

Aircraft control bearings

Introduction

RHP and its constituent companies have been producing rolling bearings since the turn of the century and specifically for Aerospace from the first powered flight. RHP Aerospace an autonomous Division of RHP Bearings is wholly dedicated to the design and manufacture of bearings for aero engines, transmissions and aircraft controls.

Over the years RHP Aerospace has significantly extended the range of aircraft control bearings to meet the changing requirements of more advanced civil and military aircraft and aerospace vehicles.

The range of bearings listed in this catalogue was designed principally for Aerospace application. Particular emphasis has been given to load capacity - extremes of operating temperature - torque characteristics - weight and environment protection.

Many bearings in the standard range are used with success by other industries where the operating duty involves mainly oscillatory movement. RHP Aerospace should be consulted when proposing the use of full complement bearings for rotational duty and where the operating conditions are outside the scope of this catalogue.

RHP Aerospace has approval for all procedures including design and quality control to NATO AQAP1 Ed. 3.

February 1988

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Introduction (en Francais)

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F

Introduction

RHP et les Societes qui la composent produisent des roulements depuis la fin du siecle dernier et ceci notamment pour l'industrie aerospatiale depuis le premier avion a moteur. RHP Aerospace, division autonome de RHP Bearings, se consacre entierement a la conception et fabrication de roulements pour les moteurs d'avions, les transmissions et systemes de controle d'avions.

D'annee en annee, RHP Aerospace a considerablement augmente sa gamme de roulements de controle d'avions afin de satisfaire les besoins de ses clients pour des avions militaires et civils et des vehicules aero-spatiaux de plus en plus sophistiques.

La gamme de roulements de ce catalogue a principalement ete congue pour des applications aerospaciales. L'accent a ete mis sur la capacite de charge, les temperatures de fonctionnement minimales et maximales, les caracteristiques de torsion, le poids et la protection face a l'environnement.

Quelques industries ont utilise plusieurs roulements de la gamme standard principalement dans des conditions de mouvement oscillatoire. Lorsque le client desire utiliser les roulements dans un mouvement rotatoire et lorsque les conditions de fonctionnement different de celles indiquees dans le catalogue RHP, il devra consulter RHP Aerospace.

Toutes les procedures RHP Aerospace, y compris la conception et le controle qualite, sont approuvees selon la norme OTAN AQAP1 Ed. 3.

D

Einleitung

RHP und seine Grundunternehmen haben Walzlager seit der Jahrhundertwende produziert und besonders fur die Luftfahrt vom ersten motorgetriebenen Flug an. RHP Aerospace, ein selbstandiger Unternehmensbereich von RHP Bearings, widmet sich ganz der Entwicklung und Herstellung von Lagern fur Flugzeugtriebwerke, Getriebe und Flugsteuerungen.

In den vergangenen Jahren hat RHP Aerospace den Umfang von Lagern fur Flugsteuerungen bedeutend erweitert, um dem sich andernden Anforderungen der weiterentwickelten zivilen und militarischen Luft- und Raumfahrtfahrzeugen nachzukommen.

Die in diesem Katalog aufgelisteten Lagerreihen wurden generell fur die Verwendung in der Luftfahrt entwickelt. Dabei ist besonderer Wert auf iibertragbare Lasten - Besonderheiten der Betriebstemperatur - Reibmomenteigenschaften - Gewicht und Schutz vor UmgebungseinfluB gelegt worden.

Viele Lager aus den Standardabmessungen werden erfolgreich von anderen Industriezweigen benutzt, bei denen die Betriebsanforderungen hauptsachlich oszillierende Bewegungen darstellen. RHP Aerospace sollte

zu Rate gezogen werden, wenn die Anwendung von erganzenden Lagern fur Drehbewegungen erforderlich ist und die Betriebsbedingungen auBerhalb des Anwendungsbereiches dieses Katalogs liegen.

RHP Aerospace hat die Zulassung fur alle Verfahren einschlieSlich Entwicklung und Qualitatssicherung nach NATO AQAP1 Ed3.

I

Introduzione

La RHP e le Societa che la costituiscono sono produttori di cuscinetti a rotolamento fino dagli inizi del secolo ed in particolare per il Settore Aeronautico l'impegno RHP risale al primo volo a motore.

La RHP "Aerospace Division", una divisione autonoma della RHP Cuscinetti, e interamente coinvolta nella progettazione e produzione di cuscinetti per motori aeronautici!, scatole di trasmissione e per comandi di volo.

Nel corso degli anni, la RHP "Aerospace Division" ha esteso in maniera significative la propria gamma dei cuscinetti per comandi di volo al fine di soddisfare le esigenze di velivoli civili e militari tecnicamente sempre piu evoluti ed avanzati.

La gamma dei cuscinetti elencati in questo catalogo e stata progettata principalmente per l'applicazione nel Settore Aeronautico. Una particolare importanza viene data alle singole capacita di carico - elevate temperature operative - caratteristiche di resistenza meccanica - peso e protezione da agenti contaminanti.

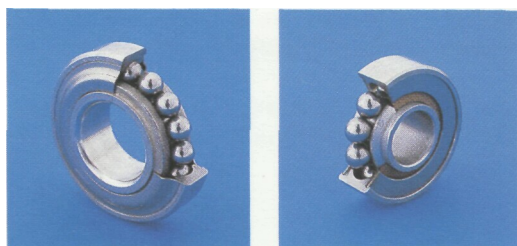
Molti cuscinetti della gamma normale vengono usati con successo in altre Industrie dove l'uso operative implica principalmente dei movimenti oscillatori!.

Il Settore tecnico RHP dovrebbe essere consultato quanto l'impiego dei cuscinetti di questo catalogo non rientra nelle condizioni operative e di funzionalita per gli stessi designati.

La RHP "Aerospace Division" ha l'approvazione per tutte le procedure incluso progettazione e controllo qualita secondo la specifica NATO AQAP1 Ed. 3.

Aircraft control bearings

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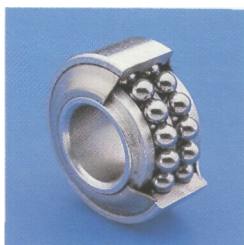
CS

CS-E

Single row radial ball bearings
 Roulements radiales a une rangee de billes
 Einreihige Rillenkugellager
 Cuscinetti radiali ad una corona di sfere

(precision series)
 (serie de precision)
 (prazisionsserien)
 (serie di precisione)

CS	inch	13
CS100	inch	14
CS200	inch	15
CS500	metric	10
CS600	metric	11
CS700	metric	12
MCS100	inch	16
MCS200	inch	17



DCS

Double row radial ball bearings
 Roulements radiales a deux rangees de billes
 Zweireihige Rillenkugellager
 Cuscinetti radiali a due corona di sfere

(precision series)
 (serie de precision)
 (prazisionsserien)
 (serie di precisione)

DCS	inch	19
DCS100	inch	20
DCS500	metric	18
MDCS100	inch	21



T-E

T-E

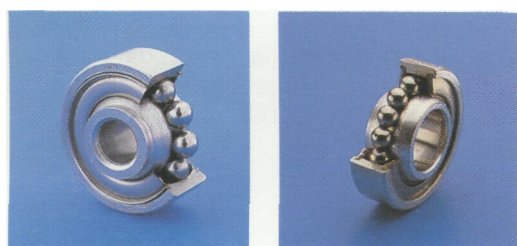
Single row radial ball bearings (light section)
 Roulements radiales a une rangee de billes
 Einreihige Rillenkugellager
 Cuscinetti ad una corona di sfere

(precision series)
 (serie de precision)
 (prazisionsserien)
 (serie di precisione)

T	inch	27
T100	inch	28
T200	inch	29
T300	inch	30
T500	metric	22
T600	metric	23
T700	metric	24
T800	metric	25
T900	metric	26
MT100	inch	31
MT200	inch	32
MT300	inch	33



T-NP



CA

CA-E

Single row self-aligning ball bearings
 Roulements a rotule sur une rangee de billes
 Einreihige Pendelkugellager
 Cuscinetti autoallineanti ad una corona di sfere

(precision series)
 (serie de precision)
 (prazisionsserien)
 (serie di precisione)

CA	inch	34
CA100	inch	35
MCA100	inch	36



DCA-2

Double row self-aligning ball bearings
 Roulements a rotule sur deux rangees de billes
 Zweireihige Pendelkugellager
 Cuscinetti autoallineanti a due corona di sfere

(precision series)
 (serie de precision)
 (prazisionsserien)
 (serie di precisione)

DCA	inch	39
DCA100	inch	40
DCA500	metric	37
DCA800	metric	38
MDCA100	inch	41



CJ

Spherical plain bearings
Rotules metal/metal
Gelenklager
Cuscinetti a strisciamento

CJ	inch	43
CJ500	metric	42



RN

Double row needle roller bearings
Roulements a aiguilles a deux rangees
Zweireihige Nadellager
Cuscinetti a due corona di rullini

RN5000	inch	44
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CP Aluminium



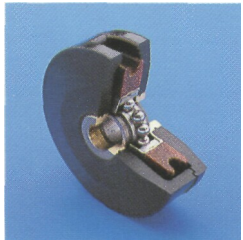
CP Phenolic

Control pulleys
Poulies a cable
Seilrollen
Pulegge di comando

CP (A.S.)	inch	47
CP (Aluminium)	metric	46
CP (EN2081)	metric	45



CE-A



PA

(Control pulleys CE and PA details supplied on request)



FL

Fairleads
Poulie stabilisatrice
Stutzrolle
Cuscinetti Passacavi

FL	metric	48
----	--------	----



CM



CF

Double row self-aligning ball bearing rod ends
Embouts a rotule sur deux rangees de billes
Oesenkopf mit zweireihigen Pendelkugel-
lager
Terminali autoallineanti a doppia corona di
sfere

CF	inch	50
CM	inch	50
CM500	metric	49
SCF100	inch	52
SCM100/200	inch	54

Aircraft control bearings

Designation structure

The RHP designation structure consists of the following:

- Prefix and oblique for special bearings
- Prefix letters for standard variants
- Type letters
- Series and size code
- Suffix letters for variations

EXAMPLE

1A/ SM T 3 39 ENP

1A/	SPECIAL	Indicates special design features
SM	PREFIX for standard variants	<ul style="list-style-type: none"> D = Double row (where standard is single row) S = Corrosion resisting steel M = Precision tolerances C = Profiled flange T800/T900 series
T	TYPE	<ul style="list-style-type: none"> CS = Radial ball bearings CA = Self aligning ball bearings T = Radial ball bearings - Light sections CJ = Spherical plain bearings CF = Rod ends - Internal thread CM = Rod ends - External thread CP = Pulley assemblies FL = Fairleads RN = Needle roller bearings
3	SERIES	
39	SIZE	
ENP	SUFFIX for variations	<ul style="list-style-type: none"> E = Two PTFE coated glass cloth seals Z = Two shields R = Two nitrile rubber seals NP = Not plated NPP = Not plated - passivated S = Rod end without keyway in shank L = Left hand thread (applies to rod ends) H = Non threaded shank L = Inner ring lubrication holes (spherical plain bearings only) B = Aluminium pulley body.f C3 = Radial internal clearance larger than normal R*/* = Special radial internal clearance. Numbers are limits in 0,001mm units, eg R7/13 A*/* = Special axial clearance. Numbers are limits in 0,001mm units. G** = Lubrication code. ** = Number/letter QA** = Technical instruction codes. <p>t Suffix introduced MAY 87, will not be retrospectively applied to control pulleys designed prior to this date.</p>

Dimensional standards and technical specifications

RHP airframe bearings are designed to the following dimensional standards:

International Standard: ISO 1002

British Standard: SP89

European Standards: AECMA EN..

American Standards: MS..

Aircraft Manufacturers Standards: SL. NSA.. FON.. PAN..

They are designed and manufactured to meet the functional requirements of the following technical specifications:

European: EN2063, EN2067, EN2062

American: MIL-B-7949, MIL-B-6039, MIL-P-7034

Bearing selection and application

Airframe bearings in general are of "full complement" design which gives the largest static load carrying capacity for a given cross section.

The majority of airframe bearings have wider inner rings than outer rings to eliminate the need for separate spacers.

- Single/double row radial bearings are intended for use where there is a high static radial and/or high static axial load.
- Single row self aligning bearings are designed to accommodate build misalignment and deflection in the structure. Suitable for radial load only.
- Double row self aligning bearings can accommodate radial and axial loads together with build and operating misalignment.

It is recommended that these bearings are only used in pivoting or slow rotational applications

Materials

RHP use aircraft quality bearing steels.

Radial and self-aligning bearings:-

High carbon chromium steel - SAE 52100 (100C6, AMS 6440, 1.3505, EN2031)

Heat treated to give a hardness of HRc 60-64

Corrosion resisting steel - AISI 440C (Z100CD17, AMS 5630, 1.3544, EN2030)

Heat treated to give a hardness of HRc 58 min.

Rod end bodies:-

Case hardening steel - BS.S15 (12NC12, 1.5924, EN2135)

Heat treated to give raceway hardness of HRc 62-64 core hardness of HRc 24-40

Material references in brackets are for information only.

Plating

Bearings are cadmium plated to provide corrosion protection and to reduce galvanic corrosion of non ferrous housings.

Where specified RHP bearings are cadmium plated to the general requirements of DEF STAN 03-19 (QQ-P-416). The thickness of plating is defined either by the bearing specification or by agreement with customer. RHP will consider the use of approved alternatives to cadmium plating.

RHP where appropriate will apply clear or chromate passivation.

Lubricants

The standard greases used in RHP airframe bearings meet the requirements of NATO G354 and G395.

Bearings are charged with grease to G354 as standard unless otherwise specified. To order bearings charged with G395 the suffix G2 should be added to the RHP designation.

Temperature ranges are as follows:-

G354 -73 °C to +121 °C

G395 -54 °C to +177 °C

Grease quantities

Airframe bearings - Filled 80% min.

Pulley bearings - Filled 66% min.

The provision of alternative greases and charging quantities will be considered when requested.

Associated Grease Codes

NATO Code	UK DEF-STAN	USA MIL-G	FRANCE AIR	TYPE	RHP Code
G354	91-53	23827	4210	Ester Extreme pressure	G1*
G395	91-52	81322	4222	Synthetic Hydrocarbon	G2

* Not marked on boxes.

Tolerances and bearing internal clearances

RHP produce airframe bearings to normal and precision tolerances.

Precision bearings (prefixed M) are manufactured with reduced external and internal tolerances and reduced radial internal clearances.

The boundary tolerances and radial internal clearances are included in the bearing tables.

The running accuracies are listed below:

Symbols

Kia = radial run-out of assembled bearing inner ring.

Kea = radial run-out of assembled bearing outer ring.

Sia = assembled bearing inner ring face run-out with raceway.

Sea = assembled bearing outer ring face run-out with raceway.

Metric bearings

TYPE	Kia mm max	Kea mm max	Sia mm max	Sea mm max
Radial	.025	.040	.040	.040
Self Aligning	.025	.040		

Inch bearings

Normal tolerances

TYPE	Kia mm max	Kea mm max	Sia mm max	Sea mm max
Radial other than T300 and T series	.025	.040	.025	.040
T300 and T.	.050	.040	.050	.040
Self Aligning	.025	.040	—	

Aircraft control bearings

Precision tolerances

TYPE	Kia mm max	Kea mm max	Sia mm max	Sea mm max
MCS100, MCS200 and MDCS100	.013	.020	.018	.025
MT100&MT200	.020	.020	.020	.025
MT300	.020	.020	.020	.020
MCA100 & MCA100	.013	.020	—	—

Load ratings

For airframe bearings when rotation is slow and the requirements for smoothness are not exacting, a greater load rating than the basic ISO R76-1978 static load rating C_{or} is permitted.

The maximum permissible static radial load C_s as used in this catalogue is obtained as follows:-

$$C_s = C_{or} \times \text{Factor (ISO 1002-1983 table 29)}$$

The ultimate static radial load at which the bearing will not fracture but will require replacing at the earliest opportunity is :-

$$C_s \times 1.5$$

The axial load rating F_a only applies while the bearing is stationary.

$$F_a = C_{or} \times \text{Factor (ISO 1002-1983 table 29)}$$

Starting torque

Due to the many factors which can influence starting torque, these are not stated but we can supply specific details on request.

Packaging and storage

RHP airframe bearings are packed so that they are protected from corrosion, contamination and damage during transit. Special packaging is available where storage in high humidity is unavoidable and this need should be advised at the time of ordering.

The shelf life of all sealed and shielded bearings is dependant upon the grease shelf life which is normally a minimum of one year. Pre-greased bearings should be hand rotated prior to use, to verify that the grease has not hardened.

Normal storage conditions should be clean, dry and temperature controlled to 15/25 °C.

Identification

Bearing

RHP airframe bearings are normally marked on the seal retaining rings or shields, but should size preclude this, then only the box is marked.

Normal marking consists of:

RHP designation
RHP
ENGLAND
International reference where required.

Box

Normal marking consists of:

RHP designation
RHP
Lubricant code
Date of packing
International reference where required.
Customer part number where required.

Shaft and housing fitting tolerances

It is very important that seatings do not cause uneven distortion of bearing rings. Correct fitting will ensure accurate bearing load distribution, which will maximise the load carrying capability and minimise starting torque variation of airframe bearings.

When selecting a method of mounting it should be noted that at least half the interference fit will be transferred through the bearing ring causing a reduction in radial internal clearance. For this reason it is recommended that maximum interference fits are not used on self aligning and spherical plain bearings with normal radial internal clearances.

For light alloy housings, when wide variations in temperature or heavy shock loading occurs, special fits or steel liners may be required.

The following general guidelines will give suitable mounting fits when normal temperatures and bearing radial internal clearances are involved.

Metric bearings

Selected mounting fits which are suitable for most metric airframe bearings are listed in Tables 1 and 2. Limits of the relevant ISO tolerance grades are reproduced in Table 3 .

(Full details of the ISO tolerance system are recorded in BS4500).

Table 1. Oscillatory applications

SHAFT	HOUSING			
	NORMAL (TRANSITION FIT)		INTERFERENCE FIT	
STEEL OR LIGHT ALLOY	STEEL	LIGHT ALLOY	STEEL	LIGHT ALLOY
96	J6	K6	K6	M6
	FITTING WITH CRIMPED BUSHES (Bushes to be interference fit in housing)			
	H6			
	FITTING WITH ADHESIVE COMPOUNDS (CLEARANCE FIT)			
G6				

Table 2. Intermittent rotational applications

SHAFT ROTATING AND HOUSING STATIONARY	
SHAFT	HOUSING
J5	H6

HOUSING ROTATING AND SHAFT STATIONARY

Recommended mounting fits are as for oscillatory applications Table 1.

Table 3. ISO Tolerance grades

ISO SHAFT LIMITS (.001mm)					ISO HOUSING LIMITS (.001mm)										
SHAFT DIAMETER					HOUSING BORE DIAMETER										
over incl mm					G6		H6		J6		K6		M6		
					over incl mm										
3-6	-4	-12	+3	-2	10-18	+6	+17	+0	+11	-5	+6	-9	+2	-15	-4
6-10	-5	-14	+4	-2	18-30	+7	+20	+0	+13	-5	+8	-11	+2	-17	-4
10-18	-6	-17	+5	-3	30-50	+9	+25	+0	+16	-6	+10	-13	+3	-20	-4
18-30	-7	-20	+5	-4	50-80	+10	+29	+0	+19	-6	+13	-15	+4	-24	-5
30-50	-9	-25	+6	-5	80-120	+12	+34	+0	+22	-6	+16	-18	+4	-28	-6
50-80	-10	-29	+6	-7											

Inch bearings

Recommended mounting fits for most inch sizes of airframe bearings are listed in Tables 4 and 5.

For advice on bearing series not specified consult RHP Aerospace.

Table 4. Oscillatory applications

BEARING SERIES	SHAFT		HOUSING			
	STEEL AND LIGHT ALLOY (.001 mm)		STEEL (.001 mm)		LIGHT ALLOY (.001 mm)	
CS100, CS200 CA100, DCA100 DCS100.	-13	-25	-13	-25	-18	-31
MCS100, MCS200 MCA100, MDCA100 MDCS100	-8	-20	-10	-23	-15	-28
T116, T216	-13	-25	+25	+0	+25	+0
T121-T149 T212-T249	-25	-51	+25	+0	+25	+0
MT116-MT149	-13	-25	+13	-13	+13	-13
MT216-MT249	-13	-25	+25	+0	+25	+0
T338-T343	-18	-43	+25	+0	+25	+0
T344-T346	-25	-51	+25	+0	+25	+0
MT338-MT343	-13	-25	+0	-13	+0	-13
MT344-MT346	-20	-33	+0	-13	+0	-13

Table 5. Intermittent rotational applications

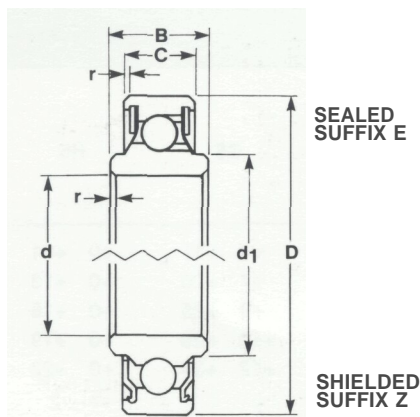
BEARING SERIES	SHAFT ROTATING HOUSING STATIONARY			
	BEARING BORE mm Up to & Incl.	SHAFT (.001 mm)	BEARING OUTSIDE DIA. mm Over - Incl.	HOUSING (.001 mm)
CS100, CS200 CA100, DCA100 DCS100 MCS100, MCS200 MCA100, MDCA100 MDCS100	32	-5 +8	15-31 31-50 50-61	-3 +10 -3 +13 -3 +18

BEARING SERIES	HOUSING ROTATING SHAFT STATIONARY			
	BEARING BORE mm Up to & Incl.	SHAFT (.001 mm)	BEARING OUTSIDE DIA. mm Over - Incl.	HOUSING (.001 mm)
CS100, CS200 CA100, DCA100 DCS100 MCS100, MCS200 MCA100, MDCA100 MDCS100	32	-20 -8	15-31 31-50 50-61	-15 -3 -18 -3 -20 +0

Aircraft control bearings

CS 500 series

Single row radial ball bearing



BSI Series 3SP89 Table 1
ISO Series R1002 Table 1
AECMA Series EN2013

Bearing	Measurement in mm		B	C	d _n Nom	Chamfer at 45° r	Limit load rating		RIC	Approx Mass g
	d	D					C _s kN	F _a kN		
CS505	5.000 4.992	16.000 15.992	7.00 6.88	5.00 4.88	7.1	.8 .3	6.94	3.10	.002/.013	6
CS506	6.000 5.992	19.000 18.991	8.00 7.88	6.00 5.88	8.4	.8 .3	9.60	4.28	.002/.013	9
CS508	8.000 7.992	22.000 21.991	9.00 8.88	7.00 6.88	10.6	.8 .3	12.12	5.41	.002/.013	14
CS510	10.000 9.992	26.000 25.991	10.00 9.88	8.00 7.88	12.6	.8 .3	17.18	7.67	.002/0.13	21
CS512	12.000 11.992	28.000 27.991	10.00 9.88	8.00 7.88	14.7	.8 .3	20.31	9.06	.003/.018	24
CS515	15.000 14.992	32.000 31.989	11.00 10.88	9.00 8.88	17.7	.8 .3	23.43	10.46	.003/.018	34
CS517	17.000 16.992	35.000 34.989	12.00 11.88	10.00 9.88	20.2	.8 .3	27.55	12.30	.003/.018	42
CS520	20.000 19.990	42.000 41.989	14.00 13.88	12.00 11.88	23.5	.8 .3	41.66	18.60	.005/.020	72
CS525	25.000 24.990	47.000 46.989	14.00 13.88	12.00 11.88	28.6	.8 .3	49.99	22.32	.005/.020	85
CS530	30.000 29.990	55.000 54.987	15.00 14.88	13.00 12.88	34.1	1.0 .3	66.79	29.82	.005/.020	123

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
SHIELDS - Corrosion Resisting Steel
SEALS - PTFE coated glass cloth

ADDITIONAL AECMA STANDARDS:

EN 2012
Non Plated High Carbon Chromium Steel eg CS 505ENP
EN 2014
Non Plated Corrosion Resisting Steel eg SCS 505ENP

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

For shaft and housing fits see pages 8 and 9

LUBRICATION:

Normally charged with grease to NATO G-354

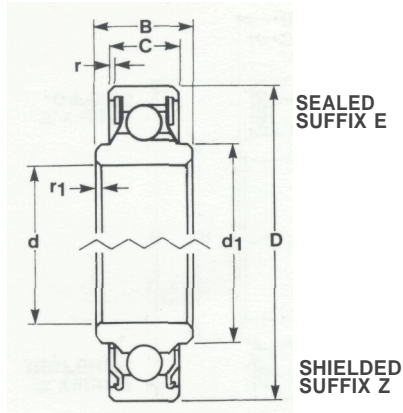
DESIGNATION MODIFIERS:

PREFIX S Corrosion Resisting Steel AISI 440C
SUFFIX E Sealed
Z Shielded
NP Not cadmium plated
G2 Grease to NATO G-395



CS 600 series

Single row radial ball bearing



BSI Series 3SP89 Table 2
ISO Series R1002 Table 2

Bearing	Measurement in mm					Chamfer at 45° r	Limit load rating		RIC	Approx Mass g
	d	D	B	C	d, Nom		C _s kN	F _a kN		
CS610	10.000	30.000	11.00	9.00	12.6	.8	24.80	11.07	.002/.013	34
	9.992	29.991	10.88	8.88		.3				
CS612	12.000	32.000	12.00	10.00	14.7	.8	27.28	12.18	.003/.018	41
	11.992	31.989	11.88	9.88		.3				
CS615	15.000	35.000	13.00	11.00	17.7	.8	31.92	14.25	.003/.018	50
	14.992	34.989	12.88	10.88		.3				
CS617	17.000	40.000	14.00	12.00	20.2	.8	40.32	18.00	.003/.018	74
	16.992	39.989	13.88	11.88		.3				
CS620	20.000	47.000	16.00	14.00	23.5	.8	56.42	25.19	.005/.020	115
	19.990	46.989	15.88	13.88		.3				
CS625	25.000	52.000	17.00	15.00	29.0	.8	73.51	32.82	.005/.020	139
	24.990	51.987	16.88	14.88		.3				
CS630	30.000	62.000	18.00	16.00	34.1	.8	93.74	41.85	.005/.020	214
	29.990	61.987	17.88	15.88		.3				

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
SHIELDS - Corrosion Resisting Steel
SEALS - PTFE coated glass cloth

For shaft and housing fits see pages 8 and 9

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

LUBRICATION:

Normally charged with grease to NATO G-354

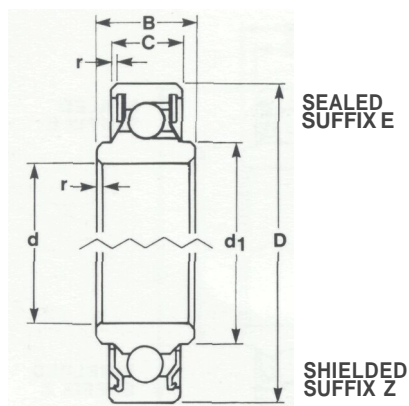
DESIGNATION MODIFIERS:

PREFIX S Rings & balls in Corrosion Resisting Steel AISI 440C
SUFFIX E Sealed
Z Shielded
NP Not cadmium plated
G2 Grease to NATO G-395

Aircraft control bearings

CS 700 series

Single row radial ball bearing



Bearing	Measurement in mm					Chamfer at 45° r +0.5 -0	Limit load rating		RIC	Approx Mass g
	d +0.000 -0.008	D +0.000 -0.009	B +0.00 -0.10	C +0.00 -0.10	d, Nom		Radial C, kN	Axial F, kN		
CS708	8.000	22.000	11.00	7.00	10.6	.3	12.12	5.41	.003/.011	14
CS710	10.000	26.000	12.00	8.00	12.6	.3	17.18	7.67	.003/.011	22
CS712	12.000	28.000	12.00	8.00	14.7	.3	20.31	9.06	.003/.011	26
CS715	15.000	32.000	13.00	9.00	17.7	.3	23.43	10.46	.003/.011	35
CS717	17.000	35.000	14.00	10.00	20.2	.3	27.55	12.30	.003/.011	45
CS720	20.000	42.000	16.00	12.00	23.5	.3	41.66	18.60	.005/.013	75
CS725	25.000*	47.000	16.00	12.00	28.6	.3	49.99	22.32	.005/.013	88
CS730	30.000*	55.000t	19.00	13.00	34.1	.3	66.79	28.92	.005/.013	133

* Tolerance is +.000/-0.009
t Tolerance is +.000/-0.011

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
SHIELDS - Corrosion Resisting Steel
SEALS - PTFE coated glass cloth

For shaft and housing fits see pages 8 and 9.

PROTECTION:

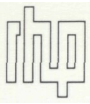
All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

LUBRICATION:

Normally charged with grease to NATO G-354

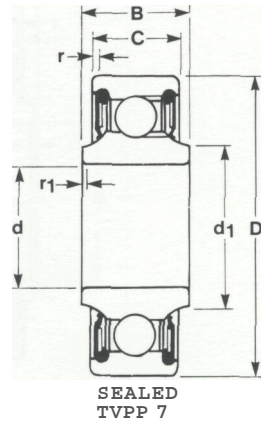
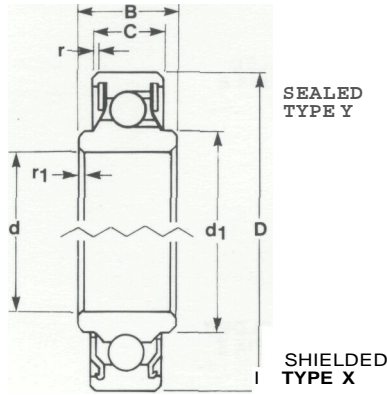
DESIGNATION MODIFIERS:

PREFIX S Corrosion Resisting Steel AISI 440C
SUFFIX E Sealed
Z Shielded
NP Not cadmium plated
G2 Grease to NATO G-395



CS series

Single row radial ball bearing



Bearing	Measurement in mm				d, Nom	Limit load rating			RIC	Approx Mass g	Type	
	d	D	B	d ₁		Min	Min	Radial C _s kN				Axial F _a kN
	+0.005 -0.008 +0.0002 -0.0003	-0.008 -0.020 -0.0003 -0.0008	+0.00 -0.13 +0.000 -0.005	+0.00 -0.13 +0.000 -0.005								
CS0	4.8209 .1898	15.8750 .6250	6.3500 .2500	5.1587 .2031	7.163 .282	.406 .016	.406 .016	6.94	3.10	.003/.013	5	X
CS1	6.3500 .2500	19.0500 .7500	7.9375 .3125	5.5575 .2188	9.042 .356	.635 .025	.406 .016	8.33	3.72	.003/.013	10	X
CS1-1	6.3500 .2500	19.0500 .7500	11.1125 .4375	5.5575 .2188	9.042 .356	.635 .025	.406 .016	8.33	3.72	.003/.013	11	X
CS1-3R	6.3449 .2498	19.0576 .7503	7.1374 .2810	5.5626 .2190	8.788 .346	.381 .015	.381 .015	8.33	3.72	.003/.013	8	Z
CS1-4R	6.3449 .2498	22.9032 .9017	12.2936 .4840	8.5090 .3350	10.947 .431	1.016 .040	.762 .030	13.02	5.81	.003/.013	19	Z
CS2-2R	7.9324 .3123	20.6451 .8128	7.5438 .2970	5.9436 .2340	10.516 .414	.381 .015	.381 .015	9.72	4.34	.003/.013	10	Z
CSS	9.5250 .3750	22.2250 .8750	7.9375 .3125	5.5575 .2188	12.217 .481	.762 .030	.406 .016	11.11	4.96	.003/.013	12	X
CS3-1	9.5250 .3750	22.2250 .8750	11.1125 .4375	5.5575 .2188	12.217 .481	.635 .025	.406 .016	11.11	4.96	.003/.013	13	X
CS3-2	9.5250 .3750	22.2250 .8750	12.7000 .5000	5.5575 .2188	12.217 .481	.635 .025	.406 .016	11.11	4.96	.003/.013	14	X
CS3-3E	9.5250 .3750	22.2250 .8750	7.9375 .3125	5.5575 .2188	11.557 .455	.406 .016	.762 .030	11.11	4.96	.003/.013	11	Y
CSS	12.7000 .5000	28.5750 1.1250	9.5250 .3750	6.3500 .2500	16.256 .640	.889 .035	.381 .015	17.36	7.75	.003/.018	24	X
CS5-1R	12.6949 .4998	42.8701 1.6878	15.7480 .6200	12.7000 .5000	19.050 .750	.889 .035	.889 .035	52.51	23.44	.003/.018	99	Z
CS5-2E	12.7000 .5000	28.5750 1.1250	9.5250 .3750	6.3500 .2500	16.205 .638	.838 .033	.381 .015	17.36	7.75	.003/.018	23	Y
CS7	15.8750 .6250	34.9250 1.3750	10.3200 .4063	7.1450 .2813	20.574 .810	.838 .033	.787 .031	26.56	11.86	.003/.018	40	X

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100

SHIELDS - Corrosion Resisting Steel TYPE X

SEALS - PTFE coated glass cloth TYPE Y
Nitrile rubber bonded to steel insert TYPE Z

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEFSTAN 03-19

For shaft and housing fits consult RHP

LUBRICATION:

Normally charged with grease to NATO G-354

DESIGNATION MODIFIERS:

PREFIX S Rings & balls in Corrosion Resisting Steel AISI 440C

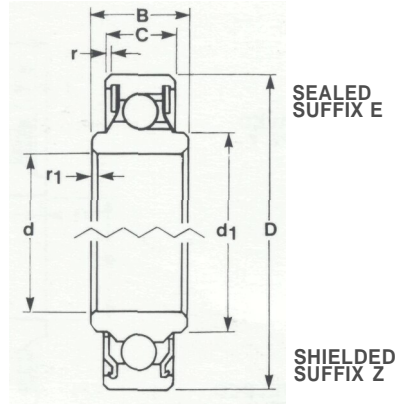
SUFFIX NP Not plated

G2 Grease to NATO G-395

Aircraft control bearings

CS 100 series

Single row radial ball bearing



BSI Series 3SP89 Table 12
 ISO Series R1002 Table 12
 MIL Series MS27640 (when suffix E specified)

Bearing	Measurement in mm		Measurement in inches		d,	Chamfer at 45°		Limit load rating		RIC (MS27640)	Approx Mass g
	d	D	B	C		r,	r	Radial C _s kN	Axial F _a kN		
	+0.00 -0.013 +0.0000 -0.0005	+0.00 -0.013 +0.0000 -0.0005	+0.00 -0.13 +0.000 -0.005	+0.00 -0.13 +0.000 -0.005	Nom	+0.38 -0.00 +0.015 -0.000	+0.38 -0.00 +0.015 -0.000	Radial C _s kN	Axial F _a kN	RIC (MS27640)	Approx Mass g
CS103A	4.8260 .1900	15.8750 .6250	6.223 .245	5.156 .203	7.112 .280	.127 .005	.254 .010	6.94	3.11	.010/.025	5
CS103	4.8260 .1900	19.7460 .7774	7.544 .297	6.858 .270	8.407 .331	.127 .005	.559 .022	8.36	4.00	.010/.025	14
CS104	6.3500 .2500	22.8956 .9014	12.294 .484	8.509 .335	9.906 .390	.127 .005	.813 .032	11.94	5.33	.010/.025	18
CS105	7.9375 .3125	31.7500 1.2500	14.173 .558	9.525 .375	11.913 .469	.381 .015	.813 .032	25.00	11.16	.010/.025	41
CS106	9.5250 .3750	36.5125 1.4375	15.748 .620	11.913 .469	15.011 .591	.381 .015	.813 .032	35.18	15.57	.010/.025	68
CS108	12.7000 .5000	42.8625 1.6875	15.748 .620	12.700 .500	19.507 .768	.381 .015	1.118 .044	52.51	23.44	.010/.025	95
CS110	15.8750 .6250	49.2125 1.9375	15.748 .620	12.700 .500	21.590 .850	.381 .015	1.118 .044	62.72	27.58	.010/.025	127

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
 SHIELDS - Corrosion Resisting Steel
 SEALS - PTFE coated glass cloth

For shaft and housing fits see page 9

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

LUBRICATION:

Normally charged with grease to NATO G-354

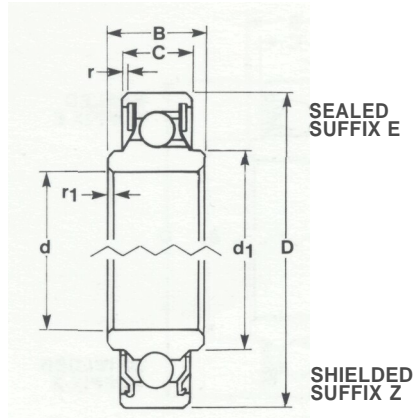
DESIGNATION MODIFIERS:

PREFIX M Precision series—see page 16
 S Corrosion Resisting Steel AISI 440C
 SUFFIX E Sealed
 Z Shielded
 NP Not cadmium plated
 G2 Grease to NATO G-395



CS 200 series

Single row radial ball bearing



BSI Series 3SP89 Table 11
 ISO Series R1002 Table 11
 MS27641 (when suffix E specified)

Bearing	Measurement in mm		Measurement in inches		d _s	Chamfer at 45°		Limit load rating		RIC (MS27641)	Approx Mass g
	d	D	B	C		r _s	r	Radial C _r kN	Axial F _a kN		
	+0.000 -0.013 +0.000 -0.0005	+0.000 -0.013 +0.000 -0.0005	+0.00 -0.13 +0.00 -0.005	+0.00 -0.13 +0.00 -0.005	Nom	+0.38 -0.00 +0.015 -0.000	+0.38 -0.00 +0.015 -0.000				
CS203A	4.8260 .1900	12.7000 .5000	6.020 .237	4.978 .196	6.553 .258	.127 .005	.305 .012	4.31	1.91	.010/.025	4
CS203	4.8260 .1900	15.8750 .6250	7.544 .297	5.944 .234	7.544 .297	.127 .005	.406 .016	6.94	3.11	.010/.025	5
CS204	6.3500 .2500	19.0500 .7500	7.137 .281	5.563 .219	9.144 .360	.127 .005	.406 .016	8.36	4.00	.010/.025	8
CS205	7.9375 .3125	20.6375 .8125	7.544 .297	5.944 .234	10.439 .411	.381 .015	.406 .016	9.74	4.45	.010/.025	10
CS206	9.5250 .3750	22.2250 .8750	7.950 .313	6.350 .250	12.650 .498	.381 .015	.406 .016	11.12	4.89	.010/.025	12
CS208	12.7000 .5000	28.5750 1.1250	9.525 .375	7.950 .313	15.646 .616	.381 .015	.406 .016	17.39	7.56	.010/.025	23
CS210	15.8750 .6250	34.9250 1.3750	10.312 .406	8.738 .344	19.355 .762	.381 .015	.813 .032	29.80	13.34	.010/.025	39
CS212	19.0500 .7500	41.2750 1.6250	11.100 .437	9.525 .375	24.003 .945	.381 .015	.813 .032	41.66	18.60	.010/.025	59
CS216	25.4000 1.0000	50.8000 2.0000	12.700 .500	11.125 .438	31.521 1.241	.381 .015	.813 .032	52.93	23.13	.010/.025	100
CS220	31.7500 1.2500	57.1500 2.2500	12.700 .500	11.125 .438	37.541 1.478	.381 .015	.813 .032	61.38	27.13	.010/.025	118

MATERIALS:

- RINGS & BALLS - High Carbon Chromium Steel SAE 52100
- SHIELDS - Corrosion Resisting Steel
- SEALS - PTFE coated glass cloth

For shaft and housing fits see page 9

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

LUBRICATION:

Normally charged with grease to NATO G-354

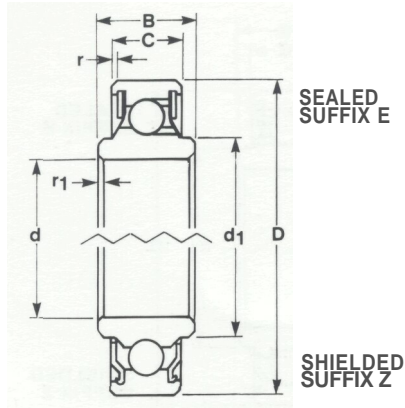
DESIGNATION MODIFIERS:

- PREFIX M Precision series—see page 17
- S Corrosion Resisting Steel AISI 440C
- SUFFIX E Sealed
- Z Shielded
- NP Not cadmium plated
- G2 Grease to NATO G-395

Aircraft control bearings

MCS 100 series

Single row radial ball bearing



Bearing	Measurement in mm		Measurement in inches		d _i	Chamfer at 45°		Limit load rating		RIC	Approx Mass
	d	D	B	C		r _i	r	Radial	Axial		
	+0.00 -0.08 +.0000 -0.0003	+0.00 -0.10 +.0000 -0.0004	+0.00 -0.064 +.0000 -0.0025	+0.0 -0.13 +.000 -0.005	Nom	+0.38 -0.00 +.015 -0.000	+0.38 -0.00 +.015 -0.000	C ₅ kN	F _a kN		g
MCS103A	4.8260 .1900	15.8750 .6250	6.223 .245	5.156 .203	7.112 .280	.127 .005	.254 .010	6.94	3.11	.005/.013	5
MCS103	4.8260 .1900	19.7460 .7774	7.544 .297	6.858 .270	8.407 .331	.127 .005	.559 .022	8.36	4.00	.005/.013	14
MCS104	6.3500 .2500	22.8956 .9014	12.294 .484	8.509 .335	9.906 .390	.127 .005	.813 .032	11.94	5.33	.005/.013	18
MCS105	7.9375 .3125	31.7500 1.2500	14.173 .558	9.525 .375	11.913 .469	.381 .015	.813 .032	25.00	11.16	.005/.013	41
MCS106	9.5250 .3750	36.5125 1.4375	15.748 .620	11.913 .469	15.011 .591	.381 .015	.813 .032	35.18	15.57	.005/.013	68
MCS108	12.7000 .5000	42.8625 1.6875	15.748 .620	12.700 .500	19.507 .768	.381 .015	1.118 .044	52.51	23.44	.005/.013	95
MCS110	15.8750 .6250	49.2125 1.9375	15.748 .620	12.700 .500	21.590 .850	.381 .015	1.118 .044	62.72	27.58	.005/.013	127

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
SHIELDS - Corrosion Resisting Steel
SEALS - PTFE coated glass cloth

For shaft and housing fits see page 9

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

LUBRICATION:

Normally charged with grease to NATO G-354

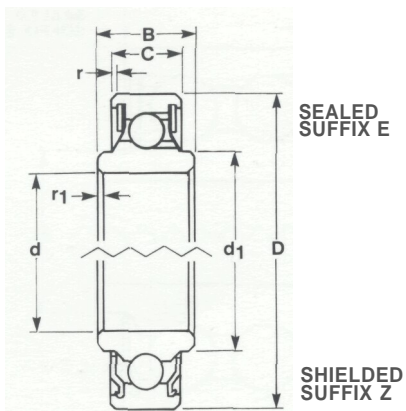
DESIGNATION MODIFIERS:

PREFIX S Corrosion Resisting Steel AISI 440C
SUFFIX E Sealed
Z Shielded
NP Not cadmium plated
G2 Grease to NATO G-395



MCS 200 series

Single row radial ball bearing



Bearing	Measurement in mm		Measurement in inches		d _i	Chamfer at 45°		Limit load rating		RIC	Approx Mass
	d	D	B	C		r _i	r	Radial	Axial		
	+0.00 -0.08 +0.000 -0.0003	+0.00 -0.10 +0.000 -0.0004	+0.00 -0.064 +0.000 -0.0025	+0.0 -0.13 +0.000 -0.005	Nom	+0.38 -0.0 +0.015 -0.000	+0.38 -0.0 +0.015 -0.000	C _s kN	F _a kN		g
MCS203A	4.8260 .1900	12.7000 .5000	6.020 .237	4.978 .196	6.553 .258	.127 .005	.305 .012	4.31	1.91	.005/.013	4
MCS203	4.8260 .1900	15.8750 .6250	7.544 .297	5.944 .234	7.544 .297	.127 .005	.406 .016	6.94	3.11	.005/.013	5
MCS204	6.3500 .2500	19.0500 .7500	7.137 .281	5.563 .219	9.144 .360	.127 .005	.406 .016	8.36	4.00	.005/.013	8
MCS205	7.9375 .3125	20.6375 .8125	7.544 .297	5.944 .234	10.439 .411	.381 .015	.406 .016	9.74	4.45	.005/.013	10
MCS206	9.5250 .3750	22.2250 .8750	7.950 .313	6.350 .250	12.573 .495	.381 .015	.406 .016	11.12	4.89	.005/.013	12
MCS208	12.7000 .5000	28.5750 1.1250	9.525 .375	7.950 .313	15.646 .616	.381 .015	.406 .016	17.39	7.56	.005/.013	23
MCS210	15.8750 .6250	34.9250 1.3750	10.312 .406	8.738 .344	19.355 .762	.381 .015	.813 .032	29.80	13.34	.005/.013	39
MCS212	19.0500 .7500	41.2750 1.6250	11.100 .437	9.525 .375	24.003 .945	.381 .015	.813 .032	41.66	18.60	.005/.013	59
MCS216	25.4000 1.0000	50.8000 2.0000	12.700 .500	11.125 .438	31.521 1.241	.381 .015	.813 .032	52.93	23.13	.005/.013	100
MCS220	31.7500 1.2500*	57.1500 2.2500	12.700 .500	11.125 .438	37.541 1.478	.381 .015	.813 .032	61.38	27.13	.005/.013	118

MATERIALS:

- RINGS & BALLS - High Carbon Chromium Steel SAE 52100
- SHIELDS - Corrosion Resisting Steel
- SEALS - PTFE coated glass cloth

For shaft and housing fits see page 9

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

LUBRICATION:

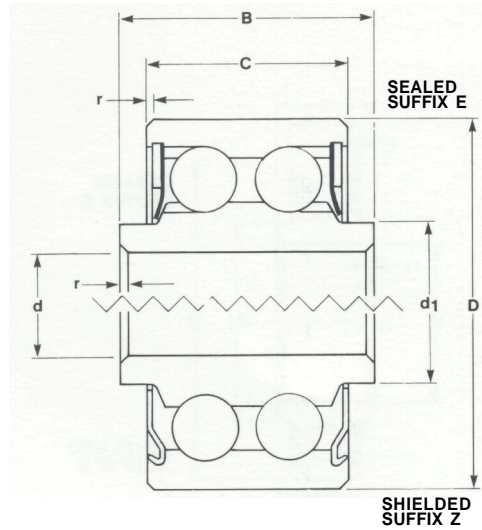
Normally charged with grease to NATO G-354

DESIGNATION MODIFIERS:

- PREFIX S Corrosion Resisting Steel AISI 440C
- SUFFIX E Sealed
- Z Shielded
- NP Not cadmium plated
- G2 Grease to NATO G-395

Aircraft control bearings

DCS 500 series Double row radial ball bearing



Bearing	Measurement in mm		B	C	d, Nom	Chamfer at 45° r	Limit load rating		Diagonal Clearance	Approx Mass g
	d	D					Radial C _s kN	Axial F _a kN		
DCS508	8.000	22.000	22.00	17.00	10.6	.8	24.00	10.91	.050/.250	30
	7.992	21.991	21.88	16.88		.3				
DCS510	10.000	26.000	24.00	18.00	12.6	.8	34.40	15.64	.050/.250	52
	9.992	25.991	23.88	17.88		.3				
DCS512	12.000	28.000	24.00	18.00	14.7	.8	40.40	18.36	.050/.250	60
	11.992	27.991	23.88	17.88		.3				
DCS515	15.000	32.000	26.00	20.00	17.7	.8	47.00	21.36	.050/.250	80
	14.992	31.989	25.88	19.88		.3				
DCS517	17.000	35.000	28.00	22.00	20.2	.8	53.80	24.45	.050/.250	100
	16.992	34.989	27.88	21.88		.3				
DCS520	20.000	42.000	32.00	26.00	23.5	.8	83.00	37.73	.050/.250	165
	19.990	41.989	31.88	25.88		.3				

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
SHIELDS - Corrosion Resisting Steel
SEALS - PTFE coated glass cloth

ADDITIONAL AECMA STANDARDS:

EN 3056
Non Plated High Carbon Chromium Steel eg DCS 505ENP
EN 3058
Non Plated Corrosion Resisting Steel eg SDCS 505ENP

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

For shaft and housing fits see pages 8 and 9

LUBRICATION:

Normally charged with grease to NATO G-354

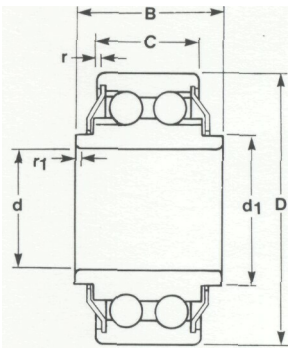
DESIGNATION MODIFIERS:

PREFIX S Corrosion Resisting Steel AISI 440C
SUFFIX E Sealed
Z Shielded
NP Not cadmium plated
G2 Grease to NATO G-395

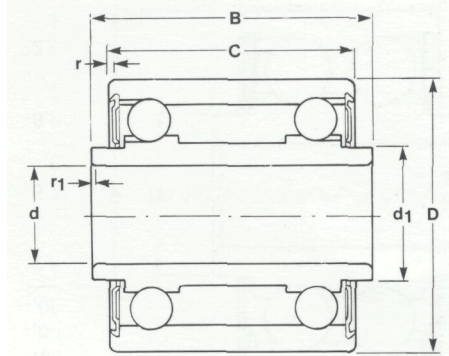


DCS series

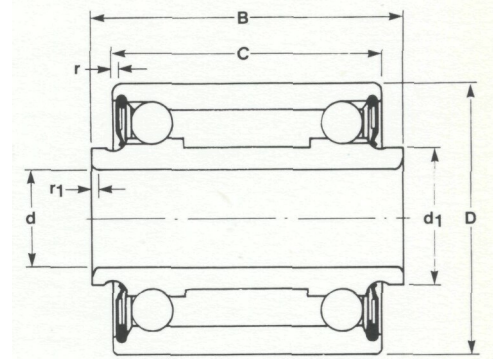
Double row radial ball bearing



TYPE W



TYPE X



TYPE Y

Bearing	Measurement in mm		Measurement in inches		d	r	r	Limit load rating			Approx Mass	Type
	d	D	B	C				Radial	Axial	RIC		
	+0.00	+0.00	+0.00	+0.00	Nom	Min	Min	C _s	F _a			
	-0.013	-0.013	-0.005	-0.005				kN	kN		g	
	+0.000	+0.000	+0.000	+0.000								
	-0.0005	-0.0005	-0.005	-0.005								
DCS1R	6.3500	19.0500	22.2250	19.0500	9.042	.381	.381	16.66	5.95	.003/.013	27	Y
	.2500	.7500	.8750	.7500	.356	.015	.015					
DCS1-1R	6.3500*	19.0500t	17.0002	11.9990	9.042	.508	.508	16.66	5.95	.003/.013	19	Y
	.2500	.7500	.6693	.4724	.356	.020	.020					
DCS2	7.9375	22.2250	23.8125	20.6375	10.922	.381	.381	22.85	8.16	.003/.013	38	X
	.3125	.8750	.9375	.8125	.430	.015	.015					
DCS3-5R	9.5250	26.9875	30.1625	26.9875	13.005	.381	.381	37.50	13.39	.003/.013	70	Y
	.3750	1.0625	1.1875	1.0625	.512	.015	.015					
DCS5	12.7051	28.5674	15.8750	11.1125	16.256	.838	.381	34.72	12.40	.003/.018	42	W
	.5002	1.1247	.6250	.4375	.640	.033	.015					

* Tolerance is +.000/-0.008
 +.0000/-0.0003
 † Tolerance is +.000/-0.010
 +.0000/-0.0004

MATERIALS:

- RINGS & BALLS - High Carbon Chromium Steel SAE 52100
- SHIELDS - Corrosion Resisting Steel TYPES W & X
- SEALS - Nitrile rubber bonded to steel insert TYPE Y

For shaft and housing fits consult RHP

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

LUBRICATION:

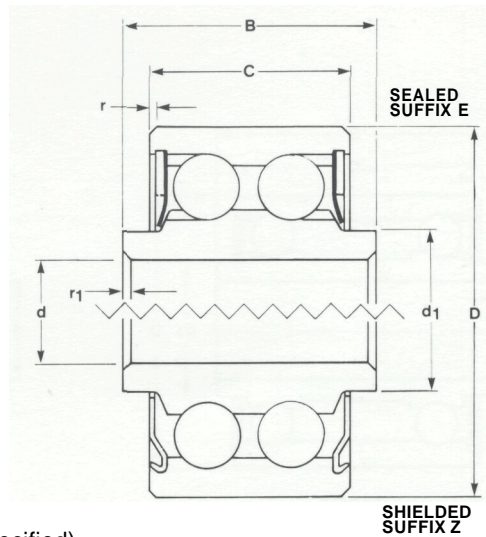
Normally charged with grease to NATO G-354

DESIGNATION MODIFIERS:

- PREFIX S Rings & balls in Corrosion Resisting Steel AISI 440C
- SUFFIX G2 Grease to NATO G-395

Aircraft control bearings

DCS 100 series Double row radial ball bearing



BSI Series 3SP89 Table 15
ISO Series R1002 Table 15
MIL Series MS27644 (when suffix E specified)

Bearing	Measurement in mm				d _s	Chamfer at 45°		Limit load rating		RIC (MS27644)	Approx Mass g
	d	D	B	C		r _s	r	C _s kN	F _a kN		
	+0.00 -0.013	+0.00 -0.013	+0.0 -0.13	+0.0 -0.13	Nom	+0.38 -0.00	+0.38 -0.00	Radial	Axial		
	+0.0000 -0.0005	+0.0000 -0.0005	+0.000 -0.005	+0.000 -0.005		+0.015 -0.000	+0.015 -0.000	C _s kN	F _a kN		
DCS103	4.8260 .1900	19.7460 .7774	12.573 .495	12.014 .473	7.671 .302	.127 .005	.457 .018	21.70	7.75	.010/.025	18
DCS104	6.3500 .2500	22.8956 .9014	15.748 .620	12.471 .491	9.957 .392	.127 .005	.813 .032	23.89	8.01	.010/.025	29
DCS105	7.9375 .3125	31.7500 1.2500	18.923 .745	17.450 .687	11.913 .469	.381 .015	.813 .032	49.59	17.71	.010/.025	77
DCS106	9.5250 .3750	36.5125 1.4375	22.098 .870	20.168 .794	13.995 .551	.381 .015	.813 .032	70.31	25.11	.010/.025	118
DCS108	12.7000 .5000	42.8625 1.6875	23.673 .932	21.742 .856	18.669 .735	.381 .015	1.118 .044	105.01	37.51	.010/.025	172
DCS110	15.8750 .6250	49.2125 1.9375	25.273 .995	23.368 .920	22.606 .890	.381 .015	1.118 .044	126.33	41.81	.010/.025	240

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
SHIELDS - Corrosion Resisting Steel
SEALS - PTFE coated glass cloth

For shaft and housing fits see page 9

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

LUBRICATION:

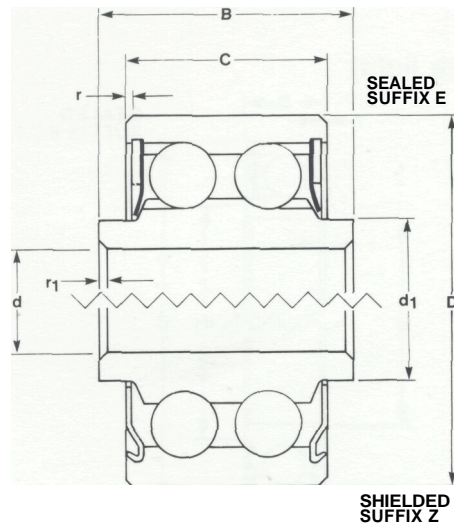
Normally charged with grease to NATO G-354

DESIGNATION MODIFIERS:

PREFIX M Precision series—see page 21
S Corrosion Resisting Steel AISI 440C
SUFFIX E Sealed
Z Shielded
NP Not cadmium plated
G2 Grease to NATO G-395



MDCS 100 series Double row radial ball bearing



Bearing	Measurement in mm		Measurement in inches		d ₁	Chamfer at 45°		Limit load rating		RIC	Approx Mass
	d	D	B	C		r ₁	r	C _s kN	F _a kN		
	+0.000 -0.008	+0.000 -0.010	+0.000 -0.064	+0.00 -0.13	Nom	+0.38 -0.00	+0.38 -0.00	Radial	Axial		
	+0.0000 -0.0003	+0.0000 -0.0004	+0.0000 -0.0025	+0.000 -0.005		+0.015 -0.000	+0.015 -0.000	C _s kN	F _a kN		g
MDCS103	4.8260 .1900	19.7460 .7774	12.573 .495	12.014 .473	7.671 .302	.127 .005	.457 .018	21.70	7.75	.005/.013	18
MDCS104	6.3500 .2500	22.8956 .9014	15.748 .620	12.471 .491	9.957 .392	.127 .005	.813 .032	23.89	8.01	.005/.013	29
MDCS105	7.9375 .3125	31.7500 1.2500	18.923 .745	17.450 .687	11.913 .469	.381 .015	.813 .032	49.59	17.71	.005/.013	77
MOCS106	9.5250 .3750	36.5125 1.4375	22.098 .870	20.168 .794	13.995 .551	.381 .015	.813 .032	70.31	25.11	.005/.013	118
MDCS108	12.7000 .5000	42.8625 1.6875	23.673 .932	21.742 .856	18.669 .735	.381 .015	1.118 .044	105.01	37.51	.005/.013	172
MDCS110	15.8750 .6250	49.2125 1.9375	25.273 .995	23.368 .920	22.606 .890	.381 .015	1.118 .044	126.33	41.81	.005/.013	240

MATERIALS:

- RINGS & BALLS - High Carbon Chromium Steel SAE 52100
- SHIELDS - Corrosion Resisting Steel
- SEALS - PTFE coated glass cloth

For shaft and housing fits see page 9

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

LUBRICATION:

Normally charged with grease to NATO G-354

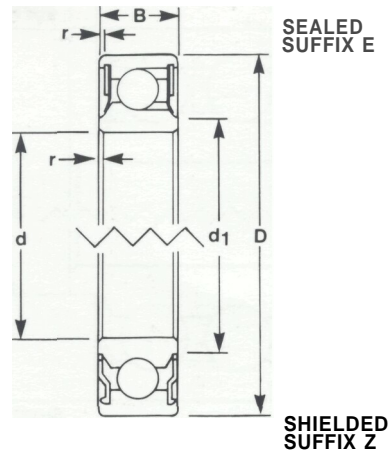
DESIGNATION MODIFIERS:

- PREFIX S Corrosion Resisting Steel AISI 440C
- SUFFIX E Sealed
- Z Shielded
- NP Not cadmium plated
- G2 Grease to NATO G-395

Aircraft control bearings

T 500 series

Single row radial ball bearing (extra light)



BSI Series 3SP89 Table 3
ISO Series R1002 Table 3
AECMA Series EN2010

Bearing	Measurement in mm			Chamfer at 45° r	Limit load rating		RIC	Approx Mass g	
	d	D	B		Radial C _s kN	Axial F _a kN			
T510	10.000 9.992	22.000 21.991	6.00 5.88	13.0	.8 .3	11.11	4.96	.002/.013	11
T512	12.000 11.992	24.000 23.991	6.00 5.88	15.0	.8 .3	12.50	5.58	.003/.018	13
T515	15.000 14.992	28.000 27.991	7.00 6.88	17.6	.8 .3	16.20	7.23	.003/.018	16
T517	17.000 16.992	30.000 29.991	7.00 6.88	19.7	.8 .3	17.72	7.91	.003/.018	18
T520	20.000 19.990	32.000 31.989	7.00 6.88	22.9	.8 .3	18.05	8.06	.005/.020	20
T525	25.000 24.990	37.000 36.989	7.00 6.88	27.9	.8 .3	21.52	9.61	.005/.020	23
T530	30.000 29.990	42.000 41.989	7.00 6.88	32.9	.8 .3	25.00	11.16	.005/.020	26
T535	35.000 34.988	47.000 46.989	7.00 6.88	37.8	.8 .3	28.47	12.71	.006/.020	30
T540	40.000 39.988	52.000 51.987	7.00 6.88	42.2	.8 .3	31.80	14.20	.006/.020	38
T550	50.000 49.988	65.000 64.987	7.00 6.88	53.0	.8 .3	43.10	19.24	.006/.023	55
T560	60.000 59.985	78.000 77.987	10.00 9.88	63.5	.8 .3	70.29	31.38	.008/.028	100

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
SHIELDS - Corrosion Resisting Steel
SEALS - PTFE coated glass cloth

ADDITIONAL AECMA STANDARDS:

EN 2009
Non Plated High Carbon Chromium Steel eg T 530ENP
EN 2011
Non Plated Corrosion Resisting Steel eg ST 530ENP

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEFSTAN 03-19

For shaft and housing fits see pages 8 and 9

LUBRICATION:

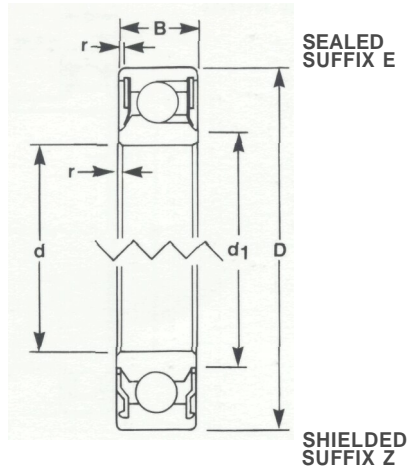
Normally charged with grease to NATO G-354

DESIGNATION MODIFIERS:

PREFIX S Corrosion Resisting Steel AISI 440C
SUFFIX E Sealed
Z Shielded
NP Not cadmium plated
G2 Grease to NATO G-395

T 600 series

Single row radial ball bearing (light)



Bearing	Measurement in mm		B	d _n Nom	Chamfer at 45° r	Limit load rating		RIC	Approx Mass g
	d	D				Radial C, kN	Axial F _a kN		
T615	15.000 14.992	28.000 27.991	6.00 5.90	17.7	.8 .4	14.60	6.54	.003/.011	15
T616	16.000 15.992	30.000 29.991	6.00 5.90	18.7	.8 .4	15.30	6.84	.003/.011	17
T620	20.000 19.990	35.000 34.989	7.00 6.90	23.9	.8 .4	18.75	8.37	.005/.013	26
T625	25.000 24.990	40.000 39.989	7.00 6.90	28.9	.8 .4	22.22	9.92	.005/.013	30
T628	28.000 27.990	43.000 42.989	7.00 6.90	31.8	.8 .4	27.00	12.05	.005/.013	33
T632	32.000 31.989	48.000 47.989	7.00 6.90	36.5	.8 .4	30.40	13.63	.005/.013	41
T635	35.000 34.988	51.000 50.989	7.00 6.90	39.9	.8 .4	32.91	14.69	.005/.013	44
T640	40.000 39.988	57.000 56.987	8.00 7.90	43.7	.8 .4	41.23	18.41	.005/.013	58
T645	45.000 44.988	62.000 61.987	8.00 7.90	48.7	.8 .4	45.60	20.38	.005/.013	63
T650	50.000 49.988	68.000 67.987	8.00 7.90	53.8	.8 .4	51.00	22.71	.005/.013	69
T655	55.000 54.985	73.000 72.985	8.00 7.90	58.9	.8 .4	54.25	24.22	.005/.013	78
T663	63.000 62.985	82.000 81.985	9.00 8.90	67.5	.8 .4	61.84	27.51	.005/.013	113
T680	80.000 79.983	100.000 99.983	9.00 8.90	85.4	.8 .4	77.03	34.39	.005/.013	134
T690	90.000 89.983	115.000 114.983	9.00 8.90	96.6	.8 .4	86.80	38.73	.005/.013	222

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
 SHIELDS - Corrosion Resisting Steel
 SEALS - PTFE coated glass cloth

For shaft and housing fits see pages 8 and 9

LUBRICATION:

Normally charged with grease to NATO G-354

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

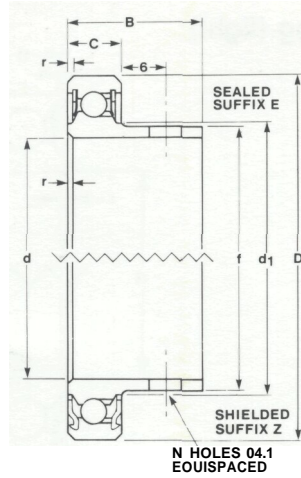
DESIGNATION MODIFIERS:

PREFIX S Rings & balls in Corrosion Resisting Steel AISI 440C
 SUFFIX E Sealed
 Z Shielded
 NP Not cadmium plated
 G2 Grease to NATO G-395

Aircraft control bearings

T 700 series

Single row radial ball bearing with extended inner



Bearing	Measurement in mm							Chamfer at 45° r	Limit load rating		RIC	Approx Mass g
	d	D	B	C	d, Nom	f	N		C _r kN	F _a kN		
T732	32.003 31.989	48.000 47.989	18.00 17.90	7.00 6.90	36.5	35.0 34.9	4	.8 .4	30.40	13.63	.005/.013	59
T735	35.003 34.989	51.000 50.989	18.00 17.90	7.00 6.90	39.9	38.0 37.9	4	.8 .4	32.91	14.69	.005/.013	72
T740	40.003 39.989	57.000 56.987	19.00 18.90	8.00 7.90	43.7	43.0 42.9	4	.8 .4	41.23	18.41	.005/.013	84
T745	45.003 44.989	62.000 61.987	19.00 18.90	8.00 7.90	48.7	48.0 47.9	4	.8 .4	45.60	20.38	.005/.013	93
T750	50.003 49.989	68.000 67.987	19.00 18.90	8.00 7.90	53.8	53.0 52.9	6	.8 .4	51.00	22.71	.005/.013	107
T763	63.003 62.988	82.000 81.985	20.00 19.90	9.00 8.90	67.5	67.0 66.9	6	.8 .4	61.84	27.61	.005/.013	150

MATERIALS:

- RINGS & BALLS - High Carbon Chromium Steel SAE 52100
- SHIELDS - Corrosion Resisting Steel
- SEALS - PTFE coated glass cloth

PROTECTION:

All external surfaces except seals/shields are cadmium plated to DEFSTAN 03-19

LUBRICATION:

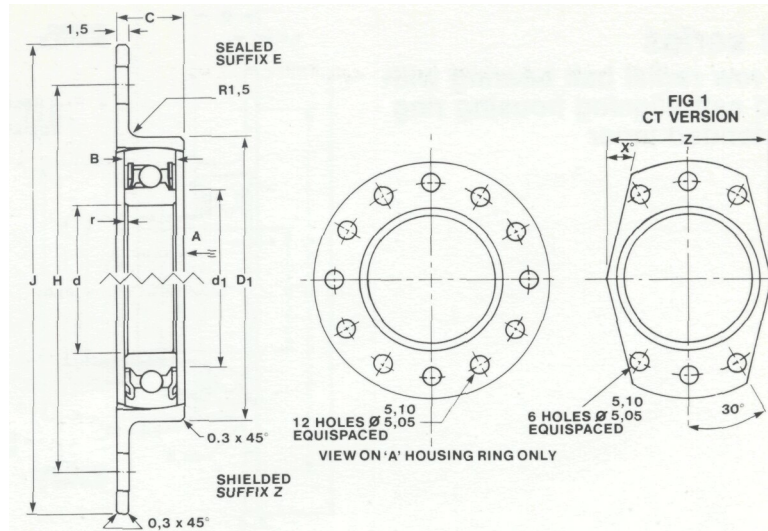
Normally charged with grease to NATO G-354

DESIGNATION MODIFIERS:

- SUFFIX E Sealed
- Z Shielded
- NP Not cadmium plated
- G2 Grease to NATO G-395

T 800 series

Single row radial ball bearing with flanged self-aligning housing ring



AECMA Series EN3060

Bearing	Measurement in mm							Chamfer at 45° r	Flange limit load rating Radial C _s kN	RIC	Approx Mass g	Applies to CT versions only FIG 1	
	d	D, Nom	B	C	H	J	d _n Nom					Z	X°
T816	16.000 15.992	33.0	6.00 5.88	8.00	47	58	18.7	.8 .4	15.20	.003/.011	47	35	0
T820	20.000 19.990	38.0	7.00 6.88	9.00	52	63	23.9	.8 .4	18.70	.005/.013	62	42	7
T825	25.000 24.990	43.0	7.00 6.88	9.00	57	68	28.9	.8 .4	20.60	.005/.013	70	46	7
T832	32.000 31.988	52.0	7.00 6.88	9.00	66	77	36.5	.8 .4	24.50	.005/.013	94	55	12
T835	35.000 34.988	55.0	7.00 6.88	9.00	69	80	39.9	.8 .4	25.50	.005/.013	100	58	15
T840	40.000 39.988	61.0	8.00 7.88	10.00	75	86	43.7	.8 .4	29.50	.005/.013	125	64	15
T845	45.000 44.988	66.0	8.00 7.88	10.00	80	91	48.7	.8 .4	32.40	.005/.013	137	68	15
T850	50.000 49.988	72.0	8.00 7.88	10.00	86	97	53.8	.8 .4	35.30	.005/.013	155	74	15
T863	63.000 62.985	86.0	9.00 8.88	11.00	100	111	67.5	.8 .4	39.20	.005/.013	210	90	22

MATERIALS:

- RINGS & BALLS - High Carbon Chromium Steel SAE 52100
- FLANGED HOUSING - Carbon Molybdenum Steel BS: S142
- SHIELDS - Corrosion Resisting Steel
- SEALS - PTFE coated glass cloth

ADDITIONAL AECMA STANDARDS:

- EN 3059
- Non Plated High Carbon Chromium Steel eg T 830ENP
- EN 3061
- Non Plated Corrosion Resisting Steel eg ST 830ENP

PROTECTION:

All external surfaces of flanged housing only are cadmium plated to DEFSTAN 03-19

Axial movement (AM) 0.12 max

RIC and AM do not take account of outer ring/housing freedom.

LUBRICATION:

Normally charged with grease to NATO G-354

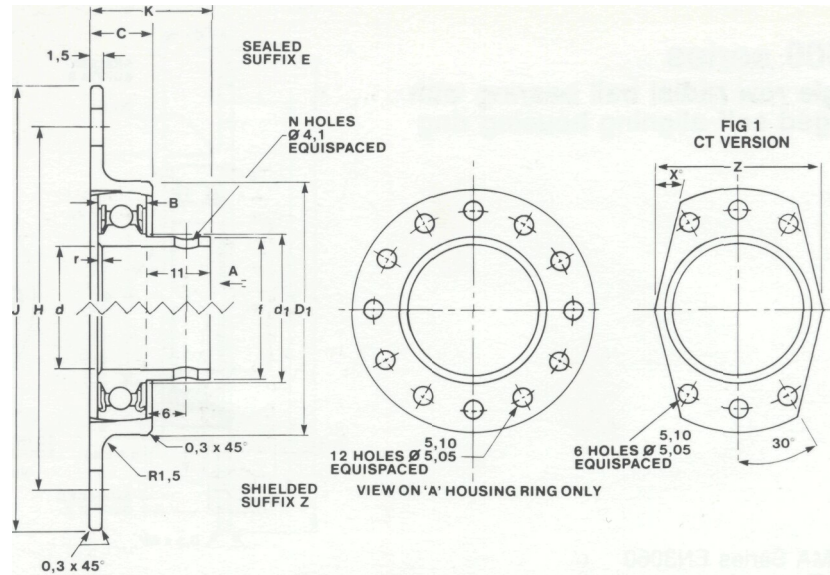
DESIGNATION MODIFIERS:

- PREFIX S Rings & balls in Corrosion Resisting Steel AISI 440C
- C Modified flange—see FIG 1
- SUFFIX E Sealed
- Z Shielded
- NP Not cadmium plated (Standard for series)
- (NOTE - Flanged housing always cadmium plated)
- G2 Grease to NATO G-395

Aircraft control bearings

T 900 series

Single row radial ball bearing with flanged self-aligning housing ring and extended inner



Bearing	Measurement in mm				H	J	K	d	f	N	r	Chamfer at 45°	Flange limit load rating Radial C _s kN	RIC	Approx Mass g	Applies to CT versions only FIG 1	
	d	D	B	C												Z	x °
T932	32.003 31.989	52.05 51.95	7.00 6.90	9.00	66	77	19	36.5 34.9	35.0 34.9	4	.8 .4	24.50	.005/.013	96	55	12	
T935	35.003 34.989	55.05 54.95	7.00 6.90	9.00	69	80	19	39.9 37.9	38.0 37.9	4	.8 .4	25.48	.005/.013	102	58	15	
T940	40.003 39.989	61.05 60.95	8.00 7.90	10.00	75	86	20	43.7 42.9	43.0 42.9	4	.8 .4	29.40	.005/.013	127	64	15	
T945	45.003 44.989	66.05 65.95	8.00 7.90	10.00	80	91	20	48.7 47.9	48.0 47.9	4	.8 .4	32.34	.005/.013	140	68	15	
T950	50.003 49.989	72.05 71.95	8.00 7.90	10.00	86	97	20	53.8 52.9	53.0 52.9	6	.8 .4	35.28	.005/.013	157	74	15	
T963	63.003 62.988	86.05 85.95	9.00 8.90	11.00	100	111	21	67.5 67.0	67.0	6	.8	39.20	.005/.013	213	90	22	

MATERIALS:

- RINGS & BALLS - High Carbon Chromium Steel SAE 52100
- FLANGED HOUSING - Carbon Molybdenum Steel BS: S142
- SHIELDS - Corrosion Resisting Steel
- SEALS - PTFE coated glass cloth

RIC does not take account of the outer ring/housing freedom

PROTECTION:

All external surfaces of inner ring and flanged housing are cadmium plated to DEF STAN 03-19

LUBRICATION:

Normally charged with grease to NATO G-354

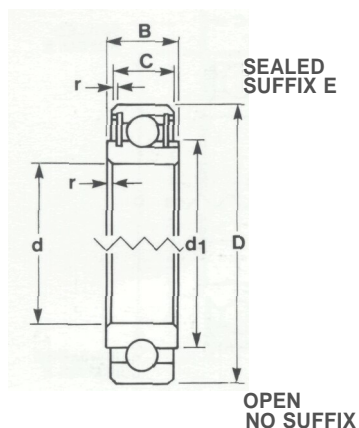
DESIGNATION MODIFIERS:

- PREFIX S Rings and balls in Corrosion Resisting Steel AISI 440C
- C Modified flange see FIG 1
- SUFFIX E Sealed
- Z Shielded
- NP Not cadmium plated (Flanged housing always cadmium plated)
- G2 Grease to NATO G-395



T series

Single row radial ball bearing (extra light)



Bearing	Measurement in mm		Measurement in inches		di	Chamfer at 45° r	Limit load rating			Approx Mass g
	d	D	B	C			Radial C, kN	Axial F _a kN	RIC	
	+0.005 -0.008 +0.002 -0.0003	-0.008 -0.020 -0.0003 -0.0008	+0.0 -0.13 +0.000 -0.005	+0.0 -0.13 +0.000 -0.005	Nom	Min				
T8	12.7000* .5000	23.7998* .9370	7.145 .281	6.350 .250	16.612 .654	.381 .015	12.50	5.58	.003/.018	13
T10	15.8750* .6250	26.9875 1.0625	7.145 .281	6.350 .250	19.736 .777	.381 .015	14.59	6.67	.003/.018	14
T12	19.0500* .7500	30.1625 1.1875	7.145 .281	6.350 .250	22.733 .895	.381 .015	16.68	7.56	.005/.020	17
T13	20.6375* .8125	31.7500 1.2500	7.145 .281	6.350 .250	24.689 .972	.381 .015	17.36	7.75	.005/.020	18
T14	22.2250* .8750	33.3375 1.3125	7.145 .281	6.350 .250	25.806 1.016	.381 .015	18.77	8.45	.005/.020	20
T17	26.9875 1.0625	38.1000 1.5000	7.145 .281	6.350 .250	30.759 1.211	.381 .015	22.24	9.79	.005/.020	23
T21	33.3375 1.3125	44.4500 1.7500	7.145 .281	6.350 .250	36.855 1.451	.381 .015	26.47	12.01	.005/.020	28
T25	39.6875 1.5625	50.8000 2.0000	7.145 .281	6.350 .250	43.104 1.697	.381 .015	30.60	14.23	.005/.020	32
T29	46.0375 1.8125	57.1500t 2.2500	7.145 .281	6.350 .250	49.962 1.967	.381 .015	35.50	16.01	.005/.023	37
T33	52.3875 2.0625	66.6750t 2.6250	7.145 .281	6.350 .250	58.039 2.285	.381 .015	41.01	17.79	.005/.028	58
T37	58.7375 2.3125	73.0250f 2.8750	7.145 .281	6.350 .250	64.110 2.524	.381 .015	45.15	19.57	.005/.028	64

* Tolerance is +.005/-0.005
+0.002/-0.002

t Tolerance is -.013/-0.025
-0.005/-0.010

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
SEALS - PTFE coated glass cloth

PROTECTION:

All external surfaces except bore and seals are cadmium plated to DEF STAN 03-19

For shaft and housing fits consult RHP

LUBRICATION:

Normally charged with grease to NATO G-354

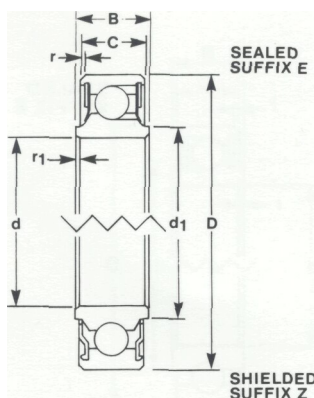
DESIGNATION MODIFIERS:

PREFIX S Corrosion Resisting Steel AISI 440C
SUFFIX E Sealed
NP Not cadmium plated
G2 Grease to NATO G-395

Aircraft control bearings

T 100 series

Single row radial ball bearing (light)



BSI Series 3SP89 Table 14
 ISO Series R1002 Table 14
 MIL Series MS27642 (when suffix E specified)

Bearing	Measurement in mm		Measurement in inches		d ₁	Chamfer at 45°		Limit load rating		RIC (MS27642)	Approx Mass g
	d	D	B	C		r ₁	r	Radial C, kN	Axial F _a kN		
	+0.00 -0.025	+0.00 -0.025	+0.0 -0.13	+0.0 -0.13	Nom	+0.38 -0.00	+0.38 -0.00				
	+0.000 -0.0010	+0.000 -0.0010	+0.00 -0.005	+0.00 -0.005		+0.015 -0.000	+0.015 -0.000				
T116	25.4000* 1.0000	44.4500 1.7500	11.100 .437	9.525 .375	29.286 1.153	.610 .024	.610 .024	35.96	16.01	.008/.025	64
T121	33.3502 1.3130	52.3875 2.0625	11.100 .437	9.525 .375	36.932 1.454	.610 .024	.610 .024	43.77	19.57	.008/.025	73
T123	36.5252 1.4380	55.5625 2.1875	11.100 .437	9.525 .375	40.005 1.575	.610 .024	.610 .024	46.86	20.92	.008/.025	77
T125	39.7002 1.5630	58.5625 2.3125	11.100 .437	9.525 .375	43.002 1.693	.610 .024	.610 .024	50.26	22.24	.008/.025	86
T129	46.0502 1.8130	65.0875 2.5625	11.100 .437	9.525 .375	49.047 1.931	.610 .024	.610 .024	56.49	24.91	.008/.025	95
T133	52.4002 2.0630	71.4375 2.8125	11.100 .437	9.525 .375	56.667 2.231	.610 .024	.610 .024	64.05	28.47	.008/.025	104
T137	58.7502 2.3130	77.7875 3.0625	11.100 .437	9.525 .375	62.687 2.468	.610 .024	.610 .024	70.29	31.38	.008/.025	118
T147	74.6252 2.9380	98.4250 3.8750	13.487 .531	11.913 .469	78.562 3.093	.991 .039	.991 .039	111.59	49.81	.008/.025	222
T149	77.8002 3.0630	101.6000 4.0000	13.487 .531	11.913 .469	81.839 3.222	.991 .039	.991 .039	122.33	53.82	.008/.025	240

* Tolerance is +.000/-0.013
 +.0000/-0.0005

MATERIALS:

- RINGS & BALLS - High Carbon Chromium Steel SAE 52100
- SHIELDS - Corrosion Resisting Steel
- SEALS - PTFE coated glass cloth

For shaft and housing fits see page 9

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

LUBRICATION:

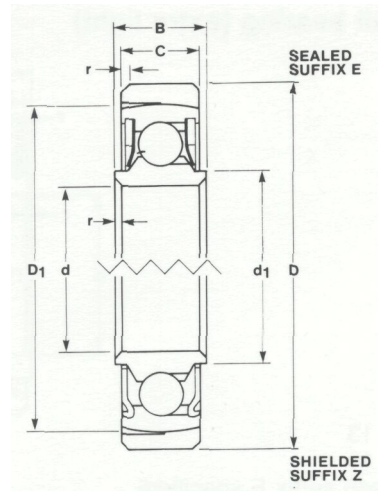
Normally charged with grease to NATO G-354

DESIGNATION MODIFIERS:

- PREFIX M Precision series—see page 31
- S Corrosion Resisting Steel AISI 440C
- SUFFIX E Sealed
- Z Shielded
- NP Not cadmium plated
- G2 Grease to NATO G-395

T 200 series

Single row radial ball bearing externally self-aligning



MIL Series MS27648 (when suffix E specified)

Bearing	Measurement in mm				Measurement in inches				Chamfer at 45° r	Swivel Angle +°	Limit load rating		RIC	Approx Mass g
	d	D	B	C	d,	D,					Radial C _s kN	Axial F _a max kN		
	+0.000 -0.025 +0.0000 -0.0010	+0.000 -0.025 +0.0000 -0.0010	+0.00 -0.13 +0.000 -0.005	+0.00 -0.13 +0.000 -0.005	Nom	Nom	+0.38 -0.00 +0.015 -0.000							
T216	25.4000* 1.0000	49.2125 1.9375	11.100 .437	9.525 .375	29.286 1.153	43.002 1.693	.610 .024	7°25'	35.96	7.12	.008/.025	88		
T221	33.3502 1.3130	57.1500 2.2500	11.100 .437	9.525 .375	36.982 1.456	51.511 2.028	.610 .024	6°30'	43.77	8.90	.008/.025	96		
T223	36.5252 1.4380	60.3250 2.3750	11.100 .437	9.525 .375	40.005 1.575	54.737 2.155	.610 .024	6°00'	46.86	9.79	.008/.025	100		
T225	39.7002 1.5630	63.5000 2.5000	11.100 .437	9.525 .375	43.002 1.693	57.302 2.256	.610 .024	5°45'	50.26	10.23	.008/.025	113		
T229	46.0502 1.8130	69.8500 2.7500	11.100 .437	9.525 .375	49.047 1.931	64.389 2.535	.610 .024	5°00'	56.49	11.56	.008/.025	122		
T233	52.4002 2.0630	76.2000 3.0000	11.100 .437	9.525 .375	57.074 2.247	70.790 2.787	.610 .024	5°00'	64.05	12.90	.008/.025	136		
T237	58.7502 2.3130	82.5500 3.2500	11.100 .437	9.525 .375	62.687 2.468	77.191 3.039	.610 .024	4°30'	70.29	14.23	.008/.025	150		
T247	74.6252 2.9380	104.7750 4.1250	13.487 .531	11.913 .469	77.038 3.033	97.688 3.846	.991 .039	4°30'	111.59	22.24	.008/.025	290		
T248	76.2000 3.0000	107.9500 4.2500	13.487 .531	11.913 .469	81.839 3.222	100.889 3.972	.991 .039	4°00'	122.33	24.46	.008/.025	313		
T249	77.8002 3.0630	107.9500 4.2500	13.487 .531	11.913 .469	81.839 3.222	100.889 3.972	.991 .039	4°00'	122.33	24.46	.008/.025	313		

* Tolerance is +.000/-0.013
+0.0000/-0.0005

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
SHIELDS - Corrosion Resisting Steel
SEALS - PTFE coated glass cloth

For shaft and housing fits see page 9

LUBRICATION:

Normally charged with grease to NATO G-354

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

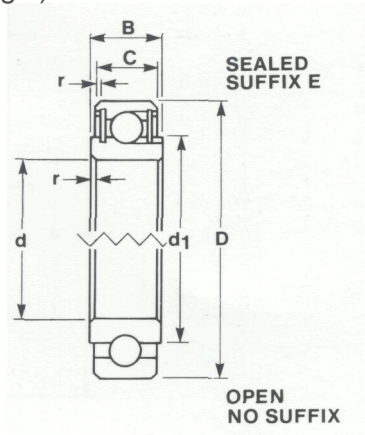
DESIGNATION MODIFIERS:

PREFIX M Precision series—see page 32
S Corrosion Resisting Steel AISI 440C
SUFFIX E Sealed
Z Shielded
NP Not cadmium plated
G2 Grease to NATO G-395

Aircraft control bearings

T 300 series

Single row radial ball bearing (extra light)



BSI Series 3SP89 Table 13
ISO Series R1002 Table 13
MIL Series MS27646 (when suffix E specified)

Bearing	Measurement in mm		Measurement in inches		Chamfer at 45° r	Limit load rating	RIC (MS27646)	Approx Mass		
	d	D	B	C					di	C _s kN
	+0.018 -0.018	+0.000 -0.025	+0.00 -0.13	+0.00 -0.13	Nom	+0.51 -0.00				
	+0.0007 -0.0007	+0.0000 -0.0010	+0.000 -0.005	+0.000 -0.005		+0.020 -0.000				
T338	15.8750 .6250	26.9875 1.0625	7.137 .281	6.350 .250	19.736 .777	.381 .015	14.59	6.67	.020/.046	14
T339	19.0500 .7500	30.1625 1.1875	7.137 .281	6.350 .250	22.733 .895	.381 .015	16.68	7.56	.020/.046	17
T340	22.2250 .8750	33.3375 1.3125	7.137 .281	6.350 .250	25.806 1.016	.381 .015	18.77	8.45	.020/.046	20
T341	26.9875 1.0625	38.1000 1.5000	7.137 .281	6.350 .250	30.759 1.211	.381 .015	22.24	9.79	.020/.046	23
T342	33.3375 1.3125	44.4500 1.7500	7.137 .281	6.350 .250	36.855 1.451	.381 .015	26.47	12.01	.020/.046	28
T343	39.6875 1.5625	50.8000 2.0000	7.137 .281	6.350 .250	43.104 1.697	.381 .015	30.60	14.23	.020/.046	32
T344	40.0375* 1.6125	57.1500f 2.2500	7.137 .281	6.350 .250	49.962 1.967	.381 .015	35.50	16.01	.020/.046	37
T345	52.3875* 2.0625	66.6750t 2.6250	7.137 .281	6.350 .250	58.039 2.285	.381 .015	41.01	17.79	.020/.046	58
T346	58.7375* 2.3125	73.02501 2.8750	7.137 .281	6.350 .250	64.110 2.524	.381 .015	45.15	19.57	.020/.046	64

*Tolerance is +.025/-0.025
+0.0010/-0.0010
t Tolerance is +.000/-0.038
+0.0000/-0.0015

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
SEALS - PTFE coated glass cloth

For shaft and housing fits see page 9

PROTECTION:

All external surfaces except bore and seals are cadmium plated to DEFSTAN 03-19

LUBRICATION:

Normally charged with grease to NATO G-354

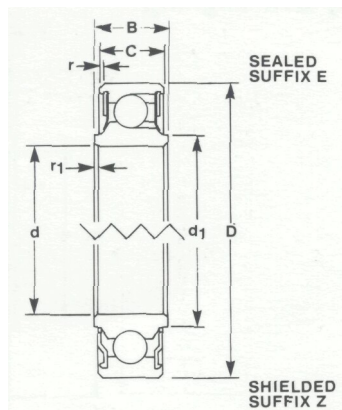
DESIGNATION MODIFIERS:

PREFIX M Precision series-see page 33
S Corrosion Resisting Steel AISI 440C
SUFFIX E Sealed
NP Not cadmium plated
G2 Grease to NATO G-395



MT 100 series

Single row radial ball bearing



MIL Series MS27642-S (when suffix E specified)

Bearing	Measurement in mm		Measurement in inches		d _r	Chamfer at 45°		Limit load rating		RIC (MS27642-S)	Approx Mass
	d	D	B	C		r _n	r	Radial C _r kN	Axial F _a kN		
	+0.000 -0.013 +0.0000 -0.0005	+0.000 -0.025 +0.0000 -0.0010	+0.000 -0.064 +0.0000 -0.0025	+0.00 -0.13 +0.000 -0.005	Nom	+0.38 -0.00 +0.015 -0.000	+0.38 -0.00 +0.015 -0.000				9
MT116	25.4000 1.0000	44.4500 1.7500	11.100 .437	9.525 .375	28.981 1.153	.610 .024	.610 .024	35.96	16.01	.003/.013	64
MT121	33.3502 1.3130	52.3875 2.0625	11.100 .437	9.525 .375	36.932 1.454	.610 .024	.610 .024	43.77	19.57	.003/.013	73
MT123	36.5252 1.4380	55.5625 2.1875	11.100 .437	9.525 .375	39.980 1.575	.610 .024	.610 .024	46.86	20.92	.003/.013	77
MT125	39.7002 1.5630	58.7375 2.3125	11.100 .437	9.525 .375	43.002 1.693	.610 .024	.610 .024	50.26	22.24	.003/.013	86
MT129	46.0502 1.8130	65.0875 2.5625	11.100 .437	9.525 .375	49.047 1.931	.610 .024	.610 .024	56.49	24.91	.003/.013	95
MT133	52.4002 2.0630	71.4375 2.8125	11.100 .437	9.525 .375	56.667 2.231	.610 .024	.610 .024	64.05	28.47	.003/.013	104
MT137	58.7502 2.3130	77.7875 3.0625	11.100 .437	9.525 .375	62.687 2.468	.610 .024	.610 .024	70.29	31.38	.003/.013	118
MT147	74.6252 2.9380	98.4250 3.8750	13.487 .531	11.913 .469	78.562 3.093	.991 .039	.991 .039	111.59	49.81	.003/.013	222
MT149	77.8002 3.0630	101.6000 4.0000	13.487 .531	11.913 .469	81.839 3.222	.991 .039	.991 .039	122.33	53.82	.003/.013	240

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
 SHIELDS - Corrosion Resisting Steel
 SEALS - PTFE coated glass cloth

For shaft and housing fits see page 9

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEFSTAN 03-19

LUBRICATION:

Normally charged with grease to NATO G-354

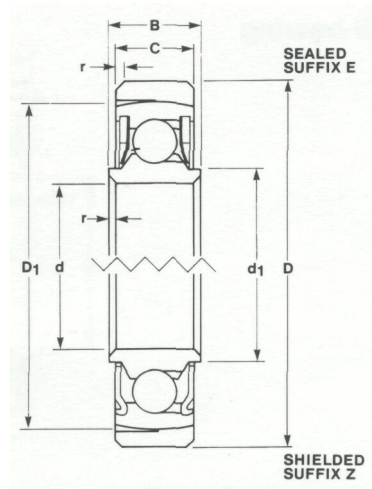
DESIGNATION MODIFIERS:

PREFIX S Corrosion Resisting Steel AISI 440C
 SUFFIX E Sealed
 Z Shielded
 NP Not cadmium plated
 G2 Grease to NATO G-395

Aircraft control bearings

MT 200 series

Single row radial ball bearing externally self-aligning



Bearing	Measurement in mm Measurement in inches				di Nom	DI Nom	Chamfer at 45° r	Swivel Angle ±°	Limit load rating		RIC	Approx Mass g
	d	D	B	G					Radial Cs kN	Axial Fa kN		
	+0.00 -0.013 +0.000 -0.0005	+0.00 -0.025 +0.000 -0.0010	+0.0 -0.064 +0.000 -0.0025	+0.0 -0.13 +0.00 -0.005			+0.38 -0.00 +0.015 -0.000					
MT216	25.4000 1.0000	49.2125 1.9375	11.100 .437	9.525 .375	29.286 1.153	43.002 1.693	.610 .024	7°25'	35.96	7.12	.005/.013	88
MT221	33.3502 1.3130	57.1500 2.2500	11.100 .437	9.525 .375	36.982 1.456	51.511 2.028	.610 .024	6°30'	43.77	8.90	.005/.013	96
MT223	36.5252 1.4380	60.3250 2.3750	11.100 .437	9.525 .375	40.005 1.575	54.737 2.155	.610 .024	6°00'	46.86	9.79	.005/.013	100
MT225	39.7002 1.5630	63.5000 2.5000	11.100 .437	9.525 .375	43.002 1.693	57.302 2.256	.610 .024	5°45'	50.26	10.23	.005/.013	113
MT229	46.0502 1.8130	69.8500 2.7500	11.100 .437	9.525 .375	49.047 1.931	64.389 2.535	.610 .024	5°00'	56.49	11.56	.005/.013	122
MT233	52.4002 2.0630	76.2000 3.0000	11.100 .437	9.525 .375	57.074 2.247	70.790 2.787	.610 .024	5°00'	64.05	12.90	.005/.013	136
MT237	58.7502 2.3130	82.5500 3.2500	11.100 .437	9.525 .375	62.687 2.468	77.191 3.039	.610 .024	4°30'	70.29	14.23	.005/.013	150
MT247	74.6252 2.9380	104.7750 4.1250	13.487 .531	11.913 .469	77.038 3.033	97.688 3.846	.991 .039	4°30'	111.59	22.24	.005/.013	290
MT248	76.2000 3.0000	107.9500 4.2500	13.487 .531	11.913 .469	81.839 3.222	100.889 3.972	.991 .039	4°00'	122.33	24.46	.005/.013	313
MT249	77.8002 3.0630	107.9500 4.2500	13.487 .531	11.913 .469	81.839 3.222	100.889 3.972	.991 .039	4°00'	122.33	24.46	.008/.025	313

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
SHIELDS - Corrosion Resisting Steel
SEALS - PTFE coated glass cloth

For shaft and housing fits see page 9

PROTECTION:

All surfaces except bore and seals/shields are cadmium plated to DEFSTAN 03-19

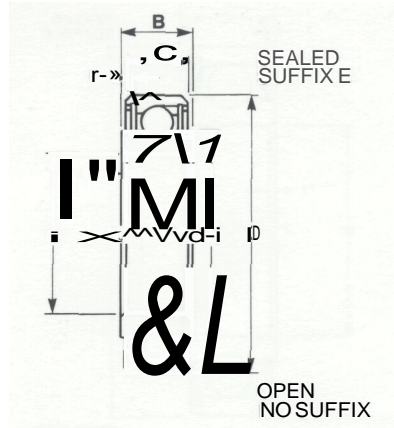
LUBRICATION:

Normally charged with grease to NATO G-354

DESIGNATION MODIFIERS:

PREFIX S Corrosion Resisting Steel AISI 440C
SUFFIX E Sealed
Z Shielded
NP Not cadmium plated
G2 Grease to NATO G-395

MT 300 series
Single row radial ball bearing



MIL Series

E specified)

Bearing	+0.000 -0.013 +0.0000 -0.0005		+0.000 -0.013 +0.0000 -0.0005		B +0.000 -0.064 +0.0000 -0.0025		C +0.00 -0.13 +0.000 -0.005		d. Nom	Chamfer at 45° r +0.51 -0.00 +0.020 -0.000	Limit load rating		RIC	Approx Mass g
											C _r kN	F _a kN		
MT338	15.8750 .6250	26.9875 1.0625	7.137 .281	6.350 .250	19.736 .777	.381 .015	14.59	6.67	.003/.013	14				
MT339	19.0500 .7500	30.1625 1.1875	7.137 .281	6.350 .250	22.733 .895	.381 .015	16.68	7.56	.003/.013	17				
MT340	22.2250 .8750	33.3375 1.3125	7.137 .281	6.350 .250	25.806 1.016	.381 .015	18.77	8.45	.003/.013	20				
MT341	26.9875 1.0625	38.1000 1.5000	7.137 .281	6.350 .250	30.759 1.211	.381 .015	22.24	9.79	.003/.013	23				
MT342	33.6338 1.3125	44.4500 1.7500	7.137 .281	6.350 .250	36.855 1.451	.381 .015	26.47	12.01	.003/.013	28				
MT343	39.6875 1.5625	50.8000 2.0000	7.137 .281	6.350 .250	43.104 1.697	.381 .015	30.60	14.23	.003/.013	32				
MT344	46.0375* 1.8125	57.1500f 2.2500	7.137 .281	6.350 .250	49.962 1.967	.381 .015	35.50	16.01	.003/.013	37				
MT345	52.3875* 2.0625	66.6750f 2.6250	7.137 .281	6.350 .250	58.039 2.285	.381 .015	41.01	17.79	.003/.013	58				
MT346	58.7375* 2.3125	73.0250t 2.8750	7.137 .281	6.350 .250	64.110 2.524	.381 .015	45.15	19.57	.003/.013	64				

* Tolerance is +0.000/-0.020
+0.0000/-0.0008
t Tolerance is +0.000/-0.018
+0.0000/-0.0007

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
SEALS - PTFE coated glass cloth

For shaft and housing fits see page 9

PROTECTION:

All external surfaces except bore and seals are cadmium plated to
DEF STAN 03-19

LUBRICATION:

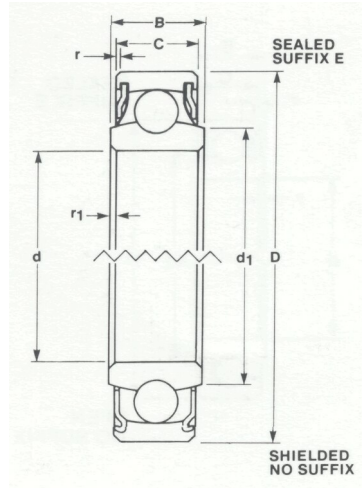
Normally charged with grease to NATO G-354

DESIGNATION MODIFIERS:

PREFIX S Corrosion Resisting Steel AISI 440C
SUFFIX E Sealed
NP Not cadmium plated
G2 Grease to NATO G-395

CA series

Single row self-aligning ball bearing



Bearing	Measurement in mm		Measurement in inches		di	r ₁	r ₂	Swivel Angle +°	Limit load rating Radial C _s kN	RIC	Approx Mass g
	d	D	B	C							
	+0.005 -0.008 +0.0002 -0.0003	+0.000 -0.013 +0.0000 -0.0005	+0.00 -0.13 +0.000 -0.005	+0.00 -0.13 +0.000 -0.005	Nom	Min	Min				
CA0	4.8209 .1898	19.7460 .7774	7.5438 .2970	6.8580 .2700	8.331 .328	.762 .030	.762 .030	12	3.95	.000/.013	12
CA0-1	4.8209 .1898	15.8750 .6250	6.2230 .2450	5.1562 .2030	6.528 .257	.381 .015	.381 .015	10	2.41	.000/.013	5
CA0-2E	4.8209 .1898	19.7460 .7774	9.5250 .3750	6.8580 .2700	7.569 .298	.127 .005	.559 .022	7	3.95	.000/.013	12
CA1	6.3500 .2500	22.8958 .9014	12.2936 .4840	8.5090 .3350	10.414 .410	1.016 .040	1.016 .040	12	6.18	.000/.013	19
CA2	7.9375 .3125	31.7500 1.2500	14.1605 .5575	9.5250 .3750	14.300 .563	1.016 .040	1.016 .040	10	9.63	.000/.013	47
CA2-1	7.9375 .3125	22.2250 .8750	15.8750 .6250	7.9375 .3125	10.541 .415	.406 .016	.406 .016	10	5.66	.003/.013	17
CA2-2	7.9375 .3125	22.2250 .8750	13.2080 .5200	7.9375 .3125	10.541 .415	.406 .016	.406 .016	10	5.66	.000/.013	16
CA2-2E	7.9375 .3125	22.2250 .8750	13.2080 .5200	7.9375 .3125	10.541 .415	.406 .016	.406 .016	7	5.66	.000/.013	16
CA3	9.5250 .3750	30.5125 1.4375	15.7480 .6200	11.9075 .4688	17.475 .688	1.016 .040	1.016 .040	10	15.81	.000/.013	71
CA3E	9.5250 .3750	36.5125 1.4375	15.7480 .6200	11.9075 .4688	14.249 .561	1.016 .040	1.016 .040	8	15.81	.000/.013	71
CA3-1	9.5199 .3748	22.2250 .8750	7.9502 .3130	6.3500 .2500	12.065 .475	.635 .025	.635 .025	9	4.94	.003/.013	12
CA5	12.7000 .5000	42.8625 1.6875	15.7480 .6200	12.7000 .5000	21.692 .854	1.194 .047	1.194 .047	10	18.44	.000/.018	107
CA5E	12.7000 .5000	42.8685 1.6875	15.7480 .6200	12.7000 .5000	21.311 .839	1.194 .047	1.194 .047	8	18.44	.000/.018	107
CA7	15.8750 .6250	49.2125 1.9375	20.6375 .8125	15.8750 .6250	25.400 1.000	1.194 .047	1.194 .047	12	25.01	.000/.018	172
CA7E	15.8750 .6250	49.2125 1.9375	20.6375 .8125	15.8750 .6250	24.028 .946	1.194 .047	1.194 .047	10	25.01	.000/.018	172

MATERIALS:

- RINGS & BALLS - High Carbon Chromium Steel SAE 52100
- SHIELDS - Corrosion Resisting Steel
- SEALS - PTFE coated glass cloth

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

For shaft and housing fits consult RHP

External corners r and r₂ may be radii or chamfers

LUBRICATION:

Normally charged with grease to NATO G-354

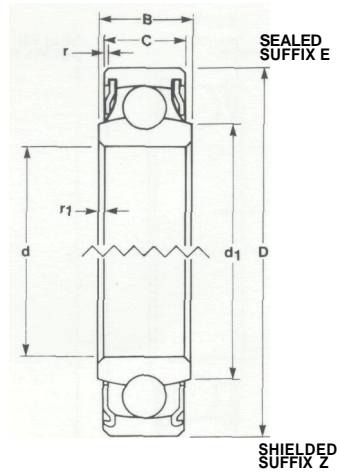
DESIGNATION MODIFIERS:

- PREFIX S Rings & balls in Corrosion Resisting Steel AISI 440C
- SUFFIX E Sealed (No suffix = Shielded)
- G2 Grease to NATO G-395



CA 100 series

Single row self-aligning ball bearing



MIL Series MS27645 (when suffix E specified)

Bearing	Measurement in mm				Measurement in inches				Chamfer at 45°		Limit load rating		
	d	D	B	C	d ₁	r ₁	r	Swivel Angle	Radial C _s kN	Axial F _a kN	RIC	Approx Mass g	
	+0.000 -0.013	+0.000 -0.013	+0.00 -0.13	+0.00 -0.13	Nom	+0.38 -0.00	+0.38 -0.00	±°					
	+0.0000 -0.0005	+0.0000 -0.0005	+0.000 -0.005	+0.000 -0.005		+0.015 -0.000	+0.015 -0.000						
CA103	4.8260 .1900	19.7460 .7774	7.544 .297	6.858 .270	7.366 .290	.127 .005	.559 .022	10	4.00	.89	.000/.025	14	
CA104	6.3500 .2500	22.8956 .9014	12.294 .484	8.509 .335	9.347 .368	.127 .005	.813 .032	10	6.27	1.33	.000/.025	19	
CA105	7.9375 .3125	31.7500 1.2500	14.173 .558	9.525 .375	14.249 .561	.381 .015	.813 .032	10	9.74	1.33	.000/.025	45	
CA106	9.5250 .3750	36.5125 1.4375	15.748 .620	11.913 .469	15.418 .607	.381 .015	.813 .032	10	13.26	1.78	.000/.025	74	
CA108	12.7000 .5000	42.8625 1.6875	15.748 .620	12.700 .500	21.260 .837	.381 .015	1.118 .044	10	16.32	2.22	.000/.025	104	
CA110	15.8750 .6250	49.2125 1.9375	20.650 .813	15.875 .625	23.266 .916	.381 .015	1.118 .044	10	23.66	2.67	.000/.025	168	

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
 SHIELDS - Corrosion Resisting Steel
 SEALS - PTFE coated glass cloth

For shaft and housing fits see page 9

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

LUBRICATION:

Normally charged with grease to NATO G-354

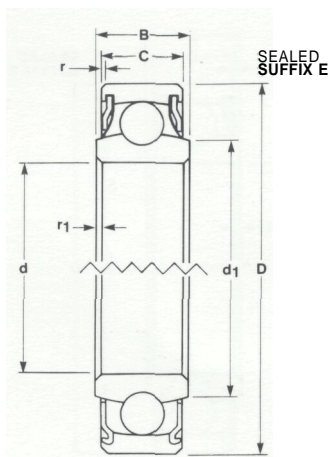
DESIGNATION MODIFIERS:

PREFIX M Precision series—see page 36
 S Rings & balls in Corrosion Resisting Steel AISI 440C
 SUFFIX E Sealed
 Z Shielded
 NP Not cadmium plated
 G2 Grease to NATO G-395

Aircraft control bearings

MCA 100 series

Single row self-aligning ball bearing



Bearing	Measurement in mm		Measurement in inches		d _i	Chamfer at 45°		Swivel Angle	Limit load rating		RIC	Approx Mass
	d	D	B	C		r _i	r		Radial	Axial		
	+0.00 -0.008	+0.00 -0.010	+0.00 -0.064	+0.00 -0.13	Nom	+0.38 -0.00	+0.38 -0.00	±°	^c » kN	kN		g
	+0.0000 -0.0003	+0.0000 -0.0004	+0.0000 -0.0025	+0.000 -0.005		+0.015 -0.000	+0.015 -0.000					
MCA103	4.8260 .1900	19.7460 .7774	7.544 .297	6.858 .270	7.366 .290	.127 .005	.559 .022	10	4.00	.89	.005/.013	14
MCA104	6.3500 .2500	22.8956 .9014	12.294 .484	8.509 .335	9.347 .368	.127 .005	.813 .032	10	6.27	1.33	.005/.013	19
MCA105	7.9375 .3125	31.7500 1.2500	14.173 .558	9.525 .375	14.249 .561	.381 .015	.813 .032	10	9.74	1.33	.005/.013	45
MCA106	9.5250 .3750	36.5125 1.4375	15.748 .620	11.913 .469	15.418 .607	.381 .015	.813 .032	10	13.26	1.78	.005/.013	.74
MCA108	12.7000 .5000	42.8625 1.6875	15.748 .620	12.700 .500	21.260 .837	.381 .015	1.118 .044	10	16.32	2.22	.005/.013	104
MCA110	15.8750 .6250	49.2125 1.9375	20.650 .813	15.875 .625	23.266 .916	.381 .015	1.118 .044	10	23.66	2.67	.005/.013	168

MATERIALS:

- RINGS & BALLS - High Carbon Chromium Steel SAE 52100
- SHIELDS - Corrosion Resisting Steel
- SEALS - PTFE coated glass cloth

For shaft and housing fits see page 9

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

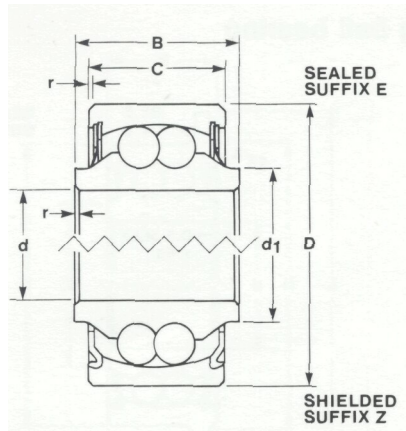
LUBRICATION:

Normally charged with grease to NATO G-354

DESIGNATION MODIFIERS:

- PREFIX S Rings and balls in Corrosion Resisting Steel AISI 440C
- SUFFIX E Sealed
- Z Shielded
- NP Not plated
- G2 Grease to NATO G-395

DCA 500 series
Double row self-aligning ball bearing



BSI Series 3SP89 Table 5
 ISO Series R1002 Table 5
 AECMA Series EN2016

Bearing	Measurement in mm				d, Norm	Chamfer at 45° r	Swivel Angle +°	Limit load rating		RIC	RIC Group 3	Approx Mass g
	d	D	B	C				Radial C _s kN	Axial F _a kN			
DCA505	5.000 4.992	16.000 15.992	12.00 11.88	8.00 7.88	7.2	.8 .3	6	3.85	1.20	.002/.013	.010/.020	9
DCA506	6.000 5.992	19.000 18.991	14.00 13.88	10.00 9.88	8.4	.8 .3	6	6.29	1.97	.002/.013	.010/.020	16
DCA508	8.000 7.992	24.000 23.991	15.00 14.88	10.00 9.88	11.1	.8 .3	6	9.10	2.84	.002/.013	.010/.020	27
DCA510	10.000 9.992	30.000 29.991	20.00 19.88	14.00 13.88	13.6	.8 .3	6	15.38	4.81	.002/.013	.010/.020	57
DCA512	12.000 11.992	32.000 31.989	20.00 19.88	14.00 13.88	15.4	.8 .3	6	16.63	5.20	.003/.018	.013/.023	62
DCA515	15.000 14.992	35.000 34.989	20.00 19.88	14.00 13.88	18.5	.8 .3	6	19.07	5.96	.003/.018	.013/.023	75
DCA517	17.000 16.992	40.000 39.989	22.00 21.88	16.00 15.88	21.2	.8 .3	6	24.30	7.59	.003/.018	.013/.023	110
DCA520	20.000 19.990	47.000 46.989	24.00 23.88	18.00 17.88	23.6	.8 .3	6	33.83	10.57	.005/.020	.015/.025	170

MATERIALS:
 RINGS & BALLS - High Carbon Chromium Steel SAE 52100
 SHIELDS - Corrosion Resisting Steel
 SEALS - PTFE coated glass cloth

ADDITIONAL AECMA STANDARDS:
 EN 2015
 Non Plated High Carbon Chromium Steel eg DCA 505ENP
 EN2017
 Non Plated Corrosion Resisting Steel eg SDCA 505ENP

PROTECTION:
 All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

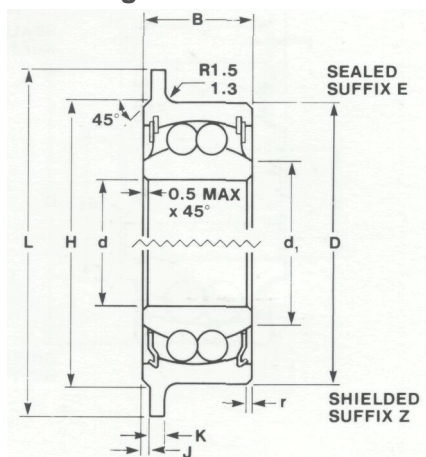
For shaft and housing fits see pages 8 and 9

LUBRICATION:
 Normally charged with grease to NATO G-354

DESIGNATION MODIFIERS:
 PREFIX S Corrosion Resisting Steel AISI 440C
 SUFFIX E Sealed
 Z Shielded
 NP Not cadmium plated
 G2 Grease to NATO G-395

DCA 800 series

Flanged double row self-aligning ball bearing



Bearing	Measurement in mm			d, Norm	Chamfer at 45° r	H	L	J	K	Swivel Angle +°	Limit load rating		Approx Mass g
	d	D	B								C _s kN	F _a kN	
DCA815	15.000 14.992	33.000 32.989	13.00 12.90	19.4	.8 .3	34	41	1	.6 .5	2°30'	15.70	5.30	61
DCA816	16.000 15.992	33.000 32.989	13.00 12.90	19.4	.8 .3	34	41	1	.6 .5	2°30'	15.70	5.30	58
DCA820	20.000 19.991	38.000 37.989	13.00 12.90	24.7	.8 .3	39	46	1	.6 .5	2°30'	19.00	5.30	74
DCA825	25.000 24.991	43.000 42.987	14.00 13.90	28.6	.8 .3	44	51	1	1.6 1.5	2°30'	21.60	5.30	90
DCA832	32.000 31.990	52.000 51.987	14.00 13.90	38.0	.8 .3	55	60	2	2.1 2.0	2°30'	27.50	5.30	132
DCA835	35.000 34.989	55.000 54.985	14.00 13.90	40.6	.8 .3	58	63	2	2.1 2.0	2°30'	29.10	5.30	141
DCA840	40.000 39.989	61.000 60.985	16.00 15.90	45.3	.8 .3	64	69	2	2.1 2.0	2°30'	32.50	5.30	183

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
 SHIELDS - Corrosion Resisting Steel
 SEALS - PTFE coated glass cloth

For shaft and housing fits see pages 8 and 9

Non flanged version available

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

LUBRICATION:

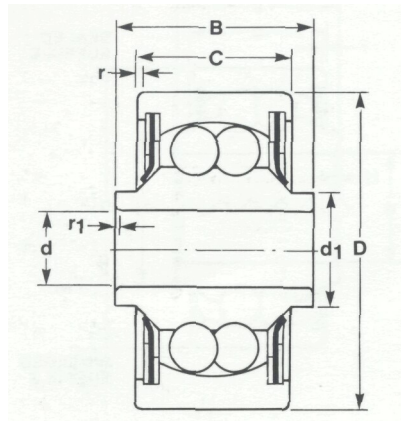
Normally charged with grease to NATO G-354

DESIGNATION MODIFIERS:

PREFIX S Corrosion Resisting Steel AISI 440C
 SUFFIX E Sealed
 Z Shielded
 NP Not cadmium plated
 G2 Grease to NATO G-395

DCA series

Double row self-aligning ball bearing



	Measurement in mm				Measurement in inches				Limit load rating			
	d	D	B	C	di	Ci	r	Swivel Angle ±°	Radial C _r kN	Axial F _a kN	RIC	Approx Mass
Bearing	+0.000 -0.013 +0.0000 -0.0005	+0.000 -0.013 +0.0000 -0.0005	+0.00 -0.13 +0.000 -0.005	+0.00 -0.13 +0.000 -0.005	Nom	Min	Min					9
DCA1-1E	6.3500 .2500	19.7460 .7774	10.3200 .4063	8.3312 .3280	8.280 .326	.127 .005	.559 .022	8	5.19	1.62	.000/.013	15
DCA5-2E	12.7000 .5000	36.5125 1.4375	23.7998 .9370	19.0500 .7500	17.475 .688	.381 .015	.813 .032	5	22.40	7.00	.000/.018	110

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
SEALS - PTFE coated glass cloth

For shaft and housing fits consult RHP

External corners r and r₁ may be radii or chamfers

PROTECTION:

All external surfaces except bore and seals are cadmium plated to DEFSTAN 03-19

LUBRICATION:

Normally charged with grease to NATO G-354

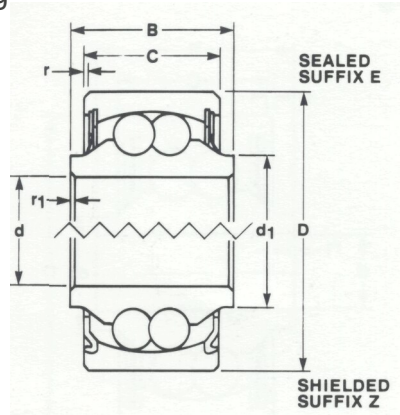
DESIGNATION MODIFIERS:

PREFIX S Rings & balls in Corrosion Resisting Steel AISI 440C
SUFFIX E Sealed
G2 Grease to NATO G-395

Aircraft control bearings

DCA 100 series

Double row self-aligning ball bearing



BSI Series 3SP89 Table 16

ISO Series R1002 Table 16

MIL Series MS27643 (when suffix E specified)

Bearing	Measurement in mm				d-i	Chamfer at 45°		Swivel Angle	Limit load rating		RIC (MS27643)	Approx Mass
	d	D	B	C		r ₁	r		C _r > kN	F _a » kN		
	+0.000 -0.013	+0.000 -0.013	+0.00 -0.13	+0.00 -0.13	Nom	+0.38 -0.00	+0.38 -0.00	±°	Radial	Axial		9
	+0.000 -0.0005	+0.0000 -0.0005	+0.000 -0.005	+0.000 -0.005		+0.015 -0.000	+0.015 -0.000					
DCA103	4.8260 .1900	19.7460 .7774	12.700 .500	9.957 .392	7.722 .304	.127 .005	.559 .022	10	6.32	.89	.000/.025	18
DCA104	6.3500 .2500	22.8956 .9014	17.450 .687	11.786 .464	10.922 .430	.127 .005	.813 .032	10	7.93	1.33	.000/.025	29
DCA105	7.9375 .3125	31.7500 1.2500	20.625 .812	16.662 .656	13.081 .515	.381 .015	.813 .032	10	16.64	2.67	.000/.025	79
DCA106	9.5250 .3750	36.5125 1.4375	23.800 .937	19.050 .750	14.326 .564	.381 .015	.813 .032	10	22.68	3.56	.000/.025	115
DCA108	12.7000 .5000	42.8625 1.6875	25.400 1.000	20.625 .812	19.685 .775	.381 .015	1.118 .044	10	31.72	4.45	.000/.025	168
DCA110	15.8750 .6250	49.2125 1.9375	28.575 1.125	23.800 .937	22.073 .869	.381 .015	1.118 .044	10	40.14	5.78	.000/.025	240

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
SHIELDS - Corrosion Resisting Steel
SEALS - PTFE coated glass cloth

For shaft and housing fits see page 9

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

LUBRICATION:

Normally charged with grease to NATO G-354

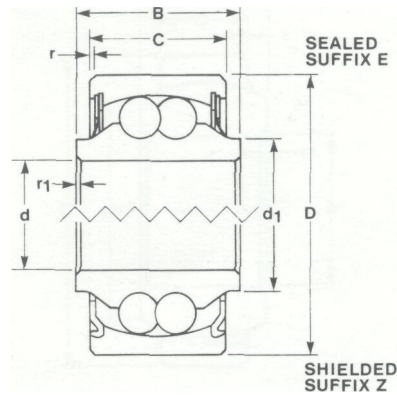
DESIGNATION MODIFIERS:

PREFIX M Precision series—see page 41
S Corrosion Resisting Steel AISI 440C
SUFFIX E Sealed
Z Shielded
NP Not plated
G2 Grease to NATO G-395



MDCA 100 series

Double row self-aligning ball bearing



Bearing	Measurement in mm		Measurement in inches		di	Chamfer at 45°		Swivel Angle ±°	Limit load rating		RIC	Approx Mass g
	d	D	B	C		r _i	r		Radial C _s kN	Axial F _a kN		
	+0.00 -0.008 +0.000 -0.0003	+0.00 -0.010 +0.000 -0.0004	+0.00 -0.064 +0.000 -0.0025	+0.00 -0.13 +0.000 -0.005	Nom	+0.38 -0.00 +0.015 -0.000	+0.38 -0.00 +0.015 -0.000					
MDCA103	4.8260 .1900	19.7460 .7774	12.700 .500	9.957 .392	7.722 .304	.127 .005	.559 .022	10	6.32	.89	.005/.013	18
MDCA104	6.3500 .2500	22.8956 .9014	17.450 .687	11.786 .464	10.922 .430	.127 .005	.813 .032	10	7.93	1.33	.005/.013	29
MDCA105	7.9375 .3125	31.7500 1.2500	20.625 .812	16.662 .656	13.081 .515	.381 .015	.813 .032	10	16.64	2.67	.005/.013	79
MDCA106	9.5250 .3750	36.5125 1.4375	23.800 .937	19.050 .750	14.326 .564	.381 .015	.813 .032	10	22.68	3.56	.005/.013	115
MDCA108	12.7000 .5000	42.8625 1.6875	25.400 1.000	20.625 .812	19.685 .775	.381 .015	1.118 .044	10	31.72	4.45	.005/.013	168
MDCA110	15.8750 .6250	49.2125 1.9375	28.575 1.125	23.800 .937	22.073 .869	.381 .015	1.118 .044	10	40.14	5.78	.005/.013	240

MATERIALS:

RINGS & BALLS - High Carbon Chromium Steel SAE 52100
 SHIELDS - Corrosion Resisting Steel
 SEALS - PTFE coated glass cloth

For shaft and housing fits see page 9

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

LUBRICATION:

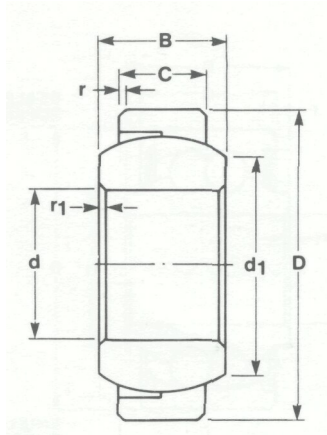
Normally charged with grease to NATO G-354

DESIGNATION MODIFIERS:

PREFIX S Rings and balls in Corrosion Resisting Steel AISI 440C
 SUFFIX E Sealed
 Z Shielded
 NP Not plated
 G2 Grease to NATO G-395

Aircraft control bearings

CJ 500 series Spherical plain bearing



AECMA series EN2336

Bearing	Measurement in mm				d, Min	Chamfer at 45°		Nom Spherical dia	Swivel Angle +°	Limit load rating Radial C _s kN	RIC (Max)	Approx Mass g
	d	D	B	C		r ₁	r					
CJ505	5.000 4.992	14.000 13.992	6.00 5.93	4.00 3.75	7	.6 .3	.8 .3	10	13	12	.015	4
CJ506	6.000 5.992	14.000 13.992	6.00 5.93	4.00 3.75	8	.6 .3	.8 .3	10	13	16	.015	4
CJ508	8.000 7.992	16.000 15.992	8.00 7.91	5.00 4.75	10	.6 .3	.8 .3	13	15	26	.015	7
CJ510	10.000 9.991	19.000 18.991	9.00 8.91	6.00 5.75	13	.8 .5	.8 .3	16	12	45	.015	11
CJ512	12.000 11.991	22.000 21.991	10.00 9.91	7.00 6.75	15	.8 .5	1.2 .5	18	11	60	.015	15
CJ515	15.000 14.991	26.000 25.991	12.00 11.89	9.00 8.75	18	.8 .5	1.2 .5	22	8	90	.015	28
CJ517	17.000 16.991	30.000 29.991	14.00 13.89	10.00 9.75	20	1.1 .7	1.5 .6	25	10	110	.015	44
CJ520	20.000 19.989	35.000 34.989	16.00 15.89	12.00 11.75	24	1.1 .7	1.5 .6	29	9	160	.015	60
CJ525	25.000 24.989	42.000 41.989	20.00 19.87	16.00 15.75	29	1.1 .7	1.5 .6	36	7	270	.015	105
CJ530	30.000 29.989	47.000 46.989	22.00 21.87	18.00 17.75	34	1.1 .7	1.5 .6	41	6	380	.015	145
CJ535	35.000 34.987	55.000 54.987	25.00 24.87	20.00 19.75	39	1.1 .7	1.5 .6	47	6	500	.020	210
CJ540	40.000 39.987	62.000 61.987	28.00 27.87	22.00 21.75	45	1.7 1.2	1.7 .8	53	7	630	.020	285
CJ545	45.000 44.987	68.000 67.987	32.00 31.84	25.00 24.75	50	1.7 1.2	1.7 .8	60	7	820	.020	420
CJ550	50.000 49.987	75.000 74.987	35.00 34.84	28.00 27.75	55	1.7 1.2	1.7 .8	66	6	1000	.020	515
CJ560	60.000 59.985	90.000 89.985	44.00 43.84	36.00 35.75	66	1.7 1.2	1.7 .8	80	6	1600	.025	1050
CJ570	70.000 69.985	105.000 104.985	49.00 48.84	40.00 39.75	77	1.7 1.2	1.7 .8	92	6	2000	.025	1510
CJ580	80.000 79.985	120.000 119.985	55.00 54.81	45.00 44.75	88	1.7 1.2	1.7 .8	105	6	2600	.025	2250

MATERIALS:

RINGS - High Carbon Chromium Steel SAE 52100

DESIGNATION MODIFIERS:

PREFIX S Rings in Corrosion Resisting Steel AISI 440C

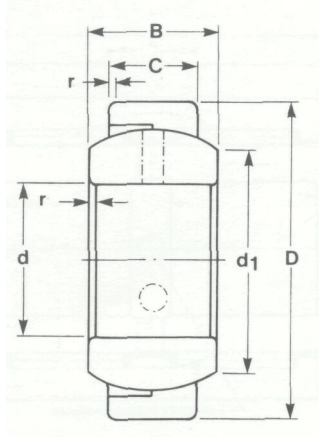
SUFFIX L Inner ring lubrication holes

For shaft and housing fits see pages 8 and 9

Special coatings ie Molybdenum Disulphide can be applied to bearing if required



CJ series Spherical plain bearings



Bearing	Measurement in mm Measurement in inches				d, Norm	r	Oil Hole dia	Swivel Angle +°	Limit load rating Radial C _s kN	RIC (Max)	Approx Mass g
	d	D	B	C							
	+0.005 -0.005 +0.0002 -0.0002	-0.008 -0.018 -0.0003 -0.0007	+0.00 -0.05 +0.000 -0.002	+0.00 -0.05 +0.000 -0.002							
CJ0	4.8209 .1898	14.2875 .5625	5.5563 .2188	3.9688 .1563	8.64 .34	.396 .016	1.2	10	20.48	.004	4
CJ1	6.3500 .2500	14.2875 .5625	5.5563 .2188	3.9688 .1563	8.64 .34	.396 .016	1.2	10	20.48	.004	4
CJ2	7.9375 .3125	15.8750 .6250	6.3500 .2500	4.7625 .1875	10.16 .40	.396 .016	1.2	9	28.35	.004	6
CJ3	9.5250 .3750	19.0500 .7500	7.9375 .3125	5.5563 .2188	13.72 .54	.396 .016	1.2	9	44.46	.004	10
CJ5	12.7000 .5000	23.8125 .9375	11.1125 .4375	7.9375 .3125	15.75 .62	.396 .016	1.6	11	75.60	.004	21
CJ7	15.8750 .6250	28.5750 ^f 1.1250	12.7000 .5000	8.7313 .3438	19.30 .76	.396 .016	1.6	11	100.50	.004	32
CJ8	19.0500 .7500	33.3375 ^f 1.3125	14.2875 .5625	9.5250 .3750	23.88 .94	.792 .031	1.6	11	133.06	.004	52
CJ10	25.4000* 1.0000	39.6875 ^f 1.5625	17.4625 .6875	11.1125 .4375	29.97 1.18	.792 .031	1.6	12	186.29	.004	77

* Tolerance is +.005/.008
+0.0002/-0.0003
^t Tolerance is -.008/.020
-0.0003/-0.0008

MATERIALS:
RINGS - High Carbon Chromium Steel SAE 52100

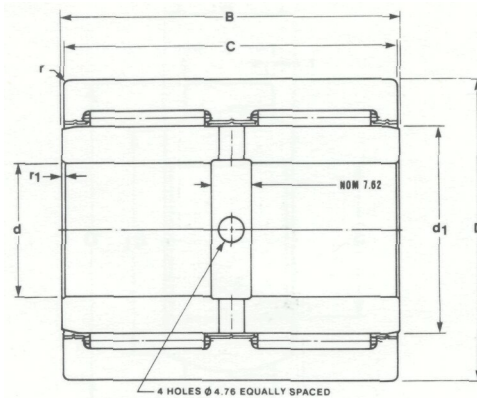
PREFIX/SUFFIX:
PREFIX S Rings in Corrosion Resisting Steel AISI 440C
SUFFIX L Inner ring relubrication holes

Three oil holes equally spaced around the inner ring if suffix L present

Special coatings ie Molybdenum Disulphide can be applied to the bearing if required

Aircraft control bearings

RN 5000 series Double row needle roller bearing



Bearing	Measurement in mm		B	C	d, Nom	r/ r*	Limit load rating	Radial C _s kN	RIC	Approx Mass g
	d	D								
RN5028	17.4800	38.1250	63.750	63.550	23.089	.270	89.00	.041/.076	410	
	17.4620	38.0890	63.750	63.500		.100				
	.6882	1.5010	2.510	2.502	.909	.011				
	.6875	1.4996	2.508	2.500		.004				
RN5029	22.2450	44.4750	63.750	63.550	27.864	.270	105.50	.041/.076	530	
	22.2250	44.4390	63.700	63.500		.100				
	.8758	1.7510	2.510	2.502	1.097	.011				
	.8750	1.7496	2.508	2.500		.004				
RN5030	25.4300	57.1750	63.750	63.550	39.357	.270	154.00	.041/.081	950	
	25.4000	57.1390	63.700	63.500		.100				
	1.0012	2.2510	2.510	2.502	1.549	.011				
	1.0000	2.2496	2.508	2.500		.004				
RN5031	13.5120	31.7754	63.750	63.550	18.319	.380	72.50	.041/.076	290	
	13.4940	31.7502	63.700	63.500		.130				
	.5320	1.2510	2.510	2.502	.721	.015				
	.5313	1.2500	2.508	2.500		.005				

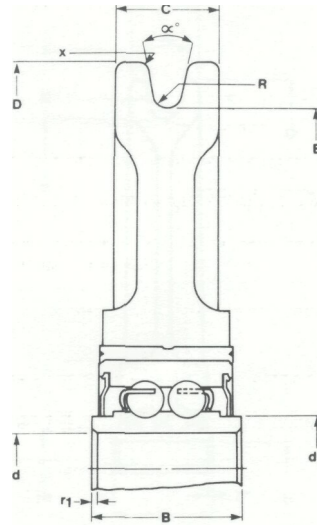
MATERIALS:
RINGS & ROLLERS - High Carbon Chromium Steel SAE 52100
RETAINING RINGS -Corrosion Resisting Steel

" Corners will clear fillet radius of stated values

Four lubrication holes equally spaced in inner ring
Outer ring outside diameter hard chrome plated



Control pulleys



AECMA Series EN 2081

Control pulley	Cable Dia	Measurement in mm										Chamfer at 45°	Limit load ratings		Approx Mass g
		E	D	C	R	x	α	d	d ₁	B	x		r ₁	Radial C _S kN	
CP1630t	1.6	+5 -0	+0 -5	+0 -5	+1 -1	+1°30' -1°30'	+0.002 -0.010	Min	+0 -1	Nom	+5 -0	6.1	2.60	12	
CP1650	1.6	50	58	6.0	1.0	28	6	8.8	8	1	.3	4.5	2.60	25	
CP1664	1.6	64	72	6.0	1.0	28	6	8.8	8	1	.3	4.5	2.60	35	
CP2464	2.4	64	72	8.0	1.5	28	8	10.6	12	1	.3	9.7	4.90	55	
CP2480	2.4	80	88	8.0	1.5	28	8	10.6	12	1	.3	9.7	4.90	65	
CP3280	3.2	80	90	10.0	1.9	22	10	13.2	14	1	.3	13.8	10.80	80	
CP32120	3.2	120	130	10.0	1.9	22	10	13.2	14	1	.3	13.8	10.80	145	
CP40120	4.0	120	133	11.0	2.3	22	12*	15.5	16	1	.3	19.4	14.90	165	
CP40150	4.0	150	163	11.0	2.3	22	12*	15.5	16	1	.3	19.4	14.90	240	
CP48120	4.8	120	133	12.0	2.8	22	12*	16.0	17	1	.3	25.2	22.40	175	
CP48150	4.8	150	163	12.0	2.8	22	12*	16.0	17	1	.3	25.2	22.40	250	
CP64150t	6.4	150	166	14.0	3.7	22	15*	17.7	18	1	.3	42.3	37.20	300	
CP64180t	6.4	180	196	14.0	3.7	22	15*	17.7	18	1	.3	42.3	37.20	400	

*Tolerance -0.011/+0.003

t No cage in bearing

MATERIALS:

- PULLEY BODY - Fabric Reinforced Phenolic Resin
- BEARING - Corrosion Resisting Steel AISI 440C
- RETAINING RING - Aluminium
- SHIELDS - Corrosion Resisting Steel

LUBRICATION:

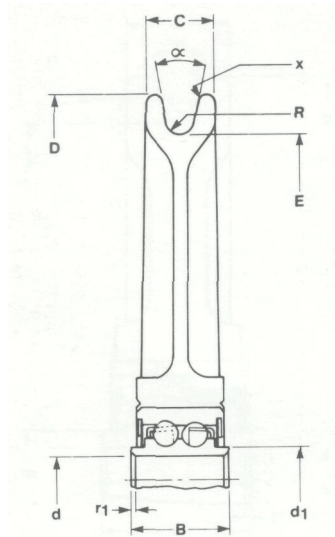
Normally charged with grease to NATO G-354

DESIGNATIONMODIFIERS:

Suffix G2 Grease to NATO G-395

C_R - Load ratings as defined in EN2062

Control pulleys (Aluminium)



Control pulley	Cable dia	Measurement in mm										Limit load ratings		Approx Mass g
		E	D	C	R Nom	x°	d	d, Nom	B	x Norm	Chamfer at 45° r ₁	C _S kN	C _R kN	
1A/CP2480	2.4	80.60	90.00	11.00	1.50	23	7.937	11.55	15.875	1.0	.51	15.2	4.9	115
		80.00	89.40	10.50		21	7.924		15.748		.13			
2A/CP2480	2.4	80.50	90.00	11.00	1.50	23	7.937	11.55	15.875	1.0	.51	15.2	4.9	115
		80.00	89.50	10.50		21	7.924		15.748		.13			
4A/CP3280	3.2	80.50	90.00	10.00	1.85	23	7.937	11.55	15.875	1.0	.51	15.2	10.8	110
		80.00	89.50	9.50		21	7.924		15.748		.13			
5A/CP3280	3.2	80.50	90.00	10.00	1.90	23	12.700	15.50	16.000	1.0	.51	21.6	10.8	120
		80.00	89.50	9.50		21	12.687		15.873		.13			
4A/CP32120	3.2	120.70	130.00	10.00	1.65	23	10.000	13.25	14.000	1.0	.60	13.8	10.8	165
		120.00	129.30	9.50		21	9.992		13.900		.40			
5A/CP32120	3.2	120.70	130.00	10.00	1.90	23	7.937	11.55	15.875	1.0	.51	15.2	10.8	155
		120.00	129.30	9.50		21	7.924		15.748		.13			
2A/CP32200	3.2	200.50	212.00	10.00	1.90	23	7.937	11.55	15.875	1.0	.51	15.2	10.8	380
		200.00	211.50	9.50		21	7.924		15.748		.13			
3A/CP40120	4.0	120.50	133.00	11.00	2.25	23	12.700	15.50	16.000	.6	.51	21.6	14.9	180
		120.00	132.50	10.50		21	12.687		15.873		.13			
1A/CP40125	4.0	125.14	137.84	9.65	2.08	23	12.705	16.21	15.875	.9	1.02	36.5	14.9	200
		124.59	137.29	9.40		21	12.692		15.824		.84			
1A/CP40150	4.0	150.55	163.24	9.65	2.08	23	12.705	16.21	15.875	.9	1.02	36.5	14.9	220
		150.00	162.69	9.40		21	12.692		15.824		.84			
3A/CP40150	4.0	150.50	163.00	11.00	2.30	23	12.700	15.50	16.000	1.0	.51	21.6	14.9	240
		150.00	162.50	10.50		21	12.687		15.873		.13			
1A/CP40175	4.0	175.95	188.65	9.65	2.08	23	12.705	16.21	15.875	.9	1.02	36.5	14.9	285
		175.40	188.10	9.40		21	12.692		15.824		.84			

Control Pulleys are produced to many specifications including the following:

- Airbus Industries - NSA
- Aerospatiale - ASNA
- British Aerospace - SL

The pulley bodies are in various Aluminiums eg BS: L93, AU4G1-T351 and can be protected by anodising or painting with polyurethane paint.

The grooves can be coated with PTFE.

The bearings are in high Carbon Chromium Steel SAE 52100 or Corrosion Resisting Steel AISI 440C with either PTFE coated glass cloth seals or Corrosion Resisting Steel shields to meet the project specifications for which they were designed.

LUBRICATION:

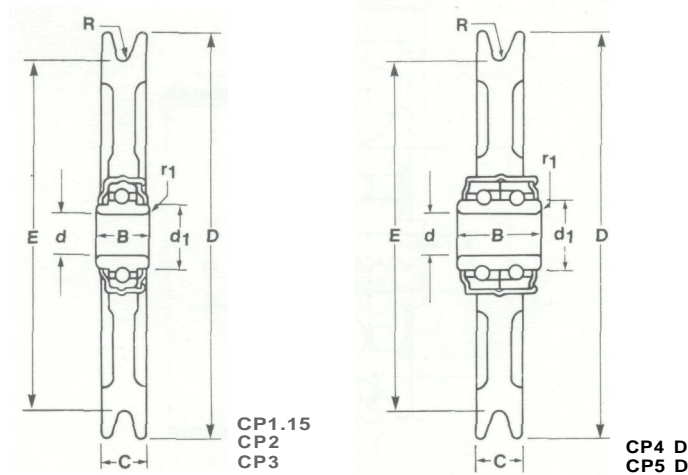
Normally charged with grease to NATO G-354

DESIGNATION MODIFIERS:

Suffix G2 Grease to NATO G-395

C_R - Load ratings as defined in EN2062

Control pulleys



SBAC Series A.S.

Control pulley	SBAC Reference	Measurement in mm Measurement in inches								Chamfer at 45°	Limit load ratings		Approx Mass
		E	D	C	R	d	di	B	r,		Radial		
		+0.25 -0.25 +0.10	+0.00 -0.25 +0.000	+0.25 -0.25 +0.10	+0.13 -0.00 +0.005	+0.005 -0.005 +0.0002	Nom	+0.00 -0.05 +0.000			C _s kN	C _B kN	g
CP1.15	AS 111	29.210 1.150	35.560 1.400	6.350 .250	1.524 .060	6.3500 .2500	10.084 .397	7.9375 .3125	.76 .03		9	3	16
CP2	AS 103	50.800 2.000	60.960 2.400	9.398 .370	2.032 .080	9.5250 .3750	12.573 .495	12.7000 .5000	.76 .03		11	6	36
CP3	As 104	76.200 3.000	88.900 3.500	10.414 .410	2.413 .095	9.5250 .3750	12.573 .495	12.7000 .5000	.76 .03		11	11	59
CP4D	AS 105	101.600 4.000	116.840 4.600	11.938 .470	3.048 .120	12.7000 .5000	18.669 .735	15.8750 .6250	1.02 .04		36	21	135
CP5D	AS 106	127.000 5.000	142.240 5.600	11.938 .470	3.048 .120	12.7000 .5000	18.669 .735	15.8750 .6250	1.02 .04		36	21	177

MATERIALS:

- PULLEY BODY - Fabric Reinforced Phenolic Resin
- BEARING - High Carbon Chromium Steel SAE 52100
- HOUSING/SIELDS - Corrosion Resisting Steel

LUBRICATION:

Normally charged with grease to NATO G-354

DESIGNATION MODIFIERS:

Suffix G2 Grease to NATO G-395

SUITABLE CABLE SIZES (mm):

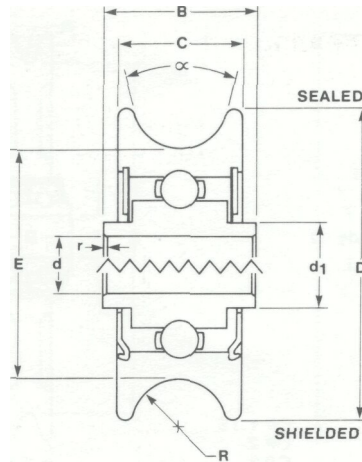
- CP1.15 2.0
- CP2 2.0 3.0
- CP3 3.0 3.8 4.1
- CP4D 4.1 4.6 5.3
- CP5D 4.1 4.6 5.3

Consideration will also be given to the supply of pulleys in aluminium alloy.

C_R - Load ratings as defined in EN2062

Aircraft control bearings

FL series Fairleads



Fairlead	Measurement in mm								Chamfer at 45° r	Approx Mass g	Closure
	E	D	C	R	oc°	d	<J, Nom	B			
FL4823	23.000	32.254	9.774	2.8	29	6.350	9.1	11.125	.51	11	Shielded
	22.746	31.746	9.266	2.7	27	6.337		10.998	.25		
FL6419	19.180	26.040	10.410	4.1		4.826	7.5	12.700	.50	9	Sealed
	18.920	25.780	10.290	3.8		4.813		12.570	.13		

MATERIALS:

- INNER RING & BALLS - Corrosion Resisting Steel AISI 440C
- OUTER RING - Molybdenum Disulphide filled Nylon
- CAGE - Corrosion Resisting Steel
- SHIELDS - Corrosion Resisting Steel
- SEALS - PTFE coated glass cloth

LUBRICATION:

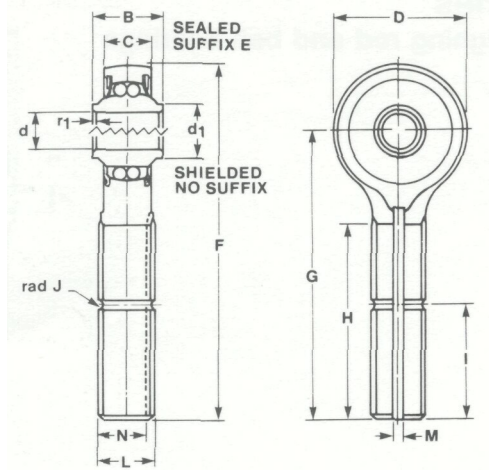
Self lubricating due to composition of outer ring

FAIRLEADS AVAILABLE WITH METALLIC OUTER RING



CM 500 series

Double row self-aligning rod end ball bearing



AECMA Series EN 2492

	Measurement in mm						Chamfer at 45°		Limit load rating											
	d	D	B	C	d ₁	r ₁	F	G	H	I	J	M	N	L	Thread	Swivel Angle	Radial C, kN	Axial F _a , kN	RIC Max	Approx Mass g
Bearing	+0.00 -0.008	+2 -0	+0.00 -0.12	+1 -0	Min	+3 -2	Ref	+5 -5				+1 -0	+0 -0.1	MJ8x1.0	+°	C	F _a	RIC	Max	g
CM505	5.000	20.50	12.00	8.50	7.6	.5	58.25	48	33	18	.7	1.6	6.6	MJ8x1.0	8	5.24	1.64	.005	35	
CM506	6.000	22.50	14.00	10.00	8.5	.5	65.25	54	37	22	.8	2.4	8.0	MJ10x1.25	8	6.84	2.14	.005	60	
CM508	8.000	28.50	15.00	10.00	11.4	.5	76.25	62	42	25	.8	2.4	10.2	MJ12x1.25	8	9.02	2.82	.005	85	
CM510	10.000	32.00	20.00	14.00	13.6	.5	89.00	73	48	31	1.0	3.2	12.2	MJ14x1.5	8	15.38	4.81	.005	130	

MATERIALS:

- ROD END BODY -3% Nickel Case Hardening Steel BS: S15
- INNER RING & BALLS - High Carbon Chromium Steel SAE 52100
- SHIELDS - Corrosion Resisting Steel
- SEALS - PTFE coated glass cloth

PROTECTION:

All external surfaces of rod end body only are cadmium plated to DEF STAN 03-19

LUBRICATION:

Normally charged with grease to NATO G-354

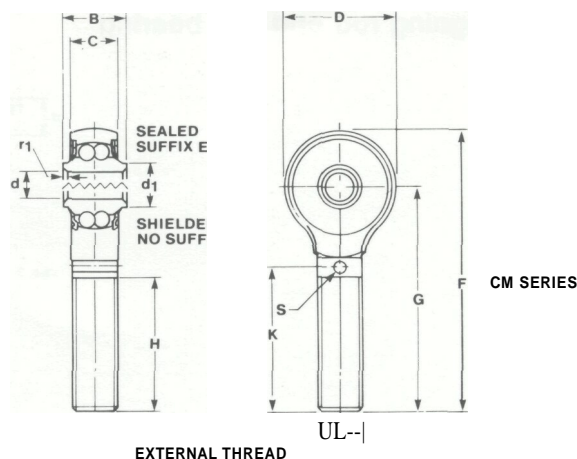
DESIGNATION MODIFIERS:

- PREFIX S Corrosion Resisting Steel AISI 440C (Inner ring & balls only)
- SUFFIX E Sealed (Shielded as standard)
- L Left hand thread
- S No keyway in shank
- G2 Grease to NATO G-395

Alternative thread forms may be available

CM and CF series

Double row self-aligning rod end ball bearings



Bearing	Measurement in mm		Measurement in inches		d ,	Chamfer at 45° r ,	F	G	H	L	K
	d	D	B	C							
	+0.000 -0.013 +0.0000 -0.0005	+0.25 -0.25 +0.010 -0.010	+0.00 -0.13 +0.000 -0.005	+0.00 -0.13 +0.000 -0.005	Nom	+0.25 -0.00 +0.010 -0.000	ref	+0.25 -0.25 +0.010 -0.010			
EXTERNAL THREADS											
CM3	4.8260* .1900	19.837 .781	11.100 .437	8.331 .328	7.620 .300	.762 .030	49.61 1.95	39.624 1.560	23.825 .938	5/16-24UNF-2A	24.841 .978
CM3L	4.8260* .1900	19.837 .781	11.100 .437	8.331 .328	7.620 .300	.762 .030	49.61 1.95	39.624 1.560	23.825 .938	5/16-24UNF-2A	24.841 .978
CM4-1	6.3500 .2500	23.825 .938	15.062 .593	11.125 .438	8.763 .345	.406 .016	59.54 2.34	47.625 1.875	28.575 1.125	3/8-24UNF-2A	
CM4-2	6.3500 .2500	23.825 .938	15.062 .593	11.125 .438	8.712 .343	.406 .016	59.54 2.34	47.625 1.875	26.010 1.024	3/8-24UNF-2A	31.750 1.250
CM4-2E	6.3500 .2500	23.825 .938	15.062 .593	11.379 .448	8.712 .343	.406 .016	59.54 2.34	47.625 1.875	26.010 1.024	3/8-24UNF-2A	31.750 1.250
CM4-6E	6.3500 .2500	19.837 .781	10.312 .406	8.585 .338	8.280 .326	.127 .005	51.21 2.02	41.275 1.625	24.206 .953	5/16-24UNF-2A	28.753 1.132
INTERNAL THREADS											
CF3-1	4.8260* .1900	19.837 .781	11.100 .437	8.331 .328	7.620 .300	.762 .030	44.86 1.77	34.925 1.375	19.050 .750	3/8-24UNF-2B	22.225f .875
CF3-2	4.8260* .1900	19.837 .781	11.100 .437	8.331 .328	7.620 .300	.762 .030	44.86 1.77	34.925 1.375	19.050 .750	1/4-28UNF-2B	20.650 .813
CF4-2	6.3500 .2500	23.825 .938	15.062 .593	11.125 .438	8.712 .343	.406 .016	49.21 1.94	37.313 1.469	19.050 .750	5/16-24UNF-2B	20.650 .813
CF4-3H	6.3500 .2500	23.825 .938	15.062 .593	11.125 .438	8.763 .345	.406 .016	59.53 2.34	47.625 1.875	30.963 1.219	10.720 .422	—

* Tolerance is +.000/-0.010
+.0000/-0.0004

f Hole at this position rotated 90° to lower hole

MATERIALS:

ROD END - 3% Nickel Case Hardening Steel BS S15
INNER RING & BALLS - High Carbon Chromium Steel SAE 52100
SHIELDS - Corrosion Resisting Steel
SEALS - PTFE coated glass cloth

PROTECTION:

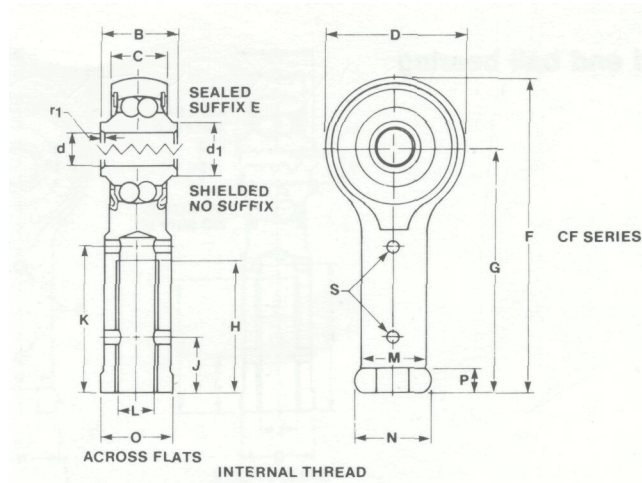
All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

LUBRICATION:

Normally charged with grease to NATO G-354

DESIGNATION MODIFIERS:

SUFFIX E Sealed (No suffix = Shielded)
L Left hand thread
H Non threaded shank
G2 Grease to NATO G-395

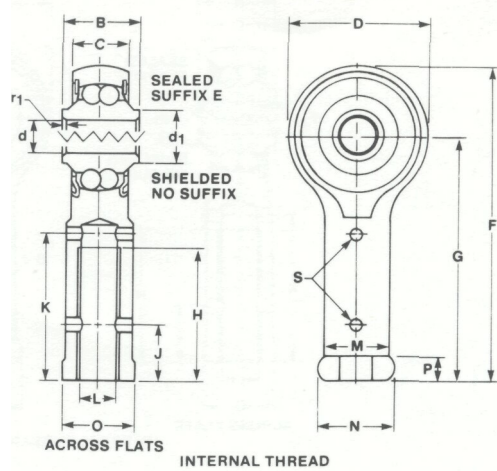


S	J	M	N	O	P	Form at end of shank	Swivel Angle +°	Limit Load rating		RIC (Max)	Approx Mass g
								Radial C _s kN	Axial F _a kN		
1.78 .07							10	5.24	1.64	.003	26
1.78 .07							10	5.24	1.64	.003	26
							14	8.97	2.80	.003	47
1.78 .07							10	8.97	2.80	.003	44
1.78 .07							5	8.97	2.80	.003	44
1.02 .04							8	5.24	1.64	.003	25
1.78 .07	7.925 .312	12.700 .500	15.240 .600	13.284 .523	4.76 .19	Bead	10	5.24	1.64	.003	29
1.78 .07	7.925 .312	9.525 .375	11.125 .438		3.18 .13	Bead	10	5.24	1.64	.003	25
1.78 .07	7.925 .312	11.125 .438		11.125 .438	4.76 .19	Hexagonal	10	8.97	2.80	.003	38
		15.875 .625					14	8.97	2.80	.003	62

Aircraft control bearings

SCF 100 series

Double row self-aligning rod end ball bearing



Bearing	Measurement in mm		Measurement in inches		d , Norm	Chamfer at 45° r , +.23 -.00 +.009 -.000	F	G	H	K	L
	d	D	B	C							
	+0.00 -.013 +0.0000 -.0005	+0.25 -.25 +0.010 -.010	+0.00 -.13 +0.000 -.005	+0.00 -.51 +0.000 -.020			REF	+0.25 -.25 +0.010 -.010	Nom	+0.25 -.25 +0.010 -.010	Thread UNJF-3B
SCF143	4.8260 .1900	19.837 .781	11.100 .437	8.585 .338	7.620 .300	.406 .016	44.856 1.766	34.925 1.375	19.050 .750	20.650 .813	1/4-28
SCF154	6.3500 .2500	23.825 .938	15.062 .593	11.379 .448	8.763 .345	.406 .016	49.225 1.938	37.313 1.469	19.050 .750	20.650 .813	5/16-24
SCF164	6.3500 .2500	23.825 .938	15.062 .593	11.379 .448	8.763 .345	.406 .016	59.538 2.344	47.625 1.875	28.575 1.125	30.480 1.200	3/8-24

MATERIALS:

- ROD END - 3% Nickel Case Hardening Steel BS S15
- INNER RING & BALLS - Corrosion Resisting Steel A1S1 440C
- SHIELDS - Corrosion Resisting Steel
- SEALS - PTFE coated glass cloth

PROTECTION:

All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

LUBRICATION:

Normally charged with grease to NATO G-354

DESIGNATION MODIFIERS:

- SUFFIX E Sealed (No suffix = Shielded)
- L Left hand thread
- S No keyway in shank (standard for this series)
- NP Not cadmium plated
- G2 Grease to NATO G-395

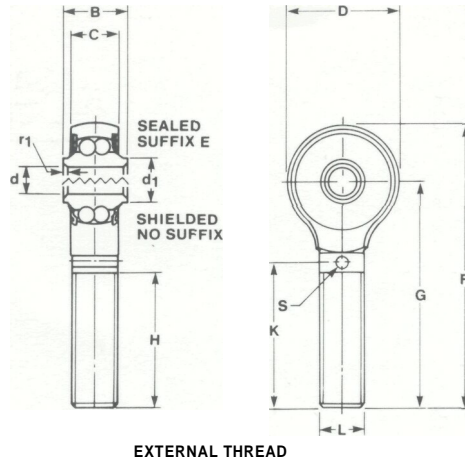


S	J	M	N	O	P	Form at end of shank	Swivel Angle +°	Limit load rating			Approx Mass g
								Radial C _s kN	Axial F _a kN	RIC (Max)	
1.78 .07	7.925 .312	9.525 .375	11.125 .438		3.429 .135	Bead	5	5.24	1.64	.003	25
1.78 .07	7.925 .312	11.125 .438		11.125 .438	5.000 .197	Hexagonal	5	8.97	2.80	.003	40
1.78 .07	7.925 .312	15.875 .625					5	8.97	2.80	.003	70

Aircraft control bearings

SCM 100/200 series

Double row self-aligning rod end ball bearing



Rod end	Measurement in mm				Measurement in inches		Chamfer at 45° r ₁	F	G	H	K	L	S	Limit load rating			Approx Mass	
	d	D	B	C	d ₁	Swivel Angle +°								C _s kN	F _a kN	RIC (Max)		
	+0.00 -0.13 -0.005	+0.25 -0.25 -0.10	+0.00 -0.13 -0.005	+0.00 -0.51 -0.020	Nom -0.00 -0.000	+0.23 -0.00 +0.009		+0.25 -0.25 +0.010 -0.010					Thread UNJF-3A	Nom				
SCM153	4.8260 .1900	19.837 .781	11.100 .437	8.585 .338	7.620 .300	.406 .016		49.606 1.953	39.624 1.560	23.825 .938	27.000 1.063	5/16-24	1.78 .07	5	5.24	1.64	.003	25
SCM154	6.3500 .2500	23.825 .938	15.062 .593	11.379 .448	8.763 .345	.406 .016		54.864 2.160	42.875 1.688	23.825 .938	27.000 1.063	5/16-24	1.78 .07	5	8.97	2.80	.003	37
SCM164	6.3500 .2500	23.825 .938	15.062 .593	11.379 .448	8.763 .345	.406 .016		59.538 2.344	47.625 1.875	28.575 1.125	31.750 1.250	3/8-24	1.78 .07	5	8.97	2.80	.003	44
SCM165	7.9375 .3125	33.020 1.300	22.098 .870	16.637 .655	11.049 .435	.406 .016		78.410 3.087	61.544 2.423	38.100 1.500	41.021 1.615	3/8-24	1.78 .07	5	16.61	5.19	.003	100
SCM254	6.3500 .2500	23.825 .938	15.062 .593	11.379 .448	8.763 .345	.406 .016		50.089 1.972	38.100 1.500	19.050 .750	22.225 .875	5/16-24	1.78 .07	5	8.97	2.80	.003	35

MATERIALS:

- ROD END - 3% Nickel Case Hardening Steel BS. S15
- INNER RING & BALLS -Corrosion Resisting Steel AISI 440C
- SHIELDS - Corrosion Resisting Steel
- SEALS - PTFE coated glass cloth

PROTECTION:

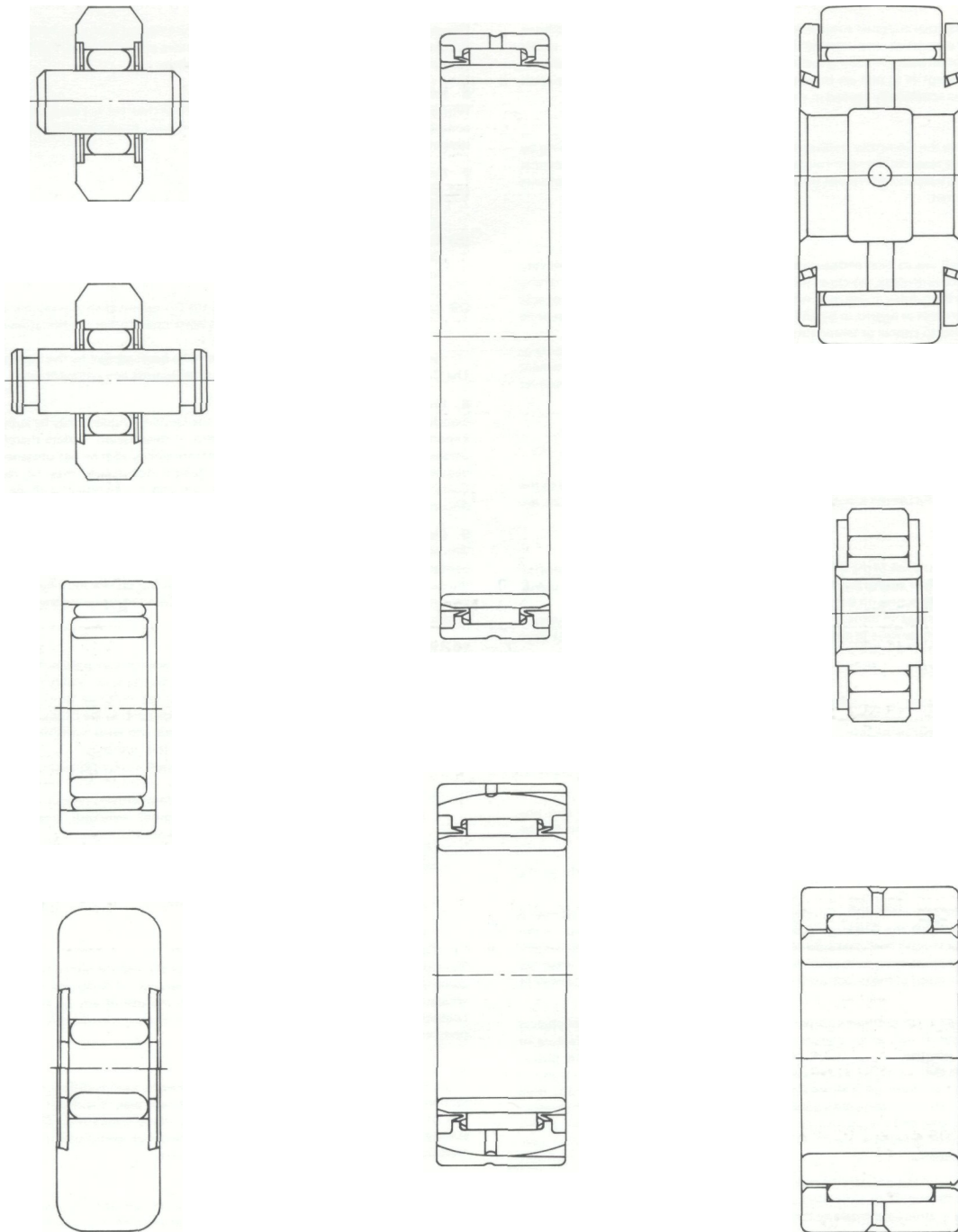
All external surfaces except bore and seals/shields are cadmium plated to DEF STAN 03-19

LUBRICATION:

Normally charged with grease to NATO G-354

DESIGNATION MODIFIERS:

- SUFFIX E Sealed (No suffix = Shielded)
- L Left hand thread
- S No keyway in shank (standard for this series)
- NP Not cadmium plated
- G2 Grease to NATO G-395



Typical of the many special needle roller bearings designed to meet specific aerospace requirements, eg.—Canard support externally aligning—track and guide rollers—undercarriage main bearings—taileron support bearings.

Roulements a aiguilles conqus pour satisfaire les besoins specifiques du domaine aerospacial, par exemple: support Canard a alignement exterieur, bandes de roulements de support d'empennage de profondeur.

Auswahl aus der Vielzahl von Spezialnadellager, welche entsprechend den jeweils anwendbaren Luftfahrtanforderungen entwickelt wurden.
z.B.

Canard Aufhangung auBen ausrichtend (fluchtend)
Stiitz-u. Fiihrungsrollen
Fahrwerkaufhangungs-Lager
Leitwerkaufhangungs-Lager

Intestazione per il gruppo di cuscinetti special! a rullini.
Tipico di molti cuscinetti a rullini progettati per soddisfare esigenze specifich del Settore aeronautico, ad es. supporto Canard per allineamenti esterni rulli guida per pista—cuscinetti principal! carrello—cuscinetti supporto taileron.