MOTION & CONTROL™

NSK

Solid Needle Roller Bearings

Solid needle roller bearings are high-accuracy, precision-ground bearings, that offer greater performance, and deliver long service life in a variety of high-speed, high-precision applications.

Delivering high precision and long life to a wide variety of applications, including machines tools and industrial vehicles.

1. High load capacity

Highly precise bearings offering maximum load capacity within a limited space.

2. Impact-load resistant

The bearing washer is precisely polished after heat treatment to enhance resistance to impact loads.

3. Wear resistant

The highly precision-finished cage is surface-hardened to improve wear resistance.

4. High limiting speed

Accurately guiding the rollers, the one-piece cage is excellent for high-speed applications.

Solid Needle Roller Bearings

Solid needle roller bearings are high-accuracy bearings with maximum load capacity within a limited space for various operating conditions. Made of carefully selected vacuum-degassed bearing steel, the raceway rings are finished with accurate grinding after heat treatment. The outer rings have strong integrated ribs and contain high-accuracy rollers that have the proper crowning finish. Lightweight and extremely strong, the cage guides the rollers accurately and smoothly.

1. Design and Types

Solid needle roller bearings come in various types for various applications ranging from light- to heavy-load usage (metric bearings), and heavy-load usage (inch bearings). Series of each type are available with or without an inner ring (both series are shown in the same bearing table). Types of solid needle roller bearings are shown in **Table 1**, while the composition of bearing numbers is shown in **Table 2**. Among NSK solid needle roller bearings, the RNA, NA49, 59, 69 and 48 series conform to ISO standards.

HJ, HJ + IR series of inch bearings are widely used globally and conform to MIL standards in the U.S.A. The section height of RLM and LM types of bearings is close to that of drawn cup needle bearings.
Bearings with seals are also available. Please contact NSK for details. Typical structure and features of solid needle roller bearings are shown in **Fig. 1**.

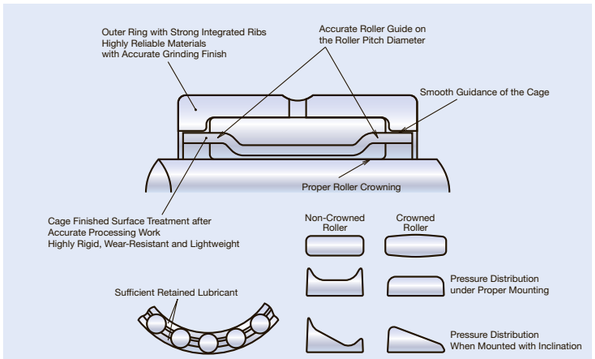


Fig. 1 Features of Solid Needle Roller Bearings

Table 1 Bearing Types

Bearing Code			Shaft Diameter (mm)	Description
Series	Without Inner Ring	With Inner Ring		
Metric	RLM		8 ~ 110	Single-row, section height less than or equal to dimensional series 49, **for light loads**
		LM	5 ~ 90	
	RNA49		8 ~ 490	Single-row, dimensional series 49, **for normal loads**
		NA49	8 ~ 440	
	RNA59		14 ~ 160	Single-row, dimensional series 59, same section height as series 49 with wider width, **for heavy loads**
		NA59	10 ~ 140	
	RNA69		14 ~ 110	Single-row, dimensional series 69, same section height as series 49, wider than series 59, **for heavy loads**
		NA69	10 ~ 95	
	RNA48		120 ~ 415	Single-row, dimensional series 48, smaller section height than series 49, **for light to normal loads**
		NA48	110 ~ 380	
Inch	HJ		15.875 ~ 234.950	Single-row, section height slightly greater, with wider width series, **for heavy loads**
		HJ + IR	9.525 ~ 203.200	

Table 2 Bearing Numbers for Solid Needle Roller Bearings

Type Code		Composition of Bearing Number	Examples
Without Inner Ring	With Inner Ring		
RLM		Type code, inscribed circle diameter, and width. Or, code, inscribed circle diameter, outside diameter, and width (expressed in mm)	RLM2520, RLM304020
	LM		LM2520, LM304020
RNA		Type code, dimension series, and bore number (48, 49, 59, 69) (00 ~ 88)	RNA4905, RNA6908, RNA4830
	NA		NA4905, NA6908, NA4830
HJ		Type code, hyphen, inscribed circle diameter, outside diameter, and width (expressed in integers in units of 1/16 inch)	HJ-243316
	HJ+IR	Following HJ bearing number, + inner ring code, hyphen, bore diameter, inner ring raceway diameter, and width (expressed in integers in units of 1/16 inch)	HJ-243316 + IR-202416

2. Accuracy Standard

The dimensional accuracy and rotating accuracy of all NSK solid needle roller bearings, excluding inch bearings (HJ and HJ + IR), conform to ISO standards. When highly accurate bearings are specifically required, bearings in Class 6 or higher are also available. Tolerance values for inch bearings (HJ and HJ + IR) are shown in **Table 3**.

Table 3 Tolerances for Inch Bearings HJ, HJ + IR

Units: μm

Nominal Bore Diameter, d, or Nominal Outside Diameter, D (mm)		Single Plane Mean Bore Diameter Deviation, Δdmp		Single Plane Mean Outside Diameter Deviation, ΔDmp		Inner Ring Width Deviation, ΔB_s		Outer Ring Width Deviation, ΔC_s		Radial Runout of Assembled Inner Ring, K_{ia}	Radial Runout of Assembled Outer Ring, K_{ea}
over	incl	high	low	high	low	high	low	high	low	max	max
7.938 (5/16)	19.050 (3/4)	0	−10	—	—	+250	+120	—	—	10	—
19.050 (3/4)	30.162 (1 3/16)	0	−13	0	−13	+250	+120	0	−130	13	15
30.162 (1 3/16)	50.800 (2)	0	−13	0	−13	+250	+120	0	−130	15	20
50.800 (2)	82.550 (3 1/4)	0	−15	0	−15	+250	+120	0	−130	20	25
82.550 (3 1/4)	107.950 (4 1/4)	0	−20	0	−20	+250	+120	0	−130	25	35
107.950 (4 1/4)	120.650 (4 3/4)	0	−20	0	−20	+380	+250	0	−130	25	35
120.650 (4 3/4)	177.800 (7)	0	−25	0	−25	+380	+250	0	−130	30	45
177.800 (7)	184.150 (7 1/4)	0	−30	0	−25	+380	+250	0	−130	30	45
184.150 (7 1/4)	203.200 (8)	0	−30	0	−30	+380	+250	0	−130	40	50
203.200 (8)	260.350 (10 1/4)	—	—	0	−30	—	—	0	−130	—	50
260.350 (10 1/4)	317.500 (12 1/2)	—	—	0	−36	—	—	0	−130	—	60

Remarks Δdmp, ΔB_s and K_{ia} are found from the dimension category of d, and ΔDmp, ΔC_s and K_{ea} are from the dimension category of D.

Solid Needle Roller Bearings

■ Tolerances for inscribed circle diameter

NSK metric needle roller bearings are primarily manufactured within the inscribed circle diameter tolerance class F6 (refer to **Table 4**). RLM and LM types that have a small section height, however, are within F7. Tolerances for the inscribed circle diameter of inch needle bearings are shown in **Table 5**.

Table 4 Inscribed Circle Diameter for Metric Solid Needle Roller Bearings

Nominal Inscribed Circle Diameter, F_w (mm)		Deviation (F6) of Minimum Diameter, $F_{w\,min}$, of Roller Inscribed Circle Diameter (1) (μm)	
over	incl.	high	low
6	10	+ 22	+13
10	18	+ 27	+16
18	30	+ 33	+20
30	50	+ 41	+25
50	80	+ 49	+30
80	120	+ 58	+36
120	180	+ 68	+43
180	250	+ 79	+50
250	315	+ 88	+56
315	400	+ 98	+62
400	500	+108	+68

Note (1) When using a cylinder instead of an inner ring, $F_{w\,min}$ is the diameter of the cylinder at which the internal clearance is zero in at least one radial direction. ($F_{w\,min}$ is the minimum diameter of each inscribed circle diameter where deviation is suspected.)

Table 5 Tolerance of Inscribed Circle Diameter for Inch Solid Needle Roller Bearings

Nominal Inscribed Circle Diameter, F_w (mm)		Deviation of Minimum Diameter, $F_{w\,min}$, of Roller Inscribed Circle Diameter (1) (μm)	
over	incl.	high	low
—	15.875 (5/8)	+43	+20
15.875 (5/8)	28.575 (1 1/8)	+46	+23
28.575 (1 1/8)	41.275 (1 5/8)	+48	+25
41.275 (1 5/8)	47.625 (1 7/8)	+51	+25
47.625 (1 7/8)	69.850 (2 3/4)	+53	+28
69.850 (2 3/4)	76.200 (3)	+58	+28
76.200 (3)	101.600 (4)	+61	+30
101.600 (4)	114.300 (4 1/2)	+66	+30
114.300 (4 1/2)	152.400 (6)	+69	+33
152.400 (6)	165.100 (6 1/2)	+74	+33
165.100 (6 1/2)	196.850 (7 3/4)	+76	+36
196.850 (7 3/4)	234.950 (9 1/4)	+81	+36

Note (1) When using a cylinder instead of an inner ring, $F_{w\,min}$ is the diameter of the cylinder at which the internal clearance is zero in at least one radial direction. ($F_{w\,min}$ is the minimum diameter of each inscribed circle diameter where deviation is suspected.)

3. Applications to Maximize Performance

■ Specifications of shaft and housing

The shaft and housing bore should be finished with recommended dimensional tolerance. Accuracy, surface roughness and hardness should satisfy the conditions shown in **Table 6**.

■ Accuracy and roughness of fitting surfaces

Whereas a needle-bearing race is extremely thin, the raceway surface is greatly affected by shaft and housing accuracy. For general operating conditions, a turned finish, smooth bored finish, or reaming finish is acceptable. For high accuracy and low noise under heavy load, however, a grinding finish is required.

As a split housing may deform the outer ring of a thin-wall needle bearing, care should be exercised with the bearing's finish, such as putting a relief on the machining surface of the mating parts.

■ Accuracy and roughness of the raceway surface

The shaft is often used as a raceway surface of needle bearings in order to achieve the most compact bearing design and enhance shaft rigidity, load capacity, and accuracy. In this case, accuracy and roughness of the raceway surface greatly affect the life, noise, and accuracy of bearings. Therefore, shape, accuracy and roughness have to be treated with great care.

In particular, harmful circumferential waviness and a polygonal shape are not desirable. Accuracy and roughness for raceway surfaces are shown in **Table 6**. Since these values may change depending on desired performance, please contact NSK for details.

■ Shaft inclination

Shaft inclination due to deflection by an external force and mounting error of the bearing should be within the values found in **Table 7**.

Table 6 Accuracy, Roughness, and Hardness of Shaft and Housing

Category	Shaft		Housing Bore
	Raceway Surface	Fitting Surface	
Out-of-Roundness Tolerance	IT3/2	IT3/2 ~ IT4/2	IT4/2 ~ IT5/2
Cylindrical Tolerance	IT3/2	IT3/2 ~ IT4/2	IT4/2 ~ IT5/2
Roughness, R_a	0.4	0.8	1.6
Hardness	HRC58 to 64 Appropriate depth of hardening layer required	—	—

Table 7 Shaft Inclination

Bearing Width (mm)		Permissible Inclination (mm/mm)
over	incl.	With cage
—	25	0.0015
25	50	0.0010
50	—	0.0005

■ Material and heat treatment of raceway furnace

The raceway rings and rollers of needle bearings are repeatedly stressed on their relatively small contact surfaces. The materials for raceway rings, rollers, and shafts and housings that function as raceways, must therefore have high hardness, resistance to permanent deformation, and long rolling fatigue life. These materials are also required to be resistant to wear and shock, and have good dimensional stability. Common materials used for shafts and housings that function as bearing raceways include the following:

High-carbon chromium bearing steel (for through hardening)	SUJ2 (JIS G 4805)
Carbon steel for machine construction (for carbonizing)	S15CK (JIS G 4051)
Chrome molybdenum steel (for carbonizing)	SCM415~421 (JIS G 4105)
Chrome steel (for carbonizing)	SCr415, 420 (JIS G 4104)
Nickel chrome steel (for carbonizing)	SNC415~815 (JIS G 4102)
Nickel chrome molybdenum steel (for carbonizing)	SNCM220, 415, 420 (JIS G 4103)

* JIS: Japanese Industrial Standard

Other materials, such as S50C and S55C, can be utilized with through hardening or induction hardening.

The hardened layer, which is tempered at a temperature between 160 ˚C and 180 ˚C after hardening, has to develop a martensite structure with an even distribution of very fine carbides. In the case of cemented or induction hardening of the raceway surface, the surface hardness should not only be HRC58 to 64 (HRC60 to 64 is preferable), but also the hardened layers, with Vickers hardness of HV 653 (HRC58) and HV550 (HRC52.3), have to reach appropriate depths. When the values of hardness are below these values, bearing fatigue life significantly decreases. The hardened layer depth (up to HV550) after grinding finish is estimated by using the following equation:

$$t \geq (0.08\sim0.10)\, D_w$$

where, t: Effective Hardened layer depth (mm)

D_w: Roller diameter (mm)

Core hardness is generally HRC30 to 45.

Solid Needle Roller Bearings

■ Recommended fittings and internal clearance of bearings

Depending on the application, the outer ring of NSK solid needle roller bearings is used with either a transitional fit or a tight fit. Recommended fittings for solid needle roller bearings are shown in **Table 8**.
Please refer to **Table 9.1** and **9.2** to fully consider operating conditions and choose the appropriate fittings.
For needle roller bearings with wider bearing widths and longer rollers, CN clearance is not always applicable, and greater clearance is selected for many cases. For needle bearings without an inner ring, such radial internal clearances as shown in **Table 10** will be achieved by selecting the proper shaft tolerance class.

Table 8 Recommended Fittings for Solid Needle Roller Bearings Units: mm

Code		Fitting Tolerance			
		Shaft or Inner Ring Rotation		Outer Ring Rotation	
		Shaft	Housing Bore	Shaft	Housing Bore
RLM, RNA HJ	Without Inner Ring	h5 ($F_w \leq 80$) g6 ($180 \geq F_w > 80$)	H7	g5 ($F_w \leq 80$) f6 ($180 \geq F_w > 80$)	N7
LM, NA HJ + IR	With Inner Ring	k5 ($d \leq 50$) m5 ($d > 50$)	H7	g6	N7

Remarks For metric needle bearings with an inner ring, if the inner and outer rings are fitted tighter than class k and K, respectively, a bearing with an internal clearance greater than CN clearance should be selected.

Table 9.1 Fittings between Inner Rings and Shafts of Needle Roller Bearings

Load Conditions		Examples	Shaft Diameter (mm)	Tolerance of Shaft
Rotating Outer Ring Load	Medium-speed rotation with light or normal load	Wheels on stationary axles, rope sheaves, tension pulleys, idle gears	All shaft diameters	g6
	Medium-speed rotation with heavy load			h6
	Accuracy required			h5
Rotating Inner Ring Load or Indeterminate Directional Load	Light loads (less than or equal to 0.06 C_r (1))	Electric appliances, precision machinery, machine tools, pumps, blowers, transport vehicles	≤ 18	h5 or js5 (j5)
			≤ 50	js5 (j5)
			50 ~ 150	k6
			> 150	m6
	Normal loads (0.06 ~ 0.13 C_r (1))	General bearings, pumps, main bearings of medium- and large-sized engines, woodworking machinery, gears	≤ 50	js5 (j5) or k5
			50 ~ 100	m5
			100 ~ 150	m6
			150 ~ 200	n6
			> 200	p6
	Heavy loads (more than 0.13 C_r (1)) or shock loads	Industrial vehicles, construction equipment, crushers	50 ~ 150	n6
			> 150	p6

Note (1) C_r represents the basic dynamic load rating of each bearing.
Remarks 1. This table is applicable only to solid steel shafts.
2. For metric bearings, bearings with clearance larger than CN are used when the fitting is greater than k.

Table 9.2 Fittings between Solid Needle Roller Bearings and Housing Bores

Load Conditions		Examples	Tolerance of Bores
Rotating Outer Ring Load	Light or variable loads	Conveyors, rope sheaves, tension pulleys	M7
	Normal or heavy loads	Wheel hubs, crankshafts, connecting loads	N7
	Heavy shock load	Flywheels	P7
Indeterminate Directional Load	Accurate running under light loads	Machine tools	K6
	Light or normal loads	Crankshafts, pumps, compressors, large high-speed gears, blowers	JS7 (J7)
	Normal or heavy loads		K7
	Shock loads	Eccentric cams	M7
Rotating Inner Ring Load	Accurate running under light or normal loads	Main spindles of machine tools	JS6 (J6)
	Light or normal load	Gears, plummer blocks	H7
	Loads of all kinds	General applications	H7 or G7
	Shock loads	Industrial vehicles, construction equipment, crushers	JS7 (J7)

Remarks 1. This table is applicable to steel and cast iron housing. For light metal housings, fitting should be tighter than in this table.
2. For metric bearings, bearings with clearance larger than CN are used when the fitting is greater than K.

Table 10 Fitting Tolerances and Radial Internal Clearance of Shafts Assembled with Solid Needle Roller Bearings without Inner Rings

Nominal Inscribed Circle Diameter, F_w (mm)		C2	CN	C3	C4
over	incl.				
6	180	k5	g5	f6	e6
180	315	j6	f6	e6	d6
315	490	h6	e6	d6	c6

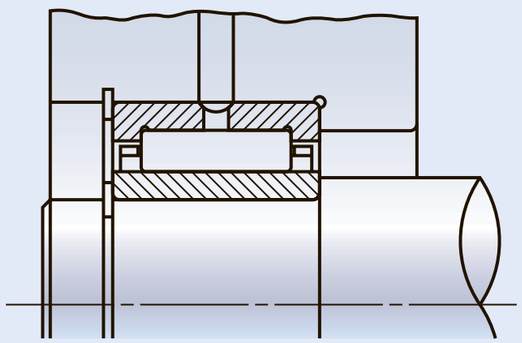
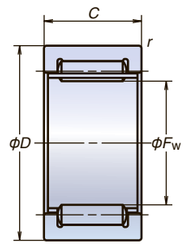


Fig. 2 Diagram of a Mounting

RLM · LM

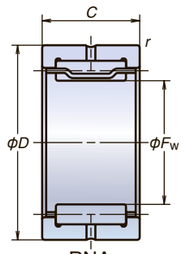
RNA · NA

Inscribed Circle Diameter (F_w) 8~16 mm

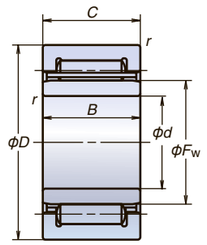


RLM

Without Inner Ring

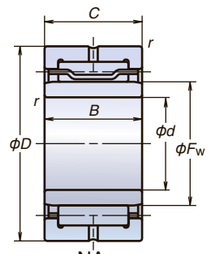


RNA



LM

With Inner Ring



NA

Bearing Numbers					Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speed (rpm)	Mass (kg)	
Without Inner Ring				With Inner Ring										Approximate	
RLM	RNA49	RNA59	RNA69	LM · NA	F_w	D	C	r min	d	B	C_r	C_{or}	Oil	Without Inner Ring	With Inner Ring
	RNA496			—	8	15	10	0.15	—	—	4 300	3 800	60 000	0.0070	—
RLM81512-1				LM81512-1	8	15	12	0.15	5	12	5 500	4 600	45 000	0.0083	0.011
RLM815				—	8	15	15	0.3	—	—	6 550	5 800	45 000	0.010	—
RLM81516-1				LM81516-1	8	15	16	0.15	5	16	7 100	6 350	45 000	0.011	0.015
RLM912				LM91612-1	9	16	12	0.3	6	12	6 150	5 400	40 000	0.0092	0.013
RLM916				—	9	16	16	0.3	—	—	7 900	7 450	40 000	0.011	—
	RNA497			—	9	17	10	0.15	—	—	4 700	4 350	50 000	0.0091	—
RLM1010				—	10	15	10	0.3	—	—	4 500	4 900	36 000	0.0055	—
RLM101710				—	10	17	10	0.3	—	—	5 350	4 650	36 000	0.0082	—
RLM101712-1				LM101712-1	10	17	12	0.15	7	12	6 750	6 200	36 000	0.0097	0.014
RLM101715				—	10	17	15	0.3	—	—	8 050	7 800	36 000	0.012	—
RLM101716-1				LM101716-1	10	17	16	0.15	7	16	8 650	8 600	36 000	0.013	0.018
	RNA498			NA498	10	19	11	0.2	8	11	6 550	6 000	48 000	0.012	0.015
RLM1212				LM1212	12	17	12	0.3	8	12.2	6 150	7 650	30 000	0.0076	0.013
RLM121912				LM121912	12	19	12	0.3	8	12.2	7 300	7 150	30 000	0.011	0.017
RLM121915				LM121915	12	19	15	0.3	8	15.2	8 700	8 950	30 000	0.014	0.021
RLM121916-1				LM121916-1	12	19	16	0.3	9	16	9 400	9 850	30 000	0.014	0.022
RLM121920-1				—	12	19	20	0.3	—	—	12 000	13 500	30 000	0.018	—
	RNA499			NA499	12	20	11	0.3	9	11	7 050	6 850	38 000	0.013	0.017
RLM1412				—	14	22	12	0.3	—	—	9 350	9 150	24 000	0.014	—
	RNA4900			NA4900	14	22	13	0.3	10	13	9 150	9 950	32 000	0.016	0.024
RLM1416				LM1416	14	22	16	0.3	10	16.2	12 100	12 700	24 000	0.019	0.028
		RNA5900		NA5900	14	22	16	0.3	10	16	11 600	13 600	32 000	0.022	0.031
RLM1420				LM1420	14	22	20	0.3	10	20.2	15 500	17 500	24 000	0.024	0.036
			RNA6900	NA6900	14	22	22	0.3	10	22	16 300	20 900	32 000	0.027	0.040
RLM158				LM158	15	20	8	0.3	10	8.2	4 050	4 800	24 000	0.0061	0.012
RLM1515				LM1515	15	20	15	0.3	10	15.2	8 100	11 700	24 000	0.011	0.022
RLM1520				LM1520	15	20	20	0.3	10	20.2	11 100	17 400	24 000	0.015	0.030
RLM152212				LM152212	15	22	12	0.3	10	12.2	8 300	8 900	24 000	0.013	0.022
RLM152215				LM152215	15	22	15	0.3	10	15.2	9 900	11 100	24 000	0.016	0.027
RLM152220				LM152220	15	22	20	0.3	10	20.2	13 600	16 800	24 000	0.021	0.036
RLM152316-1				—	15	23	16	0.3	—	—	12 300	14 800	24 000	0.021	—
RLM152320-1				—	15	23	20	0.3	—	—	15 500	20 100	24 000	0.026	—
	RNA4901			NA4901	16	24	13	0.3	12	13	10 100	11 700	28 000	0.018	0.027
RLM1616				LM1616	16	24	16	0.3	12	16.2	12 900	14 200	22 000	0.021	0.032
		RNA5901		NA5901	16	24	16	0.3	12	16	12 800	16 000	28 000	0.024	0.035
RLM1620				LM1620	16	24	20	0.3	12	20.2	16 500	19 500	22 000	0.027	0.041
			RNA6901	NA6901	16	24	22	0.3	12	22	17 900	24 500	28 000	0.030	0.045

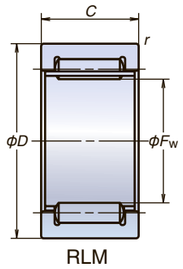
Remarks If a full complement roller bearing is required, please contact NSK.

Solid Needle Roller Bearings (Metric)

RLM · LM

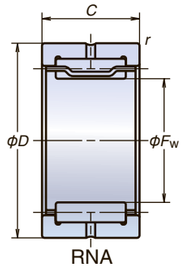
RNA · NA

Inscribed Circle Diameter (F_w)
17~22 mm

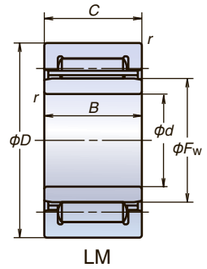


RLM

Without Inner Ring

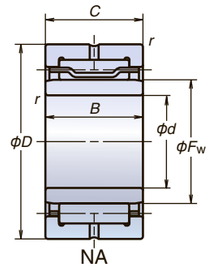


RNA



LM

With Inner Ring



NA

Bearing Numbers					Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speed (rpm)	Mass (kg)	
Without Inner Ring				With Inner Ring										Approximate	
RLM	RNA49	RNA59	RNA69	LM · NA	F_w	D	C	r min	d	B	C_r	C_{or}	Oil	Without Inner Ring	With Inner Ring
RLM1710				LM1710	17	22	10	0.3	12	10.2	5 850	7 950	20 000	0.0080	0.017
RLM1720				LM1720	17	22	20	0.3	12	20.2	11 800	19 500	20 000	0.016	0.034
RLM172415				LM172415	17	24	15	0.5	12	15.2	11 000	13 200	20 000	0.018	0.032
RLM172425				LM172425	17	24	25	0.5	12	25.2	18 200	25 300	20 000	0.030	0.052
RLM172516-1				—	17	25	16	0.3	—	—	13 600	15 500	20 000	0.023	—
RLM172520-1				—	17	25	20	0.3	—	—	16 200	21 900	20 000	0.029	—
RLM1815				LM1815	18	25	15	0.5	15	15.2	11 500	14 300	20 000	0.019	0.028
RLM1817				LM1817	18	25	17	0.5	15	17.2	13 300	17 200	20 000	0.021	0.031
RLM1820				LM1820	18	25	20	0.5	15	20.2	15 800	21 500	20 000	0.025	0.037
RLM1825				LM1825	18	25	25	0.5	15	25.2	19 000	27 300	20 000	0.032	0.047
	RNA49 / 14			—	18	26	13	0.3	—	—	10 500	12 700	24 000	0.020	—
RLM182616-1				—	18	26	16	0.3	—	—	12 700	16 200	20 000	0.024	—
RLM182620-1				—	18	26	20	0.3	—	—	16 100	22 000	20 000	0.030	—
RLM1916				LM1916	19	27	16	0.5	15	16.2	14 300	17 000	18 000	0.025	0.039
RLM1920				LM1920	19	27	20	0.5	15	20.2	18 300	23 400	18 000	0.031	0.048
RLM2010				LM2010	20	27	10	0.5	15	10.2	7 950	9 150	18 000	0.014	0.025
RLM2015				LM2015	20	27	15	0.5	15	15.2	11 900	15 400	18 000	0.021	0.037
RLM2020				LM2020	20	27	20	0.5	15	20.2	16 400	23 200	18 000	0.028	0.049
RLM2020				LM2020-1	20	27	20	0.5	15	20	16 400	23 200	18 000	0.028	0.048
RLM2025				LM2025	20	27	25	0.5	15	25.2	19 800	29 500	18 000	0.035	0.061
	RNA4902			NA4902	20	28	13	0.3	15	13	10 800	13 600	22 000	0.021	0.035
RLM202816-1				—	20	28	16	0.3	—	—	14 400	19 700	18 000	0.026	—
		RNA5902		NA5902	20	28	18	0.3	15	18	15 700	21 900	22 000	0.032	0.051
RLM202820				LM202820	20	28	20	0.5	15	20.2	18 200	23 500	18 000	0.033	0.055
			RNA6902	NA6902	20	28	23	0.3	15	23	19 300	28 600	22 000	0.039	0.064
RLM2116				LM2116	21	29	16	0.5	17	16.2	14 900	18 500	17 000	0.027	0.042
RLM2120				LM2120	21	29	20	0.5	17	20.2	19 100	25 400	17 000	0.034	0.053
RLM2215				LM2215	22	29	15	0.5	17	15.2	12 900	17 500	16 000	0.023	0.041
RLM2220				LM2220	22	29	20	0.5	17	20.2	17 700	26 400	16 000	0.030	0.054
RLM2225				LM2225	22	29	25	0.5	17	25.2	21 300	33 500	16 000	0.038	0.068
	RNA4903			NA4903	22	30	13	0.3	17	13	11 600	15 400	20 000	0.023	0.038
RLM223016				LM223016	22	30	16	0.5	17	16.2	15 600	19 800	16 000	0.028	0.045
		RNA5903		NA5903	22	30	18	0.3	17	18	16 800	24 800	20 000	0.034	0.055
RLM223020				LM223020	22	30	20	0.5	17	20.2	20 000	27 200	16 000	0.035	0.060
			RNA6903	NA6903	22	30	23	0.3	17	23	20 700	32 500	20 000	0.041	0.068

Remarks If a full complement roller bearing is required, please contact NSK.

Solid Needle Roller Bearings (Metric)

RLM · LM

RNA · NA

Inscribed Circle Diameter (F_w) 24~30 mm

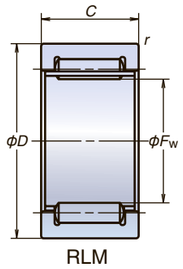
Bearing Numbers					Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speed (rpm)	Mass (kg)	
Without Inner Ring				With Inner Ring										Approximate	
RLM	RNA49	RNA59	RNA69	LM · NA	F_w	D	C	r min	d	B	C_r	C_{or}	Oil	Without Inner Ring	With Inner Ring
RLM2420				LM2420	24	31	20	0.5	20	20.2	18 200	28 100	15 000	0.033	0.054
RLM2428				LM2428	24	31	28	0.5	20	28.2	23 700	39 500	15 000	0.046	0.076
RLM243216				LM243216	24	32	16	0.5	20	16.2	16 100	21 300	15 000	0.030	0.048
RLM243220				LM243220	24	32	20	0.5	20	20.2	20 700	29 200	15 000	0.038	0.060
RLM2512				LM2512	25	32	12	0.5	20	12.2	10 300	13 700	14 000	0.020	0.036
RLM2520				LM2520	25	32	20	0.5	20	20.2	18 800	29 700	14 000	0.034	0.061
RLM2525				LM2525	25	32	25	0.5	20	25.2	22 700	37 500	14 000	0.042	0.076
RLM253316-1				—	25	33	16	0.5	—	—	16 800	22 600	14 000	0.032	—
RLM253320				LM253320	25	33	20	0.5	20	20.2	21 500	31 000	14 000	0.040	0.068
RLM253325				LM253325	25	33	25	0.5	20	25.2	25 900	39 500	14 000	0.050	0.085
	RNA4904			NA4904	25	37	17	0.3	20	17	19 700	22 900	18 000	0.055	0.077
		RNA5904		NA5904	25	37	23	0.3	20	23	27 800	35 500	18 000	0.089	0.12
			RNA6904	NA6904	25	37	30	0.3	20	30	36 500	50 500	18 000	0.098	0.14
RLM2620				LM2620	26	34	20	0.5	22	16.2	21 400	31 000	13 000	0.041	0.065
RLM2820				LM2820	28	35	20	0.5	22	20.2	19 900	33 000	12 000	0.038	0.062
RLM2825				LM2825	28	35	25	0.3	22	25.2	23 900	42 000	12 000	0.047	0.092
RLM283720				LM283720	28	37	20	0.5	22	20.2	24 200	33 500	12 000	0.050	0.087
RLM283730				LM283730	28	37	30	0.5	22	30.2	34 000	52 500	12 000	0.075	0.13
	RNA49 / 22			NA49 / 22	28	39	17	0.3	22	17	22 400	30 500	15 000	0.056	0.086
		RNA59 / 22		NA59 / 22	28	39	23	0.3	22	23	28 300	41 500	15 000	0.091	0.135
			RNA69 / 22	NA69 / 22	28	39	30	0.3	22	30	37 000	58 500	15 000	0.096	0.15
RLM2920				LM2920	29	38	20	0.5	25	20.2	25 100	36 000	12 000	0.052	0.079
RLM293820-1				LM293820-1	29	38	20	0.5	25	20	23 400	36 500	12 000	0.052	0.078
RLM2930				LM2930	29	38	30	0.5	25	30.2	35 500	55 500	12 000	0.078	0.118
RLM293830				LM293830	29	38	30	0.3	25	30.2	32 000	54 000	12 000	0.078	0.117
RLM3015				LM3015	30	37	15	0.5	25	15.2	14 800	23 000	12 000	0.030	0.055
RLM3020				LM3020	30	37	20	0.5	25	20.2	20 300	34 500	12 000	0.040	0.073
RLM3025				LM3025	30	37	25	0.5	25	25.2	24 500	44 000	12 000	0.050	0.092
RLM304020				LM304020	30	40	20	0.5	25	20.2	25 000	36 000	12 000	0.060	0.093
RLM304025				LM304025	30	40	25	0.5	25	25.2	30 000	46 000	12 000	0.075	0.12
RLM304030				LM304030	30	40	30	0.5	25	30.2	35 000	56 000	12 000	0.090	0.14
	RNA4905			NA4905	30	42	17	0.3	25	17	21 400	26 800	14 000	0.063	0.091
		RNA5905		NA5905	30	42	23	0.3	25	23	30 000	41 500	14 000	0.10	0.14
			RNA6905	NA6905	30	42	30	0.3	25	30	39 500	59 000	14 000	0.11	0.16

Remarks If a full complement roller bearing is required, please contact NSK.

RLM · LM

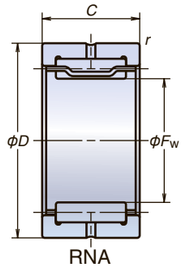
RNA · NA

Inscribed Circle Diameter (F_w)
32~43 mm

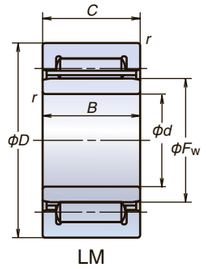


RLM

Without Inner Ring

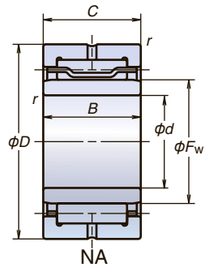


RNA



LM

With Inner Ring



NA

Bearing Numbers					Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speed (rpm)	Mass (kg)	
Without Inner Ring				With Inner Ring	F_w	D	C	r min	d	B	C_r	C_{or}	Oil	Approximate Without Inner Ring	Approximate With Inner Ring
RLM	RNA49	RNA59	RNA69	LM · NA											
RLM3220				LM3220	32	42	20	0.5	28	20.2	25 800	38 000	11 000	0.064	0.090
RLM3230				LM3230	32	42	30	0.5	28	30.2	36 500	59 000	11 000	0.096	0.14
	RNA49 / 28			NA49 / 28	32	45	17	0.3	28	17	22 200	28 700	13 000	0.076	0.099
		RNA59 / 28		NA59 / 28	32	45	23	0.3	28	23	31 500	44 500	13 000	0.11	0.145
			RNA69 / 28	NA69 / 28	32	45	30	0.3	28	30	41 000	63 500	13 000	0.13	0.175
RLM3520				LM3520	35	42	20	0.5	30	20.2	22 300	41 000	10 000	0.046	0.085
RLM3530				LM3530	35	42	30	0.5	30	30.2	31 000	63 500	10 000	0.070	0.13
RLM354520				LM354520	35	45	20	0.5	30	20.2	27 500	42 500	10 000	0.069	0.11
RLM354525				LM354525	35	45	25	0.5	30	25.2	33 000	54 500	10 000	0.086	0.135
RLM354530				LM354530	35	45	30	0.5	30	30.2	38 500	66 000	10 000	0.10	0.16
	RNA4906			NA4906	35	47	17	0.3	30	17	23 900	32 500	12 000	0.072	0.105
		RNA5906		NA5906	35	47	23	0.3	30	23	33 500	50 500	12 000	0.11	0.15
			RNA6906	NA6906	35	47	30	0.3	30	30	44 000	71 500	12 000	0.13	0.19
RLM3720				LM3720	37	47	20	0.6	32	20.3	28 200	45 000	9 500	0.072	0.115
RLM3730				LM3730	37	47	30	0.6	32	30.3	39 500	69 500	9 500	0.11	0.175
RLM374730-1				LM374730-1	37	47	30	0.6	32	30	39 500	69 500	9 500	0.11	0.17
RLM3815				LM3815	38	48	15	0.6	32	15.3	20 900	30 500	9 000	0.056	0.094
RLM3820				LM3820	38	48	20	0.6	32	20.3	29 000	47 000	9 000	0.074	0.125
RLM3825				LM3825	38	48	25	0.6	32	25.3	35 000	60 000	9 000	0.093	0.16
RLM3830				LM3830	38	48	30	0.6	32	30.3	41 000	73 000	9 000	0.11	0.195
RLM4015				LM4015	40	50	15	0.6	35	15.3	21 400	32 000	9 000	0.058	0.092
RLM4020				LM4020	40	50	20	0.6	35	20.3	29 700	49 000	9 000	0.078	0.125
RLM405020-1				LM405020-1	40	50	20	0.6	35	20	29 700	49 000	9 000	0.125	0.125
RLM4025				LM4025	40	50	25	0.6	35	25.3	36 000	62 500	9 000	0.097	0.155
RLM4030				LM4030	40	50	30	0.6	35	30.3	42 000	76 500	9 000	0.12	0.19
	RNA49 / 32			NA49 / 32	40	52	20	0.6	32	20	29 900	45 000	10 000	0.092	0.16
		RNA59 / 32		NA59 / 32	40	52	27	0.6	32	27	40 500	66 000	10 000	0.15	0.24
			RNA69 / 32	NA69 / 32	40	52	36	0.6	32	36	56 000	101 000	10 000	0.17	0.29
RLM425220-1				—	42	52	20	0.3	—	—	32 000	54 500	8 500	0.081	—
RLM425230-1				—	42	52	30	0.3	—	—	44 500	84 500	8 500	0.12	—
	RNA4907			NA4907	42	55	20	0.6	35	20	30 500	47 500	10 000	0.11	0.17
		RNA5907		NA5907	42	55	27	0.6	35	27	41 500	69 500	10 000	0.175	0.25
			RNA6907	NA6907	42	55	36	0.6	35	36	57 500	106 000	10 000	0.20	0.315
RLM435320-1				LM435320-1	43	53	20	0.3	38	20	32 000	55 000	8 000	0.082	0.132
RLM435330-1				LM435330-1	43	53	30	0.3	38	30	44 500	84 500	8 000	0.125	0.199

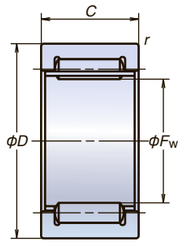
Remarks If a full complement roller bearing is required, please contact NSK.

Solid Needle Roller Bearings (Metric)

RLM · LM

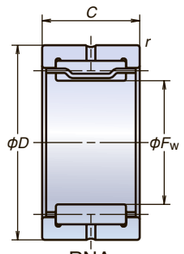
RNA · NA

Inscribed Circle Diameter (F_w) 45~60 mm

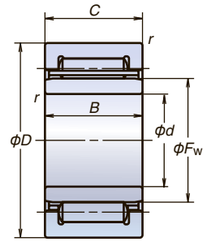


RLM

Without Inner Ring

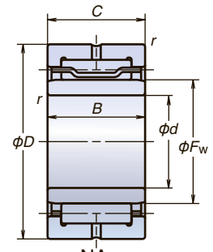


RNA



LM

With Inner Ring



NA

Bearing Numbers					Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speed (rpm)	Mass (kg)	
Without Inner Ring				With Inner Ring	F_w	D	C	r min	d	B	C_r	C_{or}	Oil	Approximate Without Inner Ring	Approximate With Inner Ring
RLM	RNA49	RNA59	RNA69	LM · NA											
RLM4520				LM4520	45	55	20	0.6	40	20.3	31 000	53 500	8 000	0.086	0.14
RLM4525				LM4525	45	55	25	0.6	40	25.3	37 500	68 500	8 000	0.11	0.17
RLM4530				LM4530	45	55	30	0.6	40	30.3	43 500	83 500	8 000	0.13	0.21
	RNA49 / 38			—	45	58	20	0.6	—	—	34 000	56 000	9 500	0.12	—
RLM475720-1				LM475720-1	47	57	20	0.3	42	20	33 000	59 500	7 500	0.089	0.12
RLM475730-1				LM475730-1	47	57	30	0.3	42	30	46 500	91 500	7 500	0.14	0.22
	RNA4908			NA4908	48	62	22	0.6	40	22	39 000	61 500	9 000	0.15	0.24
		RNA5908		NA5908	48	62	30	0.6	40	30	54 500	95 000	9 000	0.23	0.355
			RNA6908	NA6908	48	62	40	0.6	40	40	72 000	137 000	9 000	0.265	0.435
RLM5020				LM5020	50	60	20	0.6	42	20.3	33 000	60 500	7 100	0.098	0.19
RLM5030				LM5030	50	60	30	0.6	42	30.3	46 500	94 000	7 100	0.15	0.28
RLM506220				LM506220	50	62	20	0.6	42	20.3	35 500	60 500	7 100	0.12	0.21
RLM506225				LM506225	50	62	25	0.6	42	25.3	43 000	77 500	7 100	0.155	0.265
RLM506225				LM506225-1	50	62	25	0.6	45	25	43 000	77 500	7 100	0.155	0.22
RLM506230				LM506230	50	62	30	0.6	42	30.3	50 000	94 500	7 100	0.18	0.315
RLM506235-1				LM506235-1	50	62	35	0.6	45	35	66 500	136 000	7 100	0.21	0.31
	RNA49 / 42			—	50	65	22	0.6	—	—	43 000	72 000	8 500	0.17	—
	RNA4909			NA4909	52	68	22	0.6	45	22	41 000	67 500	8 000	0.19	0.28
		RNA5909		NA5909	52	68	30	0.6	45	30	57 000	104 000	8 000	0.27	0.39
			RNA6909	NA6909	52	68	40	0.6	45	40	76 000	149 000	8 000	0.335	0.495
RLM5530				LM5530	55	65	30	0.6	45	30.3	49 000	104 000	6 300	0.16	0.34
RLM5540				LM5540	55	65	40	0.6	45	40.3	64 000	146 000	6 300	0.125	0.46
RLM556720				LM556720	55	67	20	0.6	45	20.3	38 000	68 000	6 300	0.13	0.25
RLM556725				LM556725	55	67	25	0.6	45	25.3	46 000	87 000	6 300	0.165	0.32
RLM556825-1				LM556825-1	55	68	25	0.5	50	25	48 000	92 500	6 300	0.18	0.27
RLM556835-1				LM556835-1	55	68	35	0.3	50	35	63 500	132 000	6 300	0.25	0.37
	RNA49 / 48			—	55	70	22	0.6	—	—	45 000	78 000	7 500	0.18	—
	RNA4910			NA4910	58	72	22	0.6	50	22	42 500	73 500	7 100	0.18	0.295
		RNA5910		NA5910	58	72	30	0.6	50	30	59 500	113 000	7 100	0.25	0.405
			RNA6910	NA6910	58	72	40	0.6	50	40	79 000	163 000	7 100	0.32	0.53
RLM6040				LM6040	60	70	40	0.6	50	40.3	66 000	156 000	6 000	0.235	0.505
RLM607225				LM607225-1	60	72	25	0.3	55	25	50 000	99 500	6 000	0.175	0.26
RLM607230				LM607230	60	72	30	0.6	50	30.3	58 000	120 000	6 000	0.21	0.41
RLM607235-1				LM607235-1	60	72	35	0.3	55	35	65 500	142 000	6 000	0.245	0.37
RLM607240				LM607240	60	72	40	0.6	50	40.3	73 000	162 000	6 000	0.28	0.545
	RNA49 / 52			—	60	75	22	0.6	—	—	48 000	87 500	7 100	0.20	—

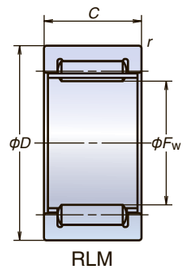
Remarks If a full complement roller bearing is required, please contact NSK.

Solid Needle Roller Bearings (Metric)

RLM · LM

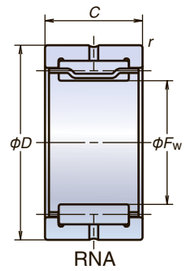
RNA · NA

Inscribed Circle Diameter (F_w)
63~95 mm

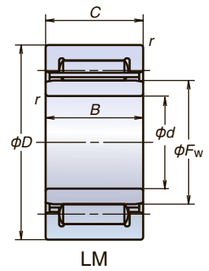


RLM

Without Inner Ring

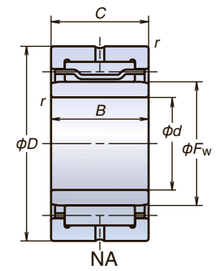


RNA



LM

With Inner Ring



NA

Bearing Numbers					Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speed (rpm)	Mass (kg)	
Without Inner Ring				With Inner Ring										Approximate	
RLM	RNA49	RNA59	RNA69	LM · NA	F_w	D	C	r min	d	B	C_r	C_{or}	Oil	Without Inner Ring	With Inner Ring
	RNA4911			NA4911	63	80	25	1	55	25	53 500	87 500	6 700	0.26	0.40
		RNA5911		NA5911	63	80	34	1	55	34	73 500	133 000	6 700	0.37	0.56
			RNA6911	NA6911	63	80	45	1	55	45	93 500	181 000	6 700	0.475	0.73
RLM657835-1				—	65	78	35	0.6	—	—	67 500	151 000	5 300	0.29	—
	RNA49 / 58			—	65	82	25	1	—	—	60 500	105 000	6 300	0.27	—
RLM688225-1				LM688225-1	68	82	25	0.6	60	25	56 500	112 000	5 000	0.23	0.39
RLM688235-1				LM688235-1	68	82	35	0.6	60	35	78 000	169 000	5 000	0.325	0.54
	RNA4912			NA4912	68	85	25	1	60	25	56 000	95 500	6 300	0.28	0.435
		RNA5912		NA5912	68	85	34	1	60	34	77 500	145 000	6 300	0.415	0.625
			RNA6912	NA6912	68	85	45	1	60	45	98 000	197 000	6 300	0.485	0.76
	RNA49 / 62			—	70	88	25	1	—	—	63 000	113 000	6 000	0.31	—
	RNA4913			NA4913	72	90	25	1	65	25	58 500	103 000	5 600	0.32	0.465
		RNA5913		NA5913	72	90	34	1	65	34	81 000	157 000	5 600	0.48	0.675
			RNA6913	NA6913	72	90	45	1	65	45	103 000	213 000	5 600	0.53	0.79
RLM739025-1				—	73	90	25	1	—	—	64 500	117 000	4 800	0.305	—
RLM739035-1				LM739035-1	73	90	35	1	65	35	88 500	177 000	4 800	0.43	0.67
RLM759225-1				—	75	92	25	1	—	—	64 000	118 000	4 800	0.315	—
RLM759235-1				—	75	92	35	1	—	—	88 000	177 000	4 800	0.44	—
	RNA49 / 68			—	75	95	30	1	—	—	83 500	148 000	5 600	0.46	—
RLM809525-1				LM809525-1	80	95	25	1	70	25	62 500	125 000	4 500	0.29	0.52
RLM809535-1				LM809535-1	80	95	35	1	70	35	86 000	189 000	4 500	0.405	0.73
	RNA4914			NA4914	80	100	30	1	70	30	80 500	143 000	5 300	0.47	0.74
		RNA5914		NA5914	80	100	40	1	70	40	107 000	206 000	5 300	0.69	1.05
			RNA6914	NA6914	80	100	54	1	70	54	143 000	298 000	5 300	0.89	1.4
RLM8510525-1				LM8510525-1	85	105	25	1	75	25	79 000	143 000	4 000	0.42	0.67
	RNA4915			NA4915	85	105	30	1	75	30	84 000	155 000	5 000	0.50	0.79
RLM8510535-1				LM8510535-1	85	105	35	1	75	35	109 000	215 000	4 000	0.59	0.93
		RNA5915		NA5915	85	105	40	1	75	40	112 000	222 000	5 000	0.735	1.1
			RNA6915	NA6915	85	105	54	1	75	54	149 000	325 000	5 000	0.96	1.5
RLM9011025-1				LM9011025-1	90	110	25	1	80	25	82 500	154 000	4 000	0.44	0.70
	RNA4916			NA4916	90	110	30	1	80	30	87 500	166 000	4 500	0.53	0.835
		RNA5916		NA5916	90	110	40	1	80	40	116 000	239 000	4 500	0.75	1.15
			RNA6916	NA6916	90	110	54	1	80	54	157 000	350 000	4 500	0.99	1.55
RLM9511526-1				LM9511526-1	95	115	26	1	85	26	85 500	164 000	3 600	0.48	0.75
	RNA49 / 82			—	95	115	30	1	—	—	95 500	189 000	4 300	0.57	—

Remarks If a full complement roller bearing is required, please contact NSK.

Solid Needle Roller Bearings (Metric)

RLM · LM

RNA · NA

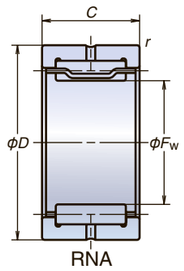
Inscribed Circle Diameter (F_w) 100~115 mm

Bearing Numbers					Boundary Dimensions (mm)						Basic Load Ratings (N)		Limiting Speed (rpm)	Mass (kg)	
Without Inner Ring				With Inner Ring										Approximate	
RLM	RNA49	RNA59	RNA69	LM · NA	F_w	D	C	r min	d	B	C_r	C_{or}	Oil	Without Inner Ring	With Inner Ring
RLM10012026-1				LM10012026-1	100	120	26	1	90	26	86 000	168 000	3 600	0.505	0.81
	RNA4917			NA4917	100	120	35	1.1	85	35	104 000	214 000	4 000	0.68	1.25
		RNA5917		NA5917	100	120	46	1.1	85	46	138 000	310 000	4 000	0.99	1.75
			RNA6917	NA6917	100	120	63	1.1	85	63	174 000	415 000	4 000	1.2	2.25
	RNA4918			NA4918	105	125	35	1.1	90	35	108 000	228 000	4 000	0.72	1.35
		RNA5918		NA5918	105	125	46	1.1	90	46	143 000	330 000	4 000	1.05	1.85
			RNA6918	NA6918	105	125	63	1.1	90	63	181 000	445 000	4 000	1.35	2.45
RLM11013030-1				—	110	130	30	1	—	—	101 000	213 000	3 200	0.635	—
	RNA4919			NA4919	110	130	35	1.1	95	35	111 000	242 000	3 800	0.74	1.4
RLM11013040-1				—	110	130	40	1	—	—	134 000	305 000	3 200	0.85	—
		RNA5919		NA5919	110	130	46	1.1	95	46	148 000	350 000	3 800	1.15	2.0
			RNA6919	NA6919	110	130	63	1.1	95	63	187 000	470 000	3 800	1.5	2.65
	RNA4920			NA4920	115	140	40	1.1	100	40	144 000	295 000	3 600	1.15	1.95
		RNA5920		NA5920	115	140	54	1.1	100	54	193 000	430 000	3 600	1.8	2.85

Remarks If a full complement roller bearing is required, please contact NSK.

RNA · NA

Inscribed Circle Diameter (F_w) 120~225 mm



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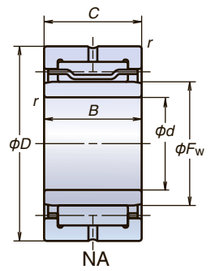


NA

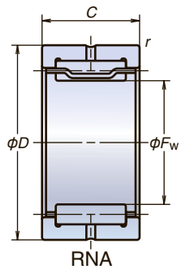
Baring Numbers				Boundary Dimensions (mm)					Basic Load Ratings (N)		Limiting Speed (rpm)	Mass (kg)	
Without Inner Ring			With Inner Ring	F_w	D	B, C	r min	d	C_r	C_{or}	Oil	Approximate Without Inner Ring	Approximate With Inner Ring
RNA48	RNA49	RNA59	NA										
RNA4822			NA4822	120	140	30	1	110	99 500	214 000	3 400	0.67	1.1
	RNA4922		NA4922	125	150	40	1.1	110	149 000	315 000	3 200	1.25	2.1
		RNA5922	NA5922	125	150	54	1.1	110	200 000	460 000	3 200	1.95	3.05
RNA4824			NA4824	130	150	30	1	120	105 000	238 000	3 200	0.71	1.15
	RNA4924		NA4924	135	165	45	1.1	120	192 000	395 000	3 000	1.9	2.9
		RNA5924	NA5924	135	165	60	1.1	120	253 000	565 000	3 000	2.7	4.05
RNA4826			NA4826	145	165	35	1.1	130	127 000	315 000	2 800	0.92	1.8
	RNA4926		NA4926	150	180	50	1.5	130	228 000	515 000	2 800	2.3	4.0
		RNA5926	NA5926	150	180	67	1.5	130	299 000	725 000	2 800	3.3	5.55
RNA4828			NA4828	155	175	35	1.1	140	133 000	340 000	2 600	0.98	1.9
	RNA4928		NA4928	160	190	50	1.5	140	235 000	545 000	2 600	2.45	4.25
		RNA5928	NA5928	160	190	67	1.5	140	310 000	775 000	2 600	3.55	6.0
RNA4830			NA4830	165	190	40	1.1	150	180 000	440 000	2 400	1.6	2.75
	RNA4930		NA4930	170	210	60	2	150	315 000	645 000	2 400	3.9	6.25
RNA4832			NA4832	175	200	40	1.1	160	184 000	465 000	2 200	1.75	2.95
	RNA4932		NA4932	180	220	60	2	160	325 000	695 000	2 200	4.1	6.6
RNA4834			NA4834	185	215	45	1.1	170	224 000	540 000	2 200	2.55	4.0
	RNA4934		NA4934	190	230	60	2	170	340 000	745 000	2 200	4.3	6.95
RNA4836			NA4836	195	225	45	1.1	180	230 000	570 000	2 000	2.65	4.2
	RNA4936		NA4936	205	250	69	2	180	400 000	940 000	2 000	6.2	10
RNA4838			NA4838	210	240	50	1.5	190	268 000	705 000	1 900	3.2	5.6
	RNA4938		NA4938	215	260	69	2	190	415 000	1 000 000	1 900	6.45	10.5
RNA4840			NA4840	220	250	50	1.5	200	274 000	740 000	1 800	3.35	5.9
	RNA4940		NA4940	225	280	80	2.1	200	525 000	1 140 000	1 900	9.7	15

Remarks If a full complement roller bearing is required, please contact NSK.

Solid Needle Roller Bearings (Metric)

RNA · NA

Inscribed Circle Diameter (F_w) 240~490 mm



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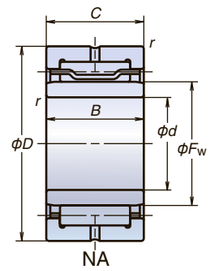


NA

Baring Numbers				Boundary Dimensions (mm)					Basic Load Ratings (N)		Limiting Speed (rpm)	Mass (kg)	
Without Inner Ring			With Inner Ring	F_w	D	B, C	r min	d	C_r	C_{or}	Oil	Approximate Without Inner Ring	Approximate With Inner Ring
RNA48	RNA49	RNA59	NA										
RNA4844			NA4844	240	270	50	1.5	220	286 000	805 000	1 700	3.65	6.45
	RNA4944		NA4944	245	300	80	2.1	220	545 000	1 230 000	1 700	10	15.5
RNA4848			NA4848	265	300	60	2	240	375 000	1 070 000	1 500	5.45	10
	RNA4948		NA4948	265	320	80	2.1	240	590 000	1 400 000	1 600	11.5	17.5
RNA4852			NA4852	285	320	60	2	260	395 000	1 160 000	1 400	5.9	11
	RNA4952		NA4952	290	360	100	2.1	260	870 000	1 910 000	1 400	19.5	29.5
RNA4856			NA4856	305	350	69	2	280	510 000	1 390 000	1 300	9.5	15.5
	RNA4956		NA4956	310	380	100	2.1	280	905 000	2 050 000	1 300	20.5	31
RNA4860			NA4860	330	380	80	2.1	300	660 000	1 810 000	1 200	13	22
	RNA4960		NA4960	340	420	118	3	300	1 150 000	2 630 000	1 200	30	48.5
RNA4864			NA4864	350	400	80	2.1	320	675 000	1 900 000	1 100	13.5	23.5
	RNA4964		NA4964	360	440	118	3	320	1 190 000	2 820 000	1 100	32	51.5
RNA4868			NA4868	370	420	80	2.1	340	690 000	1 990 000	1 100	14	24.5
	RNA4968		NA4968	380	460	118	3	340	1 240 000	3 000 000	1 100	33.5	54
RNA4872			NA4872	390	440	80	2.1	360	705 000	2 080 000	1 000	15	26
	RNA4972		NA4972	400	480	118	3	360	1 280 000	3 200 000	1 000	35.5	57
RNA4876			NA4876	415	480	100	2.1	380	1 030 000	2 940 000	1 000	25.5	42.5
	RNA4976		NA4976	430	520	140	4	380	1 550 000	3 750 000	950	50.5	85.5
	RNA4980		NA4980	450	540	140	4	400	1 600 000	4 000 000	900	52.5	89
	RNA4984		NA4984	470	560	140	4	420	1 660 000	4 250 000	900	54.5	92.5
	RNA4988		NA4988	490	600	160	4	440	1 980 000	4 750 000	850	81.5	125

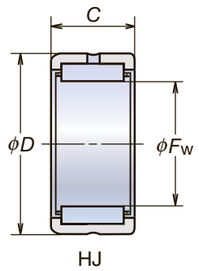
Remarks If a full complement roller bearing is required, please contact NSK.

Solid Needle Roller Bearings (Inch)

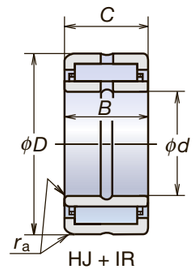
HJ Single-Row, Without Inner Ring

HJ + IR Single-Row, With Inner Ring

Inscribed Circle
Diameter (F_w)
15.875~57.150 mm



HJ



HJ + IR

Bearing Numbers Without Inner Ring	Matrching Inner Rings	Boundary Dimensions (mm, inch) F_w	D	C	d	B	Basic Load Ratings (N) C_r	C_{or}	Limiting Speed (rpm) Oil	Fillet Radius of Shaft, Housing (mm) r_a max	Mass (kg) Approximate Without Inner Ring	With Inner Ring
HJ-101812	IR-061012	15.875 0.6250	28.575 1.1250	19.05 0.7500	9.525 0.3750	19.05 0.7500	18 600	19 400	30 000	0.6	0.050	0.068
HJ-122012	IR-081212	19.050 0.7500	31.750 1.2500	19.05 0.7500	12.700 0.5000	19.05 0.7500	19 800	21 900	24 000	1	0.054	0.081
HJ-122016	IR-081216		31.750 1.2500	25.40 1.0000	12.700 0.5000	25.40 1.0000	26 800	32 000	24 000	1	0.073	0.11
HJ-142212	IR-101412	22.225 0.8750	34.925 1.3750	19.05 0.7500	15.875 0.6250	19.05 0.7500	22 100	26 200	20 000	1	0.064	0.090
	IR-111412				17.462 0.6875	19.05 0.7500				1	0.064	0.087
HJ-142216	IR-101416		34.925 1.3750	25.40 1.0000	15.875 0.6250	25.40 1.0000	29 900	38 500	20 000	1	0.082	0.115
HJ-162412	IR-121612	25.400 1.0000	38.100 1.5000	19.05 0.7500	19.050 0.7500	19.05 0.7500	24 200	30 500	17 000	1	0.068	0.10
HJ-162416	IR-121616		38.100 1.5000	25.40 1.0000	19.050 0.7500	25.40 1.0000	32 500	45 000	17 000	1	0.091	0.135
	IR-131616				20.638 0.8125	25.40 1.0000				1	0.091	0.125
HJ-182616	IR-141816	28.575 1.1250	41.275 1.6250	25.40 1.0000	22.225 0.8750	25.40 1.0000	35 500	51 500	15 000	1	0.10	0.15
	IR-151816				23.812 0.9375	25.40 1.0000				1	0.10	0.14
HJ-182620	IR-141820		41.275 1.6250	31.75 1.2500	22.225 0.8750	31.75 1.2500	44 000	68 000	15 000	1	0.13	0.195
	IR-151820				23.812 0.9375	31.75 1.2500				1	0.13	0.18
HJ-202816	IR-162016	31.750 1.2500	44.450 1.7500	25.40 1.0000	25.400 1.0000	25.40 1.0000	36 500	55 000	13 000	1	0.11	0.17
HJ-202820	IR162020		44.450 1.7500	31.75 1.2500	25.400 1.0000	31.75 1.2500	45 500	72 500	13 000	1	0.14	0.215
HJ-223016	IR-182216	34.925 1.3750	47.625 1.8750	25.40 1.0000	28.575 1.1250	25.40 1.0000	38 500	61 000	12 000	1	0.12	0.185
HJ-223020	IR-182220		47.625 1.8750	31.75 1.2500	28.575 1.1250	31.75 1.2500	48 000	81 000	12 000	1	0.155	0.23
HJ-243316	IR-202416	38.100 1.5000	52.388 2.0625	25.40 1.0000	31.750 1.2500	25.40 1.0000	46 000	68 500	11 000	1.5	0.155	0.23
HJ-243320	IR-192420		52.388 2.0625	31.75 1.2500	30.162 1.1875	31.75 1.2500	57 000	91 000	11 000	1.5	0.195	0.30
	IR-202420				31.750 1.2500	31.75 1.2500				1.5	0.195	0.285
HJ-263516	IR-212616	41.275 1.6250	55.562 2.1875	25.40 1.0000	33.338 1.3125	25.40 1.0000	47 000	72 500	10 000	1.5	0.16	0.255
HJ-263520	IR-212620		55.562 2.1875	31.75 1.2500	33.338 1.3125	31.75 1.2500	58 500	96 500	10 000	1.5	0.20	0.32
	IR-222620				34.925 1.3750	31.75 1.2500				1.5	0.20	0.30
HJ-283716	IR-232816	44.450 1.7500	58.738 2.3125	25.40 1.0000	36.512 1.4375	25.40 1.0000	48 000	76 500	9 500	1.5	0.17	0.27
	IR-242816				38.100 1.5000	25.40 1.0000				1.5	0.17	0.265
HJ-283720	IR-222820		58.738 2.3125	31.75 1.2500	34.925 1.3750	31.75 1.2500	60 000	102 000	9 500	1.5	0.215	0.36
	IR-232820				36.512 1.4375	31.75 1.2500				1.5	0.215	0.34
	IR-242820				38.100 1.5000	31.75 1.2500				1.5	0.215	0.315
HJ-303920	IR-253020	47.625 1.8750	61.912 2.4375	31.75 1.2500	39.688 1.5625	31.75 1.2500	63 500	112 000	9 000	1.5	0.225	0.36
HJ-324116	IR-273216	50.800 2.0000	65.088 2.5625	25.40 1.0000	42.862 1.6875	25.40 1.0000	52 000	88 000	8 500	1.5	0.185	0.305
HJ-324120	IR-243220		65.088 2.5625	31.75 1.2500	38.100 1.5000	31.75 1.2500	65 000	117 000	8 500	1.5	0.235	0.455
	IR-253220				39.688 1.5625	31.75 1.2500				1.5	0.235	0.43
	IR-263220				41.275 1.6250	31.75 1.2500				1.5	0.235	0.405
	IR-273220				42.862 1.6875	31.75 1.2500				1.5	0.235	0.38
HJ-364824	IR-283624	57.150 2.2500	76.200 3.0000	38.10 1.5000	44.450 1.7500	38.10 1.5000	89 000	161 000	7 500	1.5	0.45	0.755
HJ-364828	IR-283628		76.200 3.0000	44.45 1.7500	44.450 1.7500	44.45 1.7500	103 000	194 000	7 500	1.5	0.525	0.88

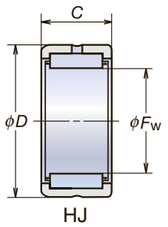
Remarks 1. For bearings with inner rings, the inner ring numer is written separately from the bearing number.
Example: HJ-202816 + IR-162016
2. If a full complement roller bearing is required, please contact NSK.

Solid Needle Roller Bearings (Inch)

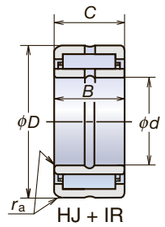
HJ Single-Row, Without Inner Ring

HJ + IR Single-Row, With Inner Ring

Inscribed Circle
Diameter (F_w)
63.500~234.950 mm



HJ



HJ + IR

Bearing Numbers Without Inner Ring	Matrching Inner Rings	Boundary Dimensions (mm, inch) F_w		D		C		d		B		Basic Load Ratings (N) C_r	C_{or}	Limiting Speed (rpm) Oil	Fillet Radius of Shaft, Housing (mm) r_a max	Mass (kg) Approximate Without Inner Ring	With Inner Ring
HJ-405224	IR-314024	63.500	2.5000	82.550	3.2500	38.10	1.5000	49.212	1.9375	38.10	1.5000	96 000	183 000	6 700	2	0.525	0.90
	IR-324024							50.800	2.0000	38.10	1.5000				2	0.525	0.865
HJ-405228	IR-314028			82.550	3.2500	44.45	1.7500	49.212	1.9375	44.45	1.7500	111 000	221 000	6 700	2	0.575	1.0
	IR-324028							50.800	2.0000	44.45	1.7500				2	0.575	0.975
HJ-445616	—	69.850	2.7500	88.900	3.5000	25.40	1.0000	—	—	—	—	66 000	116 000	6 000	2	0.485	—
HJ-445624	IR-364424			88.900	3.5000	38.10	1.5000	57.150	2.2500	38.10	1.5000	100 000	199 000	6 000	2	0.595	0.97
HJ-445628	IR-354428			88.900	3.5000	44.45	1.7500	55.562	2.1875	44.45	1.7500	116 000	240 000	6 000	2	0.65	1.15
	IR-364428							57.150	2.2500	44.45	1.7500				2	0.65	1.1
HJ-486024	IR-404824	76.200	3.0000	95.250	3.7500	38.10	1.5000	63.500	2.5000	38.10	1.5000	106 000	221 000	5 600	2	0.61	1.05
HJ-486028	IR-384828			95.250	3.7500	44.45	1.7500	60.325	2.3750	44.45	1.7500	123 000	268 000	5 600	2	0.68	1.25
	IR-404828							63.500	2.5000	44.45	1.7500				2	0.68	1.15
HJ-526828	IR-445228	82.550	3.2500	107.950	4.2500	44.45	1.7500	69.850	2.7500	44.45	1.7500	161 000	300 000	5 000	2	1.05	1.55
HJ-526832	IR-445232			107.950	4.2500	50.80	2.0000	69.850	2.7500	50.80	2.0000	182 000	350 000	5 000	2	1.2	1.8
HJ-567232	IR-475632	88.900	3.5000	114.300	4.5000	50.80	2.0000	74.612	2.9375	50.80	2.0000	186 000	370 000	4 800	2	1.2	1.95
	IR-485632							76.200	3.0000	50.80	2.0000				2	1.2	1.9
HJ-607632	IR-506032	95.250	3.7500	120.650	4.7500	50.80	2.0000	79.375	3.1250	50.80	2.0000	194 000	400 000	4 500	2.5	1.3	2.2
	IR-526032							82.550	3.2500	50.80	2.0000				2.5	1.3	2.0
HJ-648032	IR-526432	101.600	4.0000	127.000	5.0000	50.80	2.0000	82.550	3.2500	50.80	2.0000	202 000	430 000	4 000	2.5	1.4	2.5
	IR-546432							85.725	3.3750	50.80	2.0000				2.5	1.4	2.3
	IR-566432							88.900	3.5000	50.80	2.0000				2.5	1.4	2.15
HJ-688432	IR-566832	107.950	4.2500	133.350	5.2500	50.80	2.0000	88.900	3.5000	50.80	2.0000	205 000	445 000	3 800	2.5	1.5	2.65
	IR-606832							95.250	3.7500	50.80	2.0000				2.5	1.5	2.5
HJ-729636	IR-607236	114.300	4.5000	152.400	6.0000	57.15	2.2500	95.250	3.7500	57.15	2.2500	290 000	525 000	3 800	2.5	2.75	4.15
HJ-729640	IR-607240			152.400	6.0000	63.50	2.5000	95.250	3.7500	63.50	2.5000	325 000	600 000	3 800	2.5	3.05	4.6
HJ-8010432	—	127.000	5.0000	165.100	6.5000	50.80	2.0000	—	—	—	—	279 000	515 000	3 400	2.5	2.4	—
HJ-8010436	IR-648036			165.100	6.5000	57.15	2.2500	101.600	4.0000	57.15	2.2500	315 000	600 000	3 400	2.5	2.9	4.95
	IR-688036							107.950	4.2500	57.15	2.2500				2.5	2.9	4.45
HJ-8010440	IR-648040			165.100	6.5000	63.50	2.5000	101.600	4.0000	63.50	2.5000	350 000	685 000	3 400	2.5	3.3	5.55
HJ-8811240	IR-728840	139.700	5.5000	177.800	7.0000	63.50	2.5000	114.300	4.5000	63.50	2.5000	350 000	715 000	3 000	2.5	3.6	6.1
HJ-8811248	IR-728848			177.800	7.0000	76.20	3.0000	114.300	4.5000	76.20	3.0000	415 000	890 000	3 000	2.5	4.25	7.2
HJ-9211648	IR-769248	146.050	5.7500	184.150	7.2500	76.20	3.0000	120.650	4.7500	76.20	3.0000	425 000	925 000	2 800	3	4.55	7.7
HJ-9612040	IR-809640	152.400	6.0000	190.500	7.5000	63.50	2.5000	127.000	5.0000	63.50	2.5000	375 000	795 000	2 800	3	3.9	6.65
HJ-9612048	IR-809648			190.500	7.5000	76.20	3.0000	127.000	5.0000	76.20	3.0000	445 000	995 000	2 800	3	4.75	8.1
HJ-10412840	IR-8810440	165.100	6.5000	203.200	8.0000	63.50	2.5000	139.700	5.5000	63.50	2.5000	385 000	855 000	2 400	3	4.15	7.2
HJ-10412848	IR-8810448			203.200	8.0000	76.20	3.0000	139.700	5.5000	76.20	3.0000	460 000	1 060 000	2 400	3	4.75	8.4
HJ-11614648	IR-9611648	184.150	7.2500	231.775	9.1250	76.20	3.0000	152.400	6.0000	76.20	3.0000	535 000	1 140 000	2 200	3	7.1	12
HJ-12415448	IR-10412448	196.850	7.7500	244.475	9.6250	76.20	3.0000	165.100	6.5000	76.20	3.0000	555 000	1 230 000	2 000	3	7.5	13
HJ-13216248	IR-11213248	209.550	8.2500	257.175	10.1250	76.20	3.0000	177.800	7.0000	76.20	3.0000	575 000	1 310 000	2 000	3	7.95	13.5
HJ-14017048	IR-12014048	222.250	8.7500	269.875	10.6250	76.20	3.0000	190.500	7.5000	76.20	3.0000	590 000	1 390 000	1 900	4	8.35	14.5
HJ-14817848	IR-12814048	234.950	9.2500	282.575	11.1250	76.20	3.0000	203.200	8.0000	76.20	3.0000	610 000	1 470 000	1 800	4	8.6	15

Remarks 1. For bearings with inner rings, the inner ring numer is written separately from the bearing number.
Example: HJ-202816 + IR-162016
2. If a full complement roller bearing is required, please contact NSK.

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