

# Double-row ball bearings



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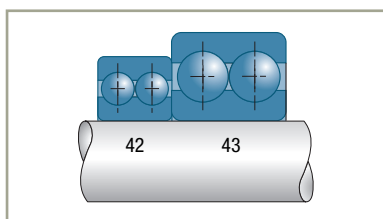
## Radial double-row ball bearings

### 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  $0.06^\circ$ .

### 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 C0.

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

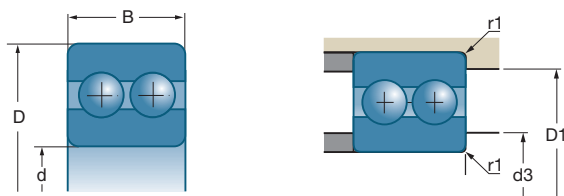
Each pair of bearings is calculated like a single bearing.



## Suffixes

**A**

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

## Radial double-row ball bearings (continued)

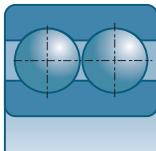




d		D	B				
mm	References	mm	mm	10 <sup>3</sup> N	10 <sup>3</sup> N	rpm*	rpm*
<b>10</b>	4200 A	30	14	9.2	5.2	18000	22000
<b>12</b>	4201 A	32	14	9.4	5.5	16000	20000
<b>15</b>	4202 A 4302 A	35	14	10.4	6.6	14000	18000
		42	17	14.8	9.1	12000	16000
<b>17</b>	4203 A 4303 A	40	16	14.7	9.5	13000	16000
		47	19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

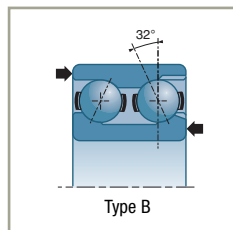
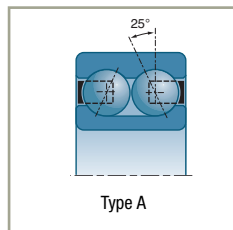
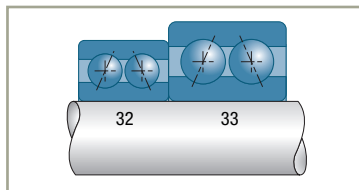
#### ■ Series 32...B, 33...B

Contact angle 32°.

With filling slots.

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

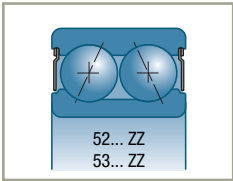
Cage in pressed steel, synthetic material or machined brass.



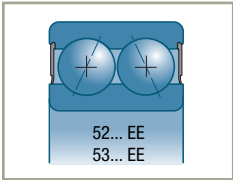
# Variants

## 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:

$$J_r = 0.5 J_a$$

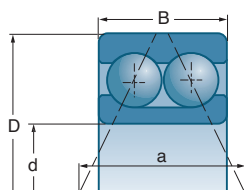
# Installation/assembly criteria

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.

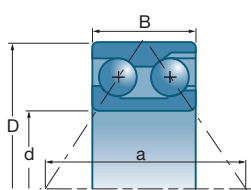
# Suffixes

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

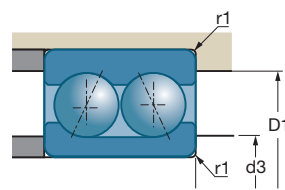
## Double-row angular-contact ball bearings (continued)



version A



version B



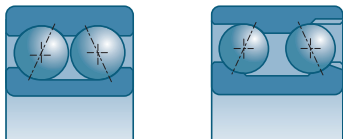
d		D	B	a				
mm	References	mm	mm	mm	10 <sup>3</sup> N	10 <sup>3</sup> N	rpm*	rpm*
10	3200 A	30	14	15.1	7.8	4.55	16000	21000
12	3201 A	32	15.9	16.6	10.7	5.9	15000	20000
15	3202 A 3302 A	35 42	15.9 19	18 21.5	11.8 16.2	7.1 10.1	13000 11000	18000 15000
17	3203 A 3303 A	40 47	17.5 22.2	20.4 24	14.6 20.9	9 12.4	12000 10000	15000 14000
20	3204 A 3304 B	47 52	20.6 22.2	24.2 34	19.6 20.8	12.5 18.3	9700 9000	13000 12000
25	3205 B 3305 B	52 62	20.6 25.4	35 40	18.9 29	18.2 26.5	8400 7500	11000 10000
30	3206 B 3306 B	62 72	23.8 30.2	40.6 47.3	27 38	27 36	7200 6400	9600 8600
35	3207 B 3307 B	72 80	27 34.9	47.2 54.1	37 48.5	37.5 47	6100 5600	8200 7500
40	3208 B 3308 B	80 90	30.2 36.5	52 59	42 60	44 59	5500 5100	7300 6800
45	3209 A 3309 A	85 100	30.2 39.7	43.2 50.1	48 68	37 51	5100 4600	6800 6100
50	3210 A 3310 A	90 110	30.2 44.4	45.5 55	51 81	42 62	4700 4200	6300 5600
55	3211 A 3311 A 3311 B	100 120 120	33.3 49.2 49.2	49.9 61.2 80.4	63 102 101	52 79 113	4300 3800 3800	5700 5100 5100
60	3212 A 3312 A	110 130	36.5 54	55.1 67.3	72 125	61 98	3900 3500	5200 4600
65	3213 A 3313 A	120 140	38.1 58.7	59.8 73.3	80 149	73 118	3500 3200	4700 4300
70	3214 A 3314 B	125 150	39.7 63.5	61.6 100.8	84 147	76 172	3400 3000	4600 4000
75	3215 A	130	41.3	65	77	84	3200	4200
80	3216 A	140	44.4	69	99	93	3000	4000

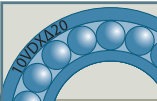

\* These are the speed limits according to the SNR concept (see pages 85 to 87).



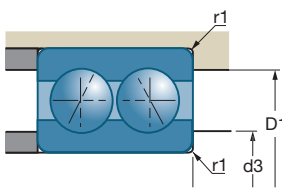
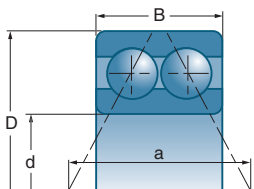
## Characteristics





### ■ Double-row angular-contact ball bearings



	d3 min	D1 max	r1 max	
	mm	mm	mm	kg
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)

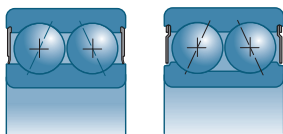


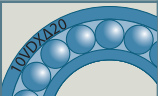

d		D	B	a					
mm	References	mm	mm	mm	10°N	10°N	rpm*	rpm*	
<b>12</b>	5201 EE 5201 ZZ	32	15.9	16.6	10.7	5.9	15000	15000	
<b>15</b>	5202 EE 5202 ZZ 5302 EE	35 42	15.9 19	18 21.5	11.8 16.2	7.1 10.1	13000 11000	13000	
<b>17</b>	5203 EE 5203 ZZ 5303 EE 5303 ZZ	40 47	17.5 22.2	20.4 24	14.6 20.9	9 12.4	12000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

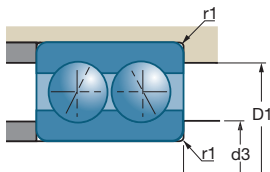
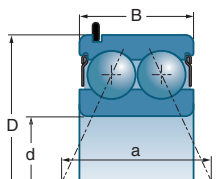
## Characteristics





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



		d3 min	D1 max	r1 max	
References		mm	mm	mm	kg
5201 EE	5201 ZZ	17	27	0,6	0,051
5202 EE	5202 ZZ	20	30	0,6	0,058
5302 EE		21	36	1	0,112
5203 EE	5203 ZZ	22	35	0,6	0,085
5303 EE	5303 ZZ	23	41	1	0,161
5204 EE	5204 ZZ	26	41	1	0,140
5304 EE	5304 ZZ	27	45	1	0,200
5205 EE	5205 ZZ	31	46	1	0,160
5305 EE	5305 ZZ	32	55	1	0,320
5206 EE	5206 ZZ	36	56	1	0,265
5306 EE	5306 ZZ	37	65	1,1	0,510
5207 EE	5207 ZZ	42	65	1,1	0,430
5307 EE	5307 ZZ	44	71	1,5	0,790
5208 EE	5208 ZZ	47	73	1,1	0,570
5308 EE	5308 ZZ	49	81	1,5	1,050
5209 EE	5209 ZZ	52	78	1,1	0,620
5309 EE	5309 ZZ	54	91	1,5	1,420
5210 EE	5210 ZZ	57	83	1,1	0,800
5310 EE	5310 ZZ	60	100	2	1,930
5211 EE	5211 ZZ	64	91	1,5	0,876
	5311 ZZ	6	110	2	2,110
5212 EE	5212 ZZ	69	101	1,5	1,180
	5312 ZZ	73	118	2,1	2,700
5213 EE	5213 ZZ	74	111	1,5	1,520
	5313 ZZ	78	128	2,1	3,390
5214 EE	5214 ZZ	79	116	1,5	1,640

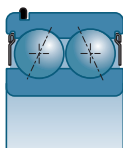
## Double-row angular-contact ball bearings (continued)





d		D	B	a			
mm	References	mm	mm	mm	10°N	10°N	rpm*
<b>15</b>	5202 NRZZ	35	15.9	18	11.8	7.1	13000
<b>17</b>	5203 NRZZ	40	17.5	20.4	14.6	9	12000
	5303 NRZZ	47	22.2	24	20.9	12.4	10000
<b>20</b>	5204 NRZZ	47	20.6	24.2	19.6	12.5	9700
	5304 NRZZ	52	22.2	26.4	23.3	15.1	8900
<b>25</b>	5205 NRZZ	52	20.6	26.5	21.3	14.7	8400
	5305 NRZZ	62	25.4	30.7	30	19.9	7600
<b>30</b>	5206 NRZZ	62	23.8	31.4	29.5	21.1	7100
	5306 NRZZ	72	30.2	36.2	41.5	28.5	6500
<b>35</b>	5207 NRZZ	72	27	36.5	39	28.5	6200
	5307 NRZZ	80	34.9	41.5	51	34.5	5700
<b>40</b>	5208 NRZZ	80	30.2	40.9	48	36.5	5500
	5308 NRZZ	90	36.5	45.8	62	45	5100
<b>45</b>	5209 NRZZ	85	30.2	43.2	48	37	5100
	5309 NRZZ	100	39.7	50.1	68	51	4600
<b>50</b>	5210 NRZZ	90	30.2	45.5	51	42	4700
	5310 NRZZ	110	44.4	55	81	62	4200
<b>55</b>	5211 NRZZ	100	33.3	49.9	59	49.5	4300
	5311 NRZZ	120	49.2	61.2	102	79	3800
<b>60</b>	5212 NRZZ	110	36.5	55.1	72	61	3900
	5312 NRZZ	130	54	67.3	125	98	3500
<b>65</b>	5213 NRZZ	120	38.1	59.8	80	73	3500
	5313 NRZZ	140	58.7	73.3	149	118	3200
<b>70</b>	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	20	30	0,6	R35	0,058
5203 NRZZ	22	35	0,6	R40	0,100
5303 NRZZ	23	41	1	R47	0,190
5204 NRZZ	26	41	1	R47	0,140
5304 NRZZ	27	45	1	R52	0,200
5205 NRZZ	31	46	1	R52	0,160
5305 NRZZ	32	55	1	R62	0,320
5206 NRZZ	36	56	1	R62	0,265
5306 NRZZ	37	65	1,1	R72	0,590
5207 NRZZ	42	65	1,1	R72	0,480
5307 NRZZ	44	71	1,5	R80	0,820
5208 NRZZ	47	73	1,1	R80	0,650
5308 NRZZ	49	81	1,5	R90	1,050
5209 NRZZ	52	78	1,1	R85	0,710
5309 NRZZ	54	91	1,5	R100	1,340
5210 NRZZ	57	83	1,1	R90	0,760
5310 NRZZ	60	100	2	R11	1,720
5211 NRZZ	64	91	1,5	R100	0,876
5311 NRZZ	65	110	2	R120	2,110
5212 NRZZ	69	101	1,5	R110	1,180
5312 NRZZ	73	118	2,1	R130	2,700
5213 NRZZ	74	111	1,5	R120	1,520
5313 NRZZ	78	128	2,1	R140	3,390
5214 NRZZ	79	116	1,5	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.

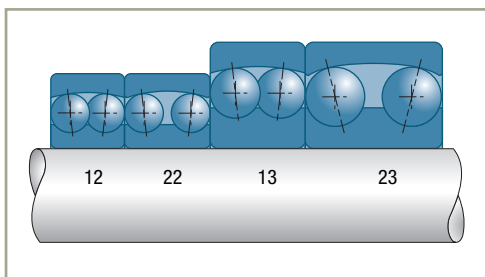
#### ■ Misalignment

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.

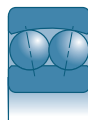
#### → Clearances

##### ■ 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

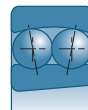


Bore diameter	Group 2		Group N		Group 3		Group 4		Group 5	
d (mm)	min	max	min	max	min	max	min	max	min	max
2,5 < d ≤ 6	1	8	5	15	10	20	15	25	21	33
6 < d ≤ 10	2	9	6	17	12	25	19	33	27	42
10 < d ≤ 18	2	10	6	19	13	26	21	35	30	48
14 < d ≤ 18	3	12	8	21	15	28	23	37	32	50
18 < d ≤ 24	4	14	10	23	17	30	25	39	34	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	Group 2		Group N		Group 3		Group 4		Group 5	
d (mm)	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

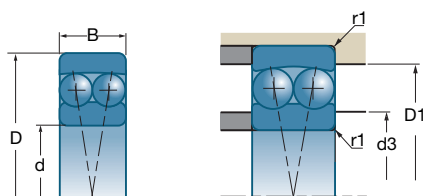
This type of bearing is very sensitive to any cancellation of clearance and the residual clearance must be checked after fitting swivelling by hand. It is particularly important to perform this check on bearings with a tapered bore.



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

## Suffixes

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

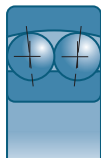
## Double-row self-aligning ball bearings (continued)



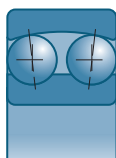
d		D	B		C	e	Y		Y <sub>0</sub>
							Fa — ≤ e Fr	Fa — > e Fr	
mm	References	mm	mm	10°N	10°N				
<b>10</b>	1200 G15	30	9	5.50	1.19	0.31	2.00	3.10	2.00
	2200 G14	30	14	7.30	1.58	0.31	2.00	3.10	2.00
<b>12</b>	1201 G15	32	10	5.60	1.26	0.31	2.00	3.10	2.00
	2201 G15	32	14	7.50	1.71	0.31	2.00	3.10	2.00
	1301 G14	37	12	9.40	2.14	0.33	1.90	2.90	1.90
<b>15</b>	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
<b>17</b>	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
<b>20</b>	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
<b>25</b>	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
<b>30</b>	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
<b>35</b>	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
<b>40</b>	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
<b>45</b>	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..

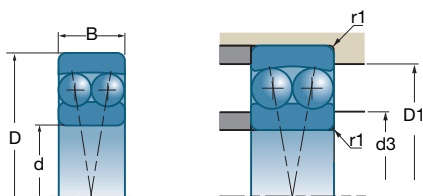


22../23..

			d3 min	D1 max	r1 max	
References	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

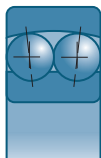
\* These are the speed limits according to the SNR concept (see pages 85 to 87).

## Double-row self-aligning ball bearings (continued)

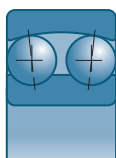


d		D	B			e	Y		Yo
							Fa — ≤ e Fr	Fa — > e Fr	
mm	References	mm	mm	10°N	10°N				
<b>50</b>	1210	90	20	22.50	8.10	0.19	3.30	5.10	3.50
	2210	90	23	23.00	8.50	0.27	2.30	3.60	2.40
	1310 G15	110	27	41.50	14.30	0.24	2.60	4.10	2.80
	2310 G15	110	40	65.00	20.10	0.44	1.50	2.20	1.50
<b>55</b>	1211	100	21	26.50	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
<b>60</b>	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
<b>65</b>	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
<b>70</b>	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
<b>75</b>	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
<b>80</b>	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
<b>85</b>	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
<b>90</b>	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
<b>95</b>	1219	170	32	64.00	27.00	0.18	3.60	5.50	3.60
<b>100</b>	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
<b>110</b>	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..

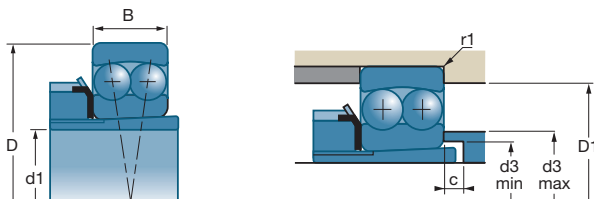


22../23..

			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).

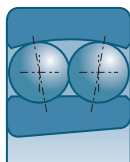
## Double-row self-aligning ball bearings (continued)





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

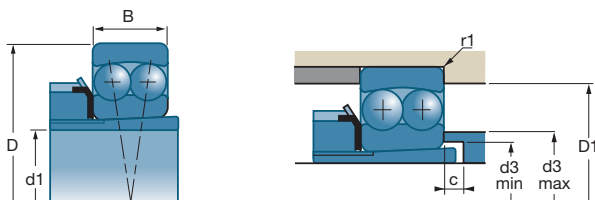
\* These are the speed limits according to the SNR concept (see pages 85 to 87).

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



	Sleeves	e	Y		Yo	d3 max	d3 min	c	D1 max	r1 max	
			$\frac{Fa}{Fr} \leq e$	$\frac{Fa}{Fr} > e$							
References	References					mm	mm	mm	mm	mm	kg
1205 K	H205	0.27	2.3	3.6	2.4	32	28	5	47	1.0	0.139
2205 K	H305	0.42	1.5	2.4	1.6	33	28	5	46	1.0	0.164
1305 KG15	H305	0.27	2.3	3.6	2.4	37	28	6	55	1.1	0.280
2305 KG15	H2305	0.48	1.3	2.0	1.4	36	30	5	55	1.1	0.328
1206 K	H206	0.24	2.6	4.0	2.7	39	33	5	57	1.0	0.220
2206 K	H306	0.38	1.7	2.6	1.7	40	33	5	56	1.0	0.260
1306 K	H306	0.26	2.4	3.8	2.4	43	33	6	65	1.5	0.408
2306 K	H2306	0.43	1.4	2.3	1.5	43	35	5	65	1.1	0.500
1207 K	H207	0.22	2.9	4.5	3.0	46	38	5	65	1.1	0.322
2207 K	H307	0.36	1.8	2.7	1.9	47	39	5	65	1.1	0.401
1307 KG15	H307	0.24	2.6	4.0	2.7	51	39	8	72	1.5	0.510
2307 KG15	H2307	0.46	1.4	2.1	1.4	48	40	5	71	1.5	0.680
1208 K	H208	0.21	2.9	4.6	3.1	53	43	5	73	1.1	0.417
2208 KG15	H308	0.25	2.6	4.0	2.7	53	44	5	73	1.1	0.550
1308 K	H308	0.24	2.6	4.0	2.8	57	44	5	82	1.5	0.715
2308 K	H2308	0.44	1.5	2.2	1.5	55	45	5	81	1.5	0.930
1209 K	H209	0.21	2.9	4.6	3.1	57	48	5	78	1.1	0.465
2209 K	H309	0.29	2.1	3.3	2.2	58	50	8	78	1.1	0.550
1309 K	H309	0.24	2.6	4.0	2.7	63	50	5	92	1.5	0.959
2309 K	H2309	0.44	1.5	2.2	1.5	62	50	5	91	1.5	1.250
1210 K	H210	0.19	3.3	5.1	3.5	61	53	5	83	1.1	0.525
2210 K	H310	0.27	2.3	3.6	2.4	63	55	10	83	1.1	0.584
1310 KG15	H310	0.24	2.6	4.1	2.8	69	55	5	99	2.0	1.200
2310 K	H2310	0.44	1.5	2.2	1.5	67	56	5	99	2.0	1.650
1211 K	H211	0.19	3.4	5.2	3.5	68	60	6	92	1.5	0.697
2211 K	H311	0.27	2.3	3.6	2.3	70	60	10	91	1.5	0.773
1311 KG15	H311	0.23	2.8	4.3	2.8	76	60	6	109	2.0	1.550
2311 K	H2311	0.44	1.5	2.2	1.5	74	61	6	109	2.0	2.260
1212 KG15	H212	0.18	3.6	5.5	3.6	76	64	5	102	1.5	0.890
2212 K	H312	0.27	2.3	3.6	2.3	77	65	8	101	1.5	1.079
1312 K	H312	0.23	2.8	4.3	2.8	85	65	5	117	2.1	1.952
2312 K	H2312	0.4	1.6	2.5	1.6	75	66	5	117	2.1	2.600
1213 K	H213	0.18	3.6	5.5	3.6	84	70	5	111	1.5	1.124
2213 K	H313	0.27	2.3	3.6	2.3	83	70	8	111	1.5	1.419
2313 K	H2313	0.4	1.6	2.5	1.6	88	72	5	127	2.1	3.170

## Double-row self-aligning ball bearings (continued)

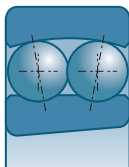




d1		Sleeves	d	D	B	C1				
mm	References	References	mm	mm	mm	mm	10 <sup>3</sup> N	10 <sup>3</sup> N	rpm*	rpm*
<b>65</b>	1215K 2215K 1315K 2315K	H215 H315 H315 H2315	75 75 75 75	130 130 160 160	25 31 37 55		39.00 44.50 79.00 123.00	15.50 17.90 30.00 42.50	4700 4500 3800 3500	5600 5400 4500 4200
<b>70</b>	1216K 2216K	H216 H316	80 80	140 140	26 33		40.00 49.00	16.90 20.00	4400 4200	5200 5100
<b>75</b>	1217K 1317K	H217 H317	85 85	150 180	28 41		49.00 94.00	20.40 37.00	4100 3300	4800 4000
<b>80</b>	1218K 2218K 2318K	H218 H318 H2318	90 90 90	160 160 190	30 40 64		57.00 69.00 149.00	23.50 28.50 58.00	3800 3700 2900	4600 4000 3000
<b>85</b>	1219K	H219	95	170	32		64.00	27.00	3600	4300
<b>90</b>	1220K 2220K 1320K	H220 H320 H320	100 100 100	180 180 215	34 46 47	2.5	69.00 96.00 143.00	29.50 40.50 58.00	3400 3300 2800	4000 4000 3400
<b>100</b>	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).

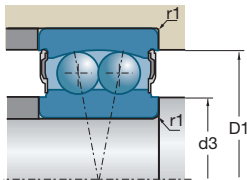
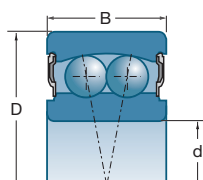




■ Double-row self-aligning ball bearings with tapered bore with adapter sleeve (continued)



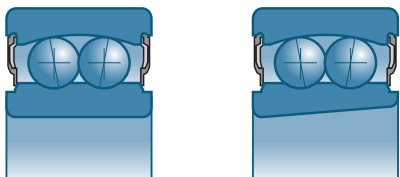
	Sleeves	e	Y		Yo	d3 max	d3 min	c	D1 max	r1 max	
			$\frac{Fa}{Fr} \leq e$	$\frac{Fa}{Fr} > e$							
References	References					mm	mm	mm	mm	mm	kg
1215K	H215	0.18	3.6	5.5	3.6	92	80	5	121	1.5	1.324
2215K	H315	0.25	2.5	3.8	2.5	93	80	12	121	1.5	1.600
1315K	H315	0.23	2.8	4.3	2.8	102	80	5	147	2.1	3.690
2315K	H2315	0.4	1.6	2.5	1.6	101	82	5	147	2.1	4.700
1216K	H216	0.18	3.6	5.5	3.6	101	85	5	129	2.0	1.630
2216K	H316	0.25	2.5	3.8	2.5	100	85	12	129	2.0	2.100
1217K	H217	0.18	3.6	5.5	3.6	105	90	6	139	2.0	2.029
1317K	H317	0.23	2.8	4.3	2.8	115	91	6	166	3.0	5.150
1218K	H218	0.18	3.6	5.5	3.6	110	95	6	149	2.0	2.500
2218K	H318	0.27	2.4	3.7	2.5	112.3	96	10	151	2.0	3.190
2318K	H2318	0.37	1.7	2.6	1.8	112	100	7	177	3.0	7.840
1219K	H219	0.18	3.6	5.5	3.6	118	100	7	157	2.1	3.200
1220K	H220	0.18	3.6	5.5	3.6	125	106	7	167	2.1	3.790
2220K	H320	0.26	2.4	3.7	2.5	120	108	8	169	2.1	4.680
1320K	H320	0.23	2.8	4.3	2.8	135	108	7	201	3.0	8.300
1222K	H222	0.18	3.6	5.5	3.6	139	116	7	187	2.1	5.320

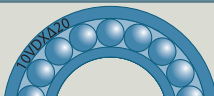


## Double-row self-aligning ball bearings (continued)



d		D	B		e	Y		Y <sub>0</sub>	
						$\frac{F_a}{F_r} \leq e$	$\frac{F_a}{F_r} > e$		
mm	References	mm	mm	10 <sup>3</sup> N	10 <sup>3</sup> N				
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

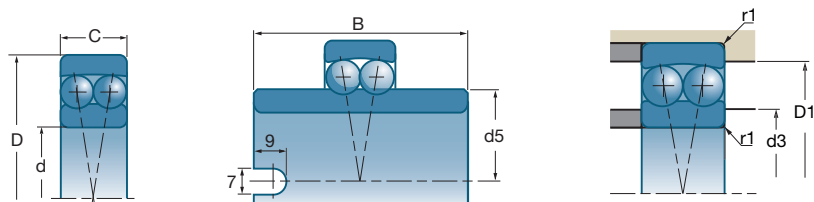
## ■ Double-row self-aligning ball bearings sealed






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

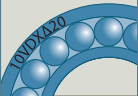



## Double-row self-aligning ball bearings (continued)



d		D	B	C			e	Y		Yo
								$\frac{F_a}{F_r} \leq e$	$\frac{F_a}{F_r} > e$	
mm	References	mm	mm	mm	10 <sup>3</sup> N	10 <sup>3</sup> 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



			d5	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).