N	NF
	110	27	2	2	106	89.0	10.9	5 700	6 700	NU408	NJ	NUP	N	NF
45	75	16	1	0.6	34.5	34.0	4.10	9 900	12 000	NU1009	NJ	NUP	N	—

1) Smallest allowable dimension for chamfer dimension r or r_1.
2) This value is for machined cages; when pressed cages are used, 80 % of this value is acceptable.
3) Bearing numbers marked "∗" designate ULTAGE™ series bearings.
4) Bearing marked "∗∗" are going to be integrated with ULTAGE™ series.

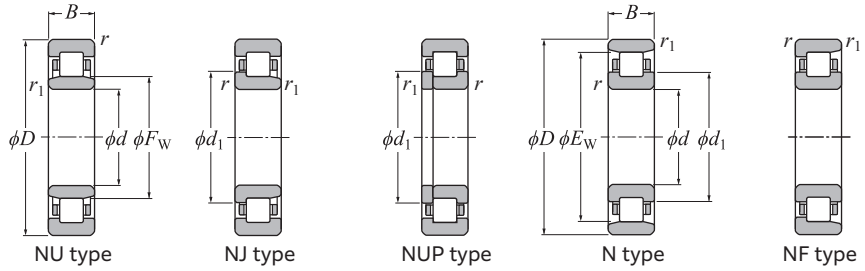


Dynamic equivalent radial load
$P_r = F_r$

Static equivalent radial load
$P_{0r} = F_r$

Dimension mm			Installation-related dimensions mm									Mass kg	
F_w	E_w	d_1	d_a Min.	d_b Min.	d_c Max.	d_d Min.	d_e Min.	D_a Max.	D_b Max.	D_b Min. [6]	r_{as} Max.	r_{1as} Max.	NU type (approx.)	N type (approx.)
26.5	41.5	29.5	24	25	26	29	32	42	42	42	1	0.6	0.115	0.11
26.5	41.5	29.5	24	25	26	29	32	42	42	42	1	0.6	0.146	0.144
27.5	45.5	31.1	24	26.5	27	30	33	45.5	45.5	45.5	1	0.6	0.176	0.147
27.5	45.5	31.1	24	26.5	27	30	33	45.5	45.5	45.5	1	0.6	0.242	0.212
30.5	41.5	32.7	27	29	30	32	33	43	45	42.5	0.6	0.3	0.092	0.091
31.5	46.5	34.5	29	30	31	34	37	47	47	47	1	0.6	0.151	0.13
31.5	46.5	34.5	29	30	31	34	37	47	47	47	1	0.6	0.186	0.163
34	54	38	31.5	31.5	33	37	40	55.5	55.5	55	1	1	0.275	0.242
34	54	38	31.5	31.5	33	37	40	55.5	55.5	55	1	1	0.386	0.345
38.8	62.8	43.6	33	33	38	41	46	72	72	64	1.5	1.5	0.55	0.536
36.5	48.5	38.9	34	35	35	38	39.5	50	51	49.5	1	0.6	0.13	0.128
37.5	55.5	41.1	34	35	37	40	44	57	57	56.5	1	0.6	0.226	0.205
37.5	55.5	41.1	34	35	37	40	44	57	57	56.5	1	0.6	0.297	0.259
40.5	62.5	44.9	36.5	36.5	40	44	48	65.5	65.5	64	1	1	0.398	0.353
40.5	62.5	44.9	36.5	36.5	40	44	48	65.5	65.5	64	1	1	0.58	0.526
45	73	50.5	38	38	44	47	52	82	82	74	1.5	1.5	0.751	0.732
42	55	44.6	39	40	41	44	45	57	58	56	1	0.6	0.179	0.176
44	64	48	39	41.5	43	46	50	65.5	65.5	65.5	1	0.6	0.327	0.294
44	64	48	39	41.5	43	46	50	65.5	65.5	65.5	1	0.6	0.455	0.405
46.2	70.2	51	41.5	43	45	48	53	72	72	71.5	1.5	1	0.545	0.483
46.2	70.2	51	41.5	43	45	48	53	72	72	71.5	1.5	1	0.78	0.737
53	83	59	43	43	52	55	61	92	92	84	1.5	1.5	0.99	0.965
47	61	49.8	44	45	46	49	50.5	63	64	62	1	0.6	0.22	0.217
50	70	54.2	46.5	46.5	49	52	56	73.5	73.5	72	1	1	0.378	0.37
49.5	71.5	53.9	46.5	46.5	49	52	56	73.5	73.5	72.5	1	1	0.426	0.365
50	70	54.2	46.5	46.5	49	52	56	73.5	73.5	72	1	1	0.49	0.48
49.5	71.5	53.9	46.5	46.5	49	52	56	73.5	73.5	72.5	1	1	0.552	0.491
53.5	77.5	58.4	48	48	51	55	60	82	82	80	1.5	1.5	0.658	0.643
52	80	57.6	48	48	51	55	60	82	82	81.5	1.5	1.5	0.754	0.658
53.5	77.5	58.4	48	48	51	55	60	82	82	80	1.5	1.5	0.951	0.932
52	80	57.6	48	48	51	55	60	82	82	81.5	1.5	1.5	1.06	0.952
58	92	64.8	49	49	57	60	67	101	101	93	2	2	1.3	1.27
52.5	67.5	55.5	49	50	52	54	56	70	71	68.5	1	0.6	0.28	0.276

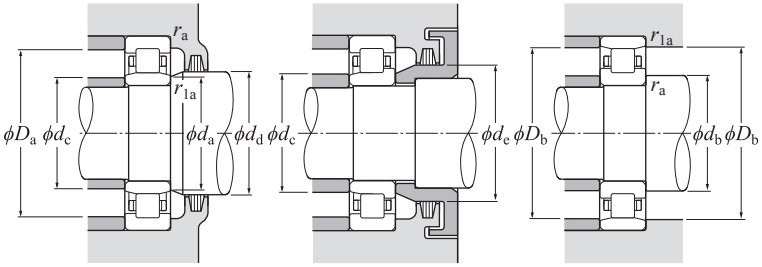
5) Bearing numbers having no standard form are switched to E type or ULTAGE™ series.
6) Does not apply to the sides of the outer ring rib of NF type bearings.



d 45–60 mm

Boundary dimensions mm					Basic load rating dynamic kN	static kN	Fatigue load limit kN	Allowable speed 2) min^{-1} Grease lubrication	Oil lubrication	Bearing number 3) 4) NU type	NJ type	NUP type	N type	NF type
d	D	B	$r_{s\,min}$ 1)	$r_{1s\,min}$ 1)	C_r	C_{0r}	C_u							
45	85	19	1.1	1.1	51.0	47.0	5.70	8 400	9 900	**NU209	NJ	NUP	N	NF
	85	19	1.1	1.1	74.5	66.5	8.10	7 600	10 800	*NU209EA	NJ	NUP	N	NF
	85	23	1.1	1.1	68.0	68.0	8.25	7 600	9 000	**NU2209	NJ	NUP	N	—
	85	23	1.1	1.1	90.0	84.5	10.3	6 800	9 600	*NU2209EA	NJ	NUP	N	NF
	100	25	1.5	1.5	82.0	71.0	8.65	7 200	8 400	**NU309	NJ	NUP	N	NF
	100	25	1.5	1.5	115	98.5	12.0	6 500	9 100	*NU309EA	NJ	NUP	N	NF
	100	36	1.5	1.5	110	104	12.7	6 300	7 400	**NU2309	NJ	NUP	N	—
	100	36	1.5	1.5	162	153	18.7	5 700	8 200	*NU2309EA	NJ	NUP	N	NF
	120	29	2	2	119	102	12.4	5 100	6 000	NU409	NJ	NUP	N	NF
50	80	16	1	0.6	35.5	36.0	4.40	8 900	11 000	NU1010	NJ	NUP	N	—
	90	20	1.1	1.1	53.5	51.0	6.20	7 600	9 000	**NU210	NJ	NUP	N	NF
	90	20	1.1	1.1	81.5	76.5	9.30	6 900	9 700	*NU210EA	NJ	NUP	N	NF
	90	23	1.1	1.1	71.0	73.5	9.00	6 900	8 100	**NU2210	NJ	NUP	N	—
	90	23	1.1	1.1	98.5	97.0	11.9	6 200	8 800	*NU2210EA	NJ	NUP	N	NF
	110	27	2	2	96.5	86.0	10.5	6 500	7 700	**NU310	NJ	NUP	N	NF
	110	27	2	2	130	113	13.8	5 900	8 300	*NU310EA	NJ	NUP	N	NF
	110	40	2	2	134	131	16.0	5 700	6 700	**NU2310	NJ	NUP	N	—
	110	40	2	2	192	187	22.7	5 200	7 300	*NU2310EA	NJ	NUP	N	NF
	130	31	2.1	2.1	143	124	15.1	4 700	5 500	NU410	NJ	NUP	N	NF
55	90	18	1.1	1	42.0	44.0	5.35	8 200	9 700	NU1011	NJ	NUP	N	—
	100	21	1.5	1.1	64.5	62.5	7.60	6 900	8 200	**NU211	NJ	NUP	N	NF
	100	21	1.5	1.1	102	98.5	12.0	6 300	8 900	*NU211EA	NJ	NUP	N	NF
	100	25	1.5	1.1	83.5	87.0	10.6	6 300	7 400	**NU2211	NJ	NUP	N	—
	100	25	1.5	1.1	120	122	14.8	5 600	7 900	*NU2211EA	NJ	NUP	N	NF
	120	29	2	2	123	111	13.6	5 900	7 000	**NU311	NJ	NUP	N	NF
	120	29	2	2	162	143	17.4	5 300	7 600	*NU311EA	NJ	NUP	N	NF
	120	43	2	2	164	162	19.8	5 200	6 100	**NU2311	NJ	NUP	N	—
	120	43	2	2	238	233	28.4	4 700	6 700	*NU2311EA	NJ	NUP	N	NF
	140	33	2.1	2.1	154	138	16.9	4 300	5 000	NU411	NJ	NUP	N	NF
60	95	18	1.1	1	44.5	48.5	5.95	7 500	8 800	NU1012	NJ	NUP	N	—
	110	22	1.5	1.5	76.0	75.0	9.15	6 400	7 600	**NU212	NJ	NUP	N	NF
	110	22	1.5	1.5	115	107	13.1	5 800	8 200	*NU212EA	NJ	NUP	N	NF
	110	28	1.5	1.5	107	116	14.1	5 800	6 800	**NU2212	NJ	NUP	N	—
	110	28	1.5	1.5	155	157	19.1	5 200	7 300	*NU2212EA	NJ	NUP	N	NF

1) Smallest allowable dimension for chamfer dimension r or r_1.
2) This value is for machined cages; when pressed cages are used, 80 % of this value is acceptable.
3) Bearing numbers marked "*" designate ULTAGE™ series bearings.
4) Bearing marked "**" are going to be integrated with ULTAGE™ series.

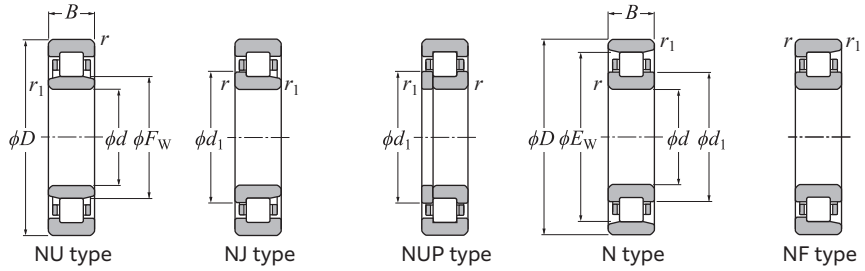


Dynamic equivalent radial load
$P_r = F_r$

Static equivalent radial load
$P_{0r} = F_r$

Dimension mm			Installation-related dimensions mm								Mass kg	
F_w	E_w	d_1	d_a Min.	d_b Min.	d_c Max.	d_d Min.	d_e Min.	D_a Max.	D_b Max.	D_b Min.5)	r_{as} Max.	r_{las} Max.	NU type (approx.)	N type (approx.)
55	75	59	51.5	51.5	54	57	61	78.5	78.5	77	1	1	0.432	0.423
54.5	76.5	58.9	51.5	51.5	54	57	61	78.5	78.5	77.5	1	1	0.495	0.423
55	75	59	51.5	51.5	54	57	61	78.5	78.5	77	1	1	0.53	0.52
54.5	76.5	58.9	51.5	51.5	54	57	61	78.5	78.5	77.5	1	1	0.6	0.533
58.5	86.5	64	53	53	57	60	66	92	92	89	1.5	1.5	0.877	0.857
58.5	88.5	64.5	53	53	57	60	66	92	92	90.5	1.5	1.5	0.996	0.865
58.5	86.5	64	53	53	57	60	66	92	92	89	1.5	1.5	1.27	1.24
58.5	88.5	64.5	53	53	57	60	66	92	92	90.5	1.5	1.5	1.41	1.3
64.5	100.5	71.8	54	54	63	66	74	111	111	102	2	2	1.62	1.58
57.5	72.5	60.5	54	55	57	59	61	75	76	73.5	1	0.6	0.295	0.291
60.4	80.4	64.6	56.5	56.5	58	62	67	83.5	83.5	83	1	1	0.47	0.46
59.5	81.5	63.9	56.5	56.5	58	62	67	83.5	83.5	82.5	1	1	0.503	0.47
60.4	80.4	64.6	56.5	56.5	58	62	67	83.5	83.5	83	1	1	0.571	0.56
59.5	81.5	63.9	56.5	56.5	58	62	67	83.5	83.5	82.5	1	1	0.587	0.584
65	95	71	59	59	63	67	73	101	101	98	2	2	1.14	1.11
65	97	71.4	59	59	63	67	73	101	101	99	2	2	1.3	1.12
65	95	71	59	59	63	67	73	101	101	98	2	2	1.7	1.67
65	97	71.4	59	59	63	67	73	101	101	99	2	2	1.9	1.75
70.8	110.8	78.8	61	61	69	73	81	119	119	112	2	2	2.02	1.97
64.5	80.5	67.7	60	61.5	63	66	68.5	83.5	85	81.5	1	1	0.442	0.435
66.5	88.5	70.8	61.5	63	65	68	73	92	93.5	91	1.5	1	0.638	0.626
66	90	70.8	61.5	63	65	68	73	92	92	91	1.5	1	0.675	0.635
66.5	88.5	70.8	61.5	63	65	68	73	92	93.5	91	1.5	1	0.773	0.758
66	90	70.8	61.5	63	65	68	73	92	92	91	1.5	1	0.807	0.805
70.5	104.5	77.2	64	64	69	72	80	111	111	107	2	2	1.45	1.42
70.5	106.5	77.7	64	64	69	72	80	111	111	108.5	2	2	1.65	1.43
70.5	104.5	77.2	64	64	69	72	80	111	111	107	2	2	2.17	2.13
70.5	106.5	77.7	64	64	69	72	80	111	111	108.5	2	2	2.37	2.23
77.2	117.2	85.2	66	66	76	79	87	129	129	119	2	2	2.48	2.42
69.5	85.5	72.7	65	66.5	68	71	73.5	88.5	90	86.5	1	1	0.474	0.467
73.5	97.5	78.4	68	68	71	75	80	102	102	100	1.5	1.5	0.818	0.802
72	100	77.6	68	68	71	75	80	102	102	101	1.5	1.5	0.923	0.798
73.5	97.5	78.4	68	68	71	75	80	102	102	100	1.5	1.5	1.06	1.04
72	100	77.6	68	68	71	75	80	102	102	101	1.5	1.5	1.21	1.08

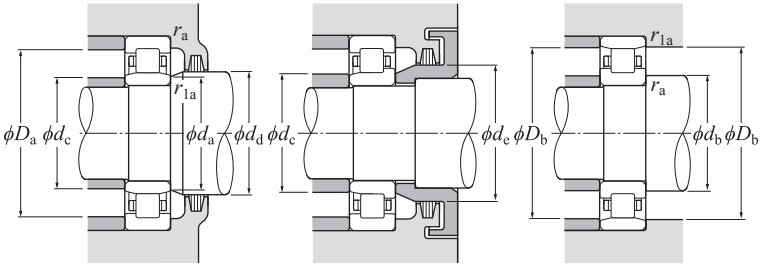
5) Does not apply to the sides of the outer ring rib of NF type bearings.



d 60–75 mm

Boundary dimensions mm					Basic load rating dynamic kN	static kN	Fatigue load limit kN	Allowable speed 2) min^{-1} Grease lubrication	Oil lubrication	Bearing number 3) 4) NU type	NJ type	NUP type	N type	NF type
d	D	B	$r_{s\,min}$ 1)	$r_{1s\,min}$ 1)	C_r	C_{0r}	C_u							
60	130	31	2.1	2.1	137	126	15.4	5 500	6 500	**NU312	NJ	NUP	N	NF
	130	31	2.1	2.1	177	157	19.1	4 900	7 000	*NU312EA	NJ	NUP	N	NF
	130	46	2.1	2.1	187	188	22.9	4 800	5 700	**NU2312	NJ	NUP	N	—
	130	46	2.1	2.1	263	262	32.0	4 400	6 200	*NU2312EA	NJ	NUP	N	NF
	150	35	2.1	2.1	185	168	20.2	3 900	4 600	NU412	NJ	NUP	N	NF
65	100	18	1.1	1	45.5	51.0	6.30	7 000	8 200	NU1013	NJ	NUP	N	—
	120	23	1.5	1.5	93.0	94.5	11.5	5 900	7 000	**NU213	NJ	NUP	N	NF
	120	23	1.5	1.5	127	119	14.5	5 400	7 600	*NU213EA	NJ	NUP	N	NF
	120	31	1.5	1.5	133	149	18.2	5 400	6 300	**NU2213	NJ	NUP	N	—
	120	31	1.5	1.5	176	181	22.1	4 800	6 700	*NU2213EA	NJ	NUP	N	NF
	140	33	2.1	2.1	150	139	16.8	5 100	6 000	**NU313	NJ	NUP	N	NF
	140	33	2.1	2.1	213	191	23.1	4 600	6 500	*NU313EA	NJ	NUP	N	NF
	140	48	2.1	2.1	208	212	25.7	4 400	5 200	**NU2313	NJ	NUP	N	—
	140	48	2.1	2.1	293	287	34.5	4 100	5 800	*NU2313EA	NJ	NUP	N	NF
	160	37	2.1	2.1	202	186	21.9	3 600	4 300	NU413	NJ	NUP	N	NF
70	110	20	1.1	1	64.5	70.5	8.60	6 500	7 600	NU1014	NJ	NUP	N	—
	125	24	1.5	1.5	92.5	95.0	11.6	5 500	6 500	**NU214	NJ	NUP	N	NF
	125	24	1.5	1.5	140	137	16.7	5 000	7 100	*NU214EA	NJ	NUP	N	NF
	125	31	1.5	1.5	132	151	18.4	5 000	5 900	**NU2214	NJ	NUP	N	—
	125	31	1.5	1.5	184	194	23.7	4 500	6 200	*NU2214EA	NJ	NUP	N	NF
	150	35	2.1	2.1	175	168	20.0	4 700	5 500	**NU314	NJ	NUP	N	NF
	150	35	2.1	2.1	242	222	26.2	4 200	6 000	*NU314EA	NJ	NUP	N	NF
	150	51	2.1	2.1	247	262	31.0	4 100	4 800	**NU2314	NJ	NUP	N	—
	150	51	2.1	2.1	325	325	38.0	3 800	5 300	*NU2314EA	NJ	NUP	N	NF
	180	42	3	3	253	236	26.8	3 400	4 000	NU414	NJ	NUP	N	NF
75	115	20	1.1	1	66.5	74.5	9.10	6 100	7 100	NU1015	NJ	NUP	N	—
	130	25	1.5	1.5	107	111	13.4	5 100	6 000	**NU215	NJ	NUP	N	NF
	130	25	1.5	1.5	154	156	18.9	4 700	6 600	*NU215EA	NJ	NUP	N	NF
	130	31	1.5	1.5	144	162	19.6	4 700	5 500	**NU2215	NJ	NUP	N	—
	130	31	1.5	1.5	191	207	25.0	4 200	5 900	*NU2215EA	NJ	NUP	N	NF
	160	37	2.1	2.1	211	205	23.8	4 400	5 200	**NU315	NJ	NUP	N	NF
	160	37	2.1	2.1	284	263	30.5	4 000	5 600	*NU315EA	NJ	NUP	N	NF
	160	55	2.1	2.1	286	300	35.0	3 800	4 500	**NU2315	NJ	NUP	N	—
	160	55	2.1	2.1	390	395	45.5	3 500	4 900	*NU2315EA	NJ	NUP	N	NF
	190	45	3	3	291	274	30.5	3 200	3 700	NU415	NJ	NUP	N	NF

1) Smallest allowable dimension for chamfer dimension r or r_1.
2) This value is for machined cages; when pressed cages are used, 80 % of this value is acceptable.
3) Bearing numbers marked "*" designate ULTAGE™ series bearings.
4) Bearing marked "**" are going to be integrated with ULTAGE™ series.

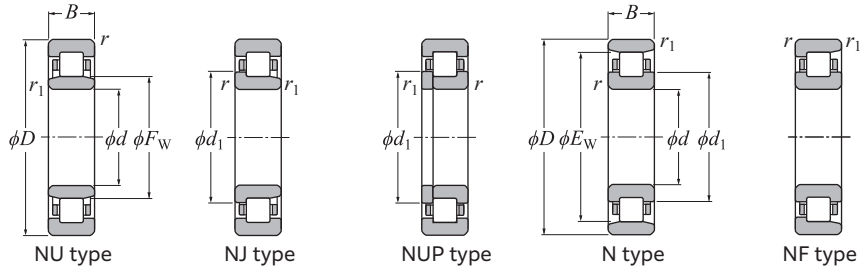


Dynamic equivalent radial load
$P_r = F_r$

Static equivalent radial load
$P_{0r} = F_r$

Dimension mm			Installation-related dimensions mm									Mass kg	
F_w	E_w	d_1	d_a Min.	d_b Min.	d_c Max.	d_d Min.	d_e Min.	D_a Max.	D_b Max.	D_b Min.5)	r_{as} Max.	r_{las} Max.	NU type (approx.)	N type (approx.)
77	113	84.2	71	71	75	79	86	119	119	116	2	2	1.8	1.76
77	115	84.6	71	71	75	79	86	119	119	117	2	2	2.05	1.77
77	113	84.2	71	71	75	79	86	119	119	116	2	2	2.71	2.66
77	115	84.6	71	71	75	79	86	119	119	117	2	2	2.96	2.73
83	127	91.8	71	71	82	85	94	139	139	128	2	2	3	2.93
74.5	90.5	77.7	70	71.5	73	76	78.5	93.5	95	91.5	1	1	0.485	0.477
79.6	105.6	84.8	73	73	77	81	87	112	112	108	1.5	1.5	1.02	1
78.5	108.5	84.5	73	73	77	81	87	112	112	110	1.5	1.5	1.21	1.01
79.6	105.6	84.8	73	73	77	81	87	112	112	108	1.5	1.5	1.4	1.37
78.5	108.5	84.5	73	73	77	81	87	112	112	110	1.5	1.5	1.6	1.44
83.5	121.5	91	76	76	81	85	93	129	129	125	2	2	2.23	2.18
82.5	124.5	91	76	76	81	85	93	129	129	127	2	2	2.54	2.2
83.5	121.5	91	76	76	81	85	93	129	129	125	2	2	3.27	3.2
82.5	124.5	91	76	76	81	85	93	129	129	127	2	2	3.48	3.25
89.3	135.3	98.5	76	76	88	91	100	149	149	137	2	2	3.6	3.5
80	100	84	75	76.5	78	82	85	103.5	105	101	1	1	0.699	0.689
84.5	110.5	89.6	78	78	82	86	92	117	117	114	1.5	1.5	1.12	1.1
83.5	113.5	89.5	78	78	82	86	92	117	117	115	1.5	1.5	1.3	1.13
84.5	110.5	89.6	78	78	82	86	92	117	117	114	1.5	1.5	1.47	1.44
83.5	113.5	89.5	78	78	82	86	92	117	117	115	1.5	1.5	1.7	1.52
90	130	98	81	81	87	92	100	139	139	134	2	2	2.71	2.65
89	133	98	81	81	87	92	100	139	139	136	2	2	3.1	2.75
90	130	98	81	81	87	92	100	139	139	134	2	2	3.98	3.9
89	133	98	81	81	87	92	100	139	139	136	2	2	4.25	3.95
100	152	110.5	83	83	99	102	112	167	167	153	2.5	2.5	5.24	5.1
85	105	89	80	81.5	83	87	90	108.5	110	106	1	1	0.738	0.727
88.5	116.5	94	83	83	87	90	96	122	122	120	1.5	1.5	1.23	1.21
88.5	118.5	94.5	83	83	87	90	96	122	122	120	1.5	1.5	1.41	1.28
88.5	116.5	94	83	83	87	90	96	122	122	120	1.5	1.5	1.55	1.52
88.5	118.5	94.5	83	83	87	90	96	122	122	120	1.5	1.5	1.79	1.61
95.5	139.5	104.2	86	86	93	97	106	149	149	143	2	2	3.28	3.21
95	143	104.6	86	86	93	97	106	149	149	146	2	2	3.74	3.28
95.5	139.5	104.2	86	86	93	97	106	149	149	143	2	2	4.87	4.77
95	143	104.6	86	86	93	97	106	149	149	—	2	2	5.25	4.85
104.5	160.5	116	88	88	103	107	118	177	177	162	2.5	2.5	6.22	6.06

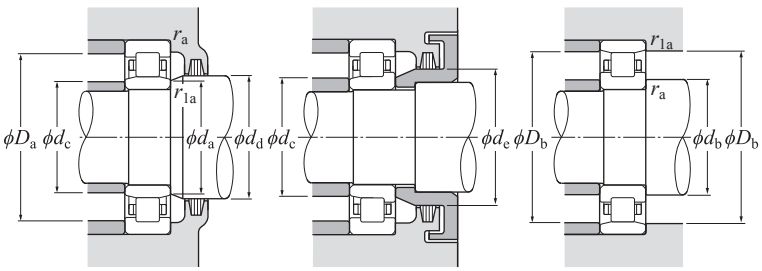
5) Does not apply to the sides of the outer ring rib of NF type bearings.



d 80–95 mm

Boundary dimensions mm					Basic load rating dynamic kN	static kN	Fatigue load limit kN	Allowable speed 2) min^{-1} Grease lubrication	Oil lubrication	Bearing number 3) 4) NU type	NJ type	NUP type	N type	NF type
d	D	B	$r_{s\,min}$ 1)	$r_{1s\,min}$ 1)	C_r	C_{0r}	C_u							
80	125	22	1.1	1	80.0	90.5	11.0	5 700	6 700	NU1016	NJ	NUP	N	—
	140	26	2	2	118	122	14.5	4 800	5 700	**NU216	NJ	NUP	N	NF
	140	26	2	2	165	167	19.7	4 400	6 100	*NU216EA	NJ	NUP	N	NF
	140	33	2	2	163	186	22.0	4 400	5 100	**NU2216	NJ	NUP	N	—
	140	33	2	2	220	243	28.7	3 900	5 500	*NU2216EA	NJ	NUP	N	NF
	170	39	2.1	2.1	211	207	23.7	4 100	4 800	NU316	NJ	NUP	N	NF
	170	39	2.1	2.1	284	282	32.0	3 700	4 400	NU316E	NJ	NUP	N	NF
	170	58	2.1	2.1	305	330	38.0	3 600	4 200	NU2316	NJ	NUP	N	—
	170	58	2.1	2.1	395	430	49.0	3 300	3 900	NU2316E	NJ	NUP	N	NF
	200	48	3	3	330	315	34.5	3 000	3 500	NU416	NJ	NUP	N	NF
85	130	22	1.1	1	82.5	95.5	11.4	5 400	6 300	NU1017	NJ	NUP	N	—
	150	28	2	2	134	140	16.3	4 500	5 300	**NU217	NJ	NUP	N	NF
	150	28	2	2	198	199	23.0	4 100	5 800	*NU217EA	NJ	NUP	N	NF
	150	36	2	2	188	218	25.3	4 100	4 800	**NU2217	NJ	NUP	N	—
	150	36	2	2	257	279	32.5	3 700	5 200	*NU2217EA	NJ	NUP	N	NF
	180	41	3	3	235	228	25.6	3 900	4 600	NU317	NJ	NUP	N	NF
	180	41	3	3	325	330	37.0	3 500	4 100	NU317E	NJ	NUP	—	—
	180	60	3	3	350	380	43.0	3 400	4 000	NU2317	NJ	NUP	N	—
	180	60	3	3	435	485	54.0	3 100	3 700	NU2317E	NJ	NUP	—	—
90	140	24	1.5	1.1	98.0	114	13.4	5 100	5 900	NU1018	NJ	NUP	N	—
	160	30	2	2	169	178	20.3	4 300	5 000	**NU218	NJ	NUP	N	NF
	160	30	2	2	215	217	24.7	3 900	5 500	*NU218EA	NJ	NUP	N	NF
	160	40	2	2	219	248	28.3	3 900	4 600	**NU2218	NJ	NUP	N	—
	160	40	2	2	286	315	35.5	3 500	4 900	*NU2218EA	NJ	NUP	N	NF
	190	43	3	3	266	265	29.3	3 700	4 300	NU318	NJ	NUP	N	NF
	190	43	3	3	350	355	39.0	3 300	3 900	NU318E	NJ	NUP	—	—
	190	64	3	3	360	395	43.5	3 200	3 800	NU2318	NJ	NUP	N	—
	190	64	3	3	485	535	58.5	2 900	3 400	NU2318E	NJ	NUP	—	—
95	145	24	1.5	1.1	101	120	13.9	4 800	5 600	NU1019	NJ	NUP	N	—
	170	32	2.1	2.1	184	195	21.8	4 000	4 700	**NU219	NJ	NUP	N	NF
	170	32	2.1	2.1	260	265	29.6	3 600	5 200	*NU219EA	NJ	NUP	N	NF
	170	43	2.1	2.1	256	298	33.5	3 600	4 300	NU2219	NJ	NUP	N	—
	170	43	2.1	2.1	315	370	41.5	3 300	3 800	NU2219E	NJ	NUP	N	NF
	200	45	3	3	287	289	31.5	3 400	4 000	NU319	NJ	NUP	N	NF
	200	45	3	3	370	385	42.0	3 100	3 600	NU319E	NJ	NUP	—	—

1) Smallest allowable dimension for chamfer dimension r or r_1.
2) This value is for machined cages; when pressed cages are used, 80 % of this value is acceptable.
3) Bearing numbers marked "*" designate ULTAGE™ series bearings.
4) Bearing marked "**" are going to be integrated with ULTAGE™ series.

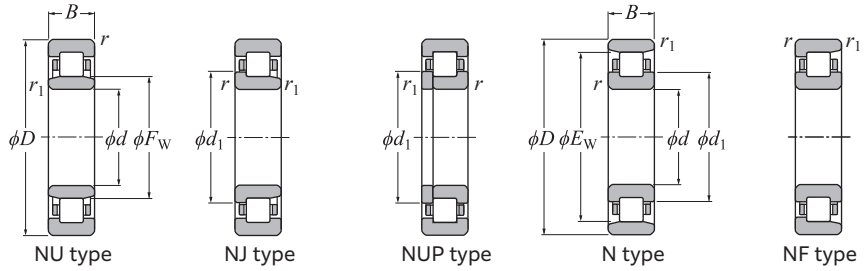


Dynamic equivalent radial load
$P_r = F_r$

Static equivalent radial load
$P_{0r} = F_r$

Dimension mm			Installation-related dimensions mm								Mass kg	
F_w	E_w	d_1	d_a Min.	d_b Min.	d_c Max.	d_d Min.	d_e Min.	D_a Max.	D_b Max.	D_b Min.5)	r_{as} Max.	r_{las} Max.	NU type (approx.)	N type (approx.)
91.5	113.5	95.9	85	86.5	90	94	97	118.5	120	114.5	1	1	0.98	0.965
95.3	125.3	101.2	89	89	94	97	104	131	131	128	2	2	1.5	1.47
95.3	127.3	101.7	89	89	94	97	104	131	131	128.5	2	2	1.67	1.56
95.3	125.3	101.2	89	89	94	97	104	131	131	128	2	2	1.93	1.89
95.3	127.3	101.7	89	89	94	97	104	131	131	128.5	2	2	2.12	2.02
103	147	111.8	91	91	99	105	114	159	159	151	2	2	3.86	3.77
101	151	111	91	91	99	105	114	159	159	154	2	2	4.22	4.12
103	147	111.8	91	91	99	105	114	159	159	151	2	2	5.79	5.67
101	151	111	91	91	99	105	114	159	159	154	2	2	6.25	5.78
110	170	122	93	93	109	112	124	187	187	172	2.5	2.5	7.32	7.14
96.5	118.5	100.9	90	91.5	95	99	102	123.5	125	119.5	1	1	1.03	1.01
101.8	133.8	108.2	94	94	99	104	110	141	141	137	2	2	1.87	1.83
100.5	136.5	107.7	94	94	99	104	110	141	141	138	2	2	2.11	1.93
101.8	133.8	108.2	94	94	99	104	110	141	141	137	2	2	2.44	2.39
100.5	136.5	107.7	94	94	99	104	110	141	141	138	2	2	2.68	2.52
108	156	117.5	98	98	106	110	119	167	167	160	2.5	2.5	4.54	4.44
108	—	118.4	98	—	106	110	119	167	—	—	2.5	2.5	4.81	—
108	156	117.5	98	98	106	110	119	167	167	160	2.5	2.5	6.7	6.57
108	—	118.4	98	—	106	110	119	167	—	—	2.5	2.5	7.16	—
103	127	107.8	96.5	98	101	106	109	132	133.5	129	1.5	1	1.33	1.31
107	143	114.2	99	99	105	109	116	151	151	146	2	2	2.3	2.25
107	145	114.6	99	99	105	109	116	151	151	147	2	2	2.44	2.37
107	143	114.2	99	99	105	109	116	151	151	146	2	2	3.1	3.04
107	145	114.6	99	99	105	109	116	151	151	147	2	2	3.33	3.2
115	165	125	103	103	111	117	127	177	177	169	2.5	2.5	5.3	5.18
113.5	—	124.7	103	—	111	117	127	177	—	—	2.5	2.5	5.72	—
115	165	125	103	103	111	117	127	177	177	169	2.5	2.5	7.95	7.79
113.5	—	124.7	103	—	111	117	127	177	—	—	2.5	2.5	8.56	—
108	132	112.8	101.5	103	106	111	114	137	138.5	134	1.5	1	1.4	1.38
113.5	151.5	121	106	106	111	116	123	159	159	155	2	2	2.78	2.72
112.5	154.5	121	106	106	111	116	123	159	159	156.5	2	2	3.02	2.85
113.5	151.5	121	106	106	111	116	123	159	159	155	2	2	3.79	3.71
112.5	154.5	121	106	106	111	116	123	159	159	156.5	2	2	4.14	3.84
121.5	173.5	132	108	108	119	124	134	187	187	178	2.5	2.5	6.13	5.99
121.5	—	132.7	108	—	119	124	134	187	—	—	2.5	2.5	6.62	—

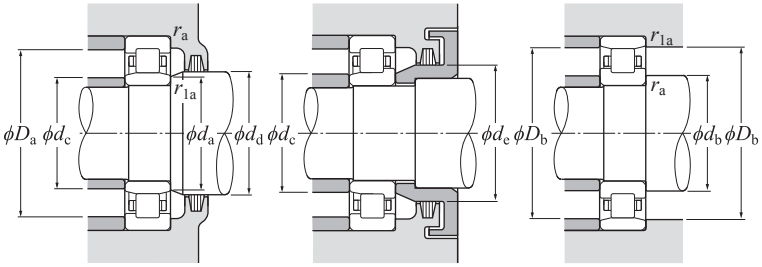
5) Does not apply to the sides of the outer ring rib of NF type bearings.



d 95–130 mm

Boundary dimensions mm					Basic load rating dynamic kN	static kN	Fatigue load limit kN	Allowable speed 2) min^{-1} Grease lubrication	Allowable speed 2) min^{-1} Oil lubrication	Bearing number NU type	NJ type	NUP type	N type	NF type
d	*D*	*B*	$r_{s\,min}$ 1)	$r_{1s\,min}$ 1)	C_r	C_{0r}	C_u							
95	200	67	3	3	410	460	50.0	3 000	3 500	**NU2319**	**NJ**	**NUP**	**N**	—
	200	67	3	3	510	585	63.0	2 700	3 200	**NU2319E**	**NJ**	**NUP**	—	—
	150	24	1.5	1.1	103	126	14.4	4 600	5 400	**NU1020**	**NJ**	**NUP**	**N**	—
	180	34	2.1	2.1	203	217	23.9	3 800	4 500	**NU220**	**NJ**	**NUP**	**N**	**NF**
	180	34	2.1	2.1	277	305	33.5	3 500	4 100	**NU220E**	**NJ**	**NUP**	—	—
	180	46	2.1	2.1	286	340	37.5	3 500	4 100	**NU2220**	**NJ**	**NUP**	**N**	—
100	180	46	2.1	2.1	370	445	49.0	3 100	3 600	**NU2220E**	**NJ**	**NUP**	—	—
	215	47	3	3	330	335	36.0	3 300	3 800	**NU320**	**NJ**	**NUP**	**N**	**NF**
	215	47	3	3	420	425	45.0	2 900	3 500	**NU320E**	**NJ**	**NUP**	—	—
	215	73	3	3	455	505	54.0	2 900	3 400	**NU2320**	**NJ**	**NUP**	**N**	—
	215	73	3	3	630	715	76.0	2 600	3 100	**NU2320E**	**NJ**	**NUP**	—	—
	160	26	2	1.1	117	142	16.0	4 300	5 100	**NU1021**	**NJ**	**NUP**	**N**	—
105	190	36	2.1	2.1	223	241	26.1	3 600	4 300	**NU221**	**NJ**	**NUP**	**N**	**NF**
	225	49	3	3	355	360	37.5	3 100	3 700	**NU321**	**NJ**	**NUP**	**N**	**NF**
	170	28	2	1.1	146	174	19.2	4 100	4 800	**NU1022**	**NJ**	**NUP**	**N**	—
	200	38	2.1	2.1	266	290	31.0	3 400	4 000	**NU222**	**NJ**	**NUP**	**N**	**NF**
	200	38	2.1	2.1	325	365	39.0	3 100	3 700	**NU222E**	**NJ**	**NUP**	—	—
	200	53	2.1	2.1	350	415	44.0	3 100	3 700	**NU2222**	**NJ**	**NUP**	**N**	—
110	200	53	2.1	2.1	425	515	55.0	2 800	3 300	**NU2222E**	**NJ**	**NUP**	—	—
	240	50	3	3	395	400	41.5	3 000	3 500	**NU322**	**NJ**	**NUP**	**N**	**NF**
	240	50	3	3	500	525	54.0	2 700	3 100	**NU322E**	**NJ**	**NUP**	—	—
	240	80	3	3	670	790	81.5	2 600	3 100	**NU2322**	**NJ**	**NUP**	**N**	—
	240	80	3	3	750	880	90.5	2 400	2 800	**NU2322E**	**NJ**	**NUP**	—	—
	180	28	2	1.1	154	191	20.6	3 800	4 400	**NU1024**	**NJ**	**NUP**	**N**	—
	215	40	2.1	2.1	288	320	33.5	3 200	3 700	**NU224**	**NJ**	**NUP**	**N**	**NF**
	215	40	2.1	2.1	370	420	44.0	2 900	3 400	**NU224E**	**NJ**	**NUP**	—	—
	215	58	2.1	2.1	385	460	48.0	2 900	3 400	**NU2224**	**NJ**	**NUP**	**N**	—
120	215	58	2.1	2.1	500	620	64.5	2 600	3 000	**NU2224E**	**NJ**	**NUP**	—	—
	260	55	3	3	500	510	51.0	2 700	3 200	**NU324**	**NJ**	**NUP**	**N**	**NF**
	260	55	3	3	585	610	61.0	2 400	2 800	**NU324E**	**NJ**	**NUP**	—	—
	260	86	3	3	785	920	92.5	2 400	2 800	**NU2324**	**NJ**	**NUP**	**N**	—
	260	86	3	3	880	1 030	103	2 200	2 500	**NU2324E**	**NJ**	**NUP**	—	—
130	200	33	2	1.1	191	238	24.9	3 400	4 000	**NU1026**	**NJ**	**NUP**	**N**	—

1) Smallest allowable dimension for chamfer dimension *r* or r_1.
2) This value is for machined cages; when pressed cages are used, 80 % of this value is acceptable.

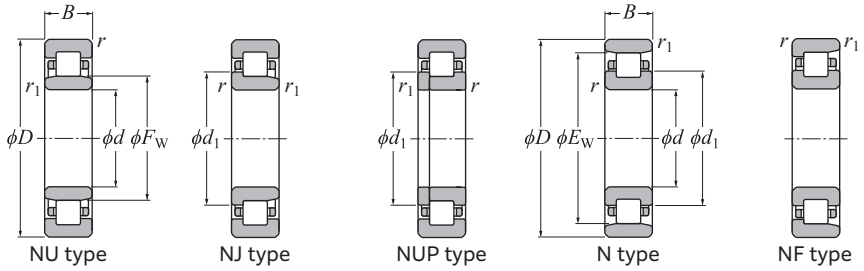


Dynamic equivalent radial load
$P_r = F_r$

Static equivalent radial load
$P_{0r} = F_r$

Dimension mm			Installation-related dimensions mm									Mass kg	
F_w	E_w	d_1	d_a Min.	d_b Min.	d_c Max.	d_d Min.	d_e Min.	D_a Max.	D_b Max.	D_b Min.3)	r_{as} Max.	r_{las} Max.	**NU** type (approx.)	**N** type (approx.)
121.5	173.5	132	108	108	119	124	134	187	187	178	2.5	2.5	9.2	9.02
121.5	—	132.7	108	—	119	124	134	187	—	—	2.5	2.5	9.8	—
113	137	117.8	106.5	108	111	116	119	142	143.5	139	1.5	1	1.45	1.43
120	160	128	111	111	117	122	130	169	169	164	2	2	3.33	3.26
119	—	128	111	—	117	122	130	169	—	—	2	2	3.66	—
120	160	128	111	111	117	122	130	169	169	164	2	2	4.57	4.48
119	—	128	111	—	117	122	130	169	—	—	2	2	5.01	—
129.5	185.5	140.5	113	113	125	132	143	202	202	190	2.5	2.5	7.49	7.32
127.5	—	140.3	113	—	125	132	143	202	—	—	2.5	2.5	8.57	—
129.5	185.5	140.5	113	113	125	132	143	202	202	190	2.5	2.5	11.7	11.5
127.5	—	140.3	113	—	125	132	143	202	—	—	2.5	2.5	12.8	—
119.5	145.5	124.7	111.5	114	118	122	126	151	153.5	147.5	2	1	1.84	1.81
126.8	168.8	135	116	116	124	129	137	179	179	173	2	2	3.95	3.87
135	195	147	118	118	132	137	149	212	212	199	2.5	2.5	8.53	8.33
125	155	131	116.5	119	124	128	132	161	163.5	157	2	1	2.33	2.3
132.5	178.5	141.5	121	121	130	135	144	189	189	182	2	2	4.63	4.54
132.5	—	142.1	121	—	130	135	144	189	—	—	2	2	4.27	—
132.5	178.5	141.5	121	121	130	135	144	189	189	182	2	2	6.56	6.43
132.5	—	142.1	121	—	130	135	144	189	—	—	2	2	7.4	—
143	207	155.5	123	123	140	145	158	227	227	211	2.5	2.5	10	9.77
143	—	156.6	123	—	140	145	158	227	—	—	2.5	2.5	11.1	11.4
143	207	155.5	123	123	140	145	158	227	227	211	2.5	2.5	17.1	16.8
143	—	156.6	123	—	140	145	158	227	—	—	2.5	2.5	19.4	—
135	165	141	126.5	129	134	138	142	171	173.5	167	2	1	2.44	2.4
143.5	191.5	153	131	131	141	146	156	204	204	196	2	2	5.57	5.46
143.5	—	153.9	131	—	141	146	156	204	—	—	2	2	5.97	—
143.5	191.5	153	131	131	141	146	156	204	204	196	2	2	8.19	8.03
143.5	—	153.9	131	—	141	146	156	204	—	—	2	2	9.18	—
154	226	168.5	133	133	151	156	171	247	247	230	2.5	2.5	12.8	12.5
154	—	169.2	133	—	151	156	171	247	—	—	2.5	2.5	13.9	—
154	226	168.5	133	133	151	156	171	247	247	230	2.5	2.5	21.5	21.1
154	—	169.2	133	—	151	156	171	247	—	—	2.5	2.5	26.1	—
148	182	154.8	136.5	139	146	151	156	191	193.5	184	2	1	3.69	3.63

3) Does not apply to the sides of the outer ring rib of **NF** type bearings.

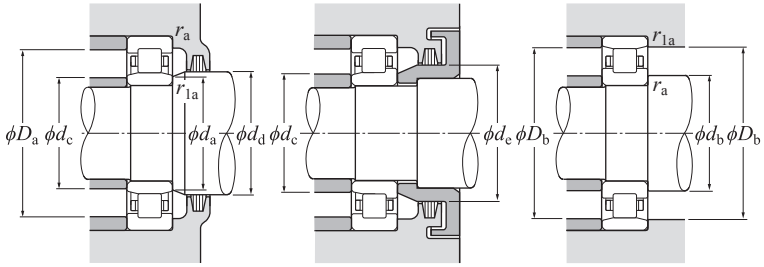


NU type NJ type NUP type N type NF type

d 130–160 mm

Boundary dimensions mm					Basic load rating dynamic kN	static kN	Fatigue load limit kN	Allowable speed[2] min^{-1} Grease lubrication	Oil lubrication	Bearing number NU type	NJ type	NUP type	N type	NF type
d	*D*	*B*	$r_{s\,min}$[1]	$r_{1s\,min}$[1]	C_r	C_{0r}	C_u							
130	230	40	3	3	300	340	35.0	2 900	3 400	**NU226**	NJ	NUP	N	NF
	230	40	3	3	405	455	46.0	2 600	3 100	**NU226E**	NJ	NUP	—	—
	230	64	3	3	420	530	54.0	2 600	3 100	**NU2226**	NJ	NUP	N	—
	230	64	3	3	590	735	75.0	2 300	2 700	**NU2226E**	NJ	NUP	—	—
	280	58	4	4	620	665	65.5	2 500	2 900	**NU326**	NJ	NUP	N	NF
	280	58	4	4	685	735	72.0	2 200	2 600	**NU326E**	NJ	NUP	—	—
	280	93	4	4	930	1 130	111	2 200	2 600	**NU2326**	NJ	NUP	N	—
	280	93	4	4	1 020	1 230	121	2 000	2 300	**NU2326E**	NJ	NUP	—	—
140	210	33	2	1.1	195	250	25.7	3 200	3 800	**NU1028**	NJ	NUP	N	—
	250	42	3	3	345	400	39.5	2 700	3 100	**NU228**	NJ	NUP	N	NF
	250	42	3	3	435	515	51.0	2 400	2 800	**NU228E**	NJ	NUP	—	—
	250	68	3	3	495	635	63.5	2 400	2 800	**NU2228**	NJ	NUP	N	—
	250	68	3	3	635	835	83.0	2 100	2 500	**NU2228E**	NJ	NUP	—	—
	300	62	4	4	685	745	72.0	2 300	2 700	**NU328**	NJ	NUP	N	NF
	300	62	4	4	735	795	76.5	2 100	2 400	**NU328E**	NJ	NUP	—	—
	300	102	4	4	1 020	1 250	120	2 000	2 300	**NU2328**	NJ	NUP	N	—
	300	102	4	4	1 130	1 380	133	1 800	2 100	**NU2328E**	NJ	NUP	—	—
150	225	35	2.1	1.5	224	294	29.6	3 000	3 500	**NU1030**	NJ	NUP	N	—
	270	45	3	3	380	435	42.5	2 500	2 900	**NU230**	NJ	NUP	N	NF
	270	45	3	3	495	595	58.0	2 200	2 600	**NU230E**	NJ	NUP	—	—
	270	73	3	3	555	710	69.5	2 200	2 600	**NU2230**	NJ	NUP	N	—
	270	73	3	3	735	980	95.5	2 000	2 400	**NU2230E**	NJ	NUP	—	—
	320	65	4	4	735	805	76.0	2 100	2 500	**NU330**	NJ	NUP	N	NF
	320	65	4	4	840	920	86.5	1 900	2 300	**NU330E**	NJ	NUP	—	—
	320	108	4	4	1 130	1 400	132	1 900	2 200	**NU2330**	NJ	NUP	N	—
	320	108	4	4	1 290	1 600	150	1 700	2 000	**NU2330E**	NJ	NUP	—	—
160	240	38	2.1	1.5	263	340	34.0	2 800	3 300	**NU1032**	NJ	NUP	N	—
	290	48	3	3	475	570	54.5	2 300	2 700	**NU232**	NJ	NUP	N	NF
	290	48	3	3	555	665	63.5	2 100	2 400	**NU232E**	NJ	NUP	—	—
	290	80	3	3	700	940	90.0	2 100	2 400	**NU2232**	NJ	NUP	N	—
	290	80	3	3	895	1 190	114	1 900	2 200	**NU2232E**	NJ	NUP	—	—
	340	68	4	4	775	875	81.0	2 000	2 300	**NU332**	NJ	NUP	N	NF
	340	68	4	4	950	1 050	97.5	1 800	2 100	**NU332E**	NJ	NUP	—	—
	340	114	4	4	1 190	1 520	141	1 700	2 000	**NU2332**	NJ	NUP	N	—
	340	114	4	4	1 460	1 820	168	1 600	1 900	**NU2332E**	NJ	NUP	—	—

1) Smallest allowable dimension for chamfer dimension *r* or r_1.
2) This value is for machined cages; when pressed cages are used, 80 % of this value is acceptable.

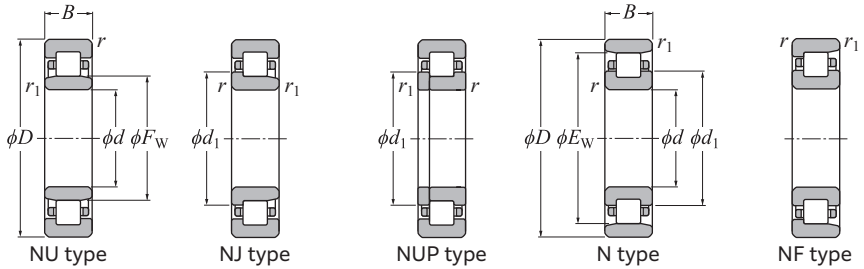


Dynamic equivalent radial load
$P_r = F_r$

Static equivalent radial load
$P_{0r} = F_r$

Dimension mm			Installation-related dimensions mm									Mass kg	
F_w	E_w	d_1	d_a Min.	d_b Min.	d_c Max.	d_d Min.	d_e Min.	D_a Max.	D_b Max.	D_b Min.[3]	r_{as} Max.	r_{1as} Max.	NU type (approx.)	N type (approx.)
156	204	165.5	143	143	151	158	168	217	217	208	2.5	2.5	6.3	6.17
153.5	—	164.7	143	—	151	158	168	217	—	—	2.5	2.5	6.9	—
156	204	165.5	143	143	151	158	168	217	217	208	2.5	2.5	10.2	10
153.5	—	164.7	143	—	151	158	168	217	—	—	2.5	2.5	11.8	—
167	243	182	146	146	164	169	184	264	264	247	3	3	17.4	17
167	—	183	146	—	164	169	184	264	—	—	3	3	19.4	—
167	243	182	146	146	164	169	184	264	264	247	3	3	26.9	26.4
167	—	183	146	—	164	169	184	264	—	—	3	3	30.9	—
158	192	164.8	146.5	149	156	161	166	201	203.5	194	2	1	4.05	3.98
169	221	179.5	153	153	166	171	182	237	237	225	2.5	2.5	7.88	7.72
169	—	180.2	153	—	166	171	182	237	—	—	2.5	2.5	8.73	—
169	221	179.5	153	153	166	171	182	237	237	225	2.5	2.5	12.9	12.6
169	—	180.2	153	—	166	171	182	237	—	—	2.5	2.5	15.8	—
180	260	196	156	156	176	182	198	284	284	265	3	3	21.2	20.7
180	—	196.8	156	—	176	182	198	284	—	—	3	3	23.2	—
180	260	196	156	156	176	182	198	284	284	265	3	3	33.8	33.1
180	—	196.8	156	—	176	182	198	284	—	—	3	3	38.7	—
169.5	205.5	176.7	158	161	167	173	178	214	217	207.5	2	1.5	4.77	4.7
182	238	193	163	163	179	184	196	257	257	242	2.5	2.5	9.92	9.72
182	—	194	163	—	179	184	196	257	—	—	2.5	2.5	11	—
182	238	193	163	163	179	184	196	257	257	242	2.5	2.5	16.3	16
182	—	194	163	—	179	184	196	257	—	—	2.5	2.5	19.7	—
193	277	210	166	166	190	195	213	304	304	282	3	3	25.3	24.7
193	—	211	166	—	190	195	213	304	—	—	3	3	28.4	—
193	277	210	166	166	190	195	213	304	304	282	3	3	40.6	39.8
193	—	211	166	—	190	195	213	304	—	—	3	3	47.2	—
180	220	188	168	171	178	184	189	229	232	222	2	1.5	5.9	5.81
195	255	207	173	173	192	197	210	277	277	259	2.5	2.5	13.7	13.4
195	—	207.8	173	—	192	197	210	277	—	—	2.5	2.5	15.6	—
195	255	207	173	173	192	197	210	277	277	259	2.5	2.5	22	21.6
193	—	206.6	173	—	192	197	210	277	—	—	2.5	2.5	25.1	—
208	292	225	176	176	200	211	228	324	324	297	3	3	31.3	30.6
204	—	223.2	176	—	200	211	228	324	—	—	3	3	34	—
208	292	225	176	176	200	211	228	324	324	297	3	3	50.5	49.5
204	—	223.2	176	—	200	211	228	324	—	—	3	3	56	—

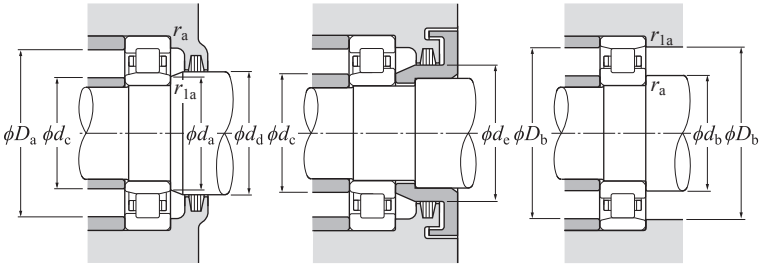
3) Does not apply to the sides of the outer ring rib of **NF** type bearings.



d 170–220 mm

Boundary dimensions mm					Basic load rating kN		Fatigue load limit kN	Allowable speed 2) min^{-1}		Bearing number				
d	*D*	*B*	$r_{s\,min}$ 1)	$r_{1s\,min}$ 1)	dynamic C_r	static C_{0r}	C_u	Grease lubrication	Oil lubrication	NU type	NJ type	NUP type	N type	NF type
	260	42	2.1	2.1	310	400	38.5	2 600	3 000	**NU1034**	**NJ**	**NUP**	**N**	—
	310	52	4	4	530	635	59.5	2 200	2 500	**NU234**	**NJ**	**NUP**	**N**	**NF**
	310	52	4	4	670	800	75.0	2 000	2 300	**NU234E**	**NJ**	**NUP**	—	—
170	310	86	4	4	795	1 080	101	2 000	2 300	**NU2234**	**NJ**	**NUP**	**N**	—
	310	86	4	4	1 070	1 410	132	1 800	2 100	**NU2234E**	**NJ**	**NUP**	—	—
	360	72	4	4	885	1 010	92.0	1 800	2 200	**NU334**	**NJ**	**NUP**	**N**	**NF**
	360	120	4	4	1 360	1 750	159	1 600	1 900	**NU2334**	**NJ**	**NUP**	**N**	—
	280	46	2.1	2.1	380	485	46.5	2 400	2 900	**NU1036**	**NJ**	**NUP**	**N**	—
	320	52	4	4	550	675	62.5	2 000	2 400	**NU236**	**NJ**	**NUP**	**N**	**NF**
	320	52	4	4	695	850	78.5	1 800	2 200	**NU236E**	**NJ**	**NUP**	—	—
180	320	86	4	4	825	1 140	106	1 800	2 200	**NU2236**	**NJ**	**NUP**	**N**	—
	320	86	4	4	1 120	1 510	139	1 600	1 900	**NU2236E**	**NJ**	**NUP**	—	—
	380	75	4	4	1 000	1 150	103	1 700	2 000	**NU336**	**NJ**	**NUP**	**N**	**NF**
	380	126	4	4	1 530	1 990	179	1 500	1 800	**NU2336**	**NJ**	**NUP**	**N**	—
	290	46	2.1	2.1	390	510	48.0	2 300	2 700	**NU1038**	**NJ**	**NUP**	**N**	—
	340	55	4	4	615	770	70.0	1 900	2 200	**NU238**	**NJ**	**NUP**	**N**	**NF**
	340	55	4	4	770	955	86.5	1 700	2 000	**NU238E**	**NJ**	**NUP**	—	—
190	340	92	4	4	920	1 290	117	1 700	2 000	**NU2238**	**NJ**	**NUP**	**N**	—
	340	92	4	4	1 220	1 670	152	1 500	1 800	**NU2238E**	**NJ**	**NUP**	—	—
	400	78	5	5	1 080	1 260	111	1 600	1 900	**NU338**	**NJ**	**NUP**	**N**	**NF**
	400	132	5	5	1 680	2 220	196	1 400	1 700	**NU2338**	**NJ**	**NUP**	**N**	—
	310	51	2.1	2.1	430	580	53.5	2 200	2 600	**NU1040**	**NJ**	**NUP**	**N**	—
	360	58	4	4	690	865	77.5	1 800	2 100	**NU240**	**NJ**	**NUP**	**N**	**NF**
	360	58	4	4	850	1 060	95.0	1 600	1 900	**NU240E**	**NJ**	**NUP**	—	—
200	360	98	4	4	1 020	1 440	129	1 600	1 900	**NU2240**	**NJ**	**NUP**	**N**	—
	360	98	4	4	1 350	1 870	167	1 500	1 700	**NU2240E**	**NJ**	**NUP**	—	—
	420	80	5	5	1 080	1 270	111	1 500	1 800	**NU340**	**NJ**	**NUP**	**N**	**NF**
	420	138	5	5	1 680	2 240	195	1 400	1 600	**NU2340**	**NJ**	**NUP**	**N**	—
	340	56	3	3	555	750	67.0	2 000	2 300	**NU1044**	**NJ**	**NUP**	**N**	—
	400	65	4	4	845	1 080	94.0	1 600	1 900	**NU244**	**NJ**	**NUP**	**N**	**NF**
220	400	108	4	4	1 260	1 810	157	1 500	1 700	**NU2244**	**NJ**	**NUP**	**N**	—
	460	88	5	5	1 320	1 570	133	1 400	1 600	**NU344**	**NJ**	**NUP**	**N**	**NF**
	460	145	5	5	1 970	2 620	222	1 200	1 400	**NU2344**	**NJ**	**NUP**	**N**	—

1) Smallest allowable dimension for chamfer dimension *r* or r_1.
2) This value is for machined cages; when pressed cages are used, 80 % of this value is acceptable.

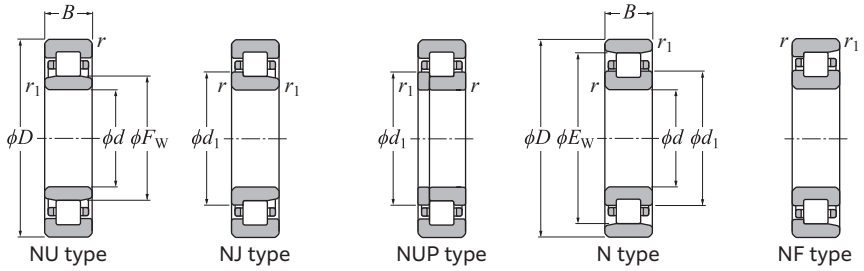


Dynamic equivalent radial load
$P_r = F_r$

Static equivalent radial load
$P_{0r} = F_r$

Dimension mm			Installation-related dimensions mm									Mass kg	
F_w	E_w	d_1	d_a Min.	d_b Min.	d_c Max.	d_d Min.	d_e Min.	D_a Max.	D_b Max.	D_b Min.3)	r_{as} Max.	r_{las} Max.	NU type (approx.)	N type (approx.)
193	237	201.8	181	181	190	197	203	249	249	239	2	2	7.88	7.76
208	272	220.5	186	186	204	211	223	294	294	277	3	3	17	16.7
207	—	221.4	186	—	204	211	223	294	—	—	3	3	19.6	—
208	272	220.5	186	186	204	211	223	294	294	277	3	3	27.2	26.7
205	—	220.2	186	—	204	211	223	294	—	—	3	3	31	—
220	310	238	186	186	216	223	241	344	344	315	3	3	37	36.1
220	310	238	186	186	216	223	241	344	344	315	3	3	59.5	58.3
205	255	215	191	191	203	209	216	269	269	257	2	2	10.3	10.1
218	282	230.5	196	196	214	221	233	304	304	287	3	3	17.7	17.3
217	—	231.4	196	—	214	221	233	304	—	—	3	3	20.4	—
218	282	230.5	196	196	214	221	233	304	304	287	3	3	28.4	27.8
215	—	230.2	196	—	214	221	233	304	—	—	3	3	31.9	—
232	328	252	196	196	227	235	255	364	364	333	3	3	44.2	43.2
232	328	252	196	196	227	235	255	364	364	333	3	3	69.5	68.1
215	265	225	201	201	213	219	226	279	279	267	2	2	10.7	10.5
231	299	244.5	206	206	227	234	247	324	324	304	3	3	21.3	20.8
230	—	245.2	206	—	227	234	247	324	—	—	3	3	24.2	—
231	299	244.5	206	206	227	234	247	324	324	304	3	3	34.4	33.7
228	—	244	206	—	227	234	247	324	—	—	3	3	39.5	—
245	345	265	210	210	240	248	268	380	380	351	4	4	49.4	48.3
245	345	265	210	210	240	248	268	380	380	351	4	4	80.5	78.9
229	281	239.4	211	211	226	233	241	299	299	283	2	2	13.9	13.7
244	316	258	216	216	240	247	261	344	344	321	3	3	25.3	24.8
243	—	259	216	—	240	247	261	344	—	—	3	3	28.1	—
244	316	258	216	216	240	247	261	344	344	321	3	3	41.3	40.5
241	—	257.8	216	—	240	247	261	344	—	—	3	3	47.8	—
260	360	280	220	220	254	263	283	400	400	366	4	4	55.8	54.5
260	360	280	220	220	254	263	283	400	400	366	4	4	92.6	90.7
250	310	262	233	233	248	254	264	327	327	313	2.5	2.5	18.2	17.9
270	350	286	236	236	266	273	289	384	384	355	3	3	37.7	37
270	350	286	236	236	266	273	289	384	384	355	3	3	59	57.8
284	396	307	240	240	279	287	307	440	440	402	4	4	73.4	71.7
284	396	307	240	240	279	287	307	440	440	402	4	4	116	114

3) Does not apply to the sides of the outer ring rib of **NF** type bearings.

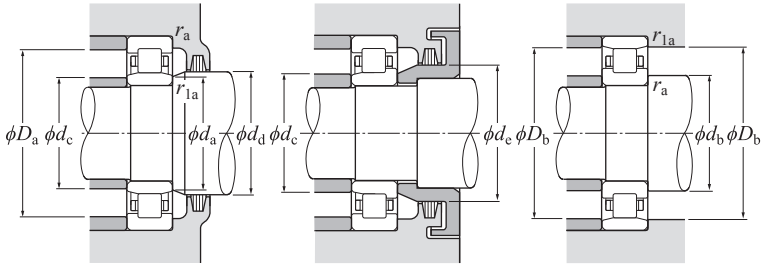


NU type NJ type NUP type N type NF type

d 240–440 mm

Boundary dimensions mm					Basic load rating kN		Fatigue load limit kN	Allowable speed 2) min^{-1}		Bearing number				
d	*D*	*B*	$r_{s\,min}$ 1)	$r_{1s\,min}$ 1)	dynamic C_r	static C_{0r}	C_u	Grease lubrication	Oil lubrication	NU type	NJ type	NUP type	N type	NF type
	360	56	3	3	585	820	72.0	1 800	2 100	**NU1048**	**NJ**	**NUP**	**N**	—
	440	72	4	4	1 040	1 340	113	1 500	1 700	**NU248**	**NJ**	**NUP**	**N**	**NF**
240	440	120	4	4	1 590	2 320	196	1 300	1 600	**NU2248**	**NJ**	**NUP**	**N**	—
	500	95	5	5	1 590	1 950	160	1 300	1 500	**NU348**	**NJ**	**NUP**	**N**	**NF**
	500	155	5	5	2 330	3 200	262	1 100	1 300	**NU2348**	**NJ**	**NUP**	**N**	—
	400	65	4	4	715	1 000	85.0	1 600	1 900	**NU1052**	**NJ**	**NUP**	**N**	—
	480	80	5	5	1 270	1 660	137	1 300	1 600	**NU252**	**NJ**	**NUP**	**N**	**NF**
260	480	130	5	5	1 980	2 930	241	1 200	1 400	**NU2252**	**NJ**	**NUP**	**N**	—
	540	102	6	6	1 790	2 230	180	1 200	1 400	**NU352**	**NJ**	**NUP**	**N**	**NF**
	540	165	6	6	2 600	3 600	289	1 000	1 200	**NU2352**	**NJ**	**NUP**	**N**	—
	420	65	4	4	730	1 050	88.0	1 500	1 800	**NU1056**	**NJ**	**NUP**	**N**	—
	500	80	5	5	1 320	1 760	143	1 200	1 400	**NU256**	**NJ**	**NUP**	**N**	**NF**
280	500	130	5	5	2 050	3 100	252	1 100	1 300	**NU2256**	**NJ**	**NUP**	**N**	—
	580	108	6	6	2 010	2 540	200	1 100	1 200	**NU356**	**NJ**	**NUP**	**N**	**NF**
	580	175	6	6	3 000	4 250	335	920	1 100	**NU2356**	**NJ**	**NUP**	**N**	—
	460	74	4	4	950	1 340	109	1 400	1 600	**NU1060**	**NJ**	**NUP**	**N**	—
300	540	85	5	5	1 560	2 070	164	1 100	1 300	**NU260**	**NJ**	**NUP**	**N**	**NF**
	540	140	5	5	2 420	3 650	290	1 000	1 200	**NU2260**	**NJ**	**NUP**	**N**	—
	480	74	4	4	970	1 410	113	1 300	1 500	**NU1064**	**NJ**	**NUP**	**N**	—
320	580	92	5	5	1 780	2 390	186	1 000	1 200	**NU264**	**NJ**	**NUP**	**N**	**NF**
	580	150	5	5	2 830	4 350	340	950	1 100	**NU2264**	**NJ**	**NUP**	**N**	—
340	520	82	5	5	1 160	1 670	132	1 200	1 400	**NU1068**	**NJ**	**NUP**	**N**	—
360	540	82	5	5	1 190	1 750	136	1 100	1 300	**NU1072**	**NJ**	**NUP**	**N**	—
380	560	82	5	5	1 220	1 840	141	1 100	1 200	**NU1076**	**NJ**	**NUP**	**N**	—
400	600	90	5	5	1 460	2 190	164	990	1 200	**NU1080**	**NJ**	**NUP**	**N**	—
420	620	90	5	5	1 500	2 290	170	950	1 100	**NU1084**	**NJ**	**NUP**	**N**	—
440	650	94	6	6	1 590	2 430	178	900	1 100	**NU1088**	**NJ**	**NUP**	**N**	—

1) Smallest allowable dimension for chamfer dimension *r* or r_1.
2) This value is for machined cages; when pressed cages are used, 80 % of this value is acceptable.

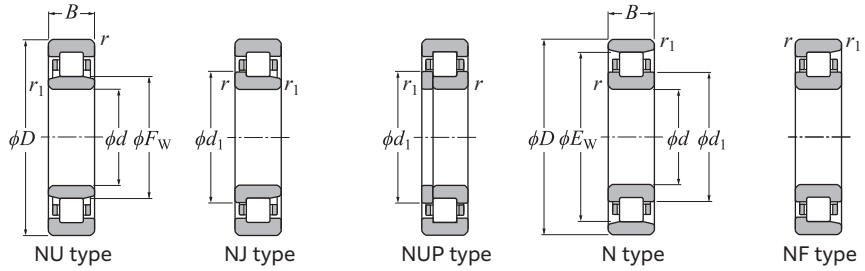


Dynamic equivalent radial load
$P_r = F_r$

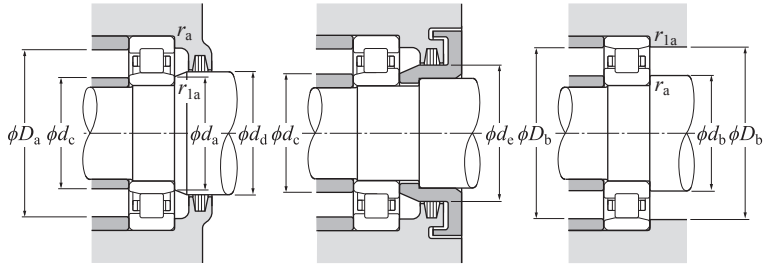
Static equivalent radial load
$P_{0r} = F_r$

Dimension mm			Installation-related dimensions mm									Mass kg	
F_w	E_w	d_1	d_a Min.	d_b Min.	d_c Max.	d_d Min.	d_e Min.	D_a Max.	D_b Max.	D_b Min.3)	r_{as} Max.	r_{las} Max.	NU type (approx.)	N type (approx.)
270	330	282	253	253	268	275	284	347	347	333	2.5	2.5	19.6	19.3
295	385	313	256	256	293	298	316	424	424	390	3	3	50.2	49.2
295	385	313	256	256	293	298	316	424	424	390	3	3	80	78.4
310	430	335	260	260	305	313	333	480	480	436	4	4	93.4	91.3
310	430	335	260	260	305	313	333	480	480	436	4	4	147	144
296	364	309.6	276	276	292	300	312	384	384	367	3	3	29.1	28.7
320	420	340	280	280	318	323	343	460	460	426	4	4	66.9	65.6
320	420	340	280	280	318	323	343	460	460	426	4	4	104	102
336	464	362	284	284	331	339	359	516	516	471	5	5	117	114
336	464	362	284	284	331	339	359	516	516	471	5	5	182	178
316	384	329.6	296	296	312	320	332	404	404	387	3	3	30.9	30.4
340	440	360	300	300	336	343	365	480	480	446	4	4	70.8	69.4
340	440	360	300	300	336	343	365	480	480	446	4	4	109	107
362	498	390	304	304	356	366	386	556	556	505	5	5	142	139
362	498	390	304	304	356	366	386	556	556	505	5	5	222	218
340	420	356	316	316	336	344	358	444	444	423	3	3	43.6	42.9
364	476	387	320	320	361	368	392	520	520	482	4	4	88.2	86.4
364	476	387	320	320	361	368	392	520	520	482	4	4	138	135
360	440	376	336	336	356	364	378	464	464	443	3	3	46	45.3
390	510	415	340	340	386	393	419	560	560	516	4	4	111	109
390	510	415	340	340	386	393	419	560	560	516	4	4	172	168
385	475	403	360	360	381	390	405	500	500	479	4	4	61.8	60.8
405	495	423	380	380	401	410	425	520	520	499	4	4	64.7	63.7
425	515	443	400	400	421	430	445	540	540	519	4	4	67.5	66.5
450	550	470	420	420	446	455	473	580	580	554	4	4	87.6	86.3
470	570	490	440	440	466	475	493	600	600	574	4	4	91	89.6
493	597	513.8	464	464	488	499	517	626	626	602	5	5	105	103

3) Does not apply to the sides of the outer ring rib of **NF** type bearings.



NU type NJ type NUP type N type NF type



Dynamic equivalent radial load
$P_r = F_r$

Static equivalent radial load
$P_{0r} = F_r$

d 460–500 mm

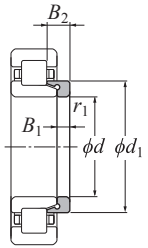
Boundary dimensions mm					Basic load rating kN		Fatigue load limit kN	Allowable speed [2] min^{-1}		Bearing number				
					dynamic	static		Grease lubrication	Oil lubrication					
d	D	B	$r_{s\,min}$ [1]	$r_{1s\,min}$ [1]	C_r	C_{0r}	C_u			NU type	NJ type	NUP type	N type	NF type
460	680	100	6	6	1 710	2 630	191	850	1 000	**NU1092**	**NJ**	**NUP**	**N**	—
480	700	100	6	6	1 750	2 750	197	810	960	**NU1096**	**NJ**	**NUP**	**N**	—
500	720	100	6	6	1 790	2 870	203	770	910	**NU10/500**	**NJ**	**NUP**	**N**	—

Dimension mm			Installation-related dimensions mm										Mass kg	
F_w	E_w	d_1	d_a Min.	d_b Min.	d_c Max.	d_d Min.	d_e Min.	D_a Max.	D_b Max.	D_b Min. [3]	r_{as} Max.	r_{1as} Max.	NU type (approx.)	N type (approx.)
516	624	537.6	484	484	511	522	541	656	656	629	5	5	122	120
536	644	557.6	504	504	531	542	561	676	676	649	5	5	126	124
556	664	577.6	524	524	551	562	581	696	696	669	5	5	130	128

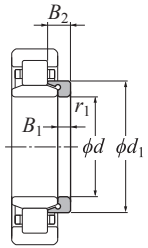
1) Smallest allowable dimension for chamfer dimension r or r_1.
2) This value is for machined cages; when pressed cages are used, 80 % of this value is acceptable.

3) Does not apply to the sides of the outer ring rib of **NF** type bearings.

L type collar ring



NH = NJ + HJ

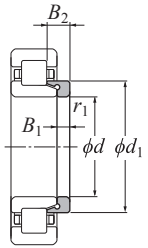


NUJ = NU + HJ

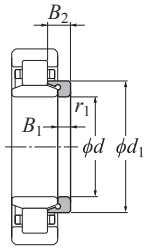
d 20–60 mm

Dimension mm					L type collar ring number	Mass kg
d	d_1	B_1	B_2	$r_{1s\,min}$ [1]		(approx.)
20	29.9	3	6.75	0.6	**HJ204**	0.012
	29.5	3	5.5	0.6	**HJ204E**	0.009
	29.9	3	7.5	0.6	**HJ2204**	0.013
	29.5	3	6.5	0.6	**HJ2204E**	0.01
	31.8	4	7.5	0.6	**HJ304**	0.017
	31.1	4	6.5	0.6	**HJ304E**	0.014
	31.8	4	8.5	0.6	**HJ2304**	0.018
	31.1	4	7.5	0.6	**HJ2304E**	0.015
25	34.8	3	7.25	0.6	**HJ205**	0.015
	34.5	3	6	0.6	**HJ205E**	0.012
	34.8	3	7.5	0.6	**HJ2205**	0.015
	34.5	3	6.5	0.6	**HJ2205E**	0.013
	39	4	8	1.1	**HJ305**	0.025
	38	4	7	1.1	**HJ305E**	0.021
	39	4	9	1.1	**HJ2305**	0.027
	38	4	8	1.1	**HJ2305E**	0.024
	43.6	6	10.5	1.5	**HJ405**	0.057
30	41.7	4	8.25	0.6	**HJ206**	0.025
	41.1	4	7	0.6	**HJ206E**	0.017
	41.7	4	8.5	0.6	**HJ2206**	0.025
	41.1	4	7.5	0.6	**HJ2206E**	0.02
	45.9	5	9.5	1.1	**HJ306**	0.039
	44.9	5	8.5	1.1	**HJ306E**	0.035
	45.9	5	11.5	1.1	**HJ2306**	0.043
	44.9	5	9.5	1.1	**HJ2306E**	0.035
	50.5	7	11.5	1.5	**HJ406**	0.08
35	47.6	4	8	0.6	**HJ207**	0.03
	48	4	7	0.6	**HJ207E**	0.027
	47.6	4	8.5	0.6	**HJ2207**	0.031
	48	4	8.5	0.6	**HJ2207E**	0.031
	50.8	6	11	1.1	**HJ307**	0.056
	51	6	9.5	1.1	**HJ307E**	0.048
	50.8	6	14	1.1	**HJ2307**	0.064
	51	6	11	1.1	**HJ2307E**	0.055
	59	8	13	1.5	**HJ407**	0.12
40	54.2	5	9	1.1	**HJ208**	0.046
	53.9	5	8.5	1.1	**HJ208E**	0.042
	54.2	5	9.5	1.1	**HJ2208**	0.047
	53.9	5	9	1.1	**HJ2208E**	0.045
	58.4	7	12.5	1.5	**HJ308**	0.083
	57.6	7	11	1.5	**HJ308E**	0.07
	58.4	7	14.5	1.5	**HJ2308**	0.09
	57.6	7	12.5	1.5	**HJ2308E**	0.08
	64.8	8	13	2	**HJ408**	0.14
45	59	5	9.5	1.1	∗**HJ209**	0.053
	58.9	5	8.5	1.1	**HJ209E**	0.047
	58.9	5	9	1.1	**HJ2209E**	0.05
	64	7	12.5	1.5	**HJ309**	0.099
	64.5	7	11.5	1.5	**HJ309E**	0.093
	64	7	15	1.5	**HJ2309**	0.109
	64.5	7	13	1.5	**HJ2309E**	0.103
	71.8	8	13.5	2	**HJ409**	0.175
50	64.6	5	10	1.1	**HJ210**	0.063
	63.9	5	9	1.1	∗**HJ210E**	0.055
	64.6	5	9.5	1.1	**HJ2210**	0.061
	71	8	14	2	**HJ310**	0.142
	71.4	8	13	2	**HJ310E**	0.134
	71	8	17	2	**HJ2310**	0.157
	71.4	8	14.5	2	**HJ2310E**	0.15
	78.8	9	14.5	2.1	**HJ410**	0.23
55	70.8	6	11	1.1	∗**HJ211**	0.084
	70.8	6	9.5	1.1	**HJ211E**	0.072
	70.8	6	10	1.1	**HJ2211E**	0.076
	77.2	9	15	2	**HJ311**	0.182
	77.7	9	14	2	**HJ311E**	0.168
	77.2	9	18.5	2	**HJ2311**	0.203
	77.7	9	15.5	2	**HJ2311E**	0.185
	85.2	10	16.5	2.1	**HJ411**	0.29
60	78.4	6	11	1.5	∗**HJ212**	0.108
	77.6	6	10	1.5	∗**HJ212E**	0.094

1) Smallest allowable dimension for chamfer dimension r. Note: 1. This L type collar ring is used with NU type cylindrical roller bearings; in duplex arrangements with NJ or NU type bearing numbers, they become NH type and NUJ type respectively. Refer to page B-98 through page B-101 for bearing dimensions, allowable speed, and mass. 2. "∗" indicates L type collar rings that can also be used with dimension series 22 bearings.



NH = NJ + HJ



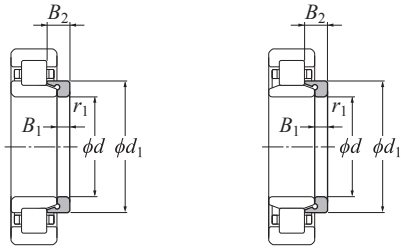
NUJ = NU + HJ

d 60–105 mm

Dimension mm					L type collar ring number	Mass kg
d	d_1	B_1	B_2	$r_{1s\,min}$ [1]		(approx.)
60	84.2	9	15.5	2.1	**HJ312**	0.22
	84.6	9	14.5	2.1	**HJ312E**	0.205
	84.2	9	19	2.1	**HJ2312**	0.245
	84.6	9	16	2.1	**HJ2312E**	0.23
	91.8	10	16.5	2.1	**HJ412**	0.34
65	84.8	6	11	1.5	**HJ213**	0.123
	84.5	6	10	1.5	**HJ213E**	0.111
	84.8	6	11.5	1.5	**HJ2213**	0.126
	84.5	6	10.5	1.5	**HJ2213E**	0.118
	91	10	17	2.1	**HJ313**	0.28
	91	10	15.5	2.1	**HJ313E**	0.25
	91	10	20	2.1	**HJ2313**	0.304
	91	10	18	2.1	**HJ2313E**	0.29
	98.5	11	18	2.1	**HJ413**	0.42
70	89.6	7	12.5	1.5	∗**HJ214**	0.15
	89.5	7	11	1.5	**HJ214E**	0.13
	89.5	7	11.5	1.5	**HJ2214E**	0.138
	98	10	17.5	2.1	**HJ314**	0.33
	98	10	15.5	2.1	**HJ314E**	0.293
	98	10	20.5	2.1	**HJ2314**	0.358
	98	10	18.5	2.1	**HJ2314E**	0.35
	110.5	12	20	3	**HJ414**	0.605
75	94	7	12.5	1.5	∗**HJ215**	0.156
	94.5	7	11	1.5	**HJ215E**	0.141
	94.5	7	11.5	1.5	**HJ2215E**	0.164
	104.2	11	18.5	2.1	**HJ315**	0.4
	104.6	11	16.5	2.1	**HJ315E**	0.35
	104.2	11	21.5	2.1	**HJ2315**	0.432
	104.6	11	19.5	2.1	**HJ2315E**	0.41
	116	13	21.5	3	**HJ415**	0.71
80	101.2	8	13.5	2	∗**HJ216**	0.207
	101.7	8	12.5	2	∗**HJ216E**	0.193
	111.8	11	19.5	2.1	**HJ316**	0.47
	111	11	17	2.1	**HJ316E**	0.405
	111.8	11	23	2.1	**HJ2316**	0.511
80	111	11	20	2.1	**HJ2316E**	0.45
	122	13	22	3	**HJ416**	0.78
85	108.2	8	14	2	∗**HJ217**	0.25
	107.7	8	12.5	2	**HJ217E**	0.21
	107.7	8	13	2	**HJ2217E**	0.216
	117.5	12	20.5	3	**HJ317**	0.56
	118.4	12	18.5	3	**HJ317E**	0.505
	117.5	12	24	3	**HJ2317**	0.606
	118.4	12	22	3	**HJ2317E**	0.55
90	114.2	9	15	2	**HJ218**	0.305
	114.6	9	14	2	**HJ218E**	0.272
	114.2	9	16	2	**HJ2218**	0.315
	114.6	9	15	2	**HJ2218E**	0.308
	125	12	21	3	**HJ318**	0.63
	124.7	12	18.5	3	**HJ318E**	0.548
	125	12	26	3	**HJ2318**	0.704
	124.7	12	22	3	**HJ2318E**	0.69
95	121	9	15.5	2.1	**HJ219**	0.352
	121	9	14	2.1	**HJ219E**	0.304
	121	9	16.5	2.1	**HJ2219**	0.363
	121	9	15.5	2.1	**HJ2219E**	0.335
	132	13	22.5	3	**HJ319**	0.76
	132.7	13	20.5	3	**HJ319E**	0.7
	132	13	26.5	3	**HJ2319**	0.826
	132.7	13	24.5	3	**HJ2319E**	0.8
100	128	10	17	2.1	**HJ220**	0.444
	128	10	15	2.1	**HJ220E**	0.38
	128	10	18	2.1	**HJ2220**	0.456
	128	10	16	2.1	**HJ2220E**	0.385
	140.5	13	22.5	3	**HJ320**	0.895
	140.3	13	20.5	3	**HJ320E**	0.8
	140.5	13	27.5	3	**HJ2320**	0.986
	140.3	13	23.5	3	**HJ2320E**	0.92
105	135	10	17.5	2.1	**HJ221**	0.505

1) Smallest allowable dimension for chamfer dimension r. Note: 1. This L type collar ring is used with NU type cylindrical roller bearings; in duplex arrangements with NJ or NU type bearing numbers, they become NH type and NUJ type respectively. Refer to page B-102 through page B-107 for bearing dimensions, allowable speed, and mass. 2. "∗" indicates L type collar rings that can also be used with dimension series 22 bearings.

L type collar ring



NH = NJ + HJ

NUJ = NU + HJ

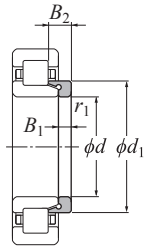
d 105–200 mm

Dimension mm					L type collar ring number	Mass kg
d	d_1	B_1	B_2	$r_{1s\ min}$[1]		(approx.)
105	147	13	22.5	3	**HJ321**	0.97
110	141.5	11	18.5	2.1	**HJ222**	0.615
	142.1	11	17	2.1	**HJ222E**	0.553
	141.5	11	20.5	2.1	**HJ2222**	0.645
	142.1	11	19.5	2.1	**HJ2222E**	0.605
	155.5	14	23	3	**HJ322**	1.17
	156.6	14	22	3	**HJ322E**	1.09
	155.5	14	28	3	**HJ2322**	1.28
	156.6	14	26.5	3	**HJ2322E**	1.25
120	153	11	19	2.1	**HJ224**	0.715
	153.9	11	17	2.1	**HJ224E**	0.634
	153	11	22	2.1	**HJ2224**	0.767
	153.9	11	20	2.1	**HJ2224E**	0.705
	168.5	14	23.5	3	**HJ324**	1.4
	169.2	14	22.5	3	**HJ324E**	1.28
	168.5	14	28	3	**HJ2324**	1.53
	169.2	14	26	3	**HJ2324E**	1.42
130	165.5	11	19	3	**HJ226**	0.84
	164.7	11	17	3	**HJ226E**	0.684
	165.5	11	25	3	**HJ2226**	0.953
	164.7	11	21	3	**HJ2226E**	0.831
	182	14	24	4	**HJ326**	1.62
	183	14	23	4	**HJ326E**	1.53
	182	14	29.5	4	**HJ2326**	1.8
	183	14	28	4	**HJ2326E**	1.75
140	179.5	11	19	3	**HJ228**	1
	180.2	11	18	3	**HJ228E**	0.929
	179.5	11	25	3	**HJ2228**	1.14
	180.2	11	23	3	**HJ2228E**	1.11
	196	15	26	4	**HJ328**	1.93
	196.8	15	25	4	**HJ328E**	1.91
	196	15	33.5	4	**HJ2328**	2.21
	196.8	15	31	4	**HJ2328E**	2.3
150	193	12	20.5	3	**HJ230**	1.24
	194	12	19.5	3	**HJ230E**	1.18
	193	12	26.5	3	**HJ2230**	1.39
	194	12	24.5	3	**HJ2230E**	1.42
150	210	15	26.5	4	**HJ330**	2.37
	211	15	25	4	**HJ330E**	2.25
	210	15	34	4	**HJ2330**	2.69
	211	15	31.5	4	**HJ2330E**	2.6
160	207	12	21	3	**HJ232**	1.48
	207.8	12	20	3	**HJ232E**	1.34
	207	12	28	3	**HJ2232**	1.69
	206.6	12	24.5	3	**HJ2232E**	1.61
	225	15	28	4	**HJ332**	2.75
	223.2	15	25	4	**HJ332E**	2.4
	225	15	37	4	**HJ2332**	3.16
	223.2	15	32	4	**HJ2332E**	2.85
170	220.5	12	22	4	**HJ234**	1.7
	221.4	12	20	4	**HJ234E**	1.51
	220.5	12	29	4	**HJ2234**	1.93
	220.2	12	24	4	**HJ2234E**	1.82
	238	16	29.5	4	**HJ334**	3.25
	238	16	38.5	4	**HJ2334**	3.71
180	230.5	12	22	4	**HJ236**	1.8
	231.4	12	20	4	**HJ236E**	1.7
	230.5	12	29	4	**HJ2236**	2.04
	230.2	12	24	4	**HJ2236E**	1.91
	252	17	30.5	4	**HJ336**	3.85
	252	17	40	4	**HJ2336**	4.42
190	244.5	13	23.5	4	**HJ238**	2.2
	245.2	13	21.5	4	**HJ238E**	1.94
	244.5	13	31.5	4	**HJ2238**	2.52
	244	13	26.5	4	**HJ2238E**	2.38
	265	18	32	5	**HJ338**	4.45
	265	18	41.5	5	**HJ2338**	5.05
200	258	14	25	4	**HJ240**	2.6

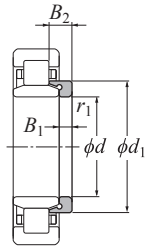
1) Smallest allowable dimension for chamfer dimension r.

Note: This L type collar ring is used with NU type cylindrical roller bearings; in duplex arrangements with NJ or NU type bearing numbers, they become NH type and NUJ type respectively. Refer to page B-106 through page B-111 for bearing dimensions, allowable speed, and mass.

Cylindrical Roller Bearings
NTN



NH = NJ + HJ



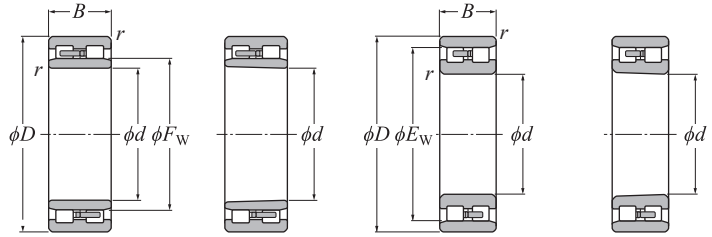
NUJ = NU + HJ

d 200–320 mm

Dimension mm					L type collar ring number	Mass kg
d	d_1	B_1	B_2	$r_{1s\ min}$[1]		(approx.)
200	259	14	23	4	**HJ240E**	2.35
	258	14	34	4	**HJ2240**	2.99
	257.8	14	28	4	**HJ2240E**	2.86
	280	18	33	5	**HJ340**	5
	280	18	44.5	5	**HJ2340**	5.76
220	286	15	27.5	4	**HJ244**	3.55
	307	20	36	5	**HJ344**	7.05
240	313	16	29.5	4	**HJ248**	4.65
	335	22	39.5	5	**HJ348**	8.2
260	340	18	33	5	**HJ252**	6.2
	362	24	43	6	**HJ352**	11.4
280	360	18	33	5	**HJ256**	7.39
	390	26	46	6	**HJ356**	13.9
300	387	20	34.5	5	**HJ260**	9.14
320	415	21	37	5	**HJ264**	11.3

1) Smallest allowable dimension for chamfer dimension r.

Note: This L type collar ring is used with NU type cylindrical roller bearings; in duplex arrangements with NJ or NU type bearing numbers, they become NH type and NUJ type respectively. Refer to page B-110 through page B-113 for bearing dimensions, allowable speed, and mass.



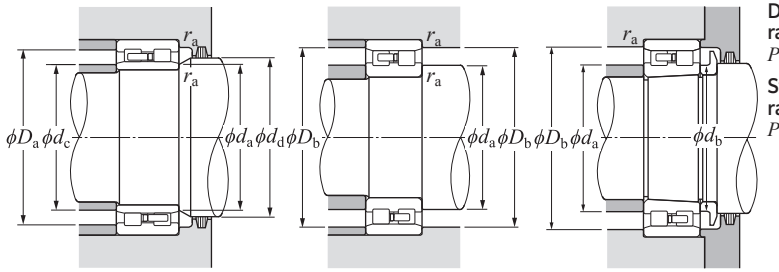
NNU type
Cylindrical bore Tapered bore

NN type
Cylindrical bore Tapered bore

d 25–110 mm

Boundary dimensions mm				Basic load rating dynamic kN	Basic load rating static kN	Fatigue load limit kN	Allowable speed min^{-1}		Bearing number 2) NNU type	
d	D	B	$r_{s\,min}$ 1)	C_r	C_{0r}	C_u	Grease lubrication	Oil lubrication	Cylindrical bore	Tapered bore
25	47	16	0.6	28.6	30.0	3.65	14 000	17 000	—	—
30	55	19	1	34.0	37.0	4.55	12 000	15 000	—	—
35	62	20	1	42.0	47.5	5.80	11 000	13 000	—	—
40	68	21	1	48.0	55.5	6.75	9 700	11 000	—	—
45	75	23	1	57.5	68.5	8.35	8 800	10 000	—	—
50	80	23	1	59.0	72.5	8.85	8 000	9 400	—	—
55	90	26	1.1	77.0	96.5	11.8	7 300	8 600	—	—
60	95	26	1.1	78.5	102	12.4	6 700	7 900	—	—
65	100	26	1.1	83.0	111	13.6	6 200	7 300	—	—
70	110	30	1.1	105	143	17.4	5 800	6 800	—	—
75	115	30	1.1	107	149	18.2	5 400	6 300	—	—
80	125	34	1.1	128	179	21.6	5 100	5 900	—	—
85	130	34	1.1	135	194	23.1	4 800	5 600	—	—
90	140	37	1.5	158	228	26.6	4 500	5 300	—	—
95	145	37	1.5	162	238	27.4	4 300	5 000	—	—
100	140	40	1.1	145	260	30.0	4 300	5 100	**NNU4920**	**NNU4920K**
	150	37	1.5	170	256	29.2	4 000	4 800	—	—
105	145	40	1.1	147	268	30.5	4 100	4 800	**NNU4921**	**NNU4921K**
	160	41	2	220	320	36.0	3 800	4 500	—	—
110	150	40	1.1	152	284	32.0	3 900	4 600	**NNU4922**	**NNU4922K**
	170	45	2	254	375	41.5	3 600	4 300	—	—

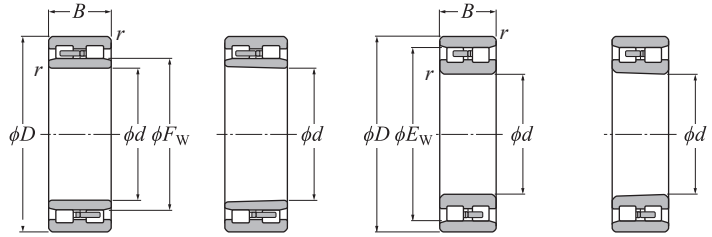
1) Smallest allowable dimension for chamfer dimension r.
2) "**K**" indicates bearings having a tapered bore with a taper ratio of 1:12.



Dynamic equivalent radial load
$P_r = F_r$

Static equivalent radial load
$P_{0r} = F_r$

Bearing number 2) NN type Cylindrical bore	Bearing number 2) NN type Tapered bore	Dimension mm F_w	E_w	Installation-related dimensions mm d_a Min.	d_b Min.	d_c Max.	d_d Min.	D_a Max.	D_b Max.	D_b Min.	r_{as} Max.	Mass (approx.) kg NNU type Cylindrical bore	NNU type Tapered bore	NN type Cylindrical bore	NN type Tapered bore
NN3005	**NN3005K**	—	41.3	29	30	—	—	—	43	42	0.6	—	—	0.124	0.121
NN3006	**NN3006K**	—	48.5	35	36.5	—	—	—	50	49	1	—	—	0.199	0.193
NN3007	**NN3007K**	—	55	40	41.5	—	—	—	57	56	1	—	—	0.242	0.235
NN3008	**NN3008K**	—	61	45	47	—	—	—	63	62	1	—	—	0.312	0.303
NN3009	**NN3009K**	—	67.5	50	52	—	—	—	70	69	1	—	—	0.405	0.393
NN3010	**NN3010K**	—	72.5	55	57	—	—	—	75	74	1	—	—	0.433	0.419
NN3011	**NN3011K**	—	81	61.5	63.5	—	—	—	83.5	82	1	—	—	0.651	0.631
NN3012	**NN3012K**	—	86.1	66.5	68.5	—	—	—	88.5	87	1	—	—	0.704	0.683
NN3013	**NN3013K**	—	91	71.5	73.5	—	—	—	93.5	92	1	—	—	0.758	0.735
NN3014	**NN3014K**	—	100	76.5	79	—	—	—	103.5	101	1	—	—	1.04	1.01
NN3015	**NN3015K**	—	105	81.5	84	—	—	—	108.5	106	1	—	—	1.14	1.11
NN3016	**NN3016K**	—	113	86.5	89.5	—	—	—	118.5	114	1	—	—	1.52	1.47
NN3017	**NN3017K**	—	118	91.5	94.5	—	—	—	123.5	119	1	—	—	1.61	1.56
NN3018	**NN3018K**	—	127	98	101	—	—	—	132	129	1.5	—	—	2.07	2.01
NN3019	**NN3019K**	—	132	103	106	—	—	—	137	134	1.5	—	—	2.17	2.1
NN4920	**NN4920K**	113	129	106.5	110	111	115	133.5	133.5	131	1	1.83	1.75	1.75	1.67
NN3020	**NN3020K**	—	137	108	111	—	—	—	142	139	1.5	—	—	2.26	2.19
NN4921	**NN4921K**	118	134	111.5	115	116	120	138.5	138.5	136	1	1.91	1.82	1.82	1.73
NN3021	**NN3021K**	—	146	114	117	—	—	—	151	148	2	—	—	2.89	2.8
NN4922	**NN4922K**	123	139	116.5	120	121	125	143.5	143.5	141	1	1.99	1.9	1.9	1.81
NN3022	**NN3022K**	—	155	119	123	—	—	—	161	157	2	—	—	3.69	3.56



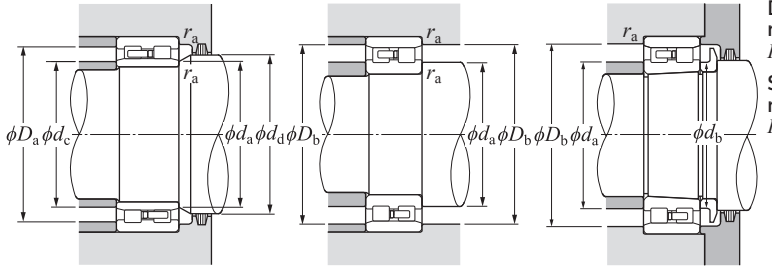
NNU type
Cylindrical bore Tapered bore

NN type
Cylindrical bore Tapered bore

d 120–280 mm

Boundary dimensions mm				Basic load rating kN		Fatigue load limit kN	Allowable speed min^{-1}		Bearing number 2) NNU type	
d	D	B	$r_{s\,min}$ 1)	dynamic C_r	static C_{0r}	C_u	Grease lubrication	Oil lubrication	Cylindrical bore	Tapered bore
120	165	45	1.1	203	360	39.5	3 600	4 200	NNU4924	NNU4924K
	180	46	2	258	390	42.5	3 300	3 900	—	—
130	180	50	1.5	244	440	47.0	3 300	3 900	NNU4926	NNU4926K
	200	52	2	315	475	50.0	3 100	3 600	—	—
140	190	50	1.5	251	470	49.0	3 000	3 600	NNU4928	NNU4928K
	210	53	2	330	515	53.0	2 800	3 300	—	—
150	210	60	2	380	690	70.5	2 800	3 300	NNU4930	NNU4930K
	225	56	2.1	370	585	59.0	2 600	3 100	—	—
160	220	60	2	395	740	74.0	2 600	3 100	NNU4932	NNU4932K
	240	60	2.1	415	660	65.5	2 500	2 900	—	—
170	230	60	2	400	765	75.5	2 500	2 900	NNU4934	NNU4934K
	260	67	2.1	490	775	75.0	2 300	2 700	—	—
180	250	69	2	510	965	93.0	2 300	2 700	NNU4936	NNU4936K
	280	74	2.1	630	995	94.5	2 200	2 600	—	—
190	260	69	2	525	1 030	98.0	2 200	2 600	NNU4938	NNU4938K
	290	75	2.1	640	1 040	97.0	2 000	2 400	—	—
200	280	80	2.1	615	1 180	110	2 100	2 400	NNU4940	NNU4940K
	310	82	2.1	725	1 170	107	1 900	2 300	—	—
220	300	80	2.1	650	1 300	118	1 900	2 200	NNU4944	NNU4944K
	340	90	3	905	1 480	132	1 700	2 100	—	—
240	320	80	2.1	680	1 410	126	1 700	2 000	NNU4948	NNU4948K
	360	92	3	945	1 600	140	1 600	1 900	—	—
260	360	100	2.1	1 000	2 070	179	1 600	1 800	NNU4952	NNU4952K
	400	104	4	1 180	1 990	170	1 500	1 700	—	—
280	380	100	2.1	1 030	2 200	187	1 400	1 700	NNU4956	NNU4956K
	420	106	4	1 200	2 080	174	1 300	1 600	—	—

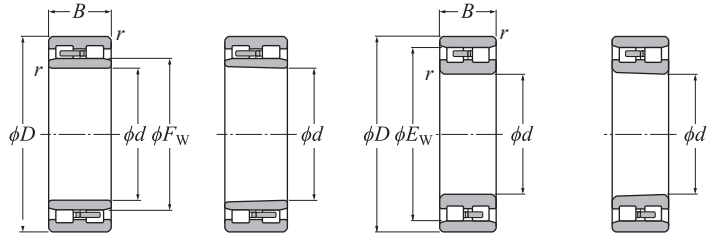
1) Smallest allowable dimension for chamfer dimension r.
2) "K" indicates bearings having a tapered bore with a taper ratio of 1:12.



Dynamic equivalent radial load
$P_r = F_r$

Static equivalent radial load
$P_{0r} = F_r$

Bearing number 2) NN type Cylindrical bore	Bearing number 2) NN type Tapered bore	Dimension mm F_w	E_w	Installation-related dimensions mm d_a Min.	d_b Min.	d_c Max.	d_d Min.	D_a Max.	D_b Max.	D_b Min.	r_{as} Max.	Mass (approx.) kg NNU type Cylindrical bore	NNU type Tapered bore	NN type Cylindrical bore	NN type Tapered bore
NN4924	NN4924K	134.5	154.5	126.5	130	133	137	158.5	158.5	156.5	1	2.75	2.63	2.63	2.51
NN3024	NN3024K	—	165	129	133	—	—	—	171	167	2	—	—	3.98	3.83
NN4926	NN4926K	146	168	138	142	144	148	172	172	170	1.5	3.69	3.52	3.52	3.35
NN3026	NN3026K	—	182	139	143	—	—	—	191	183	2	—	—	5.92	5.71
NN4928	NN4928K	156	178	148	152	154	158	182	182	180	1.5	3.94	3.76	3.76	3.58
NN3028	NN3028K	—	192	149	153	—	—	—	201	194	2	—	—	6.44	6.21
NN4930	NN4930K	168.5	196.5	159	164	166	171	201	201	198.5	2	6.18	5.9	5.9	5.62
NN3030	NN3030K	—	206	161	166	—	—	—	214	208	2	—	—	7.81	7.53
NN4932	NN4932K	178.5	206.5	169	174	176	182	211	211	208.5	2	6.53	6.23	6.24	5.94
NN3032	NN3032K	—	219	171	176	—	—	—	229	221	2	—	—	8.92	8.59
NN4934	NN4934K	188.5	216.5	179	184	186	192	221	221	218.5	2	6.87	6.55	6.56	6.24
NN3034	NN3034K	—	236	181	187	—	—	—	249	238	2	—	—	12.6	12.2
NN4936	NN4936K	202	234	189	195	199	205	241	241	236	2	9.9	9.46	9.45	9.01
NN3036	NN3036K	—	255	191	197	—	—	—	269	257	2	—	—	16.6	16
NN4938	NN4938K	212	244	199	205	209	215	251	251	246	2	10.4	9.94	9.93	9.47
NN3038	NN3038K	—	265	201	207	—	—	—	279	267	2	—	—	18	17.4
NN4940	NN4940K	225	261	211	218	222	228	269	269	264	2	14.7	14	14	13.3
NN3040	NN3040K	—	282	211	218	—	—	—	299	285	2	—	—	21.6	20.8
NN4944	NN4944K	245	281	231	238	242	248	289	289	284	2	15.9	15.2	15.2	14.5
NN3044	NN3044K	—	310	233	240	—	—	—	327	313	2.5	—	—	29.3	28.2
NN4948	NN4948K	265	301	251	258	262	269	309	309	304	2	17.2	16.4	16.4	15.6
NN3048	NN3048K	—	330	253	261	—	—	—	347	333	2.5	—	—	32.8	31.6
NN4952	NN4952K	292	336	271	279	288	296	349	349	339	2	29.6	28.3	28.3	27
NN3052	NN3052K	—	364	276	285	—	—	—	384	367	3	—	—	47.4	45.8
NN4956	NN4956K	312	356	291	299	308	316	369	369	359	2	31.6	30.2	30.2	28.8
NN3056	NN3056K	—	384	296	305	—	—	—	404	387	3	—	—	51.1	49.3



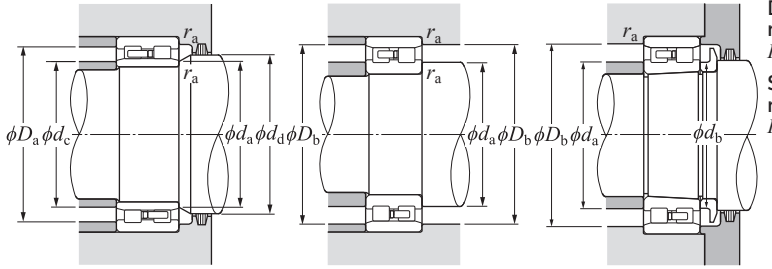
NNU type
Cylindrical bore Tapered bore

NN type
Cylindrical bore Tapered bore

d 300–500 mm

Boundary dimensions mm				Basic load rating dynamic kN	static kN	Fatigue load limit kN	Allowable speed min^{-1}		Bearing number [2] NNU type	
d	*D*	*B*	$r_{s\,min}$ [1]	C_r	C_{0r}	C_u	Grease lubrication	Oil lubrication	Cylindrical bore	Tapered bore
300	420	118	3	1 330	2 800	231	1 300	1 500	**NNU4960**	**NNU4960K**
	460	118	4	1 470	2 560	209	1 200	1 500	—	—
320	440	118	3	1 370	2 970	242	1 200	1 400	**NNU4964**	**NNU4964K**
	480	121	4	1 500	2 670	214	1 100	1 300	—	—
340	460	118	3	1 410	3 150	252	1 100	1 300	**NNU4968**	**NNU4968K**
	520	133	5	1 800	3 200	251	1 100	1 300	—	—
360	480	118	3	1 430	3 250	255	1 100	1 300	**NNU4972**	**NNU4972K**
	540	134	5	1 830	3 300	258	1 000	1 200	—	—
380	520	140	4	1 810	4 050	315	1 000	1 200	**NNU4976**	**NNU4976K**
	560	135	5	1 870	3 450	265	940	1 100	—	—
400	540	140	4	1 870	4 300	325	940	1 100	**NNU4980**	**NNU4980K**
	600	148	5	2 260	4 150	310	880	1 000	—	—
420	560	140	4	1 930	4 500	340	900	1 100	**NNU4984**	**NNU4984K**
	620	150	5	2 300	4 300	320	840	990	—	—
440	600	160	4	2 380	5 550	410	850	1 000	**NNU4988**	**NNU4988K**
	650	157	6	2 680	5 100	370	800	940	—	—
460	620	160	4	2 460	5 850	430	800	950	**NNU4992**	**NNU4992K**
	680	163	6	2 830	5 350	385	750	890	—	—
480	650	170	5	2 530	5 900	425	770	910	**NNU4996**	**NNU4996K**
500	670	170	5	2 670	6 400	455	730	860	**NNU49/500**	**NNU49/500K**

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



Dynamic equivalent radial load
$P_r = F_r$

Static equivalent radial load
$P_{0r} = F_r$

Bearing number [2] NN type Cylindrical bore	Bearing number [2] NN type Tapered bore	Dimension mm F_w	E_w	Installation-related dimensions mm d_a Min.	d_b Min.	d_c Max.	d_d Min.	D_a Max.	D_b Max.	D_b Min.	r_{as} Max.	Mass (approx.) kg NNU type Cylindrical bore	NNU type Tapered bore	NN type Cylindrical bore	NN type Tapered bore
NN4960	**NN4960K**	339	391	313	323	335	343	407	407	394	2.5	48.6	46.4	46.4	44.2
NN3060	**NN3060K**	—	418	316	326	—	—	—	444	421	3	—	—	70.8	68.6
NN4964	**NN4964K**	359	411	333	343	355	363	427	427	414	2.5	51.4	49.1	49	46.7
NN3064	**NN3064K**	—	438	336	346	—	—	—	464	441	3	—	—	76.2	73.5
—	—	379	—	353	363	375	383	447	—	—	2.5	54.2	51.7	—	—
NN3068	**NN3068K**	—	473	360	371	—	—	—	500	477	4	—	—	102	98.5
—	—	398	—	373	383	394	402	467	—	—	2.5	57	54.4	—	—
NN3072	**NN3072K**	—	493	380	391	—	—	—	520	497	4	—	—	107	103
—	—	425	—	396	408	420	430	504	—	—	3	84.5	80.6	—	—
NN3076	**NN3076K**	—	512	400	411	—	—	—	540	516	4	—	—	113	109
—	—	445	—	416	428	440	450	524	—	—	3	88.2	84.1	—	—
NN3080	**NN3080K**	—	547	420	432	—	—	—	580	551	4	—	—	146	141
—	—	465	—	436	448	460	470	544	—	—	3	92	87.7	—	—
NN3084	**NN3084K**	—	567	440	452	—	—	—	600	571	4	—	—	154	148
—	—	492	—	456	469	487	497	584	—	—	3	127	121	—	—
NN3088	**NN3088K**	—	596	464	477	—	—	—	626	601	5	—	—	178	172
—	—	512	—	476	489	507	517	604	—	—	3	132	126	—	—
NN3092	**NN3092K**	—	622	484	498	—	—	—	656	627	5	—	—	202	195
—	—	534	—	500	514	531	541	630	—	—	4	156	149	—	—
—	—	556	—	520	534	551	561	650	—	—	4	162	155	—	—