Toroidal roller bearings

FAG

Matrix for bearing preselection

The matrix gives an overview of the types and design features of toroidal roller bearings.

It can be used to make a preliminary assessment of whether a bearing is fundamentally suitable for the envisaged application.

The additional information provided in the product chapter (see column "detailed information") and in the Technical principles must, however, be observed in addition to this overview in selection of the bearing.

Design features and suitability			Toroidal roller bearings		
+++ extremely suitable ++ highly suitable + suitable (+) suitable with restrictions – not suitable/not applicable ✓ available			with cage	full complement roller set	detailed information ➤ 800
Load carrying capacity	radial		+++	+++	➤805|1.2
	axial, one direction		–	–	➤805|1.2
	axial, both directions		–	–	➤805|1.2
	moments		–	–	➤805|1.2
Compensation of angular misalignments	static		+++	+++	➤805|1.3
	dynamic		++	++	➤805|1.3
Bearing design	cylindrical bore		✓	✓	➤800|1.1
	tapered bore		✓	✓	➤800|1.1
	separable		–	–	➤800|1.1
Lubrication	greased		–	–	➤805|1.4
Sealing	open		✓	✓	➤805|1.5
	non-contact		–	–	➤805|1.5
	contact		–	–	➤805|1.5
Operating temperature in °C		from to	–30 +200	–30 +200	➤806|1.8
Suitability for	high speeds		+	(+)	➤806|1.6
	high running accuracy		++	++	➤808|1.11 ➤114
	low-noise running		+	+	➤806|1.7 ➤27
	high rigidity		++	+++	➤54
	reduced friction		+	(+)	➤56
	length compensation within bearing		+++	+++	➤800|1.1 ➤25
	non-locating bearing arrangement		+++	+++	➤139
	locating bearing arrangement		–	–	➤139
X-life bearings			✓	✓	➤804
Bearing bore d in mm		from to	70 900	60 220	➤832
Product tables		from page ➤	832	832	

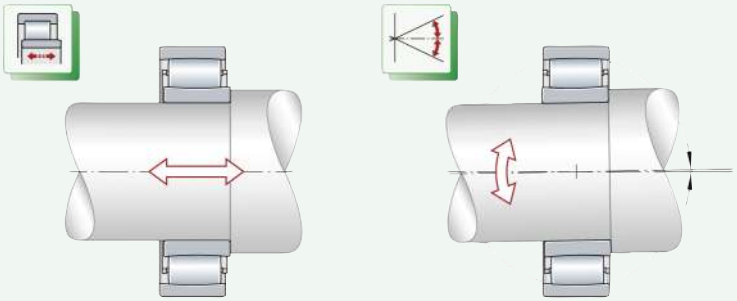
1 Toroidal roller bearings

Toroidal roller bearings:

- combine the angular adjustment facility of spherical roller bearings with the unconstrained axial displacement facility of cylindrical roller bearings in one bearing ➤*800*|*1.1*
- have a very high radial load carrying capacity (in the full complement design) ➤*832*|▦
- support radial loads only ➤*805*|*1.2*
- are used solely as non-locating bearings (compensate axial displacements of the shaft relative to the housing)
- compensate misalignments between the shaft and housing ➤*800*|🗀*1*, ➤*805*|*1.3*
- permit high speeds in spite of line contact ➤*832*|▦
- are available in numerous sizes and designs ➤*832*|▦
- result in particularly compact and economical bearing arrangements.

For an overview of other product-specific features, see the Matrix for bearing preselection ➤*799*.

🗀 ***1***
Axial displacement facility and angular adjustment facility in one bearing



1.1 Bearing design

✎ *Design variants*

Toroidal roller bearings are X-life bearings.
The standard product range comprises:

- bearings with cage ➤*801*|🗀*3*
- full complement bearings ➤*801*|🗀*3*
- bearings with cylindrical or tapered bore (bearings with cage or full complement bearings) ➤*802*|🗀*4*.

The bearings described here constitute the basic product range of Schaeffler toroidal roller bearings. These bearings are, however, also available in many other designs and sizes, as well as for specific applications. Related information is available from Schaeffler on request.

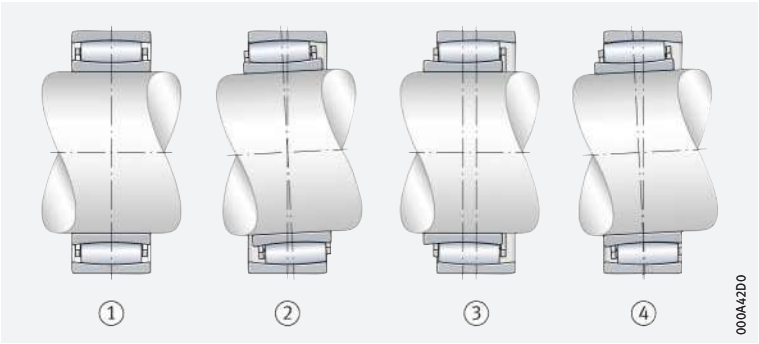
Toroidal roller bearings

✎ *Suitable for misalignments and where axial displacements of the shaft relative to the housing must be compensated without constraint in the bearing*

Toroidal roller bearings are single row radial roller bearings with a low radial section height and very high load carrying capacity, which are part of the group of self-aligning bearings ➤*801*|*2*, ➤*801*|*3* and ➤*802*|*4*. The outer ring has a toroidal raceway, which is concentric relative to the centre of the bearing. Correspondingly, the inner ring raceway is concave. This raceway design allows the bearings to compensate static and dynamic angular misalignments (skewing between the inner and outer ring) within certain limits ➤*805*|*1.3* and ➤*832*|▦.
The relatively long and slightly crowned symmetrical rollers have self-aligning characteristics (they are “self-guiding”); i. e. they will always automatically adopt the position at which the load is distributed uniformly over the length of the roller, irrespective of whether the bearing rings are displaced or skewed relative to each other ➤*801*|*2*.
As this “self-guiding” of the rollers improves the load distribution in the bearing, the bearing is able to run with less friction and, as a result, at lower temperatures. This in turn has a positive effect on the operating life of the bearing and lubricant.

2
Operating modes of the inner ring – with tilting and axial displacement

① *Initial position*
② *Inner ring with tilting*
③ *Inner ring with axial displacement*
④ *Inner ring with displacement and tilting*



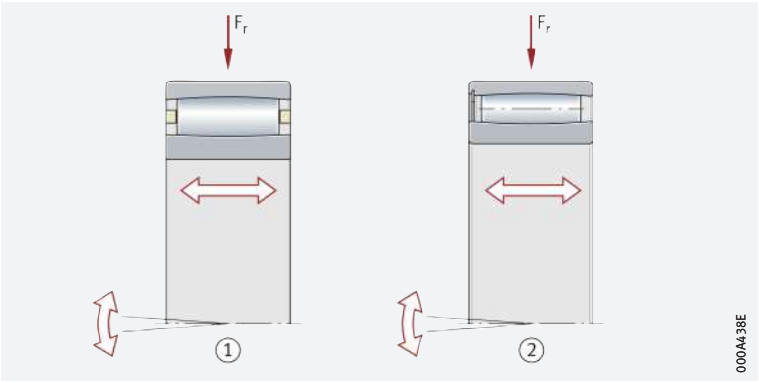
✎ *With cage or full complement cylindrical roller set*

The bearings are available with a sheet steel cage, brass cage (suffix M or M1B) and in a full complement design ➤*801*|*3* and ➤*806*|▦ *1.9*. Full complement bearings have the suffix V.

3
Toroidal roller bearings with cage or full complement cylindrical roller set

F_r = *radial load*

① *Bearing with solid brass cage*
② *Full complement design*



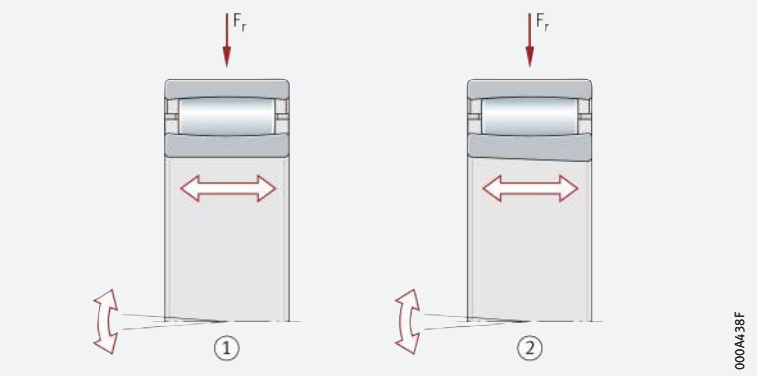
✎ *The bore is cylindrical or tapered*

With only a few exceptions, the bearings are available with a cylindrical bore as well as with a tapered bore ➤*802*|*4*. Bearings with a tapered bore have the bore taper 1:12 (suffix K) and 1:30 (suffix K30) ➤*809*|▦ *4* and ➤*806*|*1.9*.

4
Toroidal roller bearings with cylindrical or tapered bore

F_r = *radial load*

① *Bearing with cylindrical bore*
② *Bearing with tapered bore, taper angle 1:12*

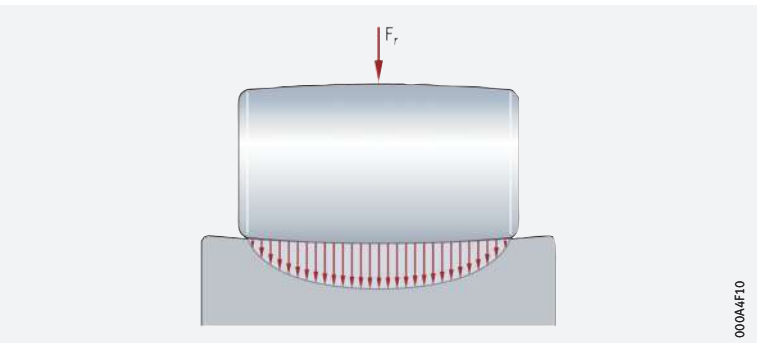


Roller profile design

The stress distribution at the contact points between the rollers and raceways is determined by the contact profile of the rollers. As a result, the roller profile is matched to the raceway profiles. In addition, the rollers exhibit high dimensional and geometrical accuracy. Consequently, the rollers in an individual rolling element set are practically identical in terms of their size and shape. This gives a favourable and even load distribution across all rollers and over the entire length of the roller, thus preventing edge stresses and stress peaks at the ends of the roller ➤*802*| 5.

5
Uniform load distribution due to optimised roller profile

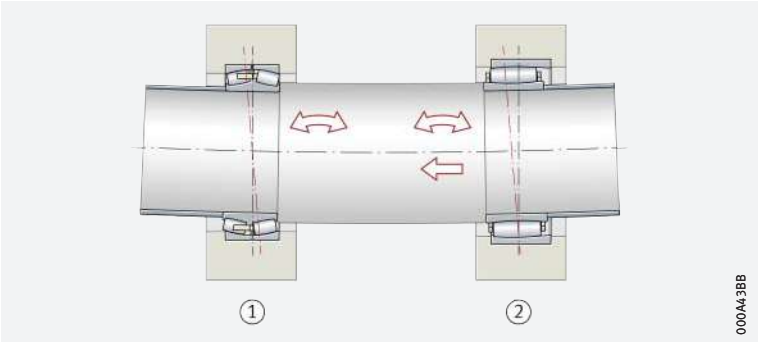
F_r = *radial load*



Length compensation takes place without constraint in the bearing

Bearings with non-locating bearing function

Toroidal roller bearings simplify the design of locating/non-locating bearing arrangements, as they compensate temperature-induced changes in length and skewing between the inner and outer ring with hardly any friction in the bearing ➤*803*| 6. Axial displacements of the shaft relative to the housing are possible in both directions and within certain limits. Even more considerable axial displacements have no effect on the locating bearing. Length compensation takes place during rotary motion. The constraining forces occurring are so slight that they can be disregarded during operation. The maximum axial displacement distance s_1 and s_2 is given in the product tables ➤*832*|. s_1 is valid for bearings with cages, s_1 and s_2 are valid for full complement bearings.

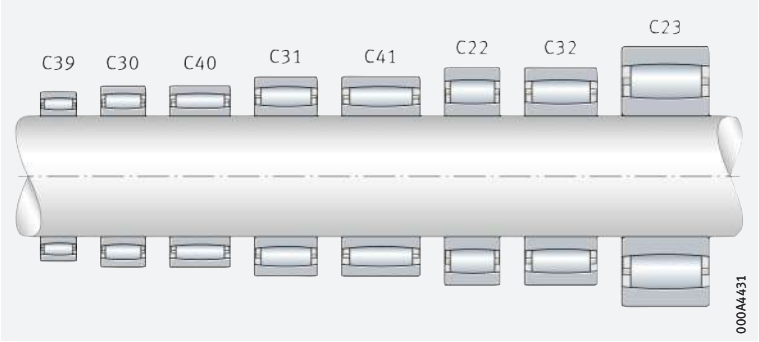


6
Locating/non-locating bearing arrangement, angular adjustment facility and axial displacement facility

① *Spherical roller bearing (locating bearing)*
② *Toroidal roller bearing (non-locating bearing)*

Product range

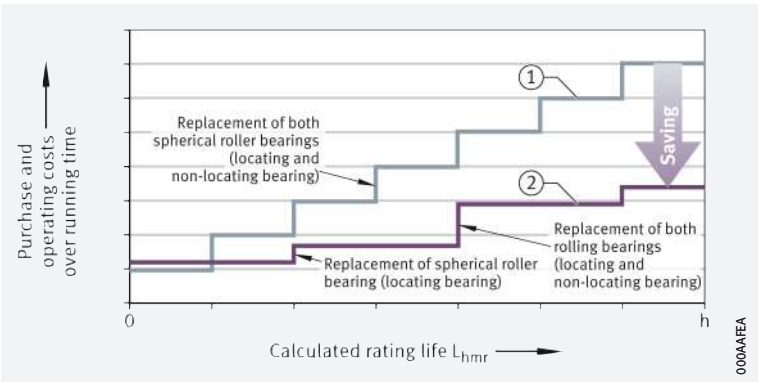
The range of toroidal roller bearings comprises eight series ➤*803*|*7*.



7
Product range – cross-sectional comparison of available series

Interchangeable with spherical roller bearings and cylindrical roller bearings

Substituting bearing arrangements composed of two spherical roller bearings for one spherical roller bearing (locating bearing) and one toroidal roller bearing (non-locating bearing) can significantly reduce the overall operating costs of the locating/non-locating system ➤*803*|*6* and ➤*803*|*8*. The interchangeability of the bearings is ensured, as toroidal roller bearings are manufactured as standard in the same ISO dimension series and sizes as spherical roller bearings.



8
Comparison of the overall operating costs of locating/non-locating bearing systems

① *Bearing arrangement with two spherical roller bearings*
② *Bearing arrangement with one spherical roller bearing (locating bearing) and one toroidal roller bearing (non-locating bearing)*

X-life premium quality

The toroidal roller bearings described here are X-life bearings. These products exhibit considerably higher performance than toroidal roller bearings that are not X-life. This is achieved, for example, through the optimised contact geometry between the rollers and raceways, as well as through the higher quality of the steel and rolling elements, higher surface quality and appropriate heat treatment.

Advantages

Increased customer benefits due to X-life

The technical enhancements offer a range of advantages, such as:

- a more favourable load distribution in the bearing and thus a higher dynamic load carrying capacity of the bearings (higher basic dynamic load ratings C_r)
- quieter running and higher running accuracy
- running with reduced friction and greater energy efficiency
- lower heat generation in the bearing
- higher possible speeds
- lower lubricant consumption and, consequently, longer maintenance intervals
- significantly reduced maintenance requirements
- a measurably longer operating life ➤*803*|*8*
- high operational security
- compact, environmentally-friendly bearing arrangements.

Lower operating costs, higher machine availability

In conclusion, these advantages improve the overall cost-efficiency of the bearing position significantly and thus bring about a sustainable increase in the efficiency of the machine and equipment.

Suffix XL

X-life toroidal roller bearings include the suffix XL in the designation ➤*800*|*1.1* and ➤*832*|.

Areas of application

Wide application range

Due to their special technical features, X-life toroidal roller bearings are highly suitable for bearing arrangements in:

- paper machinery
- marine propulsion systems
- continuous casting plant
- steelworks and rolling mills
- ventilators, fans and pumps
- conveying equipment and belt installations
- crushers
- gearboxes
- agricultural machinery.

X-life indicates a high product performance density and thus a particularly significant benefit to the customer. Further information on X-life ➤*10*.

1.2 Load carrying capacity

The bearings are radial bearings

Toroidal roller bearings support very high radial forces due to the line contact of the rollers. They may, however, only be subjected to purely radial load ➤*801*|*3*, ➤*802*|*4* and ➤*800*|*1.1*. As non-locating bearings, they cannot guide the shaft axially in either direction. Combining toroidal roller bearings with a spherical roller bearing on the locating bearing side results in bearing arrangements with a smaller design envelope, a lower mass and only low maintenance requirements ➤*803*|*6*.

Full complement bearings have the highest load carrying capacity

Bearings without a cage can accommodate the largest possible number of rolling elements. As a result, the radial load carrying capacity of full complement toroidal roller bearings is higher still than for the designs with a cage. These bearings are therefore highly suitable for bearing arrangements in continuous casting plant.

1.3 Compensation of angular misalignments

Toroidal roller bearings compensate angular misalignments

Toroidal roller bearings can be tilted by an angle of up to 0,5° between the centre axes of the inner ring and outer ring without impairing the function and rating life. This allows the toroidal roller bearing to easily compensate a slight geometrical deviation of the housing bore or a shaft that is not precisely aligned.

Depending on the series and size, skewing of more than 0,5° is possible, but may be associated with a reduction in the rating life. In the case of such applications, please contact our technical advisory service in order to achieve an optimum design of the bearing arrangement.

Roller offset under skewing

Skewing of the bearing rings relative to each other causes a degree of roller offset in the bearing, which can cause the rollers to protrude beyond the rings. In order to prevent this, the axial displacement facility of the rings relative to each other is restricted ➤*822*.

If there is any uncertainty regarding possible skewing in a specific application, please consult Schaeffler.

1.4 Lubrication

Oil or grease lubrication is possible

Open toroidal roller bearings are not greased. They must be lubricated with oil or grease. Lubricant is introduced from one side and exits on the opposing side.

If there is any uncertainty regarding the suitability of the selected lubricant for the application, please consult Schaeffler or the lubricant manufacturer.

1.5 Sealing

Provide seals in the adjacent construction

The bearings are not sealed; i.e. sealing of the bearing position must be carried out in the adjacent construction. This must reliably prevent:

- moisture and contaminants from entering the bearing
- the egress of lubricant from the bearing.

1.6 Speeds

Limiting speeds and reference speeds in the product tables

The product tables give two speeds for most bearings ➤*832*|▦:

- the kinematic limiting speed n_G
- the thermal speed rating $n_{\vartheta r}$.

Limiting speeds

The limiting speed n_G is the kinematically permissible speed of the bearing. Even under favourable mounting and operating conditions, this value should not be exceeded without prior consultation with Schaeffler ➤*64*.

Reference speeds

$n_{\vartheta r}$ is used to calculate n_ϑ

The thermal speed rating $n_{\vartheta r}$ is not an application-oriented speed limit, but is a calculated ancillary value for determining the thermally safe operating speed n_ϑ ➤*64*.

1.7 Noise

Schaeffler Noise Index

The Schaeffler Noise Index (SGI) is not yet available for this bearing type ➤*69*. The data for these bearing series will be introduced and updated in stages.

Further information:

- ***medias*** ➤*https://medias.schaeffler.com*.

1.8 Temperature range

Limiting values

The operating temperature of the bearings is limited by:

- the dimensional stability of the bearing rings and rollers
- the cage
- the lubricant.

Toroidal roller bearings are dimensionally stable up to +200 °C. Possible operating temperatures of bearings ➤*806*|▦ *1*.

▦ ***1***
Permissible temperature ranges

Operating temperature	Toroidal roller bearings	
	with cage	full complement roller set
	–30 °C to +200 °C	–30 °C to +200 °C

In the event of anticipated temperatures which lie outside the stated values, please contact Schaeffler.

1.9 Cages

Sheet steel and brass cages are used as standard

Depending on the series and bearing size, toroidal roller bearings are supplied with the following cages ➤*809*|▦ *4*:

- roller-guided sheet steel cage, single-piece (no suffix)
- roller-guided brass window cage (suffix M)
- brass window cage, guided on inner ring (suffix M1B).

1.10 Internal clearance

Radial internal clearance

✎ *The standard is CN*

Toroidal roller bearings are manufactured as standard with radial internal clearance CN (normal). CN is not stated in the designation. Values for bearings with a cylindrical bore ➤*807*|▦*2*, values for bearings with a tapered bore ➤*808*|▦*3*.

Toroidal roller bearings are also available with the smaller internal clearance C2 and with the larger internal clearance C3, C4 and C5 ➤*807*|▦*2* and ➤*808*|▦*3*.

The values for radial internal clearance correspond to ISO 5753-1:2009 ➤*807*|▦*2* and ➤*808*|▦*3*. They are valid for unmounted bearings which are free from load and measurement forces (without elastic deformation).

Axial displacements of the bearing rings relative to each other will reduce the internal clearance of toroidal roller bearings. This reduction can be determined by way of calculation ➤*821*|*f* 13.

▦*2*
Radial internal clearance of toroidal roller bearings with cylindrical bore

Nominal bore diameter		Radial internal clearance									
d		C2 (Group 2)		CN (Group N)		C3 (Group 3)		C4 (Group 4)		C5 (Group 5)	
mm		µm		µm		µm		µm		µm	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
18	24	15	30	25	40	35	55	50	65	65	85
24	30	15	35	30	50	45	60	60	80	75	95
30	40	20	40	35	55	55	75	70	95	90	120
40	50	25	45	45	65	65	85	85	110	105	140
50	65	30	55	50	80	75	105	100	140	135	175
65	80	40	70	65	100	95	125	120	165	160	210
80	100	50	85	80	120	120	160	155	210	205	260
100	120	60	100	100	145	140	190	185	245	240	310
120	140	75	120	115	170	165	215	215	280	280	350
140	160	85	140	135	195	195	250	250	325	320	400
160	180	95	155	150	220	215	280	280	365	360	450
180	200	105	175	170	240	235	310	305	395	390	495
200	225	115	190	185	265	260	340	335	435	430	545
225	250	125	205	200	285	280	370	365	480	475	605
250	280	135	225	220	310	305	410	405	520	515	655
280	315	150	240	235	330	330	435	430	570	570	715
315	355	160	260	255	360	360	485	480	620	620	790
355	400	175	280	280	395	395	530	525	675	675	850
400	450	190	310	305	435	435	580	575	745	745	930
450	500	205	335	335	475	475	635	630	815	810	1 015
500	560	220	360	360	520	510	690	680	890	890	1 110
560	630	240	400	390	570	560	760	750	980	970	1 220
630	710	260	440	430	620	610	840	830	1 080	1 070	1 340
710	800	300	500	490	680	680	920	920	1 200	1 200	1 480
800	900	320	540	530	760	750	1 020	1 010	1 330	1 320	1 660
900	1 000	370	600	590	830	830	1 120	1 120	1 460	1 460	1 830
1 000	1 120	410	660	660	930	930	1 260	1 260	1 640	1 640	2 040
1 120	1 250	450	720	720	1 020	1 020	1 380	1 380	1 800	1 800	2 240
1 250	1 400	490	800	800	1 130	1 130	1 510	1 540	1 970	1 970	2 460
1 400	1 600	570	890	890	1 250	1 250	1 680	1 680	2 200	2 200	2 740
1 600	1 800	650	1 010	1 010	1 390	1 390	1 870	1 870	2 430	2 430	3 000

3 *Radial internal clearance of toroidal roller bearings with tapered bore*

Nominal bore diameter d mm		Radial internal clearance									
		C2 (Group 2) µm		CN (Group N) µm		C3 (Group 3) µm		C4 (Group 4) µm		C5 (Group 5) µm	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.	min.	max.
18	24	15	35	30	45	40	55	55	70	65	85
24	30	20	40	35	55	50	65	65	85	80	100
30	40	25	50	45	65	60	80	80	100	100	125
40	50	30	55	50	75	70	95	90	120	115	145
50	65	40	65	60	90	85	115	110	150	145	185
65	80	50	80	75	110	105	140	135	180	175	220
80	100	60	100	95	135	130	175	170	220	215	275
100	120	75	115	115	155	155	205	200	255	255	325
120	140	90	135	135	180	180	235	230	295	290	365
140	160	100	155	155	215	210	270	265	340	335	415
160	180	115	175	170	240	235	305	300	385	380	470
180	200	130	195	190	260	260	330	325	420	415	520
200	225	140	215	210	290	285	365	360	460	460	575
225	250	160	235	235	315	315	405	400	515	510	635
250	280	170	260	255	345	340	445	440	560	555	695
280	315	195	285	280	380	375	485	480	620	615	765
315	355	220	320	315	420	415	545	540	680	675	850
355	400	250	350	350	475	470	600	595	755	755	920
400	450	280	385	380	525	525	655	650	835	835	1 005
450	500	305	435	435	575	575	735	730	915	910	1 115
500	560	330	480	470	640	630	810	800	1 010	1 000	1 230
560	630	380	530	530	710	700	890	880	1 110	1 110	1 350
630	710	420	590	590	780	770	990	980	1 230	1 230	1 490
710	800	480	680	670	860	860	1 100	1 100	1 380	1 380	1 660
800	900	520	740	730	960	950	1 220	1 210	1 530	1 520	1 860
900	1 000	580	820	810	1 040	1 040	1 340	1 340	1 670	1 670	2 050
1 000	1 120	640	900	890	1 170	1 160	1 500	1 490	1 880	1 870	2 280
1 120	1 250	700	980	970	1 280	1 270	1 640	1 630	2 060	2 050	2 500
1 250	1 400	770	1 080	1 080	1 410	1 410	1 790	1 780	2 250	2 250	2 740
1 400	1 600	870	1 200	1 200	1 550	1 550	1 990	1 990	2 500	2 500	3 050
1 600	1 800	950	1 320	1 320	1 690	1 690	2 180	2 180	2 730	2 730	3 310

1.11 Dimensions, tolerances

Dimension standards

The main dimensions of toroidal roller bearings correspond to ISO 15:2017 (DIN 616:2000).

Chamfer dimensions

The limiting dimensions for chamfer dimensions correspond to DIN 620-6:2004. Overview and limiting values ➤*135*|*7.11*. Nominal value of chamfer dimension ➤*832*|▦.

Tolerances

The dimensional tolerances of toroidal roller bearings with a cylindrical and tapered bore correspond to the tolerance class Normal in accordance with ISO 492:2014. Tolerance values in accordance with ISO 492 ➤*122*|▦ *8*.

✎ *Running accuracy*

The running accuracy of the inner and outer ring corresponds to tolerance class 5 in accordance with ISO 492:2014. Tolerance values in accordance with ISO 492 ➤*126*|▦ *14*.

1.12 Suffixes

For a description of the suffixes used in this chapter ➤*809*|▦*4* and ***medias*** interchange ➤*https://www.schaeffler.de/std/1D52*.

▦**4**
Suffixes and corresponding descriptions

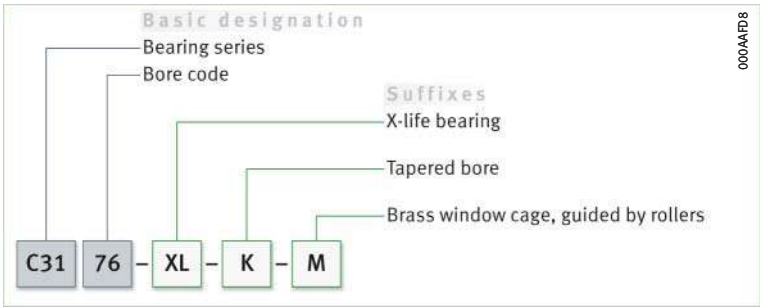
Suffix	Description of suffix	
C2	Radial internal clearance C2 (smaller than normal)	Available by agreement
C3	Radial internal clearance C3 (larger than normal)	
C4	Radial internal clearance C4 (larger than C3)	
C5	Radial internal clearance C5 (larger than C4)	
K	Tapered bore, taper 1:12	Standard
K30	Tapered bore, taper 1:30	
M	Brass window cage, guided by rollers	
M1B	Brass window cage, guided on inner ring	
V	Full complement	
W209B	Inner ring made from case hardening steel	
XL	X-life bearing	

1.13 Structure of bearing designation

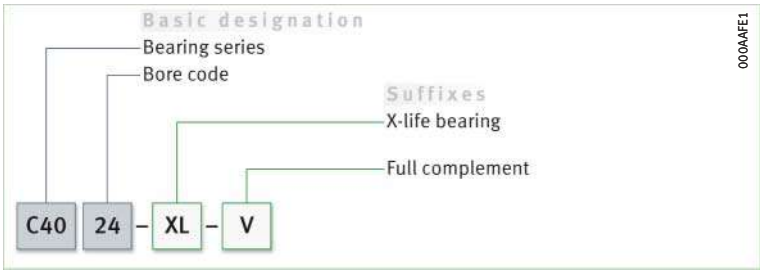
✎*Examples of composition of bearing designation*

The designation of bearings follows a set model. Examples ➤*809*|⧉*9* and ➤*809*|⧉*10*. The composition of designations is subject to DIN 623-1 ➤*102*|⧉*10*.

⧉**9**
Toroidal roller bearing, series 31, with cage, tapered bore: designation structure



⧉**10**
Toroidal roller bearing, series 40, full complement, cylindrical bore: designation structure



1.14 Dimensioning

Equivalent dynamic bearing load

✎ *$P = F_r$ under purely radial load of constant magnitude and direction*

The basic rating life equation $L = (C_r/P)^p$ used in the dimensioning of bearings under dynamic load assumes a load of constant magnitude and direction. In radial bearings, this is a purely radial load F_r.
If this condition is met, the bearing load F_r is used in the rating life equation for P ($P = F_r$) ➤*810| ƒ1*.

ƒ1 *Equivalent dynamic load*

$$P = F_r$$

Legend

P	N	Equivalent dynamic bearing load
F_r	N	Radial load.

Permissible dynamic bearing load

Maximum values in accordance with ➤*810| 5* apply to dynamic bearing load P.

5 *Permissible dynamic bearing load*

Fundamentally valid for	Valid up to bore diameter d ≦ 200 mm for
P	
$P \leqq 0{,}33\ C_r$	$P \leqq 0{,}18\ C_{0r}$

In applications with very high dynamic loads, the rating life calculation must be carried out in greater detail.
In such cases, please consult Schaeffler.

Equivalent static bearing load

For toroidal bearings subjected to static load ➤*810| ƒ2*.

ƒ2 *Equivalent static load*

$$P_0 = F_r$$

Legend

P_0	N	Equivalent static bearing load
F_r	N	Largest radial load present (maximum load).

Static load safety factor

✎ *$S_0 = C_0/P_0$*

In addition to the basic rating life L (L_{10h}), it is also always necessary to check the static load safety factor S_0 ➤*810| ƒ3*.

ƒ3 *Static load safety factor*

$$S_0 = \frac{C_0}{P_0}$$

Legend

S_0	–	Static load safety factor
C_0	N	Basic static load rating
P_0	N	Equivalent static bearing load.

1.15 Minimum load

In order to prevent damage due to slippage, a minimum radial load is required

In order that no slippage occurs between the contact partners, the toroidal roller bearings must be constantly subjected to a sufficiently high radial load. This applies in particular to high speed bearings since, if the radial load is not present, damaging sliding motion may occur between the rolling elements and raceways. Based on experience, a minimum load is thus necessary ➤*811*|*4*. In most cases, however, the radial load is already higher than the requisite minimum load $F_{r\,min}$ due to the weight of the supported parts and the external forces.

4
Minimum radial load

$$F_{r\,min} = 0{,}0135 \cdot C_0$$

Legend

$F_{r\,min}$	kN	Minimum radial load
C_0	kN	Basic static load rating ➤*832*|

If the minimum radial load $F_{r\,min} \leqq 0{,}0135 \cdot C_0$, please consult Schaeffler.

Minimum radial load with oil lubrication

Values can be determined from a diagram or by calculation

If oil lubrication is used, the requisite minimum load $F_{r\,min}$ is reduced as a function of the bearing type and speed. $F_{r\,min}$ can be determined for this operating condition:

- with the aid of a diagram, whereby $F_{r\,min}$ is read off relative to C_0 ➤*811*|*11*
- by calculation ➤*812*|*6* and ➤*812*|*6*.

Determining the minimum radial load with the aid of a diagram

Determining ancillary value k_r

In order to calculate $F_{r\,min}$, the ancillary value k_r must first be determined ➤*811*|*5*.

5
Ancillary value

$$k_r = k_\delta \cdot d_M$$

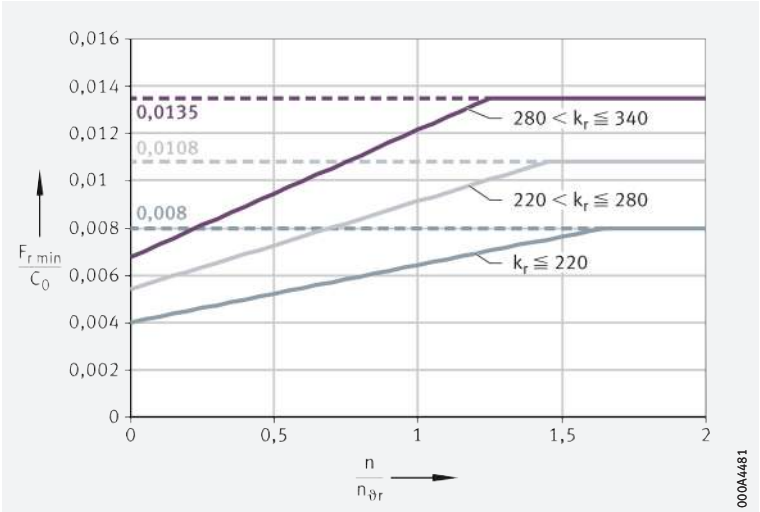
Legend

k_r	–	Ancillary value
k_δ	–	Operating clearance factor ➤*832*|
d_M	mm	Mean bearing diameter (d+D)/2.

Reading off the minimum radial load from a diagram

With the aid of the ancillary value k_r and the speed ratio $n/n_{\vartheta r}$, the requisite minimum load can be read off relative to the basic static load rating C_0 ➤*811*|*11*.

11
Minimum radial load with oil lubrication



$F_{r\,min}$ = *minimum radial load*
C_0 = *basic static load rating* ➤*832*|
n = *operating speed*
$n_{\vartheta r}$ = *speed rating* ➤*832*|
k_r = *ancillary value* ➤*811*|*5*

Determining the minimum radial load by calculation

As an alternative to using a diagram, the requisite minimum radial load can also be determined by calculation ➤*812*| *f*6 to ➤*812*| *f*8.

*f*6 *Factor f_n, if $n < n_K \cdot n_{\vartheta r}$*

$$f_n = 0{,}5 \cdot \left(1 + \frac{n}{n_{\vartheta r} \cdot n_K}\right)$$

*f*7 *Factor f_n, if $n \geqq n_K \cdot n_{\vartheta r}$*

$$f_n = 1$$

Legend

f_n	–	Factor for determining the influence of speed. In the case of full complement bearings: $f_n = 1$
n	min^{-1}	Operating speed
$n_{\vartheta r}$	min^{-1}	Speed rating ➤*832*|
n_K	–	Speed parameter ➤*812*| 6.

*f*8 *Minimum radial load*

$$F_{r\,min} = f_F \cdot f_n \cdot C_0$$

Legend

$F_{r\,min}$	kN	Minimum radial load
f_F	–	Factor due to influence of load ➤*812*| 6
f_n	–	Factor due to influence of speed ➤*812*| *f*6 and ➤*812*| *f*7
C_0	kN	Basic static load rating ➤*832*|.

Higher minimum radial loads may also be necessary under certain conditions when starting up at low temperature, when using greases with a high base oil viscosity and where bearings have been regreased.

As a function of k_r, the factors for calculation of the minimum load should be selected as follows ➤*812*| 6.

6 *Factors for calculation of minimum radial load*

Ancillary value k_r		Factor due to influence of load f_F	Speed parameter n_K
over	incl.		
–	220	0,0080	1,65
220	280	0,0108	1,45
280	340	0,0135	1,25

Calculation example 1:
Determining the minimum radial load $F_{r\,min}$ with the aid of a diagram

Task

The aim is to determine the minimum radial load $F_{r\,min}$ for toroidal roller bearing C3144-XL-K-C4 using a diagram ➤*813*| *9* and ➤*813*| *12*. The operating speed n = 260 min^{-1}, the static load carrying capacity of the bearing C_{0r} = 2 900 kN.

9
Ancillary value

$$k_r = k_\delta \cdot d_M$$

Calculation factor ➤*832*|

$$k_\delta = 0{,}791$$

Mean bearing diameter ➤*832*|

$$d_M = \frac{220\ mm + 370\ mm}{2} = 295\ mm$$

Ancillary value ➤*813*| *9*

$$k_r = 0{,}791 \cdot 295\ mm = 233{,}345\ mm \approx 233\ mm$$

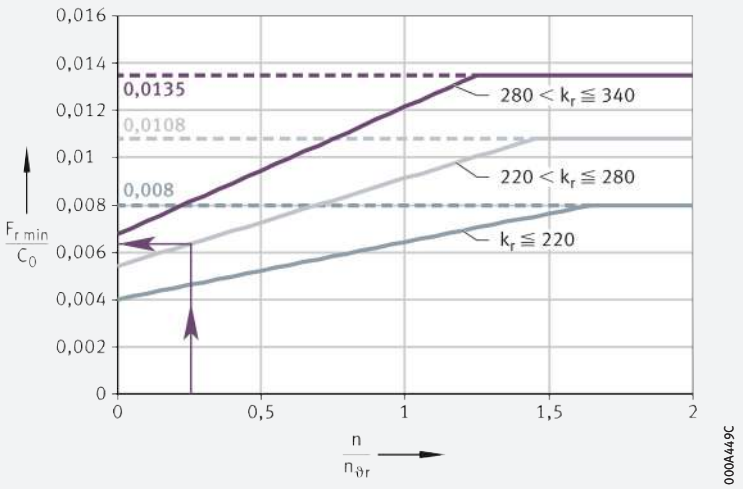
Speed ratio ➤*813*| *12*

$$\frac{n}{n_{\vartheta r}} = \frac{260\ min^{-1}}{960\ min^{-1}} = 0{,}27$$

The middle curve applies

k_r = 233 mm, therefore the middle (grey) curve is selected in the diagram ➤*813*| *12*. $n/n_{\vartheta r}$ = 0,27 for $F_{r\,min}/C_0$ = 0,0064.

12
Minimum radial load with oil lubrication



$F_{r\,min}$ = *minimum radial load*
C_0 = *basic static load rating* ➤*832*|
n = *operating speed*
$n_{\vartheta r}$ = *speed rating* ➤*832*|
k_r = *ancillary value* ➤*813*| *9*

$F_{r\,min}$

Calculate the minimum radial load for C3144-XL-K-C4:

$$F_{r\,min} = 0{,}0064 \cdot 2\,900\ kN = 18{,}6\ kN$$

Calculation example 2:
Determining the minimum radial load $F_{r\,min}$ by calculation

Task

The aim is to determine the minimum radial load $F_{r\,min}$ for toroidal roller bearing C3144-XL-K-C4 by calculation ➤*814*| *f 10*, ➤*814*| *f 11* and ➤*812*| *6*. The operating speed $n = 260\ min^{-1}$, the static load carrying capacity of the bearing $C_{0r} = 2\,900$ kN.

If $k_r \approx 233$ mm is taken from Example 1, this gives:

- $n_K = 1{,}45$ ➤*812*| *6*
- $f_F = 0{,}0108$ ➤*812*| *6*.

If $n_{\vartheta r} \cdot n_K = 960\ min^{-1} \cdot 1{,}45 = 1\,392\ min^{-1} > 260\ min^{-1}$, this gives ➤*814*| *f 10* and ➤*814*| *f 11*.

f 10
Factor for determining the influence of speed

$$f_n = 0{,}5 \cdot \left(1 + \frac{n}{n_{\vartheta r} \cdot n_K}\right)$$

$$f_n = 0{,}5 \cdot \left(1 + \frac{260\ min^{-1}}{960\ min^{-1} \cdot 1{,}45}\right) = 0{,}593$$

f 11
Minimum radial load

$$F_{r\,min} = f_F \cdot f_n \cdot C_0$$

$$F_{r\,min} = 0{,}0108 \cdot 0{,}593 \cdot 2\,900\ kN \approx 18{,}6\ kN$$

1.16 Design of bearing arrangements

Support bearing rings over their entire circumference and width

In order to allow full utilisation of the load carrying capacity of the bearings and achieve the requisite rating life, the bearing rings must be rigidly and uniformly supported by means of contact surfaces over their entire circumference and over the entire width of the raceway. Support can be provided by means of a cylindrical or tapered seating surface ➤816|13 to ➤820|16. The seating and contact surfaces should not be interrupted by grooves, holes or other recesses. The accuracy of mating parts must meet specific requirements ➤817|7 to ➤818|9.

Radial location – fit recommendations for bearings with cylindrical bore

For secure radial location, tight fits are necessary

In addition to supporting the rings adequately, the bearings must also be securely located in a radial direction, to prevent creep of the bearing rings on the mating parts under load. This is generally achieved by means of tight fits between the bearing rings and the mating parts. If the rings are not secured adequately or correctly, this can cause severe damage to the bearings and adjacent machine parts. Influencing factors, such as the conditions of rotation, magnitude of the load, internal clearance, temperature conditions, design of the mating parts and the mounting and dismounting options must be taken into consideration in the selection of fits.

If shock type loads occur, tight fits (transition fit or interference fit) are required to prevent the rings from coming loose at any point. Clearance, transition or interference fits ➤150|6 and ➤158|7.

The following information provided in Technical principles must be taken into consideration in the design of bearing arrangements:

- conditions of rotation ➤145
- tolerance classes for cylindrical shaft seats (radial bearings) ➤147|2
- shaft fits ➤150|6
- tolerance classes for bearing seats in housings (radial bearings) ➤148|4
- housing fits ➤158|7
- shaft tolerances for adapter sleeves and withdrawal sleeves ➤166|8.

Axial location – bearings with cylindrical bore

The bearings must also be securely located in an axial direction

As a tight fit alone is not normally sufficient to also locate the bearing rings securely on the shaft and in the housing bore in an axial direction, this must usually be achieved by means of an additional axial location or retention method. The axial location of the bearing rings must be matched to the type of bearing arrangement. Shaft and housing shoulders, housing covers, nuts, spacer rings and retaining rings etc., are fundamentally suitable.

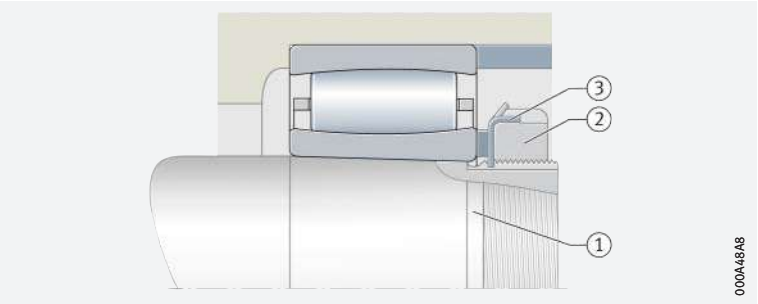
Axial location – bearings with tapered bore

✎ Location by means of locknut and tab washer

If a bearing with a tapered bore is mounted directly on a tapered journal, the bearing can be axially located with ease using a locknut and tab washer ➤*816*|🗀 *13*.

🗀 ***13***
Toroidal roller bearing with tapered bore, mounted directly on the tapered shaft journal

① *Tapered journal with fixing thread*
② *Locknut*
③ *Tab washer*



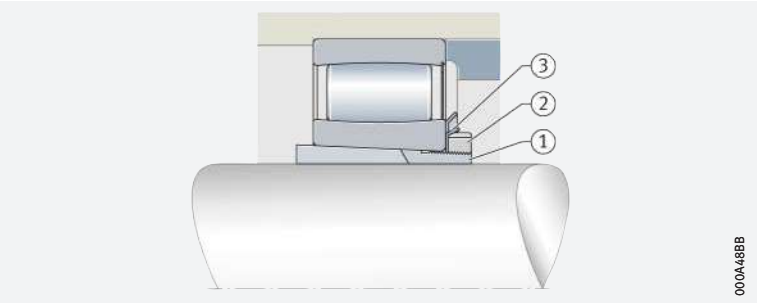
Location of bearings by means of adapter sleeve or withdrawal sleeve

✎ Mounting can be carried out quickly and reliably by means of wrench sets from Schaeffler

Toroidal roller bearings with a tapered bore can be located easily and with operational reliability on smooth or stepped cylindrical shafts by means of an adapter sleeve or withdrawal sleeve ➤*816*|🗀 *14*. The adapter sleeve does not need to be secured on the shaft by any additional means. The bearings can be positioned at any point on smooth shafts.

🗀 ***14***
Toroidal roller bearing with adapter sleeve, located on smooth shaft

① *Adapter sleeve*
② *Locknut*
③ *Tab washer*



Dimensional, geometrical and running accuracy of cylindrical bearing seats

✎A minimum of IT6 should be provided for the shaft seat and a minimum of IT7 for the housing seat

The accuracy of the cylindrical bearing seat on the shaft and in the housing should correspond to the accuracy of the bearing used. For toroidal roller bearings with the tolerance class Normal, the shaft seat should correspond to a minimum of standard tolerance grade IT6 and the housing seat to a minimum of IT7. Guide values for the geometrical and positional tolerances of bearing seating surfaces ➤817|▦ 7, tolerances t_1 to t_3 in accordance with ➤168|◯ 11. Numerical values for IT grades ➤817|▦ 8.

▦ 7
Guide values for the geometrical and positional tolerances of bearing seating surfaces

Bearing tolerance class		Bearing seating surface	Standard tolerance grades to ISO 286-1 (IT grades)			
to ISO 492	to DIN 620		Diameter tolerance	Roundness tolerance t_1	Parallelism tolerance t_2	Total axial runout tolerance of abutment shoulder t_3
Normal	PN (P0)	Shaft	IT6 (IT5)	Circumferential load IT4/2	Circumferential load IT4/2	IT4
				Point load IT5/2	Point load IT5/2	
		Housing	IT7 (IT6)	Circumferential load IT5/2	Circumferential load IT5/2	IT5
				Point load IT6/2	Point load IT6/2	
5	P5	Shaft	IT5	Circumferential load IT2/2	Circumferential load IT2/2	IT2
				Point load IT3/2	Point load IT3/2	
		Housing	IT6	Circumferential load IT3/2	Circumferential load IT3/2	IT3
				Point load IT4/2	Point load IT4/2	

▦ 8
Numerical values for ISO standard tolerances (IT grades) to ISO 286-1:2010

IT grade	Nominal dimension in mm									
	over	**50**	**80**	**120**	**180**	**250**	**315**	**400**	**500**	**630**	**800**
	incl.	**80**	**120**	**180**	**250**	**315**	**400**	**500**	**630**	**800**	**1 000**
	Values in µm										
IT4	8		10	12	14	16	18	20	22	25	28
IT5	13		15	18	20	23	25	27	32	36	40
IT6	19		22	25	29	32	36	40	44	50	56
IT7	30		35	40	46	52	57	63	70	80	90

Roughness of cylindrical bearing seating surfaces

Ra must not be too high

The roughness of the bearing seats must be matched to the tolerance class of the bearings. The mean roughness value Ra must not be too high, in order to maintain the interference loss within limits. The shafts must be ground, while the bores must be precision turned. Guide values as a function of the IT grade of bearing seating surfaces ➤*818*|▦*9*.

▦**9**
Roughness values for cylindrical bearing seating surfaces – guide values

Nominal diameter of the bearing seat d (D) mm		Recommended mean roughness value for ground bearing seats Ramax µm			
		Diameter tolerance (IT grade)			
over	incl.	IT7	IT6	IT5	IT4
–	80	1,6	0,8	0,4	0,2
80	500	1,6	1,6	0,8	0,4
500	1 250	3,2[1)]	1,6	1,6	0,8

1) *For the mounting of bearings using the hydraulic method, a value Ra = 1,6 µm must not be exceeded.*

Tolerances for tapered bearing seats

Specifications for tapered bearing seats

For bearings located directly on a tapered shaft journal ➤*816*|*13*, the data are in accordance with ➤*171*|*12*.

Mounting dimensions for the contact surfaces of bearing rings

The contact surfaces for the rings must be of sufficient height

The mounting dimensions of the shaft and housing shoulders, and spacer rings etc., must ensure that the contact surfaces for the bearing rings are of sufficient height. However, they must also reliably prevent rotating parts of the bearing from grazing stationary parts. Proven mounting dimensions for the radii and diameters of the abutment shoulders ➤*832*|▦. These dimensions are limiting dimensions (maximum or minimum dimensions); the actual values should not be higher or lower than specified.

Required axial free space

Calculating minimum values

Toroidal roller bearings can compensate thermally-induced changes in the length of the shaft relative to the housing within the bearing. In order to ensure the function of the bearings, free space must be provided on both end faces of the bearings ➤819| 15.

The minimum values recommended by Schaeffler for the depth of the free space are in accordance with ➤819| 12.

12
Requisite value for the depth of the free space

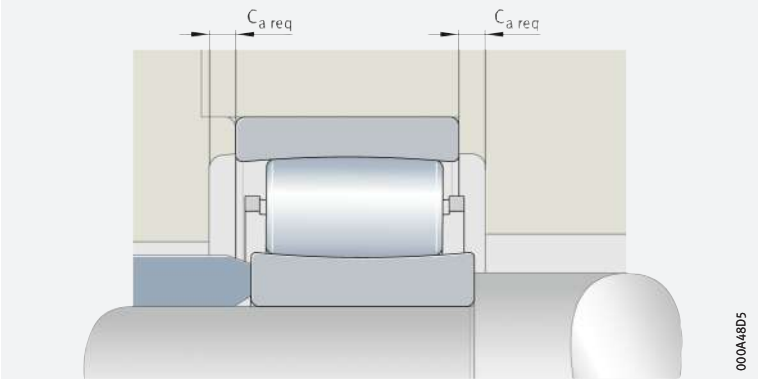
$$C_{a\,req} = C_a + 0{,}5 \cdot \left(\delta_{ax} + s_\varphi\right)$$

Legend

$C_{a\,req}$	mm	Requisite value for the depth of the free space ➤819| 15
C_a	mm	Minimum value for depth of free space in the case of bearing rings without offset ➤832|
δ_{ax}	mm	Axial displacement from central position
s_φ	mm	Reduction in axial displacement facility as a result of tilting ➤823| 17.

15
Free space in the housing for toroidal roller bearings with a cage

$C_{a\,req}$ = *requisite value for the depth of the free space*



Offset mounting

Suitable for significant changes in length in one direction

In standard mounting, the bearing rings are fitted concentrically in relation to each other. If significant changes in length occur in one direction in the application due to heat, the inner ring can be fitted offset relative to the outer ring in the opposing direction by up to the maximum permissible axial displacement. As a result, there is a significant increase in the possible axial displacement.

Axial fixing elements

Toroidal roller bearings can be axially located by means of shaft nuts KML or KM and tab washers MBL or MB ➤820| 16. For bearings with a bore diameter larger than 200 mm, nuts of series HM30 should be used with retaining bracket MS30.

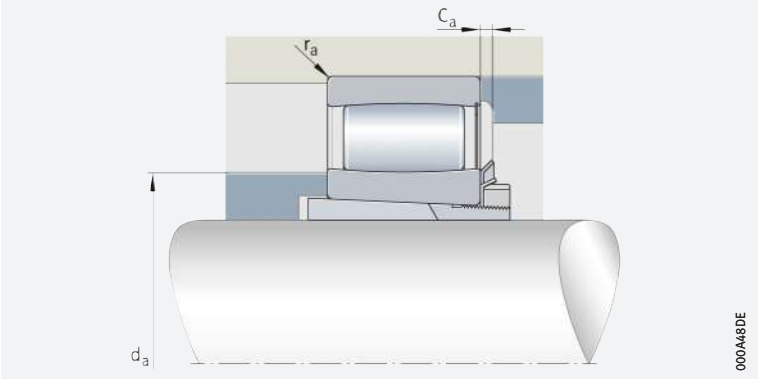
In the axial location of toroidal roller bearings with retaining nuts, it must be ensured that the cage of the bearing does not graze the retaining nut or tab washer if the shaft undergoes axial displacement. The outside diameter of the retaining nut should always be smaller than the stated mounting dimension $d_{a\ max}$. If this is not possible, an intermediate ring can be arranged between the bearing and means of retention and the thread on the shaft can be made correspondingly longer.

16
Toroidal roller bearing on adapter sleeve

C_a = *minimum value for free space in the case of bearings with cage and rings without offset, or required free space with offset bearing rings*

r_a = *maximum chamfer dimension* ➤832|

d_a = *maximum or minimum abutment height for inner ring* ➤832|



Possible axial displacement of the bearing rings relative to each other from the central position

Conditions for s_1 and s_2

Toroidal roller bearings compensate axial displacement of the shaft relative to the housing within the bearing ➤*800*|*1.1*. As a result, they can accommodate thermal expansion or deviations from the required bearing position within certain limits. The maximum displacement distances s_1 and s_2 in the product tables apply only where a sufficiently large operating clearance is present and to untilted bearing rings.

Axial displacement and tilting of the bearing rings changes the position of the rolling element in the bearing and thus also the operating clearance.

In order to ensure that the axial displacement distance is available, the free space on both sides of the bearing must be maintained ➤*819*| *15* and ➤*819*| *12*.

Factors which restrict the axial displacement of the bearing rings

Roller offset and operating clearance restrict the axial displacement of the bearing rings

The possible axial displacement of one bearing ring relative to the other from the central position is limited by:

- the restriction of the roller offset (geometrical restriction)
- the restriction of the operating clearance.

Parameters which must be fulfilled for a reliable function

In order to ensure the function of toroidal roller bearings in operation, the following must always be checked when designing the bearing position:

- The axial displacement of the bearing rings in combination with any tilting lies within the permitted displacement distance s_1 or s_2 ➤*832*| respectively
- Sufficient operating clearance is present under axial displacement, tilting and under axial displacement and tilting (since the axial displacement and tilting of the bearing rings changes the bearing clearance.

Determining the resulting bearing clearance

The resulting bearing clearance can be determined using the following equation:

*f*1 **13**
Resulting bearing clearance

$$s_{res} = s_{ini} - k_{\delta} \cdot \left(\delta_{ax} + k_{\varphi} \cdot \varphi\right)^2$$

Legend

s_{res}	µm	Resulting bearing clearance after tilting and axial displacement
s_{ini}	µm	Radial internal clearance after mounting
k_{δ}	–	Operating clearance factor ➤*832*|
δ_{ax}	mm	Axial displacement from central position
k_{φ}	–	Tilting factor ➤*832*|
φ	°	Tilting between inner ring and outer ring (misalignment ± shaft deflection).

Other influences such as differences in temperature between the inner ring and outer ring must also be taken into consideration.

Restriction of the axial displacement facility by the roller offset

The axial displacement facility is reduced here

Tilting causes axial displacement of the rollers from the central position. This means that the axial displacement facility of the bearing rings relative to each other is reduced by s_φ. The reduction in the axial displacement facility due to tilting can be calculated ➤*822*| *f 14*.

f 14
Reduction in the axial displacement facility

$$s_\varphi = k_\varphi \cdot \varphi$$

Legend

s_φ	mm	Reduction in axial displacement facility as a result of tilting
k_φ	–	Tilting factor ➤*832*|
φ	°	Tilting between inner ring and outer ring (misalignment ± shaft deflection).

When tilting occurs at the same time, this gives the maximum possible axial displacement facility ➤*822*| *f 15* and ➤*822*| *f 16*.

f 15
Maximum axial displacement facility

$$s_{red} = s_1 - s_\varphi$$

In the case of full complement bearings, there is an additional effect as follows:

f 16
Maximum axial displacement facility

$$s_{red} = s_2 - s_\varphi$$

Legend

s_{red}	mm	Maximum axial displacement facility under tilting
s_1	mm	Maximum axial displacement facility ➤*832*| in the case of full complement bearings in the opposing direction to the retaining ring
s_φ	mm	Reduction in axial displacement facility as a result of tilting
s_2	mm	Maximum axial displacement facility ➤*832*| in the case of full complement bearings in the direction of the retaining ring.

Restriction of axial displacement due to reduction in radial bearing clearance

Influences on the reduction of the bearing clearance

The bearing clearance is reduced in the following cases:

- axial displacement
- tilting of the bearing from the central position
- axial displacement and tilting of the bearing from the central position.

Depending on the necessary operating clearance, it must be checked whether the required axial displacement is possible under the tilting present.

The reduction in operating clearance is calculated in accordance with ➤*823*| *f1 17*.

f1 17
Reduction in radial bearing clearance

$$\Delta s = k_{\delta} \cdot \left(\delta_{ax} + k_{\varphi} \cdot \varphi\right)^2$$

Legend

Δs	µm	Reduction in radial bearing clearance
k_{δ}	–	Operating clearance factor ➤*832*|
δ_{ax}	mm	Axial displacement
k_{φ}	–	Tilting factor ➤*832*|
φ	°	Tilting between inner ring and outer ring (misalignment ± shaft deflection).

Calculation example

Bearing data

The toroidal roller bearing C3144-XL-K-C4 with a tapered bore is supplied with a radial internal clearance of 390 µm. The operating clearance in the central position is only 240 µm due to mounting.

k_{φ} = 13,67 ➤*832*|
φ = 0,2
s_1 = 22,3 ➤*832*|

Dryer roll application

In the dryer roll, the misalignment is 0,2° and the shaft also undergoes thermal elongation of 6,3 mm.

Questions:

- Is this displacement permissible in addition to the tilting?
- What is the change in the operating clearance?

f1 18
Reduction in the axial displacement facility

$$s_{\varphi} = k_{\varphi} \cdot \varphi$$

$$s_{\varphi} = 13{,}67 \cdot 0{,}2 \approx 2{,}73 \text{ mm}$$

Legend

s_{φ}	mm	Reduction in axial displacement facility as a result of tilting
k_{φ}	–	Tilting factor ➤*832*|
φ	°	Tilting between inner ring and outer ring (misalignment ± shaft deflection).

f19
Maximum axial displacement

$$s_{red} = s_1 - s_\varphi$$

$$s_{red} = 22{,}30\ \text{mm} - 2{,}73\ \text{mm} = 19{,}57\ \text{mm}$$

The axial displacement by 6,3 mm is in the permissible range of 19,57 mm in combination with tilting by 0,2°. The application must now be checked in relation to the reduction in operating clearance.

k_δ = 0,791 ➤*832*
δ_{ax} = 6,30 mm

f20
Resulting operating clearance

$$s_{res} = s_{ini} - k_\delta \cdot \left(\delta_{ax} + k_\varphi \cdot \varphi\right)^2$$

$$s_{res} = 240\ \mu\text{m} - 0{,}791 \cdot \left(6{,}3 + 2{,}73\right)^2 \approx 175\ \mu\text{m}$$

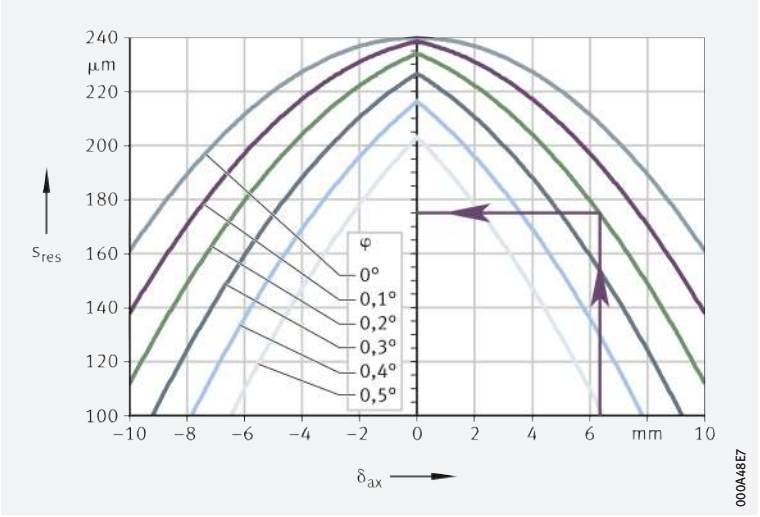
The resulting operating clearance after tilting and axial displacement is 175 µm.

The influence of the difference in temperature between the inner ring and outer ring must also be taken into consideration.

The axial displacement facility for the bearing C3144-XL-K-C4 is shown as an example ➤*824* 17. The actual internal clearance as a function of axial displacement is shown in relation to the bearing width.

17
Resulting operating clearance s_{res}, shown using the example of toroidal roller bearing C3144-XL-K-C4, as a function of tilting and axial displacement

s_{res} = *operating clearance*
δ_{ax} = *axial displacement*
φ = *tilting*



Suitable bearing housings for toroidal roller bearings

✎A large range of housings is available

For economical, operationally reliable and easily interchangeable bearing arrangement units, toroidal roller bearings can also be combined with Schaeffler bearing housings ➤*825*|*18*. These easy-to-fit units fulfil all of the requirements for modern machine and plant designs with favourable maintenance-related characteristics.

Due to the large number of application areas, an extensive range of bearing housings is available for bearings with cylindrical and tapered bores. These include split and unsplit plummer block housings, take-up housings, flanged housings and housings for specific industrial and railway applications. Detailed information on bearing housings can be found in publication GK 1 ➤*https://www.schaeffler.de/std/1D54*. This book can be ordered from Schaeffler.

18
Bearing housing with toroidal roller bearing

① *Toroidal roller bearing*
② *Bearing housing*

1.17 Mounting and dismounting

The mounting and dismounting options for toroidal roller bearings, by thermal, hydraulic or mechanical methods, must be taken into consideration in the design of the bearing position. The hydraulic method should be used in preference for the mounting and dismounting of larger bearings on a tapered journal and on adapter or withdrawal sleeves.
In cases where a bearing failure may result in a production stoppage and incur high costs, monitoring of rolling bearings is advisable.

Special tool extractor PULLER-SPECIAL-E

The extractor PULLER-SPECIAL-E is a special tool for the dismounting of spherical roller bearings and toroidal roller bearings. The dismounting tool has specially produced fingers that grip behind the end faces of the rollers. The extractor then presses on the shaft by means of a hydraulic cylinder and pulls the bearing out.

Ensure that the bearings are not damaged during mounting

Toroidal roller bearings are not separable. In the mounting of non-separable bearings, the mounting forces must always be applied to the bearing ring with a tight fit.

Mounting on a horizontally aligned shaft

During mounting of the bearings, the bearing rings can become axially displaced from the central position. For this reason, toroidal roller bearings should be mounted on horizontally aligned shafts and in appropriately aligned housing bores. In order that the bearing rings and roller set can achieve concentric alignment during mounting, the inner and outer ring should be rotated a couple of times on assembly.

If the intention is to mount the toroidal roller bearings on a vertically aligned shaft or in a vertically aligned housing bore, it should be noted that the outer and inner ring, complete with roller and cage assembly, will be displaced downwards. This will, in turn, have an effect on the internal clearance. If the user has no experience in the design of such bearing arrangements, please consult Schaeffler.

Mounting of bearings with a tapered bore

Suitable methods for checking the fit strength

Bearings with a tapered bore are mounted with a tight fit on the shaft or on the adapter or withdrawal sleeve. Proven methods for checking the strength of the fit involve measuring:

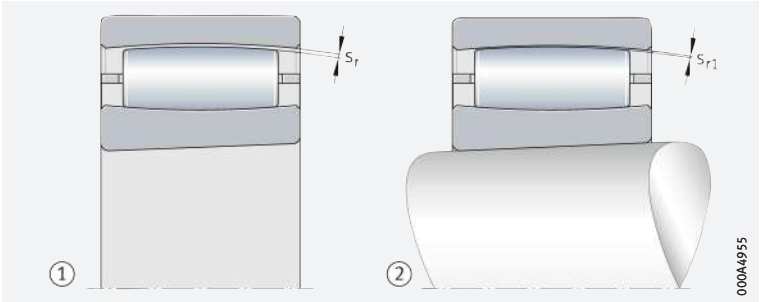
- the reduction in radial internal clearance
- the axial drive-up distance of the inner ring on the tapered bearing seat
- the tightening angle of the fixing nut.

Measuring the reduction in radial internal clearance

Measurement with a feeler gauge

The reduction in radial internal clearance is the difference between the radial internal clearance before mounting and the bearing clearance after mounting of the bearing ➤826| 19 and ➤828| 10. The radial internal clearance must be measured first. During pressing on, the radial clearance (bearing clearance) must be checked until the necessary reduction in the radial internal clearance and thus the required tight fit is achieved ➤828| 10.

19
Reduction in radial internal clearance



s_r = *radial internal clearance before mounting*
s_{r1} = *radial internal clearance after mounting*
$s_r - s_{r1}$ = *reduction in radial internal clearance*

① *Before mounting*
② *After mounting*

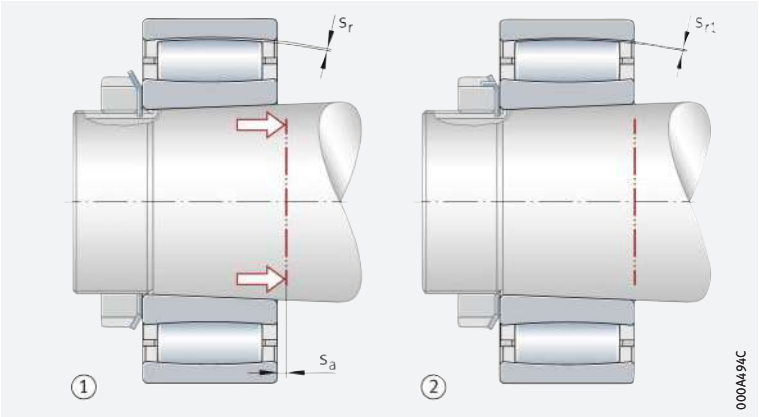
Measuring the axial drive-up distance

The axial drive-up distance can also be measured in place of the reduction in radial internal clearance ➤*383*|*14*.

20
Axial drive-up distance

s_a = *axial press-on distance (axial drive-up distance of the bearing)*
s_r = *radial internal clearance before pressing on*
s_{r1} = *radial internal clearance after pressing on*
$s_r - s_{r1}$ = *reduction in radial internal clearance*

① *Before pressing on*
② *After pressing on*



Example of calculation of the axial drive-up distance

Principal procedure

Toroidal roller bearing C2215-XL-K with adapter sleeve H2316:

- Radial internal clearance before mounting
  – 0,075 mm to 0,110 mm ➤*828*|*10*
- Reduction in radial internal clearance during mounting
  – 0,030 mm to 0,046 mm ➤*828*|*10*
- Control value for radial internal clearance after mounting
  – 0,045 mm ➤*829*|*10*
- Axial drive-up distance, taper angle 1:12
  – 0,55 mm to 0,61 mm ➤*829*|*10*.

The malfunction-free operation of toroidal roller bearings presupposes that these have been mounted correctly. An insufficient operating clearance or inadequately tight fit on the shaft generally leads to bearing damage.

If there is any uncertainty regarding the practical application of the methods, Schaeffler must always be consulted.

Guide values for the reduction in radial internal clearance

Reduced radial internal clearance in mounting

When bearings with a tapered bore are mounted, there is a reduction in the radial internal clearance. Adherence to the indicated values ensures that the bearings or sleeve are securely seated on the shaft and prevents the inner ring from creeping on the shaft ➤*828*|▦ *10*. The setting should not, however, be equated to the later appropriate operating clearance.

▦ **10**
Reduction in radial internal clearance in mounting of toroidal roller bearings with tapered bore

Nominal bore diameter d mm		Radial internal clearance before mounting in accordance with DIN 620-4:2004 (ISO 5753-1:2009)						Reduction in radial internal clearance during mounting[1]	
		CN (Group N) mm		C3 (Group 3) mm		C4 (Group 4) mm			
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.
24	**30**	0,035	0,055	0,050	0,065	0,065	0,085	0,010	0,017
30	**40**	0,045	0,065	0,060	0,080	0,080	0,100	0,014	0,021
40	**50**	0,050	0,075	0,070	0,095	0,090	0,120	0,018	0,028
50	**65**	0,060	0,090	0,085	0,115	0,110	0,150	0,024	0,035
65	**80**	0,075	0,110	0,105	0,140	0,135	0,180	0,030	0,046
80	**100**	0,095	0,135	0,130	0,175	0,170	0,220	0,040	0,056
100	**120**	0,115	0,155	0,155	0,205	0,200	0,255	0,049	0,069
120	**140**	0,135	0,180	0,180	0,235	0,230	0,295	0,060	0,083
140	**160**	0,155	0,215	0,210	0,270	0,265	0,340	0,072	0,095
160	**180**	0,170	0,240	0,235	0,305	0,300	0,385	0,081	0,107
180	**200**	0,190	0,260	0,260	0,330	0,325	0,420	0,090	0,121
200	**225**	0,210	0,290	0,285	0,365	0,360	0,460	0,101	0,134
225	**250**	0,235	0,315	0,315	0,405	0,400	0,515	0,113	0,151
250	**280**	0,255	0,345	0,340	0,445	0,440	0,560	0,126	0,168
280	**315**	0,280	0,380	0,375	0,485	0,480	0,620	0,142	0,188
315	**355**	0,315	0,420	0,415	0,545	0,540	0,680	0,160	0,211
355	**400**	0,350	0,475	0,470	0,600	0,595	0,755	0,180	0,238
400	**450**	0,380	0,525	0,525	0,655	0,650	0,835	0,203	0,268
450	**500**	0,435	0,575	0,575	0,735	0,730	0,915	0,225	0,300
500	**560**	0,470	0,640	0,630	0,810	0,800	1,010	0,250	0,335
560	**630**	0,530	0,710	0,700	0,890	0,880	1,110	0,285	0,375
630	**710**	0,590	0,780	0,770	0,990	0,980	1,230	0,320	0,420
710	**800**	0,670	0,860	0,860	1,100	1,100	1,380	0,360	0,475
800	**900**	0,730	0,960	0,950	1,220	1,210	1,530	0,405	0,535
900	**1 000**	0,810	1,040	1,040	1,340	1,340	1,670	0,450	0,605
1 000	**1 120**	0,890	1,170	1,160	1,500	1,490	1,880	0,505	0,670
1 120	**1 250**	0,970	1,280	1,270	1,640	1,630	2,060	0,565	0,750
1 250	**1 400**	1,080	1,410	1,410	1,790	1,780	2,250	0,630	0,840
1 400	**1 600**	1,200	1,550	1,550	1,990	1,990	2,500	0,720	0,940
1 600	**1 800**	1,320	1,690	1,690	2,180	2,180	2,730	0,810	1,070

continued ▼

[1] *Valid only for solid steel shafts and hollow shafts with a bore no larger than half the shaft diameter. The following applies: bearings with a radial internal clearance before mounting in the upper half of the tolerance range are mounted using the larger value for the reduction in radial internal clearance or the axial drive-up distance, while bearings in the lower half of the tolerance range are mounted using the smaller value for the reduction in radial internal clearance or the axial drive-up distance.*

10
Axial drive-up distance of the inner ring in mounting of toroidal roller bearings with tapered bore

Nominal bore diameter d		Drive-up distance on taper 1:12[1] Shaft		Drive-up distance on taper 1:30[1] Shaft		Minimum radial internal clearance required after mounting, control value with		
						CN (Group N)	C3 (Group 3)	C4 (Group 4)
mm		mm		mm		mm	mm	mm
over	incl.	min.	max.	min.	max.	min.	min.	min.
24	**30**	0,24	0,29	0,61	0,72	0,025	0,035	0,048
30	**40**	0,30	0,34	0,76	0,84	0,031	0,041	0,059
40	**50**	0,37	0,42	0,91	1,04	0,033	0,046	0,062
50	**65**	0,46	0,50	1,14	1,24	0,036	0,054	0,075
65	**80**	0,55	0,61	1,37	1,53	0,045	0,065	0,090
80	**100**	0,67	0,73	1,68	1,83	0,056	0,080	0,114
100	**120**	0,79	0,89	1,98	2,23	0,066	0,093	0,131
120	**140**	0,91	1,05	2,29	2,62	0,075	0,105	0,147
140	**160**	1,04	1,21	2,59	3,02	0,083	0,123	0,170
160	**180**	1,16	1,36	2,90	3,41	0,089	0,137	0,193
180	**200**	1,28	1,52	3,20	3,81	0,100	0,150	0,204
200	**225**	1,43	1,68	3,58	4,20	0,109	0,162	0,226
225	**250**	1,59	1,88	3,96	4,69	0,123	0,177	0,249
250	**280**	1,77	2,08	4,42	5,19	0,129	0,186	0,273
280	**315**	1,98	2,31	4,95	5,78	0,138	0,203	0,292
315	**355**	2,23	2,59	5,56	6,47	0,155	0,221	0,329
355	**400**	2,50	2,90	6,25	7,26	0,170	0,251	0,357
400	**450**	2,81	3,26	7,01	8,15	0,178	0,279	0,382
450	**500**	3,11	3,66	7,78	9,14	0,210	0,300	0,430
500	**560**	3,48	4,05	8,69	10,13	0,220	0,325	0,465
560	**630**	3,90	4,52	9,76	11,31	0,245	0,355	0,505
630	**710**	4,39	5,08	10,98	12,69	0,270	0,380	0,560
710	**800**	4,94	5,71	12,35	14,27	0,310	0,425	0,625
800	**900**	5,55	6,42	13,88	16,05	0,325	0,460	0,675
900	**1 000**	6,16	7,21	15,40	18,03	0,360	0,490	0,735
1 000	**1 120**	6,89	8,00	17,23	20,00	0,385	0,545	0,820
1 120	**1 250**	7,69	8,95	19,21	22,37	0,410	0,580	0,880
1 250	**1 400**	8,60	9,98	21,50	24,94	0,450	0,640	0,940
1 400	**1 600**	9,82	11,16	24,55	27,90	0,480	0,685	1,050
1 600	**1 800**	11,04	12,74	27,60	31,85	0,510	0,705	1,110

continued ▲

1) *Valid only for solid steel shafts and hollow shafts with a bore no larger than half the shaft diameter. The following applies: bearings with a radial internal clearance before mounting in the upper half of the tolerance range are mounted using the larger value for the reduction in radial internal clearance or the axial drive-up distance, while bearings in the lower half of the tolerance range are mounted using the smaller value for the reduction in radial internal clearance or the axial drive-up distance.*

Schaeffler Mounting Handbook

Rolling bearings must be handled with great care

Rolling bearings are well-proven precision machine elements for the design of economical and reliable bearing arrangements, which offer high operational security. In order that these products can function correctly and achieve the envisaged operating life without detrimental effect, they must be handled with care.

The Schaeffler Mounting Handbook MH 1 gives comprehensive information about the correct storage, mounting, dismounting and maintenance of rotary rolling bearings ➤ *https://www.schaeffler.de/std/1D53*. It also provides information which should be observed by the designer, in relation to the mounting, dismounting and maintenance of bearings, in the original design of the bearing position. This book is available from Schaeffler on request.

1.18 Legal notice regarding data freshness

The further development of products may also result in technical changes to catalogue products

Of central interest to Schaeffler is the further development and optimisation of its products and the satisfaction of its customers. In order that you, as the customer, can keep yourself optimally informed about the progress that is being made here and with regard to the current technical status of the products, we publish any product changes which differ from the printed version in our electronic product catalogue.

We therefore reserve the right to make changes to the data and illustrations in this catalogue. This catalogue reflects the status at the time of printing. More recent publications released by us (as printed or digital media) will automatically precede this catalogue if they involve the same subject. Therefore, please always use our electronic product catalogue to check whether more up-to-date information or modification notices exist for your desired product.

Link to electronic product catalogue

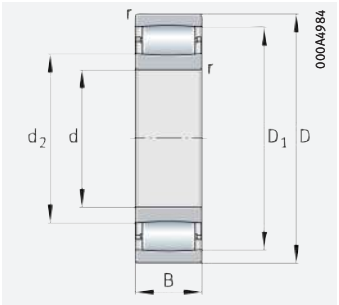
The following link will take you to the Schaeffler electronic product catalogue: ➤ *https://medias.schaeffler.com*.

1.19 Further information

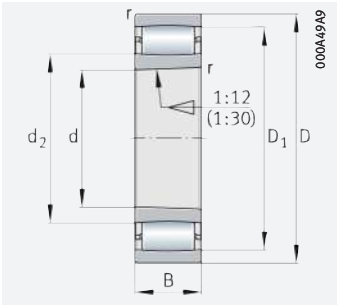
In addition to the data in this chapter, the following chapters in Technical principles must also be observed in the design of bearing arrangements:

- Determining the bearing size ➤*34*
- Rigidity ➤*54*
- Friction and increases in temperature ➤*56*
- Speeds ➤*64*
- Bearing data ➤*97*
- Lubrication ➤*70*
- Sealing ➤*182*
- Design of bearing arrangements ➤*139*
- Mounting and dismounting ➤*191*.

Toroidal roller bearings



Cylindrical bore



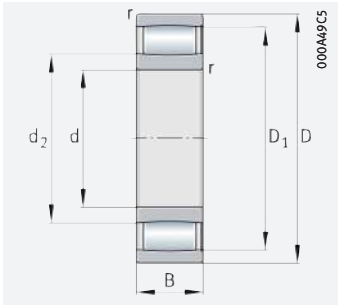
Tapered bore

d = 60 – 85 mm

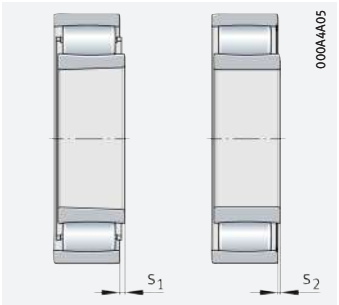
Main dimensions			Basic load ratings		Fatigue limit load	Limiting speed	Speed rating	Mass	Designation ➤*809 | 1.12* ➤*809 | 1.13* X-life ➤*804*
d	D	B	dyn. C_r	stat. C_{0r}	C_{ur}	n_G	$n_{\vartheta r}$	m	
			N	N	N	min^{-1}	min^{-1}	≈ kg	
60	110	28	171 000	195 000	32 500	2 650	–	1,12	**C2212-XL-K-V**
	110	28	171 000	195 000	32 500	2 650	–	1,15	**C2212-XL-V**
65	100	35	197 000	285 000	33 500	3 050	–	0,95	**C4013-XL-K30-V**
	100	35	197 000	285 000	33 500	3 050	–	0,98	**C4013-XL-V**
	120	31	208 000	216 000	36 000	2 340	–	1,48	**C2213-XL-K-V**
	120	31	208 000	216 000	36 000	2 340	–	1,52	**C2213-XL-V**
70	125	31	215 000	229 000	38 000	2 180	–	1,56	**C2214-XL-K-V**
	125	31	215 000	229 000	38 000	2 180	–	1,6	**C2214-XL-V**
	150	51	405 000	440 000	52 000	6 000	3 200	4,33	**C2314-XL**
	150	51	405 000	440 000	52 000	6 000	3 200	4,22	**C2314-XL-K**
75	115	40	209 000	355 000	39 500	2 470	–	1	**C4015-XL-K30-V**
	115	40	209 000	355 000	39 500	2 470	–	1,47	**C4015-XL-V**
	130	31	197 000	207 000	33 000	7 000	3 250	1,69	**C2215-XL**
	130	31	197 000	207 000	33 000	7 000	3 250	1,64	**C2215-XL-K**
	130	31	221 000	241 000	38 500	2 050	–	1,64	**C2215-XL-K-V**
	130	31	221 000	241 000	38 500	2 050	–	1,69	**C2215-XL-V**
	160	55	430 000	470 000	56 000	5 600	3 200	5,3	**C2315-XL**
	160	55	430 000	470 000	56 000	5 600	3 200	5,16	**C2315-XL-K**
80	140	33	224 000	250 000	41 000	6 300	2 900	2,1	**C2216-XL**
	140	33	224 000	250 000	41 000	6 300	2 900	2,05	**C2216-XL-K**
	140	33	260 000	305 000	49 500	1 790	–	2,05	**C2216-XL-K-V**
	140	33	260 000	305 000	49 500	1 790	–	2,1	**C2216-XL-V**
	170	58	510 000	550 000	62 000	5 100	3 050	6,3	**C2316-XL**
	170	58	510 000	550 000	62 000	5 100	3 050	6,1	**C2316-XL-K**
85	150	36	315 000	395 000	59 000	1 640	–	2,65	**C2217-XL-V**
	150	36	315 000	395 000	59 000	1 640	–	2,58	**C2217-XL-K-V**
	150	36	275 000	330 000	49 000	5 900	2 750	2,65	**C2217-XL**
	150	36	275 000	330 000	49 000	5 900	2 750	2,58	**C2217-XL-K**
	180	60	550 000	610 000	68 000	4 800	2 850	7,29	**C2317-XL**
	180	60	550 000	610 000	68 000	4 800	2 850	7,1	**C2317-XL-K**

medias ➤ *https://www.schaeffler.de/std/1E75*

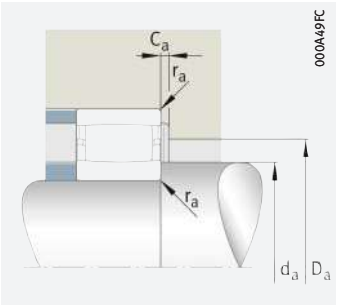
Before ordering, availability for delivery must be checked.



Full complement



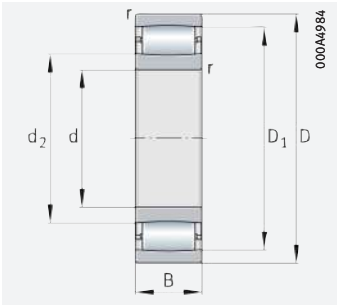
Axial displacement distance



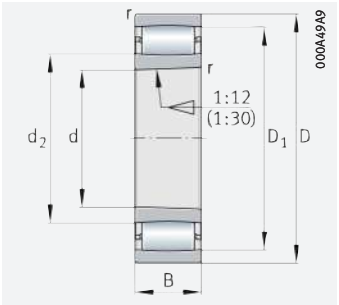
Mounting dimensions

Dimensions						Mounting dimensions						Calculation factors	
d	r	D_1	d_2	s_1	s_2	D_a		d_a		C_a	r_a	k_φ	k_δ
	min.	≈	≈			max.	min.	max.	min.	min.	max.		
60	1,5	98,1	77,1	8,5	5,3	101	–	85	69	–	1,5	3,116	3,713
	1,5	98,1	77,1	8,5	5,3	101	–	85	69	–	1,5	3,116	3,713
65	1,1	88,6	74,7	6	2,8	94	–	82	71	–	1	3,543	3,082
	1,1	88,6	74,7	6	2,8	94	–	82	71	–	1	3,543	3,082
	1,5	106,1	78,9	9,6	5,3	111	–	97	74	–	1,5	3,298	3,505
	1,5	106,1	78,9	9,6	5,3	111	–	97	74	–	1,5	3,298	3,505
70	1,5	111,1	83,6	9,6	5,3	116	–	97	79	–	1,5	3,523	3,265
	1,5	111,1	83,6	9,6	5,3	116	–	97	79	–	1,5	3,523	3,265
	2,1	130,9	92,5	9,1	–	138	121	105	82	1,6	2	5,477	1,941
	2,1	130,9	92,5	9,1	–	138	121	105	82	1,6	2	5,477	1,941
75	1,1	100,2	89,5	9,4	5,1	109	–	97	81	–	1	3,893	2,845
	1,1	100,2	89,5	9,4	5,1	109	–	97	81	–	1	3,893	2,845
	1,5	115,4	88	9,6	–	121	110	96	84	1,11	1,5	3,56	3,268
	1,5	115,4	88	9,6	–	121	110	96	84	1,11	1,5	3,56	3,268
	1,5	115,4	88	9,6	5,3	121	–	102	84	–	1,5	3,56	3,268
	1,5	115,4	88	9,6	5,3	121	–	102	84	–	1,5	3,56	3,268
	2,1	136,5	99	13,1	–	148	127	111	87	1,5	2	5,53	1,941
	2,1	136,5	99	13,1	–	148	127	111	87	1,5	2	5,53	1,941
80	2	125,5	98,2	9,1	–	129	120	106	91	1,1	2	3,889	2,997
	2	125,5	98,2	9,1	–	129	120	106	91	1,1	2	3,889	2,997
	2	125,5	98,2	9,1	4,8	129	–	116	91	–	2	3,889	2,997
	2	125,5	98,2	9,1	4,8	129	–	116	91	–	2	3,889	2,997
	2,1	145,5	103,5	10,1	–	158	135	117	92	1,7	2	6,094	1,745
	2,1	145,5	103,5	10,1	–	158	135	117	92	1,7	2	6,094	1,745
85	2	132,2	104,8	7,1	1,7	139	–	117	96	–	2	4,194	2,763
	2	132,2	104,8	7,1	1,7	139	–	117	96	–	2	4,194	2,763
	2	132,2	104,8	7,1	–	139	126	113	96	1,1	2	4,194	2,763
	2	132,2	104,8	7,1	–	139	126	113	96	1,1	2	4,194	2,763
	3	153,9	111,1	12,1	–	166	143	125	99	1,72	2,5	6,144	1,752
	3	153,9	111,1	12,1	–	166	143	125	99	1,72	2,5	6,144	1,752

Toroidal roller bearings



Cylindrical bore



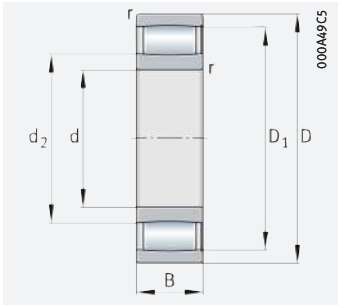
Tapered bore

d = 90 – 110 mm

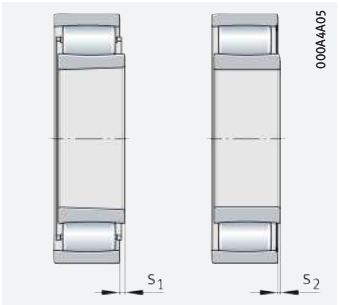
Main dimensions			Basic load ratings		Fatigue limit load	Limiting speed	Speed rating	Mass	Designation ➤809|1.12 ➤809|1.13 X-life ➤804
d	D	B	dyn. C_r	stat. C_{0r}	C_{ur}	n_G	$n_{\vartheta r}$	m	
			N	N	N	min^{-1}	min^{-1}	≈ kg	
90	160	40	330 000	380 000	55 000	5 300	2 650	3,29	**C2218-XL-K**
	160	40	330 000	380 000	55 000	5 300	2 650	3,38	**C2218-XL**
	190	64	650 000	740 000	77 000	4 350	2 500	8,4	**C2318-XL-K**
	190	64	650 000	740 000	77 000	4 350	2 500	8,65	**C2318-XL**
95	170	43	370 000	405 000	61 000	5 000	2 750	4,01	**C2219-XL-K**
	170	43	370 000	405 000	61 000	5 000	2 750	4,12	**C2219-XL**
	200	67	660 000	750 000	78 000	4 350	2 600	9,75	**C2319-XL-K**
	200	67	660 000	750 000	78 000	4 350	2 600	10	**C2319-XL**
100	150	50	355 000	530 000	66 000	1 580	–	2,94	**C4020-XL-K30-V**
	150	50	355 000	530 000	66 000	1 580	–	3,02	**C4020-XL-V**
	165	52	490 000	660 000	86 000	1 330	–	4,21	**C3120-XL-K-V**
	165	52	490 000	660 000	86 000	1 330	–	4,32	**C3120-XL-V**
	165	65	530 000	730 000	83 000	1 350	–	5,26	**C4120-XL-K30-V**
	165	65	530 000	730 000	83 000	1 350	–	5,4	**C4120-XL-V**
	180	46	420 000	470 000	68 000	4 700	2 700	4,97	**C2220-XL**
	180	46	420 000	470 000	68 000	4 700	2 700	4,84	**C2220-XL-K**
	215	73	820 000	920 000	97 000	3 850	2 290	12,4	**C2320-XL-K**
	215	73	820 000	920 000	97 000	3 850	2 290	12,8	**C2320-XL**
110	170	45	360 000	480 000	63 000	4 800	2 480	3,65	**C3022-XL**
	170	45	360 000	480 000	63 000	4 800	2 480	3,55	**C3022-XL-K**
	170	60	510 000	800 000	89 000	1 320	–	4,86	**C4022-XL-V**
	170	60	510 000	800 000	89 000	1 320	–	4,74	**C4022-XL-K30-V**
	180	69	680 000	1 000 000	104 000	1 160	–	6,58	**C4122-XL-K30-V**
	180	69	680 000	1 000 000	104 000	1 160	–	6,76	**C4122-XL-V**
	200	53	550 000	650 000	89 000	4 050	2 330	6,95	**C2222-XL-K**
	200	53	550 000	650 000	89 000	4 050	2 330	7,14	**C2222-XL**

medias ➤ *https://www.schaeffler.de/std/1E76*

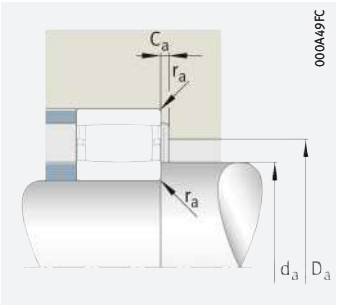
Before ordering, availability for delivery must be checked.



Full complement



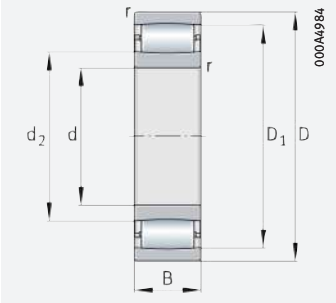
Axial displacement distance



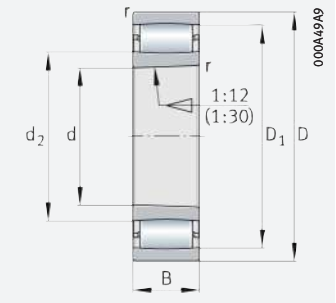
Mounting dimensions

Dimensions						Mounting dimensions						Calculation factors	
d	r	D_1	d_2	s_1	s_2	D_a		d_a		C_a	r_a	k_φ	k_δ
	min.	≈	≈			max.	min.	max.	min.	min.	max.		
90	2	143,9	112,1	9,5	–	149	137	122	101	1,3	2	4,103	2,924
	2	143,9	112,1	9,5	–	149	137	122	101	1,3	2	4,103	2,924
	3	167,4	119,6	9,6	–	176	154	136	104	1,9	2,5	6,754	1,589
	3	167,4	119,6	9,6	–	176	154	136	104	1,9	2,5	6,754	1,589
95	2,1	149,7	112,3	10,5	–	158	140	125	107	1,5	2	4,75	2,42
	2,1	149,7	112,3	10,5	–	158	140	125	107	1,5	2	4,75	2,42
	3	167,6	120,4	12,6	–	186	155	137	109	1,9	2,5	6,758	1,589
	3	167,6	120,4	12,6	–	186	155	137	109	1,9	2,5	6,758	1,589
100	1,5	133,6	113,6	14	9,7	141	–	125	109	–	1,5	4,766	2,365
	1,5	133,6	113,6	14	9,7	141	–	125	109	–	1,5	4,766	2,365
	2	150,7	119,7	10	4,7	154	–	132	111	–	2	6,699	1,582
	2	150,7	119,7	10	4,7	154	–	132	111	–	2	6,699	1,582
	2	147,4	120,6	17,7	5,2	154	–	132	111	–	2	5,69	1,929
	2	147,4	120,6	17,7	5,2	154	–	132	111	–	2	5,69	1,929
	2,1	156,9	118,1	10,1	–	168	147	131	112	1,6	2	4,849	2,393
	2,1	156,9	118,1	10,1	–	168	147	131	112	1,6	2	4,849	2,393
	3	184	129	11,2	–	201	169	148	114	2,2	2,5	8,026	1,312
	3	184	129	11,2	–	201	169	148	114	2,2	2,5	8,026	1,312
110	2	156,2	127,8	9,5	–	161	151	136	119	1,8	2	5,707	1,954
	2	156,2	127,8	9,5	–	161	151	136	119	1,8	2	5,707	1,954
	2	151,2	127,2	12	6,6	160	–	140	120	–	2	6,296	1,717
	2	151,2	127,2	12	6,6	160	–	140	120	–	2	6,296	1,717
	2	163	132,7	11,4	4,6	170	–	145	120	–	2	6,99	1,529
	2	163	132,7	11,4	4,6	170	–	145	120	–	2	6,99	1,529
	2,1	178,5	135,9	11,1	–	188	168	150	122	2	2	5,866	1,941
	2,1	178,5	135,9	11,1	–	188	168	150	122	2	2	5,866	1,941

Toroidal roller bearings



Cylindrical bore



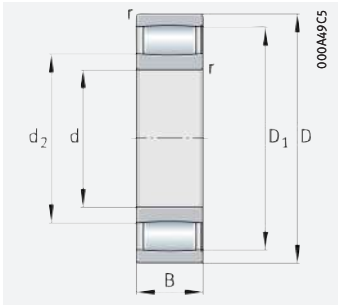
Tapered bore

d = 120 – 140 mm

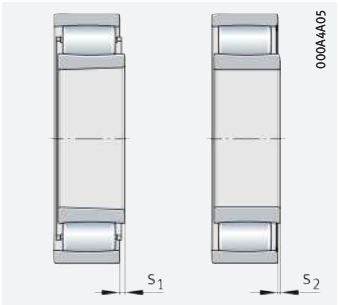
Main dimensions			Basic load ratings		Fatigue limit load	Limiting speed	Speed rating	Mass	Designation ➤*809 | 1.12* ➤*809 | 1.13* X-life ➤*804*
d	D	B	dyn. C_r	stat. C_{0r}	C_{ur}	n_G	$n_{\vartheta r}$	m	
			N	N	N	min^{-1}	min^{-1}	≈ kg	
120	180	46	435 000	630 000	81 000	1 140	–	4	**C3024-XL-V**
	180	46	435 000	630 000	81 000	1 140	–	3,88	**C3024-XL-K-V**
	180	46	390 000	550 000	70 000	4 450	2 290	4	**C3024-XL**
	180	46	390 000	550 000	70 000	4 450	2 290	3,89	**C3024-XL-K**
	180	60	550 000	890 000	99 000	1 120	–	5,08	**C4024-XL-K30-V**
	180	60	550 000	890 000	99 000	1 120	–	5,2	**C4024-XL-V**
	200	80	780 000	1 140 000	124 000	1 030	–	9,63	**C4124-XL-K30-V**
	200	80	780 000	1 140 000	124 000	1 030	–	9,88	**C4124-XL-V**
	215	58	630 000	740 000	101 000	3 700	2 200	8,91	**C2224-XL**
	215	58	630 000	740 000	101 000	3 700	2 200	8,68	**C2224-XL-K**
	215	76	760 000	1 000 000	92 000	3 700	1 960	11,3	**C3224-XL-K**
	215	76	760 000	1 000 000	92 000	3 700	1 960	11,7	**C3224-XL**
130	200	52	405 000	600 000	74 000	4 000	2 210	5,63	**C3026-XL-K**
	200	52	405 000	600 000	74 000	4 000	2 210	5,8	**C3026-XL**
	200	69	730 000	1 130 000	119 000	990	–	7,49	**C4026-XL-K30-V**
	200	69	730 000	1 130 000	119 000	990	–	7,69	**C4026-XL-V**
	210	80	840 000	1 240 000	129 000	910	–	10,2	**C4126-XL-K30-V**
	210	80	840 000	1 240 000	129 000	910	–	10,5	**C4126-XL-V**
	230	64	760 000	970 000	119 000	3 550	2 040	11,1	**C2226-XL**
	230	64	760 000	970 000	119 000	3 550	2 040	10,8	**C2226-XL-K**
	280	93	1 040 000	1 270 000	135 000	2 800	1 710	27,6	**C2326-XL**
	280	93	1 040 000	1 270 000	135 000	2 800	1 710	26,9	**C2326-XL-K**
140	210	53	495 000	730 000	88 000	3 650	1 940	6,1	**C3028-XL-K**
	210	53	495 000	730 000	88 000	3 650	1 940	6,27	**C3028-XL**
	210	69	760 000	1 220 000	126 000	890	–	8,16	**C4028-XL-V**
	210	69	760 000	1 220 000	126 000	890	–	7,95	**C4028-XL-K30-V**
	225	85	1 020 000	1 590 000	157 000	810	–	12,4	**C4128-XL-K30-V**
	225	85	1 020 000	1 590 000	157 000	810	–	12,7	**C4128-XL-V**
	250	68	830 000	1 080 000	126 000	3 050	1 750	14,1	**C2228-XL**
	250	68	830 000	1 080 000	126 000	3 050	1 750	13,7	**C2228-XL-K**

medias ➤ *https://www.schaeffler.de/std/1E77*

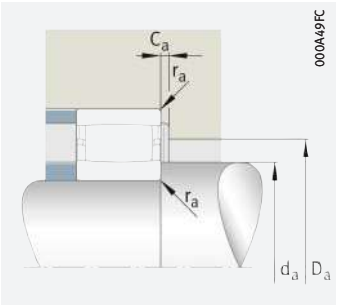
Before ordering, availability for delivery must be checked.



Full complement



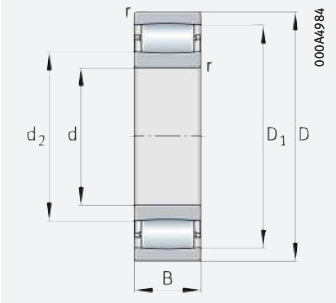
Axial displacement distance



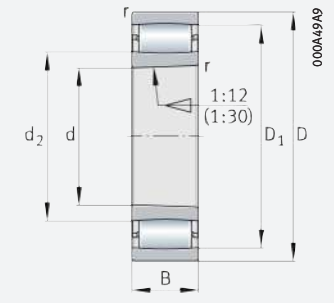
Mounting dimensions

Dimensions						Mounting dimensions						Calculation factors	
d	r	D_1	d_2	s_1	s_2	D_a		d_a		C_a	r_a	k_φ	k_δ
	min.	≈	≈			max.	min.	max.	min.	min.	max.		
120	2	166	138	10,6	3,8	171	–	150	129	–	2	6,176	1,799
	2	166	138	10,6	3,8	171	–	150	129	–	2	6,176	1,799
	2	165,5	137,9	10,6	–	171	161	150	129	1,7	2	6,176	1,799
	2	165,5	137,9	10,6	–	171	161	150	129	1,7	2	6,176	1,799
	2	165,6	141,6	12	5,2	171	–	150	129	–	2	6,421	1,717
	2	165,6	141,6	12	5,2	171	–	150	129	–	2	6,421	1,717
	2	174	142	18	11,2	189	–	160	131	–	2	7,458	1,435
	2	174	142	18	11,2	189	–	160	131	–	2	7,458	1,435
	2,1	190,2	144,8	13	–	203	178	160	132	1,9	2	6,372	1,778
	2,1	190,2	144,8	13	–	203	178	160	132	1,9	2	6,372	1,778
	2,1	190	149	17,1	–	203	180	162	132	1,5	2	7,65	1,423
	2,1	190	149	17,1	–	203	180	162	132	1,5	2	7,65	1,423
130	2	179,9	154,1	16,5	–	191	176	161	139	0,8	2	6,777	1,641
	2	179,9	154,1	16,5	–	191	176	161	139	0,8	2	6,777	1,641
	2	179,8	150,2	11,4	4,6	191	–	165	139	–	2	7,137	1,531
	2	179,8	150,2	11,4	4,6	191	–	165	139	–	2	7,137	1,531
	2	188,4	154,6	18	9,7	199	–	170	141	–	2	7,568	1,437
	2	188,4	154,6	18	9,7	199	–	170	141	–	2	7,568	1,437
	3	199,3	151,7	9,6	–	216	188	167	144	2	2,5	6,983	1,602
	3	199,3	151,7	9,6	–	216	188	167	144	2	2,5	6,983	1,602
	4	236	179	31,2	–	263	–	205	147	2,12	3	9,001	1,216
	4	236	179	31,2	–	263	–	205	147	2,12	3	9,001	1,216
140	2	193,9	163,1	11	–	201	188	172	149	1	2	7,08	1,581
	2	193,9	163,1	11	–	201	188	172	149	1	2	7,08	1,581
	2	191,1	161,5	11,4	5,9	201	–	175	149	–	2	7,235	1,531
	2	191,1	161,5	11,4	5,9	201	–	175	149	–	2	7,235	1,531
	2,1	203,2	166,8	12	5,2	214	–	182	151	–	2	9,241	1,144
	2,1	203,2	166,8	12	5,2	214	–	182	151	–	2	9,241	1,144
	3	221,4	174,6	13,7	–	236	210	190	154	1,9	2,5	7,191	1,598
	3	221,4	174,6	13,7	–	236	210	190	154	1,9	2,5	7,191	1,598

Toroidal roller bearings



Cylindrical bore



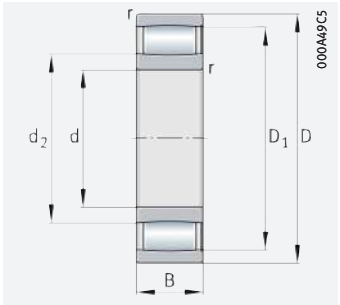
Tapered bore

d = 150 – 170 mm

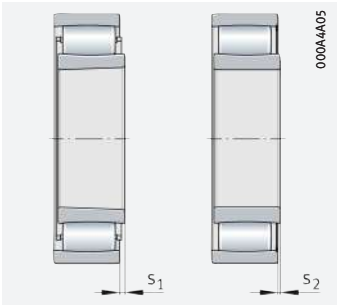
Main dimensions			Basic load ratings		Fatigue limit load	Limiting speed	Speed rating	Mass	Designation ➤809|1.12 ➤809|1.13 X-life ➤804
d	D	B	dyn. C_r	stat. C_{0r}	C_{ur}	n_G	$n_{\vartheta r}$	m	
			N	N	N	min^{-1}	min^{-1}	≈ kg	
150	225	56	600 000	960 000	114 000	810	–	7,6	**C3030-XL-V**
	225	56	540 000	850 000	101 000	3 400	1 790	7,4	**C3030-XL-K-M1B**
	225	56	600 000	960 000	114 000	810	–	7,4	**C3030-XL-K-V**
	225	56	540 000	850 000	101 000	3 400	1 790	7,6	**C3030-XL-M1B**
	225	75	780 000	1 320 000	132 000	810	–	9,91	**C4030-XL-K30-V**
	225	75	780 000	1 320 000	132 000	810	–	10,2	**C4030-XL-V**
	250	80	920 000	1 310 000	139 000	3 000	1 610	15	**C3130-XL-K**
	250	80	920 000	1 310 000	139 000	3 000	1 610	15,4	**C3130-XL**
	250	100	1 240 000	1 880 000	186 000	710	–	18,8	**C4130-XL-K30-V**
	250	100	1 240 000	1 880 000	186 000	710	–	19,3	**C4130-XL-V**
	270	73	1 010 000	1 240 000	152 000	2 850	1 680	17,8	**C2230-XL**
	270	73	1 010 000	1 240 000	152 000	2 850	1 680	17,3	**C2230-XL-K**
160	240	60	610 000	980 000	116 000	3 150	1 640	9,26	**C3032-XL**
	240	60	610 000	980 000	116 000	3 150	1 640	9	**C3032-XL-K**
	240	80	910 000	1 470 000	158 000	740	–	12	**C4032-XL-K30-V**
	240	80	910 000	1 470 000	158 000	740	–	12,4	**C4032-XL-V**
	270	86	1 010 000	1 410 000	147 000	2 800	1 550	19,1	**C3132-XL-K-M1B**
	270	86	1 010 000	1 410 000	147 000	2 800	1 550	19,6	**C3132-XL-M1B**
	270	109	1 470 000	2 200 000	211 000	630	–	24,2	**C4132-XL-K30-V**
	270	109	1 470 000	2 200 000	211 000	630	–	24,9	**C4132-XL-V**
	290	104	1 440 000	1 870 000	224 000	2 550	1 340	29,4	**C3232-XL**
	290	104	1 440 000	1 870 000	224 000	2 550	1 340	28,5	**C3232-XL-K**
170	260	67	770 000	1 200 000	114 000	2 850	1 480	12,5	**C3034-XL**
	260	67	770 000	1 200 000	114 000	2 850	1 480	12,2	**C3034-XL-K**
	260	90	1 140 000	1 880 000	187 000	650	–	16,4	**C4034-XL-K30-V**
	260	90	1 140 000	1 880 000	187 000	650	–	16,8	**C4034-XL-V**
	280	88	1 060 000	1 490 000	154 000	2 650	1 470	20,5	**C3134-XL-K**
	280	88	1 060 000	1 490 000	154 000	2 650	1 470	21	**C3134-XL**
	280	109	1 540 000	2 310 000	223 000	580	–	25,4	**C4134-XL-K30-V**
	280	109	1 540 000	2 310 000	223 000	580	–	26	**C4134-XL-V**
	310	86	1 310 000	1 630 000	202 000	2 340	1 390	27,9	**C2234-XL**
	310	86	1 310 000	1 630 000	202 000	2 340	1 390	27,1	**C2234-XL-K**

medias ➤ *https://www.schaeffler.de/std/1E78*

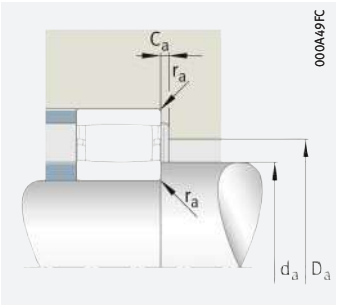
Before ordering, availability for delivery must be checked.



Full complement



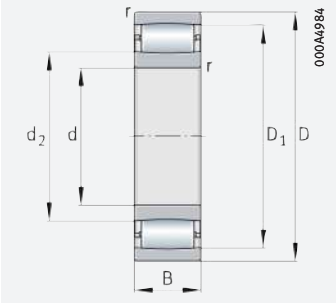
Axial displacement distance



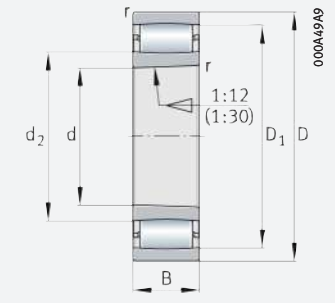
Mounting dimensions

Dimensions						Mounting dimensions						Calculation factors	
d	r	D_1	d_2	s_1	s_2	D_a		d_a		C_a	r_a	k_φ	k_δ
	min.	≈	≈			max.	min.	max.	min.	min.	max.		
150	2,1	204,1	173,9	14,1	7,3	214	–	187	161	–	2	7,535	1,483
	2,1	204,1	173,9	8,7	–	214	199	172,2	161	1,16	2	7,535	1,483
	2,1	204,1	173,9	14,1	7,3	214	–	187	161	–	2	7,535	1,483
	2,1	204,1	173,9	8,7	–	214	199	172,2	161	1,16	2	7,535	1,483
	2,1	202,2	173,8	17,4	10,6	214	–	187	161	–	2	7,338	1,531
	2,1	202,2	173,8	17,4	10,6	214	–	187	161	–	2	7,338	1,531
	2,1	225,5	182,5	13,9	–	238	215	197	162	0,9	2	9,371	1,15
	2,1	225,5	182,5	13,9	–	238	215	197	162	0,9	2	9,371	1,15
	2,1	221,5	179,5	20	10,1	228	–	200	162	–	2	10,222	1,03
	2,1	221,5	179,5	20	10,1	228	–	200	162	–	2	10,222	1,03
	3	235,8	177,2	11,2	–	256	220	197	164	2,4	2,5	8,45	1,313
	3	235,8	177,2	11,2	–	256	220	197	164	2,4	2,5	8,45	1,313
160	2,1	218,1	186,9	15	–	229	212	196	171	0,8	2	8,127	1,373
	2,1	218,1	186,9	15	–	229	212	196	171	0,8	2	8,127	1,373
	2,1	215,7	182,3	18,1	8,2	229	–	200	171	–	2	8,521	1,286
	2,1	215,7	182,3	18,1	8,2	229	–	200	171	–	2	8,521	1,286
	2,1	238,2	191,8	10,3	–	258	227	189	172	1,73	2	9,469	1,15
	2,1	238,2	191,8	10,3	–	258	227	189	172	1,73	2	9,469	1,15
	2,1	239	192	21	11,1	258	–	215	172	–	2	10,886	0,969
	2,1	239	192	21	11,1	258	–	215	172	–	2	10,886	0,969
	3	255,2	194,8	19,3	–	276	239	216	174	2,4	2,5	11,556	0,915
	3	255,2	194,8	19,3	–	276	239	216	174	2,4	2,5	11,556	0,915
170	2,1	236,1	200,9	12,5	–	249	229	211	181	0,9	2	7,129	1,672
	2,1	236,1	200,9	12,5	–	249	229	211	181	0,9	2	7,129	1,672
	2,1	233,7	196,3	17,1	7,2	249	–	222	181	–	2	9,496	1,145
	2,1	233,7	196,3	17,1	7,2	249	–	222	181	–	2	9,496	1,145
	2,1	248	201	21	–	268	237	216	182	1,7	2	8,985	1,243
	2,1	248	201	21	–	268	237	216	182	1,7	2	8,985	1,243
	2,1	250,5	200,5	21	11,1	268	–	225	182	–	2	10,948	0,971
	2,1	250,5	200,5	21	11,1	268	–	225	182	–	2	10,948	0,971
	4	273,8	209,2	16,4	–	293	257	231	187	2,6	3	9,647	1,158
	4	273,8	209,2	16,4	–	293	257	231	187	2,6	3	9,647	1,158

Toroidal roller bearings



Cylindrical bore



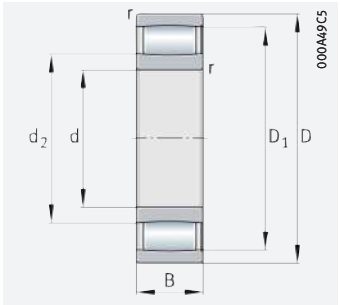
Tapered bore

d = 180 – 200 mm

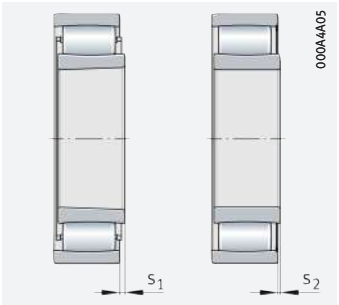
Main dimensions			Basic load ratings		Fatigue limit load	Limiting speed	Speed rating	Mass	Designation ➤809|1.12 ➤809|1.13 X-life ➤804
d	D	B	dyn. C_r	stat. C_{0r}	C_{ur}	n_G	$n_{\vartheta r}$	m	
			N	N	N	min^{-1}	min^{-1}	≈ kg	
180	280	74	900 000	1 360 000	150 000	2 650	1 420	16,4	**C3036-XL**
	280	74	900 000	1 360 000	150 000	2 650	1 420	16	**C3036-XL-K**
	280	100	1 330 000	2 140 000	212 000	600	–	21,6	**C4036-XL-K30-V**
	280	100	1 330 000	2 140 000	212 000	600	–	22,2	**C4036-XL-V**
	300	96	1 300 000	1 780 000	216 000	2 380	1 310	26	**C3136-XL-K**
	300	96	1 300 000	1 780 000	216 000	2 380	1 310	26,7	**C3136-XL**
	300	118	1 780 000	2 700 000	242 000	530	–	31,9	**C4136-XL-K30-V**
	300	118	1 780 000	2 700 000	242 000	530	–	32,8	**C4136-XL-V**
	320	112	1 570 000	2 220 000	255 000	2 200	1 110	36,8	**C3236-XL-K**
	320	112	1 570 000	2 220 000	255 000	2 200	1 110	37,8	**C3236-XL**
190	290	75	940 000	1 480 000	161 000	2 450	1 280	17,4	**C3038-XL**
	290	75	940 000	1 480 000	161 000	2 450	1 280	16,9	**C3038-XL-K**
	290	100	1 370 000	2 330 000	221 000	540	–	22,6	**C4038-XL-K30-V**
	290	100	1 370 000	2 330 000	221 000	540	–	23,2	**C4038-XL-V**
	320	104	1 540 000	2 240 000	205 000	2 220	1 160	32,4	**C3138-XL-K**
	320	104	1 540 000	2 240 000	205 000	2 220	1 160	33,3	**C3138-XL**
	320	128	2 060 000	3 200 000	270 000	485	–	39,9	**C4138-XL-K30-V**
	320	128	2 060 000	3 200 000	270 000	485	–	41	**C4138-XL-V**
	340	92	1 430 000	1 760 000	217 000	2 130	1 310	34,4	**C2238-XL**
	340	92	1 430 000	1 760 000	217 000	2 130	1 310	35,3	**C2238-XL-K**
200	310	82	1 170 000	1 760 000	181 000	2 250	1 180	22,2	**C3040-XL**
	310	82	1 170 000	1 760 000	181 000	2 250	1 180	21,6	**C3040-XL-K**
	310	109	1 650 000	2 650 000	265 000	490	–	28,7	**C4040-XL-K30-V**
	310	109	1 650 000	2 650 000	265 000	490	–	29,5	**C4040-XL-V**
	340	112	1 600 000	2 330 000	265 000	2 060	1 120	39,8	**C3140-XL-K**
	340	112	1 600 000	2 330 000	265 000	2 060	1 120	40,8	**C3140-XL**
	340	140	2 400 000	3 700 000	315 000	435	–	49,7	**C4140-XL-K30-V**
	340	140	2 400 000	3 700 000	365 000	435	–	51,1	**C4140-XL-V**

medias ➤ *https://www.schaeffler.de/std/1E79*

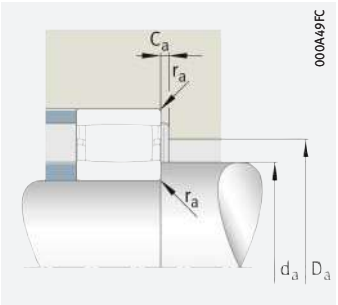
Before ordering, availability for delivery must be checked.



Full complement



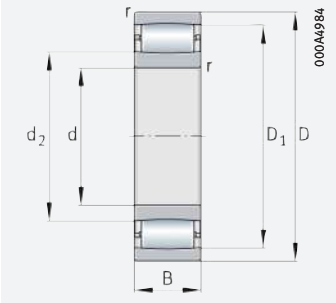
Axial displacement distance



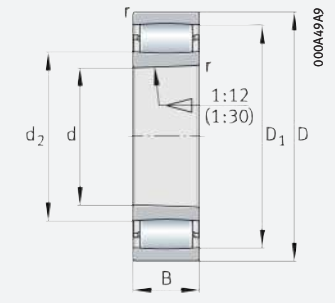
Mounting dimensions

Dimensions						Mounting dimensions						Calculation factors	
d	r	D_1	d_2	s_1	s_2	D_a		d_a		C_a	r_a	k_φ	k_δ
	min.	≈	≈			max.	min.	max.	min.	min.	max.		
180	2,1	251	208,9	15,1	–	269	241	223	191	1,4	2	9,696	1,136
	2,1	251	208,9	15,1	–	269	241	223	191	1,4	2	9,696	1,136
	2,1	246	204	20,1	10,2	269	–	230	191	–	2	10,427	1,03
	2,1	246	204	20,1	10,2	269	–	230	191	–	2	10,427	1,03
	3	270,8	215,2	23,2	–	286	257	234	194	2,1	2,5	9,634	1,162
	3	270,8	215,2	23,2	–	286	257	234	194	2,1	2,5	9,634	1,162
	3	264	212	20	10,1	286	–	248	194	–	2,5	11,41	0,935
	3	264	212	20	10,1	286	–	248	194	–	2,5	11,41	0,935
	4	288	229	27,3	–	303	274	248	197	2,1	3	11,849	0,915
	4	288	229	27,3	–	303	274	248	197	2,1	3	11,849	0,915
190	2,1	266,5	224,5	16,1	–	279	258	237	201	1,4	2	9,831	1,136
	2,1	266,5	224,5	16,1	–	279	258	237	201	1,4	2	9,831	1,136
	2,1	262,5	220,5	20	10,1	279	–	240	201	–	2	10,571	1,03
	2,1	262,5	220,5	20	10,1	279	–	240	201	–	2	10,571	1,03
	3	288,7	228,3	19	–	306	274	248	204	2,3	2,5	11,767	0,918
	3	288,7	228,3	19	–	306	274	249	204	2,3	2,5	11,767	0,918
	3	280,5	225,5	20	10,1	306	–	255	204	–	2,5	12,252	0,868
	3	280,5	225,5	20	10,1	306	–	255	204	–	2,5	12,252	0,868
	4	296	223,2	22,5	–	323	275	250	207	3	3	9,695	1,176
	4	296	223,2	22,5	–	323	275	250	207	3	3	9,695	1,176
200	2,1	285,2	234,8	15,2	–	299	272	252	211	1,6	2	10,083	1,117
	2,1	285,2	234,8	15,2	–	299	272	252	211	1,6	2	10,083	1,117
	2,1	278,6	230,4	21	11,1	299	–	255	211	–	2	11,664	0,924
	2,1	278,6	230,4	21	11,1	299	–	255	211	–	2	11,664	0,924
	3	304,4	245,6	27,3	–	326	290	265	214	2,1	2,5	11,861	0,923
	3	304,4	245,6	27,3	–	326	290	265	214	2,1	2,5	11,861	0,923
	3	300,6	238,4	22	12,1	326	–	270	214	–	2,5	14,02	0,747
	3	300,5	238,5	22	12,1	326	–	270	214	–	2,5	13,961	0,752

Toroidal roller bearings



Cylindrical bore



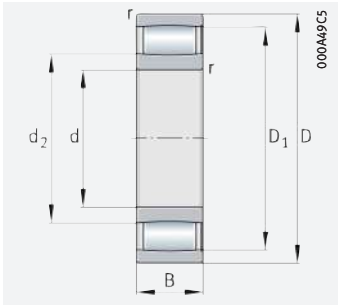
Tapered bore

d = 220 – 300 mm

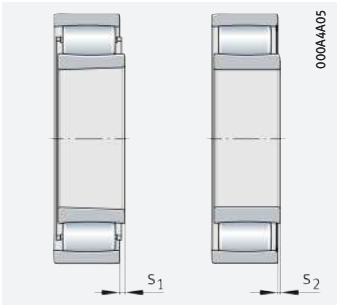
Main dimensions			Basic load ratings		Fatigue limit load	Limiting speed	Speed rating	Mass	Designation ➤809|1.12 ➤809|1.13 X-life ➤804
d	D	B	dyn. C_r	stat. C_{0r}	C_{ur}	n_G	$n_{\vartheta r}$	m	
			N	N	N	min^{-1}	min^{-1}	≈ kg	
220	340	90	1 370 000	2 130 000	221 000	2 030	1 050	28,4	**C3044-XL-K**
	340	90	1 370 000	2 130 000	221 000	2 030	1 050	29,2	**C3044-XL**
	340	118	1 960 000	3 250 000	285 000	425	–	37,3	**C4044-XL-K30-V**
	340	118	1 960 000	3 250 000	285 000	425	–	38,3	**C4044-XL-V**
	370	120	1 930 000	2 900 000	280 000	1 850	960	49,9	**C3144-XL-K**
	370	120	1 930 000	2 900 000	280 000	1 850	960	51,3	**C3144-XL**
	400	108	2 080 000	2 550 000	300 000	1 720	1 050	58,2	**C2244-XL**
	400	108	2 080 000	2 550 000	300 000	1 720	1 050	56,7	**C2244-XL-K**
240	360	92	1 400 000	2 230 000	228 000	1 880	980	31,1	**C3048-XL-K**
	360	92	1 400 000	2 230 000	228 000	1 880	980	32	**C3048-XL**
	400	128	2 380 000	3 500 000	370 000	1 690	870	61,6	**C3148-XL-K**
	400	128	2 380 000	3 500 000	370 000	1 690	870	63,2	**C3148-XL**
260	400	104	1 830 000	2 950 000	280 000	1 650	830	45,2	**C3052-XL-K**
	400	104	1 830 000	2 950 000	280 000	1 650	830	46,4	**C3052-XL**
	440	144	2 750 000	4 250 000	435 000	1 480	740	85,3	**C3152-XL-K**
	440	144	2 750 000	4 250 000	435 000	1 480	740	87,5	**C3152-XL**
280	420	106	1 870 000	3 100 000	290 000	1 530	770	48,8	**C3056-XL-K**
	420	106	1 870 000	3 100 000	290 000	1 530	770	50,1	**C3056-XL**
	460	146	2 850 000	4 500 000	455 000	1 400	700	93,8	**C3156-XL**
	460	146	2 850 000	4 500 000	455 000	1 400	700	91,4	**C3156-XL-K**
300	460	118	2 220 000	3 800 000	330 000	1 400	690	67,4	**C3060-XL-K-M**
	460	118	2 220 000	3 800 000	330 000	1 400	690	69,2	**C3060-XL-M**
	460	160	2 650 000	4 550 000	420 000	1 440	600	91,4	**C4060-XL-K30-M1B**
	460	160	2 650 000	4 550 000	420 000	1 440	600	93,9	**C4060-XL-M1B**
	500	160	3 350 000	5 300 000	510 000	1 280	630	120	**C3160-XL-K**
	500	160	3 350 000	5 300 000	510 000	1 280	630	124	**C3160-XL**
	500	200	4 150 000	6 800 000	670 000	1 280	495	150	**C4160-XL-K30-M1B**
	500	200	4 150 000	6 800 000	670 000	1 280	495	154	**C4160-XL-M1B**

medias ➤ *https://www.schaeffler.de/std/1E7A*

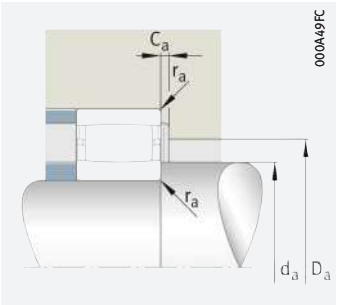
Before ordering, availability for delivery must be checked.



Full complement



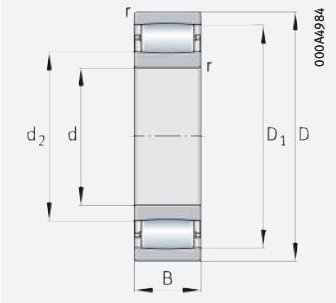
Axial displacement distance



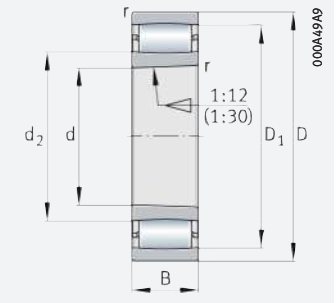
Mounting dimensions

Dimensions						Mounting dimensions						Calculation factors	
d	r	D_1	d_2	s_1	s_2	D_a		d_a		C_a	r_a	k_φ	k_δ
	min.	≈	≈			max.	min.	max.	min.	min.	max.		
220	3	310	256,7	17,2	–	327	297	274	233	1,7	2,5	11,851	0,931
	3	310	256,7	17,2	–	327	297	274	233	1,7	2,5	11,851	0,931
	3	304,1	252,9	20	10,1	327	–	280	233	–	2,5	11,548	0,957
	3	304,1	252,9	20	10,1	327	–	280	233	–	2,5	11,548	0,957
	4	333,1	269,2	22,3	–	353	316	291	237	1,4	3	13,667	0,791
	4	333,1	269,2	22,3	–	353	316	291	237	1,4	3	13,667	0,791
	4	351,1	257,9	20,5	–	383	323	292	237	3,9	3	11,976	0,937
	4	351,1	257,9	20,5	–	383	323	292	237	3,9	3	11,976	0,937
240	3	329,2	275,8	19,2	–	347	316	293	253	1,7	2,5	12,016	0,931
	3	329,2	275,8	19,2	–	347	316	293	253	1,7	2,5	12,016	0,931
	4	365,8	281,2	20,4	–	383	337	307	257	2,9	3	14,559	0,741
	4	356,8	281,2	20,4	–	383	337	307	257	2,9	3	14,559	0,741
260	4	366,1	305,8	19,3	–	385	351	326	275	1,9	3	12,381	0,924
	4	366,1	305,8	19,3	–	385	351	326	275	1,9	3	12,381	0,924
	4	397	318,9	26,4	–	423	377	346	277	1,7	3	16,223	0,667
	4	397	318,9	26,4	–	423	377	346	277	1,7	3	16,223	0,667
280	4	388,5	328,5	21,3	–	405	374	348	295	1,9	3	12,577	0,924
	4	388,5	328,5	21,3	–	405	374	348	295	1,9	3	12,577	0,924
	5	415	337	28,4	–	440	394	364	300	1,7	4	16,385	0,666
	5	415	337	28,4	–	440	394	364	300	1,7	4	16,385	0,666
300	4	416	353	20	–	445	400	369	315	1,6	3	14,109	0,812
	4	416	353	20	–	445	400	369	315	1,6	3	14,109	0,812
	4	404,8	343,2	16	–	445	392	357	315	0,71	3	16,395	0,665
	4	404,8	343,2	16	–	445	392	357	315	0,71	3	16,395	0,665
	5	447,6	362,4	30,5	–	480	426	391	320	1,9	4	17,019	0,647
	5	447,6	362,4	30,5	–	480	426	391	320	1,9	4	17,019	0,647
	5	446,1	355,9	14,9	–	480	425	352	320	4,2	4	27,776	0,359
	5	446,1	355,9	14,9	–	480	425	352	320	4,2	4	27,776	0,359

Toroidal roller bearings



Cylindrical bore



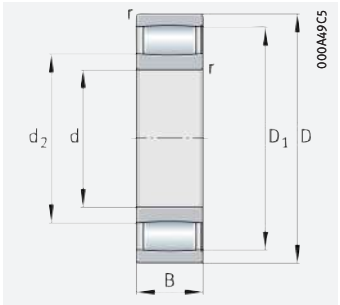
Tapered bore

d = 320 – 420 mm

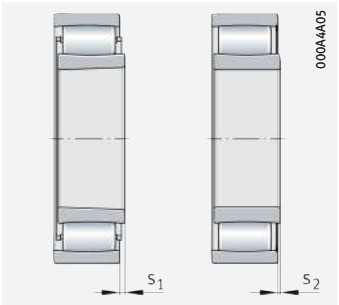
Main dimensions			Basic load ratings		Fatigue limit load	Limiting speed	Speed rating	Mass	Designation ➤809|1.12 ➤809|1.13 X-life ➤804
d	D	B	dyn. C_r	stat. C_{0r}	C_{ur}	n_G	$n_{\vartheta r}$	m	
			N	N	N	min^{-1}	min^{-1}	≈ kg	
320	480	121	2 300 000	4 100 000	365 000	1 310	640	74,7	**C3064-XL-M**
	480	121	2 300 000	4 100 000	365 000	1 310	640	72,8	**C3064-XL-K-M**
	540	176	4 150 000	6 300 000	610 000	1 180	590	157	**C3164-XL-M**
	540	176	4 150 000	6 300 000	610 000	1 180	590	157	**C3164-XL-K-M**
340	520	133	2 950 000	4 950 000	460 000	1 170	560	99,3	**C3068-XL-M**
	520	133	2 950 000	4 950 000	460 000	1 170	560	96,8	**C3068-XL-K-M**
	580	190	4 900 000	7 500 000	710 000	1 060	510	202	**C3168-XL-M**
	580	190	4 900 000	7 500 000	710 000	1 060	510	197	**C3168-XL-K-M**
360	480	90	1 770 000	3 250 000	360 000	1 280	600	42,6	**C3972-XL-K-M**
	480	90	1 770 000	3 250 000	360 000	1 280	600	43,8	**C3972-XL-M**
	540	134	2 950 000	5 000 000	460 000	1 120	550	105	**C3072-XL-M**
	540	134	2 950 000	5 000 000	460 000	1 120	550	102	**C3072-XL-K-M**
	600	192	5 100 000	8 000 000	750 000	1 020	485	213	**C3172-XL-M**
	600	192	5 100 000	8 000 000	750 000	1 020	485	208	**C3172-XL-K-M**
380	520	106	2 130 000	4 000 000	405 000	1 150	550	62,8	**C3976-XL-K-M**
	520	106	2 130 000	4 000 000	405 000	1 150	550	64,4	**C3976-XL-M**
	560	135	3 050 000	5 200 000	475 000	1 090	530	110	**C3076-XL-M**
	560	135	3 050 000	5 200 000	475 000	1 090	530	107	**C3076-XL-K-M**
	620	194	5 000 000	8 500 000	720 000	990	455	225	**C3176-XL-M**
	620	194	5 000 000	8 500 000	720 000	990	455	219	**C3176-XL-K-M**
400	540	106	2 170 000	4 150 000	415 000	1 120	530	65,6	**C3980-XL-K-M**
	540	106	2 170 000	4 150 000	415 000	1 120	530	67,3	**C3980-XL-M**
	600	148	3 750 000	6 200 000	560 000	980	475	143	**C3080-XL-M**
	600	148	3 750 000	6 200 000	560 000	980	475	139	**C3080-XL-K-M**
	650	200	4 800 000	8 300 000	750 000	910	435	253	**C3180-XL-M**
	650	200	4 800 000	8 300 000	750 000	910	435	247	**C3180-XL-K-M**
420	560	106	2 200 000	4 250 000	425 000	1 070	510	68,4	**C3984-XL-K-M**
	560	106	2 200 000	4 250 000	425 000	1 070	510	70,2	**C3984-XL-M**
	620	150	3 800 000	6 400 000	580 000	950	460	151	**C3084-XL-M**
	620	150	3 800 000	6 400 000	580 000	950	460	147	**C3084-XL-K-M**
	700	224	6 000 000	10 600 000	890 000	860	390	339	**C3184-XL-M**
	700	224	6 000 000	10 600 000	890 000	860	390	330	**C3184-XL-K-M**

medias ➤ *https://www.schaeffler.de/std/1E7B*

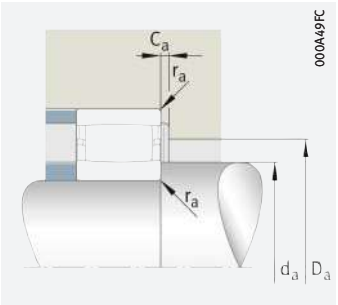
Before ordering, availability for delivery must be checked.



Full complement



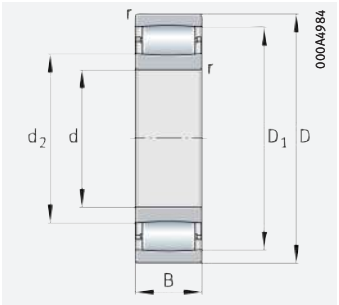
Axial displacement distance



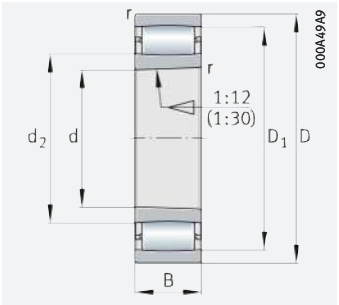
Mounting dimensions

Dimensions						Mounting dimensions						Calculation factors	
d	r	D_1	d_2	s_1	s_2	D_a		d_a		C_a	r_a	k_φ	k_δ
	min.	≈	≈			max.	min.	max.	min.	min.	max.		
320	4	439,4	376,6	23,3	–	465	423	393	335	1,6	3	15,05	0,76
	4	439,4	376,6	23,3	–	465	423	393	335	1,6	3	15,05	0,76
	5	475,9	372,1	26,7	–	520	448	400	340	4	4	19,823	0,542
	5	475,9	372,1	26,7	–	520	448	400	340	4	4	19,823	0,542
340	5	481,7	402,3	25,4	–	502	460	424	358	2,5	4	15,578	0,745
	5	481,7	402,3	25,4	–	502	460	424	358	2,5	4	15,578	0,745
	5	517,6	404,4	25,9	–	560	485	437	360	2,7	4	22,159	0,481
	5	517,6	404,4	25,9	–	560	485	437	360	2,7	4	22,159	0,481
360	3	450,6	393,4	17,2	–	467	437	408	373	2,1	2,5	13,126	0,925
	3	450,6	393,4	17,2	–	467	437	408	373	2,1	2,5	13,126	0,925
	5	496,6	417,4	26,4	–	522	475	439	378	2,5	4	15,709	0,745
	5	496,6	417,4	26,4	–	522	475	439	378	2,5	4	15,709	0,745
	5	542,7	427,2	27,9	–	580	509	461	380	2,7	4	25,896	0,403
	5	542,7	427,2	27,9	–	580	509	461	380	2,7	4	25,896	0,403
380	4	489,1	427,9	21	–	505	474	444	395	2,2	3	14,746	0,813
	4	489,1	427,9	21	–	505	474	444	395	2,2	3	14,746	0,813
	5	510,5	431,5	27	–	542	489	453	398	2,5	4	15,827	0,745
	5	510,5	431,5	27	–	542	489	453	398	2,5	4	15,827	0,745
	5	548,6	448,4	25,4	–	600	523	474	400	2,1	4	20,403	0,544
	5	548,6	448,4	25,4	–	600	523	474	400	2,1	4	20,403	0,544
400	4	500,6	439,4	21	–	525	485	456	415	2,2	3	14,846	0,813
	4	500,6	439,4	21	–	525	485	456	415	2,2	3	14,846	0,813
	5	553	458	30,6	–	582	527	484	418	3	4	17,429	0,671
	5	553	458	30,6	–	582	527	484	418	3	4	17,429	0,671
	6	586,1	490,9	50,7	–	624	563	514	426	1,8	5	20,809	0,542
	6	586,1	490,9	50,7	–	624	563	514	426	1,8	5	20,809	0,542
420	4	518,6	457,4	21,3	–	545	503	474	435	2,2	3	15,003	0,813
	4	518,6	457,4	21,3	–	545	503	474	435	2,2	3	15,003	0,813
	5	569,8	475,2	32,6	–	602	544	501	438	3	4	17,577	0,671
	5	569,8	475,2	32,6	–	602	544	501	438	3	4	17,577	0,671
	6	615,7	510,3	34,8	–	674	587	539	446	1,9	5	24,992	0,435
	6	615,7	510,3	34,8	–	674	587	539	446	1,9	5	24,992	0,435

Toroidal roller bearings



Cylindrical bore



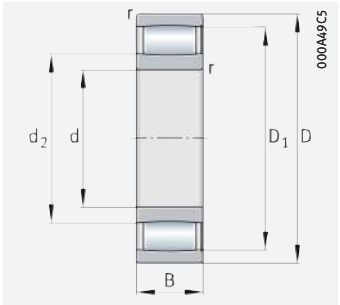
Tapered bore

d = 440 – 500 mm

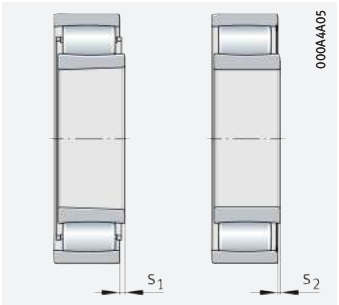
Main dimensions			Basic load ratings		Fatigue limit load	Limiting speed	Speed rating	Mass	Designation ➤809|1.12 ➤809|1.13 X-life ➤804
d	D	B	dyn. C_r	stat. C_{0r}	C_{ur}	n_G	$n_{\vartheta r}$	m	
			N	N	N	min^{-1}	min^{-1}	≈ kg	
440	600	118	2 650 000	5 300 000	490 000	970	445	92,3	**C3988-XL-K-M**
	600	118	2 650 000	5 300 000	490 000	970	445	94,7	**C3988-XL-M**
	650	157	3 750 000	6 500 000	570 000	920	460	169	**C3088-XL-K-M1B**
	650	157	3 750 000	6 500 000	570 000	920	460	173	**C3088-XL-M1B**
	720	226	6 900 000	11 600 000	960 000	810	360	345	**C3188-XL-K-M1B**
	720	226	6 900 000	11 600 000	960 000	810	360	354	**C3188-XL-M1B**
	720	280	7 600 000	12 900 000	1 060 000	820	305	427	**C4188-XL-K30-M1B**
	720	280	7 600 000	12 900 000	1 060 000	820	305	439	**C4188-XL-M1B**
460	620	118	2 750 000	5 600 000	510 000	940	425	95,8	**C3992-XL-K-M**
	620	118	2 750 000	5 600 000	510 000	940	425	98,4	**C3992-XL-M**
	680	163	4 000 000	7 500 000	640 000	850	400	197	**C3092-XL-M**
	680	163	4 000 000	7 500 000	640 000	850	400	192	**C3092-XL-K-M**
	760	240	6 800 000	12 000 000	1 010 000	760	350	424	**C3192-XL-M**
	760	240	6 800 000	12 000 000	1 010 000	760	350	413	**C3192-XL-K-M**
	760	300	8 700 000	14 900 000	1 190 000	770	280	516	**C4192-XL-K30-M1B**
	760	300	8 700 000	14 900 000	1 190 000	770	280	530	**C4192-XL-M1B**
480	650	128	3 300 000	6 200 000	610 000	880	405	116	**C3996-XL-K-M**
	650	128	3 300 000	6 200 000	610 000	880	405	119	**C3996-XL-M**
	700	165	4 100 000	7 800 000	660 000	820	390	207	**C3096-XL-M**
	700	165	4 100 000	7 800 000	660 000	820	390	201	**C3096-XL-K-M**
	790	248	7 100 000	12 600 000	1 050 000	730	335	459	**C3196-XL-K-M1B**
	790	248	7 100 000	12 600 000	1 050 000	730	335	471	**C3196-XL-M1B**
500	670	128	3 350 000	6 500 000	620 000	830	375	120	**C39/500-XL-K-M**
	670	128	3 350 000	6 500 000	620 000	830	375	123	**C39/500-XL-M**
	720	167	4 300 000	8 300 000	700 000	790	370	216	**C30/500-XL-M**
	720	167	4 300 000	8 300 000	700 000	790	370	211	**C30/500-XL-K-M**
	830	264	7 500 000	12 900 000	1 090 000	680	330	545	**C31/500-XL-K-M**
	830	264	7 500 000	12 900 000	1 090 000	680	330	559	**C31/500-XL-M**
	830	325	10 700 000	19 100 000	1 410 000	680	225	670	**C41/500-XL-K30-M1B**
	830	325	10 700 000	19 100 000	1 410 000	680	225	688	**C41/500-XL-M1B**

medias ➤ *https://www.schaeffler.de/std/1E7C*

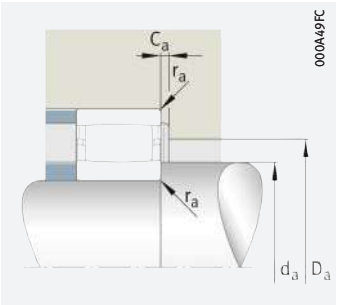
Before ordering, availability for delivery must be checked.



Full complement



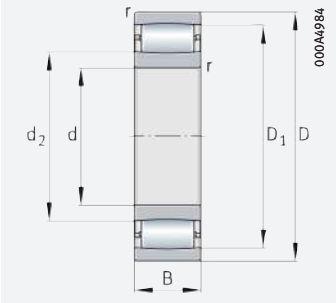
Axial displacement distance



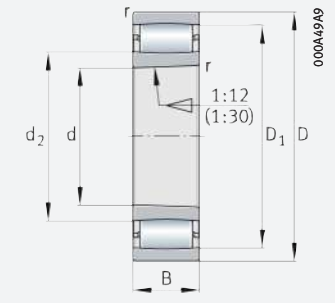
Mounting dimensions

Dimensions						Mounting dimensions						Calculation factors	
d	r	D_1	d_2	s_1	s_2	D_a		d_a		C_a	r_a	k_φ	k_δ
	min.	≈	≈			max.	min.	max.	min.	min.	max.		
440	4	559,5	494,5	20	–	585	545	517	455	1,4	3	16,524	0,732
	4	559,5	494,5	20	–	585	545	517	455	1,4	3	16,524	0,732
	6	583,7	491,9	19,7	–	627	566	489	463	5,5	5	18,096	0,652
	6	583,7	494,3	19,7	–	627	566	489	463	5,5	5	18,096	0,652
	6	646,2	521,1	16	–	694	615	518	466	6,3	5	25,092	0,347
	6	646,2	521,1	16	–	694	615	518	466	6,3	5	25,092	0,347
	6	634,4	512,6	27,8	–	694	608	506	466	6,5	5	29,46	0,357
	6	634,4	512,6	27,8	–	694	608	506	466	6,5	5	29,46	0,357
460	4	574	509	20	–	605	561	504	467	1,4	3	16,651	0,732
	4	574	509	20	–	605	561	504	467	1,4	3	16,651	0,732
	6	623,7	539,2	33,5	–	654	603	560	486	2,2	5	18,559	0,647
	6	623,7	539,2	33,5	–	654	603	560	486	2,2	5	18,559	0,647
	7,5	679,2	558,8	51	–	728	649	589	492	2,1	6	25,204	0,441
	7,5	679,2	558,8	51	–	728	649	589	492	2,1	6	25,204	0,441
	7,5	668,3	539,6	23,3	–	728	634	588	477	6,9	6	32,219	0,324
	7,5	668,3	539,6	23,3	–	728	634	588	477	6,9	6	32,219	0,324
480	5	607,6	525,4	20,4	–	632	588	555	498	3,1	4	19,501	0,6
	5	607,6	525,4	20,4	–	632	588	555	498	3,1	4	19,501	0,6
	6	639,5	555,5	35,5	–	677	619	576	503	2,2	5	18,699	0,647
	6	639,5	555,5	35,5	–	677	619	576	503	2,2	5	18,699	0,647
	7,5	697,4	577,1	35,1	–	758	676	574	512	6,1	6	25,47	0,439
	7,5	697,4	577,1	35,1	–	758	676	574	512	6,1	6	25,47	0,439
500	5	634,6	552,4	20,4	–	652	615	573	518	3,1	4	19,736	0,6
	5	634,6	552,4	20,4	–	652	615	573	518	3,1	4	19,736	0,6
	6	655,8	572,2	37,5	–	697	635	593	523	2,1	5	18,843	0,647
	6	655,8	572,2	37,5	–	697	635	593	523	2,1	5	18,843	0,647
	7,5	734,2	608,8	75,3	–	798	702	641	532	4,4	6	25,64	0,441
	7,5	734,2	608,8	75,3	–	798	702	641	532	4,4	6	25,64	0,441
	7,5	739,2	598,7	15	–	798	708	594	532	7,5	6	36,213	0,287
	7,5	739,2	598,7	15	–	798	708	594	532	7,5	6	36,213	0,287

Toroidal roller bearings



Cylindrical bore



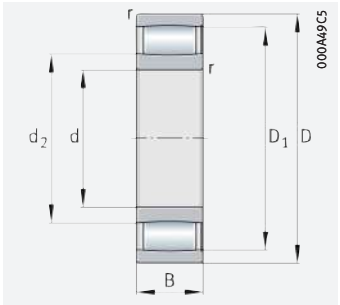
Tapered bore

d = 530 – 670 mm

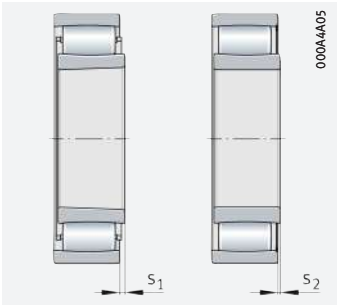
Main dimensions			Basic load ratings		Fatigue limit load	Limiting speed	Speed rating	Mass	Designation ➤*809 | 1.12* ➤*809 | 1.13* X-life ➤*804*
d	D	B	dyn. C_r	stat. C_{0r}	C_{ur}	n_G	$n_{\vartheta r}$	m	
			N	N	N	min^{-1}	min^{-1}	≈ kg	
530	710	136	3 550 000	7 100 000	670 000	790	365	143	**C39/530-XL-K-M**
	710	136	3 550 000	7 100 000	670 000	790	365	146	**C39/530-XL-M**
	780	185	5 200 000	9 700 000	790 000	730	340	292	**C30/530-XL-M**
	780	185	5 200 000	9 700 000	790 000	730	340	285	**C30/530-XL-K-M**
	870	272	9 100 000	16 100 000	1 310 000	640	280	625	**C31/530-XL-M**
	870	272	9 100 000	16 100 000	1 310 000	640	280	609	**C31/530-XL-K-M**
560	750	140	3 650 000	7 500 000	700 000	730	335	164	**C39/560-XL-K-M**
	750	140	3 650 000	7 500 000	700 000	730	335	168	**C39/560-XL-M**
	820	195	5 700 000	11 200 000	890 000	660	295	338	**C30/560-XL-M**
	820	195	5 700 000	11 200 000	890 000	660	295	329	**C30/560-XL-K-M**
	920	280	9 600 000	17 400 000	1 350 000	610	265	701	**C31/560-XL-K-M1B**
	920	280	9 600 000	17 400 000	1 350 000	610	265	720	**C31/560-XL-M1B**
600	800	150	4 100 000	8 800 000	790 000	680	305	197	**C39/600-XL-K-M**
	800	150	4 100 000	8 800 000	790 000	680	305	203	**C39/600-XL-M**
	870	200	6 300 000	12 200 000	970 000	620	275	383	**C30/600-XL-M**
	870	200	6 300 000	12 200 000	970 000	620	275	373	**C30/600-XL-K-M**
	980	300	11 100 000	19 100 000	1 490 000	550	247	847	**C31/600-XL-K-M1B**
	980	300	11 100 000	19 100 000	1 490 000	550	247	869	**C31/600-XL-M1B**
	980	375	13 600 000	24 500 000	1 780 000	560	186	1 058	**C41/600-XL-K30-M1B**
	980	375	13 600 000	24 500 000	1 780 000	560	186	1 086	**C41/600-XL-M1B**
630	850	165	5 000 000	10 100 000	890 000	630	285	253	**C39/630-XL-K-M**
	850	165	5 000 000	10 100 000	890 000	630	285	259	**C39/630-XL-M**
	920	212	6 900 000	12 900 000	1 050 000	580	270	460	**C30/630-XL-M**
	920	212	6 900 000	12 900 000	1 050 000	580	270	448	**C30/630-XL-K-M**
	1 030	315	12 200 000	22 000 000	1 660 000	520	222	983	**C31/630-XL-K-M1B**
	1 030	315	12 200 000	22 000 000	1 660 000	520	222	1 009	**C31/630-XL-M1B**
670	900	170	5 700 000	12 300 000	1 020 000	570	237	289	**C39/670-XL-K-M**
	900	170	5 700 000	12 300 000	1 020 000	570	237	296	**C39/670-XL-M**
	980	230	8 300 000	16 500 000	1 250 000	530	226	568	**C30/670-XL-M**
	980	230	8 300 000	16 500 000	1 250 000	530	226	553	**C30/670-XL-K-M**
	1 090	336	12 600 000	22 300 000	1 740 000	490	220	1 167	**C31/670-XL-K-M1B**
	1 090	336	12 600 000	22 300 000	1 740 000	490	220	1 198	**C31/670-XL-M1B**

medias ➤ *https://www.schaeffler.de/std/1E7D*

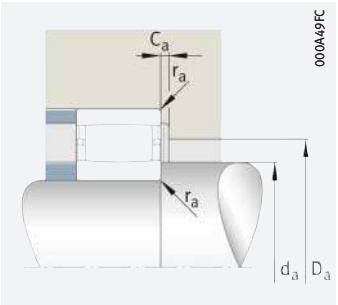
Before ordering, availability for delivery must be checked.



Full complement



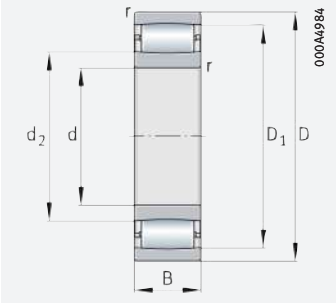
Axial displacement distance



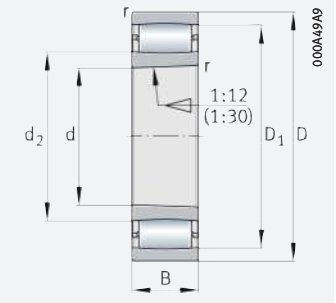
Mounting dimensions

Dimensions						Mounting dimensions						Calculation factors	
d	r	D_1	d_2	s_1	s_2	D_a		d_a		C_a	r_a	k_φ	k_δ
	min.	≈	≈			max.	min.	max.	min.	min.	max.		
530	5	658	577	28,4	–	692	639	606	548	2,9	4	19,946	0,6
	5	658	577	28,4	–	692	639	606	548	2,9	4	19,946	0,6
	6	702,9	602,1	35,7	–	757	677	628	553	2,5	5	21,626	0,548
	6	702,9	602,1	35,7	–	757	677	628	553	2,5	5	21,626	0,548
	7,5	779,2	636,8	44,4	–	838	738	678	562	3	6	30,734	0,356
	7,5	779,2	636,8	44,4	–	838	738	678	562	3	6	30,734	0,356
560	5	701,7	621,3	32,4	–	732	683	650	578	2,9	4	20,33	0,6
	5	701,7	621,3	32,4	–	732	683	650	578	2,9	4	20,33	0,6
	6	758,9	662,1	45,7	–	793	735	686	583	2,4	5	22,141	0,548
	6	758,9	662,1	45,7	–	793	735	686	583	2,4	5	22,141	0,548
	7,5	805,2	663,4	28	–	888	778	660	592	7,3	6	30,983	0,355
	7,5	805,2	663,4	28	–	888	778	660	592	7,3	6	30,983	0,355
600	5	745,3	664,7	32,4	–	782	726	685	618	1,7	4	21,712	0,561
	5	745,3	664,7	32,4	–	782	726	685	618	1,7	4	21,712	0,561
	6	805,6	691,4	35,9	–	847	773	724	623	2	5	28,196	0,403
	6	805,6	691,4	35,9	–	847	773	724	623	2	5	28,196	0,403
	7,5	869,9	702,9	26,1	–	948	837	699	632	8,8	6	30,953	0,363
	7,5	869,9	702,9	26,1	–	948	837	699	632	8,8	6	30,953	0,363
	7,5	864,7	701,2	24,6	–	948	828	695	632	9	6	40,44	0,26
	7,5	864,7	701,2	24,6	–	948	828	695	632	9	6	40,44	0,26
630	6	790,8	693,2	35,5	–	827	766	729	653	3,6	5	22,766	0,536
	6	790,8	693,2	35,5	–	827	766	729	653	3,6	5	22,766	0,536
	7,5	841,7	715,2	48,1	–	892	809	748	658	3,9	6	29,154	0,39
	7,5	841,7	715,2	48,1	–	892	809	748	658	3,9	6	29,154	0,39
	7,5	910,9	743,4	23,8	–	998	878	739	662	8,8	6	34,168	0,324
	7,5	910,9	743,4	23,8	–	998	878	739	662	8,8	6	34,168	0,324
670	6	852,8	756,2	24,9	–	877	833	749	693	2,1	5	24,732	0,493
	6	852,8	756,2	24,9	–	877	833	749	693	2,1	5	24,732	0,493
	7,5	902,3	776,7	41,1	–	952	870	809	698	3,1	6	27,163	0,44
	7,5	902,3	776,7	41,1	–	952	870	809	698	3,1	6	27,163	0,44
	7,5	963,7	786	41	–	1 058	930	782	702	12	6	34,543	0,325
	7,5	963,7	786	41	–	1 058	930	782	702	12	6	34,543	0,325

Toroidal roller bearings



Cylindrical bore



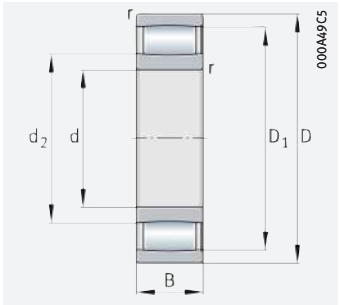
Tapered bore

d = 710 – 900 mm

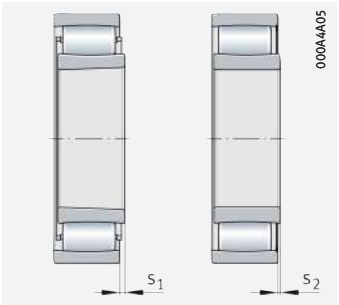
Main dimensions			Basic load ratings		Fatigue limit load	Limiting speed	Speed rating	Mass	Designation ➤*809|1.12* ➤*809|1.13* X-life ➤*804*
d	D	B	dyn. C_r	stat. C_{0r}	C_{ur}	n_G	$n_{\vartheta r}$	m	
			N	N	N	min^{-1}	min^{-1}	≈ kg	
710	950	180	6 100 000	12 900 000	1 040 000	550	237	337	**C39/710-XL-K-M**
	950	180	6 100 000	12 900 000	1 040 000	550	237	346	**C39/710-XL-M**
	1 030	236	9 000 000	17 600 000	1 360 000	500	214	634	**C30/710-XL-M**
	1 030	236	9 000 000	17 600 000	1 360 000	500	214	618	**C30/710-XL-K-M**
	1 030	315	10 300 000	21 100 000	1 560 000	510	176	824	**C40/710-XL-K30-M1B**
	1 030	315	10 300 000	21 100 000	1 560 000	510	176	846	**C40/710-XL-M1B**
	1 150	345	12 700 000	24 200 000	1 810 000	465	203	1 327	**C31/710-XL-K-M1B**
	1 150	345	12 700 000	24 200 000	1 810 000	465	203	1 362	**C31/710-XL-M1B**
750	1 000	185	6 400 000	14 000 000	1 120 000	510	216	380	**C39/750-XL-K-M**
	1 000	185	6 400 000	14 000 000	1 120 000	510	216	391	**C39/750-XL-M**
	1 090	250	9 500 000	19 300 000	1 430 000	475	201	735	**C30/750-XL-K-M1B**
	1 090	250	9 500 000	19 300 000	1 430 000	475	201	755	**C30/750-XL-M1B**
800	1 060	195	6 600 000	14 800 000	1 160 000	475	205	443	**C39/800-XL-K-M**
	1 060	195	6 600 000	14 800 000	1 160 000	475	205	455	**C39/800-XL-M**
	1 150	258	9 600 000	20 100 000	1 470 000	445	191	828	**C30/800-XL-K-M1B**
	1 150	258	9 600 000	20 100 000	1 470 000	445	191	828	**C30/800-XL-M1B**
850	1 120	200	7 800 000	17 000 000	1 390 000	440	182	500	**C39/850-XL-K-M**
	1 120	200	7 800 000	17 000 000	1 390 000	440	182	513	**C39/850-XL-M**
900	1 180	206	9 000 000	20 300 000	1 570 000	410	159	564	**C39/900-XL-K-M**
	1 180	206	9 000 000	20 300 000	1 570 000	410	159	579	**C39/900-XL-M**

medias ➤ *https://www.schaeffler.de/std/1E7E*

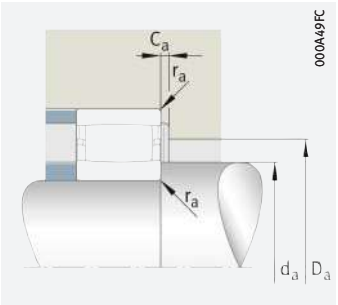
Before ordering, availability for delivery must be checked.



Full complement



Axial displacement distance



Mounting dimensions

Dimensions						Mounting dimensions						Calculation factors	
d	r	D_1	d_2	s_1	s_2	D_a		d_a		C_a	r_a	k_φ	k_δ
	min.	≈	≈			max.	min.	max.	min.	min.	max.		
710	6	877,4	772,6	30,7	–	927	849	802	733	6,5	5	25,417	0,479
	6	877,4	772,6	30,7	–	927	849	802	733	6,5	5	25,417	0,479
	7,5	943,3	808,7	47,3	–	1 002	906	846	738	4,3	6	27,717	0,435
	7,5	943,3	808,7	47,3	–	1 002	906	846	738	4,3	6	27,717	0,435
	7,5	931,2	806,8	31,5	–	1 002	899	841	738	1,3	6	34,772	0,321
	7,5	931,2	806,8	31,5	–	1 002	899	841	738	1,3	6	34,772	0,321
	9,5	1 005,3	843,3	47,8	–	1 100	976	839	750	8,7	8	35,044	0,324
	9,5	1 005,3	843,3	47,8	–	1 100	976	839	750	8,7	8	35,044	0,324
750	6	933,5	829,5	35,7	–	977	906	869	773	3,8	5	25,91	0,479
	6	933,5	829,5	35,7	–	977	906	869	773	3,8	5	25,91	0,479
	7,5	991,7	856,3	25	–	1 062	965	852	778	6,9	6	29,669	0,404
	7,5	991,7	856,3	25	–	1 062	965	852	778	6,9	6	29,669	0,404
800	6	990,6	888,4	45,7	–	1 037	970	879	823	3,6	5	26,416	0,479
	6	990,6	888,4	45,7	–	1 037	970	879	823	3,6	5	26,416	0,479
	7,5	1 045,4	911,5	25	–	1 122	1 020	906	828	6,9	6	30,144	0,404
	7,5	1 045,4	911,5	25	–	1 122	1 020	906	828	6,9	6	30,144	0,404
850	6	1 056,9	936,1	35,9	–	1 097	1 027	981	873	4,5	5	30,626	0,398
	6	1 056,9	936,1	35,9	–	1 097	1 027	981	873	4,5	5	30,626	0,398
900	6	1 114,6	987,4	20	–	1 157	1 087	981	923	3	5	32,311	0,377
	6	1 114,6	987,4	20	–	1 157	1 087	981	923	3	5	32,311	0,377