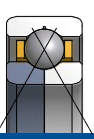




# SINGLE ROW FOUR-POINT ANGULAR CONTACT BALL BEARINGS



## SINGLE ROW FOUR-POINT ANGULAR CONTACT BALL BEARINGS

Single row four-point angular contact ball bearings are single row angular contact bearings. The raceways of these bearings are designed to carry axial load in both directions.

In the axial direction arrangement, single row four-point angular contact ball bearings require less space than double row angular contact ball bearings. The contact angle is 35°. The two-part inner ring allows the bearing to be filled with more balls, which creates a design with higher load rating. Whereas these bearings are separable, the outer ring with a filled cage can be mounted in the arrangement separately.

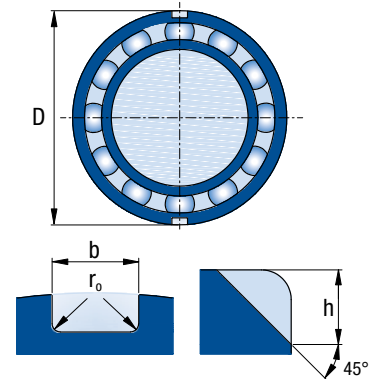


### DESIGN SPECIFICATION

#### SNAP RING GROOVES

Single row four-point angular contact ball bearings are designed to carry mainly axial loads and their clearance in the housing is similar to the clearance of axial bearings. Bearings with outer diameter higher than 160 mm are made with two snap ring grooves in the outer ring (type N2) to enable simple fixing, which stops the outer ring from twisting. For the groove dimensions see the following table.

Outer Diameter D (mm)		Dimensions (mm)					
over	incl.	LINE QJ 2			LINE QJ 3		
		b	h	r <sub>o</sub>	b	h	r <sub>o</sub>
—	170	6,5	8,1	1	8,5	10,1	2
170	210	8,5	10,1	2	10,5	11,7	2
210	270	10,5	11,7	2	10,5	11,7	2



#### CAGE

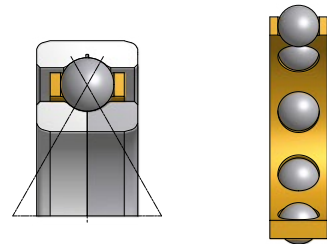
Single row four-point angular contact ball bearings are mainly equipped with a massive brass cage. They can also be equipped with a glass fiber reinforced polyamide cage.

#### DIMENSIONS

The dimensions of single row four-point angular contact ball bearings are in the table part and they are in accordance with the international standards ISO 15.

#### MISALIGNMENT

Single row four-point angular contact ball bearings can accommodate the misalignment of the rings by aligning the outer ring towards the inner ring at a limited degree. Factors influencing the alignment of these bearings are the same as in the case of single row deep groove ball bearings. Any misalignment produces increased vibration level whilst the bearing is in operation. If the single row four-point angular contact ball bearings are combined in the arrangement with other radial bearings so they shall operate as axial bearings, there must be a radial clearance in the body. This way, the external ring may align modifications caused by thermal expansiveness.



#### TOLERANCES

The limit values of deviations in tolerances and the operation of these bearing types are specified in tables 10a to 13b of this catalogue.

#### AXIAL CLEARANCE

Due to the special design of these bearings there is only axial clearance. The ranges of the axial clearances (C2 to C4) of this type of bearings are given in table 19b of this catalogue.

#### EQUIVALENT DYNAMIC LOAD

$$P = F_r + 0,66 \cdot F_a \quad (\text{kN}) \text{ for } F_a/F_r \leq 0,95$$

$$P = 0,6 \cdot F_r + 1,07 \cdot F_a \quad (\text{kN}) \text{ for } F_a/F_r > 0,95$$

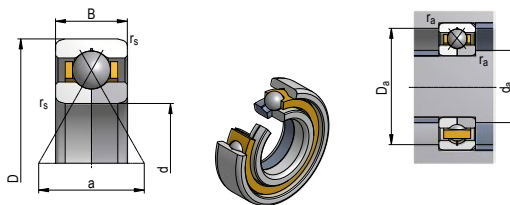
To prevent unacceptable friction, the axial load applied on the single row four-point angular contact ball bearing should ensure a contact of every ball with the raceways in two points only.

This requirement is met providing that at  $F_a \geq 1,2 \cdot F_r$

#### EQUIVALENT STATIC LOAD

$$P_o = F_r + 0,58 \cdot F_a$$

# SINGLE ROW FOUR-POINT ANGULAR CONTACT BALL BEARINGS



Dimensions mm					Basic Load Rating kN		Limiting Speed for Lubrication min <sup>-1</sup>		Bearing Designation	Abutment and Fillet Dimensions mm			Weight kg
d	D	B	r <sub>s</sub> min	-a	C	C <sub>0</sub>				d <sub>a</sub> max	D <sub>a</sub> max	r <sub>a</sub> max	
17	40	12	0,6	20	15,90	10,60	14 000	19 000	QJ203MA	22	35	0,6	0,082
17	47	14	1	22	23,40	15,00	12 000	17 000	QJ303MA	23	41	1	0,140
20	52	15	1,1	25	29,60	20,00	10 000	15 000	QJ304MA	27	45	1	0,180
25	52	15	1	27	25,10	20,00	9 500	14 000	QJ205MA	31	46	1	0,160
30	62	16	1	32	35,10	28,50	8 500	12 000	QJ206MA	36	56	1	0,240
30	72	19	1,1	36	46,93	37,05	7 500	10 000	QJ306MA	44,5	58	1	0,420
35	72	17	1,1	37	35,70	30,10	6 500	7 200	QJ207MA	42	65	1	0,350
35	80	21	1,5	40	67,28	50,69	6 000	6 600	QJ307MA	50	65,2	1,5	0,570
40	80	18	1,1	42	36,30	32,00	6 100	6 700	QJ208MA	54	66	1	0,450
40	90	23	1,5	46	72,04	58,20	5 900	6 400	QJ308MA	57,5	73	1,5	0,760
45	85	19	1,1	46	39,20	35,20	6 800	6 600	QJ209MA	58	72	1	0,520
45	100	25	1,5	51	73,10	68,20	5 700	6 300	QJ309MA	64	81	1,5	1,030
50	90	20	1,1	49	49,00	45,00	4 800	5 500	QJ210MA	63	77	1	0,590
50	110	27	2	56	109,62	92,21	4 600	6 200	QJ310MA	70	90	1,5	1,330
55	100	21	1,5	54	55,30	53,50	4 500	6 000	QJ211MA	64	91	1,5	0,770
55	120	29	2	61	115,50	102,20	3 800	5 100	QJ311MA	77	98	2	1,750
60	110	22	1,5	60	64,60	60,50	4 100	5 300	QJ212MA	77,5	93	1,5	0,990
60	130	31	2,1	67	153,40	137,58	3 600	4 700	QJ312MA	84,5	107	2	2,150
65	120	23	1,5	65	72,80	68,80	3 600	4 700	QJ213MA	83,5	101	1,5	1,200
65	140	33	2,1	72	172,00	147,00	3 400	4 500	QJ313MA	77	128	2	2,700
70	125	24	1,5	38	79,80	75,80	3 600	4 700	QJ214MA	89	106	1,5	1,300
70	150	35	2,1	77	183,00	176,00	3 100	4 100	QJ314MA	97	122,5	2	3,150
75	130	25	1,5	72	117,00	122,00	4 000	5 300	QJ215MA	84	121	1,5	1,450
75	160	37	2,1	82	199,00	186,00	3 400	4 500	QJ315N2MA	87	148	2	3,900
80	140	26	2	77	138,00	146,00	3 600	4 800	QJ216MA	90	130	2	1,850
80	170	39	2,1	82	216,00	208,00	3 200	4 300	QJ316N2MA	92	158	2	4,600
85	150	28	2	83	148,00	160,00	3 400	4 500	QJ217MA	95	140	2	2,250
85	180	41	3	93	234,00	236,00	3 000	4 000	QJ317N2MA	99	166	2,5	5,450
90	160	30	2	88	174,00	186,00	3 200	4 300	QJ218N2MA	100	150	2	2,750
90	190	43	3	98	265,00	285,00	2 800	3 800	QJ318N2MA	104	176	2,5	6,450
95	170	32	2,1	93	199,00	212,00	3 000	4 000	QJ219N2MA	107	158	2	3,350
95	200	45	3	103	286,00	315,00	2 600	3 600	QJ319N2MA	109	186	2,5	7,450
100	180	34	2,1	98	225,00	240,00	2 800	3 800	QJ220N2MA	112	168	2	4,050
100	215	47	3	110	307,00	340,00	2 400	3 400	QJ320N2MA	114	201	2,5	9,300
110	200	38	2,1	109	265,00	305,00	2 400	3 400	QJ222N2MA	122	188	2	5,600
110	240	50	3	123	364,00	430,00	2 000	3 000	QJ322N2MA	124	226	2,5	12,500
120	215	40	2,1	117	286,00	340,00	2 200	3 200	QJ224N2MA	132	203	2	6,950
120	260	55	3	133	390,00	490,00	1 900	2 800	QJ324N2MA	134	246	2,5	16,000
130	230	40	3	126	296,00	365,00	1 900	2 800	QJ226N2MA	144	216	2,5	7,710
130	280	58	4	144	423,00	560,00	1 800	2 600	QJ326N2MA	148	262	3	19,500
140	250	42	3	137	325,00	440,00	1 800	2 600	QJ228N2MA	154	236	2,5	9,850
140	300	62	4	154	468,00	640,00	1 700	2 400	QJ328N2MA	158	282	3	24,000
150	270	45	3	147	338,00	465,00	1 700	2 400	QJ230N2MA	164	256	2,5	12,500
150	320	65	4	165	542,01	796,28	1 600	2 200	QJ330N2MA	168	302	3	29,000
160	290	48	3	158	390,00	570,00	1 600	2 200	QJ232N2MA	174	276	3	15,500
170	310	52	4	168	397,00	600,00	1 600	2 200	QJ234N2MA	188	292	3	19,500
170	360	72	4	186	618,00	965,00	1 400	1 900	QJ334N2MA	188	342	3	41,500
180	320	52	4	175	436,00	680,00	1 500	2 000	QJ236N2MA	198	302	3	20,500
180	380	75	4	196	637,00	1 020,00	1 300	1 800	QJ336N2MA	198	362	3	47,500
200	360	58	4	196	507,00	850,00	1 300	1 800	QJ240N2MA	218	342	3	28,500
220	400	65	4	217	553,00	980,00	1 100	1 500	QJ244N2MA	238	382	3	39,500