

4. SELF-ALIGNING BALL BEARINGS

INTRODUCTION C 116

BEARING TABLES

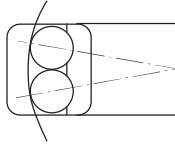
SELF-ALIGNING BALL BEARINGS

Bore Diameter 5 – 110 mm C 118



DESIGN, TYPES, AND FEATURES

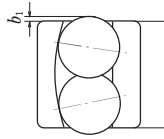
The outer ring of a self-aligning ball bearing has a spherical raceway and its center of curvature coincides with that of the bearing; therefore, the axis of the inner ring, balls and cage can deflect to some extent around the bearing center. This type is recommended when the alignment of the shaft and housing is difficult and when the shaft may bend. Since the contact angle is small, axial load capacity is low. Pressed-steel cages are usually used.



PROTRUSION AMOUNT

Some self-aligning ball bearings have balls that protrude from the side face as shown below. This protrusion amount b_1 is listed in the following table.

| Bearing Designation | b_1 (mm) |
|------------------------------------|------------|
| 2222(K), 2316(K) | 0.5 |
| 2319(K), 2320(K) 2321 , 2322(K) | 0.5 |
| 1318(K) | 1.5 |
| 1319(K) | 2 |
| 1320(K), 1321 1322(K) | 3 |



TOLERANCES AND RUNNING ACCURACY

..... Table 7.2 (Pages A128 to A131)

RECOMMENDED FITS

..... Table 8.3 (Page A164)
..... Table 8.5 (Page A165)

INTERNAL CLEARANCE

..... Table 8.13 (Page A170)

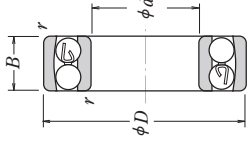
PERMISSIBLE MISALIGNMENT

The permissible misalignment of self-aligning ball bearings is approximately 0.07 to 0.12 radian (4° to 7°) under normal loads. However, depending on the surrounding structure, such an angle may not be possible. Take care in the design of the bearing surroundings.

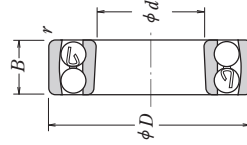


SELF-ALIGNING BALL BEARINGS

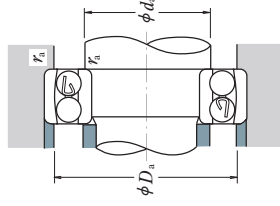
Bore Diameter 5 – 30 mm



Cylindrical Bore



Tapered Bore



Dynamic Equivalent Load

$$P = X F_r + Y F_a$$

$$F_r / F_a \leq e \quad F_r / F_a > e$$

| | | | |
|---|----------------|------|----------------|
| X | Y | X | Y |
| 1 | Y ₃ | 0.65 | Y ₂ |

Static Equivalent Load

$$P_0 = F_r + Y_0 F_a$$

The values of e , Y_2 , Y_3 , and Y_0 are listed in the table below.

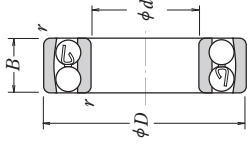
| d | Boundary Dimensions (mm) | | Basic Load Ratings (N) | | Limiting Speeds (min ⁻¹) | | Bearing Cylindrical Bore | Designations Tapered Bore (1) | Abutment and Fillet Dimensions (mm) | | | Constant | | | Axial Load Factors | | | Mass (kg) approx. |
|----|--------------------------|----|------------------------|-----------------|--------------------------------------|--------|--------------------------|-------------------------------|-------------------------------------|---------------------|---------------------|----------|----------------|----------------|--------------------|-------|--|-------------------|
| | D | B | C _r | C _{0r} | Grease | Oil | | | d _a min. | D _a max. | r _a max. | e | Y ₂ | Y ₃ | Y ₀ | | | |
| 5 | 19 | 6 | 2530 | 475 | 30 000 | 36 000 | 135 | — | 7 | 17 | 0.3 | 0.34 | 2.9 | 1.9 | 1.9 | 0.009 | | |
| 6 | 19 | 6 | 2530 | 475 | 30 000 | 36 000 | 126 | — | 8 | 17 | 0.3 | 0.34 | 2.9 | 1.9 | 1.9 | 0.008 | | |
| 7 | 22 | 7 | 2750 | 600 | 26 000 | 32 000 | 127 | — | 9 | 20 | 0.3 | 0.31 | 3.1 | 2.0 | 2.1 | 0.013 | | |
| 8 | 22 | 7 | 2750 | 600 | 26 000 | 32 000 | 108 | — | 10 | 20 | 0.3 | 0.31 | 3.1 | 2.0 | 2.1 | 0.016 | | |
| 9 | 26 | 8 | 4 150 | 895 | 26 000 | 30 000 | 129 | — | 13 | 22 | 0.6 | 0.32 | 3.1 | 2.0 | 2.1 | 0.021 | | |
| 10 | 30 | 9 | 5 550 | 1 190 | 22 000 | 28 000 | 1200 | — | 14 | 26 | 0.6 | 0.32 | 3.1 | 2.0 | 2.1 | 0.034 | | |
| 10 | 30 | 14 | 7 450 | 1 590 | 24 000 | 28 000 | 2200 | — | 14 | 26 | 0.6 | 0.64 | 1.5 | 0.98 | 1.0 | 0.046 | | |
| 10 | 35 | 11 | 7 350 | 1 620 | 20 000 | 24 000 | 1300 | — | 14 | 31 | 0.6 | 0.35 | 2.8 | 1.8 | 1.9 | 0.059 | | |
| 10 | 35 | 17 | 9 200 | 2 010 | 18 000 | 22 000 | 2300 | — | 14 | 31 | 0.6 | 0.71 | 1.4 | 0.89 | 0.93 | 0.080 | | |
| 12 | 32 | 10 | 5 700 | 1 270 | 22 000 | 26 000 | 1201 | — | 16 | 28 | 0.6 | 0.36 | 2.7 | 1.8 | 1.8 | 0.041 | | |
| 12 | 32 | 14 | 7 750 | 1 730 | 22 000 | 26 000 | 2201 | — | 16 | 28 | 0.6 | 0.58 | 1.7 | 1.1 | 1.1 | 0.051 | | |
| 12 | 37 | 12 | 9 650 | 2 160 | 18 000 | 22 000 | 1301 | — | 17 | 32 | 1 | 0.33 | 2.9 | 1.9 | 2.0 | 0.068 | | |
| 12 | 37 | 17 | 12 100 | 2 730 | 17 000 | 22 000 | 2301 | — | 17 | 32 | 1 | 0.60 | 1.6 | 1.1 | 1.1 | 0.089 | | |
| 15 | 35 | 11 | 7 600 | 1 750 | 18 000 | 22 000 | 1202 | — | 19 | 31 | 0.6 | 0.32 | 3.1 | 2.0 | 2.1 | 0.050 | | |
| 15 | 35 | 14 | 9 800 | 2 420 | 16 000 | 20 000 | 2202 | — | 19 | 31 | 0.6 | 0.50 | 1.9 | 1.3 | 1.3 | 0.058 | | |
| 15 | 42 | 13 | 9 700 | 2 290 | 16 000 | 20 000 | 1302 | — | 20 | 37 | 1 | 0.33 | 2.9 | 1.9 | 2.0 | 0.101 | | |
| 15 | 42 | 17 | 12 300 | 2 910 | 14 000 | 18 000 | 2302 | — | 20 | 37 | 1 | 0.51 | 1.9 | 1.2 | 1.3 | 0.116 | | |
| 17 | 40 | 12 | 8 000 | 2 010 | 16 000 | 20 000 | 1203 | — | 21 | 36 | 0.6 | 0.31 | 3.1 | 2.0 | 2.1 | 0.074 | | |
| 17 | 40 | 16 | 9 950 | 2 420 | 14 000 | 17 000 | 2203 | — | 21 | 36 | 0.6 | 0.50 | 1.9 | 1.3 | 1.3 | 0.089 | | |
| 17 | 47 | 14 | 12 700 | 3 200 | 14 000 | 17 000 | 1303 | — | 22 | 42 | 1 | 0.32 | 3.1 | 2.0 | 2.1 | 0.13 | | |
| 17 | 47 | 19 | 14 700 | 3 550 | 13 000 | 16 000 | 2303 | — | 22 | 42 | 1 | 0.51 | 1.9 | 1.2 | 1.3 | 0.16 | | |
| 20 | 47 | 14 | 10 000 | 2 610 | 14 000 | 17 000 | 1204 | 1204 K | 25 | 42 | 1 | 0.29 | 3.4 | 2.2 | 2.3 | 0.12 | | |
| 20 | 47 | 18 | 12 800 | 3 300 | 14 000 | 17 000 | 2204 | 2204 K | 25 | 42 | 1 | 0.47 | 2.1 | 1.3 | 1.4 | 0.142 | | |
| 20 | 52 | 15 | 12 600 | 3 350 | 12 000 | 15 000 | 1304 | 1304 K | 26.5 | 45.5 | 1 | 0.29 | 3.4 | 2.2 | 2.3 | 0.164 | | |
| 20 | 52 | 21 | 18 500 | 4 700 | 11 000 | 14 000 | 2304 | 2304 K | 26.5 | 45.5 | 1 | 0.50 | 1.9 | 1.2 | 1.3 | 0.210 | | |
| 25 | 52 | 15 | 12 200 | 3 300 | 12 000 | 14 000 | 1205 | 1205 K | 30 | 47 | 1 | 0.28 | 3.5 | 2.3 | 2.4 | 0.14 | | |
| 25 | 52 | 18 | 12 400 | 3 450 | 10 000 | 14 000 | 2205 | 2205 K | 30 | 47 | 1 | 0.41 | 2.4 | 1.5 | 1.6 | 0.16 | | |
| 25 | 62 | 17 | 18 200 | 5 000 | 10 000 | 13 000 | 1305 | 1305 K | 31.5 | 55.5 | 1 | 0.28 | 3.5 | 2.3 | 2.4 | 0.261 | | |
| 25 | 62 | 24 | 24 900 | 6 600 | 9 500 | 12 000 | 2305 | 2305 K | 31.5 | 55.5 | 1 | 0.47 | 2.1 | 1.4 | 1.4 | 0.340 | | |
| 30 | 62 | 16 | 15 800 | 4 650 | 10 000 | 12 000 | 1206 | 1206 K | 35 | 57 | 1 | 0.25 | 3.9 | 2.5 | 2.6 | 0.22 | | |
| 30 | 62 | 20 | 15 300 | 4 550 | 10 000 | 12 000 | 2206 | 2206 K | 35 | 57 | 1 | 0.38 | 2.5 | 1.6 | 1.7 | 0.262 | | |
| 30 | 72 | 19 | 21 400 | 6 300 | 8 500 | 11 000 | 1306 | 1306 K | 36.5 | 65.5 | 1 | 0.26 | 3.7 | 2.4 | 2.5 | 0.391 | | |
| 30 | 72 | 27 | 32 000 | 8 750 | 8 000 | 10 000 | 2306 | 2306 K | 36.5 | 65.5 | 1 | 0.44 | 2.2 | 1.4 | 1.5 | 0.51 | | |

Note (1) Suffix K represents bearings with tapered bores (1 : 12).

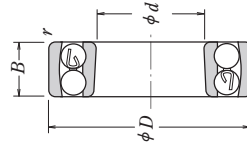
Remark For dimensions related to adapters, refer to Page C348.

SELF-ALIGNING BALL BEARINGS

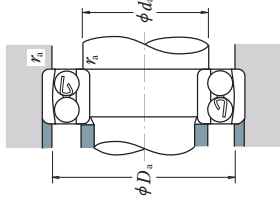
Bore Diameter 35 – 70 mm



Cylindrical Bore



Tapered Bore



Dynamic Equivalent Load

$$P = X F_r + Y F_a$$

$$F_r / F_a \leq e \quad F_r / F_a > e$$

| | | | |
|---|----------------|------|----------------|
| X | Y | X | Y |
| 1 | Y ₃ | 0.65 | Y ₂ |

Static Equivalent Load

$$P_0 = F_r + Y_0 F_a$$

The values of e , Y_2 , Y_3 , and Y_0 are listed in the table below.

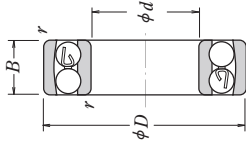
| d | Boundary Dimensions (mm) | | Basic Load Ratings (N) | | Limiting Speeds (min ⁻¹) | | Bearing | Designations | Abutment and Fillet Dimensions (mm) | | | Constant | Axial Load Factors | | | Mass (kg) |
|----|--------------------------|----|------------------------|-----------------|--------------------------------------|--------|---------|--------------|-------------------------------------|------------------|---------------------|----------|---------------------|---------------------|-----|-----------|
| | D | B | C _r | C _{0r} | Grease | Oil | | | Cylindrical Bore | Tapered Bore (1) | d _a min. | | D _a max. | r _a max. | e | |
| 35 | 72 | 17 | 15 900 | 5 100 | 8 500 | 10 000 | 1207 | 1207 K | 41.5 | 65.5 | 1 | 0.23 | 4.2 | 2.7 | 2.8 | 0.33 |
| | 72 | 23 | 21 700 | 6 600 | 8 500 | 10 000 | 2207 | 2207 K | 41.5 | 65.5 | 1 | 0.37 | 2.6 | 1.7 | 1.8 | 0.403 |
| | 80 | 21 | 25 300 | 7 850 | 7 500 | 9 500 | 1307 | 1307 K | 43 | 72 | 1.5 | 0.26 | 3.8 | 2.5 | 2.6 | 0.52 |
| | 80 | 31 | 40 000 | 11 300 | 7 100 | 9 000 | 2307 | 2307 K | 43 | 72 | 1.5 | 0.46 | 2.1 | 1.4 | 1.4 | 0.687 |
| 40 | 80 | 18 | 19 300 | 6 500 | 7 500 | 9 000 | 1208 | 1208 K | 46.5 | 73.5 | 1 | 0.22 | 4.3 | 2.8 | 2.9 | 0.42 |
| | 80 | 23 | 22 400 | 7 350 | 7 500 | 9 000 | 2208 | 2208 K | 46.5 | 73.5 | 1 | 0.35 | 3.0 | 1.9 | 2.0 | 0.506 |
| | 90 | 23 | 29 800 | 9 700 | 6 700 | 8 500 | 1308 | 1308 K | 48 | 82 | 1.5 | 0.24 | 4.0 | 2.6 | 2.7 | 0.727 |
| | 90 | 33 | 45 500 | 13 500 | 6 300 | 8 000 | 2308 | 2308 K | 48 | 82 | 1.5 | 0.43 | 2.3 | 1.5 | 1.5 | 0.940 |
| 45 | 85 | 19 | 22 000 | 7 350 | 7 100 | 8 500 | 1209 | 1209 K | 51.5 | 78.5 | 1 | 0.21 | 4.7 | 3.0 | 3.1 | 0.47 |
| | 85 | 23 | 23 300 | 8 150 | 7 100 | 8 500 | 2209 | 2209 K | 51.5 | 78.5 | 1 | 0.30 | 3.2 | 2.1 | 2.2 | 0.656 |
| | 100 | 25 | 38 500 | 12 700 | 6 000 | 7 500 | 1309 | 1309 K | 53 | 92 | 1.5 | 0.25 | 4.0 | 2.6 | 2.7 | 0.971 |
| | 100 | 36 | 55 000 | 16 700 | 5 600 | 7 100 | 2309 | 2309 K | 53 | 92 | 1.5 | 0.41 | 2.4 | 1.5 | 1.6 | 1.3 |
| 50 | 90 | 20 | 22 800 | 8 100 | 6 300 | 8 000 | 1210 | 1210 K | 56.5 | 83.5 | 1 | 0.21 | 4.7 | 3.1 | 3.2 | 0.535 |
| | 90 | 23 | 23 300 | 8 450 | 6 300 | 8 000 | 2210 | 2210 K | 56.5 | 83.5 | 1 | 0.28 | 3.4 | 2.2 | 2.3 | 0.598 |
| | 110 | 27 | 43 500 | 14 100 | 5 600 | 6 700 | 1310 | 1310 K | 59 | 101 | 2 | 0.23 | 4.2 | 2.7 | 2.8 | 1.23 |
| | 110 | 40 | 65 000 | 20 200 | 5 000 | 6 300 | 2310 | 2310 K | 59 | 101 | 2 | 0.42 | 2.3 | 1.5 | 1.6 | 1.66 |
| 55 | 100 | 21 | 26 900 | 10 000 | 6 000 | 7 100 | 1211 | 1211 K | 63 | 92 | 1.5 | 0.20 | 4.9 | 3.2 | 3.3 | 0.708 |
| | 100 | 25 | 26 700 | 9 900 | 6 000 | 7 100 | 2211 | 2211 K | 63 | 92 | 1.5 | 0.28 | 3.5 | 2.3 | 2.4 | 0.807 |
| | 120 | 29 | 51 500 | 17 900 | 5 000 | 6 300 | 1311 | 1311 K | 64 | 111 | 2 | 0.23 | 4.2 | 2.7 | 2.8 | 1.6 |
| | 120 | 43 | 76 500 | 24 000 | 4 800 | 6 000 | 2311 | 2311 K | 64 | 111 | 2 | 0.41 | 2.4 | 1.5 | 1.6 | 2.12 |
| 60 | 110 | 22 | 30 500 | 11 500 | 5 300 | 6 300 | 1212 | 1212 K | 68 | 102 | 1.5 | 0.18 | 5.3 | 3.4 | 3.6 | 0.91 |
| | 110 | 28 | 34 000 | 12 600 | 5 300 | 6 300 | 2212 | 2212 K | 68 | 102 | 1.5 | 0.28 | 3.5 | 2.3 | 2.4 | 1.1 |
| | 130 | 31 | 57 500 | 20 800 | 4 500 | 5 600 | 1312 | 1312 K | 71 | 119 | 2 | 0.23 | 4.3 | 2.8 | 2.9 | 2.0 |
| | 130 | 46 | 88 500 | 28 300 | 4 300 | 5 300 | 2312 | 2312 K | 71 | 119 | 2 | 0.40 | 2.4 | 1.6 | 1.6 | 2.63 |
| 65 | 120 | 23 | 31 000 | 12 500 | 4 800 | 6 000 | 1213 | 1213 K | 73 | 112 | 1.5 | 0.17 | 5.7 | 3.7 | 3.8 | 1.16 |
| | 120 | 31 | 43 500 | 16 400 | 4 800 | 6 000 | 2213 | 2213 K | 73 | 112 | 1.5 | 0.28 | 3.5 | 2.3 | 2.4 | 1.5 |
| | 140 | 33 | 62 500 | 22 900 | 4 300 | 5 300 | 1313 | 1313 K | 76 | 129 | 2 | 0.23 | 4.2 | 2.7 | 2.9 | 2.47 |
| | 140 | 48 | 97 000 | 32 500 | 3 800 | 4 800 | 2313 | 2313 K | 76 | 129 | 2 | 0.39 | 2.5 | 1.6 | 1.7 | 3.3 |
| 70 | 125 | 24 | 35 000 | 13 800 | 4 800 | 5 600 | 1214 | 1214 | 78 | 117 | 1.5 | 0.18 | 5.3 | 3.4 | 3.6 | 1.3 |
| | 125 | 31 | 44 000 | 17 100 | 4 500 | 5 600 | 2214 | 2214 | 78 | 117 | 1.5 | 0.26 | 3.7 | 2.4 | 2.5 | 1.55 |
| | 150 | 35 | 75 000 | 27 700 | 4 000 | 5 000 | 1314 | 1314 | 81 | 139 | 2 | 0.22 | 4.4 | 2.8 | 3.0 | 3.03 |
| | 150 | 51 | 111 000 | 37 500 | 3 600 | 4 500 | 2314 | 2314 | 81 | 139 | 2 | 0.38 | 2.6 | 1.7 | 1.8 | 4.0 |

Note (1) Suffix K represents bearings with tapered bores (1 : 12)

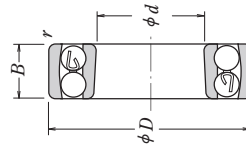
Remark For dimensions related to adapters, refer to Pages C348 and C349.

SELF-ALIGNING BALL BEARINGS

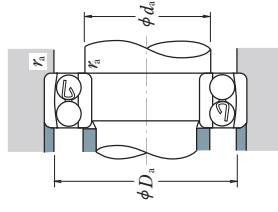
Bore Diameter 75 – 110 mm



Cylindrical Bore



Tapered Bore



Dynamic Equivalent Load

$$P = X F_r + Y F_a$$

$$F_r / F_a \leq e \quad F_r / F_a > e$$

| | | | |
|---|----------------|------|----------------|
| X | Y | X | Y |
| 1 | Y ₃ | 0.65 | Y ₂ |

Static Equivalent Load

$$P_0 = F_r + Y_0 F_a$$

The values of e , Y_2 , Y_3 , and Y_0 are listed in the table below.

| d | Boundary Dimensions (mm) | | | Basic Load Ratings (N) | | Limiting Speeds (min ⁻¹) | | Bearing | Designations | Abutment and Fillet Dimensions (mm) | | | Constant | | | | Axial Load Factors | | | | Mass (kg) |
|-----|--------------------------|----|--------|------------------------|-----------------|--------------------------------------|-------|----------|--------------|-------------------------------------|-----------------|---------------------|---------------------|---------------------|-----|----------------|--------------------|----------------|---------|--|-----------|
| | D | B | r min. | C _r | C _{0r} | Grease | Oil | | | Cylindrical Bore | Tapered Bore(1) | d _a min. | D _a max. | r _a max. | e | Y ₂ | Y ₃ | Y ₀ | approx. | | |
| 75 | 130 | 25 | 1.5 | 39 000 | 15 700 | 4 300 | 5 300 | 1215 | 1215 K | 83 | 122 | 1.5 | 0.17 | 5.6 | 3.6 | 3.8 | 1.36 | | | | |
| | 130 | 31 | 1.5 | 44 500 | 17 800 | 4 300 | 5 300 | 2215 | 2215 K | 83 | 122 | 1.5 | 0.25 | 3.9 | 2.5 | 2.6 | 1.6 | | | | |
| | 160 | 37 | 2.1 | 80 000 | 30 000 | 3 800 | 4 500 | 1315 | 1315 K | 86 | 149 | 2 | 0.22 | 4.4 | 2.8 | 2.9 | 3.63 | | | | |
| 80 | 160 | 55 | 2.1 | 125 000 | 43 000 | 3 400 | 4 300 | 2315 | 2315 K | 86 | 149 | 2 | 0.38 | 2.5 | 1.6 | 1.7 | 4.84 | | | | |
| | 140 | 26 | 2 | 40 000 | 17 000 | 4 000 | 5 000 | 1216 | 1216 K | 89 | 131 | 2 | 0.16 | 6.0 | 3.9 | 4.1 | 1.68 | | | | |
| | 140 | 33 | 2 | 49 000 | 19 900 | 4 000 | 5 000 | 2216 | 2216 K | 89 | 131 | 2 | 0.25 | 3.9 | 2.5 | 2.7 | 2.02 | | | | |
| 85 | 170 | 39 | 2.1 | 89 000 | 33 000 | 3 600 | 4 300 | 1316 | 1316 K | 91 | 159 | 2 | 0.22 | 4.5 | 2.9 | 3.1 | 4.24 | | | | |
| | 170 | 58 | 2.1 | 130 000 | 45 000 | 3 200 | 4 000 | 2316 | * 2316 K | 91 | 159 | 2 | 0.39 | 2.5 | 1.6 | 1.7 | 5.75 | | | | |
| | 150 | 28 | 2 | 49 500 | 20 800 | 3 800 | 4 500 | 1217 | 1217 K | 94 | 141 | 2 | 0.17 | 5.7 | 3.7 | 3.8 | 2.1 | | | | |
| 90 | 150 | 36 | 2 | 58 500 | 23 600 | 3 800 | 4 800 | 2217 | 2217 K | 94 | 141 | 2 | 0.25 | 3.9 | 2.5 | 2.6 | 2.56 | | | | |
| | 180 | 41 | 3 | 98 500 | 38 000 | 3 400 | 4 000 | 1317 | 1317 K | 98 | 167 | 2.5 | 0.21 | 4.6 | 2.9 | 3.1 | 5.03 | | | | |
| | 180 | 60 | 3 | 142 000 | 51 500 | 3 000 | 3 800 | 2317 | 2317 K | 98 | 167 | 2.5 | 0.37 | 2.6 | 1.7 | 1.8 | 6.88 | | | | |
| 95 | 160 | 30 | 2 | 57 500 | 23 500 | 3 600 | 4 300 | 1218 | 1218 K | 99 | 151 | 2 | 0.17 | 5.8 | 3.8 | 3.9 | 2.56 | | | | |
| | 160 | 40 | 2 | 70 500 | 28 700 | 3 600 | 4 300 | 2218 | 2218 K | 99 | 151 | 2 | 0.27 | 3.7 | 2.4 | 2.5 | 3.22 | | | | |
| | 190 | 43 | 3 | 117 000 | 44 500 | 3 200 | 3 800 | * 1318 K | * 1318 K | 103 | 177 | 2.5 | 0.22 | 4.3 | 2.8 | 2.9 | 5.83 | | | | |
| 100 | 190 | 64 | 3 | 154 000 | 57 500 | 2 800 | 3 600 | 2318 | * 2318 K | 103 | 177 | 2.5 | 0.38 | 2.6 | 1.7 | 1.7 | 7.87 | | | | |
| | 170 | 32 | 2.1 | 64 000 | 27 100 | 3 400 | 4 000 | 1219 | 1219 K | 106 | 159 | 2 | 0.17 | 5.8 | 3.7 | 3.9 | 3.12 | | | | |
| | 170 | 43 | 2.1 | 84 000 | 34 500 | 3 400 | 4 000 | 2219 | 2219 K | 106 | 159 | 2 | 0.27 | 3.7 | 2.4 | 2.5 | 3.96 | | | | |
| 105 | 200 | 45 | 3 | 129 000 | 51 000 | 3 000 | 3 600 | * 1319 K | * 1319 K | 108 | 187 | 2.5 | 0.23 | 4.3 | 2.8 | 2.9 | 6.79 | | | | |
| | 200 | 67 | 3 | 161 000 | 64 500 | 2 800 | 3 400 | 2319 | * 2319 K | 108 | 187 | 2.5 | 0.38 | 2.6 | 1.7 | 1.8 | 9.09 | | | | |
| | 180 | 34 | 2.1 | 69 500 | 29 700 | 3 200 | 3 800 | 1220 | 1220 K | 111 | 169 | 2 | 0.17 | 5.6 | 3.6 | 3.8 | 3.74 | | | | |
| 110 | 180 | 46 | 2.1 | 94 500 | 38 500 | 3 200 | 3 800 | 2220 | 2220 K | 111 | 169 | 2 | 0.27 | 3.7 | 2.4 | 2.5 | 4.71 | | | | |
| | 215 | 47 | 3 | 140 000 | 57 500 | 2 800 | 3 400 | * 1320 K | * 1320 K | 113 | 202 | 2.5 | 0.24 | 4.1 | 2.7 | 2.8 | 8.4 | | | | |
| | 215 | 73 | 3 | 187 000 | 79 000 | 2 400 | 3 200 | 2320 | * 2320 K | 113 | 202 | 2.5 | 0.38 | 2.6 | 1.7 | 1.8 | 11.7 | | | | |
| 105 | 190 | 36 | 2.1 | 75 000 | 32 500 | 3 000 | 3 600 | 1221 | — | 116 | 179 | 2 | 0.18 | 5.5 | 3.6 | 3.7 | 4.43 | | | | |
| | 190 | 50 | 2.1 | 109 000 | 45 000 | 3 000 | 3 600 | 2221 | — | 116 | 179 | 2 | 0.28 | 3.5 | 2.3 | 2.4 | 5.73 | | | | |
| | 225 | 49 | 3 | 154 000 | 64 500 | 2 600 | 3 200 | * 1321 | — | 118 | 212 | 2.5 | 0.23 | 4.2 | 2.7 | 2.9 | 9.58 | | | | |
| 110 | 225 | 77 | 3 | 200 000 | 87 000 | 2 400 | 3 000 | 2321 | — | 118 | 212 | 2.5 | 0.38 | 2.6 | 1.7 | 1.7 | 14.5 | | | | |
| | 200 | 38 | 2.1 | 87 000 | 38 500 | 2 800 | 3 400 | 1222 | 1222 K | 121 | 189 | 2 | 0.17 | 5.7 | 3.7 | 3.9 | 5.21 | | | | |
| | 200 | 53 | 2.1 | 122 000 | 51 500 | 2 800 | 3 400 | 2222 | * 2222 K | 121 | 189 | 2 | 0.28 | 3.5 | 2.2 | 2.3 | 6.75 | | | | |
| 110 | 240 | 50 | 3 | 161 000 | 72 000 | 2 400 | 3 000 | * 1322 K | * 1322 K | 123 | 227 | 2.5 | 0.22 | 4.4 | 2.8 | 3.0 | 11.5 | | | | |
| | 240 | 80 | 3 | 211 000 | 94 500 | 2 200 | 2 800 | 2322 | * 2322 K | 123 | 227 | 2.5 | 0.37 | 2.6 | 1.7 | 1.8 | 17.5 | | | | |

Notes (1) Suffix K represents bearings with tapered bores (1 : 12).

(*) The balls of the bearings marked * protrude slightly from the bearing face. The protrusion amounts are shown on Page C114.

Remark For dimensions related to adapters, refer to Pages C350 and C351.