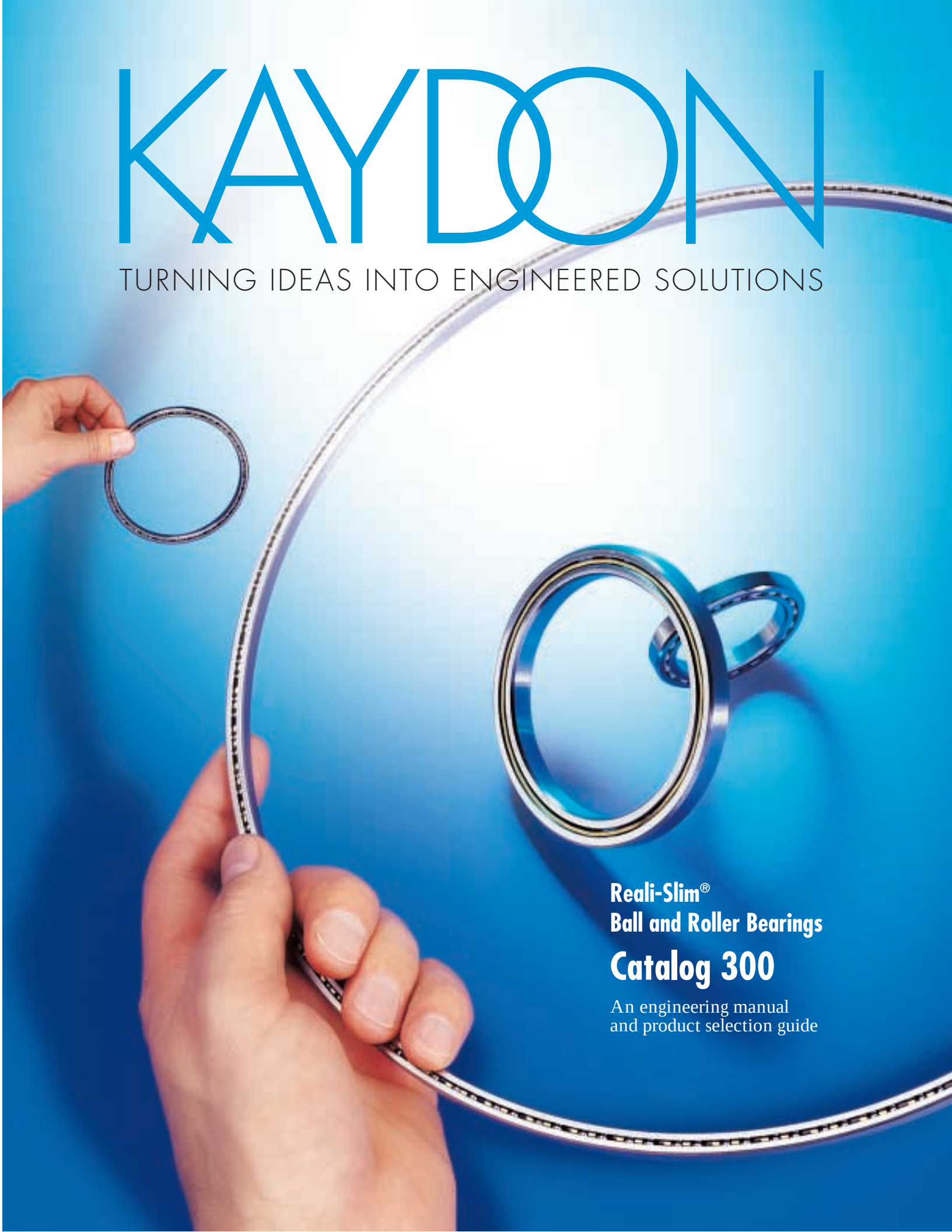
KAYDON

TURNING IDEAS INTO ENGINEERED SOLUTIONS



Reali-Slim®
Ball and Roller Bearings

Catalog 300

An engineering manual
and product selection guide

Reali-Slim®—The Industry Standard in Thin-Section Bearings

When your design calls for thin-section, call on Kaydon. We're the largest manufacturer of thin-section bearings in the world. Reali-Slim thin-section bearings were designed to save space, lower the overall weight of your designs, dramatically reduce friction, and provide excellent running accuracy. With Reali-Slim you can downsize your design and cut manufacturing costs, without sacrificing bearing performance or life.

In addition to the complete stock of popular cross-sections and bore sizes (up to 40") you'll see in this catalog, our thin-section bearings are also available for a wide variety of special applications.

- *Need bearings with corrosion resistance comparable to 440 stainless steel, but with a harder surface finish?* ***Our Endurakote® plating is ideal.***
- *Need bearings for extreme environments?* ***Specify our LLPP Series, stainless steel and hybrid bearings.***
- *Need a drop-in equivalent to replace metric cross-roller bearings?* ***Specify our BA/BB Series metric ball bearings.***
- *Does your design call for a housed bearing with or without gearing?* ***Specify the TG Series.***
- *Got special load, speed, accuracy, or mounting requirements?* ***Reali-Slim higher level assemblies may be the solution.***

In this catalog, you'll find a thin-section bearing for virtually every purpose. What's more, with Real-Slim bearings you also benefit from Kaydon's expert design and applications engineering assistance, dependable customer support, and off-the-shelf delivery from distributors nationwide.

Specify Reali-Slim thin-section bearings for compact, lightweight designs of the future.

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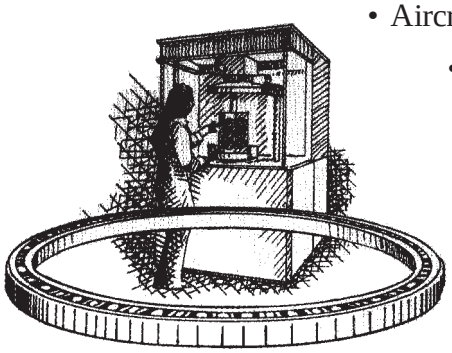
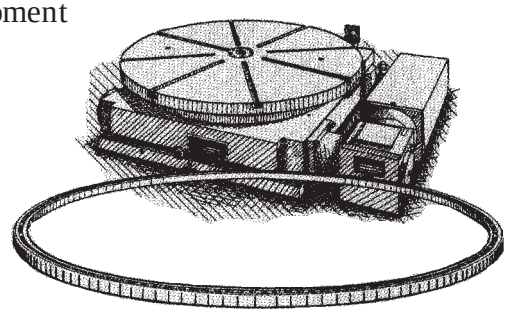
Section 1— An Introduction to Reali-Slim® Thin-Section Bearings

Reali-Slim...For Compact, Lightweight Designs of the Future.

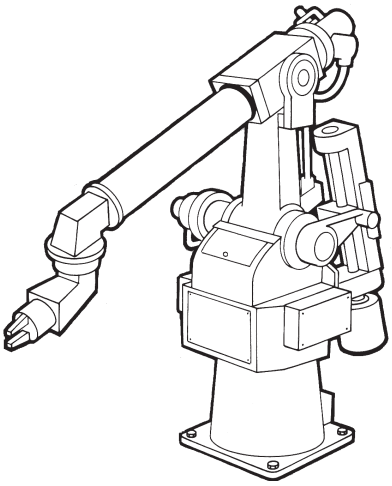


Semiconductor
Fabrication Equipment

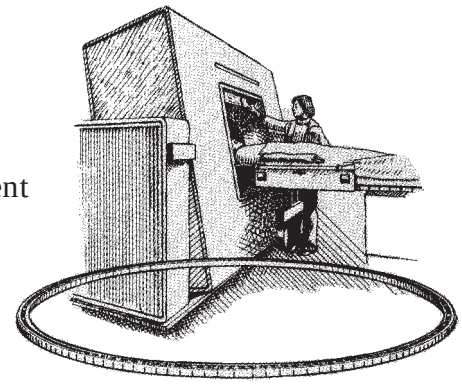
- Aircraft, aerospace and astronomy instrumentation
- Fixturing and workholding equipment
- Food processing equipment
- Glassworking equipment
- Index and rotary tables
- Packaging equipment
- Machine tools
- Medical devices
- Optical scanning equipment
- Tire making equipment
- Radar, satellite and communications equipment
- Robotics
- Textile machinery
- Tube and pipe cutting machines
- Semiconductor manufacturing equipment
- Sorting equipment



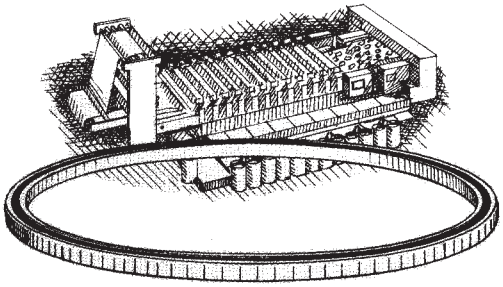
Rotary Table



Industrial Robots



CAT Scanner



Textile Printer

Kaydon Reali-Slim bearings were designed to fill the need for a fully hardened, thin-section, anti-friction bearing—a need resulting from the modern design concepts of simplicity, miniaturization, weight reduction, and compactness being applied to a wide variety of rotating devices.

Before the introduction of Reali-Slim bearings, designers were forced to use bushings or select bearings from the lightest bearings then commercially available, the standard “Light”, “Extra-Light”, and “Extremely Light” series—many of which often had undesirable cross sections, and excess weight at high cost.

Reali-Slim bearings overcome the problems of excess weight and size in bearings, shafts, and housings.

Product Line Overview

The Reali-Slim product line consists of a family of seven open and five sealed series of thin section bearings ranging in bore diameters from 1.000 inch to 40.000 inch. Series range from .187 x .187 inch to 1.000 x 1.000 inch 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, these bearings can be quickly modified to have special clearances, preloads, lubricants, separators and other features to meet the most demanding application requirements. In addition, the Reali-Slim product line can be quickly modified to obtain corrosion resistance by applying Endurakote® thin-dense chrome plating. When assembled with 440C stainless steel balls, this modification makes up the basis for Kaydon's Endura-Slim series of bearings that provide corrosion protection equal to or better than a full 440C stainless steel bearing.

Additional product line variants include KT thin section taper bearings, LLPP Harsh Environment bearings, TG series bearing assemblies and BA/BB metric ball bearings.

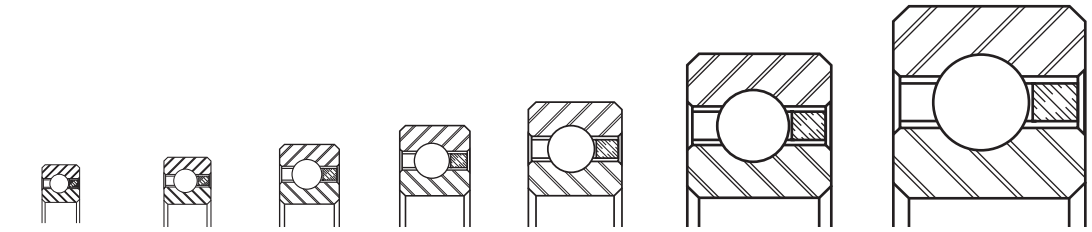
Within these families, you can generally choose between open bearings (for applications where bearings will not be exposed to damaging particulates) and sealed bearings (for applications where bearings need to be kept clean and well lubricated).

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

Reali-Slim bearings are available with various separators to space the rolling elements uniformly and prevent contact between them. Separator types available include: continuous ring "snap-over pocket", continuous ring circular pocket, formed wire, toroid, Teflon spacers, and spacer balls separators. See pages 59 through 63 for complete details.

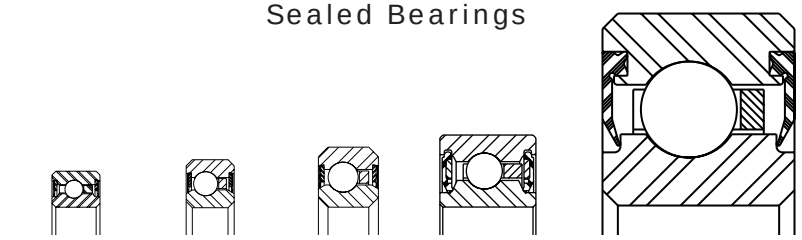
The Product Line At a Glance

Open Bearings



Series AA 3/16" x 3/16"
Series A 1/4" x 1/4"
Series B 5/16" x 5/16"
Series C 3/8" x 3/8"
Series D 1/2" x 1/2"
Series F 3/4" x 3/4"
Series G 1" x 1"

Sealed Bearings



Series JHA 3/16" x 1/4"
Series JA 1/4" x 1/4"
Series JB 5/16" x 5/16"
Series JU 1/2" x 3/8"
Series JG 1" x 1"

Design Efficiency

An Example of How Reali-Slim Bearings Improve Design Efficiency

In Reali-Slim bearings, each series is based on a single cross section which remains constant as the bore diameter is increased. This is in sharp contrast to standard bearings in which the cross section increases as the bore diameter increases. The constant cross section of a Reali-Slim bearing is of particular value when designing a product which will be manufactured in various sizes based on shaft diameter and power requirements (Figure 1). By using the same series of Reali-Slim bearings throughout a product line, the designer can standardize on common components. For all diameters of this rotary table your bearing envelope stays the same.

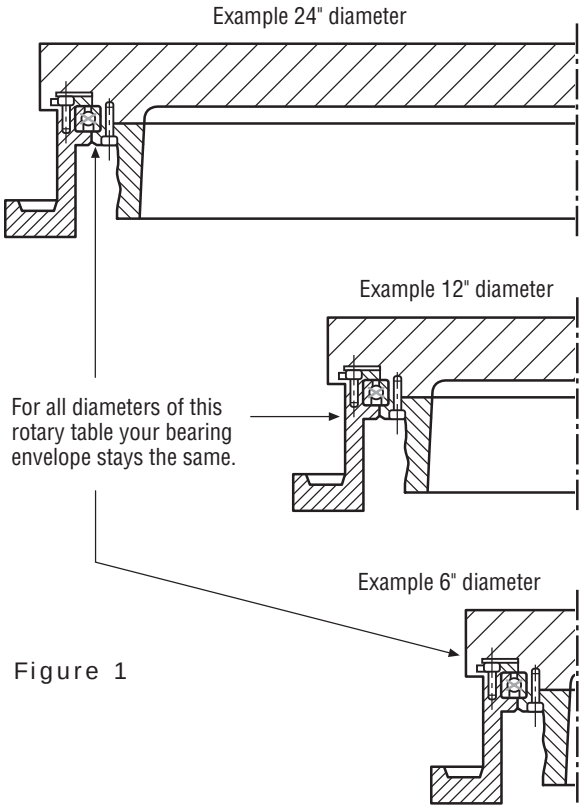


Figure 1

An Example of How Reali-Slim Bearings Make a More Compact Design

Additional advantages in application design made possible by Reali-Slim bearings can be seen by referring to Figures 2, 3 and 4. A large bore, small cross section Reali-Slim bearing permits the use of a large diameter hollow shaft (Figure 3) in place of a smaller diameter solid shaft (Figure 2), king-post design. Components such as air and hydraulic lines or electrical wiring and slip rings can then be accommodated within the hollow shaft, resulting in a neater, more efficient design.

In many applications, a single four-point contact Reali-Slim bearing (Figure 4) can replace two bearings (Figures 2 and 3) compacting the design and simplifying the bearing mounting. Besides the obvious cost savings of eliminating one bearing, this arrangement also contributes further savings in weight and space. The use of Reali-Slim bearings also provide a stiffer structure by using large diameter hollow tubes to replace solid shafts and by supporting the rotating structure (table) at the periphery.

Figure 2

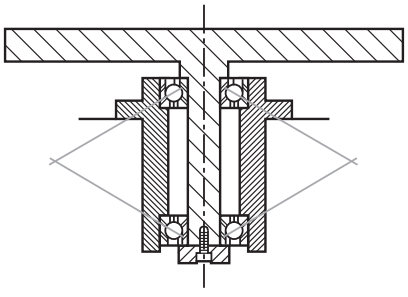


Figure 3

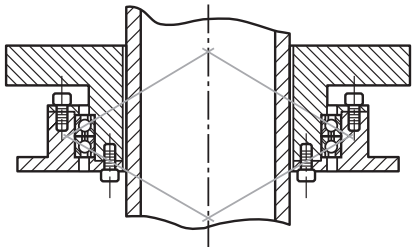
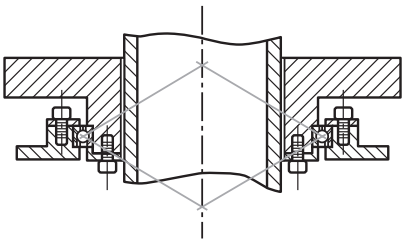


Figure 4

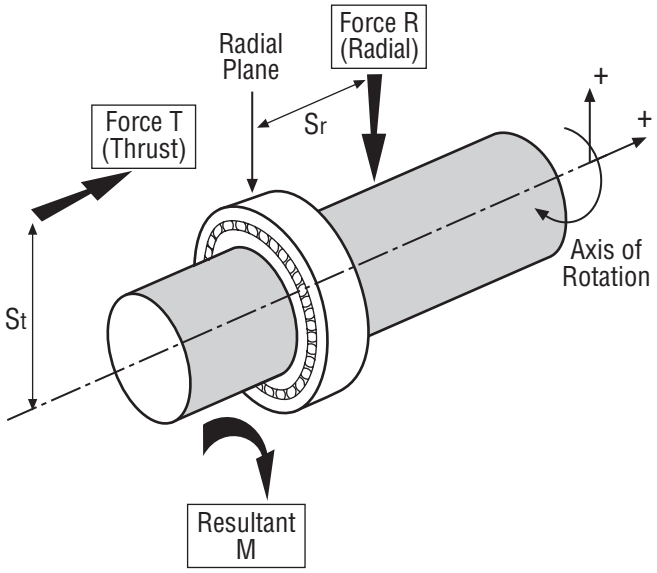


How Reali-Slim Bearing Types Support All Load Scenarios

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 5). 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 St) or radial plane (distance Sr), a resulting moment load (M) will be created. Kaydon Reali-Slim bearings are available in a variety of types to handle radial loads, axial loads and moment loads.

Figure 5



The resultant moment load (M) equation:
$M = (\pm T)(S_t) + (\pm R)(S_r)$

Types of Reali-Slim Bearings

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

Reali-Slim Bearing Types
A = angular
C = radial
X = four-point

(see pages 48-52 for bearing type selection)

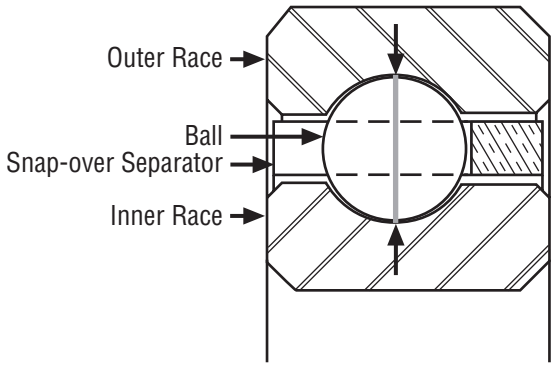
By using these three types, the designer has a wider choice of mounting arrangements to meet load, stiffness and accuracy requirements in the most efficient manner.

Radial Contact Bearing (Type C)

The Type C Radial Contact Bearing (Figure 6) 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.

Reali-Slim TYPE C

Figure 6



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.

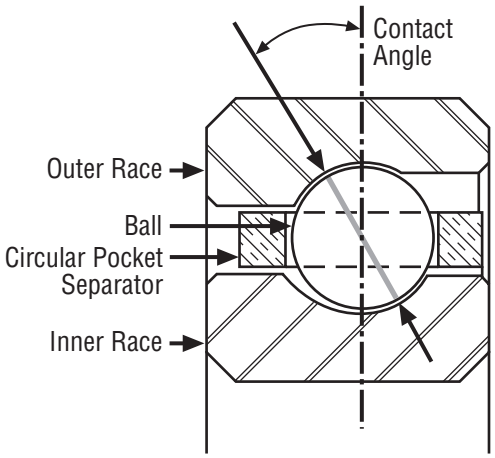
Angular Contact Bearing (Type A)

The Type A Bearing is also a conventional design. It features a circular pocket separator and a thirty degree contact angle (see Figure 7) 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.

Reali-Slim TYPE A

Figure 7



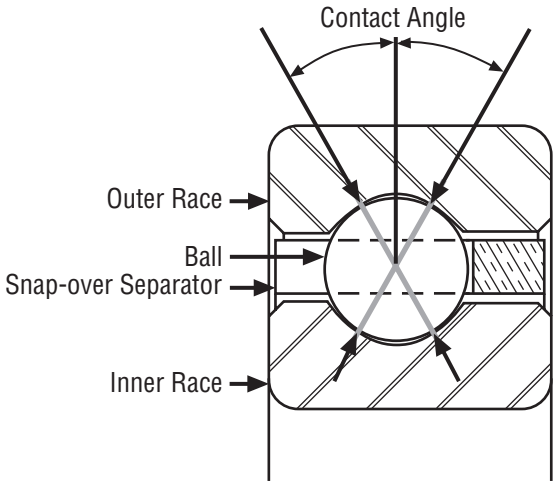
Four-Point Contact Bearing (Type X)

Standard bearing lines are most often designed to handle either radial or axial load conditions. The unique feature about the Kaydon Reali-Slim Type X four-point contact bearing 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.

Type X bearings may also be furnished with an internal diametral preload for those applications requiring greater stiffness or zero free 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.

Reali-Slim TYPE X

Figure 8



Warning: Type X bearings are designed to be used singularly. Use of two Type X bearings on a common shaft could result in objectionable friction torque.

General Information and Availability Chart

Standard REALI-SLIM Bearings—are those listed in the Series Data Tables. They are manufactured to Kaydon Precision Class I and the specifications on page 11.

Stock REALI-SLIM Bearings—are indicated by dots (•) in the Series Data Tables (pages 15-34) and are also shown below. New sizes are added to stock periodically.

Special REALI-SLIM Bearings—are available on a special order basis for non-standard materials, sizes, tolerances, specifications, and features. We will be pleased to quote on your requirements.

Modifications—to stock Reali-Slim bearings are available at additional cost and include changes in diametral clearance; preloading; special lubricants; special packaging; etching of high points; tagging bearing with actual dimensions as requested; separators; duplexing, etc.

Order REALI-SLIM Bearings—by bearing numbers shown in Series Data Tables.

Assistance—in bearing selection and applications will be furnished by our regional sales managers or the Kaydon Engineering Department upon request. Kaydon welcomes the opportunity to solve your bearing problems.

Changes—Kaydon reserves the right to change specifications and other information included in this catalog without notice.

Errors—All information, data, and dimension tables in this catalog have been carefully compiled and thoroughly checked. However, no responsibility for possible errors or omissions can be assumed.

This table applies to standard bearings. For stainless steel and metric stock sizes, please see section 7.

Type Bore		Bore Diameter In Inches																													
Series		1	1½	1¼	2	2½	3	3½	4	4¼	4½	4¾	5	5½	6	6½	7	7½	8	9	10	11	12	14	16	18	20	21	22	25	30	35	40
KAA Series	A	•	•	•																												
3/16" Radial	C	•	•	•																												
Section	X	•	•	•																												
JA Series	A																															
¼" Radial	C				•	•	•	•	•	•	•		x																			
Section	X				•	•	•	•	•	•	•		x			x																
KA Series	A				•	•	•	•	•	•	•	•	•	•	•	•	x	•			x											
¼" Radial	C				•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•									
Section	X				•	•	•	•	•	x	•	•	•	•	•	•	•	•			•		•									
JB Series	A																															
5/16" Radial	C					•	•	•	•	•																						
Section	X				•	•	•	•	•	•																						
KB Series	A				•	•	•	•	•	x	x		x	x	x	x				•												
5/16" Radial	C				•	•	•	•	•	•	•		•	x	•	•			•	x												
Section	X				•	•	•	•	•	•	•		•	•	•	•			•	•					x							
KC Series	A								•	x	•	x	•	x	•		•	x	x	x		x										
3/8" Radial	C								•	•	•	•	•	•	•	•	•	•	•	x	x	x	x									
Section	X								•		•	•	•	•	•	•	•		•	•	•	•	•		x							
JU Series	A																															
3/8" Radial	C								•		•	x	•	•	•	•	•	•	•	•	•	x	x									
Section	X								•		•	x	•	•	•	•	x	•	•	•	•	x	x									
KD Series	A								•	•	•	•	•	•	•	•	•	x	•	•	x	x	x	x	x	x	x					
½" Radial	C								•	•	•	•	•	•	•	•	•	x	•	•	•	•	•	x	x								
Section	X								•	•	•	x	•	•	x	•	x	x	•	•	•	•	•	•	x	•	x	x		x			
KF Series	A											•		•	x	•	x	x	•	x	x	x	•	x	x								
¾" Radial	C								•	•	x	•	•	•	•	•	x	•	•	•	•	•	•	x									
Section	X								•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•									
KG Series	A														•	x	x	•	•	•	x	x	•	•	•	x	x			x	x		x
1" Radial	C									x			•	•	x	•	•	•	•	•	•	•	•	•	•	•	x			x	x	x	x
Section	X										x		•	•	•	x	•	•	•	•	•	•	•	•	•	•	x		•	•	•	•	•

• *Available from stock* x *Limited availability* — *Check for availability of other sizes*

Specifications for Standard Reali-Slim Bearings

ITEM	DESCRIPTION	REFERENCE SPECIFICATION
	MATERIAL ANALYSIS	
RACES & BALLS	AISI 52100 Type Steel Vacuum Degassed	ASTM A-295, FED-STD-66
SEPARATORS **C, X BEARINGS**	P Type—Brass or Non-metallic composite L Type—Nylon, Fiberglass Reinforced	ASTM B-36 or B-134
A BEARINGS	R Type—Brass or Non-metallic composite G Type—Nylon, Fiberglass Reinforced	ASTM B-36 or B-134
SEALS	Buna N Rubber, 70 Durometer, Steel Reinforced	MIL-R 6855
	HEAT TREATMENT	
RACES	Through hardened and dimensionally stabilized for use from -65°F to +250°F (-54°C to +121°C)	
BALLS	Hardened to Rc 62-66	ABMA Std. 10, MIL-B-1083
	PRECISION	
RACE DIMENSIONS	KAYDON Precision Class 1	ABMA ABEC-1F or better
RACE RUNOUTS	KAYDON Precision Class 1	ABMA ABEC-1F or better
BALLS	Grade 24	ABMA Std. 10
	DIAMETRAL CLEARANCE AND CONTACT ANGLE	
TYPE C BEARING **TYPE X BEARING** **TYPE A BEARING**	Sufficient diametral clearance to provide small amount of running clearance after installation with recommended fits Gothic Arch Form for two 30° contact angles under light radial gaging load. Sufficient diametral clearance to provide clearance after installation with recommended fits Diametral clearance for 30° contact angle in single unmounted bearing under light axial gaging load. Wide range of preload or running clearance for matched sets	ABMA Standard 26.2
	SEPARATOR DESIGN	
P & L TYPES **C, X BEARINGS** **R & G TYPES** **A BEARINGS**	Land Riding Ring, Snapped Over Balls for Retention Land Riding Ring, Circular Pockets, Self Retained	
QUALITY CONTROL	Kaydon Quality Control procedures have been approved by major aerospace industries and agencies of the U.S. Government	ISO 9001, MIL-I-45208
IDENTIFICATION	Marked on Bearing O.D.: Cage Code, "KAYDON" ®, Part Number and Date Code	MIL-STD-130
CLEANING	Multiple cycle immersion and agitation in P-D-680 Solvent, MIL-C-15074 Finger Print Remover, and P-D-680 Solvent	MIL-P-116
PRESERVATIVE	Preservative Oil	
PACKAGING	Heat Sealed in Plastic Bag & Boxed	MIL-P-197, Class C

NOTES: Quality Control Per MIL-Q-9858 is Available on Special Order.
Special Preservation, Packaging, Lubrication and "White Room" Facilities are Available on Special Order.

Identification of REALI-SLIM Bearings

Standard and modified Reali-Slim bearings are marked for complete identification with an (8) or (9) digit part number. Positions 1-8 identify materials, size, type, and precision. Position 9 (optional) identifies non-standard internal fit. Custom and proprietary bearings cannot be identified by code, and are marked only with an eight digit number.

Part Number Code Example

Position	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**
Nomenclature	Material	Series	Size			Type	Separator	Precision	Internal Fit
Typical Part No.	K	G	1	2	0	X	P	0	L

Position 1 – Material

	Races, Balls		Seals, Shields
C	CEVR 52100 Steel	with	No seals or shields
D	VD 52100 Steel	with	One shield
E	VD 52100 Steel	with	Two shields
F	VD 52100 Steel	with	One seal—Buna N bonded to phenolic laminate
G	VD 52100 Steel	with	Two seals—Buna N bonded to phenolic laminate
H	VD 52100 Steel	with	One seal—molded Buna N steel reinforced
J	VD 52100 Steel	with	Two seals—molded Buna N steel reinforced
K	VD 52100 Steel	with	No seals or shields
L	VD 52100 Steel	with	Two seals and Endurakote®
M	M-50 Steel	with	No seals or shields
N	VD 52100 Steel	with	Endurakote® corrosion resistance coating
S	440C Stainless Steel	with	No seals or shields
V	440C Stainless Steel	with	Two shields
W	440C Stainless Steel	with	Two seals
Z	Other		

Position 2 – Series Cross Section

		Radial Thickness		Width
Standard Cross-Sections	A	*.187	x	.187
	or	.250	x	.250
	B	.312	x	.312
	C	.375	x	.375
	D	.500	x	.500
	E	.625	x	.625
	F	.750	x	.750
	G	1.000	x	1.000
Extended Width	H	*.187	x	.250
	or	.250	x	.312
	I	.312	x	.375
	J	.375	x	.437
	K	.500	x	.578
	L	.625	x	.727
	M	.750	x	.875
	N	1.000	x	1.187
Extra-Extended Width	S	*.187	x	.312
	or	.250	x	.375
	T	.312	x	.437
	U	.375	x	.500
	V	.500	x	.656
	W	.625	x	.828
	X	.750	x	1.000
	Y	1.000	x	1.375

**Smaller section applies when position 3 is alphabetic—see following explanations of positions 3, 4, and 5.*

Position 3, 4 and 5—Size (Bearing Bore)

Numeric Characters

Nominal bearing bore in inches multiplied by ten

Alphabetic Characters

If the character in position 3 is an "A", it denotes a .187 radial cross section.

Examples

040 = 4.0" Bore

120 = 12.0" Bore

400 = 40.0" Bore

A10 following A in Position 2 = .187 x .187 Series with 1.0" Bore

A15 following H in Position 2 = .187 x .250 Series with 1.5" Bore

Position 6—Bearing Type (see pages 48-52)

A Angular contact single bearing (not ground for universal duplexing)
B Angular contact pair—duplexed back to back
C Radial contact
F Angular contact pair—duplexed face to face
T Angular contact pair—duplexed tandem
U Angular contact single bearing—ground for universal duplexing
X Four-point contact
Z Other

Position 7—Separator (see pages 59-63)

A Machined Aluminum riveted two-piece ring for Conrad assembled bearings or one-piece circular pocket ring for angular contact bearings
B Same as A except material is bronze
C Non-metallic composite, segmental, "snap-over" type
D Phenolic laminate, one-piece ring "snap-over" type
E Brass, segmental "snap-over" type
F Full complement bearing—no separator
G Nylon one-piece ring, circular pocket
H Phenolic laminate, one-piece ring with circular pockets
J Nylon segmental separator, circular pockets
K Phenolic laminate, riveted two-piece ring
L Nylon, one-piece ring "snap-over" type
M Formed wire, strip or segmental, "snap-over" type, ball in every pocket
N Nylon, segmental "snap-over" type
P Standard formed ring "snap-over" type (material—brass or non-metallic composite)
R Standard formed ring, circular pocket (material—brass or non-metallic composite)
S Helical coil springs
T Stainless steel, formed ring "snap-over" type
U Stainless steel, formed ring circular pockets
V Brass, formed ring, "snap-over" type
W Formed wire, strip or segmental, "snap-over" type
Y Brass, formed ring, circular pockets
Z Other (toroids, slugs, spacer balls or others available)

Position 8—Precision (see pages 35-39)

(ABEC Specifications are per ABMA Standard 26.2)

0 Kaydon Precision Class 1 per ABEC 1F
1 Kaydon Precision Class 1 with Class 4 Runouts
2 Kaydon Precision Class 1 with Class 6 Runouts
3 Kaydon Precision Class 3 per ABEC 3F
4 Kaydon Precision Class 4 per ABEC 5F
6 Kaydon Precision Class 6 per ABEC 7F
8 Other

Position 9—Bearing Internal Fit

A .0000 to .0005 Clearance
B .0000 to .0010 Clearance
C .0005 to .0010 Clearance
D .0005 to .0015 Clearance
E .0010 to .0020 Clearance
F .0015 to .0025 Clearance
G .0020 to .0030 Clearance
H .0030 to .0040 Clearance
I .0040 to .0050 Clearance
J .0050 to .0060 Clearance
K .0000 to .0005 Preload
L .0000 to .0010 Preload
M .0005 to .0010 Preload
N .0005 to .0015 Preload
P .0010 to .0020 Preload
Z Special clearance or preload

- *Type X or C = Diametral Preload or Clearance*
- *Duplexed Type A = Axial Preload or Clearance*

Note: *Above internal bearing fits apply to unmounted bearings only. Mounting fits can greatly affect final internal bearing fit.*

Section 2 — Selection Tables for the Complete Line

Open Bearing Selections

Type A

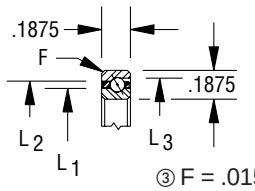
Angular Contact

A deep groove bearing with reduced shoulder on one side of inner or outer race ball path. Snapover assembly permits use of a one-piece circular pocket ring separator and greater ball complement. These bearings will accept radial load and single direction thrust load and are normally used in conjunction with another bearing of similar construction. Type A requires the application of thrust to establish contact angle. Stock bearings are individual units and when purchased as such must be adjusted at installation to desired running clearance or preload. When required, matched sets are available. Kaydon also offers matched spacers for applications requiring extra precision.

K A A SERIES

Kaydon Bearing Number	Dimensions in Inches					Capacities in Pounds①				Weight in Pounds
						Radial		Thrust		
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	C'Bore Dia. L_3	Static②	Dyn.	Static②	Dyn.	
• **KAA10AG0**	**1.000**	1.375	1.140	1.235	1.274	340	150	970	450	.025
• **KAA15AG0**	**1.500**	1.875	1.640	1.735	1.774	480	200	1,380	560	.038
• **KAA17AG0**	**1.750**	2.125	1.890	1.985	2.024	530	210	1,520	600	.045

Circular pocket separator 3/32" balls

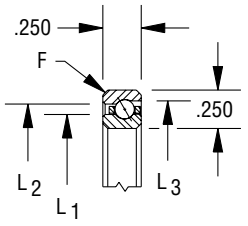


③ F = .015

K A SERIES

Kaydon Bearing Number	Dimensions in Inches					Capacities in Pounds①				Weight in Pounds
						Radial		Thrust		
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	C'Bore Dia. L_3	Static②	Dyn.	Static②	Dyn.	
• **KA020AR0**	**2.000**	2.500	2.186	2.314	2.369	790	330	2,280	960	.10
• **KA025AR0**	**2.500**	3.000	2.686	2.814	2.869	960	380	2,780	1,100	.12
• **KA030AR0**	**3.000**	3.500	3.186	3.314	3.367	1,140	430	3,290	1,230	.14
• **KA035AR0**	**3.500**	4.000	3.686	3.814	3.867	1,310	470	3,790	1,350	.17
• **KA040AR0**	**4.000**	4.500	4.186	4.314	4.367	1,490	510	4,300	1,470	.19
• **KA042AR0**	**4.250**	4.750	4.436	4.564	4.615	1,580	530	4,550	1,530	.20
• **KA045AR0**	**4.500**	5.000	4.686	4.814	4.865	1,660	550	4,810	1,580	.21
• **KA047AR0**	**4.750**	5.250	4.936	5.064	5.115	1,750	570	5,060	1,640	.22
• **KA050AR0**	**5.000**	5.500	5.186	5.314	5.365	1,840	590	5,310	1,690	.23
• **KA055AR0**	**5.500**	6.000	5.686	5.814	5.863	2,020	620	5,820	1,800	.25
• **KA060AR0**	**6.000**	6.500	6.186	6.314	6.363	2,190	660	6,320	1,900	.28
• **KA065AR0**	**6.500**	7.000	6.686	6.814	6.861	2,370	690	6,830	2,000	.30
◊ **KA070AR0**	**7.000**	7.500	7.186	7.314	7.361	2,540	730	7,340	2,100	.32
• **KA075AR0**	**7.500**	8.000	7.686	7.814	7.861	2,720	760	7,840	2,190	.34
KA080AR0	**8.000**	8.500	8.186	8.314	8.359	2,890	790	8,350	2,280	.36
KA090AR0	**9.000**	9.500	9.186	9.314	9.357	3,240	850	9,360	2,470	.41
◊ **KA100AR0**	**10.000**	10.500	10.186	10.314	10.355	3,590	910	10,370	2,640	.45
KA110AR0	**11.000**	11.500	11.186	11.314	11.353	3,940	970	11,380	2,810	.50
KA120AR0	**12.000**	12.500	12.186	12.314	12.349	4,290	1,030	12,390	2,970	.54

Circular pocket separator 1/8" balls



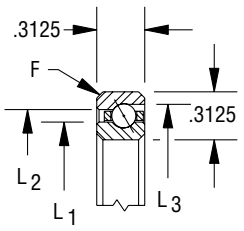
③ F = .025
Bearing corners are normally chamfered

① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
◊ Limited availability.
• Available from stock—check for availability of other sizes.

KB SERIES

Kaydon Bearing Number	Dimensions in Inches					Capacities in Pounds①				Weight in Pounds
						Radial		Thrust		
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	C'Bore Dia. L_3	Static②	Dyn.	Static②	Dyn.	
• **KB020AR0**	**2.000**	2.625	2.231	2.393	2.464	1,090	480	3,150	1,380	.15
• **KB025AR0**	**2.500**	3.125	2.731	2.893	2.964	1,340	550	3,860	1,590	.19
• **KB030AR0**	**3.000**	3.625	3.231	3.393	3.462	1,550	610	4,470	1,750	.22
• **KB035AR0**	**3.500**	4.125	3.731	3.893	3.962	1,790	670	5,180	1,930	.27
• **KB040AR0**	**4.000**	4.625	4.231	4.393	4.460	2,040	730	5,890	2,100	.30
◊ **KB042AR0**	**4.250**	4.875	4.481	4.643	4.710	2,150	750	6,200	2,170	.31
◊ **KB045AR0**	**4.500**	5.125	4.731	4.893	4.960	2,250	780	6,500	2,240	.34
KB047AR0	**4.750**	5.375	4.981	5.143	5.210	2,390	810	6,910	2,340	.35
◊ **KB050AR0**	**5.000**	5.625	5.231	5.393	5.460	2,500	830	7,210	2,410	.37
◊ **KB055AR0**	**5.500**	6.125	5.731	5.893	5.958	2,740	890	7,920	2,560	.40
◊ **KB060AR0**	**6.000**	6.625	6.231	6.393	6.458	2,990	940	8,630	2,710	.44
◊ **KB065AR0**	**6.500**	7.125	6.731	6.893	6.958	3,200	980	9,240	2,840	.47
KB070AR0	**7.000**	7.625	7.231	7.393	7.456	3,450	1,030	9,960	2,980	.50
KB075AR0	**7.500**	8.125	7.731	7.893	7.955	3,700	1,080	10,670	3,120	.54
KB080AR0	**8.000**	8.625	8.231	8.393	8.453	3,940	1,130	11,380	3,260	.57
• **KB090AR0**	**9.000**	9.625	9.231	9.393	9.451	4,400	1,220	12,700	3,510	.64
KB100AR0	**10.000**	10.625	10.231	10.393	10.449	4,890	1,300	14,120	3,760	.71
KB110AR0	**11.000**	11.625	11.231	11.393	11.447	5,350	1,380	15,440	4,000	.78
KB120AR0	**12.000**	12.625	12.231	12.393	12.445	5,840	1,470	16,860	4,240	.85
KB140AR0	**14.000**	14.625	14.231	14.393	14.439	6,760	1,620	19,500	4,670	.98
KB160AR0	**16.000**	16.625	16.231	16.393	16.433	7,710	1,770	22,250	5,100	1.12
KB180AR0	**18.000**	18.625	18.231	18.393	18.425	8,660	1,910	24,990	5,510	1.26
KB200AR0	**20.000**	20.625	20.231	20.393	20.416	9,610	2,050	27,730	5,900	1.40

Circular pocket separator 5/32" balls



③ F = .040
Bearing corners are normally chamfered

① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
◊ Limited availability.
• Available from stock—check for availability of other sizes.

CONTACT KAYDON AT—

Kaydon Corporation • Muskegon, Michigan 49443
Telephone: 231/755-3741 • Fax: 231/759-4102

NEED SERVICE FAST?

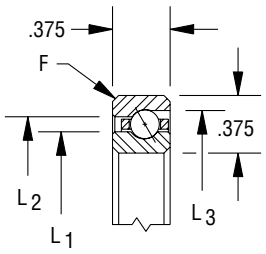
1-800-514-3066

Website: www.kaydonbearings.com

KC SERIES

Kaydon Bearing Number	Dimensions in Inches					Capacities in Pounds①				Weight in Pounds
						Radial		Thrust		
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	C'Bore Dia. L_3	Static②	Dyn.	Static②	Dyn.	
• KC040AR0	**4.000**	4.750	4.277	4.473	4.554	2,550	960	7,360	2,770	.44
◊ KC042AR0	**4.250**	5.000	4.527	4.723	4.804	2,710	1,000	7,820	2,880	.46
• KC045AR0	**4.500**	5.250	4.777	4.973	5.052	2,860	1,040	8,270	2,990	.49
◊ KC047AR0	**4.750**	5.500	5.027	5.223	5.302	3,020	1,070	8,720	3,100	.51
• KC050AR0	**5.000**	5.750	5.277	5.473	5.552	3,180	1,110	9,170	3,200	.54
◊ KC055AR0	**5.500**	6.250	5.777	5.973	6.052	3,440	1,170	9,920	3,370	.58
• KC060AR0	**6.000**	6.750	6.277	6.473	6.550	3,750	1,240	10,820	3,580	.64
KC065AR0	**6.500**	7.250	6.777	6.973	7.050	4,060	1,310	11,720	3,770	.68
• KC070AR0	**7.000**	7.750	7.277	7.473	7.550	4,320	1,360	12,470	3,930	.74
◊ KC075AR0	**7.500**	8.250	7.777	7.973	8.048	4,630	1,430	13,380	4,120	.78
◊ KC080AR0	**8.000**	8.750	8.277	8.473	8.548	4,950	1,490	14,280	4,300	.84
◊ KC090AR0	**9.000**	9.750	9.277	9.473	9.546	5,520	1,600	15,930	4,630	.98
KC100AR0	**10.000**	10.750	10.277	10.473	10.544	6,140	1,720	17,730	4,970	1.04
◊ KC110AR0	**11.000**	11.750	11.277	11.473	11.542	6,720	1,830	19,390	5,280	1.14
KC120AR0	**12.000**	12.750	12.277	12.473	12.540	7,290	1,930	21,040	5,570	1.23
KC140AR0	**14.000**	14.750	14.277	14.473	14.535	8,490	2,140	24,500	6,170	1.43
KC160AR0	**16.000**	16.750	16.277	16.473	16.529	9,680	2,330	27,950	6,730	1.63
KC180AR0	**18.000**	18.750	18.277	18.473	18.523	10,880	2,520	31,410	7,280	1.83
KC200AR0	**20.000**	20.750	20.277	20.473	20.517	12,030	2,690	34,720	7,780	2.03
KC250AR0	**25.000**	25.750	25.277	25.473	25.500	14,900	3,120	43,280	9,010	2.52
KC300AR0	**30.000**	30.750	30.277	30.473	30.484	17,960	3,520	51,850	10,160	3.02

Circular pocket separator 3/16" balls

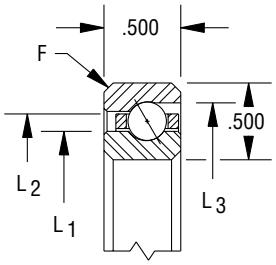


③ F = .040
Bearing corners are normally chamfered

KD SERIES

Kaydon Bearing Number	Dimensions in Inches					Capacities in Pounds①				Weight in Pounds
						Radial		Thrust		
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	C'Bore Dia. L_3	Static②	Dyn.	Static②	Dyn.	
• KD040AR0	**4.000**	5.000	4.370	4.630	4.741	3,550	1,480	10,260	4,260	.80
• KD042AR0	**4.250**	5.250	4.620	4.880	4.991	3,750	1,530	10,830	4,420	.84
• KD045AR0	**4.500**	5.500	4.870	5.130	5.241	3,950	1,580	11,400	4,570	.88
• KD047AR0	**4.750**	5.750	5.120	5.380	5.490	4,150	1,640	11,970	4,720	.93
• KD050AR0	**5.000**	6.000	5.370	5.630	5.740	4,340	1,690	12,540	4,870	.98
• KD055AR0	**5.500**	6.500	5.870	6.130	6.238	4,740	1,790	13,680	5,160	1.06
• KD060AR0	**6.000**	7.000	6.370	6.630	6.738	5,130	1,890	14,820	5,440	1.15
• KD065AR0	**6.500**	7.500	6.870	7.130	7.236	5,530	1,980	15,960	5,720	1.24
• KD070AR0	**7.000**	8.000	7.370	7.630	7.736	5,920	2,070	17,100	5,990	1.33
◊ KD075AR0	**7.500**	8.500	7.870	8.130	8.236	6,320	2,170	18,240	6,250	1.42
• KD080AR0	**8.000**	9.000	8.370	8.630	8.734	6,710	2,260	19,380	6,510	1.52
• KD090AR0	**9.000**	10.000	9.370	9.630	9.732	7,500	2,430	21,660	7,010	1.69
◊ KD100AR0	**10.000**	11.000	10.370	10.630	10.732	8,290	2,600	23,940	7,500	1.87
◊ KD110AR0	**11.000**	12.000	11.370	11.630	11.730	9,080	2,760	26,220	7,960	2.05
◊ KD120AR0	**12.000**	13.000	12.370	12.630	12.728	9,870	2,920	28,500	8,420	2.23
◊ KD140AR0	**14.000**	15.000	14.370	14.630	14.724	11,450	3,220	33,060	9,290	2.57
◊ KD160AR0	**16.000**	17.000	16.370	16.630	16.718	13,030	3,510	37,620	10,130	2.93
◊ KD180AR0	**18.000**	19.000	18.370	18.630	18.712	14,610	3,790	42,180	10,930	3.29
◊ KD200AR0	**20.000**	21.000	20.370	20.630	20.705	16,190	4,060	46,740	11,710	3.65
KD250AR0	**25.000**	26.000	25.370	25.630	25.688	20,140	4,690	58,140	13,540	4.54
KD300AR0	**30.000**	31.000	30.370	30.630	30.672	24,090	5,290	69,540	15,260	5.44

Circular pocket separator 1/4" balls



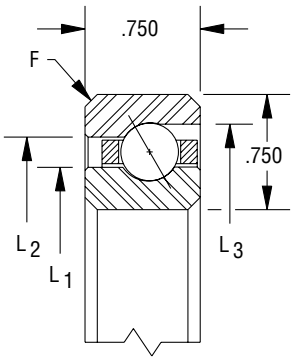
③ F = .060
Bearing corners are normally chamfered

① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
◊ Limited availability.
• Available from stock—check for availability of other sizes.

KF SERIES

Kaydon Bearing Number	Dimensions in Inches					Capacities in Pounds①				Weight in Pounds
						Radial		Thrust		
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	C'Bore Dia. L_3	Static②	Dyn.	Static②	Dyn.	
KF040AR0	4.000	5.500	4.555	4.945	5.115	6,350	2,920	18,340	8,420	1.92
KF042AR0	4.250	5.750	4.805	5.195	5.365	6,600	2,990	19,050	8,630	2.04
KF045AR0	4.500	6.000	5.060	5.445	5.615	7,090	3,140	20,460	9,050	2.14
• KF047AR0	4.750	6.250	5.305	5.695	5.865	7,330	3,210	21,160	9,260	2.26
KF050AR0	5.000	6.500	5.555	5.945	6.115	7,570	3,280	21,870	9,460	2.37
• KF055AR0	5.500	7.000	6.055	6.445	6.613	8,310	3,490	23,980	10,060	2.59
◊ KF060AR0	6.000	7.500	6.555	6.945	7.113	9,040	3,690	26,100	10,650	2.72
• KF065AR0	6.500	8.000	7.055	7.445	7.613	9,770	3,890	28,220	11,220	
◊ KF070AR0	7.000	8.500	7.555	7.945	8.113	10,510	4,080	30,330	11,770	3.16
◊ KF075AR0	7.500	9.000	8.055	8.445	8.610	11,000	4,200	31,740	12,130	3.39
• KF080AR0	8.000	9.500	8.555	8.945	9.110	11,730	4,390	33,860	12,670	3.61
◊ KF090AR0	9.000	10.500	9.555	9.945	10.108	13,190	4,750	38,090	13,700	3.95
◊ KF100AR0	10.000	11.500	10.555	10.945	11.106	14,420	5,030	41,620	14,530	4.40
◊ KF110AR0	11.000	12.500	11.555	11.945	12.106	15,880	5,370	45,850	15,500	4.75
• KF120AR0	12.000	13.500	12.555	12.945	13.104	17,100	5,640	49,380	16,290	5.20
◊ KF140AR0	14.000	15.500	14.555	14.945	15.102	19,790	6,220	57,140	17,950	5.76
◊ KF160AR0	16.000	17.500	16.555	16.945	17.098	22,480	6,770	64,890	19,540	6.78
KF180AR0	18.000	19.500	18.555	18.945	19.096	25,410	7,350	73,360	21,210	7.67
KF200AR0	20.000	21.500	20.555	20.945	21.092	28,100	7,860	81,120	22,680	8.47
KF250AR0	25.000	26.500	25.555	25.945	26.085	34,700	9,040	100,200	26,100	10.50
KF300AR0	30.000	31.500	30.555	30.945	31.075	41,540	10,190	119,900	29,430	12.50
KF350AR0	35.000	36.500	35.555	35.945	36.064	48,380	11,290	139,700	32,580	14.60
KF400AR0	40.000	41.500	40.555	40.945	41.054	55,220	12,330	159,400	35,580	16.60

Circular pocket separator 3/8" balls

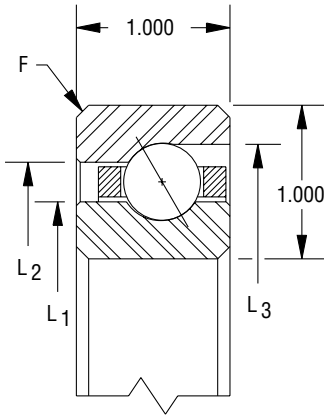


③ F = .080
Bearing corners are normally chamfered

KG SERIES

Kaydon Bearing Number	Dimensions in Inches					Capacities in Pounds①				Weight in Pounds
						Radial		Thrust		
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	C'Bore Dia. L_3	Static②	Dyn.	Static②	Dyn.	
KG040AR0	4.000	6.000	4.742	5.258	5.491	9,480	4,720	27,360	13,630	3.61
KG042AR0	4.250	6.250	4.992	5.508	5.741	9,950	4,880	28,730	14,090	3.83
KG045AR0	4.500	6.500	5.242	5.758	5.989	10,430	5,030	30,100	14,530	3.95
KG047AR0	4.750	6.750	5.492	6.008	6.239	10,900	5,180	31,460	14,970	4.17
KG050AR0	5.000	7.000	5.742	6.258	6.489	11,370	5,330	32,830	15,400	4.42
KG055AR0	5.500	7.500	6.242	6.758	6.989	12,320	5,630	35,570	16,240	4.73
• KG060AR0	6.000	8.000	6.742	7.258	7.489	13,270	5,910	38,300	17,060	5.07
◊ KG065AR0	6.500	8.500	7.242	7.758	7.987	14,220	6,190	41,040	17,870	5.41
◊ KG070AR0	7.000	9.000	7.742	8.258	8.487	15,160	6,460	43,780	18,650	5.87
• KG075AR0	7.500	9.500	8.242	8.758	8.987	16,110	6,730	46,510	19,420	6.20
• KG080AR0	8.000	10.000	8.742	9.258	9.485	17,060	6,990	49,250	20,180	6.54
• KG090AR0	9.000	11.000	9.742	10.258	10.485	18,960	7,500	54,720	21,640	7.22
◊ KG100AR0	10.000	12.000	10.742	11.258	11.483	20,850	7,990	60,190	23,060	8.00
◊ KG110AR0	11.000	13.000	11.742	12.258	12.481	22,750	8,470	65,660	24,440	8.68
• KG120AR0	12.000	14.000	12.742	13.258	13.481	24,640	8,930	71,140	25,780	9.47
• KG140AR0	14.000	16.000	14.742	15.258	15.478	28,430	9,820	82,080	28,360	10.90
• KG160AR0	16.000	18.000	16.742	17.258	17.474	32,220	10,680	93,020	30,830	12.40
◊ KG180AR0	18.000	20.000	18.742	19.258	19.472	36,020	11,500	104,000	33,200	13.80
◊ KG200AR0	20.000	22.000	20.742	21.258	21.468	39,810	12,300	114,900	35,490	15.20
◊ KG250AR0	25.000	27.000	25.742	26.258	26.461	49,280	14,180	142,300	40,920	18.80
◊ KG300AR0	30.000	32.000	30.742	31.258	31.451	58,760	15,940	169,600	46,020	22.50
KG350AR0	35.000	37.000	35.742	36.258	36.440	68,240	17,610	197,000	50,840	26.20
◊ KG400AR0	40.000	42.000	40.472	41.258	41.430	77,720	19,210	224,400	55,440	29.80

Circular pocket separator 1/2" balls



③ F = .080
Bearing corners are normally chamfered

① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
◊ Limited availability. • Available from stock—check for availability of other sizes.

Open Bearing Selections

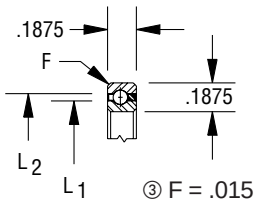
Type C
Radial Contact

A Conrad assembled bearing designed primarily for application of radial load—deep ball grooves also permit application of thrust load in either direction – often used in conjunction with another bearing.

K A A SERIES

Kaydon Bearing Number	Dimensions in Inches				Radial Capacity (lbs.)①		Weight in Pounds
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	Static②	Dynamic	
• **KAA10CL0**	**1.000**	1.375	1.140	1.235	290	150	.026
• **KAA15CL0**	**1.500**	1.875	1.640	1.735	400	180	.039
• **KAA17CL0**	**1.750**	2.125	1.890	1.985	460	200	.045

Snapover separator 3/32" balls

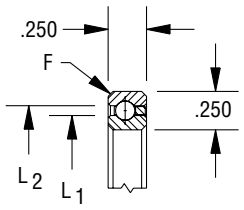


③ F = .015

K A SERIES

Kaydon Bearing Number	Dimensions in Inches				Radial Capacity (lbs.)①		Weight in Pounds
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	Static②	Dynamic	
• **KA020CP0**	**2.000**	2.500	2.186	2.314	680	320	.10
• **KA025CP0**	**2.500**	3.000	2.686	2.814	830	360	.13
• **KA030CP0**	**3.000**	3.500	3.186	3.314	990	410	.15
• **KA035CP0**	**3.500**	4.000	3.686	3.814	1,140	450	.18
• **KA040CP0**	**4.000**	4.500	4.186	4.314	1,290	480	.19
• **KA042CP0**	**4.250**	4.750	4.436	4.564	1,370	500	.20
• **KA045CP0**	**4.500**	5.000	4.686	4.814	1,440	520	.22
• **KA047CP0**	**4.750**	5.250	4.936	5.064	1,520	540	.23
• **KA050CP0**	**5.000**	5.500	5.186	5.314	1,590	560	.24
• **KA055CP0**	**5.500**	6.000	5.686	5.814	1,750	590	.25
• **KA060CP0**	**6.000**	6.500	6.186	6.314	1,900	630	.28
• **KA065CP0**	**6.500**	7.000	6.686	6.814	2,050	660	.30
• **KA070CP0**	**7.000**	7.500	7.186	7.314	2,200	690	.31
• **KA075CP0**	**7.500**	8.000	7.686	7.814	2,350	720	.34
• **KA080CP0**	**8.000**	8.500	8.186	8.314	2,500	750	.38
• **KA090CP0**	**9.000**	9.500	9.186	9.314	2,810	810	.44
• **KA100CP0**	**10.000**	10.500	10.186	10.314	3,110	870	.50
• **KA110CP0**	**11.000**	11.500	11.186	11.314	3,410	930	.52
• **KA120CP0**	**12.000**	12.500	12.186	12.314	3,720	980	.56

Snapover separator 1/8" balls



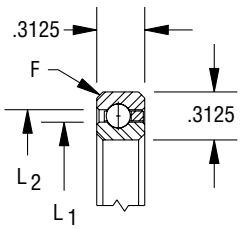
③ F = .025
Bearing corners are normally chamfered

① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
◊ Limited availability.
• Available from stock—check for availability of other sizes.

KB SERIES

Kaydon Bearing Number	Dimensions in Inches				Radial Capacity (lbs.)①		Weight in Pounds
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	Static②	Dynamic	
• **KB020CP0**	**2.000**	2.625	2.231	2.393	930	450	.16
• **KB025CP0**	**2.500**	3.125	2.731	2.893	1,140	520	.20
• **KB030CP0**	**3.000**	3.625	3.231	3.393	1,340	580	.24
• **KB035CP0**	**3.500**	4.125	3.731	3.893	1,540	630	.27
• **KB040CP0**	**4.000**	4.625	4.231	4.393	1,750	690	.30
• **KB042CP0**	**4.250**	4.875	4.481	4.643	1,830	710	.31
• **KB045CP0**	**4.500**	5.125	4.731	4.893	1,950	740	.33
KB047CP0	**4.750**	5.375	4.981	5.143	2,030	760	.34
• **KB050CP0**	**5.000**	5.625	5.231	5.393	2,150	790	.38
◊ **KB055CP0**	**5.500**	6.125	5.731	5.893	2,360	840	.41
• **KB060CP0**	**6.000**	6.625	6.231	6.393	2,560	890	.44
• **KB065CP0**	**6.500**	7.125	6.731	6.893	2,760	930	.47
KB070CP0	**7.000**	7.625	7.231	7.393	2,970	980	.50
KB075CP0	**7.500**	8.125	7.731	7.893	3,170	1,020	.53
• **KB080CP0**	**8.000**	8.625	8.231	8.393	3,370	1,070	.57
◊ **KB090CP0**	**9.000**	9.625	9.231	9.393	3,780	1,150	.66
KB100CP0	**10.000**	10.625	10.231	10.393	4,190	1,230	.73
KB110CP0	**11.000**	11.625	11.231	11.393	4,590	1,310	.75
KB120CP0	**12.000**	12.625	12.231	12.393	5,000	1,390	.83
KB140CP0	**14.000**	14.625	14.231	14.393	5,810	1,530	1.05
KB160CP0	**16.000**	16.625	16.231	16.393	6,620	1,670	1.20
KB180CP0	**18.000**	18.625	18.231	18.393	7,440	1,810	1.35
KB200CP0	**20.000**	20.625	20.231	20.393	8,250	1,940	1.50

Snapover separator 5/32" balls



③ F = .040
Bearing corners are normally chamfered

① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
◊ Limited availability.
• Available from stock—check for availability of other sizes.

CONTACT KAYDON AT—

Kaydon Corporation • Muskegon, Michigan 49443
Telephone: 231/755-3741 • Fax: 231/759-4102

NEED SERVICE FAST?

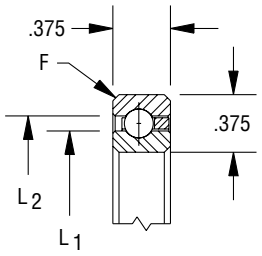
1-800-514-3066

Website: www.kaydonbearings.com

KC SERIES

Kaydon Bearing Number	Dimensions in Inches				Radial Capacity (lbs.)①		Weight in Pounds
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	Static②	Dynamic	
• KC040CP0	**4.000**	4.750	4.277	4.473	2,100	880	.45
• KC042CP0	**4.250**	5.000	4.527	4.723	2,220	920	.47
• KC045CP0	**4.500**	5.250	4.777	4.973	2,340	950	.48
• KC047CP0	**4.750**	5.500	5.027	5.223	2,460	980	.50
• KC050CP0	**5.000**	5.750	5.277	5.473	2,590	1,010	.58
• KC055CP0	**5.500**	6.250	5.777	5.973	2,830	1,080	.59
• KC060CP0	**6.000**	6.750	6.277	6.473	3,070	1,140	.63
• KC065CP0	**6.500**	7.250	6.777	6.973	3,310	1,200	.68
• KC070CP0	**7.000**	7.750	7.277	7.473	3,550	1,250	.73
• KC075CP0	**7.500**	8.250	7.777	7.973	3,790	1,310	.78
• KC080CP0	**8.000**	8.750	8.277	8.473	4,030	1,360	.84
◊ KC090CP0	**9.000**	9.750	9.277	9.473	4,510	1,470	.94
◊ KC100CP0	**10.000**	10.750	10.277	10.473	4,990	1,570	1.06
◊ KC110CP0	**11.000**	11.750	11.277	11.473	5,470	1,670	1.16
◊ KC120CP0	**12.000**	12.750	12.277	12.473	5,950	1,770	1.25
KC140CP0	**14.000**	14.750	14.277	14.473	6,910	1,950	1.52
KC160CP0	**16.000**	16.750	16.277	16.473	7,880	2,130	1.73
KC180CP0	**18.000**	18.750	18.277	18.473	8,840	2,300	1.94
KC200CP0	**20.000**	20.750	20.277	20.473	9,800	2,470	2.16
KC250CP0	**25.000**	25.750	25.277	25.473	12,200	2,850	2.69
KC300CP0	**30.000**	30.750	30.277	30.473	14,610	3,220	3.21

Snapover separator 3/16" balls

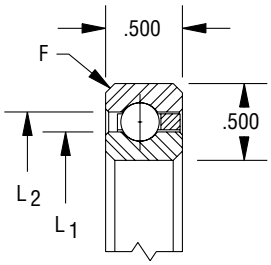


③ F = .040
Bearing corners are normally chamfered

KD SERIES

Kaydon Bearing Number	Dimensions in Inches				Radial Capacity (lbs.)①		Weight in Pounds
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	Static②	Dynamic	
• KD040CP0	**4.000**	5.000	4.370	4.630	3,080	1,410	.78
• KD042CP0	**4.250**	5.250	4.620	4.880	3,190	1,440	.83
• KD045CP0	**4.500**	5.500	4.870	5.130	3,420	1,510	.88
• KD047CP0	**4.750**	5.750	5.120	5.380	3,530	1,540	.94
• KD050CP0	**5.000**	6.000	5.370	5.630	3,760	1,610	1.00
• KD055CP0	**5.500**	6.500	5.870	6.130	4,100	1,700	1.06
• KD060CP0	**6.000**	7.000	6.370	6.630	4,450	1,800	1.16
• KD065CP0	**6.500**	7.500	6.870	7.130	4,790	1,890	1.22
• KD070CP0	**7.000**	8.000	7.370	7.630	5,130	1,980	1.31
◊ KD075CP0	**7.500**	8.500	7.870	8.130	5,470	2,060	1.41
• KD080CP0	**8.000**	9.000	8.370	8.630	5,810	2,150	1.53
• KD090CP0	**9.000**	10.000	9.370	9.630	6,500	2,320	1.72
• KD100CP0	**10.000**	11.000	10.370	10.630	7,180	2,470	1.88
• KD110CP0	**11.000**	12.000	11.370	11.630	7,870	2,630	2.06
• KD120CP0	**12.000**	13.000	12.370	12.630	8,550	2,780	2.25
◊ KD140CP0	**14.000**	15.000	14.370	14.630	9,920	3,070	2.73
◊ KD160CP0	**16.000**	17.000	16.370	16.630	11,290	3,350	3.10
KD180CP0	**18.000**	19.000	18.370	18.630	12,650	3,610	3.48
KD200CP0	**20.000**	21.000	20.370	20.630	14,020	3,870	3.85
KD250CP0	**25.000**	26.000	25.370	25.630	17,440	4,470	4.79
KD300CP0	**30.000**	31.000	30.370	30.360	20,860	5,040	5.73

Snapover separator 1/4" balls



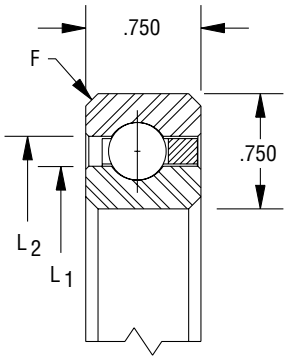
③ F = .060
Bearing corners are normally chamfered

① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
◊ Limited availability.
• Available from stock—check for availability of other sizes.

KF SERIES

Kaydon Bearing Number	Dimensions in Inches				Radial Capacity (lbs.)①		Weight in Pounds
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	Static②	Dynamic	
• KF040CP0	4.000	5.500	4.555	4.945	5,360	2,730	1.9
• KF042CP0	4.250	5.750	4.805	5.195	5,640	2,830	2.0
◊ KF045CP0	4.500	6.000	5.055	5.445	5,930	2,920	2.1
• KF047CP0	4.750	6.250	5.305	5.695	6,210	3,010	2.2
• KF050CP0	5.000	6.500	5.555	5.945	6,490	3,100	2.3
• KF055CP0	5.500	7.000	6.055	6.445	7,050	3,280	2.5
• KF060CP0	6.000	7.500	6.555	6.945	7,620	3,450	2.7
• KF065CP0	6.500	8.000	7.055	7.445	8,180	3,620	2.9
◊ KF070CP0	7.000	8.500	7.555	7.945	8,750	3,790	3.2
• KF075CP0	7.500	9.000	8.055	8.445	9,310	3,950	3.4
• KF080CP0	8.000	9.500	8.555	8.945	9,880	4,100	3.5
• KF090CP0	9.000	10.500	9.555	9.945	11,000	4,410	3.9
• KF100CP0	10.000	11.500	10.555	10.945	12,130	4,710	4.3
• KF110CP0	11.000	12.500	11.555	11.945	13,260	5,000	4.8
• KF120CP0	12.000	13.500	12.555	12.945	14,390	5,280	5.2
◊ KF140CP0	14.000	15.500	14.555	14.945	16,650	5,810	6.0
KF160CP0	16.000	17.500	16.555	16.945	18,900	6,330	7.1
KF180CP0	18.000	19.500	18.555	18.945	21,160	6,820	7.9
KF200CP0	20.000	21.500	20.555	20.945	23,420	7,300	8.9
KF250CP0	25.000	26.500	25.555	25.945	29,060	8,430	10.9
KF300CP0	30.000	31.500	30.555	30.945	34,700	9,490	13.0
KF350CP0	35.000	36.500	35.555	35.945	40,350	10,490	15.1
KF400CP0	40.000	41.500	40.555	40.945	45,990	11,450	17.2

Snapover separator 3/8" balls

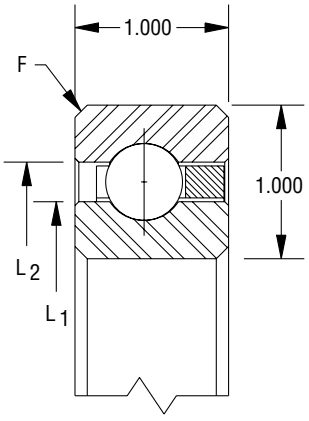


③ F = .080
Bearing corners are normally chamfered

KG SERIES

Kaydon Bearing Number	Dimensions in Inches				Radial Capacity (lbs.)①		Weight in Pounds
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	Static②	Dynamic	
KG040CP0	4.000	6.000	4.742	5.258	8,210	4,500	3.6
◊ KG042CP0	4.250	6.250	4.992	5.508	8,210	4,500	3.8
KG045CP0	4.500	6.500	5.242	5.758	8,760	4,700	4.0
KG047CP0	4.750	6.750	5.492	6.008	9,300	4,890	4.1
• KG050CP0	5.000	7.000	5.742	6.258	9,850	5,080	4.3
• KG055CP0	5.500	7.500	6.242	6.758	10,400	5,270	4.7
◊ KG060CP0	6.000	8.000	6.742	7.258	11,490	5,630	5.1
• KG065CP0	6.500	8.500	7.242	7.758	12,040	5,810	5.4
• KG070CP0	7.000	9.000	7.742	8.258	13,130	6,160	5.8
• KG075CP0	7.500	9.500	8.242	8.758	13,680	6,330	6.1
• KG080CP0	8.000	10.000	8.742	9.258	14,770	6,660	6.5
• KG090CP0	9.000	11.000	9.742	10.258	16,420	7,150	7.2
• KG100CP0	10.000	12.000	10.742	11.258	18,060	7,620	7.9
• KG110CP0	11.000	13.000	11.742	12.258	19,700	8,070	8.6
• KG120CP0	12.000	14.000	12.742	13.258	21,340	8,510	9.3
• KG140CP0	14.000	16.000	14.742	15.258	24,620	9,360	10.8
• KG160CP0	16.000	18.000	16.742	17.258	27,910	10,180	12.3
• KG180CP0	18.000	20.000	18.742	19.258	31,190	10,960	13.7
◊ KG200CP0	20.000	22.000	20.742	21.258	34,470	11,720	15.8
◊ KG250CP0	25.000	27.000	25.742	26.258	42,680	13,510	19.5
◊ KG300CP0	30.000	32.000	30.742	31.258	50,890	15,190	23.3
◊ KG350CP0	35.000	37.000	35.742	36.258	59,100	16,790	27.1
◊ KG400CP0	40.000	42.000	40.742	41.258	67,310	18,310	30.8

Snapover separator 1/2" balls



③ F = .080
Bearing corners are normally chamfered

① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
◊ Limited availability. • Available from stock—check for availability of other sizes.

Open Bearing Selections

Type X

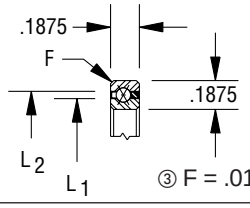
Four-Point Contact

A Conrad assembled bearing designed for applications involving multiple loads. Unique internal geometry permits application of radial load, thrust load in either direction, and moment load, individually or in any combination. A single four-point contact bearing may replace two bearings in many applications.

K A A SERIES

Kaydon Bearing Number	Dimensions in Inches				Capacities①						Weight in Pounds
					Radial in Pounds		Thrust in Pounds		Moment (Lbs-In)		
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	Static②	Dyn.	Static②	Dyn.	Static②	Dyn.	
•KAA10XL0	**1.000**	1.375	1.140	1.235	290	150	730	370	170	90	.026
•KAA15XL0	**1.500**	1.875	1.640	1.735	400	180	1,000	460	340	150	.039
•KAA17XL0	**1.750**	2.125	1.890	1.985	460	200	1,140	500	440	190	.045

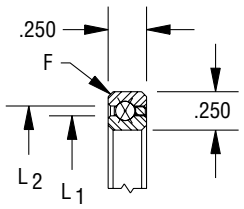
Snapover separator 3/32" balls



K A SERIES

Kaydon Bearing Number	Dimensions in Inches				Capacities①						Weight in Pounds
					Radial in Pounds		Thrust in Pounds		Moment (Lbs-In)		
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	Static②	Dyn.	Static②	Dyn.	Static②	Dyn.	
•KA020XP0	**2.000**	2.500	2.186	2.314	680	320	1,710	790	770	360	.10
•KA025XP0	**2.500**	3.000	2.686	2.814	830	360	2,090	910	1,150	500	.13
•KA030XP0	**3.000**	3.500	3.186	3.314	990	410	2,470	1,010	1,600	660	.15
•KA035XP0	**3.500**	4.000	3.686	3.814	1,140	450	2,850	1,110	2,130	840	.18
•KA040XP0	**4.000**	4.500	4.186	4.314	1,290	480	3,220	1,210	2,740	1,030	.19
◊KA042XP0	**4.250**	4.750	4.436	4.564	1,370	500	3,410	1,260	3,070	1,130	.20
•KA045XP0	**4.500**	5.000	4.686	4.814	1,440	520	3,600	1,310	3,420	1,240	.22
•KA047XP0	**4.750**	5.250	4.936	5.064	1,520	540	3,790	1,350	3,790	1,350	.23
•KA050XP0	**5.000**	5.500	5.186	5.314	1,590	560	3,980	1,400	4,180	1,460	.24
•KA055XP0	**5.500**	6.000	5.686	5.814	1,750	590	4,360	1,480	5,020	1,700	.25
•KA060XP0	**6.000**	6.500	6.186	6.314	1,900	630	4,740	1,570	5,930	1,960	.28
•KA065XP0	**6.500**	7.000	6.686	6.814	2,050	660	5,120	1,650	6,910	2,230	.30
•KA070XP0	**7.000**	7.500	7.186	7.314	2,200	690	5,500	1,730	7,980	2,510	.31
•KA075XP0	**7.500**	8.000	7.686	7.814	2,350	720	5,880	1,810	9,120	2,800	.34
KA080XP0	**8.000**	8.500	8.186	8.314	2,500	750	6,260	1,890	10,330	3,110	.38
KA090XP0	**9.000**	9.500	9.186	9.314	2,810	810	7,020	2,040	12,990	3,770	.44
•KA100XP0	**10.000**	10.500	10.186	10.314	3,110	870	7,780	2,180	15,940	4,470	.50
KA110XP0	**11.000**	11.500	11.186	11.314	3,410	930	8,540	2,320	19,210	5,220	.52
•KA120XP0	**12.000**	12.500	12.186	12.314	3,720	980	9,300	2,450	22,770	6,010	.56

Snapover separator 1/8" balls



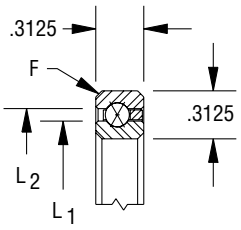
③ F = .025
Bearing corners are normally chamfered

① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
◊ Limited availability.
• Available from stock—check for availability of other sizes.

KB SERIES

Kaydon Bearing Number	Dimensions in Inches				Capacities①						Weight in Pounds
					Radial in Pounds		Thrust in Pounds		Moment (Lbs-In)		
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	Static②	Dyn.	Static②	Dyn.	Static②	Dyn.	
• **KB020XP0**	**2.000**	2.625	2.231	2.393	930	450	2,340	1,130	1,080	520	.16
• **KB025XP0**	**2.500**	3.125	2.731	2.893	1,140	520	2,840	1,290	1,600	730	.19
• **KB030XP0**	**3.000**	3.625	3.231	3.393	1,340	580	3,350	1,440	2,220	960	.24
• **KB035XP0**	**3.500**	4.125	3.731	3.893	1,540	630	3,860	1,590	2,940	1,210	.27
• **KB040XP0**	**4.000**	4.625	4.231	4.393	1,750	690	4,370	1,720	3,770	1,490	.30
• **KB042XP0**	**4.250**	4.875	4.481	4.643	1,830	710	4,570	1,780	4,170	1,620	.31
• **KB045XP0**	**4.500**	5.125	4.731	4.893	1,950	740	4,880	1,850	4,690	1,780	.33
KB047XP0	**4.750**	5.375	4.981	5.143	2,030	760	5,080	1,900	5,140	1,930	.34
• **KB050XP0**	**5.000**	5.625	5.231	5.393	2,150	790	5,380	1,980	5,720	2,100	.38
• **KB055XP0**	**5.500**	6.125	5.731	5.893	2,360	840	5,890	2,100	6,850	2,440	.41
• **KB060XP0**	**6.000**	6.625	6.231	6.393	2,560	890	6,400	2,220	8,080	2,800	.44
• **KB065XP0**	**6.500**	7.125	6.731	6.893	2,760	930	6,910	2,340	9,410	3,180	.47
KB070XP0	**7.000**	7.625	7.231	7.393	2,970	980	7,420	2,450	10,850	3,580	.50
KB075XP0	**7.500**	8.125	7.731	7.893	3,170	1,020	7,920	2,560	12,380	4,000	.53
• **KB080XP0**	**8.000**	8.625	8.231	8.393	3,370	1,070	8,430	2,670	14,020	4,440	.57
• **KB090XP0**	**9.000**	9.625	9.231	9.393	3,780	1,150	9,450	2,880	17,600	5,360	.66
KB100XP0	**10.000**	10.625	10.231	10.393	4,190	1,230	10,460	3,080	21,580	6,360	.73
KB110XP0	**11.000**	11.625	11.231	11.393	4,590	1,310	11,480	3,280	25,970	7,420	.75
KB120XP0	**12.000**	12.625	12.231	12.393	5,000	1,390	12,500	3,470	30,770	8,550	.83
KB140XP0	**14.000**	14.625	14.231	14.393	5,810	1,530	14,530	3,840	41,580	10,980	1.05
◊ **KB160XP0**	**16.000**	16.625	16.231	16.393	6,620	1,670	16,560	4,190	54,020	13,660	1.20
KB180XP0	**18.000**	18.625	18.231	18.393	7,440	1,810	18,590	4,520	68,090	16,560	1.35
KB200XP0	**20.000**	20.625	20.231	20.393	8,250	1,940	20,620	4,850	83,780	19,690	1.50

Snapover separator 5/32" balls



③ F = .040
Bearing corners are normally chamfered

① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
◊ Limited availability.
• Available from stock—check for availability of other sizes.

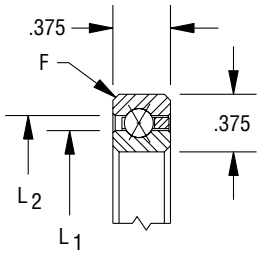
CONTACT KAYDON AT—
Kaydon Corporation • Muskegon, Michigan 49443
Telephone: 231/755-3741 • Fax: 231/759-4102

NEED SERVICE FAST?
1-800-514-3066
Website: www.kaydonbearings.com

KC SERIES

Kaydon Bearing Number	Dimensions in Inches				Capacities①						Weight in Pounds
					Radial in Pounds		Thrust in Pounds		Moment (Lbs-In)		
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	Static②	Dyn.	Static②	Dyn.	Static②	Dyn.	
• KC040XP0	4.000	4.750	4.277	4.473	2,100	880	5,260	2,210	4,600	1,930	.45
KC042XP0	4.250	5.000	4.527	4.723	2,220	920	5,560	2,290	5,140	2,120	.47
• KC045XP0	4.500	5.250	4.777	4.973	2,340	950	5,860	2,380	5,710	2,320	.48
• KC047XP0	4.750	5.500	5.027	5.223	2,460	980	6,160	2,460	6,320	2,520	.50
• KC050XP0	5.000	5.750	5.277	5.473	2,590	1,010	6,460	2,540	6,950	2,730	.58
• KC055XP0	5.500	6.250	5.777	5.973	2,830	1,080	7,060	2,690	8,300	3,160	.59
• KC060XP0	6.000	6.750	6.277	6.473	3,070	1,140	7,660	2,840	9,770	3,620	.63
• KC065XP0	6.500	7.250	6.777	6.973	3,310	1,200	8,270	2,990	11,370	4,110	.68
• KC070XP0	7.000	7.750	7.277	7.473	3,550	1,250	8,870	3,130	13,080	4,620	.73
KC075XP0	7.500	8.250	7.777	7.973	3,790	1,310	9,470	3,270	14,910	5,150	.78
• KC080XP0	8.000	8.750	8.277	8.473	4,030	1,360	10,070	3,410	16,870	5,710	.84
• KC090XP0	9.000	9.750	9.277	9.473	4,510	1,470	11,270	3,670	21,130	6,890	.94
• KC100XP0	10.000	10.750	10.277	10.473	4,990	1,570	12,470	3,930	25,880	8,160	1.06
• KC110XP0	11.000	11.750	11.277	11.473	5,470	1,670	13,680	4,180	31,110	9,510	1.16
• KC120XP0	12.000	12.750	12.277	12.473	5,950	1,770	14,880	4,420	36,830	10,940	1.25
KC140XP0	14.000	14.750	14.277	14.473	6,910	1,950	17,280	4,890	49,690	14,050	1.52
◊ KC160XP0	16.000	16.750	16.277	16.473	7,880	2,130	19,690	5,330	64,480	17,450	1.73
KC180XP0	18.000	18.750	18.277	18.473	8,840	2,300	22,090	5,760	81,190	21,150	1.94
KC200XP0	20.000	20.750	20.277	20.473	9,800	2,470	24,500	6,170	99,830	25,120	2.16
KC250XP0	25.000	25.750	25.277	25.473	12,200	2,850	30,510	7,140	154,800	36,220	2.69
KC300XP0	30.000	30.750	30.277	30.473	14,610	3,220	36,520	8,050	221,900	48,880	3.21

Snapover separator 3/16" balls

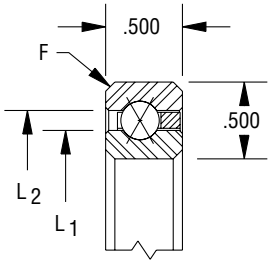


③ F = .040
Bearing corners are normally chamfered

KD SERIES

Kaydon Bearing Number	Dimensions in Inches				Capacities①						Weight in Pounds
					Radial in Pounds		Thrust in Pounds		Moment (Lbs-In)		
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	Static②	Dyn.	Static②	Dyn.	Static②	Dyn.	
• KD040XP0	4.000	5.000	4.370	4.630	3,080	1,410	7,700	3,520	6,930	3,170	.78
• KD042XP0	4.250	5.250	4.620	4.880	3,190	1,440	7,980	3,600	7,580	3,420	.83
• KD045XP0	4.500	5.500	4.870	5.130	3,420	1,510	8,550	3,770	8,550	3,770	.88
◊ KD047XP0	4.750	5.750	5.120	5.380	3,530	1,540	8,840	3,860	9,280	4,050	.94
• KD050XP0	5.000	6.000	5.370	5.630	3,760	1,610	9,410	4,020	10,350	4,420	1.00
• KD055XP0	5.500	6.500	5.870	6.130	4,100	1,700	10,260	4,260	12,310	5,110	1.06
◊ KD060XP0	6.000	7.000	6.370	6.630	4,450	1,800	11,120	4,490	14,450	5,840	1.16
• KD065XP0	6.500	7.500	6.870	7.130	4,790	1,890	11,970	4,720	16,760	6,610	1.22
◊ KD070XP0	7.000	8.000	7.370	7.630	5,130	1,980	12,830	4,940	19,240	7,420	1.31
◊ KD075XP0	7.500	8.500	7.870	8.130	5,470	2,060	13,680	5,160	21,890	8,260	1.41
• KD080XP0	8.000	9.000	8.370	8.630	5,810	2,150	14,540	5,370	24,710	9,140	1.53
• KD090XP0	9.000	10.000	9.370	9.630	6,500	2,320	16,250	5,790	30,870	11,000	1.72
• KD100XP0	10.000	11.000	10.370	10.630	7,180	2,470	17,960	6,190	37,710	12,990	1.88
• KD110XP0	11.000	12.000	11.370	11.630	7,870	2,630	19,670	6,570	45,230	15,120	2.06
• KD120XP0	12.000	13.000	12.370	12.630	8,550	2,780	21,380	6,950	53,440	17,370	2.25
• KD140XP0	14.000	15.000	14.370	14.630	9,920	3,070	24,800	7,670	71,910	22,250	2.73
◊ KD160XP0	16.000	17.000	16.370	16.630	11,290	3,350	28,220	8,360	93,110	27,600	3.10
• KD180XP0	18.000	19.000	18.370	18.630	12,650	3,610	31,640	9,030	117,000	33,400	3.48
◊ KD200XP0	20.000	21.000	20.370	20.630	14,020	3,870	35,060	9,670	143,700	39,630	3.85
◊ KD210XP0	21.000	22.000	21.370	21.630	14,710	3,990	36,770	9,980	158,100	42,900	4.04
• KD250XP0	25.000	26.000	25.370	25.630	17,440	4,470	43,610	11,180	222,400	57,010	4.79
KD300XP0	30.000	31.000	30.370	30.630	20,860	5,040	52,160	12,600	318,100	76,840	5.73

Snapover separator 1/4" balls



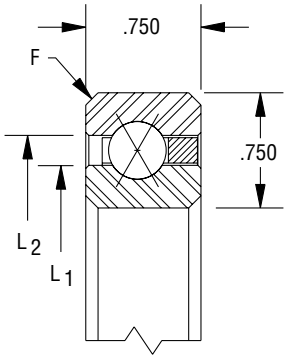
③ F = .060
Bearing corners are normally chamfered

① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
◊ Limited availability.
• Available from stock—check for availability of other sizes.

KF SERIES

Kaydon Bearing Number	Dimensions in Inches				Capacities①						Weight in Pounds
					Radial in Pounds		Thrust in Pounds		Moment (Lbs-In)		
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	Static②	Dyn.	Static②	Dyn.	Static②	Dyn.	
• KF040XP0	4.000	5.500	4.555	4.945	5,360	2,730	13,400	6,830	12,730	6,490	1.9
• KF042XP0	4,250	5.750	4.805	5.195	5,640	2,830	14,110	7,070	14,110	7,070	2.0
• KF045XP0	4.500	6.000	5.055	5.445	5,930	2,920	14,810	7,300	15,550	7,660	2.1
• KF047XP0	4.750	6.250	5.305	5.695	6,210	3,010	15,520	7,530	17,070	8,280	2.2
• KF050XP0	5.000	6.500	5.555	5.945	6,490	3,100	16,220	7,760	18,660	8,920	2.3
• KF055XP0	5.500	7.000	6.055	6.445	7,050	3,280	17,630	8,200	22,040	10,250	2.5
• KF060XP0	6.000	7.500	6.555	6.945	7,620	3,450	19,050	8,630	25,710	11,650	2.7
• KF065XP0	6.500	8.000	7.055	7.445	8,180	3,620	20,460	9,050	29,660	13,130	2.9
• KF070XP0	7.000	8.500	7.555	7.945	8,750	3,790	21,870	9,460	33,890	14,670	3.2
• KF075XP0	7.500	9.000	8.055	8.445	9,310	3,950	23,280	9,870	38,410	16,280	3.4
• KF080XP0	8.000	9.500	8.555	8.945	9,880	4,100	24,690	10,260	43,200	17,960	3.5
• KF090XP0	9.000	10.500	9.555	9.945	11,000	4,410	27,510	11,030	53,640	21,510	3.9
• KF100XP0	10.000	11.500	10.555	10.945	12,130	4,710	30,330	11,770	65,210	25,310	4.3
• KF110XP0	11.000	12.500	11.555	11.945	13,260	5,000	33,150	12,490	77,910	29,350	4.8
• KF120XP0	12.000	13.500	12.555	12.945	14,390	5,280	35,970	13,190	91,730	33,630	5.2
• KF140XP0	14.000	15.500	14.555	14.945	16,650	5,810	41,620	14,530	122,800	42,880	6.0
KF160XP0	16.000	17.500	16.555	16.945	18,900	6,330	47,260	15,820	158,300	53,000	7.1
KF180XP0	18.000	19.500	18.555	18.945	21,160	6,820	52,900	17,060	198,400	63,960	7.9
KF200XP0	20.000	21.500	20.555	20.945	23,420	7,300	58,550	18,250	243,000	75,730	8.9
KF250XP0	25.000	26.500	25.555	25.945	29,060	8,430	72,650	21,070	374,200	108,500	10.9
KF300XP0	30.000	31.500	30.555	30.945	34,700	9,490	86,760	23,720	533,600	145,900	13.0
KF350XP0	35.000	36.500	35.555	35.945	40,350	10,490	100,900	26,220	721,200	187,500	15.1
KF400XP0	40.000	41.500	40.555	40.945	45,990	11,450	115,000	28,620	937,100	233,200	17.2

Snapover separator 3/8" balls

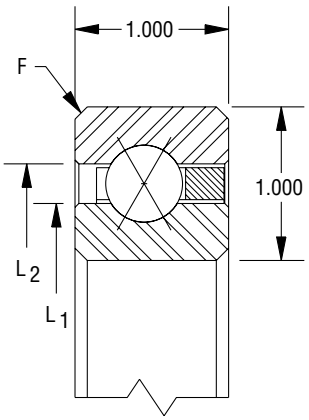


③ F = .080
Bearing corners are normally chamfered

KG SERIES

Kaydon Bearing Number	Dimensions in Inches				Capacities①						Weight in Pounds
					Radial in Pounds		Thrust in Pounds		Moment (Lbs-In)		
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	Static②	Dyn.	Static②	Dyn.	Static②	Dyn.	
KG040XP0	4.000	6.000	4.742	5.258	8,210	4,500	20,520	11,260	20,520	11,260	3.6
KG042XP0	4.250	6.250	4.992	5.508	8,210	4,500	20,520	11,260	21,550	11,820	3.8
◊KG045XP0	4.500	6.500	5.242	5.758	8,760	4,700	21,890	11,750	24,080	12,920	4.0
KG047XP0	4.750	6.750	5.492	6.008	9,300	4,890	23,260	12,230	26,740	14,070	4.1
•KG050XP0	5.000	7.000	5.742	6.258	9,850	5,080	24,620	12,710	29,550	15,250	4.3
•KG055XP0	5.500	7.500	6.242	6.758	10,400	5,270	25,990	13,180	33,790	17,130	4.7
•KG060XP0	6.000	8.000	6.742	7.258	11,490	5,630	28,730	14,090	40,220	19,720	5.1
◊KG065XP0	6.500	8.500	7.242	7.758	12,040	5,810	30,100	14,530	45,140	21,790	5.4
•KG070XP0	7.000	9.000	7.742	8.258	13,130	6,160	32,830	15,400	52,530	24,630	5.8
•KG075XP0	7.500	9.500	8.242	8.758	13,680	6,330	34,200	15,820	58,140	26,900	6.1
•KG080XP0	8.000	10.000	8.742	9.258	14,770	6,660	36,940	16,650	66,480	29,980	6.5
•KG090XP0	9.000	11.000	9.742	10.258	16,420	7,150	41,040	17,870	82,080	35,730	7.2
•KG100XP0	10.000	12.000	10.742	11.258	18,060	7,620	45,140	19,040	99,320	41,880	7.9
•KG110XP0	11.000	13.000	11.742	12.258	19,700	8,070	49,250	20,180	118,200	48,420	8.6
•KG120XP0	12.000	14.000	12.742	13.258	21,340	8,510	53,350	21,280	138,700	55,330	9.3
•KG140XP0	14.000	16.000	14.742	15.258	24,620	9,360	61,560	23,410	184,700	70,230	10.8
•KG160XP0	16.000	18.000	16.742	17.258	27,910	10,180	69,770	25,450	237,200	86,530	12.3
•KG180XP0	18.000	20.000	18.742	19.258	31,190	10,960	77,980	27,410	296,300	104,100	13.7
◊KG200XP0	20.000	22.000	20.742	21.258	34,470	11,720	86,180	29,300	362,000	123,100	15.8
•KG220XP0	22.000	24.000	22.742	23.258	37,760	12,450	94,390	31,130	434,200	143,200	17.3
•KG250XP0	25.000	27.000	25.742	26.258	42,680	13,510	106,700	33,780	554,900	175,700	19.5
•KG300XP0	30.000	32.000	30.742	31.258	50,890	15,190	127,200	37,980	788,800	235,500	23.3
•KG350XP0	35.000	37.000	35.742	36.258	59,100	16,790	147,700	41,970	1,064,000	302,200	27.1
•KG400XP0	40.000	42.000	40.472	41.258	67,310	18,310	168,300	45,770	1,380,000	375,300	30.8

Snapover separator 1/2" balls



③ F = .080
Bearing corners are normally chamfered

① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
◊ Limited availability. • Available from stock—check for availability of other sizes.

Sealed Bearings Selections
Seals and Shields Available

To realize the full benefits from anti-friction bearings, it is important to keep them clean and well lubricated. Seals and shields properly designed and mounted help to accomplish this. In this catalog these terms have the following definitions:

Seal—a contacting closure between the stationary and rotating members, for retaining lubricant within and excluding foreign material from the bearing, one member of which makes positive contact. Seals are retained in the outer race and make positive contact with the inner race.

Shield—a closure for the same purpose as a seal but without positive contact.

A seal is more effective, but requires more turning effort (torque), generates more heat, and as a result, has a lower speed limit than an open or shielded bearing.

The accompanying illustrations are examples by which Reali-Slim bearings may be sealed or shielded, either integrally or externally. The lubricant and lubrication systems, torque requirements, speed, and operating environment will influence the choice.

Integral seals and shields offer a very compact overall design with the additional advantage of protecting the bearing before, during and after installation.

Figure 9 shows a double sealed Reali-Slim bearing, available from stock in the JU series. In this case, adding shields and seals requires an increase in the width of the bearing. Page 12, Position 2. In the case of JA, JB, and JG double sealed Reali-Slims, the bearing width is the same as that of the open bearing.

Illustrated in Figure 10 is a double "Lami-Seal" bearing. Shown in Figure 11 is a double "Lami-Shield" bearing for use where a shield will suffice or is required due to torque limitations or speed.

Note: Sealed Reali-Slim bearings are pre-lubricated with a general purpose grease. Operating conditions (i.e. time, temperature, speed, environment) may result in premature grease breakdown.

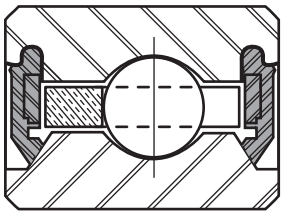


Figure 9
Double Sealed Reali-Slim

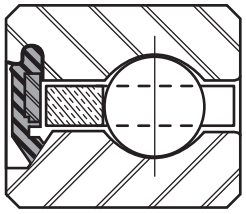


Figure 12
Single Sealed Reali-Slim

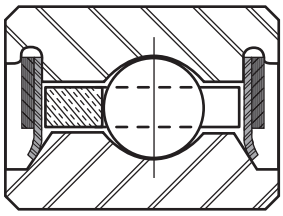


Figure 10
Double Lami-Seal bearing

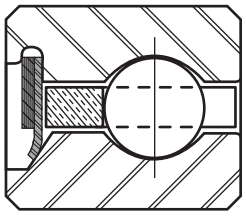


Figure 13
Single Lami-Seal bearing

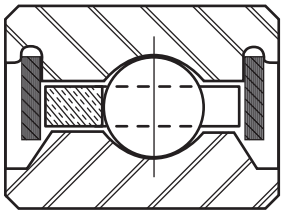


Figure 11
Double Lami-Shield bearing

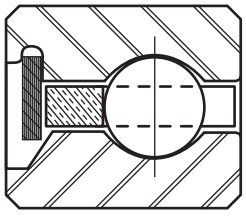


Figure 14
Single Lami-Shield bearing

Where weight and space are at a premium, and a seal or shield is required on one side only, single sealed or single shielded bearings as shown in Figures 12, 13 and 14 may be supplied on special order.

Figure 15 shows a Buna N lip-type seal ring available in a variety of cross-sections compatible with the Reali-Slim bearing series. While this is a very effective seal, torque is substantial and speeds must not exceed 1000 feet per minute if continuous. Figure 16 shows a felt seal ring which is suitable for higher speeds and can be made from commercially available strip stock by bonding the ends with solvent resistant glue. Many grades of felt are readily obtainable for experimental determination of the best compromise between torque, heat, wear, and seal effectiveness.

If grease lubrication is used and torque is not critical, a very effective shield is that shown in Figure 17 where annular grooves are cut in the housing shoulder and clamp plate and filled with grease.

When a separate shield is required, washers made from precision flat stock are ideal, as shown in Figure 18. They serve well where weight limitations are strict.

Whether or not integral seals or shields are specified, bearings must be isolated from hostile environments and debris.

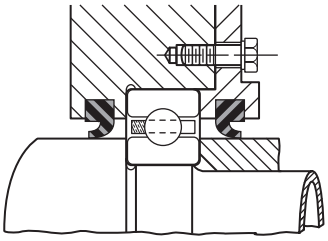


Figure 15
Buna N Lip-Type Seal

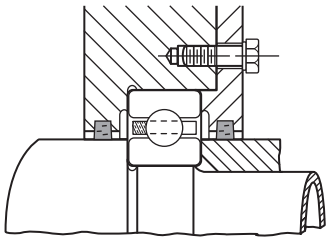


Figure 16
Felt Seal Ring

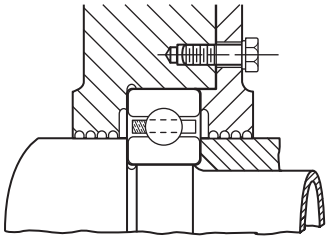


Figure 17
Annular Grooves

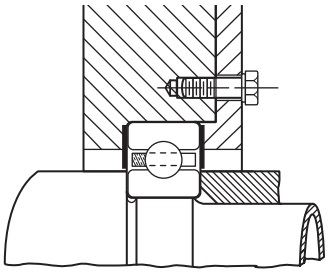


Figure 18
Washer Shield From Precision Flat Stock

Sealed Bearing Selections

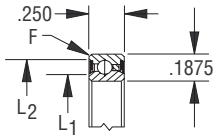
Type C

Radial Contact

JHA SERIES (DOUBLE SEALED)

Kaydon Bearing Number	Dimensions in Inches				Radial Capacity (lbs.)①		Limiting Speeds (RPM*)	Torque Max. No Load (Oz-In)④	Weight in Pounds
	Bore	Outside Diameter	Dia. L_1	Dia. L_2	Static②	Dyn.			
JHA10CL0	**1.000**	1.375	1.108	1.274	290	150	6110	5	.035
JHA15CL0	**1.500**	1.875	1.608	1.774	400	180	4300	5	.052
JHA17CL0	**1.750**	2.125	1.858	2.024	460	200	3750	6	.060

Snapover separator 3/32" balls

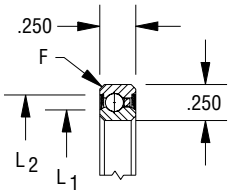


③ F = .015
Bearing corners are normally chamfered

JA SERIES (DOUBLE SEALED)

Kaydon Bearing Number	Dimensions in Inches				Radial Capacity (lbs.)①		Limiting Speeds (RPM*)	Torque Max. No Load (Oz-In)④	Weight in Pounds
	Bore	Outside Diameter	Dia. L_1	Dia. L_2	Static②	Dyn.			
• **JA020CP0**	**2.000**	2.500	2.148	2.356	680	320	3,220	6	.10
• **JA025CP0**	**2.500**	3.000	2.648	2.856	830	360	2,630	8	.12
• **JA030CP0**	**3.000**	3.500	3.148	3.356	990	410	2,230	12	.14
• **JA035CP0**	**3.500**	4.000	3.648	3.856	1,140	450	1,930	16	.17
• **JA040CP0**	**4.000**	4.500	4.148	4.356	1,290	480	1,700	20	.19
• **JA042CP0**	**4.250**	4.750	4.398	4.606	1,370	500	1,610	24	.20
• **JA045CP0**	**4.500**	5.000	4.648	4.856	1,440	520	1,520	28	.21
JA047CP0	**4.750**	5.250	4.898	5.106	1,520	540	1,450	32	.22
JA050CP0	**5.000**	5.500	5.148	5.356	1,590	560	1,380	36	.23
JA055CP0	**5.500**	6.000	5.648	5.856	1,750	590	1,260	44	.25
JA060CP0	**6.000**	6.500	6.148	6.356	1,900	630	1,160	52	.28
JA065CP0	**6.500**	7.000	6.648	6.856	2,050	660	1,070	61	.30

Snapover separator 1/8" balls



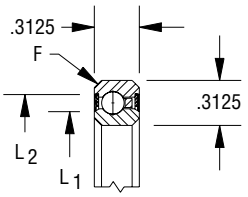
③ F = .025
Bearing corners are normally chamfered

① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
④ Torque figures shown are for single bearings with standard lubricant at room temperature and under 5 pounds thrust load.
◊ Limited availability.
* Values apply to bearings loaded up to 20% of their dynamic capacity.
• Available from stock—check for availability of other sizes.

JB SERIES (DOUBLE SEALED)

Kaydon Bearing Number	Dimensions in Inches				Radial Capacity (lbs.)①		Limiting Speeds (RPM*)	Torque Max. No Load (Oz-In)④	Weight in Pounds⑤
	Bore	Outside Diameter	Dia. L_1	Dia. L_2	Static②	Dyn.			
• **JB020CP0**	**2.000**	2.625	2.136	2.362	930	450	3,130	6	.15
• **JB025CP0**	**2.500**	3.125	2.636	2.862	1,140	520	2,580	8	.19
• **JB030CP0**	**3.000**	3.625	3.136	3.362	1,340	580	2,190	12	.22
• **JB035CP0**	**3.500**	4.125	3.636	3.862	1,540	630	1,900	16	.27
• **JB040CP0**	**4.000**	4.625	4.136	4.362	1,750	690	1,630	20	.30
• **JB042CP0**	**4.250**	4.875	4.386	4.662	1,830	710	1,600	24	.31
• **JB045CP0**	**4.500**	5.125	4.636	4.862	1,950	740	1,500	28	.34
JB047CP0	**4.750**	5.375	4.886	5.162	2,030	760	1,430	32	.35
JB050CP0	**5.000**	5.625	5.136	5.362	2,150	790	1,360	36	.37
JB055CP0	**5.500**	6.125	5.636	5.862	2,360	840	1,240	44	.40
JB060CP0	**6.000**	6.625	6.136	6.362	2,560	890	1,150	52	.44
JB065CP0	**6.500**	7.125	6.636	6.862	2,760	930	1,060	61	.47

Snapover separator 5/32" balls

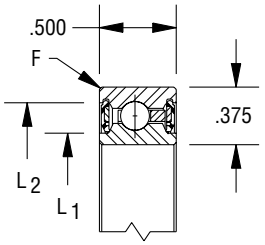


③ F = .040
Bearing corners are normally chamfered

JU SERIES (DOUBLE SEALED)

Kaydon Bearing Number	Dimensions in Inches				Radial Capacity (lbs.)①		Limiting Speeds (RPM*)	Torque Max. No Load (Lbs-In)④	Weight in Pounds⑤
	Bore	Outside Diameter	Dia. L_1	Dia. L_2	Static②	Dyn.			
• **JU040CP0**	**4.000**	4.750	4.150	4.547	2,100	880	1,640	2.9	.55
JU042CP0	**4.250**	5.000	4.400	4.797	2,220	920	1,520	3.2	.58
• **JU045CP0**	**4.500**	5.250	4.650	5.047	2,340	950	1,440	3.5	.61
◊ **JU047CP0**	**4.750**	5.500	4.900	5.295	2,460	980	1,360	3.9	.65
• **JU050CP0**	**5.000**	5.750	5.150	5.545	2,590	1,010	1,300	4.3	.68
• **JU055CP0**	**5.500**	6.250	5.650	6.042	2,830	1,080	1,180	5.1	.74
• **JU060CP0**	**6.000**	6.750	6.150	6.542	3,070	1,140	1,080	6.1	.81
• **JU065CP0**	**6.500**	7.250	6.650	7.037	3,315	1,200	1,000	7.0	.87
• **JU070CP0**	**7.000**	7.750	7.150	7.537	3,550	1,250	920	8.1	.93
• **JU075CP0**	**7.500**	8.250	7.650	8.037	3,790	1,310	860	9.2	.99
• **JU080CP0**	**8.000**	8.750	8.150	8.537	4,030	1,360	810	10.4	1.06
• **JU090CP0**	**9.000**	9.750	9.150	9.535	4,510	1,470	720	13.0	1.18
• **JU100CP0**	**10.000**	10.750	10.150	10.535	4,990	1,570	650	16.0	1.31
• **JU110CP0**	**11.000**	11.750	11.150	11.535	5,470	1,670	590	19.2	1.43
◊ **JU120CP0**	**12.000**	12.750	12.150	12.535	5,950	1,770	540	22.8	1.56

Snapover separator 3/16" balls



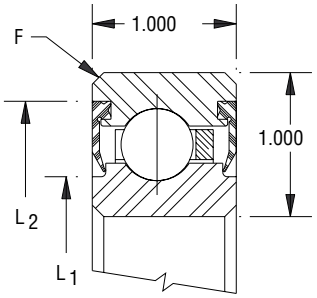
③ F = .015
Bearing corners are normally chamfered

① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
④ Torque figures shown are for single bearings with standard lubricant at room temperature and under 5 pound thrust load.
⑤ Weight includes standard lubricant.
◊ Limited availability.
* Values apply to bearings loaded up to 20% of their dynamic capacity.
• Available from stock—check for availability of other sizes.

JG SERIES (DOUBLE SEALED)

Kaydon Bearing Number	Dimensions in Inches				Radial Capacity (lbs.)①		Limiting Speeds (RPM*)	Torque Max. No Load (lb-in)④	Weight in Pounds
	Bore	Outside Diameter	Dia. L_1	Dia. L_2	Static②	Dyn.			
• **JG120CP0**	**12.000**	14.000	12.554	13.602	21,340	8,510	140	44	9.3
• **JG140CP0**	**14.000**	16.000	14.554	15.602	24,620	9,360	125	59	10.8
• **JG160CP0**	**16.000**	18.000	16.554	17.602	27,910	10,180	110	76	12.3
• **JG180CP0**	**18.000**	20.000	18.554	19.602	31,190	10,960	100	95	13.7
• **JG200CP0**	**20.000**	22.000	20.554	21.602	34,470	11,720	90	115	15.8
• **JG250CP0**	**25.000**	27.000	25.554	26.602	42,680	13,510	75	177	19.5
• **JG300CP0**	**30.000**	32.000	30.554	31.602	50,890	15,190	60	252	23.3
◊ **JG350CP0**	**35.000**	37.000	35.554	36.602	59,100	16,790	55	339	27.1
◊ **JG400CP0**	**40.000**	42.000	40.554	41.602	67,310	18,310	50	440	30.8

Snapover separator 1/2" balls



③ F = .080
Bearing corners are normally chamfered

① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
④ Torque figures shown are for single bearings with standard lubricant at room temperature and under 5 pounds thrust load.
◊ Limited availability.
* Values apply to bearings loaded up to 20% of their dynamic capacity.
• Available from stock—check for availability of other sizes.

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Website: www.kaydonbearings.com

Sealed Bearing Selections

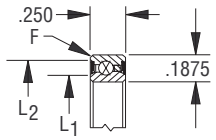
Type X

Four-Point Contact

JHA SERIES (DOUBLE SEALED)

Kaydon Bearing Number	Dimensions in Inches				Capacities①						Limiting Speeds (RPM*)	Torque Max. No Load (Oz-In)④	Weight in Pounds
					Radial in Lbs.		Thrust in Lbs.		Moment (Lbs.-In)				
	Bore	Outside Diameter	Dia. L_1	Dia. L_2	Static②	Dyn.	Static②	Dyn.	Static②	Dyn.			
JHA10XL0	**1.000**	1.375	1.108	1.274	290	150	730	370	170	90	3,000	5	.035
JHA15XL0	**1.500**	1.875	1.608	1.774	400	180	1,000	460	340	150	2,000	5	.052
JHA17XL0	**1.750**	2.125	1.858	2.024	460	200	1,140	500	440	190	1,710	6	.060

Snapover separator 3/32" balls

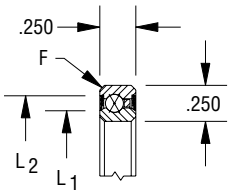


③ F = .015
Bearing corners are normally chamfered

JA SERIES (DOUBLE SEALED)

Kaydon Bearing Number	Dimensions in Inches				Capacities①						Limiting Speeds (RPM*)	Torque Max. No Load (Oz-In)④	Weight in Pounds
					Radial in Lbs.		Thrust in Lbs.		Moment (Lbs.-In)				
	Bore	Outside Diameter	Dia. L_1	Dia. L_2	Static②	Dyn.	Static②	Dyn.	Static②	Dyn.			
• **JA020XP0**	**2.000**	2.500	2.148	2.356	680	320	1,710	790	770	360	1,500	6	.10
• **JA025XP0**	**2.500**	3.000	2.648	2.856	830	360	2,090	910	1,150	500	1,200	8	.12
• **JA030XP0**	**3.000**	3.500	3.148	3.356	990	410	2,470	1,010	1,600	660	830	12	.14
• **JA035XP0**	**3.500**	4.000	3.648	3.856	1,140	450	2,850	1,110	2,130	840	710	16	.17
• **JA040XP0**	**4.000**	4.500	4.148	4.356	1,290	480	3,220	1,210	2,740	1,030	620	20	.19
• **JA042XP0**	**4.250**	4.750	4.398	4.606	1,370	500	3,410	1,260	3,070	1,130	580	24	.20
• **JA045XP0**	**4.500**	5.000	4.648	4.856	1,440	520	3,600	1,310	3,420	1,240	550	28	.21
JA047XP0	**4.750**	5.250	4.898	5.106	1,520	540	3,790	1,350	3,790	1,350	520	32	.22
JA050XP0	**5.000**	5.500	5.148	5.356	1,590	560	3,980	1,400	4,180	1,460	500	36	.23
JA055XP0	**5.500**	6.000	5.648	5.856	1,750	590	4,360	1,480	5,020	1,700	450	44	.25
JA060XP0	**6.000**	6.500	6.148	6.356	1,900	630	4,740	1,570	5,930	1,960	330	52	.28
JA065XP0	**6.500**	7.000	6.648	6.856	2,050	660	5,120	1,650	6,910	2,230	300	61	.30

Snapover separator 1/8" balls



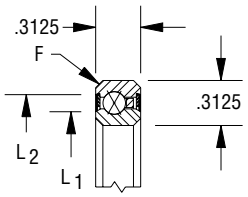
③ F = .025
Bearing corners are normally chamfered

① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
④ Torque figures shown are for single bearings with standard lubricant at room temperature and under 5 pounds thrust load.
◊ Limited availability.
* Values apply to bearings loaded up to 20% of their dynamic capacity.
• Available from stock—check for availability of other sizes.

JB SERIES (DOUBLE SEALED)

Kaydon Bearing Number	Dimensions in Inches				Capacities①						Limiting Speeds (RPM*)	Torque Max. No Load (In-Oz)⑤	Weight in Pounds
					Radial in Lbs.		Thrust in Lbs.		Moment (Lbs.-In)				
	Bore	Outside Diameter	Dia. L_1	Dia. L_2	Static②	Dyn.	Static②	Dyn.	Static②	Dyn.			
• **JB020XP0**	**2.000**	2.625	2.136	2.362	930	450	2,340	1,130	1,080	520	1,500	6	.15
• **JB025XP0**	**2.500**	3.125	2.636	2.862	1,140	520	2,840	1,290	1,600	730	1,200	8	.19
• **JB030XP0**	**3.000**	3.625	3.136	3.362	1,340	580	3,350	1,440	2,220	960	1,000	12	.22
• **JB035XP0**	**3.500**	4.125	3.636	3.862	1,540	630	3,860	1,590	2,940	1,210	710	16	.27
• **JB040XP0**	**4.000**	4.625	4.136	4.362	1,750	690	4,370	1,720	3,770	1,490	620	20	.30
• **JB042XP0**	**4.250**	4.875	4.386	4.662	1,830	710	4,570	1,780	4,170	1,620	590	24	.31
• **JB045XP0**	**4.500**	5.125	4.636	4.862	1,950	740	4,880	1,850	4,690	1,780	550	28	.34
JB047XP0	**4.750**	5.375	4.886	5.162	2,030	760	5,080	1,900	5,140	1,930	520	32	.35
JB050XP0	**5.000**	5.625	5.136	5.362	2,150	790	5,380	1,980	5,720	2,100	500	36	.37
JB055XP0	**5.500**	6.125	5.636	5.862	2,360	840	5,890	2,100	6,850	2,440	450	44	.40
JB060XP0	**6.000**	6.625	6.136	6.362	2,560	890	6,400	2,220	8,080	2,800	410	52	.44
JB065XP0	**6.500**	7.125	6.636	6.862	2,760	930	6,910	2,340	9,410	3,180	380	61	.47

Snapover separator 5/32" balls

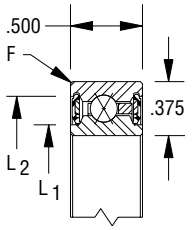


③ F = .040
Bearing corners are normally chamfered

JU SERIES (DOUBLE SEALED)

Kaydon Bearing Number	Dimensions in Inches				Capacities①						Limiting Speeds (RPM*)	④ Lube Amt. (c.c.)	⑤Torque Max. No Load (Lbs-In)	⑥ Weight in Pounds
					Radial in Lbs.		Thrust in Lbs.		Moment (Lbs.-In)					
	Bore	Outside Dia.	Dia. L_1	Dia. L_2	Static②	Dyn.	Static②	Dyn.	Static②	Dyn.				
• **JU040XP0**	**4.000**	4.750	4.150	4.547	2,100	880	5,260	2,210	4,600	1,930	620	2.5	2.9	.55
JU042XP0	**4.250**	5.000	4.400	4.797	2,220	920	5,560	2,290	5,140	2,120	590	2.5	3.2	.58
• **JU045XP0**	**4.500**	5.250	4.650	5.047	2,340	950	5,860	2,380	5,710	2,320	550	3.0	3.5	.61
• **JU047XP0**	**4.750**	5.500	4.900	5.295	2,460	980	6,160	2,460	6,320	2,520	520	3.0	3.9	.65
• **JU050XP0**	**5.000**	5.750	5.150	5.545	2,590	1,010	6,460	2,540	6,950	2,730	500	3.5	4.3	.68
◊ **JU055XP0**	**5.500**	6.250	5.650	6.042	2,830	1,080	7,060	2,690	8,300	3,160	450	3.5	5.1	.74
• **JU060XP0**	**6.000**	6.750	6.150	6.542	3,070	1,140	7,660	2,840	9,770	3,620	410	3.5	6.1	.81
• **JU065XP0**	**6.500**	7.250	6.650	7.037	3,310	1,200	8,270	2,990	11,370	4,110	380	4.0	7.0	.87
◊ **JU070XP0**	**7.000**	7.750	7.150	7.537	3,550	1,250	8,870	3,130	13,080	4,620	350	4.5	8.1	.93
• **JU075XP0**	**7.500**	8.250	7.650	8.037	3,790	1,310	9,470	3,270	14,910	5,150	330	4.5	9.2	.99
• **JU080XP0**	**8.000**	8.750	8.150	8.537	4,030	1,360	10,070	3,410	16,870	5,710	310	5.0	10.4	1.06
• **JU090XP0**	**9.000**	9.750	9.150	9.535	4,510	1,470	11,270	3,670	21,130	6,890	220	5.5	13.0	1.18
• **JU100XP0**	**10.000**	10.750	10.150	10.535	4,990	1,570	12,470	3,930	25,880	8,160	200	6.0	16.0	1.31
• **JU110XP0**	**11.000**	11.750	11.150	11.535	5,470	1,670	13,680	4,180	31,110	9,510	180	6.5	19.2	1.43
◊ **JU120XP0**	**12.000**	12.750	12.150	12.535	5,950	1,770	14,880	4,420	36,830	10,940	160	7.0	22.8	1.56

Snapover separator 3/16" balls



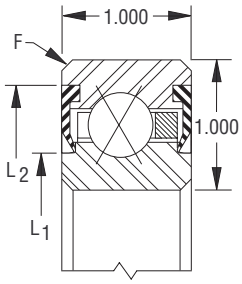
③ F = .015
Bearing corners are normally chamfered

① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
④ "JU" Series Bearings are supplied with general purpose grease, satisfactory for operating temperatures of -15°F to +250°F (-26°C to +121°C). Other lubricants are available on special order.
⑤ Torque figures shown are single bearings with standard lubricant at room temperature and under 5 pound thrust load.
⑥ Weight includes standard lubricant.
◊ Limited availability.
* Values apply to bearings loaded up to 20% of their dynamic capacity.
• Available from stock—check for availability of other sizes.

JG SERIES (DOUBLE SEALED)

Kaydon Bearing Number	Dimensions in Inches				Capacities①						Limiting Speeds (RPM*)	Torque Max. No Load (Lbs-In)④	⑤ Weight in Pounds
					Radial in Lbs.		Thrust in Lbs.		Moment (Lbs.-In)				
	Bore	Outside Diameter	Dia. L_1	Dia. L_2	Static②	Dyn.	Static②	Dyn.	Static②	Dyn.			
• **JG120XP0**	**12.000**	14.000	12.554	13.602	21,340	8,510	53,350	21,280	138,700	55,300	140	44	9.3
• **JG140XP0**	**14.000**	16.000	14.554	15.602	24,620	9,360	61,560	34,410	184,700	70,230	125	59	10.8
• **JG160XP0**	**16.000**	18.000	16.554	17.602	27,910	10,180	69,770	25,450	237,200	86,530	110	76	12.3
• **JG180XP0**	**18.000**	20.000	18.554	19.602	31,190	10,960	77,980	27,410	296,300	104,100	100	95	13.7
• **JG200XP0**	**20.000**	22.000	20.554	21.602	34,470	11,720	86,180	29,300	362,000	123,100	90	115	15.8
• **JG220XP0**	**22.000**	24.000	22.554	23.602	37,750	12,450	94,390	31,130	434,200	143,190	80	138	16.8
• **JG250XP0**	**25.000**	27.000	25.554	26.602	42,680	13,510	106,700	33,780	554,900	175,700	75	177	19.5
• **JG300XP0**	**30.000**	32.000	30.554	31.602	50,890	15,190	127,200	37,980	788,800	235,500	60	252	23.3
• **JG350XP0**	**35.000**	37.000	35.554	36.602	59,100	16,790	147,700	41,970	1,064,000	302,300	55	339	27.1
• **JG400XP0**	**40.000**	42.000	40.554	41.602	63,310	18,310	168,300	45,770	1,380,000	375,300	50	440	30.8

Snapover separator 1/2" balls



F = .080
Bearing corners are normally chamfered

① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
④ Torque figures shown are single bearings with standard lubricant at room temperature and under 5 pound thrust load.
⑤ Weight includes standard lubricant.
◊ Limited availability.
* Values apply to bearings loaded up to 20% of their dynamic capacity.
• Available from stock—check for availability of other sizes.

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Kaydon Precision Tolerances and Recommended Fits for REALI-SLIM Ball Bearings in Normal Applications

TYPE C – PRECISION CLASS 1 (REF. ABEC 1F)												
Bearing Size (All Series)	Bearing Diameters		Radial & Axial Runout		Rotating Shaft or Duplex DF Mounting		Stationary Shaft or Duplex DB Mounting				Bearing Diametral Clearance*	
	Bearing Bore	Bearing O.D.			Shaft Diameter	Housing Bore	Shaft Diameter		Housing Bore			
	Nominal +.0000	Nominal +.0000	Inner Race	Outer Race	Nominal +.0000	Nominal +.0000	Nominal		Nominal		Before Installation	
10	–.0004	–.0005	.0005	.0008	+.0004	+.0005	–.0004	–.0008	–.0005	–.0010	.0010	.0016
15	–.0005	–.0005	.0006	.0008	+.0005	+.0005	–.0005	–.0010	–.0005	–.0010	.0012	.0018
17	–.0006	–.0005	.0008	.0010	+.0006	+.0005	–.0006	–.0012	–.0005	–.0010	.0012	.0024
020	–.0006	–.0005	.0008	.0010	+.0006	+.0005	–.0006	–.0012	–.0005	–.0010	.0012	.0024
025	–.0006	–.0005	.0008	.0010	+.0006	+.0005	–.0006	–.0012	–.0005	–.0010	.0012	.0024
030	–.0006	–.0006	.0008	.0010	+.0006	+.0006	–.0006	–.0012	–.0006	–.0012	.0012	.0024
035	–.0008	–.0006	.0010	.0012	+.0008	+.0006	–.0008	–.0016	–.0006	–.0012	.0016	.0028
040	–.0008	–.0006	.0010	.0012	+.0008	+.0006	–.0008	–.0016	–.0006	–.0012	.0016	.0028
042	–.0008	–.0008	.0010	.0014	+.0008	+.0008	–.0008	–.0016	–.0008	.–0016	.0016	.0028
045	–.0008	–.0008	.0010	.0014	+.0008	+.0008	–.0008	–.0016	–.0008	–.0016	.0016	.0028
047	–.0010	–.0008	.0008	.0014	+.0010	+.0008	–.0010	–.0020	–.0008	–.0016	.0020	.0034
050	–.0010	–.0008	.0012	.0014	+.0010	+.0008	–.0010	–.0020	–.0008	–.0016	.0020	.0034
055	–.0010	–.0010	.0012	.0016	+.0010	+.0010	–.0010	–.0020	–.0010	–.0020	.0020	.0034
060	–.0010	–.0010	.0012	.0016	+.0010	+.0010	–.0010	–.0020	–.0010	–.0020	.0020	.0034
065	–.0010	–.0010	.0012	.0016	+.0010	+.0010	–.0010	–.0020	–.0010	–.0020	.0020	.0034
070	–.0010	–.0012	.0012	.0016	+.0010	+.0012	–.0010	–.0020	–.0012	–.0024	.0020	.0034
075	–.0012	–.0012	.0016	.0018	+.0012	+.0012	–.0012	–.0024	–.0012	–.0024	.0024	.0042
080	–.0012	–.0012	.0016	.0018	+.0012	+.0012	–.0012	–.0024	–.0012	–.0024	.0024	.0042
090	–.0012	–.0012	.0016	.0018	+.0012	+.0012	–.0012	–.0024	–.0012	–.0024	.0024	.0042
100	–.0014	–.0014	.0018	.0020	+.0014	+.0014	–.0014	–.0028	–.0014	–.0028	.0028	.0048
110	–.0014	–.0014	.0018	.0020	+.0014	+.0014	–.0014	–.0028	–.0014	–.0028	.0028	.0048
120	–.0014	–.0014	.0018	.0020	+.0014	+.0014	–.0014	–.0028	–.0014	–.0028	.0028	.0048
140	–.0016	–.0016	.0018	.0020	+.0016	+.0016	–.0016	–.0032	–.0016	–.0032	.0032	.0052
160	–.0018	–.0018	.0018	.0020	+.0018	+.0018	–.0018	–.0036	–.0018	–.0036	.0036	.0056
180	–.0018	–.0018	.0020	.0020	+.0018	+.0018	–.0018	–.0036	–.0018	–.0036	.0036	.0056
200	–.0020	–.0020	.0020	.0020	+.0020	+.0020	–.0020	–.0040	–0020	–.0040	.0040	.0060
250	–.0030	–.0030	.0020	.0020	+.0030	+.0030	–.0030	–.0060	–.0030	–.0060	.0060	.0080
300	–.0030	–.0030	.0020	.0020	+.0030	+.0030	–.0030	–.0060	–.0030	–.0060	.0060	.0080
350	–.0040	–.0040	.0020	.0020	+.0040	+.0040	–.0040	–.0080	–.0040	–.0080	.0080	.0100
400	–.0040	–.0040	.0020	.0020	+.0040	+.0040	–.0040	–.0080	–.0040	–.0080	.0080	.0100

* Diametral clearance after installation theoretically can range rather widely if all contributing bearing, housing, and shaft tolerances are at either of their extremes.

Listed shaft and housing diameters are for steel under normal conditions. Recommended diameters can change greatly based on orientation, temperature, speed, and other performance requirements. Consult Kaydon.

All dimensions in inches.

Race Width Tolerance:
Up thru 12" Bearing Bore +.000 –.005
Over 12" Bearing Bore +.000 –.010

TYPE X AND A – PRECISION CLASS 1 (REF. ABEC 1F)

Bearing Size (All Series)	Bearing Diameters		Radial & Axial Runout		Rotating Shaft or Duplex DF Mounting		Stationary Shaft or Duplex DB Mounting				Bearing Diametral Clearance* (Type "X" only)	
	Bearing Bore	Bearing O.D.			Shaft Diameter	Housing Bore	Shaft Diameter		Housing Bore			
	Nominal +.0000	Nominal +.0000	Inner Race	Outer Race	Nominal +.0000	Nominal +.0000	Nominal		Nominal		Before Installation	
10	–.0004	–.0005	.0003	.0004	+.0004	+.0005	–.0004	–.0008	–.0005	–.0010	.0010	.0015
15	–.0005	–.0005	.0004	.0004	+.0005	+.0005	–.0005	–.0010	–.0005	–.0010	.0012	.0017
17	–.0006	–.0005	.0005	.0005	+.0006	+.0005	–.0006	–.0012	–.0005	–.0010	.0012	.0022
020	–.0006	–.0005	.0005	.0005	+.0006	+.0005	–.0006	–.0012	–.0005	–.0010	.0012	.0022
025	–.0006	–.0005	.0005	.0005	+.0006	+.0005	–.0006	–.0012	–.0005	–.0010	.0012	.0022
030	–.0006	–.0006	.0006	.0006	+.0006	+.0006	–.0006	–.0012	–.0006	–.0012	.0012	.0022
035	–.0008	–.0006	.0006	.0006	+.0008	+.0006	–.0008	–.0016	–.0006	–.0012	.0016	.0026
040	–.0008	–.0006	.0006	.0006	+.0008	+.0006	–.0008	–.0016	–.0006	–.0012	.0016	.0026
042	–.0008	–.0008	.0008	.0008	+.0008	+.0008	–.0008	–.0016	–.0008	.–0016	.0016	.0026
045	–.0008	–.0008	.0008	.0008	+.0008	+.0008	–.0008	–.0016	–.0008	–.0016	.0016	.0026
047	–.0010	–.0008	.0008	.0008	+.0010	+.0008	–.0010	–.0020	–.0008	–.0016	.0020	.0030
050	–.0010	–.0008	.0008	.0008	+.0010	+.0008	–.0010	–.0020	–.0008	–.0016	.0020	.0030
055	–.0010	–.0010	.0010	.0010	+.0010	+.0010	–.0010	–.0020	–.0010	–.0020	.0020	.0030
060	–.0010	–.0010	.0010	.0010	+.0010	+.0010	–.0010	–.0020	–.0010	–.0020	.0020	.0030
065	–.0010	–.0010	.0010	.0010	+.0010	+.0010	–.0010	–.0020	–.0010	–.0020	.0020	.0030
070	–.0010	–.0012	.0010	.0010	+.0010	+.0012	–.0010	–.0020	–.0012	–.0024	.0020	.0030
075	–.0012	–.0012	.0012	.0012	+.0012	+.0012	–.0012	–.0024	–.0012	–.0024	.0024	.0034
080	–.0012	–.0012	.0012	.0012	+.0012	+.0012	–.0012	–.0024	–.0012	–.0024	.0024	.0034
090	–.0012	–.0012	.0012	.0012	+.0012	+.0012	–.0012	–.0024	–.0012	–.0024	.0024	.0034
100	–.0014	–.0014	.0014	.0014	+.0014	+.0014	–.0014	–.0028	–.0014	–.0028	.0028	.0038
110	–.0014	–.0014	.0014	.0014	+.0014	+.0014	–.0014	–.0028	–.0014	–.0028	.0028	.0038
120	–.0014	–.0014	.0014	.0014	+.0014	+.0014	–.0014	–.0028	–.0014	–.0028	.0028	.0038
140	–.0014	–.0014	.0014	.0014	+.0014	+.0014	–.0014	–.0028	–.0014	–.0028	.0028	.0038
160	–.0016	–.0016	.0016	.0016	+.0016	+.0016	–.0016	–.0032	–.0016	–.0032	.0032	.0042
180	–.0016	–.0016	.0016	.0016	+.0016	+.0016	–.0016	–.0032	–.0016	–.0032	.0032	.0042
200	–.0018	–.0018	.0018	.0018	+.0018	+.0018	–.0018	–.0036	–0018	–.0036	.0036	.0046
220	–.0018	–.0018	.0018	.0018	+.0018	+.0018	–.0018	–.0036	–0018	–.0036	.0036	.0046
250	–.0018	–.0018	.0018	.0018	+.0018	+.0018	–.0018	–.0036	–.0018	–.0036	.0036	.0046
300	–.0018	–.0018	.0018	.0018	+.0018	+.0018	–.0018	–.0036	–.0018	–.0036	.0036	.0046
350	–.0020	–.0020	.0020	.0020	+.0020	+.0020	–.0020	–.0040	–.0020	–.0040	.0040	.0050
400	–.0020	–.0020	.0020	.0020	+.0020	+.0020	–.0020	–.0040	–.0020	–.0040	.0040	.0050

* Diametral clearance after installation theoretically can range rather widely if all contributing bearing, housing, and shaft tolerances are at either of their extremes. Diametral clearances shown do not apply to Type A (angular contact) bearings.

Listed shaft and housing diameters are for steel under normal conditions. Recommended diameters can change greatly based on orientation, temperature, speed, and other performance requirements. Consult Kaydon.

All dimensions in inches.

Total Width Tolerance—Duplexed Type A Bearings:

Up thru 2" Bearing Bore	+.000 –.020
Over 2" thru 5" Bore	+.000 –.030
Over 5" thru 14" Bore	+.000 –.040
Over 14" Bore	+.000 –.050

Race Width Tolerance—Single Type C, X, A Bearings:

Up thru 12" Bearing Bore	+.000 –.005
Over 12" Bearing Bore	+.000 –.010

TYPE C, X AND A – PRECISION CLASS 3 (REF. ABEC 3F)

Bearing Size (All Series)	Bearing Diameters		Radial & Axial Runout		Rotating Shaft or Duplex DF Mounting		Stationary Shaft or Duplex DB Mounting				Bearing Diametral Clearance* (Type "X"and "C" only)	
	Bearing Bore	Bearing O.D.			Shaft Diameter	Housing Bore	Shaft Diameter		Housing Bore			
	Nominal +.0000	Nominal +.0000	Inner Race	Outer Race	Nominal +.0000	Nominal +.0000	Nominal		Nominal		Before Installation	
10	–.0002	–.0003	.0003	.0004	+.0002	+.0003	–.0002	–.0004	–.0003	–.0006	.0007	.0011
15	–.0003	–.0003	.0004	.0004	+.0003	+.0003	–.0003	–.0006	–.0003	–.0006	.0008	.0012
17	–.0004	–.0004	.0004	.0005	+.0004	+.0004	–.0004	–.0008	–.0004	–.0008	.0008	.0018
020	–.0004	–.0004	.0004	.0005	+.0004	+.0004	–.0004	–.0008	–.0004	–.0008	.0008	.0018
025	–.0004	–.0004	.0004	.0005	+.0004	+.0004	–.0004	–.0008	–.0004	–.0008	.0008	.0018
030	–.0004	–.0004	.0004	.0006	+.0004	+.0004	–.0004	–.0008	–.0004	–.0008	.0008	.0018
035	–.0005	–.0004	.0005	.0006	+.0005	+.0004	–.0005	–.0010	–.0004	–.0008	.0010	.0020
040	–.0005	–.0004	.0005	.0006	+.0005	+.0004	–.0005	–.0010	–.0004	–.0008	.0010	.0020
042	–.0005	–.0005	.0005	.0008	+.0005	+.0005	–.0005	–.0010	–.0005	.–0010	.0010	.0020
045	–.0005	–.0005	.0005	.0008	+.0005	+.0005	–.0005	–.0010	–.0005	–.0010	.0010	.0020
047	–.0006	–.0005	.0006	.0008	+.0006	+.0005	–.0006	–.0012	–.0005	–.0010	.0012	.0022
050	–.0006	–.0005	.0006	.0008	+.0006	+.0005	–.0006	–.0012	–.0005	–.0010	.0012	.0022
055	–.0006	–.0006	.0006	.0009	+.0006	+.0006	–.0006	–.0012	–.0006	–.0012	.0012	.0022
060	–.0006	–.0006	.0006	.0009	+.0006	+.0006	–.0006	–.0012	–.0006	–.0012	.0012	.0022
065	–.0006	–.0006	.0006	.0009	+.0006	+.0006	–.0006	–.0012	–.0006	–.0012	.0012	.0022
070	–.0006	–.0007	.0006	.0010	+.0006	+.0007	–.0006	–.0012	–.0007	–.0014	.0014	.0024
075	–.0007	–.0007	.0008	.0010	+.0007	+.0007	–.0007	–.0014	–.0007	–.0014	.0014	.0024
080	–.0007	–.0007	.0008	.0010	+.0007	+.0007	–.0007	–.0014	–.0007	–.0014	.0014	.0024
090	–.0007	–.0007	.0008	.0010	+.0007	+.0007	–.0007	–.0014	–.0007	–.0014	.0014	.0024
100	–.0008	–.0008	.0010	.0012	+.0008	+.0008	–.0008	–.0016	–.0008	–.0016	.0016	.0026
110	–.0008	–.0008	.0010	.0012	+.0008	+.0008	–.0008	–.0016	–.0008	–.0016	.0016	.0026
120	–.0008	–.0009	.0010	.0014	+.0008	+.0009	–.0008	–.0016	–.0009	–.0018	.0018	.0028
140	–.0008	–.0009	.0012	.0014	+.0008	+.0009	–.0008	–.0016	–.0009	–.0018	.0018	.0028
160	–.0009	–.0010	.0014	.0016	+.0009	+.0010	–.0009	–.0018	–.0010	–.0020	.0020	.0030
180	–.0009	–.0010	.0014	.0016	+.0009	+.0010	–.0009	–.0018	–.0010	–.0020	.0020	.0030
200	–.0010	–.0012	.0016	.0018	+.0010	+.0012	–.0010	–.0020	–.0012	–.0024	.0024	.0034

* Diametral clearance after installation theoretically can range rather widely if all contributing bearing, housing, and shaft tolerances are at either of their extremes. Diametral clearances shown do not apply to Type A (angular contact) bearings.

Listed shaft and housing diameters are for steel under normal conditions. Recommended diameters can change greatly based on orientation, temperature, speed, and other performance requirements. Consult Kaydon.

All dimensions in inches.

Total Width Tolerance—Duplexed Type A Bearings:

Up thru 2" Bearing Bore	+.000 –.020
Over 2" thru 5" Bore	+.000 –.030
Over 5" thru 14" Bore	+.000 –.040
Over 14" Bore	+.000 –.050

Race Width Tolerance—Single Type C, X, A Bearings:

Up thru 12" Bearing Bore	+.000 –.005
Over 12" Bearing Bore	+.000 –.010

TYPE C, X AND A – PRECISION CLASS 4 (REF. ABEC 5F)

Bearing Size (All Series)	Bearing Diameters		Radial & Axial Runout				Rotating Shaft or Duplex DF Mounting		Stationary Shaft or Duplex DB Mounting				Bearing Diametral Clearance* (Type "X"and "C" only)	
	Bearing Bore	Bearing O.D.					Shaft Diameter	Housing Bore	Shaft Diameter		Housing Bore			
	Nominal +.0000	Nominal +.0000	Inner Race		Outer Race		Nominal +.0000	Nominal +.0000	Nominal		Nominal		Before Installation	
10	–.0002	–.0002	R.0002,	A.0003	R.0002,	A.0003	+.0002	+.0002	–.0002	–.0004	–.0002	–.0004	.0005	.0009
15	–.0002	–.0002	R.0002,	A.0003	R.0002,	A.0003	+.0002	+.0002	–.0002	–.0004	–.0002	–.0004	.0005	.0009
17	–.0003	–.0003	R.0002,	A.0003	R.0003,	A.0004	+.0003	+.0003	–.0003	–.0006	–.0003	–.0006	.0006	.0012
020	–.0003	–.0003	R.0002,	A.0003	R.0003,	A.0004	+.0003	+.0003	–.0003	–.0006	–.0003	–.0006	.0006	.0012
025	–.0003	–.0003	R.0002,	A.0003	R.0003,	A.0004	+.0003	+.0003	–.0003	–.0006	–.0003	–.0006	.0006	.0012
030	–.0003	–.0003	R.0002,	A.0003	R.0004,	A.0005	+.0003	+.0003	–.0003	–.0006	–.0003	–.0006	.0006	.0012
035	–.0003	–.0003	R.0003,	A.0004	R.0004,	A.0005	+.0003	+.0003	–.0003	–.0006	–.0003	–.0006	.0006	.0012
040	–.0003	–.0003	R.0003,	A.0004	R.0004,	A.0005	+.0003	+.0003	–.0003	–.0006	–.0003	–.0006	.0006	.0012
042	–.0003	–.0004	R.0003,	A.0004	R.0004,	A.0005	+.0003	+.0004	–.0003	–.0006	–.0004	–.0008	.0008	.0014
045	–.0003	–.0004	R.0003,	A.0004	R.0004,	A.0005	+.0003	+.0004	–.0003	–.0006	–.0004	–.0008	.0008	.0014
047	–.0004	–.0004	R.0003,	A.0004	R.0004,	A.0005	+.0004	+.0004	–.0004	–.0008	–.0004	–.0008	.0008	.0014
050	–.0004	–.0004	R.0003,	A.0004	R.0004,	A.0005	+.0004	+.0004	–.0004	–.0008	–.0004	–.0008	.0008	.0014
055	–.0004	–.0005	R.0003,	A.0004	R.0005,	A.0006	+.0004	+.0005	–.0004	–.0008	–.0005	–.0010	.0010	.0016
060	–.0004	–.0005	R.0003,	A.0004	R.0005,	A.0006	+.0004	+.0005	–.0004	–.0008	–.0005	–.0010	.0010	.0016
065	–.0004	–.0005	R.0003,	A.0004	R.0005,	A.0006	+.0004	+.0005	–.0004	–.0008	–.0005	–.0010	.0010	.0016
070	–.0004	–.0005	R.0003,	A.0004	R.0005,	A.0006	+.0004	+.0005	–.0004	–.0008	–.0005	–.0010	.0010	.0016
075	–.0005	–.0005	R.0004,	A.0005	R.0005,	A.0006	+.0005	+.0005	–.0005	–.0010	–.0005	–.0010	.0010	.0016
080	–.0005	–.0005	R.0004,	A.0005	R.0005,	A.0006	+.0005	+.0005	–.0005	–.0010	–.0005	–.0010	.0010	.0016
090	–.0005	–.0005	R.0004,	A.0005	R.0005,	A.0006	+.0005	+.0005	–.0005	–.0010	–.0005	–.0010	.0010	.0016
100	–.0005	–.0005	R.0005,	A.0006	R.0006,	A.0007	+.0005	+.0005	–.0005	–.0010	–.0005	–.0010	.0010	.0016
110	–.0005	–.0005	R.0005,	A.0006	R.0006,	A.0007	+.0005	+.0005	–.0005	–.0010	–.0005	–.0010	.0010	.0016
120	–.0005	–.0006	R.0005,	A.0006	R.0007,	A.0008	+.0005	+.0006	–.0005	–.0010	–.0006	–.0012	.0012	.0018
140	–.0006	–.0006	R.0005,	A.0007	R.0007,	A.0008	+.0006	+.0006	–.0006	–.0012	–.0006	–.0012	.0012	.0018
160	–.0006	–.0007	R.0007,	A.0008	R.0008,	A.0009	+.0006	+.0007	–.0006	–.0012	–.0007	–.0014	.0014	.0020
180	–.0006	–.0007	R.0007,	A.0008	R.0008,	A.0009	+.0006	+.0007	–.0006	–.0012	–.0007	–.0014	.0014	.0020
200	–.0007	–.0008	R.0008,	A.0009	R.0009,	A.0010	+.0007	+.0008	–.0006	–.0014	–.0007	–.0016	.0014	.0022

* Diametral clearance after installation theoretically can range rather widely if all contributing bearing, housing, and shaft tolerances are at either of their extremes. Diametral clearances shown do not apply to Type A (angular contact) bearings.

Listed shaft and housing diameters are for steel under normal conditions. Recommended diameters can change greatly based on orientation, temperature, speed, and other performance requirements. Consult Kaydon.

All dimensions in inches.

Total Width Tolerance—Duplexed Type A Bearings:

Up thru 2" Bearing Bore	+.000 –.020
Over 2" thru 5" Bore	+.000 –.030
Over 5" thru 14" Bore	+.000 –.040
Over 14" Bore	+.000 –.050

Race Width Tolerance—Single Type C, X, A Bearings:

Up thru 12" Bearing Bore	+.000 –.005
Over 12" Bearing Bore	+.000 –.010

TYPE C, X AND A – PRECISION CLASS 6 (REF. ABEC 7F)

Bearing Size (All Series)	Bearing Diameters		Radial & Axial Runout		Rotating Shaft or Duplex DF Mounting		Stationary Shaft or Duplex DB Mounting				Bearing Diametral Clearance* (Type "X"and "C" only)	
	Bearing Bore	Bearing O.D.			Shaft Diameter	Housing Bore	Shaft Diameter		Housing Bore			
	Nominal +.0000	Nominal +.0000	Inner Race	Outer Race	Nominal +.0000	Nominal +.0000	Nominal		Nominal		Before Installation	
10	–.00015	–.00020	.00015	.0002	+.00015	+.00020	–.00015	–.00030	–.00020	–.00040	.0004	.0008
15	–.00020	–.00020	.00015	.0002	+.00020	+.00020	–.00020	–.00040	–.00020	–.00040	.0005	.0009
17	–.0002	–.0002	.00015	.0002	+.0002	+.0002	–.0002	–.0004	–.0002	–.0004	.0004	.0010
020	–.0002	–.0002	.00015	.0002	+.0002	+.0002	–.0002	–.0004	–.0002	–.0004	.0004	.0010
025	–.0002	–.0002	.00015	.0002	+.0002	+.0002	–.0002	–.0004	–.0002	–.0004	.0004	.0010
030	–.0002	–.0003	.00015	.0002	+.0002	+.0003	–.0002	–.0004	–.0003	–.0006	.0006	.0012
035	–.00025	–.00030	.0002	.0002	+.00025	+.00030	–.00025	–.00050	–.00030	–.00060	.0006	.0012
040	–.00025	–.00030	.0002	.0002	+.00025	+.00030	–.00025	–.00050	–.00030	–.00060	.0006	.0012
042	–.00025	–.00040	.0002	.0003	+.00025	+.00040	–.00025	–.00050	–.00040	–.00080	.0008	.0014
045	–.00025	–.00040	.0002	.0003	+.00025	+.00040	–.00025	–.00050	–.00040	–.00080	.0008	.0014
047	–.0003	–.0004	.0003	.0003	+.0003	+.0004	–.0003	–.0006	–.0004	–.0008	.0008	.0014
050	–.0003	–.0004	.0003	.0003	+.0003	+.0004	–.0003	–.0006	–.0004	–.0008	.0008	.0014
055	–.0003	–.0004	.0003	.0003	+.0003	+.0004	–.0003	–.0006	–.0004	–.0008	.0008	.0014
060	–.0003	–.0004	.0003	.0003	+.0003	+.0004	–.0003	–.0006	–.0004	–.0008	.0008	.0014
065	–.0003	–.0004	.0003	.0003	+.0003	+.0004	–.0003	–.0006	–.0004	–.0008	.0008	.0014
070	–.0003	–.0004	.0003	.0004	+.0003	+.0004	–.0003	–.0006	–.0004	–.0008	.0008	.0014
075	–.0004	–.0004	.0003	.0004	+.0004	+.0004	–.0004	–.0008	–.0004	–.0008	.0008	.0014
080	–.0004	–.0004	.0003	.0004	+.0004	+.0004	–.0004	–.0008	–.0004	–.0008	.0008	.0014
090	–.0004	–.0004	.0003	.0004	+.0004	+.0004	–.0004	–.0008	–.0004	–.0008	.0008	.0014
100	–.0005	–.0005	.0004	.0004	+.0005	+.0005	–.0005	–.0010	–.0005	–.0010	.0010	.0016
110	–.0005	–.0005	.0004	.0004	+.0005	+.0005	–.0005	–.0010	–.0005	–.0010	.0010	.0016
120	–.0005	–.0005	.0004	.0005	+.0005	+.0005	–.0005	–.0010	–.0005	–.0010	.0010	.0016
140	–.0005	–.0006	.0004	.0005	+.0005	+.0006	–.0005	–.0010	–.0006	–.0012	.0012	.0018

* Diametral clearance after installation theoretically can range rather widely if all contributing bearing, housing, and shaft tolerances are at either of their extremes. Diametral clearances shown do not apply to Type A (angular contact) bearings.

Listed shaft and housing diameters are for steel under normal conditions. Recommended diameters can change greatly based on orientation, temperature, speed, and other performance requirements. Consult Kaydon.

All dimensions in inches.

Total Width Tolerance—Duplexed Type A Bearings:

Up thru 2" Bearing Bore	+.000 –.020
Over 2" thru 5" Bore	+.000 –.030
Over 5" thru 14" Bore	+.000 –.040
Over 14" Bore	+.000 –.050

Race Width Tolerance—Single Type C, X, A Bearings:

Up thru 12" Bearing Bore	+.000 –.005
Over 12" Bearing Bore	+.000 –.010

Section 3—Endurakote® Plating for Corrosion-Resistant Bearings

Introduction

Endurakote plating protects bearings from corrosion and provides substantial life improvements in hostile environments. Endurakote is applied over conventional bearing materials such as 52100 steel, and offers the benefit of corrosion resistance normally found only in stainless steel bearings. The coating is applied to the entire bearing race rings, including the paths, thus leaving no area exposed. Other commercial chrome or cadmium coatings normally accepted and used cannot be applied to the path due to the rolling contact stresses. The Endurakote plating is hard chromium, electrodeposited by a proprietary process which achieves a true molecular bond, and will not flake or peel even under the high contact stresses experienced in the bearing paths.

Laboratory and field testing results have proven the benefits of this process. Severe salt spray testing has shown that bearings with Endurakote plating withstand corrosion as well as or better than 440C stainless steel. The hard, dense exterior surface formed by the coating is extremely wear resistant and is excellent in the retention of the lubricant film. Conventional life testing of 52100 steel bearings with Endurakote plating has shown that no life de-rating is necessary. In fact, the extremely hard surface of Endurakote plating protects the bearing from surface generated damage which can promote premature failure. Since the coating is capable of withstanding extremely high temperatures, the bearings are limited by the bearing materials or lubricant used.

The coating used for Endurakote plating can be applied to any type of bearing and to most bearing materials. Its primary advantage is to utilize stock materials such as 52100, etc. with their economies, and convert them to wear and corrosion resistant bearings. Thus, cost savings can be achieved over more exotic or specialized materials. Also, stock bearings can have Endurakote plating applied for quick delivery.

The net result is that we can offer bearings with the capacity of conventional bearing steels and the corrosion resistance of 440C stainless steel from standard stock components.

Application

Endurakote provides corrosion resistance and is effective in increasing wear resistance in sliding surface contacts such as the lands where the cage pilots. The micro-surface composition of Endurakote plating aids in lubricant dispersion, enhancing base metals to the degree of reducing or eliminating galling, seizing, and high friction, over a wide range of installations and environments.

Advantages

Endurakote plating effects a buildup of less than .0002 under normal circumstances. Thus, it can often be applied to stock bearing components which have been specially selected. Endurakote plating is compatible with most ferrous and non-ferrous metal, allowing maximum flexibility in selection of base material. Endurakote plating is normally a final process, and its quality is constant with any given base metal, insuring design reproducibility.

Properties and Characteristics

A. Hardness

Endurakote plating, as deposited, has an equivalent hardness in excess of 70 Rockwell "C." When measured by conventional micro-hardness methods, the host material will modify this measurement to some degree.

B. Coefficient of Friction

(Note: Measurements made at 72°, using other materials for comparison.)

Material	Against	Material	Static	—	Sliding
Steel		Steel	0.30	—	0.20
Steel		Brass, Bronze	0.25	—	0.20
Steel		Endurakote	0.17	—	0.16
Brass, Bronze		Endurakote	0.15	—	0.13
Endurakote		Endurakote	0.14	—	0.12

C. Adhesion

Endurakote will not flake, crack, chip, peel or otherwise separate from the base material under standard bend tests or under conditions where severe heat is induced. In an extensive testing program at Kaydon the adherence proved adequate to withstand the extremely high compressive stresses in the contact areas of ball and roller bearings.

D. Effect On Base

The purity of the chromium surface will not be less than 99% as deposited. A comprehensive testing program at Kaydon established that bearings with Endurakote exhibited load carrying capacities and life expectancy equal to or better than uncoated 52100 steel bearings.

E. Corrosion Resistance

Endurakote resists attack by most organic and inorganic compounds with a pH within the range of 4 and 11 except sulfuric and hydrochloric acids. Porosity of the base metal, compound concentration and exposure time to the compound become corrosion factors, but Endurakote greatly enhances the base material. In severe salt spray tests as well as tap water immersion tests, 52100 steel with Endurakote proved equal to fully hardened 440C stainless steel in resistance to rusting. Endurakote is better for corrosion protection in many instances, than cadmium plate, zinc plate, phosphates, chromates, black oxide and normal chrome plate. We invite inquiries about and will be pleased to arrange tests to qualify Endurakote for specific environments.

F. Heat Resistance

Endurakote will withstand temperatures of -400°F to 2300°F. Hardness and wear resistance properties can be affected at temperatures above 700°F. At temperatures above 1300°F Endurakote will react with carbon monoxide, sulfur vapor and phosphorus. With bright red heat, oxidation occurs in steam or alkali hydroxide atmospheres. (Note: Suitability for use at elevated temperatures is dependent upon the base material, which must be selected for adequate physical properties at the expected temperature range.) Standard Reali-Slim bearings are heat treated for dimensional stability over an operating temperature of -65°F to 250°F.

G. Surface Quality

Endurakote conforms to the texture of the existing surface. R.M.S. finish will be improved slightly down to about 8 R.M.S., below 4 R.M.S. there is little change. Endurakote has a mat or micro-orange peel surface with very good lubricant retention qualities.

I. Endurakote coating is FDA approved for use in the food industries.

Bearing Size Capabilities

Endurakote can be applied to parts up to 72 inches in diameter.

Selection Guide for Endurakote Bearings

REALI-SLIM ② (Dimensions in Inches)			ENDURA-SLIM ② (Dimensions in Inches)			Dynamic Load Capacities (Pounds) ①				
						Type A		Type X		
								Type C		
Bearing No.	Bore	Outside Dia.	Bearing No.	Bore	Outside Dia.	Radial	Thrust	Radial	Thrust	Moment
KAA10	**1.000**	1.375	**NAA10**	**1.0000**	1.3752	150	450	150	370	90
KAA15	**1.500**	1.875	**NAA15**	**1.5000**	1.8752	200	560	180	460	150
KAA17	**1.750**	2.125	**NAA17**	**1.7500**	2.1252	210	600	200	500	190
KA020	**2.000**	2.500	**NA020**	**2.0000**	2.5002	330	960	320	790	360
KB020	**2.000**	2.625	**NB020**	**2.0000**	2.6252	480	1380	450	1130	520
KA025	**2.500**	3.000	**NA025**	**2.5000**	3.0002	380	1100	360	910	500
KB025	**2.500**	3.125	**NB025**	**2.5000**	3.1252	550	1590	520	1290	730
KA030	**3.000**	3.500	**NA030**	**3.0000**	3.5002	430	1230	410	1010	660
KB030	**3.000**	3.625	**NB030**	**3.0000**	3.6252	610	1750	580	1440	960
KA035	**3.500**	4.000	**NA035**	**3.5000**	4.0002	470	1350	450	1110	840
KB035	**3.500**	4.125	**NB035**	**3.5000**	4.1252	670	1930	630	1590	1210
KA040	**4.000**	4.500	**NA040**	**3.9998**	4.5003	510	1470	480	1210	1030
KB040	**4.000**	4.625	**NB040**	**3.9998**	4.6253	730	2100	690	1720	1490
KC040	**4.000**	4.750	**NC040**	**3.9998**	4.7503	960	2770	880	2210	1930
JU040	**4.000**	4.750	**LU040**	**3.9998**	4.7503	–	–	880	2210	1930
KD040	**4.000**	5.000	**ND040**	**3.9998**	5.0003	1480	4260	1410	3520	3170
KF040	**4.000**	5.500	**NF040**	**3.9998**	5.5003	2920	8420	2730	6830	6490
KG040	**4.000**	6.000	**NG040**	**3.9998**	6.0003	4720	13630	4500	11260	11260
KA042	**4.250**	4.750	**NA042**	**4.2498**	4.7503	530	1530	500	1260	1130
KB042	**4.250**	4.875	**NB042**	**4.2498**	4.8753	750	2170	710	1780	1620
KC042	**4.250**	5.000	**NC042**	**4.2498**	5.0003	1000	2880	920	2290	2120
KD042	**4.250**	5.250	**ND042**	**4.2498**	5.2503	1530	4420	1440	3600	3420
KF042	**4.250**	5.750	**NF042**	**4.2498**	5.7503	2990	8630	2830	7070	7070
KG042	**4.250**	6.250	**NG042**	**4.2498**	6.2503	4880	14090	4500	11260	11820
KA045	**4.500**	5.000	**NA045**	**4.4998**	5.0003	550	1580	520	1310	1240
KB045	**4.500**	5.125	**NB045**	**4.4998**	5.1253	780	2240	740	1850	1780
KC045	**4.500**	5.250	**NC045**	**4.4998**	5.2503	1040	2990	950	2380	2320
JU045	**4.500**	5.250	**LU045**	**4.4998**	5.2503	–	–	950	2380	2320
KD045	**4.500**	5.500	**ND045**	**4.4998**	5.5003	1580	4570	1510	3770	3770
KF045	**4.500**	6.000	**NF045**	**4.4998**	6.0003	3140	9050	2920	7300	7660
KG045	**4.500**	6.500	**NG045**	**4.4998**	6.5003	5030	14530	4700	11750	12920
KA047	**4.750**	5.250	**NA047**	**4.7498**	5.2503	570	1640	540	1350	1350
KB047	**4.750**	5.375	**NB047**	**4.7498**	5.3753	810	2340	760	1900	1930
KC047	**4.750**	5.500	**NC047**	**4.7498**	5.5003	1070	3100	980	2460	2520
KD047	**4.750**	5.750	**ND047**	**4.7498**	5.7503	1640	4720	1540	3860	4050
KF047	**4.750**	6.250	**NF047**	**4.7498**	6.2503	3210	9260	3010	7530	8280
KG047	**4.750**	6.750	**NG047**	**4.7498**	6.7503	5180	14970	4890	12230	14070
KA050	**5.000**	5.500	**NA050**	**4.9998**	5.5003	590	1690	560	1400	1460
KB050	**5.000**	5.625	**NB050**	**4.9998**	5.6253	830	2410	790	1980	2100
KC050	**5.000**	5.750	**NC050**	**4.9998**	5.7503	1110	3200	1010	2540	2730
JU050	**5.000**	5.750	**LU050**	**4.9998**	5.7503	–	–	1010	2540	2730
KD050	**5.000**	6.000	**ND050**	**4.9998**	6.0003	1690	4870	1610	4020	4420
KF050	**5.000**	6.500	**NF050**	**4.9998**	6.5003	3280	9460	3100	7760	8920
KG050	**5.000**	7.000	**NG050**	**4.9998**	7.0003	5330	15400	5080	12710	15250
KA055	**5.550**	6.000	**NA055**	**5.4998**	6.0003	620	1800	590	1480	1700
KB055	**5.550**	6.125	**NB055**	**5.4998**	6.1253	890	2560	840	2100	2440
KC055	**5.550**	6.250	**NC055**	**5.4998**	6.2503	1170	3370	1080	2690	3160
JU055	**5.550**	6.250	**LU055**	**5.4998**	6.2503	–	–	1080	2690	3160
KD055	**5.550**	6.500	**ND055**	**5.4998**	6.5003	1790	5160	1700	4260	5110
KF055	**5.550**	7.000	**NF055**	**5.4998**	7.0003	3490	10060	3280	8200	10250
KG055	**5.500**	7.500	**NG055**	**5.4998**	7.5003	5630	16240	5270	13180	17130

① Dynamic capacities are based upon (1.0 million revolutions). of L10 life. Thrust capacity of radial contact ball bearings is dependent upon internal clearance after installation. With expected clearance, thrust capacity approximates radial capacity. Capacities listed are not simultaneous. Moment capacity shown is in pound-inches. Static capacities are dependent upon the amount of support provided by the shaft and housing. Consult Kaydon when static loads greater than the dynamic capacities are anticipated.

② For Ordering by Part Number, add suffix ARO for Type A, CPO for Type C and XPO for Type X. Example: KA020ARO for 2.000 x 2.500 x .250 Type A. Bearing. For nylon separator: add XLO suffix. for Type X; ALO suffix for Type A.

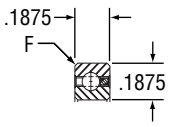
③ "F" is maximum shaft or housing fillet radius which bearing corners will clear.

FITS **Rotating shaft**
Shaft—Tight, zero to 2 X bearing bore tolerance.
Housing—Loose, zero to 2 X bearing O.D. tolerance.

Stationary Shaft
Shaft—Loose, zero to 2 X bearing bore tolerance.
Housing—Tight, zero to 2 X bearing O.D. tolerance.

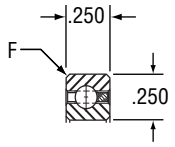
③

KAA or NAA



F = .015

KA or NA



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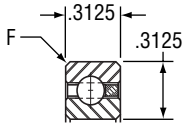
KB or NB



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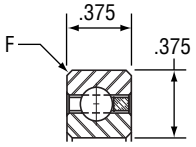

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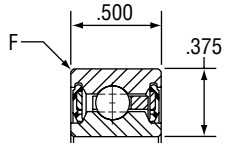

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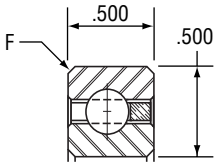

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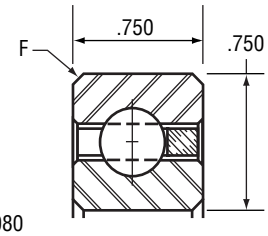
KF or NF



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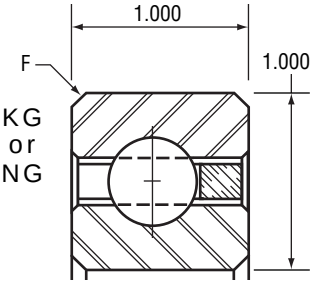
KG or NG

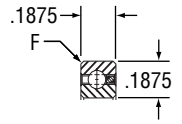


F = .080

Selection Guide

③

KAA or NAA



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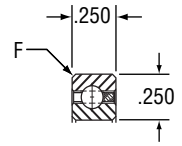

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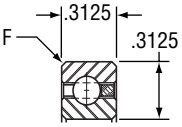
KB or NB



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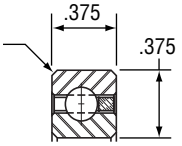

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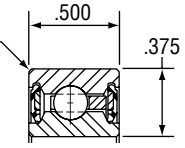
JU or LU



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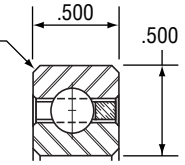

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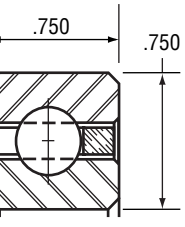
KF or NF



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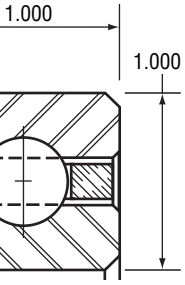
KG or NG



F = .080

REALI-SLIM ② (Dimensions in Inches)			ENDURA-SLIM ② (Dimensions in Inches)			Dynamic Load Capacities (Pounds) ①				
						Type A		Type X		
								Type C		
Bearing No.	Bore	Outside Dia.	Bearing No.	Bore	Outside Dia.	Radial	Thrust	Radial	Thrust	Moment
KA060	**6.000**	6.500	**NA060**	**5.9998**	6.5003	660	1900	630	1570	1960
KB060	**6.000**	6.625	**NB060**	**5.9998**	6.6253	940	2710	890	2220	2800
KC060	**6.000**	6.750	**NC060**	**5.9998**	6.7503	1240	3580	1140	2840	3620
JU060	**6.000**	6.750	**LU060**	**5.9998**	6.7503	–	–	1140	2840	3620
KD060	**6.000**	7.000	**ND060**	**5.9998**	7.0003	1890	5440	1800	4490	5840
KF060	**6.000**	7.500	**NF060**	**5.9998**	7.5003	3690	10650	3450	8630	11650
KG060	**6.000**	8.000	**NG060**	**5.9998**	8.0003	5910	17060	5630	14090	19720
KA065	**6.500**	7.000	**NA065**	**6.4998**	7.0003	690	2000	660	1650	2230
KB065	**6.500**	7.125	**NB065**	**6.4998**	7.1253	980	2840	930	2340	3180
KC065	**6.500**	7.250	**NC065**	**6.4998**	7.2503	1310	3770	1200	2990	4110
JU065	**6.500**	7.250	**LU065**	**6.4998**	7.2503	–	–	1200	2990	4110
KD065	**6.500**	7.500	**ND065**	**6.4998**	7.5003	1980	5720	1890	4720	6610
KF065	**6.500**	8.000	**NF065**	**6.4998**	8.0003	3890	11220	3620	9050	13130
KG065	**6.500**	8.500	**NG065**	**6.4998**	8.5003	6190	17870	5810	14530	21790
KA070	**7.000**	7.500	**NA070**	**6.9998**	7.5003	730	2100	690	1730	2510
KB070	**7.000**	7.625	**NB070**	**6.9998**	7.6253	1030	2980	980	2450	3580
KC070	**7.000**	7.750	**NC070**	**6.9998**	7.7503	1360	3930	1250	3130	4620
KD070	**7.000**	8.000	**ND070**	**6.9998**	8.0003	2070	5990	1980	4940	7420
KF070	**7.000**	8.500	**NF070**	**6.9998**	8.5003	4080	11770	3790	9460	14670
KG070	**7.000**	9.000	**NG070**	**6.9998**	9.0003	6460	18650	6160	15400	24630
KA075	**7.500**	8.000	**NA075**	**7.4998**	8.0003	760	2190	720	1810	2800
KB075	**7.500**	8.125	**NB075**	**7.4998**	8.1253	1080	3120	1020	2560	4000
KC075	**7.500**	8.250	**NC075**	**7.4998**	8.2503	1430	4120	1310	3270	5150
JU075	**7.500**	8.250	**LU075**	**7.4998**	8.2503	–	–	1310	3270	5150
KD075	**7.500**	8.500	**ND075**	**7.4998**	8.5003	2170	6250	2060	5160	8260
KF075	**7.500**	9.000	**NF075**	**7.4998**	9.0003	4200	12130	3950	9870	16280
KG075	**7.500**	9.500	**NG075**	**7.4998**	9.5003	6730	19420	6330	15820	26900
KA080	**8.000**	8.500	**NA080**	**7.9998**	8.5003	790	2280	750	1890	3110
KB080	**8.000**	8.625	**NB080**	**7.9998**	8.6253	1130	3260	1070	2670	4440
KC080	**8.000**	8.750	**NC080**	**7.9998**	8.7503	1490	4300	1360	3410	5710
JU080	**8.000**	8.750	**LU080**	**7.9998**	8.7503	–	–	1360	3410	5710
KD080	**8.000**	9.000	**ND080**	**7.9998**	9.0003	2260	6510	2150	5370	9140
KF080	**8.000**	9.500	**NF080**	**7.9998**	9.5003	4390	12670	4100	10260	17960
KG080	**8.000**	10.000	**NG080**	**7.9998**	10.0003	6990	20180	6660	16650	29980
KA090	**9.000**	9.500	**NA090**	**8.9998**	9.5003	850	2470	810	2040	3770
KB090	**9.000**	9.625	**NB090**	**8.9998**	9.6253	1220	3510	1150	2880	5360
KC090	**9.000**	9.750	**NC090**	**8.9998**	9.7503	1600	4630	1470	3670	6890
JU090	**9.000**	9.750	**LU090**	**8.9998**	9.7503	–	–	1470	3670	6890
KD090	**9.000**	10.000	**ND090**	**8.9998**	10.0003	2430	7010	2320	5790	11000
KF090	**9.000**	10.500	**NF090**	**8.9998**	10.5003	4750	13700	4410	11030	21510
KG090	**9.000**	11.000	**NG090**	**8.9998**	11.0003	7500	21640	7150	17870	35730
KA100	**10.000**	10.500	**NA100**	**9.9998**	10.5003	910	2640	870	2180	4470
KB100	**10.000**	10.625	**NB100**	**9.9998**	10.6253	1300	3760	1230	3080	6360
KC100	**10.000**	10.750	**NC100**	**9.9998**	10.7503	1720	4970	1570	3930	8160
JU100	**10.000**	10.750	**LU100**	**9.9998**	10.7503	–	–	1570	3930	8160
KD100	**10.000**	11.000	**ND100**	**9.9998**	11.0003	2600	7500	2470	6190	12990
KF100	**10.000**	11.500	**NF100**	**9.9998**	11.5003	5030	14530	4710	11770	25310
KG100	**10.000**	12.000	**NG100**	**9.9998**	12.0003	7990	23060	7620	19040	41880
KA110	**11.000**	11.500	**NA110**	**10.9998**	11.5003	970	2810	930	2320	5220
KB110	**11.000**	11.625	**NB110**	**10.9998**	11.6253	1380	4000	1310	3280	7420

① Dynamic capacities are based upon (1.0 million revolutions). of L10 life. Thrust capacity of radial contact ball bearings is dependent upon internal clearance after installation. With expected clearance, thrust capacity approximates radial capacity. Capacities listed are not simultaneous. Moment capacity shown is in pound-inches. Static capacities are dependent upon the amount of support provided by the shaft and housing. Consult Kaydon when static loads greater than the dynamic capacities are anticipated.

② For Ordering by Part Number, add suffix ARO for Type A, CPO for Type C and XPO for Type X. Example: KA020ARO for 2.000 x 2.500 x .250 Type A. Bearing. For nylon separator: add XLO suffix. for Type X; ALO suffix for Type A.

③ "F" is maximum shaft or housing fillet radius which bearing corners will clear.

FITS **Rotating shaft**
Shaft—Tight, zero to 2 X bearing bore tolerance.
Housing—Loose, zero to 2 X bearing O.D. tolerance.

Stationary Shaft
Shaft—Loose, zero to 2 X bearing bore tolerance.
Housing—Tight, zero to 2 X bearing O.D. tolerance.

REALI-SLIM ② (Dimensions in Inches)			ENDURA-SLIM ② (Dimensions in Inches)			Dynamic Load Capacities (Pounds) ①				
						Type A		Type X		
								Type C		
Bearing No.	Bore	Outside Dia.	Bearing No.	Bore	Outside Dia.	Radial	Thrust	Radial	Thrust	Moment
KC110	**11.000**	11.750	**NC110**	**10.9998**	11.7503	1830	5280	1670	4180	9510
JU110	**11.000**	11.750	**LU110**	**10.9998**	11.7503	–	–	1670	4180	9510
KD110	**11.000**	12.000	**ND110**	**10.9998**	12.0003	2760	7960	2630	6570	15120
KF110	**11.000**	12.500	**NF110**	**10.9998**	12.5003	5370	15500	5000	12490	29350
KG110	**11.000**	13.000	**NG110**	**10.9998**	13.0003	8470	24440	8070	20180	48420
KA120	**12.000**	12.500	**NA120**	**11.9998**	12.5003	1030	2970	980	2450	6010
KB120	**12.000**	12.625	**NB120**	**11.9998**	12.6253	1470	4240	1390	3470	8550
KC120	**12.000**	12.750	**NC120**	**11.9998**	12.7503	1930	5570	1770	4420	10940
KD120	**12.000**	13.000	**ND120**	**11.9998**	13.0003	2920	8420	2780	6950	17370
KF120	**12.000**	13.500	**NF120**	**11.9998**	13.5003	5640	16290	5280	13190	33630
KG120	**12.000**	14.000	**NG120**	**11.9998**	14.0003	8930	25780	8510	21280	55330
KB140	**14.000**	14.625	**NB140**	**13.9998**	14.6253	1620	4670	1530	3840	10980
KC140	**14.000**	14.750	**NC140**	**13.9998**	14.7503	2140	6170	1950	4890	14050
KD140	**14.000**	15.000	**ND140**	**13.9998**	15.0003	3220	9290	3070	7670	22250
KF140	**14.000**	15.500	**NF140**	**13.9998**	15.5003	6220	17950	5810	14530	42880
KG140	**14.000**	16.000	**NG140**	**13.9998**	16.0003	9820	28360	9360	23410	70230
KB160	**16.000**	16.625	**NB160**	**15.9998**	16.6253	1770	5100	1670	4190	13660
KC160	**16.000**	16.750	**NC160**	**15.9998**	16.7503	2330	6730	2130	5330	17450
KD160	**16.000**	17.000	**ND160**	**15.9998**	17.0003	3510	10130	3350	8360	27600
KF160	**16.000**	17.750	**NF160**	**15.9998**	17.5003	6770	19540	6330	15820	53000
KG160	**16.000**	18.000	**NG160**	**15.9998**	18.0003	10680	30830	10180	25450	86530
KB180	**18.000**	18.625	**NB180**	**17.9998**	18.6253	1910	5510	1810	4520	16560
KC180	**18.000**	18.750	**NC180**	**17.9998**	18.7503	2520	7280	2300	5760	21150
KD180	**18.000**	19.000	**ND180**	**17.9998**	19.0003	3790	10930	3610	9030	33400
KF180	**18.000**	19.500	**NF180**	**17.9998**	19.5003	7350	21210	6820	17060	63960
KG180	**18.000**	20.000	**NG180**	**17.9998**	20.0003	11500	33200	10960	27410	104100
KB200	**20.000**	20.625	**NB200**	**19.9998**	20.6253	2050	5900	1940	4850	19690
KC200	**20.000**	20.750	**NC200**	**19.9998**	20.7503	2690	7780	2470	6170	25120
KD200	**20.000**	21.000	**ND200**	**19.9998**	21.0003	4060	11710	3870	9670	39630
KF200	**20.000**	21.500	**NF200**	**19.9998**	21.5003	7860	22680	7300	18250	75730
KG200	**20.000**	22.000	**NG200**	**19.9998**	22.0003	12300	35490	11720	29300	123100
KD210	**21.000**	22.000	**ND210**	**20.9998**	22.0003	–	–	3990	9980	42900
KG220	**22.000**	24.000	**NG220**	**21.9998**	24.0003	–	–	12450	31130	143200
KC250	**25.000**	25.750	**NC250**	**24.9998**	25.7503	3120	9010	2850	7140	36220
KD250	**25.000**	26.000	**ND250**	**24.9998**	26.0003	4690	13540	4470	11180	57010
KF250	**25.000**	26.500	**NF250**	**24.9998**	26.5003	9040	26100	8430	21070	108500
KG250	**25.000**	27.000	**NG250**	**24.9998**	27.0003	14180	40920	13510	33780	175700
KC300	**30.000**	30.750	**NC300**	**29.9998**	30.7503	3520	10160	3220	8050	48880
KD300	**30.000**	31.000	**ND300**	**29.9998**	31.0003	5290	15260	5040	12600	76840
KF300	**30.000**	31.500	**NF300**	**29.9998**	31.5003	10190	29430	9490	23720	145900
KG300	**30.000**	32.000	**NG300**	**29.9998**	32.0003	15940	46020	15190	37980	235500
KF350	**35.000**	36.500	**NF350**	**34.9998**	36.5003	11290	32580	10490	26220	187500
KG350	**35.000**	37.000	**NG350**	**34.9998**	37.0003	17610	50840	16790	41970	302200
KF400	**40.000**	41.500	**NF400**	**39.9998**	41.5003	12330	35580	11450	28620	233200
KG400	**40.000**	42.000	**NG400**	**39.9998**	42.0003	19210	55440	18310	45770	375300

① Dynamic capacities are based upon (1.0 million revolutions). of L10 life. Thrust capacity of radial contact ball bearings is dependent upon internal clearance after installation. With expected clearance, thrust capacity approximates radial capacity. Capacities listed are not simultaneous. Moment capacity shown is in pound-inches. Static capacities are dependent upon the amount of support provided by the shaft and housing. Consult Kaydon when static loads greater than the dynamic capacities are anticipated.

② For Ordering by Part Number, add suffix ARO for Type A, CPO for Type C and XPO for Type X. Example: KA020ARO for 2.000 x 2.500 x .250 Type A. Bearing. For nylon separator: add XLO suffix. for Type X; ALO suffix for Type A.

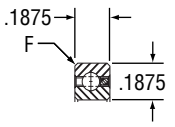
③ "F" is maximum shaft or housing fillet radius which bearing corners will clear.

FITS **Rotating shaft**
Shaft—Tight, zero to 2 X bearing bore tolerance.
Housing—Loose, zero to 2 X bearing O.D. tolerance.

Stationary Shaft
Shaft—Loose, zero to 2 X bearing bore tolerance.
Housing—Tight, zero to 2 X bearing O.D. tolerance.

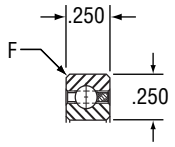
③

KAA or NAA



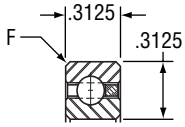
F = .015

KA or NA



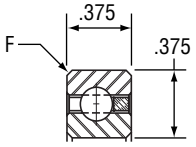
F = .025

KB or NB



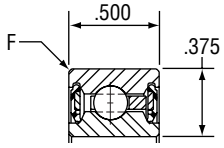
F = .040

KC or NC



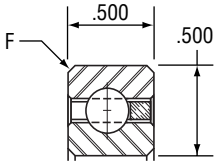
F = .040

JU or LU



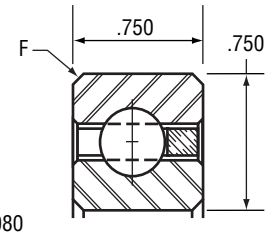
F = .015

KD or ND



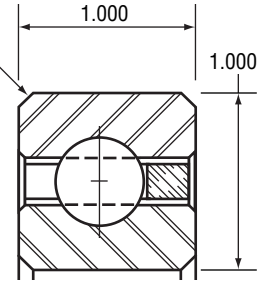
F = .060

KF or NF



F = .080

KG or NG



F = .080

Comparative Tolerances for Endura-Slim Bearings

Basic Bearing Bore Size (Inches)	Type	REALI-SLIM		ENDURA-SLIM					
		Bearing Bore Nominal +.0000	Bearing O.D. Nominal +.0000	Bearing Bore Nominal +.0000	Bearing O.D. Nominal +.0000	Runouts Radial & Axial		Diametral Clearance Type C & X Only	
						Inner Race	Outer Race	Before Installation	
								Min.	Max.
1.0	**C**	–.0004	–.0005	–.0006	–.0007	.0005	.0008	.0010	.0016
	A, X	–.0004	–.0005	–.0006	–.0007	.0003	.0004	.0010	.0015
1.5	**C**	–.0005	–.0005	–.0007	–.0007	.0006	.0008	.0012	.0018
	A, X	–.0005	–.0005	–.0007	–.0007	.0004	.0004	.0012	.0017
1.7	**C**	–.0006	–.0005	–.0008	–.0007	.0008	.0010	.0012	.0024
	A, X	–.0006	–.0005	–.0008	–.0007	.0005	.0005	.0012	.0022
2.0 to 2.5	**C**	–.0006	–.0005	–.0008	–.0007	.0008	.0010	.0012	.0024
	A, X	–.0006	–.0005	–.0008	–.0007	.0005	.0005	.0012	.0022
3.0	**C**	–.0006	–.0006	–.0008	–.0008	.0008	.0010	.0012	.0024
	A, X	–.0006	–.0006	–.0008	–.0008	.0006	.0006	.0012	.0022
3.5	**C**	–.0008	–.0006	–.0010	–.0008	.0010	.0012	.0016	.0028
	A, X	–.0008	–.0006	–.0010	–.0008	.0006	.0006	.0016	.0026
4.0	**C**	–.0008	–.0006	–.0009	–.0007	.0010	.0012	.0016	.0028
	A, X	–.0008	–.0006	–.0009	–.0007	.0006	.0006	.0016	.0026
4.2 to 4.5	**C**	–.0008	–.0008	–.0009	–.0009	.0010	.0014	.0016	.0028
	A, X	–.0008	–.0008	–.0009	–.0009	.0008	.0008	.0016	.0026
4.7 to 5.0	**C**	–.0010	–.0008	–.0011	–.0009	.0012	.0014	.0020	.0034
	A, X	–.0010	–.0008	–.0011	–.0009	.0008	.0008	.0020	.0030
5.5 to 6.5	**C**	–.0010	–.0010	–.0011	–.0011	.0012	.0016	.0020	.0034
	A, X	–.0010	–.0010	–.0011	–.0011	.0010	.0010	.0020	.0030
7.0	**C**	–.0010	–.0012	–.0011	–.0013	.0012	.0016	.0020	.0034
	A, X	–.0010	–.0012	–.0011	–.0013	.0010	.0010	.0020	.0030
7.5 to 9.0	**C**	–.0012	–.0012	–.0013	–.0013	.0016	.0018	.0024	.0042
	A, X	–.0012	–.0012	–.0013	–.0013	.0012	.0012	.0024	.0034
10.0 to 12.0	**C**	–.0014	–.0014	–.0015	–.0015	.0018	.0020	.0028	.0048
	A, X	–.0014	–.0014	–.0015	–.0015	.0014	.0014	.0028	.0038
14.0	**C**	–.0016	–.0016	–.0017	–.0017	.0018	.0020	.0032	.0052
	A, X	–.0014	–.0014	–.0015	–.0015	.0014	.0014	.0028	.0038
16.0	**C**	–.0018	–.0018	–.0019	–.0019	.0018	.0020	.0036	.0056
	A, X	–.0016	–.0016	–.0017	–.0017	.0016	.0016	.0032	.0042
18.0	**C**	–.0018	–.0018	–.0019	–.0019	.0020	.0020	.0036	.0056
	A, X	–.0016	–.0016	–.0017	–.0017	.0016	.0016	.0032	.0042
20.0	**C**	–.0020	–.0020	–.0021	–.0021	.0020	.0020	.0040	.0060
	A, X	–.0018	–.0018	–.0019	–.0019	.0018	.0018	.0036	.0046
25.0 to 30.0	**C**	–.0030	–.0030	–.0031	–.0031	.0020	.0020	.0060	.0080
	A, X	–.0018	–.0018	–.0019	–.0019	.0018	.0018	.0036	.0046
35.0 to 40.0	**C**	–.0040	–.0040	–.0041	–.0041	.0020	.0020	.0080	.0100
	A, X	–.0020	–.0020	–.0021	–.0021	.0020	.0020	.0040	.0050

FITS

Rotating Shaft
Shaft – Tight, zero to 2X bearing bore tolerance.
Housing – Loose, zero to 2X bearing O.D. tolerance.

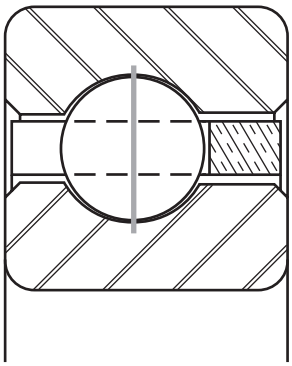
Stationary Shaft
Shaft – Tight, zero to 2X bearing bore tolerance.
Housing – Loose, zero to 2X bearing O.D. tolerance.

Listed shaft and housing diameters are for steel under normal conditions. Recommended diameters can change greatly based on orientation, temperature, speed, and other performance requirements. Consult Kaydon.

Section 4—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:

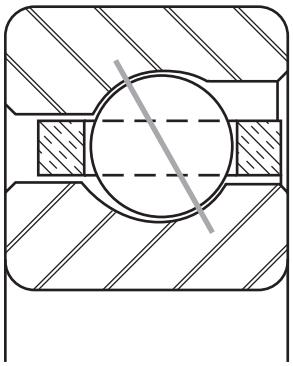
- Interference fitting between bearing races and mounting members;
- Differential thermal expansion or contraction of steel races;
- Misalignment between shaft and housing and other factors may require the clearance to be modified accordingly.

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



The Type A Angular Contact ball bearing may be described as a modified Type C bearing in which sufficient diametral clearance has been provided 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 substan-

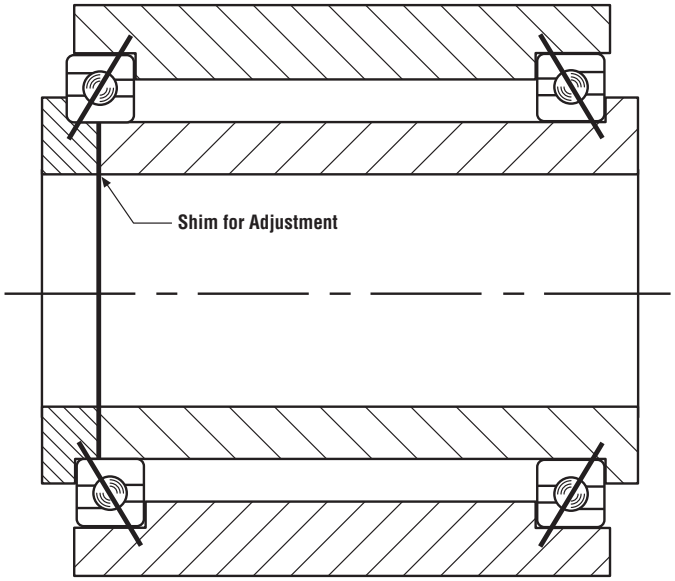
tial axial force in one direction. With an axial force applied, the faces of the inner and outer rings are approximately flush to minimize preload adjustments .

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

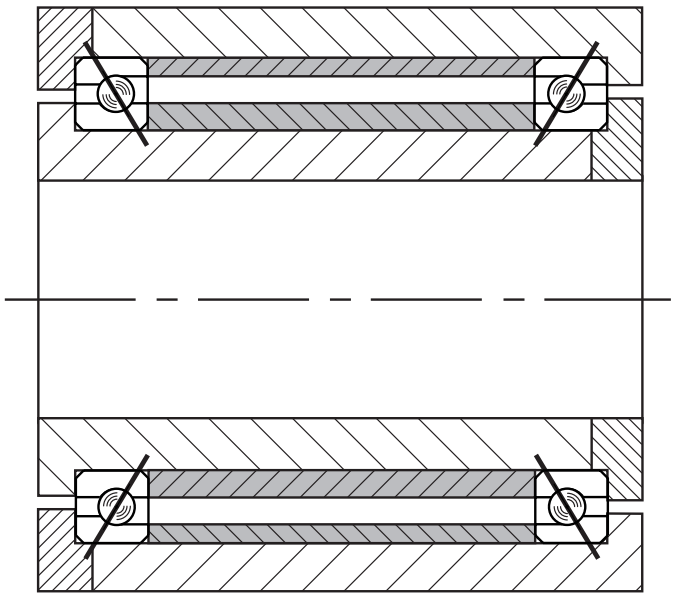
Figure 20



Typical mountings of Type A bearings are shown in Figure 20 and 21. In Figure 20, 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.”

Face-to-face Mounting

Figure 21



In Figure 21, 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.

Duplexed Bearings

Type A bearings are furnished as matched sets when they are to be mounted adjacent or with equal length inner and outer race spacers. When required, Kaydon can supply assemblies with matched ground spacers. The arrangements shown in Figures 22, 23, and 24 are known as duplexed bearings—back-to-back, face-to-face, and tandem, respectively. Sets of three, four or more bearings can also be matched where conditions require additional capacity and there is insufficient space radially for larger bearings.

The bearings in these sets are matched within close limits for size of bore and outside diameter. Each set is marked with a "V" across the bores and outside diameters at the high point of radial runout and indicate the proper orientation of the races at installation (Figure 24).

The pairs shown in Figures 22 and 23 are normally furnished with the race faces ground to provide preload when installed. To accomplish this, a gap is provided between the inner races of the pair in Figure 22 and between the outer races of the pair in Figure 23. When the bearings are installed and clamped axially, the gap is closed producing a preload on the bearings.

- Back-to-back arrangement of Figures 20 and 22 offers greater rigidity under moment loading and should be used when the space between single bearings is small or when a single pair of adjacent bearings is employed.
- Face-to-face arrangement is more tolerant of misalignment between the shaft and housing and should be considered when there are multiple pairs of bearings along an axis. When single bearings are mounted face-to-face, they must be spaced sufficiently to provide resistance to moment load. If required, a face-to-face pair can be mounted in conjunction with another bearing in a "fixed-float" arrangement with the pair in the fixed position. (Also see page 56).

Figure 22
Back-to-back (Type DB)

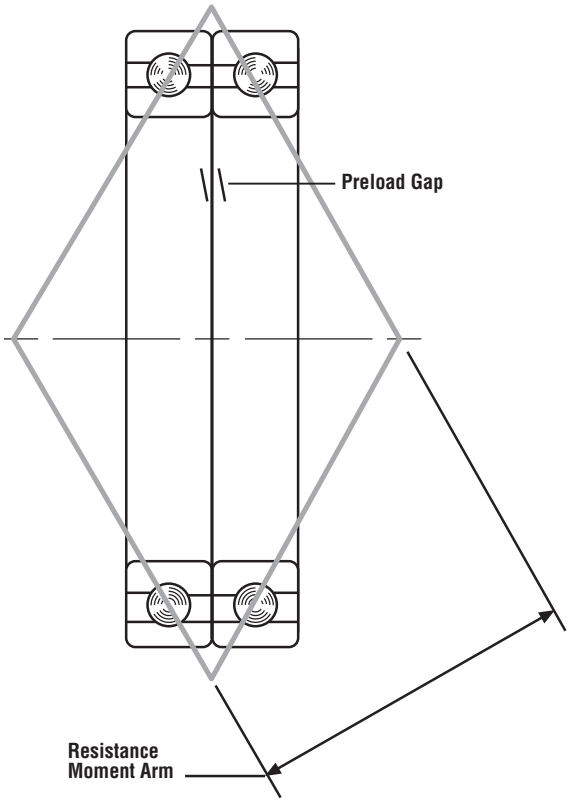


Figure 23
Face-to-face (Type DF)

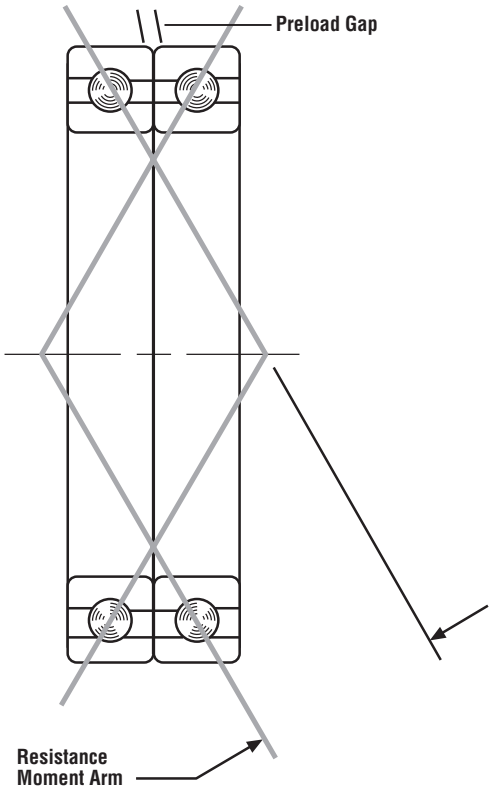
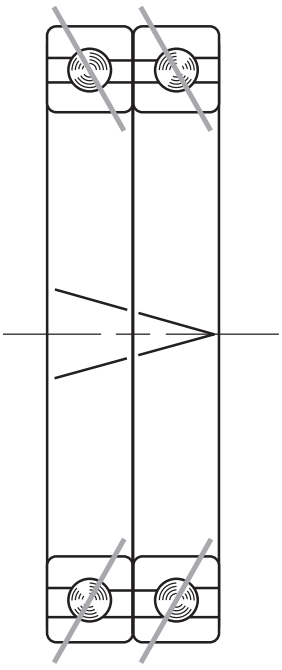


Figure 24
Tandem (Type DT)

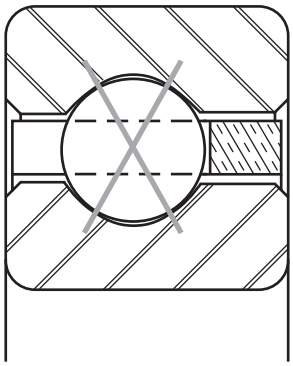


- Tandem bearing sets have single direction thrust capacity and must be mounted opposed to another bearing or set.

When applying catalog load ratings to matched sets, the total radial capacity is considered equal to the single bearing radial rating multiplied by $N^{0.7}$, where N is the number of bearings in the set. The thrust capacity in each direction is considered equal to the single bearing thrust rating multiplied by $N^{0.7}$, where N is the number of bearings resisting thrust in that direction.

Unless specifically requested, the outboard faces of bearing sets are not controlled. If outboard face flushness is required for preload purposes, universally ground bearings should be considered. On universally ground bearings, both inboard and outboard faces are matched under a specified gage load to control preload and allow for mounting orientation flexibility.

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 25). 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 26). 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 27). The latter construction gives the Type X bearing its unique "Gothic Arch" configuration, making possible four contact points 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 28, 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.

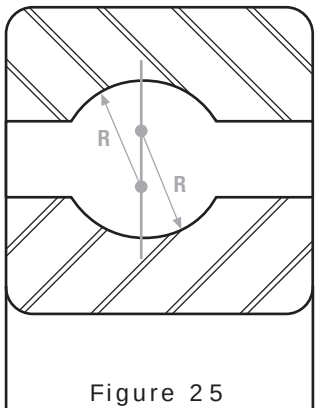


Figure 25
Type C

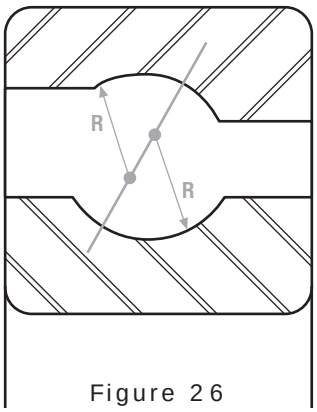


Figure 26
Type A

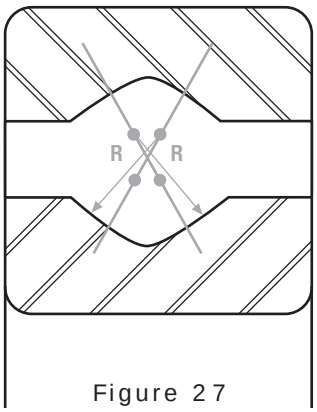


Figure 27
Type X

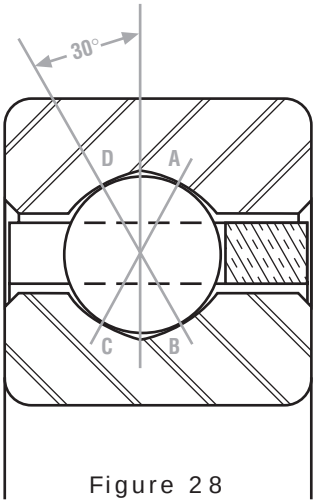


Figure 28

Moment or Overturning Load

A moment or overturning load is similar to two thrust loads acting in opposite directions at diametrically opposite sides of the bearing. With a moment load, the loading on one side of the bearing will pass from point B to D, relieving points A and C. Directly across the bearing, the load passes from point C to point A, relieving points B and D.

A radial load is resisted equally across the lines of contact CA and BD. Under combined loading the resistance is along both lines of contact with the magnitude of each reaction dependent upon the relationship of the individual loads.

By its ability to resist radial, thrust, and moment loads in any combination, the Type X bearing is often able to replace two bearings—a pair of angular contact ball bearings, a pair of tapered roller bearings, or a combination of thrust and radial bearings, either ball or roller.

As in the case of the Type C bearing, Type X bearings are normally supplied with diametral clearance. The latter bearing, however, is not dependent upon this clearance for its nominal contact angle and thrust capacity. On the contrary, where thrust or moment loading is considerable, the clearance should be minimized to prevent the angle of contact from becoming excessive. For many applications requiring greater stiffness, Type X bearings are furnished with an internal preload. This is accomplished by using balls larger in diameter than the space provided between the raceways. The balls and raceways in this case have some elastic deformation without the presence of external load.

WARNING: Type X Bearings are designed to be used singularly. Use of two Type X bearings on a common shaft could result in objectionable friction torque.

Mounting

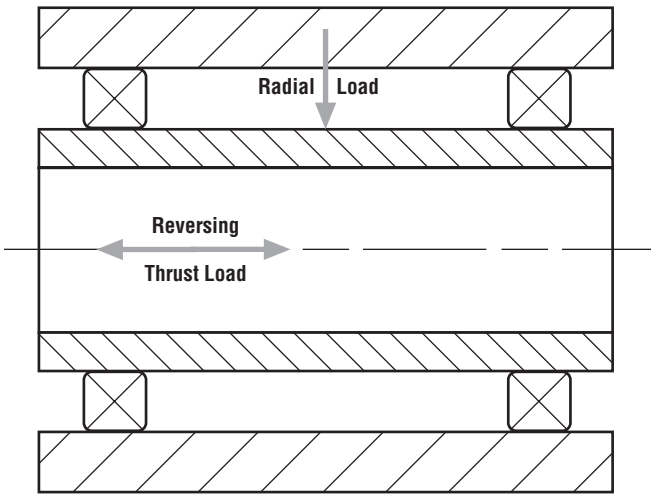
Accuracy

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.

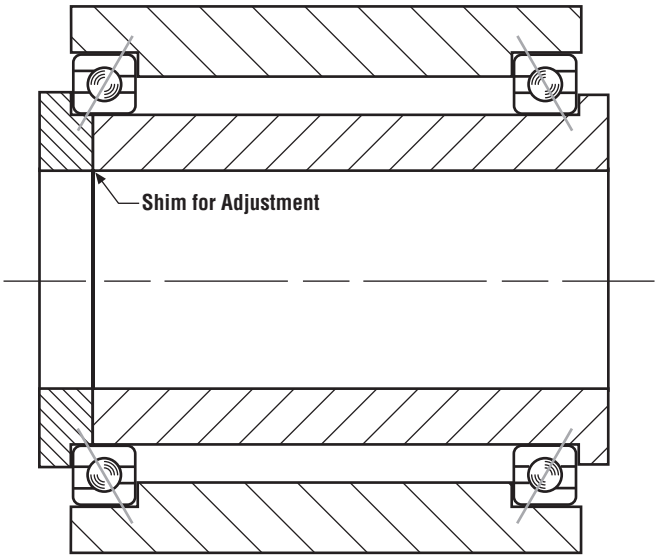
Considering the load condition of Figure 29, it can be seen that with internal looseness (diametral clearance) in a Type C or Type X bearing, the thrust load will cause axial movement of the shaft relative to the housing. Because of its unique internal geometry with "built-in" contact angles, a Type 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.

Figure 29



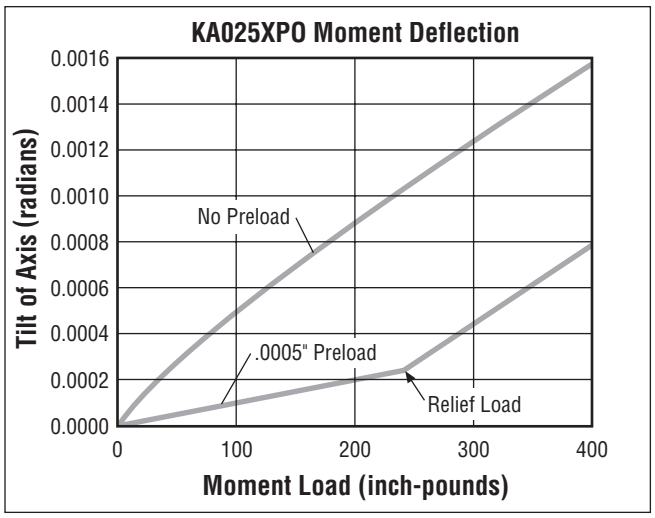
Where axial movement must be completely restricted, the Type X bearing can be preloaded by using balls of greater diameter than the space provided for them between the raceways. This is common practice and provides excellent control of axial play. Where speed is appreciable, however, preload is not acceptable in the Type X bearing due to increased friction and wear. The alternative, then, is to use the mounting of Figure 30 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.

Figure 30



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 31.

Figure 31



Deflection data for the three bearing types is shown on pages 70 thru 75.

In each series of Reali-Slim bearings the ball to raceway conformity is the same for all three bearing types. Deflection under load varies from one type to another within a given series as a function of the contact angle and the number of balls. Conrad assembled bearings (C and X types) will exhibit greater deflection than those assembled by “filling notch” or a Type A bearing since C and X types have fewer balls. When two bearings are spaced apart to support a moment load, the space between the bearings is most important when considering angular deflection (tilt-of-axis).

Preloading is also a significant factor in reducing deflection, as shown in the load-deflection curve. In Figure 31 it can be seen that a deflection is non-linear for the non-preloaded bearing. In addition, the rate of deflection is higher for lower loads than higher loads. Deflection for the preloaded bearings is linear up to the point of preload relief. For loads that exceed the preload relief, the subsequent deflection follows the same slope as the non-preloaded curve but at a reduced rate.

Thus if preload is used, the deflection due to the work load will be markedly less whether preload is relieved or not.

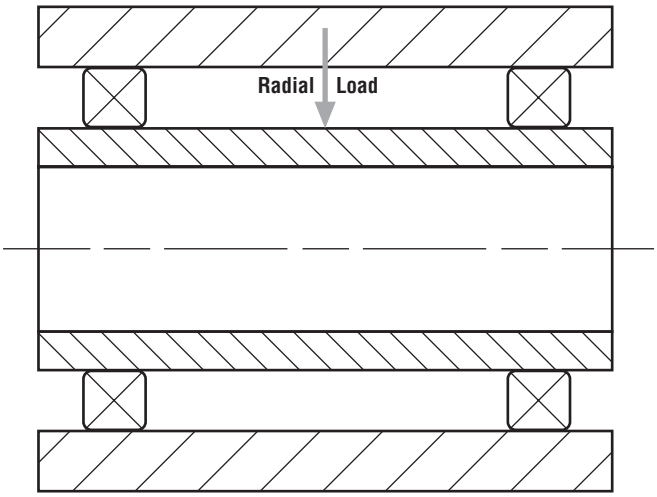
The Type A bearing is more tolerant of preload than is the Type X bearing. If maximum stiffness is required and speed of rotation is significant, Type A bearings are preferred.

Bearing precision, which influences accuracy, is independent of bearing type. Radial and axial runout, bore and O.D. tolerances, etc. are essentially the same for Types C, A, and X bearings of a given precision class.

Load

With a pure radial load such as shown in Figure 32, it can be seen that the Type C bearings in Figure 34 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.

Figure 32



With an axial load applied as in Figure 29, 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 34 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 37.

In the third load condition (Figure 33), the bearing arrangement in Figure 34 will be satisfactory for small thrust loads. Where thrust is significant, the arrangement of Figures 30, 35 and 36 should be considered. In the latter case, one Type X bearing will accommodate the combined loads while effecting savings in space, weight, and cost.

Figure 33

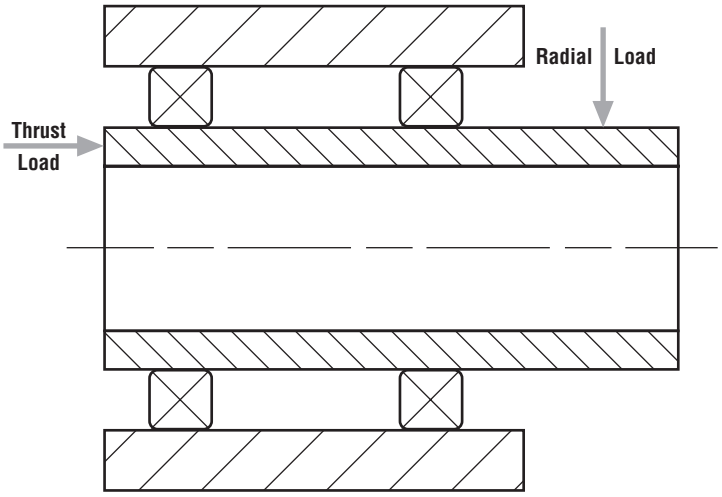
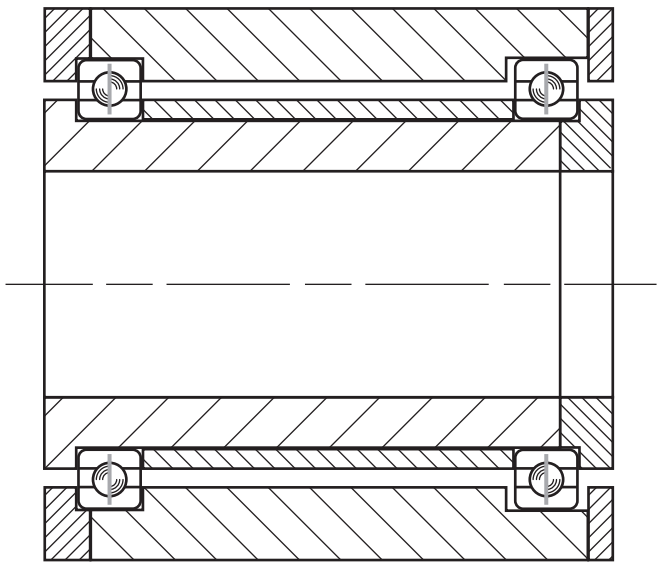


Figure 34

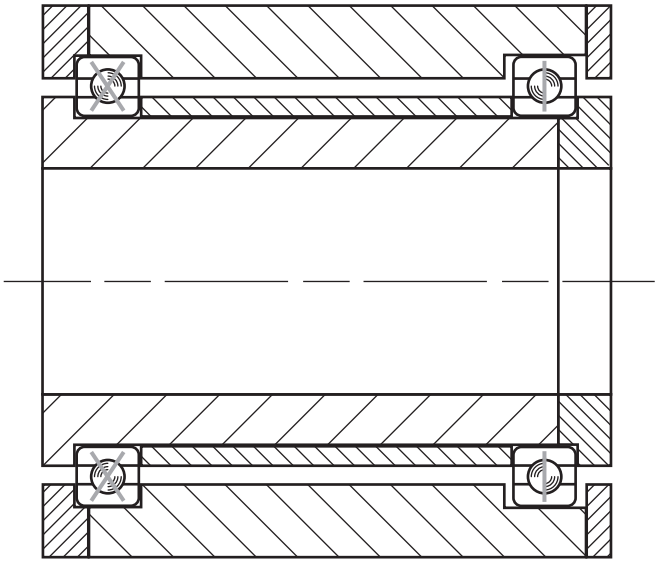


Speed

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

Referring to Figure 29, arrangements of both Figure 30 and Figure 35 would satisfy the load conditions, but their suitability for high speed must be considered.

Figure 35



The better arrangement for high speed operation is that using Type A bearings (Figure 30), which can be adjusted to provide the optimum internal fit.

There is the possibility of differential expansion creating a problem when two Type A bearings a sizable distance apart are clamped against each other with all internal clearance removed. If this is the case, a “fixed-floating” arrangement can be used as shown in Figure 37 with a duplexed pair of Type A bearings at the “fixed” position and a Type C bearing at the “float” position. Another possibility is to spring load the Type A bearings of Figure 30.

Figure 36

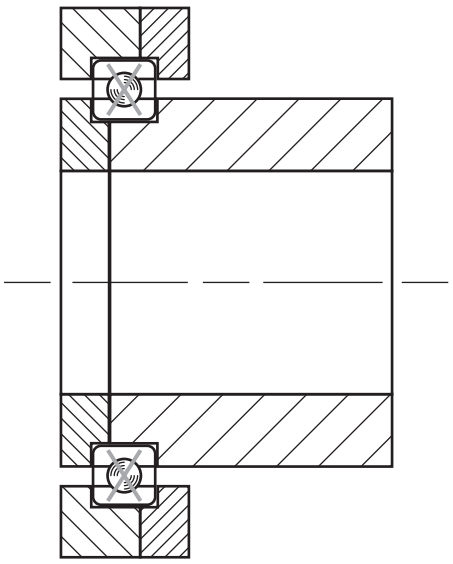


Figure 37

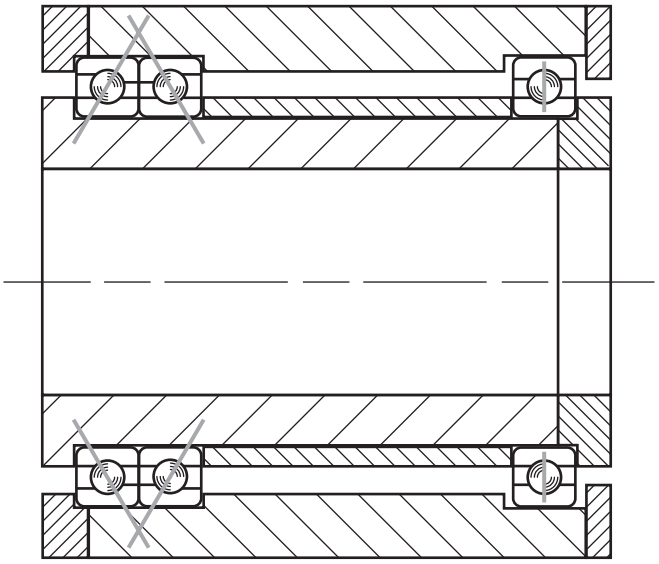
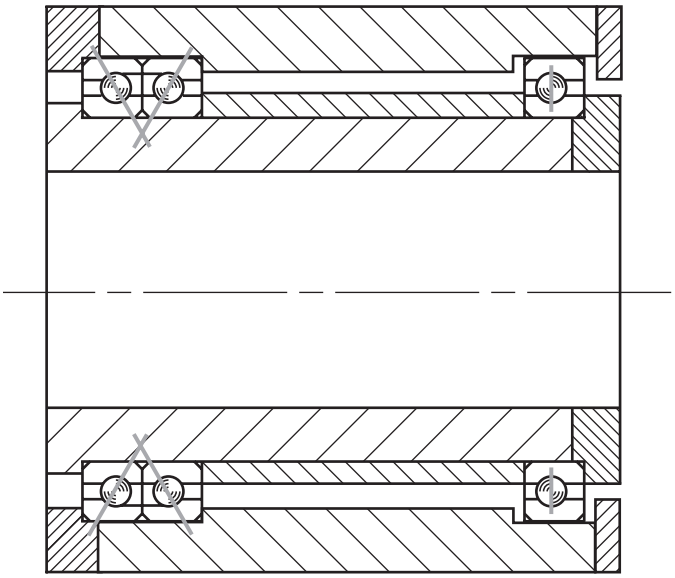
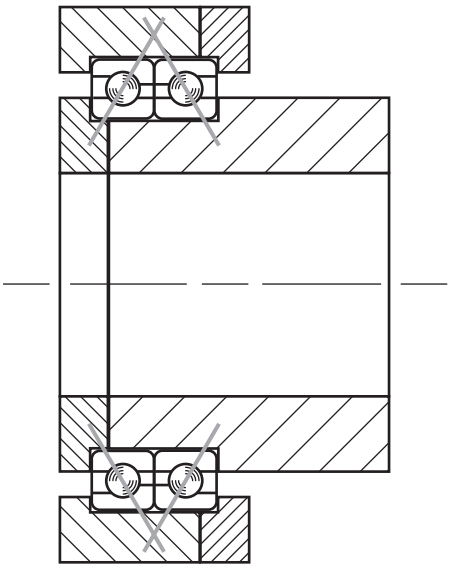


Figure 37A



Where space is limited, combined loading exists, and speed is relatively high, a pair of Type A bearings as shown in Figure 38 would be given preference over the single Type X bearing of Figure 36. In this event preloading must be minimized. This can be accomplished by using a short spacer between the outer races and adjusting the bearings through the inner races.

Figure 38



Limiting speeds are given on page 64 and 65.

Other Considerations

Friction Torque

In applications where minimum driving force is a requirement, consideration should be given to friction torque. For low torque, preload should be avoided if possible. Type X bearings under combined loading can be expected to have more friction than Type A bearings. The separators, ball to raceway conformity, lubrication method, shaft and housing fits and temperature are among the factors influencing bearing friction. Awareness of a low torque requirement enables the bearing engineer to weigh the compatibility of these factors. Additional information on friction torque is on pages 66 and 67. Kaydon product engineering can provide estimates on friction torque, preload, mounting, temperature, and other criteria.

Bearing Mounting

What materials are to be used for the shaft and housing? What range of operating temperatures will be encountered? Will there be a temperature differential between the shaft and housing? The answers to these questions are necessary for proper bearing selection and application. Significant differential expansion will cause marked changes in both the external and internal bearing fits, especially in the case of the thin-section, Reali-Slim bearings. These changes affect accuracy, friction, and bearing life.

Special attention must be given to bearing selection and application whenever conditions are different from those considered normal. For a normal application of standard Reali-Slim bearings, the following apply:

Arrangement

Type C and Type A bearings—Used with a second bearing with sufficient separation to resist moment loads. When the axis of rotation is within 45° of vertical, snapover separators should be positioned with pocket openings down or the shaft or housing should be extended as added assurance of separator retention.

All Types—Fixed races located axially by positive means. Snap rings used only for positioning and light loads. Shoulders, sleeves, or clamping rings used for heavy loads. No reliance upon interference fits for resistance to applied axial loads.

Mounting

Shaft and housing of material with coefficient of thermal expansion of approximately .000007 inch per inch per degree F. Shaft and housing diameters round within bearing radial runout tolerances; shoulders flat within bearing axial runout tolerances; cross sections sufficiently rigid to provide good load distribution within bearing. Suitable sealing or shielding to protect bearing from contamination.

Temperature

Means provided to maintain race temperature between -65°F and +250°F with no appreciable differential across the bearing.

Lubrication

Oil and grease suitable for speed and temperature.
See pages 80-81.

Speed

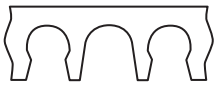
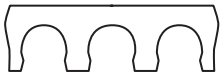
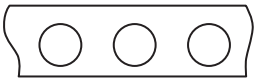
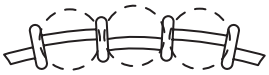
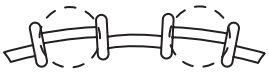
Within limits of chart on pages 64 and 65.

Load

Within catalog rating after modification with suitable safety factor.

Section 5—Performance Considerations and Options Available

Overview of Reali-Slim Bearing Separators

Code Letter*	Description	Design Features	Precautions	Material	Design
P	One piece formed ring with “snapover” pockets.	Standard ball complement. Used in Type C and X bearings for “KA” through “KG” cross-section bearings.	Commercial type cage, not recommended for low torque applications. Consult factory for temperatures below -65°F and above 250°F.	Brass or non-metallic composite.	
R	One piece formed ring with circular pockets.	Standard ball complement. Used in Type A bearings for “KA” through “KG” cross-section bearings.	Commercial type cage, not recommended for low torque applications. Consult factory for temperatures below -65°F and above 250°F.	Brass or non-metallic composite.	
L	One piece molded ring with “snapover” pockets.	Standard ball complement. Used in Type C and X KAA cross-section bearings.	Consult factory for temperatures below -65°F and above 250°F.	Nylon. Fiberglass reinforced.	
G	One piece molded ring with circular pockets.	Standard ball complement. Used in Type A KAA cross-section bearings.	Consult factory for temperatures below -65°F and above 250°F.	Nylon. Fiberglass reinforced.	
D	One piece machined ring with “snapover” pockets.	Standard ball complement. Used in Type C and X bearing when low torque, lightweight or vacuumed impregnation is required.	Not recommended above 250°F. Longer lead time and higher cost than “P” type separators.	Phenolic laminate.	
H	One piece machined ring with circular pockets.	Standard ball complement. Used in Type A bearing when low torque, lightweight or vacuumed impregnation is required.	Not recommended above 250°F. Longer lead time and higher cost than “R” type separators. Use toroid ball spacer when possible.	Phenolic laminate.	
M	Formed wire strip or segmental cage with “snapover” pockets.	Increased ball complement. Used in Type A, C, and X bearings for greater capacity (approx. 150%) and higher temperature.	Higher torque and lower speed capability than “R” type separators. Comparatively high wear rate. Requires loading notch for “C” and “X” bearings.	17-7PH stainless steel	
W	Formed wire strip or segmental cage with “snapover” pockets.	Used in Type C and X bearings for high temperature applications. Standard ball complement.	Higher torque and lower speed capability than “R” type separators. Comparatively high wear rate.	17-7PH stainless steel	
F	Full complement bearing.	Max. ball complement. Used in Type C, X, and A bearings for maximum capacity and stiffness.	High torque and low limiting speed due to ball rubbing. Not recommended for dynamic applications. Loading notches are required for “C” and “X” bearings.	Steel (Per ABMA Standard 10).	
S	Helical coil spring.	Modified ball complement. Used in Type C and X bearings for low torque and high temperature.	Increased assembly cost. Should only be considered when Teflon® spacer slugs cannot be used. Slow speed and light load only.	300 Series stainless steel.	
Z	Spacer slugs.	Standard ball complement. Used in Type C or X bearings for low torque. Prevents separator wind-up.	Not recommended for temperatures greater than 250°F or speeds in excess of 500 ft/min pitch line velocity. (Example: KA040CZ0 max speed = 450 rpm).	PTFE tubing	
Z	Toroid ball spacers.	Increased ball complement. Used in Type A bearings for low torque. Prevents separator wind-up.	Not recommended for speeds greater than 500 ft/min pitch line velocity. Teflon® is limited to 250®F. Vespel® is limited to 500°F.	Teflon® or VESPEL SP-1 polyamide plastic.	
Z	Spacer ball.	Requires a loading notch for C and X assembly. Low speed capability. Relatively high torque.	Increased ball complement. Used in Type A bearings for low torque. Prevents separator wind-up.	Steel per ABMA Standard 10. (Spacer balls are smaller than load carrying balls.)	

*Code descriptions are position 7 of a bearing identification number. See page 13.

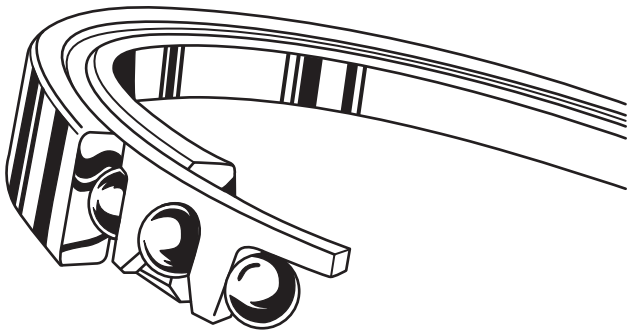
Technical Specifics on Bearing Separators

The principal function of a bearing separator is to space the rolling elements uniformly, thereby preventing contact between them. Minute differentials in rolling element motion result from differences in individual rolling element loads and the inherent elasticity of bearing and mounting components. Without a separator some rolling elements will eventually contact each other. Due to the shape of the rolling elements and the opposite direction of motion of the contacting surfaces, a combination of relatively high contact stress and rapid motion is possible. Consequent abrasion of the rolling elements and residue of wear in the raceways affect life and torque characteristics, limiting the use of full complement bearings to slow speed applications where relatively large torque variations can be tolerated.

Kaydon separators for Reali-Slim bearings are designated by a single letter character in coded part numbers (page 13), standard P, R, L, and G, separators have proved to be suitable for a wide range of operating conditions. Special requirements, however, may dictate the use of a non-standard design or material as discussed in the following text. Where a non-standard design affects the bearing ball complement, a modification of the catalog rating is described. Operating temperatures for various separator materials are shown on page 59.

Continuous Ring "Snapover Pocket" Separator

Figure 39



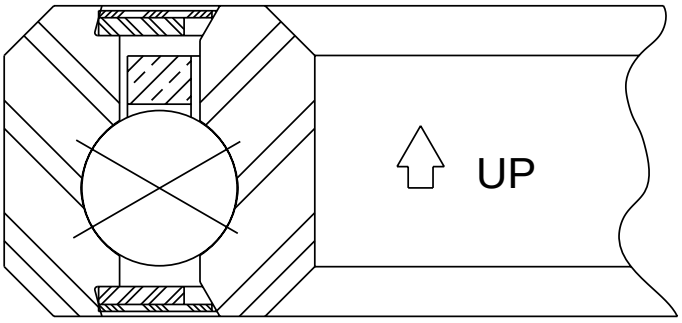
Designed for use in bearing types C and X, this style is installed after Conrad assembly of the races and balls. The tangs of the alternate "snap" pockets deform elastically to snap over the balls for retention of the separator. Centered on the balls at room temperature, the separator becomes outer race land riding or inner race land riding when temperatures cause differential thermal expansion or contraction.

Close control of roundness and wall thickness insures effective piloting in either case, limiting separator "whip" and friction between the separator and race lands for smooth operation.

Standard materials used in this style are brass, non-metallic composite, and nylon reinforced with glass fibers. All have adequate strength, suitable friction characteristics and sufficient clearances for use in normal applications (as defined on Page 59).

Special materials for unusual operating conditions include stainless steel and non-metallics such as phenolic laminate, and Teflon*. Stainless steel separators are used in stainless steel bearings or high temperature applications for corrosion resistance. Phenolic laminate is used where lightweight and/or lubricant absorption is desired. The "snap-over" non-metallic separator is ideal for high speed applications of bearings too small in cross section for the two-piece riveted design (bearing Series C and lighter sections). It is also desirable in low speed, minimum torque applications.

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.

*Trademark of E.I. DuPont de Nemours

Continuous Ring Circular Separators

Figure 40

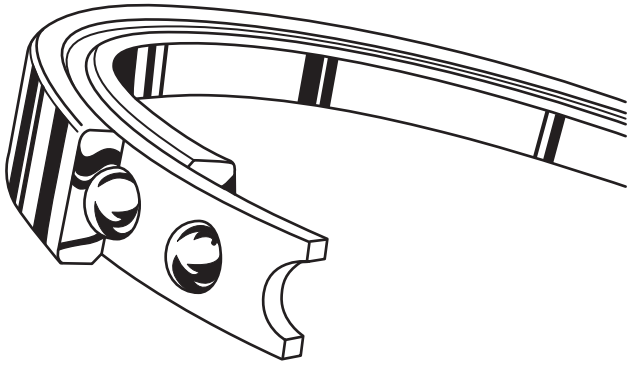
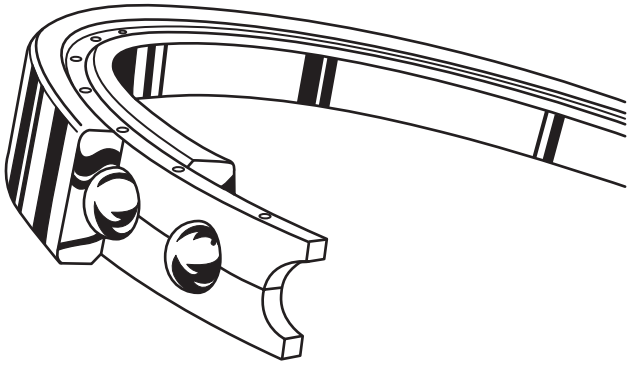


Figure 41



Designed for use in Type A bearings, the one-piece separator shown in Figure 40 is positioned around the inner race with the balls placed in pockets before the outer race is expanded thermally and dropped over the balls. This method of assembly permits the use of more balls than in the Conrad bearing Types C and X. In addition to the standard separators of brass, non-metallic composite and reinforced nylon, this style can be furnished in phenolic laminate, stainless steel, and aluminum.

Designed for use in special bearings of Type C or Type X, the separator shown in Figure 41 is installed after Conrad assembly of the races and bearing and riveted together. Because of the space required for rivets, use is limited to Series D and heavier sections. Usually machined all over, this style is recommended in phenolic laminate for very high speeds. Where very high strength is required, it is furnished in bronze, aluminum, or stainless steel.

As in the case of the continuous ring "snapover" pocket separator, both of these styles are centered on the balls at room temperature, becoming either outer race land riding or inner race land riding as the temperature changes.

Segmental Separators

Segmental separators of either the ring or "snapover" design offer advantages for certain applications.

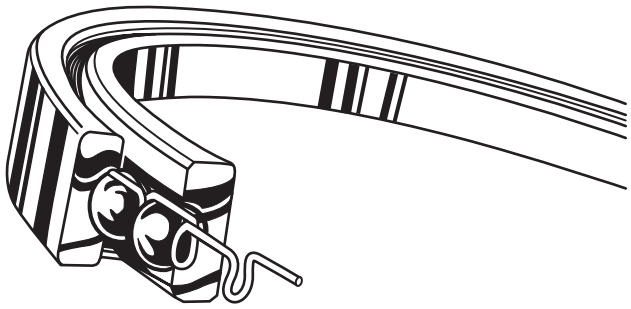
1. When larger diameter bearings are subjected to high temperatures, expansion differentials between the separator and the races may exceed the normal clearances provided.
2. When oscillatory motion, variable loading and a vertical axis combine to cause differential ball travel with no "vacation zone," torque may become objectionably high or erratic.

A segmental separator may consist of a one piece open ring or it may be composed of two or more segments. Where differential expansion creates a problem, sufficient clearance is provided between the ends of the open ring or between the several segments to allow for this expansion. Where torque is of concern, the selection of the number of segments is made based upon experience. In all other respects, segmental separators satisfy the above descriptions for **Continuous Ring "Snapover Pocket" Separators or Continuous Ring "Circular Pocket" Separators.**

Segmenting the separator imposes somewhat greater restrictions on the bearings. Maximum allowable speed of rotation is reduced due to the centrifugal force energized "brake banding" of the segments against the outer race lands. Also, in the case of the "snapover pocket" style, a shaft or housing shoulder should be extended to assure retention of the separator irrespective of the operating position of the bearing. See next page.

Formed Wire Separator

Figure 42



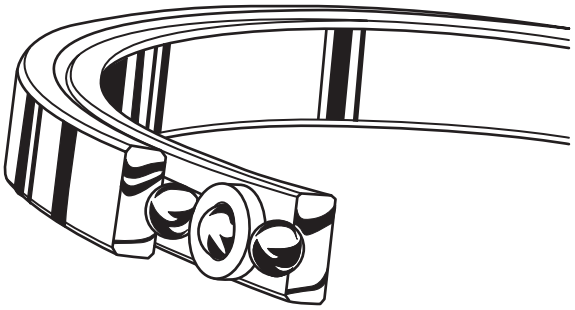
When the need exists for maximum capacity and thus the greatest possible number of balls, a formed wire separator may be used to avoid the disadvantages of a full complement bearing. It has been most successfully employed in Type A bearings, where the greater number of balls can be installed without resorting to use of a loading slot. Use in bearing Types C and X should be restricted to very low speed applications.

Comparatively high wear rate coupled with relatively light section can cause the wear life of the wire separator to be a limiting factor in the life a bearing, especially if the loads are high. However, where weight or space are at a premium and the added capacity is an important consideration, this separator may be considered a good compromise.

A bearing with a wire separator and maximum allowable ball complement has a static load capacity of 180% of the catalog static rating.

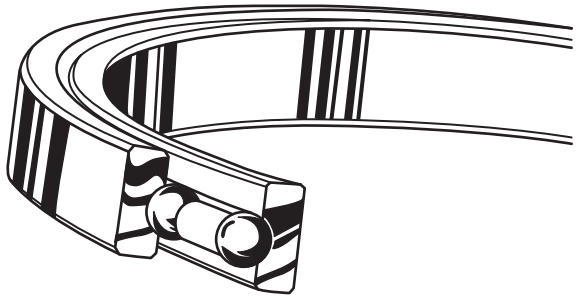
Toroid Separators

Figure 43a



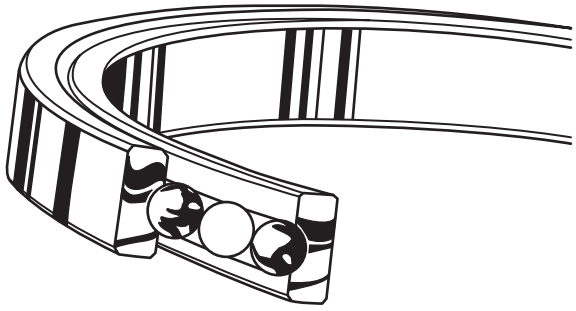
Teflon® Spacers

Figure 43b



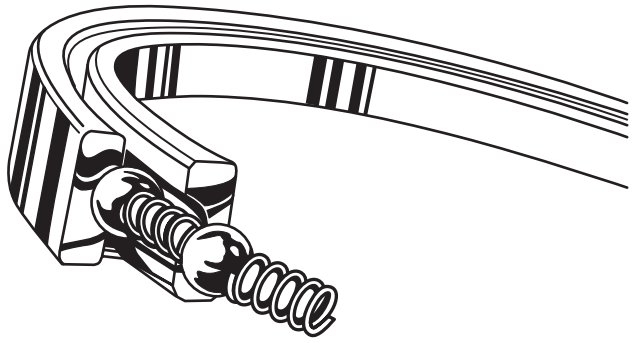
Spacer Balls

Figure 43c



Helical Spring Separators

Figure 43d



In some critical positioning applications, uniformity of torque is more important than the actual mean torque level. Specially designed toroids (Figure 43a), teflon spacers (Figure 43b), spacer balls (Figure 43c) or helical compression springs (Figure 43d) have proved in a number of such instances to be satisfactory for ball separation—by their nature they give a large amount of individual and cumulative circumferential freedom to the balls. To prevent this freedom from being abused, however, speeds must be low and loads comparatively light.

Applications involving use of these separators should be referred to Kaydon for review and recommendation.

Number of Balls in Standard REALI-SLIM Bearings

Figure 44

	Type A							Types C and X						
Brg. No.	KAA	KA	KB	KC	KD	KF	KG	KAA	KA	KB	KC	KD	KF	KG
10	28							21						
15	40							29						
17	44							33						
20		36	31						27	23				
25		44	38						33	28				
30		52	44						39	33				
35		60	51						45	38				
40		68	58	49	36	26	20		51	43	35	27	19	15
42		72	61	52	38	27	21		54	45	37	28	20	15
45		76	64	55	40	29	22		57	48	39	30	21	16
47		80	68	58	42	30	23		60	50	41	31	22	17
50		84	71	61	44	31	24		63	53	43	33	23	18
55		92	78	66	48	34	26		69	58	47	36	25	19
60		100	85	72	52	37	28		75	63	51	39	27	21
65		108	91	78	56	40	30		81	68	55	42	29	22
70		116	98	83	60	43	32		87	73	59	45	31	24
75		124	105	89	64	45	34		93	78	63	48	33	25
80		132	112	95	68	48	36		99	83	67	51	35	27
90		148	125	106	76	54	40		111	93	75	57	39	30
100		164	139	118	84	59	44		123	103	83	63	43	33
110		180	152	129	92	65	48		135	113	91	69	47	36
120		196	166	140	100	70	52		147	123	99	75	51	39
140			192	163	116	81	60			143	115	87	59	45
160			219	186	132	92	68			163	131	99	67	51
180			246	209	148	104	76			183	147	111	75	57
200			273	231	164	115	84			203	163	123	83	63
210												129		
220														69
250				288	204	142	104				203	153	103	78
300				345	244	170	124				243	183	123	93
350						198	144						143	108
400						226	164						163	123

Limiting Speeds

The determination of maximum safe operating speeds is largely empirical. A number of complex factors play a part in limiting the speed of rotation, some of which are:

- Bearing diameter
- Ratio of bearing diameter to cross-section
- Bearing type and internal configuration
- Ratio of ball groove radius to ball diameter
- Bearing internal fit-up (diametral clearance or preload)
- Operating contact angle(s)
- Bearing precision (runouts)
- Ball separator material and design
- Precision of mount (roundness, flatness under load)
- Lubrication
- Ambient temperature and provision for heat dissipation
- Seals
- Loads
- Life requirement

While precise speed limits cannot be set, experience in actual applications and in the Kaydon test laboratories can serve as a basis for setting general limits. Figure 47 takes into account some of the factors and assumes proper installation and adequate provision for heat dissipation. These limits are based upon achieving the full service life of 1,000,000 revolutions. If a shorter life is acceptable, higher speeds may be tolerated, except for bearings using formed wire and helical spring separators.

For speeds near or over the limits in the table, special attention must be given to lubrication and heat. Greases should be of types specially formulated for high speed bearings. Frequency of regreasing must be adequate to insure presence of lubricant at all times. If oil is used, viscous drag should be minimized by controlling the level, using slingers and/or metering small amounts as a liquid or mist. Windage effects at high speeds can make the introduction of oil to the critical surfaces very difficult, and the design of the lubrication system then becomes important.

Generally speaking, operating temperature will be limited by the allowable maximum temperature for the lubricant. If, however, bearing temperature is expected to exceed 250°F for extended periods, the bearings should be given special stabilization treatment by Kaydon. This treatment will permit operation at temperatures up to 400°F.

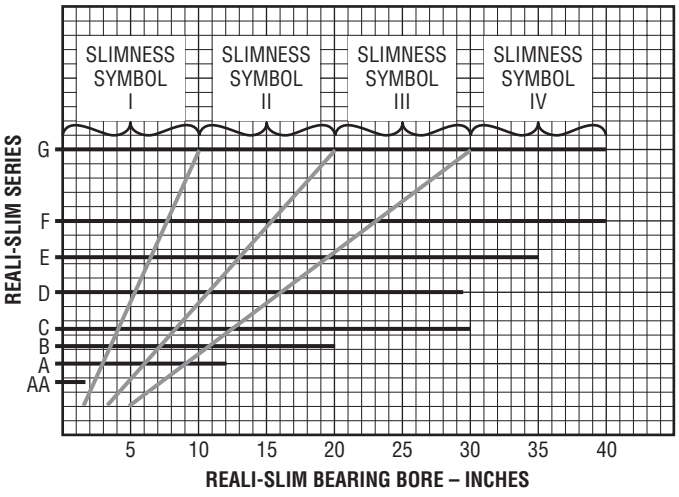
While maximum temperature is important, consideration must also be given to possible temperature differential across the bearing. Generally, heat is lost through the housing at a higher rate than through the shaft. The housing fit and the bearing internal clearance before installation must be sufficient to allow for this as well as for the shaft fit if the necessary running clearance is to be realized.

Examples of Limiting Speed Calculations

Example 1 (Standard Bearing)
Limited speed calculation for bearing part number KG040XP0.
Conditions: light thrust loads (<20%), grease lubrication.
From figure 45: slimness symbol = I
From figure 46: derating factor = 1.0
From figure 47: Type X; Separator P; Grease; Class I; Charted figure = 9
Calculation: $N = \frac{(1.0)\ (9)\ (1000)}{4} = 2{,}250$

Example 2 (High Performance Bearing)
Limiting speed calculation for bearing number KD100AH6.
Conditions: loading at 25%, oil lubrication
From figure 45: slimness symbol = II
From figure 46: derating factor = 0.9
From figure 47: Type A; Separator H; Oil; Class 6; Charted figure = 32
Calculation: $N = \frac{(0.9)\ (32)\ (1000)}{10} = 2{,}880$

Figure 45 - Slimness Symbol (S_s)



Limiting Speeds for Unsealed Lightly Loaded Reali-Slim Ball Bearings

$$\text{Limiting Speed (N)} = \frac{(F_l)\,(C_f)\,(1000)}{D}$$

where

D = Bearing bore in inches

N = RPM

Figure 46 - Derating Factor (F_l)

For bearings loaded to following percent of dynamic rating	Multiply DN values by following factors
20	1.0
33	.9
50	.8
67	.7
100	.5
150	.2

Figure 47 - Charted Figures (C_f)

Bearing Type	Load Conditions	Separator Type	PRECISION CLASS AND LUBRICATION																			
			CLASS 1, 3 & 4								CLASS 6											
			GREASE				OIL				GREASE				OIL				OIL MIST			
Slimness Symbol from Figure 45			I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV	I	II	III	IV
C	Radial	P, L	15	12	9	6	21	18	15	12	21	18	15	12	27	24	21	18	30	27	24	21
with Diametral		K, B	20	16	12	8	28	24	20	16	28	24	20	16	36	32	28	24	40	36	32	28
Clearance		E, C	SEE PAGE 61																			
A	Radial	R, B	15	12	9	6	21	18	15	12	21	18	15	12	27	24	21	18	30	27	24	21
Spring Loaded or	and/or	G, H	20	16	12	8	28	24	20	16	28	24	20	16	36	32	28	24	40	36	32	28
Axially Adjusted	Thrust	M	8	6	5	3	11	9	8	6	11	9	8	6	14	12	11	9	15	14	12	11
X	Thrust	P, L, B	9	8	7	6	11	10	9	8	11	10	9	8	14	12	11	9	15	14	12	11
	Only	S	SEE PAGE 62																			
with Diametral	Radial Only	P, L, B	3.0	2.5	2.0	1.5	4	3.5	3	2	4	3.5	3	2	4.5	4	3.5	3	5	4.5	4	3.5
Clearance	or Combined	S	SEE PAGE 62																			
	Loading																					

Torque Considerations

Torque, as it applies to bearings, is defined as the moment required to turn the rotating race with respect to the stationary race.

Usually the torque requirement of a ball bearing is only a small part of the demand of a mechanical system. In many Reali-Slim bearing applications, however, masses and consequent inertias are slight and the amount of work being done is not great. In such cases, it may be important to know as accurately as possible how much turning effort must be provided.

Many factors contribute to the resistance to rotation of a lightly loaded anti-friction bearing, and most of this resistance comes from the more unpredictable ones—separator drag; viscous drag of the lubricant; minute deviations from true geometry in the balls, race ways, and mounting surfaces of bearing, shaft, and housing; internal fit-up of the bearing; and the presence of contaminants.

If it is a design goal to minimize available power required, Kaydon should be advised so that special attention can be given to these factors. If necessary, the bearings can be furnished to a maximum torque level specification. In most cases, if proper attention is given to the lubricant, the shaft and housing mounting surfaces, and bearing cleanliness, the torque level of standard bearings will be satisfactory.

In the selection of the lubricant and lubricating system, their effects on torque should be kept in mind. To be considered are operating temperatures; speeds of rotation; type, viscosity and quantity of lubricant. All are major factors in determining lubricant drag.

In tolerancing the shaft and housing it is important to set limits for out-of-roundness and out-of-flatness of the bearing seats. For normal requirements a good rule of thumb is to use the bearing radial and axial runout tolerances as the respective limits. For critical torque applications, closer tolerances should be specified since even a very small amount of localized internal preload (negative clearance) will create surprisingly large ball loads and consequent high torque. Where torque must be minimized it is important to limit out-of-roundness of housing or shaft to values which will insure against complete loss of internal clearance.

Cleanliness is extremely important in maintaining uniformity of torque as well as a low level of torque. Very small amounts of microscopic particles of lint, dust, and other common contaminants can cause bearing torque to vary several hundred percent in just a few degrees of rotation. For this reason bearings should be kept in their original unopened package until time for installation. Every effort should be made to protect them from foreign matter, whether or not torque is critical.

The accompanying charts show approximate torque levels of Reali-Slim bearings under common conditions. Estimates can be furnished for more unusual situations. Information submitted should contain all operating conditions of load, speed, lubricant, and environment including temperature together with a print of the intended mounting, showing materials and radial sections. If a limit has been set on permissible system error in terms of axis deviation—radial translation, axial translation, or angular rotation (page 68)—this information should also be submitted.

Starting Torque vs. Load

Figure 48

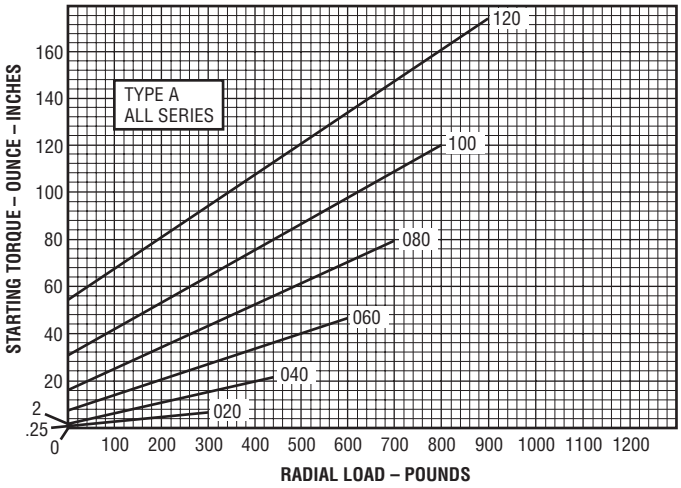


Figure 49

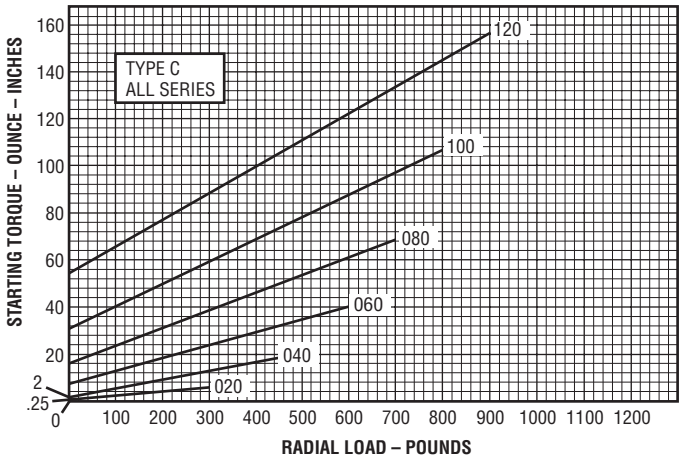


Figure 50

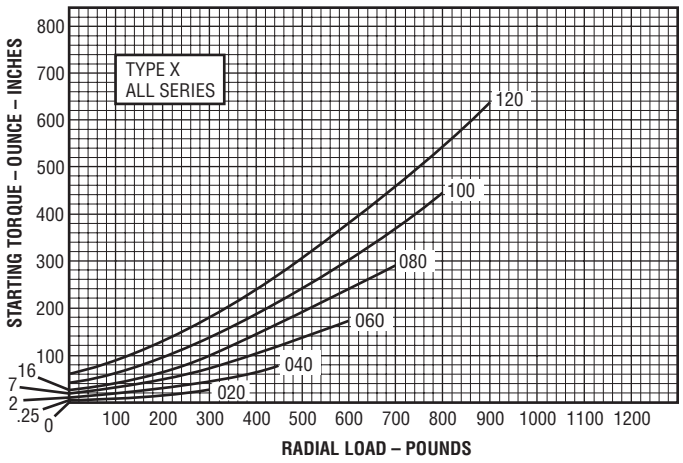
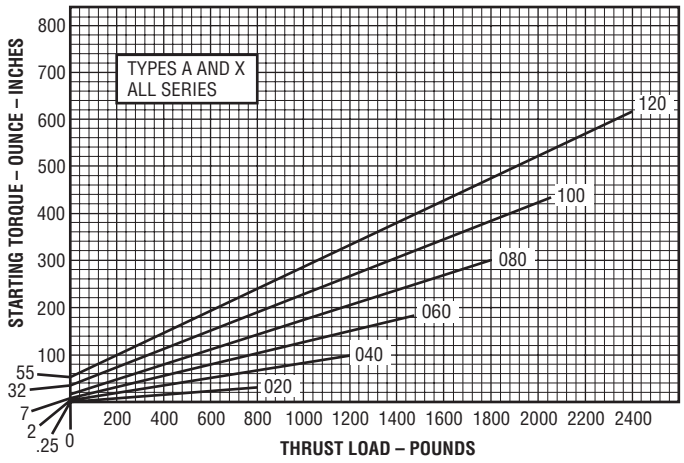


Figure 51



Notes Applying To These Charts

1. Values shown are T10 ratings* based on:
   - Kaydon Precision Class 1 bearings with some internal clearance remaining after installation
   - A rigid mounting, round and flat within respective radial and axial bearing runout limits
   - Light oil lubrication
   - Room temperature
2. Running torque at speeds up to 10 RPM usually averages from 25 to 50% of starting torque, and increases with increasing speed to as much as 200% at maximum allowable diametral clearance (page 69).
3. Interpolate for intermediate sizes.
4. Curve number indicates bearing bore in tenths of an inch.

*Usually not more than 10% of a group of bearings will have torque demands higher than those shown.

Bearing Axis Deviation Due To Clearance And Deflection

Reali-Slim bearings are often used in applications where the position of a rotating part relative to the stationary structure is critical. Knowledge of the displacement of the axis of rotation and the factors contributing to it are thus important.

The axis of rotation can be displaced from its true position in three ways—radially, axially, and angularly. These deviations are referred to as radial translation, axial translation, and tilt (angular rotation) respectively.

In addition to the obvious effects of bearing runout, total deviation of bearing axis in any one of the above conditions is due to the effects of bearing diametral clearance and elastic deflection (deformation) at the ball or roller contacts. The diametral clearance after installation results from the modification of initial diametral clearance by the combined effects of external fitting practice, differential thermal expansion or contraction of the bearing races and mounting structures, and relative rigidity of the races and mating parts.

Elastic deflection at the ball or roller contacts results from the externally applied bearing loads and is influenced by ball or roller diameter, race groove radius, raceway diameters, and contact angle.

The following three equations are given to aid in determining displacement. The internal diametral clearance (DC) must be calculated or approximated. The remaining independent variables can be obtained from the graphs on pages 70 thru 75.

$$RT = RD + \frac{DC}{2}$$

$$AT = AD + \frac{AC}{2}$$

$$AR = MD + AC/PD$$

Where:

RT = Radial Translation	– in inches
AT = Axial Translation	– in inches
AR = Angular Rotation	– in inches/inch or radians
RD = Radial deflection due to radial load	– in inches
AD = Axial deflection due to axial load	– in inches
MD = Moment deflection due to moment load	– in inches/inch or radians
DC = Diametral clearance	– in inches
AC = Axial clearance	– in inches
PD = Pitch diameter $\frac{O.D. + Bore}{2}$	– in inches

The equations may be used in applications where the radial, axial, or moment load is applied singly or where one type of loading predominates. Applications subjected to combined loading in which more than one type is significant should be referred to Kaydon for analysis.

Axial Clearance vs. Diametral Clearance

Figure 52

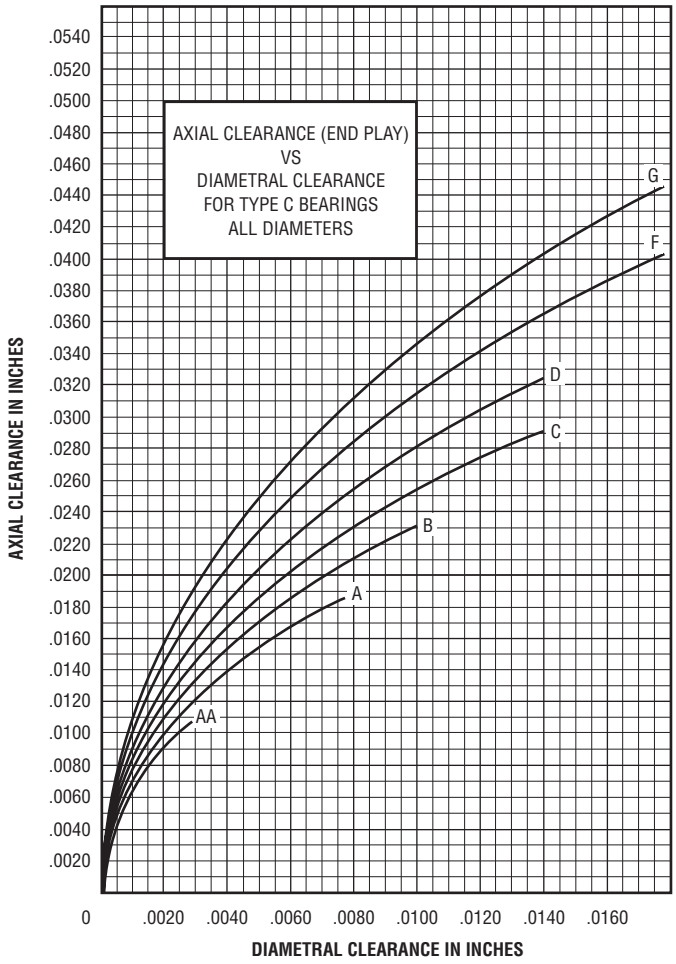
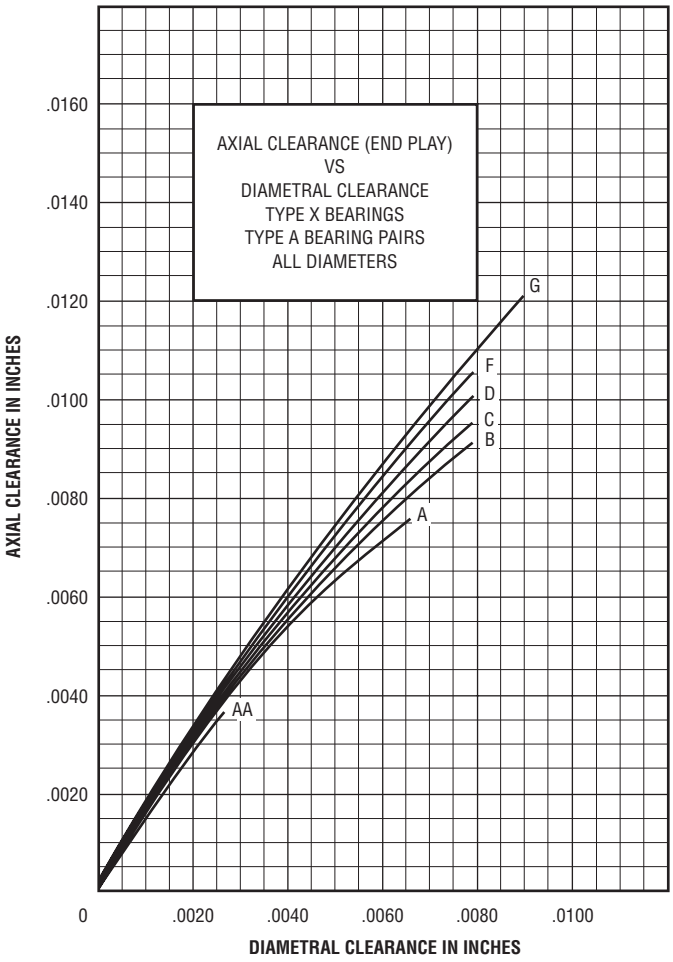


Figure 53



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Axial Deflection vs. Axial Load

Type A Angular Contact

Figure 54

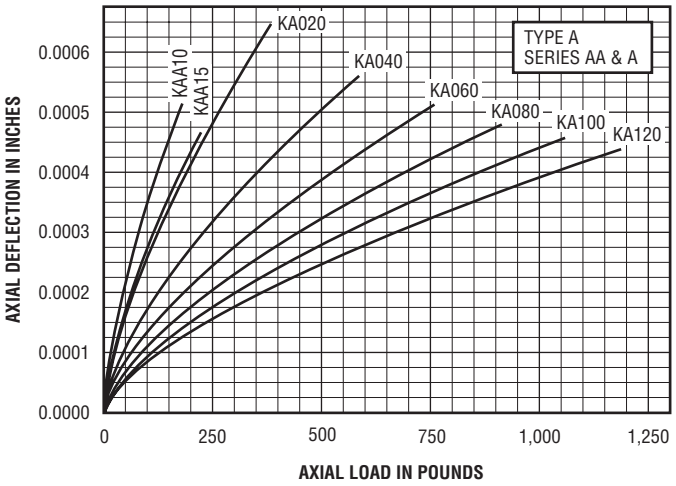


Figure 55

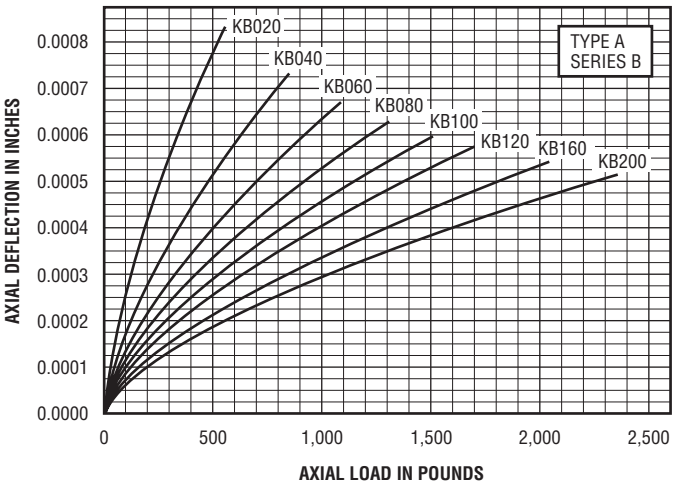


Figure 56

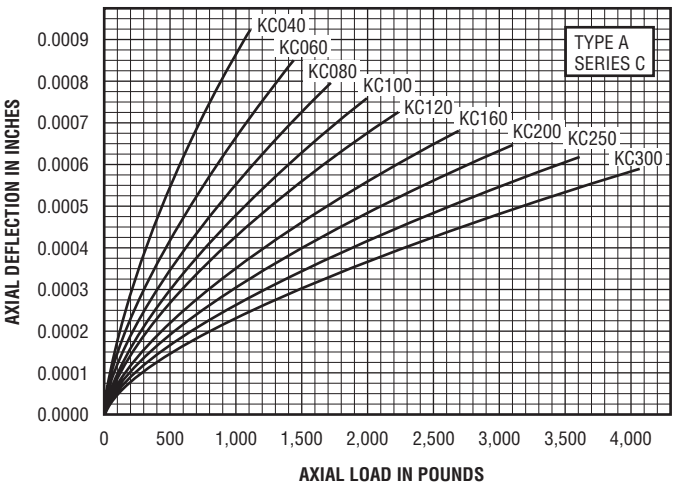
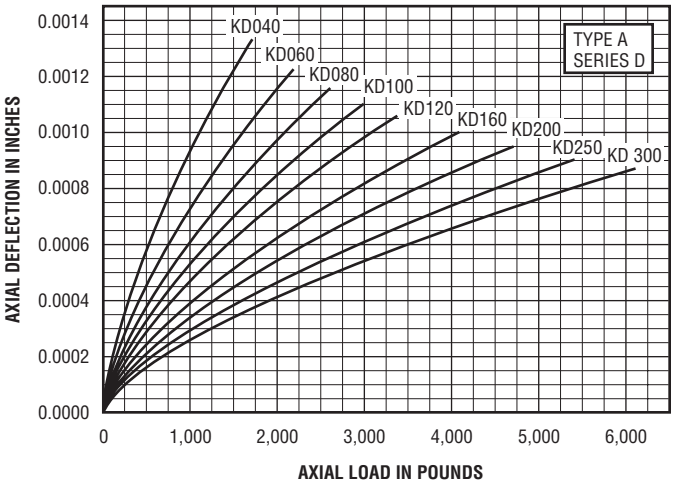


Figure 57



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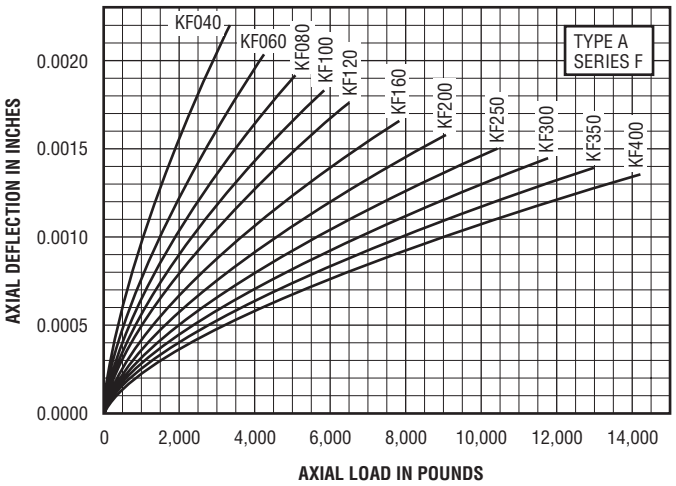
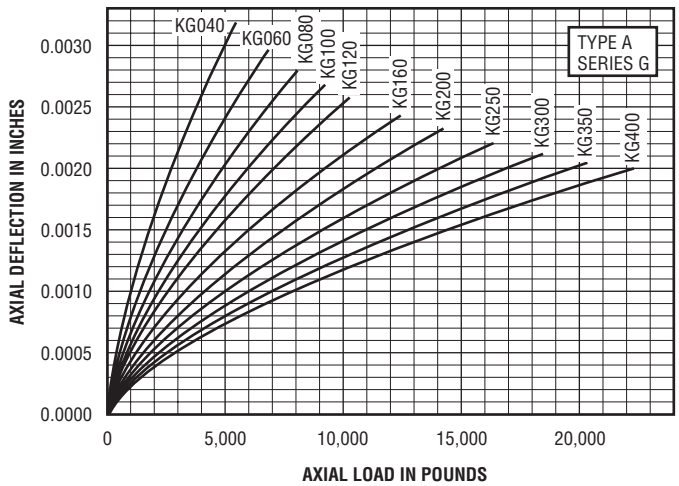


Figure 59



Radial Deflection vs. Radial Load

Type A Angular Contact

Figure 60

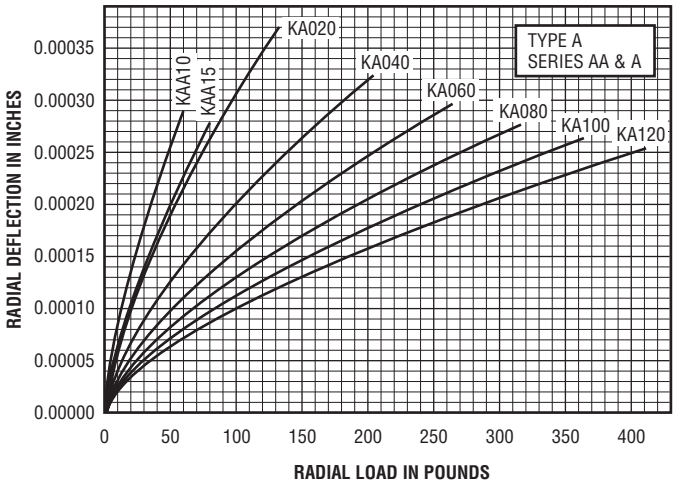


Figure 61

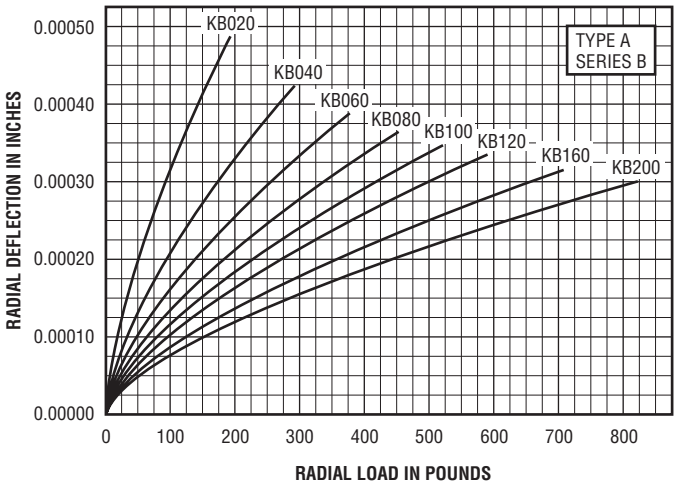


Figure 62

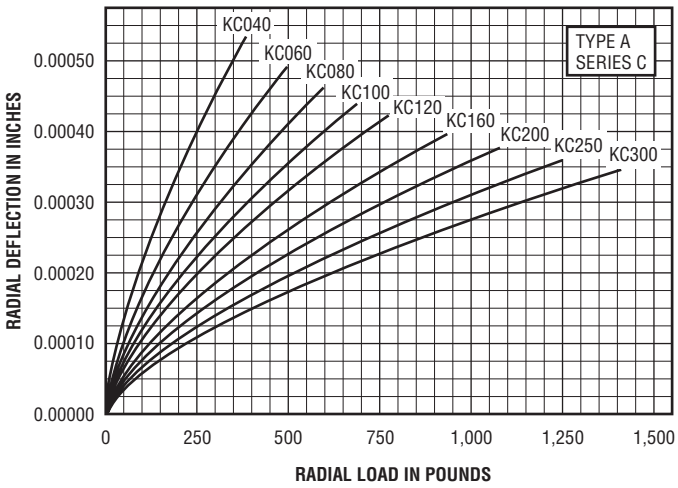


Figure 63

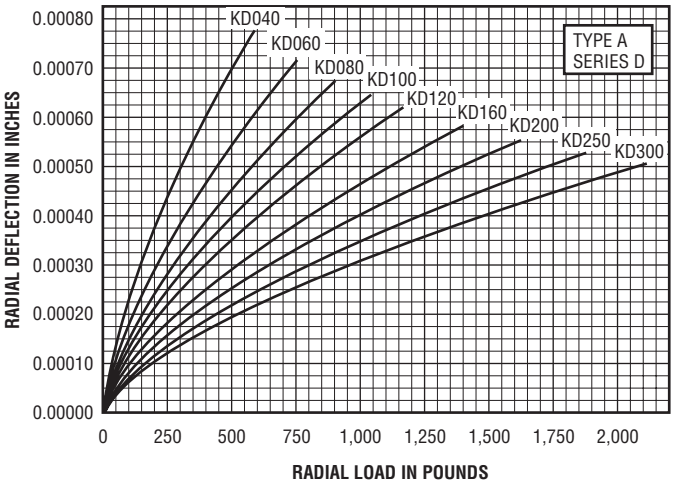


Figure 64

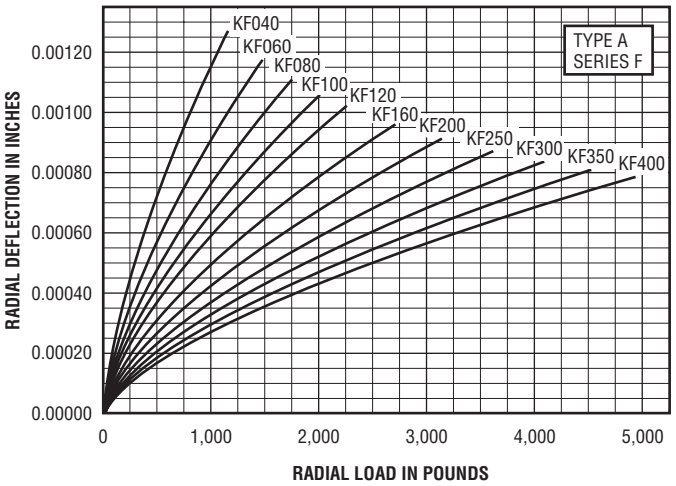
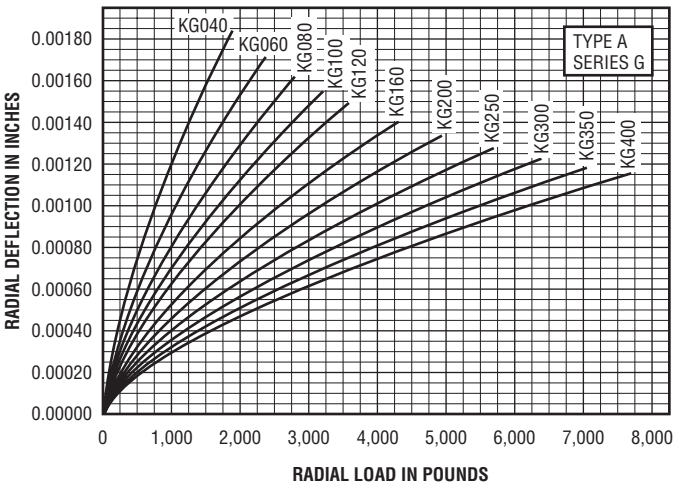


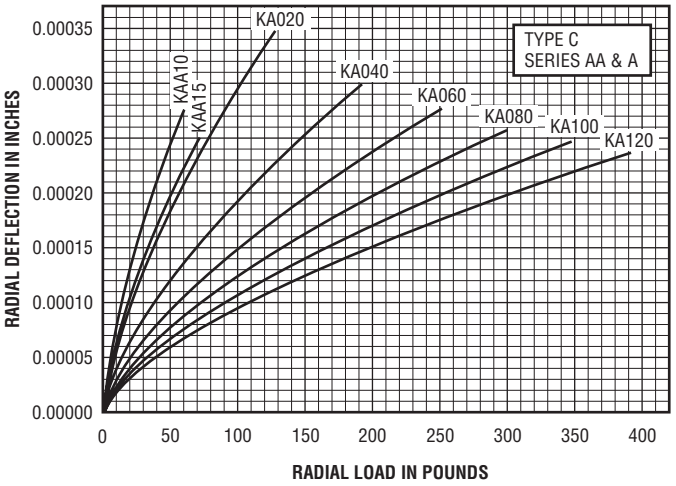
Figure 65



Radial Deflection vs. Radial Load

Type C Radial Contact

Figure 66



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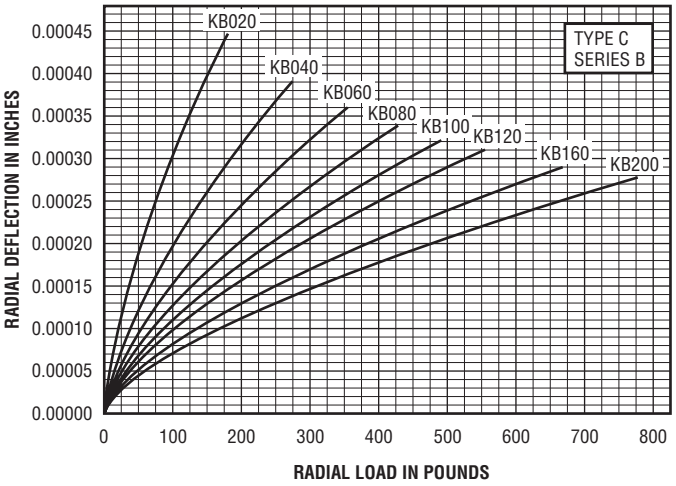

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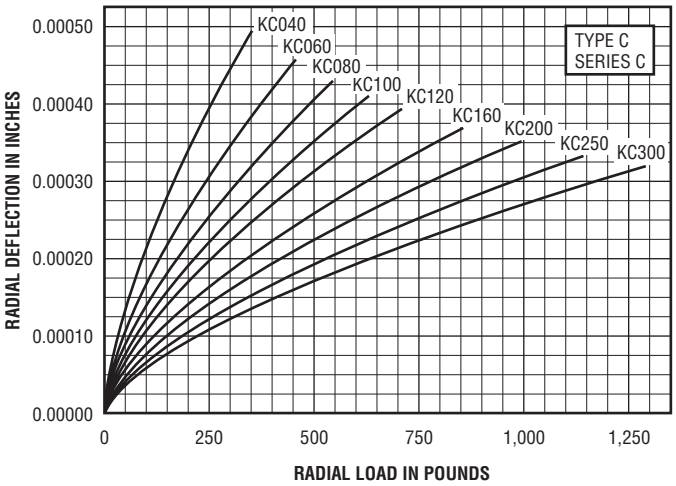

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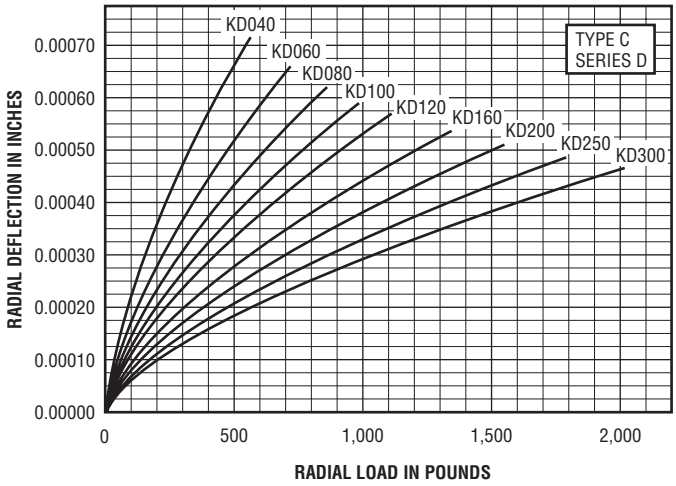

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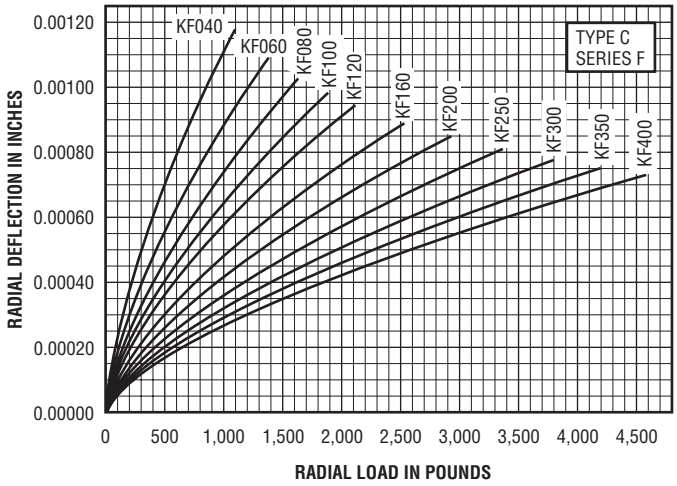

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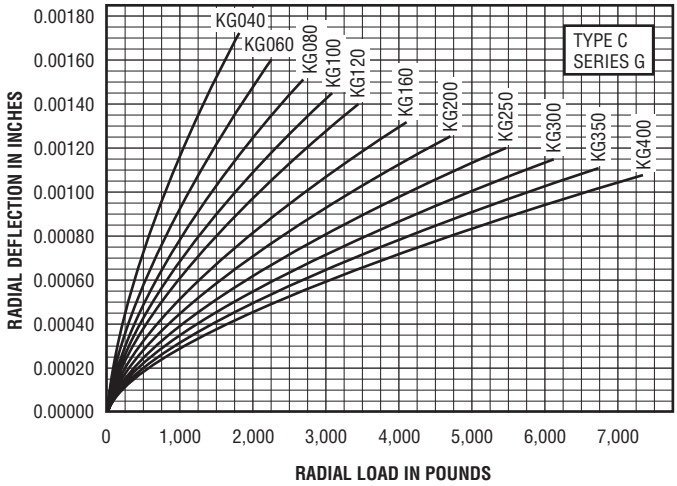
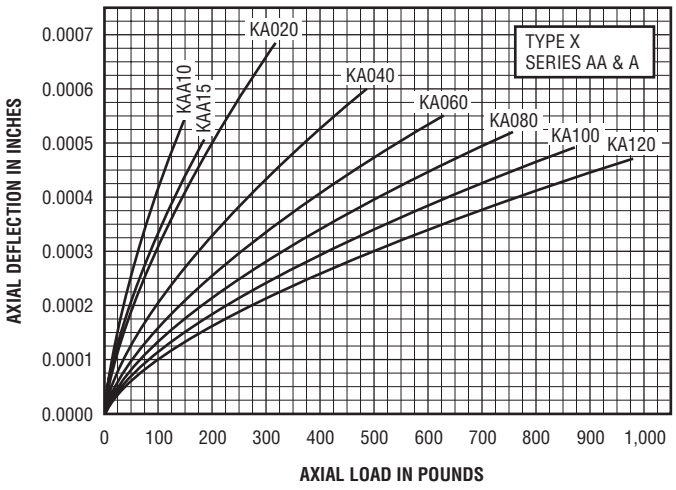


Axial Deflection vs. Axial Load

Type X Four-Point Contact

Figure 72



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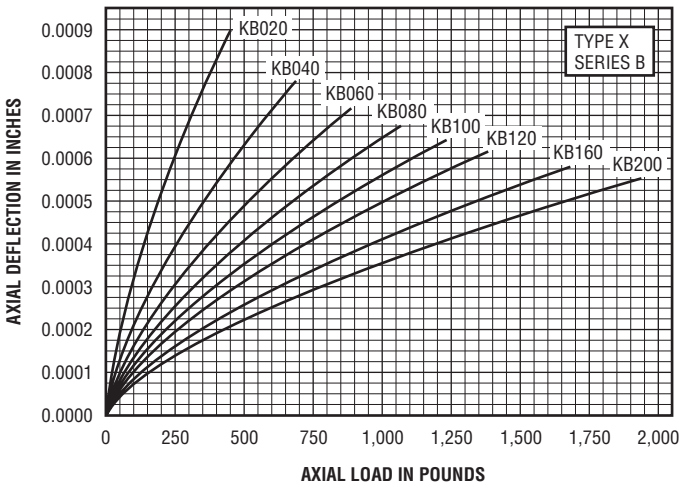

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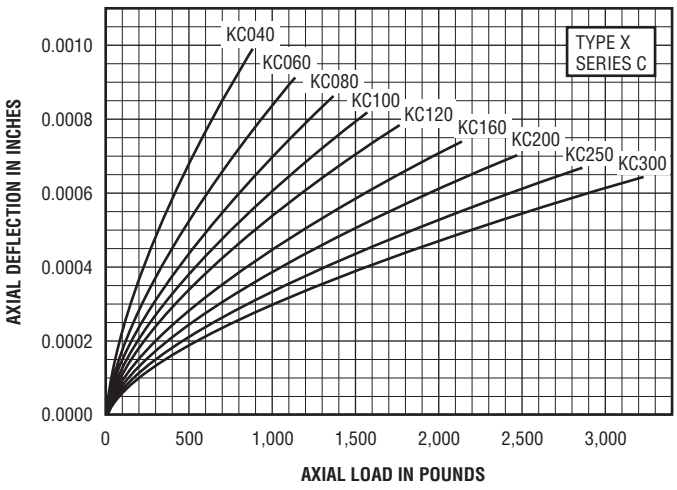

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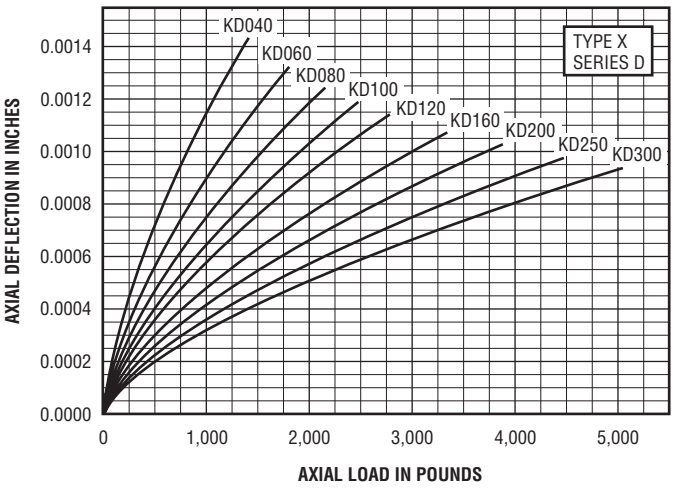

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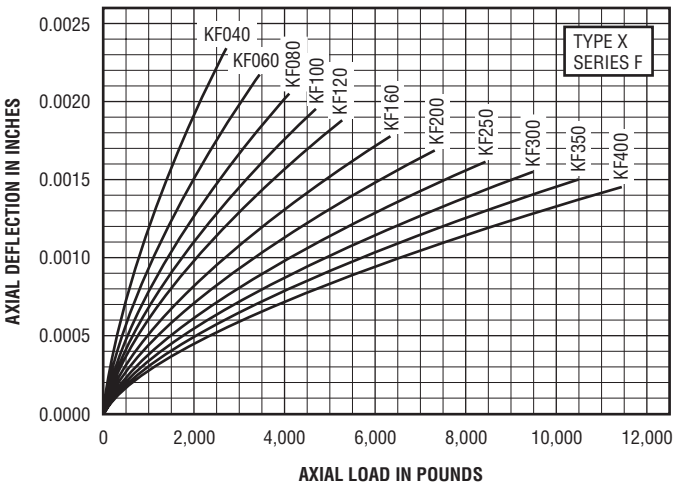

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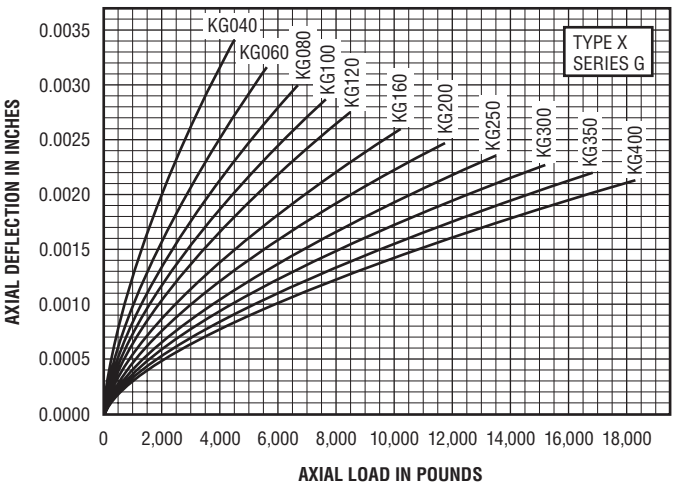
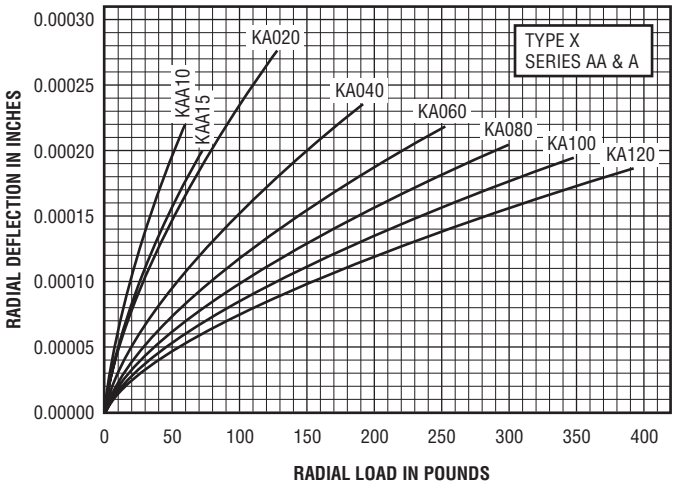


Radial Deflection vs. Radial Load

Type X Four-Point Contact

Figure 78



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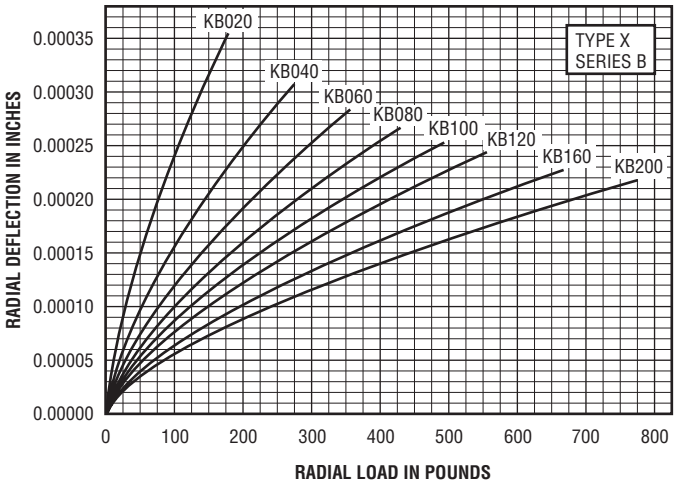

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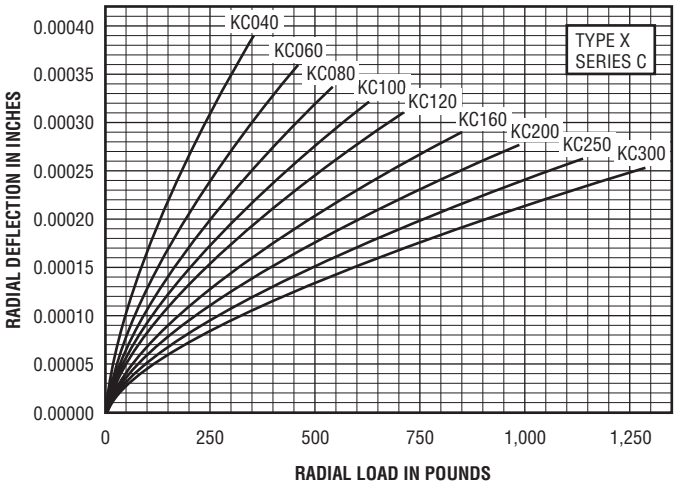

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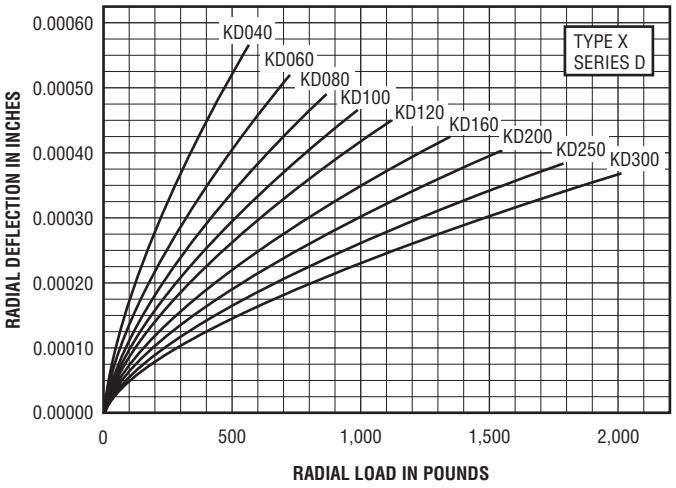

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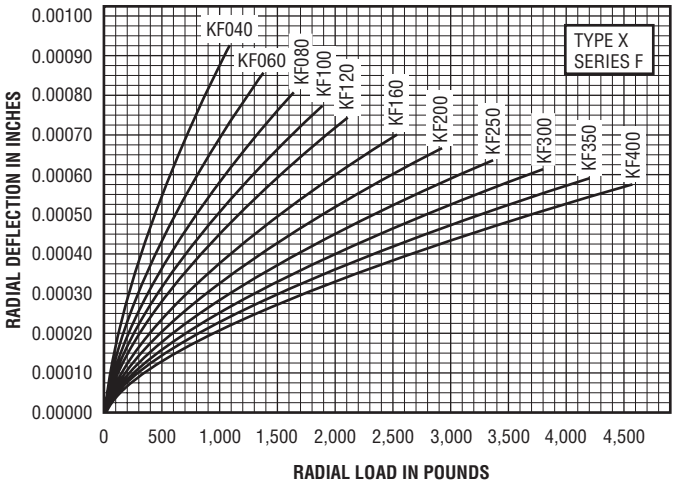
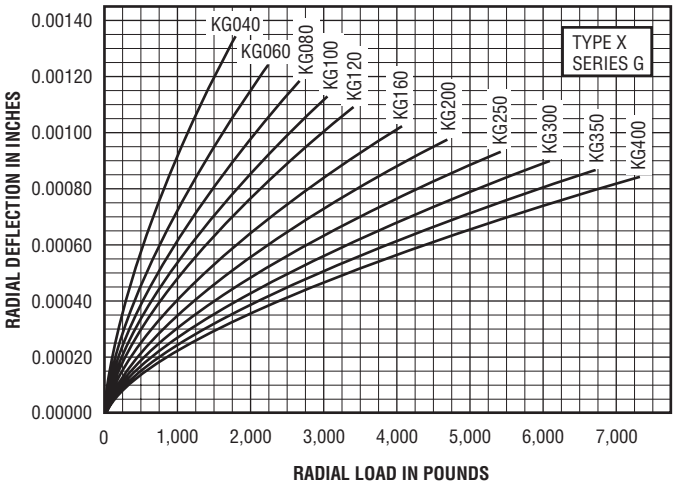


Figure 83



Moment Deflection vs. Moment Load

Type X Four-Point Contact

Figure 84

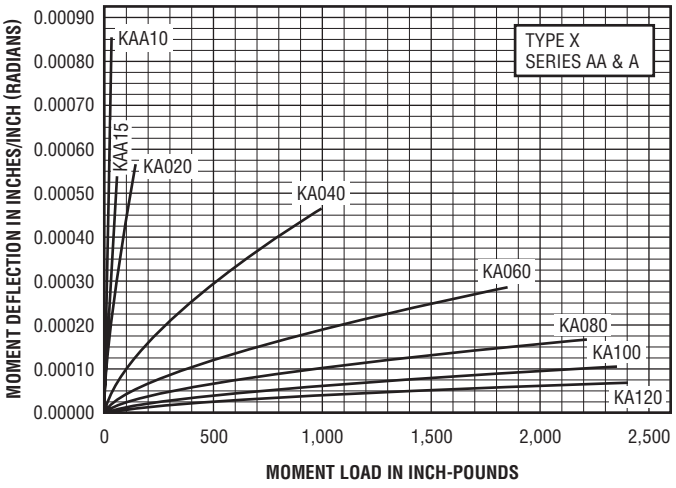
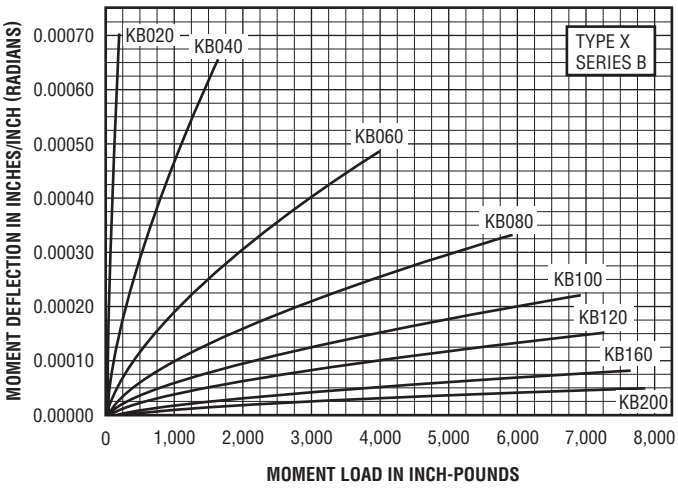


Figure 85



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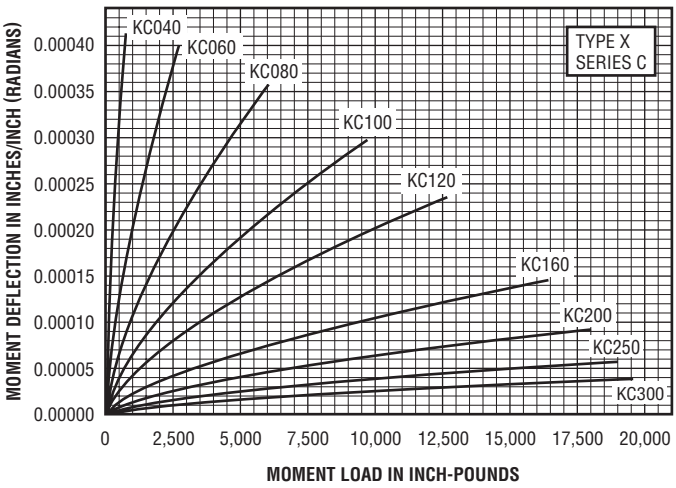


Figure 87

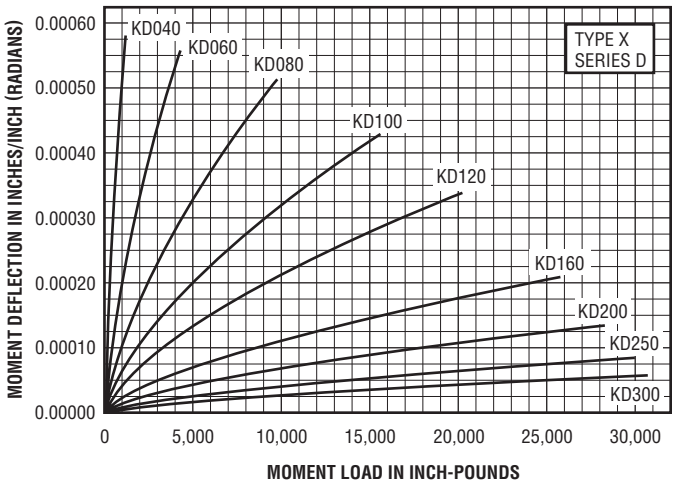


Figure 88

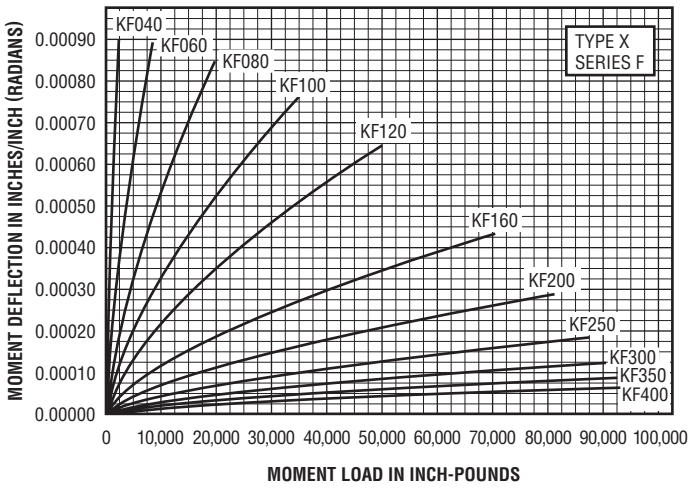
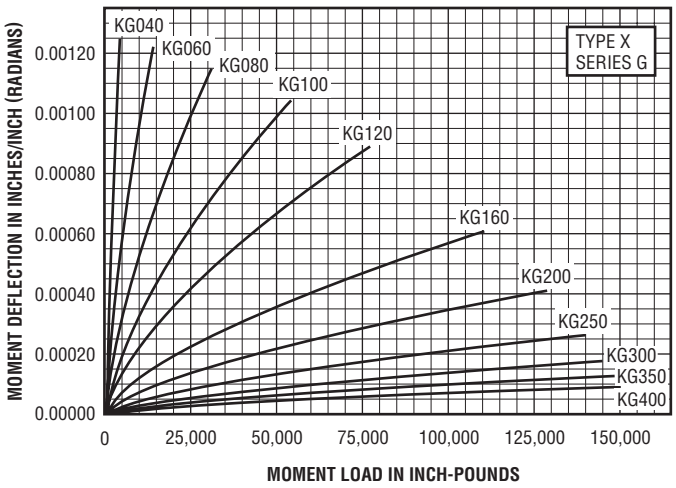


Figure 89



Section 6—Other Application and Quality Control Considerations

Inspection and Installation Procedures

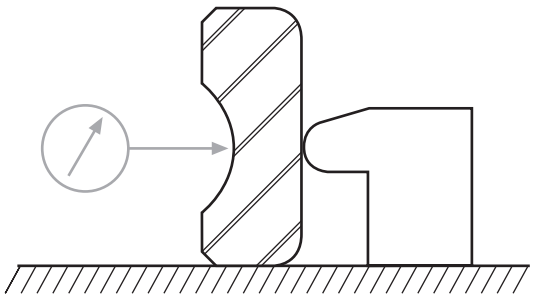
Inspection

The unique proportions of Reali-Slim 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. A Reali-Slim bearing may be out-of-round in the free state① more than the ABMA tolerance for its precision class. 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 90. 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 90



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

Standard inspection and quality control procedures at Kaydon meet the requirements of government procurement agencies and major aerospace industries. However, if special assurance is required, a certificate of compliance to specifications can be furnished.

Installation

To realize the potential accuracy and long trouble-free life of a Reali-Slim 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 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.

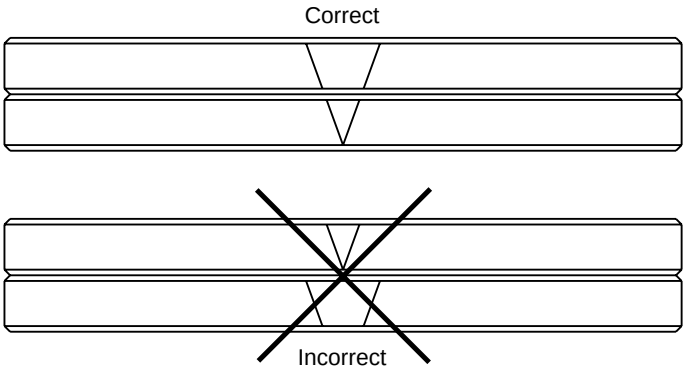
Only when all this has been done and it is time to install the bearing, should it be removed from its protective package.

① As explained in ABMA Standard 26.2

Interference fitting any bearing to the shaft or housing must be carefully done to avoid injury to the bearing. For Reali-Slim bearings, the use of temperature difference is recommended to minimize or eliminate the forces necessary. To calculate the differential required, use a coefficient of expansion of .000007 inch per inch per degree F for 52100 steel races. For a Kaydon Precision Class 1 bearing of 2" bore to be fitted to a steel shaft, the differential required to eliminate all interference between a maximum diameter shaft and minimum diameter bearing is 90°F, for a 4" bore it is 60°F. Either dry heat or hot oil may be used. Electrical resistance tape is convenient for the large bearings. Care must be taken to avoid overheating the bearing. Do not exceed 250°F.

If pressure is necessary, an arbor press should be used with a suitable pusher to apply the force to all 360° of the race being press fitted—never to the other race as damage will be done to the balls and raceways.

All duplexed bearings are marked with a single "V" on the bores and outside diameters to indicate the proper relative circumferential position of inner and outer races. This "V" is located at the high points of race eccentricity so that these may be placed at the low points of shaft and housing eccentricity for the canceling effect.



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.

CONTACT KAYDON AT—

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NEED SERVICE FAST?

1-800-514-3066

Website: www.kaydonbearings.com

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 (see page 65). 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 special 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.

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

Unsealed bearings are supplied with a coating of preservative type lubricating oil for the prevention of corrosion during storage. For best performance it is recommended that this preservative be removed with clean solvent prior to lubricating during assembly. If this is not done, the end user should verify the lubricant used is compatible with the preservative.

In applications where minimum torque is required, the coating should be removed by washing with a clean petroleum solvent followed by immediate relubrication with a light spindle oil.

Sealed bearings are packed approximately one-third full with a multi-purpose industrial grease. Exterior surfaces are given a light coating of the same lubricant for protection during storage in the original package. The initial grease pack is usually good for the life of the bearing, but if relubrication proves necessary, grease may be injected with a hypodermic syringe.

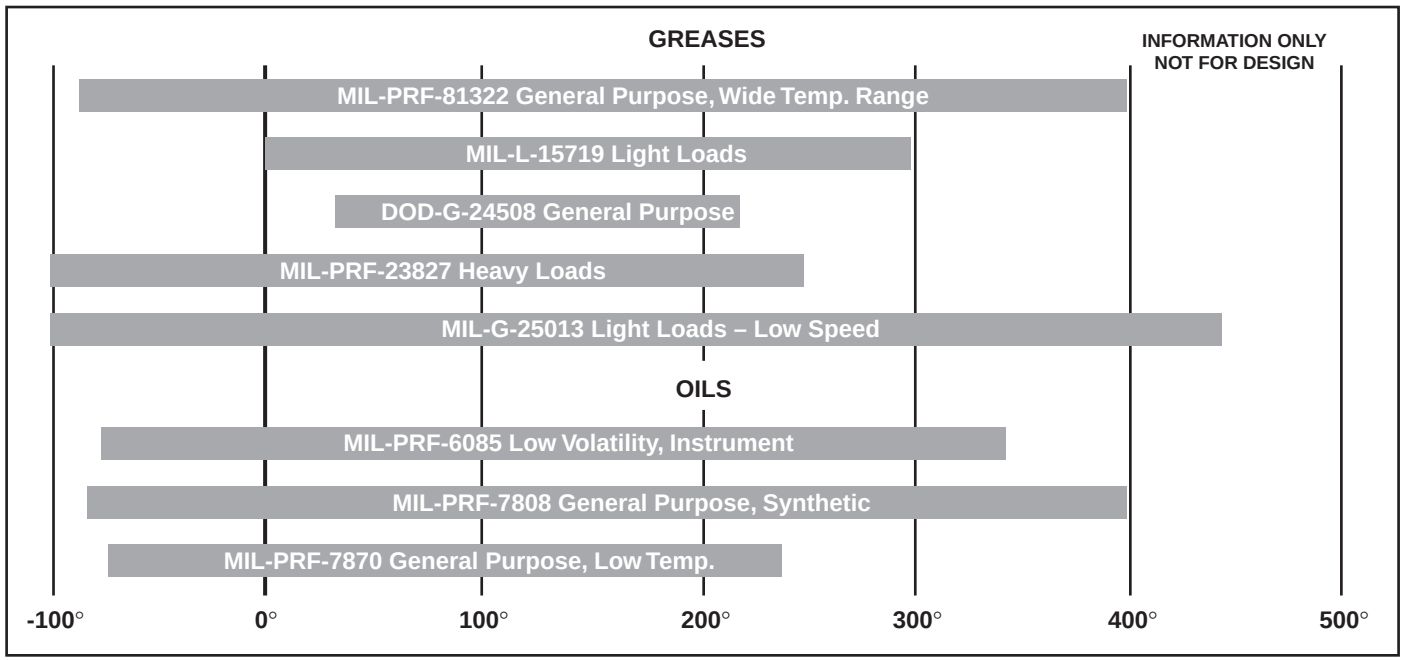
Operating conditions may cause the grease to loose its properties before the theoretical bearing fatigue life. If relubrication proves necessary, grease may be injected under the seal with a hypodermic syringe. However, in most cases, it is better practice to replace a bearing with identified grease failure.

Bearings, with or without seals, can be supplied with special lubricants. Shown in the accompanying table are some of the greases and oils more frequently specified. Several have been developed to meet the special 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.**

It is an unfortunate fact that most bearings fail due to abuse and/or neglect. To realize the full potential life of a Reali-Slim bearing, protection must be afforded against the intrusion of foreign matter of all types, and fresh oil or grease must be introduced with sufficient frequency to cleanse the bearing and assure continued good lubrication.

Figure 93

Lubrication Temperature Ranges



Capacity, Life and Load Analysis of Reali-Slim Ball Bearings Load Capacity

The dynamic capacity values shown in this catalog are based on actual data from fatigue life testing. The capacities are based on 1,000,000 revolutions L10 fatigue life. This is the industry standard that was established for ease of calculation. It is not advisable to apply loads equal to the catalog capacities in an actual application. Loads of these magnitudes create contact stresses approaching the elastic limit of the bearing material. Continuous rotation under these conditions would not normally yield acceptable life.

L10 fatigue life is that life which 90% of a representative group of identical bearings can be expected to achieve or exceed before evidence of subsurface material fatigue appears. The life of the remaining 10% is unpredictable. The life which 50% of the bearings may be expected to achieve or exceed is approximately 5 times the L10 life. This is known as the L50 or median life.

There is no significant difference between the dynamic capacity for inner race rotation versus outer race rotation. This is due to the relatively small ratio of ball diameter to pitch diameter in Reali-Slim bearings.

Static load capacities are shown in this catalog. However, the actual static load a Real-Slim bearing can withstand is dependent upon the amount of support provided by the shaft and housing. Please contact Kaydon whenever heavy static loads are anticipated.

Life-Load-Speed Formulas

Since life, load, and speed of rotation are interrelated, this relationship must be considered when selecting bearings for various speed and life requirements. Based on extensive testing, bearing fatigue life has been determined to vary inversely with the third power of the applied load. This is expressed as follows:

(1) $$\frac{L_r}{L_b} = \left(\frac{C}{P}\right)^3 \quad \text{or } L_r = L_b\left(\frac{C}{P}\right)^3$$

Where: L_r = L10 life in revolutions
L_b = Basic life of 1,000,000 revolutions
C = Kaydon dynamic rating
*P = Applied load

For determining the life in hours at a given speed of rotation the above formula can be changed to read:

(2) $$L_h = \frac{16{,}667}{S}\left(\frac{C}{P}\right)^3$$

Where: L_h = L10 life in hours
S = Speed in RPM

A further revision of the basic formula may be used to modify the catalog load rating for various conditions of speed and load:

(3) $$P = C\left(\frac{500}{L_h}\right)^{1/3}\left(\frac{33.3}{(S)}\right)^{1/3} \quad \text{or } P = CF_1F_s$$

Where: $F_1 = \left(\frac{500}{L_h}\right)^{1/3}$ = Life factor

$F_s = \left(\frac{33.3}{(S)}\right)^{1/3}$ = Speed factor

To determine the required catalog capacity for given conditions of speed, load, and life the following formula may be used:

(4) $$C = \frac{P}{F_1F_s}$$

*In many applications the applied load P will be a mean effective load or equivalent load as described in the following paragraphs.

***This applied load should contain a factor of safety selected by the designer on the basis of his knowledge of indeterminate loading, impact, vibration, etc.**

Mean Effective Load for Variable Loads and Speeds

In many applications, the speed of rotation and the applied load are variable and the effect of these variations on bearing life must be considered. For the effective load in these cases, the cubic mean of the various load conditions is determined. This mean effective load then becomes the applied load P in formulas (1) through (4).

When load alone is variable, the mean effective load may be found by the following formula:

$$P_m = \left(T_1 P^3_1 + T_2 P^3 + ...T_n P^3_n \right)^{1/3}$$

Where: P_m = Mean effective load

$P_l, P_2, \ldots\ldots\ldots P_n$ = Variable load

$T_l, T_2, \ldots\ldots\ldots T_n$ = Percent of time (expressed as a decimal fraction) during which $P_l, P_2, \ldots P_n$ are applied.

When speed varies with the load, the mean effective load is found by the formula:

$$P_m = \left(\frac{N_1 P_1{}^3 + N_2 P_2{}^3 + ...N_n P_n{}^3}{N_t} \right)^{1/3}$$

Where: $N_l, N_2 \ldots\ldots\ldots$ Nn = Number of revolutions during which $P_l, P_2, \ldots P_n$ are applied.

N_t = Total revolutions of bearing

or by:

$$P_m = \left(\frac{T_1 S_1 P_1{}^3 + T_2 S_2 P_2{}^3 + ...T_n S_n P_n{}^3}{S_m} \right)^{1/3}$$

Where: $S_1, S_2 \ldots\ldots\ldots$ Sn = Speed of rotation in RPM during time $T_1, T_2 \ldots T_n$.

Sm = $T_1 S_1 + T_2 S_2 + \ldots$TnSn = Mean speed of rotation

Equivalent Load Calculation for Combined Loading

In most applications, the external force or forces acting on a bearing mounting result in both radial and thrust (axial) loads on one or more of the bearings involved. To select a bearing on the basis of catalog load rating, it thus becomes necessary to determine an equivalent load to be used for the applied load P in formulas (1) through (4).

Type C Radial Contact

Where this bearing is properly applied, radial load should predominate and an equivalent radial load is determined by the formula:

$$P_r = F_r + 1.5\, F_t$$

Where: P_r = Equivalent radial load

F_r = Radial load

F_t = Thrust load

Type A Angular Contact

In the discussion of bearing types, it was pointed out that angular contact bearings are commonly used in pairs, either adjacent or separated by spacers. In either case, the effect of combined loads can be best determined by a free-body analysis. Before proceeding with such analysis, however, a preliminary selection of bearing size may be determined by the following equivalent load formula:

$$P_r = F_r + 0.9\, F_t$$

Where: P_r = Equivalent radial load

F_r = Radial load per bearing

F_t = Thrust load

Figure 94

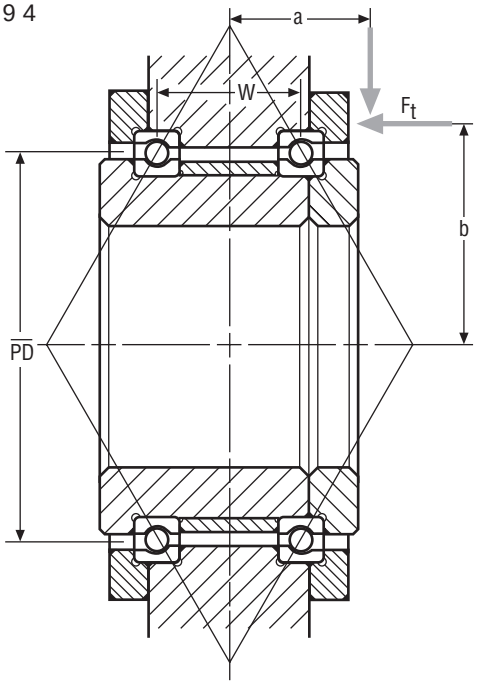
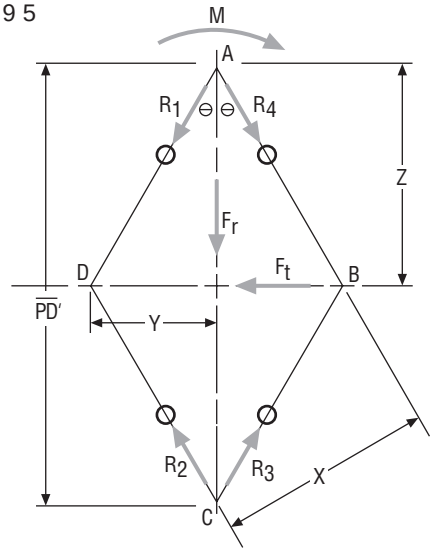


Figure 95



$\overline{PD'} = \overline{PD} + \frac{W}{\tan \Theta}$ $\quad Z = \frac{\overline{PD'}}{2}$

$X = \overline{PD'} \sin \Theta$ $\quad M = \text{Moment} = \pm F_r a \pm F_t b$

$Y = \frac{\overline{PD'} \sin \Theta}{2}$ $\quad \Theta = \text{Contact Angle} = 30°$ for Standard Bearing

R_1, R_2, R_3, & R_4 = Bearing Reactions

Once a tentative bearing size is selected, the free-body calculation can be made.

Figure 94 shows a typical mounting of two angular contact bearings subject to external forces F_r and F_t. Figure 95 shows the equivalent force diagram including the net moment caused by the action of F_r and F_t.

In this analysis, the loaded races (usually the inners) are considered to constitute a free-body in space acted upon by the applied loads and stabilized through the ball contacts by the alternate races (usually the outers).

A plane is passed through the axis and the lines of action of the applied loads. For purposes of calculating the reactions R_1, R_2, R_3, and R_4, they are assumed to act only on the four balls whose centers are in the selected plane. Once the reactions are determined, the maximum reaction on each bearing is assumed to be distributed among the balls in that bearing in the same manner that a radial load would be distributed.

The maximum reaction can thus be converted to an equivalent radial load by the formula:

$$P_r = R_{max.} \text{ Cos } \Theta$$

While four possible reactions are indicated, only three of these will occur due to bearing deflections under the applied forces. To solve for the reactions, one must be assumed equal to zero. The three remaining reactions are then determined by the summation of moments about points selected from A, B, C, and D. If one of the three calculated reactions is found to be negative, the original assumption of the inactive reaction is incorrect and a new assumption must be made.

The case illustrated here is for two bearings of the same pitch diameter mounted apart. A similar force diagram can be constructed for two bearings of unequal pitch diameter or for two identical bearings duplexed and adjacent. In the latter case, the bearing spread is approximately equal to the width of one bearing.

Figure 96

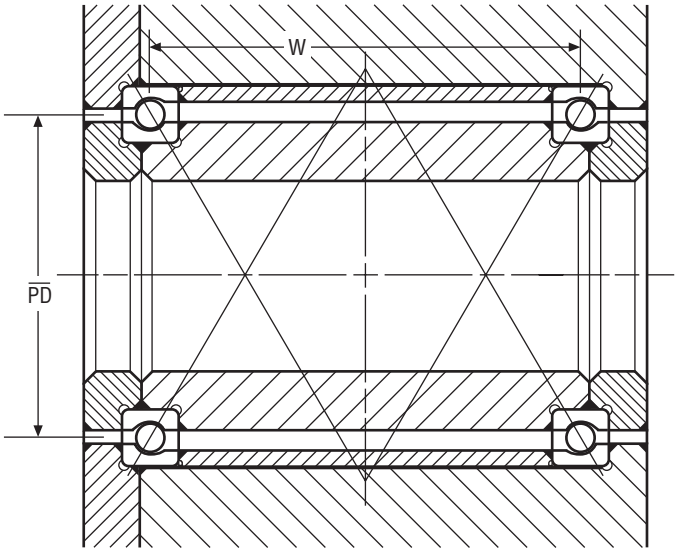
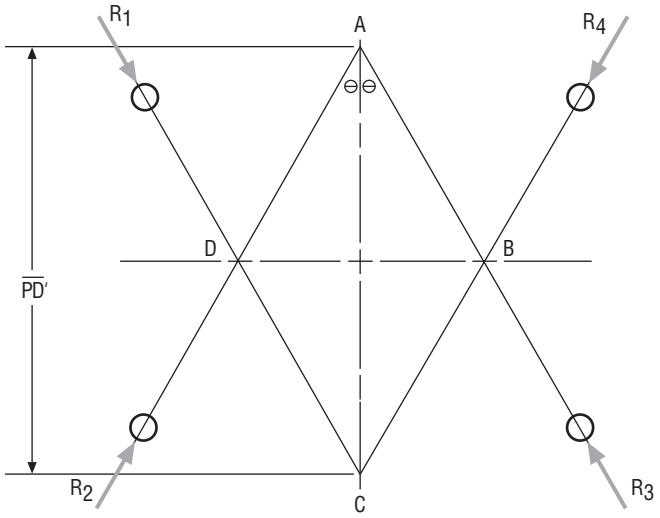


Figure 97



$$\overline{PD'} = \frac{W}{\tan \Theta} - \overline{PD} \text{ when } \frac{W}{\tan \Theta} > \overline{PD}$$

$$\overline{PD'} = \overline{PD} - \frac{W}{\tan \Theta} \text{ when } \overline{PD} > \frac{W}{\tan \Theta}$$

When angular contact bearings are used in the face-to-face arrangement with the lines of contact converging inside the bearings as in Figure 96, the force diagram appears as shown in Figure 97.

Type X Four-Point Contact

Since this bearing is capable of resisting radial, thrust, and moment loads, it is ordinarily subjected to a combination of two or more of these loads wherever it is applied. If used singly, in lieu of two angular contact (Type A) or two radial contact (Type C) bearings, it will usually have all three types of loading applied. If used in conjunction with a radial contact bearing, only thrust and radial loads are encountered. In either case, the effect of combined loads is best determined by a free-body analysis similar to that described for the angular contact bearings. Before proceeding with this analysis, a tentative bearing selection may be made by use of the following general formula for equivalent radial load:

$$P_r = \frac{1.2\ M}{\overline{PD}\ \text{Sin}\ \Theta} + 0.75\ F_r + 0.9\ F_t$$

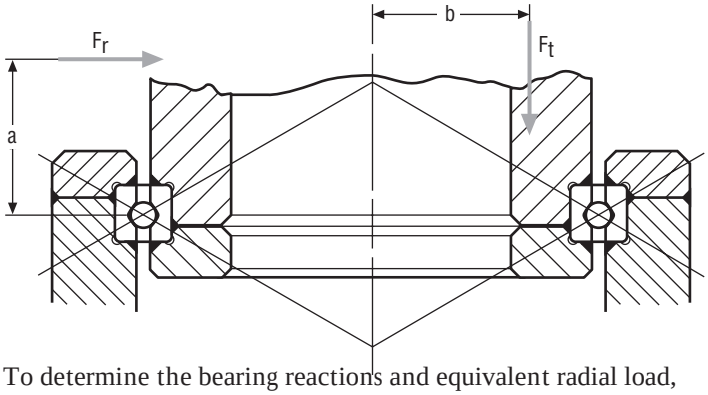
Where: Pr = Equivalent radial load
Fr = Radial load
Ft = Thrust load
M = Moment load
$\overline{PD}$ = Bearing pitch diameter in inches
Θ = Bearing contact angle
(30° for standard bearing)

When moment load is present, the known values, M, F_r, F_t, and Θ (can be inserted in the formula to produce a relationship between P_r and $\overline{PD}$. Then by inspection and reference to the bearing tables, a bearing of sufficient $\overline{PD}$ and cross section can be selected quite readily.

Once a tentative bearing selection has been determined, the free-body analysis can be made.

Figure 98 shows a four-point contact bearing subjected to radial and thrust forces which also induce a moment load. Figure 99 shows the equivalent force diagram including the moment.

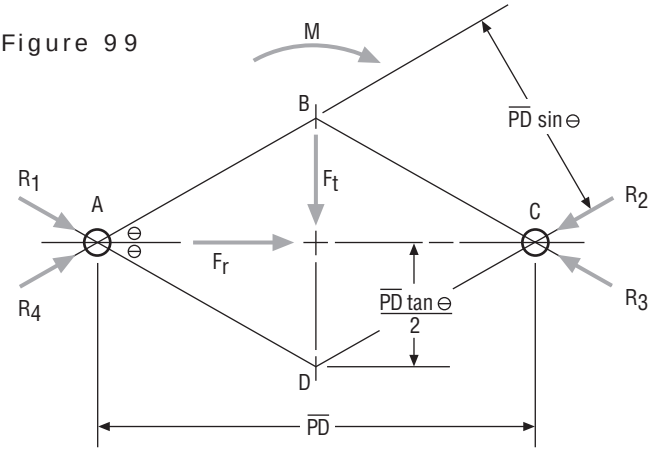
Figure 98



To determine the bearing reactions and equivalent radial load, the procedure is identical to that described for the Type A angular contact bearing with:

$P_r = R_{max.}$

Figure 99



Tapered Roller – KT Series

While the Reali-Slim tapered roller bearing will accept both radial and thrust load, it is designed primarily for radial load. It is commonly employed in the same manner as the angular contact ball bearing (Type A) and can be selected for size by following the free-body load analysis for the latter bearing. In this analysis, a contact angle of 12° should be used.

For a preliminary selection, an equivalent load may be determined by the formula:

$P_r = 0.67\ F_r + 0.94\ F_t$

Where: P_r = Equivalent radial load
F_r = Radial load per bearing
F_t = Thrust load

Section 7— Other Products

KT Series
Tapered Roller Bearings

The Kaydon concept of standard bearings with light-weight, thin-sections, and large bore diameters include tapered and radial roller bearings as well as ball bearings.

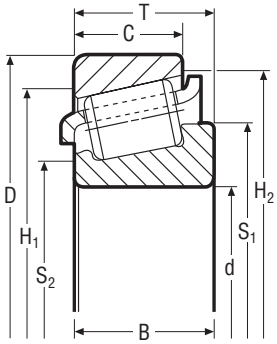
KT Series tapered roller bearings offer advantages to those designs requiring a bearing of higher capacity, which would benefit from the many unique advantages of a thin-section bearing. KT tapered roller bearings are used to advantage in applications ranging from oil field equipment to machine tool tables where space and weight considerations are meaningful.

Standard tapered roller bearings, KT Series, have races and rollers of through-hardened AISI 52100 vacuum degassed steel with a one-piece stamped steel cage. They can be furnished, when specified, in pairs match ground for use with or without spacers.

The Tapered Roller Bearings in this catalog are of the single-row radial type, designed primarily for application of radial load. While of separable construction, the rolling elements are retained in the separator.

Since this bearing assumes a contact angle of approximately 12° under an axial force, it does have a reasonable amount of thrust capacity. This capacity is uni-directional and is realized when the axial force is applied to the wide faces of the races.

As in the case of the angular contact ball bearing, the single row tapered roller bearing is commonly mounted in opposition to another bearing (usually of similar construction) to provide an axial force for establishing and maintaining the angle of contact. Two bearings of this type may be mounted with the lines of contact converging outside of the bearings (back-to-back) or inside (face-to-face) with the former preferred for stability in the presence of overturning load.



Kaydon Bearing Number	Bore d (IN)	Outside Dia. D (IN)	Assem. Width T (IN)	Factor K (IN)	Rating at 500 RPM for 3000 hrs. L-10		Cone Width B (IN)	Cup Width C (IN)	Shoulder Diameters				Bearing Wt. (LB)
									Shaft		Housing		
					Radial (LB)	Thrust (LB)			S1 (IN)	S2 (IN)	H1 (IN)	H2 IN)	
• **KT-070**	**7.000**	8.500	.812	1.74	4970	2860	.812	.625	7.375	7.300	8.125	8.250	3.11
KT-091	**9.125**	10.250	.718	1.79	4920	2750	.722	.597	9.625	9.312	9.850	10.050	2.88
• **KT-098**	**9.875**	11.500	1.062	1.85	9260	5000	1.062	.875	10.375	10.225	11.063	11.250	6.05
KT-100	**10.000**	11.125	.625	1.79	4020	2250	.625	.500	10.500	10.300	10.750	10.900	2.88
KT-110	**11.000**	12.500	.875	1.86	7620	4100	.875	.688	11.438	11.250	12.000	12.250	5.06
• **KT-112**	**11.250**	12.750	.812	1.86	7150	3860	.812	.625	11.688	11.500	12.313	12.500	4.72
• **KT-118**	**11.875**	13.562	.937	1.76	7250	4120	.812	1.125	12.438	12.210	13.000	13.320	6.63
KT-130	**13.000**	14.562	.843	1.44	5580	3880	.843	.594	13.438	13.320	14.125	14.300	5.20
KT-132	**13.250**	15.000	.937	1.69	6160	3650	.937	.750	13.875	13.625	14.375	14.500	6.79
• **KT-151**	**15.125**	17.375	1.125	1.72	11760	6840	1.125	.812	15.750	15.625	16.750	16.875	13.57
• **KT-165**	**16.500**	18.750	.875	1.78	8220	4620	.882	.812	17.250	17.000	18.125	18.500	11.14
KT-180	**18.000**	19.625	.812	1.69	7400	4330	.812	.687	18.438	18.375	19.188	19.300	8.19
KT-200	**20.000**	21.750	.812	1.80	7930	4400	.812	.687	20.625	20.375	21.125	21.250	9.78

• Available from Stock—check for availability of other sizes.

Tolerances are: Bore: +.001" – .000" up to KT-110; +.002" – .000" for KT-110 to KT-200
Outside Diameter: Same as for bore.
Width: ±.010" up to KT-112; ±.015" for KT-112 to KT-200
Cup Radial Runout .0015" Max. F.I.M., Cone Radial Runout .0020" Max. F.I.M.

Special Performance Bearings

BA and BB Metric Series Ball Bearings

Drop-in Replacements For Cross-Roller Bearings

Kaydon BA and BB Metric Series four-point contact ball bearings are dimensionally interchangeable with cross-roller bearings.

Now there's an alternative to cross-roller bearings for applications that require a combination of radial, thrust and moment load capability. Our BA and BB Metric Series four-point contact ball bearings are engineered to fit existing cross-roller bearing envelopes. Plus, Kaydon's BA and BB Series bearings can be specified with additional features not commonly available in standard cross-roller bearings, including a special protective package for corrosion resistance, custom sealing for extreme environments, special temperature capability, and application-specific lubrication.

Optimize Your Design Options

With additional features not commonly available in standard cross-roller bearings, BA and BB Series bearings provide greater design flexibility.

Endurakote® coating—For applications requiring superior corrosion resistance, we offer our proprietary Endurakote coating. This thin, dense chrome plating gives AISI 52100 bearing material corrosion resistance equal to or better than that of AISI 440 stainless steel. Unlike many traditional chrome platings, the extremely hard surface of Endurakote coating doesn't peel and flake from the bearing race under stress, so corrosion resistance is retained and surface wear is minimized. The performance of Endurakote has been proven in critical military, aerospace, and deep space applications.

Seals/Shields—Standard industry seals are generally available from Buna-N rubber. Kaydon can also provide custom seals manufactured from silicone or Viton® materials for applications where high temperature or extreme environments are likely to be encountered.

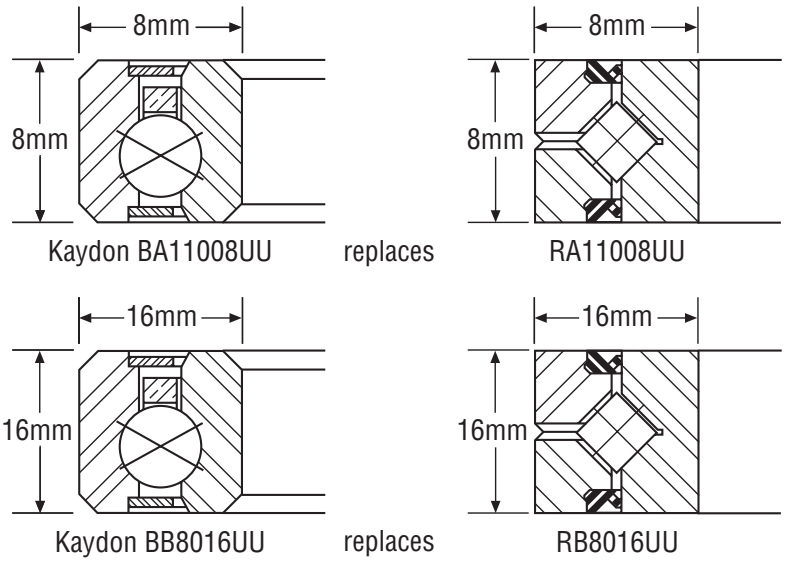
Temperature Capability—Standard cross-roller bearings have a maximum full capacity operating temperature of only 212°F. In contrast, Kaydon's heat treating procedures allow Kaydon bearings to operate at higher temperatures.

Special Lubrication—Kaydon offers a full range of lubricants, allowing you to optimize bearing performance in a range of applications with special requirements for moisture resistance, hot or cold temperatures, vacuum, and low torque.

Separators—The common roller spacer for many cross-roller bearings is a non-metallic composite. High temperature and/or horizontal axis applications may require special materials or a non-standard separator design, however. Kaydon four-point contact ball bearings are available with special separator options to meet a wide range of applications.

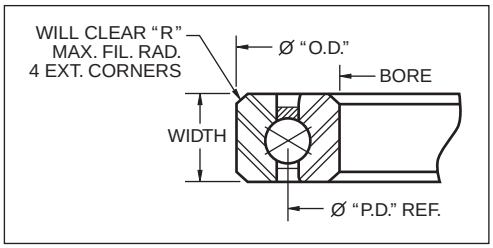
Internal Fitup—Kaydon can help you optimize internal fitup of our BA and BB Series four-point contact ball bearings to provide the desired operating performance. Pre-loaded bearings are recommended for greater stiffness, and diametral clearance is recommended for lower torque applications.

Replacement Examples

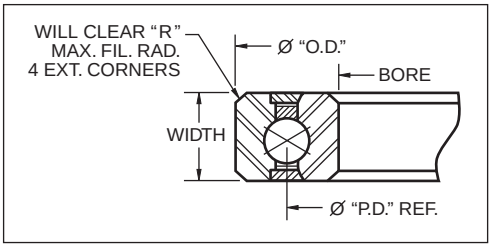


BA and BB Series Bearings Are Available to Match the Bores and Widths of Common Cross-Roller Bearings.

When factors such as cost, availability, corrosion resistance, tighter tolerances, torque, seal/shield options, and temperature resistance are important in your application, it pays to consider BA and BB Series four-point contact metric ball bearings as an alternative to cross-roller bearings. The additional design flexibility they offer can often help you achieve your design objectives with optimum performance and economy.



Open Bearing



Sealed Bearing

BA Series—all dimensions in mm

(Reali-Slim replacements for RA Series standard cross-roller bearings)

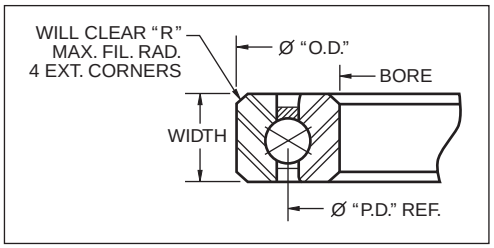
Model No.	Kaydon Part No.	Wt. (kg)	Bore (nominal +O)	O.D. (nominal +O)	Width (nominal +O)	P.D.	"R"	Dynamic Capacity		
								Radial (kg)	Axial (kg)	Moment (kg-M)
• **BA5008**	**39300001**	0.07	50 -0.012	66 -0.013	8 -0.12	58	0.8	267	666	7.7
• **BA6008**	**39301001**	0.09	60 -0.015	76 -0.013	8 -0.12	68	0.8	298	745	10.1
• **BA7008**	**39302001**	0.1	70 -0.015	86 -0.015	8 -0.12	78	0.8	327	819	12.8
• **BA8008**	**39303001**	0.11	80 -0.015	96 -0.015	8 -0.12	88	0.8	356	890	15.7
• **BA9008**	**39304001**	0.13	90 -0.02	106 -0.015	8 -0.12	98	0.8	384	959	18.8
• **BA10008**	**39305001**	0.14	100 -0.02	116 -0.015	8 -0.12	108	0.8	410	1025	22.1
• **BA11008**	**39306001**	0.15	110 -0.02	126 -0.018	8 -0.12	118	0.8	436	1090	25.7
• **BA12008**	**39307001**	0.16	120 -0.02	136 -0.018	8 -0.12	128	0.8	461	1152	29.5
• **BA13008**	**39308001**	0.18	130 -0.025	146 -0.018	8 -0.12	138	0.8	485	1212	33.4
• **BA14008**	**39309001**	0.19	140 -0.025	156 -0.025	8 -0.12	148	0.8	508	1271	37.6
BA15008	**39310001**	0.2	150 -0.025	166 -0.025	8 -0.12	158	0.8	532	1329	42.0
BA16013	**39311001**	0.59	160 -0.025	186 -0.025	13 -0.12	173	1.2	1017	2541	87.9
• **BA17013**	**39312001**	0.63	170 -0.025	196 -0.03	13 -0.12	183	1.2	1066	2666	97.6
BA18013	**39313001**	0.66	180 -0.025	206 -0.03	13 -0.12	193	1.2	1100	2748	106.0
BA19013	**39314001**	0.69	190 -0.03	216 -0.03	13 -0.12	203	1.2	1132	2829	114.8
BA20013	**39315001**	0.73	200 -0.03	226 -0.03	13 -0.12	213	1.2	1179	2948	125.6

Note 1: Capacities listed not apply simultaneously. Dynamic capacity is based on 1 million revolutions L10 fatigue life.

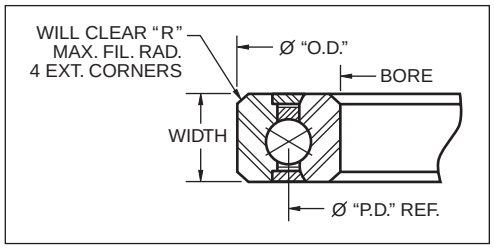
Note 2: Standard bearings are supplied without seals and shields, and they are assembled with a light clearance. Alternate features can be obtained by adding the following suffix letter to the basic part number.

U = single seal
UU = double seal
CO = standard clearance
CI = greater than standard clearance
CCO = preload

• Available from stock. Check for availability of other sizes.



Open Bearing



Sealed Bearing

BB Series — all dimensions in mm

(Reali-Slim replacements for RB Series standard cross-roller bearings)

Model No.	Kaydon Part No.	Wt. (kg)	Bore (nominal +O)	O.D. (nominal +O)	Width (nominal +O)	P.D.	"R"	Dynamic Capacity		
								Radial (kg)	Axial (kg)	Moment (kg-M)
• BB2008	39316001	0.03	20 -0.01	36 -0.011	8 -0.12	28	0.8	168	420	2.3
• BB2508	39317001	0.04	25 -0.01	41 -0.011	8 -0.12	33	0.8	187	469	3.1
• BB3010	39318001	0.1	30 -0.01	55 -0.013	10 -0.12	42.5	1	270	675	5.7
BB3510	39319001	0.11	35 -0.012	60 -0.013	10 -0.12	47.5	1	284	709	6.7
BB4010	39320001	0.12	40 -0.012	65 -0.013	10 -0.12	52.5	1	310	776	8.1
BB4510	39321001	0.13	45 -0.012	70 -0.013	10 -0.12	57.5	1	336	839	9.7
BB5013	39322001	0.24	50 -0.012	80 -0.013	13 -0.12	65	1	528	1321	17.2
BB6013	39323001	0.3	60 -0.015	90 -0.013	13 -0.12	75	1	575	1436	21.5
• BB7013	39324001	0.31	70 -0.015	100 -0.015	13 -0.12	85	1	640	1601	27.2
BB8016	39325001	0.62	80 -0.015	120 -0.015	16 -0.12	100	1	967	2417	48.3
• BB9016	39326001	0.73	90 -0.02	130 -0.015	16 -0.12	110	1.5	1033	2584	56.8
BB10020	39327001	1.21	100 -0.02	150 -0.015	20 -0.12	125	1.5	1392	3480	87.0
BB11015	39328001	0.66	110 -0.02	145 -0.018	15 -0.12	127.5	1	839	2097	53.5
BB11020	39329001	1.36	110 -0.02	160 -0.02	20 -0.12	140	1.5	1488	3720	100.4
BB12025	39330001	2.13	120 -0.02	180 -0.02	25 -0.12	150	2	2298	5745	172.3
BB13025	39331001	2.27	130 -0.025	190 -0.025	25 -0.12	160	2	2387	5968	190.9
• BB14025	39332001	2.5	140 -0.025	200 -0.025	25 -0.12	170	2	2561	6402	217.6
BB15013	39333001	0.61	150 -0.025	180 -0.025	13 -0.12	165	1	982	2455	81.0
• BB15025	39334001	2.72	150 -0.025	210 -0.025	25 -0.12	180	2	2645	6614	238.0
BB15030	39335001	4.54	150 -0.025	230 -0.025	30 -0.12	190	2	3730	9325	354.2
BB20025	39336001	3.4	200 -0.03	260 -0.03	25 -0.12	230	2.5	3128	7820	359.6
BB20030	39337001	5.72	200 -0.03	280 -0.03	30 -0.12	240	2.5	4392	10980	526.9
BB20035	39338001	8.17	200 -0.03	295 -0.03	35 -0.12	247.5	2.5	5568	13921	688.9
BB25025	39339001	4.09	250 -0.03	310 -0.035	25 -0.12	280	3	3576	8939	500.5
• BB25030	39340001	7.04	250 -0.03	330 -0.035	30 -0.12	290	3	5008	12519	725.9
BB25040	39341001	9.08	250 -0.03	355 -0.035	40 -0.12	302.5	3	6324	15812	956.3
BB30025	39342001	4.99	300 -0.035	360 -0.035	25 -0.12	330	3	3929	9821	648.0
BB30035	39343001	11.8	300 -0.035	395 -0.035	35 -0.12	347.5	3	7038	17595	1222.5
BB30040	39344001	15.44	300 -0.035	405 -0.035	40 -0.12	352.5	3	7038	17595	1240.1
BB40035	39345001	12.03	400 -0.04	480 -0.04	35 -0.25	440	3.5	8207	20518	1805.1
BB40040	39346001	20.66	400 -0.04	510 -0.04	40 -0.25	455	3.5	8367	20919	1903.0
• BB50040	39347001	22.7	500 -0.045	600 -0.045	40 -0.25	550	3.5	9598	23996	2638.8
BB50050	39348001	38.05	500 -0.045	625 -0.045	50 -0.25	562.5	3.5	9747	24367	2740.4
• BB60040	39349001	27.24	600 -0.045	700 -0.045	40 -0.2	650	4	10755	26887	3494.3
BB70045	39350001	44.95	700 -0.045	815 -0.045	45 -0.25	757.5	4	11852	29634	4487.6
BB80070	39351001	98.52	800 -0.05	950 -0.05	70 -0.25	875	5	19119	47799	8362.3
BB90070	39352001	109.87	900 -0.05	1050 -0.05	70 -0.25	975	5	20591	51478	10035.2

Note 1: Capacities listed not apply simultaneously. Dynamic capacity is based on 1 million revolutions L10 fatigue life.

Note 2: Standard bearings are supplied without seals and shields, and they are assembled with a light clearance. Alternate features can be obtained by adding the following suffix letter to the basic part number.

U = single seal
UU = double seal
CO = standard clearance
CI = greater than standard clearance
CCO = preload
• Available from stock. Check for availability of other sizes.
T = single shield
TT = double shield

BA Precision Tolerances—all dimensions in mm

Model Number	Bore (nominal +0)	O.D. (nominal +0)	Width (nominal +0)	Std. Diametral Clearance	Radial and Axial Runout	
					Inner	Outer
BA5008	50 -0.012	66 -0.013	8 -0.12	0.03-0.056	0.013	0.013
BA6008	60 -0.015	76 -0.013	8 -0.12	0.03-0.056	0.013	0.013
BA7008	70 -0.015	86 -0.015	8 -0.12	0.03-0.056	0.015	0.015
BA8008	80 -0.015	96 -0.015	8 -0.12	0.03-0.056	0.015	0.015
BA9008	90 -0.02	106 -0.015	8 -0.12	0.041-0.066	0.015	0.015
BA10008	100 -0.02	116 0.015	8 -0.12	0.041-0.066	0.015	0.015
BA11008	110 -0.02	126 -0.018	8 -0.12	0.041-0.066	0.015	0.02
BA12008	120 -0.02	136 -0.018	8 -0.12	0.05-0.08	0.02	0.02
BA13008	130 -0.025	146 -0.018	8 -0.12	0.05-0.08	0.025	0.025
BA14008	140 -0.025	156 -0.025	8 -0.12	0.05-0.08	0.025	0.025
BA15008	150 -0.025	166 -0.025	8 -0.12	0.05-0.08	0.025	0.025
BA16013	160 -0.025	186 -0.025	13 -0.12	0.05-0.08	0.025	0.025
BA17013	170 -0.025	196 -0.03	13 -0.12	0.05-0.08	0.025	0.025
BA18013	180 -0.025	206 -0.03	13 -0.12	0.05-0.08	0.03	0.03
BA19013	190 -0.03	216 0.03	13 -0.12	0.06-0.09	0.03	0.03
BA20013	200 -0.03	226 -0.03	13 -0.12	0.06-0.09	0.03	0.03

BB Precision Tolerances—all dimensions in mm

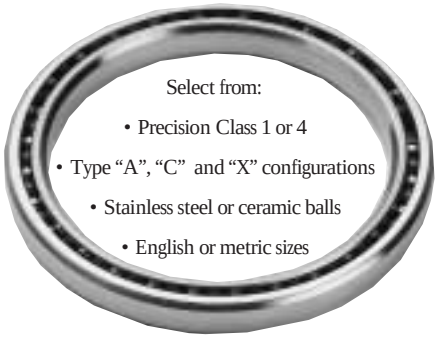
Model Number	Bore (nominal +0)	O.D. (nominal +0)	Width (nominal +0)	Std. Diametral Clearance	Radial and Axial Runout	
					Inner	Outer
BB2008	20 -0.01	36 0.011	8 -0.12	0.025-0.038	0.008	0.01
BB2508	25 -0.01	41 -0.011	8 -0.12	0.025-0.038	0.008	0.01
BB3010	30 -0.01	55 -0.013	10 -0.12	0.025-0.038	0.01	0.01
BB3510	35 -0.012	60 -0.013	10 -0.12	0.03-0.043	0.01	0.01
BB4010	40 -0.012	65 -0.013	10 -0.12	0.03-0.043	0.013	0.013
BB4510	45 -0.012	70 -0.013	10 -0.12	0.03-0.043	0.013	0.013
BB5013	50 -0.012	80 -0.013	13 -0.12	0.03-0.056	0.013	0.013
BB6013	60 -0.015	90 -0.013	13 -0.12	0.03-0.056	0.013	0.013
BB7013	70 -0.015	100 -0.015	13 -0.12	0.03-0.056	0.015	0.015
BB8016	80 -0.015	120 -0.015	16 -0.12	0.03-0.056	0.015	0.015
BB9016	90 -0.02	130 -0.015	16 -0.12	0.041-0.066	0.015	0.015
BB10020	100 -0.02	150 -0.015	20 -0.12	0.041-0.066	0.015	0.015
BB11015	110 -0.02	145 -0.018	15 -0.12	0.041-0.066	0.015	0.02
BB11020	110 -0.02	160 -0.02	20 -0.012	0.041-0.066	0.015	0.02
BB12025	120 -0.02	180 -0.02	25 -0.12	0.05-0.08	0.02	0.02
BB13025	130 -0.025	190 -0.025	25 -0.12	0.05-0.08	0.025	0.025
BB14025	140 -0.025	200 -0.025	25 -0.12	0.05-0.08	0.025	0.025
BB15013	150 -0.025	180 -0.025	13 0.23	0.05-0.08	0.025	0.025
BB15025	150 -0.025	210 -0.025	25 -0.12	0.05-0.08	0.025	0.025
BB15030	150 -0.025	230 -0.025	30 -0.12	0.05-0.08	0.025	0.025
BB20025	200 -0.03	260 -0.03	25 -0.12	0.06-0.09	0.03	0.03
BB20030	200 -0.03	280 -0.03	30 -0.12	0.06-0.09	0.03	0.03
BB20035	200 -0.03	295 -0.03	35 -0.12	0.06-0.09	0.03	0.03
BB25025	250 -0.03	310 -0.035	25 -0.12	0.07-0.1	0.035	0.035
BB25030	250 -0.03	330 -0.035	30 -0.12	0.07-0.1	0.035	0.035
BB25040	250 -0.03	355 -0.035	40 0.12	0.07-0.1	0.035	0.035
BB30025	300 -0.035	360 -0.035	25 -0.12	0.07-0.1	0.035	0.035
BB30035	300 -0.035	395 -0.035	35 -0.12	0.07-0.1	0.035	0.035
BB30040	300 -0.035	405 -0.035	40 -0.12	0.07-0.1	0.035	0.035
BB40035	400 -0.04	480 -0.04	35 -0.25	0.08-0.11	0.04	0.04
BB40040	400 -0.04	510 -0.04	40 -0.2	0.08-0.11	0.04	0.04
BB50040	500 -0.045	600 -0.045	40 -0.25	0.09-0.12	0.045	0.045
BB50050	500 -0.045	625 -0.045	50 -0.25	0.09-0.12	0.045	0.045
BB60040	600 -0.045	700 -0.045	40 -0.25	0.09-0.12	0.045	0.045
BB70045	700 -0.045	815 -0.045	45 -0.25	0.09-0.12	0.045	0.045
BB80070	800 -0.05	950 -0.05	70 -0.25	0.09-0.12	0.05	0.05
BB90070	900 -0.05	1050 -0.05	70 -0.25	0.1-0.13	0.05	0.05

Harsh Environment Bearings
The LLPP Series

Kaydon's stock line of stainless steel and hybrid bearings

As the latest addition to the Reali-Slim thin-section bearing family, new LLPP-Series bearings feature 440C stainless steel races, brass or non-metallic separators, and your choice of either stainless steel or ceramic balls. Available in either radial contact "C," angular contact "A," or four-point contact "X" configurations. These bearings minimize the surface degradation and particulate formation so common in harsh environment applications. Best of all, these bearings are available in popular sizes from stock for immediate delivery.

LLPP-Series Bearings are Available to Fit a Wide Range of Your Design Requirements.



LLPP-Series stainless bearings are used where high precision and corrosion resistance are required.

Kaydon Real-Slim bearing performance is legendary in demanding applications. That's because these high-precision, compact, lightweight bearings feature low torque, high temperature performance, outstanding cleanliness, and superior chemical compatibility.

LLPP-Series hybrid bearings are very well suited for applications where lubrication is marginal.

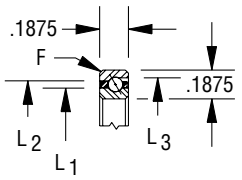
Applications requiring low particle generation, high accuracy, and high speeds and/or which must operate in adverse or no lube conditions, can benefit from LLPP hybrid bearings. The unique feature of this series is the use of ceramic rolling elements on hardened steel races. Tests have shown that significant reductions in particle generation can be obtained. In addition, the physical properties of the ceramic rolling elements (precision, hardness, lightweight) provide additional benefits such as improved repeatability, low torque, high stiffness, and resistance to breakdown under marginal or no lube conditions.

Specifications for Stainless Steel Reali-Slim Bearings

ITEM	DESCRIPTION	REFERENCE SPECIFICATION
	MATERIAL ANALYSIS	
RACES	AISI 440C Stainless steel	ASTM A-756
BALLS	440C Stainless steel or ceramic: Silicon Nitride	
SEPARATORS		
C, X BEARINGS	P Type—Brass or non-metallic composite L Type—Nylon, fiberglass reinforced } other options, see p. 59	ASTM B-36 or B-134
A BEARINGS	R Type—Brass or non-metallic composite G Type—Nylon, fiberglass reinforced } other options, see p. 59	ASTM B-36 or B-134
	HEAT TREATMENT	
RACES	Through hardened and dimensionally stabilized for use from -65°F to +250°F (-54°C to +121°C), Rc 58 min.	MIL-H-6875 with approved proprietary modifications
BALLS	Hardened to Rc 58-65, Ceramic—Rc 75 min.	ABMA Std. 10, MIL-B-1083
	PRECISION	
RACE DIMENSIONS	KAYDON Precision Class 1, Higher classes available	ABMA ABEC-1F or better
RACE RUNOUTS	KAYDON Precision Class 1, Higher classes available	ABMA ABEC-1F or better
BALLS	Grade 24 Stainless steel or Grade 5 ceramic	ABMA Std. 10

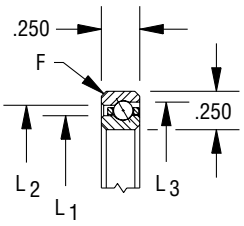
SAA SERIES (3/16" cross-section)

Kaydon Bearing Number	Dimensions in Inches					Capacities in Pounds ①				Weight in Pounds
						Radial		Thrust		
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	C'Bore Dia. L_3	Static②	Dyn.	Static②	Dyn.	
• **SAA10AG0**	**1.000**	1.375	1.140	1.235	1.274	340	150	970	450	.025
• **SAA15AG0**	**1.500**	1.875	1.640	1.735	1.774	480	300	1,380	560	.038



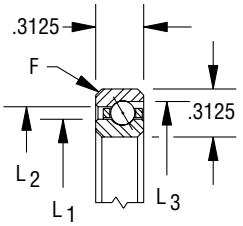
SA SERIES (1/4" cross-section)

Kaydon Bearing Number	Dimensions in Inches					Capacities in Pounds ①				Weight in Pounds
						Radial		Thrust		
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	C'Bore Dia. L_3	Static②	Dyn.	Static②	Dyn.	
• **SA020AR0**	**2.000**	2.500	2.186	2.314	2.369	790	330	2,280	960	.10
• **SA025AR0**	**2.500**	3.000	2.686	2.814	2.869	960	380	2,780	1,100	.12
• **SA030AR0**	**3.000**	3.500	3.186	3.314	3.367	1,140	430	3,290	1,230	.14
• **SA035AR0**	**3.500**	4.000	3.686	3.814	3.867	1,310	470	3,790	1,350	.17
• **SA040AR0**	**4.000**	4.500	4.186	4.314	4.367	1,490	510	4,300	1,470	.19



SB SERIES (5/16" cross-section)

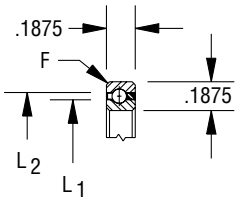
Kaydon Bearing Number	Dimensions in Inches					Capacities in Pounds ①				Weight in Pounds
						Radial		Thrust		
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	C'Bore Dia. L_3	Static②	Dyn.	Static②	Dyn.	
• **SB020AR0**	**2.000**	2.625	2.231	2.393	2.464	1,090	480	3,150	1,380	.15
• **SB025AR0**	**2.500**	3.125	2.731	2.893	2.964	1,340	550	3,860	1,590	.19
• **SB030AR0**	**3.000**	3.625	3.231	3.393	3.462	1,550	610	4,470	1,750	.22
• **SB035AR0**	**3.500**	4.125	3.731	3.893	3.962	1,790	670	5,180	1,930	.27
• **SB040AR0**	**4.000**	4.625	4.231	4.393	4.460	2,040	730	5,890	2,100	.30



① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
◊ Limited availability.
• Available from stock—check for availability of other sizes.

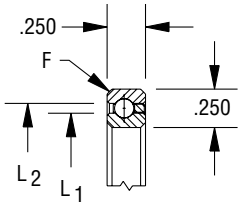
SAA SERIES (3/16" cross section)

Kaydon Bearing Number	Dimensions in Inches				Radial Capacity (lbs.) ①		Weight in Pounds
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	Static ②	Dynamic	
• **SAA10CL0**	**1.000**	1.375	1.140	1.235	290	150	.026
• **SAA15CL0**	**1.500**	1.875	1.640	1.735	400	180	.039



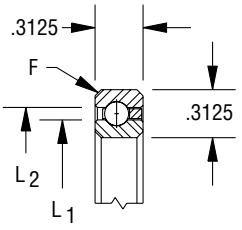
SA SERIES (1/4" cross section)

Kaydon Bearing Number	Dimensions in Inches				Radial Capacity (lbs.) ①		Weight in Pounds
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	Static ②	Dynamic	
• **SA020CP0**	**2.000**	2.500	2.186	2.314	680	320	.10
• **SA025CP0**	**2.500**	3.000	2.686	2.814	830	360	.13
• **SA030CP0**	**3.000**	3.500	3.186	3.314	990	410	.15
• **SA035CP0**	**3.500**	4.000	3.686	3.814	1,140	450	.18
• **SA040CP0**	**4.000**	4.500	4.186	4.314	1,290	480	.19



SB SERIES (5/16" cross section)

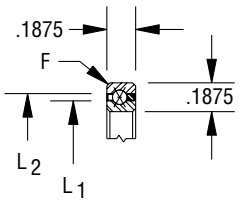
Kaydon Bearing Number	Dimensions in Inches				Radial Capacity (lbs.) ①		Weight in Pounds
	Bore	Outside Diameter	Land Dia. L_1	Land Dia. L_2	Static ②	Dynamic	
• **SB020CP0**	**2.000**	2.625	2.231	2.393	930	450	.16
• **SB025CP0**	**2.500**	3.125	2.731	2.893	1,140	520	.20
• **SB030CP0**	**3.000**	3.625	3.231	3.393	1,340	580	.24
• **SB035CP0**	**3.500**	4.125	3.731	3.893	1,540	630	.27
• **SB040CP0**	**4.000**	4.625	4.231	4.393	1,750	690	.30



① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
◊ Limited availability.
• Available from stock—check for availability of other sizes.

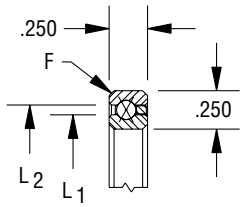
SERIES SAA (3/16" cross section)

Kaydon Bearing Number	Dimensions in Inches				Capacities①						Weight in Pounds
					Radial in Pounds		Thrust in Pounds		Moment (Lbs-In)		
	Bore	Outside Diameter	Land Dia.L_1	Land Dia.L_2	Static②	Dyn.	Static②	Dyn.	Static②	Dyn.	
• **SAA10XL0**	**1.000**	1.375	1.140	1.235	290	150	730	370	170	90	.026
• **SAA15XL0**	**1.500**	1.875	1.640	1.735	400	180	1,000	460	340	150	.039



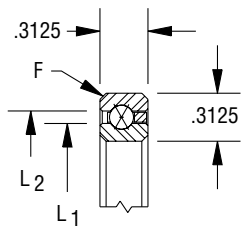
SERIES SA (1/4" cross section)

Kaydon Bearing Number	Dimensions in Inches				Capacities①						Weight in Pounds
					Radial in Pounds		Thrust in Pounds		Moment (Lbs-In)		
	Bore	Outside Diameter	Land Dia.L_1	Land Dia.L_2	Static②	Dyn.	Static②	Dyn.	Static②	Dyn.	
• **SA020XP0**	**2.000**	2.500	2.186	2.314	680	320	1,710	790	770	360	.10
• **SA025XP0**	**2.500**	3.000	2.686	2.814	830	360	2,090	910	1,150	500	.13
• **SA030XP0**	**3.000**	3.500	3.186	3.314	990	410	2,470	1,010	1,600	660	.15
• **SA035XP0**	**3.500**	4.000	3.686	3.814	1,140	450	2,850	1,110	2,130	840	.18
• **SA040XP0**	**4.000**	4.500	4.186	4.314	1,290	480	3,220	1,210	2,740	1,030	.19



SERIES SB (5/16" cross section)

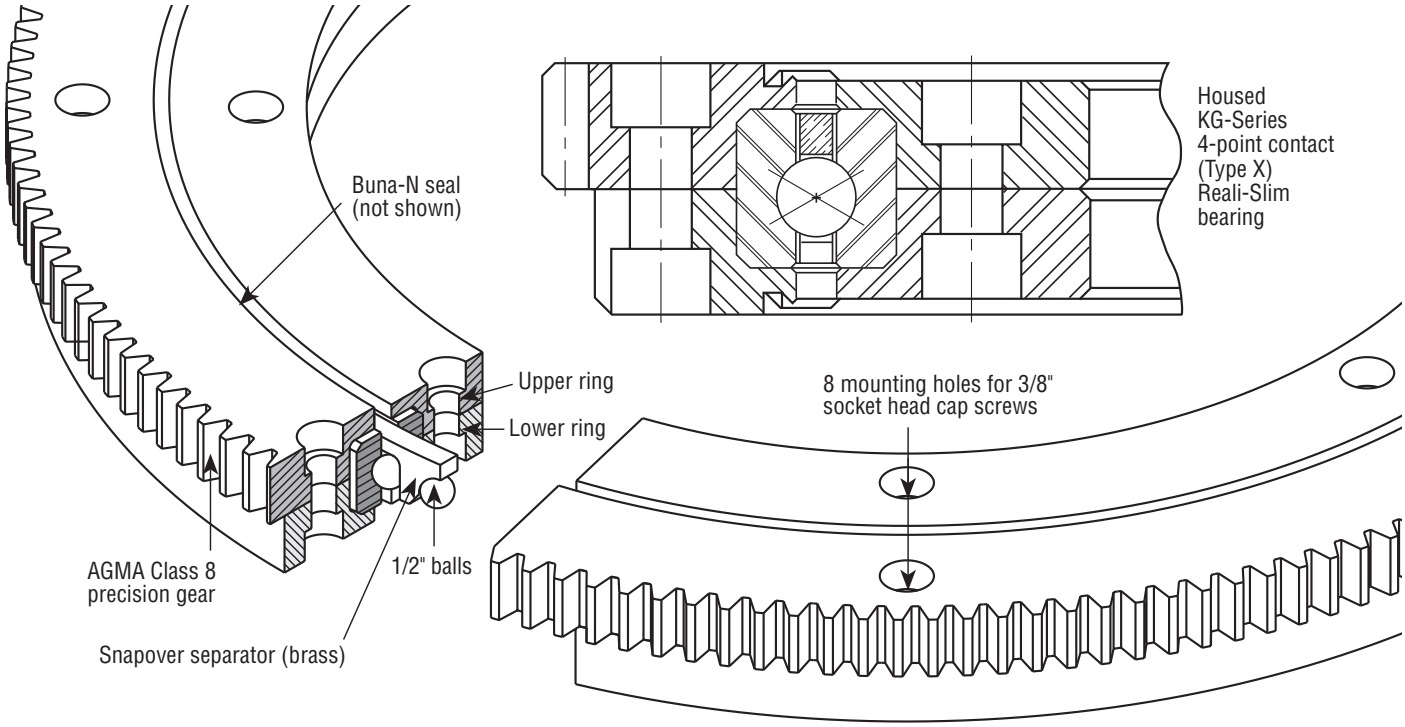
Kaydon Bearing Number	Dimensions in Inches				Capacities①						Weight in Pounds
					Radial in Pounds		Thrust in Pounds		Moment (Lbs-In)		
	Bore	Outside Diameter	Land Dia.L_1	Land Dia.L_2	Static②	Dyn.	Static②	Dyn.	Static②	Dyn.	
• **SB020XP0**	**2.000**	2.625	2.231	2.393	930	450	2,340	1,130	1,080	520	.16
• **SB025XP0**	**2.500**	3.125	2.731	2.893	1,140	520	2,840	1,290	1,600	730	.19
• **SB030XP0**	**3.000**	3.625	3.231	3.393	1,340	580	3,350	1,440	2,220	960	.24
• **SB035XP0**	**3.500**	4.125	3.731	3.893	1,540	630	3,860	1,590	2,940	1,210	.27
• **SB040XP0**	**4.000**	4.625	4.231	4.393	1,750	690	4,370	1,720	3,770	1,490	.30



① Capacities listed are not simultaneous. For combined loading see discussion of Bearing Selection and Load Analysis. Dynamic capacities are based upon (1.0 million revolutions) of L10 life.
② Static capacities are non-brinell limits based on rigid support from the shaft and housing.
③ "F" is the maximum shaft or housing fillet radius the bearing corners will clear.
◊ Limited availability.
• Available from stock—check for availability of other sizes.

Reali-Slim TG Series Bearings

New Easy-Mount Bearing/Gear Assemblies Give High Rotational Accuracy



Designed Especially for Precision Applications

- Rotary tables
- Material handling equipment
- Robots
- Balancing systems
- Grinding tables
- Polishing tables
- Positioning systems

Reali-Slim TG Series bearings are modular bearing/gear assemblies that have been specifically designed to simplify mounting. Based on Reali-Slim KG Series Type X bearings, TG Series bearings are ideal for use in continuous rotation applications that require ABEC 1 Type precision in a mounted bearing design. They provide greater precision and rotational accuracy than are available from standard turntable bearings.

The unmatched rotational accuracy inherent in TG Series mounted bearings results from a combination of the unique internal geometry of the four-point contact Type X bearing-a design well-known for its ability to minimize axial movement-and the precision of the rings in which we mount them. Our modular, pre-engineered approach to TG Series bearings allows us to combine the benefits of customization with the convenience and economy of an off-the-shelf bearing assembly. This significantly reduces both the lead time and the costs associated with prototyping a bearing for a specific precision application.

TG Series bearing assemblies can be mounted on either vertical or horizontal shafts-without the need for machining operations such as milling, drilling, or grinding.

They are available in geared (internal and external) and non-geared configurations. They also feature a full, formed-ring “snapover” type separator, through-hardened replaceable bearings, space-saving Buna-N seals, optional relube provisions, and they are available in bore sizes from 16" to 30".

Part Number

	TG160	TG180	TG200	TG220	TG250	TG300

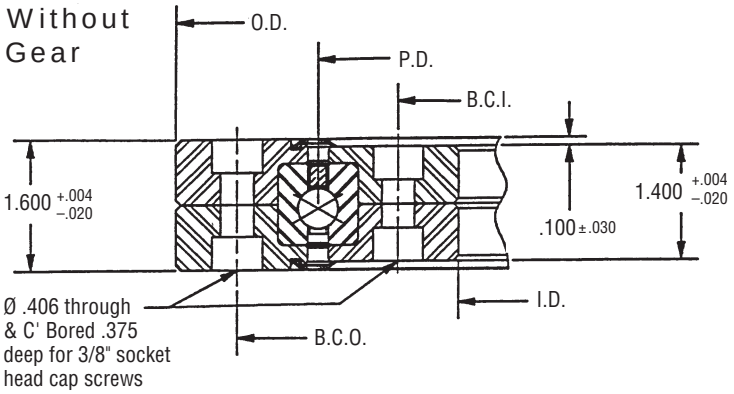
Dimensions and Tolerances

I.D. +000 –.002	13.500	15.500	17.500	19.500	22.500	27.500
O.D. +000 –.002	20.500	22.250	24.500	26.500	29.500	34.500
P.D. (BASIC)	17.000	19.000	21.000	23.000	26.000	31.000
B.C.O. ⊕ .015	19.000	21.000	23.000	25.000	28.000	33.000
B.C.I. ⊕ .015	15.000	17.000	19.000	21.000	24.000	29.000
G.P.D. EXT (BASIC)	20.250	22.250	24.250	26.250	29.250	34.250
# Teeth (EXT)	162	178	194	210	234	274
G.P.D. INT (BASIC)	13.750	15.750	17.750	19.750	22.750	27.750
# Teeth (INT)	110	126	142	158	182	222
# Bolts	12	14	16	18	20	24
C.O.D.	19.818	21.818	23.818	25.818	28.818	33.818
C.I.D.	14.182	16.182	18.182	20.182	23.182	28.182
Axial Runout	.0033	.0033	.0038	.0038	.0038	.0038
Diametral Clearance	.0032 .0042	.0032 .0042	.0036 .0046	.0036 .0046	.0036 .0046	.0036 .0046
Uses R/S BRG	KG 160XP0	KG 180XP0	KG 200XP0	KG 220XP0	KG 250XP0	KG 300XP0

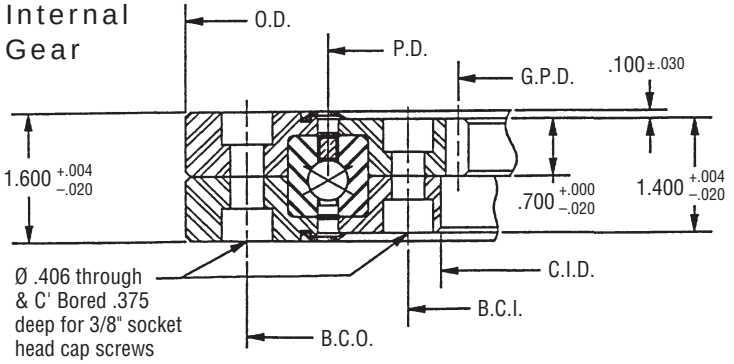
Bearing Capacities

Dynamic Capacity (1 Million Rev. L10)						
Radial (lbs)	10180	10960	11710	12610	13510	15190
Thrust (lbs)	25440	27400	29290	31530	33780	37980
Moment (in-lbs)	86520	104140	123050	149350	175660	235500
Static Capacity (Non-Brinell Limit)						
Radial (lbs)	27900	31190	34470	38570	42680	50890
Thrust (lbs)	69760	77970	86180	96440	106700	127220
Moment (in-lbs)	237210	296300	361970	458410	554860	788780

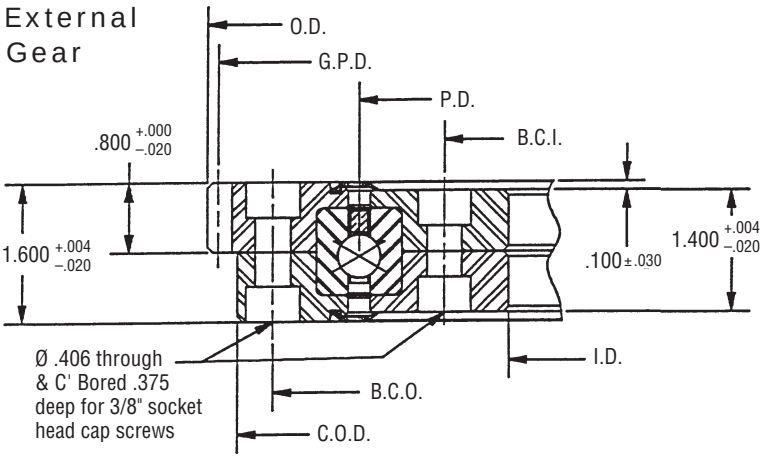
Without Gear



Internal Gear



External Gear



Gear Data – All Sizes

Profile: 8DP, 20°, full depth involute

Precision: AGMA Class 8

Capacity: lbs — Tangential tooth capacity, external gear – 1,700

Tangential tooth capacity, internal gear – 2,000 lbs

Tooth thickness: (Circular) – .196/.191

Section 8—Appendix and Sales Information

Bearing Definitions and Terms

Axial Clearance:

The total amount of free axial movement between the inner and outer race of a bearing. Bearings with internal clearance will contain both axial and radial clearance.

Axial Load:

Also known as thrust load, it is load applied to the bearing parallel with the bearing axis of rotation.

Capacity:

Dynamic capacity is the basic "C" rating which represents a load that the bearing can theoretically endure for 1 million revolutions. Static capacity is the approximate load the bearing can endure before permanent deformation occurs on the ball or raceway.

Deflection:

The amount of movement associated with compression or stretching of bearing components when placed under load.

Diameter Tolerance:

The range in which the average diameter of a bore or O.D. may fall. Reali-Slim bearings are considered "non-rigid" rings and all diameters are averaged using multi-point gaging techniques per ABMA Std. 26.2.

Diametral Clearance:

Also referred to as radial clearance, it is the total free movement of the inner race relative to the outer race in a radial plane. "X" and "C" type bearings are made with some internal clearance as a standard factory internal fit before mounting.

L10 Life:

The theoretical life span of a bearing under a specific set of dynamic operating conditions associated with 90% reliability.

Moment Load:

Load such that when applied to a bearing system, tends to overturn or bend the axis of rotation in an angular direction.

Pitch Diameter:

The theoretical median diameter of a bearing, which passes through the center of the rolling elements. Reali-Slim pitch diameters are equivalent to: (OD+Bore)/2.

Preload:

The amount of load placed on the rolling elements before the application of any external loads. Preload can be created in "X" and "C" type bearings by controlling internal fits of the ball and the raceway at the factory. Preload in angular contact bearings is controlled by a "preload gap" between the duplexed races. Tight mounting conditions will increase the final bearing preload. Preload stiffens the bearing and eliminates axial and radial play, but the load on the balls increases friction and shortens L10 life.

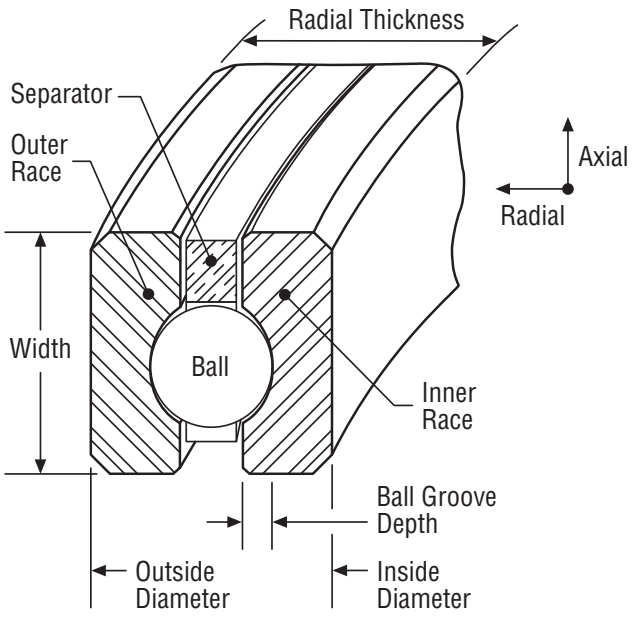
Radial Load:

Load applied perpendicular to the bearing axis of rotation.

Runout:

The maximum axial or radial race wall thickness variation of an inner or outer bearing race. Runout influences the repeatable location variation of rotating components.

Standard bearing nomenclature



Warranty

Seller warrants the products manufactured by it to be free from defects in materials and workmanship only. The extent of Seller's obligation hereunder is to either repair or replace its work or the defective products, F.O.B. Seller's plant, if returned within 12 months after date of delivery. No allowance will be granted for repairs or alterations made by Buyer without Seller's written approval. The warranty shall not be construed to cover the cost of any work done by Buyer on material furnished by Seller or the cost of removal or installation of product. Products and parts not manufactured by Seller are warranted only to the extent and in the manner that the same are warranted to Seller by Seller's vendors and then only to the extent Seller is able to enforce such warranty. There is no other warranty, express or implied in fact or by law.

THE FOREGOING STATES THE SOLE AND EXCLUSIVE WARRANTY OF BUYER AND THE SOLE AND EXCLUSIVE WARRANTY OF SELLER. THE WARRANTIES, STATED IN THIS PARAGRAPH ARE IN LIEU OF ALL OTHER WARRANTIES, WRITTEN OR VERBAL STATUTORY, EXPRESSED OR IMPLIED, INCLUDING WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, WHICH ARE HEREBY DISCLAIMED.

Seller's agreement to sell the products is made upon the condition and agreement that, with respect to the products, there have been no representations or undertakings made by or on behalf of Seller and Seller makes no guarantees or warranties, expressed or implied, in fact or in law, except as expressly stated above.

Changes

Kaydon reserves the right to change specifications and other information (included) in Kaydon bulletins without notice. We recommend that you contact your District Sales Engineer or Kaydon to be sure the information you have is current.

Errors

All information, data, and dimension tables in this manual and Kaydon bulletins have been carefully compiled and thoroughly checked. However, no responsibility for possible errors or omissions can be assumed.

Important Notice

Because of possible danger to persons or property from accidents which may result from the use of the products described in this catalog, it is important that good design practices and correct procedures be followed. The products must be used in accordance with the engineering information provided herein; and proper installation, lubrication, maintenance, and periodic inspection must be assured. It is strongly recommended that appropriate instructions be incorporated in equipment manuals to assure safe operation under all conditions. Proper guards and other suitable safety devices or procedures as may be desirable or as may be specified in safety codes should be provided, and are neither provided by Kaydon nor are the responsibility of Kaydon.

The product capability statements and engineering specifications in this catalog supersede those published in all prior product publications.

Bearing Application Data

Copy, fill out and fax to 231-759-4102

Please answer the questions on this form as completely as possible. Include a drawing (or sketch) of the application if available. Be sure to show all parts and information relevant to the application. The data you supply is the basis for our recommendations.

TO _____ Kaydon Corporation
Muskegon, Michigan 49443 Date _____
Fax: 231/759-4102

FROM _____ Name _____ Title _____
Company _____ Telephone _____
Address _____
Application _____ Project _____
Experimental ❑ Prototype ❑ Production ❑ Special Machine ❑ Other ❑
Quantity _____ Original Equipment Manufacturer ❑ Resale ❑ Own Use ❑ Replacement ❑

LOADS _____ Static Radial (Max. _____ Dynamic Radial (Mean) _____
Static Thrust (Max.) _____ Dynamic Thrust (Mean) _____
Static Moment (Max.) _____ Dynamic Moment (Mean) _____
If mean dynamic loads are unknown, attach all conditions with percent of time each occurs.
Vibration or shock _____ Describe _____
Factor of Safety of _____ (is) (is not) included in loads above.

SPEED _____ RPM (Max.) _____ RPM (Mean) _____ or attach conditions with percent of time.

OSCILLATION____ Angle _____° Frequency_____

ACCURACY _____ Kaydon Precision Class _____ or:
Permissible Eccentricity: Inner _____ Outer_____
Permissible Face Run-Out: Inner _____ Outer_____
Permissible Looseness: Radial_____ Axial_____

LIFE_____ Hours (Min._____ Hours (Avg.) _____ Other _____

TEMPERATURE __ Normal Operating _____°F Minimum _____°F Maximum _____°F.
Differential between shaft and housing _____°F.

LUBRICATION __ Proposed Lubricant _____ and method _____

BEARING _____ Preferred Size: Bore _____Outside Dia. _____Width _____
Min. Bore _____Max. Outside Dia. _____Max. Width_____
Preferred Type: _____
Bearing Axis in (Vertical) (Horizontal) position with (outer) (inner) race rotation relative to load.

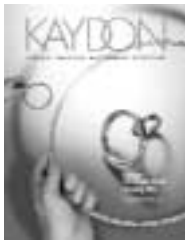
MATERIAL _____ Shaft _____Housing _____

SPECIAL _____ Allowable Bearing Torque _____

REQUIREMENTS__ Sealing _____
Protective Coating _____
Other _____

REMARKS _____ _____
_____

Application Information to Help In Your Designs



1. Reali-Slim thin-section bearings catalog

Complete engineering and selection information on the entire product line. 104-pages. Request Catalog 300.

2. Reali-Slim bearings for special applications

A selection guide for bearings used in high temperature, low torque, cleanroom and chemical environments. 12-pages. Request Catalog 307.

3. An illustrated mounting guide for Reali-Slim bearings

Gives ideas on how to improve designs through better mounting and use of bearing assemblies. 24-pages. Request Catalog 306.

4. Reali-Slim bearings for semiconductor manufacturing equipment

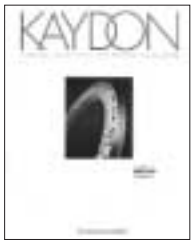
Application guide for bearings which have to deliver unique performance. 12-pages. Request Catalog 305.

5. An illustrated mounting guide for Reali-Slim bearings in semiconductor applications

Generic designs showing how Kaydon Bearings have been used in semiconductor manufacturing equipment. Request Catalog 310. 16 pages.

6. Reali-Design 2000 software on CD

Speeds Reali-Slim bearing selection process. Includes data sheets, life calculations, CAD-ready DXF library, and metric conversions.

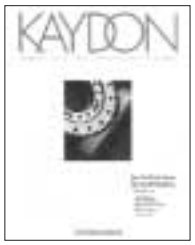


7. Large turntable bearing catalog

Complete engineering and selection information on standard and custom turntable bearings. 32-pages. Request Catalog 390.

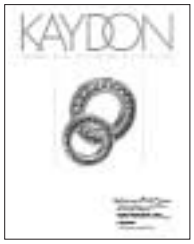
8. Reali-Design II software

Speeds turntable bearing evaluation process through menu-driven calculations.



9. Worm drive rotation systems

Selection guide for pre-tested, compact bearing/worm assemblies for light-to-medium duty applications. 4-pages. Request Catalog 308.



10. Holo-Rol™

Engineering manual and product selection guide for high performance spindle bearings. Request Catalog 312.

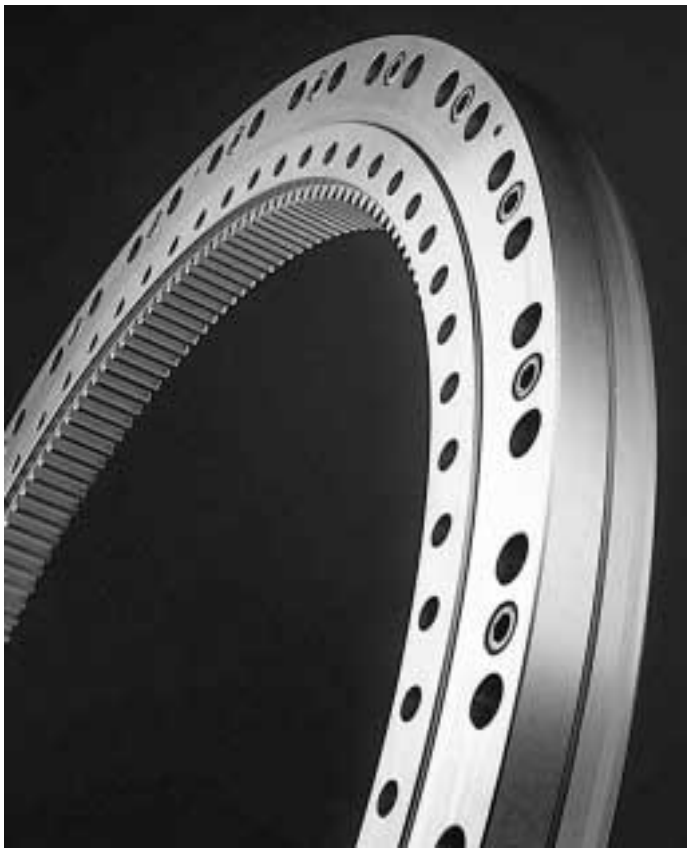
11. Holo-Rol™ Application Guide

Shows how to apply these high performance bearings to machine tool spindles, grinders and other precision equipment. Request Catalog 313.

Custom Turntable Bearings from Kaydon

Custom designs-Our design engineers work with yours to specify the optimum bearing solution for your application.

- Ball and roller bearings in single and multi-row designs.
- Up to 180" O.D.
- Solid and wire race designs.
- Geared races; internal or external.
- Special materials.
- Induction and through hardened races.
- Precision gears, runouts, preloads, and torque control to suit specific applications.



CONTACT KAYDON AT—

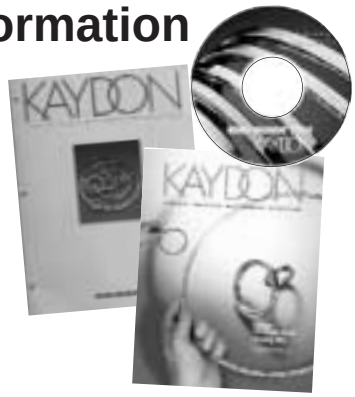
Kaydon Corporation • Muskegon, Michigan 49443
Telephone: 231/755-3741 • Fax: 231/759-4102

NEED SERVICE FAST?

1-800-514-3066

Website: www.kaydonbearings.com

Please send me more information on Reali-Slim® bearings:



- ❑ #300 REALI-SLIM® Bearing Selection Guide
- ❑ #306 REALI-SLIM Mounting Guide
- ❑ #307 REALI-SLIM Special Applications
- ❑ REALI-DESIGN 2000 CD for REALI-SLIM® Bearings

Name _____ Title _____

Company _____ Mailstop/Dept. _____

Address _____ E-mail: _____

City _____ State _____ Zip _____

Phone (____) _____ Fax (____) _____

Printed in U.S.A.

Please send me more information on large bearings:

- ❑ #390 Large Bearing Catalog and Design Manual
- ❑ #308 Worm Drive Rotating System Catalog
- ❑ Stock Turntable Bearing Brochure

Name _____ Title _____

Company _____ Mailstop/Dept. _____

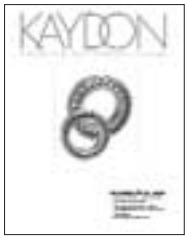
Address _____ E-mail: _____

City _____ State _____ Zip _____

Phone (____) _____ Fax (____) _____

Printed in U.S.A.

Tell me more about the advantages of HOLO-ROL™ bearings and how they can improve grinding machine performance.



- ❑ Please send me HOLO-ROL Bearing Catalog 312.
- ❑ Please send me HOLO-ROL Mounting Guide Catalog 313.
- ❑ Please contact me for a bearing application review.

Types of grinders I work with most are:

❑ Cincinnati-Milacron ❑ Viking ❑ Other

Name _____ Title _____

Company _____ Mailstop/Dept. _____

Address _____ E-mail: _____

City _____ State _____ Zip _____

Phone (____) _____ Fax (____) _____

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