Angular contact ball bearings

7205 BE CB Y HC5

SRACBB – single row

A	30° contact angle
B	40° contact angle
BE	40° contact angle, high capacity, all ISO corners
C	25° contact angle
CA	Designed for duplex mounting with lower than normal (CB) axial clearance
CB	Designed for duplex mounting with normal axial clearance
CC	Designed for duplex mounting with larger than normal (CB) axial clearance
DGA	Duplex ground for a light preload
DGB	Duplex ground for a medium preload
GA	Designed for duplex mounting with a light axial preload
GB	Designed for duplex mounting with a medium axial preload
GC	Designed for duplex mounting with a heavy axial preload
G###	Designed for duplex mounting with a non-standard preload in dN
N1	One locating slot in outer ring side face
N2	Two locating slots in outer ring side face 180° apart
W64	Solid Oil lubricants
2RZP	Two seals
F	Machined steel cage
J	Pressed steel cage
M	Machined brass cage
P	Glass fiber reinforced PA66 cage
PH	Glass fiber reinforced PEEK cage
Y	Pressed brass cage

3200 A-2RS1 TN9

DRACBB – double row

A	Conrad design (no filling slot) with outwardly converging contact angles
AW	Conrad design (no filling slot) with inwardly converging contact angles
E	Max type design (filling slot), with outwardly converging contact angles
EW	Max type design (filling slot), with inwardly converging contact angles
D	Two piece inner ring design
DMA	Two piece inner ring design with a machined brass cage
NR	Snap ring groove and snap ring in the OD of the bearing
Z	Metal shield on one side
2Z	Metal shield on both side
RS1	Rubber seal on one side
2RS1	Rubber seal on both sides
W64	Solid Oil lubricants
TN9	Glass fiber reinforced PA66 cage
M	Machined brass cage
MT33	Lithium thickened grease with mineral base oil
C2	Less than normal (C0) axial internal clearance
C0	Normal axial internal clearance (not designated in part number)
C3	Greater than normal axial internal clearance

QJ 203 N2MA

FPACBB – four point

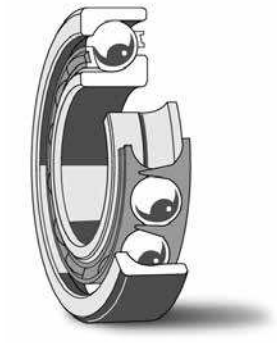
C2	Less than normal (C0) axial internal clearance
C2L	Lower half of C2 axial internal clearance
C0	Normal axial internal clearance (not designated in part number)
C3	Greater than normal (C0) axial internal clearance
C4	Greater than C3 axial internal clearance
F	Machined steel cage
MA	Machined brass cage, outer ring centered
N2	Two locating slots in outer ring side face 180° apart
PHAS	Glass fiber reinforced PEEK cage
P63	ABEC-3 precision and C3 internal clearance
LA	Machined light alloy cage, outer ring centered

Special features:

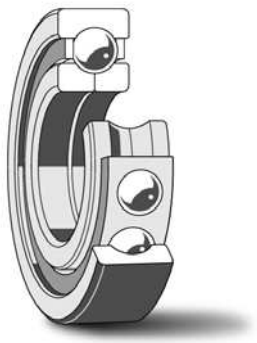
HC5	Ceramic ball set
W64	Solid Oil lubricants

Technical features

	Single row ACBB	Double row ACBB	Four-point contact ACBB
Boundary dimensions	In accordance with ISO 15 and ISO 12044	In accordance with ISO 15	In accordance with ISO 15
Tolerances	ABEC 3 (P6, dimension) ABEC 5 (P5, running accuracy)	ABEC 3	ABEC 3
Heat stabilization	302° F (150° C)	302° F (150° C)	302° F (150° C)
Misalignment	2 minutes of arc	2 minutes of arc	2 minutes of arc
Cage materials	Polyamide (P) Machined brass (M) Pressed brass (Y) Pressed steel (J)	Polyamide (TN9) Pressed steel (not designated)	Machined brass (M, MA)
Axial load – max	1.4 x C_0 for single or tandem mounted bearings 0.7 x C_0 for duplex mounted bearings	0.7 x C_0 – Conrad $F_a / F_r \leq 0.3$	0.7 x C_0
Seals	2RZP – Synthetic rubber (NBR)	2RS1 – Synthetic rubber (NBR)	Not available
Shields	Consult SKF for NILOS ring options	2Z – Stamped steel	Consult SKF for NILOS ring options

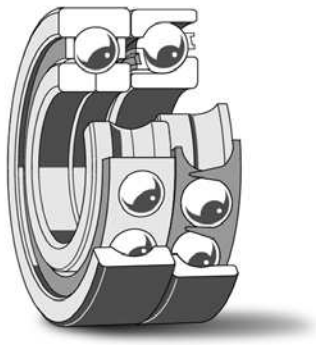


Single row angular contact ball bearing
(data tables on page 68)



Four-point angular contact ball bearing
(data tables on page 74)

Double row angular contact ball bearing
(data tables on page 81)



Thrust pack angular contact ball bearing
(data tables on page 80)

Introduction

SKF standard angular contact ball bearings are available with axial clearances, preloads and high precision. Single row angular contact ball bearings are designed to accommodate axial loads acting in one direction. Under radial loads, an induced force acting in the axial direction is produced which must be counteracted. Consequently, the single bearings are normally adjusted against a second bearing.

SKF angular contact ball bearings are produced in a wide variety of designs and sizes. Those commonly used in general engineering are shown in this catalog:

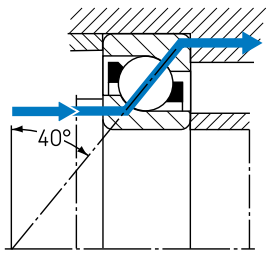
- Single row bearings
- Double row bearings
- Four-point contact ball bearings
- Thrust pack

Basic design

Angular contact ball bearings have raceways in the inner and outer rings that are displaced with respect to each other in the direction of the bearing axis. This means that they are suitable to accommodate combined loads; for example, simultaneously acting radial and axial loads.

The axial load carrying capacity of angular contact ball bearings increases with increasing contact angle a. This is defined as the angle between the line joining the points of contact between the ball and the raceways in the radial plane, along which the load is transmitted from one raceway to the other, and a line perpendicular to the bearing axis. For single row bearings, the magnitude of the contact angle is indicated by a suffix in the designation (B = 40 degrees) (Figure 1). For double row angular contact ball bearings, the contact angle is 30 degrees and for QJ four-point angular contact ball bearings the contact angle is 35 degrees and neither is indicated in the nomenclature.

Figure 1



Angular contact ball bearings, single row

Single row angular contact ball bearings can accommodate combined loads however the axial loads can only act in one direction (Figure 1). Under radial loads, a force acting in the axial direction is produced which must be counteracted. Consequently, the bearings are normally adjusted against a second bearing.

The single row angular contact ball bearings shown in the tables have one high and one low shoulder on each ring, enabling a large number of balls to be incorporated. This gives the bearings relatively high load carrying capacity. The contact angle is 40° (suffix B) and the bearings are therefore suitable for heavy axial loads. They are of non-separable design and permit relatively high-speed operation.

Bearings of the BE design feature an increased load carrying capacity, and either machined brass (M), glass fiber reinforced polyamide 6-6 (P), or pressed brass (Y) cages as standard.

The single row angular contact ball bearings are produced in two standard versions for different design purposes. The standard design (no additional designation suffix such as BEP) is intended for arrangements where only one bearing is used at each bearing position (Figure 4, page 66).

The most common version, identified by suffix CB (universal matching) is designed for arrangements where two or more bearings are mounted immediately adjacent to each other in random order (back-to-back, face-to-face or tandem, Figure 5, page 66). Because of demand, the larger sized bearings are only produced with universal matching (suffix CB).

SKF offers sealed single row 40° ACBB in both the 7200 and 7300 series. Consult SKF Engineering for specifications.

SKF Explorer class bearings

High performance SKF Explorer angular contact ball bearings are printed in blue in the product tables. SKF Explorer bearings retain the designation of the earlier standard bearings, e.g. 7208 BECBP. However, each bearing and its box are marked with the name “SKF Explorer”. Additional details on SKF Explorer performance class bearings can be found on page 25.

Product highlights

High running accuracy and speed capabilities
Angular contact ball bearings feature high radial and axial load capacity combined with high speed capabilities. SKF ACBB are made as standard to ISO P6 or ABMA ABEC 3 precision as standard.

Universal matching
Angular contact ball bearings are manufactured for universal mounting in multiple arrangements, including face-to-face, back-to-back and tandem.

Large product assortment
Available in a wide range (10 to 240 mm inside bore diameter) with cage and clearance / preload combinations. The double row design is available with a choice of shields, seals and snap rings as well as max-type bearings with a filling slot. Special application designs include 4-point contact and thrust pack.

Machined brass cage for heavy duty applications
The machined brass cage provides better performance and longer service life under harsh conditions and can be used in applications where a standard metal or plastic cage is normally used.

Meets ANSI and API pump requirements
Angular contact ball bearings are widely used in centrifugal pump applications and are manufactured in accordance with ANSI and API pump standards.

Introduction

Angular contact ball bearings, double row (Figure 1a)

SKF double row ball bearings are designed with solid or one-piece inner and outer rings with contact angles converging outside the bearing providing overall system rigidity.

The double row angular contact ball bearings are available in two styles, Conrad (suffix A) and Max type (suffix E). The more popular style is the Conrad type. This assembly uses a slight elastic deflection of the outer ring to insert the "last ball". This results in uninterrupted raceways with smooth running, and significant thrust carrying capacity in both directions.

Bearings of the Max type design (suffix E) have a filling slot for inserting the balls. This permits assembly with a greater number of balls than in the previously described Conrad type bearings.

Filling slot bearing features are similar to those of the Conrad type; however, because of the greater number of balls (with the exception of a few sizes) their radial load carrying capacity is often higher than that of the Conrad type. On the other hand, heavy thrust loads can be accommodated in only one direction. These bearings should be mounted so that the predominant axial load acting on the shaft is directed away from the filling slot (**Figure 1a**). Thrust loads in the direction of the filling slot **should not** exceed a thrust to radial load ratio of Fa / Fr = 0.3.

Part number markings are normally located on either the side face or the O.D. The side face marking is always on the side opposite the filling slot, and the O.D. marking is offset from the center away from the side with the filling slot. Therefore, even double sealed or shielded bearings with the filling slot covered from view can be oriented correctly.

Angular contact ball bearings, four-point (Figure 1b)

Four-point contact ball bearings are single row angular contact ball bearings having raceways which are designed to enable axial loads to be accommodated in both directions. They need less axial space than double row bearings. The four-point contact ball bearings shown in the following tables have a contact angle of 35° and a two-part inner ring, allowing a large number of balls to be incorporated, thus providing a high axial load carrying capacity. The bearings are separable, i.e. the inner ring halves and the outer ring with ball and cage assembly can be mounted individually.

Angular contact ball bearings, thrust pack

A thrust pack bearing consists of a standard QJ bearing and a single row angular contact bearing (BEGAM version) matched together and are intended for applications having predominate axial load in one direction. The axial load should not reverse direction during operation except for transient conditions such as at machine start up or shut-down, else the BEGAM bearing may become unloaded and have possible skidding problems. These bearings are matched in sets and are serialized and therefore **are not** interchangeable amongst sets.

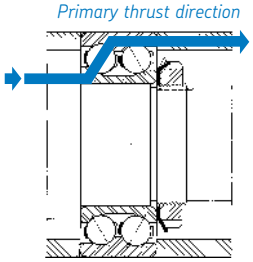
Variations

Angular contact ball bearings, single row for universal matching

These bearings are specially manufactured so that when mounted in random order (back-to-back, face-to-face or tandem) (**Figure 2**), but immediately adjacent to each other, the predetermined value of axial internal clearance or preload will be attained. An even distribution of load will occur without shims or similar devices.

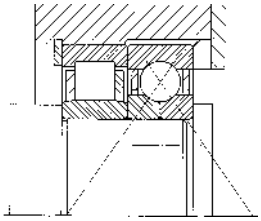
The standard bearings for universal matching carry the suffix CB where C indicates clearance and B the magnitude of the clearance (**Figure 3**). Bearings with a smaller or greater clearance are also available (suffixes CA and CC, respectively) as are bearings with light, moderate or heavy preload, (suffixes GA, GB and GC, respectively where G = preload or negative clearance). When ordering bearings for universal matching; for example 7206 BECB, it is necessary to indicate the number of individual bearings required since SKF does not stock these in sets.

Figure 1a



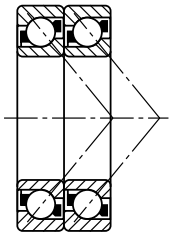
Double row, angular contact ball bearing

Figure 1b

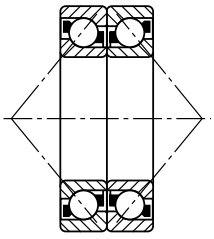


Four-point contact ball bearing

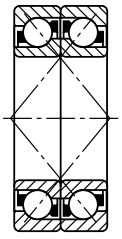
Figure 2



Tandem arrangement



Back-to-back arrangement



Face-to-face arrangement

Limiting speeds

The limiting speeds listed in the bearing tables are guideline values and are valid for single row bearings. The values under oil lubrication are maximum values and the values under grease lubrication are maximum values that can be attained using a good quality grease of a soft consistency.

If single bearings are to be adjusted against each other in matched sets of two, three or four bearings, the limiting speed values given in the bearing tables must be reduced. Reduction factors are given in the table below.

Reduction factors for limiting speeds angular contact ball bearings, single row

Bearing arrangement	Reduction factors
Two bearings	0.80
Three bearings	0.70
Four bearings	0.65

Load carrying capacity of bearing sets

The values given in the bearing tables for the basic dynamic load ratings apply to single bearings. The basic dynamic and static load ratings for sets of bearings arranged back-to-back, face-to-face or in tandem is obtained by multiplying the C value for a single bearings by:

Two bearings	1.62 x C
Three bearings	2.16 x C
Four bearings	2.64 x C

Where the basic static load rating is concerned, the table value C_0 should be multiplied by the number of bearings in the set, 2, 3 or 4.

For example, a pair of 7205 BEGAP angular contact ball bearings will have the following values:

C (single) = 3,510 lbs
C (pair) = 3,510 x 1.62 = 5,690 lbs

C_0 (single) = 2,290 lbs
C_0 (pair) = 2,290 x 2 = 4,580 lbs

Grease speed (single) = 10,000 rpm
Grease speed (pair) = 10,000 x 0.8 = 8,000 rpm

The C, C_0 and speed limits of the pair of bearings must be used for calculation purposes in this case.

Special solutions using angular contact ball bearings

- Precision angular contact ball bearings for machine tools
- Large-size single and double row bearings for heavy engineering applications
- Hub units produced for the automotive industry

The precision angular contact ball bearings are available with a contact angle of 15° (suffix CD) or 25° (suffix ACD) and can be supplied either individually or in matched sets of two, three or four bearings.

Details on these special solution products are available in publication BU/P1 13383 EN, Super-precision bearings.

Figure 3

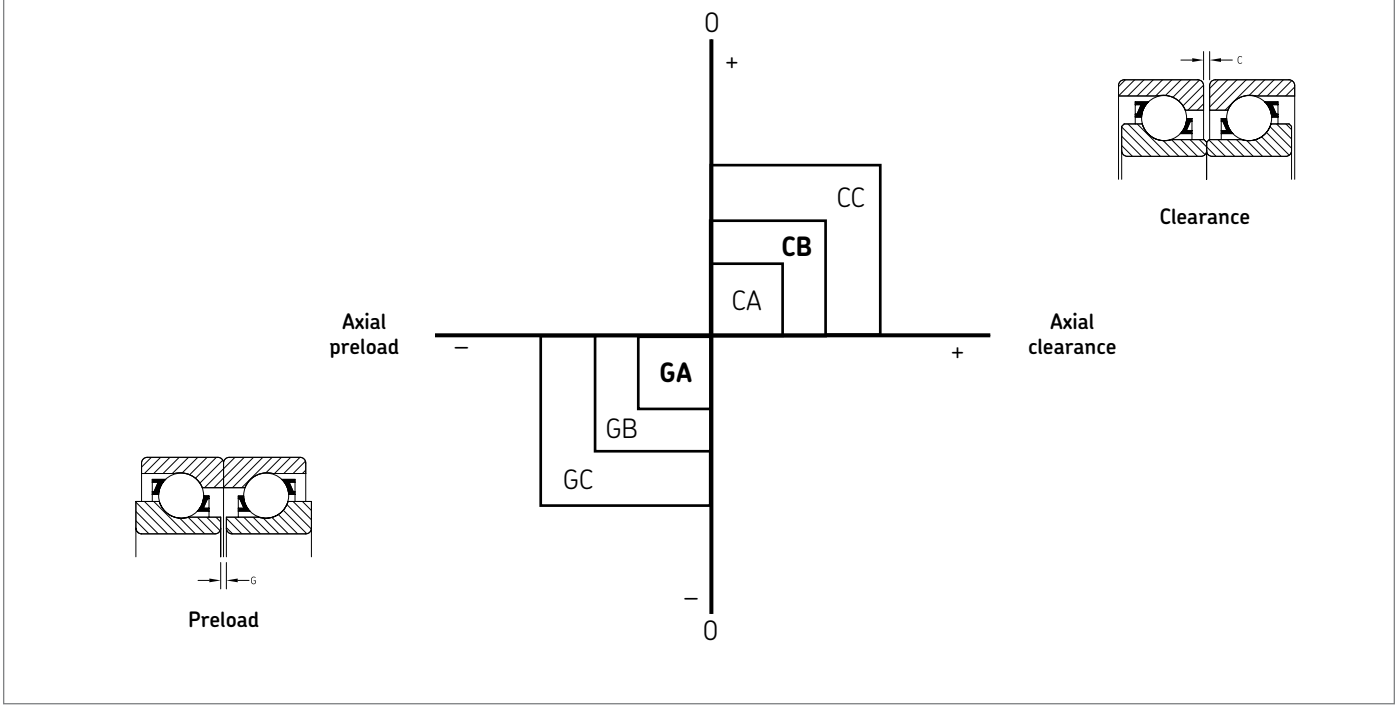
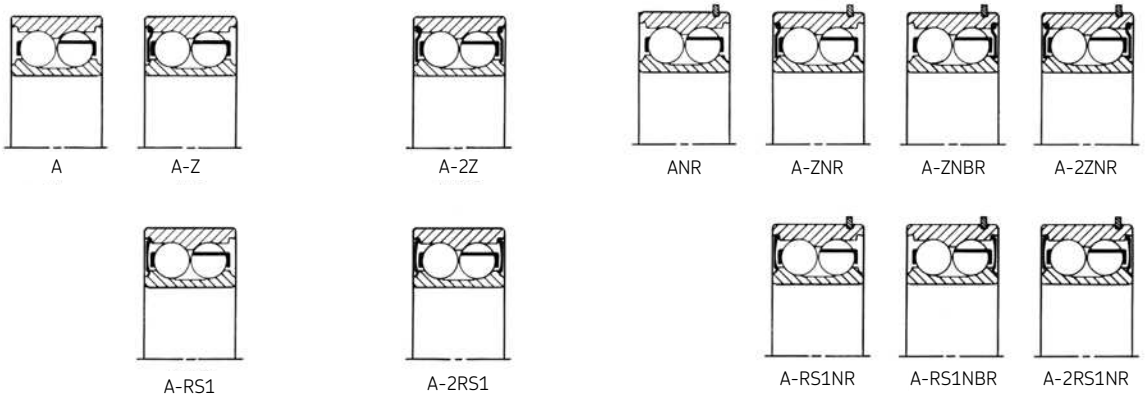


Figure 3a

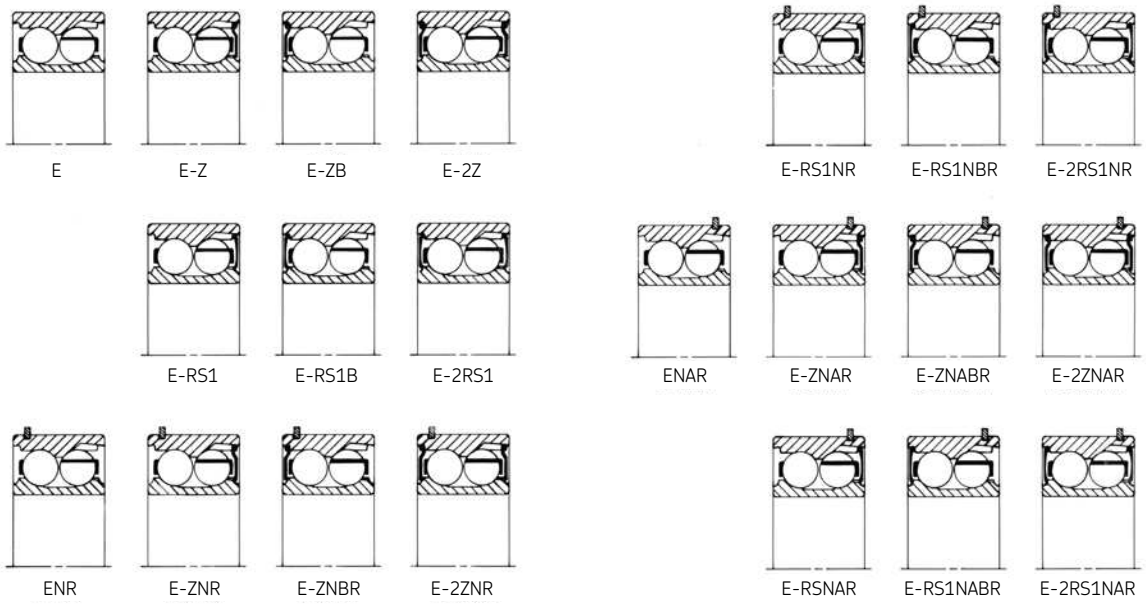
Conrad type

Designations for Conrad type double-row ball bearings with various combinations of seals, shields and snap rings



Max type

Designations for Max type (single slot) filling slot double-row ball bearings with various combinations of seals, shields and snap rings



Angular contact ball bearings, double row

Shielded (Z) and sealed (RS1) bearings

In addition to the open designs, most SKF double row ball bearings are offered with shields or seals, on either one or both sides. In most sizes, open bearings also contain seal grooves on the inner and/or outer rings.

Shields (suffix Z and 2Z) are non-contacting. They form a small gap with a chamfer on the inner ring. They are made from pressed steel and are fixed into an outer ring groove. This non-contacting closure is designed to retain lubricant and exclude larger particles of foreign matter. These shielded bearings are primarily intended for applications with inner ring rotation. Single shielded bearings can be used with oil or grease lubrication, while double shielded bearings are packed with a predetermined quantity of grease, providing maintenance-free operation for the life of the bearings.

Most bearings are also available with either one or two contacting seals, (suffix -RS1 and -2RS1). The seals consist of an oil and wear resistant elastomer bonded to a metal plate. The O.D. of either of the seal is firmly fixed into an outer ring groove. The lip at the I.D. of the seal contacts an inner ring seal chamfer for effective closure. This seal effectively excludes solid contaminants and moisture from the inside surfaces of the bearing. The permissible operating temperature range for the seals with a proper lubricant is -40° to +250° F (-40° to +120° C). Single sealed bearings can be regreased while double sealed bearings are greased for life.

They should not be heated at temperatures greater than 250° F (120° C) prior to mounting and must on no account be washed.

Snap rings

Snap rings (suffix NR) in the outer ring can provide an easy method of locating the bearing in the application. The snap rings and the snap ring grooves in the outer rings generally conform to ABMA Standard 20 and ISO standard 464. Important snap ring dimensions are shown in the deep groove ball bearings section, **Table 4** page 65.

Combination of seals, shields and snap rings

Most bearings are available in various combinations of seals, shields and snap rings. **Figure 3a** illustrates the designations for Conrad type bearings in various configurations and shows the same for max-type filling slot bearings.

In a single sealed or shielded Conrad type bearing with snap ring, the snap ring is normally on the opposite side of the seal or shield. An additional suffix B indicates the snap ring is on the same side as the seal or shield, e.g. NBR.

Max type bearings use a suffix A to indicate that the snap ring is on the side of the filling slot (NAR). Suffix B in single seal or shield designation indicates that the seal or shield is on the opposite side of the filling slot (RS1B or ZB).

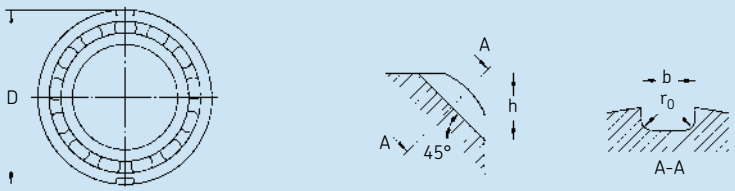
Angular contact ball bearings, four-point

Locating slots

Four-point contact ball bearings are designed to accommodate predominantly axial loads and are arranged as thrust bearings with radial clearance in the housing in many applications. To permit simple location and prevent rotation of the outer ring, all bearings with an outside diameter of 160 mm and above are provided with two locating slots in the outer ring (N2 design). The dimensions of these locating slots are given in **Table 1**.

Table 1

Locating slots in outer ring of four-point contact ball bearings



Outside diameter D				Dimensions Diameter series 2						Diameter series 3						Tolerance[1]	
				h		b		r_0		h		b		r_0		t	
over		incl.														max.	
mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in
35	**1.3779**	**45**	**1.7116**	2.5	0.0398	3.5	0.1378	0.5	0.0197	–	–	–		–		0.2	0.0079
45	**1.7116**	**60**	**2.3622**	3.0	0.2953	4.5	0.1771	0.5	0.0197	3.5	0.1378	4.5	0.1771	0.5	0.0197	0.2	0.0079
60	**2.3622**	**72**	**2.8346**	3.5	0.1378	4.5	0.1771	0.5	0.0197	3.5	0.1378	4.5	0.1771	0.5	0.0197	0.2	0.0079
72	**2.8346**	**95**	**3.7401**	4.0	0.1575	5.5	0.2165	0.5	0.0197	4.0	0.1575	5.5	0.2165	0.5	0.0197	0.2	0.0079
95	**3.7401**	**115**	**4.5276**	5.0	0.1968	6.5	0.2559	0.5	0.0197	5.0	0.1968	6.5	0.2559	0.5	0.0197	0.2	0.0079
115	**4.5276**	**130**	**5.1181**	6.5	0.2559	6.5	0.2559	0.5	0.0197	8.1	0.3189	6.5	0.2559	1.0	0.0394	0.2	0.0079
130	**5.1181**	**145**	**5.7087**	8.1	0.3189	6.5	0.2559	1.0	0.0394	8.1	0.3189	6.5	0.2559	1.0	0.0394	0.2	0.0079
145	**5.7087**	**170**	**6.6929**	8.1	0.3189	6.5	0.2559	1.0	0.0394	10.1	0.3976	8.5	0.3346	2.0	0.0787	0.2	0.0079
170	**6.6929**	**190**	**7.4803**	10.1	0.3976	8.5	0.3346	2.0	0.0787	11.7	0.4606	10.5	0.4134	2.0	0.0787	0.2	0.0079
190	**7.4803**	**210**	**8.2677**	10.1	0.3976	8.5	0.3346	2.0	0.0787	11.7	0.4606	10.5	0.4134	2.0	0.0787	0.2	0.0079
210	**8.2677**	**240**	**9.4488**	11.7	0.4606	10.5	0.4134	2.0	0.0787	11.7	0.4606	10.5	0.4134	2.0	0.0787	0.2	0.0079
240	**9.4488**	**270**	**10.6299**	11.7	0.4606	10.5	0.4134	2.0	0.0787	11.7	0.4606	10.5	0.4134	2.0	0.0787	0.2	0.0079
270	**10.6299**	**400**	**15.7480**	12.7	0.5000	10.5	0.4134	2.0	0.0787	12.7	0.5000	10.5	0.4134	2.0	0.0787	0.4	0.0157

1) Other tolerances are in accordance with ISO 20515.
mm x 0.0394 = inches

Internal clearance

Axial internal clearance single row angular contact ball bearings

Internal clearance in a single row angular contact ball bearing is only obtained after mounting and is dependent on adjustment against a second bearing that provides axial location in the opposite direction.

Bearings for universal pairing (suffix CB) are the standard SKF bearings for paired mounting in random order (back-to-back, face-to-face or tandem). Bearings can be supplied with smaller axial internal clearance (suffix CA) or larger (suffix CC) or with preload (suffixes GA, GB and GC) for universal pairing.

Bearings identified by suffix CA, CB or CC can be mounted immediately adjacent to each other in any order and two or more bearings may be used. Bearings with preload of the GA, GB and GC designs can only be arranged in pairs, otherwise the preload will increase.

The values of axial internal clearance for the classes CA, CB and CC can be found in **Table 2**. They are valid for bearings arranged back-to-back or face-to-face before mounting and under zero measuring load. Preload values for classes GA, GB and GC are given in **Table 2a. Table 3** shows a conversion from the old preload suffices to the current suffix.

Table 2

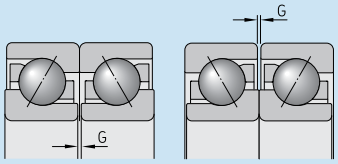
Unmounted axial internal clearance of single row angular contact ball bearings of series 72B (E), 73B (E) and 74B (B) when arranged in random pairs (back-to-back or face-to-face)

Bore diameter		Axial internal clearance													
		CA				CB				CC					
d															
over	incl.	min	max	min	max	min	max	min	max	min	max	min	max		
mm		µm		in		µm		in		µm		in			
–	18	5	13	0.1969	0.5118	15	23	0.5906	0.9055	24	32	0.9449	1.2598		
18	30	7	15	0.2756	0.5906	18	26	0.7087	1.0236	32	40	1.2598	1.5748		
30	50	9	17	0.3543	0.6693	22	30	0.8661	1.1811	40	48	1.5748	1.8898		
50	80	11	23	0.4331	0.9055	26	38	1.0236	1.4961	48	60	1.8898	2.3622		
80	120	14	26	0.5512	1.0236	32	44	1.2598	1.7323	55	67	2.1654	2.6378		
120	160	17	29	0.6693	1.1417	35	47	1.3780	1.8504	62	74	2.4409	2.9134		
160	180	17	29	0.6693	1.1417	35	47	1.3780	1.8504	62	74	2.4409	2.9134		
180	250	21	37	0.8268	1.4567	45	61	1.7717	2.4016	74	90	2.9134	3.5433		
250	315	26	42	1.0236	1.6535	52	68	2.0472	2.6772	90	106	3.5433	4.1732		

Radial clearance [~=] 0.85 axial clearance.
µm x 0.00004 = inches

Table 2a

Unmounted preload of single row angular contact ball bearings of series 72B (E), 73B (E) and 74 (B) when arranged in random pairs (back-to-back or face-to-face)



Bore diameter		Preload																			
		GA						GB								GC							
d																							
over	incl.	min	max	min	max	max	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
mm		µm		in		N	lbf	µm		in		N		lbf		µm		in		N		lbf	
10	18	4	-4	0.0002	-0.0002	80	18	-2	-10	-0.0001	-0.0004	30	330	7	74	-8	-16	-0.0003	-0.0006	230	660	52	149
18	30	4	-4	0.0002	-0.0002	120	27	-2	-10	-0.0001	-0.0004	40	480	9	108	-8	-16	-0.0003	-0.0006	340	970	76	218
30	50	4	-4	0.0002	-0.0002	160	36	-2	-10	-0.0001	-0.0004	60	630	13	142	-8	-16	-0.0003	-0.0006	450	1 280	101	288
50	80	6	-6	0.0002	-0.0002	380	86	-3	-15	-0.0001	-0.0006	140	1 500	31	338	-12	-24	-0.0005	-0.0009	1 080	3 050	243	686
80	120	6	-6	0.0002	-0.0002	410	92	-3	-15	-0.0001	-0.0006	150	1 600	34	360	-12	-24	-0.0005	-0.0009	1 150	3 250	259	731
120	180	6	-6	0.0002	-0.0002	540	122	-3	-15	-0.0001	-0.0006	200	2 150	45	484	-12	-24	-0.0005	-0.0009	1 500	4 300	337	968
180	250	8	-8	0.0003	-0.0003	940	212	-4	-20	-0.0002	-0.0008	330	3 700	74	833	-16	-32	-0.0006	-0.0013	2 650	7 500	596	1 688

µm x 0.00004 = inches

Axial internal clearance double row angular contact ball bearings

Internal clearances for double row angular contact ball bearings differ from deep groove ball bearings in that axial rather than radial clearance is specified. **Table 4** shows the axial clearance of the SKF double row angular contact bearings in four standard clearance ranges; C2 (less than normal clearance), normal clearance, C3 (greater than normal clearance), and C4 (greater than C3 clearance). These are valid for bearings before mounting under zero measuring load.

Axial internal clearance four-point contact ball bearings

Standard manufacture SKF four-point contact ball bearings have Normal axial internal clearance. Most sizes can also be supplied with greater or smaller internal clearance than Normal. Availability should be checked before ordering.

The values for the axial internal clearance are shown in **Table 5** and are for bearings before mounting under zero measuring load.

Old versus current designations on SRACBB (Table 3)

Use this table to determine which current preload designations replace old preload designations. Simply find the bearing bore size/diameter on the left, and the old preload across the top. The current designation is at the point where the bore size/diameter row intersects with the old preload column.

***Example:** 73**08** BEAG1Y = 08 bore size,
40 mm bore diameter
G1 (100 lbs) preload
Replace with: 73**08** BE**GB**Y

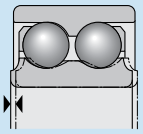
Table 3

Old/current preload designation interchange, single row angular contact ball bearings 72xx, 73xx and 74xx series

Bore size	Bore diameter (mm)	Old preload suffix					
		G02	**G05**	**G1***	**G2**	**G3**	**G5**
00	10	GB	GB	GC	–	–	–
01	12	GB	GB	GC	–	–	–
02	15	GB	GB	GC	–	–	–
03	17	GB	GB	GC	–	–	–
04	20	GA	GB	GC	–	–	–
06	30	GA	GB	GC	–	–	–
07	35	GA	GB	GB	GC	–	–
08*	**40***	**GA**	**GB**	**GB***	**GC**	**–**	**–**
09	45	GA	GB	GB	GC	–	–
10	50	GA	GB	GB	GC	–	–
11	55	GA	GA	GB	GB	GB	GC
12	60	GA	GA	GB	GB	GB	GC
13	65	GA	GA	GB	GB	GB	GC
14	70	GA	GA	GB	GB	GB	GC
15	75	GA	GA	GB	GB	GB	GC
16	80	GA	GA	GB	GB	GB	GC
17	85	GA	GA	GB	GB	GB	GC
18	90	GA	GA	GB	GB	GB	GC
19	95	GA	GA	GB	GB	GB	GC
20	100	GA	GA	GB	GB	GB	GC
21	105	GA	GA	GB	GB	GB	GC
22	110	GA	GA	GB	GB	GB	GC
24	120	GA	GA	GB	GB	GB	GC
26	130	GA	GA	GB	GB	GB	GC
28	140	GA	GA	GB	GB	GB	GC
30	150	GA	GA	GB	GB	GB	GC
32	160	GA	GA	GB	GB	GB	GC
34	170	GA	GA	GB	GB	GB	GC
36	180	GA	GA	GB	GB	GB	GC

Table 4

Axial internal clearance of Conrad type and filling slot double row angular contact ball bearings 32 and 33 series (values in 0.001 mm)



Bore diameter d		Axial internal clearance															
		C2				**Normal (not designated)**				**C3**				**C4**			
over	incl.	min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
mm		µm		in		µm		in		µm		in		µm		in	
-	10	1	11	0.0000	0.0004	5	21	0.0002	0.0008	12	28	0.0005	0.0011	25	45	0.0010	0.0018
10	18	1	12	0.0000	0.0005	6	23	0.0002	0.0009	13	31	0.0005	0.0012	27	47	0.0011	0.0019
18	24	2	14	0.0001	0.0006	7	25	0.0003	0.0010	16	34	0.0006	0.0013	28	48	0.0011	0.0019
24	30	2	15	0.0001	0.0006	8	27	0.0003	0.0011	18	37	0.0007	0.0015	30	50	0.0012	0.0020
30	40	2	16	0.0001	0.0006	9	29	0.0004	0.0011	21	40	0.0008	0.0016	33	54	0.0013	0.0021
40	50	2	18	0.0001	0.0007	11	33	0.0004	0.0013	23	44	0.0009	0.0017	36	58	0.0014	0.0023
50	65	3	22	0.0001	0.0009	13	36	0.0005	0.0014	26	48	0.0010	0.0019	40	63	0.0016	0.0025
65	80	3	24	0.0001	0.0009	15	40	0.0006	0.0016	30	54	0.0012	0.0021	46	71	0.0018	0.0028
80	100	3	26	0.0001	0.0010	18	46	0.0007	0.0018	35	63	0.0014	0.0025	55	83	0.0022	0.0033
100	110	4	30	0.0002	0.0012	22	53	0.0009	0.0021	42	73	0.0017	0.0029	65	96	0.0026	0.0038

Introduction

Table 5

Axial internal clearance of four-point contact ball bearings

Bore diameter d				Axial internal clearance															
				C2				Normal (not designated)				C3				C4			
over		incl.		min	max	min	max	min	max	min	max	min	max	min	max	min	max	min	max
mm	in	mm	in	µm		in		µm		in		µm		in		µm		in	
10	**18**	**0.3937**	**0.7087**	15	65	0.0006	0.0026	50	95	0.0020	0.0038	85	130	0.0034	0.0052	120	165	0.0048	0.0066
18	**40**	**0.7087**	**1.5748**	25	75	0.0010	0.0030	65	110	0.0026	0.0044	100	150	0.0040	0.0060	135	185	0.0054	0.0074
40	**60**	**1.5748**	**2.3622**	35	85	0.0014	0.0034	75	125	0.0030	0.0050	110	165	0.0044	0.0066	150	200	0.0060	0.0080
60	**80**	**2.3622**	**3.1496**	45	100	0.0018	0.0040	85	140	0.0034	0.0056	125	175	0.0050	0.0070	165	215	0.0066	0.0086
80	**100**	**3.1496**	**3.9370**	55	110	0.0022	0.0044	95	150	0.0038	0.0060	135	190	0.0054	0.0076	180	235	0.0072	0.0094
100	**140**	**3.9370**	**5.5118**	70	130	0.0028	0.0052	115	175	0.0046	0.0070	160	220	0.0064	0.0088	205	265	0.0082	0.0106
140	**180**	**5.5118**	**7.0866**	90	155	0.0036	0.0062	135	200	0.0054	0.0080	185	250	0.0074	0.0100	235	300	0.0094	0.0120
180	**220**	**7.0866**	**8.6614**	105	175	0.0042	0.0070	155	225	0.0062	0.0102	210	280	0.0084	0.0112	260	330	0.0104	0.0132

Radial clearance ≈0.7 axial clearance.

Design of bearing arrangements

When designing bearing arrangements using single row angular contact ball bearings it is necessary to pay attention to the special characteristics of the bearings. Because of their internal design they cannot be used singly and must be used either with a second bearing **(Figure 4)** or as bearing sets **(Figure 5)**.

As already mentioned under "Internal clearance", it is necessary to adjust the two single row angular contact ball bearings of an arrangement against each other until the operational clearance or requisite preload is obtained.

Arrangements using bearings for universal mounting, where the bearings are immediately adjacent to each other, do not require adjustment. Here, the required operational preload or clearance is obtained by choosing an appropriate preload or clearance class as well as suitable fits for the bearings in the housing and on the shaft.

For more specific mounting instructions visit the SKF website at www.skf.com/mount or contact SKF Applications Engineering.

Figure 4

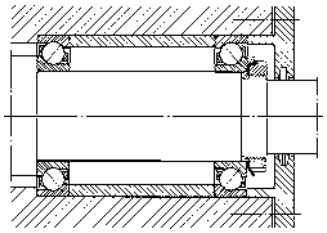


Figure 5

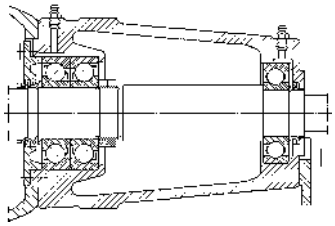


Table 6

Calculation factors for double row angular contact ball bearings

Bearing series	Calculation factors				
	e	X	Y1	Y2	Y0
32 A, 33 A	0.80	0.63	0.78	1.24	0.66
33 D	1.34	0.54	0.47	0.81	0.44
33 DNRCBM	1.14	0.57	0.55	0.93	0.52

Loads

Equivalent dynamic bearing load for single row bearings of the B and BE designs when mounted as single bearings or paired in tandem

$P = F_r$ when $F_a / F_r \leq 1.14$
$P = 0.35\ F_r + 0.57\ F_a$ when $F_a / F_r > 1.14$

where
P = equivalent dynamic bearing load
F_r = radial load acting on the bearing
F_a = axial load acting on the bearing

When determining the axial force Fa reference should be made to the following section.

Equivalent dynamic bearing load for bearings mounted in pairs, back-to-back or face-to-face

$P = F_r + 0.55\ F_a$
when $F_a / F_r \leq 1.14$

$P = 0.57\ F_r + 0.93\ F_a$
when $F_a / F_r > 1.14$

F_a and F_r are the forces acting on the bearing pair.

Equivalent dynamic bearing load for double row bearings

For the double row angular contact bearings described in this catalog, the equivalent dynamic bearing load is

$F_a / F_r \leq e \rightarrow P = F_r + Y_1 F_a$
$F_a / F_r > e \rightarrow P = XF_r + Y_2 F_a$

where
P = equivalent dynamic bearing load
X, Y_1, Y_2, Y_0 = calculation factors (see **Table 6**)
F_r = actual radial bearing load
F_a = actual axial bearing load

Equivalent dynamic bearing load for four-point contact bearings

When four-point contact ball bearings with a contact angle of 35° are used as locating bearings to accommodate radial and axial loads, the equivalent dynamic bearing load can be obtained from

$P = F_r + 0.66\ F_a$
when $F_a / F_r \leq 0.95$

$P = 0.6\ F_r + 1.07\ F_a$
when $F_a / F_r > 0.95$

It should be remembered that satisfactory performance of the ball set of four-point contact ball bearings is only obtained when the balls are in contact with the raceways at two points, i.e. when the axial load

$F_a \geq 1.27\ F_r$

If the four-point contact ball bearing is used as a thrust bearing in combination with other radial bearings, and it is mounted with radial clearance in the housing, the equivalent dynamic bearing load becomes

$P = 1.07\ F_a$

Minimum load

In order to provide satisfactory operation of all ball and roller bearings they must always be subjected to a given minimum load.

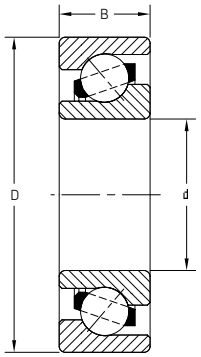
This is also true of angular contact ball bearings, particularly if they run at high speeds where the inertia forces of the balls and cage, and the friction in the lubricant can have a detrimental influence on the rolling conditions in the bearing and may cause damaging sliding movements to occur between the balls and the raceways.

The requisite minimum radial load to be applied in such cases can be determined by using the tools available on the SKF website www.skf.com under Knowledge Centre/Engineering tools and CAD, or by contacting SKF Applications Engineering. However, the weight of the components supported by the bearing, together with the external forces, often exceeds the requisite minimum load. If this is not the case, an additional radial load must be applied to the bearing; for example, by increasing belt tension, by applying a preload to the inner or outer rings, or by using springs.

Frequency vibration data

Frequency vibration data is available on the SKF website, www.skf.com under Knowledge Centre/Engineering tools and CAD, or by contacting SKF Applications Engineering.

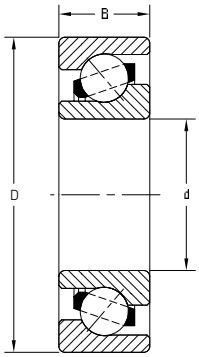
Single row
Standard
Series: 7024 B – 70/1250 AMB
Size: 120 mm – 1250 mm
4.2744 in – 49.2126 in



These bearings are typically used in pairs and require additional suffix letters to define the end play and preload values as well as cage type for the specific application conditions. Refer to page 60 for details.

Designation	Principal dimensions						Basic load ratings				Speed rating		Mass	
	Bore d		Outside dimeter D		Width B		Dynamic C		Static C_0		Reference speed	Limiting speed		
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	r/min	kg	lb
7024 B	120	4.7244	180	7.0866	28	1.1024	87 100	19 570	93 000	20 900	3 000	4 000	2.4	5.29
7028 B	140	5.5118	210	8.2677	33	1.2992	114 000	25 620	129 000	28 990	2 400	3 400	3.85	8.49
7030 B	150	5.9055	225	8.8583	35	1.3780	133 000	29 890	146 000	32 810	2 400	3 200	4.7	10.36
7034 B	170	6.6929	260	10.2362	42	1.6535	172 000	38 650	204 000	45 840	2 000	2 800	7.65	16.87
7036 B	180	7.0866	280	11.0236	46	1.8110	195 000	43 820	240 000	53 900	1 900	2 600	10	22.05
7038 B	190	7.4803	290	11.4173	46	1.8110	199 000	44 720	255 000	57 300	1 800	2 400	10.5	23.15
7040 B	200	7.8740	310	12.2047	51	2.0079	225 000	50 600	290 000	65 200	1 700	2 200	18	39.69
7044 B	220	8.6614	340	13.3858	56	2.2047	255 000	57 300	355 000	79 800	1 600	2 000	18	39.69
7048 B	240	9.4488	360	14.1732	56	2.2047	260 000	58 400	375 000	84 300	1 500	1 900	19	41.90
7052 B	260	10.2362	400	15.7480	65	2.5591	332 000	74 600	510 000	114 600	1 300	1 700	30	66.15
7056 B	280	11.0236	420	16.5354	65	2.5591	338 000	76 000	540 000	121 300	1 200	1 600	30	66.15
7060 B	300	11.8110	460	18.1102	74	2.9134	377 000	84 700	630 000	141 600	1 400	1 500	42.5	93.71
7064 B	320	12.5984	480	18.8976	74	2.9134	390 000	87 600	670 000	150 600	1 300	1 400	44.5	98.12
7068 B	340	13.3858	520	20.4724	82	3.2283	449 000	100 900	815 000	183 100	1 200	1 300	59.5	131.20
7072 B	360	14.1732	540	21.2598	82	3.2283	462 000	103 800	850 000	191 000	1 200	1 200	61.8	136.27
7076 B	380	14.9606	560	22.0472	82	3.2283	468 000	105 200	850 000	191 000	1 100	1 200	64.7	142.66
7080 B	400	15.7480	600	23.6220	90	3.5433	527 000	118 400	1 020 000	229 200	1 000	1 100	90.5	199.55
7084 B	420	16.5354	620	24.4094	90	3.5433	540 000	121 300	1 060 000	238 200	1 000	1 000	88	194.04
7088 B	440	17.3228	650	25.5906	94	3.7008	572 000	128 500	1 180 000	265 200	950	950	100	220.50
7092 B	460	18.1102	680	26.7717	100	3.9370	618 000	138 900	1 290 000	289 900	900	900	120	264.60
7096 B	480	18.8976	700	27.5591	100	3.9370	624 000	140 200	1 340 000	301 100	850	900	125	275.63
70/500 B	500	19.6850	720	28.3465	100	3.9370	637 000	143 100	1 400 000	314 600	800	850	130	286.65
70/530 B	530	20.8661	780	30.7087	112	4.4094	741 000	166 500	1 700 000	382 000	750	800	180	396.90
70/560 AMB	560	22.0472	820	32.2835	115	4.5276	793 000	178 200	1 900 000	427 000	700	700	203	447.62
708/600 AMB	600	23.6220	730	28.7402	42	1.6535	338 000	76 000	735 000	165 200	800	850	38.5	84.89
70/600 AGMB	600	23.6220	870	34.2520	118	4.6457	884 000	198 700	2 160 000	485 400	700	750	236	520.38
70/630 AMB	630	24.8031	920	36.2205	128	5.0394	956 000	214 800	2 450 000	550 600	560	700	270	595.35
70/670 AMB	670	26.3780	980	38.5827	136	5.3543	1 170 000	262 900	3 100 000	696 600	560	560	353	778.37
70/710 AMB	710	27.9528	1 030	40.5512	140	5.5118	1 190 000	267 400	3 250 000	730 300	560	600	370	815.85
70/750 AMB	750	29.5276	1 090	42.9134	150	5.9055	1 300 000	292 100	3 650 000	820 200	530	560	445	981.23
70/800 AMB	800	31.4961	1 150	45.2756	155	6.1024	1 250 000	280 900	3 650 000	820 200	450	450	524	1155.42
70/850 AMB	850	33.4646	1 220	48.0315	165	6.4961	1 380 000	310 100	4 150 000	932 600	400	400	626	1380.33
70/900 AMB	900	35.4331	1 280	50.3937	170	6.6929	1 560 000	350 600	4 900 000	1 101 100	400	430	665	1466.33
70/950 AMB	950	37.4016	1 360	53.5433	180	7.0866	1 630 000	366 300	5 200 000	1 168 500	380	400	805	1775.03
70/1000 AMB	1 000	39.3701	1 420	55.9055	185	7.2835	1 630 000	366 300	5 400 000	1 213 500	360	380	890	1962.45
70/1060 AMB	1 060	41.7323	1 500	59.0551	195	7.6772	1 680 000	377 500	5 700 000	1 280 900	320	340	1 050	2315.25
70/1120 AMB	1 120	44.0945	1 580	62.2047	200	7.8740	1 720 000	386 500	5 850 000	1 314 600	300	320	1 150	2535.75
70/1180 AMB	1 180	46.4567	1 660	65.3543	212	8.3465	1 740 000	391 000	6 200 000	1 393 300	280	280	1 350	2976.75
708/1250 AMB	1 250	49.2126	1 500	59.0551	80	3.1496	806 000	181 100	2 700 000	606 700	280	300	295	650.48
70/1250 AMB	1 250	49.2126	1 750	68.8976	218	8.5827	1 780 000	400 000	6 550 000	1 471 900	240	260	1 600	3528.00

Consult SKF USA Inc. prior to design change or order placement.



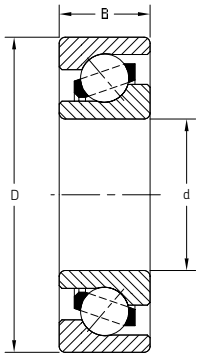
Single row
Standard and SKF Explorer
Series: 7200 BE – 7280 B
Size: 10 mm – 400 mm
0.3937 in – 15.7480 in

These bearings are typically used in pairs and require additional suffix letters to define the end play and preload values as well as cage type for the specific application conditions. Refer to page 60 for details.

Designation	Principal dimensions						Basic load ratings				Speed rating		Mass	
	Bore d		Outside dimeter D		Width B		Dynamic C		Static C_0		Reference speed	Limiting speed		
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	r/min	kg	lb
7200 BE	10	0.3937	30	1.1811	9	0.3543	7 020	1 580	3 350	750	22 000	30 000	0.03	0.07
7201 BE	12	0.4724	32	1.2598	10	0.3937	7 610	1 710	3 800	850	20 000	26 000	0.036	0.08
7202 BE	15	0.5906	35	1.3780	11	0.4331	8 320	1 870	4 400	990	18 000	24 000	0.045	0.10
7203 BE	17	0.6693	40	1.5748	12	0.4724	10 400	2 340	5 500	1 240	15 000	20 000	0.065	0.14
7204 BE	20	0.7874	47	1.8504	14	0.5512	13 300	2 990	7 650	1 720	13 000	18 000	0.11	0.24
7205 BE	25	0.9843	52	2.0472	15	0.5906	14 800	3 330	9 300	2 090	11 000	15 000	0.13	0.29
7206 BE	30	1.1811	62	2.4409	16	0.6299	22 500	5 060	14 300	3 210	9 500	13 000	0.2	0.44
7207 BE	35	1.3780	72	2.8346	17	0.6693	29 100	6 540	19 000	4 270	8 000	11 000	0.28	0.62
7208 BE	40	1.5748	80	3.1496	18	0.7087	34 500	7 750	24 000	5 390	7 000	10 000	0.37	0.82
7209 BE	45	1.7717	85	3.3465	19	0.7480	35 800	8 040	26 000	5 840	6 700	9 000	0.42	0.93
7210 BE	50	1.9685	90	3.5433	20	0.7874	37 700	8 470	28 500	6 400	6 300	8 500	0.47	1.04
7211 BE	55	2.1654	100	3.9370	21	0.8268	46 200	10 380	36 000	8 090	5 600	7 500	0.62	1.37
7212 BE	60	2.3622	110	4.3307	22	0.8661	57 200	12 850	45 500	10 220	5 000	7 000	0.8	1.76
7213 BE	65	2.5591	120	4.7244	23	0.9055	66 300	14 900	54 000	12 130	4 800	6 300	1	2.21
7214 BE	70	2.7559	125	4.9213	24	0.9449	67 600	15 190	56 000	12 580	4 500	6 000	1.1	2.43
7215 BE	75	2.9528	130	5.1181	25	0.9843	70 200	15 780	60 000	13 480	5 600	5 600	1.2	2.65
7216 BE	80	3.1496	140	5.5118	26	1.0236	80 600	18 110	69 500	15 620	4 000	5 300	1.45	3.20
7217 BE	85	3.3465	150	5.9055	28	1.1024	95 600	21 480	83 000	18 650	3 800	5 000	1.85	4.08
7218 BE	90	3.5433	160	6.2992	30	1.1811	108 000	24 270	96 500	21 690	3 600	4 500	2.3	5.07
7219 BE	95	3.7402	170	6.6929	32	1.2598	124 000	27 870	108 000	24 270	3 200	4 300	2.7	5.95
7220 BE	100	3.9370	180	7.0866	34	1.3386	135 000	30 340	122 000	27 420	3 200	4 000	3.3	7.28
7221 BE	105	4.1339	190	7.4803	36	1.4173	148 000	33 260	137 000	30 790	3 000	3 800	3.95	8.71
7222 BE	110	4.3307	200	7.8740	38	1.4961	153 000	34 380	143 000	32 130	2 800	3 600	4.6	10.14
7224 B	120	4.7244	215	8.4646	40	1.5748	165 000	37 080	163 000	36 630	2 600	3 600	5.89	12.99
7226 B	130	5.1181	230	9.0551	40	1.5748	186 000	41 800	193 000	43 370	2 400	3 400	6.95	15.32
7228 B	140	5.5118	250	9.8425	42	1.6535	199 000	44 720	212 000	47 640	2 200	3 000	8.85	19.51
7230 B	150	5.9055	270	10.6299	45	1.7717	216 000	48 540	240 000	53 900	2 000	3 200	11.5	25.36
7232 B	160	6.2992	290	11.4173	48	1.8898	255 000	57 300	300 000	67 400	2 000	3 000	14	30.87
7234 B	170	6.6929	310	12.2047	52	2.0472	281 000	63 100	345 000	77 500	1 800	2 800	17.5	38.59
7236 B	180	7.0866	320	12.5984	52	2.0472	291 000	65 400	375 000	84 300	1 800	2 600	18	39.69
7238 B	190	7.4803	340	13.3858	55	2.1654	307 000	69 000	405 000	91 000	1 800	2 600	22	48.51
7240 B	200	7.8740	360	14.1732	58	2.2835	325 000	73 000	430 000	96 600	1 600	2 400	25	55.13
7244 B	220	8.6614	400	15.7480	65	2.5591	390 000	87 600	560 000	125 800	1 400	2 200	37	81.59
7248 B	240	9.4488	440	17.3228	72	2.8346	449 000	100 900	670 000	150 600	1 600	2 600	49	108.05
7252 B	260	10.2362	480	18.8976	80	3.1496	507 000	113 900	780 000	175 300	1 400	1 500	66	145.53
7256 B	280	11.0236	500	19.6850	80	3.1496	507 000	113 900	830 000	186 500	1 400	1 400	67.5	148.84
7260 B	300	11.8110	540	21.2598	85	3.3465	553 000	124 300	930 000	209 000	1 300	1 300	85	187.43
7264 B	320	12.5984	580	22.8346	92	3.6220	572 000	128 500	1 020 000	229 200	1 200	1 200	110	242.55
7268 B	340	13.3858	620	24.4094	92	3.6220	702 000	157 800	1 340 000	301 100	1 100	1 100	125	275.63
7272 B	360	14.1732	650	25.5906	95	3.7402	806 000	181 100	1 559 999	350 600	1 900	1 700	145	319.73
7280 B	400	15.7480	720	28.3465	103	4.0551	728 000	163 600	1 500 000	337 100	900	950	190	418.95

Consult SKF USA Inc. prior to design change or order placement.

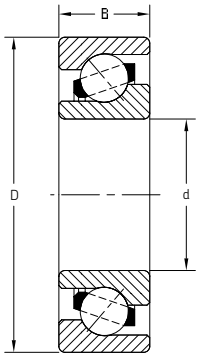
Single row
Standard and SKF Explorer
Series: 7301 BE – 7348 B
Size: 12 mm – 240 mm
0.4724 in – 9.4488 in



These bearings are typically used in pairs and require additional suffix letters to define the end play and preload values as well as cage type for the specific application conditions. Refer to page 60 for details.

Designation	Principal dimensions						Basic load ratings				Speed rating		Mass	
	Bore d		Outside dimeter D		Width B		Dynamic C		Static C_0		Reference speed	Limiting speed		
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	r/min	kg	lb
7301 BE	12	0.4724	37	1.4567	12	0.4724	10 600	2 380	5 000	1 120	18 000	24 000	0.06	0.13
7302 BE	15	0.5906	42	1.6535	13	0.5118	13 000	2 920	6 700	1 510	15 000	20 000	0.08	0.18
7303 BE	17	0.6693	47	1.8504	14	0.5512	15 900	3 570	8 300	1 870	14 000	19 000	0.11	0.24
7304 BE	20	0.7874	52	2.0472	15	0.5906	17 400	3 910	9 500	2 130	12 000	16 000	0.14	0.31
7305 BE	25	0.9843	62	2.4409	17	0.6693	24 200	5 440	14 000	3 150	10 000	14 000	0.23	0.51
7306 BE	30	1.1811	72	2.8346	19	0.7480	32 500	7 300	19 300	4 340	8 500	12 000	0.34	0.75
7307 BE	35	1.3780	80	3.1496	21	0.8268	39 000	8 760	24 500	5 510	7 500	10 000	0.45	0.99
7308 BE	40	1.5748	90	3.5433	23	0.9055	46 200	10 380	30 500	6 850	6 700	9 000	0.62	1.37
7309 BE	45	1.7717	100	3.9370	25	0.9843	55 900	12 560	37 500	8 430	6 000	8 000	0.82	1.81
7310 BE	50	1.9685	110	4.3307	27	1.0630	68 900	15 480	47 500	10 670	5 300	7 500	1.1	2.43
7311 BE	55	2.1654	120	4.7244	29	1.1417	79 300	17 820	55 000	12 360	5 000	6 700	1.4	3.09
7312 BE	60	2.3622	130	5.1181	31	1.2205	95 600	21 480	69 500	15 620	4 500	6 000	1.75	3.86
7313 BE	65	2.5591	140	5.5118	33	1.2992	108 000	24 270	80 000	17 980	4 300	5 600	2.15	4.74
7314 BE	70	2.7559	150	5.9055	35	1.3780	119 000	26 740	90 000	20 220	4 000	5 300	2.65	5.84
7315 BE	75	2.9528	160	6.2992	37	1.4567	125 000	28 090	98 000	22 020	3 800	5 000	3.2	7.06
7316 BE	80	3.1496	170	6.6929	39	1.5354	135 000	30 340	110 000	24 720	3 600	4 500	3.8	8.38
7317 BE	85	3.3465	180	7.0866	41	1.6142	146 000	32 810	122 000	27 420	3 200	4 300	4.45	9.81
7318 BE	90	3.5433	190	7.4803	43	1.6929	156 000	35 060	134 000	30 110	3 200	4 000	5.2	11.47
7319 BE	95	3.7402	200	7.8740	45	1.7717	168 000	37 750	150 000	33 710	3 000	3 800	6.05	13.34
7320 BE	100	3.9370	215	8.4646	47	1.8504	203 000	45 620	190 000	42 700	2 800	3 600	7.5	16.54
7321 BE	105	4.1339	225	8.8583	49	1.9291	203 000	45 620	193 000	43 370	2 600	3 400	8.55	18.85
7322 BE	110	4.3307	240	9.4488	50	1.9685	225 000	50 600	224 000	50 300	2 400	3 200	10	22.05
7324 B	120	4.7244	260	10.2362	55	2.1654	238 000	53 500	250 000	56 200	2 200	3 600	14.5	31.97
7326 B	130	5.1181	280	11.0236	58	2.2835	276 000	62 000	305 000	68 500	2 000	2 800	17.1	37.71
7328 B	140	5.5118	300	11.8110	62	2.4409	302 000	67 900	345 000	77 500	2 000	3 000	21.5	47.41
7330 B	150	5.9055	320	12.5984	65	2.5591	332 000	74 600	390 000	87 600	1 900	2 800	26	57.33
7332 B	160	6.2992	340	13.3858	68	2.6772	358 000	80 400	440 000	98 900	1 800	2 600	30.32	66.86
7334 B	170	6.6929	360	14.1732	72	2.8346	390 000	87 600	490 000	110 100	1 600	2 600	36	79.38
7336 B	180	7.0866	380	14.9606	75	2.9528	410 000	92 100	540 000	121 300	1 600	2 400	42	92.61
7338 B	190	7.4803	400	15.7480	78	3.0709	442 000	99 300	600 000	134 800	1 500	2 200	48.5	106.94
7340 B	200	7.8740	420	16.5354	80	3.1496	462 000	103 800	655 000	147 200	1 400	2 200	53	116.87
7344 B	220	8.6614	460	18.1102	88	3.4646	494 000	111 000	720 000	161 800	1 600	1 700	70	154.35
7348 B	240	9.4488	500	19.6850	95	3.7402	559 000	125 600	800 000	179 800	1 400	1 500	89.4	197.13

Consult SKF USA Inc. prior to design change or order placement.



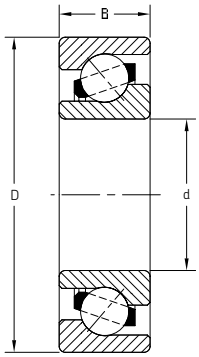
Single row
Series: 7405 B – 7420
Standard
Size: 25 mm – 100 mm
0.9843 in – 3.9370 in

Series: AMS 22 ABP – ALS 40 ABM
Standard
Size: 69.85 mm – 127 mm
2.75 in – 5.00 in

Designation	Principal dimensions						Basic load ratings				Speed rating		Mass	
	Bore d		Outside dimeter D		Width B		Dynamic C		Static C_0		Reference speed	Limiting speed		
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	r/min	kg	lb
7405 B	25	0.9843	80	3.1496	21	0.8268	39 700	8 920	23 600	5 300	11 000	11 000	0.61	1.35
7406 B	30	1.1811	90	3.5433	23	0.9055	47 500	10 670	29 000	6 520	10 000	10 000	0.83	1.83
7407 B	35	1.3780	100	3.9370	25	0.9843	60 500	13 600	38 000	8 540	8 500	9 000	1.10	2.43
7408 B	40	1.5748	110	4.3307	27	1.0630	70 200	15 780	45 000	10 110	8 000	8 000	1.40	3.09
7409 B	45	1.7717	120	4.7244	29	1.1417	85 200	19 150	55 000	12 360	7 000	7 500	1.55	3.42
7410 B	50	1.9685	130	5.1181	31	1.2205	95 600	21 480	64 000	14 380	6 300	6 700	2.25	4.96
7411 B	55	2.1654	140	5.5118	33	1.2992	111 000	24 940	76 500	17 190	6 000	6 300	2.35	5.18
7412 B	60	2.3622	150	5.9055	35	1.3780	119 000	26 740	86 500	19 440	5 600	6 000	3.30	7.28
7413 B	65	2.5591	160	6.2992	37	1.4567	130 000	29 210	96 500	21 690	5 000	5 300	4.00	8.82
7414 B	70	2.7559	180	7.0866	42	1.6535	159 000	35 730	127 000	28 540	4 500	4 800	5.00	11.03
7415 B	75	2.9528	190	7.4803	45	1.7717	168 000	37 750	140 000	31 460	4 300	4 500	6.85	15.10
7416 B	80	3.1496	200	7.8740	48	1.8898	178 000	40 000	153 000	34 380	4 000	4 300	8.10	17.86
7417 B	85	3.3465	210	8.2677	52	2.0472	190 000	42 700	166 000	37 300	3 800	4 000	9.60	21.17
7418	90	3.5433	225	8.8583	54	2.1260	212 000	47 640	193 000	43 370	3 600	3 800	11.50	25.36
7419	95	3.7402	250	9.8425	55	2.1654	242 000	54 400	236 000	53 000	3 400	3 400	13.50	29.77
7420	100	3.9370	265	10.4331	60	2.3622	265 000	59 600	270 000	60 700	3 200	3 200	15.50	34.18
AMS 22 ABP	69.85	2.7500	158.75	6.2500	34.92	1.3750	138 000	31 010	104 000	23 370	6 000	6 000	3.60	7.94
AMS 24 ABP	76.20	3.0000	177.80	7.0000	39.69	1.5625	163 000	36 630	137 000	30 790	5 000	5 000	5.21	11.49
ALS 28 ABP	88.90	3.5000	165.10	6.5000	28.57	1.1250	127 000	28 540	112 000	25 170	5 000	5 000	2.89	6.37
ALS 32 ABP	101.60	4.0000	184.15	7.2500	31.75	1.2500	159 000	35 730	143 000	32 130	4 500	4 500	3.15	6.95
ALS 40 ABM	127.00	5.0000	228.60	9.0000	34.92	1.3750	186 000	41 800	190 000	42 700	3 600	3 600	6.10	13.45

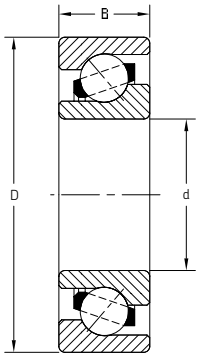
Consult SKF USA Inc. prior to design change or order placement.

Single row
Standard
Series: 71964 AC – 719/710 ACMB
Size: 320 mm – 710 mm
12.5894 in – 27.9528 in



Designation	Principal dimensions						Basic load ratings				Speed rating		Mass	
	Bore d		Outside dimeter D		Width B		Dynamic C		Static C_0		Reference speed	Limiting speed		
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	r/min	kg	lb
71964 AC	320	12.5984	440	17.3228	56	2.2047	351 000	78 900	585 000	131 500	1 500	1 600	25.5	56.23
71968 AC	340	13.3858	460	18.1102	56	2.2047	338 000	76 000	585 000	131 500	1 500	1 500	24	52.92
71972 B	360	14.1732	480	18.8976	56	2.2047	302 000	67 900	550 000	123 600	1 400	1 500	28.5	62.84
71972 A	360	14.1732	480	18.8976	56	2.2047	338 000	76 000	610 000	137 100	1 400	1 500	28.5	62.84
71972 AC	360	14.1732	480	18.8976	56	2.2047	351 000	78 900	630 000	141 600	1 400	1 500	28	61.74
71976 AC	380	14.9606	520	20.4724	65	2.5591	410 000	92 100	735 000	165 200	1 300	1 300	40.5	89.30
71980 A	400	15.7480	540	21.2598	65	2.5591	403 000	90 600	735 000	165 200	1 200	1 200	39	86.00
71984 B	420	16.5354	560	22.0472	65	2.5591	364 000	81 800	670 000	150 600	1 200	1 200	44.5	98.12
71984 A	420	16.5354	560	22.0472	65	2.5591	410 000	92 100	765 000	171 900	1 200	1 200	42	92.61
71988 AC	440	17.3228	600	23.6220	74	2.9134	507 000	113 900	1 040 000	233 700	1 000	1 100	61	134.51
71992 AC	460	18.1102	620	24.4094	74	2.9134	507 000	113 900	1 040 000	233 700	100	1 100	58	127.89
719/500 AGMB	500	19.6850	670	26.3780	78	3.0709	553 000	124 300	1 220 000	274 200	950	1 000	78	171.99
719/530 ACM	530	20.8661	710	27.9528	82	3.2283	618 000	138 900	1 340 000	301 100	850	900	92	202.86
719/560 AMB	560	22.0472	750	29.5276	85	3.3465	592 000	133 000	1 290 000	289 900	800	850	105	231.53
719/600 ACM	600	23.6220	800	31.4961	90	3.5433	715 000	160 700	1 730 000	388 800	750	800	125	275.63
719/710 ACMB	710	27.9528	950	37.4016	106	4.1732	852 000	191 500	2 200 000	494 400	600	630	195	429.98

Consult SKF USA Inc. prior to design change or order placement.

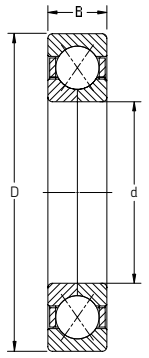


Single row
Standard
Series: 71872 AC – 718/1250 AMB
Size: 360 mm – 1250 mm
14.1732 in – 49.2126 in

Designation	Principal dimensions						Basic load ratings				Speed rating		Mass	
	Bore d		Outside dimeter D		Width B		Dynamic C		Static C_0		Reference speed	Limiting speed		
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	r/min	kg	lb
71872 AC	360	14.1732	440	17.3228	38	1.4961	234 000	52 600	425 000	95 500	1 500	1 500	12	26.46
71876 AC	380	14.9606	480	18.8976	46	1.8110	291 000	65 400	500 000	112 400	1 300	1 400	18	39.69
71892 AG	460	18.1102	580	22.8346	56	2.2047	371 000	83 400	765 000	171 900	1 100	1 100	35	77.18
718/500 AM	500	19.6850	620	24.4094	56	2.2047	390 000	87 600	850 000	191 000	1 000	1 000	38	83.79
718/530 AMB	530	20.8661	650	25.5906	56	2.2047	390 000	87 600	900 000	202 200	950	1 000	39.5	87.10
718/560 AMB	560	22.0472	680	26.7717	56	2.2047	397 000	89 200	930 000	209 000	850	900	41.5	91.51
718/600 AMB	600	23.6220	730	28.7402	60	2.3622	449 000	100 900	1 100 000	247 200	800	850	52	114.66
718/670 AMB	670	26.3780	820	32.2835	69	2.7165	527 000	118 400	1 250 000	280 900	700	750	77	169.79
718/670 ACMB	670	26.3780	820	32.2835	69	2.7165	553 000	124 300	1 290 000	289 900	700	750	77	169.79
718/710 AMB	710	27.9528	870	34.2520	74	2.9134	572 000	128 500	1 560 000	350 600	630	670	93.5	206.17
718/710 ACMB	710	27.9528	870	34.2520	74	2.9134	605 000	136 000	1 630 000	366 300	630	630	92.4	203.74
718/750 AGMB	750	29.5276	920	36.2205	78	3.0709	618 000	138 900	1 730 000	388 800	600	630	110	242.55
718/750 ACMB	750	29.5276	920	36.2205	78	3.0709	650 000	146 100	1 800 000	404 500	600	630	110	242.55
718/850 AMB	850	33.4646	1 030	40.5512	82	3.2283	689 000	154 800	1 860 000	418 000	500	530	140	308.70
718/1000 AMB	1 000	39.3701	1 220	48.0315	100	3.9370	923 000	207 400	2 750 000	618 000	400	430	243	535.82
718/1120 AMB	1 120	44.0945	1 360	53.5433	106	4.1732	1 060 000	238 200	3 750 000	842 700	340	360	320	705.60
718/1250 AMB	1 250	49.2126	1 500	59.0551	112	4.4094	1 140 000	256 200	3 900 000	876 400	280	300	390	859.95

Consult SKF USA Inc. prior to design change or order placement.

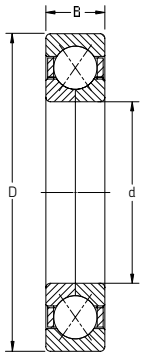
Single row
Four-point ACBB
SKF Explorer
Series: QJ 202 N2MA – QJ 215 MA
Size: 15 mm – 75 mm
0.5906 in – 2.9528 in



N2 Design

Designation	Principal dimensions						Basic load ratings				Speed rating	Mass	
	Bore d		Outside dimeter D		Width B		Dynamic C		Static C_0		Limiting speed		
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	kg	lb
QJ 202 N2MA	15	0.5906	35	1.3780	11	0.4331	12 700	2 850	8 300	1 870	36 000	0.06	0.1
QJ 203 N2MA	17	0.6693	40	1.5748	12	0.4724	17 000	3 820	11 400	2 560	30 000	0.08	0.2
QJ 205 MA	25	0.9843	52	2.0472	15	0.5906	27 000	6 070	21 200	4 760	22 000	0.16	0.4
QJ 205 N2MA	25	0.9843	52	2.0472	15	0.5906	27 000	6 070	21 200	4 760	22 000	0.16	0.4
QJ 206 MA	30	1.1811	62	2.4409	16	0.6299	37 500	8 430	30 500	6 850	19 000	0.24	0.5
QJ 206 N2MA	30	1.1811	62	2.4409	16	0.6299	37 500	8 430	30 500	6 850	19 000	0.24	0.5
QJ 207 N2MA	35	1.3780	72	2.8346	17	0.6693	49 000	11 010	41 500	9 330	17 000	0.35	0.8
QJ 208 MA	40	1.5748	80	3.1496	18	0.7087	56 000	12 580	49 000	11 010	15 000	0.45	1.0
QJ 208 N2MA	40	1.5748	80	3.1496	18	0.7087	56 000	12 580	49 000	11 010	15 000	0.45	1.0
QJ 209 MA	45	1.7717	85	3.3465	19	0.7480	63 000	14 160	56 000	12 580	14 000	0.52	1.1
QJ 210 MA	50	1.9685	90	3.5433	20	0.7874	65 500	14 720	61 000	13 710	13 000	0.59	1.3
QJ 211 MA	55	2.1654	100	3.9370	21	0.8268	85 000	19 100	83 000	18 650	11 000	0.77	1.7
QJ 211 N2MA	55	2.1654	100	3.9370	21	0.8268	85 000	19 100	83 000	18 650	11 000	0.77	1.7
QJ 212 MA	60	2.3622	110	4.3307	22	0.8661	96 500	21 690	93 000	20 900	10 000	0.99	2.2
QJ 212 N2MA	60	2.3622	110	4.3307	22	0.8661	96 500	21 690	93 000	20 900	10 000	0.99	2.2
QJ 213 MA	65	2.5591	120	4.7244	23	0.9055	110 000	24 720	112 000	25 170	9 500	1.20	2.6
QJ 213 N2MA	65	2.5591	120	4.7244	23	0.9055	110 000	24 720	112 000	25 170	9 500	1.20	2.6
QJ 214 MA	70	2.7559	125	4.9213	24	0.9449	120 000	26 970	122 000	27 420	9 000	1.30	2.9
QJ 214 N2MA	70	2.7559	125	4.9213	24	0.9449	120 000	26 970	122 000	27 420	9 000	1.30	2.9
QJ 215 MA	75	2.9528	130	5.1181	25	0.9843	125 000	28 090	132 000	29 660	8 500	1.45	3.2

Consult SKF USA Inc. prior to design change or order placement.



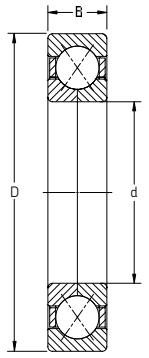
N2 Design

Single row
Four-point ACBB
Standard and SKF Explorer
Series: QJ 215 N2MA – QJ 260 N2MA
Size: 75 mm – 260 mm
2.9528 in – 10.2362 in

Designation	Principal dimensions						Basic load ratings				Speed rating	Mass	
	Bore d		Outside dimeter D		Width B		Dynamic C		Static C_0		Limiting speed		
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	kg	lb
QJ 215 N2MA	75	2.9528	130	5.1181	25	0.9843	125 000	28 090	132 000	29 660	8 500	1.45	3.2
QJ 216 MA	80	3.1496	140	5.5118	26	1.0236	146 000	32 810	156 000	35 060	8 000	1.85	4.1
QJ 216 N2MA	80	3.1496	140	5.5118	26	1.0236	146 000	32 810	156 000	35 060	8 000	1.85	4.1
QJ 217 MA	85	3.3465	150	5.9055	28	1.1024	156 000	35 060	173 000	38 880	7 500	2.25	5.0
QJ 217 N2MA	85	3.3465	150	5.9055	28	1.1024	156 000	35 060	173 000	38 880	7 500	2.25	5.0
QJ 218 N2MA	90	3.5433	160	6.2992	30	1.1811	186 000	41 800	200 000	44 940	7 000	2.75	6.1
QJ 219 N2MA	95	3.7402	170	6.6929	32	1.2598	212 000	47 640	232 000	52 100	6 700	3.35	7.4
QJ 220 N2MA	100	3.9370	180	7.0866	34	1.3386	236 000	53 000	265 000	59 600	6 300	4.05	8.9
QJ 222 N2MA	110	4.3307	200	7.8740	38	1.4961	280 000	62 900	325 000	73 000	5 600	5.60	12.3
QJ 224 N2MA	120	4.7244	215	8.4646	40	1.5748	300 000	67 400	365 000	82 000	5 000	6.95	15.3
QJ 226 N2MA	130	5.1181	230	9.0551	40	1.5748	310 000	69 700	400 000	89 900	4 800	7.75	17.1
QJ 228 N2MA	140	5.5118	250	9.8425	42	1.6535	345 000	77 500	475 000	106 700	4 300	9.85	21.7
QJ 230 N2MA	150	5.9055	270	10.6299	45	1.7717	400 000	89 900	570 000	128 100	4 000	12.50	27.6
QJ 232 N2MA	160	6.2992	290	11.4173	48	1.8898	450 000	101 100	670 000	150 600	3 800	15.50	34.2
QJ 234 N2MA	170	6.6929	310	12.2047	52	2.0472	455 000	102 200	720 000	161 800	3 400	19.50	43.0
QJ 236 N2MA	180	7.0866	320	12.5984	52	2.0472	475 000	106 700	765 000	171 900	3 400	20.50	45.2
QJ 238 N2MA	190	7.4803	340	13.3858	55	2.1654	510 000	114 600	850 000	191 000	3 200	23.30	51.4
QJ 240 N2MA	200	7.8740	360	14.1732	58	2.2835	540 000	121 300	915 000	205 600	3 000	28.50	62.8
QJ 248 N2MA	240	9.4488	440	17.3228	72	2.8346	650 000	146 100	1 200 000	269 700	2 400	53.20	117.3
QJ 252 N2MA	260	10.2362	480	18.8976	80	3.1496	728 000	163 600	1 430 000	321 300	2 200	68.00	149.9

Consult SKF USA Inc. prior to design change or order placement.

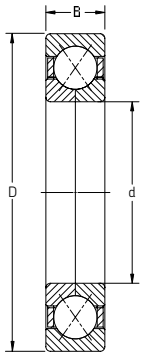
Single row
Four-point ACBB
SKF Explorer
Series: QJ 303 N2MA – QJ 313 MA
Size: 17 mm – 65 mm
0.6693 in – 2.5591 in



N2 Design

Designation	Principal dimensions						Basic load ratings				Speed rating	Mass	
	Bore d		Outside dimeter D		Width B		Dynamic C		Static C_0		Limiting speed		
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	kg	lb
QJ 303 N2MA	17	0.6693	47	1.8504	14	0.5512	23 400	5 260	15 000	3 370	28 000	0.14	0.3
QJ 304 MA	20	0.7874	52	2.0472	15	0.5906	32 000	7 190	21 600	4 850	24 000	0.18	0.4
QJ 304 N2MA	20	0.7874	52	2.0472	15	0.5906	32 000	7 190	21 600	4 850	24 000	0.18	0.4
QJ 305 MA	25	0.9843	62	2.4409	17	0.6693	42 500	9 550	30 000	6 740	20 000	0.29	0.6
QJ 305 N2MA	25	0.9843	62	2.4409	17	0.6693	42 500	9 550	30 000	6 740	20 000	0.29	0.6
QJ 306 MA	30	1.1811	72	2.8346	19	0.7480	53 000	11 910	41 500	9 330	17 000	0.42	0.9
QJ 306 N2MA	30	1.1811	72	2.8346	19	0.7480	53 000	11 910	41 500	9 330	17 000	0.42	0.9
QJ 307 MA	35	1.3780	80	3.1496	21	0.8268	64 000	14 380	51 000	11 460	15 000	0.57	1.3
QJ 307 N2MA	35	1.3780	80	3.1496	21	0.8268	64 000	14 380	51 000	11 460	15 000	0.57	1.3
QJ 308 MA	40	1.5748	90	3.5433	23	0.9055	78 000	17 530	64 000	14 380	14 000	0.78	1.7
QJ 308 N2MA	40	1.5748	90	3.5433	23	0.9055	78 000	17 530	64 000	14 380	14 000	0.78	1.7
QJ 309 MA	45	1.7717	100	3.9370	25	0.9843	100 000	22 470	83 000	18 650	12 000	1.05	2.3
QJ 309 N2MA	45	1.7717	100	3.9370	25	0.9843	100 000	22 470	83 000	18 650	12 000	1.05	2.3
QJ 310 MA	50	1.9685	110	4.3307	27	1.0630	118 000	26 520	100 000	22 470	11 000	1.35	3.0
QJ 311 MA	55	2.1654	120	4.7244	29	1.1417	137 000	30 790	118 000	26 520	10 000	1.75	3.9
QJ 311 N2MA	55	2.1654	120	4.7244	29	1.1417	137 000	30 790	118 000	26 520	10 000	1.75	3.9
QJ 312 MA	60	2.3622	130	5.1181	31	1.2205	156 000	35 060	137 000	30 790	9 000	2.15	4.7
QJ 312 N2MA	60	2.3622	130	5.1181	31	1.2205	156 000	35 060	137 000	30 790	9 000	2.15	4.7
QJ 313 MA	65	2.5591	140	5.5118	33	1.2992	176 000	39 550	156 000	35 060	8 500	2.70	6.0

Consult SKF USA Inc. prior to design change or order placement.



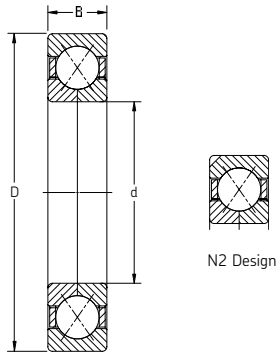
N2 Design

Single row
Four-point ACBB
Standard and SKF Explorer
Series: QJ 314 MA – QJ 344 N2MA
Size: 70 mm – 220 mm
2.7559 in – 8.6614 in

Designation	Principal dimensions						Basic load ratings				Speed rating	Mass	
	Bore d		Outside dimeter D		Width B		Dynamic C		Static C_0		Limiting speed		
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	kg	lb
QJ 314 MA	70	2.7559	150	5.9055	35	1.3780	200 000	44 940	180 000	40 450	8 000	3.15	6.9
QJ 314 N2MA	70	2.7559	150	5.9055	35	1.3780	200 000	44 940	180 000	40 450	8 000	3.15	6.9
QJ 315 N2MA	75	2.9528	160	6.2992	37	1.4567	216 000	48 540	200 000	44 940	7 500	3.90	8.6
QJ 316 N2MA	80	3.1496	170	6.6929	39	1.5354	232 000	52 100	228 000	51 200	7 000	4.60	10.1
QJ 317 N2MA	85	3.3465	180	7.0866	41	1.6142	250 000	56 200	255 000	57 300	6 700	5.45	12.0
QJ 318 N2MA	90	3.5433	190	7.4803	43	1.6929	285 000	64 000	305 000	68 500	6 300	6.45	14.2
QJ 319 N2MA	95	3.7402	200	7.8740	45	1.7717	305 000	68 500	340 000	76 400	6 000	7.45	16.4
QJ 320 N2MA	100	3.9370	215	8.4646	47	1.8504	345 000	77 500	400 000	89 900	5 600	9.30	20.5
QJ 322 N2MA	110	4.3307	240	9.4488	50	1.9685	390 000	87 600	480 000	107 900	4 800	12.50	27.6
QJ 324 N2MA	120	4.7244	260	10.2362	55	2.1654	415 000	93 300	530 000	119 100	4 500	16.00	35.3
QJ 326 N2MA	130	5.1181	280	11.0236	58	2.2835	455 000	102 200	610 000	137 100	4 000	19.50	43.0
QJ 328 N2MA	140	5.5118	300	11.8110	62	2.4409	500 000	112 400	695 000	156 200	3 800	24.00	52.9
QJ 330 N2MA	150	5.9055	320	12.5984	65	2.5591	530 000	119 100	765 000	171 900	3 600	29.00	63.9
QJ 332 N2MA	160	6.2992	340	13.3858	68	2.6772	570 000	128 100	880 000	197 800	3 400	34.50	76.1
QJ 334 N2MA	170	6.6929	360	14.1732	72	2.8346	655 000	147 200	1 040 000	233 700	3 200	41.50	91.5
QJ 336 N2MA	180	7.0866	380	14.9606	75	2.9528	680 000	152 800	1 100 000	247 200	3 000	47.50	104.7
QJ 338 N2MA	190	7.4803	400	15.7480	78	3.0709	702 000	157 800	1 159 999	260 700	2 800	49.00	108.0
QJ 344 N2MA	220	8.6614	460	18.1102	88	3.4646	780 000	175 300	1 399 999	314 600	2 400	78.00	172.0

Consult SKF USA Inc. prior to design change or order placement.

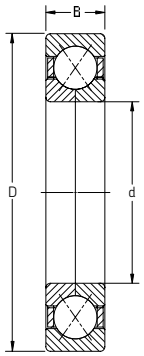
Single row
Four-point ACBB
Standard and SKF Explorer
Series: QJ 1017 N2MA – QJ 1096 N2MA
Size: 85 mm – 480 mm
3.3465 in – 18.8976 in



N2 Design

Designation	Principal dimensions						Basic load ratings				Speed rating	Mass	
	Bore d		Outside dimeter D		Width B		Dynamic C		Static C_0		Limiting speed		
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	kg	lb
QJ 1017 N2MA	85	3.3465	130	5.1181	22	0.8661	99 500	22 360	114 000	25 620	8 000	1.10	2.40
QJ 1021 N2MA	105	4.1339	160	6.2992	26	1.0236	135 000	30 340	170 000	38 200	6 700	2.00	4.40
QJ 1022 N2MA	110	4.3307	170	6.6929	28	1.1024	153 000	34 380	193 000	43 370	6 300	2.50	5.50
QJ 1030 N2MA	150	5.9055	225	8.8583	35	1.3780	242 000	54 400	335 000	75 300	4 500	5.25	11.60
QJ 1032 N2MA	160	6.2992	240	9.4488	38	1.4961	270 000	60 700	380 000	85 400	4 300	6.45	14.20
QJ 1038 N2MA	190	7.4803	290	11.4173	46	1.8110	364 000	81 800	560 000	125 800	3 400	11.50	25.40
QJ 1040 N2MA	200	7.8740	310	12.2047	51	2.0079	390 000	87 600	620 000	139 300	3 200	15.00	33.10
QJ 1056 N2MA	280	11.0236	420	16.5354	65	2.5591	585 000	131 500	1 139 999	256 200	2 400	33.50	73.90
QJ 1060 MA	300	11.8110	460	18.1102	74	2.9134	702 000	157 800	1 429 999	321 300	2 200	47.00	103.60
QJ 1060 N2MA	300	11.8110	460	18.1102	74	2.9134	650 000	146 100	1 340 000	301 100	2 200	47.50	104.70
QJ 1064 MA	320	12.5984	480	18.8976	74	2.9134	715 000	160 700	1 529 999	343 800	2 000	50.00	110.30
QJ 1064 N2MA	320	12.5984	480	18.8976	74	2.9134	715 000	160 700	1 530 000	343 800	2 000	50.00	110.30
QJ 1068 N2MA	340	13.3858	520	20.4724	82	3.2283	780 000	175 300	1 700 000	382 000	1 800	67.50	148.80
QJ 1072 N2MA	360	14.1732	540	21.2598	82	3.2283	852 000	191 500	1 930 000	433 700	1 700	70.50	155.50
QJ 1076 N2MA	380	14.9606	560	22.0472	82	3.2283	884 000	198 700	2 039 999	458 400	1 600	72.50	159.90
QJ 1080 N2MA	400	15.7480	600	23.6220	90	3.5433	904 000	203 100	2 160 000	485 400	1 500	95.00	209.50
QJ 1084 N2MA	420	16.5354	620	24.4094	90	3.5433	923 000	207 400	2 280 000	512 400	1 500	99.50	219.40
QJ 1088 N2MA	440	17.3228	650	25.5906	94	3.7008	995 000	223 600	2 500 000	561 800	1 400	115.00	253.60
QJ 1092 N2MA	460	18.1102	680	26.7717	100	3.9370	1 040 000	233 700	2 650 000	595 500	1 300	130.00	286.70
QJ 1096 N2MA	480	18.8976	700	27.5591	100	3.9370	1 060 000	238 200	2 799 999	629 200	1 300	135.00	297.70

Consult SKF USA Inc. prior to design change or order placement.



N2 Design

Single row
Four-point ACBB
Standard and SKF Explorer
Series: QJ 1096 N2MA – QJ 1296 N2MA
Size: 200 mm – 480 mm
7.8740 in – 18.8976 in

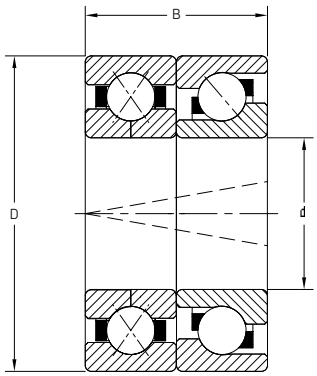
Series: QJ 1984 N2MA – QJ 1988 N2MA
Size: 420 mm – 440 mm
16.5354 in – 17.3228 in

Designation	Principal dimensions						Basic load ratings				Speed rating	Mass	
	Bore d		Outside dimeter D		Width B		Dynamic C		Static C_0		Limiting speed		
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	kg	lb
QJ 1240 N2MA	200	7.8740	360	14.1732	70	2.7559	520 000	116 900	865 000	194 400	3 000	32.50	71.70
QJ 1244 N2MA	220	8.6614	400	15.7480	78	3.0709	592 000	133 000	1 020 000	229 200	2 600	45.50	100.30
QJ 1248 MA/344524	240	9.4488	440	17.3228	85	3.3465	663 000	149 000	1 220 000	274 200	2 400	61.00	134.50
QJ 1252 MA	260	10.2362	480	18.8976	90	3.5433	741 000	166 500	1 460 000	328 100	2 200	78.50	173.10
QJ 1252 N2MA	260	10.2362	480	18.8976	90	3.5433	741 000	166 500	1 459 999	328 100	2 200	78.00	172.00
QJ 1256 N2MA	280	11.0236	500	19.6850	90	3.5433	728 000	163 600	1 460 000	328 100	2 000	82.00	180.80
QJ 1260 N2MA	300	11.8110	540	21.2598	98	3.8583	832 000	187 000	1 760 000	395 500	1 900	105.00	231.50
QJ 1264 N2MA	320	12.5984	580	22.8346	105	4.1339	956 000	214 800	2 080 000	467 400	1 700	130.00	286.70
QJ 1268 MA/344524	340	13.3858	620	24.4094	118	4.6457	1 060 000	238 200	2 450 000	550 600	1 600	165.00	363.80
QJ 1272 N2MA	360	14.1732	650	25.5906	122	4.8031	1 110 000	249 400	2 600 000	584 300	1 500	190.00	419.00
QJ 1276 N2MA	380	14.9606	680	26.7717	132	5.1969	1 170 000	262 900	2 850 000	640 400	1 400	220.00	485.10
QJ 1280 N2MA	400	15.7480	720	28.3465	140	5.5118	1 300 000	292 100	3 250 000	730 300	1 300	265.00	584.30
QJ 1284 N2MA	420	16.5354	760	29.9213	150	5.9055	1 430 000	321 300	3 750 000	842 700	1 300	315.00	694.60
QJ 1288 N2MA	440	17.3228	790	31.1024	155	6.1024	1 400 000	314 600	3 750 000	842 700	1 200	350.00	771.80
QJ 1292 N2MA	460	18.1102	830	32.6772	165	6.4961	1 530 000	343 800	4 250 000	955 100	1 100	415.00	915.10
QJ 1296 N2MA	480	18.8976	870	34.2520	170	6.6929	1 680 000	377 500	4 750 000	1 067 400	1 100	470.00	1036.40
QJ 1984 MA	420	16.5354	560	22.0472	65	2.5591	637 000	143 100	1 600 000	359 600	1 600	51.00	112.50
QJ 1988 N2MA	440	17.3228	600	23.6220	74	2.9134	761 000	171 000	1 900 000	427 000	1 500	65.00	143.30

Consult SKF USA Inc. prior to design change or order placement.

Thrust pack
Double row
Four-point ACBB and Single row ACBB
Standard
Series: BA2B 459304 – BA2B 459328
Size: 20 mm – 140 mm
0.7874 in – 5.5118 in

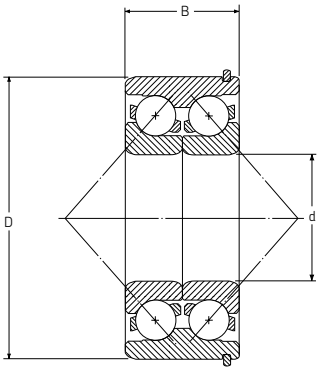
Series: BA2B 459418 – BA2B 459430
Size: 90 mm – 150 mm
3.5433 in – 5.9055 in



BA2B 4593XX

Designation	Principal dimensions						Basic load ratings				Speed rating		Mass	
	Bore d		Outside dimeter D		Width B		Dynamic C		Static C_0		Reference speed	Limiting speed		
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	r/min	kg	lb
BA2B 459304	20	0.7874	52	2.0472	30	1.1811	30 700	6 900	20 800	4 680	9 000	13 000	0.28	0.62
BA2B 459306	30	1.1811	72	2.8346	38	1.4961	55 900	12 600	42 500	9 550	6 700	9 000	0.68	1.50
BA2B 459307	35	1.3780	80	3.1496	42	1.6535	62 400	14 000	49 000	11 000	6 000	8 000	0.90	2.00
BA2B 459308	40	1.5748	90	3.5433	46	1.8110	79 300	17 800	65 500	14 700	5 300	7 000	1.25	2.75
BA2B 459309	45	1.7717	100	3.9370	50	1.9685	97 500	21 900	81 500	18 300	4 800	6 300	1.70	3.75
BA2B 459310	50	1.9685	110	4.3307	54	2.1260	119 000	26 800	102 000	22 900	4 300	5 600	2.20	4.85
BA2B 459311	55	2.1654	120	4.7244	58	2.2835	138 000	31 000	120 000	27 000	3 800	5 000	2.80	6.15
BA2B 459312	60	2.3622	130	5.1181	62	2.4409	156 000	35 100	140 000	31 500	3 600	4 800	3.50	7.70
BA2B 459313	65	2.5591	140	5.5118	65	2.5984	174 000	39 100	160 000	36 000	3 200	4 300	4.30	9.50
BA2B 459314	70	2.7559	150	5.9055	70	2.7559	195 000	43 800	180 000	40 500	3 000	4 000	5.30	11.50
BA2B 459317	85	3.3465	180	7.0866	82	3.2283	251 000	56 400	265 000	59 600	2 400	3 400	8.90	19.50
BA2B 459318	90	3.5433	190	7.4803	86	3.3858	270 000	60 700	290 000	65 200	2 200	3 200	10.50	23.00
BA2B 459320	100	3.9370	215	8.4646	94	3.7008	325 000	73 100	380 000	85 400	1 900	2 800	15.00	33.00
BA2B 459322	110	4.3307	240	9.4488	100	3.9370	364 000	81 800	450 000	101 000	1 700	2 400	20.00	44.00
BA2B 459326	130	5.1181	280	11.0236	116	4.5669	403 000	90 600	540 000	121 000	1 500	2 000	35.00	77.00
BA2B 459328	140	5.5118	300	11.8110	124	4.8819	449 000	101 000	620 000	139 000	1 400	1 900	43.00	95.00
BA2B 459418	90	3.5433	160	6.2992	60	2.3622	178 000	40 000	193 000	43 400	2 600	3 600	4.60	10.00
BA2B 459420	100	3.9370	180	7.0866	68	2.6772	221 000	49 700	245 000	55 100	2 200	3 200	6.60	14.50
BA2B 459422	110	4.3307	200	7.8740	76	2.9921	260 000	58 500	310 000	69 700	1 900	2 800	9.20	20.50
BA2B 459424	120	4.7244	215	8.4646	80	3.1496	270 000	60 700	325 000	73 100	1 700	2 400	12.20	27.00
BA2B 459428	140	5.5118	250	9.8425	84	3.3071	296 000	66 500	390 000	87 700	1 600	2 200	17.70	39.00
BA2B 459430	150	5.9055	270	10.6299	90	3.5433	319 000	71 700	44 0000	98 900	1 500	2 000	23.00	50.50

Consult SKF USA Inc. prior to design change or order placement.

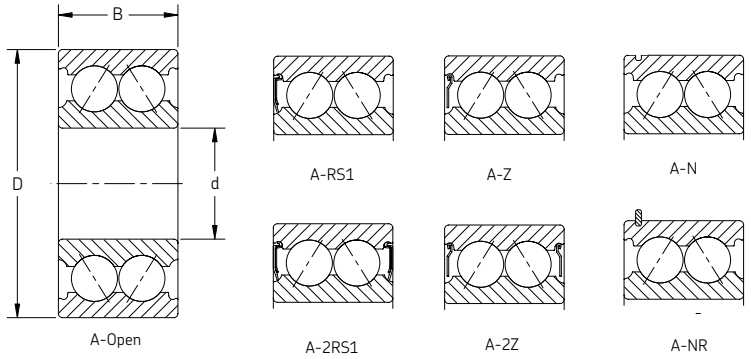


Double row, 40° contact angle
Standard
Series: 3308 DNRCBM – 3313 DNRCBM
Size: 40 mm – 65 mm
1.5748 in – 2.5591 in

Designation	Principal dimensions						Basic load ratings				Speed rating		Mass	
	Bore d		Outside dimeter D		Width B		Dynamic C		Static C_0		Reference speed	Limiting speed		
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	r/min	kg	lb
3308 DNRCBM	40	1.5748	90	3.5433	36.5	1.4370	49 400	11 100	41 500	9 330	6 700	7 000	1.20	2.60
3309 DNRCBM	45	1.7716	100	3.9370	39.7	1.5630	61 800	13 890	52 000	11 690	6 000	6 300	1.50	3.30
3310 DNRCBM	50	1.9685	110	4.3307	44.4	1.7480	81 900	18 400	69 500	15 620	5 300	5 600	1.95	4.30
3311 DNRCBM	55	2.1653	120	4.7244	49.2	1.9370	95 600	21 480	83 000	18 650	5 000	5 300	2.55	5.60
3313 DNRCBM	65	2.5591	140	5.5118	58.7	2.3110	138 000	31 010	122 000	27 420	4 300	4 500	4.00	8.80

Consult SKF USA Inc. prior to design change or order placement.

Double row, 30° contact angle
Conrad
Open, sealed, shielded and snap ring
Standard and SKF Explorer
Series: 3200 A – 3220 A
Size: 10 mm – 100 mm
0.3937 in – 3.9370 in

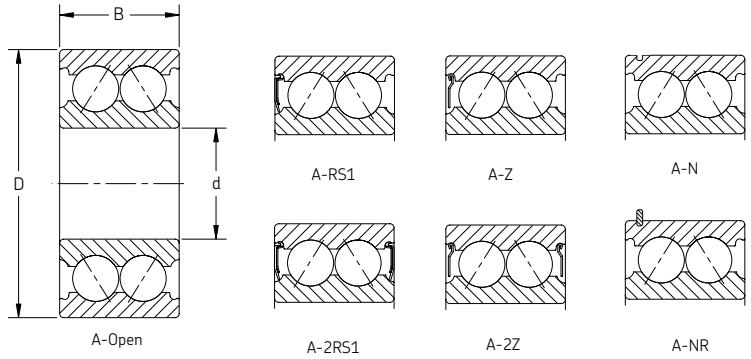


Designation	Principal dimensions						Basic load ratings				Speed rating			Mass	
	Bore d		Outside dimeter D		Width B		Dynamic C		Static C_0		Reference speed	Limiting speed	Sealed imiting speed		
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	r/min	r/min	kg	lb
3200 A	10	0.3937	30	1.1811	14.0	0.5625	7 610	1 700	4 300	1 000	22 000	24 000	17 000	0.05	0.11
3201 A	12	0.4724	32	1.2598	15.9	0.6250	10 100	2 300	5 600	1 300	20 000	22 000	15 000	0.06	0.13
3202 A	15	0.5906	35	1.3780	15.9	0.6250	11 200	2 500	6 800	1 500	17 000	18 000	14 000	0.07	0.15
3203 A	17	0.6693	40	1.5748	17.5	0.6875	14 300	3 200	8 800	2 000	15 000	16 000	12 000	0.10	0.21
3204 A	20	0.7874	47	1.8504	20.6	0.8125	20 000	4 500	12 000	2 700	14 000	14 000	10 000	0.16	0.35
3205 A	25	0.9843	52	2.0472	20.6	0.8125	21 600	4 900	14 300	3 200	12 000	12 000	8 500	0.19	0.42
3206 A	30	1.1811	62	2.4409	23.8	0.9375	30 000	6 700	20 400	4 600	10 000	10 000	7 500	0.29	0.64
3207 A	35	1.3780	72	2.8346	27.0	1.0625	40 000	9 000	28 000	6 300	9 000	9 000	6 300	0.40	0.88
3208 A	40	1.5748	80	3.1496	30.2	1.1875	47 500	10 700	34 000	7 600	8 000	8 000	5 600	0.58	1.28
3209 A	45	1.7717	85	3.3465	30.2	1.1875	51 000	11 500	39 000	8 800	7 500	7 500	5 300	0.64	1.41
3210 A	50	1.9685	90	3.5433	30.2	1.1875	51 000	11 500	39 000	8 800	7 000	7 000	4 800	0.66	1.46
3211 A	55	2.1654	100	3.9370	33.3	1.3125	60 000	13 500	47 500	10 700	6 300	6 300	4 500	1.05	2.31
3212 A	60	2.3622	110	4.3307	36.5	1.4375	73 500	16 500	58 500	13 200	5 600	5 600	4 000	1.40	3.09
3213 A	65	2.5591	120	4.7244	38.1	1.5000	80 600	18 100	73 500	16 500	4 500	4 800	3 600	1.75	3.86
3214 A	70	2.7559	125	4.9213	39.7	1.5625	88 400	19 900	80 000	18 000	4 300	4 500	–	1.90	4.19
3215 A	75	2.9528	130	5.1181	41.3	1.6250	95 600	21 500	88 000	19 800	4 300	4 500	3 200	2.10	4.63
3216 A	80	3.1496	140	5.5118	44.4	1.7500	106 000	23 800	95 000	21 400	4 000	4 300	3 000	2.65	5.84
3217 A	85	3.3465	150	5.9055	49.2	1.9375	124 000	27 900	110 000	24 700	3 600	3 800	–	3.40	7.50
3218 A	90	3.5433	160	6.2992	52.4	2.0625	130 000	29 200	120 000	27 000	3 400	3 600	–	4.15	9.15
3219 A	95	3.7402	170	6.6929	55.6	2.1875	159 000	35 700	146 000	32 800	3 200	3 400	–	5.00	11.02
3220 A	100	3.9370	180	7.0866	60.3	2.3750	178 000	40 000	166 000	37 300	3 000	3 200	–	6.10	13.45

Note: The 5200/5300 series DRACBB have been replaced with the 3200/3300 series designation.
The product design has not changed; therefore, the fit, form and function remain the same.

Consult SKF USA Inc. prior to design change or order placement.

Double row, 30° contact angle
Conrad
Open, sealed, shielded and snap ring
Standard and SKF Explorer
Series: 3302 A – 3322 A
Size: 15 mm – 110 mm
0.5905 in – 4.3307 in



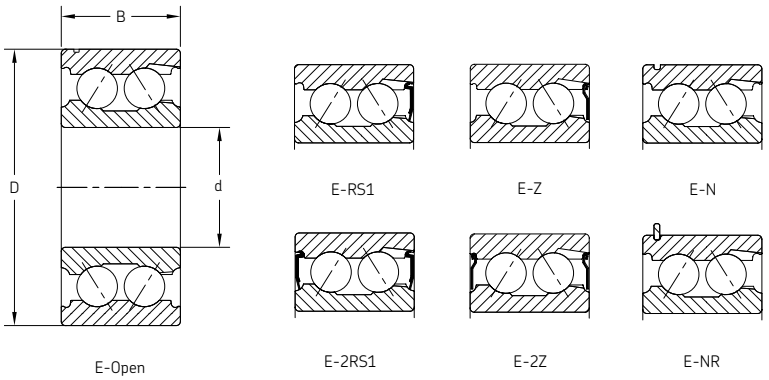
Designation	Principal dimensions						Basic load ratings				Speed rating			Mass	
	Bore d		Outside dimeter D		Width B		Dynamic C		Static C_0		Reference speed	Limiting speed	Sealed imiting speed		
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	r/min	r/min	kg	lb
3302 A	15	0.5905	42	1.6535	19	0.7480	15 100	3 390	9 300	2 090	15 000	16 000	12 000	0.13	0.3
3303 A	17	0.6692	47	1.8504	22.2	0.8740	21 600	4 850	12 700	2 850	14 000	14 000	11 000	0.18	0.4
3304 A	20	0.7874	52	2.0472	22.2	0.8740	23 600	5 300	14 600	3 280	13 000	13 000	9 000	0.22	0.5
3305 A	25	0.9842	62	2.4409	25.4	1.0000	32 000	7 190	20 400	4 580	11 000	11 000	7 500	0.35	0.8
3306 A	30	1.1811	72	2.8346	30.2	1.1890	42 500	9 550	30 000	6 740	9 000	9 000	6 300	0.52	1.1
3307 A	35	1.3779	80	3.1496	34.9	1.3740	52 000	11 690	35 500	7 980	8 500	8 500	6 000	0.73	1.6
3308 A	40	1.5748	90	3.5433	36.5	1.4370	64 000	14 380	44 000	9 890	7 500	7 500	5 000	0.93	2.1
3309 A	45	1.7716	100	3.9370	39.7	1.5630	75 000	16 850	53 000	11 910	6 700	6 700	4 800	1.25	2.8
3310 A	50	1.9685	110	4.3307	44.4	1.7480	90 000	20 220	64 000	14 380	6 000	6 000	4 300	1.70	3.7
3311 A	55	2.1653	120	4.7244	49.2	1.9370	112 000	25 170	81 500	18 310	5 300	5 300	–	2.65	5.8
3312 A	60	2.3622	130	5.1181	54	2.1260	127 000	28 540	95 000	21 350	5 000	5 000	–	2.80	6.2
3313 A	65	2.5590	140	5.5118	58.7	2.3110	146 000	32 810	110 000	24 720	4 500	4 500	–	4.10	9.0
3314 A	70	2.7559	150	5.9055	63.5	2.5000	163 000	36 630	125 000	28 090	4 300	4 300	–	5.05	11.1
3315 A	75	2.9527	160	6.2992	68.3	2.6890	176 000	39 550	140 000	31 460	4 000	4 000	–	5.55	12.2
3316 A	80	3.1496	170	6.6929	68.3	2.6890	193 000	43 370	156 000	35 060	3 800	3 800	–	6.80	15.0
3317 A	85	3.3464	180	7.0866	73	2.8740	208 000	46 740	176 000	39 550	3 600	3 600	–	8.30	18.3
3318 A	90	3.5433	190	7.4803	73	2.8740	208 000	46 740	180 000	40 450	3 400	3 400	–	9.25	20.4
3319 A	95	3.7401	200	7.8740	77.8	3.0630	240 000	53 900	216 000	48 540	3 200	3 200	–	11.00	24.3
3320 A	100	3.9370	215	8.4646	82.6	3.2520	255 000	57 300	255 000	57 300	2 600	2 800	–	13.50	29.8
3322 A	110	4.3307	240	9.4488	92.1	3.6260	291 000	65 400	305 000	68 500	2 400	2 600	–	19.00	41.9

Note: The 5200/5300 series DRACBB have been replaced with the 3200/3300 series designation. The product design has not changed; therefore, the fit, form and function remain the same. The "AH" features have been incorporated into the standard design, and that suffix has been eliminated.

Consult SKF USA Inc. prior to design change or order placement.

Double row, 30° contact angle
Max type
Open, sealed, shielded and snap ring
Standard
Series: 3205 E – 3218 E
Size: 25 mm – 90 mm
0.9843 in – 3.5433 in

Series: 3305 E – 3316 E
Size: 25 mm – 80 mm
0.9843 in – 3.1496 in



Designation	Principal dimensions						Basic load ratings				Speed rating			Mass	
	Bore d		Outside dimeter D		Width B		Dynamic C		Static C_0		Reference speed	Limiting speed	Sealed imiting speed		
	mm	in	mm	in	mm	in	N	lbf	N	lbf	r/min	r/min	r/min	kg	lb
3205 E	25	0.9843	52	2.0472	20.6	0.8125	22 900	5 150	21 200	4 770	11 000	12 000	8 500	0.25	0.55
3206 E	30	1.1811	62	2.4409	23.8	0.9375	30 300	6 810	28 000	6 290	9 500	10 000	7 500	0.35	0.8
3207 E	35	1.378	72	2.8346	27	1.0625	39 100	8 790	36 500	8 210	8 000	8 500	6 300	0.54	1.2
3208 E	40	1.5748	80	3.1496	30.2	1.1875	49 500	11 130	49 000	11 020	7 500	8 000	5 600	0.73	1.6
3209 E	45	1.7717	85	3.3465	30.2	1.1875	51 200	11 510	54 000	12 140	6 700	7 000	5 300	0.77	1.7
3210 E	50	1.9685	90	3.5433	30.2	1.1875	53 900	12 120	58 500	13 150	6 300	6 700	4 800	0.82	1.8
3211 E	55	2.1654	100	3.937	33.3	1.3125	66 000	14 840	76 500	17 200	5 600	6 000	4 500	1.15	2.5
3212 E	60	2.3622	110	4.3307	36.5	1.4375	78 100	17 560	88 000	19 780	5 000	5 300	4 000	1.5	3.3
3213 E	65	2.5591	120	4.7244	38.1	1.5	88 000	19 780	106 000	23 800	4 800	5 000	3 600	1.95	4.3
3214 E	70	2.7559	125	4.9213	39.7	1.5625	101 000	22 700	125 000	28 100	4 500	4 800	3 200	2.15	4.7
3215 E	75	2.9528	130	5.1181	41.3	1.625	108 000	24 300	137 000	30 800	4 300	4 500	3 000	2.5	5.5
3216 E	80	3.1496	140	5.5118	44.4	1.75	128 000	28 800	160 000	36 000	4 000	4 000	–	3	6.6
3217 E	85	3.3465	150	5.9055	49.2	1.9375	142 000	31 900	176 000	39 600	3 600	3 800	–	3.7	8.16
3218 E	90	3.5433	160	6.2992	52.4	2.0625	151 000	33 900	193 000	43 400	3 400	3 600	–	4.55	10
3305 E	25	0.9843	62	2.4409	25.4	1	34 100	7 670	30 500	6 860	10 000	10 000	7 500	0.39	0.9
3306 E	30	1.1811	72	2.8346	30.2	1.1875	46 800	10 520	43 000	9 670	8 500	9 000	6 300	0.59	1.3
3307 E	35	1.378	80	3.1496	34.9	1.375	52 300	11 760	48 000	10 790	7 500	8 000	6 000	0.86	1.9
3308 E	40	1.5748	90	3.5433	36.5	1.4375	67 100	15 080	65 500	14 720	6 700	7 000	5 000	1.15	2.5
3309 E	45	1.7717	100	3.937	39.7	1.5625	80 900	18 190	80 000	17 980	6 000	6 300	4 800	1.5	3.3
3310 E	50	1.9685	110	4.3307	44.4	1.75	95 200	21 400	95 000	21 360	5 300	5 600	–	2	4.4
3311 E	55	2.1654	120	4.7244	49.2	1.9375	119 000	26 800	122 000	27 400	5 000	5 300	–	2.65	5.8
3312 E	60	2.3622	130	5.1181	54	2.125	134 000	30 100	143 000	32 100	4 500	4 800	–	3.3	7.3
3313 E	65	2.5591	140	5.5118	58.7	2.3125	182 000	40 900	163 000	36 600	4 300	4 500	–	4.2	9.3
3314 E	70	2.7559	150	5.9055	63.5	2.5	172 000	38 700	186 000	41 800	4 000	4 300	–	5	11
3315 E	75	2.9528	160	6.2992	68.3	2.6875	187 000	42 000	208 000	46 800	3 600	3 800	–	6.35	14
3316 E	80	3.1496	170	6.6929	68.3	2.6875	201 000	45 200	236 000	53 100	3 400	3 600	–	7.25	16

Note: The 5200/5300 series DRACBB have been replaced with the 3200/3300 series designation.
The product design has not changed; therefore, the fit, form and function remain the same.

Consult SKF USA Inc. prior to design change or order placement.

Notes