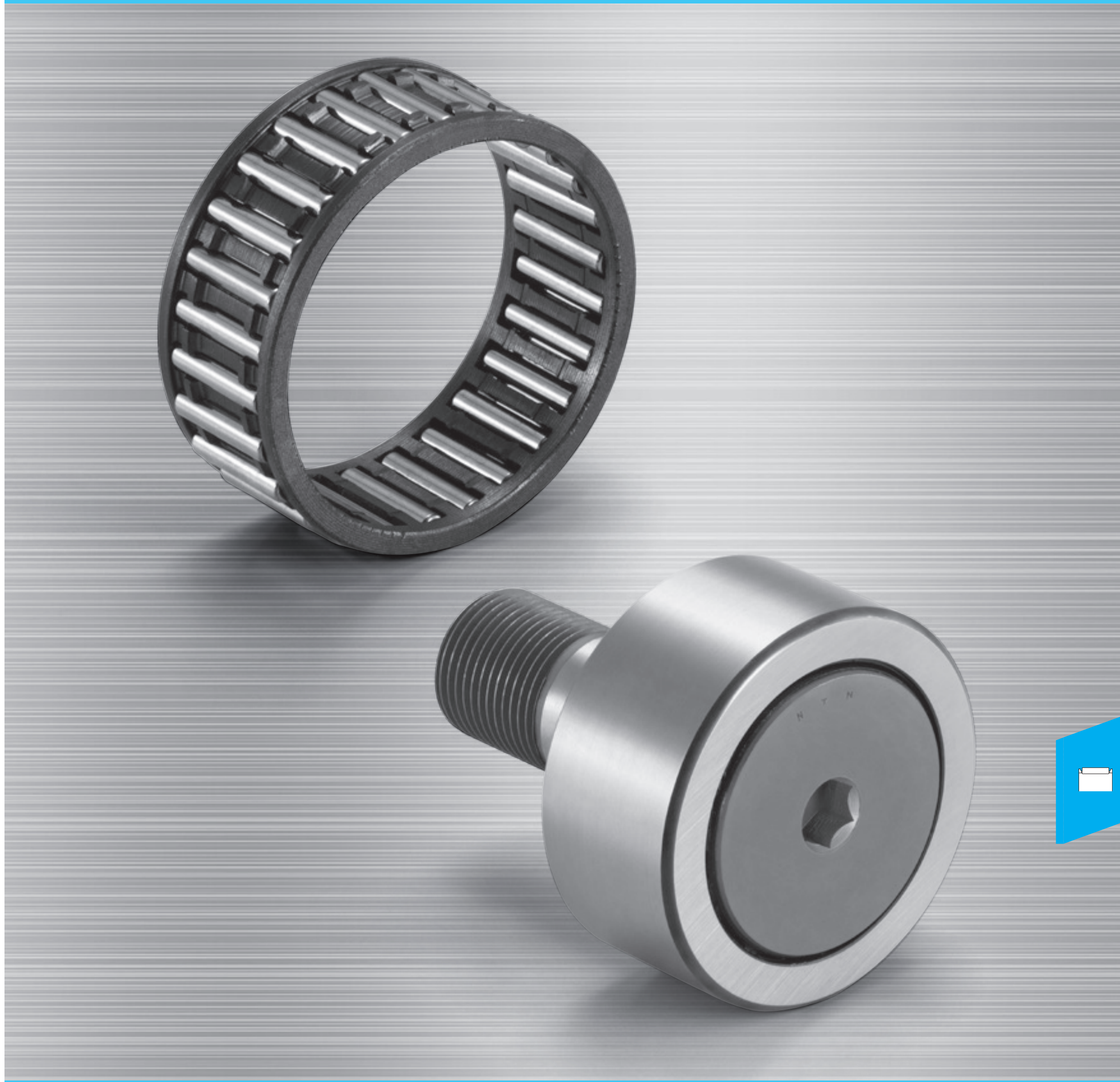
Needle Roller Bearings



Needle Roller Bearings Contents

1. Characteristics and types of needle roller bearings

Needle roller bearing are rolling bearings which have small diameter cylindrical rolling elements whose length is relatively long compared with their diameter.

Needle roller bearings have a small cross-sectional height and have a larger load capacity and rigidity than other types of rolling bearings for their relative size. They are also suitable for oscillating motion due to their low moment of inertia. Types of needle roller bearings are shown in the table below. This catalog **provides dimension tables for the representative bearing types indicated by blue text in the table below**.

For more information about needle roller bearings, see the special catalog "**Needle Roller Bearings (CAT. No. 2300/E)**."

Bearing type		Type code	Shaft diameter mm	Page of bearing dimension table
Radial roller bearings	Needle roller bearing with cage	K, K···T2, K···S, KMJ···S, K···ZW, KV···S, KV···ZWS, K···L1	3 to 285	E-12 to E-25
	Connecting rod needle roller bearings with cage	PK, KBK, GPK, KMJ···S, KBK, KV···S	—	—
	Drawn cup needle roller bearings	HK, HMK, HK···ZWD, HMK···ZWD, BK, BK···ZWD, HK···L, HMK···L, HK···LL, HMK···LL, DCL, HCK	3 to 50	E-26 to E-33
	Solid type needle roller bearings	RNA48, RNA49, RNA49···R, RNA59, RNA69···R, NK, NK···R, NA48, NA49, NA49···R, NA59, NA69···R, NK+IR, NK···R+IR NA49···L, RNA49···L, NA49···LL, RNA49···LL, MR, MR+MI, NKS, NKS+IR	5 to 440	E-34 to E-55
	Separable solid type needle roller bearings	RNAO, RNAO···ZW, NAO, NAO···ZW	—	—
	Clearance adjusting needle roller bearings	RNA49···S, NA49···S	—	—
Thrust roller bearings	Thrust cylindrical roller bearings	811, 812, 893, K811, K812, K893 WS, GS, 874, K874	10 to 160	E-56 to E-61
	Thrust needle roller bearings	AXK11, AS, WS, GS	10 to 160	E-62 to E-65
Complex bearings	Complex bearings	NKX, NKX···Z, NKXR, NKXR···Z, NKX+IR, NKX···Z+IR, NKXR+IR, NKXR···Z+IR, NKIA, NKIB, AXN, ARN	—	—
Track rollers	Cam followers	KR···(F), KR···(F)LL, KRV···(F), KRV···(F)LL, KR···(F)H, KRV···(F)H, KRT, KRT···LL, KRVT, KRVT···LL, KRVU, KRVU···LL, CR, CR···LL, CRV, CRV···LL, CR···H, CRV···H, NUKR, NUKRT, NUKRU	3 to 64 (Stud diameter)	E-66 to E-83
	Roller followers	RNAB2, NAB2, RNA22···LL, NA22···LL, NATR, NATR···LL, NATV, NACV, NATV···LL, NACV···LL, NUTR, NUTW	5 to 50	E-84 to E-91
Components	Inner rings, needle rollers, snap rings, seals	IR, MI, F, WR, BR, G, GD, LEG, LEGD	—	D-24 to D-27
Linear motion bearings	Linear ball bearings	KLM, KH, KD, RLM, FF, FF···ZW, RF, BF	—	—
Textile machinery bearings	Bottom roller bearing tension pulleys	JPU···S, FRIS, FR	—	—

Note: 1. Bearings with polyamide resin cages (supplementary suffix code: T2/example: HK0408FT2) must be used at an allowable temperature of 120 °C or below or 100 °C or below for continuous use.
2. Bearings with an attached synthetic rubber seal and filled with grease inside (supplementary suffix code: L or LL / example: NATR20LL/3AS) must be used at an allowable temperature of –20 to 120 °C or 100 °C or below for continuous use.

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2. Handling and accuracy of needle roller bearings

2.1 Required accuracy and surface hardness of raceway surfaces

For applications using needle roller bearings, the outside diameter of the shaft or the bore diameter of the housing or the gear is sometimes used directly as a raceway surface. **Table 1** shows the accuracy, surface roughness, and surface hardness required for raceway surfaces in order to keep radial clearance within the prescribed allowable tolerance range after needle roller bearing installation, and to ensuring high rotational accuracy. To set a surface hardness of the raceway surface from HRC 58 to 64 and obtain a sufficient load capacity, apply appropriate heat treatment to materials as shown in **Table 2**.

Depending on the usage conditions, the bearing function may not be satisfactory even with the following recommended values. If this applies, consult with **NTN** Engineering.

Table 1 Recommended accuracy of raceway surfaces

Characteristics		Shaft	Housing
Dimensional accuracy		IT5 (IT4)	IT6 (IT5)
Roundness Cylindricity (Max.)		IT3 (IT2)	IT4 (IT3)
Abutment squareness (Max.)	Radial	IT3	
	Thrust	IT5 (IT4)	
Surface roughness μm *Ra*		Shaft diameter ϕ80 or below : 0.2 Shaft diameter ϕ81 to ϕ120 : 0.3 Shaft diameter over ϕ120 : 0.4	
Surface hardness		HRC 58 to 64	

Remarks: Accuracy in ( ) applies for high rotational accuracy.

Table 2 Materials used for raceways

Steel type	Representative example	Standard
High carbon chrome bearing steel	SUJ2	JIS G 4805
Carbon tool steel	SK85 (Former: SK5)	JIS G 4401
Nickel chrome molybdenum steel	SNCM420	JIS G 4053 (Former: JIS G 4103)
Chrome steel	SCr420	JIS G 4053 (Former: JIS G 4104)
Chrome molybdenum steel	SCM420	JIS G 4053 (Former: JIS G 4105)
Stainless steel	SUS440C	JIS G 4303

When steel is surface-hardened by carburizing or carbonitriding, the depth from the surface to 550 HV is defined as effective case depth per JIS. The minimum value of the effective case depth is roughly estimated using formula (1).

$$Eht_{\min} \geq 0.8D_w\,(0.1 + 0.002D_w) \cdots\cdots\cdots (1)$$

Where:
$Eht_{\min}$: Minimum effective case depth, mm
D_w : Roller diameter, mm

Needle roller bearings have low allowable misalignment because the ratio of roller length to roller diameter is high. For normal applications, bearing misalignment must not exceed the values shown in **Table 3**.

Table 3 Allowable misalignment of needle roller bearings

Bearing type	Allowable misalignment
Radial roller bearings	1/2 000
Thrust roller bearings	1/10 000

Mating part dimensions must be set so that the rolling surface does not come in contact with the recessed portion of the shaft or the chamfered area of the housing raceway surface. Contact **NTN** Engineering when dimension A_{min} (see **Fig. 1**) must be confirmed.

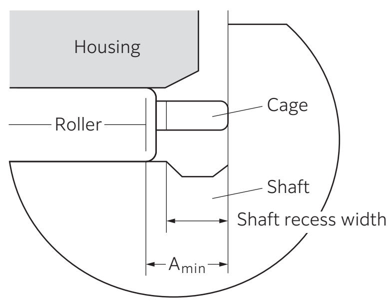

Fig. 1 Dimension A_{min}

2.2 Needle roller bearing with cage

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

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

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

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

Table 4 Fits recommended for needle roller bearings with cage

Shaft diameter mm	Recommended fits					
	Internal clearance less than normal		Normal clearance		Internal clearance greater than normal	
	Shaft	Housing	Shaft	Housing	Shaft	Housing
Up to 80	j5	G6	h5	G6	g6	G6
80 to140	h5	G6	g5	G6	f6	G6
140 or more	h5	G6	f5	H6	f6	G6

Table 5 Diameter dimensional tolerance and classification of needle rollers

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

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

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

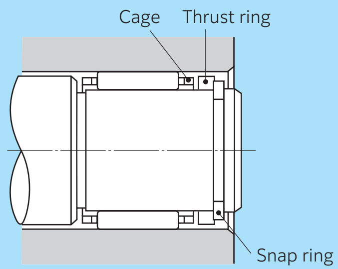

Fig. 2 Fixing using thrust ring

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2.3 Drawn cup needle roller bearings

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

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

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

Table 6 Drawn cup needle roller bearing housing and shaft fits

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

Table 7 Recommended shaft and housing accuracy

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

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

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

Since the outer ring is formed by a thin steel plate, **the safety factor (S_0) when the bearing is used must be $S_0 \geq 3$ for standard specifications, and $S_0 \geq 2$ must be maintained for the carburized/quenched specification (HK-F type drawn cup needle roller bearings[1])**.

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

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

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

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

When a drawn cup needle roller bearing is to be inserted into a housing, **the marked side of the bearing must be press-fit into the appropriate position with the use of a jig**. (There is no designation for the installation direction of pre-bent specification products[1].)

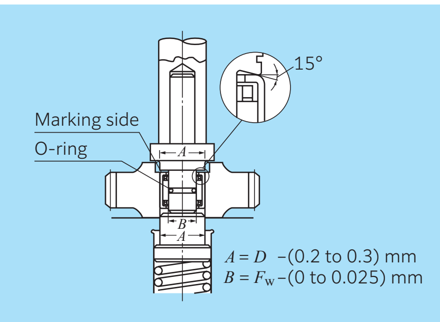

Fig. 3

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

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

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

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

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

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

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

2.4 Solid type needle roller bearings

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

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

Table 9 Dimensional tolerance for shaft (raceway diameter)

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

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

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

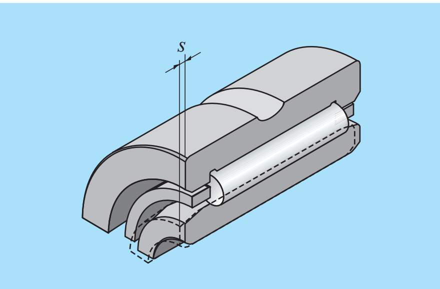


Fig. 4 Allowable movement amount (s)

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

Unit: μm

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

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

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

Unit: μm

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

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

2.5 Thrust roller bearing

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

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

Table 11 Fits recommended for thrust roller bearings

Bearing parts		Type and class	
		Shaft diameter	Housing bore
AXK type, K811 type	Bore diameter guide	h8 1)	—
K812 type, K893 type	Outside diameter guide	—	H9 1)
WS type raceway (inner ring)		h6	—
GS type raceway (outer ring)		—	H7
Steel raceway AS type	Shaft fixing	h10	Clearance with housing
	Housing fixing	Clearance with shaft	H11

1) The guide surface is finished by grinding.

2.6 Cam follower/roller follower

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

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

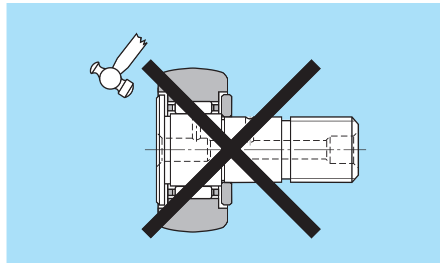


Fig. 5

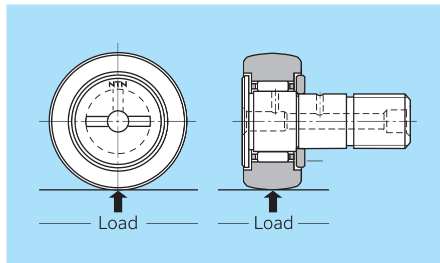


Fig. 6

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

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

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

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

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

Table 13 Dimensional accuracy of cam followers Unit: μm

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

Table 14 Fits recommended for cam followers

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

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

Table 15 Fits recommended for roller followers

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

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

Table 16 Correction coefficient G

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

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

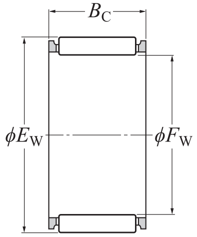
Further, lubrication is also necessary between the outer ring outside diameter surface and the track of the bearing. Even after lubrication, the bearing and the track may be damaged at an early stage when slippage occurs between the outer ring outside diameter surface and the track of the bearing due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

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

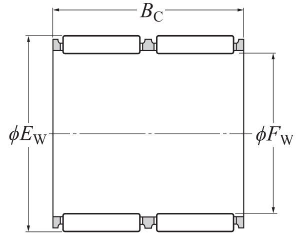
Needle Roller Bearings

Needle roller and cage assemblies

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



K type
K··T2 type
K··S type



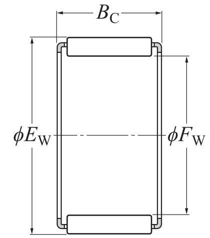
K··ZW type

F_w 3–10 mm

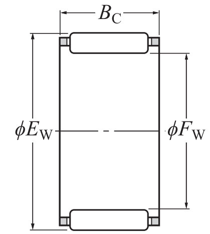
Boundary dimensions mm				Basic load rating N dynamic	static	Fatigue load limit N	Allowable speed min^{-1} Grease lubrication	Oil lubrication	Number	Mass kg (approx.)
F_w	E_w	B_c		C_r	C_{0r}	C_u				
3	6	7	−0.2 −0.55	1 460	970	118	33 000	50 000	**K3×6×7T2T**	0.0004
4	6	8	−0.2 −0.55	1 560	1 330	162	30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

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

Needle Roller Bearings



KMJ··S type



KV··S type

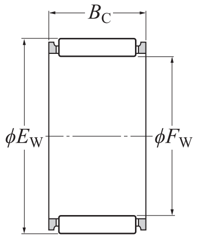
F_w 10–15 mm

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

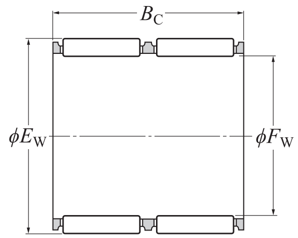
Note: Bearings may be delivered with a different cage type even if they are ordered by the bearing numbers in the table.

Needle roller and cage assemblies

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



K type
K··T2 type
K··S type

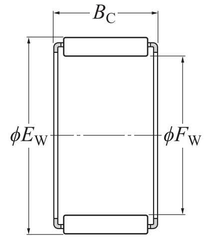


K··ZW type

F_w 15–18 mm

Boundary dimensions mm				Basic load rating N		Fatigue load limit N	Allowable speed min^{-1}		Number	Mass kg
F_w	E_w	B_c		dynamic C_r	static C_{0r}	C_u	Grease lubrication	Oil lubrication		(approx.)
	19	17		10 900	14 600	1 780	15 000	23 000	**K15×19×17**	0.0090
	19	24		14 100	20 400	2 490	15 000	23 000	**K15×19×24ZW**	0.013
	20	13		10 100	11 500	1 410	15 000	23 000	**K15×20×13**	0.0088
15	20	16	−0.2 −0.55	12 600	15 200	1 850	15 000	23 000	**KMJ15×20×15.8XS**	0.0090
	21	15		11 900	12 500	1 530	15 000	23 000	**K15×21×15**	0.013
	21	17		14 900	16 800	2 050	15 000	23 000	**KMJ15×21×16.8X1SK**	0.012
	21	21		16 500	19 100	2 330	15 000	23 000	**K15×21×21**	0.017
	20	10		7 500	9 250	1 130	15 000	23 000	**K16×20×10T**	0.0057
	20	11		8 300	10 500	1 280	15 000	23 000	**K16×20×11T**	0.0061
	20	13		9 050	11 800	1 430	15 000	23 000	**K16×20×13**	0.0071
	20	17		11 900	16 800	2 050	15 000	23 000	**K16×20×17ST**	0.0092
16	22	12	−0.2 −0.55	11 700	12 500	1 530	15 000	23 000	**K16×22×12**	0.010
	22	13		12 600	13 900	1 690	15 000	23 000	**KMJ16×22×13S**	0.011
	22	16		13 600	15 200	1 850	15 000	23 000	**K16×22×15.8X**	0.014
	22	17		14 400	16 400	2 000	15 000	23 000	**K16×22×17**	0.015
	22	20		16 000	18 800	2 300	15 000	23 000	**K16×22×20**	0.017
	21	10		7 450	9 300	1 140	15 000	22 000	**K17×21×10S**	0.0056
	21	13		9 400	12 600	1 530	15 000	22 000	**K17×21×13S**	0.0075
	21	15		10 400	14 400	1 750	15 000	22 000	**K17×21×15**	0.0089
17	21	17	−0.2 −0.55	11 800	16 900	2 060	15 000	22 000	**K17×21×17**	0.0095
	22	20		14 700	19 200	2 340	15 000	22 000	**K17×22×20**	0.015
	23	17		14 400	16 500	2 020	15 000	22 000	**K17×23×17**	0.016
	23	23		16 800	20 200	2 470	15 000	22 000	**K17×23×22.8X1T2**	0.013
	22	10		7 400	9 400	1 140	14 000	21 000	**K18×22×10**	0.0061
	22	13		8 900	11 900	1 450	14 000	21 000	**K18×22×13**	0.0077
	22	17	−0.2 −0.55	11 700	17 000	2 070	14 000	21 000	**K18×22×17**	0.011
18	23	20		14 600	19 300	2 360	14 000	21 000	**K18×23×20S**	0.015
	24	12		12 300	13 800	1 690	14 000	21 000	**K18×24×12**	0.012
	24	13		11 600	12 800	1 560	14 000	21 000	**K18×24×13**	0.013

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



KMJ··S type

F_w 18–22 mm

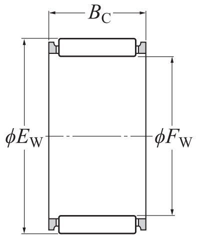
Boundary dimensions mm				Basic load rating N		Fatigue load limit N	Allowable speed min^{-1}		Number	Mass kg
F_w	E_w	B_c		dynamic C_r	static C_{0r}	C_u	Grease lubrication	Oil lubrication		(approx.)
	24	17		16 000	19 300	2 350	14 000	21 000	**KMJ18×24×17SV1**	0.014
18	24	20	−0.2 −0.55	17 000	20 900	2 550	14 000	21 000	**K18×24×20**	0.019
	25	17		18 000	20 400	2 490	14 000	21 000	**K18×25×17**	0.019
	25	22		22 100	26 600	3 250	14 000	21 000	**K18×25×22**	0.024
19	23	13	−0.2 −0.55	9 650	13 500	1 640	14 000	21 000	**K19×23×13**	0.0082
	23	17		12 700	19 200	2 340	14 000	21 000	**K19×23×17**	0.011
	24	10		8 300	11 200	1 370	13 000	20 000	**K20×24×10S**	0.0065
	24	11		9 500	13 400	1 640	13 000	20 000	**K20×24×11**	0.0072
	24	13		10 000	14 300	1 740	13 000	20 000	**K20×24×13SV4**	0.0086
	24	17		13 200	20 400	2 480	13 000	20 000	**K20×24×17S**	0.011
	24	45		16 400	27 100	3 300	13 000	20 000	**K20×24×45ZW**	0.028
	25	40		29 000	48 000	5 880	13 000	20 000	**K20×25×40ZWT**	0.033
20	26	12	−0.2 −0.55	12 900	15 100	1 840	13 000	20 000	**K20×26×12**	0.013
	26	13		14 000	16 700	2 040	13 000	20 000	**KMJ20×26×13ST**	0.012
	26	14		15 800	19 600	2 390	13 000	13 000	**KMJ20×26×13.8X1S**	0.013
	26	17		17 800	22 800	2 780	13 000	20 000	**KMJ20×26×17S**	0.016
	26	20		20 600	27 600	3 350	13 000	20 000	**KMJ20×26×20S**	0.019
	28	17		21 700	24 600	3 000	13 000	20 000	**KMJ20×28×16.8XS**	0.022
	28	20		24 600	28 900	3 500	13 000	20 000	**KMJ20×28×19.8X4S**	0.026
	28	25		27 100	32 500	3 950	13 000	20 000	**8Q-K20×28×25**	0.039
21	25	13	−0.2 −0.55	10 700	15 900	1 940	13 000	19 000	**KMJ21×25×12.8X1S**	0.0081
	25	17		13 600	21 500	2 630	13 000	19 000	**K21×25×17**	0.012
	26	10		8 500	11 900	1 450	12 000	18 000	**K22×26×10S**	0.0071
	26	11		10 100	14 900	1 820	12 000	18 000	**8Q-K22×26×11**	0.0090
	26	13		10 200	15 200	1 850	12 000	18 000	**K22×26×13**	0.0094
22	26	17	−0.2 −0.55	13 500	21 600	2 640	12 000	18 000	**K22×26×17S**	0.012
	27	20		17 500	25 900	3 150	12 000	18 000	**K22×27×20**	0.020
	27	28.5		24 200	39 500	4 800	12 000	18 000	**K22×27×28.3X**	0.028
	27	40		29 900	51 500	6 300	12 000	18 000	**K22×27×40ZW**	0.039
	28	17		17 700	23 300	2 850	12 000	18 000	**K22×28×17V1**	0.020

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

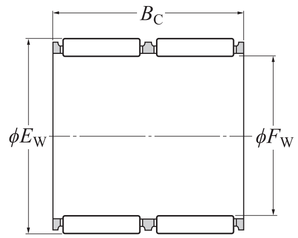
Needle Roller Bearings

Needle roller and cage assemblies

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



K type
K··T2 type
K··S type

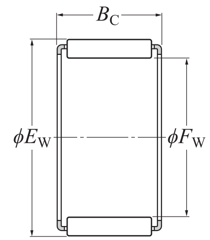


K··ZW type

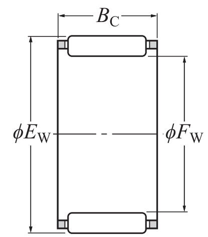
F_w 22–25 mm

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

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



KMJ··S type



KV··S type

F_w 26–30 mm

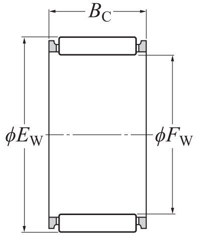
Boundary dimensions mm F_w	E_w	B_c		Basic load rating dynamic N C_r	static C_{0r}	Fatigue load limit N C_u	Allowable speed min^{-1} Grease lubrication	Oil lubrication	Number	Mass kg (approx.)
26	30	13		11 800	19 200	2 340	10 000	15 000	**K26×30×13**	0.011
	30	17	−0.2 −0.55	15 500	27 400	3 350	10 000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

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

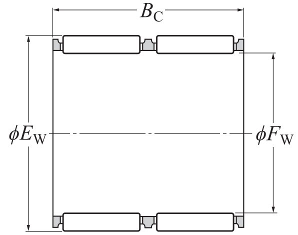
Needle Roller Bearings

Needle roller and cage assemblies

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



K type
K··T2 type
K··S type



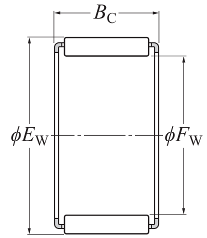
K··ZW type

F_w 31–35 mm

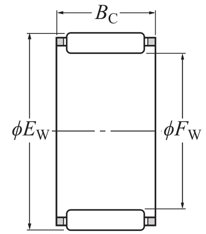
Boundary dimensions mm F_w	E_w	B_c		Basic load rating N dynamic C_r	static C_{0r}	Fatigue load limit N C_u	Allowable speed min^{-1} Grease lubrication	Oil lubrication	Number	Mass kg (approx.)
31	35	24	$^{-0.2}_{-0.55}$	21 200	43 500	5 300	8 500	13 000	**KV31×35×23.8XS**	0.022
	36	14		15 800	25 400	3 100	8 500	13 000	**KV31×36×13.8XS**	0.017
32	36	15	$^{-0.2}_{-0.55}$	14 300	26 400	3 200	8 500	13 000	**K32×36×15ST**	0.017
	37	13		14 500	23 000	2 810	8 500	13 000	**K32×37×13**	0.018
	37	17		19 200	33 000	4 000	8 500	13 000	**K32×37×17S**	0.022
	37	26		24 900	46 000	5 600	8 500	13 000	**K32×37×26ZWV3**	0.032
	37	27		29 600	57 500	7 000	8 500	13 000	**K32×37×27**	0.037
	38	14		19 800	30 500	3 700	8 500	13 000	**KMJ32×38×14S**	0.022
	38	26		31 500	54 000	6 600	8 500	13 000	**K32×38×26**	0.041
	39	16		22 600	32 000	3 900	8 500	13 000	**K32×39×16V1**	0.033
	39	18		24 000	35 000	4 250	8 500	13 000	**K32×39×18**	0.037
33	38	30.5	$^{-0.2}_{-0.55}$	28 400	55 000	6 700	8 000	12 000	**K33×38×30.3X1T2**	0.026
34	40	39.5	$^{-0.2}_{-0.55}$	39 000	73 500	8 950	8 000	12 000	**KV34×40×39.3X1ZWS**	0.066
35	39	22.5	$^{-0.2}_{-0.55}$	21 500	46 000	5 600	7 500	11 000	**KV35×39×22.3XS**	0.024
	39	24		21 300	45 000	5 500	7 500	11 000	**K35×39×23.8X1T2**	0.015
	40	13		15 200	25 100	3 050	7 500	11 000	**K35×40×13**	0.019
	40	17		20 000	36 000	4 350	7 500	11 000	**K35×40×17**	0.025
	40	19		22 300	41 000	5 000	7 500	11 000	**K35×40×19**	0.029
	40	26		26 100	50 000	6 100	7 500	11 000	**K35×40×26ZW**	0.037
	40	30		26 100	50 000	6 100	7 500	11 000	**K35×40×30ZW**	0.043
	41	14		19 400	30 500	3 700	7 500	11 000	**K35×41×14**	0.026
	41	15		20 900	33 500	4 050	7 500	11 000	**K35×41×15**	0.027
	41	24		31 000	55 500	6 800	7 500	11 000	**K35×41×23.8X1**	0.042
	41	40		43 000	84 000	10 200	7 500	11 000	**K35×41×40ZW**	0.055
	42	16		24 100	36 000	4 350	7 500	11 000	**K35×42×16**	0.035
	42	18		24 700	37 000	4 500	7 500	11 000	**K35×42×18**	0.039

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

Needle Roller Bearings



KMJ··S type



KV··S type

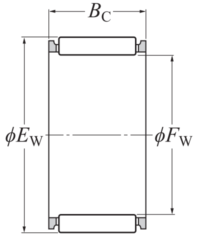
F_w 35–42 mm

Boundary dimensions mm F_w	E_w	B_c		Basic load rating N dynamic C_r	static C_{0r}	Fatigue load limit N C_u	Allowable speed min^{-1} Grease lubrication	Oil lubrication	Number	Mass kg (approx.)
35	42	20	$^{-0.2}_{-0.55}$	26 500	40 500	4 950	7 500	11 000	**KV35×42×20SV2**	0.040
	42	30		39 500	68 000	8 300	7 500	11 000	**K35×42×30**	0.062
	42	45		42 500	74 000	9 000	7 500	11 000	**K35×42×45ZW**	0.106
36	42	46	$^{-0.2}_{-0.55}$	51 000	106 000	12 900	7 500	11 000	**K36×42×46ZW**	0.086
37	42	13	$^{-0.2}_{-0.55}$	15 900	27 100	3 300	7 500	11 000	**K37×42×13V4**	0.021
	42	17		21 000	38 500	4 700	7 500	11 000	**K37×42×17V2**	0.026
	43	33.5		39 000	76 000	9 250	7 500	11 000	**KV37×43×33.3XS**	0.062
	44	18		26 300	41 000	5 000	7 500	11 000	**K37×44×18**	0.042
	45	25		37 000	58 000	7 050	7 500	11 000	**K37×45×24.8XT2**	0.039
38	43	17	$^{-0.2}_{-0.55}$	20 900	38 500	4 700	7 500	11 000	**8E-K38×43×17**	0.027
	43	27		32 000	67 500	8 250	7 500	11 000	**K38×43×27**	0.043
	43	29		32 500	68 000	8 300	7 500	11 000	**K38×43×28.8X**	0.047
	46	32		54 000	95 500	11 600	7 500	11 000	**K38×46×32**	0.073
40	45	13	$^{-0.2}_{-0.55}$	16 500	29 200	3 550	6 500	10 000	**K40×45×13V2**	0.023
	45	17		21 800	41 500	5 100	6 500	10 000	**K40×45×17T**	0.027
	45	21		26 700	54 000	6 600	6 500	10 000	**K40×45×21V2**	0.035
	45	27		33 500	72 500	8 850	6 500	10 000	**K40×45×27**	0.044
	46	17		24 600	43 000	5 200	6 500	10 000	**K40×46×17**	0.030
	46	34		40 500	80 500	9 850	6 500	10 000	**KV40×46×33.8XS**	0.063
	47	18		27 700	45 000	5 450	6 500	10 000	**K40×47×18**	0.045
	47	20		31 000	51 500	6 300	6 500	10 000	**K40×47×20**	0.048
	48	20		33 000	51 000	6 250	6 500	10 000	**K40×48×20**	0.052
	48	25		41 000	68 000	8 300	6 500	10 000	**KV40×48×25SV1**	0.065
41	49	22	$^{-0.2}_{-0.55}$	30 500	46 000	5 650	6 500	9 500	**8E-KV41×49×21.8XS**	0.065
42	47	17	$^{-0.2}_{-0.55}$	22 100	43 000	5 250	6 500	9 500	**K42×47×17**	0.028
	47	27		34 000	75 500	9 200	6 500	9 500	**K42×47×27**	0.047
	48	17		25 700	46 000	5 650	6 500	9 500	**K42×48×17**	0.036
	50	20		34 000	53 500	6 550	6 500	9 500	**K42×50×20**	0.054

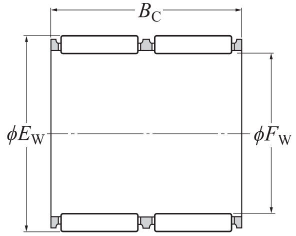
Note: Bearings may be delivered with a different cage type even if they are ordered by the bearing numbers in the table.

Needle roller and cage assemblies

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



K type
K··T2 type
K··S type

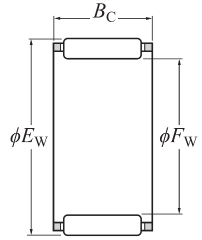


K··ZW type

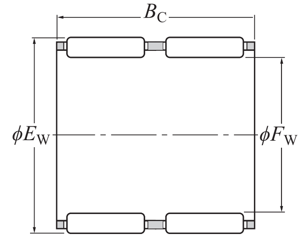
F_w 43–50 mm

Boundary dimensions (mm) F_w	E_w	B_c		Basic load rating dynamic (N) C_r	static (N) C_{0r}	Fatigue load limit (N) C_u	Allowable speed (min^{-1}) Grease lubrication	Oil lubrication	Number	Mass kg (approx.)
43	48	17	−0.2 −0.55	22 000	43 000	5 250	6 500	9 500	**K43×48×17**	0.029
	48	27		34 000	75 500	9 200	6 500	9 500	**K43×48×27**	0.046
	48	38		41 000	96 000	11 700	6 500	9 500	**KV43×48×37.8XZWS**	0.058
	50	18		29 100	49 000	5 950	6 500	9 500	**K43×50×18**	0.049
44	50	31	−0.2 −0.55	43 500	91 500	11 100	6 500	9 500	**KV44×50×30.8XS**	0.067
45	49	19	−0.2 −0.55	22 100	52 000	6 350	6 000	9 000	**K45×49×19**	0.027
	50	17		22 300	44 500	5 450	6 000	9 000	**K45×50×17V3**	0.033
	50	25.8		30 500	66 500	8 100	6 000	9 000	**KV45×50×25.8XS**	0.045
	50	27		34 500	78 000	9 500	6 000	9 000	**K45×50×27**	0.050
	51	27		34 500	68 000	8 300	6 000	9 000	**KV45×51×26.8XS**	0.058
	52	18		29 700	51 000	6 200	6 000	9 000	**K45×52×18**	0.051
	52	21		32 000	56 500	6 900	6 000	9 000	**K45×52×21**	0.061
	53	20		36 000	59 000	7 200	6 000	9 000	**K45×53×20**	0.062
	53	25		46 500	82 000	10 000	6 000	9 000	**K45×53×25**	0.077
47	52	15.5	−0.2 −0.55	19 400	38 000	4 650	5 500	8 500	**8E-K47×52×15.3X2**	0.031
	52	17		23 200	47 500	5 800	5 500	8 500	**K47×52×17**	0.033
	52	23		29 600	65 500	7 950	5 500	8 500	**KV47×52×22.8X2S**	0.044
	52	24		33 500	76 500	9 350	5 500	8 500	**K47×52×23.8X**	0.044
	52	27		35 500	83 000	10 100	5 500	8 500	**K47×52×27**	0.051
	52	33		38 000	90 500	11 100	5 500	8 500	**KV47×52×32.8XZWS**	0.064
48	53	22.5	−0.2 −0.55	31 000	69 500	8 450	5 500	8 500	**KV48×53×22.3XS**	0.042
	53	26		36 500	86 500	10 600	5 500	8 500	**K48×53×25.8X3T2**	0.029
	53	30		36 500	85 500	10 400	5 500	8 500	**K48×53×29.8X1**	0.062
	53	37		45 000	112 000	13 700	5 500	8 500	**KV48×53×36.8XZWS**	0.064
	53	37.5		41 500	101 000	12 300	5 500	8 500	**K48×53×37.5ZW**	0.072
	54	19		31 000	61 000	7 450	5 500	8 500	**K48×54×19**	0.044
	55	24.5		39 000	74 500	9 050	5 500	8 500	**KV48×55×24.3XS**	0.070
50	55	13.5	−0.2 −0.55	18 100	35 500	4 300	5 500	8 000	**K50×55×13.5T**	0.023
	55	20		27 900	62 000	7 550	5 500	8 000	**KV50×55×20S**	0.040

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



KV··S type



KV··ZWS type

F_w 50–60 mm

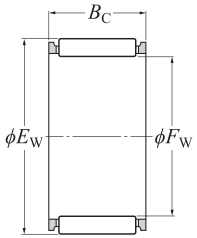
Boundary dimensions (mm) F_w	E_w	B_c		Basic load rating dynamic (N) C_r	static (N) C_{0r}	Fatigue load limit (N) C_u	Allowable speed (min^{-1}) Grease lubrication	Oil lubrication	Number	Mass kg (approx.)
50	55	27	−0.2 −0.55	37 000	88 500	10 800	5 500	8 000	**K50×55×27**	0.053
	55	30		39 500	97 000	11 800	5 500	8 000	**K50×55×30**	0.059
	57	18		31 500	57 000	6 950	5 500	8 000	**K50×57×18**	0.053
	58	20		38 500	67 500	8 200	5 500	8 000	**K50×58×20**	0.065
	58	25		48 500	90 000	11 000	5 500	8 000	**K50×58×25**	0.081
	58	58		83 500	181 000	22 100	5 500	8 000	**KV50×58×57.8XZWS**	0.188
52	57	18	−0.2 −0.55	22 800	48 000	5 850	5 000	7 500	**KV52×57×17.8XS**	0.037
	57	23		30 500	69 500	8 500	5 000	7 500	**KV52×57×22.8X1S**	0.048
	58	19		32 000	65 500	7 950	5 000	7 500	**K52×58×19**	0.048
54	59	23	−0.2 −0.55	31 500	73 500	8 950	5 000	7 500	**KV54×59×22.8XS**	0.049
55	60	17	−0.2 −0.55	25 800	58 000	7 050	5 000	7 500	**K55×60×17**	0.043
	60	20		28 800	66 500	8 100	5 000	7 500	**K55×60×20T**	0.045
	60	30		42 000	108 000	13 200	5 000	7 500	**KV55×60×30S**	0.069
	60	37		47 500	127 000	15 500	5 000	7 500	**K55×60×36.8X**	0.086
	61	19		33 000	69 500	8 450	5 000	7 500	**K55×61×19**	0.051
	61	20		33 000	69 500	8 450	5 000	7 500	**K55×61×20**	0.054
	61	30		48 000	113 000	13 700	5 000	7 500	**K55×61×30**	0.081
	62	18		33 500	63 000	7 700	5 000	7 500	**K55×62×18**	0.054
	63	20		39 000	70 000	8 500	5 000	7 500	**K55×63×20**	0.073
	63	25		50 500	97 500	11 900	5 000	7 500	**K55×63×25**	0.088
	63	32		61 000	125 000	15 200	5 000	7 500	**K55×63×32**	0.117
56	66	41	−0.2 −0.55	90 000	178 000	21 700	5 000	7 500	**K56×66×40.8XT2**	0.148
57	65	40	−0.2 −0.55	66 000	140 000	17 100	4 700	7 000	**KV57×65×39.8XZWS**	0.145
58	64	19	−0.2 −0.55	34 000	73 500	8 950	4 700	7 000	**K58×64×19**	0.052
60	65	20	−0.2 −0.55	29 800	71 500	8 750	4 300	6 500	**K60×65×20**	0.051
	65	27		40 000	104 000	12 700	4 300	6 500	**K60×65×26.8X**	0.067
	65	30		43 500	116 000	14 200	4 300	6 500	**K60×65×30**	0.071
	66	19		33 500	73 500	8 950	4 300	6 500	**K60×66×19**	0.053
	66	20		33 500	73 500	8 950	4 300	6 500	**K60×66×20**	0.056

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

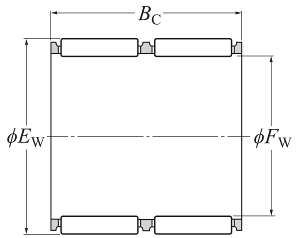
Needle Roller Bearings

Needle roller and cage assemblies

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



K type
K··T2 type
K··S type



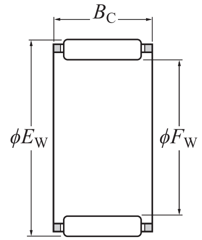
K··ZW type

F_w 60–73 mm

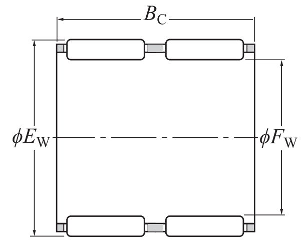
Boundary dimensions mm F_w	E_w	B_c		Basic load rating N dynamic C_r	static C_{0r}	Fatigue load limit N C_u	Allowable speed min^{-1} Grease lubrication	Oil lubrication	Number	Mass kg (approx.)
60	66	30		49 000	119 000	14 600	4 300	6 500	**K60×66×30**	0.084
	68	15		27 200	45 500	5 550	4 300	6 500	**K60×68×15**	0.058
	68	20		40 000	75 000	9 200	4 300	6 500	**K60×68×20**	0.077
	68	23	$^{-0.2}_{-0.55}$	44 500	85 000	10 400	4 300	6 500	**K60×68×23**	0.092
	68	25		52 000	105 000	12 800	4 300	6 500	**K60×68×25T**	0.097
	68	27		52 000	105 000	12 800	4 300	6 500	**K60×68×27**	0.098
	68	30		46 500	91 000	11 100	4 300	6 500	**K60×68×30ZW**	0.119
61	66	20	$^{-0.2}_{-0.55}$	29 700	71 500	8 750	4 300	6 500	**K61×66×20**	0.054
	66	30		43 500	116 000	14 200	4 300	6 500	**K61×66×30**	0.073
63	70	21	$^{-0.2}_{-0.55}$	44 500	95 500	11 600	4 300	6 500	**K63×70×21**	0.075
	71	50.5		74 500	167 000	20 400	4 300	6 500	**KV63×71×50.3XZWS**	0.193
64	70	16	$^{-0.2}_{-0.55}$	28 400	60 500	7 350	4 300	6 500	**K64×70×16**	0.053
65	70	20		30 500	75 000	9 150	4 000	6 000	**K65×70×20**	0.055
	70	21.5		30 500	75 000	9 150	4 000	6 000	**KV65×70×21.3X1S**	0.056
	70	30	$^{-0.2}_{-0.55}$	45 000	124 000	15 200	4 000	6 000	**K65×70×30**	0.083
	73	23		47 000	94 000	11 500	4 000	6 000	**K65×73×23**	0.100
	73	30		61 000	132 000	16 000	4 000	6 000	**K65×73×30**	0.126
68	74	20		36 000	83 500	10 200	4 000	6 000	**K68×74×20**	0.065
	74	30	$^{-0.2}_{-0.55}$	51 500	133 000	16 200	4 000	6 000	**K68×74×30**	0.097
	74	35		49 500	125 000	15 300	4 000	6 000	**K68×74×35ZW**	0.116
	75	21		45 500	101 000	12 300	4 000	6 000	**K68×75×21**	0.077
70	76	20		36 500	86 000	10 500	3 700	5 500	**K70×76×20**	0.070
	76	30		53 000	139 000	17 000	3 700	5 500	**K70×76×30**	0.100
	77	21	$^{-0.2}_{-0.55}$	45 000	101 000	12 300	3 700	5 500	**K70×77×21**	0.080
	78	23		49 500	103 000	12 600	3 700	5 500	**K70×78×23**	0.107
	78	30		65 500	149 000	18 100	3 700	5 500	**K70×78×30**	0.136
72	79	21	$^{-0.2}_{-0.55}$	46 500	106 000	12 900	3 700	5 500	**K72×79×21**	0.085
73	79	20	$^{-0.2}_{-0.55}$	37 500	90 000	11 000	3 700	5 500	**K73×79×20**	0.074
	79	30		54 500	146 000	17 800	3 700	5 500	**K73×79×30**	0.106

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

Needle Roller Bearings



KV··S type



KV··ZWS type

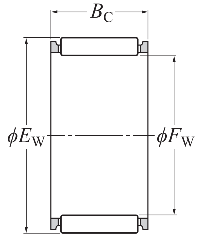
F_w 74–100 mm

Boundary dimensions mm F_w	E_w	B_c		Basic load rating N dynamic C_r	static C_{0r}	Fatigue load limit N C_u	Allowable speed min^{-1} Grease lubrication	Oil lubrication	Number	Mass kg (approx.)
74	90	50	$^{-0.2}_{-0.55}$	157 000	287 000	35 000	3 700	5 500	**K74×90×49.8XT2**	0.380
75	81	20		40 000	99 500	12 200	3 700	5 500	**KV75×81×19.8X1S**	0.071
	81	30		56 000	152 000	18 600	3 700	5 500	**K75×81×30**	0.108
	82	21	$^{-0.2}_{-0.55}$	46 000	106 000	13 000	3 700	5 500	**K75×82×21**	0.088
	83	23		50 500	109 000	13 300	3 700	5 500	**K75×83×23**	0.113
	83	30		67 500	157 000	19 200	3 700	5 500	**K75×83×30**	0.147
80	86	20		39 000	98 000	11 900	3 300	5 000	**KV80×86×20SV1**	0.077
	86	30		57 000	159 000	19 400	3 300	5 000	**K80×86×30**	0.110
	88	23	$^{-0.2}_{-0.55}$	53 000	118 000	14 400	3 300	5 000	**K80×88×23**	0.125
	88	26		61 000	142 000	17 300	3 300	5 000	**K80×88×26**	0.131
	88	30		69 000	166 000	20 300	3 300	5 000	**K80×88×30**	0.157
85	92	30		66 000	176 000	21 500	3 100	4 700	**K85×92×30**	0.142
	93	27	$^{-0.2}_{-0.55}$	64 000	153 000	18 700	3 100	4 700	**K85×93×27**	0.145
	93	30		71 000	175 000	21 400	3 100	4 700	**8Q-K85×93×30**	0.174
90	97	20		46 000	113 000	13 700	2 900	4 400	**K90×97×20**	0.103
	97	30		67 500	184 000	22 400	2 900	4 400	**K90×97×30**	0.151
	98	26	$^{-0.2}_{-0.55}$	64 000	157 000	19 200	2 900	4 400	**K90×98×26**	0.148
	98	27		64 000	157 000	19 200	2 900	4 400	**K90×98×27**	0.150
	98	30		72 500	184 000	22 400	2 900	4 400	**K90×98×30**	0.172
95	102	21		48 000	122 000	14 900	2 800	4 200	**K95×102×21**	0.115
	102	31	$^{-0.2}_{-0.55}$	70 500	199 000	24 300	2 800	4 200	**K95×102×31**	0.172
	103	27		65 500	165 000	20 100	2 800	4 200	**K95×103×27**	0.159
	103	30		74 000	193 000	23 500	2 800	4 200	**K95×103×30**	0.165
100	107	21		47 500	122 000	14 700	2 700	4 000	**KV100×107×21S**	0.120
	107	31	$^{-0.3}_{-0.65}$	71 500	207 000	24 900	2 700	4 000	**K100×107×31**	0.173
	108	27		61 000	153 000	18 400	2 700	4 000	**K100×108×27**	0.176
	108	30		76 000	201 000	24 300	2 700	4 000	**K100×108×30**	0.190

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

Needle roller and cage assemblies

K type
K··L1 type



K type
K··L1 type

F_w 105–170 mm

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

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

F_w 175–285 mm

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

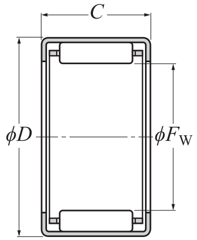
Note: Bearings may be delivered with a different cage type even if they are ordered by the bearing numbers in the table.

Needle Roller Bearings

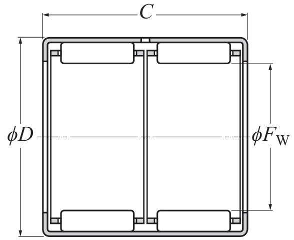
NTN

Drawn cup needle roller bearings

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



HK type, HMK type



HK··ZWD type

(Open end type)

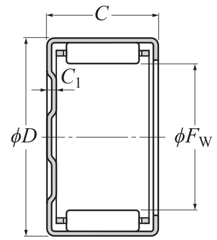
F_w 3–10 mm

F_w	D	C 0 −0.2	C_1 Max.	Basic load rating dynamic C_r (N)	Basic load rating static C_{0r} (N)	Fatigue load limit C_u (N)	Allowable speed (min^{-1}) Grease lubrication	Allowable speed (min^{-1}) Oil lubrication	Number Open end type	Number Closed end type	Mass kg (approx.)	Applied inner ring 1) (approx.)
3	6.5	6	—	925	565	69	33 000	50 000	HK0306FT2	—	0.0006	—
	6.5	6	0.8	925	565	69	33 000	50 000	—	BK0306T2	0.0007	—
4	8	8	—	1 770	1 270	155	30 000	45 000	HK0408FT2	—	0.0016	—
	8	8	1.6	1 770	1 270	155	30 000	45 000	—	BK0408T2	0.0018	—
5	9	9	—	2 450	1 990	243	27 000	40 000	HK0509FM	—	0.0019	—
	9	9	1.6	2 450	1 990	243	27 000	40 000	—	BK0509	0.0021	—
6	10	9	—	2 920	2 590	315	25 000	37 000	HK0609FM	—	0.0022	—
	10	9	1.6	2 660	2 280	278	25 000	37 000	—	BK0609T2	0.0024	—
7	11	9	—	3 150	2 930	355	23 000	34 000	HK0709FM	—	0.0025	—
	11	9	1.6	3 150	2 930	355	23 000	34 000	—	BK0709CT	0.0027	—
8	12	10	—	3 850	3 950	480	20 000	30 000	HK0810FM	—	0.0032	IR 5× 8×12
	12	10	1.6	3 850	3 950	480	20 000	30 000	—	BK0810CT	0.0034	IR 5× 8×12
	15	10	—	4 200	3 300	400	20 000	30 000	HMK0810CT	—	0.0067	IR 5× 8×12
	15	15	—	7 300	6 650	770	20 000	30 000	HMK0815CT	—	0.010	IR 5× 8×16
	15	20	—	9 050	8 750	1 070	20 000	30 000	HMK0820T2	—	0.013	—
9	13	10	—	4 300	4 650	570	18 000	27 000	HK0910FM	—	0.0035	IR 6× 9×12
	13	10	1.6	4 300	4 650	570	18 000	27 000	—	BK0910CT	0.0039	IR 6× 9×12
	13	12	—	5 400	6 250	765	18 000	27 000	HK0912F	—	0.0042	IR 6× 9×12
	13	12	1.6	5 400	6 250	765	18 000	27 000	—	BK0912CT	0.0045	IR 6× 9×12
	16	12	—	5 300	4 450	545	18 000	27 000	HMK0912	—	0.0087	IR 6× 9×16
	16	16	—	7 400	6 850	840	18 000	27 000	HMK0916	—	0.012	—
10	14	10	—	4 500	5 100	620	16 000	24 000	HK1010FM	—	0.0038	IR 7×10×10.5
	14	10	1.6	4 500	5 100	620	16 000	24 000	—	BK1010	0.0042	IR 7×10×10.5
	14	12	—	5 650	6 800	830	16 000	24 000	HK1012F	—	0.0045	IR 7×10×16
	14	12	1.6	5 900	7 250	880	16 000	24 000	—	BK1012	0.0050	IR 7×10×16
	14	15	—	7 250	9 400	1 140	16 000	24 000	HK1015F	—	0.0056	IR 7×10×16
	14	15	1.6	7 250	9 400	1 140	16 000	24 000	—	BK1015CT	0.0062	IR 7×10×16
	17	10	—	4 250	3 450	420	16 000	24 000	HMK1010	—	0.0079	IR 7×10×10.5
	17	12	—	5 600	4 850	590	16 000	24 000	HMK1012	—	0.0094	IR 7×10×16

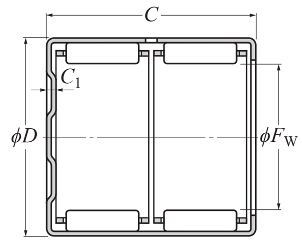
1) If the bearing has an inner ring, the value indicates HK + IR.
Example: HK1012F + IR7 × 10 × 16

Needle Roller Bearings

NTN



BK type



BK··ZWD type

(Closed end type)

F_w 10–15 mm

F_w	D	C 0 −0.2	C_1 Max.	Basic load rating dynamic C_r (N)	Basic load rating static C_{0r} (N)	Fatigue load limit C_u (N)	Allowable speed (min^{-1}) Grease lubrication	Allowable speed (min^{-1}) Oil lubrication	Number Open end type	Number Closed end type	Mass kg (approx.)	Applied inner ring 1) (approx.)
10	17	15	—	7 400	6 950	850	16 000	24 000	HMK1015	—	0.012	IR 7×10×16
	17	20	—	9 900	10 100	1 240	16 000	24 000	7E-HMK1020CT	—	0.016	—
12	16	10	—	5 050	6 250	760	13 000	20 000	HK1210FM	—	0.0046	IR 8×12×10.5
	16	10	1.6	5 050	6 250	760	13 000	20 000	—	BK1210	0.0052	IR 8×12×10.5
	18	12	—	6 600	7 300	890	13 000	20 000	HK1212FM	—	0.0091	IR 8×12×12.5
	18	12	2.7	6 600	7 300	890	13 000	20 000	—	BK1212	0.010	IR 8×12×12.5
	19	12	—	7 100	6 900	845	13 000	20 000	HMK1212	—	0.011	IR 8×12×12.5
	19	15	—	9 400	9 900	1 210	13 000	20 000	7E-HMK1215C	—	0.014	IR 9×12×16
	19	20	—	12 900	14 900	1 820	13 000	20 000	HMK1220CT	—	0.018	—
	19	25	—	15 300	18 600	2 260	13 000	20 000	HMK1225	—	0.023	—
13	19	12	—	6 950	7 900	965	12 000	18 000	HK1312FM	—	0.010	IR10×13×12.5
	19	12	2.7	6 950	7 900	965	12 000	18 000	—	BK1312	0.011	IR10×13×12.5
14	20	12	—	7 200	8 500	1 040	11 000	17 000	HK1412FM	—	0.011	IR10×14×13
	20	12	2.7	7 200	8 500	1 040	11 000	17 000	—	BK1412	0.012	IR10×14×13
	20	16	—	10 300	13 400	1 640	11 000	17 000	HK1416F	—	0.015	—
	20	16	2.7	10 300	13 400	1 640	11 000	17 000	—	BK1416CT	0.016	—
	22	16	—	11 500	12 000	1 460	11 000	17 000	HMK1416C	—	0.019	IR10×14×20
	22	20	—	14 600	16 200	1 980	11 000	17 000	HMK1420C	—	0.024	—
15	21	12	—	7 500	9 100	1 110	11 000	16 000	HK1512FM	—	0.011	IR12×15×12.5
	21	12	2.7	7 500	9 100	1 110	11 000	16 000	—	BK1512	0.013	IR12×15×12.5
	21	16	—	10 700	14 400	1 750	11 000	16 000	HK1516F	—	0.015	IR12×15×16.5
	21	16	2.7	10 700	14 400	1 750	11 000	16 000	—	BK1516	0.017	IR12×15×16.5
	21	22	—	12 900	18 200	2 220	11 000	16 000	HK1522ZWFD	—	0.020	IR12×15×22.5
	21	22	2.7	12 900	18 200	2 220	11 000	16 000	—	BK1522ZWD	0.022	IR12×15×22.5
	22	10	—	6 100	6 000	730	11 000	16 000	HMK1510	—	0.011	IR10×15×12.5
	22	12	—	7 950	8 450	1 030	11 000	16 000	HMK1512	—	0.013	IR12×15×12.5
	22	15	—	10 500	12 100	1 480	11 000	16 000	HMK1515C	—	0.016	IR12×15×16
	22	20	—	15 300	19 700	2 400	11 000	16 000	HMK1520CV6	—	0.022	IR12×15×22.5
	22	25	—	18 500	25 000	3 050	11 000	16 000	HMK1525	—	0.027	—

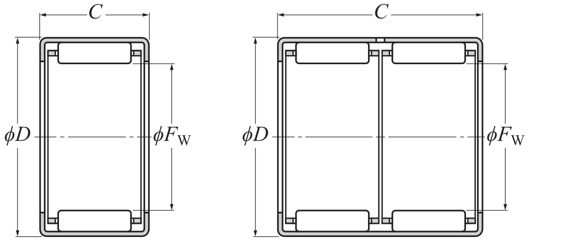
1) If the bearing has an inner ring, the value indicates HK + IR.
Example: HK1312FM + IR10 × 13 × 12.5

Needle Roller Bearings

NTN

Drawn cup needle roller bearings

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



HK type, HMK type   HK··ZWD type
(Open end type)

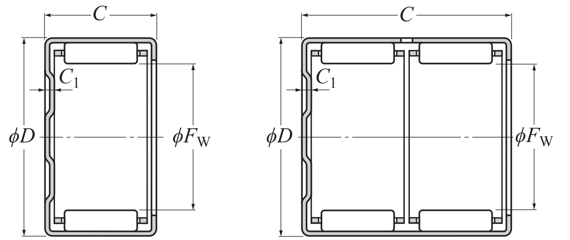
F_w 16–20 mm

Boundary dimensions mm F_w	D	C 0 −0.2	C_1 Max.	Basic load rating N dynamic C_r	static C_{0r}	Fatigue load limit N C_u	Allowable speed min⁻¹ Grease lubrication	Oil lubrication	Number Open end type	Closed end type	Mass kg (approx.)	Applied inner ring 1) (approx.)
16	22	12	—	7 750	9 700	1 180	10 000	15 000	HK1612FM	—	0.012	IR12×16×13
	22	12	2.7	7 750	9 700	1 180	10 000	15 000	—	BK1612	0.014	IR12×16×13
	22	16	—	11 100	15 300	1 870	10 000	15 000	HK1616F	—	0.016	IR12×16×20
	22	16	2.7	11 100	15 300	1 870	10 000	15 000	—	BK1616	0.018	IR12×16×20
	22	22	—	13 300	19 400	2 370	10 000	15 000	HK1622ZWFD	—	0.022	—
	22	22	2.7	13 300	19 400	2 370	10 000	15 000	—	BK1622ZWD	0.023	—
	24	16	—	12 400	13 500	1 640	10 000	15 000	HMK1616	—	0.021	IR12×16×20
	24	20	—	15 600	18 200	2 220	10 000	15 000	7E-HMK1620CT	—	0.027	IR12×16×22
17	23	12	—	8 050	10 300	1 260	9 500	14 000	HK1712FM	—	0.012	—
	23	12	2.7	8 050	10 300	1 260	9 500	14 000	—	BK1712CT	0.015	—
	24	15	—	11 600	14 200	1 740	9 500	14 000	7E-HMK1715CT	—	0.018	IR14×17×17
	24	20	—	15 200	20 000	2 440	9 500	14 000	7E-HMK1720CT	—	0.024	IR12×17×20.5
	24	25	—	19 000	26 700	3 250	9 500	14 000	7E-HMK1725CT	—	0.030	IR12×17×25.5
18	24	12	—	8 300	10 900	1 330	8 500	13 000	HK1812FM	—	0.013	IR15×18×12.5
	24	12	2.7	8 300	10 900	1 330	8 500	13 000	—	BK1812	0.015	IR15×18×12.5
	24	16	—	11 800	17 300	2 110	8 500	13 000	HK1816F	—	0.018	IR15×18×16.5
	24	16	2.7	11 800	17 300	2 110	8 500	13 000	—	BK1816	0.020	IR15×18×16.5
	25	13	—	10 200	12 200	1 480	8 500	13 000	HMK1813	—	0.016	IR15×18×16
	25	15	—	12 000	15 100	1 840	8 500	13 000	HMK1815	—	0.019	IR15×18×16
	25	17	—	13 300	17 200	2 100	8 500	13 000	HMK1817C	—	0.021	IR15×18×17.5
	25	19	—	15 500	20 900	2 540	8 500	13 000	HMK1819	—	0.024	IR15×18×20.5
	25	20	—	16 300	22 300	2 720	8 500	13 000	HMK1820	—	0.025	IR15×18×20.5
	25	25	—	20 900	31 000	3 750	8 500	13 000	HMK1825V2	—	0.031	IR15×18×25.5
19	27	16	—	13 900	16 300	2 000	8 500	13 000	HMK1916	—	0.025	IR15×19×20
	27	20	—	18 100	23 000	2 800	8 500	13 000	HMK1920F	—	0.031	—
20	26	12	—	8 750	12 100	1 480	8 000	12 000	HK2012FM	—	0.014	IR15×20×13
	26	12	2.7	9 250	13 000	1 590	8 000	12 000	—	BK2012	0.017	IR15×20×13
	26	16	—	12 500	19 200	2 340	8 000	12 000	HK2016F	—	0.019	IR17×20×16.5
	26	16	2.7	13 000	20 100	2 450	8 000	12 000	—	BK2016	0.022	IR17×20×16.5
	26	20	—	16 000	26 200	3 200	8 000	12 000	HK2020F	—	0.024	IR17×20×20.5

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

Needle Roller Bearings

NTN



BK type   BK··ZWD type
(Closed end type)

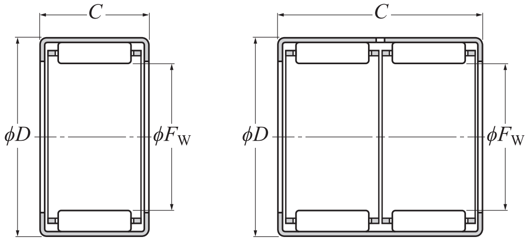
F_w 20–25 mm

Boundary dimensions mm F_w	D	C 0 −0.2	C_1 Max.	Basic load rating N dynamic C_r	static C_{0r}	Fatigue load limit N C_u	Allowable speed min⁻¹ Grease lubrication	Oil lubrication	Number Open end type	Closed end type	Mass kg (approx.)	Applied inner ring 1) (approx.)
20	26	20	2.7	16 000	26 200	3 200	8 000	12 000	—	BK2020CT	0.027	IR17×20×20.5
	26	30	—	21 500	38 500	4 700	8 000	12 000	HK2030ZWFD	—	0.035	IR17×20×30.5
	26	30	2.7	22 200	40 000	4 900	8 000	12 000	—	BK2030ZWD	0.037	IR17×20×30.5
	27	15	—	13 000	17 300	2 110	8 000	12 000	HMK2015CV3	—	0.021	IR17×20×16.5
	27	20	—	17 200	24 800	3 000	8 000	12 000	HMK2020CT	—	0.027	IR17×20×20.5
	27	25	—	22 000	34 000	4 150	8 000	12 000	HMK2025C	—	0.034	IR15×20×26
	27	30	—	26 100	42 000	5 150	8 000	12 000	HMK2030	—	0.041	IR17×20×30.5
21	29	16	—	15 300	19 100	2 320	7 500	11 000	HMK2116	—	0.027	IR17×21×20
	29	20	—	19 400	25 800	3 150	7 500	11 000	HMK2120	—	0.033	—
22	28	12	—	9 200	13 400	1 630	7 500	11 000	HK2212FM	—	0.013	IR17×22×13
	28	12	2.7	9 200	13 400	1 630	7 500	11 000	—	BK2212CT	0.015	IR17×22×13
	28	16	—	13 200	21 100	2 570	7 500	11 000	HK2216F	—	0.021	IR17×22×18
	28	16	2.7	13 600	22 100	2 700	7 500	11 000	—	BK2216	0.024	IR17×22×18
	28	20	—	16 800	28 800	3 500	7 500	11 000	HK2220F	—	0.026	IR17×22×20.5
	28	20	2.7	17 200	29 800	3 650	7 500	11 000	—	BK2220	0.030	IR17×22×20.5
	29	10	—	8 400	10 100	1 240	7 500	11 000	HMK2210	—	0.015	IR17×22×13
	29	15	—	12 900	17 600	2 150	7 500	11 000	7E-HMK2215C	—	0.022	IR17×22×16D
	29	20	—	18 200	27 400	3 350	7 500	11 000	HMK2220CV2	—	0.030	IR17×22×20.5
	29	25	—	23 200	37 500	4 550	7 500	11 000	HMK2225CT	—	0.037	IR17×22×26
	29	30	—	26 900	45 000	5 500	7 500	11 000	HMK2230	—	0.045	IR17×22×32
24	31	20	—	18 300	28 200	3 450	6 500	10 000	HMK2420CT	—	0.032	—
	31	28	—	26 000	44 500	5 400	6 500	10 000	HMK2428	—	0.045	IR20×24×28.5
25	32	12	—	11 100	15 200	1 850	6 500	9 500	HK2512F	—	0.021	IR20×25×12.5
	32	12	2.7	11 800	16 300	1 990	6 500	9 500	—	BK2512	0.023	IR20×25×12.5
	32	16	—	15 900	24 000	2 920	6 500	9 500	HK2516F	—	0.027	IR20×25×17
	32	16	2.7	15 900	24 000	2 920	6 500	9 500	—	BK2516	0.031	IR20×25×17
	32	20	—	20 300	33 000	4 000	6 500	9 500	HK2520	—	0.034	IR20×25×20.5
	32	20	2.7	20 300	33 000	4 000	6 500	9 500	—	BK2520	0.039	IR20×25×20.5
	32	26	—	26 400	46 000	5 600	6 500	9 500	HK2526C	—	0.045	IR20×25×26.5
	32	26	2.7	26 400	46 000	5 600	6 500	9 500	—	BK2526C	0.049	IR20×25×26.5

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

Drawn cup needle roller bearings

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



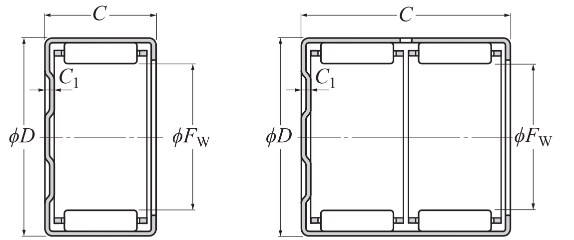
HK type, HMK type HK··ZWD type HMK··ZWD type

(Open end type)

F_w 25–30 mm

F_w	D	C 0 −0.2	C_1 Max.	Basic load rating dynamic C_r (N)	Basic load rating static C_{0r} (N)	Fatigue load limit C_u (N)	Allowable speed min^{-1} Grease lubrication	Allowable speed min^{-1} Oil lubrication	Number Open end type	Number Closed end type	Mass kg (approx.)	Applied inner ring [1)] (approx.)
25	32	38	—	35 000	65 500	8 000	6 500	9 500	HK2538ZWD	—	0.065	IR20×25×38.5
	32	38	2.7	35 000	65 500	8 000	6 500	9 500	—	BK2538ZWD	0.069	IR20×25×38.5
	33	10	—	9 150	10 400	1 270	6 500	9 500	HMK2510	—	0.019	IR20×25×12.5
	33	15	—	15 200	19 900	2 430	6 500	9 500	HMK2515CT	—	0.029	IR20×25×16
	33	20	—	21 200	30 500	3 750	6 500	9 500	HMK2520CT	—	0.039	IR20×25×20.5
	33	25	—	26 700	41 000	5 000	6 500	9 500	HMK2525F	—	0.048	IR20×25×26.5
	33	30	—	32 000	52 000	6 350	6 500	9 500	7E-HMK2530C	—	0.058	IR20×25×32
26	34	16	—	17 100	23 400	2 860	6 000	9 000	7E-HMK2616	—	0.032	IR22×26×20
	34	20	—	21 100	30 500	3 750	6 000	9 000	7E-HMK2620CT	—	0.040	—
28	35	16	—	16 700	26 400	3 200	5 500	8 500	HK2816CT	—	0.030	IR22×28×17
	35	16	2.7	16 700	26 400	3 200	5 500	8 500	—	BK2816CT	0.034	IR22×28×17
	35	20	—	21 300	36 000	4 400	5 500	8 500	HK2820	—	0.038	IR22×28×20.5
	35	20	2.7	21 300	36 000	4 400	5 500	8 500	—	BK2820	0.043	IR22×28×20.5
	37	20	—	23 600	32 500	4 000	5 500	8 500	HMK2820	—	0.049	IR22×28×20.5
	37	30	—	35 000	54 500	6 600	5 500	8 500	7E-HMK2830C	—	0.073	—
29	38	20	—	24 600	35 000	4 250	5 500	8 500	HMK2920	—	0.050	—
	38	30	—	34 500	54 000	6 600	5 500	8 500	HMK2930	—	0.075	—
30	37	12	—	12 300	18 200	2 220	5 500	8 000	HK3012CT	—	0.024	IR25×30×12.5
	37	12	2.7	12 300	18 200	2 220	5 500	8 000	—	BK3012CT	0.028	IR25×30×12.5
	37	16	—	18 100	30 000	3 650	5 500	8 000	7E-HK3016C	—	0.032	IR25×30×17
	37	16	2.7	18 100	30 000	3 650	5 500	8 000	—	BK3016CT	0.037	IR25×30×17
	37	20	—	22 300	39 500	4 800	5 500	8 000	HK3020F	—	0.040	IR25×30×20.5
	37	20	2.7	22 300	39 500	4 800	5 500	8 000	—	BK3020	0.047	IR25×30×20.5
	37	26	—	28 500	54 000	6 550	5 500	8 000	HK3026F	—	0.053	IR25×30×26.5
	37	26	2.7	28 500	54 000	6 550	5 500	8 000	—	7E-BK3026T	0.059	IR25×30×26.5
	37	38	—	38 500	78 500	9 600	5 500	8 000	HK3038ZWD	—	0.076	IR25×30×38.5
	37	38	2.7	38 500	78 500	9 600	5 500	8 000	—	BK3038ZWD	0.083	IR25×30×38.5
	40	13	—	14 100	17 100	2 090	5 500	8 000	HMK3013	—	0.040	IR25×30×16
	40	15	—	17 100	22 100	2 690	5 500	8 000	HMK3015	—	0.044	IR25×30×16
	40	20	—	24 200	34 500	4 200	5 500	8 000	HMK3020	—	0.058	IR25×30×20.5

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



BK type BK··ZWD type

(Closed end type)

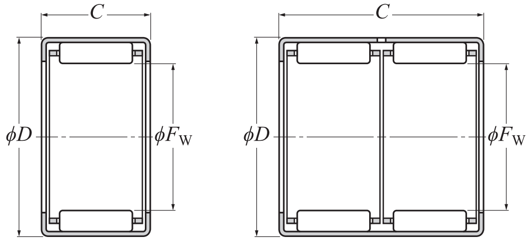
F_w 30–40 mm

F_w	D	C 0 −0.2	C_1 Max.	Basic load rating dynamic C_r (N)	Basic load rating static C_{0r} (N)	Fatigue load limit C_u (N)	Allowable speed min^{-1} Grease lubrication	Allowable speed min^{-1} Oil lubrication	Number Open end type	Number Closed end type	Mass kg (approx.)	Applied inner ring [1)] (approx.)
30	40	25	—	31 000	47 500	5 800	5 500	8 000	7E-HMK3025CT	—	0.073	IR25×30×26.5
	40	30	—	36 000	57 500	7 000	5 500	8 000	HMK3030	—	0.087	IR25×30×32
32	42	20	—	27 500	38 000	4 600	5 000	7 500	7E-HMK3220	—	0.062	—
	42	30	—	41 500	64 500	7 850	5 000	7 500	7E-HMK3230	—	0.092	—
35	42	12	—	13 300	21 300	2 600	4 700	7 000	HK3512CV2	—	0.028	—
	42	12	2.7	13 300	21 300	2 600	4 700	7 000	—	BK3512CT	0.033	—
	42	16	—	19 000	33 500	4 100	4 700	7 000	HK3516CT	—	0.037	—
	42	16	2.7	19 000	33 500	4 100	4 700	7 000	—	BK3516CT	0.044	—
	42	20	—	24 800	47 500	5 800	4 700	7 000	HK3520	—	0.046	—
	42	20	2.7	24 800	47 500	5 800	4 700	7 000	—	BK3520	0.055	—
	45	12	—	14 900	17 600	2 150	4 700	7 000	HMK3512	—	0.040	—
	45	15	—	20 200	26 200	3 200	4 700	7 000	HMK3515	—	0.050	—
	45	20	—	28 400	40 500	4 900	4 700	7 000	7E-HMK3520B	—	0.067	—
	45	25	—	36 000	54 500	6 650	4 700	7 000	HMK3525	—	0.083	—
	45	30	—	44 000	71 000	8 650	4 700	7 000	HMK3530CV1	—	0.100	—
37	47	20	—	29 300	43 000	5 250	4 300	6 500	HMK3720	—	0.070	—
	47	30	—	44 500	73 000	8 900	4 300	6 500	HMK3730	—	0.105	—
38	48	15	—	21 700	29 300	3 550	4 300	6 500	HMK3815	—	0.054	—
	48	20	—	30 500	45 000	5 500	4 300	6 500	HMK3820	—	0.072	—
	48	25	—	38 500	61 000	7 450	4 300	6 500	HMK3825	—	0.090	—
	48	30	—	46 000	77 000	9 400	4 300	6 500	HMK3830	—	0.107	IR32×38×32
	48	45	—	62 000	113 000	13 700	4 300	6 500	HMK3845ZWD	—	0.161	—
40	47	12	—	12 100	19 500	2 380	4 000	6 000	HK4012V2	—	0.031	IR35×40×12.5
	47	12	2.7	12 600	20 800	2 530	4 000	6 000	—	7E-BK4012CT	0.038	IR35×40×12.5
	47	16	—	20 300	38 500	4 700	4 000	6 000	HK4016CT	—	0.041	IR35×40×17
	47	16	2.7	20 300	38 500	4 700	4 000	6 000	—	BK4016CT	0.051	IR35×40×17
	47	20	—	25 900	52 500	6 400	4 000	6 000	HK4020F	—	0.052	IR35×40×20.5
	47	20	2.7	25 900	52 500	6 400	4 000	6 000	—	BK4020	0.064	IR35×40×20.5
	50	15	—	23 100	32 500	3 950	4 000	6 000	HMK4015	—	0.056	IR35×40×17
	50	20	—	32 500	50 000	6 100	4 000	6 000	7E-HMK4020	—	0.075	IR35×40×20.5

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

Drawn cup needle roller bearings

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

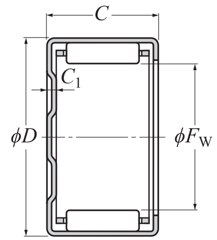


HK type, HMK type   HMK··ZWD type
(Open end type)

F_w 40–50 mm

Boundary dimensions mm F_w	D	C 0 −0.2	C_1 Max.	Basic load rating dynamic N C_r	static N C_{0r}	Fatigue load limit N C_u	Allowable speed min⁻¹ Grease lubrication	Oil lubrication	Number Open end type	Closed end type	Mass kg (approx.)	Applied inner ring 1) (approx.)
40	50	25	—	41 000	67 500	8 250	4 000	6 000	**7E-HMK4025**	—	0.094	—
	50	30	—	49 000	85 000	10 400	4 000	6 000	**HMK4030**	—	0.112	IR35×40×34
	50	40	—	58 500	107 000	13 000	4 000	6 000	**HMK4040ZWD**	—	0.150	—
45	52	16	—	21 600	43 000	5 250	3 700	5 500	**HK4516**	—	0.046	IR40×45×17
	52	16	2.7	21 600	43 000	5 250	3 700	5 500	—	**BK4516**	0.058	IR40×45×17
	52	20	—	27 600	59 000	7 200	3 700	5 500	**HK4520**	—	0.058	IR40×45×20.5
	52	20	2.7	27 600	59 000	7 200	3 700	5 500	—	**BK4520**	0.072	IR40×45×20.5
	55	20	—	32 000	51 000	6 200	3 700	5 500	**7E-HMK4520CT**	—	0.083	IR40×45×20.5
	55	25	—	41 500	71 500	8 700	3 700	5 500	**HMK4525**	—	0.104	IR40×45×26.5
	55	30	—	49 500	90 000	11 000	3 700	5 500	**7E-HMK4530CT**	—	0.125	IR40×45×34
	55	40	—	59 500	113 000	13 800	3 700	5 500	**HMK4540ZWD**	—	0.167	—
50	58	20	—	31 500	63 000	7 700	3 200	4 800	**HK5020**	—	0.072	IR40×50×22
	58	20	2.7	31 500	63 000	7 700	3 200	4 800	—	**BK5020**	0.087	IR40×50×22
	58	25	—	38 500	82 000	10 000	3 200	4 800	**HK5025**	—	0.090	IR45×50×25.5
	58	25	2.7	38 500	82 000	10 000	3 200	4 800	—	**BK5025**	0.109	IR45×50×25.5
	62	12	—	18 200	23 600	2 880	3 200	4 800	**7E-HMK5012**	—	0.067	—
	62	15	—	25 900	37 000	4 550	3 200	4 800	**7E-HMK5015**	—	0.084	—
	62	20	—	37 500	60 000	7 300	3 200	4 800	**7E-HMK5020CT**	—	0.112	IR40×50×22
	62	25	—	48 000	82 500	10 100	3 200	4 800	**7E-HMK5025**	—	0.140	IR45×50×25.5
	62	30	—	58 500	105 000	12 800	3 200	4 800	**7E-HMK5030CPX1**	—	0.168	IR45×50×32
	62	40	—	70 000	134 000	16 300	3 200	4 800	**7E-HMK5040ZWD**	—	0.224	—
	62	45	—	79 000	156 000	19 100	3 200	4 800	**7E-HMK5045ZWCDPX1**	—	0.252	—

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



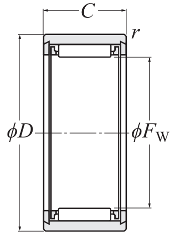
BK type
(Closed end type)

Needle Roller Bearings

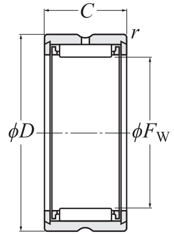
NTN

Machined-ring needle roller bearings without an inner ring

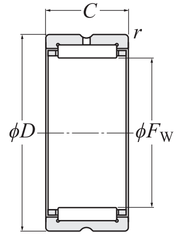
RNA49 type
RNA59 type
RNA69 type
NK type



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



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

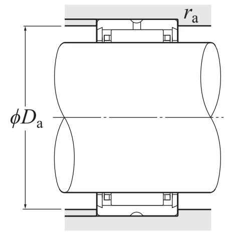


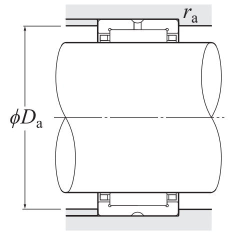
RNA49··R type ($\phi F_w \geq 14$ mm)
RNA59 type
RNA69··R type
NK··R type ($\phi F_w \geq 14$ mm)

F_w 5–16 mm

Boundary dimensions mm					Basic load rating N		Fatigue load limit N	Allowable speed min^{-1}		Number	Installation-related dimensions mm		Mass kg
					dynamic	static		Grease lubrication	Oil lubrication				(approx.)
F_w		D	C	$r_{s\,min}$ 1)	C_r	C_{0r}	C_u				D_a Max.	r_{as} 2) Max.	
5	+0.018 +0.010	10	10	0.15	2 640	2 190	267	27 000	40 000	NK5/10T2	6.5	0.15	0.0031
		10	12	0.15	2 720	2 250	275	27 000	40 000	NK5/12T2	6.5	0.15	0.0037
6	+0.018 +0.010	12	10	0.15	2 660	2 280	278	25 000	37 000	NK6/10T2	7.5	0.15	0.0047
		12	12	0.15	3 400	3 150	380	25 000	37 000	NK6/12T2	7.5	0.15	0.0057
7	+0.022 +0.013	13	10	0.15	2 670	2 350	286	23 000	34 000	RNA495T2	8.5	0.15	0.0055
		14	10	0.3	2 670	2 350	286	23 000	34 000	NK7/10T2	8.5	0.3	0.0069
		14	12	0.3	3 400	3 200	390	23 000	34 000	NK7/12T2	8.5	0.3	0.0082
8	+0.022 +0.013	15	10	0.15	3 150	3 000	365	21 000	32 000	RNA496T2T	9.5	0.15	0.0073
		15	12	0.3	4 000	4 100	500	21 000	32 000	NK8/12T2	9.5	0.3	0.0087
		15	16	0.3	4 850	5 200	635	21 000	32 000	NK8/16	9.5	0.3	0.012
9	+0.022 +0.013	16	12	0.3	4 550	5 000	615	20 000	30 000	NK9/12T2	10.5	0.3	0.010
		16	16	0.3	5 500	6 400	780	20 000	30 000	NK9/16T2	10.5	0.3	0.013
		17	10	0.15	3 600	3 650	445	20 000	30 000	RNA497	10.5	0.15	0.0095
10	+0.022 +0.013	17	12	0.3	4 550	5 100	620	19 000	28 000	NK10/12T2	11.5	0.3	0.010
		17	16	0.3	5 450	6 450	790	19 000	28 000	8E-NK10/16CT	11.5	0.3	0.013
		19	11	0.15	5 250	5 150	630	19 000	28 000	RNA498CT	12	0.15	0.013
12	+0.027 +0.016	19	12	0.3	5 000	6 100	740	17 000	26 000	NK12/12	13.5	0.3	0.013
		19	16	0.3	6 000	7 700	940	17 000	26 000	NK12/16	13.5	0.3	0.016
		20	11	0.3	4 850	4 900	600	17 000	26 000	RNA499	14	0.3	0.013
14	+0.027 +0.016	22	13	0.3	8 600	9 200	1 120	16 000	24 000	RNA4900R	20	0.3	0.017
		22	16	0.3	10 300	11 500	1 400	16 000	24 000	NK14/16RCT	20	0.3	0.021
		22	20	0.3	13 000	15 600	1 900	16 000	24 000	NK14/20R	20	0.3	0.026
15	+0.027 +0.016	23	16	0.3	10 900	12 700	1 550	15 000	23 000	NK15/16R	21	0.3	0.022
		23	20	0.3	13 800	17 200	2 100	15 000	23 000	NK15/20R	21	0.3	0.027
16	+0.027 +0.016	24	13	0.3	9 550	10 900	1 330	15 000	23 000	RNA4901R	22	0.3	0.017
		24	16	0.3	12 200	14 900	1 820	15 000	23 000	NK16/16R	22	0.3	0.022
		24	20	0.3	14 600	18 800	2 290	15 000	23 000	NK16/20R	22	0.3	0.028
		24	22	0.3	15 400	20 000	2 440	15 000	23 000	RNA6901R	22	0.3	0.031

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





F_w 17–28 mm

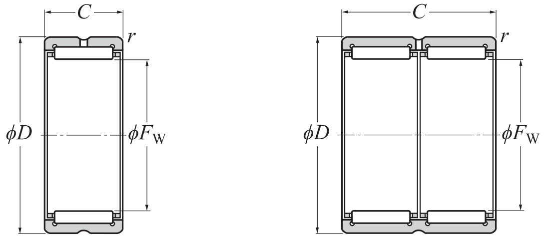
Boundary dimensions mm					Basic load rating N		Fatigue load limit N	Allowable speed min^{-1}		Number	Installation-related dimensions mm		Mass kg
					dynamic	static		Grease lubrication	Oil lubrication				(approx.)
F_w		D	C	$r_{s\,min}$ 1)	C_r	C_{0r}	C_u				D_a Max.	r_{as} 2) Max.	
17	+0.027 +0.016	25	16	0.3	12 100	15 000	1 830	15 000	22 000	NK17/16R	23	0.3	0.024
		25	20	0.3	15 400	20 400	2 490	15 000	22 000	NK17/20R	23	0.3	0.030
18	+0.027 +0.016	26	16	0.3	12 700	16 200	1 980	14 000	21 000	NK18/16R	24	0.3	0.025
		26	20	0.3	16 100	22 000	2 690	14 000	21 000	NK18/20RCT	24	0.3	0.031
19	+0.033 +0.020	27	16	0.3	13 300	17 400	2 120	14 000	21 000	NK19/16R	25	0.3	0.026
		27	20	0.3	16 000	22 200	2 700	14 000	21 000	NK19/20R	25	0.3	0.032
20	+0.033 +0.020	28	13	0.3	10 300	12 800	1 560	13 000	20 000	RNA4902R	26	0.3	0.022
		28	16	0.3	13 200	17 500	2 140	13 000	20 000	NK20/16RCT	26	0.3	0.027
		28	18	0.3	14 100	19 100	2 330	13 000	20 000	RNA5902CT	26	0.3	0.033
		28	20	0.3	16 700	23 800	2 900	13 000	20 000	NK20/20R	26	0.3	0.034
		28	23	0.3	17 600	25 300	3 100	13 000	20 000	RNA6902R	26	0.3	0.040
21	+0.033 +0.020	29	16	0.3	13 700	18 700	2 280	13 000	19 000	NK21/16R	27	0.3	0.028
		29	20	0.3	17 400	25 400	3 100	13 000	19 000	NK21/20R	27	0.3	0.035
22	+0.033 +0.020	30	16	0.3	14 200	19 900	2 430	12 000	18 000	NK22/16R	28	0.3	0.034
		30	20	0.3	18 000	27 000	3 300	12 000	18 000	NK22/20R	28	0.3	0.037
		30	13	0.3	11 200	14 600	1 780	12 000	18 000	RNA4903R	28	0.3	0.022
		30	18	0.3	15 200	21 700	2 650	12 000	18 000	RNA5903	28	0.3	0.035
		30	23	0.3	18 200	27 200	3 300	12 000	18 000	RNA6903R	28	0.3	0.042
24	+0.033 +0.020	32	16	0.3	15 200	22 300	2 720	11 000	17 000	NK24/16R	30	0.3	0.032
		32	20	0.3	18 600	28 800	3 500	11 000	17 000	NK24/20R	30	0.3	0.040
25	+0.033 +0.020	33	16	0.3	15 100	22 400	2 730	11 000	16 000	NK25/16R	31	0.3	0.033
		33	20	0.3	19 200	30 500	3 700	11 000	16 000	NK25/20RCT	31	0.3	0.042
		37	17	0.3	21 300	25 500	3 100	11 000	16 000	RNA4904RCT	35	0.3	0.052
		37	23	0.3	28 400	37 000	4 500	11 000	16 000	RNA5904	35	0.3	0.084
		37	30	0.3	36 500	50 500	6 150	11 000	16 000	RNA6904R	35	0.3	0.100
26	+0.033 +0.020	34	16	0.3	15 600	23 600	2 880	10 000	15 000	8E-NK26/16RCT	32	0.3	0.034
		34	20	0.3	19 100	30 500	3 700	10 000	15 000	NK26/20R	32	0.3	0.042
28	+0.033 +0.020	37	20	0.3	22 300	34 000	4 150	9 500	14 000	NK28/20R	35	0.3	0.052
		37	30	0.3	26 700	48 000	5 850	9 500	14 000	NK28/30RCT	35	0.3	0.082

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

Needle Roller Bearings

Machined-ring needle roller bearings without an inner ring

RNA49 type
RNA59 type
RNA69 type
NK type



RNA49··R type, RNA59 type
RNA69··R type ($\phi F_W \le 35$ mm)
NK··R type

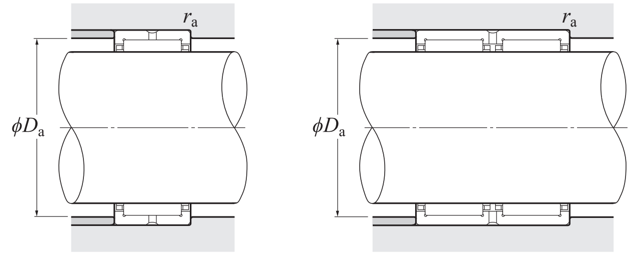
RNA69 type··R type
($\phi F_W \ge 40$ mm)

F_W 28–40 mm

Boundary dimensions mm					Basic load rating N		Fatigue load limit N	Allowable speed min^{-1}		Number	Installation-related dimensions mm		Mass kg
F_W		D	C	$r_{s\,min}$[1)]	dynamic C_r	static C_{0r}	C_u	Grease lubrication	Oil lubrication		D_a Max.	r_{as}[2)] Max.	(approx.)
28	+0.033 +0.020	39	17	0.3	23 200	29 300	3 600	9 500	14 000	RNA49/22R	37	0.3	0.050
		39	23	0.3	26 400	37 500	4 600	9 500	14 000	RNA59/22	37	0.3	0.092
		39	30	0.3	40 000	58 500	7 150	9 500	14 000	RNA69/22R	37	0.3	0.100
29	+0.033 +0.020	38	20	0.3	22 200	34 000	4 150	9 500	14 000	NK29/20R	36	0.3	0.054
		38	30	0.3	27 500	50 500	6 150	9 500	14 000	NK29/30R	36	0.3	0.084
30	+0.033 +0.020	40	20	0.3	22 100	34 000	4 150	8 500	13 000	NK30/20R	38	0.3	0.065
		40	30	0.3	33 000	57 000	6 950	8 500	13 000	NK30/30R	38	0.3	0.098
		42	17	0.3	24 000	31 500	3 800	8 500	13 000	RNA4905R	40	0.3	0.061
		42	23	0.3	30 500	43 000	5 200	8 500	13 000	RNA5905	40	0.3	0.101
		42	30	0.3	41 500	63 000	7 650	8 500	13 000	RNA6905R	40	0.3	0.112
32	+0.041 +0.025	42	20	0.3	23 500	37 500	4 600	8 500	13 000	NK32/20R	40	0.3	0.068
		42	30	0.3	34 000	60 500	7 350	8 500	13 000	NK32/30R	40	0.3	0.102
		45	17	0.3	24 800	33 500	4 050	8 500	13 000	RNA49/28RCT	43	0.3	0.073
		45	23	0.3	32 000	45 500	5 550	8 500	13 000	RNA59/28	43	0.3	0.108
		45	30	0.3	43 000	67 000	8 150	8 500	13 000	RNA69/28R	43	0.3	0.135
35	+0.041 +0.025	45	20	0.3	24 800	41 500	5 050	7 500	11 000	NK35/20RCT	43	0.3	0.074
		45	30	0.3	36 000	66 500	8 100	7 500	11 000	NK35/30R	43	0.3	0.112
		47	17	0.3	25 500	35 500	4 300	7 500	11 000	RNA4906R	45	0.3	0.069
		47	23	0.3	32 500	48 500	5 950	7 500	11 000	RNA5906	45	0.3	0.108
		47	30	0.3	42 500	67 500	8 250	7 500	11 000	RNA6906R	45	0.3	0.126
37	+0.041 +0.025	47	20	0.3	25 300	43 500	5 300	7 500	11 000	NK37/20R	45	0.3	0.077
		47	30	0.3	36 500	69 500	8 500	7 500	11 000	NK37/30R	45	0.3	0.107
38	+0.041 +0.025	48	20	0.3	25 900	45 000	5 500	7 500	11 000	NK38/20R	46	0.3	0.079
		48	30	0.3	37 500	73 000	8 900	7 500	11 000	NK38/30R	46	0.3	0.107
40	+0.041 +0.025	50	20	0.3	26 400	47 000	5 750	6 500	10 000	NK40/20R	48	0.3	0.083
		50	30	0.3	38 500	76 000	9 250	6 500	10 000	NK40/30R	48	0.3	0.125
		52	20	0.6	31 500	47 500	5 800	6 500	10 000	RNA49/32R	48	0.6	0.089
		52	27	0.6	38 000	61 000	7 450	6 500	10 000	RNA59/32	48	0.6	0.149
		52	36	0.6	47 500	82 000	10 000	6 500	10 000	RNA69/32R	48	0.6	0.162

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

Needle Roller Bearings



F_W 42–63 mm

Boundary dimensions mm					Basic load rating N		Fatigue load limit N	Allowable speed min^{-1}		Number	Installation-related dimensions mm		Mass kg
F_W		D	C	$r_{s\,min}$[1)]	dynamic C_r	static C_{0r}	C_u	Grease lubrication	Oil lubrication		D_a Max.	r_{as}[2)] Max.	(approx.)
42	+0.041 +0.025	52	20	0.3	26 900	49 000	5 950	6 500	9 500	NK42/20R	50	0.3	0.086
		52	30	0.3	39 000	79 000	9 650	6 500	9 500	NK42/30R	50	0.3	0.130
		55	20	0.6	32 000	50 000	6 100	6 500	9 500	RNA4907R	51	0.6	0.107
		55	27	0.6	39 000	64 500	7 850	6 500	9 500	RNA5907	51	0.6	0.176
		55	36	0.6	49 000	86 500	10 500	6 500	9 500	RNA6907R	51	0.6	0.193
43	+0.041 +0.025	53	20	0.3	27 500	51 000	6 200	6 500	9 500	NK43/20R	51	0.3	0.086
		53	30	0.3	40 000	82 000	10 000	6 500	9 500	NK43/30R	51	0.3	0.133
45	+0.041 +0.025	55	20	0.3	28 000	52 500	6 450	6 000	9 000	NK45/20R	53	0.3	0.092
		55	30	0.3	41 000	85 500	10 400	6 000	9 000	NK45/30RCT	53	0.3	0.139
47	+0.041 +0.025	57	20	0.3	28 800	55 500	6 800	5 500	8 500	NK47/20RCT	55	0.3	0.095
		57	30	0.3	42 500	91 500	11 200	5 500	8 500	NK47/30R	55	0.3	0.142
48	+0.041 +0.025	62	22	0.6	43 500	66 500	8 150	5 500	8 500	RNA4908R	58	0.6	0.140
		62	30	0.6	53 000	92 500	11 300	5 500	8 500	RNA5908	58	0.6	0.225
		62	40	0.6	67 000	116 000	14 100	5 500	8 500	RNA6908R	58	0.6	0.256
50	+0.041 +0.025	62	25	0.6	38 500	74 500	9 050	5 500	8 000	NK50/25RCT	58	0.6	0.158
		62	35	0.6	51 000	106 000	12 900	5 500	8 000	NK50/35R	58	0.6	0.221
52	+0.049 +0.030	68	22	0.6	46 000	73 000	8 950	5 000	7 500	RNA4909R	64	0.6	0.182
		68	30	0.6	56 000	101 000	12 300	5 000	7 500	RNA5909	64	0.6	0.232
		68	40	0.6	70 500	127 000	15 500	5 000	7 500	RNA6909R	64	0.6	0.273
55	+0.049 +0.030	68	25	0.6	41 000	82 000	10 000	5 000	7 500	NK55/25R	64	0.6	0.193
		68	35	0.6	54 000	118 000	14 300	5 000	7 500	NK55/35R	64	0.6	0.26
58	+0.049 +0.030	72	22	0.6	48 000	80 000	9 750	4 700	7 000	RNA4910R	68	0.6	0.163
		72	30	0.6	58 000	110 000	13 400	4 700	7 000	RNA5910	68	0.6	0.289
		72	40	0.6	74 000	139 000	17 000	4 700	7 000	RNA6910R	68	0.6	0.320
60	+0.049 +0.030	72	25	0.6	41 000	85 000	10 400	4 300	6 500	NK60/25R	68	0.6	0.185
		72	35	0.6	57 000	130 000	15 800	4 300	6 500	NK60/35R	68	0.6	0.258
63	+0.049 +0.030	80	25	1	58 500	99 500	12 100	4 300	6 500	RNA4911R	75	1	0.255
		80	34	1	76 500	140 000	17 100	4 300	6 500	RNA5911	75	1	0.367
		80	45	1	94 000	183 000	22 300	4 300	6 500	RNA6911R	75	1	0.470

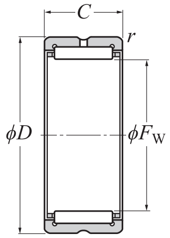
1) Smallest allowable dimension for chamfer dimension r.
2) Largest allowable dimension for fillet radius r_a of housing and shaft.

Needle Roller Bearings

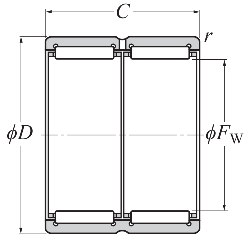
NTN

Machined-ring needle roller bearings without an inner ring

RNA49 type
RNA59 type
RNA69 type
NK type



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



RNA69··R type

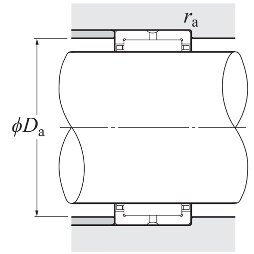
F_w 65–90 mm

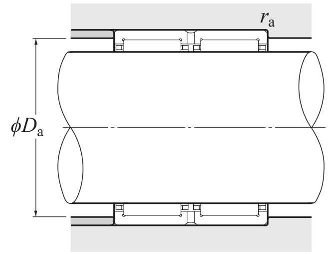
Boundary dimensions mm					Basic load rating N		Fatigue load limit N	Allowable speed min^{-1}		Number	Installation-related dimensions mm		Mass kg
F_w		D	C	$r_{s\,min}$ 1)	dynamic C_r	static C_{0r}	C_u	Grease lubrication	Oil lubrication		D_a Max.	r_{as} 2) Max.	(approx.)
65	+0.049 +0.030	78	25	0.6	45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

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

Needle Roller Bearings

NTN





F_w 90–135 mm

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

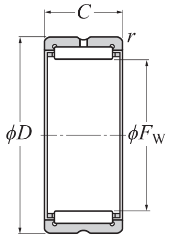
1) Smallest allowable dimension for chamfer dimension r.
2) Largest allowable dimension for fillet radius r_a of housing and shaft.

Needle Roller Bearings

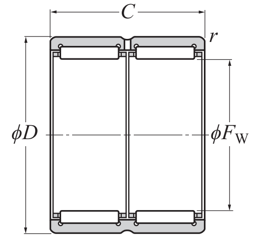
NTN

Machined-ring needle roller bearings without an inner ring

RNA48 type
RNA49 type
RNA59 type
RNA69 type
NK type



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



RNA69··R type

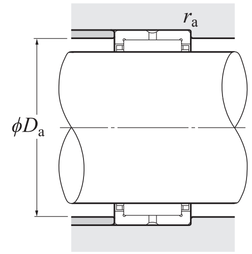
F_w 145–245 mm

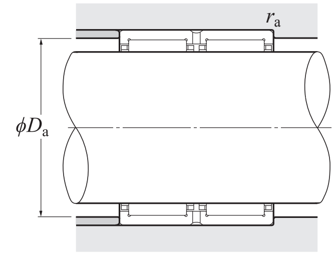
Boundary dimensions mm					Basic load rating N dynamic	static	Fatigue load limit N	Allowable speed min^{-1} Grease lubrication	Oil lubrication	Number	Installation-related dimensions mm		Mass kg
F_w		D	C	$r_{s\,min}$ 1)	C_r	C_{0r}	C_u				D_a Max.	r_{as} 2) Max.	(approx.)
145	+0.068 / +0.043	165	35	1.1	118 000	305 000	32 500	1 900	2 800	RNA4826	158.5	1	0.95
		170	32	1.5	111 000	238 000	25 600	1 900	2 800	NK145/32	162.5	1.5	1.12
		170	42	1.5	153 000	360 000	38 500	1 900	2 800	NK145/42	162.5	1.5	1.49
150	+0.068 / +0.043	180	50	1.5	202 000	455 000	48 000	1 800	2 700	RNA4926	172	1.5	2.21
		180	67	1.5	296 000	690 000	73 000	1 800	2 700	RNA5926	172	1.5	3.21
155	+0.068 / +0.043	175	35	1.1	121 000	315 000	33 500	1 700	2 600	RNA4828	168.5	1	1.02
		180	32	1.5	114 000	252 000	26 500	1 700	2 600	NK155/32	172	1.5	1.20
		180	42	1.5	156 000	380 000	40 000	1 700	2 600	NK155/42	172	1.5	1.59
160	+0.068 / +0.043	190	50	1.5	209 000	485 000	50 500	1 700	2 500	RNA4928	182	1.5	2.35
		190	67	1.5	315 000	760 000	79 000	1 700	2 500	RNA5928	182	1.5	3.48
165	+0.068 / +0.043	190	32	1.5	117 000	265 000	27 400	1 600	2 400	NK165/32	182	1.5	1.42
		190	40	1.1	152 000	390 000	40 500	1 600	2 400	RNA4830	183.5	1	1.60
		190	42	1.5	160 000	400 000	41 000	1 600	2 400	NK165/42	182	1.5	1.66
170	+0.068 / +0.043	210	60	2	261 000	610 000	62 500	1 600	2 400	RNA4930	201	2	2.98
175	+0.068 / +0.043	200	40	1.1	160 000	425 000	43 500	1 500	2 300	RNA4832	193.5	1	1.70
180	+0.068 / +0.043	220	60	2	270 000	650 000	65 500	1 500	2 200	RNA4932	211	2	3.10
185	+0.079 / +0.050	215	45	1.1	185 000	495 000	49 500	1 500	2 200	RNA4834	208.5	1	2.54
190	+0.079 / +0.050	230	60	2	279 000	690 000	68 500	1 400	2 100	RNA4934	221	2	3.22
195	+0.079 / +0.050	225	45	1.1	195 000	540 000	53 500	1 400	2 100	RNA4836	218.5	1	2.68
205	+0.079 / +0.050	250	69	2	375 000	890 000	86 000	1 300	2 000	RNA4936	241	2	4.48
210	+0.079 / +0.050	240	50	1.5	227 000	680 000	65 500	1 300	1 900	RNA4838	232	1.5	3.21
215	+0.079 / +0.050	260	69	2	390 000	945 000	90 500	1 300	1 900	RNA4938	251	2	4.53
220	+0.079 / +0.050	250	50	1.5	231 000	705 000	67 000	1 200	1 800	RNA4840	242	1.5	3.35
225	+0.079 / +0.050	280	80	2.1	505 000	1 180 000	111 000	1 200	1 800	RNA4940	269	2	7.20
240	+0.079 / +0.050	270	50	1.5	244 000	780 000	72 500	1 100	1 700	RNA4844	262	1.5	3.62
245	+0.079 / +0.050	300	80	2.1	525 000	1 270 000	116 000	1 100	1 600	RNA4944	289	2	7.81

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

Needle Roller Bearings

NTN





F_w 265–490 mm

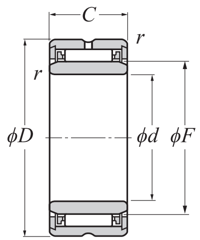
Boundary dimensions mm					Basic load rating N dynamic	static	Fatigue load limit N	Allowable speed min^{-1} Grease lubrication	Oil lubrication	Number	Installation-related dimensions mm		Mass kg
F_w		D	C	$r_{s\,min}$ 1)	C_r	C_{0r}	C_u				D_a Max.	r_{as} 2) Max.	(approx.)
265	+0.088 / +0.056	300	60	2	365 000	1 090 000	98 500	1 000	1 500	RNA4848	291	2	5.40
		320	80	2.1	540 000	1 350 000	121 000	1 000	1 500	RNA4948	309	2	8.40
285	+0.088 / +0.056	320	60	2	375 000	1 170 000	103 000	950	1 400	RNA4852	311	2	5.80
290	+0.088 / +0.056	360	100	2.1	810 000	1 920 000	166 000	950	1 400	RNA4952	349	2	15.9
305	+0.088 / +0.056	350	69	2	455 000	1 300 000	112 000	850	1 300	RNA4856	341	2	9.30
310	+0.088 / +0.056	380	100	2.1	840 000	2 050 000	175 000	850	1 300	RNA4956	369	2	16.7
330	+0.098 / +0.062	380	80	2.1	625 000	1 770 000	149 000	800	1 200	RNA4860	369	2	12.7
340	+0.098 / +0.062	420	118	3	1 080 000	2 640 000	219 000	800	1 200	RNA4960	407	2.5	24.0
350	+0.098 / +0.062	400	80	2.1	640 000	1 850 000	153 000	750	1 100	RNA4864	389	2	13.4
360	+0.098 / +0.062	440	118	3	1 120 000	2 820 000	230 000	750	1 100	RNA4964	427	2.5	25.2
370	+0.098 / +0.062	420	80	2.1	655 000	1 940 000	158 000	750	1 100	RNA4868	409	2	14.0
380	+0.098 / +0.062	460	118	3	1 160 000	3 000 000	242 000	750	1 100	RNA4968	447	2.5	26.5
390	+0.098 / +0.062	440	80	2.1	665 000	2 020 000	162 000	650	1 000	RNA4872	429	2	14.8
400	+0.108 / +0.068	480	118	3	1 200 000	3 200 000	253 000	650	1 000	RNA4972	467	2.5	28.2
415	+0.108 / +0.068	480	100	2.1	1 000 000	2 840 000	223 000	650	950	RNA4876	469	2	26.0
430	+0.108 / +0.068	520	140	4	1 400 000	3 750 000	292 000	650	950	RNA4976	504	3	38.6
450	+0.108 / +0.068	540	140	4	1 450 000	4 000 000	306 000	600	900	RNA4980	524	3	40.1
470	+0.108 / +0.068	560	140	4	1 500 000	4 250 000	320 000	550	850	RNA4984	544	3	51.6
490	+0.108 / +0.068	600	160	4	1 750 000	4 600 000	342 000	550	800	RNA4988	584	3	66.9

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

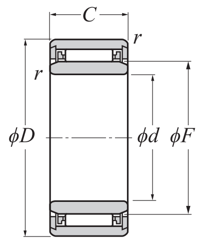
Needle Roller Bearings

Machined-ring needle roller bearings with an inner ring

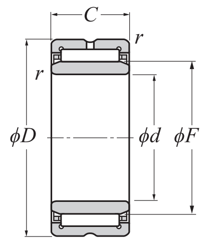
NA49 type
NA59 type
NA69 type
NK+IR type



NA49 type ($\phi d \le 9$ mm)



NK+IR type ($\phi d \le 9$ mm)

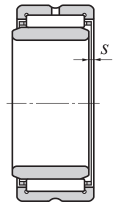


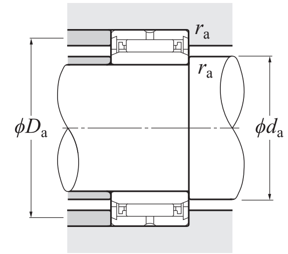
NA49··R type ($\phi d \ge 10$ mm)
NA59 type
NA69··R type
NK+IR type ($\phi d \ge 10$ mm)

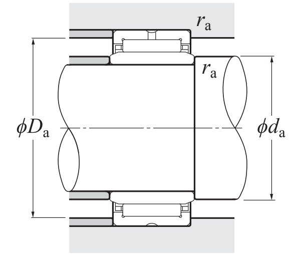
d 5–17 mm

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

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







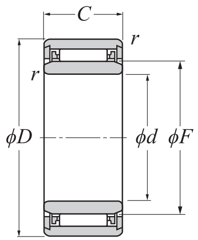
Installation-related dimensions (mm)			Mass (kg)
d_a Min.	D_a Max.	r_{as} 3) Max.	(approx.)
6.2	8.5	0.15	0.007
7	9.5	0.3	0.012
7	9.5	0.3	0.016
8	9.5	0.15	0.009
8	10.5	0.3	0.013
8	10.5	0.3	0.017
9	10.5	0.15	0.010
9	11.5	0.3	0.014
9	11.5	0.3	0.018
10	12	0.15	0.016
11	13.5	0.3	0.018
11	13.5	0.3	0.022
11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

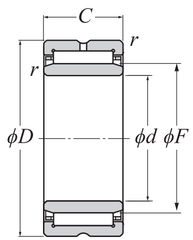
Note: The number of inner rings (IR) is composed of the IR bore diameter dimension × outside diameter dimension × width dimension.

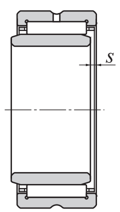
Needle Roller Bearings

Machined-ring needle roller bearings with an inner ring

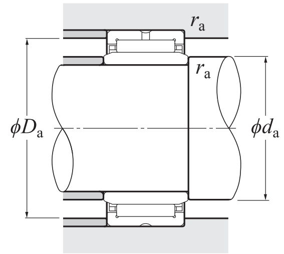
NA49 type
NA59 type
NA69 type
NK+IR type







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



d 17–32 mm

Boundary dimensions mm						Basic load rating N		Fatigue load limit N	Allowable speed min^{-1}		Number	Installation-related dimensions mm			Mass kg
d	D	C	$r_{s\,min}$ 1)	F	s 2)	dynamic C_r	static C_{0r}	C_u	Grease lubrication	Oil lubrication		d_a Min.	D_a Max.	r_{as} 3) Max.	(approx.)
17	30	18	0.3	22	0.5	15 200	21 700	2 650	12 000	18 000	**NA5903**	19	28	0.3	0.056
	30	23	0.3	22	1	18 200	27 200	3 300	12 000	18 000	**NA6903R**	19	28	0.3	0.069
20	32	16	0.3	24	0.5	15 200	22 300	2 720	11 000	17 000	**NK24/16R+IR20×24×16**	22	30	0.3	0.049
	32	20	0.3	24	0.5	18 600	28 800	3 500	11 000	17 000	**NK24/20R+IR20×24×20**	22	30	0.3	0.061
	37	17	0.3	25	0.8	21 300	25 500	3 100	11 000	16 000	**NA4904RCT**	22	35	0.3	0.074
	37	23	0.3	25	0.8	28 400	37 000	4 500	11 000	16 000	**NA5904**	22	35	0.3	0.115
	37	30	0.3	25	1	36 500	50 500	6 150	11 000	16 000	**NA6904R**	22	35	0.3	0.141
22	34	16	0.3	26	0.5	15 600	23 600	2 880	10 000	15 000	**8E-NK26/16RCT+IR22×26×16**	24	32	0.3	0.046
	34	20	0.3	26	0.5	19 100	30 500	3 700	10 000	15 000	**NK26/20R+IR22×26×20**	24	32	0.3	0.064
	39	17	0.3	28	0.8	23 200	29 300	3 600	9 500	14 000	**NA49/22R**	24	37	0.3	0.080
	39	23	0.3	28	0.8	26 400	37 500	4 600	9 500	14 000	**NA59/22**	24	37	0.3	0.134
	39	30	0.3	28	0.5	40 000	58 500	7 150	9 500	14 000	**NA69/22R**	24	37	0.3	0.154
25	38	20	0.3	29	1	22 200	34 000	4 150	9 500	14 000	**NK29/20R+IR25×29×20**	27	36	0.3	0.079
	38	30	0.3	29	1.5	27 500	50 500	6 150	9 500	14 000	**NK29/30R+IR25×29×30**	27	36	0.3	0.123
	42	17	0.3	30	0.8	24 000	31 500	3 800	8 500	13 000	**NA4905R**	27	40	0.3	0.088
	42	23	0.3	30	0.8	30 500	43 000	5 200	8 500	13 000	**NA5905**	27	40	0.3	0.139
	42	30	0.3	30	1	41 500	63 000	7 650	8 500	13 000	**NA6905R**	27	40	0.3	0.162
28	42	20	0.3	32	1	23 500	37 500	4 600	8 500	13 000	**NK32/20R+IR28×32×20**	30	40	0.3	0.096
	42	30	0.3	32	1.5	34 000	60 500	7 350	8 500	13 000	**NK32/30R+IR28×32×30**	30	40	0.3	0.146
	45	17	0.3	32	0.8	24 800	33 500	4 050	8 500	13 000	**NA49/28RCT**	30	43	0.3	0.098
	45	23	0.3	32	0.8	32 000	45 500	5 550	8 500	13 000	**NA59/28**	30	43	0.3	0.142
	45	30	0.3	32	1	43 000	67 000	8 150	8 500	13 000	**NA69/28R**	30	43	0.3	0.179
30	45	20	0.3	35	0.5	24 800	41 500	5 050	7 500	11 000	**NK35/20RCT+IR30×35×20**	32	43	0.3	0.112
	45	30	0.3	35	1	36 000	66 500	8 100	7 500	11 000	**NK35/30R+IR30×35×30**	32	43	0.3	0.171
	47	17	0.3	35	0.8	25 500	35 500	4 300	7 500	11 000	**NA4906R**	32	45	0.3	0.101
	47	23	0.3	35	0.8	32 500	48 500	5 950	7 500	11 000	**NA5906**	32	45	0.3	0.152
	47	30	0.3	35	1	42 500	67 500	8 250	7 500	11 000	**NA6906R**	32	45	0.3	0.185
32	47	20	0.3	37	0.5	25 300	43 500	5 300	7 500	11 000	**NK37/20R+IR32×37×20**	34	45	0.3	0.117
	47	30	0.3	37	1	36 500	69 500	8 500	7 500	11 000	**NK37/30R+IR32×37×30**	34	45	0.3	0.170
	52	20	0.6	40	0.8	31 500	47 500	5 800	6 500	10 000	**NA49/32R**	36	48	0.6	0.157

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

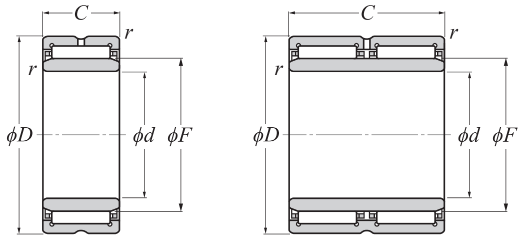
Note: The number of inner rings (IR) is composed of the IR bore diameter dimension × outside diameter dimension × width dimension.

Needle Roller Bearings NTN

Needle Roller Bearings

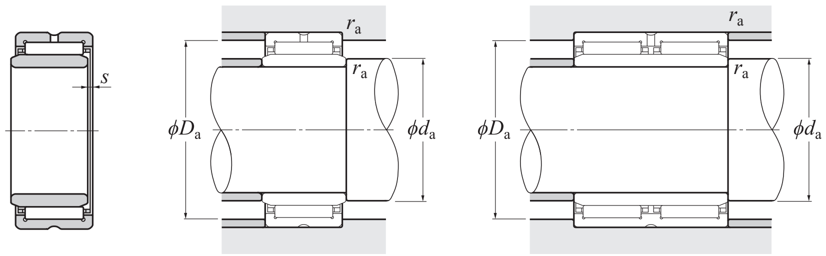
Machined-ring needle roller bearings with an inner ring

NA49 type
NA59 type
NA69 type
NK+IR type



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

NA69··R type



d 32–55 mm

Boundary dimensions (mm)						Basic load rating (N)		Fatigue load limit (N)	Allowable speed (min⁻¹)		Number	Installation-related dimensions (mm)			Mass (kg)
						dynamic	static								
d	D	C	$r_{s\,min}$ 1)	F	s 2)	C_r	C_{0r}	C_u	Grease lubrication	Oil lubrication		d_a Min.	D_a Max.	r_{as} 3) Max.	(approx.)
32	52	27	0.6	40	0.8	38 000	61 000	7 450	6 500	10 000	**NA59/32**	36	48	0.6	0.241
	52	36	0.6	40	0.5	47 500	82 000	10 000	6 500	10 000	**NA69/32R**	36	48	0.6	0.286
35	50	20	0.3	40	0.5	26 400	47 000	5 750	6 500	10 000	**NK40/20R+IR35×40×20**	37	48	0.3	0.130
	50	30	0.3	40	1	38 500	76 000	9 250	6 500	10 000	**NK40/30R+IR35×40×30**	37	48	0.3	0.193
	55	20	0.6	42	0.8	32 000	50 000	6 100	6 500	9 500	**NA4907R**	39	51	0.6	0.171
	55	27	0.6	42	0.8	39 000	64 500	7 850	6 500	9 500	**NA5907**	39	51	0.6	0.256
	55	36	0.6	42	0.5	49 000	86 500	10 500	6 500	9 500	**NA6907R**	39	51	0.6	0.310
38	53	20	0.3	43	0.5	27 500	51 000	6 200	6 500	9 500	**NK43/20R+IR38×43×20**	40	51	0.3	0.134
	53	30	0.3	43	1	40 000	82 000	10 000	6 500	9 500	**NK43/30R+IR38×43×30**	40	51	0.3	0.207
40	55	20	0.3	45	0.5	28 000	52 500	6 450	6 000	9 000	**NK45/20R+IR40×45×20**	42	53	0.3	0.143
	55	30	0.3	45	1	41 000	85 500	10 400	6 000	9 000	**NK45/30RCT+IR40×45×30**	42	53	0.3	0.216
	62	22	0.6	48	1	43 500	66 500	8 150	5 500	8 500	**NA4908R**	44	58	0.6	0.232
	62	30	0.6	48	1	53 000	92 500	11 300	5 500	8 500	**NA5908**	44	58	0.6	0.348
	62	40	0.6	48	0.5	67 000	116 000	14 100	5 500	8 500	**NA6908R**	44	58	0.6	0.426
42	57	20	0.3	47	0.5	28 800	55 500	6 800	5 500	8 500	**NK47/20RCT+IR42×47×20**	44	55	0.3	0.148
	57	30	0.3	47	1	42 500	91 500	11 200	5 500	8 500	**NK47/30R+IR42×47×30**	44	55	0.3	0.222
45	62	25	0.6	50	1.5	38 500	74 500	9 050	5 500	8 000	**NK50/25RCT+IR45×50×25**	48	58	0.6	0.229
	62	35	0.6	50	2	51 000	106 000	12 900	5 500	8 000	**NK50/35R+IR45×50×35**	48	58	0.6	0.322
	68	22	0.6	52	1	46 000	73 000	8 950	5 000	7 500	**NA4909R**	49	64	0.6	0.270
	68	30	0.6	52	1	56 000	101 000	12 300	5 000	7 500	**NA5909**	49	64	0.6	0.396
	68	40	0.6	52	0.5	70 500	127 000	15 500	5 000	7 500	**NA6909R**	49	64	0.6	0.437
50	68	25	0.6	55	1.5	41 000	82 000	10 000	5 000	7 500	**NK55/25R+IR50×55×25**	53	64	0.6	0.271
	68	35	0.6	55	2	54 000	118 000	14 300	5 000	7 500	**NK55/35R+IR50×55×35**	53	64	0.6	0.379
	72	22	0.6	58	1	48 000	80 000	9 750	4 700	7 000	**NA4910R**	54	68	0.6	0.276
	72	30	0.6	58	1	58 000	110 000	13 400	4 700	7 000	**NA5910**	54	68	0.6	0.498
	72	40	0.6	58	0.5	74 000	139 000	17 000	4 700	7 000	**NA6910R**	54	68	0.6	0.529
55	72	25	0.6	60	1.5	41 000	85 000	10 400	4 300	6 500	**NK60/25R+IR55×60×25**	58	68	0.6	0.271
	72	35	0.6	60	2	57 000	130 000	15 800	4 300	6 500	**NK60/35R+IR55×60×35**	58	68	0.6	0.379
	80	25	1	63	1.5	58 500	99 500	12 100	4 300	6 500	**NA4911R**	60	75	1	0.396

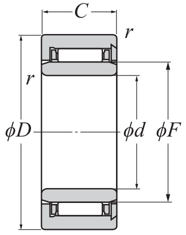
1) Smallest allowable dimension for chamfer dimension r.
2) Allowable axial movement amount of the inner ring with respect to the outer ring.
3) Largest allowable dimension for fillet radius r_a of housing and shaft.

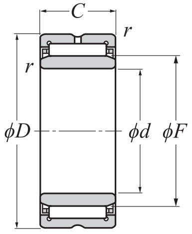
Note: The number of inner rings (IR) is composed of the IR bore diameter dimension × outside diameter dimension × width dimension.

Needle Roller Bearings

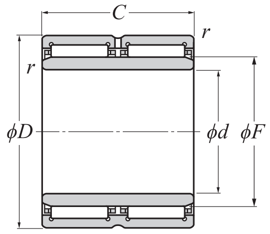
Machined-ring needle roller bearings with an inner ring

NA49 type
NA59 type
NA69 type
NK+IR type





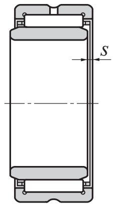
NA49··R type
NA59 type
NK··R + IR type

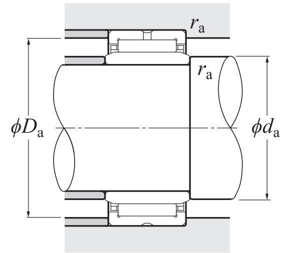


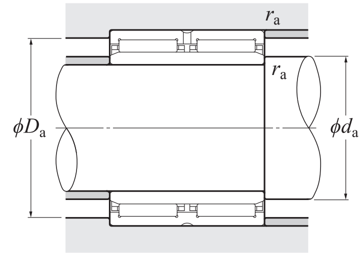
NA69··R type

Needle Roller Bearings

NTN







d 55–85 mm

Boundary dimensions mm						Basic load rating N		Fatigue load limit N	Allowable speed min^{-1}		Number	Installation-related dimensions mm			Mass kg
						dynamic	static		Grease lubrication	Oil lubrication					
d	D	C	$r_{s\,min}$ 1)	F	s 2)	C_r	C_{0r}	C_u				d_a Min.	D_a Max.	r_{as} 3) Max.	(approx.)
55	80	34	1	63	1.5	76 500	140 000	17 100	4 300	6 500	**NA5911**	60	75	1	0.559
	80	45	1	63	1.5	94 000	183 000	22 300	4 300	6 500	**NA6911R**	60	75	1	0.726
60	82	25	1	68	1	44 500	89 000	10 800	4 000	6 000	**NK68/25R+IR60×68×25**	65	77	0.6	0.393
	82	35	0.6	68	1	63 000	139 000	17 000	4 000	6 000	**NK68/35R+IR60×68×35**	64	78	0.6	0.551
	85	25	1	68	1.5	61 500	108 000	13 100	4 000	6 000	**NA4912R**	65	80	1	0.427
	85	34	1	68	1.5	80 500	153 000	18 600	4 000	6 000	**NA5912**	65	80	1	0.614
	85	45	1	68	1.5	95 500	191 000	23 200	4 000	6 000	**NA6912R**	65	80	1	0.758
65	90	25	0.6	73	1	54 000	100 000	12 200	3 700	5 500	**NK73/25R+IR65×73×25**	69	86	0.6	0.466
	90	25	1	72	1.5	62 500	112 000	13 700	3 700	5 500	**NA4913R**	70	85	1	0.454
	90	34	1	72	1.5	84 000	165 000	20 100	3 700	5 500	**NA5913**	70	85	1	0.655
	90	35	0.6	73	1	76 500	156 000	19 100	3 700	5 500	**NK73/35R+IR65×73×35**	69	86	0.6	0.660
	90	45	1	72	1.5	97 000	198 000	24 200	3 700	5 500	**NA6913R**	70	85	1	0.779
70	95	25	1	80	0.8	57 000	119 000	14 500	3 300	5 000	**NK80/25R+IR70×80×25**	75	90	1	0.525
	95	35	1	80	0.8	79 500	184 000	22 400	3 300	5 000	**NK80/35R+IR70×80×35**	75	90	1	0.738
	100	30	1	80	1.5	85 500	156 000	19 000	3 300	5 000	**NA4914R**	75	95	1	0.727
	100	40	1	80	1.5	103 000	187 000	22 800	3 300	5 000	**NA5914**	75	95	1	1.06
	100	54	1	80	1	130 000	267 000	32 500	3 300	5 000	**NA6914R**	75	95	1	1.34
75	105	25	1	85	1	70 500	123 000	15 000	3 100	4 700	**NK85/25R+IR75×85×25**	80	100	1	0.642
	105	30	1	85	1.5	87 000	162 000	19 700	3 100	4 700	**NA4915R**	80	100	1	0.776
	105	35	1	85	1	100 000	193 000	23 600	3 100	4 700	**NK85/35R+IR75×85×35**	80	100	1	0.853
	105	40	1	85	1.5	109 000	205 000	25 000	3 100	4 700	**NA5915**	80	100	1	1.13
	105	54	1	85	1	132 000	277 000	34 000	3 100	4 700	**NA6915R**	80	100	1	1.45
80	110	25	1	90	1	71 500	128 000	15 600	2 900	4 400	**NK90/25R+IR80×90×25**	85	105	1	0.680
	110	30	1	90	1.5	90 500	174 000	21 200	2 900	4 400	**NA4916R**	85	105	1	0.820
	110	35	1	90	1	104 000	208 000	25 400	2 900	4 400	**NK90/35R+IR80×90×35**	85	105	1	0.959
	110	40	1	90	1.5	115 000	223 000	27 200	2 900	4 400	**NA5916**	85	105	1	1.15
	110	54	1	90	1.5	138 000	298 000	36 500	2 900	4 400	**NA6916R**	85	105	1	1.53
85	115	26	1	95	1.5	74 500	137 000	16 600	2 800	4 200	**NK95/26R+IR85×95×26**	90	110	1	0.644
	115	36	1	95	1.5	108 000	223 000	27 000	2 800	4 200	**NK95/36R+IR85×95×36**	90	110	1	1.05

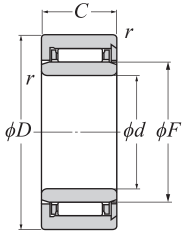
1) Smallest allowable dimension for chamfer dimension *r*.
2) Allowable axial movement amount of the inner ring with respect to the outer ring.
3) Largest allowable dimension for fillet radius r_a of housing and shaft.

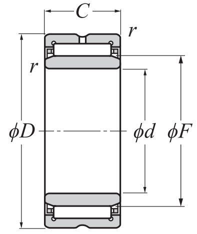
Note: The number of inner rings (IR) is composed of the IR bore diameter dimension × outside diameter dimension × width dimension.

Needle Roller Bearings

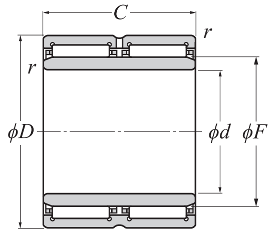
Machined-ring needle roller bearings with an inner ring

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



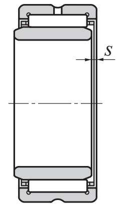


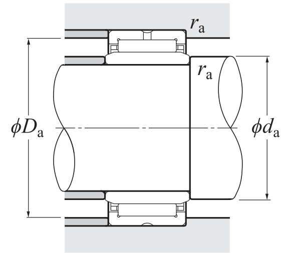
NA49··R type
NA59 type
NK··R + IR type

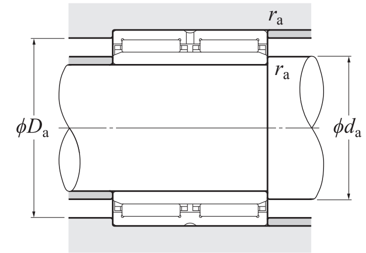


NA69··R type

Needle Roller Bearings







d 85–130 mm

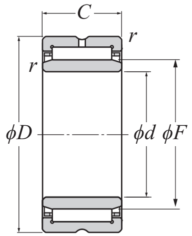
Boundary dimensions (mm)						Basic load rating (N)		Fatigue load limit (N)	Allowable speed (min^{-1})		Number	Installation-related dimensions (mm)			Mass (kg)
						dynamic	static								
d	D	C	$r_{s\,min}$ 1)	F	s 2)	C_r	C_{0r}	C_u	Grease lubrication	Oil lubrication		d_a Min.	D_a Max.	r_{as} 3) Max.	(approx.)
85	120	35	1.1	100	1	112 000	237 000	28 400	2 700	4 000	**NA4917R**	91.5	113.5	1	1.24
	120	46	1.1	100	1.5	137 000	290 000	34 500	2 700	4 000	**NA5917**	91.5	113.5	1	1.76
	120	63	1.1	100	1	169 000	400 000	48 000	2 700	4 000	**NA6917R**	91.5	104	1.1	2.25
90	120	26	1	100	1.5	73 500	137 000	16 400	2 700	4 000	**NK100/26R+IR90×100×26**	95	115	1	0.781
	120	36	1	100	1.5	107 000	223 000	26 700	2 700	4 000	**NK100/36R+IR90×100×36**	95	115	1	1.09
	125	35	1.1	105	1	116 000	252 000	29 800	2 500	3 800	**NA4918R**	96.5	118.5	1	1.84
	125	46	1.1	105	1	143 000	310 000	37 000	2 500	3 800	**NA5918**	96.5	118.5	1	2.44
	125	63	1.1	105	1	175 000	425 000	50 500	2 500	3 800	**NA6918R**	96.5	109	1.1	2.37
95	125	26	1	105	1.5	76 500	147 000	17 300	2 500	3 800	**NK105/26R+IR95×105×26**	100	120	1	0.819
	125	36	1	105	1.5	111 000	238 000	28 100	2 500	3 800	**NK105/36R+IR95×105×36**	100	120	1	1.15
	130	35	1.1	110	1	118 000	260 000	30 500	2 400	3 600	**NA4919R**	101.5	123.5	1	1.36
	130	46	1.1	110	1	149 000	335 000	39 000	2 400	3 600	**NA5919**	101.5	123.5	1	1.98
	130	63	1.1	110	1	177 000	440 000	51 000	2 400	3 600	**NA6919R**	101.5	123.5	1	2.63
100	130	30	1.1	110	1.5	97 500	204 000	23 800	2 400	3 600	**NK110/30R+IR100×110×30**	106.5	123.5	1	0.990
	130	40	1.1	110	2	129 000	292 000	34 000	2 400	3 600	**NK110/40R+IR100×110×40**	106.5	123.5	1	1.34
	140	40	1.1	115	2	127 000	260 000	29 900	2 300	3 500	**NA4920**	106.5	133.5	1	1.93
	140	54	1.1	115	2	182 000	395 000	45 500	2 300	3 500	**NA5920**	106.5	133.5	1	2.85
110	140	30	1	120	0.8	95 000	214 000	24 400	2 200	3 300	**NA4822**	115	135	1	1.11
	140	40	1.1	120	—	114 000	271 000	31 000	2 200	3 300	**NK120/40+IR110×120×40**	116.5	133.5	1	1.49
	150	40	1.1	125	2	131 000	279 000	31 500	2 100	3 200	**NA4922**	116.5	143.5	1	2.08
	150	54	1.1	125	2	193 000	440 000	49 500	2 100	3 200	**NA5922**	116.5	143.5	1	2.98
120	150	30	1	130	0.8	101 000	237 000	26 400	2 100	3 100	**NA4824**	125	145	1	1.17
	150	40	1.1	130	—	117 000	287 000	32 000	2 100	3 100	**NK130/40+IR120×130×40**	126.5	143.5	1	1.57
	165	45	1.1	135	2	180 000	380 000	41 500	2 000	3 000	**NA4924**	126.5	158.5	1	2.84
	165	60	1.1	135	2	246 000	530 000	57 500	2 000	3 000	**NA5924**	126.5	158.5	1	3.92
130	165	35	1.1	145	1	120 000	310 000	33 000	1 900	2 800	**NA4826**	136.5	158.5	1	1.60
	170	32	1.5	145	—	111 000	238 000	25 600	1 900	2 800	**NK145/32+IR130×145×32**	138	162.5	1.5	1.90
	170	42	1.5	145	—	153 000	360 000	38 500	1 900	2 800	**NK145/42+IR130×145×42**	138	162.5	1.5	2.54
	180	50	1.5	150	1.5	202 000	455 000	48 000	1 800	2 700	**NA4926**	138	172	1.5	3.90
	180	67	1.5	150	1.5	296 000	690 000	73 000	1 800	2 700	**NA5926**	138	172	1.5	5.60

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

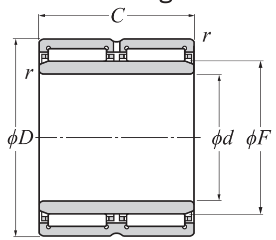
Note: The number of inner rings (IR) is composed of the IR bore diameter dimension × outside diameter dimension × width dimension.

Machined-ring needle roller bearings with an inner ring

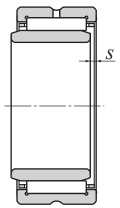
NA48 type
NA49 type
NA59 type
NA69 type
NK+IR type



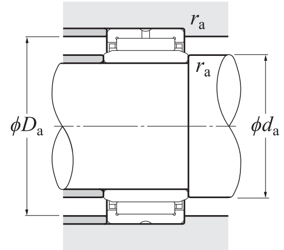
NA48 type
NA49··R type, NA49 type
NA59 type
NK··R + IR type, NK + IR type
NKS + IR type ($\phi d \geq 100$ mm)



NA69··R type



d 140–280 mm



Boundary dimensions (mm)						Basic load rating (N)		Fatigue load limit (N)	Allowable speed ($\min^{-1}$)		Number	Installation-related dimensions (mm)			Mass (kg)
						dynamic	static		Grease lubrication	Oil lubrication		d_a Min.	D_a Max.	r_{as} [3] Max.	(approx.)
d	D	C	$r_{s\,min}$ [1]	F	s [2]	C_r	C_{0r}	C_u							
140	175	35	1.1	155	1	121 000	315 000	33 500	1 700	2 600	**NA4828**	146.5	168.5	1	1.82
	180	32	1.5	155	—	114 000	252 000	26 500	1 700	2 600	**NK155/32+IR140×155×32**	148	172	1.5	2.04
	180	42	1.5	155	—	156 000	380 000	40 000	1 700	2 600	**NK155/42+IR140×155×42**	148	172	1.5	2.69
	190	50	1.5	160	1.5	209 000	485 000	50 500	1 700	2 500	**NA4928**	148	182	1.5	4.05
	190	67	1.5	160	1.5	315 000	760 000	79 000	1 700	2 500	**NA5928**	148	182	1.5	6.18
150	190	32	1.5	165	—	117 000	265 000	27 500	1 600	2 400	**NK165/32+IR150×165×32**	158	182	1.5	2.32
	190	40	1.1	165	1.5	152 000	390 000	40 500	1 600	2 400	**NA4830**	156.5	183.5	1	2.72
	190	42	1.5	165	—	160 000	400 000	41 000	1 600	2 400	**NK165/42+IR150×165×42**	158	182	1.5	2.84
	210	60	2	170	1.5	261 000	610 000	62 500	1 600	2 400	**NA4930**	159	201	2	5.33
160	200	40	1.1	175	1.5	160 000	425 000	43 500	1 500	2 300	**NA4832**	166.5	193.5	1	2.90
	220	60	2	180	1.5	270 000	650 000	65 500	1 500	2 200	**NA4932**	169	211	2	5.60
170	215	45	1.1	185	1.5	185 000	495 000	49 500	1 500	2 200	**NA4834**	176.5	208.5	1	3.99
	230	60	2	190	1.5	279 000	690 000	68 500	1 400	2 100	**NA4934**	179	221	2	5.87
180	225	45	1.1	195	1.5	195 000	540 000	53 500	1 400	2 100	**NA4836**	186.5	218.5	1	4.19
	250	69	2	205	1.5	375 000	890 000	86 000	1 300	2 000	**NA4936**	189	241	2	8.58
190	240	50	1.5	210	1.5	227 000	680 000	65 500	1 300	1 900	**NA4838**	198	232	1.5	5.62
	260	69	2	215	1.5	390 000	945 000	90 500	1 300	1 900	**NA4938**	199	251	2	8.68
200	250	50	1.5	220	1.5	231 000	705 000	67 000	1 200	1 800	**NA4840**	208	242	1.5	5.84
	280	80	2.1	225	1.5	505 000	1 180 000	111 000	1 200	1 800	**NA4940**	211	269	2	12.2
220	270	50	1.5	240	1.5	244 000	780 000	72 500	1 100	1 700	**NA4844**	228	262	1.5	6.37
	300	80	2.1	245	1.5	525 000	1 270 000	116 000	1 100	1 600	**NA4944**	231	289	2	13.5
240	300	60	2	265	2	365 000	1 090 000	98 500	1 000	1 500	**NA4848**	249	291	2	10.0
	320	80	2.1	265	2	540 000	1 350 000	121 000	1 000	1 500	**NA4948**	251	309	2	14.7
260	320	60	2	285	2	375 000	1 170 000	103 000	950	1 400	**NA4852**	269	311	2	10.8
	360	100	2.1	290	2	810 000	1 920 000	166 000	950	1 400	**NA4952**	271	349	2	25.9
280	350	69	2	305	2.5	455 000	1 300 000	112 000	850	1 300	**NA4856**	289	341	2	15.5
	380	100	2.1	310	2.5	840 000	2 050 000	175 000	850	1 300	**NA4956**	291	369	2	27.5

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

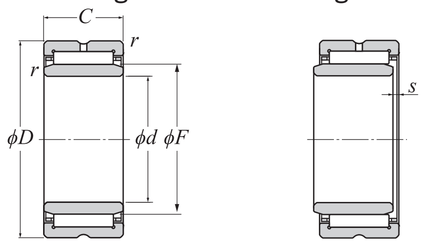
Note: The number of inner rings (IR) is composed of the IR bore diameter dimension × outside diameter dimension × width dimension.

Needle Roller Bearings

NTN

Machined-ring needle roller bearings with an inner ring

NA48 type
NA49 type
NA59 type
NK+IR type



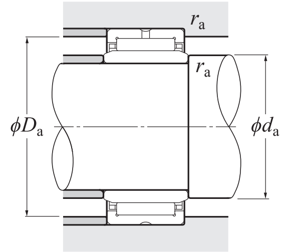
d 300–440 mm

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

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

Needle Roller Bearings

NTN



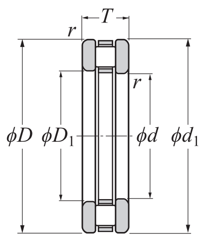
Installation-related dimensions mm			Mass kg
d_a Min.	D_a Max.	r_{as} 3) Max.	(approx.)
311	369	2	22.0
313	407	2.5	42.5
331	389	2	23.2
333	427	2.5	45.2
351	409	2	24.1
353	447	2.5	47.3
371	429	2	25.7
373	467	2.5	49.0
391	469	2	44.5
396	504	3	73.6
416	524	3	76.6
436	544	3	89.8
456	584	3	123

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

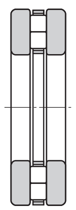
Needle Roller Bearings

Thrust cylindrical roller bearings

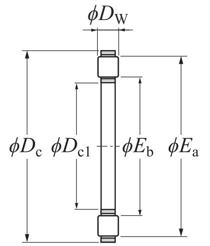
811 type
812 type
893 type



811 type
812 type
(Bearing)



893 type
(Bearing)



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

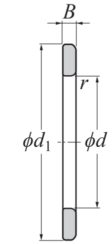
d 10–60 mm

Boundary dimensions mm										Basic load rating N		Fatigue load limit N	Allowable speed min⁻¹	
d	D	d_1	D_1	T	D_{c1}[2)] E11	D_c a13	D_w 0 -0.010	B h11	$r_{s\,min}$[1)]	dynamic C_a	static C_{0a}	C_u	Grease lubrication	Oil lubrication
10	24	24	10	9	10	24	3.5	2.75	0.3	10 300	20 100	2 450	3 400	13 000
12	26	26	12	9	12	26	3.5	2.75	0.3	10 900	22 300	2 720	3 000	12 000
15	28	28	16	9	15	28	3.5	2.75	0.3	12 200	26 800	3 250	2 800	11 000
17	30	30	18	9	17	30	3.5	2.75	0.3	12 700	29 000	3 550	2 500	10 000
20	35	35	21	10	20	35	4.5	2.75	0.3	20 200	46 500	5 650	2 100	8 500
25	42	42	26	11	25	42	5	3	0.6	27 300	68 000	8 250	1 800	7 000
30	47	47	32	11	30	47	5	3	0.6	27 800	72 500	8 850	1 500	6 000
	52	52	32	16	30	52	7.5	4.25	0.6	53 000	129 000	15 700	1 500	6 000
	60	60	32	18	30	60	5.5	6.25	1	54 000	166 000	20 200	1 300	5 000
35	52	52	37	12	35	52	5	3.5	0.6	31 000	87 000	10 600	1 400	5 500
	62	62	37	18	35	62	7.5	5.25	1	54 500	139 000	17 000	1 200	4 900
	68	68	37	20	35	68	6	7	1	66 500	214 000	26 100	1 200	4 600
40	60	60	42	13	40	60	6	3.5	0.6	43 000	121 000	14 800	1 200	4 800
	68	68	42	19	40	68	9	5	1	74 500	190 000	23 200	1 100	4 400
	78	78	42	22	40	78	7	7.5	1	85 000	277 000	34 000	1 000	4 000
45	65	65	47	14	45	65	6	4	0.6	45 500	135 000	16 500	1 100	4 400
	73	73	47	20	45	73	9	5.5	1	82 000	222 000	27 000	1 000	4 100
	85	85	47	24	45	85	7.5	8.25	1	102 000	345 000	42 000	900	3 600
50	70	70	52	14	50	70	6	4	0.6	48 500	150 000	18 300	1 000	4 000
	78	78	52	22	50	78	9	6.5	1	85 000	238 000	29 000	950	3 800
	95	95	52	27	50	95	8	9.5	1.1	125 000	445 000	54 000	800	3 200
55	78	78	57	16	55	78	6	5	0.6	62 500	215 000	26 200	900	3 600
	90	90	57	25	55	90	11	7	1	121 000	340 000	41 500	830	3 300
	105	105	57	30	55	105	9	10.5	1.1	158 000	570 000	69 500	730	2 900
60	85	85	62	17	60	85	7.5	4.75	1	69 000	215 000	26 200	830	3 300
	95	95	62	26	60	95	11	7.5	1	126 000	365 000	44 500	780	3 100
	110	110	62	30	60	110	9	10.5	1.1	162 000	600 000	73 500	680	2 700

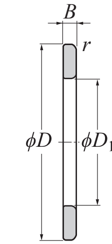
1) Smallest allowable dimension for chamfer dimension r.
2) The tolerance of bearings with suffix code T2 is E12.

Needle Roller Bearings

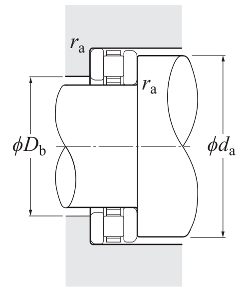
K893 type
(Thrust cylindrical roller
and cage assembly)



WS type raceway
(Inner ring)



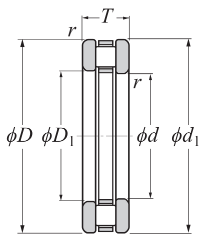
GS type raceway
(Outer ring)



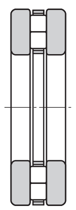
Number				Approx. dimension mm		Installation-related dimensions mm			Mass kg (approx.)			
Bearing	Thrust cylindrical roller and cage assembly	Inner ring	Outer ring	E_b	E_a	d_a Min.	D_b Max.	r_{as} Max.	811	K811 K812 K893	WS811 WS812 WS893	GS811 GS812 GS893
81100T2	**K81100T2**	**WS81100**	**GS81100**	13.5	21.3	21	14	0.3	0.020	0.0035	0.0081	0.0081
81101T2	**K81101T2**	**WS81101**	**GS81101**	15.5	23.3	23	16	0.3	0.022	0.0040	0.0090	0.0090
81102T2	**K81102T2**	**WS81102**	**GS81102**	17.2	25	25	18	0.3	0.024	0.0060	0.0095	0.0090
81103T2	**K81103T2**	**WS81103**	**GS81103**	19.2	27	27	20	0.3	0.028	0.0080	0.010	0.010
81104T2	**K81104T2**	**WS81104**	**GS81104**	22.4	32.3	32	23	0.3	0.039	0.012	0.014	0.013
81105T2	**K81105T2**	**WS81105**	**GS81105**	27.6	38.7	39	28	0.6	0.059	0.018	0.021	0.020
81106T2	**K81106T2**	**WS81106**	**GS81106**	33.1	43.9	44	33	0.6	0.066	0.020	0.024	0.022
81206T2	**K81206T2**	**WS81206**	**GS81206**	32.8	49	48	33	0.6	0.141	0.050	0.047	0.044
89306	**K89306**	**WS89306**	**GS89306**	34	56.4	56	34	1	0.249	0.046	0.104	0.099
81107T2	**K81107T2**	**WS81107**	**GS81107**	38	48.9	49	38	0.6	0.085	0.024	0.032	0.029
81207T2	**K81207T2**	**WS81207**	**GS81207**	39.8	56	56	41	1	0.230	0.065	0.085	0.080
89307	**K89307**	**WS89307**	**GS89307**	40	64.4	64	40	1	0.351	0.064	0.147	0.140
81108T2	**K81108T2**	**WS81108**	**GS81108**	43.2	56.4	56	44	0.6	0.118	0.035	0.043	0.040
81208T2	**K81208T2**	**WS81208**	**GS81208**	43.7	62.9	63	44	1	0.266	0.085	0.093	0.088
89308	**K89308**	**WS89308**	**GS89308**	46	74.4	74	46	1	0.507	0.100	0.207	0.200
81109T2	**K81109T2**	**WS81109**	**GS81109**	48.4	61.6	61	49	0.6	0.144	0.040	0.054	0.050
81209T2	**K81209T2**	**WS81209**	**GS81209**	48.8	68	68	49	1	0.318	0.100	0.112	0.106
89309	**K89309**	**WS89309**	**GS89309**	50.9	81.3	81	51	1	0.660	0.140	0.264	0.255
81110T2	**K81110T2**	**WS81110**	**GS81110**	53.2	66.4	66	54	0.6	0.158	0.045	0.059	0.054
81210T2	**K81210T2**	**WS81210**	**GS81210**	53.7	73.1	73	54	1	0.384	0.105	0.144	0.135
89310	**K89310**	**WS89310**	**GS89310**	58	90.4	90	58	1	0.932	0.180	0.382	0.370
81111T2	**K81111T2**	**WS81111**	**GS81111**	57.8	75.2	75	58	0.6	0.242	0.060	0.094	0.087
81211T2	**K81211T2**	**WS81211**	**GS81211**	60.1	83.4	83	61	1	0.618	0.190	0.219	0.209
89311	**K89311**	**WS89311**	**GS89311**	63.9	100.3	100	64	1	1.26	0.240	0.518	0.503
81112T2	**K81112T2**	**WS81112**	**GS81112**	63.7	80.1	80	65	1	0.288	0.083	0.106	0.099
81212T2	**K81212T2**	**WS81212**	**GS81212**	64.9	88.4	88	66	1	0.690	0.200	0.251	0.240
89312	**K89312**	**WS89312**	**GS89312**	68.9	105.3	105	69	1	1.33	0.250	0.550	0.534

Thrust cylindrical roller bearings

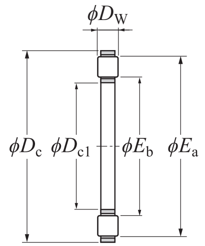
811 type
812 type
893 type



811 type
812 type
(Bearing)



893 type
(Bearing)



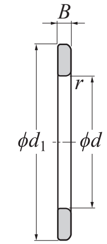
K811 type, K812 type
(Thrust cylindrical roller and cage assembly)

d 65–130 mm

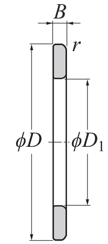
d	D	d_1	D_1	T	D_{c1} [2] E11	D_c a13	D_W 0 -0.010	B h11	$r_{s\,min}$ [1]	Dynamic C_a (N)	Static C_{0a} (N)	Fatigue load limit C_u (N)	Allowable speed min^{-1} Grease lubrication	Allowable speed min^{-1} Oil lubrication
65	90	90	67	18	65	90	7.5	5.25	1	73 000	236 000	28 800	780	3 100
	100	100	67	27	65	100	11	8	1	130 000	385 000	47 000	730	2 900
	115	115	67	30	65	115	9	10.5	1.1	167 000	635 000	77 500	650	2 600
70	95	95	72	18	70	95	7.5	5.25	1	76 500	257 000	31 500	730	2 900
	105	105	72	27	70	105	11	8	1	134 000	410 000	50 000	680	2 700
	125	125	72	34	70	125	10	12	1.1	205 000	790 000	96 500	600	2 400
75	100	100	77	19	75	100	7.5	5.75	1	78 000	268 000	32 500	680	2 700
	110	110	77	27	75	110	11	8	1	138 000	435 000	53 000	650	2 600
	135	135	77	36	75	135	11	12.5	1.5	239 000	920 000	110 000	550	2 200
80	105	105	82	19	80	105	7.5	5.75	1	79 500	279 000	34 000	650	2 600
	115	115	82	28	80	115	11	8.5	1	143 000	460 000	56 000	630	2 500
	140	140	82	36	80	140	11	12.5	1.5	246 000	970 000	114 000	530	2 100
85	110	110	87	19	85	110	7.5	5.75	1	83 000	300 000	36 500	630	2 500
	125	125	88	31	85	125	12	9.5	1	169 000	550 000	66 500	580	2 300
	150	150	88	39	85	150	12	13.5	1.5	281 000	1 100 000	128 000	500	2 000
90	120	120	92	22	90	120	9	6.5	1	112 000	395 000	47 500	580	2 300
	135	135	93	35	90	135	14	10.5	1.1	213 000	680 000	80 000	530	2 100
	155	155	93	39	90	155	12	13.5	1.5	289 000	1 160 000	132 000	480	1 900
100	135	135	102	25	100	135	11	7	1	158 000	555 000	65 000	500	2 000
	150	150	103	38	100	150	15	11.5	1.1	243 000	795 000	91 000	480	1 900
	170	170	103	42	100	170	13	14.5	1.5	335 000	1 370 000	153 000	430	1 700
110	145	145	112	25	110	145	11	7	1	165 000	605 000	68 500	480	1 900
	160	160	113	38	110	160	15	11.5	1.1	258 000	885 000	98 500	450	1 800
	190	190	113	48	110	190	15	16.5	2	430 000	1 770 000	190 000	400	1 600
120	155	155	122	25	120	155	11	7	1	172 000	655 000	72 500	450	1 800
	170	170	123	39	120	170	15	12	1.1	264 000	930 000	101 000	430	1 700
130	170	170	132	30	130	170	12	9	1	197 000	755 000	81 500	400	1 600
	190	187	133	45	130	190	19	13	1.5	360 000	1 210 000	128 000	380	1 500

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

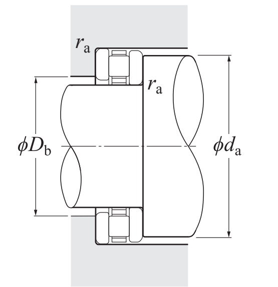
K893 type
(Thrust cylindrical roller and cage assembly)



WS type raceway
(Inner ring)



GS type raceway
(Outer ring)

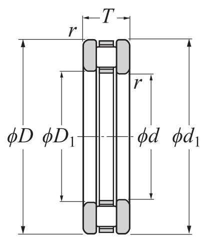


Bearing	Thrust cylindrical roller and cage assembly	Inner ring	Outer ring	Approx. dimension (mm) E_b	E_a	Installation-related dimensions (mm) d_a Min.	D_b Max.	r_{as} Max.	Mass kg (approx.) 811 812 893	K811 K812 K893	WS811 WS812 WS893	GS811 GS812 GS893
81113T2	**K81113T2**	**WS81113**	**GS81113**	68.8	85.2	85	70	1	0.332	0.090	0.125	0.117
81213T2	**K81213T2**	**WS81213**	**GS81213**	69.9	93.3	93	71	1	0.772	0.215	0.285	0.272
89313	**K89313**	**WS89313**	**GS89313**	73.9	110.3	110	74	1	1.41	0.260	0.583	0.566
81114T2	**K81114T2**	**WS81114**	**GS81114**	73.7	90.1	90	74	1	0.355	0.097	0.134	0.124
81214T2	**K81214T2**	**WS81214**	**GS81214**	75	98.4	98	76	1	0.815	0.225	0.302	0.288
89314	**K89314**	**WS89314**	**GS89314**	79.8	120.2	120	80	1	1.91	0.340	0.793	0.772
81115T2	**K81115T2**	**WS81115**	**GS81115**	78.7	95.1	95	80	1	0.414	0.115	0.155	0.144
81215T2	**K81215T2**	**WS81215**	**GS81215**	80.1	103.7	103	81	1	0.864	0.240	0.319	0.304
89315	**K89315**	**WS89315**	**GS89315**	84.7	129.2	129	85	1.5	2.39	0.470	0.971	0.948
81116T2	**K81116T2**	**WS81116**	**GS81116**	83.7	100.1	100	85	1	0.435	0.119	0.164	0.152
81216T2	**K81216T2**	**WS81216**	**GS81216**	84.8	108.4	106	86	1	0.948	0.250	0.358	0.341
89316	**K89316**	**WS89316**	**GS89316**	89.8	134.2	134	90	1.5	2.50	0.490	1.02	0.992
81117T2	**K81117T2**	**WS81117**	**GS81117**	88.7	105.3	105	89	1	0.458	0.125	0.173	0.161
81217	**K81217**	**WS81217**	**GS81217**	92.2	116.9	116	92	1	1.25	0.300	0.492	0.462
89317	**K89317**	**WS89317**	**GS89317**	95.8	144.2	144	96	1.5	3.09	0.590	1.27	1.23
81118T2	**K81118T2**	**WS81118**	**GS81118**	94.7	114.3	114	95	1	0.660	0.170	0.252	0.238
81218J	**K81218J**	**WS81218**	**GS81218**	97.9	126.7	126	97	1	1.82	0.540	0.655	0.620
89318	**K89318**	**WS89318**	**GS89318**	100.8	149.2	149	101	1.5	3.23	0.620	1.33	1.28
81120T2	**K81120T2**	**WS81120**	**GS81120**	105.1	128.7	128	106	1	0.993	0.300	0.355	0.338
81220	**K81220**	**WS81220**	**GS81220**	109.2	140	139	109	1	2.35	0.620	0.886	0.843
89320	**K89320**	**WS89320**	**GS89320**	110.6	163	163	110	1.5	4.13	0.810	1.69	1.64
81122T2	**K81122T2**	**WS81122**	**GS81122**	115	138.8	138	116	1	1.08	0.325	0.385	0.366
81222	**K81222**	**WS81222**	**GS81222**	119.2	150	149	119	1	2.55	0.685	0.957	0.910
89322	**K89322**	**WS89322**	**GS89322**	122.5	183	183	122	2	5.96	1.15	2.44	2.37
81124T2	**K81124T2**	**WS81124**	**GS81124**	125	148.8	148	126	1	1.15	0.340	0.415	0.395
81224	**K81224**	**WS81224**	**GS81224**	129.2	160	159	129	1	2.82	0.730	1.07	1.02
81126	**K81126**	**WS81126**	**GS81126**	137.7	162.4	162	137	1	1.72	0.415	0.666	0.637
81226	**K81226**	**WS81226**	**GS81226**	140.1	179	178	140	1.5	4.06	1.14	1.45	1.48

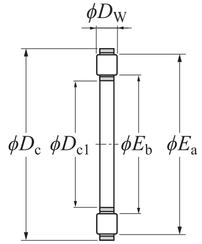
Needle Roller Bearings

Thrust cylindrical roller bearings

811 type
812 type



811 type
812 type
(Bearing)



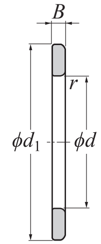
K811 type, K812 type
(Thrust cylindrical roller
and cage assembly)

d 140–160 mm

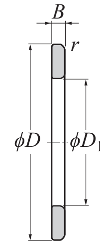
Boundary dimensions (mm)										Basic load rating (N)		Fatigue load limit (N)	Allowable speed (min^{-1})	
d	D	d_1	D_1	T	D_{c1} E11	D_c a13	D_w 0 -0.010	B h11	$r_{s\,min}$ 1)	dynamic C_a	static C_{0a}	C_u	Grease lubrication	Oil lubrication
140	180	178	142	31	140	180	12	9.5	1	206 000	815 000	86 000	380	1 500
	200	197	143	46	140	200	19	13.5	1.5	370 000	1 280 000	133 000	350	1 400
150	190	188	152	31	150	190	12	9.5	1	214 000	870 000	90 500	350	1 400
160	200	198	162	31	160	200	12	9.5	1	221 000	930 000	95 000	330	1 300

1) Smallest allowable dimension for chamfer dimension *r*.

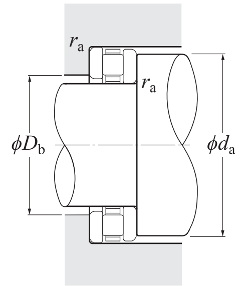
Needle Roller Bearings



WS type raceway
(Inner ring)



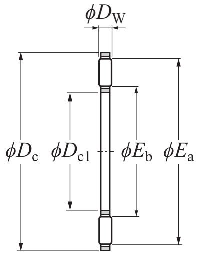
GS type raceway
(Outer ring)



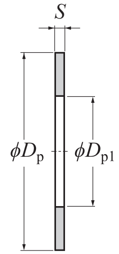
Number				Approx. dimension (mm)		Installation-related dimensions (mm)			Mass kg (approx.)			
Bearing	Thrust cylindrical roller and cage assembly	Inner ring	Outer ring	E_b	E_a	d_a Min.	D_b Max.	r_{as} Max.	811	K811 K812 K893	WS811 WS812 WS893	GS811 GS812 GS893
81128	**K81128**	**WS81128**	**GS81128**	147.8	172.5	172	147	1	1.87	0.450	0.708	0.717
81228	**K81228**	**WS81228**	**GS81228**	150.1	189	188	150	1.5	4.43	1.20	1.60	1.63
81130	**K81130**	**WS81130**	**GS81130**	157.7	182.4	182	157	1	1.98	0.470	0.752	0.761
81132	**K81132**	**WS81132**	**GS81132**	167.8	192.5	192	167	1	2.10	0.500	0.797	0.806

Thrust needle roller bearings

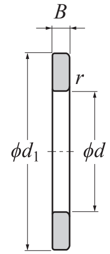
AXK11 type
AS11 type
WS811 type
GS811 type



AXK type
(Thrust needle roller and cage assembly)



AS type raceway
(Washer)

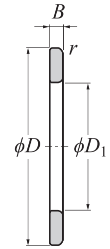


WS type raceway
(Inner ring)

D_{c1} 10–140 mm

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

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



GS type raceway
(Outer ring)

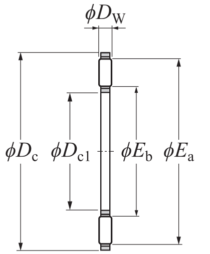
Allowable speed min^{-1}		Number				Approx. dimension mm		Mass kg (approx.)			
Grease lubrication	Oil lubrication	Thrust needle roller and cage assembly	Washer	Inner ring	Outer ring	E_b	E_a	AXK11	AS11	WS811 WS812 WS893	GS811 GS812 GS893
3 500	14 000	**AXK1100**	**AS1100**	**WS81100**	**GS81100**	12.3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

Needle Roller Bearings

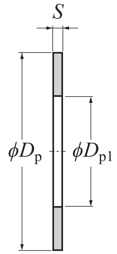
NTN

Thrust needle roller bearings

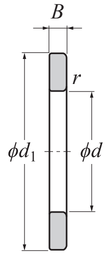
AXK11 type
AS11 type
WS811 type
GS811 type



AXK type
(Thrust needle roller and cage assembly)



AS type raceway
(Washer)



WS type raceway
(Inner ring)

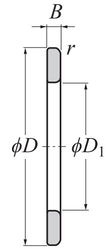
D_{c1} 150–160 mm

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

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

Needle Roller Bearings

NTN



GS type raceway
(Outer ring)

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