

## Cylindrical Roller Bearings

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### ● Designs and Configurations

NACHI Cylindrical Roller Bearings are produced in a wide variety of designs and configurations.

### ● Conventional Design

Cylindrical Roller Bearings of conventional design are available in 10 configurations as shown in Fig. 1. Configurations N, NU, NN and NNU will not sustain axial loading. These configurations must be used as the float end bearing.

Configurations NF, NJ, NUH are designed with the capability of sustaining axial loading in one direction. Configuration NUH is basically an NU

bearing with an addition of a guide ring (an “L” ring).

The NUH dimensional data is the same as the NH bearing configuration.

Configuration NF, NJ, and NUH can sustain axial loading in one direction.

Configuration NH, NP, and NUP have bi-directional thrust load-carrying-capability.

● The suffix of the bearing number indicates:

E: high capacity

G: polyamide cage

● The bearing with polyamide cage should be used at less than 120°C operating temperature.

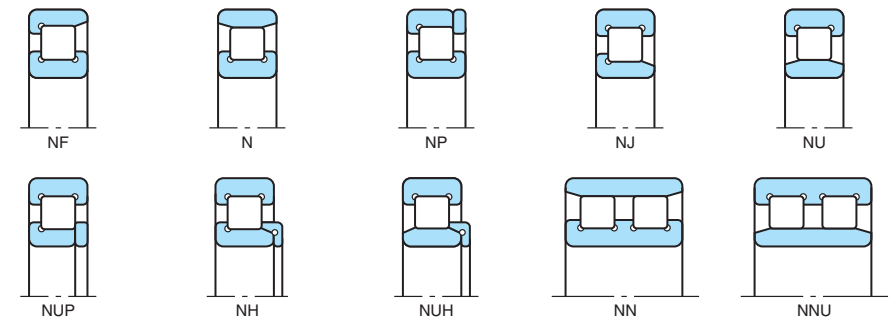


Fig 1. Cylindrical Roller Bearing Configurations

Table 1. Cylindrical Roller Bearing Standard Cage

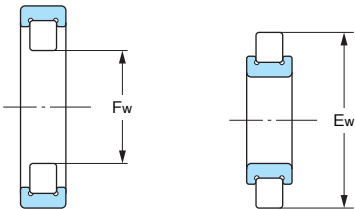
| Bearing series | Pressed Steel | Machined Brass |
|----------------|---------------|----------------|
| NU10           | 1007~1038     | 1040~10/500    |
| NU2            | 203~ 228      | 230~ 264       |
| NU22           | 2204~2226     | 2228~2252      |
| NU3            | 304~ 324      | 326~ 352       |
| NU23           | 2304~2319     | 2320~2340      |
| NU4            | 405~ 416      | 417~ 430       |



● Interchangeable Bearings

Interchangeable cylindrical roller bearing means that a separable ring can be replaced by another ring of the bearing with the same bearing number without impairing the function of the bearing.

Table 2. Interchangeable Cylindrical Roller Bearings: Tolerance of Inscribed (Fw) and Circumscribed (Ew) Diameters



Unit: μm

| Nominal bore dia. d (mm) |       | Tolerance of Fw |     | Tolerance of Ew |     |
|--------------------------|-------|-----------------|-----|-----------------|-----|
| Over                     | Incl. | High            | Low | High            | Low |
| —                        | 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   | —               | —   |

● Radial Internal Clearance

The initial radial internal clearance of the bearing should be determined for optimal bearing operation.

The following procedure should be observed to determine the proper initial radial internal clearance:

- (a) Place the bearing in an upright position with inner/outer ring faces parallel.
- (b) Place thumbs on inner ring bore and oscillate inner ring two or three times, pressing down firmly. This "seats" the inner ring and rollers.
- (c) Position the individual roller assemblies so that a roller is at the top of inner ring - on both sides of the bearing.
- (d) Press the two rollers inward to assure contact with the center guide ring as well as the inner ring raceway.
- (e) With the rollers in correct position, insert a thin feeler gauge between the rollers and the raceway. **Caution : DO NOT ROLL THE BEARING.**
- (f) Move it carefully over the top roller between the roller and outer raceway.
- (g) Repeat this procedure, using progressively thicker feeler gauge until one is found that will not go through.
- (h) The gauge thickness that preceded the "No - GO" gauge is the radial internal clearance.

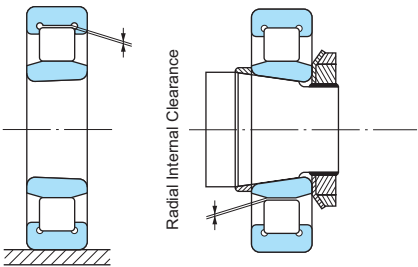
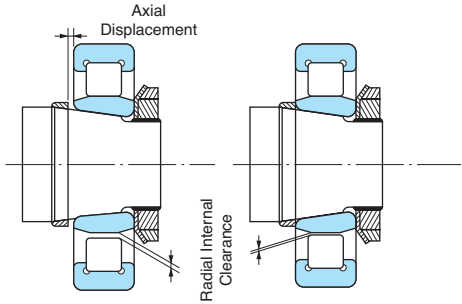


Table 3. Mounting cylindrical roller bearings with tapered bore



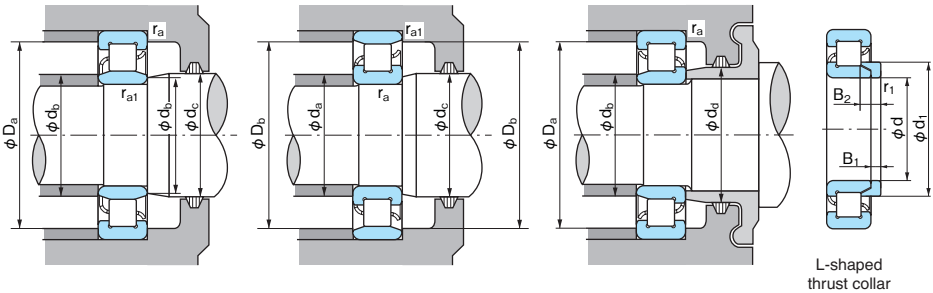
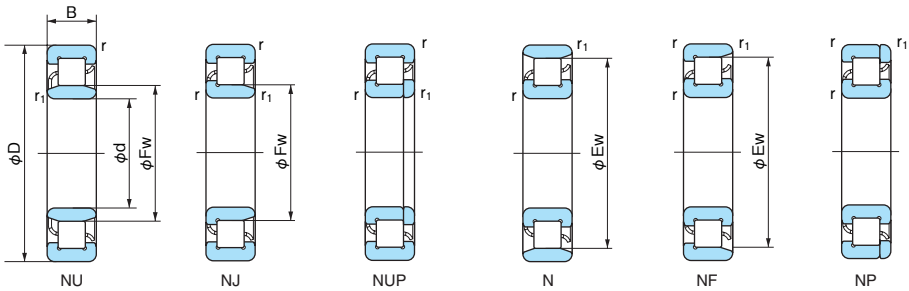
Unit: μm

| Bearing Bore Diameter d (mm) |       | Radial Clearance Reduction (mm) |       | Axial displacement Taper 1:12     |      |                              |      |
|------------------------------|-------|---------------------------------|-------|-----------------------------------|------|------------------------------|------|
|                              |       |                                 |       | Direct Mounting on the shaft (mm) |      | With Adapter Assemblies (mm) |      |
| Over                         | Incl. | min                             | max   | min                               | max  | max                          | min  |
| 40                           | 50    | 0.025                           | 0.030 | 0.40                              | 0.50 | 0.55                         | 0.60 |
| 50                           | 65    | 0.030                           | 0.035 | 0.50                              | 0.55 | 0.60                         | 0.70 |
| 65                           | 80    | 0.030                           | 0.040 | 0.50                              | 0.65 | 0.60                         | 0.75 |
| 80                           | 100   | 0.035                           | 0.045 | 0.55                              | 0.70 | 0.70                         | 0.85 |
| 100                          | 120   | 0.040                           | 0.050 | 0.65                              | 0.80 | 0.75                         | 0.90 |
| 120                          | 140   | 0.045                           | 0.055 | 0.70                              | 0.85 | 0.85                         | 1.00 |
| 140                          | 160   | 0.045                           | 0.060 | 0.70                              | 0.95 | 0.85                         | 1.05 |
| 160                          | 180   | 0.050                           | 0.065 | 0.80                              | 1.00 | 0.90                         | 1.15 |
| 180                          | 200   | 0.055                           | 0.070 | 0.85                              | 1.10 | 1.00                         | 1.20 |
| 200                          | 225   | 0.065                           | 0.080 | 1.00                              | 1.25 | 1.15                         | 1.35 |
| 225                          | 250   | 0.070                           | 0.085 | 1.10                              | 1.30 | 1.20                         | 1.45 |
| 250                          | 280   | 0.075                           | 0.095 | 1.15                              | 1.45 | 1.30                         | 1.60 |
| 280                          | 315   | 0.080                           | 0.100 | 1.25                              | 1.55 | 1.35                         | 1.65 |
| 315                          | 355   | 0.095                           | 0.115 | 1.45                              | 1.75 | 1.60                         | 1.90 |
| 355                          | 400   | 0.100                           | 0.125 | 1.55                              | 1.90 | 1.65                         | 2.05 |
| 400                          | 450   | 0.115                           | 0.140 | 1.80                              | 2.20 | 1.90                         | 2.30 |
| 450                          | 500   | 0.130                           | 0.160 | 2.00                              | 2.50 | 2.10                         | 2.60 |

Note: 1. The axial displacement values are applied for mounting on a solid shaft. In case of a hollow shaft, larger axial displacement should be applied.  
2. It is imperative to check radial internal clearance after mounting when ;  
- The initial unmounted radial internal clearance is in the lower half of the tolerance range.  
- There is a temperature difference between the inner and outer rings under operating conditions.  
Internal clearance after mounting must be above the values shown in the table.

Cylindrical Roller Bearings

Bore Diameter: 17~30mm

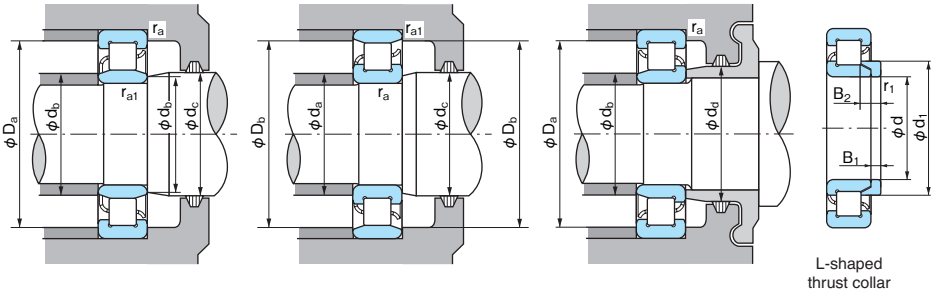
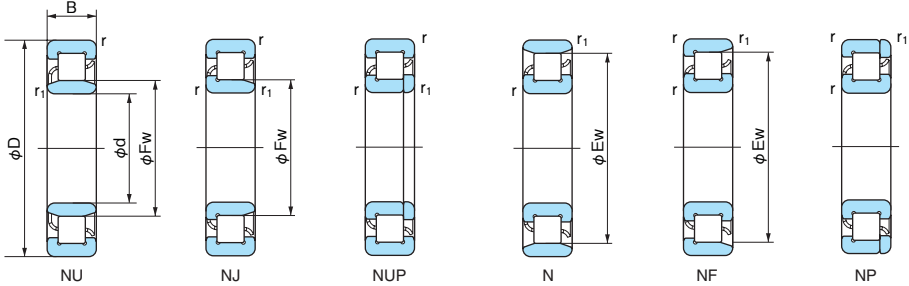


| 1N=0.102kgf              |    |      |      |      |         |           |             |     |     |    |    |       |                                  |                                  |                                                     |                 |                                     |          |          |          |          |          |          |          |           |          |                                           |       |           |             |      |          |      |      |          |                     |   |   |   |
|--------------------------|----|------|------|------|---------|-----------|-------------|-----|-----|----|----|-------|----------------------------------|----------------------------------|-----------------------------------------------------|-----------------|-------------------------------------|----------|----------|----------|----------|----------|----------|----------|-----------|----------|-------------------------------------------|-------|-----------|-------------|------|----------|------|------|----------|---------------------|---|---|---|
| Boundary dimensions (mm) |    |      |      |      |         |           | Bearing No. |     |     |    |    |       | Basic dynamic load rating Cr (N) | Basic static load rating Cor (N) | Limiting speed (min <sup>-1</sup> )( <sup>1</sup> ) |                 | Abutment and fillet dimensions (mm) |          |          |          |          |          |          |          | Mass (kg) |          | Dimensions of L-shaped thrust collar (mm) |       |           |             |      |          |      |      |          |                     |   |   |   |
| d                        | D  | B    | Ew   | Fw   | r (min) | r1 (min)  | NU          | NJ  | NUP | N  | NF | NP    |                                  |                                  | Grease lubrication                                  | Oil lubrication |                                     | da (min) | db (min) | db (max) | dc (min) | dd (min) | Da (max) | Db (max) | (min)     | ra (max) | ra1 (max)                                 | NU    | N         | Bearing No. | d    | d1 (max) | B1   | B2   | r1 (min) | Mass (kg) Reference |   |   |   |
| 17                       | 40 | 12   | 33.9 | 22.9 | 0.6     | 0.3       | NU 203      | NJ  | NUP | N  | NF | NP    | 12600                            | 7950                             | 16000                                               | 19000           |                                     | 22       | 19       | 22       | 24       | 25       | 35       | 34       | 34        | 0.6      | 0.3                                       | 0.082 | 0.080     | —           | —    | —        | —    | —    | —        | —                   | — | — | — |
| 20                       | 47 | 14   | 40   | 27   | 1       | 0.6       | NU 204      | NJ  | NUP | N  | NF | NP    | 15400                            | 12700                            | 15000                                               | 18000           |                                     | 26       | 25       | 26       | 29       | 32       | 41       | 42       | 42        | 1        | 0.6                                       | 0.112 | 0.110     | HJ 204      | 20   | 30       | 3    | 6.75 | 0.6      | 0.012               |   |   |   |
|                          | 47 | 14   | —    | 26.5 | 1       | 0.6       | NU 204 E    | NJ  | NUP | —  | —  | —     | 25700                            | 22600                            | 13000                                               | 16000           |                                     | —        | 25       | 26       | 29       | 32       | 41       | —        | —         | 1        | 0.6                                       | 0.124 | —         | HJ 204 E    | 20   | 29.8     | 3    | 5.5  | 0.6      | 0.011               |   |   |   |
|                          | 47 | 18   | —    | 27   | 1       | 0.6       | NU 2204     | NJ  | NUP | —  | —  | —     | 20700                            | 18400                            | 14000                                               | 17000           |                                     | —        | 25       | 26       | 29       | 32       | 41       | —        | —         | 1        | 0.6                                       | 0.144 | —         | HJ 2204     | 20   | 30       | 3    | 7.5  | 0.6      | 0.012               |   |   |   |
|                          | 47 | 18   | —    | 26.5 | 1       | 0.6       | NU 2204 E   | NJ  | NUP | —  | —  | —     | 30500                            | 28300                            | 13000                                               | 16000           |                                     | —        | 25       | 26       | 29       | 32       | 41       | —        | —         | 1        | 0.6                                       | 0.162 | —         | HJ 2204 E   | 20   | 29.8     | 3    | 6.5  | 0.6      | 0.011               |   |   |   |
|                          | 52 | 15   | 44.5 | 28.5 | 1.1     | 0.6       | NU 304      | NJ  | NUP | N  | NF | NP    | 21400                            | 17300                            | 12000                                               | 15000           |                                     | 27       | 25       | 27       | 30       | 33       | 45       | 47       | 47        | 1        | 0.6                                       | 0.154 | 0.150     | HJ 304      | 20   | 31.8     | 4    | 7.5  | 0.6      | 0.017               |   |   |   |
|                          | 52 | 15   | —    | 27.5 | 1.1     | 0.6       | NU 304 EG   | NJ  | NUP | —  | —  | —     | 31500                            | 26900                            | 12000                                               | 15000           |                                     | —        | 25       | 27       | 30       | 33       | 45       | —        | —         | 1        | 0.6                                       | 0.150 | —         | HJ 304 E    | 20   | 31.4     | 4    | 6.5  | 0.6      | 0.016               |   |   |   |
|                          | 52 | 21   | —    | 28.5 | 1.1     | 0.6       | NU 2304     | NJ  | NUP | —  | —  | —     | 30500                            | 27200                            | 11000                                               | 14000           |                                     | —        | 25       | 27       | 30       | 33       | 45       | —        | —         | 1        | 0.6                                       | 0.213 | —         | HJ 2304     | 20   | 31.8     | 4    | 8.5  | 0.6      | 0.018               |   |   |   |
| 52                       | 21 | —    | 27.5 | 1.1  | 0.6     | NU 2304 E | NJ          | NUP | —   | —  | —  | 42000 | 39000                            | 11000                            | 14000                                               |                 | —                                   | 25       | 27       | 30       | 33       | 45       | —        | —        | 1         | 0.6      | 0.240                                     | —     | HJ 2304 E | 20          | 31.4 | 4        | 7.5  | 0.6  | 0.017    |                     |   |   |   |
| 25                       | 47 | 12   | 41.5 | 30.5 | 0.6     | 0.3       | NU 1005     | —   | —   | N  | —  | —     | 14300                            | 13100                            | 15000                                               | 18000           |                                     | 29       | 27.5     | 30       | 32       | —        | 42       | 45       | 41.8      | 0.6      | 0.3                                       | 0.086 | 0.084     | —           | —    | —        | —    | —    | —        | —                   | — |   |   |
|                          | 52 | 15   | 45   | 32   | 1       | 0.6       | NU 205      | NJ  | NUP | N  | NF | NP    | 17700                            | 15700                            | 13000                                               | 16000           |                                     | 31       | 30       | 31       | 34       | 37       | 46       | 47       | 47        | 1        | 0.6                                       | 0.133 | 0.130     | HJ 205      | 25   | 35       | 3    | 7.25 | 0.6      | 0.015               |   |   |   |
|                          | 52 | 15   | —    | 31.5 | 1       | 0.6       | NU 205 EG   | NJ  | NUP | —  | —  | —     | 29300                            | 27700                            | 12000                                               | 14000           |                                     | —        | 30       | 31       | 34       | 37       | 46       | —        | —         | 1        | 0.6                                       | 0.140 | —         | HJ 205 E    | 25   | 34.8     | 3    | 6    | 0.6      | 0.013               |   |   |   |
|                          | 52 | 18   | —    | 32   | 1       | 0.6       | NU 2205     | NJ  | NUP | —  | —  | —     | 24300                            | 23500                            | 12000                                               | 14000           |                                     | —        | 30       | 31       | 34       | 37       | 46       | —        | —         | 1        | 0.6                                       | 0.163 | —         | HJ 2205     | 25   | 35       | 3    | 7.5  | 0.6      | 0.016               |   |   |   |
|                          | 52 | 18   | —    | 31.5 | 1       | 0.6       | NU 2205 EG  | NJ  | NUP | —  | —  | —     | 35000                            | 34500                            | 12000                                               | 14000           |                                     | —        | 30       | 31       | 34       | 37       | 46       | —        | —         | 1        | 0.6                                       | 0.185 | —         | HJ 2205 E   | 25   | 34.8     | 3    | 6.5  | 0.6      | 0.015               |   |   |   |
|                          | 62 | 17   | 53   | 35   | 1.1     | 1.1       | NU 305      | NJ  | NUP | N  | NF | NP    | 29300                            | 25200                            | 10000                                               | 13000           |                                     | 32       | 32       | 33       | 37       | 40       | 55       | 55       | 55        | 1        | 1                                         | 0.238 | 0.230     | HJ 305      | 25   | 39       | 4    | 8    | 1.1      | 0.027               |   |   |   |
|                          | 62 | 17   | —    | 34   | 1.1     | 1.1       | NU 305 EG   | NJ  | NUP | —  | —  | —     | 41500                            | 37500                            | 10000                                               | 12000           |                                     | —        | 32       | 33       | 37       | 40       | 55       | —        | —         | 1        | 1                                         | 0.240 | —         | HJ 305 E    | 25   | 38.2     | 4    | 7    | 1.1      | 0.024               |   |   |   |
|                          | 62 | 24   | —    | 35   | 1.1     | 1.1       | NU 2305     | NJ  | NUP | —  | —  | —     | 42500                            | 41000                            | 9300                                                | 11000           |                                     | —        | 32       | 33       | 37       | 40       | 55       | —        | —         | 1        | 1                                         | 0.340 | —         | HJ 2305     | 25   | 39       | 4    | 9    | 1.1      | 0.029               |   |   |   |
| 62                       | 24 | —    | 34   | 1.1  | 1.1     | NU 2305 E | NJ          | NUP | —   | —  | —  | 57000 | 56000                            | 9000                             | 11000                                               |                 | —                                   | 32       | 33       | 37       | 40       | 55       | —        | —        | 1         | 1        | 0.390                                     | —     | HJ 2305 E | 25          | 38.2 | 4        | 8    | 1.1  | 0.026    |                     |   |   |   |
| 80                       | 21 | 62.8 | 38.8 | 1.5  | 1.5     | NU 405    | NJ          | NUP | N   | NF | NP | 46500 | 40000                            | 9000                             | 11000                                               |                 | 33.5                                | 33.5     | 38       | 41       | 46       | 71.5     | 71.5     | 64       | 1.5       | 1.5      | 0.564                                     | 0.550 | HJ 405    | 25          | 43.6 | 6        | 10.5 | 1.5  | 0.054    |                     |   |   |   |
| 30                       | 55 | 13   | 48.5 | 36.5 | 1       | 0.6       | NU 1006     | —   | —   | N  | —  | —     | 19700                            | 19600                            | 12000                                               | 15000           |                                     | 35       | 33.5     | 35       | 38       | —        | 49       | 52       | 49        | 1        | 0.6                                       | 0.123 | 0.121     | —           | —    | —        | —    | —    | —        | —                   | — |   |   |
|                          | 62 | 16   | 53.5 | 38.5 | 1       | 0.6       | NU 206      | NJ  | NUP | N  | NF | NP    | 23500                            | 21500                            | 11000                                               | 13000           |                                     | 36       | 35       | 37       | 40       | 44       | 56       | 57       | 56        | 1        | 0.6                                       | 0.204 | 0.200     | HJ 206      | 30   | 41.8     | 4    | 8.25 | 0.6      | 0.026               |   |   |   |
|                          | 62 | 16   | —    | 37.5 | 1       | 0.6       | NU 206 EG   | NJ  | NUP | —  | —  | —     | 39000                            | 37500                            | 9500                                                | 12000           |                                     | —        | 35       | 37       | 40       | 44       | 56       | —        | —         | 1        | 0.6                                       | 0.210 | —         | HJ 206 E    | 30   | 41.4     | 4    | 7    | 0.6      | 0.024               |   |   |   |
|                          | 62 | 20   | —    | 38.5 | 1       | 0.6       | NU 2206     | NJ  | NUP | —  | —  | —     | 33000                            | 33000                            | 10000                                               | 12000           |                                     | —        | 35       | 37       | 40       | 44       | 56       | —        | —         | 1        | 0.6                                       | 0.262 | —         | HJ 2206     | 30   | 41.8     | 4    | 8.5  | 0.6      | 0.026               |   |   |   |
|                          | 62 | 20   | —    | 37.5 | 1       | 0.6       | NU 2206 EG  | NJ  | NUP | —  | —  | —     | 49000                            | 50000                            | 9500                                                | 12000           |                                     | —        | 35       | 37       | 40       | 44       | 56       | —        | —         | 1        | 0.6                                       | 0.295 | —         | HJ 2206 E   | 30   | 41.4     | 4    | 7.5  | 0.6      | 0.025               |   |   |   |
|                          | 72 | 19   | 62   | 42   | 1.1     | 1.1       | NU 306      | NJ  | NUP | N  | NF | NP    | 38500                            | 35000                            | 8500                                                | 11000           |                                     | 37       | 37       | 40       | 44       | 48       | 65       | 65       | 64        | 1        | 1                                         | 0.357 | 0.350     | HJ 306      | 30   | 45.9     | 5    | 9.5  | 1.1      | 0.044               |   |   |   |
|                          | 72 | 19   | —    | 40.5 | 1.1     | 1.1       | NU 306 EG   | NJ  | NUP | —  | —  | —     | 53000                            | 50000                            | 8500                                                | 10000           |                                     | —        | 37       | 40       | 44       | 48       | 65       | —        | —         | 1        | 1                                         | 0.370 | —         | HJ 306 E    | 30   | 45.1     | 5    | 8.5  | 1.1      | 0.041               |   |   |   |
|                          | 72 | 27   | —    | 42   | 1.1     | 1.1       | NU 2306     | NJ  | NUP | —  | —  | —     | 51500                            | 51000                            | 8200                                                | 9800            |                                     | —        | 37       | 40       | 44       | 48       | 65       | —        | —         | 1        | 1                                         | 0.500 | —         | HJ 2306     | 30   | 45.9     | 5    | 11.5 | 1.1      | 0.048               |   |   |   |
|                          | 72 | 27   | —    | 40.5 | 1.1     | 1.1       | NU 2306 E   | NJ  | NUP | —  | —  | —     | 74500                            | 77500                            | 8000                                                | 9500            |                                     | —        | 37       | 40       | 44       | 48       | 65       | —        | —         | 1        | 1                                         | 0.585 | —         | HJ 2306 E   | 30   | 45.1     | 5    | 9.5  | 1.1      | 0.043               |   |   |   |
| 90                       | 23 | 73   | 45   | 1.5  | 1.5     | NU 406    | NJ          | NUP | N   | NF | NP | 62500 | 55000                            | 7500                             | 9500                                                |                 | 38.5                                | 38.5     | 44       | 47       | 52       | 81.5     | 81.5     | 74       | 1.5       | 1.5      | 0.770                                     | 0.750 | HJ 406    | 30          | 50.5 | 7        | 11.5 | 1.5  | 0.080    |                     |   |   |   |

Note: (1) The dimension table shows limiting speed for bearings made with machined cages. For bearings made with pressed steel cages, multiply the table limits by 0.8.

Cylindrical Roller Bearings

Bore Diameter: 35~45mm

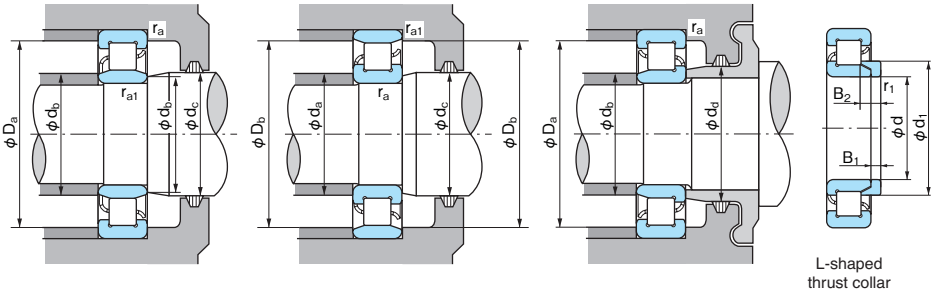
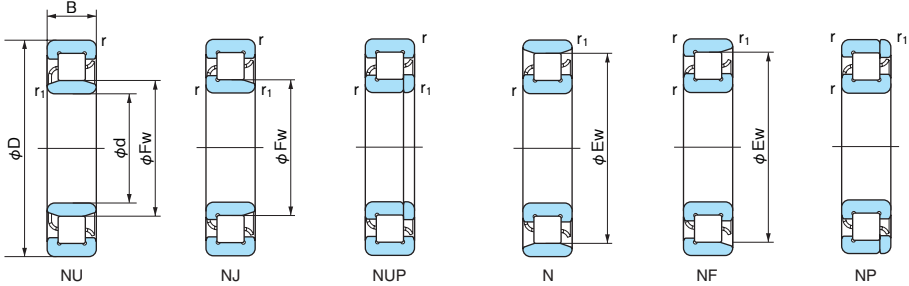


| 1N=0.102kgf              |     |    |       |      |         |                      |           |    |     |   |    |                                  |                                  |                                                     |                    |                                     |  |                      |                            |       |                      |                      |                      |                            |      |                                           |                       |       |       |             |    |                      |                |                |                      |                     |   |   |   |
|--------------------------|-----|----|-------|------|---------|----------------------|-----------|----|-----|---|----|----------------------------------|----------------------------------|-----------------------------------------------------|--------------------|-------------------------------------|--|----------------------|----------------------------|-------|----------------------|----------------------|----------------------|----------------------------|------|-------------------------------------------|-----------------------|-------|-------|-------------|----|----------------------|----------------|----------------|----------------------|---------------------|---|---|---|
| Boundary dimensions (mm) |     |    |       |      |         | Bearing No.          |           |    |     |   |    | Basic dynamic load rating Cr (N) | Basic static load rating Cor (N) | Limiting speed (min <sup>-1</sup> )( <sup>1</sup> ) |                    | Abutment and fillet dimensions (mm) |  |                      |                            |       |                      |                      |                      | Mass (kg)                  |      | Dimensions of L-shaped thrust collar (mm) |                       |       |       |             |    |                      |                |                |                      |                     |   |   |   |
| d                        | D   | B  | Ew    | Fw   | r (min) | r <sub>1</sub> (min) | NU        | NJ | NUP | N | NF | NP                               |                                  |                                                     | Grease lubrication | Oil lubrication                     |  | d <sub>a</sub> (min) | d <sub>b</sub> (min) (max) |       | d <sub>c</sub> (min) | d <sub>d</sub> (min) | D <sub>a</sub> (max) | D <sub>b</sub> (max) (min) |      | r <sub>a</sub> (max)                      | r <sub>a1</sub> (max) | NU    | N     | Bearing No. | d  | d <sub>1</sub> (max) | B <sub>1</sub> | B <sub>2</sub> | r <sub>1</sub> (min) | Mass (kg) Reference |   |   |   |
| 35                       | 62  | 14 | 55    | 42   | 1       | 0.6                  | NU 1007   | —  | —   | N | —  | —                                | 22600                            | 23200                                               | 11000              | 13000                               |  | 40                   | 38.5                       | (max) | 44                   | —                    | 56                   | 59                         | 55.5 | 1                                         | 0.6                   | 0.185 | 0.182 | —           | —  | —                    | —              | —              | —                    | —                   | — | — | — |
|                          | 72  | 17 | 61.8  | 43.8 | 1.1     | 0.6                  | NU 207    | NJ | NUP | N | NF | NP                               | 33500                            | 31500                                               | 9500               | 11000                               |  | 42                   | 40                         | 43    | 46                   | 50                   | 65                   | 67                         | 64   | 1                                         | 0.6                   | 0.295 | 0.290 | HJ 207      | 35 | 47.6                 | 4              | 8              | 0.6                  | 0.032               |   |   |   |
|                          | 72  | 17 | —     | 44   | 1.1     | 0.6                  | NU 207EG  | NJ | NUP | — | —  | —                                | 50500                            | 50000                                               | 8500               | 10000                               |  | —                    | 40                         | 43    | 46                   | 50                   | 65                   | —                          | —    | 1                                         | 0.6                   | 0.300 | —     | HJ 207E     | 35 | 48.2                 | 4              | 7              | 0.6                  | 0.032               |   |   |   |
|                          | 72  | 23 | —     | 43.8 | 1.1     | 0.6                  | NU 2207   | NJ | NUP | — | —  | —                                | 49000                            | 51000                                               | 8500               | 10000                               |  | —                    | 40                         | 43    | 46                   | 50                   | 65                   | —                          | —    | 1                                         | 0.6                   | 0.402 | —     | HJ 2207     | 35 | 47.6                 | 4              | 8.5            | 0.6                  | 0.033               |   |   |   |
|                          | 72  | 23 | —     | 44   | 1.1     | 0.6                  | NU 2207EG | NJ | NUP | — | —  | —                                | 61500                            | 65000                                               | 8500               | 10000                               |  | —                    | 40                         | 43    | 46                   | 50                   | 65                   | —                          | —    | 1                                         | 0.6                   | 0.446 | —     | HJ 2207E    | 35 | 48.2                 | 4              | 8.5            | 0.6                  | 0.035               |   |   |   |
|                          | 80  | 21 | 68.2  | 46.2 | 1.5     | 1.1                  | NU 307    | NJ | NUP | N | NF | NP                               | 49500                            | 47000                                               | 8000               | 9500                                |  | 43.5                 | 42                         | 45    | 48                   | 53                   | 71.5                 | 73                         | 71   | 1.5                                       | 1                     | 0.470 | 0.460 | HJ 307      | 35 | 50.8                 | 6              | 11             | 1.1                  | 0.060               |   |   |   |
|                          | 80  | 21 | —     | 46.2 | 1.5     | 1.1                  | NU 307EG  | NJ | NUP | — | —  | —                                | 66500                            | 65500                                               | 7500               | 9500                                |  | —                    | 42                         | 45    | 48                   | 53                   | 71.5                 | —                          | —    | 1.5                                       | 1                     | 0.490 | —     | HJ 307E     | 35 | 51.1                 | 6              | 9.5            | 1.1                  | 0.058               |   |   |   |
|                          | 80  | 31 | —     | 46.2 | 1.5     | 1.1                  | NU 2307   | NJ | NUP | — | —  | —                                | 60500                            | 60000                                               | 7200               | 8600                                |  | —                    | 42                         | 45    | 48                   | 53                   | 71.5                 | —                          | —    | 1.5                                       | 1                     | 0.696 | —     | HJ 2307     | 35 | 50.8                 | 6              | 14             | 1.1                  | 0.067               |   |   |   |
|                          | 80  | 31 | —     | 46.2 | 1.5     | 1.1                  | NU 2307E  | NJ | NUP | — | —  | —                                | 99000                            | 109000                                              | 6800               | 8500                                |  | —                    | 42                         | 45    | 48                   | 53                   | 71.5                 | —                          | —    | 1.5                                       | 1                     | 0.780 | —     | HJ 2307E    | 35 | 51.1                 | 6              | 11             | 1.1                  | 0.062               |   |   |   |
|                          | 100 | 25 | 83    | 53   | 1.5     | 1.5                  | NU 407    | NJ | NUP | — | NF | NP                               | 75500                            | 69000                                               | 6700               | 8000                                |  | 43.5                 | 43.5                       | 52    | 55                   | 61                   | 91.5                 | 91.5                       | 84   | 1.5                                       | 1.5                   | 1.05  | 1.02  | HJ 407      | 35 | 59                   | 8              | 13             | 1.5                  | 0.120               |   |   |   |
| 40                       | 68  | 15 | 61    | 47   | 1       | 0.6                  | NU 1008   | —  | —   | N | —  | —                                | 27300                            | 29000                                               | 10000              | 12000                               |  | 45                   | 45                         | 46    | 49                   | —                    | 62                   | 64                         | 61.5 | 1                                         | 0.6                   | 0.226 | 0.223 | —           | —  | —                    | —              | —              | —                    | —                   | — | — | — |
|                          | 80  | 18 | 70    | 50   | 1.1     | 1.1                  | NU 208    | NJ | NUP | N | NF | NP                               | 43500                            | 43000                                               | 8500               | 10000                               |  | 47                   | 47                         | 49    | 52                   | 56                   | 73                   | 73                         | 72   | 1                                         | 1                     | 0.369 | 0.360 | HJ 208      | 40 | 54.2                 | 5              | 9              | 1.1                  | 0.049               |   |   |   |
|                          | 80  | 18 | —     | 49.5 | 1.1     | 1.1                  | NU 208EG  | NJ | NUP | — | —  | —                                | 55500                            | 55500                                               | 9500               | 9000                                |  | —                    | 47                         | 49    | 52                   | 56                   | 73                   | —                          | —    | 1                                         | 1                     | 0.380 | —     | HJ 208E     | 40 | 54.1                 | 5              | 8.5            | 1.1                  | 0.047               |   |   |   |
|                          | 80  | 23 | —     | 50   | 1.1     | 1.1                  | NU 2208   | NJ | NUP | — | —  | —                                | 58000                            | 62000                                               | 7500               | 9000                                |  | —                    | 47                         | 49    | 52                   | 56                   | 73                   | —                          | —    | 1                                         | 1                     | 0.490 | —     | HJ 2208     | 40 | 54.2                 | 5              | 9.5            | 1.1                  | 0.050               |   |   |   |
|                          | 80  | 23 | —     | 49.5 | 1.1     | 1.1                  | NU 2208EG | NJ | NUP | — | —  | —                                | 72500                            | 77500                                               | 7500               | 9000                                |  | —                    | 47                         | 49    | 52                   | 56                   | 73                   | —                          | —    | 1                                         | 1                     | 0.743 | —     | HJ 2208E    | 40 | 54.1                 | 5              | 9              | 1.1                  | 0.049               |   |   |   |
|                          | 90  | 23 | 77.5  | 53.5 | 1.5     | 1.5                  | NU 308    | NJ | NUP | N | NF | NP                               | 58500                            | 57000                                               | 6700               | 8500                                |  | 48.5                 | 48.5                       | 51    | 55                   | 60                   | 81.5                 | 81.5                       | 80   | 1.5                                       | 1.5                   | 0.665 | 0.650 | HJ 308      | 40 | 58.4                 | 7              | 12.5           | 1.5                  | 0.090               |   |   |   |
|                          | 90  | 23 | —     | 52   | 1.5     | 1.5                  | NU 308EG  | NJ | NUP | — | —  | —                                | 83000                            | 81500                                               | 6700               | 8000                                |  | —                    | 48.5                       | 51    | 55                   | 60                   | 81.5                 | —                          | —    | 1.5                                       | 1.5                   | 0.670 | —     | HJ 308E     | 40 | 57.7                 | 7              | 11             | 1.5                  | 0.084               |   |   |   |
|                          | 90  | 33 | —     | 53.5 | 1.5     | 1.5                  | NU 2308   | NJ | NUP | — | —  | —                                | 82500                            | 88000                                               | 6500               | 7800                                |  | —                    | 48.5                       | 51    | 55                   | 60                   | 81.5                 | —                          | —    | 1.5                                       | 1.5                   | 0.956 | —     | HJ 2308     | 40 | 58.4                 | 7              | 14.5           | 1.5                  | 0.097               |   |   |   |
|                          | 90  | 33 | —     | 52   | 1.5     | 1.5                  | NU 2308E  | NJ | NUP | — | —  | —                                | 114000                           | 122000                                              | 6400               | 7700                                |  | —                    | 48.5                       | 51    | 55                   | 60                   | 81.5                 | —                          | —    | 1.5                                       | 1.5                   | 1.05  | —     | HJ 2308E    | 40 | 57.7                 | 7              | 12.5           | 1.5                  | 0.090               |   |   |   |
|                          | 110 | 27 | 92    | 58   | 2       | 2                    | NU 408    | NJ | NUP | N | NF | NP                               | 95500                            | 89000                                               | 6000               | 7500                                |  | 50                   | 50                         | 57    | 60                   | 67                   | 100                  | 100                        | 93   | 2                                         | 2                     | 1.33  | 1.30  | HJ 408      | 40 | 64.8                 | 8              | 13             | 2                    | 0.144               |   |   |   |
| 45                       | 75  | 16 | 67.5  | 52.5 | 1       | 0.6                  | NU 1009   | —  | —   | N | —  | —                                | 32500                            | 35500                                               | 9000               | 11000                               |  | 50                   | 50                         | 52    | 54                   | —                    | 69                   | 71                         | 68   | 1                                         | 0.6                   | 0.284 | 0.289 | —           | —  | —                    | —              | —              | —                    | —                   | — | — | — |
|                          | 85  | 19 | 75    | 55   | 1.1     | 1.1                  | NU 209    | NJ | NUP | N | NF | NP                               | 46000                            | 47000                                               | 7500               | 9000                                |  | 52                   | 52                         | 54    | 57                   | 61                   | 78                   | 78                         | 77   | 1                                         | 1                     | 0.430 | 0.420 | HJ 209      | 45 | 59                   | 5              | 9.5            | 1.1                  | 0.054               |   |   |   |
|                          | 85  | 19 | —     | 54.5 | 1.1     | 1.1                  | NU 209EG  | NJ | NUP | — | —  | —                                | 63000                            | 66500                                               | 7000               | 8500                                |  | —                    | 52                         | 54    | 57                   | 61                   | 78                   | —                          | —    | 1                                         | 1                     | 0.440 | —     | HJ 209E     | 45 | 59.1                 | 5              | 8.5            | 1.1                  | 0.053               |   |   |   |
|                          | 85  | 23 | —     | 55   | 1.1     | 1.1                  | NU 2209   | NJ | NUP | — | —  | —                                | 61500                            | 68000                                               | 7400               | 8900                                |  | —                    | 52                         | 54    | 57                   | 61                   | 78                   | —                          | —    | 1                                         | 1                     | 0.536 | —     | HJ 2209     | 45 | 59                   | 5              | 9.5            | 1.1                  | 0.054               |   |   |   |
|                          | 85  | 23 | —     | 54.5 | 1.1     | 1.1                  | NU 2209EG | NJ | NUP | — | —  | —                                | 76000                            | 84500                                               | 7000               | 8500                                |  | —                    | 52                         | 54    | 57                   | 61                   | 78                   | —                          | —    | 1                                         | 1                     | 0.593 | —     | HJ 2209E    | 45 | 59.1                 | 5              | 9              | 1.1                  | 0.054               |   |   |   |
|                          | 100 | 25 | 86.5  | 58.5 | 1.5     | 1.5                  | NU 309    | NJ | NUP | N | NF | NP                               | 78500                            | 77500                                               | 6300               | 7500                                |  | 53.5                 | 53.5                       | 57    | 60                   | 66                   | 91.5                 | 91.5                       | 89   | 1.5                                       | 1.5                   | 0.871 | 0.850 | HJ 309      | 45 | 64                   | 7              | 12.5           | 1.5                  | 0.105               |   |   |   |
|                          | 100 | 25 | —     | 58.5 | 1.5     | 1.5                  | NU 309EG  | NJ | NUP | — | —  | —                                | 97500                            | 98500                                               | 6000               | 7500                                |  | —                    | 53.5                       | 57    | 60                   | 66                   | 91.5                 | —                          | —    | 1.5                                       | 1.5                   | 0.910 | —     | HJ 309E     | 45 | 64.5                 | 7              | 11.5           | 1.5                  | 0.103               |   |   |   |
|                          | 100 | 36 | —     | 58.5 | 1.5     | 1.5                  | NU 2309   | NJ | NUP | — | —  | —                                | 99000                            | 104000                                              | 6100               | 7300                                |  | —                    | 53.5                       | 57    | 60                   | 66                   | 91.5                 | —                          | —    | 1.5                                       | 1.5                   | 1.25  | —     | HJ 2309     | 45 | 64                   | 7              | 15             | 1.5                  | 0.115               |   |   |   |
|                          | 100 | 36 | —     | 58.5 | 1.5     | 1.5                  | NU 2309E  | NJ | NUP | — | —  | —                                | 137000                           | 153000                                              | 6000               | 7200                                |  | —                    | 53.5                       | 57    | 60                   | 66                   | 91.5                 | —                          | —    | 1.5                                       | 1.5                   | 1.40  | —     | HJ 2309E    | 45 | 64.5                 | 7              | 13             | 1.5                  | 0.112               |   |   |   |
|                          | 120 | 29 | 100.5 | 64.5 | 2       | 2                    | NU 409    | NJ | NUP | N | NF | NP                               | 107000                           | 102000                                              | 5600               | 6700                                |  | 55                   | 55                         | 63    | 66                   | 74                   | 110                  | 110                        | 102  | 2                                         | 2                     | 1.67  | 1.64  | HJ 409      | 45 | 71.8                 | 8              | 13.5           | 2                    | 0.176               |   |   |   |

Note: (<sup>1</sup>) The dimension table shows limiting speed for bearings made with machined cages. For bearings made with pressed steel cages, multiply the table limits by 0.8.

Cylindrical Roller Bearings

Bore Diameter: 50~60mm

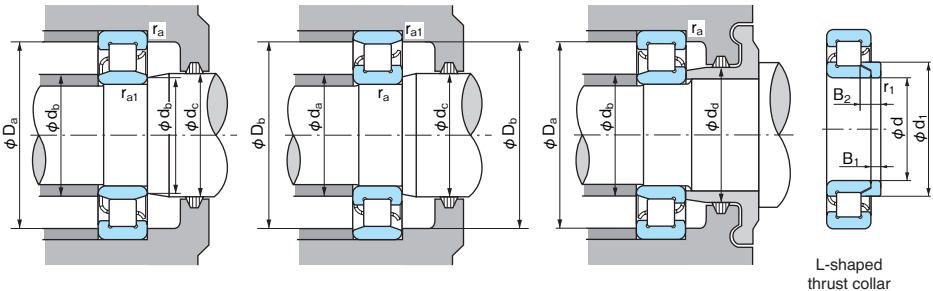
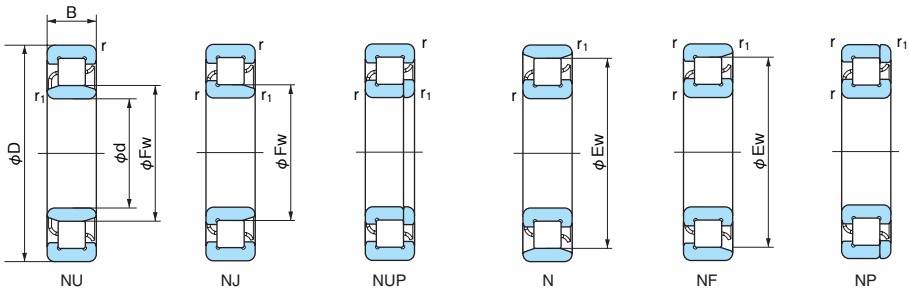


| 1N=0.102kgf              |     |    |       |      |         |             |           |    |     |   |    |                                  |                    |                                  |            |                                                     |          |                                     |          |          |          |          |           |      |     |             |       |                                           |          |    |          |                     |      |     |       |
|--------------------------|-----|----|-------|------|---------|-------------|-----------|----|-----|---|----|----------------------------------|--------------------|----------------------------------|------------|-----------------------------------------------------|----------|-------------------------------------|----------|----------|----------|----------|-----------|------|-----|-------------|-------|-------------------------------------------|----------|----|----------|---------------------|------|-----|-------|
| Boundary dimensions (mm) |     |    |       |      |         | Bearing No. |           |    |     |   |    | Basic dynamic load rating Cr (N) |                    | Basic static load rating Cor (N) |            | Limiting speed (min <sup>-1</sup> )( <sup>1</sup> ) |          | Abutment and fillet dimensions (mm) |          |          |          |          |           |      |     | Mass (kg)   |       | Dimensions of L-shaped thrust collar (mm) |          |    |          |                     |      |     |       |
| d                        | D   | B  | Ew    | Fw   | r (min) | r1 (min)    | NU        | NJ | NUP | N | NF | NP                               | Grease lubrication | Oil lubrication                  |            | da (min)                                            | db (min) | dc (max)                            | dd (min) | Da (max) | Db (min) | ra (max) | ra1 (max) | NU   | N   | Bearing No. | d     | d1 (max)                                  | B1       | B2 | r1 (min) | Mass (kg) Reference |      |     |       |
| 50                       | 80  | 16 | 72.5  | 57.5 | 1       | 0.6         | NU 1010   | —  | —   | N | —  | —                                | 32000              | 36000                            | 8500 10000 |                                                     | 53       | 55                                  | 57       | 59       | —        | 74       | 76        | 73   | 1   | 0.6         | 0.310 | 0.306                                     | —        | —  | —        | —                   | —    | —   |       |
|                          | 90  | 20 | 80.4  | 60.4 | 1.1     | 1.1         | NU 210    | NJ | NUP | N | NF | NP                               | 48000              | 51000                            | 7100 8500  |                                                     | 57       | 57                                  | 58       | 62       | 67       | 83       | 83        | 83   | 1   | 1           | 0.481 | 0.470                                     | HJ 210   | 50 | 64.6     | 5                   | 10   | 1.1 | 0.063 |
|                          | 90  | 20 | —     | 59.5 | 1.1     | 1.1         | NU 210EG  | NJ | NUP | — | —  | —                                | 69000              | 76500                            | 6400 7700  |                                                     | —        | 57                                  | 58       | 62       | 67       | 83       | —         | —    | 1   | 1           | 0.490 | —                                         | HJ 210E  | 50 | 64.1     | 5                   | 9    | 1.1 | 0.059 |
|                          | 90  | 23 | —     | 60.4 | 1.1     | 1.1         | NU 2210   | NJ | NUP | — | —  | —                                | 64000              | 73500                            | 6500 8000  |                                                     | —        | 57                                  | 58       | 62       | 67       | 83       | —         | —    | 1   | 1           | 0.580 | —                                         | HJ 2210  | 50 | 64.6     | 5                   | 9.5  | 1.1 | 0.062 |
|                          | 90  | 23 | —     | 59.5 | 1.1     | 1.1         | NU 2210EG | NJ | NUP | — | —  | —                                | 83500              | 97000                            | 6400 8000  |                                                     | —        | 57                                  | 58       | 62       | 67       | 83       | —         | —    | 1   | 1           | 0.632 | —                                         | HJ 2210E | 50 | 64.1     | 5                   | 9    | 1.1 | 0.059 |
|                          | 110 | 27 | 95    | 65   | 2       | 2           | NU 310    | NJ | NUP | N | NF | NP                               | 87000              | 86000                            | 5600 6700  |                                                     | 60       | 60                                  | 63       | 67       | 73       | 100      | 100       | 98   | 2   | 2           | 1.17  | 1.14                                      | HJ 310   | 50 | 71       | 8                   | 14   | 2   | 0.145 |
|                          | 110 | 27 | —     | 65   | 2       | 2           | NU 310EG  | NJ | NUP | — | —  | —                                | 110000             | 113000                           | 5400 6500  |                                                     | —        | 60                                  | 63       | 67       | 73       | 100      | —         | —    | 2   | 2           | 1.17  | —                                         | HJ 310E  | 50 | 71.4     | 8                   | 13   | 2   | 0.145 |
|                          | 110 | 40 | —     | 65   | 2       | 2           | NU 2310   | NJ | NUP | — | —  | —                                | 121000             | 131000                           | 5400 6500  |                                                     | —        | 60                                  | 63       | 67       | 73       | 100      | —         | —    | 2   | 2           | 1.69  | —                                         | HJ 2310  | 50 | 71       | 8                   | 17   | 2   | 0.159 |
| 55                       | 110 | 40 | —     | 65   | 2       | 2           | NU 2310E  | NJ | NUP | — | —  | —                                | 163000             | 187000                           | 5400 6500  |                                                     | —        | 60                                  | 63       | 67       | 73       | 100      | —         | —    | 2   | 2           | 1.85  | —                                         | HJ 2310E | 50 | 71.4     | 8                   | 14.5 | 2   | 0.152 |
|                          | 130 | 31 | 110.8 | 70.8 | 2.1     | 2.1         | NU 410    | NJ | NUP | N | NF | NP                               | 138000             | 136000                           | 5000 6000  |                                                     | 62       | 62                                  | 69       | 73       | 81       | 118      | 118       | 112  | 2   | 2           | 2.05  | 2.01                                      | HJ 410   | 50 | 78.8     | 9                   | 14.5 | 2.1 | 0.230 |
|                          | 90  | 18 | 80.5  | 64.5 | 1.1     | 1           | NU 1011   | —  | —   | N | —  | —                                | 37500              | 44000                            | 7500 9000  |                                                     | 61.5     | 61                                  | 63       | 66       | —        | 83       | 85        | 81.5 | 1   | 1           | 0.449 | 0.445                                     | —        | —  | —        | —                   | —    | —   |       |
|                          | 100 | 21 | 88.5  | 66.5 | 1.5     | 1.1         | NU 211    | NJ | NUP | N | NF | NP                               | 58000              | 62500                            | 6300 7500  |                                                     | 63.5     | 62                                  | 65       | 68       | 73       | 91.5     | 93        | 91   | 1.5 | 1           | 0.634 | 0.630                                     | HJ 211   | 55 | 70.8     | 6                   | 11   | 1.1 | 0.086 |
|                          | 100 | 21 | —     | 66   | 1.5     | 1.1         | NU 211EG  | NJ | NUP | — | —  | —                                | 86500              | 98500                            | 5800 7100  |                                                     | —        | 62                                  | 65       | 68       | 73       | 91.5     | —         | —    | 1.5 | 1           | 0.670 | —                                         | HJ 211E  | 55 | 70.9     | 6                   | 9.5  | 1.1 | 0.083 |
|                          | 100 | 25 | —     | 66.5 | 1.5     | 1.1         | NU 2211   | NJ | NUP | — | —  | —                                | 75500              | 87000                            | 6200 7400  |                                                     | —        | 62                                  | 65       | 68       | 73       | 91.5     | —         | —    | 1.5 | 1           | 0.780 | —                                         | HJ 2211  | 55 | 70.8     | 6                   | 11   | 1.1 | 0.086 |
|                          | 100 | 25 | —     | 66   | 1.5     | 1.1         | NU 2211EG | NJ | NUP | — | —  | —                                | 101000             | 122000                           | 5800 7100  |                                                     | —        | 62                                  | 65       | 68       | 73       | 91.5     | —         | —    | 1.5 | 1           | 0.870 | —                                         | HJ 2211E | 55 | 70.9     | 6                   | 10   | 1.1 | 0.085 |
|                          | 120 | 29 | 104.5 | 70.5 | 2       | 2           | NU 311    | NJ | NUP | N | NF | NP                               | 111000             | 111000                           | 5000 6300  |                                                     | 65       | 65                                  | 69       | 72       | 80       | 110      | 110       | 107  | 2   | 2           | 1.43  | 1.40                                      | HJ 311   | 55 | 77.2     | 9                   | 15   | 2   | 0.186 |
| 60                       | 120 | 29 | —     | 70.5 | 2       | 2           | NU 311EG  | NJ | NUP | — | —  | —                                | 137000             | 143000                           | 4800 5600  |                                                     | —        | 65                                  | 69       | 72       | 80       | 110      | —         | —    | 2   | 2           | 1.50  | —                                         | HJ 311E  | 55 | 77.6     | 9                   | 14   | 2   | 0.186 |
|                          | 120 | 43 | —     | 70.5 | 2       | 2           | NU 2311   | NJ | NUP | — | —  | —                                | 148000             | 162000                           | 4800 5600  |                                                     | —        | 65                                  | 69       | 72       | 80       | 110      | —         | —    | 2   | 2           | 2.10  | —                                         | HJ 2311  | 55 | 77.2     | 9                   | 18.5 | 2   | 0.206 |
|                          | 120 | 43 | —     | 70.5 | 2       | 2           | NU 2311E  | NJ | NUP | — | —  | —                                | 201000             | 233000                           | 4800 5600  |                                                     | —        | 65                                  | 69       | 72       | 80       | 110      | —         | —    | 2   | 2           | 2.35  | —                                         | HJ 2311E | 55 | 77.6     | 9                   | 15.5 | 2   | 0.195 |
|                          | 140 | 33 | 117.2 | 77.2 | 2.1     | 2.1         | NU 411    | NJ | NUP | N | NF | NP                               | 139000             | 138000                           | 4800 5600  |                                                     | 67       | 67                                  | 76       | 79       | 87       | 128      | 128       | 119  | 2   | 2           | 2.54  | 2.51                                      | HJ 411   | 55 | 85.2     | 10                  | 16.5 | 2.1 | 0.292 |
|                          | 95  | 18 | 85.5  | 69.5 | 1.1     | 1           | NU 1012   | —  | —   | N | —  | —                                | 40000              | 48500                            | 6700 8500  |                                                     | 66.5     | 66                                  | 68       | 71       | —        | 88       | 90        | 86.5 | 1   | 1           | 0.484 | 0.477                                     | —        | —  | —        | —                   | —    | —   |       |
|                          | 110 | 22 | 97.5  | 73.5 | 1.5     | 1.5         | NU 212    | NJ | NUP | N | NF | NP                               | 68500              | 75000                            | 6000 7100  |                                                     | 68.5     | 68.5                                | 71       | 75       | 80       | 101.5    | 101.5     | 100  | 1.5 | 1.5         | 0.835 | 0.820                                     | HJ 212   | 60 | 78.4     | 6                   | 11   | 1.5 | 0.109 |
|                          | 110 | 22 | —     | 72   | 1.5     | 1.5         | NU 212E   | NJ | NUP | — | —  | —                                | 97500              | 107000                           | 5300 6300  |                                                     | —        | 68.5                                | 71       | 75       | 80       | 101.5    | —         | —    | 1.5 | 1.5         | 0.921 | —                                         | HJ 212E  | 60 | 77.7     | 6                   | 10   | 1.5 | 0.104 |
|                          | 110 | 28 | —     | 73.5 | 1.5     | 1.5         | NU 2212   | NJ | NUP | — | —  | —                                | 96000              | 116000                           | 5300 6300  |                                                     | —        | 68.5                                | 71       | 75       | 80       | 101.5    | —         | —    | 1.5 | 1.5         | 1.07  | —                                         | HJ 2212  | 60 | 78.4     | 6                   | 11   | 1.5 | 0.109 |
| 60                       | 110 | 28 | —     | 72   | 1.5     | 1.5         | NU 2212E  | NJ | NUP | — | —  | —                                | 131000             | 157000                           | 5300 6300  |                                                     | —        | 68.5                                | 71       | 75       | 80       | 101.5    | —         | —    | 1.5 | 1.5         | 1.23  | —                                         | HJ 2212E | 60 | 77.7     | 6                   | 10   | 1.5 | 0.104 |
|                          | 130 | 31 | 113   | 77   | 2.1     | 2.1         | NU 312    | NJ | NUP | N | NF | NP                               | 124000             | 126000                           | 4800 5600  |                                                     | 72       | 72                                  | 75       | 79       | 86       | 118      | 118       | 116  | 2   | 2           | 1.82  | 1.78                                      | HJ 312   | 60 | 84.2     | 9                   | 15.5 | 2.1 | 0.224 |
|                          | 130 | 31 | —     | 77   | 2.1     | 2.1         | NU 312EG  | NJ | NUP | — | —  | —                                | 150000             | 157000                           | 4300 5000  |                                                     | —        | 72                                  | 75       | 79       | 86       | 118      | —         | —    | 2   | 2           | 1.87  | —                                         | HJ 312E  | 60 | 84.5     | 9                   | 14.5 | 2.1 | 0.222 |
|                          | 130 | 46 | —     | 77   | 2.1     | 2.1         | NU 2312   | NJ | NUP | — | —  | —                                | 169000             | 188000                           | 4300 5300  |                                                     | —        | 72                                  | 75       | 79       | 86       | 118      | —         | —    | 2   | 2           | 2.69  | —                                         | HJ 2312  | 60 | 84.2     | 9                   | 19   | 2.1 | 0.248 |
|                          | 130 | 46 | —     | 77   | 2.1     | 2.1         | NU 2312E  | NJ | NUP | — | —  | —                                | 222000             | 262000                           | 4300 5300  |                                                     | —        | 72                                  | 75       | 79       | 86       | 118      | —         | —    | 2   | 2           | 3.01  | —                                         | HJ 2312E | 60 | 84.5     | 9                   | 16   | 2.1 | 0.232 |
|                          | 150 | 35 | 127   | 83   | 2.1     | 2.1         | NU 412    | NJ | NUP | N | NF | NP                               | 167000             | 168000                           | 4300 5300  |                                                     | 72       | 72                                  | 82       | 85       | 94       | 118      | 118       | 128  | 2   | 2           | 3.05  | 3.02                                      | HJ 412   | 60 | 91.8     | 10                  | 16.5 | 2.1 | 0.336 |

Note: (<sup>1</sup>) The dimension table shows limiting speed for bearings made with machined cages. For bearings made with pressed steel cages, multiply the table limits by 0.8.

Cylindrical Roller Bearings

Bore Diameter: 65~75mm



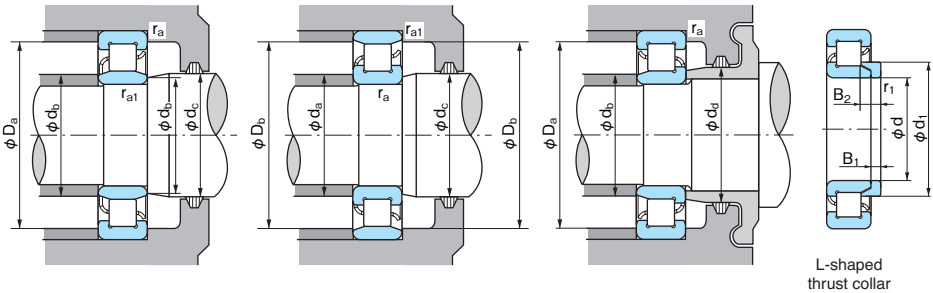
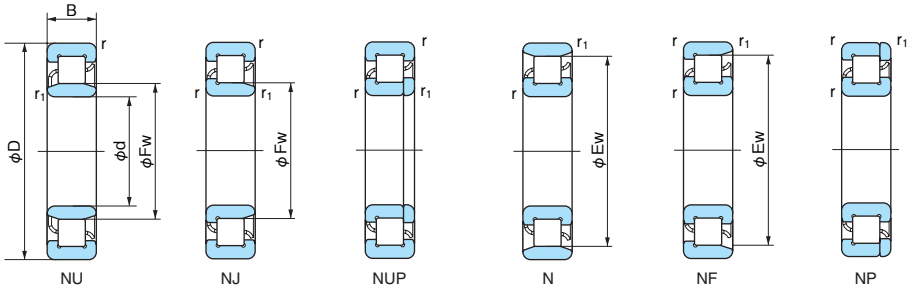
|                          |     |    |       |       |       |                |           |    |     |   |    | 1N=0.102kgf                               |                                           |                                                        |      |                                     |                |                |                |                |                |                |       |                |                 |                                           |     |             |       |                |                |                |                |           |           |       |
|--------------------------|-----|----|-------|-------|-------|----------------|-----------|----|-----|---|----|-------------------------------------------|-------------------------------------------|--------------------------------------------------------|------|-------------------------------------|----------------|----------------|----------------|----------------|----------------|----------------|-------|----------------|-----------------|-------------------------------------------|-----|-------------|-------|----------------|----------------|----------------|----------------|-----------|-----------|-------|
| Boundary dimensions (mm) |     |    |       |       |       | Bearing No.    |           |    |     |   |    | Basic<br>dynamic<br>load rating<br>Cr (N) | Basic<br>static load<br>rating<br>Cor (N) | Limiting speed<br>(min <sup>-1</sup> )( <sup>1</sup> ) |      | Abutment and fillet dimensions (mm) |                |                |                |                |                |                |       | Mass (kg)      |                 | Dimensions of L-shaped thrust collar (mm) |     |             |       |                |                |                |                |           |           |       |
| d                        | D   | B  | Ew    | Fw    | r     | r <sub>1</sub> | NU        | NJ | NUP | N | NF | NP                                        |                                           |                                                        |      |                                     | d <sub>a</sub> | d <sub>b</sub> | d <sub>c</sub> | d <sub>d</sub> | D <sub>a</sub> | D <sub>b</sub> |       | r <sub>a</sub> | r <sub>a1</sub> | NU                                        | N   | Bearing No. | d     | d <sub>1</sub> | B <sub>1</sub> | B <sub>2</sub> | r <sub>1</sub> | Mass (kg) |           |       |
|                          |     |    |       |       | (min) | (min)          |           |    |     |   |    |                                           |                                           |                                                        |      |                                     | (min)          | (min)          | (max)          | (min)          | (max)          | (max)          | (min) | (max)          | (max)           |                                           |     |             |       |                |                |                |                |           | Reference |       |
| 65                       | 100 | 18 | 90.5  | 74.5  | 1.1   | 1              | NU 1013   | —  | —   | N | —  | —                                         | 41000                                     | 51000                                                  | 6300 | 8000                                |                | 71.5           | 71             | 73             | 75             | —              | 93    | 95             | 91.5            | 1                                         | 1   | 0.514       | 0.560 | —              | —              | —              | —              | —         | —         |       |
|                          | 120 | 23 | 105.6 | 79.6  | 1.5   | 1.5            | NU 213    | NJ | NUP | N | NF | NP                                        | 84000                                     | 94500                                                  | 5300 | 6300                                |                | 73.5           | 73.5           | 77             | 81             | 87             | 111.5 | 111.5          | 108             | 1.5                                       | 1.5 | 1.06        | 1.04  | HJ 213         | 65             | 84.8           | 6              | 11        | 1.5       | 0.127 |
|                          | 120 | 23 | —     | 78.5  | 1.5   | 1.5            | NU 213 E  | NJ | NUP | — | —  | —                                         | 108000                                    | 119000                                                 | 4800 | 5600                                |                | —              | 73.5           | 77             | 81             | 87             | 111.5 | —              | —               | 1.5                                       | 1.5 | 1.18        | —     | HJ 213 E       | 65             | 84.5           | 6              | 10        | 1.5       | 0.123 |
|                          | 120 | 31 | —     | 79.6  | 1.5   | 1.5            | NU 2213   | NJ | NUP | — | —  | —                                         | 120000                                    | 149000                                                 | 4800 | 6000                                |                | —              | 73.5           | 77             | 81             | 87             | 111.5 | —              | —               | 1.5                                       | 1.5 | 1.43        | —     | HJ 2213        | 65             | 84.8           | 6              | 11.5      | 1.5       | 0.130 |
|                          | 120 | 31 | —     | 78.5  | 1.5   | 1.5            | NU 2213 E | NJ | NUP | — | —  | —                                         | 149000                                    | 181000                                                 | 4800 | 6000                                |                | —              | 73.5           | 77             | 81             | 87             | 111.5 | —              | —               | 1.5                                       | 1.5 | 1.65        | —     | HJ 2213 E      | 65             | 84.5           | 6              | 10.5      | 1.5       | 0.126 |
|                          | 140 | 33 | 121.5 | 83.5  | 2.1   | 2.1            | NU 313    | NJ | NUP | N | NF | NP                                        | 135000                                    | 139000                                                 | 4500 | 5300                                |                | 77             | 77             | 81             | 85             | 93             | 128   | 128            | 125             | 2                                         | 2   | 2.27        | 2.22  | HJ 313         | 65             | 91             | 10             | 17        | 2.1       | 0.286 |
|                          | 140 | 33 | —     | 82.5  | 2.1   | 2.1            | NU 313 E  | NJ | NUP | — | —  | —                                         | 181000                                    | 191000                                                 | 4000 | 4800                                |                | —              | 77             | 81             | 85             | 93             | 128   | —              | —               | 2                                         | 2   | 2.55        | —     | HJ 313 E       | 65             | 90.6           | 10             | 15.5      | 2.1       | 0.274 |
|                          | 140 | 48 | —     | 83.5  | 2.1   | 2.1            | NU 2313   | NJ | NUP | — | —  | —                                         | 188000                                    | 212000                                                 | 4000 | 4800                                |                | —              | 77             | 81             | 85             | 93             | 128   | —              | —               | 2                                         | 2   | 3.25        | —     | HJ 2313        | 65             | 91             | 10             | 20        | 2.1       | 0.309 |
|                          | 140 | 48 | —     | 82.5  | 2.1   | 2.1            | NU 2313 E | NJ | NUP | — | —  | —                                         | 247000                                    | 287000                                                 | 3800 | 4800                                |                | —              | 77             | 81             | 85             | 93             | 128   | —              | —               | 2                                         | 2   | 3.56        | —     | HJ 2313 E      | 65             | 90.6           | 10             | 18        | 2.1       | 0.309 |
|                          | 160 | 37 | 135.3 | 89.3  | 2.1   | 2.1            | NU 413    | NJ | NUP | N | NF | NP                                        | 195000                                    | 203000                                                 | 4000 | 4800                                |                | 77             | 77             | 88             | 91             | 100            | 148   | 148            | 137             | 2                                         | 2   | 3.68        | 3.58  | HJ 413         | 65             | 98.5           | 11             | 18        | 2.1       | 0.417 |
| 70                       | 110 | 20 | 100   | 80    | 1.1   | 1              | NU 1014   | —  | —   | N | —  | —                                         | 58500                                     | 70500                                                  | 6000 | 7100                                |                | 76.5           | 76             | 78             | 82             | —              | 103   | 105            | 100.5           | 1                                         | 1   | 0.712       | 0.702 | —              | —              | —              | —              | —         | —         |       |
|                          | 125 | 24 | 110.5 | 84.5  | 1.5   | 1.5            | NU 214    | NJ | NUP | N | NF | NP                                        | 83500                                     | 95000                                                  | 5000 | 6300                                |                | 78.5           | 78.5           | 82             | 86             | 92             | 116.5 | 116.5          | 114             | 1.5                                       | 1.5 | 1.16        | 1.14  | HJ 214         | 70             | 89.6           | 7              | 12.5      | 1.5       | 0.154 |
|                          | 125 | 24 | —     | 83.5  | 1.5   | 1.5            | NU 214 E  | NJ | NUP | — | —  | —                                         | 119000                                    | 137000                                                 | 4600 | 5600                                |                | —              | 78.5           | 82             | 86             | 92             | 116.5 | —              | —               | 1.5                                       | 1.5 | 1.26        | —     | HJ 214 E       | 70             | 89.5           | 7              | 11        | 1.5       | 0.149 |
|                          | 125 | 31 | —     | 84.5  | 1.5   | 1.5            | NU 2214   | NJ | NUP | — | —  | —                                         | 119000                                    | 151000                                                 | 4800 | 5600                                |                | —              | 78.5           | 82             | 86             | 92             | 116.5 | —              | —               | 1.5                                       | 1.5 | 1.52        | —     | HJ 2214        | 70             | 89.6           | 7              | 12.5      | 1.5       | 0.154 |
|                          | 125 | 31 | —     | 83.5  | 1.5   | 1.5            | NU 2214 E | NJ | NUP | — | —  | —                                         | 156000                                    | 194000                                                 | 4600 | 5600                                |                | —              | 78.5           | 82             | 86             | 92             | 116.5 | —              | —               | 1.5                                       | 1.5 | 1.68        | —     | HJ 2214 E      | 70             | 89.5           | 7              | 11.5      | 1.5       | 0.152 |
|                          | 150 | 35 | 130   | 90    | 2.1   | 2.1            | NU 314    | NJ | NUP | N | NF | NP                                        | 158000                                    | 220000                                                 | 4000 | 5000                                |                | 82             | 82             | 87             | 92             | 100            | 138   | 138            | 134             | 2                                         | 2   | 2.73        | 2.68  | HJ 314         | 70             | 98             | 10             | 17.5      | 2.1       | 0.336 |
|                          | 150 | 35 | —     | 89    | 2.1   | 2.1            | NU 314 E  | NJ | NUP | — | —  | —                                         | 205000                                    | 222000                                                 | 3600 | 4300                                |                | —              | 82             | 87             | 92             | 100            | 138   | —              | —               | 2                                         | 2   | 3.15        | —     | HJ 314 E       | 70             | 97.5           | 10             | 15.5      | 2.1       | 0.315 |
|                          | 150 | 51 | —     | 90    | 2.1   | 2.1            | NU 2314   | NJ | NUP | — | —  | —                                         | 223000                                    | 262000                                                 | 3800 | 4500                                |                | —              | 82             | 87             | 92             | 100            | 138   | —              | —               | 2                                         | 2   | 3.97        | —     | HJ 2314        | 70             | 98             | 10             | 20.5      | 2.1       | 0.362 |
|                          | 150 | 51 | —     | 89    | 2.1   | 2.1            | NU 2314 E | NJ | NUP | — | —  | —                                         | 274000                                    | 325000                                                 | 3600 | 4500                                |                | —              | 82             | 87             | 92             | 100            | 138   | —              | —               | 2                                         | 2   | 4.30        | —     | HJ 2314 E      | 70             | 97.5           | 10             | 18.5      | 2.1       | 0.343 |
|                          | 180 | 42 | 152   | 100   | 3     | 3              | NU 414    | NJ | NUP | N | NF | NP                                        | 228000                                    | 236000                                                 | 3600 | 4300                                |                | 84             | 84             | 99             | 102            | 112            | 166   | 166            | 153             | 2.5                                       | 2.5 | 5.40        | 5.26  | HJ 414         | 70             | 110.5          | 12             | 20        | 3         | 0.607 |
| 75                       | 115 | 20 | 105   | 85    | 1.1   | 1              | NU 1015   | —  | —   | N | —  | —                                         | 60000                                     | 74500                                                  | 5600 | 6700                                |                | 81.5           | 81             | 83             | 87             | —              | 108   | 110            | 105.5           | 1                                         | 1   | 0.745       | 0.735 | —              | —              | —              | —              | —         | —         |       |
|                          | 130 | 25 | 116.5 | 88.5  | 1.5   | 1.5            | NU 215    | NJ | NUP | N | NF | NP                                        | 96500                                     | 111000                                                 | 4800 | 6000                                |                | 83.5           | 83.5           | 87             | 90             | 96             | 121.5 | 121.5          | 120             | 1.5                                       | 1.5 | 1.24        | 1.22  | HJ 215         | 75             | 94             | 7              | 12.5      | 1.5       | 0.161 |
|                          | 130 | 25 | —     | 88.5  | 1.5   | 1.5            | NU 215 E  | NJ | NUP | — | —  | —                                         | 130000                                    | 156000                                                 | 4300 | 5300                                |                | —              | 83.5           | 87             | 90             | 96             | 121.5 | —              | —               | 1.5                                       | 1.5 | 1.38        | —     | HJ 215 E       | 75             | 94.5           | 7              | 11        | 1.5       | 0.159 |
|                          | 130 | 31 | —     | 88.5  | 1.5   | 1.5            | NU 2215   | NJ | NUP | — | —  | —                                         | 130000                                    | 162000                                                 | 4500 | 5300                                |                | —              | 83.5           | 87             | 90             | 96             | 121.5 | —              | —               | 1.5                                       | 1.5 | 1.57        | —     | HJ 2215        | 75             | 94             | 7              | 12.5      | 1.5       | 0.161 |
|                          | 130 | 31 | —     | 88.5  | 1.5   | 1.5            | NU 2215 E | NJ | NUP | — | —  | —                                         | 162000                                    | 207000                                                 | 4300 | 5300                                |                | —              | 83.5           | 87             | 90             | 96             | 121.5 | —              | —               | 1.5                                       | 1.5 | 1.80        | —     | HJ 2215 E      | 75             | 94.5           | 7              | 11.5      | 1.5       | 0.162 |
|                          | 160 | 37 | 139.5 | 95.5  | 2.1   | 2.1            | NU 315    | NJ | NUP | N | NF | NP                                        | 190000                                    | 205000                                                 | 3800 | 4800                                |                | 87             | 87             | 93             | 97             | 106            | 148   | 148            | 143             | 2                                         | 2   | 3.21        | 3.15  | HJ 315         | 75             | 104.2          | 11             | 18.5      | 2.1       | 0.406 |
|                          | 160 | 37 | —     | 95    | 2.1   | 2.1            | NU 315 E  | NJ | NUP | — | —  | —                                         | 240000                                    | 263000                                                 | 3400 | 4000                                |                | —              | 87             | 93             | 97             | 106            | 148   | —              | —               | 2                                         | 2   | 3.70        | —     | HJ 315 E       | 75             | 104.2          | 11             | 16.5      | 2.1       | 0.389 |
|                          | 160 | 55 | —     | 95.5  | 2.1   | 2.1            | NU 2315   | NJ | NUP | — | —  | —                                         | 258000                                    | 300000                                                 | 3400 | 4300                                |                | —              | 87             | 93             | 97             | 106            | 148   | —              | —               | 2                                         | 2   | 4.84        | —     | HJ 2315        | 75             | 104.2          | 11             | 21.5      | 2.1       | 0.437 |
|                          | 160 | 55 | —     | 95    | 2.1   | 2.1            | NU 2315 E | NJ | NUP | — | —  | —                                         | 330000                                    | 395000                                                 | 3400 | 4300                                |                | —              | 87             | 93             | 97             | 106            | 148   | —              | —               | 2                                         | 2   | 5.30        | —     | HJ 2315 E      | 75             | 104.2          | 11             | 19.5      | 2.1       | 0.421 |
|                          | 190 | 45 | 160.5 | 104.5 | 3     | 3              | NU 415    | NJ | NUP | N | NF | NP                                        | 262000                                    | 274000                                                 | 3400 | 4000                                |                | 89             | 89             | 103            | 107            | 118            | 176   | 176            | 162             | 2.5                                       | 2.5 | 6.40        | 6.25  | HJ 415         | 75             | 116            | 13             | 21.5      | 3         | 0.710 |

Note: (<sup>1</sup>) The dimension table shows limiting speed for bearings made with machined cages. For bearings made with pressed steel cages, multiply the table limits by 0.8.



Cylindrical Roller Bearings

Bore Diameter: 95~110mm

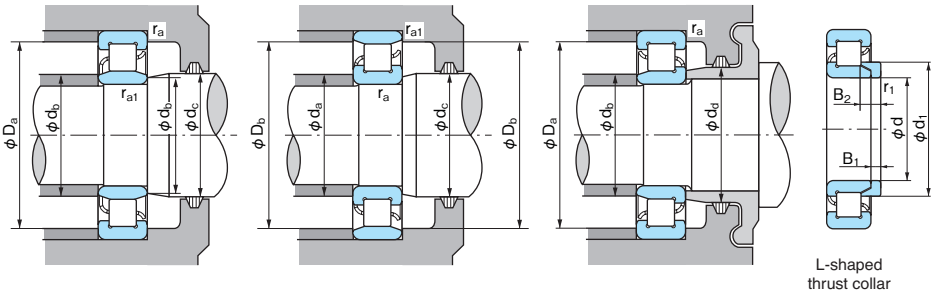
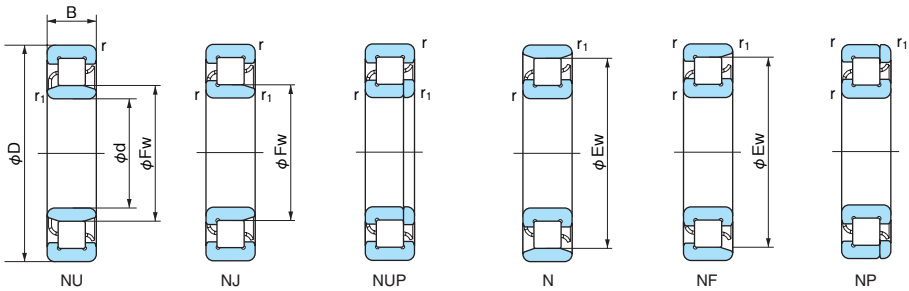


| 1N=0.102kgf              |     |       |       |       |         |                      |           |     |     |    |    |                                  |                                  |                                                     |      |                                     |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|--------------------------|-----|-------|-------|-------|---------|----------------------|-----------|-----|-----|----|----|----------------------------------|----------------------------------|-----------------------------------------------------|------|-------------------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|----|-------------------------------------------|-------------|---|----------------------|----------------|----------------|----------------------|---------------------|--|--|
| Boundary dimensions (mm) |     |       |       |       |         | Bearing No.          |           |     |     |    |    | Basic dynamic load rating Cr (N) | Basic static load rating Cor (N) | Limiting speed (min <sup>-1</sup> )( <sup>1</sup> ) |      | Abutment and fillet dimensions (mm) |                      |                      |                      |                      |                      |                      |                      | Mass (kg)             |    | Dimensions of L-shaped thrust collar (mm) |             |   |                      |                |                |                      |                     |  |  |
| d                        | D   | B     | Ew    | Fw    | r (min) | r <sub>1</sub> (min) | NU        | NJ  | NUP | N  | NF | NP                               |                                  |                                                     |      |                                     | d <sub>a</sub> (min) | d <sub>b</sub> (min) | d <sub>c</sub> (min) | d <sub>d</sub> (min) | D <sub>a</sub> (max) | D <sub>b</sub> (max) | r <sub>a</sub> (max) | r <sub>a1</sub> (max) | NU | N                                         | Bearing No. | d | d <sub>1</sub> (max) | B <sub>1</sub> | B <sub>2</sub> | r <sub>1</sub> (min) | Mass (kg) Reference |  |  |
| 95                       | 145 | 24    | 132   | 108   | 1.5     | 1.1                  | NU 1019   | —   | —   | N  | —  | —                                | 90500                            | 120000                                              | 4500 | 5300                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 170 | 32    | 151.5 | 113.5 | 2.1     | 2.1                  | NU 219    | NJ  | NUP | N  | NF | NP                               | 165000                           | 195000                                              | 3800 | 4500                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 170 | 32    | —     | 112.5 | 2.1     | 2.1                  | NU 219 E  | NJ  | NUP | —  | —  | —                                | 222000                           | 259000                                              | 3400 | 4000                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 170 | 43    | —     | 113.5 | 2.1     | 2.1                  | NU 2219   | NJ  | NUP | —  | —  | —                                | 230000                           | 298000                                              | 3400 | 4000                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 170 | 43    | —     | 112.5 | 2.1     | 2.1                  | NU 2219 E | NJ  | NUP | —  | —  | —                                | 286000                           | 370000                                              | 3400 | 4000                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 200 | 45    | 173.5 | 121.5 | 3       | 3                    | NU 319    | NJ  | NUP | N  | NF | NP                               | 259000                           | 289000                                              | 3000 | 3600                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 200 | 45    | —     | 121.5 | 3       | 3                    | NU 319 E  | NJ  | NUP | —  | —  | —                                | 335000                           | 385000                                              | 2600 | 3200                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 200 | 67    | —     | 121.5 | 3       | 3                    | NU 2319   | NJ  | NUP | —  | —  | —                                | 370000                           | 460000                                              | 2600 | 3400                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 200 | 67    | —     | 121.5 | 3       | 3                    | NU 2319 E | NJ  | NUP | —  | —  | —                                | 460000                           | 585000                                              | 2600 | 3200                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
| 240                      | 55  | 201.5 | 133.5 | 4     | 4       | NU 419               | NJ        | NUP | N   | NF | NP | 400000                           | 445000                           | 2600                                                | 3200 |                                     |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
| 100                      | 150 | 24    | 137   | 113   | 1.5     | 1.1                  | NU 1020   | —   | —   | N  | —  | —                                | 93000                            | 126000                                              | 4300 | 5300                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 180 | 34    | 160   | 120   | 2.1     | 2.1                  | NU 220    | NJ  | NUP | N  | NF | NP                               | 183000                           | 217000                                              | 3600 | 4300                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 180 | 34    | —     | 119   | 2.1     | 2.1                  | NU 220 E  | NJ  | NUP | —  | —  | —                                | 250000                           | 305000                                              | 3200 | 3800                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 180 | 46    | —     | 120   | 2.1     | 2.1                  | NU 2220   | NJ  | NUP | —  | —  | —                                | 257000                           | 335000                                              | 3200 | 3800                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 180 | 46    | —     | 119   | 2.1     | 2.1                  | NU 2220 E | NJ  | NUP | —  | —  | —                                | 335000                           | 445000                                              | 3200 | 3800                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 215 | 47    | 185.5 | 129.5 | 3       | 3                    | NU 320    | NJ  | NUP | N  | NF | NP                               | 300000                           | 335000                                              | 2800 | 3400                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 215 | 47    | —     | 127.5 | 3       | 3                    | NU 320 E  | NJ  | NUP | —  | —  | —                                | 380000                           | 425000                                              | 2400 | 3000                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 215 | 73    | —     | 129.5 | 3       | 3                    | NU 2320   | NJ  | NUP | —  | —  | —                                | 435000                           | 545000                                              | 2400 | 3200                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 215 | 73    | —     | 127.5 | 3       | 3                    | NU 2320 E | NJ  | NUP | —  | —  | —                                | 570000                           | 715000                                              | 2400 | 3000                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
| 250                      | 58  | 211   | 139   | 4     | 4       | NU 420               | NJ        | NUP | N   | NF | NP | 450000                           | 500000                           | 2600                                                | 3000 |                                     |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
| 105                      | 160 | 26    | 145.5 | 119.5 | 2       | 1.1                  | NU 1021   | —   | —   | N  | —  | —                                | 109000                           | 149000                                              | 4000 | 4800                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 190 | 36    | 168.8 | 126.8 | 2.1     | 2.1                  | NU 221    | NJ  | NUP | N  | NF | NP                               | 202000                           | 241000                                              | 3400 | 4000                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 225 | 49    | 195   | 135   | 3       | 3                    | NU 321    | NJ  | NUP | N  | NF | NP                               | 340000                           | 385000                                              | 2600 | 3200                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 260 | 60    | 220.5 | 144.5 | 4       | 4                    | NU 421    | NJ  | NUP | N  | NF | NP                               | 495000                           | 555000                                              | 2400 | 3000                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
| 110                      | 170 | 28    | 155   | 125   | 2       | 1.1                  | NU 1022   | —   | —   | N  | —  | —                                | 131000                           | 174000                                              | 3800 | 4500                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 200 | 38    | 178.5 | 132.5 | 2.1     | 2.1                  | NU 222    | NJ  | NUP | N  | NF | NP                               | 240000                           | 290000                                              | 3200 | 3800                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 200 | 38    | —     | 132.5 | 2.1     | 2.1                  | NU 222 E  | NJ  | NUP | —  | —  | —                                | 293000                           | 365000                                              | 2800 | 3400                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 200 | 53    | —     | 132.5 | 2.1     | 2.1                  | NU 2222   | NJ  | NUP | —  | —  | —                                | 320000                           | 440000                                              | 2800 | 3400                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 200 | 53    | —     | 132.5 | 2.1     | 2.1                  | NU 2222 E | NJ  | NUP | —  | —  | —                                | 385000                           | 515000                                              | 2800 | 3400                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 240 | 50    | 207   | 143   | 3       | 3                    | NU 322    | NJ  | NUP | N  | NF | NP                               | 380000                           | 435000                                              | 2600 | 3000                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 240 | 50    | —     | 143   | 3       | 3                    | NU 322 E  | NJ  | NUP | —  | —  | —                                | 450000                           | 525000                                              | 2200 | 2800                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 240 | 80    | —     | 143   | 3       | 3                    | NU 2322   | NJ  | NUP | —  | —  | —                                | 570000                           | 735000                                              | 2200 | 2800                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 240 | 80    | —     | 143   | 3       | 3                    | NU 2322 E | NJ  | NUP | —  | —  | —                                | 670000                           | 880000                                              | 2200 | 2800                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |
|                          | 280 | 65    | 235   | 155   | 4       | 4                    | NU 422    | NJ  | NUP | N  | NF | NP                               | 550000                           | 620000                                              | 2200 | 2800                                |                      |                      |                      |                      |                      |                      |                      |                       |    |                                           |             |   |                      |                |                |                      |                     |  |  |

Note: (<sup>1</sup>) The dimension table shows limiting speed for bearings made with machined cages. For bearings made with pressed steel cages, multiply the table limits by 0.8.

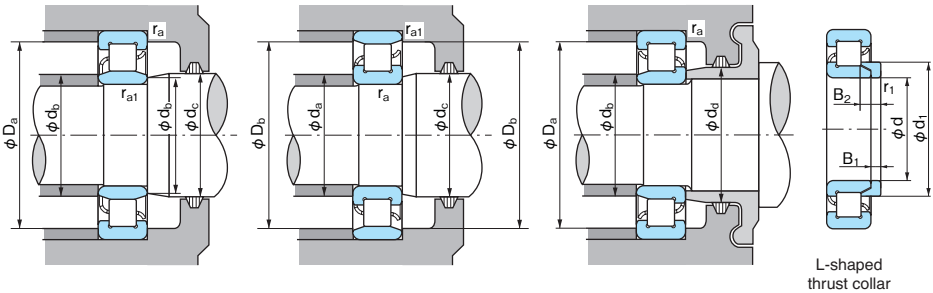
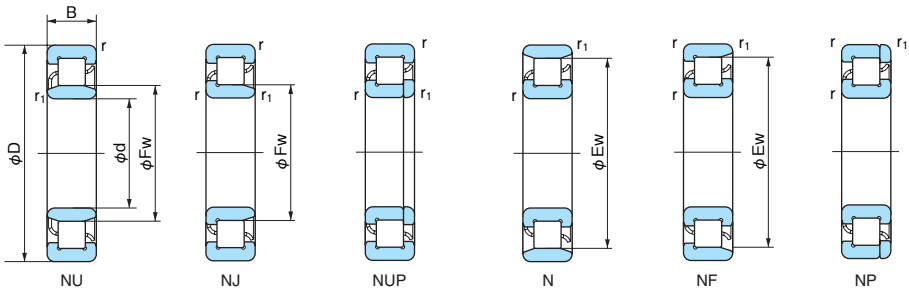
Cylindrical Roller Bearings

Bore Diameter: 120~140mm



| 1N=0.102kgf              |     |     |       |       |         |                      |           |     |     |    |    |                                  |                    |                                  |      |                                                     |                      |                                     |                      |                      |                      |                      |                       |       |     |             |      |                                           |                |                |                      |                     |      |      |      |       |
|--------------------------|-----|-----|-------|-------|---------|----------------------|-----------|-----|-----|----|----|----------------------------------|--------------------|----------------------------------|------|-----------------------------------------------------|----------------------|-------------------------------------|----------------------|----------------------|----------------------|----------------------|-----------------------|-------|-----|-------------|------|-------------------------------------------|----------------|----------------|----------------------|---------------------|------|------|------|-------|
| Boundary dimensions (mm) |     |     |       |       |         | Bearing No.          |           |     |     |    |    | Basic dynamic load rating Cr (N) |                    | Basic static load rating Cor (N) |      | Limiting speed (min <sup>-1</sup> )( <sup>1</sup> ) |                      | Abutment and fillet dimensions (mm) |                      |                      |                      |                      |                       |       |     | Mass (kg)   |      | Dimensions of L-shaped thrust collar (mm) |                |                |                      |                     |      |      |      |       |
| d                        | D   | B   | Ew    | Fw    | r (min) | r <sub>1</sub> (min) | NU        | NJ  | NUP | N  | NF | NP                               | Grease lubrication | Oil lubrication                  |      | d <sub>a</sub> (min)                                | d <sub>b</sub> (min) | d <sub>c</sub> (max)                | d <sub>d</sub> (min) | D <sub>a</sub> (max) | D <sub>b</sub> (max) | r <sub>a</sub> (max) | r <sub>a1</sub> (max) | NU    | N   | Bearing No. | d    | d <sub>1</sub> (max)                      | B <sub>1</sub> | B <sub>2</sub> | r <sub>1</sub> (min) | Mass (kg) Reference |      |      |      |       |
| 120                      | 180 | 28  | 165   | 135   | 2       | 1.1                  | NU 1024   | —   | —   | N  | —  | —                                | 139000             | 191000                           | 3400 | 4300                                                |                      | 129                                 | 127                  | 134                  | 138                  | —                    | 170                   | 173.5 | 166 | 2           | 1    | 2.51                                      | 2.47           | —              | —                    | —                   | —    | —    | —    |       |
|                          | 215 | 40  | 191.5 | 143.5 | 2.1     | 2.1                  | NU 224    | NJ  | NUP | N  | NF | NP                               | 260000             | 320000                           | 3000 | 3400                                                |                      | 132                                 | 132                  | 141                  | 146                  | 156                  | 203                   | 203   | 196 | 2           | 2    | 5.61                                      | 5.50           | HJ 224         | 120                  | 153                 | 11   | 19   | 2.1  | 0.700 |
|                          | 215 | 40  | —     | 143.5 | 2.1     | 2.1                  | NU 224 E  | NJ  | NUP | —  | —  | —                                | 335000             | 420000                           | 2600 | 3200                                                |                      | —                                   | 132                  | 141                  | 146                  | 156                  | 203                   | —     | —   | 2           | 2    | 6.25                                      | —              | HJ 224 E       | 120                  | 153.4               | 11   | 17   | 2.1  | 0.680 |
|                          | 215 | 58  | —     | 143.5 | 2.1     | 2.1                  | NU 2224   | NJ  | NUP | —  | —  | —                                | 365000             | 490000                           | 2600 | 3200                                                |                      | —                                   | 132                  | 141                  | 146                  | 156                  | 203                   | —     | —   | 2           | 2    | 8.56                                      | —              | HJ 2224        | 120                  | 153                 | 11   | 22   | 2.1  | 0.749 |
|                          | 215 | 58  | —     | 143.5 | 2.1     | 2.1                  | NU 2224 E | NJ  | NUP | —  | —  | —                                | 450000             | 620000                           | 2600 | 3200                                                |                      | —                                   | 132                  | 141                  | 146                  | 156                  | 203                   | —     | —   | 2           | 2    | 9.35                                      | —              | HJ 2224 E      | 120                  | 153.4               | 11   | 20   | 2.1  | 0.731 |
|                          | 260 | 55  | 226   | 154   | 3       | 3                    | NU 324    | NJ  | NUP | N  | NF | NP                               | 450000             | 510000                           | 2200 | 2800                                                |                      | 134                                 | 134                  | 151                  | 156                  | 171                  | 246                   | 246   | 230 | 2.5         | 2.5  | 15.4                                      | 15.1           | HJ 324         | 120                  | 168.5               | 14   | 23.5 | 3    | 1.38  |
|                          | 260 | 55  | —     | 154   | 3       | 3                    | NU 324 E  | NJ  | NUP | —  | —  | —                                | 530000             | 610000                           | 2000 | 2600                                                |                      | —                                   | 134                  | 151                  | 156                  | 171                  | 246                   | —     | —   | 2.5         | 2.5  | 15.2                                      | —              | HJ 324 E       | 120                  | 168.6               | 14   | 22.5 | 3    | 1.36  |
|                          | 260 | 86  | —     | 154   | 3       | 3                    | NU 2324   | NJ  | NUP | —  | —  | —                                | 710000             | 920000                           | 2000 | 2600                                                |                      | —                                   | 134                  | 151                  | 156                  | 171                  | 246                   | —     | —   | 2.5         | 2.5  | 23.1                                      | —              | HJ 2324        | 120                  | 168.5               | 14   | 28   | 3    | 1.51  |
|                          | 260 | 86  | —     | 154   | 3       | 3                    | NU 2324 E | NJ  | NUP | —  | —  | —                                | 795000             | 1030000                          | 2000 | 2600                                                |                      | —                                   | 134                  | 151                  | 156                  | 171                  | 246                   | —     | —   | 2.5         | 2.5  | 22.9                                      | —              | HJ 2324 E      | 120                  | 168.6               | 14   | 26   | 3    | 1.46  |
| 310                      | 72  | 260 | 170   | 5     | 5       | NU 424               | NJ        | NUP | N   | NF | NP | 675000                           | 770000             | 2000                             | 2400 |                                                     | 142                  | 142                                 | 168                  | 172                  | 190                  | 288                  | 288                   | 262   | 4   | 4           | 28.7 | 28.0                                      | HJ 424         | 120            | 188                  | 17                  | 30.5 | 5    | 2.55 |       |
| 130                      | 200 | 33  | 182   | 148   | 2       | 1.1                  | NU 1026   | —   | —   | N  | —  | —                                | 172000             | 238000                           | 3200 | 3800                                                |                      | 139                                 | 137                  | 146                  | 151                  | —                    | 190                   | 193.5 | 183 | 2           | 1    | 3.83                                      | 3.77           | —              | —                    | —                   | —    | —    | —    |       |
|                          | 230 | 40  | 204   | 156   | 3       | 3                    | NU 226    | NJ  | NUP | N  | NF | NP                               | 270000             | 340000                           | 2600 | 3200                                                |                      | 144                                 | 144                  | 151                  | 158                  | 168                  | 216                   | 216   | 208 | 2.5         | 2.5  | 7.60                                      | 7.39           | HJ 226         | 130                  | 165.5               | 11   | 19   | 3    | 0.805 |
|                          | 230 | 40  | —     | 153.5 | 3       | 3                    | NU 226 E  | NJ  | NUP | —  | —  | —                                | 365000             | 455000                           | 2400 | 2800                                                |                      | —                                   | 144                  | 151                  | 158                  | 168                  | 216                   | —     | —   | 2.5         | 2.5  | 7.50                                      | —              | HJ 226 E       | 130                  | 164.2               | 11   | 17   | 3    | 0.775 |
|                          | 230 | 64  | —     | 156   | 3       | 3                    | NU 2226   | NJ  | NUP | —  | —  | —                                | 380000             | 530000                           | 2400 | 3000                                                |                      | —                                   | 144                  | 151                  | 158                  | 168                  | 216                   | —     | —   | 2.5         | 2.5  | 11.2                                      | —              | HJ 2226        | 130                  | 165.5               | 11   | 25   | 3    | 0.911 |
|                          | 230 | 64  | —     | 153.5 | 3       | 3                    | NU 2226 E | NJ  | NUP | —  | —  | —                                | 530000             | 735000                           | 2400 | 3000                                                |                      | —                                   | 144                  | 151                  | 158                  | 168                  | 216                   | —     | —   | 2.5         | 2.5  | 12.5                                      | —              | HJ 2226 E      | 130                  | 164.2               | 11   | 21   | 3    | 0.833 |
|                          | 280 | 58  | 243   | 167   | 4       | 4                    | NU 326    | NJ  | NUP | N  | NF | NP                               | 555000             | 665000                           | 2200 | 2600                                                |                      | 148                                 | 148                  | 164                  | 169                  | 184                  | 262                   | 262   | 247 | 3           | 3    | 18.2                                      | 17.8           | HJ 326         | 130                  | 182                 | 14   | 24   | 4    | 1.61  |
|                          | 280 | 58  | —     | 167   | 4       | 4                    | NU 326 E  | NJ  | NUP | —  | —  | —                                | 615000             | 735000                           | 1900 | 2400                                                |                      | —                                   | 148                  | 164                  | 169                  | 184                  | 262                   | —     | —   | 3           | 3    | 18.5                                      | —              | HJ 326 E       | 130                  | 182.3               | 14   | 23   | 4    | 1.59  |
|                          | 280 | 93  | —     | 167   | 4       | 4                    | NU 2326   | NJ  | NUP | —  | —  | —                                | 840000             | 1130000                          | 1900 | 2400                                                |                      | —                                   | 148                  | 164                  | 169                  | 184                  | 262                   | —     | —   | 3           | 3    | 29.1                                      | —              | HJ 2326        | 130                  | 182                 | 14   | 29.5 | 4    | 1.78  |
|                          | 280 | 93  | —     | 167   | 4       | 4                    | NU 2326 E | NJ  | NUP | —  | —  | —                                | 920000             | 1230000                          | 1900 | 2400                                                |                      | —                                   | 148                  | 164                  | 169                  | 184                  | 262                   | —     | —   | 3           | 3    | 28.5                                      | —              | HJ 2326 E      | 130                  | 182.3               | 14   | 28   | 4    | 1.75  |
| 340                      | 78  | 285 | 185   | 5     | 5       | NU 426               | NJ        | NUP | N   | NF | NP | 825000                           | 955000             | 1800                             | 2200 |                                                     | 152                  | 152                                 | 183                  | 187                  | 208                  | 318                  | 318                   | 287   | 4   | 4           | 36.9 | 36.1                                      | HJ 426         | 130            | 205                  | 18                  | 32   | 5    | 3.23 |       |
| 140                      | 210 | 33  | 192   | 158   | 2       | 1.1                  | NU 1028   | —   | —   | N  | —  | —                                | 176000             | 250000                           | 3000 | 3600                                                |                      | 149                                 | 147                  | 156                  | 161                  | —                    | 200                   | 203.5 | 193 | 2           | 1    | 4.07                                      | 4.00           | —              | —                    | —                   | —    | —    | —    |       |
|                          | 250 | 42  | 221   | 169   | 3       | 3                    | NU 228    | NJ  | NUP | N  | NF | NP                               | 310000             | 420000                           | 2400 | 3000                                                |                      | 154                                 | 154                  | 166                  | 171                  | 182                  | 236                   | 236   | 228 | 2.5         | 2.5  | 9.49                                      | 9.26           | HJ 228         | 140                  | 179.5               | 11   | 19   | 3    | 0.968 |
|                          | 250 | 42  | —     | 169   | 3       | 3                    | NU 228 E  | NJ  | NUP | —  | —  | —                                | 395000             | 515000                           | 2200 | 2600                                                |                      | —                                   | 154                  | 166                  | 171                  | 182                  | 236                   | —     | —   | 2.5         | 2.5  | 8.90                                      | —              | HJ 228 E       | 140                  | 180                 | 11   | 18   | 3    | 0.966 |
|                          | 250 | 68  | —     | 169   | 3       | 3                    | NU 2228   | NJ  | NUP | —  | —  | —                                | 465000             | 670000                           | 2200 | 2800                                                |                      | —                                   | 154                  | 166                  | 171                  | 182                  | 236                   | —     | —   | 2.5         | 2.5  | 14.3                                      | —              | HJ 2228        | 140                  | 179.5               | 11   | 25   | 3    | 1.09  |
|                          | 250 | 68  | —     | 169   | 3       | 3                    | NU 2228 E | NJ  | NUP | —  | —  | —                                | 570000             | 835000                           | 2200 | 2600                                                |                      | —                                   | 154                  | 166                  | 171                  | 182                  | 236                   | —     | —   | 2.5         | 2.5  | 14.9                                      | —              | HJ 2228 E      | 140                  | 180                 | 11   | 23   | 3    | 1.08  |
|                          | 300 | 62  | 260   | 180   | 4       | 4                    | NU 328    | NJ  | NUP | N  | NF | NP                               | 595000             | 745000                           | 2000 | 2400                                                |                      | 158                                 | 158                  | 176                  | 182                  | 198                  | 282                   | 282   | 268 | 3           | 3    | 22.4                                      | 21.8           | HJ 328         | 140                  | 196                 | 15   | 26   | 4    | 2.01  |
|                          | 300 | 62  | —     | 180   | 4       | 4                    | NU 328 E  | NJ  | NUP | —  | —  | —                                | 665000             | 795000                           | 1800 | 2200                                                |                      | —                                   | 158                  | 176                  | 182                  | 198                  | 282                   | —     | —   | 3           | 3    | 21.8                                      | —              | HJ 328 E       | 140                  | 196                 | 15   | 25   | 4    | 1.97  |
|                          | 300 | 102 | —     | 180   | 4       | 4                    | NU 2328   | NJ  | NUP | —  | —  | —                                | 920000             | 1250000                          | 1800 | 2200                                                |                      | —                                   | 158                  | 176                  | 182                  | 198                  | 282                   | —     | —   | 3           | 3    | 36.8                                      | —              | HJ 2328        | 140                  | 196                 | 15   | 33.5 | 4    | 2.27  |
|                          | 300 | 102 | —     | 180   | 4       | 4                    | NU 2328 E | NJ  | NUP | —  | —  | —                                | 1020000            | 1380000                          | 1800 | 2200                                                |                      | —                                   | 158                  | 176                  | 182                  | 198                  | 282                   | —     | —   | 3           | 3    | 35.9                                      | —              | HJ 2328 E      | 140                  | 196                 | 15   | 31   | 4    | 2.18  |
| 360                      | 82  | 302 | 198   | 5     | 5       | NU 428               | NJ        | NUP | N   | NF | NP | 875000                           | 1020000            | 1700                             | 2000 |                                                     | 162                  | 162                                 | 195                  | 200                  | 222                  | 338                  | 338                   | 304   | 4   | 4           | 48.0 | 46.8                                      | HJ 428         | 140            | 219                  | 18                  | 33   | 5    | 3.70 |       |

Cylindrical Roller Bearings  
Bore Diameter: 150~180mm

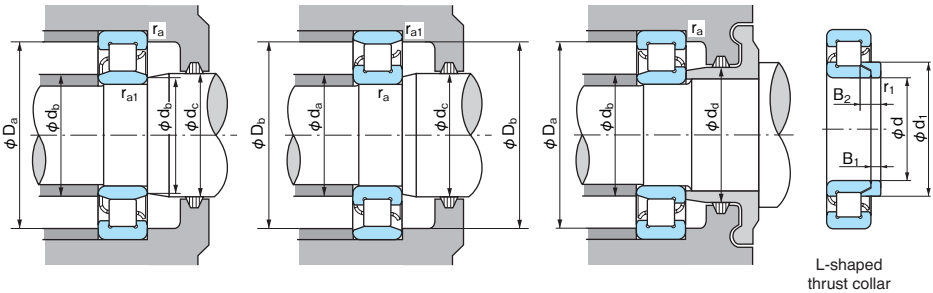
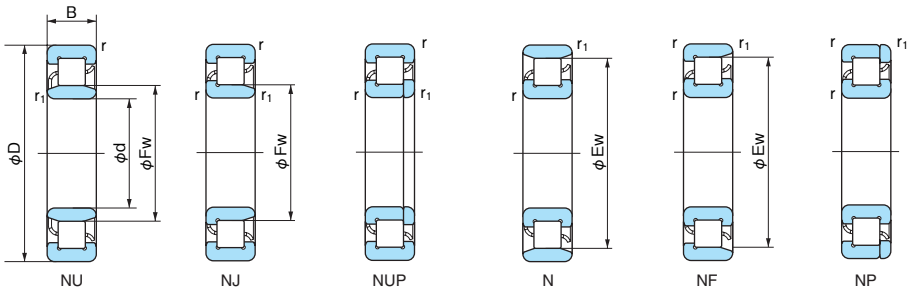


| 1N=0.102kgf              |     |     |       |       |         |           |             |     |     |    |    |         |                                  |                     |                                  |                 |                                                     |          |                                     |          |          |          |          |           |     |     |             |      |                                           |           |       |          |                     |      |      |      |
|--------------------------|-----|-----|-------|-------|---------|-----------|-------------|-----|-----|----|----|---------|----------------------------------|---------------------|----------------------------------|-----------------|-----------------------------------------------------|----------|-------------------------------------|----------|----------|----------|----------|-----------|-----|-----|-------------|------|-------------------------------------------|-----------|-------|----------|---------------------|------|------|------|
| Boundary dimensions (mm) |     |     |       |       |         |           | Bearing No. |     |     |    |    |         | Basic dynamic load rating Cr (N) |                     | Basic static load rating Cor (N) |                 | Limiting speed (min <sup>-1</sup> )( <sup>1</sup> ) |          | Abutment and fillet dimensions (mm) |          |          |          |          |           |     |     | Mass (kg)   |      | Dimensions of L-shaped thrust collar (mm) |           |       |          |                     |      |      |      |
| d                        | D   | B   | Ew    | Fw    | r (min) | r1 (min)  | NU          | NJ  | NUP | N  | NF | NP      | load rating Cr (N)               | load rating Cor (N) | Grease lubrication               | Oil lubrication | da (min)                                            | db (min) | dc (max)                            | dd (min) | Da (max) | Db (min) | ra (max) | ra1 (max) | NU  | N   | Bearing No. | d    | d1 (max)                                  | B1        | B2    | r1 (min) | Mass (kg) Reference |      |      |      |
| 150                      | 225 | 35  | 205.5 | 169.5 | 2.1     | 1.5       | NU 1030     | —   | —   | N  | —  | —       | 202000                           | 294000              | 2800                             | 3400            |                                                     | 161      | 158.5                               | 167      | 173      | —        | 213      | 217       | 207 | 2   | 1.5         | 4.90 | 4.83                                      | —         | —     | —        | —                   | —    | —    | —    |
|                          | 270 | 45  | 238   | 182   | 3       | 3         | NU 230      | NJ  | NUP | N  | NF | NP      | 375000                           | 490000              | 2200                             | 2800            |                                                     | 164      | 164                                 | 179      | 184      | 196      | 256      | 256       | 245 | 2.5 | 2.5         | 11.9 | 11.7                                      | HJ 230    | 150   | 193      | 12                  | 20.5 | 3    | 1.22 |
|                          | 270 | 45  | —     | 182   | 3       | 3         | NU 230 E    | NJ  | NUP | —  | —  | —       | 450000                           | 595000              | 2000                             | 2400            |                                                     | —        | 164                                 | 179      | 184      | 196      | 256      | —         | —   | 2.5 | 2.5         | 11.5 | —                                         | HJ 230 E  | 150   | 193.7    | 12                  | 19.5 | 3    | 1.23 |
|                          | 270 | 73  | —     | 182   | 3       | 3         | NU 2230     | NJ  | NUP | —  | —  | —       | 545000                           | 800000              | 2000                             | 2600            |                                                     | —        | 164                                 | 179      | 184      | 196      | 256      | —         | —   | 2.5 | 2.5         | 18.7 | —                                         | HJ 2230   | 150   | 193      | 12                  | 26.5 | 3    | 1.36 |
|                          | 270 | 73  | —     | 182   | 3       | 3         | NU 2230 E   | NJ  | NUP | —  | —  | —       | 660000                           | 990000              | 2000                             | 2400            |                                                     | —        | 164                                 | 179      | 184      | 196      | 256      | —         | —   | 2.5 | 2.5         | 18.5 | —                                         | HJ 2230 E | 150   | 193.7    | 12                  | 24.5 | 3    | 1.35 |
|                          | 320 | 65  | 277   | 193   | 4       | 4         | NU 330      | NJ  | NUP | N  | NF | NP      | 660000                           | 805000              | 1800                             | 2200            |                                                     | 168      | 168                                 | 190      | 195      | 213      | 302      | 302       | 287 | 3   | 3           | 26.5 | 25.9                                      | HJ 330    | 150   | 210      | 15                  | 26.5 | 4    | 2.32 |
|                          | 320 | 65  | —     | 193   | 4       | 4         | NU 330 E    | NJ  | NUP | —  | —  | —       | 755000                           | 920000              | 1600                             | 2000            |                                                     | —        | 168                                 | 190      | 195      | 213      | 302      | —         | —   | 3   | 3           | 28.8 | —                                         | HJ 330 E  | 150   | 210      | 15                  | 25   | 4    | 2.26 |
|                          | 320 | 108 | —     | 193   | 4       | 4         | NU 2330     | NJ  | NUP | —  | —  | —       | 1020000                          | 1400000             | 1700                             | 2000            |                                                     | —        | 168                                 | 190      | 195      | 213      | 302      | —         | —   | 3   | 3           | 44.7 | —                                         | HJ 2330   | 150   | 210      | 15                  | 34   | 4    | 2.62 |
|                          | 320 | 108 | —     | 193   | 4       | 4         | NU 2330 E   | NJ  | NUP | —  | —  | —       | 1160000                          | 1600000             | 1600                             | 2000            |                                                     | —        | 168                                 | 190      | 195      | 213      | 302      | —         | —   | 3   | 3           | 48.2 | —                                         | HJ 2330 E | 150   | 210      | 15                  | 31.5 | 4    | 2.52 |
| 380                      | 85  | 317 | 213   | 5     | 5       | NU 430    | NJ          | NUP | N   | NF | NP | 930000  | 1120000                          | 1600                | 2000                             |                 | 172                                                 | 172      | 210                                 | 216      | 237      | 358      | 358      | 319       | 4   | 4   | 54.5        | 53.3 | HJ 430                                    | 150       | 234   | 20       | 36.5                | 5    | 4.61 |      |
| 160                      | 240 | 38  | 220   | 180   | 2.1     | 1.5       | NU 1032     | —   | —   | N  | —  | —       | 238000                           | 340000              | 2600                             | 3200            |                                                     | 171      | 168.5                               | 178      | 184      | —        | 228      | 232       | 220 | 2   | 1.5         | 6.01 | 5.93                                      | —         | —     | —        | —                   | —    | —    |      |
|                          | 290 | 48  | 255   | 195   | 3       | 3         | NU 232      | NJ  | NUP | N  | NF | NP      | 430000                           | 570000              | 2200                             | 2600            |                                                     | 174      | 174                                 | 192      | 197      | 210      | 276      | 276       | 262 | 2.5 | 2.5         | 14.5 | 14.2                                      | HJ 232    | 160   | 207      | 12                  | 21   | 3    | 1.44 |
|                          | 290 | 48  | —     | 195   | 3       | 3         | NU 232 E    | NJ  | NUP | —  | —  | —       | 500000                           | 665000              | 1900                             | 2200            |                                                     | —        | 174                                 | 192      | 197      | 210      | 276      | —         | —   | 2.5 | 2.5         | 15.6 | —                                         | HJ 232 E  | 160   | 207.3    | 12                  | 20   | 3    | 1.43 |
|                          | 290 | 80  | —     | 195   | 3       | 3         | NU 2232     | NJ  | NUP | —  | —  | —       | 630000                           | 940000              | 1900                             | 2400            |                                                     | —        | 174                                 | 192      | 197      | 210      | 276      | —         | —   | 2.5 | 2.5         | 24.1 | —                                         | HJ 2232   | 160   | 205      | 12                  | 28   | 3    | 1.50 |
|                          | 290 | 80  | —     | 193   | 3       | 3         | NU 2232 E   | NJ  | NUP | —  | —  | —       | 810000                           | 1190000             | 1900                             | 2400            |                                                     | —        | 174                                 | 192      | 197      | 210      | 276      | —         | —   | 2.5 | 2.5         | 25.9 | —                                         | HJ 2232 E | 160   | 206.1    | 12                  | 24.5 | 3    | 1.54 |
|                          | 340 | 68  | 292   | 208   | 4       | 4         | NU 332      | NJ  | NUP | N  | NF | NP      | 700000                           | 875000              | 1700                             | 2000            |                                                     | 178      | 178                                 | 200      | 211      | 228      | 322      | 322       | 304 | 3   | 3           | 31.2 | 30.6                                      | HJ 332    | 160   | 225      | 15                  | 28   | 4    | 2.71 |
|                          | 340 | 68  | —     | 204   | 4       | 4         | NU 332 E    | NJ  | NUP | —  | —  | —       | 860000                           | 1050000             | 1700                             | 2000            |                                                     | —        | 178                                 | 200      | 211      | 228      | 322      | —         | —   | 3   | 3           | 34.1 | —                                         | HJ 332 E  | 160   | 222.1    | 15                  | 25   | 4    | 2.49 |
|                          | 340 | 114 | —     | 208   | 4       | 4         | NU 2332     | NJ  | NUP | —  | —  | —       | 1070000                          | 1520000             | 1500                             | 1900            |                                                     | —        | 178                                 | 200      | 211      | 228      | 322      | —         | —   | 3   | 3           | 52.5 | —                                         | HJ 2332   | 160   | 225      | 15                  | 37   | 4    | 3.09 |
| 340                      | 114 | —   | 204   | 4     | 4       | NU 2332 E | NJ          | NUP | —   | —  | —  | 1310000 | 1820000                          | 1600                | 1900                             |                 | —                                                   | 178      | 200                                 | 211      | 228      | 322      | —        | —         | 3   | 3   | 57.2        | —    | HJ 2332 E                                 | 160       | 222.1 | 15       | 32                  | 4    | 2.80 |      |
| 170                      | 260 | 42  | 237   | 193   | 2.1     | 2.1       | NU 1034     | —   | —   | N  | —  | —       | 287000                           | 415000              | 2400                             | 2800            |                                                     | 181      | 182                                 | 190      | 197      | —        | 248      | 249       | 237 | 2   | 2           | 8.02 | 7.90                                      | —         | —     | —        | —                   | —    | —    |      |
|                          | 310 | 52  | 272   | 208   | 4       | 4         | NU 234      | NJ  | NUP | N  | NF | NP      | 475000                           | 635000              | 2000                             | 2400            |                                                     | 188      | 188                                 | 204      | 211      | 223      | 292      | 292       | 284 | 3   | 3           | 17.9 | 17.6                                      | HJ 234    | 170   | 220.5    | 12                  | 22   | 4    | 1.67 |
|                          | 310 | 52  | —     | 207   | 4       | 4         | NU 234 E    | NJ  | NUP | —  | —  | —       | 605000                           | 800000              | 1900                             | 2300            |                                                     | —        | 188                                 | 204      | 211      | 223      | 292      | —         | —   | 3   | 3           | 19.3 | —                                         | HJ 234 E  | 170   | 220.8    | 12                  | 20   | 4    | 1.64 |
|                          | 310 | 86  | —     | 208   | 4       | 4         | NU 2234     | NJ  | NUP | —  | —  | —       | 725000                           | 1100000             | 1800                             | 2200            |                                                     | —        | 188                                 | 204      | 211      | 223      | 292      | —         | —   | 3   | 3           | 29.6 | —                                         | HJ 2234   | 170   | 219      | 12                  | 29   | 4    | 1.78 |
|                          | 310 | 86  | —     | 205   | 4       | 4         | NU 2234 E   | NJ  | NUP | —  | —  | —       | 970000                           | 1400000             | 1900                             | 2300            |                                                     | —        | 188                                 | 204      | 211      | 223      | 292      | —         | —   | 3   | 3           | 31.9 | —                                         | HJ 2234 E | 170   | 219.5    | 12                  | 24   | 4    | 1.76 |
|                          | 360 | 72  | 310   | 220   | 4       | 4         | NU 334      | NJ  | NUP | N  | NF | NP      | 795000                           | 1010000             | 1600                             | 2000            |                                                     | 188      | 188                                 | 216      | 223      | 241      | 342      | 342       | 314 | 3   | 3           | 37.1 | 36.1                                      | HJ 334    | 170   | 238      | 16                  | 29.5 | 4    | 3.20 |
|                          | 360 | 120 | —     | 220   | 4       | 4         | NU 2334     | NJ  | NUP | —  | —  | —       | 1220000                          | 1750000             | 1400                             | 1800            |                                                     | —        | 188                                 | 216      | 223      | 241      | 342      | —         | —   | 3   | 3           | 62.7 | —                                         | HJ 2334   | 170   | 238      | 16                  | 38.5 | 4    | 3.62 |
| 180                      | 280 | 46  | 255   | 205   | 2.1     | 2.1       | NU 1036     | —   | —   | N  | —  | —       | 355000                           | 510000              | 2200                             | 2600            |                                                     | 191      | 192                                 | 203      | 209      | —        | 268      | 269       | 256 | 2   | 2           | 10.8 | 10.5                                      | —         | —     | —        | —                   | —    | —    |      |
|                          | 320 | 52  | 282   | 218   | 4       | 4         | NU 236      | NJ  | NUP | N  | NF | NP      | 495000                           | 675000              | 1900                             | 2200            |                                                     | 198      | 198                                 | 214      | 221      | 233      | 302      | 302       | 294 | 3   | 3           | 19.3 | 18.3                                      | HJ 236    | 180   | 230.5    | 12                  | 22   | 4    | 1.76 |
|                          | 320 | 52  | —     | 217   | 4       | 4         | NU 236 E    | NJ  | NUP | —  | —  | —       | 625000                           | 850000              | 1800                             | 2200            |                                                     | —        | 198                                 | 214      | 221      | 233      | 302      | —         | —   | 3   | 3           | 20.5 | —                                         | HJ 236 E  | 180   | 230.8    | 12                  | 20   | 4    | 1.73 |
|                          | 320 | 86  | —     | 218   | 4       | 4         | NU 2236     | NJ  | NUP | —  | —  | —       | 775000                           | 1210000             | 1700                             | 2000            |                                                     | —        | 198                                 | 214      | 221      | 233      | 302      | —         | —   | 3   | 3           | 30.4 | —                                         | HJ 2236   | 180   | 229      | 12                  | 29   | 4    | 1.87 |
|                          | 320 | 86  | —     | 215   | 4       | 4         | NU 2236 E   | NJ  | NUP | —  | —  | —       | 1010000                          | 1510000             | 1800                             | 2200            |                                                     | —        | 198                                 | 214      | 221      | 233      | 302      | —         | —   | 3   | 3           | 34.5 | —                                         | HJ 2236 E | 180   | 229.5    | 12                  | 24   | 4    | 1.85 |
|                          | 380 | 75  | 328   | 232   | 4       | 4         | NU 336      | NJ  | NUP | N  | NF | NP      | 9050000                          | 1150000             | 1500                             | 1800            |                                                     | 198      | 198                                 | 227      | 235      | 255      | 362      | 362       | 332 | 3   | 3           | 42.8 | 41.9                                      | HJ 336    | 180   | 252      | 17                  | 30.5 | 4    | 3.80 |
| 380                      | 126 | —   | 232   | 4     | 4       | NU 2336   | NJ          | NUP | —   | —  | —  | 1380000 | 1990000                          | 1300                | 1700                             |                 | —                                                   | 198      | 227                                 | 235      | 255      | 362      | —        | —         | 3   | 3   | 73.1        | —    | HJ 2336                                   | 180       | 252   | 17       | 40                  | 4    | 4.35 |      |

Note: (<sup>1</sup>) The dimension table shows limiting speed for bearings made with machined cages. For bearings made with pressed steel cages, multiply the table limits by 0.8.



Cylindrical Roller Bearings  
Bore Diameter: 400~500mm



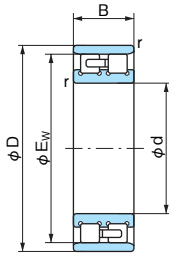
|                          |     |     |     |     |           |            |             |    |     |   |    |    | 1N=0.102kgf                               |                                           |                                                        |                    |
|--------------------------|-----|-----|-----|-----|-----------|------------|-------------|----|-----|---|----|----|-------------------------------------------|-------------------------------------------|--------------------------------------------------------|--------------------|
| Boundary dimensions (mm) |     |     |     |     |           |            | Bearing No. |    |     |   |    |    | Basic<br>dynamic<br>load rating<br>Cr (N) | Basic<br>static load<br>rating<br>Cor (N) | Limiting speed<br>(min <sup>-1</sup> )( <sup>1</sup> ) |                    |
| d                        | D   | B   | Ew  | Fw  | r<br>(mm) | r1<br>(mm) | NU          | NJ | NUP | N | NF | NP |                                           |                                           | Grease<br>lubrication                                  | Oil<br>lubrication |
| 400                      | 600 | 90  | 550 | 450 | 5         | 5          | NU 1080     | —  | —   | N | —  | —  | 1360000                                   | 2280000                                   | 950                                                    | 1100               |
| 420                      | 620 | 90  | 570 | 470 | 5         | 5          | NU 1084     | —  | —   | N | —  | —  | 1390000                                   | 2380000                                   | 900                                                    | 1100               |
| 440                      | 650 | 94  | 597 | 493 | 6         | 6          | NU 1088     | —  | —   | N | —  | —  | 1530000                                   | 2530000                                   | 850                                                    | 1050               |
| 460                      | 680 | 100 | 624 | 516 | 6         | 6          | NU 1092     | —  | —   | N | —  | —  | 1630000                                   | 2740000                                   | 800                                                    | 1000               |
| 480                      | 700 | 100 | 644 | 536 | 6         | 6          | NU 1096     | —  | —   | N | —  | —  | 1620000                                   | 2860000                                   | 780                                                    | 950                |
| 500                      | 720 | 100 | 664 | 556 | 6         | 6          | NU 10/500   | —  | —   | N | —  | —  | 1700000                                   | 2970000                                   | 750                                                    | 900                |

Note: (<sup>1</sup>) The dimension table shows limiting speed for bearings made with machined cages. For bearings made with pressed steel cages, multiply the table limits by 0.8.

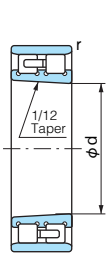
| Abutment and fillet dimensions (mm) |                   |     |             |             |             |                   |     |             |              | Mass (kg) |      | Dimensions of L-shaped thrust collar (mm) |   |             |    |    |             |                        |  |
|-------------------------------------|-------------------|-----|-------------|-------------|-------------|-------------------|-----|-------------|--------------|-----------|------|-------------------------------------------|---|-------------|----|----|-------------|------------------------|--|
| da<br>(min)                         | db<br>(min) (max) |     | dc<br>(min) | dd<br>(min) | Da<br>(max) | Db<br>(max) (min) |     | ra<br>(max) | ra1<br>(max) | NU        | N    | Bearing No.                               | d | d1<br>(max) | B1 | B2 | r1<br>(min) | Mass (kg)<br>Reference |  |
| 422                                 | 422               | 446 | 455         | —           | 578         | 578               | 551 | 4           | 4            | 92.5      | 92.4 | —                                         | — | —           | —  | —  | —           | —                      |  |
| 442                                 | 442               | 466 | 475         | —           | 598         | 598               | 571 | 4           | 4            | 97.6      | 95.8 | —                                         | — | —           | —  | —  | —           | —                      |  |
| 468                                 | 468               | 489 | 498         | —           | 622         | 622               | 598 | 5           | 5            | 112       | 110  | —                                         | — | —           | —  | —  | —           | —                      |  |
| 488                                 | 488               | 512 | 520         | —           | 652         | 652               | 625 | 5           | 5            | 130       | 128  | —                                         | — | —           | —  | —  | —           | —                      |  |
| 508                                 | 508               | 532 | 541         | —           | 672         | 672               | 645 | 5           | 5            | 135       | 132  | —                                         | — | —           | —  | —  | —           | —                      |  |
| 528                                 | 528               | 552 | 561         | —           | 692         | 692               | 665 | 5           | 5            | 140       | 137  | —                                         | — | —           | —  | —  | —           | —                      |  |

Double-row Cylindrical Roller Bearings

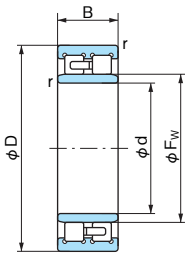
Bore Diameter: 25~180mm



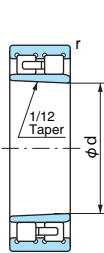
NN  
Cylindrical bore



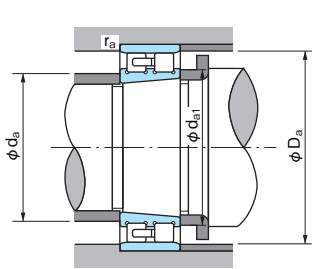
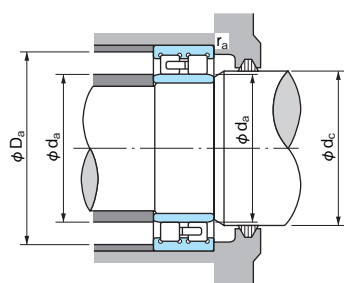
NN  
Tapered bore (Taper: 1/12)



NNU  
Cylindrical bore



NNU  
Tapered bore (Taper: 1/12)

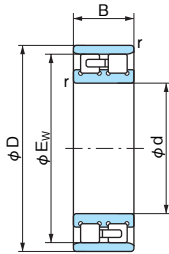


1N=0.102kgf

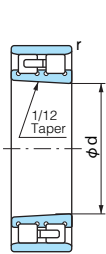
| Boundary dimensions (mm) |     |    |      |       |         | Bearing No.      |              | Basic dynamic load rating Cr (N) | Basic static load rating Cor (N) |  | Limiting speed (min <sup>-1</sup> ) |                 | Abutment and fillet dimensions (mm) |          |           |          |          |          |          | Mass (kg)<br>(Reference Tapered bore) | Bearing No. |
|--------------------------|-----|----|------|-------|---------|------------------|--------------|----------------------------------|----------------------------------|--|-------------------------------------|-----------------|-------------------------------------|----------|-----------|----------|----------|----------|----------|---------------------------------------|-------------|
| d                        | D   | B  | Ew   | Fw    | r (min) | Cylindrical bore | Tapered bore |                                  |                                  |  | Grease lubrication                  | Oil lubrication | da (min)                            | da (max) | da1 (min) | dc (min) | Da (min) | Da (max) | ra (max) |                                       |             |
| 25                       | 47  | 16 | 41.3 | —     | 0.6     | NN3005           | NN3005K      | 25800                            | 30000                            |  | 15000                               | 17000           | 30                                  | —        | 30        | —        | 42       | 41.8     | 0.6      | 0.123                                 | NN3005K     |
| 30                       | 55  | 19 | 48.5 | —     | 1       | NN3006           | NN3006K      | 31000                            | 37000                            |  | 12000                               | 15000           | 36                                  | —        | 37        | —        | 49       | 49       | 1        | 0.199                                 | NN3006K     |
| 35                       | 62  | 20 | 55   | —     | 1       | NN3007           | NN3007K      | 39500                            | 50000                            |  | 11000                               | 13000           | 41                                  | —        | 42        | —        | 56       | 56       | 1        | 0.258                                 | NN3007K     |
| 40                       | 68  | 21 | 61   | —     | 1       | NN3008           | NN3008K      | 43500                            | 55500                            |  | 9800                                | 11000           | 46                                  | —        | 48        | —        | 62       | 62       | 1        | 0.312                                 | NN3008K     |
| 45                       | 75  | 23 | 67.5 | —     | 1       | NN3009           | NN3009K      | 52000                            | 68500                            |  | 8800                                | 10000           | 51                                  | —        | 52        | —        | 69       | 69       | 1        | 0.405                                 | NN3009K     |
| 50                       | 80  | 23 | 72.5 | —     | 1       | NN3010           | NN3010K      | 53000                            | 72500                            |  | 8200                                | 9600            | 56                                  | —        | 58        | —        | 74       | 74       | 1        | 0.454                                 | NN3010K     |
| 55                       | 90  | 26 | 81   | —     | 1.1     | NN3011           | NN3011K      | 69500                            | 96500                            |  | 7300                                | 8600            | 62                                  | —        | 64        | —        | 83       | 82       | 1        | 0.651                                 | NN3011K     |
| 60                       | 95  | 26 | 86.1 | —     | 1.1     | NN3012           | NN3012K      | 73500                            | 106000                           |  | 6800                                | 8000            | 67                                  | —        | 68        | —        | 88       | 87       | 1        | 0.704                                 | NN3012K     |
| 65                       | 100 | 26 | 91   | —     | 1.1     | NN3013           | NN3013K      | 77000                            | 116000                           |  | 6400                                | 7600            | 72                                  | —        | 74        | —        | 93       | 92       | 1        | 0.758                                 | NN3013K     |
| 70                       | 110 | 30 | 100  | —     | 1.1     | NN3014           | NN3014K      | 97500                            | 148000                           |  | 5700                                | 6800            | 77                                  | —        | 78        | —        | 103      | 101      | 1        | 1.04                                  | NN3014K     |
| 75                       | 115 | 30 | 105  | —     | 1.1     | NN3015           | NN3015K      | 96500                            | 149000                           |  | 5500                                | 6400            | 82                                  | —        | 84        | —        | 108      | 106      | 1        | 1.14                                  | NN3015K     |
| 80                       | 125 | 34 | 113  | —     | 1.1     | NN3016           | NN3016K      | 119000                           | 186000                           |  | 5000                                | 6000            | 87                                  | —        | 90        | —        | 118      | 114      | 1        | 1.52                                  | NN3016K     |
| 85                       | 130 | 34 | 118  | —     | 1.1     | NN3017           | NN3017K      | 125000                           | 201000                           |  | 4800                                | 5600            | 92                                  | —        | 96        | —        | 123      | 119      | 1        | 1.61                                  | NN3017K     |
| 90                       | 140 | 37 | 127  | —     | 1.5     | NN3018           | NN3018K      | 143000                           | 228000                           |  | 4500                                | 5200            | 98.5                                | —        | 100       | —        | 131.5    | 129      | 1.5      | 2.07                                  | NN3018K     |
| 95                       | 145 | 37 | 132  | —     | 1.5     | NN3019           | NN3019K      | 150000                           | 246000                           |  | 4300                                | 5000            | 103.5                               | —        | 106       | —        | 136.5    | 134      | 1.5      | 2.17                                  | NN3019K     |
| 100                      | 140 | 40 | —    | 113   | 1.1     | NNU4920          | NNU4920K     | 155000                           | 305000                           |  | 4200                                | 5000            | 106.5                               | 111      | 110       | 115      | 133.5    | —        | 1        | 1.77                                  | NNU4920K    |
|                          | 150 | 37 | 137  | —     | 1.5     | NN3020           | NN3020K      | 157000                           | 265000                           |  | 4000                                | 4800            | 108.5                               | —        | 112       | —        | 141.5    | 139      | 1.5      | 2.26                                  | NN3020K     |
| 105                      | 145 | 40 | —    | 118   | 1.1     | NNU4921          | NNU4921K     | 161000                           | 325000                           |  | 4000                                | 4800            | 111.5                               | 116      | 115       | 120      | 138.5    | —        | 1        | 1.85                                  | NNU4921K    |
|                          | 160 | 41 | 146  | —     | 2       | NN3021           | NN3021K      | 198000                           | 320000                           |  | 3800                                | 4500            | 115                                 | —        | 116       | —        | 150      | 148      | 2        | 2.89                                  | NN3021K     |
| 110                      | 150 | 40 | —    | 123   | 1.1     | NNU4922          | NNU4922K     | 167000                           | 335000                           |  | 3900                                | 4600            | 116.5                               | 121      | 120       | 125      | 143.5    | —        | 1        | 1.93                                  | NNU4922K    |
|                          | 170 | 45 | 155  | —     | 2       | NN3022           | NN3022K      | 229000                           | 375000                           |  | 3600                                | 4300            | 120                                 | —        | 122       | —        | 160      | 157      | 2        | 3.68                                  | NN3022K     |
| 120                      | 165 | 45 | —    | 134.5 | 1.1     | NNU4924          | NNU4924K     | 183000                           | 360000                           |  | 3500                                | 4200            | 126.5                               | 133      | 130       | 137      | 158.5    | —        | 1        | 2.65                                  | NNU4924K    |
|                          | 180 | 46 | 165  | —     | 2       | NN3024           | NN3024K      | 239000                           | 405000                           |  | 3300                                | 3900            | 130                                 | —        | 132       | —        | 170      | 167      | 2        | 3.98                                  | NN3024K     |
| 130                      | 180 | 50 | —    | 146   | 1.5     | NNU4926          | NNU4926K     | 275000                           | 565000                           |  | 3200                                | 3800            | 138                                 | 144      | 142       | 148      | 172      | —        | 1.5      | 3.55                                  | NNU4926K    |
|                          | 200 | 52 | 182  | —     | 2       | NN3026           | NN3026K      | 284000                           | 475000                           |  | 3000                                | 3600            | 140                                 | —        | 144       | —        | 190      | 183      | 2        | 5.92                                  | NN3026K     |
| 140                      | 190 | 50 | —    | 156   | 1.5     | NNU4928          | NNU4928K     | 283000                           | 585000                           |  | 3000                                | 3600            | 148                                 | 154      | 151       | 158      | 182      | —        | 1.5      | 3.80                                  | NNU4928K    |
|                          | 210 | 53 | 192  | —     | 2       | NN3028           | NN3028K      | 298000                           | 515000                           |  | 2800                                | 3400            | 150                                 | —        | 154       | —        | 200      | 194      | 2        | 6.44                                  | NN3028K     |
| 150                      | 210 | 60 | —    | 168.5 | 2       | NNU4930          | NNU4930K     | 350000                           | 715000                           |  | 2700                                | 3300            | 159                                 | 166      | 162       | 171      | 201      | —        | 2        | 5.95                                  | NNU4930K    |
|                          | 225 | 56 | 206  | —     | 2.1     | NN3030           | NN3030K      | 335000                           | 585000                           |  | 2600                                | 3100            | 162                                 | —        | 164       | —        | 213      | 208      | 2        | 7.81                                  | NN3030K     |
| 160                      | 220 | 60 | —    | 178.5 | 2       | NNU4932          | NNU4932K     | 365000                           | 760000                           |  | 2600                                | 3100            | 169                                 | 176      | 172       | 182      | 211      | —        | 2        | 6.25                                  | NNU4932K    |
|                          | 240 | 60 | 219  | —     | 2.1     | NN3032           | NN3032K      | 375000                           | 660000                           |  | 2500                                | 2900            | 172                                 | —        | 174       | —        | 228      | 221      | 2        | 8.92                                  | NN3032K     |
| 170                      | 230 | 60 | —    | 188.5 | 2       | NNU4934          | NNU4934K     | 375000                           | 805000                           |  | 2400                                | 2900            | 179                                 | 186      | 182       | 192      | 221      | —        | 2        | 6.60                                  | NNU4934K    |
|                          | 260 | 67 | 236  | —     | 2.1     | NN3034           | NN3034K      | 450000                           | 805000                           |  | 2300                                | 2700            | 182                                 | —        | 184       | —        | 248      | 238      | 2        | 12.6                                  | NN3034K     |
| 180                      | 250 | 69 | —    | 202   | 2       | NNU4936          | NNU4936K     | 480000                           | 1020000                          |  | 2200                                | 2700            | 189                                 | 199      | 194       | 205      | 241      | —        | 2        | 9.50                                  | NNU4936K    |
|                          | 280 | 74 | 255  | —     | 2.1     | NN3036           | NN3036K      | 565000                           | 995000                           |  | 2100                                | 2500            | 192                                 | —        | 196       | —        | 268      | 257      | 2        | 16.6                                  | NN3036K     |

Double-row Cylindrical Roller Bearings

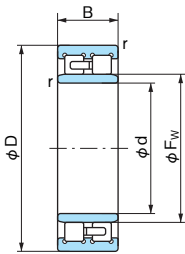
Bore Diameter: 190~320mm



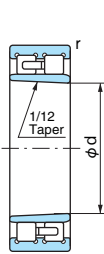
NN  
Cylindrical bore



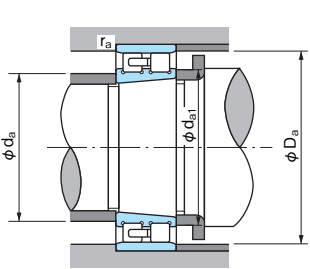
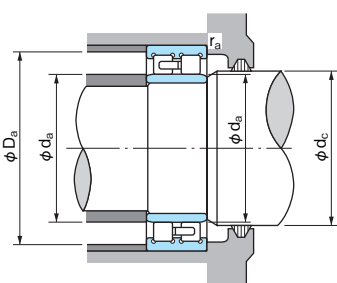
NN  
Tapered bore (Taper: 1/12)



NNU  
Cylindrical bore



NNU  
Tapered bore (Taper: 1/12)



1N=0.102kgf

| Boundary dimensions (mm) |     |     |     |     |         | Bearing No.      |              | Basic dynamic load rating Cr (N) | Basic static load rating Cor (N) |  | Limiting speed (min <sup>-1</sup> ) |                 | Abutment and fillet dimensions (mm) |     |           |          |     |     |          | Mass (kg)<br>(Reference Tapered bore) | Bearing No. |
|--------------------------|-----|-----|-----|-----|---------|------------------|--------------|----------------------------------|----------------------------------|--|-------------------------------------|-----------------|-------------------------------------|-----|-----------|----------|-----|-----|----------|---------------------------------------|-------------|
| d                        | D   | B   | Ew  | Fw  | r (min) | Cylindrical bore | Tapered bore |                                  |                                  |  | Grease lubrication                  | Oil lubrication | da                                  |     | da1 (min) | dc (min) | Da  |     | ra (max) |                                       |             |
|                          |     |     |     |     |         |                  |              |                                  |                                  |  | (min)                               | (max)           |                                     |     | (max)     | (min)    |     |     |          |                                       |             |
| 190                      | 260 | 69  | —   | 212 | 2       | NNU4938          | NNU4938K     | 485000                           | 1060000                          |  | 2100                                | 2600            | 199                                 | 209 | 204       | 215      | 251 | —   | 2        | 10.0                                  | NNU4938K    |
|                          | 290 | 75  | 265 | —   | 2.1     | NN3038           | NN3038K      | 595000                           | 1080000                          |  | 2000                                | 2400            | 202                                 | —   | 206       | —        | 278 | 267 | 2        | 17.5                                  | NN3038K     |
| 200                      | 280 | 80  | —   | 225 | 2.1     | NNU4940          | NNU4940K     | 570000                           | 1220000                          |  | 2000                                | 2400            | 211                                 | 222 | 214       | 228      | 269 | —   | 2        | 10.1                                  | NNU4940K    |
|                          | 310 | 82  | 282 | —   | 2.1     | NN3040           | NN3040K      | 655000                           | 1170000                          |  | 1900                                | 2200            | 212                                 | —   | 216       | —        | 298 | 285 | 2        | 21.6                                  | NN3040K     |
| 220                      | 300 | 80  | —   | 245 | 2.1     | NNU4944          | NNU4944K     | 600000                           | 1330000                          |  | 1800                                | 2200            | 231                                 | 242 | 234       | 248      | 289 | —   | 2        | 15.5                                  | NNU4944K    |
|                          | 340 | 90  | 310 | —   | 3       | NN3044           | NN3044K      | 815000                           | 1480000                          |  | 1700                                | 2000            | 234                                 | —   | 238       | —        | 326 | 313 | 2.5      | 28.4                                  | NN3044K     |
| 240                      | 320 | 80  | —   | 265 | 2.1     | NNU4948          | NNU4948K     | 625000                           | 1450000                          |  | 1700                                | 2000            | 251                                 | 262 | 254       | 269      | 309 | —   | 2        | 17.0                                  | NNU4948K    |
|                          | 360 | 92  | 330 | —   | 3       | NN3048           | NN3048K      | 855000                           | 1600000                          |  | 1600                                | 1900            | 254                                 | —   | 256       | —        | 346 | 333 | 2.5      | 31.8                                  | NN3048K     |
| 260                      | 360 | 100 | —   | 292 | 2.1     | NNU4952          | NNU4952K     | 935000                           | 2100000                          |  | 1500                                | 1800            | 271                                 | 288 | 276       | 296      | 349 | —   | 2        | 28.3                                  | NNU4952K    |
|                          | 400 | 104 | 364 | —   | 4       | NN3052           | NN3052K      | 1080000                          | 2070000                          |  | 1400                                | 1700            | 278                                 | —   | 280       | —        | 382 | 367 | 3        | 46.0                                  | NN3052K     |
| 280                      | 380 | 100 | —   | 312 | 2.1     | NNU4956          | NNU4956K     | 960000                           | 2230000                          |  | 1400                                | 1700            | 291                                 | 308 | 296       | 316      | 369 | —   | 2        | 30.3                                  | NNU4956K    |
|                          | 420 | 106 | 384 | —   | 4       | NN3056           | NN3056K      | 1080000                          | 2080000                          |  | 1300                                | 1600            | 298                                 | —   | 300       | —        | 402 | 387 | 3        | 49.6                                  | NN3056K     |
| 300                      | 420 | 118 | —   | 339 | 3       | NNU4960          | NNU4960K     | 1230000                          | 2880000                          |  | 1300                                | 1500            | 313                                 | 335 | 320       | 343      | 407 | —   | 2.5      | 46.7                                  | NNU4960K    |
|                          | 460 | 118 | 418 | —   | 4       | NN3060           | NN3060K      | 1430000                          | 2740000                          |  | 1200                                | 1400            | 318                                 | —   | 325       | —        | 442 | 421 | 3        | 68.7                                  | NN3060K     |
| 320                      | 440 | 118 | —   | 359 | 3       | NNU4964          | NNU4964K     | 1270000                          | 3050000                          |  | 1200                                | 1400            | 333                                 | 335 | 340       | 363      | 427 | —   | 2.5      | 49.6                                  | NNU4964K    |
|                          | 480 | 121 | 438 | —   | 4       | NN3064           | NN3064K      | 1430000                          | 2750000                          |  | 1200                                | 1400            | 338                                 | —   | 345       | —        | 462 | 442 | 3        | 74.0                                  | NN3064K     |

## Tapered Roller Bearings

|                                       |         |
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| Internal clearance / Double-row ..... |         |
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### ● Interchangeability

Bearings designated as E ..... J (E prefix and J suffix) comply with ISO standards in sub-unit dimensions. The cups and cones of these bearings are internationally interchangeable.

$\alpha$  : Contact angle  
C : Cup width  
E : Cup smallest internal diameter

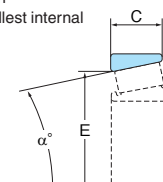


Fig 1. Sub-unit dimensions

### ● Combination and Double-row Tapered Roller Bearings

When radial loads act on a Tapered roller bearing, an axial load is generated from the reaction of the internal contact angle of the bearing. This induced axial load creates a separating force on the cup and cone which is normally offset by mounting Tapered roller bearings in pairs or as multi-row sets.

Table 1 shows combination and double-row mounting of Tapered roller bearings.

### ● Inch Series

NACHI manufactures inch-dimensioned series Tapered Roller Bearings to ABMA (ANSI) standards.

Table 1. Double-row Tapered Roller Bearing Configurations and Features

| Series or Configuration    | Cross section | Example Bearing Number | Adjustment                                                                                                                                                                                           |
|----------------------------|---------------|------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Back-to-back (DB mounting) |               | E32208JDB10            | Combination of two standard single-row Tapered roller bearings. Two mounting systems are used; one using preset spacers, and the other requiring adjustment using either torque or end-play control. |
| Face-to-face (DF mounting) |               | E32208JDF              |                                                                                                                                                                                                      |
| KBE<br>KDE                 |               | 150KBE030              | Either double inner or outer ring. Adjustment is normally done using spacers. If spacers are not used, please contact NACHI for end-play specifications.                                             |
| KBD                        |               | 150KBD030              |                                                                                                                                                                                                      |

