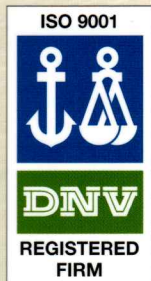


IJK

PRODUCTS GUIDE

BALL BEARINGS



INOUE JIKUKE KOGYO CO., LTD.

We, IJK (Inoue Jikuuke Kogyo), have been one of the leading manufacturers of small sized ball bearings since 1938. Our high quality bearings for precision motors meet the various needs of both domestic and overseas well-known electric appliances manufacturers.

In order to respond to the rapid development of many appliances and the specific demands for types, dimensions and efficiency of bearings, we have been endeavouring to innovate our manufacturing equipment and technology.

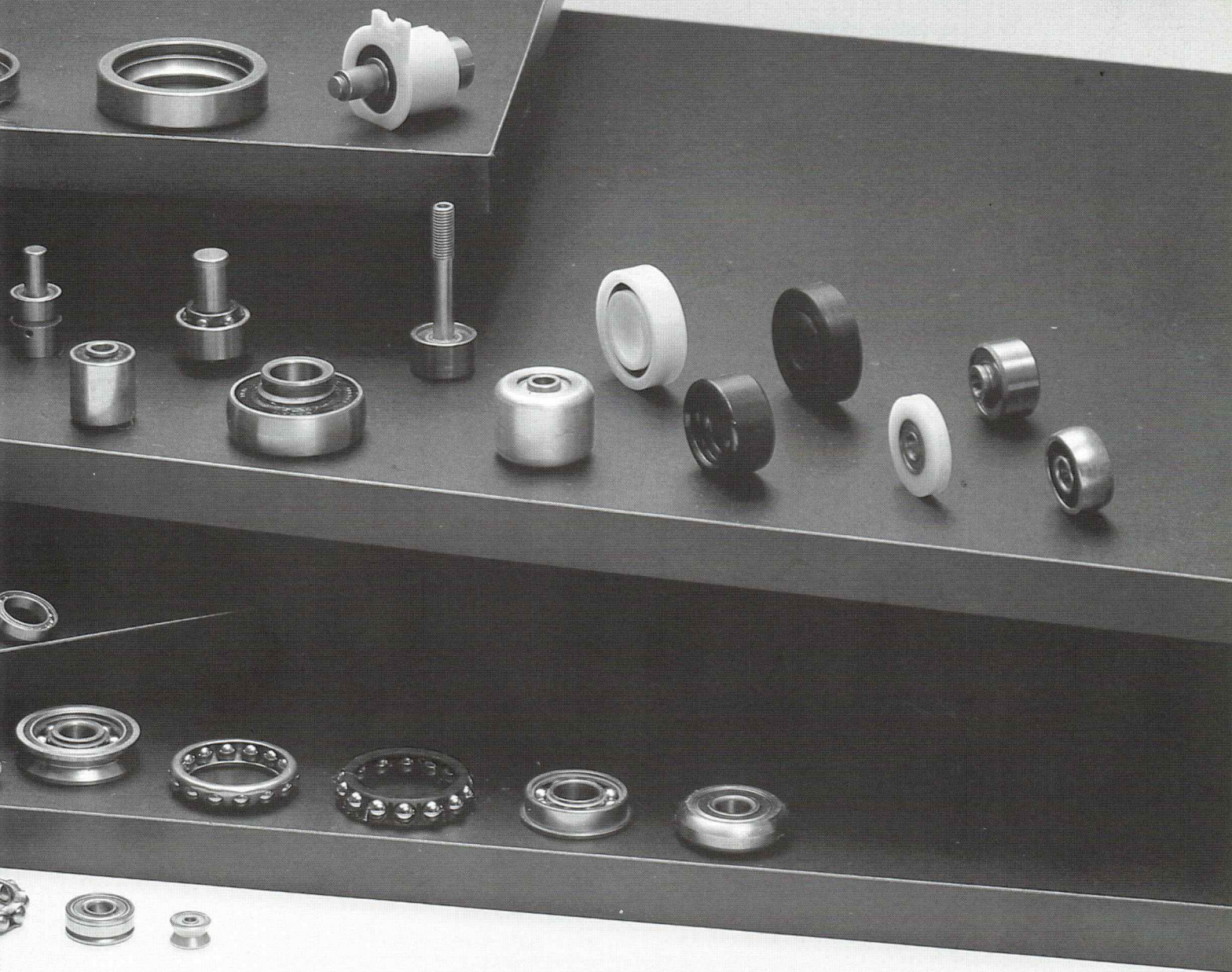


IJK BAL

Now we have revised our catalog. We believe **IJK** ball bearings will result in the highest satisfaction to the users. In addition to the standard types shown in this new catalog, we can offer you special types or sizes to fit your need. So, what ever your needs, please ask us to help you plan better.

IJK ball bearing company is always ready to serve you.

INOUE JIKUUE KOGYO



For the content of this catalog, we take every possible care for accuracy, but please excuse us in case of clerical error or omissions. Regarding the extra or special specifications of the bearings, the usual manner is for applications to be sent to us and after approval, we produce it.

BEARINGS

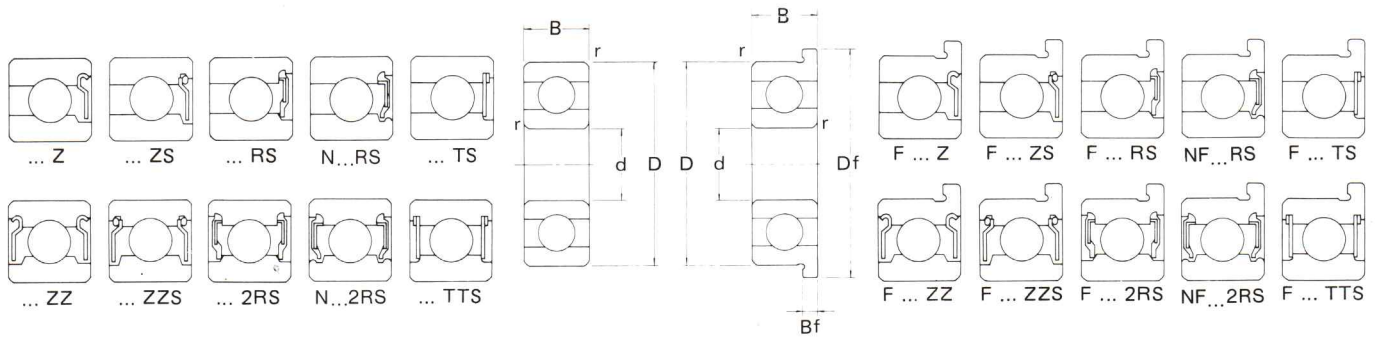
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DEEP GROOVE BALL BEARINGS

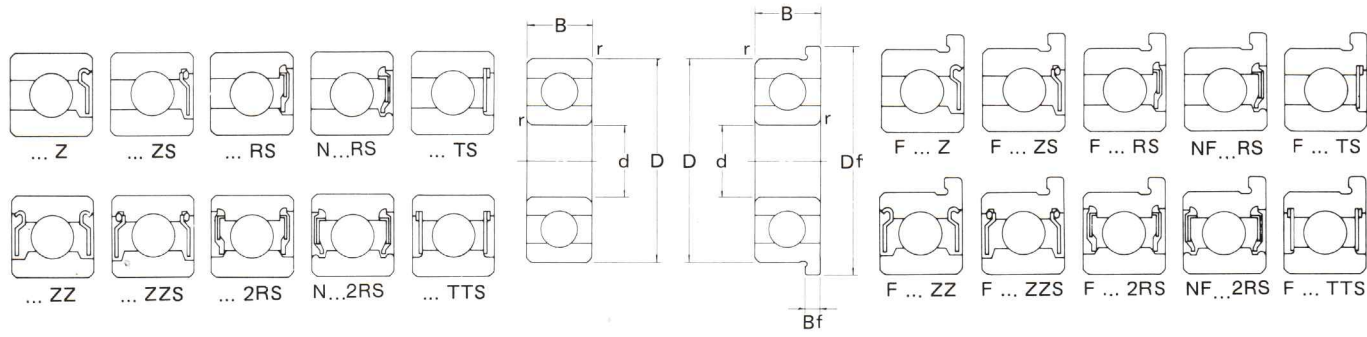
METRIC SERIES 68



BASIC BEARING NUMBER	Dimensions mm inches									
	BORE	O.D.	WIDTH	CHAMFER	FLANGE		BALLS		LOAD RATINGS	
	d	D	B	f min.	Df	Bf	NO.	SIZE	DYNAMIC C (kgf/lbf)	STATIC Co (kgf/lbf)
686 *	6.000	13.000	3.500	0.15	15.00	1.00	8	2.000	110	45
	.2362	.5118	.1378	.006	.591	.039			.0787	243
686	6.000	13.000	5.000	0.15	15.00	1.10	8	2.000	110	45
	.2362	.5118	.1969	.006	.591	.043			.0787	243
687 *	7.000	14.000	3.500	0.15	16.00	1.00	9	2.000	120	52
	.2756	.5512	.1378	.006	.630	.039			.0787	265
687	7.000	14.000	5.000	0.15	16.00	1.10	9	2.000	120	52
	.2756	.5512	.1969	.006	.630	.043			.0787	265
688 *	8.000	16.000	4.000	0.20	18.00	1.00	10	2.000	128	60
	.3150	.6299	.1575	.008	.709	.039			.0787	282
688	8.000	16.000	5.000	0.20	18.00	1.10	10	2.000	128	60
	.3150	.6299	.1969	.008	.709	.043			.0787	282
689 *	9.000	17.000	4.000	0.20	19.00	1.00	11	2.000	136	68
	.3543	.6693	.1575	.008	.748	.039			.0787	300
689	9.000	17.000	5.000	0.20	19.00	1.10	11	2.000	136	68
	.3543	.6693	.1969	.008	.748	.043			.0787	300
6800	10.000	19.000	5.000	0.30	22.00	1.50	10	2.381	175	86
	.3937	.7480	.1969	.012	.866	.059		3-32	386	190
6801	12.000	21.000	5.000	0.30			12	2.381	195	106
	.4724	.8268	.1969	.012				3-32	430	234
6802	15.000	24.000	5.000	0.30	26.80	1.50	14	2.778	212	128
	.5906	.9449	.1969	.012	1.055	.059		7-64	467	282
6803	17.000	26.000	5.000	0.30			13	2.778	212	128
	.6693	1.0236	.1969	.012				7-64	467	282
6804	20.000	32.000	7.000	0.30			13	3.500	410	252
	.7874	1.2598	.2756	.012				.1378	904	556

* Open type only.

DEEP GROOVE BALL BEARINGS METRIC SERIES 69



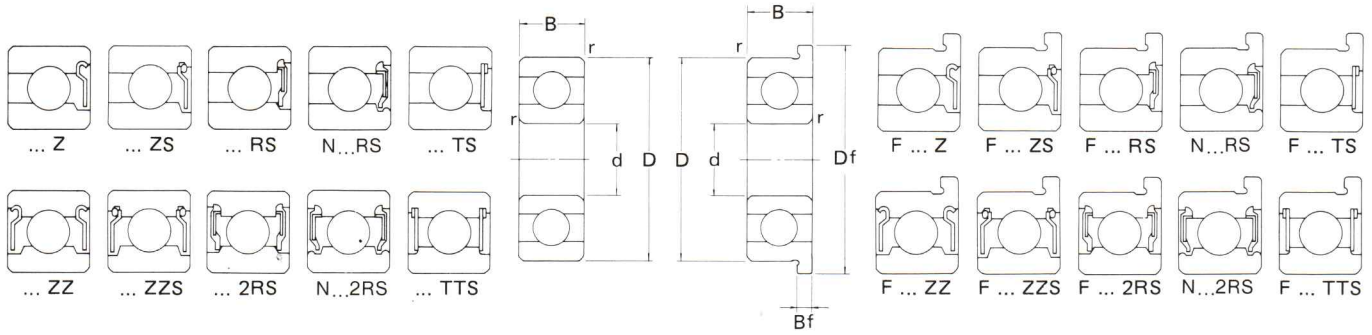
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BASIC BEARING NUMBER	Dimensions mm inches									
	BORE	O.D.	WIDTH	CHAMFER	FLANGE		BALLS		LOAD RATINGS	
	d	D	B	f min.	Df	Bf	NO.	SIZE	DYNAMIC C (kgf/lbf)	STATIC Co (kgf/lbf)
695	5.000	13.000	4.000	0.20	15.00	1.00	8	2.000	110	44
	.1969	.5118	.1575	.008	.590	.039			.0787	243
696	6.000	15.000	5.000	0.20	17.00	1.20	8	2.381	177	68
	.2362	.5906	.1969	.008	.669	.047			3-32	390
697 *	7.000	17.000	6.000	0.30	19.00	1.20	9	2.381	164	73
	.2756	.6693	.2362	.012	.748	.047			3-32	362
698	8.000	19.000	6.000	0.30	22.00	1.50	7	3.175	228	93
	.3150	.7480	.2362	.012	.866	.059			1-8	503
699	9.000	20.000	6.000	0.30	23.00	1.500	10	2.381	175	86
	.3543	.7874	.2362	.012	.906	.059			3-32	386
6900	10.000	22.000	6.000	0.30			9	3.175	275	129
	.3937	.8661	.2362	.012					1-8	606
6901	12.000	24.000	6.000	0.30			10	3.175	295	149
	.4724	.9449	.2362	.012					1-8	650
6902	15.000	28.000	7.000	0.30			10	3.969	440	230
	.5906	1.1024	.2756	.012					5-32	970
6903	17.000	30.000	7.000	0.30			11	3.969	470	260
	.6693	1.1811	.2756	.012					5-32	1036
6904	20.000	37.000	9.000	0.30			11	4.762	650	375
	.7874	1.4567	.3543	.012					3-16	1433

* Open type only.

DEEP GROOVE BALL BEARINGS

METRIC SERIES 60

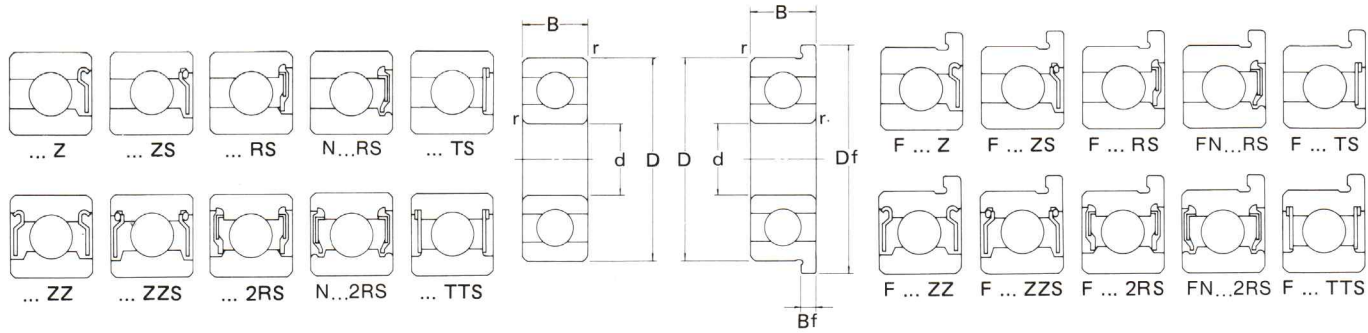


BASIC BEARING NUMBER	Dimensions $\frac{\text{mm}}{\text{inches}}$									
	BORE	O.D.	WIDTH	CHAMFER	FLANGE		BALLS		LOAD RATINGS	
	d	D	B	f min.	Df	Bf	NO.	SIZE	DYNAMIC C (kgf/lbf)	STATIC Co (kgf/lbf)
604	4.000	12.000	4.000	0.20	13.50	1.00	7	2.000	98	35
	.1575	.4724	.1575	.008	.531	.039		.0787	216	77
605	5.000	14.000	5.000	0.20	16.00	1.00	7	2.381	135	52
	.1969	.5512	.1969	.008	.630	.039		3.32	298	115
606	6.000	17.000	6.000	0.30	19.00	1.20	6	3.500	231	85
	.2362	.6693	.2362	.012	.748	.047		.1378	509	187
607	7.000	19.000	6.000	0.30	22.00	1.50	7	3.500	238	90
	.2756	.7480	.2362	.012	.866	.059		.1378	525	198
608	8.000	22.000	7.000	0.30	25.00	1.50	7	3.969	335	140
	.3150	.8661	.2756	.012	.984	.059		5-32	739	309
609	9.000	24.000	8.000	0.30			7	3.969	335	140
	.3543	.9449	.2756	.012				5-32	739	309
6000	10.000	26.000	8.000	0.30			7	4.762	465	201
	.3937	1.0236	.3150	.012				3-16	1025	443
6001	12.000	28.000	8.000	0.30			8	4.762	520	241
	.4724	1.1024	.3150	.012				3-16	1146	531

* Open type only.

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DEEP GROOVE BALL BEARINGS METRIC SERIES 62



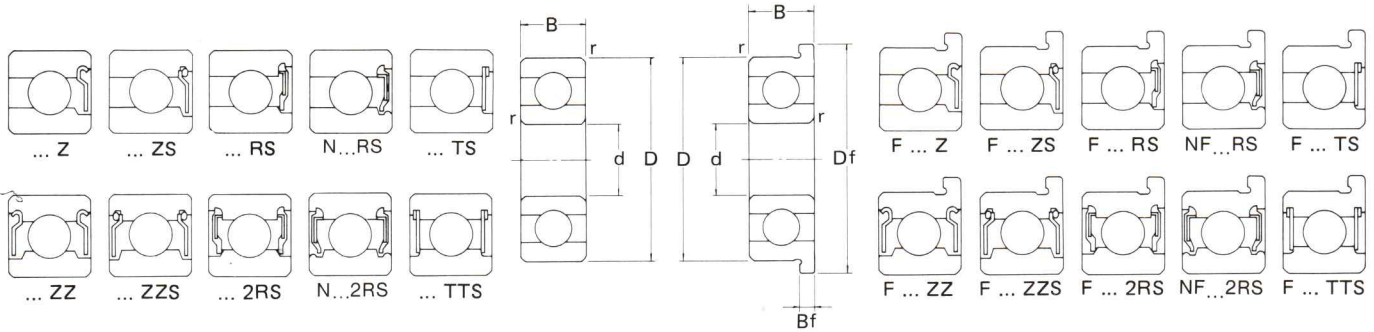
Dimensions $\frac{\text{mm}}{\text{inches}}$

BASIC BEARING NUMBER	BORE d	O.D. D	WIDTH B	CHAMFER r min.	FLANGE		BALLS		LOAD RATINGS	
					Df	Bf	NO.	SIZE	DYNAMIC C (kgf/lbf)	STATIC Co (kgf/lbf)
624	4.000	13.000	5.000	0.20	15.00	1.00	7	2.381	133	49
	.1575	.5118	.1969	.008	.590	.039			293	108
625	5.000	16.000	5.000	0.30	18.00	1.00	8	2.500	177	67
	.1969	.6299	.1969	.012	.709	.039			390	148
626	6.000	19.000	6.000	0.30	22.00	1.50	7	3.500	238	90
	.2362	.7480	.2362	.012	.866	.059			525	198
627	7.000	22.000	7.000	0.30	25.00	1.50	7	3.969	335	140
	.2756	.8661	.2756	.012	.984	.059			789	309
628	8.000	24.000	8.000	0.30			7	3.969	340	146
	.3150	.9449	.3150	.012					750	322
629	9.000	26.000	8.000	0.60			7	4.762	465	201
	.3543	1.0236	.3150	.024					1025	443
6200	10.000	30.000	9.000	0.60			8	4.762	520	244
	.3937	1.1811	.3543	.024					1146	538

IJK

DEEP GROOVE BALL BEARINGS

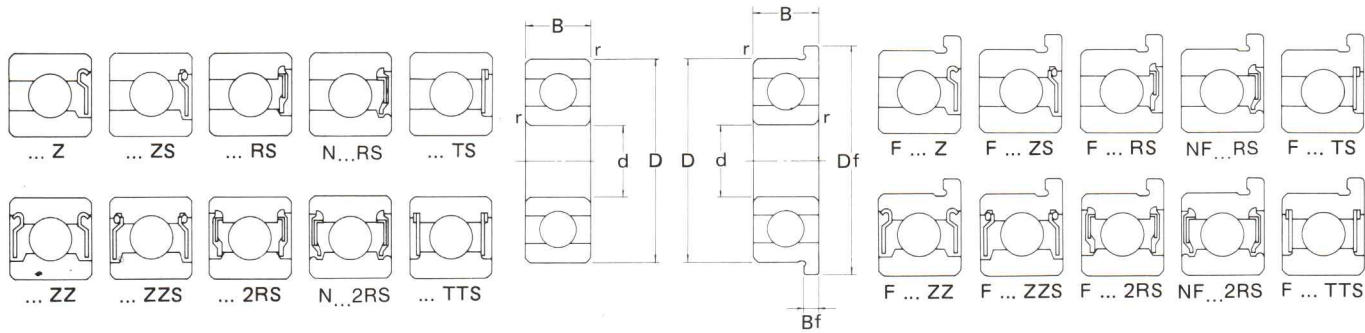
METRIC SERIES 63



BASIC BEARING NUMBER	Dimensions $\frac{\text{mm}}{\text{inches}}$									
	BORE d	O.D. D	WIDTH B	CHAMFER r min.	FLANGE		BALLS		LOAD RATINGS	
					Df	Bi	NO.	SIZE	DYNAMIC C (kgf/lbf)	STATIC Co (kgf/lbf)
634	4.000	16.000	5.000	0.30	18.00	1.00	8	2.500	177	68
	.1575	.6299	.1969	.012	.709	.039			.0984	390
635	5.000	19.000	6.000	0.30	22.00	1.50	7	3.500	266	107
	.1969	.7480	.2362	.012	.866	.059			.1378	586
636	6.000	22.000	7.000	0.30						
	.2362	.8661	.2756	.012						
637	7.000	26.000	9.000	0.30						
	.2756	1.0236	.3543	.012						
638	8.000	28.000	9.000	0.30			7	4.762	465	201
	.3150	1.1024	.3543	.012					3-16	1025
639	9.000	30.000	10.000	0.60			8	4.762	520	230
	.3543	1.1811	.3937	.024					3-16	1146
6300	10.000	35.000	11.000	0.60			6	7.144	825	350
	.3937	1.3780	.4331	.024					9-32	1819
6301	12.000	37.000	12.000	1.00			6	7.938	990	425
	.4724	1.4567	.4724	.040					5-16	2183
6302	15.000	42.000	13.000	1.00			7	7.938	1162	555
	.5906	1.6535	.5118	.040					5-16	2563

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DEEP GROOVE BALL BEARINGS INCH SERIES



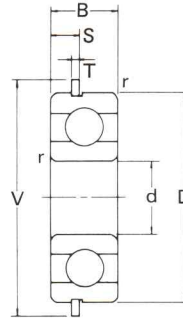
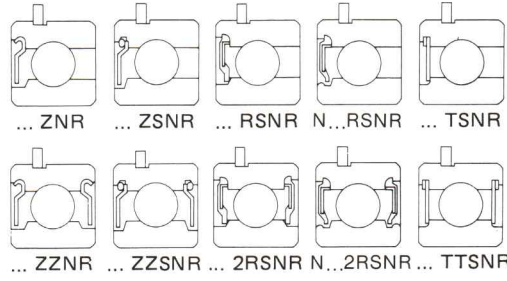
Dimensions $\frac{\text{mm}}{\text{inches}}$

BASIC BEARING NUMBER	BORE d	O.D. D	WIDTH B	CHAMFER r_{min}	FLANGE		BALLS		LOAD RATINGS	
					Df	Bf	NO.	SIZE	DYNAMIC C (kgf/lbf)	STATIC Co (kgf/lbf)
R3 *	4.762 .1875	12.700 .5000	3.967 .1562	0.30 .012	14.35 .565	1.07 .042	7	2.381 3-32	133 293	49 108
R3	4.762 .1875	12.700 .5000	4.978 .1960	0.30 .012	14.35 .565	1.07 .042	7	2.381 3-32	133 293	49 108
R188 *	6.350 .2500	12.700 .5000	3.175 .1250	0.15 .006	13.89 .547	0.58 .023	10	1.588 1-16	110 243	45 99
R188	6.350 .2500	12.700 .5000	4.762 .1875	0.15 .006	13.89 .547	1.14 .045	10	1.588 1-16	110 243	45 99
R4	6.350 .2500	15.875 .6250	4.978 .1960	0.30 .012	17.53 .690	1.07 .042	8	2.500 .0984	164 362	68 150
R4A *	6.350 .2500	19.050 .7500	5.558 .2188	0.40 .016			7	3.500 .1378	274 604	107 236
R4A	6.350 .2500	19.050 .7500	7.142 .2812	0.40 .016	17.53 .690	1.07 .042	7	3.500 .1378	274 604	107 236
R5A	7.938 .3125	22.225 .8750	7.142 .2812	0.40 .016			7	3.969 5-32	340 750	138 304
R6 *	9.525 .3750	22.225 .8750	5.558 .2188	0.40 .016	24.61 .969	1.57 .062	7	3.969 5-32	340 750	138 304
R6	9.525 .3750	22.225 .8750	7.142 .2812	0.40 .016	24.61 .969	1.57 .062	7	3.969 5-32	340 750	138 304
R8 *	12.700 .5000	28.575 1.1250	6.350 .2500	0.40 .016			8	4.762 3-16	520 1146	229 505
R8	12.700 .5000	28.575 1.1250	7.938 .3125	0.40 .016	31.11 1.225	1.57 .062	8	4.762 3-16	520 1146	229 505
R10 *	15.875 .6250	34.925 1.375	7.142 .2812	0.80 .031			10	4.762 3-16	611 1347	331 729
R10	15.875 .6250	34.925 1.375	8.733 .3438	0.80 .031			10	4.762 3-16	611 1347	331 729
R12 *	19.05 .75	41.275 1.625	7.938 .3125	0.80 .031			9	6.350 1-4	955 2105	510 1124
R12	19.05 .75	41.275 1.625	11.112 .4375	0.80 .031			9	6.350 1-4	955 2105	510 1124

* Open type only.

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DEEP GROOVE BALL BEARINGS INCH SERIES, WITH SNAP RING



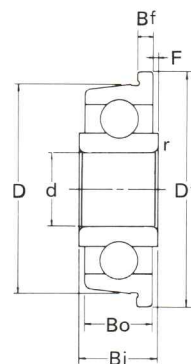
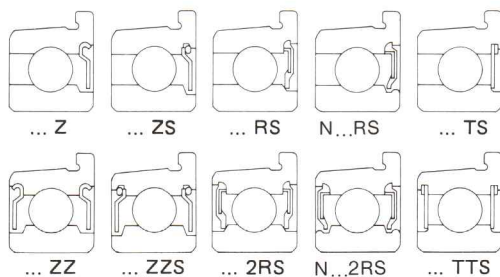
Dimensions $\frac{\text{mm}}{\text{inches}}$

BASIC BEARING NUMBER	Dimensions $\frac{\text{mm}}{\text{inches}}$										
	BORE BORE d	O.D. D	WIDTH B	CHAMFER r min.	SNAP RING			BALLS		LOAD RATINGS [*]	
					V	T	S	NO.	SIZE	DYNAMIC C (kgf/lbf)	STATIC C ₀ (kgf/lbf)
R4	6.350	15.875	4.978	0.30	18.64	0.65	1.78	8	2.500	164	68
	.2500	.6250	.1960	.012	.730	.026	.070		.0984	362	150
R4A	6.350	19.050	7.142	0.40	21.64	0.66	2.28	7	3.500	274	107
	.2500	.7500	.2812	.016	.852	.026	.090		.1378	604	236
R6	9.525	22.225	7.142	0.40	25.40	0.80	2.28	7	3.969	340	138
	.3750	.8750	.2812	.016	1.000	.031	.090		5-32	750	304
R8	12.700	28.575	7.938	0.40	31.93	0.70	2.28	8	4.762	520	229
	.5000	1.1250	.3125	.016	1.257	.028	.090		3-16	1146	505

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DEEP GROOVE BALL BEARINGS O.D. TAPER FLANGED EXTR-SMALL

INCH SERIES
OPEN TYPE
CLOSURES TYPE



Dimensions $\frac{\text{mm}}{\text{inches}}$

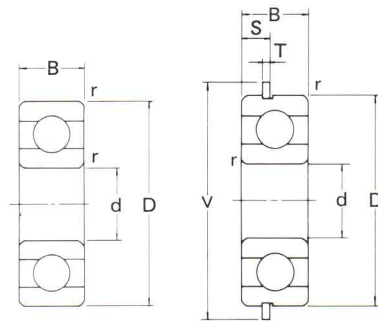
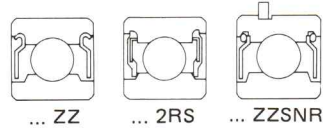
BEARING NUMBER	BORE		O.D. TAPER PER FOOT	WIDTH		INNER RING PROJECT F	CAMFER $r \times 45^\circ$	FLANGE		BALLS		LOAD RATINGS	
	d	D		Bo	Bi			O.D. Df	WIDTH Bf	NO.	SIZE	DYNAMIC C (kgf/lbf)	STATIC Co (kgf/lbf)
												(mm TOLERANCE)	(in TOLERANCE)
	+0.008 -0	+0 -0.010		+0 -0.10	± 0.025	+0.25 -0	+0.25 -0	+0.127 -0	± 0.050	← (mm TOLERANCE)			
	+0.003 -0.0000	+0.000 -0.0004		+0.00 -0.004	$\pm .001$	+0.01 -0.000	+0.01 -0.000	+0.005 -0.002	$\pm .002$	← (in TOLERANCE)			
F2 *	4.762 .1875	11.130 .4382	2.032 .080	4.14 .163	4.78 .188	0.41 .016	0.25 .010	12.700 .5000	1.07 .042	15	1.588 1-16	108 238	47 104
F3	4.762 .1875	14.305 .5632	2.032 .080	4.95 .195	5.51 .217	0.38 .015	0.25 .010	15.875 .6250	1.07 .042	7	2.381 3-32	135 298	50 243
F4	6.350 .2500	15.893 .6257	1.727 .068	5.740 .226	6.62 .249	0.38 .015	0.25 .010	17.462 .6875	1.07 .042	8	2.500 .0984	163 359	63 139
F5	7.938 .3125	17.480 .6882	1.727 .068	5.740 .226	6.32 .249	0.38 .015	0.25 .010	19.050 .7500	1.07 .042	7	3.175 1-8	226 498	88 198
F2ZZ	3.175 .1250	9.543 .3757	1.905 .075	4.14 .163	4.78 .188	0.38 .015	0.25 .010	11.125 .438	0.94 .037	7	1.588 1-16	65 143	22 49
F3ZZ	4.762 .1875	14.305 .5632	1.727 .068	5.740 .226	6.35 .250	0.38 .015	0.25 .010	15.875 .625	1.07 .042	7	2.381 3-32	135 298	50 110
F4ZZ	6.350 .2500	15.893 .6257	1.727 .068	5.740 .226	6.35 .250	0.38 .015	0.25 .010	17.450 .687	1.07 .042	8	2.500 .0984	163 359	63 139
F5ZZ	7.938 .3125	17.480 .6882	1.727 .068	5.740 .226	6.35 .250	0.38 .015	0.25 .010	19.050 .750	1.07 .042	7	3.175 1-8	226 498	88 194

* Full complement – no cage.

IJK

DEEP GROOVE BALL BEARINGS

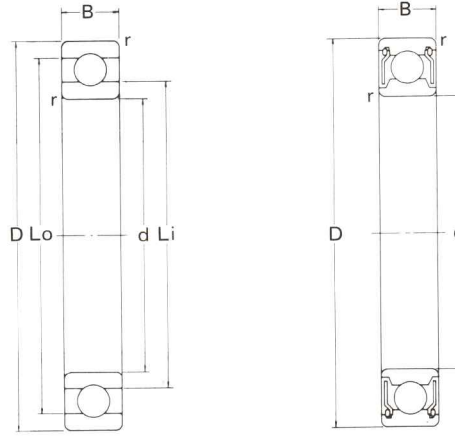
INCH SERIES, 1600



Dimensions $\frac{\text{mm}}{\text{inches}}$

BEARING NUMBER	O.D.	BORE	WIDTH	CHAMFER	SNAP RING			BALLS		LOAD RATINGS	
	D	d	B	r min.	V	T	S	NO.	SIZE	DYNAMIC C (kgf/lbf)	STATIC Co (kgf/lbf)
1601ZZ	17.462	4.762	6.350	0.40				6	3.175	201	76
	.6875	.1875	.2500	.016					1-8	443	168
1601DC	17.462	4.762	7.938	0.40				6	3.175	201	76
	.6875	.1875	.3125	.016					1-8	443	168
1602ZZ	17.462	6.350	6.350	0.40				6	3.175	201	76
	.6875	.2500	.2500	.016					1-8	443	168
1602DC	17.462	6.350	7.938	0.40				6	3.175	201	76
	.6875	.2500	.3125	.016					1-8	443	168
1603ZZ	22.225	7.938	7.142	0.50				7	3.969	340	138
	.8750	.3125	.2812	.020					5-32	750	304
1603ZZNR	22.225	7.938	7.142	0.50	25.40	0.50	1.68	7	3.969	340	138
	.8750	.3125	.2812	.020	1.000	.020	.066		5-32	750	304
1603DC	22.225	7.938	8.731	0.50				7	3.969	340	138
	.8750	.3125	.3438	.020					5-32	750	304
1604ZZ	22.225	9.525	7.142	0.50				7	3.969	340	138
	.8750	.3750	.2812	.020					5-32	750	304
1604DC	22.225	9.525	8.731	0.50				7	3.969	340	138
	.8750	.3750	.3438	.020					5-32	750	304
1605ZZ	23.017	7.938	7.938	0.50				7	3.969	340	138
	.9062	.3125	.3125	.020					5-32	750	304
1605-2RS	23.017	7.938	7.938	0.50				7	3.969	340	138
	.9062	.3125	.3125	.020					5-32	750	304
1606ZZ	23.017	9.525	7.938	0.50				7	3.969	340	138
	.9062	.3750	.3125	.020					5-32	750	304
1606-2RS	23.017	9.525	7.938	0.50				7	3.969	340	138
	.9062	.3750	.3125	.020					5-32	750	304
1607ZZ	23.017	11.112	7.938	0.50				9	3.500	328	138
	.9062	.4375	.3125	.020					.1378	723	304
1607-2RS	23.017	11.112	7.938	0.50				9	3.500	328	138
	.9062	.4375	.3125	.020					.1378	723	304
1614ZZ	28.575	9.525	9.525	0.60				8	4.762	520	241
	1.1250	.3750	.3750	.024					3-16	1146	531
1614-2RS	28.575	9.525	9.525	0.60				8	4.762	520	241
	1.1250	.3750	.3750	.024					3-16	1146	531
1615ZZ	28.575	11.112	9.525	0.60				8	4.762	520	241
	1.1250	.4375	.3750	.024					3-16	1146	531
1615-2RS	28.575	11.112	9.525	0.60				8	4.762	520	241
	1.1250	.4375	.3750	.024					3-16	1146	531
1616ZZ	28.575	12.700	9.525	0.60				8	4.762	520	241
	1.1250	.5000	.3750	.024					3-16	1146	531
1616-2RS	28.575	12.700	9.525	0.60				8	4.762	520	241
	1.1250	.5000	.3750	.024					3-16	1146	531

LARGE BORE, EXTRA THIN BEARINGS
METRIC SERIES
BORE 10–20mm
INCH SERIES
BORE .3750–.7500 inches



Dimensions $\frac{\text{mm}}{\text{inches}}$

BASIC BEARING NUMBER	BORE	O.D.	WIDTH	CHAMFER	LAND DIAMETER		BALLS		LOAD RATINGS	
	d	D	B	r min.	Lo	Li	NO.	SIZE	DYNAMIC C (kgf/lbf)	STATIC Co (kgf/lbf)
1510	10.000	15.000	3.000	0.25	13.60	11.25	11	1.588	64	29
	.3937	.5906	.1181	.010	.535	.443			1-16	141
2015	15.000	20.000	3.500	0.25	18.60	16.40	14	1.588	96	49
	.5906	.7874	.1378	.010	.732	.646			1-16	212
2115	15.000	21.000	3.500	0.25	18.90	16.80	14	1.588	96	49
	.5906	.8286	.1378	.010	.744	.661			1-16	212
2216	16.000	22.000	4.000	0.25	19.90	17.80	15	1.588	99	50
	.6299	.8661	.1575	.010	.783	.700			1-16	218
2418	18.000	24.000	4.000	0.25	21.90	19.75	16	1.588	100	51
	.7087	.9449	.1575	.010	.862	.778			1-16	220
2520	20.000	25.000	4.000	0.25	23.40	21.35	17	1.588	103	54
	.7874	.9843	.1575	.010	.921	.841			1-16	227
6700	10.000	15.000	3.000	0.15	13.70	11.30	13	1.588	75	44
	.3937	.5906	.1181	.006	.539	.445			1-16	165
6701	12.000	18.000	4.000	0.20	16.14	13.86	16	1.588	109	55
	.4724	.7087	.1575	.008	.646	.546			1-16	240
6702 *	15.000	21.000	4.000	0.20	19.14	16.86	19	1.588	90	66
	.5906	.8268	.1575	.008	.754	.664			1-16	198
6703	17.000	23.000	4.000	0.20	21.14	18.86	21	1.588	94	73
	.6693	.9055	.1575	.008	.831	.743			1-16	207
6704	20.000	27.000	4.000	0.20	24.85	22.15	20	2.000	140	110
	.7874	1.0630	.1575	.008	.978	.872			10-127	309
6705	25.000	32.000	4.000	0.20	29.85	27.15	24	2.000	151	134
	.9843	1.2598	.1575	.008	1.175	1.069			10-127	333
6706	30.000	37.000	4.000	0.20	34.85	32.15	28	2.000	160	157
	1.1811	1.4567	.1575	.008	1.372	1.266			10-127	353
6707	35.000	44.000	5.000	0.30	41.12	37.88	28	2.381	220	222
	1.3780	1.7323	.1969	.012	1.619	1.491			3-32	485
6708	40.000	50.000	6.000	0.30	46.89	43.11	27	2.778	370	291
	1.5748	1.9685	.2362	.012	1.846	1.697			7-64	816
6709	45.000	55.000	6.000	0.30	51.89	48.11	30	2.778	298	325
	1.7717	2.1654	.2362	.012	2.043	1.894			7-64	657
6710	50.000	62.000	6.000	0.30	58.40	53.60	27	3.500	435	460
	1.9685	2.4409	.2362	.012	2.299	2.110			35-254	959

Open type only

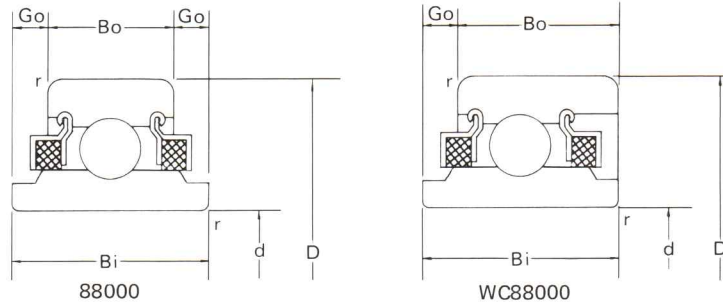
* Rubber Seals type available

IJK

FELT SEAL BALL BEARINGS

88000 SERIES

WC88000 SERIES

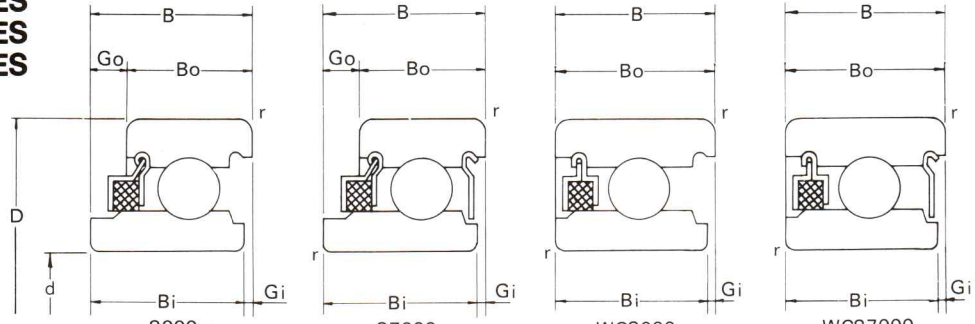


Dimensions $\frac{\text{mm}}{\text{inches}}$

BEARING NUMBER	BORE		O.D.		WIDTH		CHAMFER		BALLS		LOAD RATINGS	
	d	D	Bo	Bi	Go	r min.	NO.	SIZE	DYNAMIC C	STATIC Co		
88035	5.000	19.000	8.000	12.620	2.31	0.30	7	3.500	266	107		
	.1969	.7480	.3150	.4970	.091	.012		.1378	586	236		
WC88035	5.000	19.000	10.310	12.600	2.31	0.30	7	3.500	266	107		
	.1969	.7480	.4059	.4970	.091	0.12		.1378	586	236		
88036	6.000	19.000	8.000	12.620	2.31	0.30	7	3.500	266	107		
	.2362	.7480	.3150	.4970	.091	0.12		.1378	586	236		
WC88036	6.000	19.000	10.310	12.620	2.31	0.30	7	3.500	266	107		
	.2362	.7480	.4059	.4970	.091	0.12		.1378	586	236		
88006	6.000	24.000	8.000	12.620	2.31	0.30	7	3.969	335	140		
	.2362	.9449	.3150	.4970	.091	0.12		5-32	739	309		
WC88006	6.000	24.000	10.310	12.620	2.31	0.30	7	3.969	335	140		
	.2362	.9449	.4059	.4970	.091	0.12		5-32	739	309		
88037	7.000	22.000	8.000	12.620	2.31	0.30	7	3.969	335	140		
	.2756	.8661	.3150	.4970	.091	0.12		5-32	739	309		
WC88037	7.000	22.000	10.310	12.620	2.31	0.30	7	3.969	335	140		
	.2756	.8661	.4059	.4970	.091	0.12		5-32	739	309		
88007	7.000	24.000	8.000	12.620	2.31	0.30	7	3.969	335	140		
	.2756	.9449	.3150	.4970	.091	0.12		5-32	739	309		
WC88007	7.000	24.000	10.310	12.620	2.31	0.30	7	3.969	335	140		
	.2756	.9449	.4059	.4970	.091	0.12		5-32	739	309		
88038	8.000	22.000	8.000	12.620	2.31	0.30	7	3.969	335	140		
	.3150	.8661	.3150	.4970	.091	0.12		5-32	739	309		
WC88038	8.000	22.000	10.310	12.620	2.31	0.30	7	3.969	335	140		
	.3150	.8661	.4059	.4970	.091	0.12		5-32	739	309		
88008	8.000	24.000	8.000	12.620	2.31	0.30	7	3.969	335	140		
	.3150	.9449	.3150	.4970	.091	.012		5-32	739	309		
WC88008	8.000	24.000	10.310	12.620	2.31	0.30	7	3.969	335	140		
	.3150	.9449	.4059	.4970	.091	.012		5-32	739	309		
88039	9.000	26.000	8.000	12.620	2.31	0.63	7	4.762	465	201		
	.3543	1.0236	.3150	.4970	.091	.025		3-16	1025	443		
WC88039	9.000	26.000	10.310	12.620	2.31	0.63	7	4.762	465	201		
	.3543	1.0236	.4059	.4970	.091	.025		3-16	1025	443		
88009	9.000	30.000	8.990	16.400	3.70	0.63	7	5.556	520	241		
	.3543	1.1811	.3539	.6457	.146	.025		7-32	1146	531		
WC88009	9.000	30.000	12.700	16.400	3.70	0.63	7	5.556	520	241		
	.3543	1.1811	.5000	.6457	.146	.025		7-32	1146	531		
88500	10.000	30.000	8.990	16.400	3.70	0.63	7	5.556	520	241		
	.3937	1.1811	.3539	.6457	.146	.025		7-32	1146	531		
WC88500	10.000	30.000	12.700	16.400	3.70	0.63	7	5.556	520	241		
	.3937	1.1811	.5000	.6457	.146	.025		7-32	1146	531		

FELT SEAL BALL BEARINGS

8000 SERIES
87000 SERIES
WC8000 SERIES
WC87000 SERIES



Dimensions $\frac{\text{mm}}{\text{inches}}$

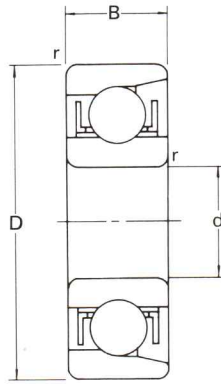
BEARING NUMBER	BORE d	O. D. D	WIDTH				CHAMFER r min.	BALLS NO.	BALLS SIZE	LOAD RATINGS		
			B	Bo	Bi	Go				Gi	DYNAMIC C	STATIC Co
8035	5.000	19.000	10.310	8.000	9.800	2.31	0.51	0.30	7	3.500	266	107
87035	.1969	.7480	.4059	.3150	.3858	.091	.020	.012	7	.1378	586	236
WC8035	5.000	19.000	10.310	10.310	9.800		0.51	0.30	7	3.500	266	107
WC87035	.1969	.7480	.4059	.4059	.3858		.020	.012	7	.1378	586	236
8036	6.000	19.000	10.310	8.000	9.800	2.31	0.51	0.30	7	3.500	266	107
87036	.2362	.7480	.4059	.3150	.3858	.091	.020	.012	7	.1378	586	236
WC8036	6.000	19.000	10.310	10.310	9.800		0.51	0.30	7	3.500	266	107
WC87036	.2362	.7480	.4059	.4059	.3858		.020	.012	7	.1378	586	236
8006	6.000	24.000	10.310	8.000	9.800	2.31	0.51	0.30	7	3.969	335	140
87006	.2362	.9449	.4059	.3150	.3858	.091	.020	.012	7	5-32	739	309
WC8006	6.000	24.000	10.310	10.310	9.800		0.51	0.30	7	3.969	335	140
WC87006	.2362	.9449	.4059	.4059	.3858		.020	.012	7	5-32	739	309
8037	7.000	22.000	10.310	8.000	9.800	2.31	0.51	0.30	7	3.969	335	140
87037	.2756	.8661	.4059	.3150	.3858	.091	.020	.012	7	5-32	739	309
WC8037	7.000	22.000	10.310	10.310	9.800		0.51	0.30	7	3.969	335	140
WC87037	.2756	.8661	.4059	.4059	.3858		.020	.012	7	5-32	739	309
8007	7.000	24.000	10.310	8.000	9.800	2.31	0.51	0.30	7	3.969	335	140
87007	.2756	.9449	.4059	.3150	.3858	.091	.020	.012	7	5-32	739	309
WC8007	7.000	24.000	10.310	10.310	9.800		0.51	0.30	7	3.969	335	140
WC87007	.2756	.9449	.4059	.4059	.3858		.020	.012	7	5-32	739	309
8038	8.000	22.000	10.310	8.000	9.800	2.31	0.51	0.30	7	3.969	335	140
87038	.3150	.8661	.4059	.3150	.3858	.091	.020	.012	7	5-32	739	309
WC8038	8.000	22.000	10.310	10.310	9.800		0.51	0.30	7	3.969	335	140
WC87038	.3150	.8661	.4059	.4059	.3858		.020	.012	7	5-32	739	309
8008	8.000	24.000	10.310	8.000	9.800	2.31	0.51	0.30	7	3.969	335	140
87008	.3150	.9449	.4059	.3150	.3858	.091	.020	.012	7	5-32	739	309
WC8008	8.000	24.000	10.310	10.310	9.800		0.51	0.30	7	3.969	335	140
WC87008	.3150	.9449	.4059	.4059	.3858		.020	.012	7	5-32	739	309
8039	9.000	26.000	10.310	8.000	9.800	2.31	0.51	0.63	7	4.762	465	201
87039	.3543	1.0236	.4059	.3150	.3858	.091	.020	.025	7	3-16	1025	443
WC8039	9.000	26.000	10.310	10.310	9.800		0.51	0.63	7	4.762	465	201
WC87039	.3543	1.0236	.4059	.4059	.3858		.020	.025	7	3-16	1025	443
8009	9.000	30.000	12.700	8.900	12.190	3.70	0.51	0.63	8	4.762	520	241
87009	.3543	1.1811	.5000	.3539	.4800	.146	.020	.025	8	3-16	1146	531
WC8009	9.000	30.000	12.700	12.700	12.190		0.51	0.63	8	4.762	520	241
WC87009	.3543	1.1811	.5000	.5000	.4800		.020	.025	8	3-16	1146	531
8500	10.000	30.000	12.700	8.990	12.190	3.70	0.51	0.63	8	4.762	520	241
87500	.3937	1.1811	.5000	.3539	.4800	.146	.020	.025	8	3-16	1146	531
WC8500	10.000	30.000	12.700	12.700	12.190		0.51	0.63	8	4.762	520	241
WC87500	.3937	1.1811	.5000	.5000	.4800		.020	.025	8	3-16	1146	531

IJK

MAGNETO BALL BEARINGS

E SERIES

EN SERIES



Values in 0.001mm

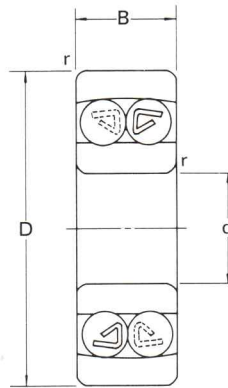
O.D. (mm)	ALLOWABLE DEVIATIONS			
	E SERIES		EN SERIES	
OVER INCL.	HIGH	LOW	HIGH	LOW
— 10	+ 8	0	0	— 8
10 18	+ 8	0	0	— 8
18 30	+ 9	0	0	— 9
30 50	+11	0	0	—11

Dimensions $\frac{\text{mm}}{\text{inches}}$

BEARING NUMBER	BORE d	O.D. D	WIDTH B	CHAMFER r min.	BALLS		LOAD RATINGS	
					NO.	SIZE	DYNAMIC C (kgf/lbf)	STATIC Co (kgf/lbf)
E 3 EN 3	3.000 .1181	16.000 .6299	5.000 .1969	0.15 .006	8	3.175 1-8	168 370	29 64
E 4 EN 4	4.000 .1575	16.000 .6299	5.000 .1969	0.15 .006	8	3.175 1-8	168 370	29 64
E 5 EN 5	5.000 .1969	16.000 .6299	5.000 .1969	0.15 .006	8	3.175 1-8	168 370	29 64
E 6 EN 6	6.000 .2362	21.000 .8268	7.000 .2756	0.30 .012	8	3.969 5-32	254 560	46 101
E 7 EN 7	7.000 .2756	22.000 .8661	7.000 .2756	0.30 .012	8	3.969 5-32	254 560	46 101
E 8 EN 8	8.000 .3150	24.000 .9449	7.000 .2756	0.30 .012	8	4.762 3-16	350 772	66 146
E 9 EN 9	9.000 .3543	28.000 1.1024	8.000 .3150	0.30 .012	8	5.556 7-32	465 1025	90 198
E10 EN10	10.000 .3937	28.000 1.1024	8.000 .2150	0.30 .012	8	5.556 7-32	465 1025	90 198
E11 EN11	11.000 .4331	32.000 1.2598	7.000 .2756	0.30 .012	11	4.762 3-16	450 992	86 190
E12 EN12	12.000 .4724	32.000 1.2598	7.000 .2756	0.30 .012	11	4.762 3-16	450 992	86 190
E13 EN13	13.000 .5118	30.000 1.1811	7.000 .2756	0.30 .012	11	4.762 3-16	450 992	86 190
E14 EN14	14.000 .5512	35.000 1.3780	8.000 .3150	0.30 .012	11	5.556 7-32	590 1301	117 258
E15 EN15	15.000 .5906	35.000 1.3780	8.000 .3150	0.30 .012	11	5.556 7-32	590 1301	117 258
E16 EN16	16.000 .6299	38.000 1.4960	10.000 .3937	0.60 .024	10	6.350 1-4	705 1554	141 311
E17 EN17	17.000 .6693	44.000 1.7323	11.000 .4331	0.60 .024	11	6.350 1-4	750 1653	153 337
E18 EN18	18.000 .7087	40.000 1.5748	9.000 .3543	0.60 .024	14	4.762 3-16	515 1135	105 231
E19 EN19	19.000 .7480	40.000 1.5748	9.000 .3543	0.60 .024	14	4.762 3-16	515 1135	105 231
E20 EN20	20.000 .7874	47.000 1.8504	12.000 .4724	0.60 .024	11	7.938 5-16	1120 2469	245 540

SELF-ALIGNING BALL EBEARINGS

100 SERIES
12000 SERIES
RL SERIES



Dimensions $\frac{\text{mm}}{\text{inches}}$

BEARING NUMBER	BORE	O.D.	WIDTH	CHAMFER	BALLS		LOAD RATINGS	
	d	D	B	r min.	NO.	SIZE	DYNAMIC C (kgf/lbf)	STATIC Co (kgf/lbf)
135	5.000	19.000	6.000	0.30	16	3.175	258	49
	.1969	.7480	.2362	.012		1-8	569	108
12306	6.000	15.000	5.000	0.30	20	2.381	136	27
	.2362	.5906	.1968	.012		3-32	300	60
126	6.000	19.000	6.000	0.30	16	3.175	258	49
	.2362	.7480	.2362	.012		1-8	569	108
127	7.000	22.000	7.000	0.30	22	3.175	280	61
	.2756	.8661	.2756	.012		1-8	617	134
12308	8.000	18.000	5.000	0.30	24	2.500	193	51
	.3150	.7087	.1969	.012		.0984	425	112
108	8.000	22.000	7.000	0.30	22	3.175	280	61
	.3150	.8661	.2756	.012		1-8	617	134
129	9.000	26.000	8.000	0.60	20	3.969	425	91
	.3543	1.0236	.3150	.024		5-32	937	201
12310	10.000	23.000	7.000	0.30	22	3.175	280	61
	.3937	.9055	.2756	.012		1-8	617	134
RL4	12.700	33.338	11.112	0.60	20	4.762	590	154
	.5000	1.3125	.4375	.024		3-16	1300	340
RL5	15.875	39.688	11.112	0.60	24	5.556	827	252
	.6250	1.5625	.4375	.024		7-32	1823	556

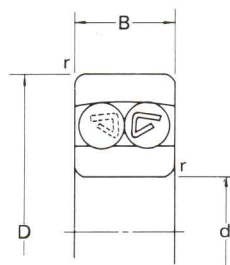
IJK

SELF-ALIGNING BALL BEARINGS

12 SERIES

13 SERIES

22 SERIES



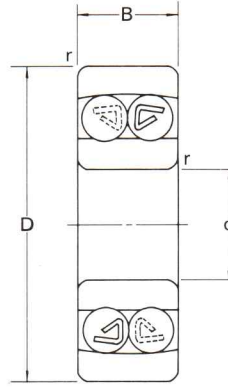
Dimensions $\frac{\text{mm}}{\text{inches}}$

BEARING NUMBER	BORE	O.D.	WIDTH	CHAMFER	BALLS		LOAD RATINGS	
	d	D	B	r min.	NO.	SIZE	DYNAMIC C (kgf/lbf)	STATIC Co (kgf/lbf)
1200	10.000	30.000	9.000	0.60	18	4.762	570	121
	.3937	1.1811	.3543	.024		3-16	1257	267
1201	12.000	32.000	10.000	0.60	20	4.762	580	130
	.4724	1.2598	.3937	.024		3-16	1279	287
1202	15.000	35.000	11.000	0.60	20	5.556	775	179
	.5906	1.3780	.4331	.024		7-32	1709	395
1203	17.000	40.000	12.000	0.60	24	5.556	815	205
	.6693	1.5748	.4724	.024		7-32	1797	452
1204	20.000	47.000	14.000	1.00	24	6.350	1020	266
	.7874	1.8504	.5512	.040		1-4	2249	586
1205	25.000	52.000	15.000	1.00	24	7.144	1250	335
	.9843	2.0472	.5906	.040		9-32	2755	739
1300	10.000	35.000	11.000	0.60	18	5.556	750	165
	.3937	1.3780	.4331	.024		7-32	1653	364
1301	12.000	37.000	12.000	1.00	18	6.350	985	221
	.4724	1.4567	.4724	.040		1.4	2171	487
1302	15.000	42.000	13.000	1.00	20	6.350	990	234
	.5906	1.6535	.5118	.040		1.4	2183	516
1303	17.000	47.000	14.000	1.00	22	7.144	1300	325
	.6693	1.8504	.5512	.040		9-32	2866	717
1304	20.000	52.000	15.000	1.10	24	7.144	1280	340
	.7874	2.0472	.5906	.430		9-32	2822	750
2200 *	10.000	30.000	14.000	0.60	18	5.556	760	162
	.3937	1.1811	.5512	.024		7-32	1676	357
2201 *	12.000	32.000	14.000	0.60	20	5.556	790	177
	.4724	1.2593	.5512	.024		7-32	1742	390
2202 *	15.000	35.000	14.000	0.60	22	5.556	795	188
	.5906	1.3780	.5512	.024		7-32	1753	414
2203 *	17.000	40.000	16.000	0.60	22	6.350	1010	247
	.6693	1.5748	.6299	.024		1-4	2227	545
2204 *	20.000	47.000	18.000	1.10	24	7.144	1310	340
	.7874	1.8504	.7087	.043		9-32	2888	750
2205 *	25.000	52.000	18.000	1.00	26	7.144	1270	350
	.9843	2.0472	.7087	.040		9-32	2800	772
2206 ※	30.000	62.000	20.000	1.00	28	7.938	1560	460
	1.1811	2.4409	.7874	.039		5-16	3439	1014

* Rubber Seals type available

※ M cage only

SELF-ALIGNING BALL BEARINGS 23 SERIES



Dimensions $\frac{\text{mm}}{\text{inches}}$

BEARING NUMBER	BORE	O.D.	WIDTH	CHAMFER	BALLS		LOAD RATINGS	
	d	D	B	r min.	NO.	SIZE	DYNAMIC C (kgf/lbf)	STATIC Co (kgf/lbf)
2300 *	10.000	35.000	17.000	0.60	18	6.350	953	205
	.3937	1.3780	.6693	.024		1-4	2101	452
2301 *	12.000	37.000	17.000	1.10	18	7.144	1240	278
	.4724	1.4567	.6693	.043		9-32	2734	613
2302 *	15.000	42.000	17.000	1.10	20	7.144	1250	296
	.5906	1.6535	.6693	.043		9-32	2756	653
2303 *	17.000	47.000	19.000	1.10	20	7.938	1500	365
	.6693	1.8504	.7480	.043		5-16	3307	805
2304 *	20.000	52.000	21.000	1.10	22	8.731	1880	480
	.7874	2.0472	.8268	.043		11-32	4145	1058
2305 ※	25.000	62.000	24.000	1.50	22	10.319	2520	675
	.9843	2.4409	.9449	.043		13-32	5578	1488

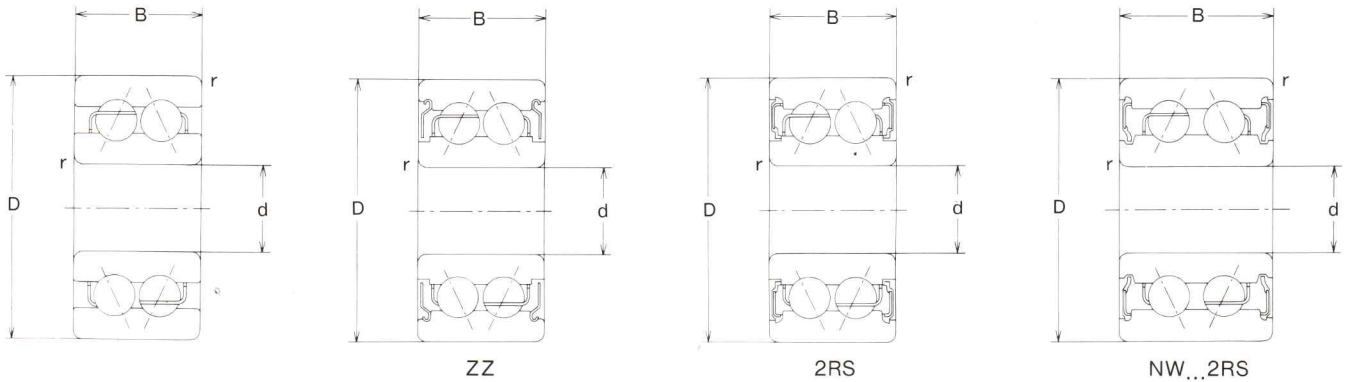
* Rubber Seals type available
 ※ M cage only

IJK

DOUBLE ROW ANGULAR CONTACT BALL BEARINGS

52 SERIES

53 SERIES



Dimensions $\frac{\text{mm}}{\text{inches}}$

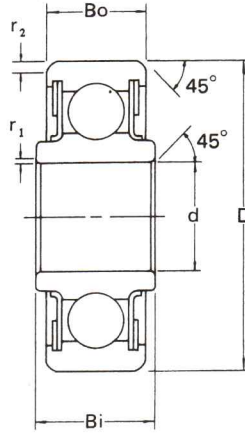
BEARING NUMBER	BORE d	O.D. D	WIDTH B	CHAMFER r min.	BALLS		LOAD RATINGS	
					NO.	SIZE	DYNAMIC C (kgf/lbf)	STATIC C ₀ (kgf/lbf)
5200	10.000	30.000	14.30	0.60	14	4.762	730	400
	.3937	1.1811	.5630	.024		3-16	1609	882
NW5200-2RS	10.000	30.000	17.462	0.60	14	4.762	730	400
	.3937	1.1811	.6875	.024		3-16	1609	882
5201 *	12.000	32.000	15.90	0.60	14	5.953	1070	590
	.4724	1.2598	.6260	.024		15-64	2359	1301
5201T1X ※	12.000	32.000	15.90	0.60	18	4.762	865	480
	.4724	1.2598	.6260	.024		3-16	1907	1058
5202 *	15.000	35.000	15.90	0.60	16	5.953	1190	715
	.5906	1.3780	.6260	.024		15-64	2624	1576
5202T1X ※	15.000	35.000	15.90	0.60	18	4.762	865	480
	.5906	1.3780	.6260	.024		3-16	1907	1058
5203	17.000	40.000	17.462	0.60	18	5.556	1170	765
	.6693	1.5748	.6875	.024		7-32	2579	1687
W5203-2RS	17.000	40.000	20.638	0.60	18	5.556	1170	765
	.6693	1.5748	.8125	.024		7-32	2579	1687
5204 *	20.000	47.000	20.60	1.0	16	7.938	2000	1270
	.7874	1.8504	.8110	.040		5-16	1416	2800
5204ZZ	20.000	47.000	20.60	1.0	18	6.747	1620	1090
	.7874	1.8504	.8110	.040		17-64	3571	2403
5205 *	25.000	52.000	20.60	1.0	18	7.938	2170	1500
	.9843	2.0472	.8110	.040		5-16	4791	3307
5205T12ZZ	25.000	52.000	20.60	1.0	20	6.747	1730	1260
	.9843	2.0472	.8110	.040		17-64	3814	2778
5206 *	30.000	62.000	23.80	1.0	18	9.525	3000	2150
	1.1811	2.4409	.9370	.040		3-8	6615	4740
5206ZZ	30.000	62.000	23.80	1.0	18	8.731	2570	1850
	1.1811	2.4409	.9370	.040		11-32	5667	4079
5300T12 ※	10.000	35.000	19.05	0.60	14	5.953	1060	560
	.3937	1.3780	.7500	.024		15-64	2337	1235
5301	12.000	37.000	19.05	1.0	14	6.350	1210	640
	.4724	1.4567	.7500	.040		1-4	2668	1411
5302	15.000	42.000	19.05	1.0	16	6.350	1370	755
	.5906	1.6535	.7500	.040		1-4	3020	1664
5303	17.000	47.000	22.225	1.0	16	7.144	1600	955
	.6693	1.8504	.8750	.040		9-32	3527	2105
5304 *	20.000	52.000	22.20	1.5	14	9.525	2510	1530
	.7874	2.0472	.8740	.059		3-8	5534	3373
5304ZZ	20.000	52.000	22.20	1.5	16	7.938	2010	1300
	.7874	2.0472	.8740	.059		5-16	4432	2866
5305 *	25.000	62.000	25.40	1.5	14	11.112	3350	2110
	.9843	2.4409	1.000	.059		7-16	7387	4653
5305ZZ	25.000	62.000	25.40	1.5	18	8.731	2570	1850
	.9843	2.4409	1.000	.059		11-32	5667	4079

* Open type only.
 ※ Plastic cage.

ZZ,2RS types related to 52xx series available
 (Basic reference 5000, 5001, 508 series available)

**CONTROL BEARINGS
KP-A SERIES
SINGLE ROW
RADIAL TYPE**

Equipped with teflon seals.



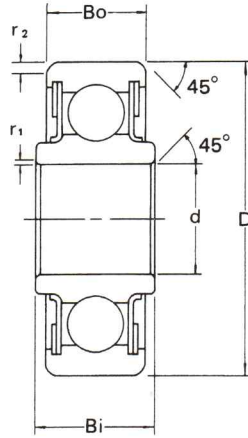
X : Non-Plated

Dimensions $\frac{\text{mm}}{\text{inches}}$

BEARING NUMBER	BORE		O.D.		WIDTH		MINIMUM CHAMFER		BALLS		LIMITED LOAD RATINGS	
	d	D	Bi	Bo	r ₁	r ₂	NO.	SIZE	RADIAL	THRUST	(kgf)	(kgf)
											(lbf)	(lbf)
	+0.000	+0.000	+0.00	+0.00	+0.38	+0.38						
	-0.013	-0.013	-0.13	-0.13	-0.00	-0.00						
	+0.000	+0.000	+0.00	+0.00	+0.015	+0.015						
	-0.005	-0.005	-0.05	-0.05	-0.00	-0.00						
KP3ALX	4.826	12.700	6.02	4.98	0.13	0.30	11	2.381	440	195		
	.1900	.5000	.237	.196	.005	.012		3-32	970	430		
KP 3AX	4.826	15.875	7.54	5.94	0.13	0.41	10	3.175	708	318		
	.1900	.6250	.297	.234	.005	.016		1-8	1560	700		
KP 4AX	6.350	19.050	7.14	5.56	0.13	0.41	12	3.175	853	408		
	.2500	.7500	.281	.219	.005	.016		1-8	1880	900		
KP 5AX	7.938	20.638	7.54	5.94	0.38	0.41	14	3.175	993	454		
	.3125	.8125	.297	.234	.015	.016		1-8	2190	1000		
KP 6AX	9.525	22.225	7.95	6.35	0.38	0.41	16	3.175	1134	499		
	.3750	.8750	.313	.250	.015	.016		1-8	2500	1100		
KP 8AX	12.700	28.575	9.52	7.95	0.38	0.41	16	3.969	1774	771		
	.5000	1.1250	.375	.313	.015	.016		5-32	3910	1700		
KP10AX	15.875	34.925	10.31	8.74	0.38	0.81	14	5.556	3039	1361		
	.6250	1.3750	.406	.344	.015	.032		7-32	6700	3000		

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CONTROL BEARINGS
KP SERIES
SINGLE ROW
RADIAL TYPE



Equipped with teflon seals.

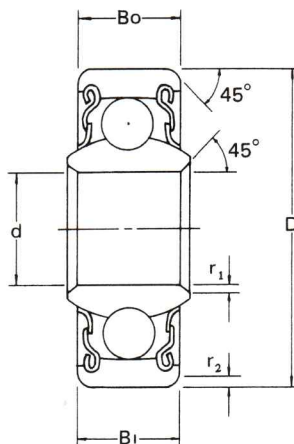
X : Non-Plated

Dimensions $\frac{\text{mm}}{\text{inches}}$

BEARING NUMBER	BORE		O.D.		WIDTH		MINIMUM CHAMFER		BALLS		LIMITED LOAD RATINGS	
	d	D	Bi	Bo	r ₁	r ₂	NO.	SIZE	RADIAL	THRUST	(kgf)	(kgf)
											(lbf)	(lbf)
	+0.000	+0.000	+0.00	+0.00	+0.38	+0.38						
	-0.013	-0.013	-0.13	-0.13	-0.00	-0.00						
	+0.000	+0.000	+0.00	+0.00	+0.15	+0.15						
	-0.0005	-0.0005	-0.005	-0.005	-0.00	-0.00						
KP3LX	4.826	15.875	6.22	5.16	0.13	0.25	10	3.175	708	318		
	.1900	.6250	.245	.203	.005	.010		1-8	1560	700		
KP 3X	4.826	19.746	7.54	6.86	0.13	0.56	12	3.175	853	408		
	.1900	.7774	.297	.270	.005	.022		1-8	1880	900		
KP 4X	6.350	22.896	12.29	8.51	0.13	0.81	11	3.969	1216	544		
	.2500	.9014	.484	.335	.005	.032		5-32	2680	1200		
KP 5X	7.938	31.750	14.17	9.52	0.38	0.81	9	6.350	2549	1134		
	.3125	1.2500	.558	.375	.015	.032		1-4	5620	2500		
KP 6X	9.525	36.516	15.75	11.91	0.38	0.81	10	7.144	3588	1588		
	.3750	1.4375	.620	.469	.015	.032		9-32	7910	3500		
KP 8X	12.700	42.862	15.75	12.70	0.38	1.12	10	9.525	5352	2359		
	.5000	1.6875	.620	.500	.015	.044		3-8	11800	5200		
KP10X	15.875	49.212	15.75	12.70	0.38	1.12	10	9.525	6396	2812		
	.6250	1.9375	.620	.500	.015	.044		3-8	14100	6200		

**CONTROL BEARINGS
KSP, KSP-A SERIES
SINGLE ROW
SELF-ALIGNING TYPE**

Equipped with teflon seals.



X : Non-Plated

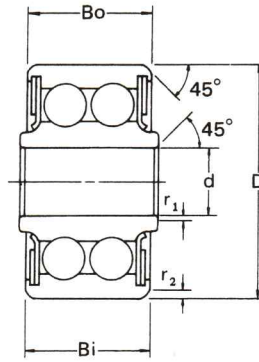
Dimensions $\frac{\text{mm}}{\text{inches}}$

BEARING NUMBER	BORE		O.D.		WIDTH		MINIMUM CHAMFER		BALLS		LIMITED LOAD RATINGS	
	d	D	Bi	Bo	r ₁	r ₂	NO.	SIZE	RADIAL	THRUST	(kgf)	(kgf)
	+0.000	+0.000	+0.00	+0.00	+0.38	+0.38					(kgf)	(kgf)
	-0.013	-0.013	-0.13	-0.13	-0.00	-0.00					(lbf)	(lbf)
	+0.000	+0.000	+0.00	+0.00	+0.015	+0.015						
	-0.005	-0.005	-0.005	-0.005	-0.000	-0.000						
KSP3LX	4.826	15.875	6.22	5.16	0.13	0.41	13	2.381	249	45		
	.1900	.6250	.245	.203	.005	.016		3-32	550	100		
KSP4AX	6.350	19.050	7.14	5.56	0.13	0.41	12	3.175	408	91		
	.2500	.7500	.281	.219	.005	.016		1-8	900	200		
KSP5AX	7.938	20.638	7.54	5.94	0.38	0.41	14	3.175	454	91		
	.3125	.8125	.297	.234	.015	.016		1-8	1000	200		
KSP6AX	9.525	22.225	7.95	6.35	0.41	0.41	15	3.175	508	91		
	.3750	.8750	.313	.250	.016	.016		1-8	1120	200		
KSP 3X	4.826	19.746	7.54	6.86	0.13	0.56	12	3.175	408	91		
	.1900	.7774	.297	.270	.005	.022		1-8	900	200		
KSP 4X	6.350	22.896	12.29	8.51	0.13	0.81	13	3.572	640	136		
	.2500	.9014	.484	.335	.005	.032		9-64	1410	300		
KSP 5X	7.938	31.750	14.17	9.52	0.38	0.81	13	4.762	993	186		
	.3125	1.2500	.558	.375	.015	.032		3-16	2190	300		
KSP 6X	9.525	36.512	15.75	11.91	0.38	0.81	13	5.556	1352	181		
	.3750	1.4375	.620	.469	.015	.032		7-32	2980	400		
KSP 8X	12.700	42.862	15.75	12.70	0.38	1.12	16	5.556	1665	227		
	.5000	1.6875	.620	.500	.015	.044		7-32	3670	500		
KSP10X	15.875	49.212	20.65	15.88	0.38	1.12	14	7.144	2413	272		
	.6250	1.9375	.813	.625	.015	.044		9-32	5320	600		

IJK

**CONTROL BEARINGS
DPP SERIES
DOUBLE ROW
RADIAL TYPE**

Equipped with teflon seals.

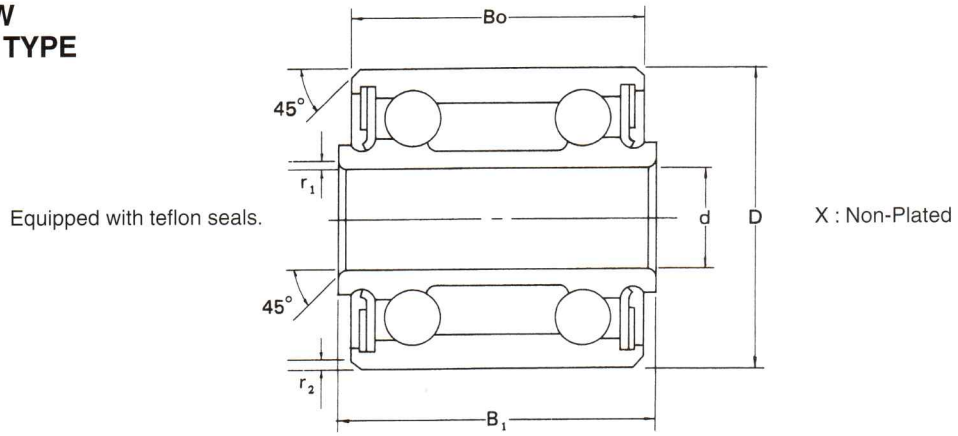


X : Non-Plated

Dimensions $\frac{\text{mm}}{\text{inches}}$

BEARING NUMBER	BORE		O.D.		WIDTH		MINIMUM CHAMFER		BALLS		LIMITED LOAD RATINGS	
	d		D		Bi		Bo		NO. SIZE		RADIAL THRUST	
											$\left(\frac{\text{kgf}}{\text{lbf}}\right)$	
	+0.000	+0.000	+0.00	+0.00	+0.38	+0.38						
	-0.013	-0.013	-0.13	-0.13	-0.00	-0.00						
	+0.0000	+0.0000	+0.000	+0.000	+0.015	+0.015						
	-0.0005	-0.0005	-0.005	-0.005	-0.000	-0.000						
DPP 3X	4.826	19.746	12.57	12.01	0.13	0.46	20	3.969	1338	771		
	.1900	.7774	.495	.473	.005	.018		5-32	2950	1700		
DPP 4X	6.350	22.896	15.75	12.47	0.13	0.81	22	3.969	2436	816		
	.2500	.9014	.620	.491	.005	.032		5-32	5370	1800		
DPP 5X	7.938	31.750	18.92	17.45	0.38	0.81	22	5.953	499	1814		
	.3125	1.2500	.745	.687	.015	.032		15-64	11000	4000		
DPP 6X	9.525	36.512	22.10	20.17	0.38	0.81	20	7.144	7149	2404		
	.3750	1.4375	.870	.794	.015	.032		9-32	15760	5300		
DPP 8X	12.700	42.862	23.67	21.74	0.38	1.12	20	8.731	10705	3538		
	.5000	1.6875	.932	.856	.015	.044		11-32	23600	7800		
DPP10X	15.875	49.212	25.27	23.37	0.38	1.12	24	8.731	12882	4264		
	.6250	1.9375	.995	.920	.015	.044		11-32	28400	9400		

**CONTROL BEARINGS
DW SERIES
DOUBLE ROW
EXTRA WIDE TYPE**



Dimensions $\frac{\text{mm}}{\text{inches}}$

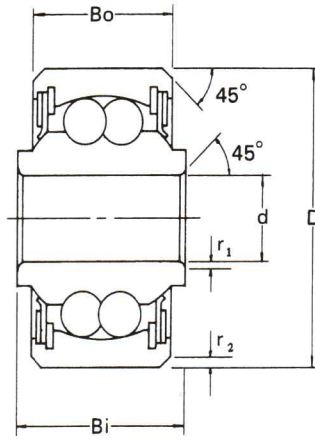
BEARING NUMBER	BORE		O.D.		WIDTH		MINIMUM CHAMFER		BALLS		LIMITED LOAD RATINGS	
	d	D	Bi	Bo	r ₁	r ₂	NO.	SIZE	RADIAL	THRUST	(kgf)	(kgf)
	$\frac{\text{mm}}{\text{inches}}$											
	+0.000	+0.000	+0.00	+0.00	+0.38	+0.38						
	-0.013	-0.013	-0.13	-0.13	-0.00	-0.00						
	+0.000	+0.000	+0.00	+0.00	+0.015	+0.015					(kgf)	(kgf)
	-0.0005	-0.0005	-0.005	-0.005	-0.000	-0.000					(lbf)	(lbf)
DW4K2X*	6.350	15.875	14.27	12.70	0.13	0.41	16	2.381	635	227		
	.2500	.6250	.562	.500	.005	.016		3-32	1400	500		
DW4KX *	6.350	19.050	22.22	19.05	0.13	0.41	14	3.572	1256	408		
	.2500	.7500	.875	.750	.005	.016		9-64	2770	900		
DW4X	6.350	19.050	22.22	19.05	0.13	0.41	24	3.175	1701	562		
	.2500	.7500	.875	.750	.005	.016		1-8	3750	1240		
DW5X	7.938	22.225	23.83	20.65	0.13	0.41	26	3.572	2332	726		
	.3125	.8750	.938	.813	.005	.016		9-64	5140	1600		
DW6X	9.525	26.988	30.18	27.00	0.13	0.41	24	4.762	3828	1179		
	.3750	1.0625	1.188	1.063	.005	.016		3-16	8440	2600		

* Retainer type

IJK

**CONTROL BEARINGS
DSP SERIES
DOUBLE ROW
SELF-ALIGNING TYPE**

Equipped with teflon seals.



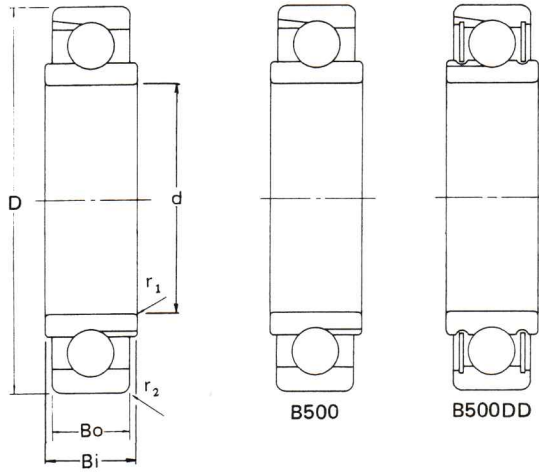
X : Non-Plated

Dimensions $\frac{\text{mm}}{\text{inches}}$

BEARING NUMBER	BORE		O.D.		WIDTH		MINIMUM CHAMFER		BALLS		LIMITED LOAD RATINGS	
	d	D	Bi	Bo	r ₁	r ₂	NO.	SIZE	RADIAL	THRUST	(kgf)	(kgf)
											(lbf)	(lbf)
	+0.000	+0.000	+0.00	+0.00	+0.38	+0.38						
	-0.013	-0.013	-0.13	-0.13	-0.00	-0.00						
	+0.000	+0.000	+0.00	+0.00	+0.015	+0.015						
	-0.0005	-0.0005	-0.005	-0.005	-0.000	-0.000						
DSP 3X	4.826	19.746	12.70	9.96	0.13	0.56	24	3.175	644	91		
	.1900	.7774	.500	.392	.005	.022		1-8	1420	200		
DSP 4X	6.350	22.896	17.45	11.79	0.13	0.81	30	3.175	807	136		
	.2500	.9014	.687	.464	.005	.032		1-8	1780	300		
DSP 5X	7.938	31.750	20.62	16.66	0.38	0.81	28	4.762	1696	272		
	.3125	1.2500	.812	.656	.015	.032		3-16	3740	600		
DSP 6X	9.525	36.512	23.80	19.05	0.38	0.81	28	5.556	2313	363		
	.3750	1.4375	.937	.750	.015	.032		7-32	5100	800		
DSP 8X	12.700	42.862	25.40	20.62	0.38	1.12	30	6.350	3230	454		
	.5000	1.6875	1.000	.812	.015	.044		1-4	7120	1000		
DSP10X	15.875	49.212	28.58	23.80	0.38	1.12	30	7.144	4082	590		
	.6250	1.9375	1.125	.937	.015	.044		9-32	9000	1300		

**CONTROL BEARINGS
B500, B500DD SERIES
SINGLE ROW
TORQUE TUBE TYPE**

DD: Equipped with teflon coated glass fabric seals.



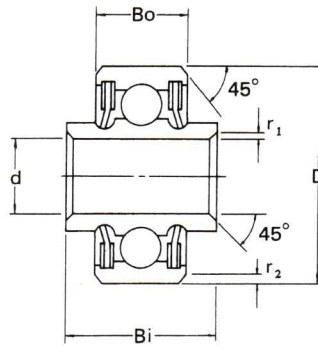
Dimensions $\frac{\text{mm}}{\text{inches}}$

BEARING NUMBER	BORE	O.D.	WIDTH		MINIMUM CHAMFER		BALLS		LIMITED LOAD RATINGS	
	d	D	Bi	Bo	r ₁	r ₂	NO.	SIZE	RADIAL R (kgf) (lbf)	THRUST T (kgf) (lbf)
TYPE	+0.018	+0.000	+0.00	+0.00	0.38	0.38				
OPEN SEAL	-0.018	-0.025	-0.13	-0.13	.015	.015				
	+0.0007	+0.0000	+0.000	+0.000						
	-0.0007	-0.0010	-0.005	-0.005						
B538,B538DDX	15.875 .6250	26.988 1.0625	7.14 .281	6.35 .250	0.38 .015	0.38 .015	21	3.175 1-8	1487 3280	680 1500
B539,B539DDX	19.050 .7500	30.162 1.1875	7.14 .281	6.35 .250	0.38 .015	0.38 .015	24	3.175 1-8	1701 3750	771 1700
B540,B540DDX	22.225 .8750	33.338 1.3125	7.14 .281	6.35 .250	0.38 .015	0.38 .015	27	3.175 1-8	1914 4220	862 1900
B541,B541DDX	26.988 1.0625	38.100 1.5000	7.14 .281	6.35 .250	0.38 .015	0.38 .015	32	3.175 1-8	2268 5000	998 2200
B542,B542DDX	33.338 1.3125	44.450 1.7500	7.14 .281	6.35 .250	0.38 .015	0.38 .015	38	3.175 1-8	2699 5950	1225 2700
B543,B543DDX	39.688 1.5625	50.800 2.0000	7.14 .281	6.35 .250	0.38 .015	0.38 .015	44	3.175 1-8	3121 6880	1452 3200

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**CONTROL BEARINGS
P SERIES
SINGLE ROW
RADIAL TYPE**

Equipped with teflon seals.



X : Non-Plated

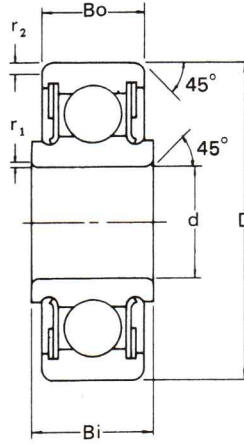
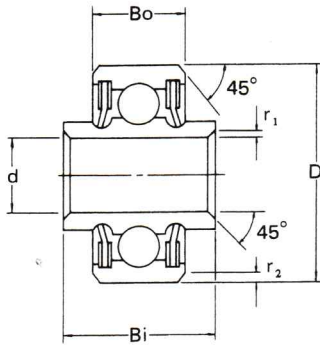
Dimensions $\frac{\text{mm}}{\text{inches}}$

BEARING NUMBER	BORE		O.D.		WIDTH		MINIMUM CHAMFER		BALLS		LIMITED LOAD RATINGS	
	d	D	Bi	Bo	r ₁	r ₂	NO.	SIZE	RADIAL	THRUST	(kgf)	(kgf)
											(lbf)	(lbf)
	+0.000	+0.000	+0.00	+0.00	+0.38	+0.38						
	-0.013	-0.013	-0.13	-0.13	-0.00	-0.00						
	+0.0000	+0.0000	+0.000	+0.000	+0.015	+0.015						
	-0.0005	-0.0005	-0.005	-0.005	-0.000	-0.000						
KP3KX	4.826	19.746	7.54	6.86	0.13	0.61	7	3-175	494	272		
	.1900	.7774	.297	.270	.005	.024		1-8	1090	600		
KP3AKX	4.826	15.875	7.54	5.94	0.13	0.41	8	2-381	320	175		
	.1900	.6250	.297	.234	.005	.016		3-32	705	385		
KP3AK-2X	4.826	15.875	15.88	5.94	0.13	0.41	8	2-381	320	175		
	.1900	.6250	.625	.234	.005	.016		3-32	705	385		
W4AKX	6.350	19.050	11.13	7.92	0.13	0.41	7	3-175	494	272		
	.2500	.7500	.438	.312	.005	.016		1-8	1090	600		
KP4KX	6.350	22.896	12.29	8.51	0.13	0.86	7	3-969	776	363		
	.2500	.9014	.484	.335	.005	.034		5-32	1710	800		

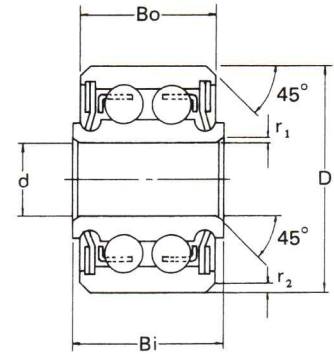
IJK

CONTROL BEARINGS P SERIES

Equipped with teflon seals.



X : Non-Plated



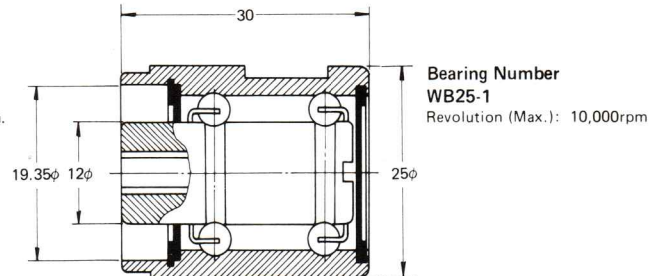
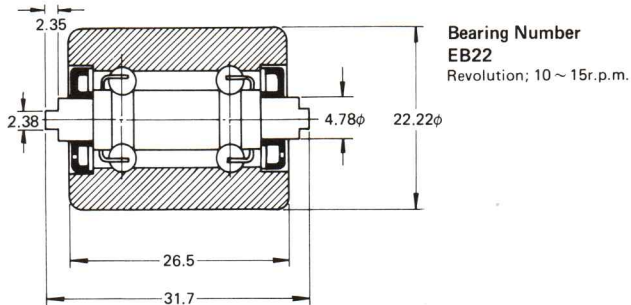
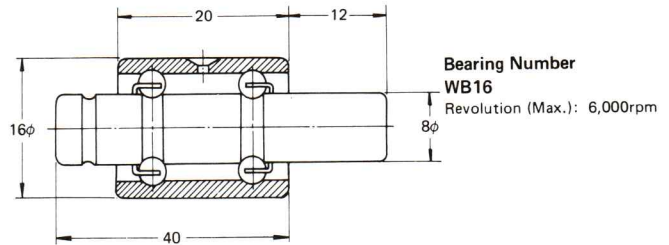
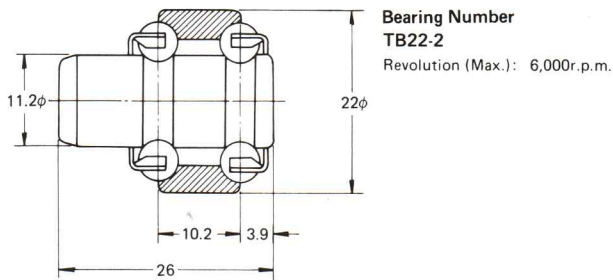
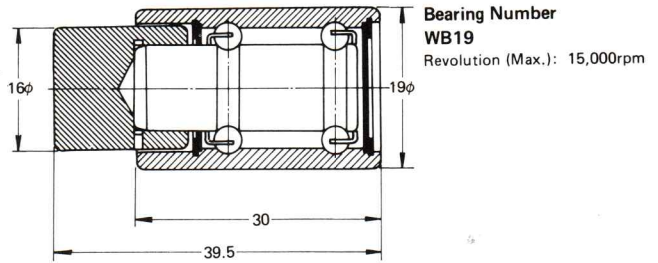
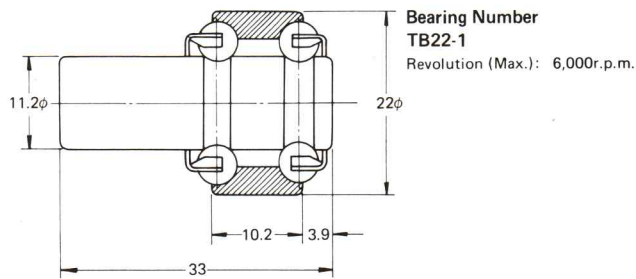
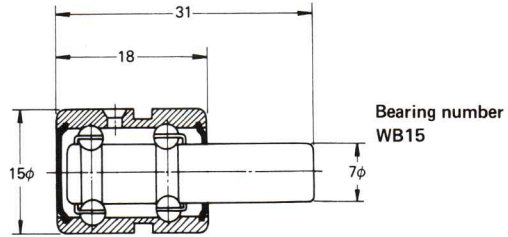
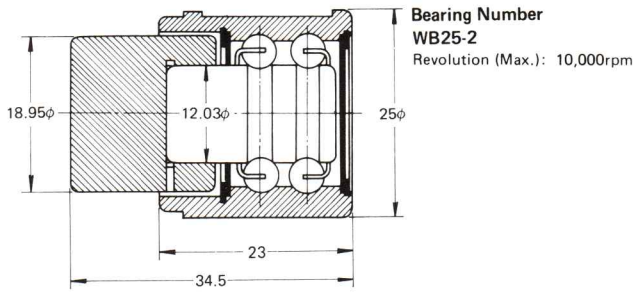
Dimensions $\frac{\text{mm}}{\text{inches}}$

BEARING NUMBER	BORE		O.D.		WIDTH		MINIMUM CHAMFER		BALLS		LIMITED LOAD RATINGS	
	d	D	Bi	Bo	r ₁	r ₂	NO.	SIZE	RADIAL	THRUST	(kgf)	(kgf)
											(lbf)	(lbf)
	+0.000	+0.000	+0.00	+0.00	+0.38	+0.38						
	-0.013	-0.013	-0.13	-0.13	-0.00	-0.00						
	+0.000	+0.000	+0.00	+0.00	+0.015	+0.015						
	-0.0005	-0.0005	-0.005	-0.005	-0.000	-0.000						
P 4KX	6.350	22.225	11.13	9.52	0.13	0.56	7	3.969	776	363		
	.2500	.8750	.438	.375	.005	.022		5-32	1710	800		
P 5KX	7.938	22.225	15.88	9.52	0.13	0.56	7	3.969	776	363		
	.3125	.8750	.625	.375	.005	.022		5-32	1710	800		
PD5KX	7.938	23.812	15.88	14.30	0.13	0.56	14	3.969	1551	467		
	.3125	.9375	.625	.563	.005	.022		5-32	3420	1030		
P 8X *	12.700	42.862	19.05	14.30	0.13	0.81	10	8.731	5352	2359		
	.5000	1.6875	.750	.563	.005	.032		11-32	11800	5200		
P10KX	15.875	30.162	11.13	9.52	0.13	0.56	10	3.969	1107	499		
	.6250	1.1875	.438	.375	.005	.022		5-32	2440	1100		

* Full complement-no cage.

IJK

**SPECIAL BEARINGS
DOUBLE ROW BALL BEARINGS
FOR SPINNING MACHINE**



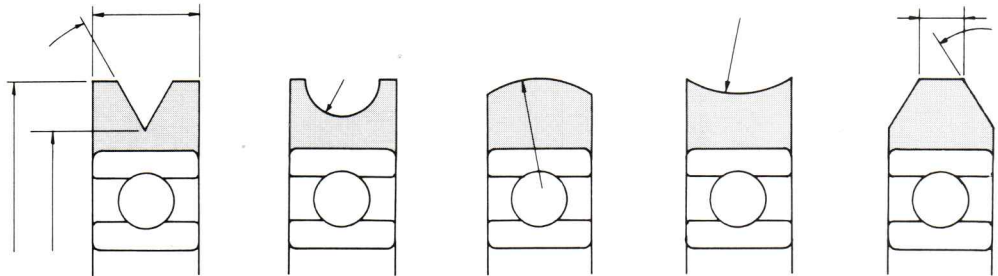
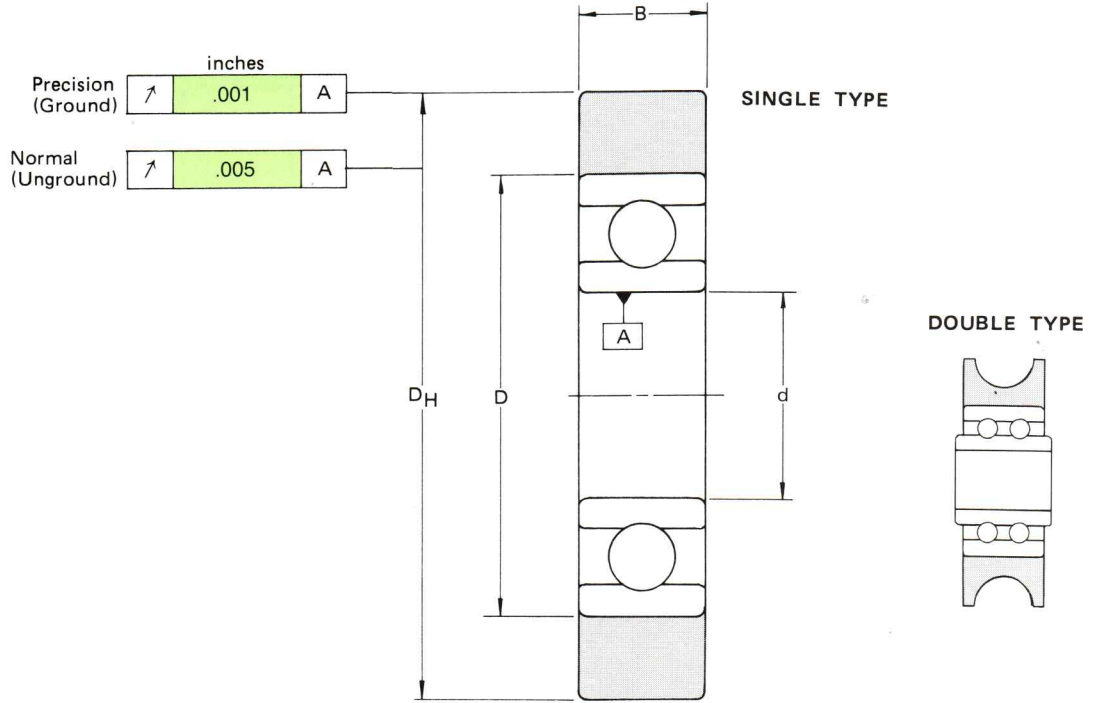
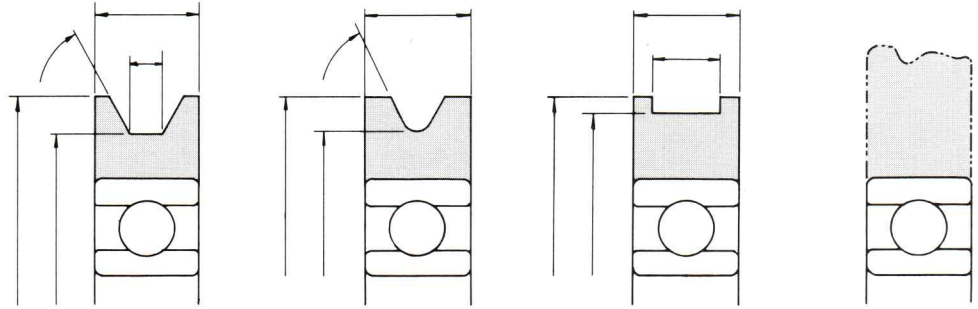
SPECIAL BEARINGS

HOUSING TYPE BALL BEARINGS

MATERIAL: HARD ANODIZED ALUMINUM, ACETAL RESIN SAE 52100 CHROME STEEL,
AISI 440C STAINLESS STEEL

INSERT BEARING: SINGLE ROW BALL BEARING, DOUBLE ROW BEARING

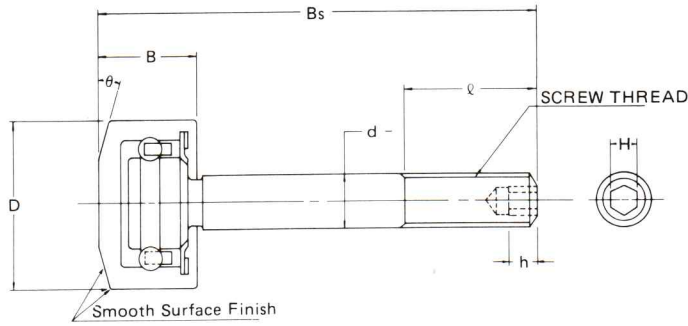
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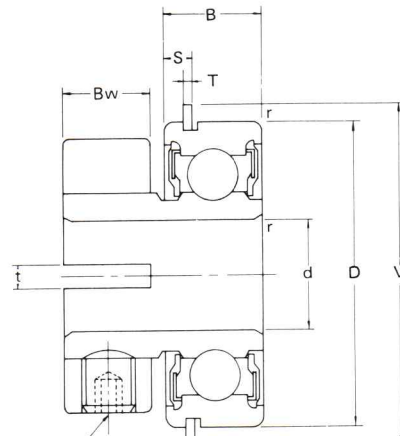
BALL **29** BEARINGS

SPECIAL BEARINGS

CARRIER ROLL BEARING WITH THREADED STUD



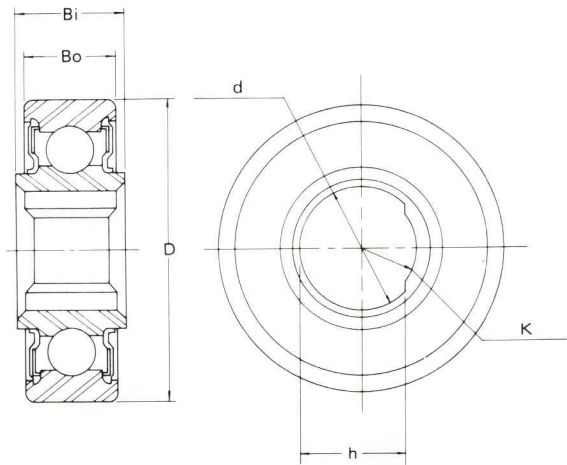
POWER TRANSMISSION TYPE BALL BEARING



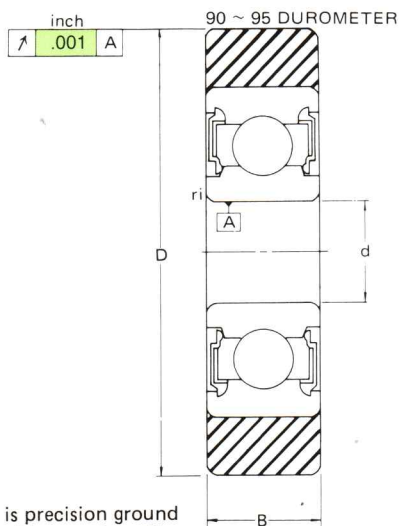
HEXAGON SOCKET HEAD LESS SCREW

A cup-point, hexagon socket type set screw lock the collar to the shaft.

SPECIAL HOLE TYPE BALL BEARING

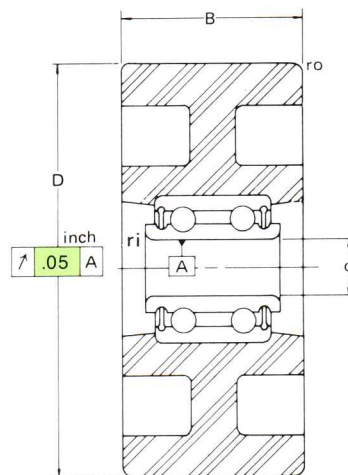


DRIVE ROLLS BEARING



The Urethane tire is precision ground on the O.D. to provide a straight, flat and true running contact surface.

IDLER BEARING



ENGINEERING SECTION

MATERIAL

As regard the material of bearings, JIS G4805 High Carbon Chromium Bearing Steel Class 2 (SUJ2) is in general use, but where corrosion resistance is required, JIS G4303 Stainless Steel Bar Class 440 (SUS 440C) which belongs to martensite type stainless steel used.

Table 1 Composition of bearing material

Kind of steel	Symbol	Chemical composition							Similar steel
		C	Si	Mn	P	S	Cr	Mo	
High Carbon Chromium Bearing Steel Class 2	SUJ 2	0.95 ~ 1.10	0.15 ~ 0.35	Max. 0.50	Max. 0.025	Max. 0.025	1.30 ~ 1.60	—	AISI 52100
Stainless Steel Bar Class 440	SUS 440C	0.95 ~ 1.20	Max. 1.00	Max. 1.00	Max. 0.040	Max. 0.030	16.00 ~ 18.00	Max. 0.75	AISI 440C

TOLERANCE

The bearings, which are important mechanical elements are used for every machinery, have internationally standardized: ISA, ISO.

The countries of the world have the standards of the bearings:

JIS (JAPAN), ANSI/AFBMA (U.S.A.), DIN (Germany), BS (England)

IJK have applied AFBMA STANDARDS.

AFBMA STANDARDS NO. 20

(METRIC BALL AND ROLLER BEARINGS)

AFBMA STANDARDS NO. 12

(INSTRUMENT BALL BEARINGS)

ABEC 1 – ABEC 7

ABEC 3 – ABEC 7P, ABEC 7T

Selection of Tolerance

Tolerance class of bearings is designated according to application.

Table 2 Selection of tolerance class

Place of application	Tolerance class
Electric motor, generator, servomechanism, cam mechanism, pinch roller, servomotor, low sensitivity synchro, etc.	ABEC 1, ABEC 3,
Gyro gimbals & rotor, high sensitivity synchro, servomotor, resolver, potentiometer, high frequency spindle, etc.	ABEC 5P, ABEC 7P,

IJK

INTERNAL CLEARANCE

The internal clearance of bearing has a considerable affect upon the life, generation of heat, and noise of the bearing; Accordingly, it is important to select clearance most suitable for the working conditions.

To determine the clearance of bearings, the following should be taken into account.

Decrease of the clearance by fitting.

Decrease of the clearance by the difference of temperature of the inner and outer rings.

The most suitable operating clearance.

IJK Tolerance Limits are shown in the following table. (Table 3 ~ Table 8)

(AFBMA Tolerance Limits See Table 9)

Table 3 Radial Internal Clearance in Single Row Deep Groove Ball Bearings under No Load

Values in 0.001 mm

Nominal Bore Diameter <i>d</i> mm		Radial Internal Clearance							
		C2		Normal		C3		C4	
Over	Incl	Low	High	Low	High	Low	High	Low	High
(10mm only*)		—	7	2	13	8	23	14	29
10	18	—	9	3	18	11	25	18	33
18	24	—	10	5	20	13	28	20	36
24	30	—	11	5	20	13	28	23	41
30	40	—	11	6	20	15	33	28	46
40	50	—	11	6	23	18	36	30	51
50	65	—	15	8	28	23	43	38	61

Values in 0.0001 inch

Nominal Bore Diameter <i>d</i> inch		Radial Internal Clearance							
		C2		Normal		C3		C4	
Over	Incl	Low	High	Low	High	Low	High	Low	High
(0.3937 inch only*)		—	2.8	0.8	5.1	3.1	9.1	5.5	11.4
0.3937	0.7087	—	3.5	1.2	7.1	4.3	9.8	7.1	13.0
0.7087	0.9449	—	3.9	2.0	7.9	5.1	11.0	7.9	14.2
0.9449	2.1811	—	4.3	2.0	7.9	5.1	11.0	9.1	16.1
1.1811	1.5748	—	4.3	2.4	7.9	5.9	13.0	11.0	18.1
1.5748	1.9685	—	4.3	2.4	9.1	7.1	14.2	11.8	20.1
1.9685	2.5591	—	5.9	3.1	11.0	9.1	16.9	15.0	24.0

Table 4 Radial Internal Clearance in Extra Small and Miniature Ball Bearings under No Load

Values in 0.001 mm

Clearance Symbols	MC1		MC2		MC3		MC4		MC5		MC6	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Radial Internal Clearance	0	5	3	8	5	10	8	13	13	20	20	28
Nominal Bore Diameter $d < 10\text{mm}(0.3937\text{ inch})$												
Values in 0.0001 inch												
Clearance Symbols	MC1		MC2		MC3		MC4		MC5		MC6	
	Low	High	Low	High	Low	High	Low	High	Low	High	Low	High
Radial Internal Clearance	0	2.0	1.2	3.1	2.0	3.9	3.1	5.1	5.1	7.9	7.9	11.0

Table 5 Radial Internal Clearances in Magneto Bearings under No Load

Nominal Bore Diameter d				Radial Internal Clearance			
mm		inch		Values in 0.001 mm		Values in 0.0001 inch	
Over	Incl	Over	Incl	Low	High	Low	High
2.5	30	0.0984	1.1811	30	60	11.8	23.6

Table 6 Radial Internal Clearances of Deep Groove Ball Bearings for Electric Motors

Nominal Bore Diameter d				Radial Internal Clearance CM			
mm		inch		Values in 0.001 mm		Values in 0.0001 inch	
Over	Incl	Over	Incl	Low	High	Low	High
($d=$) 10	10	($d=$) 0.3937	0.3937	4	11	1.6	4.3
10	18	0.3937	0.7087	4	11	1.6	4.3
18	30	0.7087	1.1811	5	12	2.0	4.7
30	50	1.1811	1.9685	9	17	3.5	6.7



Table 7 Radial Internal Clearances in Self-Aligning Ball Bearings with Cylindrical Bore under No Load

Values in 0.001 mm

Nominal Bore Diameter <i>d</i> mm		Radial Internal Clearance							
		C2		Normal		C3		C4	
Over	Inch	Low	High	Low	High	Low	High	Low	High
2.5	6	1	5	5	10	10	15	15	21
6	10	2	6	6	12	12	19	19	27
10	14	2	6	6	13	13	21	21	30
14	18	3	8	8	15	15	23	23	32
18	24	4	10	10	17	17	25	25	34
24	30	5	11	11	19	19	29	29	40
30	40	6	13	13	23	23	34	34	46
40	50	6	14	14	25	25	37	37	50
50	65	7	16	16	30	30	45	45	65

Values in 0.001 inch

Nominal Bore Diameter <i>d</i> inch		Radial Internal Clearance							
		C2		Normal		C3		C4	
Over	Incl	Low	High	Low	High	Low	High	Low	High
0.0984	0.2362	0.4	2.0	2.0	3.9	3.9	5.9	5.9	8.3
0.2362	0.3937	0.8	2.4	2.4	4.7	4.7	7.5	7.5	10.6
0.3937	0.5512	0.8	2.4	2.4	5.1	5.1	8.3	8.3	11.8
0.5512	0.7087	1.2	3.1	3.1	5.9	5.9	9.1	9.1	12.6
0.7087	0.9449	1.6	3.9	3.9	6.7	6.7	9.8	9.8	13.4
0.9449	1.1811	2.0	4.3	4.3	7.5	7.5	11.4	11.4	15.7
1.1811	1.5748	2.4	5.1	5.1	9.1	9.1	13.4	13.4	18.1
1.5748	1.9685	2.4	5.5	5.5	9.8	9.8	14.6	14.6	19.7
1.9685	2.5591	2.8	6.3	6.3	11.8	11.8	17.7	17.7	25.6
2.5591	3.1496	3.1	7.1	7.1	13.8	13.8	21.3	21.3	29.9
3.1496	3.9370	3.5	8.7	8.7	16.5	16.5	25.2	25.2	35.0
3.9370	4.7244	3.9	9.8	9.8	19.7	19.7	29.5	29.5	41.3

Table 8 Axial Internal Clearances in Double Row Angular Contact Ball Bearings under No Load

Values in 0.001 mm

Nominal Bore Diameter <i>d</i> mm		Axial Internal Clearance					
		C2		Normal		C3	
Over	Incl	Low	High	Low	High	Low	High
—	10	0	6	4	11	11	18
10	18	0	6	4	14	14	24
18	24	0	8	6	16	16	27
24	30	0	8	6	17	17	28
30	40	0	9	7	18	18	29
40	50	0	10	9	20	20	32

Values in 0.0001 inch

Nominal Bore Diameter <i>d</i> inch		Axial Internal Clearance					
		C2		Normal		C3	
Over	Incl	Low	High	Low	High	Low	High
—	0.3937	0	2.4	1.6	4.3	4.3	7.1
0.3937	0.7087	0	2.4	1.6	5.5	5.5	9.4
0.7087	0.9449	0	3.1	2.4	6.3	6.3	10.6
0.9449	1.1811	0	3.1	2.4	6.7	6.7	11.0
1.1811	1.5748	0	3.5	2.8	7.1	7.1	11.4
1.5748	1.9685	0	3.9	3.5	7.9	7.9	12.6

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**Table 9 Radial Internal Clearances, Single Row, Radial Contact, Ball Bearings.
(AFBMA STANDARD NO. 20 – 1977)**

Tolerance Limits for Radial Internal Clearance of Single
Row, Radial Contact Ball Bearings under no load

(Applicable to Bearings of ABEC 1, ABEC 5, ABEC 7 and ABEC 9 Tolerance Classes)

TOLERANCE LIMITS IN 0.0001 INCH

BASIC BORE DIAMETER d		SYMBOL 2 ⁽¹⁾				SYMBOL 0 ⁽¹⁾ (Normal)				SYMBOL 3 ⁽¹⁾				SYMBOL 4 ⁽¹⁾			
		Acceptance Limits				Acceptance Limits				Acceptance Limits				Acceptance Limits			
mm		Mfg. Limits		Mfg. Limits		Mfg. Limits		Mfg. Limits		Mfg. Limits		Mfg. Limits		Mfg. Limits		Mfg. Limits	
Over	Incl.	Low	Low	High	High	Low	Low	High	High	Low	Low	High	High	Low	Low	High	High
2.5	10	—	—	2.5	3.0	1	1.5	4.5	5	3	4	8	9				
10	18	—	—	3.0	3.5	1	2	6	7	4	5	9	10	7	8	12	13
18	24	—	—	3.5	4.0	2	3	7	8	5	6	10	11	8	9	13	14
24	30	—	—	4	4.5	2	3	7	8	5	6	10	11	9	10	15	16
30	40	—	—	4	4.5	2	3	7	8	5	6	10	11	9	10	15	16
40	50	—	—	4	4.5	2	3	8	9	7	8	13	14	12	13	19	20
50	65	—	1	5	6	3	4	10	11	9	10	16	17	15	16	23	24
65	80	—	1	5	6	4	5	11	12	10	11	19	20	18	19	27	28
80	100	—	1	6	7	5	6	13	14	12	13	22	23	21	22	32	33
100	120	—	1	7	8	6	7	15	16	14	15	25	26	24	25	37	38
120	140	—	1	8	9	7	8	18	19	16	18	30	32	28	30	43	45
140	160	—	1	8	9	7	8	20	21	18	20	34	36	32	34	49	51
160	180	—	1	9	10	8	9	23	24	21	23	38	40	36	38	55	58
180	200	—	1	11	12	10	11	27	28	25	27	44	46	42	44	62	64

(1) These symbols relate to the Identification Code.

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LUBRICANT CODE TABLE

The standard lubrication for IJK BALL BEARINGS is NS7; however, many other types of lubricants may be supplied. A number of other standard and acceptable lubricants are shown in the following table.

COMMON OILS AND GREASES

NAME	MANU-FACTURE	U.S.A. MIL SPEC.	IJK CODE	OPERATING TEMPERATURE RANGE (°F)	THICKNER TYPE	LUBRICANT BASE
Aero Shell Fluid 3	Shell	MIL-L-7870A	AF3	-70 ~ +240	-	Petroleum
Aero Shell Fluid 12	Shell	MIL-L-6085A	AF2	-65 ~ +250	-	Diester
Anderol L-401D	Teneco	MIL-L-6085A	A4D	-75 ~ +260	-	Diester
Aero Shell Grease 6	Shell	MIL-G-7711A	AG2	-40 ~ +250	Non-soap	Mineral
Aero Shell Grease 5	Shell	MIL-G-3545C	AG3	-40 ~ +350	Non-soap	Mineral
Aero Shell Grease 14	Shell	MIL-G-255374	AG4	-65 ~ +250	Ca	Mineral
Aero Shell Grease 15A	Shell	MIL-G-25013D	AG5	-100 ~ +500	Non-soap	Silicon
Aero Shell Grease 16	Shell	MIL-G-25760A	AG6		Non-soap	Diester
Aero Shell Grease 22	Shell	MIL-G-81322A	A22		Non-soap	Diester
Alvania No. 1	Shell		AV1	-15 ~ +250	Li	Mineral
Alvania No. 2	Shell		AV2	-15 ~ +250	Li	Mineral
Alvania No. 3	Shell		AV3	-15 ~ +280	Li	Mineral
Alvania RA	Shell		AVR	-40 ~ +280	Li	Mineral
Aero Shell Grease 17	Shell	MIL-G-21164C	AG8	-100 ~ +300	Microgel	Diester
Alvania EP Grease 2	Shell	MIL-G-21164C	AP2	0 ~ +230	Li	Mineral
Andok B	Esso	MIL-G-18709A	AKB	-40 ~ +250	Na	Mineral
Andok C	Esso		AKC	0 ~ +250	Na	Mineral
Andok 260	Esso	MIL-G-3545B	AK2	0 ~ +300	Na	Mineral
Anderol L-793A	Teneco	MIL-G-3278A	AL7	-75 ~ +300	Na	Diester
Texaco Regal AFB2	Texaco		AB2		Li	Mineral
Beacon 325	Esso	MIL-G-3278A	B32	-65 ~ +250	Li	Diester
Tore Silicon SH331	Tore	MIL-S-27875	D31	-100 ~ +350	-	-
Dow Corning DC44	Dow	MIL-G-15719A	D4F	-40 ~ +400	Li	Silicon
Dow Corning DC55	Dow	MIL-G-4343A	D5M	-65 ~ +325	Li	Silicon
Tore silicon SH44M	Tore		D4M	-40 ~ +400	Li	Silicon
Krytox 240 AB	Dupont	MIL-G-38220	KAB	-40 ~ +400	Fluorotelomer	Fluorinated
Krytox 240 AC	Dupont	MIL-G-27617A	KAC		Fluorotelomer	Fluorinated
Krytox 240 AD	Dupont	MIL-G-27617A	KAD		Fluorotelomer	Fluorinated
Krytox 283 AC	Dupont	MIL-G-27617A	K3C		Fluorotelomer	Fluorinated
Krytox 280 AC	Dupont	MIL-G-27617A	K0C		Fluorotelomer	Fluorinated
Mobil 28	Mobil	MIL-G-81322A	MG2	-65 ~ +350	Non-soap	Synthetic
NS High Lube	Kyodo Ushi		NS7	-40 ~ +260	Li	Diester
Martemp PS No. 1	Mobil		PS1		Li	Diester
Martemp PS No. 2	Mobil		PS2	-40 ~ +230	Li	Diester
Martemp PS No. 3	Mobil		PS3		Li	Diester
Martemp PS 2A	Mobil		PSA		Li	Diester
Univis P-38	Esso	MIL-L-6085A	P38		-	-
Caltex RPM BRB-2	Caltex	MIL-G-3545B	RB2		Non-soap	Mineral
Caltex Aviation 33	Caltex	MIL-G-3545B	RP3		Non-soap	Mineral
Caltex RPM SRI 2	Caltex		SRI		Non-soap	Mineral
Molykote EP	Dow		MEP		Li	Mineral

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TORQUE

Standard Torque Unit – The standard units of torque shall be the milligram-force millimeter. Convenient multiples thereof may also be used (1gram-force centimeter = 10,000 milligram force millimeter). Ref. AFBMA STANDARD NO. 12 – 1969 TABLE 9. (STARTING TORQUE VALUES FOR INSTRUMENT BALL BEARINGS)

VIBRATION (NOISE GRADE CODE)

One basis for quality ball bearings is the degree of quietness with which they operate. Higher grade bearings receive an ANDEROMETER Test or IJK-developed "VMC" to check noise level and nature of sound. The operator observes vibration noise level readings visually on dial level meter or oscilloscope.

Grade N = Commercial grade.

EM = Indicates very low noise-leveled bearings for electric moter quality.

EMR = Best quality

SPECIAL REQUIREMENTS

- CHAMFERS
- FACE CONDITIONS
- SURFACE CONDITIONS
- PLATING
- WIDTH
- MATERIAL
- HEAT STABILIZATION

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Please consult with your IJK sales engineer or contact the factory in Japan for information on many special sizes not listed in the catalog.

NUMBERING SYSTEM

DEEP GROOVE BALL BEARINGS

Typical Call-Out	S	F	R4	E	J	ZZ	EM	5	K25	B32-L	Q15
	Material	Flange	Basic Number	Special Feature	Retainer Type	Closures	Vibration Spec.	Tolerance	Radial Clearance	Lubrication	Torque Spec.
Code Positions	1	2	3	4	5	6	7	8	9	10	11

EXAMPLES: SFR4EZZEM5K25B32Q15

1	S = AISI 440C Stainless Steel OMITTED = SAE 52100 Chrome Steel										
2	F = Flanged										
3	Basic Number										
4	E = Extended Inner Ring NW = Narrower Than Standard Width W = Wider Than Standard Width										
5	J = Two Piece Ribbon, Crimped (Omitted) TD = Delrin Crown TG = Teflon Slugs TN = Nylon Crown TP = Phenol Crown										
6	Z1 = Shield on Flanged Side, RS = 1 Rubber Seal Molded Steel. Z2 = Shield Opposite Flange, 2RS = 2 Rubber Seal Molded Steel. Z = 1 Shield, ZZ = 2 Shield, T = 1 Teflon Seal Grass-Reinforced ZS = 1 Shield, Removable TT = 2 Teflon Seal Grass-Reinforced ZZS = 2 Shield, Removable										
7	N = Commercial Grade EM = High Grade (General Motor Grade) EMR = Higher Grade Than EM (Precision Motor Grade)										
8	1 = ABEC 1, 3 = ABEC 3, 5 = ABEC 5, 7 = ABEC 7										
9	K Followed by Last Digit of Each Limit. EXAMPLE .0002 to .0005 = K25 (inches) .0002 to .0008 = K28 IJK Standard, → Table 3 ~ Table 8 } See clearance Symbols AFBMA Standard → Table 9										
10	AF2 = ASF12 (MIL-L-6085A) – Amount of Grease (%) AK2 = ANDOK 260 (MIL-G-3545B) – L = Light B32 = BEACON 325 (MIL-G-3278A) – M = Medium NS7 = NS High Lube – F = Full PS2 = Maltemp PS No. 2										
11	Q Followed by a Number Indicates Peak Starting Torque Limit in Hundred of mg.mm. for Example "Q15" Indicates a Bearing with Less Than 1500 mg. mm. Peak Starting Torque.										

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TOLERANCES

ABEC standards for dimensional tolerances and terminology have been established by the Anti Friction Bearing Manufacturers Association. These are shown in the tables below. Tolerances are in .0001".

INNER RING	BORE DIAMETER				Bore Tolerance +0		Radial Runout		Width Tolerance +0	
	mm		inch		ABEC 3	ABEC 1	ABEC 3	ABEC 1	ABEC 3	ABEC 1
	Over	Incl	Over	Incl						
	0	10	0	0.3937	-2	-3	2	3	-50	-50
	10	18	0.3937	0.7087	-2	-3	3	4	-50	-50
	18	30	0.7087	1.1811	-2	-4	3	5	-50	-50

ABEC 3-ABEC 1

OUTER RING	OUTSIDE DIAMETER				Outside Diameter Tolerance Limits +0		Radial Runout		Width Tolerances +0		Flange Width Tolerance Limits +0		Flange Diameter Tolerance Limits +50	
	mm		inch		ABEC 3	ABEC 1	ABEC 3	ABEC 1	ABEC 3	ABEC 1	ABEC 3	ABEC 1	ABEC 3	ABEC 1
	Over	Incl	Over	Incl										
	0	18	0	0.7087	-3	-3	4	6	-50	-50	-20	-20	-20	-20
	18	30	0.7087	1.1811	-3	-4	4	6	-50	-50	-20	-20	-20	-20
	30	50	1.1811	1.9685	-3	-5	4	8	-50	-50	-20	-20	-20	-20

INNER RING	BORE DIAMETER				Bore Tolerance +0		Radial Runout (Max.)		Width Variation (Max.)				Width Tolerances +0		Bore 2 point Out-of-Round (Max.)		Bore Taper (Max.)	
	mm		inch		ABEC 7P	ABEC 5P	ABEC 7P	ABEC 5P	ABEC 7P	ABEC 5P	ABEC 7P	ABEC 5P	ABEC 7P	ABEC 5P	ABEC 7P	ABEC 5P	ABEC 7P	ABEC 5P
	Over	Incl	Over	Incl														
	0	10	0	0.3937	-2	-2	1.0	1.5	1	2	1.0	3	1.0	3	-10	-10	1	1
	10	18	0.3937	0.7087	-2	-2	1.0	1.5	1	2	1.0	3	1.0	3	-10	-10	1	1
	18	30	0.7087	1.1811	-2	-2	1.5	1.5	1	2	1.5	3	1.5	3	-10	-10	1	1

ABEC 7P-ABEC 5P

OUTER RING	OUTSIDE DIAMETER				O.D. Tolerance +0		Radial Runout (Max.)		Width Variation (Max.)		Outside Cylindrical Surface Runout with Reference Side (Max.)		Groove Runout with Reference Side (Max.)		With Toleranced +0		Flange Width Tolerance Limits +0		Flange Diameter Tolerance Limits +0		O.D. 2 Point Out-of-Round (Max.)		Outside Diameter Taper (Max.)	
	mm		inch		ABEC 7P	ABEC 5P	ABEC 7P	ABEC 5P	ABEC 7P	ABEC 5P	ABEC 7P	ABEC 5P	ABEC 7P	ABEC 5P	ABEC 7P	ABEC 5P	ABEC 7P	ABEC 5P	ABEC 7P	ABEC 5P	ABEC 7P	ABEC 5P	ABEC 7P	ABEC 5P
	Over	Incl	Over	Incl																				
	18	30	0.7087	1.1811	-2	-2	1.5	2	1	2	1.5	3	2	3	-10	-10	-20	-20	-10	-10	1	1	1	1
	0	18	0	0.7087	-2	-2	1.5	2	1	2	1.5	3	2	3	-10	-10	-20	-20	-10	-10	1	1	1	1
	30	50	1.1811	1.9685	-2	-2	1.2	2	1	2	1.5	3	2	3	-10	-10	-20	-20	-10	-10	1	1	1	1



INNER RING	BORE DIAMETER d				BORE TOLERANCE LIMITS(S)						Radial Runout	Width Variation	Bore Runout With Reference Side	Raceway Runout with Reference Side
	mm		inch		dm		Torque Tube Type		Extra Thin Section					
	Over	Incl	Over	Incl	Low	High	d _{im}	d _{max}	d _{min}	d _{max}	Max.	Max.	Max.	Max.
	13	18	.5118	.7087	-2	+0	-3	+1	-3	+1	2	2	3	3
	18	30	.7087	1.1811	-2	+0	-3	+1	-4	+2	2	2	3	3
	30	45	1.1811	1.7717	-3	+0	-4	+1	-6	+3	3	2	3	3

ABEC 5T

OUTER RING	OUTSIDE DIAMETER D				OUTSIDE DIAMETER TOLERANCE LIMITS (2)								Radial Runout	Width Variation	Outside Cylindrical Surface Runout with Reference Side	Raceway Runout with Reference Side		
	mm		inch		Dm		Open Type Bearings		Shielded or Sealed Bearings									
	Over	Incl	Over	Incl	High	Low	D _{max}	D _{min}	D _{max}	D _{min}	D _{max}	D _{min}	D _{max}	D _{min}	Max.	Max.	Max.	Max.
	18	28	.7087	1.1024	+0	-2	+1	-3	+1	-3	+2	-4	+2	-4	2	2	3	3
	28	50	1.1024	1.9685	+0	-4	+1	-5	+3	-7	+2	-6	+4	-8	3	2	3	3
	50	80	1.9685	3.1496	+0	-4	+1	-5	+4	-8	+2	-6	+5	-9	3	2	3	4

INNER RING	BORE DIAMETER d				BORE TOLERANCE LIMITS(1)						Radial Runout	Width Variation	Bore Runout with Reference Side	Raceway Runout with Reference Side
	mm		inch		dm		Torque Tube Type		Extra Thin Section					
	Over	Incl	Over	Incl	Low	High	d _{min}	d _{max}	d _{min}	d _{max}	Max.	Max.	Max.	Max.
	13	18	.5118	.7087	-2	+0	-2	+0	-2	+0	1	1	1	1
	18	30	.7087	1.1811	-2	+0	-2.5	+0.5	-3	+1	1.5	1	1.5	1.5
	30	45	1.1811	1.7717	-2	+0	-3	+1	-4	+2	1.5	1	1.5	1.5

ABEC 7T

OUTER RING	OUTSIDE DIAMETER D				OUTSIDE DIAMETER TOLERANCE LIMITS(2)								Radial Runout	Width Variation	Outside Cylindrical Surface Runout with Reference Side	Raceway Runout with Reference Side		
	mm		inch		Dm		Open Type Bearings		Shielded or Sealed Bearings									
	Over	Incl	Over	Incl	High	Low	D _{max}	D _{min}	D _{max}	D _{min}	D _{max}	D _{min}	D _{max}	D _{min}	Max.	Max.	Max.	Max.
	18	28	.7087	1.1024	+0	-2	+0	-2	+0	-2	+1	-3	+1	-3	1.5	1	1.5	2
	28	50	1.1024	1.9685	+0	-2	+1	-3	+2	-4	+2	-4	+3	-5	2	1	1.5	2
	50	80	1.9685	3.1496	+0	-3	+1	-4	+3	-6	+2	-5	+4	-7	2	1.5	1.5	3

TOLERANCE LIMITS	Bore Inner Ring Bore				Bearings Other Than Duplex				Duplex Bearings			
	mm		inch		Width of Individual Inner or Outer Ring		Total Width of a pair of Inner or Outer Rings		HIGH		LOW	
	Over	Incl	Over	Incl	ABEC 5T	ABEC 7T	ABEC 5T	ABEC 7T	ABEC 5T	ABEC 7T	ABEC 5T	ABEC 7T
	0	30	0	1.1811	+0	+0	-10	-10	+0	+0	-150	-150
	30	80	1.1811	3.1496	+0	+0	-50	-10	+0	+0	-200	-150

(1) $\frac{d_{max} + d_{min}}{2}$ must be within dm. (2) $\frac{D_{max} + D_{min}}{2}$ must be within dm.



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