



Machined needle roller bearings

Technical Product Information



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Partner Power

X-life – this is the new premium grade from INA and FAG, offering you new opportunities for success. Benefit from the combined expertise of two rolling bearing manufacturers with a worldwide reputation – in every area of application covering automotive, machine building and precision engineering.

INA and FAG have brought together their strengths to give a new dimension in quality:

X-life.
Higher cost-effectiveness.
Higher operational security.

What X-life offers:

X-life offers excellent product quality that far exceeds previous standards.

Furthermore, X-life optimises all the parameters that are decisive for a problem-free production cycle. This includes correct fitting and dismantling, maintenance intervals matched to the specific application and the selection of lubricants matched to operating conditions.

A further convincing advantage of X-life is product characteristics that fulfil your specific requirements and offer additional benefits: for example, particularly low-noise, maintenance-friendly or high load capacity system solutions.

Your X-life advantages at a glance:

- product characteristics far above the norm
- lasting quality assurance and control
- extremely high reliability
- even greater security in planning and systems
- optimum availability
- smooth-running working processes
- reduced energy consumption
- the maximum possible cost-effectiveness
- the maximum possible level of service and support

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Higher cost-effectiveness and operational security with X-life

Due to their excellent technical characteristics such as high radial load carrying capacity together with their suitability for high speeds, single and double row INA machined needle roller bearings have been used with outstanding success for decades in numerous different applications. With the X-life generation of these needle roller bearings, the performance capacity of the products up to 120 mm outside diameter has once more been significantly increased.

Advantages of the new design

The use of state of the art manufacturing technologies has resulted in a better, more uniform surface over the whole contact face between the rolling elements and raceway.

As a result, under identical load there is a significant reduction in the stress conditions present on the rolling elements and raceway, see *Figure 1* and *Figure 2*. The improved surface quality gives reduced friction and lower bearing temperatures, running resistance is lower and less strain is placed on the grease.

Taken together, these improvements mean that the basic dynamic load ratings C_r are approximately 13% higher than the values for the standard design.

As a result, the basic rating life is therefore increased by more than 50%; i.e., the operating life of the bearings is considerably longer under the same operating conditions, see *Figure 3*. Alternatively, higher loads can now be applied while maintaining the same life values.

With their optimised characteristics, X-life needle roller bearings open up completely new application prospects, such as downsizing of the bearing arrangement. Furthermore, the improved price/performance ratio ultimately increases the overall cost-effectiveness of the bearing arrangement.

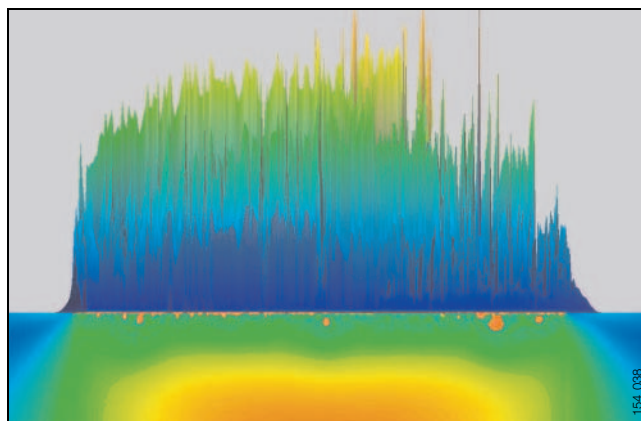


Figure 1 • Stress condition on standard surfaces

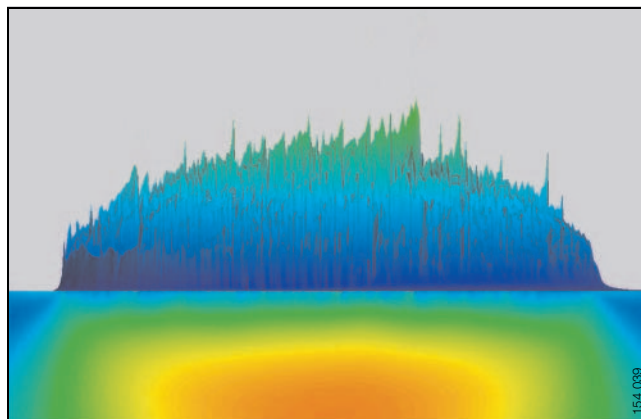


Figure 2 • Stress condition on X-life surfaces

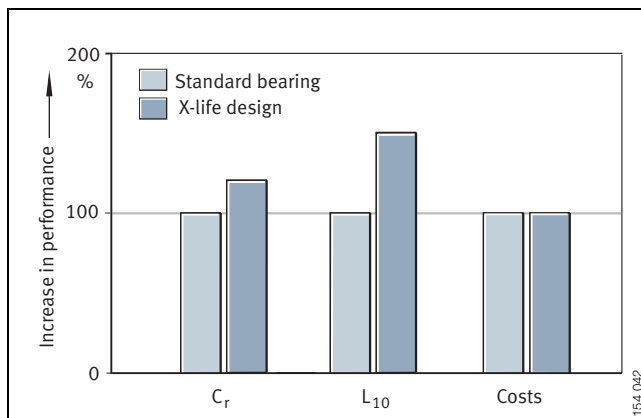


Figure 3 • Comparison: Standard bearings vs. X-life design

Machined needle roller bearings

..... 4 **Needle roller bearings with ribs**

In needle roller bearings with ribs, the outer ring combined with the needle roller and cage assembly form a self-retaining unit. These rolling bearings with low radial section height and high load carrying capacity are particularly suitable for designs with a limited radial design envelope.

The bearings are available with and without an inner ring and in both sealed and open versions.

Bearings without an inner ring are the best solution for bearing arrangements where the shaft can be hardened and ground.

Needle roller bearings with inner ring are used if the shaft cannot be configured as a rolling bearing raceway.

..... 26 **Needle roller bearings without ribs**

Needle roller bearings without ribs on the outer ring are not self-retaining. This means that the outer ring, needle roller and cage assembly and inner ring can be fitted independently of each other. This makes fitting of the bearings considerably easier.

Needle roller bearings are available with and without an inner ring and in both single and double row versions.

Bearings without an inner ring are used if the shaft can be hardened and ground.

..... 36 **Aligning needle roller bearings**

Aligning needle roller bearings have a raceway ring with a spherical outside surface and a concave support ring. As a result, they can compensate for static misalignment of the bearing axis by up to 3°, but are not suitable for supporting swivel or wobble type motion.

The bearings are available with and without an inner ring.

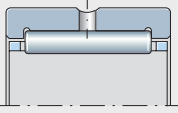
Bearings without an inner ring are used if the shaft can be hardened and ground.

..... 44 **Combined needle roller bearings**

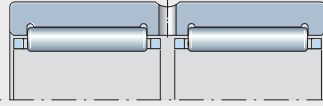
Combined needle roller bearings are radial bearings with an axial component capable of supporting loads. Combined needle roller bearings are used as semi-locating or locating bearings. They do not permit any skewing between the shaft and housing.

The bearings are available with and without an inner ring.

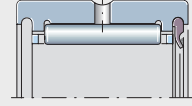
Bearings without an inner ring are used if the shaft can be hardened and ground.



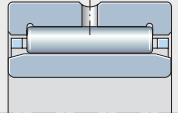
**NK..-XL, NKS..-XL,
RNA49..-XL, RNA48..-XL**



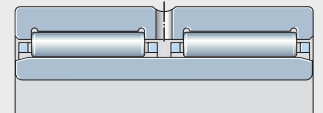
RNA69..-ZW-XL



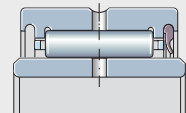
RNA49..-RSR-XL



**NKI..-XL, NKIS..-XL,
NA49..-XL, NA48..-XL**

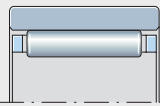


NA69..-ZW-XL

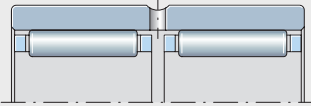


NA49..-RSR-XL

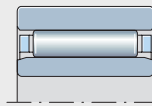
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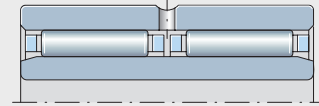
RNAO..-XL



RNAO..-XL

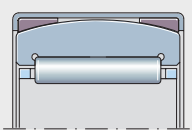


NAO..-XL

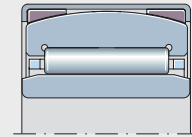


NAO..-XL

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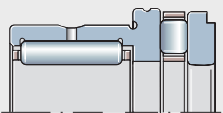


RPNA..-XL

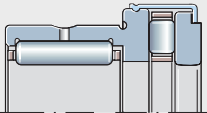


PNA..-XL

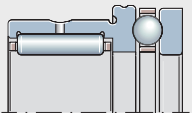
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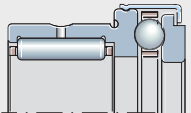
NKXR..-XL



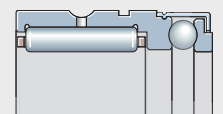
NKXR..-Z-XL



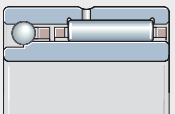
NKX..-XL



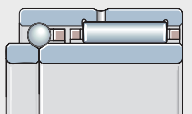
NKX..-Z-XL



NX..-XL, NX..-Z-XL

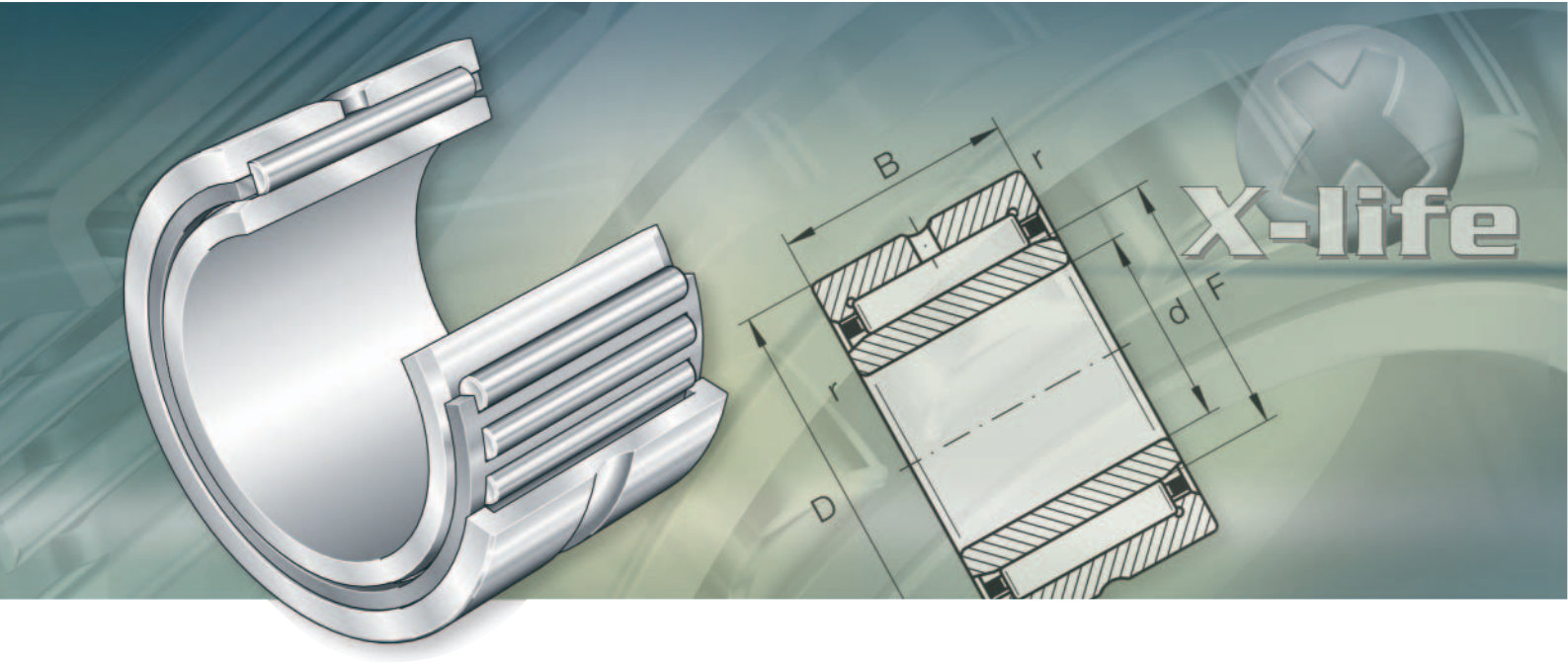


NKIA..-XL



NKIB..-XL

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Needle roller bearings with ribs

Needle roller bearings with ribs

Features	Needle roller bearings without inner ring	6
	Needle roller bearings with inner ring.....	7
	Operating temperature	8
	Cages	8
	Suffixes	8
Design and safety guidelines	Design of bearing arrangements for bearings with inner ring	8
	Raceways for bearings without inner ring	8
	Minimum radial load.....	8
	Speeds	9
	Sealing rings/wider inner rings	9
	Radial location.....	9
	Axial location	9
Accuracy	Radial internal clearance	10
	Enveloping circle	10
Dimension tables	Needle roller bearings without inner ring	12
	Needle roller bearings with inner ring.....	18
	Needle roller bearings without inner ring, sealed	24
	Needle roller bearings with inner ring, sealed	25

Needle roller bearings with ribs

Features

Needle roller bearings are single or double row units comprising machined outer rings with ribs, needle roller and cage assemblies and removable inner rings.

Needle roller bearings without inner ring

Bearings without inner rings have particularly compact radial dimensions. However, they require a shaft raceway that is hardened and ground. The bearings are available in open and sealed versions, *Figure 1* and *Figure 2*.

Bearings of type RNA69 are double row units if $F_w \geq 40$ mm.

Sealing/lubricant

Bearings of type RNA49..-RSR are fitted on one side and bearings of type RNA49..-2RSR on both sides with contact seals, *Figure 2*. They are greased with a lithium complex soap grease to DIN 51825-KP2N-20 and can be lubricated.

For lubrication, the bearings have a lubrication groove and lubrication hole in the outer ring, with the exception of: NK with $F_w \leq 10$ mm.

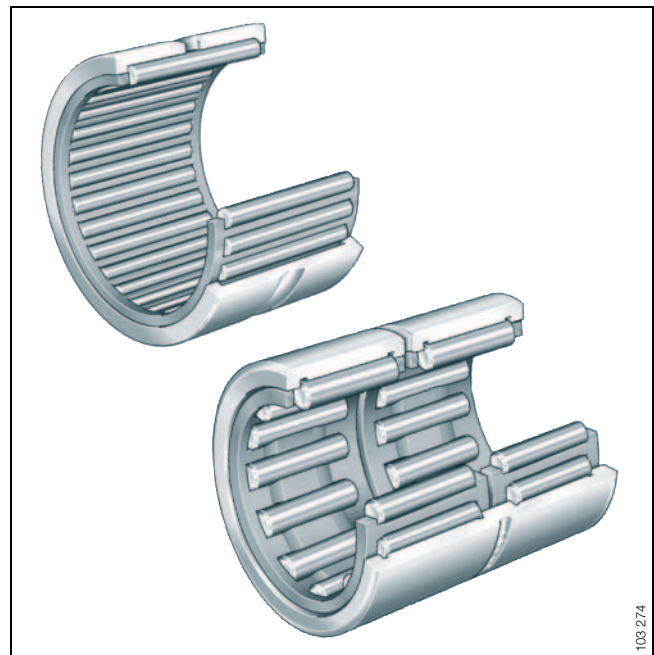


Figure 1 • Bearings without seals
NK..-XL, NKS..-XL, RNA49..-XL, RNA48..-XL, RNA69..-XL

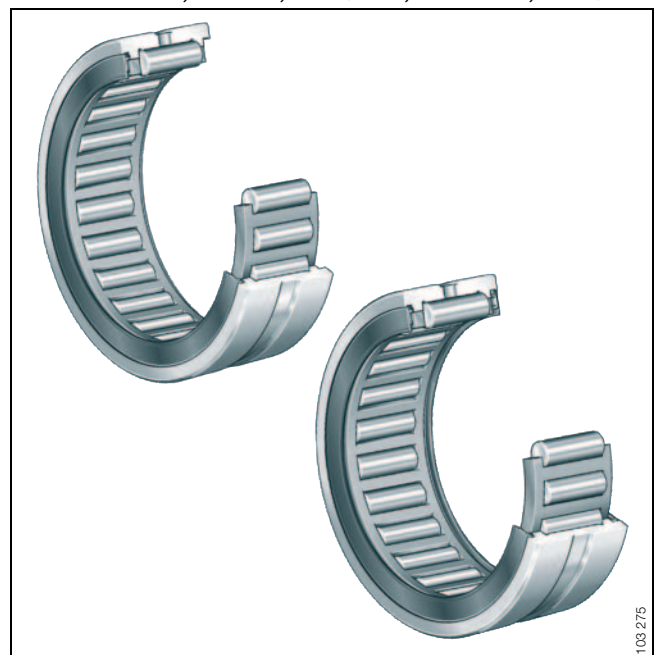


Figure 2 • Bearings with seals
RNA49..-RSR-XL, RNA49..-2RSR-XL

Needle roller bearings with inner ring

Needle roller bearings with inner ring are used if the shaft cannot be configured as a rolling bearing raceway. The bearings are available in open and sealed versions, *Figure 3* and *Figure 4*. Bearings of type NA69 are double row units if $d \geq 32$ mm.

Sealing/lubricant

Bearings of type NA49..-RSR are fitted on one side and bearings of type NA49..-2RSR on both sides with contact seals, *Figure 4*. They are greased with a lithium complex soap grease to DIN 51825-KP2N-20 and can be lubricated.

For lubrication, the bearings have a lubrication groove and lubrication hole in the outer ring, with the exception of: NKL with $d \leq 7$ mm.

Axial displacement of the inner ring

The standard inner ring allows axial displacement within the values “s” stated in the dimension tables. Where larger displacements occur, the standard ring can be replaced by a wider inner ring IR.

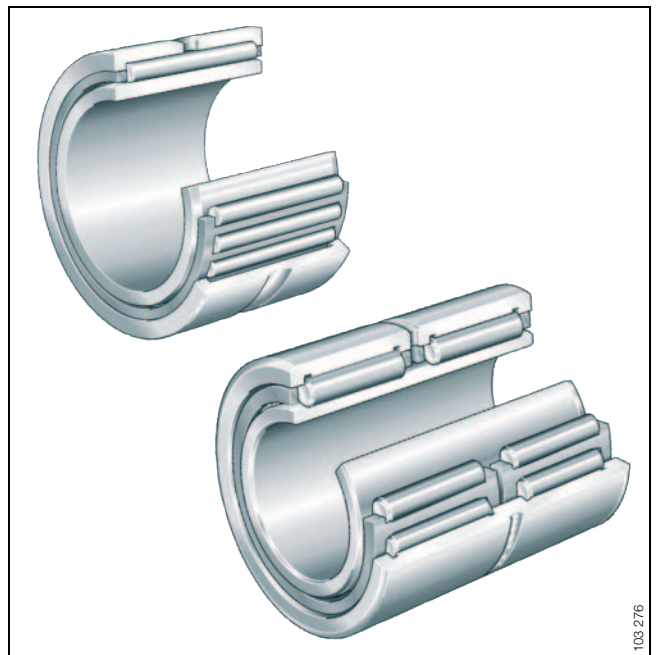


Figure 3 · Bearings without seals
NKL..-XL, NKIS..-XL, NA49..-XL, NA48..-XL, NA69..-XL

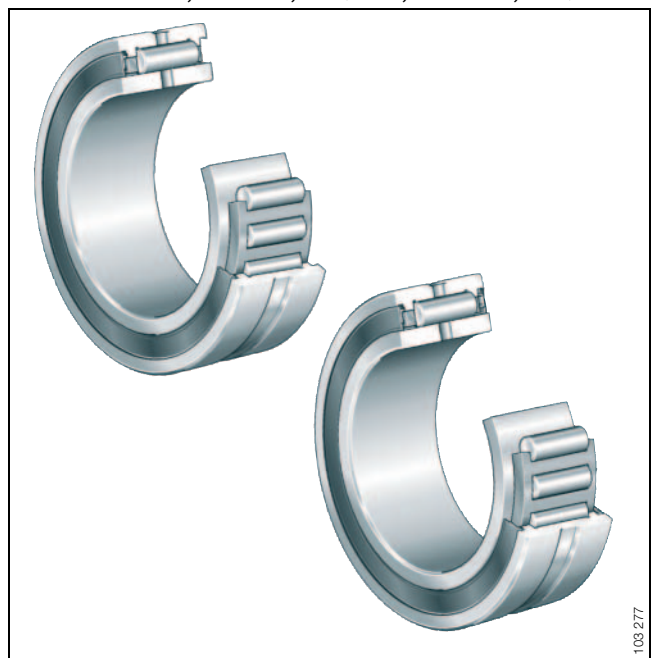


Figure 4 · Bearings with seals
NA49..-RSR-XL, NA49..-2RSR-XL

Needle roller bearings with ribs

Operating temperature

Unsealed bearings can be used at operating temperatures from -20 °C to $+120\text{ °C}$.



Sealed bearings are suitable for operating temperatures from -20 °C to $+100\text{ °C}$; this is limited by the grease and seal material.

Cages

The cages made from sheet steel or plastic. Plastic cages have the suffix TN.



Before using bearings with plastic cages, check the compatibility of the lubricant used with the cage material (PA66-GF/H).

Suffixes

Suffixes for the available designs: see table.

Available designs

Suffix	Description	Design
C3	Radial internal clearance larger than normal	Special design ¹⁾
P5	High dimensional and geometrical tolerances	Special design ¹⁾
RSR	Contact seal on one side	Standard
TN ²⁾	Cage made from glass fibre reinforced polyamide 66	Standard
XL	Bearings in X-life design	Standard
ZW ³⁾	Double row	Standard
2RSR	Contact seals on both sides	Standard

¹⁾ Available by agreement.

²⁾ Bearings with plastic cage: see dimension tables.

³⁾ Dependent on size.

Design and safety guidelines

Design of bearing arrangements for bearings with inner ring

Shaft and housing tolerances for bearings with inner ring: see “INA Catalogue 307”.

Raceways for bearings without inner ring

In the case of bearings without an inner ring, the rolling element raceway on the shaft must be hardened and ground.

The surface hardness of the raceway must be $670\text{ HV} + 170\text{ HV}$ and the hardness depth Eht or Rht must be sufficiently large.

Raceway design

Shaft diameter		Shaft tolerance			Roughness max.	Roundness max.	Parallelism max.
Nominal dimension mm	Operating clearance	Small	Normal	Large			
–	65	k5	h5	g6	R _a 0,1 (R _z 0,4)	25% of diameter tolerance	50% of diameter tolerance
65	80	k5	h5	f6			
80	120	k5	g5	f6			
120	160	k5	g5	f6	R _a 0,2 (R _z 1)		
160	180	k5	g5	e6			
180	200	j5	g5	e6			
200	250	j5	f6	e6			
250	315	h5	f6	e6			
315	415	g5	f6	d6			



The values apply to housing tolerances up to K7. For tighter housing bores, the operating clearance should be checked by either calculation or measurement.

Minimum radial load

In order to ensure operation without slippage, the bearings must be subjected to a minimum radial load $F_{r\text{ min}}$. This applies in particular to high speed bearings since, if the radial load is insufficient or not present, damaging sliding motion may occur between the rolling elements and raceways.

In continuous operation, therefore, a minimum radial load of magnitude $C_r/P < 50$ is necessary.

Speeds



The limiting speeds n_G for series RNA49..-RSR (2RSR) and NA49..-RSR (2RSR) are valid for grease lubrication.

Sealing rings/wider inner rings

Sealing rings of series G, GR and SD are matched to the bearing dimensions and can be combined with wider inner rings of series IR. The outer surface of the inner rings can be used as the sliding surface for seal lips.

Sealing rings: see “INA publication GSD”.

Radial location

Needle roller bearings with inner ring are radially located by means of a close fit on the shaft and in the housing.

Axial location

In order to prevent lateral creep of the bearing rings, they must be located by means of physical locking, *Figure 5* and *Figure 6*. The abutting shoulders (shaft, housing) should be sufficiently high and perpendicular to the bearing axis.

The transition from the bearing seat to the abutting shoulder should be designed with rounding to DIN 5 418 or an undercut to DIN 509. The minimum values for the chamfer dimensions r as given in the dimension tables must be observed.

The overlap between the snap rings and the end faces of the bearing rings must be sufficiently large.

The maximum chamfer dimensions for the inner rings to DIN 620-6 must be taken into consideration.

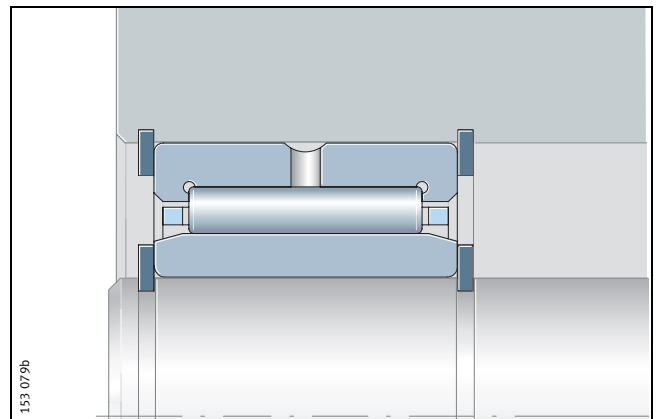


Figure 5 · Axial location by snap rings – NKI

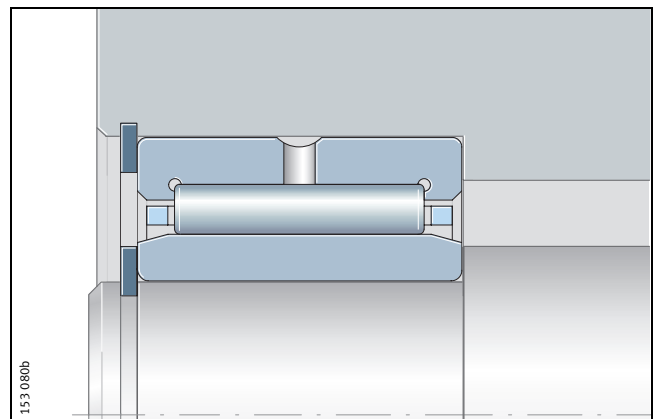


Figure 6 · Axial location by snap rings and abutting shoulders – NKI

Needle roller bearings with ribs

Accuracy

The dimensional and geometrical tolerances correspond to tolerance class PN to DIN 620.

Radial internal clearance

Bearings with inner ring have a radial internal clearance of CN, see table "Radial internal clearance".

Radial internal clearance to DIN 620-4

Bore		Radial internal clearance			
d mm		CN μm		C3 μm	
over	incl.	min.	max.	min.	max.
–	24	20	45	35	60
24	30	20	45	35	60
30	40	25	50	45	70
40	50	30	60	50	80
50	65	40	70	60	90
65	80	40	75	65	100
80	100	50	85	75	110
100	120	50	90	85	125
120	140	60	105	100	145
140	160	70	120	115	165
160	180	75	125	120	170
180	200	90	145	140	195
200	225	105	165	160	220
225	250	110	175	170	235
250	280	125	195	190	260
280	315	130	205	200	275
315	355	145	225	225	305
355	400	190	280	280	370
400	450	210	310	310	410
450	500	220	330	330	440

Enveloping circle

For bearings without inner ring, the decisive factor is not the radial internal clearance but the enveloping circle diameter F_w .

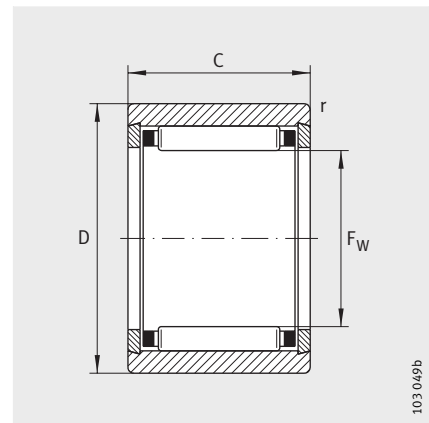
The enveloping circle is the inner inscribed circle of the needle rollers in clearance-free contact with the outer raceway.

For bearings before fitting, the enveloping circle F_w is in the tolerance zone F6.

Dimension tables ►

Needle roller bearings

Without inner ring



NK..-XL ($F_w \leq 10 \text{ mm}$)

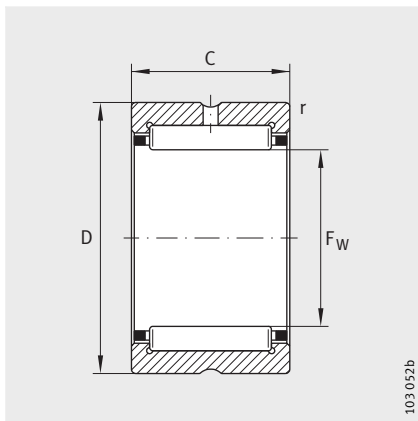


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Dimension table · Dimensions in mm

Designation			Mass ≈g	Dimensions				Basic load ratings		Fatigue limit load C_{ur} kN	Limiting speed n_G min^{-1}	Reference speed n_B min^{-1}
NK..-XL	RNA49..-XL	RNA69..-XL		F_w	D	C	r min.	dyn. C_r kN	stat. C_{0r} kN			
+ NK5/10-TN-XL	-	-	3,1	5	10	10	0,15	2,65	1,92	0,295	37 000	65 000
+ NK5/12-TN-XL	-	-	3,7	5	10	12	0,15	3,4	2,65	0,435	37 000	65 000
+ NK 6/10-TN-XL	-	-	4,7	6	12	10	0,15	2,95	2,28	0,355	33 000	55 000
+ NK 6/12-TN-XL	-	-	5,7	6	12	12	0,15	3,8	3,15	0,52	33 000	55 000
+ NK 7/10-TN-XL	-	-	6,9	7	14	10	0,3	3,25	2,65	0,41	31 000	50 000
+ NK 7/12-TN-XL	-	-	8,2	7	14	12	0,3	4,15	3,6	0,60	31 000	49 000
+ NK 8/12-TN-XL	-	-	8,7	8	15	12	0,3	4,45	4,1	0,69	29 000	43 000
+ NK 8/16-TN-XL	-	-	12	8	15	16	0,3	5,8	5,8	0,97	29 000	42 000
+ NK 9/12-TN-XL	-	-	10,3	9	16	12	0,3	5,1	5	0,84	28 000	37 000
+ NK 9/16-TN-XL	-	-	12,8	9	16	16	0,3	6,6	7,1	1,19	28 000	37 000
+ NK 10/12-TN-XL	-	-	10,1	10	17	12	0,3	5,3	5,5	0,93	27 000	34 000
+ NK 10/16-TN-XL	-	-	13,3	10	17	16	0,3	7	7,8	1,31	27 000	33 000
NK 12/12 XL	-	-	12,1	12	19	12	0,3	7,2	7,1	1,28	25 000	26 000
NK 12/16 XL	-	-	15,9	12	19	16	0,3	10,1	11	1,92	25 000	25 000
NK 14/16 XL	-	-	20,7	14	22	16	0,3	11,4	11,5	2,1	24 000	22 000
NK 14/20 XL	-	-	25,5	14	22	20	0,3	14,5	15,6	2,7	24 000	21 000
-	RNA4900-XL	-	16,5	14	22	13	0,3	9,6	9,2	1,63	25 000	21 000
NK 15/16-XL	-	-	21,8	15	23	16	0,3	12,1	12,7	2,32	23 000	20 000
NK 15/20-XL	-	-	26,6	15	23	20	0,3	15,4	17,2	3	23 000	20 000
NK 16/16-XL	-	-	22,4	16	24	16	0,3	12,8	13,9	2,55	22 000	19 000
NK 16/20-XL	-	-	28,4	16	24	20	0,3	16,3	18,8	3,25	22 000	19 000
-	RNA4901-XL	-	17,4	16	24	13	0,3	10,6	10,9	1,94	24 000	18 000
-	-	RNA6901-XL	31	16	24	22	0,3	18,1	21,6	3,8	22 000	17 000
NK 17/16-XL	-	-	23,7	17	25	16	0,3	13,5	15	2,75	22 000	18 000
NK 17/20-XL	-	-	29,8	17	25	20	0,3	17,1	20,4	3,55	22 000	17 000
NK 18/16-XL	-	-	24,9	18	26	16	0,3	14,1	16,2	3	21 000	17 000
NK 18/20-XL	-	-	31,4	18	26	20	0,3	17,9	22	3,85	21 000	17 000
NK 19/16-XL	-	-	26,1	19	27	16	0,3	14,7	17,4	3,2	21 000	16 000
NK 19/20-XL	-	-	32,2	19	27	20	0,3	18,7	23,6	4,15	21 000	16 000

+ With closing rings, without lubrication hole and groove.

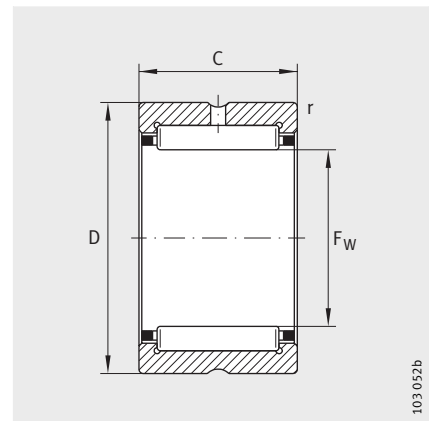


NK...XL ($F_w \geq 12$ mm)
 NKS...XL, RNA49...XL, RNA69...XL

Designation				Mass ≈g	Dimensions				Basic load ratings		Fatigue limit load C_{ur} kN	Limiting speed n_G min ⁻¹	Reference speed n_B min ⁻¹
NK...XL	RNA49...XL	RNA69...XL	NKS...XL		F_w	D	C	r	dyn. C_r kN	stat. C_{Or} kN			
NK20/16-XL	-	-	-	27	20	28	16	0,3	14,6	17,5	3,2	20 000	15 000
NK20/20-XL	-	-	-	33,9	20	28	20	0,3	18,6	23,8	4,15	20 000	15 000
-	RNA4902-XL	-	-	21,7	20	28	13	0,3	12	13,6	2,43	22 000	14 000
-	-	RNA6902-XL	-	39,7	20	28	23	0,3	19,5	25,5	4,45	20 000	14 000
-	-	-	NKS20-XL	48,7	20	32	20	0,6	26	25	4,4	19 000	14 000
NK21/16-XL	-	-	-	28,1	21	29	16	0,3	15,2	18,7	3,45	20 000	15 000
NK21/20-XL	-	-	-	35,2	21	29	20	0,3	19,3	25,5	4,45	20 000	14 000
NK22/16-XL	-	-	-	30	22	30	16	0,3	15,8	19,9	3,65	19 000	14 000
NK22/20-XL	-	-	-	37	22	30	20	0,3	20	27	4,7	19 000	14 000
-	RNA4903-XL	-	-	22,2	22	30	13	0,3	12,4	14,6	2,6	21 000	13 000
-	-	RNA6903-XL	-	42,4	22	30	23	0,3	21,1	29	5,1	19 000	12 000
-	-	-	NKS22-XL	61,5	22	35	20	0,6	27,5	28	4,9	17 000	13 000
NK24/16-XL	-	-	-	31,9	24	32	16	0,3	16,9	22,3	4,1	18 000	13 000
NK24/20-XL	-	-	-	40	24	32	20	0,3	21,4	30,5	5,3	18 000	13 000
-	-	-	NKS24-XL	65,5	24	37	20	0,6	29,5	31	5,4	16 000	12 000
NK25/16-XL	-	-	-	32,6	25	33	16	0,3	16,8	22,4	4,15	17 000	12 000
NK25/20-XL	-	-	-	42	25	33	20	0,3	21,3	30,5	5,3	17 000	12 000
-	RNA4904-XL	-	-	52,3	25	37	17	0,3	23,7	25,5	4,6	17 000	12 000
-	-	RNA6904-XL	-	100	25	37	30	0,3	40,5	51	9,1	16 000	11 000
-	-	-	NKS25-XL	68,1	25	38	20	0,6	31	33,5	5,8	16 000	11 000
NK26/16-XL	-	-	-	34	26	34	16	0,3	17,3	23,6	4,35	16 000	12 000
NK26/20-XL	-	-	-	42	26	34	20	0,3	22	32	5,6	16 000	12 000
NK28/20-XL	-	-	-	52,2	28	37	20	0,3	24,8	34	5,9	15 000	11 000
NK28/30-XL	-	-	-	82	28	37	30	0,3	37	57	10,5	15 000	11 000
-	RNA49/22-XL	-	-	50,2	28	39	17	0,3	26	29,5	5,3	16 000	10 000
-	-	RNA69/22-XL	-	98	28	39	30	0,3	42	55	9,9	15 000	10 000
-	-	-	NKS28-XL	83,6	28	42	20	0,6	32,5	36,5	6,4	14 000	10 000
NK29/20-TN-XL	-	-	-	50	29	38	20	0,3	27,5	39	6,9	16 000	10 000
NK29/30	-	-	-	84,3	29	38	30	0,3	37	57	10,6	15 000	10 000
NK30/20-TN-XL	-	-	-	61	30	40	20	0,3	28	41	7,2	15 000	10 000
NK30/30-TN-XL	-	-	-	92,4	30	40	30	0,3	42	69	12,7	15 000	9 500
-	RNA4905-XL	-	-	61	30	42	17	0,3	26,5	31,5	5,7	15 000	9 500
-	-	RNA6905-XL	-	112	30	42	30	0,3	44	59	10,6	14 000	9 000
-	-	-	NKS30-XL	104	30	45	22	0,6	36,5	40	6,9	13 000	10 000

Needle roller bearings

Without inner ring

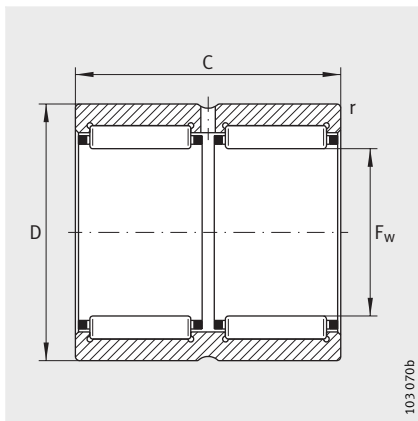


NK...-XL, NKS...-XL, RNA49...-XL
RNA69...-XL ($F_w \leq 35$ mm)



Dimension table (continued) · Dimensions in mm

Designation				Mass ≈g	Dimensions				Basic load ratings		Fatigue limit load C_{ur} kN	Limiting speed n_G min^{-1}	Reference speed n_B min^{-1}
NK...-XL	RNA49...-XL	RNA69...-XL	NKS...-XL		F_w	D	C	r min.	dyn. C_r kN	stat. C_{0r} kN			
NK32/20-TN-XL	-	-	-	64	32	42	20	0,3	29,5	44,5	7,8	14 000	9 000
NK32/30-XL	-	-	-	102	32	42	30	0,3	39	63	11,7	13 000	9 500
-	RNA49/28-XL	-	-	73,2	32	45	17	0,3	27,5	33,5	6,1	13 000	9 000
-	-	RNA69/28-XL	-	135	32	45	30	0,3	45,5	63	11,4	13 000	8 500
-	-	-	NKS32-XL	110	32	47	22	0,6	38	43,5	7,4	12 000	9 500
NK35/20-TN-XL	-	-	-	69,4	35	45	20	0,3	31	48,5	8,5	13 000	8 500
NK35/30-TN-XL	-	-	-	106	35	45	30	0,3	46	81	15	13 000	8 000
-	RNA4906-XL	-	-	69,4	35	47	17	0,3	28,5	35,5	6,4	13 000	8 000
-	-	RNA6906-XL	-	126	35	47	30	0,3	49	71	12,9	12 000	7 500
-	-	-	NKS35-XL	118	35	50	22	0,6	39,5	47	8	12 000	8 500
NK37/20-XL	-	-	-	77	37	47	20	0,3	28	43,5	7,6	12 000	8 500
NK37/30-XL	-	-	-	113	37	47	30	0,3	42	73	13,5	12 000	8 500
-	-	-	NKS37-XL	123	37	52	22	0,6	41,5	50	8,6	11 000	8 500
NK38/20-XL	-	-	-	79,4	38	48	20	0,3	29	45	7,9	11 000	8 500
NK38/30-XL	-	-	-	116	38	48	30	0,3	43	76	14	11 000	8 000
NK40/20-TN-XL	-	-	-	78	40	50	20	0,3	33,5	56	9,8	12 000	7 500
NK40/30-XL	-	-	-	125	40	50	30	0,3	44	79	14,6	11 000	8 000
-	RNA49/32-XL	-	-	89,1	40	52	20	0,6	34,5	47,5	8,9	12 000	7 500
-	-	RNA69/32-ZW-XL	-	162	40	52	36	0,6	53	82	15,1	11 000	7 500
-	-	-	NKS40-XL	129	40	55	22	0,6	42,5	54	9,2	10 000	7 500
NK42/20-XL	-	-	-	85,8	42	52	20	0,3	30	49	8,6	10 000	8 000
NK42/30-XL	-	-	-	130	42	52	30	0,3	44,5	82	15,2	10 000	7 500
-	RNA4907-XL	-	-	107	42	55	20	0,6	35,5	50	9,4	11 000	7 000
-	-	RNA6907-ZW-XL	-	193	42	55	36	0,6	54	86	15,9	10 000	7 000
NK43/20-XL	-	-	-	86	43	53	20	0,3	30,5	51	8,9	10 000	7 500
NK43/30-XL	-	-	-	133	43	53	30	0,3	45,5	85	15,8	10 000	7 500
-	-	-	NKS43-XL	139	43	58	22	0,6	44	57	9,8	9 500	7 500
NK45/20-TN-XL	-	-	-	85,3	45	55	20	0,3	35	62	10,8	10 000	7 000
NK45/30-TN-XL	-	-	-	132	45	55	30	0,3	52	103	19,1	10 000	6 500
-	-	-	NKS45-XL	145	45	60	22	0,6	45,5	60	10,4	9 500	7 000
NK47/20-XL	-	-	-	94,5	47	57	20	0,3	32,5	56	9,9	9 500	7 000
NK47/30-XL	-	-	-	142	47	57	30	0,3	48,5	94	17,5	9 500	7 000
-	RNA4908-XL	-	-	140	48	62	22	0,6	48,5	67	11,5	9 500	6 000
-	-	RNA6908-ZW-XL	-	256	48	62	40	0,6	74	116	19,4	9 000	6 500

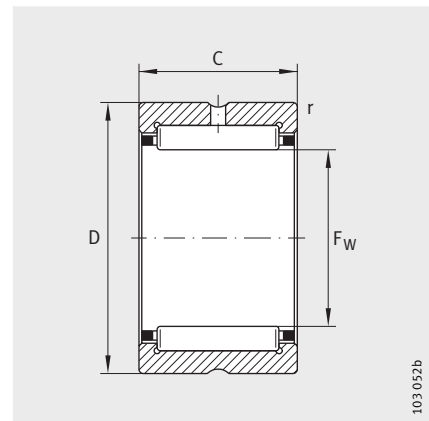


RNA69..-ZW-XL ($F_w \geq 40$ mm)

Designation				Mass ≈g	Dimensions				Basic load ratings		Fatigue limit load C_{ur} kN	Limiting speed n_G min^{-1}	Reference speed n_B min^{-1}
NK...XL	RNA49...XL	RNA69..-ZW-XL	NKS...XL		F_w	D	C	r min.	dyn. C_r kN	stat. C_{0r} kN			
NK50/25-TN-XL	-	-	-	146	50	62	25	0,6	48,5	87	14,8	9 000	6 500
NK50/35-TN-XL	-	-	-	207	50	62	35	0,6	67	132	23,9	9 000	6 000
-	-	-	NKS50-XL	157	50	65	22	1	48	67	11,5	8 500	6 500
-	RNA4909-XL	-	-	182	52	68	22	0,6	51	73	12,6	8 500	6 000
-	-	RNA6909-ZW-XL	-	338	52	68	40	0,6	79	127	21,4	8 000	6 000
NK55/25-XL	-	-	-	180	55	68	25	0,6	45,5	82	14	8 000	6 000
NK55/35-XL	-	-	-	250	55	68	35	0,6	60	118	21,3	8 000	6 000
-	-	-	NKS55-XL	221	55	72	22	1	51	74	12,7	7 500	6 000
-	RNA4910-XL	-	-	163	58	72	22	0,6	53	80	13,8	8 000	5 000
-	-	RNA6910-ZW-XL	-	310	58	72	40	0,6	82	139	23,4	7 500	5 000
NK60/25-TN-XL	-	-	-	170	60	72	25	0,6	53	103	17,5	7 500	5 500
NK60/35-XL	-	-	-	258	60	72	35	0,6	63	130	23,5	7 500	5 500
-	-	-	NKS60-XL	335	60	80	28	1,1	71	98	17,3	7 000	5 500
-	RNA4911-XL	-	-	255	63	80	25	1	65	100	17,3	7 500	4 900
-	-	RNA6911-ZW-XL	-	470	63	80	45	1	102	176	30	7 000	4 900
NK65/25-XL	-	-	-	221	65	78	25	0,6	50	98	16,7	7 000	5 500
NK65/35-XL	-	-	-	310	65	78	35	0,6	66	142	25,5	7 000	5 500
-	-	-	NKS65-XL	356	65	85	28	1,1	75	108	19,1	6 500	5 000
NK68/25-XL	-	-	-	241	68	82	25	0,6	49,5	89	15,2	6 500	5 500
NK68/35-XL	-	-	-	338	68	82	35	0,6	70	139	25,5	6 500	5 000
-	RNA4912-XL	-	-	275	68	85	25	1	68	108	18,8	7 000	4 500
-	-	RNA6912-ZW-XL	-	488	68	85	45	1	106	191	32,5	6 500	4 500
NK70/25-XL	-	-	-	260	70	85	25	0,6	50	92	15,7	6 500	5 000
NK70/35-XL	-	-	-	370	70	85	35	0,6	71	144	26,5	6 500	5 000
-	-	-	NKS70-XL	380	70	90	28	1,1	77	113	20	6 000	4 900
-	RNA4913-XL	-	-	312	72	90	25	1	69	112	19,5	6 500	4 300
-	-	RNA6913-ZW-XL	-	580	72	90	45	1	108	198	33,5	6 000	4 300
NK73/25-XL	-	-	-	302	73	90	25	1	60	100	17,5	6 000	4 900
NK73/35-XL	-	-	-	428	73	90	35	1	85	156	27	6 000	4 700
NK75/25-XL	-	-	-	315	75	92	25	1	61	104	18,2	6 000	4 800
NK75/35-XL	-	-	-	445	75	92	35	1	87	162	28	6 000	4 600
-	-	-	NKS75-XL	402	75	95	28	1,1	81	123	21,9	6 000	4 600

Needle roller bearings

Without inner ring

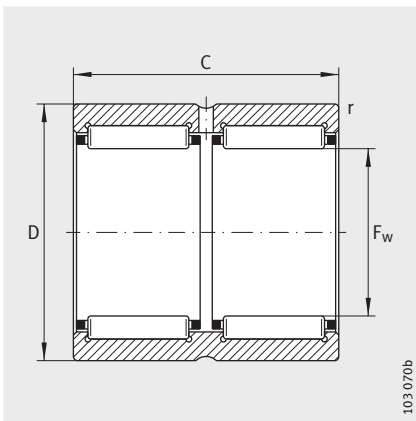


NK...XL, RNA49...XL, RNA48...XL



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Dimension table (continued) · Dimensions in mm												
Designation			Mass ≈g	Dimensions				Basic load ratings		Fatigue limit load C _{ur} kN	Limiting speed n _G min ⁻¹	Reference speed n _B min ⁻¹
NK...XL	RNA49...XL	RNA69...ZW-XL		F _w	D	C	r min.	dyn. C _r kN	stat. C _{0r} kN			
NK80/25-XL	–	–	301	80	95	25	1	63	119	19,6	5 500	4 400
NK80/35-XL	–	–	425	80	95	35	1	89	184	32,5	5 500	4 300
–	RNA4914-XL	–	460	80	100	30	1	95	156	27,5	6 000	4 000
–	–	RNA6914-ZW-XL	857	80	100	54	1	145	265	47,5	5 500	3 900
NK85/25-XL	–	–	425	85	105	25	1	78	123	21,7	5 000	4 200
NK85/35-XL	–	–	600	85	105	35	1	111	193	34,5	5 000	4 000
–	RNA4915-XL	–	489	85	105	30	1	97	162	28,5	5 500	3 800
–	–	RNA6915-ZW-XL	935	85	105	54	1	147	275	49,5	5 000	3 600
NK90/25-XL	–	–	450	90	110	25	1	81	132	23,3	4 900	4 000
NK90/35-XL	–	–	630	90	110	35	1	116	208	37	4 900	3 800
–	RNA4916-XL	–	516	90	110	30	1	101	174	30,5	5 000	3 500
–	–	RNA6916-ZW-XL	987	90	110	54	1	153	300	53	4 900	3 300
NK95/26-XL	–	–	490	95	115	26	1	83	137	24	4 700	3 900
NK95/36-XL	–	–	680	95	115	36	1	121	223	39,5	4 700	3 700
NK100/26-XL	–	–	515	100	120	26	1	86	146	25	4 500	3 700
NK100/36-XL	–	–	715	100	120	36	1	125	237	41,5	4 500	3 500
–	RNA4917-XL	–	657	100	120	35	1,1	125	237	41,5	4 800	3 300
–	–	RNA6917-ZW-XL	1 200	100	120	63	1,1	188	400	71	4 500	2 900
NK105/26-XL	–	–	540	105	125	26	1	89	155	26,5	4 300	3 600
NK105/36-XL	–	–	713	105	125	36	1	129	250	43,5	4 300	3 400
–	RNA4918-XL	–	745	105	125	35	1,1	129	250	43,5	4 600	3 100
–	–	RNA6918-ZW-XL	1 330	105	125	63	1,1	195	425	74	4 300	2 700
NK110/30-XL	–	–	650	110	130	30	1,1	111	210	35,5	4 100	3 300
NK110/40-XL	–	–	830	110	130	40	1,1	143	290	50	4 100	3 100
–	RNA4919-XL	–	719	110	130	35	1,1	131	260	44,5	4 400	2 900
–	–	RNA6919-ZW-XL	1 460	110	130	63	1,1	197	440	76	4 100	2 600

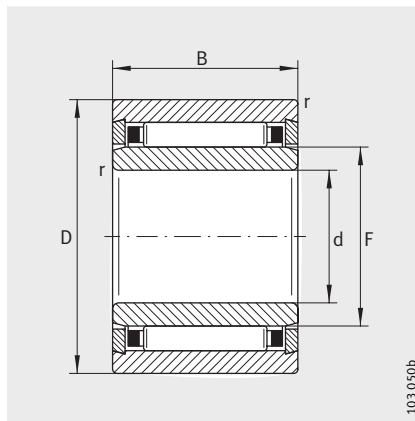


RNA69..-ZW-XL

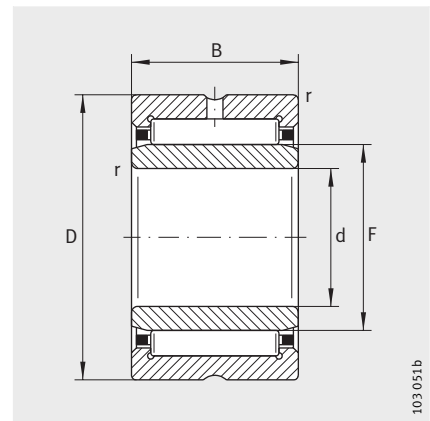
Dimension table (continued) · Dimensions in mm											
Designation		Mass ≈g	Dimensions				Basic load ratings		Fatigue limit load C _{ur} kN	Limiting speed n _G min ⁻¹	Reference speed n _B min ⁻¹
RNA49...-XL	RNA48...-XL		F _w	D	C	r	dyn. C _r kN	stat. C _{0r} kN			
RNA4920-XL	–	1 150	115	140	40	1,1	144	270	45,5	4 100	2 900
–	RNA4822-XL	670	120	140	30	1	106	216	36	3 800	2 700
RNA4922-XL	–	1 240	125	150	40	1,1	149	290	47,5	3 800	2 600
–	RNA4824-XL	730	130	150	30	1	112	239	39	3 500	2 500
RNA4924-XL	–	1 860	135	165	45	1,1	205	390	64	3 400	2 300
–	RNA4826-XL	990	145	165	35	1,1	134	310	48,5	3 200	2 200
RNA4926-XL	–	2 210	150	180	50	1,5	229	470	74	3 200	2 100
–	RNA4828-XL	1 050	155	175	35	1,1	136	325	50	3 000	2 000
RNA4928-XL	–	2 350	160	190	50	1,5	237	500	78	3 000	1 900
–	RNA4830-XL	1 600	165	190	40	1,1	172	400	62	2 800	1 900
–	RNA4832-XL	1 700	175	200	40	1,1	181	435	66	2 600	1 700
–	RNA4834-XL	2 540	185	215	45	1,1	209	510	75	2 500	1 600
–	RNA4836-XL	2 680	195	225	45	1,1	219	550	80	2 300	1 500
–	RNA4838-XL	3 210	210	240	50	1,5	255	690	100	2 200	1 300
–	RNA4840-XL	3 350	220	250	50	1,5	260	720	102	2 100	1 300
–	RNA4844-XL	3 620	240	270	50	1,5	275	790	110	1 900	1 100
–	RNA4848-XL	5 400	265	300	60	2	400	1 080	150	1 700	950
–	RNA4852-XL	5 800	285	320	60	2	415	1 160	158	1 600	900
–	RNA4856-XL	9 300	305	350	69	2	510	1 300	175	1 500	850
–	RNA4860-XL	12 700	330	380	80	2,1	700	1 770	235	1 400	750
–	RNA4864-XL	13 400	350	400	80	2,1	710	1 850	242	1 300	700
–	RNA4868-XL	14 000	370	420	80	2,1	730	1 940	249	1 200	650
–	RNA4872-XL	14 800	390	440	80	2,1	740	2 020	255	1 200	600
–	RNA4876-XL	26 000	415	480	100	2,1	1 130	2 900	370	1 100	500

Needle roller bearings

With inner ring



NKI...XL ($d \leq 7$ mm)

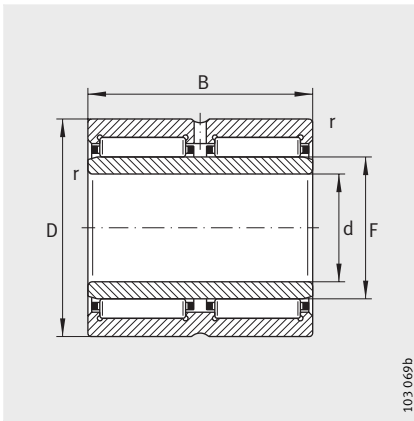


NKI...XL ($d \geq 9$ mm)
NKIS...XL, NA49...XL,
NA69...XL ($d \leq 30$ mm)

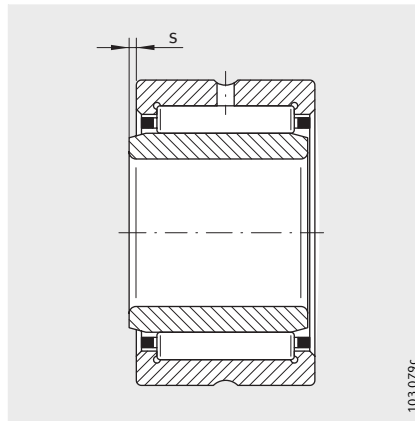
Dimension table · Dimensions in mm

Designation				Mass \approx g	Dimensions						Basic load ratings		Fatigue limit load C_{ur} kN	Limiting speed n_G min^{-1}	Reference speed n_B min^{-1}
NKI...XL	NA49...XL	NA69...XL	NKIS...XL		d	F	D	B	r	$s^1)$	dyn. C_r kN	stat. C_{0r} kN			
+ NKI5/12-TN-XL	-	-	-	11,5	5	8	15	12	0,3	1,5	4,45	4,1	0,69	32 000	38 000
+ NKI5/16-TN-XL	-	-	-	15,3	5	8	15	16	0,3	2	5,8	5,8	0,97	32 000	37 000
+ NKI6/12-TN-XL	-	-	-	13,5	6	9	16	12	0,3	1,5	5,1	5	0,84	30 000	33 000
+ NKI6/16-TN-XL	-	-	-	17,4	6	9	16	16	0,3	2	6,6	7,1	1,19	30 000	33 000
+ NKI7/12-TN-XL	-	-	-	13,7	7	10	17	12	0,3	1,5	5,3	5,5	0,93	29 000	30 000
+ NKI7/16-TN-XL	-	-	-	18,2	7	10	17	16	0,3	2	7	7,8	1,31	29 000	30 000
NKI9/12-XL	-	-	-	16,6	9	12	19	12	0,3	1,5	7,2	7,1	1,28	27 000	24 000
NKI9/16-XL	-	-	-	21,9	9	12	19	16	0,3	2	10,1	11	1,92	27 000	23 000
NKI10/16-XL	-	-	-	29,4	10	14	22	16	0,3	0,5	11,4	11,5	2,1	25 000	19 000
NKI10/20-XL	-	-	-	37,1	10	14	22	20	0,3	0,5	14,5	15,6	2,7	25 000	19 000
-	NA4900-XL	-	-	23	10	14	22	13	0,3	0,5	9,6	9,2	1,63	25 000	20 000
NKI12/16-XL	-	-	-	33,3	12	16	24	16	0,3	0,5	12,8	13,9	2,55	24 000	17 000
NKI12/20-XL	-	-	-	41,9	12	16	24	20	0,3	0,5	16,3	18,8	3,25	24 000	17 000
-	NA4901-XL	-	-	26	12	16	24	13	0,3	0,5	10,6	10,9	1,94	24 000	17 000
-	-	NA6901-XL	-	46	12	16	24	22	0,3	1	18,1	21,6	3,8	24 000	16 000
NKI15/16-XL	-	-	-	38,8	15	19	27	16	0,3	0,5	14,7	17,4	3,2	22 000	14 000
NKI15/20-XL	-	-	-	48,7	15	19	27	20	0,3	0,5	18,7	23,6	4,15	22 000	14 000
-	NA4902-XL	-	-	34	15	20	28	13	0,3	0,5	12	13,6	2,43	22 000	14 000
-	-	NA6902-XL	-	63,6	15	20	28	23	0,3	1	19,5	25,5	4,45	22 000	13 000
-	-	-	NKIS15-XL	92	15	22	35	20	0,6	0,5	27,5	28	4,9	20 000	11 000
NKI17/16-XL	-	-	-	42,4	17	21	29	16	0,3	0,5	15,2	18,7	3,45	21 000	13 000
NKI17/20-XL	-	-	-	53,4	17	21	29	20	0,3	0,5	19,3	25,5	4,45	21 000	13 000
-	NA4903-XL	-	-	37	17	22	30	13	0,3	0,5	12,4	14,6	2,6	21 000	12 000
-	-	NA6903-XL	-	72	17	22	30	23	0,3	1	21,1	29	5,1	21 000	11 000
-	-	-	NKIS17-XL	98	17	24	37	20	0,6	0,5	29,5	31	5,4	18 000	10 000

+ With closing rings, without lubrication hole and groove.



NA69...ZW-XL ($d \geq 32$ mm)

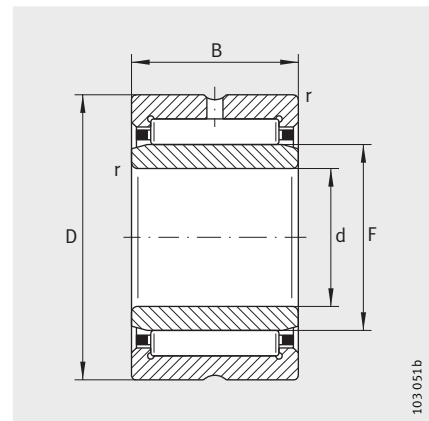


1) Axial displacement "s"

Dimension table (continued) · Dimensions in mm															
Designation				Mass ≈g	Dimensions						Basic load ratings		Fatigue limit load C_{ur} kN	Limiting speed n_G min ⁻¹	Reference speed n_B min ⁻¹
NKI...-XL	NA49...-XL	NA69...-XL	NKIS...-XL		d	F	D	B	r	s ¹⁾	dyn. C_r kN	stat. C_{0r} kN			
NKI20/16-XL	-	-	-	49	20	24	32	16	0,3	0,5	16,9	22,3	4,1	19 000	12 000
NKI20/20-XL	-	-	-	61	20	24	32	20	0,3	0,5	21,4	30,5	5,3	19 000	12 000
-	NA4904-XL	-	-	75,2	20	25	37	17	0,3	0,8	23,7	25,5	4,6	17 000	11 000
-	-	NA6904-XL	-	141	20	25	37	30	0,3	1	40,5	51	9,1	17 000	10 000
-	-	-	NKIS20-XL	129	20	28	42	20	0,6	0,5	32,5	36,5	6,4	16 000	9 000
NKI22/16-XL	-	-	-	52	22	26	34	16	0,3	0,5	17,3	23,6	4,35	18 000	11 000
NKI22/20-XL	-	-	-	65,4	22	26	34	20	0,3	0,5	22	32	5,6	18 000	11 000
-	NA49/22-XL	-	-	80	22	28	39	17	0,3	0,8	26	29,5	5,3	16 000	9 500
-	-	NA69/22-XL	-	150	22	28	39	30	0,3	0,5	42	55	9,9	16 000	9 000
NKI25/20-TN-XL	-	-	-	75,8	25	29	38	20	0,3	1	27,5	39	6,8	16 000	10 000
NKI25/30-XL	-	-	-	124	25	29	38	30	0,3	1,5	37	57	10,6	16 000	9 500
-	NA4905-XL	-	-	88	25	30	42	17	0,3	0,8	26,5	31,5	5,7	15 000	9 500
-	-	NA6905-XL	-	161	25	30	42	30	0,3	1	44	59	10,6	15 000	9 000
-	-	-	NKIS25-XL	162	25	32	47	22	0,6	1	38	43,5	7,4	14 000	8 500
NKI28/20-TN-XL	-	-	-	92,4	28	32	42	20	0,3	1	29,5	44,5	7,8	14 000	9 000
NKI28/30-XL	-	-	-	146	28	32	42	30	0,3	1,5	39	63	11,7	14 000	9 000
-	NA49/28-XL	-	-	97,7	28	32	45	17	0,3	0,8	27,5	33,5	6,1	13 000	8 500
-	-	NA69/28-XL	-	182	28	32	45	30	0,3	1	45,5	63	11,4	13 000	8 500
NKI30/20-TN-XL	-	-	-	108	30	35	45	20	0,3	0,5	31	48,5	8,5	13 000	8 500
NKI30/30-TN-XL	-	-	-	165	30	35	45	30	0,3	1	46	81	15	13 000	8 000
-	NA4906-XL	-	-	101	30	35	47	17	0,3	0,8	28,5	35,5	6,4	13 000	8 000
-	-	NA6906-XL	-	192	30	35	47	30	0,3	1	49	71	12,9	13 000	7 500
-	-	-	NKIS30-XL	184	30	37	52	22	0,6	1	41,5	50	8,6	12 000	7 500
NKI32/20-XL	-	-	-	118	32	37	47	20	0,3	0,5	28	43,5	7,6	12 000	8 000
NKI32/30-XL	-	-	-	180	32	37	47	30	0,3	1	42	73	13,5	12 000	8 000
-	NA49/32-XL	-	-	158	32	40	52	20	0,6	0,8	34,5	47,5	8,9	12 000	7 000
-	-	NA69/32-ZW-XL	-	288	32	40	52	36	0,6	0,5	53	82	15,1	12 000	7 000
NKI35/20-TN-XL	-	-	-	122	35	40	50	20	0,3	0,5	33,5	56	9,8	12 000	7 500
NKI35/30-XL	-	-	-	193	35	40	50	30	0,3	1	44	79	14,6	12 000	7 500
-	NA4907-XL	-	-	170	35	42	55	20	0,6	0,8	35,5	50	9,4	11 000	7 000
-	-	NA6907-ZW-XL	-	310	35	42	55	36	0,6	0,5	54	86	15,9	11 000	7 000
-	-	-	NKIS35-XL	220	35	43	58	22	0,6	0,5	44	57	9,8	11 000	6 500

Needle roller bearings

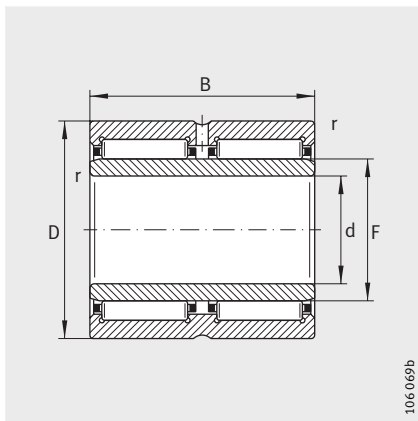
With inner ring



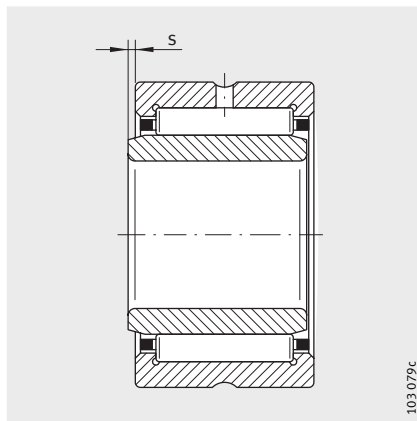
NKI...XL, NKIS...XL, NA49...XL



Dimension table (continued) · Dimensions in mm															
Designation				Mass ≈g	Dimensions						Basic load ratings		Fatigue limit load C _{ur} kN	Limiting speed n _G min ⁻¹	Reference speed n _B min ⁻¹
NKI...XL	NA 49...XL	NA69...XL	NKIS...XL		d	F	D	B	r	s ¹⁾	dyn. C _r kN	stat. C _{0r} kN			
								min.							
NKI38/20	-	-	-	136	38	43	53	20	0,3	0,5	30,5	51	8,9	11 000	7 000
NKI38/30	-	-	-	207	38	43	53	30	0,3	1	45,5	85	15,8	11 000	7 000
NKI40/20-TN-XL	-	-	-	136	40	45	55	20	0,3	0,5	35	62	10,8	10 000	7 000
NKI40/30-TN-XL	-	-	-	216	40	45	55	30	0,3	1	52	103	19,1	10 000	6 500
-	NA4908-XL	-	-	230	40	48	62	22	0,6	1	48,5	67	11,5	9 500	6 000
-	-	NA6908-ZW-XL	-	430	40	48	62	40	0,6	0,5	74	116	19,4	9 500	6 000
-	-	-	NKIS40-XL	281	40	50	65	22	1	0,5	48	67	11,5	9 500	5 500
NKI42/20-XL	-	-	-	148	42	47	57	20	0,3	0,5	32,5	56	9,9	10 000	6 500
NKI42/30-XL	-	-	-	222	42	47	57	30	0,3	1	48,5	94	17,5	10 000	6 500
NKI45/25-TN-XL	-	-	-	217	45	50	62	25	0,6	1,5	48,5	87	14,8	9 000	6 500
NKI45/35-TN-XL	-	-	-	308	45	50	62	35	0,6	2	67	132	23,9	9 000	6 000
-	NA4909-XL	-	-	271	45	52	68	22	0,6	1	51	73	12,6	8 500	5 500
-	-	NA6909-ZW-XL	-	495	45	52	68	40	0,6	0,5	79	127	21,4	8 500	5 500
-	-	-	NKIS45-XL	336	45	55	72	22	1	0,5	51	74	12,7	8 500	5 500
NKI50/25-XL	-	-	-	270	50	55	68	25	0,6	1,5	45,5	82	14	8 500	6 000
NKI50/35-XL	-	-	-	379	50	55	68	35	0,6	2	60	118	21,3	8 500	6 000
-	NA4910-XL	-	-	274	50	58	72	22	0,6	1	53	80	13,8	8 000	5 000
-	-	NA6910-ZW-XL	-	515	50	58	72	40	0,6	0,5	82	139	23,4	8 000	4 900
-	-	-	NKIS50-XL	518	50	60	80	28	1,1	2	71	98	17,3	7 500	5 000
NKI55/25-TN-XL	-	-	-	255	55	60	72	25	0,6	1,5	47,5	90	15,4	7 500	5 500
NKI55/35-XL	-	-	-	379	55	60	72	35	0,6	2	63	130	23,5	7 500	5 500
-	NA4911-XL	-	-	393	55	63	80	25	1	1,5	65	100	17,3	7 500	4 700
-	-	NA6911-ZW-XL	-	780	55	63	80	45	1	1,5	102	176	30	7 500	4 700
-	-	-	NKIS55-XL	558	55	65	85	28	1,1	2	75	108	19,1	7 000	4 700
NKI60/25-XL	-	-	-	394	60	68	82	25	0,6	1	49,5	89	15,2	7 000	4 900
NKI60/35-XL	-	-	-	553	60	68	82	35	0,6	1	70	139	25,5	7 000	4 800
-	NA4912-XL	-	-	426	60	68	85	25	1	1,5	68	108	18,8	7 000	4 300
-	-	NA6912-ZW-XL	-	808	60	68	85	45	1	1,5	106	191	32,5	7 000	4 300
-	-	-	NKIS60-XL	560	60	70	90	28	1,1	2	77	113	20	6 500	4 500



NA69..-XL



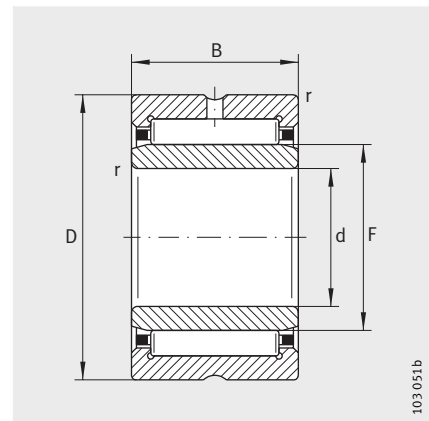
1) Axial displacement "s"

Dimension table (continued) · Dimensions in mm

Designation				Mass ≈g	Dimensions						Basic load ratings		Fatigue limit load C_{ur} kN	Limiting speed n_G min ⁻¹	Reference speed n_B min ⁻¹
NKI..-XL	NA49..-XL	NA69..-XL	NKIS..-XL		d	F	D	B	r	$s^1)$	dyn. C_r kN	stat. C_{0r} kN			
NKI65/25-XL	-	-	-	467	65	73	90	25	1	1	60	100	17,5	6 500	4 600
NKI65/35-XL	-	-	-	659	65	73	90	35	1	1	85	156	27	6 500	4 400
-	NA4913-XL	-	-	456	65	72	90	25	1	1,5	69	112	19,5	6 500	4 100
-	-	NA6913-ZW-XL	-	833	65	72	90	45	1	1,5	108	198	33,5	6 500	4 100
-	-	-	NKIS65-XL	641	65	75	95	28	1,1	2	81	123	21,9	6 000	4 200
NKI70/25-XL	-	-	-	521	70	80	95	25	1	0,8	63	119	19,7	6 000	4 100
NKI70/35-XL	-	-	-	737	70	80	95	35	1	0,8	89	184	32,5	6 000	4 000
-	NA4914-XL	-	-	728	70	80	100	30	1	1,5	95	156	27,5	6 000	3 800
-	-	NA6914-ZW-XL	-	1340	70	80	100	54	1	1	145	265	47,5	6 000	3 800
NKI75/25-XL	-	-	-	641	75	85	105	25	1	1	78	123	21,7	5 500	3 900
NKI75/35-XL	-	-	-	908	75	85	105	35	1	1	111	193	34,5	5 500	3 800
-	NA4915-XL	-	-	775	75	85	105	30	1	1,5	97	162	28,5	5 500	3 600
-	-	NA6915-ZW-XL	-	1 450	75	85	105	54	1	1	147	275	49,5	5 500	3 500
NKI80/25-XL	-	-	-	677	80	90	110	25	1	1	81	132	23,3	5 000	3 700
NKI80/35-XL	-	-	-	959	80	90	110	35	1	1	116	208	37	5 000	3 600
-	NA4916-XL	-	-	878	80	90	110	30	1	1,5	101	174	30,5	5 000	3 400
-	-	NA6916-ZW-XL	-	1 522	80	90	110	54	1	1	153	300	53	5 000	3 200
NKI85/26-XL	-	-	-	743	85	95	115	26	1	1,5	83	137	24	4 900	3 600
NKI85/36-XL	-	-	-	1 040	85	95	115	36	1	1,5	121	223	39,5	4 900	3 400
-	NA4917-XL	-	-	1 250	85	100	120	35	1,1	1	125	237	41,5	4 800	3 100
-	-	NA6917-ZW-XL	-	2 200	85	100	120	63	1,1	1	188	400	71	4 800	2 800
NKI90/26-XL	-	-	-	778	90	100	120	26	1	1,5	86	146	25	4 700	3 500
NKI90/36-XL	-	-	-	1 090	90	100	120	36	1	1,5	125	237	41,5	4 700	3 300
-	NA4918-XL	-	-	1 312	90	105	125	35	1,1	1	129	250	43,5	4 600	3 000
-	-	NA6918-ZW-XL	-	2 310	90	105	125	63	1,1	1	195	425	74	4 600	2 600
NKI95/26-XL	-	-	-	816	95	105	125	26	1	1,5	89	155	26,5	4 500	3 300
NKI95/36-XL	-	-	-	1 145	95	105	125	36	1	1,5	129	250	43,5	4 500	3 200
-	NA4919-XL	-	-	1 371	95	110	130	35	1,1	1	131	260	44,5	4 400	2 800
-	-	NA6919-ZW-XL	-	2 500	95	110	130	63	1,1	1	197	440	76	4 400	2 500

Needle roller bearings

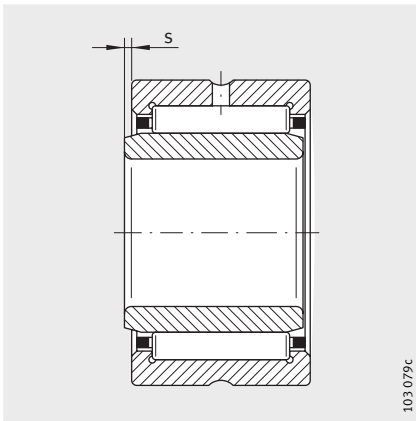
With inner ring



NKI...-XL, NA49...-XL, NA48...-XL



Designation			Mass ≈g	Dimensions						Basic load ratings		Fatigue limit load C_{ur} kN	Limiting speed n_G min^{-1}	Reference speed n_B min^{-1}
NKI...-XL	NA49...-XL	NA48...-XL		d	F	D	B	r	$s^1)$	dyn. C_r kN	stat. C_{0r} kN			
NKI100/30-XL	–	–	990	100	110	130	30	1,1	1,5	111	210	35,5	4 300	3 100
NKI100/40-XL	–	–	1 330	100	110	130	40	1,1	2	143	290	50	4 300	3 000
–	NA4920-XL	–	1 900	100	115	140	40	1,1	2	144	270	45,5	4 100	2 900
–	NA4922-XL	–	2 070	110	125	150	40	1,1	2	149	290	47,5	3 800	2 600
–	–	NA4822-XL	1 080	110	120	140	30	1	0,8	106	216	36	3 900	2 700
–	NA4924-XL	–	2 860	120	135	165	45	1,1	2	205	390	64	3 400	2 300
–	–	NA4824-XL	1 170	120	130	150	30	1	0,8	112	239	39	3 600	2 400
–	NA4926-XL	–	3 900	130	150	180	50	1,5	1,5	229	470	74	3 200	2 000
–	–	NA4826-XL	1 810	130	145	165	35	1,1	1	134	310	48,5	3 300	2 100
–	NA4928-XL	–	4 150	140	160	190	50	1,5	1,5	237	500	78	3 000	1 800
–	–	NA4828-XL	1 920	140	155	175	35	1,1	1	136	325	50	3 100	2 000
–	–	NA4830-XL	2 720	150	165	190	40	1,1	1,5	172	400	62	2 900	1 800
–	–	NA4832-XL	2 890	160	175	200	40	1,1	1,5	181	435	66	2 700	1 700
–	–	NA4834-XL	3 960	170	185	215	45	1,1	1,5	209	510	75	2 500	1 600
–	–	NA4836-XL	4 200	180	195	225	45	1,1	1,5	219	550	80	2 400	1 500
–	–	NA4838-XL	5 610	190	210	240	50	1,5	1,5	255	690	100	2 300	1 300



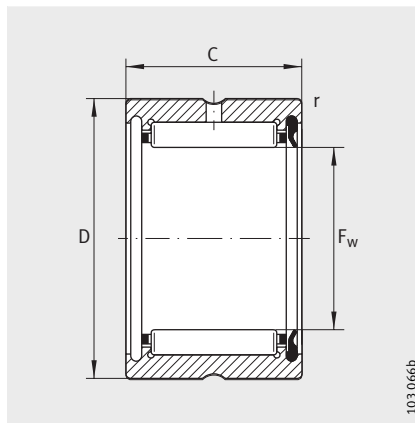
1) Axial displacement "s"

Dimension table (continued) · Dimensions in mm

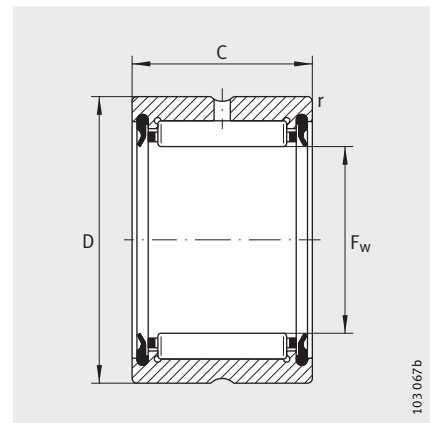
Designation	Mass ≈g	Dimensions						Basic load ratings		Fatigue limit load C _{ur} kN	Limiting speed n _G min ⁻¹	Reference speed n _B min ⁻¹
		d	F	D	B	r	s ¹⁾	dyn. C _r kN	stat. C _{0r} kN			
NA4840-XL	5 840	200	220	250	50	1,5	1,5	260	720	102	2 200	1 200
NA4844-XL	6 380	220	240	270	50	1,5	1,5	275	790	110	2 000	1 100
NA4848-XL	10 000	240	265	300	60	2	2	400	1 080	150	1 800	950
NA4852-XL	10 600	260	285	320	60	2	2	415	1 160	158	1 700	850
NA4856-XL	15 300	280	305	350	69	2	2,5	510	1 300	175	1 600	850
NA4860-XL	21 800	300	330	380	80	2,1	2	700	1 770	235	1 400	700
NA4864-XL	23 000	320	350	400	80	2,1	2	710	1 850	242	1 400	650
NA4868-XL	24 200	340	370	420	80	2,1	2	730	1 940	249	1 300	600
NA4872-XL	25 600	360	390	440	80	2,1	2	740	2 020	255	1 200	600
NA4876-XL	42 600	380	415	480	100	2,1	2	1 130	2 900	370	1 100	500

Needle roller bearings

Without inner ring, sealed



RNA49..RSR-XL



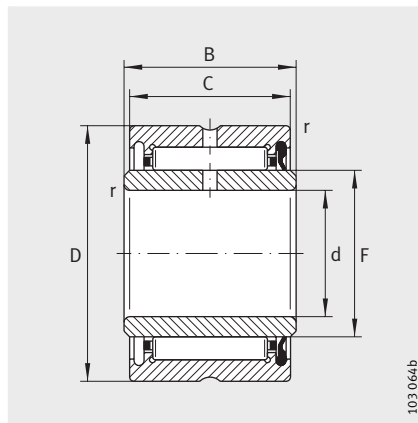
RNA49..-2RSR-XL

Dimension table · Dimensions in mm

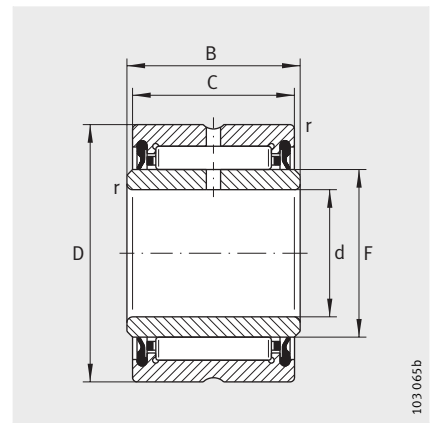
Designation		Mass ≈g	Dimensions				Basic load ratings		Fatigue limit load C _{ur} kN	Limiting speed n _G Grease min ⁻¹
RNA49..-RSR-XL	RNA49..-2RSR-XL		F _w	D	C	r min.	dyn. C _r kN	stat. C _{0r} kN		
RNA4900-RSR-XL	RNA4900-2RSR-XL	16	14	22	13	0,3	7,7	6,9	1,36	13 000
RNA4901-RSR-XL	RNA4901-2RSR-XL	18	16	24	13	0,3	8,6	8,3	1,63	12 000
RNA4902-RSR-XL	RNA4902-2RSR-XL	21,5	20	28	13	0,3	9,7	10,3	2,04	10 000
RNA4903-RSR-XL	RNA4903-2RSR-XL	23	22	30	13	0,3	10	11	2,18	9 000
RNA4904-RSR-XL	RNA4904-2RSR-XL	56	25	37	17	0,3	19,5	19,9	3,75	7 500
RNA4905-RSR-XL	RNA4905-2RSR-XL	60	30	42	17	0,3	21,8	24,2	4,55	6 500
RNA4906-RSR-XL	RNA4906-2RSR-XL	69	35	47	17	0,3	23,9	28,5	5,4	5 500
RNA4907-RSR-XL	RNA4907-2RSR-XL	107	42	55	20	0,6	29,5	39,5	7,2	4 800
RNA4908-RSR-XL	RNA4908-2RSR-XL	154	48	62	22	0,6	41	53	8,8	4 200
RNA4909-RSR-XL	RNA4909-2RSR-XL	157	52	68	22	0,6	43	59	9,7	3 900
RNA4910-RSR-XL	RNA4910-2RSR-XL	160	58	72	22	0,6	45	64	10,6	3 500

Needle roller bearings

With inner ring, sealed



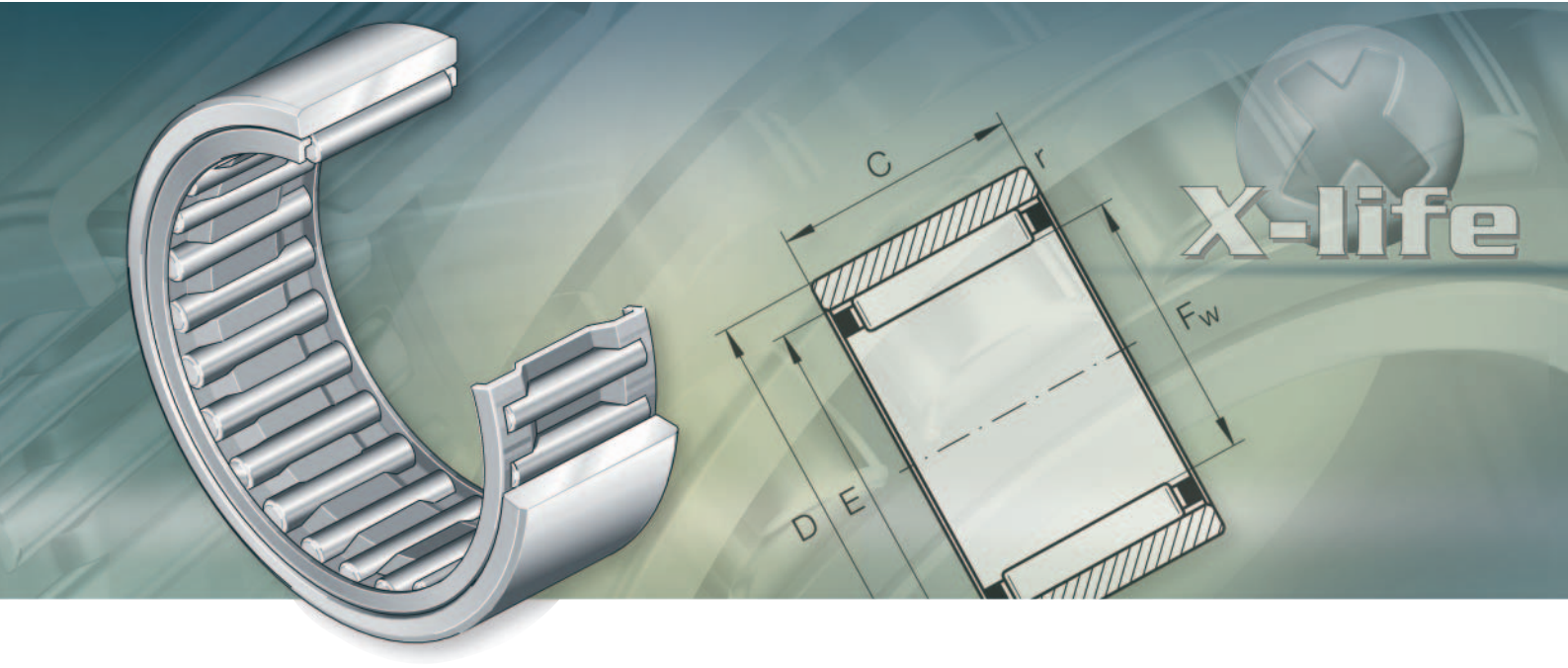
NA49..-RSR-XL



NA49..-2RSR-XL

Dimension table · Dimensions in mm

Designation		Mass ≈ g	Dimensions						Basic load ratings		Fatigue limit load C _{ur} kN	Limiting speed n _G Grease min ⁻¹
NA49..-RSR-XL	NA49..-2RSR-XL		d	F	D	C	B	r	dyn. C _r kN	stat. C _{0r} kN		
NA4900-RSR-XL	NA 4900-2RSR-XL	24,5	10	14	22	13	14	0,3	7,7	6,9	1,36	13 000
NA4901-RSR-XL	NA 4901-2RSR-XL	27,5	12	16	24	13	14	0,3	8,6	8,3	1,63	12 000
NA4902-RSR-XL	NA 4902-2RSR-XL	37	15	20	28	13	14	0,3	9,7	10,3	2,04	10 000
NA4903-RSR-XL	NA 4903-2RSR-XL	40	17	22	30	13	14	0,3	10	11	2,18	9 000
NA4904-RSR-XL	NA 4904-2RSR-XL	80	20	25	37	17	18	0,3	19,5	19,9	3,75	7 500
NA4905-RSR-XL	NA 4905-2RSR-XL	89,5	25	30	42	17	18	0,3	21,8	24,2	4,55	6 500
NA4906-RSR-XL	NA 4906-2RSR-XL	104	30	35	47	17	18	0,3	23,9	28,5	5,4	5 500
NA4907-RSR-XL	NA 4907-2RSR-XL	175	35	42	55	20	21	0,6	29,5	39,5	7,2	4 800
NA4908-RSR-XL	NA 4908-2RSR-XL	252	40	48	62	22	23	0,6	41	53	8,8	4 200
NA4909-RSR-XL	NA 4909-2RSR-XL	290	45	52	68	22	23	0,6	43	59	9,7	3 900
NA4910-RSR-XL	NA 4910-2RSR-XL	295	50	58	72	22	23	0,6	45	64	10,6	3 500



Needle roller bearings without ribs

Needle roller bearings without ribs

Features	Needle roller bearings without inner ring	28
	Needle roller bearings with inner ring.....	29
	Operating temperature	30
	Cages	30
	Suffixes	30
Design and safety guidelines	Design of bearing arrangements for bearings with inner ring	30
	Raceways for bearings without inner ring	30
	Minimum radial load.....	30
	Sealing rings/wider inner rings	30
	Axial guidance of needle roller and cage assemblies	31
	Radial location.....	31
	Axial location	31
Accuracy	Radial internal clearance	31
	Enveloping circle	31
Dimension tables	Needle roller bearings without ribs, without inner ring	32
	Needle roller bearings without ribs, with inner ring	34

Needle roller bearings without ribs

Features

Needle roller bearings are single or double row units comprising machined outer rings without ribs, needle roller and cage assemblies and removable inner rings.

The bearings are not self-retaining. This means that the outer ring, needle roller and cage assembly and inner ring can be fitted independently of each other.

Sealing/lubricant

Needle roller bearings without ribs are unsealed and are not supplied greased.

Double row bearings can be lubricated via a lubrication groove and lubrication hole in the outer ring.

Needle roller bearings without inner ring

Bearings of type RNAO have particularly compact radial dimensions, *Figure 1*. However, they require a shaft raceway that is hardened and ground.

The needle roller and cage assembly can be fitted either together with the outer ring or with the shaft. It can also be subsequently slid between the outer ring and shaft.

The double row design is indicated by the suffix ZW, the lubrication hole and lubrication groove are indicated by the suffix ASR1, *Figure 2*.

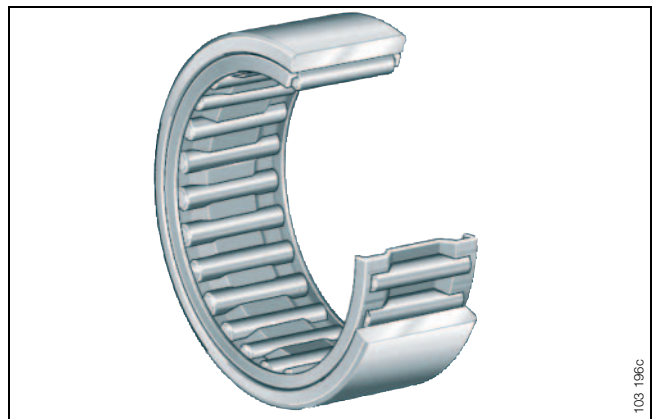


Figure 1 · Single row bearings
RNAO..-XL

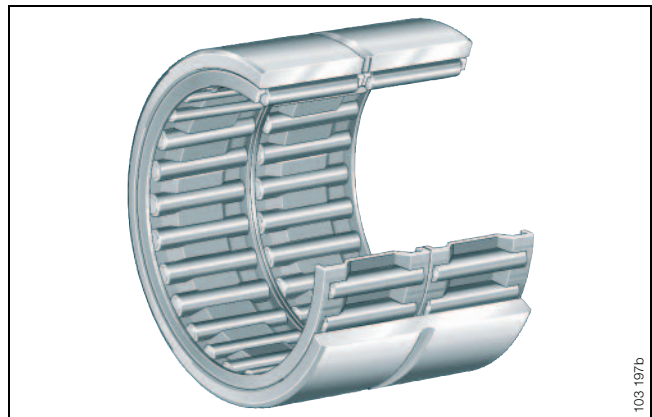


Figure 2 · Double row bearings
RNAO..-ZW-ASR1-XL

Needle roller bearings with inner ring

Bearings of type NAO are used if the shaft cannot be configured as a rolling bearing raceway, *Figure 3*.

The needle roller and cage assembly can be fitted either together with the outer ring or with the inner ring. It can also be subsequently slid between the outer ring and inner ring.

Bearings with a lubrication hole in the inner ring have the suffix IS1.

The double row design is indicated by the suffix ZW, the lubrication hole and lubrication groove are indicated by the suffix ASR1, *Figure 4*.

Axial displacement of the inner ring

The standard inner ring allows axial displacement within the values "s" stated in the dimension tables.

Where larger displacements occur, the standard ring can be replaced by a wider inner ring IR.



Figure 3 · Single row bearings
NAO..-XL



Figure 4 · Double row bearings
NAO..-ZW-ASR1-XL

Needle roller bearings without ribs

Operating temperature

Bearings with plastic cage can be used at operating temperatures from -20 °C to $+120\text{ °C}$.

Cages

The cages made from sheet steel or plastic. Plastic cages have the suffix TN.

Suffixes

Suffixes for the available designs: see table.

Available designs

Suffix	Description
ASR1 ²⁾	Lubrication hole and lubrication groove in outer ring
CN	Normal radial internal clearance
IS1 ²⁾	Lubrication hole in inner ring
TN ¹⁾²⁾	Cage made from glass fibre reinforced polyamide 66
XL	Bearings in X-life design
ZW ²⁾	Double row

¹⁾ Bearings with plastic cage: see dimension tables.

²⁾ Dependent on size.

Design and safety guidelines

Design of bearing arrangements for bearings with inner ring

Shaft and housing tolerances for bearings with inner ring: see “INA Catalogue 307”.

Raceways for bearings without inner ring

In the case of bearings without an inner ring, the rolling element raceway on the shaft must be hardened and ground.

The surface hardness of the raceway must be $670\text{ HV} + 170\text{ HV}$ and the hardness depth Eht or Rht must be sufficiently large.

Raceway design

Shaft diameter Nominal dimension mm	Shaft tolerance			Roughness max.	Roundness max.	Parallelism max.	
	Operating clearance						
over	incl.	Small	Normal	Large			
–	65	k5	h5	g6	R _a 0,1 (R _z 0,4)	25% of diameter tolerance	50% of diameter tolerance
65	80	k5	h5	f6			
80	120	k5	g5	f6	R _a 0,15 (R _z 0,63)		



The values apply to housing tolerances up to K7. For tighter housing bores, the operating clearance should be checked by either calculation or measurement.

Minimum radial load

In order to ensure operation without slippage, the bearings must be subjected to a minimum radial load $F_{r\text{ min}}$. This applies in particular to high speed bearings since, if the radial load is insufficient or not present, damaging sliding motion may occur between the rolling elements and raceways.

In continuous operation, therefore, a minimum radial load of magnitude $C_r/P < 50$ is necessary.

Sealing rings/wider inner rings

Sealing rings of series G, GR and SD are matched to the bearing dimensions and can be combined with wider inner rings of series IR. The outer surface of the inner rings can be used as the sliding surface for seal lips.

Sealing rings: see “INA publication GSD”.



Sealing rings must not be used as running surfaces for the cage.

Axial guidance of needle roller and cage assemblies

In bearings without ribs, the needle roller and cage assemblies must be axially guided on lateral, burr-free running surfaces, see dimension tables.



The axial running surfaces for the cage must be precision machined ($R_a \leq 2$) and resistant to wear. The mounting dimensions in the dimension tables must be taken into consideration.

Radial location

Needle roller bearings with inner ring are radially located by means of a close fit on the shaft and in the housing.

Axial location

In order to prevent lateral creep of the bearing rings, they must be located by means of physical locking.

The abutting shoulders (shaft, housing) should be sufficiently high and perpendicular to the bearing axis.

The transition from the bearing seat to the abutting shoulder should be designed with rounding to DIN 5 418 or an undercut to DIN 509. The minimum values for the chamfer dimensions r as given in the dimension tables must be observed.

The overlap between the snap rings and the end faces of the bearing rings must be sufficiently large.

The maximum chamfer dimensions for the inner rings to DIN 620-6 must be taken into consideration.

Accuracy

The dimensional and geometrical tolerances correspond to tolerance class PN to DIN 620.

Radial internal clearance

Bearings with inner ring have a radial internal clearance of CN, see table "Radial internal clearance".

Radial internal clearance to DIN 620-4

Bore		Radial internal clearance	
d mm		CN μm	
over	incl.	min.	max.
–	24	20	45
24	30	20	45
30	40	25	50
40	50	30	60
50	65	40	70
65	80	40	75
80	100	50	85
100	120	50	90

Enveloping circle

For bearings without inner ring, the decisive factor is not the radial internal clearance but the enveloping circle diameter F_w .

The enveloping circle is the inner inscribed circle of the needle rollers in clearance-free contact with the outer raceway.

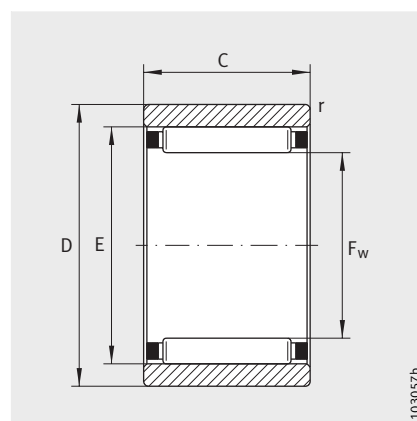
For bearings before fitting, the enveloping circle F_w is in the tolerance zone F6.



If an F6 tolerance zone is required for the enveloping circle diameter, the parts as delivered (outer ring/needle roller and cage assembly as a matched pair) must not be interchanged with other matched pairs.

Needle roller bearings without ribs

Without inner ring

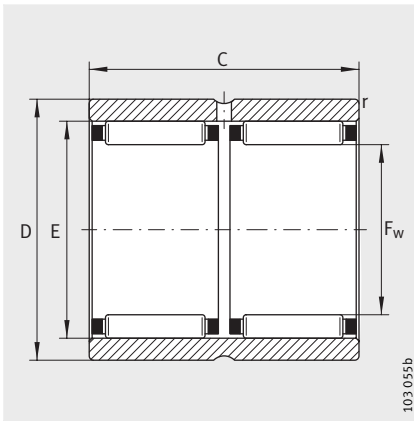


RNAO..XL

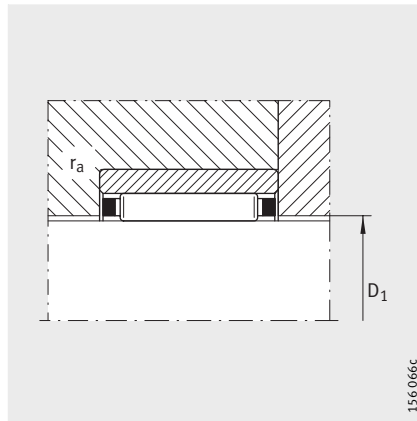
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Dimension table · Dimensions in mm

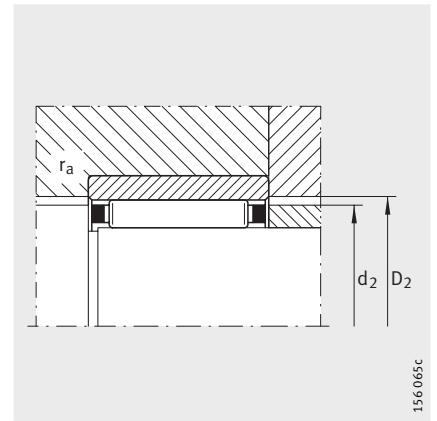
Designation	Mass ≈g	Dimensions					Mounting dimensions				Basic load ratings		Fatigue limit load C _{ur} kN	Limiting speed n _G min ⁻¹	Reference speed n _B min ⁻¹
		F _w	D	C	E	r min.	D ₁	d ₂	D ₂	r _a max.	dyn. C _r kN	stat. C _{0r} kN			
RNAO5X10X8-TN-XL	3	5	10	8	8	0,15	5,3	7,7	8,3	0,1	2,65	1,92	0,295	37 000	60 000
RNAO6X13X8-TN-XL	6	6	13	8	9	0,3	6,3	8,7	9,3	0,3	2,95	2,28	0,355	32 000	55 000
RNAO7X14X8-TN-XL	6	7	14	8	10	0,3	7,3	9,7	10,3	0,3	3,25	2,65	0,41	31 000	48 000
RNAO8X15X10-TN-XL	8	8	15	10	11	0,3	8,3	10,7	11,3	0,3	4,45	4,1	0,69	29 000	41 000
RNAO10X17X10-TN-XL	10	10	17	10	13	0,3	10,3	12,7	13,3	0,3	5,3	5,5	0,93	27 000	33 000
RNAO12X22X12-TN-XL	19	12	22	12	18	0,3	12,3	17,6	18,3	0,3	11,3	9,9	1,74	24 000	23 000
RNAO15X23X13-XL	20	15	23	13	19	0,3	15,4	18,6	19,3	0,3	9,7	10,9	1,76	23 000	21 000
RNAO16X24X13-XL	21	16	28	12	20	0,3	16,4	19,6	20,3	0,3	10,1	11,8	1,89	22 000	20 000
RNAO16X28X12-XL	32	16	28	12	22	0,3	16,4	21,6	22,3	0,3	13	12,5	2,21	21 000	19 000
RNAO17X25X13	22	17	25	13	21	0,3	17,4	20,6	21,3	0,3	11,7	14,6	2,24	22 000	18 000
RNAO18X30X24-ZW-ASR1-XL	69	18	30	24	24	0,3	18,4	23,6	24,5	0,3	24,8	30	5,3	20 400	17 300
RNAO20X28X13-XL	25	20	28	13	24	0,3	20,4	23,6	24,3	0,3	11,1	14,3	2,31	20 000	16 000
RNAO20X28X26-ZW-ASR1-XL	50	20	28	26	24	0,3	20,4	23,6	24,3	0,3	19	28,5	4,6	20 000	16 000
RNAO20X32X12-XL	38	20	32	12	26	0,3	20,4	25,6	26,5	0,3	15,1	16,2	2,85	19 000	15 000
RNAO22X30X13-XL	27	22	30	13	26	0,3	22,4	25,6	26,3	0,3	11,8	15,9	2,55	19 000	15 000
RNAO22X35X16-XL	59	22	35	16	29	0,3	22,4	28,4	29,5	0,3	22,6	25,5	4,2	17 000	13 000
RNAO25X35X17-XL	53	25	35	17	29	0,3	25,6	28,4	29,5	0,3	16,8	26	4,25	16 000	13 000
RNAO25X35X26-ZW-ASR1-XL	76	25	35	26	29	0,3	25,6	28,4	29,5	0,3	21,9	37	5,9	16 000	13 000
RNAO25X37X16-XL	60	25	37	16	32	0,3	25,6	31,4	32,5	0,3	23,8	28	4,65	16 000	12 000
RNAO30X40X17-XL	60	30	40	17	35	0,3	30,6	34,4	35,5	0,3	22,1	34	5,3	14 000	10 000
RNAO30X42X16-XL	59	30	42	16	37	0,3	30,6	36,4	37,5	0,3	26	33,5	5,5	14 000	10 000
RNAO30X42X32-ZW-ASR1-XL	137	30	42	32	37	0,3	30,6	36,4	37,5	0,3	45	67	11	14 000	10 000
RNAO35X45X13-XL	53	35	45	13	40	0,3	35,6	39,4	40,5	0,3	18,3	28	4,45	12 000	9 000
RNAO35X45X17-XL	69	35	45	17	40	0,3	35,6	39,4	40,5	0,3	23,5	38,5	6,1	12 000	9 000
RNAO35X45X26-ZW-ASR1-XL	91	35	45	26	40	0,3	35,6	39,4	40,5	0,3	31,5	56	8,9	12 000	9 000
RNAO35X47X16-XL	78	34	47	16	42	0,3	35,6	41,4	42,5	0,3	27,5	37,5	6,2	12 000	9 000
RNAO35X47X18-XL	89	35	47	16	42	0,3	35,6	41,4	42,5	0,3	31	43	7,4	12 000	8 500
RNAO35X47X32-ZW-ASR1-XL	156	35	47	32	42	0,3	35,6	41,4	42,5	0,3	47,5	75	12,4	12 000	9 000



RNAO..-ZW-ASR1-XL



Axial guidance of needle roller and cage assembly in housing



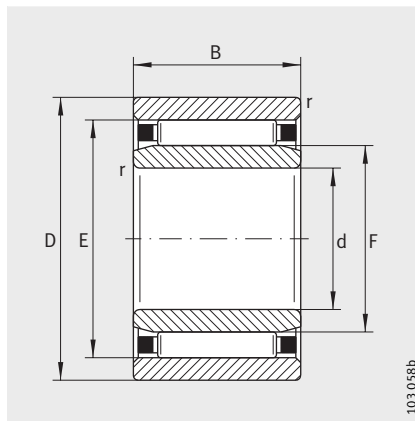
Axial guidance of needle roller and cage assembly on shaft

Dimension table (continued) · Dimensions in mm

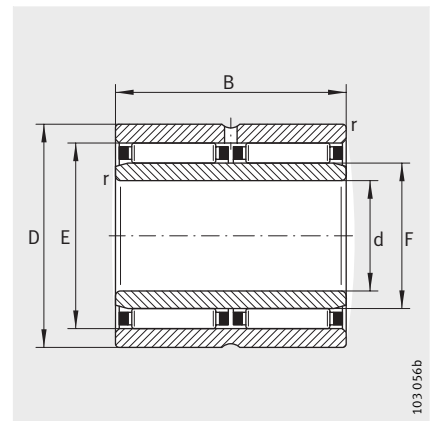
Designation	Mass ≈ g	Dimensions					Mounting dimensions				Basic load ratings		Fatigue limit load C _{ur} kN	Limiting speed n _G min ⁻¹	Reference speed n _B min ⁻¹
		F _w	D	C	E	r	D ₁	d ₂	D ₂	r _a	dyn. C _r kN	stat. C _{0r} kN			
RNAO40X50X17-XL	74	40	50	17	45	0,3	40,6	44,4	45,5	0,3	24,2	41,5	6,4	11 000	8 000
RNAO40X50X34-ZW-ASR1-XL	152	40	50	34	45	0,3	40,6	44,4	45,5	0,3	41,5	8,3	12,9	11 000	7 000
RNAO40X55X20-XL	145	40	55	20	47	0,3	40,6	46,2	47,5	0,3	37	57	8,9	11 000	8 500
RNAO40X55X40-ZW-ASR1-XL	275	40	55	40	48	0,3	40,6	47,2	47,5	0,3	70	118	18,7	10 000	7 500
RNAO45X55X17-XL	83	45	55	17	50	0,3	45,6	49,2	50,5	0,3	25,5	46	7,1	10 000	7 500
RNAO45X62X40-ZW-ASR1-XL	377	45	62	40	53	0,3	45,6	52,2	53,5	0,3	76	135	21,5	9 000	7 000
RNAO50X62X20-XL	140	50	62	20	55	0,3	50,6	54,2	55,8	0,3	30	60	9,6	9 000	7 000
RNAO50X65X20-XL	168	50	65	20	58	0,3	50,6	57,2	58,5	0,3	40,5	62	10,8	8 500	6 500
RNAO50X65X40-ZW-ASR1-XL	355	50	65	40	58	0,6	50,6	57,2	58,5	0,6	69	124	21,7	8 500	6 500
RNAO55X68X20-XL	166	55	68	20	60	0,6	55,8	59,4	60,8	0,6	32	66	10,7	8 000	6 500
RNAO60X78X20-XL	255	60	78	20	68	1	60,8	67,2	68,8	1	49,5	85	13,6	7 000	5 500
RNAO60X78X40-ZW-ASR1-XL	435	60	78	40	68	1	60,8	67,2	68,8	1	85	171	27,5	7 000	5 500
RNAO65X85X30-XL	464	65	85	30	73	1	66	72,2	73,8	1	64	123	21,1	6 500	5 500
RNAO70X90X30-XL	499	70	90	30	78	1	71	77,2	78,8	1	68	135	23,2	6 000	5 000
RNAO80X100X30-XL	580	80	100	30	88	1	81	87,2	89	1	80	176	31	5 500	4 200
RNAO90X105X26-XL	373	90	105	26	98	1	91	97,2	99	1	69	150	25	5 000	4 000
RNAO90X110X30-XL	610	90	110	30	98	1	91	97,2	99	1	76	172	29,5	4 900	4 000
RNAO100X120X30-XL	694	100	120	30	108	1	101	107,2	109	1	80	188	32	4 500	3 700

Needle roller bearings without ribs

With inner ring



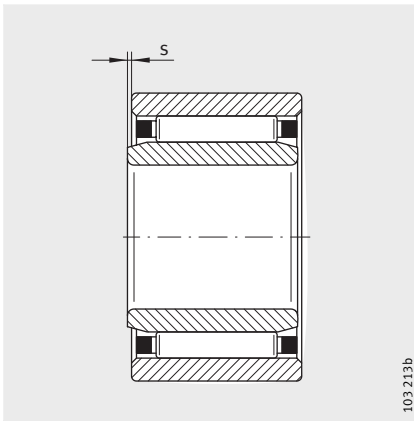
NAO..-XL



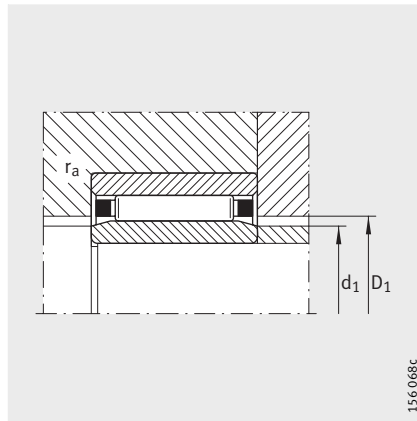
NAO..-ZW-ASR1-XL

Dimension table · Dimensions in mm

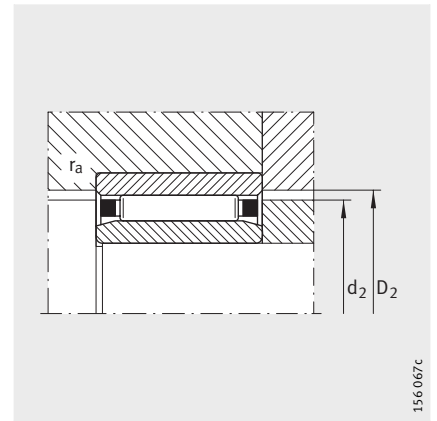
Designation	Mass ≈ g	Dimensions						
		d	D	B	F	E	r min.	s ¹⁾
NAO6X17X10-TN-IS1-XL	14	6	17	10	10	13	0,3	0,5
NAO9X22X12-TN-XL	23,5	9	22	12	12	18	0,3	0,5
NAO12X24X13-XL	30	12	24	13	16	20	0,3	0,5
NAO12X28X12-IS1-XL	40	12	28	12	16	22	0,3	0,5
NAO15X28X13-XL	29	15	28	13	20	24	0,3	0,5
NAO15X32X12-IS1-XL	50	15	32	12	20	26	0,3	0,5
NAO17X30X13-XL	42	17	30	13	22	26	0,3	0,5
NAO17X35X16-XL	78	17	35	16	22	29	0,3	0,5
NAO20X35X17-XL	76	20	35	17	25	29	0,3	0,5
NAO20X37X16-XL	82	20	37	16	25	32	0,3	0,5
NAO25X40X17-XL	88	25	40	17	30	35	0,3	0,8
NAO25X42X16-IS1-XL	86	25	42	16	30	37	0,3	0,8
NAO25X42X32-ZW-ASR1-XL	190	25	43	32	30	37	0,3	0,8
NAO30X45X17-XL	102	30	45	17	35	40	0,3	0,8
NAO30X45X26-ZW-ASR1-XL	157	30	45	26	35	40	0,3	0,8
NAO30X47X16-XL	109	30	47	16	35	42	0,3	0,8
NAO30X47X18-XL	119	30	47	18	35	42	0,3	0,8
NAO35X50X17-XL	113	35	50	17	40	45	0,3	0,8
NAO35X55X20-XL	190	35	55	20	40	47	0,3	0,8
NAO40X55X17-XL	127	40	55	17	45	50	0,3	0,8
NAO50X68X20-IS1-XL	230	50	68	20	55	60	0,6	1
NAO70X100X30-XL	850	70	100	30	80	88	1	1
NAO80X110X30-XL	920	80	110	30	90	98	1	1
NAO90X120X30-XL	1044	90	120	30	100	108	1	1



1) Axial displacement "s"

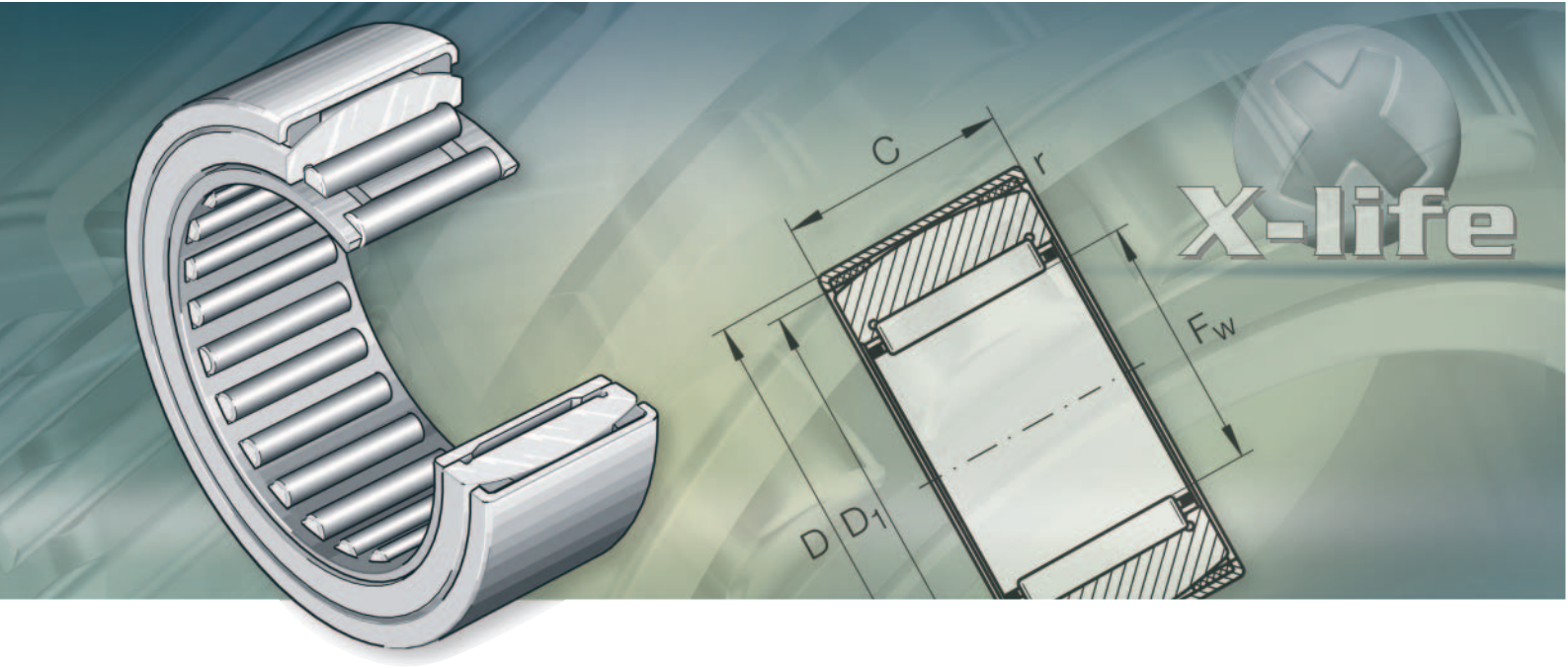


Axial guidance of needle roller and cage assembly in housing



Axial guidance of needle roller and cage assembly on shaft

Mounting dimensions					Basic load ratings		Fatigue limit load	Limiting speed	Reference speed
d ₁	D ₁	d ₂	D ₂	r _a	dyn. C _r	stat. C _{0r}	C _{ur}	n _G	n _B
				max.	kN	kN	kN	min ⁻¹	min ⁻¹
9,7	10,3	12,7	13,3	0,3	5,3	5,5	0,93	29 000	28 000
11,7	12,3	17,6	18,3	0,3	11,3	9,9	1,74	25 000	21 000
15,7	16,4	19,6	20,3	0,3	10,1	11,8	1,89	24 000	18 000
15,7	16,4	21,6	22,3	0,3	13	12,5	2,21	22 000	17 000
19,7	20,4	23,6	24,3	0,3	11,1	14,3	2,31	22 000	14 000
19,7	20,4	25,6	26,5	0,3	15,1	16,2	2,85	21 000	13 000
21,5	22,4	25,6	26,3	0,3	11,8	15,9	2,55	21 000	13 000
21,5	22,4	28,4	29,5	0,3	22,6	25,5	4,2	19 000	12 000
24,5	25,6	28,4	29,5	0,3	16,8	26	4,25	18 000	12 000
24,5	25,6	31,4	32,5	0,3	23,8	28	4,65	17 000	11 000
29,5	30,6	34,4	35,5	0,3	22,1	34	5,3	15 000	9 500
29,5	30,6	36,4	37,5	0,3	26	33,5	5,5	15 000	9 000
29,5	30,6	36,4	37,5	0,3	45	67	11	15 000	9 000
34,5	35,6	39,4	40,5	0,3	23,5	38,5	6,1	13 000	8 500
34,5	35,6	39,4	40,5	0,3	31,5	56	8,9	13 000	8 500
34,5	35,6	41,4	42,5	0,3	27,5	37,5	6,2	13 000	8 000
34,5	35,6	41,4	42,5	0,3	31	43	7,4	13 000	8 000
39,5	40,6	44,4	45,5	0,3	24,2	41,5	6,4	12 000	7 500
39,5	40,6	46,2	47,5	0,3	37	57	8,9	11 000	7 500
44,5	45,6	49,2	50,5	0,3	25,5	46	7,1	10 000	7 000
54,5	55,8	59,2	60,8	0,6	32	66	10,7	8 500	6 000
79,3	81	87,2	89	1	80	176	31	6 000	3 900
89,3	91	97,2	99	1	76	172	29,5	5 000	3 800
99,3	101	107,2	109	1	80	188	32	4 700	3 500



Aligning needle roller bearings

Aligning needle roller bearings

Features	Needle roller bearings with/without inner ring	38
	Operating temperature	39
	Cages	39
	Suffixes	39
Design and safety guidelines	Compensation of misalignment	39
	Design of bearing arrangements for bearings with inner ring	39
	Raceways for bearings without inner ring	39
	Minimum radial load.....	39
	Speeds	39
	Radial and axial location.....	40
	Fitting by means of pressing mandrel.....	40
Accuracy	Radial internal clearance	40
	Enveloping circle	40
Dimension tables	Aligning needle roller bearings, with and without inner ring	42

Aligning needle roller bearings

Features

Aligning needle roller bearings are units comprising drawn outer cups, plastic support rings with a concave inner profile, outer rings with a spherical outside surface, needle roller and cage assemblies and removable inner rings.

The bearings can compensate static misalignments and can thus tolerate misalignment of the shaft relative to the housing; see "Compensation of misalignment", page 39.

Aligning needle roller bearings are firmly seated in the housing bore. The bore can therefore be produced easily and economically.

Sealing/lubricant

Aligning needle roller bearings without ribs are unsealed and are not supplied greased. They can be lubricated with grease or oil.

Needle roller bearings with/without inner ring

Bearings of type RPNA do not have an inner ring and are therefore particularly compact, *Figure 1*. However, they require a raceway that is hardened and ground.

Bearings of type PNA have an inner ring, *Figure 2*. They are used if the shaft cannot be configured as a rolling bearing raceway.

Displacement of the inner ring

The standard inner ring allows axial displacement within the values "s" stated in the dimension tables. Where larger displacements occur, the standard ring can be replaced by a wider inner ring IR.

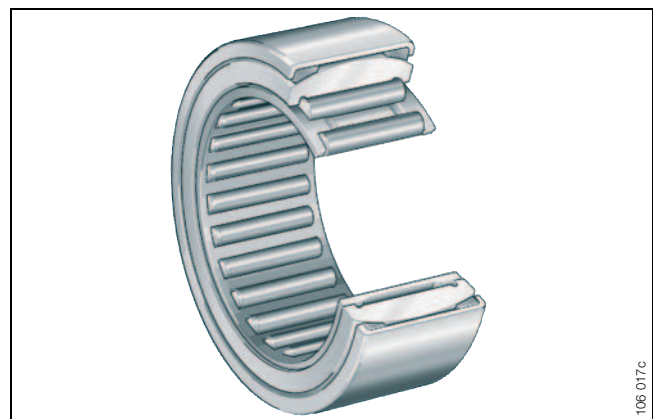


Figure 1 · Bearings without inner ring
RPNA..-XL

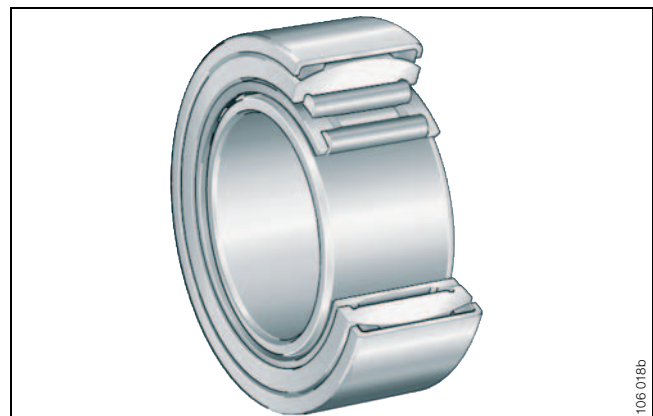


Figure 2 · Bearings with inner ring
PNA..-XL

Operating temperature



Aligning needle roller bearings are suitable for operating temperatures from -20 °C to $+100\text{ °C}$, limited by the plastic support rings.

Cages

The bearings have sheet steel cages.

Suffixes

Suffixes for the available designs: see table.

Available designs

Suffix	Description
XL	Bearings in X-life design

Design and safety guidelines

Compensation of misalignment

Due to the spherical outer ring and the concave support ring, aligning needle roller bearings can compensate static shaft misalignments of up to 3° .



The bearings must not be used to support swivel or wobble type motion. During adjustment motion between the outer cup and the ring, a breakaway torque occurs.

In order that adjustment motion can take place, the tolerances for the housing bore according to the table must be observed.

Design of bearing arrangements for bearings with inner ring

Shaft and housing tolerances for bearings with inner ring: see “INA Catalogue 307”.

Raceways for bearings without inner ring

In the case of bearings without an inner ring, the rolling element raceway on the shaft must be hardened and ground.

The surface hardness of the raceway must be $670\text{ HV} + 170\text{ HV}$ and the hardness depth Eht or Rht must be sufficiently large.

Tolerances for the shaft raceway/housing bore

Housing material	Shaft tolerance for bearings without inner ring	Bore tolerance
Steel or cast iron	h6	N6
Light metal		R6

Tolerances for the shaft raceway/housing bore

Surface quality	Raceway for bearings without inner ring	Housing bore
Roughness max.	$R_a 0,1 (R_z 0,4)$	$R_a 0,8 (R_z 4)$
Roundness max.	25% of h6	IT 5/2
Parallelism max.	50% of h6	IT 5/2

Minimum radial load

In order to ensure operation without slippage, the bearings must be subjected to a minimum radial load $F_{r\text{min}}$. This applies in particular to high speed bearings since, if the radial load is insufficient or not present, damaging sliding motion may occur between the rolling elements and raceways.

In continuous operation, therefore, a minimum radial load of magnitude $C_r/P < 50$ is necessary.

Speeds

The speeds n_G in the dimension tables are valid for oil lubrication.



With grease lubrication, the permissible value is taken as 60% of the value given in the table.

Aligning needle roller bearings

Radial and axial location

Aligning needle roller bearings are firmly seated in the housing bore. No further axial location is required.

Fitting by means of pressing mandrel

Due to the drawn outer cup, the bearings must be fitted using a special pressing mandrel: see the section “Drawn cup needle roller bearings” in “INA Catalogue 307”.

The marked side of the bearing should be in contact with the flange of the mandrel. A toroidal ring on the mandrel holds the bearing securely on the mandrel.

Do not tilt the bearing while it is being pressed in.

Accuracy

Dimensional and geometrical tolerances are in accordance with tolerance class PN to DIN 620, apart from the outside diameter and width of the outer cup. The width has a tolerance of $\pm 0,5$ mm.

Radial internal clearance

Bearings with inner ring have a radial internal clearance of CN, see table “Radial internal clearance”.

Radial internal clearance to DIN 620-4

Bore d mm		Radial internal clearance CN μm	
over	incl.	min.	max.
–	24	20	45
24	30	20	45
30	40	25	50
40	50	30	60

Enveloping circle

For bearings without inner ring, the decisive factor is not the radial internal clearance but the enveloping circle diameter F_w .

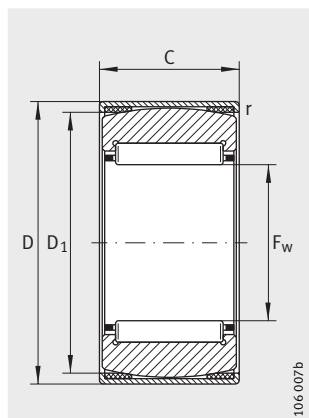
The enveloping circle is the inner inscribed circle of the needle rollers in clearance-free contact with the outer raceway.

The enveloping circle F_w before fitting is in the tolerance zone F6.

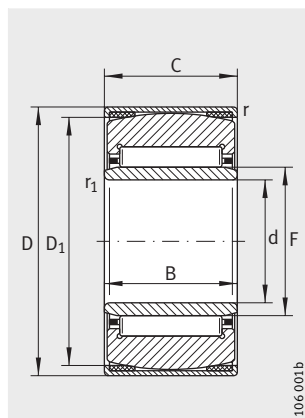
Dimension tables ►

Aligning needle roller bearings

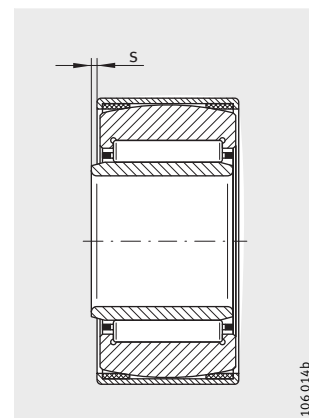
With and without inner ring



RPNA..-XL



PNA..-XL



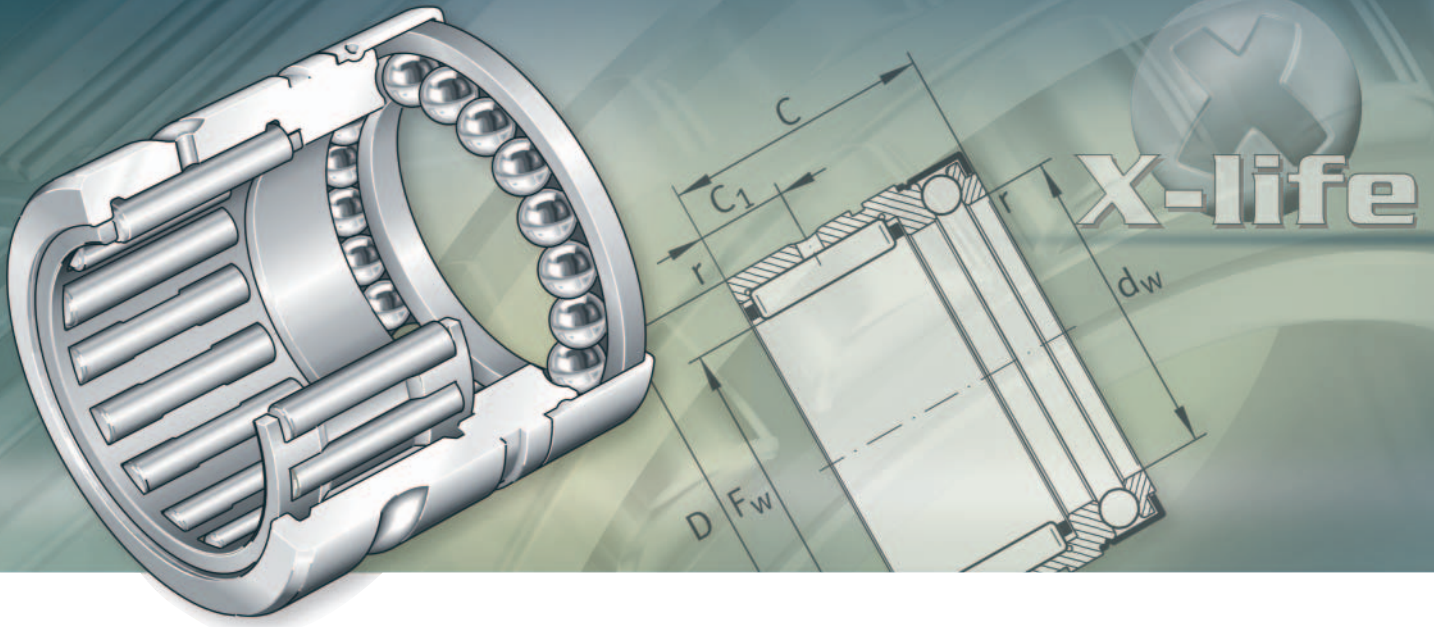
1) Axial displacement "s"

Dimension table · Dimensions in mm

Designation	Mass ≈g	Dimensions					Basic load ratings		Fatigue limit load C _{ur} kN	Limiting speed n _G min ⁻¹
		F _w	D	C ±0,5	D ₁	r min.	dyn. C _r kN	stat. C _{0r} kN		
RPNA15/28-XL	32	15	28	12	24,5	0,8	7,8	7,9	1,43	24 000
RPNA18/32-XL	52	18	32	16	27	0,8	14,1	16,2	3	22 000
RPNA20/35-XL	62	20	35	16	30,5	0,8	14,6	17,5	3,2	21 000
RPNA25/42-XL	109	25	42	20	36,5	0,8	21,3	30,5	5,3	18 000
RPNA28/44-XL	112	28	44	20	38,5	0,8	24,8	34	5,9	16 000
RPNA30/47-XL	125	30	47	20	42	0,8	25,5	36	6,3	15 000
RPNA35/52-XL	131	35	52	20	47,5	0,8	27,5	41,5	7,3	13 000
RPNA40/55-XL	141	40	55	20	50,5	0,8	29,5	47	8,3	11 000
RPNA45/62-XL	176	45	62	20	58	0,8	31	53	9,3	10 000

Dimension table · Dimensions in mm

Designation	Mass ≈g	Dimensions									Basic load ratings		Fatigue limit load C _{ur} kN	Limiting speed n _G min ⁻¹
		d	F	D	C ±0,5	B	D ₁	r min.	r ₁ min.	s ¹⁾ min.	dyn. C _r kN	stat. C _{0r} kN		
PNA12/28-XL	37	12	15	28	12	12	24,5	0,8	0,3	0,5	7,8	7,9	1,43	24 000
PNA15/32-XL	62	15	18	32	16	16	27	0,8	0,3	0,5	14,1	16,2	3	22 000
PNA17/35-XL	73	17	20	35	16	16	30,5	0,8	0,3	0,5	14,6	17,5	3,2	21 000
PNA20/42-XL	136	20	25	42	20	20	36,5	0,8	0,3	0,5	21,3	30,5	5,3	18 000
PNA22/44-XL	145	22	28	44	20	20	38,5	0,8	0,3	0,5	24,8	34	5,9	16 000
PNA25/47-XL	157	25	30	47	20	20	42	0,8	0,3	0,5	25,5	36	6,3	15 000
PNA30/52-XL	181	30	35	52	20	20	47,5	0,8	0,3	0,5	27,5	41,5	7,3	13 000
PNA35/55-XL	177	35	40	55	20	20	50,5	0,8	0,3	0,5	29,5	47	8,3	11 000
PNA40/62-XL	227	40	45	62	20	20	58	0,8	0,3	0,5	31	53	9,3	10 000



Combined needle roller bearings

Combined needle roller bearings

Features	Needle roller/axial deep groove ball bearings	46
	Needle roller/axial cylindrical roller bearings	47
	Needle roller/angular contact ball bearings	47
	Operating temperature	48
	Cages	48
	Suffixes	48
Design and safety guidelines	Design of bearing arrangements for bearings with inner ring	48
	Raceways for bearings without inner ring	48
	Support of axial forces	49
	Axial static load safety factor	49
	Minimum radial load.....	49
	Speeds	51
	Radial location.....	51
	Axial location.....	51
	Lubrication	51
Accuracy	Radial internal clearance	51
	Enveloping circle	51
Dimension tables	Needle roller/axial deep groove ball bearings	52
	Needle roller/axial cylindrical roller bearings	56
	Needle roller/angular contact ball bearings	58

Combined needle roller bearings

Features

Combined needle roller bearings are units comprising radial needle roller bearings with a rolling bearing component capable of supporting axial loads.

The bearings can support high radial forces as well as axial forces in one direction, while bearings of type NKIB can support axial forces from both directions, and are used as locating or semi-locating bearings, *Figure 1*.

Needle roller/axial deep groove ball bearings

These bearings do not have an inner ring. Bearings without inner ring have particularly compact radial dimensions. However, they require a shaft raceway that is hardened and ground, see page 48.

Bearings of type NX and NX..-Z have a full complement axial ball bearing component with end caps, *Figure 2*.

Bearings of type NKX (NAXK to DIN 5 429.1) and NKX..-Z (NAXK..-Z to DIN 5 429-1) have an axial bearing component comprising a ball and cage assembly with a sheet steel or plastic cage, *Figure 3*. Series NKX..-Z also has an end cap on the axial bearing component.

Sealing/lubricant

For lubrication, the bearings have a lubrication groove and lubrication hole in the outer ring.

Bearings of series NX and NKX are lubricated with oil.

The end cap in series NX has lubrication holes.

Bearings of series NX..-Z and NKX..-Z are lubricated with grease.

The axial bearing component is greased with a lithium complex soap grease to DIN 51 825-KP2N-20. The end caps do not have lubrication holes.

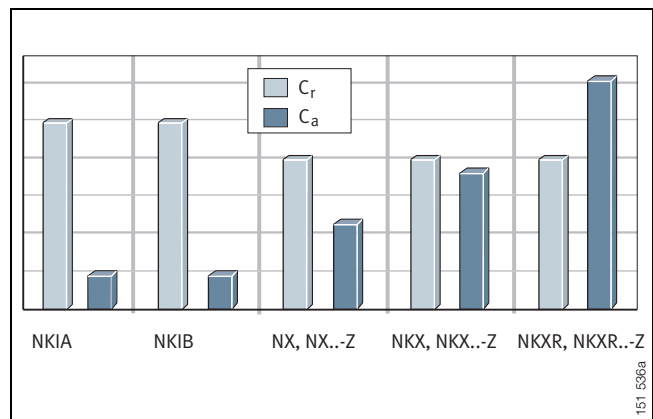


Figure 1 • Dynamic load carrying capacity C_r and C_a

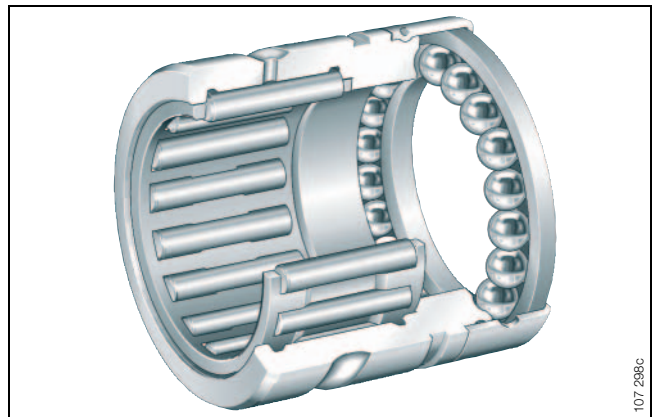


Figure 2 • Needle roller/axial deep groove ball bearings NX..-XL, NX..-Z-XL

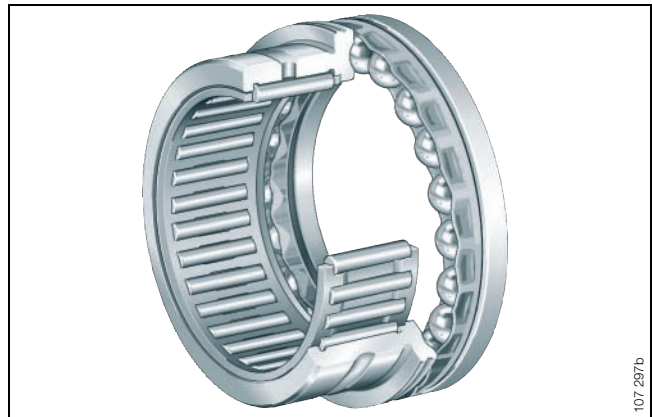


Figure 3 • Needle roller/axial deep groove ball bearings NKX..-XL, NKX..-Z-XL

Needle roller/axial cylindrical roller bearings

Bearings of type NKXR (NAXR to DIN 5 429.1) and NKXR..-Z (NAXR..-Z to DIN 5 429.1) have an axial bearing component comprising a roller and cage assembly with a plastic cage; NKXR..-Z also has an end cap on the axial bearing component, *Figure 4*.

These bearings do not have an inner ring. Bearings without inner ring have particularly compact radial dimensions. However, they require a shaft raceway that is hardened and ground, see page 48.

Sealing/lubricant

For lubrication, the bearings have a lubrication groove and lubrication hole in the outer ring.

Bearings of series NKXR are lubricated with oil.

Bearings of series NKXR..-Z are lubricated with grease.

The axial bearing component is greased with a lithium complex soap grease to DIN 51825-KP2N-20. The end cap does not have lubrication holes.

Needle roller/angular contact ball bearings

Combined bearings of type NKIA and NKIB have an inner ring.

Series NKIA corresponds to DIN 5 429-2. It can support axial loads in one direction, *Figure 5*.

Series NKIB have one narrow and one wide inner ring, *Figure 6*.

The axial bearing component has a plastic ball cage. At the point where the inner rings join, there is a shoulder on both sides for guidance of the ball and cage assembly. As a result, these bearings are also suitable for supporting axial forces alternating in direction. The bearings guide the shaft with an axial clearance of 0,08 mm to 0,25 mm.

Sealing/lubricant

Bearings of type NKIA and NKIB can be lubricated with grease or oil.

For lubrication, the outer ring has a lubrication groove and a lubrication hole.

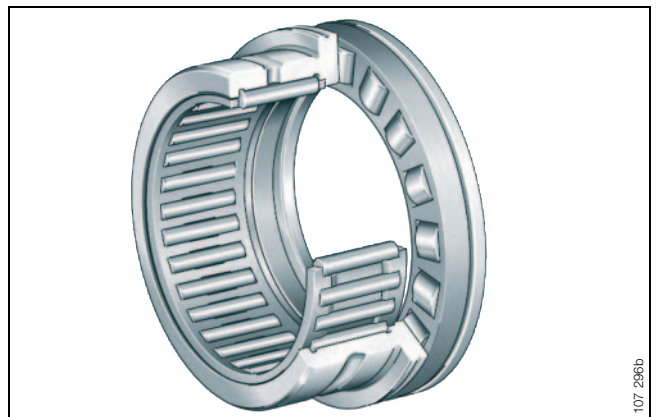


Figure 4 · Needle roller/axial cylindrical roller bearings NKXR-XL, NKXR..-Z-XL

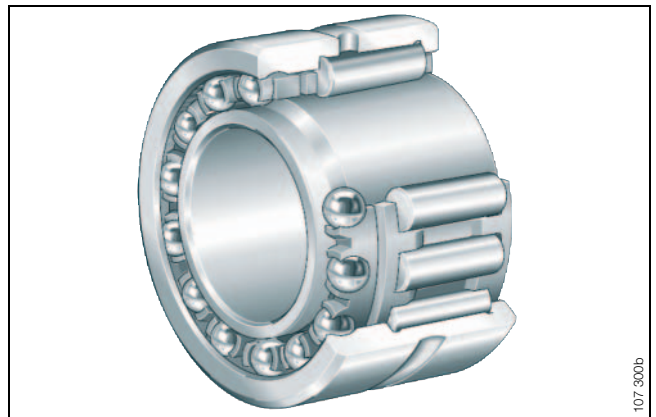


Figure 5 · Needle roller/angular contact ball bearings NKIA..-XL

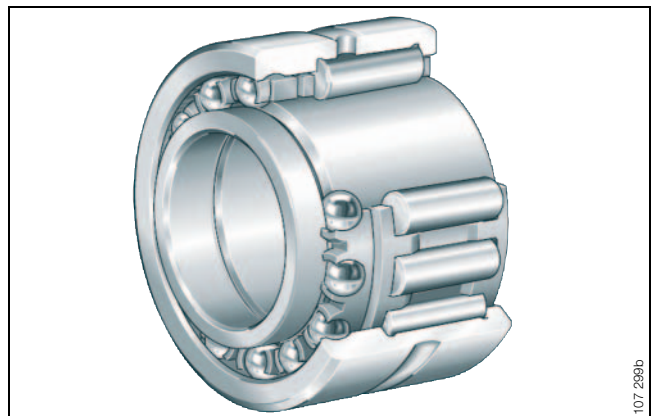


Figure 6 · Needle roller/angular contact ball bearings NKIB..-XL

Combined needle roller bearings

Operating temperature

The bearings can be used at operating temperatures from -20 °C to $+120\text{ °C}$.

Cages

Bearings with plastic cage are indicated by the suffix TN in the dimension tables.

Suffixes

Suffixes for the available designs: see table.

Available designs

Suffix	Description
TN ¹⁾	Cage made from glass fibre reinforced polyamide 66
XL	Bearings in X-life design
Z	Bearing with end cap, axial bearing component greased with lithium complex soap grease to DIN 51825-KP2N-20

¹⁾ Bearings with plastic cage: see dimension tables.

Design and safety guidelines

Design of bearing arrangements for bearings with inner ring

Shaft and housing tolerances for bearings with inner ring: see "INA Catalogue 307".

Raceways for bearings without inner ring

In the case of bearings without an inner ring, the rolling element raceway on the shaft must be hardened and ground.

The surface hardness of the raceway must be $670\text{ HV} + 170\text{ HV}$ and the hardness depth Eht or Rht must be sufficiently large.

Tolerances for shaft raceway/housing bore

Series	Shaft tolerance		Bore tolerance
	Bearings without inner ring	Bearings with inner ring	
NKIA, NKIB	–	k6	M6
NX, NKX, NKXR	k6	k6	K6, M6 for rigid bearing arrangements



For bearings NKIA and NKIB, the shaft tolerance must not be greater than k6 and the bore tolerance must not be less than M6.

Surface for shaft raceway/housing bore

Surface quality	Shaft raceway		Housing bore
	Bearings without inner ring	Bearings with inner ring	
Roughness max.	$R_a 0,1$ ($R_z 0,4$)	–	–
Roundness max.	25% of k6	IT 4/2	IT 5/2
Parallelism max.	50% of k6	IT 4	IT 4

If the shaft cannot be configured as a raceway, inner rings of series IR or LR can be used. The inner rings must be ordered separately.

Support of axial forces

The axial bearing component must be preloaded to 1% of the axial basic static load rating C_{0a} . The basic load ratings C_{0a} are stated in the dimension tables.

Needle roller/axial deep groove ball bearings, needle roller/axial cylindrical roller bearings

In order to support axial forces, the bearing must be abutted by means of snap rings on the outer ring or a housing shoulder.

If there is little distance between the shaft centres, the snap rings should be shortened. Snap rings WR and SW are available from trade outlets.

If the bearings are to support axial forces from alternating directions, two bearings must be fitted opposed to each other. The unloaded bearing must be axially preloaded, for example by means of springs. This allows compensation of thermal expansion.

In order to avoid double fits on NKX and NKXR bearings, the axial bearing component should be free in the housing (outside diameter D_1 or $D_2 + 0,5$ mm min.).

Needle roller/angular contact ball bearings

Bearings of type NKIA can support axial forces in one direction, bearings of type NKIB can support axial forces in both directions.

If bearings of type NKIA are to support axial forces from alternating directions, two bearings must be fitted opposed to each other, *Figure 7*.

In the case of bearing type NKIB, the wide and narrow inner ring must be axially clamped against each other. The narrow inner ring has a larger bore diameter. This results in an interference fit if a shaft tolerance of k6 is used. The bearings guide the shaft with an axial clearance of between 0,08 mm and 0,25 mm.

Axial static load safety factor

The axial static load safety factor S_0 must be $> 1,5$.



The axial load must not exceed $1/4$ of the radial load.

Minimum radial load

In order to ensure operation without slippage, the bearings must be subjected to a minimum radial load $F_{r\min}$. This applies in particular to high speed bearings since, if the radial load is insufficient or not present, damaging sliding motion may occur between the rolling elements and raceways.

In continuous operation, therefore, a minimum radial load of magnitude $C_r/P < 50$ is necessary.

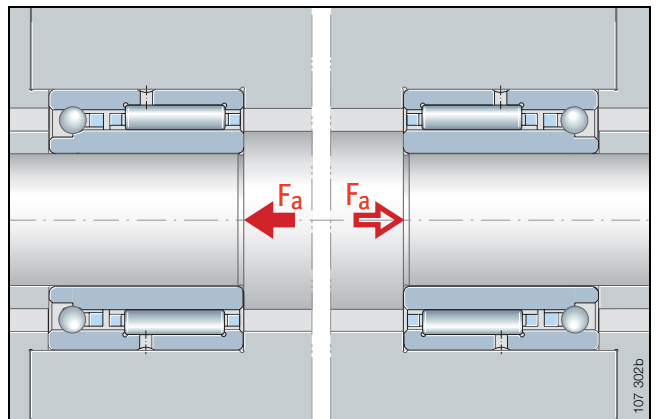


Figure 7 · NKIA..-XL, two bearings in opposed arrangement

Combined needle roller bearings

Speeds

The speeds n_G in the dimension tables are valid for oil lubrication.



With grease lubrication, the permissible value is taken as 60% of the value given in the table.

Für bearings of type NKXR, NKXR..-Z, NKIA, NKIB, the reference speed n_B is stated in the dimension tables. In order to calculate the thermally safe speed n_{per} , NKXR(Z) must be regarded as an axial bearing and NKIA, NKIB must be regarded as radial bearings.

Radial location

Combined needle roller bearings with inner ring are radially located by means of a close fit on the shaft and in the housing.

Axial location

In order to prevent lateral creep of the bearing rings, they must be located by means of physical locking.

The abutting shoulders (shaft, housing) should be sufficiently high and perpendicular to the bearing axis.

The transition from the bearing seat to the abutting shoulder should be designed with rounding to DIN 5 418 or an undercut to DIN 509. The minimum values for the chamfer dimensions r as given in the dimension tables must be observed.

The overlap between the snap rings and the end faces of the bearing rings must be sufficiently large.

The maximum chamfer dimensions for the inner rings to DIN 620-6 must be taken into consideration.

Lubrication

Before operation, the radial component should be greased using a grease of similar quality to that used in the axial component.

In order to determine the relubrication interval, values must be calculated separately for the axial and radial component and the lower value should be used.

Accuracy

The dimensional and geometrical tolerances correspond to tolerance class PN to DIN 620. This excludes bearings of type NKIB in relation to the bore d_1 of the narrow inner ring and the width ($-0,3$ mm) over both inner rings and bearings of type NKX and NKXR in relation to the diameters D_1, D_2 .

Radial internal clearance

Bearings with inner ring have a radial internal clearance of CN, see table "Radial internal clearance".

Radial internal clearance to DIN 620-4

Bore d mm		Radial internal clearance CN μm	
over	incl.	min.	max.
–	24	20	45
24	30	20	45
30	40	25	50
40	50	30	60
50	65	40	70
65	80	40	75
80	100	50	85

Enveloping circle

For bearings without inner ring, the decisive factor is not the radial internal clearance but the enveloping circle diameter F_w .

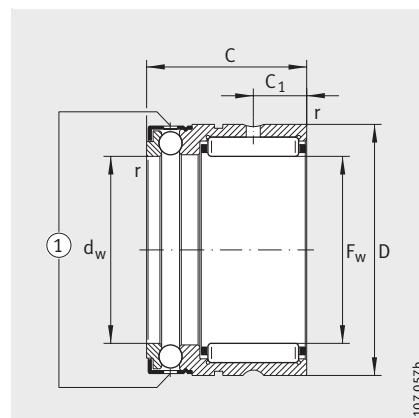
The enveloping circle is the inner inscribed circle of the needle rollers in clearance-free contact with the outer raceway.

For bearings before fitting, the enveloping circle F_w is in the tolerance zone F6.

Dimension tables ►

Needle roller/ axial deep groove ball bearings

Without inner ring



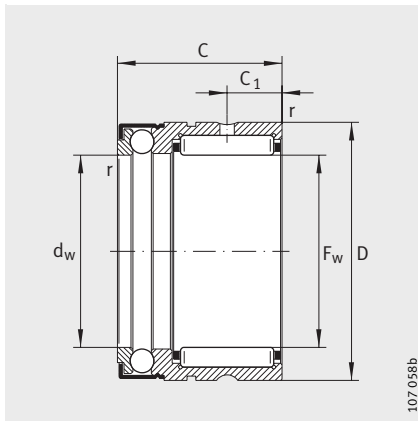
NX...XL

① Holes for lubricating oil

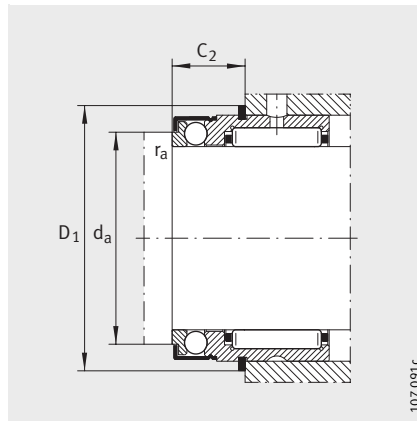
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Dimension table · Dimensions in mm

Designation			Dimensions						Mounting dimensions			
For oil lubrication	For grease lubrication	Mass ≈g	F _w	D	C	C ₁	d _w	r	C ₂	D ₁	d _a	r _a
					-0,25		E8	min.				max.
NX7-TN-XL	NX7-Z-TN-XL	14	7	14	18	4,7	7	0,3	10	16,5	9,6	0,3
NX10-XL	NX10-Z-XL	25	10	19	18	4,7	10	0,3	10	21,9	14,6	0,3
NX12-XL	NX12-Z-XL	28	12	21	18	4,7	12	0,3	10	23,7	16,6	0,3
NX15-XL	NX15-Z-XL	48	15	24	28	8	15	0,3	12,2	26,5	19	0,3
NX17-XL	NX17-Z-XL	53	17	26	28	8	17	0,3	12,2	28,5	21	0,3
NX20-XL	NX20-Z-XL	68	20	30	28	8	20	0,3	12,2	33,6	25	0,3
NX25-XL	NX25-Z-XL	115	25	37	30	8	25	0,3	14,2	40,4	31,6	0,3
NX30-XL	NX30-Z-XL	130	30	42	30	10	30	0,3	14,2	45,1	36,5	0,3
NX35-XL	NX35-Z-XL	160	35	47	30	10	35	0,3	14,2	50,1	40,5	0,3



NX..-Z-XL

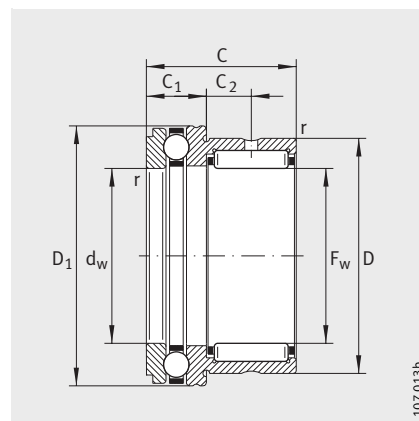


Mounting dimensions,
snap ring in outer ring

Basic load ratings				Fatigue limit load		Limiting speed n_G min^{-1}	Recommended inner rings Designation	Suitable snap rings
Radial		Axial		C_{ur}	C_{ua}			
dyn. C_r kN	stat. C_{0r} kN	dyn. C_a kN	stat. C_{0a} kN	kN	kN			
3,25	2,65	3,15	4,3	0,41	0,19	15 000	–	WR14, SW14
6	4,65	4,6	7,2	0,72	0,32	11 000	IR6X10X10	WR19, SW19
5,4	4,3	4,85	8,2	0,83	0,365	9 500	IR8X12X10	WR21, SW21
12,1	12,7	5,6	10,4	2,32	0,46	8 000	IR12X15X16	WR24, SW24
13,5	15	5,8	11,5	2,75	0,51	7 500	IR14X17X17	WR26, SW26
14,6	17,5	7	14,7	3,2	0,65	6 500	IR17X20X16	WR30, SW30
16,8	22,4	11,1	24,3	4,15	1,08	4 900	IR20X25X16	WR37, SW37
25,5	36	11,7	28	6,3	1,23	4 300	IR25X30X20	WR42, SW42
27,5	41,5	12,4	32,5	7,3	1,44	3 700	IR30X35X20	WR47, SW47

Needle roller/ axial deep groove ball bearings

Without inner ring
With or without end cap

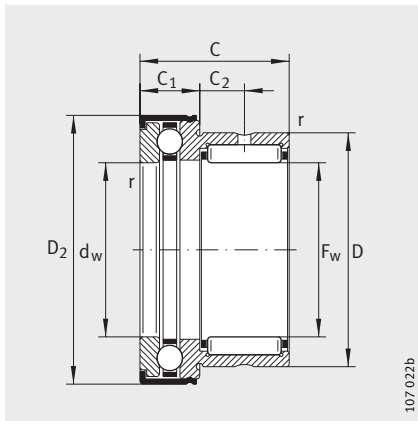


NKX...XL

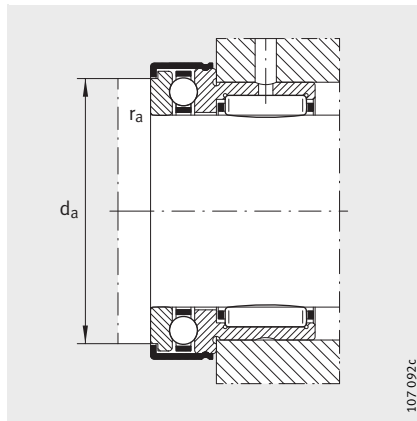
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Dimension table · Dimensions in mm

Without end cap Designation	Designation to DIN 5 429	Mass ≈g	With end cap Designation	Designation to DIN 5 429	Mass ≈g	Dimensions					
						F _w	D	D ₁ max.	D ₂ max.	C -0,25	C ₁ 0,2
NKX10-TN-XL	NAXK10TN	34	NKX10-Z-TN-XL	NAXK10-ZTN	36	10	19	24,1	25,2	23	9
NKX12-XL	NAXK12	38	NKX12-Z-XL	NAXK12-Z	40	12	21	26,1	27,2	23	9
NKX15-XL	NAXK15	44	NKX15-Z-XL	NAXK15-Z	47	15	24	28,1	29,2	23	9
NKX17-XL	NAXK17	53	NKX17-Z-XL	NAXK17-Z	55	17	26	30,1	31,2	25	9
NKX20-XL	NAXK20	83	NKX20-Z-XL	NAXK20-Z	90	20	30	35,1	36,2	30	10
NKX25-XL	NAXK25	125	NKX25-Z-XL	NAXK25-Z	132	25	37	42,1	43,2	30	11
NKX30-XL	NAXK30	141	NKX30-Z-XL	NAXK30-Z	148	30	42	47,1	48,2	30	11
NKX35-XL	NAXK35	163	NKX35-Z-XL	NAXK35-Z	168	35	47	52,1	53,2	30	12
NKX40-XL	NAXK40	200	NKX40-Z-XL	NAXK40-Z	208	40	52	60,1	61,2	32	13
NKX45-XL	NAXK45	252	NKX45-Z-XL	NAXK45-Z	265	45	58	65,2	66,5	32	14
NKX50-XL	NAXK50	280	NKX50-Z-XL	NAXK50-Z	300	50	62	70,2	71,5	35	14
NKX60-XL	NAXK60	360	NKX60-Z-XL	NAXK60-Z	380	60	72	85,2	86,5	40	17
NKX70-XL	NAXK70	500	NKX70-Z-XL	NAXK70-Z	520	70	85	95,2	96,5	40	18



NKX...-Z-XL

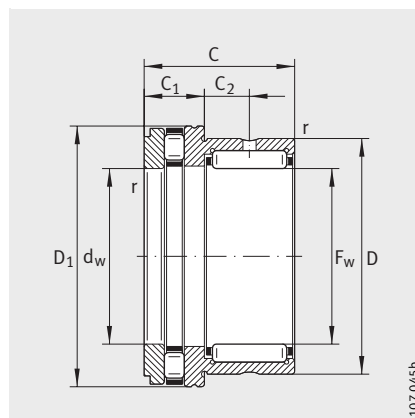


Mounting dimensions

			Mounting dimensions		Basic load ratings				Fatigue limit load		Limiting speed n_G min ⁻¹	Recommended inner rings
C_2	d_w E8	r min.	d_a	r_a max.	Radial		Axial		C_{ur} kN	C_{ua} kN		
					dyn. C_r kN	stat. C_{0r} kN	dyn. C_a kN	stat. C_{0a} kN				
6,5	10	0,3	19,7	0,3	7	7,8	10	14	1,31	0,67	12 000	IR7X10X16
6,5	12	0,3	21,7	0,3	10,1	11	10,3	15,4	1,92	0,74	11 000	IR9X12X16
6,5	15	0,3	23,7	0,3	12,1	12,7	10,5	16,8	2,32	0,81	9 500	IR12X15X16
8	17	0,3	25,7	0,3	13,5	15	10,8	18,2	2,75	0,87	8 500	IR14X17X17
10,5	20	0,3	30,7	0,3	18,6	23,8	14,3	24,7	4,15	1,19	7 500	IR17X20X20
9,5	25	0,6	37,7	0,6	21,3	30,5	19,6	37,5	5,3	1,79	6 000	IR20X25X20
9,5	30	0,6	42,7	0,6	25,5	36	20,4	42	6,3	2,03	5 000	IR25X30X20
9	35	0,6	47,7	0,6	27,5	41,5	21,2	47	7,3	2,27	4 600	IR30X35X20
10	40	0,6	55,7	0,6	29,5	47	27	63	8,3	3	4 000	IR35X40X20
9	45	0,6	60,5	0,6	31	53	28	69	9,3	3,35	3 600	IR40X45X20
10	50	0,6	65,5	0,6	43	74	29	75	12,7	3,65	3 300	IR45X50X25
12	60	1	80,5	1	47,5	90	41,5	113	15,4	5,4	2 800	IR50X60X25
11	70	1	90,5	1	50	92	43	127	15,7	6,1	2 400	IR60X70X25

Needle roller/ axial cylindrical roller bearings

Without inner ring
With or without end cap

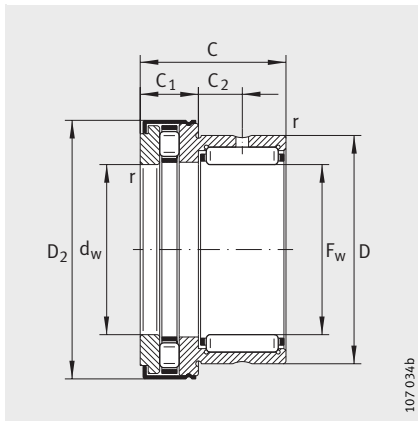


NKXR..-XL

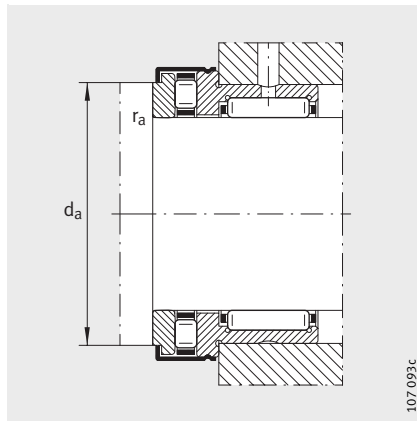
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Dimension table · Dimensions in mm

Designation	Without end cap Designation to DIN 5 429	Mass ≈g	With end cap Designation	Designation to DIN 5 429	Mass ≈g	Dimensions						
						F _w	D	D ₁ max.	D ₂ max.	C -0,25	C ₁ 0,2	C ₂
NKXR15-XL	NAXR15	42	NKXR15-Z-XL	NAXR15Z	45	15	24	28,1	29,2	23	9	6,5
NKXR17-XL	NAXR17	50	NKXR17-Z-XL	NAXR17Z	53	17	26	30,1	31,2	25	9	8
NKXR20-XL	NAXR20	80	NKXR20-Z-XL	NAXR20Z	84	20	30	35,1	36,2	30	10	10,5
NKXR25-XL	NAXR25	120	NKXR25-Z-XL	NAXR25Z	125	25	37	42,1	43,2	30	11	9,5
NKXR30-XL	NAXR30	135	NKXR30-Z-XL	NAXR30Z	141	30	42	47,1	48,2	30	11	9,5
NKXR35-XL	NAXR35	157	NKXR35-Z-XL	NAXR35Z	165	35	47	52,1	53,2	30	12	9
NKXR40-XL	NAXR40	204	NKXR40-Z-XL	NAXR40Z	214	40	52	60,1	61,2	32	13	10
NKXR45-XL	NAXR45	244	NKXR45-Z-XL	NAXR45Z	260	45	58	65,2	66,5	32	14	9
NKXR50-XL	NAXR50	268	NKXR50-Z-XL	NAXR50Z	288	50	62	70,2	71,5	35	14	10



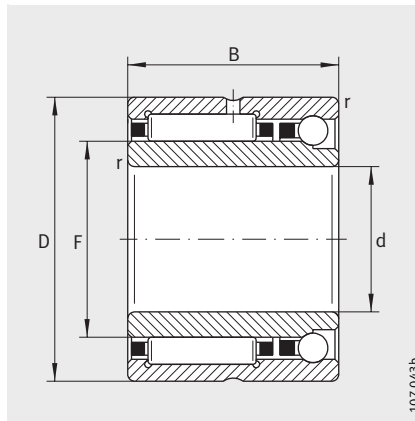
NKXR..-Z-XL



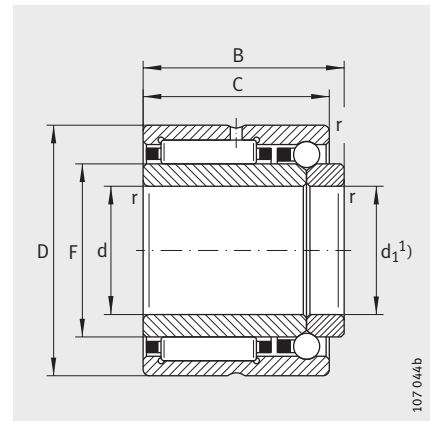
Mounting dimensions

		Mounting dimensions		Basic load ratings				Fatigue limit load		Limiting speed	Reference speed	Recommended inner rings
dw	r	da	ra	Radial		Axial		Cur	Cua	nG	nB	
				dyn. Cr	stat. Cor	dyn. Ca	stat. Coa					
E8	min.		max.	kN	kN	kN	kN	kN	kN	min ⁻¹	min ⁻¹	
15	0,3	23,7	0,3	12,1	12,7	14,4	28,5	2,32	4	13 000	6 500	IR12X15X16
17	0,3	25,7	0,3	13,5	15	15,9	33,5	2,75	4,65	12 000	5 500	IR14X17X17
20	0,3	30,7	0,3	18,6	23,8	24,9	53	4,15	7,3	10 000	4 200	IR17X20X20
25	0,6	37,7	0,6	21,3	30,5	33,5	76	5,3	7,1	8 500	3 400	IR20X25X20
30	0,6	42,7	0,6	25,5	36	35,5	86	6,3	8	7 500	2 900	IR25X30X20
35	0,6	47,7	0,6	27,5	41,5	39	101	7,3	9,5	6 500	2 500	IR30X35X20
40	0,6	55,7	0,6	29,5	47	56	148	8,3	14,5	6 000	2 000	IR35X40X20
45	0,6	60,6	0,6	31	53	59	163	9,3	16	5 000	1 900	IR40X45X20
50	0,6	65,5	0,6	43	74	61	177	12,7	17,4	4 800	1 700	IR45X50X25

Needle roller/ angular contact ball bearings



NKIA..-XL
Single direction bearing



NKIB..-XL
Double direction bearing

Dimension table · Dimensions in mm

Designation	Mass ≈g	Dimensions						Basic load ratings				Fatigue limit load		Limiting speed n_G min ⁻¹	Reference speed n_B min ⁻¹
		d	F	D	B	C	r min.	Radial		Axial		C_{ur} kN	C_{ua} kN		
								dyn. C_r kN	stat. C_{0r} kN	dyn. C_a kN	stat. C_{0a} kN				
NKIA5901-XL	40	12	16	24	16	-	0,3	10,6	10,9	2,7	3,45	1,94	0,152	24 000	21 000
NKIB5901-XL	43	12	16	24	17,5	16	0,3	10,6	10,9	2,7	3,45	1,94	0,152	24 000	21 000
NKIA5902-XL	50	15	20	28	18	-	0,3	12	13,6	2,9	4,2	2,43	0,186	22 000	17 000
NKIB5902-XL	52	15	20	28	20	18	0,3	12	13,6	2,9	4,2	2,43	0,186	22 000	17 000
NKIA5903-XL	56	17	22	30	18	-	0,3	12,4	14,6	3,15	4,9	2,6	0,216	21 000	15 000
NKIB5903-XL	58	17	22	30	20	18	0,3	12,4	14,6	3,15	4,9	2,6	0,216	21 000	15 000
NKIA5904-XL	103	20	25	37	23	-	0,3	23,7	25,5	4,9	7,4	4,6	0,33	17 000	14 000
NKIB5904-XL	107	20	25	37	25	23	0,3	23,7	25,5	4,9	7,4	4,6	0,33	17 000	14 000
NKIA59/22-XL	118	22	28	39	23	-	0,3	26	29,5	5,3	8,6	5,3	0,38	16 000	12 000
NKIB59/22-XL	122	22	28	39	25	23	0,3	26	29,5	5,3	8,6	5,3	0,38	16 000	12 000
NKIA5905-XL	130	25	30	42	23	-	0,3	26,5	31,5	5,4	9,3	5,7	0,41	15 000	12 000
NKIB5905-XL	134	25	30	42	25	23	0,3	26,5	31,5	5,4	9,3	5,7	0,41	15 000	12 000
NKIA5906-XL	147	30	35	47	23	-	0,3	28,5	35,5	5,9	11,2	6,4	0,495	13 000	10 000
NKIB5906-XL	151	30	35	47	25	23	0,3	28,5	35,5	5,9	11,2	6,4	0,495	13 000	10 000
NKIA5907-XL	243	35	42	55	27	-	0,6	35,5	50	7,4	14,9	9,4	0,66	11 000	9 000
NKIB5907-XL	247	35	42	55	30	27	0,6	35,5	50	7,4	14,9	9,4	0,66	11 000	9 000
NKIA5908-XL	315	40	48	62	30	-	0,6	48,5	67	9,2	19,4	11,5	0,86	9 500	7 500
NKIB5908-XL	320	40	48	62	34	30	0,6	48,5	67	9,2	19,4	11,5	0,86	9 500	7 500
NKIA5909-XL	375	45	52	68	30	-	0,6	51	73	9,6	21,4	12,6	0,95	8 500	7 000
NKIB5909-XL	380	45	52	68	34	30	0,6	51	73	9,6	21,4	12,6	0,95	8 500	7 000
NKIA5910-XL	380	50	58	72	30	-	0,6	53	80	10,1	24,3	13,8	1,08	8 000	6 500
NKIB5910-XL	385	50	58	72	34	30	0,6	53	80	10,1	24,3	13,8	1,08	8 000	6 500
NKIA5911-XL	550	55	63	80	34	-	1	65	100	12,1	29,5	17,3	1,3	7 500	6 000
NKIB5911-XL	555	55	63	80	38	34	1	65	100	12,1	29,5	17,3	1,3	7 500	6 000
NKIA5912-XL	590	60	68	85	34	-	1	68	108	12,4	32	18,8	1,41	7 000	5 500
NKIB5912-XL	595	60	68	85	38	34	1	68	108	12,4	32	18,8	1,41	7 000	5 500
NKIA5913-XL	635	65	72	90	34	-	1	69	112	12,8	34	19,5	1,51	6 500	5 500
NKIB5913-XL	640	65	72	90	38	34	1	69	112	12,8	34	19,5	1,51	6 500	5 500
NKIA5914-XL	980	70	80	100	40	-	1	95	156	16,8	44,5	27,5	1,97	6 000	4 900
NKIB5914-XL	985	70	80	100	45	40	1	95	156	16,8	44,5	27,5	1,97	6 000	4 900

¹⁾ Diameter d_1 deviates from DIN 620.

The narrow inner ring has a larger bore diameter. This results in an interference fit if a shaft tolerance of k6 is used.

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TPI 117