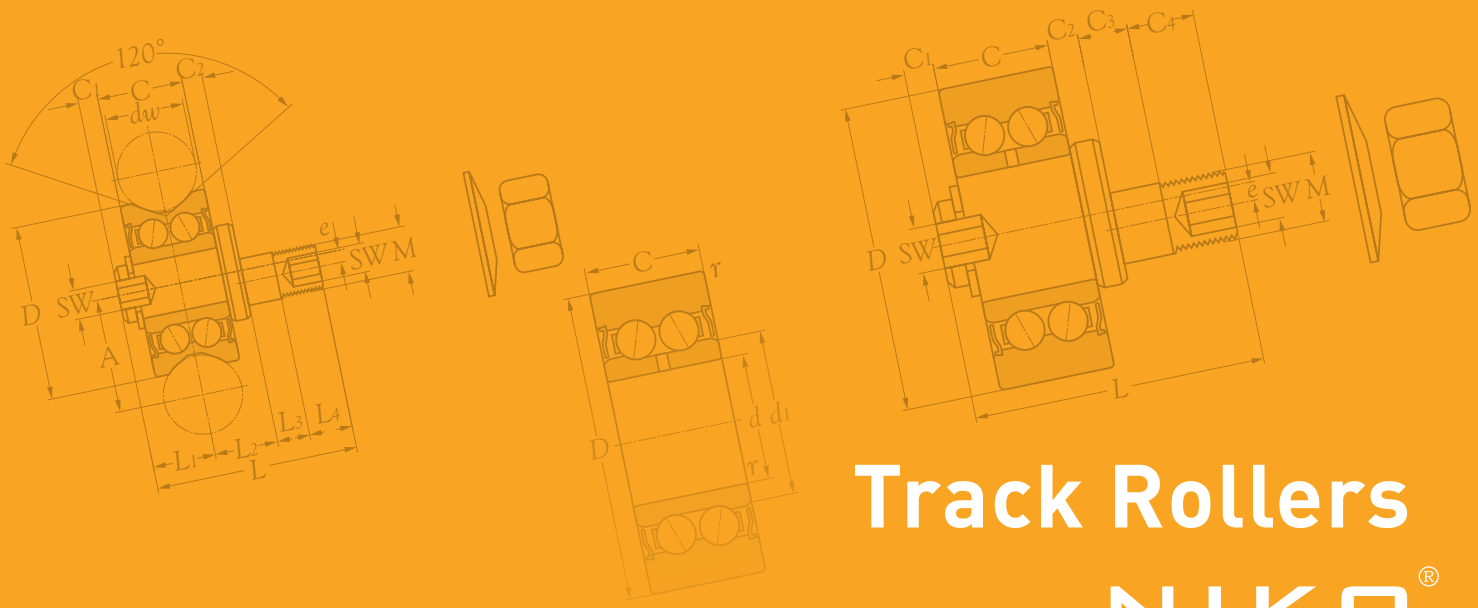

Track Rollers

NIKO®

NIPPON KODO
AUTOMATION TECHNOLOGY

Track Rollers

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Track Rollers

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

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

3.2 Tolerances for radial bearings

Table 3.2 Inner rings

(Unit : μm)

Nominal bore diameter d mm		Single plane mean bore diameter deviation $\triangle d_{mp}$										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

Table 3.3 Inner rings

(Unit : μm)

Nominal bore diameter d mm		Single radial plane bore diameter variation V_{dp} maxdiameter series 2,3,4					Mean single plane bore diameter variation V_{dmp}					Inner ring radial runout K_{ia}					Face runout with bore S_d		
		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

Table 3.4 Inner rings

(Unit : μm)

Nominal bore diameter d mm		Inner ring axial runout (with side) S_{ia} ❷			Inner ring width deviation $\triangle B_s$										Inner ring width varietion V_{Bs}				
					normal						modified ❸								
		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

Note: ❶ The dimensional difference $\triangle d_s$ of bore diameter to applied for class 4 and 2 is the same as the tolerance of dimentional difference $\triangle d_{mp}$ 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: $\triangle d_{mp}$: deviation of the mean bore diameter from the nominal ($\triangle dmp = dmp - d$).
V_{dp}: bore diameter variation; difference between the largest and smallest single bore diameters in one plane.
V_{dmp}: mean bore diameter variation; difference between the largest and smallest mean bore diameters of one ring or washer.
K_{ia}: radial runout of assembled bearing inner ring and assembled bearing outer ring, respectively.
S_d: side face runout with reference to bore (of inner ring).
S_{ia}: side face runout of assembled bearing inner ring and assembled bearing outer ring, respectively.
$\triangle B_s$: deviation of single inner ring width or single outer ring width from the nominal ($\triangle Bs = Bs - B$ etc.)
V_{Bs}: 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}									
												diameter series 9					maxdiameter series 0.1				
		class 0		class 6		class 5		class 4⑤		class 2⑤		class 0	class 6	class 5 max.	class 4	class 2	class 0	class 6	class 5 max.	class 4	class 2
over	incl.	high	low	high	low	high	low	high	low	high	low										
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}⑥ capped bearings diameter series		Mean single plane outside diameter variation V_{Dmp}				
		class 0	class 6	class 5	class 4	class 2	2,3,4 class 0	0,1,2,3,4 class 6	class 0	class 6	class 5	class 4	class 2
over	incl.	max.					max.		max.				
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: △Dmp: deviation of the mean outside diameter from the nominal (△Dmp=Dmp − D).
VDp: outside diameter variation; difference between the largest and smallest single outside diameters in one plane.
VDmp: mean outside diameter variation; difference between the largest and smallest mean outside diameters of one ring or washer.

Table 3.7 Outer rings **(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 Sea❼ class 5	class 4 max.	class 2	Outer ring width deviation △Cs 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 △Bs of inner ring of same bearing	Identical to △Bs 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

Note: ❺ The dimensional difference △*Ds* of outer diameter to be applied for classes 4 and 2 is the same as the tolerance of dimensional difference △*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 Cfass 2.
❻ To be applied in case snap rings are not installed on the bearings.
❼ To be applied for Track Roller Bearings.

Symbols: Kea: radial runout of assembled bearing inner ring and assembled bearing outer ring, respectively.
SD: outside inclination variation: variation in inclination of outside cylindrical surface to outer ring side face.
Sea: side face runout of assembled bearing inner ring and assembled bearing outer ring, respectively.
△Cs: deviation of single inner ring width or single outer ring width from the nominal (△Bs = Bs - B etc.)
VCs: 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

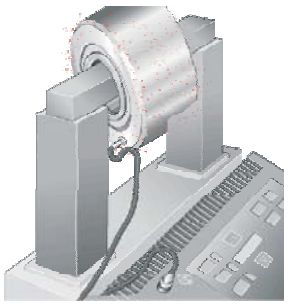
- The assembly area must be kept clean and free from dust
- Protect bearings from dust, contaminants and moisture
  - contaminants have a detrimental influence on the running and operating life of rolling bearings
- Inspect the housing bore and shaft/axis seating for
  - dimensional and geometrical tolerances
  - 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

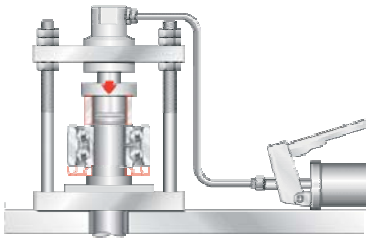
Note: Fitting forces must never be directed through the rolling elements. Direct blows on the bearing rings must be avoided.


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.

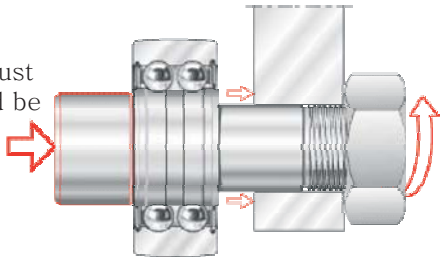
Note: Fitting forces must not be directed through the rolling elements.
It must be ensured that the seals are not damaged during fitting.
- Track rollers must be secured axially according to the advice given.


Fitting of the yoke type track roller using a fitting press

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 intemal 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

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.

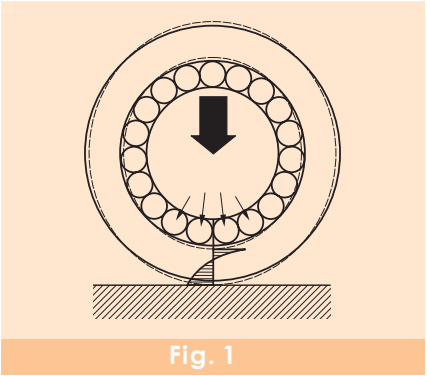


Fig. 1

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

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.

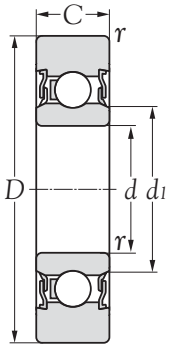
9. Allowable speed

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.

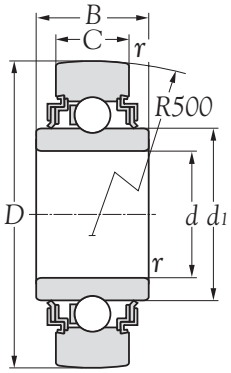
The allowable speeds listed in the bearing tables for grease and oil lubrication are for NIKO track roller under normal operating conditions, correctly installed, using the suitable lubricants with adequate supply and proper maintenance. Moreover, these values are based on normal load conditions ($P \leqslant 0.09C$, $Fa/Fr \leqslant 0.3$). 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.

Track roller bearings double row
series LR..NPP; LR..RRU



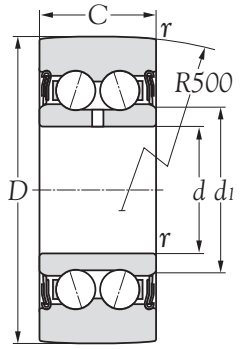
NPP



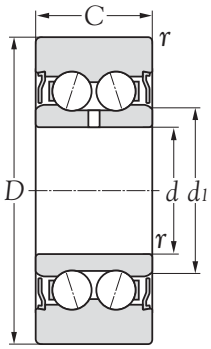
RRU

Boundary dimensions mm						Basic load ratings dynamic static N		Limiting speeds rpm		Bearing number	Mass kg
d	*D*	*C*	*rs*	*d1*	*B*	*C*	*Co*	grease	oil		(approx.)
10	32	9	0.6	15.4	-	4,200	2,050	13,000	-	**LR 200 NPP**	0.050
12	35	10	0.6	17.1	-	5,500	2,600	15,000	-	**LR 201 NPP**	0.050
15	40	11	0.6	20.0	-	6,700	3,150	14,000	-	**LR 202 NPP**	0.070
17	47	12	0.6	22.5	-	9,100	4,200	11,000	-	**LR 203 NPP**	0.110
20	52	14	1.0	26.5	-	11,800	5,400	10,000	-	**LR 204 NPP**	0.150
25	62	15	1.0	30.3	-	14,900	6,800	9,000	-	**LR 205 NPP**	0.230
30	72	16	1.0	37.4	-	20,800	9,200	5,500	-	**LR 206 NPP**	0.330
35	80	17	1.1	42.4	-	26,100	11,400	4,500	-	**LR 207 NPP**	0.400
45	90	19	1.1	53.2	-	30,300	13,100	3,600	-	**LR 209 NPP**	0.450
12	35	10	0.6	18.5	15.0	5,500	3,000	15,000	-	**LR 201 RRU**	0.070
15	40	11	0.6	21.5	14.4	6,700	3,500	14,000	-	**LR 202 RRU**	0.080

Track roller bearings double row
series LR 52..NPPU; LR 52..KDD



NPPU

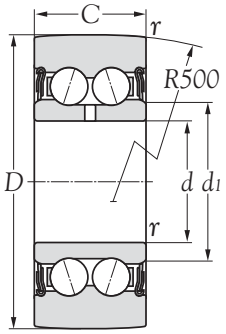


KDD

Track Rollers

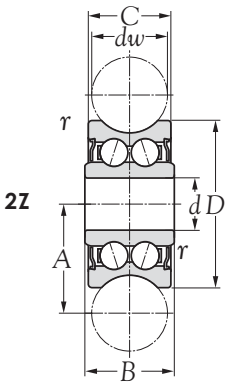
Boundary dimensions mm					Basic load ratings dynamic N	static N	Limiting speeds rpm		Bearing number	Mass kg
d	D	C	rs	d1	C	Co	grease	oil		(approx.)
10	32	14.0	0.6	15.4	6,500	3,900	8,000	-	**LR 5200 NPPU**	0.070
12	35	15.9	0.6	17.1	8,500	4,900	7,500	-	**LR 5201 NPPU**	0.080
15	40	15.9	0.6	20.0	10,100	5,900	7,000	-	**LR 5202 NPPU**	0.110
17	47	17.5	0.6	22.5	13,700	7,800	5,500	-	**LR 5203 NPPU**	0.170
20	52	20.6	1.0	26.5	17,700	10,000	5,000	-	**LR 5204 NPPU**	0.230
25	62	20.6	1.0	30.3	22,000	12,400	4,500	-	**LR 5205 NPPU**	0.340
30	72	23.8	1.0	37.4	30,700	20,400	3,500	-	**LR 5206 NPPU**	0.510
35	80	27.0	1.1	42.4	39,400	21,300	2,800	-	**LR 5207 NPPU**	0.660
40	85	30.2	1.1	48.4	45,500	24,300	2,500	-	**LR 5208 NPPU**	0.750
10	32	14.0	0.6	15.4	6,500	3,900	11,000	-	**LR 5200 KDD**	0.070
12	35	15.9	0.6	17.1	8,500	4,900	10,000	-	**LR 5201 KDD**	0.080
15	40	15.9	0.6	20.0	10,100	5,900	10,000	-	**LR 5202 KDD**	0.110
17	47	17.5	0.6	22.5	13,700	7,800	7,500	-	**LR 5203 KDD**	0.170
20	52	20.6	1.0	26.5	17,700	10,000	7,000	-	**LR 5204 KDD**	0.230
25	62	20.6	1.0	30.3	22,000	12,400	6,500	-	**LR 5205 KDD**	0.340
30	72	23.8	1.0	37.4	30,700	20,400	5,000	-	**LR 5206 KDD**	0.510
35	80	27.0	1.1	42.4	39,400	21,300	3,900	-	**LR 5207 KDD**	0.660
40	85	30.2	1.1	48.4	45,500	24,300	3,500	-	**LR 5208 KDD**	0.750

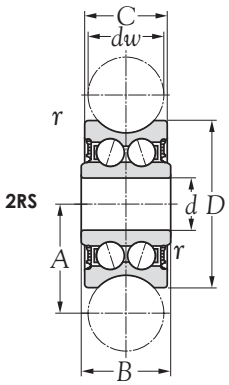
Track roller bearings double row series LR 53.. NPPU



Boundary dimensions mm					Basic load ratings dynamic static N		Limiting speeds rpm		Bearing number	Mass kg
d	D	C	rs	d1	C	Co	grease	oil		(approx.)
17	52	22.2	1.0	23.5	19,300	10,600	4,700	-	LR 5303 NPPU	0.210
20	62	22.2	1.1	29.0	25,100	13,800	4,500	-	LR 5304 NPPU	0.340
25	72	25.4	1.1	34.4	34,300	18,600	3,900	-	LR 5305 NPPU	0.500
30	80	30.2	1.1	41.4	47,200	25,200	3,100	-	LR 5306 NPPU	0.670
35	90	34.9	1.5	47.7	59,800	31,400	2,500	-	LR 5307 NPPU	0.970
40	100	36.5	1.5	52.4	78,000	39,900	2,300	-	LR 5308 NPPU	1.200

Track roller bearings double row series LFR..2RS; LFR..2Z

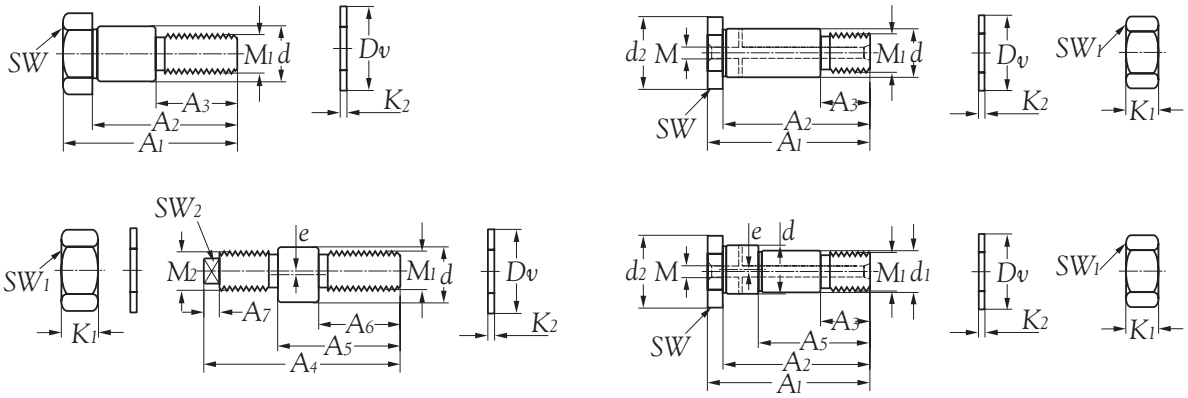




Boundary dimensions mm							Basic load ratings dynamic static N		Limiting speeds rpm		Bearing number		Mass kg
d	dw	D	C	B	A	rs	C	Co	grease	oil			(approx.)
4	4	13.0	6.0	7.0	7.55	0.2	1,050	850	1,150	1,600	LFR 50/4-4 2Z	LFR 50/4-4 2RS	0.007
5	4	16.0	7.0	8.0	9.00	0.2	1,200	860	1,300	1,780	LFR 50/5-4 2Z	LFR 50/5-4 2RS	0.009
5	6	17.0	7.0	8.0	10.50	0.2	1,270	820	1,300	1,780	LFR 50/5-6 2Z	LFR 50/5-6 2RS	0.010
8	6	24.0	11.0	11.0	14.00	0.3	3,670	2,280	1,300	4,560	LFR 50/8-6 2Z	LFR 50/8-6 2RS	0.020
12	10	35.0	15.9	15.9	20.65	0.3	8,500	5,100	5,100	10,200	LFR 5201-10 2Z	LFR 5201-10 2RS	0.080
12	10	42.0	19.0	19.0	24.00	0.6	13,000	7,700	7,500	14,200	LFR 5301-10 2Z	LFR 5301-10 2RS	0.100
15	10	47.0	19.0	19.0	26.65	1.0	16,200	9,200	6,200	18,400	LFLFR 5302-10 2Z	LFR 5302-10 2RS	0.170
12	12	35.0	15.9	15.9	21.75	0.3	8,400	5,000	5,100	10,000	LFR 5201-12 2Z	LFR 5201-12 2RS	0.085
12	14	39.9	18.0	20.0	24.00	0.3	8,900	5,000	6,700	12,100	LFR 5201-14 2Z	LFR 5201-14 2RS	0.095
20	16	52.0	20.6	22.6	31.50	0.6	16,800	9,500	12,100	16,600	LFR 5204-16 2Z*	LFR 5204-16 2RS*	0.230
25	20	72.0	23.8	25.8	41.00	0.6	29,500	16,600	20,700	33,200	LFR 5206-20 2Z*	LFR 5206-20 2RS*	0.250
25	25	72.0	23.8	25.8	43.50	0.6	29,200	16,400	23,100	32,800	LFR 5206-25 2Z*	LFR 5206-25 2RS*	0.250
30	30	80.0	27.0	29.0	51.00	1.0	38,000	20,800	21,400	36,200	LFR 5207-30 2Z*	LFR 5207-30 2RS*	0.660
40	40	98.0	36.0	38.0	62.50	1.0	54,800	29,000	55,000	58,000	LFR 5208-40 2Z*	LFR 5208-40 2RS*	1.360
40	50	110.0	44.0	46.0	72.50	1.1	53,000	39,500	69,000	79,000	LFR 5308-50 2Z*	LFR 5308-50 2RS*	1.400

Remark: * Standard with lubrication hole on inner ring

Track roller bearings double row
series RC..; RE..



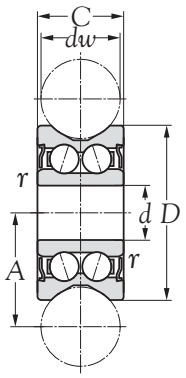
RC..; RE..

RC..A1; RE..A1

Track Rollers

Boundary dimensions mm																		Bearing number	Mass kg (approx.)
A_1	A_2	A_3	A_4	A_5	A_6	A_7 h9	d_1	d_2	M_1	M_2	K_1	K_2	D_v	SW	SW_1	SW_2	e	M	
19.5	16.0	9.5	20.5	15.0	9.0	-	-	-	M4	M4	2.9	-	-	3	7	2	0.50	-	**RC 5; RE 5-05**	0.010
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	-	**RC 8; RE 8-1**	0.020
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	-	**RC 12; RE 12-1**	0.040
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	-	**RC 12/M12; RE 12-1/M12**	0.060
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	-	**RC 15; RE 15-1**	0.060
50.0	45.0	16.0	-	30.0	-	-	10	20	M10x1.5	-	8.0	2.0	21	17	17	6	0.75	5.9	**RC 12X45 A1; RE 12X45 A1**	0.040
75.0	67.0	23.0	-	45.0	-	-	17	30	M16x1.5	-	13.0	3.0	30	27	24	-	1.00	5.9	**RC 20X67 A1; RE 20X67 A1**	0.200
92.0	82.0	30.0	-	57.0	-	-	22	40	M20x1.5	-	16.0	3.0	37	36	30	-	1.00	5.9	**RC 25X82 A1; RE 25X82 A1**	0.400
107.0	95.0	32.0	-	67.0	-	-	27	45	M24x1.5	-	19.0	4.0	44	41	36	-	1.00	5.9	**RC 30X95 A1; RE 30X95 A1**	0.620
117.0	107.0	42.0	-	72.0	-	-	36	55	M30x1.5	-	24.0	4.0	56	46	46	-	1.00	5.9	**RC 40X107 A1; RE 40X107 A1**	1.100
125.0	115.0	42.0	-	72.0	-	-	36	55	M30x1.5	-	24.0	4.0	56	46	46	-	1.00	5.9	**RC 40X115 A1; RE 40X115 A1**	1.200

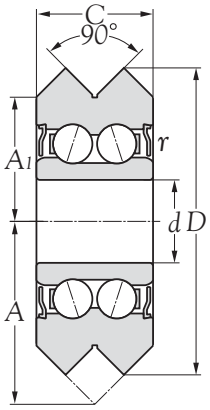
Track roller bearings double row
series RV



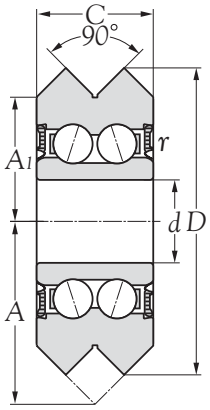
Boundary dimensions mm						Basic load ratings dynamic static N		Limiting speeds rpm		Bearing number	Mass kg
d	*dw*	*D*	*C*	*A*	*rs*	*C*	*Co*	grease	oil		(approx.)
7	10	22	11	14.50	0.3	2,450	1,620	2,350	4,150	**RV 20/7-10**	0.017
8	10	30	14	18.10	0.3	4,490	2,700	11,000	19,800	**RV 20/8-10**	0.062
15	10	38	17	22.25	0.5	7,290	4,550	10,200	17,900	**RV 202/15.38-10**	0.086
15	10	40	18	22.00	0.5	7,950	4,950	14,500	26,500	**RV 20/15.40-10**	0.110
12	20	41	20	28.00	0.3	8,180	5,100	17,200	31,500	**RV 201/12-20**	0.130
15	20	41	20	28.00	0.5	8,180	5,100	17,200	31,500	**RV 202/15.41-20**	0.120
17	20	58	25	35.00	0.5	16,580	9,200	47,000	86,000	**RV 203/17-20**	0.325
20	30	57	22	41.00	0.6	16,910	9,200	47,000	86,000	**RV 204/20.57-30**	0.290
20	30	58	25	41.00	0.6	16,790	9,200	40,000	72,000	**RV 204/20.58-30**	0.310

Remark: * The unit contamination protection is provided by side shields 2Z.

Track roller bearings double row
series RM..2Z; RM..2RS



2Z

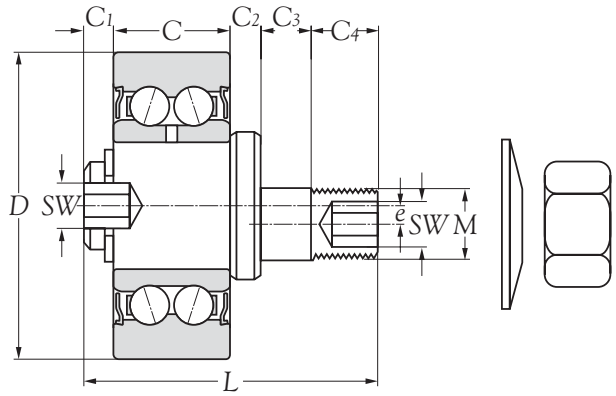


2RS

Track Rollers

Boundary dimensions mm						Basic load ratings dynamic static N		Limiting speeds rpm		Bearing number		Mass kg
d	D	A	C	A_1	rs	C	Co	grease	oil			(approx.)
4.763	19.56	11.86	7.87	7.93	0.3	1,650	1,140	4,150	7,500	**RM 1 2Z**	**RM 1 2RS**	0.012
9.525	30.73	18.24	11.10	12.70	0.3	8,260	2,650	6,500	11,700	**RM 2 2Z**	**RM 2 2RS**	0.040
11.999	45.72	26.98	15.88	19.05	0.6	5,530	5,200	31,000	55,000	**RM 3 2Z**	**RM 3 2RS**	0.136
15.001	59.94	34.93	19.05	25.40	1.0	16,250	9,200	39,500	72,000	**RM 4 2Z**	**RM 4 2RS**	0.285

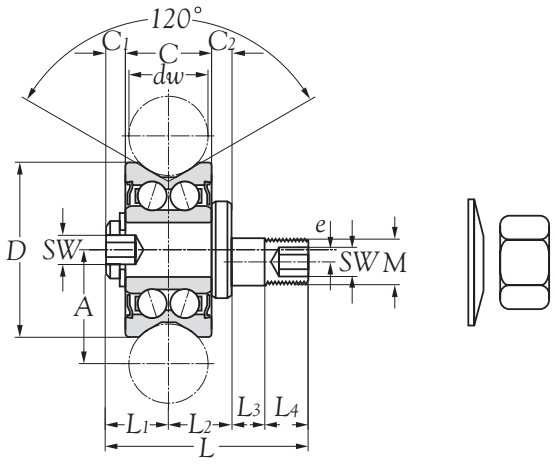
Track roller bearings double row
series RA..A



Boundary dimensions mm										Basic load ratings dynamic static N		Limiting speeds rpm		Bearing number	Mass kg
D	C	L	C_1	C_2	C_3	C_4	e	SW	M	C	Co	grease	oil		(approx.)
35	15.9	42	2.1	5	6.0	13	1.0	5	M 12	8,100	4,900	4,900	9,700	**RA 35 A**	0.150
52	22.2	57	3.3	8	9.5	14	1.5	6	M 16	16,000	9,100	11,500	15,800	**RA 52 A**	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.

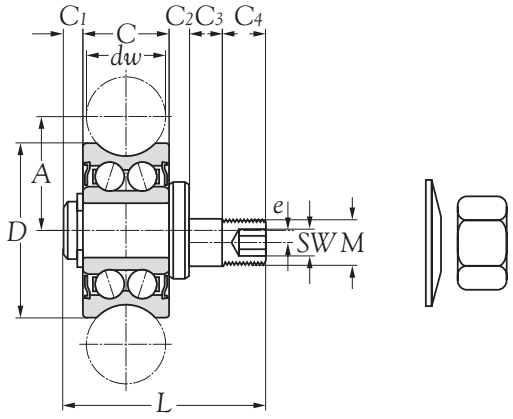
Track roller bearings double row
series RV..C; RV..E



Boundary dimensions mm														Basic load ratings dynamic static N		Limiting speeds rpm		Bearing number concentric	eccentric	Mass kg
dw	D	C	A	L	L1	L2	L3	L4	C1	C2	e	SW	M	C	Co	grease	oil			(approx.)
10	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	**RV 22 C**	**RV 22 E**	0.028
10	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	**RV 30 C**	**RV 30 E**	0.069
10	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	**RV 38 C**	**RV 38 E**	0.145
20	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	**RV 41 C**	**RV 41 E**	0.190
20	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	**RV 58 C**	**RV 58 E**	0.460

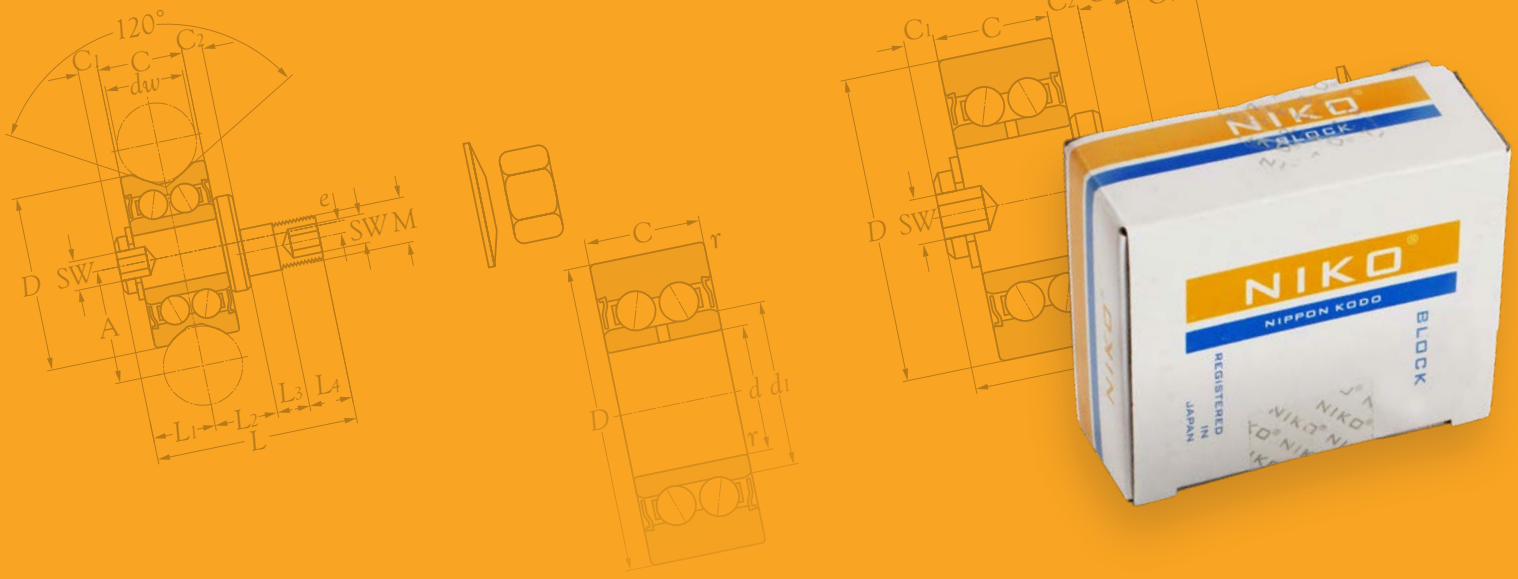
Remark: * Track rollers with integral studs are supplied with split washer and nut.
* The unit contamination protection is provided by side shields 2Z.

Trackrollerbearingsdoublerow
series RPC; RPE



Boundary dimensions mm												Basic load ratings dynamic static N		Limiting speeds rpm		Bearing number concentric	eccentric	Mass kg
dw	D	C	A	L	C1	C2	C3	C4	e	SW	M	C	Co	grease	oil			(approx.)
6	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	**RPC 17**	**RPE 17**	0.015
6	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	**RPC 24**	**RPE 24**	0.042
10	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	**RPC 35**	**RPE 35**	0.120

Remark: * Track rollers with integral studs are supplied with split washer and nut.



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