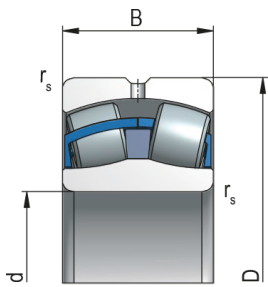
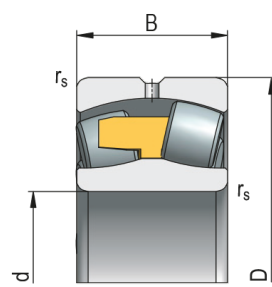


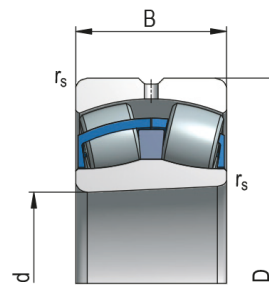
# Double row spherical roller bearings with cylindrical and tapered bore



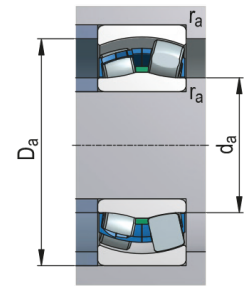
EW33J



W33M



EKW33J



|  |             |
|--|-------------|
| Bearing Designation with Cylindrical Bore    | 22209EW33J  |
| Bearing Designation with Tapered Bore (1:12) | 22209EKW33J |

## Dimensions (mm)

|                    |     |
|--------------------|-----|
| d                  | 45  |
| D                  | 85  |
| B                  | 23  |
| r <sub>s</sub> min | 1,1 |

## Abutment and Fillet Dimensions (mm)

|                    |    |
|--------------------|----|
| d <sub>a</sub> min | 52 |
| D <sub>a</sub> max | 78 |
| r <sub>a</sub> max | 1  |

## Basic Load Rating (kN)

|                |        |
|----------------|--------|
| C              | 92,44  |
| C <sup>0</sup> | 107,45 |

## Limiting Speed for Lubrication (min<sup>-1</sup>)

|        |      |
|--------|------|
| Grease | 5300 |
| Oil    | 6700 |

|                 |       |
|-----------------|-------|
| Weight [kg]     | 0,570 |
| Weight - K [kg] | 0,560 |

## Corresponding

|                   |       |
|-------------------|-------|
| Adapter Sleeve    | H309  |
| Withdrawal Sleeve | AH309 |
| Withdrawal Nut    | KM10  |

## Coefficients

|                |      |
|----------------|------|
| e              | 0,26 |
| Y <sub>1</sub> | 2,6  |
| Y <sub>2</sub> | 3,9  |
| Y <sub>3</sub> | 2,6  |

## Tolerance Class

| Tolerance Class | Inner Ring       |     |                 |     |       |           |          |               |      |          |
|-----------------|------------------|-----|-----------------|-----|-------|-----------|----------|---------------|------|----------|
|                 | Cylindrical Bore |     |                 |     |       |           |          |               |      |          |
|                 | $\Delta_{dmp}$   |     | $V_{dp}$        |     |       | $V_{dmp}$ | $K_{ia}$ | $\Delta_{BS}$ |      | $V_{BS}$ |
|                 |                  |     | Diameter Series |     |       |           |          |               |      |          |
|                 |                  |     | 7,8,9           | 0,1 | 2,3,4 |           |          |               |      |          |
| max             | min              | max | max             | max | max   | max       | min      | max           |      |          |
| $\mu m$         |                  |     |                 |     |       |           |          |               |      |          |
| P0              | 0                | -12 | 15              | 12  | 9     | 9         | 15       | 0             | -120 | 20       |
| P6              | 0                | -10 | 13              | 10  | 8     | 8         | 10       | 0             | -120 | 20       |

| Tolerance Class | Inner Ring        |   |                                |   |               |                   |   |                                |   |               |     |     |     |     |     |
|-----------------|-------------------|---|--------------------------------|---|---------------|-------------------|---|--------------------------------|---|---------------|-----|-----|-----|-----|-----|
|                 | Tapered Bore 1:12 |   |                                |   |               | Tapered Bore 1:30 |   |                                |   |               |     |     |     |     |     |
|                 | $\Delta_{dmp}$    |   | $\Delta_{d1mp} - \Delta_{dmp}$ |   | $V_{dp}^{1)}$ | $\Delta_{dmp}$    |   | $\Delta_{d1mp} - \Delta_{dmp}$ |   | $V_{dp}^{1)}$ |     |     |     |     |     |
|                 |                   |   |                                |   |               |                   |   |                                |   |               | max | min | max | min | max |
|                 |                   |   |                                |   |               |                   |   |                                |   |               | max | min | max | min | max |
| $\mu m$         |                   |   |                                |   |               |                   |   |                                |   |               |     |     |     |     |     |
| P0 - P6         | 25                | 0 | 25                             | 0 | 15            | -                 | - | -                              | - | -             |     |     |     |     |     |

| Tolerance Class | Outer Ring     |     |                 |     |       |                                      |           |          |   |  |
|-----------------|----------------|-----|-----------------|-----|-------|--------------------------------------|-----------|----------|---|--|
|                 | $\Delta_{Dmp}$ |     | $V_{Dp}$        |     |       | bearings <sup>2)</sup><br>with seals | $V_{Dmp}$ | $K_{ea}$ | $\Delta_{CS}, V_{CS}$   |  |
|                 |                |     | Diameter Series |     |       |                                      |           |          |   |  |
|                 |                |     | 7,8,9           | 0,1 | 2,3,4 |                                      |           |          |   |  |
|                 | max            | min | max             | max | max   | max                                  | max       |          |   |  |
| $\mu m$         |                |     |                 |     |       |                                      |           |          |   |  |
| P0              | 0              | -15 | 19              | 19  | 11    | 26                                   | 11        | 35       | Corresponds to $\Delta_{BS}, V_{BS}$<br>of the same bearing<br>inner ring |  |
| P6              | 0              | -13 | 16              | 16  | 10    | 20                                   | 10        | 18       |   |  |

1) Valid in any bore radial plane

2) P0 - Valid only for bearings in diameter series 2, 3 and 4 \* P6 - Valid only for bearings in diameter series 0, 1, 2, 3 and 4

## Radial Clearance - Cylindrical Bore

| C2      |     | normal |     | C3  |     | C4  |     | C5  |     |
|---------|-----|--------|-----|-----|-----|-----|-----|-----|-----|
| min     | max | min    | max | min | max | min | max | min | max |
| $\mu m$ |     |        |     |     |     |     |     |     |     |
| 20      | 35  | 35     | 55  | 55  | 75  | 75  | 100 | 100 | 125 |

## Radial Clearance - Tapered Bore

| C2      |     | normal |     | C3  |     | C4  |     | C5  |     |
|---------|-----|--------|-----|-----|-----|-----|-----|-----|-----|
| min     | max | min    | max | min | max | min | max | min | max |
| $\mu m$ |     |        |     |     |     |     |     |     |     |
| 30      | 45  | 45     | 60  | 60  | 80  | 80  | 100 | 100 | 130 |

## Tolerance Symbols and Their Meaning

|                 |   |                |   |
|-----------------|---|----------------|---|
| $d$             | nominal bore diameter   | $H_4$          | rated height of spherical-roller bearing  |
| $d_1$           | nominal diameter of larger theoretical tapered bore diameter  | $\Delta_{Bs}$  | inner ring single width deviation   |
| $d_2$           | nominal diameter of the shaft washer of double direction thrust bearings  | $\Delta_{Cs}$  | outer ring single width deviation   |
| $\Delta_{ds}$   | deviation of single bore diameter from nominal  | $\Delta_{Is}$  | bearing single width deviation (total)  |
| $\Delta_{dmp}$  | mean cylindrical bore diameter deviation in single radial plane<br>(for tapered bore $\Delta_{dmp}$ is valid for theoretical bore diameter) | $\Delta_{T1s}$ | cone sub-unit effective width deviation   |
| $\Delta_{d1mp}$ | deviation of mean larger theoretical diameter of tapered bore   | $\Delta_{T2s}$ | cup sub-unit effective width deviation  |
| $\Delta_{d2mp}$ | mean shaft washer bore diameter deviation of double direction thrust bearings in single radial plane  | $\Delta_{Hs}$  | height deviation of single direction axial bearings from nominal value                                  |
| $V_{dp}$        | single bore diameter variation in single radial plane   | $\Delta_{H1s}$ | height deviation of single direction axial ball bearings with sphered housing washer from nominal value |
| $V_{dmp}$       | mean cylindrical bore diameter variation  | $\Delta_{H2s}$ | height deviation of double direction axial bearings from nominal value                                  |
| $V_{d2p}$       | shaft washer bore diameter variation of double direction thrust bearings in single radial plane   | $\Delta_{H3s}$ | height deviation of double direction axial ball bearings with sphered housing washer from nominal value |
| $D$             | nominal outside diameter  | $\Delta_{H4s}$ | height deviation of axial spherical-roller bearing from the rated value                                 |
| $\Delta_{Ds}$   | deviation of single outside diameter from the nominal dimension   | $C$            | outer ring nominal width  |
| $\Delta_{Dmp}$  | mean outside cylindrical surface diameter deviation in single plane   | $V_{Bs}$       | inner ring single width variation   |
| $V_{Dp}$        | single outside cylindrical surface diameter variation in single radial plane  | $V_{Cs}$       | outer ring single width variation   |
| $V_{Dmp}$       | mean outside cylindrical surface diameter variation   | $K^{ia}$       | radial runout of assembled bearing inner ring   |
| $B$             | inner ring nominal width  | $K^{ea}$       | radial runout of assembled bearing outer ring   |
| $T$             | total nominal width of tapered roller bearings  | $S_t^{ea}$     | shaft washer raceway axial runout   |
| $T_1$           | nominal effective width of cup sub-unit   | $S_t^e$        | housing washer raceway axial runout   |
| $T_2$           | nominal effective width of cone sub-unit  | $S_{ia}^e$     | inner ring flat seat face axial runout of assembled bearing   |
| $H$             | rated width of unidirectional axial bearing   | $S_{ea}^e$     | outer ring flat seat face axial runout of assembled bearing   |
| $H_1$           | rated height of unidirectional ball axial bearing including the body ring   | $S_d^{ea}$     | flat seat face axial runout   |
| $H_2$           | rated height of bidirectional axial bearing   | $S_D$          | runout of outside cylindrical surface towards outer ring face   |
| $H_3$           | rated height of bidirectional axial ball bearing including body rings   | $S_s$          | runout of supporting face towards seat face for single row tapered roller bearings                      |