14 Track runner bearings

Designs and variants

Track runner bearings are designed to run on all types of tracks and to be used in cam drives, conveyor systems, etc. These bearings have a thick-walled outer ring, which enables them to accommodate high radial loads, while reducing distortion and bending stresses.

The outer ring running surface is crowned as standard. This is beneficial for applications where angular misalignment relative to the track may occur or where edge stresses need to be minimized. With the exception of single row cam rollers, track runner bearings are also available with a cylindrical (flat) outer ring running surface.

SKF supplies track runner bearings greased, sealed and ready to mount.

SKF supplies track runner bearings in many different types and designs, and for a wide variety of operating conditions and applications. The assortment comprises:

- cam rollers, internal design based on ball bearings
- support rollers, internal design based on needle or cylindrical roller bearings
- cam followers, internal design based on needle or cylindrical roller bearings

More information

Bearing life and load ratings **63**

Design considerations **159**

Lubrication **239**

Mounting, dismounting and bearing care **271**

Cam rollers

Single row cam rollers

SKF single row cam rollers (→ **fig. 1**) are based on deep groove ball bearings in the 62 series. They are supplied greased and capped with a sheet steel reinforced NBR contact seal on both sides.

Double row cam rollers

SKF double row cam rollers (→ **fig. 2**) are based on double row angular contact ball bearings in the 32 dimension series and have a 30° contact angle. They are supplied greased and capped with a sheet steel shield on both sides, which extends into a recess on the inner ring.

Fig. 1

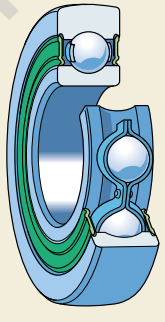
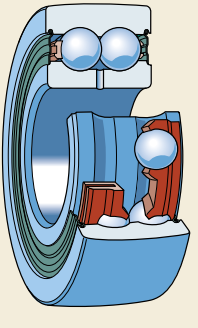


Fig. 2



Support rollers

Support rollers without flange rings

SKF support rollers without flange rings (→ **fig. 3**) are designed for applications where associated components limit axial movement of the outer ring. Based on needle roller bearings, these support rollers are available with or without an inner ring. Support rollers with an inner ring have an inner ring that is slightly wider than the outer ring to avoid axial clamping of the outer ring. Support rollers without an inner ring are intended for arrangements where the pin or shaft is hardened and ground.

STO and RSTO design support rollers

STO design support rollers have an inner ring, while RSTO design support rollers do not have an inner ring (→ **fig. 4**). Both designs are only available open (without seals). The components can be mounted separately, but the outer ring and the needle roller and cage assembly must always be kept together as supplied.

NA 22...2RS and RNA 22...2RS design support rollers

NA 22...2RS design support rollers have an inner ring, while RNA 22...2RS design support rollers do not have an inner ring (→ **fig. 5**). The needle roller and cage assembly is guided axially between two integral flanges in the outer ring to form a non-separable unit. The inner ring of NA 22...2RS design support rollers can be mounted separately from the outer ring, roller and cage assembly. Both designs are supplied greased and capped with a sheet steel reinforced NBR contact seal on both sides.

Fig. 3

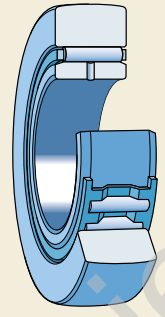


Fig. 4

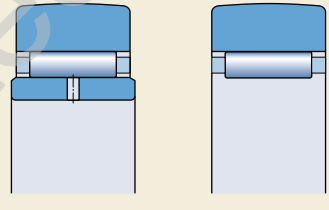
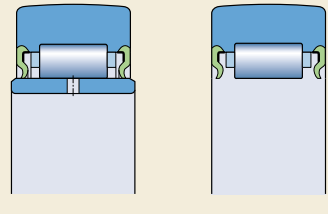


Fig. 5



Support rollers with flange rings

Support rollers with flange rings are non-separable units, designed for applications where there are axial loads, but no lateral (axial) support surfaces (→ **fig. 6**). These axial loads, which are induced when shafts are not horizontal or aligned properly, are accommodated by the flange rings. Depending on the design of the support rollers, the flange rings are pressed-on (NATR and NATV designs) or loose (NUTR, PWTR and NNTR designs).

NATR and NATV design support rollers

NATR design support rollers are fitted with a needle roller and cage assembly, while NATV design support rollers have a full complement of needle rollers (→ **fig. 7**). The outer rings of both designs are guided axially by pressed-on flange rings. The narrow gap between the flange rings and the outer ring serves as a gap-type seal.

Both designs are also available with an axial sliding ring on both sides, identified by the designation suffix PPA (→ **fig. 8**). The axial sliding rings are made of PA66. 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. This improves the lubrication conditions in the bearing, keeps friction and frictional heat low, and extends grease life.

Support rollers with axial sliding rings can accommodate somewhat heavier axial loads than those without axial sliding rings. Axial loads are induced when operating in an inclined or tilted position.

Fig. 6

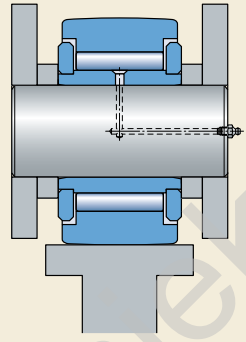
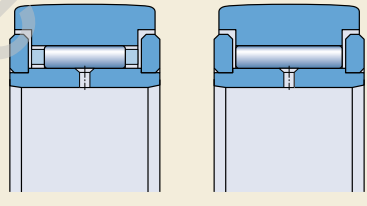
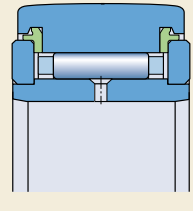


Fig. 7



NATR NATV

Fig. 8



NATR .. PPA

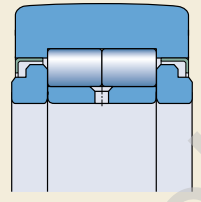
NUTR .. A design support rollers

NUTR .. A design support rollers (→ **fig. 9**) are based on double row, full complement cylindrical roller bearings without an integral flange between the two roller sets. The outer ring has two integral flanges to guide the roller sets axially. A loose flange ring on both sides of the inner ring provides axial guidance for the outer ring via the roller sets. This enables NUTR .. A design support rollers to accommodate relatively heavy axial loads that are induced when operating in an inclined or tilted position.

A sheet metal angle ring is pressed into the outer ring shoulder on both sides and forms an effective labyrinth seal. The angle rings extend over the flange rings, making the bearing non-separable.

If heavy shock loads occur, support rollers with a reinforced outer ring should be used. These are identified by a bearing designation that has a four- or five-digit number instead of a two-digit number, e.g. NUTR 50110 A.

Fig. 9



NUTR .. A

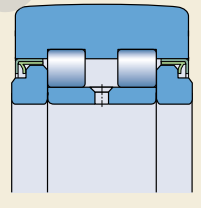
PWTR ...2RS design support rollers

PWTR ...2RS design support rollers (→ **fig. 10**) are based on double row, full complement cylindrical roller bearings. Three integral flanges in the outer ring guide the two roller sets axially. A loose flange ring on both sides of the inner ring provides axial guidance for the outer ring via the roller sets. This, together with the relatively large grease quantity between the two roller sets, enable PWTR ...2RS design support rollers to accommodate relatively heavy constant axial loads that are induced when operating in an inclined or tilted position.

PWTR ...2RS design support rollers are supplied with an NBR contact seal on both sides. The seals are integral with the sheet metal angle rings and press against the flange rings. The angle rings are pressed into the outer ring shoulder. They extend over the flange rings, making the bearing non-separable.

If heavy shock loads occur, support rollers with a reinforced outer ring should be used. These are identified by a bearing designation that has a four- or five-digit number instead of a two-digit number, e.g. PWTR 50110.2RS.

Fig. 10



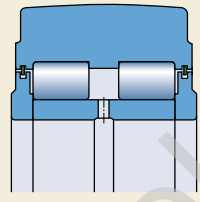
PWTR ...2RS

NNTR ...2ZL design support rollers

NNTR ...2ZL design support rollers (→ **fig. 11**) are based on double row, full complement cylindrical roller bearings. They are designed to accommodate very heavy radial loads. Three integral flanges in the outer ring axially guide the two roller sets. A loose flange ring on both sides of the inner ring provides axial guidance for the outer ring via the roller sets. This, together with the relatively large grease quantity between the two roller sets, enable NNTR ...2ZL design support rollers to accommodate relatively heavy constant axial loads that are induced when operating in an inclined or tilted position.

NNTR ...2ZL design support rollers are fitted with a lamellar seal on both sides. The seals are inserted into recesses in the shoulders of the flange rings and the outer ring, making the bearing non-separable.

Fig. 11



NNTR ...2ZL

Cam followers

Instead of an inner ring, cam followers have a solid stud (pin) that is threaded so that the cam follower can be quickly and easily attached to appropriate machine components by means of a hexagonal nut.

SKF cam followers are available in three basic designs:

- KR design
- NUKR design
- PWKR design

All three cam follower 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.

All designs are available with a concentric seat (→ **fig. 12**) or an eccentric collar (→ **fig. 13**) on the stud. An eccentric collar, which has a shrink-fit onto the stud, enables less stringent positioning tolerances to be specified for associated components. The values for the adjustable eccentricity are listed in the product tables. An eccentric collar is identified by the letter E at the end of the basic designation.

Fig. 12

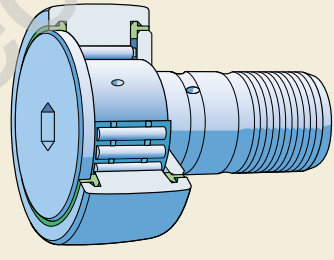
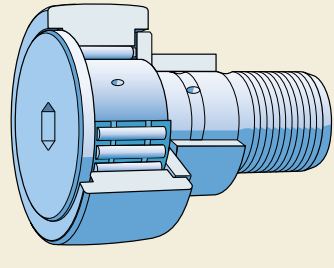


Fig. 13

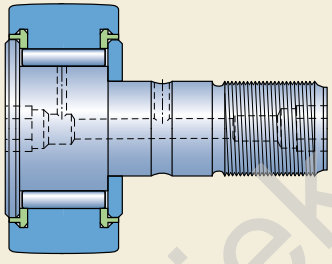


KR design cam followers

KR design cam followers are fitted with a needle roller and cage assembly. They are also available with a full complement needle roller set (→ **fig. 14**), which is identified by the letter V at the end of the basic designation. The outer ring is axially guided by the pressed-on flange ring and the head of the stud, which also serves as an integral flange.

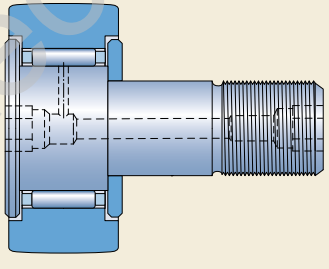
KR design cam followers without a designation suffix or with the designation suffix B (→ **fig. 15**) have a narrow gap between the outer ring and the two flanges that serves as a gap-type seal.

Fig. 14



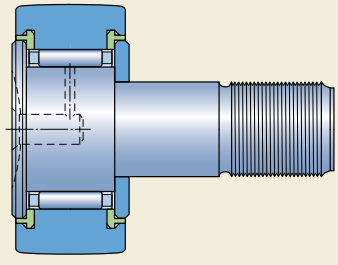
KRV .. PPA, size ≥ 30

Fig. 15

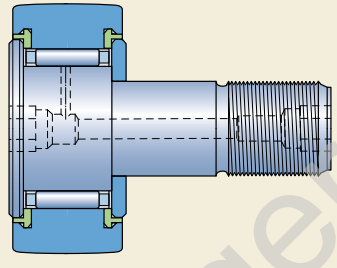


KR .. B, sizes 22 and 26

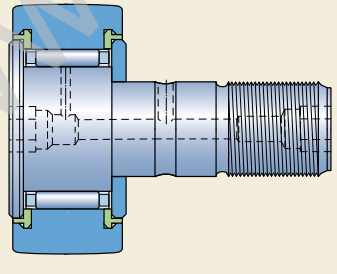
Fig. 16



KR .. PPA, sizes 16 and 19



KR .. PPA, sizes 22 and 26



KR .. PPA, size ≥ 30

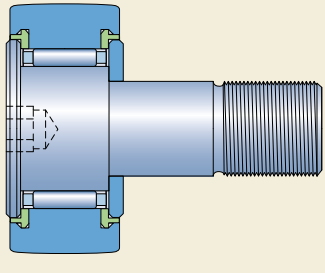
KR design cam followers are also available with an axial sliding ring made of PA66 on both sides, identified by the designation suffix PPA (→ **fig. 16**) or PPSKA (→ **fig. 17**). In the radial direction, the sliding ring forms a narrow labyrinth seal with the outer ring to protect against coarse contaminants. In the axial direction, the sliding ring serves as a contact seal to reliably retain grease in the bearing. This improves the lubrication conditions in the bearing, keeps friction and frictional heat low, and extends grease life.

Cam followers with axial sliding rings can accommodate somewhat heavier axial loads than those without axial sliding rings. Axial loads are induced when operating in an inclined or tilted position.

KR design cam followers, sizes 16 and 19, either without a designation suffix or with the designation suffix PPA have one slot in the head of the stud that enables the stud to be held in place by a screwdriver during mounting. In the centre of that slot is a relubrication hole for a press-in grease fitting or a plug if relubrication is not required (→ *Accessories*, **page 1109**). SKF also supplies these two sizes with a hexagonal recess in the head of the stud. They are fitted with an axial sliding ring on both sides and are identified by the designation suffix PPSKA (→ **fig. 17**).

KR design cam followers with the designation suffix B, sizes 22 and larger, have a hexagonal recess at each end of the stud (→ **fig. 15**, **page 1105**), enabling the cam follower to be held in place by a hexagonal key (Allen wrench)

Fig. 17



KR .. PPSKA

during mounting. In the centre of each hexagon is a relubrication hole for a press-in grease fitting, if needed. Sizes 35 and larger can accommodate adapters from a central lubrication system (→ *Accessories*, **page 1109**).

NUKR .. A design cam followers

NUKR .. A design cam followers (→ **fig. 18**) are based on double row, full complement cylindrical roller bearings without an integral flange between the two roller sets. The stud head and pressed-on flange ring guide the outer ring axially via the roller sets. This enables NUKR .. A design cam followers to accommodate relatively heavy axial loads that are induced when operating in an inclined or tilted position.

A sheet metal angle ring is pressed into the outer ring shoulder on both sides to form an effective labyrinth seal.

NUKR .. A design cam followers have a hexagonal recess at each end of the stud, enabling the cam follower to be held in place by a hexagonal key (Allen wrench) during mounting. In the centre of each hexagon is a relubrication hole for a press-in grease fitting or an adapter from a central lubrication system (→ *Accessories*, **page 1109**).

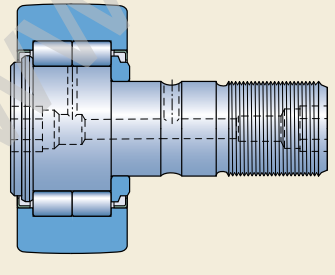
PWKR ...2RS design cam followers

PWKR ...2RS design cam followers (→ **fig. 19**) are based on double row, full complement cylindrical roller bearings. The stud head and a pressed-on flange ring guide the outer ring axially via the roller sets. This enables PWKR ...2RS design cam followers to accommodate relatively heavy constant axial loads that are induced when operating in an inclined or tilted position.

PWKR ...2RS design cam followers are supplied with an NBR contact seal on both sides. The seals are integral with the sheet metal angle rings and press against the flange ring and the stud head. The angle rings are pressed into the outer ring shoulder.

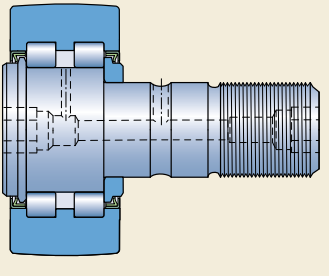
PWKR ...2RS design cam followers have a hexagonal recess at both ends of the stud, enabling the cam follower to be held in place by a hexagonal key (Allen wrench) during mounting. In the centre of each hexagon is a relubrication hole for a press-in grease fitting or an adapter from a central lubrication system (→ *Accessories*, **page 1109**).

Fig. 18



NUKR .. A

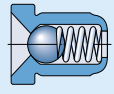
Fig. 19



PWKR ...2RS

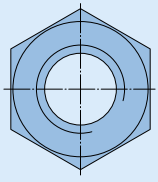
Table 1

Accessories for cam followers

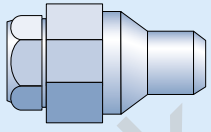


Grease fitting

Plug



Hexagonal nut

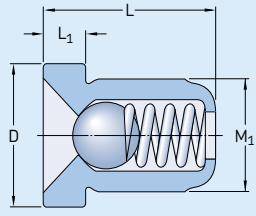


Adapter

Cam follower Design	Size without seals	with seals	Supplied with the cam follower Grease fitting	Hexagonal nut	To be ordered separately Plug	Adapter
KR						
KRE						
KRV						
	16	**16 PPA**	NIP A1	M 6x1	VD1	–
	–	**16 PPSKA**	–	M 6x1	–	–
	19	**19 PPA**	NIP A1	M 8x1,25	VD1	–
	–	**19 PPSKA**	–	M 8x1,25	–	–
	22 B	**22 PPA**	2 x NIP A1x4,5	M 10x1	–	–
	26 B	**26 PPA**	2 x NIP A1x4,5	M 10x1	–	–
	30 B	**30 PPA**	2 x NIP A1x4,5	M 12x1,5	–	–
	32 B	**32 PPA**	2 x NIP A1x4,5	M 12x1,5	–	–
	35 B	**35 PPA**	2 x NIP A2x7,5	M 16x1,5	–	AP 8
	40 B	**40 PPA**	2 x NIP A2x7,5	M 18x1,5	–	AP 8
	–	**47 PPA**	2 x NIP A2x7,5	M 20x1,5	–	AP 10
	–	**52 PPA**	2 x NIP A2x7,5	M 20x1,5	–	AP 10
	–	**62 PPA**	2 x NIP A3x9,5	M 24x1,5	–	AP 14
	–	**72 PPA**	2 x NIP A3x9,5	M 24x1,5	–	AP 14
	–	**80 PPA**	2 x NIP A3x9,5	M 30x1,5	–	AP 14
	–	**90 PPA**	2 x NIP A3x9,5	M 30x1,5	–	AP 14
NUKR .. A						
NUKRE .. A						
PWKR ...2RS						
PWKRE ...2RS						
	–	**35**	2 x NIP A2x7,5	M 16x1,5	–	AP 8
	–	**40**	2 x NIP A2x7,5	M 18x1,5	–	AP 8
	–	**47**	2 x NIP A2x7,5	M 20x1,5	–	AP 10
	–	**52**	2 x NIP A2x7,5	M 20x1,5	–	AP 10
	–	**62**	2 x NIP A3x9,5	M 24x1,5	–	AP 14
	–	**72**	2 x NIP A3x9,5	M 24x1,5	–	AP 14
	–	**80**	2 x NIP A3x9,5	M 30x1,5	–	AP 14
	–	**90**	2 x NIP A3x9,5	M 30x1,5	–	AP 14

Table 2

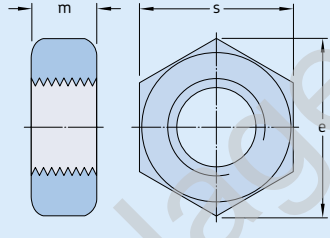
Grease fittings



Designation	Dimensions M_1	D	L	L_1
–	mm			
NIP A1	4	6	6	1,5
NIP A1x4,5	4	4,7	4,5	1
NIP A2x7,5	6	7,5	7,5	2
NIP A3x9,5	8	10	9,5	3

Table 3

Hexagonal nuts



Size	Dimensions m	e	s	Tightening torque	Standard[1)]
–	mm			Nm	–
M 6x1	5,2	11	10	3	1
M 8x1,25	6,8	14,4	13	8	1
M 10x1	8,4	17,8	16	15	2
M 12x1,5	10,8	20	18	22	2
M 16x1,5	14,8	26,8	24	58	2
M 18x1,5	15,8	29,6	27	87	2
M 20x1,5	18	33	30	120	2
M 24x1,5	21,5	39,5	36	220	2
M 30x1,5	25,6	50,9	46	450	2

[1)] 1 = EN ISO 4032, ISO 4032
2 = EN ISO 8673, ISO 8673

Accessories

Accessories provide SKF cam followers with reliable lubrication and location (→ **table 1**). Accessories, other than grease fittings and hexagonal nuts must be ordered separately.

Grease fittings

SKF supplies the appropriate grease fittings, that can be pressed into position, with each cam follower as standard (→ **table 1**). These are the only grease fittings that should be used. Dimensions are listed in **table 2**.

For KR design cam followers, sizes 16 and 19, the head of the grease fitting protrudes from the head end of the stud by 1,5 mm.

Hexagonal nuts

SKF supplies the appropriate hexagonal nuts with each cam follower as standard (→ **table 1**). They are in accordance with ISO 4032 or ISO 8673. These 8.8 strength class nuts are zinc galvanized to ISO 4042. Dimensions and recommended tightening torques are listed in **table 3**.

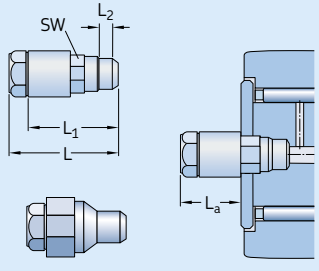
Plugs

The end of the relubrication hole in the stud of KR design cam followers, sizes 16 and 19, except those with the designation suffix PPSKA, can be plugged if relubrication is not required or if there is no space for the head of the grease fitting. Appropriate plugs (→ **table 1**) with a VD1 designation must be ordered separately.

Table 4

Dimensions of adapters for connecting to a centralized lubrication system

AP 8 and AP 10



AP 14

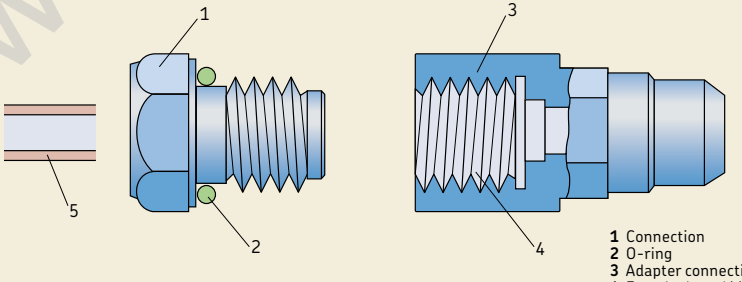
Designation	Dimensions L	L_1	L_2	L_a	SW
–	mm				
AP 8	27	22	4	16	8
AP 10	27	22	5	15	10
AP 14	25	20	6	8	14

Adapters for connecting to a centralized lubrication system

AP design adapters enable cam followers to be relubricated via a centralized lubrication system. These adapters have a connection that accommodates, for example, 4 × 0,75 polyamide tubing in accordance with DIN 73378 (→ **fig. 20**). Appropriate adapters are listed in **table 1** (→ **page 1108**), the dimensions are listed in **table 4**.

Fig. 20

Adapter for connection to a centralized lubrication system



1 Connection
2 O-ring
3 Adapter connection
4 Female thread M 10×1
5 Polyamide tube

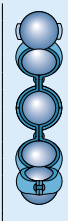
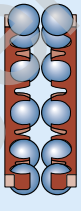
Cages

Depending on their design and series, SKF track runner bearings are fitted with one of the cages shown in **table 5**. Double row cam rollers are equipped with two cages. The standard cage is not identified in the bearing designation.

The lubricants generally used for rolling bearings do not have a detrimental effect on cage properties. However, some synthetic oils and greases with a synthetic oil base and lubricants containing a high proportion of EP additives, when used at high temperatures, can have a detrimental effect on polyamide cages. For information about the suitability of cages, refer to *Cages* (→ **page 37**) and *Cage materials* (→ **page 152**).

Table 5

Cages for track runner bearings

	Single row cam rollers		Double row cam rollers	Support rollers		Cam followers
						
Cage type	Riveted, ball centred	Ribbon-type, ball centred	Snap-type, ball centred	Window-type, centring depends on size and design	Window-type, outer raceway centred	Window-type, roller centred
Material	Stamped steel	Stamped steel	PA66, glass fibre reinforced	Sheet steel	PA66, glass fibre reinforced	Sheet steel
Suffix	–	–	–	–	TN	–

Lubrication

SKF track runner bearings are supplied greased. They are filled with the appropriate amount of a high-quality grease under clean conditions. The technical specifications of the greases are listed in **table 6**.

(R)STO design support rollers can be oil or grease lubricated. In applications where oil is used, SKF recommends thoroughly washing the initial grease fill from the bearing prior to operation.

Relubrication requirements

Single row cam rollers are greased for the life of the bearing and cannot be relubricated.

Double row cam rollers are also greased for the life of the bearing under normal operating conditions. If subjected to moisture or solid contaminants, or if they run for long periods at temperatures above 70 °C *(160 °F)*, they should be relubricated. When relubricating double row cam rollers, the grease should be applied slowly to avoid damaging the shields.

Support rollers and cam followers require little maintenance, but they should be relubricated regularly to achieve their full service life. SKF recommends relubrication while the initial grease fill still has its full lubricating properties. Support rollers and cam followers used in applications where there are light loads, relatively slow speeds and clean surroundings, can operate for long periods before relubrication is required. Support rollers and cam followers that operate under contaminated and damp conditions at high speeds or at temperatures above 70 °C *(160 °F)* require more frequent relubrication. Full complement support rollers or cam followers require more frequent relubrication.

KR design cam followers, sizes 16 and 19, designation suffix PPSKA, cannot be relubricated.

Table 6

Technical specifications of SKF greases for track runner bearings

Bearing type	Specifications for the initial grease fill Temperature range[1]	Thickener	Base oil type	NLGI consistency class	Base oil viscosity [mm²/s] at 40 °C *(105 °F)*	at 100 °C *(210 °F)*	Grease for relubrication
Single row cam roller (D ≤ 62 mm)	–50 0 50 100 150 200 250 °C –60 30 120 210 300 390 480 °F	Lithium soap	Mineral	2	70	7,3	–
Single row cam roller (D > 62 mm), Double row cam roller		Lithuim soap	Mineral	3	100	10	– LGMT 3
Support roller, Cam follower		Lithium complex soap	Mineral	2	160	15,5	LGWA 2

[1] Refer to the SKF traffic light concept → page 244

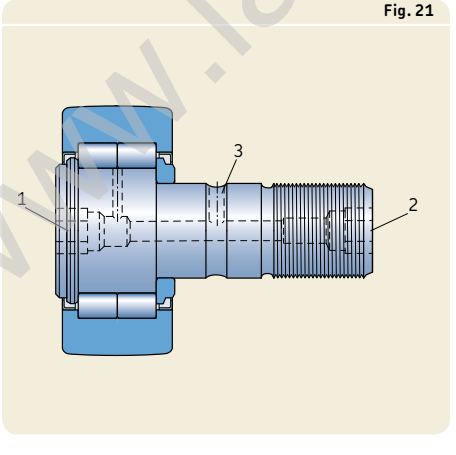
Relubrication facilities

SKF supplies all inner rings for support rollers and double row cam rollers with one lubrication hole, except for inner rings of the NNTR design support rollers, which have three lubrication holes when d ≤ 90 mm or six lubrication holes when d ≥ 100 mm. If suitable ducts are provided in the pin, the bearings are easy to relubricate.

Cam followers can be relubricated via ducts in the stud. Depending on series and size, there are up to three positions for relubrication (→ **fig. 21**). Detailed information about the positions can be obtained from the product tables (→ **page 1140**). Positions 1 and 2 can take the grease fitting supplied with the cam follower. Position 3 should be used when relubricating via ducts in the adjacent components. Positions not used for relubrication should be closed with a grease fitting or a plug.

For cam followers, size ≥ 35, positions 1 and 2 can be connected to a central lubrication system (→ *Accessories*, **page 1109**).

Fig. 21



Bearing data

	Single row cam rollers	Double row cam rollers
Dimension standards	ISO 15, dimension series 02, except for the outside diameter	ISO 15, dimension series 32, except for the outside diameter
Profile of the outer ring running surface	Radius = 400 mm	**3057.. C design** Cylindrical (flat) **3058.. C design** Radius = 400 mm
Tolerances For additional information (→ **page 132**)	Normal, except: • diameter of the crowned running surface: twice the Normal tolerance	
	Values for Normal tolerance class: ISO 492 (→ **table 3**, **page 137**). Values for ISO tolerance classes h7, h9, h10, ...	
Internal clearance	C3	Normal
For additional information (→ **page 149**)	Values: ISO 5753-1 (→ **table 6**, **page 314**)	Values 32 A series: (→ **table 7**, **page 489**)
	Values are valid for unmounted bearings under zero ...	
Defect frequencies	Defect frequencies can be calculated using the tools available ...	

	Support rollers	Cam followers
	(R)NA 22 designs ISO 15, dimension series 22, except for the outer ring width **NATR, NATV, NUTR .. A, PWTR designs** ISO 7063 and ANSI/ABMA Standard 18.1 (where standardized) **(R)STO designs** Not standardized	ISO 7063 and ANSI/ABMA Standard 18.1 (where standardized)
	(R)STO, (R)NA 22, NATR, NATV designs Radius = 500 mm **NNTR design** D ≤ 260 mm → Radius = 10 000 mm D ≥ 290 mm → Radius = 15 000 mm **NATR .. PPA, NATV .. PPA, NUTR .. A, PWTR designs** Improved crowned profile for better load distribution, higher stiffness and reduced wear	**KR .. (B) design** Radius = 500 mm **Other designs** Improved crowned profile for better load distribution, higher stiffness and reduced wear
	Normal, except: • diameter of the crowned running surface, NNTR design: h10 • diameter of the crowned running surface, other designs: 0/–0,05 mm • width B, NNTR design: 0/–0,5 mm • width B, NATR, NATV, NUTR .. A, PWTR designs: h12 • inside diameter F_w, RSTO, RNA 22 designs: F6	Normal, except: • KR, KRE, KRV designs: ISO 7063 • diameter of the crowned running surface: 0/–0,05 mm • stud shank diameter: h7 • eccentric collar diameter: h9
	… h12 and F6: (→ **table 7**, **page 1118**)	
	STO and NA 22 designs Normal **Other designs** Between C2 and Normal	Between C2 and Normal
	Values: ISO 5753-1 (→ **table 13**, **page 710**)	
	… measuring load.	
	… online at skf.com/bearingcalculator.	

Loads

	Single row cam rollers	Double row cam rollers	Support rollers
Dynamic loads	Compared to a typical rolling bearing, where the outer ring is fully supported in a housing, a track runner bearing has only a small contact area between its outside surface and the track. The actual contact area depends on the applied radial load and the profile of the runner surface. Deformation of the outer ring, caused by this limited contact, alters the load distribution in the bearing, which affects load carrying ability. The basic load ratings listed in the product tables take this into account. ...		
Static loads	The permissible static load for a track runner bearing is determined by the smaller of the values $F_{0r\,max}$ and C_0 (→ **product tables**). If requirements for smooth running are below normal, the static load may exceed C_0, ...		
Axial loads	Cam rollers are intended for predominantly radial loads. If an axial load acts on the outer ring, as when the cam roller runs against a guide flange, it produces a tilting moment and the service life of the cam roller may be reduced as a consequence.		Support rollers with flange rings can generally accommodate axial loads that are induced when operating in an inclined or tilted position. The magnitude of permissible load depends on the internal design.
Minimum load For additional information (→ **page 86**)	$F_{rm} = 0{,}0167\ C_0$ The weight of the components supported by the bearing, together with external forces, generally exceed the requisite minimum load. If this ...		
Equivalent dynamic bearing load For additional information (→ **page 85**)	$F_a/F_r \leq e$ → $P = F_r$ $F_a/F_r > e$ → $P = 0{,}46\ F_r + Y\ F_a$	$F_a/F_r \leq 0{,}8$ → $P = F_r + 0{,}78\ F_a$ $F_a/F_r > 0{,}8$ → $P = 0{,}63\ F_r + 1{,}24\ F_a$	$P = F_r$
Equivalent static bearing load For additional information (→ **page 88**)	$P_0 = 0{,}6\ F_r + 0{,}5\ F_a$ $P_0 < F_r$ → $P_0 = F_r$	$P_0 = F_r + 0{,}66\ F_a$	$P_0 = F_r$

	Cam followers
	... The ability to accommodate dynamic loads depends on the requisite life, but it is also important to consider the strength of the outer ring. Therefore, the value of the maximum permissible dynamic radial load $F_{r\,max}$ (→ **product tables**) should not be exceeded.
	... but should never exceed the maximum permissible static radial load $F_{0r\,max}$.
	The flange rings enable cam followers to accommodate axial loads that are induced when operating in an inclined or tilted position. The magnitude of permissible load depends on the internal design.
	... is not the case, the bearing must be subjected to an additional radial load.
	$P = F_r$
	$P_0 = F_r$

Symbols

C_0 = basic static load rating [kN] (→ **product tables**)
e = limit for the load ratio depending on the relationship $f_0\,F_a/C_0$ (→ **table 8, page 1118**)
f_0 = calculation factor (→ **product table**)
F_a = axial load [kN]
F_r = radial load [kN]
F_{rm} = minimum radial load [kN]
$F_{r\,max}$ = maximum permissible dynamic radial load [kN] (→ **product tables**)
$F_{0r\,max}$ = maximum permissible static radial load [kN] (→ **product tables**)
P = equivalent dynamic bearing load [kN]
P_0 = equivalent static bearing load [kN]
Y = calculation factor for the axial load, depending on the relationship $f_0\,F_a/C_0$ (→ **table 8, page 1118**)

Table 7

ISO tolerance classes

Nominal dimension over	incl.	h7Ⓔ Deviations high	low	h9Ⓔ Deviations high	low	h10Ⓔ Deviations high	low	h12Ⓔ Deviations high	low	F6Ⓔ Deviations high	low
mm		µm		µm		µm		µm		µm	
3	**6**	0	–12	–	–	–	–	–	–	–	–
6	**10**	0	–15	0	–36	–	–	–	–	+22	+13
10	**18**	0	–18	0	–43	–	–	0	–180	+27	+16
18	**30**	0	–21	0	–52	–	–	0	–210	+33	+20
30	**50**	–	–	0	–62	–	–	0	–250	+41	+25
50	**80**	–	–	–	–	–	–	–	–	+49	+30
120	**180**	–	–	–	–	0	–160	–	–	–	–
180	**250**	–	–	–	–	0	–185	–	–	–	–
250	**315**	–	–	–	–	0	–210	–	–	–	–

Table 8

Calculation factors for single row cam rollers

$f_0 F_a/C_0$	e	Y
0,172	0,29	1,88
0,345	0,32	1,71
0,689	0,36	1,52
1,03	0,38	1,41
1,38	0,4	1,34
2,07	0,44	1,23
3,45	0,49	1,1
5,17	0,54	1,01
6,89	0,54	1

Intermediate values can be obtained by linear interpolation.

Temperature limits

The permissible operating temperature for track runner bearings can be limited by:

- the dimensional stability of the bearing rings and rolling elements
- the cage
- the seals
- the lubricant

When temperatures outside the permissible range are expected, contact the SKF application engineering service.

Bearing rings and rolling elements

SKF track runner bearings undergo a special heat treatment. The bearings are heat stabilized up to at least:

- 120 °C *(250 °F)* for single row cam rollers
- 150 °C *(300 °F)* for double row cam rollers
- 140 °C *(280 °F)* for support rollers and cam followers

Cages

Steel cages can be used at the same operating temperatures as the bearing rings and rolling elements. For temperature limits of PA66 cages, refer to *Cage materials* (→ **page 152**).

Seals

The permissible operating temperature for seals depends on the material:

- NBR seals:
  –40 to +100 °C *(–40 to +210 °F)*
  Temperatures up to 120 °C *(250 °F)* can be tolerated for brief periods.
- PA66 sliding rings:
  –30 to +100 °C *(–20 to +210 °F)*

Lubricants

Temperature limits for greases used in SKF track runner bearings are provided in **table 6** (→ **page 1112**). Temperature limits for other SKF greases are provided under *Lubrication* (→ **page 239**)

When using lubricants not supplied by SKF, the temperature limits should be evaluated according to the SKF traffic light concept (→ **page 244**).

Speed limits

Values for the limiting speeds are listed in the product tables. For additional information about the limiting speed, refer to *Speeds* (→ **page 117**).

Design of associated components

Pins

Cam rollers and support rollers generally operate under conditions of stationary inner ring load. For this type of load, and if easy displacement of the inner ring is required, the pin or shaft should be machined to tolerance class g6Ⓔ.

The recommended pin tolerance class for support rollers without an inner ring is k5Ⓔ. To exploit the full load carrying capacity of support rollers, the raceways on the pins should have the same hardness and surface finish normally found on bearing raceways. For additional information, refer to *Raceways on shafts and in housings* (→ **page 210**).

Attachment holes for studs

The holes in the adjacent part of machinery to accommodate the stud or eccentric collar of a cam follower should be machined to tolerance class H7Ⓔ. If the requisite tightening torque for the hexagonal nut (→ **table 3**, **page 1109**) cannot be achieved or the cam followers are subjected to shock loads, the stud or eccentric collar should be mounted with an interference fit. The lead-in chamfer of the holes should be ≤ 0,5 × 45°.

Support surfaces

Cam rollers

Cam rollers that must accommodate heavy axial loads should be supported over the entire inner ring side face (→ **fig. 22**). The support surface should be dimensioned according to diameter d_1 (→ **product tables**).

Support rollers

The outer ring support surfaces of support rollers without flange rings must be fine turned, free of burrs and clean. Unhardened surfaces should extend to at least half the outer ring side face (→ **fig. 23**) while hardened surfaces may be smaller.

Heavily loaded support rollers with flange rings should be axially supported over the entire flange ring side faces (→ **fig. 24**). The support surface should be dimensioned according to diameter d_1 (→ **product tables**).

Cam followers

The flange ring that is pressed onto the stud shank should be supported axially over its entire side face (→ **fig. 25**). The support surface should be dimensioned according to diameter d_1 (→ **product tables**). The strength of the material should be sufficiently high to accommodate the tightening torque.

Fig. 22

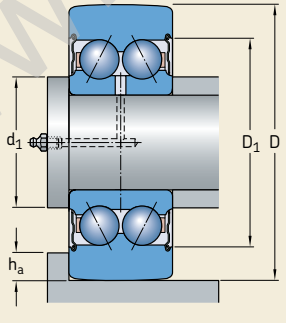
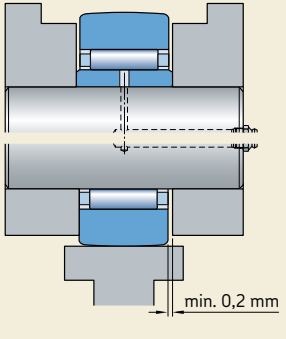


Fig. 23



Guide flanges for cam rollers

For rails or cams with guide flanges, the recommended flange height h_a (→ **fig. 22**) should be:

$h_a \leq 0{,}5\ (D - D_1)$

This helps to avoid damage to the seals or shields fitted in the outer ring. The values for the outer ring diameters D and D_1 are listed in the product tables.

Axial gap

Support rollers without flange rings, but with an inner ring, and support rollers with flange rings must be located without any axial gap (→ **fig. 24**).

Support rollers without an inner ring must have an axial gap ≥ 0,2 mm between the outer ring and support surface (→ **fig. 23**).

Fig. 24

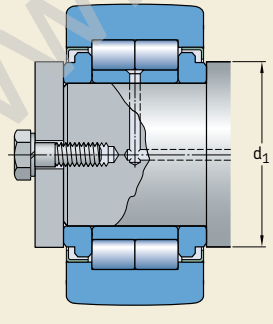
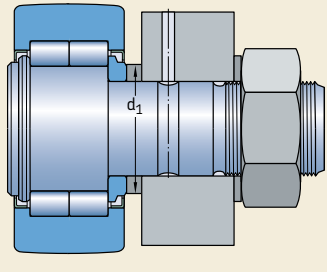


Fig. 25



Mounting

Support rollers

SKF recommends positioning the lubrication hole in the unloaded zone of the support roller inner ring, except for PWTR and NNTR design support rollers, which have the lubrication holes in the empty space between the two roller sets.

When mounting the outer ring assembly and inner ring separately, care must be taken not to damage the seal lips.

Cam followers

Cam followers can be attached to associated components (→ **fig. 25**, **page 1121**) using the hexagonal nut (→ **table 3**, **page 1109**) supplied together with the cam follower. Spring washers, which are not supplied by SKF, can be used to secure the nuts.

The nuts should be tightened to the recommended torque values listed in **table 3** (→ **page 1109**). The recommended tightening torques enable the full load carrying capacity of the cam follower to be exploited. If heavy vibrations occur, the cam followers can be located using self-locking nuts in accordance with ISO 10511 or special lock washers.

For self-locking nuts, a higher tightening torque must be applied. Follow the recommendations of the nut manufacturer.

Most cam followers (all for sizes ≥ 22) have a hexagonal recess in the stud head and can be held in place by a hexagonal key (Allen wrench) while the nut is being tightened. Some cam follower designs of the small sizes 16 and 19 have a slot in the stud head instead, and can be held in place by a screwdriver. For additional information, refer to the illustrations in the product tables (→ **page 1140**).

Depending on the mounting conditions, cam followers with an eccentric collar can be adjusted to the required eccentricity via the slot or the hexagonal recess.

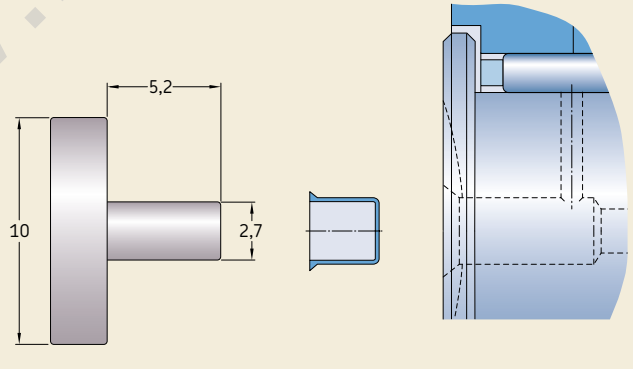
Do not hit the head of the stud as damage to the cam follower may result.

SKF recommends positioning the lubrication hole in the stud head in the unloaded zone of the cam follower. The position of this hole corresponds to the marking on the head end of the stud.

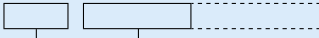
The lubrication hole in position 3 (→ **fig. 21**, **page 1113**) may be used to incorporate a locking device to prevent the stud from turning.

When inserting a plug, it should be pressed into place using a mandrel (→ **fig. 26**).

Fig. 26



Designation system



Prefixes

R	Support roller without an inner ring

Basic designation

3612.. R	Single row cam roller with an NBR contact seal on both sides.
3057.. C	Double row cam roller with a cylindrical (flat) outer ring running surface.
3058.. C	Double row cam roller with a crowned outer ring running surface.
NA 22	Support roller without a flange ring, fitted with a needle roller and cage assembly.
STO	Support roller without a flange ring, fitted with a needle roller and cage assembly.
NATR	Support roller with two pressed-on flange rings, fitted with a needle roller and cage assembly.
NATV	Support roller with two pressed-on flange rings, fitted with a full complement of needle rollers.
NUTR	Support roller based on a double row, full complement cylindrical roller bearing with two integral outer ring flanges and a loose flange ring on both sides of the inner ring.
NNTR	Support roller based on a double row, full complement cylindrical roller bearing with three integral outer ring flanges and a loose flange ring on both sides of the inner ring.
PWTR	Support roller based on a double row, full complement cylindrical roller bearing with three integral outer ring flanges and a loose flange ring on both sides of the inner ring.
KR	Cam follower fitted with a needle roller and cage assembly.
KRE	Cam follower fitted with a needle roller and cage assembly, with an eccentric collar pressed onto the stud.
KRV	Cam follower fitted with a full complement of needle rollers.
KRVE	Cam follower fitted with a full complement of needle rollers, with an eccentric collar pressed onto the stud.
NUKR	Cam follower based on a double row, full complement cylindrical roller bearing with two integral outer ring flanges.
NUKRE	Cam follower based on a double row, full complement cylindrical roller bearing with two integral outer ring flanges, with an eccentric collar pressed onto the stud.
PWKR	Cam follower based on a double row, full complement cylindrical roller bearing with three integral outer ring flanges.
PWKRE	Cam follower based on a double row, full complement cylindrical roller bearing with three integral outer ring flanges, with an eccentric collar pressed onto the stud.

Group 1 | Group 2 | Group 3

Group 3: Cage design

TN	Glass fibre reinforced PA66 cage

Group 2: External design (seals, snap ring groove etc.)

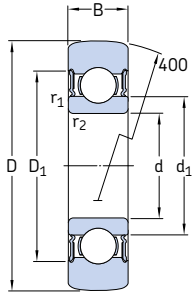
.2RS	NBR contact seal on both sides
.2ZL	Lamellar seal on both sides
-2Z	Shield on both sides
B	KR design cam follower with a hexagonal recess on both ends of the stud.
PPA	**1** NATR or NATV design support roller with a PA66 axial sliding and sealing ring on both sides. Improved crowned profile of the outer ring running surface. **2** KR design cam follower have the same features as listed above. Sizes 16 and 19 have one slot in the head of the stud as standard. Sizes ≥ 22 have a hexagonal recess on both ends.
PPSKA	KR design cam follower, sizes 16 and 19, with a PA66 axial sliding and sealing ring on both sides, improved crowned profile of the outer ring running surface and a hexagonal recess in the head of the stud, no relubrication facilities.
PPXA	Cam followers with PPA features except for the outer ring running surface, which has a cylindrical profile.

Group 1: Internal design

A	Improved crowned profile of the outer ring running surface (NUTR design support rollers or NUKR design cam followers).
X	Cylindrical (flat) profile of the outer ring running surface.
XA	Cylindrical (flat) profile of the outer ring running surface (NUKR .. A or NUKRE .. A design cam follower).

Suffixes

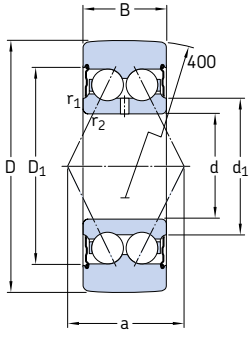
14.1 Single row cam rollers
D **32 – 80** mm



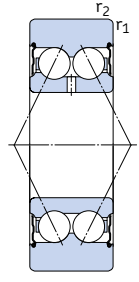
Dimensions						Limiting speed	Mass	Designation
D	B	d	d_1 ~	D_1 ~	$r_{1,2}$ min.			
mm						r/min	kg	–
32	9	10	17	24,8	0,6	12 000	0,04	**361200 R**
35	10	12	18,4	27,4	0,6	11 000	0,051	**361201 R**
40	11	15	21,7	30,4	0,6	9 500	0,072	**361202 R**
47	12	17	24,5	35	0,6	8 500	0,11	**361203 R**
52	14	20	28,8	40,6	1	7 000	0,15	**361204 R**
62	15	25	34,3	46,3	1	6 300	0,24	**361205 R**
72	16	30	40,3	54,1	1	5 300	0,34	**361206 R**
80	17	35	46,9	62,7	1,1	4 500	0,42	**361207 R**

Outside diameter	Basic load ratings dynamic	static	Fatigue load limit	Maximum radial loads dynamic	static	Calculation factor
D	C	C_0	P_u	F_r	F_{0r}	f_0
mm	kN		kN	kN		–
32	4,68	2,04	0,085	3,45	5	13
35	6,24	2,6	0,11	3,35	4,75	12
40	7,02	3,2	0,137	5,1	7,35	13
47	8,84	4,25	0,18	8,15	11,6	13
52	11,4	5,5	0,232	7,5	10,6	13
62	13	6,8	0,29	12,9	18,6	14
72	17,4	9,5	0,4	14,6	20,8	14
80	22,1	11,8	0,5	12,9	18,3	14

14.2 Double row cam rollers
D **32 – 80** mm



3058.. C-2Z

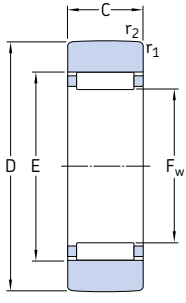


3057.. C-2Z

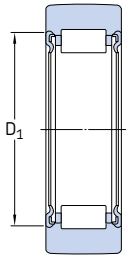
Dimensions							Limiting speed	Mass	Designations Cam roller with crowned runner surface	cylindrical runner surface
D	B	d	d_1 ~	D_1 ~	$r_{1,2}$ min.	a				
mm							r/min	kg	–	
32	14	10	15,8	25	0,6	16,5	11 000	0,062	**305800 C-2Z**	**–**
35	15,9	12	17,2	27,7	0,6	19	9 500	0,078	**305801 C-2Z**	**305701 C-2Z**
40	15,9	15	20,2	30,7	0,6	21	9 000	0,1	**305802 C-2Z**	**305702 C-2Z**
47	17,5	17	23,3	35	0,6	23	8 000	0,16	**305803 C-2Z**	**305703 C-2Z**
52	20,6	20	27,7	40,9	1	28	7 000	0,22	**305804 C-2Z**	**305704 C-2Z**
62	20,6	25	32,7	45,9	1	30	6 000	0,32	**305805 C-2Z**	**305705 C-2Z**
72	23,8	30	38,7	55,2	1	36	5 000	0,49	**305806 C-2Z**	**305706 C-2Z**
80	27	35	45,4	63,9	1,1	42	4 300	0,65	**305807 C-2Z**	**305707 C-2Z**

Outside diameter	Basic load ratings dynamic	static	Fatigue load limit	Maximum radial loads dynamic	static
D	C	C_0	P_u	F_r	F_{0r}
mm	kN		kN	kN	
32	7,61	4,3	0,183	4,4	6,3
35	10,1	5,6	0,24	3,8	5,4
40	11,2	6,8	0,285	5,85	8,5
47	14,3	8,8	0,365	9,3	13,4
52	19	12	0,51	8,3	12
62	20,8	14,3	0,6	15,3	21,6
72	28,6	20,4	0,865	17	24
80	37,7	28	1,18	15,6	22,4

14.3 Support rollers without flange rings, without an inner ring
D **16 – 90** mm



RSTO

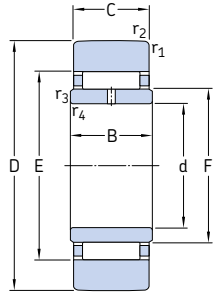


RNA 22 ...2RS

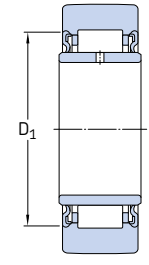
Dimensions						Limiting speed	Mass	Designation
D	C	D_1	F_w	E	$r_{1,2}$ min			
mm						r/min	kg	–
16	7,8	–	7	10	0,3	8 000	0,008	**RSTO 5 TN**
19	9,8	–	10	13	0,3	7 000	0,012	**RSTO 6 TN**
	11,8	16	10	–	0,3	7 000	0,018	**RNA 22/6.2RS**
24	9,8	–	12	15	0,3	7 000	0,021	**RSTO 8 TN**
	11,8	18	12	–	0,3	6 700	0,029	**RNA 22/8.2RS**
30	11,8	–	14	20	0,3	6 000	0,042	**RSTO 10**
	13,8	20	14	–	0,6	6 300	0,052	**RNA 2200.2RS**
32	11,8	–	16	22	0,3	5 600	0,049	**RSTO 12**
	13,8	22	16	–	0,6	6 000	0,057	**RNA 2201.2RS**
35	11,8	–	20	26	0,3	5 000	0,05	**RSTO 15**
	13,8	26	20	–	0,6	5 000	0,06	**RNA 2202.2RS**
40	15,8	28	22	–	1	4 500	0,094	**RNA 2203.2RS**
	15,8	–	22	29	0,3	4 500	0,088	**RSTO 17**
47	15,8	–	25	32	0,3	4 000	0,13	**RSTO 20**
	17,8	33	25	–	1	4 000	0,15	**RNA 2204.2RS**
52	15,8	–	30	37	0,3	3 400	0,15	**RSTO 25**
	17,8	38	30	–	1	3 400	0,18	**RNA 2205.2RS**
62	19,8	43	35	–	1	2 800	0,28	**RNA 2206.2RS**
	19,8	–	38	46	0,6	2 600	0,26	**RSTO 30**
72	19,8	–	42	50	0,6	2 200	0,38	**RSTO 35**
	22,7	50	42	–	1,1	2 200	0,43	**RNA 2207.2RS**
80	19,8	–	50	58	1	1 900	0,42	**RSTO 40**
	22,7	57	48	–	1,1	1 900	0,53	**RNA 2208.2RS**
85	19,8	–	55	63	1	1 700	0,45	**RSTO 45**
90	19,8	–	60	68	1	1 600	0,48	**RSTO 50**

Designation	Basic load ratings dynamic	static	Fatigue load limit	Maximum radial loads dynamic	static
	C	C_0	P_u	F_r	F_{0r}
–	kN		kN	kN	
RSTO 5 TN	2,51	2,5	0,27	3,55	5
RSTO 6 TN	3,74	4,5	0,5	4,25	6,1
RNA 22/6.2RS	4,02	3,65	0,425	2,55	3,6
RSTO 8 TN	4,13	5,4	0,6	7,5	10,8
RNA 22/8.2RS	4,68	4,55	0,54	5,3	7,5
RSTO 10	8,25	8,8	1,04	8,5	12,2
RNA 2200.2RS	6,6	7,5	0,88	12	17,3
RSTO 12	8,8	9,8	1,18	8,3	12
RNA 2201.2RS	7,04	8,5	1	11,6	16,6
RSTO 15	9,13	10,6	1,27	7,1	10
RNA 2202.2RS	7,48	9,3	1,12	9,5	13,7
RNA 2203.2RS	9,52	13,2	1,6	15,3	22
RSTO 17	14,2	17,6	2,08	12	17,3
RSTO 20	16,1	21,2	2,5	18,6	26,5
RNA 2204.2RS	16,1	18	2,16	17,6	25,5
RSTO 25	16,5	22,8	2,7	18	26
RNA 2205.2RS	16,8	20	2,4	17,3	24,5
RNA 2206.2RS	17,9	25,5	3,05	28,5	40,5
RSTO 30	22,9	34,5	4,25	23,6	33,5
RSTO 35	24,6	39	4,8	36	51
RNA 2207.2RS	22,4	35,5	4,3	38	54
RSTO 40	23,8	39	4,75	34,5	49
RNA 2208.2RS	27,5	40,5	5	35,5	51
RSTO 45	25,1	43	5,3	34,5	50
RSTO 50	26	45,5	5,7	34,5	50

14.4 Support rollers without flange rings, with an inner ring
D **19 – 90** mm



STO

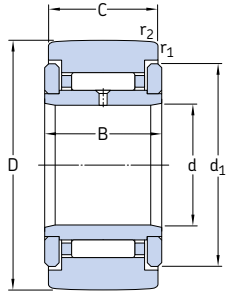


NA 22 ...2RS

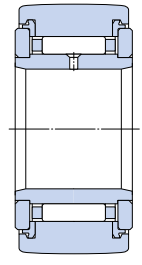
Dimensions									Limiting speed	Mass	Designation
D	d	C	B	D_1	F	E	$r_{1,2}$ min.	$r_{3,4}$ min.			
mm									r/min	kg	–
19	6	9,8	10	–	10	13	0,3	0,3	7 000	0,017	**STO 6 TN**
	6	11,8	12	16	10	–	0,3	0,3	7 000	0,022	**NA 22/6.2RS**
24	8	9,8	10	–	12	15	0,3	0,3	7 000	0,026	**STO 8 TN**
	8	11,8	12	18	12	–	0,3	0,3	6 700	0,034	**NA 22/8.2RS**
30	10	11,8	12	–	14	20	0,3	0,3	6 000	0,049	**STO 10**
	10	13,8	14	20	14	–	0,6	0,3	6 300	0,06	**NA 2200.2RS**
32	12	11,8	12	–	16	22	0,3	0,3	5 600	0,057	**STO 12**
	12	13,8	14	22	16	–	0,6	0,3	6 000	0,067	**NA 2201.2RS**
35	15	11,8	12	–	20	26	0,3	0,3	5 000	0,063	**STO 15**
	15	13,8	14	26	20	–	0,6	0,3	5 000	0,075	**NA 2202.2RS**
40	17	15,8	16	28	22	–	1	0,3	4 500	0,11	**NA 2203.2RS**
	17	15,8	16	–	22	29	0,3	0,3	4 500	0,11	**STO 17**
47	20	15,8	16	–	25	32	0,3	0,3	4 000	0,15	**STO 20**
	20	17,8	18	33	25	–	1	0,3	4 000	0,18	**NA 2204.2RS**
52	25	15,8	16	–	30	37	0,3	0,3	3 400	0,18	**STO 25**
	25	17,8	18	38	30	–	1	0,3	3 400	0,21	**NA 2205.2RS**
62	30	19,8	20	43	35	–	1	0,3	2 800	0,32	**NA 2206.2RS**
	30	19,8	20	–	38	46	0,6	0,6	2 600	0,31	**STO 30**
72	35	19,8	20	–	42	50	0,6	0,6	2 200	0,44	**STO 35**
	35	22,7	23	50	42	–	1,1	0,6	2 200	0,51	**NA 2207.2RS**
80	40	19,8	20	–	50	58	1	1	1 900	0,53	**STO 40**
	40	22,7	23	57	48	–	1,1	0,6	1 900	0,63	**NA 2208.2RS**
85	45	19,8	20	–	55	63	1	1	1 700	0,58	**STO 45**
90	50	19,8	20	–	60	68	1	1	1 600	0,62	**STO 50**
	50	22,7	23	68	58		1,1	0,6	1 600	0,69	**NA 2210.2RS**

Designation	Basic load ratings dynamic	static	Fatigue load limit	Maximum radial loads dynamic	static
	C	C_0	P_u	F_r	F_{0r}
–	kN		kN	kN	
STO 6 TN	3,74	4,5	0,5	4,25	6,1
NA 22/6.2RS	4,02	3,65	0,425	2,55	3,6
STO 8 TN	4,13	5,4	0,6	7,5	10,8
NA 22/8.2RS	4,68	4,55	0,54	5,3	7,5
STO 10	8,25	8,8	1,04	8,5	12,2
NA 2200.2RS	6,6	7,5	0,88	12	17,3
STO 12	8,8	9,8	1,18	8,3	12
NA 2201.2RS	7,04	8,5	1	11,6	16,6
STO 15	9,13	10,6	1,27	7,1	10
NA 2202.2RS	7,48	9,3	1,12	9,5	13,7
NA 2203.2RS	9,52	13,2	1,6	15,3	22
STO 17	14,2	17,6	2,08	12	17,3
STO 20	16,1	21,2	2,5	18,6	26,5
NA 2204.2RS	16,1	18	2,16	17,6	25,5
STO 25	16,5	22,8	2,7	18	26
NA 2205.2RS	16,8	20	2,4	17,3	24,5
NA 2206.2RS	17,9	25,5	3,05	28,5	40,5
STO 30	22,9	34,5	4,25	23,6	33,5
STO 35	24,6	39	4,8	36	51
NA 2207.2RS	22,4	35,5	4,3	38	54
STO 40	23,8	39	4,75	34,5	49
NA 2208.2RS	27,5	40,5	5	35,5	51
STO 45	25,1	43	5,3	34,5	50
STO 50	26	45,5	5,7	34,5	50
NA 2210.2RS	28,1	43	5,3	34,5	50

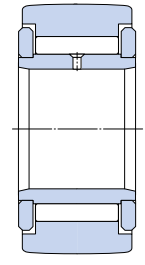
14.5 Support rollers with flange rings, with an inner ring
D **16 – 42** mm



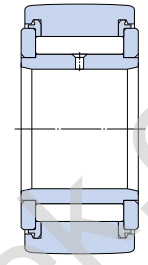
NATR



NATR .. PPA

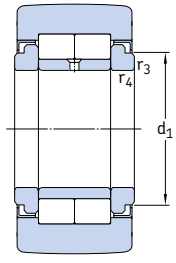


NATV

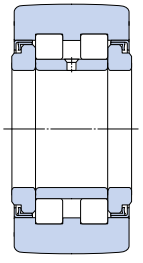


NATV .. PPA

Dimensions							Limiting speed	Mass	Designation
D	d	C	B	d_1	$r_{1,2}$ min.	$r_{3,4}$ min.			
mm							r/min	kg	–
16	5	11	12	12,5	0,15	–	6 000	0,014	**NATR 5**
	5	11	12	12,5	0,15	–	6 000	0,014	**NATR 5 PPA**
	5	11	12	12,5	0,15	–	4 300	0,015	**NATV 5**
	5	11	12	12,5	0,15	–	4 300	0,015	**NATV 5 PPA**
19	6	11	12	15	0,15	–	5 600	0,02	**NATR 6**
	6	11	12	15	0,15	–	5 600	0,019	**NATR 6 PPA**
	6	11	12	15	0,15	–	4 000	0,021	**NATV 6**
	6	11	12	15	0,15	–	4 000	0,021	**NATV 6 PPA**
24	8	14	15	19	0,3	–	5 000	0,041	**NATR 8**
	8	14	15	19	0,3	–	5 000	0,038	**NATR 8 PPA**
	8	14	15	19	0,3	–	3 600	0,042	**NATV 8**
	8	14	15	19	0,3	–	3 600	0,041	**NATV 8 PPA**
30	10	14	15	23	0,6	–	4 800	0,064	**NATR 10**
	10	14	15	23	0,6	–	4 800	0,061	**NATR 10 PPA**
	10	14	15	23	0,6	–	3 200	0,065	**NATV 10**
	10	14	15	23	0,6	–	3 200	0,064	**NATV 10 PPA**
32	12	14	15	25	0,6	–	4 500	0,071	**NATR 12**
	12	14	15	25	0,6	–	4 500	0,066	**NATR 12 PPA**
	12	14	15	25	0,6	–	3 000	0,072	**NATV 12**
	12	14	15	25	0,6	–	3 000	0,069	**NATV 12 PPA**
35	15	18	19	27,6	0,6	–	4 000	0,1	**NATR 15**
	15	18	19	27,6	0,6	–	4 000	0,095	**NATR 15 PPA**
	15	18	19	27,6	0,6	–	2 600	0,11	**NATV 15**
	15	18	19	27,6	0,6	–	2 600	0,1	**NATV 15 PPA**
	15	18	19	20	0,6	0,3	5 000	0,099	**NUTR 15 A**
	15	18	19	20	0,6	0,3	5 000	0,099	**PWTR 15.2RS**
40	17	20	21	31,5	1	–	3 400	0,14	**NATR 17**
	17	20	21	31,5	1	–	3 400	0,14	**NATR 17 PPA**
	17	20	21	31,5	1	–	2 200	0,15	**NATV 17**
	17	20	21	31,5	1	–	2 200	0,15	**NATV 17 PPA**
	17	20	21	22	1	0,5	4 500	0,15	**NUTR 17 A**
	17	20	21	22	1	0,5	4 500	0,15	**PWTR 17.2RS**
42	15	18	19	20	0,6	0,3	5 000	0,16	**NUTR 1542 A**
	15	18	19	20	0,6	0,3	5 000	0,16	**PWTR 1542.2RS**



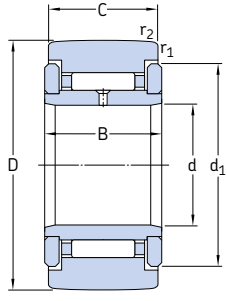
NUTR .. A



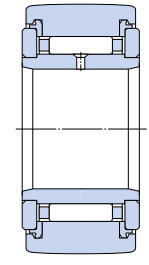
PWTR ...2RS

Designation	Basic load ratings dynamic	static	Fatigue load limit	Maximum radial loads dynamic	static
	C	C_0	P_u	F_r	F_{0r}
–	kN		kN	kN	
NATR 5	3,14	3,2	0,345	2,9	4,15
NATR 5 PPA	3,14	3,2	0,345	2,9	4,15
NATV 5	4,73	6,55	0,72	4,05	5,7
NATV 5 PPA	4,73	6,55	0,72	4,05	5,7
NATR 6	3,47	3,8	0,415	3,8	5,5
NATR 6 PPA	3,47	3,8	0,415	3,8	5,5
NATV 6	5,28	8	0,88	5,1	7,35
NATV 6 PPA	5,28	8	0,88	5,1	7,35
NATR 8	5,28	6,1	0,695	5,2	7,35
NATR 8 PPA	5,28	6,1	0,695	5,2	7,35
NATV 8	7,48	11,4	1,32	7,35	10,4
NATV 8 PPA	7,48	11,4	1,32	7,35	10,4
NATR 10	6,44	8	0,88	7,8	11,2
NATR 10 PPA	6,44	8	0,88	7,8	11,2
NATV 10	8,97	14,6	1,66	11	15,6
NATV 10 PPA	8,97	14,6	1,66	11	15,6
NATR 12	6,6	8,5	0,95	7,65	10,8
NATR 12 PPA	6,6	8,5	0,95	7,65	10,8
NATV 12	9,35	15,3	1,76	10,6	15
NATV 12 PPA	9,35	15,3	1,76	10,6	15
NATR 15	9,52	13,7	1,56	11,4	16,3
NATR 15 PPA	9,52	13,7	1,56	11,4	16,3
NATV 15	12,3	23,2	2,7	14,6	20,8
NATV 15 PPA	12,3	23,2	2,7	14,6	20,8
NUTR 15 A	16,8	17,6	2	8,65	12,2
PWTR 15.2RS	11,9	11,4	1,2	8,65	12,5
NATR 17	10,5	14,6	1,73	12,5	18
NATR 17 PPA	10,5	14,6	1,73	12,5	18
NATV 17	14,2	26,5	3,1	17	24,5
NATV 17 PPA	14,2	26,5	3,1	17	24,5
NUTR 17 A	19	22	2,5	14	20
PWTR 17.2RS	13,8	14,3	1,5	13,7	19,6
NUTR 1542 A	20,1	23,2	2,65	21,6	31
PWTR 1542.2RS	14,2	15	1,6	22	31,5

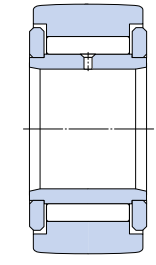
14.5 Support rollers with flange rings, with an inner ring
D **47 – 80** mm



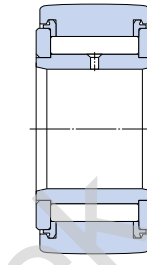
NATR



NATR .. PPA

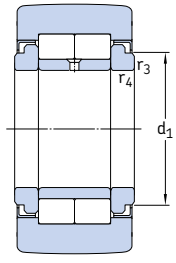


NATV

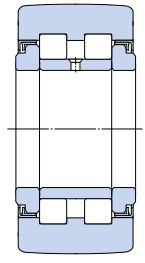


NATV .. PPA

Dimensions							Limiting speed	Mass	Designation
D	d	C	B	d_1	$r_{1,2}$ min.	$r_{3,4}$ min.			
mm							r/min	kg	–
47	17	20	21	22	1	0,5	4 500	0,22	**NUTR 1747 A**
	17	20	21	22	1	0,5	4 500	0,22	**PWTR 1747.2RS**
	20	24	25	36,5	1	–	3 000	0,25	**NATR 20**
	20	24	25	36,5	1	–	3 000	0,24	**NATR 20 PPA**
	20	24	25	36,5	1	–	1 900	0,25	**NATV 20**
	20	24	25	36,5	1	–	1 900	0,25	**NATV 20 PPA**
	20	24	25	27	1	0,5	3 800	0,25	**NUTR 20 A**
	20	24	25	27	1	0,5	3 800	0,25	**PWTR 20.2RS**
52	20	24	25	27	1	0,5	3 800	0,32	**NUTR 2052 A**
	20	24	25	27	1	0,5	3 800	0,32	**PWTR 2052.2RS**
	25	24	25	41,5	1	–	2 400	0,28	**NATR 25**
	25	24	25	41,5	1	–	2 400	0,27	**NATR 25 PPA**
	25	24	25	41,5	1	–	1 600	0,29	**NATV 25**
	25	24	25	41,5	1	–	1 600	0,28	**NATV 25 PPA**
	25	24	25	31	1	0,5	3 200	0,28	**NUTR 25 A**
	25	24	25	31	1	0,5	3 200	0,28	**PWTR 25.2RS**
62	25	24	25	31	1	0,5	3 200	0,45	**NUTR 2562 A**
	25	24	25	31	1	0,5	3 200	0,45	**PWTR 2562.2RS**
	30	28	29	51	1	–	1 800	0,47	**NATR 30**
	30	28	29	51	1	–	1 800	0,44	**NATR 30 PPA**
	30	28	29	51	1	–	1 400	0,48	**NATV 30**
	30	28	29	51	1	–	1 400	0,47	**NATV 30 PPA**
	30	28	29	38	1	0,5	2 600	0,47	**NUTR 30 A**
	30	28	29	38	1	0,5	2 600	0,47	**PWTR 30.2RS**
72	30	28	29	38	1	0,5	2 600	0,7	**NUTR 3072 A**
	30	28	29	38	1	0,5	2 000	0,7	**PWTR 3072.2RS**
	35	28	29	58	1,1	–	1 600	0,55	**NATR 35 PPA**
	35	28	29	58	1,1	–	1 100	0,63	**NATV 35 PPA**
	35	28	29	44	1,1	0,6	2 000	0,63	**NUTR 35 A**
	35	28	29	44	1,1	0,6	2 000	0,63	**PWTR 35.2RS**
80	35	28	29	44	1,1	0,6	2 000	0,84	**NUTR 3580 A**
	35	28	29	44	1,1	0,6	2 000	0,84	**PWTR 3580.2RS**



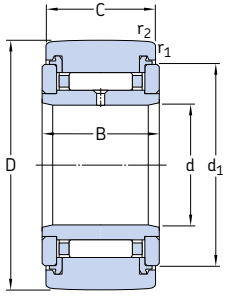
NUTR .. A



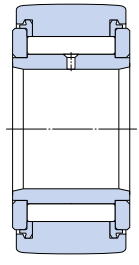
PWTR ...2RS

Designation	Basic load ratings dynamic	static	Fatigue load limit	Maximum radial loads dynamic	static
	C	C_0	P_u	F_r	F_{0r}
–	kN		kN	kN	
NUTR 1747 A	22	27	3,05	30	43
PWTR 1747.2RS	15,7	17,6	1,86	30	42,5
NATR 20	14,7	24,5	2,9	23,6	33,5
NATR 20 PPA	14,7	24,5	2,9	23,6	33,5
NATV 20	19,4	41,5	5	30,5	43
NATV 20 PPA	19,4	41,5	5	30,5	43
NUTR 20 A	28,6	33,5	3,9	17,6	25
PWTR 20.2RS	22,9	24,5	2,8	18,3	26
NUTR 2052 A	31,9	39	4,55	30	42,5
PWTR 2052.2RS	25,5	29	3,35	30,5	44
NATR 25	14,7	25,5	3,1	21,6	31
NATR 25 PPA	14,7	25,5	3,1	21,6	31
NATV 25	19,8	44	5,3	28,5	40,5
NATV 25 PPA	19,8	44	5,3	28,5	40,5
NUTR 25 A	29,7	36	4,25	18	25,5
PWTR 25.2RS	23,8	26,5	3,05	18,6	26,5
NUTR 2562 A	35,8	48	5,6	44	63
PWTR 2562.2RS	29,2	36	4,05	45	64
NATR 30	22,9	37,5	4,55	26,5	38
NATR 30 PPA	22,9	37,5	4,55	26,5	38
NATV 30	29,2	62	7,65	34,5	49
NATV 30 PPA	29,2	62	7,65	34,5	49
NUTR 30 A	41,3	47,5	5,85	24	34,5
PWTR 30.2RS	31,9	32,5	4,05	20,4	29
NUTR 3072 A	48,4	61	7,5	53	76,5
PWTR 3072.2RS	39,6	45	5,6	47,5	68
NATR 35 PPA	24,6	43	5,3	33,5	48
NATV 35 PPA	31,9	72	8,8	43	62
NUTR 35 A	45,7	57	6,95	33,5	47,5
PWTR 35.2RS	35,8	40,5	5	28	40
NUTR 3580 A	51,2	68	8,3	57	81,5
PWTR 3580.2RS	41,8	50	6,3	51	72

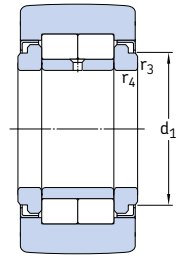
14.5 Support rollers with flange rings, with an inner ring
D **80 – 310** mm



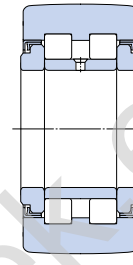
NATR .. PPA



NATV .. PPA

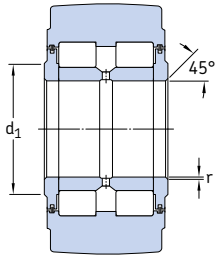


NUTR .. A



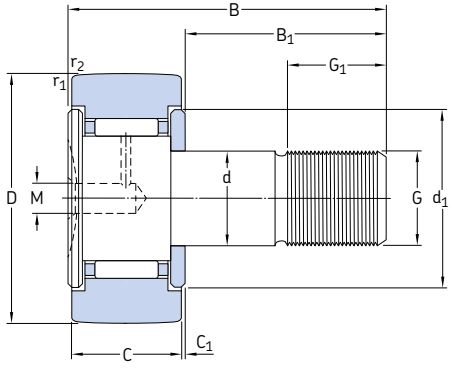
PWTR ...2RS

Dimensions							Limiting speed	Mass	Designation
D	d	C	B	d_1	$r_{1,2}$ min.	r, $r_{3,4}$ min.			
mm							r/min	kg	–
80	40	30	32	66	1,1	–	1 500	0,8	**NATR 40 PPA**
cont.	40	30	32	66	1,1	–	950	0,83	**NATV 40 PPA**
	40	30	32	50,5	1,1	0,6	1 800	0,82	**NUTR 40 A**
	40	30	32	50,5	1,1	0,6	1 800	0,82	**PWTR 40.2RS**
85	45	30	32	55,2	1,1	0,6	1 700	0,88	**NUTR 45 A**
	45	30	32	55,2	1,1	0,6	1 700	0,88	**PWTR 45.2RS**
90	40	30	32	50,5	1,1	0,6	1 800	1,15	**NUTR 4090 A**
	40	30	32	50,5	1,1	0,6	1 800	1,15	**PWTR 4090.2RS**
	50	30	32	76	1,1	–	1 200	0,87	**NATR 50 PPA**
	50	30	32	76	1,1	–	850	0,97	**NATV 50 PPA**
	50	30	32	59,8	1,1	0,6	1 600	0,95	**NUTR 50 A**
	50	30	32	59,8	1,1	0,6	1 600	0,95	**PWTR 50.2RS**
100	45	30	32	55,2	1,1	0,6	1 700	1,4	**NUTR 45100 A**
	45	30	32	55,2	1,1	0,6	1 700	1,4	**PWTR 45100.2RS**
110	50	30	32	59,8	1,1	0,6	1 600	1,7	**NUTR 50110 A**
	50	30	32	59,8	1,1	0,6	1 600	1,7	**PWTR 50110.2RS**
130	50	63	65	63	3	2	750	5,2	**NNTR 50X130X65.2ZL**
140	55	68	70	73	3	2	700	6,4	**NNTR 55X140X70.2ZL**
150	60	73	75	78	3	2	670	7,8	**NNTR 60X150X75.2ZL**
160	65	73	75	82	3	2	600	8,8	**NNTR 65X160X75.2ZL**
180	70	83	85	92	3	2	560	13	**NNTR 70X180X85.2ZL**
200	80	88	90	102	4	2	500	17	**NNTR 80X200X90.2ZL**
220	90	98	100	119	4	2,5	430	22,5	**NNTR 90X220X100.2ZL**
240	100	103	105	132	4	2,5	380	28	**NNTR 100X240X105.2ZL**
260	110	113	115	143	4	2,5	360	35,5	**NNTR 110x260x115.2ZL**
290	120	133	135	155	4	3	320	53	**NNTR 120X290X135.2ZL**
310	130	144	146	165	5	3	300	65	**NNTR 130x310x146.2ZL**

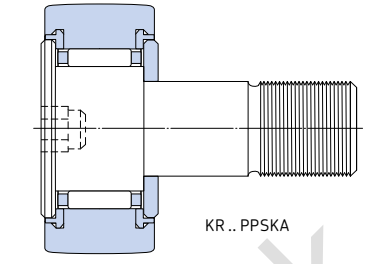


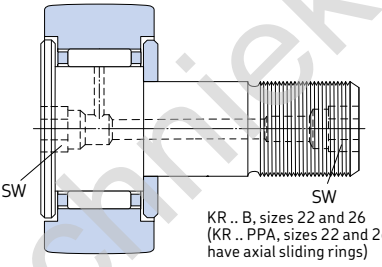
NNTR ...2ZL

Designation	Basic load ratings dynamic	static	Fatigue load limit	Maximum radial loads dynamic	static
	C	C_0	P_u	F_r	F_{0r}
–	kN		kN	kN	
NATR 40 PPA	31,9	57	7,1	41,5	58,5
NATV 40 PPA	39,1	88	11	51	73,5
NUTR 40 A	57,2	72	9	32	45,5
PWTR 40.2RS	41,8	49	6	33,5	48
NUTR 45 A	58,3	75	9,3	32,5	46,5
PWTR 45.2RS	42,9	50	6,2	34	48
NUTR 4090 A	68,2	91,5	11,4	63	90
PWTR 4090.2RS	49,5	62	7,65	64	91,5
NATR 50 PPA	30,8	58,5	7,2	40	57
NATV 50 PPA	39,1	93	11,6	50	72
NUTR 50 A	58,3	78	9,65	32,5	47,5
PWTR 50.2RS	42,9	52	6,55	34,5	49
NUTR 45100 A	73,7	104	12,7	80	114
PWTR 45100.2RS	53,9	69,5	8,65	81,5	116
NUTR 50110 A	78,1	116	14,3	98	140
PWTR 50110.2RS	57,2	78	9,65	100	143
NNTR 50X130X65.2ZL	179	232	31	224	320
NNTR 55X140X70.2ZL	209	275	37,5	224	320
NNTR 60X150X75.2ZL	238	320	42,5	265	375
NNTR 65X160X75.2ZL	255	345	46,5	285	405
NNTR 70X180X85.2ZL	330	455	61	375	540
NNTR 80X200X90.2ZL	391	540	71	455	640
NNTR 90X220X100.2ZL	468	670	83	480	680
NNTR 100X240X105.2ZL	528	780	93	550	780
NNTR 110x260x115.2ZL	627	930	112	655	950
NNTR 120X290X135.2ZL	825	1 270	143	900	1 290
NNTR 130x310x146.2ZL	952	1 460	166	1 040	1 500



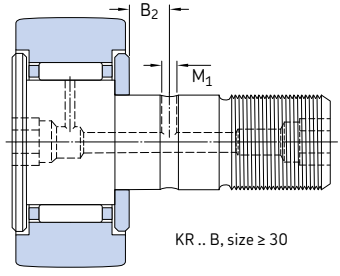
KR, sizes 16 and 19
(KR .. PPA, sizes 16 and 19
have axial sliding rings)



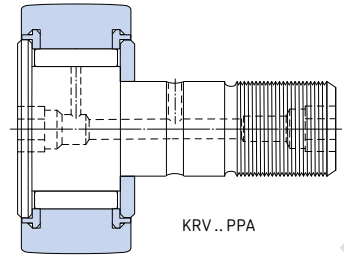


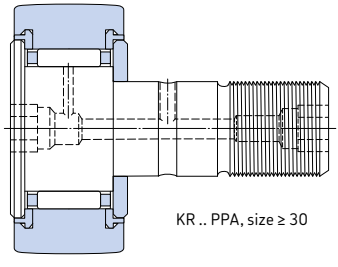
KR .. B, sizes 22 and 26
(KR .. PPA, sizes 22 and 26
have axial sliding rings)

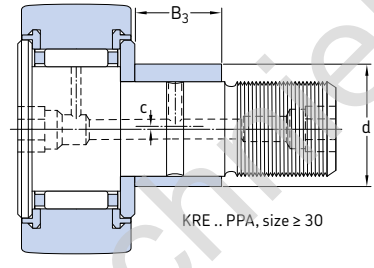
Dimensions																Mass	Designation
D	C	d	B	B_1	B_2	C_1	d_1	G	G_1	M	M_1	$r_{1,2}$ min.	SW	c	B_3		
mm																kg	–
16	11	6	28	16	–	0,6	12,5	M 6	8	4	–	0,15	–	–	–	0,019	**KR 16**
	11	6	28	16	–	0,6	12,5	M 6	8	4	–	0,15	–	–	–	0,018	**KR 16 PPA**
	11	6	28	16	–	0,6	12,5	M 6	8	–	–	0,15	4	–	–	0,019	**KR 16 PPSKA**
	11	6	28	16	–	0,6	12,5	M 6	8	4	–	0,15	–	–	–	0,019	**KRV 16 PPA**
	11	9	28	16	–	0,6	12,5	M 6	8	4	–	0,15	–	0,5	7	0,02	**KRE 16 PPA**
19	11	8	32	20	–	0,6	15	M 6	10	4	–	0,15	–	–	–	0,029	**KR 19**
	11	8	32	20	–	0,6	15	M 6	10	4	–	0,15	–	–	–	0,029	**KR 19 PPA**
	11	8	32	20	–	0,6	15	M 8	10	–	–	0,15	4	–	–	0,029	**KR 19 PPSKA**
	11	8	32	20	–	0,6	15	M 6	10	4	–	0,15	–	–	–	0,031	**KRV 19 PPA**
	11	11	32	20	–	0,6	15	M 6	10	4	–	0,15	–	0,5	9	0,032	**KRE 19 PPA**
22	12	10	36	23	–	0,6	17,5	M 10x1	12	4	–	0,3	5	–	–	0,045	**KR 22 B**
	12	10	36	23	–	0,6	17,5	M 10x1	12	4	–	0,3	5	–	–	0,043	**KR 22 PPA**
	12	10	36	23	–	0,6	17,5	M 10x1	12	4	–	0,3	5	–	–	0,045	**KRV 22 PPA**
	12	13	36	23	–	0,6	17,5	M 10x1	12	4	–	0,3	5	0,5	10	0,047	**KRE 22 PPA**
26	12	10	36	23	–	0,6	17,5	M 10x1	12	4	–	0,3	5	–	–	0,059	**KR 26 B**
	12	10	36	23	–	0,6	17,5	M 10x1	12	4	–	0,3	5	–	–	0,057	**KR 26 PPA**
	12	10	36	23	–	0,6	17,5	M 10x1	12	4	–	0,3	5	–	–	0,059	**KRV 26 PPA**
	12	13	36	23	–	0,6	17,5	M 10x1	12	4	–	0,3	5	0,5	10	0,062	**KRE 26 PPA**
30	14	12	40	25	6	0,6	23	M 12x1,5	13	4	3	0,6	6	–	–	0,092	**KR 30 B**
	14	12	40	25	6	0,6	23	M 12x1,5	13	4	3	0,6	6	–	–	0,088	**KR 30 PPA**
	14	12	40	25	6	0,6	23	M 12x1,5	13	4	3	0,6	6	–	–	0,091	**KRV 30 PPA**
	14	15	40	25	6	0,6	23	M 12x1,5	13	4	3	0,6	6	0,5	11	0,093	**KRE 30 PPA**
32	14	12	40	25	6	0,6	23	M 12x1,5	13	4	3	0,6	6	–	–	0,103	**KR 32 B**
	14	12	40	25	6	0,6	23	M 12x1,5	13	4	3	0,6	6	–	–	0,098	**KR 32 PPA**
	14	12	40	25	6	0,6	23	M 12x1,5	13	4	3	0,6	6	–	–	0,101	**KRV 32 PPA**
	14	15	40	25	6	0,6	23	M 12x1,5	13	4	3	0,6	6	0,5	11	0,104	**KRE 32 PPA**



KR .. B, size ≥ 30

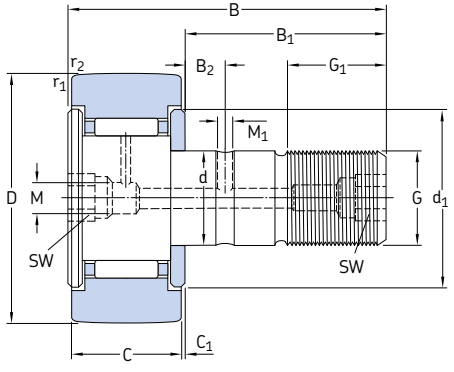

KRV .. PPA


KR .. PPA, size ≥ 30

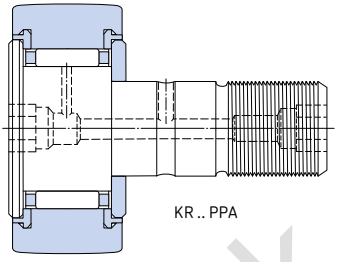


KRE .. PPA, size ≥ 30

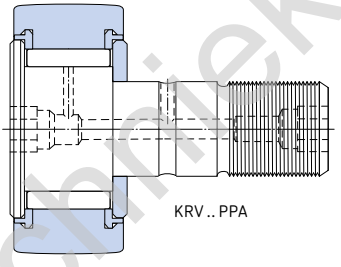
Designation	Basic load ratings dynamic	static	Fatigue load limit	Maximum radial loads dynamic	static	Limiting speed
	C	C_0	P_u	F_r	F_{0r}	
–	kN		kN	kN		r/min
KR 16	3,14	3,2	0,345	2,9	4,15	6 000
KR 16 PPA	3,14	3,2	0,345	2,9	4,15	6 000
KR 16 PPSKA	3,14	3,2	0,345	2,9	4,15	6 000
KRV 16 PPA	4,73	6,55	0,72	4,05	5,7	4 300
KRE 16 PPA	3,14	3,2	0,345	2,9	4,15	6 000
KR 19	3,47	3,8	0,415	3,8	5,5	5 600
KR 19 PPA	3,47	3,8	0,415	3,8	5,5	5 600
KR 19 PPSKA	3,47	3,8	0,415	3,8	5,5	5 600
KRV 19 PPA	5,28	8	0,88	5,1	7,35	4 000
KRE 19 PPA	3,47	3,8	0,415	3,8	5,5	5 600
KR 22 B	4,4	5	0,56	4,25	6	5 300
KR 22 PPA	4,4	5	0,56	4,25	6	5 300
KRV 22 PPA	6,05	9,15	1,04	5,7	8,15	3 600
KRE 22 PPA	4,4	5	0,56	4,25	6	5 300
KR 26 B	4,84	6	0,655	9,3	13,2	5 300
KR 26 PPA	4,84	6	0,655	9,3	13,2	5 300
KRV 26 PPA	6,82	11	1,25	11,4	16,3	3 600
KRE 26 PPA	4,84	6	0,655	9,3	13,2	5 300
KR 30 B	6,44	8	0,88	7,8	11,2	4 800
KR 30 PPA	6,44	8	0,88	7,8	11,2	4 800
KRV 30 PPA	8,97	14,6	1,66	11	15,6	3 200
KRE 30 PPA	6,44	8	0,88	7,8	11,2	4 800
KR 32 B	6,71	8,5	0,95	10,6	15	4 800
KR 32 PPA	6,71	8,5	0,95	10,6	15	4 800
KRV 32 PPA	9,35	15,3	1,76	14,3	20,4	3 200
KRE 32 PPA	6,71	8,5	0,95	10,6	15	4 800



KR .. B

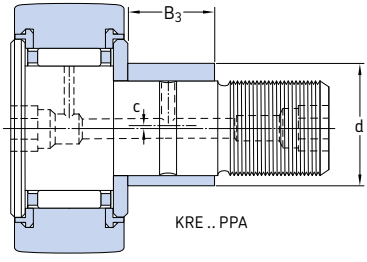


KR .. PPA

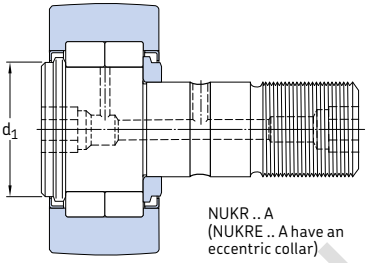


KRV .. PPA

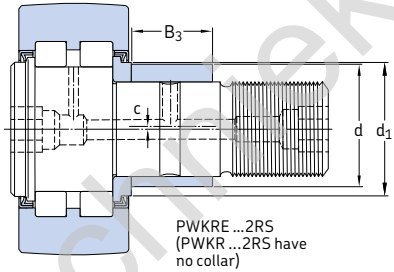
Dimensions																Mass	Designation
D	C	d	B	B_1	B_2	C_1	d_1	G	G_1	M	M_1	$r_{1,2}$ min.	SW	c	B_3		
mm																kg	–
35	18	16	52	32,5	8	0,8	27,6	M 16x1,5	17	6	3	0,6	8	–	–	0,173	**KR 35 B**
	18	16	52	32,5	8	0,8	27,6	M 16x1,5	17	6	3	0,6	8	–	–	0,164	**KR 35 PPA**
	18	16	52	32,5	8	0,8	27,6	M 16x1,5	17	6	3	0,6	8	–	–	0,166	**KRV 35 PPA**
	18	16	52	32,5	7,8	0,8	20	M 16x1,5	17	6	3	0,6	8	–	–	0,164	**NUKR 35 A**
	18	16	52	32,5	7,8	0,8	20	M 16x1,5	17	6	3	0,6	8	–	–	0,164	**PWKR 35.2RS**
	18	20	52	32,5	8	0,8	27,6	M 16x1,5	17	6	3	0,6	8	1	14	0,177	**KRE 35 PPA**
	18	20	52	29,5	7,8	3,8	27,6	M 16x1,5	17	6	3	0,6	8	1	12	0,177	**NUKRE 35 A**
	18	20	52	29,5	7,8	3,8	27,6	M 16x1,5	17	6	3	0,6	8	1	12	0,177	**PWKRE 35.2RS**
40	20	18	58	36,5	8	0,8	31,5	M 18x1,5	19	6	3	1	8	–	–	0,247	**KR 40 B**
	20	18	58	36,5	8	0,8	31,5	M 18x1,5	19	6	3	1	8	–	–	0,239	**KR 40 PPA**
	20	18	58	36,5	8	0,8	31,5	M 18x1,5	19	6	3	1	8	–	–	0,247	**KRV 40 PPA**
	20	18	58	36,5	8	0,8	22	M 18x1,5	19	6	3	1	8	–	–	0,242	**NUKR 40 A**
	20	18	58	36,5	8	0,8	22	M 18x1,5	19	6	3	1	8	–	–	0,242	**PWKR 40.2RS**
	20	22	58	36,5	8	0,8	31,5	M 18x1,5	19	6	3	1	8	1	16	0,255	**KRE 40 PPA**
	20	22	58	33,5	8	3,8	30	M 18x1,5	19	6	3	1	8	1	14	0,258	**NUKRE 40 A**
	20	22	58	33,5	8	3,8	30	M 18x1,5	19	6	3	1	8	1	14	0,258	**PWKRE 40.2RS**
47	24	20	66	40,5	9	0,8	36,5	M 20x1,5	21	6	4	1	10	–	–	0,381	**KR 47 PPA**
	24	20	66	40,5	9	0,8	36,5	M 20x1,5	21	6	4	1	10	–	–	0,39	**KRV 47 PPA**
	24	20	66	40,5	9	0,8	27	M 20x1,5	21	6	4	1	10	–	–	0,38	**NUKR 47 A**
	24	20	66	40,5	9	0,8	27	M 20x1,5	21	6	4	1	10	–	–	0,38	**PWKR 47.2RS**
	24	24	66	40,5	9	0,8	36,5	M 20x1,5	21	6	4	1	10	1	18	0,4	**KRE 47 PPA**
	24	24	66	40,5	9	0,8	27	M 20x1,5	21	6	4	1	10	1	18	0,4	**NUKRE 47 A**
	24	24	66	40,5	9	0,8	27	M 20x1,5	21	6	4	1	10	1	18	0,4	**PWKRE 47.2RS**
52	24	20	66	40,5	9	0,8	36,5	M 20x1,5	21	6	4	1	10	–	–	0,454	**KR 52 PPA**
	24	20	66	40,5	9	0,8	36,5	M 20x1,5	21	6	4	1	10	–	–	0,463	**KRV 52 PPA**
	24	20	66	67,5	9	0,8	31	M 20x1,5	25	6	4	1	10	–	–	0,45	**NUKR 52 A**
	24	20	66	40,5	9	0,8	31	M 20x1,5	25	6	4	1	10	–	–	0,45	**PWKR 52.2RS**



KRE .. PPA

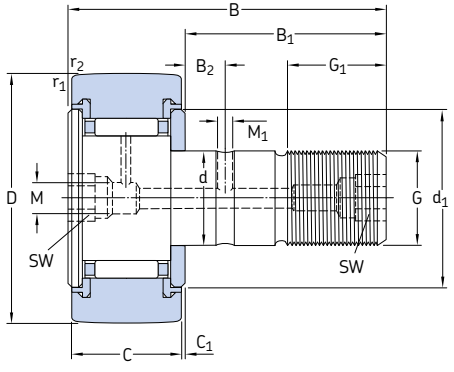


NUKR .. A
(NUKRE .. A have an eccentric collar)

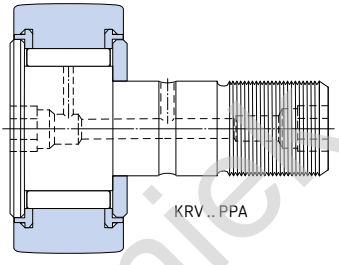


PWKRE ...2RS
(PWKR ...2RS have no collar)

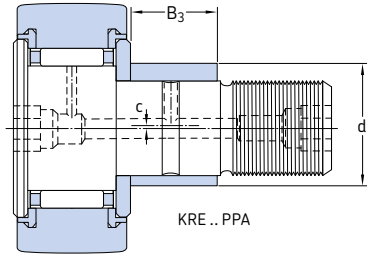
Designation	Basic load ratings dynamic	static	Fatigue load limit	Maximum radial loads dynamic	static	Limiting speed
	C	C_0	P_u	F_r	F_{0r}	
–	kN		kN	kN		r/min
KR 35 B	9,52	13,7	1,56	11,4	16,3	4 000
KR 35 PPA	9,52	13,7	1,56	11,4	16,3	4 000
KRV 35 PPA	12,3	23,2	2,7	14,6	20,8	2 600
NUKR 35 A	16,8	17,6	2	8,65	12,2	5 000
PWKR 35.2RS	11,9	11,4	1,2	8,65	12,5	5 000
KRE 35 PPA	9,52	13,7	1,56	11,4	16,3	4 000
NUKRE 35 A	16,8	17,6	2	8,65	12,2	5 000
PWKRE 35.2RS	11,9	11,4	1,2	8,65	12,5	5 000
KR 40 B	10,5	14,6	1,73	12,5	18	3 400
KR 40 PPA	10,5	14,6	1,73	12,5	18	3 400
KRV 40 PPA	14,2	26,5	3,1	17	24,5	2 200
NUKR 40 A	19	22	2,5	14	20	4 500
PWKR 40.2RS	13,8	14,3	1,5	13,7	19,6	4 500
KRE 40 PPA	10,5	14,6	1,73	12,5	18	3 400
NUKRE 40 A	19	22	2,5	14	20	4 500
PWKRE 40.2RS	13,8	14,3	1,5	13,7	19,6	4 500
KR 47 PPA	14,7	24,5	2,9	23,6	33,5	3 000
KRV 47 PPA	19,4	41,5	5	30,5	43	1 900
NUKR 47 A	28,6	33,5	3,9	17,6	25	3 800
PWKR 47.2RS	22,9	24,5	2,8	18,3	26	3 800
KRE 47 PPA	14,7	24,5	2,9	23,6	33,5	3 000
NUKRE 47 A	28,6	33,5	3,9	17,6	25	3 800
PWKRE 47.2RS	22,9	24,5	2,8	18,3	26	3 800
KR 52 PPA	15,7	27	3,2	36	51	3 000
KRV 52 PPA	20,9	46,5	5,6	45	64	1 900
NUKR 52 A	29,7	36	4,25	18	25,5	3 200
PWKR 52.2RS	23,8	26,5	3,05	18,6	26,5	3 200



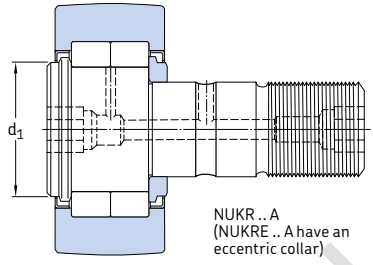
KR .. PPA



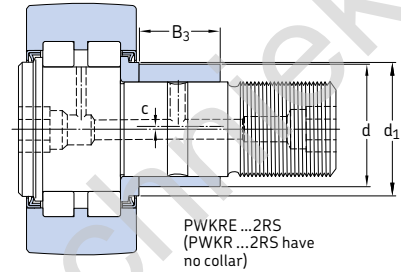
Dimensions																Mass	Designation
D	C	d	B	B_1	B_2	C_1	d_1	G	G_1	M	M_1	$r_{1,2}$ min.	SW	c	B_3		
mm																kg	–
52	24	24	66	40,5	9	0,8	36,5	M 20x1,5	21	6	4	1	10	1	18	0,473	**KRE 52 PPA**
cont.	24	24	66	40,5	9	0,8	31	M 20x1,5	25	6	4	1	10	1	18	0,47	**NUKRE 52 A**
	24	24	66	40,5	9	0,8	31	M 20x1,5	25	6	4	1	10	1	18	0,47	**PWKRE 52.2RS**
62	28	24	80	49,5	11	1,3	38	M 24x1,5	25	8	4	1	14	–	–	0,795	**NUKR 62 A**
	28	24	80	49,5	11	1,3	38	M 24x1,5	25	8	4	1	14	–	–	0,795	**PWKR 62.2RS**
	28	28	80	49,5	11	1,3	38	M 24x1,5	25	8	4	1	14	1	22	0,824	**NUKRE 62 A**
	28	28	80	49,5	11	1,3	38	M 24x1,5	25	8	4	1	14	1	22	0,824	**PWKRE 62.2RS**
	29	24	80	49,5	11	0,8	44	M 24x1,5	25	8	4	1	14	–	–	0,77	**KR 62 PPA**
	29	24	80	49,5	11	0,8	44	M 24x1,5	25	8	4	1	14	–	–	0,787	**KRV 62 PPA**
	29	28	80	49,5	11	0,8	44	M 24x1,5	25	8	4	1	14	1	22	0,798	**KRE 62 PPA**
72	28	24	80	49,5	11	1,3	44	M 24x1,5	25	8	4	1,1	14	–	–	1,02	**NUKR 72 A**
	28	24	80	49,5	11	1,3	44	M 24x1,5	25	8	4	1,1	14	–	–	1,02	**PWKR 72.2RS**
	28	28	80	49,5	11	1,3	44	M 24x1,5	25	8	4	1,1	14	1	22	1,05	**NUKRE 72 A**
	28	28	80	49,5	11	1,3	44	M 24x1,5	25	8	4	1,1	14	1	22	1,05	**PWKRE 72.2RS**
	29	24	80	49,5	11	0,8	44	M 24x1,5	25	8	4	1,1	14	–	–	1,01	**KR 72 PPA**
	29	24	80	49,5	11	0,8	44	M 24x1,5	25	8	4	1,1	14	–	–	1,027	**KRV 72 PPA**
	29	28	80	49,5	11	0,8	44	M 24x1,5	25	8	4	1,1	14	1	22	1,038	**KRE 72 PPA**
80	35	30	100	63	15	1	53	M 30x1,5	32	8	4	1,1	14	–	–	1,608	**KR 80 PPA**
	35	30	100	63	15	1	53	M 30x1,5	32	8	4	1,1	14	–	–	1,636	**KRV 80 PPA**
	35	30	100	63	15	1	47	M 30x1,5	32	8	4	1,1	14	–	–	1,6	**NUKR 80 A**
	35	30	100	63	15	1	47	M 30x1,5	32	8	4	1,1	14	–	–	1,6	**PWKR 80.2RS**
	35	35	100	63	15	1	53	M 30x1,5	32	8	4	1,1	14	1,5	29	1,665	**KRE 80 PPA**
	35	35	100	63	15	1	47	M 30x1,5	32	8	4	1,1	14	1,5	29	1,67	**NUKRE 80 A**
	35	35	100	63	15	1	47	M 30x1,5	32	8	4	1,1	14	1,5	29	1,67	**PWKRE 80.2RS**



KRE .. PPA

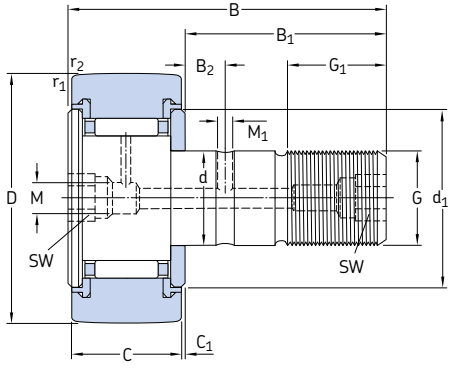


NUKR .. A
(NUKRE .. A have an eccentric collar)

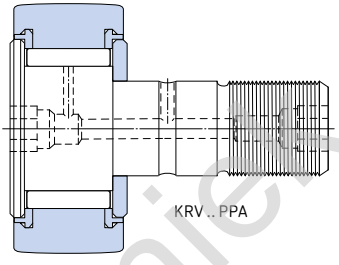


PWKRE ...2RS
(PWKR ...2RS have no collar)

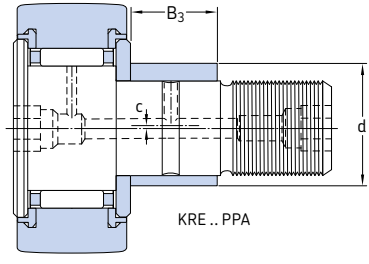
Designation	Basic load ratings dynamic	static	Fatigue load limit	Maximum radial loads dynamic	static	Limiting speed
	C	C_0	P_u	F_r	F_{0r}	
–	kN		kN	kN		r/min
KRE 52 PPA	15,7	27	3,2	36	51	3 000
NUKRE 52 A	29,7	36	4,25	18	25,5	3 200
PWKRE 52.2RS	23,8	26,5	3,05	18,6	26,5	3 200
NUKR 62 A	41,3	48	5,85	25	36	2 600
PWKR 62.2RS	31,9	32,5	4,05	20,4	29	2 600
NUKRE 62 A	41,3	48	5,85	25	36	2 600
PWKRE 62.2RS	31,9	32,5	4,05	20,4	29	2 600
KR 62 PPA	24,6	44	5,5	58,5	85	2 400
KRV 62 PPA	31,4	72	9	72	102	1 700
KRE 62 PPA	24,6	44	5,5	58,5	85	2 400
NUKR 72 A	45,7	58,5	7,1	34,5	50	2 000
PWKR 72.2RS	39,6	45	5,6	47,5	68	2 600
NUKRE 72 A	45,7	58,5	7,1	34,5	50	2 000
PWKRE 72.2RS	39,6	45	5,6	47,5	68	2 600
KR 72 PPA	26	48	6	100	143	2 400
KRV 72 PPA	33	80	9,8	118	170	1 700
KRE 72 PPA	26	48	6	100	143	2 400
KR 80 PPA	36,9	72	9	106	150	1 800
KRV 80 PPA	45,7	114	14	122	176	1 400
NUKR 80 A	69,3	86,5	10,8	48	69,5	1 900
PWKR 80.2RS	57,2	73,5	9,3	64	91,5	2 000
KRE 80 PPA	36,9	72	9	106	150	1 800
NUKRE 80 A	69,3	86,5	10,8	48	69,5	1 900
PWKRE 80.2RS	57,2	73,5	9,3	64	91,5	2 000



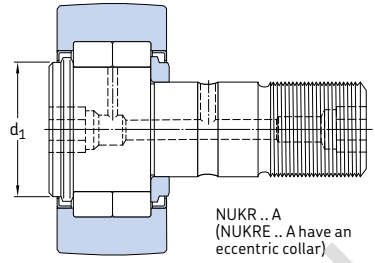
KR .. PPA



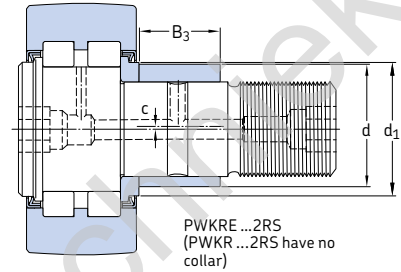
Dimensions																Mass	Designation
D	C	d	B	B_1	B_2	C_1	d_1	G	G_1	M	M_1	$r_{1,2}$ min.	SW	c	B_3		
mm																kg	–
90	35	30	100	63	15	1	53	M 30x1,5	32	8	4	1,1	14	–	–	1,975	**KR 90 PPA**
	35	30	100	63	15	1	53	M 30x1,5	32	8	4	1,1	14	–	–	2,003	**KRV 90 PPA**
	35	30	100	63	15	1	47	M 30x1,5	32	8	4	1,1	14	–	–	1,96	**NUKR 90 A**
	35	30	100	63	15	1	47	M 30x1,5	32	8	4	1,1	14	–	–	1,96	**PWKR 90.2RS**
	35	35	100	63	15	1	53	M 30x1,5	32	8	4	1,1	14	1,5	29	2,032	**KRE 90 PPA**
	35	35	100	63	15	1	47	M 30x1,5	32	8	4	1,1	14	1,5	29	2,02	**NUKRE 90 A**
	35	35	100	63	15	1	47	M 30x1,5	32	8	4	1,1	14	1,5	29	2,02	**PWKRE 90.2RS**



KRE .. PPA



NUKR .. A
(NUKRE .. A have an eccentric collar)



PWKRE ...2RS
(PWKR ...2RS have no collar)

Designation	Basic load ratings dynamic	static	Fatigue load limit	Maximum radial loads dynamic	static	Limiting speed
	C	C_0	P_u	F_r	F_{0r}	
–	kN		kN	kN		r/min
KR 90 PPA	38	76,5	9,5	160	228	1 800
KRV 90 PPA	47,3	122	15	183	260	1 400
NUKR 90 A	78,1	102	12,7	86,5	125	1 900
PWKR 90.2RS	62,7	85	10,8	108	153	2 000
KRE 90 PPA	38	76,5	9,5	160	228	1 800
NUKRE 90 A	78,1	102	12,7	86,5	125	1 900
PWKRE 90.2RS	62,7	85	10,8	108	153	2 000