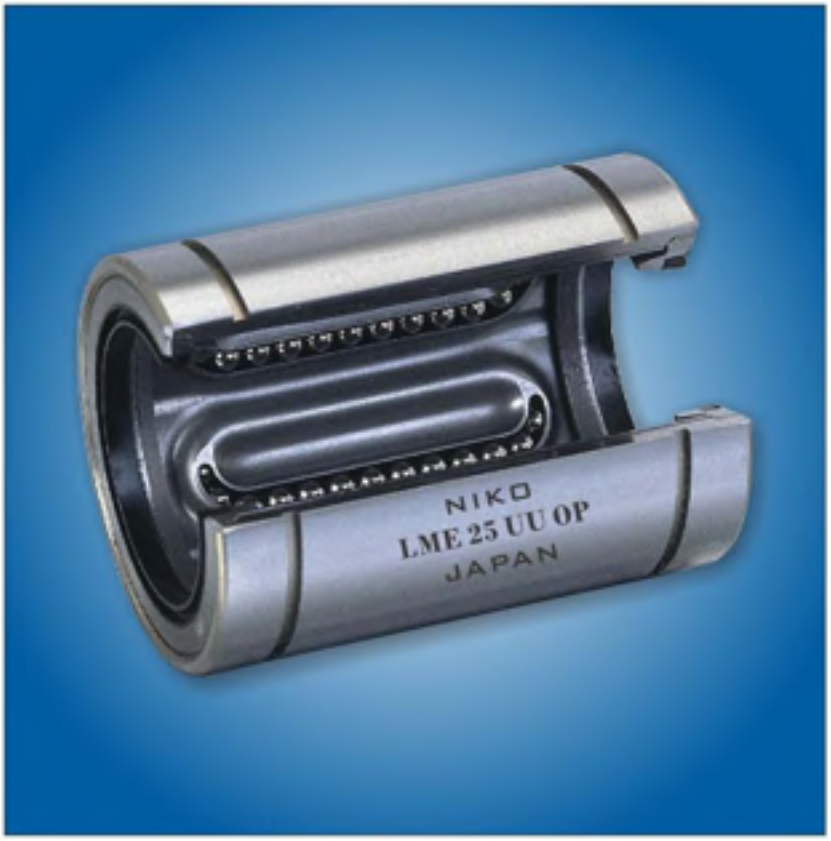
NIKO®

NIPPON KODO
AUTOMATION TECHNOLOGY

SINCE 2002

GENERAL BEARINGS



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General Bearings

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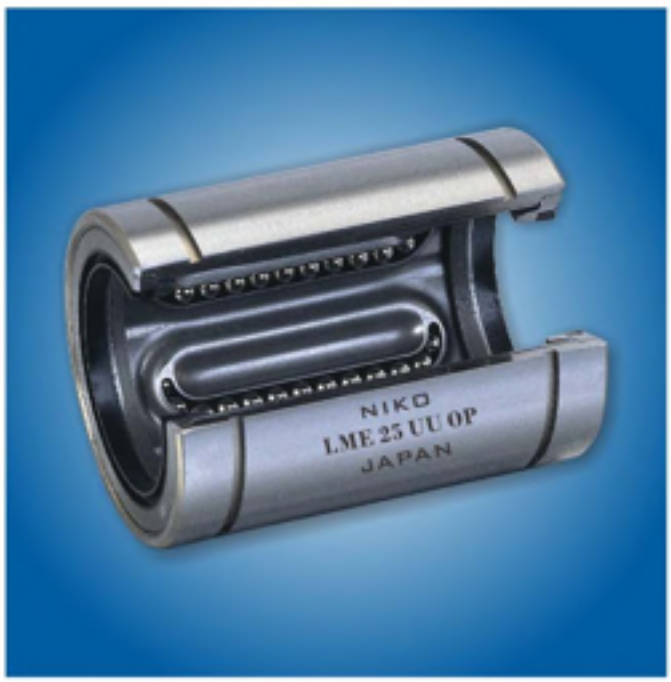


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AUTOMATION TECHNOLOGY

TECHNICAL TABLES

GENERAL INDEX

GENERAL INDEX

PAGES FOR REFER

235 PAGES

PRODUCT INFORMATION

TECHNICAL TABLES

TECHNICAL TABLES

TECHNICAL TABLES

TECHNICAL TABLES

1. Bearing materials

1.1 Raceway and rolling element materials

1.1.1 High/mid carbon alloy steel

In general,steel varieties which can be hardened not just on the surface but also deep hardened by the so-called "through hardening method" are used for the raceways and rolling elements of bearings. Foremost among these is high carbon chromium bearing steel, which is widely used.

1.1.2 Mid-carbon chromium steel

Mid-carbon chromium steel incorporating silicone and manganese, which gives it hardening properties comparable to high carbon chromium steel.

1.2 Cage materials

Bearing cage materials must have the strength to withstand rotational vibrations and shock loads. These materials must also have a low friction coefficient, be light weight, and be able to withstand bearing operation temperatures.

1.2.1 Pressed cages

For small and medium sized bearings, pressed cages of cold or hot rolled steel with a low carbon content of approx. 0.1% are used. However, depending on the application, austenitic stainless steel is also used.

1.2.2 Plastic cages

Injection molded plastic cages are now widely used: most are made from fiber glass reinforced heat resistant polyamide resin. Plastic cages are light weight, corrosion resistant and have excellent dampening and sliding properties. Heat resistant polyamide resins now enable the production of cages that perform well in applications ranging between -40°C ~ 120°C. However, they are not recommended for use at temperatures exceeding 120°C.

1.2.3 Steel cages

For temperatures exceeding 120°C, steel cages are required to use.

Tables 1.1 and 1.2 give the chemical composition for these representative cage materials.

Table 1.1 Chemical composition of steel plate for pressed cages and carbon steel for machined cages.

	Standard	Symbol	Chemical composition(%)						
			C	Si	Mn	P	S	Ni	Cr
Pressed retainers	JIS G 4305	SUS440 C	Max. 0.08	Max. 1.00	Max. 2.00	Max. 0.045	Max. 0.030	8.00~10.50	18.00~20.00

Table 1.2 Chemical composition of high-strength cast brass for machined cages

Standard	Symbol	Chemical composition(%)							Impurities	
		Cu	Zn	Mn	Fe	Al	Sn	Ni	Pb	Si
JIS H 5120	CAC301	55.0~60.0	33.0~42.0	0.1~1.5	0.5~1.5	0.5~1.5	Max. 1.0	Max. 1.0	Max. 0.4	Max. 0.1

2. External bearing sealing devices

External seals have two main functions: to prevent lubricating oil from leaking out, and, to prevent dust,water, and other contaminants from entering the bearing. When selecting a seal, the following factors need to be taken into consideration: the type of lubricant(oil or grease), seal peripheral speed, shaft fitting errors, space limitations, seal friction and resultant heat increase, and cost. Sealing devices for rolling bearings fall into two main classifications: non-contact seals and contact seals.

2.1 Non-contact seals:
Non-contact seals utilize a small clearance between the shaft and the housing cover. Theref ore friction is negligible,making them suitable forhigh speed applications. In order to improve sealing capability, clearance spaces are often filled with lubricant.

2.2 Contact seals:
Contact seals accomplish their sealing action through the contact pressure of a resilient the seal (the lip is often made of synthetic rubber) the sealing surface. Contact seals are generally far superior to noncontact seals in sealing efficieny, although their friction torque and temperature rise coefficients are higher. Furthermore, because the portion of a contact seal rotates while in contact wi the shaft,the allowable seal peripheral speed varie depending on seal type.

3. Bearing tolerances

3.1 Standard of tolerances
Ball bearing "tolerances"or dimensional accuracy and running accuracy, are regulated by ISO and JIS standards (rolling bearing tolerances). For dimensional accuracy, these standards prescribe the tolerances necessary when installing bearings on shafts or in housings.Running accuracy is defined as the allowable limits for bearing runout during operation.

Table 3.1 Comparison of tolerance classifications of national standards

Standard		Tolerance class				
Japanese industrial standard (JIS)	JIS	class 0,6X	class 6	class 5	class 4	class 2
International Organization for Standardization (ISO)	ISO	Normal class Class 6X	Class 6	Class 5	Class 4	Class 2
Deutsches Institut fur Normung(ISO)	DIN	P0	P6	P5	P4	P2
American National Standards Institute (ANSI)	ANSI/ABMA	ABEC-1	ABEC-3	ABEC-5	ABEC-7	ABEC-9

Table 3.2 Bearings types and applicable tolerance

Bearing type		Applicable standard	Applicable tolerance class				Applicable table
Ball bearings		JIS B 1514 ISO 492 (NIKO standard)	class 0	class 6	class 5	class 4	Table 3.3
Angular contact ball bearings			class 0	class 6	class 5	class 4	Table 3.3
Self-aligning ball bearings			class 0	class 6	class 5	class 4	Table 3.3
Taper roller bearings			class 0, 6X	class 6	class 5	class 4	Table 3.4
Spherical roller bearings			class 0, 6X	class 6	class 5	class 4	Table 3.3
Needle roller bearings			class change	class 6	class 5	class 4	Table 3.5
Complex bearings	Radial bearings		class 0	class 6	class 5	—	Table 3.5
	Thrust bearings		class 0	class 6	class 5	class 4	Table 3.5
Needle roller bearing with double-direction thrustf roller bearings	Radial bearings		—	—	class 5	class 4	Table 3.5
	Thrust bearings		—	—	class 5	class 4	Table 3.5
Thrust roller bearings			class 0	class 6	class 5	class 4	Table 3.6
Roller follower/cam follower			class 0	—	—	—	Table 3.5

Note: JIS B 1514 and ISO 492 have the same specification level.

TECHNICAL TABLES

Table 3.3 Tolerances for radial ball bearings
Inner rings

Nominal bore diameter d mm		Single plane mean bore diameter deviation Δ_{dmp}										Single radial plane bore diameter variation V_{dp}									
		class 0		class 6		class 5		class 4 ❶		class 2 ❶		diameter series 9					maxdiameter series 0,1				
												class 0	class 6	class 5	class 4	class 2	class 0	class 6	class 5	class 4	class 2
over	incl.	high	low	high	low	high	low	high	low	high	low	max.					max.				
10	18	0	-8	0	-7	0	-5	0	-4	0	-2.5	10	9	5	4	2.5	8	7	4	3	2.5
18	30	0	-10	0	-8	0	-6	0	-5	0	-2.5	13	10	6	5	2.5	10	8	5	4	2.5
30	50	0	-12	0	-10	0	-8	0	-6	0	-2.5	15	13	8	6	2.5	12	10	6	5	2.5
50	80	0	-15	0	-12	0	-9	0	-7	0	-4.0	19	15	9	7	4.0	19	15	7	5	4.0
80	120	0	-20	0	-15	0	-10	0	-8	0	-5.0	25	19	10	8	5.0	25	19	8	6	5.0

Nominal bore diameter d mm		Single radial plane bore diameter variation V_{dp}					Mean single plane bore diameter variation V_{dmp}					Inner ring radial runout K_{ia}					Face runout with bore S_d		
		maxdiameter series 2,3,4																	
		class 0	class 6	class 5	class 4	class 2	class 0	class 6	class 5	class 4	class 2	class 0	class 6	class 5	class 4	class 2	class 5	class 4	class 2
over	incl.			max.					max.					max.				max.	
10	18	6	5	4	3	2.5	6	5	3	2.0	1.5	10	7	4	2.5	1.5	7.0	3.0	1.5
18	30	8	6	5	4	2.5	8	6	3	2.5	1.5	13	8	4	3.0	2.5	8.0	4.0	1.5
30	50	9	8	6	5	2.5	9	8	4	3.0	1.5	15	10	5	4.0	2.5	8.0	4.0	1.5
50	80	11	9	7	5	4.0	11	9	5	3.5	2.0	20	10	5	4.0	2.5	8.0	5.0	1.5
80	120	15	11	8	6	5.0	15	11	5	4.0	2.5	25	13	6	5.0	2.5	9.0	5.0	2.5

(Unit : μm)

Nominal bore diameter d mm		Inner ring axial runout (with side) S_{ia} ❷			Inner ring width deviation Δ_{Bs}										Inner ring width variation V_{Bs}				
					normal						modified ❷								
		class 5	class 4	class 2	class 0,6		class 5,4		class 2		class 0,6		class 5,4		class 0	class 6	class 5	class 4	class 2
over	incl.				high	low	high	low	high	low	high	low	high	low			max.		
10	18	7	3	1.5	0	-120	0	-80	0	-80	0	-250	0	-250	20	20	5	2.5	1.5
18	30	8	4	2.5	0	-120	0	-120	0	-120	0	-250	0	-250	20	20	5	2.5	1.5
30	50	8	4	2.5	0	-120	0	-120	0	-120	0	-380	0	-250	20	20	5	3.0	1.5
50	80	8	5	2.5	0	-150	0	-150	0	-150	0	-380	0	-250	25	25	6	4.0	1.5
80	120	9	5	2.5	0	-200	0	-200	0	-200	0	-380	0	-380	25	25	7	4.0	2.5

Note: ❶ The dimensional difference Δ_{ds} of bore diameter to applied for class 4 and 2 is the same as the tolerance of dimentional difference Δ_{dmp} of average bore diameter. However, the dimensional difference is applied to diameter series 0, 1, 2, 3 and 4 against Class 4, and to all the diameter series against Class 2.
❷ To be applied for deep groove ball bearing and angular contact ball bearings.
❸ To be applied for individual raceway rings manufactured for combined bearing use.

Outer rings

(Unit : μm)

Nominal Outside diameter D mm over	incl.	Single plane mean outside diameter deviation ΔDmp class 0 high	low	class 6 high	low	class 5 high	low	class 4 ❶ high	low	class 2 ❶ high	low	Single radial plane outside diameter variation VDp diameter series 9 class 0	class 6	class 5 max.	class 4	class 2	maxdiameter series 0,1 class 0	class 6	class 5 max.	class 4	class 2
6	18	0	-8	0	-7	0	-5	0	-4	0	-2.5	10	9	5	4	2.5	8	7	4	3	2.5
18	30	0	-9	0	-8	0	-6	0	-5	0	-4.0	12	10	6	5	4.0	9	8	5	4	4.0
30	50	0	-11	0	-9	0	-7	0	-6	0	-4.0	14	11	7	6	4.0	11	9	5	5	4.0
50	80	0	-13	0	-11	0	-9	0	-7	0	-4.0	16	14	9	7	4.0	13	11	7	5	4.0
80	120	0	-15	0	-13	0	-10	0	-8	0	-5.0	19	16	10	8	5.0	19	16	8	6	5.0
120	150	0	-18	0	-15	0	-11	0	-9	0	-5.0	23	19	11	9	5.0	23	19	8	7	5.0
150	180	0	-25	0	-18	0	-13	0	-10	0	-7.0	31	23	13	10	7.0	31	23	10	8	7.0
180	250	0	-30	0	-20	0	-15	0	-11	0	-8.0	38	25	15	11	8.0	38	25	11	8	8.0

Nominal Outside diameter D mm over	incl.	Single radial plane outside diameter variation VDp maxdiameter series 2,3,4 class 0	class 6	class 5 max.	class 4	class 2	Single radial plane outside diameter variation VDp ❷ capped bearings diameter series 2,3,4 class 0 max.	0,1,2,3,4 class 6	Mean single plane outside diameter variation VDmp class 0	class 6	class 5 max.	class 4	class 2
6	18	6	5	4	3	2.5	10	9	6	5	3	2.0	1.5
18	30	7	6	5	4	4.0	12	10	7	6	3	2.5	2.0
30	50	8	7	5	5	4.0	16	13	8	7	4	3.0	2.0
50	80	10	8	7	5	4.0	20	16	10	8	5	3.5	2.0
80	120	11	10	8	6	5.0	26	20	11	10	5	4.0	2.5
120	150	14	11	8	7	5.0	30	25	14	11	6	5.0	2.5
150	180	19	14	10	8	7.0	38	30	19	14	7	5.0	3.5
180	250	23	15	11	8	8.0	—	—	23	15	8	6.0	4.0

(Unit : μm)

Nominal Outside diameter D mm over	incl.	Outer ring radial runout Kea class 0	class 6	class 5 max.	class 4	class 2	Outside surface inclination SD class 5	class 4 max.	class 2	Outside ring axial runout Sea ❸ class 5	class 4 max.	class 2	Outer ring width deviation ΔCs all type	Outer ring width variation VCs class 0,6	class 5	class 4 max.	class 2
6	18	15	8	5	3	1.5	8	4	1.5	8	5	1.5	Identical to ΔBs of inner ring of same bearing	Identical to ΔBs and VBs of inner ring of same bearing	5	2.5	1.5
18	30	15	9	6	4	2.5	8	4	1.5	8	5	2.5			5	2.5	1.5
30	50	20	10	7	5	2.5	8	4	1.5	8	5	2.5			5	2.5	1.5
50	80	25	13	8	5	4.0	8	4	1.5	10	5	4.0			6	3.0	1.5
80	120	35	18	10	6	5.0	9	5	2.5	11	6	5.0			8	4.0	2.5
120	150	40	20	11	7	5.0	10	5	2.5	13	7	5.0			8	5.0	2.5
150	180	45	23	13	8	5.0	10	5	2.5	14	8	5.0			8	5.0	2.5
180	250	50	25	15	10	7.0	11	7	4.0	15	10	7.0			10	7.0	4.0

Note: ❶ The dimensional difference ΔDs of outer diameter to be applied for classes 4 and 2 is the same as the tolerance of dimensional difference ΔDmp of average outer diameter. However,the dimensional difference is applied to diameter series 0,1,2,3 and 4 against Class 4, and also to all the diameter series against Class 2.
❷ To be applied in case snap rings are not installed on the bearings.
❸ To be applied for Deep Groove Ball Bearings and Angular Contact Ball Bearings.

TECHNICAL TABLES

Table 3.4 Tolerance for taper roller bearings

Inner rings

Nominal bore diameter d mm		Single plane mean bore diameter deviation Δ_{dmp}						Single radial plane bore diameter variation V_{dp}				Mean single plane bore diameter variation V_{dmp}				Inner ring radial runout K_{ia}			
		class 0 class 6X		class 5 class 6		class 4❶		class 0 class 6X	class 6	class 5	class 4	class 0 class 6X	class 6	class 5	class 4	class 0 class 6X	class 6	class 5	class 4
over	incl.	high	low	high	low	high	low	max.				max.				max.			
18	30	0	-12	0	-8	0	-6	12	8	6	5	9	6	5	4	18	8	5	3
30	50	0	-12	0	-10	0	-8	12	10	8	6	9	8	5	5	20	10	6	4
50	80	0	-15	0	-12	0	-9	15	12	9	7	11	9	6	5	25	10	7	4
80	120	0	-20	0	-15	0	-10	20	15	11	8	15	11	8	5	30	13	8	5
120	180	0	-25	0	-18	0	-13	25	18	14	10	19	14	9	7	35	18	11	6
180	250	0	-30	0	-22	0	-15	30	22	17	11	23	16	11	8	50	20	13	8
250	315	0	-35	-	-	-	-	35	-	-	-	26	-	-	-	60	-	-	-

Note: ❶ The dimensional difference Δ_{ds} of the bore diameter to be applied for class 4 is the same as the tolerance of dimensional difference Δ_{dmp} of the average bore diameter

(Unit: μm)

Face runout with bore S_d		Inner ring axial runout (with side) S_{ia}	Inner ring width deviation ΔB_s						Single-row bearing width deviation ΔT_s						Double-row bearing width deviation $\Delta B1S$, $\Delta C1S$			Four-row bearing width deviation $\Delta B2S$, $\Delta C2S$		
class 5	class 4	class 4	class 0 class 6		class 6X		class 5 class 4		class 0 class 6		class 6X		class 5 class 4		class 0	class 6	class 5	class 0	class 6	class 5
max.		max.	high	low	high	low	high	low	high	low	high	low	high	low	high		low	high		low
8	4	4	0	-120	0	-50	0	-200	+200	0	+100	0	+200	-200	-		-	-		-
8	4	4	0	-120	0	-50	0	-240	+200	0	+100	0	+200	-200	+240		-240	-		-
8	5	4	0	-150	0	-50	0	-300	+200	0	+100	0	+200	-200	+300		-300	-		-
9	5	5	0	-200	0	-50	0	-400	+200	-200	+100	0	+200	-200	+400		-400	+500		-500
10	6	7	0	-250	0	-50	0	-500	+350	-250	+150	0	+350	-250	+500		-500	+600		-600
11	7	8	0	-300	0	-50	0	-600	+350	-250	+150	0	+350	-250	+600		-600	+750		-750
-	-	-	-	-350	0	-50	-	-	+350	-250	+200	0	-	-	+700		-700	+900		-900

Outer rings

Nominal outside diameter D mm		Single plane mean outside diameter deviation Δ_{Dmp}						Single radial plane outside diameter variation V_{Dp}				Mean single plane outside diameter variation V_{Dmp}				Outer ring radial runout K_{ea}			
		class 0 class 6X		class 5 class 6		class 4❷		class 0 class 6X	class 6	class 5	class 4	class 0 class 6X	class 6	class 5	class 4	class 0 class 6X	class 6	class 5	class 4
over	incl.	high	low	high	low	high	low	max.				max.				max.			
18	30	0	-12	0	-8	0	-6	12	8	6	5	9	6	5	4	18	9	6	4
30	50	0	-14	0	-9	0	-7	14	9	7	5	11	7	5	5	20	10	7	5
50	80	0	-16	0	-11	0	-9	16	11	8	7	12	8	6	5	25	13	8	5
80	120	0	-18	0	-13	0	-10	18	13	10	8	14	10	7	5	35	18	10	6
120	150	0	-20	0	-15	0	-11	20	15	11	8	15	11	8	6	40	20	11	7
150	180	0	-25	0	-18	0	-13	25	18	14	10	19	14	9	7	45	23	13	8
180	250	0	-30	0	-20	0	-15	30	20	15	11	23	15	10	8	50	25	15	10
250	315	0	-35	0	-25	0	-18	35	25	19	14	26	19	13	9	60	30	18	11

Note: ❷ The dimensional difference Δ_{Ds} of the outer diameter to be applied for class 4 is the same as the tolerance of dimensional difference Δ_{Dmp} of the average outer diameter.

(Unit: μm)

Outside surface inclination S_D		Outside ring axial runout S_{ea}	Outer ring width deviation ΔC_s			
class 5	class 4	class 4	class 0 class 6 class 5 class 4		class 6X	
max.		max.	high	low	high	low
8	4	5	Identical to ΔB_s of inner ring of same bearing		0	-100
8	4	5			0	-100
8	4	5			0	-100
9	5	6			0	-100
10	5	7			0	-100
10	5	8			0	-100
11	7	10			0	-100
13	8	10			0	-100

Table 3.5 Tolerance for needle roller bearings
Inner rings

Nominal bore diameter d mm		Single plane mean bore diameter deviation Δ_{dmp}								Single radial plane bore diameter variation V_{dp}				Mean single plane bore diameter variation V_{dmp}				Inner ring radial runout K_{ia}			
		class 0		class 6		class 5		class 4❶		class 0	class 6	class 5	class 4	class 0	class 6	class 5	class 4	class 0	class 6	class 5	class 4
over	incl.	high	low	high	low	high	low	high	low	max.				max.				max.			
2.5❷	10	0	-8	0	-7	0	-5	0	-4	10	9	5	4	6	5	3	2.0	10	6	4	2.5
10	18	0	-8	0	-7	0	-5	0	-4	10	9	5	4	6	5	3	2.0	10	7	4	2.5
18	30	0	-10	0	-8	0	-6	0	-5	13	10	6	5	8	6	3	2.5	13	8	4	3.0
30	50	0	-12	0	-10	0	-8	0	-6	15	13	8	6	9	8	4	3.0	15	10	5	4.0
50	80	0	-15	0	-12	0	-9	0	-7	19	15	9	7	11	9	5	3.5	20	10	5	4.0
80	120	0	-20	0	-15	0	-10	0	-8	25	19	10	8	15	11	5	4.0	25	13	6	5.0
120	150	0	-25	0	-18	0	-13	0	-10	31	23	13	10	19	14	7	5.0	30	18	8	6.0
150	180	0	-25	0	-18	0	-13	0	-10	31	23	13	10	19	14	7	5.0	30	18	8	6.0
180	250	0	-30	0	-22	0	-15	0	-12	38	28	15	12	23	17	8	6.0	40	20	10	8.0
250	315	0	-35	0	-25	0	-18	—	—	44	31	18	—	26	19	9	—	50	25	13	—
315	400	0	-40	0	-30	0	-23	—	—	50	38	23	—	30	23	12	—	60	30	15	—
400	500	0	-45	0	-35	—	—	—	—	56	44	—	—	34	26	—	—	65	35	—	—

Note: ❶ The dimensional difference Δ_{ds} of the bore diameter to be applied for class 4 is the same as the tolerance of dimensional difference Δ_{dmp} of the average bore diameter
❷ Nominal bore diameter of bearings of 2.5 mm is included in this dimensional division.

TECHNICAL TABLES

(Unit: μm)

Nominal bore diameter d mm over	incl.	Face runout with bore Sd max. class 0	class 6	class 5	Inner ring axial runout (with side) Sia ❹ max. class 0	class 6	class 5	Inner ring width deviation ΔBs class 0,6 high	low	class 5,4 high	low	Inner ring width variation VBs max. class 0	class 6	class 5	class 4
2.5 ❸	10	7	3	1.5	7	3	1.5	0	-120	0	-40	15	15	5	2.5
10	18	7	3	1.5	7	3	1.5	0	-120	0	-80	20	20	5	2.5
18	30	8	4	1.5	8	4	2.5	0	-120	0	-120	20	20	5	2.5
30	50	8	4	1.5	8	4	2.5	0	-120	0	-120	20	20	5	3.0
50	80	8	5	1.5	8	5	2.5	0	-150	0	-150	25	25	6	4.0
80	120	9	5	2.5	9	5	2.5	0	-200	0	-200	25	25	7	4.0
120	150	10	6	2.5	10	7	2.5	0	-250	0	-250	30	30	8	5.0
150	180	10	6	4.0	10	7	5.0	0	-250	0	-250	30	30	8	5.0
180	250	11	7	5.0	13	8	5.0	0	-300	0	-300	30	30	10	6.0
250	315	13	—	—	15	—	—	0	-350	0	-350	35	35	13	—
315	400	15	—	—	20	—	—	0	-400	0	-400	40	40	15	—
400	500	—		—	—	—	—	0	-450	—	—	50	45	—	—

Note: ❸ To be applied for deep groove ball bearing.

Note: Δdmp: deviation of the mean bore diameter from the nominal (Δdmp = dmp - d).
Vdp: bore diameter variation: difference between the largest and smallest single bore diameters in one plane.
Vdmp: mean bore diameter variation: difference between the largest and smallest mean bore diameters of one ring or washer.
Kia: radial runout of assembled bearing inner ring and assembled bearing outer ring, respectively.
Sd: side face runout with reference to bore (of inner ring).
Sia: side face runout of assembled bearing inner ring and assembled bearing outer ring, respectively.
ΔBs: deviation of single inner ring width or single outer ring width from the nominal (ΔBs = Bs - B etc.)
VBs: ring width variation: difference between the largest and smallest single widths of inner ring and of outer ring, respectively.

Outer rings

Nominal outside diameter D mm over	incl.	Single plane mean outside diameter deviation ΔDmp class 0 high	low	class 6 high	low	class 5 high	low	class 4 ❹ high	low	Single radial plane outside diameter variation VDp max. class 0	class 6	class 5	class 4	Mean single plane outside diameter variation VDmp max. class 0	class 6	class 5	class 4	Outer ring radial runout KOa max. class 0	class 6	class 5	class 4
6 ❺	18	0	-8	0	-7	0	-5	0	-4	10	9	5	4	6	5	3	2.0	15	8	5	3
18	30	0	-9	0	-8	0	-6	0	-5	12	10	6	5	7	6	3	2.5	15	9	6	4
30	50	0	-11	0	-9	0	-7	0	-6	14	11	7	6	8	7	4	3.0	20	10	7	5
50	80	0	-13	0	-11	0	-9	0	-7	16	14	9	7	10	8	5	3.5	25	13	8	5
80	120	0	-15	0	-13	0	-10	0	-8	19	16	10	8	11	10	5	4.0	35	18	10	6
120	150	0	-18	0	-15	0	-11	0	-9	23	19	11	9	14	11	6	5.0	40	20	11	7
150	180	0	-25	0	-18	0	-13	0	-10	31	23	13	10	19	14	7	5.0	45	23	13	8
180	250	0	-30	0	-20	0	-15	0	-11	38	25	15	11	23	15	8	6.0	50	25	15	10
250	315	0	-35	0	-25	0	-18	0	-13	44	31	18	13	26	19	9	7.0	60	30	18	11
315	400	0	-40	0	-28	0	-20	0	-15	50	35	20	15	30	21	10	8.0	70	35	20	13
400	500	0	-45	0	-33	0	-23	—	—	56	41	23	—	34	25	12	—	80	40	23	—
500	630	0	-50	0	-38	0	-28	—	—	63	48	28	—	38	29	14	—	100	50	25	—

Note: ❹ The dimensional difference ΔDs of the outer diameter to be applied for class 4 is the same as the tolerance of dimensional difference ΔDmp of the average outer diameter.
❺ Nominal outer diameter of bearings of 6 mm is included in this dimensional division.

(Unit: μm)

Nominal outside diameter D mm over	incl.	Outside surface inclination Sd class 5 max.	class 4	Outside ring axial runout Sia ❻ class 5 max.	class 4	Outer ring width deviation ΔCs all type	Outer ring width variation VCs class 0,6	class 5 max.	class 4
6 ❻	18	8	4	8	5			5	2.5
18	30	8	4	8	5	Identical to	Identical to	5	2.5
30	50	8	4	8	5	ΔBs of inner	ΔBs and Vbs	5	2.5
50	80	8	4	10	5	ring of same	of inner	6	3.0
80	120	9	5	11	6	bearing	ring of same	8	4.0
120	150	10	5	13	7		bearing	8	5.0
150	180	10	5	14	8			8	5.0
180	250	11	7	15	10			10	7.0
250	315	13	8	18	10			11	7.0
315	400	13	10	20	13			13	8.0
400	500	15	—	23	—			15	—
500	630	18	—	25	—			18	—

Note: ❻ To be applied for deep groove ball bearings.

Note: ΔDmp: deviation of the mean outside diameter from the nominal (ΔDmp=Dmp − D).
VDp: outside diameter variation: difference between the largest and smallest single outside diameters in one plane.
Vdmp: mean bore diameter variation: difference between the largest and smallest mean bore diameters of one ring or washer.
Kea: radial runout of assembled bearing inner ring and assembled bearing outer ring, respectively.
Sd: side face runout with reference to bore (of inner ring).
Sia: side face runout of assembled bearing inner ring and assembled bearing outer ring, respectively.
ΔCs: deviation of single inner ring width or single outer ring width from the nominal (ΔBs = Bs − B etc.)
VCs: ring width variation: difference between the largest and smallest single widths of inner ring and of outer ring, respectively.

Table 3.6 Tolerance of thrust roller bearings

Inner rings (Unit: μm)

Nominal outer diameter d mm		Single plane mean bore diameter deviation Δdmp				Single radial plane bore diameter variation Vdp		Thrust bearing shaft washer raceway (or center washer raceway) thickness variation Si			
		class 0,6,5		class 4		class 0,6,5	class 4	class 0	class 6	class 5	class 4
over	incl.	high	low	high	low	max.		max.			
—	18	0	-8	0	-7	6	5	10	5	3	2
18	30	0	-10	0	-8	8	6	10	5	3	2
30	50	0	-12	0	-10	9	8	10	6	3	2
50	80	0	-15	0	-12	11	9	10	7	4	3
80	120	0	-20	0	-15	15	11	15	8	4	3
120	180	0	-25	0	-18	19	14	15	9	5	4
180	250	0	-30	0	-22	23	17	20	10	5	4
250	315	0	-35	0	-25	26	19	25	13	7	5
315	400	0	-40	0	-30	30	23	30	15	7	5
400	500	0	-45	0	-35	34	26	30	18	9	6
500	630	0	-50	0	-40	38	30	35	21	11	7

Outer rings (Unit: μm)

Nominal outside diameter D mm		Single plane mean outside diameter deviation ΔDmp				Single radial plane outside diameter variation VDp		Thrust bearing housing washer raceway thickness variation Se			
		class 0,6,5		class 4		class 0,6,5	class 4	class 0	class 6	class 5	class 4
over	incl.	high	low	high	low	max.		max.			
10	18	0	-11	0	-7	8	5	According to the tolerance of Si against "d" or "d_1" of the same bearings			
18	30	0	-13	0	-8	10	6				
30	50	0	-16	0	-9	12	7				
50	80	0	-19	0	-11	14	8				
80	120	0	-22	0	-13	17	10				
120	180	0	-25	0	-15	19	11				
180	250	0	-30	0	-20	23	15				
250	315	0	-35	0	-25	26	19				
315	400	0	-40	0	-28	30	21				
400	500	0	-45	0	-33	34	25				
500	630	0	-50	0	-38	38	29				
630	800	0	-75	0	-45	55	34				

Note: Δdmp: deviation of the mean bore diameter from the nominal ($\Delta dmp = dmp - d$).
Vdp: bore diameter variation: difference between the largest and smallest single bore diameters in one plane.
Si: thickness variation, measured from middle of raceway to back (seating) face of shaft washer and of housing washer, respectively (axial runout).
ΔDmp: deviation of the mean outside diameter from the nominal ($\Delta Dmp = Dmp - D$).
VDp: outside diameter variation: difference between the largest and smallest single outside diameters in one plane.
Se: thickness variation, measured from middle of raceway to back (seating) face of shaft washer and of housing washer, respectively (axial runout).

3.2 Chamfer measurements and tolerance or allowable values of tapered bore

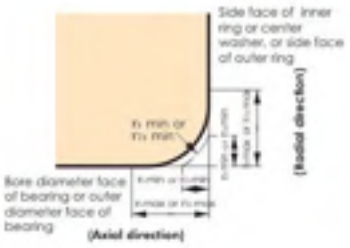


Table 3.8 Allowable critical-value of bearing chamfer

(Unit: μm)

r_s min ❶ or r_s min	Nominal bore ❷ diameter of bearing "d" or nominal outside diameter "D"		r_s max or r_s max	
	over	incl.	Radial direction	Axial direction
0.3	-	40	0.7	1.4
0.3	40	-	0.9	1.6
0.6	-	40	1.1	1.7
0.6	40	-	1.3	2.0
1.0	-	50	1.6	2.5
1.0	50	-	1.9	3.0
1.5	-	120	2.3	3.0
1.5	120	250	2.8	3.5
1.5	250	-	3.5	4.0
2.0	-	120	2.8	4.0
2.0	120	250	3.5	4.5
2.0	250	-	4.0	5.0
2.5	-	120	3.5	5.0
2.5	120	250	4.0	5.5
2.5	250	-	4.5	6.0
3.0	-	120	4.0	5.5
3.0	120	250	4.5	6.5
3.0	250	400	5.0	7.0
3.0	400	-	5.5	7.5
4.0	-	120	5.0	7.0
4.0	120	250	5.5	7.5
4.0	250	400	6.0	8.0
4.0	400	-	6.5	8.5
5.0	-	180	6.5	8.0
5.0	180	-	7.5	9.0
6.0	-	180	7.5	10.0
6.0	180	-	9.0	11.0

4. Bearing fits

4.1 Interference

For rolling bearings, inner and outer rings are fixed on the shaft or in the housing so that relative movement does not occur between fitted surfaces during operation or under load. This relative movement (referred to as "creep") between the fitted surfaces of the bearing and the shaft or housing can occur in a radial direction, an axial direction, or in the direction of rotation. To help prevent this creeping movement, bearing rings and the shaft or housing are installed with one of three interference fits, a "tight fit" (also called shrink fit), "transition fit," or "loose fit" (also called clearance fit), and the degree of interference between their fitted surfaces varies.

The most effective way to fix the fitted surfaces between a bearing's raceway and shaft or housing is to apply a "tight fit." The advantage of this tight fit for thin walled bearings is that it provides uniform load support over the entire ring circumference without any loss of load carrying capacity. However, with a tight fit, ease of installation and disassembly is lost; And when using a non-separable bearing as the floating-side bearing, axial displacement is not possible. For this reason, a tight fit cannot be recommended in all cases.

4.2 The necessity of a proper fit

In some cases, improper fit may lead to damage and shorten bearing life, therefore it is necessary to make a careful analysis in selecting a proper fit. Some of the negative conditions caused by improper fit are listed below.

- Raceway cracking, early peeling and displacement of raceway
- Raceway and shaft or housing abrasion caused by creeping and fretting corrosion
- Seizing caused by loss of internal clearances
- Increased noise and lowered rotational accuracy due to raceway groove deformation

4.3 Fit selection

Selection of a proper fit is dependent upon thorough analysis of bearing operating conditions, including consideration of:

- Shaft and housing material, wall thickness, finished surface accuracy, etc.
- Machinery operating conditions (nature and magnitude of load, rotational speed, temperature, etc.)

4.3.1 "Tight fit," "transition fit," or "loose fit"

For raceways under rotating loads, a tight fit is necessary. (Refer to Table 4.1) "Raceways under rotating loads" refers to raceways receiving loads rotating relative to their radial direction. For raceways under static loads, on the other hand, a loose fit is sufficient.
(Example) Rotating inner ring load the direction of the radial load on the inner ring is rotating relatively.

For non-separable bearings, such as Deep Groove Ball Bearings, it is generally recommended that either the inner ring or outer ring be given a loose fit.

Table 4.1 Radial load for ball bearings

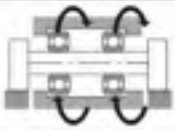
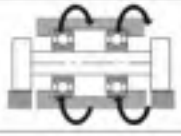
Illustration	Bearing rotation		Ring load	Fit
Static load 		Inner ring: Rotating Outer ring: Stationary	Rotating inner ring load	Inner ring: Tight fit
Unbalanced load 		Inner ring: Stationary Outer ring: Rotating	Static outer ring load	Outer ring: Loose fit
Static load 		Inner ring: Stationary Outer ring: Rotating	Static inner ring load	Inner ring: Loose fit
Unbalanced load 		Inner ring: Rotating Outer ring: Stationary	Rotating outer ring load	Outer ring: Tight fit

Table 4.2 Radial load for roller bearings

Illustration	Bearing rotation	Ring load	Fit
Static load 	 Inner ring: Rotating Outer ring: Stationary	Rotating inner ring load	Inner ring: Tight fit
Imbalanced load 	 Inner ring: Stationary Outer ring: Rotating	Static outer ring load	Outer ring: Loose fit
Static load 	 Inner ring: Stationary Outer ring: Rotating	Static inner ring load	Inner ring: Loose fit
Imbalanced load 	 Inner ring: Rotating Outer ring: Stationary	Rotating outer ring load	Outer ring: Tight fit

4.3.2 Recommended Fits

The system of limits and fits define the tolerances of the outside diameter of the shaft or the bore diameter of a housing (the shaft or housing to which a metric bearing is installed). Bearing fit is governed by the selection of tolerances for the shaft outside diameter and housing bore diameter. Fig . 3.1 summarizes the interrelations between shaft outside diameter and bearing bore diameter, and between housing bore diameter and shaft outside diameter.Table 3.2 provides the recommended fits for common radial needle roller bearings (machined ring needle roller bearings with inner ring), relative to dimensions and loading conditions. Table 3.3 is a table of the numerical value of fits.

4.3.3 Interference minimum and maximum values

The following points should be considered when it is necessary to calculate the interference for an application:

- In calculating the minimum required amount of interference keep in mind that:
  1) interference is reduced by radial loads
  2) interference is reduced by differences between bearing temperature and ambient temperature
- 3) interference is reduced by variation of fitted surfaces

Maximum interference should be no more than 1:1000 of the shaft diameter or outer diameter. Required interference calculations are shown below.

4.3.3.1 Fitted surface variation and required interference

Interference between fitted surfaces is reduced by roughness and other slight variations of these surfaces which are flattened in the fitting process. The degree of reduced interference depends upon the finish treatment of these surfaces, but in general it is necessary to assume the following interference reductions.

For ground shafts: 1.0 ~ 2.5 μm
For lathed shafts : 5.0 ~ 7.0 μm

4.3.3.2 Maximum interference

When bearing rings are installed with an interference fit, tension or compression stress may occur along their raceways. If interference is too great, this may cause damage to the rings and reduce bearing life. For these reasons, maximum interference should not exceed the previously mentioned ratio of 1:1,000 of the shaft or outside diameter.

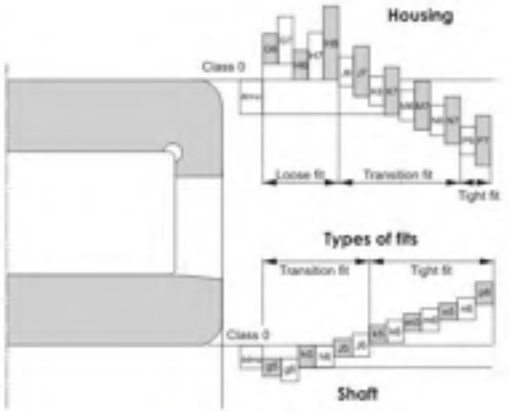


Fig. 4.1

Table 4.3 General standards for taper roller bearings & spherical roller bearings fits
Shaft fits

Nature of load	Fit	Load condition, magnitude	Shaft diameter mm over	incl	Tolerance class	Remarks
Indeterminate direction load Rotating inner ring load	Tight fit/ Transition fit	Light load❶		~ 40	js6	When greater accuracy is required m5 may be substituted for m6.
			40 ~ 140		k6	
			140 ~ 200		m6	
		Normal load❶		~ 40	k5	
			40 ~ 100		m5	
			100 ~ 140		m6	
			140 ~ 200		n6	
			200 ~ 400		p6	
		Heavy load❶ or shock load	50 ~ 140		n6	When greater accuracy is required m5 may be substituted for m6.
			140 ~ 200		p6	
			200 ~		r6	
Static inner ring load	Transition fit	Inner ring axial displacement possible	All shaft diameters		g6	When greater accuracy is required use g5. For large bearings, f6 may be used.
		Inner ring axial displacement unnecessary			h6	When greater accuracy is required use h5.
Centric axial load only	Transition fit	All loads	All shaft diameters		h9/IT5	General: depending on the fit, shaft and inner rings are not fixed.

❶ Standards for light loads, normal loads, and heavy loads
Light loads : equivalent radial load ≤ 0.06 Cr
Normal loads: 0.06 Cr < equivalent radial load ≤ 0.12 Cr
Heavy loads : 0.12 Cr <equivalent radial load

Note: All values and fits listed in the above tables are for solid steel shafts.

Housing fits (Housing of the drawn cup taper roller bearings & spherical roller bearings)

Housing	Solid housing or split housing		Split housing
Load condition, magnitude	Static outer load	All loads	H7
		with large temperature different	G7
	Direction indeterminate load	Light to normal load	JS7
Tolerance class		Normal to heavy load	K7
		Heavy shock load	M7
	Outer ring Rotating load	Light or variable load	M7
		Normal to heavy load	N7
		Heavy load (thin wall housing) or heavy shock load	P7

Note: All values add fits listed in the above tables are for cast iron or steel housings.
Select more tighten tolerance class for light weight alloy housings.

Table 4.4 General standards for needle roller bearings fits
Shaft fits

Nature of load	Fit	Load condition, magnitude	Shaft diameter mm over – incl	Tolerance class	Remarks
Indeterminate direction load Rotating inner ring load	Tight fit/ Transition fit	Light load●	– 50	js6	When greater accuracy is required m5 may be substituted for m6.
			50 – 100	k6	
			100 – 200	m6	
		Normal load●	– 50	k5	
			50 – 100	m5	
			100 – 150	m6	
			150 – 200	n6	
			200 –	p6	
		Heavy load● or shock load	– 150	n6	When greater accuracy is required m5 may be substituted for m6.
			150 –	p6	
				r6	
Static inner ring load	Transition fit	Inner ring axial displacement possible	All shaft diameters	g6	When greater accuracy is required use g5. For large bearings, f6 may be used.
		Inner ring axial displacement unnecessary		h6	When greater accuracy is required use h5.
Centric axial load only	Transition fit	All loads	All shaft diameters	js6	General: depending on the fit, shaft and inner rings are not fixed.

● Standards for light loads, normal loads, and heavy loads
Light loads : equivalent radial load ≤ 0.06 Cr
Normal loads: 0.06 Cr < equivalent radial load ≤ 0.12 Cr
Heavy loads : 0.12 Cr <equivalent radial load

Note: All values and fits listed in the above tables are for solid steel shafts.

Housing fits (Housing of the drawn cup needle roller bearings)

Nature of load	Housing	Fit	Load condition, magnitude	Tolerance class	Outer ring axial displacement❷	Remarks
Rotating outer ring load or static outer ring load	Solid housing or split housing	Loose fit	All loads	J7	Displacement possible	G7 also acceptable for large type bearings as well as outer rings and housings with large temperature differences
			Light❶ to normal load	H7	Displacement possible	—
	Solid housing	Transition or loose fit	High rotation accuracy required with light to normal loads	K6	Displacement not possible(in principle)	Applies primarily to roller bearings
Direction indeterminate load		Tight to transition fit	Light to normal load	J7	Displacement possible	When greater accuracy is required substitute j6 for J7 and K6 for K7.
			Normal to heavy load	K7	Displacement not possible(in principle)	
			Heavy shock load	M7	Displacement not possible	—
Inner ring static load or outer ring rotating load		Tight fit	Light or variable load	M7	Displacement not possible	—
			Normal to heavy load	N7	Displacement not possible	—
			Heavy load (thin wall housing)or heavy shock load	P7	Displacement not possible	—
Centered axial load only - Loose fit		Loose fit	—	Select a tolerance class that will provide clearance between outer ring and housing.		—

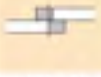
❶ Standards for light loads, normal loads, and heavy loads
Light loads: equivalent radial load ≤ 0.06 Cr
Normal loads: 0.06 Cr < equivalent radial load ≤ 0.12 Cr
Heavy loads: 0.12 Cr <equivalent radial load

❷ Indicates whether or not outer ring axial displacement is possible with non-separable type bearings.

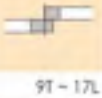
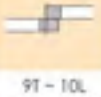
Note 1 : All values and fits listed in the above tables are for cast iron or steel housings.
2 : In cases where only a centered axial load acts on the bearing, select a tolerance class that will provide clearance in the axial direction for the outer ring.

Table 4.7 Numeric value table of fitting for radial bearing of class 0 (taper roller bearings & spherical roller bearings)

Fitting against shaft

Nominal bore diameter of bearing d mm		Single plane mean bore diameter deviation Δ_{dmp}		g5	g6	h5	h6	j5	js5	j6
				bearing shaft	bearing shaft	bearing shaft	bearing shaft	bearing shaft	bearing shaft	bearing shaft
over	incl.	high	low							
10	18	0	-8	2T ~ 14L	2T ~ 17L	8T ~ 8L	8T ~ 11L	13T ~ 3L	12T ~ 4L	16T ~ 3L
18	30	0	-10	3T ~ 16L	3T ~ 20L	10T ~ 9L	10T ~ 13L	15T ~ 4L	14.5T ~ 4.5L	19T ~ 4L
30	50	0	-12	3T ~ 20L	3T ~ 25L	12T ~ 11L	12T ~ 16L	15T ~ 5L	17.5T ~ 5.5L	23T ~ 5L
50	80	0	-15	5T ~ 23L	5T ~ 29L	15T ~ 13L	15T ~ 19L	21T ~ 7L	21.5T ~ 6.5L	27T ~ 7L
80	120	0	-20	8T ~ 27L	8T ~ 34L	20T ~ 15L	20T ~ 22L	26T ~ 9L	27.5T ~ 7.5L	33T ~ 9L
120	140									
140	160	0	-25	11T ~ 32L	11T ~ 39L	25T ~ 18L	25T ~ 25L	32T ~ 11L	34T ~ 9L	39T ~ 11L
160	180									
180	200									
200	225	0	-30	15T ~ 35L	15T ~ 44L	30T ~ 20L	30T ~ 29L	37T ~ 13L	40T ~ 10L	46T ~ 13L
225	250									
250	280	0	-35	18T ~ 40L	18T ~ 49L	35T ~ 23L	35T ~ 32L	42T ~ 16L	46.5T ~ 11.5L	51T ~ 16L
280	315									

Fitting against housing

Nominal outside diameter of bearing d mm		Single plane mean outside diameter deviation Δ_{Dmp}		G7	H6	H7	J6	J7	Js7	K6
				housing bearing	housing bearing	housing bearing	housing bearing	housing bearing	housing bearing	housing bearing
over	incl.	high	low							
10	18	0	-8	6L ~ 32L	0 ~ 19L	0 ~ 26L	5T ~ 14L	8T ~ 18L	9T ~ 17L	9T ~ 10L
18	30	0	-9	7L ~ 37L	0 ~ 22L	0 ~ 30L	5T ~ 17L	9T ~ 21L	10.5T ~ 19.5L	11T ~ 11L
30	50	0	-11	9L ~ 45L	0 ~ 27L	0 ~ 36L	6T ~ 21L	11T ~ 25L	12.5T ~ 23.5L	13T ~ 14L
50	80	0	-13	10L ~ 53L	0 ~ 32L	0 ~ 43L	6T ~ 26L	12T ~ 31L	15T ~ 28L	15T ~ 17L
80	120	0	-15	12L ~ 62L	0 ~ 37L	0 ~ 50L	6T ~ 31L	13T ~ 37L	17.5T ~ 32.5L	18T ~ 19L
120	150	0	-18	14L ~ 72L	0 ~ 43L	0 ~ 58L	7T ~ 36L	14T ~ 44L	20T ~ 38L	21T ~ 22L
150	180	0	-25	14L ~ 79L	0 ~ 50L	0 ~ 65L	7T ~ 43L	14T ~ 51L	20T ~ 45L	21T ~ 29L
180	250	0	-30	15L ~ 91L	0 ~ 59L	0 ~ 76L	7T ~ 52L	16T ~ 60L	23T ~ 53L	24T ~ 35L
250	315	0	-35	17L ~ 104L	0 ~ 67L	0 ~ 87L	7T ~ 60L	16T ~ 71L	26T ~ 61L	27T ~ 40L

Note: T = tight, L = loose

TECHNICAL TABLES

(Unit: μm)

js6	k5	k6	m5	m6	n6	p6	r6	Nominal bore diameter of bearing d mm	
bearing shaft	bearing shaft	bearing shaft	bearing shaft	bearing shaft	bearing shaft	bearing shaft	bearing shaft	over	incl
13.5T ~ 5.5L	17T ~ 1T	20T ~ 1T	23T ~ 7T	26T ~ 7T	31T ~ 12T	37T ~ 18T	—	10	18
16.5T ~ 6.5L	21T ~ 2T	25T ~ 2T	27T ~ 8T	31T ~ 8T	38T ~ 15T	45T ~ 22T	—	18	30
20T ~ 8L	25T ~ 2T	30T ~ 2T	32T ~ 9T	37T ~ 9T	45T ~ 17T	54T ~ 26T	—	30	50
24.5T ~ 9.5L	30T ~ 2T	36T ~ 2T	39T ~ 11T	45T ~ 11T	54T ~ 20T	66T ~ 32T	—	50	80
31T ~11L	38T ~ 3T	45T ~ 2T	48T ~ 13T	55T ~ 13T	65T ~ 23T	79T ~ 37T	—	80	120
37.5T ~ 12.5L	46T ~ 3T	53T ~ 3T	58T ~ 15T	65T ~ 15T	77T ~ 27T	93T ~ 43T	113T ~ 63T	120	140
							115T ~ 65T	140	160
							118T ~ 68T	160	180
44.5T ~ 14.5L	54T ~ 4T	63T ~ 4T	67T ~ 17T	76T ~ 17T	90T ~ 31T	109T ~ 50T	136T ~ 77T	180	200
							139T ~ 80T	200	225
							143T ~ 84T	225	250
51T ~ 16L	62T ~ 4T	71T ~ 4T	78T ~ 20T	87T ~ 20T	101T ~ 34T	123T ~ 56T	161T ~ 94T	250	280
							165T ~ 98T	280	315

(Unit: μm)

K7	M7	N7	P7	Nominal outside diameter of bearing d mm	
housing bearing	housing bearing	housing bearing	housing bearing	over	incl
12T ~ 14L	18T ~ 8L	23T ~ 3L	29T ~ 3L	10	18
15T ~ 15L	21T ~ 9L	28T ~ 2L	35T ~ 5L	18	30
18T ~ 18L	25T ~ 11L	33T ~ 3L	42T ~ 6L	30	50
21T ~ 22L	30T ~ 13L	39T ~ 4L	52T ~ 8L	50	80
25T ~ 25L	35T ~ 15L	45T ~ 5L	59T ~ 9L	80	120
28T ~ 30L	40T ~ 18L	52T ~ 6L	68T ~ 10L	120	150
28T ~ 37L	40T ~ 25L	52T ~ 13L	68T ~ 3L	150	180
33T ~ 43L	46T ~ 30L	60T ~ 16L	79T ~ 3L	180	250
36T ~ 51L	52T ~ 35L	66T ~ 21L	88T ~ 1L	250	315

Table 4.7 Numeric value table of fitting for radial bearing of class 0 (needle roller bearings)

Fitting against shaft

Nominal bore diameter of bearing d mm over	incl.	Single plane mean bore diameter deviation Δ_{dmp} high	low	g5 bearing shaft	g6 bearing shaft	h5 bearing shaft	h6 bearing shaft	j5 bearing shaft	js5 bearing shaft	j6 bearing shaft
3	6	0	-8	4T ~ 9L	4T ~ 12L	8T ~ 5L	8T ~ 8L	11T ~ 2L	10.5T ~ 2.5L	14T ~ 2L
6	10	0	-8	3T ~ 11L	3T ~ 14L	8T ~ 6L	8T ~ 9L	12T ~ 2L	11T ~ 3L	15T ~ 2L
10	18	0	-8	2T ~ 14L	2T ~ 17L	8T ~ 8L	8T ~ 11L	13T ~ 3L	12T ~ 4L	16T ~ 3L
18	30	0	-10	3T ~ 16L	3T ~ 20L	10T ~ 9L	10T ~ 13L	15T ~ 4L	14.5T ~ 4.5L	19T ~ 4L
30	50	0	-12	3T ~ 20L	3T ~ 25L	12T ~ 11L	12T ~ 16L	15T ~ 5L	17.5T ~ 5.5L	23T ~ 5L
50	80	0	-15	5T ~ 23L	5T ~ 29L	15T ~ 13L	15T ~ 19L	21T ~ 7L	21.5T ~ 6.5L	27T ~ 7L
80	120	0	-20	8T ~ 27L	8T ~ 34L	20T ~ 15L	20T ~ 22L	26T ~ 9L	27.5T ~ 7.5L	33T ~ 9L
120	140	0	-25	11T ~ 32L	11T ~ 39L	25T ~ 18L	25T ~ 25L	32T ~ 11L	34T ~ 9L	39T ~ 11L
140	160									
160	180									
180	200	0	-30	15T ~ 35L	15T ~ 44L	30T ~ 20L	30T ~ 29L	37T ~ 13L	40T ~ 10L	46T ~ 13L
200	225									
225	250									
250	280	0	-35	18T ~ 40L	18T ~ 49L	35T ~ 23L	35T ~ 32L	42T ~ 16L	46.5T ~ 11.5L	51T ~ 16L
280	315									
315	355	0	-40	22T ~ 43L	22T ~ 54L	40T ~ 25L	40T ~ 36L	47T ~ 18L	52.5T ~ 12.5L	58T ~ 18L
355	400									
400	450	0	-45	25T ~ 47L	25T ~ 60L	45T ~ 27L	45T ~ 40L	52T ~ 20L	58.5T ~ 13.5L	65T ~ 20L
450	500									

Fitting against housing

Nominal outside diameter of bearing d mm over	incl.	Single plane mean outside diameter deviation Δ_{Dmp} high	low	G7 housing bearing	H6 housing bearing	H7 housing bearing	J6 housing bearing	J7 housing bearing	Js7 housing bearing	K6 housing bearing
6	10	0	-8	5L ~ 28L	0 ~ 17L	0 ~ 23L	4T ~ 13L	7T ~ 16L	7.5T ~ 15.5L	7T ~ 10L
10	18	0	-8	6L ~ 32L	0 ~ 19L	0 ~ 26L	5T ~ 14L	8T ~ 18L	9T ~ 17L	9T ~ 10L
18	30	0	-9	7L ~ 37L	0 ~ 22L	0 ~ 30L	5T ~ 17L	9T ~ 21L	10.5T ~ 19.5L	11T ~ 11L
30	50	0	-11	9L ~ 45L	0 ~ 27L	0 ~ 36L	6T ~ 21L	11T ~ 25L	12.5T ~ 23.5L	13T ~ 14L
50	80	0	-13	10L ~ 53L	0 ~ 32L	0 ~ 43L	6T ~ 26L	12T ~ 31L	15T ~ 28L	15T ~ 17L
80	120	0	-15	12L ~ 62L	0 ~ 37L	0 ~ 50L	6T ~ 31L	13T ~ 37L	17.5T ~ 32.5L	18T ~ 19L
120	150	0	-18	14L ~ 72L	0 ~ 43L	0 ~ 58L	7T ~ 36L	14T ~ 44L	20T ~ 38L	21T ~ 22L
150	180	0	-25	14L ~ 79L	0 ~ 50L	0 ~ 65L	7T ~ 43L	14T ~ 51L	20T ~ 45L	21T ~ 29L
180	250	0	-30	15L ~ 91L	0 ~ 59L	0 ~ 76L	7T ~ 52L	16T ~ 60L	23T ~ 53L	24T ~ 35L
250	315	0	-35	17L ~ 104L	0 ~ 67L	0 ~ 87L	7T ~ 60L	16T ~ 71L	26T ~ 61L	27T ~ 40L
315	400	0	-40	18L ~ 115L	0 ~ 76L	0 ~ 97L	7T ~ 69L	18T ~ 79L	28.5T ~ 68.5L	29T ~ 47L
400	500	0	-45	20L ~ 128L	0 ~ 85L	0 ~ 108L	7T ~ 78L	20T ~ 88L	31.5T ~ 76.5L	32T ~ 53L

Note: T = tight, L = loose

TECHNICAL TABLES

js6 bearing shaft	k5 bearing shaft	k6 bearing shaft	m5 bearing shaft	m6 bearing shaft	n6 bearing shaft	p6 bearing shaft	r6 bearing shaft	Nominal bore diameter of bearing d mm over	incl
12T ~ 4L	14T ~ 1T	17T ~ 1T	17T ~ 4T	20T ~ 4T	24T ~ 8T	28T ~ 12T	—	3	6
12.5T ~ 4.5L	15T ~ 1T	18T ~ 1T	20T ~ 6T	23T ~ 6T	27T ~ 10T	32T ~ 15T	—	6	10
13.5T ~ 5.5L	17T ~ 1T	20T ~ 1T	23T ~ 7T	26T ~ 7T	31T ~ 12T	37T ~ 18T	—	10	18
16.5T ~ 6.5L	21T ~ 2T	25T ~ 2T	27T ~ 8T	31T ~ 8T	38T ~ 15T	45T ~ 22T	—	18	30
20T ~ 8L	25T ~ 2T	30T ~ 2T	32T ~ 9T	37T ~ 9T	45T ~ 17T	54T ~ 26T	—	30	50
24.5T ~ 9.5L	30T ~ 2T	36T ~ 2T	39T ~ 11T	45T ~ 11T	54T ~ 20T	66T ~ 32T	—	50	80
31T ~11L	38T ~ 3T	45T ~ 2T	48T ~ 13T	55T ~ 13T	65T ~ 23T	79T ~ 37T	—	80	120
37.5T ~ 12.5L	46T ~ 3T	53T ~ 3T	58T ~ 15T	65T ~ 15T	77T ~ 27T	93T ~ 43T	113T ~ 63T	120	140
							115T ~ 65T	140	160
							118T ~ 68T	160	180
44.5T ~ 14.5L	54T ~ 4T	63T ~ 4T	67T ~ 17T	76T ~ 17T	90T ~ 31T	109T ~ 50T	136T ~ 77T	180	200
							139T ~ 80T	200	225
							143T ~ 84T	225	250
51T ~ 16L	62T ~ 4T	71T ~ 4T	78T ~ 20T	87T ~ 20T	101T ~ 34T	123T ~ 56T	161T ~ 94T	250	280
							165T ~ 98T	280	315
58T ~ 18L	69T ~ 4T	80T ~ 4T	86T ~ 21T	97T ~ 21T	113T ~ 37T	138T ~ 62T	184T ~ 108T	315	355
							190T ~ 114T	355	400
65T ~ 20L	77T ~ 5T	90T ~ 4T	95T ~ 23T	108T ~ 23T	125T ~ 40T	153T ~ 68T	211T ~ 126T	400	450
							217T ~ 132T	450	500

(Unit: μm)

K7 housing bearing	M7 housing bearing	N7 housing bearing	P7 housing bearing	Nominal outside diameter of bearing d mm over	incl
10T ~ 13L	15T ~ 8L	19T ~ 4L	24T ~ 1L	6	10
12T ~ 14L	18T ~ 8L	23T ~ 3L	29T ~ 3L	10	18
15T ~ 15L	21T ~ 9L	28T ~ 2L	35T ~ 5L	18	30
18T ~ 18L	25T ~ 11L	33T ~ 3L	42T ~ 6L	30	50
21T ~ 22L	30T ~ 13L	39T ~ 4L	52T ~ 8L	50	80
25T ~ 25L	35T ~ 15L	45T ~ 5L	59T ~ 9L	80	120
28T ~ 30L	40T ~ 18L	52T ~ 6L	68T ~ 10L	120	150
28T ~ 37L	40T ~ 25L	52T ~ 13L	68T ~ 3L	150	180
33T ~ 43L	46T ~ 30L	60T ~ 16L	79T ~ 3L	180	250
36T ~ 51L	52T ~ 35L	66T ~ 21L	88T ~ 1L	250	315
40T ~ 57L	57T ~ 40L	73T ~ 24L	98T ~ 1L	315	400
45T ~ 63L	63T ~ 45L	80T ~ 28L	108T ~ 0	400	500

5. Bearings internal clearance

Bearings internal clearance (initial clearance) is the amount of internal clearance a bearing has before being installed on a shaft or in a housing. The internal clearance valves for NIKO ball bearing classes are shown in tables 5.1 to 5.5

Table 5.1 Radial internal clearance of ball bearings (Unit : μm)

Nominal bore diameter d (mm)		C2		CN		C3		C4		C5	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
6	10	0	7	2	13	8	23	14	29	20	37
10	18	0	9	3	18	11	25	18	33	25	45
18	24	0	10	5	20	13	28	20	36	28	48
24	30	1	11	5	20	13	28	23	41	30	53
30	40	1	11	6	20	15	33	28	46	40	64
40	50	1	11	6	23	18	36	30	51	45	73
50	65	1	15	8	28	23	43	38	61	55	90
65	80	1	15	10	30	25	51	46	71	65	105
80	100	1	18	12	36	30	58	53	84	75	120
100	120	2	20	15	41	36	66	61	97	90	140

Table 5.2 Radial internal clearance for self-aligning ball bearings (for bearing with cylindrical bore) (Unit : μm)

Nominal bore diameter d (mm)		Bearing with cylindrical bore							
		C2		Normal		C3		C4	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.
6	10	2	9	6	17	12	25	19	33
10	14	2	10	6	19	13	26	21	35
14	18	3	12	8	21	15	28	23	37
18	24	4	14	10	23	17	30	25	39
24	30	5	16	11	24	19	35	29	46
30	40	6	18	13	29	23	40	34	53
40	50	6	19	14	31	25	44	37	57
50	65	7	21	16	36	30	50	45	69
65	80	8	24	18	40	35	60	54	83

Table 5.3 Radial internal clearance for self-aligning Ball Bearings (for bearing with tapered bore) (Unit : μm)

Nominal bore diameter d (mm)		Bearing with tapered bore							
		C2		Normal		C3		C4	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.
6	10	—	—	—	—	—	—	—	—
10	14	—	—	—	—	—	—	—	—
14	18	—	—	—	—	—	—	—	—
18	24	7	17	13	26	20	33	28	42
24	30	9	20	15	28	23	39	33	50
30	40	12	24	19	35	29	46	40	59
40	50	14	27	22	39	33	52	45	65
50	65	18	32	27	47	41	61	56	80
65	80	23	39	35	57	50	75	69	98

Table 5.4 Radial internal clearance of double row angular contact ball bearings (Unit : μm)

Nominal bore diameter d (mm)		C2		Normal		C3		C4	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.
-	10	6	12	8	15	15	22	22	30
10	18	6	12	8	15	15	24	30	40
18	30	6	12	10	20	20	32	40	55
30	50	8	14	14	25	25	40	55	75

Table 5.5 Radial internal clearance of ball bearings (60, 62 and 63 series) for electric motor

(Unit : μm)

Nominal bore diameter d (mm)		Radial internal clearance CM Deep groove ball bearings	
over	incl.	min.	max.
10(incl.)	18	4	11
18	24	5	12
24	30	5	12
30	40	9	17
40	50	9	17
50	65	12	22
65	80	12	22

Table 5.6 Radial internal clearance of taper roller bearings (Unit: μm)

Nominal bore diameter d (mm)		C2		CN		C3		C4		C5	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
10	24	0	25	20	45	35	60	50	75	65	90
24	30	0	25	20	45	35	60	50	75	70	95
30	40	5	30	25	50	45	70	60	85	80	105
40	50	5	35	30	60	50	80	70	100	95	125
50	65	10	40	40	70	60	90	80	110	110	140
65	80	10	45	40	75	65	100	90	125	130	165
80	100	15	50	50	85	75	110	105	140	155	190
100	120	15	55	50	90	85	125	125	165	180	220
120	140	15	60	60	105	100	145	145	190	200	245
140	160	20	70	70	120	115	165	165	215	225	275
160	180	25	75	75	125	120	170	170	220	250	300
180	200	35	90	90	145	140	195	195	250	275	330
200	225	45	105	105	165	160	220	220	280	305	365
225	250	45	110	110	175	170	235	235	300	330	395
250	280	55	125	125	195	190	260	260	330	370	440
280	315	55	130	130	205	200	275	275	350	410	485

Table 5.7 Radial internal clearance of spherical roller bearings (Unit: μm)

Nominal bore diameter d (mm)		Cylindrical bore										sphericaled bore									
		C2		CN		C3		C4		C5		C2		CN		C3		C4		C5	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
18	24	10	20	20	35	35	45	45	60	60	75	15	25	25	35	35	45	45	60	60	75
24	30	15	25	25	40	40	55	55	75	75	95	20	30	30	40	40	55	55	75	75	95
30	40	15	30	30	45	45	60	60	80	80	100	25	35	35	50	50	65	65	85	85	105
40	50	20	35	35	55	55	75	75	100	100	125	30	45	45	60	60	80	80	100	100	130
50	65	20	40	40	65	65	90	90	120	120	150	40	55	55	75	75	95	95	120	120	160
65	80	30	50	50	80	80	110	110	145	145	180	50	70	70	95	95	120	120	150	150	200
80	100	35	60	60	100	100	135	135	180	180	225	55	80	80	110	110	140	140	180	180	230
100	120	40	75	75	120	120	160	160	210	210	260	65	100	100	135	135	170	170	220	220	280
120	140	50	95	95	145	145	190	190	240	240	300	80	120	120	160	160	200	200	260	260	330
140	160	60	110	110	170	170	220	220	280	280	350	90	130	130	180	180	230	230	300	300	380
160	180	65	120	120	180	180	240	240	310	310	390	100	140	140	200	200	260	260	340	340	430

Table 5.6 Radial internal clearance of needle roller bearings (Unit: μm)

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

6. Lubrication

6.1 Lubrication of rolling bearings

The purpose of bearing lubrication is to prevent direct metallic contact between the various rolling and sliding elements. This is accomplished through the formation of a thin oil (or grease) film on the contact surfaces. However, for rolling bearings, lubrication has the following advantages:

(1) Friction and wear reduction
(2) Friction heat dissipation
(3) Prolonged bearing life
(4) Prevention of rust
(5) Protection against harmful elements

In order to achieve the above effects, the most effective lubrication method for the operating conditions must be selected. Also a good quality, reliable lubricant must be selected. In addition, an effectively designed sealing system that prevents the intrusion of damaging elements (dust, water, etc.) into the bearing interior, removes other impurities from the lubricant, and prevents lubricant from leaking to the outside, is also a requirement.

Almost all rolling bearings use either grease or oil lubrication methods, but in some special applicatic solid lubricant such as molybdenum disulfide or graphite may be used.

6.2 Grease lubrication
Grease type lubricants are relatively easy to handle require only the simplest sealing devicesfor these reasons, grease is the most widely used lubricant rolling bearings.

6.2.1 Types and characteristics of grease
Lubricating grease are composed of either a mineral base or a synthetic oil base. To this base a thicks other additives are added. The properties of all greases are mainly determined by the kind of base oil use the combination of thickening agent and various additives.

Standard greases and their characteristics are Table 6.2. As performance characteristics of even same type of grease will vary widely from brand, it is best to check the manufacturers' data when selecting a grease.

6.3 Lubrication methods and characteristics
The lubrication methods come in two general methods: grease or oil, each with their own characteristics. These characteristics are shown in Table 6.1

Table 6.1 Comparison of grease lubrication and oil lubrication characteristics

Concern \ Method		
Handling	Very good	Fair
Reliability	Good	Very good
Cooling effect	Poor	Good (circulation necessary)
Seal structure	Good	Fair
Power loss	Good	Good
Environment contamination	Good	Fair
High speed rotation	Poor	Good

6.4 Grease lubrication
Grease type lubricants are relatively easy to handle and require only the simplest sealing devices. For these reasons, grease is the most widely used lubricant for rolling bearings.

6.4.1 Types and characteristics of grease
Lubricating grease are composed of either a mineral ol base or a synthetic oil base. To this base a thickener and other additives are added. The properties of all greases are mainly determined by the kind of base oil used and by the combination of thickening agent and various additives.

Standard greases and their characteristics are listed in Table 6.2 as performance characteristics of even the same type of grease will vary widely from brand to brand, it is best to check the manufacturers' data when selecting a grease.

Also, greases of different brands should not be mixed because of the different additives they contain.

However, if different greases must be mixed, at least greases with the same base oil and thickening agent should be selected. But even when greases of the samel base oil and thickening agent are mixed, the quality of U grease may still change due to the difference in additives. For this reason, changes in consistency and other qualities should be checked before being applied.

Table 6.2 Grease varieties and characteristics

Grease name	Lithium grease			Sodium grease (Fiber grease)	Calcium compound base grease
Thickener	Li soap			Na soap	Ca+Na soap Ca+Li soap
Base oil	Mineral oil	Diester oil	Silicone oil	Mineral oil	Mineral oil
Dropping poin °C	170 ~ 190	170 ~ 190	200 ~ 250	150 ~ 180	150 ~ 180
Operating temperature range °C	-30 ~ +130	-50 ~ +130	-50 ~ +160	-20 ~ +130	-20 ~ +120
Mechanical stability	Excellent	Good	Good	Excellent ~ Good	Excellent ~ Good
Pressure resistance	Good	Good	poor	Good	Excellent ~ Good
Water resistance	Good	Good	Good	Good ~ poor	Good ~ poor
Applications	Widest range of applications. Grease used in all types of rolling bearings.	Excellent low temperature and wear characteristics. Suitable for small sized and miniature bearings.	Suitable for high and low temperatures. Unsuitable for heavy load applications due to low oil film strength.	Some emulsification when water is introduced. Excellent characteristics at relatively high temperatures.	Excellent pressure resistance and mechanical stability. Suitable for bearings receiving shock loads.

Grease name	Aluminum grease	Non-soap base grease Thickener	
Thickener	Al soap	Bentone, silica gel, urea, carbon black, fluorine compounds, etc.	
Base oil	Mineral oil	Mineral oil	Synthetic oil
Dropping poin °C	70 ~ 90	250 or above	250 or above
Operating temperature range °C	-10 ~ +80	-10 ~ +130	-50 ~ +200
Mechanical stability	Good ~ poor	Good	Good
Pressure resistance	Good	Good	Good
Water resistance	Good	Good	Good
Applications	Excellent viscosity characteristics. Suitable for bearings subjected to vibrations.	Can be used in a wide range of low to high temperatures. Shows excellent heat resistance, cold resistance, chemical resistance, and other characteristics when matched with a suitable base oil and thickener. Grease used in all types of rolling bearings.	

6.4.2 Amount of grease

The amount of grease used in any given situation will depend on many factors relating to the size and shaped the housing, space limitations, bearing's rotating speed and type of grease used.

As a general rule, housings and bearings should be only filled from 50% to 80% of their capacities.

Where speeds are high and temperature rises need to be kept to a minimum, a reduced amount of grease should be used. Excessive amounts of grease cause temperature rise which in turn causes the grease to soften and may allow leakage. With excessive grease fills oxidation and deterioration may cause lubricating efficiency to be lowered.

Moreover, the standard bearing space can be found by below formula (6.1)

$V = K \cdot W$ ..... Formula (6.1)

where,
V : Quantity of bearing space open type (approx.) cm^3
K : Bearing space factor (Table 6.3)
W : Mass of bearing kg (See bearing tables)

Table 6.3 Bearings space ratio K

Bearing type	Retainer type	K
Needle roller bearings	Pressed or Machined retainer	35

7. Load rating and life

7.1 Bearing life
Even in bearings operating under normal conditions, the surfaces of the raceway and rolling elements are constantly being subjected to repeated compressive stresses which causes flaking of these surfaces to occur. This flaking is due to material fatigue and will eventually cause the bearings to fail. The effective life of a bearing is usually defined in terms of the total number of revolutions a bearing can undergo before flaking of either the raceway surface or the olling element surfaces occurs.

Other causes of bearing failure are often attributed to problems such as seizing, abrasions, cracking, chipping, gnawing, rust, etc. However, these so called "causes" of bearing failure are usually themselves caused by improper installation, insufficient or improper lubrication, faulty sealing or inaccurate bearing selection. Since the above mentioned "causes" of bearing failure can be avoided by taking the proper precautions,and are not simply caused by material fatigue, they are considered separately from the flaking aspect.

7.2 Basic rating life and basic dynamic load rating
A group of seemingly identical bearings when subjected to identical load and operating conditions will exhibit a wide diversity in their durability.

This " life " disparity can be accounted for by the difference in the fatigue of the bearing material itself. This disparity is considered statistically when calculating bearing life, and the basic rating life is defined as follows.

The basic rating life is based on a 90% statistical model which is expressed as the total number of revolutions 90% of the bearings in an identical group of bearings subjected to identical operating conditions will attain or surpass before flaking due to material fatigue occurs. For bearings operating at fixed constant speeds, the basic rating life (90% reliability) is expressed in the total number of hours of operation.

TECHNICAL TABLES

The basic dynamic load rating is an expression of the load capacity of a bearing based on a constant load which the bearing can sustain for one million revolutions (the basic life rating). For radial bearings this rating applies to pure radial loads, and for thrust bearings it refers to pure axial loads. The basic dynamic load ratings given in the bearing tables of this catalog are for bearings constructed of **NIKO** standard bearing materials, using standard manufacturing techniques. Please consult **NIKO** engineering for basic load ratings of bearings constructed of special materialsor using special manufacturing techniques.

The relationship between the basic rating life, the basic dynamic load rating and the bearing load is given in formula (7.1).

$$L_{10} = \left(\frac{C}{P}\right)^{P} \quad \text{.....(7.1)}$$

where,

$P = 3$ ..... For ball bearings

L_{10} : Basic rating life 106 revolutions

C : Basic dynamic rating load, *n*
(Cr: radial bearings)

P : Equivalent dynamic load, *n*
(Pr: radial bearings)

The basic rating life can also be expressed in terms of hours of operation (revolution), and is calculated as shown in formula (7.2).

$$L_{10h} = 500 f_h^{P} \quad \text{.....(7.2)}$$

$$f_h = f_n \frac{C}{P} \quad \text{.....(7.3)}$$

$$f_n = \left(\frac{33.3}{n}\right)^{1/p} \quad \text{.....(7.4)}$$

where,

L_{10} : Basic rating life, *h*

f_h : Life factor

f_n : Speed factor

n : Rotational speed, r/min

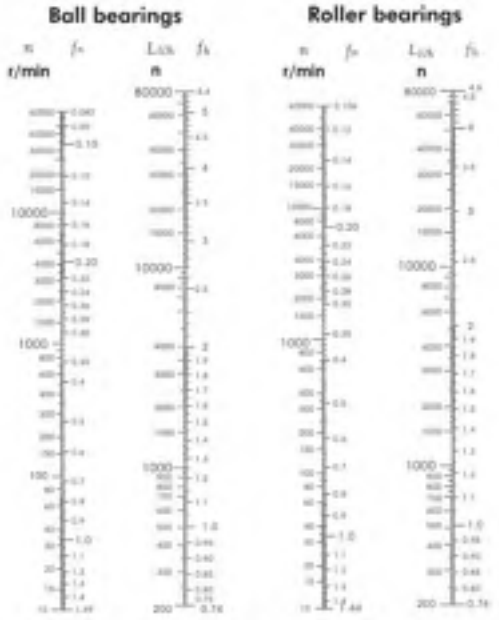


Fig. 7.1 Bearing life rating scale

Formula (7.2) can also be expressed as shown in formula (7.5).

$$L_{10h} = \frac{10^6}{60n}\left(\frac{C}{P}\right)^{P} \quad \text{.....(7.5)}$$

The relationship between rotational speed n and speed factor fn as well as the relation between the basic rating life L10h and the life factor fn is shown in Fig. 7.1. When several bearings are incorporated in machines or equipment as complete units, all the bearings in the unit are considered as a whole when computing bearing life (see formula 7.6). The total bearing life of the unit is a life rating based on the viable lifetime of the unit before even one of the bearings fails due to rolling contact fatigue.

$$L = \frac{1}{\left(\frac{1}{L_1^{e}} + \frac{1}{L_2^{e}} + \cdots + \frac{1}{L_n^{e}}\right)^{1/e}} \quad \text{.....(7.6)}$$

where,
e = 10/9.....For ball bearings
L = Total basic rating life or entire unit, h
$L_1, L_2 ... L_n$: Basic rating life or individual bearings, 1, 2,...n, h

When the load conditions vary at regular intervals, the life can be given by formula (7.7).

$$L_m = (\Sigma \phi_j / L_j)^{-1} \quad \text{.....(7.7)}$$

where,
ϕj : Frequency of individual load conditions
Lj : Life under individual conditions

7.3 Machine applications and requisite life
When selecting a bearing, it is essential that the requisite life of the bearing be established in relation to the operating conditions.The requisite life of the bearing is usually determined by the type of machine in which the bearing will be used, and duration of service and operational reliability requirements. When determining bearing size, the fatigue life of the bearing is an important factor; however, besides bearing life, the strength and rigidity of the shaft and housing must also be taken into consideration.

7.4 Adjusted life rating factor
The basic bearing life rating (90% reliability factor) can be calculated through the formulas mentioned earlier in Section 7.2. However, in some applications a bearing fife factor of over 90% reliability may be required. To meet these requir ements, bearing life can be lengthened by the use of specially improved bearing materials or special construction techniques. Moreover, according to elastohydrodynamic lubrication theory, it is clear that the bearing operating conditions (lubrication, temperature, speed, etc.) all exert an effect on bearing life. All these adjustment factors are taken into consideration when calculating bearing life, the adjusted bearing life can be determined.

$$L_{na} = a1 \cdot a2 \cdot a3 \cdot (C/P)^P \quad \text{.....(7.8)}$$

where,
Lna : Adjusted life rating in millions of revolutions (10^6)(adjusted for reliability, material and operating conditions)
$a1$: Reliability adjustment factor
$a2$: Material adjustment factor
$a3$: Operating condition adjustment factor

7.4.1 Life adjustment factor for reliability a_1
The values for the reliability adjustment factor ai (for a reliability factor higher than 90%) can be found in Table 7.1

Table 7.1 Reliability adjustment factor values a_1

Reliability %	L_n	Reliability factor a_1
90	L_{10}	1.00
95	L_5	0.62
96	L_4	0.53
97	L_3	0.44
98	L_2	0.33
99	L_1	0.21

7.4.2 Life adjustment factor for material a_2

The life of a bearing is affected by the material type and quality as well as the manufacturing process.In this regard, the life is adjusted by the use of an a_2 factor.

The basic dynamic load ratings listed in the catalog are based on NIKO's standard material and process, therefore, the adjustment factor a_2 =1. When special materials or processes are used the adjustment factor can be larger than 1.

NIKO bearings can generally be used up to 120°C. If bearings are operated at a higher temperature, the bearing must be specially heat treated (stabilized) so that inadmissible dimensional change does not occur due to changes in the micro-structure. This special heat treatment might cause the reduction of bearing life because of a hardness change.

7.4.3 Life adjustment factor a_3 for operating conditions

The operating conditions life adjustment factor a_3 is used to adjust for such conditions as lubrication, operating temperature, and other operation factors which have an effect on bearing life.

Generally speaking, when lubricating conditions are satisfactory, the a_3 factor has a value of one; and when lubricating conditions are exceptionally favorable, and all other operating conditions are normal, as can have a value greater than one.

However, when lubricating conditions are particularly unfavorable and the oil film formation on the contact surfaces of the raceway and rolling elements is insufficient, the value of a_3 becomes less than one. This Insufficient oil film formation can be caused, for example, by the lubricating oil viscosity being too low for the operating temperature (below13 mm^2/s for ball bearings or by exceptionally low rotational speed (nr/min x dpmm less than 10,000). For bearings used under special operating conditions, please consult NIKO engineering.

As the operating temperature of the bearing increases, the hardness of the bearing material decreases . Thus , the bearing life correspondingly decreases. The opera-ting temperature adjustment values are shown in Fig.7.2.

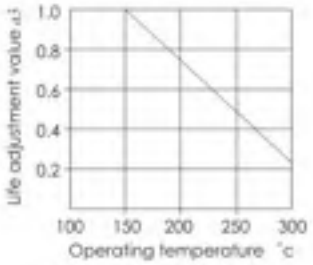


Fig. 7.2 Life adjustment value for operating temperature

7.5 Life of bearing with oscillating motion

The life of a radial bearing with oscillating motion can be calculated according to formula (7.9).

$$L_{osc} = \Omega L_{Rot} \quad \text{..... (7.9)}$$

where,

L_{osc} : life for oscillating bearing

L_{Rot} : rating life at assumed number of rotations same as oscillation cycles

Ω : oscillation factor (Fig.7.3 indicates the relationship between half oscillation angle β and Ω).

Fig. 7.3 is valid only when the amplitude exceeds a certain degree (critical angle 2βc). The critical angle is determined by the internal design of the bearing, in particular by the number of rolling elements in one row. Critical angle values are given in Table 7.3. When the magnitude of the oscillation is less than the critical angle, the life may be shorter than that calculated to be the value in Fig.7.3 It is safer to calculate life with the factor Ω corresponding to the critical angle. For the critical angle of an individual bearing, please consult **NIKO** Engineering. Where the amplitude of the oscillation 2β is small, it is difficult for a complete lubricant film to form on the contact surfaces of the rings and rolling elements, and fretting corrosion may occur. Therefore it is necessary to exercise extreme care in the selection of bearing type, lubrication and lubricant.

Table 7.3 Critical angle

Number of rolling elements	Half critical angle βc
10	10°
25	4°
40	2.6°

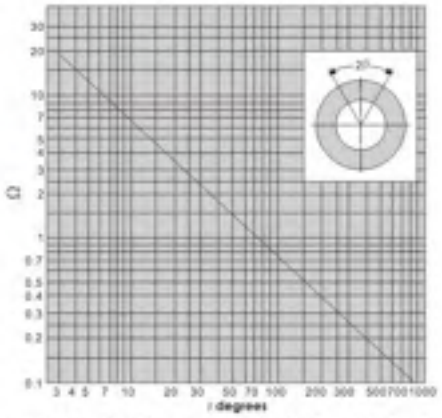


Fig. 7.3 Relationship between half angle β and factor Ω

7.6 Life of bearing with linear motion

With a linear motion bearing such as a linear ball bearing or linear flat roller bearing, the relation among the axial travel distance, bearing load, and load rating is expressed by formulas (7.10).

When the rolling elements are rollers:

$$L = 100 \times \left(\frac{C_r}{P_r}\right)^{\frac{10}{3}} \quad \text{.....(7.10)}$$

where,

L	: Load rating	km
C_r	: Basic dynamic load rating	[kgf]
P_r	: Bearing load	[kgf]

If the cycle and travel distancewithin a particular travel motion remain constant, the rating life of the bearing can be determined by formulas (7.11).

$$L_h = \frac{50 \times 10^3}{10 \cdot S}\left(\frac{C_r}{P_r}\right)^{\frac{10}{3}} \quad \text{..... (7.11)}$$

Where,

L_h : Travel life, h

S : Travel distance per minute, m/min.

$S = 2 \cdot L \cdot N$

L : Stroke length, m

n : Stroke cycle, N(kgf)

Fig. 7.4 summarizes the relation between C_r/P_r and L.

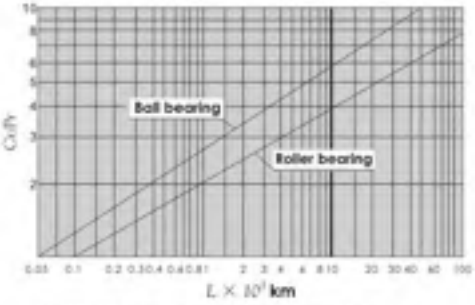


Fig. 7.4 Life of bearing with axial motion

7.7 Basic static load rating

When stationary rolling bearings are subjected to static loads, they suffer from partial permanent deformation of the contact surfaces at the contact point between the rolling elements and the raceway. The amount of deformity increases as the load increases, and if this increase in load exceeds certain limits, the subsequent smooth operation of the bearings is impaired.

It has been found through experience that a permanent deformity of 0.0001 times the diameter of the rolling element, occurring at the most heavily stressed contact point between the raceway and the rolling elements, can be tolerated without any impairment in running efficiency.

The basic rated static load refers to a fixed static load limit at which a specified amount of permanent deformation occurs. It applies to pure radial loads for radial bearings and to pure axial loads for thrust bearings. The maximum applied load values for contact stress occurring at the rolling element and raceway contact points are given below.

For Ball Bearings (except Self-aligning Ball Bearings)	4,200 Mpa
For Self-aligning Ball Bearings	4,600 Mpa
For roller bearings	4,000 Mpa

7.8 Allowable static equivalent load

Generally the static equivalent load which can be permitted is limited by the basic static rated load as stated in Section 7.7. However, depending on requirements regarding friction and smooth operation, these limits may be greater or lesser than the basic static rated load.

In the following formula (7.12) and Table 6.4 the safety factor S_o can be determined considering the maximum static equivalent load.

$$S_o = C_o / P_o \quad \ldots\ldots (7.12)$$

where,

S_o : Safety factor

C_o : Basic static rated load, N
(radial bearings: C_{or}, thrust bearings: C_{oa})

$P_{o\,max}$: Maximum static equivalent load, N
(radial: $P_{or\,max}$, thrust: $C_{oa\,max}$)

Table 7.4 Minimum safety factor values S_o

Operating conditions	Ball bearings	Roller bearings
High rotational accuracy demand	2.0	3.0
Normal rotating accuracy demand (Universal application)	1.0	1.5
Slight rotational accuracy deterioration permitted (Low speed, heavy loading, etc.)	0.5	1.0

Note 1 : For drawn-cup spherical roller bearings, min. S_o value=3.
2 : When vibration and/or shock loads are present, a load factor based on the shock load needs to be included in the P_o max value.

8. Bearing handling

Bearings are precision parts and, in order to preserve their accuracy and reliability, care must be exercised in their handling. In particular, bearing cleanliness must be maintained, sharp impacts avoided, and rust prevented.

8.1 Bearing storage
Most rolling bearings are coated with a rust preventative before being packed and shipped, and they should be stored at room temperature with a relative humidity of less than 60%.

8.2 Installation
When bearings are being installed on shafts or in housings, the bearing rings should never be struck directly with a hammer or a drift, as shown in Fig. 8.1, because damage to the bearing may result. Any force applied to the bearing should always be evenly distributed over the entire bearing ring face.


Fig. 8.1

8.2.1 Installation preparations
Bearings should be fitted in a clean, dry work area. Especially for small and miniature bearings, a "clean room" should be provided as any contamination particles in the bearing will greatly affect bearing efficiency. Before installation, all fitting tools, shafts, housings, and related parts should be cleaned and any burrs or cutting chips removed if necessary. Shaft and housing fitting surfaces should also be checked for roughness, dimensional and design accuracy, and to ensure that they are within allowable tolerance limits.
Bearings should not be unwrapped until just prior to installation. Normally, bearings to be usedwith grease lubricant can be installed as is, without removing the rust preventative. However, for bearings which will use oil lubricant, or in cases where mixing the grease and rust preventative would result in loss of lubrication efficiency, the rust preventative should be removed by washing with benzene or petroleum solvent and dried before installation. Bearings should also be washed and dried before installation if the package has been damaged or there are other chances that the bearings have been contaminated. Double shielded bearings and sealed bearings, one way clutches should never be washed.

8.2.2 Installing cylindrical bore bearings
Bearings with relatively small interference fits can be press fit at room temperature by using a sleeve against the inner ring face as shown in Fig. 8.2. Usually, bearings are installed by striking the sleeve with a hammer; however, when installing a large number of bearings, a mechanical or hydraulic press should be used.

When installing non-separable bearings on a shaft and in a housing simultaneously, a pad which distributesth fitting pressure evenly over the inner and outer rings is used as shown in Fig. 8.3. When fitting bearings which have a large inner ring interference fit, or when fitting bearings on shafts that have a large diameter, a considerable amount of force is required to install the bearing at room temperature. Installation can be facilitated by heating and expanding the inner ring beforehand. The required relative temperature difference between the inner ring and the fitting surface depends on the amount of interference and the shaft fitting surface diameter. Fig. 8.4 shows the relation between the bearing inner bore diameter temperature differential and the amount of thermal expansion. In any event, bearings should never be heated above 120°C.

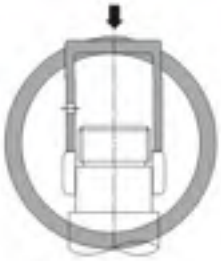


Fig. 8.2 Fitting sleeve pressure against inner ring

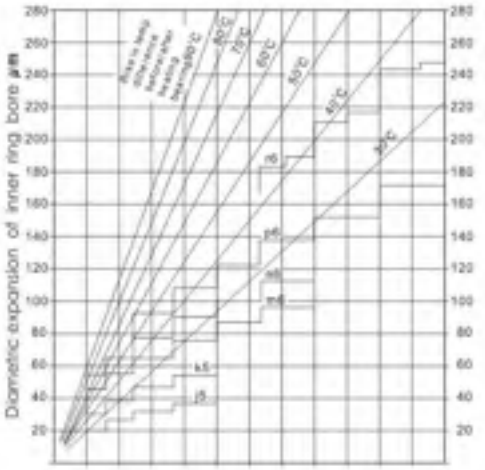


Fig. 8.3 Temperature differential required for shrinkage fit of inner ring

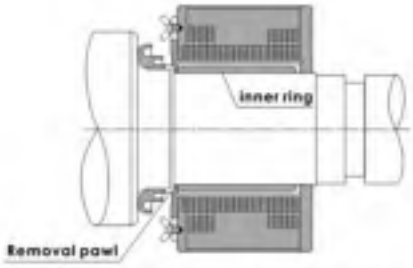


Fig. 8.4 Removal of inner ring using an induction heater

The most commonly used method of heating bearings is to immerse them in hot oil. However, this method should not be used for prelubricated shielded and sealed bearings. To avoid overheating parts of the bearings they should never be brought into direct contact with the heat source, but instead should be suspended inside the heating tank orplacedonawire grid. If bearings are dry-heated with a heating cabinet or hot plate, they can be mounted without drying. An induction heater can be used to quickly heat bearings in a dry state (always demagnetize). When heated bearings are installed on shafts, the inner rings must be held against the shaft abutment until the bearing has been cooled in order to prevent gaps from occurring between the ring and the abutment face.

8.2.3 Installation of outer ring

Even for tight interference fits, the outer rings of small type bearings can be installed by driving them into housings at room temperature. For large type bearings, the housing can be heated before installing the bearing, or the bearing's outer ring can be cooled with dry ice, etc. Before installing. If dry ice or other cooling agent is used, atmospheric moisture will condense on bearing surfaces, and therefore appropriate rust preventative measures are necessary.

8.3 Post installation running test

To insure that the bearing has been properly installed, a running test is performed after installation is completed. The shaft or housing is first rotated by hand and if no problems are observed a low speed, no load power test is performed. If no abnormalities are observed, the load and speed are gradually increased to operating conditions. During the test if any unusual noise, vibration, or temperature rise is observed the test should be stopped and the equipment examined. If necessary, the bearing should be disassembled for inspection. To check bearing running noise, the sound can be amplified and the type of noise ascertained with a listening instrument placed against the housing. A clear, smooth and continuous running sound is normal. A high, metallic or irregular sound indicates some error in function.

Vibration can be accurately checked with a vibration measuring instrument, and the amplitude and frequency characteristics measured against a fixed standard. Usually the bearing temperature can be estimated from the housing surface temperature. However, if the bearing outer ring is accessible through oil inlets, etc., the temperature can be more accurately measured. Under normal conditions, bearing temperature rises with rotation time and then reaches a stable operating temperature after a certain period of time. If the temperature does not level off and continues to rise, or if there is a sudden temperature rise, or if the temperature is unusually high, the bearing should be inspected.

8.4 Bearing disassembly

Bearings are often removed as part of periodic inspection procedures or during the replacement of other parts. However, the shaft and housing are almost always reinstalled, and in more than a few cases the bearings themselves are reused. These bearings, shafts, housings, and other related parts must be designed to prevent damage during disassembly procedures, and the proper disassembly tools must be employed. When removing inner and outer rings which have been installed with interference fits, the dismounting force should be applied to that ring only and not applied to other parts of the bearing, as this may cause internal damage to the bearing's raceway or rolling elements.

8.4.1 Disassembly of bearings with cylindrical bores

For small type bearings, the pullers shown in Fig. 8.5 or the press method shown in Fig. 8.6 can be used for disassembly. When used properly, these methods can improve disassembly efficiency and prevent damage to bearings. To facilitate disassembly procedures, attention should be given to planning the designs of shafts and housings, such as providing extraction grooves on the shaft and housing for puller claws as shown Figs. 8.7 and 8.8. Threaded bolt holes should also be provided in housings to facilitate the pressing out of outer rings as shown in Fig. 8.9.

Fig. 8.5 Puller disassembly

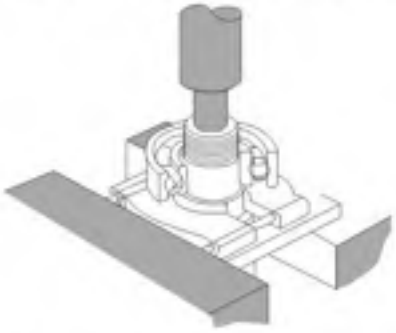


Fig. 8.6 press disassembly

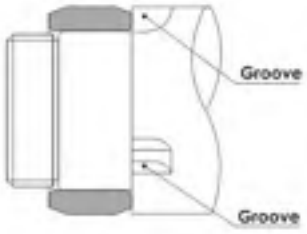


Fig. 8.7 Extracting grooves

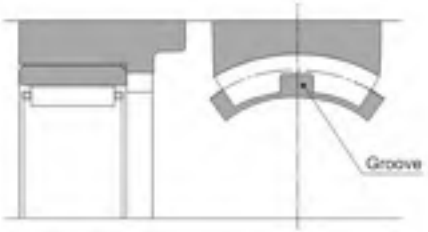


Fig. 8.8 Extraction groove for outer ring disassembly

Fig. 8.9 Outer ring disassembly bolt

TECHNICAL TABLES

9. Allowable speed

As bearing speed increases, the temperature of the bearing also increases due to friction heat generated in the bearing interior. If the temperature continues to rise and exceeds certain limits, the efficiency of the lubricant start to fail down drastically, and the bearing can no longercontinue to operate in a stable manner. Therefore, the maximum speed at which it is possible for the bearing to continuously operate without the generation of excessive heat beyond specified limits, is called the allowable speed (r/min). The allowable speed of a bearing depends on the type of bearing, bearing dimensions, type of cage, load, lubricating conditions, and cooling conditions.

The allowable speeds listed in the bearing tables for grease and oil lubrication are for standard NIKO bearings under normal operating conditions, correctly installed, using the suitable lubricants with adequate supply and proper maintenance. Moreover, these values are based on normal load conditions (P≤0.09C, Fa/Fr≤0.3). For ball bearings with contact seals (LLU type), the allowable speed is determined by the peripheral lip speed of the seal.

For bearings to be used under heavier than normal load conditions, the allowable speed values listed in the bearing tables must be multiplied by an adjustment factor. The adjustment factors f_L and f_C are given in Figs. 9.1 and 9.2.

Also, when radial bearings are mounted on vertical shafts, lubricant retentions and cage guidance are not favorable compared to horizontal shaft mounting.

Therefore, the allowable speed should be reduced to approximately 80% of the listed speed.

It is possible to operate precision bearings with high speed specification cages at speeds higher than those listed in the bearing tables , if special precautions are taken. These precautions should include the use of forced oil circulation methods such as oil jet or oil mist lubrication.

Under such high speed operating conditions , when special care is taken , the standard allowable speeds given in the bearing tables can be adjusted upward. The maximum speed adjustment values, /B, by which the bearing table speeds can be multiplied, are shown in Table 9.1. However, for any application requiring speeds in excess of the standard allowable speed, please consult NIKO Engineering.

Fig.9.1 Value of adjustment factor FL depends on bearing load

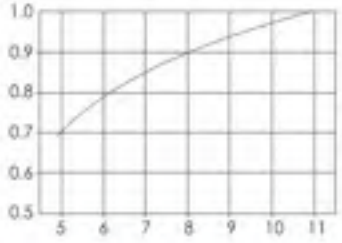


Fig.9.2 Value of adjustment factor Fc depends on combined load

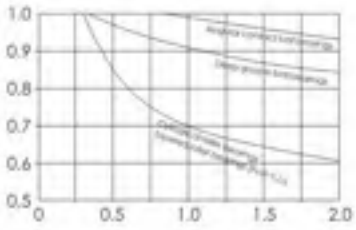


Table 9.1 Adjustment factor, f_B, for allowable number of revolutions

Type of bearing	Adjustment factor f_B
Deep groove ball bearings	3.0
Angular contact ball bearings	2.0

10. Vibration and noise value

NIKO also supplies bearings for air conditioners, domestic ceiling fans and electric power tools etc. As a rule, the vibration or noise level of these bearings should be carefully controlled and checked. To be a part of our quality control system, NIKO well equipped with two types of testing instrument S0910-1 (For standard application) and BVT1-1A (For precision or quiet applications). Relatively, here it gives out both vibration and noise standard of these bearings for your reference (Please refer to Table 10.1) .

The vibration and noise of NIKO bearings are classified in three classes as Z1, Z2 and Z3, it is measured by the instruments of S0910-1. Details please find in the following Table 10.1.

Table 10.1 Specifications of vibration and noise.

Inner bores (mm)	Vibration acceleration (S0910-1)								
	60 Series			62 Series			63 Series		
	Z1≤	Z2≤	Z3≤	Z1≤	Z2≤	Z3≤	Z1≤	Z2≤	Z3≤
4	34	32	28	35	32	30	36	33	31
5	36	34	30	37	34	32	37	35	33
6	36	34	30	37	34	32	37	35	33
7	38	35	31	38	36	34	-	-	-
8	38	35	31	38	36	34	-	-	-
9	40	36	32	40	37	35	-	-	-
10	42	38	33	42	39	35	44	40	37
12	43	39	34	43	39	35	45	40	37
15	44	40	35	44	41	36	46	42	38
17	44	40	35	45	41	36	47	42	38
20	45	41	36	46	42	38	48	43	39
25	46	42	38	47	43	40	49	44	41
30	47	43	39	48	44	41	50	45	42
35	49	45	41	50	46	43	51	47	44
40	51	46	42	52	47	44	54	49	45
45	53	48	45	54	49	46	56	51	47
50	54	50	47	55	51	48	57	53	49
55	56	52	49	57	53	50	59	54	51
60	58	54	51	59	54	51	61	56	53

For special requirement, it is measured by BVT-1 A and NIKO bearings are also classified in three classes as V1, V2 and V3. Details please find in the following Table 10.2.

Table 10.2 Specifications of vibration and noise.

Inner bores (mm)	Vibration acceleration BVT-1 (0.001/s)								
	V1≤			V2≤			V3≤		
	Low	Medium	High	Low	Medium	High	Low	Medium	High
4	60	35	32	48	26	22	31	16	15
5	74	48	40	58	36	30	35	21	18
6	74	48	40	58	36	30	35	21	18
7	92	66	54	72	48	40	44	28	24
8	92	66	54	72	48	40	44	28	24
9	92	66	54	72	48	40	44	28	24
10	120	80	70	90	60	50	55	35	30
12	120	80	70	90	60	50	55	35	30
15	150	100	85	110	78	60	65	46	35
17	150	100	85	110	78	60	65	46	35
20	180	125	100	130	100	75	80	60	45
25	180	125	100	130	100	75	80	60	45
30	200	150	130	150	120	100	90	75	60
35	200	150	130	150	120	100	90	75	60
40	240	180	160	180	150	130	110	90	80
45	240	180	160	180	150	130	110	90	80
50	280	200	200	210	160	160	125	100	100
55	280	220	200	210	180	180	125	110	110
60	320	220	240	240	180	200	145	110	130

In our NIKO Ball bearings, our series of vibration and noise level, good levels to be classified as following Table 10.3.

Table 10.3 Specifications of vibration and noise.

Series	Bores (mm)	
	V1	Z3
60	6 ~ 20	25 ~ 30
62	5 ~ 20	25 ~ 30
63	10 ~ 12	15 ~ 20
618	5 ~ 20	25 ~ 40
619	5 ~ 20	25 ~ 40

The rest of the series which showing in the catalogue pages, below35mm inner bores should be controlled under Z2, Over 40mm inner bores should be controlled under Z1.

NIKO

NIPPON KODO

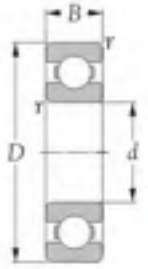
Ball Bearings

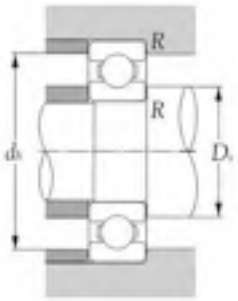
Ball Bearings

Souvenirs

BALL BEARING
SERIES 60

BALL BEARINGS





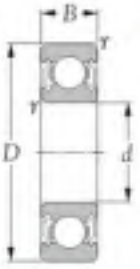
Boundary dimensions mm				Basic load ratings dynamic N	static N	Limiting speeds rpm		Bearing numbers	Abutment and fillet dimensions mm			Mass kg(s).
d	D	B	$r_{s\,min}$	C_r	C_{or}	grease	oil		D_a min	d_a max	R max	(approx.)
10	26	8	0.3	4,550	1,960	29,000	34,000	**6000**	12.5	23.5	0.3	0.019
12	28	8	0.3	5,100	2,390	26,000	30,000	**6001**	14.5	25.5	0.3	0.021
15	32	9	0.3	5,600	2,840	22,000	26,000	**6002**	17.5	29.5	0.3	0.030
17	35	10	0.3	6,800	3,350	20,000	24,000	**6003**	19.5	32.5	0.3	0.039
20	42	12	0.6	9,400	5,050	18,000	21,000	**6004**	25.0	37.0	0.6	0.069
25	47	12	0.6	10,100	5,850	15,000	18,000	**6005**	30.0	42.0	0.6	0.080
30	55	13	1.0	13,200	8,300	13,000	15,000	**6006**	36.0	49.0	1.0	0.116
35	62	14	1.0	16,000	10,300	12,000	14,000	**6007**	41.0	56.0	1.0	0.155
40	68	15	1.0	16,800	11,500	10,000	12,000	**6008**	46.0	62.0	1.0	0.190
45	75	16	1.0	21,000	15,100	9,200	11,000	**6009**	51.0	69.0	1.0	0.237
50	80	16	1.0	21,800	16,600	8,400	9,800	**6010**	56.0	74.0	1.0	0.261
55	90	18	1.1	28,300	21,200	7,700	9,000	**6011**	62.0	83.0	1.0	0.388
60	95	18	1.1	29,500	23,200	7,000	8,300	**6012**	67.0	88.0	1.0	0.414
65	100	18	1.1	30,500	25,200	6,500	7,700	**6013**	72.0	93.0	1.0	0.421
70	110	20	1.1	38,000	31,000	6,100	7,100	**6014**	77.0	103.0	1.0	0.604
75	115	20	1.1	39,500	33,500	5,700	6,700	**6015**	82.0	108.0	1.0	0.649
80	125	22	1.1	47,500	40,000	5,300	6,200	**6016**	87.0	118.0	1.0	0.854
85	130	22	1.1	49,500	43,000	5,000	5,900	**6017**	92.0	123.0	1.0	0.890
90	140	24	1.5	58,000	49,500	4,700	5,600	**6018**	98.5	131.5	1.5	1.020
95	145	24	1.5	60,500	54,000	4,500	5,300	**6019**	103.5	136.5	1.5	1.080
100	150	24	1.5	60,000	54,000	4,200	5,000	**6020**	108.5	141.5	1.5	1.150

Remark:

Cages		Precision	Grease
Steel -	√	Class 6 (JIS)	
Polyamid -	X		
Brass -	X	Class 0 (JIS)	Nil

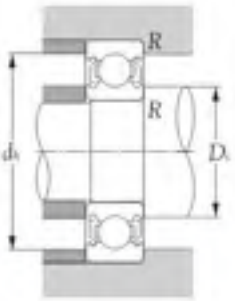
Remark: If you have more inquiry of technical, please inquire NIKO website: Http://www.nipponkoyubearings.com

BALL BEARING
SERIES 60..LLB, 60..ZZ



Shielded type (ZZ)

Non-contact sealed type (LLB)



BALL BEARINGS

Boundary dimensions mm				Basic load ratings dynamic static N		Limiting speeds rpm		Bearing numbers		Abutment and fillet dimensions mm				Mass kg(s).
										Da		da	R	
d	D	B	r min*	Cr	Cor	grease	oil			min	max	max	max	(approx.)
10	26	8	0.3	4,550	1,960	29,000	21,000	6000 LLB	6000 ZZ	12.5	13.5	23.5	0.3	0.019
12	28	8	0.3	5,100	2,390	26,000	18,000	6001 LLB	6001 ZZ	14.5	16.0	25.5	0.3	0.021
15	32	9	0.3	5,600	2,840	22,000	15,000	6002 LLB	6002 ZZ	17.5	19.0	29.5	0.3	0.030
17	35	10	0.3	6,800	3,350	20,000	14,000	6003 LLB	6003 ZZ	19.5	21.0	32.5	0.3	0.039
20	42	12	0.6	9,400	5,050	18,000	11,000	6004 LLB	6004 ZZ	25.0	26.0	37.0	0.6	0.069
25	47	12	0.6	10,100	5,850	15,000	9,400	6005 LLB	6005 ZZ	30.0	30.5	42.0	0.6	0.080
30	55	13	1.0	13,200	8,300	13,000	7,700	6006 LLB	6006 ZZ	36.0	37.0	49.0	1.0	0.116
35	62	14	1.0	16,000	10,300	12,000	6,800	6007 LLB	6007 ZZ	41.0	42.0	56.0	1.0	0.155
40	68	15	1.0	16,800	11,500	10,000	6,100	6008 LLB	6008 ZZ	46.0	47.0	62.0	1.0	0.190
45	75	16	1.0	21,000	15,100	9,200	5,400	6009 LLB	6009 ZZ	51.0	52.5	69.0	1.0	0.237
50	80	16	1.0	21,800	16,600	8,400	5,000	6010 LLB	6010 ZZ	56.0	57.5	74.0	1.0	0.261
55	90	18	1.1	28,300	21,200	7,700	4,500	6011 LLB	6011 ZZ	62.0	64.0	83.0	1.0	0.388
60	95	18	1.1	29,500	23,200	7,000	4,100	6012 LLB	6012 ZZ	67.0	69.0	88.0	1.0	0.414
65	100	18	1.1	30,500	25,200	6,500	3,900	6013 LLB	6013 ZZ	72.0	73.0	93.0	1.0	0.421
70	110	20	1.1	38,000	31,000	6,100	3,600	6014 LLB	6014 ZZ	77.0	80.5	103.0	1.0	0.604
75	115	20	1.1	39,500	33,500	5,700	3,300	6015 LLB	6015 ZZ	82.0	85.5	108.0	1.0	0.649
80	125	22	1.1	47,500	40,000	5,300	3,100	6016 LLB	6016 ZZ	87.0	91.5	118.0	1.0	0.854
85	130	22	1.1	49,500	43,000	5,000	2,900	6017 LLB	6017 ZZ	92.0	97.0	123.0	1.0	0.890
90	140	24	1.5	58,000	49,500	4,700	2,800	6018 LLB	6018 ZZ	98.5	102.0	131.5	1.5	1.020
95	145	24	1.5	60,500	54,000	4,500	2,600	6019 LLB	6019 ZZ	103.5	109.0	136.5	1.5	1.080
100	150	24	1.5	60,000	54,000	4,200	2,600	6020 LLB	6020 ZZ	108.5	110.0	141.5	1.5	1.150

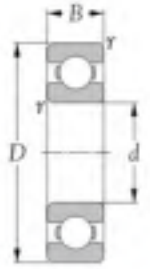
Remark:

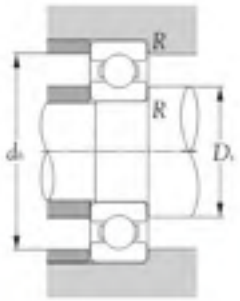
Cages		Precision	Grease
Steel -	√	Class 6 (JIS)	Multemp SRL -40°C ~ +150°C
Polyamid -	X		
Brass -	X	Class 0 (JIS)	Alvania S2 -25°C ~ +120°C

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

BALL BEARING
SERIES 62

BALL BEARINGS





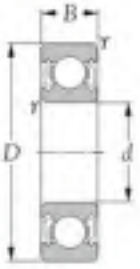
Boundary dimensions mm				Basic load ratings dynamic static N		Limiting speeds rpm		Bearing numbers	Abutment and fillet dimensions mm			Mass kg(s).
d	D	B	r min*	Cr	Cor	grease	oil		Da min	da max	R max	(approx.)
10	30	9	0.6	5,100	2,390	25,000	30,000	6200	15.0	25.0	0.6	0.032
12	32	10	0.6	6,100	2,750	22,000	26,000	6201	17.0	27.0	0.6	0.037
15	35	11	0.6	7,750	3,600	19,000	23,000	6202	20.0	30.0	0.6	0.045
17	40	12	0.6	9,600	4,600	18,000	21,000	6203	22.0	35.0	0.6	0.066
20	47	14	1.0	12,800	6,650	16,000	18,000	6204	26.0	41.0	1.0	0.106
25	52	15	1.0	14,000	7,850	13,000	15,000	6205	31.0	46.0	1.0	0.128
30	62	16	1.0	19,500	11,300	11,000	13,000	6206	36.0	56.0	1.0	0.199
35	72	17	1.1	25,700	15,300	9,800	11,000	6207	42.0	65.0	1.0	0.288
40	80	18	1.1	29,100	17,800	8,700	10,000	6208	47.0	73.0	1.0	0.366
45	85	19	1.1	32,500	20,400	7,800	9,200	6209	52.0	78.0	1.0	0.398
50	90	20	1.1	35,000	23,200	7,100	8,300	6210	57.0	83.0	1.0	0.454
55	100	21	1.5	43,500	29,200	6,400	7,600	6211	63.5	91.5	1.5	0.601
60	110	22	1.5	52,500	36,000	6,000	7,000	6212	68.5	101.5	1.5	0.783
65	120	23	1.5	57,500	40,000	5,500	6,500	6213	73.5	111.5	1.5	0.990
70	125	24	1.5	62,000	44,000	5,100	6,000	6214	78.5	116.5	1.5	1.070
75	130	25	1.5	66,000	49,500	4,800	5,600	6215	83.5	121.5	1.5	1.180
80	140	26	2.0	72,500	53,000	4,500	5,300	6216	90.0	130.0	2.0	1.400
85	150	28	2.0	83,500	64,000	4,200	5,000	6217	95.0	140.0	2.0	1.790
90	160	30	2.0	96,000	71,500	4,000	4,700	6218	100.0	150.0	2.0	2.150
95	170	32	2.1	109,000	82,000	3,700	4,400	6219	107.0	158.0	2.0	2.620
100	180	34	2.1	122,000	93,000	3,500	4,200	6220	112.0	168.0	2.0	3.140

Remark:

Cages		Precision	Grease
Steel -	√	Class 6 (JIS)	
Polyamid -	X		
Brass -	X	Class 0 (JIS)	Nil

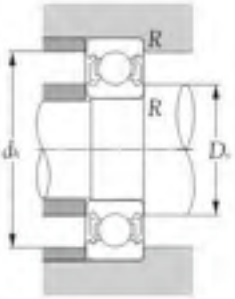
Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

BALL BEARING
SERIES **62..LLB, 62..ZZ**



Shielded type
(ZZ)

Non-contact
sealed type
(LLB)



BALL BEARINGS

Boundary dimensions mm				Basic load ratings dynamic N	static N	Limiting speeds rpm		Bearing numbers		Abutment and fillet dimensions mm				Mass kg(s).
										Da		da	R	
d	D	B	r min	Cr	Cor	grease	oil			min	max	max	max	(approx.)
10	30	9	0.6	5,100	2,390	25,000	18,000	6200 LLB	6200 ZZ	15.0	16.0	25.0	0.6	0.032
12	32	10	0.6	6,100	2,750	22,000	16,000	6201 LLB	6201 ZZ	17.0	17.5	27.0	0.6	0.037
15	35	11	0.6	7,750	3,600	19,000	15,000	6202 LLB	6202 ZZ	20.0	20.5	30.0	0.6	0.045
17	40	12	0.6	9,600	4,600	18,000	12,000	6203 LLB	6203 ZZ	22.0	23.0	35.0	0.6	0.066
20	47	14	1.0	12,800	6,650	16,000	10,000	6204 LLB	6204 ZZ	26.0	28.0	41.0	1.0	0.106
25	52	15	1.0	14,000	7,850	13,000	8,900	6205 LLB	6205 ZZ	31.0	32.0	46.0	1.0	0.128
30	62	16	1.0	19,500	11,300	11,000	7,300	6206 LLB	6206 ZZ	36.0	39.0	56.0	1.0	0.199
35	72	17	1.1	25,700	15,300	9,800	6,300	6207 LLB	6207 ZZ	42.0	45.0	65.0	1.0	0.288
40	80	18	1.1	29,100	17,800	8,700	5,600	6208 LLB	6208 ZZ	47.0	51.0	73.0	1.0	0.366
45	85	19	1.1	32,500	20,400	7,800	5,200	6209 LLB	6209 ZZ	52.0	55.5	78.0	1.0	0.398
50	90	20	1.1	35,000	23,200	7,100	4,700	6210 LLB	6210 ZZ	57.0	60.0	83.0	1.0	0.454
55	100	21	1.5	43,500	29,200	6,400	4,300	6211 LLB	6211 ZZ	63.5	67.0	91.5	1.5	0.601
60	110	22	1.5	52,500	36,000	6,000	3,800	6212 LLB	6212 ZZ	68.5	75.0	101.5	1.5	0.783
65	120	23	1.5	57,500	40,000	5,500	3,600	6213 LLB	6213 ZZ	73.5	80.5	111.5	1.5	0.990
70	125	24	1.5	62,000	44,000	5,100	3,400	6214 LLB	6214 ZZ	78.5	85.0	116.5	1.5	1.070
75	130	25	1.5	66,000	49,500	4,800	3,200	6215 LLB	6215 ZZ	83.5	90.5	121.5	1.5	1.180
80	140	26	2.0	72,500	53,000	4,500	3,000	6216 LLB	6216 ZZ	90.0	95.5	130.0	2.0	1.400
85	150	28	2.0	83,500	64,000	4,200	2,800	6217 LLB	6217 ZZ	95.0	103.0	140.0	2.0	1.790
90	160	30	2.0	96,000	71,500	4,000	2,600	6218 LLB	6218 ZZ	100.0	109.0	150.0	2.0	2.150
95	170	32	2.1	109,000	82,000	3,700	2,500	6219 LLB	6219 ZZ	107.0	116.0	158.0	2.0	2.620
100	180	34	2.1	122,000	93,000	3,500	2,300	6220 LLB	6220 ZZ	112.0	122.0	168.0	2.0	3.140

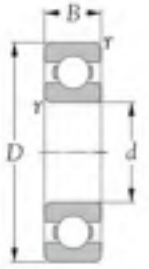
Remark:

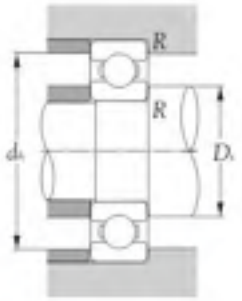
Cages		Precision	Grease
Steel -	√	Class 6 (JIS)	Multemp SRL -40℃ ~ +150℃
Polyamid -	X		
Brass -	X	Class 0 (JIS)	Alvania S2 -25℃ ~ +120℃

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

BALL BEARING
SERIES 63

BALL BEARINGS





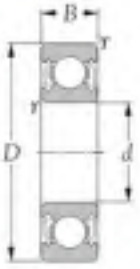
Boundary dimensions mm				Basic load ratings dynamic N	static N	Limiting speeds rpm		Bearing numbers	Abutment and fillet dimensions mm			Mass kg(s).
d	D	B	rs min*	Cr	Cor	grease	oil		Da min	da max	R max	(approx.)
10	35	11	0.6	8,200	3,500	23,000	27,000	6300	15.0	30.0	0.6	0.053
12	37	12	1.0	9,700	4,200	20,000	24,000	6301	18.0	31.0	1.0	0.060
15	42	13	1.0	11,400	5,450	17,000	21,000	6302	21.0	36.0	1.0	0.082
17	47	14	1.0	13,500	6,550	16,000	19,000	6303	23.0	41.0	1.0	0.115
20	52	15	1.1	15,900	7,900	14,000	17,000	6304	27.0	45.0	1.0	0.144
25	62	17	1.1	21,200	10,900	12,000	14,000	6305	32.0	55.0	1.0	0.232
30	72	19	1.1	26,700	15,000	10,000	12,000	6306	37.0	65.0	1.0	0.360
35	80	21	1.5	33,500	19,100	8,800	10,000	6307	43.5	71.5	1.5	0.457
40	90	23	1.5	40,500	24,000	7,800	9,200	6308	48.5	81.5	1.5	0.630
45	100	25	1.5	53,000	32,000	7,000	8,200	6309	53.5	91.5	1.5	0.814
50	110	27	2.0	62,000	38,500	6,400	7,500	6310	60.0	100.0	2.0	1.070
55	120	29	2.0	71,500	45,000	5,800	6,800	6311	65.0	110.0	2.0	1.370
60	130	31	2.1	82,000	52,000	5,400	6,300	6312	72.0	118.0	2.0	1.730
65	140	33	2.1	92,500	60,000	4,900	5,800	6313	77.0	128.0	2.0	2.080
70	150	35	2.1	104,000	68,000	4,600	5,400	6314	82.0	138.0	2.0	2.520
75	160	37	2.1	113,000	77,000	4,300	5,000	6315	87.0	148.0	2.0	3.020
80	170	39	2.1	123,000	86,500	4,000	4,700	6316	92.0	158.0	2.0	3.590
85	180	41	3.0	133,000	97,000	3,800	4,500	6317	99.0	166.0	2.5	4.230
90	190	43	3.0	143,000	107,000	3,600	4,200	6318	104.0	176.0	2.5	4.910
95	200	45	3.0	153,000	119,000	3,300	3,900	6319	109.0	186.0	2.5	5.670
100	215	47	3.0	173,000	141,000	3,200	3,700	6320	114.0	201.0	2.5	7.000

Remark:

Cages		Precision	Grease
Steel -	√	Class 6 (JIS)	
Polyamid -	X		
Brass -	X	Class 0 (JIS)	Nil

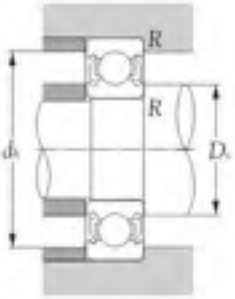
Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

BALL BEARING
SERIES **63..LLB, 63..ZZ**



Shielded type
(ZZ)

Non-contact
sealed type
(LLB)



BALL BEARINGS

Boundary dimensions mm				Basic load ratings dynamic N	static N	Limiting speeds rpm		Bearing numbers		Abutment and fillet dimensions mm				Mass kg(s).
										D_a		d_a	R	
d	D	B	$r_{s\,min}$	C_r	C_{or}	grease	oil			min	max	max	max	(approx.)
10	35	11	0.6	8,200	3,500	23,000	16,000	**6300 LLB**	**6300 ZZ**	15.0	17.0	30.0	0.6	0.053
12	37	12	1.0	9,700	4,200	20,000	15,000	**6301 LLB**	**6301 ZZ**	18.0	18.5	31.0	1.0	0.060
15	42	13	1.0	11,400	5,450	17,000	12,000	**6302 LLB**	**6302 ZZ**	21.0	23.0	36.0	1.0	0.082
17	47	14	1.0	13,500	6,550	16,000	11,000	**6303 LLB**	**6303 ZZ**	23.0	25.0	41.0	1.0	0.115
20	52	15	1.1	15,900	7,900	14,000	10,000	**6304 LLB**	**6304 ZZ**	27.0	28.5	45.0	1.0	0.144
25	62	17	1.1	21,200	10,900	12,000	8,100	**6305 LLB**	**6305 ZZ**	32.0	35.0	55.0	1.0	0.232
30	72	19	1.1	26,700	15,000	10,000	6,600	**6306 LLB**	**6306 ZZ**	37.0	43.0	65.0	1.0	0.360
35	80	21	1.5	33,500	19,100	8,800	6,000	**6307 LLB**	**6307 ZZ**	43.5	47.0	71.5	1.5	0.457
40	90	23	1.5	40,500	24,000	7,800	5,300	**6308 LLB**	**6308 ZZ**	48.5	54.0	81.5	1.5	0.630
45	100	25	1.5	53,000	32,000	7,000	4,700	**6309 LLB**	**6309 ZZ**	53.5	61.5	91.5	1.5	0.814
50	110	27	2.0	62,000	38,500	6,400	4,200	**6310 LLB**	**6310 ZZ**	60.0	68.5	100.0	2.0	1.070
55	120	29	2.0	71,500	45,000	5,800	3,900	**6311 LLB**	**6311 ZZ**	65.0	74.0	110.0	2.0	1.370
60	130	31	2.1	82,000	52,000	5,400	3,600	**6312 LLB**	**6312 ZZ**	72.0	80.5	118.0	2.0	1.730
65	140	33	2.1	92,500	60,000	4,900	3,300	**6313 LLB**	**6313 ZZ**	77.0	86.0	128.0	2.0	2.080
70	150	35	2.1	104,000	68,000	4,600	3,100	**6314 LLB**	**6314 ZZ**	82.0	92.5	138.0	2.0	2.520
75	160	37	2.1	113,000	77,000	4,300	2,900	**6315 LLB**	**6315 ZZ**	87.0	99.0	148.0	2.0	3.020
80	170	39	2.1	123,000	86,500	4,000	2,700	**6316 LLB**	**6316 ZZ**	92.0	105.0	158.0	2.0	3.590
85	180	41	3.0	133,000	97,000	3,800	2,600	**6317 LLB**	**6317 ZZ**	99.0	112.0	166.0	2.5	4.230
90	190	43	3.0	143,000	107,000	3,600	2,400	**6318 LLB**	**6318 ZZ**	104.0	118.0	176.0	2.5	4.910
95	200	45	3.0	153,000	119,000	3,300	2,300	-	**6319 ZZ**	109.0	125.0	186.0	2.5	5.670
100	215	47	3.0	173,000	141,000	3,200	2,200	-	**6320 ZZ**	114.0	133.0	201.0	2.5	7.000

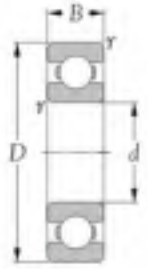
Remark:

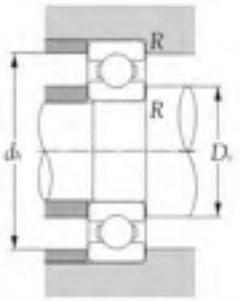
Cages		Precision	Grease
Steel -	√	Class 6 (JIS)	Multemp SRL -40℃ ~ +150℃
Polyamid -	X		
Brass -	X	Class 0 (JIS)	Alvania S2 -25℃ ~ +120℃

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

BALL BEARING
SERIES 160

BALL BEARINGS





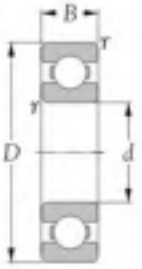
Boundary dimensions mm				Basic load ratings dynamic N	static N	Limiting speeds rpm		Bearing numbers	Abutment and fillet dimensions mm			Mass kg(s).
d	D	B	r min*	Cr	Cor	grease	oil		D_a min	d_a max	R max	(approx.)
12	28	7	0.3	5,100	2,390	26,000	30,000	**16001**	14.5	25.5	0.3	0.019
15	32	8	0.3	5,600	2,840	22,000	26,000	**16002**	17.5	29.5	0.3	0.025
17	35	8	0.3	6,800	3,350	20,000	24,000	**16003**	19.5	32.5	0.3	0.032
20	42	8	0.3	7,900	4,500	18,000	21,000	**16004**	22.5	39.5	0.3	0.051
25	47	8	0.3	8,350	5,100	15,000	18,000	**16005**	27.5	44.5	0.3	0.060
30	55	9	0.3	11,200	7,350	13,000	15,000	**16006**	32.5	52.5	0.3	0.091
35	62	9	0.3	11,700	8,200	12,000	14,000	**16007**	37.5	59.5	0.3	0.110
40	68	9	0.3	12,600	9,650	10,000	12,000	**16008**	42.5	65.5	0.3	0.125
45	75	10	0.6	12,900	10,500	9,200	11,000	**16009**	50.0	70.0	0.6	0.171
50	80	10	0.6	13,200	11,300	8,400	9,800	**16010**	55.0	75.0	0.6	0.180
55	90	11	0.6	18,600	15,300	7,700	9,000	**16011**	60.0	85.0	0.6	0.258
60	95	11	0.6	20,000	17,500	7,000	8,300	**16012**	65.0	90.0	0.6	0.283
65	100	11	0.6	20,500	18,700	6,500	7,700	**16013**	70.0	95.0	0.6	0.307
70	110	13	0.6	24,400	22,600	6,100	7,100	**16014**	75.0	105.0	0.6	0.441
75	115	13	0.6	25,000	24,000	5,700	6,700	**16015**	80.0	110.0	0.6	0.464
80	125	14	0.6	25,400	25,100	5,300	6,200	**16016**	85.0	120.0	0.6	0.597
85	130	14	0.6	25,900	26,200	5,000	5,900	**16017**	90.0	125.0	0.6	0.626
90	140	16	1.0	33,500	33,500	4,700	5,600	**16018**	96.0	134.0	1.0	0.848
95	145	16	1.0	34,500	35,000	4,500	5,300	**16019**	101.0	139.0	1.0	0.885
100	150	16	1.0	35,000	36,500	4,200	5,000	**16020**	106.0	144.0	1.0	0.910
105	160	18	1.0	52,000	50,500	4,000	4,700	**16021**	111.0	154.0	1.0	1.200
110	170	19	1.0	57,500	56,500	3,800	4,500	**16022**	116.0	164.0	1.0	1.460
120	180	19	1.0	63,000	63,500	3,500	4,100	**16024**	126.0	174.0	1.0	1.560

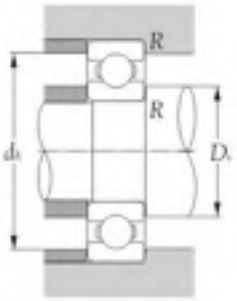
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X		
Brass -	X	Class 6 (JIS)	Nil

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

BALL BEARING
SERIES 68





Boundary dimensions mm				Basic load ratings dynamic N	static N	Limiting speeds rpm		Bearing numbers	Abutment and fillet dimensions mm			Mass kg.
d	D	B	r s min	Cr	Cor	grease	oil		Da min	da max	R max	(approx.)
10	19	5	0.3	1,830	925	32,000	38,000	**6800**	12	17	0.3	0.005
12	21	5	0.3	1,920	1,040	29,000	35,000	**6801**	14	19	0.3	0.006
15	24	5	0.3	2,080	1,260	26,000	31,000	**6802**	17	22	0.3	0.007
17	26	5	0.3	2,810	1,720	24,000	28,000	**6803**	19	24	0.3	0.008
20	32	7	0.3	4,000	2,470	21,000	25,000	**6804**	22	30	0.3	0.019
25	37	7	0.3	4,300	2,950	18,000	21,000	**6805**	27	35	0.3	0.022
30	42	7	0.3	4,700	3,650	15,000	18,000	**6806**	32	40	0.3	0.026
35	47	7	0.3	4,900	4,050	13,000	16,000	**6807**	37	45	0.3	0.029
40	52	7	0.3	5,100	4,400	12,000	14,000	**6808**	42	50	0.3	0.033
45	58	7	0.3	6,400	5,650	11,000	12,000	**6809**	47	56	0.3	0.040
50	65	7	0.3	6,600	6,100	9,600	11,000	**6810**	52	63	0.3	0.052
55	72	9	0.3	8,800	8,100	8,700	10,000	**6811**	57	70	0.3	0.083
60	78	10	0.3	11,500	10,600	8,000	9,400	**6812**	62	76	0.3	0.106
65	85	10	0.6	11,600	11,000	7,400	8,700	**6813**	69	81	0.6	0.128
70	90	10	0.6	12,100	11,900	6,900	8,100	**6814**	74	86	0.6	0.137
75	95	10	0.6	12,500	12,900	6,400	7,600	**6815**	79	91	0.6	0.145
80	100	10	0.6	12,700	13,300	6,000	7,100	**6816**	84	96	0.6	0.154

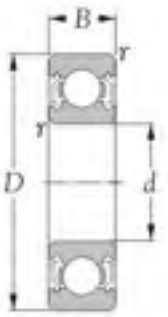
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

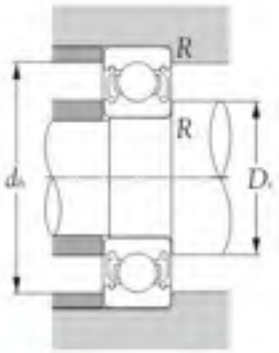
BALL BEARING
SERIES 68..LLB, 68..ZZ

BALL BEARINGS



Shielded type (ZZ)

Non-contact sealed type (LLB)



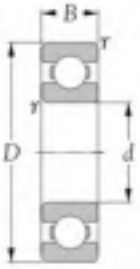
Boundary dimensions mm				Basic load ratings dynamic static N		Limiting speeds rpm		Bearing numbers		Abutment and fillet dimensions mm				Mass kg.
										D_a		d_b	R	
d	D	B	$r_{s\,min}$	C_r	C_{or}	grease	oil			min	max	max	max	(approx.)
10	19	5	0.3	1,830	925	32,000	24,000	6800 LLB	6800 ZZ	12	12.5	17	0.3	0.005
12	21	5	0.3	1,920	1,040	29,000	20,000	6801 LLB	6801 ZZ	14	14.5	19	0.3	0.006
15	24	5	0.3	2,080	1,260	26,000	17,000	6802 LLB	6802 ZZ	17	17.5	22	0.3	0.007
17	26	5	0.3	2,810	1,720	24,000	15,000	6803 LLB	6803 ZZ	19	19.5	24	0.3	0.008
20	32	7	0.3	4,000	2,470	21,000	13,000	6804 LLB	6804 ZZ	22	23.0	30	0.3	0.019
25	37	7	0.3	4,300	2,950	18,000	10,000	6805 LLB	6805 ZZ	27	28.0	35	0.3	0.022
30	42	7	0.3	4,700	3,650	15,000	8,800	6806 LLB	6806 ZZ	32	33.0	40	0.3	0.026
35	47	7	0.3	4,900	4,050	13,000	7,600	6807 LLB	6807 ZZ	37	38.0	45	0.3	0.029
40	52	7	0.3	5,100	4,400	12,000	6,700	6808 LLB	6808 ZZ	42	43.0	50	0.3	0.033
45	58	7	0.3	6,400	5,650	11,000	5,900	6809 LLB	6809 ZZ	47	48.0	56	0.3	0.040
50	65	7	0.3	6,600	6,100	9,600	5,300	6810 LLB	6810 ZZ	52	54.0	63	0.3	0.052
55	72	9	0.3	8,800	8,100	8,700	4,800	6811 LLB	6811 ZZ	57	59.0	70	0.3	0.083
60	78	10	0.3	11,500	10,600	8,000	4,400	6812 LLB	6812 ZZ	62	64.5	76	0.3	0.106
65	85	10	0.6	11,600	11,000	7,400	4,100	6813 LLB	6813 ZZ	69	70.0	81	0.6	0.128
70	90	10	0.6	12,100	11,900	6,900	3,800	6814 LLB	6814 ZZ	74	75.5	86	0.6	0.137
75	95	10	0.6	12,500	12,900	6,400	3,600	6815 LLB	6815 ZZ	79	80.0	91	0.6	0.145
80	100	10	0.6	12,700	13,300	6,000	3,400	6816 LLB	6816 ZZ	84	85.0	96	0.6	0.154

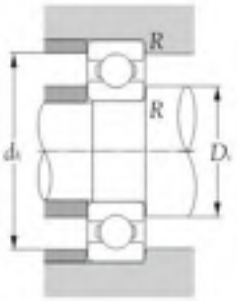
Remark:

Cages		Precision	Grease
Steel -	√		
Polymid -	X	Class 0 (JIS)	Alvania S2 -25℃ ~ +120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire
NIKO web-site: Http://www.nipponkodobearings.com

BALL BEARING
SERIES 69





Boundary dimensions mm				Basic load ratings dynamic static N		Limiting speeds rpm		Bearing numbers	Abutment and fillet dimensions mm			Mass kg.
d	D	B	$r_{s\,min}$	C_r	C_{or}	grease	oil		D_a min	d_a max	R max	(approx.)
10	22	6	0.3	2,700	1,270	30,000	36,000	**6900**	12	20	0.3	0.009
12	24	6	0.3	2,890	1,460	27,000	32,000	**6901**	14	22	0.3	0.011
15	28	7	0.3	4,100	2,060	24,000	28,000	**6902**	17	26	0.3	0.016
17	30	7	0.3	4,650	2,580	22,000	26,000	**6903**	19	28	0.3	0.018
20	37	9	0.3	6,400	3,700	19,000	23,000	**6904**	22	35	0.3	0.036
25	42	9	0.3	7,050	4,550	16,000	19,000	**6905**	27	40	0.3	0.042
30	47	9	0.3	7,250	5,000	14,000	17,000	**6906**	32	45	0.3	0.048
35	55	10	0.6	11,200	7,450	12,000	15,000	**6907**	39	51	0.6	0.074
40	62	12	0.6	14,600	10,200	11,000	13,000	**6908**	44	58	0.6	0.110
45	68	12	0.6	15,100	11,200	9,800	12,000	**6909**	49	64	0.6	0.128
50	72	12	0.6	15,600	12,200	8,900	11,000	**6910**	54	68	0.6	0.132
55	80	13	1.0	16,000	13,300	8,200	9,600	**6911**	60	75	1.0	0.180
60	85	13	1.0	16,400	14,300	7,600	8,900	**6912**	65	80	1.0	0.193
65	90	13	1.0	17,400	16,100	7,000	8,200	**6913**	70	85	1.0	0.206
70	100	16	1.0	23,700	21,200	6,500	7,700	**6914**	75	95	1.0	0.334
75	105	16	1.0	24,400	22,600	6,100	7,200	**6915**	80	100	1.0	0.353
80	110	16	1.0	24,900	24,000	5,700	6,700	**6916**	85	105	1.0	0.373

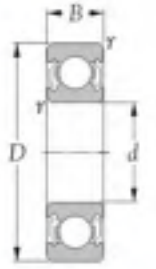
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

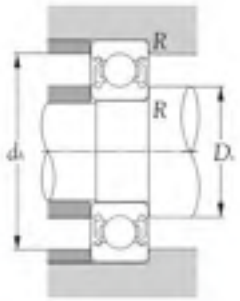
BALL BEARING
SERIES 69..LLB, 69..ZZ

BALL BEARINGS



Shielded type (ZZ)


Non-contact sealed type (LLB)



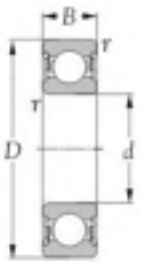
Boundary dimensions mm				Basic load ratings dynamic N	static N	Limiting speeds rpm		Bearing numbers		Abutment and fillet dimensions mm				Mass kg.
d	D	B	r min*	Cr	Cor	grease	oil			Da min	Db max	ra max		(approx.)
10	22	6	0.3	2,700	1,270	30,000	21,000	6900 LLB	6900 ZZ	12	13.0	20	0.3	0.009
12	24	6	0.3	2,890	1,460	27,000	19,000	6901 LLB	6901 ZZ	14	15.0	22	0.3	0.011
15	28	7	0.3	4,100	2,060	24,000	16,000	6902 LLB	6902 ZZ	17	18.0	26	0.3	0.016
17	30	7	0.3	4,650	2,580	22,000	14,000	6903 LLB	6903 ZZ	19	20.0	28	0.3	0.018
20	37	9	0.3	6,400	3,700	19,000	12,000	6904 LLB	6904 ZZ	22	24.0	35	0.3	0.036
25	42	9	0.3	7,050	4,550	16,000	9,800	6905 LLB	6905 ZZ	27	29.0	40	0.3	0.042
30	47	9	0.3	7,250	5,000	14,000	8,400	6906 LLB	6906 ZZ	32	34.0	45	0.3	0.048
35	55	10	0.6	11,200	7,450	12,000	7,100	6907 LLB	6907 ZZ	39	40.0	51	0.6	0.074
40	62	12	0.6	14,600	10,200	11,000	6,300	6908 LLB	6908 ZZ	44	45.0	58	0.6	0.110
45	68	12	0.6	15,100	11,200	9,800	5,600	6909 LLB	6909 ZZ	49	51.0	64	0.6	0.128
50	72	12	0.6	15,600	12,200	8,900	5,100	6910 LLB	6910 ZZ	54	55.5	68	0.6	0.132
55	80	13	1.0	16,000	13,300	8,200	4,600	6911 LLB	6911 ZZ	60	61.5	75	1.0	0.180
60	85	13	1.0	16,400	14,300	7,600	4,300	6912 LLB	6912 ZZ	65	66.5	80	1.0	0.193
65	90	13	1.0	17,400	16,100	7,000	4,000	6913 LLB	6913 ZZ	70	71.5	85	1.0	0.206
70	100	16	1.0	23,700	21,200	6,500	3,700	6914 LLB	6914 ZZ	75	77.5	95	1.0	0.334
75	105	16	1.0	24,400	22,600	6,100	3,500	6915 LLB	6915 ZZ	80	82.5	100	1.0	0.353
80	110	16	1.0	24,900	24,000	5,700	3,200	6916 LLB	6916 ZZ	85	88.0	105	1.0	0.373

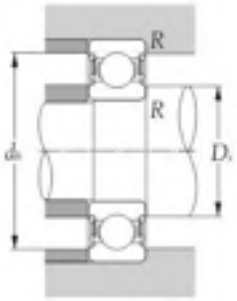
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Alvania S2 -25℃~+120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

BALL BEARING
SERIES 622..2RS





Boundary dimensions mm				Basic load ratings dynamic static N		Speed rating rpm	Bearing numbers	Abutment and fillet dimensions mm				Mass kg.
								Da		da	R	
d	D	B	r min	C	C0r			min	max	max	max	(approx.)
10	30	14	0.6	5,070	2,360	17,000	**62200 2RS**	14.0	14.5	26.0	0.6	0.040
12	32	14	0.6	6,890	3,100	15,000	**62201 2RS**	16.0	16.0	28.0	0.6	0.045
15	35	14	0.6	7,800	3,750	13,000	**62202 2RS**	19.0	19.0	31.0	0.6	0.054
17	40	16	0.6	9,560	4,750	12,000	**62203 2RS**	21.0	21.0	36.0	0.6	0.083
20	47	18	1.0	12,700	6,550	10,000	**62204 2RS**	25.0	25.5	42.0	1.0	0.130
25	52	18	1.0	14,000	7,800	8,500	**62205 2RS**	30.0	31.0	47.0	1.0	0.150
30	62	20	1.0	19,500	11,200	7,500	**62206 2RS**	35.0	37.0	57.0	1.0	0.240
35	72	23	1.1	25,500	15,300	6,300	**62207 2RS**	41.5	43.5	65.5	1.0	0.370
40	80	23	1.1	30,700	19,000	5,600	**62208 2RS**	46.5	49.5	73.5	1.0	0.440
45	85	23	1.1	33,200	21,600	5,000	**62209 2RS**	51.5	54.0	78.5	1.0	0.480
50	90	23	1.1	35,100	23,200	4,800	**62210 2RS**	56.5	58.0	83.5	1.0	0.520

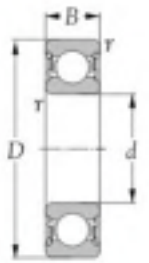
Remark:

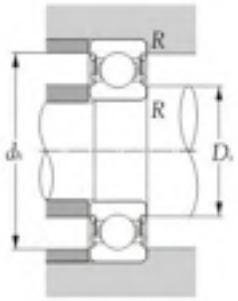
Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Alvania N2 -25℃ ~ +120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

BALL BEARING
SERIES 623..2RS

BALL BEARINGS





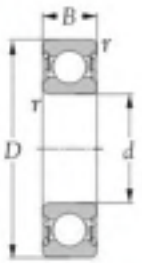
Boundary dimensions mm				Basic load ratings dynamic static N		Speed rating rpm	Bearing numbers	Abutment and fillet dimensions mm				Mass kg(s).
								Da		da	R	
d	D	B	r min	C	C0r			min	max	max	max	(approx.)
10	35	17	0.6	8,060	3,400	15,000	**62300 2RS**	14.0	15.0	31.0	0.6	0.06
12	37	17	1.0	9,750	4,150	14,000	**62301 2RS**	17.0	17.0	32.0	1.0	0.07
15	42	17	1.0	11,400	5,400	12,000	**62302 2RS**	20.0	20.5	37.0	1.0	0.11
17	47	19	1.0	13,500	6,550	11,000	**62303 2RS**	22.0	23.5	42.0	1.0	0.15
20	52	21	1.1	15,900	7,800	9,500	**62304 2RS**	26.5	27.0	45.5	1.0	0.20
25	62	24	1.1	22,500	11,600	7,500	**62305 2RS**	31.5	33.5	55.5	1.0	0.32
30	72	27	1.1	28,100	16,000	6,300	**62306 2RS**	36.5	41.5	65.5	1.0	0.48
35	80	31	1.5	33,200	19,000	6,000	**62307 2RS**	43.0	44.0	72.0	1.5	0.66
40	90	33	1.5	41,000	24,000	5,000	**62308 2RS**	48.0	50.5	82.0	1.5	0.89
45	100	36	1.5	52,700	31,500	4,500	**62309 2RS**	53.0	56.5	92.0	1.5	1.15
50	110	40	2.0	61,800	38,000	4,300	**62310 2RS**	59.0	63.0	101.0	2.0	1.55

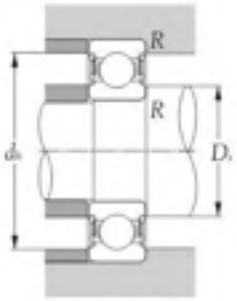
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Alvania #2 -25℃~+120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

BALL BEARING
SERIES 630..2RS





Boundary dimensions mm				Basic load ratings dynamic static N		Speed rating rpm	Bearing numbers	Abutment and fillet dimensions mm				Mass kg.
								Da		da	R	
d	D	B	r1 min*	C	C0r			min	max	max	max	(approx.)
10	26	12	0.3	4,620	1,960	19,000	**63000 2RS**	12	12.5	24	0.3	0.025
12	28	12	0.3	5,070	2,360	17,000	**63001 2RS**	14	14.5	26	0.3	0.029
15	32	13	0.3	5,590	2,850	14,000	**63002 2RS**	17	18.0	30	0.3	0.039
17	35	14	0.3	6,050	3,250	13,000	**63003 2RS**	19	20.0	33	0.3	0.052
20	42	16	0.6	9,360	5,000	11,000	**63004 2RS**	24	24.5	38	0.6	0.086
25	47	16	0.6	11,200	6,550	9,500	**63005 2RS**	29	29.0	43	0.6	0.100
30	55	19	1.0	13,300	8,300	8,000	**63006 2RS**	35	35.5	50	1.0	0.160
35	62	20	1.0	15,900	10,200	7,000	**63007 2RS**	40	40.5	57	1.0	0.210
40	68	21	1.0	16,800	11,600	6,300	**63008 2RS**	45	46.0	63	1.0	0.260
45	75	23	1.0	20,800	14,600	5,600	**63009 2RS**	50	51.0	70	1.0	0.340
50	80	23	1.0	21,600	16,000	5,000	**63010 2RS**	55	56.0	75	1.0	0.370

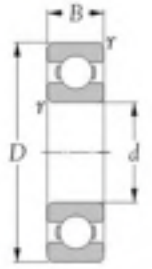
Remark:

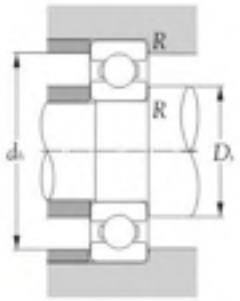
Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Alvania N2 -25℃ ~ +120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

BALL BEARING
SERIES 64

BALL BEARINGS





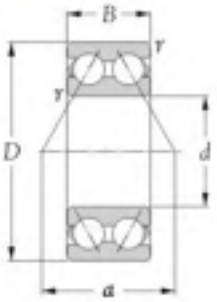
Boundary dimensions mm				Basic load ratings dynamic N	static N	Limiting speeds rpm		Bearing numbers	Abutment and fillet dimensions mm			Mass kg(s).
d	D	B	r_s min*	C_r	C_{or}	grease	oil		D_a min	d_a max	R max	(approx.)
17	62	17	1.1	22,700	10,800	14,000	16,000	**6403**	24.0	55.0	1.0	0.270
20	72	19	1.1	28,500	13,900	12,000	14,000	**6404**	27.0	65.0	1.0	0.400
25	80	21	1.5	34,500	17,500	10,000	12,000	**6405**	33.5	71.5	1.5	0.530
30	90	23	1.5	43,500	23,900	8,800	10,000	**6406**	38.5	81.5	1.5	0.735
35	100	25	1.5	55,000	31,000	7,800	9,100	**6407**	43.5	91.5	1.5	0.952
40	110	27	2.0	63,500	36,500	7,000	8,200	**6408**	50.0	100.0	2.0	1.230
45	120	29	2.0	77,000	45,000	6,300	7,400	**6409**	55.0	110.0	2.0	1.530
50	130	31	2.1	83,000	49,500	5,700	6,700	**6410**	62.0	118.0	2.0	1.880
55	140	33	2.1	89,000	54,000	5,200	6,100	**6411**	67.0	128.0	2.0	2.290
60	150	35	2.1	102,000	64,500	4,800	5,700	**6412**	72.0	138.0	2.0	2.770

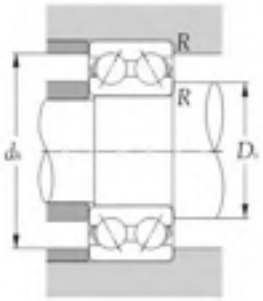
Remark:

Cages		Precision	Grease
Steel -	√		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

BALL BEARING
SERIES 52





Boundary dimensions mm				Basic load ratings dynamic static N		Limiting speeds rpm		Bearing numbers		Abutment and fillet dimensions mm				Mass kg.
d	D	B	r s min	Cr	Cor	grease	oil			Da min	da max	R max	a	(approx.)
10	30	14.3	0.6	6950	3800	14000	19000	5200 (UG)	5200 A (UG)	15	25	0.6	17.5	0.049
12	32	15.9	0.6	9150	5050	13000	17000	5201 (UG)	5201 A (UG)	17	27	0.6	19.0	0.057
15	35	15.9	0.6	10000	6050	11000	15000	5202 (UG)	5202 A (UG)	20	30	0.6	21.0	0.064
17	40	17.5	0.6	12800	7900	9900	13000	5203 (UG)	5203 A (UG)	22	35	0.6	24.0	0.096
20	47	20.6	1.0	19000	12100	8800	12000	5204 (UG)	5204 A (UG)	26	41	1.0	28.0	0.153
25	52	20.6	1.0	20600	14300	7300	9800	5205 (UG)	5205 A (UG)	31	46	1.0	31.5	0.175
30	62	23.8	1.0	28600	20400	6300	8400	5206 (UG)	5206 A (UG)	36	56	1.0	36.5	0.286
35	72	27.0	1.1	38000	27800	5500	7400	5207 (UG)	5207 A (UG)	42	65	1.0	42.5	0.436
40	80	30.2	1.1	42500	32500	4900	6600	5208 (UG)	5208 A (UG)	47	73	1.0	47.5	0.590
45	85	30.2	1.1	48000	37000	4400	5900	5209 (UG)	5209 A (UG)	52	78	1.0	50.5	0.640
50	90	30.2	1.1	51000	42000	4000	5300	5210 (UG)	5210 A (UG)	57	83	1.0	54.0	0.689

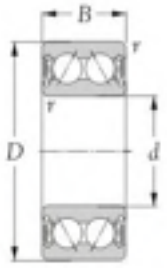
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	A	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

BALL BEARING
SERIES 52..2RS

BALL BEARINGS



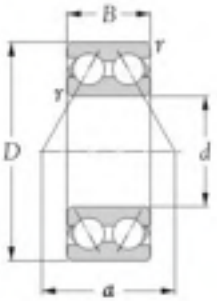
Boundary dimensions mm				Basic load ratings dynamic static N		Limiting speeds rpm		Bearing numbers		Mass kg.
d	D	B	$r_{s\,min}$	C_r	C_{or}	grease	oil			(approx.)
10	30	14.3	0.6	7150	3900	16000	22000	**5200 2RS**	**5200 A 2RS**	0.045
12	32	15.9	0.6	10600	5850	15000	20000	**5201 2RS**	**5201 A 2RS**	0.050
15	35	15.9	0.6	11700	6950	12000	17000	**5202 2RS**	**5202 A 2RS**	0.068
17	40	17.5	0.6	14800	9000	10000	15000	**5203 2RS**	**5203 A 2RS**	0.090
20	47	20.6	1.0	19500	12200	9000	13000	**5204 2RS**	**5204 A 2RS**	0.140
25	52	20.6	1.0	21200	14600	8000	11000	**5205 2RS**	**5205 A 2RS**	0.160
30	62	23.8	1.0	29600	21200	7000	9500	**5206 2RS**	**5206 A 2RS**	0.260
35	72	27.0	1.1	37700	27500	6000	8000	**5207 2RS**	**5207 A 2RS**	0.400
40	80	30.2	1.1	44900	34000	5600	7500	**5208 2RS**	**5208 A 2RS**	0.530
45	85	30.2	1.1	48800	39000	5000	6700	**5209 2RS**	**5209 A 2RS**	0.570

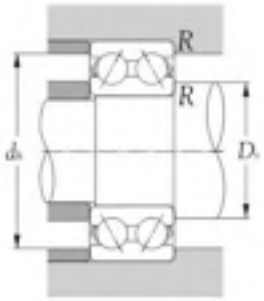
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	A	Class 0 (JIS)	Alvania S2 -25℃~+120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

BALL BEARING
SERIES 53





Boundary dimensions mm				Basic load ratings dynamic static N		Limiting speeds rpm		Bearing numbers		Abutment and fillet dimensions mm				Mass
d	D	B	r min	Cr	Cor	grease	oil			Da min	da max	R max	a	(approx.)
15	42	19.0	1.0	17200	10100	9900	13000	5302 (UG)	5302 A (UG)	21.0	36.0	1.0	26.0	0.132
17	47	22.2	1.0	20400	12100	9000	12000	5303 (UG)	5303 A (UG)	23.0	41.0	1.0	28.5	0.181
20	52	22.2	1.1	20600	12700	8000	11000	5304 (UG)	5304 A (UG)	27.0	45.0	1.0	30.5	0.217
25	62	25.4	1.1	30500	20500	6700	8900	5305 (UG)	5305 A (UG)	32.0	55.0	1.0	36.5	0.362
30	72	30.2	1.1	39500	27500	5700	7600	5306 (UG)	5306 A (UG)	37.0	65.0	1.0	43.0	0.553
35	80	34.9	1.5	49500	35000	5000	6600	5307 (UG)	5307 A (UG)	43.5	71.5	1.5	48.5	0.766
40	90	36.5	1.5	60500	44000	4400	5900	5308 (UG)	5308 A (UG)	48.5	81.5	1.5	53.5	1.010
45	100	39.7	1.5	72500	54000	4000	5300	5309 (UG)	5309 A (UG)	53.5	91.5	1.5	60.0	1.340
50	110	44.4	2.0	85500	64500	3600	4800	5310 (UG)	5310 A (UG)	60.0	100.0	2.0	65.5	1.810

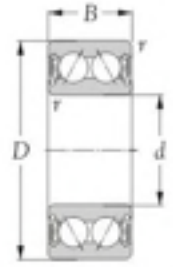
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	A	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

BALL BEARING
SERIES 53..2RS

BALL BEARINGS



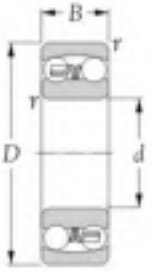
Boundary dimensions mm				Basic load ratings dynamic static N		Limiting speeds rpm		Bearing numbers		Mass kg(s).
d	D	B	$r_{s\,min}$	C_r	C_{or}	grease	oil			(approx.)
15	42	19.0	1.0	17,200	10,100	9,900	13,000	**5302 2RS**	**5302 A 2RS**	0.132
17	47	22.2	1.0	20,400	12,100	9,000	12,000	**5303 2RS**	**5303 A 2RS**	0.181
20	52	22.2	1.1	22,500	14,600	8,500	12,000	**5304 2RS**	**5304 A 2RS**	0.200
25	62	25.4	1.1	30,700	20,400	7,500	10,000	**5305 2RS**	**5305 A 2RS**	0.320
30	72	30.2	1.1	41,600	29,000	6,300	8,500	**5306 2RS**	**5306 A 2RS**	0.480
45	100	39.7	1.5	72,800	53,000	4,500	6,000	**5309 2RS**	**5309 A 2RS**	1.150

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	A	Class 0 (JIS)	Alvania S2 -25℃ ~ +120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

BALL BEARING
SERIES 12,12..K



Cylindrical bore

Tapered bore
taper 1:12

BALL BEARINGS

Boundary dimensions mm				Basic load ratings dynamic / static N		Limiting speeds rpm		Bearing numbers		Mass kg(s). cylindrical bore / tapered bore (approx.)	
d	D	B	r min	Cr	Cor	grease	oil				
10	30	9	0.6	5,500	1,190	21,000	24,000	1200 E	-	0.033	-
12	32	10	0.6	5,600	1,270	18,000	22,000	1201 E	-	0.040	-
15	35	11	0.6	7,450	1,750	16,000	19,000	1202 E	-	0.049	-
17	40	12	0.6	7,900	2,010	14,000	17,000	1203 E	-	0.072	-
20	47	14	1.0	9,900	2,610	13,000	15,000	1204	1204 K	0.116	0.114
25	52	15	1.0	12,100	3,300	11,000	13,000	1205	1205 K	0.138	0.135
30	62	16	1.0	15,600	4,650	9,200	11,000	1206	1206 K	0.217	0.213
35	72	17	1.1	15,800	5,100	8,000	9,400	1207	1207 K	0.317	0.312
40	80	18	1.1	19,300	6,550	7,100	8,400	1208	1208 K	0.414	0.407
45	85	19	1.1	21,900	7,350	6,400	7,500	1209	1209 K	0.457	0.448
50	90	20	1.1	22,700	8,100	5,800	6,800	1210	1210 K	0.515	0.504
55	100	21	1.5	26,800	10,000	5,300	6,200	1211	1211 K	0.692	0.679
60	110	22	1.5	30,000	11,500	4,900	5,800	1212	1212 K	0.879	0.864
65	120	23	1.5	31,000	12,500	4,500	5,300	1213	1213 K	1.130	1.110
70	125	24	1.5	34,500	13,800	4,200	4,900	1214	-	1.240	-
75	130	25	1.5	39,000	15,700	3,900	4,600	1215	1215 K	1.330	1.310
80	140	26	2.0	40,000	17,000	3,700	4,300	1216	1216 K	1.650	1.620

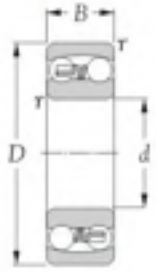
Remark:

Cages		Precision	Grease
Steel -	J		
Polyamid -	E	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

BALL BEARING
SERIES 13,13..K

BALL BEARINGS



Cylindrical bore

Tapered bore
taper 1:12

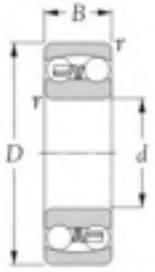
Boundary dimensions mm				Basic load ratings dynamic static N		Limiting speeds rpm		Bearing numbers		Mass kg(s). cylindrical bore	tapered bore
d	D	B	$r_{s\,min}$	C_r	C_{or}	grease	oil			(approx.)	
10	35	11	0.6	7,250	1,620	18,000	21,000	**1300 E**	-	0.058	-
12	37	12	1.0	9,450	2,160	16,000	18,000	**1301 E**	-	0.066	-
15	42	13	1.0	9,550	2,300	13,000	16,000	**1302 E**	-	0.092	-
17	47	14	1.0	12,500	3,200	12,000	14,000	**1303 E**	-	0.128	-
20	52	15	1.1	12,400	3,350	11,000	13,000	**1304**	**1304 K**	0.160	0.158
25	62	17	1.1	18,000	5,000	9,100	11,000	**1305**	**1305 K**	0.255	0.251
30	72	19	1.1	21,300	6,300	7,700	9,100	**1306**	**1306 K**	0.383	0.377
35	80	21	1.5	25,100	7,850	6,800	8,000	**1307**	**1307 K**	0.500	0.492
40	90	23	1.5	29,600	9,700	6,000	7,000	**1308**	**1308 K**	0.709	0.698
45	100	25	1.5	38,000	12,700	5,400	6,300	**1309**	**1309 K**	0.953	0.938
50	110	27	2.0	43,500	14,100	4,900	5,800	**1310**	**1310 K**	1.200	1.180
55	120	29	2.0	51,500	17,900	4,500	5,200	**1311**	**1311 K**	1.580	1.560
60	130	31	2.1	57,000	20,800	4,100	4,800	**1312**	**1312 K**	1.960	1.930

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	K	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

BALL BEARING
SERIES **22, 22..K**



Cylindrical bore

Tapered bore
taper 1:12

BALL BEARINGS

Boundary dimensions mm				Basic load ratings dynamic / static N		Limiting speeds rpm		Bearing numbers		Mass kg(s). cylindrical bore / tapered bore (approx.)	
d	D	B	r_s min°	C_r	C_{or}	grease	oil				
10	30	14	0.6	7,300	1,590	19,000	23,000	**2200 E**	-	0.047	-
12	32	14	0.6	7,600	1,730	17,000	20,000	**2201 E**	-	0.051	-
15	35	14	0.6	7,700	1,850	15,000	18,000	**2202**	-	0.060	-
17	40	16	0.6	9,800	2,410	13,000	16,000	**2203**	-	0.088	-
20	47	18	1.0	12,600	3,300	12,000	14,000	**2204**	**2204 K**	0.140	0.137
25	52	18	1.0	12,300	3,450	10,000	12,000	**2205**	**2205 K**	0.157	0.153
30	62	20	1.0	15,200	4,500	8,600	10,000	**2206**	**2206 K**	0.256	0.250
35	72	23	1.1	21,500	6,600	7,500	8,800	**2207**	**2207 K**	0.392	0.382
40	80	23	1.1	22,300	7,350	6,700	7,900	**2208**	**2208 K**	0.493	0.482
45	85	23	1.1	23,200	8,150	6,000	7,100	**2209**	**2209 K**	0.540	0.528
50	90	23	1.1	23,200	8,450	5,500	6,400	**2210**	**2210 K**	0.583	0.569
55	100	25	1.5	26,500	9,900	5,000	5,800	**2211**	**2211 K**	0.787	0.769
60	110	28	1.5	34,000	12,600	4,600	5,400	**2212**	**2212 K**	1.080	1.060

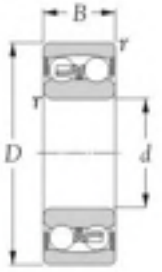
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	E	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

BALL BEARING
SERIES 22..2RS

BALL BEARINGS



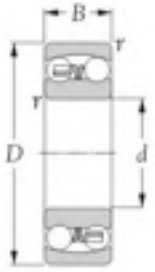
Boundary dimensions mm				Basic load ratings dynamic / static N		Speed rating rpm	Bearing numbers	Mass kg(s).
d	D	B	rs min	Cr	Cor	grease		(approx.)
10	30	14	0.6	5,530	1,180	17,000	**2200 E 2RS**	0.048
12	32	14	0.6	6,240	1,430	16,000	**2201 E 2RS**	0.053
15	35	14	0.6	7,410	1,760	14,000	**2202 2RS**	0.058
17	40	16	0.6	8,840	2,200	12,000	**2203 2RS**	0.089
20	47	18	1.0	12,700	3,400	10,000	**2204 2RS**	0.140
25	52	18	1.0	14,300	4,000	9,000	**2205 2RS**	0.160
30	62	20	1.0	15,600	4,650	7,500	**2206 2RS**	0.260
35	72	23	1.1	19,000	6,000	6,300	**2207 2RS**	0.410
40	80	23	1.1	19,900	6,950	5,600	**2208 2RS**	0.500
45	85	23	1.1	22,900	7,800	5,300	**2209 2RS**	0.530
50	90	23	1.1	22,900	8,150	4,800	**2210 2RS**	0.570
55	100	25	1.5	27,600	10,600	4,300	**2211 2RS**	0.790
60	110	28	1.5	31,200	12,200	3,800	**2212 2RS**	1.050

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	E	Class 0 (JIS)	Alvania N2 -25℃~+120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

BALL BEARING
SERIES **23, 23..K**



Cylindrical bore

Tapered bore
taper 1:12

BALL BEARINGS

Boundary dimensions mm				Basic load ratings dynamic / static N		Limiting speeds rpm		Bearing numbers		Mass kg(s). cylindrical bore / tapered bore (approx.)	
d	D	B	r_s min°	C_r	C_{or}	grease	oil				
10	35	17	0.6	10,100	2,150	17,000	20,000	**2300 E**	-	0.083	-
12	37	17	1.0	11,800	2,710	15,000	17,000	**2301 E**	-	0.091	-
15	42	17	1.0	12,000	2,900	13,000	15,000	**2302**	-	0.114	-
17	47	19	1.0	14,400	3,550	11,000	14,000	**2303**	-	0.156	-
20	52	21	1.1	18,100	4,700	10,000	12,000	**2304**	**2304 K**	0.206	0.201
25	62	24	1.1	24,400	6,600	8,500	10,000	**2305**	**2305 K**	0.334	0.326
30	72	27	1.1	31,500	8,750	7,200	8,500	**2306**	**2306 K**	0.496	0.485
35	80	31	1.5	39,500	11,300	6,300	7,400	**2307**	**2307 K**	0.671	0.653
40	90	33	1.5	45,000	13,500	5,600	6,600	**2308**	**2308 K**	0.918	0.895
45	100	36	1.5	54,000	16,700	5,000	5,900	**2309**	**2309 K**	1.230	1.200
50	110	40	2.0	64,500	20,200	4,600	5,400	**2310**	**2310 K**	1.630	1.590
55	120	43	2.0	75,500	24,000	4,200	4,900	**2311**	**2311 K**	2.100	2.050
60	130	46	2.1	87,000	28,200	3,800	4,500	**2312**	**2312 K**	2.590	2.520

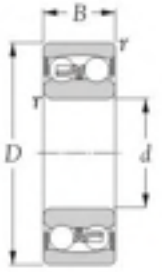
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	E	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

BALL BEARING
SERIES 23..2RS

BALL BEARINGS



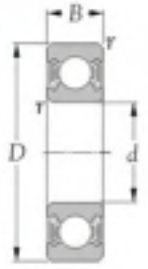
Boundary dimensions mm				Basic load ratings dynamic / static N		Speed rating rpm	Bearing numbers	Mass kg(s).
d	D	B	r_s min.*	C_r	C_{or}	grease		(approx.)
15	42	17	1.0	10,800	2,600	12,000	**2302 2RS**	0.11
17	47	19	1.0	12,700	3,400	11,000	**2303 2RS**	0.16
20	52	21	1.1	14,300	4,000	9,500	**2304 2RS**	0.21
25	62	24	1.1	19,000	5,400	7,500	**2305 2RS**	0.34
30	72	27	1.1	22,500	6,800	6,700	**2306 2RS**	0.51
35	80	31	1.5	26,500	8,500	5,600	**2307 2RS**	0.70
40	90	33	1.5	33,800	11,200	5,000	**2308 2RS**	0.96
45	100	36	1.5	39,000	13,400	4,500	**2309 2RS**	1.30
50	110	40	2.0	43,600	14,000	4,000	**2310 2RS**	1.65

Remark:

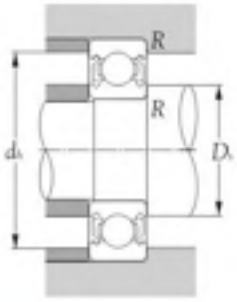
Cages		Precision	Grease
Steel -	√		
Polyamid -	E	Class 0 (JIS)	Alvania #2 -25℃~+120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

Stainless Steel Ball Bearings
series S 60.. 2RS



Non-contact
sealed type (2RS)



Boundary dimensions mm				Basic load ratings dynamic static N		Limiting speeds rpm	Bearing numbers	Mass kg.
d	D	B	rs min*	Cr	Cor			(approx.)
10	26	8	0.3	4,550	1,960	19,000	S 6000 2RS	0.020
12	28	8	0.3	5,100	2,360	18,000	S 6001 2RS	0.023
15	32	9	0.3	5,600	2,850	16,000	S 6002 2RS	0.031
17	35	10	0.3	6,000	3,250	14,000	S 6003 2RS	0.040
20	42	12	0.6	9,300	5,000	12,000	S 6004 2RS	0.067
25	47	12	0.6	10,000	5,850	10,000	S 6005 2RS	0.084
30	55	13	0.6	12,700	8,000	8,000	S 6006 2RS	0.120
35	62	14	0.6	16,000	10,200	7,500	S 6007 2RS	0.163
40	68	15	1.0	17,800	11,600	6,300	S 6008 2RS	0.190
45	75	16	1.0	20,000	14,300	6,000	S 6009 2RS	0.244
50	80	16	1.0	20,800	15,600	5,600	S 6010 2RS	0.271
55	90	18	1.1	29,600	21,200	4,500	S 6011 2RS	0.390
60	95	18	1.1	30,700	23,200	4,300	S 6012 2RS	0.420
65	100	18	1.1	31,900	25,000	4,000	S 6013 2RS	0.440

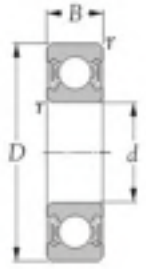
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Alvania N2 -25°C ~ +120°C
Brass -	X		

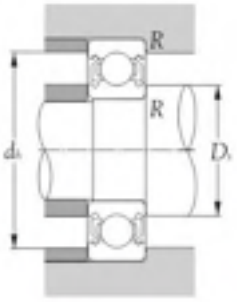
Remark: If you have more inquiry of technical, please inquire NIKO website: Http://www.nipponkodobearings.com

BALL BEARINGS

STAINLESS STEEL BALL BEARINGS
SERIES S 62.. 2RS



Non-contact sealed type (2RS)



Boundary dimensions mm				Basic load ratings dynamic static N		Limiting speeds rpm	Bearing numbers	Mass kg.
d	D	B	r_s min*	C_r	C_{or}			(approx.)
10	30	9	0.6	6,000	2,600	17,000	**S 6200 2RS**	0.034
12	32	10	0.6	6,950	3,100	16,000	**S 6201 2RS**	0.040
15	35	11	0.6	7,800	3,750	14,000	**S 6202 2RS**	0.045
17	40	12	0.6	9,500	4,750	12,000	**S 6203 2RS**	0.067
20	47	14	1.0	12,700	6,550	10,000	**S 6204 2RS**	0.109
25	52	15	1.0	14,000	7,800	9,000	**S 6205 2RS**	0.133
30	62	16	1.0	19,300	11,200	7,500	**S 6206 2RS**	0.211
35	72	17	1.1	25,500	15,300	6,300	**S 6207 2RS**	0.303
40	80	18	1.1	29,000	18,000	5,600	**S 6208 2RS**	0.384
45	85	19	1.1	31,000	20,400	5,300	**S 6209 2RS**	0.441
50	90	20	1.1	37,100	23,200	4,800	**S 6210 2RS**	0.460

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Alvania S2 -25°C ~ +120°C
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

NIKO

NIPPON KOGO

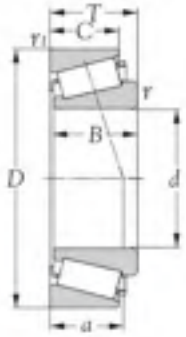
Taper Roller Bearings

Taper Roller Bearings

Souvenirs

TAPER ROLLER BEARING
SERIES 302

TAPER ROLLER BEARINGS



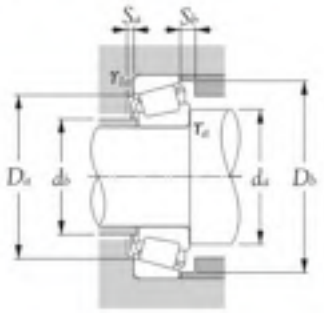
Boundary dimensions mm							Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Limiting speeds min⁻¹		Bearing numbers
d	D	T	B	C	r1 min	r min	Cr	Cor	Cr	Cor	grease	oil	
17	40	13.25	12	11	1.0	1.0	20,500	20,300	2,090	2,070	9,900	13,000	30203-A
20	47	15.25	14	12	1.0	1.0	28,200	28,700	2,870	2,930	8,800	12,000	30204-A
25	52	16.25	15	13	1.0	1.0	31,500	34,000	3,200	3,450	7,300	9,800	30205-A
30	62	17.25	16	14	1.0	1.0	43,500	48,000	4,450	4,900	6,300	8,400	30206-A
35	72	18.25	17	15	1.5	1.5	55,500	61,500	5,650	6,250	5,500	7,400	30207-A
40	80	19.75	18	16	1.5	1.5	61,000	67,000	6,250	6,850	4,900	6,600	30208-A
45	85	20.75	19	16	1.5	1.5	67,500	78,500	6,900	8,000	4,400	5,900	30209-A
50	90	21.75	20	17	1.5	1.5	77,000	93,000	7,850	9,450	4,000	5,300	30210-A
55	100	22.75	21	18	2.0	1.5	93,000	111,000	9,500	11,300	3,600	4,900	30211-A
60	110	23.75	22	19	2.0	1.5	105,000	125,000	10,700	12,700	3,400	4,500	30212-A
65	120	24.75	23	20	2.0	1.5	123,000	148,000	12,500	15,000	3,100	4,200	30213-A
70	125	26.25	24	21	2.0	1.5	131,000	162,000	13,400	16,500	2,900	3,900	30214-A
75	130	27.25	25	22	2.0	1.5	139,000	175,000	14,200	17,900	2,700	3,600	30215-A
80	140	28.25	26	22	2.5	2.0	160,000	200,000	16,300	20,400	2,500	3,400	30216-A
85	150	30.50	28	24	2.5	2.0	183,000	232,000	18,600	23,600	2,400	3,200	30217-A
90	160	32.50	30	26	2.5	2.0	208,000	267,000	21,200	27,200	2,200	3,000	30218-A
95	170	34.50	32	27	3.0	2.5	226,000	290,000	23,000	29,600	2,100	2,800	30219-A
100	180	37.00	34	29	3.0	2.5	258,000	335,000	26,300	34,500	2,000	2,700	30220-A

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

TAPER ROLLER BEARING
SERIES 302



Equivalent radial load
dynamic

$Pr = XFr + YFa$

$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	0	0.4	Y_2

Static

$Por = 0.5Fr + Y_0Fa$

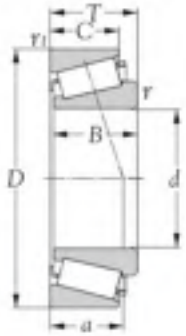
When $Por < Fr$ **use** $Por = Fr$
For values of e, Y_2 **and** Y_0
see the table below.

TAPER ROLLER BEARINGS

Abutment and fillet dimensions mm									Load center mm	Constant	Axial load factors		Mass kg(s).
d_a min	d_b max	D_a max	D_a min	D_b min	S_a min	S_b min	r_{as} max	r_{bs} max	a	e	Y_2	Y_0	(approx.)
22.5	23	34.5	33	37	2	2.0	1.0	1.0	9.5	0.35	1.74	0.96	0.080
25.5	27	41.5	40	44	2	3.0	1.0	1.0	11.5	0.35	1.74	0.96	0.127
30.5	31	46.5	44	48	2	3.0	1.0	1.0	12.5	0.37	1.60	0.88	0.154
35.5	37	56.5	53	57	2	3.0	1.0	1.0	13.5	0.37	1.60	0.88	0.241
43.5	44	63.5	62	67	3	3.0	1.5	1.5	15.0	0.37	1.60	0.88	0.344
48.5	49	71.5	69	75	3	3.5	1.5	1.5	16.5	0.37	1.60	0.88	0.435
53.5	54	76.5	74	80	3	4.5	1.5	1.5	18.0	0.40	1.48	0.81	0.495
58.5	58	81.5	79	85	3	4.5	1.5	1.5	19.5	0.42	1.43	0.79	0.563
65.0	64	91.5	88	94	4	4.5	2.0	1.5	21.0	0.40	1.48	0.81	0.740
70.0	70	101.5	96	103	4	4.5	2.0	1.5	22.0	0.40	1.48	0.81	0.949
75.0	77	111.5	106	113	4	4.5	2.0	1.5	23.5	0.40	1.48	0.81	1.180
80.0	81	116.5	110	118	4	5.0	2.0	1.5	25.5	0.42	1.43	0.79	1.260
85.0	85	121.5	115	124	4	5.0	2.0	1.5	27.0	0.44	1.38	0.76	1.410
92.0	91	130.0	124	132	4	6.0	2.0	2.0	27.5	0.42	1.43	0.79	1.720
97.0	97	140.0	132	141	5	6.5	2.0	2.0	30.0	0.42	1.43	0.79	2.140
102.0	103	150.0	140	150	5	6.5	2.0	2.0	32.0	0.42	1.43	0.79	2.660
109.0	110	158.0	149	159	5	7.5	2.5	2.0	34.0	0.42	1.43	0.79	3.070
114.0	116	168.0	157	168	5	8.0	2.5	2.0	36.0	0.42	1.43	0.79	3.780

TAPER ROLLER BEARING
SERIES 303

TAPER ROLLER BEARINGS



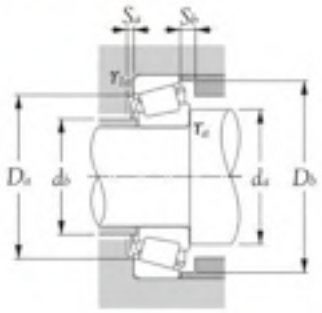
Boundary dimensions mm							Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Limiting speeds min⁻¹		Bearing numbers
d	D	T	B	C	r1 min	r min	Cr	Cor	Cr	Cor	grease	oil	
17	47	15.25	14	12	1.0	1.0	28,900	26,300	2,940	2,680	9,000	12,000	30303
20	52	16.25	16	13	1.5	1.5	35,500	34,000	3,600	3,450	8,000	11,000	30304
25	62	18.25	17	15	1.5	1.5	48,500	47,500	4,950	4,850	6,700	8,900	30305
30	72	20.75	19	16	1.5	1.5	60,000	61,000	6,100	6,200	5,700	7,600	30306
35	80	22.75	21	18	2.0	1.5	75,000	77,000	7,650	7,900	5,000	6,600	30307
40	90	25.25	23	20	2.0	1.5	91,500	102,000	9,350	10,400	4,400	5,900	30308
45	100	27.25	25	22	2.0	1.5	111,000	126,000	11,300	12,800	4,000	5,300	30309
50	110	29.25	27	23	2.5	2.0	133,000	152,000	13,500	15,500	3,600	4,800	30310
55	120	31.50	29	25	2.5	2.0	155,000	179,000	15,800	18,300	3,300	4,400	30311
60	130	33.50	31	26	3.0	2.5	180,000	210,000	18,300	21,400	3,000	4,000	30312
65	140	36.00	33	28	3.0	2.5	203,000	238,000	20,700	24,300	2,800	3,700	30313
70	150	38.00	35	30	3.0	2.5	230,000	272,000	23,400	27,800	2,600	3,500	30314
75	160	40.00	37	31	3.0	2.5	255,000	305,000	26,000	31,000	2,400	3,200	30315
80	170	42.50	39	33	3.0	2.5	291,000	350,000	29,700	36,000	2,300	3,000	30316

Remark:

Cages	Precision	Grease
Steel - √		
Polyamid - X	Class 0 (JIS)	Nil
Brass - X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

TAPER ROLLER BEARING
SERIES 303



Equivalent radial load
dynamic

$Pr = XFr + YFa$

$\frac{Fa}{Fr} \le e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	0	0.4	Y_2

Static

$Por = 0.5Fr + Y_0Fa$

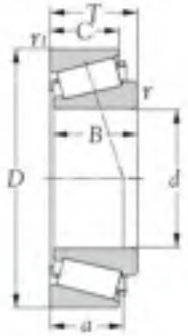
When $Por < Fr$ **use** $Por = Fr$
For values of e, Y_2 **and** Y_0
see the table below.

TAPER ROLLER BEARINGS

Abutment and fillet dimensions mm									Load center mm	Constant	Axial load factors		Mass kg(s).
d_a min	d_b max	D_a max	D_a min	D_b min	S_a min	S_b min	r_{as} max	r_{1as} max	a	e	Y_2	Y_0	(approx.)
22.5	24.0	41.5	40.0	42.0	3	3.5	1.0	1.0	10.5	0.29	2.11	1.16	0.134
28.5	28.0	43.5	42.5	47.5	3	3.0	1.5	1.5	10.5	0.30	2.00	1.10	0.176
33.5	34.0	53.5	52.0	57.0	3	3.0	1.5	1.5	13.0	0.30	2.00	1.10	0.272
38.5	40.0	63.5	62.0	66.0	3	4.5	1.5	1.5	15.0	0.31	1.90	1.05	0.408
45.0	45.0	71.5	70.0	74.0	3	4.5	2.0	1.5	17.0	0.31	1.90	1.05	0.540
50.0	52.0	81.5	77.0	82.0	3	5.0	2.0	1.5	19.5	0.35	1.74	0.96	0.769
55.0	59.0	91.5	86.0	93.0	3	5.0	2.0	1.5	21.0	0.35	1.74	0.96	1.010
62.0	65.0	100.0	95.0	102.0	3	6.0	2.0	2.0	23.0	0.35	1.74	0.96	1.310
67.0	71.0	110.0	104.0	111.0	4	6.5	2.0	2.0	24.5	0.35	1.74	0.96	1.660
74.0	77.0	118.0	112.0	120.0	4	7.5	2.5	2.0	26.5	0.35	1.74	0.96	2.060
79.0	83.0	128.0	122.0	130.0	4	8.0	2.5	2.0	28.5	0.35	1.74	0.96	2.550
84.0	89.0	138.0	130.0	140.0	4	8.0	2.5	2.0	30.0	0.35	1.74	0.96	3.060
89.0	95.0	148.0	139.0	149.0	4	9.0	2.5	2.0	32.0	0.35	1.74	0.96	3.570
94.0	102.0	158.0	148.0	159.0	4	9.5	2.5	2.0	34.0	0.35	1.74	0.96	4.410

TAPER ROLLER BEARING
SERIES 320

TAPER ROLLER BEARINGS



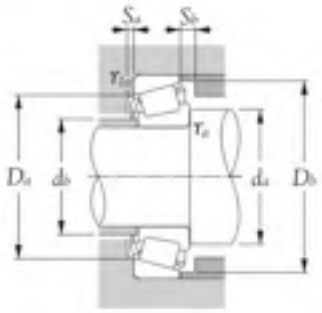
Boundary dimensions mm							Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Limiting speeds min⁻¹		Bearing numbers
d	D	T	B	C	r1 min	r min	Cr	Cor	Cr	Cor	grease	oil	
20	42	15	15	12.0	0.6	0.6	24,900	27,900	2,540	2,840	9,500	13,000	32004 X
22	44	15	15	11.5	0.6	0.6	27,000	31,500	2,760	3,250	8,900	12,000	320/22 X
25	47	15	15	11.5	0.6	0.6	27,800	33,500	2,830	3,450	7,900	11,000	32005 X
28	52	16	16	12.0	1.0	1.0	33,000	40,500	3,400	4,150	7,300	9,700	320/28 X
30	55	17	17	13.0	1.0	1.0	37,500	46,000	3,800	4,700	6,900	9,200	32006 X
32	58	17	17	13.0	1.0	1.0	37,000	46,500	3,750	4,750	6,600	8,700	320/32 X
35	62	18	18	14.0	1.0	1.0	41,500	52,500	4,250	5,350	6,100	8,100	32007 X
40	68	19	19	14.5	1.0	1.0	50,000	65,500	5,100	6,650	5,300	7,100	32008 X
45	75	20	20	15.5	1.0	1.0	57,500	76,500	5,850	7,800	4,800	6,400	32009 X
50	80	20	20	15.5	1.0	1.0	62,500	88,000	6,400	9,000	4,400	5,800	32010 X
55	90	23	23	17.5	1.5	1.5	80,500	118,000	8,200	12,000	4,000	5,400	32011 X
60	95	23	23	17.5	1.5	1.5	82,000	123,000	8,350	12,500	3,700	4,900	32012 X
65	100	23	23	17.5	1.5	1.5	83,000	128,000	8,450	13,000	3,400	4,600	32013 X
70	110	25	25	19.0	1.5	1.5	105,000	160,000	10,700	16,400	3,200	4,200	32014 X
75	115	25	25	19.0	1.5	1.5	106,000	167,000	10,800	17,000	3,000	4,000	32015 X
80	125	29	29	22.0	1.5	1.5	139,000	216,000	14,200	22,000	2,800	3,700	32016 X
85	130	29	29	22.0	1.5	1.5	142,000	224,000	14,400	22,900	2,600	3,500	32017 X
90	140	32	32	24.0	2.0	1.5	168,000	270,000	17,200	27,600	2,500	3,300	32018 X
95	145	32	32	24.0	2.0	1.5	171,000	280,000	17,500	28,600	2,300	3,100	32019 X
100	150	32	32	24.0	2.0	1.5	170,000	281,000	17,300	28,600	2,200	3,000	32020 X
105	160	35	35	26.0	2.5	2.0	201,000	335,000	20,500	34,000	2,100	2,800	32021 X
110	170	38	38	29.0	2.5	2.0	236,000	390,000	24,000	39,500	2,000	2,700	32022 X
120	180	38	38	29.0	2.5	2.0	245,000	420,000	25,000	43,000	1,800	2,500	32024 X

Remark:

Cages	Precision	Grease
Steel - J		
Polyamid - X		
Brass - X	Class 0 (JIS)	Nil

Remark: If you have more inquiry of technical, please inquire NIKO website: Http://www.nipponkoshobearings.com

TAPER ROLLER BEARING
SERIES 320



Equivalent radial load
dynamic

$Pr = XFr + YFa$

$\frac{Fa}{Fr} \le e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	0	0.4	Y_2

Static

$Por = 0.5Fr + Y_0Fa$

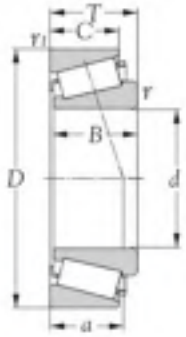
When $Por < Fr$ **use** $Por = Fr$
For values of e, Y_2 **and** Y_0
see the table below.

TAPER ROLLER BEARINGS

Abutment and fillet dimensions mm									Load center mm	Constant	Axial load factors		Mass kg(s).
da min	db max	Da max	Da min	Db min	Sa min	Sb min	ra max	rb max	a	e	Y2	Y0	(approx.)
24.5	25	37.5	36	39	3	3.0	0.6	0.6	10.5	0.37	1.60	0.88	0.097
26.5	27	39.5	38	41	3	3.5	0.6	0.6	11.0	0.40	1.51	0.83	0.106
29.5	30	42.5	40	44	3	3.5	0.6	0.6	12.0	0.43	1.39	0.77	0.114
33.5	33	46.5	45	49	3	4.0	1.0	1.0	12.5	0.43	1.39	0.77	0.146
35.5	35	49.5	48	52	3	4.0	1.0	1.0	13.5	0.43	1.39	0.77	0.166
37.5	38	52.5	50	55	3	4.0	1.0	1.0	14.5	0.45	1.32	0.73	0.181
40.5	40	56.5	54	59	4	4.0	1.0	1.0	15.5	0.45	1.32	0.73	0.224
45.5	46	62.5	60	65	4	4.5	1.0	1.0	15.0	0.38	1.58	0.87	0.273
50.5	51	69.5	67	72	4	4.5	1.0	1.0	16.5	0.39	1.53	0.84	0.346
55.5	56	74.5	72	77	4	4.5	1.0	1.0	17.5	0.42	1.42	0.78	0.366
63.5	63	81.5	81	86	4	5.5	1.5	1.5	20.0	0.41	1.48	0.81	0.563
68.5	67	86.5	85	91	4	5.5	1.5	1.5	21.0	0.43	1.39	0.77	0.576
73.5	72	91.5	90	97	4	5.5	1.5	1.5	22.5	0.46	1.31	0.72	0.630
78.5	78	101.5	98	105	5	6.0	1.5	1.5	24.0	0.43	1.38	0.76	0.848
83.5	83	106.5	103	110	5	6.0	1.5	1.5	25.5	0.46	1.31	0.72	0.909
88.5	89	116.5	112	120	6	7.0	1.5	1.5	27.0	0.42	1.42	0.78	1.280
93.5	94	121.5	117	125	6	7.0	1.5	1.5	28.5	0.44	1.36	0.75	1.350
100.0	100	131.5	125	134	6	8.0	2.0	1.5	30.0	0.42	1.42	0.78	1.790
105.0	105	136.5	130	140	6	8.0	2.0	1.5	31.5	0.44	1.36	0.75	1.830
110.0	109	141.5	134	144	6	8.0	2.0	1.5	32.5	0.46	1.31	0.72	1.910
117.0	116	150.0	143	154	6	9.0	2.0	2.0	34.5	0.44	1.35	0.74	2.420
122.0	122	160.0	152	163	7	9.0	2.0	2.0	36.5	0.43	1.39	0.77	3.070
132.0	131	170.0	161	173	7	9.0	2.0	2.0	39.0	0.46	1.31	0.72	3.250

TAPER ROLLER BEARING
SERIES 322

TAPER ROLLER BEARINGS



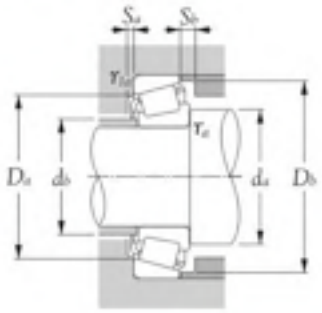
Boundary dimensions mm							Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Limiting speeds min⁻¹		Bearing numbers
d	D	T	B	C	r1 min	r min	Cr	Cor	Cr	Cor	grease	oil	
25	52	19.25	18	16	1.0	1.0	42,000	47,000	4,300	4,800	7,300	9,800	32205-A
30	62	21.25	20	17	1.0	1.0	54,500	64,000	5,600	6,550	6,300	8,400	32206-A
35	72	24.25	23	19	1.5	1.5	72,500	87,000	7,400	8,900	5,500	7,400	32207-A
40	80	24.75	23	19	1.5	1.5	79,500	93,500	8,100	9,550	4,900	6,600	32208-A
45	85	24.75	23	19	1.5	1.5	82,000	100,000	8,350	10,200	4,400	5,900	32209-A
50	90	24.75	23	19	1.5	1.5	87,500	109,000	8,900	11,100	4,000	5,300	32210-A
55	100	26.75	25	21	2.0	1.5	108,000	134,000	11,000	13,700	3,600	4,900	32211-A
60	110	29.75	28	24	2.0	1.5	130,000	164,000	13,200	16,800	3,400	4,500	32212-A
65	120	32.75	31	27	2.0	1.5	159,000	206,000	16,200	21,000	3,100	4,200	32213-A
70	125	33.25	31	27	2.0	1.5	166,000	220,000	16,900	22,400	2,900	3,900	32214-A
75	130	33.25	31	27	2.0	1.5	168,000	224,000	17,100	22,800	2,700	3,600	32215-A
80	140	35.25	33	28	2.5	2.0	199,000	265,000	20,300	27,000	2,500	3,400	32216-A
85	150	38.50	36	30	2.5	2.0	224,000	300,000	22,900	30,500	2,400	3,200	32217-A

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

TAPER ROLLER BEARING
SERIES 322



Equivalent radial load
dynamic

$Pr = XFr + YFa$

$\frac{Fa}{Fr} \le e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	0	0.4	Y_2

Static

$Por = 0.5Fr + Y_0Fa$

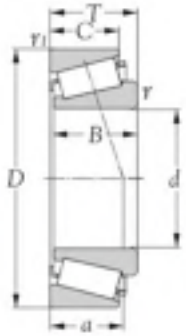
When $Por < Fr$ **use** $Por = Fr$
For values of e, Y_2 **and** Y_0
see the table below.

TAPER ROLLER BEARINGS

Abutment and fillet dimensions mm									Load center mm	Constant	Axial load factors		Mass kg(s).
da min	db max	Da max	Da min	Db min	Sa min	Sb min	ras max	ras max	a	e	Y2	Y0	(approx.)
30.5	31	46.5	43	49.5	2.0	4.0	1.0	1.0	14.0	0.36	1.67	0.92	0.187
35.5	37	56.5	52	58.0	2.5	4.0	1.0	1.0	15.5	0.37	1.60	0.88	0.301
43.5	43	63.5	61	67.0	3.0	5.0	1.5	1.5	17.5	0.37	1.60	0.88	0.457
48.5	48	71.5	68	75.0	3.0	5.5	1.5	1.5	19.0	0.37	1.60	0.88	0.558
53.5	53	76.5	73	81.0	3.0	5.5	1.5	1.5	20.0	0.40	1.48	0.81	0.607
58.5	58	81.5	78	85.0	3.0	5.5	1.5	1.5	21.0	0.42	1.43	0.79	0.648
65.0	63	91.5	87	95.0	4.0	5.5	2.0	1.5	22.5	0.40	1.48	0.81	0.876
70.0	69	101.5	95	104.0	4.0	5.5	2.0	1.5	25.0	0.40	1.48	0.81	1.180
75.0	75	111.5	104	115.0	4.0	5.5	2.0	1.5	27.0	0.40	1.48	0.81	1.580
80.0	80	116.5	108	119.0	4.0	6.0	2.0	1.5	28.5	0.42	1.43	0.79	1.680
85.0	85	121.5	114	125.0	4.0	6.0	2.0	1.5	30.0	0.44	1.38	0.76	1.740
92.0	90	130.0	122	134.0	4.0	7.0	2.0	2.0	31.0	0.42	1.43	0.79	2.180
97.0	96	140.0	130	142.0	5.0	8.5	2.0	2.0	33.5	0.42	1.43	0.79	2.750

TAPER ROLLER BEARING
SERIES 323

TAPER ROLLER BEARINGS



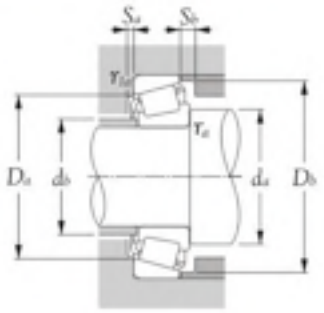
Boundary dimensions mm							Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Limiting speeds min⁻¹		Bearing numbers
d	D	T	B	C	$r_{s\,min}$	$r_{1s\,min}$	C_r	C_{or}	C_r	C_{or}	grease	oil	
20	52	22.25	21	18	1.5	1.5	46,500	48,500	4,750	4,950	8,000	11,000	**32304-A**
25	62	25.25	24	20	1.5	1.5	61,500	64,500	6,250	6,600	6,700	8,900	**32305-A**
30	72	28.75	27	23	1.5	1.5	81,000	90,000	8,250	9,150	5,700	7,600	**32306-A**
35	80	32.75	31	25	2.0	1.5	101,000	115,000	10,300	11,700	5,000	6,600	**32307-A**
40	90	35.25	33	27	2.0	1.5	122,000	150,000	12,500	15,300	4,400	5,900	**32308-A**
45	100	38.25	36	30	2.0	1.5	154,000	191,000	15,700	19,500	4,000	5,300	**32309-A**
50	110	42.25	40	33	2.5	2.0	184,000	232,000	18,700	23,600	3,600	4,800	**32310-A**
55	120	45.50	43	35	2.5	2.0	215,000	275,000	21,900	28,000	3,300	4,400	**32311-A**
60	130	48.50	46	37	3.0	2.5	244,000	315,000	24,900	32,000	3,000	4,000	**32312-A**

Remark:

Cages		Precision	Grease
Steel -	√		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

TAPER ROLLER BEARING
SERIES 323



Equivalent radial load
dynamic

$Pr = XFr + YFa$

$\frac{Fa}{Fr} \le e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	0	0.4	Y_2

Static

$Por = 0.5Fr + Y_0Fa$

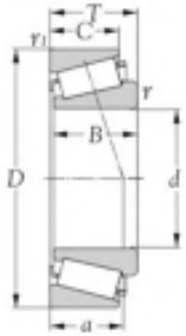
When $Por < Fr$ **use** $Por = Fr$
For values of e, Y_2 **and** Y_0
see the table below.

TAPER ROLLER BEARINGS

Abutment and fillet dimensions mm									Load center mm	Constant	Axial load factors		Mass kg(s).
da min	db max	Da max	Da min	Db min	Sa min	Sb min	ra max	ra1 max	a	e	Y2	Y0	(approx.)
28.5	27	43.5	43	47	3	4.0	1.5	1.5	14.0	0.30	2.00	1.10	0.245
33.5	32	53.5	52	57	3	5.0	1.5	1.5	16.0	0.30	2.00	1.10	0.381
38.5	38	63.5	59	66	3	5.5	1.5	1.5	18.5	0.31	1.90	1.05	0.583
45.0	43	71.5	66	74	3	7.5	2.0	1.5	20.5	0.31	1.90	1.05	0.787
50.0	50	81.5	73	82	3	8.0	2.0	1.5	23.0	0.35	1.74	0.96	1.080
55.0	56	91.5	82	93	3	8.0	2.0	1.5	25.5	0.35	1.74	0.96	1.460
62.0	62	100.0	90	102	3	9.0	2.0	2.0	28.5	0.35	1.74	0.96	1.920
67.0	68	110.0	99	111	4	10.5	2.0	2.0	30.5	0.35	1.74	0.96	2.440
74.0	74	118.0	107	120	4	11.5	2.5	2.0	32.0	0.35	1.74	0.96	3.020

TAPER ROLLER BEARING
SERIES 332

TAPER ROLLER BEARINGS



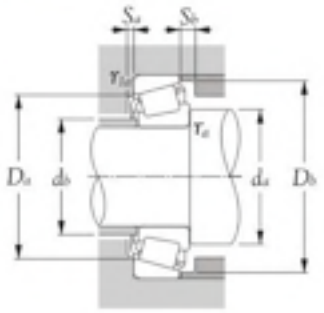
Boundary dimensions mm							Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Limiting speeds min⁻¹		Bearing numbers
d	D	T	B	C	$r_{s\,min}$	$r_{1s\,min}$	C_r	C_{or}	C_r	C_{or}	grease	oil	
25	52	22	22	18.0	1.0	1.0	47,500	57,500	4,850	5,850	7,300	9,800	**33205**
30	62	25	25	19.5	1.0	1.0	65,000	77,000	6,600	7,850	6,300	8,400	**33206**
35	72	28	28	22.0	1.5	1.5	87,500	109,000	8,900	11,200	5,500	7,400	**33207**
40	80	32	32	25.0	1.5	1.5	103,000	132,000	10,500	13,400	4,900	6,600	**33208**
45	85	32	32	25.0	1.5	1.5	107,000	141,000	10,900	14,400	4,400	5,900	**33209**
50	90	32	32	24.5	1.5	1.5	115,000	158,000	11,700	16,100	4,000	5,300	**33210**
55	100	35	35	27.0	2.0	1.5	138,000	188,000	14,100	19,100	3,600	4,900	**33211**

Remark:

Cages		Precision	Grease
Steel -	√		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

TAPER ROLLER BEARING
SERIES 332



Equivalent radial load
dynamic

$Pr = XFr + YFa$

$\frac{Fa}{Fr} \le e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	0	0.4	Y_2

Static

$Pr = 0.5Fr + Y_0Fa$

When $Por < Fr$ **use** $Por = Fr$
For values of e, Y_2 **and** Y_0
see the table below.

TAPER ROLLER BEARINGS

Abutment and fillet dimensions mm									Load center mm	Constant	Axial load factors		Mass kg(s).
d_a min	d_b max	D_a max	D_a min	D_b min	S_a min	S_b min	r_{as} max	r_{1as} max	a	e	Y_2	Y_0	(approx.)
30.5	30	46.5	43	49	4	4.0	1.0	1.0	14.0	0.35	1.71	0.94	0.217
35.5	36	56.5	53	59	5	5.5	1.0	1.0	16.0	0.34	1.76	0.97	0.344
43.5	42	63.5	61	68	5	6.0	1.5	1.5	18.5	0.35	1.70	0.93	0.531
48.5	47	71.5	67	76	5	7.0	1.5	1.5	21.0	0.36	1.68	0.92	0.728
53.5	52	76.5	72	81	5	7.0	1.5	1.5	22.0	0.39	1.56	0.86	0.783
58.5	57	81.5	77	87	5	7.5	1.5	1.5	23.5	0.41	1.45	0.80	0.852
65.0	62	91.5	85	96	6	8.0	2.0	1.5	25.5	0.40	1.50	0.83	1.150

TAPER ROLLER
BEARINGS

NOTE

NIKO

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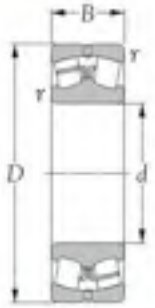
Spherical Roller Bearings

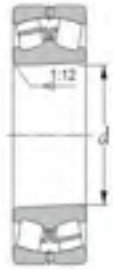
Spherical Roller Bearings

Souvenirs

Spherical Roller Bearings
series 213



Cylinrical bore



Tapered bore


Spherical Roller Bearings

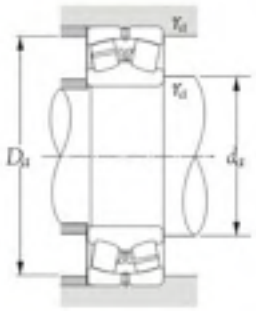
Boundary dimensions mm				Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Limiting speeds min^{-1}		Bearing numbers
d	D	B	$r_{s\,min}$	C_r	C_{or}	C_r	C_{or}	grease	oil	
20	52	15	1.1	41,000	33,000	4,182	3,366	9,700	15,000	21304 MB W33
20	52	15	1.1	41,000	33,000	4,182	3,366	9,700	15,000	21304 MB/K W33
25	62	17	1.1	53,000	43,500	5,406	4,437	8,400	13,000	21305 MB W33
25	62	17	1.1	53,000	43,500	5,406	4,437	8,400	13,000	21305 MB/K W33
30	72	19	1.1	72,000	63,000	7,344	6,426	7,300	11,000	21306 MB W33
30	72	19	1.1	72,000	63,000	7,344	6,426	7,300	11,000	21306 MB/K W33
35	80	21	1.5	83,000	74,000	8,466	7,548	6,800	9,500	21307 MB W33
35	80	21	1.5	83,000	74,000	8,466	7,548	6,800	9,500	21307 MB/K W33
40	90	23	1.5	88,000	90,000	8,950	9,150	4,900	6,400	21308 MB W33
40	90	23	1.5	88,000	90,000	8,950	9,150	4,900	6,400	21308 MB/K W33
45	100	25	1.5	102,000	106,000	10,400	10,800	4,400	5,700	21309 MB W33
45	100	25	1.5	102,000	106,000	10,400	10,800	4,400	5,700	21309 MB/K W33
50	110	27	2.0	118,000	127,000	12,000	12,900	4,000	5,200	21310 MB W33
50	110	27	2.0	118,000	127,000	12,000	12,900	4,000	5,200	21310 MB/K W33
55	120	29	2.0	145,000	163,000	14,800	16,600	3,700	4,800	21311 MB W33
55	120	29	2.0	145,000	163,000	14,800	16,600	3,700	4,800	21311 MB/K W33
60	130	31	2.1	167,000	191,000	17,100	19,500	3,400	4,400	21312 MB W33
60	130	31	2.1	167,000	191,000	17,100	19,500	3,400	4,400	21312 MB/K W33
65	140	33	2.1	194,000	228,000	19,800	23,200	3,100	4,000	21313 MB W33
65	140	33	2.1	194,000	228,000	19,800	23,200	3,100	4,000	21313 MB/K W33
70	150	35	2.1	220,000	262,000	22,400	26,800	2,900	3,800	21314 MB W33
70	150	35	2.1	220,000	262,000	22,400	26,800	2,900	3,800	21314 MB/K W33

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	MB		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

Spherical Roller Bearings
series 213



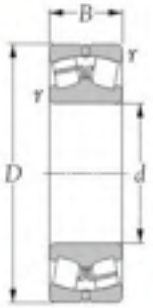
Equivalent radial load
dynamic
$Pr = XFr + YFa$

$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	Y_1	0.67	Y_2

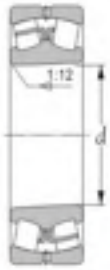
Static
$Pr = Fr + Y_0 Fa$
For values of e, Y_2 and Y_0 see the tabla below.

Abutments and fillet dimensions mm			Constant	Axial load factors			Mass (approx.) kg(s).	
d_a min	D_a max	r_{as} max	e	Y_1	Y_2	Y_0	cylindrical bore	tapered bore
27.0	45.0	1.0	0.30	2.25	3.34	2.20	0.160	-
27.0	45.0	1.0	0.30	2.25	3.34	2.20	-	0.155
32.0	55.0	1.0	0.28	2.43	3.61	2.37	0.254	-
32.0	55.0	1.0	0.28	2.43	3.61	2.37	-	0.247
37.0	65.0	1.0	0.27	2.49	3.71	2.43	0.386	-
37.0	65.0	1.0	0.27	2.49	3.71	2.43	-	0.375
44.0	71.0	1.5	0.26	2.55	3.80	2.50	0.503	-
44.0	71.0	1.5	0.26	2.55	3.80	2.50	-	0.488
48.5	81.5	1.5	0.26	2.55	3.80	2.50	0.705	-
48.5	81.5	1.5	0.26	2.55	3.80	2.50	-	0.694
53.5	91.5	1.5	0.26	2.60	3.87	2.54	0.927	-
53.5	91.5	1.5	0.26	2.60	3.87	2.54	-	0.912
60.0	100.0	2.0	0.26	2.64	3.93	2.58	1.210	-
60.0	100.0	2.0	0.26	2.64	3.93	2.58	-	1.190
65.0	110.0	2.0	0.25	2.69	4.01	2.63	1.710	-
65.0	110.0	2.0	0.25	2.69	4.01	2.63	-	1.690
72.0	118.0	2.0	0.25	2.69	4.00	2.63	2.100	-
72.0	118.0	2.0	0.25	2.69	4.00	2.63	-	2.070
77.0	128.0	2.0	0.25	2.69	4.00	2.63	2.550	-
77.0	128.0	2.0	0.25	2.69	4.00	2.63	-	2.510
82.0	138.0	2.0	0.25	2.69	4.00	2.63	3.180	-
82.0	138.0	2.0	0.25	2.69	4.00	2.63	-	3.140

Spherical Roller Bearings
series 213



Cylinrical bore



Tapered bore


Spherical Roller Bearings

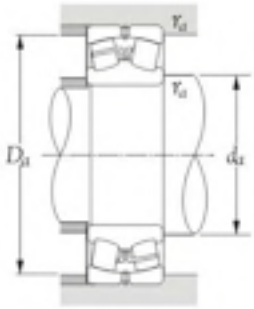
Boundary dimensions mm				Basic load ratings dynamic N	static	dynamic kgf	static	Limiting speeds min^{-1}		Bearing numbers
d	D	B	$r_{s\,min}$	C_r	C_{or}	C_r	C_{or}	grease	oil	
75	160	37	2.1	239,000	287,000	24,300	29,300	2,700	3,500	21315 MB W33
75	160	37	2.1	239,000	287,000	24,300	29,300	2,700	3,500	21315 MB/K W33
80	170	39	2.1	260,000	315,000	26,500	32,000	2,500	3,300	21316 MB W33
80	170	39	2.1	260,000	315,000	26,500	32,000	2,500	3,300	21316 MB/K W33
85	180	41	3.0	289,000	355,000	29,500	36,000	2,400	3,100	21317 MB W33
85	180	41	3.0	289,000	355,000	29,500	36,000	2,400	3,100	21317 MB/K W33
90	190	43	3.0	320,000	400,000	32,500	40,500	2,300	3,000	21318 MB W33
90	190	43	3.0	320,000	400,000	32,500	40,500	2,300	3,000	21318 MB/K W33
95	200	45	3.0	335,000	420,000	34,000	43,000	2,100	2,700	21319 MB W33
95	200	45	3.0	335,000	420,000	34,000	43,000	2,100	2,700	21319 MB/K W33
100	215	47	3.0	370,000	465,000	37,500	47,500	2,000	2,600	21320 MB W33
100	215	47	3.0	370,000	465,000	37,500	47,500	2,000	2,600	21320 MB/K W33
110	240	50	3.0	495,000	615,000	50,500	62,500	1,800	2,300	21322 MB W33
110	240	50	3.0	495,000	615,000	50,500	62,500	1,800	2,300	21322 MB/K W33

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	MB		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

Spherical Roller Bearings
series 213



Equivalent radial load
dynamic

$P_r = XF_r + YF_a$

$\frac{F_a}{F_r} \le e$		$\frac{F_a}{F_r} > e$	
X	Y	X	Y
1	Y_1	0.67	Y_2

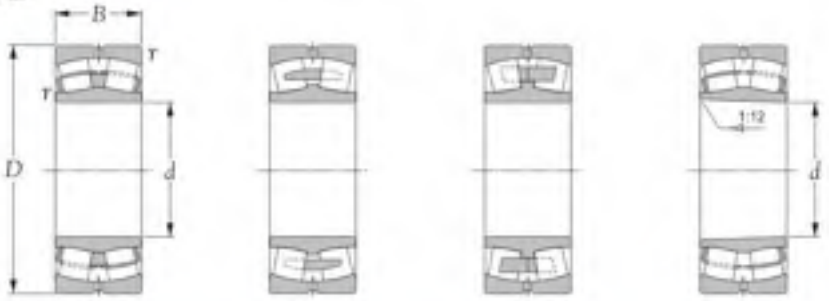
Static

$P_r = F_r + Y_o F_a$

For values of e, Y_2 and Y_o see the table below.

Abutments and fillet dimensions mm			Constant	Axial load factors			Mass (approx.) kgs.	
d_a min	D_a max	r_{as} max	e	Y_1	Y_2	Y_o	cylindrical bore	tapered bore
87	148	2.0	0.24	2.84	4.23	2.78	3.81	-
87	148	2.0	0.24	2.84	4.23	2.78	-	3.76
92	158	2.0	0.23	2.95	4.39	2.88	4.53	-
92	158	2.0	0.23	2.95	4.39	2.88	-	4.47
99	166	2.5	0.25	2.69	4.00	2.63	5.35	-
99	166	2.5	0.25	2.69	4.00	2.63	-	5.28
104	176	2.5	0.24	2.83	4.22	2.77	6.30	-
104	176	2.5	0.24	2.83	4.22	2.77	-	6.21
109	186	2.5	0.23	3.00	4.46	2.93	7.10	-
109	186	2.5	0.23	3.00	4.46	2.93	-	7.00
114	201	2.5	0.22	3.01	4.48	2.94	8.89	-
114	201	2.5	0.22	3.01	4.48	2.94	-	8.78
124	226	2.5	0.21	3.20	4.77	3.13	11.20	-
124	226	2.5	0.21	3.20	4.77	3.13	-	11.10

SPHERICAL ROLLER BEARINGS
SERIES 222



Cylindrical bore CC Type | Cylindrical bore CA Type | Cylindrical bore MB Type | Tapered bore Taper 1 : 12

SPHERICAL ROLLER BEARINGS

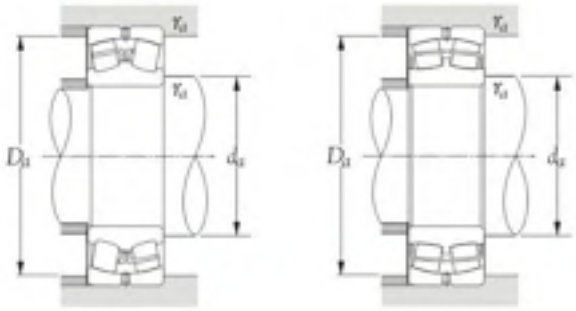
Boundary dimensions mm				Basic load ratings dynamic N		static		Limiting speeds min^{-1}		Bearing numbers
				dynamic kgf		static				
d	D	B	$r_{s\,min}$	C_r	C_{0r}	C_r	C_{0r}	grease	oil	
25	52	18	1.0	36,500	36,000	3,750	3,650	8,500	11,000	22205 MB W33
25	52	18	1.0	36,500	36,000	3,750	3,650	8,500	11,000	22205 MB/K W33
25	52	18	1.0	36,500	36,000	3,750	3,650	8,500	11,000	22205 CC W33
25	52	18	1.0	36,500	36,000	3,750	3,650	8,500	11,000	22205 CC/K W33
30	62	20	1.0	49,000	49,000	5,000	5,000	7,500	9,500	22206 MB W33
30	62	20	1.0	49,000	49,000	5,000	5,000	7,500	9,500	22206 MB/K W33
30	62	20	1.0	49,000	49,000	5,000	5,000	7,500	9,500	22206 CC W33
30	62	20	1.0	49,000	49,000	5,000	5,000	7,500	9,500	22206 CC/K W33
35	72	23	1.1	69,500	71,000	7,050	7,200	6,500	8,500	22207 MB W33
35	72	23	1.1	69,500	71,000	7,050	7,200	6,500	8,500	22207 MB/K W33
35	72	23	1.1	69,500	71,000	7,050	7,200	6,500	8,500	22207 CC W33
35	72	23	1.1	69,500	71,000	7,050	7,200	6,500	8,500	22207 CC/K W33
40	80	23	1.1	79,000	88,500	8,050	9,000	6,000	7,600	22208 MB W33
40	80	23	1.1	79,000	88,500	8,050	9,000	6,000	7,600	22208 MB/K W33
40	80	23	1.1	79,000	88,500	8,050	9,000	6,000	7,600	22208 CC W33
40	80	23	1.1	79,000	88,500	8,050	9,000	6,000	7,600	22208 CC/K W33
45	85	23	1.1	82,500	95,000	8,400	9,700	5,300	6,800	22209 MB W33
45	85	23	1.1	82,500	95,000	8,400	9,700	5,300	6,800	22209 MB/K W33
45	85	23	1.1	82,500	95,000	8,400	9,700	5,300	6,800	22209 CC W33
45	85	23	1.1	82,500	95,000	8,400	9,700	5,300	6,800	22209 CC/K W33
50	90	23	1.1	86,000	102,000	8,750	10,400	4,900	6,300	22210 MB W33
50	90	23	1.1	86,000	102,000	8,750	10,400	4,900	6,300	22210 MB/K W33

Remark:

Cages		Precision	Grease
Steel -	CC		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	MB		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

Spherical Roller Bearings
series 222



Equivalent radial load
dynamic
$Pr = XFr + YFa$

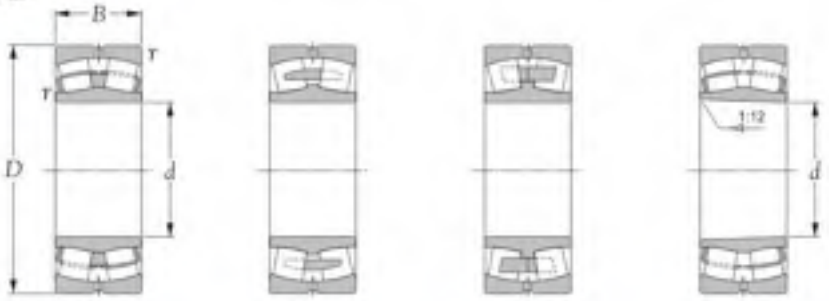
$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	Y_1	0.67	Y_2

Static
$Pr = Fr + Y_oFa$
For values of e, Y2 and Yo see the table below.

Spherical Roller Bearings

Abutments and fillet dimensions mm			Constant	Axial load factors			Mass (approx.) kg.	
da min	Da max	ras max	e	Y_1	Y_2	Y_o	cylindrical bore	tapered bore
31	46	1	0.35	1.92	2.86	1.88	0.186	-
31	46	1	0.35	1.92	2.86	1.88	-	0.182
31	46	1	0.35	1.92	2.86	1.88	0.186	-
31	46	1	0.35	1.92	2.86	1.88	-	0.182
36	56	1	0.33	2.07	3.09	2.03	0.287	-
36	56	1	0.33	2.07	3.09	2.03	-	0.282
36	56	1	0.33	2.07	3.09	2.03	0.287	-
36	56	1	0.33	2.07	3.09	2.03	-	0.282
42	65	1	0.32	2.09	3.11	2.04	0.446	-
42	65	1	0.32	2.09	3.11	2.04	-	0.437
42	65	1	0.32	2.09	3.11	2.04	0.446	-
42	65	1	0.32	2.09	3.11	2.04	-	0.437
47	73	1	0.29	2.35	3.50	2.30	0.526	-
47	73	1	0.29	2.35	3.50	2.30	-	0.515
47	73	1	0.29	2.35	3.50	2.30	0.526	-
47	73	1	0.29	2.35	3.50	2.30	-	0.515
52	78	1	0.27	2.50	3.72	2.44	0.584	-
52	78	1	0.27	2.50	3.72	2.44	-	0.572
52	78	1	0.27	2.50	3.72	2.44	0.584	-
52	78	1	0.27	2.50	3.72	2.44	-	0.572
57	83	1	0.25	2.69	4.01	2.63	0.630	-
57	83	1	0.25	2.69	4.01	2.63	-	0.616

Spherical Roller Bearings
series 222



Cylindrical bore CC Type | Cylindrical bore CA Type | Cylindrical bore MB Type | Tapered bore Taper 1 : 12

Spherical Roller Bearings

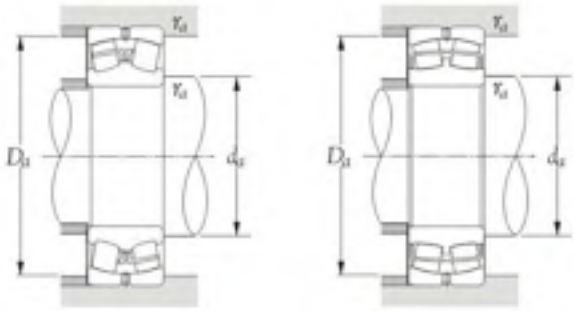
Boundary dimensions mm				Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Limiting speeds min⁻¹		Bearing numbers
d	D	B	$r_{s\,min}$	C_r	C_{or}	C_r	C_{or}	grease	oil	
50	90	23	1.1	86,000	102,000	8,750	10,400	4,900	6,300	22210 CC W33
50	90	23	1.1	86,000	102,000	8,750	10,400	4,900	6,300	22210 CC/K W33
55	100	25	1.5	93,500	110,000	9,500	11,200	4,500	5,800	22211 MB W33
55	100	25	1.5	93,500	110,000	9,500	11,200	4,500	5,800	22211 MB/K W33
55	100	25	1.5	93,500	110,000	9,500	11,200	4,500	5,800	22211 CC W33
55	100	25	1.5	93,500	110,000	9,500	11,200	4,500	5,800	22211 CC/K W33
60	110	28	1.5	115,000	147,000	11,700	15,000	4,100	5,300	22212 MB W33
60	110	28	1.5	115,000	147,000	11,700	15,000	4,100	5,300	22212 MB/K W33
60	110	28	1.5	115,000	147,000	11,700	15,000	4,100	5,300	22212 CC W33
60	110	28	1.5	115,000	147,000	11,700	15,000	4,100	5,300	22212 CC/K W33
65	120	31	1.5	143,000	179,000	14,600	18,300	3,900	5,000	22213 MB W33
65	120	31	1.5	143,000	179,000	14,600	18,300	3,900	5,000	22213 MB/K W33
65	120	31	1.5	143,000	179,000	14,600	18,300	3,900	5,000	22213 CC W33
65	120	31	1.5	143,000	179,000	14,600	18,300	3,900	5,000	22213 CC/K W33
70	125	31	1.5	154,000	201,000	15,700	20,500	3,500	4,600	22214 MB W33
70	125	31	1.5	154,000	201,000	15,700	20,500	3,500	4,600	22214 MB/K W33
70	125	31	1.5	154,000	201,000	15,700	20,500	3,500	4,600	22214 CC W33
70	125	31	1.5	154,000	201,000	15,700	20,500	3,500	4,600	22214 CC/K W33
75	130	31	1.5	166,000	223,000	16,900	22,800	3,200	4,200	22215 MB W33
75	130	31	1.5	166,000	223,000	16,900	22,800	3,200	4,200	22215 MB/K W33
75	130	31	1.5	166,000	223,000	16,900	22,800	3,200	4,200	22215 CC W33
75	130	31	1.5	166,000	223,000	16,900	22,800	3,200	4,200	22215 CC/K W33

Remark:

Cages		Precision	Grease
Steel -	CC		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	MB		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

Spherical Roller Bearings
series 222



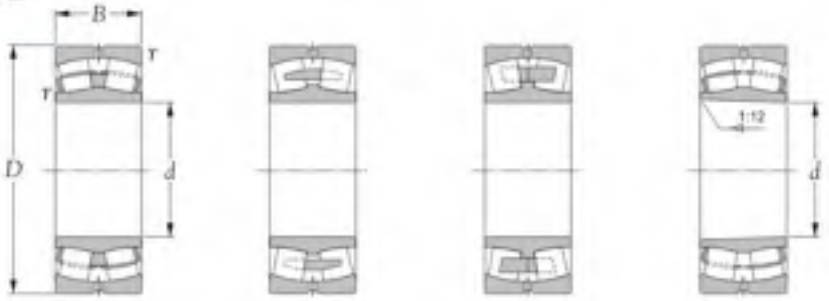
Equivalent radial load
dynamic
$Pr = XFr + YFa$

$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	Y_1	0.67	Y_2

Static
$Pr = Fr + Y_0Fa$
For values of e, Y_2 and Y_0 see the table below.

Abutments and fillet dimensions mm			Constant	Axial load factors			Mass (approx.) kg(s).	
da min	Da max	ras max	e	Y_1	Y_2	Y_0	cylindrical bore	tapered bore
57.0	83.0	1.0	0.25	2.69	4.01	2.63	0.63	-
57.0	83.0	1.0	0.25	2.69	4.01	2.63	-	0.616
63.5	91.5	1.5	0.28	2.42	3.61	2.37	0.85	-
63.5	91.5	1.5	0.28	2.42	3.61	2.37	-	0.832
63.5	91.5	1.5	0.28	2.42	3.61	2.37	0.85	-
63.5	91.5	1.5	0.28	2.42	3.61	2.37	-	0.832
68.5	101.5	1.5	0.27	2.49	3.71	2.44	1.15	-
68.5	101.5	1.5	0.27	2.49	3.71	2.44	-	1.130
68.5	101.5	1.5	0.27	2.49	3.71	2.44	1.15	-
68.5	101.5	1.5	0.27	2.49	3.71	2.44	-	1.130
73.5	111.5	1.5	0.28	2.42	3.60	2.37	1.50	-
73.5	111.5	1.5	0.28	2.42	3.60	2.37	-	1.470
73.5	111.5	1.5	0.28	2.42	3.60	2.37	1.50	-
73.5	111.5	1.5	0.28	2.42	3.60	2.37	-	1.470
78.5	116.5	1.5	0.26	2.55	3.80	2.50	1.55	-
78.5	116.5	1.5	0.26	2.55	3.80	2.50	-	1.520
78.5	116.5	1.5	0.26	2.55	3.80	2.50	1.55	-
78.5	116.5	1.5	0.26	2.55	3.80	2.50	-	1.520
83.5	121.5	1.5	0.24	2.81	4.19	2.75	1.65	-
83.5	121.5	1.5	0.24	2.81	4.19	2.75	-	1.610
83.5	121.5	1.5	0.24	2.81	4.19	2.75	1.65	-
83.5	121.5	1.5	0.24	2.81	4.19	2.75	-	1.610

Spherical Roller Bearings
series 222



Cylindrical bore CC Type | Cylindrical bore CA Type | Cylindrical bore MB Type | Tapered bore Taper 1 : 12

Spherical Roller Bearings

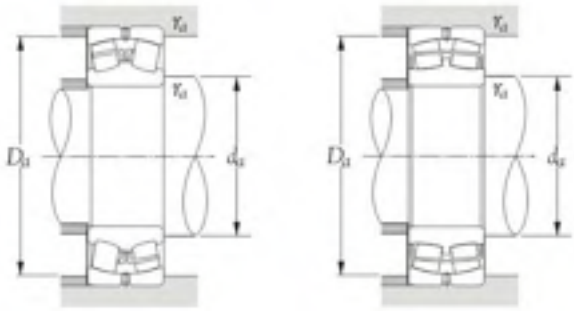
Boundary dimensions mm				Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Limiting speeds min⁻¹		Bearing numbers
d	D	B	$r_{s\,min}$	C_r	C_{or}	C_r	C_{or}	grease	oil	
80	140	33	2.0	179,000	239,000	18,300	24,400	3,100	4,000	**22216 MB W33**
80	140	33	2.0	179,000	239,000	18,300	24,400	3,100	4,000	**22216 MB/K W33**
80	140	33	2.0	179,000	239,000	18,300	24,400	3,100	4,000	**22216 CC W33**
80	140	33	2.0	179,000	239,000	18,300	24,400	3,100	4,000	**22216 CC/K W33**
85	150	36	2.0	206,000	272,000	21,000	27,800	2,900	3,800	**22217 MB W33**
85	150	36	2.0	206,000	272,000	21,000	27,800	2,900	3,800	**22217 MB/K W33**
85	150	36	2.0	206,000	272,000	21,000	27,800	2,900	3,800	**22217 CC W33**
85	150	36	2.0	206,000	272,000	21,000	27,800	2,900	3,800	**22217 CC/K W33**
90	160	40	2.0	256,000	345,000	26,200	35,000	2,700	3,500	**22218 MB W33**
90	160	40	2.0	256,000	345,000	26,200	35,000	2,700	3,500	**22218 MB/K W33**
90	160	40	2.0	256,000	345,000	26,200	35,000	2,700	3,500	**22218 CC W33**
90	160	40	2.0	256,000	345,000	26,200	35,000	2,700	3,500	**22218 CC/K W33**
95	170	43	2.1	294,000	390,000	30,000	39,500	2,500	3,300	**22219 MB W33**
95	170	43	2.1	294,000	390,000	30,000	39,500	2,500	3,300	**22219 MB/K W33**
100	180	46	2.1	315,000	415,000	32,000	42,500	2,400	3,200	**22220 MB W33**
100	180	46	2.1	315,000	415,000	32,000	42,500	2,400	3,200	**22220 MB/K W33**
110	200	53	2.1	410,000	570,000	42,000	58,000	2,200	2,800	**22222 MB W33**
110	200	53	2.1	410,000	570,000	42,000	58,000	2,200	2,800	**22222 MB/K W33**
120	215	58	2.1	485,000	700,000	49,500	71,500	2,000	2,600	**22224 MB W33**
120	215	58	2.1	485,000	700,000	49,500	71,500	2,000	2,600	**22224 MB/K W33**
130	230	64	3.0	570,000	790,000	58,000	80,500	1,800	2,400	**22226 MB W33**
130	230	64	3.0	570,000	790,000	58,000	80,500	1,800	2,400	**22226 MB/K W33**

Remark:

Cages		Precision	Grease
Steel -	CC		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	MB		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

Spherical Roller Bearings
series 222



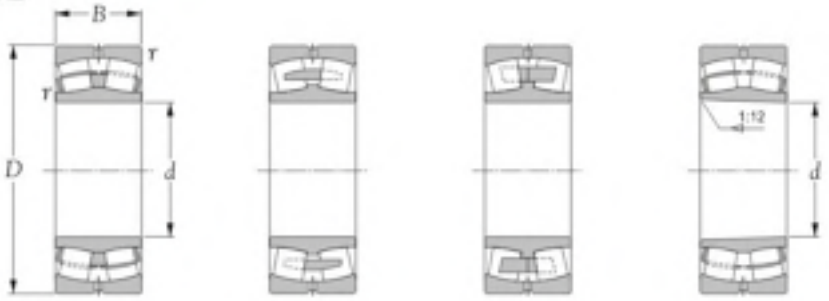
Equivalent radial load
dynamic
$Pr = XFr + YFa$

$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	Y_1	0.67	Y_2

Static
$Pr = Fr + Y_0Fa$
For values of e, Y_2 and Y_0 see the table below.

Abutments and fillet dimensions mm			Constant	Axial load factors			Mass (approx.) kgs.	
d_a min	D_a max	r_{as} max	e	Y_1	Y_2	Y_0	cylindrical bore	tapered bore
90	130	2.0	0.26	2.64	3.93	2.58	2.15	-
90	130	2.0	0.26	2.64	3.93	2.58	-	2.11
90	130	2.0	0.26	2.64	3.93	2.58	2.15	-
90	130	2.0	0.26	2.64	3.93	2.58	-	2.11
95	140	2.0	0.26	2.60	3.88	2.55	2.66	-
95	140	2.0	0.26	2.60	3.88	2.55	-	2.61
95	140	2.0	0.26	2.60	3.88	2.55	2.66	-
95	140	2.0	0.26	2.60	3.88	2.55	-	2.61
100	150	2.0	0.26	2.55	3.80	2.49	3.50	-
100	150	2.0	0.26	2.55	3.80	2.49	-	3.42
100	150	2.0	0.26	2.55	3.80	2.49	3.50	-
100	150	2.0	0.26	2.55	3.80	2.49	-	3.42
107	158	2.0	0.26	2.63	3.92	2.57	4.20	-
107	158	2.0	0.26	2.63	3.92	2.57	-	2.80
112	168	2.0	0.26	2.55	3.80	2.49	4.95	-
112	168	2.0	0.26	2.55	3.80	2.49	-	4.84
122	188	2.0	0.27	2.51	3.74	2.46	7.20	-
122	188	2.0	0.27	2.51	3.74	2.46	-	7.04
132	203	2.0	0.27	2.47	3.68	2.42	9.10	-
132	203	2.0	0.27	2.47	3.68	2.42	-	8.89
144	216	2.5	0.28	2.39	3.56	2.33	11.20	-
144	216	2.5	0.28	2.39	3.56	2.33	-	10.90

Spherical Roller Bearings
series 222



Cylindrical bore
CC Type

Cylindrical bore
CA Type

Cylindrical bore
MB Type

Tapered bore
Taper 1 : 12

Spherical Roller Bearings

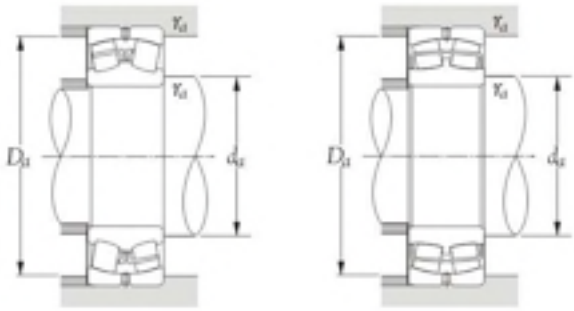
Boundary dimensions mm				Basic load ratings dynamic N	static	dynamic kgf	static	Limiting speeds min^{-1}		Bearing numbers
d	D	B	$r_{s\,min}$	C_r	C_{or}	C_r	C_{or}	grease	oil	
140	250	68	3.0	685,000	975,000	70,000	99,500	1,700	2,200	**22228 MB W33**
140	250	68	3.0	685,000	975,000	70,000	99,500	1,700	2,200	**22228 MB/K W33**
150	270	73	3.0	775,000	1,160,000	79,000	119,000	1,600	2,000	**22230 MB W33**
150	270	73	3.0	775,000	1,160,000	79,000	119,000	1,600	2,000	**22230 MB/K W33**

Remark:

Cages		Precision	Grease
Steel -	CC		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	MB		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

Spherical Roller Bearings
series 222



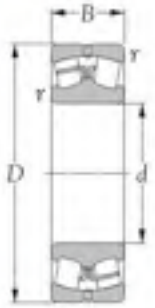
Equivalent radial load
dynamic
$Pr = XFr + YFa$

$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	Y_1	0.67	Y_2

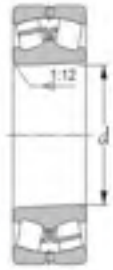
Static
$Pr = Fr + Y_0Fa$
For values of e, Y_2 and Y_0 see the table below.

Abutments and fillet dimensions mm			Constant	Axial load factors			Mass (approx.) kgs.	
da min	Da max	r_{as} max	e	Y_1	Y_2	Y_0	cylindrical bore	tapered bore
154	236	2.5	0.28	2.39	3.55	2.33	14.00	-
154	236	2.5	0.28	2.39	3.55	2.33	-	2.11
164	256	2.5	0.27	2.46	3.66	2.40	18.10	-
164	256	2.5	0.27	2.46	3.66	2.40	-	2.11

Spherical Roller Bearings
series 223



Cylinrical bore



Tapered bore


Spherical Roller Bearings

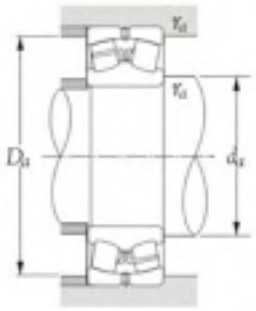
Boundary dimensions mm				Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Limiting speeds min^{-1}		Bearing numbers
d	D	B	$r_{s\,min}$	C_r	C_{or}	C_r	C_{or}	grease	oil	
40	90	33	1.5	121,000	128,000	12,300	13,000	4,500	5,900	**22308 MB W33**
40	90	33	1.5	121,000	128,000	12,300	13,000	4,500	5,900	**22308 MB/K W33**
45	100	36	1.5	148,000	167,000	15,100	17,000	4,100	5,300	**22309 MB W33**
45	100	36	1.5	148,000	167,000	15,100	17,000	4,100	5,300	**22309 MB/K W33**
50	110	40	2.0	186,000	212,000	19,000	21,600	3,700	4,800	**22310 MB W33**
50	110	40	2.0	186,000	212,000	19,000	21,600	3,700	4,800	**22310 MB/K W33**
55	120	43	2.0	204,000	234,000	20,800	23,900	3,400	4,400	**22311 MB W33**
55	120	43	2.0	204,000	234,000	20,800	23,900	3,400	4,400	**22311 MB/K W33**
60	130	46	2.1	238,000	273,000	24,300	27,800	3,100	4,000	**22312 MB W33**
60	130	46	2.1	238,000	273,000	24,300	27,800	3,100	4,000	**22312 MB/K W33**
65	140	48	2.1	265,000	320,000	27,100	32,500	2,800	3,700	**22313 MB W33**
65	140	48	2.1	265,000	320,000	27,100	32,500	2,800	3,700	**22313 MB/K W33**
70	150	51	2.1	325,000	380,000	33,000	39,000	2,700	3,500	**22314 MB W33**
70	150	51	2.1	325,000	380,000	33,000	39,000	2,700	3,500	**22314 MB/K W33**
75	160	55	2.1	330,000	410,000	33,500	42,000	2,500	3,200	**22315 MB W33**
75	160	55	2.1	330,000	410,000	33,500	42,000	2,500	3,200	**22315 MB/K W33**
80	170	58	2.1	385,000	470,000	39,500	48,000	2,300	3,000	**22316 MB W33**
80	170	58	2.1	385,000	470,000	39,500	48,000	2,300	3,000	**22316 MB/K W33**
85	180	60	3.0	415,000	510,000	42,500	52,000	2,200	2,900	**22317 MB W33**
85	180	60	3.0	415,000	510,000	42,500	52,000	2,200	2,900	**22317 MB/K W33**
90	190	64	3.0	480,000	590,000	49,000	60,000	2,100	2,700	**22318 MB W33**
90	190	64	3.0	480,000	590,000	49,000	60,000	2,100	2,700	**22318 MB/K W33**

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	MB		

Remark: If you have more inquiry of technical, please inquire NIKO website: Http://www.nipponkoshobearings.com

SPHERICAL ROLLER BEARINGS
SERIES 223



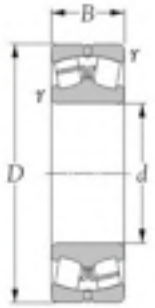
Equivalent radial load
dynamic
$Pr = XFr + YFa$

$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	Y_1	0.67	Y_2

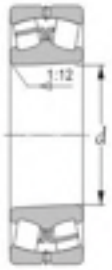
Static
$Pr = Fr + Y_0 Fa$
For values of e, Y_2 and Y_0 see the tabla below.

Abutments and fillet dimensions mm			Constant	Axial load factors			Mass (approx.) kg(s).	
d_a min	D_a max	r_{as} max	e	Y_1	Y_2	Y_0	cylindrical bore	tapered bore
48.5	81.5	1.5	0.38	1.76	2.62	1.72	0.97	-
48.5	81.5	1.5	0.38	1.76	2.62	1.72	-	0.95
53.5	91.5	1.5	0.36	1.86	2.77	1.82	1.33	-
53.5	91.5	1.5	0.36	1.86	2.77	1.82	-	1.30
60.0	100.0	2.0	0.37	1.80	2.69	1.76	1.79	-
60.0	100.0	2.0	0.37	1.80	2.69	1.76	-	1.75
65.0	110.0	2.0	0.40	1.68	2.50	1.64	2.30	-
65.0	110.0	2.0	0.40	1.68	2.50	1.64	-	2.25
72.0	118.0	2.0	0.42	1.62	2.42	1.59	2.90	-
72.0	118.0	2.0	0.42	1.62	2.42	1.59	-	2.83
77.0	128.0	2.0	0.38	1.79	2.67	1.75	3.45	-
77.0	128.0	2.0	0.38	1.79	2.67	1.75	-	3.37
82.0	138.0	2.0	0.37	1.81	2.70	1.77	4.22	-
82.0	138.0	2.0	0.37	1.81	2.70	1.77	-	4.12
87.0	148.0	2.0	0.37	1.80	2.69	1.76	5.25	-
87.0	148.0	2.0	0.37	1.80	2.69	1.76	-	5.13
92.0	158.0	2.0	0.37	1.80	2.69	1.76	6.05	-
92.0	158.0	2.0	0.37	1.80	2.69	1.76	-	5.91
99.0	166.0	2.5	0.37	1.82	2.71	1.78	7.10	-
99.0	166.0	2.5	0.37	1.82	2.71	1.78	-	6.94
104.0	176.0	2.5	0.37	1.80	2.69	1.76	8.35	-
104.0	176.0	2.5	0.37	1.80	2.69	1.76	-	8.16

Spherical Roller Bearings
series 223



Cylinrical bore



Tapered bore

Spherical Roller Bearings

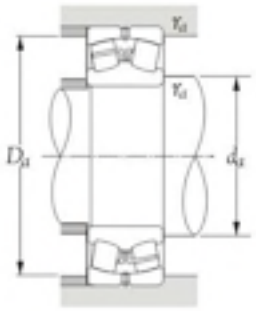
Boundary dimensions mm				Basic load ratings dynamic N	static	dynamic kgf	static	Limiting speeds min^{-1}		Bearing numbers
d	D	B	r_s min*	C_r	C_{or}	C_r	C_{or}	grease	oil	
95	200	67	3	500,000	615,000	51,000	63,000	1,900	2,500	**22319 MB W33**
95	200	67	3	500,000	615,000	51,000	63,000	1,900	2,500	**22319 MB/K W33**
100	215	73	3	605,000	755,000	61,500	77,000	1,800	2,400	**22320 MB W33**
100	215	73	3	605,000	755,000	61,500	77,000	1,800	2,400	**22320 MB/K W33**
110	240	80	3	745,000	930,000	76,000	95,000	1,700	2,200	**22322 MB W33**
110	240	80	3	745,000	930,000	76,000	95,000	1,700	2,200	**22322 MB/K W33**
120	260	86	3	880,000	1,120,000	89,500	114,000	1,500	2,000	**22324 MB W33**
120	260	86	3	880,000	1,120,000	89,500	114,000	1,500	2,000	**22324 MB/K W33**

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	MB		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

Spherical Roller Bearings
series 223



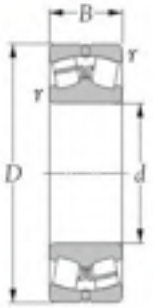
Equivalent radial load
dynamic
$Pr = XFr + YFa$

$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	Y_1	0.67	Y_2

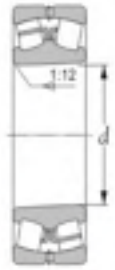
Static
$Pr = Fr + Y_0 Fa$
For values of e, Y_2 and Y_0 see the tabla below.

Abutments and fillet dimensions mm			Constant	Axial load factors			Mass (approx.) kgs.	
d_a min	D_a max	r_{as} max	e	Y_1	Y_2	Y_0	cylindrical bore	tapered bore
109	186	2.5	0.37	1.80	2.69	1.76	9.76	-
109	186	2.5	0.37	1.80	2.69	1.76	-	9.54
114	201	2.5	0.37	1.80	2.69	1.76	12.40	-
114	201	2.5	0.37	1.80	2.69	1.76	-	12.10
124	226	2.5	0.36	1.87	2.79	1.83	17.10	-
124	226	2.5	0.36	1.87	2.79	1.83	-	16.70
134	246	2.5	0.37	1.80	2.69	1.76	21.50	-
134	246	2.5	0.37	1.80	2.69	1.76	-	21.00

Spherical Roller Bearings
series 230



Cylinrical bore



Tapered bore


Spherical Roller Bearings

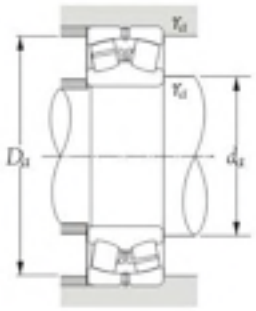
Boundary dimensions mm				Basic load ratings dynamic N	static	dynamic kgf	static	Limiting speeds min^{-1}		Bearing numbers
d	D	B	$r_{s\,min}$	C_r	C_{or}	C_r	C_{or}	grease	oil	
110	170	45	2.0	282,000	455,000	28,800	46,500	2,200	2,800	**23022 MB W33**
110	170	45	2.0	282,000	455,000	28,800	46,500	2,200	2,800	**23022 MB/K W33**
120	180	46	2.0	296,000	495,000	30,000	50,500	2,000	2,600	**23024 MB W33**
120	180	46	2.0	296,000	495,000	30,000	50,500	2,000	2,600	**23024 MB/K W33**
130	200	52	2.0	375,000	620,000	38,500	63,500	1,800	2,300	**23026 MB W33**
130	200	52	2.0	375,000	620,000	38,500	63,500	1,800	2,300	**23026 MB/K W33**
140	210	53	2.0	405,000	690,000	41,000	70,500	1,700	2,200	**23028 MB W33**
140	210	53	2.0	405,000	690,000	41,000	70,500	1,700	2,200	**23028 MB/K W33**
150	225	56	2.1	445,000	775,000	45,500	79,000	1,500	2,000	**23030 MB W33**
150	225	56	2.1	445,000	775,000	45,500	79,000	1,500	2,000	**23030 MB/K W33**
160	240	60	2.1	505,000	885,000	51,500	90,000	1,500	1,900	**23032 MB W33**
160	240	60	2.1	505,000	885,000	51,500	90,000	1,500	1,900	**23032 MB/K W33**

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	MB		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

Spherical Roller Bearings
series 230



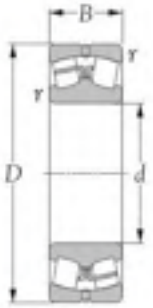
Equivalent radial load
dynamic
$Pr = XFr + YFa$

$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	Y_1	0.67	Y_2

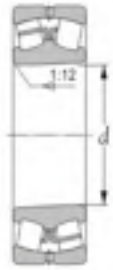
Static
$Pr = Fr + Y_0 Fa$
For values of e, Y_2 and Y_0 see the tabla below.

Abutments and fillet dimensions mm			Constant	Axial load factors			Mass (approx.) kgs.	
d_a min	D_a max	r_{as} max	e	Y_1	Y_2	Y_0	cylindrical bore	tapered bore
120	160	2	0.26	2.59	3.85	2.53	3.71	-
120	160	2	0.26	2.59	3.85	2.53	-	3.58
130	170	2	0.25	2.69	4.01	2.63	4.05	-
130	170	2	0.25	2.69	4.01	2.63	-	3.90
140	190	2	0.26	2.63	3.92	2.57	5.90	-
140	190	2	0.26	2.63	3.92	2.57	-	5.69
150	200	2	0.25	2.73	4.06	2.67	6.35	-
150	200	2	0.25	2.73	4.06	2.67	-	6.12
162	213	2	0.24	2.76	4.11	2.70	7.73	-
162	213	2	0.24	2.76	4.11	2.70	-	7.45
172	228	2	0.25	2.74	4.09	2.68	9.42	-
172	228	2	0.25	2.74	4.09	2.68	-	9.09

Spherical Roller Bearings
series 231



Cylinrical bore



Tapered bore


Spherical Roller Bearings

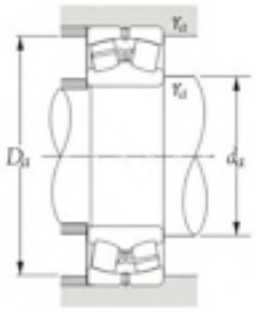
Boundary dimensions mm				Basic load ratings dynamic N	static	dynamic kgf	static	Limiting speeds min^{-1}		Bearing numbers
d	D	B	$r_{s\,min}$	C_r	C_{or}	C_r	C_{or}	grease	oil	
100	165	52	2.0	310,000	470,000	31,500	47,500	2,000	2,600	**23120 MB W33**
100	165	52	2.0	310,000	470,000	31,500	47,500	2,000	2,600	**23120 MB/K W33**
110	180	56	2.0	370,000	580,000	37,500	59,500	1,800	2,400	**23122 MB W33**
110	180	56	2.0	370,000	580,000	37,500	59,500	1,800	2,400	**23122 MB/K W33**
120	200	62	2.0	455,000	705,000	46,500	71,500	1,600	2,100	**23124 MB W33**
120	200	62	2.0	455,000	705,000	46,500	71,500	1,600	2,100	**23124 MB/K W33**
130	210	64	2.0	495,000	795,000	50,500	81,000	1,500	2,000	**23126 MB W33**
130	210	64	2.0	495,000	795,000	50,500	81,000	1,500	2,000	**23126 MB/K W33**
140	225	68	2.1	540,000	895,000	55,000	91,000	1,400	1,800	**23128 MB W33**
140	225	68	2.1	540,000	895,000	55,000	91,000	1,400	1,800	**23128 MB/K W33**
150	250	80	2.1	730,000	1,190,000	74,500	121,000	1,300	1,700	**23130 MB W33**
150	250	80	2.1	730,000	1,190,000	74,500	121,000	1,300	1,700	**23130 MB/K W33**
160	270	86	2.1	840,000	1,370,000	85,500	140,000	1,200	1,600	**23132 MB W33**
160	270	86	2.1	840,000	1,370,000	85,500	140,000	1,200	1,600	**23132 MB/K W33**

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	MR		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

Spherical Roller Bearings
series 231



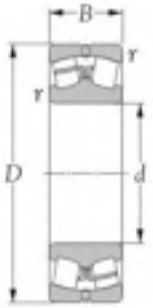
Equivalent radial load
dynamic
$Pr = XFr + YFa$

$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	Y_1	0.67	Y_2

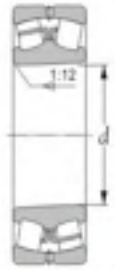
Static
$Pr = Fr + Y_0 Fa$
For values of e, Y_2 and Y_0 see the tabla below.

Abutments and fillet dimensions mm			Constant	Axial load factors			Mass (approx.) kgs.	
d_a min	D_a max	r_{as} max	e	Y_1	Y_2	Y_0	cylindrical bore	tapered bore
110	155	2	0.32	2.12	3.15	2.07	4.30	-
110	155	2	0.32	2.12	3.15	2.07	-	4.16
120	170	2	0.31	2.17	3.24	2.13	5.40	-
120	170	2	0.31	2.17	3.24	2.13	-	5.22
130	190	2	0.31	2.17	3.24	2.13	7.70	-
130	190	2	0.31	2.17	3.24	2.13	-	7.46
140	200	2	0.30	2.23	3.32	2.18	8.47	-
140	200	2	0.30	2.23	3.32	2.18	-	8.20
152	213	2	0.30	2.25	3.35	2.20	10.20	-
152	213	2	0.30	2.25	3.35	2.20	-	9.86
162	238	2	0.32	2.11	3.15	2.06	15.60	-
162	238	2	0.32	2.11	3.15	2.06	-	15.10
172	258	2	0.32	2.11	3.15	2.07	19.80	-
172	258	2	0.32	2.11	3.15	2.07	-	19.20

Spherical Roller Bearings
series 232



Cylinrical bore



Tapered bore


Spherical Roller Bearings

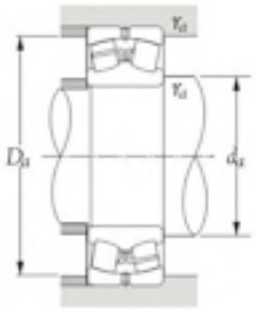
Boundary dimensions mm				Basic load ratings dynamic N	static	dynamic kgf	static	Limiting speeds min^{-1}		Bearing numbers
d	D	B	$r_{s\,min}$	C_r	C_{or}	C_r	C_{or}	grease	oil	
90	160	52.4	2.0	315,000	455,000	32,500	46,500	2,200	2,800	**23218 MB W33**
90	160	52.4	2.0	315,000	455,000	32,500	46,500	2,200	2,800	**23218 MB/K W33**
100	180	60.3	2.1	405,000	580,000	41,500	59,000	1,900	2,500	**23220 MB W33**
100	180	60.3	2.1	405,000	580,000	41,500	59,000	1,900	2,500	**23220 MB/K W33**
110	200	69.8	2.1	515,000	760,000	52,500	77,500	1,700	2,200	**23222 MB W33**
110	200	69.8	2.1	515,000	760,000	52,500	77,500	1,700	2,200	**23222 MB/K W33**
120	215	76.0	2.1	585,000	880,000	59,500	89,500	1,500	2,000	**23224 MB W33**
120	215	76.0	2.1	585,000	880,000	59,500	89,500	1,500	2,000	**23224 MB/K W33**
130	230	80.0	3.0	685,000	1060,000	70,000	108,000	1,500	1,900	**23226 MB W33**
130	230	80.0	3.0	685,000	1060,000	70,000	108,000	1,500	1,900	**23226 MB/K W33**
140	250	88.0	3.0	805,000	1270,000	82,000	129,000	1,300	1,700	**23228 MB W33**
140	250	88.0	3.0	805,000	1270,000	82,000	129,000	1,300	1,700	**23228 MB/K W33**

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	MB		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

Spherical Roller Bearings
series 232



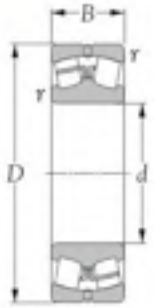
Equivalent radial load
dynamic
$Pr = XFr + YFa$

$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	Y_1	0.67	Y_2

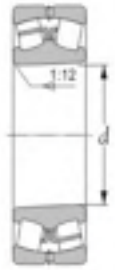
Static
$Pr = Fr + Y_0 Fa$
For values of e, $Y2$ and Y_0 see the tabla below.

Abutments and fillet dimensions mm			Constant	Axial load factors			Mass (approx.) kgs.	
d_a min	D_a max	r_{as} max	e	Y_1	Y_2	Y_0	cylindrical bore	tapered bore
100	150	2.0	0.33	2.04	3.03	1.99	4.45	-
100	150	2.0	0.33	2.04	3.03	1.99	-	4.32
112	168	2.0	0.34	1.98	2.94	1.93	6.47	-
112	168	2.0	0.34	1.98	2.94	1.93	-	6.28
122	188	2.0	0.35	1.91	2.84	1.86	9.71	-
122	188	2.0	0.35	1.91	2.84	1.86	-	9.43
132	203	2.0	0.36	1.89	2.82	1.85	12.10	-
132	203	2.0	0.36	1.89	2.82	1.85	-	11.70
144	216	2.5	0.35	1.92	2.86	1.88	14.30	-
144	216	2.5	0.35	1.92	2.86	1.88	-	13.90
154	236	2.5	0.36	1.90	2.83	1.86	18.80	-
154	236	2.5	0.36	1.90	2.83	1.86	-	18.20

Spherical Roller Bearings
series 240



Cylinrical bore



Tapered bore

Spherical Roller Bearings

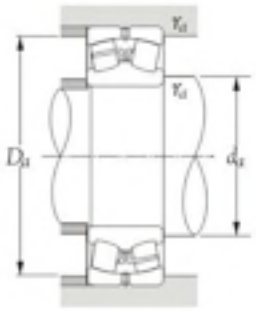
Boundary dimensions mm				Basic load ratings dynamic N	static	dynamic kgf	static	Limiting speeds min^{-1}		Bearing numbers
d	D	B	$r_{s\,min}$	C_r	C_{or}	C_r	C_{or}	grease	oil	
110	170	60	1.2	415,000	620,000	42,330	63,240	2,400	3,600	**24022 MB W33**
110	170	60	1.2	415,000	620,000	42,330	63,240	2,400	3,600	**24022 MB/K W33**
120	180	60	2.0	390,000	670,000	39,500	68,500	1,800	2,300	**24024 MB W33**
120	180	60	2.0	390,000	670,000	39,500	68,500	1,800	2,300	**24024 MB/K W33**
130	200	69	2.0	505,000	895,000	51,500	91,000	1,600	2,100	**24026 MB W33**
130	200	69	2.0	505,000	895,000	51,500	91,000	1,600	2,100	**24026 MB/K W33**
140	210	69	2.0	510,000	945,000	52,000	96,500	1,500	1,900	**24028 MB W33**
140	210	69	2.0	510,000	945,000	52,000	96,500	1,500	1,900	**24028 MB/K W33**
150	225	75	2.1	585,000	1,060,000	59,500	108,000	1,400	1,800	**24030 MB W33**
150	225	75	2.1	585,000	1,060,000	59,500	108,000	1,400	1,800	**24030 MB/K W33**
160	240	80	2.1	650,000	1,200,000	66,500	122,000	1,300	1,700	**24032 MB W33**
160	240	80	2.1	650,000	1,200,000	66,500	122,000	1,300	1,700	**24032 MB/K W33**

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	MB		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

Spherical Roller Bearings
series 240



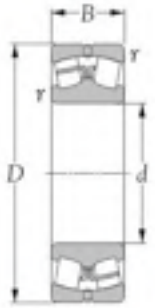
Equivalent radial load
dynamic
$Pr = XFr + YFa$

$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	Y_1	0.67	Y_2

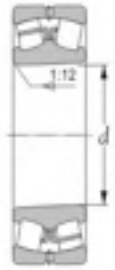
Static
$Pr = Fr + Y_0 Fa$
For values of e, Y_2 and Y_0 see the tabla below.

Abutments and fillet dimensions mm			Constant	Axial load factors			Mass (approx.) kgs.	
d_a min	D_a max	r_{as} max	e	Y_1	Y_2	Y_0	cylindrical bore	tapered bore
119	161	2	0.33	2.00	3.00	2.00	5.00	-
119	161	2	0.33	2.00	3.00	2.00	-	4.90
130	170	2	0.33	2.06	3.07	2.02	5.48	-
130	170	2	0.33	2.06	3.07	2.02	-	5.39
140	190	2	0.34	1.98	2.95	1.94	8.08	-
140	190	2	0.34	1.98	2.95	1.94	-	7.95
150	200	2	0.32	2.09	3.12	2.05	8.57	-
150	200	2	0.32	2.09	3.12	2.05	-	8.43
162	213	2	0.33	2.06	3.07	2.02	10.70	-
162	213	2	0.33	2.06	3.07	2.02	-	10.50
172	228	2	0.32	2.10	3.13	2.06	13.00	-
172	228	2	0.32	2.10	3.13	2.06	-	12.80

Spherical Roller Bearings
series 241



Cylinrical bore



Tapered bore

Spherical Roller Bearings

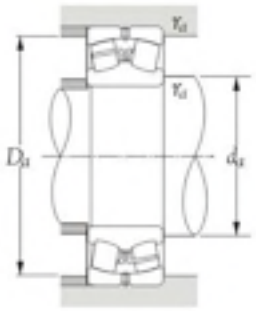
Boundary dimensions mm				Basic load ratings dynamic N	static	dynamic kgf	static	Limiting speeds min^{-1}		Bearing numbers
d	D	B	$r_{s\,min}$	C_r	C_{or}	C_r	C_{or}	grease	oil	
110	180	69	2.0	450,000	755,000	46,000	77,000	1,800	2,400	**24122 MB W33**
110	180	69	2.0	450,000	755,000	46,000	77,000	1,800	2,400	**24122 MB/K W33**
120	200	80	2.0	575,000	945,000	58,500	96,500	1,600	2,100	**24124 MB W33**
120	200	80	2.0	575,000	945,000	58,500	96,500	1,600	2,100	**24124 MB/K W33**
130	210	80	2.0	585,000	995,000	60,000	102,000	1,500	2,000	**24126 MB W33**
130	210	80	2.0	585,000	995,000	60,000	102,000	1,500	2,000	**24126 MB/K W33**
140	225	85	2.1	670,000	1,150,000	68,500	117,000	1,400	1,800	**24128 MB W33**
140	225	85	2.1	670,000	1,150,000	68,500	117,000	1,400	1,800	**24128 MB/K W33**
150	250	100	2.1	885,000	1,520,000	90,500	155,000	1,300	1,700	**24130 MB W33**
150	250	100	2.1	885,000	1,520,000	90,500	155,000	1,300	1,700	**24130 MB/K W33**
160	270	109	2.1	1,040,000	1,780,000	106,000	181,000	1,200	1,600	**24132 MB W33**
160	270	109	2.1	1,040,000	1,780,000	106,000	181,000	1,200	1,600	**24132 MB/K W33**

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	MB		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

Spherical Roller Bearings
series 241



Equivalent radial load
dynamic
$Pr = XFr + YFa$

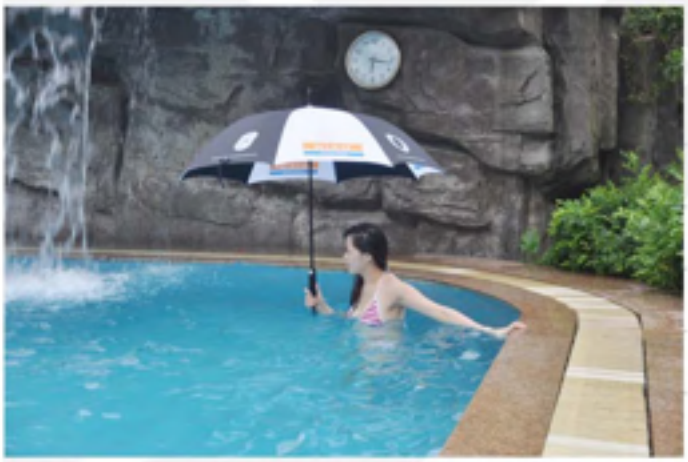
$\frac{Fa}{Fr} \leq e$		$\frac{Fa}{Fr} > e$	
X	Y	X	Y
1	Y_1	0.67	Y_2

Static
$Pr = Fr + Y_0 Fa$
For values of e, Y_2 and Y_0 see the tabla below.

Abutments and fillet dimensions mm			Constant	Axial load factors			Mass (approx.) kgs.	
d_a min	D_a max	r_{as} max	e	Y_1	Y_2	Y_0	cylindrical bore	tapered bore
120	170	2	0.38	1.76	2.63	1.73	7.07	-
120	170	2	0.38	1.76	2.63	1.73	-	6.96
130	190	2	0.40	1.68	2.50	1.64	10.30	-
130	190	2	0.40	1.68	2.50	1.64	-	10.10
140	200	2	0.38	1.78	2.65	1.74	11.00	-
140	200	2	0.38	1.78	2.65	1.74	-	10.80
152	213	2	0.38	1.80	2.68	1.76	13.30	-
152	213	2	0.38	1.80	2.68	1.76	-	13.10
162	238	2	0.40	1.69	2.51	1.65	20.20	-
162	238	2	0.40	1.69	2.51	1.65	-	20.00
172	258	2	0.40	1.67	2.48	1.63	26.00	-
172	258	2	0.40	1.67	2.48	1.63	-	25.60

SPHERICAL ROLLER
BEARINGS

NOTE



NIKO

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Needle Roller Bearings

Needle Roller Bearings

Souvenirs

NEEDLE ROLLER
BEARINGS

NIKO

NIPPON KODO

Needle Roller & Cage Assemblies

Needle Roller Bearings

Souvenirs

1. Types and designs

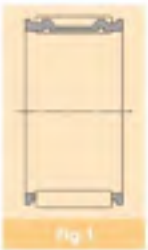


Fig. 1

NIKO Needle Roller and Cage Assemblies are supplied in single row (Fig. 1). The single row cages are available in two configurations: machined ring (series K), and molded polyamide reinforced with glass or carbon fiber (series K- -T2). The T2 cage features a maximum allowable operating temperature of 120°C and maximum allowable continuous operating temperature of 100°C .

2. Bearing numbers

As summarized in Fig. 2, the bearing numbers of NIKO Needle Roller and Cage Assemblies comprise a series number, a dimension code (inscribed enveloping circle diameter × roller set outside diameter × cage width), and a suffix.

Fig. 2

3. Radial clearance

When the shaft and housing are used as the raceway, the radial clearance of the ball and cage assembly is governed by the shaft diameter and housing bore dimension. Usually, if the tolerance range of the needle rollers is one of the standard groups, the shaft diameter and housing bore diameter in Table 1 are used.

NEEDLE ROLLER BEARINGS

Table 1 Recommended fits

Shaft dia. mm		~80	80~140	140~
Radial clearance	Smaller than normal clearance	j5/G6	h5/G6	h5/G6
	Normal clearance	h5/G6	g5/G6	f5/H6
	Greater than normal clearance	g6/G6	f6/G6	f6/G6

4. Shaft and housing requirements

When used as a raceway, a shaft and housing must satisfy the requirements indicated in Table 2.

Table 2 Shaft and housing requirements

Characteristics	Shaft	Housing
Circularity (max.)	IT3	IT4
Cylindricity (max.)	IT3	IT4
Surface roughness (max.)	0.4a	0.4a
Surface roughness (max.)	HRC58~64	

5. Mounting dimensions for bearings

Table 3 gives the recommended tolerance for the cage guide width b dimension relative to the nominal dimension " Bc ".

Table 3 Tolerance for guide width

Series classification	Tolerance for b
Metric	Bc $^{+0.2}_{+0.1}$

CAGE AND ROLLER TYPE NEEDLE ROLLER BEARINGS
SERIES K

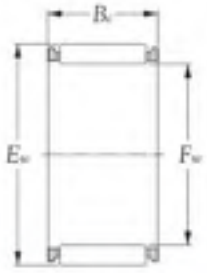
Boundary dimensions mm			Basic load ratings dynamic N	static	dynamic kgf	static	Limiting speeds rpm		Bearing numbers	kg.
F_w	E_w	B_c	C_r	C_{or}	C_r	C_{or}	grease	oil		(Approx.)
3	6	7 $^{-0.2}_{-0.35}$	1,460	970	149	99	33,000	50,000	**K 3X6X7**	0.0004
4	7	7 $^{-0.2}_{-0.35}$	1,770	1,270	180	129	30,000	45,000	**K 4X7X7**	0.0005
5	8	8 $^{-0.2}_{-0.35}$	2,640	2,190	269	224	27,000	40,000	**K 5X8X8**	0.0007
5	8	10 $^{-0.2}_{-0.35}$	2,720	2,250	277	230	27,000	40,000	**K 5X8X10**	0.0009
6	9	8 $^{-0.2}_{-0.35}$	2,660	2,280	272	233	25,000	37,000	**K 6X9X8**	0.0009
6	9	10 $^{-0.2}_{-0.35}$	3,400	3,150	345	320	25,000	37,000	**K 6X9X10**	0.0011
6	10	13 $^{-0.2}_{-0.35}$	4,400	3,700	450	380	25,000	37,000	**K 6X10X13**	0.0019
7	10	8 $^{-0.2}_{-0.35}$	2,670	2,350	272	239	23,000	34,000	**K 7X10X8**	0.0009
7	10	10 $^{-0.2}_{-0.35}$	3,400	3,200	345	330	23,000	34,000	**K 7X10X10**	0.0011
8	11	8 $^{-0.2}_{-0.35}$	3,150	3,000	320	305	21,000	32,000	**K 8X11X8**	0.0011
8	11	10 $^{-0.2}_{-0.35}$	4,000	4,100	410	420	21,000	32,000	**K 8X11X10**	0.0013
8	11	13 $^{-0.2}_{-0.35}$	4,850	5,200	495	535	21,000	32,000	**K 8X11X13**	0.0026
8	12	10 $^{-0.2}_{-0.35}$	4,650	4,150	475	425	21,000	32,000	**K 8X12X10**	0.0020
8	12	12 $^{-0.2}_{-0.35}$	5,600	5,300	570	540	21,000	32,000	**K 8X12X12**	0.0034
8	12	13 $^{-0.2}_{-0.35}$	5,600	5,300	570	540	21,000	32,000	**K 8X12X13**	0.0036
9	12	10 $^{-0.2}_{-0.35}$	4,550	5,000	465	510	20,000	30,000	**K 9X12X10**	0.0015
9	12	13 $^{-0.2}_{-0.35}$	5,500	6,400	560	650	20,000	30,000	**K 9X12X13**	0.0021
10	13	10 $^{-0.2}_{-0.35}$	4,550	5,100	460	520	19,000	28,000	**K 10X13X10**	0.0016
10	13	13 $^{-0.2}_{-0.35}$	5,450	6,450	555	660	19,000	28,000	**K 10X13X13**	0.0031
10	14	8 $^{-0.2}_{-0.35}$	4,300	3,950	435	405	19,000	28,000	**K 10X14X8**	0.0027
10	14	10 $^{-0.2}_{-0.35}$	5,500	5,450	560	555	19,000	28,000	**K 10X14X10**	0.0034

Remark:

Cages		Precision	Grease
Steel -	√		
Polyoxid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

CAGE AND ROLLER TYPE NEEDLE ROLLER BEARINGS
SERIES K



NEEDLE ROLLER BEARINGS

mm			Basic load ratings dynamic N		Basic load ratings static N		Limiting speeds rpm		Bearing numbers	Mass kg.
Fw	Ew	Bc	Cr	Cor	Cr	Cor	grease	oil		(Approx.)
10	14	13 $^{0}_{-0.05}$	6,600	6,900	675	705	19,000	28,000	K 10X14X13	0.0044
10	16	12 $^{0}_{-0.05}$	7,100	5,950	720	610	19,000	28,000	K 10X16X12	0.0066
11	14	10 $^{0}_{-0.05}$	5,050	6,000	515	615	18,000	27,000	K 11X14X10	0.0028
12	15	9 $^{0}_{-0.05}$	4,450	5,250	455	535	17,000	26,000	K 12X15X9	0.0027
12	15	13 $^{0}_{-0.05}$	6,000	7,700	615	785	17,000	26,000	K 12X15X13	0.0038
12	16	8 $^{0}_{-0.05}$	4,850	4,900	495	500	17,000	26,000	K 12X16X8	0.0034
12	16	13 $^{0}_{-0.05}$	7,500	8,500	765	870	17,000	26,000	K 12X16X13	0.0055
12	17	13 $^{0}_{-0.05}$	9,000	9,400	920	960	17,000	26,000	K 12X17X13	0.0075
12	18	12 $^{0}_{-0.05}$	8,650	8,000	880	815	17,000	26,000	K 12X18X12	0.0084
14	17	10 $^{0}_{-0.05}$	5,400	7,050	550	720	16,000	24,000	K 14X17X10	0.0033
14	18	10 $^{0}_{-0.05}$	6,900	8,000	705	815	16,000	24,000	K 14X18X10	0.0046
14	18	11 $^{0}_{-0.05}$	7,600	9,050	775	925	16,000	24,000	K 14X18X11	0.0053
14	18	13 $^{0}_{-0.05}$	8,300	10,100	845	1,030	16,000	24,000	K 14X18X13	0.0063
14	18	17 $^{0}_{-0.05}$	10,900	14,400	1,120	1,470	16,000	24,000	K 14X18X17	0.0081
14	19	13 $^{0}_{-0.05}$	8,950	9,650	915	985	16,000	24,000	K 14X19X13	0.0080
14	20	12 $^{0}_{-0.05}$	9,350	9,150	955	930	16,000	24,000	K 14X20X12	0.0095
14	20	17 $^{0}_{-0.05}$	13,500	14,600	1,370	1,490	16,000	24,000	K 14X20X17	0.0140
15	18	14 $^{0}_{-0.05}$	7,850	11,600	800	1,190	15,000	23,000	K 15X18X14	0.0060
15	19	17 $^{0}_{-0.05}$	10,900	14,600	1,110	1,490	15,000	23,000	K 15X19X17	0.0090
15	20	13 $^{0}_{-0.05}$	10,100	11,500	1,030	1,170	15,000	23,000	K 15X20X13	0.0088
15	21	15 $^{0}_{-0.05}$	11,900	12,500	1,210	1,280	15,000	23,000	K 15X21X15	0.0130

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

CAGE AND ROLLER TYPE NEEDLE ROLLER BEARINGS
SERIES K

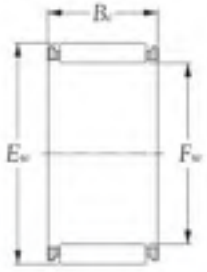
Boundary dimensions mm			Basic load ratings dynamic N		static kgf		Limiting speeds rpm		Bearing numbers	Mass kg.
F_w	E_w	B_c	C_r	C_{or}	C_r	C_{or}	grease	oil		(approx.)
15	21	21 $^{-0.2}_{-0.55}$	16,500	19,100	1,680	1,950	15,000	23,000	K 15X21X21	0.0170
16	20	10 $^{-0.2}_{-0.55}$	7,500	9,250	765	945	15,000	23,000	K 16X20X10	0.0057
16	20	11 $^{-0.2}_{-0.55}$	8,300	10,500	845	1,070	15,000	23,000	K 16X20X11	0.0061
16	20	13 $^{-0.2}_{-0.55}$	9,050	11,800	925	1,200	15,000	23,000	K 16K 20X13	0.0071
16	22	12 $^{-0.2}_{-0.55}$	11,700	12,500	1,190	1,280	15,000	23,000	K 16X22X12	0.0100
16	22	17 $^{-0.2}_{-0.55}$	14,400	16,400	1,470	1,670	15,000	23,000	K 16X22X17	0.0150
16	22	20 $^{-0.2}_{-0.55}$	16,000	18,800	1,640	1,920	15,000	23,000	K 16X22X20	0.0170
17	21	15 $^{-0.2}_{-0.55}$	10,400	14,400	1,060	1,460	15,000	22,000	K 17X21X15	0.0089
17	21	17 $^{-0.2}_{-0.55}$	11,800	16,900	1,210	1,720	15,000	22,000	K 17X21X17	0.0095
17	22	20 $^{-0.2}_{-0.55}$	14,700	19,200	1,500	1,960	15,000	22,000	K 17X22X20	0.0150
17	23	17 $^{-0.2}_{-0.55}$	14,400	16,500	1,460	1,690	15,000	22,000	K 17X23X17	0.0160
18	22	10 $^{-0.2}_{-0.55}$	7,400	9,400	755	955	14,000	21,000	K 18X22X10	0.0061
18	22	13 $^{-0.2}_{-0.55}$	8,900	11,900	910	1,210	14,000	21,000	K 18X22X13	0.0077
18	22	17 $^{-0.2}_{-0.55}$	11,700	17,000	1,200	1,730	14,000	21,000	K 18X22X17	0.0110
18	24	12 $^{-0.2}_{-0.55}$	12,300	13,800	1,250	1,410	14,000	21,000	K 18X24X12	0.0120
18	24	13 $^{-0.2}_{-0.55}$	11,600	12,800	1,180	1,300	14,000	21,000	K 18X24X13	0.0130
18	24	20 $^{-0.2}_{-0.55}$	17,000	20,900	1,730	2,130	14,000	21,000	K 18X24X20	0.0190
18	25	17 $^{-0.2}_{-0.55}$	18,000	20,400	1,830	2,080	14,000	21,000	K 18X25X17	0.0190
18	25	22 $^{-0.2}_{-0.55}$	22,100	26,600	2,250	2,710	14,000	21,000	K 18X25X22	0.0240
19	23	13 $^{-0.2}_{-0.55}$	9,650	13,500	985	1,370	14,000	21,000	K 19X23X13	0.0082
19	23	17 $^{-0.2}_{-0.55}$	12,700	19,200	1,300	1,960	14,000	21,000	K 19X23X17	0.0110

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

CAGE AND ROLLER TYPE NEEDLE ROLLER BEARINGS
SERIES K



NEEDLE ROLLER BEARINGS

Boundary dimensions mm			Basic load ratings dynamic N		static	dynamic kgf	static	Limiting speeds rpm		Bearing numbers	Mass kg.
F_w	E_w	B_c	C_r	C_{or}	C_r	C_{or}		grease	oil		(approx.)
20	24	11 $^{0}_{-0.05}$	9,500	13,400	970	1,370		13,000	20,000	**K 20X24X11**	0.0072
20	26	12 $^{0}_{-0.05}$	12,900	15,100	1,320	1,540		13,000	20,000	**K 20X26X12**	0.0130
20	28	25 $^{0}_{-0.05}$	27,100	32,500	2,760	3,300		13,000	20,000	**K 20X28X25**	0.0370
21	25	13 $^{0}_{-0.05}$	10,300	15,100	1,050	1,540		13,000	19,000	**K 21X25X13**	0.0090
21	25	17 $^{0}_{-0.05}$	13,600	21,500	1,380	2,200		13,000	19,000	**K 21X25X17**	0.0120
22	26	13 $^{0}_{-0.05}$	10,200	15,200	1,040	1,550		12,000	18,000	**K 22X26X13**	0.0094
22	27	20 $^{0}_{-0.05}$	17,500	25,900	1,780	2,640		12,000	18,000	**K 22X27X20**	0.0200
22	28	17 $^{0}_{-0.05}$	17,700	23,300	1,810	2,380		12,000	18,000	**K 22X28X17**	0.0200
22	30	15 $^{0}_{-0.05}$	19,300	21,700	1,970	2,210		12,000	18,000	**K 22X30X15**	0.0220
23	28	24 $^{0}_{-0.05}$	19,800	31,000	2,020	3,150		11,000	17,000	**K 23X28X24**	0.0230
24	28	13 $^{0}_{-0.05}$	10,800	16,800	1,100	1,710		11,000	17,000	**K 24X28X13**	0.0100
24	28	17 $^{0}_{-0.05}$	14,300	23,900	1,460	2,440		11,000	17,000	**K 24X28X17**	0.0130
24	29	13 $^{0}_{-0.05}$	12,300	16,900	1,250	1,720		11,000	17,000	**K 24X29X13**	0.0120
24	30	17 $^{0}_{-0.05}$	18,400	25,200	1,880	2,570		11,000	17,000	**K 24X30X17**	0.0220
25	29	10 $^{0}_{-0.05}$	8,950	13,300	910	1,350		11,000	16,000	**K 25X29X10**	0.0083
25	29	13 $^{0}_{-0.05}$	10,800	16,900	1,100	1,720		11,000	16,000	**K 25X29X13**	0.0100
25	30	13 $^{0}_{-0.05}$	13,200	18,800	1,350	1,920		11,000	16,000	**K 25X30X13**	0.0130
25	31	13 $^{0}_{-0.05}$	15,200	19,900	1,550	2,030		11,000	16,000	**K 25X31X13**	0.0160
25	31	14 $^{0}_{-0.05}$	16,500	22,100	1,680	2,250		11,000	16,000	**K 25X31X14**	0.0180
25	31	17 $^{0}_{-0.05}$	18,300	25,300	1,870	2,580		11,000	16,000	**K 25X31X17**	0.0220
25	31	21 $^{0}_{-0.05}$	22,500	33,000	2,290	3,350		11,000	16,000	**K 25X31X21**	0.0260

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

CAGE AND ROLLER TYPE NEEDLE ROLLER BEARINGS
SERIES K

Boundary dimensions mm			Basic load ratings dynamic N		static kgf		Limiting speeds rpm		Bearing numbers	Mass kg.
F_w	E_w	B_c	C_r	C_{or}	C_r	C_{or}	grease	oil		(approx.)
26	30	13 $^{-0.2}_{-0.55}$	11,800	19,200	1,200	1,960	10,000	15,000	**K 26X30X13**	0.011
26	30	17 $^{-0.2}_{-0.55}$	15,500	27,400	1,580	2,790	10,000	15,000	**K 26X30X17**	0.015
26	34	22 $^{-0.2}_{-0.55}$	24,200	30,000	2,470	3,050	10,000	15,000	**K 26X34X22**	0.041
28	32	17 $^{-0.2}_{-0.55}$	15,300	27,500	1,560	2,810	9,500	14,000	**K 28X32X17**	0.017
28	32	21 $^{-0.2}_{-0.55}$	18,700	35,500	1,910	3,650	9,500	14,000	**K 28X32X21**	0.020
28	33	13 $^{-0.2}_{-0.55}$	13,900	20,900	1,420	2,130	9,500	14,000	**K 28X33X13**	0.015
28	33	27 $^{-0.2}_{-0.55}$	28,300	52,000	2,890	5,300	9,500	14,000	**K 28X33X27**	0.032
28	34	14 $^{-0.2}_{-0.55}$	17,500	24,800	1,790	2,530	9,500	14,000	**K 28X34X14**	0.020
28	34	17 $^{-0.2}_{-0.55}$	18,100	25,800	1,850	2,630	9,500	14,000	**K 28X34X17**	0.024
28	35	16 $^{-0.2}_{-0.55}$	21,200	28,400	2,160	2,900	9,500	14,000	**K 28X35X16**	0.029
28	35	18 $^{-0.2}_{-0.55}$	21,500	28,900	2,190	2,950	9,500	14,000	**K 28X35X18**	0.031
29	34	27 $^{-0.2}_{-0.55}$	28,100	52,000	2,870	5,300	9,500	14,000	**K 29X34X27**	0.033
30	37	16 $^{-0.2}_{-0.55}$	21,900	30,500	2,230	3,100	8,500	13,000	**K 30X37X16**	0.029
30	37	18 $^{-0.2}_{-0.55}$	23,300	33,000	2,370	3,350	8,500	13,000	**K 30X37X18**	0.034
30	38	18 $^{-0.2}_{-0.55}$	25,000	33,000	2,550	3,350	8,500	13,000	**K 30X38X18**	0.036
32	37	13 $^{-0.2}_{-0.55}$	14,500	23,000	1,480	2,350	8,500	13,000	**K 32X37X13**	0.018
32	38	26 $^{-0.2}_{-0.55}$	31,500	54,000	3,200	5,550	8,500	13,000	**K 32X38X26**	0.041
32	39	16 $^{-0.2}_{-0.55}$	22,600	32,000	2,310	3,300	8,500	13,000	**K 32X39X16**	0.034
32	39	18 $^{-0.2}_{-0.55}$	24,000	35,000	2,450	3,550	8,500	13,000	**K 32X39X18**	0.037
35	40	13 $^{-0.2}_{-0.55}$	15,200	25,100	1,550	2,560	7,500	11,000	**K 35X40X13**	0.019
35	40	17 $^{-0.2}_{-0.55}$	20,000	36,000	2,040	3,650	7,500	11,000	**K 35X40X17**	0.025

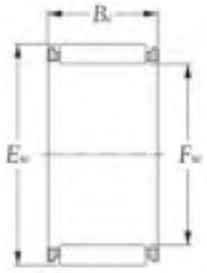
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

NEEDLE ROLLER BEARINGS

CAGE AND ROLLER TYPE NEEDLE ROLLER BEARINGS
SERIES K



NEEDLE ROLLER BEARINGS

Boundary dimensions mm			Basic load ratings dynamic N		static	dynamic kgf	static	Limiting speeds rpm		Bearing numbers	Mass kg.
F_w	E_w	B_c	C_r	C_{or}	C_r	C_{or}		grease	oil		(approx.)
35	41	14 $^{0}_{-0.05}$	19,400	30,500	1,980	3,100		7,500	11,000	**K 35X41X14**	0.026
35	41	15 $^{0}_{-0.05}$	20,900	33,500	2,130	3,400		7,500	11,000	**K 35X41X15**	0.027
35	42	16 $^{0}_{-0.05}$	24,100	36,000	2,450	3,650		7,500	11,000	**K 35X42X16**	0.035
35	42	18 $^{0}_{-0.05}$	24,700	37,000	2,510	3,750		7,500	11,000	**K 35X42X18**	0.039
35	42	20 $^{0}_{-0.05}$	28,500	44,500	2,910	4,550		7,500	11,000	**K 35X42X20**	0.041
35	42	30 $^{0}_{-0.05}$	39,500	68,000	4,050	6,950		7,500	11,000	**K 35X42X30**	0.062
37	42	13 $^{0}_{-0.05}$	15,900	27,100	1,620	2,770		7,500	11,000	**K 37X42X13**	0.021
37	44	18 $^{0}_{-0.05}$	26,300	41,000	2,680	4,150		7,500	11,000	**K 37X44X18**	0.042
38	43	17 $^{0}_{-0.05}$	20,900	38,500	2,130	39.50		7,500	11,000	**K 38X43X17**	0.026
38	43	27 $^{0}_{-0.05}$	32,000	67,500	3,300	6,900		7,500	11,000	**K 38X43X27**	0.043
38	46	32 $^{0}_{-0.05}$	54,000	95,500	5,500	9,700		7,500	11,000	**K 38X46X32**	0.073
40	45	13 $^{0}_{-0.05}$	16,500	29,200	1,680	2,980		6,500	10,000	**K 40X45X13**	0.022
40	45	17 $^{0}_{-0.05}$	21,800	41,500	2,220	4,250		6,500	10,000	**K 40X45X17**	0.027
40	45	21 $^{0}_{-0.05}$	26,700	54,000	2,720	5,500		6,500	10,000	**K 40X45X21**	0.037
40	45	27 $^{0}_{-0.05}$	33,500	72,500	3,400	7,400		6,500	10,000	**K 40X45X27**	0.044
40	46	17 $^{0}_{-0.05}$	24,600	43,000	2,500	4,350		6,500	10,000	**K 40X46X17**	0.030
40	47	18 $^{0}_{-0.05}$	27,700	45,000	2,820	4,550		6,500	10,000	**K 40X47X18**	0.045
40	47	20 $^{0}_{-0.05}$	31,000	51,500	3,150	5,250		6,500	10,000	**K 40X47X20**	0.048
40	48	20 $^{0}_{-0.05}$	33,000	51,000	3,350	5,200		6,500	10,000	**K 40X48X20**	0.052
40	48	25 $^{0}_{-0.05}$	42,500	71,000	4,350	7,250		6,500	10,000	**K 40X48X25**	0.065
42	47	17 $^{0}_{-0.05}$	22,100	43,000	2,250	4,400		6,500	9,500	**K 42X47X17**	0.028

Remark:

Cages	Precision	Grease
Steel - √		
Polymid - X	Class 0 (JIS)	Nil
Brass - X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

CAGE AND ROLLER TYPE NEEDLE ROLLER BEARINGS
SERIES K

Boundary dimensions mm			Basic load ratings dynamic N	static	dynamic K gf	static	Limiting speeds rpm		Bearing numbers	Mass kg.
F_w	E_w	B_c	C_r	C_{or}	C_r	C_{or}	grease	oil		(approx.)
42	47	27 $^{-0.2}_{-0.55}$	34,000	75,500	3,450	7,700	6,500	9,500	**K 42X47X27**	0.047
42	48	17 $^{-0.2}_{-0.55}$	25,700	46,000	2,630	4,700	6,500	9,500	**K 42X48X17**	0.036
42	50	20 $^{-0.2}_{-0.55}$	34,000	53,500	3,450	5,500	6,500	9,500	**K 42X50X20**	0.054
43	48	17 $^{-0.2}_{-0.55}$	22,000	43,000	2,240	4,400	6,500	9,500	**K 43X48X17**	0.029
43	48	27 $^{-0.2}_{-0.55}$	34,000	75,500	3,450	7,700	6,500	9,500	**K 43X48X27**	0.046
43	50	18 $^{-0.2}_{-0.55}$	29,100	49,000	2,960	5,000	6,500	9,500	**K 43X50X18**	0.049
45	49	19 $^{-0.2}_{-0.55}$	22,100	52,000	2,260	5,300	6,000	9,000	**K 45X49X19**	0.027
45	50	27 $^{-0.2}_{-0.55}$	34,500	78,000	3,500	7,950	6,000	9,000	**K 45X50X27**	0.050
45	52	18 $^{-0.2}_{-0.55}$	29,700	51,000	3,000	5,200	6,000	9,000	**K 45X52X18**	0.051
45	52	21 $^{-0.2}_{-0.55}$	32,000	56,500	3,300	5,750	6,000	9,000	**K 45X52X21**	0.061
45	53	20 $^{-0.2}_{-0.55}$	36,000	59,000	3,650	6,000	6,000	9,000	**K 45X53X20**	0.062
45	53	25 $^{-0.2}_{-0.55}$	46,500	82,000	4,700	8,400	6,000	9,000	**K 45X53X25**	0.077
47	52	17 $^{-0.2}_{-0.55}$	23,200	47,500	2,360	4,850	5,500	8,500	**K 47X52X17**	0.033
47	52	27 $^{-0.2}_{-0.55}$	35,500	83,000	3,650	8,450	5,500	8,500	**K 47X52X27**	0.051
48	54	19.0 $^{-0.2}_{-0.55}$	31,000	61,000	3,150	6,250	5,500	8,500	**K 48X54X19**	0.044
50	55	13.5 $^{-0.2}_{-0.55}$	18,100	35,500	1,850	3,600	5,500	8,000	**K 50X55X13.5**	0.023
50	55	20.0 $^{-0.2}_{-0.55}$	27,900	62,000	2,850	6,300	5,500	8,000	**K 50X55X20**	0.042
50	55	27.0 $^{-0.2}_{-0.55}$	37,000	88,500	3,750	9,000	5,500	8,000	**K 50X55X27**	0.053
50	55	30.0 $^{-0.2}_{-0.55}$	39,500	97,000	4,050	9,900	5,500	8,000	**K 50X55X30**	0.059
50	57	18.0 $^{-0.2}_{-0.55}$	31,500	57,000	3,200	5,800	5,500	8,000	**K 50X57X18**	0.053
50	58	20.0 $^{-0.2}_{-0.55}$	38,500	67,500	3,950	6,850	5,500	8,000	**K 50X58X20**	0.065

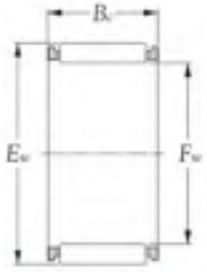
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

NEEDLE ROLLER BEARINGS

CAGE AND ROLLER TYPE NEEDLE ROLLER BEARINGS
SERIES K



NEEDLE ROLLER BEARINGS

Boundary dimensions mm			Basic load ratings dynamic N		dynamic kgf	static	Limiting speeds rpm		Bearing numbers	Mass kg.
F_w	E_w	B_c	C_r	C_{or}	C_r	C_{or}	grease	oil		(approx.)
50	58	25.0 $^{0}_{-0.05}$	48,500	90,000	4,950	9,150	5,500	8,000	**K 50X58X25**	0.081
52	58	19.0 $^{0}_{-0.05}$	32,000	65,500	3,250	6,650	5,000	7,500	**K 52X58X19**	0.048
55	60	17.0 $^{0}_{-0.05}$	25,800	58,000	2630	5,900	5,000	7,500	**K 55X60X17**	0.043
55	60	20.0 $^{0}_{-0.05}$	28,800	66,500	2,940	6,750	5,000	7,500	**K 55X60X20**	0.045
55	60	30.0 $^{0}_{-0.05}$	42,000	108,000	4,300	11,000	5,000	7,500	**K 55X60X30**	0.069
55	61	19.0 $^{0}_{-0.05}$	33,000	69500	3,350	7,100	5,000	7,500	**K 55X61X19**	0.051
55	61	20.0 $^{0}_{-0.05}$	33,000	69,500	3,350	7,100	5,000	7,500	**K 55X61X20**	0.054
55	61	30.0 $^{0}_{-0.05}$	48,000	113,000	4,900	11,500	5,000	7,500	**K 55X61X30**	0.081
55	62	18.0 $^{0}_{-0.05}$	33,500	63,000	3,400	6,450	5,000	7,500	**K 55X62X18**	0.054
55	63	20.0 $^{0}_{-0.05}$	39,000	70,000	3,950	7,100	5,000	7,500	**K 55X63X20**	0.073
55	63	25.0 $^{0}_{-0.05}$	50,500	97,500	5,150	9,950	5,000	7,500	**K 55X63X25**	0.088
55	63	32.0 $^{0}_{-0.05}$	61,000	125,000	6,200	12,700	5,000	7,500	**K 55X63X32**	0.117
58	64	19.0 $^{0}_{-0.05}$	34,000	73,500	3,450	7,500	4,700	7,000	**K 58X64X19**	0.052
60	65	20.0 $^{0}_{-0.05}$	29,800	71,500	3,050	7,300	4,300	6,500	**K 60X65X20**	0.051
60	65	30.0 $^{0}_{-0.05}$	43,500	116,000	4,450	11,800	4,300	6,500	**K 60X65X30**	0.071
60	66	19.0 $^{0}_{-0.05}$	33,500	73,500	3,450	7,500	4,300	6,500	**K 60X66X19**	0.053
60	66	20.0 $^{0}_{-0.05}$	33,500	73,500	3,450	7,500	4,300	6,500	**K 60X66X20**	0.056
60	66	30.0 $^{0}_{-0.05}$	49,000	119,000	5,000	12,200	4,300	6,500	**K 60X66X30**	0.084
60	68	15.0 $^{0}_{-0.05}$	27,200	45,500	2,780	4,650	4,300	6,500	**K 60X68X15**	0.058
60	68	20.0 $^{0}_{-0.05}$	40,000	75,000	4,100	7,650	4,300	6,500	**K 60X68X20**	0.077
60	68	23.0 $^{0}_{-0.05}$	44,500	85,000	4,500	8,700	4,300	6,500	**K 60X68X23**	0.092

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

CAGE AND ROLLER TYPE NEEDLE ROLLER BEARINGS
SERIES K

Boundary dimensions mm			Basic load ratings dynamic N	static	dynamic kgf	static	Limiting speeds rpm		Bearing numbers	Mass kg.
F_w	E_w	B_c	C_r	C_{or}	C_r	C_{or}	grease	oil		(approx.)
60	68	25 $^{-0.2}_{-0.55}$	52,000	105,000	5,300	10,700	4,300	6,500	**K 60X68X25**	0.097
60	68	27 $^{-0.2}_{-0.55}$	52,000	105,000	5,300	10,700	4,300	6,500	**K 60X68X27**	0.098
61	66	20 $^{-0.2}_{-0.55}$	29,700	71,500	3,050	7,300	4,300	6,500	**K 61X66X20**	0.054
61	66	30 $^{-0.2}_{-0.55}$	43,500	116,000	4,400	11,900	4,300	6,500	**K 61X66X30**	0.073
63	70	21 $^{-0.2}_{-0.55}$	44,500	95,500	4,500	9,700	4,300	6,500	**K 63X70X21**	0.075
64	70	16 $^{-0.2}_{-0.55}$	28,400	60,500	2,900	6,150	4,300	6,500	**K 64X70X16**	0.053
65	70	20 $^{-0.2}_{-0.55}$	30,500	75,000	3,100	7,650	4,000	6,000	**K 65X70X20**	0.055
65	70	30 $^{-0.2}_{-0.55}$	45,000	124,000	4,600	12,700	4,000	6,000	**K 65X70X30**	0.083
65	73	23 $^{-0.2}_{-0.55}$	47,000	94,000	4,800	9,600	4,000	6,000	**K 65X73X23**	0.100
65	73	30 $^{-0.2}_{-0.55}$	61,000	132,000	6,200	13,400	4,000	6,000	**K 65X73X30**	0.126
68	74	20 $^{-0.2}_{-0.55}$	36,000	83,500	3,700	8,550	4,000	6,000	**K 68X74X20**	0.065
68	74	30 $^{-0.2}_{-0.55}$	51,500	133,000	5,250	13,500	4,000	6,000	**K 68X74X30**	0.097
68	75	21 $^{-0.2}_{-0.55}$	45,500	101,000	4,600	10,300	4,000	6,000	**K 68X75X21**	0.077
70	76	20 $^{-0.2}_{-0.55}$	36,500	86,000	3,700	8,750	3,700	5,500	**K 70X76X20**	0.070
70	76	30 $^{-0.2}_{-0.55}$	53,000	139,000	5,400	14,200	3,700	5,500	**K 70X76X30**	0.100
70	77	21 $^{-0.2}_{-0.55}$	45,000	101,000	4,600	10,300	3,700	5,500	**K 70X77X21**	0.080
70	78	23 $^{-0.2}_{-0.55}$	49,500	103,000	5,050	10,500	3,700	5,500	**K 70X78X23**	0.107
70	78	30 $^{-0.2}_{-0.55}$	65,500	149,000	6,700	15,200	3,700	5,500	**K 70X78X30**	0.136
72	79	21 $^{-0.2}_{-0.55}$	46,500	106,000	4,750	10,800	3,700	5,500	**K 72X79X21**	0.085
73	79	30 $^{-0.2}_{-0.55}$	54,500	146,000	5,550	14,900	3,700	5,500	**K 73X79X30**	0.106
75	81	30 $^{-0.2}_{-0.55}$	56,000	152,000	5,700	15,500	3,700	5,500	**K 75X81X30**	0.108

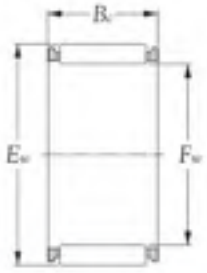
NEEDLE ROLLER BEARINGS

Remark:

Cages	Precision	Grease
Steel - √		
Polyoid - X	Class 0 (JIS)	Nil
Brass - X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

CAGE AND ROLLER TYPE NEEDLE ROLLER BEARINGS
SERIES K



NEEDLE ROLLER BEARINGS

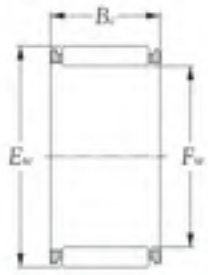
Boundary dimensions mm			Basic load ratings dynamic N		static		dynamic kgf	static	Limiting speeds rpm		Bearing numbers	Mass kg.
F_w	E_w	B_c	C_r	C_{or}	C_r	C_{or}	grease	oil		(approx.)
75	82	21 $^{-0.2}_{-0.55}$	46,000	106,000	4,700	10,800	3,700	5,500	**K 75X82X21**	0.088
75	83	23 $^{-0.2}_{-0.55}$	50,500	109,000	5,150	11,100	3,700	5,500	**K 75X83X23**	0.113
75	83	30 $^{-0.2}_{-0.55}$	67,500	157,000	6,850	16,100	3,700	5,500	**K 75X83X30**	0.147
80	86	20 $^{-0.2}_{-0.55}$	39,000	98,000	4,000	10,000	3,300	5,000	**K 80X86X20**	0.077
80	86	30 $^{-0.2}_{-0.55}$	57,000	159,000	5,800	16,200	3,300	5,000	**K 80X86X30**	0.110
80	88	23 $^{-0.2}_{-0.55}$	53,000	118,000	5,400	12,100	3,300	5,000	**K 80X88X23**	0.125
80	88	26 $^{-0.2}_{-0.55}$	61,000	142,000	6,250	14,500	3,300	5,000	**K 80X88X26**	0.131
80	88	30 $^{-0.2}_{-0.55}$	69,000	166,000	7,050	17,000	3,300	5,000	**K 80X88X30**	0.157
85	92	30 $^{-0.2}_{-0.55}$	66,000	176,000	6,750	18,000	3,100	4,700	**K 85X92X30**	0.142
85	93	27 $^{-0.2}_{-0.55}$	64,000	153,000	6,500	15,600	3,100	4,700	**K 85X93X27**	0.145
85	93	30 $^{-0.2}_{-0.55}$	71,000	175,000	7,200	17,900	3,100	4,700	**K 85X93X30**	0.160
90	97	20 $^{-0.2}_{-0.55}$	46,000	113,000	4,700	11,500	2,900	4,400	**K 90X97X20**	0.103
90	97	30 $^{-0.2}_{-0.55}$	67,500	184,000	6,850	18,700	2,900	4,400	**K 90X97X30**	0.151
90	98	26 $^{-0.2}_{-0.55}$	64,000	157,000	6,550	16,000	2,900	4,400	**K 90X98X26**	0.148
90	98	27 $^{-0.2}_{-0.55}$	64,000	157,000	6,550	16,000	2,900	4,400	**K 90X98X27**	0.150
90	98	30 $^{-0.2}_{-0.55}$	72,500	184,000	7,400	18,800	2,900	4,400	**K 90X98X30**	0.172
95	102	21 $^{-0.2}_{-0.55}$	48,000	122,000	4,900	12,400	2,800	4,200	**K 95X102X21**	0.115
95	102	31 $^{-0.2}_{-0.55}$	70,500	199,000	7,200	20,300	2,800	4,200	**K 95X102X31**	0.172
95	103	27 $^{-0.2}_{-0.55}$	65,500	165,000	6,700	16,800	2,800	4,200	**K 95X103X27**	0.159
95	103	30 $^{-0.2}_{-0.55}$	74,000	193,000	7,550	19,600	2,800	4,200	**K 95X103X30**	0.165
100	107	21 $^{-0.3}_{-0.65}$	49,000	127,000	5,000	12,900	2,700	4,000	**K 100X107X21**	0.120

Remark:

Cages	Precision	Grease
Steel - √		
Polyamid - X	Class 0 (JIS)	Nil
Brass - X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

CAGE AND ROLLER TYPE NEEDLE ROLLER BEARINGS
SERIES K



Boundary dimensions mm			Basic load ratings dynamic N	static	dynamic kgf	static	Limiting speeds rpm		Bearing numbers	Mass kg.
			C_r	C_{or}	C_r	C_{or}	grease	oil		(approx.)
100	107	31 $^{-0.3}_{-0.45}$	71,500	207,000	7,300	21,100	2,700	4,000	K 100X107X31	0.173
100	108	27 $^{-0.3}_{-0.45}$	61,000	153,000	6,250	15,600	2,700	4,000	K 100X108X27	0.176
100	108	30 $^{-0.3}_{-0.45}$	76,000	201,000	7,700	20,500	2,700	4,000	K 100X108X30	0.190
105	112	21 $^{-0.3}_{-0.45}$	48,500	127,000	4,950	12,900	2,500	3,800	K 105X112X21	0.130
105	112	31 $^{-0.3}_{-0.45}$	71,000	207,000	7,250	21,100	2,500	3,800	K 105X112X31	0.176
105	113	30 $^{-0.3}_{-0.45}$	77,500	210,000	7,900	21,400	2,500	3,800	K 105X113X30	0.198
110	117	24 $^{-0.3}_{-0.45}$	54,500	149,000	5,550	15,200	2,400	3,600	K 110X117X24	0.145
110	117	34 $^{-0.3}_{-0.45}$	77,500	235,000	7,900	24,000	2,400	3,600	K 110X117X34	0.205
110	118	30 $^{-0.3}_{-0.45}$	79,000	219,000	8,050	22,300	2,400	3,600	K 110X118X30	0.217
115	123	27 $^{-0.3}_{-0.45}$	64,000	170,000	6,550	17,300	2,300	3,500	K 115X123X27	0.200
115	125	34 $^{-0.3}_{-0.45}$	95,000	241,000	9,700	24,600	2,300	3,500	K 115X125X34	0.330
120	127	24 $^{-0.3}_{-0.45}$	57,500	165,000	5,850	16,800	2,200	3,300	K 120X127X24	0.160
120	127	34 $^{-0.3}_{-0.45}$	82,000	260,000	8,350	26,600	2,200	3,300	K 120X127X34	0.235
125	133	35 $^{-0.3}_{-0.45}$	87,000	260,000	8,900	26,500	2,100	3,200	K 125X133X35	0.275
125	135	34 $^{-0.3}_{-0.45}$	100,000	265,000	10,200	27,000	2,100	3,200	K 125X135X34	0.350
130	137	24 $^{-0.3}_{-0.45}$	59,000	175,000	6,000	17,900	2,100	3,100	K 130X137X24	0.170
130	137	34 $^{-0.3}_{-0.45}$	84,500	277,000	8,600	28,300	2,100	3,100	K 130X137X34	0.240
135	143	35 $^{-0.3}_{-0.45}$	92,500	288,000	9,450	29,400	2,000	3,000	K 135X143X35	0.300
135	150	38 $^{-0.3}_{-0.45}$	145,000	325,000	14,800	33,500	2,000	3,000	K 135X150X38	0.590
145	153	26 $^{-0.3}_{-0.45}$	72,000	214,000	7,350	21,800	1,900	2,800	K 145X153X26	0.250
145	153	28 $^{-0.3}_{-0.45}$	80,500	247,000	8,200	25,200	1,900	2,800	K 145X153X28	0.252

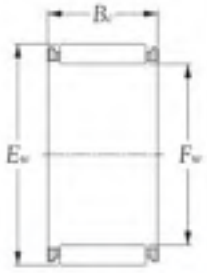
NEEDLE ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	/		
Polyoxid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

Cage and roller type needle roller bearings
series K



Needle Roller Bearings

Boundary dimensions mm			Basic load ratings dynamic N		static		Limiting speeds rpm		Bearing numbers	Mass kg(s).
			dynamic	static	dynamic kgf	static				
Fw	Ew	Bc	Cr	Cor	Cr	Cor	grease	oil		(approx.)
145	153	36 $^{-0.3}_{-0.45}$	100,000	325,000	10,200	33,000	1,900	2,800	K 145X153X36	0.335
150	160	46 $^{-0.3}_{-0.45}$	149,000	470,000	15,200	48,000	1,800	2,700	K 150X160X46	0.550
155	163	26 $^{-0.3}_{-0.45}$	73,500	224,000	7,500	22,800	1,700	2,600	K 155X163X26	0.270
155	163	36 $^{-0.3}_{-0.45}$	102,000	340,000	10,400	34,500	1,700	2,600	K 155X163X36	0.355
160	170	46 $^{-0.3}_{-0.45}$	155,000	505,000	15,800	51,500	1,700	2,500	K 160X170X46	0.570
165	173	26 $^{-0.3}_{-0.45}$	79,000	251,000	8,050	25,600	1,600	2,400	K 165X173X26	0.290
165	173	32 $^{-0.3}_{-0.45}$	97,000	330,000	9,900	33,500	1,600	2,400	K 165X173X32	0.340
165	173	36 $^{-0.3}_{-0.45}$	109,000	380,000	11,100	39,000	1,600	2,400	K 165X173X36	0.375
170	180	46 $^{-0.3}_{-0.45}$	160,000	540,000	16,400	55,000	1,600	2,400	K 170X180X46	0.620
175	183	32 $^{-0.3}_{-0.45}$	101,000	350,000	10,300	35,500	1,500	2,300	K 175X183X32	0.360
185	195	37 $^{-0.3}_{-0.45}$	131,000	425,000	13,300	43,500	1,500	2,200	K 185X195X37	0.560
195	205	37 $^{-0.3}_{-0.45}$	135,000	450,000	13,800	46,000	1,400	2,100	K 195X205X37	0.620
210	220	42 $^{-0.3}_{-0.45}$	156,000	560,000	15,900	57,000	1,300	1,900	K 210X220X42	0.740
220	230	42 $^{-0.3}_{-0.45}$	161,000	590,000	16,400	60,000	1,200	1,800	K 220X230X42	0.790
240	250	42 $^{-0.3}_{-0.45}$	167,000	635,000	17,000	64,500	1,100	1,700	K 240X250X42	0.850
265	280	50 $^{-0.3}_{-0.45}$	256,000	850,000	26,100	87,000	1,000	1,500	K 265X280X50	1.810
285	300	50 $^{-0.3}_{-0.45}$	268,000	930,000	27,300	94,500	950	1,400	K 285X300X50	1.970

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

DRAWN CUP NEEDLE ROLLER BEARINGS

NEEDLE ROLLER BEARINGS

SOUVENIRS

1. Types and designs

NIKO Drawn Cup Needle Roller Bearings can be classified into open-end and closed-end types according to the form of their outer ring.
The open-end design is further subcategorized into the series HK (metric standard series).
The closed-end design is further classified into series BK (metric standard series).
Sealed NIKO Drawn Cup Needle Roller Bearings (suffix L or LL) having a synthetic rubber seal on one or both ends are pre-filled with lithium soap grease. The allowable operating temperature range with this bearing variant is -25°C to +100°C. Its rollers are shorter than those in an open-ended type of the same dimension, so its load rating is accordingly smaller.

Fig. 1 Series HK　Fig. 2 Series BK　Fig. 3 Series HK...L　Fig. 4 Series HK...LL

The cages used for drawn cup needle roller bearings are usually pressed-steel cages. Also, certain small drawn cup needle roller bearings use molded polyamide cages reinforced with glass fiber or carbon fiber (suffix T2). The T2 cage features a maximum allowable operating temperature of 120°C and a maximum allowable continuous operating temperature of 100°C.

NEEDLE ROLLER BEARINGS

2. Interpreting bearing numbers

As summarized in Fig. 5, the bearing numbers of NIKO Drawn Cup Needle Roller Bearings comprise a series number, dimension code (inscribed enveloping circle diameter×width dimension), and suffix.

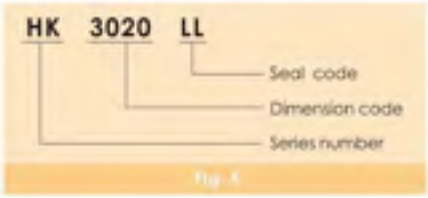


Fig. 5

3. Bearing fits

The fit of an NIKO Drawn Cup Needle Roller Bearing to a housing is usually a tight fit where the inscribed enveloping circle diameter (F_w) of press-fit rollers satisfies ISO tolerance class F8. However, the inscribed enveloping circle diameter (F_w) of press-fit rollers varies with the material and rigidity of the housing. Therefore, actual bearing fit (interference) should be measured and determined through trials before the bearing is mounted.
If a housing has sufficient rigidity, selecting a fit to housing or shaft from Table 1 can result in an inscribed enveloping circle diameter (F_w) of press-fit rollers close to F8 and a radial clearance close to normal clearance.

Table 1 Fit to housing and shaft

Series number	Housing		Shaft	
	Steel	Light alloy	Without inner ring	With inner ring
HK,BK	N6(N7)	R6(R7)	h5(h6)	k5(j6)

4. Housing bore accuracy

Because the outer ring has a thinner wall, the performance of drawn cup needle roller bearings is significantly affected by the surface roughness and the dimensional and form accuracy of the housing bore to which a bearing is press-fit. The housing bore must satisfy the accuracy of Table 2.

Table 2 Recommended fits

Characteristics	Tolerance
Circularity (max.)	IT4 or less
Cylindricithy (max.)	IT4 or less
Surface roughness (max.)	1.6a

5. Bearing tolerances and measuring methods

The outer ring of a drawn cup needle roller bearing is thin-walled. Therefore, some deformation of the outer ring unavoidably develops during the manufacturing process, particularly during heat treatment. However, when the outer ring is press-fit into a correctly dimensioned housing, the deformation is corrected, restoring the design functions of the outer ring. For this reason, measuring the dimensional accuracy of a drawn cup needle roller bearing before it is press-fit is meaningless. Therefore, its accuracy is evaluated by measuring its inscribed enveloping circle diameter (F_w) after it has been press-fit into a ring gauge of correct dimensions (wall thickness 20 mm or greater).

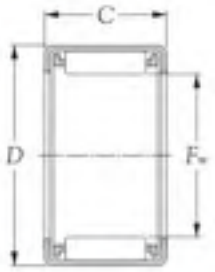
The tolerances of the bore diameter of the ring gauges and the inscribed enveloping circle diameter (F_w) are given in Tables 3, which apply to the series HK and BK (standard metric series). When measuring the inscribed enveloping circle diameter (F_w) with a plug gauge, the dimension at GO side must satisfy "Low" tolerance for inscribed enveloping circle diameter, and that at NO GO side must satisfy "Height" tolerance plus 2 μm. These values comply with the relevant ISO standard.

Table 3 Enveloping circle diameter tolerance (series HK and BK) (Unit: mm)

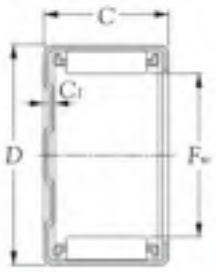
Enveloping circle dia.	Outside dia. of outer ring	Ring gauge bore dia.	Enveloping circle dia. tolerance	
F_w	D		hight	low
3	6.5	6.4840	3.016	3.006
4	8	7.9840	4.022	4.010
5	9	8.9840	5.022	5.010
6	10	9.9840	6.022	6.010
7	11	10.980	7.028	7.013
8	12	11.980	8.028	8.013
9	13	12.980	9.028	9.013
10	14	13.980	10.028	10.013
12	16	15.980	12.034	12.016
12	18	17.980	12.034	12.016
13	19	18.976	13.034	13.016
14	20	19.976	14.034	14.016
15	21	20.976	15.034	15.016
16	22	21.976	16.034	16.016
17	23	22.976	17.034	17.016
18	24	23.976	18.034	18.016
20	26	25.976	20.041	20.020
22	28	27.976	22.041	22.020
25	32	31.972	25.041	25.020
28	35	34.972	28.041	28.020
30	37	36.972	30.041	30.020
35	42	41.972	35.050	35.025
40	47	46.972	40.050	40.025
45	52	51.967	45.050	45.025
50	58	57.967	50.050	50.025
55	63	62.967	55.060	55.030
60	68	67.967	60.060	60.030

NEEDLE ROLLER BEARINGS

DRAWN CUP NEEDLE ROLLER BEARINGS
SERIES **HK.., BK..**



Type HK



Type BK

Boundary dimensions mm				Basic load ratings dynamic N		dynamic kgf	static	Limiting speeds rpm		Bearing numbers		Mass kg.	Appropriate inner ring
F_w	D	C $^{0}_{-0.2}$	C_1 max	C_r	C_{or}	C_r	C_{or}	grease	oil	Open end design	Closed end design	(approx.)	(as a reference)
3	6.5	6	-	1,250	835	128	85	33,000	50,000	**HK 0306**	-	0.0006	-
3	6.5	6	0.8	1,250	835	128	85	33,000	50,000	-	**BK 0306**	0.0007	-
4	8.0	8	-	1,770	1,270	180	129	30,000	45,000	**HK 0408**	-	0.0016	-
4	8.0	8	1.6	1,770	1,270	180	129	30,000	45,000	-	**BK 0408**	0.0018	-
5	9.0	9	-	2,640	2,190	269	224	27,000	40,000	**HK 0509**	-	0.0019	-
5	9.0	9	1.6	2,640	2,190	269	224	27,000	40,000	-	**BK 0509**	0.0021	-
6	10.0	9	-	2,660	2,280	272	233	25,000	37,000	**HK 0609**	-	0.0022	-
6	10.0	9	1.6	2,660	2,280	272	233	25,000	37,000	-	**BK 0609**	0.0024	-
7	11.0	9	-	3,400	3,250	345	330	23,000	34,000	**HK 0709**	-	0.0025	-
7	11.0	9	1.6	3,400	3,250	345	330	23,000	34,000	-	**BK 0709**	0.0027	-
8	12.0	10	-	3,850	3,950	395	400	20,000	30,000	**HK 0810**	-	0.0032	IR 5X8X12
8	12.0	10	1.6	3,850	3,950	395	400	20,000	30,000	-	**BK 0810**	0.0034	IR 5X8X12
9	13.0	10	-	4,600	5,050	465	515	18,000	27,000	**HK 0910**	-	0.0035	IR 6X9X12
9	13.0	10	1.6	4,600	5,050	465	515	18,000	27,000	-	**BK 0910**	0.0039	IR 6X9X12
9	13.0	12	-	5,650	6,650	575	680	18,000	27,000	**HK 0912**	-	0.0042	IR 6X9X12
9	13.0	12	1.6	5,650	6,650	575	680	18,000	27,000	-	**BK 0912**	0.0045	IR 6X9X12
10	14.0	10	-	4,500	5,100	460	520	16,000	24,000	**HK 1010**	-	0.0038	IR 7X10X10.5
10	14.0	10	1.6	4,500	5,100	460	520	16,000	24,000	-	**BK 1010**	0.0042	IR 7X10X10.5
10	14.0	12	-	5,900	7,250	605	735	16,000	24,000	**HK 1012**	-	0.0045	IR 7X1X16
10	14.0	12	1.6	5,900	7,250	605	735	16,000	24,000	-	**BK 1012**	0.0050	IR 7X10X16
10	14.0	15	-	7,100	9,150	725	935	16,000	24,000	**HK 1015**	-	0.0056	IR 7X10X16

NEEDLE ROLLER BEARINGS

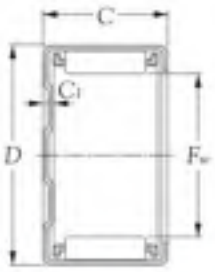
Remark:

Cages	Precision	Grease
Steel - √		
Polyamid - X	Class 0 (JIS)	Nil
Brass - X		

Remark: If you have more inquiry of technical, please inquire NIKO website: Http://www.nipponkoyobearings.com

DRAWN CUP NEEDLE ROLLER BEARINGS
SERIES HK.., BK..

Type HK



Type BK

Boundary dimensions mm				Basic load ratings dynamic N		static		Limiting speeds rpm		Bearing numbers		Mass kg.	Appropriate inner ring
F_w	D	C $^{0}_{-0.2}$	C_1 min	C_r	C_{or}	C_r	C_{or}	grease	oil	Open end design	Closed end design	(approx.)	(as a reference)
10	14.0	10	1.6	7,100	9,150	725	935	16,000	24,000	-	**BK 1015**	0.0062	IR 7X10X16
12	16.0	10	-	5,050	6,250	515	635	13,000	20,000	**HK 1210**	-	0.0046	IR 8X12X10.5
12	16.0	12	1.6	5,050	6,250	515	635	13,000	20,000	-	**BK 1210**	0.0052	IR 8X12X10.5
12	18.0	12	-	6,600	7,300	675	745	13,000	20,000	**HK 1212**	-	0.0091	IR 8X12X12.5
12	18.0	12	2.7	6,600	7,300	675	745	13,000	20,000	-	**BK 1212**	0.0100	IR 8X12X12.5
13	19.0	12	-	7,300	8,450	745	865	12,000	18,000	**HK 1312**	-	0.0100	IR10X13X12.5
13	19.0		2.7	7,300	8,450	745	865	12,000	18,000	-	**BK 1312**	0.0110	IR10X13X12.5
14	20	12	-	7,200	8,500	735	865	11,000	17,000	**HK 1412**	-	0.011	IR 10X14X13
14	20	12	2.7	7,200	8,500	735	865	11,000	17,000	-	**BK 1412**	0.012	IR 10X14X13
14	20	16	-	10,700	14,000	1,090	1,430	11,000	17,000	**HK 1416**	-	0.015	-
14	20	16	2.7	10,700	14,000	1,090	1,430	11,000	17,000	-	**BK 1416**	0.016	-
15	21	12	-	7,500	9,100	765	930	11,000	16,000	**HK 1512**	-	0.011	IR 12X15X12.5
15	21	12	2.7	7,500	9,100	765	930	11,000	16,000	-	**BK 1512**	0.013	IR 12X15X12.5
15	21	16	-	10,700	14,400	1,090	1,470	11,000	16,000	**HK 1516**	-	0.015	IR 12X15X16.5
15	21	16	2.7	10,700	14,400	1,090	1,470	11,000	16,000	-	**BK 1516**	0.017	IR 12X15X16.5
16	22	12	-	7,750	9,700	795	990	10,000	15,000	**HK 1612**	-	0.012	IR 12X16X13
16	22	12	2.7	7,750	9,700	795	990	10,000	15,000	-	**BK 1612**	0.014	IR 12X16X13
16	22	16	-	11,100	15,300	1,130	1,570	10,000	15,000	**HK 1616**	-	0.016	IR 12X16X20
16	22	16	2.7	11,100	15,300	1,130	1,570	10,000	15,000	-	**BK 1616**	0.018	IR 12X16X20
17	23	12	-	8,500	11,100	865	1,130	9,500	14,000	**HK 1712**	-	0.012	-
17	23	12	2.7	8,500	11,100	865	1,130	9,500	14,000	-	**BK 1712**	0.015	-

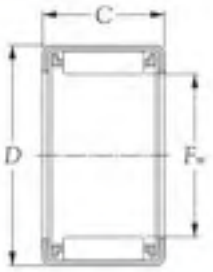
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

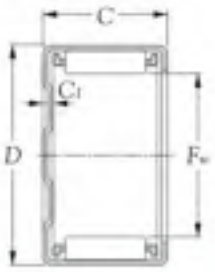
Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

NEEDLE ROLLER BEARINGS

Drawn cup needle roller bearings
series HK.., BK..



Type HK



Type BK

Boundary dimensions mm				Basic load ratings dynamic N		static		Limiting speeds rpm		Bearing numbers		Mass kg.	Appropriate inner ring
F_w	D	$C_{-0.2}^{0}$	C_1 max	C_r	C_{or}	dynamic kgf C_r	static C_{or}	grease	oil	Open end design	Closed end design	(approx.)	(as a reference)
18	24	12	-	8,300	10,900	845	1,110	8,500	13,000	**HK 1812**	-	0.013	IR 15X18X12.5
18	24	12	2.7	8,300	10,900	845	1,110	8,500	13,000	-	**BK 1812**	0.015	IR 15X18X12.5
18	24	16	-	11,800	17,300	1,210	1,760	8,500	13,000	**HK 1816**	-	0.018	IR 15X18X16.5
18	24	16	2.7	11,800	17,300	1,210	1,760	8,500	13,000	-	**BK 1816**	0.020	IR 15X18X16.5
20	26	12	-	9,250	13,000	945	1,330	8,000	12,000	**HK 2012**	-	0.014	IR 15X20X13
20	26	12	2.7	9,250	13,000	945	1,330	8,000	12,000	-	**BK 2012**	0.017	IR 15X20X13
20	26	16	-	13,000	20,100	1,320	2,050	8,000	12,000	**HK 2016**	-	0.019	IR 17X20X16.5
20	26	16	2.7	13,000	20,100	1,320	2,050	8,000	12,000	-	**BK 2016**	0.022	IR 17X20X16.5
20	26	20	-	16,400	27,100	1,670	2,760	8,000	12,000	**HK 2020**	-	0.024	IR 17X20X20.5
20	26	20	2.7	16,400	27,100	1,670	2,760	8,000	12,000	-	**BK 2020**	0.027	IR 17X20X20.5
22	28	12	-	9,750	14,300	995	1,460	7,500	11,000	**HK 2212**	-	0.013	IR 17X22X13
22	28	12	2.7	9,750	14,300	995	1,460	7,500	11,000	-	**BK 2212**	0.015	IR 17X22X13
22	28	16	-	13,600	22,100	1,390	2,250	7,500	11,000	**HK 2216**	-	0.021	IR 17X22X18
22	28	16	2.7	13,600	22,100	1,390	2,250	7,500	11,000	-	**BK 2216**	0.024	IR 17X22X18
22	28	20	-	17,200	29,800	1,760	3,050	7,500	11,000	**HK 2220**	-	0.026	IR 17X22X20.5
22	28	20	2.7	17,200	29,800	1,760	3,050	7,500	11,000	-	**BK 2220**	0.030	IR 17X22X20.5
25	32	12	-	11,800	16,300	1,200	1,660	6,500	9,500	**HK 2512**	-	0.021	IR 20X25X12.5
25	32	12	2.7	11,800	16,300	1,200	1,660	6,500	9,500	-	**BK 2512**	0.023	IR 20X25X12.5
25	32	16	-	15,900	24,000	1,620	2,450	6,500	9,500	**HK 2516**	-	0.027	IR 20X25X17
25	32	16	2.7	15,900	24,000	1,620	2,450	6,500	9,500	-	**BK 2516**	0.031	IR 20X25X17
25	32	20	-	20,300	33,000	2,070	3,350	6,500	9,500	**HK 2520**	-	0.034	IR 20X25X20.5

Needle Roller Bearings

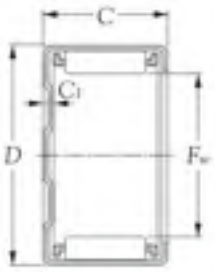
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshabearings.com

DRAWN CUP NEEDLE ROLLER BEARINGS
SERIES HK.., BK..

Type HK



Type BK

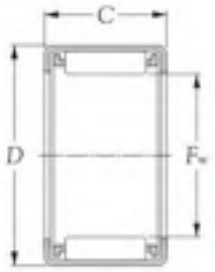
Boundary dimensions mm				Basic load ratings dynamic N		static		Limiting speeds rpm		Bearing numbers		Mass kg.	Appropriate inner ring
F_w	D	C $^{0}_{-0.2}$	C_1 min	C_r	C_{or}	C_r	C_{or}	grease	oil	Open end design	Closed end design	(approx.)	(as a reference)
25	32	20	2.7	20,300	33,000	2,070	3,350	6,500	9,500	-	**BK 2520**	0.039	IR 20X25X20.5
25	32	26	-	26,400	46,000	2,690	4,700	6,500	9,500	**HK 2526**	-	0.045	IR 20X25X26.5
25	32	26	2.7	26,400	46,000	2,690	4,700	6,500	9,500	-	**BK 2526**	0.049	IR 20X25X26.5
28	35	16	-	17,300	27,600	1,760	2,820	5,500	8,500	**HK 2816**	-	0.030	IR 22X28X17
28	35	16	2.7	17,300	27,600	1,760	2,820	5,500	8,500	-	**BK 2816**	0.034	IR 22X28X17
28	35	20	-	21,300	36,000	2,170	3,700	5,500	8,500	**HK 2820**	-	0.038	IR 22X28X20.5
28	35	20	2.7	21,300	36,000	2,170	3,700	5,500	8,500	-	**BK 2820**	0.043	IR 22X28X20.5
30	37	12	-	13,000	19,500	1,320	1,990	5,500	8,000	**HK 3012**	-	0.024	IR 25X30X12.5
30	37	12	2.7	13,000	19,500	1,320	1,990	5,500	8,000	-	**BK 3012**	0.028	IR 25X30X12.5
30	37	16	-	18,100	30,000	1,850	3,050	5,500	8,000	**HK 3016**	-	0.032	IR 25X30X17
30	37	16	2.7	18,100	30,000	1,850	3,050	5,500	8,000	-	**BK 3016**	0.037	IR 25X30X17
30	37	20	-	22,300	39,500	2,280	4,000	5,500	8,000	**HK 3020**	-	0.040	IR 25X30X20.5
30	37	20	2.7	22,300	39,500	2,280	4,000	5,500	8,000	-	**BK 3020**	0.047	IR 25X30X20.5
30	37	26	-	29,100	55,000	2,960	5,650	5,500	8,000	**HK 3026**	-	0.053	IR 25X30X26.5
30	37	26	2.7	29,100	55,000	2,960	5,650	5,500	8,000	-	**BK 3026**	0.059	IR 25X30X26.5
35	42	12	-	14,000	22,800	1,430	2,320	4,700	7,000	**HK 3512**	-	0.028	-
35	42	12	2.7	14,000	22,800	1,430	2,320	4,700	7,000	-	**BK 3512**	0.033	-
35	42	16	-	19,700	35,000	2,000	3,600	4,700	7,000	**HK 3516**	-	0.037	-
35	42	16	2.7	19,700	35,000	2,000	3,600	4,700	7,000	-	**BK 3516**	0.044	-
35	42	20	-	24,800	47,500	2,530	4,850	4,700	7,000	**HK 3520**	-	0.046	-
35	42	20	2.7	24,800	47,500	2,530	4,850	4,700	7,000	-	**BK 3520**	0.055	-

Remark:

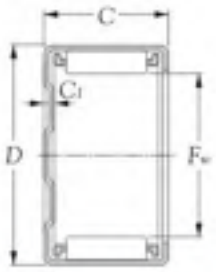
Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

DRAWN CUP NEEDLE ROLLER BEARINGS
SERIES HK.., BK..



Type HK



Type BK

Boundary dimensions mm				Basic load ratings dynamic N		static		Limiting speeds rpm		Bearing numbers		Mass kg.	Appropriate inner ring
F_w	D	C $^{0}_{-0.2}$	C_1 max	C_r	C_{or}	C_r	C_{or}	grease	oil	Open end design	Closed end design	(approx.)	(as a reference)
40	47	12	-	15,100	26,000	1,540	2,660	4,000	6,000	**HK 4012**	-	0.031	IR 35X40X12.5
40	47	12	2.7	15,100	26,000	1,540	2,660	4,000	6,000	-	**BK 4012**	0.038	IR 35X40X12.5
40	47	16	-	21,100	40,000	2,150	4,100	4,000	6,000	**HK 4016**	-	0.041	IR 35X40X17
40	47	16	2.7	21,100	40,000	2,150	4,100	4,000	6,000	-	**BK 4016**	0.051	IR 35X40X17
40	47	20	-	25,900	52,500	2,650	5,350	4,000	6,000	**HK 4020**	-	0.052	IR 35X40X20.5
40	47	20	2.7	25,900	52,500	2,650	5,350	4,000	6,000	-	**BK 4020**	0.064	IR 35X40X20.5
45	52	16	-	21,600	43,000	2,210	4,400	3,700	5,500	**HK 4516**	-	0.046	IR 40X45X17
45	52	16	2.7	21,600	43,000	2,210	4,400	3,700	5,500	-	**BK 4516**	0.058	IR 40X45X17
45	52	20	-	27,600	59,000	2,810	6,000	3,700	5,500	**HK 4520**	-	0.058	IR 40X45X20.5
45	52	20	2.7	27,600	59,000	2,810	6,000	3,700	5,500	-	**BK 4520**	0.072	IR 40X45X20.5
50	58	20	-	31,500	63,000	3,200	6,450	3,200	4,800	**HK 5020**	-	0.072	IR 40X50X22
50	58	20	2.7	31,500	63,000	3,200	6,450	3,200	4,800	-	**BK 5020**	0.087	IR 40X50X22
50	58	25	-	38,500	82,000	3,900	8,400	3,200	4,800	**HK 5025**	-	0.090	IR 45X50X25.5
50	58	25	2.7	38,500	82,000	3,900	8,400	3,200	4,800	-	**BK 5025**	0.109	IR 45X50X25.5

NEEDLE ROLLER BEARINGS

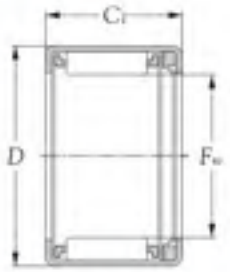
Remark:

Cages		Precision	Grease
Steel -	√		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

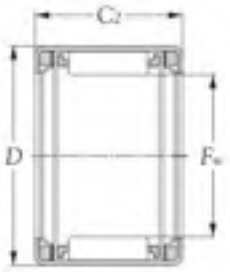
Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

NEEDLE ROLLER
BEARINGS

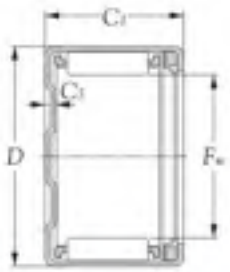
DRAWN CUP NEEDLE ROLLER BEARINGS SEALED TYPE
SERIES **HK..L, HK..LL, BK..L**



Type HK..L
(Open end. single seal)



Type HK .. LL
(Open end.single seal)



Type BK..L
(Closed end.single seal)

Boundary dimensions mm					Basic load ratings dynamic N		static		Limiting speeds rpm	Bearing numbers		
					dynamic	static	dynamic kgf	static				
Fw	D	C1	C2	C3 min	Cr	Cor	Cr	Cor	grease	open end single seal	oen end double seal	closed end single seal
12	18	14	16	2.7	6,600	7,300	675	745	10, 000	HK 1214 L	HK 1216 LL	BK 1214 L
14	20	14	16	2.7	7,200	8,500	735	865	10, 000	HK 1414 L	HK 1416 LL	BK 1414 L
15	21	14	16	2.7	7,500	9,100	765	930	10, 000	HK 1514 L	HK 1516 LL	BK 1514 L
16	22	14	16	2.7	7,750	9,700	795	990	10, 000	HK 1614 L	HK 1616 LL	BK 1614 L
18	24	14	16	2.7	8,300	10,900	845	1,110	9,000	HK 1814 L	HK 1816 LL	BK 1814 L
20	26	-	16	-	9,250	13,000	945	1,330	8,000	-	HK 2016 LL	-
20	26	18	20	2.7	13,000	20,100	1,320	2,050	8,000	HK 2018 L	HK 2020 LL	BK 2018 L
22	28	-	16	-	9,750	14,300	995	1,460	7,500	-	HK 2216 LL	-
22	28	18	20	2.7	13,600	22,100	1,390	2,250	7,500	HK 2218 L	HK 2220 LL	BK 2218 L
25	32	-	16	-	11,800	16,300	1,200	1,660	6,500	-	HK 2516 LL	-
25	32	18	20	2.7	15,900	24,000	1,620	2,450	6,500	HK 2518 L	HK 2520 LL	BK 2518 L
28	35	-	20	-	17,300	27,600	1,760	2,820	5,500	-	HK 2820 LL	-
30	37	-	16	-	13,000	19,500	1,320	1,990	5,500	-	HK 3016 LL	-
30	37	18	20	2.7	18,100	30,000	1,850	3,050	5,500	HK 3018 L	HK 3020 LL	BK 3018 L
35	42	-	16	-	14,000	22,800	1,430	2,320	4,600	-	HK 3516 LL	-
35	42	18	20	2.7	19,700	35,000	2,000	3,600	4,600	HK 3518 L	HK 3520 LL	BK 3518 L
40	47	-	16	-	15,100	26,000	1,540	2,660	4,000	-	HK 4016 LL	-
40	47	18	20	2.7	21,100	40,000	2,150	4,100	4,000	HK 4018 L	HK 4020 LL	BK 4018 L
45	52	18	20	2.7	21,600	43,000	2,210	4,400	3,600	HK 4518 L	HK 4520 LL	BK 4518 L
50	58	22	24	2.7	31,500	63,000	3,200	6,450	3,200	HK 5022 L	HK 5024 LL	BK 5022 L

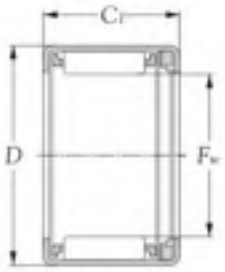
NEEDLE ROLLER BEARINGS

Remark:

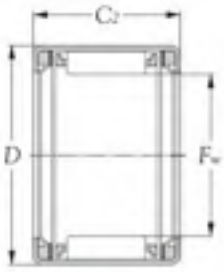
Cages		Precision	Grease
Steel -	-T		
Polyamid -	X	Class 0 (JIS)	Alvania S2 -25°C~+120°C
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshabearings.com

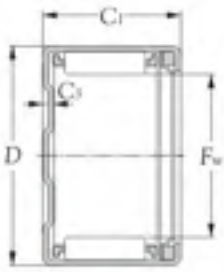
DRAWN CUP NEEDLE ROLLER BEARINGS SEALED TYPE
SERIES **HK..L, HK..LL, BK..L**



Type HK..L
(Open end. single seal)



Type HK _ LL
(Open end.single seal)



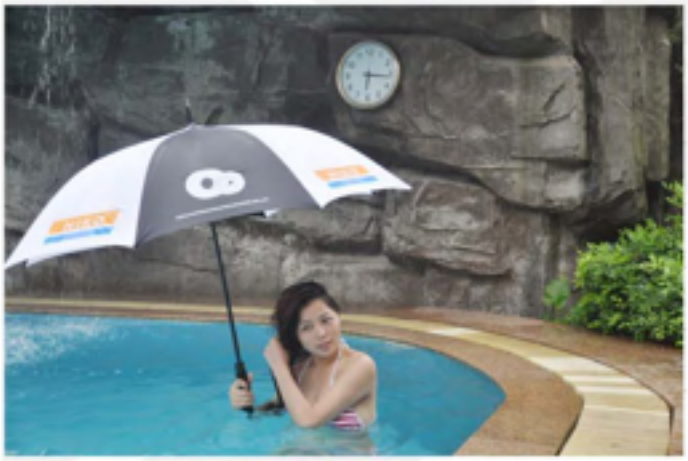
Type BK..L
(Closed end.single seal)

Appropriate inner ring (as a reference)		Bearing numbers			Mass kg. (approx.)		
single seal	double seal	open end single seal	oen end double seal	closed end single seal	open end single seal	oen end double seal	closed end single seal
IR 9×12×16	-	**HK 1214 L**	**HK 1216 LL**	**BK 1214 L**	0.011	0.012	0.012
IR 10×14×16	IR 10×14×20	**HK 1414 L**	**HK 1416 LL**	**BK 1414 L**	0.012	0.014	0.014
IR 12×15×16.5	IR 12×15×16.5	**HK 1514 L**	**HK 1516 LL**	**BK 1514 L**	0.013	0.014	0.014
IR 12×16×16	IR 12×16×20	**HK 1614 L**	**HK 1616 LL**	**BK 1614 L**	0.013	0.015	0.015
IR 15×18×16	IR 15×18×17.5	**HK 1814 L**	**HK 1816 LL**	**BK 1814 L**	0.015	0.017	0.017
-	IR 15×20×18	-	**HK 2016 LL**	-	-	0.019	-
IR 17×20×20	IR 17×20×20.5	**HK 2018 L**	**HK 2020 LL**	**BK 2018 L**	0.021	0.024	0.024
-	IR 17×22×18	-	**HK 2216 LL**	-	-	0.020	-
IR 17×22×20.5	IR 17×22×23	**HK 2218 L**	**HK 2220 LL**	**BK 2218 L**	0.024	0.026	0.027
-	IR 20×25×18D	-	**HK 2516 LL**	-	-	0.027	-
IR 20×25×20	IR 20×25×23	**HK 2518 L**	**HK 2520 LL**	**BK 2518 L**	0.031	0.033	0.035
-	IR 22×28×23	-	**HK 2820 LL**	-	-	0.037	-
-	IR 25×30×18D	-	**HK 3016 LL**	-	-	0.027	-
IR 25×30×20	IR 25×30×23	**HK 3018 L**	**HK 3020 LL**	**BK 3018 L**	0.037	0.039	0.045
-	-	-	**HK 3516 LL**	-	-	0.036	-
-	-	**HK 3518 L**	**HK 3520 LL**	**BK 3518 L**	0.037	0.040	0.047
-	IR 35×40×17	-	**HK 4016 LL**	-	-	0.041	-
IR 35×40×20	-	**HK 4018 L**	**HK 4020 LL**	**BK 4018 L**	0.047	0.050	0.062
IR 40×45×20	-	**HK 4518 L**	**HK 4520 LL**	**BK 4518 L**	0.054	0.057	0.072
IR 45×50×25	IR 45×50×25.5	**HK 5022 L**	**HK 5024 LL**	**BK 5022 L**	0.086	0.089	0.104

NEEDLE ROLLER BEARINGS

NEEDLE ROLLER
BEARINGS

NOTE



NIKO

Machined-Ring Needle Roller Bearings

Needle Roller Bearings

Souvenirs

1. Types and designs

The available **NIKO** Machined Ring Needle Roller Bearings, without an inner ring, include the series NK and RNA (metric series) The dimension series of the series RNA includes the RNA49, RNA59, and RNA69. The bearing series with an inner ring include NKI and NA (metric series) The dimension series of series NA include NA48, NA49, NA59, and NA69. The boundary dimensions (bore diameter, outside diameter, width, and chamfer dimension) for these dimension series are specified in JIS B 1512 and ISO 15. The third and fourth significant numerals in their bearing numbers represent width number and diameter number, respectively. Particular bearings, whose inscribed enveloping circle diameter is 40 mm or greater, among the RNA69 (NA69) bearings have double-row needle rollers, while bearings of other models and dimension series have single-row needle rollers. With bearings whose inscribed enveloping circle diameter (Fw) does not exceed 12 mm, the needle rollers and cage are retained in the outer ring by the side plate: in the case of the inscribed enveloping circle diameter (Fw) exceeding 12 mm, the needle rollers and cage are retained in the outer ring by the rib. The outer rings (other than those of series NK bearings whose inscribed enveloping circle diameter does not exceed 12 mm) have a lubrication hole and oil groove to simplify relubrication of the bearing.
The cage used on **NIKO** Machined Ring Needle Roller Bearings is usually a machined or pressed-steel type. However, cages of molded polyamide reinforced with glass fiber or carbon fiber (suffix T2) may be used. The T2 cage features a maximum allowable operating temperature of 120°C and maximum allowable continuous operating temperature of 100°C . Series RNA49 (NA49) bearings include a sealed type whose outer ring has a synthetic rubber seal on one or both ends (suffix L, LL). This variant is pre-filled with lithium soap grease and can operate within a temperate range of −25°C to 100°C.

NEEDLE ROLLER BEARINGS

Fig. 1 Series RNA(NK) Fig. 2 Series RNA(double row) Fig. 3 Series RNA49 ,(LL)

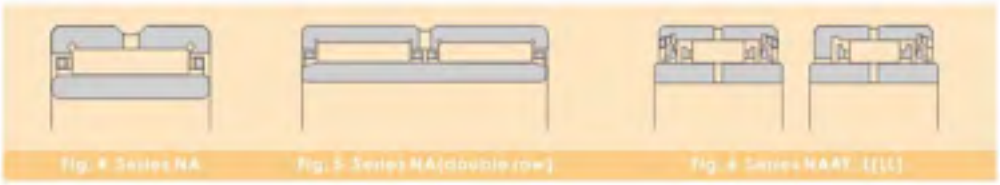


Fig. 4 Series NA Fig. 5 Series NA(double row) Fig. 6 Series NA49 ,(LL)

2. Interpreting bearing numbers

The bearing numbers of NIKO Machined Ring Needle Roller Bearings, series RNA and NA, comprise a series number, dimension series code, bore diameter number, and suffix. Bearing numbers of series NK bearings comprise a series number, dimension code (inscribed nveloping circle diameter/width dimension)

Fig. 7

3. Internal clearance and bearing fits

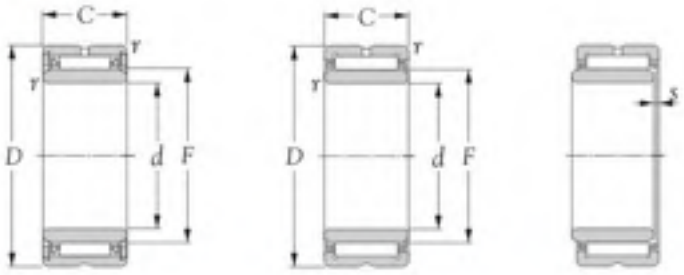
The radial clearances of NIKO Machined Ring Roller Bearings with an inner ring are given in "Bearing Internal Clearance, "Because the range of non-interchangeable clearance is limited, a bearing delivered adjusted to a non-interchangeable clearance must be mounted as is.
The dimensional tolerances (fits) with the shaft and housing bore when installing a bearing with an inner ring vary with the type and magnitude of load, shaft diameter, and housing bore size, and must satisfy the requirements in "Recommended fits," The required form accuracy and surface roughness are specified in "Shaft and housing accuracy." The bearing without an inner ring uses a shaft as a raceway surface.The required tolerances of the shaft diameter (raceway diameter)corresponding with the running clearance are given in Table 1 below. The dimensional tolerance of the housing bore is K7, which is commonly used. For the form accuracy, roughness, and hardness of the shaft as a raceway surface, refer to Table 1 "Accuracy of Raceway surface".

NEEDLE ROLLER BEARINGS

Table 1 Dimensional tolerances of shaft (raceway diameter)

Enveloping circle dia. Fw mm		Tolerance class of shaft		
over	incl.	smaller than normal clearance	normal clearance	greater than normal clearance
-	80	k5	h5	f6
80	160	k5	g5	f6
160	180	k5	g5	e6
180	200	j5	g5	e6
200	250	j5	f6	e6
250	315	h5	f6	e6
315	400	g5	f6	d6

MACHINED-RING NEEDLE ROLLER BEARINGS WITH INNER RING
SERIES NA 49-59-69



Type 49 (d≤9mm)

Type NA 49 (d≥10mm)
Type NA 59
Type NA 69 (d≤30mm)

Boundary dimensions mm						Limiting speeds rpm		Bearing numbers
d	D	C	r1 min(1)	F	s(2)	grease	oil	
5	13	10	0.15	7	-	23,000	34,000	NA 495
6	15	10	0.15	8	-	21,000	32,000	NA 496
7	17	10	0.15	9	-	20,000	30,000	NA 497
8	19	11	0.15	10	-	19,000	28,000	NA 498
9	20	11	0.30	12	-	17,000	26,000	NA 499
10	22	13	0.30	14	0.5	16,000	24,000	NA 4900
12	24	13	0.30	16	0.5	15,000	23,000	NA 4901
12	24	22	0.30	16	1.0	15,000	23,000	NA 6901
15	28	13	0.30	20	0.5	13,000	20,000	NA 4902
15	28	18	0.30	20	0.5	13,000	20,000	NA 5902
15	28	23	0.30	20	1.0	13,000	20,000	NA 6902
17	30	13	0.30	22	0.5	12,000	18,000	NA 4903
17	30	18	0.30	22	0.5	12,000	18,000	NA 5903
17	30	23	0.30	22	1.0	12,000	18,000	NA 6903
20	37	17	0.30	25	0.8	11,000	16,000	NA 4904
20	37	23	0.30	25	0.8	11,000	16,000	NA 5904
20	37	30	0.30	25	1.0	11,000	16,000	NA 6904
22	39	17	0.30	28	0.8	9,500	14,000	NA 49/22
22	39	23	0.30	28	0.8	9,500	14,000	NA 59/22
22	39	30	0.30	28	0.5	9,500	14,000	NA 69/22
25	42	17	0.30	30	0.8	8,500	13,000	NA 4905

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.
2) These values are the possible axial displacement of the inner ring against outer ring.

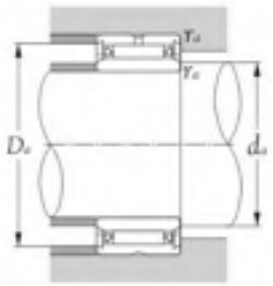
NEEDLE ROLLER BEARINGS

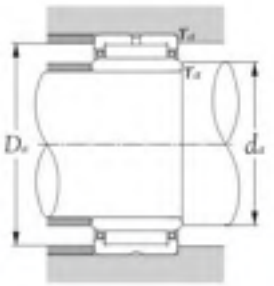
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

MACHINED-RING NEEDLE ROLLER BEARINGS WITH INNER RING
SERIES **NA 49-59-69**

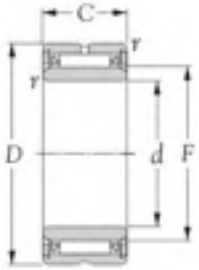




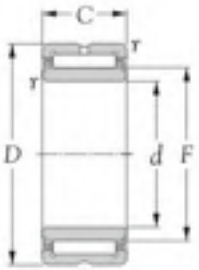
Basic load ratings dynamic N	static	dynamic kgf	static	Abutment dimensions			Bearing numbers	Mass kg.
C_r	C_{or}	C_r	C_{or}	d_a min	D_a max	r_a max		(approx.)
2,670	2,350	272	239	6.2	8.5	0.15	**NA 495**	0.007
3,150	3,000	320	305	8.0	9.5	0.15	**NA 496**	0.009
3,600	3,650	365	375	9.0	10.5	0.15	**NA 497**	0.010
4,300	3,950	435	405	10.0	12.0	0.15	**NA 498**	0.016
4,850	4,900	495	500	11.0	14.0	0.30	**NA 499**	0.017
8,600	9,200	875	935	12.0	20.0	0.30	**NA 4900**	0.024
9,550	10,900	975	1,110	14.0	22.0	0.30	**NA 4901**	0.026
15,400	20,000	1,570	2,040	14.0	22.0	0.30	**NA 6901**	0.046
10,300	12,800	1,050	1,310	17.0	26.0	0.30	**NA 4902**	0.036
14,100	19,100	1,440	1,950	17.0	26.0	0.30	**NA 5902**	0.052
17,600	25,300	1,790	2,580	17.0	26.0	0.30	**NA 6902**	0.064
11,200	14,600	1,140	1,490	19.0	28.0	0.30	**NA 4903**	0.056
15,200	21,700	1,550	2,210	19.0	28.0	0.30	**NA 5903**	0.037
18,200	27,200	1,850	2,770	19.0	28.0	0.30	**NA 6903**	0.069
21,300	25,500	2,170	2,600	22.0	35.0	0.30	**NA 4904**	0.074
28,400	37,000	2,900	3,750	22.0	35.0	0.30	**NA 5904**	0.115
36,500	50,500	3,700	5,150	22.0	35.0	0.30	**NA 6904**	0.141
23,200	29,300	2,360	2,990	24.0	37.0	0.30	**NA 49/22**	0.080
26,400	37,500	2,690	3,850	24.0	37.0	0.30	**NA 59/22**	0.134
40,000	58,500	4,050	6,000	24.0	37.0	0.30	**NA 69/22**	0.154
24,000	31,500	2,450	3,200	27.0	40.0	0.30	**NA 4905**	0.088

NEEDLE ROLLER BEARINGS

MACHINED-RING NEEDLE ROLLER BEARINGS WITH INNER RING
SERIES **NA 49-59-69**



Type 49 (d≤9mm)



Type NA 49 (d≥10mm)
Type NA 59
Type NA 69 (d≤30mm)

Boundary dimensions mm						Limiting speeds rpm		Bearing numbers
d	D	C	r1 min[1]	F	s[2]	grease	oil	
25	42	23	0.3	30	0.8	8,500	13,000	NA 5905
25	42	30	0.3	30	1.0	8,500	13,000	NA 6905
28	45	17	0.3	32	0.8	8,500	13,000	NA 49/28
28	45	23	0.3	32	0.8	8,500	13,000	NA 59/28
28	45	30	0.3	32	1.0	8,500	13,000	NA 69/28
30	47	17	0.3	35	0.8	7,500	11,000	NA 4906
30	47	23	0.3	35	0.8	7,500	11,000	NA 5906
30	47	30	0.3	35	1.0	7,500	11,000	NA 6906
32	52	20	0.6	40	0.8	6,500	10,000	NA 49/32
32	52	27	0.6	40	0.8	6,500	10,000	NA 59/32
32	52	36	0.6	40	0.5	6,500	10,000	NA 69/32
35	55	20	0.6	42	0.8	6,500	9,500	NA 4907
35	55	27	0.6	42	0.8	6,500	9,500	NA 5907
35	55	36	0.6	42	0.5	6,500	9,500	NA 6907
40	62	22	0.6	48	1.0	5,500	8,500	NA 4908
40	62	30	0.6	48	1.0	5,500	8,500	NA 5908
40	62	40	0.6	48	0.5	5,500	8,500	NA 6908
45	68	22	0.6	52	1.0	5,000	7,500	NA 4909
45	68	30	0.6	52	1.0	5,000	7,500	NA 5909
45	68	40	0.6	52	0.5	5,000	7,500	NA 6909
50	72	22	0.6	58	1.0	4,700	7,000	NA 4910

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.
2) These values are the possible axial displacement of the inner ring against outer ring.

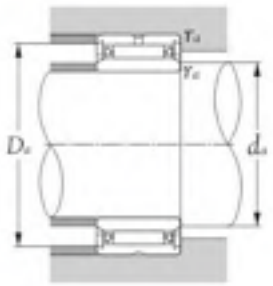
NEEDLE ROLLER BEARINGS

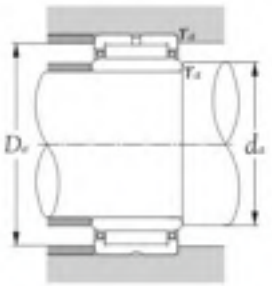
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

MACHINED-RING NEEDLE ROLLER BEARINGS WITH INNER RING
SERIES **NA 49-59-69**

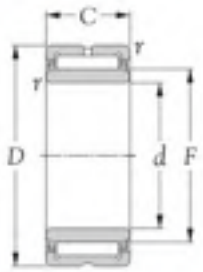




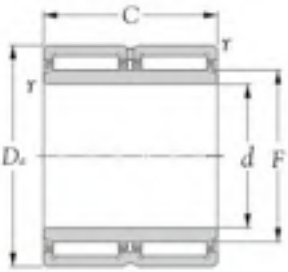
Basic load ratings dynamic N C_r	static C_{or}	dynamic kgf C_r	static C_{or}	Abutment dimensions d_a min	D_a max	r_{as} max	Bearing numbers	Mass kg. (approx.)
30,500	43,000	3,150	4,350	27.0	40	0.3	**NA 5905**	0.139
41,500	63,000	4,200	6,400	27.0	40	0.3	**NA 6905**	0.162
24,800	33,500	2,530	3,400	30.0	43	0.3	**NA 49/28**	0.098
32,000	45,500	3,250	4,650	30.0	43	0.3	**NA 59/28**	0.142
43,000	67,000	4,350	6,850	30.0	430	0.3	**NA 69/28**	0.179
25,500	35,500	2,600	3,600	32.0	45	0.3	**NA 4906**	0.101
32,500	48,500	3,350	4,950	32.0	45	0.3	**NA 5906**	0.152
42,500	67,500	4,300	6,900	32.0	45	0.3	**NA 6906**	0.185
31,500	47,500	3,200	4,850	36.0	48	0.6	**NA 49/32**	0.157
38,000	61,000	3,850	6,250	36.0	48	0.6	**NA 59/32**	0.241
47,500	82,000	4,850	4,350	36.0	48	0.6	**NA 69/32**	0.286
32,000	50,000	3,300	5,100	39.0	51	0.6	**NA 4907**	0.171
39,000	64,500	3,950	6,550	39.0	51	0.6	**NA 5907**	0.256
49,000	86,500	5,000	8,800	39.0	51	0.6	**NA 6907**	0.310
43,500	66,500	4,450	6,800	44.0	58	0.6	**NA 4908**	0.232
53,000	92,500	5,450	9,450	44.0	58	0.6	**NA 5908**	0.348
67,000	116,000	6,850	11,800	44.0	580	0.6	**NA 6908**	0.426
46,000	73,000	4,700	7,450	49.0	64	0.6	**NA 4909**	0.270
56,000	101,000	5,700	10,300	49.0	64	0.6	**NA 5909**	0.396
70,500	127,000	7,200	13,000	49.0	64	0.6	**NA 6909**	0.437
48,000	80,000	4,900	8,150	54.0	68	0.6	**NA 4910**	0.276

NEEDLE ROLLER BEARINGS

MACHINED-RING NEEDLE ROLLER BEARINGS WITH INNER RING
SERIES **NA 49-59-69**



Type NA 49 (d ≥ 10mm)
Type NA 59
Type NA 69 (d ≤ 30mm)



Type NA 69 (d ≥ 32mm)

Boundary dimensions mm						Limiting speeds rpm		Bearing numbers
d	D	C	r₁ min¹	F	s²⁾	grease	oil	
50	72	30	0.6	58	1.0	4,700	7,000	NA 5910
50	72	40	0.6	58	0.5	4,700	7,000	NA 6910
55	80	25	1.0	63	1.5	4,300	6,500	NA 4911
55	80	34	1.0	63	1.5	4,300	6,500	NA 5911
55	80	45	1.0	63	1.5	4,300	6,500	NA 6911
60	85	25	1.0	68	1.5	4,000	6,000	NA 4912
60	85	34	1.0	68	1.5	4,000	6,000	NA 5912
60	85	45	1.0	68	1.5	4,000	6,000	NA 6912
65	90	25	1.0	72	1.5	3,700	5,500	NA 4913
65	90	34	1.0	72	1.5	3,700	5,500	NA 5913
65	90	45	1.0	72	1.5	3,700	5,500	NA 6913
70	100	30	1.0	80	1.5	3,300	5,000	NA 4914
70	100	40	1.0	80	1.5	3,300	5,000	NA 5914
70	100	54	1.0	80	1.0	3,300	5,000	NA 6914
75	105	30	1.0	85	1.5	3,100	4,700	NA 4915
75	105	40	1.0	85	1.5	3,100	4,700	NA 5915
75	105	54	1.0	85	1.0	3,100	4,700	NA 6915
80	110	30	1.0	90	1.5	2,900	4,400	NA 4916
80	110	40	1.0	90	1.5	2,900	4,400	NA 5916
80	110	54	1.0	90	1.5	2,900	4,400	NA 6916
85	120	35	1.1	100	1.0	2,700	4,000	NA 4917

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.
2) These values are the possible axial displacement of the inner ring against outer ring.

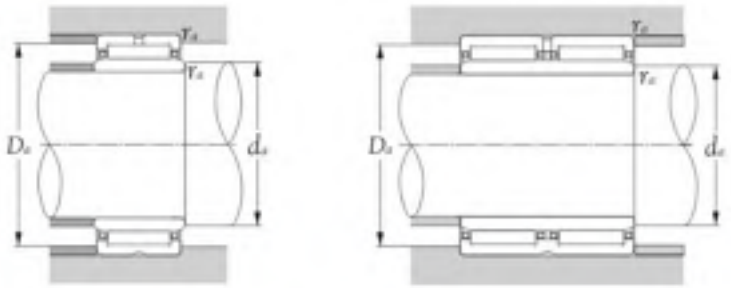
NEEDLE ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

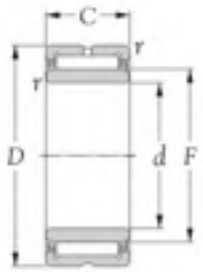
MACHINED-RING NEEDLE ROLLER BEARINGS WITH INNER RING
SERIES **NA 49-59-69**



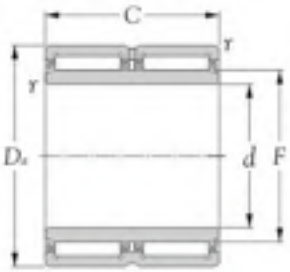
Basic load ratings dynamic N	static	dynamic kgf	static	Abutment dimensions			Bearing numbers	Mass kg(s).
C_r	C_{or}	C_r	C_{or}	d_a min	D_a max	r_{as} max		(approx.)
58,000	110,000	5,950	11,200	54.0	68.0	0.6	**NA 5910**	0.498
74,000	139,000	7,500	14,200	54.0	68.0	0.6	**NA 6910**	0.529
58,500	99,500	6,000	10,100	60.0	75.0	1.0	**NA 4911**	0.396
76,500	140,000	7,800	14,300	60.0	75.0	1.0	**NA 5911**	0.559
94,000	183,000	9,600	18,600	60.0	75.0	1.0	**NA 6911**	0.726
61,500	108,000	6,250	11,000	65.0	80.0	1.0	**NA 4912**	0.427
80,500	153,000	8,200	15,600	65.0	80.0	1.0	**NA 5912**	0.614
95,500	191,000	9,750	19,400	65.0	80.0	1.0	**NA 6912**	0.758
62,500	112,000	6,350	11,400	70.0	85.0	1.0	**NA 4913**	0.454
84,000	165,000	8,600	16,800	70.0	85.0	1.0	**NA 5913**	0.655
97,000	198,000	9,900	20,200	70.0	85.0	1.0	**NA 6913**	0.779
85,500	156,000	8,750	15,900	75.0	95.0	1.0	**NA 4914**	0.727
103,000	187,000	10,500	19,100	75.0	95.0	1.0	**NA 5914**	1.060
130,000	267,000	13,300	27,200	75.0	95.0	1.0	**NA 6914**	1.340
87,000	162,000	8,900	16,500	80.0	100.0	1.0	**NA 4915**	0.776
109,000	205,000	11,100	20,900	80.0	100.0	1.0	**NA 5915**	1.130
132,000	277,000	13,500	28,300	80.0	100.0	1.0	**NA 6915**	1.450
90,500	174,000	9,250	17,700	85.0	105.0	1.0	**NA 4916**	0.820
115,000	223,000	11,700	22,700	85.0	105.0	1.0	**NA 5916**	1.150
137,000	298,000	14,000	30,500	85.0	105.0	1.0	**NA 6916**	1.530
112,000	237,000	11,500	24,200	91.5	113.5	1.0	**NA 4917**	1.240

NEEDLE ROLLER BEARINGS

MACHINED-RING NEEDLE ROLLER BEARINGS WITH INNER RING
SERIES NA 48-49-59-69



Type NA 48
Type NA 49 (d ≥ 10mm)
Type NA 59



Type NA 69 (d ≥ 32mm)

Boundary dimensions mm						Limiting speeds rpm		Bearing numbers
d	D	C	r₁ min¹⁾	F	s²⁾	grease	oil	
85	120	46	1.1	100	1.5	2,700	4,000	NA 5917
85	120	63	1.1	100	1.0	2,700	4,000	NA 6917
90	125	35	1.1	105	1.0	2,500	3,800	NA 4918
90	125	46	1.1	105	1.0	2,500	3,800	NA 5918
90	125	63	1.1	105	1.0	2,500	3,800	NA 6918
95	130	35	1.1	110	1.0	2,400	3,600	NA 4919
95	130	46	1.1	110	1.0	2,400	3,600	NA 5919
95	130	63	1.1	110	1.0	2,400	3,600	NA 6919
100	140	40	1.1	115	2.0	2,300	3,500	NA 4920
100	140	54	1.1	115	2.0	2,300	3,500	NA 5920
110	140	30	1.0	120	0.8	2,200	3,300	NA 4822
110	150	40	1.1	125	2.0	2,100	3,200	NA 4922
110	150	54	1.1	125	2.0	2,100	3,200	NA 5922
120	150	30	1.0	130	0.8	2,100	3,100	NA 4824
120	165	45	1.1	135	2.0	2,000	3,000	NA 4924
120	165	60	1.1	135	2.0	2,000	3,000	NA 5924
130	165	35	1.1	145	1.0	1,900	2,800	NA 4826
130	180	50	1.5	150	1.5	1,800	2,700	NA 4926
130	180	67	1.5	150	1.5	1,800	2,700	NA 5926
140	175	35	1.1	155	1.0	1,700	2,600	NA 4828
140	190	50	1.5	160	1.5	1,700	2,500	NA 4928

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.
2) These values are the possible axial displacement of the inner ring against outer ring.

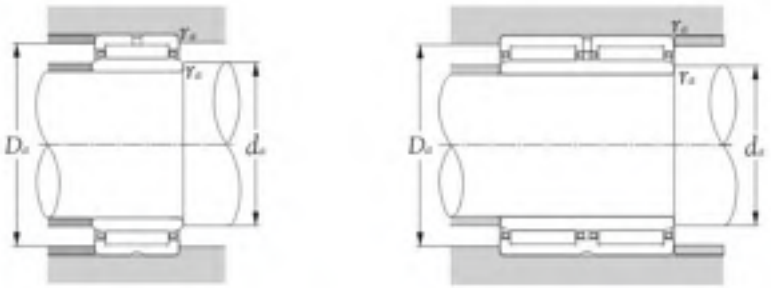
NEEDLE ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

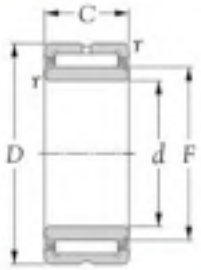
MACHINED-RING NEEDLE ROLLER BEARINGS WITH INNER RING
SERIES NA 48-49-59-69



Basic load ratings dynamic N	static	dynamic kgf	static	Abutment dimensions			Bearing numbers	Mass kg(s).
C_r	C_{or}	C_r	C_{or}	d_a min	D_a max	r_{as} max		(approx.)
137,000	290,000	14,000	29,600	91.5	113.5	1.0	**NA 5917**	1.760
169,000	400,000	17,300	41,000	91.5	113.5	1.0	**NA 6917**	2.250
116,000	252,000	11,900	25,700	96.5	118.5	1.0	**NA 4918**	1.310
143,000	310,000	14,600	32,000	96.5	118.5	1.0	**NA 5918**	1.840
175,000	425,000	17,900	43,500	96.5	118.5	1.0	**NA 6918**	2.440
118,000	260,000	12,000	26,500	101.5	123.5	1.0	**NA 4919**	1.360
149,000	335,000	15,200	34,000	101.5	123.5	1.0	**NA 5919**	1.980
177,000	440,000	18,100	45,000	101.5	123.5	1.0	**NA 6919**	2.630
127,000	260,000	12,900	26,500	106.5	133.5	1.0	**NA 4920**	1.930
182,000	395,000	18,600	40,500	106.5	133.5	1.0	**NA 5920**	2.850
93,500	210,000	9,550	21,400	115.0	135.0	1.0	**NA 4822**	1.110
131,000	279,000	13,300	28,400	116.5	143.5	1.0	**NA 4922**	2.080
193,000	440,000	19,700	45,000	116.5	143.5	1.0	**NA 5922**	2.980
99,500	233,000	10,100	23,800	125.0	145.0	1.0	**NA 4824**	1.170
180,000	380,000	18,300	38,500	126.5	158.5	1.0	**NA 4924**	2.840
245,000	525,000	25,000	53,500	126.5	158.5	1.0	**NA 5924**	3.920
118,000	305,000	12,100	31,000	136.5	158.5	1.0	**NA 4826**	1.600
202,000	455,000	20,600	46,500	138.0	172.0	1.5	**NA 4926**	3.900
294,000	685,000	30,000	70,000	138.0	172.0	1.5	**NA 5926**	5.600
121,000	315,000	12,300	32,500	146.5	168.5	1.0	**NA 4828**	1.820
209,000	485,000	21,300	49,500	148.0	182.0	1.5	**NA 4928**	4.050

NEEDLE ROLLER BEARINGS

MACHINED-RING NEEDLE ROLLER BEARINGS WITH INNER RING
SERIES **NA 48-49-59**



Type NA 48
Type NA 49..R ($d \geq 10$mm)
Type NA 59

NEEDLE ROLLER BEARINGS

Boundary dimensions mm						Limiting speeds rpm		Bearing numbers
d	D	C	$r_{s\,min}$	F	$s^{2)}$	grease	oil	
140	190	67	1.5	160	1.5	1,700	2,500	**NA 5928**
150	190	40	1.1	165	1.5	1,600	2,400	**NA 4830**
150	210	60	2.0	170	1.5	1,600	2,400	**NA 4930**
160	200	40	1.1	175	1.5	1,500	2,300	**NA 4832**
160	220	60	2.0	180	1.5	1,500	2,200	**NA 4932**
170	215	45	1.1	185	1.5	1,500	2,200	**NA 4834**
170	230	60	2.0	190	1.5	1,400	2,100	**NA 4934**
180	225	45	1.1	195	1.5	1,400	2,100	**NA 4836**
180	250	69	2.0	205	1.5	1,300	2,000	**NA 4936**
190	240	50	1.5	210	1.5	1,300	1,900	**NA 4838**
190	260	69	2.0	215	1.5	1,300	1,900	**NA 4938**
200	250	50	1.5	220	1.5	1,200	1,800	**NA 4840**
200	280	80	2.1	225	1.5	1,200	1,800	**NA 4940**
220	270	50	1.5	240	1.5	1,100	1,700	**NA 4844**
220	300	80	2.1	245	1.5	1,100	1,600	**NA 4944**
240	300	60	2.0	265	2.0	1,000	1,500	**NA 4848**
240	320	80	2.1	265	2.0	1,000	1,500	**NA 4948**
260	320	60	2.0	285	2.0	950	1,400	**NA 4852**
260	360	100	2.1	290	2.0	950	1,400	**NA 4952**
280	350	69	2.0	305	2.5	850	1,300	**NA 4856**
280	380	100	2.1	310	2.5	850	1,300	**NA 4956**

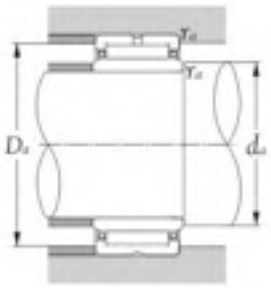
Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.
2) These values are the possible axial displacement of the inner ring against outer ring.

Remark:

Cages	Precision	Grease
Steel - √		
Polyamid - X	Class 0 (JIS)	Nil
Brass - X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

MACHINED-RING NEEDLE ROLLER BEARINGS WITH INNER RING
SERIES NA 48-49-59



Basic load ratings dynamic N	static	dynamic kgf	static	Abutment dimensions			Bearing numbers	Mass kgs.
C_r	C_{or}	C_r	C_{or}	d_a min	D_a max	r_{as} max		(approx.)
310,000	755,000	31,500	77,000	148.0	182.0	1.5	**NA 5928**	6.180
152,000	390,000	15,500	40,000	156.5	183.5	1.0	**NA 4830**	2.720
261,000	610,000	26,600	62,500	159.0	201.0	2.0	**NA 4930**	5.330
160,000	425,000	16,300	43,500	166.5	193.5	1.0	**NA 4832**	2.900
270,000	650,000	27,600	66,500	169.0	211.0	2.0	**NA 4932**	5.600
185,000	495,000	18,800	50,500	176.5	208.5	1.0	**NA 4834**	3.990
279,000	690,000	28,500	70,500	179.0	221.0	2.0	**NA 4934**	5.870
195,000	540,000	19,800	55,000	186.5	218.5	1.0	**NA 4836**	4.190
375,000	890,000	38,500	90,500	189.0	241.0	2.0	**NA 4936**	8.580
227,000	680,000	23,200	69,000	198.0	232.0	1.5	**NA 4838**	5.620
390,000	945,000	40,000	96,500	199.0	251.0	2.0	**NA 4938**	8.680
231,000	705,000	23,600	71,500	208.0	242.0	1.5	**NA 4840**	5.840
505,000	1,180,000	51,500	120,000	211.0	269.0	2.0	**NA 4940**	12.200
244,000	780,000	24,900	79,500	228.0	262.0	1.5	**NA 4844**	6.370
525,000	1,270,000	53,500	129,000	231.0	289.0	2.0	**NA 4944**	13.500
360,000	1,080,000	37,000	110,000	249.0	291.0	2.0	**NA 4848**	10.000
540,000	1,350,000	55,000	138,000	251.0	309.0	2.0	**NA 4948**	14.700
375,000	1,160,000	38,000	119,000	269.0	311.0	2.0	**NA 4852**	10.800
805,000	1,900,000	82,000	193,000	271.0	349.0	2.0	**NA 4952**	25.900
455,000	1,300,000	46,500	133,000	289.0	341.0	2.0	**NA 4856**	15.500
835,000	2,030,000	85,000	207,000	291.0	369.0	2.0	**NA 4956**	27.500

NEEDLE ROLLER BEARINGS

Machined-ring needle roller bearings with inner ring

series NA 48-49

Type NA 48
Type NA 49..R (d ≥ 10mm)
Type NA 59

Boundary dimensions mm						Limiting speeds rpm		Bearing numbers
d	D	C	$r_{s\ min}$ [1]	F	s [2]	grease	oil	
300	380	80	2.1	330	2.0	800	1,200	**NA 4860**
300	420	118	3.0	340	2.0	800	1,200	**NA 4960**
320	400	80	2.1	350	2.0	750	1,100	**NA 4864**
320	440	118	3.0	360	2.0	750	1,100	**NA 4964**
340	420	80	2.1	370	2.0	750	1,100	**NA 4868**
340	460	118	3.0	380	2.0	750	1,100	**NA 4968**
360	440	80	2.1	390	2.0	650	1,000	**NA 4872**
360	480	118	3.0	400	2.0	650	1,000	**NA 4972**
380	480	100	2.1	415	2.0	650	950	**NA 4876**
380	520	140	4.0	430	2.0	650	950	**NA 4976**
400	540	140	4.0	450	2.5	600	900	**NA 4980**
420	560	140	4.0	470	2.5	550	850	**NA 4984**
440	600	160	4.0	490	2.5	550	800	**NA 4988**

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.
2) These values are the possible axial displacement of the inner ring against outer ring.

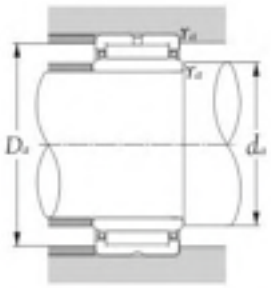
Needle Roller Bearings

Remark:

Cages		Precision	Grease
Steel -	√	Class 0 (JIS)	Nil
Polyamid -	X		
Brass -	X		

Remark: If you have more inquiry of technical, please inquire
NIKO web-site: Http://www.nipponkodobearings.com

MACHINED-RING NEEDLE ROLLER BEARINGS WITH INNER RING
SERIES NA 48-49

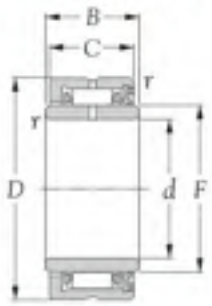


Basic load ratings dynamic N C_r	static C_{or}	dynamic kgf C_r	static C_{or}	Abutment dimensions d_a min	D_a max	r_{as} max	Bearing numbers	Mass kgs. (approx.)
625,000	1,770,000	64,000	180,000	311	369	2.0	**NA 4860**	22.000
1,080,000	2,640,000	110,000	269,000	313	407	2.5	**NA 4960**	42.500
640,000	1,850,000	65,500	189,000	331	389	2.0	**NA 4864**	23.200
1,120,000	2,820,000	114,000	288,000	333	427	2.5	**NA 4964**	45.200
655,000	1,940,000	66,500	197,000	351	409	2.0	**NA 4868**	24.100
1,160,000	3,000,000	118,000	305,000	353	447	2.5	**NA 4968**	47.300
665,000	2,020,000	68,000	206,000	371	429	2.0	**NA 4872**	25.700
1,200,000	3,200,000	122,000	325,000	373	467	2.5	**NA 4972**	49.0
1,000,000	2,840,000	102,000	289,000	391	469	2.0	**NA 4876**	44.5
1,400,000	3,750,000	143,000	385,000	396	504	3.0	**NA 4976**	73.6
1,450,000	4,000,000	148,000	410,000	416	524	3.0	**NA 4980**	76.6
1,500,000	4,250,000	153,000	430,000	436	544	3.0	**NA 4984**	89.8
1,750,000	4,600,000	179,000	470,000	456	584	3.0	**NA 4988**	123.0

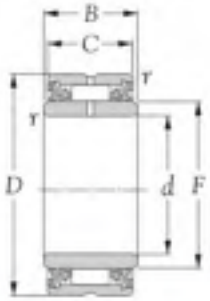
NEEDLE ROLLER BEARINGS

MACHINED-RING NEEDLE ROLLER BEARINGS WITH INNER RING SEALED TYPE

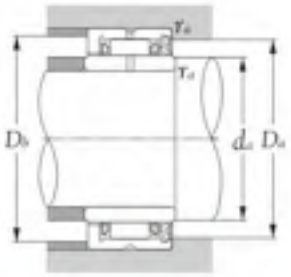
SERIES **NA 49..L, LL**



Type NA 49..L
(With single seal)



Type NA 49..LL
(With double seal)



Boundary dimensions mm						Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Limiting speeds rpm	Abutment dimensions				Bearing numbers		Mass kg.
d	D	B	C	F	r1 min	Cr	Cor	Cr	Cor		da max	Da max	Db max	ras max			(approx.)
10	22	14	13	14	0.3	7,200	8,500	735	865	10,000	12	16	20	0.3	NA 4900 L	NA 4900 LL	0.025
12	24	14	13	16	0.3	7,750	9,700	795	990	10,000	14	18	22	0.3	NA 4901 L	NA 4901 LL	0.028
15	28	14	13	20	0.3	8,300	11,200	845	1,150	10,000	17	22	26	0.3	NA 4902 L	NA 4902 LL	0.036
17	30	14	13	22	0.3	8,500	11,900	865	1,220	9,000	19	24	28	0.3	NA 4903 L	NA 4903 LL	0.039
20	37	18	17	25	0.3	15,200	19,900	1,550	2,030	8,000	22	28	35	0.3	NA 4904 L	NA 4904 LL	0.080
25	42	18	17	30	0.3	16,000	22,600	1,640	2,300	6,500	27	33	40	0.3	NA 4905 L	NA 4905 LL	0.093
30	47	18	17	35	0.3	18,000	27,400	1,830	2,800	5,500	32	38	45	0.3	NA 4906 L	NA 4906 LL	0.107
35	55	21	20	42	0.6	22,700	39,500	2,320	4,000	4,800	39	45	51	0.6	NA 4907 L	NA 4907 LL	0.175
40	62	23	22	48	0.6	27,800	53,500	2,830	5,450	4,200	44	51	58	0.6	NA 4908 L	NA 4908 LL	0.252
45	68	23	22	52	0.6	28,600	57,000	2,920	5,800	3,800	49	55	64	0.6	NA 4909 L	NA 4909 LL	0.290
50	72	23	22	58	0.6	30,500	64,000	3,100	6,500	3,400	54	61	68	0.6	NA 4910 L	NA 4910 LL	0.295

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

NEEDLE ROLLER BEARINGS

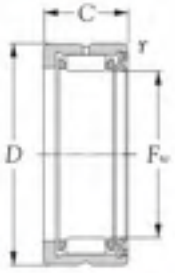
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Alvania #2 -25°C ~ +120°C
Brass -	X		

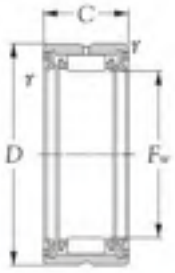
Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

MACHINED-RING NEEDLE ROLLER BEARINGS WITHOUT INNER RING SEALED TYPE

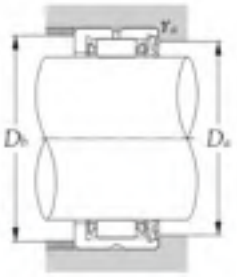
SERIES RNA 49..L, LL



Type RNA 49..L
(With single seal)



Type RNA 49..LL
(With double seal)



Boundary dimensions mm				Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Limiting speeds rpm	Abutment dimensions			Bearing numbers		Mass kg.
Fw	D	C	r1 min[1]	Cr	Cor	Cr	Cor		Da max	Db max	ra max			(approx.)
14	+0.027 +0.016	22	13	0.3	7,200	8,500	735	865	10,000	16	20	0.3	RNA 4900 L	RNA 4900 LL	0.016
16	+0.027 +0.016	24	13	0.3	7,750	9,700	795	990	10,000	18	22	0.3	RNA 4901 L	RNA 4901 LL	0.018
20	+0.033 +0.020	28	13	0.3	8,300	11,200	845	1,150	10,000	22	26	0.3	RNA 4902 L	RNA 4902 LL	0.022
22	+0.033 +0.020	30	13	0.3	8,500	11,900	865	1,220	9,000	24	28	0.3	RNA 4903 L	RNA 4903 LL	0.022
25	+0.033 +0.020	37	17	0.3	15,200	19,900	1,550	2,030	8,000	28	35	0.3	RNA 4904 L	RNA 4904 LL	0.055
30	+0.033 +0.020	42	17	0.3	16,000	22,600	1,640	2,300	6,500	33	40	0.3	RNA 4905 L	RNA 4905 LL	0.063
35	+0.041 +0.025	47	17	0.3	18,000	27,400	1,830	2,800	5,500	38	45	0.3	RNA 4906 L	RNA 4906 LL	0.072
42	+0.041 +0.025	55	20	0.6	22,700	39,500	2,320	4,000	4,800	45	51	0.6	RNA 4907 L	RNA 4907 LL	0.113
48	+0.041 +0.025	62	22	0.6	27,800	53,500	2,830	5,450	4,200	51	58	0.6	RNA 4908 L	RNA 4908 LL	0.154
52	+0.049 +0.030	68	22	0.6	28,600	57,000	2,920	5,800	3,800	55	64	0.6	RNA 4909 L	RNA 4909 LL	0.157
58	+0.049 +0.030	72	22	0.6	30,500	64,000	3,100	6,500	3,400	61	68	0.6	RNA 4910 L	RNA 4910 LL	0.160

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

NEEDLE ROLLER BEARINGS

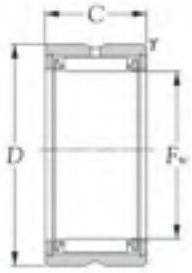
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Alvania #2 -25°C ~ +120°C
Brass -	X		

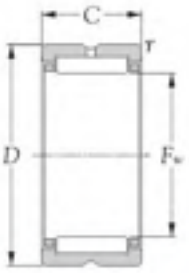
Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

MACHINED-RING NEEDLE ROLLER BEARINGS WITHOUT INNER RING

SERIES **RNA 49-59-69**



Type RNA 49 (Fw≤12mm)



Type RNA 49 (Fw≥14mm)
Type RNA 59
Type RNA 69 (Fw≤35mm)

Boundary dimensions mm				Limiting speeds rpm		Bearing numbers
F_w	D	C	r_s min.[1]	grease	oil	
7 $^{+0.022}_{+0.013}$	13	10	0.15	23,000	34,000	**RNA 495**
8 $^{+0.022}_{+0.013}$	15	10	0.15	21,000	32,000	**RNA 496**
9 $^{+0.022}_{+0.013}$	17	10	0.15	20,000	30,000	**RNA 497**
10 $^{+0.022}_{+0.013}$	19	11	0.15	19,000	28,000	**RNA 498**
12 $^{+0.027}_{+0.016}$	20	11	0.30	17,000	26,000	**RNA 499**
14 $^{+0.027}_{+0.016}$	22	13	0.30	16,000	24,000	**RNA 4900**
16 $^{+0.027}_{+0.016}$	24	13	0.30	15,000	23,000	**RNA 4901**
16 $^{+0.027}_{+0.016}$	24	22	0.30	15,000	23,000	**RNA 6901**
20 $^{+0.033}_{+0.020}$	28	13	0.30	13,000	20,000	**RNA 4902**
20 $^{+0.033}_{+0.020}$	28	18	0.30	13,000	20,000	**RNA 5902**
20 $^{+0.033}_{+0.020}$	28	23	0.30	13,000	20,000	**RNA 6902**
22 $^{+0.033}_{+0.020}$	30	13	0.30	12,000	18,000	**RNA 4903**
22 $^{+0.033}_{+0.020}$	30	18	0.30	12,000	18,000	**RNA 5903**
22 $^{+0.033}_{+0.020}$	30	23	0.30	12,000	18,000	**RNA 6903**
25 $^{+0.033}_{+0.020}$	37	17	0.30	11,000	16,000	**RNA 4904**
25 $^{+0.033}_{+0.020}$	37	23	0.30	11,000	16,000	**RNA 5904**
25 $^{+0.033}_{+0.020}$	37	30	0.30	11,000	16,000	**RNA 6904**
28 $^{+0.033}_{+0.020}$	39	17	0.30	9,500	14,000	**RNA 49/22**
28 $^{+0.033}_{+0.020}$	39	23	0.30	9,500	14,000	**RNA 59/22**
28 $^{+0.033}_{+0.020}$	39	30	0.30	9,500	14,000	**RNA 69/22**
30 $^{+0.033}_{+0.020}$	42	17	0.30	8,500	13,000	**RNA 4905**

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

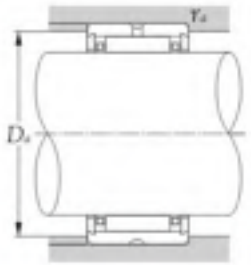
NEEDLE ROLLER BEARINGS

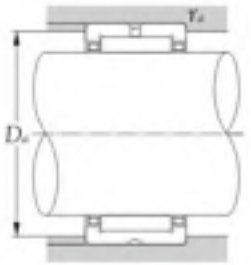
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

MACHINED-RING NEEDLE ROLLER BEARINGS WITHOUT INNER RING
SERIES **RNA 49-59-69**



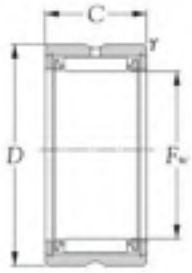


Basic load ratings dynamic N	static	dynamic kgf	static	Abutment dimensions		Bearing numbers	Mass kg.
C_r	C_{or}	C_r	C_{or}	D_a max	r_{as} max		(approx.)
2,670	2,350	272	239	8.5	0.15	**RNA 495**	0.0055
3,150	3,000	320	305	9.5	0.15	**RNA 496**	0.0073
3,600	3,650	365	375	10.5	0.15	**RNA 497**	0.0095
4,300	3,950	435	405	12.0	0.15	**RNA 498**	0.0130
4,850	4,900	495	500	14.0	0.30	**RNA 499**	0.0130
8,600	9,200	875	935	20.0	0.30	**RNA 4900**	0.0170
9,550	10,900	975	1,110	22.0	0.30	**RNA 4901**	0.0170
15,400	20,000	1,570	2,040	22.0	0.30	**RNA 6901**	0.0310
10,300	12,800	1,050	1,310	26.0	0.30	**RNA 4902**	0.0220
14,100	19,100	1,440	1,950	26.0	0.30	**RNA 5902**	0.0330
17,600	25,300	1,790	2,580	26.0	0.30	**RNA 6902**	0.0400
11,200	14,600	1,140	1,490	28.0	0.30	**RNA 4903**	0.0220
15,200	21,700	1,550	2,210	28.0	0.30	**RNA 5903**	0.0350
18,200	27,200	1,850	2,770	28.0	0.30	**RNA 6903**	0.0420
21,300	25,500	2,170	2,600	35.0	0.30	**RNA 4904**	0.0520
28,400	37,000	2,900	3,750	35.0	0.30	**RNA 5904**	0.0840
36,500	50,500	3,700	5,150	35.0	0.30	**RNA 6904**	0.1000
23,200	29,300	2,360	2,990	37.0	0.30	**RNA 49/22**	0.0500
26,400	37,500	2,690	3,850	37.0	0.30	**RNA 59/22**	0.0920
40,000	58,500	4,050	6,000	37.0	0.30	**RNA 69/22**	0.1000
24,000	31,500	2,450	3,200	40.0	0.30	**RNA 4905**	0.0610

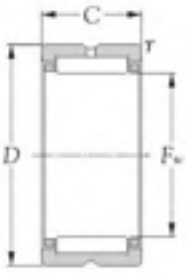
NEEDLE ROLLER BEARINGS

MACHINED-RING NEEDLE ROLLER BEARINGS WITHOUT INNER RING

SERIES **RNA 49-59-69**



Type RNA 49 (Fw≤12mm)



Type RNA 49 (Fw≥14mm)
Type RNA 59
Type RNA 69 (Fw≤35mm)

Boundary dimensions mm				Limiting speeds rpm		Bearing numbers
F_w	D	C	r_s min.[1]	grease	oil	
30 $^{+0.033}_{+0.020}$	42	23	0.3	8,500	13,000	**RNA 5905**
30 $^{+0.033}_{+0.020}$	42	30	0.3	8,500	13,000	**RNA 6905**
32 $^{+0.041}_{+0.025}$	45	17	0.3	8,500	13,000	**RNA 49/28**
32 $^{+0.041}_{+0.025}$	45	23	0.3	8,500	13,000	**RNA 59/28**
32 $^{+0.041}_{+0.025}$	45	30	0.3	8,500	13,000	**RNA 69/28**
35 $^{+0.041}_{+0.025}$	47	17	0.3	7,500	11,000	**RNA 4906**
35 $^{+0.041}_{+0.025}$	47	23	0.3	7,500	11,000	**RNA 5906**
35 $^{+0.041}_{+0.025}$	47	30	0.3	7,500	11,000	**RNA 6906**
40 $^{+0.041}_{+0.025}$	52	20	0.6	6,500	10,000	**RNA 49/32**
40 $^{+0.041}_{+0.025}$	52	27	0.6	6,500	10,000	**RNA 59/32**
40 $^{+0.041}_{+0.025}$	52	36	0.6	6,500	10,000	**RNA 69/32**
42 $^{+0.041}_{+0.025}$	55	20	0.6	6,500	9,500	**RNA 4907**
42 $^{+0.041}_{+0.025}$	55	27	0.6	6,500	9,500	**RNA 5907**
42 $^{+0.041}_{+0.025}$	55	36	0.6	6,500	9,500	**RNA 6907**
48 $^{+0.041}_{+0.025}$	62	22	0.6	5,500	8,500	**RNA 4908**
48 $^{+0.041}_{+0.025}$	62	30	0.6	5,500	8,500	**RNA 5908**
48 $^{+0.041}_{+0.025}$	62	40	0.6	5,500	8,500	**RNA 6908**
52 $^{+0.049}_{+0.030}$	68	22	0.6	5,000	7,500	**RNA 4909**
52 $^{+0.049}_{+0.030}$	68	30	0.6	5,000	7,500	**RNA 5909**
52 $^{+0.049}_{+0.030}$	68	40	0.6	5,000	7,500	**RNA 6909**
58 $^{+0.049}_{+0.030}$	72	22	0.6	4,700	7,000	**RNA 4910**

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

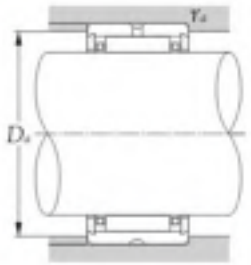
NEEDLE ROLLER BEARINGS

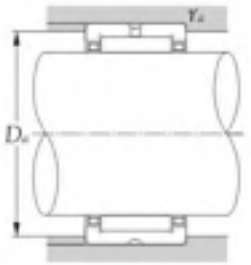
Remark:

Cages		Precision	Grease
Steel -	√		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshibearings.com

MACHINED-RING NEEDLE ROLLER BEARINGS WITHOUT INNER RING
SERIES **RNA 49-59-69**



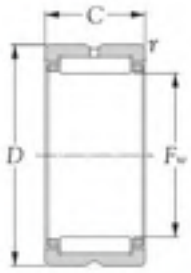


Basic load ratings dynamic N	static	dynamic kgf	static	Abutment dimensions		Bearing numbers	Mass kg.
C_r	C_{or}	C_r	C_{or}	D_a max	r_{as} max		(approx.)
30,500	43,000	3,150	4,350	40	0.3	**RNA 5905**	0.1010
41,500	63,000	4,200	6,400	40	0.3	**RNA 6905**	0.1120
24,800	33,500	2,530	3,400	43	0.3	**RNA 49/28**	0.0730
32,000	45,500	3,250	4,650	43	0.3	**RNA 59/28**	0.1080
43,000	67,000	4,350	6,850	43	0.3	**RNA 69/28**	0.1350
25,500	35,500	2,600	3,600	45	0.3	**RNA 4906**	0.0690
32,500	48,500	3,350	4,950	45	0.3	**RNA 5906**	0.1080
42,500	67,500	4,300	6,900	45	0.3	**RNA 6906**	0.126
31,500	47,500	3,200	4,850	48	0.6	**RNA 49/32**	0.089
38,000	61,000	3,850	6,250	48	0.6	**RNA 59/32**	0.149
47,500	82,000	4,850	8,350	48	0.6	**RNA 69/32**	0.162
32,000	50,000	3,300	5,100	51	0.6	**RNA 4907**	0.107
39,000	64,500	3,950	6,550	51	0.6	**RNA 5907**	0.176
49,000	86,500	5,000	8,800	51	0.6	**RNA 6907**	0.193
43,500	66,500	4,450	6,800	58	0.6	**RNA 4908**	0.140
53,000	92,500	5,450	9,450	58	0.6	**RNA 5908**	0.225
67,000	116,000	6,850	11,800	58	0.6	**RNA 6908**	0.256
46,000	73,000	4,700	7,450	64	0.6	**RNA 4909**	0.182
56,000	101,000	5,700	10,300	64	0.6	**RNA 5909**	0.232
70,500	127,000	7,200	13,000	64	0.6	**RNA 6909**	0.273
48,000	80,000	4,900	8,150	68	0.6	**RNA 4910**	0.163

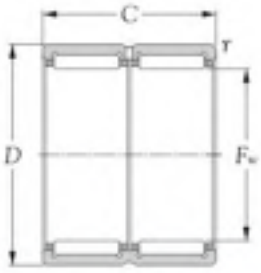
NEEDLE ROLLER BEARINGS

MACHINED-RING NEEDLE ROLLER BEARINGS WITHOUT INNER RING

SERIES **RNA 49-59-69**



Type RNA 49 (Fw ⩾ 14mm)
Type RNA 59
Type RNA 69 (Fw ⩽ 35mm)



Type RNA 69 (Fw ⩾ 40mm)

Boundary dimensions mm				Limiting speeds rpm		Bearing numbers
F_w	D	C	r_s min.[1]	grease	oil	
58 $^{+0.049}_{+0.030}$	72	30	0.6	4,700	7,000	**RNA 5910**
58 $^{+0.049}_{+0.030}$	72	40	0.6	4,700	7,000	**RNA 6910**
63 $^{+0.049}_{+0.030}$	80	25	1.0	4,300	6,500	**RNA 4911**
63 $^{+0.049}_{+0.030}$	80	34	1.0	4,300	6,500	**RNA 5911**
63 $^{+0.049}_{+0.030}$	80	45	1.0	4,300	6,500	**RNA 6911**
68 $^{+0.049}_{+0.030}$	85	25	1.0	4,000	6,000	**RNA 4912**
68 $^{+0.049}_{+0.030}$	85	34	1.0	4,000	6,000	**RNA 5912**
68 $^{+0.049}_{+0.030}$	85	45	1.0	4,000	6,000	**RNA 6912**
72 $^{+0.049}_{+0.030}$	90	25	1.0	3,700	5,500	**RNA 4913**
72 $^{+0.049}_{+0.030}$	90	34	1.0	3,700	5,500	**RNA 5913**
72 $^{+0.049}_{+0.030}$	90	45	1.0	3,700	5,500	**RNA 6913**
80 $^{+0.049}_{+0.030}$	100	30	1.0	3,300	5,000	**RNA 4914**
80 $^{+0.049}_{+0.030}$	100	40	1.0	3,300	5,000	**RNA 5914**
80 $^{+0.049}_{+0.030}$	100	54	1.0	3,300	5,000	**RNA 6914**
85 $^{+0.058}_{+0.036}$	105	30	1.0	3,100	4,700	**RNA 4915**
85 $^{+0.058}_{+0.036}$	105	40	1.0	3,100	4,700	**RNA 5915**
85 $^{+0.058}_{+0.036}$	105	54	1.0	3,100	4,700	**RNA 6915**
90 $^{+0.058}_{+0.036}$	110	30	1.0	2,900	4,400	**RNA 4916**
90 $^{+0.058}_{+0.036}$	110	40	1.0	2,900	4,400	**RNA 5916**
90 $^{+0.058}_{+0.036}$	110	54	1.0	2,900	4,400	**RNA 6916**
100 $^{+0.058}_{+0.036}$	120	35	1.1	2,700	4,000	**RNA 4917**

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

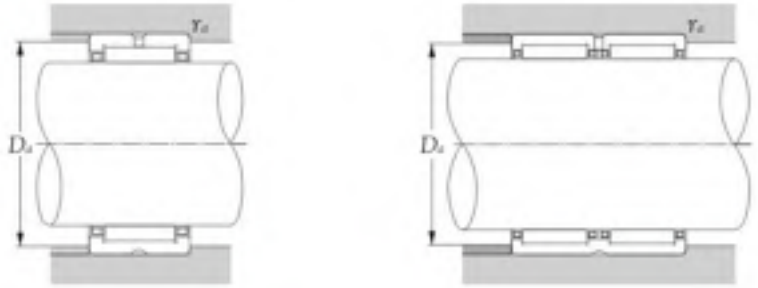
NEEDLE ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	√		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

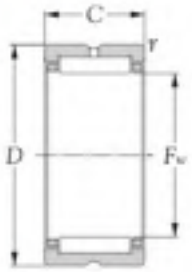
MACHINED-RING NEEDLE ROLLER BEARINGS WITHOUT INNER RING
SERIES **RNA 49-59-69**



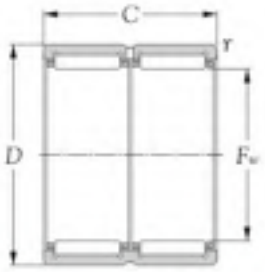
Basic load ratings dynamic N	static	dynamic kgf	static	Abutment dimensions		Bearing numbers	Mass kg.
C_r	C_{or}	C_r	C_{or}	D_a max	r_{as} max		(approx.)
58,000	110,000	5,950	11,200	68.0	0.6	**RNA 5910**	0.289
74,000	139,000	7,500	14,200	68.0	0.6	**RNA 6910**	0.320
58,500	99,500	6,000	10,100	75.0	1.0	**RNA 4911**	0.255
76,500	140,000	7,800	14,300	75.0	1.0	**RNA 5911**	0.367
94,000	183,000	9,600	18,600	75.0	1.0	**RNA 6911**	0.470
61,500	108,000	6,250	11,000	80.0	1.0	**RNA 4912**	0.275
80,500	153,000	8,200	15,600	80.0	1.0	**RNA 5912**	0.408
95,500	191,000	9,750	19,400	80.0	1.0	**RNA 6912**	0.488
62,500	112,000	6,350	11,400	85.0	1.0	**RNA 4913**	0.312
84,000	165,000	8,600	16,800	85.0	1.0	**RNA 5913**	0.462
97,000	198,000	9,900	20,200	85.0	1.0	**RNA 6913**	0.520
85,500	156,000	8,750	15,900	95.0	1.0	**RNA 4914**	0.460
103,000	187,000	10,500	19,100	95.0	1.0	**RNA 5914**	0.706
130,000	267,000	13,300	27,200	95.0	1.0	**RNA 6914**	0.857
87,000	162,000	8,900	16,500	100.0	1.0	**RNA 4915**	0.489
109,000	205,000	11,100	20,900	100.0	1.0	**RNA 5915**	0.745
132,000	277,000	13,500	28,300	100.0	1.0	**RNA 6915**	0.935
90,500	174,000	9,250	17,700	105.0	1.0	**RNA 4916**	0.516
115,000	223,000	11,700	22,700	105.0	1.0	**RNA 5916**	0.787
137,000	298,000	14,000	30,500	105.0	1.0	**RNA 6916**	0.987
112,000	237,000	11,500	24,200	113.5	1.0	**RNA 4917**	0.657

NEEDLE ROLLER BEARINGS

MACHINED-RING NEEDLE ROLLER BEARINGS WITHOUT INNER RING
SERIES **RNA 48-49-59-69**



Type RNA 48
Type RNA 49 (Fw≥14mm)
Type RNA 59



Type RNA 69 (Fw≥40mm)

Boundary dimensions mm				Limiting speeds rpm		Bearing numbers
F_w	D	C	$r_{s\,min}$ [1]	grease	oil	
100 $^{+0.058}_{+0.036}$	120	46	1.1	2,700	4,000	RNA 5917
100 $^{+0.058}_{+0.036}$	120	63	1.1	2,700	4,000	RNA 6917
105 $^{+0.058}_{+0.036}$	125	35	1.1	2,500	3,800	RNA 4918
105 $^{+0.058}_{+0.036}$	125	46	1.1	2,500	3,800	RNA 5918
105 $^{+0.058}_{+0.036}$	125	63	1.1	2,500	3,800	RNA 6918
110 $^{+0.058}_{+0.036}$	130	35	1.1	2,400	3,600	RNA 4919
110 $^{+0.058}_{+0.036}$	130	46	1.1	2,400	3,600	RNA 5919
110 $^{+0.058}_{+0.036}$	130	63	1.1	2,400	3,600	RNA 6919
115 $^{+0.058}_{+0.036}$	140	40	1.1	2,300	3,500	RNA 4920
115 $^{+0.058}_{+0.036}$	140	54	1.1	2,300	3,500	RNA 5920
120 $^{+0.058}_{+0.036}$	140	30	1.0	2,200	3,300	RNA 4822
125 $^{+0.068}_{+0.043}$	150	40	1.1	2,100	3,200	RNA 4922
125 $^{+0.068}_{+0.043}$	150	54	1.1	2,100	3,200	RNA 5922
130 $^{+0.068}_{+0.043}$	150	30	1.0	2,100	3,100	RNA 4824
135 $^{+0.068}_{+0.043}$	165	45	1.1	2,000	3,000	RNA 4924
135 $^{+0.068}_{+0.043}$	165	60	1.1	2,000	3,000	RNA 5924
145 $^{+0.068}_{+0.043}$	165	35	1.1	1,900	2,800	RNA 4826
150 $^{+0.068}_{+0.043}$	180	50	1.5	1,800	2,700	RNA 4926
150 $^{+0.068}_{+0.043}$	180	67	1.5	1,800	2,700	RNA 5926
155 $^{+0.068}_{+0.043}$	175	35	1.1	1,700	2,600	RNA 4828
160 $^{+0.068}_{+0.043}$	190	50	1.5	1,700	2,500	RNA 4928

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

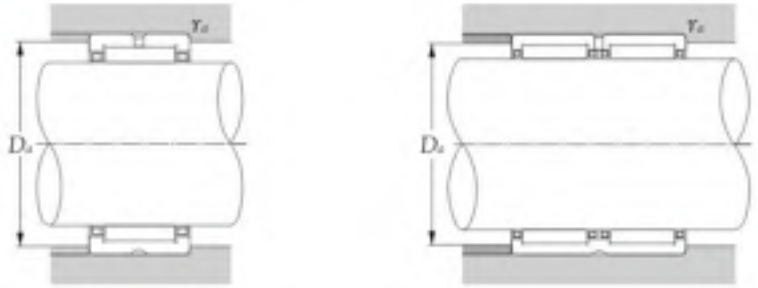
NEEDLE ROLLER BEARINGS

Remark:

Cages	Precision	Grease
Steel - √		
Polyamid - X	Class 0 (JIS)	Nil
Brass - X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

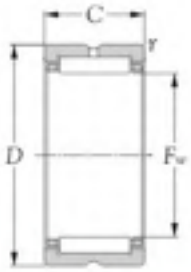
MACHINED-RING NEEDLE ROLLER BEARINGS WITHOUT INNER RING
SERIES **RNA 48-49-59-69**



Basic load ratings dynamic N C_r	static C_{or}	dynamic kgf C_r	static C_{or}	Abutment dimensions D_a max	r_{as} max	Bearing numbers	Mass kg(s). (approx.)
137,000	290,000	14,000	29,600	113.5	1.0	**RNA 5917**	1.000
169,000	400,000	17,300	41,000	113.5	1.0	**RNA 6917**	1.200
116,000	252,000	11,900	25,700	118.5	1.0	**RNA 4918**	0.697
143,000	310,000	14,600	32,000	118.5	1.0	**RNA 5918**	1.040
175,000	425,000	17,900	43,500	118.5	1.0	**RNA 6918**	1.330
118,000	260,000	12,000	26,500	123.5	1.0	**RNA 4919**	0.719
149,000	335,000	15,200	34,000	123.5	1.0	**RNA 5919**	1.130
177,000	440,000	18,100	45,000	123.5	1.0	**RNA 6919**	1.460
127,000	260,000	12,900	26,500	133.5	1.0	**RNA 4920**	1.150
182,000	395,000	18,600	40,500	133.5	1.0	**RNA 5920**	1.760
93,500	210,000	9,550	21,400	135.0	1.0	**RNA 4822**	0.670
131,000	279,000	13,300	28,400	143.5	1.0	**RNA 4922**	1.240
193,000	440,000	19,700	45,000	143.5	1.0	**RNA 5922**	1.890
99,500	233,000	10,100	23,800	145.0	1.0	**RNA 4824**	0.730
180,000	380,000	18,300	38,500	158.5	1.0	**RNA 4924**	1.860
245,000	525,000	25,000	53,500	158.5	1.0	**RNA 5924**	2.670
118,000	305,000	12,100	31,000	158.5	1.0	**RNA 4826**	0.950
202,000	455,000	20,600	46,500	172.0	1.5	**RNA 4926**	2.210
294,000	685,000	30,000	70,000	172.0	1.5	**RNA 5926**	3.210
121,000	315,000	12,300	32,500	168.5	1.0	**RNA 4828**	1.020
209,000	485,000	21,300	49,500	182.0	1.5	**RNA 4928**	2.350

NEEDLE ROLLER BEARINGS

MACHINED-RING NEEDLE ROLLER BEARINGS WITHOUT INNER RING
SERIES **RNA48-49-59**



Type RNA 48
Type RNA 49 ($F_w \geqq 14$mm)
Type RNA 59

Boundary dimensions mm				Limiting speeds rpm		Bearing numbers
F_w	D	C	$r_{s\,min}$ [1]	grease	oil	
160 $^{+0.068}_{+0.043}$	190	67	1.5	1,700	2,500	RNA 5928
165 $^{+0.068}_{+0.043}$	190	40	1.1	1,600	2,400	RNA 4830
170 $^{+0.068}_{+0.043}$	210	60	2.0	1,600	2,400	RNA 4930
175 $^{+0.068}_{+0.043}$	200	40	1.1	1,500	2,300	RNA 4832
180 $^{+0.068}_{+0.043}$	220	60	2.0	1,500	2,200	RNA 4932
185 $^{+0.079}_{+0.050}$	215	45	1.1	1,500	2,200	RNA 4834
190 $^{+0.079}_{+0.050}$	230	60	2.0	1,400	2,100	RNA 4934
195 $^{+0.079}_{+0.050}$	225	45	1.1	1,400	2,100	RNA 4836
205 $^{+0.079}_{+0.050}$	250	69	2.0	1,300	2,000	RNA 4936
210 $^{+0.079}_{+0.050}$	240	50	1.5	1,300	1,900	RNA 4838
215 $^{+0.079}_{+0.050}$	260	69	2.0	1,300	1,900	RNA 4938
220 $^{+0.079}_{+0.050}$	250	50	1.5	1,200	1,800	RNA 4840
225 $^{+0.079}_{+0.050}$	280	80	2.1	1,200	1,800	RNA 4940
240 $^{+0.079}_{+0.050}$	270	50	1.5	1,100	1,700	RNA 4844
245 $^{+0.079}_{+0.050}$	300	80	2.1	1,100	1,600	RNA 4944
265 $^{+0.088}_{+0.056}$	300	60	2.0	1,000	1,500	RNA 4848
265 $^{+0.088}_{+0.056}$	320	80	2.1	1,000	1,500	RNA 4948
285 $^{+0.088}_{+0.056}$	320	60	2.0	950	1,400	RNA 4852
290 $^{+0.088}_{+0.056}$	360	100	2.1	950	1,400	RNA 4952
305 $^{+0.088}_{+0.056}$	350	69	2.0	850	1,300	RNA 4856
310 $^{+0.088}_{+0.056}$	380	100	2.1	850	1,300	RNA 4956

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

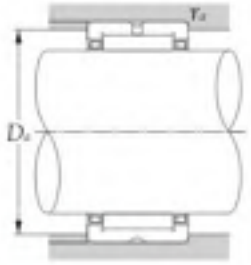
NEEDLE ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	√		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

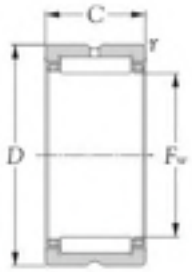
MACHINED-RING NEEDLE ROLLER BEARINGS WITHOUT INNER RING
SERIES **RNA48-49-59**



Basic load ratings dynamic N	static	dynamic kgf	static	Abutment dimensions		Bearing numbers	Mass kgs.
C_r	C_{or}	C_r	C_{or}	D_a max	r_{as} max		(approx.)
310,000	755,000	31,500	77,000	182.0	1.5	**RNA 5928**	3.48
152,000	390,000	15,500	40,000	183.5	1.0	**RNA 4830**	1.60
261,000	610,000	26,600	62,500	201.0	2.0	**RNA 4930**	2.98
160,000	425,000	16,300	43,500	193.5	1.0	**RNA 4832**	1.70
270,000	650,000	27,600	66,500	211.0	2.0	**RNA 4932**	3.10
185,000	495,000	18,800	50,500	208.5	1.0	**RNA 4834**	2.54
279,000	690,000	28,500	70,500	221.0	2.0	**RNA 4934**	3.22
195,000	540,000	19,800	55,000	218.5	1.0	**RNA 4836**	2.68
375,000	890,000	38,500	90,500	241.0	2.0	**RNA 4936**	4.48
227,000	680,000	23,200	69,000	232.0	1.5	**RNA 4838**	3.21
390,000	945,000	40,000	96,500	251.0	2.0	**RNA 4938**	4.53
231,000	705,000	23,600	71,500	242.0	1.5	**RNA 4840**	3.35
505,000	1,180,000	51,500	120,000	269.0	2.0	**RNA 4940**	7.20
242,000	770,000	24,700	78,500	262.0	1.5	**RNA 4844**	3.62
525,000	1,270,000	53,500	129,000	289.0	2.0	**RNA 4944**	7.81
360,000	1,080,000	37,000	110,000	291.0	2.0	**RNA 4848**	5.40
540,000	1,350,000	55,000	138,000	309.0	2.0	**RNA 4948**	8.40
375,000	1,160,000	38,000	119,000	311.0	2.0	**RNA 4852**	5.80
805,000	1,900,000	82,000	193,000	349.0	2.0	**RNA 4952**	15.90
455,000	1,300,000	46,500	133,000	341.0	2.0	**RNA 4856**	9.30
835,000	2,030,000	85,000	207,000	369.0	2.0	**RNA 4956**	16.70

NEEDLE ROLLER BEARINGS

MACHINED-RING NEEDLE ROLLER BEARINGS WITHOUT INNER RING
SERIES RNA48-49



Type RNA 48
Type RNA 49 (Fw≧14mm)

NEEDLE ROLLER BEARINGS

Boundary dimensions mm				Limiting speeds rpm		Bearing numbers
F_w	D	C	r_s min.[1]	grease	oil	
330 $^{+0.098}_{+0.062}$	380	80	2.1	800	1,200	**RNA 4860**
340 $^{+0.098}_{+0.062}$	420	118	3.0	800	1,200	**RNA 4960**
350 $^{+0.098}_{+0.062}$	400	80	2.1	750	1,100	**RNA 4864**
360 $^{+0.098}_{+0.062}$	440	118	3.0	750	1,100	**RNA 4964**
370 $^{+0.098}_{+0.062}$	420	80	2.1	750	1,100	**RNA 4868**
380 $^{+0.098}_{+0.062}$	460	118	3.0	750	1,100	**RNA 4968**
390 $^{+0.098}_{+0.062}$	440	80	2.1	650	1,000	**RNA 4872**
400 $^{+0.108}_{+0.068}$	480	118	3.0	650	1,000	**RNA 4972**
415 $^{+0.108}_{+0.068}$	480	100	2.1	650	950	**RNA 4876**
430 $^{+0.108}_{+0.068}$	520	140	4.0	650	950	**RNA 4976**
450 $^{+0.108}_{+0.068}$	540	140	4.0	600	900	**RNA 4980**
470 $^{+0.108}_{+0.068}$	560	140	4.0	550	850	**RNA 4984**
490 $^{+0.108}_{+0.068}$	600	160	4.0	550	800	**RNA 4988**

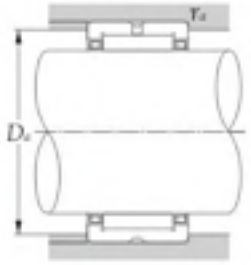
Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

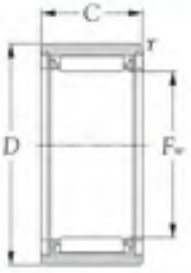
MACHINED-RING NEEDLE ROLLER BEARINGS WITHOUT INNER RING
SERIES **RNA48-49**



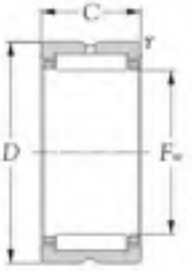
Basic load ratings dynamic N	static	dynamic kgf	static	Abutment dimensions		Bearing numbers	Mass kgs.
C_r	C_{or}	C_r	C_{or}	D_a max	r_{as} max		(approx.)
625,000	1,770,000	64,000	180,000	369.0	2.0	**RNA 4860**	12.70
1,080,000	2,640,000	110,000	269,000	407.0	2.5	**RNA 4960**	24.00
640,000	1,850,000	655,000	189,000	389.0	2.0	**RNA 4864**	13.40
1,120,000	2,820,000	114,000	288,000	427.0	2.5	**RNA 4964**	25.20
665,000	1,940,000	66,500	197,000	409.0	2.0	**RNA 4868**	14.00
1,160,000	3,000,000	118,000	305,000	447.0	2.5	**RNA 4968**	26.50
665,000	2,020,000	68,000	206,000	429.0	2.0	**RNA 4872**	14.80
1,200,000	3,200,000	122,000	325,000	467	2.5	**RNA 4972**	28.20
1,000,000	2,840,000	102,000	289,000	469	3.0	**RNA 4876**	26.00
1,400,000	3,750,000	143,000	385,000	504	3.0	**RNA 4976**	38.60
1,450,000	4,000,000	148,000	410,000	524	3.0	**RNA 4980**	40.10
1,500,000	4,250,000	153,000	430,000	544	3.0	**RNA 4984**	51.60
1,750,000	4,600,000	179,000	470,000	584	3.0	**RNA 4988**	66.90

NEEDLE ROLLER BEARINGS

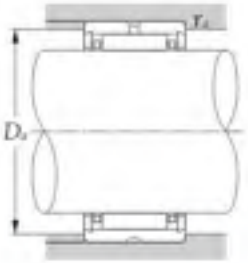
MACHINED-RING NEEDLE ROLLER BEARINGS WITHOUT INNER RING
SERIES NK

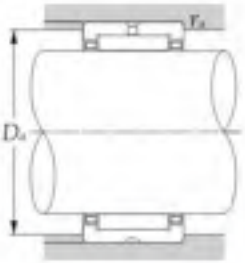


Type NK (Fw≤12mm)



Type NK (Fw≥14mm)





Boundary dimensions mm				Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Limiting speeds rpm		Bearing numbers	Abutment dimensions mm		Mass kg.
F_w	D	C	r min[1]	C_r	C_{or}	C_r	C_{or}	grease	oil		D_a max.	r_{as} max.	(approx.)
5 $^{+0.018}_{+0.010}$	10	10	0.15	2,640	2,190	269	224	27,000	40,000	**NK 5/10**	6.5	0.15	0.0031
5 $^{+0.018}_{+0.010}$	10	12	0.15	2,720	2,250	277	230	27,000	40,000	**NK 5/12**	6.5	0.15	0.0037
6 $^{+0.018}_{+0.010}$	12	10	0.15	2,660	2,280	272	233	25,000	37,000	**NK 6/10**	7.5	0.15	0.0047
6 $^{+0.018}_{+0.010}$	12	12	0.15	3,400	3,150	345	320	25,000	37,000	**NK 6/12**	7.5	0.15	0.0057
7 $^{+0.022}_{+0.013}$	14	10	0.30	2,670	2,350	272	239	23,000	34,000	**NK 7/10**	8.5	0.30	0.0069
7 $^{+0.022}_{+0.013}$	14	12	0.30	3,400	3,200	345	330	23,000	34,000	**NK 7/12**	8.5	0.30	0.0082
8 $^{+0.022}_{+0.013}$	15	12	0.30	4,000	4,100	410	420	21,000	32,000	**NK 8/12**	9.5	0.30	0.0087
8 $^{+0.022}_{+0.013}$	15	16	0.30	4,850	5,200	495	535	21,000	32,000	**NK 8/16**	9.5	0.30	0.0120
9 $^{+0.022}_{+0.013}$	16	12	0.30	4,550	5,000	465	510	20,000	30,000	**NK 9/12**	10.5	0.30	0.0100
9 $^{+0.022}_{+0.013}$	16	16	0.30	5,500	6,400	560	650	20,000	30,000	**NK 9/16**	10.5	0.30	0.0130
10 $^{+0.028}_{+0.013}$	17	12	0.30	4,550	5,100	460	520	19,000	28,000	**NK 10/12**	11.5	0.30	0.0100
10 $^{+0.028}_{+0.013}$	17	16	0.30	5,450	6,450	555	660	19,000	28,000	**NK 10/16**	11.5	0.30	0.0130
12 $^{+0.027}_{+0.016}$	19	12	0.30	5,000	6,100	510	620	17,000	26,000	**NK 12/12**	13.5	0.30	0.0130
12 $^{+0.027}_{+0.016}$	19	16	0.30	6,000	7,700	615	785	17,000	26,000	**NK 12/16**	13.5	0.30	0.0160
14 $^{+0.027}_{+0.016}$	22	16	0.30	10,300	11,500	1,050	1,170	16,000	24,000	**NK 14/16**	20.0	0.30	0.0210
14 $^{+0.027}_{+0.016}$	22	20	0.30	13,000	15,600	1,330	1,590	16,000	24,000	**NK 14/20**	20.0	0.30	0.0260
15 $^{+0.027}_{+0.016}$	23	16	0.30	10,900	12,700	1,110	1,290	15,000	23,000	**NK 15/16**	21.0	0.30	0.0220
15 $^{+0.027}_{+0.016}$	23	20	0.30	13,800	17,200	1,410	1,750	15,000	23,000	**NK 15/20**	21.0	0.30	0.0270
16 $^{+0.027}_{+0.016}$	24	16	0.30	12,200	14,900	1,240	1,520	15,000	23,000	**NK 16/16**	22.0	0.30	0.0220
16 $^{+0.027}_{+0.016}$	24	20	0.30	14,600	18,800	1,490	1,920	15,000	23,000	**NK 16/20**	22.0	0.30	0.0280
17 $^{+0.027}_{+0.016}$	25	16	0.30	12,100	15,000	1,240	1,530	15,000	22,000	**NK 17/16**	23.0	0.30	0.0240

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

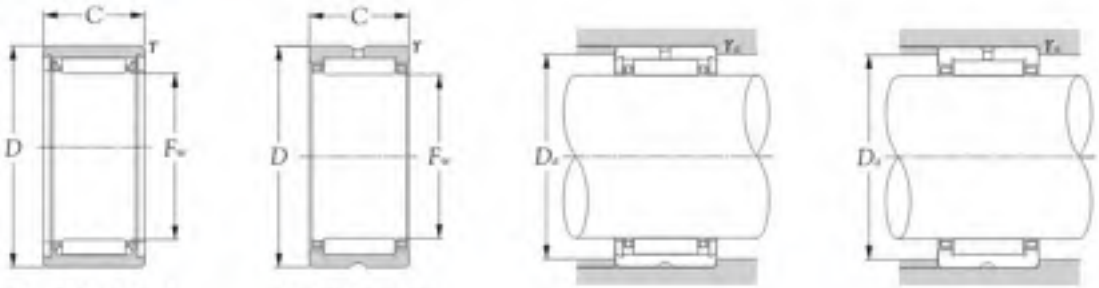
NEEDLE ROLLER BEARINGS

Remark:

Cages	Precision	Grease
Steel - √		
Polymid - X	Class 0 (JIS)	Nil
Brass - X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

MACHINED-RING NEEDLE ROLLER BEARINGS WITHOUT INNER RING
SERIES NK



Type NK (Fw≤12mm)　　Type NK (Fw≥14mm)

Boundary dimensions mm				Basic load ratings dynamic N		static	dynamic kgf	static	Limiting speeds rpm		Bearing numbers	Abutment dimensions mm		Mass kg.
F_w	D	C	r s min[1]	C_r	C_{or}		C_r	C_{or}	grease	oil		D_a max	r_{as} max	(approx.)
17 $^{+0.027}_{+0.016}$	25	20	0.3	15,400	20,400		1,570	2,080	15,000	22,000	**NK 17/20**	23	0.3	0.030
18 $^{+0.027}_{+0.016}$	26	16	0.3	12,700	16,200		1,300	1,650	14,000	21,000	**NK 18/16**	24	0.3	0.025
18 $^{+0.027}_{+0.016}$	26	20	0.3	16,100	22,000		1,640	2,250	14,000	21,000	**NK 18/20**	24	0.3	0.031
19 $^{+0.033}_{+0.020}$	27	16	0.3	13,300	17,400		1,350	1,780	14,000	21,000	**NK 19/16**	25	0.3	0.026
19 $^{+0.033}_{+0.020}$	27	20	0.3	16,000	22,200		1,630	2,260	14,000	21,000	**NK 19/20**	25	0.3	0.032
20 $^{+0.033}_{+0.020}$	28	16	0.3	13,200	17,500		1,340	1,790	13,000	20,000	**NK 20/16**	26	0.3	0.027
20 $^{+0.033}_{+0.020}$	28	20	0.3	16,700	23,800		1,700	2,420	13,000	20,000	**NK 20/20**	26	0.3	0.034
21 $^{+0.033}_{+0.020}$	29	16	0.3	13,700	18,700		1,400	1,910	13,000	19,000	**NK 21/16**	27	0.3	0.028
21 $^{+0.033}_{+0.020}$	29	20	0.3	18,300	27,100		1,860	2,760	13,000	19,000	**NK 21/20**	27	0.3	0.035
22 $^{+0.033}_{+0.020}$	30	16	0.3	14,200	19,900		1,450	2,030	12,000	18,000	**NK 22/16**	28	0.3	0.034
22 $^{+0.033}_{+0.020}$	30	20	0.3	18,000	27,000		1,840	2,760	12,000	18,000	**NK 22/20**	28	0.3	0.037
24 $^{+0.033}_{+0.020}$	32	16	0.3	15,200	22,300		1,550	2,280	11,000	17,000	**NK 24/16**	30	0.3	0.032
24 $^{+0.033}_{+0.020}$	32	20	0.3	18,600	28,800		1,890	2,930	11,000	17,000	**NK 24/20**	30	0.3	0.040
25 $^{+0.033}_{+0.020}$	33	16	0.3	15,100	22,400		1,540	2,280	11,000	16,000	**NK 25/16**	31	0.3	0.033
25 $^{+0.033}_{+0.020}$	33	20	0.3	19,200	30,500		1,960	3,100	11,000	16,000	**NK 25/20**	31	0.3	0.042
26 $^{+0.033}_{+0.020}$	34	16	0.3	15,600	23,600		1,590	2,410	10,000	15,000	**NK 26/16**	32	0.3	0.034
26 $^{+0.033}_{+0.020}$	34	20	0.3	19,100	30,500		1,940	3,100	10,000	15,000	**NK 26/20**	32	0.3	0.042
28 $^{+0.033}_{+0.020}$	37	20	0.3	22,300	34,000		2,280	3,450	9,500	14,000	**NK 28/20**	35	0.3	0.052
28 $^{+0.033}_{+0.020}$	37	30	0.3	26,700	48,000		2,720	4,900	9,500	14,000	**NK 28/30**	35	0.3	0.082
29 $^{+0.033}_{+0.020}$	38	20	0.3	22,200	34,000		2,270	3,450	9,500	14,000	**NK 29/20**	36	0.3	0.054
29 $^{+0.033}_{+0.020}$	38	30	0.3	27,500	50,500		2,810	5,150	9,500	14,000	**NK 29/30**	36	0.3	0.084

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

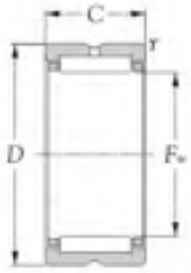
Remark:

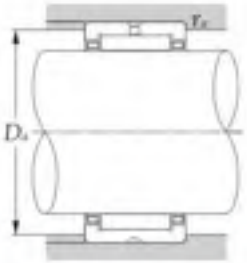
Cages	Precision	Grease
Steel -		
Polyamid - X		
Brass - X	Class 0 (JIS)	Nil

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

NEEDLE ROLLER BEARINGS

MACHINED-RING NEEDLE ROLLER BEARINGS WITHOUT INNER RING
SERIES NK





Type NK (Fw≥14mm)

Boundary dimensions mm				Basic load ratings dynamic N		dynamic kgf		Limiting speeds rpm		Bearing numbers	Abutment dimensions mm		Mass kg.
Fw	D	C	r1 min1)	Cr	Cor	Cr	Cor	grease	oil		Da max.	ras max.	(approx.)
30 +0.033 +0.020	40	20	0.3	22,100	34,000	2,260	3,500	8,500	13,000	NK 30/20	38	0.3	0.065
30 +0.033 +0.020	40	30	0.3	33,000	57,000	3,350	5,800	8,500	13,000	NK 30/30	38	0.3	0.098
32 +0.041 +0.025	42	20	0.3	23,500	37,500	2,400	3,850	8,500	13,000	NK 32/20	40	0.3	0.068
32 +0.041 +0.025	42	30	0.3	34,000	60,500	3,450	6,150	8,500	13,000	NK 32/30	40	0.3	0.102
35 +0.041 +0.025	45	20	0.3	24,800	41,500	2,520	4,250	7,500	11,000	NK 35/20	43	0.3	0.074
35 +0.041 +0.025	45	30	0.3	36,000	66,500	3,650	6,800	7,500	11,000	NK 35/30	43	0.3	0.112
37 +0.041 +0.025	47	20	0.3	25,300	43,500	2,580	4,400	7,500	11,000	NK 37/20	45	0.3	0.077
37 +0.041 +0.025	47	30	0.3	36,500	69,500	3,750	7,100	7,500	11,000	NK 37/30	45	0.3	0.107
38 +0.041 +0.025	48	20	0.3	25,900	45,000	2,640	4,600	7,500	11,000	NK 38/20	46	0.3	0.079
38 +0.041 +0.025	48	30	0.3	37,500	73,000	3,850	7,400	7,500	11,000	NK 38/30	46	0.3	0.107
40 +0.041 +0.025	50	20	0.3	26,400	47,000	2,700	4,800	6,500	10,000	NK 40/20	48	0.3	0.083
40 +0.041 +0.025	50	30	0.3	38,500	76,000	3,900	7,750	6,500	10,000	NK 40/30	48	0.3	0.125
42 +0.041 +0.025	52	20	0.3	26,900	49,000	2,750	5,000	6,500	9,500	NK 42/20	50	0.3	0.086
42 +0.041 +0.025	52	30	0.3	39,000	79,000	4,000	8,050	6,500	9,500	NK 42/30	50	0.3	0.130
43 +0.041 +0.025	53	20	0.3	27,500	51,000	2,810	5,200	6,500	9,500	NK 43/20	51	0.3	0.086
43 +0.041 +0.025	53	30	0.3	40,000	82,000	4,100	8,400	6,500	9,500	NK 43/30	51	0.3	0.133
45 +0.041 +0.025	55	20	0.3	28,000	52,500	2,860	5,400	6,000	9,000	NK 45/20	53	0.3	0.092
45 +0.041 +0.025	55	30	0.3	41,000	85,500	4,150	8,700	6,000	9,000	NK 45/30	53	0.3	0.139
47 +0.041 +0.025	57	20	0.3	28,800	55,500	2,940	5,650	5,500	8,500	NK 47/20	55	0.3	0.095
47 +0.041 +0.025	57	30	0.3	42,500	91,500	4,350	9,350	5,500	8,500	NK 47/30	55	0.3	0.142
50 +0.041 +0.025	62	25	0.6	38,500	74,500	3,950	7,550	5,500	8,000	NK 50/25	58	0.6	0.158

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

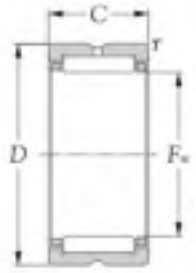
NEEDLE ROLLER BEARINGS

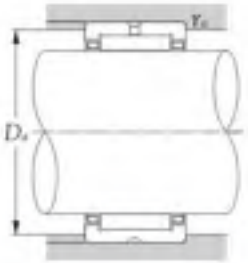
Remark:

Cages		Precision	Grease
Steel -	-/		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

MACHINED-RING NEEDLE ROLLER BEARINGS WITHOUT INNER RING
SERIES NK





Type NK (Fw ≥ 14mm)

Boundary dimensions mm				Basic load ratings dynamic N		static		Limiting speeds rpm		Bearing numbers	Abutment dimensions mm		Mass kg.
				dynamic		static kgf							
F_w	D	C	r_s min[1]	C_r	C_{or}	C_r	C_{or}	grease	oil		D_a max	r_{as} min	(approx.)
50 $^{+0.041}_{+0.025}$	62	35	0.6	51,000	106,000	5,200	10,800	5,500	8,000	**NK 50/35**	58	0.6	0.221
55 $^{+0.049}_{+0.030}$	68	25	0.6	41,000	82,000	4,150	8,400	5,000	7,500	**NK 55/25**	64	0.6	0.193
55 $^{+0.049}_{+0.030}$	68	35	0.6	54,000	118,000	5,500	12,000	5,000	7,500	**NK 55/35**	64	0.6	0.267
60 $^{+0.049}_{+0.030}$	72	25	0.6	41,000	85,000	4,200	8,700	4,300	6,500	**NK 60/25**	68	0.6	0.185
60 $^{+0.049}_{+0.030}$	72	35	0.6	57,000	130,000	5,800	13,200	4,300	6,500	**NK 60/35**	68	0.6	0.258
65 $^{+0.049}_{+0.030}$	78	25	0.6	45,000	98,000	4,550	10,000	4,000	6,000	**NK 65/25**	74	0.6	0.221
65 $^{+0.049}_{+0.030}$	78	35	0.6	60,000	142,000	6,100	14,400	4,000	6,000	**NK 65/35**	74	0.6	0.310
68 $^{+0.049}_{+0.030}$	82	25	1.0	44,500	89,000	4,500	9,050	4,000	6,000	**NK 68/25**	77	0.6	0.241
68 $^{+0.049}_{+0.030}$	82	35	0.6	63,000	139,000	6,400	14,200	4,000	6,000	**NK 68/35**	78	0.6	0.338
70 $^{+0.049}_{+0.030}$	85	25	0.6	45,000	91,500	4,600	9,350	3,700	5,500	**NK 70/25**	81	0.6	0.275
70 $^{+0.049}_{+0.030}$	85	35	0.6	64,000	144,000	6,550	14,700	3,700	5,500	**NK 70/35**	81	0.6	0.386
73 $^{+0.049}_{+0.030}$	90	25	0.6	54,000	100,000	5,500	10,200	3,700	5,500	**NK 73/25**	86	0.6	0.302
73 $^{+0.049}_{+0.030}$	90	35	0.6	76,500	156,000	7,800	16,000	3,700	5,500	**NK 73/35**	86	0.6	0.428
75 $^{+0.049}_{+0.030}$	92	25	0.6	55,000	104,000	5,600	10,600	3,700	5,500	**NK 75/25**	88	0.6	0.315
75 $^{+0.049}_{+0.030}$	92	35	0.6	78,000	162,000	7,950	16,500	3,700	5,500	**NK 75/35**	88	0.6	0.492
80 $^{+0.049}_{+0.030}$	95	25	1.0	57,000	119,000	5,800	12,200	3,300	5,000	**NK 80/25**	90	1.0	0.301
80 $^{+0.049}_{+0.030}$	95	35	1.0	79,500	184,000	8,150	18,700	3,300	5,000	**NK 80/35**	90	1.0	0.425
85 $^{+0.058}_{+0.036}$	105	25	1.0	70,500	123,000	7,200	12,600	3,100	4,700	**NK 85/25**	100	1.0	0.404
85 $^{+0.058}_{+0.036}$	105	35	1.0	100,000	193,000	10,200	19,700	3,100	4,700	**NK 85/35**	100	1.0	0.517
90 $^{+0.058}_{+0.036}$	110	25	1.0	71,500	128,000	7,300	13,100	2,900	4,400	**NK 90/25**	105	1.0	0.426
90 $^{+0.058}_{+0.036}$	110	35	1.0	104,000	208,000	10,600	21,200	2,900	4,400	**NK 90/35**	105	1.0	0.604

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

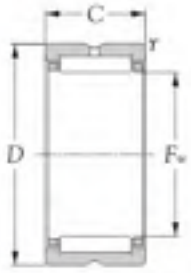
Remark:

Cages	Precision	Grease
Steel - √		
Polyamid - X	Class 0 (JIS)	Nil
Brass - X		

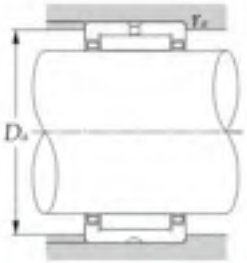
Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

NEEDLE ROLLER BEARINGS

MACHINED-RING NEEDLE ROLLER BEARINGS WITHOUT INNER RING
SERIES NK



Type NK (Fw≥14mm)



NEEDLE ROLLER BEARINGS

Boundary dimensions mm				Basic load ratings dynamic N		static		Limiting speeds rpm		Bearing numbers	Abutment dimensions mm		Mass kg(s).
				dynamic		static							
Fw	D	C	r1 min1)	Cr	C0r	Cr	C0r	grease	oil		Da max	ra1 max	(approx.)
95 +0.058 +0.036	115	26	1.0	74,500	137,000	7,600	14,000	2,800	4,200	NK 95/26	110.0	1.0	0.364
95 +0.058 +0.036	115	36	1.0	108,000	223,000	11,100	22,700	2,800	4,200	NK 95/36	110.0	1.0	0.652
100 +0.058 +0.036	120	26	1.0	73,500	137,000	7,500	14,000	2,700	4,000	NK 100/26	115.0	1.0	0.487
100 +0.058 +0.036	120	36	1.0	107,000	223,000	11,000	22,800	2,700	4,000	NK 100/36	115.0	1.0	0.679
105 +0.058 +0.036	125	26	1.0	76,500	147,000	7,800	14,900	2,500	3,800	NK 105/26	120.0	1.0	0.506
105 +0.058 +0.036	125	36	1.0	111,000	238,000	11,400	24,300	2,500	3,800	NK 105/36	120.0	1.0	0.713
110 +0.058 +0.036	130	30	1.1	97,500	204,000	9,950	20,800	2,400	3,600	NK 110/30	123.5	1.0	0.612
110 +0.058 +0.036	130	40	1.1	129,000	292,000	13,100	29,700	2,400	3,600	NK 110/40	123.5	1.0	0.830
120 +0.058 +0.036	140	40	1.1	113,000	268,000	11,500	27,300	2,200	3,300	NK 120/40	133.5	1.0	0.910
130 +0.068 +0.043	150	40	1.1	116,000	283,000	11,800	28,800	2,100	3,100	NK 130/40	143.5	1.0	0.980
145 +0.068 +0.043	170	32	1.5	111,000	238,000	11,300	24,300	1,900	2,800	NK 145/32	162.5	1.5	1.120
145 +0.068 +0.043	170	42	1.5	153,000	360,000	15,600	36,500	1,900	2,800	NK 145/42	162.5	1.5	1.490
155 +0.068 +0.043	180	32	1.5	114,000	252,000	11,600	25,700	1,700	2,600	NK 155/32	172.0	1.5	1.200
155 +0.068 +0.043	180	42	1.5	156,000	380,000	16,000	38,500	1,700	2,600	NK 155/42	172.0	1.5	1.590
165 +0.068 +0.043	190	32	1.5	117,000	265,000	11,900	27,000	1,600	2,400	NK 165/32	182.0	1.5	1.420
165 +0.068 +0.043	190	42	1.5	160,000	400,000	16,300	40,500	1,600	2,400	NK 165/42	182.0	1.5	1.660

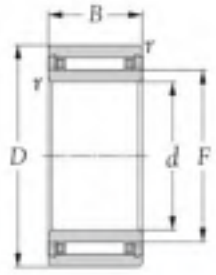
Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

MACHINED-RING NEEDLE ROLLER BEARINGS WITH INNER RING
SERIES **NKI**



Boundary dimensions mm					Basic load ratings dynamic / static N		Limiting speed rpm	Bearing numbers	Mass kg.
d	F	D	B	r) min	C_r	C_{or}	oil		(approx.)
5	8	15	12	0.3	3,950	4,100	32,000	**NKI 5/12 TN**	0.012
5	8	15	16	0.3	5,100	5,800	32,000	**NKI 5/16 TN**	0.015
6	9	16	12	0.3	4,500	5,000	31,000	**NKI 6/12 TN**	0.014
6	9	16	16	0.3	5,900	7,100	31,000	**NKI 6/16 TN**	0.018
7	10	17	12	0.3	4,750	5,500	29,000	**NKI 7/12 TN**	0.014
7	10	17	16	0.3	6,200	7,800	29,000	**NKI 7/16 TN**	0.018
9	12	19	12	0.3	6,400	7,100	27,000	**NKI 9/12**	0.017
9	12	19	16	0.3	9,000	11,000	27,000	**NKI 9/16**	0.022
10	14	22	16	0.3	10,100	11,500	25,000	**NKI 10/16**	0.029
10	14	22	20	0.3	12,800	15,600	25,000	**NKI 10/20**	0.037
12	16	24	16	0.3	11,300	13,900	23,000	**NKI 12/16**	0.033
12	16	24	20	0.3	14,400	18,800	23,000	**NKI 12/20**	0.042
15	19	27	16	0.3	13,000	17,400	22,000	**NKI 15/16**	0.039
15	19	27	20	0.3	16,500	23,600	22,000	**NKI 15/20**	0.049
17	21	29	16	0.3	13,500	18,700	21,000	**NKI 17/16**	0.043
17	21	29	20	0.3	17,100	25,500	21,000	**NKI 17/20**	0.054
20	24	32	16	0.3	15,000	22,300	18,000	**NKI 20/16**	0.049
20	24	32	20	0.3	19,000	30,500	18,000	**NKI 20/20**	0.061
22	26	34	16	0.3	15,300	23,600	17,000	**NKI 22/16**	0.052
22	26	34	20	0.3	19,400	32,000	17,000	**NKI 22/20**	0.065
25	29	38	20	0.3	21,900	34,000	15,000	**NKI 25/20**	0.080

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

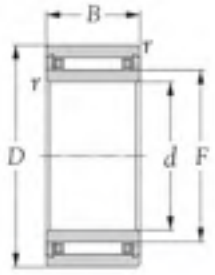
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

NEEDLE ROLLER BEARINGS

MACHINED-RING NEEDLE ROLLER BEARINGS WITH INNER RING
SERIES **NKI**



NEEDLE ROLLER BEARINGS

Boundary dimensions mm					Basic load ratings dynamic / static N		Limiting speed rpm	Bearing numbers	Mass kg.
d	F	D	B	r_s min[1]	C_r	C_{or}	oil		(approx.)
25	29	38	30	0.3	32,500	57,000	15,000	**NKI 25/30**	0.120
28	32	42	20	0.3	23,100	37,500	14,000	**NKI 28/20**	0.097
28	32	42	30	0.3	34,500	63,000	14,000	**NKI 28/30**	0.150
30	35	45	20	0.3	24,300	41,500	13,000	**NKI 30/20**	0.110
30	35	45	30	0.3	36,500	69,000	13,000	**NKI 30/30**	0.170
32	37	47	20	0.3	24,900	43,500	12,000	**NKI 32/20**	0.120
32	37	47	30	0.3	37,000	73,000	12,000	**NKI 32/30**	0.180
35	40	50	20	0.3	26,000	47,000	11,000	**NKI 35/20**	0.130
35	40	50	30	0.3	39,000	79,000	11,000	**NKI 35/30**	0.190
38	43	53	20	0.3	27,000	51,000	11,000	**NKI 38/20**	0.140
38	43	53	30	0.3	40,500	85,000	11,000	**NKI 38/30**	0.210
40	45	55	20	0.3	27,500	53,000	10,000	**NKI 40/20**	0.140
40	45	55	30	0.3	41,000	88,000	10,000	**NKI 40/30**	0.220
42	47	57	20	0.3	28,500	56,000	10,000	**NKI 42/20**	0.150
42	47	57	30	0.3	43,000	94,000	10,000	**NKI 42/30**	0.220
45	50	62	25	0.6	38,000	74,000	9,000	**NKI 45/25**	0.230
45	50	62	35	0.6	50,000	106,000	9,000	**NKI 45/35**	0.320
50	55	68	25	0.6	40,000	82,000	8,500	**NKI 50/25**	0.270
50	55	68	35	0.6	53,000	118,000	8,500	**NKI 50/35**	0.380
55	60	72	25	0.6	42,000	90,000	7,500	**NKI 55/25**	0.270
55	60	72	35	0.6	56,000	130,000	7,500	**NKI 55/35**	0.380

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

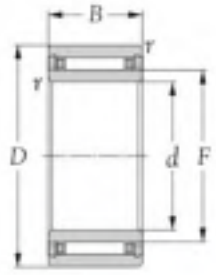
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

MACHINED-RING NEEDLE ROLLER BEARINGS WITH INNER RING

SERIES **NKI**



Boundary dimensions mm					Basic load ratings dynamic / static N		Limiting speed rpm	Bearing numbers	Mass kg(s).
d	F	D	B	r_s min[1]	C_r	C_{or}	oil		(approx.)
60	68	82	25	0.6	43,500	89,000	7,000	**NKI 60/25**	0.400
60	68	82	35	0.6	62,000	139,000	7,000	**NKI 60/35**	0.550
65	73	90	25	1.0	53,000	100,000	6,500	**NKI 65/25**	0.470
65	73	90	35	1.0	75,000	156,000	6,500	**NKI 65/35**	0.660
70	80	95	25	1.0	56,000	119,000	6,000	**NKI 70/25**	0.520
70	80	95	35	1.0	78,000	184,000	6,000	**NKI 70/35**	0.740
75	85	105	25	1.0	69,000	123,000	5,500	**NKI 75/25**	0.640
75	85	105	35	1.0	98,000	193,000	5,500	**NKI 75/35**	0.910
80	90	110	25	1.0	72,000	132,000	5,000	**NKI 80/25**	0.680
80	90	110	35	1.0	103,000	208,000	5,000	**NKI 80/35**	0.960
85	95	115	26	1.0	73,000	137,000	4,800	**NKI 85/26**	0.750
85	95	115	36	1.0	107,000	223,000	4,800	**NKI 85/36**	1.050
90	100	1320	26	1.0	76,000	146,000	4,600	**NKI 90/26**	0.780
90	100	120	36	1.0	111,000	237,000	4,600	**NKI 90/36**	1.100
95	105	125	26	1.0	78,000	155,000	4,400	**NKI 95/26**	0.820
95	105	125	36	1.0	114,000	250,000	4,400	**NKI 95/36**	1.150
100	110	130	30	1.1	98,000	210,000	4,200	**NKI 100/30**	1.000
100	110	130	40	1.1	127,000	290,000	4,200	**NKI 100/40**	1.350

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

NEEDLE ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	√		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

NEEDLE ROLLER
BEARINGS

NOTE

NIKO

Thrust roller bearings

Needle Roller Bearings

Souvenirs

1. Types and designs

NIKO Roller and Cage Thrust Assemblies are available in the series AXK, which has needle rollers; and in series K811, K812, each of which incorporates cylindrical rollers. Each pocket of the series K811 and K812 has a single row of cylindrical rollers.
Series AXK bearings, which have needle rollers, use a pressed-steel cage. Series K811,and K812 they can optionally employ a pressed-steel cage or a cage of molded polyamide reinforced with glass fiber or carbon fiber (suffix T2). The T2 cage features a maximum allowable operating temperature of 120°C and maximum allowable continuous operating temperature of 100°C .
The bearing washers for NIKO Thrust Roller Bearings are available in an AS model made of surface-hardened 1 mm-thick steel plate, and in WS and GS models, which are machined types.
The AS model can be used on either the shaft or housing side. This bearing washer, however, requires that the adjacent mechanical components have sufficient rigidity and good form accuracy. Before being mounted, the bearing washer may remain somewhat warped. This phenomenon should not be regarded as a problem because the warpage will be eliminated once a predetermined level of thrust load is exerted on the washer.
The bore of the WS model is fitted to a shaft, and the outside surface of the GS model is fitted to a housing.
Both models therefore provide the bearings with greater rigidity and higher running accuracy.
Bearing models 811, 812 are formed by respectively combining the roller and cage thrust assemblies of models K811 and K812 with the associated model WS or GS bearing washer. They are standard series bearings whose dimension series, specified in JIS B 1512 (ISO 104) (Boundary dimensions for rolling bearings), are 11, 12, and 93, respectively.

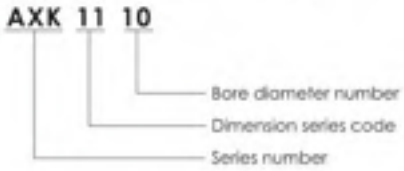
NEEDLE ROLLER BEARINGS

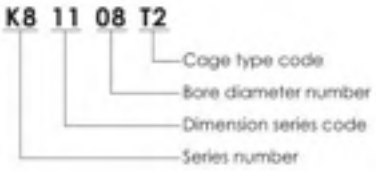
Fig. 1 Series AXK Fig. 2 Series K811, K812 Fig. 3 Series AS11 Fig. 4 Series WS11 Fig. 5 Series GS11

2. Interpreting bearing numbers

The bearing numbers of NIKO Roller and Cage Thrust Assemblies, Bearing Rings, and Thrust Roller Bearings comprise a series number, dimension series code, bore diameter number, and suffix.

Roller and cage thrust assembly





Bearing washer

3. Bearing tolerance

The dimensional accuracy, form accuracy, and running accuracy of series 811, 812 thrust cylindrical roller bearings are given in " earing Tolerances," The bore (Del) of rollerand cage thrust assemblies (series AXK, K811, K812) is machined to a tolerance of E11 (or E12 for bearings having a suffix T2). The outside surface (Dc) of the series AXK is machined to a tolerance of c12, while those of the series K811, K812 are machined to a tolerance of a13.

4. Raceway surface requirements

When the shaft and housing are used as a raceway for arollerand cage thrust assembly, the raceway should satisfy the requirements in Table 1.

Table 1 Raceway requirements

Characteristics	Requirement
Squareness (max.)	IT6 (IT4)
Surface roughness	0.4a
Surface hardness	HRC58~64

5. Bearing washer fits

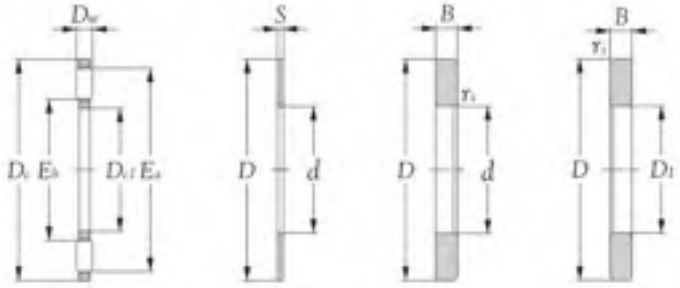
The fits of the shafts and housing that mount the thrust bearing washers (AS, WS, and GS models) are given in Table 2 below.

Table 2 Raceway requirements

Bearing washer	Shaft	Housing
Series AS	h10	H11
Series WS	h6	—
Series GS	—	H7

NEEDLE ROLLER BEARINGS

THRUST NEEDLE ROLLER BEARINGS
SERIES AXK, AS, WS, GS



Type AXK | Type AS | Type WS | Type GS

NEEDLE ROLLER BEARINGS

Boundary dimensions mm												Bearing numbers			
D_{c1}	D_c	D_w	D_p	D_{p1}	$S^{1)}$	d	d_c	D	D_1	B	r_3 min.$^{1)}$	Thrust needle roller and cage assembly (consistent with cylindrical)	Washer	Inner ring	Outer ring
10	24	2	24	10	1	10	24	24	10	2.75	0.3	AXK 1100	AS 1100	WS 1100	GS 1100
12	26	2	26	12	1	12	26	26	12	2.75	0.3	AXK 1101	AS 1101	WS 1101	GS 1101
15	28	2	28	15	1	15	28	28	16	2.75	0.3	AXK 1102	AS 1102	WS 1102	GS 1102
17	30	2	30	17	1	17	30	30	18	2.75	0.3	AXK 1103	AS 1103	WS 1103	GS 1103
20	35	2	35	20	1	20	35	35	21	2.75	0.3	AXK 1104	AS 1104	WS 1104	GS 1104
25	42	2	42	25	1	25	42	42	26	3.00	0.6	AXK 1105	AS 1105	WS 1105	GS 1105
30	47	2	47	30	1	30	47	47	32	3.00	0.6	AXK 1106	AS 1106	WS 1106	GS 1106
35	52	2	52	35	1	35	52	52	37	3.50	0.6	AXK 1107	AS 1107	WS 1107	GS 1107
40	60	3	60	40	1	40	60	60	42	3.50	0.6	AXK 1108	AS 1108	WS 1108	GS 1108
45	65	3	65	45	1	45	65	65	47	4.00	0.6	AXK 1109	AS 1109	WS 1109	GS 1109
50	70	3	70	50	1	50	70	70	52	4.00	0.6	AXK 1110	AS 1110	WS 1110	GS 1110
55	78	3	78	55	1	55	78	78	57	5.00	0.6	AXK 1111	AS 1111	WS 1111	GS 1111
60	85	3	85	60	1	60	85	85	62	4.75	1.0	AXK 1112	AS 1112	WS 1112	GS 1112
65	90	3	90	65	1	65	90	90	67	5.25	1.0	AXK 1113	AS 1113	WS 1113	GS 1113
70	95	4	95	70	1	70	95	95	72	5.25	1.0	AXK 1114	AS 1114	WS 1114	GS 1114
75	100	4	100	75	1	75	100	100	77	5.75	1.0	AXK 1115	AS 1115	WS 1115	GS 1115
80	105	4	105	80	1	80	105	105	82	5.75	1.0	AXK 1116	AS 1116	WS 1116	GS 1116
85	110	4	110	85	1	85	110	110	87	5.75	1.0	AXK 1117	AS 1117	WS 1117	GS 1117
90	120	4	120	90	1	90	120	120	92	6.50	1.0	AXK 1118	AS 1118	WS 1118	GS 1118
100	135	4	135	100	1	100	135	135	102	7.00	1.0	AXK 1120	AS 1120	WS 1120	GS 1120
110	145	4	145	110	1	110	145	145	112	7.00	1.0	AXK 1122	AS 1122	WS 1122	GS 1122

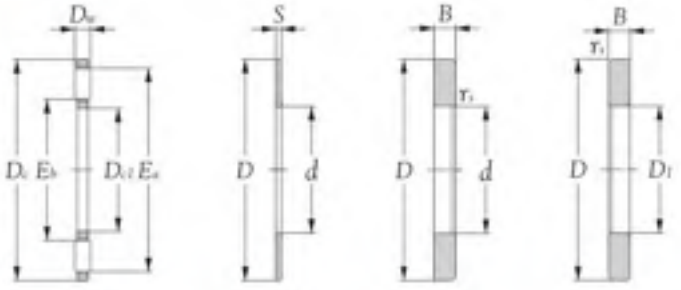
Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.
2) Measured axial load is more than 20kgf.

Remark:

Cages	Precision	Grease
Steel - √		
Polyamid - X	Class 0 (JIS)	Nil
Brass - X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshabearings.com

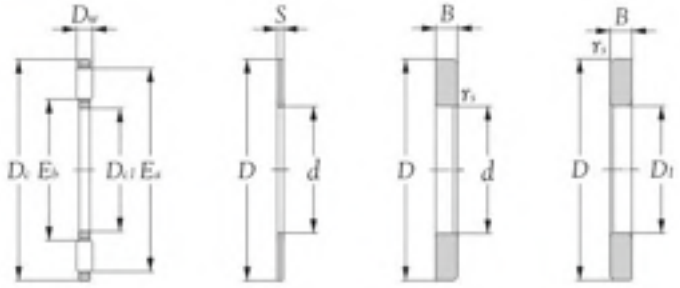
THRUST NEEDLE ROLLER BEARINGS
SERIES **AXK, AS, WS, GS**



Basic load ratings dynamic N	Basic load ratings static N	Basic load ratings dynamic kgf	Basic load ratings static kgf	Limiting speeds rpm		Reference dimensions mm		Mass kg. (approx.)		
C_a	C_{0a}	C_a	C_{0a}	grease	oil	E_b	E_a	AXK11	AS11	WS811 GS811
9,150	25,300	935	2,580	3,500	14,000	11	21	0.0028	0.0030	0.008
9,850	28,900	1,010	2,940	3,300	13,000	13	23	0.0030	0.0033	0.009
11,300	36,000	1,150	3,700	2,800	11,000	17	27	0.0035	0.0035	0.010
11,900	39,500	1,220	4,050	2,500	10,000	19	29	0.0040	0.0038	0.011
13,200	46,500	1,340	4,750	2,100	8,500	22	34	0.0050	0.0051	0.014
14,600	58,000	1,490	5,900	1,800	7,000	29	41	0.0070	0.0070	0.021
16,300	69,500	1,660	7,100	1,500	6,000	35	46	0.0080	0.0080	0.025
17,800	81,500	1,820	8,300	1,400	5,500	40	51	0.0010	0.0091	0.033
27,400	110,000	2,790	11,300	1,200	4,700	45	58	0.0185	0.0123	0.044
29,800	128,000	3,050	13,100	1,100	4,300	50	63	0.0205	0.0136	0.055
31,500	143,000	3,250	14,500	1,000	3,900	55	68	0.0235	0.0148	0.060
38,000	186,000	3,850	19,000	900	3,500	60	76	0.0308	0.0189	0.095
44,500	234,000	4,550	23,900	800	3,200	65	83	0.0390	0.0223	0.101
46,500	254,000	4,750	25,900	750	3,000	70	88	0.0400	0.0239	0.125
53,500	253,000	5,500	25,800	750	2,900	74	93	0.0600	0.0254	0.134
55,000	266,000	5,650	27,100	700	2,700	79	98	0.0610	0.0270	0.155
56,500	279,000	5,750	28,400	650	2,600	84	103	0.0630	0.0284	0.163
57,500	291,000	5,900	29,700	600	2,400	89	108	0.0668	0.0301	0.175
71,000	390,000	7,250	39,500	600	2,300	94	118	0.0860	0.0388	0.250
90,500	550,000	9,200	56,500	500	2,000	105	133	0.1120	0.0505	0.350
93,500	590,000	9,550	60,500	480	1,900	115	143	0.1220	0.0549	0.385

NEEDLE ROLLER BEARINGS

THRUST NEEDLE ROLLER BEARINGS
SERIES AXK, AS, WS, GS



Type AXK | Type AS | Type WS | Type GS

Boundary dimensions mm												Bearing numbers			
D_{c1} E17	D_c C12	D_w 0 -0.01	D_p e13	D_{p1} E12	$S^{1)}$ ±0.15	d	d_1 -0.2 -0.5	D	D_1 +0.5 +0.2	B	r_3 min.	Thrust needle roller and cage assembly (consistent with cylindrical)	Washer	Inner ring	Outer ring
120	155	4	155	120	1	120	155	155	122	7.00 0 -0.090	1	**AXK 1124**	**AS 1124**	**WS 1124**	**GS 1124**
130	170	5	170	130	1	130	170	170	132	9.00 0 -0.090	1	**AXK 1126**	**AS 1126**	**WS 1126**	**GS 1126**
140	180	5	180	140	1	140	178	180	142	9.50 0 -0.090	1	**AXK 1128**	**AS 1128**	**WS 1128**	**GS 1128**
150	190	5	190	150	1	150	188	190	152	9.50 0 -0.090	1	**AXK 1130**	**AS 1130**	**WS 1130**	**GS 1130**
160	200	5	200	160	1	160	198	200	162	9.50 0 -0.090	1	**AXK 1132**	**AS 1132**	**WS 1132**	**GS 1132**

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.
2) Measured axial load is more than 20kgf.

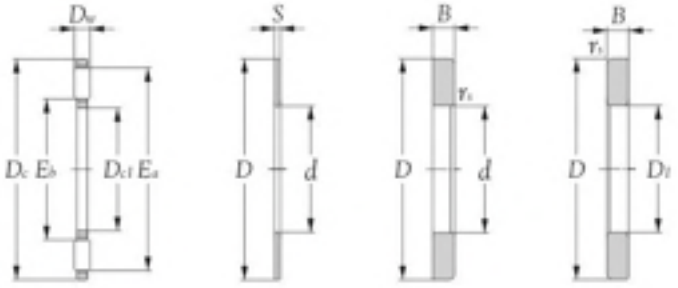
NEEDLE ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

THRUST NEEDLE ROLLER BEARINGS
SERIES **AXK, AS, WS, GS**



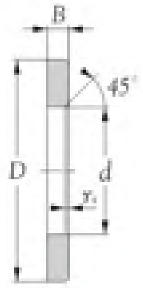
Type AXK | Type AS | Type WS | Type GS

Basic load ratings dynamic N		static		Limiting speeds rpm		Reference dimensions mm		Mass kg. (approx.)		
		dynamic kgf	static							
C_a	C_{0a}	C_a	C_{0a}	grease	oil	E_b	E_a	AXK11	AS11	WS811 GS811
99,000	650,000	10,100	66,500	430	1,700	125	153	0.1310	0.0592	0.415
140,000	900,000	14,300	92,000	400	1,600	136	167	0.2050	0.0740	0.663
145,000	960,000	14,800	97,500	380	1,500	146	177	0.2190	0.0790	0.749
149,000	1,020,000	15,200	104,000	350	1,400	156	187	0.2320	0.0840	0.796
154,000	1,070,000	15,700	110,000	330	1,300	166	197	0.2460	0.0890	0.842

NEEDLE ROLLER BEARINGS

THRUST NEEDLE ROLLER BEARINGS

SERIES **LS**



NEEDLE ROLLER BEARINGS

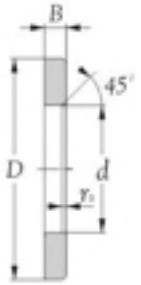
Boundary dimensions mm				Roll path size		Basic load ratings dynamic static N		Limiting speed Н grease ≈ min⁻¹	Bearing numbers
d	D	B	r_s min.	E_b	E_a	C_r	C_{or}	min^{-1}	
6	19	2.75	0.3	7	18	6,800	15,500	16,000	**LS 0619**
8	21	2.75	0.3	9	20	7,800	19,400	15,000	**LS 0821**
10	24	2.75	0.3	12	23	9,200	25,500	14,000	**LS 1024**
12	26	2.75	0.3	14	25	9,900	29,000	13,000	**LS 1226**
15	28	2.75	0.3	17	27	11,300	36,000	11,000	**LS 1528**
17	30	2.75	0.3	19	29	11,900	39,500	10,000	**LS 1730**
20	35	2.75	0.3	22	34	13,100	46,500	8,500	**LS 2035**
25	42	3.00	0.6	29	41	14,700	58,000	7,000	**LS 2542**
30	47	3.00	0.6	34	46	16,300	70,000	6,000	**LS 3047**
35	52	3.50	0.6	39	51	17,800	81,000	5,500	**LS 3552**
40	60	3.50	0.6	45	58	28,000	114,000	4,700	**LS 4060**
45	65	4.00	0.6	50	63	30,000	128,000	4,300	**LS 4565**
50	70	4.00	0.6	55	68	32,000	143,000	3,900	**LS 5070**
55	78	5.00	0.6	60	76	38,000	186,000	3,500	**LS 5578**
60	85	4.75	1.0	65	83	44,500	234,000	3,200	**LS 6085**
65	90	5.25	1.0	70	88	46,500	255,000	3,000	**LS 6090**
70	95	5.25	1.0	74	93	54,000	255,000	2,900	**LS 7095**
75	100	5.75	1.0	79	98	55,000	265,000	2,700	**LS 75100**
80	105	5.75	1.0	84	103	56,000	280,000	2,600	**LS 80105**
85	110	5.75	1.0	89	108	58,000	290,000	2,400	**LS 85110**
90	120	6.50	1.0	94	118	73,000	405,000	2,300	**LS 90120**

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire
NIKO web-site: Http://www.nippenkodobearings.com

Thrust needle roller bearings
series LS



Boundary dimensions mm				Roll path size		Basic load ratings dynamic / static N		Limiting speed n grease min⁻¹	Bearing numbers
d	D	B	r1 min.	Eb	Ea	Cr	Cor		
100	135	7.00	1	105	133	91,000	560,000	2,000	**LS 100135**
110	145	7.00	1	115	143	97,000	620,000	1,900	**LS 110145**

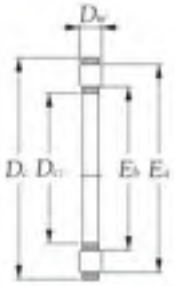
Needle Roller Bearings

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

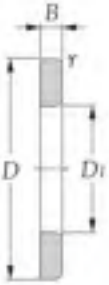
Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

THRUST NEEDLE ROLLER BEARINGS
SERIES K 811



Type K 811

Type WS
(Inner ring)



Type GS
(Outer ring)

Boundary dimensions mm			Reference dimensions mm		Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Limiting speeds rpm		Bearing numbers			Mass kg.
D_{c1} [1]	D_c	D_w	E_b	E_a	C_r	C_{or}	C_r	C_{or}	grease	oil	Thrust needle roller and cage assembly	Inner ring	Outer ring	(approx.)
10	24	3.5	12	23	10,800	21,500	1,110	2,190	3,400	13,000	K 81100	WS 81100	GS 81100	0.0035
12	26	3.5	14	25	11,500	23,900	1,170	2,430	3,000	12,000	K 81101	WS 81101	GS 81101	0.0040
15	28	3.5	16	27	12,900	28,600	1,310	2,920	2,800	11,000	K 81102	WS 81102	GS 81102	0.0060
17	30	3.5	18	29	13,400	31,000	1,370	3,150	2,500	10,000	K 81103	WS 81103	GS 81103	0.0080
20	35	4.5	21	34	20,200	46,500	2,060	4,700	2,100	8,500	K 81104	WS 81104	GS 81104	0.0120
25	42	5.0	27	40	27,300	68,000	2,780	6,900	1,800	7,000	K 81105	WS 81105	GS 81105	0.0180
30	47	5.0	32	45	27,800	72,500	2,840	7,400	1,500	6,000	K 81106	WS 81106	GS 81106	0.0200
35	52	5.0	37	50	31,000	87,000	3,150	8,900	1,400	5,500	K 81107	WS 81107	GS 81107	0.0240
40	60	6.0	42	58	43,000	121,000	4,350	12,400	1,200	4,800	K 81108	WS 81108	GS 81108	0.0350
45	65	6.0	47	63	45,500	135,000	4,650	13,800	1,100	4,400	K 81109	WS 81109	GS 81109	0.0400
50	70	6.0	52	68	48,000	150,000	4,900	15,300	1,000	4,000	K 81110	WS 81110	GS 81110	0.0450
55	78	6.0	57	76	62,500	215,000	6,350	21,900	900	3,600	K 81111	WS 81111	GS 81111	0.0600
60	85	7.5	63	82	69,000	215,000	7,000	21,900	830	3,300	K 81112	WS 81112	GS 81112	0.0830
65	90	7.5	68	87	73,000	236,000	7,400	24,100	780	3,100	K 81113	WS 81113	GS 81113	0.0900
70	95	7.5	73	92	76,500	257,000	7,800	26,200	730	2,900	K 81114	WS 81114	GS 81114	0.0970
75	100	7.5	78	97	78,000	268,000	7,950	27,300	680	2,700	K 81115	WS 81115	GS 81115	0.1150
80	105	7.5	83	102	79,500	279,000	8,100	28,400	650	2,600	K 81116	WS 81116	GS 81116	0.1190
85	110	7.5	88	107	83,000	300,000	8,450	30,500	630	2,500	K 81117	WS 81117	GS 81117	0.1250
90	120	9.0	93	117	112,000	395,000	11,400	40,500	580	2,300	K 81118	WS 81118	GS 81118	0.1700

Notes: 1) The dimensional tolerance for a bearing with a T2 suffix is E12.

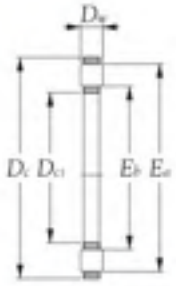
NEEDLE ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

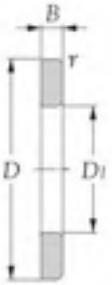
Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

THRUST NEEDLE ROLLER BEARINGS
SERIES K 812



Type K 812

Type WS
(Inner ring)



Type GS
(Outer ring)

Boundary dimensions mm			Reference dimensions mm		Basic load ratings dynamic N		static N		dynamic kgf		static kgf		Limiting speeds rpm		Bearing numbers			Mass kg.
D_{c1} [1]	D_c	D_w	E_b	E_a	C_r		C_{or}		C_r		C_{or}		grease	oil	Thrust needle roller and cage assembly	Inner ring	Outer ring	(approx.)
30	52	7.5	32	50	53,500		129,000		5,450		13,100		1,500	6,000	K 81206	WS 81206	GS 81206	0.050
35	62	7.5	37	60	54,500		139,000		5,550		14,200		1,200	4,900	K 81207	WS 81207	GS 81207	0.065
40	68	9.0	43	66	74,500		190,000		7,600		19,400		1,100	4,400	K 81208	WS 81208	GS 81208	0.085
45	73	9.0	48	71	82,000		222,000		8,350		22,600		1,000	4,100	K 81209	WS 81209	GS 81209	0.100
50	78	9.0	53	76	85,000		238,000		8,650		24,200		950	3,800	K 81210	WS 81210	GS 81210	0.105
55	90	11.0	58	87	121,000		340,000		12,300		34,500		830	3,300	K 81211	WS 81211	GS 81211	0.190
60	95	11.0	64	92	125,000		365,000		12,800		37,000		780	3,100	K 81212	WS 81212	GS 81212	0.200
65	100	11.0	69	97	130,000		385,000		13,200		39,500		730	2,900	K 81213	WS 81213	GS 81213	0.215
70	105	11.0	74	102	134,000		410,000		13,700		42,000		680	2,700	K 81214	WS 81214	GS 81214	0.225
75	110	11.0	79	107	138,000		435,000		14,100		44,500		650	2,600	K 81215	WS 81215	GS 81215	0.240
80	115	11.0	84	112	142,000		460,000		14,500		47,000		630	2,500	K 81216	WS 81216	GS 81216	0.250

Notes: 1) The dimensional tolerance for a bearing with a T2 suffix is E12.

NEEDLE ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

NEEDLE ROLLER
BEARINGS

NOTE

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COMPLEX BEARINGS

NEEDLE ROLLER BEARINGS

SOUVENIRS

1. Types and designs

Depending on the thrust bearing type that is combined with a radial needle roller bearing, NIKO Complex Bearings can be categorized as thrust ball bearings (series NKX), thrust cylindrical roller bearings (series NKXR). The series NKX and NKXR complex bearings can carry a relatively large axial load in one direction and can be axially located.
When used in opposing pairs, they can bear an axial load in both directions and can be axially located. However, because they cannot accommodate a greater axial expansion, they should be mounted on a shorter shaft whose axial expansion is small.
The variant with a dust-proofing cover on its thrust bearing (suffix Z) is easily handled because the thrust bearing is a non-separable type. This arrangement can also prevent splashing of the grease within the thrust bearing.
Generally, radial needle roller bearings in these complex bearings use a shaft as a raceway surface, without using an inner ring. However, they can incorporate an inner ring when a shaft is inappropriate as a raceway surface.
The tolerance class of the inscribed enveloping circle diameter (Fw) with needle roller bearings is class F6, the same as with machined ring needle roller bearings.

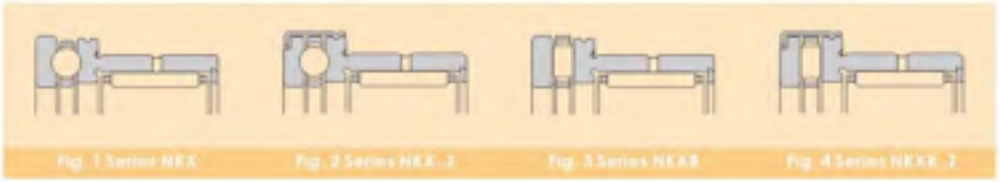


Fig. 1 Series NKX　Fig. 2 Series NKX...Z　Fig. 3 Series NKXR　Fig. 4 Series NKXR...Z

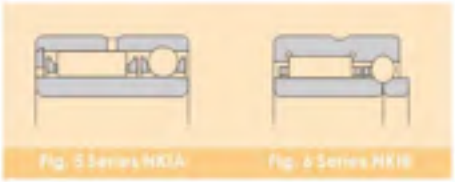


Fig. 5 Series NKIA　Fig. 6 Series NKIB

2. Interpreting bearing numbers

The bearing numbers of NIKO Complex Bearings comprise a series number, dimension series code, Dimension code, and suffix.

Series NKX, NKXR

NKX 20 Z

- Z — Dust proof cover code
- 20 — Dimension code (dimension Fw)
- NKX — Series number

Series NKIA, NKIB

NKIA 59 02

- 02 — Bore diameter number
- 59 — Dimension series code
- NKIA — Series number

3. Bearing fits

Table 1 summarizes the fits of radial needle roller bearings to a shaft and housing. The thrust bearing washers of series NKX and NKXR bearings are installed in a housing whose bore diameter is at least 0.5 mm larger than the outside diameter D1 or D2 of the bearing washer.

Table 1 Fit to shaft and housing

Bearing number	Shaft	Housing
Series NKX,NKXR	k5	K6(M6)
Series NKIA,NKIB	k5	M6

Remarks: Fits appearing in parentheses are for applications requiring greater rigidity.

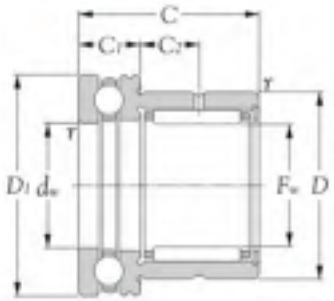
4. Rating life calculation

The rating life (L) of a complex bearings can be determined by inputting the results of the following calculations into the formula below:
Calculate the rating life (Lr) of the radial needle roller bearing according to the working radial load.
Calculate the rating life (La) of the thrust bearing according to the working axial load.

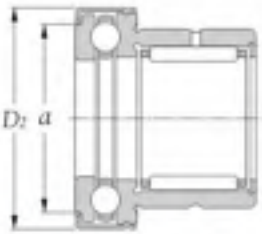
$$L = \frac{1}{\left(\frac{1}{Lr^{1.1}} + \frac{1}{La^{1.1}}\right)^{0.91}} \quad \cdots\cdots\cdots\cdots\cdots\cdots (1)$$

NEEDLE ROLLER BEARINGS

NEEDLE ROLLER BEARINGS WITH THRUST BALL BEARINGS
SERIES **NKX, NKX..Z**



Type NKX
(Open type)



Type NKX..Z
(With cover)

Boundary dimensions mm										Basic load ratings dynamic static N		dynamic static kgf		Bearing numbers	
F_w	d_w	D	D_1	D_2	C	C_1	C_2	a	r_s min[1]	Radial C_r	C_{or}	C_r	C_{or}		
10	10	19	24	25.0	23	9	6.5	19.7	0.3	5,450	6,450	555	660	NKX 10 T2	NKX 10 T2Z
12	12	21	26	27.0	23	9	6.5	21.7	0.3	6,000	7,700	615	785	NKX 12 T2	NKX 12 T2Z
15	15	24	28	29.0	23	9	6.5	23.7	0.3	8,250	10,200	840	1,040	NKX 15 T2	NKX 15 T2Z
17	17	26	30	31.0	25	9	8.0	25.7	0.3	10,400	14,400	1,060	1,460	NKX 17 T2	NKX 17 T2Z
20	20	30	35	36.0	30	10	10.5	30.7	0.3	16,400	27,100	1,670	2,760	NKX 20 T2	NKX 20 T2Z
25	25	37	42	43.0	30	11	9.5	37.7	0.6	14,200	24,000	1,450	2,450	NKX 25 T2	NKX 25 T2Z
30	30	42	47	48.0	30	11	9.5	42.7	0.6	22,300	39,500	2,280	4,000	NKX 30 T2	NKX 30 T2Z
35	35	47	52	53.0	30	12	9.0	47.7	0.6	20,000	36,000	2,040	3,650	NKX 35 T2	NKX 35 T2Z
40	40	52	60	61.0	32	13	10.0	55.7	0.6	25,900	52,500	2,650	5,350	NKX 40	NKX 40 Z
45	45	58	65	66.5	32	14	9.0	60.5	0.6	27,600	59,000	2,810	6,000	NKX 45	NKX 45 Z
50	50	62	70	71.5	35	14	10.0	65.5	0.6	27,900	62,000	2,850	6,300	NKX 50	NKX 50 Z
60	60	72	85	86.5	40	17	12.0	80.5	1.0	29,800	71,500	3,050	7,300	NKX 60	NKX 60 Z
70	70	85	95	96.5	40	18	11.0	90.5	1.0	36,500	86,000	3,700	8,750	NKX 70	NKX 70 Z

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

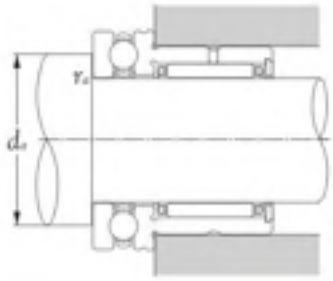
NEEDLE ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

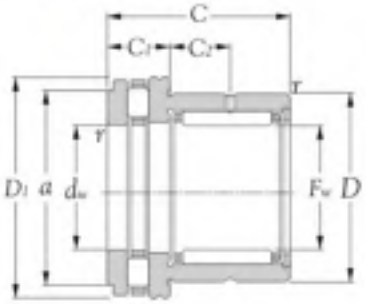
NEEDLE ROLLER BEARINGS WITH THRUST BALL BEARINGS
SERIES NKX, NKX..Z



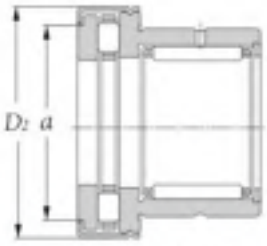
Basic load ratings dynamic N	Basic load ratings static	Basic load ratings dynamic kgf	Basic load ratings static	Abutment dimensions		Limiting speeds rpm		Bearing numbers		Mass kg. (approx.)	
Axial											
C_a	C_{0a}	C_a	C_{0a}	d_a min	r_a max	grease	oil			Type NKX	Type NKX..Z
10,000	14,000	1,020	1,420	18	0.3	6,700	9,500	**NKX 10 T2**	**NKX 10 T2Z**	0.037	0.039
10,300	15,400	1,050	1,570	20	0.3	6,400	9,200	**NKX 12 T2**	**NKX 12 T2Z**	0.042	0.044
10,500	16,800	1,070	1,710	23	0.3	6,200	8,800	**NKX 15 T2**	**NKX 15 T2Z**	0.044	0.048
10,800	18,200	1,100	1,850	25	0.3	6,000	8,500	**NKX 17 T2**	**NKX 17 T2Z**	0.051	0.056
14,200	24,700	1,450	2,520	29	0.3	5,200	7,500	**NKX 20 T2**	**NKX 20 T2Z**	0.085	0.090
19,600	37,000	1,990	3,800	35	0.6	4,600	6,500	**NKX 25 T2**	**NKX 25 T2Z**	0.125	0.132
20,400	42,000	2,080	4,300	40	0.6	4,300	6,200	**NKX 30 T2**	**NKX 30 T2Z**	0.140	0.148
20,400	44,500	2,080	4,550	45	0.6	3,900	5,600	**NKX 35 T2**	**NKX 35 T2Z**	0.167	0.175
26,900	63,000	2,740	6,400	52	0.6	3,500	5,000	**NKX 40**	**NKX 40 Z**	0.216	0.225
27,900	69,000	2,840	7,050	57	0.6	3,200	4,600	**NKX 45**	**NKX 45 Z**	0.252	0.265
28,800	75,500	2,930	7,700	62	0.6	3,100	4,500	**NKX 50**	**NKX 50 Z**	0.302	0.318
41,500	113,000	4,200	11,500	75	1.0	2,600	3,700	**NKX 60**	**NKX 60 Z**	0.465	0.484
43,000	127,000	4,400	12,900	85	1.0	2,400	3,400	**NKX 70**	**NKX 70 Z**	0.612	0.635

NEEDLE ROLLER BEARINGS WITH THRUST CYLINDRICAL ROLLER BEARINGS

SERIES NKXR, NKXR..Z



Type NKXR
(Open type)



Type NKXR..Z
(With cover)

Boundary dimensions mm											Basic load ratings dynamic static N		dynamic static kgf		Bearing numbers
F_w		d_w		D	D_1	D_2	C 0 -0.25	C_1 0 -0.20	C_2	a	r_s min[1]	Radial C_r	C_{or}	C_r	C_{or}	
15	+0.027 +0.016	15	+0.050 +0.032	24	28	29.0	23	9	6.5	23.7	0.3	8,250	10,200	840	1,040	NKXR 15 T2 NKXR 15 T2Z
17	+0.027 +0.016	17	+0.050 +0.032	26	30	31.0	25	9	8.0	25.7	0.3	10,400	14,400	1,060	1,460	NKXR 17 T2 NKXR 17 T2Z
20	+0.033 +0.020	20	+0.061 +0.040	30	35	36.0	30	10	10.5	30.7	0.3	16,400	27,100	1,670	2,760	NKXR 20 T2 NKXR 20 T2Z
25	+0.033 +0.020	25	+0.061 +0.040	37	42	43.0	30	11	9.5	37.7	0.6	14,200	24,000	1,450	2,450	NKXR 25 T2 NKXR 25 T2Z
30	+0.033 +0.020	30	+0.061 +0.040	42	47	48.0	30	11	9.5	42.7	0.6	22,300	39,500	2,280	4,000	NKXR 30 T2 NKXR 30 T2Z
35	+0.041 +0.025	35	+0.075 +0.050	47	52	53.0	30	12	9.0	47.7	0.6	20,000	36,000	2,040	3,650	NKXR 35 T2 NKXR 35 T2Z
40	+0.041 +0.025	40	+0.075 +0.050	52	60	61.0	32	13	10.0	55.7	0.6	25,900	52,500	2,650	5,350	NKXR 40 T2 NKXR 40 T2Z
45	+0.041 +0.025	45	+0.075 +0.050	58	65	66.5	32	14	9.0	60.5	0.6	27,600	59,000	2,810	6,000	NKXR 45 T2 NKXR 45 T2Z
[illegible]		50	+0.075 +0.050	62	70	71.5	35	14	10.0	65.5	0.6	27,900	62,000	2,850	6,300	NKXR 50 T2 NKXR 50 T2Z

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

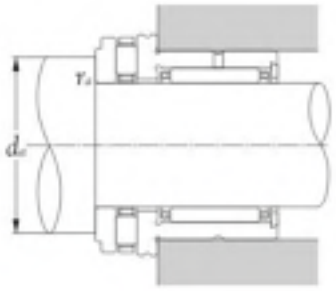
NEEDLE ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

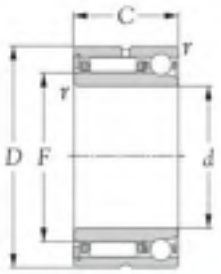
NEEDLE ROLLER BEARINGS WITH THRUST CYLINDRICAL ROLLER BEARINGS
SERIES **NKXR, NKXR..Z**



Basic load ratings dynamic N		static N		Abutment dimensions		Limiting speeds rpm		Bearing numbers		Mass kg. (approx.)	
Axial											
C_a	C_{0a}	C_a	C_{0a}	d_a min	r_{as} max	grease	oil			Type NKXR	Type NKXR..Z
12.900	28.600	1.310	2.920	25	0.3	2.800	11.000	**NKXR 15 T2**	**NKXR 15 T2Z**	0.048	0.052
13.400	31.000	1.370	3.150	27	0.3	2.500	10.000	**NKXR 17 T2**	**NKXR 17 T2Z**	0.050	0.053
20.200	46.500	2.060	4.700	32	0.3	2.100	8.500	**NKXR 20 T2**	**NKXR 20 T2Z**	0.090	0.095
27.300	68.000	2.780	6.900	39	0.6	1.800	7.000	**NKXR 25 T2**	**NKXR 25 T2Z**	0.128	0.135
27.800	72.500	2.840	7.400	44	0.6	1.500	6.000	**NKXR 30 T2**	**NKXR 30 T2Z**	0.162	0.169
31.000	87.000	3.150	8.900	49	0.6	1.400	5.500	**NKXR 35 T2**	**NKXR 35 T2Z**	0.184	0.195
43.000	121.000	4.350	12.400	56	0.6	1.200	4.800	**NKXR 40 T2**	**NKXR 40 T2Z**	0.226	0.237
45.500	135.000	4.650	13.800	61	0.6	1.100	4.400	**NKXR 45 T2**	**NKXR 45 T2Z**	0.267	0.286
48.000	150.000	4.900	15.300	66	0.6	1.000	4.000	**NKXR 50 T2**	**NKXR 50 T2Z**	0.309	0.329

NEEDLE ROLLER BEARINGS

NEEDLE ROLLER BEARINGS WITH ANGULAR CONTACT BALL BEARINGS
SERIES NKIA 59



NEEDLE ROLLER BEARINGS

Boundary dimensions mm					Basic load ratings dynamic N	static	dynamic kgf	static	dynamic N	static	dynamic kgf	static	Bearing numbers
					Radial				Axial				
d	D	C	F	$r_{s\,min}$[1]	C_r	C_{0r}	C_r	C_{0r}	C_a	C_{0a}	C_a	C_{0a}	
15	28	18	20	0.3	9,500	13,400	970	1,370	2,340	3,050	239	310	**NKIA 5902**
17	30	18	22	0.3	10,100	14,900	1,030	1,520	2,530	3,550	258	360	**NKIA 5903**
20	37	23	25	0.3	16,500	22,100	1,680	2,250	4,700	6,150	480	625	**NKIA 5904**
22	39	23	28	0.3	17,500	24,800	1,790	2,530	4,900	6,750	500	690	**NKIA 59/22**
25	42	23	30	0.3	17,400	25,000	1,770	2,550	5,100	7,350	520	750	**NKIA 5905**
30	47	23	35	0.3	19,400	30,500	1,980	3,100	5,400	8,550	550	870	**NKIA 5906**
35	55	27	42	0.6	25,700	46,000	2,630	4,700	7,400	12,300	755	1,260	**NKIA 5907**
40	62	30	48	0.6	31,000	61,000	3,150	6,250	7,750	14,000	790	1,430	**NKIA 5908**
45	68	30	55	0.6	33,000	69,500	3,350	7,100	8,500	17,100	870	1,740	**NKIA 5909**
50	72	30	60	0.6	33,500	73,500	3,450	7,500	8,800	18,700	900	1,910	**NKIA 5910**
55	80	34	63	1.0	44,500	95,500	4,500	9,700	14,300	33,000	1,460	3,350	**NKIA 5911**
60	85	34	68	1.0	45,500	101,000	4,600	10,300	14,800	36,000	1,510	3,650	**NKIA 5912**
65	90	34	75	1.0	46,000	106,000	4,700	10,800	15,200	39,000	1,550	4,000	**NKIA 5913**
70	100	40	80	1.0	62,500	146,000	6,350	14,900	18,600	47,500	1,890	4,850	**NKIA 5914**

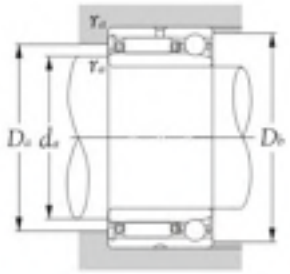
Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension *r*.

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

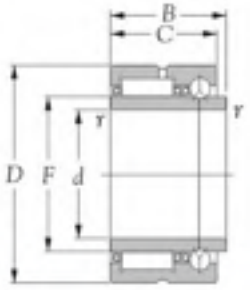
NEEDLE ROLLER BEARINGS WITH ANGULAR CONTACT BALL BEARINGS
SERIES **NKIA 59**



Limiting speeds rpm		Abutment dimensions mm				Bearing numbers	Mass kg(s).
grease	oil	d_a min	D_a max	D_b max	r_{as} max		(approx.)
13,000	20,000	17.5	22.0	25.5	0.3	**NKIA 5902**	0.050
12,000	18,000	19.5	24.0	27.5	0.3	**NKIA 5903**	0.056
11,000	16,000	22.5	28.0	34.5	0.3	**NKIA 5904**	0.111
9,500	14,000	24.5	31.0	36.5	0.3	**NKIA 59/22**	0.120
8,500	13,000	27.5	33.0	39.5	0.3	**NKIA 5905**	0.130
7,500	11,000	32.5	38.0	44.5	0.3	**NKIA 5906**	0.147
6,500	9,500	40.0	45.0	50.0	0.6	**NKIA 5907**	0.243
5,500	8,500	45.0	51.0	57.0	0.6	**NKIA 5908**	0.347
5,000	7,500	50.0	58.0	63.0	0.6	**NKIA 5909**	0.401
4,300	6,500	55.0	63.0	67.0	0.6	**NKIA 5910**	0.410
4,300	6,500	61.0	66.5	74.0	1.0	**NKIA 5911**	0.590
4,000	6,000	66.0	71.5	79.0	1.0	**NKIA 5912**	0.632
3,700	5,500	71.0	78.5	84.0	1.0	**NKIA 5913**	0.708
3,300	5,000	76.0	84.0	94.0	1.0	**NKIA 5914**	1.050

NEEDLE ROLLER BEARINGS

NEEDLE ROLLER BEARINGS WITH THREE-POINT CONTACT BALL BEARINGS
SERIES **NKIB 59**



NEEDLE ROLLER BEARINGS

Boundary dimensions mm						Basic load ratings dynamic N	static	dynamic kgf	static	dynamic N	static	dynamic kgf	static
						Radial				Axial			
d	D	B	C	F	r_s min[1]	C_r	C_{or}	C_r	C_{or}	C_a	C_{oa}	C_a	C_{oa}
15	28	20	18	20	0.3	10,800	13,600	1,100	1,390	2,750	4,200	280	430
17	30	20	18	22	0.3	11,200	14,600	1,140	1,490	2,960	4,900	300	495
20	37	25	23	25	0.3	21,300	25,500	2,170	2,600	4,650	7,400	475	755
22	39	25	23	28	0.3	23,200	29,300	2,360	2,990	5,000	8,650	510	880
25	42	25	23	30	0.3	24,000	31,500	2,450	3,200	5,150	9,250	525	945
30	47	25	23	35	0.3	25,500	35,500	2,600	3,600	5,600	11,200	570	1,140
35	55	30	42	42	0.6	32,000	50,000	3,300	5,100	7,050	14,900	720	1,520
40	62	34	48	28	0.6	43,500	66,500	4,450	6,800	8,700	19,400	890	1,980
45	68	34	52	52	0.6	46,000	73,000	4,700	7,450	9,100	21,400	925	2,180
50	72	34	58	58	0.6	48,000	80,000	4,900	8,150	9,600	24,300	980	2,480
55	80	38	63	63	1.0	58,500	99,500	6,000	10,100	11,400	29,400	1,170	3,000
60	85	38	68	68	1.0	61,500	108,000	6,250	11,000	11,800	32,000	1,200	3,250
65	90	38	72	72	1.0	62,500	112,000	6,350	11,400	12,100	34,000	1,240	3,500
70	100	45	80	80	1.0	85,500	156,000	8,750	15,900	15,900	44,500	1,620	4,550

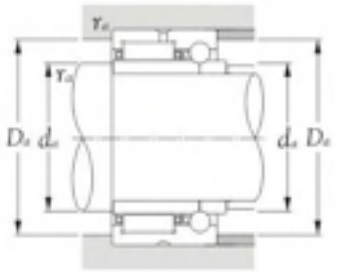
Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

NEEDLE ROLLER BEARINGS WITH THREE-POINT CONTACT BALL BEARINGS
SERIES **NKIB 59**



Limiting speeds rpm		Abutment dimensions mm			Bearing numbers	Mass kg.
grease	oil	d_{a} min	D_{a} max	r_{as} max		(approx.)
13,000	20,000	17.5	25.5	0.3	**NKIB 5902 R**	0.052
12,000	18,000	19.5	27.5	0.3	**NKIB 5903 R**	0.058
11,000	16,000	22.5	34.5	0.3	**NKIB 5904 R**	0.107
9,500	14,000	24.5	36.5	0.3	**NKIB 59/22 R**	0.122
8,500	13,000	27.5	39.5	0.3	**NKIB 5905 R**	0.134
7,500	11,000	32.5	44.5	0.3	**NKIB 5906 R**	0.151
6,500	9,500	40.0	50.0	0.6	**NKIB 5907 R**	0.247
5,500	8,500	45.0	57.0	0.6	**NKIB 5908 R**	0.320
5,000	7,500	50.0	63.0	0.6	**NKIB 5909 R**	0.380
4,300	6,500	55.0	67.0	0.6	**NKIB 5910 R**	0.385
4,300	6,500	61.0	74.0	1.0	**NKIB 5911 R**	0.555
4,000	6,000	66.0	79.0	1.0	**NKIB 5912 R**	0.595
3,700	5,500	71.0	84.0	1.0	**NKIB 5913 R**	0.640
3,300	5,000	76.0	94.0	1.0	**NKIB 5914 R**	0.985

NEEDLE ROLLER BEARINGS

NEEDLE ROLLER
BEARINGS

NOTE

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ROLLER FOLLOWERS

NEEDLE ROLLER BEARINGS

SOUVENIRS

1. Types and designs

NIKO Yoke-type Track Rollers include the series RNA22 (without inner ring) and series NA22 (with inner ring), whose outer ring is not guided in the axial direction; and the NATR, NATV and series NUTR whose outer ring is guided in the axial direction.
With the series RNA22 and NA22, a needle roller and cage assembly and steel plate reinforced synthetic rubber seal are built into the outer ring, and these components are inseparable from each other. Since the bearing can be shifted in the axial direction, the shaft must have a thrust washer or flange to guide the outer ring.

Fig. 1 Series RNA22...LL Fig. 2 Series NA22...LL

With the series NATR, NATV, the outer ring is guided in the axial direction by two side plates that are press-fit into the inner ring. The series NATR bearing has an integral cage and needle roller assembly. The series NATV full-complement type can carry a larger load compared with the series NATR bearing, although its limiting speed is low.
On **NIKO** Yoke-type Track Rollers, a labyrinth occurs between the outer ring and inner ring to provide sealing. For enhanced sealing, one type of bearing (suffix LL) incorporates a synthetic rubber seal between the outer ring and inner ring.

NEEDLE ROLLER BEARINGS

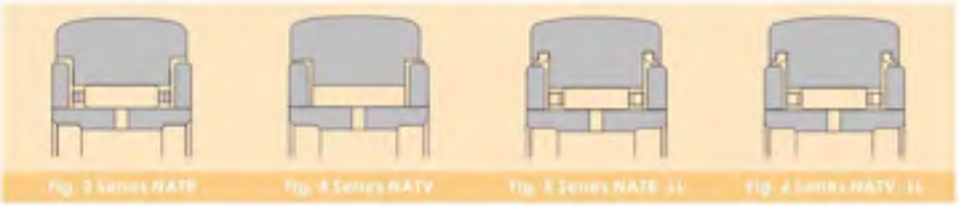


Fig. 3 Series NATR Fig. 4 Series NATV Fig. 5 Series NATR...LL Fig. 6 Series NATV...LL

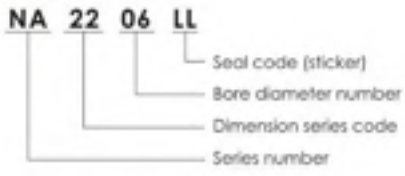
The rollers of the series NUTR are full-complement type rollers whose rolling elements are double-row cylindrical rollers. Compared with full-complement needle roller bearings, they feature greater load carrying capacity and thus are suitable for heavy load applications.Their outer ring incorporates a press-fit steel plate to form a labyrinth between the side plates on both sides of the inner ring to ensure reliable sealing and maintain the position of the side plates. The outer ring is guided in the axial direction by the outer ring rib and end faces of the cylindrical rollers, and can carry some axial load. The inner ring and side plates are tightened in the axial direction to eliminate clearance.

Fig. 7 Series NUTR

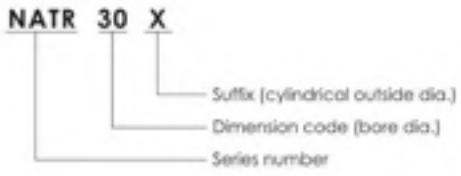
2. Interpreting bearing numbers

The bearing numbers of NIKO Yoke-type Track Rollers comprise a series number, dimension series code, dimension code, and suffix.

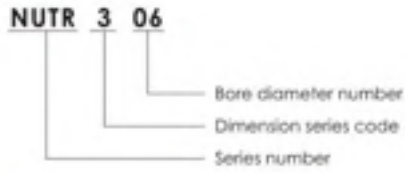
Series RNA, NA



Series NATR, NATV



Series NUTR



3. Bearing fits and radial clearance

NEEDLE ROLLER BEARINGS

The tolerance class of the shaft in relation to a bearing with an inner ring is g6 (h6). If a shaft is used directly as a raceway surface (series RNA22), the tolerance class of the shaft must be k5 (k6). Usually, the outer ring of an NIKO Yoke-type Track Roller is not built into a housing.

Table 1 Radial clearance (Unit: μm)

Enveloping circle diameter F_w (mm)		Clearance							
		C2		Normal		C3		C4	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.
3	6	0	10	3	17	15	30	20	40
6	10	0	12	5	20	15	30	25	45
10	18	0	15	5	25	15	35	30	55
18	30	0	20	10	30	20	40	40	65
30	50	0	25	10	40	25	55	50	80
50	80	0	30	15	50	30	65	60	100
80	100	0	35	20	55	35	75	70	115

4. Mounting dimensions

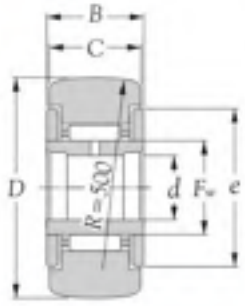
If a bearing lacks a function for axially guiding the outer ring, as in the case of the series RNA22 series or NA22 bearings, the shaft must be provided with a flange or thrust washer to guide the outer ring. The guide surface should preferably be hardened, and the guide width should be at least half the outer ring width. At minimum, the guide surface must be finished by a turning process, and must be smooth and free from burrs.
The mounting surface for series NATR, NATV and NUTR rollers must at least adopt dimensions *c* specified in the associated bearing tables so that their side plates can make full contact.

5. Lubrication

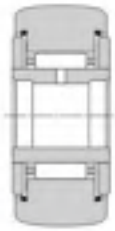
Rollers having a synthetic rubber seal (suffix LL) and those of the full-complement type are pre-filled with lithium soap grease and can operate at a temperature range of 25°C to 100 °C.
The internal bearing grease can be replenished through a lubrication hole on the inner ring. The rollers must be installed so that the lubrication hole is located in a non-load zone.
The series NATV and NUTR being full-complement types, must be lubricated more frequently than the caged types.

NEEDLE ROLLER
BEARINGS

ROLLER FOLLOWERS YOKE TYPE TRUCK ROLLERS
SERIES **NATR**



Type NATR
(With cage)



Type NATR..LL
(Sealed type with cage)

NEEDLE ROLLER BEARINGS

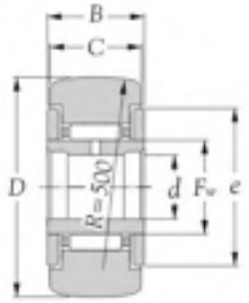
Boundary dimensions mm						Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Bearing numbers	
D $^{0}_{-0.05}$	B	C	d	e	Fw	Cr	Cor	Cr	Cor		
16	12 $^{0}_{-0.180}$	11	5	12	8.0	3,850	3,950	395	400	NATR 5	NATR 5 LL
19	12 $^{0}_{-0.180}$	11	6	14	10.0	4,500	5,100	460	520	NATR 6	NATR 6 LL
24	15 $^{0}_{-0.180}$	14	8	19	12.0	6,600	7,300	675	745	NATR 8	NATR 8 LL
30	15 $^{0}_{-0.180}$	14	10	23	15.0	7,500	9,100	765	930	NATR 10	NATR 10 LL
32	15 $^{0}_{-0.180}$	14	12	25	17.0	8,500	11,100	865	1,130	NATR 12	NATR 12 LL
35	19 $^{0}_{-0.210}$	18	15	27	20.0	13,000	20,100	1,320	2,050	NATR 15	NATR 15 LL
40	21 $^{0}_{-0.210}$	20	17	32	22.0	13,600	22,100	1,390	2,250	NATR 17	NATR 17 LL
47	25 $^{0}_{-0.210}$	24	20	37	25.0	20,300	33,000	2,070	3,350	NATR 20	NATR 20 LL
52	25 $^{0}_{-0.210}$	24	25	42	30.0	22,300	39,500	2,280	4,000	NATR 25	NATR 25 LL
62	29 $^{0}_{-0.210}$	28	30	51	38.0	35,000	64,000	3,600	6,550	NATR 30	NATR 30 LL
72	29 $^{0}_{-0.210}$	28	35	58	44.5	38,000	74,500	3,850	7,600	NATR 35	NATR 35 LL
80	32 $^{0}_{-0.250}$	30	40	66	50.0	48,500	90,000	4,950	9,150	NATR 40	NATR 40 LL
85	32 $^{0}_{-0.250}$	30	45	71	55.0	50,500	97,500	5,150	9,950	NATR 45	NATR 45 LL
90	32 $^{0}_{-0.250}$	30	50	76	60.0	52,000	105,000	5,300	10,700	NATR 50	NATR 50 LL

Remark:

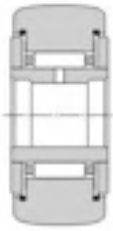
Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Alvania S2 -25°C ~ +120°C
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

ROLLER FOLLOWERS YOKE TYPE TRUCK ROLLERS
SERIES **NATR**



Type NATR
(With cage)



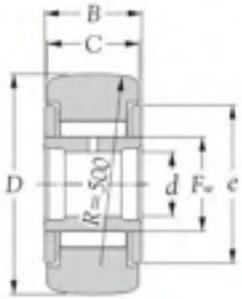
Type NATR..LL
(Sealed type with cage)

Load ratings of truck				Limiting speeds		Bearing numbers		Mass
N		kgf		rpm				kg.
Spherical outer ring	Cylindrical outer ring	Spherical outer ring	Cylindrical outer ring	grease	oil			(approx.)
1,080	3,400	110	350	※19,000	※25,000	**NATR 5**	**NATR 5 LL**	0.018
1,380	4,050	141	415	※15,000	※20,000	**NATR 6**	**NATR 6 LL**	0.025
1,900	6,650	193	680	※12,000	※16,000	**NATR 8**	**NATR 8 LL**	0.042
2,620	7,700	267	785	10,000	※13,000	**NATR 10**	**NATR 10 LL**	0.061
2,860	8,200	291	835	9,000	※12,000	**NATR 12**	**NATR 12 LL**	0.069
3,200	11,900	325	1,220	7,500	10,000	**NATR 15**	**NATR 15 LL**	0.098
3,850	14,500	390	1,480	7,000	9,000	**NATR 17**	**NATR 17 LL**	0.140
4,700	21,000	480	2,150	6,000	8,000	**NATR 20**	**NATR 20 LL**	0.246
5,500	23,300	565	2,370	5,000	6,500	**NATR 25**	**NATR 25 LL**	0.275
6,950	33,000	710	3,350	4,000	5,500	**NATR 30**	**NATR 30 LL**	0.470
8,050	37,000	820	3,750	3,300	4,500	**NATR 35**	**NATR 35 LL**	0.635
9,800	44,500	1,000	4,500	3,000	4,000	**NATR 40**	**NATR 40 LL**	0.875
10,400	47,000	1,060	4,800	2,700	3,600	**NATR 45**	**NATR 45 LL**	0.910
11,400	50,000	1,160	5,100	2,500	3,300	**NATR 50**	**NATR 50 LL**	0.960

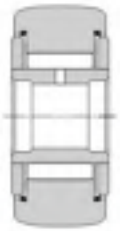
Notes: Limiting speed of sealed type bearings marked with ※ is approximately 10 000 rpm.

NEEDLE ROLLER BEARINGS

ROLLER FOLLOWERS YOKE TYPE TRUCK ROLLERS
SERIES **NATV**



Type NATV
(Full complement type)



Type NATV..LL
(Full complement type with seals)

Boundary dimensions mm						Basic load ratings dynamic N	static	dynamic kgf	static	Bearing numbers	
D $^{0}_{-0.05}$	B	C	d	e	F_w	C_r	C_{or}	C_r	C_{or}		
16	12 $^{0}_{-0.180}$	11	5	12	8.0	6,250	8,900	640	910	NATV 5	NATV 5 LL
19	12 $^{0}_{-0.180}$	11	6	14	10.0	7,200	11,200	735	1,140	NATV 6	NATV 6 LL
24	15 $^{0}_{-0.180}$	14	8	19	12.0	10,300	15,500	1,050	1,580	NATV 8	NATV 8 LL
30	15 $^{0}_{-0.180}$	14	10	23	15.0	11,700	19,500	1,190	1,980	NATV 10	NATV 10 LL
32	15 $^{0}_{-0.180}$	14	12	25	17.0	12,600	22,100	1,280	2,250	NATV 12	NATV 12 LL
35	19 $^{0}_{-0.210}$	18	15	27	20.0	18,000	37,000	1,830	3,750	NATV 15	NATV 15 LL
40	21 $^{0}_{-0.210}$	20	17	32	22.0	18,900	40,500	1,930	4,150	NATV 17	NATV 17 LL
47	25 $^{0}_{-0.210}$	24	20	37	25.0	28,400	60,000	2,900	6,100	NATV 20	NATV 20 LL
52	25 $^{0}_{-0.210}$	24	25	42	30.0	31,000	72,000	3,150	7,350	NATV 25	NATV 25 LL
62	29 $^{0}_{-0.210}$	28	30	51	38.0	46,500	112,000	4,750	11,400	NATV 30	NATV 30 LL
72	29 $^{0}_{-0.210}$	28	35	58	44.5	51,000	130,000	5,200	13,300	NATV 35	NATV 35 LL
80	32 $^{0}_{-0.250}$	30	40	66	50.0	67,500	167,000	6,850	17,100	NATV 40	NATV 40 LL
90	32 $^{0}_{-0.250}$	30	50	76	60.0	74,500	200,000	7,600	20,400	NATV 50	NATV 50 LL

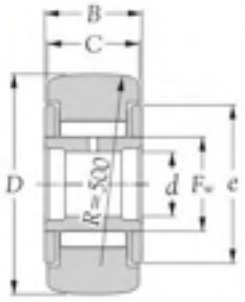
NEEDLE ROLLER BEARINGS

Remark:

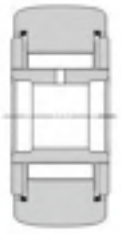
Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Alvania N2 -25°C ~ +120°C
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

ROLLER FOLLOWERS YOKE TYPE TRUCK ROLLERS
SERIES NATV



Type NATV
(Full complement type)



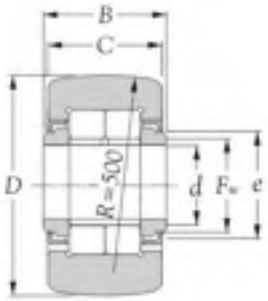
Type NATV..LL
(Full complement type with seals)

Load ratings of truck				Limiting speeds rpm		Bearing numbers		Mass kg.
N		kgf						
Spherical outer ring	Cylindrical outer ring	Spherical outer ring	Cylindrical outer ring	grease	oil			(approx.)
1,080	3,400	110	350	※13,000	※16,000	**NATV 5**	**NATV 5 LL**	0.020
1,380	4,050	141	415	10,000	※13,000	**NATV 6**	**NATV 6 LL**	0.027
1,900	6,650	193	680	8,500	※11,000	**NATV 8**	**NATV 8 LL**	0.044
2,620	7,700	267	785	6,500	8,500	**NATV 10**	**NATV 10 LL**	0.065
2,860	8,200	291	835	6,000	7,500	**NATV 12**	**NATV 12 LL**	0.074
3,200	11,900	325	1,220	5,000	6,500	**NATV 15**	**NATV 15 LL**	0.102
3,850	14,500	390	1,480	4,500	6,000	**NATV 17**	**NATV 17 LL**	0.145
4,700	21,000	480	2,150	4,000	5,000	**NATV 20**	**NATV 20 LL**	0.254
5,500	23,300	565	2,370	3,300	4,500	**NATV 25**	**NATV 25 LL**	0.285
6,950	33,000	710	3,350	2,600	3,500	**NATV 30**	**NATV 30 LL**	0.481
8,050	37,000	820	3,750	2,200	2,900	**NATV 35**	**NATV 35 LL**	0.647
9,800	44,500	1,000	4,500	2,000	2,600	**NATV 40**	**NATV 40 LL**	0.890
11,400	50,000	1,160	5,100	1,600	2,100	**NATV 50**	**NATV 50 LL**	0.990

Notes: Limiting speed of sealed type bearings marked with ※ is approximately 10 000 rpm.

NEEDLE ROLLER BEARINGS

ROLLER FOLLOWERS YOKE TYPE TRUCK ROLLERS
SERIES **NUTR**



NEEDLE ROLLER BEARINGS

Boundary dimensions mm							Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Bearing numbers
D	B	C	d	e	F_w	r_s min[1]	C_r	C_{or}	C_r	C_{or}	
35	19 $^{0}_{-0.210}$	18	15	20	19.0	0.3	22,300	25,700	2,280	2,620	NUTR 202
40	21 $^{0}_{-0.210}$	20	17	22	21.5	0.3	24,100	29,100	2,450	2,970	NUTR 203
42	19 $^{0}_{-0.210}$	18	15	20	19.0	0.3	22,300	25,700	2,280	2,620	NUTR 302
47	21 $^{0}_{-0.210}$	20	17	22	21.5	0.3	24,100	29,100	2,450	2,970	NUTR 303
47	25 $^{0}_{-0.210}$	24	20	27	25.5	0.3	38,500	48,000	3,950	4,900	NUTR 204
52	25 $^{0}_{-0.210}$	24	20	27	25.5	0.3	38,500	48,000	3,950	4,900	NUTR 304
52	25 $^{0}_{-0.210}$	24	25	31	30.0	0.3	42,500	57,500	4,350	5,850	NUTR 205
62	25 $^{0}_{-0.210}$	24	25	31	30.0	0.3	42,500	57,500	4,350	5,850	NUTR 305
62	29 $^{0}_{-0.210}$	28	30	38	35.0	0.3	56,500	72,500	5,750	7,400	NUTR 206
72	29 $^{0}_{-0.210}$	28	30	38	35.0	0.3	56,500	72,500	5,750	7,400	NUTR 306
72	29 $^{0}_{-0.210}$	28	35	44	41.5	0.6	62,000	85,500	6,350	8,700	NUTR 207
80	29 $^{0}_{-0.210}$	28	35	44	41.5	0.6	62,000	85,500	6,350	8,700	NUTR 307
80	32 $^{0}_{-0.250}$	30	40	51	47.5	0.6	87,000	125,000	8,850	12,700	NUTR 208
85	32 $^{0}_{-0.250}$	30	45	55	52.5	0.6	92,000	137,000	9,350	14,000	NUTR 209
90	32 $^{0}_{-0.250}$	30	40	51	47.5	0.6	87,000	125,000	8,850	12,700	NUTR 308
90	32 $^{0}_{-0.250}$	30	50	60	57.0	0.6	96,500	150,000	9,800	15,300	NUTR 210
100	32 $^{0}_{-0.250}$	30	45	55	52.5	0.6	92,000	137,000	9,350	14,000	NUTR 309
110	32 $^{0}_{-0.250}$	30	50	60	57.0	0.6	96,500	150,000	9,800	15,300	NUTR 310

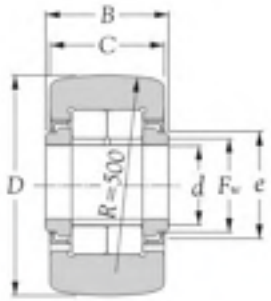
Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

Remark:

Cages		Precision	Grease
Steel -	√		
Polymid -	X	Class 0 (JIS)	Alvania S2 -25℃~+120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

ROLLER FOLLOWERS YOKE TYPE TRUCK ROLLERS
SERIES **NUTR**

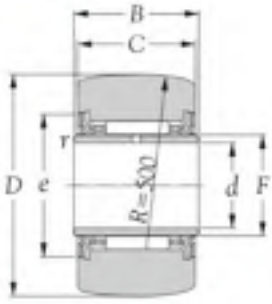


Load ratings of truck N		Load ratings of truck kgf		Limiting speeds rpm	Bearing numbers	Mass kg(s).
Spherical outer ring	Cylindrical outer ring	Spherical outer ring	Cylindrical outer ring	grease		(approx.)
3,200	11,900	325	1,220	5,500	**NUTR 202**	0.100
3,850	14,500	390	1,480	4,700	**NUTR 203**	0.147
4,100	14,300	415	1,460	5,500	**NUTR 302**	0.160
4,700	17,000	480	1,740	4,700	**NUTR 303**	0.222
4,700	21,000	480	2,150	4,000	**NUTR 204**	0.245
5,550	23,300	565	2,370	4,000	**NUTR 304**	0.321
5,550	23,300	565	2,370	3,300	**NUTR 205**	0.281
6,950	27,800	710	2,830	3,300	**NUTR 305**	0.450
6,950	33,000	710	3,350	2,900	**NUTR 206**	0.466
8,050	38,500	820	3,900	2,900	**NUTR 306**	0.697
8,050	37,000	820	3,750	2,400	**NUTR 207**	0.630
9,800	41,000	1,000	4,150	2,400	**NUTR 307**	0.840
9,800	44,500	1,000	4,500	2,100	**NUTR 208**	0.817
10,400	47,000	1,060	4,800	1,900	**NUTR 209**	0.883
11,400	50,000	1,160	5,100	2,100	**NUTR 308**	1.130
11,400	50,000	1,160	5,100	1,800	**NUTR 210**	0.950
13,000	55,500	1,330	5,650	1,900	**NUTR 309**	1.400
14,700	61,000	1,500	6,200	1,800	**NUTR 310**	1.690

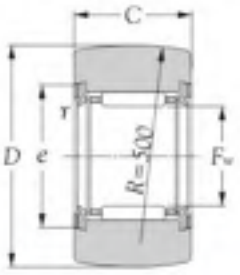
NEEDLE ROLLER BEARINGS

ROLLER FOLLOWERS YOKE TYPE TRUCK ROLLERS SEALED TYPE

SERIES NA22..LL, RNA22..LL



Type NA22..LL
(With inner ring)



Type RNA22..LL
(Without inner ring)

Boundary dimensions mm							Basic load ratings dynamic N		dynamic kgf		Bearing numbers	
$D_{-0.05}^{0}$	B	C	d	F_w	e	F	$r_{s\,min}$[1]	C_r	C_{or}	C_r	C_{or}	
19	12	11.8	6	$10^{+0.022}_{+0.013}$	16	10	0.3	4,300	3,950	435	405	NA 22/6 LL	RNA 22/6 LL
24	12	11.8	8	$12^{+0.027}_{+0.016}$	18	12	0.3	4,850	4,900	495	500	NA 22/8 LL	RNA 22/8 LL
30	14	13.8	10	$14^{+0.027}_{+0.016}$	20	14	0.3	7,200	8,500	735	865	NA 2200 LL	RNA 2200 LL
32	14	13.8	12	$16^{+0.027}_{+0.016}$	22	16	0.3	7,750	9,700	795	990	NA 2201 LL	RNA 2201 LL
35	14	13.8	15	$20^{+0.033}_{+0.020}$	26	20	0.3	9,500	13,400	970	1,370	NA 2202 LL	RNA 2202 LL
40	16	15.8	17	$22^{+0.033}_{+0.020}$	28	22	0.3	10,100	14,900	1,030	1,520	NA 2203 LL	RNA 2203 LL
47	18	17.8	20	$25^{+0.033}_{+0.020}$	33	25	0.3	16,500	22,100	1,680	2,250	NA 2204 LL	RNA 2204 LL
52	18	17.8	25	$30^{+0.033}_{+0.020}$	38	30	0.3	17,400	25,000	1,770	2,550	NA 2205 LL	RNA 2205 LL
62	20	19.8	30	$35^{+0.041}_{+0.025}$	43	35	0.3	20,900	33,500	2,130	3,400	NA 2206 LL	RNA 2206 LL
72	23	22.7	35	$42^{+0.041}_{+0.025}$	50	42	0.6	25,700	46,000	2,630	4,700	NA 2207 LL	RNA 2207 LL
80	23	22.7	40	$48^{+0.041}_{+0.025}$	57	48	0.6	27,800	53,500	2,830	5,450	NA 2208 LL	RNA 2208 LL
85	23	22.7	45	$52^{+0.049}_{+0.030}$	62	52	0.6	28,600	57,000	2,920	5,800	NA 2209 LL	RNA 2209 LL
90	23	22.7	50	$58^{+0.049}_{+0.030}$	68	58	0.6	30,500	64,000	3,100	6,500	NA 2210 LL	RNA 2210 LL

Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

NEEDLE ROLLER BEARINGS

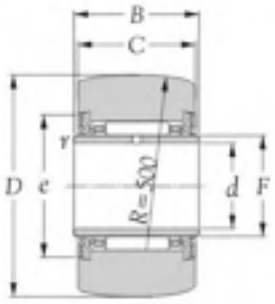
Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Alvania N2 -25℃~+120℃
Brass -	X		

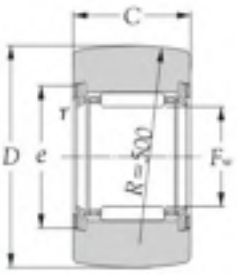
Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

ROLLER FOLLOWERS YOKE TYPE TRUCK ROLLERS SEALED TYPE

SERIES NA22..LL, RNA22..LL



Type NA22..LL
(With inner ring)



Type RNA22..LL
(Without inner ring)

Load ratings of truck				Limiting speeds	Bearing numbers		Mass kg. (approx.)	
N		Kgf		rpm				
Spherical outer ring	Cylindrical outer ring	Spherical outer ring	Cylindrical outer ring	grease			Type NA22..LL	Type RNA22..LL
1,380	4,400	141	445	10,000	**NA 22/6 LL**	**RNA 22/6 LL**	0.023	0.018
1,900	5,500	193	565	10,000	**NA 22/8 LL**	**RNA 22/8 LL**	0.035	0.027
2,620	7,550	267	770	10,000	**NA 2200 LL**	**RNA 2200 LL**	0.060	0.052
2,860	8,050	291	820	9,500	**NA 2201 LL**	**RNA 2201 LL**	0.067	0.057
3,200	8,800	325	900	7,500	**NA 2202 LL**	**RNA 2202 LL**	0.075	0.060
3,850	10,900	390	1,110	7,000	**NA 2203 LL**	**RNA 2203 LL**	0.113	0.094
4,700	14,800	480	1,510	6,000	**NA 2204 LL**	**RNA 2204 LL**	0.176	0.152
5,550	16,400	565	1,670	5,000	**NA 2205 LL**	**RNA 2205 LL**	0.209	0.179
6,950	22,200	710	2,260	4,300	**NA 2206 LL**	**RNA 2206 LL**	0.322	0.284
8,050	28,700	820	2,930	3,600	**NA 2207 LL**	**RNA 2207 LL**	0.506	0.432
9,800	32,000	1,000	3,250	3,100	**NA 2208 LL**	**RNA 2208 LL**	0.623	0.530
10,400	34,000	1,060	3,450	2,900	**NA 2209 LL**	**RNA 2209 LL**	0.638	0.545
11,400	36,000	1,160	3,650	2,600	**NA 2210 LL**	**RNA 2210 LL**	0.682	0.563

NEEDLE ROLLER
BEARINGS

NOTE

NIKO

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CAM FOLLOWERS

NEEDLE ROLLER BEARINGS

SOUVENIRS

1. Types and designs

NIKO Stud-type Track Rollers are available in three basic series: the series KR, whose rolling elements are needle rollers retained and guided by a cage; the full-complement series KRV lacking a cage, whose rolling elements are needle rollers; and the series NUKR, a full-complement type whose rolling elements are double-row cylindrical rollers. The cage of the stud-type track rollers is pressed steel. However, cages of molded polyamide reinforced with glass fiber or carbon fiber (suffix T2) may be used. The T2 cage features a maximum allowable operating temperature of 120°C and a maximum allowable continuous operating temperature of 100°C. The series KR is suitable for high-speed applications because the cage guides the needle rollers. Compared with a full-complement configuration, this bearing's larger internal volume holds a larger amount of grease, which contributes to relatively extended relubrication intervals. Also available is a variant (suffix LL) with a synthetic rubber seal located between the outer ring, flange, and side plate.

Series KR

Fig. 1

NEEDLE ROLLER BEARINGS

Compared with the series KR, the track roller series KRV has more needle rollers and therefore is suitable for heavy load applications, but it has a lower limiting speed. A variant (suffix LL) with a seal is also available. Because this bearing holds less grease, the relubrication intervals for this type are shorter.

Series KRV

Fig. 2

Compared with full-complement needle roller bearings, the series NUKR track rollers can carry a greater load and are therefore suitable for applications involving heavy load and impact load, as they are full-complement types using double-row cylindrical rollers as rolling elements. They are guided in the axial direction by the outer ring rib and end faces of cylindrical rollers, and can carry some axial load. Although they are a full-complement configuration, their limiting speed is greater than that of series KRV rollers. Their outer ring incorporates a press-fit steel plate to form a labyrinth between the flange and the outer surface of the side plate. Because there is limited space available for adding grease to the bearing, the bearing must be relubricated more frequently.

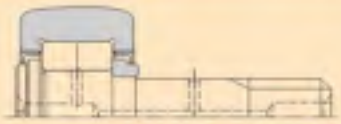


Fig. 3 Series NUKR

2. Interpreting bearing numbers

The bearing numbers of NIKO Stud-type Track Rollers comprise a series number, dimension code (outside diameter), and suffix.

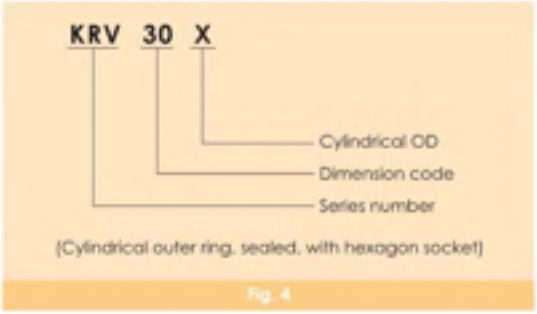
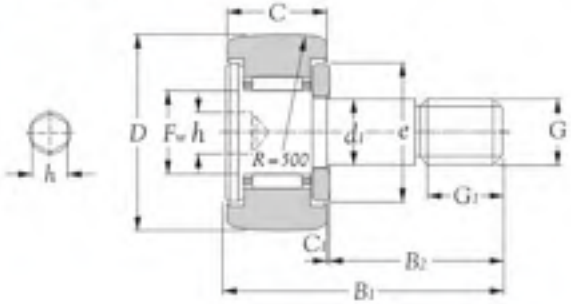


Fig. 4

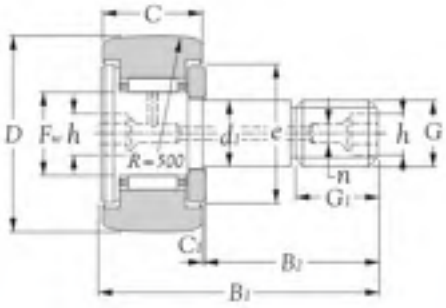
3. Lubrication

The rollers having a synthetic rubber seal (suffix LL) as well as the full-complement type are pre-filled with lithium soap grease and can operate at a temperature range of -25°C to 100°C .The inside of the bearing can be refilled tirough a grease nipple installed on the bearing-side end face (flange end face) or threaded end face of the stud. Any lubrication hole not used for relubrication must be plugged. The necessary grease nipple and plug are included in the package and must be installed on the toller before the cam follower is mounted.

CAM FOLLOWERS STUD TYPE TRUCK ROLLERS
SERIES KR



Type KR (10~19 mm)



Type KR (22~26 mm)

Boundary dimensions mm													Bearing numbers
D $^{0}_{-0.050}$	C	d_1	F_w	B_1	B_2	G	G_1	C_1	n	B_3	a	e	h	
10	7	3 $^{0}_{-0.010}$	4.00	17	9.0	M 3 X 0.5	5.0	0.5	-	-	-	7.0	2.5	KR 10
12	8	4 $^{0}_{-0.012}$	4.80	20	11.0	M 4 X 0.7	6.0	0.5	-	-	-	8.5	2.5	KR 12
13	9	5 $^{0}_{-0.012}$	5.75	23	13.0	M 5 X 0.8	7.5	0.5	-	-	-	9.5	3	KR 13
16	11	6 $^{0}_{-0.012}$	8.00	28	16.0	M 6 X 1	8.0	0.6	-	-	-	12.0	4	KR 16
19	11	8 $^{0}_{-0.015}$	10.00	32	20.0	M 8 X 1.25	10.0	0.6	-	-	-	14.0	4	KR 19
22	12	10 $^{0}_{-0.015}$	12.00	36	23.0	M 10 X 1.0	12.0	0.6	4	-	-	17.0	5	KR 22
26	12	10 $^{0}_{-0.015}$	12.00	36	23.0	M 10 X 1.0	12.0	0.6	4	-	-	17.0	5	KR 26
30	14	12 $^{0}_{-0.018}$	15.00	40	25.0	M 12 X 1.5	13.0	0.6	4	6	3	23.0	6	KR 30
32	14	12 $^{0}_{-0.018}$	15.00	40	25.0	M 12 X 1.5	13.0	0.6	4	6	3	23.0	6	KR 32
35	18	16 $^{0}_{-0.018}$	18.00	52	32.5	M 16 X 1.5	17.0	0.8	6	8	3	27.0	8	KR 35
40	20	18 $^{0}_{-0.018}$	22.00	58	36.5	M 18 X 1.5	19.0	0.8	6	8	3	32.0	8	KR 40
47	24	20 $^{0}_{-0.021}$	25.00	66	40.5	M 20 X 1.5	21.0	0.8	6	9	4	37.0	10	KR 47
52	24	20 $^{0}_{-0.021}$	25.00	66	40.5	M 20 X 1.5	21.0	0.8	6	9	4	37.0	10	KR 52
62	29	24 $^{0}_{-0.021}$	30.00	80	49.5	M 24 X 1.5	25.0	0.8	8	11	4	44.0	14	KR 62
72	29	24 $^{0}_{-0.021}$	30.00	80	49.5	M 24 X 1.5	25.0	0.8	8	11	4	44.0	14	KR 72
80	35	30 $^{0}_{-0.021}$	38.00	100	63.0	M 30 X 1.5	32.0	1.0	8	15	4	53.0	14	KR 80
85	35	30 $^{0}_{-0.021}$	38.00	100	63.0	M 30 X 1.5	32.0	1.0	8	15	4	53.0	14	KR 85
90	35	30 $^{0}_{-0.021}$	38.00	100	63.0	M 30 X 1.5	32.0	1.0	8	15	4	53.0	14	KR 90

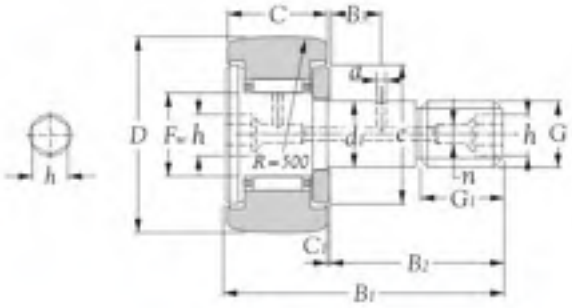
NEEDLE ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Alvania S2 -25℃~+120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

CAM FOLLOWERS STUD TYPE TRUCK ROLLERS
SERIES KR



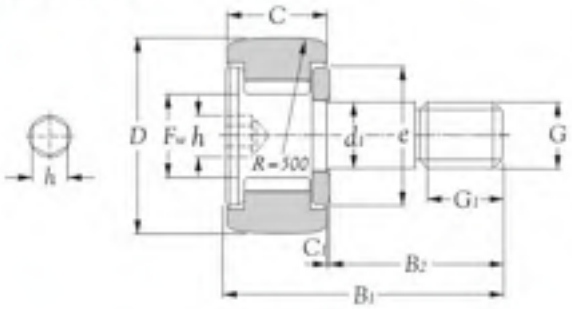
Type KR (30~90 mm)

Basic load ratings dynamic N	Basic load ratings static N	Basic load ratings dynamic kgf	Basic load ratings static kgf	Load ratings of truck N		Load ratings of truck kgf		Limiting speeds rpm		Maximum tightening torque N.m	Maximum tightening torque Kgf.m	Bearing numbers	Mass kg(s).	Stud diameter mm
C_r	C_{or}	C_r	C_{or}	Spherical outer ring	Cylindrical outer ring	Spherical outer ring	Cylindrical outer ring	grease	oil				(approx.)	
1,510	1,140	154	116	560	1,360	57	139	※27,000	※40,000	0.5	0.05	**KR 10**	0.005	3
2,030	1,550	207	159	725	1,790	74	183	※25,000	※36,000	1.0	0.10	**KR 12**	0.008	4
2,480	2,070	253	211	805	2,220	82	226	※23,000	※33,000	2.0	0.20	**KR 13**	0.010	5
3,850	3,950	395	400	1,080	3,400	110	350	※19,000	※25,000	3.0	0.30	**KR 16**	0.019	6
4,500	5,100	460	520	1,380	4,050	141	415	※15,000	※20,000	8.0	0.80	**KR 19**	0.031	8
5,050	6,250	515	635	1,690	5,150	172	525	※12,000	※16,000	15.0	1.50	**KR 22**	0.046	10
5,050	6,250	515	635	2,120	6,100	216	620	※12,000	※16,000	15.0	1.50	**KR 26**	0.059	10
7,500	9,100	765	930	2,620	7,700	267	785	10,000	※13,000	22.0	2.20	**KR 30**	0.087	12
7,500	9,100	765	930	2,860	8,200	291	835	10,000	※13,000	22.0	2.20	**KR 32**	0.097	12
11,800	17,300	1,210	1,760	3,200	11,900	325	1,220	8,000	※11,000	58.0	5.80	**KR 35**	0.169	16
13,600	22,100	1,390	2,250	3,850	14,500	390	1,480	7,000	9,000	87.0	8.70	**KR 40**	0.248	18
20,300	33,000	2,070	3,350	4,700	21,000	480	2,150	6,000	8,000	120.0	12.00	**KR 47**	0.386	20
20,300	33,000	2,070	3,350	5,550	23,300	565	2,370	6,000	8,000	120.0	12.00	**KR 52**	0.461	20
29,100	55,000	2,960	5,650	6,950	34,500	710	3,500	5,000	6,500	220.0	22.00	**KR 62**	0.790	24
29,100	55,000	2,960	5,650	8,050	38,500	820	3,900	5,000	6,500	220.0	22.00	**KR 72**	1.040	24
44,000	86,500	4,500	8,800	9,800	53,000	1,000	5,400	4,000	5,500	450.0	45.00	**KR 80**	1.550	30
44,000	86,500	4,500	8,800	10,400	56,000	1,060	5,750	4,000	5,500	450.0	45.00	**KR 85**	1.740	30
44,000	86,500	4,500	8,800	11,400	59,000	1,160	6,100	4,000	5,500	450.0	45.00	**KR 90**	1.950	30

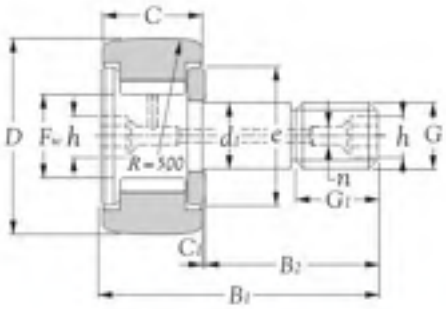
Notes: Limiting speed of sealed type bearings marked with ※ is approximately 10,000 rpm.

NEEDLE ROLLER BEARINGS

CAM FOLLOWERS STUD TYPE TRUCK ROLLERS
SERIES KRV



Type KRV (10~19 mm)



Type KRV (22~26 mm)

Boundary dimensions mm													Bearing numbers
D	C	d_1	Fw	B_1	B_2	G	G_1	C_1	n	B_3	a	e	h	
10	7	3	4.00	17	9.0	M 3 X 0.5	5.0	0.5	-	-	-	7.0	2.5°	KRV 10
12	8	4	4.80	20	11.0	M 4 X 0.7	6.0	0.5	-	-	-	8.5	2.5°	KRV 12
13	9	5	5.75	23	13.0	M 5 X 0.8	7.5	0.5	-	-	-	9.5	3°	KRV 13
16	11	6	8.00	28	16.0	M 6 X 1.0	8.0	0.6	-	-	-	12.0	3	KRV 16
19	11	8	10.00	32	20.0	M 8 X 1.25	10.0	0.6	-	-	-	14.0	4	KRV 19
22	12	10	12.00	36	23.0	M 10 X 1.0	12.0	0.6	4	-	-	17.0	5	KRV 22
26	12	10	12.00	36	23.0	M 10 X 1.0	12.0	0.6	4	-	-	17.0	5	KRV 26
30	14	12	15.00	40	25.0	M 12 X 1.5	13.0	0.6	4	6	3	23.0	6	KRV 30
32	14	12	15.00	40	25.0	M 12 X 1.5	13.0	0.6	4	6	3	23.0	6	KRV 32
35	18	16	18.00	52	32.5	M 16 X 1.5	17.0	0.8	6	8	3	27.0	8	KRV 35
40	20	18	22.00	58	36.5	M 18 X 1.5	19.0	0.8	6	8	3	32.0	8	KRV 40
47	24	20	25.00	66	40.5	M 20 X 1.5	21.0	0.8	6	9	4	37.0	10	KRV 47
52	24	20	25.00	66	40.5	M 20 X 1.5	21.0	0.8	6	9	4	37.0	10	KRV 52
62	29	24	30.00	80	49.5	M 24 X 1.5	25.0	0.8	8	11	4	44.0	14	KRV 62
72	29	24	30.00	80	49.5	M 24 X 1.5	25.0	0.8	8	11	4	44.0	14	KRV 72
80	35	30	38.00	100	63.0	M 30 X 1.5	32.0	1.0	8	15	4	53.0	14	KRV 80
90	35	30	38.00	100	63.0	M 30 X 1.5	32.0	1.0	8	15	4	53.0	14	KRV 90

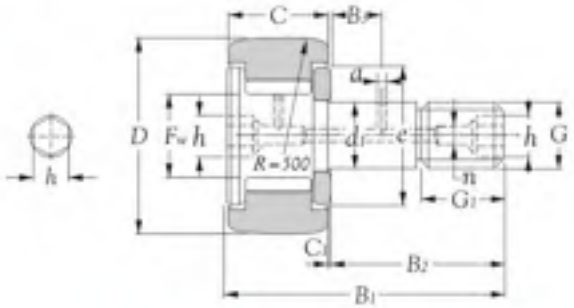
NEEDLE ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Alvania S2 -25°C ~ +120°C
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

CAM FOLLOWERS STUD TYPE TRUCK ROLLERS
SERIES KRV



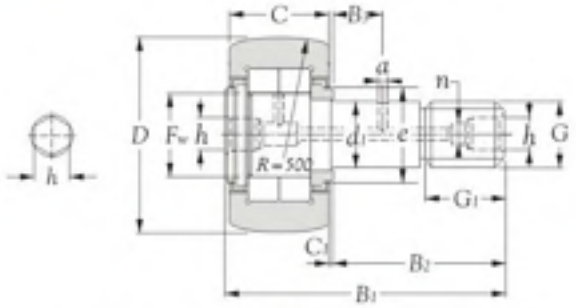
Type KRV (30~90 mm)

Basic load ratings dynamic N	Basic load ratings static N	Basic load ratings dynamic kgf	Basic load ratings static kgf	Load ratings of truck N		Load ratings of truck kgf		Limiting speeds rpm		Maximum tightening torque		Bearing numbers	Mass kg(s).	Stud diameter mm
				Spherical outer ring	Cylindrical outer ring	Spherical outer ring	Cylindrical outer ring	grease	oil	N.m	Kgf.m		(approx.)	
C_r	C_{or}	C_r	C_{or}											
2,330	2,400	238	244	560	1,360	57	139	※25,000	※32,000	0.5	0.05	**KRV 10**	0.005	3
3,350	3,550	340	360	725	1,790	74	183	※20,000	※27,000	1.0	0.10	**KRV 12**	0.008	4
4,300	5,050	435	510	805	2,220	82	226	※17,000	※22,000	2.0	0.20	**KRV 13**	0.011	5
6,250	8,900	640	910	1,080	3,400	110	350	※13,000	※16,000	3.0	0.30	**KRV 16**	0.020	6
7,200	11,200	735	1,140	1,380	4,050	141	415	10,000	※13,000	8.0	0.80	**KRV 19**	0.032	8
7,900	13,300	810	1,360	1,690	5,150	172	525	8,500	※11,000	15.0	1.50	**KRV 22**	0.047	10
7,900	13,300	810	1,360	2,120	6,100	216	620	8,500	※11,000	15.0	1.50	**KRV 26**	0.061	10
11,700	19,500	1,190	1,980	2,620	7,700	267	785	6,500	8,500	22.0	2.20	**KRV 30**	0.089	12
11,700	19,500	1,190	1,980	2,860	8,200	291	835	6,500	8,500	22.0	2.20	**KRV 32**	0.100	12
17,200	33,000	1,750	3,400	3,200	11,900	325	1,220	5,500	7,000	58.0	5.80	**KRV 35**	0.172	16
18,900	40,500	1,930	4,150	3,850	14,500	390	1,480	4,500	6,000	87.0	8.70	**KRV 40**	0.252	18
28,300	60,000	2,890	6,100	4,700	21,000	480	2,150	4,000	5,000	120.0	12.00	**KRV 47**	0.390	20
28,300	60,000	2,890	6,100	5,550	23,300	565	2,370	4,000	5,000	120.0	12.00	**KRV 52**	0.465	20
39,000	96,500	3,950	9,850	6,950	34,500	710	3,500	3,300	4,500	220.0	22.00	**KRV 62**	0.800	24
39,000	96,500	3,950	9,850	8,050	38,500	820	3,900	3,300	4,500	220.0	22.00	**KRV 72**	1.050	24
57,000	144,000	5,800	14,700	9,800	53,000	1,000	5,400	2,600	3,500	450.0	45.00	**KRV 80**	1.560	30
57,000	144,000	5,800	14,700	11,400	59,000	1,160	6,100	2,600	3,500	450.0	45.00	**KRV 90**	1.970	30

Notes: Limiting speed of sealed type bearings marked with ※ is approximately 10,000 rpm.

NEEDLE ROLLER BEARINGS

CAM FOLLOWERS STUD TYPE TRUCK ROLLERS (MULTI-ROW CYLINDRICAL ROLLER BEARINGS) SERIES NUKR



Type NUKR (D<100 mm) (Double row type full complement with seals)

Boundary dimensions mm															Bearing numbers
D	C	d2	Fw	B1	B2	G	G1	C1	n	m	B3	a	e	h	
35	18	16	19.0	52	32.5	M 16 X 1.5	17	0.8	6	-	8	3	21	8	NUKR 35
40	20	18	21.5	58	36.5	M 18 X 1.5	19	0.8	6	-	8	3	23	8	NUKR 40
47	24	20	25.5	66	40.5	M 20 X 1.5	21	0.8	6	-	9	4	27	10	NUKR 47
52	24	20	30.0	66	40.5	M 20 X 1.5	21	0.8	6	-	9	4	31	10	NUKR 52
62	29	24	35.0	80	49.5	M 24 X 1.5	25	0.8	8	-	11	4	38	14	NUKR 62
72	29	24	41.5	80	49.5	M 24 X 1.5	25	0.8	8	-	11	4	44	14	NUKR 72
80	35	30	47.5	100	63.0	M 30 X 1.5	32	1.0	8	-	15	4	51	14	NUKR 80
90	35	30	47.5	100	63.0	M 30 X 1.5	32	1.0	8	-	15	4	51	14	NUKR 90

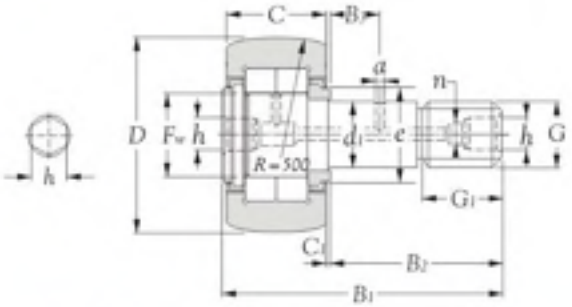
NEEDLE ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	X	Class 0 (JIS)	Alvania 92 -25℃ ~ +120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

Cam followers stud type truck rollers (Multi-row cylindrical roller bearings) series NUKR



Type NUKR (D<100 mm) (Double row type full complement with seals)

Basic load ratings dynamic N		Basic load ratings static kgf		Load ratings of truck N		Load ratings of truck kgf		Limiting speeds rpm	Maximum tightening torque		Bearing numbers	Mass kg(s).	Stud diameter mm
C_r	C_{or}	C_r	C_{or}	Spherical outer ring	Cylindrical outer ring	Spherical outer ring	Cylindrical outer ring	grease	N.m	Kgf.m		(approx.)	
22,300	25,700	2,280	2,620	3,200	11,900	325	1,220	5,500	58	5.8	**NUKR 35**	0.165	16
24,100	29,100	2,450	2,970	3,850	14,500	390	1,480	4,700	87	8.7	**NUKR 40**	0.242	18
38,500	48,000	3,950	4,900	4,700	21,000	480	2,150	4,000	120	12.0	**NUKR 47**	0.380	20
42,500	57,500	4,350	5,850	5,550	23,300	565	2,370	3,300	120	12.0	**NUKR 52**	0.450	20
56,500	72,500	5,750	7,400	6,950	34,500	710	3,500	2,900	220	22.0	**NUKR 62**	0.795	24
62,000	85,500	6,350	8,700	8,050	38,500	820	3,900	2,400	220	22.0	**NUKR 72**	1.010	24
101,000	151,000	10,300	15,400	9,800	53,000	1,000	5,400	2,100	450	45.0	**NUKR 80**	1.540	30
101,000	151,000	10,300	15,400	11,400	59,000	1,160	6,100	2,100	450	45.0	**NUKR 90**	1.960	30

Needle Roller Bearings

NEEDLE ROLLER
BEARINGS

NOTE

NIKO

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COMPONENTS

NEEDLE ROLLER BEARINGS

SOUVENIRS

1. Types and designs

NIKO Inner Rings are available in the series IR, whose boundary dimensions are in metric measurements. Both ends of the inner ring are lead-chamfered for easier assembly. Inner rings marked with an asterisk have a slight chamfer in order to provide greater axial displacement. NIKO also offers inner rings having a lubrication hole at their midpoint (suffix *D*). For much greater running accuracy, the raceway of the inner ring can be finish-ground after the inner ring has been mounted to a shaft. To accommodate this need, NIKO can supply an inner ring whose raceway surface allows for grinding. For details, contact NIKO Engineering.

2. Interpreting inner ring numbers

The inner ring numbers of NIKO Inner Rings comprise of a series number (IR), dimension code (inside dia. (*d*) × raceway dia. (*F*) × width (*B*), and a suffix.

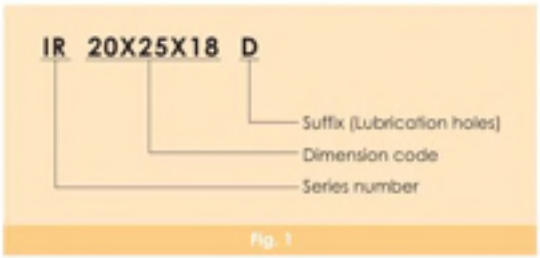
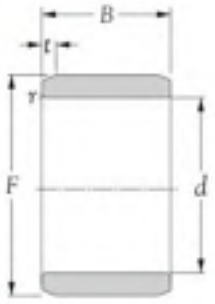
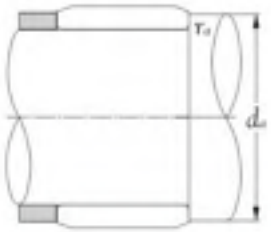


Fig. 1

NEEDLE ROLLER BEARINGS

INNER RINGS
SERIES IR





Boundary dimensions mm					Bearing numbers	Abutment dimensions mm		Mass kg.
d	$F^{1)}$	B	r_s min.$^{2)}$	t		d_a min.	r_{as} max.	(approx.)
5	7 $^{0}_{-0.004}$	10.0	0.15	1	**IR 5X7X10**	6.2	0.15	0.0014
5	8 $^{0}_{-0.004}$	12.0	0.30	1	**IR 5X8X12**	7.0	0.30	0.0028
5	8 $^{0}_{-0.004}$	16.0	0.30	-	**IR 5X8X16**	7.0	0.30	0.0038
6	8 $^{0}_{-0.004}$	10.0	0.15	1	**IR 6X8X10**	7.2	0.15	0.0017
6	9 $^{0}_{-0.004}$	12.0	0.30	1	**IR 6X9X12**	8.0	0.30	0.0032
6	9 $^{0}_{-0.004}$	16.0	0.30	1	**IR 6X9X16**	8.0	0.30	0.0043
6	10 $^{0}_{-0.004}$	10.0	0.30	1	**IR 6X10X10**	8.0	0.30	0.0037
6	10 $^{0}_{-0.004}$	12.0	0.30	-	**IR 6X10X12**	8.0	0.30	0.0046
6	10 $^{0}_{-0.004}$	13.0	0.30	1	**IR 6X10X13**	8.0	0.30	0.0050
7	9 $^{0}_{-0.004}$	10.0	0.15	1	**IR 7X9X10**	8.2	0.15	0.0019
7	10 $^{0}_{-0.004}$	10.5	0.30	1	**IR 7X10X10.5**	9.0	0.30	0.0031
7	10 $^{0}_{-0.004}$	12.0	0.30	1	**IR 7X10X12**	9.0	0.30	0.0036
7	10 $^{0}_{-0.004}$	16.0	0.30	1	**IR 7X10X16**	9.0	0.30	0.0049
7	12 $^{0}_{-0.008}$	16.0	0.30	1	**IR 7X12X16**	9.0	0.30	0.0093
8	10 $^{0}_{-0.004}$	11.0	0.15	1	**IR 8X10X11**	9.2	0.15	0.0024
8	12 $^{0}_{-0.008}$	10.0	0.30	1	**IR 8X12X10**	10.0	0.30	0.0048
8	12 $^{0}_{-0.008}$	10.5	0.30	1	**IR 8X12X10.5**	10.0	0.30	0.0050
8	12 $^{0}_{-0.008}$	12.0	0.30	-	**IR 8X12X12**	10.0	0.30	0.0057
8	12 $^{0}_{-0.008}$	12.5	0.30	1	**IR 8X12X12.5**	10.0	0.30	0.0059
8	14 $^{0}_{-0.008}$	16.0	0.30	1	**IR 8X14X16**	10.0	0.30	0.0130
9	12 $^{0}_{-0.008}$	11.0	0.30	1	**IR 9X12X11**	11.0	0.30	0.0041

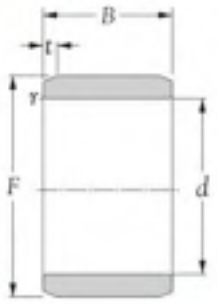
Notes: 1) The tolerance for this dimension provides regular clearance when an inner ring is combined with a needle roller bearing that lacks an inner ring.
2) These values are the allowable minimum dimensions of the chamfer dimension r.

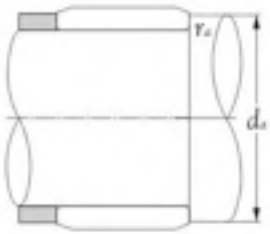
Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

INNER RINGS
SERIES IR





NEEDLE ROLLER BEARINGS

Boundary dimensions mm					Bearing numbers	Abutment dimensions mm		Mass kg.
d	$F^{1)}$	B	r_s min$^{2)}$	t		d_a min	r_{as} max	(approx.)
9	12 $^{0}_{-0.008}$	12.0	0.3	1.0	**IR 9X12X12**	11	0.3	0.0045
9	12 $^{0}_{-0.008}$	16.0	0.3	1.0	**IR 9X12X16**	11	0.3	0.0061
9	15 $^{0}_{-0.008}$	16.0	0.3	1.0	**IR 9X15X16**	11	0.3	0.0140
10	13 $^{0}_{-0.008}$	12.5	0.3	1.0	**IR 10X13X12.5**	12	0.3	0.0052
10	14 $^{0}_{-0.008}$	12.0	0.3	1.0	**IR 10X14X12**	12	0.3	0.0073
10	14 $^{0}_{-0.008}$	13.0	0.3	1.0	**IR 10X14X13**	12	0.3	0.0074
10	14 $^{0}_{-0.008}$	14.0	0.3	—	**IR 10X14X14**	12	0.3	0.0080
10	14 $^{0}_{-0.008}$	16.0	0.3	—	**IR 10X14X16**	12	0.3	0.0092
10	14 $^{0}_{-0.008}$	20.0	0.3	1.0	**IR 10X14X20**	12	0.3	0.0120
10	15 $^{0}_{-0.008}$	15.5	0.3	1.0	**IR 10X15X15.5**	12	0.3	0.0120
10	15 $^{0}_{-0.008}$	20.5	0.3	1.0	**IR 10X15X20.5**	12	0.3	0.0150
10	16 $^{0}_{-0.008}$	16.0	0.3	1.0	**IR 10X16X16**	12	0.3	0.0150
12	15 $^{0}_{-0.008}$	12.0	0.3	1.0	**IR 12X15X12**	14	0.3	0.0058
12	15 $^{0}_{-0.008}$	12.5	0.3	1.0	**IR 12X15X12.5**	14	0.3	0.0061
12	15 $^{0}_{-0.008}$	16.0	0.3	1.0	**IR 12X15X16**	14	0.3	0.0078
12	15 $^{0}_{-0.008}$	16.5	0.3	—	**IR 12X15X16.5**	14	0.3	0.0080
12	15 $^{0}_{-0.008}$	22.5	0.3	—	**IR 12X15X22.5**	14	0.3	0.0110
12	16 $^{0}_{-0.008}$	12.0	0.3	1.5	**IR 12X16X12**	14	0.3	0.0079
12	16 $^{0}_{-0.008}$	13.0	0.3	1.5	**IR 12X16X13**	14	0.3	0.0087
12	16 $^{0}_{-0.008}$	14.0	0.3	—	**IR 12X16X14**	14	0.3	0.0095
12	16 $^{0}_{-0.008}$	16.0	0.3	1.5	**IR 12X16X16**	14	0.3	0.0110

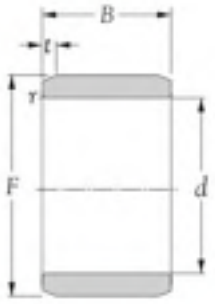
Notes: 1) The tolerance for this dimension provides regular clearance when an inner ring is combined with a needle roller bearing that lacks an inner ring.
2) These values are the allowable minimum dimensions of the chamfer dimension r.

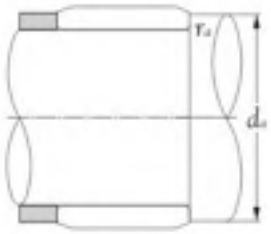
Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

INNER RINGS
SERIES IR





Boundary dimensions mm					Bearing numbers	Abutment dimensions mm		Mass kg.
d	$F^{(1)}$	B	$r_{s\,min}$ [2]	t		d_{as} min	r_{as} max	(approx.)
12	16 $^{0}_{-0.008}$	20.0	0.3	1.5	**IR 12X16X20**	14	0.3	0.0140
12	16 $^{0}_{-0.008}$	22.0	0.3	1.5	**IR 12X16X22**	14	0.3	0.0150
12	17 $^{0}_{-0.008}$	20.5	0.3	1.5	**IR 12X17X20.5**	14	0.3	0.0190
12	17 $^{0}_{-0.008}$	25.5	0.3	1.5	**IR 12X17X25.5**	14	0.3	0.0240
12	18 $^{0}_{-0.008}$	16.0	0.3	1.5	**IR 12X18X16**	14	0.3	0.0180
14	17 $^{0}_{-0.008}$	17.0	0.3	1.5	**IR 14X17X17**	16	0.3	0.0095
15	18 $^{0}_{-0.008}$	12.5	0.3	1.5	**IR 15X18X12.5**	17	0.3	0.0072
15	18 $^{0}_{-0.008}$	16.0	0.3	1.5	**IR 15X18X16**	17	0.3	0.0093
15	18 $^{0}_{-0.008}$	16.5	0.3	1.5	**IR 15X18X16.5**	17	0.3	0.0096
15	18 $^{0}_{-0.008}$	17.5	0.3	1.5	**IR 15X18X17.5**	17	0.3	0.0100
15	18 $^{0}_{-0.008}$	20.5	0.3	1.5	**IR 15X18X20.5**	17	0.3	0.0120
15	18 $^{0}_{-0.008}$	25.5	0.3	1.5	**IR 15X18X25.5**	17	0.3	0.0150
15	19 $^{0}_{-0.009}$	16.0	0.3	1.5	**IR 15X19X16**	17	0.3	0.0130
15	19 $^{0}_{-0.009}$	20.0	0.3	1.5	**IR 15X19X20**	17	0.3	0.0160
15	20 $^{0}_{-0.009}$	12.0	0.3	1.5	**IR 15X20X12**	17	0.3	0.0120
15	20 $^{0}_{-0.009}$	13.0	0.3	1.5	**IR 15X20X13**	17	0.3	0.0140
15	20 $^{0}_{-0.009}$	14.0	0.3	-	**IR 15X20X14**	17	0.3	0.0150
15	20 $^{0}_{-0.009}$	18.0	0.3	1.5	**IR 15X20X18**	17	0.3	0.0190
15	20 $^{0}_{-0.009}$	20.5	0.3	1.5	**IR 15X20X20.5**	17	0.3	0.0210
15	20 $^{0}_{-0.009}$	23.0	0.3	-	**IR 15X20X23**	17	0.3	0.0240
15	20 $^{0}_{-0.009}$	26.0	0.3	1.5	**IR 15X20X26**	17	0.3	0.0270

Notes: 1) The tolerance for this dimension provides regular clearance when an inner ring is combined with a needle roller bearing that lacks an inner ring.
2) These values are the allowable minimum dimensions of the chamfer dimension r.

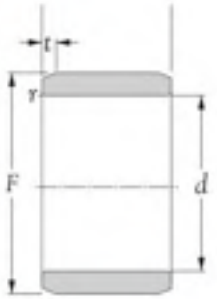
Remark:

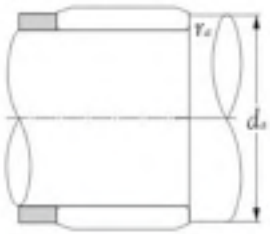
Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

NEEDLE ROLLER BEARINGS

INNER RINGS
SERIES IR





NEEDLE ROLLER BEARINGS

Boundary dimensions mm					Bearing numbers	Abutment dimensions mm		Mass kg.
d	$F^{1)}$	B	r_s min[2]	t		d_a min	r_{as} max	(approx.)
15	20 $^{0}_{-0.009}$	30.5	0.3	1.5	IR 15X20X30.5	17	0.3	0.032
15	22 $^{0}_{-0.009}$	20.0	0.6	1.5	IR 15X22X20	19	0.6	0.032
17	20 $^{0}_{-0.009}$	16.0	0.3	1.5	IR 17X20X16	19	0.3	0.011
17	20 $^{0}_{-0.009}$	16.5	0.3	1.5	IR 17X20X16.5	19	0.3	0.011
17	20 $^{0}_{-0.009}$	20.0	0.3	1.5	IR 17X20X20	19	0.3	0.014
17	20 $^{0}_{-0.009}$	20.5	0.3	-	IR 17X20X20.5	19	0.3	0.014
17	20 $^{0}_{-0.009}$	30.5	0.3	-	IR 17X20X30.5	19	0.3	0.021
17	21 $^{0}_{-0.009}$	16.0	0.3	1.5	IR 17X21X16	19	0.3	0.014
17	21 $^{0}_{-0.009}$	20.0	0.3	-	IR 17X21X20	19	0.3	0.018
17	22 $^{0}_{-0.009}$	13.0	0.3	1.5	IR 17X22X13	19	0.3	0.015
17	22 $^{0}_{-0.009}$	14.0	0.3	-	IR 17X22X14	19	0.3	0.016
17	22 $^{0}_{-0.009}$	16.0	0.3	-	IR 17X22X16	19	0.3	0.019
17	22 $^{0}_{-0.009}$	18.0	0.3	1.5	IR 17X22X18	19	0.3	0.021
17	22 $^{0}_{-0.009}$	20.5	0.3	1.5	IR 17X22X20.5	19	0.3	0.024
17	22 $^{0}_{-0.009}$	23.0	0.3	-	IR 17X22X23	19	0.3	0.027
17	22 $^{0}_{-0.009}$	26.0	0.3	1.5	IR 17X22X26	19	0.3	0.030
17	22 $^{0}_{-0.009}$	32.0	0.3	1.5	IR 17X22X32	19	0.3	0.036
17	24 $^{0}_{-0.009}$	20.0	0.6	1.5	IR 17X24X20	21	0.6	0.034
20	24 $^{0}_{-0.009}$	16.0	0.3	1.8	IR 20X24X16	22	0.3	0.017
20	24 $^{0}_{-0.009}$	20.0	0.3	-	IR 20X24X20	22	0.3	0.021
20	24 $^{0}_{-0.009}$	28.5	0.3	-	IR 20X24X28.5	22	0.3	0.030

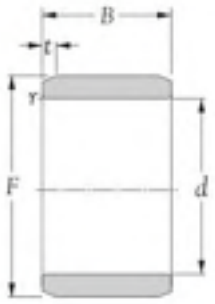
Notes: 1) The tolerance for this dimension provides regular clearance when an inner ring is combined with a needle roller bearing that lacks an inner ring.
2) These values are the allowable minimum dimensions of the chamfer dimension r.

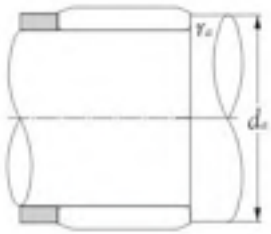
Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	X		
Brass -	X	Class 0 (JIS)	Nil

Remark: If you have more inquiry of technical, please inquire
NIKO web-site: Http://www.nipponkoshobearings.com

INNER RINGS
SERIES IR





Boundary dimensions mm					Bearing numbers	Abutment dimensions mm		Mass kg.
d	$F^{1)}$	B	$r_{s\,min}$ [2]	t		d_a min	r_{as} max	(approx.)
20	25 $^{0}_{-0.009}$	12.5	0.3	1.8	**IR 20X25X12.5**	22	0.3	0.016
20	25 $^{0}_{-0.009}$	16.0	0.3	-	**IR 20X25X16**	22	0.3	0.021
20	25 $^{0}_{-0.009}$	16.5	0.3	1.8	**IR 20X25X16.5**	22	0.3	0.022
20	25 $^{0}_{-0.009}$	17.0	0.3	1.8	**IR 20X25X17**	22	0.3	0.022
20	25 $^{0}_{-0.009}$	18.0	0.3	-	**IR 20X25X18**	22	0.3	0.024
20	25 $^{0}_{-0.009}$	20.0	0.3	-	**IR 20X25X20**	22	0.3	0.027
20	25 $^{0}_{-0.009}$	20.5	0.3	1.8	**IR 20X25X20.5**	22	0.3	0.028
20	25 $^{0}_{-0.009}$	23.0	0.3	1.8	**IR 20X25X23**	22	0.3	0.031
20	25 $^{0}_{-0.009}$	26.0	0.3	1.8	**IR 20X25X26**	22	0.3	0.034
20	25 $^{0}_{-0.009}$	26.5	0.3	-	**IR 20X25X26.5**	22	0.3	0.036
20	25 $^{0}_{-0.009}$	30.0	0.3	1.8	**IR 20X25X30**	22	0.3	0.041
20	25 $^{0}_{-0.009}$	32.0	0.3	1.8	**IR 20X25X32**	22	0.3	0.041
20	25 $^{0}_{-0.009}$	38.5	0.3	-	**IR 20X25X38.5**	22	0.3	0.053
20	28 $^{0}_{-0.009}$	20.0	0.6	1.8	**IR 20X28X20**	24	0.6	0.045
22	26 $^{0}_{-0.009}$	16.0	0.3	1.8	**IR 22X26X16**	24	0.3	0.017
22	26 $^{0}_{-0.009}$	20.0	0.3	-	**IR 22X26X20**	24	0.3	0.022
22	28 $^{0}_{-0.009}$	17.0	0.3	1.8	**IR 22X28X17**	24	0.3	0.030
22	28 $^{0}_{-0.009}$	20.0	0.3	1.8	**IR 22X28X20**	24	0.3	0.035
22	28 $^{0}_{-0.009}$	20.5	0.3	1.8	**IR 22X28X20.5**	24	0.3	0.036
22	28 $^{0}_{-0.009}$	23.0	0.3	1.8	**IR 22X28X23**	24	0.3	0.042
22	28 $^{0}_{-0.009}$	30.0	0.3	-	**IR 22X28X30**	24	0.3	0.054

Notes: 1) The tolerance for this dimension provides regular clearance when an inner ring is combined with a needle roller bearing that lacks an inner ring.
2) These values are the allowable minimum dimensions of the chamfer dimension r.

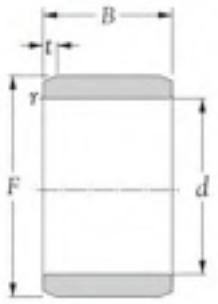
Remark:

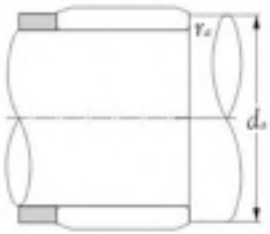
Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

NEEDLE ROLLER BEARINGS

INNER RINGS
SERIES IR





NEEDLE ROLLER BEARINGS

Boundary dimensions mm					Bearing numbers	Abutment dimensions mm		Mass kg.
d	$F^{1)}$	B	r_s min[2]	t		d_a min	r_{as} max	(approx.)
25	29 $^{0}_{-0.009}$	20.0	0.3	-	**IR 25X29X20**	27	0.3	0.026
25	29 $^{0}_{-0.009}$	30.0	0.3	1.8	**IR 25X29X30**	27	0.3	0.039
25	30 $^{0}_{-0.009}$	12.5	0.3	1.8	**IR 25X30X12.5**	27	0.3	0.020
25	30 $^{0}_{-0.009}$	16.0	0.3	1.0	**IR 25X30X16**	27	0.3	0.024
25	30 $^{0}_{-0.009}$	16.5	0.3	1.8	**IR 25X30X16.5**	27	0.3	0.026
25	30 $^{0}_{-0.009}$	17.0	0.3	1.8	**IR 25X30X17**	27	0.3	0.027
25	30 $^{0}_{-0.009}$	18.0	0.3	-	**IR 25X30X18**	27	0.3	0.030
25	30 $^{0}_{-0.009}$	20.0	0.3	1.8	**IR 25X30X20**	27	0.3	0.033
25	30 $^{0}_{-0.009}$	20.5	0.3	1.8	**IR 25X30X20.5**	27	0.3	0.034
25	30 $^{0}_{-0.009}$	23.0	0.3	1.8	**IR 25X30X23**	27	0.3	0.038
25	30 $^{0}_{-0.009}$	26.0	0.3	1.8	**IR 25X30X26**	27	0.3	0.041
25	30 $^{0}_{-0.009}$	26.5	0.3	-	**IR 25X30X26.5**	27	0.3	0.043
25	30 $^{0}_{-0.009}$	30.0	0.3	1.8	**IR 25X30X30**	27	0.3	0.050
25	30 $^{0}_{-0.009}$	32.0	0.3	1.0	**IR 25X30X32**	27	0.3	0.054
25	30 $^{0}_{-0.009}$	38.5	0.3	-	**IR 25X30X38.5**	27	0.3	0.064
25	32 $^{+0.009}_{-0.002}$	22.0	0.6	1.8	**IR 25X32X22**	29	0.6	0.052
25	32 $^{+0.009}_{-0.002}$	30.5	0.6	1.8	**IR 25X32X30.5**	29	0.6	0.072
28	32 $^{+0.009}_{-0.002}$	17.0	0.3	1.8	**IR 28X32X17**	30	0.3	0.025
28	32 $^{+0.009}_{-0.002}$	20.0	0.3	1.8	**IR 28X32X20**	30	0.3	0.028
28	32 $^{+0.009}_{-0.002}$	23.0	0.3	1.8	**IR 28X32X23**	30	0.3	0.034
28	32 $^{+0.009}_{-0.002}$	30.0	0.3	-	**IR 28X32X30**	30	0.3	0.044

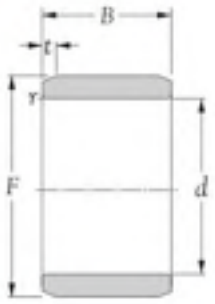
Notes: 1) The tolerance for this dimension provides regular clearance when an inner ring is combined with a needle roller bearing that lacks an inner ring.
2) These values are the allowable minimum dimensions of the chamfer dimension r.

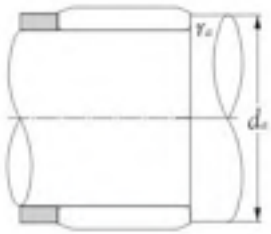
Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire
NIKO web-site: Http://www.nipponkoshobearings.com

INNER RINGS
SERIES IR





Boundary dimensions mm					Bearing numbers	Abutment dimensions mm		Mass kg.
d	$F^{(1)}$	B	$r_{s\,min}$ (2)	t		d_a min	r_{as} max	(approx.)
29	32 $^{+0.308}_{+0.302}$	13.0	0.3	1.8	**IR 29X32X13**	31	0.3	0.015
30	35 $^{+0.308}_{+0.302}$	12.5	0.3	1.8	**IR 30X35X12.5**	32	0.3	0.024
30	35 $^{+0.308}_{+0.302}$	13.0	0.3	1.3	**IR 30X35X13**	32	0.3	0.025
30	35 $^{+0.308}_{+0.303}$	16.0	0.3	-	**IR 30X35X16**	32	0.3	0.031
30	35 $^{+0.308}_{+0.302}$	16.5	0.3	1.8	**IR 30X35X16.5**	32	0.3	0.032
30	35 $^{+0.308}_{+0.303}$	17.0	0.3	1.8	**IR 30X35X17**	32	0.3	0.032
30	35 $^{+0.308}_{+0.303}$	18.0	0.3	-	**IR 30X35X18**	32	0.3	0.035
30	35 $^{+0.308}_{+0.302}$	20.0	0.3	-	**IR 30X35X20**	32	0.3	0.038
30	35 $^{+0.308}_{+0.303}$	20.5	0.3	1.8	**IR 30X35X20.5**	32	0.3	0.039
30	35 $^{+0.308}_{+0.302}$	23.0	0.3	1.8	**IR 30X35X23**	32	0.3	0.044
30	35 $^{+0.308}_{+0.302}$	26.0	0.3	1.8	**IR 30X35X26**	32	0.3	0.050
30	35 $^{+0.308}_{+0.303}$	30.0	0.3	-	**IR 30X35X30**	32	0.3	0.059
30	35 $^{+0.308}_{+0.302}$	32.0	0.3	1.8	**IR 30X35X32**	32	0.3	0.063
30	37 $^{+0.308}_{+0.302}$	18.0	0.3	1.8	**IR 30X37X18**	32	0.3	0.050
30	37 $^{+0.308}_{+0.302}$	22.0	0.6	1.8	**IR 30X37X22**	34	0.6	0.061
30	38 $^{+0.308}_{+0.303}$	20.0	0.6	-	**IR 30X38X20**	34	0.6	0.065
32	37 $^{0}_{-0.011}$	20.0	0.3	2.0	**IR 32X37X20**	34	0.3	0.040
32	37 $^{0}_{-0.011}$	30.0	0.3	-	**IR 32X37X30**	34	0.3	0.063
32	38 $^{0}_{-0.011}$	32.0	0.3	2.0	**IR 32X38X32**	34	0.3	0.082
32	40 $^{0}_{-0.011}$	20.0	0.6	2.0	**IR 32X40X20**	36	0.6	0.068
32	40 $^{0}_{-0.011}$	27.0	0.6	2.0	**IR 32X40X27**	36	0.6	0.092

Notes: 1) The tolerance for this dimension provides regular clearance when an inner ring is combined with a needle roller bearing that lacks an inner ring.
2) These values are the allowable minimum dimensions of the chamfer dimension r.

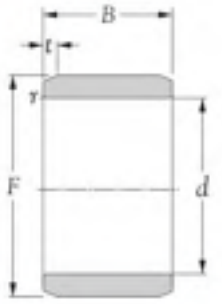
Remark:

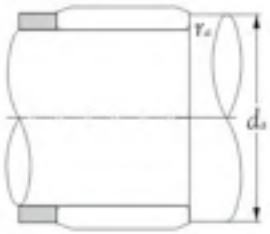
Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

NEEDLE ROLLER BEARINGS

INNER RINGS
SERIES IR





NEEDLE ROLLER BEARINGS

Boundary dimensions mm					Bearing numbers	Abutment dimensions mm		Mass kg.
d	$F^{1)}$	B	$r_{s\,min}$ [2]	t		$d_{a\,min}$	$r_{as\,max}$	(approx.)
32	40 $^{0}_{-0.011}$	36.0	0.6	2.0	**IR 32X40X36**	36	0.6	0.124
33	37 $^{0}_{-0.011}$	13.0	0.3	2.0	**IR 33X37X13**	35	0.3	0.022
35	40 $^{0}_{-0.011}$	12.5	0.3	2.0	**IR 35X40X12.5**	37	0.3	0.027
35	40 $^{0}_{-0.011}$	16.5	0.3	2.0	**IR 35X40X16.5**	37	0.3	0.037
35	40 $^{0}_{-0.011}$	17.0	0.3	2.0	**IR 35X40X17**	37	0.3	0.038
35	40 $^{0}_{-0.011}$	20.0	0.3	2.0	**IR 35X40X20**	37	0.3	0.044
35	40 $^{0}_{-0.011}$	20.5	0.3	2.0	**IR 35X40X20.5**	37	0.3	0.046
35	40 $^{0}_{-0.011}$	30.0	0.3	-	**IR 35X40X30**	37	0.3	0.068
35	40 $^{0}_{-0.011}$	34.0	0.3	1.8	**IR 35X40X34**	37	0.3	0.079
35	40 $^{0}_{-0.011}$	40.0	0.3	2.0	**IR 35X40X40**	37	0.3	0.091
35	42 $^{0}_{-0.011}$	20.0	0.6	1.8	**IR 35X42X20**	39	0.6	0.064
35	42 $^{0}_{-0.011}$	21.0	0.6	-	**IR 35X42X21**	39	0.6	0.068
35	42 $^{0}_{-0.011}$	23.0	0.6	-	**IR 35X42X23**	39	0.6	0.074
35	42 $^{0}_{-0.011}$	27.0	0.6	2.0	**IR 35X42X27**	39	0.6	0.080
35	42 $^{0}_{-0.011}$	36.0	0.6	2.0	**IR 35X42X36**	39	0.6	0.117
35	43 $^{0}_{-0.011}$	22.0	0.6	2.0	**IR 35X43X22**	39	0.6	0.081
38	43 $^{0}_{-0.011}$	20.0	0.3	1.8	**IR 38X43X20**	40	0.3	0.048
38	43 $^{0}_{-0.011}$	30.0	0.3	-	**IR 38X43X30**	40	0.3	0.074
40	45 $^{0}_{-0.011}$	16.5	0.3	2.0	**IR 40X45X16.5**	42	0.3	0.042
40	45 $^{0}_{-0.011}$	17.0	0.3	2.0	**IR 40X45X17**	42	0.3	0.043
40	45 $^{0}_{-0.011}$	20.0	0.3	2.0	**IR 40X45X20**	42	0.3	0.051

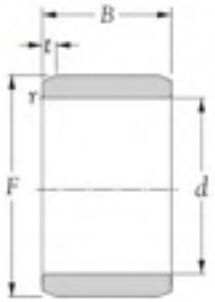
Notes: 1) The tolerance for this dimension provides regular clearance when an inner ring is combined with a needle roller bearing that lacks an inner ring.
2) These values are the allowable minimum dimensions of the chamfer dimension r.

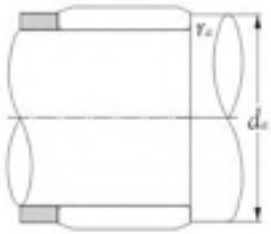
Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

INNER RINGS
SERIES IR





Boundary dimensions mm					Bearing numbers	Abutment dimensions mm		Mass kg.
d	$F^{(1)}$	B	$r_{s\,min}$ (2)	t		d_a min	r_{as} max	(approx.)
40	45 $^{0}_{-0.011}$	20.5	0.3	2.0	**IR 40X45X20.5**	42	0.3	0.053
40	45 $^{0}_{-0.011}$	26.5	0.3	-	**IR 40X45X26.5**	42	0.3	0.068
40	45 $^{0}_{-0.011}$	30.0	0.3	2.0	**IR 40X45X30**	42	0.3	0.077
40	45 $^{0}_{-0.011}$	34.0	0.3	2.0	**IR 40X45X34**	42	0.3	0.088
40	45 $^{0}_{-0.011}$	40.0	0.3	2.0	**IR 40X45X40**	42	0.3	0.106
40	48 $^{0}_{-0.011}$	22.0	0.6	2.0	**IR 40X48X22**	44	0.6	0.092
40	48 $^{0}_{-0.011}$	23.0	0.6	-	**IR 40X48X23**	44	0.6	0.097
40	48 $^{0}_{-0.011}$	30.0	0.6	2.0	**IR 40X48X30**	44	0.6	0.123
40	48 $^{0}_{-0.011}$	40.0	0.6	2.0	**IR 40X48X40**	44	0.6	0.170
40	50 $^{0}_{-0.011}$	20.0	0.3	0.8	**IR 40X50X20**	44	0.3	0.106
40	50 $^{0}_{-0.011}$	22.0	1.0	2.0	**IR 40X50X22**	45	1.0	0.118
42	47 $^{0}_{-0.011}$	20.0	0.3	2.0	**IR 42X47X20**	44	0.3	0.053
42	47 $^{0}_{-0.011}$	30.0	0.3	2.0	**IR 42X47X30**	44	0.3	0.080
45	50 $^{0}_{-0.011}$	20.0	0.3	2.0	**IR 45X50X20**	47	0.3	0.057
45	50 $^{0}_{-0.011}$	25.0	0.6	2.0	**IR 45X50X25**	49	0.6	0.071
45	50 $^{0}_{-0.011}$	25.5	0.3	-	**IR 45X50X25.5**	47	0.3	0.074
45	50 $^{0}_{-0.011}$	32.0	0.6	-	**IR 45X50X32**	49	0.6	0.092
45	50 $^{0}_{-0.011}$	35.0	0.6	2.0	**IR 45X50X35**	49	0.6	0.101
45	50 $^{0}_{-0.011}$	40.0	0.3	1.5	**IR 45X50X40**	47	0.3	0.115
45	52 $^{+0.008}_{-0.004}$	22.0	0.6	2.0	**IR 45X52X22**	49	0.6	0.088
45	52 $^{+0.008}_{-0.004}$	23.0	0.6	-	**IR 45X52X23**	49	0.6	0.093

Notes: 1) The tolerance for this dimension provides regular clearance when an inner ring is combined with a needle roller bearing that lacks an inner ring.
2) These values are the allowable minimum dimensions of the chamfer dimension r.

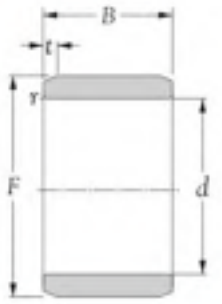
Remark:

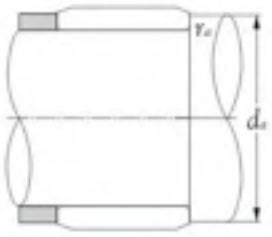
Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

NEEDLE ROLLER BEARINGS

INNER RINGS
SERIES IR





NEEDLE ROLLER BEARINGS

Boundary dimensions mm					Bearing numbers	Abutment dimensions mm		Mass kg.
d	$F^{1)}$	B	$r_{s\,min}$	t		d_a min.	r_{as} max.	(approx.)
45	52 $^{+0.030}_{+0.004}$	30	0.6	2.0	IR 45X52X30	49	0.6	0.123
45	52 $^{+0.030}_{+0.004}$	40	0.6	2.0	IR 45X52X40	49	0.6	0.164
45	55 $^{+0.030}_{+0.004}$	20	0.6	2.0	IR 45X55X20	49	0.6	0.116
45	55 $^{+0.030}_{+0.004}$	22	1.0	2.0	IR 45X55X22	50	1.0	0.130
45	55 $^{+0.030}_{+0.004}$	40	0.6	2.0	IR 45X55X40	49	0.6	0.173
50	55 $^{+0.030}_{+0.004}$	20	0.6	2.0	IR 50X55X20	54	0.6	0.063
50	55 $^{+0.030}_{+0.004}$	25	0.6	2.0	IR 50X55X25	54	0.6	0.780
50	55 $^{+0.030}_{+0.004}$	35	0.6	2.0	IR 50X55X35	54	0.6	0.112
50	55 $^{+0.030}_{+0.004}$	40	0.6	2.0	IR 50X55X40	54	0.6	0.128
50	58 $^{+0.030}_{+0.004}$	22	0.6	2.0	IR 50X58X22	54	0.6	0.113
50	58 $^{+0.030}_{+0.004}$	23	0.6	-	IR 50X58X23	54	0.6	0.119
50	58 $^{+0.030}_{+0.004}$	30	0.6	2.0	IR 50X58X30	54	0.6	0.159
50	58 $^{+0.030}_{+0.004}$	40	0.6	2.0	IR 50X58X40	54	0.6	0.209
50	60 $^{+0.030}_{+0.004}$	20	1.0	2.0	IR 50X60X20	55	1.0	0.129
50	60 $^{+0.030}_{+0.004}$	25	1.0	2.0	IR 50X60X25	55	1.0	0.163
50	60 $^{+0.030}_{+0.004}$	28	1.1	2.0	IR 50X60X28	56	1.0	0.183
50	60 $^{+0.030}_{+0.004}$	40	1.0	2.0	IR 50X60X40	55	1.0	0.262
55	60 $^{0}_{-0.013}$	25	0.6	2.2	IR 55X60X25	59	0.6	0.086
55	60 $^{0}_{-0.013}$	35	0.6	2.0	IR 55X60X35	59	0.6	0.121
55	63 $^{0}_{-0.013}$	25	1.0	2.0	IR 55X63X25	60	1.0	0.141
55	63 $^{0}_{-0.013}$	34	1.0	2.2	IR 55X63X34	60	1.0	0.192

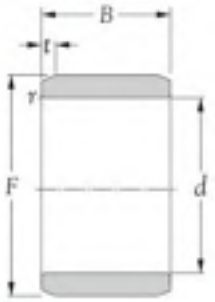
Notes: 1) The tolerance for this dimension provides regular clearance when an inner ring is combined with a needle roller bearing that lacks an inner ring.
2) These values are the allowable minimum dimensions of the chamfer dimension r.

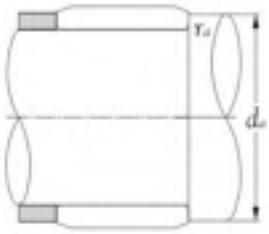
Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

INNER RINGS
SERIES IR





Boundary dimensions mm					Bearing numbers	Abutment dimensions mm		Mass kg.
d	$F^{1)}$	B	r_s min.$^{2)}$	t		d_a min.	r_{as} max.	(approx.)
55	63 $^{0}_{-0.013}$	45	1.0	2.2	**IR 55X63X45**	60.0	1.0	0.256
55	65 $^{0}_{-0.013}$	28	1.1	2.2	**IR 55X65X28**	61.5	1.0	0.206
55	65 $^{0}_{-0.013}$	30	1.0	2.2	**IR 55X65X30**	60.0	1.0	0.220
55	65 $^{0}_{-0.013}$	60	1.0	1.5	**IR 55X65X60**	60.0	1.0	0.440
60	68 $^{0}_{-0.013}$	25	1.0	2.2	**IR 60X68X25**	65.0	1.0	0.152
60	68 $^{0}_{-0.013}$	34	1.0	2.2	**IR 60X68X34**	65.0	1.0	0.206
60	68 $^{0}_{-0.013}$	35	0.6	2.2	**IR 60X68X35**	64.0	0.6	0.213
60	68 $^{0}_{-0.013}$	45	1.0	2.2	**IR 60X68X45**	65.0	1.0	0.270
60	70 $^{0}_{-0.013}$	25	1.0	2.2	**IR 60X70X25**	65.0	1.0	0.195
60	70 $^{0}_{-0.013}$	28	1.1	2.2	**IR 60X70X28**	66.5	1.0	0.216
60	70 $^{0}_{-0.013}$	30	1.0	2.2	**IR 60X70X30**	65.0	1.0	0.232
60	70 $^{0}_{-0.013}$	60	1.0	2.2	**IR 60X70X60**	65.0	1.0	0.463
65	72 $^{0}_{-0.013}$	25	1.0	2.2	**IR 65X72X25**	70.0	1.0	0.142
65	72 $^{0}_{-0.013}$	34	1.0	2.2	**IR 65X72X34**	70.0	1.0	0.193
65	72 $^{0}_{-0.013}$	45	1.0	2.2	**IR 65X72X45**	70.0	1.0	0.259
65	73 $^{0}_{-0.013}$	25	0.6	2.2	**IR 65X73X25**	69.0	0.6	0.164
65	73 $^{0}_{-0.013}$	35	0.6	2.2	**IR 65X73X35**	69.0	0.6	0.232
65	75 $^{0}_{-0.013}$	28	1.1	2.2	**IR 65X75X28**	71.5	1.0	0.240
65	75 $^{0}_{-0.013}$	30	1.0	2.2	**IR 65X75X30**	70.0	1.0	0.256
65	75 $^{0}_{-0.013}$	60	1.0	2.2	**IR 65X75X60**	70.0	1.0	0.513
70	80 $^{0}_{-0.013}$	25	1.0	2.2	**IR 70X80X25**	75.0	1.0	0.224

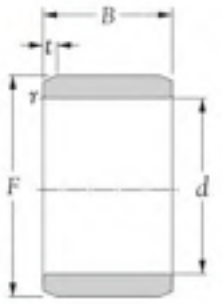
Notes: 1) The tolerance for this dimension provides regular clearance when an inner ring is combined with a needle roller bearing that locks an inner ring.
2) These values are the allowable minimum dimensions of the chamfer dimension r.

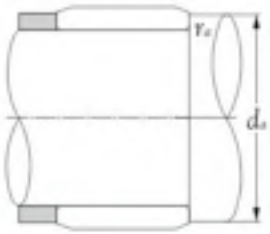
Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

INNER RINGS
SERIES IR





NEEDLE ROLLER BEARINGS

Boundary dimensions mm					Bearing numbers	Abutment dimensions mm		Mass kg.
d	$F^{1)}$	B	r_s min$^{2)}$	t		d_a min	r_{as} max	(approx.)
70	80 $^{0}_{-0.013}$	28	1.1	2.2	IR 70X80X28	76.5	1	0.250
70	80 $^{0}_{-0.013}$	30	1.0	2.2	IR 70X80X30	75.0	1	0.267
70	80 $^{0}_{-0.013}$	35	1.0	2.2	IR 70X80X35	75.0	1	0.313
70	80 $^{0}_{-0.013}$	40	1.0	2.2	IR 70X80X40	75.0	1	0.358
70	80 $^{0}_{-0.013}$	54	1.0	2.2	IR 70X80X54	75.0	1	0.483
70	80 $^{0}_{-0.013}$	56	1.0	2.2	IR 70X80X56	75.0	1	0.502
70	80 $^{0}_{-0.015}$	60	1.0	2.2	IR 70X80X60	75.0	1	0.540
75	85 $^{0}_{-0.015}$	25	1.0	2.2	IR 75X85X25	80.0	1	0.238
75	85 $^{0}_{-0.015}$	30	1.0	2.2	IR 75X85X30	80.0	1	0.287
75	85 $^{0}_{-0.015}$	35	1.0	2.2	IR 75X85X35	80.0	1	0.336
75	85 $^{0}_{-0.015}$	40	1.0	2.2	IR 75X85X40	80.0	1	0.385
75	85 $^{0}_{-0.015}$	54	1.0	2.2	IR 75X85X54	80.0	1	0.515
75	90 $^{0}_{-0.015}$	32	1.1	2.2	IR 75X90X32	81.5	1	0.480
80	90 $^{0}_{-0.015}$	25	1.0	2.2	IR 80X90X25	85.0	1	0.254
80	90 $^{0}_{-0.015}$	30	1.0	2.2	IR 80X90X30	85.0	1	0.304
80	90 $^{0}_{-0.015}$	35	1.0	2.2	IR 80X90X35	85.0	1	0.355
80	90 $^{0}_{-0.015}$	40	1.0	2.2	IR 80X90X40	85.0	1	0.408
80	90 $^{0}_{-0.015}$	54	1.0	2.2	IR 80X90X54	85.0	1	0.543
80	95 $^{0}_{-0.015}$	32	1.1	2.2	IR 80X95X32	86.5	1	0.510
85	95 $^{0}_{-0.015}$	26	1.0	2.5	IR 85X95X26	90.0	1	0.280
85	95 $^{0}_{-0.015}$	30	1.0	2.5	IR 85X95X30	90.0	1	0.323

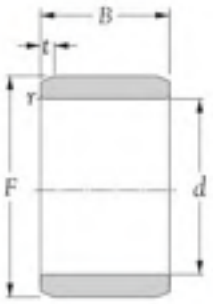
Notes: 1) The tolerance for this dimension provides regular clearance when an inner ring is combined with a needle roller bearing that lacks an inner ring.
2) These values are the allowable minimum dimensions of the chamfer dimension r.

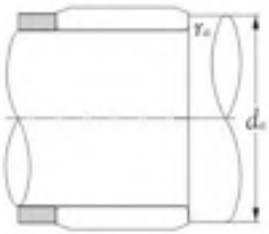
Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

INNER RINGS
SERIES IR





Boundary dimensions mm					Bearing numbers	Abutment dimensions mm		Mass kg(s).
d	$F^{(1)}$	B	r_s min[2]	t		d_a min	r_{as} max	(approx.)
85	95 $^{0}_{-0.013}$	36	1.0	2.5	**IR 85X95X36**	90.0	1	0.398
85	100 $^{0}_{-0.013}$	32	1.1	2.5	**IR 85X100X32**	91.5	1	0.530
85	100 $^{0}_{-0.013}$	35	1.1	2.5	**IR 85X100X35**	91.5	1	0.580
85	100 $^{0}_{-0.013}$	46	1.1	2.5	**IR 85X100X46**	91.5	1	0.760
85	100 $^{0}_{-0.013}$	63	1.1	2.5	**IR 85X100X63**	91.5	1	1.050
90	100 $^{0}_{-0.013}$	26	1.0	2.5	**IR 90X100X26**	95.0	1	0.294
90	100 $^{0}_{-0.013}$	30	1.0	2.5	**IR 90X100X30**	95.0	1	0.340
90	100 $^{0}_{-0.013}$	36	1.0	2.5	**IR 90X100X36**	95.0	1	0.406
90	105 $^{0}_{-0.013}$	32	1.1	2.5	**IR 90X105X32**	96.5	1	0.560
90	105 $^{0}_{-0.013}$	35	1.1	2.5	**IR 90X105X35**	96.5	1	0.610
90	105 $^{0}_{-0.013}$	46	1.1	2.5	**IR 90X105X46**	96.5	1	0.800
90	105 $^{0}_{-0.013}$	63	1.1	2.5	**IR 90X105X63**	96.5	1	1.110
95	105 $^{0}_{-0.013}$	26	1.0	2.5	**IR 95X105X26**	100.0	1	0.313
95	105 $^{0}_{-0.013}$	36	1.0	2.5	**IR 95X105X36**	100.0	1	0.430
95	110 $^{0}_{-0.013}$	32	1.1	2.5	**IR 95X110X32**	101.5	1	0.590
95	110 $^{0}_{-0.013}$	35	1.1	2.5	**IR 95X110X35**	101.5	1	0.640
95	110 $^{0}_{-0.013}$	46	1.1	2.5	**IR 95X110X46**	101.5	1	0.850
95	110 $^{0}_{-0.013}$	63	1.1	2.5	**IR 95X110X63**	101.5	1	1.170
100	110 $^{0}_{-0.013}$	30	1.1	2.5	**IR 100X110X30**	106.5	1	0.375
100	110 $^{0}_{-0.013}$	40	1.1	2.5	**IR 100X110X40**	106.5	1	0.505
100	115 $^{0}_{-0.013}$	32	1.1	2.5	**IR 100X115X32**	106.5	1	0.620

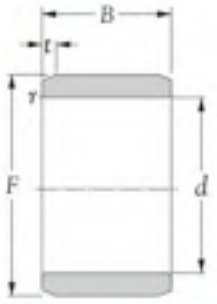
Notes: 1) The tolerance for this dimension provides regular clearance when an inner ring is combined with a needle roller bearing that lacks an inner ring.
2) These values are the allowable minimum dimensions of the chamfer dimension r.

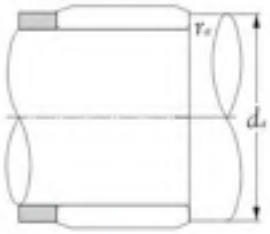
Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

INNER RINGS
SERIES IR





NEEDLE ROLLER BEARINGS

Boundary dimensions mm					Bearing numbers	Abutment dimensions mm		Mass kg(s).
d	$F^{1)}$	B	r_s min$^{2)}$	t		d_a min	r_{as} max	(approx.)
100	115 $^{0}_{-0.015}$	40	1.1	2.5	IR 100X115X40	106.5	1.0	0.775
100	115 $^{0}_{-0.015}$	54	1.1	2.5	IR 100X115X54	106.5	1.0	1.090
110	120 $^{0}_{-0.015}$	30	1.0	2.5	IR 110X120X30	115.0	1.0	0.440
110	120 $^{0}_{-0.015}$	40	1.1	2.5	IR 110X120X40	116.5	1.0	0.580
110	125 $^{0}_{-0.018}$	40	1.1	2.5	IR 110X125X40	116.5	1.0	0.840
110	125 $^{0}_{-0.018}$	54	1.1	2.5	IR 110X125X54	116.5	1.0	1.160
120	130 $^{0}_{-0.018}$	30	1.0	2.2	IR 120X130X30	125.0	1.0	0.440
120	130 $^{0}_{-0.018}$	40	1.1	2.5	IR 120X130X40	126.5	1.0	0.590
120	135 $^{0}_{-0.018}$	40	2.0	2.5	IR 120X135X40	129.0	2.0	0.870
120	135 $^{0}_{-0.018}$	45	1.1	2.5	IR 120X135X45	126.5	1.0	0.980
120	135 $^{0}_{-0.018}$	60	1.1	2.5	IR 120X135X60	126.5	1.0	1.250
130	145 $^{0}_{-0.018}$	32	1.5	3.0	IR 130X145X32	138.0	1.5	0.780
130	145 $^{0}_{-0.018}$	35	1.1	3.0	IR 130X145X35	136.5	1.0	0.855
130	145 $^{0}_{-0.018}$	42	1.5	3.0	IR 130X145X42	138.0	1.5	1.050
130	150 $^{0}_{-0.018}$	50	1.5	3.0	IR 130X150X50	138.0	1.5	1.690
130	150 $^{0}_{-0.018}$	52	2.0	3.0	IR 130X150X52	139.0	2.0	1.750
130	150 $^{0}_{-0.018}$	67	1.5	3.0	IR 130X150X67	138.0	1.5	2.250
140	155 $^{0}_{-0.018}$	32	1.5	3.0	IR 140X155X32	148.0	1.5	0.840
140	155 $^{0}_{-0.018}$	35	1.1	3.0	IR 140X155X35	146.5	1.0	0.917
140	155 $^{0}_{-0.018}$	42	1.5	3.0	IR 140X155X42	148.0	1.5	1.100
140	160 $^{0}_{-0.018}$	50	1.5	3.0	IR 140X160X50	148.0	1.5	1.700

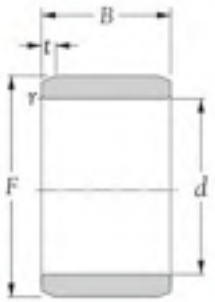
Notes: 1) The tolerance for this dimension provides regular clearance when an inner ring is combined with a needle roller bearing that locks an inner ring.
2) These values are the allowable minimum dimensions of the chamfer dimension r.

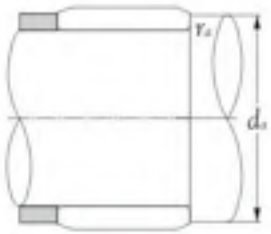
Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

INNER RINGS
SERIES IR





Boundary dimensions mm					Bearing numbers	Abutment dimensions mm		Mass kg(s).
d	$F^{1)}$	B	r_s min[2]	t		d_a min	r_{as} max	(approx.)
140	160 $^{0}_{-0.018}$	52	2.0	3.0	IR 140X160X52	149.0	2.0	1.780
140	160 $^{0}_{-0.018}$	67	1.5	3.0	IR 140X160X67	148.0	1.5	2.300
150	165 $^{-0.017}_{-0.035}$	32	1.5	3.0	IR 150X165X32	158.0	1.5	0.900
150	165 $^{-0.017}_{-0.035}$	40	1.1	3.0	IR 150X165X40	156.5	1.0	1.120
150	165 $^{-0.017}_{-0.035}$	42	1.5	3.0	IR 150X165X42	158.0	1.5	1.180
150	170 $^{-0.017}_{-0.035}$	52	2.0	3.0	IR 150X170X52	159.0	2.0	2.000
150	170 $^{-0.017}_{-0.035}$	60	2.0	3.0	IR 150X170X60	159.0	2.0	2.350
160	175 $^{-0.017}_{-0.035}$	40	1.1	3.0	IR 160X175X40	166.5	1.0	1.200
160	180 $^{-0.017}_{-0.035}$	60	2.0	3.0	IR 160X180X60	169.0	2.0	2.500
170	185 $^{-0.013}_{-0.043}$	45	1.1	3.0	IR 170X185X45	176.5	1.0	1.450
170	190 $^{-0.013}_{-0.043}$	60	2.0	3.0	IR 170X190X60	179.0	2.0	2.650
180	195 $^{-0.013}_{-0.043}$	45	1.1	3.0	IR 180X195X45	186.5	1.0	1.510
180	205 $^{-0.013}_{-0.043}$	69	2.0	3.0	IR 180X205X69	189.0	2.0	4.100
190	210 $^{-0.020}_{-0.050}$	50	1.5	3.5	IR 190X210X50	198.0	1.5	2.410
190	215 $^{-0.020}_{-0.050}$	69	2.0	3.5	IR 190X215X69	199.0	2.0	4.100
200	220 $^{-0.020}_{-0.050}$	50	1.5	3.5	IR 200X220X50	208.0	1.5	2.490
200	225 $^{-0.020}_{-0.050}$	80	2.1	3.5	IR 200X225X80	211.0	2.0	5.100
220	240 $^{-0.033}_{-0.063}$	50	1.5	3.5	IR 220X240X50	228.0	1.5	2.750
220	245 $^{-0.033}_{-0.063}$	80	2.1	3.5	IR 220X245X80	231.0	2.0	5.700
240	265 $^{-0.037}_{-0.069}$	60	2.0	3.5	IR 240X265X60	249.0	2.0	4.600
240	265 $^{-0.037}_{-0.069}$	80	2.1	3.5	IR 240X265X80	251.0	2.0	6.300

Notes: 1) The tolerance for this dimension provides regular clearance when an inner ring is combined with a needle roller bearing that lacks an inner ring.
2) These values are the allowable minimum dimensions of the chamfer dimension r.

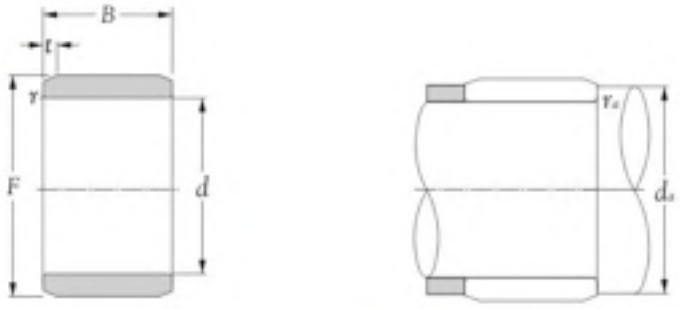
Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

NEEDLE ROLLER BEARINGS

INNER RINGS
SERIES IR



Boundary dimensions mm					Bearing numbers	Abutment dimensions mm		Mass kgs.
d	$F^{(1)}$	B	$r_{s\,min}$ [2]	t		d_{a} min	r_{as} max	(approx.)
320	360 $^{-0.042}_{-0.088}$	118	3.0	5	**IR 320X360X118**	333	2.5	20.00
340	370 $^{-0.042}_{-0.088}$	80	2.1	5	**IR 340X370X80**	351	2.0	10.10
340	380 $^{-0.042}_{-0.088}$	118	3.0	5	**IR 340X380X118**	353	2.5	22.00
360	390 $^{-0.090}_{-0.126}$	80	2.1	5	**IR 360X390X80**	371	2.0	10.90
360	400 $^{-0.090}_{-0.126}$	118	3.0	5	**IR 360X400X118**	373	2.5	22.00
380	415 $^{-0.080}_{-0.120}$	100	2.1	5	**IR 380X415X100**	391	2.0	18.50
380	430 $^{-0.080}_{-0.120}$	140	4.0	5	**IR 380X430X140**	396	3.0	35.00
400	450 $^{-0.080}_{-0.120}$	140	4.0	5	**IR 400X450X140**	416	3.0	36.50
420	470 $^{-0.105}_{-0.145}$	140	4.0	5	**IR 420X470X140**	436	3.0	38.20
440	490 $^{-0.105}_{-0.145}$	160	4.0	5	**IR 440X490X160**	456	3.0	46.50

Notes: 1) The tolerance for this dimension provides regular clearance when an inner ring is combined with a needle roller bearing that lacks an inner ring.
2) These values are the allowable minimum dimensions of the chamfer dimension r.

NEEDLE ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

One-way clutches

Needle Roller Bearings

Souvenirs

1. Types and designs

NIKO Series HF one-way clutches have an outer ring formed by precision drawing of thin steel plate, and are capable of a clutching function only. In order to carry a radial load and rotate smoothly, a one-way clutch must have bearings on both sides.

Fig. 1 Series HF

NIKO Engineering.
All of NIKO's series HF one-way clutches use a polyamide resin cage that supports a leaf spring. The leaf spring in turn forces the needle rollers to the wedge section formed between the outer ring cam way and the shaft

2. Interpreting clutch numbers

Clutch numbers of NIKO one-way clutches comprise a series number and dimension code.

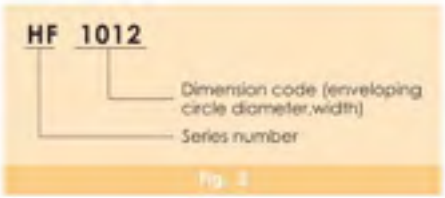


Fig. 2

3. Lubrication

NEEDLE ROLLER BEARINGS

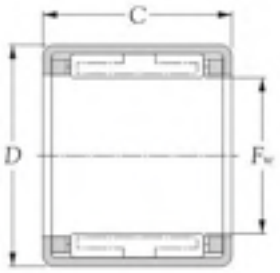
Oil is the best lubrication for NIKO one-way clutches. However, they are supplied prefilled with adequate grease, as they are often grease-lubricated. Under normal operating conditions, this grease does not need replenishment. Note, however, that excessive grease can inhibit reliable clutch operation.

4. Mounting practices

Using a press-fit mandrel is convenient when assembling one-way clutch as illustrated in Fig.7. With series HF be sure to press-fit the clutch with its inscription side placed onto the shoulder on the mandrel. With series NHF, it is important to press-fit the clutch by using a special tool that presses the outer ring without pressing the oil retaining bearing. When assembling, be sure not to pry the outer ring or directly hit the outer ring with a hammer. Be sure place the appropriate tool on the face of the outer ring when press-fitting the clutch. When mass-producing clutches with a press, using a mandrel equipped with an O-ring facilitates insertion of the one-way clutch by keeping it from falling out. Turning the shaft in the direction in which the clutch slips facilitates the assembly. If this can't be done, providing a tapered guide (chamfered) on the shaft end will also facilitate assembly.

Transmission direction (direction of engagement)
The clutch is engaged when the outer ring (housing) is turned relative to the shaft in the direction indicated by the arrow mark.
With the series HF clutch, the mark is on the rib of the outer ring.

ONE-WAY CLUTCH MINIATURE TYPE
SERIES **HF**



Boundary dimensions mm			Torque capacity Md		Part number by radial load		Bearing numbers	Mass kg.
			N・m	kgf・m	needle roller bearing	oil retaining bearing		
Fw	D	C						(approx.)
6	10	12	1.76	0.18	HK 0609 T2	B-5 6-22	**HF 0612 T2**	0.0030
8	12	12	3.15	0.32	HK 0810	B-5 8-25	**HF 0812 T2**	0.0035
10	14	12	5.30	0.54	HK 1010	B-5 10-21	**HF 1012 T2**	0.0040
12	18	16	12.20	1.24	HK 1212	B-5 12-32	**HF 1216 T2**	0.0116
14	20	16	17.30	1.76	HK 1412	B-5 14-13	**HF 1416 T2**	0.0130
16	22	16	20.50	2.09	HK 1612	B-5 16-13	**HF 1616 T2**	0.0140
18	24	16	24.10	2.46	HK 1812	B-5 18-8	**HF 1816 T2**	0.0155
20	26	16	28.50	2.91	HK 2012	B-5 20-19	**HF 2016 T2**	0.0170
25	32	20	66.00	6.73	HK 2512	B-5 25-11	**HF 2520 T2**	0.0309
30	37	20	90.00	9.18	HK 3012	B-5 30-19	**HF 3020 T2**	0.0360
35	42	20	121.00	12.30	HK 3512	B-5 35-7	**HF 3520 T2**	0.0400

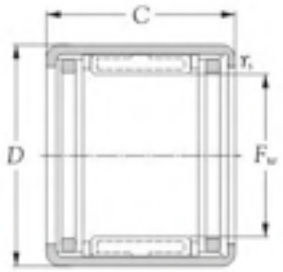
NEEDLE ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	T2	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

DRAWN CUP NEEDLE CLUTCH
SERIES **HFL**



Boundary dimensions mm			Basic load ratings dynamic N	static N	Limiting speed rpm		Permissible torque Nm	Bearing numbers	Mass kg.
F_w	D	C	C_r	C_{or}	n	nl**			(approx.)
4	8	8	1,270	1,740	34,000	14,000	0.34	**HFL 0408 T2**	0.002
6	10	15	1,650	2,030	23,000	13,000	1.76	**HFL 0615 T2**	0.004
8	12	20	4,050	4,150	17,000	12,000	3.15	**HFL 0822 T2**	0.007
10	14	22	4,300	4,650	14,000	11,000	5.30	**HFL 1022 T2**	0.008
12	18	26	6,300	6,500	11,000	8,000	12.20	**HFL 1226 T2**	0.018
14	20	26	6,300	6,500	9,500	8,000	17.30	**HFL 1426 T2**	0.020
16	22	26	7,300	8,400	8,500	7,500	20.50	**HFL 1626 T2**	0.022
18	24	26	8,200	10,300	7,500	7,500	24.10	**HFL 1826 T2**	0.025
20	26	26	8,300	10,400	7,000	6,500	28.50	**HFL 2026 T2**	0.027
25	32	30	10,900	14,100	5,500	5,500	66.00	**HFL 2530 T2**	0.044
30	37	30	12,600	17,600	4,500	4,500	90.00	**HFL 3030 T2**	0.051
35	42	30	13,000	19,300	3,900	3,900	121.00	**HFL 3530 T2**	0.058

NEEDLE ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	T2	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

Machined Ring Needle Roller Bearings, Separable

Needle Roller Bearings

Souvenirs

1. Types and designs

The available NIKO Machined Ring Needle Roller Bearings, Separable, include the series RNAO (without inner ring) and series NAO (with inner ring).
The cage used for NIKO Machined Ring Needle Roller Bearings, Separable, is usually a machined ring type. However, cages of molded polyamide reinforced with glass fiber or carbon fiber (suffix T2) may be used. The T2 cage features a maximum allowable operating temperature of 120°C and maximum allowable continuous operating temperature of 100°C.

2. Interpreting bearing numbers

The bearing numbers of NIKO Machined Ring Needle Roller Bearings, Separable, comprise a series number (RNAO, NAO), dimension code (inscribed enveloping circle diameter or bore diameter X outside diameter X width), and suffix (Fig. 1~3).

Fig. 1 Series RNAO

Fig. 2 Series NAO

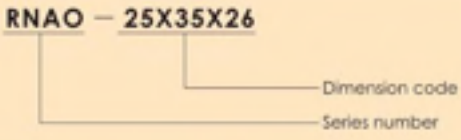
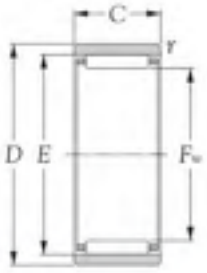


Fig. 3

NEEDLE ROLLER BEARINGS

NEEDLE ROLLER
BEARINGS

MACHINED-RING NEEDLE ROLLER BEARINGS, SEPARABLE
SERIES **RNAO**



NEEDLE ROLLER BEARINGS

Boundary dimensions mm					Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Bearing numbers
F_w	D	C	r_s min[1]	E	C_r	C_{or}	C_r	C_{or}	
5 $^{+0.018}_{+0.010}$	10	8.0	0.15	8	2,640	2,190	269	224	RNAO 5X10X8
6 $^{+0.018}_{+0.010}$	13	8.0	0.30	9	2,660	2,280	272	233	RNAO 6X13X8
7 $^{+0.022}_{+0.013}$	14	8.0	0.30	10	2,670	2,350	272	239	RNAO 7X14X8
8 $^{+0.022}_{+0.013}$	15	10.0	0.30	11	4,000	4,100	410	420	RNAO 8X15X10
10 $^{+0.022}_{+0.013}$	17	10.0	0.30	13	4,550	5,100	460	520	RNAO 10X17X10
10 $^{+0.033}_{+0.013}$	20	12.0	0.30	16	7,100	5,950	720	610	RNAO 10X20X12
12 $^{+0.027}_{+0.016}$	19	13.5	0.30	15	6,000	7,700	615	785	RNAO 12X19X13.5
12 $^{+0.027}_{+0.016}$	22	12.0	0.30	18	8,650	8,000	880	815	RNAO 12X22X12
14 $^{+0.027}_{+0.016}$	22	13.0	0.30	18	8,300	10,100	845	1,030	RNAO 14X22X13
14 $^{+0.027}_{+0.016}$	26	12.0	0.30	20	9,350	9,150	955	930	RNAO 14X26X12
15 $^{+0.027}_{+0.016}$	23	13.0	0.30	19	8,250	10,200	840	1,040	RNAO 15X23X13
16 $^{+0.027}_{+0.016}$	24	13.0	0.30	20	9,050	11,800	925	1,200	RNAO 16X24X13
16 $^{+0.027}_{+0.016}$	28	12.0	0.30	22	11,700	12,500	1,190	1,280	RNAO 16X28X12
17 $^{+0.027}_{+0.016}$	25	13.0	0.30	21	9,400	12,600	960	1,280	RNAO 17X25X13
18 $^{+0.027}_{+0.016}$	26	13.0	0.30	22	8,900	11,900	910	1,210	RNAO 18X26X13
18 $^{+0.027}_{+0.016}$	30	12.0	0.30	24	12,300	13,800	1,250	1,410	RNAO 18X30X12
20 $^{+0.033}_{+0.020}$	28	13.0	0.30	24	10,000	14,300	1,020	1,460	RNAO 20X28X13
20 $^{+0.033}_{+0.020}$	32	12.0	0.30	26	12,900	15,100	1,320	1,540	RNAO 20X32 X12
22 $^{+0.033}_{+0.020}$	30	13.0	0.30	26	10,200	15,200	1,040	1,550	RNAO 22X30X13
22 $^{+0.033}_{+0.020}$	35	16.0	0.30	29	18,700	22,700	1,910	2,310	RNAO 22X35X16
25 $^{+0.033}_{+0.020}$	35	17.0	0.30	29	14,200	24,000	1,450	2,450	RNAO 25X35X17

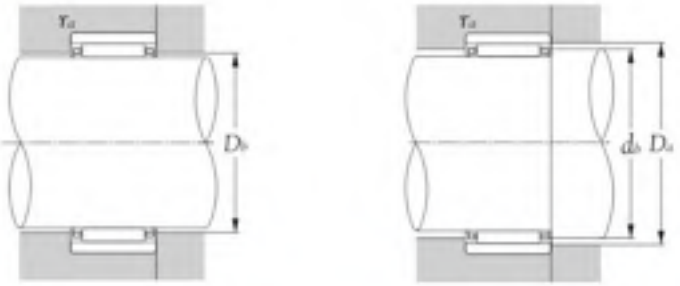
Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

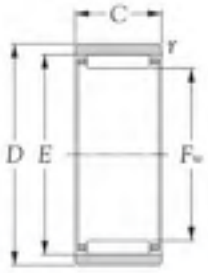
MACHINED-RING NEEDLE ROLLER BEARINGS, SEPARABLE
SERIES RNAO



Abutment dimensions				Limiting speeds rpm		Bearing numbers	Mass kg.
D_b min	D_a max	d_b min	r_{as} max	grease	oil		(approx.)
7.7	8.8	5.3	0.15	27,000	40,000	**RNAO 5X10X8**	0.003
8.7	11.0	6.3	0.30	25,000	37,000	**RNAO 6X13X8**	0.006
9.7	12.0	7.3	0.30	23,000	34,000	**RNAO 7X14X8**	0.006
10.7	13.0	8.3	0.30	21,000	32,000	**RNAO 8X15X10**	0.008
12.7	15.0	10.3	0.30	19,000	28,000	**RNAO 10X17X10**	0.010
15.7	18.0	10.3	0.30	19,000	28,000	**RNAO 10X20X12**	0.018
14.7	17.0	12.3	0.30	17,000	26,000	**RNAO 12X19X13.5**	0.015
17.6	20.0	12.3	0.30	17,000	26,000	**RNAO 12X22X12**	0.019
17.6	20.0	14.4	0.30	16,000	24,000	**RNAO 14X22X13**	0.018
19.6	24.0	14.4	0.30	16,000	24,000	**RNAO 14X26X12**	0.029
18.6	21.0	15.4	0.30	15,000	23,000	**RNAO 15X23X13**	0.020
19.6	22.0	16.4	0.30	15,000	23,000	**RNAO 16X24X13**	0.021
21.6	26.0	16.4	0.30	15,000	23,000	**RNAO 16X28X12**	0.032
20.6	23.0	17.4	0.30	15,000	22,000	**RNAO 17X25X13**	0.022
21.6	24.0	18.4	0.30	14,000	21,000	**RNAO 18X26X13**	0.022
23.6	28.0	18.4	0.30	14,000	21,000	**RNAO 18X30X12**	0.035
23.6	26.0	20.4	0.30	13,000	20,000	**RNAO 20X28X13**	0.025
25.6	30.0	20.4	0.30	13,000	20,000	**RNAO 20X32 X12**	0.038
25.6	28.0	22.4	0.30	12,000	18,000	**RNAO 22X30X13**	0.027
28.4	33.0	22.4	0.30	12,000	18,000	**RNAO 22X35X16**	0.059
28.4	33.0	25.6	0.30	11,000	16,000	**RNAO 25X35X17**	0.053

NEEDLE ROLLER BEARINGS

MACHINED-RING NEEDLE ROLLER BEARINGS, SEPARABLE
SERIES RNAO



NEEDLE ROLLER BEARINGS

Boundary dimensions mm					Basic load ratings dynamic N	static	dynamic kgf	static	Bearing numbers
F_w	D	C	r_s min[1]	E	C_r	C_{or}	C_r	C_{or}	
25 +0.033 +0.020	37	16	0.3	32	19,500	24,700	1,990	2,520	RNAO 25X37X16
26 +0.033 +0.020	39	13	0.3	30	11,800	19,200	1,200	1,960	RNAO 26X39X13
28 +0.033 +0.020	40	16	0.3	35	21,200	28,400	2,160	2,900	RNAO 28X40X16
30 +0.033 +0.020	40	17	0.3	35	19,400	32,500	1,970	3,350	RNAO 30X40X17
30 +0.033 +0.020	42	16	0.3	37	21,900	30,500	2,230	3,100	RNAO 30X42X16
32 +0.041 +0.025	42	13	0.3	37	14,500	23,000	1,480	2,350	RNAO 32X42X13
35 +0.041 +0.025	45	13	0.3	40	15,200	25,100	1,550	2,560	RNAO 35X45X13
35 +0.041 +0.025	45	17	0.3	40	20,000	36,000	2,040	3,650	RNAO 35X45X17
35 +0.041 +0.025	47	16	0.3	42	24,100	36,000	2,450	3,650	RNAO 35X47X16
35 +0.041 +0.025	47	18	0.3	42	24,700	37,000	2,510	3,750	RNAO 35X47X18
37 +0.041 +0.025	47	13	0.3	42	15,900	27,100	1,620	2,770	RNAO 37X47X13
37 +0.041 +0.025	52	18	0.3	44	26,300	41,000	2,680	4,150	RNAO 37X52X18
40 +0.041 +0.025	50	17	0.3	45	21,800	41,500	2,220	4,250	RNAO 40X50X17
40 +0.041 +0.025	55	20	0.3	47	31,000	51,500	3,150	5,250	RNAO 40X55X20
45 +0.041 +0.025	55	17	0.3	50	22,300	44,500	2,280	4,550	RNAO 45X55X17
45 +0.041 +0.025	62	20	0.3	53	36,000	59,000	3,650	6,000	RNAO 45X62X20
50 +0.041 +0.025	62	20	0.3	55	27,900	62,000	2,850	6,300	RNAO 50X62X20
50 +0.041 +0.025	65	20	0.3	58	38,500	67,500	3,950	6,850	RNAO 50X65X20
55 +0.049 +0.030	68	20	0.6	60	28,800	66,500	2,940	6,750	RNAO 55X68X20
55 +0.049 +0.030	68	25	0.6	63	50,500	97,500	5,150	9,950	RNAO 55X68X25
55 +0.049 +0.030	72	20	0.6	63	39,000	70,000	3,950	7,100	RNAO 55X72X20

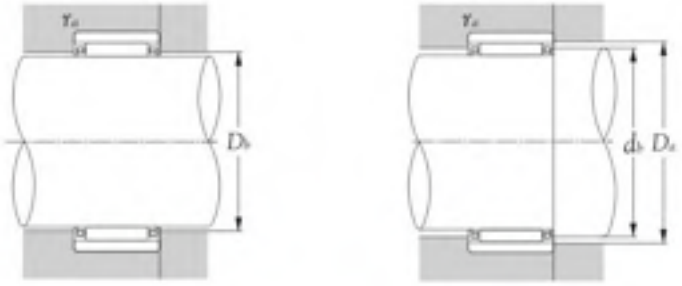
Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

Remark:

Cages		Precision	Grease
Steel -	√		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

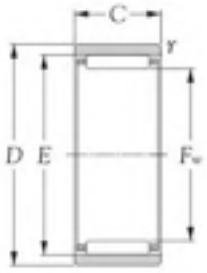
Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshibearings.com

MACHINED-RING NEEDLE ROLLER BEARINGS, SEPARABLE
SERIES RNAO



Abutment dimensions				Limiting speeds rpm		Bearing numbers	Mass kg.
D_b min	D_a max	d_b min	$r_{a\,max}$	grease	oil		(approx.)
31.4	35	25.6	0.3	11,000	16,000	**RNAO 25X37X16**	0.060
29.4	37	26.6	0.3	10,000	15,000	**RNAO 26X39X13**	0.060
34.4	38	28.6	0.3	9,500	14,000	**RNAO 28X40X16**	0.061
34.4	38	30.6	0.3	9,000	13,000	**RNAO 30X40X17**	0.060
36.4	40	30.6	0.3	9,000	13,000	**RNAO 30X42X16**	0.069
36.4	40	32.6	0.3	8,500	13,000	**RNAO 32X42X13**	0.049
39.4	43	35.6	0.3	7,500	11,000	**RNAO 35X45X13**	0.053
39.4	43	35.6	0.3	7,500	11,000	**RNAO 35X45X17**	0.069
41.4	45	35.6	0.3	7,500	11,000	**RNAO 35X47X16**	0.078
41.4	45	35.6	0.3	7,500	11,000	**RNAO 35X47X18**	0.089
41.4	45	37.6	0.3	7,000	11,000	**RNAO 37X47X13**	0.056
43.4	50	37.6	0.3	7,000	11,000	**RNAO 37X52X18**	0.125
44.4	48	40.6	0.3	6,500	10,000	**RNAO 40X50X17**	0.074
46.2	53	40.6	0.3	6,500	10,000	**RNAO 40X55X20**	0.145
49.2	53	45.6	0.3	6,000	9,000	**RNAO 45X55X17**	0.083
52.2	60	45.6	0.3	6,000	9,000	**RNAO 45X62X20**	0.175
54.2	60	50.6	0.3	5,500	8,000	**RNAO 50X62X20**	0.140
57.2	63	50.6	0.3	5,500	8,000	**RNAO 50X65X20**	0.168
59.4	64	55.8	0.6	4,800	7,500	**RNAO 55X68X20**	0.166
62.4	64	55.8	0.6	4,800	7,500	**RNAO 55X68X25**	0.200
62.4	68	55.8	0.6	4,800	7,500	**RNAO 55X72X20**	0.216

MACHINED-RING NEEDLE ROLLER BEARINGS, SEPARABLE
SERIES RNAO



NEEDLE ROLLER BEARINGS

Boundary dimensions mm					Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Bearing numbers
F_w	D	C	r_s min[1]	E	C_r	C_{or}	C_r	C_{or}	
60 $^{+0.049}_{+0.030}$	78	20	1	68	40,000	75,000	4,100	7,650	RNAO 60X78X20
65 $^{+0.049}_{+0.030}$	85	30	1	73	61,000	132,000	6,200	13,400	RNAO 65X85X30
70 $^{+0.049}_{+0.030}$	90	30	1	78	65,500	149,000	6,700	15,200	RNAO 70X90X30
75 $^{+0.049}_{+0.030}$	95	30	1	83	67,500	157,000	6,850	16,100	RNAO 75X95X30
80 $^{+0.049}_{+0.030}$	95	30	1	86	57,000	159,000	5,800	16,200	RNAO 80X95X30
80 $^{+0.049}_{+0.030}$	100	30	1	88	69,000	166,000	7,050	17,000	RNAO 80X100X30
85 $^{+0.058}_{+0.036}$	105	25	1	93	61,500	146,000	6,250	14,900	RNAO 85X105X25
85 $^{+0.058}_{+0.036}$	105	30	1	93	71,000	175,000	7,200	17,900	RNAO 85X105X30
90 $^{+0.058}_{+0.036}$	105	26	1	98	64,000	157,000	6,550	16,000	RNAO 90X105X26
90 $^{+0.058}_{+0.036}$	110	30	1	98	72,500	184,000	7,400	18,800	RNAO 90X110X30
95 $^{+0.058}_{+0.036}$	115	30	1	103	74,000	193,000	7,550	19,600	RNAO 95X115X30
100 $^{+0.058}_{+0.036}$	120	30	1	108	76,000	201,000	7,700	20,500	RNAO 100X120X30

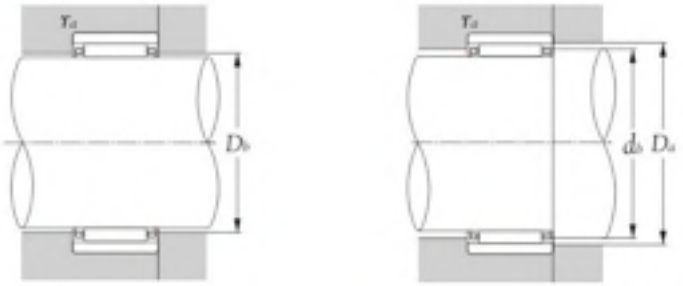
Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

Remark:

Cages		Precision	Grease
Steel -	√		
Polyoxid -	X	Class 0 (JIS)	Nil
Brass -	X		

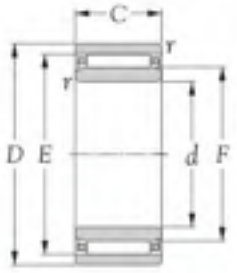
Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

MACHINED-RING NEEDLE ROLLER BEARINGS, SEPARABLE
SERIES RNAO



Abutment dimensions				Limiting speeds rpm		Bearing numbers	Mass kg.
D_b min	D_a max	d_b min	r_{a1} max	grease	oil		(approx.)
67.2	73	60.8	1	4,400	6,500	**RNAO 60X78X20**	0.255
72.2	80	66.0	1	4,100	6,000	**RNAO 65X85X30**	0.464
77.2	85	71.0	1	3,800	5,500	**RNAO 70X90X30**	0.199
82.2	90	76.0	1	3,600	5,500	**RNAO 75X95X30**	0.520
85.2	90	81.0	1	3,300	5,000	**RNAO 80X95X30**	0.405
87.2	95	81.0	1	3,300	5,000	**RNAO 80X100X30**	0.580
92.2	100	86.0	1	3,100	4,700	**RNAO 85X105X25**	0.459
92.2	100	86.0	1	3,100	4,700	**RNAO 85X105X30**	0.585
97.2	100	91.0	1	3,000	4,400	**RNAO 90X105X26**	0.373
97.2	105	91.0	1	3,000	4,400	**RNAO 90X110X30**	0.610
102.2	110	96.0	1	2,800	4,200	**RNAO 95X115X30**	0.640
107.2	115	101.0	1	2,700	4,000	**RNAO 100X120X30**	0.694

MACHINED-RING NEEDLE ROLLER BEARINGS, SEPARABLE
SERIES **NAO**



NEEDLE ROLLER BEARINGS

Boundary dimensions mm						Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Bearing numbers
d	D	C	r_s min[1]	F	E	C_r	C_{or}	C_r	C_{or}	
6	17	10	0.3	10	13	4,550	5,100	460	520	NAO 6X17X10
7	20	12	0.3	10	16	7,100	5,950	720	610	NAO 7X20X12
9	22	12	0.3	12	18	8,650	8,000	880	815	NAO 9X22X12
10	22	13	0.3	14	18	8,300	10,100	845	1,030	NAO 10X22X13
10	26	12	0.3	14	20	9,350	9,150	955	930	NAO 10X26X12
12	24	13	0.3	16	20	9,050	11,800	925	1,200	NAO 12X24X13
12	28	12	0.3	16	22	11,700	12,500	1,190	1,280	NAO 12X28X12
15	28	13	0.3	20	24	10,000	14,300	1,020	1,460	NAO 15X28X13
15	32	12	0.3	20	26	12,900	15,100	1,320	1,540	NAO 15X32X12
17	30	13	0.3	22	26	10,200	15,200	1,040	1,550	NAO 17X30X13
17	35	16	0.3	22	29	18,700	22,700	1,910	2,310	NAO 17X35X16
20	35	17	0.3	25	29	14,200	24,000	1,450	2,450	NAO 20X35X17
20	37	16	0.3	25	32	19,500	24,700	1,990	2,520	NAO 20X37X16
25	40	17	0.3	30	35	19,400	32,500	1,970	3,350	NAO 25X40X17
25	42	16	0.3	30	37	21,900	30,500	2,230	3,100	NAO 25X42X16
29	42	13	0.3	32	37	14,500	23,000	1,480	2,350	NAO 29X42X13
30	45	13	0.3	35	40	15,200	25,100	1,550	2,560	NAO 30X45X13
30	45	17	0.3	35	40	20,000	36,000	2,040	3,650	NAO 30X45X17
30	47	16	0.3	35	42	24,100	36,000	2,450	3,650	NAO 30X47X16
30	47	18	0.3	35	42	24,700	37,000	2,510	3,750	NAO 30X47X18
30	52	18	0.3	37	44	26,300	41,000	2,680	4,150	NAO 30X52X18

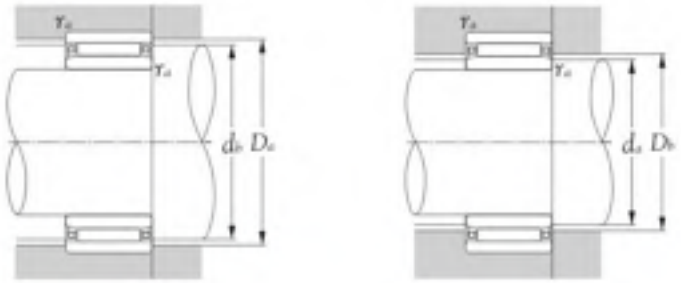
Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

Remark:

Cages		Precision	Grease
Steel -	√		
Polyoxid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshibearings.com

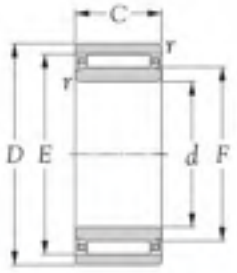
MACHINED-RING NEEDLE ROLLER BEARINGS, SEPARABLE
SERIES NAO



Abutment dimensions					Limiting speeds rpm		Bearing numbers	Mass kg.
d_a min	d_b	D_a max	D_b	r_{as} min	grease	oil		(approx.)
8	12.7	15	10.3	0.3	19,000	28,000	**NAO 6X17X10**	0.014
9	15.7	18	10.3	0.3	19,000	28,000	**NAO 7X20X12**	0.022
11	17.6	20	12.3	0.3	17,000	26,000	**NAO 9X22X12**	0.024
12	17.6	20	14.4	0.3	16,000	24,000	**NAO 10X22X13**	0.026
12	19.6	24	14.4	0.3	16,000	24,000	**NAO 10X26X12**	0.036
14	19.6	22	16.4	0.3	15,000	23,000	**NAO 12X24X13**	0.030
14	21.6	26	16.4	0.3	15,000	23,000	**NAO 12X28X12**	0.040
17	23.6	26	20.4	0.3	13,000	20,000	**NAO 15X28X13**	0.029
17	25.6	30	20.4	0.3	13,000	20,000	**NAO 15X32X12**	0.050
19	25.6	28	22.4	0.3	12,000	18,000	**NAO 17X30X13**	0.042
19	28.4	33	22.4	0.3	12,000	18,000	**NAO 17X35X16**	0.078
22	28.4	33	25.6	0.3	11,000	16,000	**NAO 20X35X17**	0.076
22	31.4	35	25.6	0.3	11,000	16,000	**NAO 20X37X16**	0.082
27	34.4	38	30.6	0.3	9,000	13,000	**NAO 25X40X17**	0.088
27	36.4	40	30.6	0.3	9,000	13,000	**NAO 25X42X16**	0.086
31	36.4	40	32.6	0.3	8,500	13,000	**NAO 29X42X13**	0.062
32	39.4	43	35.6	0.3	7,500	11,000	**NAO 30X45X13**	0.077
32	39.4	43	35.6	0.3	7,500	11,000	**NAO 30X45X17**	0.102
32	41.4	45	35.6	0.3	7,500	11,000	**NAO 30X47X16**	0.109
32	41.4	45	35.6	0.3	7,500	11,000	**NAO 30X47X18**	0.119
32	43.4	50	37.6	0.3	7,000	11,000	**NAO 30X52X18**	0.177

NEEDLE ROLLER BEARINGS

MACHINED-RING NEEDLE ROLLER BEARINGS, SEPARABLE
SERIES **NAO**



NEEDLE ROLLER BEARINGS

Boundary dimensions mm						Basic load ratings dynamic N	static N	dynamic kgf	static kgf	Bearing numbers
d	D	C	r_s min[1]	F	E	C_r	C_{or}	C_r	C_{or}	
33	47	13	0.3	37	42	15,900	27,100	1,620	2,770	NAO 33X47X13
35	50	17	0.3	40	45	21,800	41,500	2,220	4,250	NAO 35X50X17
35	55	20	0.3	40	47	31,000	51,500	3,150	5,250	NAO 35X55X20
40	55	17	0.3	45	50	22,300	44,500	2,280	4,550	NAO 40X55X17
40	62	20	0.3	45	53	36,000	59,000	3,650	6,000	NAO 40X62X20
40	65	20	0.3	50	58	38,500	67,500	3,950	6,850	NAO 40X65X20
45	62	20	0.3	50	55	27,900	62,000	2,850	6,300	NAO 45X62X20
45	72	20	0.6	55	63	39,000	70,000	3,950	7,100	NAO 45X72X20
50	68	20	0.6	55	60	28,800	66,500	2,940	6,750	NAO 50X68X20
50	78	20	1.0	60	68	40,000	75,000	4,100	7,650	NAO 50X78X20
55	85	30	1.0	65	73	61,000	132,000	6,200	13,400	NAO 55X85X30
60	90	30	1.0	70	78	65,500	149,000	6,700	15,200	NAO 60X90X30
65	95	30	1.0	75	83	67,500	157,000	6,850	16,100	NAO 65X95X30
70	95	30	1.0	80	86	57,000	159,000	5,800	16,200	NAO 70X95X30
70	100	30	1.0	80	88	69,000	166,000	7,050	17,000	NAO 70X100X30
75	105	25	1.0	85	93	61,500	146,000	6,250	14,900	NAO 75X105X25
75	105	30	1.0	85	93	71,000	175,000	7,200	17,900	NAO 75X105X30
80	110	30	1.0	90	98	72,500	184,000	7,400	18,800	NAO 80X110X30
85	115	30	1.0	95	103	74,000	193,000	7,550	19,600	NAO 85X115X30
90	120	30	1.0	100	108	76,000	201,000	7,700	20,500	NAO 90X120X30

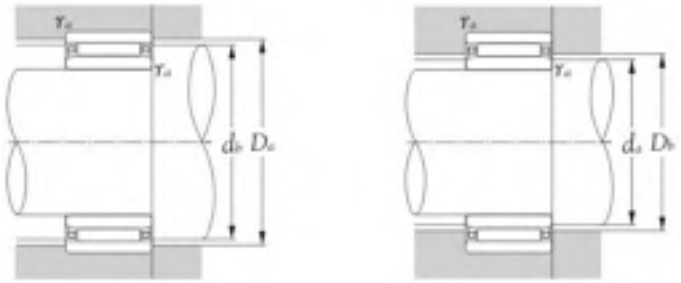
Notes: 1) These values are the allowable minimum dimensions of the chamfer dimension r.

Remark:

Cages	Precision	Grease
Steel - √		
Polyamid - X	Class 0 (JIS)	Nil
Brass - X		

Remark: If you have more inquiry of technical, please inquire
NIKO web-site: Http://www.nipponkoshibearings.com

MACHINED-RING NEEDLE ROLLER BEARINGS, SEPARABLE
SERIES **NAO**

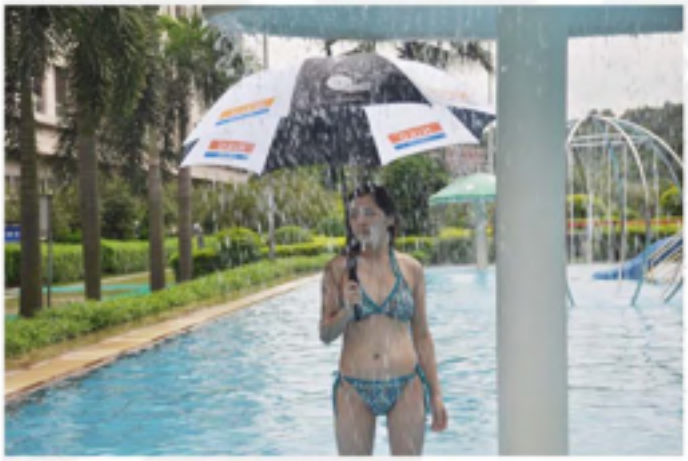


Abutment dimensions					Limiting speeds rpm		Bearing numbers	Mass kg.
d_a min	d_b	D_a max	D_b	r_{as} min	grease	oil		(approx.)
35	41.4	45	37.6	0.3	7,000	11,000	**NAO 33X47X13**	0.085
37	44.4	48	40.6	0.3	6,500	10,000	**NAO 35X50X17**	0.113
37	46.2	53	40.6	0.3	6,500	10,000	**NAO 35X55X20**	0.190
42	49.2	53	45.6	0.3	6,000	9,000	**NAO 40X55X17**	0.127
42	52.2	60	45.6	0.3	6,000	9,000	**NAO 40X62X20**	0.230
42	57.2	63	50.6	0.3	5,500	9,000	**NAO 40X65X20**	0.279
47	54.2	60	50.6	0.3	5,500	8,000	**NAO 45X62X20**	0.192
49	62.4	68	55.8	0.6	4,800	7,500	**NAO 45X72X20**	0.335
54	59.4	64	55.8	0.6	4,800	7,500	**NAO 50X68X20**	0.230
55	67.2	73	60.8	1.0	4,400	6,500	**NAO 50X78X20**	0.410
60	72.2	80	66.0	1.0	4,100	6,000	**NAO 55X85X30**	0.680
65	77.2	85	71.0	1.0	3,800	5,500	**NAO 60X90X30**	0.720
70	82.2	90	76.0	1.0	3,600	5,500	**NAO 65X95X30**	0.770
75	85.2	90	81.0	1.0	3,300	5,000	**NAO 70X95X30**	0.675
75	87.2	95	81.0	1.0	3,300	5,000	**NAO 70X100X30**	0.850
80	92.2	100	86.0	1.0	3,100	4,700	**NAO 75X105X25**	0.700
80	92.2	100	86.0	1.0	3,100	4,700	**NAO 75X105X30**	0.880
85	97.2	105	91.0	1.0	3,000	4,400	**NAO 80X110X30**	0.920
90	102.2	110	96.0	1.0	2,800	4,200	**NAO 85X115X30**	0.960
95	107.2	115	101.0	1.0	2,700	4,000	**NAO 90X120X30**	1.040

NEEDLE ROLLER BEARINGS

NEEDLE ROLLER
BEARINGS

NOTE



NIKO

1. Seals

Seals for needle roller bearings are special seals having a low cross-sectional height to accommodate needle roller bearings. These steel plate-reinforced synthetic rubber contact seals should be used within a standard operating temperature range of -25 to 120°C; the seals should not be used in excess of 100°C for continuous operation. Consult **NIKO** Engineering if you are considering an application involving special operating conditions including operating temperature of 120°C or higher.

2. Seal types

Seals for needle roller bearings are available in the series G, which has a single lip, and the series GD, which has a double lip. For special operating conditions, such as an operating temperature exceeding 120°C, consult **NIKO** Engineering.
Where good seal seating and lubricating conditions are present, the maximum allowable peripheral velocity is 10m/s for the single-lip series G, and 6 m/s for the doublelip series GD.

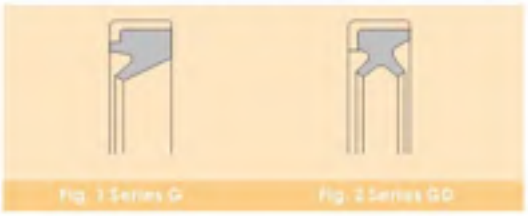


Fig. 1 Series G　　Fig. 2 Series GD

3. Interpreting seal numbers

Seal numbers comprise a series number (G or GD) and a dimension code (inside diameter X outside diameter X width.)

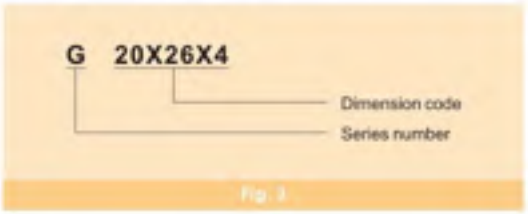


Fig. 3

4. Mounting practices

To achieve a reliable seal, the seal seating must be hardened and finish-ground. If the raceway surface of an inner ring is used as the seal seat, an extended inner ring should be used.
To prevent the seal lip and outside surface of the seal from being damaged during mounting, the shaft end or housing end should be tapered (Fig.4). If the shaft end lacks a taper or rounding, use of the mounting jig as shoun in Fig.5 is recommended. Sufficient interference between the seal and housing will be obtained from an ordinary housing tolerance of G7 to R7.

To lubricate the lip, apply lubricant to the lip before mounting the seal.

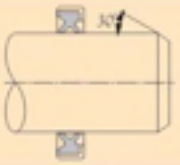


Fig. 4

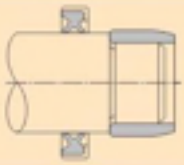


Fig. 5

5. Typical seal applications

Fig. 6 to 8 illustrate typical designs of seals for needle roller bearings.

Fig. 6

Fig. 7

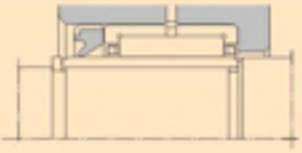
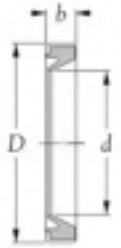
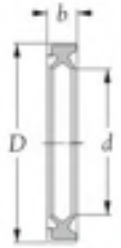


Fig. 8

SEALING RINGS
SERIES G, GD



Type G



Type GD

Boundary dimensions mm			Bearing numbers		Mass X 10^{-3} kg	
d	$D^{1)}$	b $^{+0.2}_{0}$	Type G	Type GD	G	GD
4	8 $^{+0.081}_{+0.023}$	2	G 4X8X2	-	0.18	-
5	9 $^{+0.081}_{+0.023}$	2	G 5X9X3	-	0.19	-
5	10 $^{+0.081}_{+0.023}$	2	G 5X10X2	-	0.22	-
6	10 $^{+0.081}_{+0.023}$	2	G 6X10X2	-	0.21	-
6	12 $^{+0.095}_{+0.028}$	2	G 6X12X2	-	0.38	-
7	11 $^{+0.095}_{+0.028}$	2	G 7X11X2	-	0.25	-
7	14 $^{+0.095}_{+0.028}$	2	G 7X14X2	-	0.52	-
8	12 $^{+0.095}_{+0.028}$	3	G 8X12X3	-	0.41	-
8	15 $^{+0.095}_{+0.028}$	3	G 8X15X3	-	0.74	-
9	13 $^{+0.095}_{+0.028}$	3	G 9X13X3	-	0.44	-
9	16 $^{+0.095}_{+0.028}$	3	G 9X16X3	-	0.69	-
10	14 $^{+0.095}_{+0.028}$	3	G 10X14X3	-	0.50	-
10	17 $^{+0.095}_{+0.028}$	3	G 10X17X3	-	0.87	-
12	16 $^{+0.095}_{+0.028}$	3	G 12X16X3	-	0.56	-
12	18 $^{+0.095}_{+0.028}$	3	G 12X18X3	-	0.86	-
12	19 $^{+0.119}_{+0.035}$	3	G 12X19X3	-	0.94	-
13	19 $^{+0.119}_{+0.035}$	3	G 13X19X3	-	0.87	-
14	20 $^{+0.119}_{+0.035}$	3	G 14X20X3	GD 14X20X3	0.96	0.99
14	21 $^{+0.119}_{+0.035}$	3	G 14X21X3	GD 14X21X3	1.10	1.10
14	22 $^{+0.119}_{+0.035}$	3	G 14X22X3	GD 14X22X3	1.30	1.30
15	21 $^{+0.119}_{+0.035}$	3	G 15X21X3	GD 15X21X3	1.00	1.00

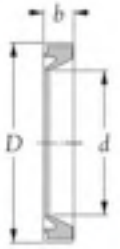
Notes: 1) The tolerance of the outside diameter is an average of two measurements taken at equally spaced points on the outside surface.

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

Sealing rings
series G, GD



Type G

Type GD

Needle Roller Bearings

Boundary dimensions mm			Bearing numbers		Mass X 10^{-3} kg	
d	$D^{1)}$	$b_{-0.2}$	Type G	Type GD	G	GD
15	23	3	G 15X23X3	GD 15X23X3	1.30	1.30
16	22	3	G 16X22X3	GD 16X22X3	1.30	1.10
16	24	3	G 16X24X3	GD 16X24X3	1.30	1.30
16	25	3	G 16X25X3	GD 16X25X3	1.60	1.60
17	23	3	G 17X23X3	GD 17X23X3	1.30	1.10
17	25	3	G 17X25X3	GD 17X25X3	1.50	1.40
18	24	3	G 18X24X3	GD 18X24X3	1.20	1.20
18	26	4	G 18X26X4	GD 18X26X4	1.8	1.8
19	27	4	G 19X27X4	GD 19X27X4	2.0	1.9
20	26	4	G 20X26X4	GD 20X26X4	1.8	1.8
20	28	4	G 20X28X4	GD 20X28X4	2.1	2.1
21	29	4	G 21X29X4	GD 21X29X4	2.2	2.1
22	28	4	G 22X28X4	GD 22X28X4	1.8	1.9
22	30	4	G 22X30X4	GD 22X30X4	2.2	2.3
24	32	4	G 24X32X4	GD 24X32X4	2.5	2.4
25	32	4	G 25X32X4	GD 25X32X4	2.3	2.2
25	33	4	G 25X33X4	GD 25X33X4	2.5	2.5
25	35	4	G 25X35X4	GD 25X35X4	2.6	2.6
26	34	4	G 26X34X4	GD 26X34X4	2.6	2.6
28	35	4	G 28X35X4	GD 28X35X4	2.4	2.5
28	37	4	G 28X37X4	GD 28X37X4	3.1	2.8

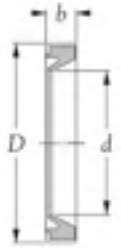
Notes: 1) The tolerance of the outside diameter is an average of two measurements taken at equally spaced points on the outside surface.

Remark:

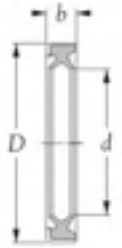
Cages		Precision	Grease
Steel -	X		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

SEALING RINGS
SERIES G, GD



Type G



Type GD

Boundary dimensions mm			Bearing numbers		Mass X 10^{-3} kg	
d	$D^{1)}$	b $^{+0.2}_{0}$	Type G	Type GD	G	GD
29	37 $^{+0.140}_{+0.040}$	4	**G 29X37X4**	**GD 29X37X4**	2.7	2.7
29	38 $^{+0.140}_{+0.040}$	4	**G 29X38X4**	**GD 29X38X4**	3.2	2.9
30	37 $^{+0.140}_{+0.040}$	4	**G 30X37X4**	**GD 30X37X4**	2.7	2.6
30	40 $^{+0.140}_{+0.040}$	4	**G 30X40X4**	**GD 30X40X4**	3.6	3.3
32	42 $^{+0.140}_{+0.040}$	4	**G 32X42X4**	**GD 32X42X4**	3.7	3.9
32	45 $^{+0.140}_{+0.040}$	4	**G 32X45X4**	**GD 32X45X4**	5.1	5.2
35	42 $^{+0.140}_{+0.040}$	4	**G 35X42X4**	**GD 35X42X4**	3.0	2.9
35	45 $^{+0.140}_{+0.040}$	4	**G 35X45X4**	**GD 35X45X4**	4.1	3.6
37	47 $^{+0.140}_{+0.040}$	4	**G 37X47X4**	**GD 37X47X4**	4.0	3.8
38	48 $^{+0.140}_{+0.040}$	4	**G 38X48X4**	**GD 38X48X4**	4.4	4.0
40	47 $^{+0.140}_{+0.040}$	4	**G 40X47X4**	**GD 40X47X4**	3.3	3.5
40	50 $^{+0.140}_{+0.040}$	4	**G 40X50X4**	**GD 40X50X4**	4.6	4.0
40	52 $^{+0.175}_{+0.050}$	5	**G 40X52X5**	**GD 40X52X5**	4.8	4.7
42	52 $^{+0.175}_{+0.050}$	4	**G 42X52X4**	**GD 42X52X4**	4.7	4.2
43	53 $^{+0.175}_{+0.050}$	4	**G 43X53X4**	**GD 43X53X4**	4.8	4.3
45	52 $^{+0.175}_{+0.050}$	4	**G 45X52X4**	**GD 45X52X4**	3.8	3.8
45	55 $^{+0.175}_{+0.050}$	4	**G 45X55X4**	**GD 45X55X4**	5.2	5.5
50	58 $^{+0.175}_{+0.050}$	4	**G 50X58X4**	**GD 50X58X4**	4.5	5.2
50	62 $^{+0.175}_{+0.050}$	5	**G 50X62X5**	**GD 50X62X5**	10.4	10.0

Notes: 1) The tolerance of the outside diameter is an average of two measurements taken at equally spaced points on the outside surface.

NEEDLE ROLLER BEARINGS

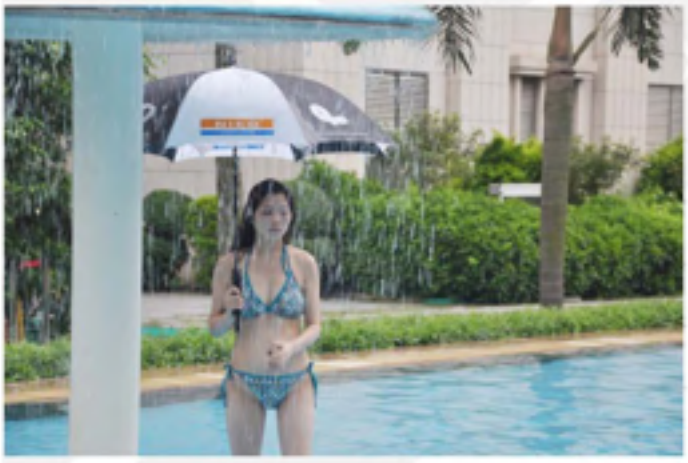
Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

NEEDLE ROLLER
BEARINGS

NOTE



NIKO

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NIPPON KODO

LINEAR MOTION

LINEAR MOTION

SOUVENIRS

LINEAR MOTION

1. Recirculating Ball Bearing, drawn shell design, compact type, series KH

The Linear Recirculating Ball Bearings KH are composed of a steel drawn shell, made of case hardened steel, a retainer made from engineered resin and precision balls. The drawn shell has pockets designed to allow the recirculation of the balls. This bearing type can only be used for linear movement and does not allow rotational movements.

1.1 Seals
The linear bearings of KH type are available in two different variants.
Without seals: KH
With contact seals: KH..PP
The seals have the dual function to prevent ingress of contaminants and the retention of lubricants in the bearings.

1.2 Lubrication
Linear bearings type KH are supplied coated with rust inhibiting oil. Linear bearings type KH..PP are supplied packaged with lithium soap grease.

1.3 Mounting tolerances
The table below shows the tolerances to be used for a proper bearing installation. They insure a precise and smooth motion.

1.4 Assembly
Linear bearings type KH are assembled with a light press fit. This insures not only the retention of the bearing but also the proper rounding of the unit. A proper fitting should be performed with the help of a mounting arbor as shown in Fig. 1.

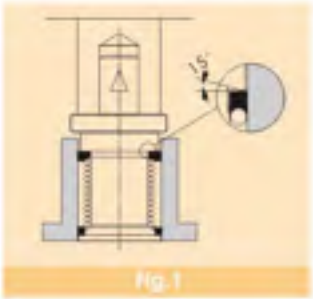


Fig.1

Table 1.1 Recommended mounting tolerances

Housing material	General application		Vertical operation Precision application	
	Housing tolerance	Shaft tolerance	Housing tolerance	Shaft tolerance
Steel/cast iron	H7	h6	H6	i5
Aluminium/alloy	K7	h6	K6	i5

2. Linear Recirculating Ball Bearing precision series type LME

NIKO Linear Recirculating Bearing type LME are composed by a cylindrical outer ring, by a cage that retains the balls, by two end rings to retain the cage and/or, when required, contact seals. All of the components are designed and assembled to optimize the unit performance. The outer ring is suitably hardened to provide the longest possible life expectancy. The cage made of steel or engineered resin, depending upon the type of bearing selected, provide the retention and allow the proper recirculation of the balls.

2.1 Characteristics of linear bearings type LME
2.1.1 High rigidity
Linear bearings with steel outer ring offer high rigidity due to the large number of balls in contact. The units can be supplied with a steel cage and, when low weight is required, with resin cage.

2.1.2 Ease of assembly
The standard units can carry load in every direction. The large variety of housing units and shaft supports allow simple and easy mounting.

2.1.3 Ease of replacement
These units follow internationally recognized boundary and are therefore dimensionally inter changeable with competitive units. Replacement due to wear or damage is quick and simple.

2.1.4 Complete range
The **NIKO** range of products is quite broad. The characteristics can be summarized as follows:
A) Closed type - standard version
B) Adjustable type - These units have a longitudinal slot tha allows the reduction of the operating clearance and the optimization of the unit rigidity.
C) Open type - These units have an opening that corresponds to a single recirculating channel (50 to 100 deg). These units are used in conjunction with long shafts that are typically supported along the entire length to reduce the elastic deflection. When mounted in a suitable housing, the units allow the adjustment of the operating clearance.
D) Flanged type - These units have a flange on the outer ring to allow the mounting without conventional housings.

2.2 Seals
Linear bearings LME can be supplied in the following versions:
-Without seals - LME
-With contact seals - LME..UU

The seals have the following functions:
-Prevent the ingress of contaminants
-Retain the lubricant in the bearing

In some applications, it may be necessary to use additional seals to prevent grease migration and thus prolong the maintenance interval.

3. Linear Recirculating Ball Bearing precision series type LME

3.1 Lubrication
Linear bearings type LME are supplied coated with rust inhibiting oil. Linear bearings type LME..UU are supplied packaged with lithium soap grease.

3.2 Mounting tolerances
The bearing assembly should be performed as to insure operation with adequate clearance. Unsuitable operating clearance could lead to poor running performance or lower than expected durability. The operating clearance of the adjustable or open version of the linear bearings can be adjusted by elastically deforming the outer ring. The suitable mounting tolerances for the mating components are shown in table 3.1 .

Note: The operating clearance is application dependent and could be zero or negative (preload). In the latter case the friction as well as the smooth running should be checked for suitability.

Table 3.1

Dimensional series	Shaft		Housing	
	Normal operating clearance	Operation without clearance	Normal operating clearance	Operation without clearance
LME	h6	j6	H7	J7

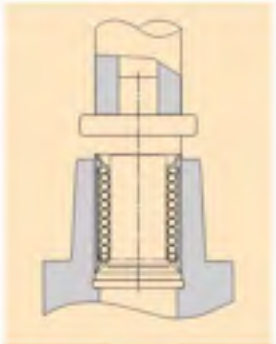
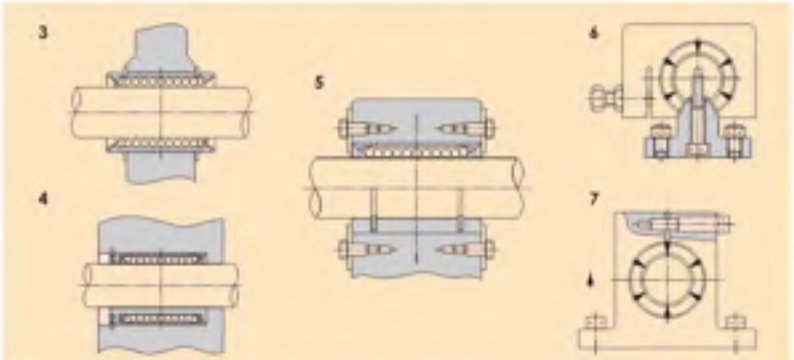


Fig. 2



3.3 Installation

Some cleanliness precautions should be taken before assembling **NIKO** Linear Bearings in their housings. Lack of cleanliness could lead to reduction of the bearing life. The installation of the units is not particularly difficult, though precaution should be observed to avoid potential damages to the unit. Direct pressing onto the cage retaining rings should be avoided. A suitable tool should be used (Fig. 2) to provide pressure on the rim of the outer ring. Once the bearing is mounted in the housing, the assembled unit should be installed onto the shaft paying attention not to score the shaft or to pop the balls from the bearing. When two shafts assemblies are assembled in a parallel assembly, the parallelism between the shafts should be checked to insure smooth running. The mounting examples shown in Fig. 3 through 7 should be used as guidelines to design and select the suitable bearings and support units.

4. Load ratings

Dynamic load rating C

The dynamic load rating C is a load of constant magnitude under which 90% of a statistically significant number of apparently identical bearings would reach a theoretical life of 50 km without the apparent appearance of metal fatigue.

Static load rating Co

The static load rating Co is defined as the load that would cause a permanent deformation equal to 1/10,000 of the ball diameter at the most stressed contact point.

4.1 Life of a Linear Recirculating Ball Bearing

Repeated stresses onto the contact surfaces could lead to material fatigue. This will lead to the appearance of surface pitting. The life of the unit is defined as the duration before the appearance of pitting.

4.1.1 Rated life(L)
The rated life L is the total travelled distance which 90% of a statistically significant number of apparently identical bearings would reach under the same operating conditions without the apparent appearance of metal fatigue.

$$L = \left(\frac{C}{P}\right)^3 \cdot 50 \quad \text{.....(1)}$$

L = rated life [km]
C = dynamic load ratings [N]
P = equivalent dynamic load [N]

When a system is subjected to a load equal to the dynamic load rating C the resulting life equal the rated life (50 km). The theoretical life of a linear bearing is affected by the load and by the operating conditions (temperature, vibration, shocks, load distribution, etc.). In such cases the theoretical life is calculated with the help of equation 2.

$$L = \left(\frac{f_H \cdot f_T \cdot f_C \cdot C}{F_W \cdot P}\right)^3 50 \quad \text{.....(2)}$$

L = Rated life[km]
C = Dynamic load rating [N]
P = Equivalent dynamic load [N]
fh = Hardness factor (see fig. 8)
ft = Temperature factor (see fig. 9)
fc = Contact coefficient (see table 4)
fw = Load factor (see table 5)

The following equation (3)allows the conversion of the rated life in hours.

$$L_h = \left(\frac{L \cdot 10}{2 \cdot l_S \cdot n_1 \cdot 60}\right)^3 \quad \text{.....(3)}$$

L_h = rated life [hours]
L_S = stroke length [m]
L = rated life [km]
n_1 = operating frequency [strokes/min]

• Hardness factor (fH)
The load ratings for the linear bearing are calculated with the raceway hardness equal or higher than 58 HRC. When the raceway hardness is reduced, the load rating of the bearing is also reduced and must be corrected using the the accompanying chart (Fig.8).

Fig. 8 Raceway hardness factor

• Temperature factor (fT)
When a linear bearing operates at temperatures in excess of 100 deg. C, its hardness is affected and son is its ability to carry load. The load rating can be corrected by using the accompanying chart (Fig.9).

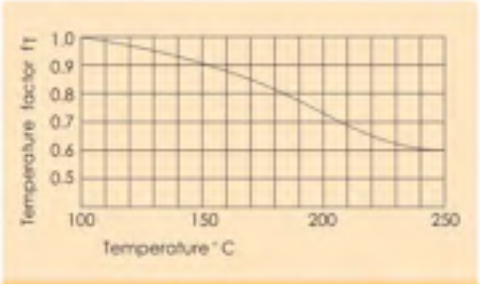


Fig. 9 Temperature factor

• Contact factor (fc)
Load biasing, attributed to mounting errors and multiple bearing assemblies can be accounted for by using the coefficient in table 4.1 .

Table 4.1 Contact factor

Number of bearings for shaft	Contact factor f_C
1	1,00
2	0,81
3	0,72
4	0,66
5	0,61

• Load factor (fw)
The loads acting on the linear units include payload, inertial effects during acceleration and deceleration as well as moment loads. All of these factors are difficult to assess and are further complicated by the potential presence of shocks and vibrations. A more practical solution involves the use of the coefficients in table 4.2 .

Table 4.2 Contact factor

Operating conditions	f_W
Low speed operations (<15 m/min) without shocks	1 - 1,5
Medium speed operation (60m/min) without shocks	1,5 - 2
High speed operations (>60m/min) with shocks	2 - 3,5

5. Static safety factor

For applications with a high requirement for accuracy and smooth running, the static safety factor fs should be higher than the values shown in table 5.1 to prevent permanent deformation at the contact points.

$$fs = \frac{CO}{PO}$$

fs = static safety factor
Po = static equivalent load (N)
Co = static load rating (N)

Table 5.1 Static safety factor

Operating conditions	f_S
Shafts subjected to small deflections and low shocks	1÷2
Elastic deflection can cross load the units	2÷4
System subjected to shock & vibration	3÷5

6. Friction

Linear Recirculating Ball Bearings have a very low static coefficient of friction, virtually identical to the dynamic coefficient of friction. This results in low and uniform motion in any condition of load and speed without sick-slip.

$F = \mu \cdot W + f$ .....(4)
F = Friction force [N]
U = Friction coefficient [-]
f = Seal drag [N]
w = Load [N]

The magnitude of the friction force is affected by several factors. The type of bearing, the operating conditions, the type and quantity of the lubricant, the presence or lack of seals all impact the overall frictional behavior. Standard seals can add between 2 and 5 N to the overall friction force. The magnitude of the coefficient of friction depends upon the operating conditions such as load, moments and/or preload. Table 6.1 shows the dynamic coefficient of friction for each type of bearing under normal operating condition (P/C< =0.2) and proper assembly.

Table 6.1 Friction coefficient

Type of bearing	Friction coefficient
KH	0.004 to 0.006
LME / LMB	0.002 to 0.003

7. Operating temperature

LINEAR MOTION

The operating temperature ranges of the various bearings are shown in table 7.1 Should the operating temperature exceed the limits shown in the table, please contact fait International Engineering. Stainless steel units, without seals, can operate between - 20/+ 120 degree. C

Table 7.1 Operating temperature

Bearing type	Operating temperature
KH	-20 to +120°C
LME / LMB	-20 to +110°C

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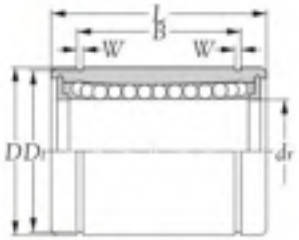
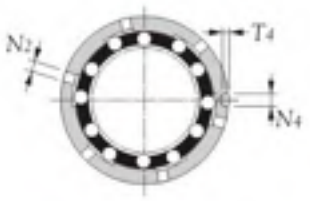
BALL BUSHING

LINEAR MOTION

Linear Ball Bearings
series LME..





Boundary dimensions d mm	Bearing number standard steel retainer	standard resin retainer	with seals steel retainer	with seals resin retainer	Number of ball tracks	Principal dimensions dr tolerance mm	0.001mm	D tolerance mm	0.001mm	L tolerance mm	mm
5	-	LME 5 AS	-	LME 5 UU AS	3	5	(+8/0)	12	(0/-8)	22	(0/-0.2)
8	LME 8 A AS	LME 8 AS	LME 8 A UU AS	LME 8 UU AS	4	8	(+8/0)	16	(0/-8)	25	(0/-0.2)
10	LME 10 A AS	-	LME 10 A UU AS	-	4	10	(+8/0)	19	(0/-9)	29	(0/-0.2)
12	LME 12 A AS	LME 12 AS	LME 12 A UU AS	LME 12 UU AS	4	12	(+8/0)	22	(0/-9)	32	(0/-0.2)
16	LME 16 A AS	LME 16 AS	LME 16 A UU AS	LME 16 UU AS	5	16	(+9/-1)	26	(0/-9)	36	(0/-0.2)
20	LME 20 A AS	LME 20 AS	LME 20 A UU AS	LME 20 UU AS	5	20	(+9/-1)	32	(0/-11)	45	(0/-0.2)
25	LME 25 A AS	LME 25 AS	LME 25 A UU AS	LME 25 UU AS	6	25	(+11/-1)	40	(0/-11)	58	(0/-0.3)
30	LME 30 A AS	LME 30 AS	LME 30 A UU AS	LME 30 UU AS	6	30	(+11/-1)	47	(0/-11)	68	(0/-0.3)
40	LME 40 A AS	LME 40 AS	LME 40 A UU AS	LME 40 UU AS	6	40	(+13/-2)	62	(0/-13)	80	(0/-0.3)
50	LME 50 A AS	LME 50 AS	LME 50 A UU AS	LME 50 UU AS	6	50	(+13/-2)	75	(0/-13)	100	(0/-0.3)
60	LME 60 A AS	LME 60 AS	LME 60 A UU AS	LME 60 UU AS	6	60	(+13/-2)	90	(0/-15)	125	(0/-0.4)

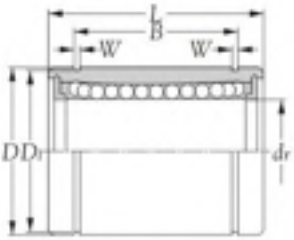
Linear Motion

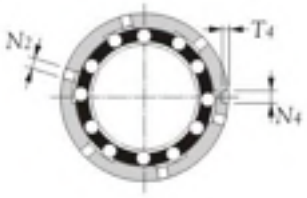
Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	√	Class 0 (JIS)	Alvania N2 -25℃ ~ +120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

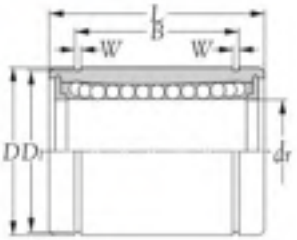
Linear Ball Bearings
series LME..

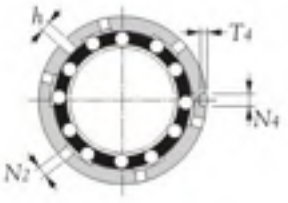




Principal dimensions				Roundness	Steel retainer maximum radial clearance	Resin retainer maximum radial clearance	Load ratings dynamic	Load ratings static	Mass steel retainer	Mass resin retainer
B	tolerance	W	D_1				C	C_0		
mm				0.001mm	0.001mm	0.001mm	N		kg(s).	
14.5	(0/-0.2)	1.10	11.5	12	-	-5	206	265	-	0.011
16.5	(0/-0.2)	1.10	15.2	12	-3	-5	265	402	0.022	0.020
22.0	(0/-0.2)	1.30	18.0	12	-4	-	372	549	0.036	-
22.9	(0/-0.2)	1.30	21.0	12	-4	-7	510	784	0.045	0.041
24.9	(0/-0.2)	1.30	24.9	12	-4	-7	578	892	0.060	0.065
31.5	(0/-0.2)	1.60	30.3	15	-6	-9	862	1370	0.102	0.091
44.1	(0/-0.3)	1.85	37.5	15	-6	-9	980	1570	0.235	0.215
52.1	(0/-0.3)	1.85	44.5	15	-8	-9	1570	2740	0.360	0.325
60.6	(0/-0.3)	2.15	59.0	17	-8	-13	2160	4020	0.770	0.705
77.6	(0/-0.3)	2.65	72.0	17	-13	-13	3820	7940	1.250	1.130
101.7	(0/-0.4)	3.15	86.5	20	-13	-16	4700	9800	2.220	2.220

LINEAR BALL BEARINGS
SERIES **LME..AJ AS**





Boundary dimensions d mm	Bearing number standard steel retainer	standard resin retainer	with seals steel retainer	with seals resin retainer	Number of ball tracks	Principal dimensions dr mm	dr tolerance 0.001mm	D mm	D tolerance 0.001mm
5	-	LME 5 AJ AS	-	LME 5 UUAJ AS	3	5	(+8/0)	12	(0/-8)
8	-	LME 8 AJ AS	-	LME 8 UUAJ AS	4	8	(+8/0)	16	(0/-8)
12	LME 12 A-AJ AS	LME 12 AJ AS	LME 12 A-UUAJ AS	LME 12 UUAJ AS	4	12	(+8/0)	22	(0/-9)
16	LME 16 A-AJ AS	LME 16 AJ AS	LME 16 A-UUAJ AS	LME 16 UUAJ AS	5	16	(+9/-1)	26	(0/-9)
20	LME 20 A-AJ AS	LME 20 AJ AS	LME 20 A-UUAJ AS	LME 20 UUAJ AS	5	20	(+9/-1)	32	(0/-11)
25	LME 25 A-AJ AS	LME 25 AJ AS	LME 25 A-UUAJ AS	LME 25 UUAJ AS	6	25	(+11/-1)	40	(0/-11)
30	LME 30 A-AJ AS	LME 30 AJ AS	LME 30 A-UUAJ AS	LME 30 UUAJ AS	6	30	(+11/-1)	47	(0/-11)
40	LME 40 A-AJ AS	LME 40 AJ AS	LME 40 A-UUAJ AS	LME 40 UUAJ AS	6	40	(+13/-2)	62	(0/-13)
50	LME 50 A-AJ AS	LME 50 AJ AS	LME 50 A-UUAJ AS	LME 50 UUAJ AS	6	50	(+13/-2)	75	(0/-13)
60	LME 60 A-AJ AS	LME 60 AJ AS	LME 60 A-UUAJ AS	LME 60 UUAJ AS	6	60	(+13/-2)	90	(0/-15)

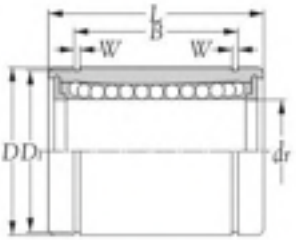
LINEAR MOTION

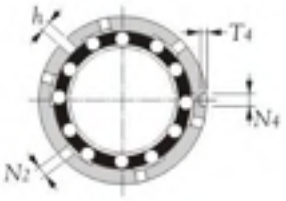
Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	√	Class 0 (JIS)	Alvania S2 -25℃~+120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

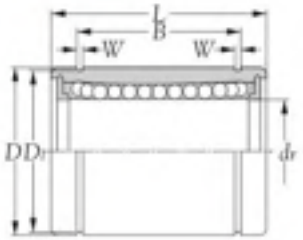
Linear Ball Bearings
series LME..AJ AS

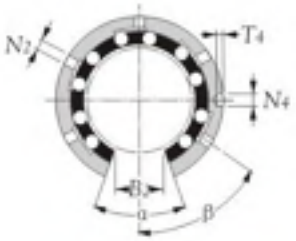




Principal dimensions							Roundness	Steel retainer maximum radial clearance	Resin retainer maximum radial clearance	Load ratings dynamic	Load ratings static	Mass steel retainer	Mass resin retainer
L	tolerance	B	tolerance	W	D_1	h				C	C_0		
mm	mm	mm	mm		mm		0.001mm	0.001mm	0.001mm	N		kg(s).	
22	(0/-0.2)	14.5	(0/-0.2)	1.10	11.5	1.0	12	-	-5	206	265	0.011	-
25	(0/-0.2)	16.5	(0/-0.2)	1.10	15.2	1.0	12	-3	-5	265	402	0.020	0.022
32	(0/-0.2)	22.9	(0/-0.2)	1.30	21.0	1.5	12	-4	-7	510	784	0.041	0.045
36	(0/-0.2)	24.9	(0/-0.2)	1.30	24.9	1.5	12	-4	-7	578	892	0.065	0.060
45	(0/-0.2)	31.5	(0/-0.2)	1.60	30.3	2.0	15	-6	-9	862	1370	0.091	0.102
58	(0/-0.3)	44.1	(0/-0.3)	1.85	37.5	2.0	15	-6	-9	980	1570	0.215	0.235
68	(0/-0.3)	52.1	(0/-0.3)	1.85	44.5	2.0	15	-8	-9	1570	2740	0.325	0.360
80	(0/-0.3)	60.6	(0/-0.3)	2.15	59.0	3.0	17	-8	-13	2160	4020	0.705	0.770
100	(0/-0.3)	77.6	(0/-0.3)	2.65	72.0	3.0	17	-13	-13	3820	7940	1.130	1.250
125	(0/-0.4)	101.7	(0/-0.4)	3.15	86.5	3.0	20	-13	-16	4700	9800	2.220	2.220

Linear Ball Bearings
series LME..OP





Boundary dimensions d mm	Bearing number standard steel retainer	standard resin retainer	with seals steel retainer	with seals resin retainer	Number of ball tracks	Principal dimensions dr tolerance mm	0.001mm	D tolerance mm	0.001mm
12	LME 12 A OP	LME 12 OP AS	LME 12 A UUOP AS	LME 12 UUOP AS	3	12	(+8/0)	22	(0/-9)
16	LME 16 A OP	LME 16 OP AS	LME 16 A UUOP AS	LME 16 UUOP AS	4	16	(+9/-1)	26	(0/-9)
20	LME 20 A OP	LME 20 OP AS	LME 20 A UUOP AS	LME 20 UUOP AS	4	20	(+9/-1)	32	(0/-11)
25	LME 25 A OP	LME 25 OP AS	LME 25 A UUOP AS	LME 25 UUOP AS	5	25	(+11/-1)	40	(0/-11)
30	LME 30 A OP	LME 30 OP AS	LME 30 A UUOP AS	LME 30 UUOP AS	5	30	(+11/-1)	47	(0/-11)
40	LME 40 A OP	LME 40 OP AS	LME 40 A UUOP AS	LME 40 UUOP AS	5	40	(+13/-2)	62	(0/-13)
50	LME 50 A OP	LME 50 OP AS	LME 50 A UUOP AS	LME 50 UUOP AS	5	50	(+13/-2)	75	(0/-13)
60	LME 60 A OP	LME 60 OP AS	LME 60 A UUOP AS	LME 60 UUOP AS	5	60	(+13/-2)	90	(0/-15)

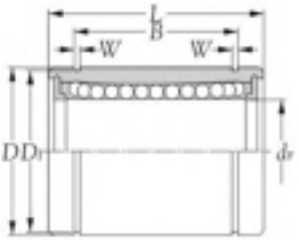
Linear Motion

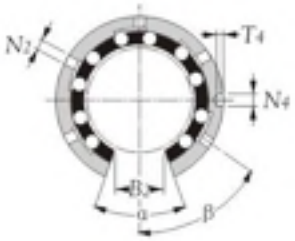
Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	√	Class 0 (JIS)	Alvania S2 -25℃~+120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

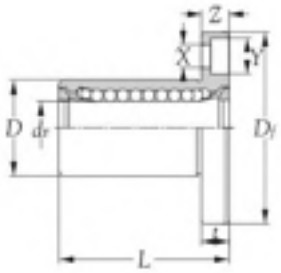
LINEAR BALL BEARINGS
SERIES **LME..OP**





Principal dimensions								Roundness	Steel retainer maximum radial clearance	Resin retainer maximum radial clearance	Load ratings		Mass	
L	tolerance	B	tolerance	W	D1	h2	θ				dynamic C	static C0	steel retainer	resin retainer
mm	mm	mm	mm	mm				0.001mm	0.001mm	0.001mm	N		kg(s).	
32	(0/-0.2)	22.9	(0/-0.2)	1.30	21.0	7.5	78°	12	-4	-7	510	784	0.045	0.041
36	(0/-0.2)	24.9	(0/-0.2)	1.30	24.9	10.0	78°	12	-4	-7	578	892	0.060	0.065
45	(0/-0.2)	31.5	(0/-0.2)	1.60	30.3	10.0	60°	15	-6	-9	862	1370	0.102	0.091
58	(0/-0.3)	44.1	(0/-0.3)	1.85	37.5	12.5	60°	15	-6	-9	980	1570	0.235	0.215
68	(0/-0.3)	52.1	(0/-0.3)	1.85	44.5	12.5	50°	15	-8	-9	1570	2740	0.360	0.325
80	(0/-0.3)	60.6	(0/-0.3)	2.15	59.0	16.8	50°	17	-8	-13	2160	4020	0.770	0.705
100	(0/-0.4)	77.6	(0/-0.4)	2.65	72.0	21.0	50°	17	-13	-13	3820	7940	1.250	1.130
125	(0/-0.4)	101.7	(0/-0.4)	3.15	86.5	27.2	54°	20	-13	-16	4700	9800	2.220	2.220

LINEAR BALL BEARINGS
SERIES LME..F



Boundary dimensions d mm	Bearing number standard resin retainer	Bearing number with seals resin retainer	Number of ball tracks	Principal dimensions d_r mm	d_r tolerance 0.001mm	Principal dimensions D mm	D tolerance 0.001mm	Principal dimensions L mm	L tolerance mm
8	LMEF 8	LMEF 8 UU	4	8	(+8/0)	16	(0/-13)	25	(±0.3)
12	LMEF 12	LMEF 12 UU	4	12	(+8/0)	22	(0/-16)	32	(±0.3)
16	LMEF 16	LMEF 16 UU	5	16	(+9/-1)	26	(0/-16)	36	(±0.3)
20	LMEF 20	LMEF 20 UU	5	20	(+9/-1)	32	(0/-19)	45	(±0.3)
25	LMEF 25	LMEF 25 UU	6	25	(+11/-1)	40	(0/-19)	58	(±0.3)
30	LMEF 30	LMEF 30 UU	6	30	(+11/-1)	47	(0/-19)	68	(±0.3)
40	LMEF 40	LMEF 40 UU	6	40	(+13/-2)	62	(0/-22)	80	(±0.3)
50	LMEF 50	LMEF 50 UU	6	50	(+13/-2)	75	(0/-22)	100	(±0.3)
60	LMEF 60	LMEF 60 UU	6	60	(+13/-2)	90	(0/-25)	125	(±0.3)

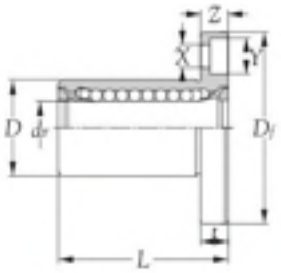
LINEAR MOTION

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	√	Class 0 (JIS)	Alvania #2 -25℃~+120℃
Brass -	X		

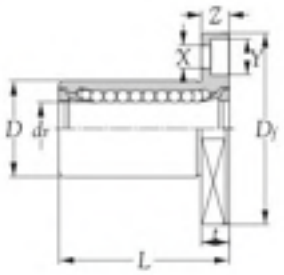
Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

LINEAR BALL BEARINGS
SERIES **LME..F**



Principa dimensions flange				Roundness	Squareness	Load ratings		Mass
D_f	t	D_p	XxYxZ			dynamic C	static C_o	kg(s).
mm				0.001mm	0.001mm	N		(approx.)
32	5	24	3.5 x 6.0 x 3.1	12	12	265	402	0.041
42	6	32	4.5 x 7.5 x 4.1	12	12	510	784	0.080
46	6	36	4.5 x 7.5 x 4.1	12	12	578	892	0.103
54	8	43	5.5 x 9.0 x 5.1	15	15	862	1370	0.182
62	8	51	5.5 x 9.0 x 5.1	15	15	980	1570	0.335
76	10	62	6.6 x 11 x 6.1	15	15	1570	2740	0.560
98	13	80	9.0 x 14 x 8.1	17	17	2160	4020	1.175
112	13	94	9.0 x 14 x 8.1	17	17	3820	7940	1.745
134	18	112	11 x 17 x 11.1	20	20	4700	9800	3.220

Linear Ball Bearings
series LME..K



Boundary dimensions mm	Bearing number standard resin retainer	Bearing number with seals resin retainer	Number of ball tracks	Principal dimensions dr mm	dr tolerance 0.001mm	D mm	D tolerance 0.001mm	L mm	L tolerance mm
8	LMEK 8	LMEK 8 UU	4	8	(+8/0)	16	(0/-13)	25	(±0.3)
12	LMEK 12	LMEK 12 UU	4	12	(+8/0)	22	(0/-16)	32	(±0.3)
16	LMEK 16	LMEK 16 UU	5	16	(+9/-1)	26	(0/-16)	36	(±0.3)
20	LMEK 20	LMEK 20 UU	5	20	(+9/-1)	32	(0/-19)	45	(±0.3)
25	LMEK 25	LMEK 25 UU	6	25	(+11/-1)	40	(0/-19)	58	(±0.3)
30	LMEK 30	LMEK 30 UU	6	30	(+11/-1)	47	(0/-19)	68	(±0.3)
40	LMEK 40	LMEK 40 UU	6	40	(+13/-2)	62	(0/-22)	80	(±0.3)
50	LMEK 50	LMEK 50 UU	6	50	(+13/-2)	75	(0/-22)	100	(±0.3)
60	LMEK 60	LMEK 60 UU	6	60	(+13/-2)	90	(0/-25)	125	(±0.3)

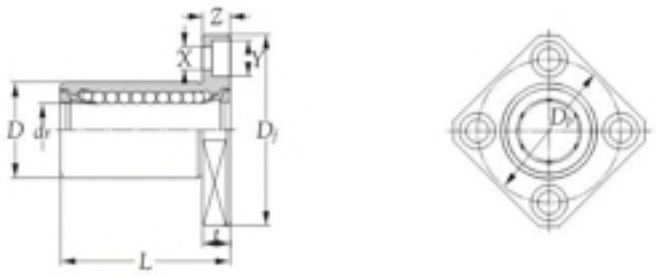
Linear Motion

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	√	Class 0 (JIS)	Alvania #2 -25℃~+120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

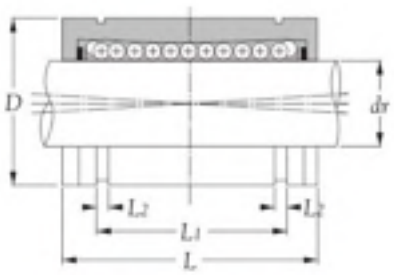
LINEAR BALL BEARINGS
SERIES **LME..K**



Principa dimensions flange				Roundness	Squareness	Load ratings		Mass
D_f	t	D_p	XxYxZ			dynamic C	static C_o	kg(s).
mm				0.001mm	0.001mm	N		(approx.)
32	5	24	3.5 x 6.0 x 3.1	12	12	265	402	0.041
42	6	32	4.5 x 7.5 x 4.1	12	12	510	784	0.080
46	6	36	4.5 x 7.5 x 4.1	12	12	578	892	0.103
54	8	43	5.5 x 9.0 x 5.1	15	15	862	1370	0.182
62	8	51	5.5 x 9.0 x 5.1	15	15	980	1570	0.335
76	10	62	6.6 x 11 x 6.1	15	15	1570	2740	0.560
98	13	80	9.0 x 14 x 8.1	17	17	2160	4020	1.175
112	13	94	9.0 x 14 x 8.1	17	17	3820	7940	1.745
134	18	112	11.0 x 17 x 11.1	20	20	4700	9800	3.220

SUPER BALL BUSHINGS
SERIES **LMES**

LMES...close, UU



Boundary dimensions d mm	Bearing number		Number of ball tracks	dr tolerance mm	0.001mm	D ±0.1	L ±0.2	L1 ±0.2	L2 min.	Load ratings dynamic C N	static C0 N	Mass kg. (approx.)
10	LMES 10	LMES 10 UU	5	10	+8 ~ 0	19	29	21.7	1.35	750	550	0.017
12	LMES 12	LMES 12 UU	5	12	+8 ~ 0	22	32	22.7	1.35	1230	1100	0.023
16	LMES 16	LMES 16 UU	5	16	+9 ~ 1	26	36	24.7	1.35	1550	1250	0.028
20	LMES 20	LMES 20 UU	6	20	+9 ~ 1	32	45	31.3	1.65	2580	1670	0.061
25	LMES 25	LMES 25 UU	6	25	+11 ~ 1	40	58	43.8	1.90	3800	2750	0.122
30	LMES 30	LMES 30 UU	6	30	+11 ~ 1	47	68	51.8	1.90	4710	2800	0.185
40	LMES 40	LMES 40 UU	6	40	+13 ~ 2	62	80	60.4	2.20	6500	5720	0.360
50	LMES 50	LMES 50 UU	6	50	+13 ~ 2	75	100	77.4	2.70	11460	7940	0.580

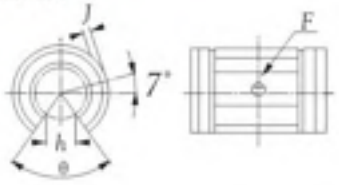
LINEAR MOTION

Remark:

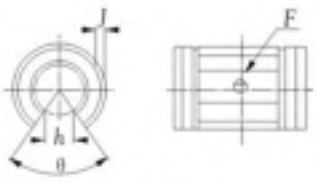
Cages		Precision	Grease
Steel -	X		
Polyamid -	√	Class 0 (JIS)	Alvania N2 -25℃ ~ +120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire
NIKO web-site: Http://www.nipponkodobearings.com

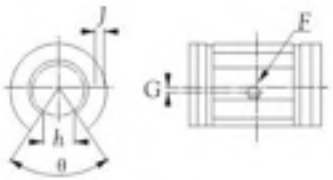
SUPER BALL BUSHINGS
SERIES **LMES..OP**



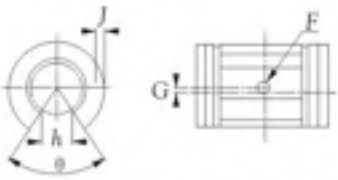
LMES 12 OP



LMES 16 OP, LMES 20 OP



LMES 25 OP



LMES 30 OP, LMES 40 OP, LMES 50 OP

Boundary dimensions d mm	Bearing number	Number of ball tracks	Principal dimensions D ±0.1	L ±0.2	L_2	h	$\theta°$	F	G	J	Load ratings dynamic C N	static C_0 N	Mass kg. (approx.)
12	LMES 12OP LMES 12UUOP	4	22	32	1.35	6.5	66	3.0	-	0.7	1290	1260	0.018
16	LMES 16OP LMES 16UUOP	4	26	36	1.35	9.0	68	3.0	-	0.7	1640	1320	0.022
20	LMES 20OP LMES 20UUOP	5	32	45	1.65	9.0	55	3.0	-	0.9	2630	1720	0.051
25	LMES 25OP LMES 25UUOP	5	40	58	1.90	11.5	57	3.0	1.5	1.4	3910	2850	0.102
30	LMES 30OP LMES 30UUOP	5	47	68	1.90	14.0	57	3.0	2.0	2.2	4850	2900	0.155
40	LMES 40OP LMES 40UUOP	5	62	80	2.20	19.5	56	3.0	1.5	2.7	6700	5900	0.300
50	LMES 50OP LMES 50UUOP	5	75	100	2.70	22.5	54	3.0	2.5	2.3	11700	8100	0.480

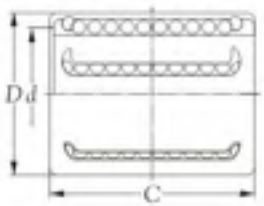
LINEAR MOTION

Remark:

Cages	Precision	Grease
Steel - X		
Polymid - √	Class 0 (JIS)	Alvania N2 -25℃ ~ +120℃
Brass - X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

LINEAR BALL BEARINGS
SERIES KH



Boundary dimensions d mm	Bearing number	Number of ball tracks	Principal dimensions D mm	C	Basic load ratings dynamic C N	static Co N	Max runout speed grease r/min	oil r/min	Mass kg. (approx.)
6	KH 0622	4	12	22	400	239	41	24	0.0070
6	KH 0622 PP	4	12	22	400	239	41	24	0.0070
8	KH 0824	4	15	24	435	280	44	29	0.0120
8	KH 0824 PP	4	15	24	435	280	44	29	0.0120
10	KH 1026	4	17	26	500	370	51	38	0.0145
10	KH 1026 PP	4	17	26	500	370	51	38	0.0145
12	KH 1228	5	19	28	620	510	63	52	0.0185
12	KH 1228 PP	5	19	28	620	510	63	52	0.0185
14	KH 1428	5	21	28	620	520	63	53	0.0205
14	KH 1428 PP	5	21	28	620	520	63	53	0.0205
16	KH 1630	5	24	30	800	620	82	63	0.0275
16	KH 1630 PP	5	24	30	800	620	82	63	0.0275
20	KH 2030	6	28	30	950	790	97	81	0.0325
20	KH 2030 PP	6	28	30	950	790	97	81	0.0325
25	KH 2540	6	35	40	1990	1670	203	170	0.0660
25	KH 2540 PP	6	35	40	1990	1670	203	170	0.0660
30	KH 3050	7	40	50	2800	2700	285	275	0.0950
30	KH 3050 PP	7	40	50	2800	2700	285	275	0.0950
40	KH 4060	8	52	60	4400	4450	449	454	0.1820
40	KH 4060 PP	8	52	60	4400	4450	449	454	0.1820
50	KH 5070	9	62	70	5500	6300	561	642	0.2520
50	KH 5070 PP	9	62	70	5500	6300	561	642	0.2520

LINEAR MOTION

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	√	DIN Standard	Alvania N2 -25℃~+120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

NIKO

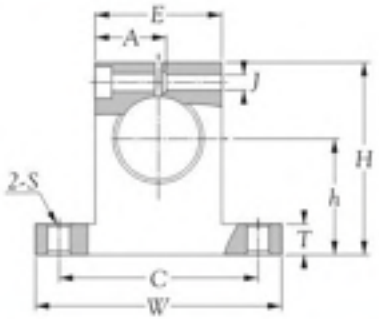
NIPPON KOGO

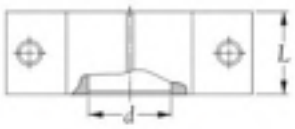
Aluminium Housings & complete units

Linear Motion

Souvenirs

Aluminium Housings
series FGWA





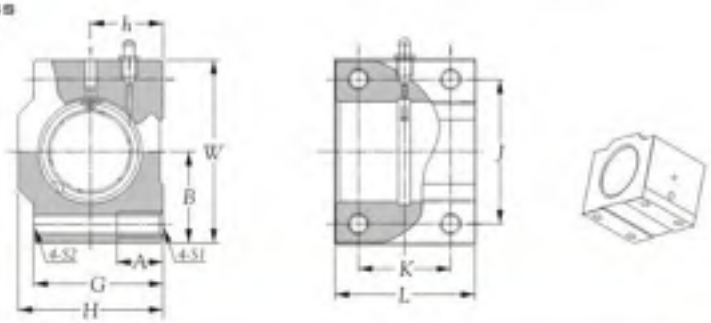
Boundary dimensions d mm	Bearing number	Principal dimensions d tolerance mm 0.001mm	W	C tolerance mm 0.001mm	H tolerance mm 0.001mm	L tolerance mm 0.001mm	h tolerance mm 0.001mm	T	E	A mm	J	S	Mass kg. (approx.)
12	**FGWA 12**	12 $^{+0.018}_{0}$	42	32 ±0.15	35 ±0.30	12 ±0.20	20 ±0.020	5.5	20	12.0	M3	5.5	0.024
16	**FGWA 16**	16 $^{+0.018}_{0}$	50	40 ±0.15	42 ±0.30	16 ±0.20	25 ±0.020	6.5	28	16.0	M3	5.5	0.050
20	**FGWA 20**	20 $^{+0.021}_{0}$	60	45 ±0.15	50 ±0.30	20 ±0.20	30 ±0.020	8.0	32	18.0	M4	5.5	0.080
25	**FGWA 25**	25 $^{+0.021}_{0}$	74	60 ±0.15	58 ±0.30	25 ±0.20	35 ±0.020	9.0	38	21.0	M5	6.6	0.132
30	**FGWA 30**	30 $^{+0.021}_{0}$	84	68 ±0.15	68 ±0.30	28 ±0.20	40 ±0.020	10.0	45	24.5	M6	9.0	0.200
40	**FGWA 40**	40 $^{+0.025}_{0}$	108	86 ±0.15	86 ±0.30	32 ±0.20	50 ±0.020	12.0	56	31.0	M8	11.0	0.350

Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

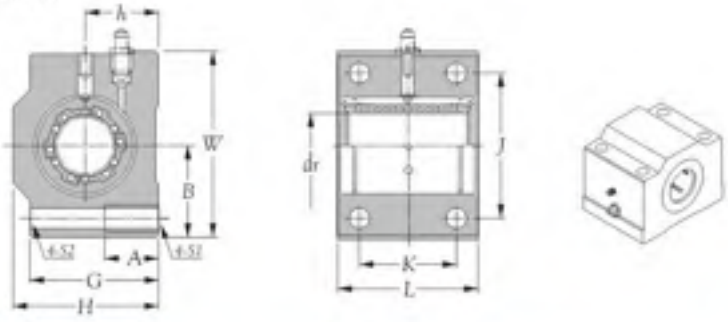
Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

Aluminium Housings
series SB..AS



Bearing number	Principal dimensions																Mass
	h		B		W		H		G	A	J		S1	S2	K		L		kg(s).
	tolerance		tolerance		tolerance		tolerance				tolerance				tolerance		tolerance		
	mm	0.001mm	mm	0.001mm	mm	0.001mm	mm	0.001mm			mm	0.001mm			mm	0.001mm	mm	0.001mm	(approx.)
SB 16 AS	22	±0.02	26.5	±0.02	53	0 ~ -0.3	42	0 ~ -0.3	37.0	13	40	±0.15	M6	5.3	26	±0.15	36	0 ~ -0.2	0.202
SB 20 AS	25	±0.02	30.0	±0.02	60	0 ~ -0.3	50	0 ~ -0.3	44.0	18	45	±0.15	M8	6.6	32	±0.15	45	0 ~ -0.2	0.301
SB 25 AS	35	±0.02	39.0	±0.02	78	0 ~ -0.3	60	0 ~ -0.3	52.5	26	60	±0.15	M10	8.4	40	±0.15	58	0 ~ -0.2	0.659
SB 30 AS	35	±0.02	43.5	±0.02	87	0 ~ -0.3	70	0 ~ -0.3	62.5	26	68	±0.15	M10	8.4	45	±0.15	68	0 ~ -0.2	1.000
SB 40 AS	45	±0.02	54.0	±0.01	108	0 ~ -0.3	90	0 ~ -0.3	80.0	26	86	±0.15	M12	10.5	58	±0.15	80	0 ~ -0.2	2.233

series SB LME..



Bearing number	Principal dimensions																Mass
	h		B		W		H		G	A	J		S1	S2	K		L		kg(s).
	tolerance		tolerance		tolerance		tolerance				tolerance				tolerance		tolerance		
	mm	0.001mm	mm	0.001mm	mm	0.001mm	mm	0.001mm			mm	0.001mm			mm	0.001mm	mm	0.001mm	(approx.)
SB LME 16 UUAS	22	±0.02	26.5	±0.02	53	0 ~ -0.3	42	0 ~ -0.3	37.0	13	40	±0.15	M6	5.3	26	±0.15	36	0 ~ -0.2	0.202
SB LME 20 UUAS	25	±0.02	30.0	±0.02	60	0 ~ -0.3	50	0 ~ -0.3	44.0	18	45	±0.15	M8	6.6	32	±0.15	45	0 ~ -0.2	0.301
SB LME 25 UUAS	35	±0.02	39.0	±0.02	78	0 ~ -0.3	60	0 ~ -0.3	52.5	26	60	±0.15	M10	8.4	40	±0.15	58	0 ~ -0.2	0.659
SB LME 30 UUAS	35	±0.02	43.5	±0.02	87	0 ~ -0.3	70	0 ~ -0.3	62.5	26	68	±0.15	M10	8.4	45	±0.15	68	0 ~ -0.2	1.000
SB LME 40 UUAS	45	±0.02	54.0	±0.01	108	0 ~ -0.3	90	0 ~ -0.3	80.0	26	86	±0.15	M12	10.5	58	±0.15	80	0 ~ -0.2	2.233

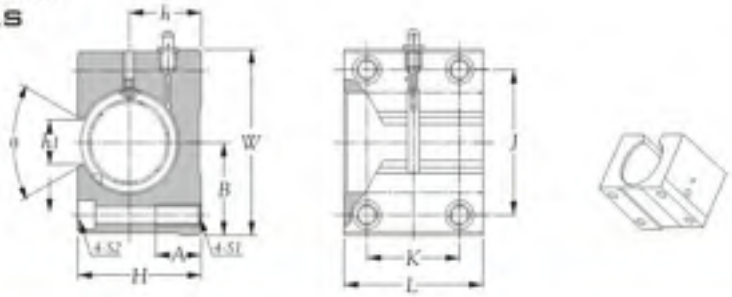
Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Alvania N2 -25°C ~ +120°C
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

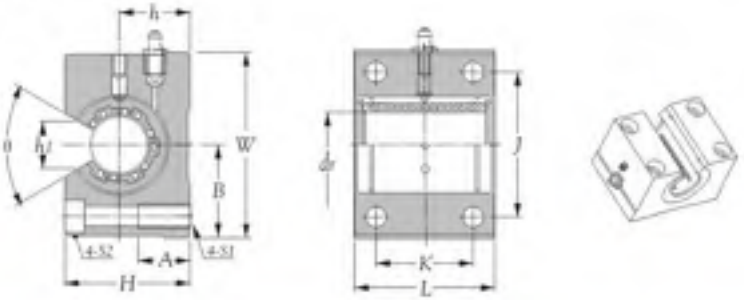
ALUMINIUM HOUSINGS

SERIES SO..AS



Bearing number	Principal dimensions												Mass
	h	B	W	H	A	J	S1	S2	K	L	h1	θ	kg(s).
	tolerance mm 0.001mm	tolerance mm 0.001mm	tolerance mm 0.001mm	tolerance mm 0.001mm		tolerance mm 0.001mm			tolerance mm 0.001mm	tolerance mm 0.001mm	tolerance mm 0.001mm		(approx.)
SO 16 AS	22 ±0.02	26.5±0.02	53 0~-0.3	35 0~-0.3	13	40 ±0.15	M6	5.3	26 ±0.15	36 0~-0.2	16.4 ±0.3	78°	0.159
SO 20 AS	25 ±0.02	30.0±0.02	60 0~-0.3	42 0~-0.3	18	45 ±0.15	M8	6.5	32 ±0.15	45 0~-0.2	16.0 ±0.3	60°	0.259
SO 25 AS	35 ±0.02	39.0±0.02	78 0~-0.3	51 0~-0.3	22	60 ±0.15	M10	8.5	40 ±0.15	58 0~-0.2	20.0 ±0.3	60°	0.574
SO 30 AS	35 ±0.02	43.5±0.02	87 0~-0.3	60 0~-0.3	22	68 ±0.15	M10	8.5	45 ±0.15	68 0~-0.2	19.9 ±0.3	50°	1.453
SO 40 AS	45 ±0.02	54.0 ±0.01	108 0~-0.3	77 0~-0.3	26	86 ±0.15	M12	10.5	58 ±0.15	80 0~-0.2	26.1 ±0.3	50°	1.996

SERIES SO LME..



LINEAR MOTION

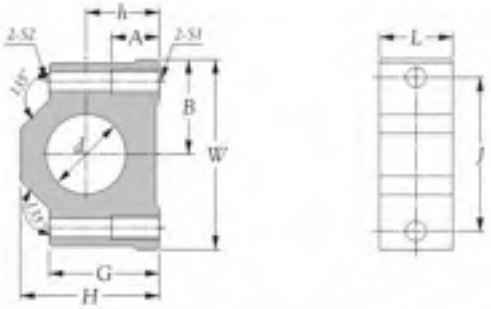
Bearing number	Principal dimensions												Mass
	h	B	W	H	A	J	S1	S2	K	L	h1	θ	kg(s).
	tolerance mm 0.001mm	tolerance mm 0.001mm	tolerance mm 0.001mm	tolerance mm 0.001mm		tolerance mm 0.001mm			tolerance mm 0.001mm	tolerance mm 0.001mm	tolerance mm 0.001mm		(approx.)
SO LME 16 UUOP AS	22 ±0.02	26.5±0.02	53 0~-0.3	35 0~-0.3	13	40 ±0.15	M6	5.3	26 ±0.15	36 0~-0.2	16.4 ±0.3	78°	0.159
SO LME 20 UUOP AS	25 ±0.02	30.0±0.02	60 0~-0.3	42 0~-0.3	18	45 ±0.15	M8	6.5	32 ±0.15	45 0~-0.2	16.0 ±0.3	60°	0.259
SO LME 25 UUOP AS	35 ±0.02	39.0±0.02	78 0~-0.3	51 0~-0.3	22	60 ±0.15	M10	8.5	40 ±0.15	58 0~-0.2	20.0 ±0.3	60°	0.574
SO LME 30 UUOP AS	35 ±0.02	43.5±0.02	87 0~-0.3	60 0~-0.3	22	68 ±0.15	M10	8.5	45 ±0.15	68 0~-0.2	19.9 ±0.3	50°	1.453
SO LME 40 UUOP AS	45 ±0.02	54.0 ±0.01	108 0~-0.3	77 0~-0.3	26	86 ±0.15	M12	10.5	58 ±0.15	80 0~-0.2	26.1 ±0.3	50°	1.996

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Alvania S2 -25℃~+120℃
Brass -	X		

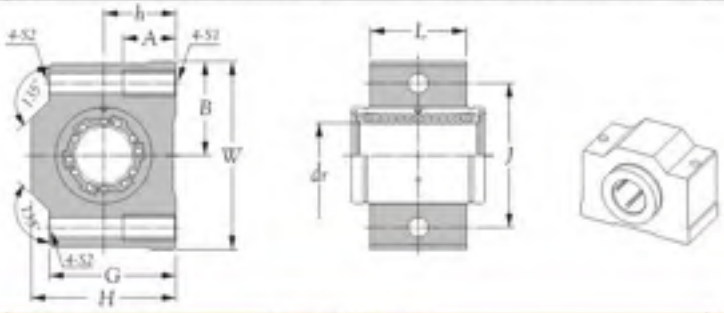
Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshabearings.com

ALUMINIUM HOUSINGS
SERIES S2B..N



Boundary dimensions d mm	Bearing number	Principal dimensions h tolerance mm	tolerance 0.001mm	B	tolerance 0.001mm	W	H	A	J	tolerance mm	tolerance 0.001mm	S1	S2	L	Mass kg. (approx.)
22	S2B 12 N	20	+0.010 ~ -0.014	26.0	±0.015	52	38	13	42	±0.15		M6	5.3	20	0.025
26	S2B 16 N	20	+0.010 ~ -0.014	28.0	±0.015	56	40	13	46	±0.15		M6	5.3	22	0.060
32	S2B 20 N	25	+0.010 ~ -0.014	35.0	±0.015	70	50	15	58	±0.20		M8	6.6	28	0.098
40	S2B 25 N	30	+0.010 ~ -0.014	40.0	±0.015	80	60	18	68	±0.15		M8	6.6	40	0.125
47	S2B 30 N	35	+0.010 ~ -0.014	44.0	±0.015	88	70	18	76	±0.15		M8	6.6	48	0.140
62	S2B 40 N	45	+0.010 ~ -0.014	54.0	±0.015	108	85	22	94	±0.15		M10	8.5	56	0.080
75	S2B 50 N	50	+0.010 ~ -0.014	67.5	±0.015	135	102	27	116	±0.15		M12	10.5	72	0.400

SERIES S2B LME..



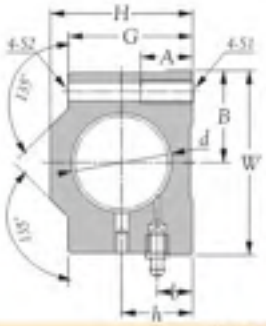
Boundary dimensions d mm	Bearing number	Principal dimensions h tolerance mm	tolerance 0.001mm	B	tolerance 0.001mm	W	H	A	J	tolerance mm	tolerance 0.001mm	S1	S2	L	Mass kg (approx.)
22	S2B 12 N + LME 12 UU AS	20	+0.010 ~ -0.014	26.0	±0.015	52	38	13	42	±0.15		M6	5.3	20	0.025
26	S2B 16 N + LME 16 UU AS	20	+0.010 ~ -0.014	28.0	±0.015	56	40	13	46	±0.15		M6	5.3	22	0.060
32	S2B 20 N + LME 20 UU AS	25	+0.010 ~ -0.014	35.0	±0.015	70	50	15	58	±0.20		M8	6.6	28	0.098
40	S2B 25 N + LME 25 UU AS	30	+0.010 ~ -0.014	40.0	±0.015	80	60	18	68	±0.15		M8	6.6	40	0.125
47	S2B 30 N + LME 30 UU AS	35	+0.010 ~ -0.014	44.0	±0.015	88	70	18	76	±0.15		M8	6.6	48	0.140
62	S2B 40 N + LME 40 UU AS	45	+0.010 ~ -0.014	54.0	±0.015	108	85	22	94	±0.15		M10	8.5	56	0.080
75	S2B 50 N + LME 50 UU AS	50	+0.010 ~ -0.014	67.5	±0.015	135	102	27	116	±0.15		M12	10.5	72	0.400

Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	X		
Brass -	X	Class 0 (JIS)	Alvania N2 -25°C ~ +120°C

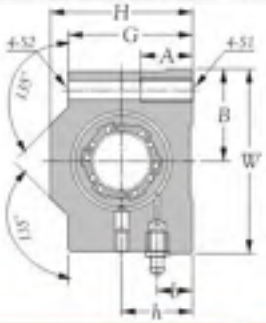
Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

ALUMINIUM HOUSINGS
SERIES **SBT..AS**



Boundary dimensions d mm	Bearing number	Principal dimensions h tolerance mm 0.001mm	B tolerance mm 0.001mm	W	H	b	A	J tolerance mm 0.001mm	S1	S2
22	**SBT 12 AS**	18 +0.010 ~ -0.014	21.5 ±0.015	43	35	8	11	32 ±0.15	M5	4.3
26	**SBT 16 AS**	22 +0.010 ~ -0.014	26.5 ±0.015	53	42	12	13	40 ±0.15	M6	5.3
32	**SBT 20 AS**	25 +0.008 ~ -0.016	30.0 ±0.010	60	50	13	18	45 ±0.15	M8	6.6
40	**SBT 25 AS**	30 +0.008 ~ -0.016	39.0 ±0.010	78	60	15	22	60 ±0.15	M10	8.4
47	**SBT 30 AS**	35 +0.008 ~ -0.016	43.5 ±0.010	87	70	16	22	68 ±0.15	M10	8.4
62	**SBT 40 AS**	45 +0.008 ~ -0.016	54.0 ±0.010	108	90	26	26	86 ±0.15	M12	10.5
75	**SBT 50 AS**	50 +0.005 ~ -0.016	66.0 ±0.015	132	101	22	34	108 ±0.15	M14	13.5

SERIES **SBT LME..**



LINEAR MOTION

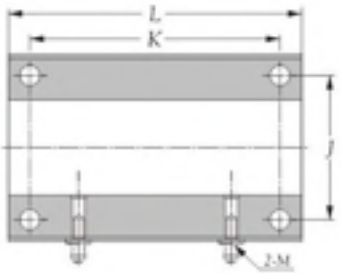
Boundary dimensions d mm	Bearing number	Principal dimensions h tolerance mm 0.001mm	B tolerance mm 0.001mm	W	H	b	A	J tolerance mm 0.001mm	S1	S2
22	**SBT 12 AS + LME 12 UU AS**	18 +0.010 ~ -0.014	21.5 ±0.015	43	35	8	11	32 ±0.15	M5	4.3
26	**SBT 16 AS + LME 16 UU AS**	22 +0.010 ~ -0.014	26.5 ±0.015	53	42	12	13	40 ±0.15	M6	5.3
32	**SBT 20 AS + LME 20 UU AS**	25 +0.008 ~ -0.016	30.0 ±0.010	60	50	13	18	45 ±0.15	M8	6.6
40	**SBT 25 AS + LME 25 UU AS**	30 +0.008 ~ -0.016	39.0 ±0.010	78	60	15	22	60 ±0.15	M10	8.4
47	**SBT 30 AS + LME 30 UU AS**	35 +0.008 ~ -0.016	43.5 ±0.010	87	70	16	22	68 ±0.15	M10	8.4
62	**SBT 40 AS + LME 40 UU AS**	45 +0.008 ~ -0.016	54.0 ±0.010	108	90	26	26	86 ±0.15	M12	10.5
75	**SBT 50 AS + LME 50 UU AS**	50 +0.005 ~ -0.016	66.0 ±0.015	132	101	22	34	108 ±0.15	M14	13.5

Remark:

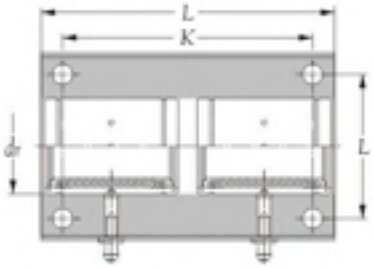
Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Alvania S2 -25°C ~ +120°C
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

Aluminium Housings series SBT..AS



Principal dimensions					Mass
K tolerance		L	M	G	kg(s).
mm	0.001mm				(approx.)
56	±0.10	70	M6X1	31.0	0.170
64	±0.15	78	M6X1	37.0	0.310
76	±0.15	96	M6X1	44.0	0.486
94	±0.15	122	M8X1	52.5	0.630
106	±0.15	142	M8X1	62.5	0.760
124	±0.15	166	M8X1	80.0	0.980
160	±0.15	212	M8X1	88.0	2.360



Linear Motion

Principal dimensions					Mass
K tolerance		L	M	G	kg(s).
mm	0.001mm				(approx.)
56	±0.10	70	M6X1	31.0	0.170
64	±0.15	78	M6X1	37.0	0.310
76	±0.15	96	M6X1	44.0	0.486
94	±0.15	122	M8X1	52.5	0.630
106	±0.15	142	M8X1	62.5	0.760
124	±0.15	166	M8X1	80.0	0.980
160	±0.15	212	M8X1	88.0	2.360

NOTE

LINEAR MOTION

NIKO

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NIPPON KOGO

Track Roller Bearings

Track Roller Bearings

Souvenirs

Track Roller Bearings

1. Bearing materials

The internal design of NIKO track rollers is the same as in single row or Double-row Angular Contact Ball Bearings.
The units can carry axial loads in both directions and, due to the thickness of the outer ring, large radial loads.
The standard product are produced from high quality bearing steel, with a hardness of 58 to 62 HRC. Some types are also available in stainless steel (440C) with hardness>58 HRC.
The track rollers contained in this catalogue are produced with standard tolerances (ISO 492) and standard clearance (CN).
The track rollers are produced in two distinct families. Cylindrical or crowned outer ring and profiled outer ring.

These track rollers are available in single and double row design. They are available with straight cylindrical OD or crowned profile OD. The crowned OD is used to reduce the edge stresses caused by possible misalignment errors. The cylindrical OD can provide increased support due to the longer contact profile.

There products are used typically on flat surfaces. Some of the most common applications are:
-transfer rolls
-idler rollers
-Support rollers
-Straightening rolls

2. Shields and seals

2.1 Types
2.1.1 Track rollers LR 2..NPP, LR 2..RRU
These single row ball track rollers are available in two different versions.
-LR2..NPP: cylindrical OD, with contact seals protected by a metal shield.
-LR2..RRU: crowned OD with contact seals protected by a metal shield, inner ring with increased width to allow additional lubricant storage.

2.1.2 Track rollers LR 52-53..NPPU, LR 52-53..KDD
These are double rows angular contact ball track rollers. Due to their internal design, they can carry axial loads of large magnitude. They are available in two versions:
-LR52-53..NPPU: crowned OD, contact seals protected by a metal shield.
-LR52-53..KDD: cylindrical OD, with metal shields.

The track rollers with profiled outer ring are basically Double-rows Angular Contact Ball Bearings with a reinforced and profiled outer ring. The outer ring profile allows the units to operate on round shafts or other type of profiled raceways. The outer profile can have three different designs:

- Track rollers with gothic arch groove - type LFR
- Track rollers with "V" shaped groove - type RV
- Track rollers with "W" profile - type RM

TRACK ROLLER BEARINGS

Type RV and RW can be supplied with the pertinent mounting hardware.
The largest portion of these products are used as linear guides.

2.2 Types
2.2.1 Track rollers LFR, mounting bolts and studs RC/RE
The track rollers series LFR can be used on round shafts with diameter from 4 mm to 50 mm.
The contact between track roller gothic arch groove profile and shaft is on two points.
This allows the units to carry loads in both axial and radial direction.
The track rollers are available with either shields ZZ or contact seals 2RS.

2.2.2 Track rollers RV
The track rollers RV have a groove machined in the outer ring. The groove is "V" shaped with an included angle of 120 degrees. These units are predominantly used on shafts with diameters from 7 to 20 MM. The contact between track roller and shafts is on two points. In special cases, the units can run on profiled ways.
The units are supplied with non contact shields.

2.2.3 Track rollers with "W" profile, type RM
The track rollers series RM have grooves machined in the outer ring of the unit with an included angle of 90 degree. They have been engineered to run on profiled steel elements that have identical shape. They can run on either the internal or the external surfaces of the outer ring.

They are available with either non-contacting shields ZZ or contact seals 2RS.

3. Bearing tolerances

3.1 Standard of tolerances
Track roller bearing "tolerances" or dimensional accuracy and running accuracy, are regulated by ISO and JIS standards (rolling bearing tolerances). For dimensional accuracy, these standards prescribe the tolerances necessary when installing bearings on shafts or in housings.
Running accuracy is defined as the allowable limits for bearing runout during operation.

Table 3.1 Comparison of tolerance classifications of national standards

Standard		Tolerance class				
Japanese industrial standard (JIS)	JIS	class 0,6X	class 6	class 5	class 4	class 2
International Organization for Standardization (ISO)	ISO	Normal class Class 6X	Class 6	Class 5	Class 4	Class 2
Deutsches Institut fur Normung(ISO)	DIN	P0	P6	P5	P4	P2
American National Standards Institute (ANSI)	ANSI/ABMA	ABEC-1	ABEC-3	ABEC-5	ABEC-7	ABEC-9

TRACK ROLLER BEARINGS

3.2 Tolerances for radial bearings

Table 3.2 Inner rings (Unit : μm)

Nominal bore diameter d mm over	incl.	Single plane mean bore diameter deviation Δdmp class 0 high	low	class 6 high	low	class 5 high	low	class 4 ❶ high	low	class 2 ❶ high	low	Single radial plane bore diameter variation Vdp diameter series 9 class 0	class 6	class 5 max.	class 4	class 2	maxdiameter series 0,1 class 0	class 6	class 5 max.	class 4	class 2
10	18	0	-8	0	-7	0	-5	0	-4	0	-2.5	10	9	5	4	2.5	8	7	4	3	2.5
18	30	0	-10	0	-8	0	-6	0	-5	0	-2.5	13	10	6	5	2.5	10	8	5	4	2.5
30	50	0	-12	0	-10	0	-8	0	-6	0	-2.5	15	13	8	6	2.5	12	10	6	5	2.5

Table 3.3 Inner rings (Unit : μm)

Nominal bore diameter d mm over	incl.	Single radial plane bore diameter variation Vdp maxdiameter series 2,3,4 class 0	class 6	class 5 max.	class 4	class 2	Mean single plane bore diameter variation Vdmp class 0	class 6	class 5 max.	class 4	class 2	Inner ring radial runout Kia class 0	class 6	class 5 max.	class 4	class 2	Face runout with bore Sd class 5	class 4 max.	class 2
10	18	6	5	4	3	2.5	6	5	3	2.0	1.5	10	7	4	2.5	1.5	7.0	3.0	1.5
18	30	8	6	5	4	2.5	8	6	3	2.5	1.5	13	8	4	3.0	2.5	8.0	4.0	1.5
30	50	9	8	6	5	2.5	9	8	4	3.0	1.5	15	10	5	4.0	2.5	8.0	4.0	1.5

Table 3.4 Inner rings (Unit : μm)

Nominal bore diameter d mm over	incl.	Inner ring axial runout (with side) Sia ❷ class 5	class 4	class 2	Inner ring width deviation ΔBs normal class 0,6 high	low	class 5,4 high	low	class 2 high	low	modified ❸ class 0,6 high	low	class 5,4 high	low	Inner ring width variation VBs class 0	class 6	class 5 max.	class 4	class 2
10	18	7	3	1.5	0	-120	0	-80	0	-80	0	-250	0	-250	20	20	5	2.5	1.5
18	30	8	4	2.5	0	-120	0	-120	0	-120	0	-250	0	-250	20	20	5	2.5	1.5
30	50	8	4	2.5	0	-120	0	-120	0	-120	0	-380	0	-250	20	20	5	3.0	1.5

Note: ❶ The dimensional difference Δds of bore diameter to applied for class 4 and 2 is the same as the tolerance of dimentional difference Δdmp of average bore diameter. However, the dimensional difference is applied to diameter series 0, 1, 2, 3 and 4 against Class 4, and to all the diameter series against Class 2.
❷ To be applied for deep groove ball bearing and angular contact ball bearings.
❸ To be applied for individual raceway rings manufactured for combined bearing use.

Symbols: Δdmp: deviation of the mean bore diameter from the nominal (Δdmp = dmp − d).
Vdp: bore diameter variation: difference between the largest and smallest single bore diameters in one plane.
Vdmp: mean bore diameter variation: difference between the largest and smallest mean bore diameters of one ring or washer.
Kia: radial runout of assembled bearing inner ring and assembled bearing outer ring, respectively.
Sd: side face runout with reference to bore (of inner ring).
Sia: side face runout of assembled bearing inner ring and assembled bearing outer ring, respectively.
ΔBs: deviation of single inner ring width or single outer ring width from the nominal (ΔBs = Bs − B etc.)
VBs: ring width variation: difference between the largest and smallest single widths of inner ring and of outer ring, respectively.

Table 3.5 Outer rings (Unit : μm)

Nominal Outside diameter D mm		Single plane mean outside diameter deviation $\triangle D_{mp}$										Single radial plane outside diameter variation V_{Dp}									
		class 0		class 6		class 5		class 4①		class 2①		diameter series 9					maxdiameter series 0.1				
over	incl.	high	low	high	low	high	low	high	low	high	low	class 0	class 6	class 5 max.	class 4	class 2	class 0	class 6	class 5 max.	class 4	class 2
6	18	0	-8	0	-7	0	-5	0	-4	0	-2.5	10	9	5	4	2.5	8	7	4	3	2.5
18	30	0	-9	0	-8	0	-6	0	-5	0	-4.0	12	10	6	5	4.0	9	8	5	4	4.0
30	50	0	-11	0	-9	0	-7	0	-6	0	-4.0	14	11	7	6	4.0	11	9	5	5	4.0
50	80	0	-13	0	-11	0	-9	0	-7	0	-4.0	16	14	9	7	4.0	13	11	7	5	4.0
80	120	0	-15	0	-13	0	-10	0	-8	0	-5.0	19	16	10	8	5.0	19	16	8	6	5.0

Table 3.6 Outer rings (Unit : μm)

Nominal Outside diameter D mm		Single radial plane outside diameter variation V_{Dp} maxdiameter series 2.3.4					Single radial plane outside diameter variation V_{Dp}② capped bearings diameter series		Mean single plane outside diameter variation V_{Dmp}				
		class 0	class 6	class 5 max.	class 4	class 2	2,3,4 class 0 max.	0,1,2,3,4 class 6	class 0	class 6	class 5 max.	class 4	class 2
over	incl.												
6	18	6	5	4	3	2.5	10	9	6	5	3	2.0	1.5
18	30	7	6	5	4	4.0	12	10	7	6	3	2.5	2.0
30	50	8	7	5	5	4.0	16	13	8	7	4	3.0	2.0
50	80	10	8	7	5	4.0	20	16	10	8	5	3.5	2.0
80	120	11	10	8	6	5.0	26	20	11	10	5	4.0	2.5

Symbols: $\triangle D_{mp}$: deviation of the mean outside diameter from the nominal ($\triangle D_{mp}=D_{mp}-D$).
V_{Dp}: outside diameter variation: difference between the largest and smallest single outside diameters in one plane.
V_{Dmp}: mean outside diameter variation: difference between the largest and smallest mean outside diameters of one ring or washer.

TRACK ROLLER BEARINGS

Table 3.7 Outer rings (Unit : μm)

Nominal Outside diameter D mm over	incl.	Outer ring radial runout K_{ea} class 0	class 6	class 5 max.	class 4	class 2	Outside surface inclination S_D class 5	class 4 max.	class 2	Outside ring axial runout S_{ea} ❶ class 5	class 4 max.	class 2	Outer ring width deviation Δ_{Cs} all type	Outer ring width variation V_{Cs} class 0,6	class 5	class 4 max.	class 2
6	18	15	8	5	3	1.5	8	4	1.5	8	5	1.5	Identical to Δ_{Bs} of inner ring of same bearing	Identical to Δ_{Bs} and V_{Bs} of inner ring of same bearing	5	2.5	1.5
18	30	15	9	6	4	2.5	8	4	1.5	8	5	2.5			5	2.5	1.5
30	50	20	10	7	5	2.5	8	4	1.5	8	5	2.5			5	2.5	1.5
50	80	25	13	8	5	4.0	8	4	1.5	10	5	4.0			6	3.0	1.5
80	120	35	18	10	6	5.0	9	5	2.5	11	6	5.0			8	4.0	2.5

Note: ❶ The dimensional difference Δ_{Ds} of outer diameter to be applied for classes 4 and 2 is the same as the tolerance of dimensional difference Δ_{Dmp} of average outer diameter. However, the dimensional difference is applied to diameter series 0,1,2,3 and 4 against Class 4, and also to all the diameter series against Class 2.
❷ To be applied in case snap rings are not installed on the bearings.
❸ To be applied for Track Roller Bearings.

Symbols: K_{ea}: radial runout of assembled bearing inner ring and assembled bearing outer ring, respectively.
S_D: outside inclination variation: variation in inclination of outside cylindrical surface to outer ring side face.
S_{ea}: side face runout of assembled bearing inner ring and assembled bearing outer ring, respectively.
Δ_{Cs}: deviation of single inner ring width or single outer ring width from the nominal ($\Delta_{Bs} = B_s - B$ etc.)
V_{Cs}: ring width variation: difference between the largest and smallest single widths of inner ring and of outer ring, respectively.

4. Bearing fits

Track rollers are precision machine elements. These products must be very carefully handled before and during fitting. Their trouble-free operation depends largely on the care taken during fitting

4.1 Compatibility and miscibility
The anti-corrosive preservation oil used for rolling bearings is compatible and miscible with oils and greases with a mineral oil base. Compatibility should be checked if the following are used:
- synthetic lubricants
- thickeners other than lithium or lithium complex soaps.

If there is an incompatibility, the anti-corrosive oil should be washed out before greasing, particularly in the following cases:
- lubricants based on PTFE/alkoxyfluoroether
- lubricants with a polycarbamide thickener

and if
- the lubricant is changed
- the rolling bearings are contaminated.

If in doubt, please contact the relevant lubricant manufacturer.

4.2 Guidelines for fitting
- The assembly area must be kept clean and free from dust
- Protect bearings from dust, contaminants and moisture
  - contaminants have a detrimental influence on the running and operating life of rolling bearings
- Inspect the housing bore and shaft/axis seating for
  - dimensional and geometrical tolerances
  - cleanliness

- Lightly oil the bearing ring seating surfaces or rub with solid lubricant
- Do not cool the bearings excessively
  - Moisture due to condensation can lead to corrosion in the bearings and bearing seatings
- After fitting
  - charge ungreased rolling bearings with lubricant
  - check the correct functioning of the bearing arrangement.

4.3 Fitting tools
- Induction heating device (see figure below)
- Heating cupboard
  - heating up to + 80 °C

Mechanical or hydraulic press
  - fitting sleeves should be used which cover the whole circumference of the bearing ring end faces
- Hammer and fitting sleeve
  - light hammer blows should be centrally directed on the fitting sleeve

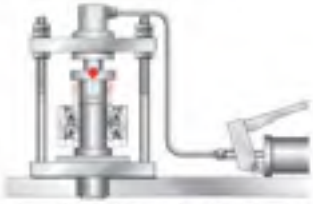
Note: Fitting forces must never be directed through the rolling elements. Direct blows on the bearing rings must be avoided.


Heating with an induction heater

4.4 Dismantling guidelines
- Dismantling should be taken into consideration in the original design of the bearing location
- If the bearings are to be reused:
  - direct blows on the bearing rings should be avoided
  - dismantling forces should not be applied through the rolling elements
  - bearings should be carefully cleaned once dismantled
  - do not use a concentrated or hard flame.

4.5 Fitting and dismantling of yoke type track rollers (ball type)
- If the tolerance zone is unfavourable: the bearing should be pressed into place using a fitting press (see figure below)
  - The inner ring must be fitted such that the pressing-in force is distributed uniformly on theend face of the inner ring.

Note: Fitting forces must not be directed through the rolling elements.
It must be ensured that the seals are not damaged during fitting.
- Track rollers must be secured axially according to the advice given.

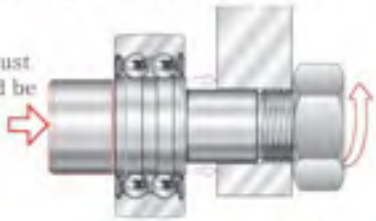

Fitting of the yoke type track roller using a fitting press


TRACK ROLLER BEARINGS

Note: Extraction forces must not be directed through the outer ring. This could damage the rolling elements and seals.

4.6 Fitting and dismantling of stud type track rollers (ball type)
Stud type track rollers are fitted and dismantled by methods similar to those used for yoke type track rollers (see figure below).
-

Note: The tightening torques given in the dimension table must be observed. Only then can the permissible radial load be ensured.
Screws and nuts of grade ≥ 8.8 must be used.


Fitting of a stud type track roller

5. Bearing internal clearance

Track Roller Bearing internal clearance (initial clearance) is the amount of internal clearance a bearing has before being installed on a shaft or in a housing. The internal clearance valves for NIKO Track roller bearing classes are shown in tables 5.1

Table 5.1 Radial internal clearance of track roller bearings (Unit : μm)

Nominal bore diameter d (mm)		C2		Normal		C3		C4	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.
-	10	6	12	8	15	15	22	22	30
10	18	6	12	8	15	15	24	30	40
18	30	6	12	10	20	20	32	40	55
30	50	8	14	14	25	25	40	55	75

6. Lubrication

6.1 Track rollers series LR 2..are supplied grease filled. (The lithium soap grease).

6.2 Track rollers series LR 52..are supplied grease filled. (The lithium soap grease) .

6.3 Track rollers LFR, mounting bolts and studs RC/RE
The units are supplied with lifetime grease lubrication
The size with an outside diameter 52 mm or greater have a lubrication hole in the inner ring.
To prevent mixing of greases with different characteristics, please insure to perform the lubrication of the units with lubricants that have the same characteristics as the grease used at the factory. Mounting bolts are available in both eccentric RE and concentric RC versions.
The eccentric bolts RE and RE..A1 allow the adjustment of the operating clearance.
Bolts of series RE..A1 and RC..A1 have facilities that enable relubrication of the track rollers.
The mounting bolts of series RC hare supplied with the pertinent washer, while the one of series RE have both washer and nut.
The units RC..A1 and RE..A1 also incorporate the grease fitting and its relative cover plug.

6.4 Track rollers RV
The units are supplied with lifetime lubrication.

6.5 Track rollers with "W" profile, type RM
The units are supplied with lifetime grease lubrication.

7. Load rating and life

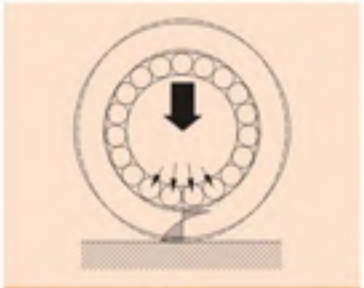


Fig. 1

If the track rollers operate on a flat surface/raceway, the outer ring deforms (fig.1)
When compared with a bearing mounted in a suitable housing, track rollers have the following characteristics:
- Modified load distribution
This is accounted for by using the load factors Cw and Cow when calculating the life.
- Alternating bending stress on the outer ring
This is taken into account by the load coefficients Frperm and Fro perm (see dimension tables). The stresses must not exceed the allowable limits.

7.1 Load ratings and life calculation
The dynamic load rating of the track roller is determined by the fatigue limit of the material.The life of the track roller is defined as the period of use before the ppearance of fatigue. The ability of a track roller to carry dynamic loads is statistically derived.

7.1.1 Life calculation
The formula to calculate the nominal life is as follows:

$$L = \left(\frac{CW}{P}\right)^3$$

$$L_h = \frac{833}{H.nosz}\left(\frac{CW}{P}\right)^3$$

$$L_h = \frac{1666}{Vm}\left(\frac{CW}{P}\right)^3$$

L = nominal life in 10^5 m reached by 90% of a statistically significant number of apparently identical bearing operating under the same loading condition before the onset of metal fatigue.
L_h [h] = nominal life in hours
C_w [N] = Dynamic load rating. Is the load that would yield a nominal life of 105 m.
P [N] = equivalent dynamic load
H [m] = stroke
n_{osz} [min^{-1}] = frequency of operation
V_m [m/min] = mean operating velocity


TRACK ROLLER BEARINGS

7.1.2 Radial dynamic limit load F_r perm
When selecting the product it is necessary to insure that no loading condition will exceed the allowable load.

8. Bearing handling

8.1 Storage
The bearings should be stored:
- in dry, clean rooms with the temperature as constant as possible
- at a relative humidity of max. 65%.

The storage period for greased and sealed bearings is limited by the shelf life of the grease.

8.2 Removal from packaging
Perspiration from handling leads to corrosion. Hands should be kept clean and dry and gloves worn if necessary.
Bearings should only be removed from their original packaging immediately before assembly. If only a few bearings are taken out of a multi-piece package preserved by volatile corrosion inhibitor paper, the package must be closed again immediately
- the protective vapour phase is only effective when the package is closed
- the bearings which have been taken out must be greased or oiled immediately.

9. Allowable speed

As bearing speed increases, the temperature of the bearing also increases due to friction heat generated in the bearing interior. If the temperature continues to rise and exceeds certain limits, the efficiency of the lubricant start to fail down drastically, and the bearing can no longer continue to operate in a stable manner. Therefore, the maximum speed at which it is possible for the bearing to continuously operate without the generation of excessive heat beyond specified limits, is called the allowable speed (r/min). The allowable speed of a bearing depends on the type of bearing, bearing dimensions, type of cage, load, lubricating conditions, and cooling conditions.

The allowable speeds listed in the bearing tables for grease and oil lubrication are for NIKO track roller under normal operating conditions, correctly installed, using the suitable lubricants with adequate supply and proper maintenance. Moreover, these values are based on normal load conditions ($P \leqslant 0.09C$, $Fa/Fr \leqslant 0.3$). For track roller with contact seals, the allowable speed is determined by the peripheral lip speed of the seal.

For track roller to be used under heavier than normal load conditions, the allowable speed values listed in the bearing tables must be multiplied by an adjustment factor. The adjustment factors f_L and f_C are given in Figs. 9.1 and 9.2.

Under such high speed operating conditions, when special care is taken, the standard allowable speeds given in the bearing tables can be adjusted upward. The maximum speed adjustment values, /B, by which the bearing table speeds can be multiplied, are shown in Table 9.1. However, for any application requiring speeds in excess of the standard allowable speed, please consult NIKO Engineering.

Fig.9.1 Value of adjustment factor FL depends on bearing load

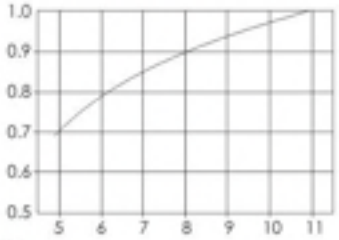
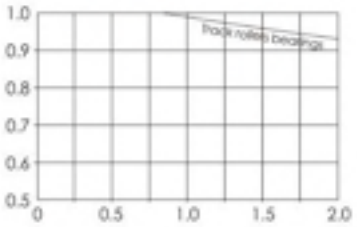


Fig.9.2 Value of adjustment factor Fc depends on combined load

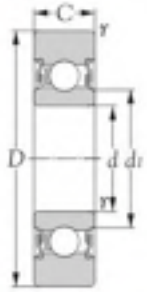


18

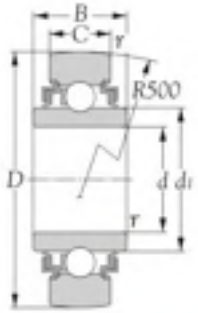
Table 9.1 Adjustment factor, f_B, for allowable number of revolutions

Type of bearing	Adjustment factor f_B
Track rollers bearings	2.0

TRACK ROLLER BEARINGS DOUBLE ROW
SERIES **LR..NPP; LR..RRU**



NPP



RRU

Boundary dimensions d mm	Bearing number	Boundary dimensions D	C	r_s	d_1	B	Basic load ratings dynamic C	static Co	Limiting speeds grease	oil	Mass kg. (approx.)
				mm			N		rpm		
10	**LR 200 NPP**	32	9	0.6	15.4	-	4,200	2,050	13,000	-	0.050
12	**LR 201 NPP**	35	10	0.6	17.1	-	5,500	2,600	15,000	-	0.050
15	**LR 202 NPP**	40	11	0.6	20.0	-	6,700	3,150	14,000	-	0.070
17	**LR 203 NPP**	47	12	0.6	22.5	-	9,100	4,200	11,000	-	0.110
20	**LR 204 NPP**	52	14	1.0	26.5	-	11,800	5,400	10,000	-	0.150
25	**LR 205 NPP**	62	15	1.0	30.3	-	14,900	6,800	9,000	-	0.230
30	**LR 206 NPP**	72	16	1.0	37.4	-	20,800	9,200	5,500	-	0.330
35	**LR 207 NPP**	80	17	1.1	42.4	-	26,100	11,400	4,500	-	0.400
45	**LR 209 NPP**	90	19	1.1	53.2	-	30,300	13,100	3,600	-	0.450
12	**LR 201 RRU**	35	10	0.6	18.5	15.0	5,500	3,000	15,000	-	0.070
15	**LR 202 RRU**	40	11	0.6	21.5	14.4	6,700	3,500	14,000	-	0.080

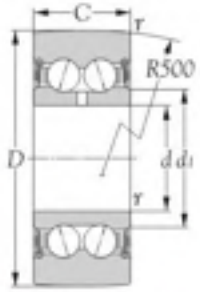
TRACK ROLLER BEARINGS

Remark:

Cages	Precision	Grease
Steel - √		
Polymid - X	Class 0 (JIS)	Alvania N2 -25℃ ~ +120℃
Brass - X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

TRACK ROLLER BEARINGS DOUBLE ROW
SERIES **LR 50..**



Type LR 50..NPPU
(Light-contact, double seals)

Boundary dimensions d mm	Bearing number	Boundary dimensions D	C	rs	d1	Basic load ratings dynamic C	static Co	Limiting speeds grease	oil	Mass kg. (approx.)
		mm				N		rpm		
5	**LR 50/5 NPP**	17	7	0.2	8.2	1,960	940	12,000	-	0.01
6	**LR 50/6 NPP**	19	9	0.3	9.3	2,700	1,370	11,000	-	0.02
7	**LR 50/7 NPP**	22	10	0.3	10.5	3,300	1,700	10,000	-	0.02
8	**LR 50/8 NPP**	24	11	0.3	10.5	4,300	2,390	10,000	-	0.03
10	**LR 5000 NPPU**	28	12	0.3	13.5	4,750	2,850	9,000	-	0.03
12	**LR 5001 NPPU**	30	12	0.3	15.5	5,100	3,100	8,500	-	0.03
15	**LR 5002 NPPU**	35	13	0.3	20.4	6,500	4,150	7,000	-	0.05
17	**LR 5003 NPPU**	40	14	0.3	21.6	7,800	5,300	6,000	-	0.07
20	**LR 5004 NPPU**	47	16	0.6	25.2	11,700	7,700	5,500	-	0.12
25	**LR 5005 NPPU**	52	16	0.6	29.8	11,800	8,200	4,700	-	0.15
30	**LR 5006 NPPU**	62	19	1.0	35.5	16,100	11,900	4,000	-	0.25
35	**LR 5007 NPPU**	68	20	1.0	41.7	17,800	13,300	4,300	-	0.30

TRACK ROLLER BEARINGS

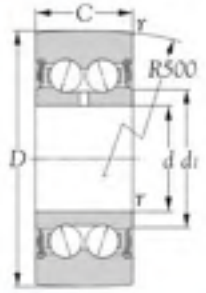
Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	√	Class 0 (JIS)	Alvania S2 -25℃~+120℃
Brass -	X		

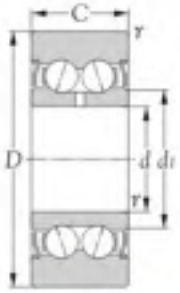
Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

TRACK ROLLER BEARINGS DOUBLE ROW

SERIES LR 52..NPPU; LR 52..KDD



NPPU



KDD

Boundary dimensions d mm	Bearing number	Boundary dimensions D	C	r	d1	Basic load ratings dynamic C	static Co	Limiting speeds grease	oil	Mass kg. (approx.)
		mm				N		rpm		
10	LR 5200 NPPU	32	14.0	0.6	15.4	6,500	3,900	8,000	-	0.070
12	LR 5201 NPPU	35	15.9	0.6	17.1	8,500	4,900	7,500	-	0.080
15	LR 5202 NPPU	40	15.9	0.6	20.0	10,100	5,900	7,000	-	0.110
17	LR 5203 NPPU	47	17.5	0.6	22.5	13,700	7,800	5,500	-	0.170
20	LR 5204 NPPU	52	20.6	1.0	26.5	17,700	10,000	5,000	-	0.230
25	LR 5205 NPPU	62	20.6	1.0	30.3	22,000	12,400	4,500	-	0.340
30	LR 5206 NPPU	72	23.8	1.0	37.4	30,700	20,400	3,500	-	0.510
35	LR 5207 NPPU	80	27.0	1.1	42.4	39,400	21,300	2,800	-	0.660
40	LR 5208 NPPU	85	30.2	1.1	48.4	45,500	24,300	2,500	-	0.750
10	LR 5200 KDD	32	14.0	0.6	15.4	6,500	3,900	11,000	-	0.070
12	LR 5201 KDD	35	15.9	0.6	17.1	8,500	4,900	10,000	-	0.080
15	LR 5202 KDD	40	15.9	0.6	20.0	10,100	5,900	10,000	-	0.110
17	LR 5203 KDD	47	17.5	0.6	22.5	13,700	7,800	7,500	-	0.170
20	LR 5204 KDD	52	20.6	1.0	26.5	17,700	10,000	7,000	-	0.230
25	LR 5205 KDD	62	20.6	1.0	30.3	22,000	12,400	6,500	-	0.340
30	LR 5206 KDD	72	23.8	1.0	37.4	30,700	20,400	5,000	-	0.510
35	LR 5207 KDD	80	27.0	1.1	42.4	39,400	21,300	3,900	-	0.660
40	LR 5208 KDD	85	30.2	1.1	48.4	45,500	24,300	3,500	-	0.750

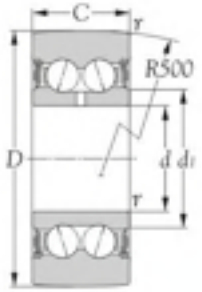
TRACK ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	√	Class 0 (JIS)	Alvania N2 -25°C ~ +120°C
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

TRACK ROLLER BEARINGS DOUBLE ROW
SERIES **LR 53.. NPPU**



NPPU

Boundary dimensions d mm	Bearing number	Boundary dimensions D	C	rs	d1	Basic load ratings dynamic C	static Co	Limiting speeds grease	oil	Mass kg(s). (approx.)
		mm				N		rpm		
17	**LR 5303 NPPU**	52	22.2	1.0	23.5	19,300	10,600	4,700	-	0.210
20	**LR 5304 NPPU**	62	22.2	1.1	29.0	25,100	13,800	4,500	-	0.340
25	**LR 5305 NPPU**	72	25.4	1.1	34.4	34,300	18,600	3,900	-	0.500
30	**LR 5306 NPPU**	80	30.2	1.1	41.4	47,200	25,200	3,100	-	0.670
35	**LR 5307 NPPU**	90	34.9	1.5	47.7	59,800	31,400	2,500	-	0.970
40	**LR 5308 NPPU**	100	36.5	1.5	52.4	78,000	39,900	2,300	-	1.200

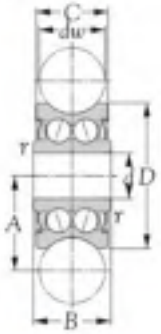
TRACK ROLLER BEARINGS

Remark:

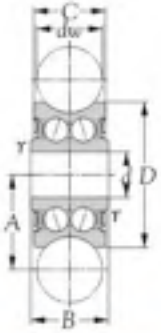
Cages		Precision	Grease
Steel -	X		
Polymid -	√	Class 0 (JIS)	Alvania S2 -25℃~+120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

TRACK ROLLER BEARINGS DOUBLE ROW
SERIES **LFR..ZZ; LFR..2RS**



ZZ



2RS

Boundary dimensions d mm	Bearing number		Boundary dimensions dw	D	C	B	A	r	Basic load ratings dynamic C	static Co	Limiting speeds grease	oil	Mass kg(s). (approx.)
			mm						N		rpm		
4	LFR 50/4-4 ZZ	LFR 50/4-4 2RS	4	13.0	6.0	7.0	7.55	0.2	1050	850	1150	1600	0.007
5	LFR 50/5-4 ZZ	LFR 50/5-4 2RS	4	16.0	7.0	8.0	9.00	0.2	1200	860	1300	1780	0.009
5	LFR 50/5-6 ZZ	LFR 50/5-6 2RS	6	17.0	7.0	8.0	10.50	0.2	1270	820	1300	1780	0.010
8	LFR 50/8-6 ZZ	LFR 50/8-6 2RS	6	24.0	11.0	11.0	14.00	0.3	3670	2280	1300	4560	0.020
12	LFR 5201-10 ZZ	LFR 5201-10 2RS	10	35.0	15.9	15.9	20.65	0.3	8500	5100	5100	10200	0.080
12	LFR 5301-10 ZZ	LFR 5301-10 2RS	10	42.0	19.0	19.0	24.00	0.6	13000	7700	7500	14200	0.100
15	LFR 5302-10 ZZ	LFR 5302-10 2RS	10	47.0	19.0	19.0	26.65	1.0	16200	9200	6200	18400	0.170
12	LFR 5201-12 ZZ	LFR 5201-12 2RS	12	35.0	15.9	15.9	21.75	0.3	8400	5000	5100	10000	0.085
12	LFR 5201-14 ZZ	LFR 5201-14 2RS	14	39.9	18.0	20.0	24.00	0.3	8900	5000	6700	12100	0.095
20	LFR 5204-16 ZZ*	LFR 5204-16 2RS*	16	52.0	20.6	22.6	31.50	0.6	16800	9500	12100	16600	0.230
25	LFR 5206-20 ZZ*	LFR 5206-20 2RS*	20	72.0	23.8	25.8	41.00	0.6	29500	16600	20700	33200	0.250
25	LFR 5206-25 ZZ*	LFR 5206-25 2RS*	25	72.0	23.8	25.8	43.50	0.6	29200	16400	23100	32800	0.250
30	LFR 5207-30 ZZ*	LFR 5207-30 2RS*	30	80.0	27.0	29.0	51.00	1.0	38000	20800	21400	36200	0.660
40	LFR 5208-40 ZZ*	LFR 5208-40 2RS*	40	98.0	36.0	38.0	62.50	1.0	54800	29000	55000	58000	1.360
40	LFR 5308-50 ZZ*	LFR 5308-50 2RS*	50	110.0	44.0	46.0	72.50	1.1	53000	39500	69000	79000	1.400

Remark: * Standard with lubrication hole on inner ring

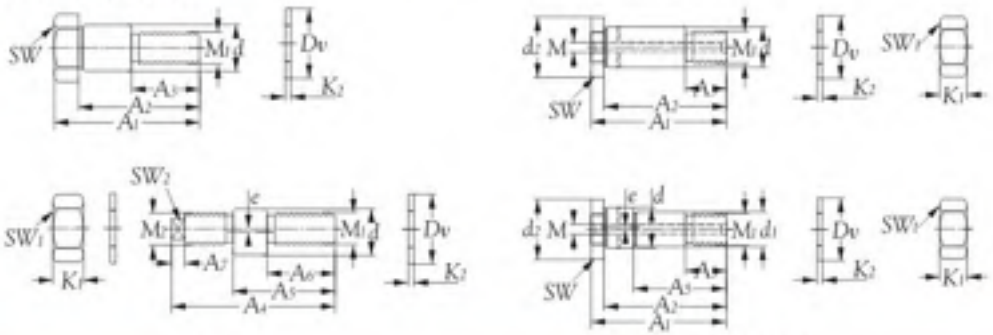
TRACK ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	√	Class 0 (JIS)	Alvania N2 -25°C ~ +120°C
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

TRACK ROLLER BEARINGS DOUBLE ROW
SERIES **RC..; RE..**



RC..; RE..

RC..A1; RE..A1

Bearing number	Boundary dimensions mm																		Mass kg(s). (approx.)
	A_1	A_2	A_3	A_4	A_5	A_6	A_7 h8	d_1	d_2	M_1	M_2	K_1	K_2	D_v	SW	SW_1	SW_2	e	M	
RC 5; RE 5-05	19.5	16.0	9.5	20.5	15.0	9.0	-	-	-	M4	M4	2.9	-	-	3	7	2	0.50	-	0.010
RC 8; RE 8-1	28.3	24.3	14.0	33.2	22.0	13.7	3.5	-	-	M8	M8x0.75	4.0	1.0	14	13	13	2	1.00	-	0.020
RC 12; RE 12-1	43.0	36.0	22.0	50.0	33.5	19.5	5.0	-	-	M10	M10	8.0	1.8	21	17	17	5	1.00	-	0.040
RC 12/M12; RE 12-1/M12	50.8	43.8	24.0	57.0	41.0	24.0	5.0	-	-	M12	M12	6.5	1.8	19	17	17	6	1.00	-	0.060
RC 15; RE 15-1	50.8	43.8	26.0	57.0	41.0	24.0	5.0	-	-	M12	M12	6.5	1.8	21	19	19	6	1.00	-	0.060
RC 12X45 A1; RE 12X45 A1	50.0	45.0	16.0	-	30.0	-	-	10	20	M10x1.5	-	8.0	2.0	21	17	17	6	0.75	5.9	0.040
RC 20X67 A1; RE 20X67 A1	75.0	67.0	23.0	-	45.0	-	-	17	30	M16x1.5	-	13.0	3.0	30	27	24	-	1.00	5.9	0.200
RC 25X82 A1; RE 25X82 A1	92.0	82.0	30.0	-	57.0	-	-	22	40	M20x1.5	-	16.0	3.0	37	36	30	-	1.00	5.9	0.400
RC 30X95 A1; RE 30X95 A1	107.0	95.0	32.0	-	67.0	-	-	27	45	M24x1.5	-	19.0	4.0	44	41	36	-	1.00	5.9	0.620
RC 40X107 A1; RE 40X107 A1	117.0	107.0	42.0	-	72.0	-	-	36	55	M30x1.5	-	24.0	4.0	56	46	46	-	1.00	5.9	1.100
RC 40X115 A1; RE 40X115 A1	125.0	115.0	42.0	-	72.0	-	-	36	55	M30x1.5	-	24.0	4.0	56	46	46	-	1.00	5.9	1.200

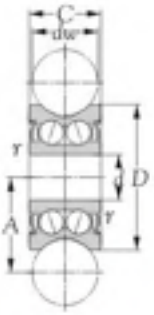
TRACK ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Nil	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

TRACK ROLLER BEARINGS DOUBLE ROW
SERIES **RV**



Boundary dimensions d mm	Bearing number	Boundary dimensions dw	D	C	A	rs	Basic load ratings dynamic C	static Co	Limiting speeds grease	oil	Mass kg. (approx.)
		mm					N		rpm		
7	**RV 20/7-10**	10	22	11	14.50	0.3	2,450	1,620	2,350	4,150	0.017
8	**RV 20/8-10**	10	30	14	18.10	0.3	4,490	2,700	11,000	19,800	0.062
15	**RV 202/15.38-10**	10	38	17	22.25	0.5	7,290	4,550	10,200	17,900	0.086
15	**RV 20/15.40-10**	10	40	18	22.00	0.5	7,950	4,950	14,500	26,500	0.110
12	**RV 201/12-20**	20	41	20	28.00	0.3	8,180	5,100	17,200	31,500	0.130
15	**RV 202/15.41-20**	20	41	20	28.00	0.5	8,180	5,100	17,200	31,500	0.120
17	**RV 203/17-20**	20	58	25	35.00	0.5	16,580	9,200	47,000	86,000	0.325
20	**RV 204/20.57-30**	30	57	22	41.00	0.6	16,910	9,200	47,000	86,000	0.290
20	**RV 204/20.58-30**	30	58	25	41.00	0.6	16,790	9,200	40,000	72,000	0.310

Remark: * The unit contamination protection is provided by side shields 2Z.

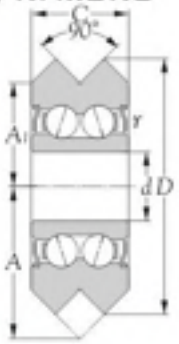
TRACK ROLLER BEARINGS

Remark:

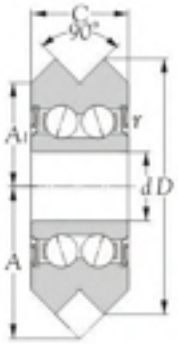
Cages		Precision	Grease
Steel -	X		
Polymid -	√	Class 0 (JIS)	Alvania N2 -25℃ ~ +120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

TRACK ROLLER BEARINGS DOUBLE ROW
SERIES **RM..2Z; RM..2RS**



2Z



2RS

Boundary dimensions d mm	Bearing number		Boundary dimensions D	A	C	A1	rs	Basic load ratings dynamic C	static Co	Limiting speeds grease	oil	Mass kg. (approx.)
			mm					N		rpm		
4.763	RM 1 2Z	RM 1 2RS	19.56	11.86	7.87	7.93	0.3	1,650	1,140	4,150	7,500	0.012
9.525	RM 2 2Z	RM 2 2RS	30.73	18.24	11.10	12.70	0.3	8,260	2,650	6,500	11,700	0.040
11.999	RM 3 2Z	RM 3 2RS	45.72	26.98	15.88	19.05	0.6	5,530	5,200	31,000	55,000	0.136
15.001	RM 4 2Z	RM 4 2RS	59.94	34.93	19.05	25.40	1.0	16,250	9,200	39,500	72,000	0.285

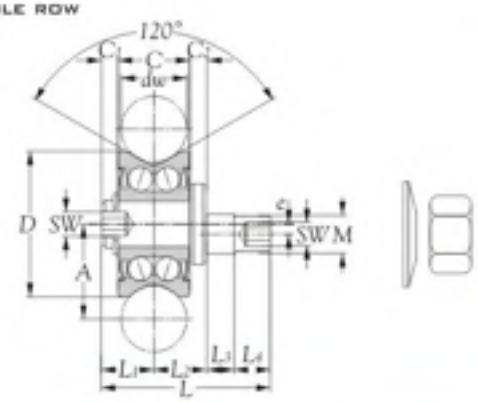
TRACK ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	√	Class 0 (JIS)	Alvania #2 -25°C ~ +120°C
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

TRACK ROLLER BEARINGS DOUBLE ROW
SERIES **RV..C; RV..E**



Boundary dimensions dw mm	Bearing number concentric	Bearing number eccentric	D	C	A	L	L1	L2	L3	L4	C1	C2	e	SW	M	Basic load ratings dynamic C N	Basic load ratings static Co N	Limiting speeds rpm grease	Limiting speeds rpm oil	Mass kg. (approx.)
			mm																	
10	**RV 22 C**	**RV 22 E**	22	11	14.5	26	8.5	8	4	5.5	3	3.0	1.5	3	M 6	2,450	1,620	2,350	4,150	0.028
10	**RV 30 C**	**RV 30 E**	30	14	18.1	33	9.5	9	6	8.0	2	2.5	1.5	4	M 8	4,490	2,700	11,000	19,800	0.069
10	**RV 38 C**	**RV 38 E**	38	17	22.3	42	11.0	11	8	12.0	3	2.5	2.0	5	M 10	7,290	4,550	10,200	17,900	0.145
20	**RV 41 C**	**RV 41 E**	41	20	28.0	47	15.0	13	6	13.0	3	5.0	2.0	6	M 12	8,180	5,100	17,200	31,500	0.190
20	**RV 58 C**	**RV 58 E**	58	25	35.0	59	17.0	19	11	13.0	6	4.0	2.5	6	M 16	16,580	9,200	47,000	86,000	0.460

Remark: * Track rollers with integral studs are supplied with split washer and nut.
* The unit contamination protection is provided by side shields 2Z.

TRACK ROLLER BEARINGS

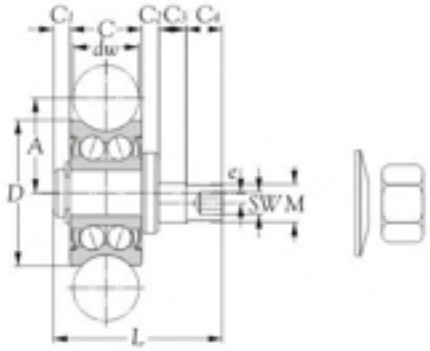
Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	X	Class 0 (JIS)	Alvania N2 -25°C ~ +120°C
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

TRACKROLLERBEARINGSDOUBLEROW

SERIES **RPC; RPE**



Boundary dimensions dw mm	Bearing number concentric	Bearing number eccentric	Boundary dimensions mm D	C	A	L	C1	C2	C3	C4	e	SW	M	Basic load ratings dynamic N C	static N Co	Limiting speeds rpm grease	oil	Mass kg. (approx.)
6	**RPC 17**	**RPE 17**	17	7.0	10.50	23	1.5	1.5	5	5.5	0.50	2.5	M5	1,250	850	1,250	1,700	0.015
6	**RPC 24**	**RPE 24**	24	11.0	14.00	29	3.0	2.0	6	7.0	0.50	4.0	M8	3,500	2,200	1,250	4,350	0.042
10	**RPC 35**	**RPE 35**	35	15.9	20.65	44	3.2	2.0	10	13.0	0.75	5.0	M10	8,100	8,100	4,900	9,700	0.120

Remark: * Track rollers with integral studs are supplied with split washer and nut.

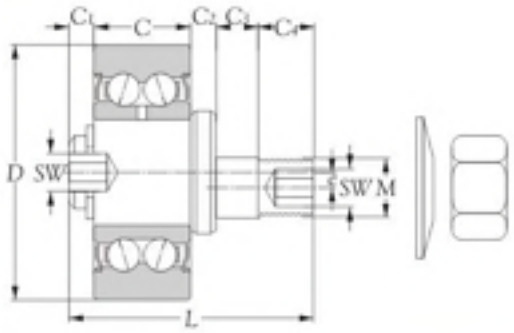
TRACK ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Alvania N2 -25℃ ~ +120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

TRACK ROLLER BEARINGS DOUBLE ROW
SERIES **RA..A**



Bearing number	Boundary dimensions										Basic load ratings dynamic	static	Limiting speeds grease	oil	Mass kg.
	D	C	L	C1	C2	C3	C4	e	SW	M	C	Co	rpm		(approx.)
	mm										N				
RA 35 A	35	15.9	42	2.1	5	6.0	13	1.0	5	M 12	8,100	4,900	4,900	9,700	0.150
RA 52 A	52	22.2	57	3.3	8	9.5	14	1.5	6	M 16	16,000	9,100	11,500	15,800	0.345

Remark: • Track rollers with integral studs are supplied with split washer and nut.
• The unit contamination protection is provided by side shields 2Z.

TRACK ROLLER BEARINGS

Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	X	Class 0 (JIS)	Alvania N2 -25℃ ~ +120℃
Brass -	X		

Remark: If you have more inquiry of technical, please inquire
NIKO web-site: Http://www.nipponkodobearings.com

NOTE

TRACK ROLLER
BEARINGS

NIKO

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NIPPON KOGO

ROD ENDS

Rod Ends

Souvenirs

Rod Ends

1. Bearing materials

Standard material for spherical bearing rod ends, stainless steel spherical bearing rod ends, winding shape ball joint rod ends, straight ball joint rod ends are mostly classified into balls, outer rings, races and bearing body structures. Details please refer to Table 1.1.

Table 1.1

Series / Classification	Lubricant type Series BNM/BNF	Maintenance free Series BM/BF	Maintenance free Series BNM..K/BNF..K	Maintenance free Series DMSS/DFSS	Maintenance free Series RBL/RBI
Balls	Chromium steel, 100Cr6 (HRc 58~64), hard chrome plated	Chromium steel, 100Cr6 (HRc 58~64), hard chrome plated	Chromium steel, 100Cr6 (HRc 58~64), hard chrome plated	Stainless steel 440, hardened	Chromium steel, 100Cr6 (HRc 58~64), hard chrome plated
Outer rings	—	—	Brass(H62)	Brass(H62)	—
Races	Brass(H62)	PTFE	PTFE	PTFE	Brass(H62)
Body	Low carbon steel, Nickel plated	Low carbon steel, Nickel plated	Low carbon steel, Nickel plated	Stainless steel 440, hardened	Low carbon steel, Nickel plated

2. Tolerances for spherical bearing rod ends

2.1 Thread of stretching rod

Metric thread: Female 6H and Male 6g.

2.2 Tolerances in details

Table 2.1 Inner ring for BNM, BNF, DM, DF, RBL, RBI, DMSS and DFSS series

(Unit : μm)

d mm over	d mm incl.	△dmp max.	△dmp min.	△Bs max.	△Bs min.
-	6	+12	0	0	-100
6	10	+15	0	0	-100
10	18	+18	0	0	-100
18	30	+21	0	0	-100

ROD ENDS

Table 2.2 Inner ring for BNM..K and BNF..K series

(Unit : μm)

d mm		△dmp		△Bs	
over	incl.	max.	min.	max.	min.
-	6	+12	0	0	-150
6	10	+15	0	0	-150
10	12	+18	0	0	-150
12	18	+18	0	0	-200
18	30	+21	0	0	-200

Table 2.3 Outer ring for BNM, BNF, DM, DF, RBL, RBI, DMSS, DFSS, BNM..K and BNF..K series

(Unit : μm)

d mm		△dmp		△Cs	
over	incl.	max.	min.	max.	min.
10	18	0	-11	+100	-100
18	30	0	-13	+100	-100
30	50	0	-16	+100	-100
50	60	0	-19	+100	-100

Table 2.4 Center height deviation for BNM, BNF, DM, DF, RBL, RBI, DMSS, DFSS, BNM..K and BNF..K series

d mm		△hs mm		△his mm	
over	incl.	max.	min.	max.	min.
-	6	+1.20	+0.80	+0.65	-1.05
6	20	+0.80	-1.20	+0.80	-1.20
20	30	+1.00	-1.70	+1.00	-1.70
30	45	+1.40	-2.10	+1.40	-2.10
45	60	+1.80	-2.70	+1.80	-2.70
60	80	+2.25	-3.40	+2.25	-3.40

3. Fits of Spherical Bearing Rod Ends

Fitted with Rod Ends.

Table 3.1 For shaft

With indeterminate loads	Normal conditions
n6, p6	h6, h7

Table 3.2 For thread

Male thread	Female thread
6g	6h

Table 3.3 Roughness of fitting surface (Unit : μm)

Fitting surface Bearing bore diameter "d" or outer diameter "D" Nominal bore diameter (mm) over	incl.	Shaft surface Ra≤	Bore surface of housing Ra≤	Side of shaft shoulder, washer, housing bore shoulder Ra≤
-	80	1.25	1.60	2.00
80	150	2.00	2.50	2.50

To look into the table with "d" for shaft, to look into the table with "D" for housing.

Table 3.4 Shape and position tolerance of fitting surface (Unit : μm)

d or D mm over	incl.	Cylindricity Housing bore max.	Shaft diameter max.	Side beat of round circuity Housing bore shoulder max.	Shaft shoulder max.	Parallelism of two sides of washer max.
-	6	4	-	8	-	12
6	10	4	4	9	9	15
10	18	5	5	10	10	18
18	30	6	6	11	11	21
30	50	7	7	13	13	25
50	80	8	8	16	16	30
80	120	10	10	19	19	35
120	150	12	12	22	22	40

4. Radial Internal Clearance for Spherical Bearing Rod Ends

4.1 Maintenance-free type

Table 4.1 Radial internal clearance for BNM..K, BNF..K, DM, DF, RBL, RBI, DMSS and DFSS series.

(Unit : μm)

d mm over	incl.	Group min.	max.
-	12	32	68
12	20	40	82
20	30	50	100

4.2 Lubricant type

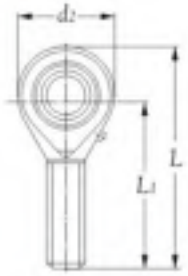
Table 4.2 Radial internal clearance for BNM and BNF series.

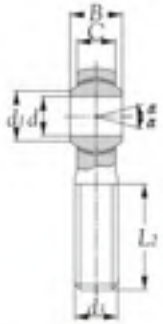
(Unit : μm)

d mm over	incl.	Group min.	max.
-	30	0	35

ROD ENDS

Spherical Bearing Rod Ends (Lubricant Type)
series BNM.., BNML..





Boundary dimensions mm			Nominal dimensions mm						β^{-}_{max}	Load ratings dynamic N	static N	Bearing numbers	Mass kg
d	d_2	B	C_1	d_3	L_1	L_2	L	d_1		C_d	C_s		(approx.)
5	16	8	6.00	M5 x 0.80	33	20	41	7.7	13	3300	3900	**BNM5**	0.0125
6	18	9	6.75	M6 x 1.00	36	22	45	9.0	13	4300	5300	**BNM6**	0.0190
8	22	12	9.00	M8 x 1.25	42	25	53	10.4	13	6800	8500	**BNM8**	0.0320
10	26	14	10.50	M10 x 1.50	48	29	61	12.9	13	10000	11000	**BNM10**	0.0540
12	30	16	12.00	M12 x 1.75	54	33	69	15.4	13	13000	14000	**BNM12**	0.0850
14	34	19	13.50	M14 x 2.00	60	36	77	16.9	13	17000	20000	**BNM14**	0.1260
16	38	21	15.00	M16 x 2.00	66	40	85	19.4	13	21000	25000	**BNM16**	0.1850
18	42	23	16.50	M18 x 1.50	72	44	93	21.9	13	26000	30000	**BNM18**	0.2600
20	46	25	18.00	M20 x 1.50	78	47	101	24.4	13	31000	35000	**BNM20**	0.3400
22	50	28	20.00	M22 x 1.50	84	51	109	25.8	13	38000	43000	**BNM22**	0.4350
25	60	31	22.00	M24 x 2.00	94	57	124	29.6	13	47000	65000	**BNM25**	0.6500
30	70	37	25.00	M30 x 2.00	110	66	145	34.8	13	63000	86000	**BNM30**	1.0700

Note: 1) Suffix "L" means with left hand thread.
2) We could supply the above models in two sorts, one is produced by forging, the another by machining. So, please let us know which of them is what you needed before you ordering.
3) We supply this series of rod end bearings strictly in accordance with the above specifications, any changes are on special order.

Rod Ends

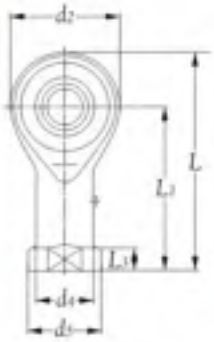
Remark:

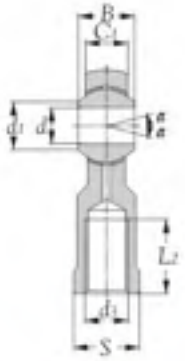
Cages		Precision	Grease
Steel -	X		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

Spherical Bearing Rod Ends (Lubricant Type)

series BNF.., BNFL..





Boundary dimensions mm			Nominal dimensions mm										Load ratings dynamic N	static N	Bearing numbers	Mass kg
d	d_2	B	C_1	S	d_3	d_4	d_5	L_1	L_2	L	L_3	d_1	$\alpha°$	C_d	C_s		(approx.)
5	16	8	6.00	9	M5 x 0.80	9.0	11	27	14	35	4.0	7.7	13	3300	3900	**BNF5**	0.016
6	18	9	6.75	11	M6 x 1.00	10.0	13	30	14	39	5.0	9.0	13	4300	5300	**BNF6**	0.026
8	22	12	9.00	14	M8 x 1.25	12.5	16	36	17	47	5.0	10.4	13	6800	8500	**BNF8**	0.044
10	26	14	10.50	17	M10 x 1.50	15.0	19	43	21	56	6.5	12.9	13	10000	11000	**BNF10**	0.072
10	26	14	10.50	17	M10 x 1.25	15.0	19	43	21	56	6.5	12.9	13	10000	11000	**BNF10.1**	0.072
12	30	16	12.00	19	M12 x 1.75	17.5	22	50	24	65	6.5	15.4	13	13000	14000	**BNF12**	0.108
12	30	16	12.00	19	M12 x 1.25	17.5	22	50	24	65	6.5	15.4	13	13000	14000	**BNF12.1**	0.108
14	34	19	13.50	22	M14 x 2.00	20.0	25	57	27	74	8.0	16.9	13	17000	20000	**BNF14**	0.161
16	38	21	15.00	22	M16 x 2.00	22.0	27	64	33	83	8.0	19.4	13	21000	25000	**BNF16**	0.225
16	38	21	15.00	22	M16 x 1.50	22.0	27	64	33	83	8.0	19.4	13	21000	25000	**BNF16.1**	0.225
18	42	23	16.50	27	M18 x 1.50	25.0	31	71	36	92	10.0	21.9	13	26000	30000	**BNF18**	0.295
20	46	25	18.00	30	M20 x 1.50	27.5	34	77	40	100	10.0	24.4	13	31000	35000	**BNF20**	0.382
22	50	28	20.00	32	M22 x 1.50	30.0	37	84	43	109	12.0	25.8	13	38000	43000	**BNF22**	0.488
25	60	31	22.00	36	M24 x 2.00	33.5	42	94	48	124	12.0	29.6	13	47000	65000	**BNF25**	0.749
30	70	37	25.00	41	M30 x 2.00	40.0	50	110	56	145	15.0	34.8	13	63000	86000	**BNF30**	1.130
30	70	37	25.00	41	M27 x 2.00	40.0	50	110	56	145	15.0	34.8	13	63000	86000	**BNF30.1**	1.130

Note: 1) Suffix "L" means with left hand thread.
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3) We supply this series of rod end bearings strictly in accordance with the above specifications, any changes are on special order.

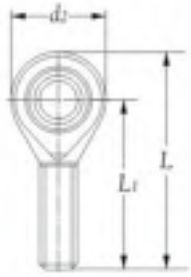
Rod Ends

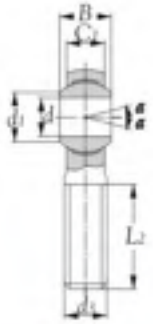
Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

Spherical Bearing Rod Ends (Maintenance-Free Type)
series DM.., DML..





Boundary dimensions mm			Nominal dimensions mm							Load ratings dynamic N	static N	Bearing numbers	Mass kg
d	d_2	B	C_2	d_3	L_1	L_2	L	d_1	β° min	C_d	C_s		(approx.)
5	16	8	6.00	M5 x 0.80	33	20	41	7.7	13	3300	3900	**DM5**	0.013
6	18	9	6.75	M6 x 1.00	36	22	45	9.0	13	4300	5300	**DM6**	0.019
8	22	12	9.00	M8 x 1.25	42	25	53	10.4	13	6800	8500	**DM8**	0.032
10	26	14	10.50	M10 x 1.50	48	29	61	12.9	13	10000	11000	**DM10**	0.054
12	30	16	12.00	M12 x 1.75	54	33	69	15.4	13	13000	14000	**DM12**	0.085
14	34	19	13.50	M14 x 2.00	60	36	77	16.9	13	17000	20000	**DM14**	0.126
16	38	21	15.00	M16 x 2.00	66	40	85	19.4	13	21000	25000	**DM16**	0.185
18	42	23	16.50	M18 x 1.50	72	44	93	21.9	13	26000	30000	**DM18**	0.260
20	46	25	18.00	M20 x 1.50	78	47	101	24.4	13	31000	35000	**DM20**	0.340
22	50	28	20.00	M22 x 1.50	84	51	109	25.8	13	38000	43000	**DM22**	0.435
25	60	31	22.00	M24 x 2.00	94	57	124	29.6	13	47000	65000	**DM25**	0.650
30	70	37	25.00	M30 x 2.00	110	66	145	34.8	13	63000	86000	**DM30**	1.070

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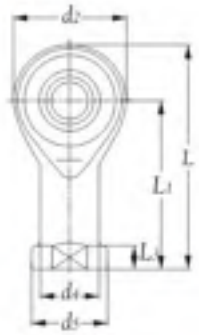
Rod Ends

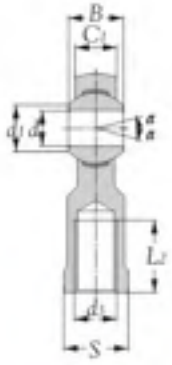
Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

Spherical Bearing Rod Ends (Maintenance-Free Type)
series DF.., DFL..





Boundary dimensions mm			Nominal dimensions mm										Load ratings dynamic N	static N	Bearing numbers	Mass kg
d	d_2	B	C_1	S	d_3	d_4	d_5	L_1	L_2	L	L_3	d_1	$\alpha°$	C_d	C_0		(approx.)
5	16	8	6.00	9	M5 x 0.80	9.0	11	27	14	35	4.0	7.7	13	3300	3900	**DF5**	0.016
6	18	9	6.75	11	M6 x 1.00	10.0	13	30	14	39	5.0	9.0	13	4300	5300	**DF6**	0.026
8	22	12	9.00	14	M8 x 1.25	12.5	16	36	17	47	5.0	10.4	13	6800	8500	**DF8**	0.044
10	26	14	10.50	17	M10 x 1.50	15.0	19	43	21	56	6.5	12.9	13	10000	11000	**DF10**	0.072
10	26	14	10.50	17	M10 x 1.25	15.0	19	43	21	56	6.5	12.9	13	10000	11000	**DF10.1**	0.072
12	30	16	12.00	19	M12 x 1.75	17.5	22	50	24	65	6.5	15.4	13	13000	14000	**DF12**	0.108
12	30	16	12.00	19	M12 x 1.25	17.5	22	50	24	65	6.5	15.4	13	13000	14000	**DF12.1**	0.108
14	34	19	13.50	22	M14 x 2.00	20.0	25	57	27	74	8.0	16.9	13	17000	20000	**DF14**	0.161
16	38	21	15.00	22	M16 x 2.00	22.0	27	64	33	83	8.0	19.4	13	21000	25000	**DF16**	0.225
16	38	21	15.00	22	M16 x 1.50	22.0	27	64	33	83	8.0	19.4	13	21000	25000	**DF16.1**	0.225
18	42	23	16.50	27	M18 x 1.50	25.0	31	71	36	92	10.0	21.9	13	26000	30000	**DF18**	0.295
20	46	25	18.00	30	M20 x 1.50	27.5	34	77	40	100	10.0	24.4	13	31000	35000	**DF20**	0.382
22	50	28	20.00	32	M22 x 1.50	30.0	37	84	43	109	12.0	25.8	13	38000	43000	**DF22**	0.488
25	60	31	22.00	36	M24 x 2.00	33.5	42	94	48	124	12.0	29.6	13	47000	65000	**DF25**	0.749
30	70	37	25.00	41	M30 x 2.00	40.0	50	110	56	145	15.0	34.8	13	63000	86000	**DF30**	1.130

Note: 1) Suffix "L" means with left hand thread.
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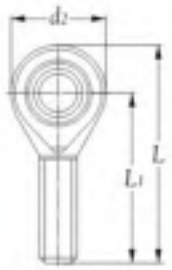
Rod Ends

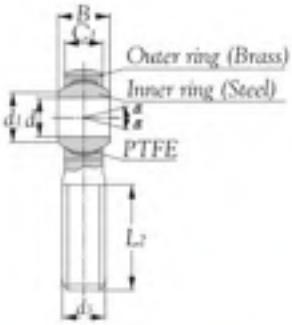
Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

Spherical Bearing Rod Ends (Maintenance-Free Type)
series BNM..K, BNML..K





Boundary dimensions mm			Nominal dimensions mm							Load ratings dynamic N	static N	Bearing numbers	Mass kg
d	d_2	B	C_1	d_3	L_1	L_2	L	d_1	$\alpha°$	C_d	C_s		(approx.)
5	18	8	6.00	M5 x 0.80	33	19	42	7.7	4	4000	7500	**BNM5K**	0.013
6	20	9	6.75	M6 x 1.00	36	22	46	8.9	9	4400	9300	**BNM6K**	0.020
8	24	12	9.00	M8 x 1.25	42	25	54	10.4	13	8000	16700	**BNM8K**	0.033
10	28	14	10.50	M10 x 1.50	48	29	62	12.9	13	12900	23400	**BNM10K**	0.056
12	32	16	12.00	M12 x 1.75	54	33	70	15.4	13	17000	32000	**BNM12K**	0.087
14	36	19	13.50	M14 x 2.00	60	38	78	16.8	13	24000	41900	**BNM14K**	0.129
16	42	21	15.00	M16 x 2.00	66	40	87	19.3	13	28500	52700	**BNM16K**	0.189
18	46	23	16.50	M18 x 1.50	72	44	95	21.8	13	35000	63800	**BNM18K**	0.267
20	50	25	18.00	M20 x 1.50	78	47	103	24.3	13	40000	78100	**BNM20K**	0.348
22	54	28	20.00	M22 x 1.50	84	51	111	25.8	13	52000	97200	**BNM22K**	0.443
25	60	31	22.00	M24 x 2.00	94	58	124	29.6	13	60000	122100	**BNM25K**	0.600
30	70	37	25.00	M30 x 2.00	110	71	145	34.8	13	81000	168400	**BNM30K**	1.030

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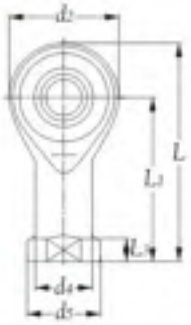
Rod Ends

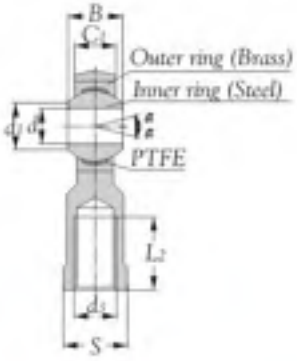
Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	X		
Brass -	X	Class 0 (JIS)	Nil

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

Spherical Bearing Rod Ends (Maintenance-Free Type)
series BNF..K, BNFL..K





Boundary dimensions mm			Nominal dimensions mm										Load ratings dynamic N	static N	Bearing numbers	Mass kg
d	d_2	B	C_1	S	d_3	d_4	d_5	L_1	L_2	L	L_3	d_1	$\alpha°$	C_d	C_0		(approx.)
5	18	8	6.00	9	M5 x 0.80	9.0	11	27	10	36	4.5	7.7	13	6000	7500	**BNF5K**	0.018
6	20	9	6.75	11	M6 x 1.00	10.0	13	30	12	40	5.0	8.9	13	7200	9300	**BNF6K**	0.027
8	24	12	9.00	13	M8 x 1.25	12.5	16	36	16	48	5.0	10.4	13	11600	16700	**BNF8K**	0.046
10	28	14	10.50	17	M10 x 1.50	15.0	19	43	20	57	6.5	12.9	13	14500	23400	**BNF10K**	0.076
10	28	14	10.50	17	M10 x 1.25	15.0	19	43	20	57	6.5	12.9	13	14500	23400	**BNF10.1K**	0.076
12	32	16	12.00	19	M12 x 1.75	17.5	22	50	22	66	6.5	15.4	13	17000	32000	**BNF12K**	0.115
12	32	16	12.00	19	M12 x 1.25	17.5	22	50	22	66	6.5	15.4	13	17000	32000	**BNF12.1K**	0.115
14	36	19	13.50	22	M14 x 2.00	20.0	25	57	25	75	8.0	16.8	13	24000	41900	**BNF14K**	0.170
16	42	21	15.00	22	M16 x 2.00	22.0	27	64	28	85	8.0	19.3	13	28500	52700	**BNF16K**	0.230
16	42	21	15.00	22	M16 x 1.50	22.0	27	64	28	85	8.0	19.3	13	28500	52700	**BNF16.1K**	0.230
18	46	23	16.50	27	M18 x 1.50	25.0	31	71	32	94	10.0	21.8	13	35000	63800	**BNF18K**	0.320
20	50	25	18.00	32	M20 x 1.50	27.5	34	77	33	102	10.0	24.3	13	40000	78100	**BNF20K**	0.415
22	54	28	20.00	32	M22 x 1.50	30.0	37	84	37	111	10.0	25.8	13	52000	97200	**BNF22K**	0.540
25	60	31	22.00	36	M24 x 2.00	33.5	42	94	42	124	12.0	29.6	13	60000	122100	**BNF25K**	0.750
30	70	37	25.00	41	M30 x 2.00	40.0	51	110	51	145	15.0	34.8	13	81000	168400	**BNF30K**	1.130

Note: 1) Suffix "L" means with left hand thread.
2) We could supply the above models in two sorts, one is produced by forging, the another by machining. So, please let us know which of them is what you needed before you ordering.
3) We supply this series of rod end bearings strictly in accordance with the above specifications, any changes are on special order.

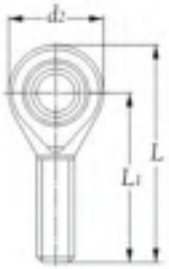
Rod Ends

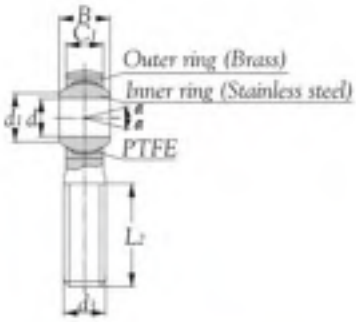
Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

Stainless Steel Spherical Bearing Rod Ends (Maintenance-Free Type)
series DMSS.., DMSSL..





Boundary dimensions mm			Nominal dimensions mm							Load ratings dynamic N	static N	Bearing numbers	Mass kg
d	d_2	B	C_1	d_3	L_1	L_2	L	d_1	$\alpha°$	C_d	C_s		(approx.)
5	16	8	6.00	M5 x 0.80	33	20	41	7.7	13	3300	3900	**DMSS5**	0.013
6	18	9	6.75	M6 x 1.00	36	22	45	9.0	13	4300	5300	**DMSS6**	0.019
8	22	12	9.00	M8 x 1.25	42	25	53	10.4	13	6800	8500	**DMSS8**	0.032
10	26	14	10.50	M10 x 1.50	48	29	61	12.9	13	10000	11000	**DMSS10**	0.054
12	30	16	12.00	M12 x 1.75	54	33	69	15.4	13	13000	14000	**DMSS12**	0.085
14	34	19	13.50	M14 x 2.00	60	36	77	16.9	13	17000	20000	**DMSS14**	0.126
16	38	21	15.00	M16 x 2.00	66	40	85	19.4	13	21000	25000	**DMSS16**	0.185
18	42	23	16.50	M18 x 1.50	72	44	93	21.9	13	26000	30000	**DMSS18**	0.260
20	46	25	18.00	M20 x 1.50	78	47	101	24.4	13	31000	35000	**DMSS20**	0.340
22	50	28	20.00	M22 x 1.50	84	51	109	25.8	13	38000	43000	**DMSS22**	0.435
25	60	31	22.00	M24 x 2.00	94	57	124	29.6	13	47000	65000	**DMSS25**	0.650
30	70	37	25.00	M30 x 2.00	110	66	145	34.8	13	63000	86000	**DMSS30**	1.070

Note: 1) Suffix "L" means with left hand thread.
2) We could supply the above models in two sorts, one is produced by forging, the another by machining. So, please let us know which of them is what you needed before you ordering.
3) We supply this series of rod end bearings strictly in accordance with the above specifications, any changes are on special order.

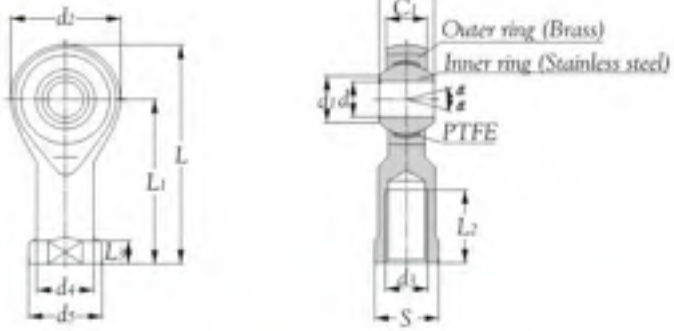
ROD ENDS

Remark:

Cages		Precision	Grease
Steel -	X		
Polyamid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

Stainless Steel Spherical Bearing Rod Ends (Maintenance-Free Type)
series DFSS.., DFSSL..



Boundary dimensions mm			Nominal dimensions mm										Load ratings dynamic N	static N	Bearing numbers	Mass kg
d	d_2	B	C_r	S	d_3	d_4	d_5	L_1	L_2	L	L_3	d_1	$\alpha°$	C_d	C_s		(approx.)
5	16	8	6.00	9	M5 x 0.80	9.0	11	27	14	35	4.0	7.7	13	3300	3900	DFSS5	0.016
6	18	9	6.75	11	M6 x 1.00	10.0	13	30	14	39	5.0	9.0	13	4300	5300	DFSS6	0.026
8	22	12	9.00	14	M8 x 1.25	12.5	16	36	17	47	5.0	10.4	13	6800	8500	DFSS8	0.044
10	26	14	10.50	17	M10 x 1.50	15.0	19	43	21	56	6.5	12.9	13	10000	11000	DFSS10	0.072
10	26	14	10.50	17	M10 x 1.25	15.0	19	43	21	56	6.5	12.9	13	10000	11000	DFSS10.1	0.072
12	30	16	12.00	19	M12 x 1.75	17.5	22	50	24	65	6.5	15.4	13	13000	14000	DFSS12	0.108
12	30	16	12.00	19	M12 x 1.25	17.5	22	50	24	65	6.5	15.4	13	13000	14000	DFSS12.1	0.108
14	34	19	13.50	22	M14 x 2.00	20.0	25	57	27	74	8.0	16.9	13	17000	20000	DFSS14	0.161
16	38	21	15.00	22	M16 x 2.00	22.0	27	64	33	83	8.0	19.4	13	21000	25000	DFSS16	0.225
16	38	21	15.00	22	M16 x 1.50	22.0	27	64	33	83	8.0	19.4	13	21000	25000	DFSS16.1	0.225
18	42	23	16.50	27	M18 x 1.50	25.0	31	71	36	92	10.0	21.9	13	26000	30000	DFSS18	0.295
20	46	25	18.00	30	M20 x 1.50	27.5	34	77	40	100	10.0	24.4	13	31000	35000	DFSS20	0.382
22	50	28	20.00	32	M22 x 1.50	30.0	37	84	43	109	12.0	25.8	13	38000	43000	DFSS22	0.488
25	60	31	22.00	36	M24 x 2.00	33.5	42	94	48	124	12.0	29.6	13	47000	65000	DFSS25	0.749
30	70	37	25.00	41	M30 x 2.00	40.0	50	110	56	145	15.0	34.8	13	63000	86000	DFSS30	1.130

Note: 1) Suffix "L" means with left hand thread.
2) We could supply the above models in two sorts, one is produced by forging, the another by machining. So, please let us know which of them is what you needed before you ordering.
3) We supply this series of rod end bearings strictly in accordance with the above specifications, any changes are on special order.

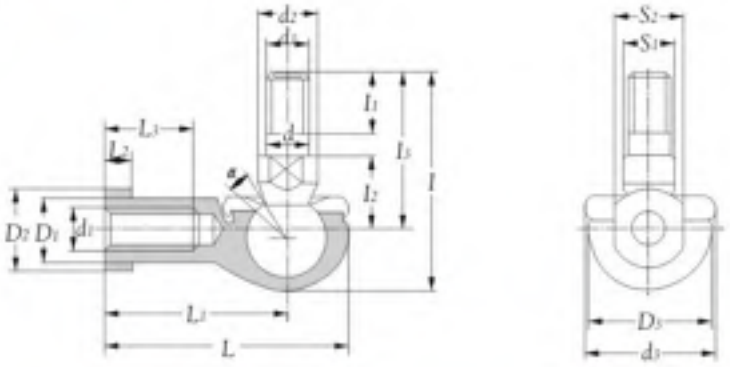
Rod Ends

Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkodobearings.com

Winding Shape Ball Joint RodEnd
series RBL...



Nominal dimensions mm																		α° (approx.)	Load ratings dynamic N C	Bearing numbers	Mass kg (approx.)
d	d1	d2 min	d3 max	I min	I1 max	I2	I3 max	S1	L max	L1	L2 max	L3 min	D1 max	D2 max	D3 max	S2					
5	M5x0.80	9	19	29.0	8	10.0	21	7	35	27	4.0	14	9.0	11	16	9		25	2200	**RBL5**	0.026
6	M6x1.00	10	20	35.5	11	11.0	26	8	40	30	5.0	14	10.0	13	19	11		25	3500	**RBL6**	0.039
8	M8x1.25	12	24	42.5	12	14.0	31	10	48	36	5.0	17	12.5	16	23	14		25	6600	**RBL8**	0.068
10	M10x1.25	14	30	50.5	15	17.0	37	11	57	43	6.5	21	15.0	19	27	17		25	10000	**RBL10**	0.112
10	M10x1.50	14	30	56.5	21	17.0	43	11	57	43	6.5	21	15.0	19	27	17		25	10000	**RBL10B**	0.112
12	M12x1.25	17	32	57.5	17	19.0	42	15	66	50	6.5	25	17.5	22	31	19		25	16000	**RBL12**	0.164
12	M12x1.75	17	32	64.5	24	19.0	49	15	66	50	6.5	25	17.5	22	31	19		25	16000	**RBL12B**	0.164
14	M14x1.50	19	38	73.5	22	21.5	56	17	75	57	8.0	26	20.0	25	35	22		25	19000	**RBL14**	0.254
14	M14x2.00	19	38	79.5	28	21.5	62	17	75	57	8.0	26	20.0	25	35	22		25	19000	**RBL14B**	0.254
16	M16x1.50	22	44	79.5	23	23.5	60	19	84	64	8.0	32	22.0	27	39	22		20	26000	**RBL16**	0.336
16	M16x2.00	22	44	85.5	29	23.5	66	19	84	64	8.0	32	22.0	27	39	22		20	26000	**RBL16B**	0.336
18	M18x1.50	23	45	90.0	25	26.5	68	20	93	71	10.0	34	25.0	31	44	27		20	33000	**RBL18**	0.464
20	M20x1.50	27	50	90.0	25	27.0	68	24	99	77	10.0	35	27.5	34	44	30		20	45000	**RBL20**	0.538
22	M22x1.50	27	52	95.0	26	28.0	70	24	100	84	12.0	41	30.0	37	50	32		16	48000	**RBL22**	0.713

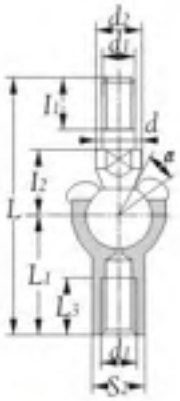
Rod Ends

Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

STRAIGHT BALL JOINT ROD ENDS
SERIES RBI...



Nominal dimensions mm																Load ratings dynamic N	Bearing numbers	Mass kg
d	d1	d2 min	d3 max	l1 min	l2	S1	L max	L1	L2 max	L3 min	D1 max	D2 max	D3 max	S2	α° ≈	Cd		(approx.)
5	M5 x 0.80	9	20	8	11.0	7	46.0	24	4.0	12	9.0	11	17	9	15.0	2800	**RBI5**	0.025
6	M6 x 1.00	10	20	11	12.2	8	55.2	28	5.0	15	10.0	13	20	11	15.0	3700	**RBI6**	0.041
8	M8 x 1.25	12	24	12	16.0	10	65.0	32	5.0	16	12.5	16	24	14	15.0	5800	**RBI8**	0.075
10	M10 x 1.25	14	30	15	19.5	11	74.5	35	6.5	18	15.0	19	28	17	15.0	8400	**RBI10**	0.120
10	M10 x 1.50	14	30	21	19.5	11	80.5	35	6.5	18	15.0	19	28	17	15.0	8400	**RBI10B**	0.120
12	M12 x 1.25	17	32	17	21.0	15	84.0	40	6.5	20	17.5	22	32	19	15.0	11000	**RBI12**	0.180
12	M12 x 1.75	17	32	24	21.0	15	91.0	40	6.5	20	17.5	22	32	19	15.0	11000	**RBI12B**	0.180
14	M14 x 1.50	19	38	22	23.5	17	103.0	45	8.0	25	20.0	25	36	22	11.0	15000	**RBI14**	0.270
14	M14 x 2.00	19	38	28	23.5	17	109.0	45	8.0	25	20.0	25	36	22	11.0	15000	**RBI14B**	0.270
16	M16 x 1.50	22	44	23	25.5	19	112.0	50	8.0	27	22.0	27	40	22	11.0	15000	**RBI16**	0.360
16	M16 x 2.00	22	44	29	25.5	19	118.0	50	8.0	27	22.0	27	40	22	11.0	15000	**RBI16B**	0.360
18	M18 x 1.50	23	45	25	31.0	20	130.0	58	10.0	31	25.0	31	45	27	11.0	19000	**RBI18**	0.540
20	M20 x 1.50	27	50	25	29.0	24	133.0	63	10.0	34	27.5	34	45	30	7.5	19000	**RBI20**	0.570
22	M22 x 1.50	27	52	26	33.0	24	145.0	70	12.0	37	30.0	37	50	32	7.5	23000	**RBI22**	0.760

ROD ENDS

Remark:

Cages		Precision	Grease
Steel -	X		
Polymid -	X	Class 0 (JIS)	Nil
Brass -	X		

Remark: If you have more inquiry of technical, please inquire
NIKO web-site: Http://www.nipponkodebearings.com

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ROD ENDS

NIKO

NIPPON KOGO

Bearing Units

Souvenirs

Bearing Units

1. Characteristics

The **NIKO** bearing unit is a combination of a radial ball bearing, seal, and a housing of high-grade cast iron or pressed steel, which comes in various shapes.

The outer surface of the bearing and the internal surface of the housing are spherical, so that the unit is self-aligning.

The inside construction of the ball bearing for the unit is such that steel balls and retainers of the same type as in series 62 and 63 of the **NIKO** deep groove ball bearing are used. A duplex seal consisting of a combination of an oil-proof synthetic rubber seal and a slinger, unique to **NIKO**, is provided on both sides.

Depending on the type, the following methods of fitting to the shaft are employed:
(1) The inner ring is fastened onto the shaft in two places by set screws.
(2) The inner ring has a tapered bore and is fitted to the shaft by means of an adapter.
(3) In the eccentric locking collar system the inner ring is fastened to the shaft by means of eccentric grooves provided at the side of the inner ring and on the collar.

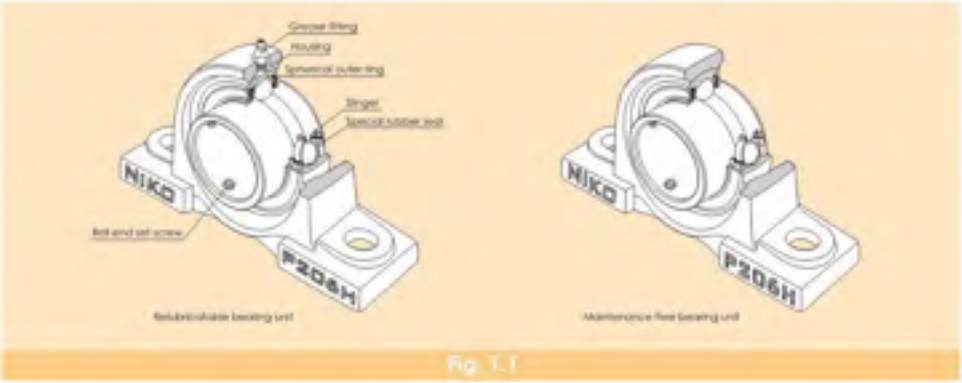


Fig. 1.1

2. Design features

2.1 Maintenance free type
The **NIKO** Maintenance free bearing unit contains a high-grade lithium-based grease, good for use over a long period, which is ideally suited to sealed-type bearings, Also provided is an excellent sealing device, unique to **NIKO**, which prevents any leakage of grease or penetration of dust and water from outside.

It is designed so that the rotation of the shaft causes the sealed-in grease to circulate through the inside space, effectively providing maximum lubrication. The lubrication effect is maintained over a long period with no need for replenishment of grease.

To summarize the advantages of the **NIKO** maintenance free bearing unit:
(1) As an adequate amount of good quality grease is sealed in at the time of manufacture, there is no need for replenishment. This means savings in terms of time and maintenance costs.
(2) Since there is no need for any regreasing facilities, such as piping, a more compact design is possible.

(3) The sealed-in design eliminates the possibility of grease leakage, which could lead to stained products.

2.2 Relubricatable type

The **NIKO** relubricatable type bearing unit has an advantage over other simillar units bearing so designed as to permit regreasing even in the case of misalignment of 2° to the right or left. The hole through which the grease fitting is mounted usually causes structural weakening of the housing.

However, as a result of extensive testing, in the **NIKO** bearing unit the hole is positioned so as to minimize this adverse effect. In addition, the regreasing groove has been designed to minimize weakening of the housing.

While the **NIKO** maintenance free type bearing unit is satisfactory for use under normal operating conditions in-doors, in the following circumstances it is necessary to use the relubricatable type bearing unit:

(1) Cases where the temperature of the bearing rises above 100°C, 212°F:
* -Normal temperature of up to 200°C, 392°F heat-resistant bearing units.
(2) Cases where there is excessive dust, but space does not permit using a bearing unit with a cover.
(3) Cases where the bearing unit is constantly exposed to splashes of water or any other liquid, but space does not permit using a bearing unit with a cover.
(4) Cases in which the humidity is very high, and the machine in which the bearing unit is used to run only intermittently.
(5) Cases involving a heavy load of which the Cr/Pr value is about 10 or below, and the speed is 10 rpm or below, or the movement is oscillatory.
(6) Cases where the number of revolutions is relatively high and the noise problem has to be considered; for example, when the bearing is used with the fan of an air conditioner.

2.3 Special sealing feature

2.3.1 Standard bearing units

The sealing device of the ball bearing for the **NIKO** Bearing unit is a Combination of a heat-resistant and oil-proof synthetic rubber seal and a slinger of an exclusive **NIKO** design.

The seal, which is fixed in the outer ring, is steel-reinforced, and its lip, in contact with the inner ring, is designed to minimize frictional torque.

The slinger is fixed to the inner ring of the bearing with which it rotates. There is a small clearance between its periphery and the outer ring.

There are triangular protrusions on the outside face of the slinger and, as the bearing rotates, these protrusions on the slinger create a flow of air outward from the bearing. In this way, the slinger acts as a fan which keeps dust and water away from the bearing.

These two types of seals on both sides of the bearing prevent grease leakage, and foreign matter is prevented from entering the bearing from outside.

2.3.2 Bearing units with covers

The **NIKO** bearing unit with a cover consists of a standard bearing unit and an outside cover-ring for extra protection against dust. Special consideration has been given to its design with respect to dust-proofing.

Sealing devices are provided in both the bearing and the housing, so that units of this type operate satisfactorily even in such adverse environments as flour mills, steel mills, foundries, galvanizing plants and chemical plants, where excessive dust is produced and/ or liquids are

used. They are also eminently suitable for outdoor environments where dust and rain are inevitable, and in heavy industrial machinery such as construction and transportation equipment.

The rubber seal of the cover contacts with the shaft by its two lips, as shown in Fig.2.2 and 2.3. By filling the groove between the two lips with grease, an excellent sealing effect is obtained and, at the same time, the contacting portions of the lips are lubricated. Furthermore, the groove is so designed that when the shaft is inclined the rubber seal can move in the radial direction.

When bearing units are exposed to splashes of water rather than to dust, a drain hole (5 to 8 mm, 0.2 to 0.3 inches in diameter)is provided at the bottom of the cover, and grease should be applied to the side of the bearing itself instead of into the cover.

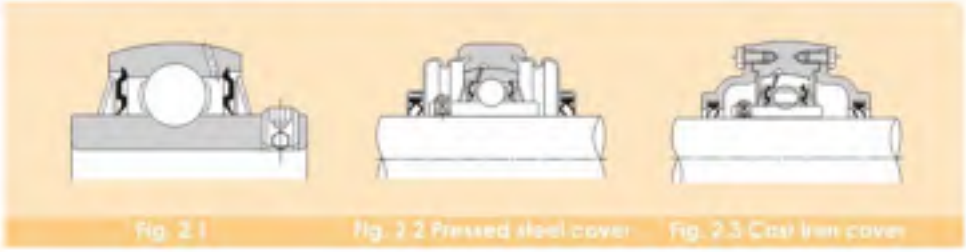


Fig. 2.1 Fig. 2.2 Pressed steel cover Fig. 2.3 Cast iron cover

2.4 Secure fitting
Fastening the bearing to the shaft is effected by tightening the ball-end set screw, situated on the inner ring. This is a unique **NIKO** feature which prevents loosening, even if the bearing is subjected to intense vibrations and shocks.

2.5 Self-aligning
With the **NIKO** bearing unit, the outer surface of the ball bearing and the inner surface of the housing are spherical, thus alignment of the assembly is automatic. Any misalignment of axis that may arise from poor workmanship on the shaft or errors in fitting will be automatically adjusted.

2.6 Higher rated load capacity
The bearing used in the unit is of the same internal construction as those in **NIKO** bearing series 62 and 63, and is capable of accommodating axial load as well as radial load, or composite load. The rated load capacity of this bearing is considerably higher than that of the corresponding self-aligning ball bearings used for standard plummer blocks.

2.7 Light weight yet strong housing
Housings for **NIKO** bearing units come in various shapes. They consist of either high-grade cast iron, one-piece Casting, or of precision finished pressed steel, the latter being lighter in weight. In either case, they are practically designed to combine lightness with maximum strength.

2.8 Easy mounting
The **NIKO** bearing unit is an integrated unit consisting of a bearing and a housing.
As the bearing is prelubricated at manufacture with the correct amount of high-grade lithium base, it can be mounted on the shaft just as it is. It is sufficient to carry out a short test run after mounting.

2.9 Accurate fitting of the housing
In order to simplify the fitting of the pillow block and flange type bearing units, the housings are provided with a seat for a dowel pin, which may be utilized as needed.

2.10 Bearing replaceability
The bearing used in the NIKO bearing unit is replaceable. In the event of bearing failure, a new bearing can be fitted to the existing housing.

3. Tolerance

The tolerances of the NIKO bearing units are in accordance with the following JIS specifications:

3.1 Tolerances of ball bearings for the unit
Tolerances of ball bearings used in the unit are shown in the following tables, 3.1 to 3.3.

Table 3.1 Cylindrical bore (UC, AS, AEL) (Unit : μm)

Nominal bore diameter d mm		Cylindrical bore: Bore diameter Δdmp Deviations		Bore diameter Vdp Variations	width ΔBs, ΔCs Deviations (reference)		Radial runout Kia (reference)
over	incl.	high	low	max.	high	low	max.
10.00	18.00	+15	0	10	0	-120	15
18.00	31.75	+18	0	12	0	-120	18
31.75	50.80	+21	0	14	0	-120	20
50.80	80.00	+24	0	16	0	-150	25
80.00	120.00	+28	0	19	0	-200	30

Note: Symbols Δdmp: Mean bore diameter deviation
Vdp: Bore diameter variation
ΔBs: Inner ring width deviation
ΔCs: Outer ring width deviation

Table 3.2 Outer ring (Unit : μm)

Nominal outside diameter D mm		Mean outside diameter deviation ΔDm		Radial runout Kea (reference)
over	incl.	high	low	max.
18	30	0	-9	15
30	50	0	-11	20
50	80	0	-13	25
80	120	0	-15	35
120	150	0	-18	40
150	180	0	-25	45

Note: 1) The low deviation of outside diameter Ds does not apply within the distance of 1/4 the width of the outer ring from the side.

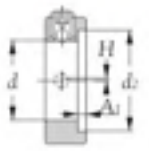
Table 3.3 Eccentric locking collar (Unit : mm)

Nominal bore diameter d mm		Bore diameter $\triangle ds$		Small bore diameter of eccentric surface deviation $\triangle d_{1s}$		Eccentricity deviation $\triangle Hs$		Collar width deviation $\triangle B_{1s}$		Collar eccentric surface width deviation $\triangle A_{1s}$	
over	incl.	High	low	High	low	High	low	High	low	High	low
10.000	36.512	0.25	+0.025	+0.3	0	+0.1	-0.1	+0.27	-0.27	0	-0.18
36.512	55.562	0.30	+0.025	+0.4	0	+0.1	-0.1	+0.33	-0.33	0	-0.18

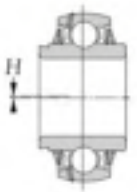
3.4 Tolerances of housings (Unit : μm)

Nominal spherical bore diameter Du mm		Du Deviations $\triangle Du$ Tolerance class H7	
over	incl.	High	low
30	50	+25	0
50	80	+30	0
80	120	+35	0
120	180	+40	0

Note: 1) Symbols $\triangle Dam$: Mean spherical bore diameter deviation.
2) Dimensional tolerances for spherical bore diameter of housing are classified as H7 for clearance fit, and J7 for intermediate fit.



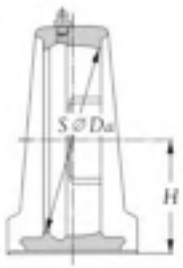
Eccentric locking collar



Eccentric locking collar type

Table 3.5 Pillow Block housings (P, UP) (Unit : mm)

Housing numbers		H Deviations $\triangle Hs$
P 203	-	
P 204	UP 204	
P 205	UP 205	
P 206	UP 206	±0.150
P 207	UP 207	
P 208	UP 208	
P 209	UP 209	
P 210	UP 210	
P 211	-	
P 212	-	
P 213	-	
P 214	-	±0.200
P 215	-	
P 216	-	
P 217	-	
P 218	-	



BEARING UNITS

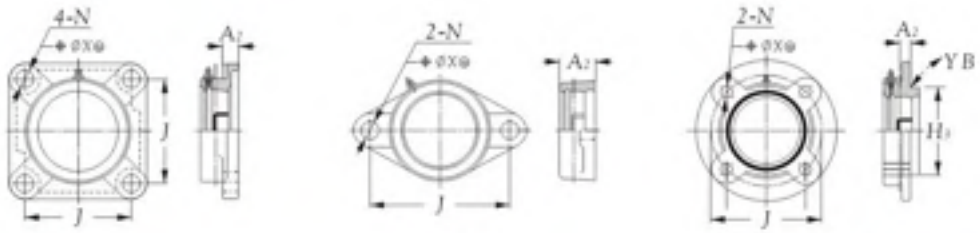


Table 3.6 (1) Flange unit housings (F, FC, FL) (Unit : mm)

Housing numbers			location tolerance of bolt hole	A_2 Deviations $\triangle A_{2s}$	$H3$ Deviations FC 2 high	low	Radial runout of spigot joint Y
F 204	FL 204	FC 204	0.7	±0.5	0	-0.0460	0.2
F 205	FL 205	FC 205					
F 206	FL 206	FC 206					
F 207	FL 207	FC 207			0	-0.0540	
F 208	FL 208	FC 208					
F 209	FL 209	FC 209					
F 210	FL 210	FC 210					
F 211	FL 211	FC 211	1.0	±0.8	0	-0.0630	0.3
F 212	FL 212	FC 212					
F 213	FL 213	FC 213					
F 214	FL 214	FC 214					
F 215	FL 215	FC 215					
F 216	FL 216	FC 216					
F 217	FL 217	FC 217					
F 218	FL 218	FC 218			0	-0.0720	

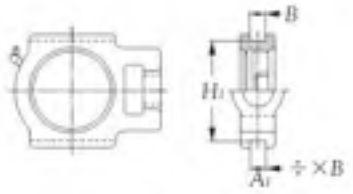
Note: 1) J is the bolt hole's center line dimension, and P.C.D. A_2 is distance between the center line of spherical bore diameter of the housing and mounting surfaces, and H3 is outside diameter of the spigot joint.
2) Radial runout of spigot joint is applied for flange units with spigot joints.

Table 3.6(2) Flange unit housings (diameter of bolt hole) (Unit : mm)

Housing type	Nominal bore diameter N mm over	incl.	N Deviations $\triangle N_s$ mm
F, FL, FC	-	30	±0.2
	30	40	±0.3

Table 3.7 Take-up unit housings (T) (Unit : mm)

Housing type	A_1 Deviations $\triangle A_{1s}$	H_1 Deviations $\triangle H_{1s}$ high	low	Parallelism of guide
T 204	±0.2	0	-0.5	0.5
T 205				
T 206				
T 207				
T 208				
T 209				
T 210				
T 211	±0.3	0	-0.8	0.6
T 212				
T 213				
T 214				
T 215				
T 216				
T 217				



(T)

Note: 1) A_1 is the width of guide rail grooves.
2) H_1 is the maximum span of guide rail grooves.
3) This table can be applied for bearing units with dust covers.

4. Basic Load Rating and Life

4.1 Bearing life

Even in bearings operating under normal conditions, the surfaces of the raceway and rolling elements are constantly being subjected to repeated compressive stresses which cause flaking of these surfaces to occur. This flaking is due to material fatigue and will eventually cause the bearings to fail. The effective life of a bearing is usually defined in terms of the total number of revolutions a bearing can undergo before flaking of either the raceway surface or the rolling element surfaces occurs.

Other causes of bearing failure are often attributed to problems such as seizing, abrasions, cracking, chipping, gnawing, rust, etc. However, these so called "causes" of bearing failure are usually themselves caused by improper installation, insufficient or inaccurate bearing selection. Since the above mentioned "causes" of bearing failure can be avoided by taking the proper precautions, and are not simply caused by material fatigue, they are considered separately from the flaking aspect.

4.2 Basic rated life and basic dynamic load rating

A group of seemingly identical bearings when subjected to identical load and operating conditions will exhibit a wide diversity in their durability.

This "life" disparity can be accounted for by the difference in the fatigue of the bearing material itself. This disparity is considered statistically when calculating bearing life, and the basic rated life is defined as follows.

The basic rated life is based on a 90% statistical model which is expressed as the total number of revolutions 90% of the bearings, in an identical group of bearings subjected to identical operating conditions, will attain of surpass before flaking due to material fatigue occurs. For bearings operating at fixed constant speeds, the basic rated life (90% reliability) is expressed in the total number of hours of operation.

The basic dynamic load rating is an expression of the load capacity of a bearing based on a constant load which the bearing can sustain for one million revolutions (the basic life rating). For radial bearings this rating applies to pure radial loads, and for thrust bearings it refers to pure axial loads. The basic dynamic load ratings given in the bearing tables of this catalog are for bearings constructed of **NIKO** standard bearing materials, using standard manufacturing techniques. Please consult **NIKO** for basic load ratings of bearings constructed of special materials or using special manufacturing techniques.

The relationship between the basic rated life, the basic dynamic load rating and the bearing load is given in formula (4.1).

$$L_{10} = \left(\frac{C_r}{P_r}\right)^3 \quad \cdots\cdots (4.1)$$

where,

L_{10} : Basic rated life 10^6 revolutions
C_r : Basic dynamic rated load, N, lbf
P_r : Equivalent dynamic load, N, lbf

The basic rated life can also be expressed in terms of hours of operation (revolution), and is calculated as shown in formula (4.2).

$$L_{10h} = 500 f_h^3 \quad \cdots\cdots (4.2)$$

$$f_h = f_h \frac{C_r}{P_r} \quad \cdots\cdots (4.3)$$

$$f_n = \left(\frac{33.3}{n}\right)^{1/3} \quad \cdots\cdots (4.4)$$

where,

L_{10h} : Basic rated life, h
f_h : Life factor
f_n : Speed factor
n : Rotational speed, r/min

Formula (4.2) can also be expressed as shown in formula (4.5).

$$L_{10h} = \frac{10^6}{60n}\left(\frac{C_r}{P_r}\right)^3 \quad \cdots\cdots (4.5)$$

The relation between rotational speed n and speed factor f_n as well as the relation between the basic rated life L_{10h} and the life factor f_h is shown in Fig. 4.1.

When several bearings are incorporated in machines or equipment as complete units, all the bearings in the unit are considered as a whole when computing bearing life (see formula 4.6). The total bearing life of the unit is a life rating based on the viable lifetime of the unit before even one of the bearings fails due to rolling contact fatigue.

$$L = \frac{1}{\left(\frac{1}{L_1^{1.1}} + \frac{1}{L_2^{1.1}} + \cdots\cdots + \frac{1}{L_n^{1.1}}\right)^{1/1.1}} \quad \cdots\cdots (4.6)$$

where,

L : Total life of the whole bearing assembly h

$L_1, L_2, \cdots, L_n$: Rated life of bearings 1, 2, ···, n, h

In the case where load and the number of revolutions change at regulated intervals, after finding the rated life $L_1, L_2, \cdots, L_n$ under conditions of n_1, P_1; n_2, P_2; ···; n_n, P_n; the built-life Lm can be given by the formula (4.7).

$$L_1 = \frac{10^6}{60 n_1}\left(\frac{C_r}{P_1}\right)^3$$

$$L_2 = \frac{10^6}{60 n_2}\left(\frac{C_r}{P_2}\right)^3$$

$$\vdots$$

$$L_n = \frac{10^6}{60 n_n}\left(\frac{C_r}{P_n}\right)^3$$

$$L_m = \left(\frac{\varnothing_1}{L_1} + \frac{\varnothing_2}{L_2} + \cdots\cdots + \frac{\varnothing_n}{L_n}\right)^{-1} \quad \text{.....(4.7)}$$

Fig. 4.1 Bearing life rating scale

where,

$L_1, L_2, \cdots, L_n$: Rated life under condition 1, 2, ···, n, h

$n_1, n_2, \cdots, n_n$: Number of revolutions under condition 1, 2, ···, n, r/min

$P_1, P_2, \cdots, P_n$: Equivalent load under condition 1, 2, ···, n, N, lbf

$\varnothing_1, \varnothing_2, \cdots, \varnothing_n$: Ratio of condition 1, 2, ···, n accounting for the total operating time

L_m : Built-in life, h

Table 4.1 Rating life for applications

Service classification	Machine application	Life time Ln
Machines used occasionally	Door mechanisms, Garage shutter	500
Equipment for short period or intermittent service-interruption permissible	Household appliances, Electric hand tools, Agricultural machines, Lifting tackles in shops	4000~8000
Intermittent service machines-high reliability	Power-Station auxiliary equipment, Elevators, Conveyors, Deck cranes	8000~14000
Machines used for 8 hours a day, but not always in full operation	Ore wagon axles, Important gear units	14000~20000
Machines fully used for 8 hours	Dblowers, General machinery in shops, Continuous operation cranes	20000~30000
Machines continuously sued for 24 hours a day	Compressors, Pumps	50000~60000
Machines continuously used for 24 hours a day with maximum reliability	Power-station equipment, Water-supply equipment for urban areas, Mine ventilators	100000~200000

4.3 Machine applications and requisite life

When selecting a bearing, it is essential that the requisite life of the bearing be established in relation to the operating conditions. The requisite life of the bearing is usually determined by the type of machine the bearing is to be used in, and duration of service and operational reliability requirements. A general guide to these requisite life criteria is shown in Table 4.1. When determining bearing size, the fatigue life of the bearing is an important factor; however, besides bearing life, the strength and rigidity of the shaft and housing must also be taken into consideration.

4.4 Adjusted life rating factor
The basic bearing life rating (90% reliability factor) can be calculated through the formulas mentioned earlier in Section 4.2. However, in some applications a bearing life factor of over 90% reliability may be required. To meet these requirements, bearing life can be lengthened by the use of specially improved bearing materials or special construction techniques. Moreover, according to elastohydrodynamic lubrication theory, it is clear that the bearing operating conditions (lubrication, temperature, speed, etc.) all exert an effect on bearing life. All these adjustment factors are taken into consideration when calculating bearing life, and using the life adjustment factor as prescribed in ISO 281, the adjusted bearing life can be arrived at.

$$L_{na} = a1\, a2\, a3 \left(\frac{C}{P}\right)^3 \quad \text{.....(4.8)}$$

where,

L_{na} : Adjusted life rating in millions of revolutions (10^6) (adjusted for reliability, material and operating conditions)
$a1$: Reliability adjustment factor
$a2$: Material adjustment factor
$a3$: Operating condition adjustment factor

4.4.4 Life adjustment factor for reliability a1
The values for the reliability adjustment factor a1 (for a reliability factor higher than 90%) can be found in table 4.2.

Table 4.2 Reliability adjustment factor values a1

Reliability %	L_n	Reliability factor $a1$
90	L_{10}	1.00
95	L_5	0.62
96	L_4	0.53
97	L_3	0.44
98	L_2	0.33
99	L_1	0.21

4.4.2 Life adjustment factor for material a2
The life of a bearing is affected by the material type and quality as well as the manufacturing process. In this regard, the life is adjusted by the use of an a2 factor.

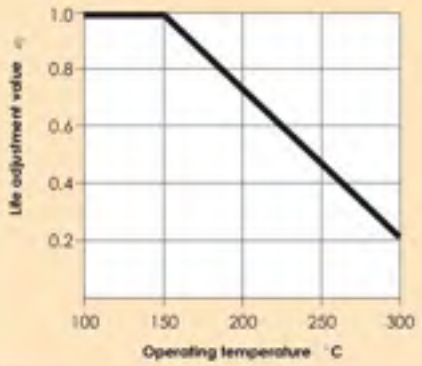
The basic dynamic load ratings listed in the catalogue are based on **NIKO**'s standard material and process, therefore, the adjustment factor $a_2 = 1$. When special materials or processes are used the adjustment factor a_2 can be larger than 1.

NIKO bearings can generally be used up to 120°C. If bearings are operated at a higher temperature, the bearing must be specially heat treated (stabilized) so that inadmissible dimensional change does not occur due to micro-structure change. This special heat treatment might cause the reduction of bearing life because of a
hardness change.

4.4.3 Life adjustment factor a_3 for operating conditions
The operating conditions life adjustment factor a_3 is used to adjust for such conditions as lubrication, operating temperature, and other operation factors which have an effect on bearing life.

Generally speaking, when lubricating conditions are satisfactory, the a_3 factor has a value of one; and when lubricating conditions are exceptionally favorable, and all other operating conditions are normal, a_3 can have a value greater than one.

However, when lubricating conditions are particularly unfavorable and the oil film formation on the contact surfaces of the raceway and rolling elements is insufficient, the value of a_3 becomes less than one. This insufficient oil film formation can be caused, for example, by the lubricating oil viscosity being too low for the operating temperature (below 13mm²/s for ball bearings); or by exceptionally low rotational speed (n r/min × dp mm less than 10 000). For bearings used under special operating conditions, please consult **NIKO**.



As the operating temperature of the bearing increases, the hardness of the bearing material decreases. Thus, the bearing life correspondingly decreases. The operating temperature adjustment values are shown in Fig. 4.2.

4.5 Basic static load rating

When stationary rolling bearings are subjected to static loads, they suffer from partial permanent deformation of the contact surfaces at the contact point between the rolling elements and the raceway. The amount of deformity increases as the load increases, and if this increase in load exceeds certain limits, the subsequent smooth operation of the bearing is impaired.

It has been found through experience that a permanent deformity of 0.0001 times the diameter of the rolling element, occurring at the most heavily stressed contact point between the raceway and the rolling elements, can be tolerated without any impairment in running efficiency.

The basic rated static load refers to a fixed static load limit at which a specified amount of permanent deformation occurs. It applies to pure radial loads for radial bearings. The maximum applied load values for contact stress occurring at the rolling element and raceway contact points are given below.

For ball bearings (for bearing unit) : 4200 MPa

4.6 Allowable static equivalent load

Generally the static equivalent load which can be permitted (see section 5.3) is limited by the basic static rated load as stated in Section 4.5. However, depending on requirements regarding friction and smooth operation, these limits may be greater or lesser than the basic static rated load.

In the following formula (4.9) and Table 4.3 the safety factor So can be determined considering the maximum static equivalent load.

$$S_0 = \frac{C_0}{P_{0\,max}} \quad \cdots\cdots (4.9)$$

where,

S_0 : Safety factor

C_0 : Basic static rated load, N, lbf

$P_{0\,max}$: Maximum static equivalent load, N, lbf

Table 4.3 Minmum safety factor values S_0

Operating conditions	Ball bearings
High rotational accuracy demand	2.0
Normal rotating accuracy demand (Universal application)	1.0
Slight rotational accuracy deterioration permitted (Low speed, heavy loading, etc.)	0.5

Note : 1) When vibration and/or shock loads are present, a load factor based on the shock load needs to be included in the Pa max value.

5. Loads

5.1 Load acting on the bearing

It is very rare that the load on a bearing can be obtained by a simple calculation. Loads applied to the bearing generally include the weight of the rotating element itself, the load produced by the working of the machine, and the load resulting from transmission of power by the belt and gearwheel. Such loads include the radial load, which works on the bearing at right angles to its axis, and the thrust load, which works on the bearing parallel to its axis. These can work either singly or in combination. In addition, the operation of a machine inevitably produces a varying degree of vibrations and shocks. To take this into account, the theoretical value of a load is multiplied by a safety factor that has been derived from past experience. This is known as the "load factor".

Load acting on the bearing = Load factor f_w × Calculated Load

Table 5.1 below shows the generally accepted load factors f_w which correspond to the degree of shock to which the machine is subjected.

Table5.1 Load factors fw

Load conditions	f_w	Examples
Little or on shock	1 to 1.2	Machines tools, electric machines, etc
Some degree of shock; machines with reciprocating parts	1.2 to 1.5	Vehicles, driving mechanism, metal-working machinery, steel-making machines, paper-making machinery, rubber mixing machines, hydraulic equipment, hoists, transportation machinery, power-transmission equipment, woodworking machines, printing machines, etc
violent shocks	1.5 to 3	Agricultural machines, vibrator screens, ball and tube mills, etc.

In the case of power transmission by belts, gear wheels, etc, load factors adopted are somewhat different from the above.
Factors used for power transmission by belts, gearwheels and chains, respectively, are given in the following sections.

5.1.1 Load applied to the bearing by power transmission
The force working on the shaft when power is transmitted by belts, Chains or gearwheels is obtainde, in general,by the following formula:

$$T = 9550\frac{H}{n}, 84500\frac{H}{n} \quad \text{.....(5.1)}$$

$$K_t = \frac{T}{r} \quad \text{.....(5.2)}$$

where,

T : Torque, N·m, lbf·inch
H : Transmission power, kW
n : Number of revolutions, r/min
K_t : Transmission force (effective transmission force of belt of chain; tangential force of gearwheel), N, lbf
r : effective radius of belt pulley, sprocket wheel or gearwheel, m, inch

Accordingly, the load actually applied to the shaft by the transmission force can be obtained by the following formula:

$$\text{Actual load} = \text{Factor} \times K_t \quad \text{.....(5.3)}$$

Different factors are adopted according to the transmission system in use. These will be dealt with in the following paragraphs.

Belt transmission
When power is transmitted by belt, the effective transmission force working on the belt pulley is calculated by formula (5.2). The term "effective transmission force of the belt" refers to the difference in tension between the tensioned side and the loose side of the belt. Therefore, to obtain the load actually acting on the shaft through the medium of the belt pulley, it is necessary to multiply the effective transmission force by a factor which takes into account the type of belt and the initial tension. This is known as the "belt factor".

Table 5.2 Belt factor f_b

Belt type	f_b
V-belt	1.5 to 2.0
Timing belt	1.1 to 1.3
Flat belt(with tension pulley)	2.5 to 3.0
Flat belt(with tension pulley)	3.0 to 4.0

Note: In cases where the distance between shafts is short the revolution speed is low, or where operating conditions severe, the higher fb values should be adopted.

Gear transmission
In the case of gear transmissions, the theoretical gear load can be calculated from the transmissions force and the type of gear. With spur gears, only a radial load is involved; whereas, with helical gears and bevel gears, an additional axial load is present.

The simplest case is that of spur gears. In this instance, the tangential force K_t is obtained from the formula (5.2) and the radial force K_s can be obtained from the following formula:

$$K_s = K_t \cdot \text{Tan}\,\alpha \quad \text{.....(5.4)}$$

where,

α is the pressure angle of the gear.

Accordingly, the theoretical composite force, K_r, working on the gear is obtained from the following formula:

$$K_r = \sqrt{K_t^2 + K_s^2} = K_t \cdot \sec\alpha \quad \text{.....(5.5)}$$

Therefore, to obtain the radial load actually working on the shaft, the theoretical composite force, as above, multiplied by a factor in which the accuracy and the degree of precision of the gear is taken into account. This is called the "gear factor" and is represented by the symbol f_t. In Table 5.3 is below, f_t values for spur wheels are given.

The gear factor is essentially almost the same as the previously described load factor, f_w. In some cases, however, vibrations and shocks are produced also by the machine of which the gear is a part. here it is necessary to calculate the actual load working on the gear by further multiplying the gear load, as obtained above, by the load factor shown in Table 5.1, according t o the degree of shock.

Table 5.3 Gear factors f_t

Gear	f_t
Precision gears (tolerance 0.02mm max., For both pitch and shape)	1.05 to 1.1
Gears finished by ordinary machining work (tolerance0.02to0.1mm, for both pitch and shape)	1.10 to 1.3

Chain transmission

When power is transmitted by chain, the effective transmission force working on the sprocket wheel is calculated by formula (5.2). To obtain the load actually working, the effective transmission force must be multiplied by the "chain factor", 1.2 to 1.5.

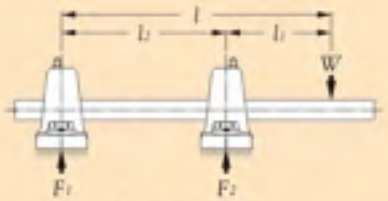
5.1.2 Distribution of the radial load

The load acting on the shaft is distributed to the bearings which support the shaft.

In Fig.5.1, the load is applied to the shaft between two bearings: In Fig.5.2 the load is applied to the shaft outside the two bearings. In practice, however, most cases are combinations of Fig.5.1 and 5.2, and the load is usually a composite load, that is to say, a combination of radial and axial loads. Therefore they are calculated by the methods described in the following sections.

$$F_1 = \frac{l_2}{l} \cdot W \quad F_2 = \frac{l_1}{l} \cdot W$$

Fig. 5.1



$$F_1 = \frac{l_1}{l_2} \cdot W \quad F_2 = \frac{l}{l_2} \cdot W$$

Fig. 5.2

5.2 Equivalent dynamic radial load

For ball bearings used in the **NIKO** unit, the basic rated dynamic loads C_r mentioned in the table of dimensions are applicable only when the load is purely radial. In practice, however, bearings are usually subjected to a composite load. As the table of dimensions is not directly applicable here, it is necessary to convert the values of the radial and axial loads into a single radial load value that would have an effect on the life of bearing equivalent fo that of the actual load applied. This is know as the "equivalent dynamic radial load", and from this the life of the ball bearings for the unit is calculated. The equivalent dynamic radial load is calculated by the following formula:

$$P_r = X \cdot F_r + Y \cdot F_a \quad \cdots\cdots (5.6)$$

where,

P_r : equivalent dynamic radial load N, lbf
F_r : radial load N, lbf
F_a : axial load N, lbf
X : radial factor
Y : axial factor

Values of X and Y are shown in Table 5.4 below.

With ball bearings for the unit, when only radial load is involved, or when $F_a/F_r \leq e$ (e is value which is determined, by the size of an individual bearing and the load acting thereon), the values of X and Y will be 1 and 0 respectively, resulting in the following equation:

$$P_r = F_r \quad \cdots\cdots (5.7)$$

Table 5.4 Values of X and Y applying when $\frac{F_a}{F_r} > e$

$\frac{F_a}{C_{or}}$	e	$\frac{F_a}{F_r} > e$ X	Y
0.01	0.18		2.46
0.02	0.20		2.14
0.04	0.24		1.83
0.07	0.27		1.61
0.10	0.29	0.56	1.48
0.15	0.32		1.35
0.20	0.35		1.25
0.30	0.38		1.13
0.40	0.41		1.05
0.50	0.44		1.00

Note : C_{or} is the basic rated static load. (See the table of dimensions.) When the value of $\frac{F_a}{C_{or}}$ or $\frac{F_a}{F_r}$ is not in conformity with those given in Table 5.4 above, find the value by interpolation.

5.3 Equivalent static radial load

In the case of a bearing which is stationary, rotates at a low speed of about 10rpm, or makes slight oscillating movements, it is necessary to take into account the equivalent static radial load, which is the counterpart of the equivalent dynamic radial load of a rotating bearing. In this case, the following formula is used.

$$P_{or} = X_o \cdot F_r + Y_o \cdot F_a \quad \cdots\cdots (5.8)$$

where,

P_{or} : equivalent static radial load N, lbf
F_r : radial load N, lbf
F_a : axial load N, lbf
X_o : static radial factor
Y_o : static axial factor

With the ball bearings for the NIKO unit, the values of X_o and Y_o are $X_o = 0.6$; $Y_o = 0.5$.
However when only radial load is involved, or when $F_a/F_r \leq e$, the following values in used:

$X_o = 1$ $Y_o = 0$

Accordingly, the following equation holds.

$$P_{or} = F_r \quad \text{.....(5.9)}$$

6. Bearing Internal Clearance

6.1 Bearing internal clearance
Bearing internal clearance (initial clearance) is the amount of internal clearance a bearing has before being installed on a shaft or in a housing.

As shown in Fig.6.1, when either the inner ring or the outer ring is fixed and the other ring is free to move, displacement can take place in either an axial or radial direction. This amount of displacement (radially or axially) is termed the internal clearance and, depending on the direction, is called the radial internal clearance or the axial internal clearance.

When the internal clearance of a bearing is measured, a slight measurement load is applied to the raceway so the internal clearance may be measured accurately. However, at this time, a slight amount of elastic deformation of the bearing occurs under the measurement load, and the clearance measurement value (measured clearance) is slightly larger than the true clearance. This discrepancy between the true bearing clearance and the increased amount due to the elastic deformation must be compensated for. These compensation values are given in Table 6.1.

The internal clearance values for each bearing class are shown in Tables 6.3.

Table 6.1 Adjustment of radial internal clearance based on measured load (Unit : μm)

Nominal bore diameter d (mm)		Measuring Load (N)	Radial Clearance Increase				
over	incl.		C2	CN	C3	C4	C5
10	18	24.5	3~4	4	4	4	4
18	50	49.0	4~5	5	6	6	6
50	200	147.0	6~8	8	9	9	9

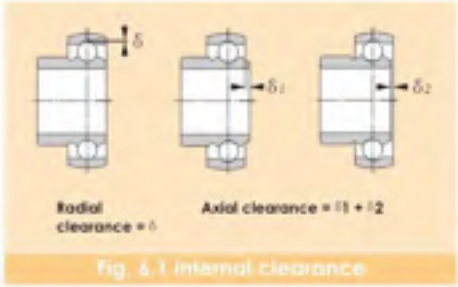


Fig. 6.1 Internal clearance

6.2 Internal clearance selection

The internal clearance of a bearing under operating conditions(effective clearance) is usually smaller than the same bearing's initial clearance before being installed and operated. This is due to several factors including bearing fit, the difference in temperature between the inner and outer rings, etc. As a bearing's operating clearance has an effect on bearing life, heat generation, vibration, noise, etc.; care must be taken in selecting the most suitable operating clearance.

Effective internal clearance:

The internal clearance differential between the initial clearance and the operating (effective) clearance (the amount of clearance reduction caused by interference fits, or clearance variation due to the temperature difference between the inner and outer rings) can be calculated by the following formula:

$$\delta_{eff} = \delta_o - (\delta_f + \delta_t) \quad \text{.....(6.1)}$$

where,

δ_{eff} : Effective internal clearance, mm
δ_o : Bearing internal clearance, mm
δ_f : Reduced amount of clearance due to interference, mm
δ_t : Reduced amount of clearance due to temperature differential of inner and outer rings, mm

Reduced clearance due to interference:

When bearings are installed with interference fits on shafts and in housings, the inner ring will expand and the outer ring will contract; thus reducing the bearing's internal clearance. The amount of expansion or contraction varies depending on the shape of the bearing, the shape of the shaft or housing, dimensions of the respective parts, and the type of materials used. The differential can range from approximately 70% to 90% of the effective interference.

$$\delta_f = (0.70 \sim 0.90) \cdot \triangle d_{eff} \quad \text{.....(6.2)}$$

where,

δ_f : Reduced amount of clearance due to interference, mm
$\triangle d_{eff}$: Effective interference, mm

Reduced internal clearance due to inner/outer ring temperature difference:

During operation, normally the outer ring will be from 5° to 10°C cooler than the inner ring or rotating parts. However, if the cooling effect of the housing is large, the shaft is connected to a heat source, or a heated substance is conducted through the hollow shaft; the temperature difference between the two rings can be even greater. The amount of internal clearance is thus further reduced by the differential expansion of the two rings.

$$\delta_t = \alpha \cdot \triangle T \cdot D_o \quad \text{.....(6.3)}$$

where,

δ_t : Amount of reduced clearance due to heat differential, mm
α : Bearing steel linear expansion coefficient 12.5 X 10^{-6}/°C
$\triangle T$: Inner / outer ring temperature differential, °C
D_o : Outer ring raceway diameter, mm

Outer ring raceway diameter, Do, values can be approximated by using formula 6.4.
For ball bearings,

$$D_o = 0.20\ (d + 4.0\ D) \quad \text{.....(6.4)}$$

where,

d : Bearing bore diameter, mm
D : Bearing outside diameter, mm

6.3 Bearing internal clearance selection standards
Theoretically, in regard to bearing life, the optimum operating internal clearance for any bearing would be a slight negative clearance after the bearing had reached normal operating temperature.

Unfortunately, under actual operating conditions, maintaining such optimum tolerances is often difficult at best. Due to various fluctuating operating conditions this slight minus clearance can quickly become a large minus, greatly lowering the life of the bearing and causing excessive heat to be generated. Therefore, an initial internal clearance which will result in a slightly greater than negative internal operating clearance should be selected.

Under normal operating conditions (e.g. normal load, fit, speed, temperature, etc.), a standard internal clearance will give a very satisfactory operating clearance.

Table 6.2 lists non-standard clearance recommendations for various applications and operating conditions.

Table 6.2 Examples of applications where bearing clearances other than normal clearance are used

Operating conditions	Applications	Selected clearance
Shaft is heated and housing is cooled.	Conveyor of casting machine	C5
Shaft or inner ring is heated.	Annealing pit, Drying pit, Curing pit	C4
Allows for shaft deflection and fitting errors.	Disc harrows Combines	C4 C3
Tight-fitted for both inner and outer rings.	Large blowers	C3
To reduce noise and vibration when rotating	Multi-wing fan of air conditioners	C2

Table 6.3 Cylindrical bore bearings **(Unit : μm)**

Nominal bore diameter d (mm)		Radial internal clearance							
		C2		CN		C3		C4	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.
10	18	0	9	3	18	11	25	18	33
18	24	0	10	5	20	13	28	20	36
24	30	1	11	5	20	13	28	23	41
30	40	1	11	6	20	15	33	28	46
40	50	1	11	6	23	18	36	30	51
50	65	1	15	8	28	23	43	38	61
65	80	1	15	10	30	25	51	46	71
80	100	1	18	12	36	30	58	53	84

Note : Heat-resistant bearings with suffix HT2 have C4 clearances.

7. Lubrication

As bearings in **NIKO** bearing units have sufficient high-grade grease sealed in at the time of manufacture, there is no need for replenishment while in use. The amount of grease necessary for lubrication is, in general, very small. With the **NIKO** Bearing units, the amount of grease occupies about a half to a third of the space inside the bearing.

7.1 Maximum permissible speed of rotation
The maximum speed possible while ensuring the safety and long life of ball bearings used in the unit is limited by their size, the circumferential speed at the point where the seal comes into contact, and the load acting on them.

To indicate the maximum speed permissible, it is customary to use the value of $d_k n$ or $d_{mm} n$ (d is the bore of the bearing; d_m is the diameter of the pitch circle = (I.d.+ O.D.) /2; n is the number of revolutions).

Problems connected with the lubrication of bearings are the generation of heat and seizures occurring at the sliding parts inside the bearing, in particular at the points where the ball is in contact with the retainer, inner and outer rings. The contact pressure at the points where friction occurs on the retainer is only slightly affected by the load acting on the bearing; the amount of heat generated there is approximately in proportion to the sliding velocity. Therefore, this sliding velocity serves as a yardstick to measure the limit of the rotating speed of the another large factor that has to be taken into account — the circumferential speed at the part where the seal is in contact.

The graph in Fig.7.1 indicates the maximum speed of rotation permissible, taking into account the aforementioned factors.

There are two common methods of locking the bearing unit onto the shaft — the set screw system and the eccentric collar system. However, in both of these systems high-speed operation will cause deformation of the inner ring, which may result in vibration of the bearing. For high-speed operation, therefore, it is recommended that an interference fit or a clearance fit with a near-zero clearance be used, with a shaft of the larger size as shown later in this manual in Fig. 8.1, Fig.8.6.

For standard bearing units with the contact type seal, the maximum speed permissible is 120000/d. Where a higher speed is required, bearing units with the non-contact type seal, are advised. Please contact **NIKO** regarding the use of the latter type. Additionally, it is necessary that the surface on which the housing is mounted be finished to as a high a degree of accuracy as possible. A regularity of within ±0.05mm, ±0.002 inch is required.

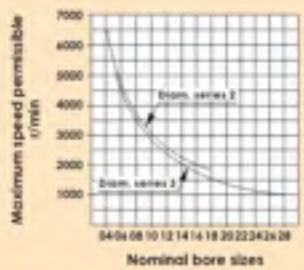


Fig. 7.1

BEARING UNITS

7.2 Replenishment of grease

7.2.1 Sealed-in grease

with NIKO bearing units, no relubrication is the general rule. The standard self-lubricating type of bearing units contain high-grade lithium-based grease which, being suitable for long-term use, is ideal for sealed-type bearings. They also feature NIKO's unique sealing device. Relubrication, therefore, is unnecessary under most operating conditions.

At high temperatures, or where there is exposure to water or excessive dust, the highest quality grease is essential. Therefore, NIKO uses its own specially selected brands which are shown in Table 7.1. It is necessary to use the same brand when replenishing grease.

Table 7.1 Brands of grease used in NIKO bearing units

Bearing units	Grease			Symbols	Operating temperature range
	Name of grease	Thickening agent	Base oil		
Standard	Alvania grease 3	Li soap	Mineral oil	D1	-15°C to +100°C (+5°F to +212°F)
Heat-resistant	SH44M	Li soap	Silicone oil	HT2D1	Normal temp. To +200°C (392°F)
Cold-resistant	SH33L	Li soap	Silicone oil	CT1D1	-60°C (-76°F) to normal temp.

7.2.2 Mixing of different kinds of grease

Whether or not different kinds of grease may be mixed usually depends on their thickeners. The commonly used criteria are shown in Table 7.2. Properties which are most susceptible to influences from mixing are viscosity, dropping point and penetration. Water and heat resisting properties as well as mechanical stability are also lowered. Therefore, when mixing in a grease which is different to that which is already in use, it is essential that the thickener (soap base) and the base oil be of the same group.

When relubricating NIKO bearing units, it is advisable to use the brands of grease shown in Table 7.1.

Table 7.2 Mixing properties of grease

Soap base	Ca	Na	Al	Ba	Li
Ca	○	△	△	X	△
Na	△	○	△	X	X
Al	△	△	○	X	X
Ba	X	X	X	○	X
Li	△	X	X	X	○

○ Mixing will not produce any appreciable change of properties.
△ Mixing may produce considerable variations of properties.
X Mixing will cause a drastic change of properties.

7.2.3 Relubrication frequency

Relubrication frequency varies with the kind and quality of grease used as well as the operating conditions. Therefore, it is difficult to establish a general rule, but under ordinary operating conditions, it is desirable that grease be replenished before one third (1/3) of its calculated life elapses. It is necessary, however, to take into consideration such factors as hardening of grease in the oil hole, making replenishment impossible; deterioration of grease while operation of the machine is suspended, and so forth.

In Table 7.3 below are shown standard relubrication frequencies. Irrespective of the calculated life of the grease, this list takes into consideration such factors as the rotational speed of the bearings, operating temperatures and environmental conditions, with a view to safety.

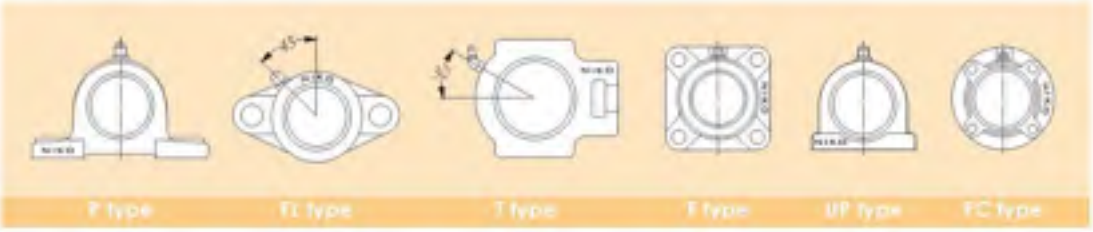
7.2.4 Re-greasing
The performance of a bearing is greatly influenced by the quantity of grease. In order to avoid over-filling, it is advisable to replenish the grease while the machine is in operation.

Continue to insert grease until a little oozes out from between the outer ring raceway and the periphery of the slinger , for optimum performance.

Table 7.3 Standard relubrication frequencies

Type of unit	Symbol	d_n Value	Environmental conditions	Operating temp °C, °F	Relubrication frequency	
					Hours	Period
Standard	D1	40 000 and below	Ordinary	-15 to +80, +5 to +176	1550 to 3000	6 to 12 mo.
Standard	D1	70 000 and below	Ordinary	-15 to +80, +5 to +176	1000 to 2000	3 to 6 mo.
Standard	D1	70 000 and below	Ordinary	+80 to +100, +176 to +212	500 to 700	1 mo.
Heat-resistant	HT2D1	70 000 and below	Ordinary	+140 to +170, +284 to +338	300 to 700	1 mo.
Heat-resistant	HT2D1	70 000 and below	Ordinary	+170 to +200, +338 to +392	100	1 wk.
Cold-resistant	CT2D1	70 000 and below	Ordinary	-60 to +80, -76 to +176	1000 to 2000	3 to 6 mo.
Standard	D1	70 000 and below	Very dusty	-15 to +100, +5 to +212	100 to 500	1 wk. To 1 mo.
Standard	D1	70 000 and below	Exposed to water splashes	-15 to +100, +5 to +212	30 to 100	1 day To 1 week.

7.4 Standard location of the grease fitting
Standard location of grease fitting on the housing for the relubricatable bearing units of each type is illustrated below.



8. Shaft Designs

Although the shafts used for NIKO bearing units require no particularly high standards of accuracy, it is desirable that, as far as possible, they are free from bends and flaws.

8.1 Set screw system bearing units
with set screw system bearing units, under normal operating conditions the inner ring is usually fitted onto the shaft by means of a clearance fit to ensure convenience of assembly. In this case the values shown in Fig. 8.1 are appropriate dimensional tolerances for the shaft.

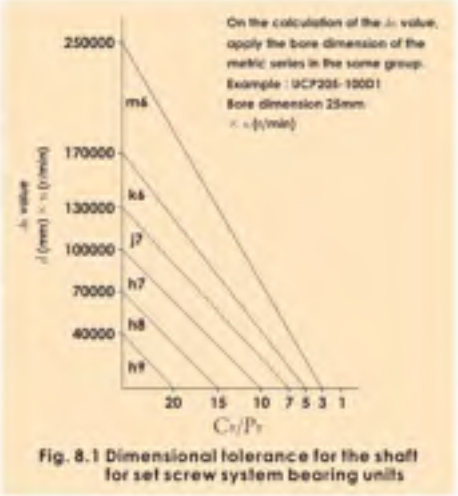


Fig. 8.1 Dimensional tolerance for the shaft for set screw system bearing units

Step shafts
Wherever there is a noticeably large axial load, a step shaft, as shown in Fig. 8.2, should, if practical, be used.

As an expedient, there may be provided a bored hole on the shaft as illustrated in Fig. 8.3. In this case it is necessary to ensure the accuracy of the relationship between the positions of the housing of the bearing and of the bored hole on the shaft.

Table 8.2 Radii of the round corners of step shafts

Designation of bearings	ras max. mm
UC 201 to UC 203	0.6
UC 204 to UC 206	1.0
UC 207 to UC 210	1.5
UC 211 to UC 215	2.0
UC 216 to UC 218	2.5

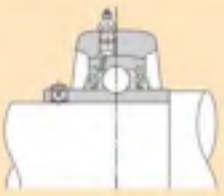


Fig. 8.2

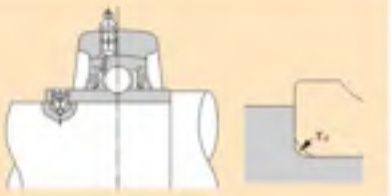


Fig. 8.3

Relief in the axial direction
Where several bearing units are fitted on the shaft, or where there is a great distance between two bearing units, one of the bearings is secured to the shaft as the "fixed-side bearing" and is subjected to both the axial and radial loads. The other is mounted on the shaft as the "free-side bearing" and is subjected only to radial load, compensating for expansion of the shaft due to a rise in temperature or for any errors in the distance between bearings that may have occurred during assembly.

If there is no free-side bearing, the bearings will be subjected to an abnormal axial load, which could cause premature breakdown.

Although it is desirable to use a cartridge-type bearing unit for the above purpose (Fig. 8.4), the following method is often employed. As illustrated in Fig. 8.5 (a) and (b), a key way is cut in the shaft, to accommodate a special set screw.

When relief is provided in the axial direction by the use of screwed bolts as above, the dimensional relationships applicable are as shown in Table 8.3 (a) and 8.3 (b) on the following pages.

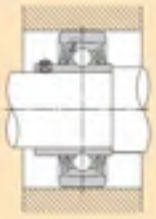


Fig. 8.4

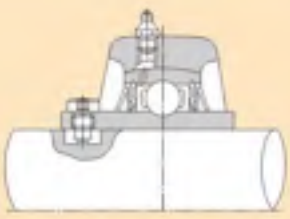


Fig. 8.5 (a)

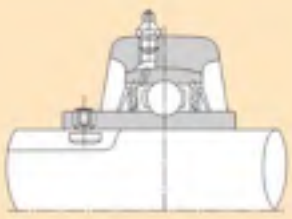


Fig. 8.5 (b)

Table 8.3 Screwed bolt system (Metric series, applied to metric bore size.) (Unit : mm)

Designation of bearings	Key way Width b	Depth h	Designation and size of bolts	d_1	l	l_1	D	H
UC 201 D1 W5	3.5	3.0	S5W 5 x 0.80 x 11.0	3.5	11.0	5.0	6	3
UC 202 D1 W5	3.5	4.5	S5W 5 x 0.80 x 11.0	3.5	11.0	5.0	6	3
UC 203 D1 W5	3.5	5.5	S5W 5 x 0.80 x 11.0	3.5	11.0	5.0	6	3
UC 204 D1 W5	3.5	4.5	S5W 5 x 0.80 x 8.5	3.5	8.5	5.0	6	3
UC 205 D1 W5	3.5	5.0	S5W 5 x 0.80 x 8.5	3.5	8.5	5.0	6	3
UC 206 D1 W5	4.0	5.5	S5W 6 x 0.75 x 10.0	4.0	10.0	5.9	8	3
UC 207 D1 W5	4.0	5.0	S5W 6 x 0.75 x 10.0	4.0	10.0	5.9	8	3
UC 208 D1 W5	6.0	5.5	S5W 8 x 1.00 x 11.5	6.0	11.5	5.5	10	3
UC 209 D1 W5	6.0	6.0	S5W 8 x 1.00 x 11.5	6.0	11.5	5.5	10	3
UC 210 D1 W5	6.0	6.0	S5W 8 x 1.00 x 11.5	6.0	11.5	5.5	10	3
UC 211 D1 W5	6.0	5.5	S5W 8 x 1.00 x 11.5	6.0	11.5	5.5	10	3
UC 212 D1 W5	7.0	5.5	S5W10 x 1.25 x 13.5	7.0	13.5	6.5	12	3
UC 213 D1 W5	7.0	5.5	S5W10 x 1.25 x 13.5	7.0	13.5	6.5	12	3
UC 214 D1 W5	7.0	5.5	S5W10 x 1.25 x 13.5	7.0	13.5	6.5	12	3
UC 215 D1 W5	7.0	5.0	S5W10 x 1.25 x 13.5	7.0	13.5	6.5	12	3
UC 216 D1 W5	7.0	6.5	S5W10 x 1.25 x 15.0	7.0	15.0	7.0	12	3
UC 217 D1 W5	9.0	6.5	S5W12 x 1.50 x 16.5	9.0	16.5	7.0	14	4
UC 218 D1 W5	9.0	6.5	S5W12 x 1.50 x 16.5	9.0	16.5	7.0	14	4

Note : The tolerance for the width (b) of the key way should preferably be set at the range of 0 to + 0.2 mm.

8.2 Eccentric collar system

As in the case of the set screw system, it is usual under normal operating conditions to fit the inner ring onto the shaft by means of a clearance fit, for ease of assembly. Fig. 8.6 shows the appropriate values of dimensional tolerances for the shaft.

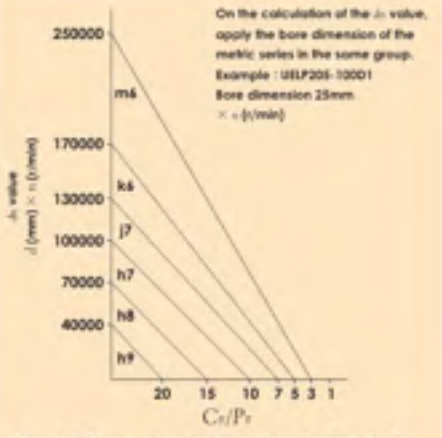


Fig. 8.6 Dimensional tolerances for the shaft eccentric collar system bearing units

9. Handling of the Bearing Unit

9.1 Mounting of the housing

9.1.1 Pillow block type and flange type

Although an advantage of the NIKO bearing unit is that it can be fitted easily and will function efficiently on any part of a machine, attention must be paid to the following points in order to ensure its normal service life.

(1) The surface on which the housing is mounted must be sufficiently rigid.

(2) The surface on which the housing is mounted should be as flat as possible (The housing should set firmly in its position). Deformation of the housing caused by incorrect mounting will in turn cause deformation of the bearing, leading to its premature breakdown.

(3) It is desirable that the angle between the surface on which the housing is mounted and the shaft be maintained to a tolerance of ±2′ .

(4) The pillow block type and flange type housings are provided with a seat for a dowel for accurate location. For the use of dowel pins, refer to Table 9.1.

Fig. 9.1

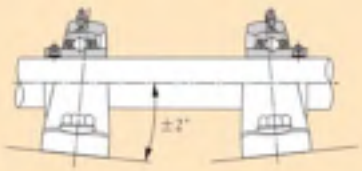


Fig. 9.2

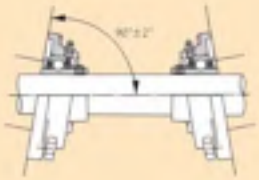
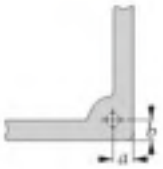


Fig. 9.3

Table 9.1 Recommended dimensions of dowel pins

(Unit : mm)

Designation of the housings	*a*	*b*	Recommended pin diameter
P 203	5.5	5.5	3
P 204	5.5	5.5	3
P 205	5.5	5.5	3
P 206	5.5	5.5	3
P 207	5.5	5.5	3
P 208	7.0	7.0	5
P 209	7.0	7.0	5
P 210	7.5	7.5	5
P 211	7.5	7.5	5
P 212	9.0	9.0	7
P 213	9.0	9.0	7
P 214	9.0	9.0	7
P 215	9.0	9.0	7
P 216	10.0	10.0	7
P 217	12.0	12.0	10
P 218	12.0	12.0	10



(Unit : mm)

Designation of the housings	a	b	Recommended pin diameter
F 204	33	6	4
F 205	35	6	4
F 206	35	6	4
F 207	38	7	5
F 208	40	8	5
F 209	43	8	5
F 210	49	8	5
F 211	49	8	5
F 212	49	8	5
F 213	52	9	6
F 214	52	9	6
F 215	52	9	6
F 216	55	12	6
F 217	55	12	6
F 218	61	14	6

(Unit : mm)

Designation of the housings	a	b	Recommended pin diameter
FL 204	22	10	4
FL 205	28	10	4
FL 206	33	12	4
FL 207	30	14	5
FL 208	33	15	5
FL 209	38	15	5
FL 210	39	16	5
FL 211	44	18	5
FL 212	54	19	5
FL 213	53	18	6
FL 214	53	18	6
FL 215	55	21	6
FL 216	55	21	6
FL 217	55	21	6
FL 218	55	22	6

9.1.2 Cartridge type
The inside diameter of the housing into which a cartridge type unit is inserted should be H7 under general operating conditions. It should be so furnished as to permit the bearing unit to move freely in the axial direction.

9.2 Mounting the bearing unit on the shaft
9.2.1 Mounting of the set screw system unit
To mount the set screw system bearing unit on the shaft, it is sufficient to tighten the two set screws uniformly.
The construction of the NIKO "Ball-End Set Screw" is illustrated in Fig. 9.4 with the pin design that prevents it from becoming loose even when it is subjected to vibrations or impact loads.
If the fit clearance between the inner ring and the shaft is very small, it is advisable, prior to fastening on the screw, to file off that part of the shaft at which the end of the set screw (ball) strikes, by approximately 0.2 to 0.5mm 0.01 to 0.02 inches, to flatten it, as illustrated in Fig .9.5.

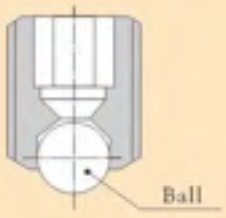


Fig. 9.4

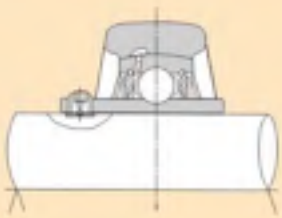


Fig. 9.5

BEARING UNITS

This will facilitate dismounting of the bearing from the shaft to become necessary.
The method of mounting the unit on the shaft is as follows:

1) Make certain that the end of the set screw is not protruding into the bore of the bearing.
2) Holding the unit at right angles to the shaft, insert the shaft into the bore of the bearing without twisting the bearing. Take care not to strike the slinger nor to subject the unit to any shock (Fig. 9.6).
3) Insert a hexagonal bar wrench securely into the hexagonal hole of the set screw, and tighten the two screws uniformly. Use the tightening torque shown in Table 9.2.
4) Mount the housing securely in position on the machine. Sometimes the order of steps 3) and 4) is reversed.

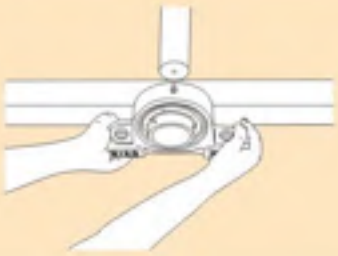


Fig. 9.6

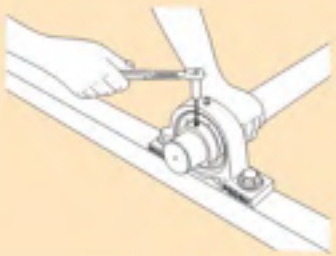


Fig. 9.7

Table 9.2 Recommended torques for tightening set screws (Metric series, applied to metric bore size.)

Designation of the bearings of applicable units	Designation of set screws	Tightening torques N.m (max.)
UC 201 to UC 205	M 5 x 0.8 x 7	3.9
UC 206	M 6 x 0.75 x 8	4.9
UC 207	M 6 x 0.75 x 8	5.8
UC 208 to UC 210	M 8 x 1 x 10	7.8
UC 211	M 8 x 1 x 10	9.8
UC 212	M10 x 1.25 x 12	16.6
UC 213 to UC 215	M10 x 1.25 x 12	19.6
UC 216	M10 x 1.25 x 12	22.5
UC 217 to UC 218	M12 x 1.5 x 13	29.4

Designation of the bearings of applicable units	Designation of set screws	Tightening torques N.m (max.)
AS 201 to 205	M5 x 0.8 x 7	3.4
AS 206	M6 x 0.75 x 8	4.4
AS 207	M6 x 0.75 x 8	4.9
AS 208	M8 x 1 x 10	6.8

9.2.2 Mounting the eccentric locking collar system unit
In this system, unlike the screw system, the shaft and inner ring are fastened together by fastening the eccentric collar in the direction of the rotation of the shaft. They are fastened together securely, and deformation of the inner ring seldom occurs. This system, however, is not recommended for applications where the direction of rotation is sometimes reversed.

Directions for mounting the unit are as follows:
1) Make certain that the frame in which the housing is to be mounted is suitable to the operating conditions with regard to rigidity, flatness, etc.
2) Make sure that the end of the shaft is not burred and that the end of the set screw in the eccentric collar is not protruding from the interior surface of the collar (Fig. 9.8).
3) Mount the housing of the unit securely onto the frame.
4) Determine the relative position of the unit and the shaft accurately so that the unit will not be subjected to any thrust, and then insert the eccentric collar (Fig. 9.9).

Fig. 9.8

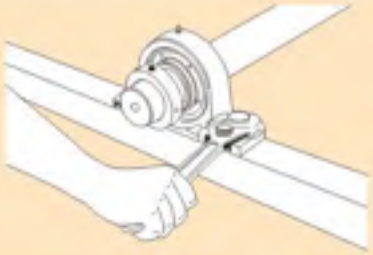


Fig. 9.9

5) Fit the eccentric circular ridge provided on the inner ring into the eccentric circular groove of the eccentric collar, and then provisionally tighten by turning the collar by hand in the direction of the shaft (Fig. 9.10).
6) Insert a bar into the hole provided on the periphery of the eccentric collar and tap the bar so that the collar turns in the direction of rotation of the shaft (see Fig. 9.11).
7) Fasten the set screw of the eccentric collar onto the shaft. Recommended tightening torques are given in Table 9.3.

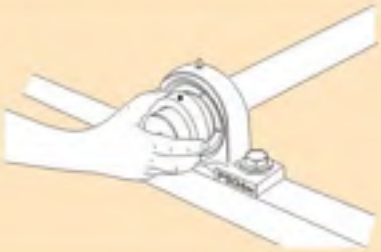


Fig. 9.10

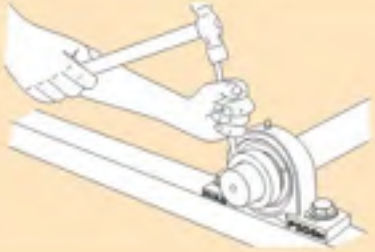


Fig. 9.11

9.2.3 Mounting covered bearing units

For selection of the shaft, mounting the bearing onto the shaft and fitting the housing follow the same procedure as for standard bearing units. Furthermore, fitting the cover presents no special difficulty, with no need for special tools or jigs.

The procedure for mounting covered bearing units is as follows:

1) Remove the cover from the bearing unit. The steel cover can usually be removed easily by hand, but should there be any difficulty due to an over-tight fit, insert a screwdriver or similar tool in a twisting motion, as shown in Fig. 9.12.
2) In order to augment the dust and waterproofing effects, completely fill the space between the two lips of the rubber seal incorporated in the cover with grease, and apply grease to the inside of the cover, filling about two-thirds of the space. Cup grease is commonly used for this purpose (Fig. 9.13).

Fig. 9.12

Fig. 9.13

3) First, pass one of the two grease-packed covers along the shaft, and then slide the bearing unit onto the shaft and fix the inner ring fast on the shaft before tightening the bolts holding the housing. Sometimes these steps are reversed for convenience of assembly. It is recommended that the end of the shaft be chamfered beforehand to avoid damaging the lips of the rubber seal.
4) Next take the cover which has been passed along the shaft and press it into the housing as follows: Be Careful not to strike the surface of the steel cover directly with a steel hammer but use a synthetic resin or wood block in between. Do not strike only in one place but tap the cover all the way round until it is firmly seated in the housing. (Fig. 9.14).
5) Pack the second cover with grease as in step 2 and pass it along the shaft. In the case of a blind cover, the recess of the housing should be filled with grease (Fig. 9.13).
6) Fit the cover into the recess of the housing using the same procedure as detailed in Step 4) (Fig. 9.15).

Fig. 9.14

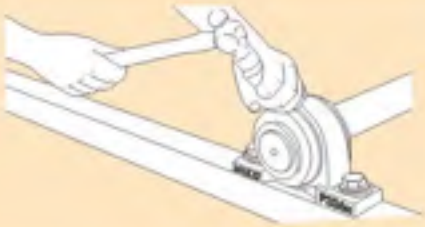


Fig. 9.15

9.3 Running tests
After mounting the bearing unit, check that it has been done correctly.
First, turn the shaft or the rotor by hand to make certain that it rotates smoothly. If there is no irregularity, start up the machine. Run the machine at low speed under no load and gradually bring it up to full operating speed while checking that there are no abnormalities.
Some indications of abnormality of faulty assembly are as follows:
When the shaft is turned by hand a resistance or drag is felt, or the shaft appears to become heavy or light in turn. Or, if the machine is running under power, any abnormal noise, vibration or overheating is evident.

9.4 Inspection during operation
Although the NIKO lubrication-free bearing unit does not require refilling with grease while in use, periodic inspections are necessary to ensure safe operation of the unit's most important parts. While the interval between inspections varies from case to case, according to the degree of importance and the rate of operation, it is usually some time between two weeks and a month.
Since the inside of the bearing can be examined only by removing the slinger, seal etc., The condition of the bearing should be judged by checking for the presence of vibration, noise, overheating of the housing, etc., while the machine is running.

9.5 Dismounting the bearing unit
If some abnormality makes it necessary to dismount the bearing unit from the shaft in order to replace it, the procedure used to mount the bearing is followed in reverse order. In this case, special care should be given to the following points:

1) Set screw system units:
If the set screw is protruding into the bore of the bearing when the unit is withdrawn from the shaft, it will damage the shaft. Therefore the screw should be turned back fully.
2) Adapter system units:
To remove an adapter system bearing unit from the shaft, raise the tab of the washer, turn the nut two or three turns back, and apply a metal block to the nut and tap it with a hammer. Do this all round the nut, until the sleeve can be moved (Fig. 9.16).
If the nut is turned back too far and the screws are only slightly engaged, tapping to remove it will eventually ruin the screws.

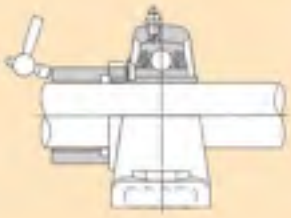
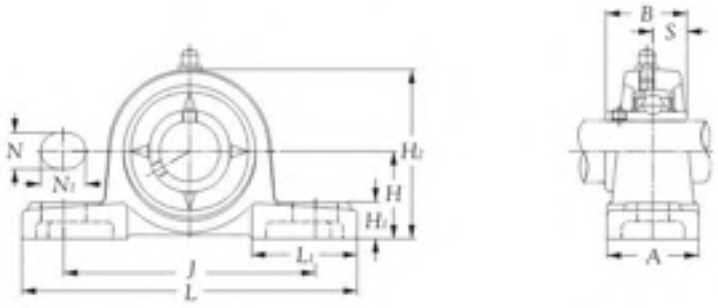


Fig. 9.16

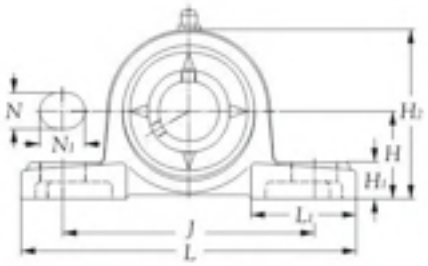
9.6 Replacement of the bearing
If the bearing in the NIKO bearing unit needs to be replaced, this can be carried out simply with a plummer block. There in no need to replace the housing, as it is reusable.
The bearing is changed using the following procedure: First, the set screw should be tightened as much as possible. Otherwise, there is a danger that it may catch in the housing when the bearing is tilted.
Next, insert the handle of a hammer or similar tool into the bore of the bearing and twist. Tilt the bearing through a full 90° , and pull it in the direction of the notch on the housing to remove it. To install a new bearing in the housing, follow the same procedure in reverse.

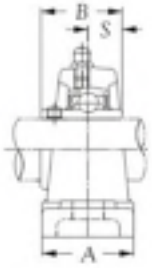
PILLOW BLOCKS CAST HOUSINGS (SET SCREW TYPE)
SERIES **UCP 200**



Shaft dia. mm	Unit number	Nominal dimensions mm										
		H	L	J	A	N	N1	H1	H2	L1	B	S
12	**UCP 201 (H)**	30.2	127	95	38	13	16	14	62	42	31.0	12.7
15	**UCP 202 (H)**	30.2	127	95	38	13	16	14	62	42	31.0	12.7
17	**UCP 203 (H)**	30.2	127	95	38	13	16	14	62	42	31.0	12.7
20	**UCP 204 (H)**	33.3	127	95	38	13	16	14	65	42	31.0	12.7
25	**UCP 205 (H)**	36.5	140	105	38	13	16	15	71	42	34.1	14.3
30	**UCP 206 (H)**	42.9	165	121	48	17	20	17	83	54	38.1	15.9
35	**UCP 207 (H)**	47.6	167	127	48	17	20	18	93	54	42.9	17.5
40	**UCP 208 (H)**	49.2	184	137	54	17	20	18	98	52	49.2	19.0
45	**UCP 209 (H)**	54.0	190	146	54	17	20	20	106	60	49.2	19.0
50	**UCP 210 (H)**	57.2	206	159	60	20	23	21	114	65	51.6	19.0
55	**UCP 211 (H)**	63.5	219	171	60	20	23	23	126	65	55.6	22.2
60	**UCP 212 (H)**	69.8	241	184	70	20	23	25	138	70	65.1	25.4
65	**UCP 213 (H)**	76.2	265	203	70	25	28	27	151	77	65.1	25.4
70	**UCP 214 (H)**	79.4	266	210	72	25	28	27	157	77	74.6	30.2
75	**UCP 215 (H)**	82.6	275	217	74	25	28	28	163	80	77.8	33.3
80	**UCP 216 (H)**	88.9	292	232	78	25	28	30	175	85	82.6	33.3
85	**UCP 217 (H)**	95.2	310	247	83	25	28	32	187	85	85.7	34.1
90	**UCP 218 (H)**	101.6	327	262	88	27	30	33	200	90	96.0	39.7

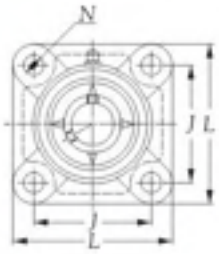
PILLOW BLOCKS CAST HOUSINGS (SET SCREW TYPE)
SERIES **UCP 200**

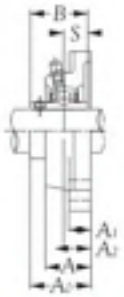




Bolt size mm	Bearing number	Housing number	Mass of unit kg
M10	**UC 201 (D1)**	**P 203 (H)**	0.7
M10	**UC 202 (D1)**	**P 203 (H)**	0.7
M10	**UC 203 (D1)**	**P 203 (H)**	0.7
M10	**UC 204 (D1)**	**P 204 (H)**	0.7
M10	**UC 205 (D1)**	**P 205 (H)**	0.8
M14	**UC 206 (D1)**	**P 206 (H)**	1.3
M14	**UC 207 (D1)**	**P 207 (H)**	1.6
M14	**UC 208 (D1)**	**P 208 (H)**	1.9
M14	**UC 209 (D1)**	**P 209 (H)**	2.2
M16	**UC 210 (D1)**	**P 210 (H)**	2.6
M16	**UC 211 (D1)**	**P 211 (H)**	3.3
M16	**UC 212 (D1)**	**P 212 (H)**	4.6
M20	**UC 213 (D1)**	**P 213 (H)**	5.9
M20	**UC 214 (D1)**	**P 214 (H)**	6.6
M20	**UC 215 (D1)**	**P 215 (H)**	7.4
M20	**UC 216 (D1)**	**P 216 (H)**	9.0
M20	**UC 217 (D1)**	**P 217 (H)**	11.0
M22	**UC 218 (D1)**	**P 218 (H)**	13.0

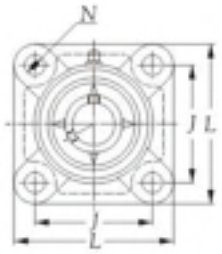
FLANGED UNITS CAST HOUSINGS (SET SCREW TYPE)
SERIES **UCF 200**

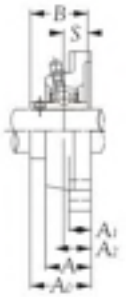




Shaft dia. mm	Unit number	Nominal dimensions mm								
		L	J	A2	A1	A	N	A0	B	S
12	**UCF 201 (H)**	86	64	15	11	25.5	12	33.3	31.0	12.7
15	**UCF 202 (H)**	86	64	15	11	25.5	12	33.3	31.0	12.7
17	**UCF 203 (H)**	86	64	15	11	25.5	12	33.3	31.0	12.7
20	**UCF 204 (H)**	86	64	15	11	25.5	12	33.3	31.0	12.7
25	**UCF 205 (H)**	95	70	16	13	27.0	12	35.8	34.1	14.3
30	**UCF 206 (H)**	108	83	18	13	31.0	12	40.2	38.1	15.9
35	**UCF 207 (H)**	117	92	19	15	34.0	14	44.4	42.9	17.5
40	**UCF 208 (H)**	130	102	21	15	36.0	16	51.2	49.2	19.0
45	**UCF 209 (H)**	137	105	22	16	38.0	16	52.2	49.2	19.0
50	**UCF 210 (H)**	143	111	22	16	40.0	16	54.6	51.6	19.0
55	**UCF 211 (H)**	162	130	25	18	43.0	19	58.4	55.6	22.2
60	**UCF 212 (H)**	175	143	29	18	48.0	19	68.7	65.1	25.4
65	**UCF 213 (H)**	187	149	30	22	50.0	19	69.7	65.1	25.4
70	**UCF 214 (H)**	193	152	31	22	54.0	19	75.4	74.6	30.2
75	**UCF 215 (H)**	200	159	34	22	56.0	19	78.5	77.8	33.3
80	**UCF 216 (H)**	208	165	34	22	58.0	23	83.3	82.6	33.3
85	**UCF 217 (H)**	220	175	36	24	63.0	23	87.6	85.7	34.1
90	**UCF 218 (H)**	235	187	40	24	68.0	23	96.3	96.0	39.7

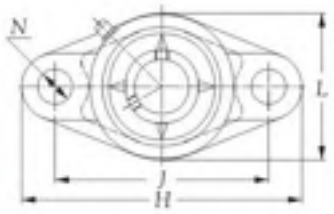
FLANGED UNITS CAST HOUSINGS (SET SCREW TYPE)
SERIES **UCF 200**

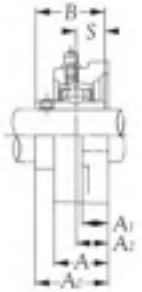




Bolt size mm	Bearing number	Housing number	Mass of unit kg
M10	**UC 201 (D1)**	**F 204 (H)**	0.7
M10	**UC 202 (D1)**	**F 204 (H)**	0.7
M10	**UC 203 (D1)**	**F 204 (H)**	0.6
M10	**UC 204 (D1)**	**F 204 (H)**	0.6
M10	**UC 205 (D1)**	**F 205 (H)**	0.8
M10	**UC 206 (D1)**	**F 206 (H)**	1.0
M12	**UC 207 (D1)**	**F 207 (H)**	1.4
M14	**UC 208 (D1)**	**F 208 (H)**	1.8
M14	**UC 209 (D1)**	**F 209 (H)**	2.2
M14	**UC 210 (D1)**	**F 210 (H)**	2.4
M16	**UC 211 (D1)**	**F 211 (H)**	3.6
M16	**UC 212 (D1)**	**F 212 (H)**	4.4
M16	**UC 213 (D1)**	**F 213 (H)**	5.5
M16	**UC 214 (D1)**	**F 214 (H)**	6.1
M16	**UC 215 (D1)**	**F 215 (H)**	6.9
M20	**UC 216 (D1)**	**F 216 (H)**	8.1
M20	**UC 217 (D1)**	**F 217 (H)**	9.3
M20	**UC 218 (D1)**	**F 218 (H)**	11.0

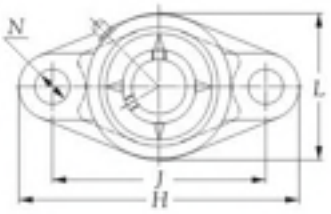
FLANGED UNITS CAST HOUSINGS (SET SCREW TYPE)
SERIES **UCFL 200**

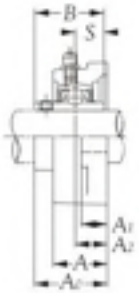




Shaft dia. mm	Unit number	Nominal dimensions mm									
		H	J	A2	A1	A	N	L	A0	B	S
12	UCFL 201 (H)	113	90	15	11	25.5	12	60	33.3	31.0	12.7
15	UCFL 202 (H)	113	90	15	11	25.5	12	60	33.3	31.0	12.7
17	UCFL 203 (H)	113	90	15	11	25.5	12	60	33.3	31.0	12.7
20	UCFL 204 (H)	113	90	15	11	25.5	12	60	33.3	31.0	12.7
25	UCFL 205 (H)	130	99	16	13	27.0	16	68	35.8	34.1	14.3
30	UCFL 206 (H)	148	117	18	13	31.0	16	80	40.2	38.1	15.9
35	UCFL 207 (H)	161	130	19	15	34.0	16	90	44.4	42.9	17.5
40	UCFL 208 (H)	175	144	21	15	36.0	16	100	51.2	49.2	19.0
45	UCFL 209 (H)	188	148	22	16	38.0	19	108	52.2	49.2	19.0
50	UCFL 210 (H)	197	157	22	16	40.0	19	115	54.6	51.6	19.0
55	UCFL 211 (H)	224	184	25	18	43.0	19	130	58.4	55.6	22.2
60	UCFL 212 (H)	250	202	29	18	48.0	23	140	68.7	65.1	25.4
65	UCFL 213 (H)	258	210	30	22	50.0	23	155	69.7	65.1	25.4
70	UCFL 214 (H)	265	216	31	22	54.0	23	160	75.4	74.6	30.2
75	UCFL 215 (H)	275	225	34	22	56.0	23	165	78.5	77.8	33.3
80	UCFL 216 (H)	290	233	34	22	58.0	25	180	83.3	82.6	33.3
85	UCFL 217 (H)	305	248	36	24	63.0	25	190	87.6	85.7	34.1
90	UCFL 218 (H)	320	265	40	24	68.0	25	205	96.3	96.0	39.7

FLANGED UNITS CAST HOUSINGS (SET SCREW TYPE)
SERIES **UCFL 200**

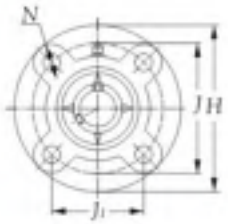


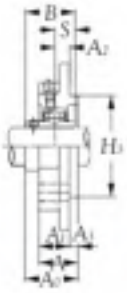


Bolt size mm	Bearing number	Housing number	Mass of unit kg
M10	**UC 201 (D1)**	**FL 204 (H)**	0.6
M10	**UC 202 (D1)**	**FL 204 (H)**	0.6
M10	**UC 203 (D1)**	**FL 204 (H)**	0.5
M10	**UC 204 (D1)**	**FL 204 (H)**	0.5
M14	**UC 205 (D1)**	**FL 205 (H)**	0.6
M14	**UC 206 (D1)**	**FL 206 (H)**	0.9
M14	**UC 207 (D1)**	**FL 207 (H)**	1.2
M14	**UC 208 (D1)**	**FL 208 (H)**	1.6
M16	**UC 209 (D1)**	**FL 209 (H)**	1.9
M16	**UC 210 (D1)**	**FL 210 (H)**	2.2
M16	**UC 211 (D1)**	**FL 211 (H)**	3.1
M20	**UC 212 (D1)**	**FL 212 (H)**	4.0
M20	**UC 213 (D1)**	**FL 213 (H)**	5.0
M20	**UC 214 (D1)**	**FL 214 (H)**	5.6
M20	**UC 215 (D1)**	**FL 215 (H)**	6.2
M22	**UC 216 (D1)**	**FL 216 (H)**	8.2
M22	**UC 217 (D1)**	**FL 217 (H)**	9.3
M22	**UC 218 (D1)**	**FL 218 (H)**	11.0

FLANGED CARTRIDGE UNITS CAST HOUSINGS (SET SCREW TYPE)

SERIES UCFC 200

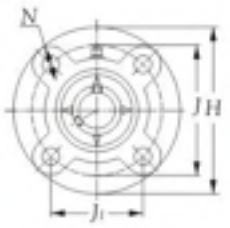


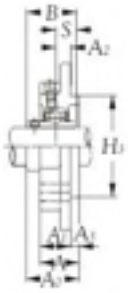


Shaft dia. mm	Unit number	Nominal dimensions mm											
		H	J	J1	A2	N	A3	A1	A	H3	A0	B	S
12	UCFC 201 (H)	100	78	55.1	10	12	5	20.5	25.5	62	33.3	31.0	12.7
15	UCFC 202 (H)	100	78	55.1	10	12	5	20.5	25.5	62	33.3	31.0	12.7
17	UCFC 203 (H)	100	78	55.1	10	12	5	20.5	25.5	62	33.3	31.0	12.7
20	UCFC 204 (H)	100	78	55.1	10	12	5	20.5	25.5	62	33.3	31.0	12.7
25	UCFC 205 (H)	115	90	63.6	10	12	6	21.0	27.0	70	35.8	34.1	14.3
30	UCFC 206 (H)	125	100	70.7	10	12	8	23.0	31.0	80	40.2	38.1	15.9
35	UCFC 207 (H)	135	110	77.8	11	14	8	26.0	34.0	90	44.4	42.9	17.5
40	UCFC 208 (H)	145	120	84.8	11	14	10	26.0	36.0	100	51.2	49.2	19.0
45	UCFC 209 (H)	160	132	93.3	10	16	12	26.0	38.0	105	52.2	49.2	19.0
50	UCFC 210 (H)	165	138	97.6	10	16	12	28.0	40.0	110	54.6	51.6	19.0
55	UCFC 211 (H)	185	150	106.1	13	19	12	31.0	43.0	125	58.4	55.6	22.2
60	UCFC 212 (H)	195	160	113.1	17	19	12	36.0	48.0	135	68.7	65.1	25.4
65	UCFC 213 (H)	205	170	120.2	16	19	14	36.0	50.0	145	69.7	65.1	25.4
70	UCFC 214 (H)	215	177	125.1	17	19	14	40.0	44.0	150	75.4	74.6	30.2
75	UCFC 215 (H)	220	184	130.1	18	19	16	40.0	56.0	160	78.5	77.8	33.3
80	UCFC 216 (H)	240	200	141.4	18	23	16	42.0	58.0	170	83.3	82.6	33.3
85	UCFC 217 (H)	250	208	147.1	18	23	18	45.0	63.0	180	87.6	85.7	34.1
90	UCFC 218 (H)	265	220	155.5	22	23	18	50.0	68.0	190	96.3	96.0	39.7

FLANGED CARTRIDGE UNITS CAST HOUSINGS (SET SCREW TYPE)

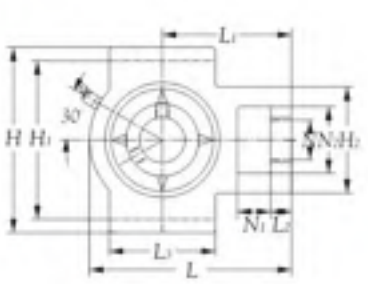
SERIES UCFC 200

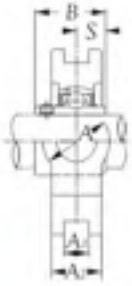




Bolt size mm	Bearing number	Housing number	Mass of unit kg
M10	**UC 201 (D1)**	**FC 204 (H)**	0.8
M10	**UC 202 (D1)**	**FC 204 (H)**	0.8
M10	**UC 203 (D1)**	**FC 204 (H)**	0.7
M10	**UC 204 (D1)**	**FC 204 (H)**	0.7
M10	**UC 205 (D1)**	**FC 205 (H)**	1.0
M10	**UC 206 (D1)**	**FC 206 (H)**	1.3
M12	**UC 207 (D1)**	**FC 207 (H)**	1.6
M12	**UC 208 (D1)**	**FC 208 (H)**	2.1
M14	**UC 209 (D1)**	**FC 209 (H)**	2.7
M14	**UC 210 (D1)**	**FC 210 (H)**	3.1
M16	**UC 211 (D1)**	**FC 211 (H)**	4.2
M16	**UC 212 (D1)**	**FC 212 (H)**	5.3
M16	**UC 213 (D1)**	**FC 213 (H)**	6.0
M16	**UC 214 (D1)**	**FC 214 (H)**	7.0
M16	**UC 215 (D1)**	**FC 215 (H)**	7.8
M20	**UC 216 (D1)**	**FC 216 (H)**	9.3
M20	**UC 217 (D1)**	**FC 217 (H)**	11.0
M20	**UC 218 (D1)**	**FC 218 (H)**	13.0

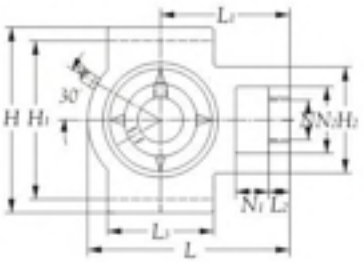
TAKE-UP UNITS CAST HOUSINGS (SET SCREW TYPE)
SERIES **UCT 200**

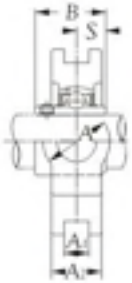




Shaft dia. mm	Unit number	Nominal dimensions mm															
		N_1	L_2	H_2	N_2	N	L_3	A_1	H_1	H	L	A_2	A	r	L_1	B	S
12	**UCT 201 (H)**	16	12	51	32	19	51	12	76	89	94	21	32	33	61	31.0	12.7
15	**UCT 202 (H)**	16	12	51	32	19	51	12	76	89	94	21	32	33	61	31.0	12.7
17	**UCT 203 (H)**	16	12	51	32	19	51	12	76	89	94	21	32	33	61	31.0	12.7
20	**UCT 204 (H)**	16	12	51	32	19	51	12	76	89	94	21	32	33	61	31.0	12.7
25	**UCT 205 (H)**	16	12	51	32	19	51	12	76	89	97	24	32	35	62	34.1	14.3
30	**UCT 206 (H)**	16	12	56	37	22	57	12	89	102	113	28	37	43	70	38.1	15.9
35	**UCT 207 (H)**	16	15	64	37	22	64	12	89	102	129	30	37	51	78	42.9	17.5
40	**UCT 208 (H)**	19	18	83	49	29	83	16	102	114	144	33	49	56	88	49.2	19.0
45	**UCT 209 (H)**	19	18	83	49	29	83	16	102	117	145	35	49	57	88	49.2	19.0
50	**UCT 210 (H)**	19	18	83	49	29	86	16	102	117	151	37	49	59	92	51.6	19.0
55	**UCT 211 (H)**	25	21	102	64	35	95	22	130	146	171	38	64	65	106	55.6	22.2
60	**UCT 212 (H)**	32	21	102	64	35	102	22	130	146	194	42	64	75	119	65.1	25.4
65	**UCT 213 (H)**	32	23	111	70	41	121	26	151	167	224	44	70	87	137	65.1	25.4
70	**UCT 214 (H)**	32	23	111	70	41	121	26	151	167	224	46	70	87	137	74.6	30.2
75	**UCT 215 (H)**	32	23	111	70	41	121	26	151	167	232	48	70	92	140	77.8	33.3
80	**UCT 216 (H)**	32	23	111	70	41	121	26	165	184	235	51	70	95	140	82.6	33.3
85	**UCT 217 (H)**	38	31	124	73	48	157	30	173	198	260	54	73	98	162	85.7	34.1

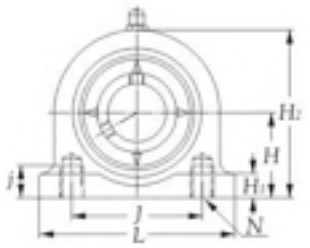
TAKE-UP UNITS CAST HOUSINGS (SET SCREW TYPE)
SERIES **UCT 200**

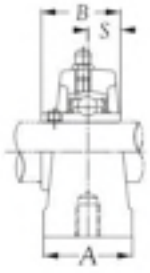




Bearing number	Housing number	Mass of unit kg
UC 201 (D1)	T 204 (H)	0.8
UC 202 (D1)	T 204 (H)	0.8
UC 203 (D1)	T 204 (H)	0.8
UC 204 (D1)	T 204 (H)	0.8
UC 205 (D1)	T 205 (H)	0.9
UC 206 (D1)	T 206 (H)	1.3
UC 207 (D1)	T 207 (H)	1.7
UC 208 (D1)	T 208 (H)	2.3
UC 209 (D1)	T 209 (H)	2.4
UC 210 (D1)	T 210 (H)	2.5
UC 211 (D1)	T 211 (H)	3.8
UC 212 (D1)	T 212 (H)	4.7
UC 213 (D1)	T 213 (H)	7.0
UC 214 (D1)	T 214 (H)	7.3
UC 215 (D1)	T 215 (H)	7.7
UC 216 (D1)	T 216 (H)	8.4
UC 217 (D1)	T 217 (H)	11.0

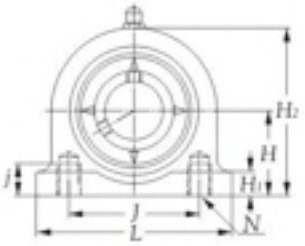
PILLOW BLOCKS CAST HOUSINGS (SET SCREW TYPE)
SERIES **UCUP 200**





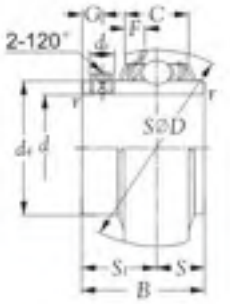
Shaft dia. mm	Unit number	Nominal dimensions mm								
		H	*L*	*J*	*A*	*j*	*H1*	*H2*	*B*	*S*
12	**UCUP 201 (H)**	30.2	76	52	38	13	11	62	31.0	12.7
15	**UCUP 202 (H)**	30.2	76	52	38	13	11	62	31.0	12.7
17	**UCUP 203 (H)**	30.2	76	52	38	13	11	62	31.0	12.7
20	**UCUP 204 (H)**	30.2	76	52	38	13	11	62	31.0	12.7
25	**UCUP 205 (H)**	36.5	84	56	38	15	12	72	34.1	14.3
30	**UCUP 206 (H)**	42.9	94	66	48	18	12	84	38.1	15.9
35	**UCUP 207 (H)**	47.6	110	80	48	20	13	95	42.9	17.5
40	**UCUP 208 (H)**	49.2	116	84	54	20	13	100	49.2	19.0
45	**UCUP 209 (H)**	54.2	120	90	54	25	13	108	49.2	19.0
50	**UCUP 210 (H)**	57.2	130	94	60	25	14	116	51.6	19.0

PILLOW BLOCKS CAST HOUSINGS (SET SCREW TYPE)
SERIES **UCUP 200**



N	Bearing number	Housing number	Mass of unit kg
M10x1.5	**UC 201 (D1)**	**UP 204 (H)**	0.6
M10x1.5	**UC 202 (D1)**	**UP 204 (H)**	0.6
M10x1.5	**UC 203 (D1)**	**UP 204 (H)**	0.6
M10x1.5	**UC 204 (D1)**	**UP 204 (H)**	0.6
M10x1.5	**UC 205 (D1)**	**UP 205 (H)**	0.8
M14x2	**UC 206 (D1)**	**UP 206 (H)**	1.2
M14x2	**UC 207 (D1)**	**UP 207 (H)**	1.7
M14x2	**UC 208 (D1)**	**UP 208 (H)**	2.0
M14x2	**UC 209 (D1)**	**UP 209 (H)**	2.2
M16x2	**UC 210 (D1)**	**UP 210 (H)**	2.9

BALL BEARINGS (SET SCREW TYPE)
SERIES UC 200



Shaft dia. mm	Unit number	Nominal dimensions mm											Basic load ratings N		Mass kg
		d	D	B	C	r1	S	S1	G	ds	d4	F	dynamic Cr	static Cor	
12	UC 201 (D1)	12	47	31.0	16	0.6	12.7	18.3	5.0	M5x0.8	29.6	3.5	12800	6650	0.21
15	UC 202 (D1)	15	47	31.0	16	0.6	12.7	18.3	5.0	M5x0.8	29.6	3.5	12800	6650	0.20
17	UC 203 (D1)	17	47	31.0	16	0.6	12.7	18.3	5.0	M5x0.8	29.6	3.5	12800	6650	0.18
20	UC 204 (D1)	20	47	31.0	16	1.0	12.7	18.3	5.0	M6x1	29.6	3.8	12800	6650	0.17
25	UC 205 (D1)	25	52	34.1	17	1.0	14.3	19.8	5.0	M6x1	33.9	4.3	14000	7850	0.20
30	UC 206 (D1)	30	62	38.1	19	1.0	15.9	22.2	5.0	M6x1	40.8	4.3	19500	11300	0.33
35	UC 207 (D1)	35	72	42.9	20	1.5	17.5	25.4	7.0	M6x1	46.8	4.3	25700	15300	0.49
40	UC 208 (D1)	40	80	49.2	21	1.5	19.0	30.2	8.0	M8x1	53.0	4.3	29100	17800	0.65
45	UC 209 (D1)	45	85	49.2	22	1.5	19.0	30.2	8.0	M8x1	57.5	4.7	32500	20400	0.70
50	UC 210 (D1)	50	90	51.6	24	1.5	19.0	32.6	10.0	M10x1.25	62.4	5.2	35000	23200	0.80
55	UC 211 (D1)	55	100	55.6	25	2.0	22.2	33.4	10.0	M10x1.25	69.0	5.2	43500	29200	1.08
60	UC 212 (D1)	60	110	65.1	27	2.0	25.4	39.7	10.0	M10x1.25	77.0	5.5	52500	36000	1.53
65	UC 213 (D1)	65	120	65.1	29	2.0	25.4	39.7	10.0	M10x1.25	82.5	5.5	57500	40000	1.85
70	UC 214 (D1)	70	125	74.6	30	2.0	30.2	44.4	12.0	M12x1.5	87.0	5.9	62000	44000	2.10
75	UC 215 (D1)	75	130	77.8	32	2.0	33.3	44.5	12.0	M12x1.5	93.0	6.6	66000	49500	2.35
80	UC 216 (D1)	80	140	82.6	33	2.5	33.3	49.3	12.0	M12x1.5	98.1	6.7	72500	53000	2.80
85	UC 217 (D1)	85	150	85.7	35	2.5	34.1	51.6	12.0	M12x1.5	106.4	6.9	83500	64000	3.37
90	UC 218 (D1)	90	160	96.0	37	2.5	39.7	56.3	12.0	M12x1.5	111.6	7.0	96000	71500	4.36

Note: It's applied to assemble with NIKO housings P, F, FL, FC, T and UP.

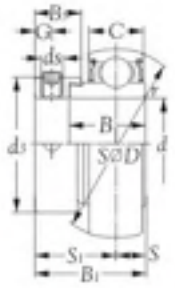
BEARING UNITS

Remark:

Cages		Slingers	Precision	Grease
Steel -	√			
Polyamid -	X	Steel	Class 0 (JIS)	Alvania RA -20°C ~ +120°C
Brass -	X			

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoyobearings.com

BALL BEARINGS (ECCENTRIC LOCKING COLLAR TYPE)
SERIES **AEL 200**



Shaft dia. mm	Unit number	Nominal dimensions mm												Basic load ratings N		Mass kg
		d	D	B1	B	C	r1s	S	S1	G	d1	d3	B5	dynamic Cr	static Cor	
12	AEL201 (D1)	12	40	28.5	19.0	12	0.6	6.0	22.5	4.8	M6x1	29.0	13.6	9600	4600	0.12
15	AEL202 (D1)	15	40	28.5	19.0	12	0.6	6.0	22.5	4.8	M6x1	29.0	13.6	9600	4600	0.11
17	AEL203 (D1)	17	40	28.5	19.0	12	0.6	6.0	22.5	4.8	M6x1	29.0	13.6	9600	4600	0.10
20	AEL204 (D1)	20	47	30.9	21.5	14	1.0	7.0	23.9	4.8	M6x1	33.0	13.5	12800	6650	0.17
25	AEL205 (D1)	25	52	30.9	21.5	15	1.0	7.5	23.4	4.8	M6x1	38.0	13.5	14000	7850	0.20
30	AEL206 (D1)	30	62	35.7	23.8	16	1.0	8.0	27.7	6.0	M6x1	44.5	15.9	19500	11300	0.31
35	AEL207 (D1)	35	72	38.9	25.4	17	1.5	8.5	30.4	6.8	M8x1	55.5	17.5	25700	15300	0.49
40	AEL208 (D1)	40	80	43.6	30.2	18	1.5	9.0	34.6	6.8	M8x1	60.0	18.3	29100	17800	0.66

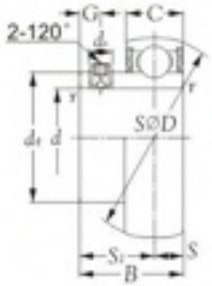
Remark:

Cages		Slingers	Precision	Grease
Steel -	√			
Polyamid -	X	Steel	Class 0 (JIS)	Alvania RA -20°C ~ +120°C
Brass -	X			

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

BEARING UNITS

BALL BEARINGS (SET SCREW TYPE)
SERIES AS 200



Shaft dia. mm	Unit number	Nominal dimensions mm										Basic load ratings N		Mass kg
		d	D	B	C	r1	S	S1	G	d5	d4	dynamic Cr	static Cor	
12	AS 201 (D1)	12	40	22.0	12	0.6	6.0	16.0	4.0	M5x0.8	24.3	9600	4600	0.10
15	AS 202 (D1)	15	40	22.0	12	0.6	6.0	16.0	4.0	M5x0.8	24.3	9600	4600	0.09
17	AS 203 (D1)	17	40	22.0	12	0.6	6.0	16.0	4.0	M5x0.8	24.3	9600	4600	0.08
20	AS 204 (D1)	20	47	24.8	14	1.0	7.0	17.8	5.0	M6x1	29.6	12800	6650	0.13
25	AS 205 (D1)	25	52	27.0	15	1.0	7.5	19.5	5.5	M6x1	33.9	14000	7850	0.16
30	AS 206 (D1)	30	62	30.0	16	1.0	8.0	22.0	6.0	M6x1	40.8	19500	11300	0.25
35	AS 207 (D1)	35	72	32.0	17	1.5	8.5	23.5	6.5	M8x1	46.8	25700	15300	0.37
40	AS 208 (D1)	40	80	34.0	18	1.5	9.0	25.0	7.0	M8x1	53.0	29100	17800	0.50

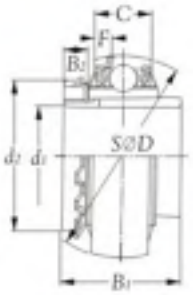
BEARING UNITS

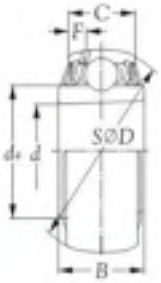
Remark:

Cages		Slingers	Precision	Grease
Steel -	√			
Polyamid -	X	Steel	Class 0 (JIS)	Alvania RA -20°C ~ +120°C
Brass -	X			

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshebearings.com

BALL BEARINGS (ADAPTER TYPE)
SERIES **UK 200**





Taper 1:12

Shaft dia. mm	Unit number	Nominal dimensions mm										Basic load ratings N		Mass kg
		d	D	B	C	d4	d1	B1	B2	d2	F	dynamic Cr	static Cor	
20	UK 205 (D1)	25	52	23	17	33.9	20	35	8	38	4.2	14000	7850	0.25
25	UK 206 (D1)	30	62	26	19	40.8	25	38	8	45	4.2	19500	11300	0.36
30	UK 207 (D1)	35	72	27	20	46.8	30	43	9	52	4.2	25700	15300	0.57
35	UK 208 (D1)	40	80	29	21	53.0	35	46	10	58	4.2	29100	17800	0.74
40	UK 209 (D1)	45	85	31	22	57.5	40	50	11	65	4.2	32500	20400	0.83
45	UK 210 (D1)	50	90	31	24	62.4	45	55	12	70	5.0	35000	23200	0.97
50	UK 211 (D1)	55	100	33	25	69.0	50	59	12	75	6.3	43500	29200	1.26
55	UK 212 (D1)	60	110	36	27	77.0	55	62	13	80	5.3	52500	36000	1.59
60	UK 213 (D1)	65	120	36	29	82.5	60	65	14	85	6.0	57500	40000	2.00
65	UK 215 (D1)	75	130	44	34	93.0	65	73	15	98	9.0	66000	49500	2.56
70	UK 216 (D1)	80	140	45	35	98.1	70	78	17	105	9.5	72500	53000	3.23

Remark:

Cages		Slingers	Precision	Grease
Steel -	√			
Polymid -	X	Steel	Class 0 (JIS)	Alvania RA -20°C ~ +120°C
Brass -	X			

Remark: If you have more inquiry of technical, please inquire NIKO web-site: Http://www.nipponkoshobearings.com

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- Metro train
- Fitness training machine
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