

# Angular contact ball bearings

The angular contact ball bearings (ACBBs) produced by RKB are used in a wide array of machines where combined loads, high speeds and runout accuracy are required. Available in single or double row configuration, they can be manufactured with different types of cage (machined brass, pressed steel or polyamide) and dimensional precisions.

Single row ACBBs can be directly paired by RKB in face-to-face (DF) or back-to-back (DB) configuration, depending on load conditions, presence of tilting moments and misalignment magnitude in the application.



Single row angular contact ball bearings

## Single row angular contact ball bearings

### Misalignment

For single row angular contact ball bearing is not possible to determine a unique value of the shaft and housing misalignment. Permissible misalignment depends on several factors such as: the bearing size, internal axial clearance, arrangement, loads and moments

acting on it. A limited misalignment can be accommodated by paired bearings in back-to-back arrangement, even if the stresses inside the balls increase and consequently the bearing life will be reduced.

### Minimum load

The minimum radial load is requested for single row angular contact ball bearing to guarantee an adequate operating condition, especially in particularly difficult working conditions like: high speed, high acceleration and sudden changes of direction. In these operating conditions, a skidding movement between the balls and raceways can be generated by the inertial forces, influencing negatively the bearing life.

Minimum radial load for single bearing and paired bearings in tandem arrangement can be theoretically estimated using this formula:

$$\frac{F_m}{C_r} > 0,015$$

where:

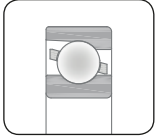
- $F_m$  minimum radial load, [kN];
- $C_r$  basic dynamic radial load, [kN].

Usually, the minimum radial load is reached or surpassed by the weight of the components supported by the bearing together with the loads acting on it, otherwise supplementary radial load must be applied on the single row angular contact ball bearing. In application where a starting up at a low temperature is planned or a lubricant with high viscosity is used, a larger value of the minimum radial load is required.

It is possible to apply an axial preload for single bearing and paired bearings in tandem arrangement by adjusting one ring against the other one or by using springs.

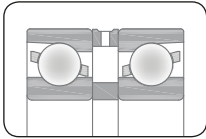
## Designs and variants

### Type M



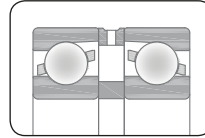
- One-piece inner and outer ring
- One-piece machined brass cage guided on balls (M)
- Available with machined brass cage guided on inner ring (MB)
- Single (non-universal) bearing execution
- Suitable for very high operating speeds
- Available with 25°, 30° or 40° contact angle

### Type DB



- Back-to-back arrangement (DB) of two ACBBs
- One-piece machined brass cage guided on balls (M)
- Preset or adjusted BEP on customer's request
- Available with machined brass cage guided on inner ring (MB)
- Available with inner and/or outer spacers featuring lubrication grooves and/or lubrication holes
- Stiffer arrangement to withstand tilting moments

### Type DF



- Face-to-face arrangement (DF) of two ACBBs
- One-piece machined brass cage guided on balls (M)
- Preset or adjusted BEP on customer's request

Prefixes

|       |                                                                                                            |
|-------|------------------------------------------------------------------------------------------------------------|
| ACBB  | Out of standard single row angular contact ball bearing followed by drawing number                         |
| ACBBF | Out of standard single row angular contact ball bearing with flanged outer ring followed by drawing number |

Suffixes Internal design

|    |                                  |
|----|----------------------------------|
| A  | Bearing with a 30° contact angle |
| AC | Bearing with a 25° contact angle |
| B  | Bearing with a 40° contact angle |

Suffixes Cage

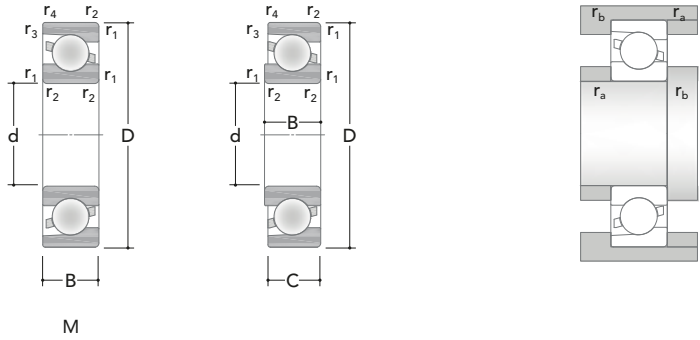
|           |                                                                                          |
|-----------|------------------------------------------------------------------------------------------|
| M         | Step-type or straight-type machined brass cage guided on balls                           |
| MF        | Machined steel cage guided on balls                                                      |
| MB        | Machined brass cage guided on inner ring                                                 |
| MBS       | Machined brass cage guided on inner ring with lubrication grooves in the guiding surface |
| TN or ATN | Molded polyamide cage (PA66) guided on balls                                             |
| TN9       | Molded glass fiber-reinforced polyamide cage (PA66-GF25) guided on balls                 |

Suffixes Accuracy, clearance, running

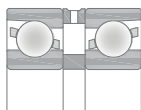
|            |                                                                                                                                                  |
|------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| A... - ... | Special axial internal clearance. The two numbers immediately following the A give minimum and maximum axial internal clearance in $\mu\text{m}$ |
| A...       | Special axial internal clearance. The number immediately following the A gives mean axial internal clearance in $\mu\text{m}$                    |
| U          | Bearing for universal paired mounting. When in back-to-back or face-to-face arrangement there will be axial internal clearance                   |
| GA         | Bearing for paired mounting. When in back-to-back or face-to-face arrangement there will be a light preload                                      |
| GB         | Bearing for paired mounting. When in back-to-back or face-to-face arrangement there will be a moderate preload                                   |
| GC         | Bearing for paired mounting. When in back-to-back or face-to-face arrangement there will be a heavy preload                                      |
| CA         | Bearing for paired mounting. When in back-to-back or face-to-face arrangement the axial internal clearance will be smaller than normal (CB)      |
| CB         | Bearing for paired mounting. When in back-to-back or face-to-face arrangement the axial internal clearance will be normal                        |
| CC         | Bearing for paired mounting. When in back-to-back or face-to-face arrangement the axial internal clearance will be greater than normal (CB)      |

| Suffixes | External design                  |
|----------|----------------------------------|
| Z        | Shield on one side               |
| ZZ or 2Z | Shield on both sides             |
| N1       | One locating slot in outer ring  |
| N2       | Two locating slots in outer ring |

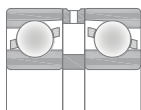
| Suffixes | Set                                            |
|----------|------------------------------------------------|
| DB       | Two bearings matched for mounting back-to-back |
| DF       | Two bearings matched for mounting face-to-face |
| DT       | Two bearings matched for mounting in tandem    |



| Main dimensions |     |    |   | Basic load ratings |                       | Fatigue load limit | Speed ratings |          | Designation     |
|-----------------|-----|----|---|--------------------|-----------------------|--------------------|---------------|----------|-----------------|
| d               | D   | B  | C | Dynamic C          | Static C <sub>0</sub> | C <sub>u</sub>     | Reference     | Limiting | Standard design |
| [mm]            |     |    |   | [kN]               |                       |                    | [rpm]         |          |                 |
| 10              | 30  | 9  | - | 7,09               | 3,34                  | 0,140              | 28200         | 28200    | 7200            |
| 12              | 32  | 10 | - | 7,69               | 3,76                  | 0,160              | 23900         | 23400    | 7201            |
|                 | 37  | 12 | - | 10,50              | 4,98                  | 0,210              | 22300         | 22600    | 7301            |
| 15              | 35  | 11 | - | 10,10              | 5,25                  | 0,200              | 17300         | 36400    | 7202            |
|                 | 42  | 13 | - | 13,30              | 6,57                  | 0,270              | 18200         | 18800    | 7302            |
| 17              | 40  | 12 | - | 11,10              | 5,74                  | 0,250              | 20000         | 19800    | 7203            |
|                 | 47  | 14 | - | 16,10              | 8,25                  | 0,350              | 17700         | 17700    | 7303            |
| 20              | 47  | 14 | - | 14,60              | 8,04                  | 0,340              | 17500         | 17900    | 7204            |
|                 | 52  | 15 | - | 18,60              | 9,92                  | 0,420              | 16400         | 16400    | 7304            |
| 25              | 52  | 15 | - | 15,30              | 9,88                  | 0,420              | 16000         | 15800    | 7205            |
|                 | 62  | 17 | - | 26,00              | 15,3                  | 0,660              | 13800         | 14000    | 7305            |
| 30              | 62  | 16 | - | 24,50              | 15,4                  | 0,650              | 13200         | 12900    | 7206            |
|                 | 72  | 19 | - | 35,50              | 21,2                  | 0,900              | 11800         | 12100    | 7306            |
| 35              | 72  | 17 | - | 30,70              | 20,5                  | 0,870              | 10800         | 10800    | 7207            |
|                 | 80  | 21 | - | 41,10              | 26,4                  | 1,140              | 10300         | 9900     | 7307            |
| 40              | 80  | 18 | - | 36,80              | 25,9                  | 1,100              | 10100         | 10200    | 7208            |
|                 | 90  | 23 | - | 50,00              | 32,2                  | 1,360              | 9100          | 9200     | 7308            |
| 45              | 85  | 19 | - | 37,60              | 28,2                  | 1,210              | 9100          | 9300     | 7209            |
|                 | 100 | 25 | - | 61,60              | 40                    | 1,710              | 8200          | 8400     | 7309            |
| 50              | 90  | 20 | - | 40,40              | 30,9                  | 1,320              | 8500          | 8300     | 7210            |
|                 | 110 | 27 | - | 73,50              | 50,2                  | 2,130              | 7200          | 7300     | 7310            |
| 55              | 100 | 21 | - | 50,00              | 39,8                  | 1,650              | 7400          | 7300     | 7211            |

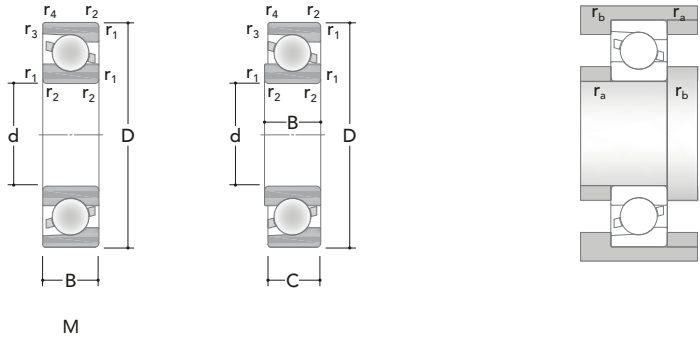


DB

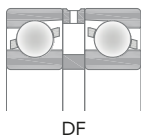
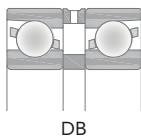


DF

| Dimensions |                     |                     |                   |                   | Mass  | Designation     |
|------------|---------------------|---------------------|-------------------|-------------------|-------|-----------------|
| d          | r <sub>1,2min</sub> | r <sub>3,4min</sub> | r <sub>amax</sub> | r <sub>bmax</sub> |       | Standard design |
| [mm]       |                     |                     |                   |                   | [kg]  |                 |
| 10         | 0,6                 | 0,3                 | 0,6               | 0,3               | 0,03  | 7200            |
| 12         | 0,6                 | 0,3                 | 0,6               | 0,3               | 0,036 | 7201            |
|            | 1                   | 0,6                 | 1                 | 0,6               | 0,06  | 7301            |
| 15         | 0,6                 | 0,3                 | 0,6               | 0,3               | 0,045 | 7202            |
|            | 1                   | 0,6                 | 1                 | 0,6               | 0,08  | 7302            |
| 17         | 0,6                 | 0,6                 | 0,6               | 0,6               | 0,065 | 7203            |
|            | 1                   | 0,6                 | 1                 | 0,6               | 0,11  | 7303            |
| 20         | 1                   | 0,6                 | 1                 | 0,6               | 0,11  | 7204            |
|            | 1,1                 | 0,6                 | 1                 | 0,6               | 0,14  | 7304            |
| 25         | 1                   | 0,6                 | 1                 | 0,6               | 0,13  | 7205            |
|            | 1,1                 | 0,6                 | 1                 | 0,6               | 0,23  | 7305            |
| 30         | 1                   | 0,6                 | 1                 | 0,6               | 0,2   | 7206            |
|            | 1,1                 | 0,6                 | 1                 | 0,6               | 0,34  | 7306            |
| 35         | 1,1                 | 0,6                 | 1                 | 0,6               | 0,28  | 7207            |
|            | 1,5                 | 1                   | 1,5               | 1                 | 0,45  | 7307            |
| 40         | 1,1                 | 0,6                 | 1                 | 0,6               | 0,37  | 7208            |
|            | 1,5                 | 1                   | 1,5               | 1                 | 0,68  | 7308            |
| 45         | 1,1                 | 0,6                 | 1                 | 0,6               | 0,42  | 7209            |
|            | 1,5                 | 1                   | 1,5               | 1                 | 0,91  | 7309            |
| 50         | 1,1                 | 0,6                 | 1                 | 0,6               | 0,47  | 7210            |
|            | 2                   | 1                   | 2                 | 1                 | 1,1   | 7310            |
| 55         | 1,5                 | 1                   | 1,5               | 1                 | 0,62  | 7211            |

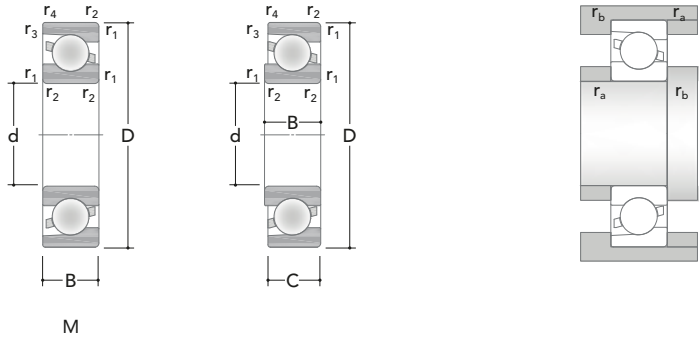


| Main dimensions |     |    |   | Basic load ratings |                       | Fatigue load limit | Speed ratings |          | Designation     |
|-----------------|-----|----|---|--------------------|-----------------------|--------------------|---------------|----------|-----------------|
| d               | D   | B  | C | Dynamic C          | Static C <sub>0</sub> | C <sub>u</sub>     | Reference     | Limiting | Standard design |
| [mm]            |     |    |   | [kN]               |                       |                    | [rpm]         |          |                 |
| 55              | 120 | 29 | - | 85,90              | 59                    | 2,510              | 6500          | 6300     | 7311            |
| (cont.)         |     |    |   |                    |                       |                    |               |          |                 |
| 60              | 110 | 22 | - | 59,80              | 49,1                  | 2,080              | 7000          | 6800     | 7212            |
|                 | 130 | 31 | - | 104,00             | 75,4                  | 3,150              | 6200          | 6000     | 7312            |
| 65              | 120 | 23 | - | 68,10              | 56,1                  | 2,410              | 6200          | 6200     | 7213            |
|                 | 140 | 33 | - | 117,20             | 84,9                  | 3,580              | 5800          | 5800     | 7313            |
| 70              | 125 | 24 | - | 72,80              | 62,8                  | 2,670              | 5900          | 5700     | 7214            |
|                 | 150 | 35 | - | 127,00             | 96,4                  | 3,840              | 5200          | 5200     | 7314            |
| 75              | 130 | 25 | - | 72,80              | 64,5                  | 2,660              | 5700          | 5700     | 7215            |
|                 | 160 | 37 | - | 132,00             | 104                   | 4,150              | 5000          | 4800     | 7315            |
| 80              | 140 | 26 | - | 84,20              | 74,3                  | 3,020              | 5000          | 5200     | 7216            |
|                 | 170 | 39 | - | 140,10             | 118                   | 4,500              | 4600          | 4700     | 7316            |
| 85              | 150 | 28 | - | 103,00             | 88,3                  | 3,480              | 4900          | 4800     | 7217            |
|                 | 180 | 41 | - | 156,00             | 131                   | 4,860              | 4400          | 4400     | 7317            |
| 90              | 160 | 30 | - | 113,70             | 102                   | 3,920              | 4600          | 4700     | 7218            |
|                 | 190 | 43 | - | 169,30             | 145                   | 5,260              | 4200          | 4100     | 7318            |
| 95              | 170 | 32 | - | 124,00             | 116                   | 4,300              | 3900          | 4200     | 7219            |
|                 | 200 | 45 | - | 178,20             | 161                   | 5,630              | 3900          | 3900     | 7319            |
| 100             | 180 | 34 | - | 143,0              | 132                   | 4,680              | 4100          | 4200     | 7220            |
|                 | 215 | 47 | - | 211,70             | 206                   | 6,880              | 3600          | 3800     | 7320            |
| 105             | 190 | 36 | - | 153,00             | 148                   | 5,130              | 3900          | 3900     | 7221            |
|                 | 225 | 49 | - | 218,20             | 204                   | 6,820              | 3400          | 3500     | 7321            |
| 110             | 170 | 21 | - | 76,1               | 82,4                  | 2,980              | 2700          | 3600     | 307536          |

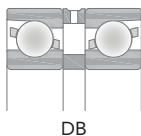


| Dimensions |                     |                     |                   |                   | Mass | Designation     |
|------------|---------------------|---------------------|-------------------|-------------------|------|-----------------|
| d          | r <sub>1,2min</sub> | r <sub>3,4min</sub> | r <sub>amax</sub> | r <sub>bmax</sub> |      | Standard design |
| [mm]       |                     |                     |                   |                   | [kg] |                 |
| 55         | 2                   | 1                   | 2                 | 1                 | 1,4  | 7311            |
| (cont.)    |                     |                     |                   |                   |      |                 |
| 60         | 1,5                 | 1                   | 1,5               | 1                 | 0,8  | 7212            |
|            | 2,1                 | 1,1                 | 2                 | 1                 | 1,75 | 7312            |
| 65         | 1,5                 | 1                   | 1,5               | 1                 | 1    | 7213            |
|            | 2,1                 | 1,1                 | 2                 | 1                 | 2,15 | 7313            |
| 70         | 1,5                 | 1                   | 1,5               | 1                 | 1,1  | 7214            |
|            | 2,1                 | 1,1                 | 2                 | 1                 | 2,65 | 7314            |
| 75         | 1,5                 | 1                   | 1,5               | 1                 | 1,2  | 7215            |
|            | 2,1                 | 1,1                 | 2                 | 1                 | 3,2  | 7315            |
| 80         | 2                   | 1                   | 2                 | 1                 | 1,45 | 7216            |
|            | 2,1                 | 1,1                 | 2                 | 1                 | 3,8  | 7316            |
| 85         | 2                   | 1                   | 2                 | 1                 | 1,85 | 7217            |
|            | 3                   | 1,1                 | 2,5               | 1                 | 4,45 | 7317            |
| 90         | 2                   | 1                   | 2                 | 1                 | 2,3  | 7218            |
|            | 3                   | 1,1                 | 2,5               | 1                 | 5,2  | 7318            |
| 95         | 2,1                 | 1,1                 | 2                 | 1                 | 2,7  | 7219            |
|            | 3                   | 1,1                 | 2,5               | 1                 | 6,05 | 7319            |
| 100        | 2,1                 | 1,1                 | 2                 | 1                 | 3,3  | 7220            |
|            | 3                   | 1,1                 | 2,5               | 1                 | 7,5  | 7320            |
| 105        | 2,1                 | 1,1                 | 2                 | 1                 | 3,95 | 7221            |
|            | 3                   | 1,1                 | 2,5               | 1                 | 8,55 | 7321            |
| 110        | 1                   | 1                   | 1                 | 1                 | 1,7  | 307536          |

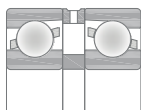




| Main dimensions |     |    |    | Basic load ratings |                       | Fatigue load limit | Speed ratings |          | Designation          |
|-----------------|-----|----|----|--------------------|-----------------------|--------------------|---------------|----------|----------------------|
| d               | D   | B  | C  | Dynamic C          | Static C <sub>0</sub> | C <sub>u</sub>     | Reference     | Limiting | Standard design      |
| [mm]            |     |    |    | [kN]               |                       |                    | [rpm]         |          |                      |
| <b>110</b>      | 200 | 38 | -  | 159,7              | 155                   | 5,270              | 3600          | 3600     | <b>7222</b>          |
| (cont.)         | 240 | 50 | -  | 235,2              | 245                   | 7,800              | 3400          | 3300     | <b>7322</b>          |
| <b>120</b>      | 180 | 28 | -  | 88,8               | 91,6                  | 3,150              | 3600          | 3600     | <b>7024</b>          |
|                 | 215 | 40 | -  | 165,0              | 162                   | 5,270              | 3100          | 3300     | <b>7224</b>          |
|                 | 260 | 55 | -  | 236,00             | 248                   | 7,590              | 2800          | 2800     | <b>7324</b>          |
| <b>130</b>      | 230 | 40 | -  | 186,00             | 193                   | 6,100              | 2900          | 3100     | <b>7226</b>          |
|                 | 280 | 58 | -  | 276,00             | 299                   | 8,820              | 2600          | 2600     | <b>7326</b>          |
| <b>140</b>      | 210 | 33 | -  | 116,0              | 128                   | 4,120              | 2900          | 3000     | <b>7028</b>          |
|                 | 250 | 42 | -  | 197,0              | 210                   | 6,340              | 2700          | 2700     | <b>7228</b>          |
|                 | 300 | 62 | -  | 296,0              | 343                   | 9,740              | 2300          | 2400     | <b>7328</b>          |
| <b>150</b>      | 210 | 28 | 25 | 98,0               | 111                   | 3,620              | 1700          | 2600     | <b>466895/307377</b> |
|                 | 225 | 35 | -  | 130,0              | 144                   | 4,490              | 2700          | 2900     | <b>7030</b>          |
|                 | 270 | 45 | -  | 216,00             | 239                   | 6,920              | 2400          | 2500     | <b>7230</b>          |
|                 | 320 | 65 | -  | 339,00             | 390                   | 10,800             | 2200          | 2200     | <b>7330</b>          |
| <b>160</b>      | 215 | 28 | -  | 82,0               | 108                   | 3,340              | 1800          | 2500     | <b>466896</b>        |
|                 | 240 | 38 | -  | 142,0              | 164                   | 4,940              | 1600          | 2300     | <b>7032</b>          |
|                 | 290 | 48 | -  | 252,0              | 296                   | 8,390              | 2200          | 2300     | <b>7232</b>          |
| <b>170</b>      | 260 | 42 | -  | 175,00             | 203                   | 5,820              | 2300          | 2500     | <b>7034</b>          |
|                 | 310 | 52 | -  | 281,00             | 343                   | 9,440              | 2200          | 2300     | <b>7234</b>          |
|                 | 360 | 72 | -  | 394,0              | 482                   | 12,490             | 1800          | 2000     | <b>7334</b>          |
| <b>175</b>      | 235 | 30 | 27 | 100,0              | 120                   | 3,840              | 1600          | 2300     | <b>468325</b>        |
| <b>180</b>      | 280 | 46 | -  | 197,0              | 238                   | 6,640              | 2200          | 2300     | <b>7036</b>          |
|                 | 320 | 52 | -  | 294,0              | 371                   | 9,89               | 2000          | 2200     | <b>7236</b>          |
|                 | 380 | 75 | -  | 414,00             | 539                   | 13,670             | 1900          | 1800     | <b>7336</b>          |

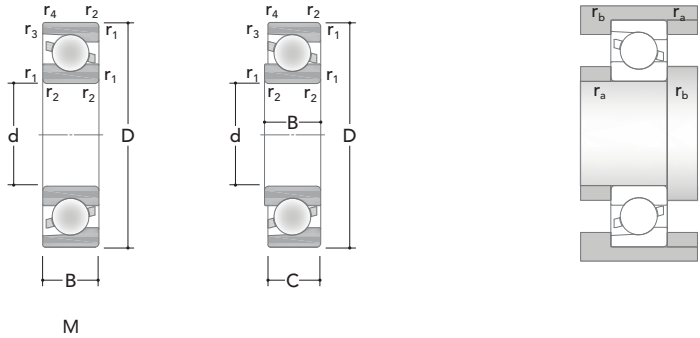


DB

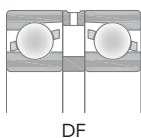
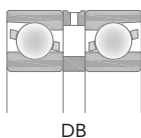


DF

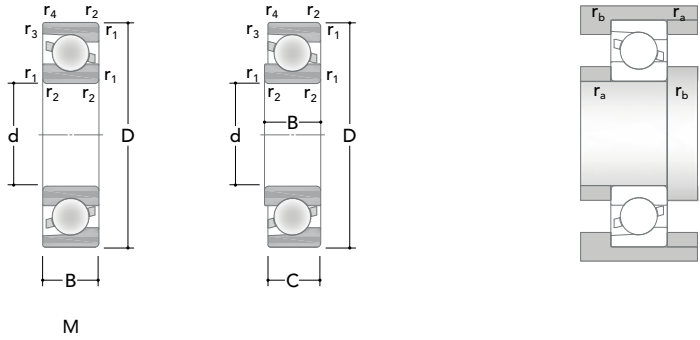
| Dimensions |                     |                     |                   |                   | Mass | Designation     |
|------------|---------------------|---------------------|-------------------|-------------------|------|-----------------|
| d          | r <sub>1,2min</sub> | r <sub>3,4min</sub> | r <sub>amax</sub> | r <sub>bmax</sub> |      | Standard design |
| [mm]       |                     |                     |                   |                   | [kg] |                 |
| 110        | 2,1                 | 1,1                 | 2                 | 1                 | 4,6  | 7222            |
| (cont.)    | 3                   | 1,1                 | 2,5               | 1                 | 10   | 7322            |
| 120        | 2                   | 1                   | 2                 | 1                 | 2,4  | 7024            |
|            | 2,1                 | 1,1                 | 2                 | 1                 | 5,9  | 7224            |
|            | 3                   | 1,5                 | 2,5               | 1                 | 14,5 | 7324            |
| 130        | 3                   | 1,1                 | 2,5               | 1                 | 6,95 | 7226            |
|            | 4                   | 1,5                 | 3                 | 1,5               | 17   | 7326            |
| 140        | 2                   | 1                   | 2                 | 1                 | 3,85 | 7028            |
|            | 3                   | 1,1                 | 2,5               | 1                 | 8,85 | 7228            |
|            | 4                   | 1,5                 | 3                 | 1,5               | 21,5 | 7328            |
| 150        | 2                   | 1                   | 2                 | 1                 | 295  | 466895/307377   |
|            | 2,1                 | 1,1                 | 2                 | 1                 | 4,7  | 7030            |
|            | 3                   | 1,1                 | 2,5               | 1                 | 11,5 | 7230            |
|            | 4                   | 1,5                 | 3                 | 1,5               | 26   | 7330            |
| 160        | 2                   | 1                   | 2                 | 1                 | 2,7  | 466896          |
|            | 2,1                 | 1,1                 | 2                 | 1                 | 5,75 | 7032            |
|            | 3                   | 1,1                 | 2,5               | 1                 | 14   | 7232            |
| 170        | 2,1                 | 1,1                 | 2                 | 1                 | 7,65 | 7034            |
|            | 4                   | 1,5                 | 3                 | 1,5               | 17,5 | 7234            |
|            | 4                   | 2                   | 3                 | 2                 | 36   | 7334            |
| 175        | 1,5                 | 1                   | 1,5               | 1                 | 3,5  | 468325          |
| 180        | 2,1                 | 1,1                 | 2                 | 1                 | 10   | 7036            |
|            | 4                   | 1,5                 | 3                 | 1,5               | 18   | 7236            |
|            | 4                   | 2                   | 3                 | 2                 | 42   | 7336            |



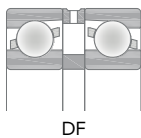
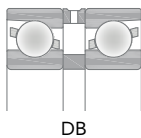
| Main dimensions |     |    |    | Basic load ratings |                       | Fatigue load limit | Speed ratings |          | Designation     |
|-----------------|-----|----|----|--------------------|-----------------------|--------------------|---------------|----------|-----------------|
| d               | D   | B  | C  | Dynamic C          | Static C <sub>0</sub> | C <sub>u</sub>     | Reference     | Limiting | Standard design |
| [mm]            |     |    |    | [kN]               |                       |                    | [rpm]         |          |                 |
| 190             | 255 | 33 | 29 | 113,0              | 141                   | 4,340              | 1500          | 2200     | 466880          |
|                 | 290 | 46 | -  | 199,0              | 251                   | 6,840              | 2200          | 2200     | 7038            |
|                 | 340 | 55 | -  | 307,0              | 402                   | 10,320             | 1800          | 2100     | 7238            |
|                 | 400 | 78 | -  | 442,0              | 596                   | 14,500             | 1700          | 1800     | 7338            |
| 200             | 310 | 51 | -  | 225,0              | 290                   | 7,64               | 2000          | 2100     | 7040            |
|                 | 360 | 58 | -  | 319,00             | 424                   | 10,850             | 1800          | 1800     | 7240            |
|                 | 420 | 80 | -  | 457,00             | 648                   | 15,430             | 1600          | 1600     | 7340            |
| 220             | 300 | 38 | 35 | 162,0              | 223                   | 5,820              | 1400          | 1800     | 466931          |
|                 | 340 | 56 | -  | 252,0              | 354                   | 8,970              | 1800          | 1800     | 7044            |
|                 | 400 | 65 | -  | 398,0              | 554                   | 13,260             | 1600          | 1600     | 7244            |
|                 | 460 | 88 | -  | 489,0              | 713                   | 16,44              | 1500          | 1500     | 7344            |
| 240             | 360 | 56 | -  | 257,00             | 373                   | 9,100              | 1600          | 1700     | 7048            |
|                 | 440 | 72 | -  | 357,00             | 537                   | 12,430             | 1500          | 1500     | 7248            |
|                 | 500 | 95 | -  | 570,0              | 808                   | 14,650             | 1300          | 1400     | 7348            |
| 260             | 320 | 28 | -  | 128,0              | 190                   | 5,300              | 1300          | 1700     | 71852           |
|                 | 360 | 46 | -  | 244,0              | 342                   | 8,570              | 1600          | 1700     | 71952           |
|                 | 400 | 65 | -  | 339,0              | 506                   | 11,71              | 1400          | 1500     | 7052            |
|                 | 480 | 80 | -  | 507,0              | 769                   | 17,06              | 1300          | 1400     | 7252            |
| 280             | 350 | 33 | -  | 156,00             | 240                   | 6,300              | 1100          | 1500     | 71856           |
|                 | 380 | 46 | -  | 252,0              | 378                   | 9,250              | 1000          | 1500     | 71956           |
|                 | 420 | 65 | -  | 338,0              | 540                   | 12,200             | 1400          | 1500     | 7056            |
|                 | 500 | 80 | -  | 506,0              | 836                   | 17,730             | 1300          | 1300     | 7256            |
| 285             | 380 | 46 | -  | 216,0              | 333                   | 7,75               | 1000          | 1400     | 466951          |
| 300             | 460 | 74 | -  | 413                | 685                   | 14,900             | 1300          | 1400     | 7060            |
|                 | 540 | 85 | -  | 547,0              | 928                   | 19,260             | 790           | 1200     | 7260            |



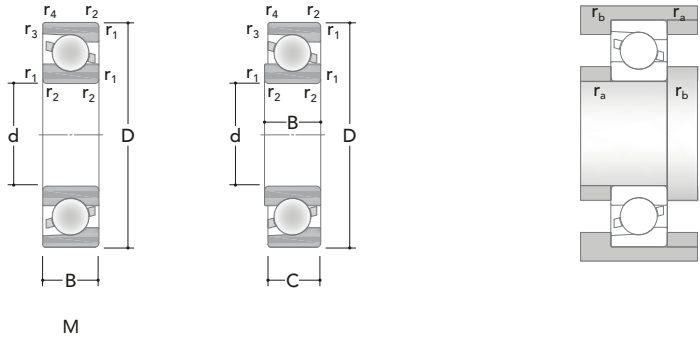
| Dimensions |                     |                     |                   |                   | Mass | Designation     |
|------------|---------------------|---------------------|-------------------|-------------------|------|-----------------|
| d          | r <sub>1,2min</sub> | r <sub>3,4min</sub> | r <sub>amax</sub> | r <sub>bmax</sub> |      | Standard design |
| [mm]       |                     |                     |                   |                   | [kg] |                 |
| 190        | 1,5                 | 1                   | 1,5               | 1                 | 4,5  | 466880          |
|            | 2,1                 | 1,1                 | 2                 | 1                 | 10,5 | 7038            |
|            | 4                   | 1,5                 | 3                 | 1,5               | 22   | 7238            |
|            | 5                   | 2                   | 4                 | 2                 | 48,5 | 7338            |
| 200        | 2,1                 | 1,1                 | 2,1               | 1,1               | 18   | 7040            |
|            | 4                   | 1,5                 | 3                 | 1,5               | 25   | 7240            |
|            | 5                   | 2                   | 4                 | 2                 | 53   | 7340            |
| 220        | 2                   | 1                   | 2                 | 1                 | 7,35 | 466931          |
|            | 3                   | 1,1                 | 2,5               | 1,1               | 18   | 7044            |
|            | 4                   | 1,5                 | 3                 | 1,5               | 37   | 7244            |
|            | 5                   | 2                   | 4                 | 2                 | 70   | 7344            |
| 240        | 3                   | 1,1                 | 2,5               | 1,1               | 19   | 7048            |
|            | 4                   | 1,5                 | 3                 | 1,5               | 49   | 7248            |
|            | 5                   | 2                   | 4                 | 2                 | 89,4 | 7348            |
| 260        | 2                   | 1,1                 | 2                 | 1                 | 4,85 | 71852           |
|            | 2,1                 | 1,1                 | 2                 | 1                 | 13,5 | 71952           |
|            | 4                   | 1,5                 | 3                 | 1,5               | 30   | 7052            |
|            | 5                   | 2                   | 4                 | 2                 | 66   | 7252            |
| 280        | 2                   | 1                   | 2                 | 1                 | 7,2  | 71856           |
|            | 2,1                 | 1,1                 | 2                 | 1                 | 15   | 71956           |
|            | 4                   | 1,5                 | 3                 | 1,5               | 30   | 7056            |
|            | 5                   | 2                   | 4                 | 2                 | 67,5 | 7256            |
| 285        | 2,1                 | 1                   | 2                 | 1                 | 14   | 466951          |
| 300        | 4                   | 1,5                 | 3                 | 1,5               | 42,5 | 7060            |
|            | 5                   | 2,1                 | 4                 | 2                 | 86,5 | 7260            |



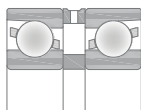
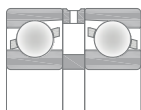
| Main dimensions |     |     |   | Basic load ratings |                       | Fatigue load limit | Speed ratings |          | Designation     |
|-----------------|-----|-----|---|--------------------|-----------------------|--------------------|---------------|----------|-----------------|
| d               | D   | B   | C | Dynamic C          | Static C <sub>0</sub> | C <sub>u</sub>     | Reference     | Limiting | Standard design |
| [mm]            |     |     |   | [kN]               |                       |                    | [rpm]         |          |                 |
| 320             | 480 | 74  | - | 423,0              | 721                   | 15,070             | 1200          | 1300     | 7064            |
|                 | 580 | 92  | - | 583,0              | 1000                  | 20,000             | 770           | 1100     | 7264            |
| 335             | 450 | 56  | - | 278,0              | 478                   | 10,36              | 1200          | 1300     | 466952          |
| 340             | 420 | 38  | - | 220                | 386                   | 8,210              | 860           | 1300     | 71868           |
|                 | 460 | 56  | - | 338,0              | 579                   | 12,370             | 1400          | 1400     | 71968           |
|                 | 520 | 82  | - | 493,0              | 885                   | 18,030             | 1100          | 1200     | 7068            |
|                 | 620 | 92  | - | 695,0              | 1320                  | 25,610             | 1010          | 990      | 7268            |
| 360             | 440 | 38  | - | 239,0              | 419                   | 8,87               | 1400          | 1400     | 71872           |
|                 | 480 | 56  | - | 326,0              | 600                   | 12,22              | 1300          | 1400     | 71972           |
|                 | 540 | 82  | - | 504                | 940                   | 18,80              | 1100          | 1100     | 7072            |
|                 | 650 | 95  | - | 790                | 1560                  | 22,680             | 1800          | 1600     | 7272            |
| 380             | 480 | 31  | - | 186,0              | 362,1                 | 7,660              | 1200          | 1300     | 70876           |
|                 | 480 | 46  | - | 294,0              | 497                   | 10,93              | 1200          | 1300     | 71876           |
|                 | 520 | 65  | - | 406,0              | 723                   | 14,76              | 1200          | 1200     | 71976           |
|                 | 560 | 82  | - | 496,0              | 940                   | 18,36              | 990           | 1100     | 7076            |
| 400             | 540 | 65  | - | 409                | 777                   | 16,17              | 1100          | 1100     | 71980           |
|                 | 600 | 90  | - | 611,00             | 1170                  | 22,210             | 880           | 1100     | 307238          |
|                 | 600 | 90  | - | 522,0              | 1030,2                | 19,200             | 920           | 1000     | 7080            |
|                 | 720 | 103 | - | 743,0              | 1480                  | 26,150             | 820           | 870      | 7280            |
| 410             | 560 | 70  | - | 419,0              | 820                   | 15,81              | 1000          | 1000     | 468431          |
| 420             | 560 | 65  | - | 408                | 795                   | 16,26              | 1100          | 1100     | 71984           |
|                 | 620 | 90  | - | 592                | 1160                  | 21,89              | 910           | 900      | 7084            |
| 440             | 650 | 94  | - | 626,0              | 1310                  | 23,980             | 890           | 870      | 7088            |
| 460             | 580 | 37  | - | 262,0              | 554                   | 10,29              | 1000          | 1000     | 70892           |



| Dimensions |                     |                     |                   |                   | Mass | Designation     |
|------------|---------------------|---------------------|-------------------|-------------------|------|-----------------|
| d          | r <sub>1,2min</sub> | r <sub>3,4min</sub> | r <sub>amax</sub> | r <sub>bmax</sub> |      | Standard design |
| [mm]       |                     |                     |                   |                   | [kg] |                 |
| 320        | 4                   | 1,5                 | 3                 | 1,5               | 44,5 | 7064            |
|            | 5                   | 2                   | 4                 | 2                 | 110  | 7264            |
| 335        | 3                   | 1                   | 2,5               | 1                 | 25,5 | 466952          |
| 340        | 2,1                 | 1                   | 2                 | 1                 | 10,5 | 71868           |
|            | 3                   | 1,1                 | 2,5               | 1                 | 24   | 71968           |
|            | 5                   | 2                   | 4                 | 2                 | 59,5 | 7068            |
|            | 6                   | 3                   | 5                 | 2,5               | 125  | 7268            |
| 360        | 2,1                 | 1,1                 | 2                 | 1                 | 12   | 71872           |
|            | 3                   | 1,1                 | 2,5               | 1                 | 28,5 | 71972           |
|            | 5                   | 2                   | 4                 | 2                 | 61,8 | 7072            |
|            | 6                   | 4                   | 6                 | 2,5               | 145  | 7272            |
| 380        | 2                   | 1                   | 2                 | 1                 | 14,4 | 70876           |
|            | 2,1                 | 1,1                 | 2                 | 1                 | 18   | 71876           |
|            | 4                   | 1,5                 | 3                 | 1,5               | 40,5 | 71976           |
|            | 5                   | 2                   | 4                 | 2                 | 65,5 | 7076            |
| 400        | 4                   | 1,5                 | 3                 | 1,5               | 39   | 71980           |
|            | 5                   | 2                   | 4                 | 2                 | 89,5 | 307238          |
|            | 5                   | 2                   | 4                 | 2                 | 90,5 | 7080            |
|            | 6                   | 3                   | 5                 | 2,5               | 190  | 7280            |
| 410        | 4                   | 1                   | 3                 | 1                 | 49,5 | 468431          |
| 420        | 4                   | 1,5                 | 3                 | 1,5               | 44,5 | 71984           |
|            | 5                   | 2                   | 4                 | 2                 | 88   | 7084            |
| 440        | 6                   | 3                   | 5                 | 2,5               | 100  | 7088            |
| 460        | 2,1                 | 1                   | 2                 | 1                 | 24,5 | 70892           |

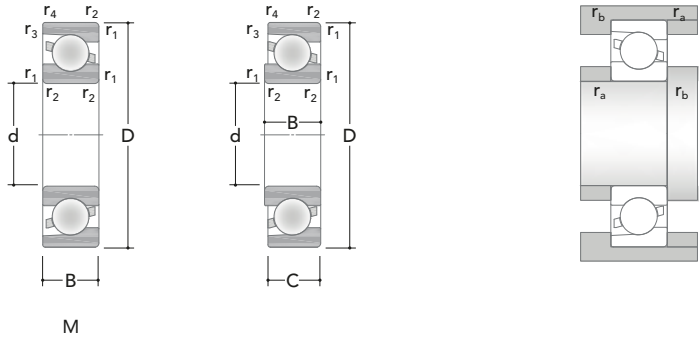


| Main dimensions |     |     |   | Basic load ratings |                       | Fatigue load limit | Speed ratings |          | Designation     |
|-----------------|-----|-----|---|--------------------|-----------------------|--------------------|---------------|----------|-----------------|
| d               | D   | B   | C | Dynamic C          | Static C <sub>0</sub> | C <sub>u</sub>     | Reference     | Limiting | Standard design |
| [mm]            |     |     |   | [kN]               |                       |                    | [rpm]         |          |                 |
| <b>460</b>      | 580 | 56  | - | 371,0              | 752                   | 14,06              | 990           | 1030     | <b>71892</b>    |
| (cont.)         | 620 | 74  | - | 512,0              | 1020                  | 18,63              | 1000          | 1000     | <b>71992</b>    |
|                 | 680 | 100 | - | 662                | 1430                  | 25,72              | 830           | 850      | <b>7092</b>     |
| <b>465</b>      | 635 | 76  | - | 459,00             | 978                   | 17,560             | 850           | 860      | <b>307352</b>   |
| <b>480</b>      | 700 | 100 | - | 687,0              | 1520                  | 27,22              | 770           | 830      | <b>7096</b>     |
| <b>500</b>      | 620 | 37  | - | 282,0              | 617                   | 10,95              | 920           | 910      | <b>708/500</b>  |
|                 | 620 | 56  | - | 382,0              | 842                   | 15,16              | 910           | 900      | <b>718/500</b>  |
|                 | 670 | 78  | - | 553                | 1210                  | 21,03              | 880           | 930      | <b>719/500</b>  |
|                 | 720 | 100 | - | 686                | 1560                  | 27,30              | 720           | 770      | <b>70/500</b>   |
| <b>530</b>      | 650 | 56  | - | 401,0              | 918                   | 15,910             | 860           | 940      | <b>718/530</b>  |
|                 | 710 | 82  | - | 618,0              | 1330                  | 23,42              | 800           | 850      | <b>719/530</b>  |
|                 | 760 | 100 | - | 702,0              | 1580                  | 27,16              | 710           | 750      | <b>307368</b>   |
|                 | 780 | 112 | - | 876,0              | 2150                  | 35,41              | 700           | 720      | <b>70/530</b>   |
| <b>540</b>      | 630 | 45  | - | 260                | 597                   | 10,55              | 770           | 830      | <b>311585</b>   |
| <b>560</b>      | 680 | 56  | - | 393,00             | 926                   | 15,930             | 780           | 810      | <b>718/560</b>  |
|                 | 750 | 85  | - | 604,0              | 1270                  | 22,45              | 730           | 770      | <b>719/560</b>  |
|                 | 820 | 115 | - | 881,0              | 2120                  | 34,03              | 660           | -        | <b>70/560</b>   |
| <b>600</b>      | 730 | 42  | - | 331,0              | 735                   | 14,00              | 720           | 770      | <b>708/600</b>  |
|                 | 730 | 60  | - | 458                | 1080                  | 17,97              | 720           | 790      | <b>718/600</b>  |
|                 | 800 | 90  | - | 729                | 1710                  | 27,18              | 680           | 720      | <b>719/600</b>  |
|                 | 870 | 118 | - | 884,00             | 2150                  | 33,84              | 650           | 710      | <b>70/600</b>   |
| <b>630</b>      | 700 | 22  | - | 135,0              | 434                   | 7,10               | 680           | 710      | <b>311712</b>   |
|                 |     |     |   | 956,0              | 2401                  |                    | 530           | 640      |                 |
| <b>670</b>      | 820 | 69  | - | 535                | 1280                  | 22,12              | 650           | 680      | <b>718/670</b>  |

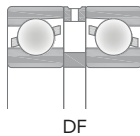
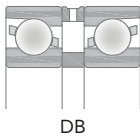
**DB****DF**

| Dimensions |                     |                     |                   |                   | Mass | Designation     |
|------------|---------------------|---------------------|-------------------|-------------------|------|-----------------|
| d          | r <sub>1,2min</sub> | r <sub>3,4min</sub> | r <sub>amax</sub> | r <sub>bmax</sub> |      | Standard design |
| [mm]       |                     |                     |                   |                   | [kg] |                 |
| <b>460</b> | 3                   | 3                   | 2,5               | 2,5               | 35   | <b>71892</b>    |
| (cont.)    | 4                   | 1,5                 | 3                 | 1,5               | 58   | <b>71992</b>    |
|            | 6                   | 3                   | 5                 | 2,5               | 120  | <b>7092</b>     |
| <b>465</b> | 4                   | 4                   | 3                 | 3                 | 70,5 | <b>307352</b>   |
| <b>480</b> | 6                   | 3                   | 5                 | 2,5               | 125  | <b>7096</b>     |
| <b>500</b> | 2,1                 | 1,1                 | 2                 | 1                 | 26   | <b>708/500</b>  |
|            | 3                   | 1,1                 | 2,5               | 1                 | 38   | <b>718/500</b>  |
|            | 5                   | 2                   | 4                 | 2                 | 78   | <b>719/500</b>  |
|            | 6                   | 3                   | 5                 | 2,5               | 130  | <b>70/500</b>   |
| <b>530</b> | 3                   | 1,1                 | 2,5               | 1                 | 39,5 | <b>718/530</b>  |
|            | 5                   | 2                   | 4                 | 2                 | 92   | <b>719/530</b>  |
|            | 6                   | 6                   | 5                 | 5                 | 150  | <b>307368</b>   |
|            | 6                   | 3                   | 5                 | 2,5               | 180  | <b>70/530</b>   |
| <b>540</b> | 3                   | 3                   | 2,5               | -                 | 21,5 | <b>311585</b>   |
| <b>560</b> | 3                   | 1,1                 | 2,5               | 1                 | 41,5 | <b>718/560</b>  |
|            | 5                   | 2                   | 4                 | 2                 | 105  | <b>719/560</b>  |
|            | 6                   | 3                   | 5                 | 2,5               | 203  | <b>70/560</b>   |
| <b>600</b> | 3                   | 1,1                 | 2,5               | 1                 | 38,5 | <b>708/600</b>  |
|            | 3                   | 1,1                 | 2,5               | 1                 | 52   | <b>718/600</b>  |
|            | 5                   | 2                   | 4                 | 2                 | 125  | <b>719/600</b>  |
|            | 6                   | 3                   | 5                 | 2,5               | 236  | <b>70/600</b>   |
| <b>630</b> | 0,6                 | -                   | 0,6               | -                 | 11,5 | <b>311712</b>   |
|            | 7,5                 | 4                   | 6                 | 3                 | 270  |                 |
| <b>670</b> | 4                   | 1,5                 | 3                 | 1,5               | 77   | <b>718/670</b>  |

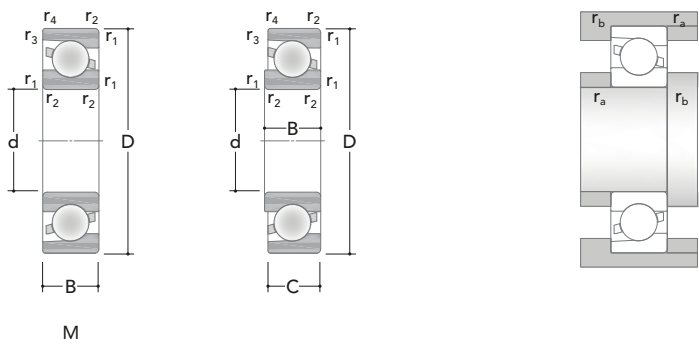




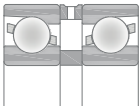
| Main dimensions |      |      |   | Basic load ratings |                       | Fatigue load limit | Speed ratings |          | Designation     |
|-----------------|------|------|---|--------------------|-----------------------|--------------------|---------------|----------|-----------------|
| d               | D    | B    | C | Dynamic C          | Static C <sub>0</sub> | C <sub>u</sub>     | Reference     | Limiting | Standard design |
| [mm]            |      |      |   | [kN]               |                       |                    | [rpm]         |          |                 |
| 670             | 980  | 136  | - | 1170               | 3080                  | 45,21              | 500           | -        | 70/670          |
| (cont.)         |      |      |   |                    |                       |                    |               |          |                 |
| 710             | 870  | 74   | - | 585,0              | 1600                  | 24,21              | 590           | 630      | 718/710         |
|                 | 950  | 106  | - | 852,0              | 2160                  | 33,87              | 550           | 590      | 719/710         |
|                 | 1030 | 140  | - | 1202,0             | 3217,5                | 45,50              | 500           | 560      | 70/710          |
| 750             | 920  | 78   | - | 650                | 1800                  | 25,91              | 560           | 590      | 718/750         |
|                 | 1090 | 150  | - | 1287               | 3590                  | 51,15              | 490           | 520      | 70/750          |
| 762             | 889  | 63,5 | - | 453,0              | 1244,6                | 18,16              | 520           | 550      | 311576          |
| 800             | 1130 | 120  | - | 1102,0             | 3190                  | 43,86              | 410           | 440      | 311745          |
|                 | 1150 | 155  | - | 1290,0             | 3720                  | 50,96              | 420           | -        | 70/800          |
| 850             | 1030 | 82   | - | 675                | 1841,4                | 28,38              | 460           | 500      | 718/850         |
|                 | 1220 | 165  | - | 1480,00            | 4560                  | 60,43              | 370           | -        | 70/850          |
| 900             | 1280 | 170  | - | 1544,0             | 4850                  | 62,36              | 380           | 400      | 70/900          |
| 950             | 1360 | 180  | - | 1597,0             | 5180                  | 65,25              | 360           | 380      | 70/950          |
| 1000            | 1220 | 100  | - | 923                | 2700                  | 38,29              | 370           | 400      | 718/1000        |
|                 | 1320 | 103  | - | 840,00             | 2401                  | 33,80              | 320           | 330      | 307101          |
|                 | 1420 | 185  | - | 1663,0             | 5300                  | 65,76              | 340           | 350      | 70/1000         |
| 1060            | 1500 | 195  | - | 1697,0             | 5670                  | 70,63              | 290           | 310      | 70/1060         |
| 1120            | 1360 | 106  | - | 1049               | 3700                  | 44,40              | 310           | 330      | 718/1120        |
|                 | 1580 | 200  | - | 1686               | 5770                  | 70,03              | 280           | 290      | 70/1120         |
| 1180            | 1660 | 212  | - | 1705,0             | 6110                  | 72,43              | 260           | 250      | 70/1180         |
| 1250            | 1500 | 80   | - | 868,0              | 3510                  | 46,80              | 250           | 270      | 708/1250        |



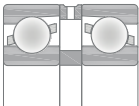
| Dimensions |                     |                     |                   |                   | Mass | Designation     |
|------------|---------------------|---------------------|-------------------|-------------------|------|-----------------|
| d          | r <sub>1,2min</sub> | r <sub>3,4min</sub> | r <sub>amax</sub> | r <sub>bmax</sub> |      | Standard design |
| [mm]       |                     |                     |                   |                   | [kg] |                 |
| 670        | 7,5                 | 4                   | 6                 | 3                 | 353  | 70/670          |
| (cont.)    |                     |                     |                   |                   |      |                 |
| 710        | 4                   | 1,5                 | 3                 | 1,5               | 93,5 | 718/710         |
|            | 6                   | 3                   | 5                 | 2,5               | 195  | 719/710         |
|            | 7,5                 | 4                   | 6                 | 3                 | 370  | 70/710          |
| 750        | 5                   | 2                   | 4                 | 2                 | 110  | 718/750         |
|            | 7,5                 | 4                   | 6                 | 3                 | 445  | 70/750          |
| 762        | 2,1                 | 2,1                 | 2                 | 2                 | 58   | 311576          |
| 800        | 7,5                 | 4                   | 6                 | 3                 | 395  | 311745          |
|            | 7,5                 | 4                   | 6                 | 3                 | 524  | 70/800          |
| 850        | 5                   | 2                   | 4                 | 2                 | 140  | 718/850         |
|            | 7,5                 | 4                   | 6                 | 3                 | 626  | 70/850          |
| 900        | 7,5                 | 4                   | 6                 | 3                 | 665  | 70/900          |
| 950        | 7,5                 | 4                   | 6                 | 3                 | 805  | 70/950          |
| 1000       | 6                   | 3                   | 5                 | 2,5               | 243  | 718/1000        |
|            | 6                   | 6                   | 5                 | 5                 | 370  | 307101          |
|            | 7,5                 | 4                   | 6                 | 3                 | 890  | 70/1000         |
| 1060       | 9,5                 | 5                   | 8                 | 4                 | 1050 | 70/1060         |
| 1120       | 6                   | 3                   | 5                 | 2,5               | 320  | 718/1120        |
|            | 9,5                 | 5                   | 8                 | 4                 | 1150 | 70/1120         |
| 1180       | 9,5                 | 5                   | 8                 | 4                 | 1350 | 70/1180         |
| 1250       | 6                   | 3                   | 5                 | 2,5               | 295  | 708/1250        |



| Main dimensions |      |     |   | Basic load ratings |                       | Fatigue load limit | Speed ratings |          | Designation     |
|-----------------|------|-----|---|--------------------|-----------------------|--------------------|---------------|----------|-----------------|
| d               | D    | B   | C | Dynamic C          | Static C <sub>0</sub> | C <sub>u</sub>     | Reference     | Limiting | Standard design |
| [mm]            |      |     |   | [kN]               |                       |                    | [rpm]         |          |                 |
| 1250            | 1500 | 112 | - | 1117               | 3850                  | 49,36              | 260           | 270      | 718/1250        |
| (cont.)         | 1750 | 218 | - | 1816               | 6450                  | 75,33              | 220           | 230      | 70/1250         |
| 1700            | 1900 | 80  | - | 975,00             | 4470                  | 44,70              | 150           | 150      | 307756          |



DB



DF

| Dimensions |                     |                     |                   |                   | Mass | Designation     |
|------------|---------------------|---------------------|-------------------|-------------------|------|-----------------|
| d          | r <sub>1,2min</sub> | r <sub>3,4min</sub> | r <sub>amax</sub> | r <sub>bmax</sub> |      | Standard design |
| [mm]       |                     |                     |                   |                   | [kg] |                 |
| 1250       | 6                   | 3                   | 5                 | 2,5               | 390  | 718/1250        |
| (cont.)    | 9,5                 | 5                   | 8                 | 4                 | 1600 | 70/1250         |
| 1700       | 7,5                 | -                   | 6                 | -                 | 310  | 307756          |