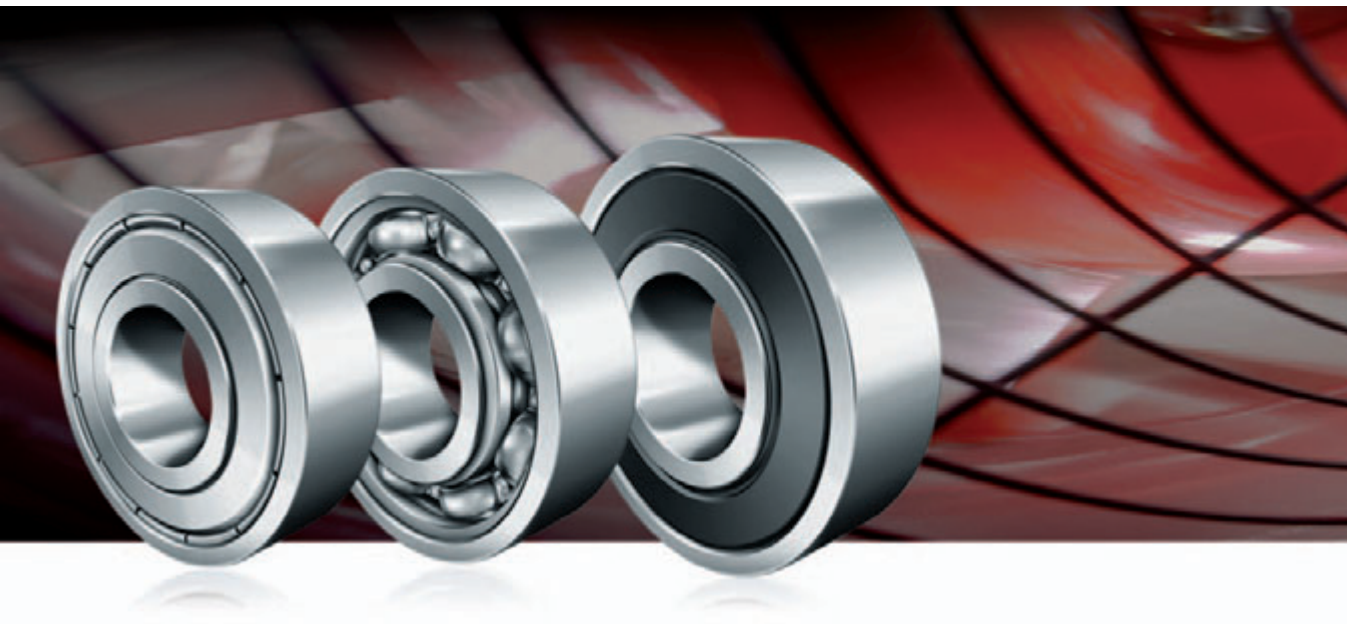


FAG



Deep Groove Ball Bearings Generation C

Single row

SCHAEFFLER



Single row deep groove ball bearings Generation C

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Product overview Single row deep groove ball bearings Generation C

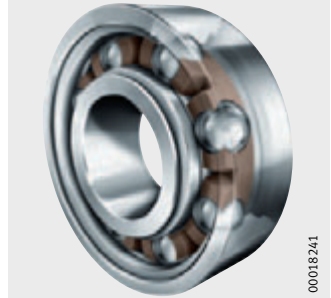
Single row

60...-C
62...-C



0001823F

60...-C-TVH
62...-C-TVH



00018241

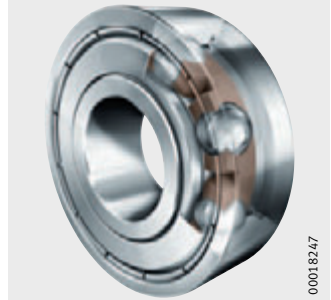
Gap seals

60...-C-2Z
62...-C-2Z



00018249

60...-C-2Z-TVH
62...-C-2Z-TVH



00018247

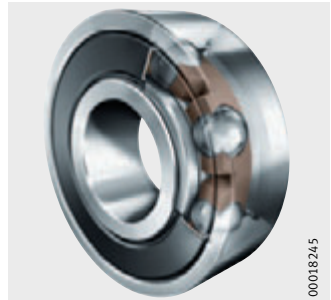
Lip seals

60...-C-2HRS
62...-C-2HRS



00018243

60...-C-2HRS-TVH
62...-C-2HRS-TVH



00018245

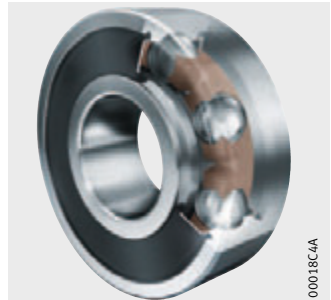
Non-contact seals

60...-C-2BRS
62...-C-2BRS



00018C49

60...-C-2BRS-TVH
62...-C-2BRS-TVH



00018C4A

Single row deep groove ball bearings Generation C

Features	<p>Deep groove ball bearings are versatile, self-retaining bearings with solid outer rings, inner rings and ball and cage assemblies. They are of a simple design, robust in operation and easy to maintain. They are available in open and sealed designs. Due to the raceway geometry and the use of balls, deep groove ball bearings can support axial forces in both directions as well as radial forces.</p> <p>Deep groove ball bearings of Generation C were specially developed in relation to low noise levels and low frictional torque. They are particularly suitable, for example, for use in electrical machinery, ventilators, washing machines and power tools.</p>
Advantages	<p>Thanks to design modifications such as improved bearing kinematics, new seals and cages as well as refined manufacturing processes, deep groove ball bearings of Generation C have numerous advantages.</p>
Lower noise levels	<p>The bearing is quieter in operation due to the better quality of the balls, the optimised surfaces, the higher stability of the cage and the internal construction.</p>
Improved sealing	<p>The bearings have improved sealing due to the optimised position of the lip seals (suffix HRS), a matched undercut on the inner ring, axial running of the seal lip on the inner ring and the use of seals with a labyrinth function (suffix Z).</p>
Lower friction	<p>The friction in the bearing is reduced by modified osculation and optimisation of surfaces, waviness and roundness.</p>
Higher cost-effectiveness	<p>Due to the lower friction, energy costs for operation are reduced. The reduced grease loss, better protection against contamination and reduced strain on the lubricant gives an extended grease operating life and thus rating life of the bearing.</p>
Sealing	<p>Open bearings are suitable for high to very high speeds. Due to the manufacturing process, they have turned recesses for sealing washers and sealing shields, <i>Figure 1</i>, page 4, ①.</p> <p>Bearings with the suffix 2Z have gap seals on both sides, <i>Figure 1</i>, page 4, ②. These bearings are greased using a high quality grease, lubricated for life and suitable for high speeds.</p> <p>Bearings with the suffix 2HRS have lip seals on both sides made from nitrile butadiene rubber, <i>Figure 1</i>, page 4, ③. In bearings of Generation C, the sealing function and retention in the outer ring are improved. They are greased using a high quality grease, lubricated for life and suitable for moderate speeds. The frictional torque and heat generation are lower than with the previous seal design with the suffix RSR.</p> <p>Bearings with the suffix BRS have non-contact seals on both sides. Their friction level is as low as with the gap seals. In addition, they offer better protection against the ingress of dust and the escape of lubricant, <i>Figure 1</i>, page 4, ④.</p>

Single row deep groove ball bearings Generation C

- ① Open bearing
- ② Gap seals on both sides (2Z)
- ③ Lip seals on both sides (2HRS)
- ④ Non-contact seals (2BRS)

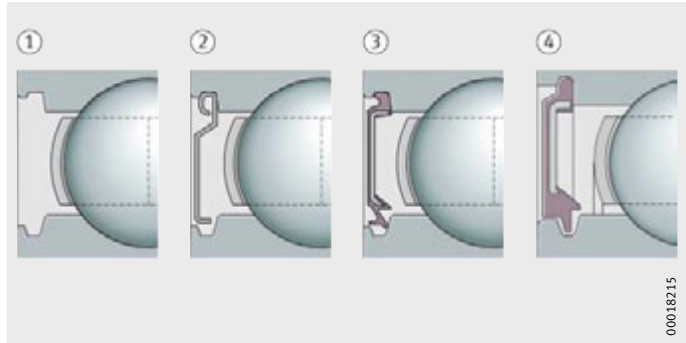


Figure 1
Available designs

Operating temperature

Suffix	Temperature range	
Open bearings	up to +120 °C	If > +120 °C please contact us
Z	-30 °C to +120 °C	-
HRS	-30 °C to +110 °C	Temperature restricted by seal material
BRS	-30 °C to +110 °C	
TVH	-30 °C to +120 °C	Temperature restricted by cage material

Suffixes for bearings for high temperatures

Suffix	S1	S2	S3	S4
max. Operating temperature	+200 °C	+250 °C	+300 °C	+350 °C

Cages

Single row deep groove ball bearings without a cage suffix have a sheet steel cage. Bearings of Generation C have a more stable riveted sheet metal cage instead of the lug cage.

Suffixes

Suffixes for available designs: see table.

Available designs

Suffix	Description	Design
C	Modified internal construction in Generation C	Standard
2Z	Gap seals on both sides	
2HRS	Lip seals on both sides	
2BRS	Labyrinth seals on both sides	
Z	Gap seal on one side	Special design, available by agreement
HRS	Lip seal on one side	
BRS	Labyrinth seal on one side	
TVH	Solid polyamide snap cage, ball-guided	



Check the chemical resistance of the polyamide to synthetic greases as well as to lubricants with EP additives.

Aged oil and additives in the oil can impair the operating life of plastic cages at high temperatures. The oil change intervals must be observed.

Further information

- Internet: www.FAG-GenerationC.info
- Technical principles of rolling bearing arrangements: see our Catalogues HR 1 and GL 1.

Design and safety guidelines

Equivalent dynamic bearing load

The equivalent dynamic load P is valid for bearings that are subjected to radial and axial dynamic loads. It gives the same rating life as the combined bearing load occurring in practice.

For bearings under dynamic loading, the following applies:

Load ratio and equivalent dynamic load

Load ratio	Equivalent dynamic bearing load
$\frac{F_a}{F_r} \leq e$	$P = F_r$
$\frac{F_a}{F_r} > e$	$P = X \cdot F_r + Y \cdot F_a$

F_a N
Axial dynamic bearing load
 F_r N
Radial dynamic bearing load
e, X, Y –
Factors, see table Factors e, X and Y
P N
Equivalent dynamic bearing load for combined load.

The factors e, X and Y required for determining P are dependent on the ratio $f_0 \cdot F_a / C_{0r}$ and the radial internal clearance.

The values in table are valid for normal fits:

- Shaft machined to j5 or k5, housing machined to J6.

Factors e, X and Y

$\frac{f_0 \cdot F_a}{C_{0r}}$	Factor for radial internal clearance								
	CN			C3			C4		
	e	X	Y	e	X	Y	e	X	Y
0,3	0,22	0,56	2	0,32	0,46	1,7	0,4	0,44	1,4
0,5	0,24	0,56	1,8	0,35	0,46	1,56	0,43	0,44	1,31
0,9	0,28	0,56	1,58	0,39	0,46	1,41	0,45	0,44	1,23
1,6	0,32	0,56	1,4	0,43	0,46	1,27	0,48	0,44	1,16
3	0,36	0,56	1,2	0,48	0,46	1,14	0,52	0,44	1,08
6	0,43	0,56	1	0,54	0,46	1	0,56	0,44	1

f_0 –
Factor, see table Factor f_0 for deep groove bearings
 F_a N
Axial dynamic bearing load
 C_{0r} N
Basic static load rating from dimension table

Factor f_0 for deep groove bearings

Bore code	Factor f_0	
	Series 60	Series 62
00	12,4	12,1
01	13	12,3
02	13,9	13,1
03	14,3	13,1
04	13,9	13,1
05	14,5	13,8

Single row deep groove ball bearings Generation C

Equivalent static bearing load

The equivalent static load P_0 is valid for bearings that are subjected to radial and axial static loads. It induces the same load at the centre point of the most heavily loaded contact point between the rolling element and raceway as the combined bearing load occurring in practice.

For bearings under static loading, the following applies:

Load ratio and equivalent static load

Load ratio	Equivalent static load
$\frac{F_{0a}}{F_{0r}} \leq 0,8$	$P_0 = F_{0r}$
$\frac{F_{0a}}{F_{0r}} > 0,8$	$P_0 = 0,6 \cdot F_{0r} + 0,5 \cdot F_{0a}$

F_{0a} N
Axial static bearing load
 F_{0r} N
Radial static bearing load
 P_0 N
Equivalent static bearing load for combined load.

Axial load carrying capacity



Deep groove ball bearings are also suitable for axial loads.

If the bearing is subjected to high loads and high speeds, a reduced life as well as increased friction and bearing temperature must be taken into consideration.

Minimum radial load

In order to ensure slippage-free operation, the bearings must be subjected to a minimum radial load. This applies particularly in the case of high speeds and high accelerations. In continuous operation, a minimum radial load of the order of $P/C_r > 0,01$ is necessary for ball bearings with cage.

Speed

The limiting speed n_G indicates the speed range within which the bearing can be used without the need for special precautions. If the limiting speed n_G is exceeded, we recommend checking with Schaeffler Application Engineering to determine whether the necessary conditions such as lubrication, internal clearance and machining of the bearing seats are fulfilled at these higher speeds.

Mounting dimensions



The dimension tables give the maximum dimension of the radius r_a and the diameters of the abutment shoulders D_a and d_a .

Bearings of Generation C may exhibit differences in diameter of the dimensions D_2 and d_2 compared to the standard bearings described in the main catalogue HR 1.

Accuracy

The main dimensions of the standardised single row deep groove ball bearings correspond to DIN 625-1 (ISO 15).

Dimensional and geometrical tolerances

The dimensional and geometrical tolerances of the standardised bearings correspond to tolerance class P6 to DIN 620-2 (ISO 492). Bearings of higher accuracy are available by agreement.

Radial internal clearance of bearings with cylindrical bore

The radial internal clearance corresponds to internal clearance group CN to DIN 620-4 (ISO 5753).

Radial internal clearance

Bore d mm		Radial internal clearance							
		C2 μm		CN μm		C3 μm		C4 μm	
over	incl.	min.	max.	min.	max.	min.	max.	min.	max.
6	10	0	7	2	13	8	23	14	29
10	18	0	9	3	18	11	25	18	33
18	24	0	10	5	20	13	28	20	36
24	30	1	11	5	20	13	28	23	41

Radial internal clearance CM

Bore d mm		Radial internal clearance CM μm	
over	incl.	min.	max.
10	18	4	11
18	30	5	12

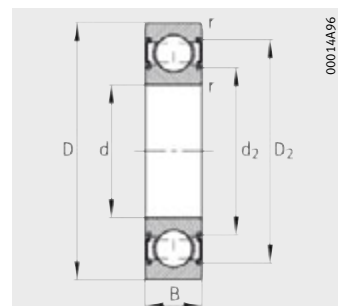
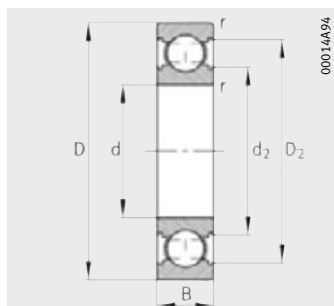


Figure 2
Deep groove ball bearings of Generation C

0001821A

Deep groove ball bearings Generation C

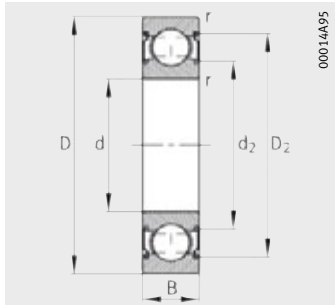
Single row
Open or sealed



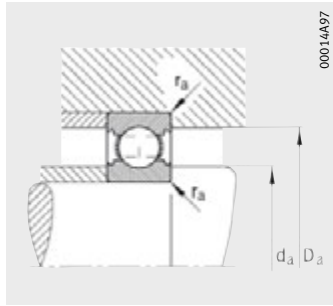
Seal 2HRS

Dimension table · Dimensions in mm

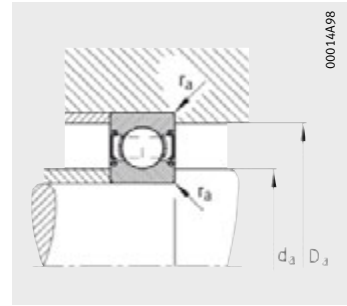
Designation	Mass m ≈kg	Dimensions					
		d	D	B	r min.	D ₂ ≈	d ₂ ≈
629-C	0,02	9	26	8	0,3	23,4	13,4
629-C-2HRS	0,021	9	26	8	0,3	23,4	13,4
629-C-2Z (-2BRS)	0,021	9	26	8	0,3	23,4	13,4
6000-C	0,019	10	26	8	0,3	23,4	13,4
6000-C-2HRS	0,02	10	26	8	0,3	23,4	13,4
6000-C-2Z (-2BRS)	0,02	10	26	8	0,3	23,4	13,4
6200-C	0,031	10	30	9	0,6	26	14,9
6200-C-2HRS	0,034	10	30	9	0,6	26	14,9
6200-C-2Z (-2BRS)	0,032	10	30	9	0,6	26	14,9
6001-C	0,02	12	28	8	0,3	25,4	15,4
6001-C-2HRS	0,022	12	28	8	0,3	25,4	15,4
6001-C-2Z (-2BRS)	0,02	12	28	8	0,3	25,4	15,4
6201-C	0,037	12	32	10	0,6	28,2	17
6201-C-2HRS	0,039	12	32	10	0,6	28,2	17
6201-C-2Z (-2BRS)	0,039	12	32	10	0,6	28,2	17
6002-C	0,031	15	32	9	0,3	29	18,9
6002-C-2HRS	0,033	15	32	9	0,3	29	18,9
6002-C-2Z (-2BRS)	0,033	15	32	9	0,3	29	18,9
6202-C	0,043	15	35	11	0,6	31,2	19,8
6202-C-2HRS	0,045	15	35	11	0,6	31,2	19,8
6202-C-2Z (-2BRS)	0,045	15	35	11	0,6	31,2	19,8
6203-C	0,065	17	40	12	0,6	35,2	22,6
6203-C-2HRS	0,067	17	40	12	0,6	35,2	22,6
6203-C-2Z (-2BRS)	0,067	17	40	12	0,6	35,2	22,6
6004-C	0,069	20	42	12	0,6	37,7	25,1
6004-C-2HRS	0,071	20	42	12	0,6	37,7	25,1
6004-C-2Z (-2BRS)	0,071	20	42	12	0,6	37,7	25,1
6204-C	0,106	20	47	14	1	41,4	26,5
6204-C-2HRS	0,11	20	47	14	1	41,4	26,5
6204-C-2Z (-2BRS)	0,11	20	47	14	1	41,4	26,5
6205-C	0,129	25	52	15	1	46,4	31,3
6205-C-2HRS	0,133	25	52	15	1	46,4	31,3
6205-C-2Z (-2BRS)	0,133	25	52	15	1	46,4	31,3
6206-C	0,195	30	62	16	1	55,4	37,4
6206-C-2HRS	0,201	30	62	16	1	55,4	37,4
6206-C-2Z (-2BRS)	0,201	30	62	16	1	55,4	37,4



Seal 2Z (2BRS)



Mounting dimensions
Open design



Mounting dimensions
Sealed design

Mounting dimensions			Basic load ratings		Fatigue limit load	Limiting speed	Reference speed
d_a	D_a	r_a	dyn. C_r	stat. C_{Or}	C_{ur}	n_G	n_B
min.	max.	max.	N	N	N	min^{-1}	min^{-1}
11,4	23,6	0,3	5 000	1 970	133	44 500	28 500
11,4	23,6	0,3	5 000	1 970	133	28 600	–
11,4	23,6	0,3	5 000	1 970	133	38 000	28 500
12	24	0,3	5 000	1 970	133	44 500	30 000
12	24	0,3	5 000	1 970	133	28 600	–
12	24	0,3	5 000	1 970	133	38 000	30 000
14,2	26	0,6	6 600	2 600	177	40 500	26 000
14,2	26	0,6	6 600	2 600	177	25 700	–
14,2	26	0,6	6 600	2 600	177	34 500	26 000
14	26	0,3	5 500	2 360	158	42 500	26 000
14	26	0,3	5 500	2 360	158	24 800	–
14	26	0,3	5 500	2 360	158	36 000	26 000
16,2	28,2	0,6	7 600	3 100	208	37 000	24 600
16,2	28,2	0,6	7 600	3 100	208	22 400	–
16,2	28,2	0,6	7 600	3 100	208	31 500	24 600
17	30	0,3	6 000	2 850	171	37 000	23 300
17	30	0,3	6 000	2 850	171	20 200	–
17	30	0,3	6 000	2 850	171	31 500	23 300
19,2	31,2	0,6	8 400	3 750	250	33 000	22 400
19,2	31,2	0,6	8 400	3 750	250	19 300	–
19,2	31,2	0,6	8 400	3 750	250	28 000	22 400
21,2	35,8	0,6	10 400	4 750	320	29 000	20 100
21,2	35,8	0,6	10 400	4 750	320	16 900	–
21,2	35,8	0,6	10 400	4 750	320	24 600	20 100
23,2	38,8	0,6	10 000	5 000	305	27 500	19 800
23,2	38,8	0,6	10 000	5 000	305	15 200	–
23,2	38,8	0,6	10 000	5 000	305	23 200	19 800
25,6	41,4	1	13 900	6 600	445	24 300	18 100
25,6	41,4	1	13 900	6 600	445	14 400	–
25,6	41,4	1	13 900	6 600	445	20 600	18 100
30,6	46,4	1	15 000	7 800	485	21 600	16 100
30,6	46,4	1	15 000	7 800	485	12 200	–
30,6	46,4	1	15 000	7 800	485	18 400	16 100
35,6	56,4	1	20 800	11 200	700	17 800	13 400
35,6	56,4	1	20 800	11 200	700	10 200	–
35,6	56,4	1	20 800	11 200	700	15 100	13 400

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