

FRB Bearings

Thin Section Bearing



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● An Introduction to Thin-Section Bearings

We supplied many replacement of brand Kaydon, THK and TIMKEN thin section type, we also can give our offer according to their standard number. The major characterization of the FRB thin-section ball bearings are that, light weight, sufficient rigidity, small section, and the excellent load bearing performance. They also have many kinds of sections and dimensions. As usual we called it as thin-section ball bearings when the hole diameter was more than 4 times larger than the radial sections. It can solve many design problems which the common bearings cannot complete in application. The thin-section ball bearings produced by our FRB company totally have three kind of structural, are divided into five series. Among them, the section which change with hole diameter are two times of the steel ball diameter. The diameter unit usually is metric.

The thin-section ball bearings series FRB are always used in the circumstances, such as requiring small space, heavy load, light weight or limiting some special forms. At the same time, we also provide some special service, for example, we produce bearings according to the customers blueprint. At present, each series of them are widely applied in aircraft, fixing and work holding equipment, food processing equipment, glass working equipment, index and rotary tables, packing equipment, machine tools, medical devices, optical scanning equipment, radar, satellite and communications equipment, robotics, textile machinery, tube and pipe cutting machines, semiconductor manufacturing equipment, sorting equipment and so on in all the various trades and occupations.

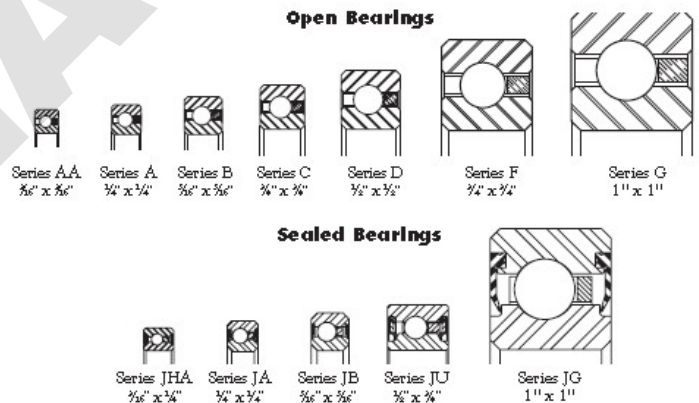
● Product Line overview

The Thin-section bearing product line consists of a family of seven open and five sealed series of thin section bearings ranging in bore diameters from 25.4mm to 1016mm. Series range from 4.750x4.750 inch to 25.4 x 25.4 mm in cross section. Open bearings are available from stock in three configurations (Type A, C & X). Stock sealed bearings are available in Types C & X only.

When required, we can provide internal fit up, lubricants, separators and other features to meet the most demanding application requirements. To obtain corrosion resistance consider using FRB's stainless steel Thin-section bearings.

To support various load scenarios, Thin-section bearings are available in three basic types: radial contact (Type C), angular 8 and 9 for explanations on each type—and in a variety of sizes, or series (e.g., KA, KB, KC, etc.).

The Product Line At a Glance



● Specification Control

In today's world, product traceability and change control are extremely important. To satisfy these requirements, requesting a "specification control drawing" for a Thin-section bearing is a valuable option to consider.

A specification control drawing provides the user a concise and complete accounting of the important bearing features and parameters for a specific application. A specification control drawing request will generate a unique part number for the standard Thin-section bearing and commercially available options required. This provides the customer quick and easy identification of product in the field as well as a concise receiving and inspection document for the factory. A specification control drawing assigned to a thin-section bearing becomes proprietary to the user for his particular application

● Thin-section Bearing Types Support All Load Scenarios

A Word About Radial and Axial (Thrust) Loads

Bearings support a shaft or housing to permit their free motion about an axis of rotation. Load can be applied to bearings in either of two basic directions (Figure 1). Radial loads act at right angles to the shaft (bearing's axis of rotation). Axial (thrust) acts parallel to the axis of rotation. When these loads are offset from either the bearing axis (distance S_t) or radial plane, a resulting moment load (M) will be created. FRB Thin-section bearings are available in a variety of types to handle radial loads, axial loads and moment loads.

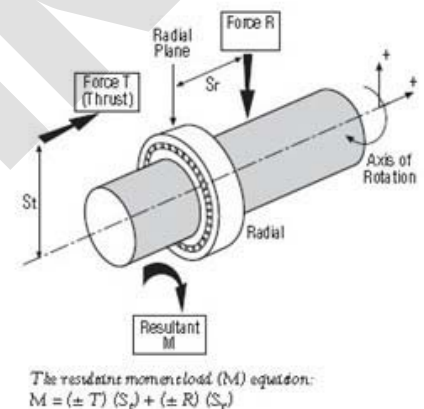


Fig 1

Types of Thin-section Bearings

Thin-section bearings are available in three basic configurations: radial (Type C), angular contact (Type A), and four-point contact (Type X).

Thin-section Bearing Types

A = angular

C = radial

X = four-point

By using these three types, the designer has a wider choice of mounting arrangements to meet load, stiffness and accuracy requirements in the most efficient manner.

Radial Contact Bearing (Type C)

The Type C Radial Contact Bearing (Figure 2) is a single row radial ball bearing of conventional design. It is a Conrad-type assembly, which means that it is assembled by eccentric displacement of the inner race within the outer race which permits insertion of about half of a full complement of balls.

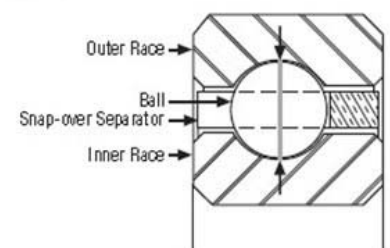


Fig 2

Although the Type C bearing is designed primarily for radial load application, it can be configured to accept some axial (thrust) load in either direction. But, if thrust is a concern, a set of angular contact bearings should be considered for the specific application.

Angular Contact Bearing (Type A)

The Type A Bearing is also a conventional design. It features a circular pocket separator and a thirty degree contact angle (see Figure 3) along with approximately 67% of a full complement of balls.

The chief benefit of the Type A bearing is that it provides greater thrust capacity than a Type C or Type X bearing. Because of its counterbored outer race, Type A bearings have unidirectional thrust capacity. Thus, this bearing should be mounted opposed to another bearing to establish and maintain the contact angle, and to support reversing thrust loads.

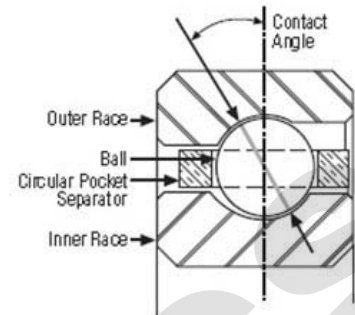


Fig 3

Four-Point Contact Bearing (Type X)

Standard bearing lines are most often designed to handle either radial or axial load conditions. The unique feature about the FRB Thin-section Type X four-point contact bearing (See Figure 4) line is that the gothic arch geometry of the inner and outer races enables a single bearing to carry three types of loading (radial, axial and moment) simultaneously. This makes it the bearing of choice for many applications since a single four-point contact bearing can often replace two bearings, providing a simplified design.

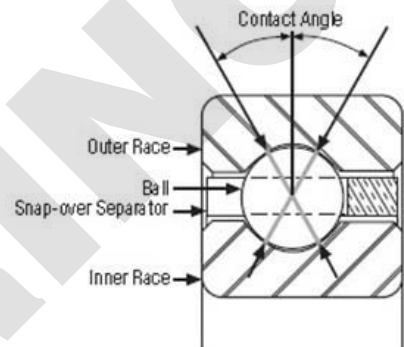
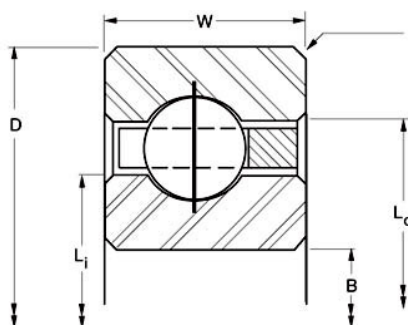


Fig 4

Type X bearings may also be furnished with an internal diametral preload for those applications requiring greater stiffness or zerofree play. This is accomplished by using balls that are larger than the space provided in the raceways. The balls and raceways, therefore, have some elastic deformation in the absence of an external load.

● Selection Tables for Standard Thin-section Bearings

● Thin-section radial contact ball bearing



Thin-section radial contact ball bearing primarily designed for deep groove ball bearing to sustain heavy pressure. The basic design intention is not only to support radical load, but also can sustain middle axial load, rotary load and moment load.

FKAA Series									
Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDON	INA
FKAA10CP0	25.400	34.925	4.762	1290	670	0.012	KRS010	KAA10CL0	CSCAA010
FKAA15CP0	38.100	47.625	4.762	1780	800	0.018	KRS015	KAA15CL0	CSCAA015
FKAA17CP0	44.450	53.975	4.762	2110	1770	0.020	KRS017	KAA17CL0	CSCAA017

FKA Series									
Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDON	INA
FKA020CPO	50.800	63.500	6.35	3020	1420	0.048	KRA020	KA020CPO	CSCA020
FKA025CPO	63.500	76.200	6.35	3690	1600	0.059	KRA025	KA025CPO	CSCA025
FKA030CPO	76.200	88.900	6.35	4400	1820	0.068	KRA030	KA030CPO	CSCA030
FKA035CPO	88.900	101.600	6.35	5070	2000	0.082	KRA035	KA035CPO	CSCA035
FKA040CPO	101.600	114.300	6.35	5730	2130	0.090	KRA040	KA040CPO	CSCA040
FKA042CPO	107.950	120.650	6.35	6090	2220	0.095	KRA042	KA042CPO	CSCA042
FKA045CPO	114.300	127.000	6.35	6400	2310	0.100	KRA045	KA045CPO	CSCA045
FKA047CPO	120.650	133.350	6.35	6760	2400	0.104	KRA047	KA047CPO	CSCA047
FKA050CPO	127.000	139.700	6.35	7070	2490	0.109	KRA050	KA050CPO	CSCA050
FKA055CPO	139.700	152.400	6.35	7780	2620	0.118	KRA055	KA055CPO	CSCA055
FKA060CPO	152.400	165.100	6.35	8450	2800	0.130	KRA060	KA060CPO	CSCA060
FKA065CPO	165.100	177.800	6.35	9110	2930	0.140	KRA065	KA065CPO	CSCA065
FKA070CPO	177.800	190.500	6.35	9780	3070	0.150	KRA070	KA070CPO	CSCA070
FKA075CPO	190.500	203.200	6.35	10450	3200	0.160	KRA075	KA075CPO	CSCA075
FKA080CPO	203.200	215.900	6.35	11110	3330	0.172	KRA080	KA080CPO	CSCA080
FKA090CPO	228.600	241.300	6.35	12490	3600	0.200	KRA090	KA090CPO	CSCA090
FKA100CPO	254.000	266.700	6.35	13820	3870	0.227	KRA100	KA100CPO	CSCA100

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Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDON	INA
FKA110CPO	279.400	292.100	6.35	15160	4130	0.236	KRA110	KA110CPO	CSCA110
FKA120CPO	304.800	317.500	6.35	16540	4360	0.254	KRA120	KA120CPO	CSCA120

FKB Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDON	INA
FKB020CPO	50.800	66.675	7.9380	4130	2000	0.073	KRB020	KB020CPO	CSCB020
FKB025CPO	63.500	79.375	7.9380	5070	2310	0.091	KRB025	KB025CPO	CSCB025
FKB030CPO	76.200	92.075	7.9380	5960	2580	0.109	KRB030	KB030CPO	CSCB030
FKB035CPO	88.900	104.775	7.9380	6850	2800	0.125	KRB035	KB035CPO	CSCB035
FKB040CPO	101.600	117.475	7.9380	7780	3070	0.140	KRB040	KB040CPO	CSCB040
FKB042CPO	107.950	123.825	7.9380	8130	3160	0.147	KRB042	KB042CPO	CSCB042
FKB045CPO	114.300	130.175	7.9380	8670	3290	0.160	KRB045	KB045CPO	CSCB045
FKB047CPO	120.650	136.525	7.9380	9020	3380	0.163	KRB047	KB047CPO	CSCB047
FKB050CPO	127.000	142.875	7.9380	9560	3510	0.172	KRB050	KB050CPO	CSCB050
FKB055CPO	139.700	155.575	7.9380	10490	3730	0.186	KRB055	KB055CPO	CSCB055
FKB060CPO	152.400	168.275	7.9380	11380	3960	0.205	KRB060	KB060CPO	CSCB060
FKB065CPO	165.100	180.975	7.9380	12270	4130	0.216	KRB065	KB065CPO	CSCB065
FKB070CPO	177.800	193.675	7.9380	13200	4360	0.232	KRB070	KB070CPO	CSCB070
FKB075CPO	190.500	206.375	7.9380	14090	4530	0.250	KRB075	KB075CPO	CSCB075
FKB080CPO	203.200	219.075	7.9380	14980	4760	0.262	KRB080	KB080CPO	CSCB080
FKB090CPO	228.600	244.475	7.9380	16800	5110	0.300	KRB090	KB090CPO	CSCB090
FKB100CPO	254.000	269.875	7.9380	18620	5470	0.331	KRB100	KB100CPO	CSCB100
FKB110CPO	279.400	295.275	7.9380	20400	5820	0.360	KRB110	KB110CPO	CSCB110
FKB120CPO	304.800	320.675	7.9380	22230	6180	0.390	KRB120	KB120CPO	CSCB120
FKB140CPO	355.600	371.475	7.9380	25830	6800	0.476	KRB140	KB140CPO	CSCB140
FKB160CPO	406.400	422.275	7.9380	29430	7420	0.544	KRB160	KB160CPO	CSCB160
FKB180CPO	457.200	473.075	7.9380	33070	8050	0.612	KRB180	KB180CPO	CSCB180
FKB200CPO	508.000	523.875	7.9380	36670	8620	0.68	KRB200	KB200CPO	CSCB200

FKC Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDON	INA
FKC040CPO	101.600	120.650	9.525	9330	3910	0.204	KRC040	KC040CPO	CSCC040
FKC042CPO	107.950	127.000	9.525	9780	4090	0.213	KRC042	KC042CPO	CSCC042
FKC045CPO	114.300	133.350	9.525	10400	4220	0.225	KRC045	KC045CPO	CSCC045
FKC047CPO	120.650	139.700	9.525	10930	4360	0.235	KRC047	KC047CPO	CSCC047
FKC050CPO	127.000	146.050	9.525	11510	4490	0.263	KRC050	KC050CPO	CSCC050
FKC055CPO	139.700	158.750	9.525	12580	4800	0.268	KRC055	KC055CPO	CSCC055
FKC060CPO	152.400	171.450	9.525	13650	5070	0.295	KRC060	KC060CPO	CSCC060
FKC065CPO	165.100	184.150	9.525	14710	5330	0.312	KRC065	KC065CPO	CSCC065

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Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDON	INA
FKC070CPO	177.800	196.850	9.525	15780	5560	0.340	KRC070	KC070CPO	CSCC070
FKC075CPO	190.500	209.550	9.525	16850	5820	0.360	KRC075	KC075CPO	CSCC075
FKC080CPO	203.200	222.250	9.525	17910	6050	0.387	KRC080	KC080CPO	CSCC080
FKC090CPO	228.600	247.650	9.525	20050	6530	0.450	KRC090	KC090CPO	CSCC090
FKC100CPO	254.000	273.050	9.525	22180	6980	0.481	KRC100	KC100CPO	CSCC100
FKC110CPO	279.400	298.450	9.525	24310	7420	0.526	KRC110	KC110CPO	CSCC110
FKC120CPO	304.800	323.850	9.525	26450	7870	0.567	KRC120	KC120CPO	CSCC120
FKC140CPO	355.600	374.650	9.525	30720	8670	0.689	KRC140	KC140CPO	CSCC140
FKC160CPO	406.400	425.450	9.525	35030	9470	0.785	KRC160	KC160CPO	CSCC160
FKC180CPO	457.200	476.250	9.525	39290	10220	0.880	KRC180	KC180CPO	CSCC180
FKC200CPO	508.000	527.050	9.525	43560	10980	0.980	KRC200	KC200CPO	CSCC200

FKD Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDON	INA
FKD040CPO	101.600	127.000	12.7	13690	6270	0.366	KRD040	KD040CPO	CSCD040
FKD042CPO	107.950	133.350	12.7	14180	6400	0.386	KRD042	KD042CPO	CSCD042
FKD045CPO	114.300	139.700	12.7	15200	6710	0.405	KRD045	KD045CPO	CSCD045
FKD047CPO	120.650	146.050	12.7	15690	6850	0.426	KRD047	KD047CPO	CSCD047
FKD050CPO	127.000	152.400	12.7	16710	7160	0.454	KRD050	KD050CPO	CSCD050
FKD055CPO	139.700	165.100	12.7	18230	7560	0.485	KRD055	KD055CPO	CSCD055
FKD060CPO	152.400	177.800	12.7	19780	8000	0.526	KRD060	KD060CPO	CSCD060
FKD065CPO	165.100	190.500	12.7	21290	8400	0.566	KRD065	KD065CPO	CSCD065
FKD070CPO	177.800	203.200	12.7	22800	8800	0.606	KRD070	KD070CPO	CSCD070
FKD075CPO	190.500	215.900	12.7	24310	9160	0.650	KRD075	KD075CPO	CSCD075
FKD080CPO	203.200	228.600	12.7	25830	9560	0.694	KRD080	KD080CPO	CSCD080
FKD090CPO	228.600	254.000	12.7	28890	10310	0.780	KRD090	KD090CPO	CSCD090
FKD100CPO	254.000	279.400	12.7	31920	10980	0.853	KRD100	KD100CPO	CSCD100
FKD110CPO	279.400	304.800	12.7	34980	11690	0.934	KRD110	KD110CPO	CSCD110
FKD120CPO	304.800	330.200	12.7	38010	12360	1.020	KRD120	KD120CPO	CSCD120
FKD140CPO	355.600	381.000	12.7	44090	13650	1.240	KRD140	KD140CPO	CSCD140
FKD160CPO	406.400	431.800	12.7	50180	14890	1.410	KRD160	KD160CPO	CSCD160
FKD180CPO	457.200	482.600	12.7	56230	16050	1.580	KRD180	KD180CPO	CSCD180
FKD200CPO	508.000	533.400	12.7	62320	17200	1.750	KRD200	KD200CPO	CSCD200

FKF Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDOF	INA
FKF040CPO	101.600	139.700	19.05	23830	12130	0.875	KRF040	KF040CPO	CSCF040
FKF042CPO	107.950	146.050	19.05	25070	12580	0.930	KRF042	KF042CPO	CSCF042
FKF045CPO	114.300	152.400	19.05	26360	12980	0.975	KRF045	KF045CPO	CSCF045
FKF047CPO	120.650	158.750	19.05	27600	13380	1.040	KRF047	KF047CPO	CSCF047

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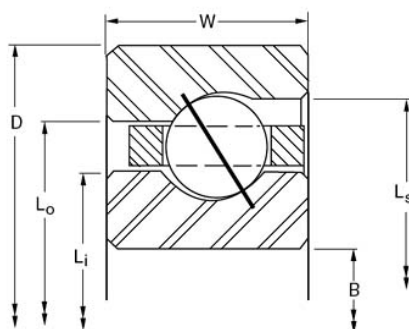
Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDOF	INA
FKF050CPO	127.000	165.100	19.05	28850	13780	1.090	KRF050	KF050CPO	CSCF050
FKF055CPO	139.700	177.800	19.05	31340	14580	1.180	KRF055	KF055CPO	CSCF055
FKF060CPO	152.400	190.500	19.05	33870	15340	1.240	KRF060	KF060CPO	CSCF060
FKF065CPO	165.100	203.200	19.05	36360	16090	1.350	KRF065	KF065CPO	CSCF065
FKF070CPO	177.800	215.900	19.05	38890	16850	1.450	KRF070	KF070CPO	CSCF070
FKF075CPO	190.500	228.600	19.05	41380	17560	1.560	KRF075	KF075CPO	CSCF075
FKF080CPO	203.200	241.300	19.05	43920	18230	1.660	KRF080	KF080CPO	CSCF080
FKF090CPO	228.600	266.700	19.05	48900	19600	1.810	KRF090	KF090CPO	CSCF090
FKF100CPO	254.000	292.100	19.05	53920	20940	2.020	KRF100	KF100CPO	CSCF100
FKF110CPO	279.400	317.500	19.05	58940	22230	2.180	KRF110	KF110CPO	CSCF110
FKF120CPO	304.800	342.900	19.05	63960	23470	2.380	KRF120	KF120CPO	CSCF120
FKF140CPO	355.600	393.700	19.05	74010	25830	2.720	KRF140	KF140CPO	CSCF140
FKF160CPO	406.400	444.500	19.05	84010	28140	3.220	KRF160	KF160CPO	CSCF160
FKF180CPO	457.200	495.300	19.05	94060	30320	3.580	KRF180	KF180CPO	CSCF180
FKF200CPO	508.000	546.100	19.05	104100	32450	4.040	KRF200	KF200CPO	CSCF200

FKG Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDON	INA
FKG040CPO	101.600	152.400	25.40	36490	20000	1.650	KRG040	KG040CPO	CSCG040
FKG042CPO	107.950	158.750	25.40	36490	20000	1.750	KRG042	KG042CPO	CSCG042
FKG045CPO	114.300	165.100	25.40	38940	20900	1.810	KRG045	KG045CPO	CSCG045
FKG047CPO	120.650	171.450	25.40	41340	21740	1.910	KRG047	KG047CPO	CSCG047
FKG050CPO	127.000	177.800	25.40	43780	22580	2.020	KRG050	KG050CPO	CSCG050
FKG055CPO	139.700	190.500	25.40	46230	23430	2.170	KRG055	KG055CPO	CSCG055
FKG060CPO	152.400	203.200	25.40	51070	25030	2.310	KRG060	KG060CPO	CSCG060
FKG065CPO	165.100	215.900	25.40	53520	25830	2.470	KRG065	KG065CPO	CSCG065
FKG070CPO	177.800	228.600	25.40	58360	27380	2.670	KRG070	KG070CPO	CSCG070
FKG075CPO	190.500	241.300	25.40	60810	28140	2.830	KRG075	KG075CPO	CSCG075
FKG080CPO	203.200	254.000	25.40	65650	29600	3.000	KRG080	KG080CPO	CSCG080
FKG090CPO	228.600	279.400	25.40	72990	31780	3.300	KRG090	KG090CPO	CSCG090
FKG100CPO	254.000	304.800	25.40	80280	33870	3.650	KRG100	KG100CPO	CSCG100
FKG110CPO	279.400	330.200	25.40	87570	35870	3.960	KRG110	KG110CPO	CSCG110
FKG120CPO	304.800	355.600	25.40	94860	37830	4.320	KRG120	KG120CPO	CSCG120
FKG140CPO	355.600	406.400	25.40	109440	41600	4.960	KRG140	KG140CPO	CSCG140
FKG160CPO	406.400	457.200	25.40	124060	45250	5.650	KRG160	KG160CPO	CSCG160
FKG180CPO	457.200	508.000	25.40	138640	48720	6.280	KRG180	KG180CPO	CSCG180
FKG200CPO	508.000	558.800	25.40	153220	52100	7.530	KRG200	KG200CPO	CSCG200
FKG250CPO	635.000	685.800	25.40	174000	71000	8.850	KRG250	KG250CPO	CSCG250

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● Thin-section angular contact bearings



Thin-section angular contact bearings are designed for supporting axial load. They can also be used to support radial or combined radial traction. But this type can't solely be used to sustain moment load or reverse radial forces. They always appear in pairs.

KAA Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDON	INA
FKAA10AG0	25.400	34.925	4.762	1510	670	0.011	KYS010	KAA10AG0	CSEAA010
FKAA15AG0	38.100	47.625	4.762	2130	890	0.017	KYS015	KAA15AG0	CSEAA015
FKAA17AG0	44.450	53.975	4.762	2220	2060	0.020	-	KAA17AG0	CSEAA017

KA Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDON	INA
FKA020AR0	50.800	63.500	6.35	3510	1470	0.045	KYA020	KA020ARO	CSEA020
FKA025AR0	63.500	76.200	6.35	4270	1690	0.054	KYA025	KA025ARO	CSEA025
FKA030AR0	76.200	88.900	6.35	5070	1910	0.064	KYA030	KA030ARO	CSEA030
FKA035AR0	88.900	101.600	6.35	5830	2090	0.077	KYA035	KA035ARO	CSEA035
FKA040AR0	101.600	114.300	6.35	6630	2270	0.086	KYA040	KA040ARO	CSEA040
FKA042AR0	107.950	120.650	6.35	7020	2360	0.091	KYA042	KA042ARO	CSEA042
FKA045AR0	114.300	127.000	6.35	7380	2450	0.095	KYA045	KA045ARO	CSEA045
FKA047AR0	120.650	133.350	6.35	7780	2530	0.100	KYA047	KA047ARO	CSEA047
FKA050AR0	127.000	139.700	6.35	8180	2620	0.104	KYA050	KA050ARO	CSEA050
FKA055AR0	139.700	152.400	6.35	8980	2760	0.113	KYA055	KA055ARO	CSEA055
FKA060AR0	152.400	165.100	6.35	9740	2930	0.127	KYA060	KA060ARO	CSEA060
FKA065AR0	165.100	177.800	6.35	10540	3070	0.136	KYA065	KA065ARO	CSEA065
FKA070AR0	177.800	190.500	6.35	11290	3250	0.145	KYA070	KA070ARO	CSEA070
FKA075AR0	190.500	203.200	6.35	12090	3380	0.154	KYA075	KA075ARO	CSEA075
FKA080AR0	203.200	215.900	6.35	12850	3510	0.163	KYA080	KA080ARO	CSEA080
FKA090AR0	228.600	241.300	6.35	14400	3780	0.186	KYA090	KA090ARO	CSEA090
FKA100AR0	254.000	266.700	6.35	15960	4050	0.204	KYA100	KA100ARO	CSEA100
FKA110AR0	279.400	292.100	6.35	17510	4310	0.227	KYA110	KA110ARO	CSEA110
FKA120AR0	304.800	317.500	6.35	19070	4580	0.245	KYA120	KA120ARO	CSEA120

FRB BEARINGS, YOU BEST CHOICE, BEST SUPPLIER

KB Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDON	INA
FKB020AR0	50.800	66.675	7.9380	4850	2130	0.068	KYB020	KB020ARO	CSEB020
FKB025AR0	63.500	79.375	7.9380	5960	2450	0.086	KYB025	KB025ARO	CSEB025
FKB030AR0	76.200	92.075	7.9380	6890	2710	0.100	KYB030	KB030ARO	CSEB030
FKB035AR0	88.900	104.775	7.9380	7960	2980	0.122	KYB035	KB035ARO	CSEB035
FKB040AR0	101.600	117.475	7.9380	9070	3250	0.136	KYB040	KB040ARO	CSEB040
FKB042AR0	107.950	123.825	7.9380	9560	3330	0.141	KYB042	KB042ARO	CSEB042
FKB045AR0	114.300	130.175	7.9380	10000	3470	0.154	KYB045	KB045ARO	CSEB045
FKB047AR0	120.650	136.525	7.9380	10620	3600	0.159	KYB047	KB047ARO	CSEB047
FKB050AR0	127.000	142.875	7.9380	11110	3690	0.168	KYB050	KB050ARO	CSEB050
FKB055AR0	139.700	155.575	7.9380	12180	3960	0.181	KYB055	KB055ARO	CSEB055
FKB060AR0	152.400	168.275	7.9380	13290	4180	0.200	KYB060	KB060ARO	CSEB060
FKB065AR0	165.100	180.975	7.9380	14220	4360	0.213	KYB065	KB065ARO	CSEB065
FKB070AR0	177.800	193.675	7.9380	15340	4580	0.227	KYB070	KB070ARO	CSEB070
FKB075AR0	190.500	206.375	7.9380	16450	4800	0.245	KYB075	KB075ARO	CSEB075
FKB080AR0	203.200	219.075	7.9380	17510	5020	0.259	KYB080	KB080ARO	CSEB080
FKB090AR0	228.600	244.475	7.9380	19560	5420	0.290	KYB090	KB090ARO	CSEB090
FKB100AR0	254.000	269.875	7.9380	21740	5780	0.322	KYB100	KB100ARO	CSEB100
FKB110AR0	279.400	295.275	7.9380	23780	6130	0.354	KYB110	KB110ARO	CSEB110
FKB120AR0	304.800	320.675	7.9380	25960	6530	0.386	KYB120	KB120ARO	CSEB120
FKB140AR0	355.600	371.475	7.9380	30050	7200	0.445	KYB140	KB140ARO	CSEB140
FKB160AR0	406.400	422.275	7.9380	34270	7870	0.509	KYB160	KB160ARO	CSEB160
FKB180AR0	457.200	473.075	7.9380	38490	8490	0.572	KYB180	KB180ARO	CSEB180
FKB200AR0	508.000	523.875	7.9380	42720	9110	0.635	KYB200	KB200ARO	CSEB200

KC Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDON	INA
FKC040AR0	101.600	120.650	9.525	11340	4270	0.200	KYC040	KC040ARO	CSEC040
FKC042AR0	107.900	127.000	9.525	12050	4450	0.209	KYC042	KC042ARO	CSEC042
FKC045AR0	114.300	133.350	9.525	12710	4620	0.222	KYC045	KC045ARO	CSEC045
FKC047AR0	120.650	139.700	9.525	13420	4760	0.231	KYC047	KC047ARO	CSEC047
FKC050AR0	127.000	146.050	9.525	14140	4930	0.245	KYC050	KC050ARO	CSEC050
FKC055AR0	139.700	158.750	9.525	15290	5200	0.263	KYC055	KC055ARO	CSEC055
FKC060AR0	152.400	171.450	9.525	16670	5510	0.290	KYC060	KC060ARO	CSEC060
FKC065AR0	165.100	184.150	9.525	18050	5820	0.308	KYC065	KC065ARO	CSEC065
FKC070AR0	177.800	196.850	9.525	19200	6050	0.336	KYC070	KC070ARO	CSEC070
FKC075AR0	190.500	209.550	9.525	20580	6360	0.354	KYC075	KC075ARO	CSEC075
FKC080AR0	203.200	222.300	9.525	22010	6620	0.381	KYC080	KC080ARO	CSEC080
FKC090AR0	228.600	247.650	9.525	24540	7110	0.445	KYC090	KC090ARO	CSEC090

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Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDON	INA
FKC100ARO	254.000	273.050	9.525	27290	7650	0.472	KYC100	KC100ARO	CSEC100
FKC110ARO	279.400	298.450	9.525	29870	8130	0.517	KYC110	KC110ARO	CSEC110
FKC120ARO	304.800	323.850	9.525	32400	8580	0.558	KYC120	KC120ARO	CSEC120
FKC140ARO	355.600	374.650	9.525	37740	9510	0.649	KYC140	KC140ARO	CSEC140
FKC160ARO	406.400	425.450	9.525	43030	10360	0.739	KYC160	KC160ARO	CSEC160
FKC180ARO	457.200	476.250	9.525	48360	11200	0.830	KYC180	KC180ARO	CSEC180
FKC200ARO	508.000	527.050	9.525	53470	11960	0.921	KYC200	KC200ARO	CSEC200

KD Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDON	INA
FKD040ARO	101.600	127.000	12.7	15780	6580	0.363	KYD040	KD040ARO	CSED040
FKD042ARO	107.950	133.350	12.7	16670	6800	0.381	KYD042	KD042ARO	CSED042
FKD045ARO	114.300	139.700	12.7	17560	7020	0.400	KYD045	KD045ARO	CSED045
FKD047ARO	120.650	146.050	12.7	18450	7290	0.422	KYD047	KD047ARO	CSED047
FKD050ARO	127.000	152.400	12.7	19290	7510	0.445	KYD050	KD050ARO	CSED050
FKD055ARO	139.700	165.100	12.7	21070	7960	0.481	KYD055	KD055ARO	CSED055
FKD060ARO	152.400	177.800	12.7	22800	8400	0.522	KYD060	KD060ARO	CSED060
FKD065ARO	165.100	190.500	12.7	24580	8800	0.562	KYD065	KD065ARO	CSED065
FKD070ARO	177.800	203.200	12.7	26310	9200	0.603	KYD070	KD070ARO	CSED070
FKD075ARO	190.500	215.900	12.7	28090	9650	0.644	KYD075	KD075ARO	CSED075
FKD080ARO	203.200	228.600	12.7	29830	10050	0.689	KYD080	KD080ARO	CSED080
FKD090ARO	228.600	254.000	12.7	33340	10800	0.767	KYD090	KD090ARO	CSED090
FKD100ARO	254.000	279.400	12.7	36850	11560	0.848	KYD100	KD100ARO	CSED100
FKD110ARO	279.400	304.800	12.7	40360	12270	0.930	KYD110	KD110ARO	CSED110
FKD120ARO	304.800	330.200	12.7	43870	12980	1.010	KYD120	KD120ARO	CSED120
FKD140ARO	355.600	381.000	12.7	50900	14310	1.170	KYD140	KD140ARO	CSED140
FKD160ARO	406.400	431.800	12.7	57920	15600	1.330	KYD160	KD160ARO	CSED160
FKD180ARO	457.200	482.600	12.7	64940	16850	1.490	KYD180	KD180ARO	CSED180
FKD200ARO	508.000	533.400	12.7	71970	18050	1.660	KYD200	KD200ARO	CSED200

KF Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDON	INA
FKF040ARO	101.600	139.700	19.05	28230	12980	0.875	KYF040	KF040ARO	CSEF040
FKF042ARO	107.950	146.050	19.05	29340	13290	0.930	KYF042	KF042ARO	CSEF042
FKF045ARO	114.300	152.400	19.05	31520	13960	0.975	KYF045	KF045ARO	CSEF045
FKF047ARO	120.650	158.750	19.05	32580	14270	1.040	KYF047	KF047ARO	CSEF047
FKF050ARO	127.000	165.100	19.05	33650	14580	1.090	KYF050	KF050ARO	CSEF050
FKF055ARO	139.700	177.800	19.05	36940	15510	1.180	KYF055	KF055ARO	CSEF055
FKF060ARO	152.400	190.500	19.05	40180	16400	1.240	KYF060	KF060ARO	CSEF060
FKF065ARO	165.100	203.200	19.05	43430	17290	1.350	KYF065	KF065ARO	CSEF065

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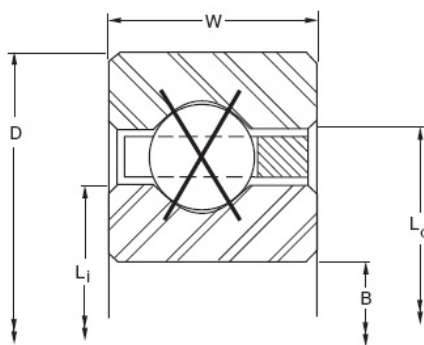
Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDON	INA
FKF070AR0	177.800	215.900	19.05	46720	18140	1.450	KYF070	KF070ARO	CSEF070
FKF075AR0	190.500	228.600	19.05	48900	18670	1.560	KYF075	KF075ARO	CSEF075
FKF080AR0	203.200	241.300	19.05	52140	19510	1.660	KYF080	KF080ARO	CSEF080
FKF090AR0	228.600	266.700	19.05	58630	21110	1.810	KYF090	KF090ARO	CSEF090
FKF100AR0	254.000	292.100	19.05	64100	22360	2.020	KYF100	KF100ARO	CSEF100
FKF110AR0	279.400	317.500	19.05	70590	23870	2.180	KYF110	KF110ARO	CSEF110
FKF120AR0	304.800	342.900	19.05	76010	25070	2.380	KYF120	KF120ARO	CSEF120
FKF140AR0	355.600	393.700	19.05	87970	27650	2.720	KYF140	KF140ARO	CSEF140
FKF160AR0	406.400	444.500	19.05	99920	30100	3.220	KYF160	KF160ARO	CSEF160
FKF180AR0	457.200	495.300	19.05	112950	32670	3.580	KYF180	KF180ARO	CSEF180
FKF200AR0	508.000	546.100	19.05	124910	34940	4.040	KYF200	KF200ARO	CSEF200

KG Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	Cor	Cr		NTN	KAYDON	INA
FKG040AR0	101.600	152.400	25.40	42140	20980	1.640	KYG040	KG040ARO	CSEG040
FKG042AR0	107.950	158.750	25.40	44230	21690	1.740	KYG042	KG042ARO	CSEG042
FKG045AR0	114.300	165.100	25.40	46360	22360	1.790	KYG045	KG045ARO	CSEG045
FKG047AR0	120.650	171.450	25.40	48450	23030	1.890	KYG047	KG047ARO	CSEG047
FKG050AR0	127.000	177.800	25.40	50540	23690	2.000	KYG050	KG050ARO	CSEG050
FKG055AR0	139.700	190.500	25.40	54760	25030	2.150	KYG055	KG055ARO	CSEG055
FKG060AR0	152.400	203.200	25.40	58990	26270	2.300	KYG060	KG060ARO	CSEG060
FKG065AR0	165.100	215.900	25.40	63210	27520	2.450	KYG065	KG065ARO	CSEG065
FKG070AR0	177.800	228.600	25.40	67390	28720	2.660	KYG070	KG070ARO	CSEG070
FKG075AR0	190.500	241.300	25.40	71610	29920	2.810	KYG075	KG075ARO	CSEG075
FKG080AR0	203.200	254.000	25.40	75830	31070	2.970	KYG080	KG080ARO	CSEG080
FKG090AR0	228.600	279.400	25.40	84280	33340	3.270	KYG090	KG090ARO	CSEG090
FKG100AR0	254.000	304.800	25.40	92680	35520	3.630	KYG100	KG100ARO	CSEG100
FKG110AR0	279.400	330.200	25.40	101120	37650	3.940	KYG110	KG110ARO	CSEG110
FKG120AR0	304.800	355.600	25.40	109530	39690	4.300	KYG120	KG120ARO	CSEG120
FKG140AR0	355.600	406.400	25.40	126370	43650	4.940	KYG140	KG140ARO	CSEG140
FKG160AR0	406.400	457.200	25.40	143220	47470	5.620	KYG160	KG160ARO	CSEG160
FKG180AR0	457.200	508.000	25.40	160110	51120	6.260	KYG180	KG180ARO	CSEG180
FKG200AR0	508.000	558.800	25.40	176960	54670	6.890	KYG200	KG200ARO	CSEG200

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● Thin-section four-point contact bearing



Thin-section four-point contact bearing is the ideal choice for supporting moment heavy pressure. It successfully satisfies the four points contact between raceway and steel ball in order to support moment load and reversing axial load. Although it can be applied in light load.

KAA Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	C0r	Cr		NTN	KAYDON	INA
FKAA10XP0	25.400	34.925	4.762	1290	670	0.012	KXS010	KAA10XL0	CSXAA010
FKAA15XP0	38.100	47.625	4.762	1780	800	0.018	KXS015	KAA15XL0	CSXAA015
FKAA17XP0	44.450	53.975	4.762	3100	2950	0.020	-	KAA17XL0	CSXAA017

KA Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	C0r	Cr		NTN	KAYDON	INA
FKA020XP0	50.800	63.500	6.35	1650	1420	0.048	KXA020	KA020XP0	CSXA020
FKA025XP0	63.500	76.200	6.35	3690	1600	0.059	KXA025	KA025XP0	CSXA025
FKA030XP0	76.200	88.900	6.35	4400	1820	0.068	KXA030	KA030XP0	CSXA030
FKA035XP0	88.900	101.600	6.35	5070	2000	0.082	KXA035	KA035XP0	CSXA035
FKA040XP0	101.600	114.300	6.35	5730	2130	0.090	KXA040	KA040XP0	CSXA040
FKA042XP0	107.950	120.650	6.35	6090	2220	0.095	KXA042	KA042XP0	CSXA042
FKA045XP0	114.300	127.000	6.35	6400	2310	0.100	KXA045	KA045XP0	CSXA045
FKA047XP0	120.650	133.350	6.35	6760	2400	0.104	KXA047	KA047XP0	CSXA047
FKA050XP0	127.000	139.700	6.35	7070	2490	0.109	KXA050	KA050XP0	CSXA050
FKA055XP0	139.700	152.400	6.35	7780	2620	0.118	KXA055	KA055XP0	CSXA055
FKA060XP0	152.400	165.100	6.35	8450	2800	0.130	KXA060	KA060XP0	CSXA060
FKA065XP0	165.100	177.800	6.35	9110	2930	0.140	KXA065	KA065XP0	CSXA065
FKA070XP0	177.800	190.500	6.35	9780	3070	0.150	KXA070	KA070XP0	CSXA070
FKA075XP0	190.500	203.200	6.35	10450	3200	0.160	KXA075	KA075XP0	CSXA075
FKA080XP0	203.200	215.900	6.35	11110	3330	0.172	KXA080	KA080XP0	CSXA080
FKA090XP0	228.600	241.300	6.35	12490	3600	0.200	KXA090	KA090XP0	CSXA090
FKA100XP0	254.000	266.700	6.35	13820	3870	0.227	KXA100	KA100XP0	CSXA100
FKA110XP0	279.400	292.100	6.35	15160	4130	0.236	KXA110	KA110XP0	CSXA110
FKA120XP0	304.800	317.500	6.35	16540	4360	0.254	KXA120	KA120XP0	CSXA120

FRB BEARINGS, YOU BEST CHOICE, BEST SUPPLIER

KB Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	C0r	Cr		NTN	KAYDON	INA
FKB020XP0	50.800	66.675	7.9380	4130	2000	0.073	KXB020	KB020XP0	CSXB020
FKB025XP0	63.500	79.375	7.9380	5070	2310	0.091	KXB025	KB025XP0	CSXB025
FKB030XP0	76.200	92.075	7.9380	5960	2580	0.109	KXB030	KB030XP0	CSXB030
FKB035XP0	88.900	104.775	7.9380	6850	2800	0.125	KXB035	KB035XP0	CSXB035
FKB040XP0	101.600	117.475	7.9380	7780	3070	0.140	KXB040	KB040XP0	CSXB040
FKB045XP0	114.300	130.175	7.9380	8670	3290	0.160	KXB045	KB045XP0	CSXB045
FKB047XP0	120.650	136.525	7.9380	9020	3380	0.163	KXB047	KB047XP0	CSXB047
FKB050XP0	127.000	142.875	7.9380	9560	3510	0.172	KXB050	KB050XP0	CSXB050
FKB055XP0	139.700	155.575	7.9380	10490	3730	0.186	KXB055	KB055XP0	CSXB055
FKB060XP0	152.400	168.275	7.9380	11380	3960	0.205	KXB060	KB060XP0	CSXB060
FKB065XP0	165.100	180.975	7.9380	12270	4130	0.216	KXB065	KB065XP0	CSXB065
FKB070XP0	177.800	193.675	7.9380	13200	4360	0.232	KXB070	KB070XP0	CSXB070
FKB075XP0	190.500	206.375	7.9380	14090	4530	0.250	KXB075	KB075XP0	CSXB075
FKB080XP0	203.200	219.075	7.9380	14980	4760	0.262	KXB080	KB080XP0	CSXB080
FKB090XP0	228.600	244.475	7.9380	16800	5110	0.300	KXB090	KB090XP0	CSXB090
FKB100XP0	254.000	269.875	7.9380	18620	5470	0.331	KXB100	KB100XP0	CSXB100
FKB110XP0	279.400	295.275	7.9380	20400	5820	0.360	KXB110	KB110XP0	CSXB110
FKB120XP0	304.800	320.675	7.9380	22230	6180	0.390	KXB120	KB120XP0	CSXB120
FKB140XP0	355.600	371.475	7.9380	25830	6800	0.476	KXB140	KB140XP0	CSXB140
FKB160XP0	406.400	422.275	7.9380	29430	7420	0.544	KXB160	KB160XP0	CSXB160
FKB180XP0	457.200	473.075	7.9380	33070	8050	0.612	KXB180	KB180XP0	CSXB180
FKB200XP0	508.000	523.875	7.9380	36670	8620	0.68	KXB200	KB200XP0	CSXB200

KC Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	C0r	Cr		NTN	KAYDON	INA
FKC040XP0	101.600	120.650	9.525	9340	3910	0.204	KXC040	KC040XP0	CSXC040
FKC042XP0	107.950	127.000	9.525	9870	4090	0.213	KXC042	KC042XP0	CSXC042
FKC045XP0	114.300	133.350	9.525	10400	4220	0.225	KXC045	KC045XP0	CSXC045
FKC047XP0	120.650	139.700	9.525	10940	4360	0.235	KXC047	KC047XP0	CSXC047
FKC050XP0	127.000	146.050	9.525	11510	4490	0.263	KXC050	KC050XP0	CSXC050
FKC055XP0	139.700	158.750	9.525	12580	4800	0.268	KXC055	KC055XP0	CSXC055
FKC060XP0	152.400	171.450	9.525	13650	5070	0.295	KXC060	KC060XP0	CSXC060
FKC065XP0	165.100	184.150	9.525	14710	5330	0.312	KXC065	KC065XP0	CSXC065
FKC070XP0	177.800	196.850	9.525	15780	5560	0.340	KXC070	KC070XP0	CSXC070
FKC075XP0	190.500	209.550	9.525	16850	5820	0.360	KXC075	KC075XP0	CSXC075
FKC080XP0	203.200	222.250	9.525	17910	6050	0.387	KXC080	KC080XP0	CSXC080
FKC090XP0	228.600	247.650	9.525	20050	6530	0.450	KXC090	KC090XP0	CSXC090
FKC100XP0	254.000	273.050	9.525	22180	6980	0.481	KXC100	KC100XP0	CSXC100

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Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	C0r	Cr		NTN	KAYDON	INA
FKC110XP0	279.400	298.450	9.525	24310	7420	0.526	KXC110	KC110XP0	CSXC110
FKC120XP0	304.800	323.850	9.525	26450	7870	0.567	KXC120	KC120XP0	CSXC120
FKC140XP0	355.600	374.650	9.525	30720	8670	0.689	KXC140	KC140XP0	CSXC140
FKC160XP0	406.400	425.450	9.525	35030	9470	0.785	KXC160	KC160XP0	CSXC160
FKC180XP0	457.200	476.250	9.525	39290	10220	0.880	KXC180	KC180XP0	CSXC180
FKC200XP0	508.000	527.050	9.525	43560	10980	0.980	KXC200	KC200XP0	CSXC200

KD Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	C0r	Cr		NTN	KAYDON	INA
FKD040XP0	101.600	127.000	12.7	13690	6270	0.366	KXD040	KD040XP0	CSXD040
FKD042XP0	107.950	133.350	12.7	14180	6400	0.386	KXD042	KD042XP0	CSXD042
FKD045XP0	114.300	139.700	12.7	15200	6710	0.405	KXD045	KD045XP0	CSXD045
FKD047XP0	120.650	146.050	12.7	15690	6850	0.426	KXD047	KD047XP0	CSXD047
FKD050XP0	127.000	152.400	12.7	16710	7160	0.454	KXD050	KD050XP0	CSXD050
FKD055XP0	139.700	165.100	12.7	18230	7560	0.485	KXD055	KD055XP0	CSXD055
FKD060XP0	152.400	177.800	12.7	19780	8000	0.526	KXD060	KD060XP0	CSXD060
FKD065XP0	165.100	190.500	12.7	21290	8400	0.566	KXD065	KD065XP0	CSXD065
FKD070XP0	177.800	203.200	12.7	22800	8800	0.606	KXD070	KD070XP0	CSXD070
FKD075XP0	190.500	215.900	12.7	24310	9160	0.650	KXD075	KD075XP0	CSXD075
FKD080XP0	203.200	228.600	12.7	25830	9560	0.694	KXD080	KD080XP0	CSXD080
FKD090XP0	228.600	254.000	12.7	28900	10310	0.780	KXD090	KD090XP0	CSXD090
FKD100XP0	254.000	279.400	12.7	31920	10980	0.853	KXD100	KD100XP0	CSXD100
FKD110XP0	279.400	304.800	12.7	34980	11690	0.934	KXD110	KD110XP0	CSXD110
FKD120XP0	304.800	330.200	12.7	38010	12360	1.020	KXD120	KD120XP0	CSXD120
FKD140XP0	355.600	381.000	12.7	44090	13650	1.240	KXD140	KD140XP0	CSXD140
FKD160XP0	406.400	431.800	12.7	50180	14890	1.410	KXD160	KD160XP0	CSXD160
FKD180XP0	457.200	482.600	12.7	56230	16050	1.580	KXD180	KD180XP0	CSXD180
FKD200XP0	508.000	533.400	12.7	62320	17200	1.750	KXD200	KD200XP0	CSXD200

KF Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	C0r	Cr		NTN	KAYDON	INA
FKF040XP0	101.600	139.700	19.05	23830	12140	0.875	KXF040	KF040XP0	CSXF040
FKF042XP0	107.950	146.050	19.05	25070	12580	0.930	KXF042	KF042XP0	CSXF042
FKF045XP0	114.300	152.400	19.05	26360	12980	0.975	KXF045	KF045XP0	CSXF045
FKF047XP0	120.650	158.750	19.05	27600	13380	1.040	KXF047	KF047XP0	CSXF047
FKF050XP0	127.000	165.100	19.05	28850	13780	1.090	KXF050	KF050XP0	CSXF050
FKF055XP0	139.700	177.800	19.05	31340	14580	1.180	KXF055	KF055XP0	CSXF055
FKF060XP0	152.400	190.500	19.05	33870	15340	1.240	KXF060	KF060XP0	CSXF060
FKF065XP0	165.100	203.200	19.05	36360	16090	1.350	KXF065	KF065XP0	CSXF065
FKF070XP0	177.800	215.900	19.05	38890	16850	1.450	KXF070	KF070XP0	CSXF070

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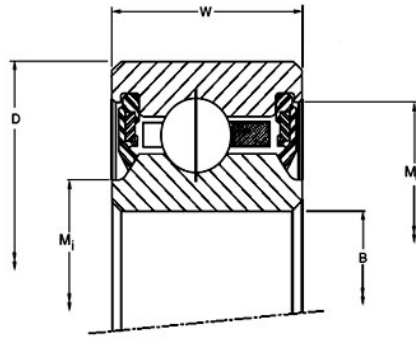
Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	C0r	Cr		NTN	KAYDON	INA
FKF075XP0	190.500	228.600	19.05	41380	17560	1.560	KXF075	KF075XP0	CSXF075
FKF080XP0	203.200	241.300	19.05	43920	18230	1.660	KXF080	KF080XP0	CSXF080
FKF090XP0	228.600	266.700	19.05	48900	19600	1.810	KXF090	KF090XP0	CSXF090
FKF100XP0	254.000	292.100	19.05	53920	20940	2.020	KXF100	KF100XP0	CSXF100
FKF110XP0	279.400	317.500	19.05	58940	22230	2.180	KXF110	KF110XP0	CSXF110
FKF120XP0	304.800	342.900	19.05	63960	23470	2.380	KXF120	KF120XP0	CSXF120
FKF140XP0	355.600	393.700	19.05	74010	25830	2.720	KXF140	KF140XP0	CSXF140
FKF160XP0	406.400	444.500	19.05	84010	28140	3.220	KXF160	KF160XP0	CSXF160
FKF180XP0	457.200	495.300	19.05	94060	30320	3.580	KXF180	KF180XP0	CSXF180
FKF200XP0	508.000	546.100	19.05	104100	32450	4.040	KXF200	KF200XP0	CSXF200

KG Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent		
	d	D	H	C0r	Cr		NTN	KAYDON	INA
FKG040XP0	101.600	152.400	25.40	36490	20000	1.650	KXG040	KG040XP0	CSXG040
FKG042XP0	107.950	158.750	25.40	36490	20000	1.750	KXG042	KG042XP0	CSXG042
FKG045XP0	114.300	165.100	25.40	38940	20900	1.810	KXG045	KG045XP0	CSXG045
FKG047XP0	120.650	171.450	25.40	41340	21740	1.910	KXG047	KG047XP0	CSXG047
FKG050XP0	127.000	177.800	25.40	43780	22580	2.020	KXG050	KG050XP0	CSXG050
FKG055XP0	139.700	190.500	25.40	46230	23430	2.170	KXG055	KG055XP0	CSXG055
FKG060XP0	152.400	203.200	25.40	51070	25030	2.310	KXG060	KG060XP0	CSXG060
FKG065XP0	165.100	215.900	25.40	53520	25830	2.470	KXG065	KG065XP0	CSXG065
FKG070XP0	177.800	228.600	25.40	58360	27380	2.670	KXG070	KG070XP0	CSXG070
FKG075XP0	190.500	241.300	25.40	60810	28140	2.830	KXG075	KG075XP0	CSXG075
FKG080XP0	203.200	254.000	25.40	65650	29600	3.000	KXG080	KG080XP0	CSXG080
FKG090XP0	228.600	279.400	25.40	72990	31780	3.300	KXG090	KG090XP0	CSXG090
FKG100XP0	254.000	304.800	25.40	80280	33870	3.650	KXG100	KG100XP0	CSXG100
FKG110XP0	279.400	330.200	25.40	87570	35870	3.960	KXG110	KG110XP0	CSXG110
FKG120XP0	304.800	355.600	25.40	94860	37830	4.320	KXG120	KG120XP0	CSXG120
FKG140XP0	355.600	406.400	25.40	109440	41600	4.960	KXG140	KG140XP0	CSXG140
FKG160XP0	406.400	457.200	25.40	124060	45250	5.650	KXG160	KG160XP0	CSXG160
FKG180XP0	457.200	508.000	25.40	138640	48720	6.280	KXG180	KG180XP0	CSXG180
FKG200XP0	508.000	558.800	25.40	153220	52100	7.530	KXG200	KG200XP0	CSXG200
FKG250XP0	635.000	685.800	25.40	300000	100000	8.850	KXG250	KG250XP0	CSXG250
FKG300XP0	762.000	812.800	25.40	360000	107000	10.570	KXG300	KG300XP0	CSXG300
FKG350XP0	889.000	939.800	25.40	420000	113000	12.300	KXG350	KG350XP0	CSXG350

FRB BEARINGS, YOU BEST CHOICE, BEST SUPPLIER

● Thin-section sealed radial contact ball bearing



Thin-section sealed radial contact ball bearing design for mounting shaped ring both sides on the basis of thin-section radial contact bearing. This perfect structure can impetus the protection function, maintain the internal cleaning of bearing and efficient lubricant. But the rotary number of the comparative open or with isolation block of bearing is low.

FJHA Series							
Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent KAYDON
	d	D	H	Cor	Cr		
FJHA10CP0	25.400	34.925	6.35	1290	670	0.016	JHA10CLO
FJHA15CP0	38.100	47.625	6.35	1780	800	0.024	JHA15CLO
FJA Series							
Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent KAYDON
	d	D	H	Cor	Cr		
FJA020CP0	50.800	63.500	6.35	3020	1420	0.045	JA020CPO
FJA025CP0	63.500	76.200	6.35	3690	1600	0.054	JA025CPO
FJA030CP0	76.200	88.900	6.35	4400	1820	0.064	JA030CPO
FJA035CP0	88.900	101.600	6.35	5070	2000	0.077	JA035CPO
FJA040CP0	101.600	114.300	6.35	5730	2130	0.086	JA040CPO
FJA042CP0	107.950	120.650	6.35	6090	2220	0.091	JA042CPO
FJA045CP0	114.300	127.000	6.35	6400	2310	0.095	JA045CPO
FJA047CP0	120.650	133.350	6.35	6760	2400	0.100	JA047CPO
FJA050CP0	127.000	139.700	6.35	7070	2490	0.104	JA050CPO
FJA055CP0	139.700	152.400	6.35	7780	2620	0.113	JA055CPO
FJA060CP0	152.400	165.100	6.35	8450	2800	0.127	JA060CPO
FJA065CP0	165.100	177.800	6.35	9110	2930	0.136	JA065CPO
FJB Series							
Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent KAYDON
	d	D	H	Cor	Cr		
FJB020CP0	50.800	66.700	7.9380	4130	2000	0.068	JB020CPO
FJB025CP0	63.500	79.375	7.9380	5070	2310	0.086	JB025CPO
FJB030CP0	76.200	92.075	7.9380	5960	2580	0.100	JB030CPO
FJB035CP0	88.900	104.775	7.9380	6850	2800	0.122	JB035CPO
FJB040CP0	101.600	117.475	7.9380	7780	3070	0.136	JB040CPO

FRB BEARINGS, YOU BEST CHOICE, BEST SUPPLIER

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent
	d	D	H	Cor	Cr		KAYDON
FJB042CP0	107.950	123.825	7.9380	8130	3160	0.141	JB042CPO
FJB045CP0	114.300	130.175	7.9380	8670	3290	0.154	JB045CPO
FJB047CP0	120.650	136.525	7.9380	9020	3380	0.159	JB047CPO
FJB050CP0	127.000	142.875	7.9380	9560	3510	0.168	JB050CPO
FJB055CP0	139.700	155.575	7.9380	10490	3730	0.181	JB055CPO
FJB060CP0	152.400	168.275	7.9380	11380	3960	0.200	JB060CPO
FJB065CP0	165.100	180.975	7.9380	12270	4130	0.213	JB065CPO

FJG Series

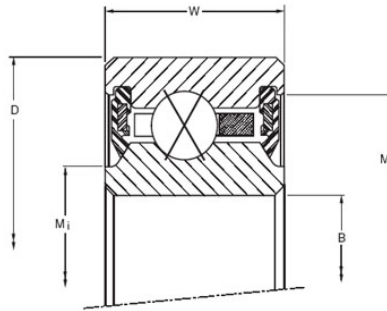
Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent
	d	D	H	Cor	Cr		KAYDON
FJG120CP0	304.800	355.600	25.40	94860	37830	4.218	JG120CPO
FJG140CP0	355.600	406.400	25.40	109440	41600	4.899	JG140CPO

FJU Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent	
	d	D	H	Cor	Cr		KAYDON	INA
FJU040XP0	101.600	120.650	12.7	9340	3910	0.249	JU040XPO	CSXU040-2RS
FJU042XP0	107.950	127.000	12.7	9870	4090	0.263	JU042XPO	CSXU042-2RS
FJU045XP0	114.300	133.350	12.7	10400	4220	0.277	JU045XPO	CSXU045-2RS
FJU047XP0	120.650	139.700	12.7	10940	4360	0.295	JU047XPO	CSXU047-2RS
FJU050XP0	127.000	146.050	12.7	11510	4490	0.308	JU050XPO	CSXU050-2RS
FJU055XP0	139.700	158.750	12.7	12580	4800	0.336	JU055XPO	CSXU055-2RS
FJU060XP0	152.400	171.450	12.7	13650	5070	0.367	JU060XPO	CSXU060-2RS
FJU065XP0	165.100	184.150	12.7	14710	5330	0.395	JU065XPO	CSXU065-2RS
FJU070XP0	177.800	196.850	12.7	15780	5560	0.422	JU070XPO	CSXU070-2RS
FJU075XP0	190.500	209.550	12.7	16850	5820	0.449	JU075XPO	CSXU075-2RS
FJU080XP0	203.200	222.250	12.7	17910	6050	0.481	JU080XPO	CSXU080-2RS
FJU090XP0	228.600	247.650	12.7	20050	6530	0.535	JU090XPO	CSXU090-2RS
FJU100XP0	254.000	273.050	12.7	22180	6980	0.594	JU100XPO	CSXU100-2RS
FJU110XP0	279.400	298.450	12.7	24310	7420	0.649	JU110XPO	CSXU110-2RS
FJU120XP0	304.800	323.850	12.7	26450	7870	0.708	JU120XPO	CSXU120-2RS

FRB BEARINGS, YOU BEST CHOICE, BEST SUPPLIER

● Thin-section sealed four-point contact ball bearing



Thin-section sealed four-point contact ball bearing is also designed for mounting shaped ring both sides on the basis of thin-section four-point contact ball bearing. We have many options for the structural form of the shaped device. Others performance are the same with thin-section four-point contact bearing, except for the low rotational speed.

FJHA Series							
Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent KAYDON
	d	D	H	Cor	Cr		
FJHA10XP0	25.400	34.925	6.35	1290	670	0.016	JHA10XL0
FJHA15XP0	38.100	47.625	6.35	1780	800	0.024	JHA15XL0
FJA Series							
Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent KAYDON
	d	D	H	Cor	Cr		
FJA020XP0	50.800	63.500	6.35	3020	1420	0.045	JA020XPO
FJA025XP0	63.500	76.200	6.35	3690	1600	0.054	JA025XPO
FJA030XP0	76.200	88.900	6.35	4400	1820	0.064	JA030XPO
FJA035XP0	88.900	101.600	6.35	5070	2000	0.077	JA035XPO
FJA040XP0	101.600	114.300	6.35	5730	2130	0.086	JA040XPO
FJA042XP0	107.950	120.650	6.35	6090	2220	0.091	JA042XPO
FJA045XP0	114.300	127.000	6.35	6400	2310	0.095	JA045XPO
FJA047XP0	120.650	133.350	6.35	6760	2400	0.100	JA047XPO
FJA050XP0	127.000	139.700	6.35	7070	2490	0.104	JA050XPO
Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent KAYDON
	d	D	H	Cor	Cr		
FJA055XP0	139.700	152.400	6.35	7780	2620	0.113	JA055XPO
FJA060XP0	152.400	165.100	6.35	8450	2800	0.127	JA060XPO
FJA065XP0	165.100	177.800	6.35	9110	2930	0.136	JA065XPO
FJB Series							
Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent KAYDON
	d	D	H	Cor	Cr		
FJB020XP0	50.800	66.675	7.9380	4130	2000	0.068	JB020XPO
FJB025XP0	63.500	79.375	7.9380	5070	2310	0.086	JB025XPO
FJB030XP0	76.200	92.075	7.9380	5960	2580	0.100	JB030XPO

FRB BEARINGS, YOU BEST CHOICE, BEST SUPPLIER

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent
	d	D	H	Cor	Cr		KAYDON
FJB035XP0	88.900	104.775	7.9380	6850	2800	0.122	JB035XPO
FJB040XP0	101.600	117.475	7.9380	7780	3070	0.136	JB040XPO
FJB042XP0	107.950	123.825	7.9380	8130	3160	0.141	JB042XPO
FJB045XP0	114.300	130.175	7.9380	8670	3290	0.154	JB045XPO
FJB047XP0	120.650	136.525	7.9380	9020	3380	0.159	JB047XPO
FJB050XP0	127.000	142.875	7.9380	9560	3510	0.168	JB050XPO
FJB055XP0	139.700	155.575	7.9380	10490	3730	0.181	JB055XPO
FJB060XP0	152.400	168.275	7.9380	11380	3960	0.200	JB060XPO
FJB065XP0	165.100	180.975	7.9380	12270	4130	0.213	JB065XPO

FJG Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent
	d	D	H	Cor	Cr		KAYDON
FJG120XP0	304.800	355.600	25.40	94860	37830	4.218	JG120XPO
FJG140XP0	355.600	406.400	25.40	109440	41610	4.899	JG140XPO
FJG160XP0	406.400	457.200	25.40	124060	45250	5.579	JG160XPO
FJG180XP0	457.200	508.000	25.40	138640	48720	6.214	JG180XPO
FJG200XP0	508.000	558.800	25.40	153220	52100	7.168	JG200XPO

FJU Series

Bearing Number	Dimensions			Rated load		Weight (kg)	Equivalent	
	d	D	H	Cor	Cr		KAYDON	INA
FJU040XP0	101.600	120.650	12.7	9340	3910	0.249	JU040XPO	CSXU040-2RS
FJU042XP0	107.950	127.000	12.7	9870	4090	0.263	JU042XPO	CSXU042-2RS
FJU045XP0	114.300	133.350	12.7	10400	4220	0.277	JU045XPO	CSXU045-2RS
FJU047XP0	120.650	139.700	12.7	10940	4360	0.295	JU047XPO	CSXU047-2RS
FJU050XP0	127.000	146.050	12.7	11510	4490	0.308	JU050XPO	CSXU050-2RS
FJU055XP0	139.700	158.750	12.7	12580	4800	0.336	JU055XPO	CSXU055-2RS
FJU060XP0	152.400	171.450	12.7	13650	5070	0.367	JU060XPO	CSXU060-2RS
FJU065XP0	165.100	184.150	12.7	14710	5330	0.395	JU065XPO	CSXU065-2RS
FJU070XP0	177.800	196.850	12.7	15780	5560	0.422	JU070XPO	CSXU070-2RS
FJU075XP0	190.500	209.550	12.7	16850	5820	0.449	JU075XPO	CSXU075-2RS
FJU080XP0	203.200	222.250	12.7	17910	6050	0.481	JU080XPO	CSXU080-2RS
FJU090XP0	228.600	247.650	12.7	20050	6530	0.535	JU090XPO	CSXU090-2RS
FJU100XP0	254.000	273.050	12.7	22180	6980	0.594	JU100XPO	CSXU100-2RS
FJU110XP0	279.400	298.450	12.7	24310	7420	0.649	JU110XPO	CSXU110-2RS
FJU120XP0	304.800	323.850	12.7	26450	7870	0.708	JU120XPO	CSXU120-2RS

● Installation and Maintenance

● Inspection and Installation Procedures

Inspection

The unique proportions of Thin-section bearings make some of the usual gaging practices impractical. Since very light pressure is sufficient to deflect the thin rings, conventional two-point measurement of bearing bore and outside diameter must not be used. Air gages of the open jet type, or other proximity devices, must be used to hold error from distortion to an acceptable level. Measurements must be made at enough points to yield a true average size, which may not be the mean of the maximum and minimum measurement. This presents no problem since the races will conform readily to a round shaft diameter and housing bore.

To determine the true runout of each race, by excluding the effect of out of roundness, measurement is made of variation in individual wall thickness. This is schematically illustrated in Figure 5. The indicator must contact the raceway at the ball or roller contact, and must be properly positioned for the particular runout (axial or radial) being checked.

Measurement of Radial Runout of Type C Inner Race

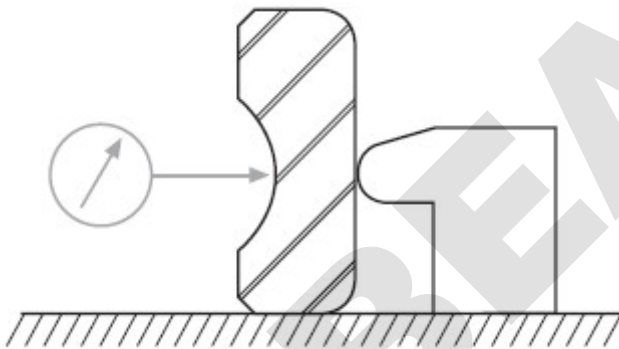


Figure 5

Diametral clearance of Thin-section bearings is controlled by selective assembly of races and balls following measurement with gages specially design for this purpose.

Installation

To realize the potential accuracy and long trouble-free life of a Thin-section bearing, it is important that the installation be properly done in a clean environment. Cleanliness is vital to satisfactory bearing performance. Work surfaces and tools must be free of dirt, chips, and burrs. Disposable wipers or clean, lint-free cloths should be used.

Under no circumstances should a bearing be used as a gage during grinding or machining of mating parts. Just a few grains of grinding grit or chips of metal (soft as well as hard) can seriously damage the precise geometry and finishes of bearing raceways and rolling elements, and are nearly impossible to remove from an assembled bearing.

The shaft and housing should be thoroughly cleaned, special attention being given to holes and crevices

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which could hold dirt, chips, and cutting oil. Unfinished surfaces of castings should be painted or otherwise sealed. The mounting surfaces for the bearing must be carefully checked, cleaned, and lightly oiled to ease fitting and minimize danger of scoring. Housing bore, shaft diameter, shoulder squareness, and fillet sizes should all be verified.

Only when all this has been done and it is time to install the bearing, should it be removed from its protective package.

After mounting, the bearings must be given continued protection from contamination until the assembly is closed. Adherence to these procedures will assure a successful installation. If bearings are being returned to verify dimensions and tolerances, they should be coated with protective oil and wrapped well to prevent damage during transit. If bearings are being returned after use for a failure analysis, they should be returned in the as removed condition, since the condition of the part (cleanliness, lubricated condition, etc.) will provide useful clues for considerations.

● **Lubrication and Maintenance**

The lubricant in an anti-friction bearing serves to reduce friction and wear between moving parts, to dissipate heat, and to prevent corrosion of critical surfaces. Selection of the proper lubricant must be based on satisfaction of the operating conditions, including rotational speed, type and magnitude of loads, and ambient temperature.

The three types of lubricant commonly used are oil, grease, and dry film or surface treatment.

Oil normally provides more complete lubrication. Because of its liquid state, it provides better coverage of the critical surfaces and assists in dissipating heat more readily, the latter being especially true when circulation and cooling are provided. In high speed applications where the heating effect is more pronounced, oil is generally mandatory. Where minimum torque is a requirement, oil will usually provide lower friction values.

Grease offers certain advantages of its own. Because it is more easily retained, the design of bearing housings and seals is simplified. In many applications, the lubricant itself serves to exclude contaminants when used in conjunction with labyrinths or close clearances between the rotating and stationary structures. Applications using a high quality bearing grease will perform for long periods of time with little or no maintenance where operating conditions are not severe. For the higher speeds within the range suitable for grease lubrication, a channeling type grease is recommended.

Dry films and surface treatments have been used as bearing lubricants in applications subject to environmental extremes, particularly where conventional lubricants cannot be tolerated or will not survive. A wide variety of types are available and can be furnished, including Tungsten disulfide, graphite, and Molybdenum disulfide.

It is important to note that the quantity of lubricant affects bearing performance under certain operating conditions. Only relatively small amounts of lubricant are necessary to reduce friction and wear if a film can be maintained on all contacting surfaces. Where speed is significant, excessive amounts of oil or grease will

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result in higher operating temperatures, leading to the possibility of early bearing fatigue.

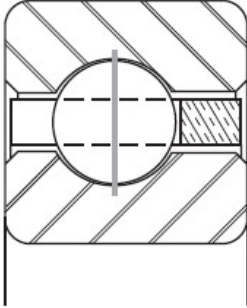
Bearings, with or without seals, can be supplied with optional lubricants. Shown in the accompanying table are some of the greases and oils more frequently specified. Several have been developed to meet the requirements of unusual operating conditions. Because of this, and the variation in cost, it is recommended that lubricants be selected with the assistance of a lubrication expert.

Due to the finite shelf life of any wet lubricant, factory lubricated bearings should not be held more than 2 years prior to use.

● Application Engineering

● Bearing Selection

Type C—Radial Contact



The Type C Radial Contact ball bearing is a single-row radial ball bearing with extra deep ball grooves in both rings (groove depth = 25% of ball diameter). Normally this bearing is assembled by eccentric displacement of the inner race within the outer race which permits insertion of about half of a full complement of balls. After insertion of the balls, the races are positioned concentrically and the balls are spaced about the entire circumference for assembly of the separator. This method of assembly is commonly termed "Conrad Assembly."

An alternate method of assembly is to insert balls through a "filling slot" made by notching the raceway shoulder of one or both races. This method permits assembly with up to a full complement of balls for additional load capacity, however, there are limitations on the operating conditions and these are discussed under Separator Types.

Type C bearings perform best with a small amount of clearance between the balls and races (diametral clearance). Standard bearings are supplied with clearances for:

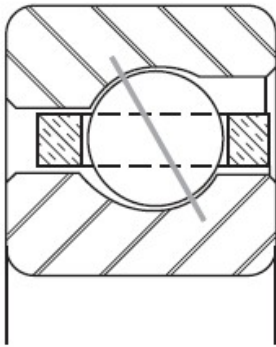
- Interference fitting between bearing races and mounting members;
- Differential thermal expansion or contraction of steel races;
- Misalignment between shaft and housing and other factors may require the clearance to be adjusted accordingly.

The Type C radial contact bearing is designed to have ball to race contact in the plane of the ball centers when pure radial load is applied and thrust forces are absent. Necessary diametral clearance may be increased or decreased to meet operating conditions.

While designed primarily for radial load application, the Type C bearing, without a filling slot, will accept some axial (thrust) load in either direction. Its ability to resist axial load, however, is dependent upon the amount of clearance in the bearing after installation. It is this clearance which allows the balls, under axial load, to contact the races at an angle, thereby offering resistance to such load. In the case of the bearing with a filling slot, the notches interrupt the ball contact paths under axial load, minimizing the dynamic thrust capability. Where axial load is present, therefore, rotation of the filling slot bearing must be restricted.

By increasing the diametral clearance beyond the standard amount, the Type C bearing can have a greater angle of contact under axial load, and thus greater thrust capacity. In this case, it is proper to adjust the bearing against another bearing of similar construction to reduce axial movement under reversing thrust forces. Used in this manner, the bearing is essentially an angular contact rather than a radial contact bearing.

Type A—Angular Contact



Type A Angular Contact ball bearings differ from Type C bearings in that Type A bearings have sufficient diametral clearance to produce a substantial angle of contact for resistance to axial load. This contact angle is 30° in the standard bearing. As in the Type C bearing, extra deep ball grooves are used (25% of ball diameter).

The distinguishing feature of the Type A bearing lies in the method of assembly. One ring, usually the outer, is counterbored to reduce one shoulder of the raceway to the extent that with the assistance of a temperature differential between the two rings, the outer ring can be installed over the inner race, ball, and separator assembly. This provides a non-separable bearing capable of carrying greater radial loads while resisting a substantial axial force in one direction. With an axial force applied, the faces of the inner and outer rings are approximately flush to minimize preload adjustments.

This assembly method permits the use of a greater complement of balls than is possible in the Type C bearing without filling slots, and together with the sizable contact angle, gives the Type A bearing its greater thrust capacity.

Because of its uni-directional thrust capability, this bearing should be mounted opposed to another bearing such that an axial force is present to establish and maintain the contact angle and to minimize axial movement under reversing thrust loads.

Back-to-back Mounting

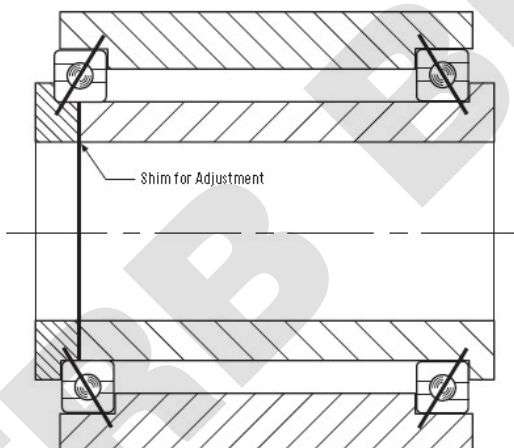


Fig 6

Face-to-face Mounting

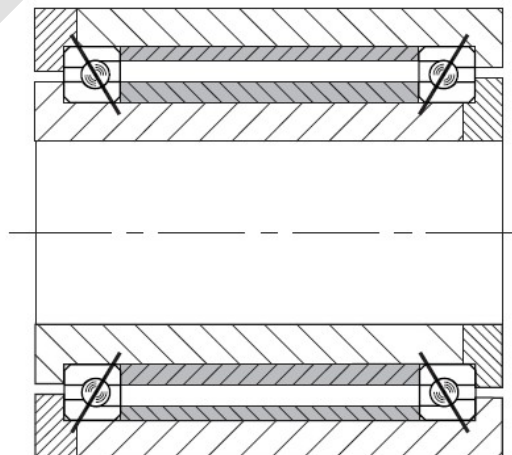


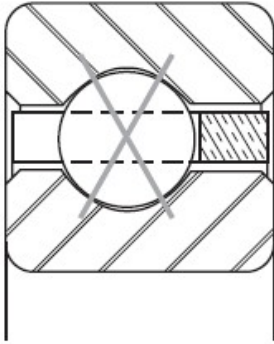
Fig7

Typical mountings of Type A bearings are shown in Figure 6 and 7. In Figure 6, the bearings are mounted with the lines of contact converging outside of the bearings. This is commonly called a "back-to-back" mounting. In this figure, the bearings are adjustable through the inner races by use of shims under the inner race clamping ring. Sufficient shim thickness is provided initially to allow axial movement of the shaft relative to the housing. The total axial movement can then be measured and the shim thickness reduced by the amount of movement plus any additional amount desired for preload. When two bearings are opposed to each other to the extent that all internal clearance is removed and elastic deformation occurs between the balls and raceways, the bearings are said to be "preloaded."

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In Figure 7, the bearings are mounted “face-to-face” with the contact lines converging inward. Spacers are used between both the inner and outer races and adjustment is possible by varying the length of one spacer relative to the other. Normally, however, the spacers are equal in length and the bearings are furnished as a matched pair with a predetermined internal fit. If the outer race spacer were removed from this assembly, the bearings could be adjusted by use of shims under the outer race clamping ring.

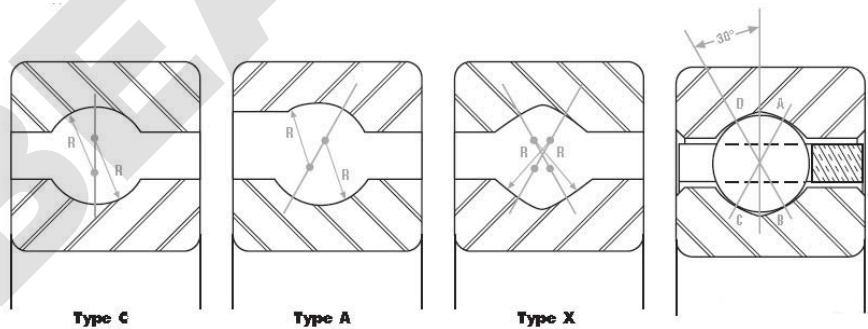
Type X—Four Point Contact



The Type X Four-Point Contact ball bearing is distinguished from Types A and C by the geometry of its ball grooves. In Type C, the centers of the radii both lie in the plane of the ball centers (Figure 8). In Type A with the races and balls in angular contact, the centers of the groove radii are offset equal amounts on either side of the plane of the ball centers (Figure 9). In the Type X bearing the groove in each race has two radii whose centers are offset from the plane of the ball centers (Figure 10). The latter construction gives the Type X bearing its unique “Gothic Arch” configuration, making possible four contactpoints between a ball and the raceways.

Type X bearings are assembled by the methods described in Type C bearings, either Conrad or filling slot. With a filling slot, both the dynamic radial and thrust capabilities are impaired by the interruption of the ball contact path and speed of rotation must be limited.

The depth of groove in the Type X bearing is the same as in Types A and C (25% of ball diameter). The deep groove combined with the four-point contact geometry enables this bearing to resist a combination of radial, thrust, and moment loading. The manner in which the bearing accomplishes this is similar to that of a pair of Type A bearings duplexed back-to-back.



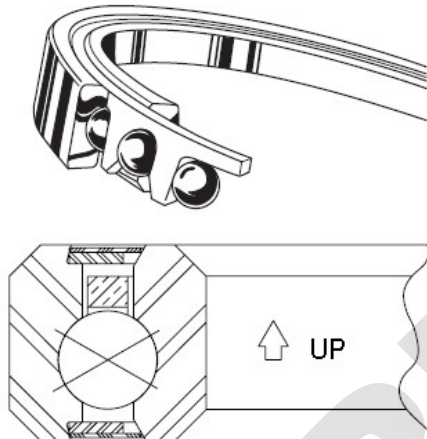
Referring to Figure 11, an axial force applied to the inner race from right to left is passed from the race to the ball at point B. It is then transmitted through the ball to point D where it passes into the outer race and support structure. The line of action BD forms a nominal 30° angle with the radial centerline of the bearing.

Because of the elastic deformation of the ball and the race grooves along the load-transmission line, the ball load is relieved at points A and C permitting smooth rotation around an axis perpendicular to line BD. With an axial force applied to the inner race from left to right, a similar transmission of load occurs between points C and A.

● Mounting

ORIENTATION

It is suggested that in an application where the bearing axis will be within 45° of vertical, the bearing be positioned with separator pocket openings down or that a shoulder of the shaft or housing be extended as added assurance of retention. Sealed and shielded bearings have this position instruction etched on the O.D. by an arrow and the word "up" as shown below.



Correct bearing orientation is shown.

Accuracy

Three primary sources of displacement should be considered in a bearing application. These are looseness, deflection and geometric imperfections of the bearing and mating parts. Bearing imperfections consist of radial runout or eccentricity and axial or face runout. Corresponding to these, and of primary concern, are out of-round and out-of-flat mounting surfaces of the mating parts.

Looseness can occur either between the bearing and the shaft and housing or within the bearing itself. In some applications, looseness cannot be tolerated, especially within the bearing.

Considering the load condition of Figure 12, it can be seen that with internal looseness (diametral clearance) in a Type C or Type X bearing, the thrust load will cause axial movement of the shaft relative to the housing. Because of its unique internal geometry with "built-in" contact angles, a Type X bearing exhibits much less axial movement (axial play) than a Type C bearing of the same dimensions, having the same diametral clearance. So even though the thrust force is within the thrust capability of the Type C bearing, the Type X bearing is the better choice where control of axial movement is important.

Where axial movement must be completely restricted, the Type X bearing can be preloaded by using balls of greater diameter than the space provided for them between the raceways. This is common practice and provides excellent control of axial play. Where speed is appreciable, however, preload is not acceptable in the Type X bearing due to increased friction and wear. The alternative, then, is to use the mounting of Figure 13 employing two Type A bearings. Their geometry is more tolerant of preload, and they offer the advantage of adjustment after installation, making it possible to remove clearance while minimizing preload.

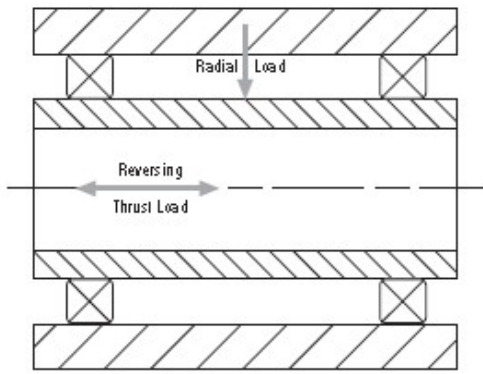


Fig 12

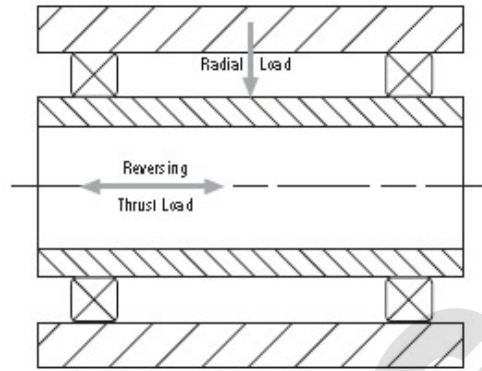


Fig 13

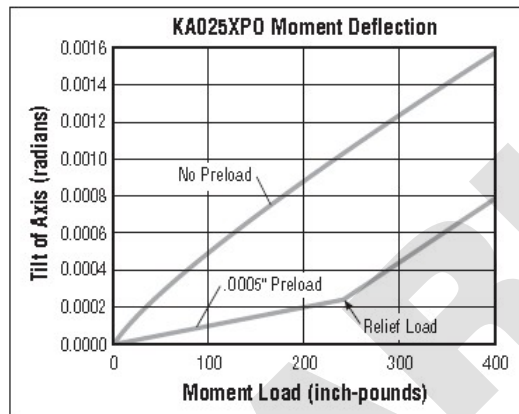


Fig 14

Regarding bearing deflection, questions as to bearing spring rate (ratio of load to deflection) are common. To answer them, the nature and magnitude of the load must be considered. Since deflection can occur in three modes-axial, radial, and angular corresponding to the three types of load, it follows that there are three types of spring rate. Moreover, deflection in a ball bearing is non-linear and thus the spring rate is not constant. Typical load vs. deflection curves are shown in Figure 14.

Load

With a pure radial load such as shown in Figure 15, it can be seen that the Type C bearings in Figure 17 would be ideal. They are designed for radial load, require no adjustment at installation, and are available in a wide variety of sizes. As shown, one bearing is fixed axially on both races and the other bearing is free to "float" in the housing. This arrangement permits differential expansion to occur between the shaft and housing without imposing axial loading on the bearings.

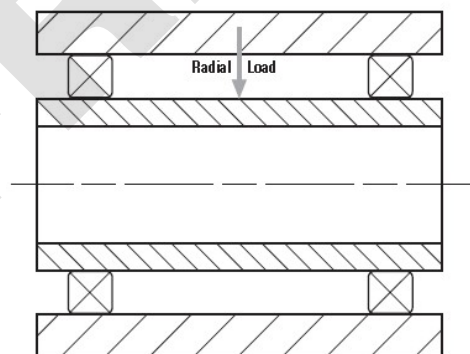


Fig 15

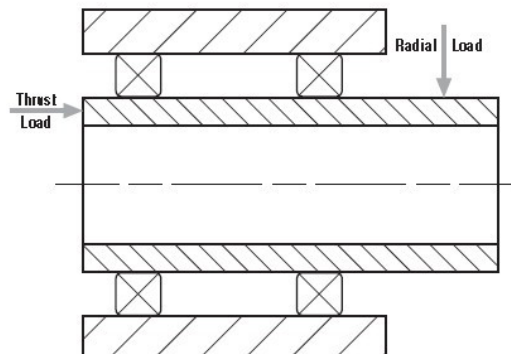


Fig16

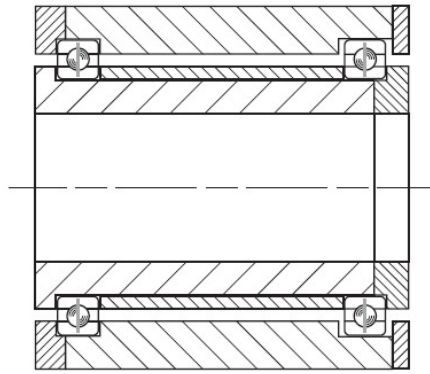


Fig17

With an axial load applied as in Figure 12, consideration must be given to the thrust capability of the bearings. Type C bearings will accept some thrust loading, but where this loading is substantial, the Type X or Type A bearing is a better choice. The Type X bearing can be used with a Type C bearing as shown in Figure 35. This mounting is the same as that of Figure 17 except for the Type X bearing which is used at the "fixed" position to resist thrust in either direction while the Type C bearing "floats" and resists only radial load. With Type A bearings, the mounting could be as shown in Figure 20.

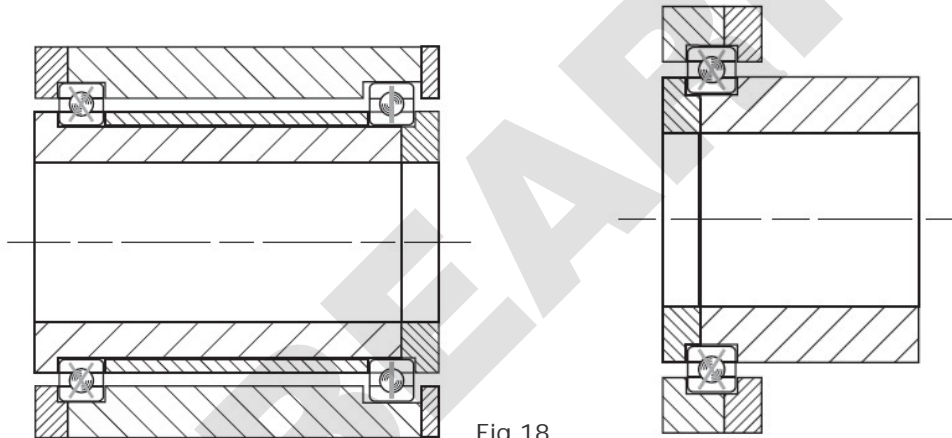


Fig 18

Fig 19

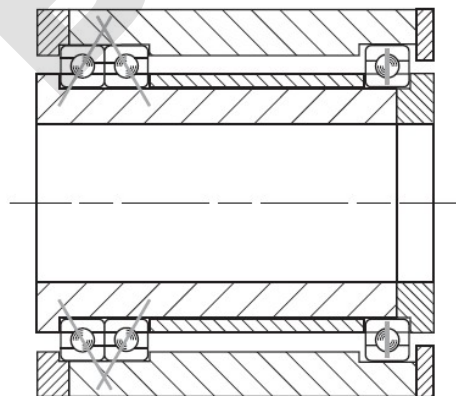


Fig20

In the third load condition (Figure 16), the bearing arrangement in Figure 17 will be satisfactory for small thrust loads. Where thrust is significant, the arrangement of Figures 13, 18 and 19 should be considered. In the latter case, one Type X bearing will accommodate the combined loads while effecting savings in space, weight, and cost.

Speed

In bearing selection, speed of rotation is equally as important as loading.

