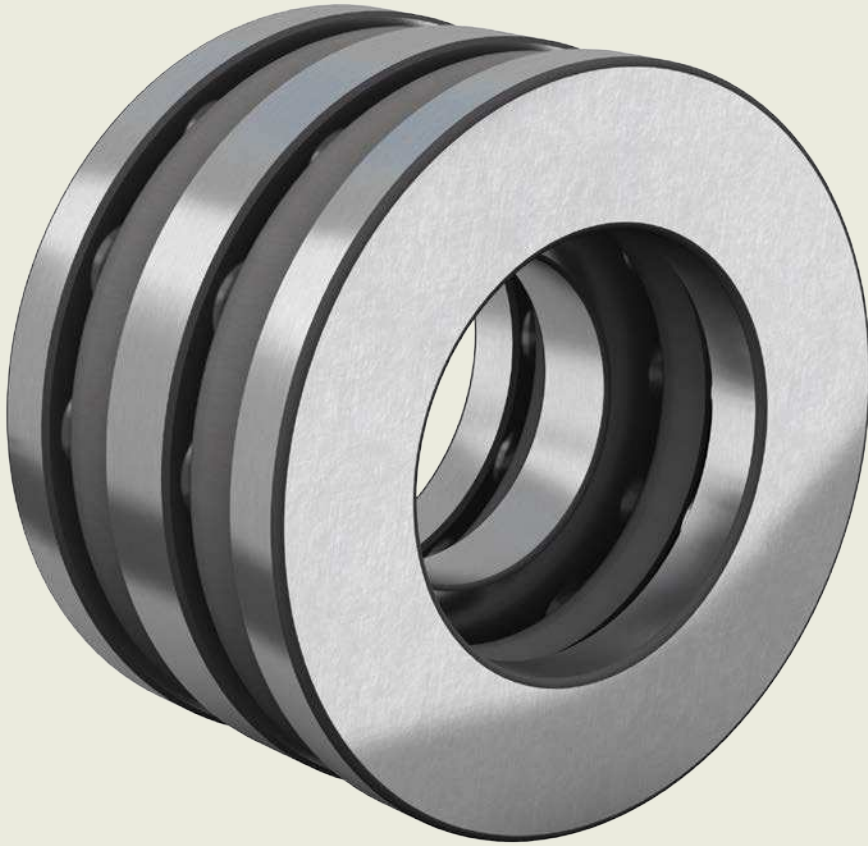


| Dimensions |                     |                     |    |                          | Abutment and fillet dimensions |                        | Calculation factors |      |                |                |                |
|------------|---------------------|---------------------|----|--------------------------|--------------------------------|------------------------|---------------------|------|----------------|----------------|----------------|
| d          | d <sub>1</sub><br>≈ | D <sub>1</sub><br>≈ | B  | r <sub>1,2</sub><br>min. | D <sub>a</sub><br>max.         | r <sub>a</sub><br>max. | k <sub>r</sub>      | e    | Y <sub>1</sub> | Y <sub>2</sub> | Y <sub>0</sub> |
| mm         |                     |                     |    |                          | mm                             |                        | —                   |      |                |                |                |
| 20         | 28,8                | 40                  | 40 | 1                        | 41,4                           | 1                      | 0,04                | 0,3  | 2,1            | 3,3            | 2,2            |
| 25         | 33,3                | 44,6                | 44 | 1                        | 46,4                           | 1                      | 0,04                | 0,28 | 2,2            | 3,5            | 2,5            |
| 30         | 40,1                | 51,9                | 48 | 1                        | 56,4                           | 1                      | 0,04                | 0,25 | 2,5            | 3,9            | 2,5            |
| 35         | 47                  | 60,9                | 52 | 1,1                      | 65                             | 1,1                    | 0,04                | 0,23 | 2,7            | 4,2            | 2,8            |
| 40         | 54                  | 67,5                | 56 | 1,1                      | 73                             | 1,1                    | 0,04                | 0,22 | 2,9            | 4,5            | 2,8            |
| 45         | 57,7                | 72,5                | 58 | 1,1                      | 78                             | 1,1                    | 0,04                | 0,21 | 3              | 4,6            | 3,2            |
| 50         | 61,7                | 78,1                | 58 | 1,1                      | 83                             | 1,1                    | 0,04                | 0,21 | 3              | 4,6            | 3,2            |
| 60         | 78                  | 95,6                | 62 | 1,5                      | 101                            | 1,5                    | 0,04                | 0,19 | 3,3            | 5,1            | 3,6            |





5

Thrust ball  
bearings



# 5 Thrust ball bearings

|                                                                                         |            |                                                           |
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|                                                                                         |            | Polymer ball bearings .....                               |
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|                                                                                         |            | 1059                                                      |
|                                                                                         |            | → <a href="https://skf.com/bearings">skf.com/bearings</a> |

# 5 Thrust ball bearings

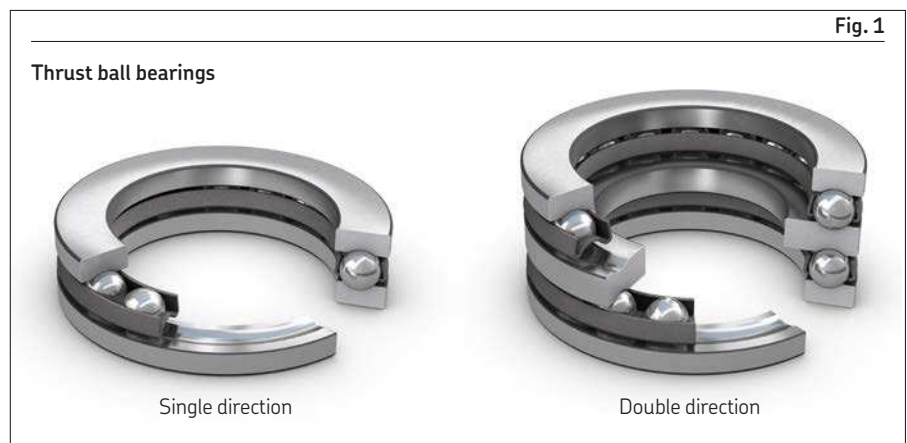
## More information

|                                                   |           |
|---------------------------------------------------|-----------|
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SKF thrust ball bearings (fig. 1) are manufactured as single direction or double direction thrust ball bearings. They are designed to accommodate axial loads only and must not be subjected to any radial load.

### Bearing features

- **Separable and interchangeable**  
The separable components of SKF thrust ball bearings are interchangeable (fig. 2). This facilitates mounting and dismounting, and maintenance inspections.
- **Initial misalignment**  
Bearings with sphered housing washer(s) (fig. 3) can accommodate initial misalignment.
- **Interference fit**  
Shaft washers have a ground bore to enable an interference fit. The bore of the housing washer is turned and always larger than the shaft washer bore.



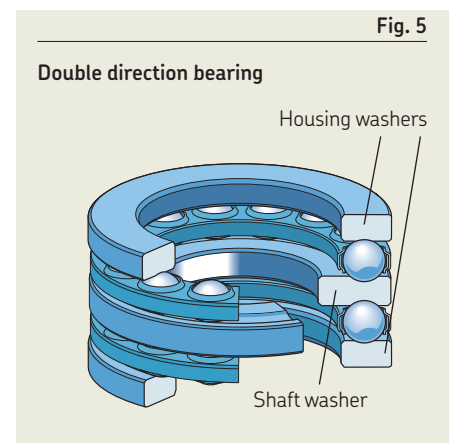
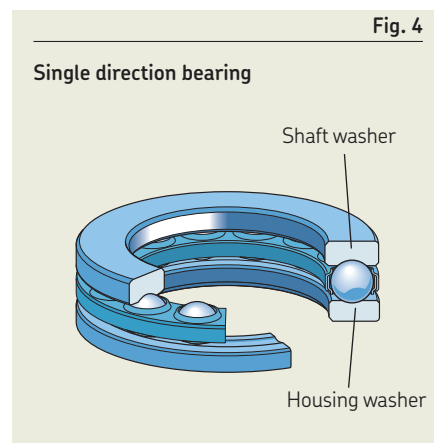
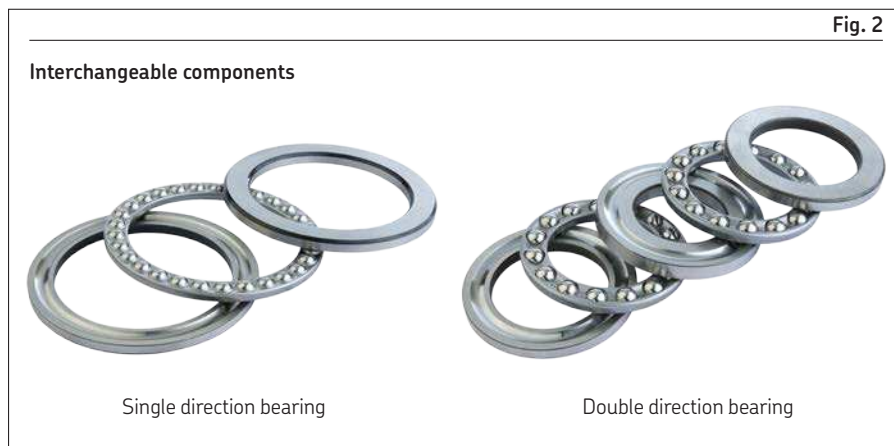
# Designs and variants

## Single direction thrust ball bearings

- consist of a shaft washer, a housing washer and a ball and cage assembly (fig. 4)
- can accommodate axial loads and locate a shaft axially, in one direction only

## Double direction thrust ball bearings

- consist of one shaft washer, two housing washers and two ball and cage assemblies (fig. 5)
- The housing washers and ball and cage assemblies of double direction bearings are identical to those used in single direction bearings.
- can accommodate axial loads and locate a shaft axially, in both directions



# Bearings with sphered housing washers

- can accommodate initial misalignment
- are available in both single (fig. 6) and double direction designs
- can be used together with a sphered seat washer adjacent to the housing washer (fig. 7) or adjacent to a machine component manufactured with a sphered surface

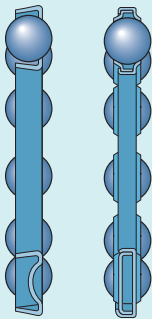
Appropriate sphered seat washers must be ordered separately (product tables, page 482, and page 490). Depending on the bearing series, they have the basic designation U 2, U 3 or U 4 followed by a two-digit number, which identifies the size, e.g. sphered seat washer U 320 for bearing 53320.

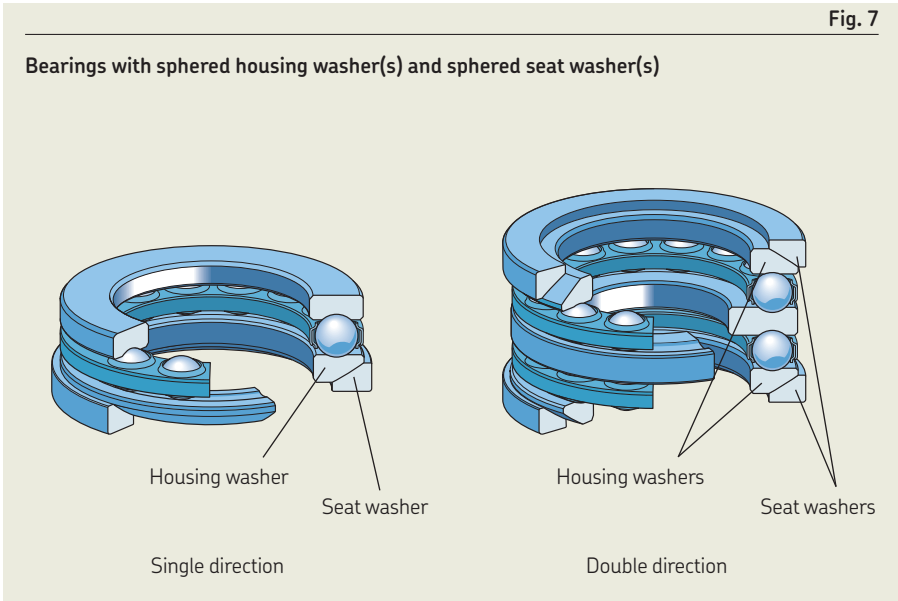
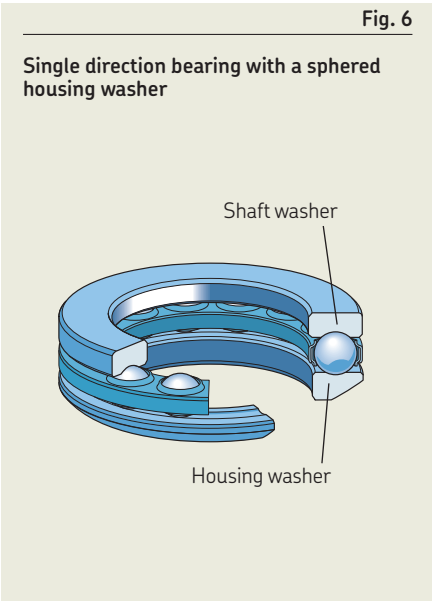
## Cages

SKF thrust ball bearings are fitted with one of the cages shown in table 1.  
For additional information about the suitability of cages , refer to Cages, page 187.

Table 1

Cages for thrust ball bearings

|                  |                                                                                   |                                                                                     |                                                                                     |
|------------------|-----------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|                  |  |  |  |
| Cage description | Stamped steel, ball centred                                                       | Machined brass, ball centred                                                        | Machined steel, ball centred                                                        |
| Suffix           | –                                                                                 | M                                                                                   | F                                                                                   |



## Bearing data

|                                                         | Thrust ball bearings with flat housing washers                                                           | Thrust ball bearings with sphered housing washers |
|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------|---------------------------------------------------|
| <b>Dimension standards</b>                              | ISO 104<br>Bearings in the BA series are not standardized.                                               | ISO 20516                                         |
| <b>Tolerances</b>                                       | Normal<br>P5 or P6 on request (single direction bearings only)                                           | Normal                                            |
| For additional information<br>→ <a href="#">page 35</a> | Values: ISO 199 ( <a href="#">table 10, page 46</a> )<br>Bearings in the BA series are not standardized. |                                                   |
| <b>Permissible misalignment</b>                         | Cannot tolerate any misalignment.                                                                        | Accommodate only initial misalignment.            |

## Loads

|                                                          |                                                |                                                                                                                                                                                                                                                                               |
|----------------------------------------------------------|------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Minimum load</b>                                      |                                                | <b>Symbols</b>                                                                                                                                                                                                                                                                |
| For additional information<br>→ <a href="#">page 106</a> | $F_{am} = A \left( \frac{n}{1\,000} \right)^2$ | A minimum load factor ( <a href="#">product tables, page 472</a> )<br>F <sub>a</sub> axial load [kN]<br>F <sub>am</sub> minimum axial load [kN]<br>n rotational speed [r/min]<br>P equivalent dynamic bearing load [kN]<br>P <sub>0</sub> equivalent static bearing load [kN] |
| <b>Equivalent dynamic bearing load</b>                   | P = F <sub>a</sub>                             |                                                                                                                                                                                                                                                                               |
| For additional information<br>→ <a href="#">page 91</a>  |                                                |                                                                                                                                                                                                                                                                               |
| <b>Equivalent static bearing load</b>                    | P <sub>0</sub> = F <sub>a</sub>                |                                                                                                                                                                                                                                                                               |
| For additional information<br>→ <a href="#">page 105</a> |                                                |                                                                                                                                                                                                                                                                               |

# Temperature limits

The permissible operating temperature for thrust ball bearings can be limited by:

- the dimensional stability of the bearing washers and balls
- the cage
- the seat washer(s)
- the lubricant

Where temperatures outside the permissible range are expected, contact SKF.

## Bearing washers and balls

Depending on their size, washers and balls of SKF thrust ball bearings are heat stabilized up to:

- 125 °C (260 °F) where  $d \leq 300$  mm
- 150 °C (300 °F) where  $d > 300$  mm

## Cages

Steel and brass cages can be used at the same operating temperatures as the bearing washers and balls.

## Seat washers

Seat washers are made of steel and can be used at the same operating temperatures as the bearing washers and balls.

## Lubricants

For temperature limits of SKF greases, refer to *Selecting a suitable SKF grease*, [page 116](#).

When using lubricants not supplied by SKF, temperature limits should be evaluated according to the SKF traffic light concept ([page 117](#)).

# Permissible speed

The speed ratings in the [product tables](#) indicate:

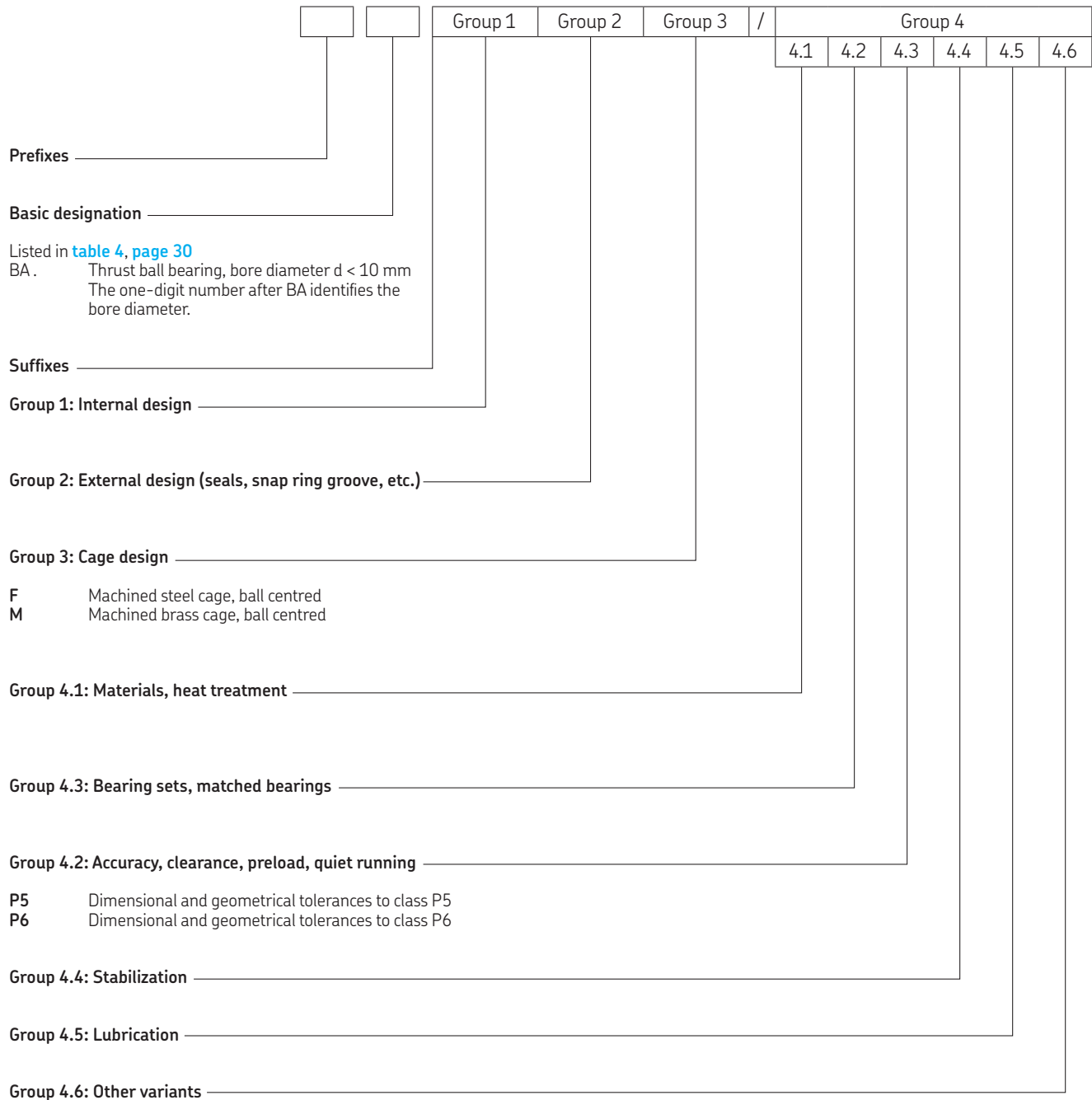
- the **reference speed**, which enables a quick assessment of the speed capabilities from a thermal frame of reference
- the **limiting speed**, which is a mechanical limit that should not be exceeded unless the bearing design and the application are adapted for higher speeds

For additional information, refer to *Operating temperature and speed*, [page 130](#).

# Mounting

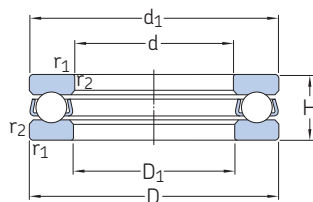
Where mounting a single direction thrust ball bearing, it is important to differentiate between the shaft washer and the housing washer. The bore of the shaft washer is ground and always smaller than the bore of the housing washer. The shaft washer should always be placed against a shaft step or fixed shaft component.

# Designation system



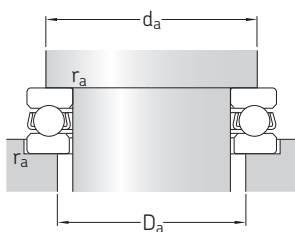
## 5.1 Single direction thrust ball bearings

d 3 – 35 mm



| Principal dimensions |    |     | Basic load ratings |                | Fatigue load limit | Minimum load factor | Speed ratings   |                | Mass   | Designation |
|----------------------|----|-----|--------------------|----------------|--------------------|---------------------|-----------------|----------------|--------|-------------|
| d                    | D  | H   | C                  | C <sub>0</sub> | P <sub>u</sub>     | A                   | Reference speed | Limiting speed |        |             |
| mm                   |    |     | kN                 |                | kN                 | –                   | r/min           |                | kg     | –           |
| 3                    | 8  | 3,5 | 0,806              | 0,72           | 0,027              | 0,000 003           | 26 000          | 36 000         | 0,0009 | ► BA 3      |
| 4                    | 10 | 4   | 0,761              | 0,72           | 0,027              | 0,000 003           | 22 000          | 30 000         | 0,0015 | ► BA 4      |
| 5                    | 12 | 4   | 0,852              | 0,965          | 0,036              | 0,000 005           | 20 000          | 28 000         | 0,0021 | ► BA 5      |
| 6                    | 14 | 5   | 1,78               | 1,92           | 0,071              | 0,000 019           | 17 000          | 24 000         | 0,0035 | ► BA 6      |
| 7                    | 17 | 6   | 2,51               | 2,9            | 0,108              | 0,000 044           | 14 000          | 19 000         | 0,0065 | ► BA 7      |
| 8                    | 19 | 7   | 3,19               | 3,8            | 0,143              | 0,000 075           | 12 000          | 17 000         | 0,0091 | ► BA 8      |
| 9                    | 20 | 7   | 3,12               | 3,8            | 0,143              | 0,000 075           | 12 000          | 16 000         | 0,01   | ► BA 9      |
| 10                   | 24 | 9   | 9,95               | 15,3           | 0,56               | 0,0012              | 9 500           | 13 000         | 0,02   | ► 51100     |
|                      | 26 | 11  | 12,7               | 18,6           | 0,695              | 0,0018              | 8 000           | 11 000         | 0,03   | ► 51200     |
| 12                   | 26 | 9   | 10,4               | 16,6           | 0,62               | 0,0014              | 9 000           | 13 000         | 0,022  | ► 51101     |
|                      | 28 | 11  | 13,3               | 20,8           | 0,765              | 0,0022              | 8 000           | 11 000         | 0,034  | ► 51201     |
| 15                   | 28 | 9   | 10,6               | 18,3           | 0,67               | 0,0017              | 8 500           | 12 000         | 0,023  | ► 51102     |
|                      | 32 | 12  | 15,9               | 25             | 0,915              | 0,0038              | 7 000           | 10 000         | 0,046  | ► 51202     |
| 17                   | 30 | 9   | 11,4               | 21,2           | 0,78               | 0,0023              | 8 500           | 12 000         | 0,025  | ► 51103     |
|                      | 35 | 12  | 16,3               | 27             | 1                  | 0,0047              | 6 700           | 9 500          | 0,053  | ► 51203     |
| 20                   | 35 | 10  | 15,1               | 29             | 1,08               | 0,0044              | 7 500           | 10 000         | 0,037  | ► 51104     |
|                      | 40 | 14  | 21,2               | 37,5           | 1,4                | 0,0085              | 6 000           | 8 000          | 0,083  | ► 51204     |
| 25                   | 42 | 11  | 18,2               | 39             | 1,43               | 0,0079              | 6 300           | 9 000          | 0,056  | ► 51105     |
|                      | 47 | 15  | 26,5               | 50             | 1,86               | 0,015               | 5 300           | 7 500          | 0,11   | ► 51205     |
|                      | 52 | 18  | 34,5               | 60             | 2,24               | 0,018               | 4 500           | 6 300          | 0,17   | ► 51305     |
|                      | 60 | 24  | 42,3               | 67             | 2,45               | 0,048               | 3 600           | 5 000          | 0,34   | ► 51405     |
| 30                   | 47 | 11  | 19                 | 43             | 1,6                | 0,0096              | 6 000           | 8 500          | 0,063  | ► 51106     |
|                      | 52 | 16  | 25,1               | 51             | 1,86               | 0,013               | 4 800           | 6 700          | 0,13   | ► 51206     |
|                      | 60 | 21  | 35,8               | 65,5           | 2,4                | 0,026               | 3 800           | 5 300          | 0,26   | ► 51306     |
|                      | 70 | 28  | 70,2               | 122            | 4,5                | 0,097               | 3 000           | 4 300          | 0,52   | ► 51406     |
| 35                   | 52 | 12  | 19,9               | 51             | 1,86               | 0,013               | 5 600           | 7 500          | 0,08   | ► 51107     |
|                      | 62 | 18  | 35,1               | 73,5           | 2,7                | 0,028               | 4 000           | 5 600          | 0,22   | ► 51207     |
|                      | 68 | 24  | 49,4               | 96,5           | 3,55               | 0,048               | 3 400           | 4 800          | 0,39   | ► 51307     |
|                      | 80 | 32  | 76,1               | 137            | 5,1                | 0,15                | 2 600           | 3 600          | 0,79   | ► 51407     |

► Popular item

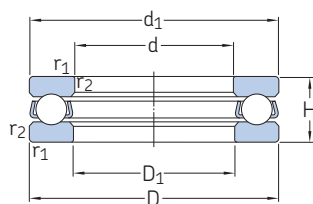


# Dimensions Abutment and fillet dimensions

| d  | $d_1$<br>≈ | $D_1$<br>≈ | $r_{1,2}$<br>min. | $d_a$<br>min. | $D_a$<br>max. | $r_a$<br>max. |
|----|------------|------------|-------------------|---------------|---------------|---------------|
| mm |            |            |                   | mm            |               |               |
| 3  | 7,8        | 3,2        | 0,15              | 5,8           | 5             | 0,15          |
| 4  | 9,8        | 4,2        | 0,15              | 7,5           | 6,5           | 0,15          |
| 5  | 11,8       | 5,2        | 0,15              | 8             | 9             | 0,15          |
| 6  | 13,8       | 6,2        | 0,2               | 11            | 9,5           | 0,2           |
| 7  | 16,8       | 7,2        | 0,2               | 12,5          | 11            | 0,2           |
| 8  | 18,8       | 8,2        | 0,3               | 14,5          | 12,5          | 0,3           |
| 9  | 19,8       | 9,2        | 0,3               | 15,5          | 13,5          | 0,3           |
| 10 | 24<br>26   | 11<br>12   | 0,3<br>0,6        | 19<br>20      | 15<br>16      | 0,3<br>0,6    |
| 12 | 26<br>28   | 13<br>14   | 0,3<br>0,6        | 21<br>22      | 17<br>18      | 0,3<br>0,6    |
| 15 | 28<br>32   | 16<br>17   | 0,3<br>0,6        | 23<br>25      | 20<br>22      | 0,3<br>0,6    |
| 17 | 30<br>35   | 18<br>19   | 0,3<br>0,6        | 25<br>28      | 22<br>24      | 0,3<br>0,6    |
| 20 | 35<br>40   | 21<br>22   | 0,3<br>0,6        | 29<br>32      | 26<br>28      | 0,3<br>0,6    |
| 25 | 42<br>47   | 26<br>27   | 0,6<br>0,6        | 35<br>38      | 32<br>34      | 0,6<br>0,6    |
|    | 52<br>60   | 27<br>27   | 1<br>1            | 41<br>46      | 36<br>39      | 1<br>1        |
| 30 | 47<br>52   | 32<br>32   | 0,6<br>0,6        | 40<br>43      | 37<br>39      | 0,6<br>0,6    |
|    | 60<br>70   | 32<br>32   | 1<br>1            | 48<br>54      | 42<br>46      | 1<br>1        |
| 35 | 52<br>62   | 37<br>37   | 0,6<br>1          | 45<br>51      | 42<br>46      | 0,6<br>1      |
|    | 68<br>80   | 37<br>37   | 1<br>1,1          | 55<br>62      | 48<br>53      | 1<br>1        |

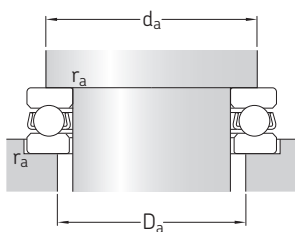
## 5.1 Single direction thrust ball bearings

d 40 – 75 mm



| Principal dimensions |     |    | Basic load ratings |                | Fatigue load limit | Minimum load factor | Speed ratings   |                | Mass | Designation |
|----------------------|-----|----|--------------------|----------------|--------------------|---------------------|-----------------|----------------|------|-------------|
| d                    | D   | H  | C                  | C <sub>0</sub> | P <sub>u</sub>     | A                   | Reference speed | Limiting speed |      |             |
| mm                   |     |    | kN                 |                | kN                 | –                   | r/min           |                | kg   | –           |
| 40                   | 60  | 13 | 25,5               | 63             | 2,32               | 0,02                | 5 000           | 7 000          | 0,12 | ► 51108     |
|                      | 68  | 19 | 44,2               | 96,5           | 3,6                | 0,058               | 3 800           | 5 300          | 0,28 | ► 51208     |
|                      | 78  | 26 | 61,8               | 122            | 4,5                | 0,077               | 3 000           | 4 300          | 0,53 | ► 51308     |
|                      | 90  | 36 | 95,6               | 183            | 6,8                | 0,26                | 2 400           | 3 400          | 1,1  | ► 51408     |
| 45                   | 65  | 14 | 26,5               | 69,5           | 2,55               | 0,025               | 4 500           | 6 300          | 0,14 | ► 51109     |
|                      | 73  | 20 | 39                 | 86,5           | 3,2                | 0,038               | 3 600           | 5 000          | 0,3  | ► 51209     |
|                      | 85  | 28 | 76,1               | 153            | 5,6                | 0,12                | 2 800           | 4 000          | 0,66 | ► 51309     |
|                      | 100 | 39 | 124                | 240            | 9                  | 0,37                | 2 200           | 3 000          | 1,4  | ► 51409     |
| 50                   | 70  | 14 | 27                 | 75             | 2,8                | 0,029               | 4 300           | 6 300          | 0,16 | ► 51110     |
|                      | 78  | 22 | 49,4               | 116            | 4,3                | 0,069               | 3 400           | 4 500          | 0,37 | ► 51210     |
|                      | 95  | 31 | 81,9               | 170            | 6,3                | 0,19                | 2 600           | 3 600          | 0,94 | ► 51310     |
|                      | 110 | 43 | 159                | 340            | 12,5               | 0,6                 | 2 000           | 2 800          | 2    | ► 51410     |
| 55                   | 78  | 16 | 30,2               | 81,5           | 3                  | 0,039               | 3 800           | 5 300          | 0,23 | ► 51111     |
|                      | 90  | 25 | 58,5               | 134            | 4,9                | 0,11                | 2 800           | 4 000          | 0,59 | ► 51211     |
|                      | 105 | 35 | 101                | 224            | 8,3                | 0,26                | 2 200           | 3 200          | 1,3  | ► 51311     |
|                      | 120 | 48 | 195                | 400            | 14,6               | 0,79                | 1 800           | 2 400          | 2,55 | ► 51411     |
| 60                   | 85  | 17 | 41,6               | 122            | 4,55               | 0,077               | 3 600           | 5 000          | 0,27 | ► 51112     |
|                      | 95  | 26 | 59,2               | 140            | 5,1                | 0,12                | 2 800           | 3 800          | 0,65 | ► 51212     |
|                      | 110 | 35 | 101                | 224            | 8,3                | 0,26                | 2 200           | 3 000          | 1,35 | ► 51312     |
|                      | 130 | 51 | 199                | 430            | 16                 | 0,96                | 1 600           | 2 200          | 3,1  | ► 51412 M   |
| 65                   | 90  | 18 | 37,7               | 108            | 4                  | 0,06                | 3 400           | 4 800          | 0,33 | ► 51113     |
|                      | 100 | 27 | 60,5               | 150            | 5,5                | 0,14                | 2 600           | 3 600          | 0,72 | ► 51213     |
|                      | 115 | 36 | 106                | 240            | 8,8                | 0,3                 | 2 000           | 3 000          | 1,5  | ► 51313     |
|                      | 140 | 56 | 216                | 490            | 18                 | 1,2                 | 1 500           | 2 200          | 4    | ► 51413 M   |
| 70                   | 95  | 18 | 40,3               | 120            | 4,4                | 0,074               | 3 400           | 4 500          | 0,35 | ► 51114     |
|                      | 105 | 27 | 62,4               | 160            | 5,85               | 0,16                | 2 600           | 3 600          | 0,79 | ► 51214     |
|                      | 125 | 40 | 135                | 320            | 11,8               | 0,53                | 1 900           | 2 600          | 2    | ► 51314     |
|                      | 150 | 60 | 234                | 550            | 19,3               | 1,6                 | 1 400           | 2 000          | 5    | ► 51414 M   |
| 75                   | 100 | 19 | 44,2               | 134            | 4,9                | 0,11                | 3 200           | 4 300          | 0,4  | ► 51115     |
|                      | 110 | 27 | 63,7               | 170            | 6,2                | 0,17                | 2 400           | 3 400          | 0,83 | ► 51215     |
|                      | 135 | 44 | 163                | 390            | 14                 | 0,79                | 1 700           | 2 400          | 2,6  | ► 51315     |
|                      | 160 | 65 | 251                | 610            | 20,8               | 1,9                 | 1 300           | 1 800          | 6,75 | ► 51415 M   |

► Popular item

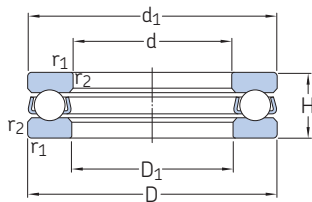


# Dimensions Abutment and fillet dimensions

| d  | $d_1$<br>≈ | $D_1$<br>≈ | $r_{1,2}$<br>min. | $d_a$<br>min. | $D_a$<br>max. | $r_a$<br>max. |
|----|------------|------------|-------------------|---------------|---------------|---------------|
| mm |            |            |                   | mm            |               |               |
| 40 | 60         | 42         | 0,6               | 52            | 48            | 0,6           |
|    | 68         | 42         | 1                 | 57            | 51            | 1             |
|    | 78         | 42         | 1                 | 63            | 55            | 1             |
|    | 90         | 42         | 1,1               | 70            | 60            | 1             |
| 45 | 65         | 47         | 0,6               | 57            | 53            | 0,6           |
|    | 73         | 47         | 1                 | 62            | 56            | 1             |
|    | 85         | 47         | 1                 | 69            | 61            | 1             |
|    | 100        | 47         | 1,1               | 78            | 67            | 1             |
| 50 | 70         | 52         | 0,6               | 62            | 58            | 0,6           |
|    | 78         | 52         | 1                 | 67            | 61            | 1             |
|    | 95         | 52         | 1,1               | 77            | 68            | 1             |
|    | 110        | 52         | 1,5               | 86            | 74            | 1,5           |
| 55 | 78         | 57         | 0,6               | 69            | 64            | 0,6           |
|    | 90         | 57         | 1                 | 76            | 69            | 1             |
|    | 105        | 57         | 1,1               | 85            | 75            | 1             |
|    | 120        | 57         | 1,5               | 94            | 81            | 1,5           |
| 60 | 85         | 62         | 1                 | 75            | 70            | 1             |
|    | 95         | 62         | 1                 | 81            | 74            | 1             |
|    | 110        | 62         | 1,1               | 90            | 80            | 1             |
|    | 130        | 62         | 1,5               | 102           | 88            | 1,5           |
| 65 | 90         | 67         | 1                 | 80            | 75            | 1             |
|    | 100        | 67         | 1                 | 86            | 79            | 1             |
|    | 115        | 67         | 1,1               | 95            | 85            | 1             |
|    | 140        | 68         | 2                 | 110           | 95            | 2             |
| 70 | 95         | 72         | 1                 | 85            | 80            | 1             |
|    | 105        | 72         | 1                 | 91            | 84            | 1             |
|    | 125        | 72         | 1,1               | 103           | 92            | 1             |
|    | 150        | 73         | 2                 | 118           | 102           | 2             |
| 75 | 100        | 77         | 1                 | 90            | 85            | 1             |
|    | 110        | 77         | 1                 | 96            | 89            | 1             |
|    | 135        | 77         | 1,5               | 111           | 99            | 1,5           |
|    | 160        | 78         | 2                 | 126           | 109           | 2             |

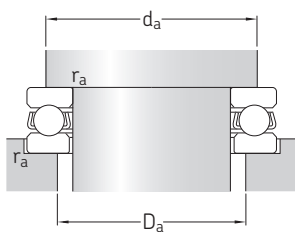
## 5.1 Single direction thrust ball bearings

d 80 – 140 mm



| Principal dimensions |     |     | Basic load ratings |                | Fatigue load limit | Minimum load factor | Speed ratings   |                | Mass | Designation |
|----------------------|-----|-----|--------------------|----------------|--------------------|---------------------|-----------------|----------------|------|-------------|
| d                    | D   | H   | C                  | C <sub>0</sub> | P <sub>u</sub>     | A                   | Reference speed | Limiting speed |      |             |
| mm                   |     |     | kN                 |                | kN                 | –                   | r/min           |                | kg   | –           |
| 80                   | 105 | 19  | 44,9               | 140            | 5,1                | 0,12                | 3 000           | 4 300          | 0,42 | ► 51116     |
|                      | 115 | 28  | 76,1               | 208            | 7,65               | 0,22                | 2 400           | 3 400          | 0,91 | ► 51216     |
|                      | 140 | 44  | 159                | 390            | 13,7               | 0,79                | 1 700           | 2 400          | 2,7  | ► 51316     |
|                      | 170 | 68  | 302                | 750            | 25                 | 2,3                 | 1 200           | 1 700          | 7,95 | ► 51416 M   |
| 85                   | 110 | 19  | 44,9               | 146            | 5,4                | 0,14                | 3 000           | 4 300          | 0,44 | ► 51117     |
|                      | 125 | 31  | 97,5               | 275            | 9,8                | 0,39                | 2 200           | 3 000          | 1,2  | ► 51217     |
|                      | 150 | 49  | 174                | 405            | 14                 | 1,1                 | 1 600           | 2 200          | 3,55 | ► 51317     |
|                      | 180 | 72  | 286                | 750            | 24                 | 2,9                 | 1 200           | 1 600          | 9,45 | ► 51417 M   |
| 90                   | 120 | 22  | 59,2               | 208            | 7,5                | 0,22                | 2 600           | 3 800          | 0,67 | ► 51118     |
|                      | 135 | 35  | 112                | 290            | 10,4               | 0,55                | 2 000           | 2 800          | 1,7  | ► 51218     |
|                      | 155 | 50  | 182                | 440            | 14,6               | 1,3                 | 1 500           | 2 200          | 3,8  | ► 51318     |
|                      | 190 | 77  | 307                | 815            | 25,5               | 3,5                 | 1 100           | 1 500          | 11   | ► 51418 M   |
| 100                  | 135 | 25  | 80,6               | 265            | 9,15               | 0,44                | 2 400           | 3 200          | 0,97 | ► 51120     |
|                      | 150 | 38  | 119                | 325            | 10,8               | 0,62                | 1 800           | 2 400          | 2,2  | ► 51220     |
|                      | 170 | 55  | 225                | 570            | 18,3               | 1,9                 | 1 400           | 1 900          | 4,95 | ► 51320     |
|                      | 210 | 85  | 371                | 1 060          | 31,5               | 5,8                 | 950             | 1 400          | 15   | ► 51420 M   |
| 110                  | 145 | 25  | 83,2               | 285            | 9,5                | 0,52                | 2 200           | 3 200          | 1,05 | ► 51122     |
|                      | 160 | 38  | 125                | 365            | 11,6               | 0,79                | 1 700           | 2 400          | 2,4  | ► 51222     |
|                      | 190 | 63  | 281                | 815            | 24,5               | 3,2                 | 1 200           | 1 700          | 7,85 | ► 51322 M   |
|                      | 230 | 95  | 410                | 1 220          | 34,5               | 7,7                 | 900             | 1 300          | 20   | 51422 M     |
| 120                  | 155 | 25  | 85,2               | 305            | 9,65               | 0,58                | 2 200           | 3 000          | 1,15 | ► 51124     |
|                      | 170 | 39  | 127                | 390            | 11,8               | 1                   | 1 600           | 2 200          | 2,65 | ► 51224     |
|                      | 210 | 70  | 325                | 980            | 28,5               | 5                   | 1 100           | 1 500          | 11   | ► 51324 M   |
|                      | 250 | 102 | 432                | 1 320          | 36                 | 16                  | 800             | 1 100          | 25,5 | 51424 M     |
| 130                  | 170 | 30  | 119                | 440            | 13,4               | 0,94                | 1 900           | 2 600          | 1,85 | ► 51126     |
|                      | 190 | 45  | 186                | 585            | 17                 | 1,8                 | 1 400           | 2 000          | 4    | ► 51226     |
|                      | 225 | 75  | 358                | 1 140          | 32                 | 6,8                 | 1 000           | 1 400          | 13   | ► 51326 M   |
|                      | 270 | 110 | 520                | 1 730          | 45                 | 16                  | 750             | 1 000          | 32   | 51426 M     |
| 140                  | 180 | 31  | 111                | 440            | 12,9               | 1                   | 1 800           | 2 600          | 2,05 | ► 51128     |
|                      | 200 | 46  | 190                | 620            | 17,6               | 2                   | 1 400           | 1 900          | 4,35 | ► 51228     |
|                      | 240 | 80  | 377                | 1 220          | 32,5               | 9,1                 | 950             | 1 300          | 15,5 | ► 51328 M   |
|                      | 280 | 112 | 520                | 1 730          | 44                 | 16                  | 700             | 1 000          | 34,5 | 51428 M     |

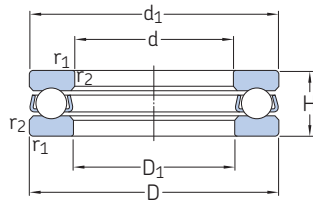
► Popular item



| Dimensions |            |            |                   | Abutment and fillet dimensions |               |               |
|------------|------------|------------|-------------------|--------------------------------|---------------|---------------|
| d          | $d_1$<br>≈ | $D_1$<br>≈ | $r_{1,2}$<br>min. | $d_a$<br>min.                  | $D_a$<br>max. | $r_a$<br>max. |
| mm         |            |            |                   | mm                             |               |               |
| <b>80</b>  | 105        | 82         | 1                 | 95                             | 90            | 1             |
|            | 115        | 82         | 1                 | 101                            | 94            | 1             |
|            | 140        | 82         | 1,5               | 116                            | 104           | 1,5           |
|            | 170        | 83         | 2,1               | 133                            | 117           | 2             |
| <b>85</b>  | 110        | 87         | 1                 | 100                            | 95            | 1             |
|            | 125        | 88         | 1                 | 109                            | 101           | 1             |
|            | 150        | 88         | 1,5               | 124                            | 111           | 1,5           |
|            | 177        | 88         | 2,1               | 141                            | 124           | 2             |
| <b>90</b>  | 120        | 92         | 1                 | 108                            | 102           | 1             |
|            | 135        | 93         | 1,1               | 117                            | 108           | 1             |
|            | 155        | 93         | 1,5               | 129                            | 116           | 1,5           |
|            | 187        | 93         | 2,1               | 149                            | 131           | 2             |
| <b>100</b> | 135        | 102        | 1                 | 121                            | 114           | 1             |
|            | 150        | 103        | 1,1               | 130                            | 120           | 1             |
|            | 170        | 103        | 1,5               | 142                            | 128           | 1,5           |
|            | 205        | 103        | 3                 | 165                            | 145           | 2,5           |
| <b>110</b> | 145        | 112        | 1                 | 131                            | 124           | 1             |
|            | 160        | 113        | 1,1               | 140                            | 130           | 1             |
|            | 187        | 113        | 2                 | 158                            | 142           | 2             |
|            | 225        | 113        | 3                 | 181                            | 159           | 2,5           |
| <b>120</b> | 155        | 122        | 1                 | 141                            | 134           | 1             |
|            | 170        | 123        | 1,1               | 150                            | 140           | 1             |
|            | 205        | 123        | 2,1               | 173                            | 157           | 2             |
|            | 245        | 123        | 4                 | 197                            | 173           | 3             |
| <b>130</b> | 170        | 132        | 1                 | 154                            | 146           | 1             |
|            | 187        | 133        | 1,5               | 166                            | 154           | 1,5           |
|            | 220        | 134        | 2,1               | 186                            | 169           | 2             |
|            | 265        | 134        | 4                 | 213                            | 187           | 3             |
| <b>140</b> | 178        | 142        | 1                 | 164                            | 156           | 1             |
|            | 197        | 143        | 1,5               | 176                            | 164           | 1,5           |
|            | 235        | 144        | 2,1               | 199                            | 181           | 2             |
|            | 275        | 144        | 4                 | 223                            | 197           | 3             |

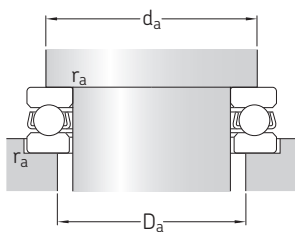
## 5.1 Single direction thrust ball bearings

d 150 – 340 mm



| Principal dimensions |     |     | Basic load ratings |                | Fatigue load limit | Minimum load factor | Speed ratings   |                | Mass | Designation |
|----------------------|-----|-----|--------------------|----------------|--------------------|---------------------|-----------------|----------------|------|-------------|
| d                    | D   | H   | C                  | C <sub>0</sub> | P <sub>u</sub>     | A                   | Reference speed | Limiting speed |      |             |
| mm                   |     |     | kN                 |                | kN                 | –                   | r/min           |                | kg   | –           |
| 150                  | 190 | 31  | 111                | 440            | 12,5               | 1                   | 1 700           | 2 400          | 2,2  | ► 51130 M   |
|                      | 215 | 50  | 238                | 800            | 22                 | 3,3                 | 1 300           | 1 800          | 6,1  | ► 51230 M   |
|                      | 250 | 80  | 390                | 1 290          | 34                 | 10                  | 900             | 1 300          | 16,5 | ► 51330 M   |
|                      | 300 | 120 | 559                | 1 960          | 48                 | 20                  | 670             | 950            | 42,5 | 51430 M     |
| 160                  | 200 | 31  | 112                | 465            | 12,9               | 1,1                 | 1 700           | 2 400          | 2,35 | ► 51132 M   |
|                      | 225 | 51  | 238                | 830            | 22,4               | 3,8                 | 1 200           | 1 700          | 6,55 | ► 51232 M   |
|                      | 270 | 87  | 449                | 1 660          | 41,5               | 14                  | 850             | 1 200          | 21   | ► 51332 M   |
| 170                  | 215 | 34  | 133                | 540            | 14,3               | 1,5                 | 1 600           | 2 200          | 3,3  | ► 51134 M   |
|                      | 240 | 55  | 270                | 930            | 24                 | 5,4                 | 1 200           | 1 700          | 8,15 | ► 51234 M   |
|                      | 280 | 87  | 468                | 1 760          | 43                 | 16                  | 800             | 1 100          | 22   | ► 51334 M   |
| 180                  | 225 | 34  | 135                | 570            | 15                 | 1,7                 | 1 500           | 2 200          | 3,5  | ► 51136 M   |
|                      | 250 | 56  | 302                | 1 120          | 28,5               | 6,1                 | 1 200           | 1 600          | 8,6  | ► 51236 M   |
|                      | 300 | 95  | 520                | 2 000          | 47,5               | 21                  | 750             | 1 100          | 28,5 | ► 51336 M   |
| 190                  | 240 | 37  | 172                | 710            | 18                 | 2,6                 | 1 400           | 2 000          | 4,05 | ► 51138 M   |
|                      | 270 | 62  | 332                | 1 270          | 31                 | 8,4                 | 1 100           | 1 600          | 12   | ► 51238 M   |
|                      | 320 | 105 | 559                | 2 200          | 51                 | 30                  | 700             | 950            | 36,5 | 51338 M     |
| 200                  | 250 | 37  | 168                | 710            | 17,6               | 2,6                 | 1 400           | 1 900          | 4,25 | ► 51140 M   |
|                      | 280 | 62  | 338                | 1 320          | 31,5               | 9,1                 | 1 100           | 1 500          | 12   | ► 51240 M   |
|                      | 340 | 110 | 624                | 2 600          | 58,5               | 35                  | 630             | 900            | 44,5 | 51340 M     |
| 220                  | 270 | 37  | 178                | 800            | 19                 | 3,3                 | 1 300           | 1 900          | 4,6  | ► 51144 M   |
|                      | 300 | 63  | 358                | 1 460          | 33,5               | 11                  | 950             | 1 300          | 13   | ► 51244 M   |
| 240                  | 300 | 45  | 234                | 1 040          | 23,6               | 5,6                 | 1 100           | 1 600          | 7,55 | ► 51148 M   |
|                      | 340 | 78  | 449                | 1 960          | 42,5               | 21                  | 800             | 1 100          | 23   | ► 51248 M   |
| 260                  | 320 | 45  | 238                | 1 100          | 24                 | 6,3                 | 1 100           | 1 500          | 8,1  | ► 51152 M   |
|                      | 360 | 79  | 488                | 2 240          | 46,5               | 24                  | 750             | 1 100          | 25   | ► 51252 M   |
| 280                  | 350 | 53  | 319                | 1 460          | 30,5               | 11                  | 950             | 1 300          | 12   | ► 51156 M   |
|                      | 380 | 80  | 488                | 2 320          | 47,5               | 28                  | 750             | 1 000          | 26,5 | ► 51256 M   |
| 300                  | 380 | 62  | 364                | 1 760          | 35,5               | 16                  | 850             | 1 200          | 17,5 | ► 51160 M   |
|                      | 420 | 95  | 585                | 3 000          | 57                 | 47                  | 630             | 850            | 42   | ► 51260 M   |
| 320                  | 400 | 63  | 371                | 1 860          | 36,5               | 18                  | 800             | 1 100          | 19   | ► 51164 M   |
|                      | 440 | 95  | 572                | 3 000          | 56                 | 47                  | 600             | 800            | 45,5 | 51264 F     |
|                      | 440 | 95  | 572                | 3 000          | 56                 | 47                  | 600             | 800            | 45   | 51264 M     |
| 340                  | 420 | 64  | 377                | 1 960          | 37,5               | 20                  | 800             | 1 100          | 20,5 | ► 51168 M   |
|                      | 460 | 96  | 605                | 3 200          | 25,5               | 53                  | 600             | 800            | 48,5 | 51268 F     |

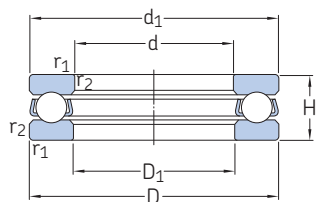
► Popular item



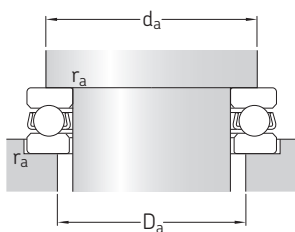
| Dimensions |            |            |                   | Abutment and fillet dimensions |               |               |
|------------|------------|------------|-------------------|--------------------------------|---------------|---------------|
| d          | $d_1$<br>≈ | $D_1$<br>≈ | $r_{1,2}$<br>min. | $d_a$<br>min.                  | $D_a$<br>max. | $r_a$<br>max. |
| mm         |            |            |                   | mm                             |               |               |
| 150        | 188        | 152        | 1                 | 174                            | 166           | 1             |
|            | 212        | 153        | 1,5               | 189                            | 176           | 1,5           |
|            | 245        | 154        | 2,1               | 209                            | 191           | 2             |
| 160        | 295        | 154        | 4                 | 239                            | 211           | 3             |
|            | 198        | 162        | 1                 | 184                            | 176           | 1             |
|            | 222        | 163        | 1,5               | 199                            | 186           | 1,5           |
| 170        | 265        | 164        | 3                 | 225                            | 205           | 2,5           |
|            | 213        | 172        | 1,1               | 197                            | 188           | 1             |
|            | 237        | 173        | 1,5               | 212                            | 198           | 1,5           |
| 180        | 275        | 174        | 3                 | 235                            | 215           | 2,5           |
|            | 222        | 183        | 1,1               | 207                            | 198           | 1             |
|            | 245        | 183        | 1,5               | 222                            | 208           | 1,5           |
| 190        | 295        | 184        | 3                 | 251                            | 229           | 2,5           |
|            | 237        | 193        | 1,1               | 220                            | 210           | 1             |
|            | 265        | 194        | 2                 | 238                            | 222           | 2             |
| 200        | 315        | 195        | 4                 | 267                            | 243           | 3             |
|            | 247        | 203        | 1,1               | 230                            | 220           | 1             |
|            | 275        | 204        | 2                 | 248                            | 232           | 2             |
| 220        | 335        | 205        | 4                 | 283                            | 257           | 3             |
|            | 267        | 223        | 1,1               | 250                            | 240           | 1             |
|            | 295        | 224        | 2                 | 268                            | 252           | 2             |
| 240        | 297        | 243        | 1,5               | 276                            | 264           | 1,5           |
|            | 335        | 244        | 2,1               | 299                            | 281           | 2             |
| 260        | 317        | 263        | 1,5               | 296                            | 284           | 1,5           |
|            | 355        | 264        | 2,1               | 319                            | 301           | 2             |
| 280        | 347        | 283        | 1,5               | 322                            | 308           | 1,5           |
|            | 375        | 284        | 2,1               | 339                            | 321           | 2             |
| 300        | 376        | 304        | 2                 | 348                            | 332           | 2             |
|            | 415        | 304        | 3                 | 371                            | 349           | 2,5           |
| 320        | 396        | 324        | 2                 | 368                            | 352           | 2             |
|            | 435        | 325        | 3                 | 391                            | 369           | 2,5           |
|            | 435        | 325        | 3                 | 391                            | 369           | 2,5           |
| 340        | 416        | 344        | 2                 | 388                            | 372           | 2             |
|            | 455        | 345        | 3                 | 411                            | 389           | 2,5           |

## 5.1 Single direction thrust ball bearings

d 360 – 670 mm



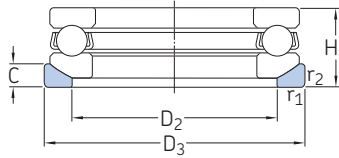
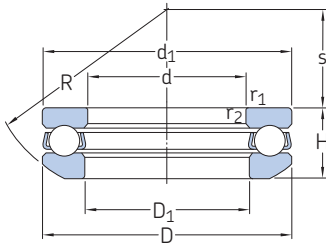
| Principal dimensions |     |     | Basic load ratings |                | Fatigue load limit | Minimum load factor | Speed ratings   |                | Mass | Designation      |
|----------------------|-----|-----|--------------------|----------------|--------------------|---------------------|-----------------|----------------|------|------------------|
| d                    | D   | H   | C                  | C <sub>0</sub> | P <sub>u</sub>     | A                   | Reference speed | Limiting speed |      |                  |
| mm                   |     |     | kN                 |                | kN                 | –                   | r/min           |                | kg   | –                |
| <b>360</b>           | 440 | 65  | 390                | 2 080          | 38                 | 22                  | 750             | 1 100          | 22   | <b>51172 F</b>   |
|                      | 500 | 110 | 741                | 4 150          | 73,5               | 90                  | 500             | 700            | 70   | <b>51272 F</b>   |
| <b>380</b>           | 460 | 65  | 397                | 2 200          | 40                 | 25                  | 750             | 1 000          | 23   | <b>51176 F</b>   |
|                      | 520 | 112 | 728                | 4 150          | 72                 | 90                  | 500             | 700            | 73   | <b>51276 F</b>   |
| <b>400</b>           | 480 | 65  | 403                | 2 280          | 40,5               | 27                  | 700             | 1 000          | 24   | <b>51180 F</b>   |
| <b>420</b>           | 500 | 65  | 410                | 2 400          | 41,5               | 30                  | 700             | 1 000          | 25,5 | <b>51184 F</b>   |
| <b>440</b>           | 540 | 80  | 527                | 3 250          | 55                 | 55                  | 600             | 850            | 42   | <b>51188 F</b>   |
| <b>460</b>           | 560 | 80  | 527                | 3 250          | 54                 | 55                  | 600             | 800            | 43,5 | <b>51192 F</b>   |
| <b>480</b>           | 580 | 80  | 540                | 3 550          | 56                 | 66                  | 560             | 800            | 45,5 | <b>51196 F</b>   |
| <b>500</b>           | 600 | 80  | 553                | 3 600          | 57                 | 67                  | 560             | 800            | 47   | <b>511/500 F</b> |
| <b>530</b>           | 640 | 85  | 650                | 4 400          | 68                 | 100                 | 530             | 750            | 58,5 | <b>511/530 F</b> |
| <b>560</b>           | 670 | 85  | 650                | 4 650          | 68                 | 110                 | 500             | 700            | 61   | <b>511/560 F</b> |
| <b>600</b>           | 710 | 85  | 663                | 4 800          | 69,5               | 120                 | 500             | 700            | 65   | <b>511/600 F</b> |
| <b>630</b>           | 750 | 95  | 728                | 5 400          | 76,5               | 150                 | 450             | 630            | 84   | <b>511/630 F</b> |
| <b>670</b>           | 800 | 105 | 852                | 6 700          | 91,5               | 230                 | 400             | 560            | 105  | <b>511/670 F</b> |
|                      | 800 | 105 | 852                | 6 700          | 91,5               | 230                 | 400             | 560            | 105  | <b>511/670 M</b> |



| Dimensions |               |               |                        | Abutment and fillet dimensions |                    |                    |
|------------|---------------|---------------|------------------------|--------------------------------|--------------------|--------------------|
| d          | $d_1 \approx$ | $D_1 \approx$ | $r_{1,2} \text{ min.}$ | $d_a \text{ min.}$             | $D_a \text{ max.}$ | $r_a \text{ max.}$ |
| mm         |               |               |                        | mm                             |                    |                    |
| <b>360</b> | 436<br>495    | 364<br>365    | 2<br>4                 | 408<br>443                     | 392<br>417         | 2<br>3             |
| <b>380</b> | 456<br>515    | 384<br>385    | 2<br>4                 | 428<br>463                     | 412<br>437         | 2<br>3             |
| <b>400</b> | 476           | 404           | 2                      | 448                            | 432                | 2                  |
| <b>420</b> | 496           | 424           | 2                      | 468                            | 452                | 2                  |
| <b>440</b> | 536           | 444           | 2,1                    | 499                            | 481                | 2                  |
| <b>460</b> | 556           | 464           | 2,1                    | 519                            | 501                | 2                  |
| <b>480</b> | 576           | 484           | 2,1                    | 539                            | 521                | 2                  |
| <b>500</b> | 596           | 504           | 2,1                    | 559                            | 541                | 2                  |
| <b>530</b> | 636           | 534           | 3                      | 595                            | 575                | 2,5                |
| <b>560</b> | 666           | 564           | 3                      | 625                            | 606                | 2,5                |
| <b>600</b> | 706           | 604           | 3                      | 665                            | 645                | 2,5                |
| <b>630</b> | 746           | 634           | 3                      | 701                            | 679                | 2,5                |
| <b>670</b> | 795<br>795    | 675<br>675    | 4<br>4                 | 747<br>747                     | 723<br>723         | 3<br>3             |

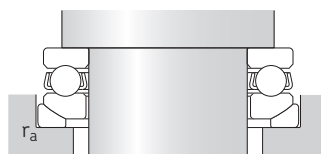
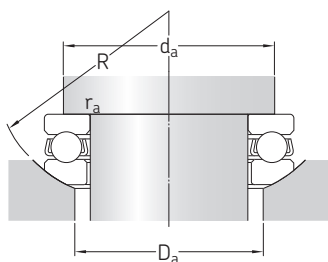
## 5.2 Single direction thrust ball bearings with a sphered housing washer

d 12 – 75 mm



| Principal dimensions |     |                | Basic load ratings |                | Fatigue load limit | Minimum load factor | Speed ratings   |                | Mass             | Designations |             |
|----------------------|-----|----------------|--------------------|----------------|--------------------|---------------------|-----------------|----------------|------------------|--------------|-------------|
| d                    | D   | H <sub>1</sub> | C                  | C <sub>0</sub> | P <sub>u</sub>     | A                   | Reference speed | Limiting speed | Bearing + washer | Bearing      | Seat washer |
| mm                   |     |                | kN                 |                | kN                 | –                   | r/min           |                | kg               | –            |             |
| 12                   | 28  | 13             | 13,3               | 20,8           | 0,765              | 0,0022              | 8 000           | 11 000         | 0,045            | ► 53201      | U 201       |
| 15                   | 32  | 15             | 15,9               | 25             | 0,915              | 0,0038              | 7 000           | 10 000         | 0,063            | ► 53202      | U 202       |
| 17                   | 35  | 15             | 16,3               | 27             | 1                  | 0,0047              | 6 700           | 9 500          | 0,071            | ► 53203      | U 203       |
| 20                   | 40  | 17             | 21,2               | 37,5           | 1,4                | 0,0085              | 5 600           | 8 000          | 0,1              | ► 53204      | U 204       |
| 25                   | 47  | 19             | 26,5               | 50             | 1,86               | 0,015               | 5 000           | 7 000          | 0,15             | ► 53205      | U 205       |
| 30                   | 52  | 20             | 25,1               | 51             | 1,86               | 0,013               | 4 500           | 6 300          | 0,18             | ► 53206      | U 206       |
|                      | 60  | 25             | 35,8               | 65,5           | 2,4                | 0,026               | 3 800           | 5 300          | 0,33             | ► 53306      | U 306       |
| 35                   | 62  | 22             | 35,1               | 73,5           | 2,7                | 0,028               | 4 000           | 5 600          | 0,28             | ► 53207      | U 207       |
|                      | 68  | 28             | 49,4               | 96,5           | 3,55               | 0,048               | 3 200           | 4 500          | 0,46             | ► 53307      | U 307       |
| 40                   | 68  | 23             | 44,2               | 96,5           | 3,6                | 0,058               | 3 600           | 5 300          | 0,35             | ► 53208      | U 208       |
|                      | 78  | 31             | 61,8               | 122            | 4,5                | 0,077               | 2 800           | 4 000          | 0,67             | ► 53308      | U 308       |
|                      | 90  | 42             | 95,6               | 183            | 6,8                | 0,26                | 2 400           | 3 200          | 1,35             | 53408        | U 408       |
| 45                   | 73  | 24             | 39                 | 86,5           | 3,2                | 0,038               | 3 400           | 4 800          | 0,39             | ► 53209      | U 209       |
|                      | 85  | 33             | 76,1               | 153            | 5,6                | 0,12                | 2 600           | 3 800          | 0,83             | ► 53309      | U 309       |
| 50                   | 78  | 26             | 49,4               | 116            | 4,3                | 0,069               | 3 200           | 4 500          | 0,47             | ► 53210      | U 210       |
|                      | 95  | 37             | 81,9               | 170            | 6,3                | 0,19                | 2 400           | 3 400          | 1,2              | ► 53310      | U 310       |
|                      | 110 | 50             | 159                | 340            | 12,5               | 0,6                 | 1 900           | 2 600          | 2,3              | 53410        | U 410       |
| 55                   | 90  | 30             | 58,5               | 134            | 4,9                | 0,11                | 2 800           | 3 800          | 0,75             | ► 53211      | U 211       |
|                      | 105 | 42             | 101                | 224            | 8,3                | 0,26                | 2 200           | 3 000          | 1,7              | ► 53311      | U 311       |
|                      | 120 | 55             | 195                | 400            | 14,6               | 0,79                | 1 700           | 2 400          | 3,1              | 53411        | U 411       |
| 60                   | 95  | 31             | 59,2               | 140            | 5,1                | 0,12                | 2 600           | 3 600          | 0,82             | ► 53212      | U 212       |
|                      | 110 | 42             | 101                | 224            | 8,3                | 0,26                | 2 000           | 3 000          | 1,7              | ► 53312      | U 312       |
|                      | 130 | 58             | 199                | 430            | 16                 | 0,96                | 1 600           | 2 200          | 3,8              | 53412 M      | U 412       |
| 65                   | 100 | 32             | 60,5               | 150            | 5,5                | 0,14                | 2 600           | 3 600          | 0,91             | ► 53213      | U 213       |
|                      | 115 | 43             | 106                | 240            | 8,8                | 0,3                 | 2 000           | 2 800          | 1,9              | ► 53313      | U 313       |
| 70                   | 105 | 32             | 62,4               | 160            | 5,85               | 0,16                | 2 600           | 3 600          | 0,97             | ► 53214      | U 214       |
|                      | 125 | 48             | 135                | 320            | 11,8               | 0,53                | 1 800           | 2 600          | 2,5              | ► 53314      | U 314       |
|                      | 150 | 69             | 234                | 550            | 19,3               | 1,6                 | 1 400           | 2 000          | 6,5              | 53414 M      | U 414       |
| 75                   | 110 | 32             | 63,7               | 170            | 6,2                | 0,17                | 2 400           | 3 400          | 1                | ► 53215      | U 215       |
|                      | 135 | 52             | 163                | 390            | 14                 | 0,79                | 1 700           | 2 400          | 3,2              | ► 53315      | U 315       |
|                      | 160 | 75             | 251                | 610            | 20,8               | 1,9                 | 1 300           | 1 800          | 8,1              | 53415 M      | U 415       |

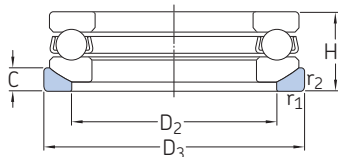
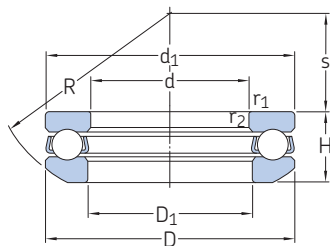
► Popular item



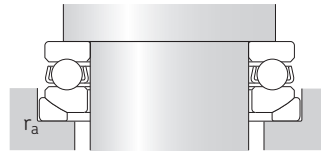
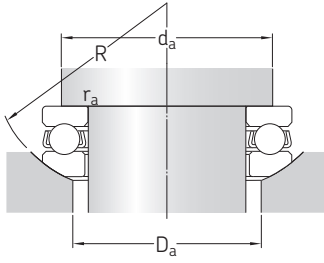
| Dimensions |                     |                     |                |                |      |      |     |      |                          | Abutment and fillet dimensions |                        |                        |
|------------|---------------------|---------------------|----------------|----------------|------|------|-----|------|--------------------------|--------------------------------|------------------------|------------------------|
| d          | d <sub>1</sub><br>≈ | D <sub>1</sub><br>≈ | D <sub>2</sub> | D <sub>3</sub> | H    | C    | R   | s    | r <sub>1,2</sub><br>min. | d <sub>a</sub><br>min.         | D <sub>a</sub><br>max. | r <sub>a</sub><br>max. |
| mm         |                     |                     |                |                |      |      |     |      |                          | mm                             |                        |                        |
| 12         | 28                  | 14                  | 20             | 30             | 11,4 | 3,5  | 25  | 11,5 | 0,6                      | 22                             | 20                     | 0,6                    |
| 15         | 32                  | 17                  | 24             | 35             | 13,3 | 4    | 28  | 12   | 0,6                      | 25                             | 24                     | 0,6                    |
| 17         | 35                  | 19                  | 26             | 38             | 13,2 | 4    | 32  | 16   | 0,6                      | 28                             | 26                     | 0,6                    |
| 20         | 40                  | 22                  | 30             | 42             | 14,7 | 5    | 36  | 18   | 0,6                      | 32                             | 30                     | 0,6                    |
| 25         | 47                  | 27                  | 36             | 50             | 16,7 | 5,5  | 40  | 19   | 0,6                      | 38                             | 36                     | 0,6                    |
| 30         | 52                  | 32                  | 42             | 55             | 17,8 | 5,5  | 45  | 22   | 0,6                      | 43                             | 42                     | 0,6                    |
|            | 60                  | 32                  | 45             | 62             | 22,6 | 7    | 50  | 22   | 1                        | 48                             | 45                     | 1                      |
| 35         | 62                  | 37                  | 48             | 65             | 19,9 | 7    | 50  | 24   | 1                        | 51                             | 48                     | 1                      |
|            | 68                  | 37                  | 52             | 72             | 25,6 | 7,5  | 56  | 24   | 1                        | 55                             | 52                     | 1                      |
| 40         | 68                  | 42                  | 55             | 72             | 20,3 | 7    | 56  | 28,5 | 1                        | 57                             | 55                     | 1                      |
|            | 78                  | 42                  | 60             | 82             | 28,5 | 8,5  | 64  | 28   | 1                        | 63                             | 60                     | 1                      |
|            | 90                  | 42                  | 65             | 95             | 38,2 | 12   | 72  | 26   | 1,1                      | 70                             | 65                     | 1                      |
| 45         | 73                  | 47                  | 60             | 78             | 21,3 | 7,5  | 56  | 26   | 1                        | 62                             | 60                     | 1                      |
|            | 85                  | 47                  | 65             | 90             | 30,1 | 10   | 64  | 25   | 1                        | 69                             | 65                     | 1                      |
| 50         | 78                  | 52                  | 62             | 82             | 23,5 | 7,5  | 64  | 32,5 | 1                        | 67                             | 62                     | 1                      |
|            | 95                  | 52                  | 72             | 100            | 34,3 | 11   | 72  | 28   | 1,1                      | 77                             | 72                     | 1                      |
|            | 110                 | 52                  | 80             | 115            | 45,6 | 14   | 90  | 35   | 1,5                      | 86                             | 80                     | 1,5                    |
| 55         | 90                  | 57                  | 72             | 95             | 27,3 | 9    | 72  | 35   | 1                        | 76                             | 72                     | 1                      |
|            | 105                 | 57                  | 80             | 110            | 39,3 | 11,5 | 80  | 30   | 1,1                      | 85                             | 80                     | 1                      |
|            | 120                 | 57                  | 88             | 125            | 50,5 | 15,5 | 90  | 28   | 1,5                      | 94                             | 88                     | 1,5                    |
| 60         | 95                  | 62                  | 78             | 100            | 28   | 9    | 72  | 32,5 | 1                        | 81                             | 78                     | 1                      |
|            | 110                 | 62                  | 85             | 115            | 38,3 | 11,5 | 90  | 41   | 1,1                      | 90                             | 85                     | 1                      |
|            | 130                 | 62                  | 95             | 135            | 54   | 16   | 100 | 34   | 1,5                      | 102                            | 95                     | 1                      |
| 65         | 100                 | 67                  | 82             | 105            | 28,7 | 9    | 80  | 40   | 1                        | 86                             | 82                     | 1                      |
|            | 115                 | 67                  | 90             | 120            | 39,4 | 12,5 | 90  | 38,5 | 1,1                      | 95                             | 90                     | 1                      |
| 70         | 105                 | 72                  | 88             | 110            | 27   | 9    | 80  | 38   | 1                        | 91                             | 88                     | 1                      |
|            | 125                 | 72                  | 98             | 130            | 44,2 | 13   | 100 | 43   | 1,1                      | 103                            | 98                     | 1                      |
|            | 150                 | 73                  | 110            | 155            | 63,6 | 19,5 | 112 | 34   | 2                        | 118                            | 110                    | 2                      |
| 75         | 110                 | 77                  | 92             | 115            | 28,3 | 9,5  | 90  | 49   | 1                        | 96                             | 92                     | 1                      |
|            | 135                 | 77                  | 105            | 140            | 48,1 | 15   | 100 | 37   | 1,5                      | 111                            | 105                    | 1                      |
|            | 160                 | 78                  | 115            | 165            | 69   | 21   | 125 | 42   | 2                        | 126                            | 115                    | 2                      |

## 5.2 Single direction thrust ball bearings with a sphered housing washer

d 80 – 140 mm



| Principal dimensions |     |                | Basic load ratings |                | Fatigue load limit | Minimum load factor | Speed ratings   |                | Mass             | Designations |             |
|----------------------|-----|----------------|--------------------|----------------|--------------------|---------------------|-----------------|----------------|------------------|--------------|-------------|
| d                    | D   | H <sub>1</sub> | C                  | C <sub>0</sub> | P <sub>u</sub>     | A                   | Reference speed | Limiting speed | Bearing + washer | Bearing      | Seat washer |
| mm                   |     |                | kN                 |                | kN                 | –                   | r/min           |                | kg               | –            |             |
| 80                   | 115 | 33             | 76,1               | 208            | 7,65               | 0,22                | 2 400           | 3 200          | 1,1              | ► 53216      | U 216       |
|                      | 140 | 52             | 159                | 390            | 13,7               | 0,79                | 1 600           | 2 200          | 3,2              | ► 53316      | U 316       |
| 85                   | 125 | 37             | 97,5               | 275            | 9                  | 0,39                | 2 000           | 3 000          | 1,5              | ► 53217      | U 217       |
|                      | 150 | 58             | 174                | 405            | 14                 | 1,1                 | 1 500           | 2 000          | 4,35             | ► 53317      | U 317       |
| 90                   | 135 | 42             | 112                | 290            | 10,4               | 0,55                | 1 900           | 2 600          | 2,1              | ► 53218      | U 218       |
|                      | 155 | 59             | 182                | 440            | 14,6               | 1,3                 | 1 400           | 2 000          | 4,7              | ► 53318      | U 318       |
|                      | 190 | 88             | 307                | 815            | 25,5               | 3,5                 | 1 100           | 1 500          | 13               | 53418 M      | U 418       |
| 100                  | 150 | 45             | 119                | 325            | 10,8               | 0,62                | 1 700           | 2 400          | 2,7              | ► 53220      | U 220       |
|                      | 170 | 64             | 225                | 570            | 18,3               | 1,9                 | 1 300           | 1 800          | 5,95             | ► 53320      | U 320       |
|                      | 210 | 98             | 371                | 1 060          | 31,5               | 5,8                 | 950             | 1 300          | 18               | ► 53420 M    | U 420       |
| 110                  | 160 | 45             | 125                | 365            | 11,6               | 0,79                | 1 700           | 2 400          | 2,9              | ► 53222      | U 222       |
|                      | 190 | 72             | 281                | 815            | 24,5               | 3,2                 | 1 100           | 1 600          | 9,1              | ► 53322 M    | U 322       |
| 120                  | 170 | 46             | 127                | 390            | 11,8               | 1                   | 1 500           | 2 200          | 3,2              | ► 53224      | U 224       |
|                      | 210 | 80             | 325                | 980            | 28,5               | 5                   | 1 000           | 1 400          | 12,5             | ► 53324 M    | U 324       |
| 130                  | 190 | 53             | 186                | 585            | 17                 | 1,8                 | 1 300           | 1 800          | 4,85             | ► 53226      | U 226       |
| 140                  | 200 | 55             | 190                | 620            | 17,6               | 2                   | 1 300           | 1 800          | 5,45             | ► 53228      | U 228       |



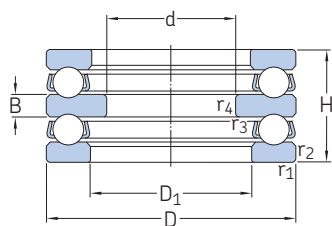
## Dimensions

## Abutment and fillet dimensions

| d          | d <sub>1</sub><br>≈ | D <sub>1</sub><br>≈ | D <sub>2</sub> | D <sub>3</sub> | H    | C    | R   | s  | r <sub>1,2</sub><br>min. | d <sub>a</sub><br>min. | D <sub>a</sub><br>max. | r <sub>a</sub><br>max. |
|------------|---------------------|---------------------|----------------|----------------|------|------|-----|----|--------------------------|------------------------|------------------------|------------------------|
| mm         |                     |                     |                |                |      |      |     |    |                          | mm                     |                        |                        |
| <b>80</b>  | 115                 | 82                  | 98             | 120            | 29,5 | 10   | 90  | 46 | 1                        | 101                    | 98                     | 1                      |
|            | 140                 | 82                  | 110            | 145            | 47,6 | 15   | 112 | 50 | 1,5                      | 116                    | 110                    | 1                      |
| <b>85</b>  | 125                 | 88                  | 105            | 130            | 33,1 | 11   | 100 | 52 | 1                        | 109                    | 105                    | 1                      |
|            | 150                 | 88                  | 115            | 155            | 53,1 | 17,5 | 112 | 43 | 1,5                      | 124                    | 115                    | 1                      |
| <b>90</b>  | 135                 | 93                  | 110            | 140            | 38,5 | 13,5 | 100 | 45 | 1,1                      | 117                    | 110                    | 1                      |
|            | 155                 | 93                  | 120            | 160            | 54,6 | 18   | 112 | 40 | 1,5                      | 129                    | 120                    | 1                      |
|            | 187                 | 93                  | 140            | 195            | 81,2 | 25,5 | 140 | 40 | 2,1                      | 133                    | 140                    | 2                      |
| <b>100</b> | 150                 | 103                 | 125            | 155            | 40,9 | 14   | 112 | 52 | 1,1                      | 130                    | 125                    | 1                      |
|            | 170                 | 103                 | 135            | 175            | 59,2 | 18   | 125 | 46 | 1,5                      | 142                    | 135                    | 1                      |
|            | 205                 | 103                 | 155            | 220            | 90   | 27   | 160 | 50 | 3                        | 165                    | 155                    | 2                      |
| <b>110</b> | 160                 | 113                 | 135            | 165            | 40,2 | 14   | 125 | 65 | 1,1                      | 140                    | 135                    | 1                      |
|            | 187                 | 113                 | 150            | 195            | 67,2 | 20   | 140 | 51 | 2                        | 140                    | 150                    | 1                      |
| <b>120</b> | 170                 | 123                 | 145            | 175            | 40,8 | 15   | 125 | 61 | 1,1                      | 150                    | 145                    | 1                      |
|            | 205                 | 123                 | 165            | 220            | 74,1 | 22   | 160 | 63 | 2,1                      | 173                    | 165                    | 1                      |
| <b>130</b> | 187                 | 133                 | 160            | 195            | 47,9 | 17   | 140 | 67 | 1,5                      | 166                    | 160                    | 1                      |
| <b>140</b> | 197                 | 143                 | 170            | 210            | 48,6 | 17   | 160 | 87 | 1,5                      | 176                    | 170                    | 1                      |

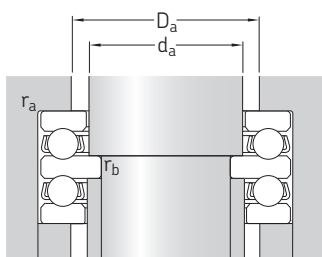
### 5.3 Double direction thrust ball bearings

d 10 – 65 mm



| Principal dimensions |     |    | Basic load ratings |                | Fatigue load limit | Minimum load factor | Speed ratings   |                | Mass  | Designation |
|----------------------|-----|----|--------------------|----------------|--------------------|---------------------|-----------------|----------------|-------|-------------|
| d                    | D   | H  | C                  | C <sub>0</sub> | P <sub>u</sub>     | A                   | Reference speed | Limiting speed |       |             |
| mm                   |     |    | kN                 |                | kN                 | –                   | r/min           |                | kg    | –           |
| <b>10</b>            | 32  | 22 | 15,9               | 25             | 0,915              | 0,0038              | 5 300           | 7 500          | 0,081 | ► 52202     |
| <b>15</b>            | 40  | 26 | 21,2               | 37,5           | 1,4                | 0,0085              | 4 300           | 6 000          | 0,15  | ► 52204     |
| <b>20</b>            | 47  | 28 | 26,5               | 50             | 1,86               | 0,015               | 3 800           | 5 300          | 0,22  | ► 52205     |
|                      | 52  | 34 | 34,5               | 60             | 2,24               | 0,018               | 3 200           | 4 500          | 0,33  | ► 52305     |
|                      | 70  | 52 | 70,2               | 122            | 4,5                | 0,097               | 2 200           | 3 200          | 1     | 52406       |
| <b>25</b>            | 52  | 29 | 25,1               | 51             | 1,86               | 0,013               | 3 600           | 5 000          | 0,25  | ► 52206     |
|                      | 60  | 38 | 35,8               | 65,5           | 2,4                | 0,026               | 2 800           | 4 000          | 0,47  | ► 52306     |
|                      | 80  | 59 | 76,1               | 137            | 5,1                | 0,15                | 2 000           | 2 800          | 1,45  | 52407       |
| <b>30</b>            | 62  | 34 | 35,1               | 73,5           | 2,7                | 0,028               | 3 000           | 4 300          | 0,41  | ► 52207     |
|                      | 68  | 36 | 44,2               | 96,5           | 3,6                | 0,058               | 2 800           | 3 800          | 0,55  | ► 52208     |
|                      | 68  | 44 | 49,4               | 96,5           | 3,55               | 0,048               | 2 400           | 3 400          | 0,68  | ► 52307     |
|                      | 78  | 49 | 61,8               | 122            | 4,5                | 0,077               | 2 200           | 3 000          | 1,05  | ► 52308     |
|                      | 90  | 65 | 95,6               | 183            | 6,8                | 0,26                | 1 800           | 2 400          | 2,05  | 52408       |
| <b>35</b>            | 73  | 37 | 39                 | 86,5           | 3,2                | 0,038               | 2 600           | 3 600          | 0,6   | ► 52209     |
|                      | 85  | 52 | 76,1               | 153            | 5,6                | 0,12                | 2 000           | 2 800          | 1,25  | ► 52309     |
|                      | 100 | 72 | 124                | 240            | 9                  | 0,37                | 1 600           | 2 200          | 2,7   | 52409       |
| <b>40</b>            | 78  | 39 | 49,4               | 116            | 4,3                | 0,069               | 2 400           | 3 400          | 0,71  | ► 52210     |
|                      | 95  | 58 | 81,9               | 170            | 6,3                | 0,19                | 1 800           | 2 600          | 1,75  | ► 52310     |
| <b>45</b>            | 90  | 45 | 58,5               | 134            | 4,9                | 0,11                | 2 200           | 3 000          | 1,1   | ► 52211     |
|                      | 105 | 64 | 101                | 224            | 8,3                | 0,26                | 1 600           | 2 200          | 2,4   | ► 52311     |
|                      | 120 | 87 | 195                | 400            | 14,6               | 0,79                | 1 300           | 1 800          | 4,7   | 52411       |
| <b>50</b>            | 95  | 46 | 59,2               | 140            | 5,1                | 0,12                | 2 000           | 2 800          | 1,2   | ► 52212     |
|                      | 110 | 64 | 101                | 224            | 8,3                | 0,26                | 1 600           | 2 200          | 2,55  | ► 52312     |
|                      | 130 | 93 | 199                | 430            | 16                 | 0,96                | 1 200           | 1 700          | 6,35  | 52412 M     |
| <b>55</b>            | 100 | 47 | 60,5               | 150            | 5,5                | 0,14                | 2 000           | 2 800          | 1,35  | ► 52213     |
|                      | 105 | 47 | 62,4               | 160            | 5,85               | 0,16                | 1 900           | 2 600          | 1,5   | ► 52214     |
|                      | 115 | 64 | 106                | 240            | 8,8                | 0,3                 | 1 600           | 2 200          | 2,75  | 52313       |
|                      | 125 | 72 | 135                | 320            | 11,8               | 0,53                | 1 400           | 2 000          | 3,65  | 52314       |
| <b>60</b>            | 110 | 47 | 63,7               | 170            | 6,2                | 0,17                | 1 900           | 2 600          | 1,55  | ► 52215     |
|                      | 135 | 79 | 163                | 390            | 14                 | 0,79                | 1 300           | 1 800          | 4,8   | 52315       |
| <b>65</b>            | 115 | 48 | 76,1               | 208            | 7,65               | 0,22                | 2 400           | 3 400          | 1,7   | ► 52216     |
|                      | 140 | 79 | 159                | 390            | 13,7               | 0,79                | 1 300           | 1 800          | 4,95  | 52316       |

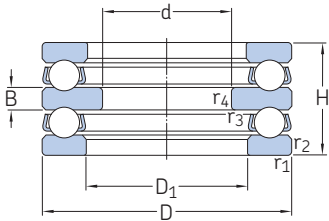
► Popular item



| Dimensions |                     |    |                          |                          | Abutment and fillet dimensions |                        |                        |                        |
|------------|---------------------|----|--------------------------|--------------------------|--------------------------------|------------------------|------------------------|------------------------|
| d          | D <sub>1</sub><br>≈ | B  | r <sub>1,2</sub><br>min. | r <sub>3,4</sub><br>min. | d <sub>a</sub>                 | D <sub>a</sub><br>max. | r <sub>a</sub><br>max. | r <sub>b</sub><br>max. |
| mm         |                     |    |                          |                          | mm                             |                        |                        |                        |
| 10         | 17                  | 5  | 0,6                      | 0,3                      | 15                             | 22                     | 0,6                    | 0,3                    |
| 15         | 22                  | 6  | 0,6                      | 0,3                      | 20                             | 28                     | 0,6                    | 0,3                    |
| 20         | 27                  | 7  | 0,6                      | 0,3                      | 25                             | 34                     | 0,6                    | 0,3                    |
|            | 27                  | 8  | 1                        | 0,3                      | 25                             | 36                     | 1                      | 0,3                    |
|            | 32                  | 12 | 1                        | 0,6                      | 30                             | 46                     | 1                      | 0,6                    |
| 25         | 30                  | 7  | 0,6                      | 0,3                      | 30                             | 39                     | 0,6                    | 0,3                    |
|            | 32                  | 9  | 1                        | 0,3                      | 30                             | 42                     | 1                      | 0,3                    |
|            | 42                  | 14 | 1,1                      | 0,6                      | 35                             | 53                     | 1                      | 0,6                    |
| 30         | 37                  | 8  | 1                        | 0,3                      | 35                             | 46                     | 1                      | 0,3                    |
|            | 42                  | 9  | 1                        | 0,6                      | 40                             | 51                     | 1                      | 0,6                    |
|            | 35                  | 10 | 1                        | 0,3                      | 35                             | 48                     | 1                      | 0,3                    |
| 35         | 40                  | 12 | 1                        | 0,6                      | 40                             | 55                     | 1                      | 0,6                    |
|            | 42                  | 15 | 1,1                      | 0,6                      | 40                             | 60                     | 1                      | 0,6                    |
|            | 47                  | 9  | 1                        | 0,6                      | 45                             | 56                     | 1                      | 0,6                    |
| 40         | 47                  | 12 | 1                        | 0,6                      | 46                             | 61                     | 1                      | 0,6                    |
|            | 47                  | 17 | 1,1                      | 0,6                      | 45                             | 67                     | 1                      | 0,6                    |
|            | 52                  | 9  | 1                        | 0,6                      | 50                             | 61                     | 1                      | 0,6                    |
| 45         | 52                  | 14 | 1,1                      | 0,6                      | 50                             | 68                     | 1                      | 0,6                    |
|            | 57                  | 10 | 1                        | 0,6                      | 55                             | 69                     | 1                      | 0,6                    |
|            | 57                  | 15 | 1,1                      | 0,6                      | 55                             | 75                     | 1                      | 0,6                    |
| 50         | 57                  | 20 | 1,5                      | 0,6                      | 55                             | 81                     | 1,5                    | 0,6                    |
|            | 62                  | 10 | 1                        | 0,6                      | 60                             | 74                     | 1                      | 0,6                    |
|            | 62                  | 15 | 1,1                      | 0,6                      | 60                             | 80                     | 1                      | 0,6                    |
| 55         | 62                  | 21 | 1,5                      | 0,6                      | 60                             | 88                     | 1,5                    | 0,6                    |
|            | 67                  | 10 | 1                        | 0,6                      | 65                             | 79                     | 1                      | 0,6                    |
|            | 72                  | 10 | 1                        | 1                        | 70                             | 84                     | 1                      | 1                      |
| 60         | 67                  | 15 | 1,1                      | 0,6                      | 65                             | 85                     | 1                      | 0,6                    |
|            | 72                  | 16 | 1,1                      | 1                        | 70                             | 92                     | 1                      | 1                      |
|            | 123                 | 24 | 2                        | 1                        | 70                             | 120                    | 1,5                    | 1                      |
| 65         | 77                  | 10 | 1                        | 1                        | 75                             | 89                     | 1                      | 1                      |
|            | 77                  | 18 | 1,5                      | 1                        | 75                             | 99                     | 1,5                    | 1                      |
| 65         | 82                  | 10 | 1                        | 0,6                      | 80                             | 94                     | 1                      | 1                      |
|            | 82                  | 18 | 1,5                      | 1                        | 80                             | 104                    | 1                      | 1                      |

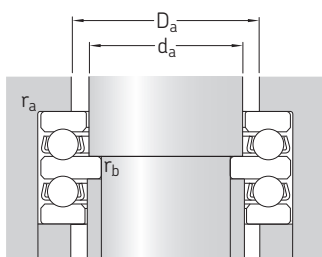
### 5.3 Double direction thrust ball bearings

d 70 – 150 mm



| Principal dimensions |     |    | Basic load ratings |                | Fatigue load limit | Minimum load factor | Speed ratings   |                | Mass | Designation |
|----------------------|-----|----|--------------------|----------------|--------------------|---------------------|-----------------|----------------|------|-------------|
| d                    | D   | H  | C                  | C <sub>0</sub> | P <sub>u</sub>     | A                   | Reference speed | Limiting speed |      |             |
| mm                   |     |    | kN                 |                | kN                 | –                   | r/min           |                | kg   | –           |
| 70                   | 125 | 55 | 97,5               | 275            | 9,8                | 0,39                | 1 600           | 2 200          | 2,4  | ► 52217     |
| 75                   | 135 | 62 | 112                | 290            | 116                | 0,55                | 1 500           | 2 000          | 3,2  | ► 52218     |
| 85                   | 150 | 67 | 119                | 325            | 10,8               | 0,62                | 1 300           | 1 800          | 4,2  | ► 52220     |
|                      | 170 | 97 | 225                | 570            | 18,3               | 1,9                 | 1 000           | 1 400          | 8,95 | ► 52320     |
| 95                   | 160 | 67 | 125                | 365            | 11,6               | 0,79                | 1 300           | 1 800          | 4,65 | 52222       |
| 100                  | 170 | 68 | 127                | 390            | 11,8               | 1                   | 1 200           | 1 700          | 5,25 | 52224       |
| 110                  | 190 | 80 | 182                | 585            | 16,6               | 1,8                 | 1 100           | 1 500          | 8    | ► 52226     |
| 120                  | 200 | 81 | 190                | 620            | 17,6               | 2                   | 1 000           | 1 400          | 8,65 | 52228       |
| 130                  | 215 | 89 | 238                | 800            | 22                 | 3,3                 | 950             | 1 300          | 11,5 | 52230 M     |
| 140                  | 225 | 90 | 238                | 830            | 22,4               | 3,8                 | 900             | 1 300          | 12   | ► 52232 M   |
| 150                  | 240 | 97 | 270                | 930            | 24                 | 5,4                 | 850             | 1 200          | 15   | ► 52234 M   |
|                      | 250 | 98 | 302                | 1 120          | 28,5               | 6,1                 | 800             | 1 100          | 16   | 52236 M     |

► Popular item



| Dimensions |                     |    |                          |                          | Abutment and fillet dimensions |                        |                        |                        |
|------------|---------------------|----|--------------------------|--------------------------|--------------------------------|------------------------|------------------------|------------------------|
| d          | D <sub>1</sub><br>≈ | B  | r <sub>1,2</sub><br>min. | r <sub>3,4</sub><br>min. | d <sub>a</sub>                 | D <sub>a</sub><br>max. | r <sub>a</sub><br>max. | r <sub>b</sub><br>max. |
| mm         |                     |    |                          |                          | mm                             |                        |                        |                        |
| 70         | 88                  | 12 | 1                        | 1                        | 85                             | 101                    | 1                      | 1                      |
| 75         | 93                  | 14 | 1,1                      | 1                        | 90                             | 108                    | 1                      | 1                      |
| 85         | 103                 | 15 | 1,1                      | 1                        | 100                            | 120                    | 1                      | 1                      |
|            | 103                 | 21 | 1,5                      | 1                        | 100                            | 128                    | 1                      | 1                      |
| 95         | 113                 | 15 | 1,1                      | 1                        | 110                            | 130                    | 1                      | 1                      |
| 100        | 123                 | 15 | 1,1                      | 1,1                      | 120                            | 140                    | 1                      | 1                      |
| 110        | 133                 | 18 | 1,5                      | 1,1                      | 130                            | 154                    | 1,5                    | 1                      |
| 120        | 143                 | 18 | 1,5                      | 1,1                      | 140                            | 164                    | 1,5                    | 1                      |
| 130        | 153                 | 20 | 1,5                      | 1,1                      | 150                            | 176                    | 1,5                    | 1                      |
| 140        | 163                 | 20 | 1,5                      | 1,1                      | 160                            | 186                    | 1,5                    | 1                      |
| 150        | 173                 | 21 | 1,5                      | 1,1                      | 170                            | 198                    | 1,5                    | 1                      |
|            | 183                 | 21 | 1,5                      | 2                        | 180                            | 208                    | 1,5                    | 2                      |