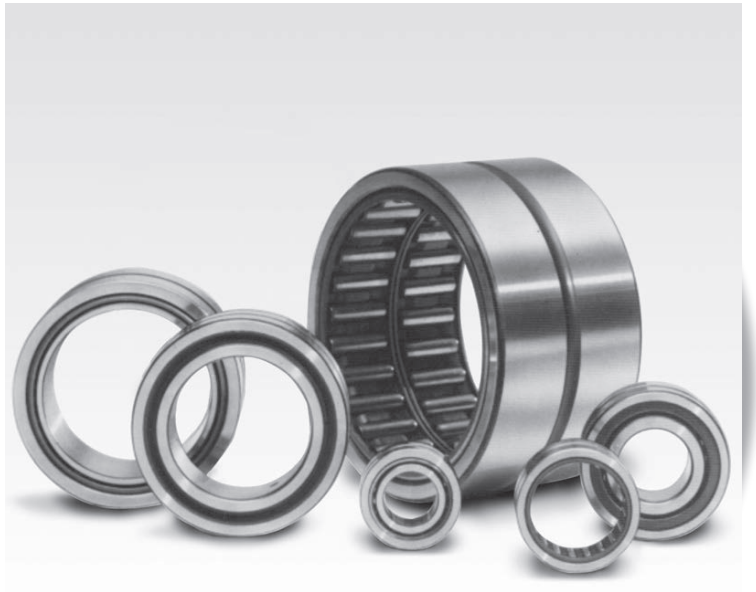
NOTES

HEAVY-DUTY NEEDLE ROLLER BEARINGS

Overview: Heavy-duty needle roller bearings consist of a machined and ground channel-shaped outer ring with a complement of needle rollers, and a cage. The high-strength cage retains and guides the rollers. An optional lubrication groove and hole in the outer ring facilitates re-lubrication. These bearings can be used with or without a machined and ground inner ring, depending on the suitability of the shaft as a raceway surface.

- **Catalogue range:** 5 mm – 335 mm (0.1969 in – 13.1890 in) bore.
- **Markets:** Gear pumps, sheaves, automotive transmissions and two-cycle engines.
- **Features:** Thick outer ring provides maximum load capacity and shock resistance with a relatively small radial cross section.
- **Benefits:** Optimum speed and lubrication-retention capability.



Needle Roller Bearings with Inner Rings – Metric Nominal Dimensions

Series
48 = dimension series 48
49 = dimension series 49
69 = dimension series 69
10 = Series 1000
20 = Series 2000
220 = Series 22000
30 = Series 3000

Inner Ring Bore Diameter
(for NA49, NA69: < 17 mm bore)
00 = 10 mm
01 = 12 mm
02 = 15 mm
03 = 17 mm

(for NA48, NA49, NA69: ≥ 20 mm bore)
bore code x 5 = bore diameter

NA **49** **04** **.2RS**

NA **69** / **22**

Suffix
RS lip contact seal on one side
.2RS lip contact seal on both sides
TN molded cage of reinforced polymer
A modified internal design

Prefix
NA needle roller bearing with inner ring, lube hole in outer ring
NKJ needle roller bearing with inner ring
NKJS needle roller bearing with inner ring, lube hole in outer ring
NAO needle roller bearing with inner ring, without flanges

NKJ **7** / **16** **TN**

Inner Ring Bore Diameter
(for NA49, NA69, NKJ, NKJS, NAO)
7 = 7 mm
22 = 22 mm
30 = 3 mm

Bearing Width
(for NKJ, NAO)
16 = 16 mm
17 = 17 mm

NAO **30** x **45** x **17**

Outer Ring Diameter
45 = 45 mm

Prefix
NQI with inner ring

NQI **15** / **16**

Width
16 = 16 mm

Inner ring bore diameter
15 = 15 mm

Needle Roller Bearings without Inner Rings – Metric Nominal Dimensions

Series
48 = dimension series 48
49 = dimension series 49
69 = dimension series 69
10 = Series 1000
20 = Series 2000
220 = Series 22000
30 = Series 3000

Needle Roller Complement Bore Code
See tables for dimensions

RNA **49** **04** **.2RS**

Suffix
RS lip contact seal on one side
.2RS lip contact seal on both sides
TN molded cage of reinforced polymer
A modified internal design

Prefix
RNA needle roller bearing without inner ring, lube hole in outer ring
NK needle roller bearing without inner ring
NKS needle roller bearing without inner ring, lube hole in outer ring
RNAO needle roller bearing without inner ring, without flanges

RNA **69** / **22**

NK **10** / **16** **TN**

Needle Roller Complement Bore Diameter
(NK, NKS, RNAO):
10 = 10 mm
35 = 35 mm
(for RNA49, RNA69):
22 = 28 mm
28 = 32 mm
32 = 40 mm

Outer Ring Width
(for NK, RNAO)
16 = 16 mm
17 = 17 mm

RNAO **35** x **45** x **17**

Outer Ring Diameter
45 = 45 mm

Prefix
NQ without inner ring

15 **NQ** **24** **10** **D**

Needle roller complement bore diameter
15 = 15 mm

Outer diameter
24 = 24 mm

Width
10 = 10 mm

Suffix
D Case hardened steel used for outer rings
N With snap ring groove (outer ring)

Inner Rings for Needle Roller Bearings – Metric Nominal Dimensions

Prefix
JR inner ring for use with metric needle roller bearing
JRZ inner ring for use with metric needle roller bearing, without mounting chamfers

Bore Diameter
25 = 25 mm

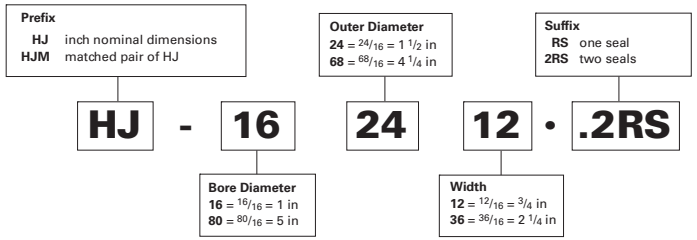
Width
18 = 18 mm

JRZ **25** x **30** x **18** **JS1**

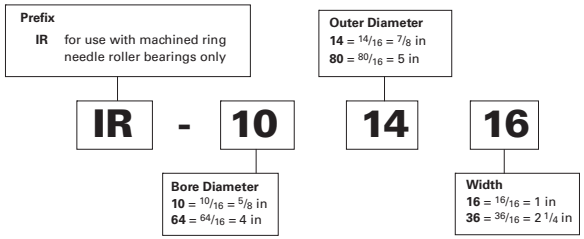
Outer Diameter
30 = 30 mm

Suffix
JS1 lubrication hole

Needle Roller Bearings – Inch Nominal Dimensions



Inner Rings (six-digit number) – Inch Nominal Dimensions



Heavy-Duty Needle Roller Bearings

Page

NEEDLE ROLLER BEARINGS – METRIC SERIES

Introduction B-4-6

Needle Roller Bearings with Inner Rings

NKJ, NKJS, NA48, NA49, NA69 Series B-4-13

NQI, NA49 Series B-4-19

Needle Roller Bearings without Inner Rings

NK, NKS, RNA48, RNA49, RNA69, NKTN Series B-4-20

NQ, RNA49, RNA69 Series B-4-27

Sealed Needle Roller Bearings with Inner Rings B-4-30

Sealed Needle Roller Bearings without Inner Rings B-4-31

Needle Roller Bearings without Flanges with Inner Rings B-4-32

Needle Roller Bearings without Flanges without Inner Rings B-4-35

Needle Roller Bearings Full Complement without Inner Rings B-4-38

Needle Roller Bearings Full Complement with Inner Rings B-4-42

NEEDLE ROLLER BEARINGS – INCH SERIES

Introduction B-4-45

HJ Type B-4-48

Sealed Heavy-Duty Needle Roller Bearings B-4-52

Inner Rings B-4-54

NEEDLE ROLLER BEARINGS

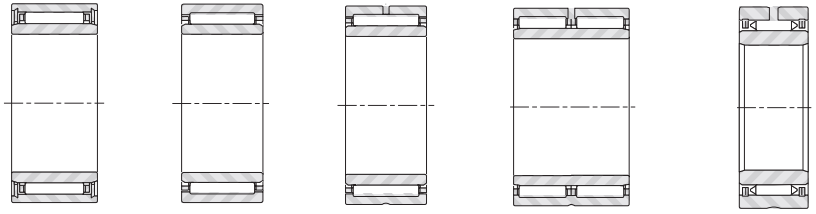
METRIC SERIES

When applications involve very heavy dynamic, static or even shock load conditions, the needle roller bearing may be found to give best results.

REFERENCE STANDARDS ARE:

- **ISO 1206** – needle roller bearings – light and medium series – dimensions and tolerances.
- **DIN 617** – rolling bearings – needle roller bearings with cage – dimension Series 48 and 49.
- **JIS B 1536** – rolling bearings – needle roller bearings – boundary dimensions and precision.

TYPES OF METRIC SERIES NEEDLE ROLLER BEARINGS



NKJ
(d ≤ 7 mm [0.2756 in])

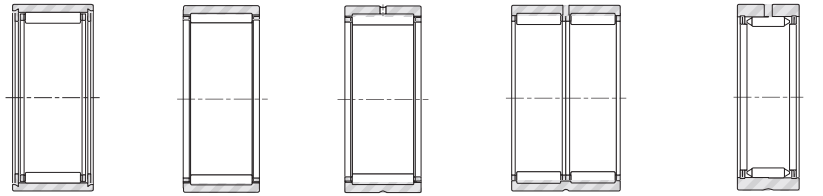
NQI

NKJ, NKJS
(d ≥ 9 mm [0.3543 in])
NA48, NA49
NA69 (d ≤ 30 mm [1.1811 in])

NA69
(d ≥ 32 mm [1.2598 in])

NA Series 1000,
2000, 22000, 3000

Fig. B4-1. Needle roller bearings with inner rings



NK
(F_w ≤ 10 mm [0.03937 in])

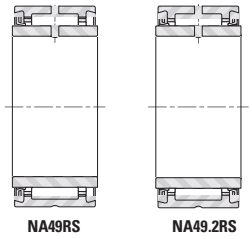
NQ

NK (F_w ≥ 12 mm [0.4724 in])
NKS, RNA48, RNA49
RNA69 (F_w ≤ 35 mm [1.3780 in])

RNA69
(F_w ≥ 40 mm [1.5748 in])

RNA Series 1000,
2000, 22000, 3000

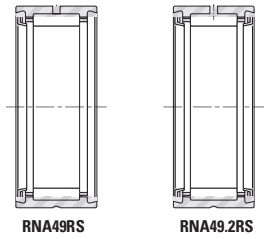
Fig. B4-2. Needle roller bearings without inner rings



NA49RS

NA49.2RS

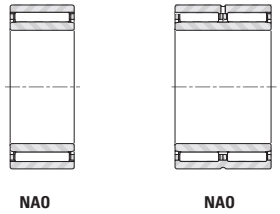
Fig. B4-3. Sealed needle roller bearings with inner rings



RNA49RS

RNA49.2RS

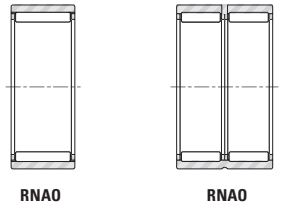
Fig. B4-4. Sealed needle roller bearings without inner rings



NAO

NAO

Fig. B4-5. Needle roller bearings without flanges, with inner rings



RNAO

RNAO

Fig. B4-6. Needle roller bearings without flanges, without inner rings

CONSTRUCTION

The basic constructions of metric series needle roller bearings are:

- With integral end flanges on the one-piece, channel-shaped outer rings (F_w ≥ 12.000 mm[0.4724 in]).
- With inserted-end washers to provide axial retention of the needle roller and cage assemblies (F_w ≤ 10.000 mm 0.3937 in).
- Without flanges where separate end washers or housing shoulders are required to provide axial retention of the needle roller and cage assemblies.
- Full, outer ring piloted complement of needle rollers (with or without inner ring).

METRIC SERIES NEEDLE ROLLER BEARINGS WITH INNER RINGS

This applies to the NKJ, NA, and NAO series.

When it is impractical to finish the shaft to meet the desired raceway design requirements, an inner ring may be used. Standard needle roller bearings are available with inner rings (such as the NA Series) to form complete bearings. Bearings furnished with inner rings meet the quality requirements in accordance with ISO standards.

- For inner- and outer-ring tolerances, the metric series bearings follow the normal tolerance class in ISO Standard 492 covering radial bearings. Bearings to more precise tolerance classes, P6 and P5, may be obtained upon request.
- The metric series bearings may be obtained with radial internal clearance in accordance with ISO Standard 5753, also specified for cylindrical roller bearings. Mostly, they follow the normal (C0) radial clearance group, although bearings to clearance groups C2, C3 and C4 may be made available on request.
- Inner ring and outer ring chamfer dimensions meet the requirements of ISO Standard 582.

METRIC SERIES NEEDLE ROLLER BEARINGS WITHOUT INNER RINGS

Whenever the shaft can be used as the inner raceway, needle roller bearings without inner rings provide advantages of economy and close control of radial internal clearance in operation. Tolerance class F6 is the normal specification for the metric series needle roller complement bore diameter of an unmounted bearing, as shown in Table B4-1 on page B-4-7 and Table B4-2 on page B-4-8. In the case of needle roller bearings of series RNAO, without flanges and without inner rings, the outer rings and needle roller and cage assemblies are not interchangeable.

Table B4-1. Metric series caged needle roller complement bore diameter for bearings without inner rings

F_w		ΔF_w min.	
>	≤	Max.	Min.
mm in	mm in	mm in	mm in
3.000 0.1181	6.000 0.2362	+0.018 +0.0007	+0.010 +0.0004
6.000 0.2362	10.000 0.3937	+0.022 +0.0009	+0.013 +0.0005
10.000 0.3937	18.000 0.7087	+0.027 +0.0011	+0.016 +0.0006
18.000 0.7087	30.000 1.1811	+0.033 +0.0013	+0.020 +0.0008
30.000 1.1811	50.000 1.9685	+0.041 +0.0016	+0.025 +0.0010
50.000 1.9685	80.000 3.1496	+0.049 +0.0019	+0.030 +0.0012
80.000 3.1496	120.000 4.7244	+0.058 +0.0023	+0.036 +0.0014
120.000 4.7244	180.000 7.0866	+0.068 +0.0027	+0.043 +0.0017
180.000 7.0866	250.000 9.8425	+0.079 +0.0031	+0.050 +0.0020
250.000 9.8425	315.000 12.4016	+0.088 +0.0035	+0.056 +0.0022
315.000 12.4016	400.000 15.7480	+0.098 +0.0039	+0.062 +0.0024

Table B4-2. Full complement metric needle roller complement bore diameter for bearings without inner rings

F_w		ΔF_w min.	
>	≤	Max.	Min.
mm in	mm in	mm in	mm in
5.000 0.1969	**15.000** 0.5906	**+0.040** +0.0016	**+0.020** +0.0008
15.000 0.5906	**25.000** 0.9843	**+0.043** +0.0017	**+0.020** +0.0008
25.000 0.9843	**30.000** 1.1811	**+0.048** +0.0019	**+0.025** +0.0010
30.000 1.1811	**35.000** 1.3780	**+0.053** +0.0021	**+0.030** +0.0012
35.000 1.3780	**60.000** 2.3622	**+0.058** +0.0023	**+0.035** +0.0014
60.000 2.3622	**80.000** 3.1496	**+0.073** +0.0029	**+0.045** +0.0018
80.000 3.1496	**115.000** 4.5276	**+0.078** +0.0031	**+0.050** +0.0020
115.000 4.5276	**180.000** 7.0866	**+0.088** +0.0035	**+0.060** +0.0024
180.000 7.0866	**220.000** 8.6614	**+0.103** +0.0041	**+0.070** +0.0028
220.000 8.6614	**270.000** 10.6299	**+0.113** +0.0044	**+0.080** +0.0031
270.000 10.6299	**350.000** 13.7795	**+0.128** +0.0050	**+0.090** +0.0035

METRIC SERIES NEEDLE ROLLER BEARINGS WITH INTEGRAL FLANGES

The needle roller bearing has a one-piece, channel-shaped outer ring of bearing-quality steel heat treated to yield maximum load rating. The integral end flanges provide axial location for the needle rollers. The bores of the end flanges serve as piloting surfaces for the cage.

A steel cage provides inward retention for the needle rollers, and the design assures roller stability and minimizes friction between the cage and the needle rollers. The cage has maximum strength consistent with the inherent high-load ratings of needle roller bearings.

Needle roller bearings of series NKJ, NQI, NKJS, NA48 and NA49 contain one needle roller and cage assembly. Bearings of series NA69, with bearing bores of 32.000 mm (1.2598 in) and above, have two needle roller and cage assemblies.

The outer ring has a lubricating groove and a lubricating hole for more convenient lubrication of the bearing. However, the smaller bearings of series **NKJ** and **NK** (Fw < 12 mm [0.4724 in]) do not have a lubricating groove or a lubricating hole.

METRIC SERIES NEEDLE ROLLER BEARINGS WITH INSERTED END WASHERS

Some metric series needle roller bearings have inserted end washers to provide axial retention of the needle roller and cage assembly. The radial needle roller and cage assemblies, consistent with other designs, provide inward and outward retention for the needle rollers.

METRIC SERIES NEEDLE ROLLER BEARINGS WITHOUT FLANGES

The radial needle roller and cage assembly, used in the metric series needle roller bearings without flanges, is slightly narrower than the inner and outer rings to ensure unobstructed operation. Separate end washers are required to provide axial retention of the radial needle roller and cage assembly. Wide needle roller bearings, using two needle roller and cage assemblies, have a lubricating groove and one lubricating hole in the outer ring to facilitate re-lubrication of the bearing. Narrow needle roller bearings do not have a lubricating groove or a lubricating hole in the outer ring.

SEALED METRIC SERIES NEEDLE ROLLER BEARINGS OF DIMENSION SERIES 49

Needle roller bearings of Series 49 are available with one or two integral lip-contact seals, as listed on page B-4-30. One seal is designated by suffix letters RS. Two seals are designated by .2RS. When combining sealed metric series needle roller bearings with inner rings, it is suggested to use inner rings, shown on pages B-2-28 and B-8-22, with designation JRZ because they are wider than the outer rings to ensure positive seal contact.

Sealed bearings are normally packed with a high quality lithium soap-based grease suitable up to 120° C (248° F) for short periods of operation.

The speed rating specified for sealed bearings listed in the bearing tables is based on operating conditions determined by testing. Optimum performance may be expected providing the bearing is properly installed with appropriate internal clearances and subjected to a load of low magnitude. Care should be taken that overheating will not occur, thus preventing breakdown of the grease and eventual bearing failure.

METRIC SERIES FULL COMPLEMENT NEEDLE ROLLER BEARINGS

Series NA and RNA 1000, 2000, 22000 and 3000 are available with possible options of extra wide and/or crowned inner ring raceways. Consult your representative for application details.

BEARING MOUNTING

MOUNTING DIMENSIONS

It is suggested that needle roller bearings are mounted in their housings with a clearance fit, if the load is stationary relative to the housing, or with a tight transition fit, if the load rotates relative to the housing. Table B4-3 lists the suggested tolerances for the housing bore and the shaft raceway for metric series bearings without inner rings. Table B4-4 lists the suggested shaft tolerances for the above two mounting conditions when the metric series bearings are used with inner rings. The suggested housing bore tolerances for metric series bearings with inner rings is the same as the housing bore tolerance listed in Table B4-3 for metric series bearings without inner rings. Other quality requirements for shafts and housings are given in the engineering section.

Other mounting dimensions may be required for special operating conditions such as:

1. Extremely heavy radial loads.
2. Shock loads.
3. Temperature gradient across bearing.
4. Housing material with heat expansion coefficient different than that of the bearing.
5. Oscillating motion applications.

Table B4-3. Mounting tolerances for metric series bearings without inner ring

Rotation conditions	Nominal housing bore diameter D	ISO tolerance zone for housing		Nominal shaft diameter F shaft	ISO tolerance zone for shaft	
	mm	caged	full	mm	caged	full
Load stationary relative to housing	all diameters	H7 (J7)	J6	all diameters	**h6 (h5)**	**h5**
General work with larger clearance		K7	—		**g6**	—
Load rotates relative to housing		N7	M6		**f6**	**g5**

Care should be taken that the selected bearing internal clearance is appropriate for the operating conditions.

Table B4-4. Shaft tolerances for metric series bearings with inner rings (use housing tolerance shown in Table B4-3)

Rotation conditions	Nominal shaft diameter, d		ISO tolerance zone for shaft	
	mm in	mm in	caged	full
Load rotates relative to housing	all diameters		g6	h5 (h6)
	>	≤		
Load stationary relative to housing		**40.000** 1.5748	k6	k5
	40.000 1.5748	**100.000** 3.9370	m6	m5
	100.000 3.9370	**140.000** 5.5118	m6	m5
	140.000 5.5118		n6	n6

Care should be taken that the selected bearing internal clearance is appropriate for the operating conditions.

Regardless of the fit of the bearing outer ring in the housing, the outer ring should be axially located by housing shoulders or other positive means. The bearing rings should closely fit against the shaft and housing shoulders and must not contact the fillet radius. The maximum shaft or housing fillet $r_{a\ max}$ should be no greater than the minimum bearing chamfer $r_{s\ min}$, as shown in Table B4-5 on page B-4-10.

In order to permit mounting and dismounting of the shaft, the maximum diameter D_1 in Table B4-6 on page B-4-10 must not be exceeded. F_w is shown in the bearing tables.

Needle roller bearings without flanges of series RNAO and NAO must have the radial needle roller and cage assembly properly end-guided by shoulders, as shown in Table B4-7(1) on page B-4-11 and Table B4-7(2) on page B-4-12, or other suitable means, such as spring steel washers (SNSH) shown on page B-8-39. These end-guiding surfaces should be hardened and precision turned, or ground to minimize wear, and should properly fit against the outer rings and the inner rings to provide the desired end clearance for the needle roller and cage assembly.

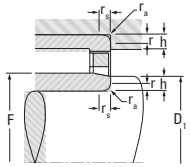


Fig. B4-7. Fillet

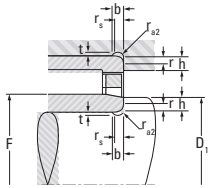


Fig. B4-8. Undercut

Table B4-5. Fillets, undercuts, and shoulder heights for metric series bearings

r_s[1]	r_a	t	r_{a2}	b	h
Min.	Max.		Min.		Min.
mm in	mm in	mm in	mm in	mm in	mm in
0.15 0.0059	**0.15** 0.0059				**0.6** 0.0236
0.3 0.0118	**0.3** 0.0118				**1** 0.0394
0.6 0.0236	**0.6** 0.0236				**2** 0.0787
1 0.0394	**1** 0.0394	**0.2** 0.0079	**1.3** 0.0512	**2** 0.0787	**2.5** 0.0984
1.1 0.0433	**1** 0.0394	**0.3** 0.0118	**2** 0.0787	**3** 0.1181	**3.25** 0.1280
1.5 0.0591	**1.5** 0.0591	**0.4** 0.0158	**2** 0.0787	**3.2** 0.1260	**4** 0.1575
2 0.0787	**2** 0.0787	**0.5** 0.0197	**2.5** 0.0984	**4** 0.1575	**5** 0.1969
2.1 0.0827	**2.1** 0.0827	**0.5** 0.0197	**3** 0.1181	**4.7** 0.1850	**5.5** 0.2165
3 0.1181	**2.5** 0.0984	**0.5** 0.0197	**3.5** 0.1378	**5.3** 0.2087	**6** 0.2362

[1] r_s : Bearing component corner rounding.

Table B4-6. Shoulder diameter $D_{1\,max.}$ for metric series bearings

		mm in	mm in	mm in	mm in	mm in
Needle roller complement bore diameter F_w	>		**20.000** 0.7874	**55.000** 2.1653	**100.000** 3.9370	**250.000** 9.8425
	≤	**20.000** 0.7874	**55.000** 2.1653	**100.000** 3.9370	**250.000** 9.8425	
Diameter	D_{1max}	F_w -0.3	F_w -0.5	F_w -0.7	F_w -1.0	F_w -1.5

LOAD RATING FACTORS

DYNAMIC LOADS

Needle roller bearings can accommodate only radial loads.

$$P = F_r \qquad (kN)$$

P = The maximum dynamic radial load that may be applied to a needle roller bearing based on the dynamic load rating, C_r, given in the bearing tables. This load should be ≤ $C_r/3$.

STATIC LOADS

Needle roller bearings can accommodate only radial loads.

$$P_0 = F_r \qquad (kN)$$

MOUNTING IN SETS

Radial needle roller and cage assemblies that are mounted side by side must have needle rollers of the same group limits to ensure uniform load distribution.

RNAO Series

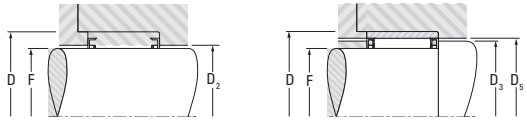


Fig. B4-9. Guidance in the housing (left) and on the shaft (right)

Table B4-7(1). Mounting dimensions for metric series needle roller bearings without flanges

Dimensions	Bearing series RNAO		
	D_3	D_2	D_5
FxD	Max.	Min.	Min.
mm in	mm in	mm in	mm in
10x17 0.3937x0.6693	**12.7** 0.5000	**10.3** 0.4055	**13.3** 0.5236
12x19 0.4724x0.7480	**14.7** 0.5787	**12.3** 0.4843	**15.3** 0.6024
14x22 0.5512x0.8661	**17.6** 0.6929	**14.4** 0.5669	**18.3** 0.7205
15x23 0.5906x0.9055	**18.6** 0.7323	**15.4** 0.6063	**19.3** 0.7598
16x24 0.6299x0.9499	**19.6** 0.7717	**16.4** 0.6457	**20.3** 0.7992
17x25 0.6693x0.9843	**20.6** 0.8110	**17.4** 0.6850	**21.3** 0.8386
18x26 0.7087x1.0236	**21.6** 0.8504	**18.4** 0.7244	**22.3** 0.8780
18x30 0.7087x1.1811	**23.6** 0.9291	**18.6** 0.7323	**24.5** 0.9646
20x28 0.7874x1.1024	**23.6** 0.9291	**20.4** 0.8032	**24.3** 0.9567
20x32 0.7874x1.2598	**25.6** 1.0079	**20.6** 0.8110	**26.5** 1.0433
22x30 0.8661x1.1811	**25.6** 1.0079	**22.4** 0.8819	**26.3** 0.9291
22x35 0.8661x1.3780	**28.4** 1.1181	**22.8** 0.8976	**29.5** 1.1614
25x35 0.9843x1.3780	**29.4** 1.1575	**25.6** 1.0079	**30.5** 1.2008
25x37 0.9843x1.4567	**31.4** 1.2362	**25.8** 1.0158	**32.5** 1.2795
28x40 1.1024x1.5748	**34.4** 1.3543	**28.8** 1.1339	**35.5** 1.3976
30x40 1.1811x1.5748	**34.4** 1.3543	**30.6** 1.2047	**35.5** 1.3976
30x42 1.1811x1.6535	**36.4** 1.4331	**30.8** 1.2126	**37.5** 1.4764
35x45 1.3780x1.7717	**39.4** 1.5512	**35.6** 1.4016	**40.5** 1.5945

Dimensions	Bearing series RNAO		
	D_3	D_2	D_5
FxD	Max.	Min.	Min.
mm in	mm in	mm in	mm in
35x47 1.3780x1.8504	**41.4** 1.6299	**35.8** 1.4096	**42.5** 1.6732
40x50 1.5748x1.9685	**44.4** 1.7480	**40.6** 1.5984	**45.5** 1.7913
40x55 1.5748x2.1654	**47.2** 1.8582	**41** 1.6142	**48.5** 1.9095
45x55 1.7717x2.1654	**49.4** 1.9449	**45.6** 1.7953	**50.5** 1.9882
45x62 1.7717x2.4409	**52.2** 2.0551	**46** 1.8110	**53.5** 2.1063
50x62 1.9685x2.4409	**54.4** 2.1417	**50.6** 1.9921	**55.8** 2.1969
50x65 1.9685x2.5591	**57.2** 2.2520	**51** 2.0079	**58.8** 2.3032
55x68 2.1654x2.6772	**59.4** 2.3386	**55.6** 2.1890	**60.8** 2.3937
55x72 2.1654x2.8347	**62.2** 2.4488	**56** 2.2047	**63.8** 2.5118
60x78 2.3622x3.0709	**67.2** 2.6457	**61** 2.4016	**68.8** 2.7087
65x85 2.5591x3.3465	**72.2** 2.8425	**66** 2.5984	**73.8** 2.9055
70x90 2.7559x3.5433	**77.2** 3.0394	**71** 2.7953	**78.8** 3.1024
75x95 2.9528x3.7402	**82.2** 3.2362	**76** 2.9921	**84** 3.3071
80x100 3.1496x3.9370	**87.2** 3.4331	**81** 3.1890	**89** 3.5039
85x105 3.3465x4.1339	**92.2** 3.6299	**86** 3.3858	**94** 3.7008
90x110 3.5433x4.3307	**97.2** 3.8268	**91** 3.5827	**99** 3.8976
95x115 3.7402x4.5276	**102.2** 4.0236	**96** 3.7795	**104** 4.0945
100x120 3.9370x4.7244	**107.2** 4.2205	**101** 3.9764	**109** 4.2913

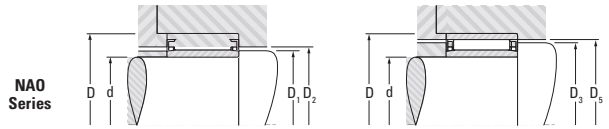


Fig. B4-10. Guidance in the housing (left) and on the shaft (right)

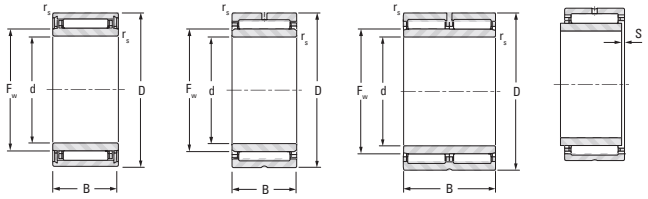
Table B4-7(2). Mounting dimensions for metric series needle roller bearings without flanges

Dimensions	Bearing series NAO			
	D_1	D_2	D_3	D_5
dxD	Max.	Min.	Max.	Min.
mm in	mm in	mm in	mm in	mm in
6x17 0.2362x'0.6693	**9.7** 0.3819	**10.3** 0.4055	**12.7** 0.5000	**13.3** 0.5236
8x19 0.3150x'0.7480	**11.7** 0.4606	**12.3** 0.4843	**14.7** 0.5787	**15.3** 0.6024
10x22 0.3937x'0.8661	**13.7** 0.5394	**14.4** 0.5669	**17.6** 0.6929	**18.3** 0.7205
10x26 0.3937x1.0236	**13.7** 0.5394	**14.6** 0.5748	**19.6** 0.7717	**20.3** 0.7992
12x24 0.4724x'0.9449	**15.7** 0.6181	**16.4** 0.6457	**19.6** 0.7717	**20.3** 0.7992
12x28 0.4724x1.1024	**15.7** 0.6181	**16.6** 0.6535	**21.6** 0.8504	**22.3** 0.878
15x28 0.5906x1.1024	**19.5** 0.7677	**20.4** 0.8032	**23.6** 0.9291	**24.3** 0.9567
15x32 0.5906x1.2598	**19.5** 0.7677	**20.6** 0.811	**25.6** 1.0079	**26.5** 1.0433
17x30 0.6693x1.1811	**21.5** 0.8465	**22.4** 0.8819	**25.6** 1.0079	**26.3** 1.0354
17x35 0.6693x1.3780	**21.5** 0.8465	**22.8** 0.8976	**28.4** 1.1181	**29.5** 1.1614
20x35 0.7874x1.3780	**24.5** 0.9646	**25.6** 1.0079	**29.4** 1.1575	**30.5** 1.2008
20x37 0.7874x1.4567	**24.5** 0.9646	**25.8** 1.0158	**31.4** 1.2362	**32.5** 1.2795
25x40 0.9843x1.5748	**29.5** 1.1614	**30.6** 1.2047	**34.4** 1.3543	**35.5** 1.3976
25x42 0.9843x1.6535	**29.5** 1.1614	**30.8** 1.2126	**36.4** 1.4331	**37.5** 1.4764
30x45 1.1811x1.7717	**34.5** 1.3583	**35.6** 1.4016	**39.4** 1.5512	**40.5** 1.5945
30x47 1.1811x1.8504	**34.5** 1.3583	**35.8** 1.4095	**41.4** 1.6299	**42.5** 1.6732

Dimensions	Bearing series NAO			
	D_1	D_2	D_3	D_5
dxD	Max.	Min.	Max.	Min.
mm in	mm in	mm in	mm in	mm in
35x50 1.3780x1.9685	**39.5** 1.5551	**40.6** 1.5984	**44.4** 1.748	**45.5** 1.7913
35x55 1.3780x2.1654	**39.5** 1.5551	**41** 1.6142	**47.2** 1.8583	**48.5** 1.9095
40x55 1.5748x2.1654	**44.5** 1.7520	**45.6** 1.7952	**49.4** 1.9449	**50.5** 1.9882
40x62 1.5748x2.4409	**44.5** 1.7520	**46** 1.8110	**52.2** 2.0551	**53.5** 2.1063
45x62 1.7717x2.4409	**49.5** 1.9488	**50.6** 1.9921	**54.4** 2.1417	**55.8** 2.1969
45x72 1.7717x2.8347	**54.5** 2.1457	**56** 2.2047	**62.2** 2.4488	**63.8** 2.5118
50x68 1.9685x2.6772	**54.5** 2.1457	**55.6** 2.1890	**59.4** 2.3386	**60.8** 2.3937
50x78 1.9685x3.0709	**59.3** 2.3347	**61** 2.4016	**67.2** 2.6457	**68.8** 2.7087
55x85 2.1654x3.3465	**64.3** 2.5315	**66** 2.5984	**72.2** 2.8425	**73.8** 2.9055
60x90 2.3622x3.5433	**69.3** 2.7284	**71** 2.7953	**77.2** 3.0394	**78.8** 3.1024
65x95 2.5591x3.7402	**74.3** 2.9252	**76** 2.9921	**82.2** 3.2362	**84** 3.3071
70x100 2.7559x3.9370	**79.3** 3.1221	**81** 3.1890	**87.2** 3.4331	**89** 3.5039
75x105 2.9528x4.1339	**84.3** 3.3189	**86** 3.3858	**92.2** 3.6299	**94** 3.7008
80x110 3.1496x4.3307	**89.3** 3.5158	**91** 3.5827	**97.2** 3.8268	**99** 3.8976
85x115 3.3465x4.5276	**94.3** 3.7126	**96** 3.7795	**102.2** 4.0236	**104** 4.0945
90x120 3.5433x4.7244	**99.3** 3.9095	**101** 3.9764	**107.2** 4.2205	**109** 4.2913

NEEDLE ROLLER BEARINGS WITH INNER RINGS

METRIC SERIES
NKJ, NKJS, NA48
NA49, NA69 SERIES



NKJ (d ≤ 7) | NKJ (d ≥ 9), NKJS, NA48, NA49, NA69 (d ≤ 30) | NA69 (d ≥ 32)

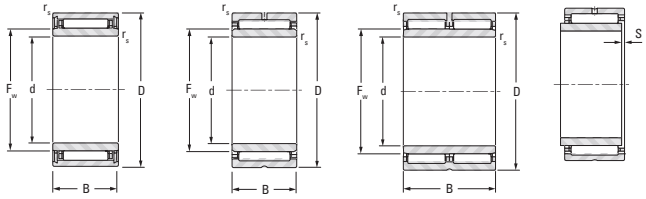
Shaft Dia.	d	D	B	F_w	$r_{s\,min.}$	s(1)	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.
								Dynamic	Static				
								C	C_0		Grease	Oil	
mm in	mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
5 0.1969	**5** 0.1969	**15** 0.5906	**12** 0.472	**8** 0.315	**0.3** 0.012	**1.5** 0.059	NKJ5/12	**4.57** 1030	**4.89** 1100	0.740	26000	41000	**0.014** 0.031
	5 0.1969	**15** 0.5906	**16** 0.63	**8** 0.315	**0.3** 0.012	**1.5** 0.059	NKJ5/16	**5.22** 1170	**5.78** 1300	0.880	26000	41000	**0.017** 0.037
6 0.2362	**6** 0.2362	**16** 0.6299	**12** 0.472	**9** 0.3543	**0.3** 0.012	**1.5** 0.059	NKJ6/12	**4.27** 960	**4.6** 1030	0.700	26000	40000	**0.015** 0.033
	6 0.2362	**16** 0.6299	**16** 0.63	**9** 0.3543	**0.3** 0.012	**1.5** 0.059	NKJ6/16	**5.57** 1250	**6.47** 1450	0.980	26000	40000	**0.019** 0.042
7 0.2756	**7** 0.2756	**17** 0.6693	**12** 0.472	**10** 0.3937	**0.3** 0.012	**1.5** 0.059	NKJ7/12	**5.4** 1210	**6.43** 1450	0.980	25000	39000	**0.017** 0.037
	7 0.2756	**17** 0.6693	**16** 0.63	**10** 0.3937	**0.3** 0.012	**1.5** 0.059	NKJ7/16TN	**5.3** 1190	**6.27** 1410	0.940	25000	39000	**0.021** 0.046
9 0.3543	**9** 0.3543	**19** 0.748	**12** 0.472	**12** 0.4724	**0.3** 0.012	**1.5** 0.059	NKJ9/12A	**6.86** 1540	**7.6** 1710	1.15	19000	30000	**0.018** 0.04
	9 0.3543	**19** 0.748	**16** 0.63	**12** 0.4724	**0.3** 0.012	**1.5** 0.059	NKJ9/16	**6.78** 1520	**9.03** 2030	1.40	19000	30000	**0.024** 0.053
10 0.3937	**10** 0.3937	**22** 0.8661	**13** 0.512	**14** 0.5512	**0.3** 0.012	**1** 0.039	NA4900	**9.39** 2110	**10.3** 2320	1.55	16000	24000	**0.025** 0.055
	10 0.3937	**22** 0.8661	**16** 0.63	**14** 0.5512	**0.6** 0.024	**1.5** 0.059	NKJ10/16A	**12.4** 2790	**14.8** 3330	2.10	16000	24000	**0.032** 0.071
	10 0.3937	**22** 0.8661	**20** 0.787	**14** 0.5512	**0.3** 0.012	**1.5** 0.059	NKJ10/20A	**14.7** 3300	**18.4** 4140	2.75	16000	24000	**0.04** 0.088
12 0.4724	**12** 0.4724	**24** 0.9449	**13** 0.512	**16** 0.6299	**0.3** 0.012	**1** 0.039	NA4901	**10.5** 2360	**12** 2700	1.85	18000	28000	**0.028** 0.062
	12 0.4724	**24** 0.9449	**16** 0.63	**16** 0.6299	**0.3** 0.012	**1.5** 0.059	NKJ12/16A	**13** 2920	**16.2** 3640	2.50	18000	28000	**0.036** 0.079
	12 0.4724	**24** 0.9449	**20** 0.787	**16** 0.6299	**0.3** 0.012	**1.5** 0.059	NKJ12/20A	**15.4** 3460	**20.2** 4540	3.20	18000	28000	**0.046** 0.101
	12 0.4724	**24** 0.9449	**22** 0.866	**16** 0.6299	**0.3** 0.012	**1** 0.039	NA6901A	**16.1** 3620	**21.3** 4790	3.55	18000	28000	**0.051** 0.11
15 0.5906	**15** 0.5906	**27** 1.063	**16** 0.63	**19** 0.748	**0.3** 0.012	**1.5** 0.059	NKJ15/16A	**14.1** 3170	**19** 4270	2.90	15000	24000	**0.042** 0.093
	15 0.5906	**27** 1.063	**20** 0.787	**19** 0.748	**0.3** 0.012	**1.5** 0.059	NKJ15/20A	**16.8** 3780	**23.6** 5310	3.75	15000	24000	**0.054** 0.119
	15 0.5906	**28** 1.1024	**13** 0.512	**20** 0.7874	**0.3** 0.012	**1** 0.039	NA4902	**11.8** 2650	**15.3** 3440	2.35	14000	22000	**0.037** 0.082
	15 0.5906	**28** 1.1024	**23** 0.906	**20** 0.7874	**0.3** 0.012	**1.5** 0.059	NA6902A	**18.4** 4140	**26.9** 6050	4.20	14000	22000	**0.067** 0.148
17 0.6693	**17** 0.6693	**29** 1.1417	**16** 0.63	**21** 0.8268	**0.3** 0.012	**2** 0.079	NKJ17/16A	**15.3** 3440	**21.6** 4860	3.30	14000	21000	**0.047** 0.104

(1) Max. axial displacement

Continued on next page.

NEEDLE ROLLER BEARINGS WITH INNER RINGS

METRIC SERIES
NKJ, NKJS, NA48
NA49, NA69 SERIES



NKJ (d ≤ 7) | **NKJ (d ≥ 9), NKJS, NA48, NA49, NA69 (d ≤ 30)** | **NA69 (d ≥ 32)**

Shaft Dia.	d	D	B	F_w	$r_{s\ min.}$	s(1)	Bearing Designation	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Speed Ratings Grease	Speed Ratings Oil	Approx. Wt.
mm in	mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
17 0.6693	**17** 0.6693	**29** 1.1417	**20** 0.787	**21** 0.8268	**0.3** 0.012	**1.5** 0.059	NKJ17/20A	**18.1** 4070	**23.9** 5370	4.25	14000	21000	**0.059** 0.13
	17 0.6693	**30** 1.1811	**13** 0.512	**22** 0.8661	**0.3** 0.012	**1** 0.039	NA4903	**12.2** 2740	**16.4** 3690	2.50	13000	20000	**0.04** 0.088
	17 0.6693	**30** 1.1811	**23** 0.906	**22** 0.8661	**0.6** 0.024	**1** 0.039	NA6903A	**19.8** 4450	**30.6** 6880	4.75	13000	20000	**0.084** 0.185
	17 0.6693	**37** 1.4567	**20** 0.787	**24** 0.9449	**0.6** 0.024	**1** 0.039	NKJS17A	**29.1** 6540	**32.8** 7370	5.30	13000	20000	**0.108** 0.238
20 0.7874	**20** 0.7874	**32** 1.2598	**16** 0.63	**24** 0.9449	**0.3** 0.012	**1.5** 0.059	NKJ20/16A	**16.2** 3640	**24.3** 5460	3.70	12000	18000	**0.053** 0.117
	20 0.7874	**32** 1.2598	**20** 0.787	**24** 0.9449	**0.3** 0.012	**1.5** 0.059	NKJ20/20A	**19.3** 4340	**30.3** 6810	4.80	12000	18000	**0.067** 0.148
	20 0.7874	**37** 1.4567	**17** 0.669	**25** 0.9843	**0.3** 0.012	**1.5** 0.059	NA4904	**21.3** 4790	**25.5** 5730	6.75	12000	18000	**0.084** 0.185
	20 0.7874	**37** 1.4567	**30** 1.181	**25** 0.9843	**0.3** 0.012	**1.5** 0.059	NA6904A	**36.6** 8230	**51** 11500	7.95	12000	18000	**0.133** 0.293
	20 0.7874	**42** 1.6535	**20** 0.787	**28** 1.1024	**0.6** 0.024	**1** 0.039	NKJS20A	**30.3** 6810	**38.4** 8630	6.15	11000	16000	**0.13** 0.287
22 0.8661	**22** 0.8661	**34** 1.3386	**16** 0.63	**26** 1.0236	**0.3** 0.012	**1.5** 0.059	NKJ22/16A	**16.6** 3730	**25.7** 5780	3.95	11000	17000	**0.058** 0.128
	22 0.8661	**34** 1.3386	**20** 0.787	**26** 1.0236	**0.3** 0.012	**2** 0.079	NKJ22/20A	**19.7** 4430	**32** 7190	5.05	11000	17000	**0.071** 0.157
	22 0.8661	**39** 1.5354	**17** 0.669	**28** 1.1024	**0.3** 0.012	**1.5** 0.059	NA49/22A	**23.3** 5240	**29.6** 6650	4.55	10000	16000	**0.089** 0.196
	22 0.8661	**39** 1.5354	**30** 1.181	**28** 1.1024	**0.3** 0.012	**1** 0.039	NA69/22A	**30.6** 6880	**50.7** 11400	7.85	10000	16000	**0.163** 0.359
25 0.9843	**25** 0.9843	**38** 1.4961	**20** 0.787	**29** 1.1417	**0.3** 0.012	**2** 0.079	NKJ25/20A	**23.4** 5260	**36.4** 8180	5.80	9800	15000	**0.086** 0.19
	25 0.9843	**38** 1.4961	**30** 1.181	**29** 1.1417	**0.3** 0.012	**2** 0.079	NKJ25/30A	**29.8** 6700	**56.4** 12700	8.70	9800	15000	**0.13** 0.287
	25 0.9843	**42** 1.6535	**17** 0.669	**30** 1.1811	**0.3** 0.012	**1.5** 0.059	NA4905	**24.3** 5460	**31.7** 7130	4.90	9700	15000	**0.099** 0.218
	25 0.9843	**42** 1.6535	**30** 1.181	**30** 1.1811	**0.3** 0.012	**1.5** 0.059	NA6905A	**39.7** 8920	**59.6** 13400	9.30	9700	15000	**0.178** 0.392
	25 0.9843	**47** 1.8504	**22** 0.866	**32** 1.2598	**0.6** 0.024	**1.5** 0.059	NKJS25A	**36** 8090	**36.2** 8140	7.40	9200	14000	**0.174** 0.384
28 1.1024	**28** 1.1024	**42** 1.6535	**20** 0.787	**32** 1.2598	**0.3** 0.012	**2** 0.079	NKJ28/20A	**24.8** 5580	**40.4** 9080	6.45	8800	14000	**0.104** 0.229
	28 1.1024	**42** 1.6535	**30** 1.181	**32** 1.2598	**0.3** 0.012	**2** 0.079	NKJ28/30A	**35.6** 8000	**64.3** 14500	9.95	8800	14000	**0.156** 0.344

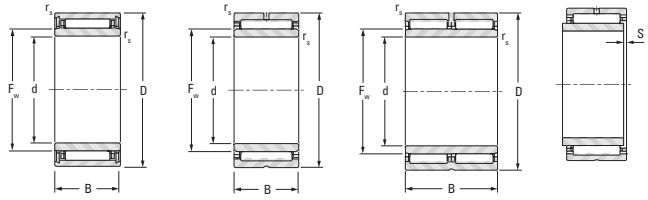
(1) Max. axial displacement

Shaft Dia.	d	D	B	F_w	$r_{s\ min.}$	s(1)	Bearing Designation	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Speed Ratings Grease	Speed Ratings Oil	Approx. Wt.
mm in	mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
28 1.1024	**28** 1.1024	**45** 1.7717	**17** 0.669	**32** 1.2598	**0.3** 0.012	**1.5** 0.059	NA49/28	**25.1** 5640	**33.8** 7600	5.20	9000	14000	**0.108** 0.238
	28 1.1024	**45** 1.7717	**30** 1.181	**32** 1.2598	**0.3** 0.012	**1.5** 0.059	NA69/28A	**37.1** 8340	**55.4** 12500	9.75	9000	14000	**0.19** 0.419
30 1.1811	**30** 1.1811	**45** 1.7717	**20** 0.787	**35** 1.378	**0.3** 0.012	**1.5** 0.059	NKJ30/20A	**26.1** 5870	**44.4** 9980	7.05	8000	12000	**0.12** 0.265
	30 1.1811	**45** 1.7717	**30** 1.181	**35** 1.378	**0.3** 0.012	**1.5** 0.059	NKJ30/30A	**37.4** 8410	**70.6** 15900	11.0	8000	12000	**0.179** 0.395
	30 1.1811	**47** 1.8504	**17** 0.669	**35** 1.378	**0.3** 0.012	**1.5** 0.059	NA4906	**25.9** 5820	**36** 8090	5.55	8200	13000	**0.114** 0.251
	30 1.1811	**47** 1.8504	**30** 1.181	**35** 1.378	**0.3** 0.012	**1** 0.039	NA6906A	**42.6** 9580	**68.2** 15300	10.6	8200	13000	**0.205** 0.452
	30 1.1811	**52** 2.0472	**22** 0.866	**37** 1.4567	**0.6** 0.024	**1.5** 0.059	NKJS30A	**39** 8770	**53.4** 12000	8.55	7900	12000	**0.198** 0.437
32 1.2598	**32** 1.2598	**47** 1.8504	**20** 0.787	**37** 1.4567	**0.3** 0.012	**2** 0.079	NKJ32/20	**26.1** 5870	**45.2** 10200	7.05	7600	12000	**0.127** 0.28
	32 1.2598	**47** 1.8504	**30** 1.181	**37** 1.4567	**0.3** 0.012	**1.5** 0.059	NKJ32/30A	**38.2** 8590	**73.9** 16600	11.5	7600	12000	**0.192** 0.423
	32 1.2598	**52** 2.0472	**20** 0.787	**40** 1.5748	**0.6** 0.024	**1.5** 0.059	NA49/32	**32** 7190	**49.3** 11100	7.85	7100	11000	**0.169** 0.373
	32 1.2598	**52** 2.0472	**36** 1.417	**40** 1.5748	**0.6** 0.024	**1** 0.039	NA69/32A	**48.6** 10900	**84.5** 19000	13.1	7100	11000	**0.313** 0.69
35 1.378	**35** 1.378	**50** 1.9685	**20** 0.787	**40** 1.5748	**0.3** 0.012	**2** 0.079	NKJ35/20A	**27.8** 6250	**50.4** 11300	8.05	7000	11000	**0.135** 0.298
	35 1.378	**50** 1.9685	**30** 1.181	**40** 1.5748	**0.3** 0.012	**1.5** 0.059	NKJ35/30A	**40** 8990	**80.2** 18000	12.4	7000	11000	**0.208** 0.459
	35 1.378	**55** 2.1654	**20** 0.787	**42** 1.6535	**0.6** 0.024	**1.5** 0.059	NA4907	**32.8** 7370	**51.7** 11600	8.25	6700	10000	**0.179** 0.395
	35 1.378	**55** 2.1654	**36** 1.417	**42** 1.6535	**0.6** 0.024	**1** 0.039	NA6907A	**49.9** 11200	**88.7** 19900	13.7	6700	10000	**0.34** 0.75
	35 1.378	**58** 2.2835	**22** 0.866	**43** 1.6929	**0.6** 0.024	**1** 0.039	NKJS35A	**41.6** 9350	**60.7** 13600	9.75	6700	10000	**0.235** 0.518
38 1.4961	**38** 1.4961	**53** 2.0866	**20** 0.787	**43** 1.6929	**0.3** 0.012	**2** 0.079	NKJ38/20A	**29** 6520	**54.4** 12200	8.65	6400	9900	**0.146** 0.322
	38 1.4961	**53** 2.0866	**30** 1.181	**43** 1.6929	**0.3** 0.012	**1.5** 0.059	NKJ38/30A	**41.6** 9350	**86.6** 19500	13.4	6400	9900	**0.196** 0.432
40 1.5748	**40** 1.5748	**55** 2.1654	**20** 0.787	**45** 1.7717	**0.3** 0.012	**2** 0.079	NKJ40/20A	**29.5** 6630	**56.4** 12700	9.00	6100	9400	**0.152** 0.335
	40 1.5748	**55** 2.1654	**30** 1.181	**45** 1.7717	**0.3** 0.012	**1.5** 0.059	NKJ40/30A	**42.3** 9510	**89.8** 20200	13.9	6100	9400	**0.229** 0.505
	40 1.5748	**62** 2.4409	**22** 0.866	**48** 1.8898	**0.6** 0.024	**1.5** 0.059	NA4908	**44.2** 9940	**67.8** 15200	10.9	5900	9100	**0.248** 0.547
	40 1.5748	**62** 2.4409	**40** 1.575	**48** 1.8898	**0.6** 0.024	**1.5** 0.059	NA6908A	**70.8** 15900	**124** 27900	19.8	5900	9100	**0.473** 1.043
	40 1.5748	**65** 2.5591	**22** 0.866	**50** 1.9685	**1** 0.039	**1** 0.039	NKJS40A	**45.5** 10200	**71.3** 16000	11.4	5700	8700	**0.292** 0.644
42 1.6535	**42** 1.6535	**57** 2.2441	**20** 0.787	**47** 1.8504	**0.3** 0.012	**2** 0.079	NKJ42/20A	**30** 6740	**58.5** 13200	9.30	5900	9000	**0.159** 0.351
	42 1.6535	**57** 2.2441	**30** 1.181	**47** 1.8504	**0.3** 0.012	**1.5** 0.059	NKJ42/30A	**39.9** 8970	**84.1** 18900	13.0	5900	9000	**0.241** 0.531
45 1.7717	**45** 1.7717	**62** 2.4409	**25** 0.984	**50** 1.9685	**0.6** 0.024	**3** 0.118	NKJ45/25A	**40.7** 9150	**79.3** 17800	12.5	5500	8500	**0.223** 0.492

Continued on next page.

NEEDLE ROLLER BEARINGS WITH INNER RINGS

METRIC SERIES
NKJ, NKJS, NA48
NA49, NA69 SERIES



NKJ (d ≤ 7) | **NKJ (d ≥ 9), NKJS, NA48, NA49, NA69 (d ≤ 30)** | **NA69 (d ≥ 32)**

Shaft Dia.	d	D	B	F_w	$r_{s\ min.}$	s(1)	Bearing Designation	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Speed Ratings Grease	Speed Ratings Oil	Approx. Wt.
mm in	mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
45 1.7717	**45** 1.7717	**62** 2.4409	**35** 1.378	**50** 1.9685	**0.6** 0.024	**3** 0.118	NKJ45/35A	**55** 12400	**117** 26300	18.2	5500	8500	**0.345** 0.761
	45 1.7717	**68** 2.6772	**22** 0.866	**52** 2.0472	**0.6** 0.024	**2** 0.079	NA4909	**46.8** 10500	**74.8** 16800	12.0	5400	8400	**0.291** 0.642
	45 1.7717	**68** 2.6772	**40** 1.575	**52** 2.0472	**0.6** 0.024	**1.5** 0.059	NA6909A	**74.7** 16800	**137** 30800	21.7	5400	8400	**0.55** 1.232
	45 1.7717	**72** 2.8346	**22** 0.866	**55** 2.1654	**1** 0.039	**1** 0.039	NKJS45A	**47.9** 10800	**78.4** 17600	12.6	5100	7900	**0.36** 0.794
50 1.9685	**50** 1.9685	**68** 2.6772	**25** 0.984	**55** 2.1654	**0.6** 0.024	**3** 0.118	NKJ50/25A	**46.1** 10400	**87.3** 19600	13.9	5000	7800	**0.288** 0.635
	50 1.9685	**68** 2.6772	**35** 1.378	**55** 2.1654	**0.6** 0.024	**3** 0.118	NKJ50/35A	**62.3** 14000	**129** 29000	20.0	5000	7800	**0.406** 0.895
	50 1.9685	**72** 2.8346	**22** 0.866	**58** 2.2835	**0.6** 0.024	**2** 0.079	NA4910	**48.9** 11000	**82** 18400	13.2	4800	7400	**0.296** 0.653
	50 1.9685	**72** 2.8346	**40** 1.575	**58** 2.2835	**0.6** 0.024	**1.5** 0.059	NA6910A	**75.7** 17000	**144** 32400	22.8	4800	7400	**0.577** 1.272
	50 1.9685	**80** 3.1496	**28** 1.102	**60** 2.3622	**1.1** 0.043	**1.5** 0.059	NKJS50A	**66.9** 15000	**103** 23200	16.5	4800	7300	**0.523** 1.153
55 2.1654	**55** 2.1654	**72** 2.8346	**25** 0.984	**60** 2.3622	**0.6** 0.024	**3** 0.118	NKJ55/25A	**44.3** 9960	**94** 21100	14.9	4600	7000	**0.29** 0.639
	55 2.1654	**72** 2.8346	**35** 1.378	**60** 2.3622	**0.6** 0.024	**3** 0.118	NKJ55/35A	**59.9** 13500	**139** 31200	21.5	4600	7000	**0.41** 0.904
	55 2.1654	**80** 3.1496	**25** 0.984	**63** 2.4803	**1** 0.039	**2.5** 0.098	NA4911	**62** 13900	**107** 24100	17.1	4500	6900	**0.426** 0.939
	55 2.1654	**80** 3.1496	**45** 1.772	**63** 2.4803	**1** 0.039	**2.5** 0.098	NA6911A	**94.2** 21200	**172** 38700	27.8	4500	6900	**0.8** 1.764
	55 2.1654	**85** 3.3465	**28** 1.102	**65** 2.5591	**1.1** 0.043	**1.5** 0.059	NKJS55A	**71** 16000	**114** 25600	18.3	4400	6700	**0.569** 1.254
60 2.3622	**60** 2.3622	**82** 3.2283	**25** 0.984	**68** 2.6772	**0.6** 0.024	**2** 0.079	NKJ60/25A	**49** 11000	**101** 22700	16.1	4000	6200	**0.44** 0.97
	60 2.3622	**82** 3.2283	**35** 1.378	**68** 2.6772	**0.6** 0.024	**2.5** 0.098	NKJ60/35A	**66.2** 14900	**149** 33500	23.2	4000	6200	**0.52** 1.146
	60 2.3622	**85** 3.3465	**25** 0.984	**68** 2.6772	**1** 0.039	**1.5** 0.059	NA4912	**64.8** 14600	**116** 26100	18.6	4100	6300	**0.457** 1.008
	60 2.3622	**85** 3.3465	**45** 1.772	**68** 2.6772	**1** 0.039	**2** 0.079	NA6912A	**99.3** 22300	**189** 42500	30.5	4100	6400	**0.829** 1.828
	60 2.3622	**90** 3.5433	**28** 1.102	**70** 2.7559	**1.1** 0.043	**1.5** 0.059	NKJS60A	**72.6** 16300	**120** 27000	19.3	4000	6200	**0.607** 1.338
65 2.5591	**65** 2.5591	**90** 3.5433	**25** 0.984	**72** 2.8346	**1** 0.039	**1.5** 0.059	NA4913	**66** 14800	**121** 27200	19.4	3900	5900	**0.489** 1.078

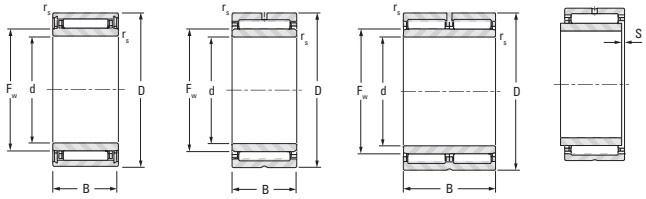
(1) Max. axial displacement

Shaft Dia.	d	D	B	F_w	$r_{s\ min.}$	s(1)	Bearing Designation	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Speed Ratings Grease	Speed Ratings Oil	Approx. Wt.
mm in	mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
65 2.5591	**65** 2.5591	**90** 3.5433	**25** 0.984	**73** 2.874	**0.6** 0.024	**2** 0.079	NKJ65/25A	**61.5** 13800	**119** 26800	19.0	3800	5800	**0.5** 1.102
	65 2.5591	**90** 3.5433	**35** 1.378	**73** 2.874	**0.6** 0.024	**2** 0.079	NKJ65/35A	**82.5** 18500	**173** 38900	27.1	3800	5800	**0.69** 1.521
	65 2.5591	**90** 3.5433	**45** 1.772	**72** 2.8346	**1** 0.039	**2** 0.079	NA6913A	**107** 24100	**213** 47900	34.5	3900	6000	**0.945** 2.083
	65 2.5591	**95** 3.7402	**28** 1.102	**75** 2.9528	**1.1** 0.043	**1.5** 0.059	NKJS65A	**76.5** 17200	**132** 29700	21.1	3700	5800	**0.655** 1.444
70 2.7559	**70** 2.7559	**95** 3.7402	**25** 0.984	**80** 3.1496	**1** 0.039	**2** 0.079	NKJ70/25A	**65** 14600	**131** 29400	21.0	3400	5300	**0.561** 1.237
	70 2.7559	**95** 3.7402	**35** 1.378	**80** 3.1496	**1** 0.039	**3.5** 0.138	NKJ70/35A	**79.7** 17900	**184** 41400	28.7	3400	5300	**0.779** 1.717
	70 2.7559	**100** 3.937	**28** 1.102	**80** 3.1496	**1.1** 0.043	**1.5** 0.059	NKJS70A	**80.1** 18000	**143** 32100	22.9	3500	5400	**0.772** 1.702
	70 2.7559	**100** 3.937	**30** 1.181	**80** 3.1496	**1** 0.039	**2.5** 0.098	NA4914	**86.3** 19400	**157** 35300	25.1	3500	5400	**0.772** 1.702
	70 2.7559	**100** 3.937	**54** 2.126	**80** 3.1496	**1** 0.039	**2** 0.079	NA6914A	**137** 30800	**286** 64300	45.7	3500	5400	**1.45** 3.197
75 2.9528	**75** 2.9528	**105** 4.1339	**25** 0.984	**85** 3.3465	**1** 0.039	**2** 0.079	NKJ75/25A	**76.4** 17200	**137** 30800	22.2	3300	5000	**0.64** 1.411
	75 2.9528	**105** 4.1339	**30** 1.181	**85** 3.3465	**1** 0.039	**2.5** 0.098	NA4915	**92.4** 20800	**175** 39300	28.0	3300	5000	**0.817** 1.801
	75 2.9528	**105** 4.1339	**32** 1.26	**90** 3.5433	**1.1** 0.043	**1.5** 0.059	NKJS75A	**91.5** 20600	**176** 39600	28.1	3100	4700	**1.06** 2.337
	75 2.9528	**105** 4.1339	**35** 1.378	**85** 3.3465	**1** 0.039	**2** 0.079	NKJ75/35A	**108** 24300	**214** 48100	33.6	3300	5000	**1.05** 2.315
	75 2.9528	**105** 4.1339	**54** 2.126	**85** 3.3465	**1** 0.039	**2** 0.079	NA6915A	**143** 32100	**308** 69200	49.3	3300	5000	**1.554** 3.426
80 3.1496	**80** 3.1496	**110** 4.3307	**25** 0.984	**90** 3.5433	**1** 0.039	**2** 0.079	NKJ80/25A	**79.5** 17900	**147** 33000	23.8	3100	4700	**0.79** 1.742
	80 3.1496	**110** 4.3307	**30** 1.181	**90** 3.5433	**1** 0.039	**2.5** 0.098	NA4916	**91.5** 20600	**176** 39600	28.1	3100	4700	**0.862** 1.9
	80 3.1496	**110** 4.3307	**32** 1.26	**95** 3.7402	**1.1** 0.043	**2** 0.079	NKJS80A	**95.1** 21400	**188** 42300	30.0	2900	4500	**1.14** 2.513
	80 3.1496	**110** 4.3307	**35** 1.378	**90** 3.5433	**1** 0.039	**2** 0.079	NKJ80/35A	**113** 25400	**230** 51700	36.1	3100	4700	**0.98** 2.161
	80 3.1496	**110** 4.3307	**54** 2.126	**90** 3.5433	**1** 0.039	**2** 0.079	NA6916A	**126** 28300	**320** 71900	50.8	3000	4700	**1.615** 3.56
85 3.3465	**85** 3.3465	**115** 4.5276	**26** 1.024	**95** 3.7402	**1** 0.039	**3** 0.118	NKJ85/26A	**49.3** 11100	**114** 25600	24.6	2800	4400	**0.862** 1.9
	85 3.3465	**115** 4.5276	**36** 1.417	**95** 3.7402	**1** 0.039	**2** 0.079	NKJ85/36A	**114** 25600	**238** 53500	37.3	2800	4400	**1.04** 2.293
	85 3.3465	**120** 4.7244	**35** 1.378	**100** 3.937	**1.1** 0.043	**2.5** 0.098	NA4917	**110** 24700	**230** 51700	36.0	2800	4200	**1.31** 2.888
	85 3.3465	**120** 4.7244	**63** 2.48	**100** 3.937	**1.1** 0.043	**2** 0.079	NA6917A	**150** 33700	**416** 93500	64.2	2700	4200	**2.427** 5.351
90 3.5433	**90** 3.5433	**120** 4.7244	**26** 1.024	**100** 3.937	**1** 0.039	**3** 0.118	NKJ90/26A	**83.6** 18800	**163** 36600	25.8	2800	4200	**0.78** 1.72
	90 3.5433	**120** 4.7244	**36** 1.417	**100** 3.937	**1** 0.039	**2.5** 0.098	NKJ90/36A	**118** 26500	**254** 57100	39.1	2800	4200	**1.08** 2.381
	90 3.5433	**125** 4.9213	**35** 1.378	**105** 4.1339	**1.1** 0.043	**2.5** 0.098	NA4918	**114** 25600	**245** 55100	37.8	2600	4000	**1.37** 3.02

Continued on next page.

NEEDLE ROLLER BEARINGS WITH INNER RINGS

METRIC SERIES
NKJ, NKJS, NA48
NA49, NA69 SERIES



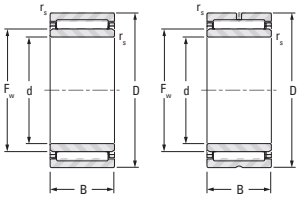
NKJ (d ≤ 7) | **NKJ (d ≥ 9), NKJS, NA48, NA49, NA69 (d ≤ 30)** | **NA69 (d ≥ 32)**

Shaft Dia.	d	D	B	F_w	$r_{s\,min.}$	s(1)	Bearing Designation	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Speed Ratings Grease	Speed Ratings Oil	Approx. Wt.
mm in	mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
90 3.5433	**90** 3.5433	**125** 4.9213	**63** 2.48	**105** 4.1339	**1.1** 0.043	**2** 0.079	NA6918A	**175** 39300	**427** 96000	66.0	2600	4000	**2.64** 5.82
95 3.7402	**95** 3.7402	**125** 4.9213	**26** 1.024	**105** 4.1339	**1** 0.039	**2.5** 0.098	NKJ95/26A	**52.2** 11700	**127** 28600	19.9	2600	3900	**0.935** 2.061
	95 3.7402	**130** 5.1181	**35** 1.378	**110** 4.3307	**1.1** 0.043	**2.5** 0.098	NA4919	**115** 25900	**253** 56900	38.4	2500	3800	**1.43** 3.153
	95 3.7402	**130** 5.1181	**63** 2.48	**110** 4.3307	**1.1** 0.043	**2** 0.079	NA6919A	**158** 35500	**458** 103000	68.8	2500	3800	**2.67** 5.88
100 3.937	**100** 3.937	**130** 5.1181	**30** 1.181	**110** 4.3307	**1.1** 0.043	**2** 0.079	NKJ100/30A	**103** 23200	**220** 49500	33.6	2500	3800	**0.984** 2.169
	100 3.937	**130** 5.1181	**40** 1.575	**110** 4.3307	**1.1** 0.043	**2** 0.079	NKJ100/40	**130** 29200	**296** 66500	44.8	2500	3800	**1.41** 3.109
	100 3.937	**135** 5.315	**32** 1.26	**115** 4.5276	**1.1** 0.043	**2** 0.079	NKJS100A	**104** 23400	**226** 50800	34.1	2400	3700	**2.01** 4.431
	100 3.937	**140** 5.5118	**40** 1.575	**115** 4.5276	**1.1** 0.043	**3.5** 0.138	NA4920	**139** 31200	**296** 66500	43.9	2400	3700	**2.01** 4.431
110 4.3307	**110** 4.3307	**140** 5.5118	**30** 1.181	**120** 4.7244	**1** 0.039	**0.5** 0.02	NA4822	**90.3** 20300	**230** 51700	33.7	2300	3500	**1.21** 2.668
	110 4.3307	**150** 5.9055	**40** 1.575	**125** 4.9213	**1.1** 0.043	**3.5** 0.138	NA4922	**147** 33000	**325** 73100	47.0	2200	3400	**2.19** 4.828
120 4.7244	**120** 4.7244	**150** 5.9055	**30** 1.181	**130** 5.1181	**1** 0.039	**0.5** 0.02	NA4824	**94.2** 21200	**249** 56000	35.7	2100	3200	**1.31** 2.888
	120 4.7244	**165** 6.4961	**45** 1.772	**135** 5.315	**1.1** 0.043	**3.5** 0.138	NA4924	**177** 39800	**407** 91500	58.5	2000	3100	**3.04** 6.702
130 5.1181	**130** 5.1181	**165** 6.4961	**35** 1.378	**145** 5.7087	**1.1** 0.043	**1** 0.039	NA4826	**112** 25200	**323** 72600	44.8	1900	2900	**1.99** 4.387
	130 5.1181	**180** 7.0866	**50** 1.969	**150** 5.9055	**1.5** 0.059	**3** 0.118	NA4926	**201** 45200	**495** 111000	68.7	1800	2800	**4.14** 9.127
140 5.5118	**140** 5.5118	**175** 6.8898	**35** 1.378	**155** 6.1024	**1.1** 0.043	**1** 0.039	NA4828	**116** 26100	**346** 77800	47.1	1700	2700	**2.12** 4.674
	140 5.5118	**190** 7.4803	**50** 1.969	**160** 6.2992	**1.5** 0.059	**3** 0.118	NA4928	**214** 48100	**549** 123000	74.8	1700	2600	**4.41** 9.72
150 5.9055	**150** 5.9055	**190** 7.4803	**40** 1.575	**165** 6.4961	**1.1** 0.043	**2** 0.079	NA4830A	**142** 31900	**402** 90400	53.5	1600	2500	**2.7** 5.952
160 6.2992	**160** 6.2992	**200** 7.874	**40** 1.575	**175** 6.8898	**1.1** 0.043	**2** 0.079	NA4832A	**146** 32800	**425** 95500	46.6	1500	2400	**3.15** 6.944

(1) Max. axial displacement

NEEDLE ROLLER BEARINGS WITH INNER RINGS

METRIC SERIES
NQI, NA49 SERIES



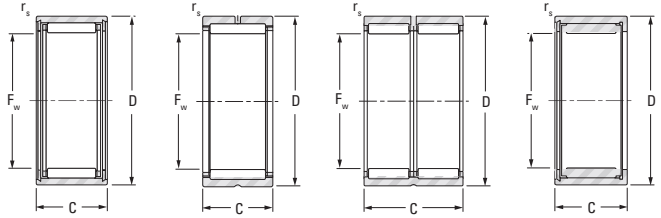
NQI | **NA49**

Shaft Dia.	d	D	B	F_w	$r_{s\,min.}$	s(1)	Bearing Designation	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Speed Ratings Grease	Speed Ratings Oil	Approx. Wt.
mm in	mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
12 0.4724	**12**	**24**	**13**	**16**	**0.3**	—	NA4901C3	**8.65**	**11.1**	1.70	—	28000	**0.027**
20 0.7874	**20**	**32**	**20**	**24**	**0.3**	—	NQI203220AD	**17.4**	**26.5**	4.15	—	18000	**0.062**
	20	**37**	**17**	**25**	**0.3**	—	NA4904NA	**16.2**	**21.5**	3.25	—	18000	**0.083**
25 0.9843	**25**	**44**	**25**	**30**	**0.3**	—	25NQI4425A(2)	**36.6**	**49.6**	7.90	—	15000	**0.161**
30 1.1811	**30**	**47**	**17**	**35**	**0.3**	—	NA4906D	**20.2**	**31.9**	4.85	—	12000	**0.114**
38 1.4961	**38**	**53**	**30**	**43**	**0.6**	—	NQI38/30	**41.3**	**85.9**	13.4	—	9900	**0.205**

(1) Max. axial displacement
(2) Inner ring width 25.5mm

NEEDLE ROLLER BEARINGS WITHOUT INNER RINGS

METRIC SERIES
NK, NKS, RNA48, RNA49
RNA69, NKTN SERIES



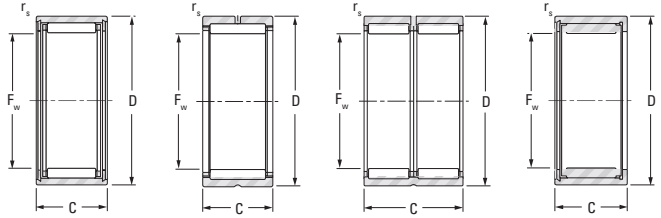
NK (Fw ≤ 10) | NK (Fw ≥ 12), NKS, RNA48, RNA49, RNA69 (Fw ≤ 35) | RNA69 (Fw ≥ 40) | NKTN

Shaft Dia.	F_w	D	C	$r_{s\,min.}$	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.
						Dynamic	Static		Grease	Oil	
						C	C_0				
mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
5 0.1969	5 0.1969	10 0.3937	10 0.394	0.2 0.006	NK5/10TN	2.18 490	1.71 384	0.260	31000	47000	0.004 0.009
	5 0.1969	10 0.3937	12 0.472	0.2 0.006	NK5/12TN	3.04 683	2.63 591	0.400	31000	47000	0.004 0.009
6 0.2362	6 0.2362	12 0.4724	10 0.394	0.2 0.006	NK6/10	3.19 717	2.9 652	0.420	29000	44000	0.005 0.011
	6 0.2362	12 0.4724	12 0.472	0.2 0.006	NK6/12TN	3.07 690	2.74 616	0.420	29000	44000	0.006 0.013
7 0.2756	7 0.2756	14 0.5512	10 0.394	0.3 0.012	NK7/10TN	2.74 616	2.44 549	0.370	28000	42000	0.007 0.015
	7 0.2756	14 0.5512	12 0.472	0.3 0.012	NK7/12TN	3.4 764	3.22 724	0.490	28000	42000	0.009 0.020
8 0.315	8 0.315	15 0.5906	12 0.472	0.3 0.012	NK8/12	4.57 1030	4.89 1 100	0.740	26000	41000	0.011 0.024
	8 0.315	15 0.5906	12 0.472	0.3 0.012	NK8/12ASR1	4.57 1030	4.89 1100	0.740	26000	41000	0.011 0.024
	8 0.315	15 0.5906	16 0.63	0.3 0.012	NK8/16	5.22 1170	5.78 1300	0.880	26000	41000	0.013 0.029
9 0.3543	9 0.3543	16 0.6299	12 0.472	0.3 0.012	NK9/12	4.27 960	4.6 1030	0.700	26000	40000	0.012 0.026
	9 0.3543	16 0.6299	16 0.63	0.3 0.012	NK9/16	5.57 1250	6.47 1450	0.980	26000	40000	0.015 0.033
10 0.3937	10 0.3937	17 0.6693	12 0.472	0.3 0.012	NK10/12	5.4 1210	6.43 1450	0.980	25000	39000	0.013 0.029
	10 0.3937	17 0.6693	16 0.63	0.3 0.012	NK10/16TN	5.3 1190	6.27 1410	0.940	25000	39000	0.015 0.033
12 0.4724	12 0.4724	19 0.748	12 0.472	0.3 0.012	NK12/12A	6.86 1540	7.6 1710	1.15	19000	30000	0.013 0.029
	12 0.4724	19 0.748	16 0.63	0.3 0.012	NK12/16	6.78 1520	9.03 2030	1.40	24000	37000	0.018 0.040
14 0.5512	14 0.5512	22 0.8661	13 0.512	0.3 0.012	RNA4900	9.39 2110	10.3 2320	1.55	16000	24000	0.018 0.040
	14 0.5512	22 0.8661	16 0.63	0.3 0.012	NK14/16A	12.4 2790	14.8 3330	2.25	16000	24000	0.023 0.051
	14 0.5512	22 0.8661	20 0.787	0.3 0.012	NK14/20A	14.7 3300	18.4 4140	2.90	16000	24000	0.028 0.060
15 0.5906	15 0.5906	23 0.9055	16 0.63	0.3 0.012	NK15/16A	12.4 2790	15 3370	2.30	15000	24000	0.024 0.053
	15 0.5906	23 0.9055	20 0.787	0.3 0.012	NK15/20A	14.7 3300	18.6 4180	2.95	15000	24000	0.031 0.068
16 0.6299	16 0.6299	24 0.9449	13 0.512	0.3 0.012	RNA4901	10.5 2360	12.3 2770	1.85	18000	28000	0.020 0.044
	16 0.6299	24 0.9449	16 0.63	0.3 0.012	NK16/16A	13 2920	16.2 3640	2.50	18000	28000	0.025 0.055
16 0.6299	16 0.6299	24 0.9449	20 0.787	0.3 0.012	NK16/20A	15.4 3460	20.2 4540	3.20	18000	28000	0.036 0.079
	16 0.6299	24 0.9449	22 0.866	0.3 0.012	RNA6901	16.1 3620	21.3 4790	3.30	18000	28000	0.036 0.079
17 0.6693	17 0.6693	25 0.9843	16 0.63	0.3 0.012	NK17/16A	13.6 3060	17.5 3930	2.70	17000	27000	0.027 0.060
	17 0.6693	25 0.9843	20 0.787	0.3 0.012	NK17/20A	15.4 3460	20.4 4590	3.25	17000	27000	0.034 0.075
18 0.7087	18 0.7087	26 1.0236	16 0.63	0.3 0.012	NK18/16A	13.6 3060	17.7 3980	2.70	16000	25000	0.028 0.062
	18 0.7087	26 1.0236	20 0.787	0.3 0.012	NK18/20A	16.1 3620	22.0 4950	3.50	16000	25000	0.035 0.077
	18 0.7087	30 1.1811	16 0.63	0.3 0.012	NKS18A	15.9 3570	16.2 3640	2.45	17000	26000	0.045 0.099
19 0.748	19 0.748	27 1.063	16 0.63	0.3 0.012	NK19/16A	14.1 3170	19.0 4270	2.90	15000	24000	0.029 0.064
	19 0.748	27 1.063	20 0.787	0.3 0.012	NK19/20A	18.8 4230	23.6 5310	3.75	15000	24000	0.037 0.082
20 0.7874	20 0.7874	28 1.1024	13 0.512	0.3 0.012	RNA4902	11.8 2650	15.3 3440	2.35	14000	22000	0.023 0.051
	20 0.7874	28 1.1024	16 0.63	0.3 0.012	NK20/16A	14.1 3170	19.1 4290	2.90	14000	22000	0.030 0.066
	20 0.7874	28 1.1024	20 0.787	0.3 0.012	NK20/20A	17.5 3930	25.3 5690	4.00	14000	22000	0.038 0.084
	20 0.7874	28 1.1024	23 0.906	0.3 0.012	RNA6902A	18.4 4140	26.9 6050	4.20	14000	22000	0.042 0.093
	20 0.7874	32 1.2598	20 0.787	0.6 0.024	NKS20A	24.4 5490	26.7 6000	4.30	15000	24000	0.058 0.128
21 0.8268	21 0.8268	29 1.1417	16 0.63	0.3 0.012	NK21/16A	15.3 3440	21.6 4860	3.30	14000	21000	0.032 0.071
	21 0.8268	29 1.1417	20 0.787	0.3 0.012	NK21/20A	18.1 4070	26.9 6050	4.25	14000	21000	0.040 0.088
22 0.8661	22 0.8661	30 1.1811	13 0.512	0.3 0.012	RNA4903	12.2 2740	16.4 3690	2.50	13000	20000	0.025 0.055
	22 0.8661	30 1.1811	16 0.63	0.3 0.012	NK22/16A	15.2 3420	21.7 4880	3.30	13000	20000	0.033 0.073
	22 0.8661	30 1.1811	20 0.787	0.3 0.012	NK22/20A	18 4050	27 6070	4.30	13000	20000	0.041 0.090
	22 0.8661	30 1.1811	23 0.906	0.3 0.012	RNA6903A	19.8 4450	30.6 6880	4.75	13000	20000	0.056 0.123
	22 0.8661	35 1.378	20 0.787	0.6 0.024	NKS22A	22.9 5150	27.1 6090	4.30	14000	21000	0.069 0.152
24 0.9449	24 0.9449	32 1.2598	16 0.63	0.3 0.012	NK24/16A	16.2 3640	24.3 5460	3.70	12000	18000	0.035 0.077
	24 0.9449	32 1.2598	20 0.787	0.3 0.012	NK24/20A	19.3 4340	30.3 6810	4.80	12000	18000	0.045 0.099
	24 0.9449	37 1.4567	20 0.787	0.6 0.024	NKS24A	29.1 6540	32.8 7370	5.30	13000	20000	0.073 0.161
25 0.9843	25 0.9843	33 1.2992	16 0.63	0.3 0.012	NK25/16A	16.1 3620	24.4 5490	3.75	11000	17000	0.037 0.082
	25 0.9843	33 1.2992	20 0.787	0.3 0.012	NK25/20A	19.1 4290	30.4 6830	4.80	11000	17000	0.047 0.104
	25 0.9843	37 1.4567	17 0.669	0.3 0.012	RNA4904	21.3 4790	25.5 5730	3.95	12000	18000	0.061 0.134
	25 0.9843	37 1.4567	30 1.181	0.3 0.012	RNA6904A	36.6 8230	51.0 11500	7.95	12000	18000	0.091 0.201

Continued on next page.

NEEDLE ROLLER BEARINGS WITHOUT INNER RINGS

METRIC SERIES
NK, NKS, RNA48, RNA49
RNA69, NKTN SERIES



NK (Fw ≤ 10) | NK (Fw ≥ 12), NKS, RNA48, RNA49, RNA69 (Fw ≤ 35) | RNA69 (Fw ≥ 40) | NKTN

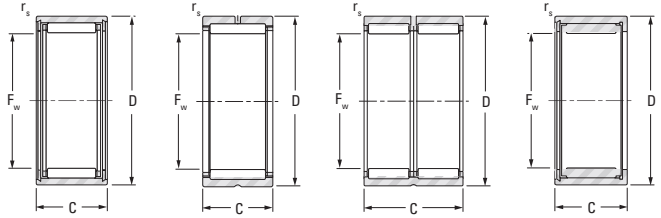
Shaft Dia.	F_w	D	C	$r_{s\,min.}$	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.
						Dynamic	Static		Grease	Oil	
						C	C_0				
mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
25 0.9843	**25** 0.9843	**38** 1.4961	**20** 0.787	**0.6** 0.024	NKS25A	**29.1** 6540	**33** 7420	5.30	12000	19000	**0.076** 0.168
26 1.0236	**26** 1.0236	**34** 1.3386	**16** 0.63	**0.3** 0.012	NK26/16A	**16.6** 3730	**25.7** 5780	3.95	11000	17000	**0.039** 0.086
	26 1.0236	**34** 1.3386	**20** 0.787	**0.3** 0.012	NK26/20A	**19.7** 4430	**32** 7190	5.05	11000	17000	**0.048** 0.106
28 1.1024	**28** 1.1024	**37** 1.4567	**20** 0.787	**0.3** 0.012	NK28/20A	**22.6** 5080	**34.4** 7730	5.50	10000	16000	**0.057** 0.126
	28 1.1024	**37** 1.4567	**30** 1.181	**0.3** 0.012	NK28/30A	**29** 6520	**53.8** 12100	8.30	10000	16000	**0.088** 0.194
	28 1.1024	**39** 1.5354	**17** 0.669	**0.3** 0.012	RNA49/22	**23.3** 5240	**29.6** 6650	4.55	10000	16000	**0.059** 0.130
	28 1.1024	**39** 1.5354	**30** 1.181	**0.3** 0.012	RNA69/22A	**30.6** 6880	**50.7** 11400	3.95	10000	16000	**0.107** 0.236
	28 1.1024	**42** 1.6535	**20** 0.787	**0.6** 0.024	NKS28A	**30.3** 6810	**38.4** 8630	6.15	11000	16000	**0.094** 0.207
29 1.1417	**29** 1.1417	**38** 1.4961	**20** 0.787	**0.3** 0.012	NK29/20A	**23.4** 5260	**36.4** 8180	5.80	9800	15000	**0.059** 0.130
	29 1.1417	**38** 1.4961	**30** 1.181	**0.3** 0.012	NK29/30A	**29.8** 6700	**56.4** 12700	8.70	9700	15000	**0.090** 0.198
30 1.1811	**30** 1.1811	**40** 1.5748	**20** 0.787	**0.3** 0.012	NK30/20A	**24.2** 5440	**38.3** 8610	6.10	9500	15000	**0.071** 0.157
	30 1.1811	**40** 1.5748	**30** 1.181	**0.3** 0.012	NK30/30A	**34.7** 7800	**61** 13700	9.45	9500	15000	**0.107** 0.236
	30 1.1811	**42** 1.6535	**17** 0.669	**0.3** 0.012	RNA4905	**24.3** 5460	**31.7** 7130	4.90	9700	15000	**0.071** 0.157
	30 1.1811	**42** 1.6535	**30** 1.181	**0.3** 0.012	RNA6905A	**39.7** 8920	**59.6** 13400	9.30	9700	15000	**0.127** 0.280
	30 1.1811	**45** 1.7717	**20** 0.787	**0.6** 0.024	NKS30A	**34.3** 7710	**42.8** 9620	6.85	9900	15000	**0.114** 0.251
32 1.2598	**32** 1.2598	**42** 1.6535	**20** 0.787	**0.3** 0.012	NK32/20A	**24.8** 5580	**40.4** 9080	6.45	8800	14000	**0.074** 0.163
	32 1.2598	**42** 1.6535	**30** 1.181	**0.3** 0.012	NK32/30A	**35.6** 8000	**64.3** 14500	9.95	8800	14000	**0.112** 0.247
	32 1.2598	**45** 1.7717	**17** 0.669	**0.3** 0.012	RNA49/28	**25.1** 5640	**33.8** 7600	5.20	9000	14000	**0.080** 0.176
	32 1.2598	**45** 1.7717	**30** 1.181	**0.3** 0.012	RNA69/28A	**43.2** 9710	**62.5** 14100	9.75	9100	14000	**0.140** 0.309
	32 1.2598	**47** 1.8504	**22** 0.866	**0.6** 0.024	NKS32A	**36** 8090	**46.2** 10400	7.40	9200	14000	**0.120** 0.265
35 1.378	**35** 1.378	**45** 1.7717	**20** 0.787	**0.3** 0.012	NK35/20A	**26.1** 5870	**44.4** 9980	7.05	8000	12000	**0.081** 0.179
	35 1.378	**45** 1.7717	**30** 1.181	**0.3** 0.012	NK35/30A	**37.4** 8410	**70.6** 15900	11.0	8000	12000	**0.122** 0.269

Shaft Dia.	F_w	D	C	$r_{s\,min.}$	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.
						Dynamic	Static		Grease	Oil	
						C	C_0				
mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
35 1.378	**35** 1.378	**47** 1.8504	**18** 0.709	**0.3** 0.012	RNA4906	**25.9** 5820	**36** 8090	5.55	8200	13000	**0.081** 0.179
	35 1.378	**47** 1.8504	**30** 1.181	**0.3** 0.012	RNA6906A	**42.6** 9580	**68.2** 15300	10.6	8200	13000	**0.148** 0.326
	35 1.378	**50** 1.9685	**22** 0.866	**0.6** 0.024	NKS35A	**37.5** 8430	**49.9** 11200	8.00	8400	13000	**0.130** 0.287
37 1.4567	**37** 1.4567	**47** 1.8504	**20** 0.787	**0.3** 0.012	NK37/20A	**26.6** 5980	**46.4** 10400	7.40	7600	12000	**0.084** 0.185
	37 1.4567	**47** 1.8504	**30** 1.181	**0.3** 0.012	NK37/30A	**38.2** 8590	**73.9** 16600	11.5	7600	12000	**0.128** 0.282
	37 1.4567	**52** 2.0472	**22** 0.866	**0.6** 0.024	NKS37A	**39** 8770	**53.4** 12000	8.55	7900	12000	**0.134** 0.295
38 1.4961	**38** 1.4961	**48** 1.8898	**20** 0.787	**0.3** 0.012	NK38/20A	**21.7** 4880	**40.9** 9190	6.40	7300	11000	**0.087** 0.192
	38 1.4961	**48** 1.8898	**30** 1.181	**0.3** 0.012	NK38/30A	**31.9** 7170	**67** 15100	10.4	7300	11000	**0.131** 0.289
40 1.5748	**40** 1.5748	**50** 1.9685	**20** 0.787	**0.3** 0.012	NK40/20A	**27.8** 6250	**50.4** 11300	8.05	7000	11000	**0.089** 0.196
	40 1.5748	**50** 1.9685	**30** 1.181	**0.3** 0.012	NK40/30A	**40** 8990	**80.2** 18000	12.4	7000	11000	**0.137** 0.302
	40 1.5748	**52** 2.0472	**20** 0.787	**0.6** 0.024	RNA49/32	**32** 7190	**49.3** 11100	7.85	7100	11000	**0.100** 0.220
	40 1.5748	**52** 2.0472	**36** 1.417	**0.6** 0.024	RNA69/32A	**48.6** 10900	**84.5** 19000	26.1	7100	11000	**0.185** 0.408
	40 1.5748	**55** 2.1654	**22** 0.866	**0.6** 0.024	NKS40A	**40.3** 9060	**57** 12800	9.15	7200	11000	**0.140** 0.309
42 1.6535	**42** 1.6535	**52** 2.0472	**20** 0.787	**0.3** 0.012	NK42/20A	**28.3** 6360	**52.4** 11800	8.35	6600	10000	**0.085** 0.187
	42 1.6535	**52** 2.0472	**30** 1.181	**0.3** 0.012	NK42/30A	**40.7** 9150	**83.5** 18800	13.0	6600	10000	**0.141** 0.311
	42 1.6535	**55** 2.1654	**20** 0.787	**0.6** 0.024	RNA4907	**32.8** 7370	**51.7** 11600	8.25	6700	10000	**0.114** 0.251
	42 1.6535	**55** 2.1654	**36** 1.417	**0.6** 0.024	RNA6907A	**49.9** 11200	**88.7** 19900	13.7	6700	10000	**0.218** 0.481
43 1.6929	**43** 1.6929	**53** 2.0866	**20** 0.787	**0.3** 0.012	NK43/20A	**29** 6520	**54.4** 12200	8.65	6400	9900	**0.096** 0.212
	43 1.6929	**53** 2.0866	**30** 1.181	**0.3** 0.012	NK43/30A	**41.6** 9350	**86.6** 19500	13.4	6400	9900	**0.134** 0.295
	43 1.6929	**58** 2.2835	**22** 0.866	**0.6** 0.024	NKS43A	**41.6** 9350	**60.7** 13600	9.75	6700	10000	**0.150** 0.331
45 1.7717	**45** 1.7717	**55** 2.1654	**20** 0.787	**0.3** 0.012	NK45/20A	**29.5** 6630	**56.4** 12700	9.00	6100	9400	**0.100** 0.220
	45 1.7717	**55** 2.1654	**30** 1.181	**0.3** 0.012	NK45/30A	**42.3** 9510	**89.8** 20200	13.9	6100	9400	**0.151** 0.333
	45 1.7717	**60** 2.3622	**22** 0.866	**0.6** 0.024	NKS45A	**43** 9670	**64.2** 14400	10.3	6400	9800	**0.156** 0.344
47 1.8504	**47** 1.8504	**57** 2.2441	**20** 0.787	**0.3** 0.012	NK47/20A	**30** 6740	**58.5** 13200	9.30	5900	9000	**0.104** 0.229
	47 1.8504	**57** 2.2441	**30** 1.181	**0.3** 0.012	NK47/30A	**43** 9670	**93.1** 20900	14.4	5900	9000	**0.158** 0.348
48 1.8898	**48** 1.8898	**62** 2.4409	**22** 0.866	**0.6** 0.024	RNA4908	**44.2** 9940	**67.8** 15200	10.9	5900	9100	**0.154** 0.340
	48 1.8898	**62** 2.4409	**40** 1.575	**0.6** 0.024	RNA6908A	**70.8** 15900	**124** 27900	19.8	5900	9100	**0.300** 0.661
50 1.9685	**50** 1.9685	**62** 2.4409	**25** 0.984	**0.3** 0.012	NK50/25A	**40.7** 9150	**79.3** 17800	12.5	5500	8500	**0.171** 0.377

Continued on next page.

NEEDLE ROLLER BEARINGS WITHOUT INNER RINGS

METRIC SERIES
NK, NKS, RNA48, RNA49
RNA69, NKTN SERIES



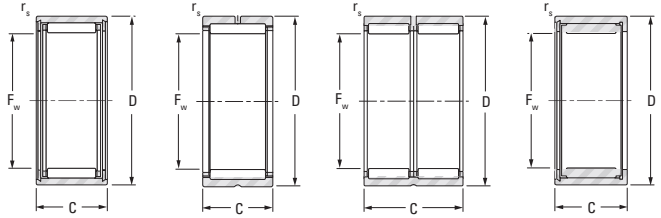
NK (Fw ≤ 10) | NK (Fw ≥ 12), NKS, RNA48, RNA49, RNA69 (Fw ≤ 35) | RNA69 (Fw ≥ 40) | NKTN

Shaft Dia.	F_w	D	C	$r_{s\,min.}$	Bearing Designation	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Speed Ratings Grease	Speed Ratings Oil	Approx. Wt.
mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
50 1.9685	**50** 1.9685	**62** 2.4409	**35** 1.378	**0.6** 0.024	NK50/35A	**55** 12400	**117** 26300	18.2	5500	8500	**0.242** 0.534
	50 1.9685	**65** 2.5591	**22** 0.866	**1** 0.039	NKS50A	**45.5** 10200	**71.3** 16000	11.4	5700	8700	**0.170** 0.375
52 2.0472	**52** 2.0472	**68** 2.6772	**22** 0.866	**0.6** 0.024	RNA4909	**46.8** 10500	**74.8** 16800	12.0	5400	8400	**0.201** 0.443
	52 2.0472	**68** 2.6772	**40** 1.575	**0.6** 0.024	RNA6909A	**74.7** 16800	**137** 30800	21.7	5400	8400	**0.392** 0.864
55 2.1654	**55** 2.1654	**68** 2.6772	**25** 0.984	**0.6** 0.024	NK55/25A	**46.1** 10400	**87.3** 19600	13.9	5000	7800	**0.207** 0.456
	55 2.1654	**68** 2.6772	**35** 1.378	**0.6** 0.024	NK55/35A	**62.3** 14000	**129** 29000	20.0	5000	7800	**0.293** 0.646
	55 2.1654	**72** 2.8346	**22** 0.866	**1** 0.039	NKS55A	**47.9** 10800	**78.4** 17600	12.6	5100	7900	**0.225** 0.496
58 2.2835	**58** 2.2835	**72** 2.8346	**22** 0.866	**0.6** 0.024	RNA4910	**48.9** 11000	**82** 18400	13.2	4800	7400	**0.179** 0.395
	58 2.2835	**72** 2.8346	**40** 1.575	**0.6** 0.024	RNA6910A	**75.7** 17000	**144** 32400	22.8	4800	7400	**0.364** 0.802
60 2.3622	**60** 2.3622	**72** 2.8346	**25** 0.984	**0.6** 0.024	NK60/25A	**44.3** 9960	**94** 21100	14.9	4400	7000	**0.202** 0.445
	60 2.3622	**72** 2.8346	**35** 1.378	**0.6** 0.024	NK60/35A	**59.9** 13500	**139** 31200	21.5	4400	7000	**0.286** 0.631
	60 2.3622	**80** 3.1496	**28** 1.102	**1.1** 0.043	NKS60A	**66.9** 15000	**103** 23200	16.5	4800	7300	**0.337** 0.743
63 2.4803	**63** 2.4803	**80** 3.1496	**25** 0.984	**1** 0.039	RNA4911	**62** 13900	**107** 24100	17.1	4500	6900	**0.285** 0.628
	63 2.4803	**80** 3.1496	**45** 1.772	**1** 0.039	RNA6911A	**94.2** 21200	**172** 38700	27.8	4500	6900	**0.540** 1.190
65 2.5591	**65** 2.5591	**78** 3.0709	**25** 0.984	**0.6** 0.024	NK65/25A	**48.2** 10800	**97.7** 22000	15.5	4200	6500	**0.257** 0.567
	65 2.5591	**78** 3.0709	**35** 1.378	**0.6** 0.024	NK65/35A	**65.2** 14700	**144** 32400	22.4	4200	6500	**0.298** 0.657
	65 2.5591	**85** 3.3465	**28** 1.102	**1.1** 0.043	NKS65A	**71** 16000	**114** 25600	18.3	4200	6700	**0.362** 0.798
68 2.6772	**68** 2.6772	**82** 3.2283	**25** 0.984	**0.6** 0.024	NK68/25A	**49** 11000	**101** 22700	16.1	4000	6200	**0.287** 0.633
	68 2.6772	**82** 3.2283	**35** 1.378	**0.6** 0.024	NK68/35A	**66.2** 14900	**149** 33500	23.2	4000	6200	**0.350** 0.772
	68 2.6772	**85** 3.3465	**25** 0.984	**1** 0.039	RNA4912	**64.8** 14600	**116** 26100	18.6	4100	6300	**0.304** 0.670
	68 2.6772	**85** 3.3465	**45** 1.772	**1** 0.039	RNA6912A	**99.3** 22300	**189** 42500	30.5	4100	6300	**0.546** 1.204
70 2.7559	**70** 2.7559	**85** 3.3465	**25** 0.984	**0.6** 0.024	NK70/25A	**43.6** 9800	**87.9** 19800	16.6	3900	6000	**0.298** 0.657
70 2.7559	**70** 2.7559	**85** 3.3465	**35** 1.378	**0.6** 0.024	NK70/35A	**62.2** 14000	**139** 31200	24.0	3900	6000	**0.411** 0.906
	70 2.7559	**90** 3.5433	**28** 1.102	**1.1** 0.043	NKS70A	**72.6** 16300	**120** 27000	19.3	4000	6200	**0.383** 0.844
72 2.8346	**72** 2.8346	**90** 3.5433	**25** 0.984	**1** 0.039	RNA4913	**66** 14800	**121** 27200	19.4	3900	5900	**0.346** 0.763
	72 2.8346	**90** 3.5433	**45** 1.772	**1** 0.039	RNA6913A	**107** 24100	**213** 47900	34.5	3900	5900	**0.679** 1.497
73 2.874	**73** 2.874	**90** 3.5433	**25** 0.984	**0.6** 0.024	NK73/25A	**61.5** 13800	**119** 26800	19.0	3800	5800	**0.320** 0.705
	73 2.874	**90** 3.5433	**35** 1.378	**0.6** 0.024	NK73/35A	**82.5** 18500	**173** 38900	27.1	3800	5800	**0.450** 0.992
75 2.9528	**75** 2.9528	**92** 3.622	**25** 0.984	**0.6** 0.024	NK75/25A	**43.7** 9820	**90.2** 20300	19.0	3600	5600	**0.364** 0.802
	75 2.9528	**92** 3.622	**35** 1.378	**0.6** 0.024	NK75/35A	**60.9** 13700	**138** 31000	27.1	3600	5600	**0.518** 1.142
	75 2.9528	**95** 3.7402	**28** 1.102	**1.1** 0.043	NKS75A	**76.5** 17200	**132** 29700	21.1	3700	5800	**0.413** 0.911
80 3.1496	**80** 3.1496	**95** 3.7402	**25** 0.984	**1** 0.039	NK80/25A	**65** 14600	**131** 29400	21.0	3400	5300	**0.331** 0.730
	80 3.1496	**95** 3.7402	**35** 1.378	**1** 0.039	NK80/35A	**79.7** 17900	**184** 41400	28.7	3400	5300	**0.380** 0.838
	80 3.1496	**100** 3.937	**30** 1.181	**1** 0.039	RNA4914	**86.3** 19400	**157** 35300	25.1	3500	5400	**0.502** 1.107
	80 3.1496	**100** 3.937	**54** 2.126	**1** 0.039	RNA6914A	**137** 30800	**286** 64300	45.7	3500	5400	**0.946** 2.086
85 3.3465	**85** 3.3465	**105** 4.1339	**25** 0.984	**1** 0.039	NK85/25A	**76.4** 17200	**137** 30800	22.2	3300	5000	**0.506** 1.116
	85 3.3465	**105** 4.1339	**30** 1.181	**1** 0.039	RNA4915	**92.4** 20800	**175** 39300	28.0	3300	5000	**0.528** 1.164
	85 3.3465	**105** 4.1339	**35** 1.378	**1** 0.039	NK85/35A	**108** 24300	**214** 48100	34.7	3300	5000	**0.610** 1.345
	85 3.3465	**105** 4.1339	**54** 2.126	**1** 0.039	RNA6915A	**143** 32100	**308** 69200	49.3	3300	5000	**1.020** 2.249
90 3.5433	**90** 3.5433	**110** 4.3307	**25** 0.984	**1** 0.039	NK90/25A	**79.5** 17900	**147** 33000	23.8	3100	4700	**0.450** 0.992
	90 3.5433	**110** 4.3307	**30** 1.181	**1** 0.039	RNA4916	**91.5** 20600	**176** 39600	28.1	3100	4700	**0.556** 1.226
	90 3.5433	**110** 4.3307	**35** 1.378	**1** 0.039	NK90/35A	**113** 25400	**230** 51700	36.1	3100	4700	**0.745** 1.642
	90 3.5433	**110** 4.3307	**54** 2.126	**1** 0.039	RNA6916A	**126** 28300	**320** 71900	50.8	3100	4700	**1.050** 2.315
95 3.7402	**95** 3.7402	**115** 4.5276	**26** 1.024	**1** 0.039	NK95/26A	**49.3** 11100	**114** 25600	24.6	2800	4400	**0.572** 1.261
	95 3.7402	**115** 4.5276	**36** 1.417	**1** 0.039	NK95/36A	**114** 25600	**238** 53500	37.3	2900	4500	**0.803** 1.770
100 3.937	**100** 3.937	**120** 4.7244	**26** 1.024	**1** 0.039	NK100/26A	**83.6** 18800	**163** 36600	25.8	2800	4200	**0.530** 1.168
	100 3.937	**120** 4.7244	**35** 1.378	**1.1** 0.043	RNA4917	**110** 24700	**230** 51700	36.0	2800	4200	**0.715** 1.576
	100 3.937	**120** 4.7244	**36** 1.417	**1** 0.039	NK100/36A	**118** 26500	**254** 57100	39.1	2800	4200	**0.658** 1.451
	100 3.937	**120** 4.7244	**63** 2.48	**1.1** 0.043	RNA6917A	**150** 33700	**416** 93500	63.0	2800	4200	**1.350** 2.976
105 4.1339	**105** 4.1339	**125** 4.9213	**26** 1.024	**1** 0.039	NK105/26A	**52.2** 11700	**127** 28600	19.9	2600	3900	**0.595** 1.312

Continued on next page.

NEEDLE ROLLER BEARINGS WITHOUT INNER RINGS

METRIC SERIES
NK, NKS, RNA48, RNA49
RNA69, NKTN SERIES

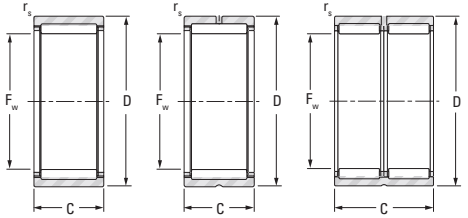


NK (Fw ≤ 10) | NK (Fw ≥ 12), NKS, RNA48, RNA49, RNA69 (Fw ≤ 35) | RNA69 (Fw ≥ 40) | NKTN

Shaft Dia.	F_w	D	C	$r_{s\ min.}$	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.
						Dynamic	Static				
						C	C_0		Grease	Oil	
mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
105 4.1339	105 4.1339	125 4.9213	35 1.378	1.1 0.043	RNA4918	114 25600	245 55100	37.8	2600	4000	0.746 1.645
	105 4.1339	125 4.9213	63 2.48	1.1 0.043	RNA6918A	154 34600	437 98200	66.0	2600	4000	1.500 3.300
110 4.3307	110 4.3307	130 5.1181	30 1.181	1.1 0.043	NK110/30A	103 23200	220 49500	33.6	2500	3800	0.660 1.455
	110 4.3307	130 5.1181	35 1.378	1.1 0.043	RNA4919	115 25900	253 56900	38.4	2500	3800	0.777 1.713
	110 4.3307	130 5.1181	40 1.575	1.1 0.043	NK110/40A	132 29700	301 67700	45.7	2500	3800	0.900 1.984
	110 4.3307	130 5.1181	63 2.48	1.1 0.043	RNA6919A	158 35500	458 103000	68.8	2500	3800	1.470 3.241
115 4.5276	115 4.5276	140 5.5118	40 1.575	1.1 0.043	RNA4920	139 31200	296 66500	43.9	2400	3700	1.220 2.690
120 4.7244	120 4.7244	140 5.5118	30 1.181	1 0.039	RNA4822	90.3 20300	230 51700	33.7	2300	3500	0.785 1.731
125 4.9213	125 4.9213	150 5.9055	40 1.575	1.1 0.043	RNA4922	147 33000	325 73100	47.0	2200	3400	1.320 2.910
130 5.1181	130 5.1181	150 5.9055	30 1.181	1 0.039	RNA4824	94.1 21200	249 56000	35.7	2100	3200	0.850 1.874
135 5.315	135 5.315	165 6.4961	45 1.772	1.1 0.043	RNA4924	177 39800	407 91500	58.5	2000	3100	1.980 4.365
145 5.7087	145 5.7087	165 6.4961	35 1.378	1 0.039	RNA4826	112 25200	323 72600	44.8	1900	2900	1.100 2.425
150 5.9055	150 5.9055	180 7.0866	50 1.969	1.5 0.059	RNA4926	201 45200	495 111000	68.7	1800	2800	2.420 5.335
155 6.1024	155 6.1024	175 6.8898	35 1.378	1.1 0.043	RNA4828	116 26100	346 77800	47.1	1700	2700	1.170 2.579
160 6.2992	160 6.2992	190 7.4803	50 1.969	1.5 0.059	RNA4928	214 48100	549 123000	74.8	1700	2600	2.560 5.644
165 6.4961	165 6.4961	190 7.4803	40 1.575	1.1 0.043	RNA4830A	142 31900	402 90400	53.5	1600	2500	1.540 3.395
175 6.8898	175 6.8898	200 7.874	40 1.575	1.1 0.043	RNA4832A	146 32800	425 95500	55.6	1500	2400	1.910 4.211

NEEDLE ROLLER BEARINGS WITHOUT INNER RINGS

METRIC SERIES
NQ, RNA49, RNA69 SERIES



NQ | RNA49 | RNA69

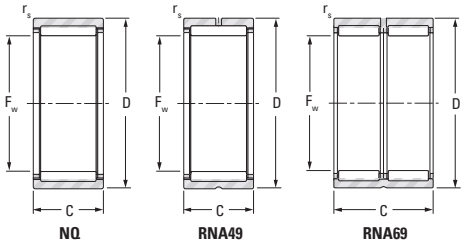
Shaft Dia.	F_w	D	C	$r_{s\ min.}$	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.
						Dynamic	Static				
						C	C_0		Grease	Oil	
mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
12 0.4724	12	19	12	0.3	NQ12/12AD	5.3	5.45	0.820	—	30000	0.012
	12	24	9.8	0.3	12NQ2410A	5.9	6.3	0.960	—	30000	0.023
13 0.5118	13	21	12	0.3	NQ132112	8.25	8.4	1.30	—	24000	0.015
14 0.5512	14	22	16	0.5	NQ14/16D	11.8	13.8	2.10	—	24000	0.021
15 0.5906	15	23	16	0.5	NQ15/16B	15.2	17.4	2.65	—	21000	0.021
	15	24	10	0.3	15NQ2410D	8.65	8.45	1.30	—	21000	0.016
	15	24	12	0.3	15NQ2412A	9.7	9.75	1.50	—	21000	0.019
	15	25	12	0.6	NQ152512	10.7	11.1	1.70	—	21000	0.022
	15	25	16	0.5	NQ152516[1]	11.8	14	2.10	—	24000	0.032
	15	28	12	0.6	15NQ2812	10.7	11.1	1.70	—	21000	0.034
	15	28	12	0.6	NQ152812-1	10.7	11.1	1.70	—	21000	0.034
	15	28	15	1.0	15NQ2815	12.7	13.7	2.10	—	21000	0.042
16 0.6299	16	23	16	0.5	16NQ2316	13	16.2	2.50	—	23000	0.019
	16	23	22	0.5	16NQ2322A	17	22.9	3.55	—	23000	0.026
17 0.6693	17	25	16	0.5	NQ17/16D	11.4	16.2	2.45	—	26000	0.026
	17	30	13	0.3	17NQ3013D	10.2	10.8	1.65	—	27000	0.041
	17	32	16	0.6	17NQ3216D	18.5	17.1	2.65	—	29000	0.053
18 0.7087	18	29	25	0.3	NQ182925-1	24.2	27.5	4.30	—	26000	0.056
	18	34	20	0.3	18NQ3420AD	17.1	21.2	3.35	—	25000	0.090
20 0.7874	20	28	16	0.3	NQ20/16D	12.1	18.2	2.75	—	22000	0.030
	20	28	23	0.3	NQ202823	18.5	27.1	4.25	—	22000	0.040
	20	30	15	0.6	20NQ3015ED	11.4	15.4	2.35	—	22000	0.037

[1] With outer ring groove

Continued on next page.

NEEDLE ROLLER BEARINGS WITHOUT INNER RINGS

METRIC SERIES
NQ, RNA49, RNA69 SERIES



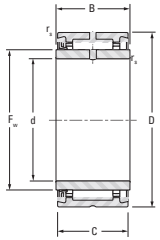
Shaft Dia.	F_w	D	C	$r_{s\,min.}$	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.
						Dynamic	Static				
						C	C_0		Grease	Oil	
mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
20 0.7874	**20**	**30**	**20**	**0.3**	20NQ3020	**19.9**	**26.4**	4.10	—	23000	**0.048**
	20	**32**	**12**	**0.3**	20NQ3212	**11.9**	**11.3**	1.70	—	23000	**0.033**
	20	**32**	**18**	**0.3**	NQ203218	**21.2**	**26.1**	4.05	—	23000	**0.053**
	20	**32**	**20**	**0.3**	NQ203220	**23**	**26.6**	4.20	—	23000	**0.057**
	20	**33**	**15**	**0.3**	20NQ3315NE[1]	**13.8**	**16.5**	2.50	—	23000	**0.053**
	20	**34**	**18**	**0.6**	20NQ3418D	**21.6**	**21.5**	3.35	—	24000	**0.060**
22 0.8661	**22**	**30**	**20**	**0.3**	NQ22/20	**15.3**	**25.6**	3.95	—	20000	**0.041**
	22	**35**	**20**	**0.3**	NQS22/20D	**21.8**	**25.4**	4.05	—	21000	**0.071**
24 0.9449	**24**	**32**	**20**	**0.3**	NQ24/20AD	**17.4**	**26.5**	4.15	—	18000	**0.041**
25 0.9843	**25**	**37**	**17**	**1.0**	25NQ3717AD-1	**19.4**	**22.5**	3.45	—	18000	**0.056**
	25	**37**	**17**	**0.9**	RNA4904ARD	**21.5**	**25.7**	3.95	—	18000	**0.057**
28 1.1024	**28**	**37**	**20**	**0.3**	NQ283720D	**20.7**	**34.9**	5.40	—	15000	**0.056**
	28	**39**	**17**	**0.3**	RNA49/22R	**22.2**	**30.3**	4.80	—	16000	**0.055**
30 1.1811	**30**	**42**	**30**	**0.6**	NQ304230	**40.6**	**61.2**	9.60	—	15000	**0.118**
35 1.378	**35**	**45**	**14**	**0.6**	NQ354514	**16.9**	**29**	4.40	—	12000	**0.055**
	35	**47**	**17**	**0.3**	RNA4906D	**20.2**	**31.9**	4.85	—	12000	**0.081**
	35	**47**	**30**	**0.3**	RNA6906	**43.1**	**69.3**	10.8	—	13000	**0.131**
37 1.4567	**37**	**47**	**20**	**0.3**	NQ37/20D	**26.3**	**45.7**	7.10	—	12000	**0.079**
40 1.5748	**40**	**48**	**20**	**0.3**	NQ404820	**21.2**	**40.4**	6.20	—	11000	**0.064**
	40	**50**	**15**	**0.3**	NQ40/15AD	**21.3**	**35.8**	5.45	—	11000	**0.063**
	40	**52**	**20**	**0.6**	RNA49/32R-1[2]	**32.4**	**50**	7.85	—	11000	**0.100**
	40	**60**	**25**	**1.0**	NQ406025	**54.2**	**66.8**	10.7	—	11000	**0.213**

[1] With outer ring groove
[2] Without outer ring lubrication holes

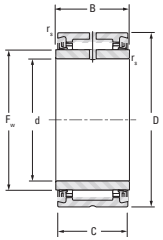
Shaft Dia.	F_w	D	C	$r_{s\,min.}$	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.
						Dynamic	Static				
						C	C_0		Grease	Oil	
mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
45 1.7717	**45**	**58**	**20**	**0.6**	RNA49/38R-1[2]	**36.7**	**56.2**	8.90	—	9700	**0.116**
48 1.8898	**48**	**62**	**22**	**0.6**	RNA4908R-2[2]	**44.3**	**67.8**	10.9	—	9100	**0.142**

SEALED NEEDLE ROLLER BEARINGS WITH INNER RINGS

METRIC SERIES



NA49RS

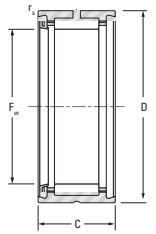


NA49.2RS

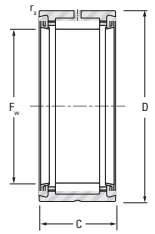
Shaft Dia.	d	D	B	C	F_w	$r_{s\,min.}$	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Rating Grease	Approx. Wt.
								Dynamic	Static			
								C	C_0			
mm in	mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}	kg lbs
10 0.3937	**10** 0.3937	**22** 0.8661	**14** 0.551	**13** 0.512	**14** 0.5512	**0.3** 0.012	NA4900ARS	**7.76** 1740	**8.06** 1810	1.20	14000	**0.027** 0.060
	10 0.3937	**22** 0.8661	**14** 0.551	**13** 0.512	**14** 0.5512	**0.3** 0.012	NA4900A.2RS	**7.76** 1740	**8.06** 1810	1.20	14000	**0.027** 0.060
12 0.4724	**12** 0.4724	**24** 0.9449	**14** 0.551	**13** 0.512	**16** 0.6299	**0.3** 0.012	NA4901ARS	**8.64** 1940	**9.59** 2160	1.45	12000	**0.031** 0.068
	12 0.4724	**24** 0.9449	**14** 0.551	**13** 0.512	**16** 0.6299	**0.3** 0.012	NA4901A.2RS	**8.64** 1940	**9.59** 2160	1.45	12000	**0.031** 0.068
15 0.5906	**15** 0.5906	**28** 1.1024	**14** 0.551	**13** 0.512	**20** 0.7874	**0.3** 0.012	NA4902ARS	**9.77** 2200	**12.0** 2700	1.80	9700	**0.041** 0.090
	15 0.5906	**28** 1.1024	**14** 0.551	**13** 0.512	**20** 0.7874	**0.3** 0.012	NA4902A.2RS	**9.77** 2200	**12.0** 2700	1.80	9700	**0.041** 0.090
17 0.6693	**17** 0.6693	**30** 1.1811	**14** 0.551	**13** 0.512	**22** 0.8661	**0.3** 0.012	NA4903ARS	**10.1** 2270	**12.8** 2880	1.95	8800	**0.044** 0.097
	17 0.6693	**30** 1.1811	**14** 0.551	**13** 0.512	**22** 0.8661	**0.3** 0.012	NA4903A.2RS	**10.1** 2270	**12.8** 2880	1.95	8800	**0.044** 0.097
20 0.7874	**20** 0.7874	**37** 1.4567	**18** 0.709	**17** 0.669	**25** 0.9843	**0.3** 0.012	NA4904ARS	**18.5** 4160	**21.2** 4770	3.30	7800	**0.087** 0.192
	20 0.7874	**37** 1.4567	**18** 0.709	**17** 0.669	**25** 0.9843	**0.3** 0.012	NA4904A.2RS	**18.5** 4160	**21.2** 4770	3.30	7800	**0.087** 0.192
25 0.9843	**25** 0.9843	**42** 1.6535	**18** 0.709	**17** 0.669	**30** 1.1811	**0.3** 0.012	NA4905ARS	**21.0** 4720	**26.4** 5930	4.10	6500	**0.106** 0.234
	25 0.9843	**42** 1.6535	**18** 0.709	**17** 0.669	**30** 1.1811	**0.3** 0.012	NA4905A.2RS	**21.0** 4720	**26.4** 5930	4.10	6500	**0.106** 0.234
30 1.1811	**30** 1.1811	**47** 1.8504	**18** 0.709	**17** 0.669	**35** 1.3780	**0.3** 0.012	NA4906ARS	**22.5** 5060	**30.0** 6740	4.65	5500	**0.119** 0.262
	30 1.1811	**47** 1.8504	**18** 0.709	**17** 0.669	**35** 1.3780	**0.3** 0.012	NA4906A.2RS	**22.5** 5060	**30.0** 6740	4.65	5500	**0.119** 0.262
35 1.3780	**35** 1.3780	**55** 2.1654	**21** 0.827	**20** 0.787	**42** 1.6535	**0.6** 0.024	NA4907ARS	**29.1** 6540	**44.4** 9980	6.85	4600	**0.198** 0.437
	35 1.3780	**55** 2.1654	**21** 0.827	**20** 0.787	**42** 1.6535	**0.6** 0.024	NA4907A.2RS	**29.1** 6540	**44.4** 9980	6.85	4600	**0.198** 0.437
40 1.5748	**40** 1.5748	**62** 2.4409	**23** 0.906	**22** 0.866	**48** 1.8898	**0.6** 0.024	NA4908ARS	**38.6** 8680	**57.0** 12800	9.10	4000	**0.263** 0.580
	40 1.5748	**62** 2.4409	**23** 0.906	**22** 0.866	**48** 1.8898	**0.6** 0.024	NA4908A.2RS	**38.6** 8680	**57.0** 12800	9.10	4000	**0.263** 0.580
45 1.7717	**45** 1.7717	**68** 2.6772	**23** 0.906	**22** 0.866	**52** 2.0472	**0.6** 0.024	NA4909ARS	**39.4** 8860	**60.0** 13500	9.60	3700	**0.303** 0.668
	45 1.7717	**68** 2.6772	**23** 0.906	**22** 0.866	**52** 2.0472	**0.6** 0.024	NA4909A.2RS	**39.4** 8860	**60.0** 13500	9.60	3700	**0.303** 0.668
50 1.9685	**50** 1.9685	**72** 2.8346	**23** 0.906	**22** 0.866	**58** 2.2835	**0.6** 0.024	NA4910ARS	**41.2** 9260	**65.8** 14800	10.5	3300	**0.309** 0.681
	50 1.9685	**72** 2.8346	**23** 0.906	**22** 0.866	**58** 2.2835	**0.6** 0.024	NA4910A.2RS	**41.2** 9260	**65.8** 14800	10.5	3300	**0.309** 0.681

SEALED NEEDLE ROLLER BEARINGS WITHOUT INNER RINGS

METRIC SERIES



RNA49RS

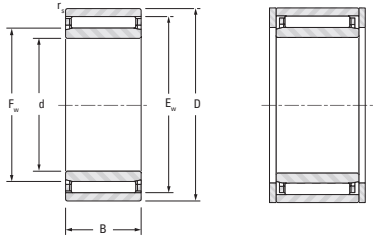


RNA49.2RS

Shaft Dia.	F_w	D	C	$r_{s\,min.}$	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Rating Grease	Approx. Wt.
						Dynamic	Static			
						C	C_0			
mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}	kg lbs
14 0.5512	**14** 0.5512	**22** 0.8661	**13** 0.512	**0.3** 0.012	RNA4900ARS	**7.76** 1740	**8.06** 1810	1.20	14000	**0.019** 0.042
	14 0.5512	**22** 0.8661	**13** 0.512	**0.3** 0.012	RNA4900A.2RS	**7.76** 1740	**8.06** 1810	1.20	14000	**0.019** 0.042
16 0.6299	**16** 0.6299	**24** 0.9449	**13** 0.512	**0.3** 0.012	RNA4901ARS	**8.64** 1940	**9.59** 2160	1.45	12000	**0.021** 0.046
	16 0.6299	**24** 0.0449	**13** 0.512	**0.3** 0.012	RNA4901A.2RS	**8.64** 1940	**9.59** 2160	1.45	12000	**0.021** 0.046
20 0.7874	**20** 0.7874	**28** 1.1024	**13** 0.512	**0.3** 0.012	RNA4902ARS	**9.70** 2180	**12.0** 2700	1.80	9700	**0.026** 0.057
	20 0.7874	**28** 1.1024	**13** 0.512	**0.3** 0.012	RNA4902A.2RS	**9.70** 2180	**12.0** 2700	1.80	9700	**0.026** 0.057
22 0.8661	**22** 0.8661	**30** 1.1811	**13** 0.512	**0.3** 0.012	RNA4903ARS	**10.1** 2270	**12.8** 2880	1.95	8800	**0.027** 0.060
	22 0.8661	**30** 1.1811	**13** 0.512	**0.3** 0.012	RNA4903A.2RS	**10.1** 2270	**12.8** 2880	1.95	8800	**0.027** 0.060
25 0.9843	**25** 0.9843	**37** 1.4567	**17** 0.669	**0.3** 0.012	RNA4904ARS	**18.5** 4160	**21.2** 4770	3.30	7800	**0.062** 0.137
	25 0.9843	**37** 1.4567	**17** 0.669	**0.3** 0.012	RNA4904A.2RS	**18.5** 4160	**21.2** 4770	3.30	7800	**0.062** 0.137
30 1.1811	**30** 1.1811	**42** 1.6535	**17** 0.669	**0.3** 0.012	RNA4905ARS	**21.0** 4720	**26.4** 5930	4.10	6500	**0.075** 0.165
	30 1.1811	**42** 1.6535	**17** 0.669	**0.3** 0.012	RNA4905A.2RS	**21.0** 4720	**26.4** 5930	4.10	6500	**0.075** 0.165
35 1.3780	**35** 1.3780	**47** 1.864	**17** 0.669	**0.3** 0.012	RNA4906ARS	**22.5** 5060	**30.0** 6740	4.65	5500	**0.083** 0.183
	35 1.3780	**47** 1.8504	**17** 0.669	**0.3** 0.012	RNA4906A.2RS	**22.5** 5060	**30.0** 6740	4.65	5500	**0.083** 0.183
42 1.6535	**42** 1.6535	**55** 2.1654	**20** 0.787	**0.6** 0.024	RNA4907ARS	**29.1** 6540	**44.4** 9980	6.85	4600	**0.130** 0.287
	42 1.6535	**55** 2.1654	**20** 0.787	**0.6** 0.024	RNA4907A.2RS	**29.1** 6540	**44.4** 9980	6.85	4600	**0.130** 0.287
48 1.8898	**48** 1.8898	**62** 2.4409	**22** 0.866	**0.6** 0.024	RNA4908ARS	**38.6** 8680	**57.0** 12800	9.10	4000	**0.163** 0.359
	48 1.8898	**62** 2.4409	**22** 0.866	**0.6** 0.024	RNA4908A.2RS	**38.6** 8680	**57.0** 12800	9.10	4000	**0.163** 0.359
52 2.0472	**52** 2.0472	**68** 2.6772	**22** 0.866	**0.6** 0.024	RNA4909ARS	**39.4** 8860	**60.0** 13500	9.60	3700	**0.207** 0.456
	52 2.0472	**68** 2.6772	**22** 0.866	**0.6** 0.024	RNA4909A.2RS	**39.4** 8860	**60.0** 13500	9.60	3700	**0.207** 0.456
58 2.2835	**58** 2.2835	**72** 2.8346	**22** 0.866	**0.6** 0.024	RNA4910ARS	**41.2** 9260	**65.8** 14800	10.5	3300	**0.187** 0.412
	58 2.2835	**72** 2.8346	**22** 0.866	**0.6** 0.024	RNA4910A.2RS	**41.2** 9260	**65.8** 14800	10.5	3300	**0.187** 0.412

NEEDLE ROLLER BEARINGS WITHOUT FLANGES WITH INNER RINGS

METRIC SERIES



NAO

SNSH

Shaft Dia.	d	D	B	F_w	E_w	$r_{s\,min.}$	s(1)	Bearing Designation	End Washer Designation	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Speed Ratings Grease	Speed Ratings Oil	Approx. Wt.
mm in	mm in	mm in	mm in	mm in	mm in	mm in	mm in			kN lbf		kN	min-1		kg lbs
6 0.2362	6 0.2362	17 0.6693	10 0.394	10 0.3937	13 0.5118	0.3 0.012	0.5 0.020	NAO6X17X10	SNSH10,5X17X0,5	5.40 1210	6.43 1450	0.980	25000	39000	0.014 0.031
	8 0.3150	19 0.7480	10 0.394	12 0.4724	15 0.5906	0.3 0.012	0.5 0.020	NAO8X19X10	SNSH12,5X19X0,5	5.85 1320	7.51 1690	1.15	24000	37000	0.017 0.037
10 0.3937	10 0.3937	22 0.8661	13 0.512	14 0.5512	18 0.7087	0.3 0.012	1.0 0.039	NAO10X22X13	SNSH14,5X22X0,5	9.73 2190	12.5 2810	1.90	19000	29000	0.026 0.057
	10 0.3937	22 0.8661	20 0.787	14 0.5512	18 0.7087	0.3 0.012	0.5 0.020	NAO10X22X20	SNSH14,5X22X0,5	12.3 2770	16.8 3780	1.30	19000	29000	0.041 0.090
	10 0.3937	26 1.0236	12 0.472	14 0.5512	20 0.7874	0.3 0.012	0.7 0.028	NAO10X26X12	SNSH14,5X26X0,5	10.5 2360	10.6 2380	1.60	14000	21000	0.036 0.079
12 0.4724	12 0.4724	24 0.9449	13 0.512	16 0.6299	20 0.7874	0.3 0.012	1.0 0.039	NAO12X24X13	SNSH16,5X24X0,5	1 0.1 2270	13.5 3030	2.05	18000	28000	0.030 0.066
	12 0.4724	24 0.9449	20 0.787	16 0.6299	20 0.7874	0.3 0.012	0.5 0.020	NAO12X24X20	SNSH16,5X24X0,5	13.4 3010	19.5 4380	2.95	18000	28000	0.046 0.101
	12 0.4724	28 1.1024	12 0.472	16 0.6299	22 0.8661	0.3 0.012	0.7 0.028	NAO12X28X12	SNSH16,5X28X0,5	11.2 2520	11.9 2680	1.80	19000	29000	0.041 0.090
15 0.5906	15 0.5906	28 1.1024	13 0.512	20 0.7874	24 0.9449	0.3 0.012	1.0 0.039	NAO15X28X13	SNSH20,5X28X0,5	11.5 2590	17.3 3890	2.65	14000	22000	0.039 0.086
	15 0.5906	28 1.1024	26 1.024	20 0.7874	24 0.9449	0.3 0.012	1.0 0.039	NAO15X28X26	SNSH20,5X28X0,5	19.8 4450	34.6 7780	5.25	14000	22000	0.078 0.172
	15 0.5906	32 1.2598	12 0.472	20 0.7874	26 1.0236	0.3 0.012	0.7 0.028	NAO15X32X12	SNSH20,5X32X0,5	13.0 2920	15.0 3370	2.30	15000	23000	0.050 0.110
17 0.6693	17 0.6693	30 1.1811	13 0.512	22 0.8661	26 1.0236	0.3 0.012	1.0 0.039	NAO17X30X13	SNSH22,5X30X0,5	11.8 2650	18.3 4110	2.80	13000	20000	0.043 0.095
	17 0.6693	30 1.1811	26 1.024	22 0.8661	26 1.0236	0.3 0.012	1.0 0.039	NAO17X30X26	SNSH22,5X30X0,5	20.2 4540	36.6 8230	5.55	13000	20000	0.084 0.185
	17 0.6693	35 1.3780	16 0.630	22 0.8661	29 1.1417	0.3 0.012	1.5 0.059	NAO17X35X16	SNSH22,5X35X0,5	19.0 4270	23.3 5240	3.70	13000	20000	0.078 0.172
	17 0.6693	35 1.3780	32 1.260	22 0.8661	29 1.1417	0.3 0.012	1.5 0.059	NAO17X35X32	SNSH22,5X35X0,5	32.7 7350	46.5 10500	7.35	13000	20000	0.154 0.340
20 0.7874	20 0.7874	35 1.3780	17 0.669	25 0.9843	30 1.1811	0.3 0.012	1.2 0.047	NAO20X35X17	SNSH25,5X35X0,5	18.8 4230	29.8 6700	4.60	11000	17000	0.073 0.161
	20 0.7874	35 1.3780	26 1.024	25 0.9843	30 1.1811	0.3 0.012	1.2 0.047	NAO20X35X26	SNSH25,5X35X0,5	25.0 5620	42.8 9620	6.50	11000	17000	0.112 0.247
	20 0.7874	37 1.4567	16 0.630	25 0.9843	32 1.2598	0.3 0.012	1.5 0.059	NAO20X37X16	SNSH25,5X37X0,5	19.8 4450	25.3 5690	4.10	11000	17000	0.080 0.176

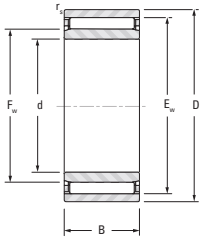
(1) Max. axial displacement.

Shaft Dia.	d	D	B	F_w	E_w	$r_{s\,min.}$	s(1)	Bearing Designation	End Washer Designation	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Speed Ratings Grease	Speed Ratings Oil	Approx. Wt.
mm in	mm in	mm in	mm in	mm in	mm in	mm in	mm in			kN lbf		kN	min-1		kg lbs
20 0.7874	20 0.7874	37 1.4567	32 1.260	25 0.9843	32 1.2598	0.3 0.012	1.5 0.059	NAO20X37X32	SNSH25,5X37X0,5	34.0 7640	50.7 11400	8.00	11000	17000	0.162 0.357
25 0.9843	25 0.9843	40 1.5748	17 0.669	30 1.1811	35 1.3780	0.3 0.012	1.2 0.047	NAO25X40X17	SNSH30,5X40X0,5	20.2 4540	34.9 7850	5.35	9300	14000	0.088 0.194
	25 0.9843	40 1.5748	26 1.024	30 1.1811	35 1.3780	0.3 0.012	1.2 0.047	NAO25X40X26	SNSH30,5X40X0,5	26.8 6020	49.7 11200	7.55	9300	14000	0.132 0.291
	25 0.9843	42 1.6535	16 0.630	30 1.1811	37 1.4567	0.3 0.012	1.5 0.059	NAO25X42X16		22.4 5040	31.0 6970	4.90	9600	15000	0.096 0.212
	25 0.9843	42 1.6535	32 1.260	30 1.1811	37 1.4567	0.3 0.012	1.5 0.059	NAO25X42X32		38.2 8590	62.1 14000	9.85	9600	15000	0.185 0.408
30 1.1811	30 1.1811	45 1.7717	17 0.669	35 1.3780	40 1.5748	0.3 0.012	1.2 0.047	NAO30X45X17		22.1 4970	40.8 9170	6.35	7900	12000	0.102 0.225
	30 1.1811	45 1.7717	26 1.024	35 1.3780	40 1.5748	0.3 0.012	1.2 0.047	NAO30X45X26		27.7 6230	54.5 12300	8.95	7900	12000	0.155 0.342
	30 1.1811	47 1.8504	16 0.630	35 1.3780	42 1.6535	0.3 0.012	1.5 0.059	NAO30X47X16	SNSH35,5X47X0,5	24.5 5510	36.8 8270	5.80	8100	12000	0.106 0.234
	30 1.1811	47 1.8504	32 1.260	35 1.3780	42 1.6535	0.3 0.012	1.5 0.059	NAO30X47X32	SNSH35,5X47X0,5	42.0 9440	73.5 16500	11.6	8100	12000	0.218 0.481
35 1.3780	35 1.3780	50 1.9685	17 0.669	40 1.5748	45 1.7717	0.3 0.012	1.2 0.047	NAO35X50X17		23.8 5350	47.0 10600	7.30	6900	11000	0.126 0.278
	35 1.3780	50 1.9685	34 1.339	40 1.5748	45 1.7717	0.3 0.012	0.7 0.028	NAO35X50X34	SNSH40,5X50X0,5	40.9 9190	94.1 21200	14.6	6900	11000	0.232 0.511
	35 1.3780	55 2.1654	20 0.787	40 1.5748	48 1.8898	0.3 0.012	1.5 0.059	NAO35X55X20	SNSH41X55X1	35.5 7980	56.3 12700	8.95	7100	11000	0.185 0.408
	35 1.3780	55 2.1654	40 1.575	40 1.5748	48 1.8898	0.3 0.012	1.7 0.067	NAO35X55X40		60.8 13700	113 25400	17.9	7100	11000	0.370 0.816
40 1.5748	40 1.5748	55 2.1654	17 0.669	45 1.7717	50 1.9685	0.3 0.012	0.7 0.028	NAO40X55X17	SNSH45,5X55X0,5	24.9 5600	51.8 11600	8.05	6100	9400	0.133 0.293
	40 1.5748	55 2.1654	34 1.339	45 1.7717	50 1.9685	0.3 0.012	0.7 0.028	NAO40X55X34	SNSH45,5X55X0,5	42.7 9600	104 23400	16.1	6100	9400	0.257 0.567
	40 1.5748	62 2.4409	20 0.787	45 1.7717	53 2.0866	0.3 0.012	1.5 0.059	NAO40X62X20	SNSH46X62X1	36.0 8090	59.5 13400	9.05	6200	9600	0.215 0.474
	40 1.5748	62 2.4409	40 1.575	45 1.7717	53 2.0866	0.3 0.012	1.7 0.067	NAO40X62X40	SNSH46X62X1	61.7 13900	119 26800	18.1	6200	9600	0.440 0.970
45 1.7717	45 1.7717	62 2.4409	20 0.787	50 1.9685	55 2.1654	0.3 0.012	0.7 0.028	NAO45X62X20		30.2 6790	68.5 15400	10.7	5400	8400	0.200 0.441
	45 1.7717	62 2.4409	40 1.575	50 1.9685	55 2.1654	0.3 0.012	0.5 0.020	NAO45X62X40		50.7 11400	137 30800	21.4	5400	8400	0.386 0.851
	45 1.7717	72 2.8346	20 0.787	55 2.1654	63 2.4803	1.0 0.039	1.5 0.059	NAO45X72X20	SNSH56X72X1	40.3 9060	73.5 16500	11.7	5000	7800	0.345 0.761
	45 1.7717	72 2.8346	40 1.575	55 2.1654	63 2.4803	1.0 0.039	1.7 0.067	NAO45X72X40	SNSH56X72X1	69.1 15500	147 33000	23.4	5000	7800	0.680 1.499
50 1.9685	50 1.9685	68 2.6772	20 0.787	55 2.1654	60 2.3622	0.3 0.012	0.7 0.028	NAO50X68X20		30.7 6900	72.4 16300	11.3	4900	7600	0.230 0.507
	50 1.9685	68 2.6772	40 1.575	55 2.1654	60 2.3622	0.3 0.012	0.5 0.020	NAO50X68X40		52.7 11800	145 32600	22.6	4900	7600	0.450 0.992
	50 1.9685	78 3.0709	20 0.787	60 2.3622	68 2.6772	1.0 0.039	1.5 0.059	NAO50X78X20	SNSH61X78X1	41.8 9400	79.2 17800	12.6	4600	7100	0.385 0.849

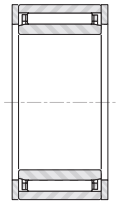
Continued on next page.

NEEDLE ROLLER BEARINGS WITHOUT FLANGES WITH INNER RINGS

METRIC SERIES



NAO



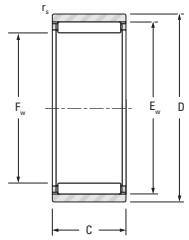
SNSH

Shaft Dia.	d	D	B	F_w	E_w	$r_{s\,min.}$	s[1]	Bearing Designation	End Washer Designation	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Speed Ratings Grease	Speed Ratings Oil	Approx. Wt.
mm in	mm in	mm in	mm in	mm in	mm in	mm in	mm in			kN lbf		kN	min^{-1}		kg lbs
50 1.9685	**50** 1.9685	**78** 3.0709	**40** 1.575	**60** 2.3622	**68** 2.6772	**1.0** 0.039	**1.7** 0.067	NAO50X78X40	SNSH61X78X1	**71.7** 16100	**158** 35500	25.2	4600	7100	**0.746** 1.645
55 2.1654	**55** 2.1654	**85** 3.3465	**30** 1.181	**65** 2.5591	**73** 2.8740	**1.0** 0.039	**2.0** 0.079	NAO55X85X30	SNSH66X85X1	**60.1** 13500	**129** 29000	20.3	4200	6500	**0.690** 1.521
	55 2.1654	**85** 3.3465	**60** 2.362	**65** 2.5591	**73** 2.8740	**1.0** 0.039	**1.5** 0.059	NAO55X85X60	SNSH66X85X1	**103** 23200	**259** 58200	40.7	4200	6500	**1.320** 2.910
60 2.3622	**60** 2.3622	**90** 3.5433	**30** 1.181	**70** 2.7559	**78** 3.0709	**1.0** 0.039	**2.0** 0.079	NAO60X90X30		**62.2** 14000	**139** 31200	21.8	3900	6000	**0.745** 1.642
	60 2.3622	**90** 3.5433	**60** 2.362	**70** 2.7559	**78** 3.0709	**1.0** 0.039	**1.7** 0.067	NAO60X90X60		**107** 24100	**277** 62300	43.6	3900	6000	**1.405** 3.097
65 2.5591	**65** 2.5591	**95** 3.7402	**30** 1.181	**75** 2.9528	**83** 3.2677	**1.0** 0.039	**2.0** 0.079	NAO65X95X30		**60.9** 13700	**138** 31000	21.7	3600	5600	**0.770** 1.698
	65 2.5591	**95** 3.7402	**60** 2.362	**75** 2.9528	**83** 3.2677	**1.0** 0.039	**1.7** 0.067	NAO65X95X60		**116** 26100	**277** 62300	43.3	3600	5600	**1.500** 3.307
70 2.7559	**70** 2.7559	**100** 3.9370	**30** 1.181	**80** 3.1496	**88** 3.4646	**1.0** 0.039	**2.0** 0.079	NAO70X100X30		**67.5** 15200	**161** 36200	25.4	3400	5200	**0.850** 1.874
	70 2.7559	**100** 3.9370	**60** 2.362	**80** 3.1496	**88** 3.4646	**1.0** 0.039	**1.7** 0.067	NAO70X100X60		**116** 26100	**322** 72400	50.7	3400	5200	**1.600** 3.527
80 3.1496	**80** 3.1496	**110** 4.3307	**30** 1.181	**90** 3.5433	**98** 3.8583	**1.0** 0.039	**2.0** 0.079	NAO80X110X30		**63.6** 14300	**155** 34800	24.3	3000	4600	**0.920** 2.028
85 3.3465	**85** 3.3465	**115** 4.5276	**30** 1.181	**95** 3.7402	**103** 4.0551	**1.0** 0.039	**2.0** 0.079	NAO85X115X30		**71.0** 16000	**183** 41100	28.6	2800	4400	**0.985** 2.172
90 3.5433	**90** 3.5433	**120** 4.7244	**30** 1.181	**100** 3.9370	**108** 4.2520	**1.0** 0.039	**2.0** 0.079	NAO90X120X30		**72.4** 16300	**191** 42900	29.5	2700	4200	**1.010** 2.22

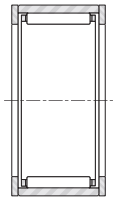
(1) Max. axial displacement.

NEEDLE ROLLER BEARINGS WITHOUT FLANGES WITHOUT INNER RINGS

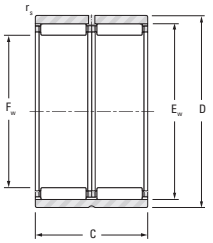
METRIC SERIES



RNAO



SNSH



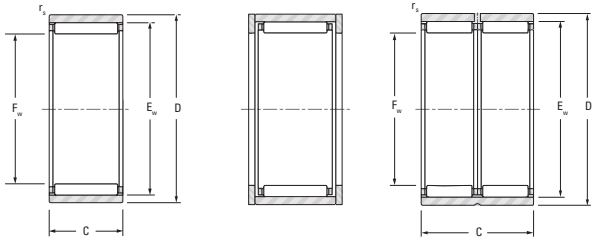
RNAO

Shaft Dia.	F_w	D	C	E_w	$r_{s\,min.}$	Bearing Designation	End Washer Designation	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Speed Ratings Grease	Speed Ratings Oil	Approx. Wt.
mm in	mm in	mm in	mm in	mm in	mm in			kN lbf		kN	min^{-1}		kg lbs
6 0.2362	**6** 0.2362	**13** 0.5118	**8** 0.315	**9** 0.3543	**0.3** 0.012	RNAO6X13X8TN		**2.47** 560	**2.07** 470	0.310	29000	44000	**0.005** 0.011
7 0.2756	**7** 0.2756	**14** 0.5512	**8** 0.315	**10** 0.3937	**0.3** 0.012	RNAO7X14X8TN		**2.74** 620	**2.44** 550	0.370	28000	42000	**0.007** 0.015
8 0.3150	**8** 0.3150	**15** 0.5906	**10** 0.394	**11** 0.4331	**0.3** 0.012	RNAO8X15X10	SNSH8,5X15X0,5	**4.57** 1030	**4.89** 1100	0.740	26000	41000	**0.008** 0.018
9 0.3543	**9** 0.3543	**16** 0.6299	**10** 0.394	**12** 0.4724	**0.3** 0.012	RNAO9X16X10		**4.27** 960	**4.60** 1030	0.700	26000	40000	**0.009** 0.020
10 0.3937	**10** 0.3937	**17** 0.6693	**10** 0.394	**13** 0.5118	**0.3** 0.012	RNAO10X17X10	SNSH10,5X17X0,5	**5.40** 1210	**6.43** 1450	0.980	25000	39000	**0.010** 0.022
	10 0.3937	**17** 0.6693	**20** 0.787	**13** 0.5118	**0.3** 0.012	RNAO10X17X20	SNSH10,5X17X0,5	**9.25** 2080	**12.9** 2900	0.980	25000	39000	**0.019** 0.042
12 0.4724	**12** 0.4724	**19** 0.7480	**10** 0.394	**15** 0.5906	**0.3** 0.012	RNAO12X19X10	SNSH12,5X19X0,5	**5.85** 1320	**7.51** 1690	1.15	24000	37000	**0.012** 0.026
14 0.5512	**14** 0.5512	**22** 0.8661	**13** 0.512	**18** 0.7087	**0.3** 0.012	RNAO14X22X13	SNSH14,5X22X0,5	**9.73** 2190	**12.5** 2810	1.90	19000	29000	**0.018** 0.040
	14 0.5512	**22** 0.8661	**20** 0.787	**18** 0.7087	**0.3** 0.012	RNAO14X22X20	SNSH14,5X22X0,5	**12.3** 2770	**16.8** 3780	1.30	19000	29000	**0.029** 0.064
	14 0.5512	**26** 1.0236	**12** 0.472	**20** 0.7874	**0.3** 0.012	RNAO14X26X12	SNSH14,5X26X0,5	**10.5** 2360	**10.6** 2380	1.60	14000	21000	**0.029** 0.064
15 0.5906	**15** 0.5906	**23** 0.9055	**13** 0.512	**19** 0.7480	**0.3** 0.012	RNAO15X23X13	SNSH15,5X23X0,5	**9.66** 2170	**12.6** 2830	1.90	18000	28000	**0.019** 0.042
	15 0.5906	**23** 0.9055	**20** 0.787	**19** 0.7480	**0.3** 0.012	RNAO15X23X20	SNSH15,5X23X0,5	**13.5** 3030	**19.4** 4360	1.45	18000	28000	**0.029** 0.064
16 0.6299	**16** 0.6299	**24** 0.9449	**13** 0.512	**20** 0.7874	**0.3** 0.012	RNAO16X24X13	SNSH16,5X24X0,5	**10.1** 2270	**13.5** 3030	2.10	18000	28000	**0.022** 0.049
	16 0.6299	**24** 0.9449	**20** 0.787	**20** 0.7874	**0.3** 0.012	RNAO16X24X20	SNSH16,5X24X0,5	**13.4** 3010	**19.5** 4380	2.95	18000	28000	**0.032** 0.071
	16 0.6299	**28** 1.1024	**12** 0.472	**22** 0.8661	**0.3** 0.012	RNAO16X28X12	SNSH16,5X28X0,5	**11.2** 2520	**11.9** 2680	1.80	19000	29000	**0.033** 0.073
17 0.6693	**17** 0.6693	**25** 0.9843	**13** 0.512	**21** 0.8268	**0.3** 0.012	RNAO17X25X13	SNSH17,5X25X0,5	**10.5** 2360	**14.5** 3260	2.20	17000	26000	**0.022** 0.049
	17 0.6693	**25** 0.9843	**20** 0.787	**21** 0.8268	**0.3** 0.012	RNAO17X25X20	SNSH17,5X25X0,5	**14.7** 3300	**22.5** 5060	3.20	17000	26000	**0.032** 0.071
18 0.7087	**18** 0.7087	**26** 1.0236	**13** 0.512	**22** 0.8661	**0.3** 0.012	RNAO18X26X13	SNSH18,5X26X0,5	**10.8** 2430	**15.4** 3460	2.35	16000	24000	**0.024** 0.053
	18 0.7087	**26** 1.0236	**13** 0.512	**22** 0.8661	**0.3** 0.012	RNAO18X26X13ASR1	SNSH18,5X26X0,5	**10.8** 2430	**15.4** 3460	2.35	16000	24000	**0.024** 0.053
	18 0.7087	**26** 1.0236	**20** 0.787	**22** 0.8661	**0.3** 0.012	RNAO18X26X20	SNSH18,5X26X0,5	**14.4** 3240	**22.2** 4990	3.40	16000	24000	**0.034** 0.075
	18 0.7087	**30** 1.1811	**24** 0.945	**24** 0.9449	**0.3** 0.012	RNAO18X30X24		**20.2** 4540	**26.2** 5890	3.95	17000	25000	**0.070** 0.154
20 0.7874	**20** 0.7874	**28** 1.1024	**13** 0.512	**24** 0.9449	**0.3** 0.012	RNAO20X28X13	SNSH20,5X28X0,5	**11.5** 2590	**17.3** 3890	1.45	14000	22000	**0.025** 0.055

Continued on next page.

NEEDLE ROLLER BEARINGS WITHOUT FLANGES WITHOUT INNER RINGS

METRIC SERIES



RNAO SNSH RNAO

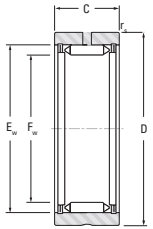
Shaft Dia.	F_w	D	C	E_w	$r_{s\ min.}$	Bearing Designation	End Washer Designation	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Speed Ratings Grease	Speed Ratings Oil	Approx. Wt.
mm in	mm in	mm in	mm in	mm in	mm in			kN lbf		kN	min^{-1}		kg lbs
20 0.7874	**20** 0.7874	**28** 1.1024	**26** 1.024	**24** 0.9449	**0.3** 0.012	RNAO20X28X26	SNSH20,5X28X0,5	**19.8** 4450	**34.6** 7780	2.90	14000	22000	**0.050** 0.110
	20 0.7874	**32** 1.2598	**12** 0.472	**26** 1.0236	**0.3** 0.012	RNAO20X32X12	SNSH20,5X32X0,5	**13.0** 2920	**15.3** 3440	2.30	15000	23000	**0.038** 0.084
	20 0.7874	**32** 1.2598	**24** 0.945	**26** 1.0236	**0.3** 0.012	RNAO20X32X24	SNSH20,5X32X0,5	**22.3** 5010	**30.6** 6880	4.60	15000	23000	**0.080** 0.176
22 0.8661	**22** 0.8661	**30** 1.1811	**13** 0.512	**26** 1.0236	**0.3** 0.012	RNAO22X30X13	SNSH22,5X30X0,5	**11.8** 2650	**18.3** 4110	2.80	13000	20000	**0.028** 0.062
	22 0.8661	**30** 1.1811	**26** 1.024	**26** 1.0236	**0.3** 0.012	RNAO22X30X26	SNSH22,5X30X0,5	**20.2** 4540	**36.6** 8230	5.55	13000	20000	**0.053** 0.117
	22 0.8661	**35** 1.3780	**16** 0.630	**29** 1.1417	**0.3** 0.012	RNAO22X35X16	SNSH22,5X35X0,5	**19.1** 4290	**23.3** 5240	3.70	13000	21000	**0.059** 0.130
	22 0.8661	**35** 1.3780	**32** 1.260	**29** 1.1417	**0.3** 0.012	RNAO22X35X32	SNSH22,5X35X0,5	**32.7** 7350	**46.5** 10500	7.35	13000	21000	**0.116** 0.256
25 0.9843	**25** 0.9843	**35** 1.3780	**17** 0.669	**30** 1.1811	**0.3** 0.012	RNAO25X35X17	SNSH25,5X35X0,5	**18.8** 4230	**29.8** 6700	4.60	11000	17000	**0.050** 0.110
	25 0.9843	**35** 1.3780	**26** 1.024	**30** 1.1811	**0.3** 0.012	RNAO25X35X26	SNSH25,5X35X0,5	**25.0** 5620	**42.8** 9620	6.50	11000	17000	**0.076** 0.168
	25 0.9843	**37** 1.4567	**16** 0.630	**32** 1.2598	**0.3** 0.012	RNAO25X37X16	SNSH25,5X37X0,5	**19.8** 4450	**25.3** 5690	4.00	12000	18000	**0.058** 0.128
	25 0.9843	**37** 1.4567	**32** 1.260	**32** 1.2598	**0.3** 0.012	RNAO25X37X32	SNSH25,5X37X0,5	**19.2** 4320	**23.6** 5310	8.00	12000	18000	**0.118** 0.260
28 1.1024	**28** 1.1024	**40** 1.5748	**16** 0.630	**35** 1.3780	**0.3** 0.012	RNAO28X40X16	SNSH28,5X40X0,5	**20.9** 4700	**27.9** 6270	4.30	10000	16000	**0.063** 0.139
	28 1.1024	**40** 1.5748	**32** 1.260	**35** 1.3780	**0.3** 0.012	RNAO28X40X32	SNSH28,5X40X0,5	**35.8** 8050	**55.9** 12600	8.60	10000	16000	**0.128** 0.282
30 1.1811	**30** 1.1811	**40** 1.5748	**17** 0.669	**35** 1.3780	**0.3** 0.012	RNAO30X40X17	SNSH30,5X40X0,5	**20.2** 4540	**34.6** 7780	5.35	9300	14000	**0.060** 0.132
	30 1.1811	**40** 1.5748	**26** 1.024	**35** 1.3780	**0.3** 0.012	RNAO30X40X26	SNSH30,5X40X0,5	**26.8** 6020	**49.7** 11200	7.55	9300	14000	**0.088** 0.194
	30 1.1811	**42** 1.6535	**16** 0.630	**37** 1.4567	**0.3** 0.012	RNAO30X42X16		**22.3** 5010	**31.0** 6970	4.90	9600	15000	**0.069** 0.152
	30 1.1811	**42** 1.6535	**32** 1.260	**37** 1.4567	**0.3** 0.012	RNAO30X42X32		**38.2** 8590	**62.1** 14000	9.85	9600	15000	**0.131** 0.289
35 1.3780	**35** 1.3780	**45** 1.7717	**17** 0.669	**40** 1.5748	**0.3** 0.012	RNAO35X45X17		**22.1** 4970	**40.8** 9170	6.35	7900	12000	**0.069** 0.152
	35 1.3780	**45** 1.7717	**26** 1.024	**40** 1.5748	**0.3** 0.012	RNAO35X45X26		**27.7** 6230	**54.5** 12300	8.30	7900	12000	**0.091** 0.201
	35 1.3780	**47** 1.8504	**16** 0.630	**41** 1.6142	**0.3** 0.012	RNAO35X47X16	SNSH35,5X47X0,5	**24.5** 5510	**36.8** 8270	5.80	8100	12000	**0.075** 0.165
	35 1.3780	**47** 1.8504	**32** 1.260	**42** 1.6535	**0.3** 0.012	RNAO35X47X32	SNSH35,5X47X0,5	**42.0** 9440	**73.5** 16500	11.6	8100	12000	**0.156** 0.344
40 1.5748	**40** 1.5748	**50** 1.9685	**17** 0.669	**45** 1.7717	**0.3** 0.012	RNAO40X50X17	SNSH40,5X50X0,5	**23.8** 5350	**47.0** 10600	7.30	6900	11000	**0.086** 0.190

Shaft Dia.	F_w	D	C	E_w	$r_{s\ min.}$	Bearing Designation	End Washer Designation	Load Ratings Dynamic C	Load Ratings Static C_0	Fatigue Load Limit C_u	Speed Ratings Grease	Speed Ratings Oil	Approx. Wt.
mm in	mm in	mm in	mm in	mm in	mm in			kN lbf		kN	min^{-1}		kg lbs
40 1.5748	**40** 1.5748	**50** 1.9685	**34** 1.339	**45** 1.7717	**0.3** 0.012	RNAO40X50X34	SNSH40,5X50X0,5	**40.9** 9190	**94.1** 21200	14.6	6900	11000	**0.152** 0.335
	40 1.5748	**55** 2.1654	**20** 0.787	**48** 1.8898	**0.3** 0.012	RNAO40X55X20	SNSH41X55X1	**35.5** 7980	**56.3** 12700	8.95	7100	11000	**0.139** 0.306
	40 1.5748	**55** 2.1654	**40** 1.575	**48** 1.8898	**0.3** 0.012	RNAO40X55X40	SNSH41X55X1	**60.8** 13700	**113** 25400	17.9	7100	11000	**0.276** 0.608
45 1.7717	**45** 1.7717	**55** 2.1654	**17** 0.669	**50** 1.9685	**0.3** 0.012	RNAO45X55X17	SNSH45,5X55X0,5	**24.9** 5600	**51.8** 11600	8.05	6100	9400	**0.089** 0.196
	45 1.7717	**55** 2.1654	**34** 1.339	**50** 1.9685	**0.3** 0.012	RNAO45X55X34	SNSH45,5X55X0,5	**42.7** 9600	**104** 23400	16.1	6100	9400	**0.168** 0.370
	45 1.7717	**62** 2.4409	**20** 0.787	**53** 2.0866	**0.3** 0.012	RNAO45X62X20	SNSH46X62X1	**30.8** 6920	**68.1** 15300	9.05	6100	9400	**0.163** 0.359
	45 1.7717	**62** 2.4409	**40** 1.575	**53** 2.0866	**0.3** 0.012	RNAO45X62X40	SNSH46X62X1	**61.7** 13900	**119** 26800	18.1	6200	9600	**0.325** 0.717
50 1.9685	**50** 1.9685	**62** 2.4409	**20** 0.787	**55** 2.1654	**0.3** 0.012	RNAO50X62X20		**30.2** 6790	**68.5** 15400	10.7	5400	8400	**0.142** 0.313
	50 1.9685	**62** 2.4409	**40** 1.575	**55** 2.1654	**0.3** 0.012	RNAO50X62X40		**51.7** 11600	**137** 30800	21.4	5400	8400	**0.269** 0.593
	50 1.9685	**65** 2.5591	**20** 0.787	**58** 2.2835	**0.3** 0.012	RNAO50X65X20	SNSH51X65X1	**38.8** 8720	**67.8** 15200	10.8	5600	8600	**0.167** 0.368
	50 1.9685	**65** 2.5591	**40** 1.575	**58** 2.2835	**0.3** 0.012	RNAO50X65X40		**66.5** 14900	**136** 30600	21.6	5600	8600	**0.342** 0.754
55 2.1654	**55** 2.1654	**68** 2.6772	**20** 0.787	**60** 2.3622	**0.3** 0.012	RNAO55X68X20		**30.7** 6900	**72.4** 16300	11.3	4900	7600	**0.165** 0.364
	55 2.1654	**68** 2.6772	**40** 1.575	**60** 2.3622	**0.3** 0.012	RNAO55X68X40		**52.7** 11800	**145** 32600	22.6	4900	7600	**0.320** 0.705
	55 2.1654	**72** 2.8346	**20** 0.787	**63** 2.4803	**1.0** 0.039	RNAO55X72X20	SNSH56X72X1	**40.3** 9060	**73.5** 16500	11.7	5000	7800	**0.212** 0.467
	55 2.1654	**72** 2.8346	**40** 1.575	**63** 2.4803	**1.0** 0.039	RNAO55X72X40	SNSH56X72X1	**69.1** 15500	**127** 28600	23.4	5000	7800	**0.433** 0.955
60 2.3622	**60** 2.3622	**78** 3.0709	**20** 0.787	**68** 2.6772	**1.0** 0.039	RNAO60X78X20	SNSH61X78X1	**41.8** 9400	**79.2** 17800	12.6	4600	7100	**0.230** 0.507
	60 2.3622	**78** 3.0709	**40** 1.575	**68** 2.6772	**1.0** 0.039	RNAO60X78X40	SNSH61X78X1	**71.7** 16100	**158** 35500	25.2	4600	7100	**0.436** 0.961
65 2.5591	**65** 2.5591	**85** 3.3465	**30** 1.181	**73** 2.8740	**1.0** 0.039	RNAO65X85X30	SNSH66X85X1	**60.1** 13500	**129** 29000	20.3	4200	6500	**0.468** 1.032
	65 2.5591	**85** 3.3465	**60** 2.362	**73** 2.8740	**1.0** 0.039	RNAO65X85X60	SNSH66X85X1	**103** 23200	**259** 58200	40.7	4200	6500	**0.876** 1.931
70 2.7559	**70** 2.7559	**90** 3.5433	**30** 1.181	**78** 3.0709	**1.0** 0.039	RNAO70X90X30		**62.2** 14000	**139** 31200	21.8	3900	6000	**0.505** 1.113
	70 2.7559	**90** 3.5433	**60** 2.362	**78** 3.0709	**1.0** 0.039	RNAO70X90X60		**107** 24100	**277** 62300	43.6	3900	6000	**0.925** 2.039
75 2.9528	**75** 2.9528	**95** 3.7402	**30** 1.181	**83** 3.2677	**1.0** 0.039	RNAO75X95X30		**60.9** 13700	**138** 31000	21.7	3600	5600	**0.510** 1.124
	75 2.9528	**95** 3.7402	**60** 2.362	**83** 3.2677	**1.0** 0.039	RNAO75X95X60		**104** 23400	**277** 62300	43.3	3600	5600	**0.980** 2.161
80 3.1496	**80** 3.1496	**100** 3.9370	**30** 1.181	**88** 3.4646	**1.0** 0.039	RNAO80X100X30		**67.5** 15200	**161** 36200	25.4	3400	5200	**0.580** 1.279
	80 3.1496	**100** 3.9370	**60** 2.362	**88** 3.4646	**1.0** 0.039	RNAO80X100X60		**116** 26100	**322** 72400	50.7	3400	5200	**1.044** 2.30
85 3.3465	**85** 3.3465	**105** 4.1339	**30** 1.181	**93** 3.6614	**1.0** 0.039	RNAO85X105X30		**69.4** 15600	**170** 38200	26.8	3000	4600	**0.586** 1.292
100 3.9370	**100** 3.9370	**120** 4.7244	**30** 1.181	**108** 4.2520	**1.0** 0.039	RNAO100X120X30		**72.4** 16300	**191** 42900	29.5	2700	4200	**0.660** 1.455

NEEDLE ROLLER BEARINGS
FULL COMPLEMENT
WITHOUT INNER RINGS

METRIC SERIES

- Check for availability.



RNA

Shaft Dia.	F_w	D	C	E_w	$r_{s\,min.}$	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.
							Dynamic	Static		Grease	Oil	
							C	C_0				
mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
7.3 0.2874	**7.3** 0.2874	**16** 0.6299	**12** 0.472	**12.3** 0.4843	**0.35** 0.014	RNA1005[1]	**3.95** 888	**4.45** 1000	0.880	34000	52000	**0.010** 0.022
9.7 0.3819	**9.7** 0.3819	**19** 0.7480	**12** 0.472	**14.7** 0.5787	**0.35** 0.014	RNA1007[1]	**4.80** 1080	**5.90** 1330	1.15	25000	39000	**0.013** 0.029
12.1 0.4764	**12.1** 0.4764	**22** 0.8661	**12** 0.472	**17.1** 0.6732	**0.35** 0.014	RNA1009[1]	**5.60** 1260	**7.40** 1660	1.45	20000	31000	**0.018** 0.040
14.4 0.5669	**14.4** 0.5669	**24** 0.9449	**12** 0.472	**19.4** 0.7638	**0.35** 0.014	RNA1010[1]	**6.35** 1430	**8.90** 2000	1.75	17000	26000	**0.020** 0.044
17.6 0.6929	**17.6** 0.6929	**28** 1.1024	**15** 0.591	**22.6** 0.8898	**0.35** 0.014	RNA1012[1]	**11.0** 2470	**16.5** 3710	2.95	14000	22000	**0.034** 0.075
20.8 0.8189	**20.8** 0.8189	**32** 1.2598	**15** 0.591	**25.8** 1.0157	**0.65** 0.026	RNA1015[1]	**12.4** 2790	**19.5** 4380	3.05	12000	18000	**0.044** 0.097
22.1 0.8701	**22.1** 0.8701	**35** 1.3780	**22** 0.866	**28.1** 1.1063	**0.65** 0.026	RNA2015	**23.5** 5280	**37.5** 8430	7.20	11000	17000	**0.082** 0.181
23.9 0.9409	**23.9** 0.9409	**35** 1.3780	**15** 0.591	**28.9** 1.1378	**0.65** 0.026	RNA1017[1]	**13.7** 3080	**22.5** 5060	4.05	10000	16000	**0.047** 0.104
28.7 1.1299	**28.7** 1.1299	**42** 1.6535	**18** 0.709	**34.7** 1.3661	**0.65** 0.026	RNA1020	**19.3** 4340	**33.5** 7530	5.55	8600	13000	**0.084** 0.185
	28.7 1.1299	**42** 1.6535	**22** 0.866	**34.7** 1.3661	**0.65** 0.026	RNA2020	**28.5** 6410	**49.0** 11000	8.15	8600	13000	**0.104** 0.229
33.5 1.3189	**33.5** 1.3189	**47** 1.8504	**18** 0.709	**39.5** 1.5551	**0.65** 0.026	RNA1025	**21.5** 4830	**39.0** 8770	6.50	7200	11000	**0.097** 0.214
	33.5 1.3189	**47** 1.8504	**22** 0.866	**39.5** 1.5551	**0.65** 0.026	RNA2025	**33.0** 7420	**60.0** 13500	9.55	7200	11000	**0.122** 0.269
	33.5 1.3189	**47** 1.8504	**30** 1.181	**39.5** 1.5551	**0.65** 0.026	RNA22025	**52.0** 11700	**94.0** 21100	15.2	7200	11000	**0.170** 0.375
38.2 1.5039	**38.2** 1.5039	**52** 2.0472	**18** 0.709	**44.2** 1.7402	**0.65** 0.026	RNA1030	**23.5** 5280	**44.5** 10000	7.40	6500	10000	**0.107** 0.236
	38.2 1.5039	**52** 2.0472	**22** 0.866	**44.2** 1.7402	**0.65** 0.026	RNA2030	**34.5** 7760	**66.0** 14800	10.9	6500	10000	**0.139** 0.306
	38.2 1.5039	**52** 2.0472	**30** 1.181	**44.2** 1.7402	**0.65** 0.026	RNA22030	**57.0** 12800	**108** 24300	17.4	6500	10000	**0.193** 0.425
44 1.7323	**44** 1.7323	**58** 2.2835	**18** 0.709	**50.0** 1.9685	**0.65** 0.026	RNA1035	**26.0** 5850	**51.0** 11500	8.55	5600	8600	**0.127** 0.280
	44 1.7323	**58** 2.2835	**22** 0.866	**50.0** 1.9685	**0.65** 0.026	RNA2035	**38.0** 8540	**75.0** 16900	12.6	5600	8600	**0.160** 0.353
	44 1.7323	**58** 2.2835	**30** 1.181	**50.0** 1.9685	**0.65** 0.026	RNA22035	**63.0** 14200	**124** 27900	20.0	5600	8600	**0.225** 0.496

(1) No lubrication holes.

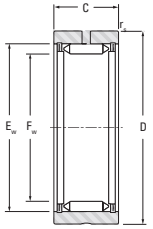
Shaft Dia.	F_w	D	C	E_w	$r_{s\,min.}$	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.
							Dynamic	Static		Grease	Oil	
							C	C_0				
mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
44 1.7323	**44** 1.7323	**62** 2.4409	**30** 1.181	**51.0** 2.0094	**0.65** 0.026	RNA3030	**64.0** 14400	**125** 28100	19.5	5600	8600	**0.309** 0.681
49.7 1.9567	**49.7** 1.9567	**65** 2.5591	**18** 0.709	**55.7** 2.1929	**0.85** 0.033	RNA1040	**28.5** 6410	**58.0** 13000	9.65	4900	7600	**0.160** 0.353
	49.7 1.9567	**65** 2.5591	**22** 0.866	**55.7** 2.1929	**0.65** 0.026	RNA2040	**41.5** 9330	**85.0** 19100	14.2	4900	7600	**0.200** 0.441
	49.7 1.9567	**65** 2.5591	**30** 1.181	**55.7** 2.1929	**0.65** 0.026	RNA22040	**68.0** 15300	**140** 31500	22.4	4900	7600	**0.278** 0.613
	49.7 1.9567	**72** 2.8346	**36** 1.417	**56.8** 2.2346	**0.65** 0.026	RNA3035	**90.0** 20200	**183** 41100	28.3	4900	7600	**0.545** 1.202
55.4 2.1811	**55.4** 2.1811	**72** 2.8346	**18** 0.709	**61.4** 2.4173	**0.85** 0.033	RNA1045	**30.5** 6860	**65.0** 14600	10.8	4500	6900	**0.193** 0.425
	55.4 2.1811	**72** 2.8346	**22** 0.866	**61.4** 2.4173	**0.85** 0.033	RNA2045	**45.0** 10100	**95.0** 21400	15.9	4500	6900	**0.242** 0.534
	55.4 2.1811	**80** 3.1496	**36** 1.417	**62.5** 2.4591	**0.85** 0.033	RNA3040	**97.0** 21800	**204** 45900	31.5	4500	6900	**0.672** 1.482
62.1 2.4449	**62.1** 2.4449	**80** 3.1496	**20** 0.787	**68.1** 2.6811	**0.85** 0.033	RNA1050	**33.0** 7420	**73.0** 16400	12.1	4000	6100	**0.255** 0.562
	62.1 2.4449	**80** 3.1496	**28** 1.102	**68.1** 2.6811	**0.85** 0.033	RNA2050	**64.0** 14400	**142** 31900	23.1	4000	6100	**0.375** 0.827
	62.1 2.4449	**85** 3.3465	**38** 1.496	**69.2** 2.7228	**0.85** 0.033	RNA3045	**105** 23600	**230** 51700	35.4	4000	6100	**0.710** 1.565
68.8 2.7087	**68.8** 2.7087	**85** 3.3465	**20** 0.787	**74.8** 2.9449	**0.85** 0.033	RNA1055	**35.5** 7980	**80.0** 18000	13.4	3600	5500	**0.258** 0.569
	68.8 2.7087	**85** 3.3465	**28** 1.102	**74.8** 2.9449	**0.85** 0.033	RNA2055	**69.0** 15500	**157** 35300	25.6	3600	5500	**0.361** 0.796
	68.8 2.7087	**90** 3.5433	**38** 1.496	**75.9** 2.9866	**0.85** 0.033	RNA3050	**113** 25400	**255** 57300	39.2	3600	5500	**0.705** 1.55
72.6 2.8583	**72.6** 2.8583	**90** 3.5433	**20** 0.787	**78.6** 3.0945	**0.85** 0.033	RNA1060	**37.0** 8320	**85.0** 19100	14.1	3400	5200	**0.283** 0.624
	72.6 2.8583	**90** 3.5433	**28** 1.102	**78.6** 3.0945	**0.85** 0.033	RNA2060	**72.0** 16200	**165** 37100	26.6	3400	5200	**0.413** 0.911
	72.6 2.8583	**95** 3.7402	**38** 1.496	**79.6** 3.1339	**0.85** 0.033	RNA3055	**117** 26300	**268** 60200	41.8	3400	5200	**0.782** 1.724
78.3 3.0827	**78.3** 3.0827	**95** 3.7402	**20** 0.787	**84.3** 3.3189	**0.85** 0.033	RNA1065	**41.5** 9330	**97.0** 21800	14.9	3200	4900	**0.306** 0.675
	78.3 3.0827	**95** 3.7402	**28** 1.102	**84.3** 3.3189	**0.85** 0.033	RNA2065	**78.0** 17500	**184** 41400	28.7	3200	4900	**0.433** 0.955
	78.3 3.0827	**100** 3.9370	**38** 1.496	**85.3** 3.3583	**0.85** 0.033	RNA3060	**123.0** 27700	**290** 65200	45.0	3200	4900	**0.810** 1.786
83.1 3.2717	**83.1** 3.2717	**100** 3.9370	**20** 0.787	**89.1** 3.5079	**0.85** 0.033	RNA1070	**43.0** 9670	**103** 23200	15.8	2900	4500	**0.322** 0.710
	83.1 3.2717	**100** 3.9370	**28** 1.102	**89.1** 3.5079	**0.85** 0.033	RNA2070	**81.0** 18200	**195** 43800	30.5	2900	4500	**0.470** 1.036
	83.1 3.2717	**105** 4.1339	**38** 1.496	**90.2** 3.5496	**0.85** 0.033	RNA3065	**129** 29000	**308** 69200	41.3	2900	4500	**0.865** 1.907
88 3.4646	**88** 3.4646	**110** 4.3307	**24** 0.945	**95.0** 3.7402	**0.85** 0.033	RNA1075	**64.0** 14400	**155** 34800	26.6	2800	4300	**0.577** 1.272

Continued on next page.

NEEDLE ROLLER BEARINGS
FULL COMPLEMENT
WITHOUT INNER RINGS

METRIC SERIES

- Check for availability.



RNA

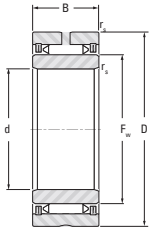
Shaft Dia.	F_w	D	C	E_w	$r_{s\,min.}$	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.
							Dynamic	Static		Grease	Oil	
							C	C_0				
mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
88 3.4646	**88** 3.4646	**110** 4.3307	**32** 1.260	**95.0** 3.7402	**0.85** 0.033	RNA2075	**104** 23400	**253** 56900	39.5	2800	4300	**0.767** 1.691
	88 3.4646	**110** 4.3307	**38** 1.496	**95.0** 3.7402	**0.85** 0.033	RNA3070	**134** 30100	**325** 73100	50.8	2800	4300	**0.906** 1.997
96 3.7795	**96** 3.7795	**115** 4.5276	**24** 0.945	**103.0** 4.0551	**0.85** 0.033	RNA1080	**68.0** 15300	**170** 38200	26.7	2600	4000	**0.510** 1.124
	96 3.7795	**115** 4.5276	**32** 1.254	**103.0** 4.0551	**0.85** 0.033	RNA2080	**110** 24700	**275** 61800	43.0	2600	4000	**0.694** 1.530
	96 3.7795	**120** 4.7244	**38** 1.496	**103.0** 4.0551	**0.85** 0.033	RNA3075	**142** 31900	**355** 79800	55.3	2600	4000	**1.098** 2.421
99.5 3.9173	**99.5** 3.9173	**120** 4.7244	**32** 1.260	**106.5** 4.1929	**1.35** 0.053	RNA2085	**113** 25400	**285** 64100	44.1	2500	3800	**0.787** 1.735
	99.5 3.9173	**125** 4.9213	**38** 1.496	**106.5** 4.1929	**0.85** 0.033	RNA3080	**145** 32600	**365** 82100	56.8	2500	3800	**1.220** 2.690
104.7 4.1220	**104.7** 4.1220	**125** 4.9213	**32** 1.260	**111.7** 4.3976	**1.35** 0.053	RNA2090	**117** 26300	**300** 67400	45.9	2300	3600	**0.837** 1.845
	104.7 4.1220	**130** 5.1181	**38** 1.496	**111.7** 4.3976	**1.35** 0.053	RNA3085	**150** 33700	**390** 87700	59.1	2300	3600	**1.252** 2.760
109.1 4.2953	**109.1** 4.2953	**130** 5.1181	**32** 1.260	**116.1** 4.5709	**1.35** 0.053	RNA2095	**120** 27000	**315** 70800	47.2	2300	3500	**0.882** 1.944
	109.1 4.2953	**135** 5.3150	**43** 1.693	**116.1** 4.5709	**1.35** 0.053	RNA3090	**185** 41600	**480** 108000	72.1	2300	3500	**1.522** 3.355
114.7 4.5157	**114.7** 4.5157	**135** 5.3150	**32** 1.260	**121.7** 4.7913	**1.35** 0.053	RNA2100	**125** 28100	**330** 74200	48.9	2100	3300	**0.677** 1.493
	114.7 4.5157	**140** 5.5118	**43** 1.693	**121.7** 4.7913	**1.35** 0.053	RNA3095	**190** 42700	**505** 114000	74.7	2100	3300	**1.551** 3.419
119.2 4.6929	**119.2** 4.6929	**140** 5.5118	**32** 1.260	**126.2** 4.9685	**1.35** 0.053	RNA2105	**129** 29000	**340** 76400	50.3	2100	3200	**0.941** 2.075
	119.2 4.6929	**145** 5.7087	**43** 1.693	**126.2** 4.9685	**1.35** 0.053	RNA3100	**195** 43800	**520** 117000	76.8	2100	3200	**1.645** 3.627
124.5 4.9016	**124.5** 4.9016	**145** 5.7087	**34** 1.339	**131.5** 5.1772	**1.35** 0.053	RNA2110	**133** 29900	**360** 80900	51.9	2000	3000	**1.015** 2.238
	124.5 4.9016	**150** 5.9055	**45** 1.772	**131.5** 5.1772	**1.35** 0.053	RNA3105	**203** 45600	**550** 124000	79.3	2000	3000	**1.762** 3.885
132.5 5.2165	**132.5** 5.2165	**155** 6.1024	**34** 1.339	**139.5** 5.4921	**1.35** 0.053	RNA2115	**139** 31200	**380** 85400	54.2	1900	2900	**1.205** 2.657
	132.5 5.2165	**160** 6.2992	**45** 1.772	**139.5** 5.4921	**1.35** 0.053	RNA3110	**210** 47200	**580** 130000	85.5	1900	2900	**2.037** 4.49

Shaft Dia.	F_w	D	C	E_w	$r_{s\,min.}$	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.
							Dynamic	Static		Grease	Oil	
							C	C_0				
mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
137 5.3937	**137** 5.3937	**160** 6.2992	**34** 1.339	**144.0** 5.6693	**1.35** 0.053	RNA2120	**142** 31900	**395** 88800	84.8	1800	2800	**1.265** 2.789
	137 5.3937	**165** 6.4961	**45** 1.772	**144.0** 5.6693	**1.35** 0.053	RNA3115	**215** 48300	**600** 135000	84.8	1800	2800	**2.140** 4.718
143.5 5.6496	**143.5** 5.6496	**165** 6.4961	**34** 1.339	**150.5** 5.9268	**1.35** 0.053	RNA2125	**145** 32600	**410** 92200	57.0	1800	2700	**1.218** 2.685
	143.5 5.6496	**170** 6.6929	**45** 1.772	**150.5** 5.9268	**1.35** 0.053	RNA3120	**224** 50400	**630** 142000	87.0	1800	2700	**2.107** 4.645
148 5.8268	**148** 5.8268	**170** 6.6929	**34** 1.339	**155.0** 6.1039	**1.35** 0.053	RNA2130	**150** 33700	**425** 95500	88.9	1700	2600	**1.292** 2.848
158 6.2205	**158** 6.2205	**180** 7.0866	**36** 1.417	**165.0** 6.4976	**1.35** 0.053	RNA2140	**157** 35300	**455** 102000	61.0	1600	2400	**1.478** 3.258
	158 6.2205	**190** 7.4803	**52** 2.047	**166.0** 6.5354	**1.35** 0.053	RNA3130	**275** 61800	**790** 178000	108	1600	2400	**3.285** 7.242
170.5 6.7126	**170.5** 6.7126	**195** 7.6772	**36** 1.417	**177.5** 6.9882	**1.35** 0.053	RNA2150	**165** 37100	**490** 110000	64.8	1400	2200	**1.790** 3.946
	170.5 6.7126	**205** 8.0709	**52** 2.047	**178.5** 7.0276	**1.35** 0.053	RNA3140	**290** 65200	**860** 193000	114	1400	2200	**3.840** 8.466
179.3 7.0591	**179.3** 7.0591	**205** 8.0709	**36** 1.417	**186.3** 7.3346	**1.35** 0.053	RNA2160	**170** 38200	**515** 116000	67.2	1400	2100	**1.970** 4.343
	179.3 7.0591	**215** 8.4646	**52** 2.047	**187.3** 7.3756	**1.35** 0.053	RNA3150	**300** 67400	**900** 202000	117	1400	2100	**4.185** 9.226
193.8 7.6299	**193.8** 7.6299	**220** 8.6614	**42** 1.654	**200.8** 7.9055	**1.85** 0.073	RNA2170	**233** 52400	**720** 162000	91.4	1300	2000	**2.570** 5.666
	193.8 7.6299	**230** 9.0551	**57** 2.244	**201.9** 7.9496	**1.35** 0.053	RNA3160	**360** 80900	**1110** 250000	139	1300	2000	**4.955** 10.924
202.6 7.9764	**202.6** 7.9764	**230** 9.0551	**42** 1.654	**209.6** 8.2520	**1.85** 0.073	RNA2180	**240** 54000	**750** 169000	94.4	1200	1900	**2.835** 6.250
216 8.5039	**216** 8.5039	**245** 9.6457	**42** 1.654	**223.0** 8.7795	**1.85** 0.073	RNA2190	**250** 56200	**800** 180000	98.7	1200	1800	**3.210** 7.077
	216 8.5039	**255** 10.0394	**57** 2.244	**224.1** 8.8236	**1.85** 0.073	RNA3180	**385** 86600	**1240** 279000	150	1200	1800	**6.040** 13.316
224.1 8.8228	**224.1** 8.8228	**255** 10.0394	**42** 1.654	**231.1** 9.0984	**1.85** 0.073	RNA2200	**257** 57800	**830** 187000	101	1100	1700	**3.560** 7.848
236 9.2913	**236** 9.2913	**265** 10.4331	**42** 1.654	**243.1** 9.5693	**1.85** 0.073	RNA2210	**279** 62700	**910** 205000	104	1000	1600	**3.470** 7.650
258.4 10.1732	**258.4** 10.1732	**300** 11.8110	**64** 2.520	**268.4** 10.5677	**1.85** 0.073	RNA3220	**490** 110000	**1650** 371000	192	980	1500	**8.570** 18.894
269.6 10.6142	**269.6** 10.6142	**300** 11.8110	**49** 1.929	**276.6** 10.8898	**1.85** 0.073	RNA2240	**345** 77600	**1190** 268000	137	910	1400	**4.985** 10.990
281.9 11.0984	**281.9** 11.0984	**325** 12.7953	**64** 2.520	**291.9** 11.4921	**1.85** 0.073	RNA3240	**520** 117000	**1800** 405000	204	850	1300	**9.480** 20.900
335 13.1890	**335** 13.1890	**375** 14.7638	**54** 2.126	**343.0** 13.5039	**1.85** 0.073	RNA2300	**460** 103000	**1690** 380000	183	720	1100	**8.600** 18.960

NEEDLE ROLLER BEARINGS
FULL COMPLEMENT
WITH INNER RINGS

METRIC SERIES

- Check for availability.



NA

Shaft Dia.	d	D	B	F_w	$r_{s\,min.}$	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.
							Dynamic	Static				
							C	C_0		Grease	Oil	
mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
12 0.4724	**12** 0.4724	**28** 1.1024	**15** 0.591	**17.6** 0.6929	**0.35** 0.014	NA1012[1]	**11.0** 2470	**16.5** 3710	2.95	14000	22000	**0.050** 0.110
15 0.5906	**15** 0.5906	**32** 1.2598	**15** 0.591	**20.8** 0.8189	**0.65** 0.026	NA1015[1]	**12.4** 2790	**19.5** 4380	3.05	12000	18000	**0.062** 0.137
	15 0.5906	**35** 1.3780	**22** 0.866	**22.1** 0.8701	**0.65** 0.026	NA2015	**23.5** 5280	**37.5** 8430	7.20	11000	17000	**0.117** 0.258
17 0.6693	**17** 0.6693	**35** 1.3780	**15** 0.591	**23.9** 0.9409	**0.65** 0.026	NA1017[1]	**13.7** 3080	**22.5** 5060	4.05	10000	16000	**0.073** 0.161
20 0.7874	**20** 0.7874	**42** 1.6535	**18** 0.709	**28.7** 1.1299	**0.65** 0.026	NA1020	**19.3** 4340	**33.5** 7530	5.55	8600	13000	**0.130** 0.287
	20 0.7874	**42** 1.6535	**22** 0.866	**28.7** 1.1299	**0.65** 0.026	NA2020	**28.5** 6410	**49.0** 11000	8.15	8600	13000	**0.160** 0.353
25 0.9843	**25** 0.9843	**47** 1.8504	**18** 0.709	**33.5** 1.3189	**0.65** 0.026	NA1025	**21.5** 4830	**39.0** 8770	6.50	7200	11000	**0.151** 0.333
	25 0.9843	**47** 1.8504	**22** 0.866	**33.5** 1.3189	**0.65** 0.026	NA2025	**33.0** 7420	**60.0** 13500	9.55	7200	11000	**0.187** 0.412
	25 0.9843	**47** 1.8504	**30** 1.181	**33.5** 1.3189	**0.65** 0.026	NA22025	**52.0** 11700	**94.0** 21100	15.2	7200	11000	**0.259** 0.571
30 1.1811	**30** 1.1811	**52** 2.0472	**18** 0.709	**38.2** 1.5039	**0.65** 0.026	NA1030	**23.5** 5280	**44.5** 10000	7.40	6500	10000	**0.167** 0.368
	30 1.1811	**52** 2.0472	**22** 0.866	**38.2** 1.5039	**0.65** 0.026	NA2030	**34.5** 7760	**66.0** 14800	10.9	6500	10000	**0.213** 0.470
	30 1.1811	**52** 2.0472	**30** 1.181	**38.2** 1.5039	**0.65** 0.026	NA22030	**57.0** 12800	**108** 24300	17.4	6500	10000	**0.293** 0.646
	30 1.1811	**62** 2.4409	**30** 1.181	**44.0** 1.7323	**0.65** 0.026	NA3030	**64.0** 14400	**125** 28100	19.5	5600	8600	**0.497** 1.10
35 1.3780	**35** 1.3780	**58** 2.2835	**18** 0.709	**44.0** 1.7323	**0.65** 0.026	NA1035	**26.0** 5850	**51.0** 11500	8.55	5600	8600	**0.204** 0.450
	35 1.3780	**58** 2.2835	**22** 0.866	**44.0** 1.7323	**0.65** 0.026	NA2035	**38.0** 8540	**75.0** 16900	12.6	5600	8600	**0.253** 0.558
	35 1.3780	**58** 2.2835	**30** 1.181	**44.0** 1.7323	**0.65** 0.026	NA22035	**63.0** 14200	**124** 27900	20.0	5600	8600	**0.352** 0.776
	35 1.3780	**72** 2.8346	**36** 1.417	**49.7** 1.9567	**0.65** 0.026	NA3035	**90.0** 20200	**183** 41100	28.3	4900	7600	**0.815** 1.80
40 1.5748	**40** 1.5748	**65** 2.5591	**18** 0.709	**49.7** 1.9567	**0.85** 0.033	NA1040	**28.5** 6410	**58.0** 13000	9.65	4900	7600	**0.254** 0.560
	40 1.5748	**65** 2.5591	**22** 0.866	**49.7** 1.9567	**0.85** 0.033	NA2040	**41.5** 9330	**85.0** 19100	14.2	4900	7600	**0.315** 0.694
	40 1.5748	**65** 2.5591	**30** 1.181	**49.7** 1.9567	**0.85** 0.033	NA22040	**68.0** 15300	**140** 31500	22.4	4900	7600	**0.434** 0.957
	40 1.5748	**80** 3.1496	**36** 1.417	**55.4** 2.1811	**0.85** 0.033	NA3040	**97.0** 21800	**204** 45900	31.5	4500	6900	**0.993** 2.19
45 1.7717	**45** 1.7717	**72** 2.8346	**18** 0.709	**55.4** 2.1811	**0.85** 0.033	NA1045	**30.5** 6860	**65.0** 14600	10.8	4500	6900	**0.306** 0.675

(1) No lubrication holes.

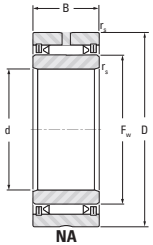
Shaft Dia.	d	D	B	F_w	$r_{s\,min.}$	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.
							Dynamic	Static				
							C	C_0		Grease	Oil	
mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
45 1.7717	**45** 1.7717	**72** 2.8346	**22** 0.866	**55.4** 2.1811	**0.85** 0.033	NA2045	**45.0** 10100	**95.0** 21400	15.9	4500	6900	**0.381** 0.840
	45 1.7717	**85** 3.3465	**38** 1.496	**62.1** 2.4449	**0.85** 0.033	NA3045	**105.0** 23600	**230** 51700	35.4	4000	6100	**1.13** 2.50
50 1.9685	**50** 1.9685	**80** 3.1496	**20** 0.787	**62.1** 2.4449	**0.85** 0.033	NA1050	**33.0** 7420	**73.0** 16400	12.1	4000	6100	**0.418** 0.922
	50 1.9685	**80** 3.1496	**28** 1.102	**62.1** 2.4449	**0.85** 0.033	NA2050	**64.0** 14400	**142** 31900	23.1	4000	6100	**0.603** 1.33
	50 1.9685	**90** 3.5433	**38** 1.496	**68.8** 2.7087	**0.85** 0.033	NA3050	**113.0** 25400	**255** 57300	39.2	3600	5500	**1.22** 2.69
55 2.1654	**55** 2.1654	**85** 3.3465	**20** 0.787	**68.8** 2.7087	**0.85** 0.033	NA1055	**35.5** 7980	**80.0** 18000	13.4	3600	5500	**0.453** 0.999
	55 2.1654	**85** 3.3465	**28** 1.102	**68.8** 2.7087	**0.85** 0.033	NA2055	**69.0** 15500	**157** 35300	25.6	3600	5500	**0.649** 1.43
	55 2.1654	**95** 3.7402	**38** 1.496	**72.6** 2.8583	**0.85** 0.033	NA3055	**117.0** 26300	**268** 60200	41.8	3400	5200	**1.31** 2.88
60 2.3622	**60** 2.3622	**90** 3.5433	**20** 0.787	**72.6** 2.8583	**0.85** 0.033	NA1060	**37.0** 8320	**85.0** 19100	14.1	3400	5200	**0.485** 1.07
	60 2.3622	**90** 3.5433	**28** 1.102	**72.6** 2.8583	**0.85** 0.033	NA2060	**72.0** 16200	**165** 37100	26.6	3400	5200	**0.695** 1.53
	60 2.3622	**100** 3.9370	**38** 1.496	**78.3** 3.0827	**0.85** 0.033	NA3060	**123.0** 27700	**290** 65200	45.0	3200	4900	**1.39** 3.07
65 2.5591	**65** 2.5591	**95** 3.7402	**20** 0.787	**78.3** 3.0827	**0.85** 0.033	NA1065	**41.5** 9330	**97.0** 21800	14.9	3200	4900	**0.536** 1.18
	65 2.5591	**95** 3.7402	**28** 1.102	**78.3** 3.0827	**0.85** 0.033	NA2065	**78.0** 17500	**184** 41400	28.7	3200	4900	**0.757** 1.67
	65 2.5591	**105** 4.1339	**38** 1.496	**83.1** 3.2717	**0.85** 0.033	NA3065	**129.0** 29000	**308** 69200	41.3	2900	4500	**1.49** 3.28
70 2.7559	**70** 2.7559	**100** 3.9370	**20** 0.787	**83.1** 3.2717	**0.85** 0.033	NA1070	**43.0** 9670	**103** 23200	15.8	2900	4500	**0.567** 1.25
	70 2.7559	**100** 3.9370	**28** 1.102	**83.1** 3.2717	**0.85** 0.033	NA2070	**81.0** 18200	**195** 43800	30.5	2900	4500	**0.805** 1.77
	70 2.7559	**110** 4.3307	**38** 1.496	**88.0** 3.4646	**0.85** 0.033	NA3070	**134.0** 30100	**325** 73100	50.8	2800	4300	**1.57** 3.46
75 2.9528	**75** 2.9528	**110** 4.3307	**32** 1.260	**88.0** 3.4646	**0.85** 0.033	NA2075	**104.0** 23400	**253** 56900	39.5	2800	4300	**1.18** 2.59
	75 2.9528	**120** 4.7244	**38** 1.496	**96.0** 3.7795	**0.85** 0.033	NA3075	**142.0** 31900	**355** 79800	55.3	2600	4000	**1.92** 4.24
80 3.1496	**80** 3.1496	**115** 4.5276	**24** 0.945	**96.0** 3.7795	**0.85** 0.033	NA1080	**68.0** 15300	**170** 38200	26.7	2600	4000	**0.920** 2.03
	80 3.1496	**115** 4.5276	**32** 1.254	**96.0** 3.7795	**0.85** 0.033	NA2080	**110.0** 24700	**275** 61800	43.0	2600	4000	**1.24** 2.73
	80 3.1496	**125** 4.9213	**38** 1.496	**99.5** 3.9173	**0.85** 0.033	NA3080	**145.0** 32600	**365** 82100	56.8	2500	3800	**2.03** 4.46
85 3.3465	**85** 3.3465	**120** 4.7244	**32** 1.260	**99.5** 3.9173	**1.35** 0.053	NA2085	**113.0** 25400	**285** 64100	44.1	2500	3800	**1.30** 2.87
	85 3.3465	**130** 5.1181	**38** 1.496	**104.7** 4.1220	**1.35** 0.053	NA3085	**150.0** 33700	**390** 87700	59.1	2300	3600	**2.12** 4.67
90 3.5433	**90** 3.5433	**125** 4.9213	**32** 1.260	**104.7** 4.1220	**1.35** 0.053	NA2090	**117.0** 26300	**300** 67400	45.9	2300	3600	**1.37** 3.02
	90 3.5433	**135** 5.3150	**43** 1.693	**109.7** 4.3189	**1.35** 0.053	NA3090	**185.0** 41600	**480** 108000	72.1	2300	3500	**2.51** 5.54
95 3.7402	**95** 3.7402	**130** 5.1181	**32** 1.260	**109.1** 4.2953	**1.35** 0.053	NA2095	**120.0** 27000	**315** 70800	47.2	2300	3500	**1.43** 3.15
	95 3.7402	**140** 5.5118	**43** 1.693	**114.7** 4.5157	**1.35** 0.053	NA3095	**190.0** 42700	**505** 114000	74.7	2100	3300	**2.63** 5.79

Continued on next page.

NEEDLE ROLLER BEARINGS
FULL COMPLEMENT
WITH INNER RINGS

METRIC SERIES

- Check for availability.



NA

Shaft Dia.	d	D	B	F_w	$r_{s\,min.}$	Bearing Designation	Load Ratings		Fatigue Load Limit C_u	Speed Ratings		Approx. Wt.
							Dynamic	Static		Grease	Oil	
							C	C_0				
mm in	mm in	mm in	mm in	mm in	mm in		kN lbf		kN	min^{-1}		kg lbs
100 3.9370	**100** 3.9370	**135** 5.3150	**32** 1.260	**114.7** 4.5157	**1.35** 0.053	NA2100	**125.0** 28100	**330** 74200	48.9	2100	3300	**1.50** 3.30
	100 3.9370	**145** 5.7087	**43** 1.693	**119.2** 4.6929	**1.35** 0.053	NA3100	**195.0** 43800	**520** 117000	76.8	2100	3200	**2.74** 6.03
105 4.1339	**105** 4.1339	**140** 5.5118	**32** 1.260	**119.2** 4.6929	**1.35** 0.053	NA2105	**129.0** 29000	**340** 76400	50.3	2100	3200	**1.56** 3.43
	105 4.1339	**150** 5.9055	**45** 1.772	**124.7** 4.9094	**1.35** 0.053	NA3105	**203.0** 45600	**550** 124000	79.3	2000	3000	**2.99** 6.59
110 4.3307	**110** 4.3307	**145** 5.7087	**34** 1.339	**124.7** 4.9094	**1.35** 0.053	NA2110	**133.0** 29900	**360** 80900	51.9	2000	3000	**1.72** 3.79
	110 4.3307	**160** 6.2992	**45** 1.772	**132.5** 5.2165	**1.35** 0.053	NA3110	**210.0** 47200	**580** 130000	85.5	1900	2900	**3.53** 7.79
115 4.5276	**115** 4.5276	**155** 6.1024	**34** 1.339	**132.5** 5.2165	**1.35** 0.053	NA2115	**139.0** 31200	**380** 85400	54.2	1900	2900	**2.10** 4.63
	115 4.5276	**165** 6.4961	**45** 1.772	**137.0** 5.3937	**1.35** 0.053	NA3115	**215.0** 48300	**600** 135000	84.8	1800	2800	**3.66** 8.07
120 4.7244	**120** 4.7244	**160** 6.2992	**34** 1.339	**137.0** 5.3937	**1.35** 0.053	NA2120	**142.0** 31900	**395** 88800	84.8	1800	2800	**2.17** 4.78
	120 4.7244	**170** 6.6929	**45** 1.772	**143.5** 5.6496	**1.35** 0.053	NA3120	**224.0** 50400	**630** 142000	87.0	1800	2700	**3.79** 8.36
125 4.9213	**125** 4.9213	**165** 6.4961	**34** 1.339	**143.5** 5.6496	**1.35** 0.053	NA2125	**145.0** 32600	**410** 92200	57.0	1800	2700	**2.24** 4.94
130 5.1181	**130** 5.1181	**170** 6.6929	**34** 1.339	**148.0** 5.8268	**1.35** 0.053	NA2130	**150.0** 33700	**425** 95500	88.9	1700	2600	**2.33** 5.13
140 5.5118	**140** 5.5118	**180** 7.0866	**36** 1.417	**158.0** 6.2205	**1.35** 0.053	NA2140	**157.0** 35300	**455** 102000	61.0	1600	2400	**2.64** 5.83
	140 5.5118	**205** 8.0709	**52** 2.047	**170.5** 6.7126	**1.35** 0.053	NA3140	**290.0** 65200	**860** 193000	114	1400	2200	**6.84** 15.1
150 5.9055	**150** 5.9055	**195** 7.6772	**36** 1.417	**170.5** 6.7126	**1.35** 0.053	NA2150	**165.0** 37100	**490** 110000	64.8	1400	2200	**3.23** 7.12
160 6.2992	**160** 6.2992	**205** 8.0709	**36** 1.417	**179.3** 7.0591	**1.35** 0.053	NA2160	**170.0** 38200	**515** 116000	67.2	1400	2100	**3.40** 7.50
170 6.6929	**170** 6.6929	**220** 8.6614	**42** 1.654	**193.8** 7.6299	**1.35** 0.053	NA2170	**233.0** 52400	**720** 162000	91.4	1300	2000	**4.77** 10.5
180 7.0866	**180** 7.0866	**230** 9.0551	**42** 1.654	**202.6** 7.9764	**1.35** 0.053	NA2180	**240.0** 54000	**750** 169000	94.4	1200	1900	**5.01** 11.0
190 7.4803	**190** 7.4803	**245** 9.6457	**42** 1.654	**216.0** 8.5039	**1.35** 0.053	NA2190	**250.0** 56200	**800** 180000	98.7	1200	1800	**5.89** 13.0
200 7.8740	**200** 7.8740	**255** 10.0394	**42** 1.654	**224.1** 8.8228	**1.35** 0.053	NA2200	**257.0** 57800	**830** 187000	101	1100	1700	**6.15** 13.6

NEEDLE ROLLER BEARINGS

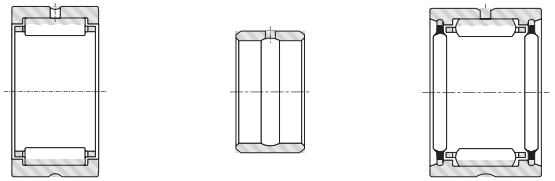
INCH SERIES

When there is a requirement for a rolling bearing to support very high dynamic, static or even shock loads with a restricted mounting space – the needle roller bearing may give best results.

REFERENCE STANDARDS ARE:

- **ANSI/ABMA Standard 18.2** – needle roller bearings – radial, inch design.
- **ASTM Standard F 2246** – standard specification for bearing, roller, needle: thick outer ring with rollers and cage.
- **Military Standard MS 51961** – bearing, roller, needle: thick outer ring with rollers and cage.
- **ASTM Standard F2431** – standard specification for ring, bearing, inner: needle roller bearing with thick outer ring.

IDENTIFICATION



HJ IR HJ – .2RS

Fig. B4-11. Construction of inch series heavy-duty needle roller bearings

The prefix letters HJ in the needle roller bearing designation denote that the bearing is manufactured to inch nominal dimensions.

Bearings are available with one or two lip-contact seals, as listed on pages B-4-52 and B-4-53. One seal is designated by suffix letters RS. Two seals are designated by .2RS.

Inner rings can be used with HJ Series needle roller bearings for applications where it is impractical to use the shaft as the inner raceway. These inch series inner rings are identified by the prefix letters IR.

Because the entire identification code may not appear on the bearing itself, the manufacturer's parts list or another reliable source should always be consulted when ordering bearings for service or field replacement to make certain that the correct bearing with the correct lubricant is used.

CONSTRUCTION

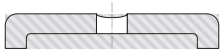


Fig. B4-12. One-piece, channel-shaped outer ring

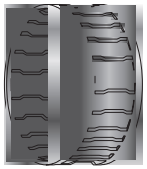


Fig. B4-13. Steel cage

The HJ Series needle roller bearing has a one-piece channel-shaped outer ring of bearing-quality steel heat treated to provide maximum load rating. The integral end flanges provide axial location for the needle rollers. The bores of the end flanges serve as piloting surfaces for the cage, locating it to prevent removal of the lubricant film on the raceway.

These bearings have a steel cage, which provides inward retention for the needle rollers. The design assures roller stability and minimizes friction between the cage and the needle rollers. The cage has a maximum strength consistent with the inherent high load ratings of needle roller bearings.

The needle rollers are made from high-carbon chrome steel, through-hardened, ground and lapped to close tolerance with controlled contour for optimum load distribution.

SEALS

Shaft contact seals, which fit into the same housing bore as the heavy-duty needle roller bearings, may be obtained from recognized seal manufacturers. Bearings can also be made available with one or two integral seals. For information and listing of sealed bearings, see pages B-4-52 and B-4-53.

LUBRICATION

The outer rings of the HJ bearings are supplied with a lubrication groove on the O.D. and a lubrication hole in this groove to facilitate re-lubrication through the outer ring. The IR inner rings have lubrication grooves in the bore and a re-lubrication hole to facilitate re-lubrication through the inner ring.

HJ Series bearings (with or without seals) are typically shipped protected with a corrosion-preventive compound that is not a lubricant. When specified by the customer, HJ Series bearings may be ordered prelubricated with suitable greases and oils.

MOUNTING DIMENSIONS

HJ needle roller bearings are normally mounted in their housings with a clearance fit if the load is stationary relative to the housing, and with a tight transition fit if the load rotates relative to the housing. Because the tight transition fit of the bearing in its housing may result in a reduction of the needle roller complement bore diameter, the shaft raceway diameter should be reduced to a like amount.

The mounting dimensions in the bearing tables (pages B-4-48 to B-4-53) list the suggested ISO H7 tolerances for the housing bore and the suggested ISO h6 tolerances for the shaft raceway when the outer ring is to be mounted with a clearance fit. The tables also list the suggested ISO N7 tolerances for the housing bore and the suggested ISO f6 tolerances for the shaft raceway when the outer ring is to be mounted with a tight transition fit.

Other mounting dimensions may be required for special conditions such as:

1. Extremely heavy radial loads.
2. Shock loads.
3. Load rotating relative to both inner and outer rings.
4. Temperature gradient across bearing.
5. Housing with heat expansion coefficient differing from that of the bearing.

If these conditions are expected, please consult your representative.

DIMENSIONAL ACCURACY, BEARINGS

HJ SERIES

Tolerances for the HJ bearings are given in Tables B4-8 and B4-9. Pages B-4-48 to B-4-53 list the nominal outer diameter, width and needle roller complement bore diameter for the HJ bearings.

Table B4-8. Outer diameter and width tolerances, HJ bearings

D				Deviaiton from nominal							
Nominal outer diameter				of single mean outer diameter, D_{mp}[1]				of width, C			
>	≤	>	≤	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
mm	mm	in	in	mm	mm	in	in	mm	mm	in	in
19.050	50.800	0.7500	2.0000	+0	-0.013	+0	-0.0005	+0	-0.013	+0	-0.005
50.800	82.550	2.0000	3.2500	+0	-0.015	+0	-0.0006	+0	-0.013	+0	-0.005
82.550	120.650	3.2500	4.7500	+0	-0.020	+0	-0.0008	+0	-0.013	+0	-0.005

[1] "Single mean diameter" is defined as the mean diameter in a single radial plane.

Table B4-9. Roller complement bore tolerance, HJ bearings

F_w				Deviaiton from nominal of the smallest single diameter of the roller complement bore, F_m[1]			
Nominal roller complement bore diameter							
>	≤	>	≤	Max.	Min.	Max.	Min.
mm	mm	in	in	mm	mm	in	in
12.700	15.875	0.5000	0.6250	+0.043	+0.020	+0.0017	+0.0008
15.875	28.575	0.6250	1.1250	+0.046	+0.023	+0.0018	+0.0009
28.575	41.275	1.1250	1.6250	+0.048	+0.025	+0.0019	+0.0010
41.275	47.625	1.6250	1.8750	+0.050	+0.025	+0.0020	+0.0010
47.625	69.850	1.8750	2.7500	+0.053	+0.028	+0.0021	+0.0011
69.850	76.200	2.7500	3.0000	+0.058	+0.028	+0.0023	+0.0011
76.200	101.600	3.0000	4.0000	+0.060	+0.030	+0.0024	+0.0012

[1] "The smallest single diameter of the roller complement bore" is defined as the diameter of the cylinder which, when used as a bearing inner ring, results in zero radial internal clearance in the bearing on at least one diameter.

DIMENSIONAL ACCURACY, INNER RINGS

IR SERIES

Tolerances for the IR inner rings are given in Tables B4-10 and B4-11. Pages B-4-54 to B-4-57 list the nominal outer diameter, width and bore diameter for the IR series inner rings.

Table B4-10. Bore and width tolerances, IR inner rings

d				Deviaiton from nominal							
Nominal bore diameter				of single mean bore diameter, d_{mp}[1]				of width, B			
>	≤	>	≤	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.
mm	mm	in	in	mm	mm	in	in	mm	mm	in	in
7.938	19.050	0.3125	0.7500	+0	-0.010	+0	-0.0004	+0.25	+0.12	+0.010	+0.005
19.050	50.800	0.7500	2.0000	+0	-0.013	+0	-0.0005	+0.25	+0.12	+0.010	+0.005
50.800	82.550	2.0000	3.2500	+0	-0.015	+0	-0.0006	+0.25	+0.12	+0.010	+0.005

[1] "Single mean diameter" is defined as the mean diameter in a single radial plane.

Table B4-11. Outer diameter tolerance, IR inner rings

F				Deviaiton from nominal of single mean outer diameter, F_{mp}[1]			
Nominal outer diameter							
>	≤	>	≤	Max.	Min.	Max.	Min.
mm	mm	in	in	mm	mm	in	in
12.700	15.875	0.5000	0.6250	-0.013	-0.023	-0.0005	-0.0009
15.875	25.400	0.6250	1.0000	-0.018	-0.031	-0.0007	-0.0012
25.400	28.575	1.0000	1.1250	-0.023	-0.036	-0.0009	-0.0014
28.575	34.925	1.1250	1.3750	-0.023	-0.036	-0.0009	-0.0015
34.925	47.625	1.3750	1.8750	-0.025	-0.038	-0.0010	-0.0016
47.625	76.200	1.8750	3.0000	-0.028	-0.040	-0.0011	-0.0018
76.200	95.250	3.0000	3.7500	-0.033	-0.046	-0.0013	-0.0022

[1] "Single mean diameter" is defined as the mean diameter in a single radial plane.

LOAD RATING FACTORS

DYNAMIC LOADS

Needle roller bearings can accommodate only radial loads.

$$P = F_r$$

P = The maximum dynamic radial load that may be applied to a needle roller bearing based on the dynamic load rating, C_r, given in the bearing tables. This load should be $\leq C_r/3$.

STATIC LOADS

Needle roller bearings can accommodate only radial loads.

$$P_0 = F_r$$

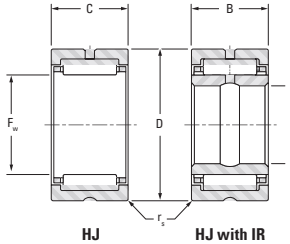
SPECIAL BEARINGS

For needle roller bearings with special dimensions or special features, such as split outer ring, consult your representative.

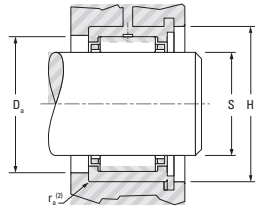
HJ TYPE

INCH SERIES

- Check for availability.
- Nominal bearing diameters and widths shown.
- Tolerance tables found on page B-4-46.
- Clearance fit suggested for outer ring when housing is stationary relative to load.
- Tight transition fit suggested if housing rotates relative to load.
- Consult your representative for oscillating applications (e.g., low radial clearance concerns).
- Unmarked end of outer ring should be assembled against housing shoulder to clear maximum allowed housing fillet.
- Meets Military Standard MS 51961 and ASTM F2246.



HJ HJ with IR



Shaft surface to be 58 HRC or equivalent

Shaft Dia.	F_w	D	C (B)	$r_{s\ min.}$	Bearing Designation	Used With Inner Ring Designation(1)	Load Ratings		Fatigue Load Limit C_u	Speed Ratings	
							Dynamic	Static			
							C	C_0		Grease	Oil
in	mm in	mm in	mm in	mm in			kN lbf		kN	min^{-1}	
5/8	15.875 0.6250	28.575 1.1250	19.050 0.750	0.64 0.025	HJ-101812	IR-061012	19.3 4350	20.7 4650	3.25	20000	30000
3/4	19.050 0.7500	31.750 1.2500	19.050 0.750	1.02 0.04	HJ-122012	IR-081212	20.7 4650	23.3 5240	3.65	16000	25000
	19.050 0.7500	31.750 1.2500	25.400 1.000	1.02 0.04	HJ-122016	IR-081216	27.8 6250	33.8 7600	5.30	16000	25000
7/8	22.225 0.8750	34.925 1.3750	19.050 0.750	1.02 0.04	HJ-142212	IR-101412	23.1 5180	27.9 6270	4.35	13000	21000
	22.225 0.8750	34.925 1.3750	25.400 1.000	1.02 0.04	HJ-142216	IR-101416	31.0 6970	40.5 9100	6.35	13000	21000
1	25.400 1.0000	38.100 1.5000	19.050 0.750	1.02 0.04	HJ-162412	IR-121612	25.2 5680	32.5 7300	5.10	12000	18000
	25.400 1.0000	38.100 1.5000	25.400 1.000	1.02 0.04	HJ-162416	IR-121616 IR-131616	34.0 7640	47.2 10600	7.40	12000	18000
1 1/8	28.575 1.1250	41.275 1.6250	25.400 1.000	1.02 0.04	HJ-182616	IR-141816 IR-151816	36.3 8170	53.8 12100	8.45	10000	16000
	28.575 1.1250	41.275 1.6250	31.750 1.250	1.02 0.04	HJ-182620	IR-141820 IR-151820	44.9 10100	70.3 15800	10.9	10000	16000
1 1/4	31.750 1.2500	44.450 1.7500	25.400 1.000	1.02 0.04	HJ-202816	IR-162016	37.4 8410	57.4 12900	9.00	9100	14000
	31.750 1.2500	44.450 1.7500	31.750 1.250	1.02 0.04	HJ-202820	IR-162020	46.3 10400	75.2 16900	11.7	9100	14000
1 3/8	34.925 1.3750	47.625 1.8750	25.400 1.000	1.02 0.04	HJ-223016	IR-182216	39.8 8950	64.1 14400	10.1	8200	13000
	34.925 1.3750	47.625 1.8750	31.750 1.250	1.02 0.04	HJ-223020	IR-182220	49.4 11100	84.1 18900	13.0	8200	13000
1 1/2	38.100 1.5000	52.388 2.0625	25.400 1.000	1.52 0.06	HJ-243316	IR-202416	47.6 10700	72.5 16300	11.4	7600	12000
	38.100 1.5000	52.388 2.0625	31.750 1.250	1.52 0.06	HJ-243320	IR-192420 IR-202420	58.7 13200	95.2 21400	14.9	7600	12000
1 5/8	41.275 1.6250	55.563 2.1875	25.400 1.000	1.52 0.06	HJ-263516	IR-212616	48.5 10900	76.5 17200	12.1	7000	11000
	41.275 1.6250	55.563 2.1875	31.750 1.250	1.52 0.06	HJ-263520	IR-212620 IR-222620	60.1 13500	100.5 22600	15.7	7000	11000
1 3/4	44.450 1.7500	58.738 2.3125	25.400 1.000	1.52 0.06	HJ-283716	IR-232816 IR-242816	49.8 11200	81.0 18200	12.8	6400	9900

Approx. Wt.	Mounting Dimensions Clearance Fit				Bearing Designation	Mounting Dimensions Tight Transition Fit				Shoulder Dia.	Shaft Dia.
	S (ISO h6)		H (ISO H7)			S (ISO f6)		H (ISO N7)		D_a	
	Max.	Min.	Max.	Min.		Max.	Min.	Max.	Min.	±0.38 ±0.015	
kg lbs	mm in	mm in	mm in	mm in		mm in	mm in	mm in	mm in	mm in	in
0.050 0.11	15.875 0.6250	15.865 0.6246	28.595 1.1258	28.575 1.1250	HJ-101812	15.860 0.6244	15.850 0.6240	28.567 1.1247	28.547 1.1239	23.83 0.938	5/8
0.059 0.13	19.050 0.7500	19.037 0.7495	31.775 1.2510	31.750 1.2500	HJ-122012	19.030 0.7492	19.017 0.7487	31.742 1.2497	31.717 1.2487	26.97 1.062	3/4
0.077 0.17	19.050 0.7500	19.037 0.7495	31.775 1.2510	31.750 1.2500	HJ-122016	19.030 0.7492	19.017 0.7487	31.742 1.2497	31.717 1.2487	26.97 1.062	
0.064 0.14	22.225 0.8750	22.212 0.8745	34.950 1.3760	34.925 1.3750	HJ-142212	22.205 0.8742	22.192 0.8737	34.917 1.3747	34.892 1.3737	30.18 1.188	7/8
0.086 0.19	22.225 0.8750	22.212 0.8745	34.950 1.3760	34.925 1.3750	HJ-142216	22.205 0.8742	22.192 0.8737	34.917 1.3747	34.892 1.3737	30.18 1.188	
0.073 0.16	25.400 1.0000	25.387 0.9995	38.125 1.5010	38.100 1.5000	HJ-162412	25.380 0.9992	25.367 0.9987	38.092 1.4997	38.067 1.4987	33.32 1.312	1
0.095 0.21	25.400 1.0000	25.387 0.9995	38.125 1.5010	38.100 1.5000	HJ-162416	25.380 0.9992	25.367 0.9987	38.092 1.4997	38.067 1.4987	33.32 1.312	
0.104 0.23	28.575 1.1250	28.562 1.1245	41.300 1.6260	41.275 1.6250	HJ-182616	28.555 1.1242	28.542 1.1237	41.267 1.6247	41.242 1.6237	36.53 1.438	1 1/8
0.132 0.29	28.575 1.1250	28.562 1.1245	41.300 1.6260	41.275 1.6250	HJ-182620	28.555 1.1242	28.542 1.1237	41.267 1.6247	41.242 1.6237	36.53 1.438	
0.113 0.25	31.750 1.2500	31.735 1.2494	44.475 1.7510	44.450 1.7500	HJ-202816	31.725 1.2490	31.709 1.2484	44.442 1.7497	44.417 1.7487	39.67 1.562	1 1/4
0.145 0.32	31.750 1.2500	31.735 1.2494	44.475 1.7510	44.450 1.7500	HJ-202820	31.725 1.2490	31.709 1.2484	44.442 1.7497	44.417 1.7487	39.67 1.562	
0.127 0.28	34.925 1.3750	34.910 1.3744	47.650 1.8760	47.625 1.8750	HJ-223016	34.900 1.374	34.884 1.3734	47.617 1.8747	47.592 1.8737	42.88 1.688	1 3/8
0.159 0.35	34.925 1.3750	34.910 1.3744	47.650 1.8760	47.625 1.8750	HJ-223020	34.900 1.3740	34.884 1.3734	47.617 1.8747	47.592 1.8737	42.88 1.688	
0.154 0.34	38.100 1.5000	38.085 1.4994	52.418 2.0637	52.388 2.0625	HJ-243316	38.075 1.4990	38.059 1.4984	52.380 2.0622	52.349 2.0610	47.63 1.875	1 1/2
0.195 0.43	38.100 1.5000	38.085 1.4994	52.418 2.0637	52.388 2.0625	HJ-243320	38.075 1.4990	38.059 1.4984	52.380 2.0622	52.349 2.0610	47.63 1.875	
0.163 0.36	41.275 1.6250	41.260 1.6244	55.593 2.1887	55.563 2.1875	HJ-263516	41.250 1.6240	41.234 1.6234	55.555 2.1872	55.524 2.1860	50.80 2.000	1 5/8
0.209 0.46	41.275 1.6250	41.260 1.6244	55.593 2.1887	55.563 2.1875	HJ-263520	41.250 1.6240	41.234 1.6234	55.555 2.1872	55.524 2.1860	50.80 2.000	
0.177 0.39	44.450 1.7500	44.435 1.7494	58.768 2.3137	58.738 2.3125	HJ-283716	44.425 1.7490	44.409 1.7484	58.730 2.3122	58.699 2.3110	53.98 2.125	1 3/4

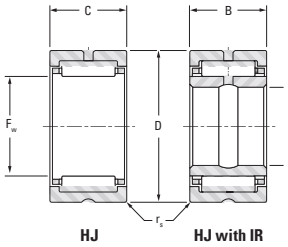
(1) See pages B-4-54 to B-4-57 for inch series inner rings. Order inner rings separately.
(2) $r_{a\ max.}$ is equal to the minimum bearing chamfer ($r_{s\ min.}$) at unmarked end.

Continued on next page.

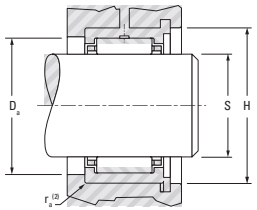
HJ TYPE

INCH SERIES

- Check for availability.
- Nominal bearing diameters and widths shown.
- Tolerance tables found on page B-4-46.
- Clearance fit suggested for outer ring when housing is stationary relative to load.
- Tight transition fit suggested if housing rotates relative to load.
- Consult your representative for oscillating applications (e.g., low radial clearance concerns).
- Unmarked end of outer ring should be assembled against housing shoulder to clear maximum allowed housing fillet ($r_{a\ max.}$[2]).
- Meets Military Standard MS 51961 and ASTM F2246.



HJ HJ with IR



Shaft surface to be 58 HRC or equivalent

Shaft Dia.	F_w	D	C (B)	$r_{s\ min.}$	Bearing Designation	Used With Inner Ring Designation[1]	Load Ratings		Fatigue Load Limit C_u	Speed Ratings	
							Dynamic	Static			
							C	C_0		Grease	Oil
in	mm in	mm in	mm in	mm in			kN lbf		kN	min^{-1}	
1 3/4	44.450 1.7500	58.738 2.3125	31.750 1.250	1.52 0.06	HJ-283720	IR-222820 IR-232820 IR-242820	61.8 13900	106 23900	16.6	6400	9900
1 7/8	47.625 1.8750	61.913 2.4375	31.750 1.250	1.52 0.06	HJ-303920	IR-253020	65.4 14700	117 26300	18.1	6000	9200
2	50.800 2.0000	65.088 2.5625	25.400 1.000	1.52 0.06	HJ-324116	IR-273216	53.8 12100	93.0 20900	14.7	5600	8600
	50.800 2.0000	65.088 2.5625	31.750 1.250	1.52 0.06	HJ-324120	IR-243220 IR-253220 IR-263220 IR-273220	66.7 15000	122 27500	19.1	5600	8600
2 1/4	57.150 2.2500	76.200 3.0000	38.100 1.500	1.52 0.06	HJ-364824	IR-283624	89.9 20200	164 36900	25.7	5000	7600
	57.150 2.2500	76.200 3.0000	44.450 1.750	1.52 0.06	HJ-364828	IR-283628	104 23400	198 44500	30.8	5000	7600
2 1/2	63.500 2.5000	82.550 3.2500	38.100 1.500	2.03 0.08	HJ-405224	IR-314024 IR-324024	97.0 21800	187 42100	29.4	4400	6800
	63.500 2.5000	82.550 3.2500	44.450 1.750	2.03 0.08	HJ-405228	IR-314028 IR-324028	112 25200	226 50800	35.2	4400	6800
2 3/4	69.850 2.7500	88.900 3.5000	25.400 1.000	2.03 0.08	HJ-445616	—	67.2 15100	120 27000	19.1	4000	6200
	69.850 2.7500	88.900 3.5000	38.100 1.500	2.03 0.08	HJ-445624	IR-364424	101 22700	203 45700	31.9	4000	6200
	69.850 2.7500	88.900 3.5000	44.450 1.750	2.03 0.08	HJ-445628	IR-354428 IR-364428	117 26300	245 55100	38.2	4000	6200
3	76.200 3.0000	95.250 3.7500	38.100 1.500	2.03 0.08	HJ-486024	IR-404824	107 24100	226 50900	35.5	3700	5600
	76.200 3.0000	95.250 3.7500	44.450 1.750	2.03 0.08	HJ-486028	IR-384828 IR-404828	124 27900	273 61400	42.5	3700	5600
3 1/4	82.550 3.2500	107.950 4.2500	44.450 1.750	2.03 0.08	HJ-526828	IR-445228	163 36600	307 69000	48.3	3400	5300
	82.550 3.2500	107.950 4.2500	50.800 2.000	2.03 0.08	HJ-526832	IR-445232	184 41300	360 80900	56.2	3400	5300
3 1/2	88.900 3.5000	114.300 4.5000	50.800 2.000	2.03 0.08	HJ-567232	IR-475632 IR-485632	188 42200	377 84700	58.9	3200	4900

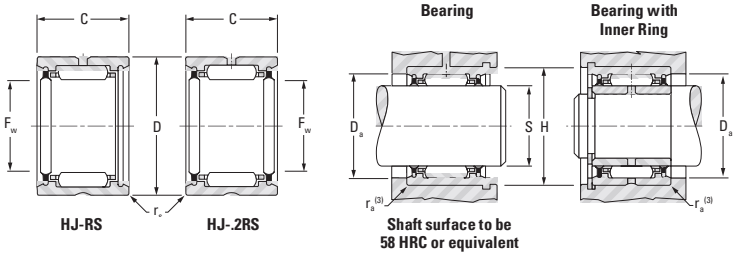
Approx. Wt.	Mounting Dimensions Clearance Fit				Bearing Designation	Mounting Dimensions Tight Transition Fit				Shoulder Dia.	Shaft Dia.
	S (ISO h6)		H (ISO H7)			S (ISO f6)		H (ISO N7)			
	Max.	Min.	Max.	Min.		Max.	Min.	Max.	Min.	D_a	
kg lbs	mm in	mm in	mm in	mm in		mm in	mm in	mm in	mm in	±0.38 ±0.015 mm in	in
0.222 0.49	44.450 1.7500	44.435 1.7494	58.768 2.3137	58.738 2.3125	HJ-283720	44.425 1.7490	44.409 1.7484	58.730 2.3122	58.699 2.3110	53.98 2.125	
0.236 0.52	47.625 1.8750	47.610 1.8744	61.943 2.4387	61.913 2.4375	HJ-303920	47.600 1.8740	47.584 1.8734	61.905 2.4372	61.874 2.4360	57.15 2.250	1 7/8
0.200 0.44	50.800 2.0000	50.782 1.9993	65.118 2.5637	65.088 2.5625	HJ-324116	50.770 1.9988	50.752 1.9981	65.080 2.5622	65.049 2.5610	60.33 2.375	
0.249 0.55	50.800 2.0000	50.782 1.9993	65.118 2.5637	65.088 2.5625	HJ-324120	50.770 1.9988	50.752 1.9981	65.080 2.5622	65.049 2.5610	60.33 2.375	2
0.458 1.01	57.150 2.2500	57.132 2.2493	76.230 3.0012	76.200 3.0000	HJ-364824	57.120 2.2488	57.102 2.2481	76.192 2.9997	76.162 2.9985	68.28 2.688	2 1/4
0.531 1.17	57.150 2.2500	57.132 2.2493	76.230 3.0012	76.200 3.0000	HJ-364828	57.120 2.2488	57.102 2.2481	76.192 2.9997	76.162 2.9985	68.28 2.688	
0.499 1.10	63.500 2.5000	63.482 2.4993	82.586 3.2514	82.550 3.2500	HJ-405224	63.470 2.4988	63.452 2.4981	82.537 3.2495	82.502 3.2481	74.63 2.938	2 1/2
0.499 1.29	63.500 2.5000	63.482 2.4993	82.586 3.2514	82.550 3.2500	HJ-405228	63.470 2.4988	63.452 2.4981	82.537 3.2495	82.502 3.2481	74.63 2.938	
0.363 0.80	69.850 2.7500	69.832 2.7493	88.936 3.5014	88.900 3.5000	HJ-445616	69.820 2.7488	69.802 2.7481	88.887 3.4995	88.852 3.4981	80.98 3.188	
0.544 1.20	69.850 2.7500	69.832 2.7493	88.936 3.5014	88.900 3.5000	HJ-445624	69.820 2.7488	69.802 2.7481	88.887 3.4995	88.852 3.4981	80.98 3.188	2 3/4
0.635 1.40	69.850 2.7500	69.832 2.7493	88.936 3.5014	88.900 3.5000	HJ-445628	69.820 2.7488	69.802 2.7481	88.887 3.4995	88.852 3.4981	80.98 3.188	
0.585 1.29	76.200 3.0000	76.182 2.9993	95.286 3.7514	95.250 3.7500	HJ-486024	76.170 2.9988	76.152 2.9981	95.237 3.7495	95.202 3.7481	87.33 3.438	3
0.685 1.51	76.200 3.0000	76.182 2.9993	95.286 3.7514	95.250 3.7500	HJ-486028	76.170 2.9988	76.152 2.9981	95.237 3.7495	95.202 3.7481	87.33 3.438	
1.016 2.24	82.550 3.2500	82.527 3.2491	107.986 4.2514	107.950 4.2500	HJ-526828	82.514 3.2486	82.492 3.2477	107.937 4.2495	107.902 4.2481	98.43 3.875	3 1/4
1.161 2.56	82.550 3.2500	82.527 3.2491	107.986 4.2514	107.950 4.2500	HJ-526832	82.514 3.2486	82.492 3.2477	107.937 4.2495	107.902 4.2481	98.43 3.875	
1.238 2.73	88.900 3.5000	88.877 3.4991	114.336 4.5014	114.300 4.5000	HJ-567232	88.864 3.4986	88.842 3.4977	114.287 4.4995	114.252 4.4981	104.78 4.125	3 1/2

[1] See pages B-4-54 to B-4-57 for inch series inner rings. Order inner rings separately.
[2] $r_{a\ max.}$ is equal to the minimum bearing chamfer ($r_{s\ min.}$) at unmarked end.

SEALED HEAVY-DUTY NEEDLE ROLLER BEARINGS

INCH SERIES

- Bearing diameters and widths listed are nominal.
- For inspection purposes, see tolerance tables on page B-4-46.
- Available with one or two lip-contact seals designed to retain lubricant and exclude foreign material.
- Single seals are normally installed in the stamped end of bearing.
- Seals limit the bearing operating temperature between -30° C and +110° C (-25° F and +225° F).
- For operating temperature outside of the above range or if seals are exposed to unusual fluids, please consult your representative.



Shaft Dia.	F_w	D	C (B)	$r_{s\ min.}$	Bearing Designation		Used With Inner Ring(1)	Load Ratings		Fatigue Load Limit C_u	Speed Rating(2)
					One Seal	Two Seals		Dynamic	Static		
								C	C_0		
in	mm in	mm in	mm in	mm in				kN lbf		kN	min^{-1}
5/8	15.875 0.6250	28.575 1.1250	25.40 1.000	0.64 0.03	HJ-101816RS	HJ-101816.2RS	—	19.3 4350	20.7 4650	3.25	12000
3/4	19.050 0.7500	31.750 1.2500	25.40 1.000	1.02 0.04	HJ-122016RS	HJ-122016.2RS	IR-081216	20.7 4650	23.3 5240	3.65	10000
7/8	22.225 0.8750	34.925 1.3750	25.40 1.000	1.02 0.04	HJ-142216RS	HJ-142216.2RS	IR-101416	23.0 5180	27.9 6270	4.35	8700
1	25.400 1.0000	38.100 1.5000	25.40 1.000	1.02 0.04	HJ-162416RS	HJ-162416.2RS	IR-121616 IR-131616	25.3 5680	32.5 7300	5.10	7600
1 1/8	28.575 1.1250	41.275 1.6250	31.75 1.250	1.02 0.04	HJ-182620RS	HJ-182620.2RS	IR-141820	36.3 8170	53.8 12100	8.45	6800
1 1/4	31.750 1.2500	44.450 1.7500	31.75 1.250	1.02 0.04	HJ-202820RS	HJ-202820.2RS	IR-162020	37.4 8410	57.4 12900	9.00	6100
1 3/8	34.925 1.3750	47.625 1.8750	31.75 1.250	1.02 0.04	HJ-223020RS	HJ-223020.2RS	IR-182220	39.8 8950	64.1 14400	10.1	5600
1 1/2	38.100 1.5000	52.388 2.0625	31.75 1.250	1.52 0.06	HJ-243320RS	HJ-243320.2RS	IR-192420	47.6 10700	72.5 16300	11.4	5100
1 5/8	41.275 1.6250	55.563 2.1875	31.75 1.250	1.52 0.06	HJ-263520RS	HJ-263520.2RS	IR-212620	48.5 10900	76.5 17200	12.1	2400
1 3/4	44.450 1.7500	58.738 2.3125	31.75 1.250	1.52 0.06	HJ-283720RS	HJ-283720.2RS	IR-222820 IR-232820 IR-242820	49.8 11200	81.0 18200	12.8	4400
2	50.800 2.0000	65.088 2.5625	31.75 1.250	1.52 0.06	HJ-324120RS	HJ-324120.2RS	IR-243220 IR-253220 IR-263220 IR-273220	53.8 12100	93.0 20900	14.7	3800
2 1/4	57.150 2.2500	76.200 3.0000	44.45 1.750	1.52 0.06	HJ-364828RS	HJ-364828.2RS	IR-283628	89.9 20200	164.1 36900	25.7	1700
2 1/2	63.500 2.5000	82.550 3.2500	44.45 1.750	2.03 0.08	HJ-405228RS	HJ-405228.2RS	IR-314028 IR-324028	97.0 21800	187.3 42100	29.4	3100
2 3/4	69.850 2.7500	88.900 3.5000	44.45 1.750	2.03 0.08	HJ-445628RS	HJ-445628.2RS	IR-354428 IR-364428	101.0 22700	203.3 45700	31.9	1400
3	76.200 3.0000	95.250 3.7500	44.45 1.750	2.03 0.08	HJ-486028RS	HJ-486028.2RS	IR-384828 IR-404828	107.2 24100	226.4 50900	35.5	2500

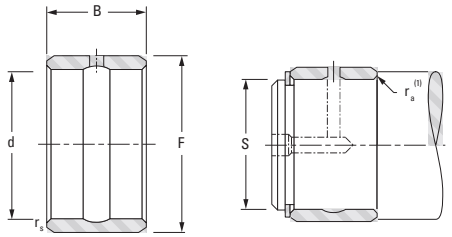
Approx. Wt.	Mounting Dimensions Clearance Fit				Bearing Designation	Mounting Dimensions Tight Transition Fit				Shoulder Dia.	Shaft Dia.
	S (ISO h6)		H (ISO H7)			S (ISO f6)		H (ISO N7)		D_a	
	Max.	Min.	Max.	Min.		Max.	Min.	Max.	Min.		
kg lbs	mm in	mm in	mm in	mm in		mm in	mm in	mm in	mm in	±0.38 ±0.015	mm in	in
0.07 0.15	15.875 0.6250	15.865 0.6246	28.595 1.1258	28.575 1.1250	HJ-101816-	15.860 0.6244	15.850 0.6240	28.567 1.1247	28.547 1.1239	23.83 0.938	5/8
0.08 0.17	19.050 0.7500	19.037 0.7495	31.775 1.2510	31.750 1.2500	HJ-122016-	19.030 0.7492	19.017 0.7487	31.742 1.2497	31.717 1.2487	26.97 1.062	3/4
0.09 0.19	22.225 0.8750	22.212 0.8745	34.950 1.3760	34.925 1.3750	HJ-142216-	22.205 0.8742	22.192 0.8737	34.917 1.3747	34.892 1.3737	30.18 1.188	7/8
0.10 0.21	25.400 1.0000	25.387 0.9995	38.125 1.5010	38.100 1.5000	HJ-162416-	25.380 0.9992	25.367 0.9987	38.092 1.4997	38.067 1.4987	33.32 1.312	1
0.13 0.29	28.575 1.1250	28.562 1.1245	41.300 1.6260	41.275 1.6250	HJ-182620-	28.555 1.1242	28.542 1.1237	41.267 1.6247	41.242 1.6237	36.53 1.438	1 1/8
0.15 0.32	31.750 1.2500	31.735 1.2494	44.475 1.7510	44.450 1.7500	HJ-202820-	31.725 1.2490	31.709 1.2484	44.442 1.7497	44.417 1.7487	39.67 1.562	1 1/4
0.16 0.35	34.925 1.3750	34.910 1.3744	47.650 1.8760	47.625 1.8750	HJ-223020-	34.900 1.3740	34.884 1.3734	47.617 1.8747	47.592 1.8737	42.88 1.688	1 3/8
0.20 0.43	38.100 1.5000	38.085 1.4994	52.418 2.0637	52.388 2.0625	HJ-243320-	38.075 1.4990	38.059 1.4984	52.380 2.0622	52.349 2.0610	47.63 1.875	1 1/2
0.21 0.46	41.275 1.6250	41.260 1.6244	55.593 2.1887	55.563 2.1875	HJ-263520-	41.250 1.6240	41.234 1.6234	55.555 2.1872	55.524 2.1860	50.80 2.000	1 5/8
0.22 0.49	44.450 1.7500	44.435 1.7494	58.768 2.3137	58.738 2.3125	HJ-283720-	44.425 1.7490	44.409 1.7484	58.730 2.3122	58.699 2.3110	53.98 2.125	1 3/4
0.25 0.55	50.800 2.0000	50.782 1.9993	65.118 2.5637	65.088 2.5625	HJ-324120-	50.770 1.9988	50.752 1.9981	65.080 2.5622	65.049 2.5610	60.33 2.375	2
0.53 1.17	57.150 2.2500	57.132 2.2493	76.230 3.0012	76.200 3.0000	HJ-364828-	57.120 2.2488	57.102 2.2481	76.192 2.9997	76.162 2.9985	68.28 2.688	2 1/4
0.59 1.29	63.500 2.5000	63.482 2.4993	82.586 3.2514	82.550 3.2500	HJ-405228-	63.470 2.4988	63.452 2.4981	82.537 3.2495	82.502 3.2481	74.63 2.938	2 1/2
0.64 1.40	69.850 2.7500	69.832 2.7493	88.936 3.5014	88.900 3.5000	HJ-445628-	69.820 2.7488	69.802 2.7481	88.887 3.4995	88.852 3.4981	80.98 3.188	2 3/4
0.68 1.51	76.200 3.0000	76.182 2.9993	95.286 3.7514	95.250 3.7500	HJ-486028-	76.170 2.9988	76.152 2.9981	95.237 3.7495	95.202 3.7481	87.33 3.438	3

(1) See pages B-4-54 to B-4-57 for inch series inner rings. Order inner rings separately.
(2) Based on standard seal shaft contact speed of 5 m/sec., 1000 ft./min.
(3) $r_{a\ max.}$ is equal to the minimum bearing chamfer ($r_{s\ min.}$) at unmarked end.

INNER RINGS

INCH SERIES

- Check for availability.
- Ideal choice when shaft is not practical to use as inner raceway.
- Provided in inch nominal dimensions for use with inch series heavy-duty needle roller bearings.
- Designed to meet established inch tolerances.
- Selected size should be wider than matching needle roller bearing.
- Maximum shaft fillet radius ($r_{a\ max.}$) cannot exceed inner ring bore chamfer ($r_{s\ min.}$) as shown.
- Optional centralized lubrication groove (bore) or through-hole available. Specify when ordering.
- Designed to be axially clamped against shoulder for loose transition fit on shaft.
- After mounting, for tight transition fit (keeping inner ring from rotating relative to shaft), inner ring O.D. must not exceed raceway diameter on matching bearing. (See mounting dimensions in the bearing table for the required raceway diameter.)
- After mounting, if O.D. of inner ring exceeds the required raceway diameter for matching bearing, ring should be ground to proper diameter while mounted on shaft.
- Meets ASTMF-2431.



Shaft Dia.	d	F	B	$r_{s\ min.}$	Bearing Designation	Approx. Wt.	Loose Transition Fit S		Interference Fit S		Used With Bearing Designation
							Max.	Min.	Max.	Min.	
in	mm in	mm in	mm in	mm in		kg lbs	mm in	mm in	mm in	mm in	
3/8	9.525 0.3750	15.875 0.6250	19.05 0.750	0.64 0.025	IR-061012	0.018 0.040	9.520 0.3748	9.510 0.3744	9.538 0.3755	9.530 0.3752	HJ-101812
1/2	12.700 0.5000	19.050 0.7500	19.05 0.750	1.02 0.04	IR-081212	0.023 0.050	12.692 0.4997	12.682 0.4993	12.715 0.5006	12.708 0.5003	HJ-122012
	12.700 0.5000	19.050 0.7500	25.40 1.000	1.02 0.04	IR-081216	0.032 0.070	12.692 0.4997	12.682 0.4993	12.715 0.5006	12.708 0.5003	HJ-122016
5/8	15.875 0.6250	22.225 0.8750	19.05 0.750	1.02 0.04	IR-101412	0.027 0.060	15.867 0.6247	15.857 0.6243	15.890 0.6256	15.883 0.6253	HJ-142212
	15.875 0.6250	22.225 0.8750	25.40 1.000	1.02 0.04	IR-101416	0.036 0.080	15.867 0.6247	15.857 0.6243	15.890 0.6256	15.883 0.6253	HJ-142216
11/16	17.463 0.6875	22.225 0.8750	19.05 0.750	1.02 0.04	IR-111412	0.023 0.050	17.455 0.6872	17.445 0.6868	17.478 0.6881	17.470 0.6878	HJ-142212
3/4	19.050 0.7500	25.400 1.0000	19.05 0.750	1.02 0.04	IR-121612	0.032 0.070	19.042 0.7497	19.030 0.7492	19.068 0.7507	19.058 0.7503	HJ-162412
	19.050 0.7500	25.400 1.0000	25.40 1.000	1.02 0.04	IR-121616	0.041 0.090	19.042 0.7497	19.030 0.7492	19.068 0.7507	19.058 0.7503	HJ-162416
13/16	20.638 0.8125	25.400 1.0000	25.40 1.000	1.02 0.04	IR-131616	0.032 0.070	20.630 0.8122	20.617 0.8117	20.655 0.8132	20.645 0.8128	HJ-162416
7/8	22.225 0.8750	28.575 1.1250	25.40 1.000	1.02 0.04	IR-141816	0.050 0.110	22.217 0.8747	22.205 0.8742	22.243 0.8757	22.233 0.8753	HJ-182616
	22.225 0.8750	28.575 1.1250	31.75 1.250	1.02 0.04	IR-141820	0.059 0.130	22.217 0.8747	22.205 0.8742	22.243 0.8757	22.233 0.8753	HJ-182620
15/16	23.813 0.9375	28.575 1.1250	25.40 1.000	1.02 0.04	IR-151816	0.036 0.080	23.805 0.9372	23.792 0.9367	23.830 0.9382	23.820 0.9378	HJ-182616
	23.813 0.9375	28.575 1.1250	31.75 1.250	1.02 0.04	IR-151820	0.045 0.100	23.805 0.9372	23.792 0.9367	23.830 0.9382	23.820 0.9378	HJ-182620
1	25.400 1.0000	31.750 1.2500	25.40 1.000	1.02 0.04	IR-162016	0.054 0.120	25.392 0.9997	25.380 0.9992	25.418 1.0007	25.408 1.0003	HJ-202816
	25.400 1.0000	31.750 1.2500	31.75 1.250	1.02 0.04	IR-162020	0.068 0.150	25.392 0.9997	25.380 0.9992	25.418 1.0007	25.408 1.0003	HJ-202820
1 1/8	28.575 1.1250	34.925 1.3750	25.40 1.000	1.02 0.04	IR-182216	0.059 0.130	28.567 1.1247	28.555 1.1242	28.593 1.1257	28.583 1.1253	HJ-223016
	28.575 1.1250	34.925 1.3750	31.75 1.250	1.02 0.04	IR-182220	0.077 0.170	28.567 1.1247	28.555 1.1242	28.593 1.1257	28.583 1.1253	HJ-223020
1 3/16	30.163 1.1875	38.100 1.5000	31.75 1.250	1.52 0.06	IR-192420	0.100 0.220	30.155 1.1872	30.142 1.1867	30.180 1.1882	30.170 1.1878	HJ-243320
1 1/4	31.750 1.2500	38.100 1.5000	25.40 1.000	1.52 0.06	IR-202416	0.068 0.150	31.740 1.2496	31.725 1.2490	31.770 1.2508	31.760 1.2504	HJ-243316
1 1/4	31.750 1.2500	38.100 1.5000	31.75 1.250	1.52 0.06	IR-202420	0.082 0.180	31.740 1.2496	31.725 1.2490	31.770 1.2508	31.760 1.2504	HJ-243320
1 5/16	33.338 1.3125	41.275 1.6250	25.40 1.000	1.52 0.06	IR-212616	0.086 0.190	33.327 1.3121	33.312 1.3115	33.358 1.3133	33.348 1.3129	HJ-263516
	33.338 1.3125	41.275 1.6250	31.75 1.250	1.52 0.06	IR-212620	0.109 0.240	33.327 1.3121	33.312 1.3115	33.358 1.3133	33.348 1.3129	HJ-263520
1 3/8	34.925 1.3750	41.275 1.6250	31.75 1.250	1.52 0.06	IR-222620	0.091 0.200	34.915 1.3746	34.900 1.3740	34.945 1.3758	34.935 1.3754	HJ-263520
	34.925 1.3750	44.450 1.7500	31.75 1.250	1.52 0.06	IR-222820	0.141 0.310	34.915 1.3746	34.900 1.3740	34.945 1.3758	34.935 1.3754	HJ-283720
1 7/16	36.513 1.4375	44.450 1.7500	25.40 1.000	1.52 0.06	IR-232816	0.095 0.210	36.502 1.4371	36.487 1.4365	36.533 1.4383	36.523 1.4379	HJ-283716
	36.513 1.4375	44.450 1.7500	31.75 1.250	1.52 0.06	IR-232820	0.118 0.260	36.502 1.4371	36.487 1.4365	36.533 1.4383	36.523 1.4379	HJ-283720
1 1/2	38.100 1.5000	44.450 1.7500	25.40 1.000	1.52 0.06	IR-242816	0.077 0.170	38.090 1.4996	38.075 1.4990	38.120 1.5008	38.110 1.5004	HJ-283716
	38.100 1.5000	44.450 1.7500	31.75 1.250	1.52 0.06	IR-242820	0.095 0.210	38.090 1.4996	38.075 1.4990	38.120 1.5008	38.110 1.5004	HJ-283720
	38.100 1.5000	50.800 2.0000	31.75 1.250	1.52 0.06	IR-243220	0.209 0.460	38.090 1.4996	38.075 1.4990	38.120 1.5008	38.110 1.5004	HJ-324120
1 9/16	39.688 1.5625	47.625 1.8750	31.75 1.250	1.52 0.06	IR-253020	0.127 0.280	39.677 1.5621	39.662 1.5615	39.708 1.5633	39.698 1.5629	HJ-303920
	39.688 1.5625	50.800 2.0000	31.75 1.250	1.52 0.06	IR-253220	0.186 0.410	39.677 1.5621	39.662 1.5615	39.708 1.5633	39.698 1.5629	HJ-324120
1 5/8	41.275 1.6250	50.800 2.0000	31.75 1.250	1.52 0.06	IR-263220	0.163 0.360	41.265 1.6246	41.250 1.6240	41.295 1.6258	41.285 1.6254	HJ-324120
1 11/16	42.863 1.6875	50.800 2.0000	25.40 1.000	1.52 0.06	IR-273216	0.109 0.240	42.852 1.6871	42.837 1.6865	42.883 1.6883	42.873 1.6879	HJ-324116
	42.863 1.6875	50.800 2.0000	31.75 1.250	1.52 0.06	IR-273220	0.136 0.300	42.852 1.6871	42.837 1.6865	42.883 1.6883	42.873 1.6879	HJ-324120
1 3/4	44.450 1.7500	57.150 2.2500	38.10 1.500	1.52 0.06	IR-283624	0.286 0.630	44.440 1.7496	44.425 1.7490	44.470 1.7508	44.460 1.7504	HJ-364824
	44.450 1.7500	57.150 2.2500	44.45 1.750	1.52 0.06	IR-283628	0.336 0.740	44.440 1.7496	44.425 1.7490	44.470 1.7508	44.460 1.7504	HJ-364828
1 15/16	49.213 1.9375	63.500 2.5000	38.10 1.500	2.03 0.08	IR-314024	0.358 0.790	49.202 1.9371	49.187 1.9365	49.233 1.9383	49.223 1.9379	HJ-405224
	49.213 1.9375	63.500 2.5000	44.45 1.750	2.03 0.08	IR-314028	0.417 0.920	49.202 1.9371	49.187 1.9365	49.233 1.9383	49.223 1.9379	HJ-405228

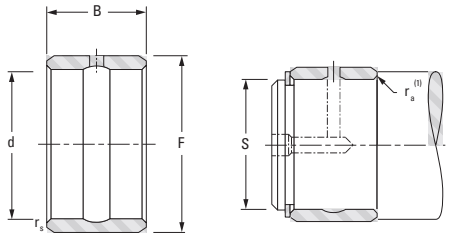
(1) $r_{a\ max.}$ is equal to the minimum bearing chamfer ($r_{s\ min.}$).

Continued on next page.

INNER RINGS

INCH SERIES

- Check for availability.
- Ideal choice when shaft is not practical to use as inner raceway.
- Provided in inch nominal dimensions for use with inch series heavy-duty needle roller bearings.
- Designed to meet established inch tolerances.
- Selected size should be wider than matching needle roller bearing.
- Maximum shaft fillet radius ($r_{a\ max.}$) cannot exceed inner ring bore chamfer ($r_{s\ min.}$) as shown.
- Optional centralized lubrication groove (bore) or through-hole available. Specify when ordering.
- Designed to be axially clamped against shoulder for loose transition fit on shaft.
- After mounting, for tight transition fit (keeping inner ring from rotating relative to shaft), inner ring O.D. must not exceed raceway diameter on matching bearing. (See mounting dimensions in the bearing table for the required raceway diameter).
- After mounting, if O.D. of inner ring exceeds the required raceway diameter for matching bearing, ring should be ground to proper diameter while mounted on shaft.
- Meets ASTMF-2431.



Shaft Dia.	d	F	B	$r_{s\ min.}$	Bearing Designation	Approx. Wt.	Loose Transition Fit S		Interference Fit S		Used With Bearing Designation
							Max.	Min.	Max.	Min.	
in	mm in	mm in	mm in	mm in		kg lbs	mm in	mm in	mm in	mm in	
2	**50.800** 2.0000	**63.500** 2.5000	**38.10** 1.500	**2.03** 0.08	IR-324024	**0.322** 0.710	**50.790** 1.9996	**50.772** 1.9989	**50.823** 2.0009	**50.810** 2.0004	HJ-405224
	50.800 2.0000	**63.500** 2.5000	**44.45** 1.750	**2.03** 0.08	IR-324028	**0.376** 0.830	**50.790** 1.9996	**50.772** 1.9989	**50.823** 2.0009	**50.810** 2.0004	HJ-405228
2 3/16	**55.563** 2.1875	**69.850** 2.7500	**44.45** 1.750	**2.03** 0.08	IR-354428	**0.467** 1.030	**55.552** 2.1871	**55.535** 2.1864	**55.585** 2.1884	**55.573** 2.1879	HJ-445628
2 1/4	**57.150** 2.2500	**69.850** 2.7500	**38.10** 1.500	**2.03** 0.08	IR-364424	**0.358** 0.790	**57.140** 2.2496	**57.122** 2.2489	**57.173** 2.2509	**57.160** 2.2504	HJ-445624
	57.150 2.2500	**69.850** 2.7500	**44.45** 1.750	**2.03** 0.08	IR-364428	**0.417** 0.920	**57.140** 2.2496	**57.122** 2.2489	**57.173** 2.2509	**57.160** 2.2504	HJ-445628
2 3/8	**60.325** 2.3750	**76.200** 3.0000	**44.45** 1.750	**2.03** 0.08	IR-384828	**0.562** 1.240	**60.315** 2.3746	**60.297** 2.3739	**60.348** 2.3759	**60.335** 2.3754	HJ-486028
2 1/2	**63.500** 2.5000	**76.200** 3.0000	**38.10** 1.500	**2.03** 0.08	IR-404824	**0.395** 0.870	**63.490** 2.4996	**63.472** 2.4989	**63.523** 2.5009	**63.510** 2.5004	HJ-486024
	63.500 2.5000	**76.200** 3.0000	**44.45** 1.750	**2.03** 0.08	IR-404828	**0.463** 1.020	**63.490** 2.4996	**63.472** 2.4989	**63.523** 2.5009	**63.510** 2.5004	HJ-486028
2 3/4	**69.850** 2.7500	**82.550** 3.2500	**44.45** 1.750	**2.03** 0.08	IR-445228	**0.503** 1.110	**69.840** 2.7496	**69.822** 2.7489	**69.873** 2.7509	**69.860** 2.7504	HJ-526828
	69.850 2.7500	**82.550** 3.2500	**50.80** 2.000	**2.03** 0.08	IR-445232	**0.576** 1.270	**69.840** 2.7496	**69.822** 2.7489	**69.873** 2.7509	**69.860** 2.7504	HJ-526832
2 15/16	**74.613** 2.9375	**88.900** 3.5000	**50.80** 2.000	**2.03** 0.08	IR-475632	**0.694** 1.530	**74.602** 2.9371	**74.585** 2.9364	**74.635** 2.9384	**74.623** 2.9379	HJ-567232
3	**76.200** 3.0000	**88.900** 3.5000	**50.80** 2.000	**2.03** 0.08	IR-485632	**0.621** 1.370	**76.190** 2.9996	**76.172** 2.9989	**76.223** 3.0009	**76.210** 3.0004	HJ-567232

(1) $r_{a\ max.}$ is equal to the minimum bearing chamfer ($r_{s\ min.}$).