NTN SNR

Needle roller bearing

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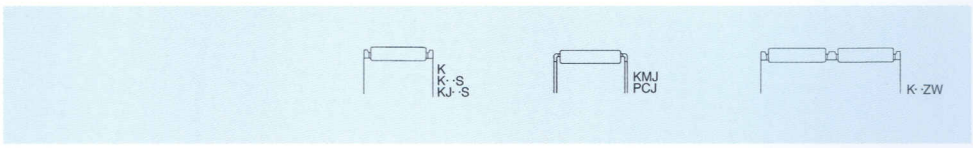
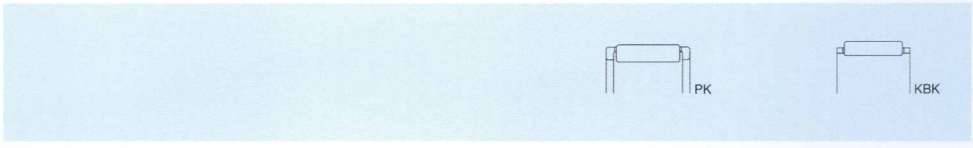
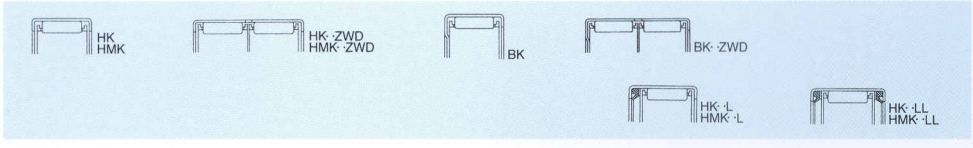


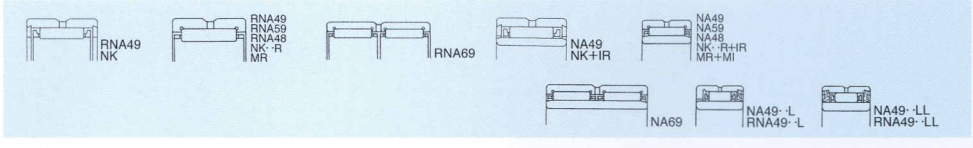
Needle roller and cage assemblies



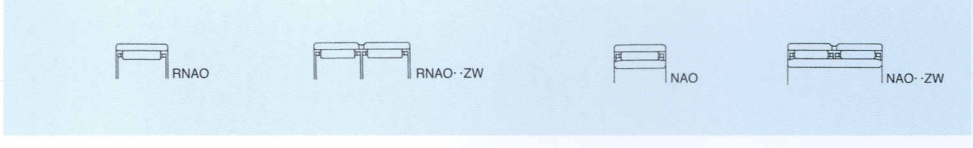
Needle roller and cage assemblies for connecting rod bearings



Drawn cup needle roller bearings

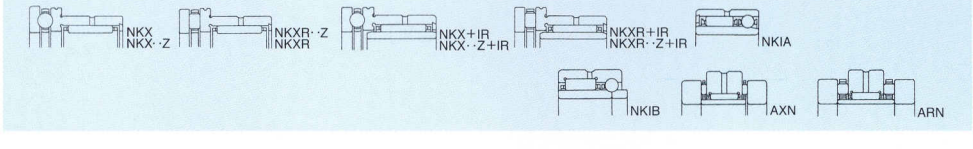


Machined-ring needle roller bearings

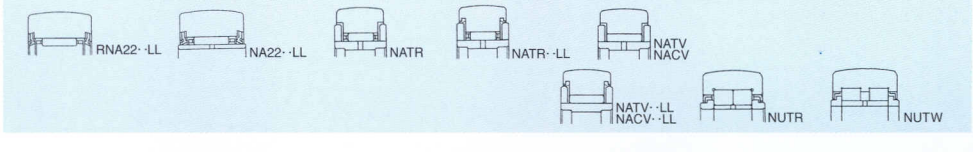


Machined-ring needle roller bearings, separable

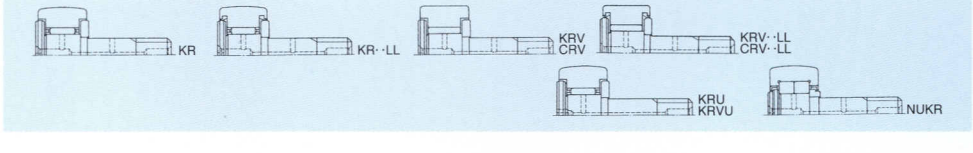
Inner ring



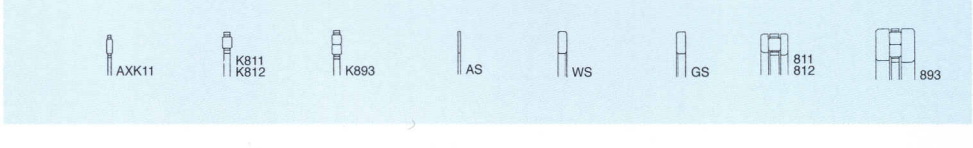
Complex bearings



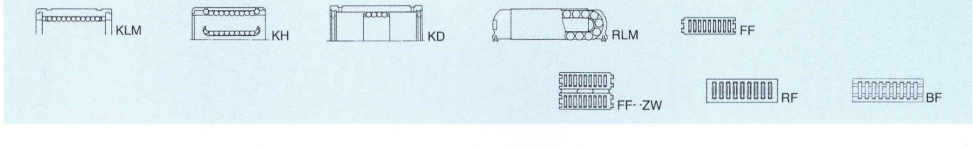
Roller followers



Cam followers



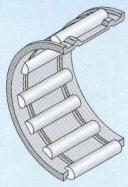
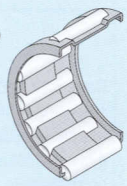
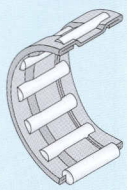
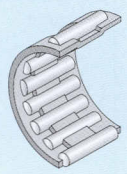
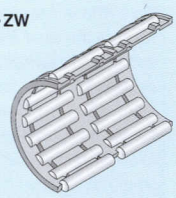
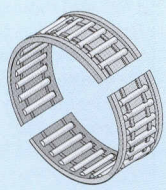
Thrust roller bearings



Linear bearings

Needle roller and cage assemblies

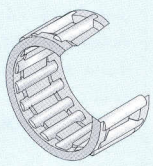
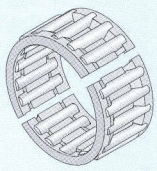
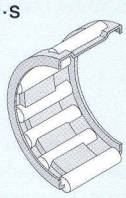
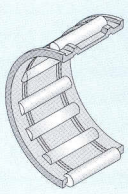
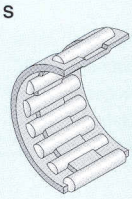
The needle roller and cage assembly form the basic components of the needle roller bearing design. The cage maintains roller separation during operation and the guidance provided is more precise than achieved with a full complement roller design, enabling higher bearing running speeds. (Full complement bearings are more suitable for high-load, low speed and oscillating applications). When utilizing a shaft or housing as the direct raceway surface this eliminates the inner ring and outer ring and so enables the needle roller and cage bearing design to make possible a more compact and lightweight assembly. It also provides high rigidity and load capacity for a given volume.

Type of needle roller and cage assembly	Cage type	Applied shaft diameter (mm)	Composition of nominal bearing number	Nominal bearing number	Code items and respective dimensions
K **(K··S)** **(K··T2)** 	Machined ring type Polyamide resin type	Ø 3 ~ Ø 285	K 20 x 24 x 10 S Tail code Width Roller set outer diameter Inscribed circle diameter Type code	K20 x 24 x 10S	Inscribed circle diameter: Ø 20 Roller set outer diameter: Ø 24 Width: 10 S: Welded cage
	Welded type	Ø 10 ~ Ø 100			
KMJ **(KMJ··S)** **(PCJ)** 	Punched type	Ø 15 ~ Ø 100	KMJ 20 x 26 x 13 Width Roller set outer diameter Inscribed circle diameter Type code	KMJ20 x 26 x 13	Inscribed circle diameter: Ø 20 Roller set outer diameter: Ø 26 Width: 13
	Welded type	Ø 10 ~ Ø 40			
KJ··S 	Welded type	Ø 20 ~ Ø 40	KJ 30 x 35 x 17 S Tail code Width Roller set outer diameter Inscribed circle diameter Type code	KJ30 x 35 x 17S	Inscribed circle diameter: Ø 30 Roller set outer diameter: Ø 35 Width: 17 S: Welded cage
KV··S 	Welded type	Ø 7 ~ Ø 100	KV 30 x 35 x 17 S Tail code Width Roller set outer diameter Inscribed circle diameter Type code	KV30 x 35 x 17S	Inscribed circle diameter: Ø 30 Roller set outer diameter: Ø 35 Width: 17 S: Welded cage
K··ZW 	Machined ring type	Ø 8 ~ Ø 285	K 20 x 24 x 45 ZW Tail code Width Roller set outer diameter Inscribed circle diameter Type code	K20 x 24 x 45ZW	Inscribed circle diameter: Ø 20 Roller set outer diameter: Ø 24 Width: 45 ZW: Double-row type
GK 	Machined ring type Split type	Ø 8 ~ Ø 285	GK 30 x 35 x 17 Width Roller set outer diameter Inscribed circle diameter Type code	GK30 x 35 x 17	Inscribed circle diameter: Ø 30 Roller set outer diameter: Ø 35 Width: 17

Bearings with cage code T2 use a polyamide resin cage which has a peak allowable temperature of 120°C. Under continuous running conditions a temperature of 100°C or less applies. Availability of welded cages in certain dimension series is limited due to manufacturing capability.

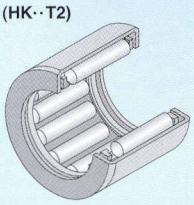
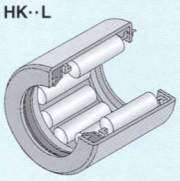
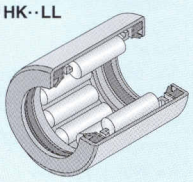
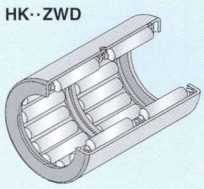
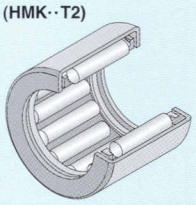
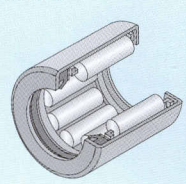
Needle Roller and Cage Assemblies for connecting rod bearings

These needle roller and cage assemblies are specially designed for the operating environmental conditions of connecting rods for small and medium reciprocal engines and compressors. The connecting rods are used under severe operating conditions where the acting load magnitude and direction fluctuate rapidly under high temperature and strict lubrication environments. Special measures are undertaken for the cage structure, material and machining methods so that the needle roller and cage assemblies are resistant to such operating and environmental conditions.

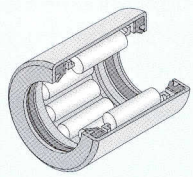
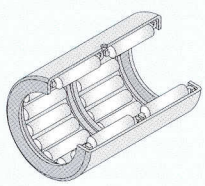
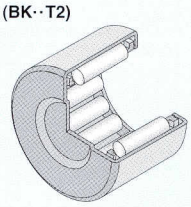
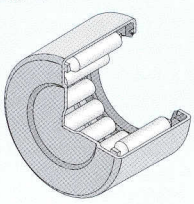
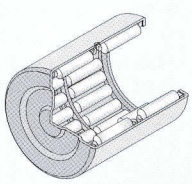
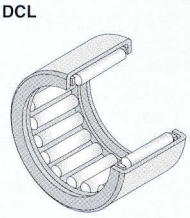
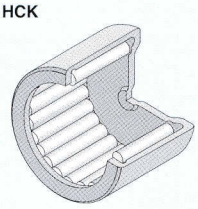
Type of needle roller and cage assembly	Location	Cage type	Applied shaft diameter (mm)	Composition of nominal bearing number	Nominal bearing number	Code items and respective dimensions	Remarks
PK 	Large end side	Machined ring type	Ø 10 ~ Ø 38	PK 20 x 26 x 13.8 X1 Tail code Width Roller set outer diameter Inscribed circle diameter Type code	PK20x26x13.8X1	Inscribed circle diameter: Ø 20 Roller set outer diameter r: Ø 26 Width: 13.8 X1: Special feature	Cage intended to guide outer ring. Surface treatment by non ferrous plating available on request.
GPK 			Ø 10 ~ Ø 38	GPK 20 x 26 x 13.8 X Tail code Width Roller set outer diameter Inscribed circle diameter Type code	GPK20 x 26 x13.8X	Inscribed circle diameter: Ø 20 Roller set outer diameter r: Ø 26 Width: 13.8 X: Special feature	Cage intended to guide outer ring. Surface treatment by non ferrous plating available on request. Can be applied to a crank of integral structure.
KMJ··S 		Welded type	Ø 10 ~ Ø 38	KMJ 10 x 14 x 8.8 S Tail code Width Roller set outer diameter Inscribed circle diameter Type code	KMJ10 x 14 x 8.8S	Inscribed circle diameter: Ø 10 Roller set outer diameter r: Ø 14 Width: 8.8 S: Welded cage	Cage intended to guide outer ring. Surface treatment by non ferrous plating available on request.
KBK 	Small end side	Machined ring type	Ø 7 ~ Ø 25	KBK 14 x 18 x 17 Width Roller set outer diameter Inscribed circle diameter Type code	KBK14 x 18 x 17	Inscribed circle diameter: Ø 14 Roller set outer diameter r: Ø 18 Width: 17	Type KBK is intended to guide the inner ring, so the guide surface is designed to be as long as possible, reducing the surface pressure. In addition, the roller length is designed to maximise the width in contact with the connecting rod, giving a high load capacity. Type V..S intended for outer ring guidance, needs to be guided along the bore surface of connecting rod.
KV··S 		Welded type	Ø 7 ~ Ø 100	KV 8 x 11 x 8 S V4 Tail code Tail code Width Roller set outer diameter Inscribed circle diameter Type code	KV8 x 11 x 8SV4	Inscribed circle diameter: Ø 8 Roller set outer diameter r: 11 Width: 8 S: Welded cage V4: Special feature	

Drawn Cup Needle Roller Bearings

This bearing type is composed of an outer ring drawn from thin steel plate by precision drawing; needle rollers and a cage are assembled in to the outer ring after the raceway surface has been hardened. Within bearing types fitted with an outer ring, this type has the smallest section height, enabling both space and cost savings. Usually this design uses a shaft as the direct raceway surface, eliminating the need for an inner ring. The outer ring of this bearing type is of such design that the needle rollers and cage are not separable, requiring that the bearing is press fitted into a rigid housing using specific fit conditions. Thus, this bearing type requires no snap ring, etc. to fix its axial position and it is also easy to handle.

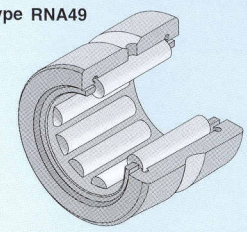
Type of bearing			Applied shaft diameter (mm)	Composition of nominal bearing number	Nominal bearing number	Code items and dimensions	Remarks
HK (HK··T2) 	Standard series	Open end	Ø 3 ~ Ø 50	HK 06 09 T2 Tail code Width Inscribed circle diameter Type code	HK0609T2	Inscribed circle diameter: Ø 6 Width: 9 T2: Resin cage	Bearings with cage code T2 use a polyamide resin cage which has a peak allowable temperature of 120°C. Under continuous running conditions a temperature of 100°C or less applies.
HK··L 		Open end Single side seal	Ø 12 ~ Ø 50	HK 20 18 L Tail code Width Inscribed circle diameter Type code	HK2018L	Inscribed circle diameter: Ø 20 Width: 18 L: Single side seal	This type (Tail code: L or LL) has built in synthetic rubber seals on a single side or both sides and is internally filled with lithium soap based grease. The operating temperature shall range from -25 to 100°C maximum to prevent deterioration of the seal and grease. The roller length and rated load of this bearing type are shorter and smaller than those of the open type of same dimension.
HK··LL 		Open end Double-side seal	Ø 12 ~ Ø 50	HK 20 20 LL Tail code Width Inscribed circle diameter Type code	HK2020LL	Inscribed circle diameter: Ø 20 Width: 20 LL: Double-side seal	
HK··ZWD 		Open end Double-row type	Ø 15 ~ Ø 30	HK 20 30 ZW D Tail code Tail code Width Inscribed circle diameter Type code	HK2030ZWD	Inscribed circle diameter: Ø 20 Width: 30 ZW: Double-row cage D: Outer ring with oil hole	This type is provided with oil hole on its outer ring.
HMK (HMK··T2) 	Heavy load series	Open end	Ø 15 ~ Ø 50	HMK 20 15 Width Inscribed circle diameter Type code	HMK2015	Inscribed circle diameter: Ø 20 Width: 15	Bearings with cage code T2 use a polyamide resin cage which has a peak allowable temperature of 120°C. Under continuous running conditions a temperature of 100°C or less applies.
HMK··L 		Open end Single side seal	Ø 15 ~ Ø 50	HMK 20 18 L Tail code Width Inscribed circle diameter Type code	HMK2018L	Inscribed circle diameter: Ø 20 Width: 18 L: Single side seal	This type (Tail code: L or LL) has built in synthetic rubber seals on a single side or both sides and is internally filled with lithium soap based grease. The operating temperature shall range ... →

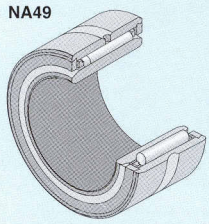
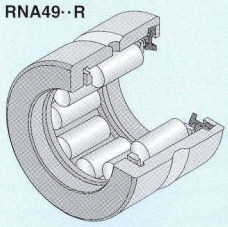
Drawn Cup Needle Roller Bearings (continued)

Type of bearing			Applied shaft diameter (mm)	Composition of nominal bearing number	Nominal bearing number	Code items and dimensions	Remarks
HMK··LL 	Heavy load series	Open end Double-side seal	Ø 15 ~ Ø 50	HMK 20 21 LL Tail code Width Inscribed circle diameter Type code	HMK2021LL	Inscribed circle diameter: Ø 20 Width: 21 LL: Double-side seal	... → from -25 to 100°C maximum to prevent deterioration of the seal and grease. The roller length and rated load of this bearing type are shorter and smaller than those of the open type of same dimension.
HMK··ZWD 		Open end Double-row type	Ø 38 ~ Ø 50	HMK 38 45 ZW D Tail code Tail code Width Inscribed circle diameter Type code	HHK3845ZWD	Inscribed circle diameter: Ø 38 Width: 45 ZW: Double-row cage D: Outer ring with oil hole	This type is provided with oil hole on its outer ring.
BK (BK··T2) 	Standard series	Closed end	Ø 12 ~ Ø 50	BK 20 20 C Tail code Width Inscribed circle diameter Type code	BK2020C	Inscribed circle diameter: Ø 20 Width: 20 C: Welded cage	Bearings with cage code T2 use a polyamide resin cage which has a peak allowable temperature of 120°C. Under continuous running conditions a temperature of 100°C or less applies.
BK··L 		Closed end Single side seal	Ø 12 ~ Ø 50	BK 20 18 L Tail code Width Inscribed circle diameter Type code	BK2018L	Inscribed circle diameter: Ø 20 Width: 18 L: single side seal	This type (Tail code: L) internally filled with lithium soap based grease. The operating temperature shall range from -25 to 100°C maximum to prevent deterioration of the seal and grease.
BK··ZWD 		Closed end Double-row type	Ø 15 ~ Ø 30	BK 20 30 ZW D Tail code Tail code Width Inscribed circle diameter Type code	BK2030ZWD	Inscribed circle diameter: Ø 20 Width: 30 ZW: Double-row cage D: Outer ring with oil hole	
DCL 	Inch series	Open end	Ø 6.35 ~ Ø 50.8	DCL 16 20 Width Inscribed circle diameter Type code	DCL1620	Inscribed circle diameter: Ø 25.4 Width: 31.75	
HCK 	Bearing series for universal joints	Open end Single side seal	Ø 10 ~ Ø 20	HCK 16 22 Outer diameter Inscribed circle diameter Type code	HCK1622	Inscribed circle diameter: Ø 16 Outer diameter: Ø 22	Full complement roller type with no cage. Already filled with specific grease.

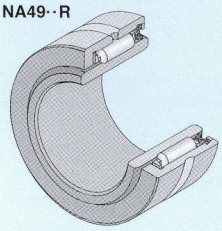
Machined ring needle roller bearings

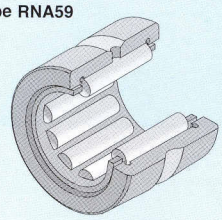
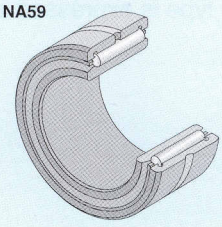
The machined ring of this bearing type contains needle rollers and a cage. The outer ring and the needle rollers are inseparable from each other due to double-side ribs on the outer ring or side plates. Its machined (solid) outer ring makes it more rigid and improves bearing accuracy. This bearing type is suitable for an application requiring high speed, high load and high running accuracy. Machined ring needle roller bearings are available in two types – either with an inner ring or without an inner ring for applications where the shaft is used as the direct raceway surface.

<table>
<tr><th>Bearing type</th><th>Applied shaft diameter (mm)</th><th>Composition of nominal bearing number</th><th>Remarks</th></tr>
<tr><td>Type RNA49
  </td><td>Ø 7 ~ Ø 12</td><td rowspan="2">RNA 49 5 T2
Tail code
Bore dia. No.
Dimension series
Type cod

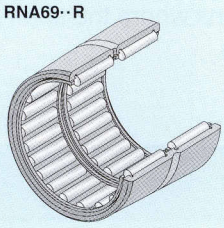
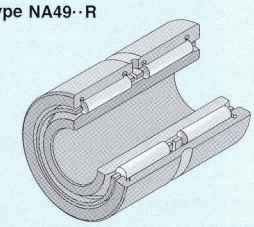
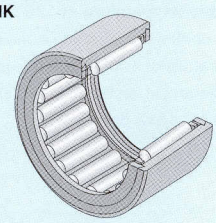
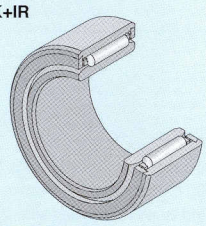
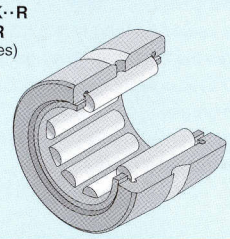
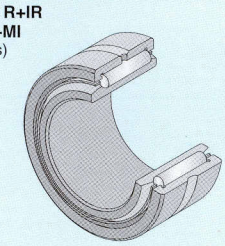
[Tail code]
T2: Resin cage</td><td rowspan="2">Bearings with cage code T2 use a polyamide resin cage which has a peak allowable temperature of 120°C.
Under continuous running conditions a temperature of 100°C or less applies.
The dimension series is in compliance with JIS B 1512 or ISO 15.</td></tr>
<tr><td>Type NA49
  </td><td>Ø 5 ~ Ø 9</td></tr>
<tr><td>Type RNA49··R
  </td><td>Ø 14 ~ Ø 490

With seal
Ø 14 ~ Ø 58</td><td rowspan="2">RNA 49 02 R
Tail code
Bore dia. No.
Dimension series
Type cod

[Tail code]
R: Rib type
L: Single-side seal type
LL: Double-side seal type</td><td rowspan="2">This type (Tail code: L or LL) has built in synthetic rubber seals on a single side or both sides and is internally filled with lithium soap based grease.
The sealed bearing type shall be used within the temperature range of -25 to 100°C to prevent deterioration of the seal and grease.
The dimension series is in compliance with JIS B 15 or ISO 15.</td></tr>
<tr><td>Type NA49··R
  </td><td>Ø 10 ~ Ø 440

With seal
Ø 10 ~ Ø 50</td></tr>
<tr><td>Type RNA59
  </td><td>Ø 20 ~ Ø 160</td><td>RNA 59 02
Type No.
Dimension series
Type code</td><td rowspan="2">The dimension series is in compliance with JIS B 1512 or ISO 15.</td></tr>
<tr><td>Type NA59
  </td><td>Ø 15 ~ Ø 140</td><td>NA 59 / 22
Type No.
Dimension series
Type code</td></tr>
</table>

Machined ring needle roller bearings (continued)

Bearing type	Applied shaft diameter (mm)	Composition of nominal bearing number	Remarks
Type RNA69··R 	Ø 15 ~ Ø 35	RNA 69 01 R Tail code Type No. Dimension series Type code	The dimension series is in compliance with JIS B 1512 or ISO 15.
	Ø 40 ~ Ø 110 Built-in cage double-row type		
Type NA49··R 	Ø 12 ~ Ø 30	NA 69 / 22 Type No. Dimension series Type code	
	Ø 32 ~ Ø 95 Built-in cage double-row type		
Type NK 	Ø 5 ~ Ø 12	NK 7 / 10 T2 Tail code Width Inscribed circle diameter Type code	Bearings with cage code T2 use a polyamide resin cage which has a peak allowable temperature of 120°C. Under continuous running conditions a temperature of 100°C or less applies.
Type NK+IR 	Ø 5 ~ Ø 9	NK24 / 16R + IR 20 x 24 x 16 Type code Bore diameter Outer diameter Width **[Tail code]** R: Rib type T2: Resin cage	
Type NK··R **Type MR** (inch series) 	NK Ø 14 ~ Ø 165	MR 10 18 12 Width code Outer diameter code Inscribed circle diameter Type code	
	MR Ø 15.875 ~ Ø 234.95		
NK··Serie R+IR **Type MR+MI** (inch series) 	NK . . R+IR Ø 10 ~ Ø 150	MR101812 + MI - 06 10 12 Type code Inscribed circle dia. Code Outer diameter code Width code	

Inner Rings

Composition of nominal number

Nominal number comprises type code (IR or MI), dimension code [bore dia. (*d*) × raceway dia. (*F*) × width (*B*)] and tail code.

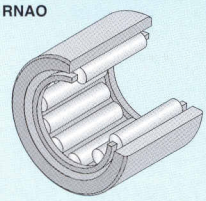
The dimension of inch series MI type is expressed in units of 1/16 inch.

IR 20 x 25 x 18 D
- D: Tail code
- 20 x 25 x 18: Dimension code
- IR: Type code

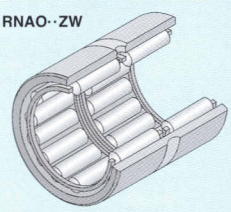
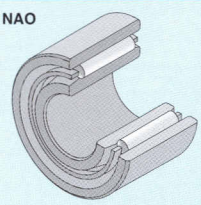
Machined ring needle roller bearings, separable type

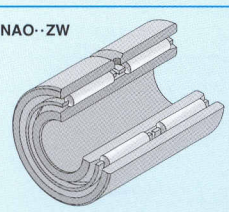
The machined ring of this bearing type has no rib or side plate, consequently the outer ring and the needle roller and cage assembly are separable from each other. The outer ring can't regulate axial displacement of the needle roller and cage assembly; therefore, the bearing construction must be so designed that the needle roller and cage assembly can be guided by a shaft or a housing. Furthermore as the outer ring, needle roller and cage assembly are separable.

It allows the inner ring to be press-fitted separately onto a shaft. This could ease the bearing mounting procedure. This bearing type is also suitable for applications requiring high running accuracy because the resultant radial clearance can be controlled to a narrow range by selection and combination of the inner ring, outer ring and needle roller and cage assembly.

<table>
<tr><th>Bearing type</th><th>Applied shaft diameter (mm)</th><th>Composition of nominal bearing number</th><th>Remarks</th></tr>
<tr><td>Type RNAO
  </td><td>Ø 5 ~ Ø 100</td><td rowspan="2">RNAO - 10 x 17 x 10 T2
Tail code
Width
Outer diameter
Bore diameter
Type code

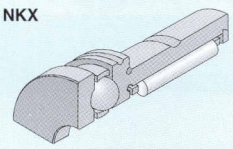
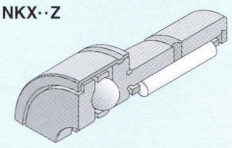
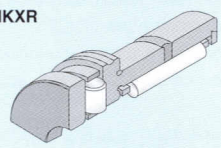
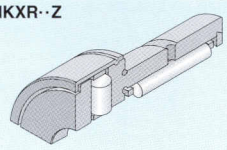
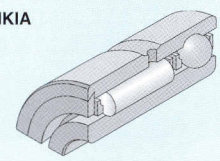
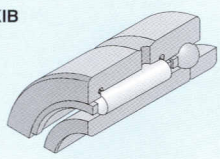
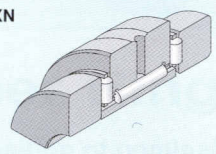
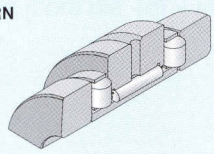
[Tail code]
T2: Resin cage
ZW: Double-row type</td><td rowspan="4">Bearings with cage code T2 use a polyamide resin cage which has a peak allowable temperature of 120°C. Under continuous running conditions a temperature of 100°C or less applies.

For an application requiring high running accuracy, manufacture of the bearings conforming to JIS Class-6, -5 and -4 is available on special request.</td></tr>
<tr><td>Type RNAO··ZW
  </td><td>Ø 8 ~ Ø 80</td></tr>
<tr><td>Type NAO
  </td><td>Ø 8 ~ Ø 90</td><td rowspan="2">NAO - 10 x 17 x 10 ZW
Tail code
Width
Outer diameter
Bore diameter
Type code

[Tail code]
T2: Resin cage
ZW: Double-row type</td></tr>
<tr><td>Type NAO··ZW
  </td><td>Ø 10 ~ Ø 70</td></tr>
</table>

Complex bearings

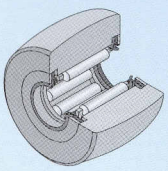
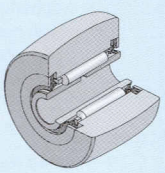
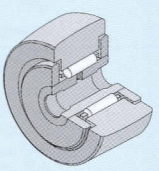
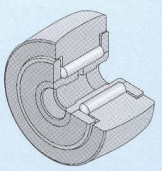
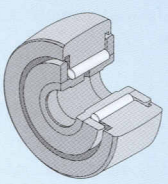
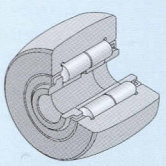
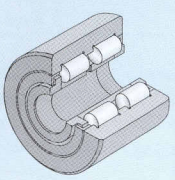
Complex bearings are composed of a radial needle roller bearing to support radial load and a thrust ball bearing or a thrust roller bearing to support axial load which are integrated into one bearing unit. Comparing with the individual use of a radial bearing and a thrust bearing for the same purpose, the complex bearing, in reducing the required installation space can contribute to making the overall equipment design more compact.

Bearing type	Applied shaft diameter (mm)	Composition of nominal bearing number	Bearing components
Type NKX 	Ø 10 ~ Ø 70	**NKX 20 T2** T2: Resin cage — Tail code Dimension code (shaft diameter) Type code	Shaft diameter : Ø 6 Radial bearing : Needle roller type, Iron cage Thrust bearing : Ball type, Resin cage Dust-proof cover : without Thrust plate : Separable
Type NKX··Z 		**NKX 20 T2 Z** T2: Resin cage — Tail code Z: with dust-proof cover Dimension code (shaft diameter) Type code	Shaft diameter : Ø 20 Radial bearing : Needle roller type, Iron cage Thrust bearing : Ball type, Resin cage Dust-proof cover : with Thrust plate : Non-separable, Integral type
Type NKXR 	Ø 15 ~ Ø 50	**NKXR 20 T2** T2: Resin cage — Tail code Dimension code (shaft diameter) Type code	Shaft diameter : Ø 20 Radial bearing : Needle roller type, Iron cager Thrust bearing : Ball type, Resin cage Dust-proof cover : without Thrust plate : Separable
Type NKXR··Z 		**NKXR 20 T2Z** T2: Resin cage — Tail code Z: with dust-proof cover Dimension code (shaft diameter) Type code	Shaft diameter : Ø 20 Radial bearing : Needle roller type, Iron cage Thrust bearing : Ball type, Resin cage Dust-proof cover : with Thrust plate : Non-separable, Integral type
Type NKIA 	Ø 15 ~ Ø 70	**NKIA 59 04** Bore diameter code Dimension series code Type code	Shaft diameter : Ø 20 Radial bearing : Needle roller type Thrust bearing : Angular type
Type NKIB 	Ø 15 ~ Ø 70	**NKIB 59 04 R** R: Outer ring with rib — Tail code Bore diameter code Dimensions series code Type code	Shaft diameter : Ø 20 Radial bearing : Needle roller type, Outer ring with rib Thrust bearing : Three-point contact Angular type
Type AXN 	Ø 20 ~ Ø 50	**AXN 20 52** Outer diameter bore Bore diameter code Type code	Shaft diameter : Ø 20 Outer ring outer diameter : 52 Radial bearing : Needle roller type Thrust bearing : Needle roller type
Type ARN 	Ø 20 ~ Ø 70	**ARN 20 62** Outer diameter code Bore diameter code Type code	Shaft diameter : Ø 20 Outer ring outer diameter : 62 Radial bearing : Needle roller type Thrust bearing : Cylindrical roller type

Roller Followers (Yoke Type track Rollers)

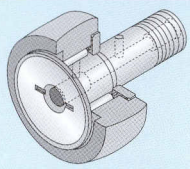
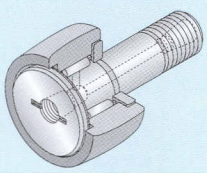
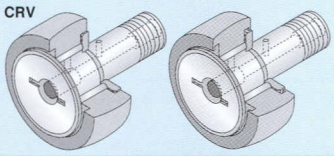
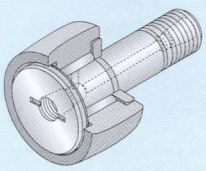
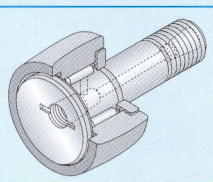
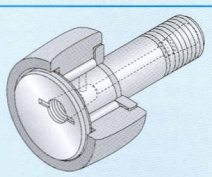
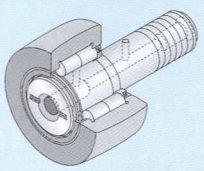
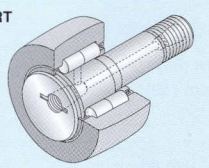
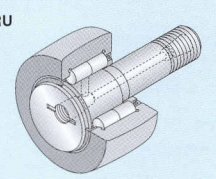
Yoke Type Track Rollers are rolling mechanisms whose outer ring rolls on a track. For example, these track rollers are applied to eccentric roller, guide roller, rocker arm roller, cam roller and pressure roller applications. The outer ring wall thickness is designed to withstand both high and shock loads.

Both spherical and cylindrical outer profiles are available for the outer ring (rolling surface). The spherical outer ring can dampen edge-load acting on the contact surface between the track and the track roller, while the cylindrical outer ring (Tail code: X) has a track load capacity greater than the spherical outer ring design.

Bearing type	Applied shaft diameter (mm)	Composition of nominal bearing number	Track roller components
RNA22 	Ø 6 ~ Ø 58	**RNA 22 / 6 LL** Tail code LL: Seal Dimension code Dimension series code Type code	Inscribed circle diameter : Ø 6 Type with cage Inner ring : without Outer profile : spherical Seal : with
NA22 		**NA 22 06 X LL** Tail code LL: Seal Tail code X: Cylindrical outer diameter Dimension code Dimension series code Type code	Inscribed circle diameter : Ø 30 Type with cage Inner ring : without Outer profile : cylindrical Seal : with
NATR 	Ø 5 ~ Ø 50	**NATR 30 X LL** Tail code LL: Seal Tail code X: Cylindrical outer diameter Dimension code Type code	Inscribed circle diameter : Ø 30 Type with cage Outer profile : cylindrical Seal : with
NATV 	Ø 5 ~ Ø 50	**NATV 25 LL** Tail code LL: Seal Dimension code Type code	Inscribed circle diameter : Ø 25 Full-complement roller type Outer profile : cylindrical Seal : with
NACV 	Ø 6.35 ~ Ø 57.15	**NACV 32 X LL** Tail code LL: Seal Tail code X: Cylindrical outer diameter Dimension code Type code	Inscribed circle diameter : Ø 32 Full-complement roller type Outer profile : cylindrical Seal : with
NUTR 	Ø 15 ~ Ø 50	**NUTR 3 10** Bore dimension (X5 for 04 and above) Dimension series code (200 or 300) Type code	Inscribed circle diameter : Ø 50 Double-row cylindrical Full-complement roller type Labyrinth seal Outer profile : spherical Note : 10 mm (00) - 12 mm (01) 15 mm (02) et 17 mm (03)
NUTW 	Ø 15 ~ Ø 50	**NUTW 2 05 X** Tail code X: Cylindrical outer diameter Bore dimension (X5 for 03 and above) Dimension series code (200 or 300) Type code	Inscribed circle diameter : Ø 50 Double-row cylindrical Full-complement roller type with center rib Labyrinth seal Outer profile : spherical Note : 10 mm (00) - 12 mm (01) 15 mm (02) et 17 mm (03)

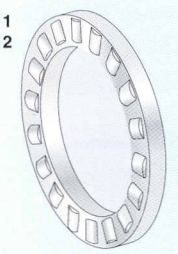
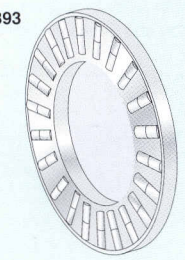
Cam followers stud type truck rollers

This is a track roller fitted with a stud as an alternative to an inner ring. Again the outer ring rolls on the track. These stud type track rollers are applied to similar applications as roller follower's ie.eccentric roller, guide roller, rocker arm roller, etc. One end of the stud is threaded to facilitate direct mounting, whilst the outer ring is guided in the axial direction by side plates which are press fitted onto the flange end of the stud and to the stud itself. Similar to the roller follower, the outer ring has a thick wall and both spherical and cylindrical outer surface profiles (tail code: X) are available.

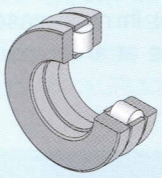
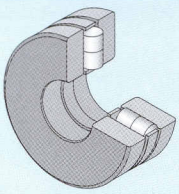
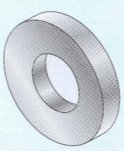
Follower type	Applied shaft diameter (mm)	Composition of nominal bearing number	Follower components
KR **CR** 	KR : Ø 3 ~ Ø 30 CR : Ø 4.826 ~ Ø 22.225	KR 12 T2 H / 3A Tailed code T2: Resin cage H: with hexagonal hole 3A: grease Dimension code Type code	Outer ring outer diameter : Ø 12 With metric series cage Without seal Outer profile : spherical Stud head : with hexagon hole Cage : resin cage Grease : already filled
KRT 	Ø 6 ~ Ø 30	KRT 12 X LL Tail code LL: Seal tailed code X: Cylindrical outer diameter Dimension code Type code	Outer ring outer diameter : Ø 12 With metric series cage Without seal Outer profile : spherical Stud head : with hexagon hole Cage : resin cage Grease : already filled
KRV **CRV** 	KRV : Ø 3 ~ Ø 30 CRV Ø 4.826 ~ Ø 6.5	CRV 30 X LL Tail code LL: Seal Tailed code X: Cylindrical outer diameter Dimension code Type code	Outer ring outer diameter : Ø 30 Inch series full-complement roller type Stud head : with recessed slot for screwdriver use Outer surface profile : cylindrical Seal : with Grease : already filled
KRVT 	Ø 6 ~ Ø 30	KRVT 52 X LL Tail code LL: Seal Tailed code X: Cylindrical outer diameter Dimension code Type code	Outer ring outer diameter : Ø 52 With metric series cage Stud head : with recessed slot for screwdriver use and tapped hole Outer surface profile : cylindrical Seal : with Grease : already filled
KRU 	Ø 6 ~ Ø 30	KRU 32 LL Tail code LL: Seal Dimension code Type code	Outer ring outer diameter : Ø 32 Metric series stud with cage, eccentric type Stud head : with recessed slot for screwdriver use and tapped hole Outer profile : spherical Seal : with Grease : already filled
KRVU 	Ø 6 ~ Ø 30	KRVU 62 X LL Tail code LL: Seal Tailed code X: Cylindrical outer diameter Dimension code Type code	Outer ring outer diameter : Ø 62 Metric series stud with cage, eccentric type Stud head: metric series full-complement roller type stud, eccentric type Seal : with Outer profile : cylindrical Grease : already filled
NUKR 	Ø 12 ~ Ø 64	NUKR 80 H Tail code H: with hexagon socket Dimension code Type code	Outer ring outer diameter : Ø 80 Metric series double-row cylindrical roller type Shielded full-complement roller type Stud head : with hexagon socket Seal : with Outer profile : spherical Grease : already filled
NUKRT 	Ø 12 ~ Ø 64	NUKRT 90 Dimension code Type code	Outer ring outer diameter : Ø 90 Metric series double-row cylindrical roller type Shielded full-complement roller type Stud head: with recessed slot for screwdriver use and tapped hole Outer profile : spherical Grease : already filled
NUKRU 	Ø 12 ~ Ø 64	NUKRU 140 X Tail code X: Cylindrical outer diameter Dimension code Type code	Outer ring outer diameter : Ø 140 Metric series double-row cylindrical roller type Shielded full-complement roller type stud, eccentric type Stud head: with recessed slot for screwdriver use and tapped hole Outer profile : cylindrical Grease : already filled

Thrust roller bearings

The thrust roller bearing is composed of a thrust roller and cage assembly, wherein needle rollers or cylindrical rollers are configured radially in the cage and a bearing ring of disc form is provided to support one-directional axial load. In mounting, it is possible to use either a shaft or housing as the direct raceway surface without using the bearing ring, providing a design of low height, lightweight and compact construction. This type of thrust roller bearing can result in slipping on the raceway surface because theoretically it can't roll perfectly, but in most cases it is practically trouble-free and can rotate at a comparatively high speed.

Bearing type	Cage type	Applied shaft diameter (mm)	Composition of nominal number	Nominal number	Remarks
AXK 	Punched steel plate cage	Ø 10 ~ Ø 120	AXK 11 04 04: Bore diameter code 11: Dimension series code AXK: Type code	AXK1104	Possible to use in combination with AS type bearing ring.
	High tensile brass cage	Ø 130 ~ Ø 160			
K811 K812 	Standard type / Polyamide resin cage	Type K811 Ø 10 ~ Ø 120 Type K812 Ø 30 ~ Ø 80	K8 11 10 T2 T2: Tail code 10: Bore diameter code 11: Dimension series code K8: Type code **[Tail code]** T2: resin cage JW: Punched steel plate cage	K81110T2	Bearings with cage code T2 use a polyamide resin cage which has a peak allowable temperature of 120°C. Under continuous running conditions a temperature of 100°C or less applies. Feel free to contact NTN for details of the punched steel plate cage. Possible to use in combination with GS and WS bearing rings. K811 conforms to the Dimension Series 11 specified in JIS B 1512. K812 conforms to the Dimension Series 12 specified in JIS B 1512
	Aluminum alloy cage	Type K811 Ø 130 ~ Ø 160 Type K812 Ø 85 ~ Ø 140		K81110	
	Punched steel plate cage	Ø 10 ~ Ø 90		K81110JW	
K893 	Aluminum alloy cage	Ø 30 ~ Ø 110	K8 93 10 10: Bore diameter code 93: Dimension series code K8: Type code	K89310	K893 conforms to the Dimension Series 93 specified in JIS B 1512.

Thrust roller bearings (continued)

Bearing type	Cage type	Applied shaft diameter (mm)	Composition of nominal number	Nominal number	Remarks
811 812 		Ø 10 ~ Ø 160	8 11 10 T2 Tail code Bore diameter code Dimension series code Type decode **[Tail code]** T2: Resin cage J: Punched steel plate cage	81110 T2	Bearings with cage code T2 use a polyamide resin cage which has a peak allowable temperature of 120°C. Under continuous running conditions a temperature of 100°C or less applies. WS and GS bearing rings are used in a set.
893 		Ø 30 ~ Ø 110	8 93 10 Bore diameter code Dimension series code Type decode	89310	WS and GS bearing rings are used in a set. 893 conforms to the Dimension Series 93 specified in JIS B 1512.
AS 	Punched steel plate cage	Ø 10 ~ Ø 130	AS 11 04 Bore diameter code Dimension series code Type decode	AS1104	Because of its 1mm thick steel plate ring, this thrust bearing needs adequate rigidity and profile accuracy of machine parts adjacent to the bearing. Unloaded the bearing may appear to have a slight camber, but once loaded the bearing is held flat and this effect disappears.
WS811 WS812 	Solid type bore guide	Ø 10 ~ Ø 160	WS8 11 04 Bore diameter code Dimension series code Type decode	WS81104	Higher rigidity and higher running accuracy than AS bearing ring.
GS811 GS812 	Solid type outer guide	Ø 10 ~ Ø 160	GS8 11 04 Bore diameter code Dimension series code Type decode	GS81104	Higher rigidity and higher running accuracy than AS bearing ring.

One-way Clutches

This is a compact and roller type one-way clutch with a formed cam face on its outer ring. (Available shaft diameter range: 6 to 35 mm). When the outer ring rotates counter clockwise against shaft rotation (arrow → direction on outer ring widthways surface), the rollers advance to the position of engagement with the outer ring cam face by spring action and drive the shaft by acting as a wedge between the outer ring cam face and the shaft. (See Fig. 1) When the outer ring rotates clockwise against the shaft, the shaft rotates counter clockwise relatively to the outer ring, resulting in the rollers moving away from the outer ring cam face and causing the outer ring to idle with the shaft. (See Fig. 2)

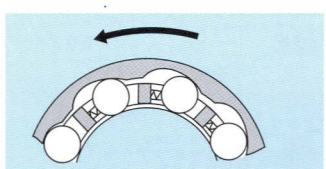


Fig. 1: One-way clutch in engagement

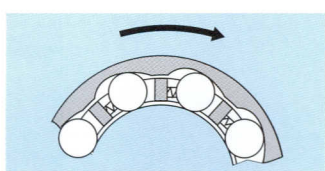
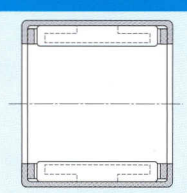
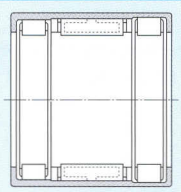
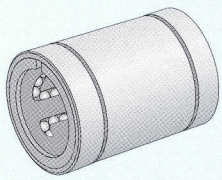
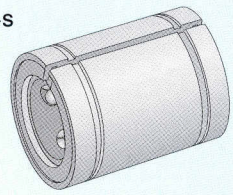
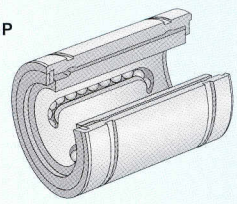
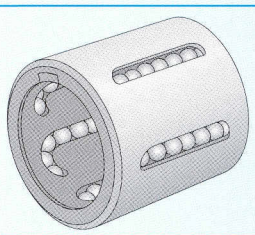
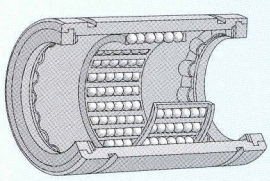
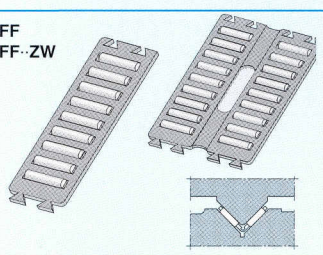
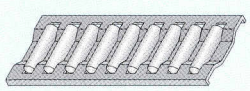
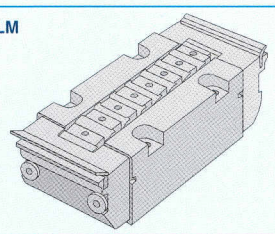
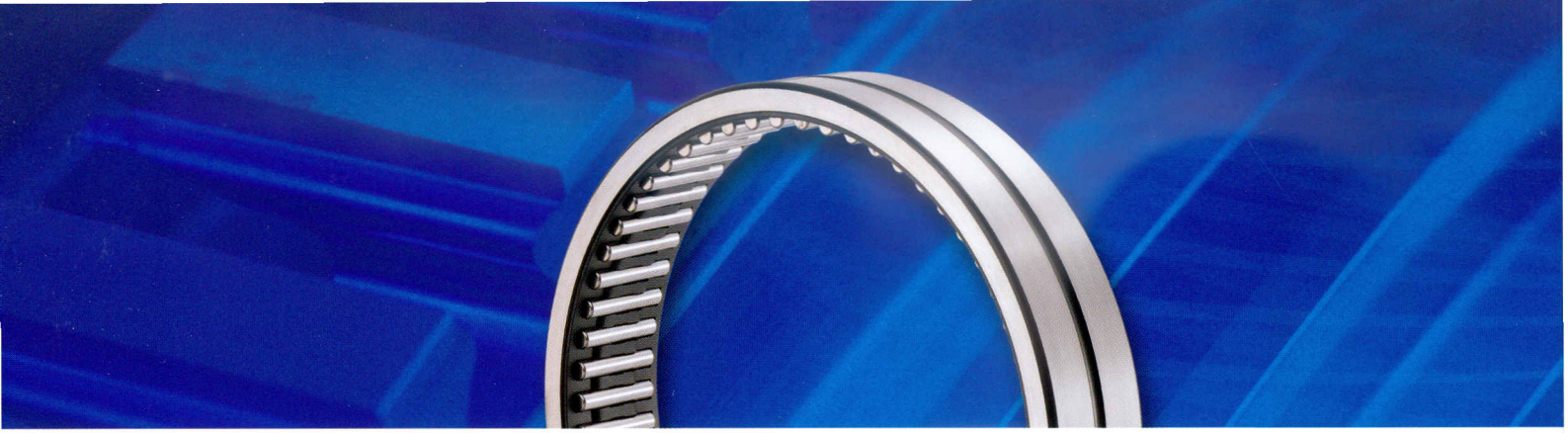


Fig. 2: One-way clutch in idling

Clutch type	Applied shaft diameter (mm)	Composition of nominal clutch number	Remarks
Type HF 	Ø 6 ~ Ø 35	HF 10 12 Width Bore diameter Type code	One-way clutch HF composed of an outer ring drawn from a thin steel plate by precision drawing has the clutching function only. This one-way clutch must be provided with a bearing at its both sides to support radial load acting thereon and to ensure smooth rotating motion.
Type HFL 	Ø 6 ~ Ø 35	HFL 10 22 Width Bore diameter Type code	

Linear Ball Bearings

Type		Applied shaft diameter (mm)	Composition of nominal number
KLM 	This type composed of an outer ring, steel balls and a cage is a cylindrical bearing suitable for most general applications. The high rigidity outer ring ensures precise and smooth infinite linear motion.	Ø 3 ~ Ø 40	KLM 06 L Tail code Inscribed circle diameter Type code
KLM··S 	This type is composed of an outer ring, steel balls and a cage. Both the outer ring and the cage are split axially so that the inscribed circle diameter can be adjusted by deforming the outer ring. The radial clearance and the preload can be easily adjusted as desired by using an adjustable housing.	Ø 10 ~ Ø 40	KLM 30 S Tail code Inscribed circle diameter Type code
KLM··P 	This type is composed of an outer ring, steel balls and a cage. The outer ring and the cage have an axial opening from which one row of balls (equivalent to 50° to 60° degree spacing) is removed. This opening allows the bearing assembly to be used on shafts which are supported. This type also ensures precise and smooth infinite linear motion, similarly to the other types. The bearing radial clearance can be also adjusted.	Ø 16 ~ Ø 40	KLM 30 P LL Tail code Tail code Inscribed circle diameter Type code
KH 	This type is composed of an outer ring, steel balls and a cage. The outer ring is cylindrical and similar to that of Type KLM and drawn from a steel plate by precision deep drawing. This allows a compact bearing design with low section height and light weight. This type also ensures precise and smooth infinite linear motion similarly to other types.	Ø 6 ~ Ø 50 With seal Ø 10 ~ Ø 50	KH 20 30 LL Tail code Width Inscribed circle diameter Type code
KD 	This type composed of an outer ring, steel balls and a cage is a cylindrical bearing suitable for most general applications. The high rigidity outer ring ensures precise and smooth infinite linear motion.	Inscribed circle diameter Ø 10 ~ Ø 80	KD 20 32 45 LL Tail code Width Outer diameter Inscribed circle diameter Type code
FF FF··ZW 	This type composed of a cage and needle rollers reduces the oscillating resistance of the sliding surfaces and ensures smooth reciprocating motion. The cage made of polyamide resin, is provided with grooved joints at both ends allowing several cages to be joined together into one unit.	Diameter of roller Ø 2 ~ Ø 3.5	FF 25 18 ZW Tail code Width Roller diameter x 10 Type code
BF (RF) 	This type composed of a cage and needle rollers reduces the oscillating resistance of the sliding surfaces and ensures smooth reciprocating motion. Either a press-formed steel plate cage (BF) or polyamde resin cage (RF) is available. The feature allowing several bearings to be joined together is not available with this bearing	Diameter of roller Ø 3 ~ Ø 7	BF 30 20 / 1000 Cage overall length Width Roller diameter x 10 Type code
RLM 	This type is composed of a track frame, a separator and rollers. The retained cylindrical rollers circulate within the track frame, ensuring infinite linear motion along a plane.	Section Ø 16 ~ Ø 38	RLM 26 X 86 Bearing overall length Section height Type code



DIAGO s.f.
Železničná 7
977 01 Brezno
SLOVAKIA

Tel.: 00421/ 48/ 671 1111
Fax: 00421/ 48/ 611 5801
E-mail: diago@diago.sk

NTN Wälzlager GmbH - Max-Planck-Straße 23 - 40699 Erkrath - DEUTSCHLAND - Amtsgericht Wuppertal Nr. HRB12669
SNR Roulements - S.A. au capital de 10.065.000 € - 1 rue des Usines - 74000 Annecy - FRANCE - RCS Annecy B325821072 - Code APE 2815Z
NTN Bearings UK Ltd - 11 Wellington Crescent - Fradley Park - Lichfield - Staffordshire - WS13 8RZ - UNITED KINGDOM - Registration Nr. 816672
NTN France - S.A. au capital de 3.700.000 € - ZI Sablière - BP 30 338 - Schweighouse sur Moder - 67507 Haguenau Cedex - FRANCE - RCS Strasbourg B 648501567 - Code APE 4669B
SNR Wälzlager GmbH - Wahlerstraße 6 - 40472 Düsseldorf - DEUTSCHLAND - Amtsgericht Düsseldorf Nr. HRB5520