

2.2 Needle roller bearing with cage

These needle roller bearings include needle rollers and cages that guide and hold the needle rollers. The structure is lightweight and compact because no inner ring or outer ring is used and the shaft and the housing are used as raceway surfaces.

Table 4 shows recommended fits for this bearing type, and **Table 5** shows the diameter dimensional tolerance and classification of needle rollers. See section 2.1 for the accuracy and surface hardness necessary for shafts and housings serving as the raceway surfaces for these bearings.

The needle roller diameter variation included in a single assembly is within $2\ \mu\text{m}$, and the standard classification shown in **Table 5** will be supplied if there is no particular designation. When two or more of the same bearings are to be used in tandem arrangement, it is necessary to use bearings having rollers of the same classification promote equal load sharing.

For caged needle roller bearings that are used for the connecting rod of small/medium reciprocating engines, see the special catalog "Needle Roller Bearings (CAT. No. 2300/E)."

Table 4 Fits recommended for needle roller bearings with cage

| Shaft diameter mm | Recommended fits | | | | | |
|-------------------|-------------------------------------|---------|------------------|---------|--|---------|
| | Internal clearance less than normal | | Normal clearance | | Internal clearance greater than normal | |
| | Shaft | Housing | Shaft | Housing | Shaft | Housing |
| Up to 80 | j5 | G6 | h5 | G6 | g6 | G6 |
| 80 to 140 | h5 | G6 | g5 | G6 | f6 | G6 |
| 140 or more | h5 | G6 | f5 | H6 | f6 | G6 |

Table 5 Diameter dimensional tolerance and classification of needle rollers

| Label color | Tolerance range (μm) | Classification |
|-------------|-----------------------------------|----------------|
| Red | 0 to -2 | Standard |
| Navy | -1 to -3 | |
| Blue | -2 to -4 | |
| Black | -3 to -5 | |
| White | -4 to -6 | |
| Gray | -5 to -7 | Sub standard |
| Green | -6 to -8 | |
| Brown | -7 to -9 | |
| Yellow | -8 to -10 | |

When a caged needle roller bearing is used as a single body to be directly guided in the axial direction by a shaft shoulder (see **Fig. 2**), any part coming into contact with the cage side surface must be sufficiently finished without burrs. For high speed or heavy load operation, the contact surface is hardened and finished by grinding.

When a cage is to be guided in the axial direction with a snap ring (see **Fig. 2**), a thrust ring is used between the cage and the snap ring so that the snap ring lugs do not come in contact with the cage directly.

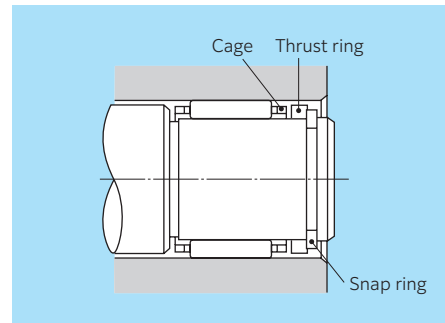


Fig. 2 Fixing using thrust ring

2.3 Drawn cup needle roller bearings

The outer ring of drawn cup needle roller bearings is formed by precision drawing from a thin steel plate, and is designed to have an appropriate accuracy for its intended function when press-fit into a rigid housing.

Therefore, **it is meaningless to measure the dimensional accuracy of the bearing itself before press fitting. After pressing into a ring gage (with wall thickness of 20 mm or more) having appropriate dimensions, the bearing accuracy is evaluated by measuring the roller inscribed circle diameter (F_w) with a plug gage or a tapered gage.**

Recommended fits for drawn cup needle roller bearings are shown in **Table 6**, and recommended shaft and housing accuracy is shown in **Table 7**. **Table 8.1** and **Table 8.2** show the dimensional tolerances of the ring gauge bore diameter dimension and the roller inscribed circle diameter (F_w) with respect to the standard metric series HK and BK types and the heavy load series HMK type.

Table 6 Drawn cup needle roller bearing housing and shaft fits

| Bearing type | Housing | | Shaft | |
|--------------|------------|-------------|---------------|--------------------|
| | Iron-based | Light alloy | No inner ring | With an inner ring |
| HK, BK | N6 (N7) | R6 (R7) | h5 (h6) | k5 (j6) |
| HMK | J6 (J7) | M6 (M7) | | |

Table 7 Recommended shaft and housing accuracy

| Characteristics | Shaft | Housing |
|--------------------------------|-----------|-----------|
| Dimensional accuracy | IT6 (IT5) | IT7 (IT6) |
| Roundness (Max.) | IT3 | IT4 |
| Cylindricity (Max.) | IT3 | IT3 |
| Abutment squareness (Max.) | IT3 | IT3 |
| Fitting surface roughness Ra | 0.8 | 1.6 |

Note: Accuracy in () applies to bearings of accuracy Class 5 and higher.

When a plug gauge is used for the measurement of the roller inscribed circle diameter (F_w), the dimension of the go side is the lower limit of the dimensional tolerance of the roller inscribed circle diameter, and the dimension of the no-go side is the value obtained by adding $2\ \mu\text{m}$ to the upper limit of the dimensional tolerance of the roller inscribed circle diameter.

Since the outer ring is formed by a thin steel plate, **the safety factor (S_0) when the bearing is used must be $S_0 \geq 3$ for standard specifications, and $S_0 \geq 2$ must be maintained for the carburized/quenched specification (HK-F type drawn cup needle roller bearings¹⁾).**

1) HK-F type drawn cup needle roller bearings
For details, see the special catalog "HK-F Type Drawn Cup Needle Roller Bearings (CAT. No. 3029/JE)." (Suffix code F is added to the bearing number.)

Table 8.1 Accuracy of drawn cup needle roller bearings (1)

Dimensional tolerance of roller inscribed circle diameter (HK and BK types) Unit: mm

| Nominal roller inscribed circle diameter F_w | Nominal outer ring outside diameter D | Ring gauge bore diameter | Dimensional tolerance of roller inscribed circle diameter | |
|---|--|--------------------------|---|-------------|
| | | | Upper limit | Lower limit |
| 3 | 6.5 | 6.484 | 3.016 | 3.006 |
| 4 | 8 | 7.984 | 4.022 | 4.010 |
| 5 | 9 | 8.984 | 5.022 | 5.010 |
| 6 | 10 | 9.984 | 6.022 | 6.010 |
| 7 | 11 | 10.980 | 7.028 | 7.013 |
| 8 | 12 | 11.980 | 8.028 | 8.013 |
| 9 | 13 | 12.980 | 9.028 | 9.013 |
| 10 | 14 | 13.980 | 10.028 | 10.013 |
| 12 | 16 | 15.980 | 12.034 | 12.016 |
| 12 | 18 | 17.980 | 12.034 | 12.016 |
| 13 | 19 | 18.976 | 13.034 | 13.016 |
| 14 | 20 | 19.976 | 14.034 | 14.016 |
| 15 | 21 | 20.976 | 15.034 | 15.016 |
| 16 | 22 | 21.976 | 16.034 | 16.016 |
| 17 | 23 | 22.976 | 17.034 | 17.016 |
| 18 | 24 | 23.976 | 18.034 | 18.016 |
| 20 | 26 | 25.976 | 20.041 | 20.020 |
| 22 | 28 | 27.976 | 22.041 | 22.020 |
| 25 | 32 | 31.972 | 25.041 | 25.020 |
| 28 | 35 | 34.972 | 28.041 | 28.020 |
| 30 | 37 | 36.972 | 30.041 | 30.020 |
| 35 | 42 | 41.972 | 35.050 | 35.025 |
| 40 | 47 | 46.972 | 40.050 | 40.025 |
| 45 | 52 | 51.967 | 45.050 | 45.025 |
| 50 | 58 | 57.967 | 50.050 | 50.025 |

When a drawn cup needle roller bearing is to be inserted into a housing, **the marked side of the bearing must be press-fit into the appropriate position with the use of a jig.** (There is no designation for the installation direction of pre-bent specification products¹⁾.)

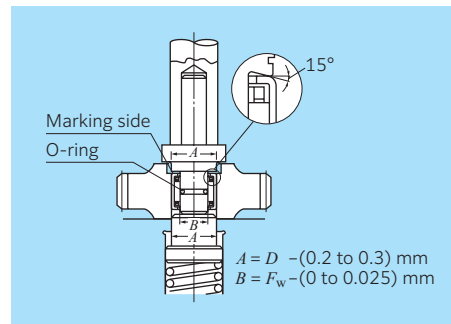


Fig. 3

Table 8.2 Accuracy of drawn cup needle roller bearings (2)

Dimensional tolerance of roller inscribed circle diameter (HMK type) Unit: mm

| Nominal roller inscribed circle diameter F_w | Nominal outer ring outside diameter D | Ring gauge bore diameter | Dimensional tolerance of roller inscribed circle diameter | |
|---|--|--------------------------|---|-------------|
| | | | Upper limit | Lower limit |
| 8 | 15 | 14.995 | 8.028 | 8.013 |
| 9 | 16 | 15.995 | 9.028 | 9.013 |
| 10 | 17 | 16.995 | 10.028 | 10.013 |
| 12 | 19 | 18.995 | 12.034 | 12.016 |
| 14 | 22 | 21.995 | 14.034 | 14.016 |
| 15 | 22 | 21.995 | 15.034 | 15.016 |
| 16 | 24 | 23.995 | 16.034 | 16.016 |
| 17 | 24 | 23.995 | 17.034 | 17.016 |
| 18 | 25 | 24.995 | 18.034 | 18.016 |
| 19 | 27 | 26.995 | 19.041 | 19.020 |
| 20 | 27 | 26.995 | 20.041 | 20.020 |
| 21 | 29 | 28.995 | 21.041 | 21.020 |
| 22 | 29 | 28.995 | 22.041 | 22.020 |
| 24 | 31 | 30.994 | 24.041 | 24.020 |
| 25 | 33 | 32.994 | 25.041 | 25.020 |
| 26 | 34 | 33.994 | 26.041 | 26.020 |
| 28 | 37 | 36.994 | 28.041 | 28.020 |
| 29 | 38 | 37.994 | 29.041 | 29.020 |
| 30 | 40 | 39.994 | 30.041 | 30.020 |
| 32 | 42 | 41.994 | 32.050 | 32.025 |
| 35 | 45 | 44.994 | 35.050 | 35.025 |
| 37 | 47 | 46.994 | 37.050 | 37.025 |
| 38 | 48 | 47.994 | 38.050 | 38.025 |
| 40 | 50 | 49.994 | 40.050 | 40.025 |
| 45 | 55 | 54.994 | 45.050 | 45.025 |
| 50 | 62 | 61.994 | 50.050 | 50.025 |

The bearings must not be directly struck by a hammer when being installed. Use an installation jig like that shown in **Fig. 3**, having a mandrel equipped with an O-ring for ease of installation, should be used to ensure the bearing will not fall off or become damaged during installation.

When inserting an inner ring or a shaft into a drawn cup needle roller bearing installed in a housing, insert it straightly by aligning the central axis of the inner ring or the shaft with the central axis of the housing.

Since a drawn cup needle roller bearing is positioned by means of the housing, it is unnecessary to provide a snap ring or a shoulder. However, when a drawn cup needle roller bearing is to be press-fitted into a housing having a shoulder, it is necessary to pay attention to prevent the bearing side surface from contacting the shoulder, thereby causing deformation of the bearing.

1) Pre-bent specification

The outer ring rib is hardened on both sides by heat treating the outer ring after inserting the cage and rollers and bending the edge of the ring. Thus, bearings can be press-fitted from any direction compared with conventional products, which required applying a jig on the outer ring marking side. (Suffix code M is added to the bearing number.)

2.4 Solid type needle roller bearings

These bearings have a non-separable construction held together by ribs or side plates on both sides of the outer ring, with needle rollers and cages contained within a solid (machined) outer ring. Since the outer ring is solid (machined), it has high rigidity and the bearing accuracy can be increased; therefore, the bearings are suitable for applications that require high speed, heavy load, and high rotational accuracy.

There are two types of solid type needle roller bearings: one having an inner ring and one having no inner ring. Bearings without an inner ring use the shaft directly as a raceway surface, and the required dimensional tolerance of the shaft diameter (raceway diameter) is as shown in **Table 9** based on required operating clearance (see **Table 1** required accuracy of other parameters). The corresponding dimensional tolerance of the housing bore is set to K7, which is widely used in general. Please consult **NTN Engineering** when setting the dimensional tolerance of the housing bore to other classes.

Table 9 Dimensional tolerance for shaft (raceway diameter)

| Roller inscribed circle diameter F_w mm | Shaft tolerance class | | | | |
|---|-----------------------|-------|-------------------------------------|------------------|--|
| | Over | Incl. | Internal clearance less than normal | Normal clearance | Internal clearance greater than normal |
| 80 | 160 | k5 | h5 | f6 | f6 |
| 160 | 180 | k5 | g5 | e6 | e6 |
| 180 | 200 | j5 | g5 | e6 | e6 |
| 200 | 250 | j5 | f6 | e6 | e6 |
| 250 | 315 | h5 | f6 | e6 | e6 |
| 315 | 400 | g5 | f6 | d6 | d6 |

Table 10.1 and Table 10.2 show values of the radial internal clearance of bearings with an inner ring. Table 10.1 shows the clearance of interchangeable bearings, and the clearance values are satisfied even if the inner rings and outer rings are intermixed. Table 10.2 shows the clearance of non-interchangeable bearings, and the clearance range is tightly controlled. Therefore, the inner rings and outer rings cannot be intermixed. The clearance codes are C2, normal, C3, and C4 from smallest to largest, and suffix code NA is added for the non-interchangeable clearance.

When there is an oil hole on the raceway surface, bearings should be installed such that the oil hole position is located in the non-loaded region. A bearing with an inner ring must be used within the allowable movement amount (s) (a state in which the rollers are within the range of the inner ring effective contact length). The allowable movement amount (s) is illustrated in Fig. 4, values are listed in the bearing dimension tables.

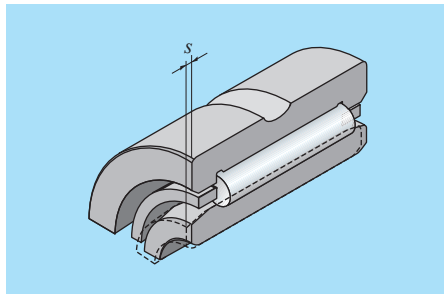


Fig. 4 Allowable movement amount (s)

Table 10.1 Radial internal clearance of solid type needle roller bearings (1) interchangeable bearings Unit: μm

| Nominal bearing bore diameter d mm | Over | Incl. | C2 | | Normal ¹⁾ | | C3 | | C4 | |
|------------------------------------|------|-------|------|------|----------------------|------|------|------|------|------|
| | | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. |
| — | 10 | | 0 | 30 | 10 | 40 | 25 | 55 | 35 | 65 |
| 10 | 18 | | 0 | 30 | 10 | 40 | 25 | 55 | 35 | 65 |
| 18 | 24 | | 0 | 30 | 10 | 40 | 25 | 55 | 35 | 65 |
| 24 | 30 | | 0 | 30 | 10 | 45 | 30 | 65 | 40 | 70 |
| 30 | 40 | | 0 | 35 | 15 | 50 | 35 | 70 | 45 | 80 |
| 40 | 50 | | 5 | 40 | 20 | 55 | 40 | 75 | 55 | 90 |
| 50 | 65 | | 5 | 45 | 20 | 65 | 45 | 90 | 65 | 105 |
| 65 | 80 | | 5 | 55 | 25 | 75 | 55 | 105 | 75 | 125 |
| 80 | 100 | | 10 | 60 | 30 | 80 | 65 | 115 | 90 | 140 |
| 100 | 120 | | 10 | 65 | 35 | 90 | 80 | 135 | 105 | 160 |
| 120 | 140 | | 10 | 75 | 40 | 105 | 90 | 155 | 115 | 180 |
| 140 | 160 | | 15 | 80 | 50 | 115 | 100 | 165 | 130 | 195 |
| 160 | 180 | | 20 | 85 | 60 | 125 | 110 | 175 | 150 | 215 |
| 180 | 200 | | 25 | 95 | 65 | 135 | 125 | 195 | 165 | 235 |
| 200 | 225 | | 30 | 105 | 75 | 150 | 140 | 215 | 180 | 255 |
| 225 | 250 | | 40 | 115 | 90 | 165 | 155 | 230 | 205 | 280 |
| 250 | 280 | | 45 | 125 | 100 | 180 | 175 | 255 | 230 | 310 |
| 280 | 315 | | 50 | 135 | 110 | 195 | 195 | 280 | 255 | 340 |
| 315 | 355 | | 55 | 145 | 125 | 215 | 215 | 305 | 280 | 370 |
| 355 | 400 | | 65 | 160 | 140 | 235 | 245 | 340 | 320 | 415 |
| 400 | 450 | | 70 | 190 | 155 | 275 | 270 | 390 | 355 | 465 |

1) No clearance code is given to this type of bearings.

Table 10.2 Radial internal clearance of solid type needle roller bearings (2) non-interchangeable bearings Unit: μm

| Nominal bearing bore diameter d mm | Over | Incl. | C2NA | | Normal ¹⁾ | | C3NA | | C4NA | |
|------------------------------------|------|-------|------|------|----------------------|------|------|------|------|------|
| | | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. |
| — | 10 | | 10 | 20 | 20 | 30 | 35 | 45 | 45 | 55 |
| 10 | 18 | | 10 | 20 | 20 | 30 | 35 | 45 | 45 | 55 |
| 18 | 24 | | 10 | 20 | 20 | 30 | 35 | 45 | 45 | 55 |
| 24 | 30 | | 10 | 25 | 25 | 35 | 40 | 50 | 50 | 60 |
| 30 | 40 | | 12 | 25 | 25 | 40 | 45 | 55 | 55 | 70 |
| 40 | 50 | | 15 | 30 | 30 | 45 | 50 | 65 | 65 | 80 |
| 50 | 65 | | 15 | 35 | 35 | 50 | 55 | 75 | 75 | 90 |
| 65 | 80 | | 20 | 40 | 40 | 60 | 70 | 90 | 90 | 110 |
| 80 | 100 | | 25 | 45 | 45 | 70 | 80 | 105 | 105 | 125 |
| 100 | 120 | | 25 | 50 | 50 | 80 | 95 | 120 | 120 | 145 |
| 120 | 140 | | 30 | 60 | 60 | 90 | 105 | 135 | 135 | 160 |
| 140 | 160 | | 35 | 65 | 65 | 100 | 115 | 150 | 150 | 180 |
| 160 | 180 | | 35 | 75 | 75 | 110 | 125 | 165 | 165 | 200 |
| 180 | 200 | | 40 | 80 | 80 | 120 | 140 | 180 | 180 | 220 |
| 200 | 225 | | 45 | 90 | 90 | 135 | 155 | 200 | 200 | 240 |
| 225 | 250 | | 50 | 100 | 100 | 150 | 170 | 215 | 215 | 265 |
| 250 | 280 | | 55 | 110 | 110 | 165 | 185 | 240 | 240 | 295 |
| 280 | 315 | | 60 | 120 | 120 | 180 | 205 | 265 | 265 | 325 |
| 315 | 355 | | 65 | 135 | 135 | 200 | 225 | 295 | 295 | 360 |
| 355 | 400 | | 75 | 150 | 150 | 225 | 255 | 330 | 330 | 405 |
| 400 | 450 | | 85 | 170 | 170 | 255 | 285 | 370 | 370 | 455 |

1) Only code "NA" is given to this type of bearings. Example: NA4920NA

2.5 Thrust roller bearing

Thrust roller bearings are bearings having a disc-shaped raceway combined with a cage-and-roller assembly having needle rollers or cylindrical rollers radially embedded, and are suitable for axial loads applied in a single direction.

Further, a shaft or housing can be directly used as a raceway surface without using a separate raceway ring. Thereby, size in the axial direction can be minimized, and lightweight and compact designs can be obtained. Table 11 shows fits recommended for thrust roller bearings. See Table 1 for the required accuracy of the raceway surface.

Table 11 Fits recommended for thrust roller bearings

| Bearing parts | | Type and class | |
|------------------------------|------------------------|----------------------|------------------------|
| | | Shaft diameter | Housing bore |
| AXK type, K811 type | Bore diameter guide | h8 ¹⁾ | — |
| | Outside diameter guide | — | H9 ¹⁾ |
| WS type raceway (inner ring) | | h6 | — |
| GS type raceway (outer ring) | | — | H7 |
| Steel raceway AS type | Shaft fixing | h10 | Clearance with housing |
| | Housing fixing | Clearance with shaft | H11 |

1) The guide surface is finished by grinding.

2.6 Cam follower/roller follower

A cam follower is a track roller having a stud in place of an inner ring, and the outer ring rolls on a track. It is a bearing used as an eccentric roller, a guide roller, etc., and it can have a cylindrical shape or a spherical shape for the outer ring outside diameter. Cam follower bearings are offered in both cage type and full complement designs.

When attaching a cam follower do not strike the rib part with a hammer because sharp impact may cause cracks and rotational failure (see Fig. 5). In addition, the oil supply hole position on the stud raceway surface of the cam follower is indicated by the NTN mark on the stud rib surface. Install it by rotating the nut while the fixing the stud so that the mark (oil hole) is positioned in the non-loaded region (see Fig. 6). The thread part may break if too much tightening torque is applied.

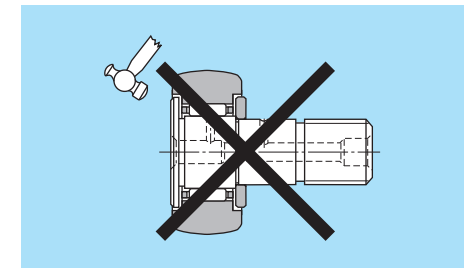


Fig. 5

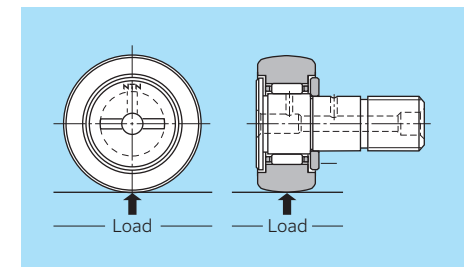


Fig. 6

A roller follower is a bearing in which the outer ring rolls on a track. As with the cam follower, there is a cylindrical shape or a spherical shape for the outer ring outside diameter, and are offered in both cage type and full complement designs. Common uses include use as an eccentric roller, guide roller, rocker arm roller, cam roller, pressure roller, etc.

A roller follower must be installed so that the oil hole is positioned in the non-loaded region because installing the oil hole position of the inner ring in the loaded region may shorten the bearing life.

Table 12 shows the radial internal clearance of cam followers and roller followers, Table 13 and Table 14 show the dimensional accuracy and recommended fits of cam followers, and Table 15 shows the recommended fits of roller followers.

Table 12 Radial internal clearance of cam followers and roller followers Unit: μm

| Nominal roller inscribed circle diameter F_w mm | Over | Incl. | C2 | | CN (normal) | | C3 | | C4 | |
|---|------|-------|------|------|-------------|------|------|------|------|------|
| | | | Min. | Max. | Min. | Max. | Min. | Max. | Min. | Max. |
| 3 | 6 | 0 | 10 | 3 | 17 | 15 | 30 | 20 | 40 | |
| 6 | 10 | 0 | 12 | 5 | 20 | 15 | 30 | 25 | 45 | |
| 10 | 18 | 0 | 15 | 5 | 25 | 15 | 35 | 30 | 55 | |
| 18 | 30 | 0 | 20 | 10 | 30 | 20 | 40 | 40 | 65 | |
| 30 | 50 | 0 | 25 | 10 | 40 | 25 | 55 | 50 | 80 | |
| 50 | 80 | 0 | 30 | 15 | 50 | 30 | 65 | 60 | 100 | |
| 80 | 100 | 0 | 35 | 20 | 55 | 35 | 75 | 70 | 115 | |

Table 13 Dimensional accuracy of cam followers Unit: μm

| Bearing | Outer ring shape | Stud diameter | Outer ring outside diameter | Outer ring width |
|---------------|---------------------|---------------|-----------------------------|------------------|
| Metric series | Spherical surface | h7 | 0 -50 | JIS Class 0 |
| | Cylindrical surface | | JIS Class 0 | |
| Inch series | Spherical surface | +25 | 0 -50 | 0 -130 |
| | Cylindrical surface | 0 | 0 -25 | |

Table 14 Fits recommended for cam followers

| Bearing | Type and class of mounting hole |
|---------------|---------------------------------|
| Metric series | H7 |
| Inch series | F7 |

Note: Assembly must be done without backlash for impact loads.

Table 15 Fits recommended for roller followers

| Type and class of shaft | |
|-------------------------|--------------------|
| Without an inner ring | With an inner ring |
| k5 or k6 | g6 or h6 |

The maximum radial load that can be statically permitted on the contact surface between the track and the track roller is referred to as the track load capacity, and the value differs depending on the hardness of the track. The track load capacity specified in the dimension table is a value considering a track hardness of HRC 40, and the load capacity of tracks having different hardness may be obtained by multiplying the track load capacity in the dimension table by the correction coefficient G in Table 16. However, when the calculated track load capacity exceeds the basic static rating load C_{0r} of the bearing, the track load capacity is equal to the basic static rating load C_{0r} of the bearing.

Table 16 Correction coefficient G

| Hardness (HRC) | Correction coefficient G | |
|----------------|----------------------------|-----------------|
| | Cylindrical shape | Spherical shape |
| 20 | 0.368 | 0.223 |
| 25 | 0.459 | 0.311 |
| 30 | 0.583 | 0.446 |
| 35 | 0.750 | 0.650 |
| 40 | 1.000 | 1.000 |
| 45 | 1.414 | 1.681 |
| 50 | 1.987 | 2.800 |
| 55 | 2.787 | 4.652 |

Since NTN cam followers and roller followers are generally installed with cantilever loading, a non-uniform load (one-sided load) may act on the bearing due to the influence of loosening of the fitting caused by continuous use. For stable operation of equipment, it is necessary to pay sufficient attention to the looseness of the fitting.

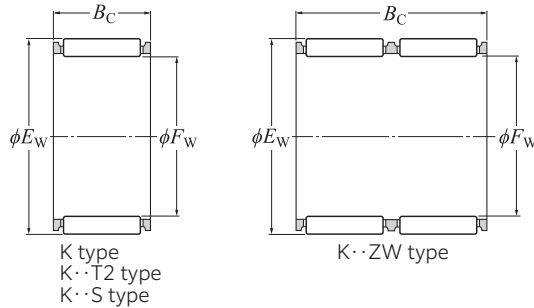
Further, lubrication is also necessary between the outer ring outside diameter surface and the track of the bearing. Even after lubrication, the bearing and the track may be damaged at an early stage when slippage occurs between the outer ring outside diameter surface and the track of the bearing due to rapid radial load fluctuation or rotational speed fluctuation during use.

For details, see the special catalog "Needle Roller Bearings (CAT. No. 2300/E)" or "Cam Followers & Roller Followers (CAT. No. 3604/ JE)."

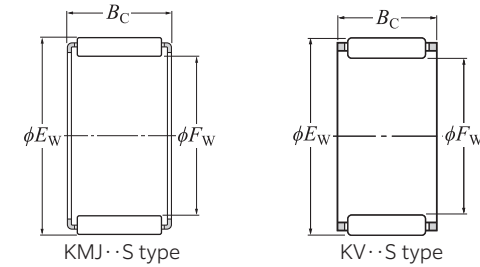
Needle Roller Bearings

Needle roller and cage assemblies

- K type
- K·T2 type
- K·S type
- K·ZW type
- KMJ·S type
- KV·S type



Needle Roller Bearings



F_w 3-10 mm

| Boundary dimensions | Basic load rating | | Fatigue load limit | Allowable speed | | Number | Mass | |
|---------------------|-------------------|---------------|--------------------|--------------------|-----------------|---------------------------|--------------------------|--------|
| | dynamic | static | | min ⁻¹ | | | | |
| mm | C_r | C_{0r} | N | Grease lubrication | Oil lubrication | | kg | |
| F_w E_w B_c | | | C_u | | | | (approx.) | |
| 3 | 6 7 | -0.2 -0.55 | 1 460 | 970 | 118 | 33 000 50 000 | K3×6×7T2T | 0.0004 |
| 4 | 6 8 | -0.2 -0.55 | 1 560 | 1 330 | 162 | 30 000 45 000 | K4×6×7.8XT2 | 0.0003 |
| | 7 7 | | 1 770 | 1 270 | 155 | 30 000 45 000 | K4×7×7T2 | 0.0005 |
| 5 | 8 8 | -0.2 -0.55 | 2 640 | 2 190 | 267 | 27 000 40 000 | K5×8×8T2 | 0.0007 |
| | 8 10 | | 2 720 | 2 250 | 275 | 27 000 40 000 | K5×8×10T2 | 0.0009 |
| 6 | 9 8 | | 2 660 | 2 280 | 278 | 25 000 37 000 | K6×9×8T2T | 0.0009 |
| | 9 10 | -0.2 -0.55 | 3 400 | 3 150 | 380 | 25 000 37 000 | K6×9×10T2T | 0.0011 |
| | 10 13 | | 4 400 | 3 700 | 455 | 25 000 37 000 | K6×10×13T2 | 0.0019 |
| 7 | 10 8 | | 2 670 | 2 350 | 286 | 23 000 34 000 | K7×10×8T2 | 0.0009 |
| | 10 10 | -0.2 -0.55 | 3 400 | 3 200 | 390 | 23 000 34 000 | K7×10×10T2 | 0.0011 |
| | 10 13 | | 5 050 | 5 400 | 655 | 23 000 34 000 | KV7×10×12.8X3S | 0.0023 |
| 8 | 11 8 | | 3 150 | 3 000 | 365 | 21 000 32 000 | K8×11×8T2T | 0.0011 |
| | 11 9 | | 3 150 | 3 000 | 365 | 21 000 32 000 | 8E-KV8×11×8.8X2S | 0.0019 |
| | 11 10 | | 4 000 | 4 100 | 500 | 21 000 32 000 | K8×11×10T2 | 0.0013 |
| | 11 12 | -0.2 -0.55 | 4 450 | 4 650 | 570 | 21 000 32 000 | 8E-KV8×11×11.8X2S | 0.0025 |
| | 11 13 | | 4 850 | 5 200 | 635 | 21 000 32 000 | K8×11×13 | 0.0026 |
| | 12 10 | | 4 650 | 4 150 | 510 | 21 000 32 000 | K8×12×10T2 | 0.0020 |
| | 12 12 | | 5 600 | 5 300 | 650 | 21 000 32 000 | 8E-KV8×12×11.8X1S | 0.0040 |
| 12 13 | | 5 050 | 4 650 | 565 | 21 000 32 000 | K8×12×13 | 0.0036 | |
| 9 | 12 10 | -0.2 -0.55 | 4 550 | 5 000 | 615 | 20 000 30 000 | K9×12×10T2 | 0.0015 |
| | 12 13 | | 5 500 | 6 400 | 780 | 20 000 30 000 | K9×12×13T2 | 0.0021 |
| 10 | 13 10 | | 4 550 | 5 100 | 620 | 19 000 28 000 | K10×13×10T2T | 0.0016 |
| | 13 13 | | 5 450 | 6 450 | 790 | 19 000 28 000 | 8E-KV10×13×12.8XS | 0.0032 |
| | 14 8 | | 4 300 | 3 950 | 485 | 19 000 28 000 | K10×14×8 | 0.0027 |
| | 14 10 | -0.2 -0.55 | 5 500 | 5 450 | 660 | 19 000 28 000 | K10×14×10T | 0.0034 |
| | 14 11 | | 5 500 | 5 450 | 660 | 19 000 28 000 | 8E-KV10×14×10.8XS | 0.0039 |
| | 14 11.5 | | 6 800 | 7 200 | 875 | 19 000 28 000 | KMJ10×14×11.3XS | 0.0040 |
| | 14 13 | | 6 600 | 6 900 | 840 | 19 000 28 000 | K10×14×13 | 0.0044 |
| 14 14 | | 7 150 | 7 650 | 930 | 19 000 28 000 | 8E-KV10×14×13.8X4S | 0.0050 | |

Note: Bearings may be delivered with a different cage type even if they are ordered by the bearing numbers in the table.

F_w 10-15 mm

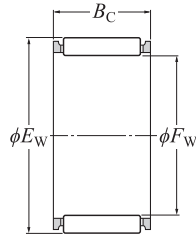
| Boundary dimensions | Basic load rating | | Fatigue load limit | Allowable speed | | Number | Mass | |
|---------------------|-------------------|---------------|--------------------|--------------------|-----------------|---------------|-------------------------|--------|
| | dynamic | static | | min ⁻¹ | | | | |
| mm | C_r | C_{0r} | N | Grease lubrication | Oil lubrication | | kg | |
| F_w E_w B_c | | | C_u | | | | (approx.) | |
| 10 | 14 17 | -0.2 -0.55 | 8 050 | 8 850 | 1 080 | 19 000 28 000 | 8E-K10×14×16.8X1 | 0.0064 |
| | 16 12 | | 7 100 | 5 950 | 730 | 19 000 28 000 | K10×16×12 | 0.0066 |
| 11 | 14 10 | -0.2 -0.55 | 5 050 | 6 000 | 735 | 18 000 27 000 | K11×14×10 | 0.0028 |
| 12 | 15 9 | | 4 450 | 5 250 | 640 | 17 000 26 000 | K12×15×9 | 0.0027 |
| | 15 10 | | 5 000 | 6 100 | 740 | 17 000 26 000 | 8Q-K12×15×10 | 0.0030 |
| | 15 13 | | 6 000 | 7 700 | 940 | 17 000 26 000 | K12×15×13 | 0.0038 |
| | 15 20 | | 8 550 | 12 200 | 1 480 | 17 000 26 000 | K12×15×20ZW | 0.0059 |
| | 16 8 | | 4 850 | 4 900 | 600 | 17 000 26 000 | K12×16×8 | 0.0034 |
| | 16 11.5 | | 6 750 | 7 400 | 900 | 17 000 26 000 | KMJ12×16×11.3XS | 0.0047 |
| | 16 13 | -0.2 -0.55 | 7 500 | 8 500 | 1 040 | 17 000 26 000 | 8Q-K12×16×13 | 0.0060 |
| | 16 18 | | 9 800 | 11 900 | 1 460 | 17 000 26 000 | 8E-K12×16×17.8X1 | 0.0070 |
| | 16 20 | | 10 300 | 12 800 | 1 560 | 17 000 26 000 | K12×16×19.8X4 | 0.010 |
| | 17 10 | | 7 350 | 7 200 | 880 | 17 000 26 000 | KMJ12×17×9.8XS | 0.0050 |
| 14 | 17 13 | | 9 000 | 9 400 | 1 150 | 17 000 26 000 | K12×17×13 | 0.0075 |
| | 17 18 | | 12 600 | 14 400 | 1 760 | 17 000 26 000 | KV12×17×17.8XS | 0.0080 |
| | 18 12 | | 8 650 | 8 000 | 975 | 17 000 26 000 | 8Q-K12×18×12 | 0.0089 |
| | 17 10 | | 5 400 | 7 050 | 860 | 16 000 24 000 | KV14×17×10ST | 0.0040 |
| | 18 10 | | 6 900 | 8 000 | 975 | 16 000 24 000 | K14×18×10 | 0.0046 |
| 15 | 18 11 | | 7 600 | 9 050 | 1 100 | 16 000 24 000 | K14×18×11 | 0.0053 |
| | 18 13 | | 8 300 | 10 100 | 1 240 | 16 000 24 000 | K14×18×13 | 0.0063 |
| | 18 15 | -0.2 -0.55 | 9 650 | 12 300 | 1 500 | 16 000 24 000 | K14×18×15S | 0.0076 |
| | 18 17 | | 10 900 | 14 400 | 1 760 | 16 000 24 000 | K14×18×17V5 | 0.0079 |
| | 18 39 | | 18 800 | 28 900 | 3 500 | 16 000 24 000 | K14×18×39ZW | 0.018 |
| | 19 13 | | 8 950 | 9 650 | 1 180 | 16 000 24 000 | K14×19×13 | 0.0080 |
| | 20 12 | | 9 350 | 9 150 | 1 110 | 16 000 24 000 | K14×20×12 | 0.0095 |
| | 20 17 | | 13 500 | 14 600 | 1 780 | 16 000 24 000 | K14×20×17 | 0.014 |
| 15 | 18 14 | | 7 850 | 11 600 | 1 420 | 15 000 23 000 | K15×18×14 | 0.0060 |
| | 19 8 | -0.2 -0.55 | 5 350 | 5 850 | 715 | 15 000 23 000 | KV15×19×7.8XS | 0.0033 |
| | 19 10 | | 6 850 | 8 050 | 980 | 15 000 23 000 | K15×19×10T | 0.0055 |
| | 19 13 | | 8 250 | 10 200 | 1 250 | 15 000 23 000 | K15×19×13 | 0.0067 |

Note: Bearings may be delivered with a different cage type even if they are ordered by the bearing numbers in the table.

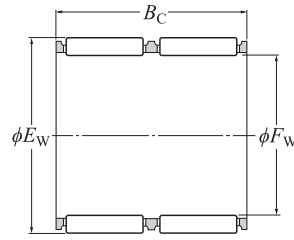
Needle Roller Bearings

Needle roller and cage assemblies

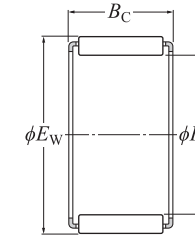
- K type
- K·T2 type
- K·S type
- K·ZW type
- KMJ·S type



K type
K·T2 type
K·S type



K·ZW type



KMJ·S type

F_w 15–18 mm

| Boundary dimensions | | | Basic load rating | | Fatigue load limit | Allowable speed | | Number | Mass |
|---------------------|-------|-------|-------------------|----------|--------------------|--------------------|-----------------|--------------------------|--------|
| mm | | | dynamic | static | N | min ⁻¹ | | | kg |
| F_w | E_w | B_c | C_r | C_{0r} | | Grease lubrication | Oil lubrication | | |
| 15 | 19 | 17 | 10 900 | 14 600 | 1 780 | 15 000 | 23 000 | K15×19×17 | 0.0090 |
| | 19 | 24 | 14 100 | 20 400 | 2 490 | 15 000 | 23 000 | K15×19×24ZW | 0.013 |
| | 20 | 13 | 10 100 | 11 500 | 1 410 | 15 000 | 23 000 | K15×20×13 | 0.0088 |
| | 20 | 16 | 12 600 | 15 200 | 1 850 | 15 000 | 23 000 | KMJ15×20×15.8XS | 0.0090 |
| | 21 | 15 | 11 900 | 12 500 | 1 530 | 15 000 | 23 000 | K15×21×15 | 0.013 |
| | 21 | 17 | 14 900 | 16 800 | 2 050 | 15 000 | 23 000 | KMJ15×21×16.8X1SK | 0.012 |
| | 21 | 21 | 16 500 | 19 100 | 2 330 | 15 000 | 23 000 | K15×21×21 | 0.017 |
| 16 | 20 | 10 | 7 500 | 9 250 | 1 130 | 15 000 | 23 000 | K16×20×10T | 0.0057 |
| | 20 | 11 | 8 300 | 10 500 | 1 280 | 15 000 | 23 000 | K16×20×11T | 0.0061 |
| | 20 | 13 | 9 050 | 11 800 | 1 430 | 15 000 | 23 000 | K16×20×13 | 0.0071 |
| | 20 | 17 | 11 900 | 16 800 | 2 050 | 15 000 | 23 000 | K16×20×17ST | 0.0092 |
| | 22 | 12 | 11 700 | 12 500 | 1 530 | 15 000 | 23 000 | K16×22×12 | 0.010 |
| | 22 | 13 | 12 600 | 13 900 | 1 690 | 15 000 | 23 000 | KMJ16×22×13S | 0.011 |
| | 22 | 16 | 13 600 | 15 200 | 1 850 | 15 000 | 23 000 | K16×22×15.8X | 0.014 |
| | 22 | 17 | 14 400 | 16 400 | 2 000 | 15 000 | 23 000 | K16×22×17 | 0.015 |
| | 22 | 20 | 16 000 | 18 800 | 2 300 | 15 000 | 23 000 | K16×22×20 | 0.017 |
| 17 | 21 | 10 | 7 450 | 9 300 | 1 140 | 15 000 | 22 000 | K17×21×10S | 0.0056 |
| | 21 | 13 | 9 400 | 12 600 | 1 530 | 15 000 | 22 000 | K17×21×13S | 0.0075 |
| | 21 | 15 | 10 400 | 14 400 | 1 750 | 15 000 | 22 000 | K17×21×15 | 0.0089 |
| | 21 | 17 | 11 800 | 16 900 | 2 060 | 15 000 | 22 000 | K17×21×17 | 0.0095 |
| | 22 | 20 | 14 700 | 19 200 | 2 340 | 15 000 | 22 000 | K17×22×20 | 0.015 |
| | 23 | 17 | 14 400 | 16 500 | 2 020 | 15 000 | 22 000 | K17×23×17 | 0.016 |
| | 23 | 23 | 16 800 | 20 200 | 2 470 | 15 000 | 22 000 | K17×23×22.8X1T2 | 0.013 |
| 18 | 22 | 10 | 7 400 | 9 400 | 1 140 | 14 000 | 21 000 | K18×22×10 | 0.0061 |
| | 22 | 13 | 8 900 | 11 900 | 1 450 | 14 000 | 21 000 | K18×22×13 | 0.0077 |
| | 22 | 17 | 11 700 | 17 000 | 2 070 | 14 000 | 21 000 | K18×22×17 | 0.011 |
| | 23 | 20 | 14 600 | 19 300 | 2 360 | 14 000 | 21 000 | K18×23×20S | 0.015 |
| | 24 | 12 | 12 300 | 13 800 | 1 690 | 14 000 | 21 000 | K18×24×12 | 0.012 |
| | 24 | 13 | 11 600 | 12 800 | 1 560 | 14 000 | 21 000 | K18×24×13 | 0.013 |

Note: Bearings may be delivered with a different cage type even if they are ordered by the bearing numbers in the table.

Needle Roller Bearings

F_w 18–22 mm

| Boundary dimensions | | | Basic load rating | | Fatigue load limit | Allowable speed | | Number | Mass |
|---------------------|-------|-------|-------------------|----------|--------------------|--------------------|-----------------|-------------------------|-------------------------|
| mm | | | dynamic | static | N | min ⁻¹ | | | kg |
| F_w | E_w | B_c | C_r | C_{0r} | | Grease lubrication | Oil lubrication | | |
| 18 | 24 | 17 | 16 000 | 19 300 | 2 350 | 14 000 | 21 000 | KMJ18×24×17SV1 | 0.014 |
| | 24 | 20 | 17 000 | 20 900 | 2 550 | 14 000 | 21 000 | K18×24×20 | 0.019 |
| | 25 | 17 | 18 000 | 20 400 | 2 490 | 14 000 | 21 000 | K18×25×17 | 0.019 |
| | 25 | 22 | 22 100 | 26 600 | 3 250 | 14 000 | 21 000 | K18×25×22 | 0.024 |
| | 23 | 13 | 9 650 | 13 500 | 1 640 | 14 000 | 21 000 | K19×23×13 | 0.0082 |
| 19 | 23 | 17 | 12 700 | 19 200 | 2 340 | 14 000 | 21 000 | K19×23×17 | 0.011 |
| | 24 | 10 | 8 300 | 11 200 | 1 370 | 13 000 | 20 000 | K20×24×10S | 0.0065 |
| 20 | 24 | 11 | 9 500 | 13 400 | 1 640 | 13 000 | 20 000 | K20×24×11 | 0.0072 |
| | 24 | 13 | 10 000 | 14 300 | 1 740 | 13 000 | 20 000 | K20×24×13SV4 | 0.0086 |
| | 24 | 17 | 13 200 | 20 400 | 2 480 | 13 000 | 20 000 | K20×24×17S | 0.011 |
| | 24 | 45 | 16 400 | 27 100 | 3 300 | 13 000 | 20 000 | K20×24×45ZW | 0.028 |
| | 25 | 40 | 29 000 | 48 000 | 5 880 | 13 000 | 20 000 | K20×25×40ZW | 0.033 |
| | 26 | 12 | 12 900 | 15 100 | 1 840 | 13 000 | 20 000 | K20×26×12 | 0.013 |
| | 26 | 13 | 14 000 | 16 700 | 2 040 | 13 000 | 20 000 | KMJ20×26×13ST | 0.012 |
| | 26 | 14 | 15 800 | 19 600 | 2 390 | 13 000 | 13 000 | KMJ20×26×13.8X1S | 0.013 |
| | 26 | 17 | 17 800 | 22 800 | 2 780 | 13 000 | 20 000 | KMJ20×26×17S | 0.016 |
| | 26 | 20 | 20 600 | 27 600 | 3 350 | 13 000 | 20 000 | KMJ20×26×20S | 0.019 |
| | 28 | 17 | 21 700 | 24 600 | 3 000 | 13 000 | 20 000 | KMJ20×28×16.8XS | 0.022 |
| | 28 | 20 | 24 600 | 28 900 | 3 500 | 13 000 | 20 000 | KMJ20×28×19.8X4S | 0.026 |
| | 28 | 25 | 27 100 | 32 500 | 3 950 | 13 000 | 20 000 | 8Q-K20×28×25 | 0.039 |
| | 21 | 25 | 13 | 10 700 | 15 900 | 1 940 | 13 000 | 19 000 | KMJ21×25×12.8X1S |
| 25 | | 17 | 13 600 | 21 500 | 2 630 | 13 000 | 19 000 | K21×25×17 | 0.012 |
| 22 | 26 | 10 | 8 500 | 11 900 | 1 450 | 12 000 | 18 000 | K22×26×10S | 0.0071 |
| | 26 | 11 | 10 100 | 14 900 | 1 820 | 12 000 | 18 000 | 8Q-K22×26×11 | 0.0090 |
| | 26 | 13 | 10 200 | 15 200 | 1 850 | 12 000 | 18 000 | K22×26×13 | 0.0094 |
| | 26 | 17 | 13 500 | 21 600 | 2 640 | 12 000 | 18 000 | K22×26×17S | 0.012 |
| | 27 | 20 | 17 500 | 25 900 | 3 150 | 12 000 | 18 000 | K22×27×20 | 0.020 |
| | 27 | 28.5 | 24 200 | 39 500 | 4 800 | 12 000 | 18 000 | K22×27×28.3X | 0.028 |
| | 27 | 40 | 29 900 | 51 500 | 6 300 | 12 000 | 18 000 | K22×27×40ZW | 0.039 |
| | 28 | 17 | 17 700 | 23 300 | 2 850 | 12 000 | 18 000 | K22×28×17V1 | 0.020 |

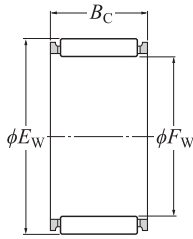
Note: Bearings may be delivered with a different cage type even if they are ordered by the bearing numbers in the table.

Needle Roller Bearings

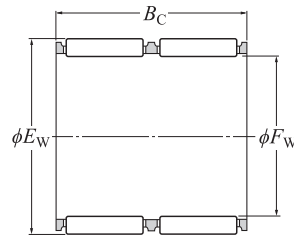


Needle roller and cage assemblies

- K type
- K·T2 type
- K·S type
- K·ZW type
- KMJ·S type
- KV·S type



K type
K·T2 type
K·S type



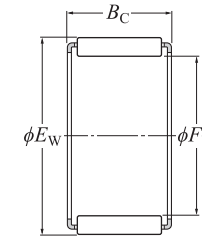
K·ZW type

F_w 22–25 mm

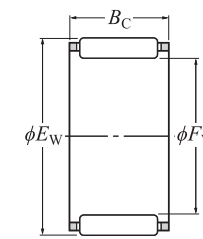
| Boundary dimensions | Basic load rating | | Fatigue load limit | Allowable speed | | Number | Mass | | | |
|---------------------|-------------------|----------|--------------------|--------------------|-----------------|--------|-----------|---------------------|--------------------------|--------|
| | dynamic | static | | min ⁻¹ | | | | | | |
| mm | C_r | C_{0r} | N | Grease lubrication | Oil lubrication | | kg | | | |
| F_w E_w B_c | | | C_u | | | | (approx.) | | | |
| 22 | 29 | 16 | | 18 700 | 22 700 | 2 770 | 12 000 | 18 000 | K22×29×16 | 0.023 |
| | 30 | 15 | -0.2 | 19 300 | 21 700 | 2 640 | 12 000 | 18 000 | K22×30×15T | 0.022 |
| | 30 | 17.5 | -0.55 | 23 200 | 27 500 | 3 350 | 12 000 | 18 000 | KMJ22×30×17.3X2S | 0.024 |
| | 30 | 24 | | 31 000 | 40 000 | 4 900 | 12 000 | 18 000 | KMJ22×30×23.8X3S | 0.035 |
| 23 | 27 | 13 | | 11 400 | 17 700 | 2 160 | 11 000 | 17 000 | KMJ23×27×12.8X1S | 0.0086 |
| | 28 | 24 | -0.2 | 19 800 | 31 000 | 3 750 | 11 000 | 17 000 | K23×28×24 | 0.023 |
| | 29 | 18 | -0.55 | 20 600 | 28 800 | 3 500 | 11 000 | 17 000 | KMJ23×29×17.8X2S | 0.019 |
| 24 | 28 | 10 | | 9 000 | 13 200 | 1 610 | 11 000 | 17 000 | K24×28×10T | 0.0080 |
| | 28 | 13 | | 10 800 | 16 800 | 2 050 | 11 000 | 17 000 | K24×28×13 | 0.010 |
| | 28 | 17 | -0.2 | 14 300 | 23 900 | 2 920 | 11 000 | 17 000 | K24×28×17 | 0.013 |
| | 29 | 13 | -0.55 | 12 300 | 16 900 | 2 060 | 11 000 | 17 000 | K24×29×13 | 0.012 |
| | 30 | 17 | | 18 400 | 25 200 | 3 050 | 11 000 | 17 000 | K24×30×17 | 0.022 |
| | 30 | 31 | | 27 900 | 43 000 | 5 200 | 11 000 | 17 000 | K24×30×31ZW | 0.039 |
| 25 | 29 | 10 | | 8 950 | 13 300 | 1 620 | 11 000 | 16 000 | K25×29×10 | 0.0083 |
| | 29 | 13 | | 10 800 | 16 900 | 2 050 | 11 000 | 16 000 | K25×29×13 | 0.010 |
| | 29 | 17 | | 14 200 | 24 000 | 2 930 | 11 000 | 16 000 | K25×29×17S | 0.014 |
| | 30 | 13 | | 13 200 | 18 800 | 2 290 | 11 000 | 16 000 | K25×30×13 | 0.013 |
| | 30 | 17 | | 17 400 | 26 800 | 3 250 | 11 000 | 16 000 | K25×30×17S | 0.017 |
| | 30 | 20 | | 19 400 | 31 000 | 3 750 | 11 000 | 16 000 | K25×30×20SV3 | 0.021 |
| | 30 | 22 | | 22 300 | 37 000 | 4 500 | 11 000 | 16 000 | KMJ25×30×21.8XS | 0.020 |
| | 30 | 26 | -0.2 | 21 800 | 35 500 | 4 350 | 11 000 | 16 000 | K25×30×26ZW | 0.027 |
| | 30 | 39 | -0.55 | 29 800 | 53 500 | 6 550 | 11 000 | 16 000 | K25×30×39ZW | 0.040 |
| | 31 | 13 | | 15 200 | 19 900 | 2 430 | 11 000 | 16 000 | K25×31×13V3 | 0.018 |
| | 31 | 14 | | 16 500 | 22 100 | 2 700 | 11 000 | 16 000 | K25×31×14 | 0.018 |
| | 31 | 17 | | 18 300 | 25 300 | 3 100 | 11 000 | 16 000 | K25×31×17 | 0.022 |
| | 31 | 18.5 | | 21 000 | 30 000 | 3 650 | 11 000 | 16 000 | KMJ25×31×18.3X1SK | 0.021 |
| | 31 | 21 | | 22 500 | 33 000 | 4 000 | 11 000 | 16 000 | K25×31×21V3 | 0.028 |
| | 32 | 16 | | 19 500 | 24 700 | 3 000 | 11 000 | 16 000 | K25×32×16 | 0.027 |
| 33 | 24 | | 34 500 | 47 000 | 5 750 | 11 000 | 16 000 | KMJ25×33×24S | 0.040 | |

Note: Bearings may be delivered with a different cage type even if they are ordered by the bearing numbers in the table.

Needle Roller Bearings



KMJ·S type



KV·S type

F_w 26–30 mm

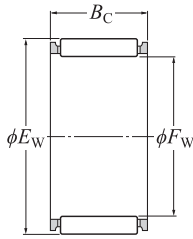
| Boundary dimensions | Basic load rating | | Fatigue load limit | Allowable speed | | Number | Mass | | | |
|---------------------|-------------------|----------|--------------------|--------------------|-----------------|--------|-----------|------------------|---------------------------|-------|
| | dynamic | static | | min ⁻¹ | | | | | | |
| mm | C_r | C_{0r} | N | Grease lubrication | Oil lubrication | | kg | | | |
| F_w E_w B_c | | | C_u | | | | (approx.) | | | |
| 26 | 30 | 13 | | 11 800 | 19 200 | 2 340 | 10 000 | 15 000 | K26×30×13 | 0.011 |
| | 30 | 17 | -0.2 | 15 500 | 27 400 | 3 350 | 10 000 | 15 000 | K26×30×17 | 0.015 |
| | 31 | 24 | -0.55 | 21 400 | 35 500 | 4 300 | 10 000 | 15 000 | 8E-K26×31×23.8X1ZW | 0.029 |
| | 34 | 22 | | 24 200 | 30 000 | 3 700 | 10 000 | 15 000 | K26×34×22 | 0.041 |
| 28 | 32 | 17 | | 15 300 | 27 500 | 3 350 | 9 500 | 14 000 | K28×32×17 | 0.017 |
| | 32 | 21 | | 18 700 | 35 500 | 4 350 | 9 500 | 14 000 | K28×32×21T | 0.020 |
| | 33 | 13 | | 13 900 | 20 900 | 2 550 | 9 500 | 14 000 | K28×33×13 | 0.015 |
| | 33 | 17 | | 18 300 | 29 800 | 3 650 | 9 500 | 14 000 | K28×33×17S | 0.020 |
| | 33 | 26 | -0.2 | 23 900 | 42 000 | 5 100 | 9 500 | 14 000 | K28×33×26ZW | 0.033 |
| | 33 | 27 | -0.55 | 28 300 | 52 000 | 6 350 | 9 500 | 14 000 | K28×33×27 | 0.032 |
| | 34 | 14 | | 17 500 | 24 800 | 3 000 | 9 500 | 14 000 | K28×34×14 | 0.020 |
| | 34 | 17 | | 18 100 | 25 800 | 3 150 | 9 500 | 14 000 | K28×34×17V1 | 0.025 |
| | 35 | 16 | | 21 200 | 28 400 | 3 450 | 9 500 | 14 000 | K28×35×16 | 0.029 |
| | 35 | 18 | | 21 500 | 28 900 | 3 550 | 9 500 | 14 000 | K28×35×18 | 0.031 |
| 29 | 34 | 17 | -0.2 | 18 900 | 31 000 | 3 800 | 9 500 | 14 000 | K29×34×17S | 0.022 |
| | 34 | 27 | -0.55 | 28 100 | 52 000 | 6 350 | 9 500 | 14 000 | K29×34×27 | 0.033 |
| 30 | 34 | 14 | | 12 400 | 21 500 | 2 600 | 8 500 | 13 000 | KV30×34×13.8XS | 0.014 |
| | 34 | 23 | | 18 000 | 34 500 | 4 200 | 8 500 | 13 000 | K30×34×22.8X1T2 | 0.013 |
| | 35 | 11 | | 12 200 | 18 000 | 2 200 | 8 500 | 13 000 | K30×35×11S | 0.014 |
| | 35 | 13 | | 14 700 | 22 900 | 2 800 | 8 500 | 13 000 | KV30×35×13S | 0.017 |
| | 35 | 20 | | 21 600 | 37 500 | 4 600 | 8 500 | 13 000 | K30×35×20S | 0.025 |
| | 35 | 26 | -0.2 | 25 200 | 46 000 | 5 600 | 8 500 | 13 000 | K30×35×26ZWV1 | 0.036 |
| | 35 | 27 | -0.55 | 29 900 | 57 000 | 6 950 | 8 500 | 13 000 | K30×35×27S | 0.033 |
| | 37 | 16 | | 21 900 | 30 500 | 3 700 | 8 500 | 13 000 | K30×37×16 | 0.029 |
| | 37 | 18 | | 23 300 | 33 000 | 4 000 | 8 500 | 13 000 | K30×37×18 | 0.034 |
| | 37 | 20 | | 26 200 | 38 000 | 4 650 | 8 500 | 13 000 | KMJ30×37×20S | 0.032 |
| | 37 | 48 | | 40 000 | 65 500 | 8 000 | 8 500 | 13 000 | K30×37×48ZW | 0.075 |
| 38 | 18 | | 25 000 | 33 000 | 4 000 | 8 500 | 13 000 | K30×38×18 | 0.036 | |

Note: Bearings may be delivered with a different cage type even if they are ordered by the bearing numbers in the table.

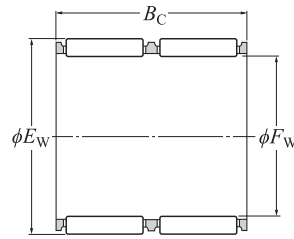
Needle Roller Bearings

Needle roller and cage assemblies

- K type
- K·T2 type
- K·S type
- K·ZW type
- KMJ·S type
- KV·S type



K type
K·T2 type
K·S type



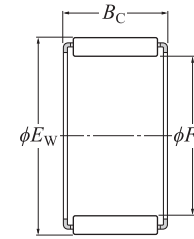
K·ZW type

F_w 31–35 mm

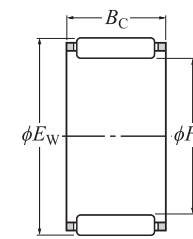
| Boundary dimensions | Basic load rating | | Fatigue load limit | Allowable speed | | Number | Mass | |
|---------------------|-------------------|----------|--------------------|--------------------|-----------------|--------|--------------------------|-------|
| | dynamic | static | | min ⁻¹ | | | | |
| mm | C_r | C_{0r} | N | Grease lubrication | Oil lubrication | | kg | |
| F_w E_w B_c | | | C_u | | | | (approx.) | |
| 31 | 35 24 | 21 200 | 43 500 | 5 300 | 8 500 | 13 000 | KV31×35×23.8XS | 0.022 |
| | 36 14 | 15 800 | 25 400 | 3 100 | 8 500 | 13 000 | KV31×36×13.8XS | 0.017 |
| 32 | 36 15 | 14 300 | 26 400 | 3 200 | 8 500 | 13 000 | K32×36×15ST | 0.017 |
| | 37 13 | 14 500 | 23 000 | 2 810 | 8 500 | 13 000 | K32×37×13 | 0.018 |
| | 37 17 | 19 200 | 33 000 | 4 000 | 8 500 | 13 000 | K32×37×17S | 0.022 |
| | 37 26 | 24 900 | 46 000 | 5 600 | 8 500 | 13 000 | K32×37×26ZWV3 | 0.032 |
| | 37 27 | 29 600 | 57 500 | 7 000 | 8 500 | 13 000 | K32×37×27 | 0.037 |
| | 38 14 | 19 800 | 30 500 | 3 700 | 8 500 | 13 000 | KMJ32×38×14S | 0.022 |
| | 38 26 | 31 500 | 54 000 | 6 600 | 8 500 | 13 000 | K32×38×26 | 0.041 |
| | 39 16 | 22 600 | 32 000 | 3 900 | 8 500 | 13 000 | K32×39×16V1 | 0.033 |
| 33 | 38 30.5 | 28 400 | 55 000 | 6 700 | 8 000 | 12 000 | K33×38×30.3X1T2 | 0.026 |
| | 39 18 | 24 000 | 35 000 | 4 250 | 8 500 | 13 000 | K32×39×18 | 0.037 |
| 34 | 40 39.5 | 39 000 | 73 500 | 8 950 | 8 000 | 12 000 | KV34×40×39.3X1ZWS | 0.066 |
| | 39 22.5 | 21 500 | 46 000 | 5 600 | 7 500 | 11 000 | KV35×39×22.3XS | 0.024 |
| 35 | 39 24 | 21 300 | 45 000 | 5 500 | 7 500 | 11 000 | K35×39×23.8X1T2 | 0.015 |
| | 40 13 | 15 200 | 25 100 | 3 050 | 7 500 | 11 000 | K35×40×13 | 0.019 |
| | 40 17 | 20 000 | 36 000 | 4 350 | 7 500 | 11 000 | K35×40×17 | 0.025 |
| | 40 19 | 22 300 | 41 000 | 5 000 | 7 500 | 11 000 | K35×40×19 | 0.029 |
| | 40 26 | 26 100 | 50 000 | 6 100 | 7 500 | 11 000 | K35×40×26ZW | 0.037 |
| | 40 30 | 26 100 | 50 000 | 6 100 | 7 500 | 11 000 | K35×40×30ZW | 0.043 |
| | 41 14 | 19 400 | 30 500 | 3 700 | 7 500 | 11 000 | K35×41×14 | 0.026 |
| | 41 15 | 20 900 | 33 500 | 4 050 | 7 500 | 11 000 | K35×41×15 | 0.027 |
| | 41 24 | 31 000 | 55 500 | 6 800 | 7 500 | 11 000 | K35×41×23.8X1 | 0.042 |
| | 41 40 | 43 000 | 84 000 | 10 200 | 7 500 | 11 000 | K35×41×40ZW | 0.055 |
| | 42 16 | 24 100 | 36 000 | 4 350 | 7 500 | 11 000 | K35×42×16 | 0.035 |
| | 42 18 | 24 700 | 37 000 | 4 500 | 7 500 | 11 000 | K35×42×18 | 0.039 |

Note: Bearings may be delivered with a different cage type even if they are ordered by the bearing numbers in the table.

Needle Roller Bearings



KMJ·S type



KV·S type

F_w 35–42 mm

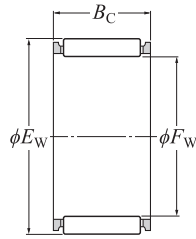
| Boundary dimensions | Basic load rating | | Fatigue load limit | Allowable speed | | Number | Mass | |
|---------------------|-------------------|----------|--------------------|--------------------|-----------------|--------|--------------------------|-------|
| | dynamic | static | | min ⁻¹ | | | | |
| mm | C_r | C_{0r} | N | Grease lubrication | Oil lubrication | | kg | |
| F_w E_w B_c | | | C_u | | | | (approx.) | |
| 35 | 42 20 | 26 500 | 40 500 | 4 950 | 7 500 | 11 000 | KV35×42×20SV2 | 0.040 |
| | 42 30 | 39 500 | 68 000 | 8 300 | 7 500 | 11 000 | K35×42×30 | 0.062 |
| 36 | 42 45 | 42 500 | 74 000 | 9 000 | 7 500 | 11 000 | K35×42×45ZW | 0.106 |
| | 42 46 | 51 000 | 106 000 | 12 900 | 7 500 | 11 000 | K36×42×46ZW | 0.086 |
| 37 | 42 13 | 15 900 | 27 100 | 3 300 | 7 500 | 11 000 | K37×42×13V4 | 0.021 |
| | 42 17 | 21 000 | 38 500 | 4 700 | 7 500 | 11 000 | K37×42×17V2 | 0.026 |
| | 43 33.5 | 39 000 | 76 000 | 9 250 | 7 500 | 11 000 | KV37×43×33.3XS | 0.062 |
| | 44 18 | 26 300 | 41 000 | 5 000 | 7 500 | 11 000 | K37×44×18 | 0.042 |
| | 45 25 | 37 000 | 58 000 | 7 050 | 7 500 | 11 000 | K37×45×24.8XT2 | 0.039 |
| 38 | 43 17 | 20 900 | 38 500 | 4 700 | 7 500 | 11 000 | 8E-K38×43×17 | 0.027 |
| | 43 27 | 32 000 | 67 500 | 8 250 | 7 500 | 11 000 | K38×43×27 | 0.043 |
| | 43 29 | 32 500 | 68 000 | 8 300 | 7 500 | 11 000 | K38×43×28.8X | 0.047 |
| 40 | 46 32 | 54 000 | 95 500 | 11 600 | 7 500 | 11 000 | K38×46×32 | 0.073 |
| | 45 13 | 16 500 | 29 200 | 3 550 | 6 500 | 10 000 | K40×45×13V2 | 0.023 |
| | 45 17 | 21 800 | 41 500 | 5 100 | 6 500 | 10 000 | K40×45×17T | 0.027 |
| | 45 21 | 26 700 | 54 000 | 6 600 | 6 500 | 10 000 | K40×45×21V2 | 0.035 |
| | 45 27 | 33 500 | 72 500 | 8 850 | 6 500 | 10 000 | K40×45×27 | 0.044 |
| | 46 17 | 24 600 | 43 000 | 5 200 | 6 500 | 10 000 | K40×46×17 | 0.030 |
| | 46 34 | 40 500 | 80 500 | 9 850 | 6 500 | 10 000 | KV40×46×33.8XS | 0.063 |
| | 47 18 | 27 700 | 45 000 | 5 450 | 6 500 | 10 000 | K40×47×18 | 0.045 |
| | 47 20 | 31 000 | 51 500 | 6 300 | 6 500 | 10 000 | K40×47×20 | 0.048 |
| | 48 20 | 33 000 | 51 000 | 6 250 | 6 500 | 10 000 | K40×48×20 | 0.052 |
| 41 | 48 25 | 41 000 | 68 000 | 8 300 | 6 500 | 10 000 | KV40×48×25SV1 | 0.065 |
| | 49 22 | 30 500 | 46 000 | 5 650 | 6 500 | 9 500 | 8E-KV41×49×21.8XS | 0.065 |
| 42 | 47 17 | 22 100 | 43 000 | 5 250 | 6 500 | 9 500 | K42×47×17 | 0.028 |
| | 47 27 | 34 000 | 75 500 | 9 200 | 6 500 | 9 500 | K42×47×27 | 0.047 |
| | 48 17 | 25 700 | 46 000 | 5 650 | 6 500 | 9 500 | K42×48×17 | 0.036 |
| | 50 20 | 34 000 | 53 500 | 6 550 | 6 500 | 9 500 | K42×50×20 | 0.054 |

Note: Bearings may be delivered with a different cage type even if they are ordered by the bearing numbers in the table.

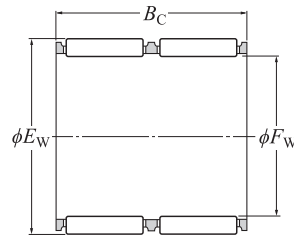
Needle Roller Bearings

Needle roller and cage assemblies

- K type
- K·T2 type
- K·ZW type
- KV·S type
- KVS·ZWS type



K type
K·T2 type
K·S type



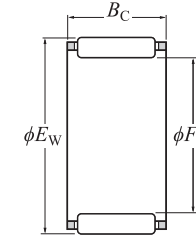
K·ZW type

F_w 43–50 mm

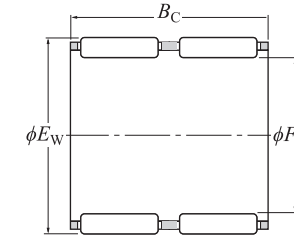
| Boundary dimensions | Basic load rating | | Fatigue load limit | Allowable speed | | Number | Mass | |
|---------------------|-------------------|----------|--------------------|--------------------|-----------------|------------------|-------------------------|-------|
| | dynamic | static | | min ⁻¹ | | | | |
| mm | C_r | C_{0r} | N | Grease lubrication | Oil lubrication | | kg | |
| F_w E_w B_c | | | C_u | | | | (approx.) | |
| 43 | 48 17 | 22 000 | 43 000 | 5 250 | 6 500 | 9 500 | K43×48×17 | 0.029 |
| | 48 27 | 34 000 | 75 500 | 9 200 | 6 500 | 9 500 | K43×48×27 | 0.046 |
| | 48 38 | 41 000 | 96 000 | 11 700 | 6 500 | 9 500 | KV43×48×37.8XZWS | 0.058 |
| | 50 18 | 29 100 | 49 000 | 5 950 | 6 500 | 9 500 | K43×50×18 | 0.049 |
| 44 | 50 31 | 43 500 | 91 500 | 11 100 | 6 500 | 9 500 | KV44×50×30.8XS | 0.067 |
| 45 | 49 19 | 22 100 | 52 000 | 6 350 | 6 000 | 9 000 | K45×49×19 | 0.027 |
| | 50 17 | 22 300 | 44 500 | 5 450 | 6 000 | 9 000 | K45×50×17V3 | 0.033 |
| | 50 25.8 | 30 500 | 66 500 | 8 100 | 6 000 | 9 000 | KV45×50×25.8XS | 0.045 |
| | 50 27 | 34 500 | 78 000 | 9 500 | 6 000 | 9 000 | K45×50×27 | 0.050 |
| | 51 27 | 34 500 | 68 000 | 8 300 | 6 000 | 9 000 | KV45×51×26.8XS | 0.058 |
| | 52 18 | 29 700 | 51 000 | 6 200 | 6 000 | 9 000 | K45×52×18 | 0.051 |
| | 52 21 | 32 000 | 56 500 | 6 900 | 6 000 | 9 000 | K45×52×21 | 0.061 |
| | 53 20 | 36 000 | 59 000 | 7 200 | 6 000 | 9 000 | K45×53×20 | 0.062 |
| 53 25 | 46 500 | 82 000 | 10 000 | 6 000 | 9 000 | K45×53×25 | 0.077 | |
| 47 | 52 15.5 | 19 400 | 38 000 | 4 650 | 5 500 | 8 500 | 8E-K47×52×15.3X2 | 0.031 |
| | 52 17 | 23 200 | 47 500 | 5 800 | 5 500 | 8 500 | K47×52×17 | 0.033 |
| | 52 23 | 29 600 | 65 500 | 7 950 | 5 500 | 8 500 | KV47×52×22.8X2S | 0.044 |
| | 52 24 | 33 500 | 76 500 | 9 350 | 5 500 | 8 500 | K47×52×23.8X | 0.044 |
| | 52 27 | 35 500 | 83 000 | 10 100 | 5 500 | 8 500 | K47×52×27 | 0.051 |
| | 52 33 | 38 000 | 90 500 | 11 100 | 5 500 | 8 500 | KV47×52×32.8XZWS | 0.064 |
| 48 | 53 22.5 | 31 000 | 69 500 | 8 450 | 5 500 | 8 500 | KV48×53×22.3XS | 0.042 |
| | 53 26 | 36 500 | 86 500 | 10 600 | 5 500 | 8 500 | K48×53×25.8X3T2 | 0.029 |
| | 53 30 | 36 500 | 85 500 | 10 400 | 5 500 | 8 500 | K48×53×29.8X1 | 0.062 |
| | 53 37 | 45 000 | 112 000 | 13 700 | 5 500 | 8 500 | KV48×53×36.8XZWS | 0.064 |
| | 53 37.5 | 41 500 | 101 000 | 12 300 | 5 500 | 8 500 | K48×53×37.5ZW | 0.072 |
| | 54 19 | 31 000 | 61 000 | 7 450 | 5 500 | 8 500 | K48×54×19 | 0.044 |
| 55 | 55 24.5 | 39 000 | 74 500 | 9 050 | 5 500 | 8 500 | KV48×55×24.3XS | 0.070 |
| 50 | 55 13.5 | 18 100 | 35 500 | 4 300 | 5 500 | 8 000 | K50×55×13.5T | 0.023 |
| | 55 20 | 27 900 | 62 000 | 7 550 | 5 500 | 8 000 | KV50×55×20S | 0.040 |

Note: Bearings may be delivered with a different cage type even if they are ordered by the bearing numbers in the table.

Needle Roller Bearings



KV·S type



KV·ZWS type

F_w 50–60 mm

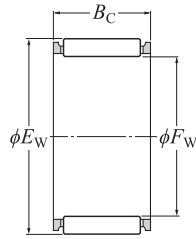
| Boundary dimensions | Basic load rating | | Fatigue load limit | Allowable speed | | Number | Mass | |
|---------------------|-------------------|----------|--------------------|--------------------|-----------------|--------|-------------------------|-------|
| | dynamic | static | | min ⁻¹ | | | | |
| mm | C_r | C_{0r} | N | Grease lubrication | Oil lubrication | | kg | |
| F_w E_w B_c | | | C_u | | | | (approx.) | |
| 50 | 55 27 | 37 000 | 88 500 | 10 800 | 5 500 | 8 000 | K50×55×27 | 0.053 |
| | 55 30 | 39 500 | 97 000 | 11 800 | 5 500 | 8 000 | K50×55×30 | 0.059 |
| | 57 18 | 31 500 | 57 000 | 6 950 | 5 500 | 8 000 | K50×57×18 | 0.053 |
| | 58 20 | 38 500 | 67 500 | 8 200 | 5 500 | 8 000 | K50×58×20 | 0.065 |
| | 58 25 | 48 500 | 90 000 | 11 000 | 5 500 | 8 000 | K50×58×25 | 0.081 |
| | 58 58 | 83 500 | 181 000 | 22 100 | 5 500 | 8 000 | KV50×58×57.8XZWS | 0.188 |
| 52 | 57 18 | 22 800 | 48 000 | 5 850 | 5 000 | 7 500 | KV52×57×17.8XS | 0.037 |
| | 57 23 | 30 500 | 69 500 | 8 500 | 5 000 | 7 500 | KV52×57×22.8X1S | 0.048 |
| | 58 19 | 32 000 | 65 500 | 7 950 | 5 000 | 7 500 | K52×58×19 | 0.048 |
| 54 | 59 23 | 31 500 | 73 500 | 8 950 | 5 000 | 7 500 | KV54×59×22.8XS | 0.049 |
| 55 | 60 17 | 25 800 | 58 000 | 7 050 | 5 000 | 7 500 | K55×60×17 | 0.043 |
| | 60 20 | 28 800 | 66 500 | 8 100 | 5 000 | 7 500 | K55×60×20T | 0.045 |
| | 60 30 | 42 000 | 108 000 | 13 200 | 5 000 | 7 500 | KV55×60×30S | 0.069 |
| | 60 37 | 47 500 | 127 000 | 15 500 | 5 000 | 7 500 | K55×60×36.8X | 0.086 |
| | 61 19 | 33 000 | 69 500 | 8 450 | 5 000 | 7 500 | K55×61×19 | 0.051 |
| | 61 20 | 33 000 | 69 500 | 8 450 | 5 000 | 7 500 | K55×61×20 | 0.054 |
| | 61 30 | 48 000 | 113 000 | 13 700 | 5 000 | 7 500 | K55×61×30 | 0.081 |
| | 62 18 | 33 500 | 63 000 | 7 700 | 5 000 | 7 500 | K55×62×18 | 0.054 |
| | 63 20 | 39 000 | 70 000 | 8 500 | 5 000 | 7 500 | K55×63×20 | 0.073 |
| | 63 25 | 50 500 | 97 500 | 11 900 | 5 000 | 7 500 | K55×63×25 | 0.088 |
| | 63 32 | 61 000 | 125 000 | 15 200 | 5 000 | 7 500 | K55×63×32 | 0.117 |
| 56 | 66 41 | 90 000 | 178 000 | 21 700 | 5 000 | 7 500 | K56×66×40.8XT2 | 0.148 |
| 57 | 65 40 | 66 000 | 140 000 | 17 100 | 4 700 | 7 000 | KV57×65×39.8XZWS | 0.145 |
| 58 | 64 19 | 34 000 | 73 500 | 8 950 | 4 700 | 7 000 | K58×64×19 | 0.052 |
| 60 | 65 20 | 29 800 | 71 500 | 8 750 | 4 300 | 6 500 | K60×65×20 | 0.051 |
| | 65 27 | 40 000 | 104 000 | 12 700 | 4 300 | 6 500 | K60×65×26.8X | 0.067 |
| | 65 30 | 43 500 | 116 000 | 14 200 | 4 300 | 6 500 | K60×65×30 | 0.071 |
| | 66 19 | 33 500 | 73 500 | 8 950 | 4 300 | 6 500 | K60×66×19 | 0.053 |
| | 66 20 | 33 500 | 73 500 | 8 950 | 4 300 | 6 500 | K60×66×20 | 0.056 |

Note: Bearings may be delivered with a different cage type even if they are ordered by the bearing numbers in the table.

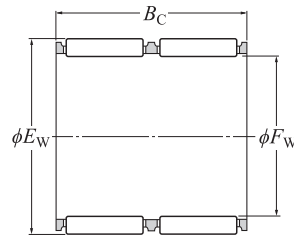
Needle Roller Bearings

Needle roller and cage assemblies

- K type
- K·T2 type
- K·ZW type
- KV·S type
- KV·ZWS type



K type
K·T2 type
K·S type



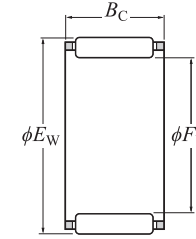
K·ZW type

F_w 60–73 mm

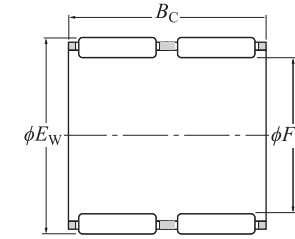
| Boundary dimensions | | | Basic load rating | | Fatigue load limit N C_u | Allowable speed | | Number | Mass kg (approx.) |
|---------------------|-------|-------|-------------------|--------------------|----------------------------------|--|--------------------|-------------------------|-------------------------|
| F_w | E_w | B_c | dynamic C_r | static C_{0r} | | min ⁻¹ Grease lubrication | Oil lubrication | | |
| 60 | 66 | 30 | 49 000 | 119 000 | 14 600 | 4 300 | 6 500 | K60×66×30 | 0.084 |
| | 68 | 15 | 27 200 | 45 500 | 5 550 | 4 300 | 6 500 | K60×68×15 | 0.058 |
| | 68 | 20 | 40 000 | 75 000 | 9 200 | 4 300 | 6 500 | K60×68×20 | 0.077 |
| | 68 | 23 | 44 500 | 85 000 | 10 400 | 4 300 | 6 500 | K60×68×23 | 0.092 |
| | 68 | 25 | 52 000 | 105 000 | 12 800 | 4 300 | 6 500 | K60×68×25T | 0.097 |
| | 68 | 27 | 52 000 | 105 000 | 12 800 | 4 300 | 6 500 | K60×68×27 | 0.098 |
| | 68 | 30 | 46 500 | 91 000 | 11 100 | 4 300 | 6 500 | K60×68×30ZW | 0.119 |
| 61 | 66 | 20 | 29 700 | 71 500 | 8 750 | 4 300 | 6 500 | K61×66×20 | 0.054 |
| | 66 | 30 | 43 500 | 116 000 | 14 200 | 4 300 | 6 500 | K61×66×30 | 0.073 |
| 63 | 70 | 21 | 44 500 | 95 500 | 11 600 | 4 300 | 6 500 | K63×70×21 | 0.075 |
| | 71 | 50.5 | 74 500 | 167 000 | 20 400 | 4 300 | 6 500 | KV63×71×50.3XZWS | 0.193 |
| 64 | 70 | 16 | 28 400 | 60 500 | 7 350 | 4 300 | 6 500 | K64×70×16 | 0.053 |
| 65 | 70 | 20 | 30 500 | 75 000 | 9 150 | 4 000 | 6 000 | K65×70×20 | 0.055 |
| | 70 | 21.5 | 30 500 | 75 000 | 9 150 | 4 000 | 6 000 | KV65×70×21.3X1S | 0.056 |
| | 70 | 30 | 45 000 | 124 000 | 15 200 | 4 000 | 6 000 | K65×70×30 | 0.083 |
| | 73 | 23 | 47 000 | 94 000 | 11 500 | 4 000 | 6 000 | K65×73×23 | 0.100 |
| | 73 | 30 | 61 000 | 132 000 | 16 000 | 4 000 | 6 000 | K65×73×30 | 0.126 |
| 68 | 74 | 20 | 36 000 | 83 500 | 10 200 | 4 000 | 6 000 | K68×74×20 | 0.065 |
| | 74 | 30 | 51 500 | 133 000 | 16 200 | 4 000 | 6 000 | K68×74×30 | 0.097 |
| | 74 | 35 | 49 500 | 125 000 | 15 300 | 4 000 | 6 000 | K68×74×35ZW | 0.116 |
| | 75 | 21 | 45 500 | 101 000 | 12 300 | 4 000 | 6 000 | K68×75×21 | 0.077 |
| 70 | 76 | 20 | 36 500 | 86 000 | 10 500 | 3 700 | 5 500 | K70×76×20 | 0.070 |
| | 76 | 30 | 53 000 | 139 000 | 17 000 | 3 700 | 5 500 | K70×76×30 | 0.100 |
| | 77 | 21 | 45 000 | 101 000 | 12 300 | 3 700 | 5 500 | K70×77×21 | 0.080 |
| | 78 | 23 | 49 500 | 103 000 | 12 600 | 3 700 | 5 500 | K70×78×23 | 0.107 |
| | 78 | 30 | 65 500 | 149 000 | 18 100 | 3 700 | 5 500 | K70×78×30 | 0.136 |
| 72 | 79 | 21 | 46 500 | 106 000 | 12 900 | 3 700 | 5 500 | K72×79×21 | 0.085 |
| 73 | 79 | 20 | 37 500 | 90 000 | 11 000 | 3 700 | 5 500 | K73×79×20 | 0.074 |
| | 79 | 30 | 54 500 | 146 000 | 17 800 | 3 700 | 5 500 | K73×79×30 | 0.106 |

Note: Bearings may be delivered with a different cage type even if they are ordered by the bearing numbers in the table.

Needle Roller Bearings



KV·S type



KV·ZWS type

F_w 74–100 mm

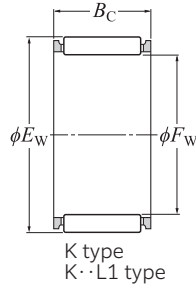
| Boundary dimensions | | | Basic load rating | | Fatigue load limit N C_u | Allowable speed | | Number | Mass kg (approx.) |
|---------------------|-------|-------|-------------------|--------------------|----------------------------------|--|--------------------|------------------------|-------------------------|
| F_w | E_w | B_c | dynamic C_r | static C_{0r} | | min ⁻¹ Grease lubrication | Oil lubrication | | |
| 74 | 90 | 50 | 157 000 | 287 000 | 35 000 | 3 700 | 5 500 | K74×90×49.8XT2 | 0.380 |
| | 81 | 20 | 40 000 | 99 500 | 12 200 | 3 700 | 5 500 | KV75×81×19.8X1S | 0.071 |
| 75 | 81 | 30 | 56 000 | 152 000 | 18 600 | 3 700 | 5 500 | K75×81×30 | 0.108 |
| | 82 | 21 | 46 000 | 106 000 | 13 000 | 3 700 | 5 500 | K75×82×21 | 0.088 |
| | 83 | 23 | 50 500 | 109 000 | 13 300 | 3 700 | 5 500 | K75×83×23 | 0.113 |
| | 83 | 30 | 67 500 | 157 000 | 19 200 | 3 700 | 5 500 | K75×83×30 | 0.147 |
| 80 | 86 | 20 | 39 000 | 98 000 | 11 900 | 3 300 | 5 000 | KV80×86×20SV1 | 0.077 |
| | 86 | 30 | 57 000 | 159 000 | 19 400 | 3 300 | 5 000 | K80×86×30 | 0.110 |
| | 88 | 23 | 53 000 | 118 000 | 14 400 | 3 300 | 5 000 | K80×88×23 | 0.125 |
| | 88 | 26 | 61 000 | 142 000 | 17 300 | 3 300 | 5 000 | K80×88×26 | 0.131 |
| | 88 | 30 | 69 000 | 166 000 | 20 300 | 3 300 | 5 000 | K80×88×30 | 0.157 |
| 85 | 92 | 30 | 66 000 | 176 000 | 21 500 | 3 100 | 4 700 | K85×92×30 | 0.142 |
| | 93 | 27 | 64 000 | 153 000 | 18 700 | 3 100 | 4 700 | K85×93×27 | 0.145 |
| | 93 | 30 | 71 000 | 175 000 | 21 400 | 3 100 | 4 700 | 8Q-K85×93×30 | 0.174 |
| 90 | 97 | 20 | 46 000 | 113 000 | 13 700 | 2 900 | 4 400 | K90×97×20 | 0.103 |
| | 97 | 30 | 67 500 | 184 000 | 22 400 | 2 900 | 4 400 | K90×97×30 | 0.151 |
| | 98 | 26 | 64 000 | 157 000 | 19 200 | 2 900 | 4 400 | K90×98×26 | 0.148 |
| | 98 | 27 | 64 000 | 157 000 | 19 200 | 2 900 | 4 400 | K90×98×27 | 0.150 |
| 95 | 98 | 30 | 72 500 | 184 000 | 22 400 | 2 900 | 4 400 | K90×98×30 | 0.172 |
| | 102 | 21 | 48 000 | 122 000 | 14 900 | 2 800 | 4 200 | K95×102×21 | 0.115 |
| | 102 | 31 | 70 500 | 199 000 | 24 300 | 2 800 | 4 200 | K95×102×31 | 0.172 |
| 100 | 103 | 27 | 65 500 | 165 000 | 20 100 | 2 800 | 4 200 | K95×103×27 | 0.159 |
| | 103 | 30 | 74 000 | 193 000 | 23 500 | 2 800 | 4 200 | K95×103×30 | 0.165 |
| 100 | 107 | 21 | 47 500 | 122 000 | 14 700 | 2 700 | 4 000 | KV100×107×21S | 0.120 |
| | 107 | 31 | 71 500 | 207 000 | 24 900 | 2 700 | 4 000 | K100×107×31 | 0.173 |
| | 108 | 27 | 61 000 | 153 000 | 18 400 | 2 700 | 4 000 | K100×108×27 | 0.176 |
| | 108 | 30 | 76 000 | 201 000 | 24 300 | 2 700 | 4 000 | K100×108×30 | 0.190 |

Note: Bearings may be delivered with a different cage type even if they are ordered by the bearing numbers in the table.

Needle Roller Bearings

Needle roller and cage assemblies

K type
K·L1 type



F_w 105–170 mm

| Boundary dimensions | | | Basic load rating | | Fatigue load limit N C_u | Allowable speed | | Number | Mass kg (approx.) | |
|---------------------|-------|-------|-------------------------|---------------|----------------------------------|--------------------|-------|--------|-------------------------|-------|
| mm | | | dynamic | static | | min^{-1} | | | | |
| F_w | E_w | B_c | C_r | N C_{0r} | Grease lubrication | Oil lubrication | | | | |
| 105 | 112 | 21 | $^{-0.3}$ $^{-0.65}$ | 48 500 | 127 000 | 15 100 | 2 500 | 3 800 | K105×112×21 | 0.130 |
| | 112 | 31 | | 71 000 | 207 000 | 24 600 | 2 500 | 3 800 | K105×112×31 | 0.176 |
| | 113 | 30 | | 77 500 | 210 000 | 25 000 | 2 500 | 3 800 | K105×113×30 | 0.198 |
| 110 | 117 | 24 | $^{-0.3}$ $^{-0.65}$ | 54 500 | 149 000 | 17 500 | 2 400 | 3 600 | K110×117×24 | 0.145 |
| | 117 | 34 | | 77 500 | 235 000 | 27 600 | 2 400 | 3 600 | K110×117×34 | 0.205 |
| | 118 | 30 | | 79 000 | 219 000 | 25 700 | 2 400 | 3 600 | K110×118×30 | 0.217 |
| 115 | 123 | 27 | $^{-0.3}$ $^{-0.65}$ | 64 000 | 170 000 | 19 700 | 2 300 | 3 500 | K115×123×27 | 0.200 |
| | 125 | 34 | | 95 000 | 241 000 | 27 800 | 2 300 | 3 500 | K115×125×34 | 0.330 |
| 120 | 127 | 24 | $^{-0.3}$ $^{-0.65}$ | 57 500 | 165 000 | 18 900 | 2 200 | 3 300 | K120×127×24 | 0.160 |
| | 127 | 34 | | 82 000 | 260 000 | 29 800 | 2 200 | 3 300 | K120×127×34 | 0.235 |
| 125 | 133 | 35 | $^{-0.3}$ $^{-0.65}$ | 87 000 | 260 000 | 29 300 | 2 100 | 3 200 | K125×133×35 | 0.275 |
| | 135 | 34 | | 100 000 | 265 000 | 29 800 | 2 100 | 3 200 | K125×135×34 | 0.350 |
| 130 | 137 | 24 | $^{-0.3}$ $^{-0.65}$ | 59 000 | 175 000 | 19 600 | 2 100 | 3 100 | K130×137×24 | 0.170 |
| | 137 | 34 | | 84 500 | 277 000 | 31 000 | 2 100 | 3 100 | K130×137×34 | 0.240 |
| 135 | 143 | 35 | $^{-0.3}$ $^{-0.65}$ | 92 500 | 288 000 | 32 000 | 2 000 | 3 000 | K135×143×35L1 | 0.313 |
| | 150 | 38 | | 145 000 | 325 000 | 36 000 | 2 000 | 3 000 | K135×150×38 | 0.590 |
| 145 | 153 | 26 | $^{-0.3}$ $^{-0.65}$ | 72 000 | 214 000 | 23 100 | 1 900 | 2 800 | K145×153×26 | 0.250 |
| | 153 | 28 | | 80 500 | 247 000 | 26 700 | 1 900 | 2 800 | K145×153×28 | 0.252 |
| | 153 | 36 | | 100 000 | 325 000 | 35 000 | 1 900 | 2 800 | K145×153×36 | 0.335 |
| 150 | 160 | 46 | $^{-0.3}$ $^{-0.65}$ | 149 000 | 470 000 | 50 500 | 1 800 | 2 700 | K150×160×46 | 0.550 |
| 115 | 163 | 26 | $^{-0.3}$ $^{-0.65}$ | 73 500 | 224 000 | 23 800 | 1 700 | 2 600 | K155×163×26 | 0.270 |
| | 163 | 36 | | 102 000 | 340 000 | 36 000 | 1 700 | 2 600 | K155×163×36 | 0.355 |
| 160 | 170 | 46 | $^{-0.3}$ $^{-0.65}$ | 155 000 | 505 000 | 53 000 | 1 700 | 2 500 | K160×170×46 | 0.570 |
| 165 | 173 | 26 | $^{-0.3}$ $^{-0.65}$ | 79 000 | 251 000 | 26 100 | 1 600 | 2 400 | K165×173×26 | 0.290 |
| | 173 | 32 | | 97 000 | 330 000 | 34 000 | 1 600 | 2 400 | K165×173×32 | 0.340 |
| | 173 | 36 | | 109 000 | 380 000 | 39 500 | 1 600 | 2 400 | K165×173×36 | 0.375 |
| 170 | 180 | 46 | $^{-0.3}$ $^{-0.65}$ | 160 000 | 540 000 | 55 500 | 1 600 | 2 400 | K170×180×46 | 0.620 |

Note: Bearings may be delivered with a different cage type even if they are ordered by the bearing numbers in the table.

Needle Roller Bearings

F_w 175–285 mm

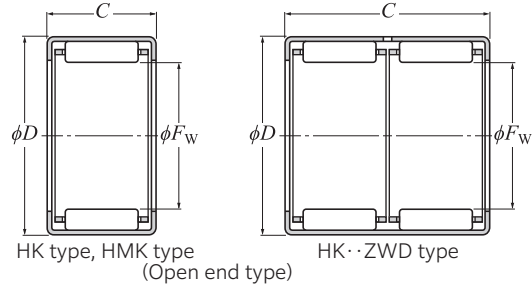
| Boundary dimensions | | | Basic load rating | | Fatigue load limit N C_u | Allowable speed | | Number | Mass kg (approx.) | |
|---------------------|-------|-------|-------------------------|---------------|----------------------------------|--------------------|-------|--------|-------------------------|-------|
| mm | | | dynamic | static | | min^{-1} | | | | |
| F_w | E_w | B_c | C_r | N C_{0r} | Grease lubrication | Oil lubrication | | | | |
| 175 | 183 | 32 | $^{-0.3}$ $^{-0.65}$ | 101 000 | 350 000 | 36 000 | 1 500 | 2 300 | K175×183×32L1 | 0.379 |
| 185 | 195 | 37 | $^{-0.3}$ $^{-0.65}$ | 131 000 | 425 000 | 43 000 | 1 500 | 2 200 | K185×195×37L1 | 0.581 |
| 195 | 205 | 37 | $^{-0.3}$ $^{-0.65}$ | 135 000 | 450 000 | 44 500 | 1 400 | 2 100 | K195×205×37L1 | 0.620 |
| 210 | 220 | 42 | $^{-0.3}$ $^{-0.65}$ | 156 000 | 560 000 | 54 000 | 1 300 | 1 900 | K210×220×42 | 0.740 |
| 220 | 230 | 42 | $^{-0.3}$ $^{-0.65}$ | 161 000 | 590 000 | 56 500 | 1 200 | 1 800 | K220×230×42 | 0.790 |
| 240 | 250 | 42 | $^{-0.3}$ $^{-0.65}$ | 167 000 | 635 000 | 59 000 | 1 100 | 1 700 | K240×250×42L1 | 0.849 |
| 265 | 280 | 50 | $^{-0.3}$ $^{-0.65}$ | 256 000 | 850 000 | 77 000 | 1 000 | 1 500 | K265×280×50L1 | 1.77 |
| 285 | 300 | 50 | $^{-0.3}$ $^{-0.65}$ | 268 000 | 930 000 | 82 000 | 950 | 1 400 | K285×300×50 | 1.97 |

Note: Bearings may be delivered with a different cage type even if they are ordered by the bearing numbers in the table.

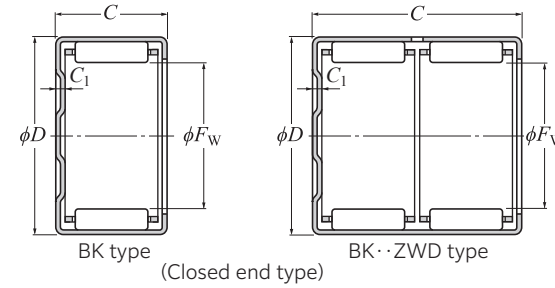
Needle Roller Bearings

Drawn cup needle roller bearings

HK type, HK · ZWD type
HMK type
BK type, BK · ZWD type



Needle Roller Bearings



F_w 3–10 mm

| F_w | Boundary dimensions mm | | Basic load rating | | Fatigue load limit N C_u | Allowable speed | | Number | | Mass kg (approx.) | Applied inner ring ¹⁾ (approx.) | |
|-------|---------------------------|----------------|-------------------|--------|--|-------------------|------------------|--------------------|----------------------------------|-------------------------|--|------------------|
| | C | C ₁ | dynamic | static | | min ⁻¹ | Open end type | Closed end type | Applied inner ring ¹⁾ | | | |
| | | | | | | | | | 0 | | | Max. |
| 3 | 6.5 | 6 | — | 925 | 565 | 69 | 33 000 | 50 000 | HK0306FT2 | — | 0.0006 | — |
| | 6.5 | 6 | 0.8 | 925 | 565 | 69 | 33 000 | 50 000 | — | BK0306T2 | 0.0007 | — |
| 4 | 8 | 8 | — | 1 770 | 1 270 | 155 | 30 000 | 45 000 | HK0408FT2 | — | 0.0016 | — |
| | 8 | 8 | 1.6 | 1 770 | 1 270 | 155 | 30 000 | 45 000 | — | BK0408T2 | 0.0018 | — |
| 5 | 9 | 9 | — | 2 450 | 1 990 | 243 | 27 000 | 40 000 | HK0509FM | — | 0.0019 | — |
| | 9 | 9 | 1.6 | 2 450 | 1 990 | 243 | 27 000 | 40 000 | — | BK0509 | 0.0021 | — |
| 6 | 10 | 9 | — | 2 920 | 2 590 | 315 | 25 000 | 37 000 | HK0609FM | — | 0.0022 | — |
| | 10 | 9 | 1.6 | 2 660 | 2 280 | 278 | 25 000 | 37 000 | — | BK0609T2 | 0.0024 | — |
| 7 | 11 | 9 | — | 3 150 | 2 930 | 355 | 23 000 | 34 000 | HK0709FM | — | 0.0025 | — |
| | 11 | 9 | 1.6 | 3 150 | 2 930 | 355 | 23 000 | 34 000 | — | BK0709CT | 0.0027 | — |
| 8 | 12 | 10 | — | 3 850 | 3 950 | 480 | 20 000 | 30 000 | HK0810FM | — | 0.0032 | IR 5 × 8 × 12 |
| | 12 | 10 | 1.6 | 3 850 | 3 950 | 480 | 20 000 | 30 000 | — | BK0810CT | 0.0034 | IR 5 × 8 × 12 |
| | 15 | 10 | — | 4 200 | 3 300 | 400 | 20 000 | 30 000 | HMK0810CT | — | 0.0067 | IR 5 × 8 × 12 |
| | 15 | 15 | — | 7 300 | 6 650 | 770 | 20 000 | 30 000 | HMK0815CT | — | 0.010 | IR 5 × 8 × 16 |
| | 15 | 20 | — | 9 050 | 8 750 | 1 070 | 20 000 | 30 000 | HMK0820T2 | — | 0.013 | — |
| 9 | 13 | 10 | — | 4 300 | 4 650 | 570 | 18 000 | 27 000 | HK0910FM | — | 0.0035 | IR 6 × 9 × 12 |
| | 13 | 10 | 1.6 | 4 300 | 4 650 | 570 | 18 000 | 27 000 | — | BK0910CT | 0.0039 | IR 6 × 9 × 12 |
| | 13 | 12 | — | 5 400 | 6 250 | 765 | 18 000 | 27 000 | HK0912F | — | 0.0042 | IR 6 × 9 × 12 |
| | 13 | 12 | 1.6 | 5 400 | 6 250 | 765 | 18 000 | 27 000 | — | BK0912CT | 0.0045 | IR 6 × 9 × 12 |
| | 16 | 12 | — | 5 300 | 4 450 | 545 | 18 000 | 27 000 | HMK0912 | — | 0.0087 | IR 6 × 9 × 16 |
| | 16 | 16 | — | 7 400 | 6 850 | 840 | 18 000 | 27 000 | HMK0916 | — | 0.012 | — |
| 10 | 14 | 10 | — | 4 500 | 5 100 | 620 | 16 000 | 24 000 | HK1010FM | — | 0.0038 | IR 7 × 10 × 10.5 |
| | 14 | 10 | 1.6 | 4 500 | 5 100 | 620 | 16 000 | 24 000 | — | BK1010 | 0.0042 | IR 7 × 10 × 10.5 |
| | 14 | 12 | — | 5 650 | 6 800 | 830 | 16 000 | 24 000 | HK1012F | — | 0.0045 | IR 7 × 10 × 16 |
| | 14 | 12 | 1.6 | 5 900 | 7 250 | 880 | 16 000 | 24 000 | — | BK1012 | 0.0050 | IR 7 × 10 × 16 |
| | 14 | 15 | — | 7 250 | 9 400 | 1 140 | 16 000 | 24 000 | HK1015F | — | 0.0056 | IR 7 × 10 × 16 |
| | 14 | 15 | 1.6 | 7 250 | 9 400 | 1 140 | 16 000 | 24 000 | — | BK1015CT | 0.0062 | IR 7 × 10 × 16 |
| | 17 | 10 | — | 4 250 | 3 450 | 420 | 16 000 | 24 000 | HMK1010 | — | 0.0079 | IR 7 × 10 × 10.5 |
| | 17 | 12 | — | 5 600 | 4 850 | 590 | 16 000 | 24 000 | HMK1012 | — | 0.0094 | IR 7 × 10 × 16 |

1) If the bearing has an inner ring, the value indicates HK + IR.
Example: HK1012F + IR7 × 10 × 16

F_w 10–15 mm

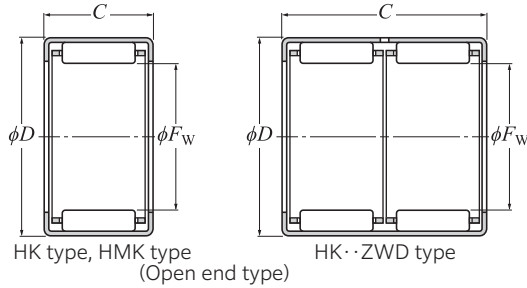
| F_w | Boundary dimensions mm | | Basic load rating | | Fatigue load limit N C_u | Allowable speed | | Number | | Mass kg (approx.) | Applied inner ring ¹⁾ (approx.) | |
|-------|---------------------------|----------------|-------------------|--------|--|-------------------|------------------|--------------------|----------------------------------|-------------------------|--|------------------|
| | C | C ₁ | dynamic | static | | min ⁻¹ | Open end type | Closed end type | Applied inner ring ¹⁾ | | | |
| | | | | | | | | | 0 | | | Max. |
| 10 | 17 | 15 | — | 7 400 | 6 950 | 850 | 16 000 | 24 000 | HMK1015 | — | 0.012 | IR 7 × 10 × 16 |
| | 17 | 20 | — | 9 900 | 10 100 | 1 240 | 16 000 | 24 000 | 7E-HMK1020CT | — | 0.016 | — |
| 12 | 16 | 10 | — | 5 050 | 6 250 | 760 | 13 000 | 20 000 | HK1210FM | — | 0.0046 | IR 8 × 12 × 10.5 |
| | 16 | 10 | 1.6 | 5 050 | 6 250 | 760 | 13 000 | 20 000 | — | BK1210 | 0.0052 | IR 8 × 12 × 10.5 |
| | 18 | 12 | — | 6 600 | 7 300 | 890 | 13 000 | 20 000 | HK1212FM | — | 0.0091 | IR 8 × 12 × 12.5 |
| | 18 | 12 | 2.7 | 6 600 | 7 300 | 890 | 13 000 | 20 000 | — | BK1212 | 0.010 | IR 8 × 12 × 12.5 |
| | 19 | 12 | — | 7 100 | 6 900 | 845 | 13 000 | 20 000 | HMK1212 | — | 0.011 | IR 8 × 12 × 12.5 |
| | 19 | 15 | — | 9 400 | 9 900 | 1 210 | 13 000 | 20 000 | 7E-HMK1215C | — | 0.014 | IR 9 × 12 × 16 |
| | 19 | 20 | — | 12 900 | 14 900 | 1 820 | 13 000 | 20 000 | HMK1220CT | — | 0.018 | — |
| 13 | 19 | 12 | — | 6 950 | 7 900 | 965 | 12 000 | 18 000 | HK1312FM | — | 0.010 | IR10 × 13 × 12.5 |
| | 19 | 12 | 2.7 | 6 950 | 7 900 | 965 | 12 000 | 18 000 | — | BK1312 | 0.011 | IR10 × 13 × 12.5 |
| 14 | 20 | 12 | — | 7 200 | 8 500 | 1 040 | 11 000 | 17 000 | HK1412FM | — | 0.011 | IR10 × 14 × 13 |
| | 20 | 12 | 2.7 | 7 200 | 8 500 | 1 040 | 11 000 | 17 000 | — | BK1412 | 0.012 | IR10 × 14 × 13 |
| | 20 | 16 | — | 10 300 | 13 400 | 1 640 | 11 000 | 17 000 | HK1416F | — | 0.015 | — |
| | 20 | 16 | 2.7 | 10 300 | 13 400 | 1 640 | 11 000 | 17 000 | — | BK1416CT | 0.016 | — |
| | 22 | 16 | — | 11 500 | 12 000 | 1 460 | 11 000 | 17 000 | HMK1416C | — | 0.019 | IR10 × 14 × 20 |
| | 22 | 20 | — | 14 600 | 16 200 | 1 980 | 11 000 | 17 000 | HMK1420C | — | 0.024 | — |
| 15 | 21 | 12 | — | 7 500 | 9 100 | 1 110 | 11 000 | 16 000 | HK1512FM | — | 0.011 | IR12 × 15 × 12.5 |
| | 21 | 12 | 2.7 | 7 500 | 9 100 | 1 110 | 11 000 | 16 000 | — | BK1512 | 0.013 | IR12 × 15 × 12.5 |
| | 21 | 16 | — | 10 700 | 14 400 | 1 750 | 11 000 | 16 000 | HK1516F | — | 0.015 | IR12 × 15 × 16.5 |
| | 21 | 16 | 2.7 | 10 700 | 14 400 | 1 750 | 11 000 | 16 000 | — | BK1516 | 0.017 | IR12 × 15 × 16.5 |
| | 21 | 22 | — | 12 900 | 18 200 | 2 220 | 11 000 | 16 000 | HK1522ZWFD | — | 0.020 | IR12 × 15 × 22.5 |
| | 21 | 22 | 2.7 | 12 900 | 18 200 | 2 220 | 11 000 | 16 000 | — | BK1522ZWD | 0.022 | IR12 × 15 × 22.5 |
| | 22 | 10 | — | 6 100 | 6 000 | 730 | 11 000 | 16 000 | HMK1510 | — | 0.011 | IR10 × 15 × 12.5 |
| | 22 | 12 | — | 7 950 | 8 450 | 1 030 | 11 000 | 16 000 | HMK1512 | — | 0.013 | IR12 × 15 × 12.5 |
| | 22 | 15 | — | 10 500 | 12 100 | 1 480 | 11 000 | 16 000 | HMK1515C | — | 0.016 | IR12 × 15 × 16 |
| | 22 | 20 | — | 15 300 | 19 700 | 2 400 | 11 000 | 16 000 | HMK1520CV6 | — | 0.022 | IR12 × 15 × 22.5 |
| 22 | 25 | — | 18 500 | 25 000 | 3 050 | 11 000 | 16 000 | HMK1525 | — | 0.027 | — | |

1) If the bearing has an inner ring, the value indicates HK + IR.
Example: HK1312FM + IR10 × 13 × 12.5

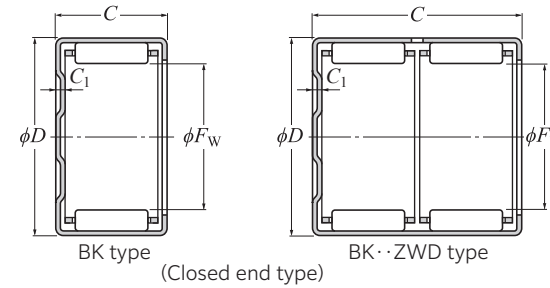
Needle Roller Bearings

Drawn cup needle roller bearings

HK type, HK · ZWD type
HMK type
BK type, BK · ZWD type



Needle Roller Bearings



F_w 16–20 mm

| F_w | Boundary dimensions mm | | Basic load rating | | Fatigue load limit N C_u | Allowable speed | | Number | | Mass kg (approx.) | Applied inner ring ¹⁾ (approx.) | |
|-------|---------------------------|----------------|-------------------|--------|----------------------------------|-------------------|---------------|-----------------|--------------|-------------------------|---|--------------|
| | C | C ₁ | dynamic | static | | min ⁻¹ | Open end type | Closed end type | | | | |
| | | | | | | | | | 0 | | | Max. |
| 16 | 22 | 12 | — | 7 750 | 9 700 | 1 180 | 10 000 | 15 000 | HK1612FM | — | 0.012 | IR12×16×13 |
| | 22 | 12 | 2.7 | 7 750 | 9 700 | 1 180 | 10 000 | 15 000 | — | BK1612 | 0.014 | IR12×16×13 |
| | 22 | 16 | — | 11 100 | 15 300 | 1 870 | 10 000 | 15 000 | HK1616F | — | 0.016 | IR12×16×20 |
| | 22 | 16 | 2.7 | 11 100 | 15 300 | 1 870 | 10 000 | 15 000 | — | BK1616 | 0.018 | IR12×16×20 |
| | 22 | 22 | — | 13 300 | 19 400 | 2 370 | 10 000 | 15 000 | HK1622ZWF | — | 0.022 | — |
| | 22 | 22 | 2.7 | 13 300 | 19 400 | 2 370 | 10 000 | 15 000 | — | BK1622ZWD | 0.023 | — |
| | 24 | 16 | — | 12 400 | 13 500 | 1 640 | 10 000 | 15 000 | HMK1616 | — | 0.021 | IR12×16×20 |
| | 24 | 20 | — | 15 600 | 18 200 | 2 220 | 10 000 | 15 000 | 7E-HMK1620CT | — | 0.027 | IR12×16×22 |
| 17 | 23 | 12 | — | 8 050 | 10 300 | 1 260 | 9 500 | 14 000 | HK1712FM | — | 0.012 | — |
| | 23 | 12 | 2.7 | 8 050 | 10 300 | 1 260 | 9 500 | 14 000 | — | BK1712CT | 0.015 | — |
| | 24 | 15 | — | 11 600 | 14 200 | 1 740 | 9 500 | 14 000 | 7E-HMK1715CT | — | 0.018 | IR14×17×17 |
| | 24 | 20 | — | 15 200 | 20 000 | 2 440 | 9 500 | 14 000 | 7E-HMK1720CT | — | 0.024 | IR12×17×20.5 |
| | 24 | 25 | — | 19 000 | 26 700 | 3 250 | 9 500 | 14 000 | 7E-HMK1725CT | — | 0.030 | IR12×17×25.5 |
| 18 | 24 | 12 | — | 8 300 | 10 900 | 1 330 | 8 500 | 13 000 | HK1812FM | — | 0.013 | IR15×18×12.5 |
| | 24 | 12 | 2.7 | 8 300 | 10 900 | 1 330 | 8 500 | 13 000 | — | BK1812 | 0.015 | IR15×18×12.5 |
| | 24 | 16 | — | 11 800 | 17 300 | 2 110 | 8 500 | 13 000 | HK1816F | — | 0.018 | IR15×18×16.5 |
| | 24 | 16 | 2.7 | 11 800 | 17 300 | 2 110 | 8 500 | 13 000 | — | BK1816 | 0.020 | IR15×18×16.5 |
| | 25 | 13 | — | 10 200 | 12 200 | 1 480 | 8 500 | 13 000 | HMK1813 | — | 0.016 | IR15×18×16 |
| | 25 | 15 | — | 12 000 | 15 100 | 1 840 | 8 500 | 13 000 | HMK1815 | — | 0.019 | IR15×18×16 |
| | 25 | 17 | — | 13 300 | 17 200 | 2 100 | 8 500 | 13 000 | HMK1817C | — | 0.021 | IR15×18×17.5 |
| | 25 | 19 | — | 15 500 | 20 900 | 2 540 | 8 500 | 13 000 | HMK1819 | — | 0.024 | IR15×18×20.5 |
| | 25 | 20 | — | 16 300 | 22 300 | 2 720 | 8 500 | 13 000 | HMK1820 | — | 0.025 | IR15×18×20.5 |
| | 25 | 25 | — | 20 900 | 31 000 | 3 750 | 8 500 | 13 000 | HMK1825V2 | — | 0.031 | IR15×18×25.5 |
| 19 | 27 | 16 | — | 13 900 | 16 300 | 2 000 | 8 500 | 13 000 | HMK1916 | — | 0.025 | IR15×19×20 |
| | 27 | 20 | — | 18 100 | 23 000 | 2 800 | 8 500 | 13 000 | HMK1920F | — | 0.031 | — |
| 20 | 26 | 12 | — | 8 750 | 12 100 | 1 480 | 8 000 | 12 000 | HK2012FM | — | 0.014 | IR15×20×13 |
| | 26 | 12 | 2.7 | 9 250 | 13 000 | 1 590 | 8 000 | 12 000 | — | BK2012 | 0.017 | IR15×20×13 |
| | 26 | 16 | — | 12 500 | 19 200 | 2 340 | 8 000 | 12 000 | HK2016F | — | 0.019 | IR17×20×16.5 |
| | 26 | 16 | 2.7 | 13 000 | 20 100 | 2 450 | 8 000 | 12 000 | — | BK2016 | 0.022 | IR17×20×16.5 |
| | 26 | 20 | — | 16 000 | 26 200 | 3 200 | 8 000 | 12 000 | HK2020F | — | 0.024 | IR17×20×20.5 |

1) If the bearing has an inner ring, the value indicates HK + IR.
Example: HK1812FM+IR15×18×12.5

F_w 20–25 mm

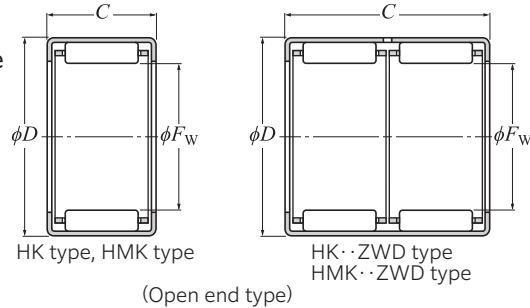
| F_w | Boundary dimensions mm | | Basic load rating | | Fatigue load limit N C_u | Allowable speed | | Number | | Mass kg (approx.) | Applied inner ring ¹⁾ (approx.) | |
|-------|---------------------------|----------------|-------------------|--------|----------------------------------|-------------------|---------------|-----------------|-------------|-------------------------|---|--------------|
| | C | C ₁ | dynamic | static | | min ⁻¹ | Open end type | Closed end type | | | | |
| | | | | | | | | | 0 | | | Max. |
| 20 | 26 | 20 | 2.7 | 16 000 | 26 200 | 3 200 | 8 000 | 12 000 | — | BK2020CT | 0.027 | IR17×20×20.5 |
| | 26 | 30 | — | 21 500 | 38 500 | 4 700 | 8 000 | 12 000 | HK2030ZWF | — | 0.035 | IR17×20×30.5 |
| | 26 | 30 | 2.7 | 22 200 | 40 000 | 4 900 | 8 000 | 12 000 | — | BK2030ZWD | 0.037 | IR17×20×30.5 |
| | 27 | 15 | — | 13 000 | 17 300 | 2 110 | 8 000 | 12 000 | HMK2015CV3 | — | 0.021 | IR17×20×16.5 |
| | 27 | 20 | — | 17 200 | 24 800 | 3 000 | 8 000 | 12 000 | HMK2020CT | — | 0.027 | IR17×20×20.5 |
| | 27 | 25 | — | 22 000 | 34 000 | 4 150 | 8 000 | 12 000 | HMK2025C | — | 0.034 | IR15×20×26 |
| | 27 | 30 | — | 26 100 | 42 000 | 5 150 | 8 000 | 12 000 | HMK2030 | — | 0.041 | IR17×20×30.5 |
| | 29 | 16 | — | 15 300 | 19 100 | 2 320 | 7 500 | 11 000 | HMK2116 | — | 0.027 | IR17×21×20 |
| 29 | 20 | — | 19 400 | 25 800 | 3 150 | 7 500 | 11 000 | HMK2120 | — | 0.033 | — | |
| 22 | 28 | 12 | — | 9 200 | 13 400 | 1 630 | 7 500 | 11 000 | HK2212FM | — | 0.013 | IR17×22×13 |
| | 28 | 12 | 2.7 | 9 200 | 13 400 | 1 630 | 7 500 | 11 000 | — | BK2212CT | 0.015 | IR17×22×13 |
| | 28 | 16 | — | 13 200 | 21 100 | 2 570 | 7 500 | 11 000 | HK2216F | — | 0.021 | IR17×22×18 |
| | 28 | 16 | 2.7 | 13 600 | 22 100 | 2 700 | 7 500 | 11 000 | — | BK2216 | 0.024 | IR17×22×18 |
| | 28 | 20 | — | 16 800 | 28 800 | 3 500 | 7 500 | 11 000 | HK2220F | — | 0.026 | IR17×22×20.5 |
| | 28 | 20 | 2.7 | 17 200 | 29 800 | 3 650 | 7 500 | 11 000 | — | BK2220 | 0.030 | IR17×22×20.5 |
| | 29 | 10 | — | 8 400 | 10 100 | 1 240 | 7 500 | 11 000 | HMK2210 | — | 0.015 | IR17×22×13 |
| | 29 | 15 | — | 12 900 | 17 600 | 2 150 | 7 500 | 11 000 | 7E-HMK2215C | — | 0.022 | IR17×22×16D |
| | 29 | 20 | — | 18 200 | 27 400 | 3 350 | 7 500 | 11 000 | HMK2220CV2 | — | 0.030 | IR17×22×20.5 |
| | 29 | 25 | — | 23 200 | 37 500 | 4 550 | 7 500 | 11 000 | HMK2225CT | — | 0.037 | IR17×22×26 |
| 29 | 30 | — | 26 900 | 45 000 | 5 500 | 7 500 | 11 000 | HMK2230 | — | 0.045 | IR17×22×32 | |
| 24 | 31 | 20 | — | 18 300 | 28 200 | 3 450 | 6 500 | 10 000 | HMK2420CT | — | 0.032 | — |
| | 31 | 28 | — | 26 000 | 44 500 | 5 400 | 6 500 | 10 000 | HMK2428 | — | 0.045 | IR20×24×28.5 |
| 25 | 32 | 12 | — | 11 100 | 15 200 | 1 850 | 6 500 | 9 500 | HK2512F | — | 0.021 | IR20×25×12.5 |
| | 32 | 12 | 2.7 | 11 800 | 16 300 | 1 990 | 6 500 | 9 500 | — | BK2512 | 0.023 | IR20×25×12.5 |
| | 32 | 16 | — | 15 900 | 24 000 | 2 920 | 6 500 | 9 500 | HK2516F | — | 0.027 | IR20×25×17 |
| | 32 | 16 | 2.7 | 15 900 | 24 000 | 2 920 | 6 500 | 9 500 | — | BK2516 | 0.031 | IR20×25×17 |
| | 32 | 20 | — | 20 300 | 33 000 | 4 000 | 6 500 | 9 500 | HK2520 | — | 0.034 | IR20×25×20.5 |
| | 32 | 20 | 2.7 | 20 300 | 33 000 | 4 000 | 6 500 | 9 500 | — | BK2520 | 0.039 | IR20×25×20.5 |
| | 32 | 26 | — | 26 400 | 46 000 | 5 600 | 6 500 | 9 500 | HK2526C | — | 0.045 | IR20×25×26.5 |
| | 32 | 26 | 2.7 | 26 400 | 46 000 | 5 600 | 6 500 | 9 500 | — | BK2526C | 0.049 | IR20×25×26.5 |

1) If the bearing has an inner ring, the value indicates HK + IR.
Example: HK2512F + IR20 × 25 × 12.5

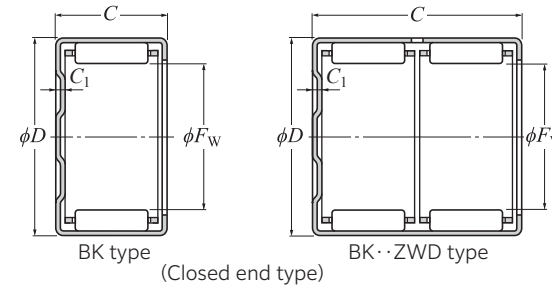
Needle Roller Bearings

Drawn cup needle roller bearings

HK type, HK·ZWD type
HMK type, HMK·ZWD type
BK type, BK·ZWD type



Needle Roller Bearings



F_w 25-30 mm

| F_w | Boundary dimensions mm | | Basic load rating | | Fatigue load limit N C_u | Allowable speed | | Number | Mass kg (approx.) | Applied inner ring ¹⁾ (approx.) | | |
|-------|---------------------------|----------------|-------------------|--------|----------------------------------|--------------------|-----------------|---------|-------------------------|---|---------------|-----------------|
| | C | C ₁ | dynamic | static | | min ⁻¹ | | | | | Open end type | Closed end type |
| | | | | | | Grease lubrication | Oil lubrication | | | | | |
| 25 | 32 | 38 | — | 35 000 | 65 500 | 8 000 | 6 500 | 9 500 | HK2538ZWD | — | 0.065 | IR20×25×38.5 |
| | 32 | 38 | 2.7 | 35 000 | 65 500 | 8 000 | 6 500 | 9 500 | — | BK2538ZWD | 0.069 | IR20×25×38.5 |
| | 33 | 10 | — | 9 150 | 10 400 | 1 270 | 6 500 | 9 500 | HMK2510 | — | 0.019 | IR20×25×12.5 |
| | 33 | 15 | — | 15 200 | 19 900 | 2 430 | 6 500 | 9 500 | HMK2515CT | — | 0.029 | IR20×25×16 |
| | 33 | 20 | — | 21 200 | 30 500 | 3 750 | 6 500 | 9 500 | HMK2520CT | — | 0.039 | IR20×25×20.5 |
| | 33 | 25 | — | 26 700 | 41 000 | 5 000 | 6 500 | 9 500 | HMK2525F | — | 0.048 | IR20×25×26.5 |
| | 33 | 30 | — | 32 000 | 52 000 | 6 350 | 6 500 | 9 500 | 7E-HMK2530C | — | 0.058 | IR20×25×32 |
| | 26 | 34 | 16 | — | 17 100 | 23 400 | 2 860 | 6 000 | 9 000 | 7E-HMK2616 | — | 0.032 |
| 34 | | 20 | — | 21 100 | 30 500 | 3 750 | 6 000 | 9 000 | 7E-HMK2620CT | — | 0.040 | — |
| 28 | 35 | 16 | — | 16 700 | 26 400 | 3 200 | 5 500 | 8 500 | HK2816CT | — | 0.030 | IR22×28×17 |
| | 35 | 16 | 2.7 | 16 700 | 26 400 | 3 200 | 5 500 | 8 500 | — | BK2816CT | 0.034 | IR22×28×17 |
| | 35 | 20 | — | 21 300 | 36 000 | 4 400 | 5 500 | 8 500 | HK2820 | — | 0.038 | IR22×28×20.5 |
| | 35 | 20 | 2.7 | 21 300 | 36 000 | 4 400 | 5 500 | 8 500 | — | BK2820 | 0.043 | IR22×28×20.5 |
| | 37 | 20 | — | 23 600 | 32 500 | 4 000 | 5 500 | 8 500 | HMK2820 | — | 0.049 | IR22×28×20.5 |
| | 37 | 30 | — | 35 000 | 54 500 | 6 600 | 5 500 | 8 500 | 7E-HMK2830C | — | 0.073 | — |
| 29 | 38 | 20 | — | 24 600 | 35 000 | 4 250 | 5 500 | 8 500 | HMK2920 | — | 0.050 | — |
| | 38 | 30 | — | 34 500 | 54 000 | 6 600 | 5 500 | 8 500 | HMK2930 | — | 0.075 | — |
| 30 | 37 | 12 | — | 12 300 | 18 200 | 2 220 | 5 500 | 8 000 | HK3012CT | — | 0.024 | IR25×30×12.5 |
| | 37 | 12 | 2.7 | 12 300 | 18 200 | 2 220 | 5 500 | 8 000 | — | BK3012CT | 0.028 | IR25×30×12.5 |
| | 37 | 16 | — | 18 100 | 30 000 | 3 650 | 5 500 | 8 000 | 7E-HK3016C | — | 0.032 | IR25×30×17 |
| | 37 | 16 | 2.7 | 18 100 | 30 000 | 3 650 | 5 500 | 8 000 | — | BK3016CT | 0.037 | IR25×30×17 |
| | 37 | 20 | — | 22 300 | 39 500 | 4 800 | 5 500 | 8 000 | HK3020F | — | 0.040 | IR25×30×20.5 |
| | 37 | 20 | 2.7 | 22 300 | 39 500 | 4 800 | 5 500 | 8 000 | — | BK3020 | 0.047 | IR25×30×20.5 |
| | 37 | 26 | — | 28 500 | 54 000 | 6 550 | 5 500 | 8 000 | HK3026F | — | 0.053 | IR25×30×26.5 |
| | 37 | 26 | 2.7 | 28 500 | 54 000 | 6 550 | 5 500 | 8 000 | — | 7E-BK3026T | 0.059 | IR25×30×26.5 |
| | 37 | 38 | — | 38 500 | 78 500 | 9 600 | 5 500 | 8 000 | HK3038ZWD | — | 0.076 | IR25×30×38.5 |
| | 37 | 38 | 2.7 | 38 500 | 78 500 | 9 600 | 5 500 | 8 000 | — | BK3038ZWD | 0.083 | IR25×30×38.5 |
| | 40 | 13 | — | 14 100 | 17 100 | 2 090 | 5 500 | 8 000 | HMK3013 | — | 0.040 | IR25×30×16 |
| | 40 | 15 | — | 17 100 | 22 100 | 2 690 | 5 500 | 8 000 | HMK3015 | — | 0.044 | IR25×30×16 |
| 40 | 20 | — | 24 200 | 34 500 | 4 200 | 5 500 | 8 000 | HMK3020 | — | 0.058 | IR25×30×20.5 | |

1) If the bearing has an inner ring, the value indicates HK + IR.
Example: HK2820 + IR22×28×20.5

F_w 30-40 mm

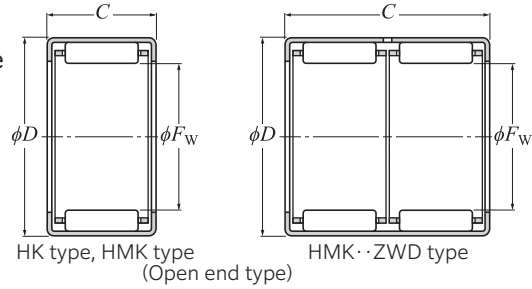
| F_w | Boundary dimensions mm | | Basic load rating | | Fatigue load limit N C_u | Allowable speed | | Number | Mass kg (approx.) | Applied inner ring ¹⁾ (approx.) | | |
|-------|---------------------------|----------------|-------------------|--------|----------------------------------|--------------------|-----------------|--------|-------------------------|---|---------------|-----------------|
| | C | C ₁ | dynamic | static | | min ⁻¹ | | | | | Open end type | Closed end type |
| | | | | | | Grease lubrication | Oil lubrication | | | | | |
| 30 | 40 | 25 | — | 31 000 | 47 500 | 5 800 | 5 500 | 8 000 | 7E-HMK3025CT | — | 0.073 | IR25×30×26.5 |
| | 40 | 30 | — | 36 000 | 57 500 | 7 000 | 5 500 | 8 000 | HMK3030 | — | 0.087 | IR25×30×32 |
| 32 | 42 | 20 | — | 27 500 | 38 000 | 4 600 | 5 000 | 7 500 | 7E-HMK3220 | — | 0.062 | — |
| | 42 | 30 | — | 41 500 | 64 500 | 7 850 | 5 000 | 7 500 | 7E-HMK3230 | — | 0.092 | — |
| 35 | 42 | 12 | — | 13 300 | 21 300 | 2 600 | 4 700 | 7 000 | HK3512CV2 | — | 0.028 | — |
| | 42 | 12 | 2.7 | 13 300 | 21 300 | 2 600 | 4 700 | 7 000 | — | BK3512CT | 0.033 | — |
| | 42 | 16 | — | 19 000 | 33 500 | 4 100 | 4 700 | 7 000 | HK3516CT | — | 0.037 | — |
| | 42 | 16 | 2.7 | 19 000 | 33 500 | 4 100 | 4 700 | 7 000 | — | BK3516CT | 0.044 | — |
| | 42 | 20 | — | 24 800 | 47 500 | 5 800 | 4 700 | 7 000 | HK3520 | — | 0.046 | — |
| | 42 | 20 | 2.7 | 24 800 | 47 500 | 5 800 | 4 700 | 7 000 | — | BK3520 | 0.055 | — |
| | 45 | 12 | — | 14 900 | 17 600 | 2 150 | 4 700 | 7 000 | HMK3512 | — | 0.040 | — |
| | 45 | 15 | — | 20 200 | 26 200 | 3 200 | 4 700 | 7 000 | HMK3515 | — | 0.050 | — |
| | 45 | 20 | — | 28 400 | 40 500 | 4 900 | 4 700 | 7 000 | 7E-HMK3520B | — | 0.067 | — |
| | 45 | 25 | — | 36 000 | 54 500 | 6 650 | 4 700 | 7 000 | HMK3525 | — | 0.083 | — |
| 37 | 47 | 20 | — | 29 300 | 43 000 | 5 250 | 4 300 | 6 500 | HMK3720 | — | 0.070 | — |
| | 47 | 30 | — | 44 500 | 73 000 | 8 900 | 4 300 | 6 500 | HMK3730 | — | 0.105 | — |
| 38 | 48 | 15 | — | 21 700 | 29 300 | 3 550 | 4 300 | 6 500 | HMK3815 | — | 0.054 | — |
| | 48 | 20 | — | 30 500 | 45 000 | 5 500 | 4 300 | 6 500 | HMK3820 | — | 0.072 | — |
| | 48 | 25 | — | 38 500 | 61 000 | 7 450 | 4 300 | 6 500 | HMK3825 | — | 0.090 | — |
| | 48 | 30 | — | 46 000 | 77 000 | 9 400 | 4 300 | 6 500 | HMK3830 | — | 0.107 | IR32×38×32 |
| | 48 | 45 | — | 62 000 | 113 000 | 13 700 | 4 300 | 6 500 | HMK3845ZWD | — | 0.161 | — |
| 40 | 47 | 12 | — | 12 100 | 19 500 | 2 380 | 4 000 | 6 000 | HK4012V2 | — | 0.031 | IR35×40×12.5 |
| | 47 | 12 | 2.7 | 12 600 | 20 800 | 2 530 | 4 000 | 6 000 | — | 7E-BK4012CT | 0.038 | IR35×40×12.5 |
| | 47 | 16 | — | 20 300 | 38 500 | 4 700 | 4 000 | 6 000 | HK4016CT | — | 0.041 | IR35×40×17 |
| | 47 | 16 | 2.7 | 20 300 | 38 500 | 4 700 | 4 000 | 6 000 | — | BK4016CT | 0.051 | IR35×40×17 |
| | 47 | 20 | — | 25 900 | 52 500 | 6 400 | 4 000 | 6 000 | HK4020F | — | 0.052 | IR35×40×20.5 |
| | 47 | 20 | 2.7 | 25 900 | 52 500 | 6 400 | 4 000 | 6 000 | — | BK4020 | 0.064 | IR35×40×20.5 |
| | 50 | 15 | — | 23 100 | 32 500 | 3 950 | 4 000 | 6 000 | HMK4015 | — | 0.056 | IR35×40×17 |
| | 50 | 20 | — | 32 500 | 50 000 | 6 100 | 4 000 | 6 000 | 7E-HMK4020 | — | 0.075 | IR35×40×20.5 |

1) If the bearing has an inner ring, the value indicates HK + IR.
Example: HK4012 + IR35×40×12.5

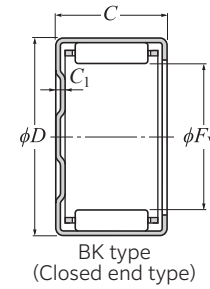
Needle Roller Bearings

Drawn cup needle roller bearings

HK type
HMK type, HMK·ZWD type
BK type



Needle Roller Bearings



F_w 40–50 mm

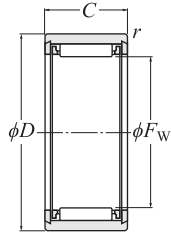
| Boundary dimensions mm | Basic load rating | | Fatigue load limit N | Allowable speed | | Number | | Mass kg (approx.) | Applied inner ring ¹⁾ (approx.) | |
|----------------------------------|-------------------|-----------------|-------------------------|--------------------|-----------------|-----------------|-------------------|-------------------------|---|--------------|
| | dynamic | static | | min ⁻¹ | Open end type | Closed end type | | | | |
| F_w C C ₁ 0 Max. | C _r | C _{0r} | N | Grease lubrication | Oil lubrication | Open end type | Closed end type | | | |
| 40 | 50 25 — | 41 000 | 67 500 | 8 250 | 4 000 | 6 000 | 7E-HMK4025 | — | 0.094 | — |
| | 50 30 — | 49 000 | 85 000 | 10 400 | 4 000 | 6 000 | HMK4030 | — | 0.112 | IR35×40×34 |
| | 50 40 — | 58 500 | 107 000 | 13 000 | 4 000 | 6 000 | HMK4040ZWD | — | 0.150 | — |
| 45 | 52 16 — | 21 600 | 43 000 | 5 250 | 3 700 | 5 500 | HK4516 | — | 0.046 | IR40×45×17 |
| | 52 16 2.7 | 21 600 | 43 000 | 5 250 | 3 700 | 5 500 | — | BK4516 | 0.058 | IR40×45×17 |
| | 52 20 — | 27 600 | 59 000 | 7 200 | 3 700 | 5 500 | HK4520 | — | 0.058 | IR40×45×20.5 |
| | 52 20 2.7 | 27 600 | 59 000 | 7 200 | 3 700 | 5 500 | — | BK4520 | 0.072 | IR40×45×20.5 |
| | 55 20 — | 32 000 | 51 000 | 6 200 | 3 700 | 5 500 | 7E-HMK4520CT | — | 0.083 | IR40×45×20.5 |
| | 55 25 — | 41 500 | 71 500 | 8 700 | 3 700 | 5 500 | HMK4525 | — | 0.104 | IR40×45×26.5 |
| | 55 30 — | 49 500 | 90 000 | 11 000 | 3 700 | 5 500 | 7E-HMK4530CT | — | 0.125 | IR40×45×34 |
| | 55 40 — | 59 500 | 113 000 | 13 800 | 3 700 | 5 500 | HMK4540ZWD | — | 0.167 | — |
| 50 | 58 20 — | 31 500 | 63 000 | 7 700 | 3 200 | 4 800 | HK5020 | — | 0.072 | IR40×50×22 |
| | 58 20 2.7 | 31 500 | 63 000 | 7 700 | 3 200 | 4 800 | — | BK5020 | 0.087 | IR40×50×22 |
| | 58 25 — | 38 500 | 82 000 | 10 000 | 3 200 | 4 800 | HK5025 | — | 0.090 | IR45×50×25.5 |
| | 58 25 2.7 | 38 500 | 82 000 | 10 000 | 3 200 | 4 800 | — | BK5025 | 0.109 | IR45×50×25.5 |
| | 62 12 — | 18 200 | 23 600 | 2 880 | 3 200 | 4 800 | 7E-HMK5012 | — | 0.067 | — |
| | 62 15 — | 25 900 | 37 000 | 4 550 | 3 200 | 4 800 | 7E-HMK5015 | — | 0.084 | — |
| | 62 20 — | 37 500 | 60 000 | 7 300 | 3 200 | 4 800 | 7E-HMK5020CT | — | 0.112 | IR40×50×22 |
| | 62 25 — | 48 000 | 82 500 | 10 100 | 3 200 | 4 800 | 7E-HMK5025 | — | 0.140 | IR45×50×25.5 |
| | 62 30 — | 58 500 | 105 000 | 12 800 | 3 200 | 4 800 | 7E-HMK5030CPX1 | — | 0.168 | IR45×50×32 |
| | 62 40 — | 70 000 | 134 000 | 16 300 | 3 200 | 4 800 | 7E-HMK5040ZWD | — | 0.224 | — |
| | 62 45 — | 79 000 | 156 000 | 19 100 | 3 200 | 4 800 | 7E-HMK5045ZWCDPX1 | — | 0.252 | — |

1) If the bearing has an inner ring, the value indicates HK + IR.
Example: HK4516+IR40×45×17

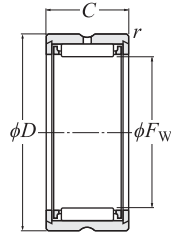
Needle Roller Bearings

Machined-ring needle roller bearings without an inner ring

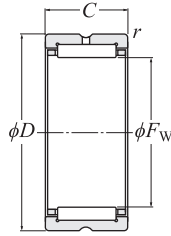
RNA49 type
RNA59 type
RNA69 type
NK type



NK type
($\phi F_w \leq 12$ mm)



RNA49 type
($\phi F_w \leq 12$ mm)



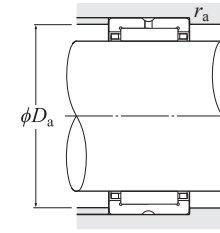
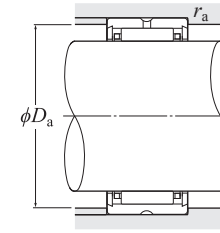
RNA49·R type ($\phi F_w \geq 14$ mm)
RNA59 type
RNA69·R type
NK·R type ($\phi F_w \geq 14$ mm)

F_w 5–16 mm

| F_w | Boundary dimensions | | | Basic load rating | | Fatigue load limit N C_u | Allowable speed | | Number | Installation-related dimensions | | Mass kg (approx.) |
|-------|---------------------|-----|------------------------|-------------------|----------|----------------------------------|--------------------|-----------------|--------------|---------------------------------|-----------------------|-------------------------|
| | mm | | | dynamic | static | | min^{-1} | | | mm | | |
| | D | C | $r_s \text{ min}^{-1}$ | C_r | C_{0r} | | Grease lubrication | Oil lubrication | | D_a Max. | $r_{as}^{2)}$ Max. | |
| 5 | +0.018 | 10 | 0.15 | 2 640 | 2 190 | 267 | 27 000 | 40 000 | NK5/10T2 | 6.5 | 0.15 | 0.0031 |
| | +0.010 | 10 | 0.15 | 2 720 | 2 250 | 275 | 27 000 | 40 000 | | NK5/12T2 | 6.5 | 0.15 |
| 6 | +0.018 | 12 | 0.15 | 2 660 | 2 280 | 278 | 25 000 | 37 000 | NK6/10T2 | 7.5 | 0.15 | 0.0047 |
| | +0.010 | 12 | 0.15 | 3 400 | 3 150 | 380 | 25 000 | 37 000 | | NK6/12T2 | 7.5 | 0.15 |
| 7 | +0.022 +0.013 | 13 | 0.15 | 2 670 | 2 350 | 286 | 23 000 | 34 000 | RNA495T2 | 8.5 | 0.15 | 0.0055 |
| | | 14 | 0.3 | 2 670 | 2 350 | 286 | 23 000 | 34 000 | NK7/10T2 | 8.5 | 0.3 | 0.0069 |
| | | 14 | 0.3 | 3 400 | 3 200 | 390 | 23 000 | 34 000 | NK7/12T2 | 8.5 | 0.3 | 0.0082 |
| 8 | +0.022 +0.013 | 15 | 0.15 | 3 150 | 3 000 | 365 | 21 000 | 32 000 | RNA496T2T | 9.5 | 0.15 | 0.0073 |
| | | 15 | 0.3 | 4 000 | 4 100 | 500 | 21 000 | 32 000 | NK8/12T2 | 9.5 | 0.3 | 0.0087 |
| | | 15 | 0.3 | 4 850 | 5 200 | 635 | 21 000 | 32 000 | NK8/16 | 9.5 | 0.3 | 0.012 |
| 9 | +0.022 +0.013 | 16 | 0.3 | 4 550 | 5 000 | 615 | 20 000 | 30 000 | NK9/12T2 | 10.5 | 0.3 | 0.010 |
| | | 16 | 0.3 | 5 500 | 6 400 | 780 | 20 000 | 30 000 | NK9/16T2 | 10.5 | 0.3 | 0.013 |
| | | 17 | 0.15 | 3 600 | 3 650 | 445 | 20 000 | 30 000 | RNA497 | 10.5 | 0.15 | 0.0095 |
| 10 | +0.022 +0.013 | 17 | 0.3 | 4 550 | 5 100 | 620 | 19 000 | 28 000 | NK10/12T2 | 11.5 | 0.3 | 0.010 |
| | | 17 | 0.3 | 5 450 | 6 450 | 790 | 19 000 | 28 000 | 8E-NK10/16CT | 11.5 | 0.3 | 0.013 |
| | | 19 | 0.15 | 5 250 | 5 150 | 630 | 19 000 | 28 000 | RNA498CT | 12 | 0.15 | 0.013 |
| 12 | +0.027 +0.016 | 19 | 0.3 | 5 000 | 6 100 | 740 | 17 000 | 26 000 | NK12/12 | 13.5 | 0.3 | 0.013 |
| | | 19 | 0.3 | 6 000 | 7 700 | 940 | 17 000 | 26 000 | NK12/16 | 13.5 | 0.3 | 0.016 |
| | | 20 | 0.3 | 4 850 | 4 900 | 600 | 17 000 | 26 000 | RNA499 | 14 | 0.3 | 0.013 |
| 14 | +0.027 +0.016 | 22 | 0.3 | 8 600 | 9 200 | 1 120 | 16 000 | 24 000 | RNA4900R | 20 | 0.3 | 0.017 |
| | | 22 | 0.3 | 10 300 | 11 500 | 1 400 | 16 000 | 24 000 | NK14/16RCT | 20 | 0.3 | 0.021 |
| | | 22 | 0.3 | 13 000 | 15 600 | 1 900 | 16 000 | 24 000 | NK14/20R | 20 | 0.3 | 0.026 |
| 15 | +0.027 +0.016 | 23 | 0.3 | 10 900 | 12 700 | 1 550 | 15 000 | 23 000 | NK15/16R | 21 | 0.3 | 0.022 |
| | | 23 | 0.3 | 13 800 | 17 200 | 2 100 | 15 000 | 23 000 | NK15/20R | 21 | 0.3 | 0.027 |
| 16 | +0.027 +0.016 | 24 | 0.3 | 9 550 | 10 900 | 1 330 | 15 000 | 23 000 | RNA4901R | 22 | 0.3 | 0.017 |
| | | 24 | 0.3 | 12 200 | 14 900 | 1 820 | 15 000 | 23 000 | NK16/16R | 22 | 0.3 | 0.022 |
| | | 24 | 0.3 | 14 600 | 18 800 | 2 290 | 15 000 | 23 000 | NK16/20R | 22 | 0.3 | 0.028 |
| | | 24 | 0.3 | 15 400 | 20 000 | 2 440 | 15 000 | 23 000 | RNA6901R | 22 | 0.3 | 0.031 |

1) Smallest allowable dimension for chamfer dimension r .
2) Largest allowable dimension for fillet radius r_s of housing and shaft.

Needle Roller Bearings



F_w 17–28 mm

| F_w | Boundary dimensions | | | Basic load rating | | Fatigue load limit N C_u | Allowable speed | | Number | Installation-related dimensions | | Mass kg (approx.) |
|-------|---------------------|-----|------------------------|-------------------|----------|----------------------------------|--------------------|-----------------|---------------|---------------------------------|-----------------------|-------------------------|
| | mm | | | dynamic | static | | min^{-1} | | | mm | | |
| | D | C | $r_s \text{ min}^{-1}$ | C_r | C_{0r} | | Grease lubrication | Oil lubrication | | D_a Max. | $r_{as}^{2)}$ Max. | |
| 17 | +0.027 | 25 | 0.3 | 12 100 | 15 000 | 1 830 | 15 000 | 22 000 | NK17/16R | 23 | 0.3 | 0.024 |
| | +0.016 | 25 | 0.3 | 15 400 | 20 400 | 2 490 | 15 000 | 22 000 | | NK17/20R | 23 | 0.3 |
| 18 | +0.027 | 26 | 0.3 | 12 700 | 16 200 | 1 980 | 14 000 | 21 000 | NK18/16R | 24 | 0.3 | 0.025 |
| | +0.016 | 26 | 0.3 | 16 100 | 22 000 | 2 690 | 14 000 | 21 000 | | NK18/20RCT | 24 | 0.3 |
| 19 | +0.033 | 27 | 0.3 | 13 300 | 17 400 | 2 120 | 14 000 | 21 000 | NK19/16R | 25 | 0.3 | 0.026 |
| | +0.020 | 27 | 0.3 | 16 000 | 22 200 | 2 700 | 14 000 | 21 000 | | NK19/20R | 25 | 0.3 |
| 20 | +0.033 +0.020 | 28 | 0.3 | 10 300 | 12 800 | 1 560 | 13 000 | 20 000 | RNA4902R | 26 | 0.3 | 0.022 |
| | | 28 | 0.3 | 13 200 | 17 500 | 2 140 | 13 000 | 20 000 | NK20/16RCT | 26 | 0.3 | 0.027 |
| | | 28 | 0.3 | 14 100 | 19 100 | 2 330 | 13 000 | 20 000 | RNA5902CT | 26 | 0.3 | 0.033 |
| | | 28 | 0.3 | 16 700 | 23 800 | 2 900 | 13 000 | 20 000 | NK20/20R | 26 | 0.3 | 0.034 |
| | | 28 | 0.3 | 17 600 | 25 300 | 3 100 | 13 000 | 20 000 | RNA6902R | 26 | 0.3 | 0.040 |
| 21 | +0.033 +0.020 | 29 | 0.3 | 13 700 | 18 700 | 2 280 | 13 000 | 19 000 | NK21/16R | 27 | 0.3 | 0.028 |
| | | 29 | 0.3 | 17 400 | 25 400 | 3 100 | 13 000 | 19 000 | | NK21/20R | 27 | 0.3 |
| 22 | +0.033 +0.020 | 30 | 0.3 | 14 200 | 19 900 | 2 430 | 12 000 | 18 000 | NK22/16R | 28 | 0.3 | 0.034 |
| | | 30 | 0.3 | 18 000 | 27 000 | 3 300 | 12 000 | 18 000 | NK22/20R | 28 | 0.3 | 0.037 |
| | | 30 | 0.3 | 11 200 | 14 600 | 1 780 | 12 000 | 18 000 | RNA4903R | 28 | 0.3 | 0.022 |
| | | 30 | 0.3 | 15 200 | 21 700 | 2 650 | 12 000 | 18 000 | RNA5903 | 28 | 0.3 | 0.035 |
| | | 30 | 0.3 | 18 200 | 27 200 | 3 300 | 12 000 | 18 000 | RNA6903R | 28 | 0.3 | 0.042 |
| 24 | +0.033 +0.020 | 32 | 0.3 | 15 200 | 22 300 | 2 720 | 11 000 | 17 000 | NK24/16R | 30 | 0.3 | 0.032 |
| | | 32 | 0.3 | 18 600 | 28 800 | 3 500 | 11 000 | 17 000 | | NK24/20R | 30 | 0.3 |
| 25 | +0.033 +0.020 | 33 | 0.3 | 15 100 | 22 400 | 2 730 | 11 000 | 16 000 | NK25/16R | 31 | 0.3 | 0.033 |
| | | 33 | 0.3 | 19 200 | 30 500 | 3 700 | 11 000 | 16 000 | NK25/20RCT | 31 | 0.3 | 0.042 |
| | | 37 | 0.3 | 21 300 | 25 500 | 3 100 | 11 000 | 16 000 | RNA4904RCT | 35 | 0.3 | 0.052 |
| | | 37 | 0.3 | 28 400 | 37 000 | 4 500 | 11 000 | 16 000 | RNA5904 | 35 | 0.3 | 0.084 |
| | | 37 | 0.3 | 36 500 | 50 500 | 6 150 | 11 000 | 16 000 | RNA6904R | 35 | 0.3 | 0.100 |
| 26 | +0.033 +0.020 | 34 | 0.3 | 15 600 | 23 600 | 2 880 | 10 000 | 15 000 | 8E-NK26/16RCT | 32 | 0.3 | 0.034 |
| | | 34 | 0.3 | 19 100 | 30 500 | 3 700 | 10 000 | 15 000 | | NK26/20R | 32 | 0.3 |
| 28 | +0.033 +0.020 | 37 | 0.3 | 22 300 | 34 000 | 4 150 | 9 500 | 14 000 | NK28/20R | 35 | 0.3 | 0.052 |
| | | 37 | 0.3 | 26 700 | 48 000 | 5 850 | 9 500 | 14 000 | | NK28/30RCT | 35 | 0.3 |

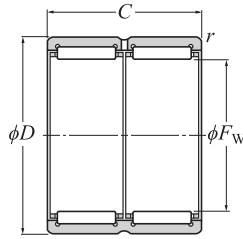
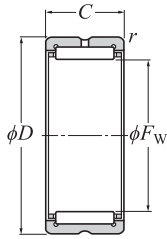
1) Smallest allowable dimension for chamfer dimension r .
2) Largest allowable dimension for fillet radius r_s of housing and shaft.

Needle Roller Bearings



Machined-ring needle roller bearings without an inner ring

RNA49 type
RNA59 type
RNA69 type
NK type



RNA49·R type, RNA59 type
RNA69·R type ($\phi F_w \leq 35$ mm)
NK·R type

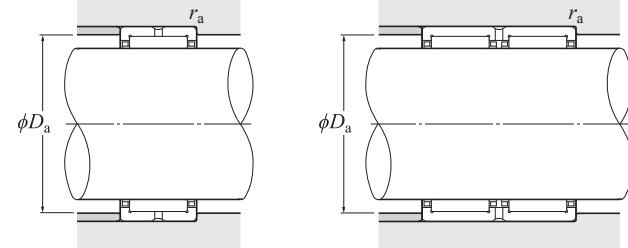
RNA69 type·R type
($\phi F_w \geq 40$ mm)

F_w 28–40 mm

| F_w | Boundary dimensions | | | Basic load rating | | Fatigue load limit N | Allowable speed | | Number | Installation-related dimensions | | Mass kg (approx.) | |
|-------|---------------------|-----|------------------------|-------------------|----------|-------------------------|--------------------|-----------------|-------------|---------------------------------|-----------------|----------------------|----|
| | mm | | | dynamic | static | | min^{-1} | | | mm | | | kg |
| | D | C | $r_s \text{ min}^{-1}$ | C_r | C_{0r} | | Grease lubrication | Oil lubrication | | D_a Max. | r_{as}^2 Max. | | |
| 28 | 39 | 17 | 0.3 | 23 200 | 29 300 | 3 600 | 9 500 | 14 000 | RNA49/22R | 37 | 0.3 | 0.050 | |
| | 39 | 23 | 0.3 | 26 400 | 37 500 | 4 600 | 9 500 | 14 000 | RNA59/22 | 37 | 0.3 | 0.092 | |
| | 39 | 30 | 0.3 | 40 000 | 58 500 | 7 150 | 9 500 | 14 000 | RNA69/22R | 37 | 0.3 | 0.100 | |
| 29 | 38 | 20 | 0.3 | 22 200 | 34 000 | 4 150 | 9 500 | 14 000 | NK29/20R | 36 | 0.3 | 0.054 | |
| | 38 | 30 | 0.3 | 27 500 | 50 500 | 6 150 | 9 500 | 14 000 | NK29/30R | 36 | 0.3 | 0.084 | |
| 30 | 40 | 20 | 0.3 | 22 100 | 34 000 | 4 150 | 8 500 | 13 000 | NK30/20R | 38 | 0.3 | 0.065 | |
| | 40 | 30 | 0.3 | 33 000 | 57 000 | 6 950 | 8 500 | 13 000 | NK30/30R | 38 | 0.3 | 0.098 | |
| | 42 | 17 | 0.3 | 24 000 | 31 500 | 3 800 | 8 500 | 13 000 | RNA4905R | 40 | 0.3 | 0.061 | |
| | 42 | 23 | 0.3 | 30 500 | 43 000 | 5 200 | 8 500 | 13 000 | RNA5905 | 40 | 0.3 | 0.101 | |
| | 42 | 30 | 0.3 | 41 500 | 63 000 | 7 650 | 8 500 | 13 000 | RNA6905R | 40 | 0.3 | 0.112 | |
| 32 | 42 | 20 | 0.3 | 23 500 | 37 500 | 4 600 | 8 500 | 13 000 | NK32/20R | 40 | 0.3 | 0.068 | |
| | 42 | 30 | 0.3 | 34 000 | 60 500 | 7 350 | 8 500 | 13 000 | NK32/30R | 40 | 0.3 | 0.102 | |
| | 45 | 17 | 0.3 | 24 800 | 33 500 | 4 050 | 8 500 | 13 000 | RNA49/28RCT | 43 | 0.3 | 0.073 | |
| | 45 | 23 | 0.3 | 32 000 | 45 500 | 5 550 | 8 500 | 13 000 | RNA59/28 | 43 | 0.3 | 0.108 | |
| | 45 | 30 | 0.3 | 43 000 | 67 000 | 8 150 | 8 500 | 13 000 | RNA69/28R | 43 | 0.3 | 0.135 | |
| 35 | 45 | 20 | 0.3 | 24 800 | 41 500 | 5 050 | 7 500 | 11 000 | NK35/20RCT | 43 | 0.3 | 0.074 | |
| | 45 | 30 | 0.3 | 36 000 | 66 500 | 8 100 | 7 500 | 11 000 | NK35/30R | 43 | 0.3 | 0.112 | |
| | 47 | 17 | 0.3 | 25 500 | 35 500 | 4 300 | 7 500 | 11 000 | RNA4906R | 45 | 0.3 | 0.069 | |
| | 47 | 23 | 0.3 | 32 500 | 48 500 | 5 950 | 7 500 | 11 000 | RNA5906 | 45 | 0.3 | 0.108 | |
| | 47 | 30 | 0.3 | 42 500 | 67 500 | 8 250 | 7 500 | 11 000 | RNA6906R | 45 | 0.3 | 0.126 | |
| 37 | 47 | 20 | 0.3 | 25 300 | 43 500 | 5 300 | 7 500 | 11 000 | NK37/20R | 45 | 0.3 | 0.077 | |
| | 47 | 30 | 0.3 | 36 500 | 69 500 | 8 500 | 7 500 | 11 000 | NK37/30R | 45 | 0.3 | 0.107 | |
| 38 | 48 | 20 | 0.3 | 25 900 | 45 000 | 5 500 | 7 500 | 11 000 | NK38/20R | 46 | 0.3 | 0.079 | |
| | 48 | 30 | 0.3 | 37 500 | 73 000 | 8 900 | 7 500 | 11 000 | NK38/30R | 46 | 0.3 | 0.107 | |
| 40 | 50 | 20 | 0.3 | 26 400 | 47 000 | 5 750 | 6 500 | 10 000 | NK40/20R | 48 | 0.3 | 0.083 | |
| | 50 | 30 | 0.3 | 38 500 | 76 000 | 9 250 | 6 500 | 10 000 | NK40/30R | 48 | 0.3 | 0.125 | |
| | 52 | 20 | 0.6 | 31 500 | 47 500 | 5 800 | 6 500 | 10 000 | RNA49/32R | 48 | 0.6 | 0.089 | |
| | 52 | 27 | 0.6 | 38 000 | 61 000 | 7 450 | 6 500 | 10 000 | RNA59/32 | 48 | 0.6 | 0.149 | |
| | 52 | 36 | 0.6 | 47 500 | 82 000 | 10 000 | 6 500 | 10 000 | RNA69/32R | 48 | 0.6 | 0.162 | |

1) Smallest allowable dimension for chamfer dimension r .
2) Largest allowable dimension for fillet radius r_a of housing and shaft.

Needle Roller Bearings



F_w 42–63 mm

| F_w | Boundary dimensions | | | Basic load rating | | Fatigue load limit N | Allowable speed | | Number | Installation-related dimensions | | Mass kg (approx.) | |
|-------|---------------------|-----|------------------------|-------------------|----------|-------------------------|--------------------|-----------------|------------|---------------------------------|-----------------|----------------------|----|
| | mm | | | dynamic | static | | min^{-1} | | | mm | | | kg |
| | D | C | $r_s \text{ min}^{-1}$ | C_r | C_{0r} | | Grease lubrication | Oil lubrication | | D_a Max. | r_{as}^2 Max. | | |
| 42 | 52 | 20 | 0.3 | 26 900 | 49 000 | 5 950 | 6 500 | 9 500 | NK42/20R | 50 | 0.3 | 0.086 | |
| | 52 | 30 | 0.3 | 39 000 | 79 000 | 9 650 | 6 500 | 9 500 | NK42/30R | 50 | 0.3 | 0.130 | |
| | 55 | 20 | 0.6 | 32 000 | 50 000 | 6 100 | 6 500 | 9 500 | RNA4907R | 51 | 0.6 | 0.107 | |
| | 55 | 27 | 0.6 | 39 000 | 64 500 | 7 850 | 6 500 | 9 500 | RNA5907 | 51 | 0.6 | 0.176 | |
| | 55 | 36 | 0.6 | 49 000 | 86 500 | 10 500 | 6 500 | 9 500 | RNA6907R | 51 | 0.6 | 0.193 | |
| 43 | 53 | 20 | 0.3 | 27 500 | 51 000 | 6 200 | 6 500 | 9 500 | NK43/20R | 51 | 0.3 | 0.086 | |
| | 53 | 30 | 0.3 | 40 000 | 82 000 | 10 000 | 6 500 | 9 500 | NK43/30R | 51 | 0.3 | 0.133 | |
| 45 | 55 | 20 | 0.3 | 28 000 | 52 500 | 6 450 | 6 000 | 9 000 | NK45/20R | 53 | 0.3 | 0.092 | |
| | 55 | 30 | 0.3 | 41 000 | 85 500 | 10 400 | 6 000 | 9 000 | NK45/30RCT | 53 | 0.3 | 0.139 | |
| 47 | 57 | 20 | 0.3 | 28 800 | 55 500 | 6 800 | 5 500 | 8 500 | NK47/20RCT | 55 | 0.3 | 0.095 | |
| | 57 | 30 | 0.3 | 42 500 | 91 500 | 11 200 | 5 500 | 8 500 | NK47/30R | 55 | 0.3 | 0.142 | |
| 48 | 62 | 22 | 0.6 | 43 500 | 66 500 | 8 150 | 5 500 | 8 500 | RNA4908R | 58 | 0.6 | 0.140 | |
| | 62 | 30 | 0.6 | 53 000 | 92 500 | 11 300 | 5 500 | 8 500 | RNA5908 | 58 | 0.6 | 0.225 | |
| | 62 | 40 | 0.6 | 67 000 | 116 000 | 14 100 | 5 500 | 8 500 | RNA6908R | 58 | 0.6 | 0.256 | |
| 50 | 62 | 25 | 0.6 | 38 500 | 74 500 | 9 050 | 5 500 | 8 000 | NK50/25RCT | 58 | 0.6 | 0.158 | |
| | 62 | 35 | 0.6 | 51 000 | 106 000 | 12 900 | 5 500 | 8 000 | NK50/35R | 58 | 0.6 | 0.221 | |
| 52 | 68 | 22 | 0.6 | 46 000 | 73 000 | 8 950 | 5 000 | 7 500 | RNA4909R | 64 | 0.6 | 0.182 | |
| | 68 | 30 | 0.6 | 56 000 | 101 000 | 12 300 | 5 000 | 7 500 | RNA5909 | 64 | 0.6 | 0.232 | |
| | 68 | 40 | 0.6 | 70 500 | 127 000 | 15 500 | 5 000 | 7 500 | RNA6909R | 64 | 0.6 | 0.273 | |
| 55 | 68 | 25 | 0.6 | 41 000 | 82 000 | 10 000 | 5 000 | 7 500 | NK55/25R | 64 | 0.6 | 0.193 | |
| | 68 | 35 | 0.6 | 54 000 | 118 000 | 14 300 | 5 000 | 7 500 | NK55/35R | 64 | 0.6 | 0.26 | |
| 58 | 72 | 22 | 0.6 | 48 000 | 80 000 | 9 750 | 4 700 | 7 000 | RNA4910R | 68 | 0.6 | 0.163 | |
| | 72 | 30 | 0.6 | 58 000 | 110 000 | 13 400 | 4 700 | 7 000 | RNA5910 | 68 | 0.6 | 0.289 | |
| | 72 | 40 | 0.6 | 74 000 | 139 000 | 17 000 | 4 700 | 7 000 | RNA6910R | 68 | 0.6 | 0.320 | |
| 60 | 72 | 25 | 0.6 | 41 000 | 85 000 | 10 400 | 4 300 | 6 500 | NK60/25R | 68 | 0.6 | 0.185 | |
| | 72 | 35 | 0.6 | 57 000 | 130 000 | 15 800 | 4 300 | 6 500 | NK60/35R | 68 | 0.6 | 0.258 | |
| 63 | 80 | 25 | 1 | 58 500 | 99 500 | 12 100 | 4 300 | 6 500 | RNA4911R | 75 | 1 | 0.255 | |
| | 80 | 34 | 1 | 76 500 | 140 000 | 17 100 | 4 300 | 6 500 | RNA5911 | 75 | 1 | 0.367 | |
| | 80 | 45 | 1 | 94 000 | 183 000 | 22 300 | 4 300 | 6 500 | RNA6911R | 75 | 1 | 0.470 | |

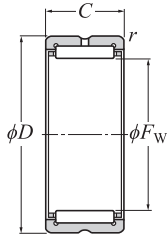
1) Smallest allowable dimension for chamfer dimension r .
2) Largest allowable dimension for fillet radius r_a of housing and shaft.

Needle Roller Bearings

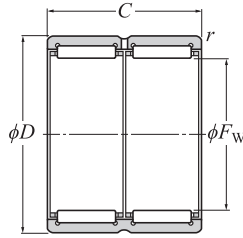


Machined-ring needle roller bearings without an inner ring

RNA49 type
RNA59 type
RNA69 type
NK type



RNA48 type
RNA49··R type
RNA59 type
NK··R type



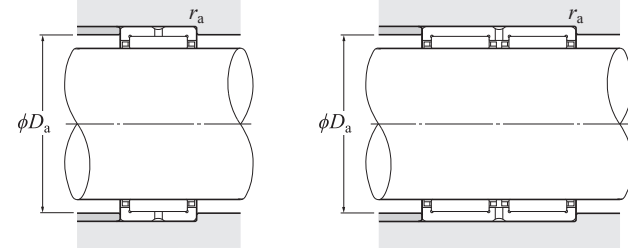
RNA69··R type

F_w 65–90 mm

| F_w | Boundary dimensions | | | Basic load rating | | Fatigue load limit N C_u | Allowable speed | | Number | Installation-related dimensions | | Mass kg (approx.) | |
|-------|---------------------|----------|------------------------|-------------------|------------------|----------------------------------|--------------------|-----------------|----------------|---------------------------------|---------------------|-------------------------|----------------|
| | mm | | | dynamic | static | | min^{-1} | | | mm | | | kg |
| | D | C | $r_s \text{ min}^{-1}$ | C_r | C_{0r} | | Grease lubrication | Oil lubrication | | D_a Max. | $r_{as}^{(2)}$ Max. | | |
| 65 | +0.049 +0.030 | 78 78 | 25 35 | 0.6 0.6 | 45 000 60 000 | 98 000 142 000 | 12 000 17 300 | 4 000 4 000 | 6 000 6 000 | NK65/25R NK65/35R | 74 74 | 0.6 0.6 | 0.221 0.310 |
| 68 | +0.049 +0.030 | 82 | 25 | 1 | 44 500 | 89 000 | 10 800 | 4 000 | 6 000 | NK68/25R | 77 | 0.6 | 0.241 |
| | | 82 | 35 | 0.6 | 63 000 | 139 000 | 17 000 | 4 000 | 6 000 | NK68/35R | 78 | 0.6 | 0.338 |
| | | 85 | 25 | 1 | 61 500 | 108 000 | 13 100 | 4 000 | 6 000 | RNA4912R | 80 | 1 | 0.275 |
| | | 85 | 34 | 1 | 80 500 | 153 000 | 18 600 | 4 000 | 6 000 | RNA5912 | 80 | 1 | 0.408 |
| 85 | 45 | 1 | 95 500 | 191 000 | 23 200 | 4 000 | 6 000 | RNA6912R | 80 | 1 | 0.488 | | |
| 70 | +0.049 +0.030 | 85 | 25 | 0.6 | 45 000 | 91 500 | 11 200 | 3 700 | 5 500 | NK70/25R | 81 | 0.6 | 0.275 |
| | | 85 | 35 | 0.6 | 64 000 | 144 000 | 17 600 | 3 700 | 5 500 | NK70/35R | 81 | 0.6 | 0.386 |
| 72 | +0.049 +0.030 | 90 | 25 | 1 | 62 500 | 112 000 | 13 700 | 3 700 | 5 500 | RNA4913R | 85 | 1 | 0.312 |
| | | 90 | 34 | 1 | 84 000 | 165 000 | 20 100 | 3 700 | 5 500 | RNA5913 | 85 | 1 | 0.462 |
| | | 90 | 45 | 1 | 97 000 | 198 000 | 24 200 | 3 700 | 5 500 | RNA6913R | 85 | 1 | 0.520 |
| 73 | +0.049 +0.030 | 90 | 25 | 0.6 | 54 000 | 100 000 | 12 200 | 3 700 | 5 500 | NK73/25R | 86 | 0.6 | 0.302 |
| | | 90 | 35 | 0.6 | 76 500 | 156 000 | 19 100 | 3 700 | 5 500 | NK73/35R | 86 | 0.6 | 0.428 |
| 75 | +0.049 +0.030 | 92 | 25 | 0.6 | 55 000 | 104 000 | 12 600 | 3 700 | 5 500 | NK75/25R | 88 | 0.6 | 0.315 |
| | | 92 | 35 | 0.6 | 78 000 | 162 000 | 19 800 | 3 700 | 5 500 | NK75/35R | 88 | 0.6 | 0.492 |
| 80 | +0.049 +0.030 | 95 | 25 | 1 | 57 000 | 119 000 | 14 500 | 3 300 | 5 000 | NK80/25R | 90 | 1 | 0.301 |
| | | 95 | 35 | 1 | 79 500 | 184 000 | 22 400 | 3 300 | 5 000 | NK80/35R | 90 | 1 | 0.425 |
| | | 100 | 30 | 1 | 85 500 | 156 000 | 19 000 | 3 300 | 5 000 | RNA4914R | 95 | 1 | 0.460 |
| | | 100 | 40 | 1 | 103 000 | 187 000 | 22 800 | 3 300 | 5 000 | RNA5914 | 95 | 1 | 0.706 |
| | | 100 | 54 | 1 | 130 000 | 267 000 | 32 500 | 3 300 | 5 000 | RNA6914R | 95 | 1 | 0.857 |
| 85 | +0.058 +0.036 | 105 | 25 | 1 | 70 500 | 123 000 | 15 000 | 3 100 | 4 700 | NK85/25R | 100 | 1 | 0.404 |
| | | 105 | 30 | 1 | 87 000 | 162 000 | 19 700 | 3 100 | 4 700 | RNA4915R | 100 | 1 | 0.489 |
| | | 105 | 35 | 1 | 100 000 | 193 000 | 23 600 | 3 100 | 4 700 | NK85/35R | 100 | 1 | 0.517 |
| | | 105 | 40 | 1 | 109 000 | 205 000 | 25 000 | 3 100 | 4 700 | RNA5915 | 100 | 1 | 0.745 |
| | | 105 | 54 | 1 | 132 000 | 277 000 | 34 000 | 3 100 | 4 700 | RNA6915R | 100 | 1 | 0.935 |
| 90 | +0.058 +0.036 | 110 | 25 | 1 | 71 500 | 128 000 | 15 600 | 2 900 | 4 400 | NK90/25R | 105 | 1 | 0.426 |
| | | 110 | 30 | 1 | 90 500 | 174 000 | 21 200 | 2 900 | 4 400 | RNA4916R | 105 | 1 | 0.516 |
| | | 110 | 35 | 1 | 104 000 | 208 000 | 25 400 | 2 900 | 4 400 | NK90/35R | 105 | 1 | 0.604 |

1) Smallest allowable dimension for chamfer dimension r .
2) Largest allowable dimension for fillet radius r_a of housing and shaft.

Needle Roller Bearings



F_w 90–135 mm

| F_w | Boundary dimensions | | | Basic load rating | | Fatigue load limit N C_u | Allowable speed | | Number | Installation-related dimensions | | Mass kg (approx.) | |
|-------|---------------------|------------|------------------------|-------------------|--------------------|----------------------------------|--------------------|-----------------|----------------|---------------------------------|---------------------|-------------------------|----------------|
| | mm | | | dynamic | static | | min^{-1} | | | mm | | | kg |
| | D | C | $r_s \text{ min}^{-1}$ | C_r | C_{0r} | | Grease lubrication | Oil lubrication | | D_a Max. | $r_{as}^{(2)}$ Max. | | |
| 90 | +0.058 +0.036 | 110 110 | 40 54 | 1 1 | 115 000 138 000 | 223 000 298 000 | 27 200 36 500 | 2 900 2 900 | 4 400 4 400 | RNA5916 RNA6916R | 105 105 | 1 1 | 0.787 0.987 |
| 95 | +0.058 +0.036 | 115 | 26 | 1 | 74 500 | 137 000 | 16 600 | 2 800 | 4 200 | NK95/26R | 110 | 1 | 0.364 |
| | | 115 | 36 | 1 | 108 000 | 223 000 | 27 000 | 2 800 | 4 200 | NK95/36R | 110 | 1 | 0.652 |
| 100 | +0.058 +0.036 | 120 | 26 | 1 | 73 500 | 137 000 | 16 500 | 2 700 | 4 000 | NK100/26R | 115 | 1 | 0.487 |
| | | 120 | 35 | 1.1 | 112 000 | 237 000 | 28 400 | 2 700 | 4 000 | RNA4917R | 113.5 | 1 | 0.657 |
| | | 120 | 36 | 1 | 107 000 | 223 000 | 26 700 | 2 700 | 4 000 | NK100/36R | 115 | 1 | 0.679 |
| | | 120 | 46 | 1.1 | 137 000 | 290 000 | 34 500 | 2 700 | 4 000 | RNA5917 | 113.5 | 1 | 1.00 |
| 120 | 63 | 1.1 | 169 000 | 400 000 | 48 000 | 2 700 | 4 000 | RNA6917R | 113.5 | 1 | 1.20 | | |
| 105 | +0.058 +0.036 | 125 | 26 | 1 | 76 500 | 147 000 | 17 300 | 2 500 | 3 800 | NK105/26R | 120 | 1 | 0.506 |
| | | 125 | 35 | 1.1 | 116 000 | 252 000 | 29 800 | 2 500 | 3 800 | RNA4918R | 118.5 | 1 | 0.697 |
| | | 125 | 36 | 1 | 111 000 | 238 000 | 28 100 | 2 500 | 3 800 | NK105/36R | 120 | 1 | 0.713 |
| | | 125 | 46 | 1.1 | 143 000 | 310 000 | 37 000 | 2 500 | 3 800 | RNA5918 | 118.5 | 1 | 1.04 |
| | | 125 | 63 | 1.1 | 175 000 | 425 000 | 50 500 | 2 500 | 3 800 | RNA6918R | 118.5 | 1 | 1.33 |
| 110 | +0.058 +0.036 | 130 | 30 | 1.1 | 97 500 | 204 000 | 23 800 | 2 400 | 3 600 | NK110/30R | 123.5 | 1 | 0.612 |
| | | 130 | 35 | 1.1 | 118 000 | 260 000 | 30 500 | 2 400 | 3 600 | RNA4919R | 123.5 | 1 | 0.719 |
| | | 130 | 40 | 1.1 | 129 000 | 292 000 | 34 000 | 2 400 | 3 600 | NK110/40R | 123.5 | 1 | 0.830 |
| | | 130 | 46 | 1.1 | 149 000 | 335 000 | 39 000 | 2 400 | 3 600 | RNA5919 | 123.5 | 1 | 1.13 |
| 130 | 63 | 1.1 | 177 000 | 440 000 | 51 000 | 2 400 | 3 600 | RNA6919R | 123.5 | 1 | 1.46 | | |
| 115 | +0.058 +0.036 | 140 | 40 | 1.1 | 127 000 | 260 000 | 29 900 | 2 300 | 3 500 | RNA4920 | 133.5 | 1 | 1.15 |
| | | 140 | 54 | 1.1 | 182 000 | 395 000 | 45 500 | 2 300 | 3 500 | RNA5920 | 133.5 | 1 | 1.76 |
| 120 | +0.058 +0.036 | 140 | 30 | 1 | 93 500 | 210 000 | 23 900 | 2 200 | 3 300 | RNA4822 | 135 | 1 | 0.670 |
| | | 140 | 40 | 1.1 | 113 000 | 268 000 | 30 500 | 2 200 | 3 300 | NK120/40 | 133.5 | 1 | 0.910 |
| 125 | +0.068 +0.043 | 150 | 40 | 1.1 | 131 000 | 279 000 | 31 500 | 2 100 | 3 200 | RNA4922 | 143.5 | 1 | 1.24 |
| | | 150 | 54 | 1.1 | 193 000 | 440 000 | 49 500 | 2 100 | 3 200 | RNA5922 | 143.5 | 1 | 1.89 |
| 130 | +0.068 +0.043 | 150 | 30 | 1 | 99 500 | 233 000 | 25 900 | 2 100 | 3 100 | RNA4824 | 145 | 1 | 0.730 |
| | | 150 | 40 | 1.1 | 116 000 | 283 000 | 31 500 | 2 100 | 3 100 | NK130/40 | 143.5 | 1 | 0.980 |
| 135 | +0.068 +0.043 | 165 | 45 | 1.1 | 180 000 | 380 000 | 41 500 | 2 000 | 3 000 | RNA4924 | 158.5 | 1 | 1.86 |
| | | 165 | 60 | 1.1 | 246 000 | 530 000 | 57 500 | 2 000 | 3 000 | RNA5924 | 158.5 | 1 | 2.67 |

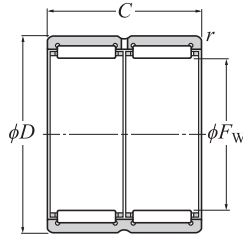
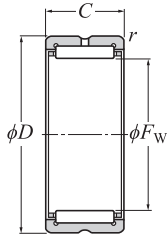
1) Smallest allowable dimension for chamfer dimension r .
2) Largest allowable dimension for fillet radius r_a of housing and shaft.

Needle Roller Bearings



Machined-ring needle roller bearings without an inner ring

RNA48 type
RNA49 type
RNA59 type
RNA69 type
NK type



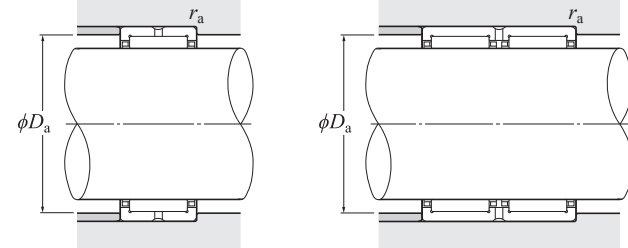
RNA48 type
RNA49·R type, RNA49 type
RNA59 type
NK·R type, NK type

F_w 145–245 mm

| F_w | Boundary dimensions | | | Basic load rating | | Fatigue load limit N C_u | Allowable speed | | Number | Installation-related dimensions | | Mass kg (approx.) | | |
|-------|---------------------|-------------------|------------------------|-------------------|-------------------------------|----------------------------------|-------------------------------|----------------------------|-------------------------|---------------------------------|---------------------------------|-------------------------|----------------------|----------------------|
| | mm | | | dynamic | static | | min^{-1} | | | mm | | | | |
| | D | C | $r_s \text{ min}^{-1}$ | C_r | C_{0r} | | Grease lubrication | Oil lubrication | | D_a Max. | $r_{as}^{2)}$ Max. | | | |
| 145 | +0.068 +0.043 | 165 170 170 | 35 32 42 | 1.1 1.5 1.5 | 118 000 111 000 153 000 | 305 000 238 000 360 000 | 32 500 25 600 38 500 | 1 900 1 900 1 900 | 2 800 2 800 2 800 | RNA4826 NK145/32 NK145/42 | 158.5 162.5 162.5 | 1 1.5 1.5 | 0.95 1.12 1.49 | |
| | 150 | +0.068 +0.043 | 180 180 | 50 67 | 1.5 1.5 | 202 000 296 000 | 455 000 690 000 | 48 000 73 000 | 1 800 1 800 | 2 700 2 700 | RNA4926 RNA5926 | 172 172 | 1.5 1.5 | 2.21 3.21 |
| | | +0.068 +0.043 | 175 180 180 | 35 32 42 | 1.1 1.5 1.5 | 121 000 114 000 156 000 | 315 000 252 000 380 000 | 33 500 26 500 40 000 | 1 700 1 700 1 700 | 2 600 2 600 2 600 | RNA4828 NK155/32 NK155/42 | 168.5 172 172 | 1 1.5 1.5 | 1.02 1.20 1.59 |
| 160 | +0.068 +0.043 | 190 190 | 50 67 | 1.5 1.5 | 209 000 315 000 | 485 000 760 000 | 50 500 79 000 | 1 700 1 700 | 2 500 2 500 | RNA4928 RNA5928 | 182 182 | 1.5 1.5 | 2.35 3.48 | |
| | +0.068 +0.043 | 190 190 190 | 32 40 42 | 1.5 1.1 1.5 | 117 000 152 000 160 000 | 265 000 390 000 400 000 | 27 400 40 500 41 000 | 1 600 1 600 1 600 | 2 400 2 400 2 400 | NK165/32 RNA4830 NK165/42 | 182 183.5 182 | 1.5 1 1.5 | 1.42 1.60 1.66 | |
| 170 | +0.068 +0.043 | 210 | 60 | 2 | 261 000 | 610 000 | 62 500 | 1 600 | 2 400 | RNA4930 | 201 | 2 | 2.98 | |
| 175 | +0.068 +0.043 | 200 | 40 | 1.1 | 160 000 | 425 000 | 43 500 | 1 500 | 2 300 | RNA4832 | 193.5 | 1 | 1.70 | |
| 180 | +0.068 +0.043 | 220 | 60 | 2 | 270 000 | 650 000 | 65 500 | 1 500 | 2 200 | RNA4932 | 211 | 2 | 3.10 | |
| 185 | +0.079 +0.050 | 215 | 45 | 1.1 | 185 000 | 495 000 | 49 500 | 1 500 | 2 200 | RNA4834 | 208.5 | 1 | 2.54 | |
| 190 | +0.079 +0.050 | 230 | 60 | 2 | 279 000 | 690 000 | 68 500 | 1 400 | 2 100 | RNA4934 | 221 | 2 | 3.22 | |
| 195 | +0.079 +0.050 | 225 | 45 | 1.1 | 195 000 | 540 000 | 53 500 | 1 400 | 2 100 | RNA4836 | 218.5 | 1 | 2.68 | |
| 205 | +0.079 +0.050 | 250 | 69 | 2 | 375 000 | 890 000 | 86 000 | 1 300 | 2 000 | RNA4936 | 241 | 2 | 4.48 | |
| 210 | +0.079 +0.050 | 240 | 50 | 1.5 | 227 000 | 680 000 | 65 500 | 1 300 | 1 900 | RNA4838 | 232 | 1.5 | 3.21 | |
| 215 | +0.079 +0.050 | 260 | 69 | 2 | 390 000 | 945 000 | 90 500 | 1 300 | 1 900 | RNA4938 | 251 | 2 | 4.53 | |
| 220 | +0.079 +0.050 | 250 | 50 | 1.5 | 231 000 | 705 000 | 67 000 | 1 200 | 1 800 | RNA4840 | 242 | 1.5 | 3.35 | |
| 225 | +0.079 +0.050 | 280 | 80 | 2.1 | 505 000 | 1 180 000 | 111 000 | 1 200 | 1 800 | RNA4940 | 269 | 2 | 7.20 | |
| 240 | +0.079 +0.050 | 270 | 50 | 1.5 | 244 000 | 780 000 | 72 500 | 1 100 | 1 700 | RNA4844 | 262 | 1.5 | 3.62 | |
| 245 | +0.079 +0.050 | 300 | 80 | 2.1 | 525 000 | 1 270 000 | 116 000 | 1 100 | 1 600 | RNA4944 | 289 | 2 | 7.81 | |

1) Smallest allowable dimension for chamfer dimension r .
2) Largest allowable dimension for fillet radius r_a of housing and shaft.

Needle Roller Bearings



F_w 265–490 mm

| F_w | Boundary dimensions | | | Basic load rating | | Fatigue load limit N C_u | Allowable speed | | Number | Installation-related dimensions | | Mass kg (approx.) | |
|-------|---------------------|------------|------------------------|-------------------|--------------------|----------------------------------|--------------------|-----------------|----------------|---------------------------------|-----------------------|-------------------------|--------------|
| | mm | | | dynamic | static | | min^{-1} | | | mm | | | |
| | D | C | $r_s \text{ min}^{-1}$ | C_r | C_{0r} | | Grease lubrication | Oil lubrication | | D_a Max. | $r_{as}^{2)}$ Max. | | |
| 265 | +0.088 +0.056 | 300 320 | 60 80 | 2 2.1 | 365 000 540 000 | 1 090 000 1 350 000 | 98 500 121 000 | 1 000 1 000 | 1 500 1 500 | RNA4848 RNA4948 | 291 309 | 2 2 | 5.40 8.40 |
| | +0.088 +0.056 | 320 | 60 | 2 | 375 000 | 1 170 000 | 103 000 | 950 | 1 400 | RNA4852 | 311 | 2 | 5.80 |
| 290 | +0.088 +0.056 | 360 | 100 | 2.1 | 810 000 | 1 920 000 | 166 000 | 950 | 1 400 | RNA4952 | 349 | 2 | 15.9 |
| 305 | +0.088 +0.056 | 350 | 69 | 2 | 455 000 | 1 300 000 | 112 000 | 850 | 1 300 | RNA4856 | 341 | 2 | 9.30 |
| 310 | +0.088 +0.056 | 380 | 100 | 2.1 | 840 000 | 2 050 000 | 175 000 | 850 | 1 300 | RNA4956 | 369 | 2 | 16.7 |
| 330 | +0.098 +0.062 | 380 | 80 | 2.1 | 625 000 | 1 770 000 | 149 000 | 800 | 1 200 | RNA4860 | 369 | 2 | 12.7 |
| 340 | +0.098 +0.062 | 420 | 118 | 3 | 1 080 000 | 2 640 000 | 219 000 | 800 | 1 200 | RNA4960 | 407 | 2.5 | 24.0 |
| 350 | +0.098 +0.062 | 400 | 80 | 2.1 | 640 000 | 1 850 000 | 153 000 | 750 | 1 100 | RNA4864 | 389 | 2 | 13.4 |
| 360 | +0.098 +0.062 | 440 | 118 | 3 | 1 120 000 | 2 820 000 | 230 000 | 750 | 1 100 | RNA4964 | 427 | 2.5 | 25.2 |
| 370 | +0.098 +0.062 | 420 | 80 | 2.1 | 655 000 | 1 940 000 | 158 000 | 750 | 1 100 | RNA4868 | 409 | 2 | 14.0 |
| 380 | +0.098 +0.062 | 460 | 118 | 3 | 1 160 000 | 3 000 000 | 242 000 | 750 | 1 100 | RNA4968 | 447 | 2.5 | 26.5 |
| 390 | +0.098 +0.062 | 440 | 80 | 2.1 | 665 000 | 2 020 000 | 162 000 | 650 | 1 000 | RNA4872 | 429 | 2 | 14.8 |
| 400 | +0.108 +0.068 | 480 | 118 | 3 | 1 200 000 | 3 200 000 | 253 000 | 650 | 1 000 | RNA4972 | 467 | 2.5 | 28.2 |
| 415 | +0.108 +0.068 | 480 | 100 | 2.1 | 1 000 000 | 2 840 000 | 223 000 | 650 | 950 | RNA4876 | 469 | 2 | 26.0 |
| 430 | +0.108 +0.068 | 520 | 140 | 4 | 1 400 000 | 3 750 000 | 292 000 | 650 | 950 | RNA4976 | 504 | 3 | 38.6 |
| 450 | +0.108 +0.068 | 540 | 140 | 4 | 1 450 000 | 4 000 000 | 306 000 | 600 | 900 | RNA4980 | 524 | 3 | 40.1 |
| 470 | +0.108 +0.068 | 560 | 140 | 4 | 1 500 000 | 4 250 000 | 320 000 | 550 | 850 | RNA4984 | 544 | 3 | 51.6 |
| 490 | +0.108 +0.068 | 600 | 160 | 4 | 1 750 000 | 4 600 000 | 342 000 | 550 | 800 | RNA4988 | 584 | 3 | 66.9 |

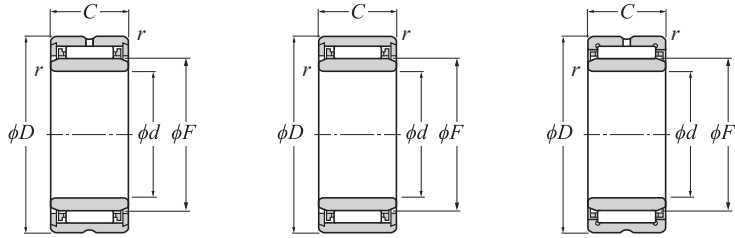
1) Smallest allowable dimension for chamfer dimension r .
2) Largest allowable dimension for fillet radius r_a of housing and shaft.

Needle Roller Bearings



Machined-ring needle roller bearings with an inner ring

NA49 type
NA59 type
NA69 type
NK+IR type



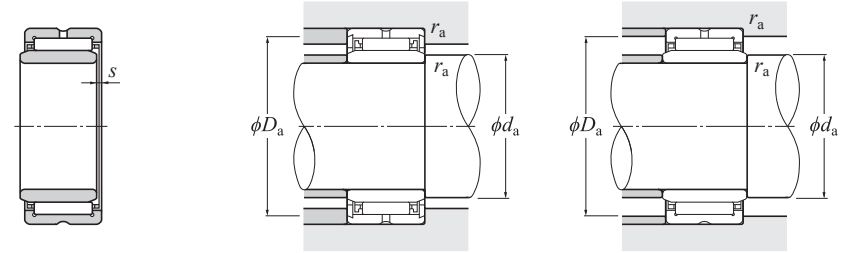
NA49 type ($\phi d \leq 9$ mm) NK+IR type ($\phi d \leq 9$ mm) NA49+R type ($\phi d \geq 10$ mm)
NA59 type
NA69+R type
NK+IR type ($\phi d \geq 10$ mm)

d 5-17 mm

| Boundary dimensions | Basic load rating | | | | | Fatigue load limit | Allowable speed | | Number | | |
|---------------------|-------------------|----|----------------------------------|----|-----------------|--------------------|-----------------|-------------------|----------------|--------------------|------------------------|
| | mm | | | | | | N | min ⁻¹ | | | |
| d | D | C | r _{s min} ¹⁾ | F | s ²⁾ | C _r | | C _{0r} | C _u | Grease lubrication | Oil lubrication |
| 5 | 13 | 10 | 0.15 | 7 | — | 2 670 | 2 350 | 287 | 23 000 | 34 000 | NA495T2 |
| | 15 | 12 | 0.3 | 8 | 1.5 | 4 000 | 4 100 | 500 | 21 000 | 32 000 | NK8/12T2+IR5×8×12 |
| | 15 | 16 | 0.3 | 8 | 2 | 4 850 | 5 200 | 635 | 21 000 | 32 000 | NK8/16T2+IR5×8×16 |
| 6 | 15 | 10 | 0.15 | 8 | — | 3 150 | 3 000 | 365 | 21 000 | 32 000 | NA496T2T |
| | 16 | 12 | 0.3 | 9 | 1.5 | 4 550 | 5 000 | 615 | 20 000 | 30 000 | NK9/12T2+IR6×9×12 |
| | 16 | 16 | 0.3 | 9 | 2 | 5 500 | 6 400 | 780 | 20 000 | 30 000 | NK9/16T2+IR6×9×16 |
| 7 | 17 | 10 | 0.15 | 9 | — | 3 600 | 3 650 | 445 | 20 000 | 30 000 | NA497 |
| | 17 | 12 | 0.3 | 10 | 1.5 | 4 550 | 5 100 | 620 | 19 000 | 28 000 | NK10/12T2+IR7×10×12 |
| | 17 | 16 | 0.3 | 10 | 2 | 5 450 | 6 450 | 790 | 19 000 | 28 000 | 8E-NK10/16CT+IR7×10×16 |
| 8 | 19 | 11 | 0.15 | 10 | — | 5 250 | 5 150 | 630 | 19 000 | 28 000 | NA498CT |
| 9 | 19 | 12 | 0.3 | 12 | 1.5 | 5 000 | 6 100 | 740 | 17 000 | 26 000 | NK12/12+IR9×12×12 |
| | 19 | 16 | 0.3 | 12 | 2 | 6 000 | 7 700 | 940 | 17 000 | 26 000 | NK12/16+IR9×12×16 |
| | 20 | 11 | 0.3 | 12 | — | 4 850 | 4 900 | 595 | 17 000 | 26 000 | NA499 |
| 10 | 22 | 13 | 0.3 | 14 | 0.5 | 8 600 | 9 200 | 1 120 | 16 000 | 24 000 | NA4900R |
| | 22 | 16 | 0.3 | 14 | 0.5 | 10 300 | 11 500 | 1 400 | 16 000 | 24 000 | NK14/16RCT+IR10×14×16 |
| | 22 | 20 | 0.3 | 14 | 0.5 | 13 000 | 15 600 | 1 900 | 16 000 | 24 000 | NK14/20R+IR10×14×20 |
| 12 | 24 | 13 | 0.3 | 16 | 0.5 | 9 550 | 10 900 | 1 330 | 15 000 | 23 000 | NA4901R |
| | 24 | 16 | 0.3 | 16 | 0.5 | 12 200 | 14 900 | 1 820 | 15 000 | 23 000 | NK16/16R+IR12×16×16 |
| | 24 | 20 | 0.3 | 16 | 0.5 | 14 600 | 18 800 | 2 290 | 15 000 | 23 000 | NK16/20R+IR12×16×20 |
| | 24 | 22 | 0.3 | 16 | 1 | 15 400 | 20 000 | 2 440 | 15 000 | 23 000 | NA6901R |
| 15 | 27 | 16 | 0.3 | 19 | 0.5 | 13 300 | 17 400 | 2 120 | 14 000 | 21 000 | NK19/16R+IR15×19×16 |
| | 27 | 20 | 0.3 | 19 | 0.5 | 16 000 | 22 200 | 2 700 | 14 000 | 21 000 | NK19/20R+IR15×19×20 |
| | 28 | 13 | 0.3 | 20 | 0.5 | 10 300 | 12 800 | 1 560 | 13 000 | 20 000 | NA4902R |
| | 28 | 18 | 0.3 | 20 | 0.5 | 14 100 | 19 100 | 2 330 | 13 000 | 20 000 | NA5902CT |
| | 28 | 23 | 0.3 | 20 | 1 | 17 600 | 25 300 | 3 100 | 13 000 | 20 000 | NA6902R |
| 17 | 29 | 16 | 0.3 | 21 | 0.5 | 13 700 | 18 700 | 2 280 | 13 000 | 19 000 | NK21/16R+IR17×21×16 |
| | 29 | 20 | 0.3 | 21 | 0.5 | 17 400 | 25 400 | 3 100 | 13 000 | 19 000 | NK21/20R+IR17×21×20 |
| | 30 | 13 | 0.3 | 22 | 0.5 | 11 200 | 14 600 | 1 780 | 12 000 | 18 000 | NA4903R |

1) Smallest allowable dimension for chamfer dimension r.
2) Allowable axial movement amount of the inner ring with respect to the outer ring.
3) Largest allowable dimension for fillet radius r_{as} of housing and shaft.

Needle Roller Bearings



| Installation-related dimensions | Mass | | |
|---------------------------------|----------------|-------------------------------|-----------|
| | mm | | |
| d _a | D _a | r _{as} ³⁾ | kg |
| Min. | Max. | Max. | (approx.) |
| 6.2 | 8.5 | 0.15 | 0.007 |
| 7 | 9.5 | 0.3 | 0.012 |
| 7 | 9.5 | 0.3 | 0.016 |
| 8 | 9.5 | 0.15 | 0.009 |
| 8 | 10.5 | 0.3 | 0.013 |
| 8 | 10.5 | 0.3 | 0.017 |
| 9 | 10.5 | 0.15 | 0.010 |
| 9 | 11.5 | 0.3 | 0.014 |
| 9 | 11.5 | 0.3 | 0.018 |
| 10 | 12 | 0.15 | 0.016 |
| 11 | 13.5 | 0.3 | 0.018 |
| 11 | 13.5 | 0.3 | 0.022 |
| 11 | 14 | 0.3 | 0.017 |
| 12 | 20 | 0.3 | 0.024 |
| 12 | 20 | 0.3 | 0.030 |
| 12 | 20 | 0.3 | 0.038 |
| 14 | 22 | 0.3 | 0.026 |
| 14 | 22 | 0.3 | 0.033 |
| 14 | 22 | 0.3 | 0.042 |
| 14 | 22 | 0.3 | 0.046 |
| 17 | 25 | 0.3 | 0.039 |
| 17 | 25 | 0.3 | 0.045 |
| 17 | 26 | 0.3 | 0.036 |
| 17 | 26 | 0.3 | 0.052 |
| 17 | 26 | 0.3 | 0.064 |
| 19 | 27 | 0.3 | 0.042 |
| 19 | 27 | 0.3 | 0.053 |
| 19 | 28 | 0.3 | 0.037 |

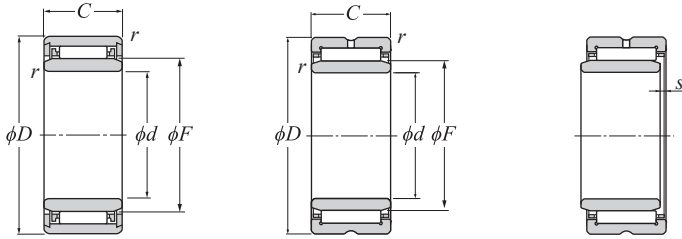
Note: The number of inner rings (IR) is composed of the IR bore diameter dimension × outside diameter dimension × width dimension.

Needle Roller Bearings



Machined-ring needle roller bearings with an inner ring

NA49 type
NA59 type
NA69 type
NK+IR type



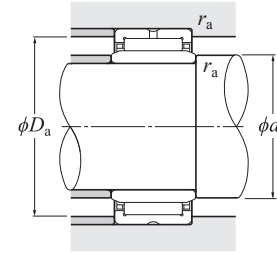
NA49·R type
NA59 type
NA69·R type
NK·R + IR type

d 17-32 mm

| d | Boundary dimensions | | | | | Basic load rating | | Fatigue load limit N C _u | Allowable speed | | Number |
|----|---------------------|----|-----|----------------------------------|-------------------|--------------------------------|--------------------------------|---|--|--------------------|--------------------------|
| | d | D | C | r _{s min} ¹⁾ | F s ²⁾ | dynamic N C _r | static N C _{0r} | | min ⁻¹ Grease lubrication | Oil lubrication | |
| 17 | 30 | 18 | 0.3 | 22 | 0.5 | 15 200 | 21 700 | 2 650 | 12 000 | 18 000 | NA5903 |
| | 30 | 23 | 0.3 | 22 | 1 | 18 200 | 27 200 | 3 300 | 12 000 | 18 000 | NA6903R |
| 20 | 32 | 16 | 0.3 | 24 | 0.5 | 15 200 | 22 300 | 2 720 | 11 000 | 17 000 | NK24/16R+IR20×24×16 |
| | 32 | 20 | 0.3 | 24 | 0.5 | 18 600 | 28 800 | 3 500 | 11 000 | 17 000 | NK24/20R+IR20×24×20 |
| | 37 | 17 | 0.3 | 25 | 0.8 | 21 300 | 25 500 | 3 100 | 11 000 | 16 000 | NA4904RCT |
| | 37 | 23 | 0.3 | 25 | 0.8 | 28 400 | 37 000 | 4 500 | 11 000 | 16 000 | NA5904 |
| 22 | 37 | 30 | 0.3 | 25 | 1 | 36 500 | 50 500 | 6 150 | 11 000 | 16 000 | NA6904R |
| | 34 | 16 | 0.3 | 26 | 0.5 | 15 600 | 23 600 | 2 880 | 10 000 | 15 000 | 8E-NK26/16RCT+IR22×26×16 |
| | 34 | 20 | 0.3 | 26 | 0.5 | 19 100 | 30 500 | 3 700 | 10 000 | 15 000 | NK26/20R+IR22×26×20 |
| | 39 | 17 | 0.3 | 28 | 0.8 | 23 200 | 29 300 | 3 600 | 9 500 | 14 000 | NA49/22R |
| 25 | 39 | 23 | 0.3 | 28 | 0.8 | 26 400 | 37 500 | 4 600 | 9 500 | 14 000 | NA59/22 |
| | 39 | 30 | 0.3 | 28 | 0.5 | 40 000 | 58 500 | 7 150 | 9 500 | 14 000 | NA69/22R |
| 28 | 38 | 20 | 0.3 | 29 | 1 | 22 200 | 34 000 | 4 150 | 9 500 | 14 000 | NK29/20R+IR25×29×20 |
| | 38 | 30 | 0.3 | 29 | 1.5 | 27 500 | 50 500 | 6 150 | 9 500 | 14 000 | NK29/30R+IR25×29×30 |
| | 42 | 17 | 0.3 | 30 | 0.8 | 24 000 | 31 500 | 3 800 | 8 500 | 13 000 | NA4905R |
| | 42 | 23 | 0.3 | 30 | 0.8 | 30 500 | 43 000 | 5 200 | 8 500 | 13 000 | NA5905 |
| 30 | 42 | 30 | 0.3 | 30 | 1 | 41 500 | 63 000 | 7 650 | 8 500 | 13 000 | NA6905R |
| | 42 | 20 | 0.3 | 32 | 1 | 23 500 | 37 500 | 4 600 | 8 500 | 13 000 | NK32/20R+IR28×32×20 |
| | 42 | 30 | 0.3 | 32 | 1.5 | 34 000 | 60 500 | 7 350 | 8 500 | 13 000 | NK32/30R+IR28×32×30 |
| | 45 | 17 | 0.3 | 32 | 0.8 | 24 800 | 33 500 | 4 050 | 8 500 | 13 000 | NA49/28RCT |
| 32 | 45 | 23 | 0.3 | 32 | 0.8 | 32 000 | 45 500 | 5 550 | 8 500 | 13 000 | NA59/28 |
| | 45 | 30 | 0.3 | 32 | 1 | 43 000 | 67 000 | 8 150 | 8 500 | 13 000 | NA69/28R |
| | 45 | 20 | 0.3 | 35 | 0.5 | 24 800 | 41 500 | 5 050 | 7 500 | 11 000 | NK35/20RCT+IR30×35×20 |
| | 45 | 30 | 0.3 | 35 | 1 | 36 000 | 66 500 | 8 100 | 7 500 | 11 000 | NK35/30R+IR30×35×30 |
| 32 | 47 | 17 | 0.3 | 35 | 0.8 | 25 500 | 35 500 | 4 300 | 7 500 | 11 000 | NA4906R |
| | 47 | 23 | 0.3 | 35 | 0.8 | 32 500 | 48 500 | 5 950 | 7 500 | 11 000 | NA5906 |
| | 47 | 30 | 0.3 | 35 | 1 | 42 500 | 67 500 | 8 250 | 7 500 | 11 000 | NA6906R |
| | 47 | 20 | 0.3 | 37 | 0.5 | 25 300 | 43 500 | 5 300 | 7 500 | 11 000 | NK37/20R+IR32×37×20 |
| 32 | 47 | 30 | 0.3 | 37 | 1 | 36 500 | 69 500 | 8 500 | 7 500 | 11 000 | NK37/30R+IR32×37×30 |
| | 52 | 20 | 0.6 | 40 | 0.8 | 31 500 | 47 500 | 5 800 | 6 500 | 10 000 | NA49/32R |

1) Smallest allowable dimension for chamfer dimension r.
2) Allowable axial movement amount of the inner ring with respect to the outer ring.
3) Largest allowable dimension for fillet radius r_a of housing and shaft.

Needle Roller Bearings



| d _a | Installation-related dimensions | | | Mass kg (approx.) |
|----------------|---------------------------------|-------------------------------------|--------------------------|-------------------------|
| | mm D _a | mm r _{as} ³⁾ | mm phi d _a | |
| 19 | 28 | 0.3 | 0.056 | |
| 19 | 28 | 0.3 | 0.069 | |
| 22 | 30 | 0.3 | 0.049 | |
| 22 | 30 | 0.3 | 0.061 | |
| 22 | 35 | 0.3 | 0.074 | |
| 22 | 35 | 0.3 | 0.115 | |
| 22 | 35 | 0.3 | 0.141 | |
| 24 | 32 | 0.3 | 0.046 | |
| 24 | 32 | 0.3 | 0.064 | |
| 24 | 37 | 0.3 | 0.080 | |
| 24 | 37 | 0.3 | 0.134 | |
| 24 | 37 | 0.3 | 0.154 | |
| 27 | 36 | 0.3 | 0.079 | |
| 27 | 36 | 0.3 | 0.123 | |
| 27 | 40 | 0.3 | 0.088 | |
| 27 | 40 | 0.3 | 0.139 | |
| 27 | 40 | 0.3 | 0.162 | |
| 30 | 40 | 0.3 | 0.096 | |
| 30 | 40 | 0.3 | 0.146 | |
| 30 | 43 | 0.3 | 0.098 | |
| 30 | 43 | 0.3 | 0.142 | |
| 30 | 43 | 0.3 | 0.179 | |
| 32 | 43 | 0.3 | 0.112 | |
| 32 | 43 | 0.3 | 0.171 | |
| 32 | 45 | 0.3 | 0.101 | |
| 32 | 45 | 0.3 | 0.152 | |
| 32 | 45 | 0.3 | 0.185 | |
| 34 | 45 | 0.3 | 0.117 | |
| 34 | 45 | 0.3 | 0.170 | |
| 36 | 48 | 0.6 | 0.157 | |

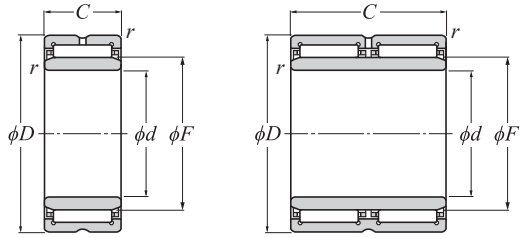
Note: The number of inner rings (IR) is composed of the IR bore diameter dimension × outside diameter dimension × width dimension.

Needle Roller Bearings



Machined-ring needle roller bearings with an inner ring

NA49 type
NA59 type
NA69 type
NK+IR type



NA49·R type
NA59 type
NK·R + IR type

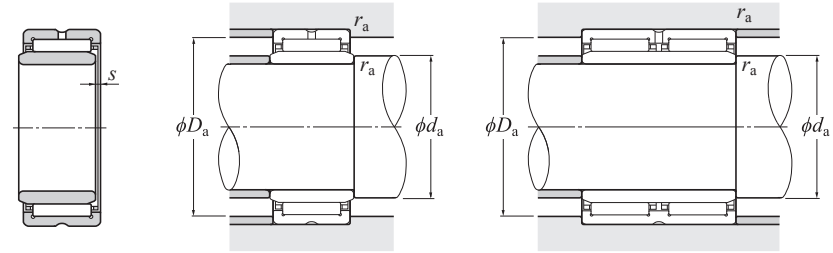
NA69·R type

d 32–55 mm

| d | Boundary dimensions | | | | | Basic load rating | | Fatigue load limit N C _u | Allowable speed | | Number | |
|----|---------------------|----|----------------------------------|----|-----------------|--------------------------------|--------------------------------|---|--|--------------------|--|--------|
| | D | C | r _{s min} ¹⁾ | F | s ²⁾ | dynamic N C _r | static N C _{0r} | | min ⁻¹ Grease lubrication | Oil lubrication | | |
| 32 | 52 | 27 | 0.6 | 40 | 0.8 | 38 000 | 61 000 | 7 450 | 6 500 | 10 000 | NA59/32 NA69/32R | |
| | 52 | 36 | 0.6 | 40 | 0.5 | 47 500 | 82 000 | | 6 500 | 10 000 | | |
| 35 | 50 | 20 | 0.3 | 40 | 0.5 | 26 400 | 47 000 | 5 750 | 6 500 | 10 000 | NK40/20R+IR35×40×20 NK40/30R+IR35×40×30 NA4907R NA5907 NA6907R | |
| | 50 | 30 | 0.3 | 40 | 1 | 38 500 | 76 000 | | 9 250 | 6 500 | | 10 000 |
| | 55 | 20 | 0.6 | 42 | 0.8 | 32 000 | 50 000 | | 6 100 | 6 500 | | 9 500 |
| | 55 | 27 | 0.6 | 42 | 0.8 | 39 000 | 64 500 | | 7 850 | 6 500 | | 9 500 |
| | 55 | 36 | 0.6 | 42 | 0.5 | 49 000 | 86 500 | | 10 500 | 6 500 | | 9 500 |
| 38 | 53 | 20 | 0.3 | 43 | 0.5 | 27 500 | 51 000 | 6 200 | 6 500 | 9 500 | NK43/20R+IR38×43×20 NK43/30R+IR38×43×30 | |
| | 53 | 30 | 0.3 | 43 | 1 | 40 000 | 82 000 | | 10 000 | 6 500 | | 9 500 |
| 40 | 55 | 20 | 0.3 | 45 | 0.5 | 28 000 | 52 500 | 6 450 | 6 000 | 9 000 | NK45/20R+IR40×45×20 NK45/30RCT+IR40×45×30 NA4908R NA5908 NA6908R | |
| | 55 | 30 | 0.3 | 45 | 1 | 41 000 | 85 500 | | 10 400 | 6 000 | | 9 000 |
| | 62 | 22 | 0.6 | 48 | 1 | 43 500 | 66 500 | | 8 150 | 5 500 | | 8 500 |
| | 62 | 30 | 0.6 | 48 | 1 | 53 000 | 92 500 | | 11 300 | 5 500 | | 8 500 |
| | 62 | 40 | 0.6 | 48 | 0.5 | 67 000 | 116 000 | | 14 100 | 5 500 | | 8 500 |
| 42 | 57 | 20 | 0.3 | 47 | 0.5 | 28 800 | 55 500 | 6 800 | 5 500 | 8 500 | NK47/20RCT+IR42×47×20 NK47/30R+IR42×47×30 | |
| | 57 | 30 | 0.3 | 47 | 1 | 42 500 | 91 500 | | 11 200 | 5 500 | | 8 500 |
| 45 | 62 | 25 | 0.6 | 50 | 1.5 | 38 500 | 74 500 | 9 050 | 5 500 | 8 000 | NK50/25RCT+IR45×50×25 NK50/35R+IR45×50×35 NA4909R NA5909 NA6909R | |
| | 62 | 35 | 0.6 | 50 | 2 | 51 000 | 106 000 | | 12 900 | 5 500 | | 8 000 |
| | 68 | 22 | 0.6 | 52 | 1 | 46 000 | 73 000 | | 8 950 | 5 000 | | 7 500 |
| | 68 | 30 | 0.6 | 52 | 1 | 56 000 | 101 000 | | 12 300 | 5 000 | | 7 500 |
| | 68 | 40 | 0.6 | 52 | 0.5 | 70 500 | 127 000 | | 15 500 | 5 000 | | 7 500 |
| 50 | 68 | 25 | 0.6 | 55 | 1.5 | 41 000 | 82 000 | 10 000 | 5 000 | 7 500 | NK55/25R+IR50×55×25 NK55/35R+IR50×55×35 NA4910R NA5910 NA6910R | |
| | 68 | 35 | 0.6 | 55 | 2 | 54 000 | 118 000 | | 14 300 | 5 000 | | 7 500 |
| | 72 | 22 | 0.6 | 58 | 1 | 48 000 | 80 000 | | 9 750 | 4 700 | | 7 000 |
| | 72 | 30 | 0.6 | 58 | 1 | 58 000 | 110 000 | | 13 400 | 4 700 | | 7 000 |
| | 72 | 40 | 0.6 | 58 | 0.5 | 74 000 | 139 000 | | 17 000 | 4 700 | | 7 000 |
| 55 | 72 | 25 | 0.6 | 60 | 1.5 | 41 000 | 85 000 | 10 400 | 4 300 | 6 500 | NK60/25R+IR55×60×25 NK60/35R+IR55×60×35 NA4911R | |
| | 72 | 35 | 0.6 | 60 | 2 | 57 000 | 130 000 | | 15 800 | 4 300 | | 6 500 |
| | 80 | 25 | 1 | 63 | 1.5 | 58 500 | 99 500 | | 12 100 | 4 300 | | 6 500 |

1) Smallest allowable dimension for chamfer dimension r.
2) Allowable axial movement amount of the inner ring with respect to the outer ring.
3) Largest allowable dimension for fillet radius r_a of housing and shaft.

Needle Roller Bearings



| d _a | Installation-related dimensions | | | Mass kg (approx.) |
|----------------|---------------------------------|------------------------------|---|-------------------------|
| | mm D _a Min. | mm D _a Max. | mm r _{as} ³⁾ Max. | |
| 36 | 48 | 0.6 | 0.241 | |
| 36 | 48 | 0.6 | 0.286 | |
| 37 | 48 | 0.3 | 0.130 | |
| 37 | 48 | 0.3 | 0.193 | |
| 39 | 51 | 0.6 | 0.171 | |
| 39 | 51 | 0.6 | 0.256 | |
| 39 | 51 | 0.6 | 0.310 | |
| 40 | 51 | 0.3 | 0.134 | |
| 40 | 51 | 0.3 | 0.207 | |
| 42 | 53 | 0.3 | 0.143 | |
| 42 | 53 | 0.3 | 0.216 | |
| 44 | 58 | 0.6 | 0.232 | |
| 44 | 58 | 0.6 | 0.348 | |
| 44 | 58 | 0.6 | 0.426 | |
| 44 | 55 | 0.3 | 0.148 | |
| 44 | 55 | 0.3 | 0.222 | |
| 48 | 58 | 0.6 | 0.229 | |
| 48 | 58 | 0.6 | 0.322 | |
| 49 | 64 | 0.6 | 0.270 | |
| 49 | 64 | 0.6 | 0.396 | |
| 49 | 64 | 0.6 | 0.437 | |
| 53 | 64 | 0.6 | 0.271 | |
| 53 | 64 | 0.6 | 0.379 | |
| 54 | 68 | 0.6 | 0.276 | |
| 54 | 68 | 0.6 | 0.498 | |
| 54 | 68 | 0.6 | 0.529 | |
| 58 | 68 | 0.6 | 0.271 | |
| 58 | 68 | 0.6 | 0.379 | |
| 60 | 75 | 1 | 0.396 | |

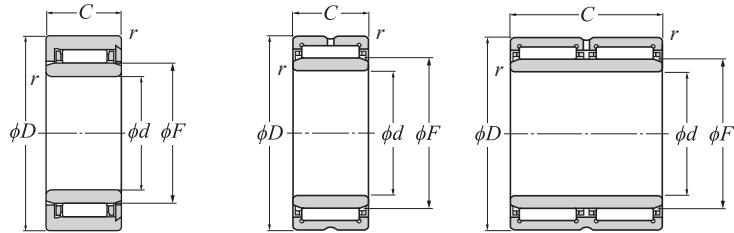
Note: The number of inner rings (IR) is composed of the IR bore diameter dimension × outside diameter dimension × width dimension.

Needle Roller Bearings



Machined-ring needle roller bearings with an inner ring

NA49 type
NA59 type
NA69 type
NK+IR type



NA49··R type
NA59 type
NK··R + IR type

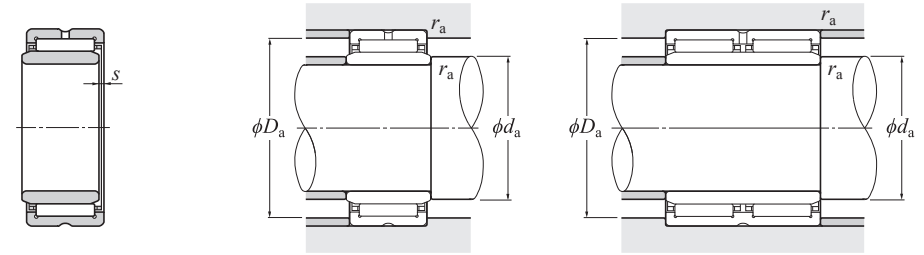
NA69··R type

d 55-85 mm

| Boundary dimensions | Basic load rating | | | | | Fatigue load limit | Allowable speed | | Number | | |
|---------------------|-------------------|----------|--|----------|------------------------|----------------------|-----------------------|----------------------|--------------------|-----------------|---------------------|
| | mm | | | | | | N | min ⁻¹ | | | |
| <i>d</i> | <i>D</i> | <i>C</i> | <i>r_{s min}</i> ¹⁾ | <i>F</i> | <i>s</i> ²⁾ | <i>C_r</i> | <i>C_{0r}</i> | <i>C_u</i> | Grease lubrication | Oil lubrication | |
| 55 | 80 | 34 | 1 | 63 | 1.5 | 76 500 | 140 000 | 17 100 | 4 300 | 6 500 | NA5911 |
| | 80 | 45 | 1 | 63 | 1.5 | 94 000 | 183 000 | 22 300 | 4 300 | 6 500 | NA6911R |
| 60 | 82 | 25 | 1 | 68 | 1 | 44 500 | 89 000 | 10 800 | 4 000 | 6 000 | NK68/25R+IR60×68×25 |
| | 82 | 35 | 0.6 | 68 | 1 | 63 000 | 139 000 | 17 000 | 4 000 | 6 000 | NK68/35R+IR60×68×35 |
| | 85 | 25 | 1 | 68 | 1.5 | 61 500 | 108 000 | 13 100 | 4 000 | 6 000 | NA4912R |
| | 85 | 34 | 1 | 68 | 1.5 | 80 500 | 153 000 | 18 600 | 4 000 | 6 000 | NA5912 |
| | 85 | 45 | 1 | 68 | 1.5 | 95 500 | 191 000 | 23 200 | 4 000 | 6 000 | NA6912R |
| 65 | 90 | 25 | 0.6 | 73 | 1 | 54 000 | 100 000 | 12 200 | 3 700 | 5 500 | NK73/25R+IR65×73×25 |
| | 90 | 25 | 1 | 72 | 1.5 | 62 500 | 112 000 | 13 700 | 3 700 | 5 500 | NA4913R |
| | 90 | 34 | 1 | 72 | 1.5 | 84 000 | 165 000 | 20 100 | 3 700 | 5 500 | NA5913 |
| | 90 | 35 | 0.6 | 73 | 1 | 76 500 | 156 000 | 19 100 | 3 700 | 5 500 | NK73/35R+IR65×73×35 |
| | 90 | 45 | 1 | 72 | 1.5 | 97 000 | 198 000 | 24 200 | 3 700 | 5 500 | NA6913R |
| 70 | 95 | 25 | 1 | 80 | 0.8 | 57 000 | 119 000 | 14 500 | 3 300 | 5 000 | NK80/25R+IR70×80×25 |
| | 95 | 35 | 1 | 80 | 0.8 | 79 500 | 184 000 | 22 400 | 3 300 | 5 000 | NK80/35R+IR70×80×35 |
| | 100 | 30 | 1 | 80 | 1.5 | 85 500 | 156 000 | 19 000 | 3 300 | 5 000 | NA4914R |
| | 100 | 40 | 1 | 80 | 1.5 | 103 000 | 187 000 | 22 800 | 3 300 | 5 000 | NA5914 |
| | 100 | 54 | 1 | 80 | 1 | 130 000 | 267 000 | 32 500 | 3 300 | 5 000 | NA6914R |
| 75 | 105 | 25 | 1 | 85 | 1 | 70 500 | 123 000 | 15 000 | 3 100 | 4 700 | NK85/25R+IR75×85×25 |
| | 105 | 30 | 1 | 85 | 1.5 | 87 000 | 162 000 | 19 700 | 3 100 | 4 700 | NA4915R |
| | 105 | 35 | 1 | 85 | 1 | 100 000 | 193 000 | 23 600 | 3 100 | 4 700 | NK85/35R+IR75×85×35 |
| | 105 | 40 | 1 | 85 | 1.5 | 109 000 | 205 000 | 25 000 | 3 100 | 4 700 | NA5915 |
| | 105 | 54 | 1 | 85 | 1 | 132 000 | 277 000 | 34 000 | 3 100 | 4 700 | NA6915R |
| 80 | 110 | 25 | 1 | 90 | 1 | 71 500 | 128 000 | 15 600 | 2 900 | 4 400 | NK90/25R+IR80×90×25 |
| | 110 | 30 | 1 | 90 | 1.5 | 90 500 | 174 000 | 21 200 | 2 900 | 4 400 | NA4916R |
| | 110 | 35 | 1 | 90 | 1 | 104 000 | 208 000 | 25 400 | 2 900 | 4 400 | NK90/35R+IR80×90×35 |
| | 110 | 40 | 1 | 90 | 1.5 | 115 000 | 223 000 | 27 200 | 2 900 | 4 400 | NA5916 |
| | 110 | 54 | 1 | 90 | 1.5 | 138 000 | 298 000 | 36 500 | 2 900 | 4 400 | NA6916R |
| 85 | 115 | 26 | 1 | 95 | 1.5 | 74 500 | 137 000 | 16 600 | 2 800 | 4 200 | NK95/26R+IR85×95×26 |
| | 115 | 36 | 1 | 95 | 1.5 | 108 000 | 223 000 | 27 000 | 2 800 | 4 200 | NK95/36R+IR85×95×36 |

1) Smallest allowable dimension for chamfer dimension *r*.
2) Allowable axial movement amount of the inner ring with respect to the outer ring.
3) Largest allowable dimension for fillet radius *r_a* of housing and shaft.

Needle Roller Bearings



| Installation-related dimensions | Mass | | |
|---------------------------------|----------------------|-------------------------------------|-----------|
| | mm | | |
| <i>d_a</i> | <i>D_a</i> | <i>r_{as}</i> ³⁾ | kg |
| Min. | Max. | Max. | (approx.) |
| 60 | 75 | 1 | 0.559 |
| 60 | 75 | 1 | 0.726 |
| 65 | 77 | 0.6 | 0.393 |
| 64 | 78 | 0.6 | 0.551 |
| 65 | 80 | 1 | 0.427 |
| 65 | 80 | 1 | 0.614 |
| 65 | 80 | 1 | 0.758 |
| 69 | 86 | 0.6 | 0.466 |
| 70 | 85 | 1 | 0.454 |
| 70 | 85 | 1 | 0.655 |
| 69 | 86 | 0.6 | 0.660 |
| 70 | 85 | 1 | 0.779 |
| 75 | 90 | 1 | 0.525 |
| 75 | 90 | 1 | 0.738 |
| 75 | 95 | 1 | 0.727 |
| 75 | 95 | 1 | 1.06 |
| 75 | 95 | 1 | 1.34 |
| 80 | 100 | 1 | 0.642 |
| 80 | 100 | 1 | 0.776 |
| 80 | 100 | 1 | 0.853 |
| 80 | 100 | 1 | 1.13 |
| 80 | 100 | 1 | 1.45 |
| 85 | 105 | 1 | 0.680 |
| 85 | 105 | 1 | 0.820 |
| 85 | 105 | 1 | 0.959 |
| 85 | 105 | 1 | 1.15 |
| 85 | 105 | 1 | 1.53 |
| 90 | 110 | 1 | 0.644 |
| 90 | 110 | 1 | 1.05 |

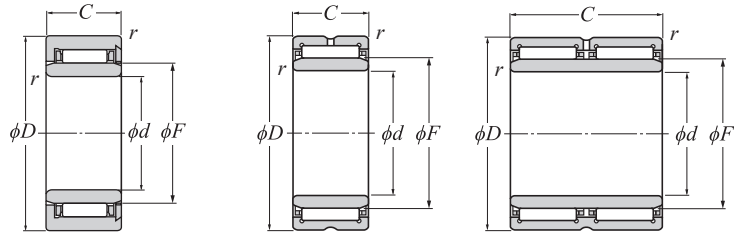
Note: The number of inner rings (IR) is composed of the IR bore diameter dimension × outside diameter dimension × width dimension.

Needle Roller Bearings



Machined-ring needle roller bearings with an inner ring

NA48 type
NA49 type
NA59 type
NA69 type
NK+IR type



NA49··R type
NA59 type
NK··R + IR type

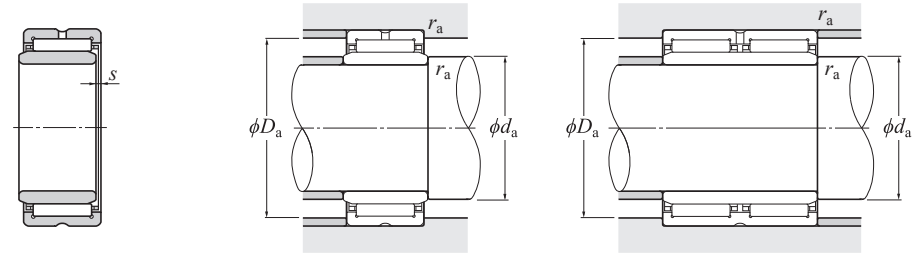
NA69··R type

d 85–130 mm

| d | Boundary dimensions | | | | | Basic load rating | | Fatigue load limit N C _u | Allowable speed | | Number |
|-----|---------------------|----|----------------------------------|-----|-----------------|--------------------------------|--------------------------------|---|-------------------|--------------------|------------------------|
| | D | C | r _{s min} ¹⁾ | F | s ²⁾ | dynamic N C _r | static N C _{0r} | | min ⁻¹ | Oil lubrication | |
| 85 | 120 | 35 | 1.1 | 100 | 1 | 112 000 | 237 000 | 28 400 | 2 700 | 4 000 | NA4917R |
| | 120 | 46 | 1.1 | 100 | 1.5 | 137 000 | 290 000 | 34 500 | 2 700 | 4 000 | NA5917 |
| | 120 | 63 | 1.1 | 100 | 1 | 169 000 | 400 000 | 48 000 | 2 700 | 4 000 | NA6917R |
| 90 | 120 | 26 | 1 | 100 | 1.5 | 73 500 | 137 000 | 16 400 | 2 700 | 4 000 | NK100/26R+IR90×100×26 |
| | 120 | 36 | 1 | 100 | 1.5 | 107 000 | 223 000 | 26 700 | 2 700 | 4 000 | NK100/36R+IR90×100×36 |
| | 125 | 35 | 1.1 | 105 | 1 | 116 000 | 252 000 | 29 800 | 2 500 | 3 800 | NA4918R |
| | 125 | 46 | 1.1 | 105 | 1 | 143 000 | 310 000 | 37 000 | 2 500 | 3 800 | NA5918 |
| | 125 | 63 | 1.1 | 105 | 1 | 175 000 | 425 000 | 50 500 | 2 500 | 3 800 | NA6918R |
| 95 | 125 | 26 | 1 | 105 | 1.5 | 76 500 | 147 000 | 17 300 | 2 500 | 3 800 | NK105/26R+IR95×105×26 |
| | 125 | 36 | 1 | 105 | 1.5 | 111 000 | 238 000 | 28 100 | 2 500 | 3 800 | NK105/36R+IR95×105×36 |
| | 130 | 35 | 1.1 | 110 | 1 | 118 000 | 260 000 | 30 500 | 2 400 | 3 600 | NA4919R |
| | 130 | 46 | 1.1 | 110 | 1 | 149 000 | 335 000 | 39 000 | 2 400 | 3 600 | NA5919 |
| | 130 | 63 | 1.1 | 110 | 1 | 177 000 | 440 000 | 51 000 | 2 400 | 3 600 | NA6919R |
| 100 | 130 | 30 | 1.1 | 110 | 1.5 | 97 500 | 204 000 | 23 800 | 2 400 | 3 600 | NK110/30R+IR100×110×30 |
| | 130 | 40 | 1.1 | 110 | 2 | 129 000 | 292 000 | 34 000 | 2 400 | 3 600 | NK110/40R+IR100×110×40 |
| | 140 | 40 | 1.1 | 115 | 2 | 127 000 | 260 000 | 29 900 | 2 300 | 3 500 | NA4920 |
| | 140 | 54 | 1.1 | 115 | 2 | 182 000 | 395 000 | 45 500 | 2 300 | 3 500 | NA5920 |
| 110 | 140 | 30 | 1 | 120 | 0.8 | 95 000 | 214 000 | 24 400 | 2 200 | 3 300 | NA4822 |
| | 140 | 40 | 1.1 | 120 | — | 114 000 | 271 000 | 31 000 | 2 200 | 3 300 | NK120/40+IR110×120×40 |
| | 150 | 40 | 1.1 | 125 | 2 | 131 000 | 279 000 | 31 500 | 2 100 | 3 200 | NA4922 |
| | 150 | 54 | 1.1 | 125 | 2 | 193 000 | 440 000 | 49 500 | 2 100 | 3 200 | NA5922 |
| 120 | 150 | 30 | 1 | 130 | 0.8 | 101 000 | 237 000 | 26 400 | 2 100 | 3 100 | NA4824 |
| | 150 | 40 | 1.1 | 130 | — | 117 000 | 287 000 | 32 000 | 2 100 | 3 100 | NK130/40+IR120×130×40 |
| | 165 | 45 | 1.1 | 135 | 2 | 180 000 | 380 000 | 41 500 | 2 000 | 3 000 | NA4924 |
| | 165 | 60 | 1.1 | 135 | 2 | 246 000 | 530 000 | 57 500 | 2 000 | 3 000 | NA5924 |
| 130 | 165 | 35 | 1.1 | 145 | 1 | 120 000 | 310 000 | 33 000 | 1 900 | 2 800 | NA4826 |
| | 170 | 32 | 1.5 | 145 | — | 111 000 | 238 000 | 25 600 | 1 900 | 2 800 | NK145/32+IR130×145×32 |
| | 170 | 42 | 1.5 | 145 | — | 153 000 | 360 000 | 38 500 | 1 900 | 2 800 | NK145/42+IR130×145×42 |
| | 180 | 50 | 1.5 | 150 | 1.5 | 202 000 | 455 000 | 48 000 | 1 800 | 2 700 | NA4926 |
| | 180 | 67 | 1.5 | 150 | 1.5 | 296 000 | 690 000 | 73 000 | 1 800 | 2 700 | NA5926 |

1) Smallest allowable dimension for chamfer dimension r.
2) Allowable axial movement amount of the inner ring with respect to the outer ring.
3) Largest allowable dimension for fillet radius r_a of housing and shaft.

Needle Roller Bearings



| d _a | Installation-related dimensions | | | Mass kg (approx.) |
|----------------|---------------------------------|-----|-------|-------------------------|
| | mm | mm | mm | |
| 91.5 | 113.5 | 1 | 1.24 | |
| 91.5 | 113.5 | 1 | 1.76 | |
| 91.5 | 104 | 1.1 | 2.25 | |
| 95 | 115 | 1 | 0.781 | |
| 95 | 115 | 1 | 1.09 | |
| 96.5 | 118.5 | 1 | 1.84 | |
| 96.5 | 118.5 | 1 | 2.44 | |
| 96.5 | 109 | 1.1 | 2.37 | |
| 100 | 120 | 1 | 0.819 | |
| 100 | 120 | 1 | 1.15 | |
| 101.5 | 123.5 | 1 | 1.36 | |
| 101.5 | 123.5 | 1 | 1.98 | |
| 101.5 | 123.5 | 1 | 2.63 | |
| 106.5 | 123.5 | 1 | 0.990 | |
| 106.5 | 123.5 | 1 | 1.34 | |
| 106.5 | 133.5 | 1 | 1.93 | |
| 106.5 | 133.5 | 1 | 2.85 | |
| 115 | 135 | 1 | 1.11 | |
| 116.5 | 133.5 | 1 | 1.49 | |
| 116.5 | 143.5 | 1 | 2.08 | |
| 116.5 | 143.5 | 1 | 2.98 | |
| 125 | 145 | 1 | 1.17 | |
| 126.5 | 143.5 | 1 | 1.57 | |
| 126.5 | 158.5 | 1 | 2.84 | |
| 126.5 | 158.5 | 1 | 3.92 | |
| 136.5 | 158.5 | 1 | 1.60 | |
| 138 | 162.5 | 1.5 | 1.90 | |
| 138 | 162.5 | 1.5 | 2.54 | |
| 138 | 172 | 1.5 | 3.90 | |
| 138 | 172 | 1.5 | 5.60 | |

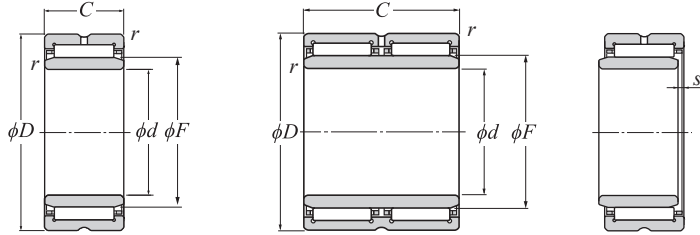
Note: The number of inner rings (IR) is composed of the IR bore diameter dimension × outside diameter dimension × width dimension.

Needle Roller Bearings



Machined-ring needle roller bearings with an inner ring

- NA48 type
- NA49 type
- NA59 type
- NA69 type
- NK+IR type



NA48 type
 NA49·R type, NA49 type
 NA59 type
 NK·R + IR type, NK + IR type
 NKS + IR type ($\phi d \geq 100$ mm)

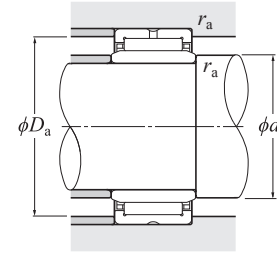
NA69·R type

d 140–280 mm

| d | Boundary dimensions | | | | | Basic load rating | | Fatigue load limit N C _u | Allowable speed | | Number |
|-----|---------------------|-----|----------------------------------|-----|-----------------|--------------------------------|--------------------------------|---|-------------------|-------|-----------------------|
| | D | C | r _{s min} ¹⁾ | F | s ²⁾ | dynamic N C _r | static N C _{0r} | | min ⁻¹ | | |
| 140 | 175 | 35 | 1.1 | 155 | 1 | 121 000 | 315 000 | 33 500 | 1 700 | 2 600 | NA4828 |
| | 180 | 32 | 1.5 | 155 | — | 114 000 | 252 000 | 26 500 | 1 700 | 2 600 | NK155/32+IR140×155×32 |
| | 180 | 42 | 1.5 | 155 | — | 156 000 | 380 000 | 40 000 | 1 700 | 2 600 | NK155/42+IR140×155×42 |
| | 190 | 50 | 1.5 | 160 | 1.5 | 209 000 | 485 000 | 50 500 | 1 700 | 2 500 | NA4928 |
| | 190 | 67 | 1.5 | 160 | 1.5 | 315 000 | 760 000 | 79 000 | 1 700 | 2 500 | NA5928 |
| 150 | 190 | 32 | 1.5 | 165 | — | 117 000 | 265 000 | 27 500 | 1 600 | 2 400 | NK165/32+IR150×165×32 |
| | 190 | 40 | 1.1 | 165 | 1.5 | 152 000 | 390 000 | 40 500 | 1 600 | 2 400 | NA4830 |
| | 190 | 42 | 1.5 | 165 | — | 160 000 | 400 000 | 41 000 | 1 600 | 2 400 | NK165/42+IR150×165×42 |
| | 210 | 60 | 2 | 170 | 1.5 | 261 000 | 610 000 | 62 500 | 1 600 | 2 400 | NA4930 |
| 160 | 200 | 40 | 1.1 | 175 | 1.5 | 160 000 | 425 000 | 43 500 | 1 500 | 2 300 | NA4832 |
| | 220 | 60 | 2 | 180 | 1.5 | 270 000 | 650 000 | 65 500 | 1 500 | 2 200 | NA4932 |
| 170 | 215 | 45 | 1.1 | 185 | 1.5 | 185 000 | 495 000 | 49 500 | 1 500 | 2 200 | NA4834 |
| | 230 | 60 | 2 | 190 | 1.5 | 279 000 | 690 000 | 68 500 | 1 400 | 2 100 | NA4934 |
| 180 | 225 | 45 | 1.1 | 195 | 1.5 | 195 000 | 540 000 | 53 500 | 1 400 | 2 100 | NA4836 |
| | 250 | 69 | 2 | 205 | 1.5 | 375 000 | 890 000 | 86 000 | 1 300 | 2 000 | NA4936 |
| 190 | 240 | 50 | 1.5 | 210 | 1.5 | 227 000 | 680 000 | 65 500 | 1 300 | 1 900 | NA4838 |
| | 260 | 69 | 2 | 215 | 1.5 | 390 000 | 945 000 | 90 500 | 1 300 | 1 900 | NA4938 |
| 200 | 250 | 50 | 1.5 | 220 | 1.5 | 231 000 | 705 000 | 67 000 | 1 200 | 1 800 | NA4840 |
| | 280 | 80 | 2.1 | 225 | 1.5 | 505 000 | 1 180 000 | 111 000 | 1 200 | 1 800 | NA4940 |
| 220 | 270 | 50 | 1.5 | 240 | 1.5 | 244 000 | 780 000 | 72 500 | 1 100 | 1 700 | NA4844 |
| | 300 | 80 | 2.1 | 245 | 1.5 | 525 000 | 1 270 000 | 116 000 | 1 100 | 1 600 | NA4944 |
| 240 | 300 | 60 | 2 | 265 | 2 | 365 000 | 1 090 000 | 98 500 | 1 000 | 1 500 | NA4848 |
| | 320 | 80 | 2.1 | 265 | 2 | 540 000 | 1 350 000 | 121 000 | 1 000 | 1 500 | NA4948 |
| 260 | 320 | 60 | 2 | 285 | 2 | 375 000 | 1 170 000 | 103 000 | 950 | 1 400 | NA4852 |
| | 360 | 100 | 2.1 | 290 | 2 | 810 000 | 1 920 000 | 166 000 | 950 | 1 400 | NA4952 |
| 280 | 350 | 69 | 2 | 305 | 2.5 | 455 000 | 1 300 000 | 112 000 | 850 | 1 300 | NA4856 |
| | 380 | 100 | 2.1 | 310 | 2.5 | 840 000 | 2 050 000 | 175 000 | 850 | 1 300 | NA4956 |

1) Smallest allowable dimension for chamfer dimension r.
 2) Allowable axial movement amount of the inner ring with respect to the outer ring.
 3) Largest allowable dimension for fillet radius r_a of housing and shaft.

Needle Roller Bearings



| d _a | Installation-related dimensions | | | Mass kg (approx.) |
|----------------|---------------------------------|-----|------|-------------------------|
| | mm | mm | mm | |
| 146.5 | 168.5 | 1 | 1.82 | |
| 148 | 172 | 1.5 | 2.04 | |
| 148 | 172 | 1.5 | 2.69 | |
| 148 | 182 | 1.5 | 4.05 | |
| 148 | 182 | 1.5 | 6.18 | |
| 158 | 182 | 1.5 | 2.32 | |
| 156.5 | 183.5 | 1 | 2.72 | |
| 158 | 182 | 1.5 | 2.84 | |
| 159 | 201 | 2 | 5.33 | |
| 166.5 | 193.5 | 1 | 2.90 | |
| 169 | 211 | 2 | 5.60 | |
| 176.5 | 208.5 | 1 | 3.99 | |
| 179 | 221 | 2 | 5.87 | |
| 186.5 | 218.5 | 1 | 4.19 | |
| 189 | 241 | 2 | 8.58 | |
| 198 | 232 | 1.5 | 5.62 | |
| 199 | 251 | 2 | 8.68 | |
| 208 | 242 | 1.5 | 5.84 | |
| 211 | 269 | 2 | 12.2 | |
| 228 | 262 | 1.5 | 6.37 | |
| 231 | 289 | 2 | 13.5 | |
| 249 | 291 | 2 | 10.0 | |
| 251 | 309 | 2 | 14.7 | |
| 269 | 311 | 2 | 10.8 | |
| 271 | 349 | 2 | 25.9 | |
| 289 | 341 | 2 | 15.5 | |
| 291 | 369 | 2 | 27.5 | |

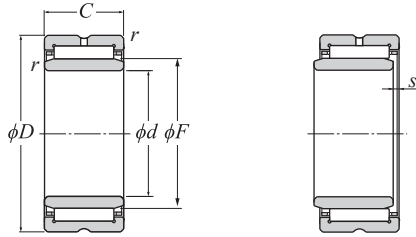
Note: The number of inner rings (IR) is composed of the IR bore diameter dimension × outside diameter dimension × width dimension.

Needle Roller Bearings

NTN

Machined-ring needle roller bearings with an inner ring

NA48 type
NA49 type
NA59 type
NK+IR type



d 300–440 mm

| d | Boundary dimensions | | | | | Basic load rating | | Fatigue load limit N C _u | Allowable speed | | Number |
|-----|---------------------|-----|----------------------------------|-----|-----------------|--------------------------------|--------------------------------|---|--|--------------------|--------|
| | D | C | r _{s min} ¹⁾ | F | s ²⁾ | dynamic N C _r | static N C _{0r} | | min ⁻¹ Grease lubrication | Oil lubrication | |
| 300 | 380 | 80 | 2.1 | 330 | 2 | 625 000 | 1 770 000 | 149 000 | 800 | 1 200 | NA4860 |
| | 420 | 118 | 3 | 340 | 2 | 1 080 000 | 2 640 000 | 219 000 | 800 | 1 200 | NA4960 |
| 320 | 400 | 80 | 2.1 | 350 | 2 | 640 000 | 1 850 000 | 153 000 | 750 | 1 100 | NA4864 |
| | 440 | 118 | 3 | 360 | 2 | 1 120 000 | 2 820 000 | 230 000 | 750 | 1 100 | NA4964 |
| 340 | 420 | 80 | 2.1 | 370 | 2 | 655 000 | 1 940 000 | 158 000 | 750 | 1 100 | NA4868 |
| | 460 | 118 | 3 | 380 | 2 | 1 160 000 | 3 000 000 | 242 000 | 750 | 1 100 | NA4968 |
| 360 | 440 | 80 | 2.1 | 390 | 2 | 665 000 | 2 020 000 | 162 000 | 650 | 1 000 | NA4872 |
| | 480 | 118 | 3 | 400 | 2 | 1 200 000 | 3 200 000 | 253 000 | 650 | 1 000 | NA4972 |
| 380 | 480 | 100 | 2.1 | 415 | 2 | 1 000 000 | 2 840 000 | 223 000 | 650 | 950 | NA4876 |
| | 520 | 140 | 4 | 430 | 2 | 1 400 000 | 3 750 000 | 292 000 | 650 | 950 | NA4976 |
| 400 | 540 | 140 | 4 | 450 | 2.5 | 1 450 000 | 4 000 000 | 305 000 | 600 | 900 | NA4980 |
| 420 | 560 | 140 | 4 | 470 | 2.5 | 1 500 000 | 4 250 000 | 320 000 | 550 | 850 | NA4984 |
| 440 | 600 | 160 | 4 | 490 | 2.5 | 1 750 000 | 4 600 000 | 340 000 | 550 | 800 | NA4988 |

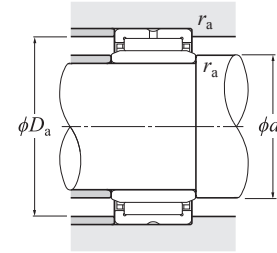
1) Smallest allowable dimension for chamfer dimension r.

2) Allowable axial movement amount of the inner ring with respect to the outer ring.

3) Largest allowable dimension for fillet radius r_a of housing and shaft.

Needle Roller Bearings

NTN



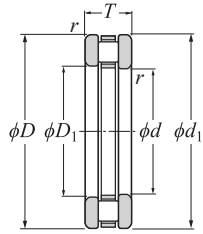
| Installation-related dimensions | | | Mass kg (approx.) |
|---------------------------------|------------------------|---------------------------------------|-------------------------|
| d _a Min. | D _a Max. | r _{as} ³⁾ Max. | |
| 311 | 369 | 2 | 22.0 |
| 313 | 407 | 2.5 | 42.5 |
| 331 | 389 | 2 | 23.2 |
| 333 | 427 | 2.5 | 45.2 |
| 351 | 409 | 2 | 24.1 |
| 353 | 447 | 2.5 | 47.3 |
| 371 | 429 | 2 | 25.7 |
| 373 | 467 | 2.5 | 49.0 |
| 391 | 469 | 2 | 44.5 |
| 396 | 504 | 3 | 73.6 |
| 416 | 524 | 3 | 76.6 |
| 436 | 544 | 3 | 89.8 |
| 456 | 584 | 3 | 123 |

Note: The number of inner rings (IR) is composed of the IR bore diameter dimension × outside diameter dimension × width dimension.

Needle Roller Bearings

Thrust cylindrical roller bearings

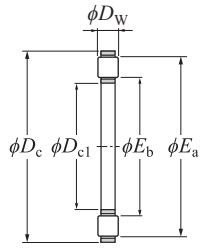
811 type
812 type
893 type



811 type
812 type
(Bearing)



893 type
(Bearing)



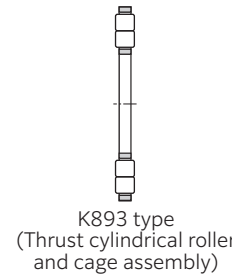
K811 type, K812 type
(Thrust cylindrical roller
and cage assembly)

d 10–60 mm

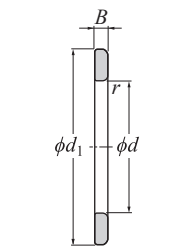
| d | Boundary dimensions | | | | | | | | | Basic load rating | | Fatigue load limit N C _u | Allowable speed | |
|----|---------------------|----------------|----------------|----|--|-----------------------|-------------------------------|----------|----------------------------------|---------------------------|--------------------------------|---|-----------------------------|--------------------|
| | D | d ₁ | D ₁ | T | mm D _{c1} ²⁾ E11 | D _c a13 | D _w 0 -0.010 | B h11 | r _{s min} ¹⁾ | dynamic C _a | static N C _{0a} | | Grease min ⁻¹ | Oil lubrication |
| 10 | 24 | 24 | 10 | 9 | 10 | 24 | 3.5 | 2.75 | 0.3 | 10 300 | 20 100 | 2 450 | 3 400 | 13 000 |
| 12 | 26 | 26 | 12 | 9 | 12 | 26 | 3.5 | 2.75 | 0.3 | 10 900 | 22 300 | 2 720 | 3 000 | 12 000 |
| 15 | 28 | 28 | 16 | 9 | 15 | 28 | 3.5 | 2.75 | 0.3 | 12 200 | 26 800 | 3 250 | 2 800 | 11 000 |
| 17 | 30 | 30 | 18 | 9 | 17 | 30 | 3.5 | 2.75 | 0.3 | 12 700 | 29 000 | 3 550 | 2 500 | 10 000 |
| 20 | 35 | 35 | 21 | 10 | 20 | 35 | 4.5 | 2.75 | 0.3 | 20 200 | 46 500 | 5 650 | 2 100 | 8 500 |
| 25 | 42 | 42 | 26 | 11 | 25 | 42 | 5 | 3 | 0.6 | 27 300 | 68 000 | 8 250 | 1 800 | 7 000 |
| 30 | 47 | 47 | 32 | 11 | 30 | 47 | 5 | 3 | 0.6 | 27 800 | 72 500 | 8 850 | 1 500 | 6 000 |
| | 52 | 52 | 32 | 16 | 30 | 52 | 7.5 | 4.25 | 0.6 | 53 000 | 129 000 | 15 700 | 1 500 | 6 000 |
| | 60 | 60 | 32 | 18 | 30 | 60 | 5.5 | 6.25 | 1 | 54 000 | 166 000 | 20 200 | 1 300 | 5 000 |
| 35 | 52 | 52 | 37 | 12 | 35 | 52 | 5 | 3.5 | 0.6 | 31 000 | 87 000 | 10 600 | 1 400 | 5 500 |
| | 62 | 62 | 37 | 18 | 35 | 62 | 7.5 | 5.25 | 1 | 54 500 | 139 000 | 17 000 | 1 200 | 4 900 |
| | 68 | 68 | 37 | 20 | 35 | 68 | 6 | 7 | 1 | 66 500 | 214 000 | 26 100 | 1 200 | 4 600 |
| 40 | 60 | 60 | 42 | 13 | 40 | 60 | 6 | 3.5 | 0.6 | 43 000 | 121 000 | 14 800 | 1 200 | 4 800 |
| | 68 | 68 | 42 | 19 | 40 | 68 | 9 | 5 | 1 | 74 500 | 190 000 | 23 200 | 1 100 | 4 400 |
| | 78 | 78 | 42 | 22 | 40 | 78 | 7 | 7.5 | 1 | 85 000 | 277 000 | 34 000 | 1 000 | 4 000 |
| 45 | 65 | 65 | 47 | 14 | 45 | 65 | 6 | 4 | 0.6 | 45 500 | 135 000 | 16 500 | 1 100 | 4 400 |
| | 73 | 73 | 47 | 20 | 45 | 73 | 9 | 5.5 | 1 | 82 000 | 222 000 | 27 000 | 1 000 | 4 100 |
| | 85 | 85 | 47 | 24 | 45 | 85 | 7.5 | 8.25 | 1 | 102 000 | 345 000 | 42 000 | 900 | 3 600 |
| 50 | 70 | 70 | 52 | 14 | 50 | 70 | 6 | 4 | 0.6 | 48 500 | 150 000 | 18 300 | 1 000 | 4 000 |
| | 78 | 78 | 52 | 22 | 50 | 78 | 9 | 6.5 | 1 | 85 000 | 238 000 | 29 000 | 950 | 3 800 |
| | 95 | 95 | 52 | 27 | 50 | 95 | 8 | 9.5 | 1.1 | 125 000 | 445 000 | 54 000 | 800 | 3 200 |
| 55 | 78 | 78 | 57 | 16 | 55 | 78 | 6 | 5 | 0.6 | 62 500 | 215 000 | 26 200 | 900 | 3 600 |
| | 90 | 90 | 57 | 25 | 55 | 90 | 11 | 7 | 1 | 121 000 | 340 000 | 41 500 | 830 | 3 300 |
| | 105 | 105 | 57 | 30 | 55 | 105 | 9 | 10.5 | 1.1 | 158 000 | 570 000 | 69 500 | 730 | 2 900 |
| 60 | 85 | 85 | 62 | 17 | 60 | 85 | 7.5 | 4.75 | 1 | 69 000 | 215 000 | 26 200 | 830 | 3 300 |
| | 95 | 95 | 62 | 26 | 60 | 95 | 11 | 7.5 | 1 | 126 000 | 365 000 | 44 500 | 780 | 3 100 |
| | 110 | 110 | 62 | 30 | 60 | 110 | 9 | 10.5 | 1.1 | 162 000 | 600 000 | 73 500 | 680 | 2 700 |

1) Smallest allowable dimension for chamfer dimension r.
2) The tolerance of bearings with suffix code T2 is E12.

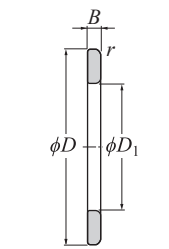
Needle Roller Bearings



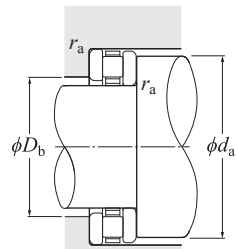
K893 type
(Thrust cylindrical roller
and cage assembly)



WS type raceway
(Inner ring)



GS type raceway
(Outer ring)

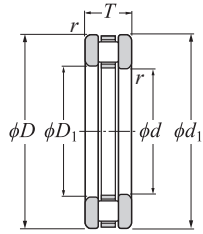


| Number | Approx. dimension mm | Installation-related dimensions | | | Mass | | | | |
|---------|-------------------------|---------------------------------|----------------|-----------------|--------------|--------------|----------------|---|--------|
| | | d _a | D _b | r _{as} | kg (approx.) | | | | |
| Bearing | E _b | E _a | Min. | Max. | 811 | K811 K893 | WS811 WS893 | GS811 GS812 GS811 GS812 GS893 | |
| 81100T2 | 13.5 | 21.3 | 21 | 14 | 0.3 | 0.020 | 0.0035 | 0.0081 | 0.0081 |
| 81101T2 | 15.5 | 23.3 | 23 | 16 | 0.3 | 0.022 | 0.0040 | 0.0090 | 0.0090 |
| 81102T2 | 17.2 | 25 | 25 | 18 | 0.3 | 0.024 | 0.0060 | 0.0095 | 0.0090 |
| 81103T2 | 19.2 | 27 | 27 | 20 | 0.3 | 0.028 | 0.0080 | 0.010 | 0.010 |
| 81104T2 | 22.4 | 32.3 | 32 | 23 | 0.3 | 0.039 | 0.012 | 0.014 | 0.013 |
| 81105T2 | 27.6 | 38.7 | 39 | 28 | 0.6 | 0.059 | 0.018 | 0.021 | 0.020 |
| 81106T2 | 33.1 | 43.9 | 44 | 33 | 0.6 | 0.066 | 0.020 | 0.024 | 0.022 |
| 81206T2 | 32.8 | 49 | 48 | 33 | 0.6 | 0.141 | 0.050 | 0.047 | 0.044 |
| 89306 | 34 | 56.4 | 56 | 34 | 1 | 0.249 | 0.046 | 0.104 | 0.099 |
| 81107T2 | 38 | 48.9 | 49 | 38 | 0.6 | 0.085 | 0.024 | 0.032 | 0.029 |
| 81207T2 | 39.8 | 56 | 56 | 41 | 1 | 0.230 | 0.065 | 0.085 | 0.080 |
| 89307 | 40 | 64.4 | 64 | 40 | 1 | 0.351 | 0.064 | 0.147 | 0.140 |
| 81108T2 | 43.2 | 56.4 | 56 | 44 | 0.6 | 0.118 | 0.035 | 0.043 | 0.040 |
| 81208T2 | 43.7 | 62.9 | 63 | 44 | 1 | 0.266 | 0.085 | 0.093 | 0.088 |
| 89308 | 46 | 74.4 | 74 | 46 | 1 | 0.507 | 0.100 | 0.207 | 0.200 |
| 81109T2 | 48.4 | 61.6 | 61 | 49 | 0.6 | 0.144 | 0.040 | 0.054 | 0.050 |
| 81209T2 | 48.8 | 68 | 68 | 49 | 1 | 0.318 | 0.100 | 0.112 | 0.106 |
| 89309 | 50.9 | 81.3 | 81 | 51 | 1 | 0.660 | 0.140 | 0.264 | 0.255 |
| 81110T2 | 53.2 | 66.4 | 66 | 54 | 0.6 | 0.158 | 0.045 | 0.059 | 0.054 |
| 81210T2 | 53.7 | 73.1 | 73 | 54 | 1 | 0.384 | 0.105 | 0.144 | 0.135 |
| 89310 | 58 | 90.4 | 90 | 58 | 1 | 0.932 | 0.180 | 0.382 | 0.370 |
| 81111T2 | 57.8 | 75.2 | 75 | 58 | 0.6 | 0.242 | 0.060 | 0.094 | 0.087 |
| 81211T2 | 60.1 | 83.4 | 83 | 61 | 1 | 0.618 | 0.190 | 0.219 | 0.209 |
| 89311 | 63.9 | 100.3 | 100 | 64 | 1 | 1.26 | 0.240 | 0.518 | 0.503 |
| 81112T2 | 63.7 | 80.1 | 80 | 65 | 1 | 0.288 | 0.083 | 0.106 | 0.099 |
| 81212T2 | 64.9 | 88.4 | 88 | 66 | 1 | 0.690 | 0.200 | 0.251 | 0.240 |
| 89312 | 68.9 | 105.3 | 105 | 69 | 1 | 1.33 | 0.250 | 0.550 | 0.534 |

Needle Roller Bearings

Thrust cylindrical roller bearings

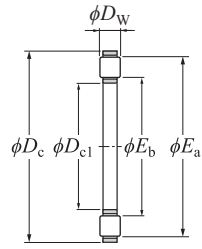
811 type
812 type
893 type



811 type
812 type
(Bearing)



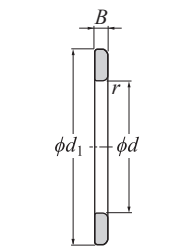
893 type
(Bearing)



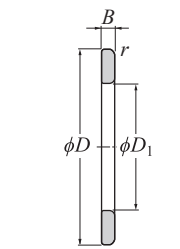
K811 type, K812 type
(Thrust cylindrical roller
and cage assembly)

Needle Roller Bearings

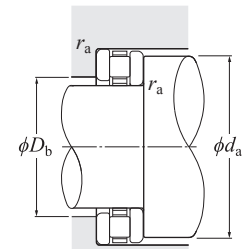
K893 type
(Thrust cylindrical roller
and cage assembly)



WS type raceway
(Inner ring)



GS type raceway
(Outer ring)



d 65–130 mm

| d | Boundary dimensions | | | | | | | | | | Basic load rating | | Fatigue load limit N C _u | Allowable speed | |
|-----|---------------------|----------------|----------------|----|--|-----------------------|-------------------------------|----------|----------------------------------|---------------------------|--------------------------------|-----------------------------|---|--------------------|--|
| | D | d ₁ | D ₁ | T | mm D _{c1} ²⁾ E11 | D _c a13 | D _w 0 -0.010 | B h11 | r _{s min} ¹⁾ | dynamic C _a | static N C _{0a} | Grease min ⁻¹ | | Oil lubrication | |
| 65 | 90 | 90 | 67 | 18 | 65 | 90 | 7.5 | 5.25 | 1 | 73 000 | 236 000 | 28 800 | 780 | 3 100 | |
| | 100 | 100 | 67 | 27 | 65 | 100 | 11 | 8 | 1 | 130 000 | 385 000 | 47 000 | 730 | 2 900 | |
| | 115 | 115 | 67 | 30 | 65 | 115 | 9 | 10.5 | 1.1 | 167 000 | 635 000 | 77 500 | 650 | 2 600 | |
| 70 | 95 | 95 | 72 | 18 | 70 | 95 | 7.5 | 5.25 | 1 | 76 500 | 257 000 | 31 500 | 730 | 2 900 | |
| | 105 | 105 | 72 | 27 | 70 | 105 | 11 | 8 | 1 | 134 000 | 410 000 | 50 000 | 680 | 2 700 | |
| | 125 | 125 | 72 | 34 | 70 | 125 | 10 | 12 | 1.1 | 205 000 | 790 000 | 96 500 | 600 | 2 400 | |
| 75 | 100 | 100 | 77 | 19 | 75 | 100 | 7.5 | 5.75 | 1 | 78 000 | 268 000 | 32 500 | 680 | 2 700 | |
| | 110 | 110 | 77 | 27 | 75 | 110 | 11 | 8 | 1 | 138 000 | 435 000 | 53 000 | 650 | 2 600 | |
| | 135 | 135 | 77 | 36 | 75 | 135 | 11 | 12.5 | 1.5 | 239 000 | 920 000 | 110 000 | 550 | 2 200 | |
| 80 | 105 | 105 | 82 | 19 | 80 | 105 | 7.5 | 5.75 | 1 | 79 500 | 279 000 | 34 000 | 650 | 2 600 | |
| | 115 | 115 | 82 | 28 | 80 | 115 | 11 | 8.5 | 1 | 143 000 | 460 000 | 56 000 | 630 | 2 500 | |
| | 140 | 140 | 82 | 36 | 80 | 140 | 11 | 12.5 | 1.5 | 246 000 | 970 000 | 114 000 | 530 | 2 100 | |
| 85 | 110 | 110 | 87 | 19 | 85 | 110 | 7.5 | 5.75 | 1 | 83 000 | 300 000 | 36 500 | 630 | 2 500 | |
| | 125 | 125 | 88 | 31 | 85 | 125 | 12 | 9.5 | 1 | 169 000 | 550 000 | 66 500 | 580 | 2 300 | |
| | 150 | 150 | 88 | 39 | 85 | 150 | 12 | 13.5 | 1.5 | 281 000 | 1 100 000 | 128 000 | 500 | 2 000 | |
| 90 | 120 | 120 | 92 | 22 | 90 | 120 | 9 | 6.5 | 1 | 112 000 | 395 000 | 47 500 | 580 | 2 300 | |
| | 135 | 135 | 93 | 35 | 90 | 135 | 14 | 10.5 | 1.1 | 213 000 | 680 000 | 80 000 | 530 | 2 100 | |
| | 155 | 155 | 93 | 39 | 90 | 155 | 12 | 13.5 | 1.5 | 289 000 | 1 160 000 | 132 000 | 480 | 1 900 | |
| 100 | 135 | 135 | 102 | 25 | 100 | 135 | 11 | 7 | 1 | 158 000 | 555 000 | 65 000 | 500 | 2 000 | |
| | 150 | 150 | 103 | 38 | 100 | 150 | 15 | 11.5 | 1.1 | 243 000 | 795 000 | 91 000 | 480 | 1 900 | |
| | 170 | 170 | 103 | 42 | 100 | 170 | 13 | 14.5 | 1.5 | 335 000 | 1 370 000 | 153 000 | 430 | 1 700 | |
| 110 | 145 | 145 | 112 | 25 | 110 | 145 | 11 | 7 | 1 | 165 000 | 605 000 | 68 500 | 480 | 1 900 | |
| | 160 | 160 | 113 | 38 | 110 | 160 | 15 | 11.5 | 1.1 | 258 000 | 885 000 | 98 500 | 450 | 1 800 | |
| | 190 | 190 | 113 | 48 | 110 | 190 | 15 | 16.5 | 2 | 430 000 | 1 770 000 | 190 000 | 400 | 1 600 | |
| 120 | 155 | 155 | 122 | 25 | 120 | 155 | 11 | 7 | 1 | 172 000 | 655 000 | 72 500 | 450 | 1 800 | |
| | 170 | 170 | 123 | 39 | 120 | 170 | 15 | 12 | 1.1 | 264 000 | 930 000 | 101 000 | 430 | 1 700 | |
| 130 | 170 | 170 | 132 | 30 | 130 | 170 | 12 | 9 | 1 | 197 000 | 755 000 | 81 500 | 400 | 1 600 | |
| | 190 | 187 | 133 | 45 | 130 | 190 | 19 | 13 | 1.5 | 360 000 | 1 210 000 | 128 000 | 380 | 1 500 | |

1) Smallest allowable dimension for chamfer dimension r.
2) The tolerance of bearings with suffix code T2 is E12.

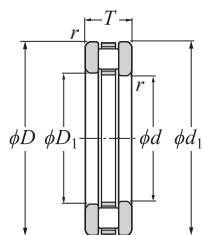
| Number | Approx. dimension mm | Installation-related dimensions | | | Mass | | | |
|---------|-------------------------|---------------------------------|----------------|-----------------|-------|--------------|-------|-------|
| | | d _a | D _b | r _{as} | 811 | kg (approx.) | | |
| Bearing | E _b | E _a | Min. | Max. | 811 | K811 | WS811 | GS811 |
| 81113T2 | 68.8 | 85.2 | 85 | 70 | 0.332 | 0.090 | 0.125 | 0.117 |
| 81213T2 | 69.9 | 93.3 | 93 | 71 | 0.772 | 0.215 | 0.285 | 0.272 |
| 89313 | 73.9 | 110.3 | 110 | 74 | 1.41 | 0.260 | 0.583 | 0.566 |
| 81114T2 | 73.7 | 90.1 | 90 | 74 | 0.355 | 0.097 | 0.134 | 0.124 |
| 81214T2 | 75 | 98.4 | 98 | 76 | 0.815 | 0.225 | 0.302 | 0.288 |
| 89314 | 79.8 | 120.2 | 120 | 80 | 1.91 | 0.340 | 0.793 | 0.772 |
| 81115T2 | 78.7 | 95.1 | 95 | 80 | 0.414 | 0.115 | 0.155 | 0.144 |
| 81215T2 | 80.1 | 103.7 | 103 | 81 | 0.864 | 0.240 | 0.319 | 0.304 |
| 89315 | 84.7 | 129.2 | 129 | 85 | 2.39 | 0.470 | 0.971 | 0.948 |
| 81116T2 | 83.7 | 100.1 | 100 | 85 | 0.435 | 0.119 | 0.164 | 0.152 |
| 81216T2 | 84.8 | 108.4 | 106 | 86 | 0.948 | 0.250 | 0.358 | 0.341 |
| 89316 | 89.8 | 134.2 | 134 | 90 | 2.50 | 0.490 | 1.02 | 0.992 |
| 81117T2 | 88.7 | 105.3 | 105 | 89 | 0.458 | 0.125 | 0.173 | 0.161 |
| 81217 | 92.2 | 116.9 | 116 | 92 | 1.25 | 0.300 | 0.492 | 0.462 |
| 89317 | 95.8 | 144.2 | 144 | 96 | 3.09 | 0.590 | 1.27 | 1.23 |
| 81118T2 | 94.7 | 114.3 | 114 | 95 | 0.660 | 0.170 | 0.252 | 0.238 |
| 81218J | 97.9 | 126.7 | 126 | 97 | 1.82 | 0.540 | 0.655 | 0.620 |
| 89318 | 100.8 | 149.2 | 149 | 101 | 3.23 | 0.620 | 1.33 | 1.28 |
| 81120T2 | 105.1 | 128.7 | 128 | 106 | 0.993 | 0.300 | 0.355 | 0.338 |
| 81220 | 109.2 | 140 | 139 | 109 | 2.35 | 0.620 | 0.886 | 0.843 |
| 89320 | 110.6 | 163 | 163 | 110 | 4.13 | 0.810 | 1.69 | 1.64 |
| 81122T2 | 115 | 138.8 | 138 | 116 | 1.08 | 0.325 | 0.385 | 0.366 |
| 81222 | 119.2 | 150 | 149 | 119 | 2.55 | 0.685 | 0.957 | 0.910 |
| 89322 | 122.5 | 183 | 183 | 122 | 5.96 | 1.15 | 2.44 | 2.37 |
| 81124T2 | 125 | 148.8 | 148 | 126 | 1.15 | 0.340 | 0.415 | 0.395 |
| 81224 | 129.2 | 160 | 159 | 129 | 2.82 | 0.730 | 1.07 | 1.02 |
| 81126 | 137.7 | 162.4 | 162 | 137 | 1.72 | 0.415 | 0.666 | 0.637 |
| 81226 | 140.1 | 179 | 178 | 140 | 4.06 | 1.14 | 1.45 | 1.48 |

Needle Roller Bearings

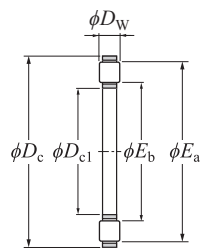


Thrust cylindrical roller bearings

811 type
812 type



811 type
812 type
(Bearing)

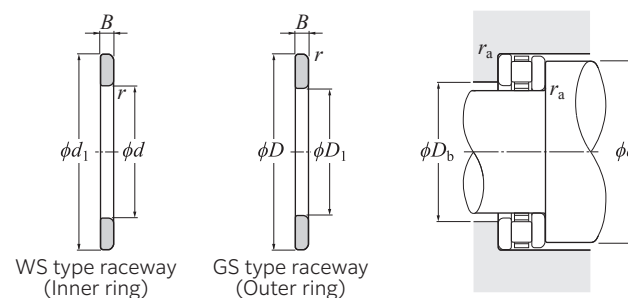


K811 type, K812 type
(Thrust cylindrical roller
and cage assembly)

d 140–160 mm

| d | Boundary dimensions | | | | | | | | | Basic load rating | | Fatigue load limit N C_u | Allowable speed | |
|-----|---------------------|----------------|----------------|--------|-----------------|----------------|----------------|----------------------------------|----------------|-------------------|--------------------|----------------------------------|-----------------|-------|
| | D | d ₁ | D ₁ | T | mm | | B | r _s min ¹⁾ | dynamic | static | min ⁻¹ | | | |
| | E11 | a13 | 0 | -0.010 | D _{c1} | D _c | D _w | h11 | C _a | C _{0a} | Grease lubrication | | Oil lubrication | |
| 140 | 180 | 178 | 142 | 31 | 140 | 180 | 12 | 9.5 | 1 | 206 000 | 815 000 | 86 000 | 380 | 1 500 |
| | 200 | 197 | 143 | 46 | 140 | 200 | 19 | 13.5 | 1.5 | 370 000 | 1 280 000 | 133 000 | 350 | 1 400 |
| 150 | 190 | 188 | 152 | 31 | 150 | 190 | 12 | 9.5 | 1 | 214 000 | 870 000 | 90 500 | 350 | 1 400 |
| 160 | 200 | 198 | 162 | 31 | 160 | 200 | 12 | 9.5 | 1 | 221 000 | 930 000 | 95 000 | 330 | 1 300 |

Needle Roller Bearings



| Bearing | Number | | | Approx. dimension mm | | Installation-related dimensions mm | | | Mass kg (approx.) | | | | |
|--------------|---|----------------|----------------|----------------------|----------------|------------------------------------|----------------|-----------------|-------------------|-------|-------|-------|-------|
| | Thrust cylindrical roller and cage assembly | Inner ring | Outer ring | E _b | E _a | d _a | D _b | r _{as} | 811 | K811 | WS811 | GS811 | |
| | | | | Min. | Max. | Min. | Max. | Max. | K812 | WS812 | GS812 | K893 | WS893 |
| 81128 | K81128 | WS81128 | GS81128 | 147.8 | 172.5 | 172 | 147 | 1 | 1.87 | 0.450 | 0.708 | 0.717 | |
| 81228 | K81228 | WS81228 | GS81228 | 150.1 | 189 | 188 | 150 | 1.5 | 4.43 | 1.20 | 1.60 | 1.63 | |
| 81130 | K81130 | WS81130 | GS81130 | 157.7 | 182.4 | 182 | 157 | 1 | 1.98 | 0.470 | 0.752 | 0.761 | |
| 81132 | K81132 | WS81132 | GS81132 | 167.8 | 192.5 | 192 | 167 | 1 | 2.10 | 0.500 | 0.797 | 0.806 | |

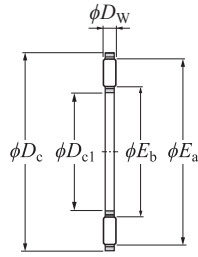
1) Smallest allowable dimension for chamfer dimension r.

Needle Roller Bearings

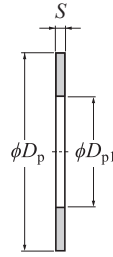


Thrust needle roller bearings

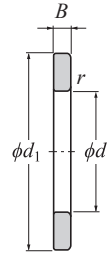
AXK11 type
AS11 type
WS811 type
GS811 type



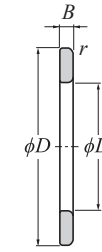
AXK type
(Thrust needle roller
and cage assembly)



AS type raceway
(Washer)



WS type raceway
(Inner ring)



GS type raceway
(Outer ring)

D_{c1} 10–140 mm

| Boundary dimensions | | | | | | | | | | | | Basic load rating | | Fatigue load limit N C_u | |
|---------------------|--------------|----------------------|--------------|-----------------|---------------------|-----|-------|-----|-------|-------------------------|-----------------------|--------------------|---------|----------------------------------|---------|
| D_{c1} E11 | D_c c12 | D_w 0 -0.010 | D_p e13 | D_{p1} E12 | S^2 ± 0.05 | mm | | | | r_s min ¹⁾ | dynamic N C_a | static C_{0a} | | | |
| | | | | | | d | d_1 | D | D_1 | B | | | | | |
| 10 | 24 | 2 | 24 | 10 | 1 | 10 | 24 | 24 | 10 | 2.75 | 0 -0.060 | 0.3 | 9 150 | 25 300 | 3 100 |
| 12 | 26 | 2 | 26 | 12 | 1 | 12 | 26 | 26 | 12 | 2.75 | 0 -0.060 | 0.3 | 9 850 | 28 900 | 3 500 |
| 15 | 28 | 2 | 28 | 15 | 1 | 15 | 28 | 28 | 16 | 2.75 | 0 -0.060 | 0.3 | 11 300 | 36 000 | 4 400 |
| 17 | 30 | 2 | 30 | 17 | 1 | 17 | 30 | 30 | 18 | 2.75 | 0 -0.060 | 0.3 | 11 900 | 39 500 | 4 800 |
| 20 | 35 | 2 | 35 | 20 | 1 | 20 | 35 | 35 | 21 | 2.75 | 0 -0.060 | 0.3 | 13 200 | 46 500 | 5 650 |
| 25 | 42 | 2 | 42 | 25 | 1 | 25 | 42 | 42 | 26 | 3 | 0 -0.060 | 0.6 | 14 600 | 58 000 | 7 050 |
| 30 | 47 | 2 | 47 | 30 | 1 | 30 | 47 | 47 | 32 | 3 | 0 -0.060 | 0.6 | 16 300 | 69 500 | 8 500 |
| 35 | 52 | 2 | 52 | 35 | 1 | 35 | 52 | 52 | 37 | 3.5 | 0 -0.075 | 0.6 | 17 800 | 81 500 | 9 900 |
| 40 | 60 | 3 | 60 | 40 | 1 | 40 | 60 | 60 | 42 | 3.5 | 0 -0.075 | 0.6 | 27 400 | 110 000 | 13 500 |
| 45 | 65 | 3 | 65 | 45 | 1 | 45 | 65 | 65 | 47 | 4 | 0 -0.075 | 0.6 | 29 800 | 128 000 | 15 600 |
| 50 | 70 | 3 | 70 | 50 | 1 | 50 | 70 | 70 | 52 | 4 | 0 -0.075 | 0.6 | 31 500 | 143 000 | 17 400 |
| 55 | 78 | 3 | 78 | 55 | 1 | 55 | 78 | 78 | 57 | 5 | 0 -0.075 | 0.6 | 38 000 | 186 000 | 22 700 |
| 60 | 85 | 3 | 85 | 60 | 1 | 60 | 85 | 85 | 62 | 4.75 | 0 -0.075 | 1 | 44 500 | 234 000 | 28 600 |
| 65 | 90 | 3 | 90 | 65 | 1 | 65 | 90 | 90 | 67 | 5.25 | 0 -0.075 | 1 | 46 500 | 254 000 | 31 000 |
| 70 | 95 | 4 | 95 | 70 | 1 | 70 | 95 | 95 | 72 | 5.25 | 0 -0.075 | 1 | 53 500 | 253 000 | 31 000 |
| 75 | 100 | 4 | 100 | 75 | 1 | 75 | 100 | 100 | 77 | 5.75 | 0 -0.075 | 1 | 55 000 | 266 000 | 32 500 |
| 80 | 105 | 4 | 105 | 80 | 1 | 80 | 105 | 105 | 82 | 5.75 | 0 -0.075 | 1 | 56 500 | 279 000 | 34 000 |
| 85 | 110 | 4 | 110 | 85 | 1 | 85 | 110 | 110 | 87 | 5.75 | 0 -0.075 | 1 | 57 500 | 291 000 | 35 500 |
| 90 | 120 | 4 | 120 | 90 | 1 | 90 | 120 | 120 | 92 | 6.5 | 0 -0.090 | 1 | 70 500 | 390 000 | 46 500 |
| 100 | 135 | 4 | 135 | 100 | 1 | 100 | 135 | 135 | 102 | 7 | 0 -0.090 | 1 | 90 000 | 550 000 | 64 000 |
| 110 | 145 | 4 | 145 | 110 | 1 | 110 | 145 | 145 | 112 | 7 | 0 -0.090 | 1 | 93 500 | 590 000 | 67 000 |
| 120 | 155 | 4 | 155 | 120 | 1 | 120 | 155 | 155 | 122 | 7 | 0 -0.090 | 1 | 99 000 | 650 000 | 72 000 |
| 130 | 170 | 5 | 170 | 130 | 1 | 130 | 170 | 170 | 132 | 9 | 0 -0.090 | 1 | 140 000 | 900 000 | 97 000 |
| 140 | 180 | 5 | 180 | 140 | 1 | 140 | 178 | 180 | 142 | 9.5 | 0 -0.090 | 1 | 145 000 | 960 000 | 102 000 |

1) Smallest allowable dimension for chamfer dimension r .
2) The measured load is 2.04 N or above.

Needle Roller Bearings

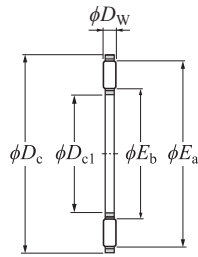


| Allowable speed min^{-1} Grease lubrication Oil lubrication | Number | | | | Approx. dimension mm | | Mass kg (approx.) | | | | |
|---|--|----------------|---------------|----------------|-------------------------|-------|----------------------|--------|-------------------------|-------------------------|--------|
| | Thrust needle roller and cage assembly | Washer | Inner ring | Outer ring | E_b | E_a | AXK11 | AS11 | WS811 WS812 WS893 | GS811 GS812 GS893 | |
| 3 500 | 14 000 | AXK1100 | AS1100 | WS81100 | GS81100 | 12.3 | 21.7 | 0.0028 | 0.0029 | 0.0081 | 0.0081 |
| 3 300 | 13 000 | AXK1101 | AS1101 | WS81101 | GS81101 | 14.3 | 23.7 | 0.0030 | 0.0033 | 0.0090 | 0.0090 |
| 2 800 | 11 000 | AXK1102 | AS1102 | WS81102 | GS81102 | 17.2 | 26.5 | 0.0035 | 0.0034 | 0.0095 | 0.0090 |
| 2 500 | 10 000 | AXK1103 | AS1103 | WS81103 | GS81103 | 19.2 | 28.5 | 0.0040 | 0.0038 | 0.010 | 0.010 |
| 2 100 | 8 500 | AXK1104 | AS1104 | WS81104 | GS81104 | 21.3 | 31.3 | 0.0050 | 0.0051 | 0.014 | 0.013 |
| 1 800 | 7 000 | AXK1105 | AS1105 | WS81105 | GS81105 | 29.5 | 39.4 | 0.0070 | 0.0070 | 0.021 | 0.020 |
| 1 500 | 6 000 | AXK1106 | AS1106 | WS81106 | GS81106 | 34.5 | 44.4 | 0.0080 | 0.0081 | 0.024 | 0.022 |
| 1 400 | 5 500 | AXK1107 | AS1107 | WS81107 | GS81107 | 39.5 | 49.4 | 0.010 | 0.0091 | 0.032 | 0.029 |
| 1 200 | 4 700 | AXK1108 | AS1108 | WS81108 | GS81108 | 44.2 | 56.2 | 0.019 | 0.012 | 0.043 | 0.040 |
| 1 100 | 4 300 | AXK1109 | AS1109 | WS81109 | GS81109 | 50.5 | 62.4 | 0.021 | 0.014 | 0.054 | 0.050 |
| 1 000 | 3 900 | AXK1110 | AS1110 | WS81110 | GS81110 | 55.5 | 67.4 | 0.024 | 0.015 | 0.059 | 0.054 |
| 900 | 3 500 | AXK1111 | AS1111 | WS81111 | GS81111 | 61.0 | 74.9 | 0.031 | 0.019 | 0.094 | 0.087 |
| 800 | 3 200 | AXK1112 | AS1112 | WS81112 | GS81112 | 66.0 | 81.9 | 0.039 | 0.022 | 0.106 | 0.099 |
| 750 | 3 000 | AXK1113 | AS1113 | WS81113 | GS81113 | 71.0 | 86.9 | 0.040 | 0.024 | 0.125 | 0.117 |
| 750 | 2 900 | AXK1114 | AS1114 | WS81114 | GS81114 | 75.5 | 91.4 | 0.060 | 0.025 | 0.134 | 0.124 |
| 700 | 2 700 | AXK1115 | AS1115 | WS81115 | GS81115 | 80.5 | 96.4 | 0.061 | 0.027 | 0.155 | 0.144 |
| 650 | 2 600 | AXK1116 | AS1116 | WS81116 | GS81116 | 84.4 | 100.3 | 0.063 | 0.029 | 0.164 | 0.152 |
| 600 | 2 400 | AXK1117 | AS1117 | WS81117 | GS81117 | 90.5 | 106.4 | 0.067 | 0.030 | 0.173 | 0.161 |
| 600 | 2 300 | AXK1118 | AS1118 | WS81118 | GS81118 | 96.5 | 116.4 | 0.086 | 0.039 | 0.252 | 0.238 |
| 500 | 2 000 | AXK1120 | AS1120 | WS81120 | GS81120 | 107.5 | 131.4 | 0.112 | 0.051 | 0.355 | 0.338 |
| 480 | 1 900 | AXK1122 | AS1122 | WS81122 | GS81122 | 115.5 | 139.4 | 0.122 | 0.055 | 0.385 | 0.366 |
| 430 | 1 700 | AXK1124 | AS1124 | WS81124 | GS81124 | 125.5 | 149.4 | 0.131 | 0.059 | 0.415 | 0.395 |
| 400 | 1 600 | AXK1126 | AS1126 | WS81126 | GS81126 | 136.0 | 164.0 | 0.205 | 0.074 | 0.666 | 0.637 |
| 380 | 1 500 | AXK1128 | AS1128 | WS81128 | GS81128 | 146.0 | 174.0 | 0.219 | 0.079 | 0.708 | 0.717 |

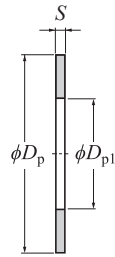
Needle Roller Bearings

Thrust needle roller bearings

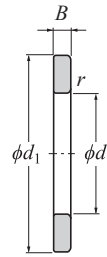
- AXK11 type
- AS11 type
- WS811 type
- GS811 type



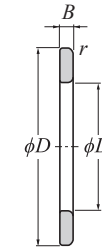
AXK type
(Thrust needle roller
and cage assembly)



AS type raceway
(Washer)



WS type raceway
(Inner ring)



GS type raceway
(Outer ring)

D_{c1} 150–160 mm

| Boundary dimensions | | | | | | | | | | | | Basic load rating | | Fatigue load limit | |
|---------------------|--------------|----------------------|--------------|-----------------|------------------------|-----|-------|-----|-------|-----|-------------------|-------------------|----------|--------------------|---------|
| D_{c1} E11 | D_c c12 | D_w 0 -0.010 | D_p e13 | D_{p1} E12 | $S^{2)}$ ± 0.05 | mm | | | | B | $r_{s \min}^{1)}$ | dynamic | static | N | |
| | | | | | | d | d_1 | D | D_1 | | | C_a | C_{0a} | C_u | |
| 150 | 190 | 5 | 190 | 150 | 1 | 150 | 188 | 190 | 152 | 9.5 | 0 -0.090 | 1 | 149 000 | 1 020 000 | 106 000 |
| 160 | 200 | 5 | 200 | 160 | 1 | 160 | 198 | 200 | 162 | 9.5 | 0 -0.090 | 1 | 154 000 | 1 070 000 | 110 000 |

Needle Roller Bearings

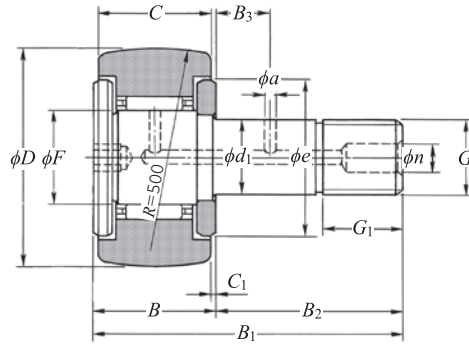
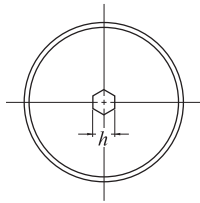
| Allowable speed | | Number | | | | Approx. dimension | | Mass | | | | |
|--------------------|-----------------|--|--------|---------|------------|-------------------|-------|-------|--------------|-------|-------|--|
| Grease lubrication | Oil lubrication | Thrust needle roller and cage assembly | | Washer | Inner ring | Outer ring | mm | | kg (approx.) | | | |
| | | E_b | E_a | AXK11 | AS11 | WS811 | WS812 | WS893 | GS811 | GS812 | GS893 | |
| 350 | 1 400 | AXK1130 | AS1130 | WS81130 | GS81130 | 156.0 | 184.2 | 0.232 | 0.084 | 0.752 | 0.761 | |
| 330 | 1 300 | AXK1132 | AS1132 | WS81132 | GS81132 | 166.0 | 194.2 | 0.246 | 0.089 | 0.797 | 0.806 | |

1) Smallest allowable dimension for chamfer dimension r .
2) The measured load is 2.04 N or above.

Needle Roller Bearings

Cam follower stud type track roller metric series

- KR···H type
- KR···XH type
- KR···LLH type
- KR···XLLH type



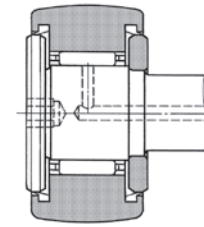
KR···H type (With cage)

D 10–90 mm

| Outside dia. ¹⁾ mm D 0 -0.05 | Dimensions mm | | | | | | | | | | | | | | Basic load rating | | Fatigue load limit N Cu |
|---|-----------------------------------|----|------|------|----------------|----------------|----------|----------------|----------------|----------------|---|---|-----|-----|--------------------------------|--------------------------------|-------------------------------|
| | d ₁ | C | F | B | B ₁ | B ₂ | G | G ₁ | B ₃ | C ₁ | n | a | e | h | dynamic N C _r | static N C _{0r} | |
| 10 | 3 ⁰ _{-0.010} | 7 | 4 | 8 | 17 | 9 | M 3×0.5 | 5 | — | 0.5 | — | — | 7 | 2.5 | 1 640 | 1 270 | 155 |
| 12 | 4 ⁰ _{-0.012} | 8 | 4.8 | 9 | 20 | 11 | M 4×0.7 | 6 | — | 0.5 | — | — | 8.5 | 2.5 | 2 170 | 1 690 | 206 |
| 13 | 5 ⁰ _{-0.012} | 9 | 5.75 | 10 | 23 | 13 | M 5×0.8 | 7.5 | — | 0.5 | — | — | 9.5 | 3 | 2 650 | 2 260 | 276 |
| 16 | 6 ⁰ _{-0.012} | 11 | 8 | 12 | 28 | 16 | M 6×1 | 8 | — | 0.6 | — | — | 12 | 3 | 4 050 | 4 200 | 510 |
| 19 | 8 ⁰ _{-0.015} | 11 | 10 | 12 | 32 | 20 | M 8×1.25 | 10 | — | 0.6 | — | — | 14 | 4 | 4 750 | 5 400 | 660 |
| 22 | 10 ⁰ _{-0.015} | 12 | 12 | 13 | 36 | 23 | M10×1.25 | 12 | — | 0.6 | 4 | — | 17 | 4 | 5 300 | 6 650 | 810 |
| 26 | 10 ⁰ _{-0.015} | 12 | 12 | 13 | 36 | 23 | M10×1.25 | 12 | — | 0.6 | 4 | — | 17 | 4 | 5 300 | 6 650 | 810 |
| 30 | 12 ⁰ _{-0.018} | 14 | 15 | 15 | 40 | 25 | M12×1.5 | 13 | 6 | 0.6 | 6 | 3 | 23 | 6 | 7 850 | 9 650 | 1 180 |
| 32 | 12 ⁰ _{-0.018} | 14 | 15 | 15 | 40 | 25 | M12×1.5 | 13 | 6 | 0.6 | 6 | 3 | 23 | 6 | 7 850 | 9 650 | 1 180 |
| 35 | 16 ⁰ _{-0.018} | 18 | 18 | 19.5 | 52 | 32.5 | M16×1.5 | 17 | 8 | 0.8 | 6 | 3 | 27 | 6 | 12 200 | 17 900 | 2 180 |
| 40 | 18 ⁰ _{-0.018} | 20 | 22 | 21.5 | 58 | 36.5 | M18×1.5 | 19 | 8 | 0.8 | 6 | 3 | 32 | 6 | 14 000 | 22 800 | 2 790 |
| 47 | 20 ⁰ _{-0.021} | 24 | 25 | 25.5 | 66 | 40.5 | M20×1.5 | 21 | 9 | 0.8 | 8 | 4 | 37 | 8 | 20 700 | 33 500 | 4 100 |
| 52 | 20 ⁰ _{-0.021} | 24 | 25 | 25.5 | 66 | 40.5 | M20×1.5 | 21 | 9 | 0.8 | 8 | 4 | 37 | 8 | 20 700 | 33 500 | 4 100 |
| 62 | 24 ⁰ _{-0.021} | 29 | 30 | 30.5 | 80 | 49.5 | M24×1.5 | 25 | 11 | 0.8 | 8 | 4 | 44 | 8 | 28 900 | 55 000 | 6 700 |
| 72 | 24 ⁰ _{-0.021} | 29 | 30 | 30.5 | 80 | 49.5 | M24×1.5 | 25 | 11 | 0.8 | 8 | 4 | 44 | 8 | 28 900 | 55 000 | 6 700 |
| 80 | 30 ⁰ _{-0.021} | 35 | 38 | 37 | 100 | 63 | M30×1.5 | 32 | 15 | 1 | 8 | 4 | 53 | 8 | 45 000 | 88 500 | 10 800 |
| 85 | 30 ⁰ _{-0.021} | 35 | 38 | 37 | 100 | 63 | M30×1.5 | 32 | 15 | 1 | 8 | 4 | 53 | 8 | 45 000 | 88 500 | 10 800 |
| 90 | 30 ⁰ _{-0.021} | 35 | 38 | 37 | 100 | 63 | M30×1.5 | 32 | 15 | 1 | 8 | 4 | 53 | 8 | 45 000 | 88 500 | 10 800 |

1) The tolerance of outer ring outside diameter D of KR···XH type and KR···XLLH type having a cylindrical outside diameter surface is JIS Class 0.

Needle Roller Bearings



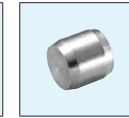
KR···LLH type (Seal type with cage)

Accessories

| Applied bearing number | Grease nipple number | Plug number | Applied hexagonal nut |
|------------------------|----------------------|-------------|-----------------------|
| 10 to 19 | — | — | 1M 3×0.5 to 1M 8×1.25 |
| 22 to 26 | NIP-B4 | SEN4 | 1M10×1.25 |
| 30 to 40 | NIP-B6 | SEN3, SEN6 | 1M12×1.5 to 1M18×1.5 |
| 47 to 90 | NIP-B8 | SEN4, SEN8 | 1M20×1.5 to 1M30×1.5 |



Grease fitting



Plug



Hexagon nut

| Track load capacity | | Allowable speed ²⁾ | | Maximum tightening torque N·m | Number ³⁾ | | | | Mass kg (approx.) | Stud dia. mm |
|------------------------------|---------------------------|-------------------------------|--------------------|----------------------------------|-------------------------|---------------------------|-------------------------|---------------------------|-------------------------|-----------------|
| N Spherical outer ring | Cylindrical outer ring | Grease lubrication | Oil lubrication | | Spherical outer ring | Cylindrical outer ring | Spherical outer ring | Cylindrical outer ring | | |
| 560 | 1 360 | *27 000 | *40 000 | 0.5 | KR10T2H/3AS | KR10XT2H/3AS | KR10T2LLH/3AS | KR10XT2LLH/3AS | 0.005 | 3 |
| 725 | 1 790 | *25 000 | *36 000 | 1 | KR12T2H/3AS | KR12XT2H/3AS | KR12T2LLH/3AS | KR12XT2LLH/3AS | 0.008 | 4 |
| 805 | 2 220 | *23 000 | *33 000 | 2 | KR13T2H/3AS | KR13XT2H/3AS | KR13T2LLH/3AS | KR13XT2LLH/3AS | 0.010 | 5 |
| 1 080 | 3 400 | *19 000 | *25 000 | 3 | KR16FDOH/L588 | KR16FXDOH/L588 | KR16FLDOH/L588 | KR16FXLDOH/L588 | 0.019 | 6 |
| 1 380 | 4 050 | *15 000 | *20 000 | 8 | KR19FDOH/L588 | KR19FXDOH/L588 | KR19FLDOH/L588 | KR19FXLDOH/L588 | 0.031 | 8 |
| 1 690 | 5 150 | *12 000 | *16 000 | 14 | KR22FH | KR22FXH | KR22FLLH/3AS | KR22FXLLH/3AS | 0.046 | 10 |
| 2 120 | 6 100 | *12 000 | *16 000 | 14 | KR26FH | KR26FXH | KR26FLLH/3AS | KR26FXLLH/3AS | 0.059 | 10 |
| 2 620 | 7 700 | 10 000 | *13 000 | 20 | KR30H | KR30XH | KR30LLH/3AS | KR30XLLH/3AS | 0.087 | 12 |
| 2 860 | 8 200 | 10 000 | *13 000 | 20 | KR32H | KR32XH | KR32LLH/3AS | KR32XLLH/3AS | 0.097 | 12 |
| 3 200 | 11 900 | 8 000 | *11 000 | 52 | KR35H | KR35XH | KR35LLH/3AS | KR35XLLH/3AS | 0.169 | 16 |
| 3 850 | 14 500 | 7 000 | 9 000 | 76 | KR40H | KR40XH | KR40LLH/3AS | KR40XLLH/3AS | 0.248 | 18 |
| 4 700 | 21 000 | 6 000 | 8 000 | 98 | KR47H | KR47XH | KR47LLH/3AS | KR47XLLH/3AS | 0.386 | 20 |
| 5 550 | 23 300 | 6 000 | 8 000 | 98 | KR52H | KR52XH | KR52LLH/3AS | KR52XLLH/3AS | 0.461 | 20 |
| 6 950 | 34 500 | 5 000 | 6 500 | 178 | KR62H | KR62XH | KR62LLH/3AS | KR62XLLH/3AS | 0.790 | 24 |
| 8 050 | 38 500 | 5 000 | 6 500 | 178 | KR72H | KR72XH | KR72LLH/3AS | KR72XLLH/3AS | 1.04 | 24 |
| 9 800 | 53 000 | 4 000 | 5 500 | 360 | KR80H | KR80XH | KR80LLH/3AS | KR80XLLH/3AS | 1.55 | 30 |
| 10 400 | 56 000 | 4 000 | 5 500 | 360 | KR85H | KR85XH | KR85LLH/3AS | KR85XLLH/3AS | 1.74 | 30 |
| 11 400 | 59 000 | 4 000 | 5 500 | 360 | KR90H | KR90XH | KR90LLH/3AS | KR90XLLH/3AS | 1.95 | 30 |

2) The allowable speed of KR···LLH type and KR···XLLH type with a "*" mark seal is about 10 000 min⁻¹.

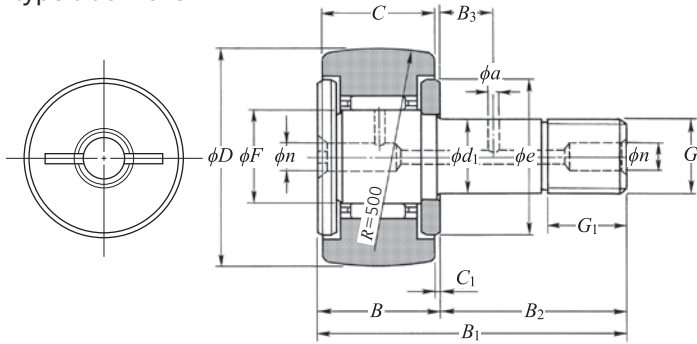
3) Bearings having T2 after the bearing number have a resin cage, and the allowable temperature is 120 °C and 100 °C or below for continuous use.

Needle Roller Bearings



Cam follower stud type track roller metric series

- KR type
- KR·X type
- KR·LL type
- KR·XLL type

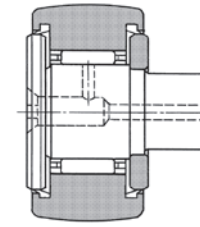


KR type (With cage)

D 16-90 mm

| Outside dia. ¹⁾ mm D 0 -0.05 | Dimensions mm | | | | | | | | | | | | | Basic load rating | | Fatigue load limit N Cu |
|---|-----------------------------------|----|----|------|----------------|----------------|----------|----------------|----------------|----------------|-----------------|---|----|-------------------|-----------------|-------------------------------|
| | d ₁ | C | F | B | B ₁ | B ₂ | G | G ₁ | B ₃ | C ₁ | n | a | e | C _r | C _{0r} | |
| 16 | 6 ⁰ _{-0.012} | 11 | 8 | 12 | 28 | 16 | M 6×1 | 8 | — | 0.6 | 4 ²⁾ | — | 12 | 4 050 | 4 200 | 510 |
| 19 | 8 ⁰ _{-0.015} | 11 | 10 | 12 | 32 | 20 | M 8×1.25 | 10 | — | 0.6 | 4 ²⁾ | — | 14 | 4 750 | 5 400 | 660 |
| 22 | 10 ⁰ _{-0.015} | 12 | 12 | 13 | 36 | 23 | M10×1.25 | 12 | — | 0.6 | 4 | — | 17 | 5 300 | 6 650 | 810 |
| 26 | 10 ⁰ _{-0.015} | 12 | 12 | 13 | 36 | 23 | M10×1.25 | 12 | — | 0.6 | 4 | — | 17 | 5 300 | 6 650 | 810 |
| 30 | 12 ⁰ _{-0.018} | 14 | 15 | 15 | 40 | 25 | M12×1.5 | 13 | 6 | 0.6 | 6 | 3 | 23 | 7 850 | 9 650 | 1 180 |
| 32 | 12 ⁰ _{-0.018} | 14 | 15 | 15 | 40 | 25 | M12×1.5 | 13 | 6 | 0.6 | 6 | 3 | 23 | 7 850 | 9 650 | 1 180 |
| 35 | 16 ⁰ _{-0.018} | 18 | 18 | 19.5 | 52 | 32.5 | M16×1.5 | 17 | 8 | 0.8 | 6 | 3 | 27 | 12 200 | 17 900 | 2 180 |
| 40 | 18 ⁰ _{-0.018} | 20 | 22 | 21.5 | 58 | 36.5 | M18×1.5 | 19 | 8 | 0.8 | 6 | 3 | 32 | 14 000 | 22 800 | 2 780 |
| 47 | 20 ⁰ _{-0.021} | 24 | 25 | 25.5 | 66 | 40.5 | M20×1.5 | 21 | 9 | 0.8 | 8 | 4 | 37 | 20 700 | 33 500 | 4 100 |
| 52 | 20 ⁰ _{-0.021} | 24 | 25 | 25.5 | 66 | 40.5 | M20×1.5 | 21 | 9 | 0.8 | 8 | 4 | 37 | 20 700 | 33 500 | 4 100 |
| 62 | 24 ⁰ _{-0.021} | 29 | 30 | 30.5 | 80 | 49.5 | M24×1.5 | 25 | 11 | 0.8 | 8 | 4 | 44 | 28 900 | 55 000 | 6 700 |
| 72 | 24 ⁰ _{-0.021} | 29 | 30 | 30.5 | 80 | 49.5 | M24×1.5 | 25 | 11 | 0.8 | 8 | 4 | 44 | 28 900 | 55 000 | 6 700 |
| 80 | 30 ⁰ _{-0.021} | 35 | 38 | 37 | 100 | 63 | M30×1.5 | 32 | 15 | 1 | 8 | 4 | 53 | 45 000 | 88 500 | 10 800 |
| 85 | 30 ⁰ _{-0.021} | 35 | 38 | 37 | 100 | 63 | M30×1.5 | 32 | 15 | 1 | 8 | 4 | 53 | 45 000 | 88 500 | 10 800 |
| 90 | 30 ⁰ _{-0.021} | 35 | 38 | 37 | 100 | 63 | M30×1.5 | 32 | 15 | 1 | 8 | 4 | 53 | 45 000 | 88 500 | 10 800 |

Needle Roller Bearings



KR·LL type (Seal type with cage)

Accessories

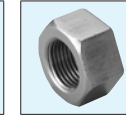
| Applied bearing number | Grease nipple number | Plug number | Applied hexagonal nut |
|------------------------|----------------------|-------------|-----------------------|
| 16 to 26 | NIP-B4 | SEN4 | 1M 6×1 to 1M10×1.25 |
| 30 to 40 | NIP-B6 | SEN3, SEN6 | 1M12×1.5 to 1M18×1.5 |
| 47 to 90 | NIP-B8 | SEN4, SEN8 | 1M20×1.5 to 1M30×1.5 |



Grease fitting



Plug



Hexagon nut

| Track load capacity | | Allowable speed ³⁾ | | Maximum tightening torque N·m | Number | | | | Mass kg (approx.) | Stud dia. mm |
|---------------------|----------------------|-------------------------------|--------------------|----------------------------------|----------------------|------------------------|----------------------|------------------------|-------------------------|-----------------|
| N | Spherical outer ring | Cylindrical outer ring | Grease lubrication | | Oil lubrication | Without seal | With seal | | | |
| | | | | | Spherical outer ring | Cylindrical outer ring | Spherical outer ring | Cylindrical outer ring | | |
| 1 080 | 3 400 | *19 000 | *25 000 | 3 | KR16F | KR16FX | KR16FLL/3AS | KR16FXLL/3AS | 0.019 | 6 |
| 1 380 | 4 050 | *15 000 | *20 000 | 8 | KR19F | KR19FX | KR19FLL/3AS | KR19FXLL/3AS | 0.031 | 8 |
| 1 690 | 5 150 | *12 000 | *16 000 | 14 | KR22F | KR22FX | KR22FLL/3AS | KR22FXLL/3AS | 0.046 | 10 |
| 2 120 | 6 100 | *12 000 | *16 000 | 14 | KR26F | KR26FX | KR26FLL/3AS | KR26FXLL/3AS | 0.059 | 10 |
| 2 620 | 7 700 | 10 000 | *13 000 | 20 | KR30 | KR30X | KR30LL/3AS | KR30XLL/3AS | 0.087 | 12 |
| 2 860 | 8 200 | 10 000 | *13 000 | 20 | KR32 | KR32X | KR32LL/3AS | KR32XLL/3AS | 0.097 | 12 |
| 3 200 | 11 900 | 8 000 | *11 000 | 52 | KR35 | KR35X | KR35LL/3AS | KR35XLL/3AS | 0.169 | 16 |
| 3 850 | 14 500 | 7 000 | 9 000 | 76 | KR40 | KR40X | KR40LL/3AS | KR40XLL/3AS | 0.248 | 18 |
| 4 700 | 21 000 | 6 000 | 8 000 | 98 | KR47 | KR47X | KR47LL/3AS | KR47XLL/3AS | 0.386 | 20 |
| 5 550 | 23 300 | 6 000 | 8 000 | 98 | KR52 | KR52X | KR52LL/3AS | KR52XLL/3AS | 0.461 | 20 |
| 6 950 | 34 500 | 5 000 | 6 500 | 178 | KR62 | KR62X | KR62LL/3AS | KR62XLL/3AS | 0.790 | 24 |
| 8 050 | 38 500 | 5 000 | 6 500 | 178 | KR72 | KR72X | KR72LL/3AS | KR72XLL/3AS | 1.04 | 24 |
| 9 800 | 53 000 | 4 000 | 5 500 | 360 | KR80 | KR80X | KR80LL/3AS | KR80XLL/3AS | 1.55 | 30 |
| 10 400 | 56 000 | 4 000 | 5 500 | 360 | KR85 | KR85X | KR85LL/3AS | KR85XLL/3AS | 1.74 | 30 |
| 11 400 | 59 000 | 4 000 | 5 500 | 360 | KR90 | KR90X | KR90LL/3AS | KR90XLL/3AS | 1.95 | 30 |

1) The tolerance of outer ring outside diameter *D* of KR·X type and KR·XLL type having a cylindrical outside diameter surface is JIS Class 0.

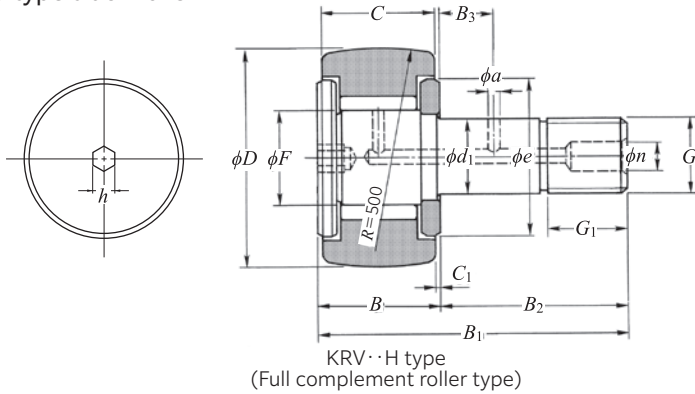
2) A grease filler hole is provided only on the front surface (left side in the above drawing).

3) The allowable speed of KR·LL type and KR·XLL type with a "*" mark seal is about 10 000 min⁻¹.

Needle Roller Bearings

Cam follower stud type track roller metric series

- KRV···H type
- KRV···XH type
- KRV···LLH type
- KRV···XLLH type



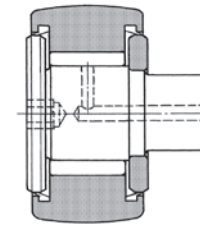
KRV···H type
(Full complement roller type)

D 10–90 mm

| Outside dia. ¹⁾ mm D 0 -0.05 | Dimensions | | | | | | | | | | | | | | Basic load rating | | Fatigue load limit N Cu |
|---|-----------------------------------|----|------|------|----------------|----------------|----------|----------------|----------------|----------------|---|---|-----|-----|--------------------|--------------------|-------------------------------|
| | mm | | | | | | | | | | | | | | dynamic N Cr | static N Cor | |
| | d ₁ | C | F | B | B ₁ | B ₂ | G | G ₁ | B ₃ | C ₁ | n | a | e | h | | | |
| 10 | 3 ⁰ _{-0.010} | 7 | 4 | 8 | 17 | 9 | M 3×0.5 | 5 | — | 0.5 | — | — | 7 | 2.5 | 2 500 | 2 610 | 320 |
| 12 | 4 ⁰ _{-0.012} | 8 | 4.8 | 9 | 20 | 11 | M 4×0.7 | 6 | — | 0.5 | — | — | 8.5 | 2.5 | 3 500 | 3 800 | 460 |
| 13 | 5 ⁰ _{-0.012} | 9 | 5.75 | 10 | 23 | 13 | M 5×0.8 | 7.5 | — | 0.5 | — | — | 9.5 | 3 | 4 500 | 5 350 | 650 |
| 16 | 6 ⁰ _{-0.012} | 11 | 8 | 12 | 28 | 16 | M 6×1 | 8 | — | 0.6 | — | — | 12 | 3 | 6 500 | 9 350 | 1 140 |
| 19 | 8 ⁰ _{-0.015} | 11 | 10 | 12 | 32 | 20 | M 8×1.25 | 10 | — | 0.6 | — | — | 14 | 4 | 7 450 | 11 700 | 1 430 |
| 22 | 10 ⁰ _{-0.015} | 12 | 12 | 13 | 36 | 23 | M10×1.25 | 12 | — | 0.6 | 4 | — | 17 | 4 | 8 200 | 14 000 | 1 700 |
| 26 | 10 ⁰ _{-0.015} | 12 | 12 | 13 | 36 | 23 | M10×1.25 | 12 | — | 0.6 | 4 | — | 17 | 4 | 8 200 | 14 000 | 1 700 |
| 30 | 12 ⁰ _{-0.018} | 14 | 15 | 15 | 40 | 25 | M12×1.5 | 13 | 6 | 0.6 | 6 | 3 | 23 | 6 | 12 000 | 20 300 | 2 470 |
| 32 | 12 ⁰ _{-0.018} | 14 | 15 | 15 | 40 | 25 | M12×1.5 | 13 | 6 | 0.6 | 6 | 3 | 23 | 6 | 12 000 | 20 300 | 2 470 |
| 35 | 16 ⁰ _{-0.018} | 18 | 18 | 19.5 | 52 | 32.5 | M16×1.5 | 17 | 8 | 0.8 | 6 | 3 | 27 | 6 | 17 600 | 34 000 | 4 150 |
| 40 | 18 ⁰ _{-0.018} | 20 | 22 | 21.5 | 58 | 36.5 | M18×1.5 | 19 | 8 | 0.8 | 6 | 3 | 32 | 6 | 19 400 | 42 000 | 5 100 |
| 47 | 20 ⁰ _{-0.021} | 24 | 25 | 25.5 | 66 | 40.5 | M20×1.5 | 21 | 9 | 0.8 | 8 | 4 | 37 | 8 | 28 800 | 61 000 | 7 450 |
| 52 | 20 ⁰ _{-0.021} | 24 | 25 | 25.5 | 66 | 40.5 | M20×1.5 | 21 | 9 | 0.8 | 8 | 4 | 37 | 8 | 28 800 | 61 000 | 7 450 |
| 62 | 24 ⁰ _{-0.021} | 29 | 30 | 30.5 | 80 | 49.5 | M24×1.5 | 25 | 11 | 0.8 | 8 | 4 | 44 | 8 | 39 500 | 98 500 | 12 000 |
| 72 | 24 ⁰ _{-0.021} | 29 | 30 | 30.5 | 80 | 49.5 | M24×1.5 | 25 | 11 | 0.8 | 8 | 4 | 44 | 8 | 39 500 | 98 500 | 12 000 |
| 80 | 30 ⁰ _{-0.021} | 35 | 38 | 37 | 100 | 63 | M30×1.5 | 32 | 15 | 1 | 8 | 4 | 53 | 8 | 58 000 | 147 000 | 18 000 |
| 90 | 30 ⁰ _{-0.021} | 35 | 38 | 37 | 100 | 63 | M30×1.5 | 32 | 15 | 1 | 8 | 4 | 53 | 8 | 58 000 | 147 000 | 18 000 |

1) The tolerance of outer ring outside diameter D of KRV···XH type and KRV···XLLH type having a cylindrical outside diameter surface is JIS Class 0.

Needle Roller Bearings



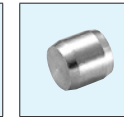
KRV···LLH type
(Full complement roller sealed type)

Accessories

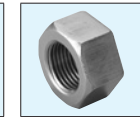
| Applied bearing number | Grease nipple number | Plug number | Applied hexagonal nut |
|------------------------|----------------------|-------------|-----------------------|
| 10 to 19 | — | — | 1M 3×0.5 to 1M 8×1.25 |
| 22 to 26 | NIP-B4 | SEN4 | 1M10×1.25 |
| 30 to 40 | NIP-B6 | SEN3, SEN6 | 1M12×1.5 to 1M18×1.5 |
| 47 to 90 | NIP-B8 | SEN4, SEN8 | 1M20×1.5 to 1M30×1.5 |



Grease fitting



Plug



Hexagon nut

| Track load capacity N | Allowable speed ²⁾ min ⁻¹ | Maximum tightening torque N·m | Number | | | | Mass kg (approx.) | Stud dia. mm | | |
|--------------------------|--|----------------------------------|----------------------|------------------------|----------------------|------------------------|-------------------------|------------------|-------|----|
| | | | Spherical outer ring | Cylindrical outer ring | Spherical outer ring | Cylindrical outer ring | | | | |
| 560 | 1 360 | *25 000 | *32 000 | 0.5 | KRV10H/3AS | KRV10XH/3AS | KRV10LLH/3AS | KRV10XLLH/3AS | 0.005 | 3 |
| 725 | 1 790 | *20 000 | *27 000 | 1 | KRV12H/3AS | KRV12XH/3AS | KRV12LLH/3AS | KRV12XLLH/3AS | 0.008 | 4 |
| 805 | 2 220 | *17 000 | *22 000 | 2 | KRV13H/3AS | KRV13XH/3AS | KRV13LLH/3AS | KRV13XLLH/3AS | 0.011 | 5 |
| 1 080 | 3 400 | *13 000 | *16 000 | 3 | KRV16FDOH/L588 | KRV16FXDOH/L588 | KRV16FLDOH/L588 | KRV16FXLDOH/L588 | 0.020 | 6 |
| 1 380 | 4 050 | 10 000 | *13 000 | 8 | KRV19FDOH/L588 | KRV19FXDOH/L588 | KRV19FLDOH/L588 | KRV19FXLDOH/L588 | 0.032 | 8 |
| 1 690 | 5 150 | 8 500 | *11 000 | 14 | KRV22FH/3AS | KRV22FXH/3AS | KRV22FLLH/3AS | KRV22FXLLH/3AS | 0.047 | 10 |
| 2 120 | 6 100 | 8 500 | *11 000 | 14 | KRV26FH/3AS | KRV26FXH/3AS | KRV26FLLH/3AS | KRV26FXLLH/3AS | 0.061 | 10 |
| 2 620 | 7 700 | 6 500 | 8 500 | 20 | KRV30H/3AS | KRV30XH/3AS | KRV30LLH/3AS | KRV30XLLH/3AS | 0.089 | 12 |
| 2 860 | 8 200 | 6 500 | 8 500 | 20 | KRV32H/3AS | KRV32XH/3AS | KRV32LLH/3AS | KRV32XLLH/3AS | 0.100 | 12 |
| 3 200 | 11 900 | 5 500 | 7 000 | 52 | KRV35H/3AS | KRV35XH/3AS | KRV35LLH/3AS | KRV35XLLH/3AS | 0.172 | 16 |
| 3 850 | 14 500 | 4 500 | 6 000 | 76 | KRV40H/3AS | KRV40XH/3AS | KRV40LLH/3AS | KRV40XLLH/3AS | 0.252 | 18 |
| 4 700 | 21 000 | 4 000 | 5 000 | 98 | KRV47H/3AS | KRV47XH/3AS | KRV47LLH/3AS | KRV47XLLH/3AS | 0.392 | 20 |
| 5 550 | 23 300 | 4 000 | 5 000 | 98 | KRV52H/3AS | KRV52XH/3AS | KRV52LLH/3AS | KRV52XLLH/3AS | 0.465 | 20 |
| 6 950 | 34 500 | 3 300 | 4 500 | 178 | KRV62H/3AS | KRV62XH/3AS | KRV62LLH/3AS | KRV62XLLH/3AS | 0.800 | 24 |
| 8 050 | 38 500 | 3 300 | 4 500 | 178 | KRV72H/3AS | KRV72XH/3AS | KRV72LLH/3AS | KRV72XLLH/3AS | 1.05 | 24 |
| 9 800 | 53 000 | 2 600 | 3 500 | 360 | KRV80H/3AS | KRV80XH/3AS | KRV80LLH/3AS | KRV80XLLH/3AS | 1.56 | 30 |
| 11 400 | 59 000 | 2 600 | 3 500 | 360 | KRV90H/3AS | KRV90XH/3AS | KRV90LLH/3AS | KRV90XLLH/3AS | 1.97 | 30 |

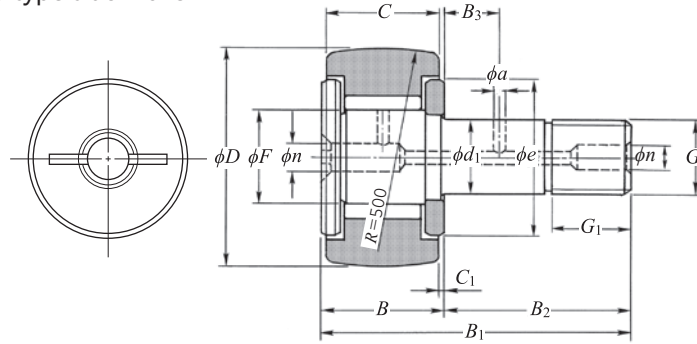
2) The allowable speed of KRV···LLH type and KRV···XLLH type with a "*" mark seal is about 10 000 min⁻¹.

Needle Roller Bearings



Cam follower stud type track roller
metric series

- KRV type
- KRV··X type
- KRV··LL type
- KRV··XLL type

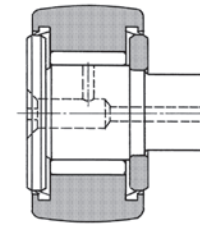


KRV type
(Full complement roller type)

D 16–90 mm

| Outside dia. ¹⁾ mm D 0 -0.05 | Dimensions | | | | | | | | | | | | | Basic load rating | | Fatigue load limit N Cu |
|---|-----------------------------------|----|----|------|----------------|----------------|----------|----------------|----------------|----------------|-----------------|---|----|--------------------|--------------------|-------------------------------|
| | mm | | | | | | | | | | | | | dynamic N Cr | static N Cor | |
| | d ₁ | C | F | B | B ₁ | B ₂ | G | G ₁ | B ₃ | C ₁ | n | a | e | | | |
| 16 | 6 ⁰ _{-0.012} | 11 | 8 | 12 | 28 | 16 | M 6×1 | 8 | — | 0.6 | 4 ²⁾ | — | 12 | 6 500 | 9 350 | 1 140 |
| 19 | 8 ⁰ _{-0.015} | 11 | 10 | 12 | 32 | 20 | M 8×1.25 | 10 | — | 0.6 | 4 ²⁾ | — | 14 | 7 450 | 11 700 | 1 430 |
| 22 | 10 ⁰ _{-0.015} | 12 | 12 | 13 | 36 | 23 | M10×1.25 | 12 | — | 0.6 | 4 | — | 17 | 8 200 | 14 000 | 1 700 |
| 26 | 10 ⁰ _{-0.015} | 12 | 12 | 13 | 36 | 23 | M10×1.25 | 12 | — | 0.6 | 4 | — | 17 | 8 200 | 14 000 | 1 700 |
| 30 | 12 ⁰ _{-0.018} | 14 | 15 | 15 | 40 | 25 | M12×1.5 | 13 | 6 | 0.6 | 6 | 3 | 23 | 12 000 | 20 300 | 2 470 |
| 32 | 12 ⁰ _{-0.018} | 14 | 15 | 15 | 40 | 25 | M12×1.5 | 13 | 6 | 0.6 | 6 | 3 | 23 | 12 000 | 20 300 | 2 470 |
| 35 | 16 ⁰ _{-0.018} | 18 | 18 | 19.5 | 52 | 32.5 | M16×1.5 | 17 | 8 | 0.8 | 6 | 3 | 27 | 17 600 | 34 000 | 4 150 |
| 40 | 18 ⁰ _{-0.018} | 20 | 22 | 21.5 | 58 | 36.5 | M18×1.5 | 19 | 8 | 0.8 | 6 | 3 | 32 | 19 400 | 42 000 | 5 100 |
| 47 | 20 ⁰ _{-0.021} | 24 | 25 | 25.5 | 66 | 40.5 | M20×1.5 | 21 | 9 | 0.8 | 8 | 4 | 37 | 28 800 | 61 000 | 7 450 |
| 52 | 20 ⁰ _{-0.021} | 24 | 25 | 25.5 | 66 | 40.5 | M20×1.5 | 21 | 9 | 0.8 | 8 | 4 | 37 | 28 800 | 61 000 | 7 450 |
| 62 | 24 ⁰ _{-0.021} | 29 | 30 | 30.5 | 80 | 49.5 | M24×1.5 | 25 | 11 | 0.8 | 8 | 4 | 44 | 39 500 | 98 500 | 12 000 |
| 72 | 24 ⁰ _{-0.021} | 29 | 30 | 30.5 | 80 | 49.5 | M24×1.5 | 25 | 11 | 0.8 | 8 | 4 | 44 | 39 500 | 98 500 | 12 000 |
| 80 | 30 ⁰ _{-0.021} | 35 | 38 | 37 | 100 | 63 | M30×1.5 | 32 | 15 | 1 | 8 | 4 | 53 | 58 000 | 147 000 | 18 000 |
| 90 | 30 ⁰ _{-0.021} | 35 | 38 | 37 | 100 | 63 | M30×1.5 | 32 | 15 | 1 | 8 | 4 | 53 | 58 000 | 147 000 | 18 000 |

Needle Roller Bearings



KRV··LL type
(Full complement roller sealed type)

Accessories

| Applied bearing number | Grease nipple number | Plug number | Applied hexagonal nut |
|------------------------|----------------------|-------------|-----------------------|
| 16 to 26 | NIP-B4 | SEN4 | 1M 6×1 to 1M10×1.25 |
| 30 to 40 | NIP-B6 | SEN3, SEN6 | 1M12×1.5 to 1M18×1.5 |
| 47 to 90 | NIP-B8 | SEN4, SEN8 | 1M20×1.5 to 1M30×1.5 |



Grease fitting



Plug



Hexagon nut

| Track load capacity | | Allowable speed ³⁾ | | Maximum tightening torque N·m | Number | | | | Mass kg (approx.) | Stud dia. mm |
|----------------------|------------------------|-------------------------------|-----------------|----------------------------------|------------------------|----------------------|------------------------|---------------|-------------------------|-----------------|
| N | min ⁻¹ | Grease lubrication | Oil lubrication | | Without seal | | With seal | | | |
| Spherical outer ring | Cylindrical outer ring | | | Spherical outer ring | Cylindrical outer ring | Spherical outer ring | Cylindrical outer ring | | | |
| 1 080 | 3 400 | *13 000 | *16 000 | 3 | KRV16F/3AS | KRV16FX/3AS | KRV16FLL/3AS | KRV16FXLL/3AS | 0.020 | 6 |
| 1 380 | 4 050 | 10 000 | *13 000 | 8 | KRV19F/3AS | KRV19FX/3AS | KRV19FLL/3AS | KRV19FXLL/3AS | 0.032 | 8 |
| 1 690 | 5 150 | 8 500 | *11 000 | 14 | KRV22F/3AS | KRV22FX/3AS | KRV22FLL/3AS | KRV22FXLL/3AS | 0.047 | 10 |
| 2 120 | 6 100 | 8 500 | *11 000 | 14 | KRV26F/3AS | KRV26FX/3AS | KRV26FLL/3AS | KRV26FXLL/3AS | 0.061 | 10 |
| 2 620 | 7 700 | 6 500 | 8 500 | 20 | KRV30/3AS | KRV30X/3AS | KRV30LL/3AS | KRV30XLL/3AS | 0.089 | 12 |
| 2 860 | 8 200 | 6 500 | 8 500 | 20 | KRV32/3AS | KRV32X/3AS | KRV32LL/3AS | KRV32XLL/3AS | 0.100 | 12 |
| 3 200 | 11 900 | 5 500 | 7 000 | 52 | KRV35/3AS | KRV35X/3AS | KRV35LL/3AS | KRV35XLL/3AS | 0.172 | 16 |
| 3 850 | 14 500 | 4 500 | 6 000 | 76 | KRV40/3AS | KRV40X/3AS | KRV40LL/3AS | KRV40XLL/3AS | 0.252 | 18 |
| 4 700 | 21 000 | 4 000 | 5 000 | 98 | KRV47/3AS | KRV47X/3AS | KRV47LL/3AS | KRV47XLL/3AS | 0.390 | 20 |
| 5 550 | 23 300 | 4 000 | 5 000 | 98 | KRV52/3AS | KRV52X/3AS | KRV52LL/3AS | KRV52XLL/3AS | 0.465 | 20 |
| 6 950 | 34 500 | 3 300 | 4 500 | 178 | KRV62/3AS | KRV62X/3AS | KRV62LL/3AS | KRV62XLL/3AS | 0.800 | 24 |
| 8 050 | 38 500 | 3 300 | 4 500 | 178 | KRV72/3AS | KRV72X/3AS | KRV72LL/3AS | KRV72XLL/3AS | 1.05 | 24 |
| 9 800 | 53 000 | 2 600 | 3 500 | 360 | KRV80/3AS | KRV80X/3AS | KRV80LL/3AS | KRV80XLL/3AS | 1.56 | 30 |
| 11 400 | 59 000 | 2 600 | 3 500 | 360 | KRV90/3AS | KRV90X/3AS | KRV90LL/3AS | KRV90XLL/3AS | 1.97 | 30 |

1) The tolerance of outer ring outside diameter *D* of KRV··X type and KRV··XLL type having a cylindrical outside diameter surface is JIS Class 0.

2) A grease filler hole is provided only on the front surface (left side in the above drawing).

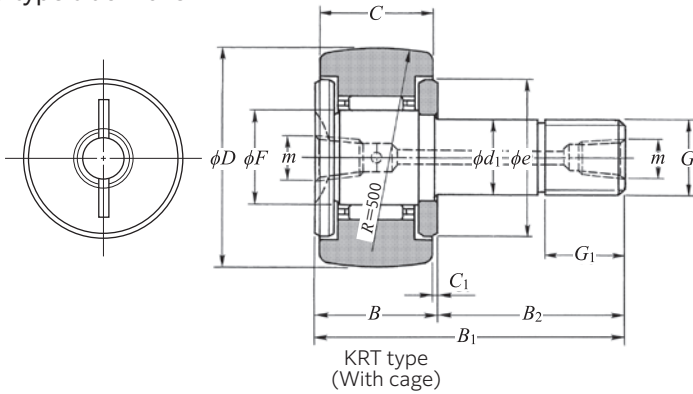
3) The allowable speed of KRV··LL type and KRV··XLL type with a "*" mark seal is about 10 000 min⁻¹.

Needle Roller Bearings



Cam follower stud type track roller metric series

KRT type
KRT··X type
KRT··LL type
KRT··XLL type

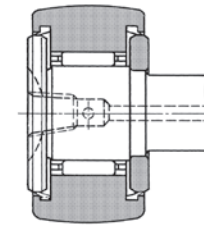


D 16–90 mm

| Outside dia. ¹⁾ mm D 0 -0.05 | Dimensions mm | | | | | | | | | | | Basic load rating | | Fatigue load limit N Cu |
|---|-----------------------------------|----|----|------|----------------|----------------|----------|----------------|----------------|----------------------|----|-------------------|-----------------|-------------------------------|
| | d ₁ | C | F | B | B ₁ | B ₂ | G | G ₁ | C ₁ | m | e | C _r | C _{0r} | |
| 16 | 6 ⁰ _{-0.012} | 11 | 8 | 12 | 28 | 16 | M 6×1 | 8 | 0.6 | M4×0.7 ²⁾ | 12 | 4 050 | 4 200 | 510 |
| 19 | 8 ⁰ _{-0.015} | 11 | 10 | 12 | 32 | 20 | M 8×1.25 | 10 | 0.6 | M4×0.7 ²⁾ | 14 | 4 750 | 5 400 | 660 |
| 22 | 10 ⁰ _{-0.015} | 12 | 12 | 13 | 36 | 23 | M10×1.25 | 12 | 0.6 | M4×0.7 | 17 | 5 300 | 6 650 | 810 |
| 26 | 10 ⁰ _{-0.015} | 12 | 12 | 13 | 36 | 23 | M10×1.25 | 12 | 0.6 | M4×0.7 | 17 | 5 300 | 6 650 | 810 |
| 30 | 12 ⁰ _{-0.018} | 14 | 15 | 15 | 40 | 25 | M12×1.5 | 13 | 0.6 | M6×0.75 | 23 | 7 850 | 9 650 | 1 180 |
| 32 | 12 ⁰ _{-0.018} | 14 | 15 | 15 | 40 | 25 | M12×1.5 | 13 | 0.6 | M6×0.75 | 23 | 7 850 | 9 650 | 1 180 |
| 35 | 16 ⁰ _{-0.018} | 18 | 18 | 19.5 | 52 | 32.5 | M16×1.5 | 17 | 0.8 | Rc ½ | 27 | 12 200 | 17 900 | 2 180 |
| 40 | 18 ⁰ _{-0.018} | 20 | 22 | 21.5 | 58 | 36.5 | M18×1.5 | 19 | 0.8 | Rc ½ | 32 | 14 000 | 22 800 | 2 785 |
| 47 | 20 ⁰ _{-0.021} | 24 | 25 | 25.5 | 66 | 40.5 | M20×1.5 | 21 | 0.8 | Rc ½ | 37 | 20 700 | 33 500 | 4 100 |
| 52 | 20 ⁰ _{-0.021} | 24 | 25 | 25.5 | 66 | 40.5 | M20×1.5 | 21 | 0.8 | Rc ½ | 37 | 20 700 | 33 500 | 4 100 |
| 62 | 24 ⁰ _{-0.021} | 29 | 30 | 30.5 | 80 | 49.5 | M24×1.5 | 25 | 0.8 | Rc ½ | 44 | 28 900 | 55 000 | 6 700 |
| 72 | 24 ⁰ _{-0.021} | 29 | 30 | 30.5 | 80 | 49.5 | M24×1.5 | 25 | 0.8 | Rc ½ | 44 | 28 900 | 55 000 | 6 700 |
| 80 | 30 ⁰ _{-0.021} | 35 | 38 | 37 | 100 | 63 | M30×1.5 | 32 | 1 | Rc ½ | 53 | 45 000 | 88 500 | 10 800 |
| 85 | 30 ⁰ _{-0.021} | 35 | 38 | 37 | 100 | 63 | M30×1.5 | 32 | 1 | Rc ½ | 53 | 45 000 | 88 500 | 10 800 |
| 90 | 30 ⁰ _{-0.021} | 35 | 38 | 37 | 100 | 63 | M30×1.5 | 32 | 1 | Rc ½ | 53 | 45 000 | 88 500 | 10 800 |

1) The tolerance of outer ring outside diameter *D* of KRT··X type and KRT··XLL type having a cylindrical outside diameter surface is JIS Class 0.
2) A tapped hole is provided only on the front surface (left side in the above drawing).

Needle Roller Bearings



KRT··LL type
(Seal type with cage)

Accessories

| Applied bearing number | Grease nipple number | Hex socket screw plug number | Applied hexagonal nut |
|------------------------|----------------------|------------------------------|-----------------------|
| 16 to 26 | NIP-X30 | M4×0.7 ×4 ℓ | 1M 6×1 to 1M10×1.25 |
| 30 to 32 | JIS 1 type (A-M6F) | M6×0.75×6 ℓ | 1M12×1.5 |
| 35 to 90 | JIS 2 type (A-PT½) | R½(P1½)×7 ℓ | 1M16×1.5 to 1M30×1.5 |



Grease fitting



Grease fitting



Hex socket screw plug



Hexagon nut

| Track load capacity | | Allowable speed ³⁾ | | Maximum tightening torque N·m | Number | | | | Mass kg (approx.) | Stud dia. mm |
|-------------------------|---------------------------|-------------------------------|--------------------|----------------------------------|---|---|--------------------------------------|--|-------------------------|-----------------|
| Spherical outer ring | Cylindrical outer ring | Grease lubrication | Oil lubrication | | Without seal Spherical outer ring | Without seal Cylindrical outer ring | With seal Spherical outer ring | With seal Cylindrical outer ring | | |
| 1 080 | 3 400 | *19 000 | *25 000 | 3 | KRT16 | KRT16X | KRT16LL/3AS | KRT16XLL/3AS | 0.019 | 6 |
| 1 380 | 4 050 | *15 000 | *20 000 | 8 | KRT19 | KRT19X | KRT19LL/3AS | KRT19XLL/3AS | 0.031 | 8 |
| 1 690 | 5 150 | *12 000 | *16 000 | 14 | KRT22 | KRT22X | KRT22LL/3AS | KRT22XLL/3AS | 0.046 | 10 |
| 2 120 | 6 100 | *12 000 | *16 000 | 14 | KRT26 | KRT26X | KRT26LL/3AS | KRT26XLL/3AS | 0.059 | 10 |
| 2 620 | 7 700 | 10 000 | *13 000 | 20 | KRT30 | KRT30X | KRT30LL/3AS | KRT30XLL/3AS | 0.087 | 12 |
| 2 860 | 8 200 | 10 000 | *13 000 | 20 | KRT32 | KRT32X | KRT32LL/3AS | KRT32XLL/3AS | 0.097 | 12 |
| 3 200 | 11 900 | 8 000 | *11 000 | 52 | KRT35 | KRT35X | KRT35LL/3AS | KRT35XLL/3AS | 0.169 | 16 |
| 3 850 | 14 500 | 7 000 | 9 000 | 76 | KRT40 | KRT40X | KRT40LL/3AS | KRT40XLL/3AS | 0.248 | 18 |
| 4 700 | 21 000 | 6 000 | 8 000 | 98 | KRT47 | KRT47X | KRT47LL/3AS | KRT47XLL/3AS | 0.386 | 20 |
| 5 550 | 23 300 | 6 000 | 8 000 | 98 | KRT52 | KRT52X | KRT52LL/3AS | KRT52XLL/3AS | 0.461 | 20 |
| 6 950 | 34 500 | 5 000 | 6 500 | 178 | KRT62 | KRT62X | KRT62LL/3AS | KRT62XLL/3AS | 0.790 | 24 |
| 8 050 | 38 500 | 5 000 | 6 500 | 178 | KRT72 | KRT72X | KRT72LL/3AS | KRT72XLL/3AS | 1.04 | 24 |
| 9 800 | 53 000 | 4 000 | 5 500 | 360 | KRT80 | KRT80X | KRT80LL/3AS | KRT80XLL/3AS | 1.55 | 30 |
| 10 400 | 56 000 | 4 000 | 5 500 | 360 | KRT85 | KRT85X | KRT85LL/3AS | KRT85XLL/3AS | 1.74 | 30 |
| 11 400 | 59 000 | 4 000 | 5 500 | 360 | KRT90 | KRT90X | KRT90LL/3AS | KRT90XLL/3AS | 1.95 | 30 |

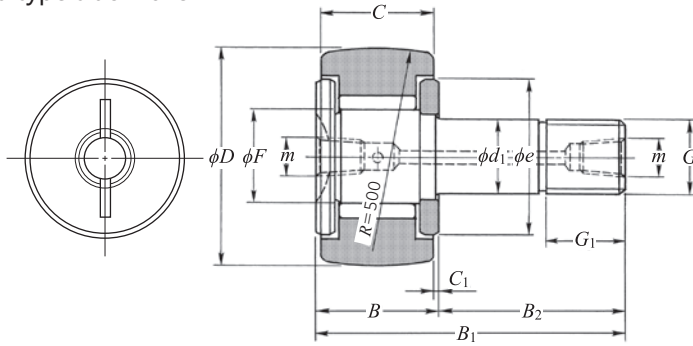
3) The allowable speed of KRT··LL type and KRT··XLL type with a “*” mark seal is about 10 000 min⁻¹.

Needle Roller Bearings



Cam follower stud type track roller metric series

KRVT type
KRVT··X type
KRVT··LL type
KRVT··XLL type

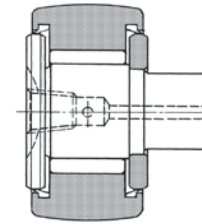


KRVT type
(Full complement roller type)

D 16–90 mm

| Outside dia. ¹⁾ mm D 0 -0.05 | Dimensions mm | | | | | | | | | | | Basic load rating | | Fatigue load limit N C_u |
|---|-----------------------------------|-----|-----|------|-------|-------|----------|-------|-------|----------------------|-----|-----------------------|-------------------------|----------------------------------|
| | d_1 | C | F | B | B_1 | B_2 | G | G_1 | C_1 | m | e | dynamic N C_r | static N C_{0r} | |
| 16 | 6 ⁰ _{-0.012} | 11 | 8 | 12 | 28 | 16 | M 6×1 | 8 | 0.6 | M4×0.7 ²⁾ | 12 | 6 500 | 9 350 | 1 140 |
| 19 | 8 ⁰ _{-0.015} | 11 | 10 | 12 | 32 | 20 | M 8×1.25 | 10 | 0.6 | M4×0.7 ²⁾ | 14 | 7 450 | 11 700 | 1 430 |
| 22 | 10 ⁰ _{-0.015} | 12 | 12 | 13 | 36 | 23 | M10×1.25 | 12 | 0.6 | M4×0.7 | 17 | 8 200 | 14 000 | 1 700 |
| 26 | 10 ⁰ _{-0.015} | 12 | 12 | 13 | 36 | 23 | M10×1.25 | 12 | 0.6 | M4×0.7 | 17 | 8 200 | 14 000 | 1 700 |
| 30 | 12 ⁰ _{-0.018} | 14 | 15 | 15 | 40 | 25 | M12×1.5 | 13 | 0.6 | M6×0.75 | 23 | 12 000 | 20 300 | 2 470 |
| 32 | 12 ⁰ _{-0.018} | 14 | 15 | 15 | 40 | 25 | M12×1.5 | 13 | 0.6 | M6×0.75 | 23 | 12 000 | 20 300 | 2 470 |
| 35 | 16 ⁰ _{-0.018} | 18 | 18 | 19.5 | 52 | 32.5 | M16×1.5 | 17 | 0.8 | Rc 1/8 | 27 | 17 600 | 34 000 | 4 150 |
| 40 | 18 ⁰ _{-0.018} | 20 | 22 | 21.5 | 58 | 36.5 | M18×1.5 | 19 | 0.8 | Rc 1/8 | 32 | 19 400 | 42 000 | 5 100 |
| 47 | 20 ⁰ _{-0.021} | 24 | 25 | 25.5 | 66 | 40.5 | M20×1.5 | 21 | 0.8 | Rc 1/8 | 37 | 28 800 | 61 000 | 7 450 |
| 52 | 20 ⁰ _{-0.021} | 24 | 25 | 25.5 | 66 | 40.5 | M20×1.5 | 21 | 0.8 | Rc 1/8 | 37 | 28 800 | 61 000 | 7 450 |
| 62 | 24 ⁰ _{-0.021} | 29 | 30 | 30.5 | 80 | 49.5 | M24×1.5 | 25 | 0.8 | Rc 1/8 | 44 | 39 500 | 98 500 | 12 000 |
| 72 | 24 ⁰ _{-0.021} | 29 | 30 | 30.5 | 80 | 49.5 | M24×1.5 | 25 | 0.8 | Rc 1/8 | 44 | 39 500 | 98 500 | 12 000 |
| 80 | 30 ⁰ _{-0.021} | 35 | 38 | 37 | 100 | 63 | M30×1.5 | 32 | 1 | Rc 1/8 | 53 | 58 000 | 147 000 | 18 000 |
| 90 | 30 ⁰ _{-0.021} | 35 | 38 | 37 | 100 | 63 | M30×1.5 | 32 | 1 | Rc 1/8 | 53 | 58 000 | 147 000 | 18 000 |

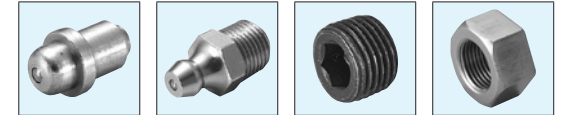
Needle Roller Bearings



KRVT··LL type
(Full complement roller sealed type)

Accessories

| Applied bearing number | Grease nipple number | Hex socket screw plug number | Applied hexagonal nut |
|------------------------|----------------------|------------------------------|-----------------------|
| 16 to 26 | NIP-X30 | M4×0.7 ×4 ℓ | 1M 6×1 to 1M10×1.25 |
| 30 to 32 | JIS 1 type (A-M6F) | M6×0.75×6 ℓ | 1M12×1.5 |
| 35 to 90 | JIS 2 type (A-PT1/8) | R1/8(PT1/8)×7 ℓ | 1M16×1.5 to 1M30×1.5 |



Grease fitting Grease fitting Hex socket screw plug Hexagon nut

| Track load capacity | | Allowable speed ³⁾ | | Maximum tightening torque N·m | Number | | | | Mass kg (approx.) | Stud dia. mm |
|-------------------------|---------------------------|-------------------------------|--------------------|----------------------------------|---|---|--------------------------------------|--|-------------------------|-----------------|
| Spherical outer ring | Cylindrical outer ring | Grease lubrication | Oil lubrication | | Without seal Spherical outer ring | Without seal Cylindrical outer ring | With seal Spherical outer ring | With seal Cylindrical outer ring | | |
| 1 080 | 3 400 | *13 000 | *16 000 | 3 | KRVT16/3AS | KRVT16X/3AS | KRVT16LL/3AS | KRVT16XLL/3AS | 0.020 | 6 |
| 1 380 | 4 050 | 10 000 | *13 000 | 8 | KRVT19/3AS | KRVT19X/3AS | KRVT19LL/3AS | KRVT19XLL/3AS | 0.032 | 8 |
| 1 690 | 5 150 | 8 500 | *11 000 | 14 | KRVT22/3AS | KRVT22X/3AS | KRVT22LL/3AS | KRVT22XLL/3AS | 0.047 | 10 |
| 2 120 | 6 100 | 8 500 | *11 000 | 14 | KRVT26/3AS | KRVT26X/3AS | KRVT26LL/3AS | KRVT26XLL/3AS | 0.061 | 10 |
| 2 620 | 7 700 | 6 500 | 8 500 | 20 | KRVT30/3AS | KRVT30X/3AS | KRVT30LL/3AS | KRVT30XLL/3AS | 0.089 | 12 |
| 2 860 | 8 200 | 6 500 | 8 500 | 20 | KRVT32/3AS | KRVT32X/3AS | KRVT32LL/3AS | KRVT32XLL/3AS | 0.100 | 12 |
| 3 200 | 11 900 | 5 500 | 7 000 | 52 | KRVT35/3AS | KRVT35X/3AS | KRVT35LL/3AS | KRVT35XLL/3AS | 0.172 | 16 |
| 3 850 | 14 500 | 4 500 | 6 000 | 76 | KRVT40/3AS | KRVT40X/3AS | KRVT40LL/3AS | KRVT40XLL/3AS | 0.252 | 18 |
| 4 700 | 21 000 | 4 000 | 5 000 | 98 | KRVT47/3AS | KRVT47X/3AS | KRVT47LL/3AS | KRVT47XLL/3AS | 0.390 | 20 |
| 5 550 | 23 300 | 4 000 | 5 000 | 98 | KRVT52/3AS | KRVT52X/3AS | KRVT52LL/3AS | KRVT52XLL/3AS | 0.465 | 20 |
| 6 950 | 34 500 | 3 300 | 4 500 | 178 | KRVT62/3AS | KRVT62X/3AS | KRVT62LL/3AS | KRVT62XLL/3AS | 0.800 | 24 |
| 8 050 | 38 500 | 3 300 | 4 500 | 178 | KRVT72/3AS | KRVT72X/3AS | KRVT72LL/3AS | KRVT72XLL/3AS | 1.05 | 24 |
| 9 800 | 53 000 | 2 600 | 3 500 | 360 | KRVT80/3AS | KRVT80X/3AS | KRVT80LL/3AS | KRVT80XLL/3AS | 1.56 | 30 |
| 11 400 | 59 000 | 2 600 | 3 500 | 360 | KRVT90/3AS | KRVT90X/3AS | KRVT90LL/3AS | KRVT90XLL/3AS | 1.97 | 30 |

1) The tolerance of outer ring outside diameter D of KRVT··X type and KRVT··XLL type having a cylindrical outside diameter surface is JIS Class 0.

2) A tapped hole is provided only on the front surface (left side in the above drawing).

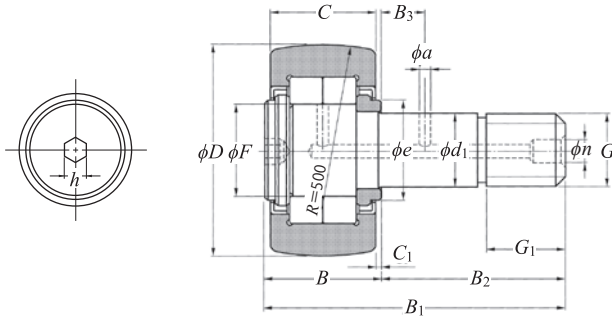
3) The allowable speed of KRVT··LL type and KRVT··XLL type with a "*" mark seal is about 10 000 min⁻¹.

Needle Roller Bearings



Cam follower stud type track roller
metric series

NUKR··H type
NUKR··XH type



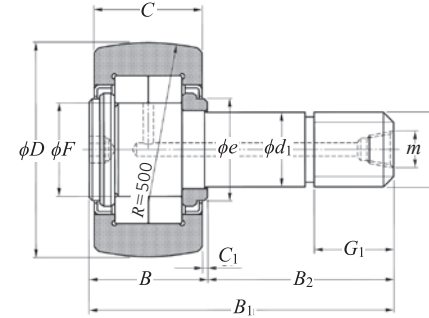
NUKR··H type ($D < 100$ mm)
(Full complement double-row cylindrical roller bearings with shield)

D 30–180 mm

| Outside dia. ¹⁾ mm D 0 -0.05 | Dimensions | | | | | | | | | | | | | | Fatigue load limit N C_u | | |
|---|------------|-------------|-----|------|-------|-------|------|---------|-------|-------|-----|-----|--------|-----|----------------------------------|----|--------|
| | mm | | | | | | | | | | | | | | | | |
| | d_1 | C | F | B | B_1 | B_2 | G | G_1 | B_3 | C_1 | n | m | a | e | h | | |
| 30 | 12 | 0 -0.018 | 14 | 14.5 | 15 | 40 | 25 | M12×1.5 | 13 | 6 | 0.6 | 6 | — | 3 | 15 | 6 | 1 650 |
| 35 | 16 | 0 -0.018 | 18 | 19 | 19.5 | 52 | 32.5 | M16×1.5 | 17 | 8 | 0.8 | 6 | — | 3 | 21 | 6 | 3 150 |
| 40 | 18 | 0 -0.018 | 20 | 21.5 | 21.5 | 58 | 36.5 | M18×1.5 | 19 | 8 | 0.8 | 6 | — | 3 | 23 | 6 | 3 550 |
| 47 | 20 | 0 -0.021 | 24 | 25.5 | 25.5 | 66 | 40.5 | M20×1.5 | 21 | 9 | 0.8 | 8 | — | 4 | 27 | 8 | 5 900 |
| 52 | 20 | 0 -0.021 | 24 | 30 | 25.5 | 66 | 40.5 | M20×1.5 | 21 | 9 | 0.8 | 8 | — | 4 | 31 | 8 | 7 000 |
| 62 | 24 | 0 -0.021 | 29 | 35 | 30.5 | 80 | 49.5 | M24×1.5 | 25 | 11 | 0.8 | 8 | — | 4 | 38 | 8 | 8 850 |
| 72 | 24 | 0 -0.021 | 29 | 41.5 | 30.5 | 80 | 49.5 | M24×1.5 | 25 | 11 | 0.8 | 8 | — | 4 | 44 | 8 | 10 400 |
| 80 | 30 | 0 -0.021 | 35 | 47.5 | 37 | 100 | 63 | M30×1.5 | 32 | 15 | 1 | 8 | — | 4 | 51 | 8 | 18 400 |
| 90 | 30 | 0 -0.021 | 35 | 47.5 | 37 | 100 | 63 | M30×1.5 | 32 | 15 | 1 | 8 | — | 4 | 51 | 8 | 18 400 |
| 100 | 36 | 0 -0.025 | 43 | 48.5 | 46 | 120 | 74 | M36×1.5 | 38 | — | 1.5 | — | Rc 1/2 | — | 53 | 14 | 20 400 |
| 120 | 42 | 0 -0.025 | 50 | 60.5 | 53 | 140 | 87 | M42×1.5 | 44 | — | 1.5 | — | Rc 1/2 | — | 66 | 14 | 32 400 |
| 140 | 48 | 0 -0.025 | 57 | 65 | 60 | 160 | 100 | M48×1.5 | 52 | — | 1.5 | — | Rc 1/2 | — | 72.5 | 14 | 35 900 |
| 150 | 52 | 0 -0.030 | 60 | 75.5 | 63 | 170 | 107 | M52×1.5 | 52 | — | 1.5 | — | Rc 1/2 | — | 85.5 | 17 | 46 500 |
| 160 | 56 | 0 -0.030 | 63 | 80.5 | 67 | 180 | 113 | M56×3 | 58 | — | 2 | — | Rc 1/2 | — | 89.5 | 17 | 49 000 |
| 170 | 60 | 0 -0.030 | 66 | 86 | 70 | 190 | 120 | M60×3 | 58 | — | 2 | — | Rc 1/2 | — | 96.5 | 17 | 58 000 |
| 180 | 64 | 0 -0.030 | 72 | 91.5 | 76 | 200 | 124 | M64×3 | 65 | — | 2 | — | Rc 1/2 | — | 103.5 | 17 | 67 500 |

1) The tolerance of outer ring outside diameter D of NUKR··XH type having a cylindrical outside diameter surface is JIS Class 0.

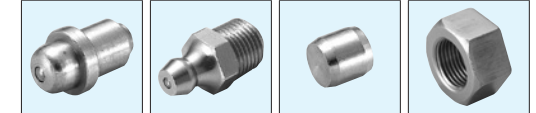
Needle Roller Bearings



NUKR··H type ($D \geq 100$ mm)

Accessories

| Applied bearing number | Grease nipple number | Plug number | Applied hexagonal nut |
|------------------------|----------------------|-------------|-----------------------|
| 30 to 40 | NIP-B6 | SEN3, SEN6 | 1M12×1.5 to 1M18×1.5 |
| 47 to 90 | NIP-B8 | SEN4, SEN8 | 1M20×1.5 to 1M30×1.5 |
| 100 to 180 | JIS 2 type (A-PT1/2) | — | 1M36×1.5 to 1M64×3 |



Grease fitting Grease fitting Plug Hexagon nut

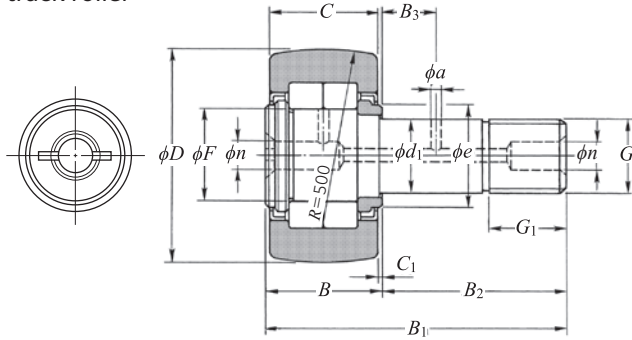
| Basic load rating | | Track load capacity | | Allowable speed min^{-1} Grease lubrication | Maximum tightening torque N·m | Number | | Mass kg (approx.) | Stud dia. mm |
|-----------------------|-------------------------|-------------------------|---------------------------|--|----------------------------------|-------------------------|---------------------------|-------------------------|-----------------|
| dynamic N C_r | static N C_{0r} | Spherical outer ring | Cylindrical outer ring | | | Spherical outer ring | Cylindrical outer ring | | |
| 13 300 | 13 500 | 2 620 | 7 700 | 6 900 | 20 | NUKR30H/3AS | NUKR30XH/3AS | 0.088 | 12 |
| 22 300 | 25 700 | 3 200 | 11 900 | 5 500 | 52 | NUKR35H/3AS | NUKR35XH/3AS | 0.165 | 16 |
| 24 100 | 29 100 | 3 850 | 14 500 | 4 700 | 76 | NUKR40H/3AS | NUKR40XH/3AS | 0.242 | 18 |
| 38 500 | 48 000 | 4 700 | 21 000 | 4 000 | 98 | NUKR47H/3AS | NUKR47XH/3AS | 0.380 | 20 |
| 42 500 | 57 500 | 5 550 | 23 300 | 3 300 | 98 | NUKR52H/3AS | NUKR52XH/3AS | 0.450 | 20 |
| 56 500 | 72 500 | 6 950 | 34 500 | 2 900 | 178 | NUKR62H/3AS | NUKR62XH/3AS | 0.795 | 24 |
| 62 000 | 85 500 | 8 050 | 38 500 | 2 400 | 178 | NUKR72H/3AS | NUKR72XH/3AS | 1.01 | 24 |
| 101 000 | 151 000 | 9 800 | 53 000 | 2 100 | 360 | NUKR80H/3AS | NUKR80XH/3AS | 1.54 | 30 |
| 101 000 | 151 000 | 11 400 | 59 000 | 2 100 | 360 | NUKR90H/3AS | NUKR90XH/3AS | 1.96 | 30 |
| 119 000 | 167 000 | 13 000 | 79 000 | 2 000 | 630 | NUKR100H/3AS | NUKR100XH/3AS | 3.08 | 36 |
| 172 000 | 266 000 | 16 400 | 113 000 | 1 700 | 1 020 | NUKR120H/3AS | NUKR120XH/3AS | 5.17 | 42 |
| 201 000 | 294 000 | 20 000 | 152 000 | 1 500 | 1 540 | NUKR140H/3AS | NUKR140XH/3AS | 7.98 | 48 |
| 258 000 | 380 000 | 22 000 | 173 000 | 1 300 | 1 950 | NUKR150H/3AS | NUKR150XH/3AS | 9.70 | 52 |
| 274 000 | 400 000 | 24 000 | 194 000 | 1 200 | 2 480 | NUKR160H/3AS | NUKR160XH/3AS | 11.7 | 56 |
| 320 000 | 475 000 | 26 000 | 218 000 | 1 100 | 3 030 | NUKR170H/3AS | NUKR170XH/3AS | 13.9 | 60 |
| 365 000 | 555 000 | 27 900 | 253 000 | 1 000 | 3 670 | NUKR180H/3AS | NUKR180XH/3AS | 17.0 | 64 |

Needle Roller Bearings



Cam follower stud type track roller metric series

NUKR type
NUKR··X type



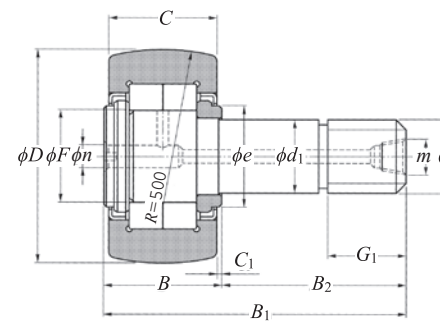
NUKR type ($D < 100$ mm)
(Full complement double-row cylindrical roller bearings with shield)

D 30–180 mm

| Outside dia. ¹⁾ mm D 0 -0.05 | Dimensions | | | | | | | | | | | | | | Fatigue load limit N C_u | |
|---|------------|-----|-----|------|-------|-------|------|---------|-------|-------|-----|-----|--------|-----|----------------------------------|--------|
| | d_1 | C | F | B | B_1 | B_2 | G | G_1 | B_3 | C_1 | n | m | a | e | | |
| 30 | 12 | 0 | 14 | 14.5 | 15 | 40 | 25 | M12×1.5 | 13 | 6 | 0.6 | 6 | — | 3 | 15 | 1 650 |
| 35 | 16 | 0 | 18 | 19 | 19.5 | 52 | 32.5 | M16×1.5 | 17 | 8 | 0.8 | 6 | — | 3 | 21 | 3 150 |
| 40 | 18 | 0 | 20 | 21.5 | 21.5 | 58 | 36.5 | M18×1.5 | 19 | 8 | 0.8 | 6 | — | 3 | 23 | 3 550 |
| 47 | 20 | 0 | 24 | 25.5 | 25.5 | 66 | 40.5 | M20×1.5 | 21 | 9 | 0.8 | 8 | — | 4 | 27 | 5 900 |
| 52 | 20 | 0 | 24 | 30 | 25.5 | 66 | 40.5 | M20×1.5 | 21 | 9 | 0.8 | 8 | — | 4 | 31 | 7 000 |
| 62 | 24 | 0 | 29 | 35 | 30.5 | 80 | 49.5 | M24×1.5 | 25 | 11 | 0.8 | 8 | — | 4 | 38 | 8 850 |
| 72 | 24 | 0 | 29 | 41.5 | 30.5 | 80 | 49.5 | M24×1.5 | 25 | 11 | 0.8 | 8 | — | 4 | 44 | 10 400 |
| 80 | 30 | 0 | 35 | 47.5 | 37 | 100 | 63 | M30×1.5 | 32 | 15 | 1 | 8 | — | 4 | 51 | 18 400 |
| 90 | 30 | 0 | 35 | 47.5 | 37 | 100 | 63 | M30×1.5 | 32 | 15 | 1 | 8 | — | 4 | 51 | 18 400 |
| 100 | 36 | 0 | 43 | 48.5 | 46 | 120 | 74 | M36×1.5 | 38 | — | 1.5 | 8 | Rc 1/8 | — | 53 | 20 400 |
| 120 | 42 | 0 | 50 | 60.5 | 53 | 140 | 87 | M42×1.5 | 44 | — | 1.5 | 8 | Rc 1/8 | — | 66 | 32 500 |
| 140 | 48 | 0 | 57 | 65 | 60 | 160 | 100 | M48×1.5 | 52 | — | 1.5 | 8 | Rc 1/8 | — | 72.5 | 36 000 |
| 150 | 52 | 0 | 60 | 75.5 | 63 | 170 | 107 | M52×1.5 | 52 | — | 1.5 | 8 | Rc 1/8 | — | 85.5 | 46 500 |
| 160 | 56 | 0 | 63 | 80.5 | 67 | 180 | 113 | M56×3 | 58 | — | 2 | 8 | Rc 1/8 | — | 89.5 | 49 000 |
| 170 | 60 | 0 | 66 | 86 | 70 | 190 | 120 | M60×3 | 58 | — | 2 | 8 | Rc 1/8 | — | 96.5 | 58 000 |
| 180 | 64 | 0 | 72 | 91.5 | 76 | 200 | 124 | M64×3 | 65 | — | 2 | 8 | Rc 1/8 | — | 103.5 | 67 500 |

1) The tolerance of outer ring outside diameter D of NUKR··X type having a cylindrical outside diameter surface is JIS Class 0.

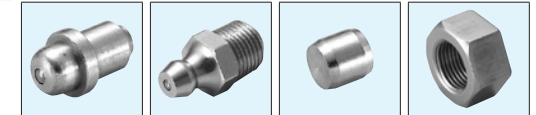
Needle Roller Bearings



NUKR type ($D \geq 100$ mm)

Accessories

| Applied bearing number | Grease nipple number | Plug number | Applied hexagonal nut |
|------------------------|----------------------|-------------|-----------------------|
| 30 to 40 | NIP-B6 | SEN3, SEN6 | 1M12×1.5 to 1M18×1.5 |
| 47 to 90 | NIP-B8 | SEN4, SEN8 | 1M20×1.5 to 1M30×1.5 |
| 100 to 180 | JIS 2 type (A-PT1/8) | — | 1M36×1.5 to 1M64×3 |



Grease fitting Grease fitting Plug Hexagon nut

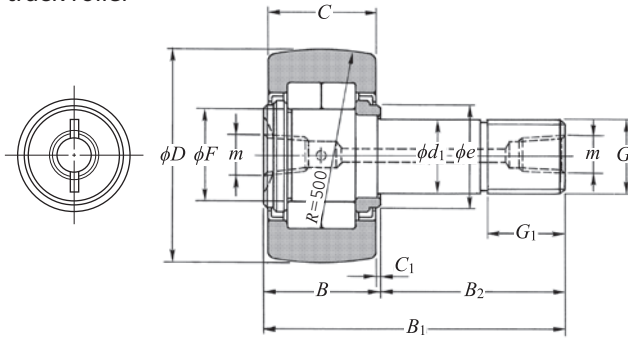
| Basic load rating dynamic C_r | static C_{0r} | Track load capacity | | Allowable speed min^{-1} Grease lubrication | Maximum tightening torque N·m | Number | | Mass kg (approx.) | Stud dia. mm |
|---------------------------------------|--------------------|----------------------|------------------------|--|----------------------------------|----------------------|------------------------|-------------------------|-----------------|
| | | Spherical outer ring | Cylindrical outer ring | | | Spherical outer ring | Cylindrical outer ring | | |
| 13 300 | 13 500 | 2 620 | 7 700 | 6 900 | 20 | NUKR 30/3AS | NUKR 30X/3AS | 0.088 | 12 |
| 22 300 | 25 700 | 3 200 | 11 900 | 5 500 | 52 | NUKR 35/3AS | NUKR 35X/3AS | 0.165 | 16 |
| 24 100 | 29 100 | 3 850 | 14 500 | 4 700 | 76 | NUKR 40/3AS | NUKR 40X/3AS | 0.242 | 18 |
| 38 500 | 48 000 | 4 700 | 21 000 | 4 000 | 98 | NUKR 47/3AS | NUKR 47X/3AS | 0.380 | 20 |
| 42 500 | 57 500 | 5 550 | 23 300 | 3 300 | 98 | NUKR 52/3AS | NUKR 52X/3AS | 0.450 | 20 |
| 56 500 | 72 500 | 6 950 | 34 500 | 2 900 | 178 | NUKR 62/3AS | NUKR 62X/3AS | 0.795 | 24 |
| 62 000 | 85 500 | 8 050 | 38 500 | 2 400 | 178 | NUKR 72/3AS | NUKR 72X/3AS | 1.01 | 24 |
| 101 000 | 151 000 | 9 800 | 53 000 | 2 100 | 360 | NUKR 80/3AS | NUKR 80X/3AS | 1.54 | 30 |
| 101 000 | 151 000 | 11 400 | 59 000 | 2 100 | 360 | NUKR 90/3AS | NUKR 90X/3AS | 1.96 | 30 |
| 119 000 | 167 000 | 13 000 | 79 000 | 2 000 | 630 | NUKR 100/3AS | NUKR 100X/3AS | 3.08 | 36 |
| 172 000 | 266 000 | 16 400 | 113 000 | 1 700 | 1 020 | NUKR 120/3AS | NUKR 120X/3AS | 5.17 | 42 |
| 201 000 | 294 000 | 20 000 | 152 000 | 1 500 | 1 540 | NUKR 140/3AS | NUKR 140X/3AS | 7.98 | 48 |
| 258 000 | 380 000 | 22 000 | 173 000 | 1 300 | 1 950 | NUKR 150/3AS | NUKR 150X/3AS | 9.70 | 52 |
| 274 000 | 400 000 | 24 000 | 194 000 | 1 200 | 2 480 | NUKR 160/3AS | NUKR 160X/3AS | 11.7 | 56 |
| 320 000 | 475 000 | 26 000 | 218 000 | 1 100 | 3 030 | NUKR 170/3AS | NUKR 170X/3AS | 13.9 | 60 |
| 365 000 | 555 000 | 27 900 | 253 000 | 1 000 | 3 670 | NUKR 180/3AS | NUKR 180X/3AS | 17.0 | 64 |

Needle Roller Bearings



Cam follower stud type track roller metric series

NUKRT type
NUKRT··X type



NUKRT type
(Full complement double-row cylindrical roller bearings with shield)

D 30-180 mm

| Outside dia. ¹⁾ mm D 0 -0.05 | Dimensions mm | | | | | | | | | | | Basic load rating | | Fatigue load limit N C _u |
|---|-----------------------------------|----|------|------|----------------|----------------|---------|----------------|----------------|---------|-------|-------------------|-----------------|---|
| | d ₁ | C | F | B | B ₁ | B ₂ | G | G ₁ | C ₁ | m | e | C _r | C _{0r} | |
| 30 | 12 ⁰ _{-0.018} | 14 | 14.5 | 15 | 40 | 25 | M12×1.5 | 13 | 0.6 | M6×0.75 | 15 | 13 300 | 13 500 | 1 650 |
| 35 | 16 ⁰ _{-0.018} | 18 | 19 | 19.5 | 52 | 32.5 | M16×1.5 | 17 | 0.8 | Rc ½ | 21 | 22 300 | 25 700 | 3 150 |
| 40 | 18 ⁰ _{-0.018} | 20 | 21.5 | 21.5 | 58 | 36.5 | M18×1.5 | 19 | 0.8 | Rc ½ | 23 | 24 100 | 29 100 | 3 550 |
| 47 | 20 ⁰ _{-0.021} | 24 | 25.5 | 25.5 | 66 | 40.5 | M20×1.5 | 21 | 0.8 | Rc ½ | 27 | 38 500 | 48 000 | 5 900 |
| 52 | 20 ⁰ _{-0.021} | 24 | 30 | 25.5 | 66 | 40.5 | M20×1.5 | 21 | 0.8 | Rc ½ | 31 | 42 500 | 57 500 | 7 000 |
| 62 | 24 ⁰ _{-0.021} | 29 | 35 | 30.5 | 80 | 49.5 | M24×1.5 | 25 | 0.8 | Rc ½ | 38 | 56 500 | 72 500 | 8 850 |
| 72 | 24 ⁰ _{-0.021} | 29 | 41.5 | 30.5 | 80 | 49.5 | M24×1.5 | 25 | 0.8 | Rc ½ | 44 | 62 000 | 85 500 | 10 400 |
| 80 | 30 ⁰ _{-0.021} | 35 | 47.5 | 37 | 100 | 63 | M30×1.5 | 32 | 1 | Rc ½ | 51 | 101 000 | 151 000 | 18 400 |
| 90 | 30 ⁰ _{-0.021} | 35 | 47.5 | 37 | 100 | 63 | M30×1.5 | 32 | 1 | Rc ½ | 51 | 101 000 | 151 000 | 18 400 |
| 100 | 36 ⁰ _{-0.025} | 43 | 48.5 | 46 | 120 | 74 | M36×1.5 | 38 | 1.5 | Rc ½ | 53 | 119 000 | 167 000 | 20 400 |
| 120 | 42 ⁰ _{-0.025} | 50 | 60.5 | 53 | 140 | 87 | M42×1.5 | 44 | 1.5 | Rc ½ | 66 | 172 000 | 266 000 | 32 500 |
| 140 | 48 ⁰ _{-0.025} | 57 | 65 | 60 | 160 | 100 | M48×1.5 | 52 | 1.5 | Rc ½ | 72.5 | 201 000 | 294 000 | 36 000 |
| 150 | 52 ⁰ _{-0.030} | 60 | 75.5 | 63 | 170 | 107 | M52×1.5 | 52 | 1.5 | Rc ½ | 85.5 | 258 000 | 380 000 | 46 500 |
| 160 | 56 ⁰ _{-0.030} | 63 | 80.5 | 67 | 180 | 113 | M56×3 | 58 | 2 | Rc ½ | 89.5 | 274 000 | 400 000 | 49 000 |
| 170 | 60 ⁰ _{-0.030} | 66 | 86 | 70 | 190 | 120 | M60×3 | 58 | 2 | Rc ½ | 96.5 | 320 000 | 475 000 | 58 000 |
| 180 | 64 ⁰ _{-0.030} | 72 | 91.5 | 76 | 200 | 124 | M64×3 | 65 | 2 | Rc ½ | 103.5 | 365 000 | 555 000 | 67 500 |

1) The tolerance of outer ring outside diameter D of NUKRT··X type having a cylindrical outside diameter surface is JIS Class 0.

Needle Roller Bearings



Accessories

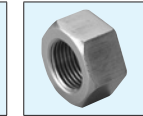
| Applied bearing number | Grease nipple number | Hex socket screw plug number | Applied hexagonal nut |
|------------------------|----------------------|------------------------------|-----------------------|
| 30 | JIS 1 type (A-M6F) | M6×0.75×6 ℓ | 1M12×1.5 |
| 35 to 180 | JIS 2 type (A-PT½) | R½(PT½)×7 ℓ | 1M16×1.5 to 1M64×3 |



Grease fitting



Hex socket screw plug



Hexagon nut

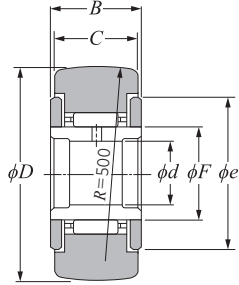
| Track load capacity | | Allowable speed min ⁻¹ Grease lubrication | Maximum tightening torque N·m | Number | | Mass kg (approx.) | Stud dia. mm |
|----------------------|------------------------|--|----------------------------------|----------------------|------------------------|-------------------------|-----------------|
| Spherical outer ring | Cylindrical outer ring | | | Spherical outer ring | Cylindrical outer ring | | |
| 2 620 | 7 700 | 6 900 | 20 | NUKRT 30/3AS | NUKRT 30X/3AS | 0.088 | 12 |
| 3 200 | 11 900 | 5 500 | 52 | NUKRT 35/3AS | NUKRT 35X/3AS | 0.165 | 16 |
| 3 850 | 14 500 | 4 700 | 76 | NUKRT 40/3AS | NUKRT 40X/3AS | 0.242 | 18 |
| 4 700 | 21 000 | 4 000 | 98 | NUKRT 47/3AS | NUKRT 47X/3AS | 0.380 | 20 |
| 5 550 | 23 300 | 3 300 | 98 | NUKRT 52/3AS | NUKRT 52X/3AS | 0.450 | 20 |
| 6 950 | 34 500 | 2 900 | 178 | NUKRT 62/3AS | NUKRT 62X/3AS | 0.795 | 24 |
| 8 050 | 38 500 | 2 400 | 178 | NUKRT 72/3AS | NUKRT 72X/3AS | 1.01 | 24 |
| 9 800 | 53 000 | 2 100 | 360 | NUKRT 80/3AS | NUKRT 80X/3AS | 1.54 | 30 |
| 11 400 | 59 000 | 2 100 | 360 | NUKRT 90/3AS | NUKRT 90X/3AS | 1.96 | 30 |
| 13 000 | 79 000 | 2 000 | 630 | NUKRT 100/3AS | NUKRT 100X/3AS | 3.08 | 36 |
| 16 400 | 113 000 | 1 700 | 1 020 | NUKRT 120/3AS | NUKRT 120X/3AS | 5.17 | 42 |
| 20 000 | 152 000 | 1 500 | 1 540 | NUKRT 140/3AS | NUKRT 140X/3AS | 7.98 | 48 |
| 22 000 | 173 000 | 1 300 | 1 950 | NUKRT 150/3AS | NUKRT 150X/3AS | 9.70 | 52 |
| 24 000 | 194 000 | 1 200 | 2 480 | NUKRT 160/3AS | NUKRT 160X/3AS | 11.7 | 56 |
| 26 000 | 218 000 | 1 100 | 3 030 | NUKRT 170/3AS | NUKRT 170X/3AS | 13.9 | 60 |
| 27 900 | 253 000 | 1 000 | 3 670 | NUKRT 180/3AS | NUKRT 180X/3AS | 17.0 | 64 |

Needle Roller Bearings

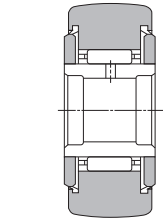


Roller follower yoke type track roller
metric series

NATR type
NATR··X type
NATR··LL type
NATR··XLL type



NATR type
(With cage)



NATR··LL type
(Seal type with cage)

D 16–90 mm

| Outside dia. ¹⁾ mm D 0 -0.05 | Dimensions | | | | | Basic load rating | | Track load capacity | | Fatigue load limit N C_u | |
|---|------------|-----|-----------------|-----|-----|-----------------------|-------------------------|------------------------------|--------------------------------|----------------------------------|--------|
| | mm | | | | | dynamic N C_r | static N C_{0r} | Spherical outer ring N | Cylindrical outer ring N | | |
| | d | B | C | e | F | | | | | | |
| 16 | 5 | 12 | 0 -0.180 | 11 | 12 | 8 | 4 050 | 4 200 | 1 080 | 3 400 | 510 |
| 19 | 6 | 12 | 0 -0.180 | 11 | 14 | 10 | 4 750 | 5 400 | 1 380 | 4 050 | 660 |
| 24 | 8 | 15 | 0 -0.180 | 14 | 19 | 12 | 6 900 | 7 700 | 1 900 | 6 650 | 940 |
| 30 | 10 | 15 | 0 -0.180 | 14 | 23 | 15 | 7 850 | 9 650 | 2 620 | 7 700 | 1 180 |
| 32 | 12 | 15 | 0 -0.180 | 14 | 25 | 17 | 8 400 | 10 900 | 2 860 | 8 200 | 1 330 |
| 35 | 15 | 19 | 0 -0.210 | 18 | 27 | 20 | 13 300 | 20 800 | 3 200 | 11 900 | 2 530 |
| 40 | 17 | 21 | 0 -0.210 | 20 | 32 | 22 | 14 000 | 22 800 | 3 850 | 14 500 | 2 790 |
| 47 | 20 | 25 | 0 -0.210 | 24 | 37 | 25 | 20 700 | 33 500 | 4 700 | 21 000 | 4 100 |
| 52 | 25 | 25 | 0 -0.210 | 24 | 42 | 30 | 22 800 | 40 500 | 5 500 | 23 300 | 4 950 |
| 62 | 30 | 29 | 0 -0.210 | 28 | 51 | 38 | 36 000 | 66 000 | 6 950 | 33 000 | 8 100 |
| 72 | 35 | 29 | 0 -0.210 | 28 | 58 | 44.5 | 39 000 | 77 000 | 8 050 | 37 000 | 9 400 |
| 80 | 40 | 32 | 0 -0.250 | 30 | 66 | 50 | 49 500 | 92 500 | 9 800 | 44 500 | 11 300 |
| 85 | 45 | 32 | 0 -0.250 | 30 | 71 | 55 | 51 500 | 100 000 | 10 400 | 47 000 | 12 200 |
| 90 | 50 | 32 | 0 -0.250 | 30 | 76 | 60 | 53 000 | 108 000 | 11 400 | 50 000 | 13 200 |

1) The tolerance of outer ring outside diameter D of NATR··X type and NATR··XLL type having a cylindrical outside diameter surface is JIS Class 0.

Needle Roller Bearings



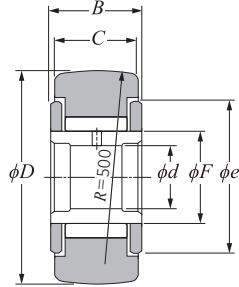
| Allowable speed ²⁾ | | Number | | | | Mass kg (approx.) | Outside dia. ¹⁾ mm D 0 -0.05 |
|--|--------------------|---|---------------------------|--------------------------------------|---------------------------|-------------------------|---|
| min ⁻¹ Grease lubrication | Oil lubrication | Without seal Spherical outer ring | Cylindrical outer ring | With seal Spherical outer ring | Cylindrical outer ring | | |
| *19 000 | *25 000 | NATR5 | NATR5X | NATR5LL/3AS | NATR5XLL/3AS | 0.018 | 16 |
| *15 000 | *20 000 | NATR6 | NATR6X | NATR6LL/3AS | NATR6XLL/3AS | 0.025 | 19 |
| *12 000 | *16 000 | NATR8 | NATR8X | NATR8LL/3AS | NATR8XLL/3AS | 0.042 | 24 |
| 10 000 | *13 000 | NATR10 | NATR10X | NATR10LL/3AS | NATR10XLL/3AS | 0.061 | 30 |
| 9 000 | *12 000 | NATR12CT | NATR12XCT | NATR12CLLT/3AS | NATR12CXLLT/3AS | 0.069 | 32 |
| 7 500 | 10 000 | NATR15 | NATR15X | NATR15LL/3AS | NATR15XLL/3AS | 0.098 | 35 |
| 7 000 | 9 000 | NATR17 | NATR17X | NATR17LL/3AS | NATR17XLL/3AS | 0.140 | 40 |
| 6 000 | 8 000 | NATR20 | NATR20X | NATR20LL/3AS | NATR20XLL/3AS | 0.246 | 47 |
| 5 000 | 6 500 | NATR25 | NATR25X | NATR25LL/3AS | NATR25XLL/3AS | 0.275 | 52 |
| 4 000 | 5 500 | NATR30 | NATR30X | NATR30LL/3AS | NATR30XLL/3AS | 0.470 | 62 |
| 3 300 | 4 500 | NATR35 | NATR35X | NATR35LL/3AS | NATR35XLL/3AS | 0.635 | 72 |
| 3 000 | 4 000 | NATR40 | NATR40X | NATR40LL/3AS | NATR40XLL/3AS | 0.875 | 80 |
| 2 700 | 3 600 | NATR45 | NATR45X | NATR45LL/3AS | NATR45XLL/3AS | 0.910 | 85 |
| 2 500 | 3 300 | NATR50 | NATR50X | NATR50LL/3AS | NATR50XLL/3AS | 0.960 | 90 |

2) The allowable speed of bearings with a "*" mark seal is about 10 000 min⁻¹.

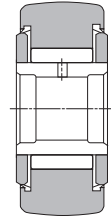
Needle Roller Bearings

Roller follower yoke type track roller
metric series

- NATV type
- NATV··X type
- NATV··LL type
- NATV··XLL type



NATV type
(Full complement roller type)



NATV··LL type
(Full complement roller sealed type)

D 16-90 mm

| Outside dia. ¹⁾ mm D 0 -0.05 | Dimensions | | | | | Basic load rating | | Track load capacity | | Fatigue load limit N C _u | |
|---|------------|----|-------------|----|----|--------------------------------|--------------------------------|-------------------------|---------------------------|---|--------|
| | mm | | | | | dynamic N C _r | static N C _{0r} | N | | | |
| | d | B | C | e | F | | | Spherical outer ring | Cylindrical outer ring | | |
| 16 | 5 | 12 | 0 -0.180 | 11 | 12 | 8 | 6 500 | 9 350 | 1 080 | 3 400 | 1 140 |
| 19 | 6 | 12 | 0 -0.180 | 11 | 14 | 10 | 7 450 | 11 700 | 1 380 | 4 050 | 1 430 |
| 24 | 8 | 15 | 0 -0.180 | 14 | 19 | 12 | 10 700 | 16 200 | 1 900 | 6 650 | 1 980 |
| 30 | 10 | 15 | 0 -0.180 | 14 | 23 | 15 | 12 000 | 20 300 | 2 620 | 7 700 | 2 470 |
| 32 | 12 | 15 | 0 -0.180 | 14 | 25 | 17 | 13 000 | 23 000 | 2 860 | 8 200 | 2 810 |
| 35 | 15 | 19 | 0 -0.210 | 18 | 27 | 20 | 18 400 | 38 000 | 3 200 | 11 900 | 4 650 |
| 40 | 17 | 21 | 0 -0.210 | 20 | 32 | 22 | 19 400 | 42 000 | 3 850 | 14 500 | 5 100 |
| 47 | 20 | 25 | 0 -0.210 | 24 | 37 | 25 | 28 800 | 61 000 | 4 700 | 21 000 | 7 450 |
| 52 | 25 | 25 | 0 -0.210 | 24 | 42 | 30 | 31 500 | 73 500 | 5 500 | 23 300 | 8 950 |
| 62 | 30 | 29 | 0 -0.210 | 28 | 51 | 38 | 47 500 | 115 000 | 6 950 | 33 000 | 14 000 |
| 72 | 35 | 29 | 0 -0.210 | 28 | 58 | 44.5 | 52 000 | 134 000 | 8 050 | 37 000 | 16 300 |
| 80 | 40 | 32 | 0 -0.250 | 30 | 66 | 50 | 68 500 | 171 000 | 9 800 | 44 500 | 20 900 |
| 90 | 50 | 32 | 0 -0.250 | 30 | 76 | 60 | 76 000 | 205 000 | 11 400 | 50 000 | 25 000 |

Needle Roller Bearings

| Allowable speed ²⁾ | | Number | | | | Mass kg (approx.) | Outside dia. ¹⁾ mm D 0 -0.05 |
|--|--------------------|---|---------------------------|--------------------------------------|---------------------------|-------------------------|---|
| min ⁻¹ Grease lubrication | Oil lubrication | Without seal Spherical outer ring | Cylindrical outer ring | With seal Spherical outer ring | Cylindrical outer ring | | |
| *13 000 | *16 000 | NATV5/3AS | NATV5X/3AS | NATV5LL/3AS | NATV5XLL/3AS | 0.020 | 16 |
| 10 000 | *13 000 | NATV6/3AS | NATV6X/3AS | NATV6LL/3AS | NATV6XLL/3AS | 0.027 | 19 |
| 8 500 | *11 000 | NATV8/3AS | NATV8X/3AS | NATV8LL/3AS | NATV8XLL/3AS | 0.044 | 24 |
| 6 500 | 8 500 | NATV10/3AS | NATV10X/3AS | NATV10LL/3AS | NATV10XLL/3AS | 0.065 | 30 |
| 6 000 | 7 500 | NATV12/3AS | NATV12X/3AS | NATV12LL/3AS | NATV12XLL/3AS | 0.074 | 32 |
| 5 000 | 6 500 | NATV15/3AS | NATV15X/3AS | NATV15LL/3AS | NATV15XLL/3AS | 0.102 | 35 |
| 4 500 | 6 000 | NATV17/3AS | NATV17X/3AS | NATV17LL/3AS | NATV17XLL/3AS | 0.145 | 40 |
| 4 000 | 5 000 | NATV20/3AS | NATV20X/3AS | NATV20LL/3AS | NATV20XLL/3AS | 0.254 | 47 |
| 3 300 | 4 500 | NATV25/3AS | NATV25X/3AS | NATV25LL/3AS | NATV25XLL/3AS | 0.285 | 52 |
| 2 600 | 3 500 | NATV30/3AS | NATV30X/3AS | NATV30LL/3AS | NATV30XLL/3AS | 0.481 | 62 |
| 2 200 | 2 900 | NATV35/3AS | NATV35X/3AS | NATV35LL/3AS | NATV35XLL/3AS | 0.647 | 72 |
| 2 000 | 2 600 | NATV40/3AS | NATV40X/3AS | NATV40LL/3AS | NATV40XLL/3AS | 0.890 | 80 |
| 1 600 | 2 100 | NATV50/3AS | NATV50X/3AS | NATV50LL/3AS | NATV50XLL/3AS | 0.990 | 90 |

1) The tolerance of outer ring outside diameter *D* of NATV··X type and NATV··XLL type having a cylindrical outside diameter surface is JIS Class 0.

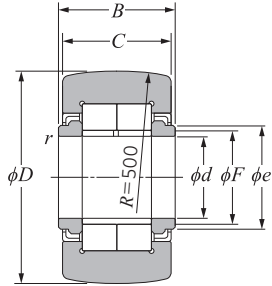
2) The allowable speed of bearings with a "*" mark seal is about 10 000 min⁻¹.

Needle Roller Bearings

NTN

Roller follower yoke type track roller
metric series

NUTR2 type
NUTR2··X type
NUTR3 type
NUTR3··X type



NUTR2 type
NUTR3 type

D 35–110 mm

| Outside dia. ¹⁾ mm D 0 -0.05 | Dimensions mm | | | | | | Basic load rating | | Track load capacity | | Fatigue load limit N C_u | |
|---|------------------|-----|--------------|-----|-----|-------------------------|-----------------------|--------------------|------------------------------|--------------------------------|----------------------------------|--------|
| | d | B | C | e | F | r_s min ²⁾ | dynamic N C_r | static C_{0r} | Spherical outer ring N | Cylindrical outer ring N | | |
| 35 | 15 | 19 | $0_{-0.210}$ | 18 | 20 | 19 | 0.3 | 22 300 | 25 700 | 3 200 | 11 900 | 3 150 |
| 40 | 17 | 21 | $0_{-0.210}$ | 20 | 22 | 21.5 | 0.3 | 24 100 | 29 100 | 3 850 | 14 500 | 3 550 |
| 42 | 15 | 19 | $0_{-0.210}$ | 18 | 20 | 19 | 0.3 | 22 300 | 25 700 | 4 100 | 14 300 | 3 150 |
| 47 | 17 | 21 | $0_{-0.210}$ | 20 | 22 | 21.5 | 0.3 | 24 100 | 29 100 | 4 700 | 17 000 | 3 550 |
| | 20 | 25 | $0_{-0.210}$ | 24 | 27 | 25.5 | 0.3 | 38 500 | 48 000 | 4 700 | 21 000 | 5 900 |
| 52 | 20 | 25 | $0_{-0.210}$ | 24 | 27 | 25.5 | 0.3 | 38 500 | 48 000 | 5 550 | 23 300 | 5 900 |
| | 25 | 25 | $0_{-0.210}$ | 24 | 31 | 30 | 0.3 | 42 500 | 57 500 | 5 550 | 23 300 | 7 000 |
| 62 | 25 | 25 | $0_{-0.210}$ | 24 | 31 | 30 | 0.3 | 42 500 | 57 500 | 6 950 | 27 800 | 7 000 |
| | 30 | 29 | $0_{-0.210}$ | 28 | 38 | 35 | 0.3 | 56 500 | 72 500 | 6 950 | 33 000 | 8 850 |
| 72 | 30 | 29 | $0_{-0.210}$ | 28 | 38 | 35 | 0.3 | 56 500 | 72 500 | 8 050 | 38 500 | 8 850 |
| | 35 | 29 | $0_{-0.210}$ | 28 | 44 | 41.5 | 0.6 | 62 000 | 85 500 | 8 050 | 37 000 | 10 400 |
| 80 | 35 | 29 | $0_{-0.210}$ | 28 | 44 | 41.5 | 0.6 | 62 000 | 85 500 | 9 800 | 41 000 | 10 400 |
| | 40 | 32 | $0_{-0.250}$ | 30 | 51 | 47.5 | 0.6 | 87 000 | 125 000 | 9 800 | 44 500 | 15 200 |
| 85 | 45 | 32 | $0_{-0.250}$ | 30 | 55 | 52.5 | 0.6 | 92 000 | 137 000 | 10 400 | 47 000 | 16 700 |
| 90 | 40 | 32 | $0_{-0.250}$ | 30 | 51 | 47.5 | 0.6 | 87 000 | 125 000 | 11 400 | 50 000 | 15 200 |
| | 50 | 32 | $0_{-0.250}$ | 30 | 60 | 57 | 0.6 | 96 500 | 150 000 | 11 400 | 50 000 | 18 300 |
| 100 | 45 | 32 | $0_{-0.250}$ | 30 | 55 | 52.5 | 0.6 | 92 000 | 137 000 | 13 000 | 55 500 | 16 700 |
| 110 | 50 | 32 | $0_{-0.250}$ | 30 | 60 | 57 | 0.6 | 96 500 | 150 000 | 14 700 | 61 000 | 18 300 |

1) The tolerance of outer ring outside diameter D of NUTR2··X type and NUTR3··X type having a cylindrical outside diameter surface is JIS Class 0.

2) Smallest allowable dimension for chamfer dimension r .

Needle Roller Bearings

NTN

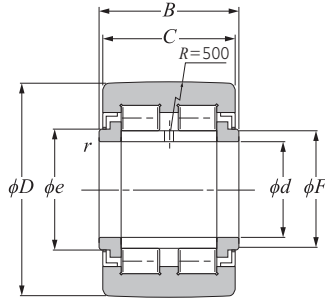
| Allowable speed min^{-1} Grease lubrication | Number | | Mass kg (approx.) | Outside dia. ¹⁾ mm D 0 -0.05 |
|---|-------------------------|---------------------------|-------------------------|---|
| | Spherical outer ring | Cylindrical outer ring | | |
| 5 500 | NUTR202/3AS | NUTR202X/3AS | 0.100 | 35 |
| 4 700 | NUTR203/3AS | NUTR203X/3AS | 0.147 | 40 |
| 5 500 | NUTR302/3AS | NUTR302X/3AS | 0.160 | 42 |
| 4 700 | NUTR303/3AS | NUTR303X/3AS | 0.222 | 47 |
| 4 000 | NUTR204/3AS | NUTR204X/3AS | 0.245 | |
| 4 000 | NUTR304/3AS | NUTR304X/3AS | 0.321 | 52 |
| 3 300 | NUTR205/3AS | NUTR205X/3AS | 0.281 | |
| 3 300 | NUTR305/3AS | NUTR305X/3AS | 0.450 | 62 |
| 2 900 | NUTR206/3AS | NUTR206X/3AS | 0.466 | |
| 2 900 | NUTR306/3AS | NUTR306X/3AS | 0.697 | 72 |
| 2 400 | NUTR207/3AS | NUTR207X/3AS | 0.630 | |
| 2 400 | NUTR307/3AS | NUTR307X/3AS | 0.840 | 80 |
| 2 100 | NUTR208/3AS | NUTR208X/3AS | 0.817 | |
| 1 900 | NUTR209/3AS | NUTR209X/3AS | 0.883 | 85 |
| 2 100 | NUTR308/3AS | NUTR308X/3AS | 1.13 | 90 |
| 1 800 | NUTR210/3AS | NUTR210X/3AS | 0.950 | |
| 1 900 | NUTR309/3AS | NUTR309X/3AS | 1.40 | 100 |
| 1 800 | NUTR310/3AS | NUTR310X/3AS | 1.69 | 110 |

Needle Roller Bearings

NTN

Roller follower yoke type track roller
metric series

NUTW2 type
NUTW·X type



NUTW2 type

D 35–90 mm

| Outside dia. ¹⁾ mm D 0 -0.05 | Dimensions | | | | | | | Basic load rating | | Track load capacity | | Fatigue load limit N C_u |
|--|------------|-----|-----------------|-----|-----|-------------------------|-------|-------------------|-------------------------|---------------------------|--------|--|
| | mm | | | | | | | dynamic | static | N | | |
| | d | B | C | e | F | r_s min ²⁾ | C_r | C_{0r} | Spherical outer ring | Cylindrical outer ring | | |
| 35 | 15 | 22 | 0 -0.210 | 21 | 20 | 19 | 0.3 | 24 100 | 28 300 | 3 200 | 14 200 | 3 450 |
| 40 | 17 | 24 | 0 -0.210 | 23 | 22 | 21.5 | 0.3 | 26 000 | 32 000 | 3 850 | 17 100 | 3 900 |
| 47 | 20 | 29 | 0 -0.210 | 28 | 27 | 25.5 | 0.3 | 40 500 | 51 500 | 4 700 | 25 100 | 6 300 |
| 52 | 25 | 29 | 0 -0.210 | 28 | 31 | 30 | 0.3 | 45 000 | 61 500 | 5 550 | 27 700 | 7 500 |
| 62 | 30 | 35 | 0 -0.210 | 34 | 38 | 35 | 0.3 | 59 500 | 77 000 | 6 950 | 41 000 | 9 400 |
| 72 | 35 | 35 | 0 -0.210 | 34 | 44 | 41.5 | 0.6 | 65 000 | 91 000 | 8 050 | 46 000 | 11 100 |
| 80 | 40 | 38 | 0 -0.250 | 36 | 51 | 47.5 | 0.6 | 90 500 | 131 000 | 9 800 | 54 500 | 16 000 |
| 85 | 45 | 38 | 0 -0.250 | 36 | 55 | 52.5 | 0.6 | 95 500 | 144 000 | 10 400 | 58 000 | 17 600 |
| 90 | 50 | 38 | 0 -0.250 | 36 | 60 | 57 | 0.6 | 100 000 | 158 000 | 11 400 | 61 500 | 19 200 |

Needle Roller Bearings

NTN

| Allowable speed min ⁻¹ Grease lubrication | Number | | Mass kg (approx.) | Outside dia. ¹⁾ mm D 0 -0.05 |
|--|-------------------------|---------------------------|-------------------------|--|
| | Spherical outer ring | Cylindrical outer ring | | |
| 5 500 | NUTW202/3AS | NUTW202X/3AS | 0.115 | 35 |
| 4 700 | NUTW203/3AS | NUTW203X/3AS | 0.167 | 40 |
| 4 000 | NUTW204/3AS | NUTW204X/3AS | 0.280 | 47 |
| 3 300 | NUTW205/3AS | NUTW205X/3AS | 0.322 | 52 |
| 2 900 | NUTW206/3AS | NUTW206X/3AS | 0.549 | 62 |
| 2 400 | NUTW207/3AS | NUTW207X/3AS | 0.747 | 72 |
| 2 100 | NUTW208/3AS | NUTW208X/3AS | 0.953 | 80 |
| 1 900 | NUTW209/3AS | NUTW209X/3AS | 1.03 | 85 |
| 1 800 | NUTW210/3AS | NUTW210X/3AS | 1.11 | 90 |

1) For bearings having a cylindrical outside diameter surface, code "X" is added after the bearing number. In this case, the tolerance of outer ring outside diameter D of bearing having a cylindrical is JIS Class 0. Example: NUTW203X

2) Smallest allowable dimension for chamfer dimension r .