

Double-row ball bearings



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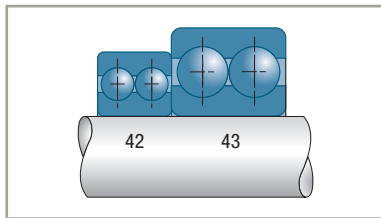
Radial double-row ball bearings

Definition and capabilities

Radial double-row ball bearings are designed to sustain higher radial loads than single-row bearings, as well as axial loads in both directions.

Practically, these bearings only admit very low misalignment between shaft and housing, to the order of 0.06°.

Series



Tolerances and clearances

→ Tolerances

Normally manufactured in the normal tolerance class.

Single-row ball bearings can be supplied on request in tolerance classes 6 and 5 for all or specific characteristics (e.g. bore or radial run-out in tolerance class 6).

→ Internal radial clearance

All standard production bearings are in the normal clearance group N. The other groups can be supplied on request.

For single-row radial ball bearings with a tapered bore, SNR has adopted group 3 (C3) as the standard clearance to allow for the greater reduction in clearance resulting from fitting on a tapered seat.

The radial clearance leads to an axial clearance; a simple formula can be used to calculate the approximate size of the theoretical axial clearance J_a as a function of the operating radial clearance J_r .

$$J_a = (J_r (D-d) / 20)^{1/2}$$



Design criteria

■ Bearing life

■ Residual radial clearance

■ Bearings operating under high axial loads

The performance of bearings operating under high axial loads can be improved by increasing the radial clearance in order to create a contact angle in operation. The axial load F_a must not exceed a mean value of 0,5 C_0 .

This type of operation has to be studied according to the loading conditions and dimensions of the bearings. Consult SNR.

■ Assembly made up by two side-by-side bearings

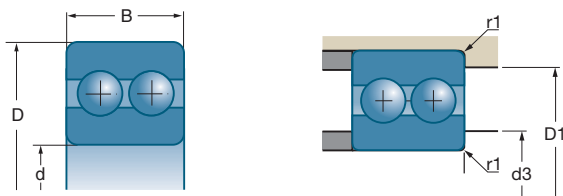
Each pair of bearings is calculated like a single bearing.




Suffixes

A

Bearing without filling slots with glass-fiber reinforced polyamide cage 6.6

Radial double-row ball bearings (continued)

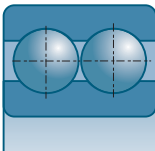




d		D	B				
				10 ³ N	10 ³ N	rpm*	rpm*
mm	References	mm	mm				
10	4200 A	30	14	9.2	5.2	18000	22000
12	4201 A	32	14	9.4	5.5	16000	20000
15	4202 A	35	14	10.4	6.6	14000	18000
	4302 A	42	17	14.8	9.1	12000	16000
17	4203 A	40	16	14.7	9.5	13000	16000
	4303 A	47	19	19.7	13.2	11000	14000
20	4204 A	47	18	17.8	12.7	11000	13000
	4304 A	52	21	23.4	16	9400	12000
25	4205 A	52	18	19.2	14.7	9400	12000
	4305 A	62	24	31.5	22.4	7800	10000
30	4206 A	62	20	26	20.7	7800	9800
	4306 A	72	27	39.5	30.5	6700	8800
35	4207 A	72	23	32	26	6700	8400
	4307 A	80	31	51	38	5900	7800
40	4208 A	80	23	34	30	6000	7500
	4308 A	90	33	63	48	5200	6900
45	4209 A	85	23	36	33	5500	6900
	4309 A	100	36	72	60	4700	6200
50	4210 A	90	23	39.8	36.5	5100	6400
	4310 A	110	40	89	76	4200	5600
55	4211 A	100	25	43	43	4600	5800
	4311 A	120	43	104	90	3900	5100
60	4212 A	110	28	57	58	4200	5300
	4312 A	130	46	120	106	3600	4700
65	4213 A	120	31	67	67	3900	4900
	4313 A	140	48	129	113	3300	4400
70	4214 A	125	31	70	73	3700	4600
75	4215 A	130	31	73	80	3500	4400
80	4216 A	140	33	81	90	3300	4100
85	4217 A	150	36	94	106	3100	3800

* These are the speed limits according to the SNR concept (see pages 85 to 87).

Design criteria

■ Radial double-row ball bearings



	d3 min	D1 max	r1 max	
References	mm	mm	mm	kg
4200 A	14	26	0.6	0.049
4201 A	16	28	0.6	0.055
4202 A 4302 A	19 21	31 36	0.6 1	0.060 0.120
4203 A 4303 A	21 23	36 41	0.6 1	0.090 0.160
4204 A 4304 A	26 27	41 45	1 1.1	0.140 0.210
4205 A 4305 A	31 32	46 55	1 1.1	0.160 0.340
4206 A 4306 A	36 37	56 65	1 1.1	0.260 0.541
4207 A 4307 A	42 44	65 71	1.1 1.5	0.434 0.732
4208A 4308A	47 49	73 81	1.1 1.5	0.531 1.006
4209 A 4309 A	52 54	78 91	1.1 1.5	0.581 1.348
4210 A 4310 A	57 61	83 99	1.1 2	0.623 1.800
4211 A 4311 A	64 66	91 109	1.5 2	0.839 2.275
4212 A 4312 A	69 73	101 117	1.5 2.1	1.153 2.890
4213 A 4313 A	74 78	111 127	1.5 2.1	1.615 3.460
4214 A	79	116	1.5	1.715
4215 A	84	121	1.5	1.810
4216 A	91	129	2	2.280
4217 A	96	139	2	2.500

Double-row angular-contact ball bearings

Definition and capabilities

→ Definition

Double-row angular-contact ball bearings accept axial loads in both directions and can be used singly, as dual bearing units.

→ Capabilities

■ Loads and speeds

These bearings are designed to:

- withstand combined loads with a predominant axial component

$$F_a / F_r \geq 1$$

- withstand axial loads in both directions
- accept relatively high speeds of rotation

■ Misalignment

The construction of these bearings limits them to very small misalignment values, in the range of 0.06°.

Series

■ Series 32...A, 33...A

Contact angle 25°.

No filling slot.

Can accept axial loads in both directions.

These bearings have synthetic material cages.

They are supplied pre-lubricated with a standard application grease (maximum operating temperature 110°C or 230°F).

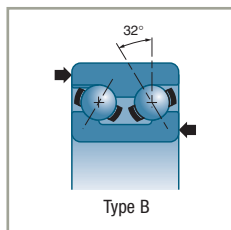
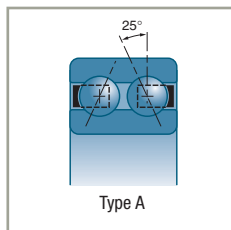
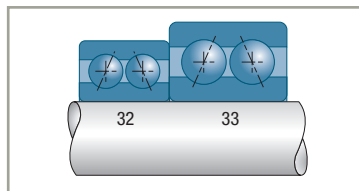
■ Series 32...B, 33...B

Contact angle 32°.

With filling slots.

Can accept axial loads (higher loads than Type A) in a predominant direction.

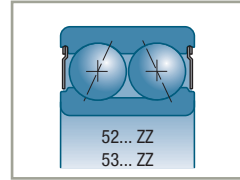
Cage in pressed steel, synthetic material or machined brass.



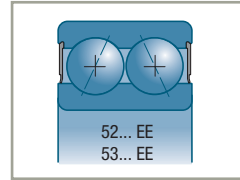
Variants

■ Sealed or protected bearings

Double-row angular-contact ball bearings also exist in variants fitted with shields or seals. In this case their reference becomes 52... ZZ, 53... ZZ or 52... EE, 53... EE.



The outer ring of bearings in the series with seals or shields can be fitted with a snap ring (reference 52...NRZZ, 53 ... NREE). The position dimensions of the snap ring are identical to those of the ball bearing with the same outside diameter.



Tolerances and clearances

→ Tolerances

Manufactured in the normal tolerance class.

→ Axial clearance

An axial clearance is defined for these bearings. This clearance is not standardised. The values are communicated by SNR on request.

The relation between the radial clearance J_r of a bearing and the axial clearance J_a defined above can be approximated using the following formula:

Type A:

$$J_r = 0.4 J_a$$

Type B:

$$J_r = 0.5 J_a$$

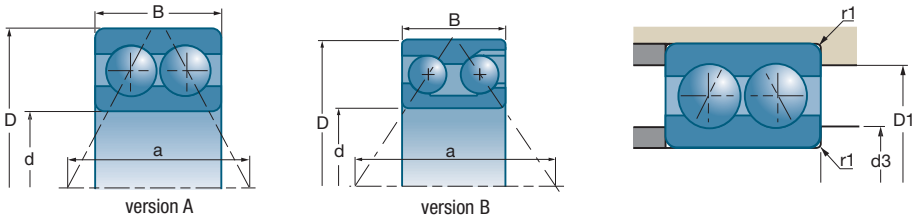
Installation/assembly criteria

In the majority of applications this bearing is considered a single assembly. It can sometimes be used like a double bearing playing the role of two bearings due to the distance between the load application points.

Suffixes

A	No filling slot with polyamide cage, angle 25°
B	With filling slots, angle 32°
G15	Glass-fiber reinforced polyamide cage

Double-row angular-contact ball bearings (continued)

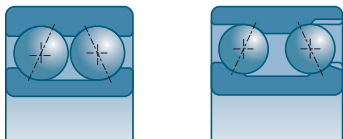




d		D	B	a				
					10°N	10°N	rpm*	rpm*
10	References	30	14	15.1	7.8	4.55	16000	21000
12	3201 A	32	15.9	16.6	10.7	5.9	15000	20000
15	3202 A 3302 A	35	15.9	18	11.8	7.1	13000	18000
		42	19	21.5	16.2	10.1	11000	15000
17	3203 A 3303 A	40	17.5	20.4	14.6	9	12000	15000
		47	22.2	24	20.9	12.4	10000	14000
20	3204 A 3304 B	47	20.6	24.2	19.6	12.5	9700	13000
		52	22.2	34	20.8	18.3	9000	12000
25	3205 B 3305 B	52	20.6	35	18.9	18.2	8400	11000
		62	25.4	40	29	26.5	7500	10000
30	3206 B 3306 B	62	23.8	40.6	27	27	7200	9600
		72	30.2	47.3	38	36	6400	8600
35	3207 B 3307 B	72	27	47.2	37	37.5	6100	8200
		80	34.9	54.1	48.5	47	5600	7500
40	3208 B 3308 B	80	30.2	52	42	44	5500	7300
		90	36.5	59	60	59	5100	6800
45	3209 A 3309 A	85	30.2	43.2	48	37	5100	6800
		100	39.7	50.1	68	51	4600	6100
50	3210 A 3310 A	90	30.2	45.5	51	42	4700	6300
		110	44.4	55	81	62	4200	5600
55	3211 A 3311 A 3311 B	100	33.3	49.9	63	52	4300	5700
		120	49.2	61.2	102	79	3800	5100
		120	49.2	80.4	101	113	3800	5100
60	3212 A 3312 A	110	36.5	55.1	72	61	3900	5200
		130	54	67.3	125	98	3500	4600
65	3213 A 3313 A	120	38.1	59.8	80	73	3500	4700
		140	58.7	73.3	149	118	3200	4300
70	3214 A 3314 B	125	39.7	61.6	84	76	3400	4600
		150	63.5	100.8	147	172	3000	4000
75	3215 A	130	41.3	65	77	84	3200	4200
80	3216 A	140	44.4	69	99	93	3000	4000

* These are the speed limits according to the SNR concept (see pages 85 to 87).

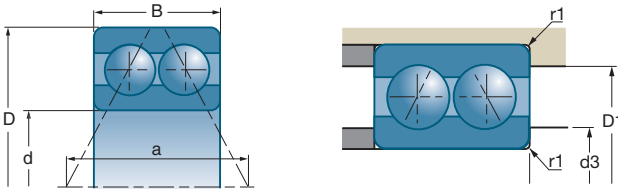
Characteristics

■ Double-row angular-contact ball bearings



	d3 min	D1 max	r1 max	
	mm	mm	mm	
3200 A	15	25	0.6	0.043
3201 A	17	27	0.6	0.051
3202 A 3302 A	20 21	30 36	0.6 1	0.058 0.112
3203 A 3303 A	22 23	35 41	0.6 1	0.085 0.161
3204 A 3304 B	26 27	41 45	1 1	0.139 0.230
3205 B 3305 B	31 32	46 55	1 1	0.190 0.370
3206 B 3306 B	36 37	56 65	1 1	0.310 0.580
3207 B 3307 B	42 44	65 71	1 1.5	0.480 0.780
3208 B 3308 B	47 49	73 81	1 1.5	0.650 1.050
3209 A 3309 A	52 54	78 91	1 1.5	0.583 1.210
3210 A 3310 A	57 60	83 100	1 2	0.760 1.600
3211 A 3311 A 3311 B	64 65 65	91 110 110	1.5 2 2	0.876 2.110 2.530
3212 A 3312 A	69 73	101 118	1.5 2	1.180 2.700
3213 A 3313 A	74 78	111 128	1.5 2	1.520 3.390
3214 A 3314 B	79 83	116 138	1.5 2	1.520 5.050
3215 A	84	121	1.5	1.910
3216 A	91	129	2	2.450

Double-row angular-contact ball bearings (continued)

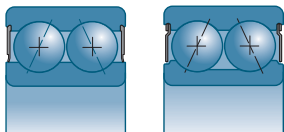


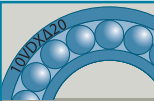

d		D	B	a				
					10 ⁶ N	10 ⁶ N	rpm*	rpm*
mm	References	mm	mm	mm				
12	5201 EE 5201 ZZ	32	15.9	16.6	10.7	5.9	15000	15000
15	5202 EE 5202 ZZ	35	15.9	18	11.8	7.1	13000	13000
	5302 EE	42	19	21.5	16.2	10.1	11000	11000
17	5203 EE 5203 ZZ	40	17.5	20.4	14.6	9	12000	12000
	5303 EE 5303 ZZ	47	22.2	24	20.9	12.4	10000	10000
20	5204 EE 5204 ZZ	47	20.6	24.2	19.6	12.5	9700	9700
	5304 EE 5304 ZZ	52	22.2	26.4	23.3	15.1	8900	8900
25	5205 EE 5205 ZZ	52	20.6	26.5	21.3	14.7	8400	8400
	5305 EE 5305 ZZ	62	25.4	30.7	30	19.9	7600	7600
30	5206 EE 5206 ZZ	62	23.8	31.4	29.5	21.1	7100	7100
	5306 EE 5306 ZZ	72	30.2	36.2	41.5	28.5	6500	6500
35	5207 EE 5207 ZZ	72	27	36.5	39	28.5	6200	6200
	5307 EE 5307 ZZ	80	34.9	41.5	51	34.5	5700	5700
40	5208 EE 5208 ZZ	80	30.2	40.9	48	36.5	5500	5500
	5308 EE 5308 ZZ	90	36.5	45.8	62	45	5100	5100
45	5209 EE 5209 ZZ	85	30.2	43.2	48	37	5100	5100
	5309 EE 5309 ZZ	100	39.7	50.1	68	51	4600	4600
50	5210 EE 5210 ZZ	90	30.2	45.5	51	42	4700	4700
	5310 EE 5310 ZZ	110	44.4	55	81	62	4200	4200
55	5211 EE 5211 ZZ	100	33.3	49.9	59	49.5	2800	4300
	5311 ZZ	120	49.2	61.2	102	79	3800	3800
60	5212 EE 5212 ZZ	110	36.5	55.1	72	61	2500	3900
	5312 ZZ	130	54	67.3	125	98	3500	3500
65	5213 EE 5213 ZZ	120	38.1	59.8	80	73	3500	3500
	5313 ZZ	140	58.7	73.3	149	118	3200	3200
70	5214 EE 5214 ZZ	125	39.7	61.6	84	76	2200	3400

* These are the speed limits according to the SNR concept (see pages 85 to 87).

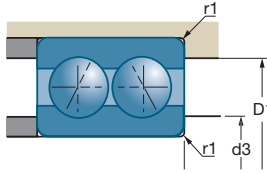
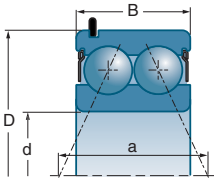
Characteristics

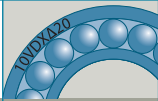



- Double-row angular-contact ball bearings sealed and protected



	d3 min	D1 max	r1 max	
References	mm	mm	mm	kg
5201 EE 5201 ZZ	017.00	027.00	00.6	0.051
5202 EE 5202 ZZ 5302 EE	020.00 021.00	030.00 036.00	00.6 01.0	0.058 0.112
5203 EE 5203 ZZ 5303 EE 5303 ZZ	022.00 023.00	035.00 041.00	00.6 01.0	0.085 0.161
5204 EE 5204 ZZ 5304 EE 5304 ZZ	026.00 027.00	041.00 045.00	01.0 01.0	0.140 0.200
5205 EE 5205 ZZ 5305 EE 5305 ZZ	031.00 032.00	046.00 055.00	01.0 01.0	0.160 0.320
5206 EE 5206 ZZ 5306 EE 5306 ZZ	036.00 037.00	056.00 065.00	01.0 01.1	0.265 0.510
5207 EE 5207 ZZ 5307 EE 5307 ZZ	042.00 044.00	065.00 071.00	01.1 01.5	0.430 0.790
5208 EE 5208 ZZ 5308 EE 5308 ZZ	047.00 049.00	073.00 081.00	01.1 01.5	0.570 1.050
5209 EE 5209 ZZ 5309 EE 5309 ZZ	052.00 054.00	078.00 091.00	01.1 01.5	0.620 1.420
5210 EE 5210 ZZ 5310 EE 5310 ZZ	057.00 060.00	083.00 100.00	01.1 02.0	0.800 1.930
5211 EE 5211 ZZ 5311 ZZ	064.00 065.00	091.00 110.00	01.5 02.0	0.876 2.110
5212 EE 5212 ZZ 5312 ZZ	069.00 073.00	101.00 118.00	01.5 02.1	1.180 2.700
5213 EE 5213 ZZ 5313 ZZ	074.00 078.00	111.00 128.00	01.5 02.1	1.520 3.390
5214 EE 5214 ZZ	079.00	116.00	01.5	1.640

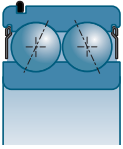
Double-row angular-contact ball bearings (continued)





d		D	B	a						
								mm	mm	mm
15	References	35	15.9	18	11.8	7.1	13000			
17	5203 NRZZ	40	17.5	20.4	14.6	9	12000			
	5303 NRZZ	47	22.2	24	20.9	12.4	10000			
20	5204 NRZZ	47	20.6	24.2	19.6	12.5	9700			
	5304 NRZZ	52	22.2	26.4	23.3	15.1	8900			
25	5205 NRZZ	52	20.6	26.5	21.3	14.7	8400			
	5305 NRZZ	62	25.4	30.7	30	19.9	7600			
30	5206 NRZZ	62	23.8	31.4	29.5	21.1	7100			
	5306 NRZZ	72	30.2	36.2	41.5	28.5	6500			
35	5207 NRZZ	72	27	36.5	39	28.5	6200			
	5307 NRZZ	80	34.9	41.5	51	34.5	5700			
40	5208 NRZZ	80	30.2	40.9	48	36.5	5500			
	5308 NRZZ	90	36.5	45.8	62	45	5100			
45	5209 NRZZ	85	30.2	43.2	48	37	5100			
	5309 NRZZ	100	39.7	50.1	68	51	4600			
50	5210 NRZZ	90	30.2	45.5	51	42	4700			
	5310 NRZZ	110	44.4	55	81	62	4200			
55	5211 NRZZ	100	33.3	49.9	59	49.5	4300			
	5311 NRZZ	120	49.2	61.2	102	79	3800			
60	5212 NRZZ	110	36.5	55.1	72	61	3900			
	5312 NRZZ	130	54	67.3	125	98	3500			
65	5213 NRZZ	120	38.1	59.8	80	73	3500			
	5313 NRZZ	140	58.7	73.3	149	118	3200			
70	5214 NRZZ	125	39.7	61.6	84	76	3400			

* These are the speed limits according to the SNR concept (see pages 85 to 87).

■ Double-row angular-contact ball bearings protected with snap ring



	d3 min	D1 max	r1 max	segment	
References	mm	mm	mm		kg
5202 NRZZ	020.00	030.00	00.6	R35	0.058
5203 NRZZ	022.00	035.00	00.6	R40	0.100
5303 NRZZ	023.00	041.00	01.0	R47	0.190
5204 NRZZ	026.00	041.00	01.0	R47	0.140
5304 NRZZ	027.00	045.00	01.0	R52	0.200
5205 NRZZ	031.00	046.00	01.0	R52	0.160
5305 NRZZ	032.00	055.00	01.0	R62	0.320
5206 NRZZ	036.00	056.00	01.0	R62	0.265
5306 NRZZ	037.00	065.00	01.1	R72	0.590
5207 NRZZ	042.00	065.00	01.1	R72	0.480
5307 NRZZ	044.00	071.00	01.5	R80	0.820
5208 NRZZ	047.00	073.00	01.1	R80	0.650
5308 NRZZ	049.00	081.00	01.5	R90	1.050
5209 NRZZ	052.00	078.00	01.1	R85	0.710
5309 NRZZ	054.00	091.00	01.5	R100	1.340
5210 NRZZ	057.00	083.00	01.1	R90	0.760
5310 NRZZ	060.00	100.00	02.0	R11	1.720
5211 NRZZ	064.00	091.00	01.5	R100	0.876
5311 NRZZ	065.00	110.00	02.0	R120	2.110
5212 NRZZ	069.00	101.00	01.5	R110	1.180
5312 NRZZ	073.00	118.00	02.1	R130	2.700
5213 NRZZ	074.00	111.00	01.5	R120	1.520
5313 NRZZ	078.00	128.00	02.1	R140	3.390
5214 NRZZ	079.00	116.00	01.5	R125	1.640

Double-row self-aligning ball bearings

Definition and capabilities

→ Definition

The spherical race in the outer ring allows angular displacement.
The variant with taper bore makes assembly easier.

■ Cages

Standard dimension bearings are equipped with a synthetic material cage (maximum operating temperature: 120°C or 248°F, 150°C or 302°F peak). Large dimension bearings are equipped with a pressed steel or machined brass cage.

→ Capabilities

■ Loads and speeds

This type of bearing accepts relatively high speeds of rotation. It has good ability to withstand radial loads. Its design, however, means that it can only accept very low axial loads.

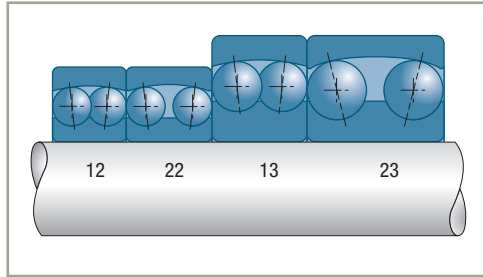
■ Misalignment

The outer ring of this type of bearing has a spherical raceway that allows angular travel rings. This means that it can accept high misalignment values, whether permanent (rotational bending of shaft) or not.

Double-row self-aligning ball bearings allow high misalignment values of the order of 2 to 4° without loss of performance.

The misalignment angle must nevertheless be limited in order to remain within values compatible with the sealing system used.

In sealed variants the permissible misalignment is limited to 0.5°.



Variants

■ Bearings with tapered bore. Suffix K

Standardized 1:12 taper. They are usually fitted using a tapered adapter sleeve.

The tapered bore variant allows the use of as-rolled shafts, thanks to the characteristics of the tapered adapter sleeve. These bearings are often mounted in split pillow blocks.

■ Sealed bearings. Suffix EE. Series 22...EE - 23...EE

These bearings are pre-greased. Their seals limit angular travel possibilities to 1/20. Their basic loads are the same as the series 12 and 13 bearings of the same diameter, because they have the same internal design definition.

They therefore also have the same equivalent load factors.

■ Bearings with wide inner ring. Series 112, 113

Bearings whose inner ring extends beyond both sides of the outer ring. The inner ring has a slot for a drive screw. These bearings are mainly used in agricultural machinery.

Double-row self-aligning ball bearings (continued)

Tolerances and clearances

→ Tolerances

These bearings are supplied with tolerances in compliance with ISO 492 Standard, but in the normal tolerance class only.

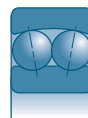
→ Clearances

■ Internal radial clearance

This clearance is standardised (ISO 5753). The values are different for cylindrical bore and tapered bore bearings (suffix K). The latter have a significantly larger clearance to allow the reduction in clearance resulting from the adapter sleeve interference fit. The recommended residual clearance after fitting is of the range of:

$$J_{rm} = 2 d^{1/2} 10^{-3}$$

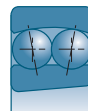
■ Double-row self-aligning ball bearings with cylindrical bore series 12-13-22-23-112-113



Bore diameter d (mm)	Group 2		Group N		Group 3		Group 4		Group 5	
	min	max	min	max	min	max	min	max	min	max
2,5 < d ≤ 6	1	8	5	15	10	20	15	25	21	33
6 < d ≤ 10	2	9	6	17	12	25	19	33	27	42
10 < d ≤ 18	2	10	6	19	13	26	21	35	30	48
14 < d ≤ 18	3	12	8	21	15	28	23	37	32	50
18 < d ≤ 24	4	14	10	23	17	30	25	39	34	52
24 < d ≤ 30	5	16	11	24	19	35	29	46	40	58
30 < d ≤ 40	6	18	13	29	23	40	34	53	46	66
40 < d ≤ 50	6	19	14	31	25	44	37	57	50	71
50 < d ≤ 65	7	21	16	36	30	50	45	69	62	88
65 < d ≤ 80	8	24	18	40	35	60	54	83	76	108
80 < d ≤ 100	9	27	22	48	42	70	64	96	89	124
100 < d ≤ 120	10	31	25	56	50	83	75	114	105	145
120 < d ≤ 140	10	38	30	68	60	100	90	135	125	175
140 < d ≤ 160	15	44	35	80	70	120	110	161	150	210

Value in μm

■ Bearings with tapered bore
series 12K-13K-22K-23K



Bore diameter d (mm)	Group 2		Group N		Group 3		Group 4		Group 5	
	min	max	min	max	min	max	min	max	min	max
18 <d≤ 24	7	17	13	26	20	33	28	42	37	55
24 <d≤ 30	9	20	15	28	23	39	33	50	44	62
30 <d≤ 40	12	24	19	35	29	46	40	59	52	72
40 <d≤ 50	14	27	22	39	33	52	45	65	58	79
50 <d≤ 65	18	32	27	47	41	61	56	80	73	99
65 <d≤ 80	23	39	35	57	50	75	69	98	91	123
80 <d≤ 100	29	47	42	68	62	90	84	116	109	144
100 <d≤ 120	35	56	50	81	75	108	100	139	130	170
120 <d≤ 140	40	68	60	98	90	130	120	165	155	205
140 <d≤ 160	45	74	65	110	100	150	140	191	180	240

Value in μm

■ Axial clearance

As the axial clearance J_a is a function of the radial clearance J_r , its value can be calculated using the following approximation formula:

$$J_a = 2.27 Y_0 \cdot J_r$$

Fitting and adjustment

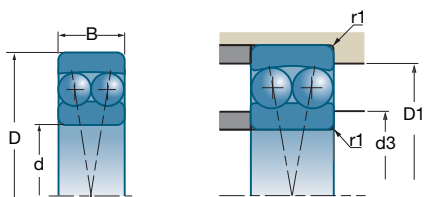
This type of bearing is very sensitive to any cancellation of clearance and the residual clearance must be checked after fitting swivelling by hand. It is particularly important to perform this check on bearings with a tapered bore.




Some self-aligning ball bearings protrude slightly with respect to the faces. Example: 1320.

Suffixes

EE	Double sealing
G14, G15	Moulded polyamide cage
K	Tapered bore, 1:12 taper
M	Machined brass cage centred on the balls

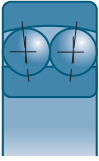
Double-row self-aligning ball bearings (continued)



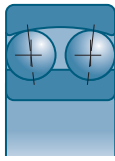
d		D	B			e	Y		Yo
							Fa Fr ≤ e	Fa Fr > e	
mm	References	mm	mm	10°N	10°N				
10	1200 G15	30	9	5.50	1.19	0.31	2.00	3.10	2.00
	2200 G14	30	14	7.30	1.58	0.31	2.00	3.10	2.00
12	1201 G15	32	10	5.60	1.26	0.31	2.00	3.10	2.00
	2201 G15	32	14	7.50	1.71	0.31	2.00	3.10	2.00
	1301 G14	37	12	9.40	2.14	0.33	1.90	2.90	1.90
15	1202 G15	35	11	7.50	1.75	0.31	2.00	3.10	2.00
	2202 G15	35	14	9.20	2.08	0.31	2.00	3.10	2.00
	1302 G14	42	13	9.50	2.28	0.33	1.90	2.90	1.90
	2302 G15	42	17	16.30	3.85	0.42	1.47	2.28	1.55
17	1203 G15	40	12	7.90	2.03	0.31	2.00	3.10	2.00
	2203 G15	40	16	11.50	2.75	0.46	1.40	2.10	1.40
	1303 G14	47	14	12.50	3.20	0.33	1.90	2.90	1.90
	2303 G14	47	19	14.40	3.55	0.50	1.20	2.00	1.20
20	1204	47	14	9.70	2.65	0.26	2.40	3.60	2.40
	2204 G15	47	18	14.30	3.50	0.43	1.50	2.30	1.50
	1304 G15	52	15	12.40	3.35	0.27	2.30	3.60	2.40
25	1205	52	15	11.90	3.30	0.27	2.30	3.60	2.40
	2205	52	18	12.20	3.45	0.42	1.50	2.40	1.60
	2205 G15	52	18	16.90	4.45	0.42	1.50	2.40	1.60
	1305 G15	62	17	18.00	5.00	0.27	2.30	3.60	2.40
	2305 G15	62	24	24.40	6.50	0.47	1.40	2.10	1.40
30	1206	62	16	15.40	4.70	0.24	2.60	4.00	2.70
	2206	62	20	15.00	4.60	0.36	1.80	2.70	1.80
	1306	72	19	20.90	6.30	0.24	2.60	4.00	2.70
	2306	72	27	30.50	8.70	0.43	1.40	2.30	1.50
35	1207	72	17	15.60	5.10	0.22	2.90	4.50	3.00
	2207	72	23	21.20	6.70	0.36	1.80	2.70	1.90
	1307 G15	80	21	25.00	7.90	0.24	2.60	4.00	2.70
	2307 G15	80	31	39.50	11.10	0.46	1.40	2.10	1.40
40	1208	80	18	19.00	6.50	0.21	2.90	4.60	3.10
	2208 G15	80	23	31.50	9.50	0.25	2.60	4.00	2.70
	1308	90	23	29.00	9.80	0.24	2.60	4.00	2.80
	2308 G15	90	33	45.00	13.40	0.44	1.50	2.20	1.50
45	1209	85	19	21.50	7.40	0.21	2.90	4.60	3.10
	2209	85	23	23.00	8.20	0.29	2.10	3.30	2.20
	1309	100	25	37.50	12.90	0.24	2.60	4.00	2.70
	2309 G15	100	36	54.00	16.40	0.44	1.50	2.20	1.50

Characteristics




■ Double-row self-aligning ball bearings with cylindrical bore



12../23..

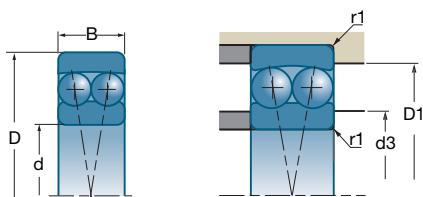


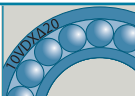

22../23..

References	 rpm*	 rpm*	d3 min	D1 max	r1 max	
	rpm*	rpm*	mm	mm	mm	kg
1200 G15 2200 G14	24000 24000	29000 29000	14.0 14.0	26.0 27.0	0.6 0.6	0.032 0.048
1201 G15 2201 G15 1301 G14	23000 22000 18000	27000 26000 22000	16.0 16.0 17.0	28.0 28.0 31.0	0.6 0.6 1.0	0.041 0.055 0.073
1202 G15 2202 G15 1302 G14 2302 G15	20000 19000 16000 15000	23000 23000 19000 17000	19.0 19.0 20.0 20.0	31.0 31.0 36.0 36.0	0.6 0.6 1.0 1.0	0.050 0.063 0.097 0.115
1203 G15 2203 G15 1303 G14 2303 G14	17000 16000 14000 13000	21000 19000 17000 16000	21.0 21.0 22.0 22.0	36.0 36.0 41.0 41.0	0.6 0.6 1.1 1.1	0.073 0.088 0.128 0.157
1204 2204 G15 1304 G15	14000 14000 12000	17000 16000 14000	25.0 25.0 26.5	42.0 42.0 47.0	1.0 1.0 1.1	0.118 0.140 0.160
1205 2205 2205 G15 1305 G15 2305 G15	12000 12000 12000 10000 9600	15000 14000 14000 12000 11000	30.0 30.0 30.0 31.5 31.5	47.0 46.0 47.0 55.0 55.0	1.0 1.0 1.0 1.1 1.1	0.138 0.163 0.160 0.280 0.340
1206 2206 1306 2306	10000 10000 8500 8100	12000 12000 10000 9000	35.0 35.0 36.5 36.5	57.0 56.0 65.0 65.0	1.0 1.0 1.1 1.1	0.221 0.260 0.387 0.500
1207 2207 1307 G15 2307 G15	9000 8800 7400 7200	10000 10000 9000 8600	41.5 41.5 43.0 43.0	65.0 65.0 72.0 71.0	1.1 1.1 1.5 1.5	0.323 0.403 0.510 0.680
1208 2208 G15 1308 2308 G15	7900 7700 6600 6400	9400 9200 8000 7700	46.5 46.5 48.0 48.0	73.0 73.0 82.0 81.0	1.1 1.1 1.5 1.5	0.417 0.550 0.715 0.919
1209 2209 1309 2309 G15	7400 7200 6000 5700	8800 8600 7000 6800	51.5 51.5 53.0 53.0	78.0 78.0 92.0 91.0	1.1 1.1 1.5 1.5	0.465 0.550 0.957 1.229

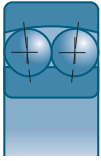
* These are the speed limits according to the SNR concept (see pages 85 to 87).

Double-row self-aligning ball bearings (continued)

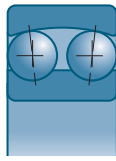


d		D	B		C	C ₀	e	Y		Y ₀
								$\frac{F_a}{F_r} \leq e$	$\frac{F_a}{F_r} > e$	
mm	References	mm	mm	10 ³ N	10 ³ N					
50	1210	90	20	22.50	8.10	0.19	3.30	5.10	3.50	
	2310	90	23	23.00	8.50	0.27	2.30	3.60	2.40	
	1311 G15	110	27	41.50	14.30	0.24	2.60	4.10	2.80	
	2310 G15	110	40	65.00	20.10	0.44	1.50	2.20	1.50	
55	1211	100	21	26.50	10.00	0.19	3.40	5.20	3.50	
	2211	100	25	26.50	9.90	0.27	2.30	3.60	2.30	
	1311 G15	120	29	51.00	18.00	0.23	2.80	4.30	2.80	
	2311 G15	120	43	75.00	23.80	0.44	1.50	2.20	1.50	
60	1212 G15	110	22	30.00	11.60	0.18	3.60	5.50	3.60	
	2212	110	28	34.00	12.50	0.27	2.30	3.60	2.30	
	1312	130	31	57.00	20.70	0.23	2.80	4.30	2.80	
	2312 G15	130	46	87.00	28.00	0.40	1.60	2.50	1.60	
65	1213	120	23	31.00	12.40	0.18	3.60	5.50	3.60	
	2213	120	31	43.50	16.40	0.27	2.30	3.60	2.30	
	2313 G15	140	48	96.00	32.50	0.40	1.60	2.50	1.60	
70	2214	125	31	44.00	17.00	0.27	2.30	3.60	2.30	
	2314	150	51	109.00	37.50	0.40	1.60	2.50	1.60	
75	1215	130	25	39.00	15.50	0.18	3.60	5.50	3.60	
	2215	130	31	44.50	17.90	0.25	2.50	3.80	2.50	
	1315	160	37	79.00	30.00	0.23	2.80	4.30	2.80	
	2315	160	55	123.00	42.50	0.40	1.60	2.50	1.60	
80	1216	140	26	40.00	16.90	0.18	3.60	5.50	3.60	
	2216	140	33	49.00	20.00	0.25	2.50	3.80	2.50	
85	1217	150	28	49.00	20.40	0.18	3.60	5.50	3.60	
	1317	180	41	98.00	38.00	0.23	2.80	4.30	2.80	
90	1218	160	30	57.00	23.50	0.18	3.60	5.50	3.60	
	2218	160	40	69.00	28.50	0.27	2.40	3.70	2.50	
	2318	190	64	149.00	58.00	0.37	1.70	2.60	1.80	
95	1219	170	32	64.00	27.00	0.18	3.60	5.50	3.60	
100	1220	180	34	69.00	29.50	0.18	3.60	5.50	3.60	
	2220	180	46	96.00	40.50	0.26	2.40	3.60	2.50	
	1320	215	47	143.00	58.00	0.23	2.80	4.30	2.80	
110	1222	200	38	88.00	38.50	0.18	3.60	5.50	3.60	

■ Double-row self-aligning ball bearings with cylindrical bore (*continued*)







12../23..



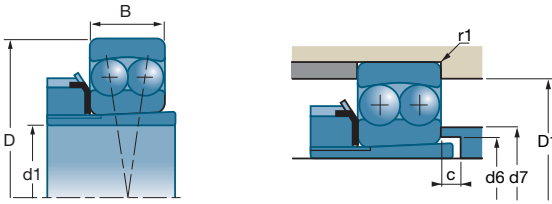
22../23..



			d3 min	D1 max	r1 max	
References	rpm*	rpm*	mm	mm	mm	kg
1210	6900	8200	56.5	83.0	1.1	0.525
2210	6700	8000	56.5	83.0	1.1	0.590
1310 G15	5400	6500	59.0	99.0	2.0	1.200
2310 G15	5200	6200	59.0	99.0	2.0	1.623
1211	6100	7300	63.0	92.0	1.5	0.697
2211	6100	7200	63.0	91.0	1.5	0.788
1311 G15	5000	6000	64.0	109.0	2.0	1.640
2311 G15	4700	5600	64.0	109.0	2.0	2.070
1212 G15	5700	6700	68.0	102.0	1.5	0.890
2212	5600	6600	68.0	101.0	1.5	1.079
1312	4600	5600	71.0	117.0	2.1	1.952
2312 G15	4300	5200	71.0	117.0	2.1	2.600
1213	5200	6200	73.0	111.0	1.5	1.133
2213	5100	6000	73.0	111.0	1.5	1.470
2313 G15	4000	4800	76.0	123.0	2.1	3.171
2214	4800	5700	78.0	116.0	1.5	1.550
2314	3700	4400	81.0	137.0	2.1	4.170
1215	4700	5600	83.0	121.0	1.5	1.341
2215	4600	5400	83.0	121.0	1.5	1.630
1315	3700	4400	86.0	147.0	2.1	3.680
2315	3500	4200	86.0	147.0	2.1	4.740
1216	4400	5200	89.0	129.0	2.0	1.646
2216	4200	5000	91.0	129.0	2.0	2.100
1217	4100	4800	94.0	139.0	2.0	2.160
1317	3300	4000	98.0	166.0	3.0	5.150
1218	3800	4500	99.0	149.0	2.0	2.500
2218	3700	4400	99.0	151.0	2.0	3.190
2318	2900	3500	103.0	177.0	3.0	7.840
1219	3600	4200	106.0	157.0	2.1	3.200
1220	3400	4000	111.0	167.0	2.1	3.700
2220	3300	4000	111.0	169.0	2.1	4.680
1320	2800	3400	113.0	201.0	3.0	8.700
1222	3100	3700	121.0	187.0	2.1	5.320

* These are the speed limits according to the SNR concept (see pages 85 to 87).

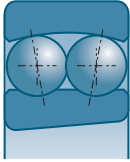
Double-row self-aligning ball bearings (continued)




d1		Sleeves	d	D	B	C1				
							C	C ₀	rpm ⁺	rpm ⁺
mm	References	References	mm	mm	mm	mm	10 ³ N	10 ³ N	rpm ⁺	rpm ⁺
20	1205 K	H205	25	52	15		11.90	3.30	12000	15000
	2205 K	H305	25	52	18		12.20	3.45	12000	14000
	1305 KG15	H305	25	62	17		18.00	5.00	10000	12000
	2305 KG15	H2305	25	62	24		24.40	6.50	9400	11000
25	1206 K	H206	30	62	16		15.40	4.70	10000	12000
	2206 K	H306	30	62	20		15.00	4.60	10000	12000
	1306 K	H306	30	72	19		21.30	6.30	8600	10000
	2306 K	H2306	30	72	27		30.50	8.70	8100	9000
30	1207 K	H207	35	72	17		15.60	5.10	9000	10000
	2207 K	H307	35	72	23		21.20	6.70	8800	10000
	1307 KG15	H307	35	80	21		25.00	7.90	7400	9000
	2307 KG15	H2307	35	80	31		39.50	11.10	7200	8600
35	1208 K	H208	40	80	18		19.00	6.50	7900	9400
	2208 KG15	H308	40	80	23		31.50	9.50	7700	9200
	1308 K	H308	40	90	23		29.00	9.80	6600	8000
	2308 K	H2308	40	90	33		45.00	13.40	6400	7700
40	1209 K	H209	45	85	19		21.50	7.40	7400	8800
	2209 K	H309	45	85	23		23.00	8.20	7200	8000
	1309 K	H309	45	100	25		37.50	12.90	6000	7000
	2309 K	H2309	45	100	36		54.00	16.40	5700	6800
45	1210 K	H210	50	90	20		22.50	8.10	6900	8200
	2210 K	H310	50	90	23		23.00	8.50	6700	8000
	1310 KG15	H310	50	110	27		41.50	14.30	5400	6500
	2310 K	H2310	50	110	40		65.00	20.10	5200	6200
50	1211 K	H211	55	100	21		26.50	10.00	6100	7300
	2211 K	H311	55	100	25		26.50	9.90	6100	7200
	1311 KG15	H311	55	120	29		51.00	18.00	5000	6000
	2311 K	H2311	55	120	43		75.00	23.80	4700	5600
55	1212 KG15	H212	60	110	22		30.00	11.60	5700	6700
	2212 K	H312	60	110	28		34.00	12.50	5500	6600
	1312 K	H312	60	130	31		57.00	20.70	4600	5600
	2312 K	H2312	60	130	46		87.00	28.00	4300	5200
60	1213 K	H213	65	120	23		31.00	12.40	5200	6200
	2213 K	H313	65	120	31		43.50	16.40	5100	6000
	2313 K	H2313	65	140	48		96.00	32.50	4000	4800

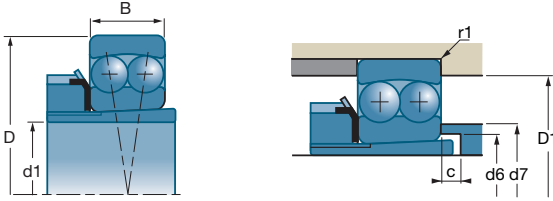
* These are the speed limits according to the SNR concept (see pages 85 to 87).

■ Double-row self-aligning ball bearings with tapered bore with adapter sleeve



References	Sleeves	e	Y		Yo	d7 max	d6 min	c	D1 max	r1 max	
			$\frac{F_a}{F_r} \leq e$	$\frac{F_a}{F_r} > e$							
References	References					mm	mm	mm	mm	mm	kg
1205 K 2205 K 1305 KG15 2305 KG15	H205 H305 H305 H2305	0.27 0.42 0.27 0.48	2.3 1.5 2.3 1.3	3.6 2.4 3.6 2.0	2.4 1.6 2.4 1.4	32 33 37 36	28 28 28 30	5 5 6 5	47 46 55 55	1.0 1.0 1.1 1.1	0.139 0.164 0.280 0.328
1206 K 2206 K 1306 K 2306 K	H206 H306 H306 H2306	0.24 0.38 0.26 0.43	2.6 1.7 2.4 1.4	4.0 2.6 3.8 2.3	2.7 1.7 2.4 1.5	39 40 43 43	33 33 33 35	5 5 6 5	57 56 65 65	1.0 1.0 1.5 1.1	0.220 0.260 0.408 0.500
1207 K 2207 K 1307 KG15 2307 KG15	H207 H307 H307 H2307	0.22 0.36 0.24 0.46	2.9 1.8 2.6 1.4	4.5 2.7 4.0 2.1	3.0 1.9 2.7 1.4	46 47 51 48	38 39 39 40	5 5 8 5	65 65 72 71	1.1 1.1 1.5 1.5	0.322 0.401 0.510 0.680
1208 K 2208 KG15 1308 K 2308 K	H208 H308 H308 H2308	0.21 0.25 0.24 0.44	2.9 2.6 2.6 1.5	4.6 4.0 4.0 2.2	3.1 2.7 2.8 1.5	53 53 57 55	43 44 44 45	5 5 5 5	73 73 82 81	1.1 1.1 1.5 1.5	0.417 0.550 0.715 0.930
1209 K 2209 K 1309 K 2309 K	H209 H309 H309 H2309	0.21 0.29 0.24 0.44	2.9 2.1 2.6 1.5	4.6 3.3 4.0 2.2	3.1 2.2 2.7 1.5	57 58 63 62	48 50 50 50	5 8 5 5	78 78 92 91	1.1 1.1 1.5 1.5	0.465 0.550 0.959 1.250
1210 K 2210 K 1310 KG15 2310 K	H210 H310 H310 H2310	0.19 0.27 0.24 0.44	3.3 2.3 2.6 1.5	5.1 3.6 4.1 2.2	3.5 2.4 2.8 1.5	61 63 69 67	53 55 55 56	5 10 5 5	83 83 99 99	1.1 1.1 2.0 2.0	0.525 0.584 1.200 1.650
1211 K 2211 K 1311 KG15 2311 K	H211 H311 H311 H2311	0.19 0.27 0.23 0.44	3.4 2.3 2.8 1.5	5.2 3.6 4.3 2.2	3.5 2.3 2.8 1.5	68 70 76 74	60 60 60 61	6 10 6 6	92 91 109 109	1.5 1.5 2.0 2.0	0.697 0.773 1.550 2.260
1212 KG15 2212 K 1312 K 2312 K	H212 H312 H312 H2312	0.18 0.27 0.23 0.4	3.6 2.3 2.8 1.6	5.5 3.6 4.3 2.5	3.6 2.3 2.8 1.6	76 77 85 75	64 65 65 66	5 8 5 5	102 101 117 117	1.5 1.5 2.1 2.1	0.890 1.079 1.952 2.600
1213 K 2213 K 2313 K	H213 H313 H2313	0.18 0.27 0.4	3.6 2.3 1.6	5.5 3.6 2.5	3.6 2.3 1.6	84 83 88	70 70 72	5 8 5	111 111 127	1.5 1.5 2.1	1.124 1.419 3.170

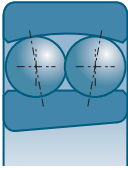
Double-row self-aligning ball bearings (continued)




d1		Sleeves	d	D	B	C1				
	References						References	mm	mm	mm
65	1215K	H215	75	130	25		39.00	15.50	4700	5600
	2215K	H315	75	130	31		44.50	17.90	4500	5400
	1315K	H315	75	160	37		79.00	30.00	3800	4500
	2315K	H2315	75	160	55		123.00	42.50	3500	4200
70	1216K	H216	80	140	26		40.00	16.90	4400	5200
	2216K	H316	80	140	33		49.00	20.00	4200	5100
75	1217K	H217	85	150	28		49.00	20.40	4100	4800
	1317K	H317	85	180	41		94.00	37.00	3300	4000
80	1218K	H218	90	160	30		57.00	23.50	3800	4600
	2218K	H318	90	160	40		69.00	28.50	3700	4000
	2318K	H2318	90	190	64		149.00	58.00	2900	3000
85	1219K	H219	95	170	32		64.00	27.00	3600	4300
90	1220K	H220	100	180	34		69.00	29.50	3400	4000
	2220K	H320	100	180	46		96.00	40.50	3300	4000
	1320K	H320	100	215	47	2.5	143.00	58.00	2800	3400
100	1222K	H222	110	200	38		88.00	38.50	3100	3700

* These are the speed limits according to the SNR concept (see pages 85 to 87).

■ Double-row self-aligning ball bearings with tapered bore with adapter sleeve (continued)



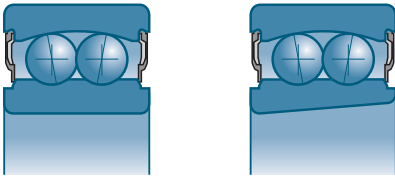
References	Sleeves	e	Y		Yo	d7 max	d6 min	c	D1 max	r1 max	
			$\frac{F_a}{F_r} \leq e$	$\frac{F_a}{F_r} > e$							
References	References					mm	mm	mm	mm	mm	kg
1215K 2215K 1315K 2315K	H215 H315 H315 H2315	0.18 0.25 0.23 0.4	3.6 2.5 2.8 1.6	5.5 3.8 4.3 2.5	3.6 2.5 2.8 1.6	92 93 102 101	80 80 80 82	5 12 5 5	121 121 147 147	1.5 1.5 2.1 2.1	1.324 1.600 3.690 4.700
1216K 2216K	H216 H316	0.18 0.25	3.6 2.5	5.5 3.8	3.6 2.5	101 100	85 85	5 12	129 129	2.0 2.0	1.630 2.100
1217K 1317K	H217 H317	0.18 0.23	3.6 2.8	5.5 4.3	3.6 2.8	105 115	90 91	6 6	139 166	2.0 3.0	2.029 5.150
1218K 2218K 2318K	H218 H318 H2318	0.18 0.27 0.37	3.6 2.4 1.7	5.5 3.7 2.6	3.6 2.5 1.8	110 112.3 112	95 96 100	6 10 7	149 151 177	2.0 2.0 3.0	2.500 3.190 7.840
1219K	H219	0.18	3.6	5.5	3.6	118	100	7	157	2.1	3.200
1220K 2220K 1320K	H220 H320 H320	0.18 0.26 0.23	3.6 2.4 2.8	5.5 3.7 4.3	3.6 2.5 2.8	125 120 135	106 108 108	7 8 7	167 169 201	2.1 2.1 3.0	3.790 4.680 8.300
1222K	H222	0.18	3.6	5.5	3.6	139	116	7	187	2.1	5.320

Double-row self-aligning ball bearings (continued)



d	References	D	B	C		e	Y		Y ₀
				10°N	10°N		$\frac{F_a}{F_r} \leq e$	$\frac{F_a}{F_r} > e$	
12	2201 EEG15	32	14	5.6	1.26	0.31	2	3.1	2
15	2202 EEG15	35	14	7.5	1.75	0.31	2	3.1	2
17	2203 EEG15 2303 EEG14	40	16	7.9	2	0.33	1.9	3	2
		47	19	12.5	3.2	0.32	1.9	3	2
20	2204 EEG15 2204 KEEG15 2304 EEG15	47	18	9.9	2.7	0.28	2.2	3.5	2.3
		52	21	12.4	3.4	0.29	2.2	3.3	2.3
25	2205 EEG15 2205 KEEG15 2305 EEG15	52	18	12.1	3.3	0.27	2.4	3.7	2.5
		62	24	18	5	0.28	2.3	3.5	2.4
30	2206 EEG15 2206 KEEG15 2306 EEG15	62	20	15.7	4.7	0.25	2.5	3.9	2.7
		72	27	21.3	6.3	0.26	2.4	3.7	2.5
35	2207 EEG15 2207 KEEG15 2307 EEG15	72	23	15.8	5.2	0.22	2.8	4.3	2.9
		80	31	25	7.9	0.26	2.5	3.8	2.6
40	2208 EEG15 2208 KEEG15 2308 EEG15	80	23	19.2	6.5	0.22	2.9	4.5	3
		90	33	29.5	9.8	0.25	2.5	3.9	2.6
45	2209 EEG15 2209 KEEG15 2309 EEG15	85	23	21.8	7.4	0.21	3	4.7	3.2
		100	36	38	12.9	0.25	2.5	3.9	2.6
50	2210 EEG15 2210 KEEG15 2310 EEG15	90	23	22.7	8.1	0.2	3.2	4.9	3.3
		110	40	41.5	14.3	0.24	2.6	4	2.7
55	2211 EEG15 2211 KEEG15	100	25	27	10	0.27	2.3	3.6	2.3
60	2212 EEG15	110	28	30	11.6	0.18	3.5	5.4	3.6

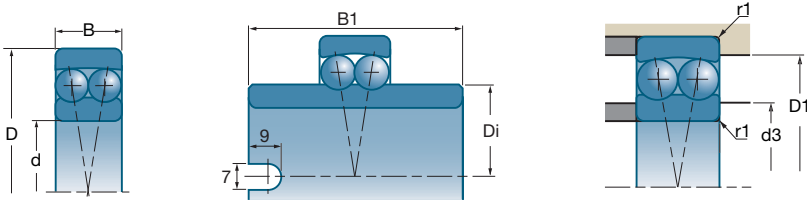
■ Double-row self-aligning ball bearings sealed



References	rpm*	d3 min	D1 max	r1 max	kg
2201 EEG15	17000	15	28.0	0.6	0.060
2202 EEG15	14000	19	31.0	0.6	0.070
2203 EEG15 2303 EEG14	12000 9800	21 22	36.0 42.0	0.6 1.0	0.103 0.179
2204 EEG15 2204 KEEG15 2304 EEG15	11000 8500	25 26	42.0 45.5	1.0 1.1	0.157 0.243
2205 EEG15 2205 KEEG15 2305 EEG15	9200 7100	30 31.5	47.0 55.5	1.0 1.1	0.174 0.385
2206 EEG15 2206 KEEG15 2306 EEG15	7700 6000	35 36.5	57.0 65.5	1.0 1.1	0.282 0.540
2207 EEG15 2207 KEEG15 2307 EEG15	6600 5300	41.5 43	65.5 71.0	1.1 1.5	0.430 0.730
2208 EEG15 2208 KEEG15 2308 EEG15	5900 4800	46.5 48	73.5 82.0	1.1 1.5	0.545 0.990
2209 EEG15 2209 KEEG15 2309 EEG15	5400 4300	51.5 53	78.5 92.0	1.1 1.5	0.579 1.400
2210 EEG15 2210 KEEG15 2310 EEG15	5000 3900	56.5 59	83.5 101.0	1.1 2.0	0.630 1.780
2211 EEG15 2211 KEEG15	6000	63	91.0	1.5	0.790
2212 EEG15	3600	68	101.0	1.5	1.160

* These are the speed limits according to the SNR concept (see pages 85 to 87).





Double-row self-aligning ball bearings (continued)



d		D	B1	B			e	Y		Yo
								$\frac{F_a}{F_r} \leq e$	$\frac{F_a}{F_r} > e$	
mm	References	mm	mm	mm	10 ³ N	10 ³ N				
20	11204 G15	47	40	14.0	9.9	2.7	0.28	2.2	3.4	2.2
25	11205 G15	52	44	15.0	12.1	3.3	0.28	2.2	3.4	2.2
	11305 G15	62	48	17.0	18.0	5.0	0.28	2.2	3.4	2.2
30	11206 G15	62	48	16.0	15.7	4.7	0.23	2.7	4.2	2.7
	11306 G15	72	52	19.0	21.3	6.3	0.26	2.4	3.8	2.4
35	11207 G15	72	52	17.0	15.8	5.2	0.23	2.7	4.2	2.7
40	11208 G15	80	56	18.0	19.2	6.5	0.21	2.9	4.5	2.9
	11308 G15	90	58	23.0	29.5	9.8	0.26	2.4	3.8	2.4
45	11209 G15	85	58	19.0	21.8	7.4	0.21	2.9	4.5	2.9
	11309	100	60	38.0	38.0	12.9	0.26	2.4	3.8	2.4
50	11210 G15	90	58	20.0	22.7	8.1	0.20	3.2	4.9	3.2
	11310	110	62	43.5	42.5	14.3	0.20	2.8	4.3	2.8
55	11211 G15	100	60	21.0	27.0	10.0	0.20	3.2	4.9	3.2
60	11212 G15	110	62	22.0	30.0	11.6	0.18	3.6	5.5	3.6

■ Double-row self-aligning ball bearings with wide inner ring



			Di min	D1 max	r1 max	
References	rpm*	rpm*	mm	mm	mm	kg
11204 G15	9400	12000	29.2	42	1	0.180
11205 G15 11305 G15	8100 6700	10000 8300	33.3 38.0	47 55	1 1	0.220 0.410
11206 G15 11306 G15	6900 5700	8600 7000	40.1 45.0	57 65	1 1	0.350 0.610
11207 G15	5900	7400	47.7	65	1	0.540
11208 G15 11308 G15	5200 4400	6500 5500	54.0 57.7	73 82	1 1	0.720 1.080
11209 G15 11309	4800 4000	6100 4900	57.7 63.9	78 92	1 1	0.770 1.380
11210 G15 11310	4500 3600	5600 4500	62.7 70.3	83 99	1 1.1	0.850 1.720
11211 G15	4000	5000	70.3	92	1.5	1.130
11212 G15	3600	4500	78.0	102	1.5	1.500

* These are the speed limits according to the SNR concept (see pages 85 to 87).