



7011 CD/P4A Super-precision, high-capacity, single row angular contact ball bearing

Super-precision, high-capacity, single row angular contact ball bearing

These super-precision, high-capacity, single row angular contact ball bearings, with 15° contact angle, accommodate radial and axial loads acting simultaneously, where the axial load acts in one direction only. They are designed to accommodate heavy loads at relatively high speeds under low to moderate operating temperatures.

- Very high running accuracy
- Very high load carrying capacity
- Relatively high speed and stiffness

Overview

Dimensions

Bore diameter	55 mm
Outside diameter	90 mm
Width	18 mm
Contact angle	15 °

Performance

Basic dynamic load rating	39.7 kN
Basic static load rating	32.5 kN
Attainable speed for grease lubrication	15 000 r/min
Attainable speed for oil-air lubrication	24 000 r/min

Properties

Contact type	Normal contact (two-point contact)
Number of rows	1
Ring type	One-piece inner and outer rings
Design	High-capacity D
Universal matching bearing	No
Matched arrangement	No
Matched condition (axial clearance/ preload)	Not applicable
Tolerance class	P4A
Material, bearing	Bearing steel

Coating	Without
Sealing	Without
Lubricant	None

Technical Specification

Universal matching bearing(s)

No



Dimensions

d	55 mm	Bore diameter
D	90 mm	Outside diameter
B	18 mm	Width
d ₁	65.8 mm	Shoulder diameter of inner ring (large side face)
d ₂	65.8 mm	Shoulder diameter of inner ring (small side face)
D ₁	79.2 mm	Shoulder diameter of outer ring (large side face)
r _{1,2}	min. 1.1 mm	Chamfer dimension
r _{3,4}	min. 0.6 mm	Chamfer dimension
a	18.8 mm	Distance from side face to pressure point

Abutment dimensions

d _a	min. 61 mm	Diameter of shaft abutment
d _b	min. 61 mm	Diameter of shaft abutment
D _a	max. 84 mm	Diameter of housing abutment
D _b	max. 86.8 mm	Diameter of housing abutment
r _a	max. 1 mm	Radius of fillet
r _b	max. 0.6 mm	Radius of fillet
d _n	68.1 mm	Position of oil nozzle





Calculation data

Basic dynamic load rating	C	39.7 kN
Basic static load rating	C_0	32.5 kN
Fatigue load limit	P_u	1.37 kN
Attainable speed for grease lubrication		15 000 r/min
Attainable speed for oil-air lubrication		24 000 r/min
Contact angle	α	15 °
Ball diameter	D_w	11.112 mm
Number of rows	i	1
Number of balls (per bearing)	z	18
Reference grease quantity (per bearing)	G_{ref}	5.1 cm ³

Preload and stiffness (back-to-back, face-to-face)

Preload, class A	G_A	150 N
Axial stiffness for preload A (sets of two brgs back to back or face to face)		67 N/ μ m
Preload, class B	G_B	300 N
Axial stiffness for preload B (sets of two brgs back-to-back or face-to-face)		91 N/ μ m
Preload, class C	G_C	600 N
Axial stiffness for preload C (sets of two brgs back-to-back or face-to-face)		128 N/ μ m
Preload, class D	G_D	1 200 N
Axial stiffness for preload D (sets of two brgs back-to-back or face-to-face)		186 N/ μ m

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, preload class B	f_{2B}	1.02
Correction factor, preload class C	f_{2C}	1.05
Correction factor, preload class D	f_{2D}	1.09
Correction factor for hybrid bearings	f_{HC}	1

Factors for equivalent bearing load calculation

Calculation factor for equivalent loads	f_0	15.1
Additional factors for equivalent loads		Refer to Notes 1 and 2 below

Mass

Mass		0.38 kg
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