

# Cylindrical roller bearings



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## Cylindrical roller bearings

### Definition and capabilities

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#### → Definition

Cylindrical roller bearings offer excellent resistance to instantaneous overloads and shocks.

They simplify assembly thanks to their detachable elements and allow, for certain types, axial displacement or low axial load, for other types.

#### ■ Cages

The standard cage for these bearings is the polyamide cage (suffix GI5) which allows bearing operating temperatures of 120°C or 248°F (150° or 302°F peak).

The standard cage for series 4 is in pressed steel.

The machined brass cage is available on option. Large-dimension bearings are equipped with a machined brass cage (suffix M). For special applications in which the synthetic material cage is unacceptable, a metal cage can be provided on request.

#### → Capabilities

##### ■ Loads and speeds

Cylindrical roller bearings are designed to:

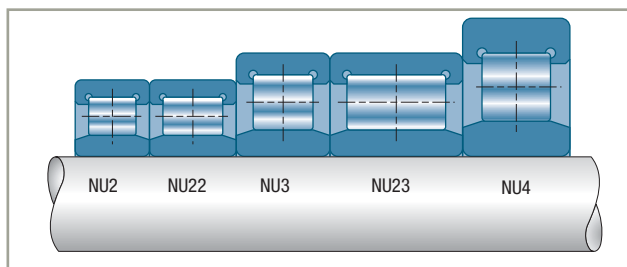
- withstand radial loads
- withstand moderate axial loads if the position of the shoulders on the rings allows them
- accept high speeds of rotation

##### ■ Misalignment

Cylindrical roller bearings accept misalignment of about 0.06° thanks to the correction on the roller surface profiles.

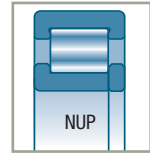
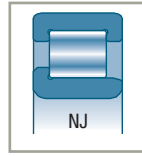
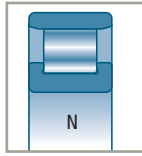
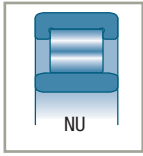
### Series

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## Variants

### Types of bearings



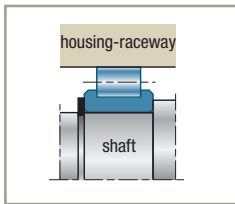
### Groove for snap ring

These bearings can be supplied on request with a groove in the outer ring (N) and snap ring (NR) per ISO 464 standard.

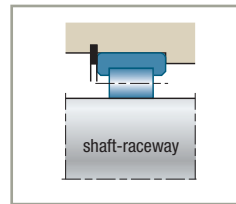
The dimensions of the grooves and rings are therefore the same as those defined for the ball bearings of the same dimension series.

### Incomplete bearings

**Type RN:** type N bearing without outer ring.



**Type RNU:** type NU bearing without inner ring.



In both cases, the raceway corresponding to the absent ring is integrally machined in the mechanism. The geometry, surface condition and hardness of the part forming the raceway must meet precise specifications. Consult SNR.



## Cylindrical roller bearings *(continued)*

### Tolerances and clearances

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#### → Tolerances

These bearings are supplied in standard precision with tolerances in compliance with ISO 492 Standard.

SNR can supply bearings with tightened tolerances on one or several characteristics on request (bore, outer diameter, precision of rotation).

#### → Clearances

##### ■ Internal radial clearance

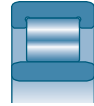
The bearing is supplied matched (in conformity with ISO 5753 Standard), that is to say that the detachable elements

(outer ring and inner ring) are associated so that the clearance is in the "matched" bearing category.

If one of the detachable elements is replaced by the complementary element of another bearing, the clearance enters the "interchangeable" bearing category, with a higher tolerance.

Order of size of recommended residual clearance after fitting:

$$J_{rm} = 4 d^{1/2} 10^{-3}$$



■ Series N..2-N..3-N..4-N..22-N..23

Bore diameter	Group 2		Group N		Group 3		Group 4		Group 5	
	d (mm)	min max	min max	min max	min max	min max	min max	min max		
d ≤ 10	0	25	20	45	35	60	50	75	–	–
10 < d ≤ 24	0	25	20	45	35	60	50	75	65	90
24 < d ≤ 30	0	25	20	45	35	60	50	75	70	95
30 < d ≤ 40	5	30	25	50	45	70	60	85	80	105
40 < d ≤ 50	5	35	30	60	50	80	70	100	95	125
50 < d ≤ 65	10	40	40	70	60	90	80	110	110	140
65 < d ≤ 80	10	45	40	75	65	100	90	125	130	165
80 < d ≤ 100	15	50	50	85	75	110	105	140	155	190
100 < d ≤ 120	15	55	50	90	85	125	125	165	180	220
120 < d ≤ 140	15	60	60	105	100	145	145	190	200	245
140 < d ≤ 160	20	70	70	120	115	165	165	215	225	275
160 < d ≤ 180	25	75	75	125	120	170	170	220	250	300
180 < d ≤ 200	35	90	90	145	140	195	195	250	275	330
200 < d ≤ 225	45	105	105	165	160	220	220	280	305	365
225 < d ≤ 250	45	110	110	175	170	235	235	300	330	395
250 < d ≤ 280	55	125	125	195	190	260	260	330	370	440
280 < d ≤ 315	55	130	130	205	200	275	275	350	410	485
315 < d ≤ 355	65	145	145	225	225	305	305	385	455	535
355 < d ≤ 400	100	190	190	280	280	370	370	460	510	600
400 < d ≤ 450	110	210	210	310	310	410	410	510	565	665
450 < d ≤ 500	110	220	220	330	330	440	440	550	625	735

Value in μm

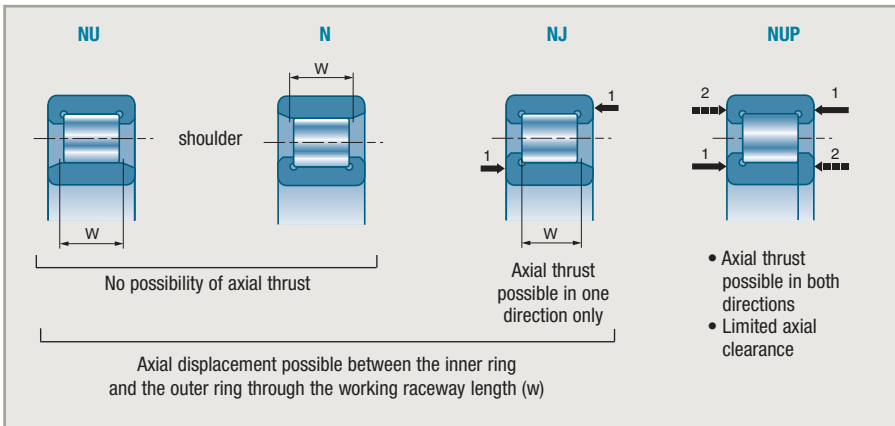
## Cylindrical roller bearings (continued)

### ■ Axial clearance

The axial clearance of cylindrical roller bearings is only specified for type NUP bearings. It is limited by the 4 internal shoulders. It is in the range of 0.1 mm.

Bearings of types N, NU or NJ allow axial displacement between the inner ring and the outer ring. It is defined by the difference between the working length ( $W$ ) of the ring raceways and the effective length of the rollers.

For types N or NU, it is in the range of 2 mm for bearings with bore diameters below 80 mm in series 2, and below 50 mm in series 3. For the largest bearings it is of the order of 3 mm. For all type NJ bearings the possible axial displacement is half the values indicated above.



## Design criteria

### ■ Bearing life

Cylindrical roller bearings are only designed to withstand radial loads  $F_r$ .

However, these bearings can accept an axial load  $F_a$  if their inner and outer rings are shouldered.

If the ratio  $F_a/F_r$  is less than 0.1, only the radial load is taken into consideration.

If the ratio  $F_a/F_r$  is greater than 0.1, the friction energy generated on the shoulders by the axial load and the wear that can result from this may be so high that bearing performance is drastically modified.

Consult SNR to evaluate the ratio according to the operating conditions (speed, lubrication, etc.).

## ■ Maximum static radial capacity

This is given by the basic static capacity  $C_0$ .

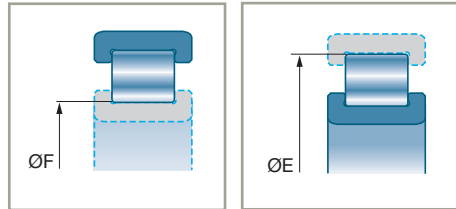
## Installation/assembly criteria

As the rings of cylindrical roller bearings are separable, they are totally interchangeable within the clearance tolerance limits.

They can also be interchanged with bearings of the same reference from other manufacturers. The dimension above the rollers (E) or below the rollers (F) and the tolerances are indicated in the "Tables of Product Characteristics" in conformity with DIN 5412 Standard.

However, since the raceway profile corrections, quality of steel and surface conditions are specific to each manufacturer, the performance of such assemblies may be significantly changed in a replacement, therefore they should be avoided.

**Caution:** dimensions E and F of the new generation of cylindrical roller bearings (suffix E) differ from those of the previous generation.

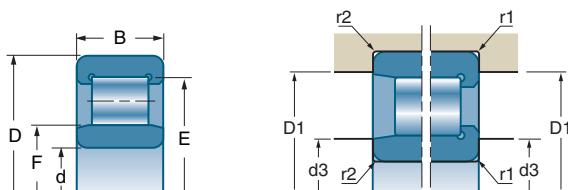





## Suffixes

<b>E</b>	Optimised capacity bearing
<b>G15</b>	Polyamide cage
<b>J</b>	Clearance. The first figure designates the ISO clearance category, the second designates the normal precision class (0). Equivalence: J20 = C2, J30 = C3, J40 = C4, J50 = C5
<b>M</b>	Machined brass cage centred on the rollers
<b>N</b>	Outer ring with groove for snap ring
<b>NR</b>	Outer ring with groove and snap ring fitted



## Cylindrical roller bearings (continued)

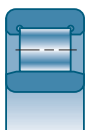


d		D	B	F	E		
						C	C <sub>0</sub>
mm	References	mm	mm	mm	mm	10 <sup>3</sup> N	10 <sup>3</sup> N
15	NJ 202 EG15	35	11	19.3	30.3	13.20	10.8
	NU 202 EG15	35	11	19.3	30.3	13.2	10.8
17	NJ 203 EG15	40	12	22.1	35.1	18	15.1
	NU 203 EG15	40	12	22.1	35.1	18	15.1
	NJ 2203 EG15	40	16	22.1	35.1	24.5	22.4
	NU 2203 EG15	40	16	22.1	35.1	24.5	22.4
	NJ 303 EG15	47	14	24.2	40.2	25.5	21.2
	NU 303 EG15	47	14	24.2	40.2	25.5	21.2
20	N 204 EG15	47	14	26.5	41.5	28	25.5
	NJ 204 EG15	47	14	26.5	41.5	28	25.5
	NU 204 EG15	47	14	26.5	41.5	28	25.5
	NUP 204 EG15	47	14	26.5	41.5	28	25.5
	NJ 2204 EG15	47	18	26.5	41.5	33	31.5
	NU 2204 EG15	47	18	26.5	41.5	33	31.5
	N 304 EG15	52	15	27.5	45.5	31.5	27
	NJ 304 EG15	52	15	27.5	45.5	31.5	27
	NU 304 EG15	52	15	27.5	45.5	31.5	27
	NJ 2304 EG15	52	21	27.5	45.5	42	39
	NU 2304 EG15	52	21	27.5	45.5	42	39
	25	N 205 EG15	52	15	31.5	46.5	30
NJ 205 EG15		52	15	31.5	46.5	30	28.5
NU 205 EG15		52	15	31.5	46.5	30	28.5
NUP 205 EG15		52	15	31.5	46.5	30	28.5
NJ 2205 EG15		52	18	31.5	46.5	36.5	35.5
NU 2205 EG15		52	18	31.5	46.5	36.5	35.5
NUP 2205 EG15		52	18	31.5	46.5	36.5	35.5
N 305 EG15		62	17	34.0	54.0	42.5	37.5
NJ 305 EG15		62	17	34.0	54.0	41.5	37.5
NU 305 EG15		62	17	34.0	54.0	41.5	37.5
NUP 305 EG15		62	17	34.0	54.0	41.5	37.5
NJ 2305 EG15		62	24	34.0	54.0	57	56
NU 2305 EG15		62	24	34.0	54.0	58	56
30		N 206 EG15	62	16	37.5	55.5	39
	NJ 206 EG15	62	16	37.5	55.5	39	37.5
	NU 206 EG15	62	16	37.5	55.5	39	37.5
	NUP 206 EG15	62	16	37.5	55.5	39	37.5
	NJ 2206 EG15	62	20	37.5	55.5	50	50
	NU 2206 EG15	62	20	37.5	55.5	49	50

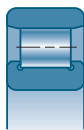


## Characteristics

### ■ Single-row cylindrical roller bearings



NU



N



NJ



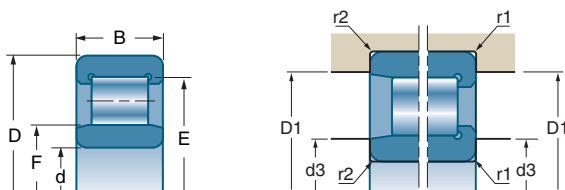
NUP




References	rpm*	rpm*	d3 max	D1 min	r1 max	r2 max	kg
NJ 202 EG15 NU 202 EG15	17000 17000	21000 21000	17 18	30.8 30.8	0.6 0.6	0.3 0.3	0.049 0.050
NJ 203 EG15 NU 203 EG15 NJ 2203 EG15 NU 2203 EG15 NJ 303 EG15 NU 303 EG15	15000 15000 15000 15000 13000 13000	18000 18000 18000 18000 15000 15000	20.7 20.7 20 19 22 21	34.1 34.1 35 34 41 39	0.6 0.6 0.6 0.6 1 1	0.3 0.3 0.3 0.3 0.6 0.6	0.070 0.069 0.053 0.051 0.125 0.122
N 204 EG15 NJ 204 EG15 NU 204 EG15 NUP 204 EG15 NJ 2204 EG15 NU 2204 EG15 N 304 EG15 NJ 304 EG15 NU 304 EG15 NJ 2304 EG15 NU 2304 EG15	12000 12000 12000 12000 12000 12000 11000 11000 11000 10000 10000	15000 15000 15000 15000 15000 15000 13000 13000 13000 13000 13000	24.2 24.2 24.2 24.2 24.2 24.2 24.2 24.2 24.2 24.2 24.2	41.4 41.4 41.4 41.4 41.4 41.4 45 45 45 45 45	1 1 1 1 1 1 1.1 1.1 1.1 1.1 1.1	0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6 0.6	0.110 0.117 0.114 0.119 0.150 0.146 0.151 0.156 0.140 0.220 0.215
N 205 EG15 NJ 205 EG15 NU 205 EG15 NUP 205 EG15 NJ 2205 EG15 NU 2205 EG15 NUP 2205 EG15 N 305 EG15 NJ 305 EG15 NU 305 EG15 NUP 305 EG15 NJ 2305 EG15 NU 2305 EG15	11000 11000 11000 11000 11000 11000 11000 9500 9500 9500 9500 9000 9000	13000 13000 13000 13000 13000 13000 13000 11000 11000 11000 11000 11000 11000	29.2 29.2 29.2 29.2 29.2 29.2 29.2 32 32 32 32 30 32	46.4 46.4 46.4 46.4 46.4 46.4 46.4 55 55 55 55 55 55	1 1 1 1 1 1 1 1 1.1 1.1 1.1 1.1 1.1 1.1	0.6 0.6 0.6 0.6 0.6 0.6 0.6 1 1.1 1.1 1.1 1.1 1.1 1.1	0.135 0.140 0.137 0.145 0.164 0.164 0.174 0.242 0.250 0.245 0.256 0.347 0.349
N 206 EG15 NJ 206 EG15 NU 206 EG15 NUP 206 EG15 NJ 2206 EG15 NU 2206 EG15	9400 9400 9400 9400 9400 9400	11000 11000 11000 11000 11000 11000	34.2 34.2 34.2 34.2 34.2 34.2	57 56.4 56.4 56.4 56.4 56.4	1 1 1 1 1 1	0.6 0.6 0.6 0.6 0.6 0.6	0.210 0.213 0.213 0.220 0.261 0.355

\* These are the speed limits according to the SNR concept (see pages 85 to 87).

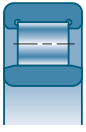


## Cylindrical roller bearings (continued)

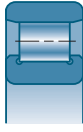


d		D	B	F	E			
						C	C <sub>0</sub>	
mm	References	mm	mm	mm	mm	10°N	10°N	
<b>30</b>	NUP 2206 EG15	62	20	37.5	55.5	50	50	
	N 306 EG15	72	19	40.5	62.5	55	50	
	NJ 306 EG15	72	19	40.5	62.5	53	50	
	NU 306 EG15	72	19	40.5	62.5	53	50	
	NUP 306 EG15	72	19	40.5	62.5	53	50	
	NJ 2306 EG15	72	27	40.5	62.5	77	78	
	NU 2306 EG15	72	27	40.5	62.5	77	78	
<b>35</b>	N 207 EG15	72	17	44.0	64.0	50	50	
	NJ 207 EG15	72	17	44.0	64.0	50	50	
	NU 207 EG15	72	17	44.0	64.0	50	50	
	NUP 207 EG15	72	17	44.0	64.0	50	50	
	NJ 2207 EG15	72	23	44.0	64.0	62	65	
	NU 2207 EG15	72	23	44.0	64.0	62	65	
	NUP 2207 EG15	72	23	44.0	64.0	62	65	
	N 307 EG15	80	21	46.2	70.2	67	65	
	NJ 307 EG15	80	21	46.2	70.2	68	65	
	NU 307 EG15	80	21	46.2	70.2	67	65	
	NUP 307 EG15	80	21	46.2	70.2	67	65	
	NJ 2307 EG15	80	31	46.2	70.2	92	100	
	NU 2307 EG15	80	31	46.2	70.2	96	101	
	NJ 407	100	25	53.0	83.0	79	71	
	NU 407	100	25	53.0	83.0	79	71	
	<b>40</b>	N 208 EG15	80	18	49.5	71.5	56	55
NJ 208 EG15		80	18	49.5	71.5	56	55	
NU 208 EG15		80	18	49.5	71.5	56	55	
NUP 208 EG15		80	18	49.5	71.5	56	55	
NJ 2208 EG15		80	23	49.5	71.5	74	78	
NU 2208 EG15		80	23	49.5	71.5	72	78	
NUP 2208 EG15		80	23	49.5	71.5	72	78	
N 308 EG15		90	23	52.0	80.0	84	80	
NJ 308 EG15		90	23	52.0	80.0	82	80	
NU 308 EG15		90	23	52.0	80.0	84	80	
NUP 308 EG15		90	23	52.0	80.0	82	80	
NJ 2308 EG15		90	33	52.0	80.0	113	121	
NU 2308 EG15		90	33	52.0	80.0	113	121	
NJ 408		110	27	58.0	92.0	99	90	
NU 408		110	27	58.0	92.0	99	90	
<b>45</b>		N 209 EG15	85	19	54.5	76.5	65	66
		NJ 209 EG15	85	19	54.5	76.5	65	66
		NU 209 EG15	85	19	54.5	76.5	63	66

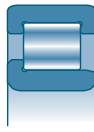
■ Single-row cylindrical roller bearings (continued)



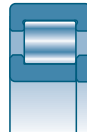
NU







N



NJ



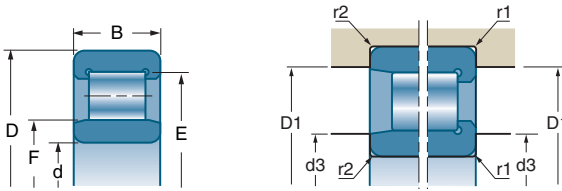
NUP

			d3 max	D1 min	r1 max	r2 max	
References	rpm*	rpm*	mm	mm	mm	mm	kg
NUP 2206 EG15	9500	11000	34.2	56.4	1	0.6	0.310
N 306 EG15	8100	9700	37	65	1	1	0.366
NJ 306 EG15	8100	9700	37	65	1.1	1.1	0.376
NU 306 EG15	8100	9700	37	65	1.1	1.1	0.368
NUP 306 EG15	8100	9700	37	65	1.1	1.1	0.385
NJ 2306 EG15	7700	9700	37	65	1.1	1.1	0.540
NU 2306 EG15	7700	9700	37	65	1.1	1.1	0.529
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N 207 EG15	8100	9800	45.5	65.8	1.1	0.6	0.300
NJ 207 EG15	8100	9800	39.2	65	1.1	0.6	0.309
NU 207 EG15	8100	9800	39.2	65	1.1	0.6	0.303
NUP 207 EG15	8100	9800	39.2	65	1.1	0.6	0.317
NJ 2207 EG15	8100	9800	39.2	65	1.1	0.6	0.416
NU 2207 EG15	8100	9800	39.2	65	1.1	0.6	0.406
NUP 2207 EG15	8100	9800	39.2	65	1.1	0.6	0.427
N 307 EG15	7200	8500	44	71	1.5	1	0.486
NJ 307 EG15	7200	8500	44	71	1.5	1.1	0.496
NU 307 EG15	7200	8500	44	71	1.5	1.1	0.485
NUP 307 EG15	7200	8500	42	71	1.5	1.1	0.506
NJ 2307 EG15	6800	8500	42	71	1.5	1.1	0.736
NU 2307 EG15	6800	8500	42	71	1.5	1.1	0.723
NJ 407	6300	7600	46	89	1.5	1.5	1.030
NU 407	6300	7600	46	89	1.5	1.5	1.030
<hr/>							
N 208 EG15	7200	8700	47	73	1	1	0.380
NJ 208 EG15	7200	8700	47	73	1.1	1.1	0.389
NU 208 EG15	7200	8700	47	73	1.1	1.1	0.379
NUP 208 EG15	7200	8700	47	73	1.1	1.1	0.399
NJ 2208 EG15	7200	8700	47	73	1.1	1.1	0.504
NU 2208 EG15	7200	8700	46	73	1.1	1.1	0.492
NUP 2208 EG15	7200	8700	47	73	1.1	1.1	0.518
N 308 EG15	6300	7500	49	81	1.5	1.5	0.660
NJ 308 EG15	6300	7500	49	81	1.5	1.5	0.674
NU 308 EG15	6300	7500	49	81	1.5	1.5	0.659
NUP 308 EG15	6300	7500	49	81	1.5	1.5	0.688
NJ 2308 EG15	6000	7500	47.5	81	1.5	1.5	0.978
NU 2308 EG15	6000	7500	49	81	1.5	1.5	0.958
NJ 408	5700	6900	53	97	2	2	1.310
NU 408	5700	6900	53	97	2	2	1.310
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N 209 EG15	6700	8000	52	78	1	1	0.445
NJ 209 EG15	6700	8000	52	78	1.1	1.1	0.445
NU 209 EG15	6700	8000	52	78	1.1	1.1	0.445

\* These are the speed limits according to the SNR concept (see pages 85 to 87).

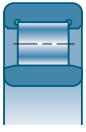


## Cylindrical roller bearings (continued)

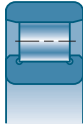


d		D	B	F	E			
						10°N	10°N	
mm	References	mm	mm	mm	mm	10°N	10°N	
45	NUP 209 EG15	85	19	54.5	76.5	63	66	
	NJ 2209 EG15	85	23	54.5	76.5	76	85	
	NU 2209 EG15	85	23	54.5	76.5	76	85	
	NUP 2209 EG15	85	23	54.5	76.5	76	85	
	N 309 EG15	100	25	58.5	88.5	102	101	
	NJ 309 EG15	100	25	58.5	88.5	99	101	
	NU 309 EG15	100	25	58.5	88.5	99	101	
	NUP 309 EG15	100	25	58.5	88.5	99	101	
	NJ 2309 EG15	100	36	58.5	88.5	139	156	
	NU 2309 EG15	100	36	58.5	88.5	143	156	
	NJ 409	120	29	64.5	100.5	111	103	
	NU 409	120	29	64.5	100.5	111	103	
	50	N 210 EG15	90	20	59.5	81.5	68	72
		NJ 210 EG15	90	20	59.5	81.5	66	72
NU 210 EG15		90	20	59.5	81.5	66	72	
NUP 210 EG15		90	20	59.5	81.5	68	72	
NJ 2210 EG15		90	23	59.5	81.5	80	92	
NU 2210 EG15		90	23	59.5	81.5	80	92	
NUP 2210 EG15		90	23	59.5	81.5	80	92	
N 310 EG15		110	27	65.0	97.0	112	116	
NJ 310 EG15		110	27	65.0	97.0	112	116	
NU 310 EG15		110	27	65.0	97.0	112	116	
NUP 310 EG15		110	27	65.0	97.0	112	116	
NJ 2310 EG15		110	40	65.0	97.0	169	189	
NU 2310 EG15		110	40	65.0	97.0	169	189	
NJ 410		130	31	70.8	110.8	136	128	
NU 410		130	31	70.8	110.8	132	128	
55		N 211 EG15	100	21	66.0	90.0	89	99
		NJ 211 EG15	100	21	66.0	90.0	86	99
	NU 211 EG15	100	21	66.0	90.0	86	99	
	NUP 211 EG15	100	21	66.0	90.0	86	99	
	NJ 2211 EG15	100	25	66.0	90.0	104	122	
	NU 2211 EG15	100	25	66.0	90.0	104	122	
	NUP 2211 EG15	100	25	66.0	90.0	101	122	
	N 311 EG15	120	29	70.5	106.5	142	144	
	NJ 311 EG15	120	29	70.5	106.5	142	144	
	NU 311 EG15	120	29	70.5	106.5	138	144	
	NUP 311 EG15	120	29	70.5	106.5	142	144	
	NJ 2311 EG15	120	43	70.5	106.5	207	235	
	NU 2311 EG15	120	43	70.5	106.5	202	230	

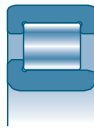
■ Single-row cylindrical roller bearings (continued)



NU







N



NJ



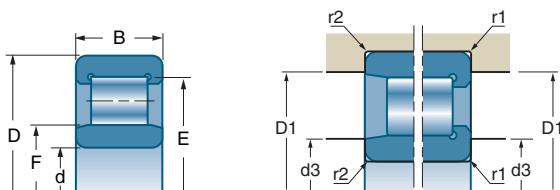
NUP




			<b>d3 max</b>	<b>D1 min</b>	<b>r1 max</b>	<b>r2 max</b>	
References	rpm*	rpm*	mm	mm	mm	mm	kg
NUP 209 EG15	6700	8000	52	78	1.1	1.1	0.457
NJ 2209 EG15	6700	8000	50	78	1.1	1.1	0.530
NU 2209 EG15	6700	8000	52	78	1.1	1.1	0.532
NUP 2209 EG15	6700	8000	52	78	1.1	1.1	0.559
N 309 EG15	5700	6800	54	91	1.5	1.5	0.895
NJ 309 EG15	5700	6800	54	91	1.5	1.5	0.913
NU 309 EG15	5700	6800	54	91	1.5	1.5	0.893
NUP 309 EG15	5700	6800	54	91	1.5	1.5	0.934
NJ 2309 EG15	5400	6800	54	91	1.5	1.5	1.330
NU 2309 EG15	5400	6800	54	91	1.5	1.5	1.290
NJ 409	5200	6300	58	107	2	2	1.660
NU 409	5200	6300	58	107	2	2	1.660
N 210 EG15	6200	7500	57	83	1	1	0.490
NJ 210 EG15	6200	7500	57	83	1.1	1.1	0.503
NU 210 EG15	6200	7500	57	83	1.1	1.1	0.490
NUP 210 EG15	6200	7500	57	83	1.1	1.1	0.517
NJ 2210 EG15	6200	7500	57	83	1.1	1.1	0.586
NU 2210 EG15	6200	7500	57	83	1.1	1.1	0.575
NUP 2210 EG15	6200	7500	57	83	1.1	1.1	0.600
N 310 EG15	5100	6100	67	100	2	2	1.160
NJ 310 EG15	5100	6100	61	99	2	2	1.190
NU 310 EG15	5100	6100	61	99	2	2	1.160
NUP 310 EG15	5100	6100	61	99	2	2	1.210
NJ 2310 EG15	4900	6100	61	99	2	2	1.740
NU 2310 EG15	4900	6100	61	99	2	2	1.740
NJ 410	4600	5500	64	116	2.1	2.1	2.080
NU 410	4700	5700	64	116	2.1	2.1	2.010
N 211 EG15	5600	6700	62	91	1.5	1	0.665
NJ 211 EG15	5600	6700	62	91	1.5	1.1	0.679
NU 211 EG15	5600	6700	62	91	1.5	1.1	0.665
NUP 211 EG15	5600	6700	62	91	1.5	1.1	0.693
NJ 2211 EG15	5600	6700	62	91	1.5	1.1	0.780
NU 2211 EG15	5600	6700	62	91	1.5	1.1	0.780
NUP 2211 EG15	5600	6700	62	91	1.5	1.1	0.828
N 311 EG15	4700	5600	66	109	2	2	1.410
NJ 311 EG15	4700	5600	66	109	2	2	1.470
NU 311 EG15	4700	5600	66	109	2	2	1.480
NUP 311 EG15	4700	5600	66	109	2	2	1.470
NJ 2311 EG15	4500	5600	66	109	2	2	2.230
NU 2311 EG15	4500	5600	66	109	2	2	2.230

\* These are the speed limits according to the SNR concept (see pages 85 to 87).

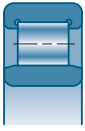


## Cylindrical roller bearings (continued)

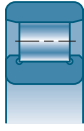


d		D	B	F	E			
						C	C <sub>0</sub>	
mm	References	mm	mm	mm	mm	10 <sup>3</sup> N	10 <sup>3</sup> N	
<b>60</b>	N 212 EG15	110	22	72.0	100.0	99	106	
	NJ 212 EG15	110	22	72.0	100.0	96	106	
	NU 212 EG15	110	22	72.0	100.0	96	106	
	NUP 212 EG15	110	22	72.0	100.0	96	106	
	NJ 2212 EG15	110	28	72.0	100.0	130	155	
	NU 2212 EG15	110	28	72.0	100.0	130	155	
	NUP 2212 EG15	110	28	72.0	100.0	130	155	
	N 312 EG15	130	31	77.0	115.0	157	162	
	NJ 312 EG15	130	31	77.0	115.0	150	156	
	NU 312 EG15	130	31	77.0	115.0	153	162	
	NUP 312 EG15	130	31	77.0	115.0	153	162	
	NJ 2312 EG15	130	46	77.0	115.0	226	265	
	NU 2312 EG15	130	46	77.0	115.0	228	260	
	NU 412	150	35	83.0	127.0	181	187	
	<b>65</b>	N 213 EG15	120	23	78.5	108.5	99	106
		NJ 213 EG15	120	23	78.5	108.5	110	122
NU 213 EG15		120	23	78.5	108.5	110	122	
NUP 213 EG15		120	23	78.5	108.5	110	122	
NJ 2213 EG15		120	31	78.5	108.5	151	184	
NU 2213 EG15		120	31	78.5	108.5	151	184	
N 313 EG15		140	33	82.5	124.5	183	195	
NJ 313 EG15		140	33	82.5	124.5	183	195	
NU 313 EG15		140	33	82.5	124.5	188	195	
NJ 2313 EG15		140	48	82.5	124.5	250	290	
NU 2313 EG15		140	48	82.5	124.5	250	290	
<b>70</b>		N 214 EG15	125	24	83.5	113.5	121	141
		NJ 214 EG15	125	24	83.5	113.5	121	141
	NU 214 EG15	125	24	83.5	113.5	121	141	
	NUP 214 EG15	125	24	83.5	113.5	121	141	
	NJ 2214 EG15	125	31	83.5	113.5	162	198	
	NU 2214 EG15	125	31	83.5	113.5	162	198	
	N 314 EG15	150	35	89.0	133.0	210	220	
	NJ 314 EG15	150	35	89.0	133.0	207	226	
	NU 314 EG15	150	35	89.0	133.0	207	226	
	NJ 2314 EG15	150	51	89.0	133.0	275	325	
	NU 2314 EG15	150	51	89.0	133.0	275	325	
	NJ 414M	180	42	100.0	152.0	246	260	
	<b>75</b>	N 215 EG15	130	25	88.5	118.5	135	161
		NJ 215 EG15	130	25	88.5	118.5	133	161
NU 215 EG15		130	25	88.5	118.5	133	161	

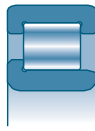
■ Single-row cylindrical roller bearings (continued)



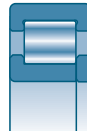
NU







N



NJ

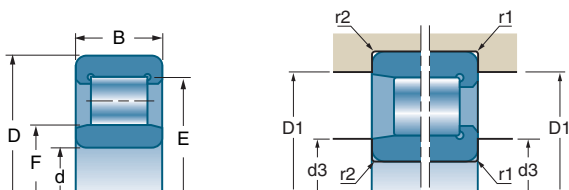





NUP

			<b>d3 max</b>	<b>D1 min</b>	<b>r1 max</b>	<b>r2 max</b>	
References	rpm*	rpm*	mm	mm	mm	mm	kg
N 212 EG15	5100	6100	69	101	1.5	1.5	0.825
NJ 212 EG15	5100	6100	69	101	1.5	1.5	0.845
NU 212 EG15	5100	6100	69	101	1.5	1.5	0.824
NUP 212 EG15	5100	6100	69	101	1.5	1.5	0.909
NJ 2212 EG15	5100	6100	69	101	1.5	1.5	1.100
NU 2212 EG15	5100	6100	69	101	1.5	1.5	1.080
NUP 2212 EG15	5100	6100	69	101	1.5	1.5	1.120
N 312 EG15	4300	5200	72	118	2	2	1.850
NJ 312 EG15	4400	5200	72	118	2.1	2.1	1.850
NU 312 EG15	4300	5200	72	118	2.1	2.1	1.850
NUP 312 EG15	4300	5200	72	118	2.1	2.1	1.930
NJ 2312 EG15	4100	5200	72	118	2.1	2.1	2.830
NU 2312 EG15	4300	5200	72	118	2	2	2.780
NU 412	4000	4900	74	136	2.1	2.1	3.000
N 213 EG15	5100	6100	74	111	1.5	1.5	1.050
NJ 213 EG15	4700	5600	74	111	1.5	1.5	1.050
NU 213 EG15	4700	5600	74	111	1.5	1.5	1.040
NUP 213 EG15	4700	5600	74	111	1.5	1.5	1.090
NJ 2213 EG15	4700	5600	74	111	1.5	1.5	1.460
NU 2213 EG15	4700	5600	74	111	1.5	1.5	1.430
N 313 EG15	4100	4800	77	128	2	2	2.240
NJ 313 EG15	4000	4800	77	128	2.1	2.1	2.320
NU 313 EG15	4000	4800	77	128	2.1	2.1	2.240
NJ 2313 EG15	3800	4800	77	128	2.1	2.1	3.380
NU 2313 EG15	3800	4800	77	128	2.1	2.1	3.320
N 214 EG15	4400	5300	79	116	1.5	1.5	1.159
NJ 214 EG15	4400	5300	79	116	1.5	1.5	1.180
NU 214 EG15	4400	5300	79	116	1.5	1.5	1.150
NUP 214 EG15	4400	5300	79	116	1.5	1.5	1.200
NJ 2214 EG15	4400	5300	79	116	1.5	1.5	1.520
NU 2214 EG15	4400	5300	79	116	1.5	1.5	1.520
N 314 EG15	3700	4500	82	138	2	2	2.800
NJ 314 EG15	3700	4500	82	138	2.1	2.1	2.840
NU 314 EG15	3700	4500	82	138	2.1	2.1	2.790
NJ 2314 EG15	3600	4500	82	138	2.1	2.1	4.090
NU 2314 EG15	3600	4500	82	138	2.1	2.1	4.020
NJ 414M	3400	4100	86	164	3	3	6.070
N 215 EG15	4200	5100	84	121	1.5	1.5	1.280
NJ 215 EG15	4200	5100	84	121	1.5	1.5	1.700
NU 215 EG15	4200	5100	84	121	1.5	1.5	1.270

\* These are the speed limits according to the SNR concept (see pages 85 to 87).

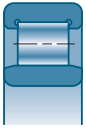


**Cylindrical roller bearings (continued)**


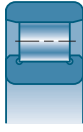
d		D	B	F	E			
						C	C <sub>0</sub>	
mm	References	mm	mm	mm	mm	10 <sup>3</sup> N	10 <sup>3</sup> N	
<b>75</b>	NUP 215 EG15	130	25	88.5	118.5	133	161	
	NJ 2215 EG15	130	31	88.5	118.5	164	211	
	NU 2215 EG15	130	31	88.5	118.5	164	211	
	N 315 EG15	160	37	95.0	143.0	250	265	
	NJ 315 EG15	160	37	95.0	143.0	250	265	
	NU 315 EG15	160	37	95.0	143.0	250	265	
	NJ 2315 EG15	160	55	95.0	143.0	330	400	
	NU 2315 EG15	160	55	95.0	143.0	330	400	
	<b>80</b>	N 216 EG15	140	26	95.3	127.3	146	171
NJ 216 EG15		140	26	95.3	127.3	146	171	
NU 216 EG15		140	26	95.3	127.3	146	171	
NJ 2216 EG15		140	33	95.3	127.3	189	247	
NU 2216 EG15		140	33	95.3	127.3	189	247	
N 316 EG15		170	39	101.0	151.0	270	290	
NJ 316 EG15		170	39	101.0	151.0	270	290	
NU 316 EG15		170	39	101.0	151.0	260	290	
NUP 316 EG15		170	39	101.0	151.0	260	290	
NU 2316 EG15		170	58	101.0	151.0	360	440	
<b>85</b>		N 217 EG15	150	28	100.5	136.5	173	201
	NJ 217 EG15	150	28	100.5	136.5	173	201	
	NU 217 EG15	150	28	100.5	136.5	173	201	
	NJ 2217 EG15	150	36	100.5	136.5	219	280	
	NU 2217 EG15	150	36	100.5	136.5	219	280	
	N 317 EM	180	41	108.0	160.0	295	325	
	NJ 317 EG15	180	41	108.0	160.0	280	315	
	NU 317 EG15	180	41	108.0	160.0	280	315	
	NUP 317 EG15	180	41	108.0	160.0	280	315	
	NU 2317 EG15	180	60	108.0	160.0	380	460	
	<b>90</b>	N 218 EG15	160	30	107.0	145.0	183	216
		NJ 218 EG15	160	30	107.0	145.0	186	224
		NU 218 EG15	160	30	107.0	145.0	191	224
NJ 2218 EG15		160	40	107.0	145.0	246	320	
NU 2218 EG15		160	40	107.0	145.0	246	320	
N 318 EM		190	43	113.5	169.5	330	360	
NJ 318 EG15		190	43	113.5	169.5	330	360	
NU 318 EG15		190	43	113.5	169.5	330	360	
NJ 2318 EM		190	64	113.5	169.5	440	540	
NU 2318 EG15		190	64	113.5	169.5	440	540	



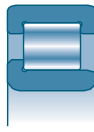
■ Single-row cylindrical roller bearings (continued)



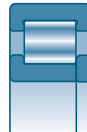
NU







N



NJ

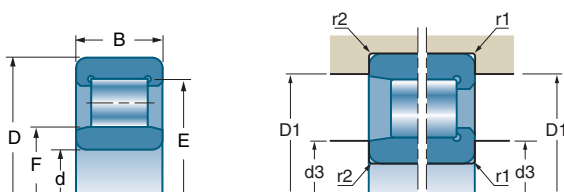





NUP

			d3 max	D1 min	r1 max	r2 max	
References	rpm*	rpm*	mm	mm	mm	mm	kg
NUP 215 EG15	4200	5100	84	121	1.5	1.5	1.330
NJ 2215 EG15	4200	5100	84	121	1.5	1.5	1.600
NU 2215 EG15	4200	5100	84	121	1.5	1.5	1.610
N 315 EG15	3500	4200	87	148	2	2	3.700
NJ 315 EG15	3500	4200	87	148	2	2	3.300
NU 315 EG15	3500	4200	87	148	2	2	3.300
NJ 2315 EG15	3300	4200	87	148	2.1	2.1	5.040
NU 2315 EG15	3300	4200	87	148	2.1	2.1	4.950
N 216 EG15	3900	4700	91	129	2	2	1.540
NJ 216 EG15	3900	4700	91	129	2	2	1.540
NU 216 EG15	3900	4700	91	129	2	2	1.540
NJ 2216 EG15	3900	4700	91	129	2	2	2.050
NU 2216 EG15	3900	4700	91	129	2	2	2.020
N 316 EG15	3300	3900	92	158	2	2	3.930
NJ 316 EG15	3300	3900	92	158	2.1	2.1	4.040
NU 316 EG15	3300	3900	92	158	2.1	2.1	3.960
NUP 316 EG15	3300	3900	92	158	2.1	2.1	4.110
NU 2316 EG15	3100	3900	92	155	2.1	2.1	5.890
N 217 EG15	3700	4400	96	139	2	2	1.890
NJ 217 EG15	3700	4400	96	139	2	2	1.890
NU 217 EG15	3700	4400	96	139	2	2	1.890
NJ 2217 EG15	3700	4400	96	139	2	2	2.550
NU 2217 EG15	3700	4400	96	139	2	2	2.500
N 317 EM	3100	3700	99	166	2.5	2.5	5.330
NJ 317 EG15	3100	3700	99	166	3	3	4.712
NU 317 EG15	3100	3700	99	166	3	3	4.620
NUP 317 EG15	3100	3700	99	166	3	3	5.200
NU 2317 EG15	2900	3700	99	162	3	3	6.710
N 218 EG15	3500	4200	101	149	2	2	2.360
NJ 218 EG15	3500	4200	101	149	2	2	2.410
NU 218 EG15	3400	4200	101	149	2	2	2.360
NJ 2218 EG15	3400	4200	101	149	2	2	3.230
NU 2218 EG15	3400	4200	101	149	2	2	3.170
N 318 EM	2900	3500	104	176	2.5	2.5	6.210
NJ 318 EG15	2900	3500	104	176	2.5	2.5	5.950
NU 318 EG15	2900	3500	104	176	2.5	2.5	5.420
NJ 2318 EM	2800	3500	104	172	3	3	9.100
NU 2318 EG15	2800	3500	104	172	3	3	8.040

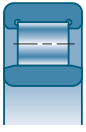
\* These are the speed limits according to the SNR concept (see pages 85 to 87).



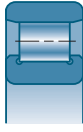
**Cylindrical roller bearings (continued)**


d		D	B	F	E		
						10 <sup>3</sup> N	10 <sup>3</sup> N
mm	References	mm	mm	mm	mm		
<b>95</b>	N 219 EG15	170	32	112.5	154.5	238	285
	NJ 219 EG15	170	32	112.5	154.5	238	285
	NU 219 EG15	170	32	112.5	154.5	238	285
	NJ 2219 EG15	170	43	112.5	154.5	290	375
	NU 2219 EG15	170	43	112.5	154.5	290	375
	N 319 EM	200	45	121.5	177.5	345	390
	NJ 319 EG15	200	45	121.5	177.5	340	390
	NU 319 EG15	200	45	121.5	177.5	340	390
	NU 2319 EG15	200	67	121.5	177.5	465	590
	<b>100</b>	N 220 EG15	180	34	119.0	163.0	260
NJ 220 EG15		180	34	119.0	163.0	260	310
NU 220 EG15		180	34	119.0	163.0	260	310
NJ 2220 EG15		180	46	119.0	163.0	335	450
NU 2220 EG15		180	46	119.0	163.0	335	450
N 320 EM		215	47	127.5	191.5	390	440
NJ 320 EG15		215	47	127.5	191.5	400	440
NU 320 EG15		215	47	127.5	191.5	390	440
NJ 2320 EM		215	73	127.5	191.5	580	730
NU 2320 EG15		215	73	127.5	191.5	570	720
<b>105</b>	NJ 221 EG15	190	36	125.5	171.5	265	325
	NU 221 EG15	190	36	125.5	171.5	265	325
	NU 221 EM	190	36	125.5	171.5	265	325
	NU 321 EM	225	49	133.0	201.0	435	495
<b>110</b>	N 222 EM	200	38	132.5	180.5	300	360
	NJ 222 EG15	200	38	132.5	180.5	300	360
	NU 222 EG15	200	38	132.5	180.5	300	360
	NU 2222 EG15	200	53	132.5	180.5	385	520
	N 322 EM	240	50	143.0	211.0	475	540
	NJ 322 EG15	240	50	143.0	211.0	435	500
	NU 322 EG15	240	50	143.0	211.0	440	510
	NJ 2322 EM	240	80	143.0	211.0	680	890
	NU 2322 EM	240	80	143.0	211.0	680	900
<b>120</b>	NJ 224 EG15	215	40	143.5	195.5	350	435
	NU 224 EG15	215	40	143.5	195.5	350	435
	NU 2224 EG15	215	58	143.5	195.5	460	630
	N 324 EM	260	55	154.0	230.0	530	620
	NJ 324 EG15	260	55	154.0	230.0	530	620
	NU 324 EG15	260	55	154.0	230.0	550	620

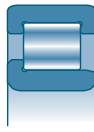
■ Single-row cylindrical roller bearings (continued)



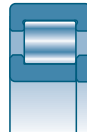
NU







N



NJ



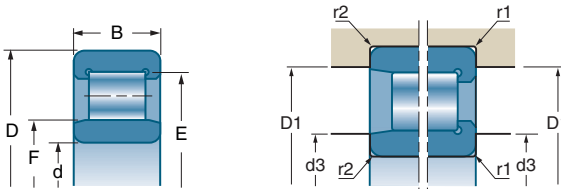
NUP

			d3 max	D1 min	r1 max	r2 max	
References	rpm*	rpm*	mm	mm	mm	mm	kg
N 219 EG15	3200	3900	107	158	2	2	2.830
NJ 219 EG15	3200	3900	107	158	2	2	2.830
NU 219 EG15	3200	3900	107	158	2	2	2.830
NJ 2219 EG15	3200	3900	107	158	2.1	2.1	3.900
NU 2219 EG15	3200	3900	107	158	2.1	2.1	3.900
N 319 EM	2800	3300	109	186	2.5	2.5	7.200
NJ 319 EG15	2800	3300	109	186	3	3	6.440
NU 319 EG15	2800	3300	109	186	3	3	6.320
NU 2319 EG15	2600	3300	109	186	3	3	9.400
N 220 EG15	3100	3700	112	168	2	2	3.440
NJ 220 EG15	3100	3700	112	168	2	2	3.440
NU 220 EG15	3100	3700	112	168	2	2	3.440
NJ 2220 EG15	3100	3700	112	168	2.1	2.1	4.850
NU 2220 EG15	3100	3700	112	168	2	2	4.800
N 320 EM	2600	3100	114	201	2.5	2.5	7.660
NJ 320 EG15	2600	3100	114	201	2.5	2.5	7.660
NU 320 EG15	2600	3100	124	202	2.5	2.5	7.660
NJ 2320 EM	2500	3100	118	195	3	3	13.500
NU 2320 EG15	2500	3100	118	195	3	3	12.100
NJ 221 EG15	2900	3500	178	117	2.1	2.1	4.083
NU 221 EG15	2900	3500	121	169	2.1	2.1	4.100
NU 221 EM	2900	3500	121	169	2.1	2.1	4.620
NU 321 EM	2500	2900	125	199	3	3	9.950
N 222 EM	2800	3400	122	188	2	2	5.500
NJ 222 EG15	2800	3300	122	188	2	2	4.850
NU 222 EG15	2800	3400	122	188	2	2	4.850
NU 2222 EG15	2800	3300	125	180	2.1	2.1	6.760
N 322 EM	2300	2800	124	226	2.5	2.5	10.600
NJ 322 EG15	2300	2800	124	226	3	3	10.330
NU 322 EG15	2400	2800	139	227	3	3	10.600
NJ 2322 EM	2200	2800	124	226	3	3	18.600
NU 2322 EM	2200	2800	124	226	3	3	18.300
NJ 224 EG15	2600	3100	132	203	2	2	5.740
NU 224 EG15	2600	3100	132	203	2	2	5.740
NU 2224 EG15	2500	3100	135	200	2.1	2.1	8.380
N 324 EM	2100	2600	134	246	3	3	15.110
NJ 324 EG15	2100	2600	134	246	3	3	13.540
NU 324 EG15	2100	2600	134	246	2.5	2.5	13.300

\* These are the speed limits according to the SNR concept (see pages 85 to 87).

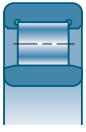


## Cylindrical roller bearings (continued)

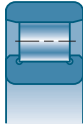


d		D	B	F	E		
						10 <sup>3</sup> N	10 <sup>3</sup> N
mm	References	mm	mm	mm	mm		
<b>120</b>	NJ 2324 EM	260	86	154.0	230.0	800	1040
	NU 2324 EM	260	86	154.0	230.0	800	1040
<b>130</b>	NJ 226 EG15	230	40	153.5	209.5	375	460
	NU 226 EG15	230	40	153.5	209.5	375	460
	NU 2226 EG15	230	64	153.5	209.5	530	740
	N 326 EM	280	58	167.0	247.0	620	750
	NJ 326 EG15	280	58	167.0	247.0	590	690
	NU 326 EG15	280	58	167.0	247.0	610	690
	NJ 2326 EM	280	93	167.0	247.0	930	1240
	NU 2326 EM	280	93	167.0	247.0	930	1240
	<b>140</b>	N 228 EM	250	42	169.0	225.0	400
NJ 228 EM		250	42	169.0	225.0	400	510
NU 228 EM		250	42	169.0	225.0	400	510
N 328 EM		300	62	180.0	264.0	680	830
NU 328 EM		300	62	180.0	264.0	680	800
NU 2328 EM		300	102	180.0	264.0	1040	1420
<b>150</b>	NJ 230 EM	270	45	182.0	242.0	465	600
	NU 230 EM	270	45	182.0	242.0	465	600
	N 330 EM	320	65	193.0	283.0	770	940
	NU 330 EM	320	65	193.0	283.0	760	890
	NU 2330 EM	320	108	193.0	283.0	1170	1600
<b>160</b>	NJ 232 EM	290	48	195.0	259.0	530	690
	NU 232 EM	290	48	195.0	259.0	530	690
	NU 2332 EM	340	114	204.0	300.0	1330	1840
<b>170</b>	NU 234 EM	310	52	207.0	279.0	610	820
	N 334 EM	360	72	218.0	318.0	990	1260
<b>180</b>	NU 236 EM	320	52	217.0	289.0	630	870
<b>190</b>	NU 238 EM	340	55	230.0	306.0	720	970
	N 338 EM	400	78	245.0	353.0	1150	1490
<b>200</b>	N 340 EM	420	80	258.0	370.0	1230	1610

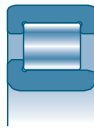
■ Single-row cylindrical roller bearings (continued)



NU



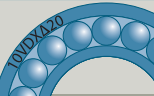


N



NJ



NUP

			d3 max	D1 min	r1 max	r2 max	
References	rpm*	rpm*	mm	mm	mm	mm	kg
NJ 2324 EM NU 2324 EM	2000 2000	2600 2600	134 134	246 246	3 3	3 3	23.800 23.200
NJ 226 EG15 NU 226 EG15 NU 2226 EG15 N 326 EM NJ 326 EG15 NU 326 EG15 NJ 2326 EM NU 2326 EM	2400 2400 2400 2000 2000 2000 1900 1900	2900 2900 2900 2400 2400 2400 2400 2400	144 144 144 180 147 147 147 147	216 216 210 253 263 263 263 263	2.5 2.5 3 4 3 3 4 4	2.5 2.5 3 4 3 3 4 4	6.500 6.500 10.400 18.440 16.500 16.400 29.200 28.800
N 228 EM NJ 228 EM NU 228 EM N 328 EM NU 328 EM NU 2328 EM	2200 2200 2200 1800 1900 1800	2700 2700 2700 2200 2200 2200	157 157 157 184 176 165	233 233 233 269 284 270	3 3 3 4 4 4	3 3 3 4 4 4	9.340 9.650 9.340 22.510 22.450 36.000
NJ 230 EM NU 230 EM N 330 EM NU 330 EM NU 2330 EM	2000 2000 1700 1800 1600	2500 2500 2100 2100 2100	170.3 170.3 189 189 185	246.6 246.6 304 304 304	3 3 4 5 4	3 3 4 5 4	12.200 12.000 26.800 27.300 43.200
NJ 232 EM NU 232 EM NU 2332 EM	1900 1900 1500	2300 2300 1900	206.5 206.5 195	264.9 264.6 298	3 3 4	3 3 4	15.100 14.600 51.500
NU 234 EM N 334 EM	1800 1500	2100 1800	201 220	276 328	4 4	4 4	18.130 37.900
NU 236 EM	1700	2000	210	286	4	4	18.910
NU 238 EM N 338 EM	1600 1400	1900 1600	226 250	324 365	5 5	5 5	22.700 50.500
N 340 EM	1300	1500	260	385	5	5	57.000

\* These are the speed limits according to the SNR concept (see pages 85 to 87).

