TRACK ROLLERS

Track rollers

Yoke type track rollers

STUD TYPE TRACK ROLLERS

Stud type track rollers are the bearings that have similar internal design as needle roller bearings or cylindrical roller bearings, the bearings have very thick outer ring to accommodate shock loads while reducing distortion and bending stress.

Instead of an inner ring, stud type rollers have a solid stud that is threaded so that the bearings can be quickly and easily attached to appropriate machine components by means of a hexagonal nut.

NPB stud track roller bearings are mainly available in KR series and NUKR series two basic designs.

The two designs have the same main dimensions. The differences are in their internal design, which make them suitable for various operating conditions. In contrast to ball and roller bearings, where the bearing size refers to the bore diameter d, for cam followers the size refers to their outside diameter D.

Profile of The Outer Ring Running Surface

The stud type track rollers with crowned surface are standard type and predominantly used since they are often inclined during operation and edge stress must be avoided. In series KR, the radius of curvature is R500mm. In series KR..PP, KRE..PP, KRV..PP, NUKR, NUKRE, PWKR..2RS and PWKRE..2RS, the outside surface has the optimized profile. The optimized profile provide better load distribution than the stud type track rollers with standard radius.

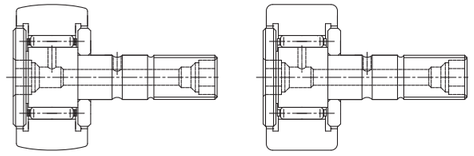
Bearings with cylindrical outer ring running surface which is suffixed with letter X are also available (fig 12). This kind of bearing is used for applications requiring high stiffness and inclined position can be avoided. These bearings are dimensionally interchangeable with the standard profile stud type track rollers.

Structure

KR design track rollers

KR design track rollers are fitted with needle roller and cage assemblies. The bearings are axially guided by the integral flange and an interference fitted washer on the stud.

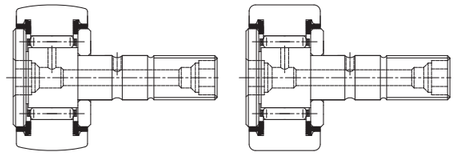
KR design stud track rollers without a designation suffix have a narrow gap between the outer ring and the two flanges and serves as a gap type seal (fig 1).



KR KR..X

fig 1

Bearings identified with suffix PP are provided with plastic plain washers served as seals on both sides (fig 2).

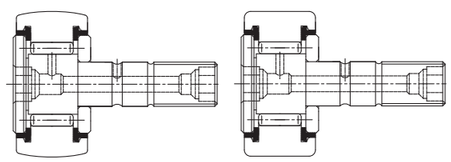


KR..PP KR..XPP

fig 2

KRV design track rollers

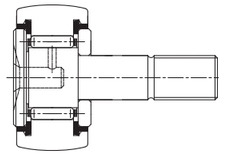
KRV design track rollers are similar to the KR design with a designation suffix PP (fig 3), but the difference is that the KRV design has a full complement of needle rollers. Therefore, stud track rollers with KRV design have higher load capacity than KR design stud track rollers, but the operation speed is lower, and it require more frequent relubrication.



KRV..PP KRV..XPP

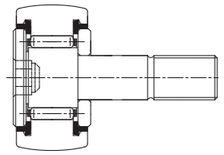
fig 3

KR design stud track rollers, size 16 and 19, either with seal suffix or not have one slot in the head of the stud (fig 4) that enables the stud to be held in place by a screwdriver. In the centre of that slot is a lubrication hole to press in a grease fitting. The two sizes are also available with a recessed hexagon in the head of the stud which is suffixed with NK (fig 5), the bearings are supplied with a polyamide 66 axial sliding and sealing ring on both sides and can not be lubricated.



KR16, KR19
KR16..PP, KR19..PP

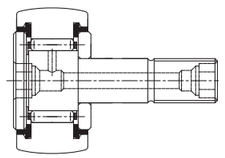
fig 4



KR16..PPNK, KR19..PPNK

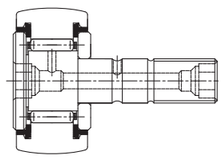
fig 5

KR design stud track rollers with designation, size 22 and larger, have a recessed hexagon at each side of the stud. However, size 22 and 26 do not have an annular groove and lubrication hole in the middle of the stud (fig 6). In the centre of each hexagon is a lubrication hole to press in a grease fitting, if needed. For stud track rollers from size 30 and larger, the grease can also be supplied via the lubrication hole with an annular groove in the middle (fig 7).



KR22, KR26
KR22..PP, KR26..PP

fig 6



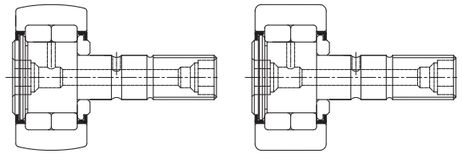
KR..PP from size 30

fig 7

NUKR design track rollers

The NUKR series track rollers (fig 8) are double row full complement cylindrical roller bearings. The stud head and pressed-on flange ring guide the outer ring axially via the roller sets. This enables NUKR design track rollers to accommodate relatively heavy axial loads that are induced when operating in an inclined or tilted position.

The metal angular ring pressed into the outer ring formed an effective labyrinth seal on both sides of the bearings. The recessed hexagons on both sides of the stud enable the track rollers to be held in place with a hexagon key easily during mounting. In the middle of the hexagon is the lubrication hole for a press-in grease fitting.



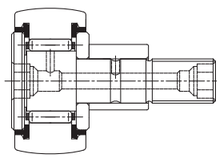
NUKR NUKR..X

fig 8

Stud type track rollers with eccentric collar

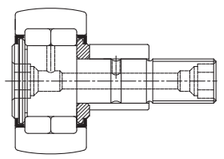
The KR design suffixed with PP and NUKR design stud track rollers are also available with an eccentric collar (fig 9, fig 10) on the stud. An eccentric collar, which has a shrink-fit onto the stud, enables less stringent manufacturing position tolerances to be specified for associated components.

The values for the adjustable eccentricity are listed in table 4. An eccentric collar is identified by the letter E at the end of the basic designation, KRE and NUKRE for example. Because the eccentric collar covers the duct in the stud, these stud type track rollers can only be lubricated via the stud ends.



KRE..PP

fig 9



NUKRE

fig 10

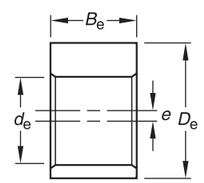


Table 4 – Eccentric sleeves dimensions

Outer diameter track roller > mm	≤	Dimensions d_e	D_e	B_e	e
	16	6	9	7	0,5
19	19	8	11	9	0,5
22	26	10	13	10	0,5
30	32	12	15	11	0,5
35	35	16	20	14	1,0
40	40	18	22	16	1,0
47	52	20	24	18	1,0
62	72	24	28	22	1,0
80	90	30	35	29	1,5

Tolerance

The tolerance of standard stud type track rollers with crowned profile has the tolerance of 0/-0.05 on outer diameter for all dimension series.

The tolerance of stud type track roller bearings with cylindrical profiled outer ring corresponds to the tolerance specification of standard ISO-492 Radial Bearings-Tolerances. The tolerance is indicated in table in next section which is also applicable for Yoke type track rollers.

For the stud type track rollers, the tolerance of the shank diameter to h7 (see table 5) and the eccentric collar diameter to h9.

Table 5 Tolerance of diameter and stud length

Stud diameter d_1 mm >	≤	Δd_{1S} µm high	low	Stud length B_2	ΔB_2 mm high	low
3	6	0	-12			
6	10	0	-15			
10	18	0	-18	all lengths	0	-1
18	30	0	-21			
30	50	0	-25			
50	80	0	-30			
80	100	0	-35			

Assembly

When the roller stud stem is assembled in a hole with tolerance H7, the assembly force should be applied only in the central part of the stud shoulder, better with a manual balance press. The hole surface, in the machine element which supports the stud, should not deform under the expected load, and the support should be rigid enough to resist bending loads.

Deformation and declines can make uneven loads on outer ring.

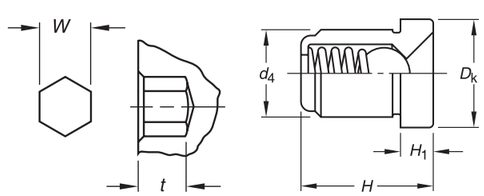
During the track roller setting, the lateral washer should be supported by a plain shoulder in vertical with stud axis. The shoulder diameter should be higher or the same to diameter da indicated in the tables.

This is the stud maximum reaction when the track roller is supported as near as possible to the lateral washer, minimizing the bending moment. For this reason, the support box of the stud should be with an alive angle but without burss. The locking nut must not be tight with a higher couple than the indicated one.

On the head of the stud, there is a slot for the screwdriver or a hexagon socket to inhibit the stud turn while tightening the nut. The dimension of hexagon socket refer to table6. The hexagonal nuts are given together with the track rollers.

Table 6 – Hexagon socket

Execusion	NK		NNK	
Track roller diameter	W mm	t mm	W mm	t mm
> 16	3	2,5	-	-
19	4	2,5	-	-
22	4	2,5	-	-
26	4	2,5	-	-
30	6	4	-	-
32	6	4	-	-
35	6	4	8	5
40	8	5	8	5
47	8	5	10	6
52	8	5	10	6
62	12	7	14	7
72	12	7	14	7
80	17	10	14	7
85	17	10	14	7
90	17	10	14	7



Lubrication

The NPB track rollers are provided lubricated with high quality lithium base grease. When series KR track rollers with cage running at low speed, light loads and in clean environment, usually there is no need to relubricate the bearing. In other applications, it could be necessary to make a periodical relubrication to have always the best performance. Track rollers with full complement set (series KRV and NUKR) have a small internal volume available for the grease, so it would require a more frequent re-lubrication.

The stud type track rollers with a slot for screwdriver and those with hexagon socket could be regreased through the flanged side. The track rollers with hexagon socket suffixed with NK could not be regreased through the flanged side of the stud. Both types with outer diameter more than 22mm, can be lubricated through both the flanged side or the thread side. Track rollers with outer diameter of 30mm or more can also be lubricated via the hole in the shank of the stud. Details can be referred to Fig4-7.

The axial holes in the stud ends are prepared for the grease nipples with series of PENN. The grease nipples are provided with bearings, the dimensions refer to table 7.

Table 7 – Grease nipple, PENN series

Code	Dimensions d_4 mm	D_K	H	H_1	Mass ≈ g
PENN 4	4	6	6	1,5	0,4
PENN 6	6	8	7	2	1,6
PENN 8	8	10	12	3	4,7

Suffixes

- **•PP** KR design track rollers with plastic axial sliding and sealing rings on both sides.
- **•2RS** PWKER design track rollers with protected lip seal on both side of the stud type track roller
- **•X** cylindrical outer ring
- **•NK** KR..PP design track rollers, size 16 and 19 with a hexagon recessed into the head of the stud. No relubrication facility.

Load Coefficient

Dynamic load

When the outer ring of a track roller rolls on a desk, with the presence of a radial load, the contact makes the outer ring an elastic deformation (ovalization). Consequently, it is loaded on a small zone of the raceway, and the load is distributed on few needle rollers. This influences the dynamic and static load coefficients of the track rollers. This deformation makes also a bending stress to the outer ring which must not exceed the maximum permissible value of the material. The maximum permissible conditions of the radial dynamic load (Fr perm) and static (F0r perm) are determined by this requirement.

The fatigue life of track rollers should be calculated using the dynamic load coeffient indicated in the tables. The tables show also the maximum permissible radial load, Fr perm that could be applied dynamically on track rollers. Anyway, to calculate the life L10 of a track roller, the applied radial load must not exceed Cw/2 based on the ideal operating conditions of alignment, lubrication, temperature, speed and acceleration.

Static load

Besides the static load coefficient C_0, the tables contain also the permissible radial static load $F_{0r\ perm}$ which could be applied to a track roller. The values of $F_{0r\ perm}$ are calculated with a minimum static coefficient fs of 0.7 in the worst conditions of internal load distribution during the operation. The values $F_{0r\ perm}$ must not be exceeded. The static coefficient fs could be calculated using the following formula:

$$f_s \geq 0.7 \frac{F_{0r\ perm}}{P_{0r}}$$

where $F_{0r\ perm}$ = maximum permissible radial static load (kN)

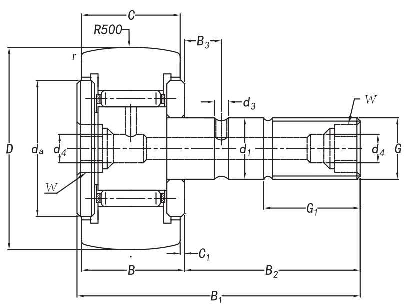
P_{0r} = radial static load (kN)
P= F for track rollers

F_{0r} = equivalent static load (kN)

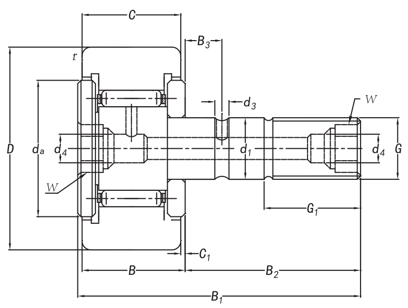
f_s = static load factor

Needle roller stud type track rollers

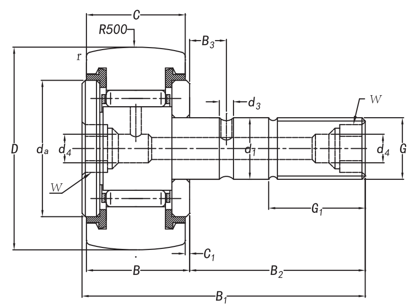
With cage and seal



KR



KR.X



KR..PP

Outer diameter	Dimensions d_1 h7	D	C	$r_{s\ min}$	B_1	B_2	B_3	G_1	d_4	d_3	G	C_1	d_a
	mm												
16	6	16	11	0,3	28,2	16		8	4		M6x1	0,6	11
	6	16	11	0,3	28,2	16		8	4		M6x1	0,6	11
	6	16	11	0,3	28,2	16		8	4		M6x1	0,6	11
	6	16	11	0,3	28,2	16		8	4		M6x1	0,6	11
	6	16	11	0,3	28,2	16		8	4		M6x1	0,6	11
	6	16	11	0,3	28,2	16		8	4		M6x1	0,6	11
19	8	19	11	0,3	32,2	20		10	4		M8x1,25	0,6	13
	8	19	11	0,3	32,2	20		10	4		M8x1,25	0,6	13
	8	19	11	0,3	32,2	20		10	4		M8x1,25	0,6	13
	8	19	11	0,3	32,2	20		10	4		M8x1,25	0,6	13
	8	19	11	0,3	32,2	20		10	4		M8x1,25	0,6	13
	8	19	11	0,3	32,2	20		10	4		M8x1,25	0,6	13
22	10	22	12	0,3	36,2	23		12	4		M10X1	0,6	15
	10	22	12	0,3	36,2	23		12	4		M10X1	0,6	15
	10	22	12	0,3	36,2	23		12	4		M10X1	0,6	15
	10	22	12	0,3	36,2	23		12	4		M10X1	0,6	15
	10	22	12	0,3	36,2	23		12	4		M10X1	0,6	15
	10	22	12	0,3	36,2	23		12	4		M10X1	0,6	15
26	10	26	12	0,3	36,2	23		12	4		M10X1	0,6	15
	10	26	12	0,3	36,2	23		12	4		M10X1	0,6	15
	10	26	12	0,3	36,2	23		12	4		M10X1	0,6	15
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	10	26	12	0,3	36,2	23		12	4		M10X1	0,6	15
	10	26	12	0,3	36,2	23		12	4		M10X1	0,6	15
30	12	30	14	0,6	40,2	25	6	13	6	3	M12x1,5	0,6	21
	12	30	14	0,6	40,2	25	6	13	6	3	M12x1,5	0,6	21
	12	30	14	0,6	40,2	25	6	13	6	3	M12x1,5	0,6	21
	12	30	14	0,6	40,2	25	6	13	6	3	M12x1,5	0,6	21
	12	30	14	0,6	40,2	25	6	13	6	3	M12x1,5	0,6	21
	12	30	14	0,6	40,2	25	6	13	6	3	M12x1,5	0,6	21
32	12	32	14	0,6	40,2	25	6	13	6	3	M12x1,5	0,6	21
	12	32	14	0,6	40,2	25	6	13	6	3	M12x1,5	0,6	21
	12	32	14	0,6	40,2	25	6	13	6	3	M12x1,5	0,6	21
	12	32	14	0,6	40,2	25	6	13	6	3	M12x1,5	0,6	21
	12	32	14	0,6	40,2	25	6	13	6	3	M12x1,5	0,6	21
	12	32	14	0,6	40,2	25	6	13	6	3	M12x1,5	0,6	21

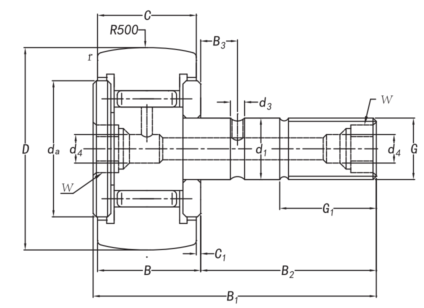
Note: 1) Eccentric version on request

2) W refer to table 6

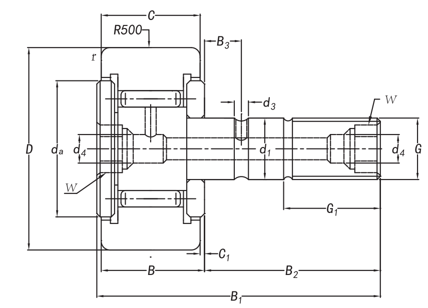
TRACK ROLLERS

Needle roller stud type track rollers

Full complement



KRV

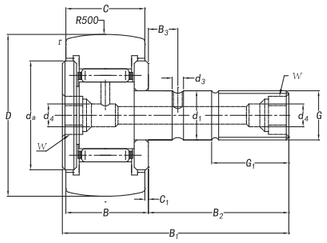


KRV..X

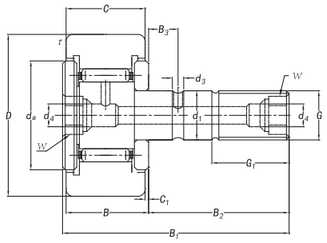
Track roller	Load coefficients: Bearing dynamic C	Bearing static C_0	C_w	Track roller dynamic $F_{r\ perm}$	Track roller static $F_{0r\ perm}$	Torque	Reference speed Grease	Mass
	kN					Nm		kg
KR16	3,6	3,58	2,97	2,85	3,58	7	17 000	0,019
KR16.X	3,6	3,58	2,97	2,85	3,58	7	17 000	0,019
KR16.PP	3,6	3,58	2,97	2,85	3,58	7	17 000	0,019
KR16.X.PP	3,6	3,58	2,97	2,85	3,58	7	17 000	0,019
KRV16	6,9	8,4	5,11	3,49	6,84	7	5 700	0,019
KRV16.X	6,9	8,4	5,11	3,49	6,84	7	5 700	0,019
KR19	4,18	4,65	3,28	3,29	4,22	16	13 000	0,031
KR19.X	4,18	4,65	3,28	3,29	4,22	16	13 000	0,031
KR19.PP	4,18	4,65	3,28	3,29	4,22	16	13 000	0,031
KR19.X.PP	4,18	4,65	3,28	3,29	4,22	16	13 000	0,031
KRV19	8,08	11	5,66	4,13	8,05	16	4 300	0,031
KRV19.X	8,08	11	5,66	4,13	8,05	16	4 300	0,031
KR22	5,35	6,79	3,94	4,04	5,45	28	10 000	0,046
KR22.X	5,35	6,79	3,94	4,04	5,45	28	10 000	0,046
KR22.PP	5,35	6,79	3,94	4,04	5,45	28	10 000	0,046
KR22.X.PP	5,35	6,79	3,94	4,04	5,45	28	10 000	0,046
KRV22	9,45	14,3	6,32	5,04	9,54	28	3 400	0,046
KRV22.X	9,45	14,3	6,32	5,04	9,54	28	3 400	0,046
KR26	5,35	6,79	4,55	6,78	7,24	28	10 000	0,059
KR26.X	5,35	6,79	4,55	6,78	7,24	28	10 000	0,059
KR26.PP	5,35	6,79	4,55	6,78	7,24	28	10 000	0,059
KR26.X.PP	5,35	6,79	4,55	6,78	7,24	28	10 000	0,059
KRV26	9,45	14,3	7,3	8,6	12,7	28	3 400	0,059
KRV26.X	9,45	14,3	7,3	8,6	12,7	28	3 400	0,059
KR30	7,89	9,79	6,32	7,74	9,31	45	8 200	0,087
KR30.X	7,89	9,79	6,32	7,74	9,31	45	8 200	0,087
KR30.PP	7,89	9,79	6,32	7,74	9,31	45	8 200	0,087
KR30.X.PP	7,89	9,79	6,32	7,74	9,31	45	8 200	0,087
KRV30	13,4	19,8	9,85	9,2	15,7	45	2 800	0,087
KRV30.X	13,4	19,8	9,85	9,2	15,7	45	2 800	0,087
KR32	7,89	9,79	6,65	9,62	10,3	45	8 200	0,098
KR32.X	7,89	9,79	6,65	9,62	10,3	45	8 200	0,098
KR32.PP	7,89	9,79	6,65	9,62	10,3	45	8 200	0,098
KR32.X.PP	7,89	9,79	6,65	9,62	10,3	45	8 200	0,098
KRV32	13,4	19,8	10,4	11,3	17,4	45	2 800	0,098
KRV32.X	13,4	19,8	10,4	11,3	17,4	45	2 800	0,098

Needle roller stud type track rollers

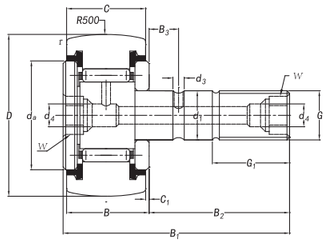
With cage and seal



KR



KR.X



KR..PP

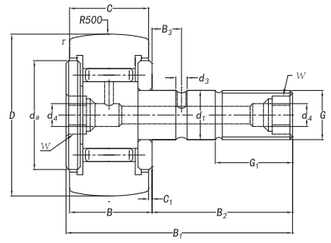
Outer diameter	Dimensions d_1 h7	D	C	$r_{s\,min}$	B_1	B_2	B_3	G_1	d_4	d_3	G	C_1	d_a
	mm												
35	16	35	18	0,6	52	32,5	8	17	6	3	M16x1,5	0,8	25
	16	35	18	0,6	52	32,5	8	17	6	3	M16x1,5	0,8	25
	16	35	18	0,6	52	32,5	8	17		3	M16x1,5	0,8	23,6
40	18	40	20	1	58	36,5	8	19	6	3	M18x1,5	0,8	27
	18	40	20	1	58	36,5	8	19	6	3	M18x1,5	0,8	27
	18	40	20	1	58	36,5	8	19		3	M18,1,5	0,8	26,4
47	20	47	24	1	66	40,5	9	21	8	4	M20x1,5	0,8	33
	20	47	24	1	66	40,5	9	21	8	4	M20x1,5	0,8	33
	20	47	24	1	66	40,5	9	21		4	M20x1,5	0,8	31
52	20	52	24	1	66	40,5	9	21	8	4	M20x1,5	0,8	37
	20	52	24	1	66	40,5	9	21	8	4	M20x1,5	0,8	37
	20	52	24	1	66	40,5	9	21		4	M20x1,5	0,8	36,4
62	24	62	29	1	80	49,5	11	25	8	4	M24x1,5	0,8	45
	24	62	29	1	80	49,5	11	25	8	4	M24x1,5	0,8	45
	24	62	29	1	80	49,5	11	25		4	M24x1,5	0,8	44,4
72	24	72	29	1,1	80	49,5	11	25	8	4	M24x1,5	0,8	51
	24	72	29	1,1	80	49,5	11	25	8	4	M24x1,5	0,8	51
	24	72	29	1,1	80	49,5	11	25		4	M24x1,5	0,8	50,4
80	30	80	35	1,1	100	63	15	32	8	4	M30x1,5	1	52
	30	80	35	1,1	100	63	15	32	8	4	M30x1,5	1	52
	30	80	35	1,1	100	63	15	32		4	M30x1,5	1	52,9
85	30	85	35	1,1	100	63	15	32	8	4	M30x1,5	1	52
	30	85	35	1,1	100	63	15	32	8	4	M30x1,5	1	52
90	30	90	35	1,1	100	63	15	32	8	4	M30x1,5	1	52
	30	90	35	1,1	100	63	15	32	8	4	M30x1,5	1	52
	30	90	35	1,1	100	63	15	32		4	M30x1,5	1	52,9

Note: 1) Eccentric version on request

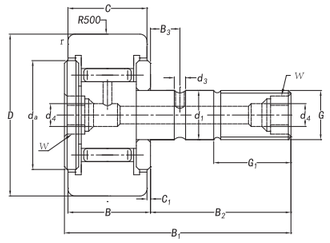
2) W refer to table 6

Needle roller stud type track rollers

Full complement



KRV

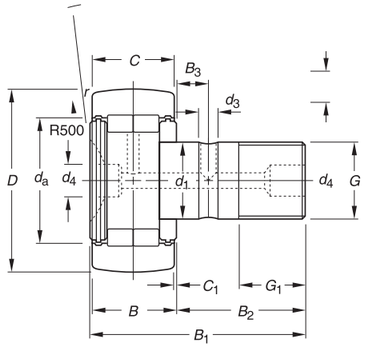


KRV..X

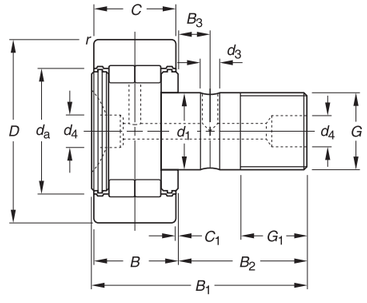
Track roller	Bearing Load coefficients dynamic C kN	static C_0	dynamic C_w	Track roller dynamic $F_{r\,perm}$	static $F_{0r\,perm}$	Torque Nm	Reference speed Grease	Mass kg
KR35	9,7	14,1	1,68	11,55	12,36	8	3691	0,178
KR35.X	9,7	14,1	1,68	11,55	12,36	8	3691	0,178
KR35.PP	9,7	14,1	1,68	11,55	12,36	8	3691	0,178
KR35.X.PP	9,7	14,1	1,68	11,55	12,36	8	3691	0,178
KRV35	12,8	23	2,91	13,56	20,88	8	1700	0,178
KRV35.X	12,8	23	2,91	13,56	20,88	8	1700	0,178
KR40	10,9	15,5	1,83	13,86	14,84	8	2950	0,256
KR40.X	10,9	15,5	1,83	13,86	14,84	8	2950	0,256
KR40.PP	10,9	15,5	1,83	13,86	14,84	8	2950	0,256
KR40.X.PP	10,9	15,5	1,83	13,86	14,84	8	2950	0,256
KRV40	14,8	20,5	3	16,27	25,06	8	1450	0,256
KRV40.X	14,8	20,5	3	16,27	25,06	8	1450	0,256
KR47	15,5	25,5	3	16,64	17,81	10	2450	0,401
KR47.X	15,5	25,5	3	16,64	17,81	10	2450	0,401
KR47.PP	15,5	25,5	3	16,64	17,81	10	2450	0,401
KR47.X.PP	15,5	25,5	3	16,64	17,81	10	2450	0,401
KRV47	20,6	42	5,2	19,50	30,08	10	1350	0,401
KRV47.X	20,6	42	5,2	19,50	30,08	10	1350	0,401
KR52	16,8	29	3,4	19,97	21,38	10	2450	0,474
KR52.X	16,8	29	3,4	19,97	21,38	10	2450	0,474
KR52.PP	16,8	29	3,4	19,97	21,38	10	2450	0,474
KR52.X.PP	16,8	29	3,4	19,97	21,38	10	2450	0,474
KRV52	22,05	48	5,9	23,43	36,10	10	1350	0,474
KRV52.X	22,05	48	5,9	23,43	36,10	10	1350	0,474
KR62	26,5	47,5	6,1	23,97	25,66	14	1950	0,797
KR62.X	26,5	47,5	6,1	23,97	25,66	14	1950	0,797
KR62.PP	26,5	47,5	6,1	23,97	25,66	14	1950	0,797
KR62.X.PP	26,5	47,5	6,1	23,97	25,66	14	1950	0,797
KRV62	34	76	9,9	28,12	43,22	14	1150	0,797
KRV62.X	34	76	9,9	28,12	43,22	14	1150	0,797
KR72	28	53	6,7	28,77	30,80	14	1950	1,381
KR72.X	28	53	6,7	28,77	30,80	14	1950	1,381
KR72.PP	28	53	6,7	28,77	30,80	14	1950	1,381
KR72.X.PP	28	53	6,7	28,77	30,80	14	1950	1,381
KRV72	37	85	11,1	33,75	51,87	14	1150	1,381
KRV72.X	37	85	11,1	33,75	51,87	14	1150	1,381
KR80	39,5	77	9,7	34,53	36,97	14	1380	1,666
KR80.X	39,5	77	9,7	34,53	36,97	14	1380	1,666
KR80.PP	39,5	77	9,7	34,53	36,97	14	1380	1,666
KR80.X.PP	39,5	77	9,7	34,53	36,97	14	1380	1,666
KRV80	49,5	120	15,6	40,50	62,25	14	880	1,666
KRV80.X	49,5	120	15,6	40,50	62,25	14	880	1,666
KR90	41,5	83	10,5	41,44	44,37	14	1380	2,032
KR90.X	41,5	83	10,5	41,44	44,37	14	1380	2,032
KR90.PP	41,5	83	10,5	41,44	44,37	14	1380	2,032
KR90.X.PP	41,5	83	10,5	41,44	44,37	14	1380	2,032
KRV90	53	130	16,9	48,60	74,70	14	880	2,032
KRV90.X	53	130	16,9	48,60	74,70	14	880	2,032

Cylindrical roller stud type track rollers

Full complement



NUKR



NUKR.X

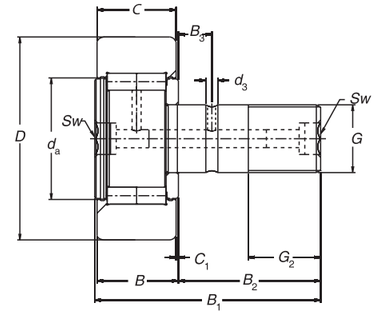
Outer diameter	Dimensions d_1 h7	D	C	$r_{s\ min}$	B_1	B_2	B_3	G_1	d_4	d_3	G	C_1	d_a
	mm												
35	16	35	18	0,6	52	32,5	8	17	6	3	M16x1,5	0,8	25
	16	35	18	0,6	52	32,5	8	17	6	3	M16x1,5	0,8	25
	16	35	18	0,6	52	32,5	8	17		3	M16x1,5	0,8	23,6
40	18	40	20	1	58	36,5	8	19	6	3	M18x1,5	0,8	27
	18	40	20	1	58	36,5	8	19	6	3	M18x1,5	0,8	27
	18	40	20	1	58	36,5	8	19		3	M18,1,5	0,8	26,4
47	20	47	24	1	66	40,5	9	21	8	4	M20x1,5	0,8	33
	20	47	24	1	66	40,5	9	21	8	4	M20x1,5	0,8	33
	20	47	24	1	66	40,5	9	21		4	M20x1,5	0,8	31
52	20	52	24	1	66	40,5	9	21	8	4	M20x1,5	0,8	37
	20	52	24	1	66	40,5	9	21	8	4	M20x1,5	0,8	37
	20	52	24	1	66	40,5	9	21		4	M20x1,5	0,8	36,4
62	24	62	29	1	80	49,5	11	25	8	4	M24x1,5	0,8	45
	24	62	29	1	80	49,5	11	25	8	4	M24x1,5	0,8	45
	24	62	29	1	80	49,5	11	25		4	M24x1,5	0,8	44,4
72	24	72	29	1,1	80	49,5	11	25	8	4	M24x1,5	0,8	51
	24	72	29	1,1	80	49,5	11	25	8	4	M24x1,5	0,8	51
	24	72	29	1,1	80	49,5	11	25		4	M24x1,5	0,8	50,4
80	30	80	35	1,1	100	63	15	32	8	4	M30x1,5	1	52
	30	80	35	1,1	100	63	15	32	8	4	M30x1,5	1	52
	30	80	35	1,1	100	63	15	32		4	M30x1,5	1	52,9
85	30	85	35	1,1	100	63	15	32	8	4	M30x1,5	1	52
	30	85	35	1,1	100	63	15	32	8	4	M30x1,5	1	52
90	30	90	35	1,1	100	63	15	32	8	4	M30x1,5	1	52
	30	90	35	1,1	100	63	15	32	8	4	M30x1,5	1	52
	30	90	35	1,1	100	63	15	32		4	M30x1,5	1	52,9

Note: 1) Eccentric version on request

2) W refer to table 6

Cylindrical roller stud type track rollers

Full complement



NUKR.NNK

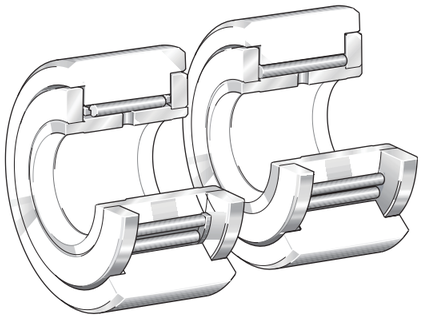
Track roller	Load coef Bearing Din. C kN	Stat. C_0	C_w	Maximum radial force Track roller Din. $F_{r\ perm}$	Stat. $F_{0r\ perm}$	Torque Nm	Limit speed Grease	Mass kg
NUKR35	24,7	29,4	15,4	6,97	17	53,2	2 300	0,17
NUKR35.X	24,7	29,4	15,4	6,97	17	53,2	2 300	0,17
NUKR35.NNK	24,7	29,3	16,4	10,4	19,3	53,2	2 300	0,166
NUKR40	26,6	33,3	17,5	9,4	21,4	77,5	2 000	0,25
NUKR40.X	26,6	33,3	17,5	9,4	21,4	77,5	2 000	0,25
NUKR40.NNK	26,6	33,3	18,7	15	24,3	77,5	2 000	0,245
NUKR47	41,4	53,2	26,7	13,9	32,9	109	1 700	0,38
NUKR47.X	41,4	53,2	26,7	13,9	32,9	109	1 700	0,38
NUKR47.NNK	41,4	53,2	28,1	20,5	36,5	109	1 700	0,388
NUKR52	45,8	63,1	28,1	15,4	35,3	109	1 400	0,46
NUKR52.X	45,8	63,1	28,1	15,4	35,3	109	1 400	0,46
NUKR52.NNK	45,8	63,1	29,6	22,2	39,1	109	1 400	0,461
NUKR62	62,7	83,1	38,5	19,6	46,8	193	1 200	0,79
NUKR62.X	62,7	83,1	38,5	19,6	46,8	193	1 200	0,79
NUK62.NNK	62,7	83,1	42,1	29,6	55,9	193	1 200	0,783
NUKR72	68,9	97,8	43,3	25,9	57,7	193	1 000	1,04
NUKR72.X	68,9	97,8	43,3	25,9	57,7	193	1 000	1,04
NUKR72.NNK	68,9	97,8	46,1	39,6	65,1	193	1 000	1,02
NUKR80	95,4	130	66,4	42,7	93,5	390	1 100	1,55
NUKR80.X	95,4	130	66,4	42,7	93,5	390	1 100	1,55
NUKR80.NNK	102	149	71	62,7	108	390	1 100	1,624
NUKR85	95,4	130	70,6	53,2	105	390	1 100	1,74
NUKR85.X	95,4	130	70,6	53,2	105	390	1 100	1,74
NUKR90	95,4	130	74,1	64,7	116	390	1 100	1,95
NUKR90.X	95,4	130	74,1	64,7	116	390	1 100	1,95
NUKR90.NNK	102	149	79,8	97	135	390	1 100	1,999

YOKE TYPE TRACK ROLLERS

Yoke type track rollers have an internal design very similar to that of a needle or cylindrical roller bearing. They comprise a thick-walled outer ring with profiled outside surface and needle roller and cage assemblies or full complement needle roller or cylindrical roller sets. Yoke type track rollers can support high radial loads as well as axial loads arising from slight misalignment and skewed running. They are suitable for cam gears, bed ways, conveying equipment etc.

NPB yoke type track rollers are available:

- without flange rings
- with flange rings



Profile of The Outer Ring Running Surface

NPB yoke type track rollers with crowned outer ring running surface are as standard since the bearings are usually operated in inclined position and edge stress must be avoided. The radius of curvature of the outside surface is R500mm. The bearings are also can be provided with cylindrical outer surface which suffixed with X.

The crowned running surface has a radius of 500mm for the following track roller designs:

- STO and RSTO designs
- NA22…2RS and RNA22…2RS designs
- NATR and NATV without designation suffix

NPB also provide yoke type track rollers with improved crowned profile of the outer ring running surface. The modified line contact provides even better load distribution than the standard radius. The modified line contact provides a higher degree of stiffness while reducing wear between the outer ring running surface and the track.

The following yoke type track roller designs have improved crowned profile:

- NATR and NATV designs with suffix PP
- NUTR deisign

Structure

Yoke Type Track Rollers Without Flange Rings

Yoke type track rollers supplied without flange rings have two designs and variants:

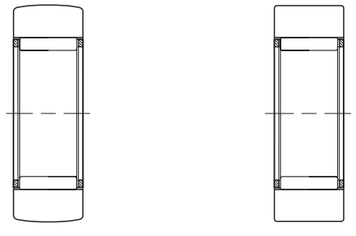
- with or without an inner ring
- open or sealed with two integral flanges in the outer ring

The bearings without flanges are designed for applications where associated components can limit axial movement of the outer ring. Bearings without inner ring are suitable for arrangements where the shaft can be hardened and served as the raceway. Yoke type track roller with an inner ring have a slightly extended inner ring to enable the necessary of outer ring.

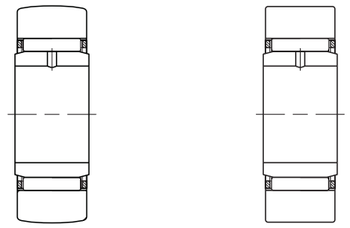
STO and RSTO design yoke type track rollers

STO design yoke type track rollers have extended inner ring, while RSTO design don't have an inner ring. Both designs of bearings are only available in open type, making it possible to mount each component separately. The bearings are pre-greased. STO and RSTO are the only designs of track rollers that can be lubricated with oil, if the bearings are lubricated with oil, the grease that pre-supplied should be cleaned out.

Yoke type track rollers without axial guidance



RSTO RSTO.X



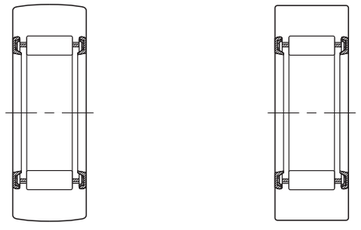
STO STO.X

NA22 ... 2RS and RNA22 ... 2RS design yoke type track rollers

The needle roller and cage assembly is axially guided between two integral flanges in the outer ring and forms a non-separable unit with the outer ring. NA22…2RS design yoke type track rollers have an inner ring that can be mounted individually. RNA22…2RS design track rollers do not have an inner ring and are used where the shaft can be hardened and ground.

Both of these designs are fitted with contact seals made of oil and wear-resistant acrylonitrile-butadiene rubber (NBR). They are designed for applications where contamination is light to moderate and where moisture or water spray can not be avoided.

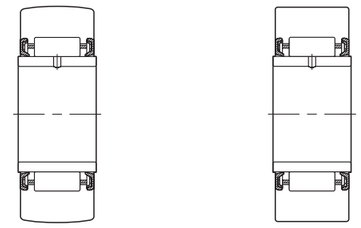
Yoke type track rollers without axial guidance, sealed



RNA22.2RS RNA22.2RS.X

Suffixes

X.TN	cylindrical profile outer diameter - solid cage of polyamide reinforced with glass fibers
TN	solid cage of polyamide reinforced with glass fibers
X	cylindrical profile outer diameter
ZZ	two washers for the outer ring
ZZ.X	two washers for the outer ring - cylindrical profile outer diameter
.2RS	two seals
.2RS.X	two seals - cylindrical profile outer diameter



NA22.2RS NA22.2RS.X

Yoke Type Track Roller With Flange Rings

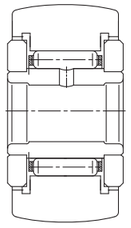
Yoke type track roller with flange rings are non-separable units and are available in different designs and varients:

- with gap-type, labyrinth, polyamide or rubber seals
- with needle or cylindrical rollers
- with one or two rows of rollers
- with a cage-guided or a full complement roller set

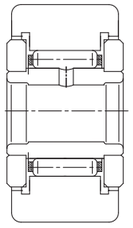
Depending on the designs, the flange rings are either pressed-on or loose. The yoke type track rollers with flange rings are suitable for applications where the thrust forces that induced during the shaft is not horizontal need to be accommodated by the flange rings.

NATR & STO..ZZ design yoke type track rollers

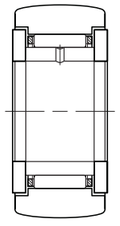
NATR & STO..ZZ type track rollers are fitted with needle roller and cage assembles, the flange rings of NATR are pressed on the inner ring and STO..ZZ have two loose washers. The flanges formed a gap-type seals with the outer ring.



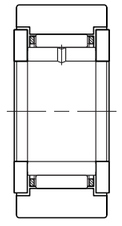
NATR



NATR..X



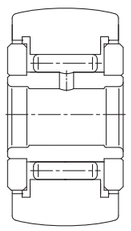
STO.ZZ



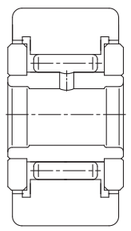
STO.ZZ.X

NATV design yoke type track rollers

NATV design track rollers are similar to the NATR design, except that they comprise full complement of needle rollers. Therefore, they can accommodate higher load.



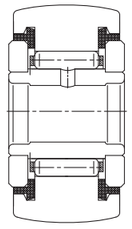
NATV



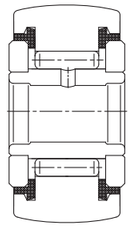
NATV .. X

NATR and NATV design yoke type track rollers, designation suffix PP

NATR and NATV design yoke type track rollers with designation suffix PP have axial sliding rings made of polyamide 66 on both side. In the radial direction, the sliding ring forms a narrow labyrinth seal with the outer ring to protect against coarse contaminants. In the axial direction, the sliding ring serves as a contact seal to reliably retain grease in the bearing.



NATR .. PP

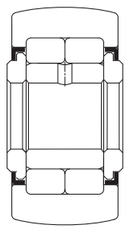


NATV ..PP

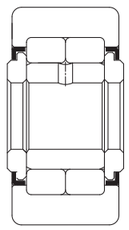
NUTR design yoke type track rollers

The NUTR design yoke type track rollers are based on double row full complement cylindrical roller bearing. The outer ring comprises two integral flanges to axially guide the rollers. A loose flange on both side of the inner ring axially guided the outer ring via the roller sets, this enable the bearing to accommodate high axial forces induced when operating in a tilted position.

The bearings are provided with metal angular ring that pressed into the outer ring on both sides. The sheet metal angular ring extend over the flange rings hold the bearing components together and form efficient labyrinth seals.



NUTR



NUTR..X

Lubrication

Yoke type track rollers are made with a lubrication hole in inner ring so they can be regreased through a transversal hole in a shaft or stud. During the assembly of a yoke type track roller it must be sure that the lubrication hole is in zone where the raceway is not loaded.

Oil is the most suitable lubrication for yoke type track rollers without seals. In case of constant rotation it is used the continuing lubrication of oil or a frequent grease lubrication. Where the applications with slow fluctuations the situation is less critical and the re-lubrication intervals could be longer.

Yoke type track rollers with seals are normally provided with a initial charge of grease for medium temperature. Yoke type track rollers with cage have a maximum grease accumulation capacity, and consequently a longer duration of pre-greasing than the types with full complement set.

Dimensional Precision

The tolerance of standard execusion of yoke type track rollers with cylindrical profile outer ring correspond to the specific tollerance in ISO-492-Radial bearings-Tollerance.

Refer tables 1 and 2 Track rollers with crowned outer diameter are different for the tolerance on outer diameter which is 0.00/-0.05 for all dimensions.

Reference standard:

ISO 6278 – Needle roller bearings – Yoke type track rollers – dimensions

ISO 492 – Radial bearings – tolerance

DIN 620 – Tolerance of ball bearings and rollers bearings

ISO 281 – Rolling bearings – Dynamic load coefficients and fatigue life calculation.

Table 1–outer ring — **tolerance μm (0,001mm)**

D mm		Δ_{Dmp}				Δ_{Cs}		K_{ea}
>	≤	cylindrical		crowned				
		sup.	inf.	sup.	inf.	inf.	sup.	max.
10	18	0	-8	0	-50	0	-120	15
18	30	0	-9	0	-50	0	-120	15
30	50	0	-11	0	-50	0	-120	20
50	80	0	-13	0	-50	0	-120	25
80	120	0	-15	0	-50	0	-120	35
120	150	0	-18	0	-50	0	-120	40
150	180	0	-25	0	-50	0	-150	45
180	240	0	-30	0	-50	0	-200	50

Table 2–Inner ring — **tolerance μm (0,001mm)**

d mm		Δ_{dmp}		Δ_{Bs}	
>	≤	sup.	inf.	sup.	inf.
2,5	18	0	-8	0	-180
18	30	0	-10	0	-210
30	50	0	-12	0	-250
50	80	0	-15	0	-300
80	120	0	-20	0	-350

Assembly

The machine element on which are realised support holes of the assembly stud or shaft, must be drive enough to resist the local stress made by the applied load and the flextons with conseguent uneven load distribution on needle rollers.

When applied loads are high, a tolerance of h6 or j6 must be used in combination with a shaft or a stud of high resistance. When loads are moderate, g6 tolerance coule be used in combination with a shaft or a stud of high resistance. For low loads, it could be used a free coupling with f6 tolerance and non-tempered shaft or stud.

Yoke type track rollers with inner ring, with or without washers should be fixed perpendicular to axis between parallel faces,to avoid the washers blown out under load. The dimensions of the machined parts adjacent to the yoke type track rollers must be set considering as minimum diameter da to garantee the lateral washers are adequately supported. If yoke type track roller can not be blocked in the estremities, it is necessary an axial guidance with a small clearance. Must pay attention that the lufrication hole is set in unloaded zone of the raceway.

Yoke type track rollers without inner ring should have a shaft or a stud temperated and adjusted according to k5 tolerance.

Load Coefficient

Equivalent dinamic load on yoke type track rollers

When the outer ring of yoke type track roller rolls directly on a desk, radial load on yoke type track roller makes the ring an elastic deformation (ovalization). Consequently, a smaller raceway zone is loaded, and the load is distributed on few needle rollers. This, provocates a reduction of dynamic and static load carrying capacity of yoke type track roller. This deformation makes also a bending stress of outer ring which must not exceed the maximum permissible stress of the material. This requirement determinates maximum permissible conditions of dynamic ($F_{r\ perm}$) and static ($F_{0r\ perm}$) radial load.

The fatigue life of yoke type track rollers must be calculated using the dynamic load coefficient Cw indicated in the tables.

The tables show also the maximum permissible radial load, Fr perm which could be applied dynamically on yoke type track rollers. However, to calculate the life L10 of a yoke type track roller, the radial applied load must not exceed Cw/2 in ideal operation conditions, alignment, lubrication, temperature, speed and acceleration.

Static load

Besides the static load coefficient C_0, the tables show also the maximum permissible radial static load which can be applied on a yoke type track roller. $F_{0r\ perm}$ values must not be exceeded. The static load factor f_s can be calculated using the following formula:

$$f_s \geq 0{,}7 \bullet \frac{F_{0r\ perm}}{P_{0r}}$$

where

$F_{0r\ perm}$ = maximum permissible radial static load (kN)

P_{0r} =equivalent static load (kN)
$P_{0r} = F_{0r}$ for yoke type track rollers

F_{0r} = radial static load (kN)

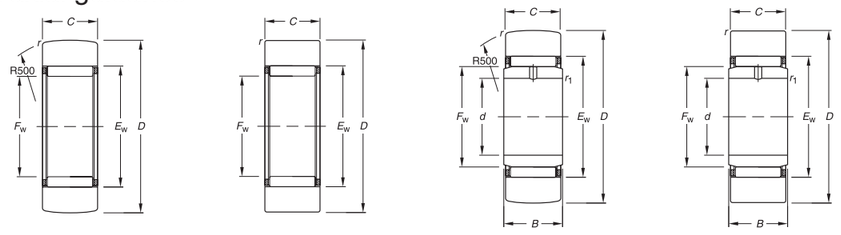
For the requirements written in table 3, the values of fs must not be lower than the values indicated in the table.

Table 3 –
indicative values for static load factor fs

Operation condition for yoke type and stud type track rollers	indicative values of fs
High load of impact quiet operation	1,5...2,5
normal load normal noise	1...1,5
lower loads and rotation where there is no particular requirements of noise	0,7...1

Yoke type track rollers

Without axial guidance

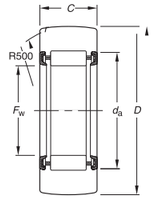


RSTO — RSTO.X — STO — STO.X

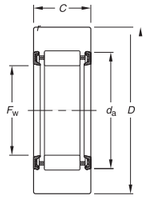
Outer diameter	Dimensions D	d	B	C	F_w	E_w	$r_{s\ min}$	$r_{1s\ min}$	Yoke type track roller	Load coeff. Bearing Dynamic C	Bearing Static C_0	Yoke type track roller Dynamic C_w	Yoke type track roller Static $F_{r\ perm}$	$F_{0r\ perm}$	Reference speed Grease	Mass ≈
	mm									kN					rpm	kg
16	16			7,8	7	10	0,3		**RSTO5.TN**	2,74	2,44	2,49	2,97	2,44	19 000	0,01
	16			7,8	7	10	0,3		**RSTO5.X.TN**	2,74	2,44	2,49	2,97	2,44	19 000	0,01
19	19			9,8	10	13	0,3		**RSTO6**	5,4	6,43	4,15	4,04	5,63	13 000	0,014
	19			9,8	10	13	0,3		**RSTO6X**	5,4	6,43	4,15	4,04	5,63	13 000	0,014
	19	6	10	9,8	10	13	0,3	0,3	**STO6**	5,4	6,43	4,15	4,04	5,63	13 000	0,018
	19	6	10	9,8	10	13	0,3	0,3	**STO6X**	5,4	6,43	4,15	4,04	5,63	13 000	0,018
24	24			9,8	12	15	0,3		**RSTO8**	5,85	7,51	4,79	6,67	7,44	10 000	0,023
	24			9,8	12	15	0,3		**RSTO8X**	5,85	7,51	4,79	6,67	7,44	10 000	0,023
	24	8	10	9,8	12	15	0,3	0,3	**STO8**	5,85	7,51	4,79	6,67	7,44	10 000	0,028
	24	8	10	9,8	12	15	0,3	0,3	**STO8X**	5,85	7,51	4,79	6,67	7,44	10 000	0,028
30	30			11,8	14	20	0,3		**RSTO10**	10,5	10,6	8,62	7,69	10,6	9 400	0,044
	30			11,8	14	20	0,3		**RSTO10X**	10,5	10,6	8,62	7,69	10,6	9 400	0,044
	30	10	12	11,8	14	20	0,3	0,3	**STO10**	10,5	10,6	8,62	7,69	10,6	9 400	0,051
	30	10	12	11,8	14	20	0,3	0,3	**STO10X**	10,5	10,6	8,62	7,69	10,6	9 400	0,051
32	32			11,8	16	22	0,3		**RSTO12**	11,2	11,9	8,8	7,65	10,9	8 100	0,049
	32			11,8	16	22	0,3		**RSTO12X**	11,2	11,9	8,8	7,65	10,9	8 100	0,049
	32	12	12	11,8	16	22	0,3	0,3	**STO12**	11,2	11,9	8,8	7,65	10,9	8 100	0,057
	32	12	12	11,8	16	22	0,3	0,3	**STO12X**	11,2	11,9	8,8	7,65	10,9	8 100	0,057
35	35			11,8	20	26	0,3		**RSTO15**	13	15,3	9,13	6,95	11,2	6 300	0,052
	35			11,8	20	26	0,3		**RSTO15X**	13	15,3	9,13	6,95	11,2	6 300	0,052
	35	15	12	11,8	20	26	0,3	0,3	**STO15**	13	15,3	9,13	6,95	11,2	6 300	0,064
	35	15	12	11,8	20	26	0,3	0,3	**STO15X**	13	15,3	9,13	6,95	11,2	6 300	0,064
40	40			15,8	22	29	0,3		**RSTO17**	19,1	23,3	13,8	11,4	18,2	5 800	0,095
	40			15,8	22	29	0,3		**RSTO17X**	19,1	23,3	13,8	11,4	18,2	5 800	0,095
	40	17	16	15,8	22	29	0,3	0,3	**STO17**	19,1	23,3	13,8	11,4	18,2	5 800	0,114
	40	17	16	15,8	22	29	0,3	0,3	**STO17X**	19,1	23,3	13,8	11,4	18,2	5 800	0,114
47	47			15,8	25	32	0,3		**RSTO20**	19,8	25,3	15,3	16,5	22,2	5 000	0,134
	47			15,8	25	32	0,3		**RSTO20X**	19,8	25,3	15,3	16,5	22,2	5 000	0,134
	47	20	16	15,8	25	32	0,3	0,3	**STO20**	19,8	25,3	15,3	16,5	22,2	5 000	0,156
	47	20	16	15,8	25	32	0,3	0,3	**STO20X**	19,8	25,3	15,3	16,5	22,2	5 000	0,156
52	52			15,8	30	37	0,3		**RSTO25**	22,3	31	16	16,9	23,7	4 100	0,155
	52			15,8	30	37	0,3		**RSTO25X**	22,3	31	16	16,9	23,7	4 100	0,155
	52	25	16	15,8	30	37	0,3	0,3	**STO25**	22,3	31	16	16,9	23,7	4 100	0,182
	52	25	16	15,8	30	37	0,3	0,3	**STO25X**	22,3	31	16	16,9	23,7	4 100	0,182
62	62			19,8	38	46	0,6		**RSTO30**	33,3	51	22,3	23,2	34,2	3 200	0,258
	62			19,8	38	46	0,6		**RSTO30X**	33,3	51	22,3	23,2	34,2	3 200	0,258
	62	30	20	19,8	38	46	0,6	0,6	**STO30**	33,3	51	22,3	23,2	34,2	3 200	0,325
	62	30	20	19,8	38	46	0,6	0,6	**STO30X**	33,3	51	22,3	23,2	34,2	3 200	0,325
72	72			19,8	42	50	0,6		**RSTO35**	35,2	56,6	25,2	33,3	43	2 900	0,37
	72			19,8	42	50	0,6		**RSTO35X**	35,2	56,6	25,2	33,3	43	2 900	0,37
	72	35	20	19,8	42	50	0,6	0,6	**STO35**	35,2	56,6	25,2	33,3	43	2 900	0,435
	72	35	20	19,8	42	50	0,6	0,6	**STO35X**	35,2	56,6	25,2	33,3	43	2 900	0,435
80	80			19,8	50	58	0,6		**RSTO40**	38,8	67,8	25,9	34,7	45	2 400	0,43
	80			19,8	50	58	0,6		**RSTO40X**	38,8	67,8	25,9	34,7	45	2 400	0,43
	80	40	20	19,8	50	58	0,6	1	**STO40**	38,8	67,8	25,9	34,7	45	2 400	0,54
	80	40	20	19,8	50	58	0,6	1	**STO40X**	38,8	67,8	25,9	34,7	45	2 400	0,54
85	85			19,8	55	63	0,6		**RSTO45**	40,3	73,5	26	35,8	45,5	2 200	0,447
	85			19,8	55	63	0,6		**RSTO45X**	40,3	73,5	26	35,8	45,5	2 200	0,447
	85	45	20	19,8	55	63	0,6	1	**STO45**	40,3	73,5	26	35,8	45,5	2 200	0,58
	85	45	20	19,8	55	63	0,6	1	**STO45X**	40,3	73,5	26	35,8	45,5	2 200	0,58
90	90			19,8	60	68	0,6		**RSTO50**	41,8	79,2	26	37,1	45,8	2 000	0,495
	90			19,8	60	68	0,6		**RSTO50X**	41,8	79,2	26	37,1	45,8	2 000	0,495
	90	50	20	19,8	60	68	0,6	1	**STO50**	41,8	79,2	26	37,1	45,8	2 000	0,65
	90	50	20	19,8	60	68	0,6	1	**STO50X**	41,8	79,2	26	37,1	45,8	2 000	0,65

Yoke type track rollers

without axial guidance, sealed



RNA22.2RS



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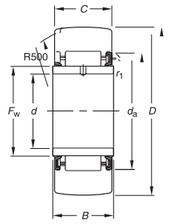

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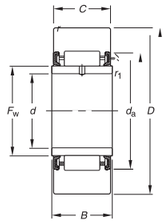
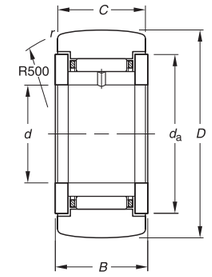


NA22.2RS.X

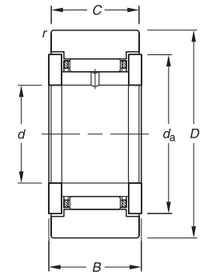
Outer diameter	Dimensions								Yoke type track roller	Load coeff.						Mass ≈
										Bearing		Yoke type track roller			Reference speed	
	D	d	B	C	F_w	d_a	$r_{s\,min}$	$r_{1s\,min}$		Dynamic C	Static C_0	Dynamic C_w	$F_{r\,perm}$	Static $F_{0r\,perm}$	Grease	
	mm									kN					rpm	kg
19	19			11,8	10	14	0,3		**RNA22/6.2RS**	5,47	5,43	4,13	3,06	4,59	13 000	0,014
	19			11,8	10	14	0,3		**RNA22/6.2RS.X**	5,47	5,43	4,13	3,06	4,59	13 000	0,014
	19	6	12	11,8	10	14	0,3	0,3	**NA22/6.2RS**	5,47	5,43	4,13	3,06	4,59	13 000	0,018
	19	6	12	11,8	10	14	0,3	0,3	**NA22/6.2RS.X**	5,47	5,43	4,13	3,06	4,59	13 000	0,018
24	24			11,8	12	18	0,3		**RNA22/8.2RS**	6,98	6,08	5,31	3,37	5,22	11 000	0,025
	24			11,8	12	18	0,3		**RNA22/8.2RS.X**	6,98	6,08	5,31	3,37	5,22	11 000	0,025
	24	8	12	11,8	12	18	0,3	0,3	**NA22/8.2RS**	6,98	6,08	5,31	3,37	5,22	11 000	0,031
	24	8	12	11,8	12	18	0,3	0,3	**NA22/8.2RS.X**	6,98	6,08	5,31	3,37	5,22	11 000	0,031
30	30			13,8	14	20	0,6		**RNA2200.2RS**	9,57	9,45	8,03	7,85	9,45	9 400	0,049
	30			13,8	14	20	0,6		**RNA2200.2RS.X**	9,57	9,45	8,03	7,85	9,45	9 400	0,049
	30	10	14	13,8	14	20	0,6	0,3	**NA2200.2RS**	9,57	9,45	8,03	7,85	9,45	9 400	0,057
	30	10	14	13,8	14	20	0,6	0,3	**NA2200.2RS.X**	9,57	9,45	8,03	7,85	9,45	9 400	0,057
32	32			13,8	16	22	0,6		**RNA2201.2RS**	10,2	10,5	8,2	7,78	10,1	8 100	0,053
	32			13,8	16	22	0,6		**RNA2201.2RS.X**	10,2	10,5	8,2	7,78	10,1	8 100	0,053
	32	12	14	13,8	16	22	0,6	0,3	**NA2201.2RS**	10,2	10,5	8,2	7,78	10,1	8 100	0,063
	32	12	14	13,8	16	22	0,6	0,3	**NA2201.2RS.X**	10,2	10,5	8,2	7,78	10,1	8 100	0,063
35	35			13,8	20	27	0,6		**RNA2202.2RS**	13,4	14,5	9,24	6	10,2	6 300	0,055
	35			13,8	20	27	0,6		**RNA2202.2RS.X**	13,4	14,5	9,24	6	10,2	6 300	0,055
	35	15	14	13,8	20	27	0,6	0,3	**NA2202.2RS**	13,4	14,5	9,24	6	10,2	6 300	0,07
	35	15	14	13,8	20	27	0,6	0,3	**NA2202.2RS.X**	13,4	14,5	9,24	6	10,2	6 300	0,07
40	40			15,8	22	30	1		**RNA2203.2RS**	16,5	17,8	11,9	8,5	13,7	5 900	0,09
	40			15,8	22	30	1		**RNA2203.2RS.X**	16,5	17,8	11,9	8,5	13,7	5 900	0,09
	40	17	16	15,8	22	30	1	0,3	**NA2203.2RS**	16,5	17,8	11,9	8,5	13,7	5 900	0,107
	40	17	16	15,8	22	30	1	0,3	**NA2203.2RS.X**	16,5	17,8	11,9	8,5	13,7	5 900	0,107
47	47			17,8	25	35	1		**RNA2204.2RS**	19,9	20,2	14,8	11	16,7	5 200	0,15
	47			17,8	25	35	1		**RNA2204.2RS.X**	19,9	20,2	14,8	11	16,7	5 200	0,15
	47	20	18	17,8	25	35	1	0,3	**NA2204.2RS**	19,9	20,2	14,8	11	16,7	5 200	0,175
	47	20	18	17,8	25	35	1	0,3	**NA2204.2RS.X**	19,9	20,2	14,8	11	16,7	5 200	0,175
52	52			17,8	30	40	1		**RNA2205.2RS**	22,1	24,3	15,5	11,3	17,7	4 300	0,171
	52			17,8	30	40	1		**RNA2205.2RS.X**	22,1	24,3	15,5	11,3	17,7	4 300	0,171
	52	25	18	17,8	30	40	1	0,3	**NA2205.2RS**	22,1	24,3	15,5	11,3	17,7	4 300	0,202
	52	25	18	17,8	30	40	1	0,3	**NA2205.2RS.X**	22,1	24,3	15,5	11,3	17,7	4 300	0,202
62	62			19,8	35	47	1		**RNA2206.2RS**	29,7	32,8	21,2	15,8	24,8	3 700	0,285
	62			19,8	35	47	1		**RNA2206.2RS.X**	29,7	32,8	21,2	15,8	24,8	3 700	0,285
	62	30	20	19,8	35	47	1	0,3	**NA2206.2RS**	29,7	32,8	21,2	15,8	24,8	3 700	0,324
	62	30	20	19,8	35	47	1	0,3	**NA2206.2RS.X**	29,7	32,8	21,2	15,8	24,8	3 700	0,324
72	72			22,8	42	54	1,1		**RNA2207.2RS**	41,1	52,5	28,6	24,2	37,9	3 000	0,42
	72			22,8	42	54	1,1		**RNA2207.2RS.X**	41,1	52,5	28,6	24,2	37,9	3 000	0,42
	72	35	23	22,8	42	54	1,1	0,6	**NA2207.2RS**	41,1	52,5	28,6	24,2	37,9	3 000	0,49
	72	35	23	22,8	42	54	1,1	0,6	**NA2207.2RS.X**	41,1	52,5	28,6	24,2	37,9	3 000	0,49
80	80			22,8	48	60	1,1		**RNA2208.2RS**	44,3	60	30,4	27,8	42	2 600	0,515
	80			22,8	48	60	1,1		**RNA2208.2RS.X**	44,3	60	30,4	27,8	42	2 600	0,515
	80	40	23	22,8	48	60	1,1	0,6	**NA2208.2RS**	44,3	60	30,4	27,8	42	2 600	0,615
	80	40	23	22,8	48	60	1,1	0,6	**NA2208.2RS.X**	44,3	60	30,4	27,8	42	2 600	0,615
85	85			22,8	52	64	1,1		**RNA2209.2RS**	45,6	63,9	30,9	29,7	43,7	2 400	0,565
	85			22,8	52	64	1,1		**RNA2209.2RS.X**	45,6	63,9	30,9	29,7	43,7	2 400	0,565
	85	45	23	22,8	52	64	1,1	0,6	**NA2209.2RS**	45,6	63,9	30,9	29,7	43,7	2 400	0,661
	85	45	23	22,8	52	64	1,1	0,6	**NA2209.2RS.X**	45,6	63,9	30,9	29,7	43,7	2 400	0,661
90	90			22,8	58	70	1,1		**RNA2210.2RS**	48,5	71,3	31	29,4	43,4	2 100	0,59
	90			22,8	58	70	1,1		**RNA2210.2RS.X**	48,5	71,3	31	29,4	43,4	2 100	0,59
	90	50	23	22,8	58	70	1,1	0,6	**NA2210.2RS**	48,5	71,3	31	29,4	43,4	2 100	0,712
	90	50	23	22,8	58	70	1,1	0,6	**NA2210.2RS.X**	48,5	71,3	31	29,4	43,4	2 100	0,712

Yoke type track rollers

With axial guidance



STO.ZZ

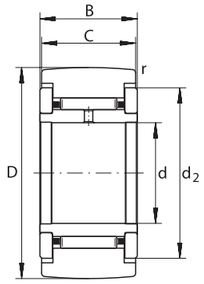


STO.ZZ. X

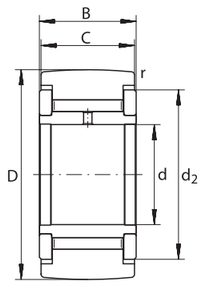
Outer diameter	Dimensions						Yoke type track roller	Load coeff.						Mass ≈
								Bearing		Yoke type track roller			Reference speed	
	D	d	B	C	d_a	$r_{s\,min}$		Dynamic C	Static C_0	Dynamic C_w	$F_{r\,perm}$	Static $F_{0r\,perm}$	Grease	
	mm							kN					rpm	kg
19	19	6	14	13,8	15	0,3	**STO6ZZ**	5,37	6,47	4,31	5,23	6,17	12 000	0,02
	19	6	14	13,8	15	0,3	**STO6ZZ.X**	5,37	6,47	4,31	5,23	6,17	12 000	0,02
24	24	8	14	13,8	18	0,3	**STO8ZZ**	5,82	7,54	4,97	7,54	8,14	9 900	0,04
	24	8	14	13,8	18	0,3	**STO8ZZ.X**	5,82	7,54	4,97	7,54	8,14	9 900	0,04
30	30	10	16	15,8	23	0,3	**STO10ZZ**	10,5	10,6	8,94	9,64	11,4	9 400	0,07
	30	10	16	15,8	23	0,3	**STO10ZZ.X**	10,5	10,6	8,94	9,64	11,4	9 400	0,07
32	32	12	16	15,8	25	0,3	**STO12ZZ**	11,2	11,9	9,13	9,54	11,7	8 100	0,08
	32	12	16	15,8	25	0,3	**STO12ZZ.X**	11,2	11,9	9,13	9,54	11,7	8 100	0,08
35	35	15	16	15,8	30	0,3	**STO15ZZ**	13	15,3	9,47	8,52	12,1	6 300	0,09
	35	15	16	15,8	30	0,3	**STO15ZZ.X**	13	15,3	9,47	8,52	12,1	6 300	0,09
40	40	17	20	19,8	33	0,3	**STO17ZZ**	19	23,3	14,2	13,4	19,3	5 600	0,14
	40	17	20	19,8	33	0,3	**STO17ZZ.X**	19	23,3	14,2	13,4	19,3	5 600	0,14
47	47	20	20	19,8	37	0,3	**STO20ZZ**	19,8	25,4	15,7	19,5	23,5	4 900	0,2
	47	20	20	19,8	37	0,3	**STO20ZZ.X**	19,8	25,4	15,7	19,5	23,5	4 900	0,2
52	52	25	20	19,8	42	0,3	**STO25ZZ**	22,2	31,1	16,4	19,8	25,1	4 100	0,24
	52	25	20	19,8	42	0,3	**STO25ZZ.X**	22,2	31,1	16,4	19,8	25,1	4 100	0,24
62	62	30	25	24,8	52	0,6	**STO30ZZ**	33,3	51	23	26,9	36,2	3 200	0,41
	62	30	25	24,8	52	0,6	**STO30ZZ.X**	33,3	51	23	26,9	36,2	3 200	0,41
72	72	35	25	24,8	56	0,6	**STO35ZZ**	35,2	56,6	25,9	39,2	45,5	2 900	0,56
	72	35	25	24,8	56	0,6	**STO35ZZ.X**	35,2	56,6	25,9	39,2	45,5	2 900	0,56
80	80	40	26	25,8	64	0,6	**STO40ZZ**	38,8	67,8	26,8	41,5	48,1	2 400	0,7
	80	40	26	25,8	64	0,6	**STO40ZZ.X**	38,8	67,8	26,8	41,5	48,1	2 400	0,7
85	85	45	26	25,8	69	0,6	**STO45ZZ**	40,3	73,5	26,9	42,4	48,6	2 200	0,7
	85	45	26	25,8	69	0,6	**STO45ZZ.X**	40,3	73,5	26,9	42,4	48,6	2 200	0,7

Yoke type track rollers

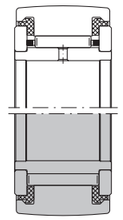
With axial guidance



NATR
R = 500 mm



NATV
R = 500 mm



NATR..PP
NATV..PP

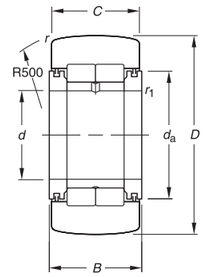
Dimensional table – Dimensions in mm

Outer diameter	Type[1]	Mass ≈ g	Type[2]	Mass ≈ g	Dimensions d	D	C	B	d_2	r min.	Load coefficients din. $C_{w\,r}$ kN	stat. $C_{0w\,r}$ kN	Limit fatigue load $P_{uw\,r}$ kN	rpm[3] $n_{D\,G}$ min^{-1}
16	NATR 5	14	NATR 5 PP	14	5	16	11	12	12,5	0,15	3,15	3,3	0,41	14 000
	NATV 5	15	NATV 5 PP	15	5	16	11	12	12,5	0,15	4,85	6,5	0,85	3 800
19	NATR 6	20	NATR 6 PP	19	6	19	11	12	15	0,15	3,5	3,9	0,485	11 000
	NATV 6	21	NATV 6 PP	21	6	19	11	12	15	0,15	5,5	7,9	1,03	3 100
24	NATR 8	41	NATR 8 PP	38	8	24	14	15	19	0,3	5,5	6,4	0,81	7 500
	NATV 8	42	NATV 8 PP	41	8	24	14	15	19	0,3	7,8	11,4	1,42	2 500
30	NATR 10	64	NATR 10 PP	61	10	30	14	15	23	0,6	6,8	8,4	1,07	5 500
	NATV 10	65	NATV 10 PP	64	10	30	14	15	23	0,6	9,5	14,6	1,82	2 100
32	NATR 12	71	NATR 12 PP	66	12	32	14	15	25	0,6	6,9	8,8	1,11	4 500
	NATV 12	72	NATV 12 PP	69	12	32	14	15	25	0,6	9,7	15,4	1,92	1 800
35	NATR 15	104	NATR 15 PP	95	15	35	18	19	27,6	0,6	9,7	14,1	1,68	3 600
	NATV 15	109	NATV 15 PP	101	15	35	18	19	27,6	0,6	12,8	23	2,9	1 600
40	NATR 17	144	NATR 17 PP	139	17	40	20	21	31,5	1	10,9	15,5	1,83	2 900
	NATV 17	152	NATV 17 PP	147	17	40	20	21	31,5	1	14,8	26,5	3	1 400
47	NATR 20	246	NATR 20 PP	236	20	47	24	25	36,5	1	15,5	25,5	3	2 400
	NATV 20	254	NATV 20 PP	245	20	47	24	25	36,5	1	20,6	42	5,2	1 300
52	NATR 25	275	NATR 25 PP	271	25	52	24	25	41,5	1	15,4	26,5	3,05	1 800
	NATV 25	285	NATV 25 PP	281	25	52	24	25	41,5	1	20,5	44	5,4	1 000
62	NATR 30	470	NATR 30 PP	444	30	62	28	29	51	1	23,6	38,5	4,55	1 300
	NATV 30	481	NATV 30 PP	468	30	62	28	29	51	1	30,5	62	7,7	850
72			NATR 35 PP	547	35	72	28	29	58	1,1	25,5	44,5	5,2	1 000
			NATV 35 PP	630	35	72	28	29	58	1,1	33	73	9	750
80			NATR 40 PP	795	40	80	30	32	66	1,1	33	59	6,9	850
			NATV 40 PP	832	40	80	30	32	66	1,1	41	90	11,2	650
90			NATR 50 PP	867	50	90	30	32	76	1,1	32	59	6,9	650
			NATV 50 PP	969	50	90	30	32	76	1,1	40,5	93	11,6	550

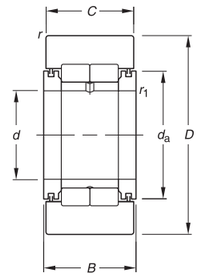
1) Bearings with non-contact seals and radius of curcature R= 500mm.
2) Bearings with seals.
Permissible operating temperature: from -30°C to +100°C (continuous operation)
3) rpm with continuous operation and lubrication with grease.

Yoke type track rollers

With axial guidance, full complement roller set



NUTR



NUTR.X

Outer diameter	Dimensions D mm	d	B	C	d_a	$r_{s\,min}$	$r_{1s\,min}$	Yoke type track roller	Load coeff. Bearing Dynamic C kN	Static C_0	Yoke type track roller Dynamic C_w	Static $F_{r\,perm}$	$F_{0r\,perm}$	Reference speed Grease rpm	Mass ≈ kg
35	35	15	19	18	24	0,6	0,3	**NUTR15**	24,7	29,3	16,2	8,97	18,8	2 300	0,10
	35	15	19	18	24	0,6	0,3	**NUTR15X**	24,7	29,3	16,2	8,97	18,8	2 300	0,10
40	40	17	21	20	27	1	0,3	**NUTR17**	26,6	33,4	18,7	13,3	24,3	2 000	0,15
	40	17	21	20	27	1	0,3	**NUTR17X**	26,6	33,4	18,7	13,3	24,3	2 000	0,15
42	42	15	19	18	24	0,6	0,3	**NUTR1542**	24,7	29,3	20	18,8	28,3	2 300	0,17
	42	15	19	18	24	0,6	0,3	**NUTR1542X**	24,7	29,3	20	18,8	28,3	2 300	0,17
47	47	17	21	20	27	1	0,3	**NUTR1747**	26,6	33,4	22	24,9	33,6	2 000	0,23
	47	17	21	20	27	1	0,3	**NUTR1747X**	26,6	33,4	22	24,9	33,6	2 000	0,23
	47	20	25	24	32	1	0,3	**NUTR20**	41,4	53,3	28,1	18,1	36,5	1 700	0,25
	47	20	25	24	32	1	0,3	**NUTR20X**	41,4	53,3	28,1	18,1	36,5	1 700	0,25
52	52	20	25	24	32	1	0,3	**NUTR2052**	41,4	53,3	31,6	27,4	46	1 700	0,33
	52	20	25	24	32	1	0,3	**NUTR2052X**	41,4	53,3	31,6	27,4	46	1 700	0,33
	52	25	25	24	37	1	0,3	**NUTR25**	45,9	63,1	29,6	19,6	39,1	1 400	0,29
	52	25	25	24	37	1	0,3	**NUTR25X**	45,9	63,1	29,6	19,6	39,1	1 400	0,29
62	62	25	25	24	37	1	0,3	**NUTR2562**	45,9	63,1	36	38,9	57,7	1 400	0,46
	62	25	25	24	37	1	0,3	**NUTR2562X**	45,9	63,1	36	38,9	57,7	1 400	0,46
	62	30	29	28	44	1	0,3	**NUTR30**	62,6	83,2	40,7	25,7	52,4	1 200	0,48
	62	30	29	28	44	1	0,3	**NUTR30X**	62,6	83,2	40,7	25,7	52,4	1 200	0,48
72	72	30	29	28	44	1	0,3	**NUTR3072**	62,6	83,2	48,6	47,1	74,3	1 200	0,71
	72	30	29	28	44	1	0,3	**NUTR3072X**	62,6	83,2	48,6	47,1	74,3	1 200	0,71
	72	35	29	28	50	1,1	0,6	**NUTR35**	68,9	97,8	45,9	34,2	64,5	1 000	0,65
	72	35	29	28	50	1,1	0,6	**NUTR35X**	68,9	97,8	45,9	34,2	64,5	1 000	0,65
80	80	35	29	28	50	1,1	0,6	**NUTR3580**	68,9	97,8	51,7	51,9	81,9	1 000	0,86
	80	35	29	28	50	1,1	0,6	**NUTR3580X**	68,9	97,8	51,7	51,9	81,9	1 000	0,86
	80	40	32	30	55	1,1	0,6	**NUTR40**	91,7	132	60,6	42,4	85,7	950	0,85
	80	40	32	30	55	1,1	0,6	**NUTR40X**	91,7	132	60,6	42,4	85,7	950	0,85
85	85	45	32	30	60	1,1	0,6	**NUTR45**	91,7	146	62	44,4	88,8	850	0,92
	85	45	32	30	60	1,1	0,6	**NUTR45X**	91,7	146	62	44,4	88,8	850	0,92
90	90	40	32	30	55	1,1	0,6	**NUTR4090**	91,7	132	69,1	66,7	111	950	1,16
	90	40	32	30	55	1,1	0,6	**NUTR4090X**	91,7	132	69,1	66,7	111	950	1,16
	90	50	32	30	65	1,1	0,6	**NUTR50**	102	160	63,3	46,8	91,6	770	0,99
	90	50	32	30	65	1,1	0,6	**NUTR50X**	102	160	63,3	46,8	91,6	770	0,99
100	100	45	32	30	60	1,1	0,6	**NUTR45100**	97,1	146	74,2	81,5	127	850	1,43
	100	45	32	30	60	1,1	0,6	**NUTR45100X**	97,1	146	74,2	81,5	127	850	1,43
110	110	50	32	30	65	1,1	0,6	**NUTR50110**	102	160	78,9	97	142	770	1,73
	110	50	32	30	65	1,1	0,6	**NUTR50110X**	102	160	78,9	97	142	770	1,73