

Image may differ from product. See technical specification for details.

# S7020 CEGA/HCP4A

**Super-precision, high speed, E design, universally matchable single row angular contact ball bearing with seals**

These super-precision, high-speed, E design, single row angular contact ball bearings, with non-contact seals, accommodate radial and axial loads acting simultaneously, where the axial load acts in one direction only. They are designed for high-speed operation and, compared to SKF B design high-speed bearings, have a slightly higher speed capability and can accommodate heavier loads. Being universally matchable, they can be used together in arrangements to provide effective load sharing, without the use of shims or similar devices.

- Very high running accuracy
- Accomodate very high speeds
- Universally matchable
- Non-contact seals
- Integral sealing prolongs bearing service life

# Overview

## Dimensions

| | |
|---|---|
| Bore diameter | 100 mm |
| Outside diameter | 150 mm |
| Width | 24 mm |
| Contact angle | 15 ° |

## Performance

| | |
|---|---|
| Basic dynamic load rating | 47.5 kN |
| Basic static load rating | 40 kN |
| Note | Refer to catalogue data or contact SKF for the attainable speeds |

## Properties

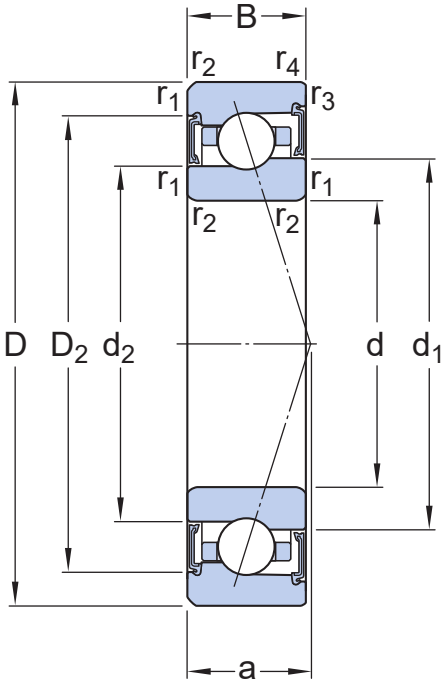
| | |
|---|---|
| Contact type | Normal contact (two-point contact) |
| Number of rows | 1 |
| Ring type | One-piece inner and outer rings |
| Design | High-speed E |
| Universal matching bearing | Yes, back-to-back (<>), face-to-face (><) or tandem (>>) |
| Matched arrangement | No |
| Matched condition (axial clearance/ preload) | Measuring load, class A |
| Tolerance class | P4A |
| Material, bearing | Hybrid (ceramic balls) |
| Coating | Without |
| Sealing | Seal on both sides |
| Sealing type | Non-contact |
| Lubricant | Grease |
| Indicative carbon footprint for new product | 4.2 kg $CO_2e$ |

## Logistics

| | |
|---|---|
| Product net weight | 1.14 kg |
| eClass code | 23-05-08-03 |
| UNSPSC code | 31171531 |

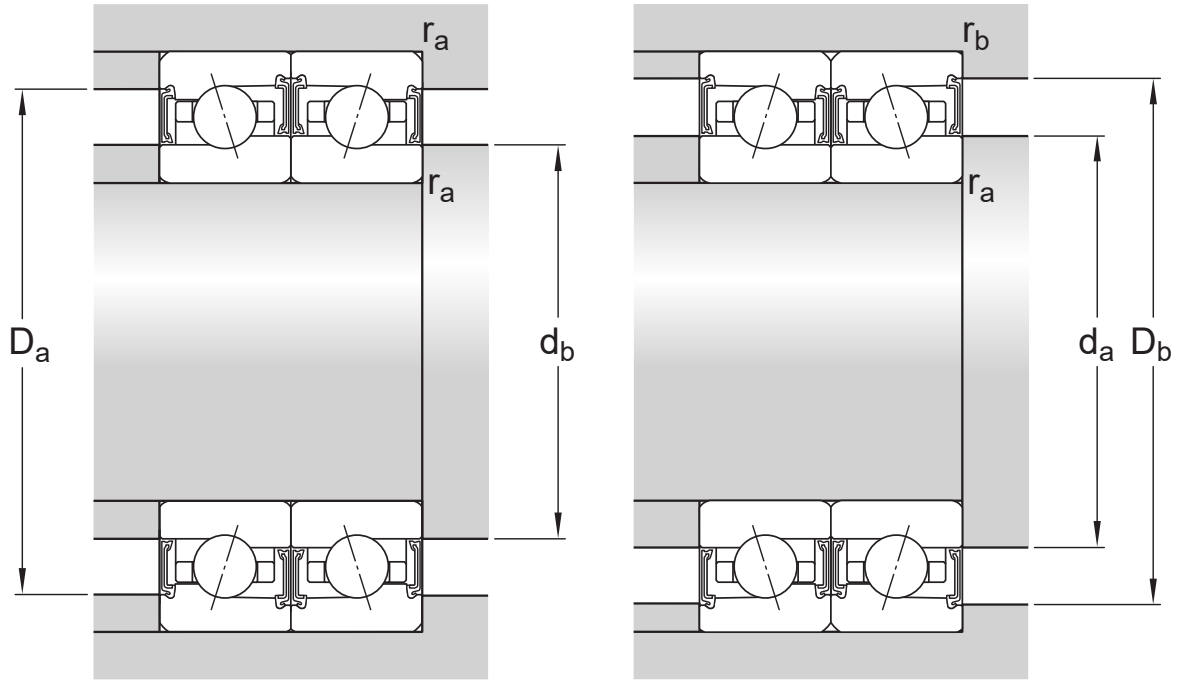
# Technical specification

| | |
|---|---|
| Universal matching bearing(s) | Yes, back-to-back (<>), face-to-face (><) or tandem (>>) |




## Dimensions

| | | |
|---|---|---|
| d | 100 mm | Bore diameter |
| D | 150 mm | Outside diameter |
| B | 24 mm | Width |
| $d_1$ | 117.38 mm | Shoulder diameter of inner ring (large side face) |
| $d_2$ | 114.2 mm | Shoulder diameter of inner ring (small side face) |
| $D_2$ | 136 mm | Recess diameter of outer ring (large side face) |
| $r_{1,2}$ | min. 1.5 mm | Chamfer dimension |
| $r_{3,4}$ | min. 1 mm | Chamfer dimension |
| a | 28.9 mm | Distance from side face to pressure point |




## Abutment dimensions

| | | |
|---|---|---|
| $d_a$ | min. 107 mm | Diameter of shaft abutment |
| $d_a$ | max. 116.7 mm | Diameter of shaft abutment |
| $d_b$ | min. 107 mm | Diameter of shaft abutment |
| $d_b$ | max. 113.5 mm | Diameter of shaft abutment |
| $D_a$ | max. 143 mm | Diameter of housing abutment |
| $D_b$ | max. 144.4 mm | Diameter of housing abutment |
| $r_a$ | max. 1.5 mm | Radius of fillet |
| $r_b$ | max. 1 mm | Radius of fillet |

## Calculation data

| | | |
|---|---|---|
| Basic dynamic load rating | C | 47.5 kN |
| Basic static load rating | $C_0$ | 40 kN |
| Fatigue load limit | $P_u$ | 1.1 kN |
| Attainable speed for grease lubrication | | To be calculated: Single bearing (14500) x speed reduction factor (see table below) |
| Attainable speed for oil-air lubrication | | To be calculated: Single bearing () x speed reduction factor (see table below) |
| Contact angle | α | 15 ° |
| Ball diameter | $D_w$ | 12.7 mm |
| Number of rows | i | 1 |
| Number of balls (per bearing) | z | 27 |

### PRELOAD AND STIFFNESS (BACK-TO-BACK, FACE-TO-FACE)

| | | |
|---|---|---|
| Preload class | | A |
| Preload when unmounted | G | 240 N |
| Axial stiffness | | 97 N/µm |

### CORRECTION FACTORS FOR PRELOAD CALCULATION

| | | |
|---|---|---|
| Correction factor dependent on bearing series and size | f | 1.1 |
| Correction factor dependent on contact angle | $f_1$ | 1 |
| Correction factor, preload class A | $f_{2A}$ | 1 |
| Correction factor for hybrid bearings | $f_{HC}$ | 1 |

### FACTORS FOR EQUIVALENT BEARING LOAD CALCULATION

| | | |
|---|---|---|
| Calculation factor for equivalent loads | $f_0$ | 9.5 |
| Additional factors for equivalent loads | | Refer to Notes 1 and 2 below |
| Axial load factor (back-to-back, face-to-face) | $Y_0$ | 0.92 |
| Radial load factor (back-to-back, face-to-face) | $X_1$ | 1 |
| Radial load factor (back-to-back, face-to-face) | $X_2$ | 0.72 |
| Radial load factor (back-to-back, face-to-face) | $X_0$ | 1 |

## Tolerances and clearances

### GENERAL BEARING SPECIFICATIONS

- Tolerances: P4A, P4B, P4, PA9A, P2

### PRINCIPLES OF BEARING SELECTION AND APPLICATION

- Chamfer dimensions
- Seat tolerances for standard conditions: shafts, housings
- Values for ISO tolerance classes: shafts, housings
- Speed dependent initial grease fill → Initial grease fill
- Clamping and fitting forces: D design, E design, B design
- Designation suffixes H, H1, L and L1 identify variants for direct oil-air lubrication.

### FACTORS FOR EQUIVALENT BEARING LOAD CALCULATION

- Note 1: Single bearings and bearings arranged in tandem
- Note 2: Bearings paired back-to-back or face-to-face

## SPEED REDUCTION FACTORS FOR SPEED CALCULATION

| Number of bearings | Arrangement | Designation suffix | Speed reduction factors | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | for matched sets | for bearings in the series | | | | | | | | | | | | | | |
| | | | 718 .. D, 719 .. E, and 70 .. E | | | | | | S70 .. W | 719 .. A and 70 .. A | 719 .. B and 70 .. B | | | 719 .. D, 70 .. D and 72 .. D | | | |
| | | | for preload class | | | | | | | | for preload class | | | for preload class | | | |
| | | | A | L | B | M | C | F | – | – | A | B | C | A | B | C | D |
| 2 | Back-to-back | DB | 0,8 | – | 0,65 | – | 0,4 | – | 0,81 | 0,8 | 0,83 | 0,78 | 0,58 | 0,81 | 0,75 | 0,65 | 0,4 |
| | Face-to-face | DF | 0,77 | – | 0,61 | – | 0,36 | – | – | – | 0,8 | 0,74 | 0,54 | 0,77 | 0,72 | 0,61 | 0,36 |
| 3 | Back-to-back and tandem | TBT | 0,69 | 0,72 | 0,49 | 0,58 | 0,25 | 0,36 | – | – | 0,72 | 0,66 | 0,4 | 0,7 | 0,63 | 0,49 | 0,25 |
| | Face-to-face and tandem | TFT | 0,63 | 0,66 | 0,42 | 0,49 | 0,17 | 0,24 | – | – | 0,64 | 0,56 | 0,3 | 0,63 | 0,56 | 0,42 | 0,17 |
| 4 | Tandem back-to-back | QBC | 0,64 | – | 0,53 | – | 0,32 | – | – | – | 0,67 | 0,64 | 0,48 | 0,64 | 0,6 | 0,53 | 0,32 |
| | Tandem face-to-face | QFC | 0,62 | – | 0,48 | – | 0,27 | – | – | – | 0,64 | 0,6 | 0,41 | 0,62 | 0,58 | 0,48 | 0,27 |

For spring-loaded tandem sets, designation suffix DT, a speed reduction factor of 0,9 should be applied.

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