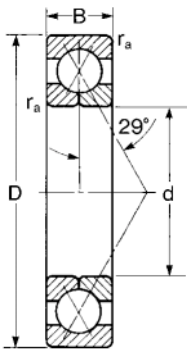


9100-UK and 9200-U Split Ring Angular Contact Bearings

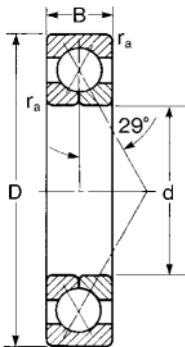
MRC Bearing Services



For duplex sets of 7000 and 9000 series bearings see page 239.

MRC Bearing Number	Bore d		Outside Diameter D		Width B		Fillet Radius ¹⁾ r _a		Basic Radial Load Rating ²⁾				Speed Rating ³⁾	
									Dynamic C _d ⁴⁾		Static C ₀		Grease RPM	Oil RPM
									N	lbf	N	lbf		
9100-UK	10	.3937	26	1.0236	8	.3150	.30	.012	4 620	1 040	2 080	468	30 000	39 000
9101-UK	12	.4724	28	1.1024	8	.3150	.30	.012	5 070	1 140	2 500	562	25 000	32 000
9102-UK	15	.5906	32	1.2598	9	.3543	.30	.012	5 400	1 210	2 900	652	22 000	28 000
9103-UK	17	.6693	35	1.3780	10	.3937	.30	.012	7 610	1 710	4 250	955	19 000	25 000
9104-UK	20	.7874	42	1.6535	12	.4724	.64	.025	9 560	2 150	5 600	1 260	16 000	21 000
9105-UK	25	.9843	47	1.8504	12	.4724	.64	.025	10 600	2 380	6 950	1 560	12 000	16 000
9106-UK	30	1.1811	55	2.1654	13	.5118	1.0	.04	13 800	3 100	9 650	2 170	11 000	14 000
9107-UK	35	1.3780	62	2.4409	14	.5512	1.0	.04	16 800	3 780	12 000	2 700	9 200	12 000
9108-UK	40	1.5748	68	2.6772	15	.5906	1.0	.04	17 200	3 870	13 200	2 970	8 500	11 000
9109-UK	45	1.7717	75	2.9528	16	.6299	1.0	.04	21 200	4 770	17 000	3 820	7 500	9 800
9110-UK	50	1.9685	80	3.1496	16	.6299	1.0	.04	22 100	4 970	18 300	4 110	6 900	9 000
9111-UK	55	2.1654	90	3.5433	18	.7087	1.0	.04	29 600	6 650	25 500	5 730	6 300	8 200
9112-UK	60	2.3622	95	3.7402	18	.7087	1.0	.04	30 200	6 790	27 000	6 070	5 700	7 400
9113-UK	65	2.5591	100	3.9370	18	.7087	1.0	.04	31 200	7 010	29 000	6 520	5 400	7 000
9114-UK	70	2.7559	110	4.3307	20	.7874	1.0	.04	34 500	7 760	35 500	7 980	5 000	6 500
9115-UK	75	2.9528	115	4.5276	20	.7874	1.0	.04	37 700	8 480	37 500	8 430	4 700	6 100
9116-UK	80	3.1496	125	4.9213	22	.8661	1.0	.04	48 800	11 000	49 000	11 000	4 500	5 800
9117-UK	85	3.3465	130	5.1181	22	.8661	1.0	.04	49 400	11 100	52 000	11 700	4 100	5 300
9118-UK	90	3.5433	140	5.5118	24	.9449	1.5	.06	58 500	13 200	61 000	13 700	3 800	4 900
9119-UK	95	3.7402	145	5.7087	24	.9449	1.5	.06	71 500	16 100	71 000	16 000	3 600	4 700
9120-UK	100	3.9370	150	5.9055	24	.9449	1.5	.06	62 400	14 000	68 000	15 300	3 500	4 500
9121-UK	105	4.1339	160	6.2992	26	1.0236	2.0	.08	74 100	16 700	80 000	18 000	3 300	4 300
9122-UK	110	4.3307	170	6.6929	28	1.1024	2.0	.08	87 100	19 600	91 500	20 600	3 200	3 800
9200-U														
9202-U	15	.5906	35	1.3780	11	.4331	.64	.025	8 060	1 810	4 750	1 070	20 000	26 000
9203-U	17	.6693	40	1.5748	12	.4724	.64	.025	9 950	2 240	6 100	1 370	18 000	23 000
9204-U	20	.7874	47	1.8504	14	.5512	1.0	.04	11 900	2 680	7 100	1 600	15 000	19 000
9205-U	25	.9843	52	2.0472	15	.5906	1.0	.04	14 300	3 210	8 800	1 980	12 000	16 000
9206-U	30	1.1811	62	2.4409	16	.6299	1.0	.04	16 800	3 780	11 800	2 550	10 000	13 000
9207-U	35	1.3780	72	2.8346	17	.6693	1.0	.04	23 400	5 260	17 000	3 820	9 200	12 000
9208-U	40	1.5748	80	3.1496	18	.7087	1.0	.04	30 700	6 900	22 800	5 130	7 700	10 000
9209-U	45	1.7717	85	3.3465	19	.7480	1.0	.04	31 900	7 170	25 000	5 620	7 300	9 500
9210-U	50	1.9685	90	3.5433	20	.7874	1.0	.04	33 200	7 460	27 000	6 070	6 400	8 300
9211-U	55	2.1654	100	3.9370	21	.8268	1.5	.06	48 800	11 000	37 500	8 430	6 000	7 800
9212-U	60	2.3622	110	4.3307	22	.8661	1.5	.06	52 700	11 800	44 000	9 890	5 400	7 000
9213-U	65	2.5591	120	4.7244	23	.9055	1.5	.06	63 700	14 300	54 000	12 100	4 900	6 400
9214-U	70	2.7559	125	4.9213	24	.9449	1.5	.06	63 700	14 300	55 000	12 400	4 600	6 000
9215-U	75	2.9528	130	5.1181	25	.9843	1.5	.06	76 100	17 100	65 500	14 700	4 300	5 600
9216-U	80	3.1496	140	5.5118	26	1.0236	1.5	.08	78 000	17 500	71 000	16 000	4 100	5 300
9217-U	85	3.3465	150	5.9055	28	1.1024	2.0	.08	90 400	20 300	85 000	19 100	3 800	4 900
9218-U	90	3.5433	160	6.2992	30	1.1811	2.0	.08	112 000	25 100	98 000	22 000	3 600	4 700
9219-U	95	3.7402	170	6.6929	32	1.2598	2.0	.08	117 000	26 300	108 000	24 300	3 500	4 500
9220-U	100	3.9370	180	7.0866	34	1.3386	2.0	.08	130 000	29 200	122 000	27 400	3 200	4 100
9221-U	105	4.1339	190	7.4803	36	1.4173	2.0	.08	148 000	33 300	137 000	30 800	3 000	3 900
9222-U	110	4.3307	200	7.8740	38	1.4961	2.0	.08	163 000	36 600	156 000	35 100	2 900	3 800

¹⁾ Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear. ²⁾ For thrust rating multiply C by 1.32 and C₀ by 2.94.
³⁾ Listed values are for machined bronze cage, ABEC-1. The values have been determined through historical application and practice. For a more complete explanation, see page 276.
⁴⁾ Rating for one million revolutions or 500 hours at 33 1/3 RPM.



For duplex sets of 7000 and 9000 series bearings see page 239.

MRC Bearing Number	Bore d		Outside Diameter D		Width B		Fillet Radius ¹⁾ r _a		Basic Radial Load Rating ²⁾				Speed Rating ³⁾	
									Dynamic C ⁴⁾		Static C ₀		Grease RPM	Oil RPM
									N	lbf	N	lbf		
9302-U	15	.5906	42	1.6535	13	.5118	1.0	.04	9 950	2 240	6 100	1 370	16 000	21 000
9303-U	17	.6693	47	1.8504	14	.5512	1.0	.04	12 100	2 720	7 500	1 690	15 000	19 000
9304-U	20	.7874	52	2.0472	15	.5906	1.0	.04	18 600	4 180	10 600	2 380	13 000	17 000
9305-U	25	.9843	62	2.4409	17	.6693	1.0	.04	21 200	4 770	13 700	3 080	11 000	14 000
9306-U	30	1.1811	72	2.8346	19	.7480	1.0	.04	28 100	6 320	18 600	4 180	9 200	12 000
9307-U	35	1.3780	80	3.1496	21	.8268	1.5	.06	35 800	8 050	24 000	5 400	8 500	11 000
9308-U	40	1.5748	90	3.5433	23	.9055	1.5	.06	44 200	9 940	31 000	7 000	7 300	9 500
9309-U	45	1.7717	100	3.9370	25	.9843	1.5	.06	52 700	11 800	38 000	8 540	6 400	8 300
9310-U	50	1.9685	110	4.3307	27	1.0630	2.0	.08	68 900	15 500	49 000	11 000	5 800	7 500
9311-U	55	2.1654	120	4.7244	29	1.1417	2.0	.08	80 600	18 100	57 000	12 800	5 100	6 600
9312-U	60	2.3622	130	5.1181	31	1.2205	2.0	.08	92 300	20 700	65 500	14 700	4 900	6 400
9313-U	65	2.5591	140	5.5118	33	1.2992	2.0	.08	97 500	21 900	75 000	16 900	4 600	6 000
9314-U	70	2.7559	150	5.9055	35	1.3780	2.0	.08	111 000	25 000	85 000	19 100	4 100	5 300
9315-U	75	2.9528	160	6.2992	37	1.4567	2.0	.08	130 000	29 200	106 000	23 800	3 900	5 000
9316-U	80	3.1496	170	6.6929	39	1.5354	2.0	.08	143 000	32 100	120 000	27 000	3 600	4 700
9317-U	85	3.3465	180	7.0866	41	1.6142	2.5	.10	153 000	34 400	134 000	30 100	3 500	4 500
9318-U	90	3.5433	190	7.4803	43	1.6929	2.5	.10	168 000	37 800	150 000	33 700	3 200	4 200
9319-U	95	3.7402	200	7.8740	45	1.7717	2.5	.10	178 000	40 000	166 000	37 300	3 100	4 000
9320-U	100	3.9370	215	8.4646	47	1.8504	2.5	.10	190 000	42 700	183 000	41 100	3 000	3 900
9321-U	105	4.1339	225	8.8583	49	1.9291	2.5	.10	203 000	45 600	200 000	45 000	2 900	3 800
9322-U	110	4.3307	240	9.4488	50	1.9685	2.5	.10	229 000	51 500	236 000	53 100	2 700	3 500

1) Fillet radius indicates maximum fillet radius on shaft or in housing which bearing corner will clear.

2) For thrust rating multiply C by 1.32 and C₀ by 2.94.

3) Listed values are for machined bronze cage, ABEC-1.

The values have been determined through historical application and practice. For a more complete explanation, see page 276.

4) Rating for one million revolutions or 500 hours at 33 1/3 RPM.

9000-U Series
Split Inner Ring
29 Degree Angular
Contact Ball Bearings
Single Bearing

Dynamic and static equivalent radial load
and life rating

Dynamic equivalent radial load

$$P = F_R \quad \text{when } F_A/F_R \leq 0.80$$

or

$$P = 0.39 F_R + 0.76 F_A \quad \text{when } F_A/F_R > 0.80$$

P = Dynamic equivalent radial load

F_R = Radial load

F_A = Thrust load

Consult MRC Bearing Services when

$F_R/F_A > 1.0$

Static equivalent radial load

$$P_0 = 0.50 F_R + 0.34 F_A$$

P_0 is always $\geq F_R$

P_0 = Static equivalent radial load

F_R = Radial load

F_A = Thrust load

Life rating

$$L_{10} = \left(\frac{C}{P}\right)^3 \quad (\text{millions of revolutions})$$

or

$$L_{10h} = \frac{10^6}{60n} \left(\frac{C}{P}\right)^3 \quad (\text{Hours})$$

C = Basic dynamic radial load rating
(from single bearing tables)

P = Dynamic equivalent radial load

n = Speed in rpm

9000-U Series

Split Inner Ring

29 Degree Angular

Contact Ball Bearings

Single Bearing

Dynamic equivalent radial load and life calculation examples

Bearing size: 9309 U

Speed: 2000 RPM

Basic dynamic radial load rating (C) = 11800

Case 1

Radial load (F_R) = 1750

Thrust load (F_A) = 1310

Equivalent load (P) = F_R or $0.39 F_R + 0.76 F_A$

$F_A/F_R = 1310/1750 = 0.75$

Since $F_A/F_R < 0.80$, $P = F_R = 1750$

$$\text{Life (L10)} = \left(\frac{C}{P}\right)^3 = \left(\frac{11800}{1750}\right)^3 = 307 \times 10^6 \text{ Rev.}$$

or

$$\begin{aligned} \text{Life (L10h)} &= \frac{10^6}{60n} \left(\frac{C}{P}\right)^3 = \frac{10^6}{60 \times 2000} \left(\frac{11800}{1750}\right)^3 \\ &= 2558 \text{ Hrs} \end{aligned}$$

Case 2

Radial load (F_R) = 1750

Thrust load (F_A) = 2100

Equivalent load (P) = F_R or $0.39 F_R + 0.76 F_A$

$F_A/F_R = 2100/1750 = 1.20$

Since $F_A/F_R > 0.80$, $P = 0.39 \times 1750 + 0.76 \times 2100 = 2279$

$$\text{Life (L10)} = \left(\frac{C}{P}\right)^3 = \left(\frac{11800}{2279}\right)^3 = 139 \times 10^6 \text{ Rev.}$$

or

$$\begin{aligned} \text{Life (L10h)} &= \frac{10^6}{60n} \left(\frac{C}{P}\right)^3 = \frac{10^6}{60 \times 2000} \left(\frac{11800}{2279}\right)^3 \\ &= 1158 \text{ Hrs} \end{aligned}$$

Case 3

Thrust load (F_A) = 2100

Equivalent load (P) = $0.39 F_R + 0.76 F_A$

$F_A/F_R = 2100/0 = \infty$

Since $F_A/F_R > 0.80$, $P = 0.76 \times 2100 = 1596$

$$\text{Life (L10)} = \left(\frac{C}{P}\right)^3 = \left(\frac{11800}{1596}\right)^3 = 404 \times 10^6 \text{ Rev.}$$

or

$$\begin{aligned} \text{Life (L10h)} &= \frac{10^6}{60n} \left(\frac{C}{P}\right)^3 = \frac{10^6}{60 \times 2000} \left(\frac{11800}{1596}\right)^3 \\ &= 3367 \text{ Hrs} \end{aligned}$$
