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CANNON CONNECTORS TYPE MC, KO, KH KM AND KM Mk.2

GENERAL AND TECHNICAL INFORMATION

BY COMMAND OF THE DEFENCE COUNCIL

L.T. Dunnett

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Chapter 1-1

CANNON MC SERIES CONNECTORS

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ILLUSTRATIONS

LEADING PARTICULARS

Environment types ... ...

Contact rating ... ... *Size 20 5A*

Contact material and finish ... *Copper alloy, gold over silver plating*

Service rating (test voltages a.c. (r.m.s.) 60 Hz).

Service 1 Voltage ... ... 1250; *at sea level*

Hermetic types

Contact rating ... ... *Size 20 5A*

Contact material and finish ... ... *Steel, tin over cadmium plating*

Service rating (test voltages a.c. (r.m.s.) 60 Hz).

Voltage ... ... 735; *at sea level*

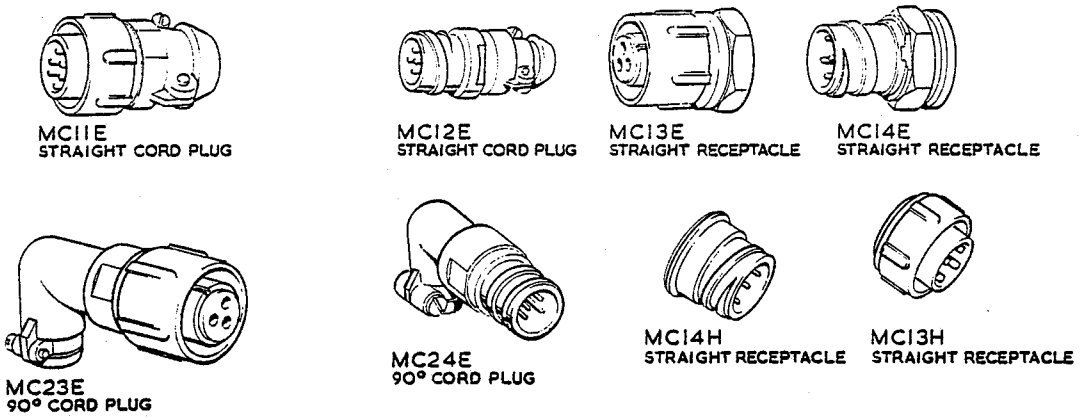

Fig. 1. MC series connectors

Introduction

1. (1) MC, environmental, sub miniature connectors have solder type contacts retained in a polychloroprene insulator. The shells are of diecast aluminium, finished in olive drab cadmium plate; endbells are straight or 90 deg. angled.

(2) MC, hermetic connectors are available only in receptacle shell styles with pin type contacts. The pin contacts are retained in a glass insulator bonded into shells which are made of steel. Shell finish is tin coating over cadmium plating.

Significance of part numbering system

2. MC SERIES connectors

MC 13 E- 8- 3 S N- —

- Modifications
- Insert position: N-normal. See para.3 for alternate insert positions.
- Contact type: P-pin; S-socket.*
- Contact arrangement. See para.4
- Shell size: 8, 10, 13
- Class:
  - E-resilient
  - H-hermetically sealed
- Shell style:
  - 11-straight cord plug
  - 12-straight cord plug
  - ** 13-panel mounting receptacle
  - ** 14-panel mounting receptacle
  - 23-90 deg. cord plug
  - 24-90 deg. cord plug
- Series

*Pins only in class H

**Styles 13 and 14 only in class H

DESCRIPTION

Insert positions (orientation)

3. The insert positions are shown in fig.2.

Note . . .

Alternate positions X and Y are not available for the 8-3 contact arrangement.

Contact arrangements

4. The contact arrangements available for the MC type connectors are shown in fig.3.

Shell styles

5. The available shell styles are shown in fig.1. Each shell style is available in the contact arrangements shown in fig.3. and the insert positions in para.3 and fig.2. Intermateability between shell styles is given in Table 1 mating guide.

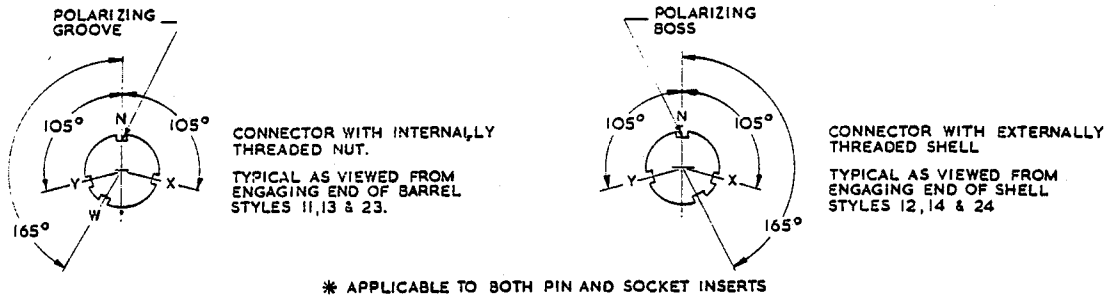

Fig. 2. Insert positions

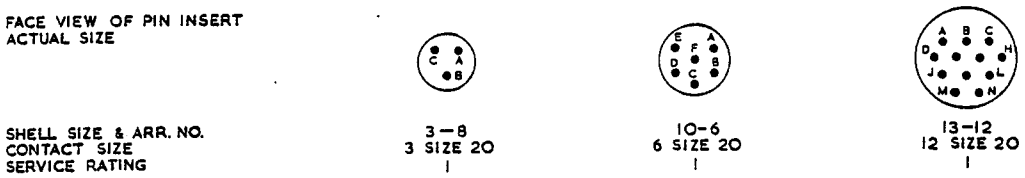

Fig. 3. Contact arrangements

TABLE 1

Mating guide

MC-11E	MC-12E
MC-13E	MC-14E
MC-13H	MC-14H
MC-23E	MC-24E

Minimum engagement lengths

6. The minimum engagement lengths for these connectors are given in fig.4 and Table 2.

TABLE 2

Minimum engagment lengths (fig.4)

Shell size	Mating connectors	A		B	
		Inches	mm	Inches	mm
8	MC23E & MC14E	1·593	40·46	1·812	46·02
	MC23E & MC14H	1·531	38·88	1·750	44·45
	MC24E & MC13E MC24E & MC13H	1·625	41·27	1·906	48·41
10	MC23E & MC14E	1·750	44·45	1·937	49·19
	MC23E & MC14H	1·687	42·84	1·875	47·62
	MC24E & MC13E MC24E & MC13H	1·781	45·23	2·062	52·37
13	MC23E & MC14E	1·906	48·41	2·093	53·16
	MC23E & MC14H	1·843	46·81	2·081	51·58
	MC24E & MC13E MC24E & MC13H	1·931	49·19	2·118	56·33

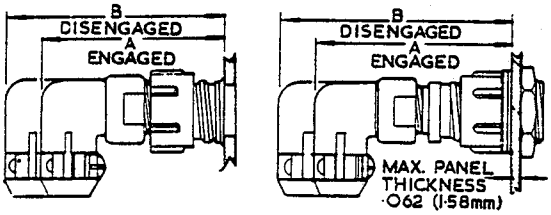

Fig. 4. Minimum engagement lengths (Table 2)

Mounting details

7. Panel cut-out dimensions for environment receptacles, shell styles MC13E and MC14E are given in fig.5 and Table 4. The panel cut-out hole diameters for hermetic receptacles, shell styles MC13H and MC14H are given in Table 3.

TABLE 3

Panel cut-out diameters for hermetic receptacles

Shell size	IN.	MM
8	0·45	12
10	0·58	15
13	0·87	20

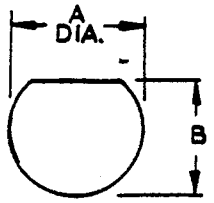

Fig. 5. MC mounting data (Table 4)

TABLE 4

MC connector mounting data (fig.5)

Size	A		B	
	IN.	MM	IN.	MM
MC-13E-8	0·563	14·30	0·531	13·48
MC-14E-8	0·563	14·30	0·531	13·48
MC-13E-10	0·688	14·47	0·656	16·66
MC-14E-10	0·688	14·47	0·656	16·66
MC-13E-13	0·875	22·22	0·840	21·33
MC-14E-13	0·875	22·22	0·840	21·33

MC series connector — dust caps

8. MC59 and MC60 dust caps, fig.6, are available for internally threaded and externally threaded connectors respectively. Details are given in fig.6 and Table 5.

INSTRUCTIONS FOR USE

Contact cable accommodation

9. All contacts are provided with solder cup terminations which will accommodate up to size 20 AWG wire.

Selection of connectors and terminations

10. The appropriate connector should be selected to suit the cable or cableform conductors and the required application. This may be ascertained from the information contained in this chapter.

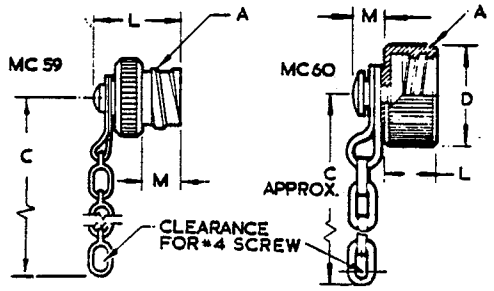

Fig. 6. MC connectors dust cap dimensions (Table 5)

TABLE 5

MC connector dust cap dimensions (fig.6)

INCHES

Part Number by Shell Size MC-59	MC-60	A Thd. Acme	MC-59 B Dia.	C Approx.	L	M	MC-60 C Approx.	D	L	M
MC- 8-59	MC- 8-60	1/2 ·6	0·375	3·500	0·437	0·250	3·437	0·640	0·375	0·156
MC-10-60	MC-10-60	5/8 ·6	0·500	3·500	0·437	0·250	3·437	0·765	0·375	0·156
—	MC-13-60	13/16·6	—	—	—	—	3·437	0·953	0·375	0·156

MILLIMETERS

Part Number by Shell Size MC-59	MC-60	A Thd. Acme	B Dia.	C Approx.	L	M	C Approx.	D	L	M
MC- 8-59	MC- 8-60	1/2 ·6	0·952	88·90	11·10	3·96	87·31	16·27	9·52	3·96
MC-10-59	MC-10-60	5/8 ·6	12·70	88·90	11·10	6·35	87·31	19·44	9·52	3·96
—	MC-13-60	13/16·6	—	—	—	—	87·31	24·20	9·52	3·96

11. Care should be taken to ensure that the diameter of cables to be used are not too large for the connector cable entry. If cables are too tight in the cable entry, they may twist as the cable clamp is tightened.

Cable preparation

12. The multi-core cableforms or cables should be prepared as follows:—

(1) For multi-core cables, cut back the

outer sheath sufficiently to allow the conductors to reach the peripheral contacts, but not so far as to allow the sheath to clear the connector endbell. Cableforms should be whipped at a point which will be inside the endbell when the connector has been assembled.

(2) Cut the conductor insulation and bare the conductors to a length to suit the depth of the appropriate contact solder cap.

(3) For solder contacts tin the bared ends of the conductors using resin cored solder, Ref. No. 30B/1606.

Connector assembly to cables

13. The cable and cableform conductors should be assembled to the connectors, in accordance with the following procedures:—

(1) Solder contacts:— Fit suitable insulating sleeves over each conductor and insert each conductor through the appropriate holes in the cable gland after fitting the appropriate endbell over the cables. Solder each conductor into its appropriate contact solder cup. After soldering slide the sleeve down over the joint and fit the endbell to the shell.

Chapter 1-2

CANNON KO AND KH SERIES CONNECTORS

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TABLES

ILLUSTRATIONS

LEADING PARTICULARS

KO environmental types

Contact rating

Size 20	*7·5A*
Size 16	*22A*
Size 12	*41A*

Contact material and finish ...	*Copper alloy; gold over silver plating*
Service rating	*At sea level with connector disengaged and grommet removed. Test voltage a.c. (r.m.s.) 60Hz.*

Service	*Voltage*
1	*1250V*
2	*2400V*
3	*3000V*

KH, hermetic types

Contact rating	*As per KO environmental types*
Contact material and finish	*Steel; cadmium plated*
Service rating	*As per KO. Environmental types*

Introduction

1. (1) KO, environmental, miniature connectors have soldered type contacts retained in a nylon insert. The shells are of diecast aluminium finished with a clear chromate coating over cadmium plating. The KO3 straight plug is only fully environmental when the rear of the plug is potted.

(2) KH hermetic connectors are available only with pin type contacts. The contacts are retained in a lead free compression glass insert which is bonded to a steel shell. Shell finish is clear chromate over cadmium plating. Straight 45 deg. and 90 deg. endbells are available. KO and KH connectors are coupled by a special Acme thread coupling nut.

Significance of part numbering system

2. (1)

KH		10	—	16		—	3	P	N	
KO	B	3	—	21		—	A10	S	N	
KO	A	2	—	21	R	—	38	P	N	
KO		0	—	19		—	20	S	N	

—Modifications.

—Insert position. N-normal. See para.3 for alternate insert positions.

—Contact type: P-pin; S-socket.*

—Contact arrangement. See para.4.

—Special hardware for KOA and KOB connectors.

—Shell size: 16, 19, 21

—Shell style:
0-wall mounting recept.—will take endbell
1-cable connecting recept.—will take endbell
2-box mounting recept.—will not take endbell
3-plug
02-hermetic recept.—solder mounted
10-hermetic recept.—nut mounted
30-hermetic recept.—nut and solder mounted

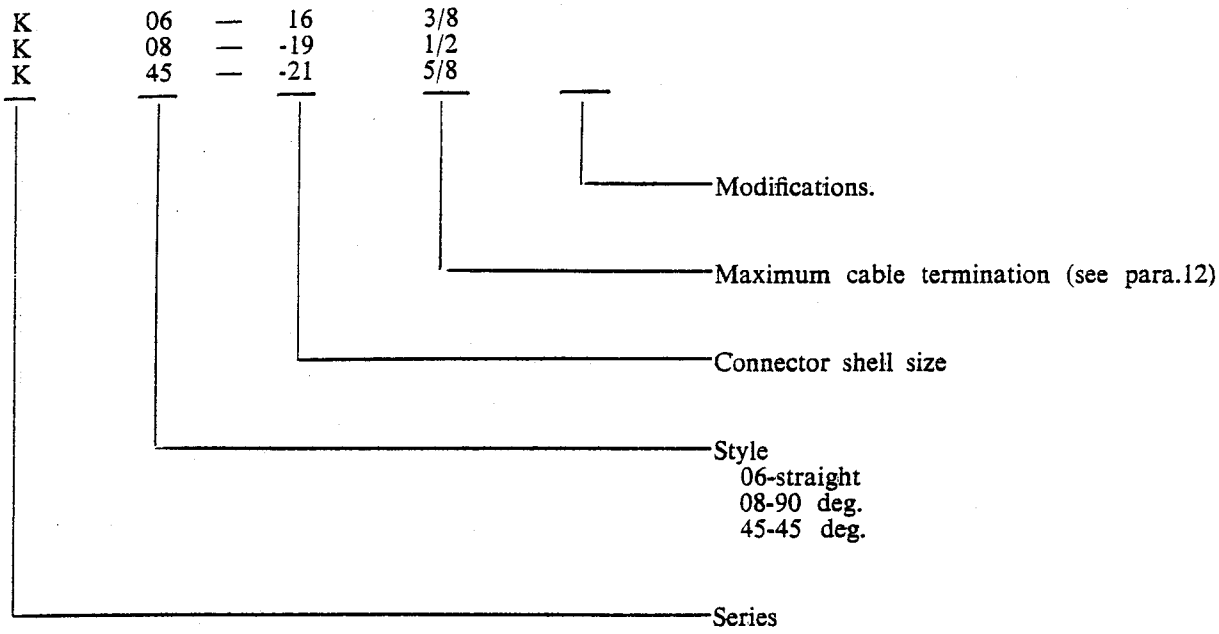
—Special shell:
A-used with 38, 48 & 50 contact arrangements only
B-used with A-10 contact arrangement only

—Series

KO-K miniature non-environmental.
KH-K miniature hermetic seal.

*Pins only in class H.

(2) KO Endbells



Note . . .

(1) *KO3 plugs may be ordered with endbells by substituting KO6, KO8 or KO9 (K45) for KO3 in the part number.*

(2) *When endbells are required for connectors with special shell A, shell size 21 the endbell style numbers become OA6, OA8 and OA9 for straight, 90 deg. and 45 deg. styles respectively.*

DESCRIPTION

Insert positions

3. A polarizing key and keyway machined on the shell of plugs and receptacles respectively ensure correct location when mating connectors. During the manufacture of orientated connectors, the insert is rotated a fixed number of degrees for each alternate insert position from the normal. Fig.1 shows the normal and position F for receptacles; for plugs the insert would be rotated in a counter-clockwise direction. Available alternate insert positions are listed in Table 1.

Note . . .

Connectors cannot be re-orientated.

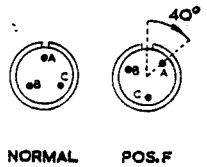


Fig. 1. Insert positions (Table 1)

TABLE 1

Insert position (fig.1)

Size	Layout	Insert positions available									
		N	V	W	X	Y	Z	E	F	G	H
16	3	•	•	•	•	•	•	•	•	•	•
	10	•	•	•	•	•	•	•	•	•	•
19	20	•	•	•	•	•	•	•	•	•	•
21	13	•	•	•	•	•	•	•	•	•	•
	23	•	•	•	•	•	•	•	•	•	•
	30	•	•	•	•	•	•	•	•	•	•
	38	•	..	•	•	•	•	•	•	..	..
	48	•	..	•	•	•	•	•	•	..	..
	50	•	..	•	•	•	•	•	•	..	..
	A10	•	•	•	•	•	•	..	..	•	•

Contact arrangements

4. The available contact arrangements are given in fig.2.

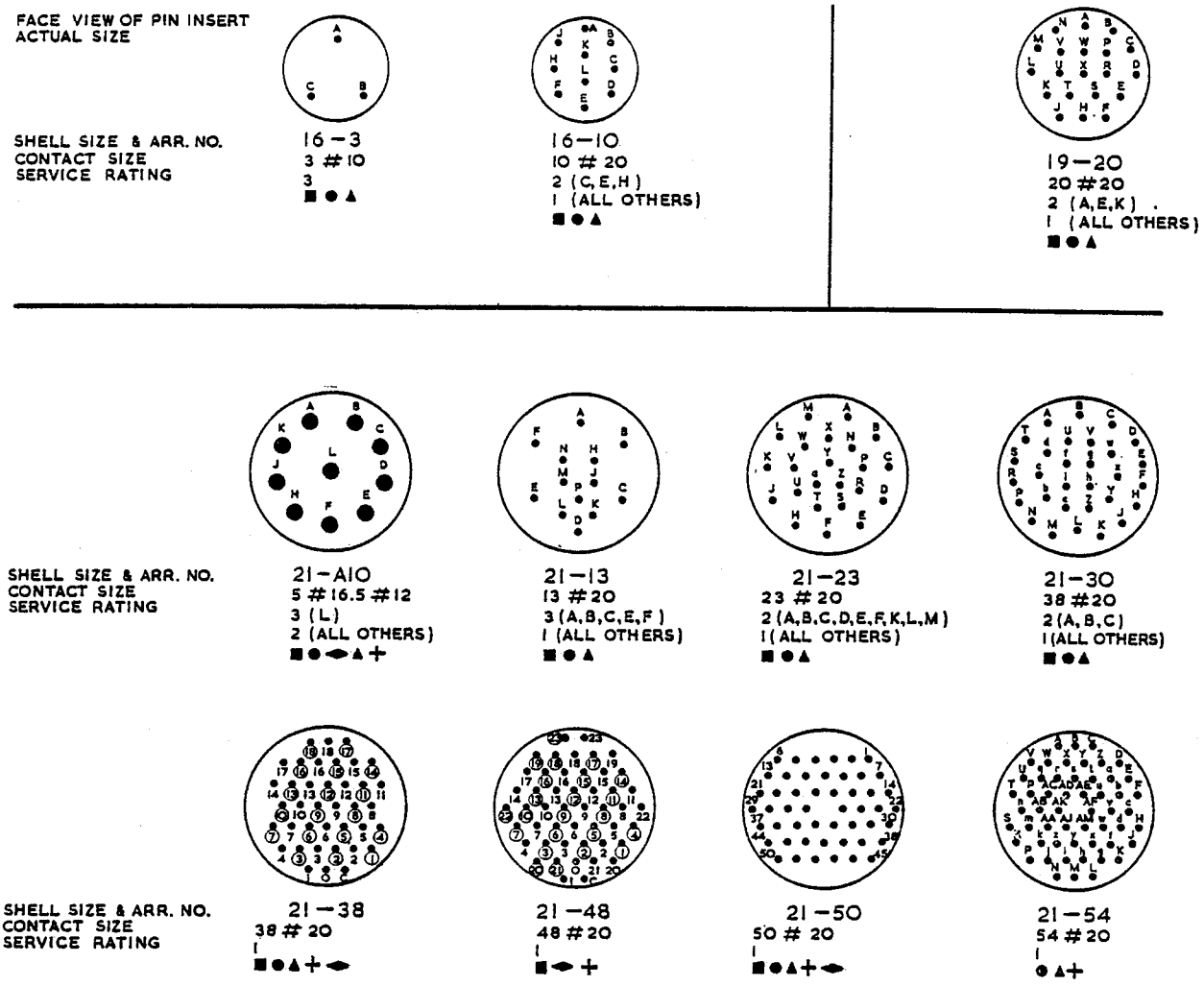


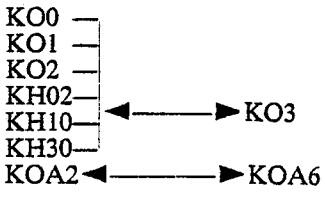
Fig. 2. Contact arrangements

Shell styles

5. The KO series connector shell styles are given in fig.3. Intermateability between the shell styles is given in Table 2. The KO series of connectors are intermateable with the KM and KM Mk. 2 series connectors Chapter 1-3 and 1-4 of this A.P. Special shells are required for certain contact arrangements in shell size 21. Reference should be made to fig. 2 and para. 2.

TABLE 2

Mating guide



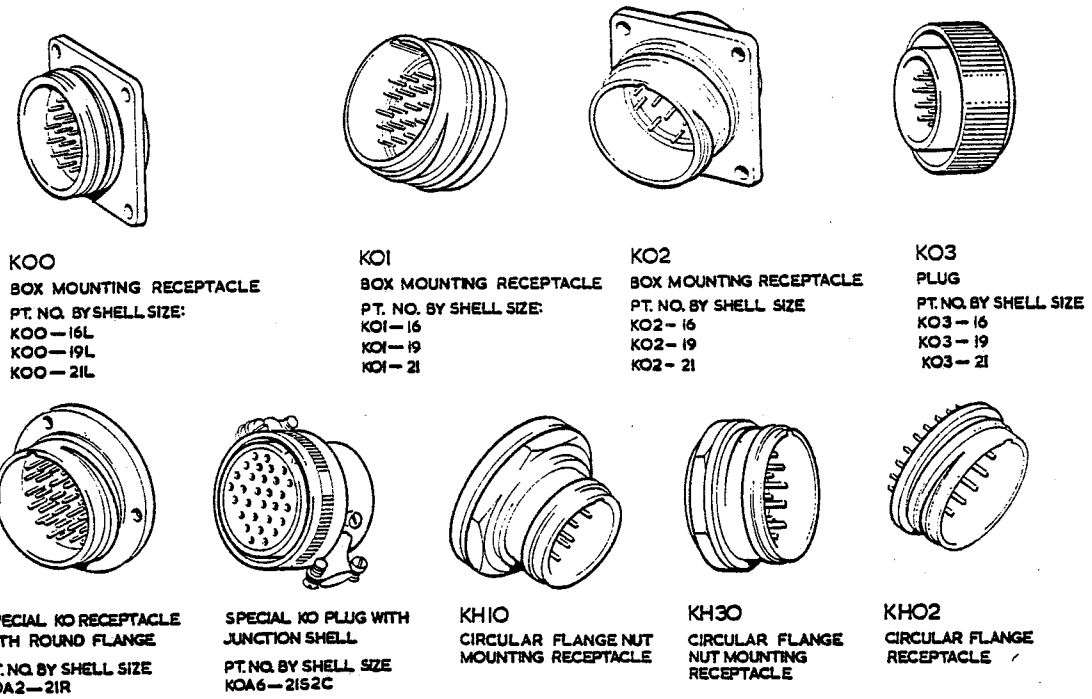


Fig. 3. Shell styles

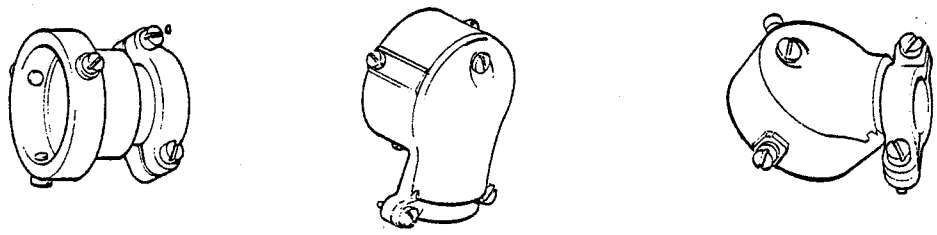


Fig. 4. KO series endbells

KO endbells

6. The endbells (cable clamps) shown in fig.4 are available in straight, 90 deg. angle and 45 deg. angle styles. For part number details reference should be made to para.2. Cable accommodation dimensions are controlled by the shell size of the endbells as follows:—

Shell size 16 cable entry diameter (max.) 0·375 in.

Shell size 19 cable entry diameter (max.) 0·5 in.

Shell size 21 cable entry diameter (max.) 0·6252 in., for style KO-A6 only 0·6562 in.

Protective caps

7. Details of KO2 metal protection caps for receptacles with external threads are shown in fig.5 and Table 3. Plastic dust caps are provided for plugs and receptacles with internal threads. The KO2 protection cap can be used on KM and KM Mk.2 series (Chap.1-3 and Chap.1-4).

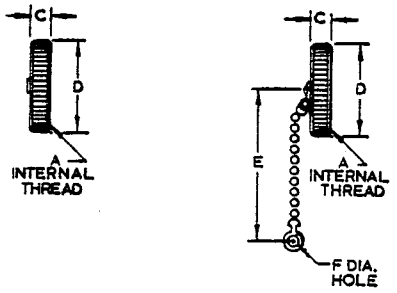


Fig. 5. Protective caps for KO and KM series (Table 3)

TABLE 3

Protective cap dimensions (fig. 5)

INCHES

Part Number Less chain	With chain	A Thread Acme	C	D Dia.	E	F Dia.
KO2-16-1-DC	KO2-16-DC	1 0·6	0·313	1·250	3·250	0·130
KO2-19-1-DC	KO2-19-DC	1·3/16·6	0·313	1·313	3·250	0·130
KO2-21-1-DC	KO2-21-DC	1·5/16·6	0·313	1·438	3·250	0·130

MILLIMETERS

Part Number Less chain	With chain	A Thread Acme	C	D Dia.	E	F Dia.
KO2-16-1-DC	KO2-16-DC	1 0·6	7·95	31·75	82·55	3·30
KO2-19-1-DC	KO2-19-DC	1·3/16·6	7·95	33·35	82·55	3·30
KO2-21-1-DC	KO2-21-DC	1·5/16·6	7·95	36·52	82·55	3·30

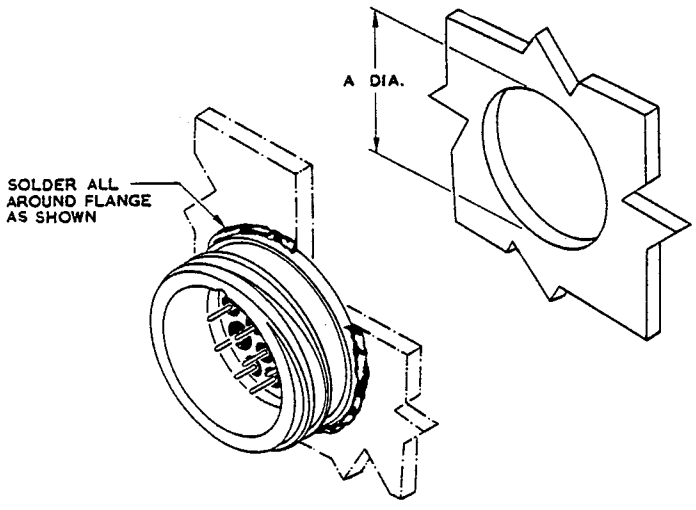
Panel mounting details

8. (1) *Environmental connectors*
KO0 box mounting receptacle, Chap. 1-3
KO2 box mounting receptacle, Chap. 1-3

(2) *Special KO receptacle with round flange* — A hole 0·7 in. radius should be cut in the mounting panel. Three holes 0·099 in. diameter should be drilled with the connector held in the mounted position to accommodate the securing screws.

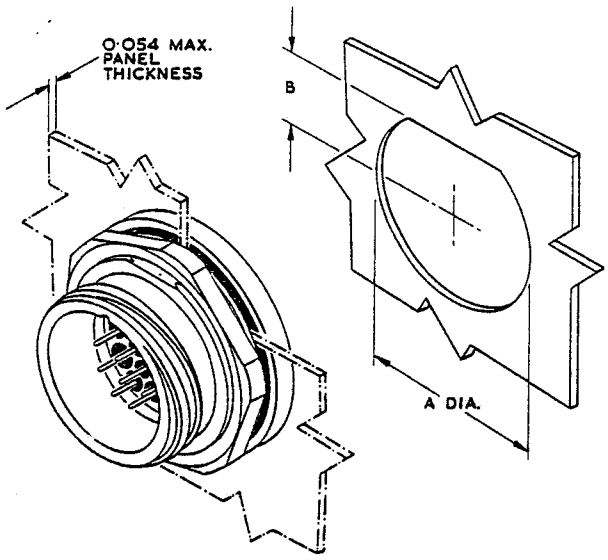
Hermetic connectors

9. The process used for installing the hermetically sealed connectors on instrument cases or equipment boxes should ensure that all parts of the connector are heated evenly, uniformly, and gradually. There should be no points of heat caused by conduction. In other words, a soldering iron is not to be left on one point of the connector for too long, because the conduction of heat from this one point might damage the insulators.



SIZE & STYLE	±0·005 A DIA.
KHO2-16	0·812
KHO2-19	1·000
KHO2-21	1·187
KHAO2-21	1·187

Fig. 6. KH12 circular flange receptacle (mounting)



SIZE & STYLE	±0·005 A DIA.	±0·005 B DIA.
KH10-16	1·135	0·505
KH10-19	1·322	0·599
KH10-21	1·447	0·661
KHA10-21	1·447	0·661

Fig. 7. KH10 circular flange nut mounting receptacle

10. Using a torch or high frequency heating is not recommended. However, if a torch must be used, the connectors should be pre-heated to nearly soldering temperature. When soldering, make sure the torch is moved around the connector gradually, heating all portions, rather than heating one location.

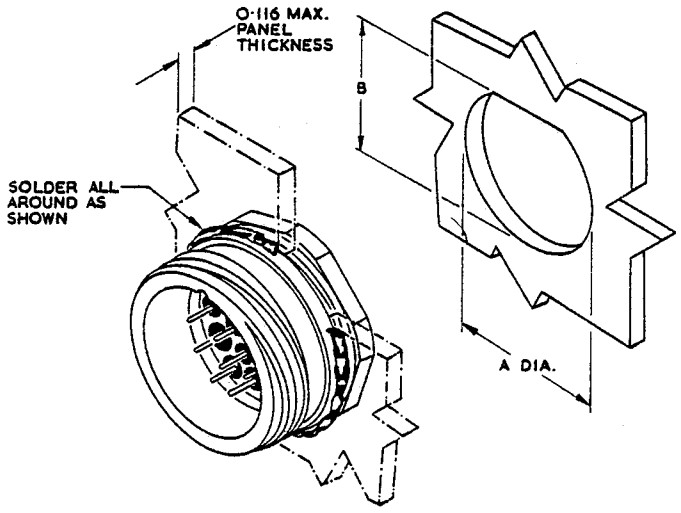
11. The use of a soldering iron is recommended over the use of a torch. A 500 watt iron should be used with the point shaped in a flat crescent and the concave section made to fit the radius around the base of the connector. The connector should be pre-heated before the soldering operation to about 300 deg.F and, when applying the solder, the iron should be wiped around the base for an even heat.

INSTRUCTIONS FOR USE

Contact cable accommodation

12. Size 20 contact — 20-26 AWG cable
Size 16 contact — 16-18 AWG cable
Size 12 contact — 12 AWG cable

13. KO series connectors are wired in a manner similar to the MC series. For cable preparation and assembly details reference should be made to Chap. 1-1.



SIZE & STYLE	±0·005 A DIA.	+0·005 B −0·000
KH30-16	0·885	0·820
KH30-19	1·072	1·013
KH30-21	1·260	1·211

Fig. 8. KH30 circular flange receptacle

Chapter 1-3

CANNON KM SERIES CONNECTORS

CONTENTS

TABLES

ILLUSTRATIONS

LEADING PARTICULARS

Contact rating

Size 20	7·5*A*
Size 16	22*A*
Size 12	41*A*

Contact material and finish ... *Copper alloy, gold over silver plating.*

Service rating: (test voltages a.c. r.m.s. 60Hz). At simulated altitude of 70 000 *ft.*

Service	*Connectors*	
	Engaged	*Disengaged*
1	940*V*	310*V*
2	1800*V*	600*V*
3	2250*V*	750*V*

Introduction

1. The fully environmental KM series of connectors are designed and qualified to military specification MIL-C-25955. Exploded and sectional views of KM series receptacles and plugs are shown in fig.1 and 2. Hermetic connectors (KH series) qualified to MIL-C-25955 are described in Chap.1-2.

2. The KM series will mate with KO and KH series connectors. KM connectors have crimped snap-in contacts retained in a Zytel polyamide insulator and are available with straight, 45 deg. and 90 deg. endbells. The endbells are not available as accessories.

3. Environmental sealing is achieved with an 'O' ring seal around the mating faces of the connectors and a moisture sealing grommet seals the cable entries.

4. KM connectors are supplied in sealed plastic bags which contain the disassembled connector (endbell, grommet and ferrule removed) and the contacts.

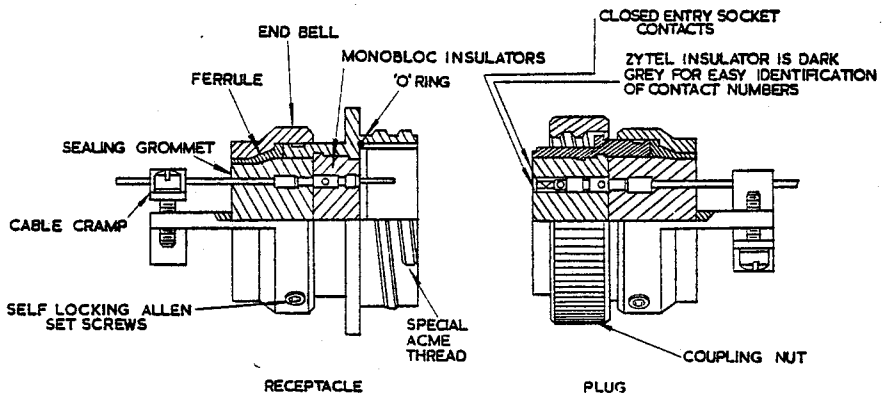


Fig. 1. Sectional view of KM connectors

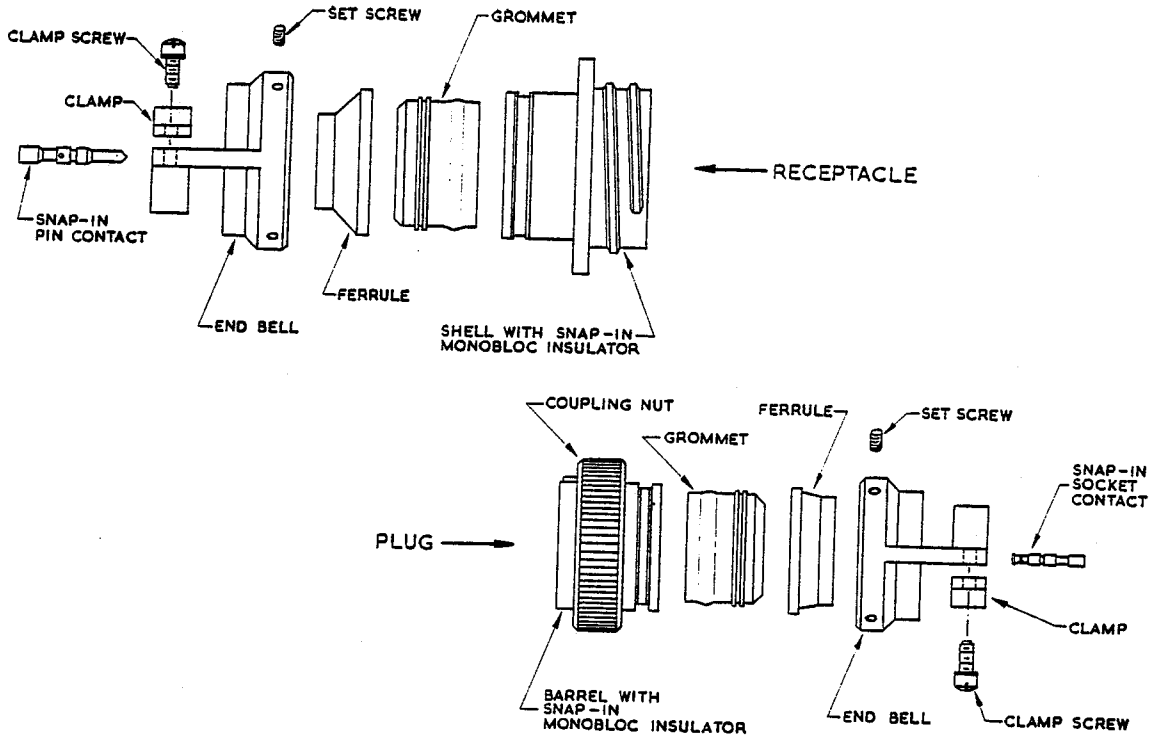
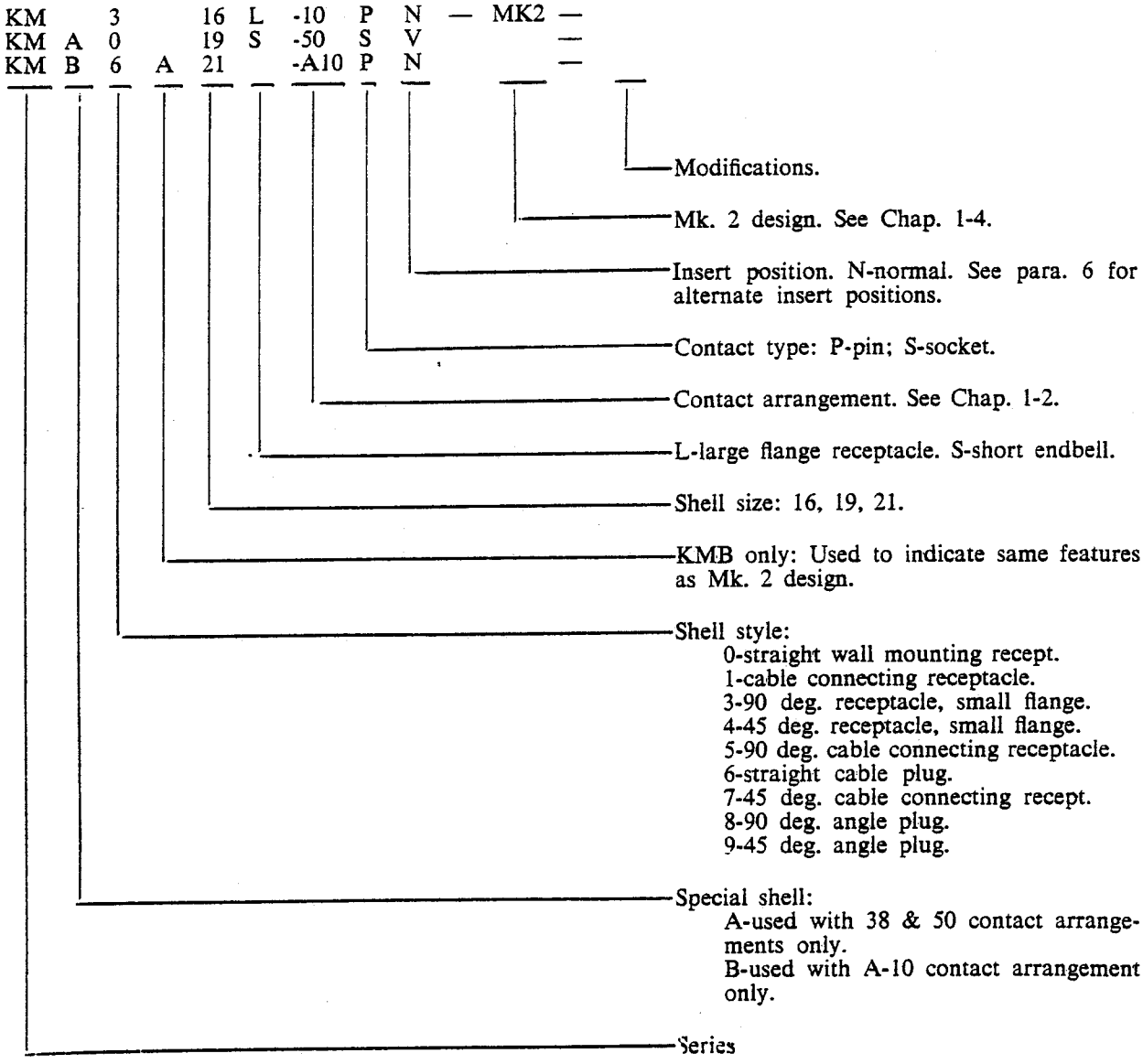


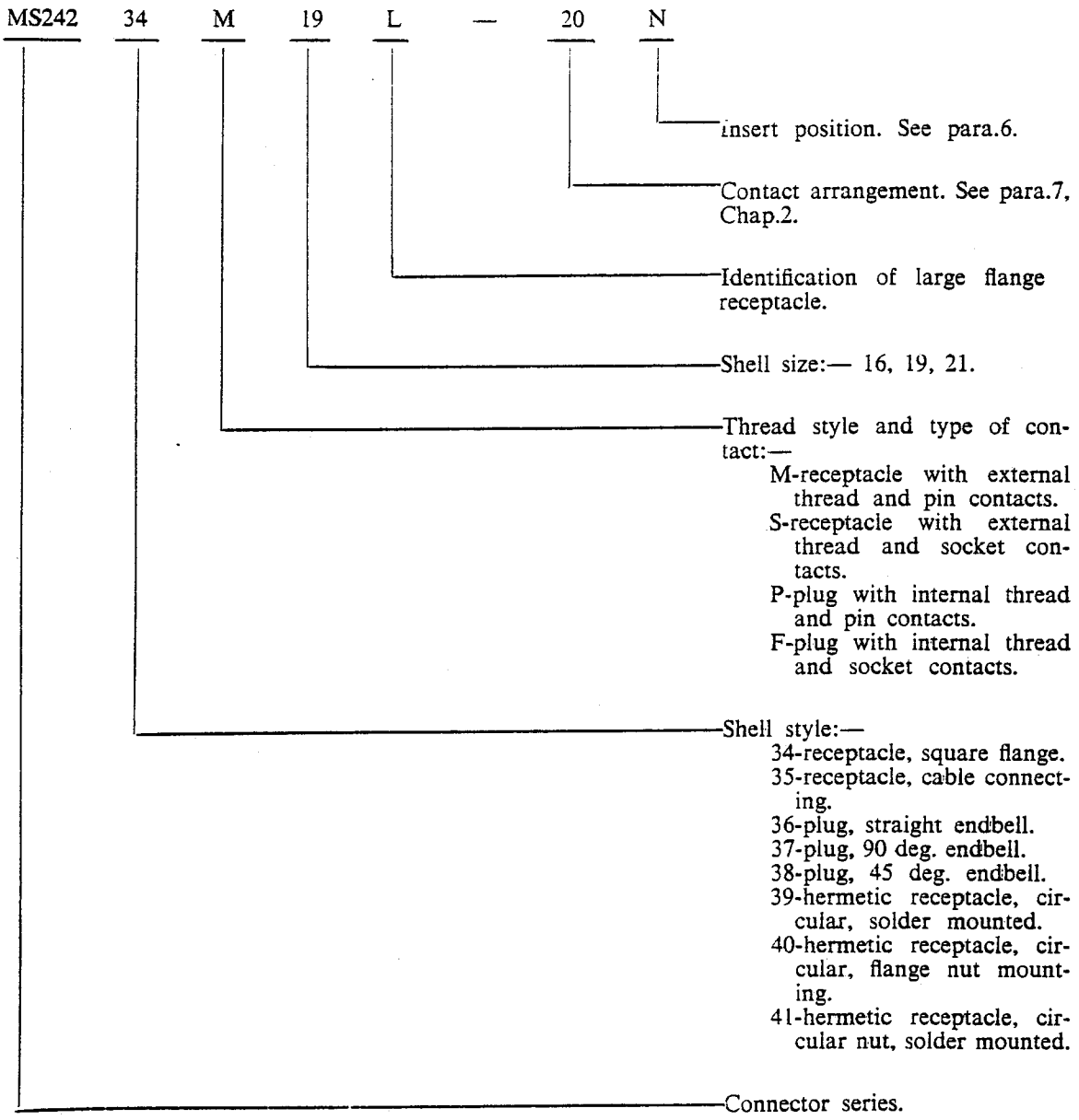
Fig. 2. Exploded view of KM connectors

Significance of part numbering system

5. (1) Cannon numbering system



(2) MS numbering system



DESCRIPTION

Alternate insert position

6. Alternate insert positioning is achieved in a manner similar to the KO series. See Chap. 1-2. The alternate insert positions available in the KM series are given in Table 1.

TABLE 1

Insert positions

Shell size	Layout	Insert positions available									
		N	V	W	X	Y	Z	E	F	G	H
16	3	•	•	•	•	•	•	•	•	•	•
	10	•	•	•	•	•	•	•	•	•	•
19	20	•	•	•	•	•	•	•	•	•	•
	13	•	•	•	•	•	•	•	•	•	•
	23	•	•	•	•	•	•	•	•	•	•
	30	•	•	•	•	•	•	•	•	•	•
21	38	•	..	•	•	•	•	•	•	..	..
	50	•	..	•	•	•	•	•	•	..	..
	54	•	•	•	•	•	•	•	•	•	•
	A10	•	•	•	•	•	•	..	..	..	..

Contact arrangements

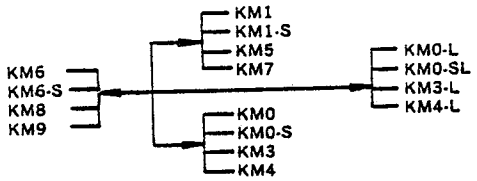
7. For available contact arrangements reference should be made to Chap. 1-2.

Shell styles

8. Available shell styles are shown in fig.3. Intermateability between connectors in the series is shown in Table 2.

TABLE 2

Mating guide



Protective caps

9. Protective caps for use with KM type connectors are given in Chap. 1-2.

Contacts

10. Part number and cable accommodation details are given in Table 3.

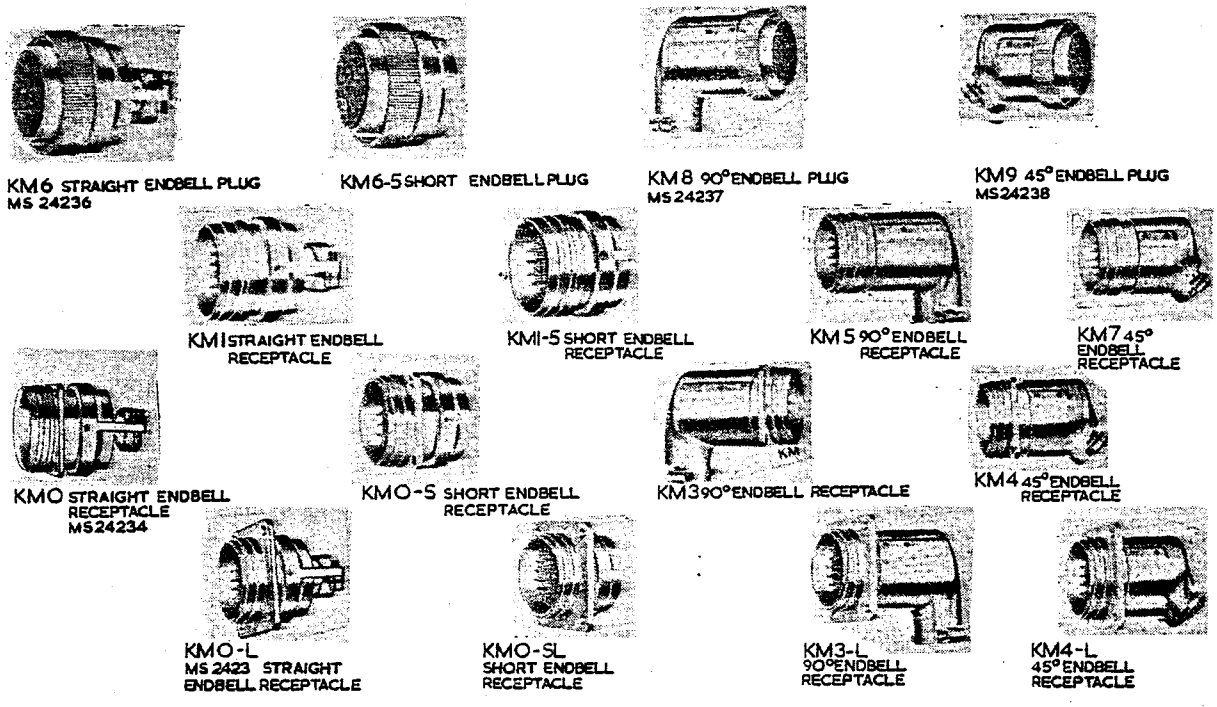


Fig. 3. Shell styles

TABLE 3

Part number and cable accommodation

Ins. Arr.	Contact type	Wire accommodation (AWG)	Contact Part No.
21-A10	Socket	12-14	031-0806-000
	pin	12-14	030-1349-000
	Socket	16-18	031-0876-000
	pin	16-18	030-1557-000
	Socket	20-22	031-0820-000
	pin	20-22	030-1436-000
All others in the series	Socket	20, 22, 24	031-0769-000
	pin	20, 22, 24	030-1208-000

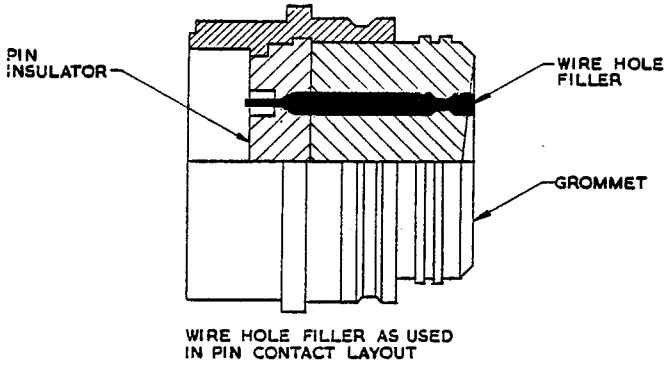


Fig. 4. Filler plugs pin contacts (Table 4)

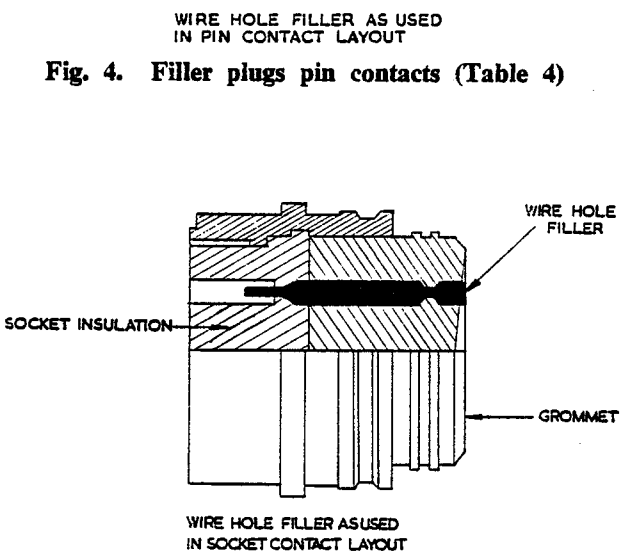


Fig. 5. Filler plugs socket contacts (Table 4)

Filler plugs

11. When the full complement of contacts is not required, the contact cavities in the grommet must be plugged with filler plugs. Fig.4 and 5 show filler plugs inserted in the correct position in socket and pin contact cavities. When the filler plug is correctly inserted it is easily removed.

12. After all contacts and filler plugs have been inserted, the ferrule, grommet, and endbell should be pushed down the cables until they are seated against the barrel or shell. The endbell Allen screws should then be tightened until they are flush with the surface of the endbell.

TABLE 4

Filler plugs (fig. 4 and 5)

Contact size	Filler plug Part No.
20	KM20
16	KM16
12	KM12

Removal of contacts

13. In preparation for extracting contacts (pin or socket), the endbell, ferrule and grommet should be removed from their assembled positions and slipped back along the cables, as shown in fig.14.

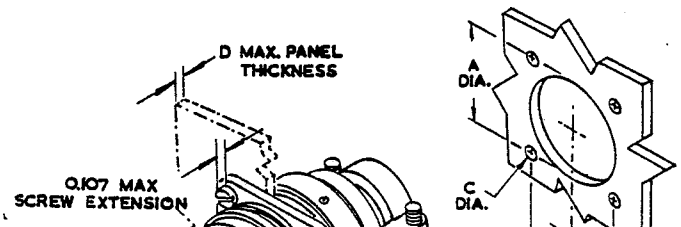
14. The socket or pin extractor end of the tool is positioned on the contact, fig.7. Pressure is applied to the tool until the contact snaps out of the insulator.

15. When removing contacts from the centre of the insert, it is recommended that some of the outer contacts be removed first to make room for the extraction tools.

Panel mounting details

Standard flange receptacles

16. (1) Front mounting. Fig.6 shows the method used in front mounting KMO shells. Endbells must be removed from the shell and reassembled after the shell is mounted to the panel.



SIZE & STYLE	MIN. A DIA.	B±0.005	B±0.002	±0.005 C DIA.	D MAX.
KMO-16	0.838	0.843	0.421	0.120	0.194
KMO-19	1.025	0.972	0.486	0.120	0.194
KMO-21	1.180	1.062	0.531	0.120	0.194
KMAO-21	1.180	1.156	0.578	0.120	0.031
KMBO-21	1.180	1.062	0.531	0.120	0.190

Fig. 6. Front panel mounting

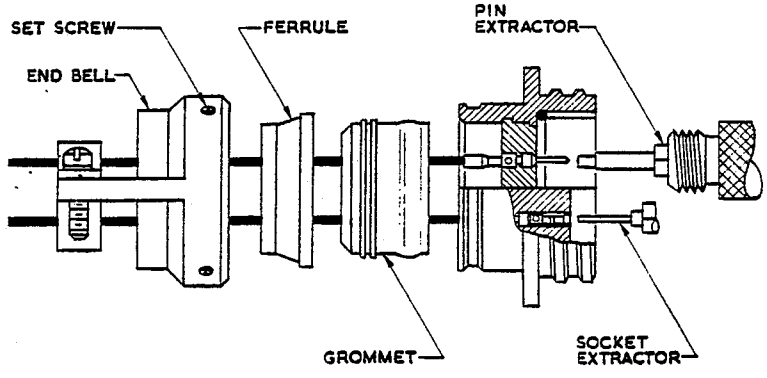
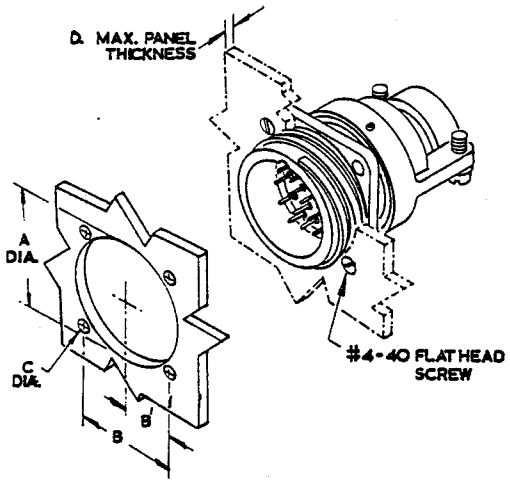


Fig. 7. Removal of contacts



SIZE & STYLE	A MIN. DIA.	B ±0·005	B ±0·002	C ±0·005 DIA.	D MAX.
KMO-16	1.005	0·843	0·412	0·120	0·123
KMO-19	1.193	0.972	0.486	0.120	0.123
KMO-21	1.317	1.062	0.531	0.120	0.123
KMAO-21	1.317	1.156	0.578	0.120	0.137
KMBO-21	1.317	1.068	0.531	0.120	0.180

Fig. 8. Rear panel mounting

Rear mounting

(2) Fig.8 shows the method used in rear rear mounting of all KM shells with a standard flange.

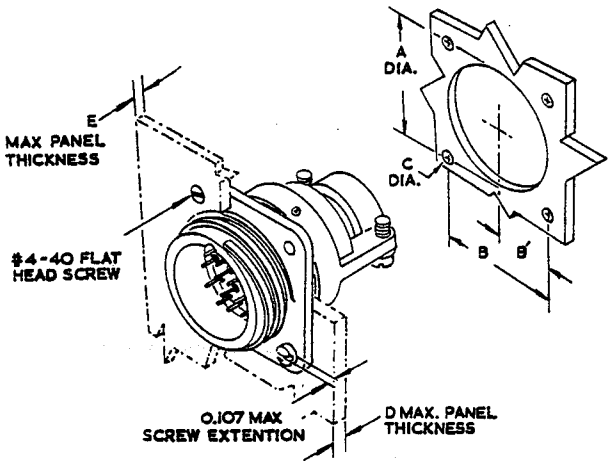
Large flange receptacles, front and rear mounting

17. The method used in front and rear mounting of all KMO shells with a large flange is shown in fig.9. These large flange shells need not have the endbells removed for installation when the shell is front mounted.

INSTRUCTIONS FOR USE

Insertion and extraction tools

18. The insertion-extraction tool is of multi-part construction. The pin and socket contact extractors are housed within the tool as shown in fig.10, an Allen key wrench is also within the tool for removing and installing connector endbells.



SIZE & STYLE	MIN. A DIA.	B ±0·005	B ±0·002	C ±0·005 DIA.	D MAX.	E MAX.
KMO-16L	1·046	1.078	0.539	0.120	0.194	0.123
KMO-19L	1.038	1.219	0.609	0.120	0.194	0.123
KMO-21L	1.390	1.297	0.648	0.120	0.194	0.123
KMAO-21L	1.390	1.297	0.648	0.120	0.031	0.137
KMBO-21L	1.390	1.282	0.641	0.120	0.190	0.180

Fig. 9. Large flange receptacles mounting

Tool Part No.	Contact size	Reference numbers R.A.F.	R.N.	Joint	Services
036069-0000	20				
036114-0000	16				
036115-0000	12				

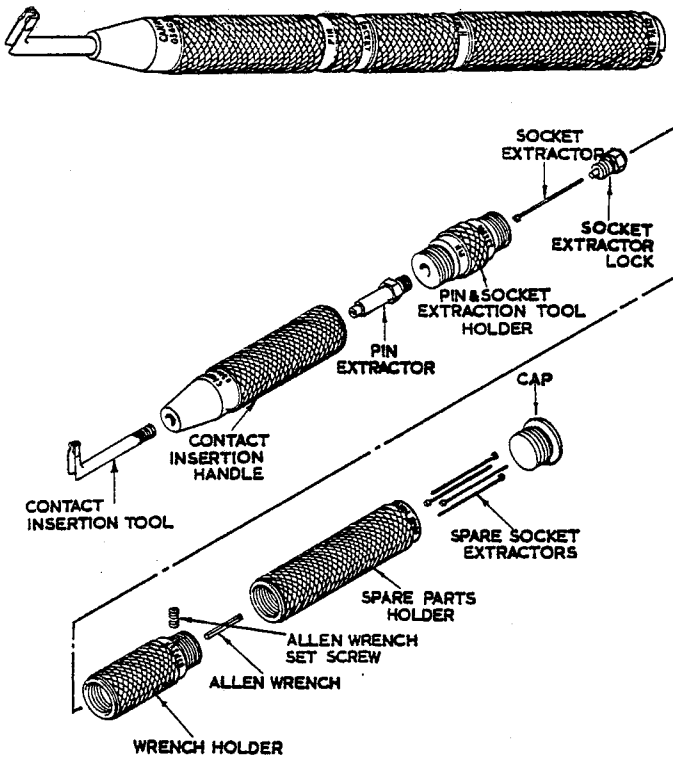


Fig. 10. Exploded view of tool

TABLE 5

Tools

Crimping tool Locators:— Part No.	1H/279 Contact cable Acc.	Ref. No.
611304-1	12-14	
611303-1	16-18	
611302-1	20-22	
611302-1	20, 22, 24	

Cable stripping procedures

19. Size 20 AWG through 26 AWG (MIL-W-5086, Type I and MIL-W-16878, Type E). Nyvin and Tersil cables.

20. Stripping length for all single conductor wires size 20 AWG through 26 fig.11 (a) AWG (MIL-W-5086, Type I and MIL-W-16878, Type E).

Note . . .

Care should be taken not to spread or fray wire strands.

Size 20 AWG (MIL-W-5274A, Type III)

21. Stripping length for size 20 fig.11(b) (MIL-W-5274A, Type III) single conductor wire.

Size 22 AWG (MIL-W-5274A, Type III)

22. Stripping length for size 22 fig.11(c) (MIL-W-5274A, Type III), single conductor wire. Outside jacket and glass braid are to be stripped from primary insulation to dimension shown. Then strip primary insulation from conductor to dimension shown.

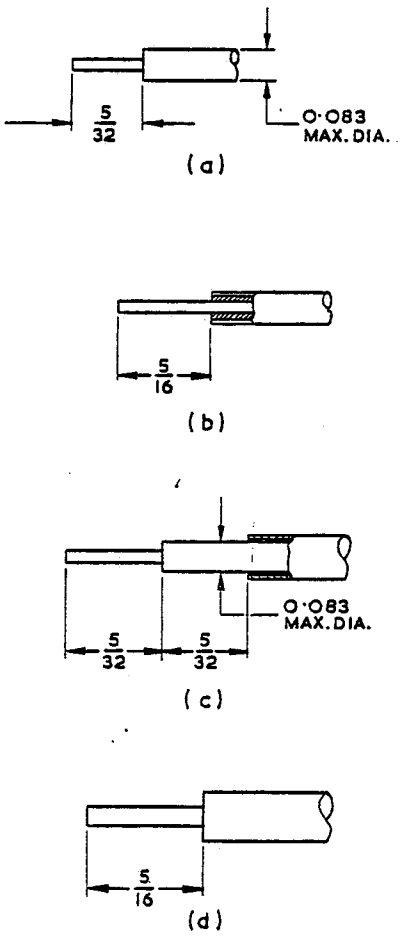


Fig. 11. Cable stripping lengths

STRIPPING AND SHIELDING RG-179/U COAXIAL CABLE

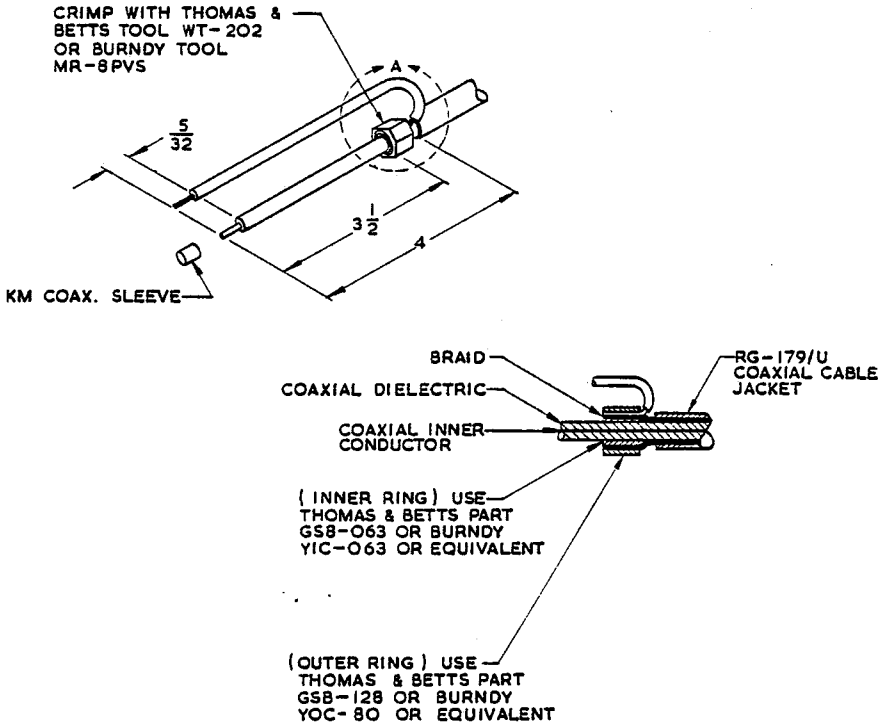


Fig. 12. Stripping and shielding RG-179/V coaxial cable

Size 12 *and* 16 *wires*

23. Stripping length for size 12 and 16 single conductor wires (fig.11(d)).

24. The attachment of the shield lead to the coaxial braid should be made before the final stripping fig.12.

25. This is accomplished as follows: Strip back the coaxial cable outer jacket to approximately 4 in. from end of cable. Then cut the cable braid approximately $3\frac{1}{2}$ in. from end of cable. Insert the inner ring under the braid as illustrated above. Then slide the outer ring over the inner ring, braid, and the shield lead. Then crimp the rings with a Thomas and Betts tool WT-202 or a Burndy tool MR-8PVS.

26. After crimping, strip the coaxial cable dielectric and the shield lead to the $\frac{5}{32}$ in. dimension as illustrated.

Note . . .

A KM coax. sleeve must be slipped over the coaxial inner conductor before a contact is crimped to the conductor.

Assembly of cable and contacts

27. When stripped wires are inserted into terminal ends of contacts, care should be taken before crimping, to ensure the following: The insulation should bottom against the contact shoulder or against the end of the contact as shown in fig.13.

28. All strands of the conductor are to be in the contact crimp pot as shown in fig.13. To verify this, the conductors can be seen through the inspection hole in the contact, when they are properly inserted.

Contact crimping

29. Contacts are crimped using crimping tool Ref. No. 1H/279 and the appropriate locator (Table 5).

30. Fit the prepared end of the cable into the contact barrel; locate the contact in the crimping tool and cycle the tool.

31. After crimping, check that the cable conductors are visible through the inspection hole in the contact barrel.

Assembly of wired contacts to connector

32. After the contacts have been crimped to wires, install the endbell and then the ferrule over the wire bundle as shown in fig.14.

33. With endbell and ferrule on wire bundle, the grommet is then attached. This is done by slipping the wired contacts—one at a time—through the rear of the grommet (fig.14). The rear can be identified by its concave surface, and by the gripping rings. Only the contact cavities on the vertical centre line will be identified on the rear of the grommet (fig.15).

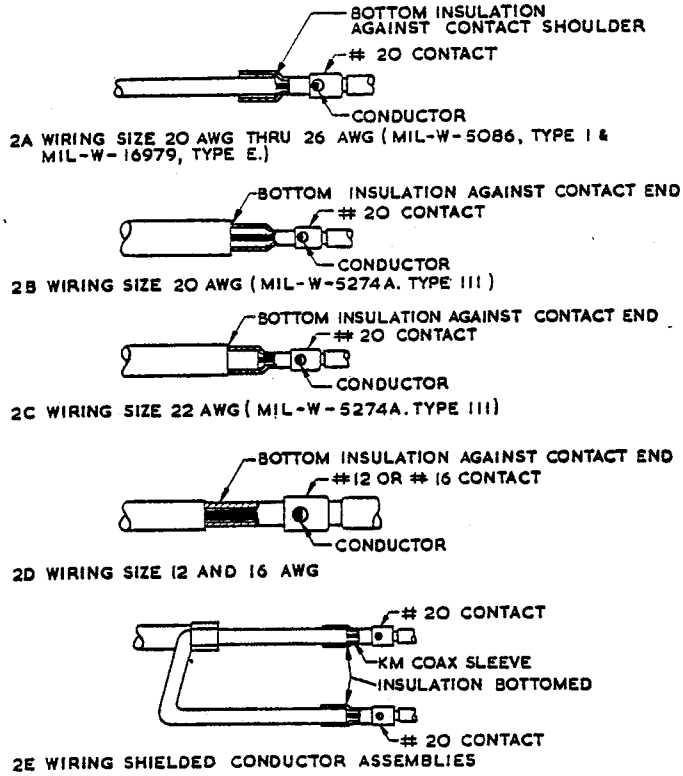


Fig. 13. Assembly of cable and contacts

Note . . .

For best results the wires should be inserted one at a time starting at the top and gradually working down. After each single wire is inserted, it should then be snapped into the insulator before inserting next wire.

Inserting contacts (pin or socket)

34. The crimping operation will form a flat area on the contact just in front of the contact insulator grip (point A). Place this flat into the slot of the insertion tool (fig.16).

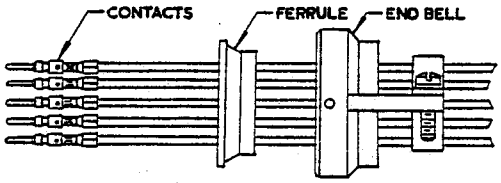


Fig. 14. Assembly of endbell and ferrule

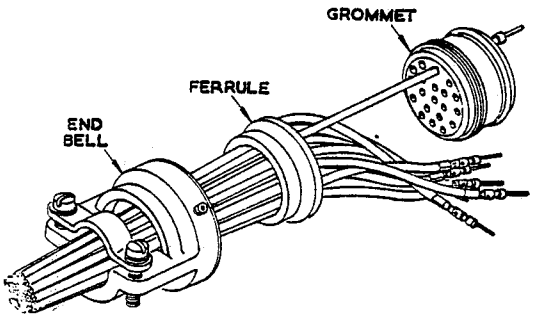


Fig. 15. Assembly of grommet

35. Then insert contacts into insulator cavities with the insertion tool until the contact snaps in place. It is recommended that the contacts be inserted at the top of the insert arrangement first, gradually working toward the bottom.

36. After all of the wired contacts have been inserted, slip the grommet down against the insulator. Insert filler plugs into the unused insulator cavities.

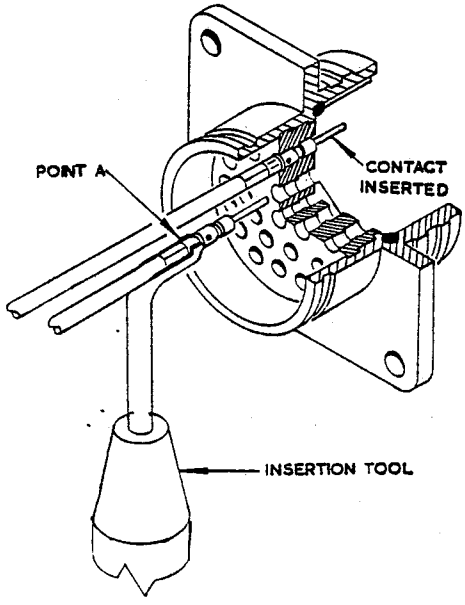


Fig. 16. Inserting contacts

Chapter 1-4

CANNON KM Mk. 2 SERIES CONNECTORS

CONTENTS

TABLES

ILLUSTRATIONS

LEADING PARTICULARS

These are identical to those given in Chapter 1-3 for Cannon Type KM series connectors.

Introduction

1. The KM, Mk.2 series connectors are an improved version of the KM series described in Chap.1-3. The KM, Mk.2 series connectors will

intermate with the KO and KH series connectors (Chap.1-2) and the KM series connectors (Chap. 1-3).

2. The KM, Mk.2 series differs from the KM series as follows:—

(1) The grommet is integral with the insulator, thus eliminating the threading of cables through the grommet and positioning of the grommet after insertion of the contacts. The environmental sealing between the insulators and the grommet is also improved.

(2) The endbells are threaded.

(3) The endbell, assembly nut and barrel coupling nut are integrated.

(4) Barrel/shells and 45/90 deg. endbells are serrated to allow positive positioning of cable bundles.

(5) Contacts are colour coded and identified with a letter S.

Significance of part numbering system

3. The part numbering system for KM, Mk.2 series connectors, is similar to that described in Chap.1-3.

DESCRIPTION

Insert positions

4. Alternative insert positions are achieved in a manner similar to that described in Chap.1-2 for KO series connectors. The alternate insert positions available for KM, Mk.2 connectors are given in Chap.1-3.

Contact arrangements

5. The contact arrangements available are similar to those given in Chap.1-3 for KM series connectors.

Shell styles

6. The shell styles for KM, Mk.2 connectors are shown in fig.1.

Contacts

7. The contact part numbers and the details of cable accommodation sizes are given in Table 1.

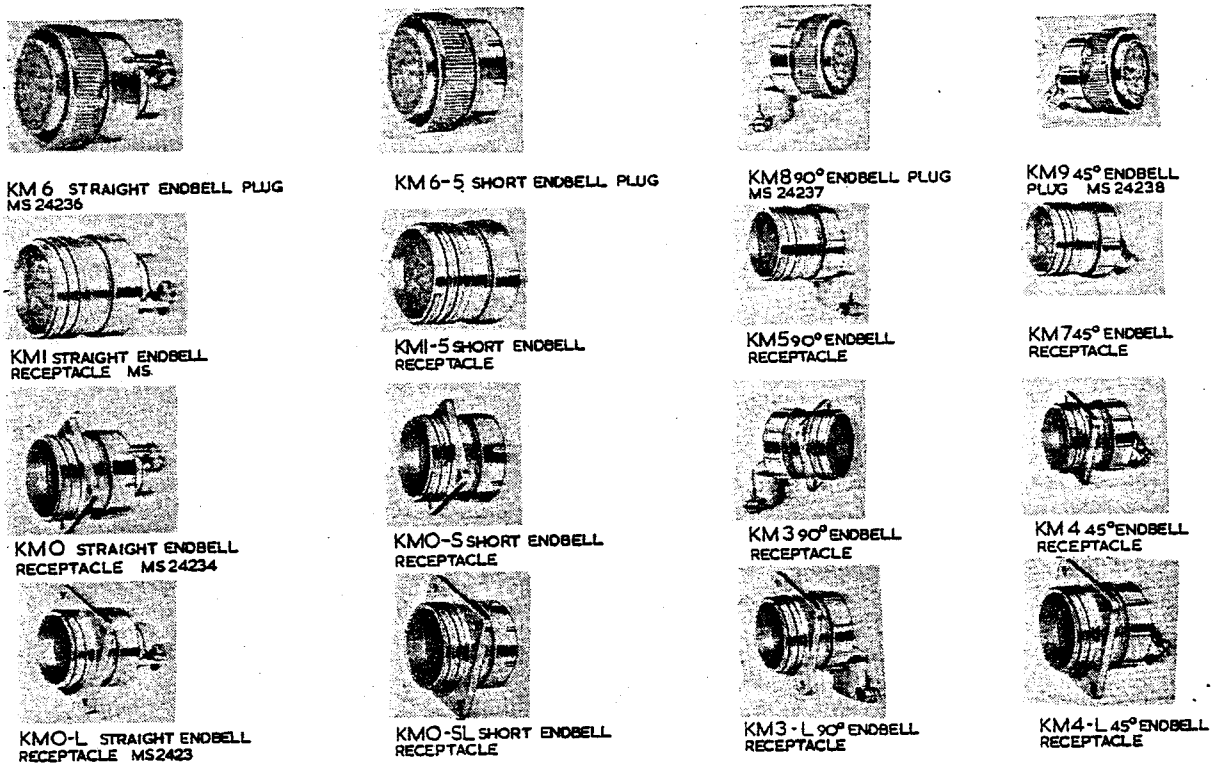


Fig. 1. Shell styles KM, Mk.2 connectors

TABLE 1

Contacts

Colour code	Contact size	Cannon order number	Wire accommodation	Description
RED	#20	030-1715-000 031-0965-000	AWG. 26, 28, 30	KM-2026P Mark 2 KM-2026S Mark 2
		030-1713-000 031-0964-000	AWG. 20, 22, 24, 26	KM-2020P Mark 2 KM-2020S Mark 2
BLUE	#16	030-1711-000 031-0962-000	AWG. 16, 18, 20	KMBA-1616P KMBA-1616S
YELLOW	#12	030-1712-000 031-0963-000	AWG. 12,14	KMBA-1212P KMBA-1212S
	Coaxial Sleeve For #20 Contacts	037179-0000	RG-179/U	KM coaxial Sleeve

Protection caps

8. The protection caps are detailed in Chap.1-2.

Panel mounting details

9. There are two styles of connector flanges which may be mounted to the front or to the rear of the panel.

Standard flange receptacle

10. (1) Front mounting — The method used to front mount KM, Mk.2 receptacles with a standard flange is shown in fig.2. The end-bells must be removed from the shell and re-assembled after the shell has been mounted to the panel.

(2) Rear mounting; the method used to rear mount the standard flange receptacle is shown in fig.3.

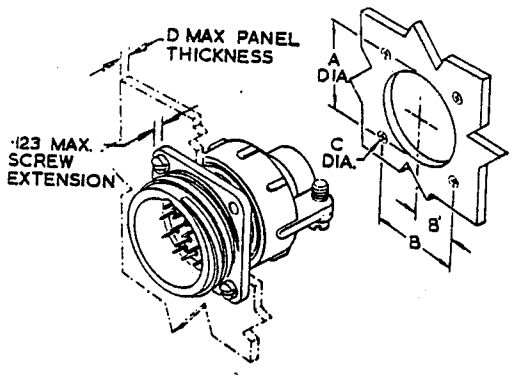


Fig. 2. Standard flange receptacle front mounting (Table 2)

TABLE 2

Standard flange receptacle front mounting dimensions (fig.2).

Mk. 2 size & style	A Min. Dia.	B ±0·005	B′ ±0·002	C ±0·005 Dia.	D Max. Str. E/B	D Max. 45 deg. & 90 deg. E/B
KMO-16	0·962	0·843	0·421	0·120	0·263	0·336
KMO-19	1·087	0·972	0·486	0·120	0·263	0·336
KMO-21	1·274	1·062	0·531	0·120	0·263	0·336
KMAO-21	1·274	1·156	0·578	0·120	0·097	0·170
KMBOA-21	1·274	1·062	0·531	0·120	0·265	0·338

TABLE 3

Standard flange receptacle rear mounting dimensions (fig.3)

Mk. 2 size & style	A Min. Dia.	B ±0·005	B′ ±0·002	C ±0·005 Dia.	D Max.
KMO-16	1·020	0·843	0·421	0·120	0·123
KMO-19	1·208	0·972	0·486	0·120	0·123
KMO-21	1·332	1·062	0·531	0·120	0·123
KMAO-21	1·332	1·156	0·578	0·120	0·137
KMBOA-21	1·332	1·062	0·531	0·120	0·180

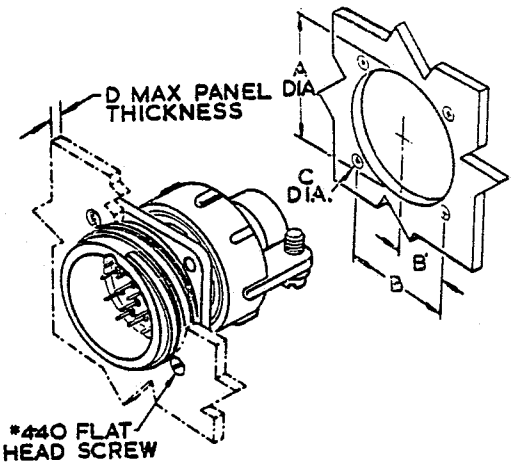


Fig. 3. Standard flange receptacle rear mounting (Table 3)

Large flange receptacles

11. The method used to mount the large flange receptacles is shown in fig.4. It is not necessary to remove the endbells when the shell is to be front mounted.

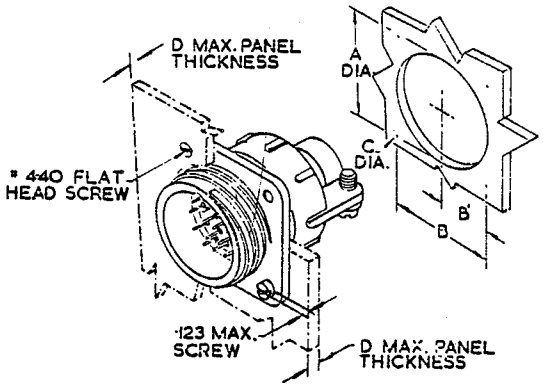


Fig. 4. Large flange receptacle mounting dimensions (Table 4)

TABLE 4

Large flange receptacles m ounting dimensions (fig. 4)

Mk.2 size & style	A Min. Dia.	B ±0·005	B' ±0·002	C ±0·005 Dia.	D Max. Str. E/B	D Max. 45 deg. & 90 deg. E/B	E Max. panel thickness & screw ext.
KMO-16L	1·102	1·078	0·539	0·120	Any	0·336	0·123
KMO-19L	1·227	1·219	0·609	0·120	panel	0·336	0·123
KMO-21L	1·415	1·297	0·648	0·120	thickness	0·336	0·123
KMAO-21L	1·415	1·297	0·648	0·120		0·170	0·137
KMBOA-21L	1·415	1·282	0·641	0·120		0·338	0·180

Filler plugs

12. Details of the filler plugs for KM Mk.2 connectors are given in Chap.1-3.

INSTRUCTIONS FOR USE

Cable stripping procedure

13. The cables should be stripped to the dimensions given in fig.5.

Crimping procedure standard contacts

14. (1) Ensure that the correct locator is fitted in the crimping pliers.

(2) Place the contact on to the stripped end of the cable, ensuring that all the strands are in the crimping barrel, and the cable insulation butts up against the end of the contact.

(3) Position the contact in the crimping tool locator and then cycle the plier handles. After removing the crimped contact, check that the conductors are visible through the small inspection hole in the side of the contact.

Coaxial sleeves (fig.6)

15. With reference to fig.6 fit the coaxial sleeves as follows:—

(1) Trim the outer jacket approximately four inches back from the end of the cable. fig.6(a).

(2) Then cut the cable braid three and a half inches from the end of the cable, fig.6(b).

(3) Insert the inner ring between the braid and the coaxial dielectric as shown in fig.6(c), strip the shield lead ½ in. back from the end.

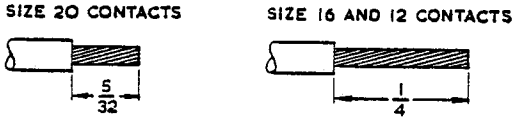


Fig. 5. Stripping dimensions

TABLE 5

Tools

Crimping tools

Part No.	Description	Reference Nos.		
		R.A.F.	Navy	Joint Services
MS3191-1	Crimping tool	1H/279	0273-064-5631	
611062	Locator Size 20 Contact and KM Coaxial Sleeve	1H/414		
602520-3	Locator Size 16 Contacts	1H/415		
602520-4	Locator Size 12 Contacts	1H/416		

Insertion extraction tools

Contact insertion tools

Tool part No.	Contact size	Reference Nos.		
		R.A.F.	Navy	Joint Services
CIT-20-18	20			
CIT-16	16			
CIT-12	12			

Contact removal tools

Tool part No.	Contact size	Reference Nos.		
		R.A.F.	Navy	Joint Services
CET 20A	20			5935-99-124-1003
CET 16	16			
CET 12	12			

(4) Then slide the outer ring over the inner ring, braid and shield lead and then crimp with a Thomas and Betts tool size WT-200 or a Burndy tool size MR-8PVS.

(5) After crimping the shield lead to the coaxial cable, strip the end of the cable dielectric and the shield lead $\frac{5}{32}$ in. back from the end, fig.6(d).

Note . . .

Before crimping a contact to the coaxial wire conductor a KM coaxial sleeve must be slipped over the wire.

Contact insertion

16. (1) Fit the endbell and ferrule over the cables.

(2) Position contact onto the appropriate insertion tool so that the tip of the tool rests against the shoulder of the contact.

(3) When inserting the contacts work from the centre to the outside edges of the connector insert. Keeping the tool in line with the grommet holes, apply a slow even pressure, until the contact snaps into position.

(4) After the contact is fully seated withdraw the insertion tool.

Final assembly

17. (1) After all wired contacts have been inserted; filler plugs should be inserted into the unwired holes (Chap.1-3).

(2) After all contacts and filler plugs have been installed, the ferrule should be pressed down into the shell and the endbell tightened.

Note . . .

(1) *Three teeth on the connector shell provide positive stop for the endbell, and positive polarization through* 360 *deg. for* 45 *deg and* 90 *deg. endbells.*

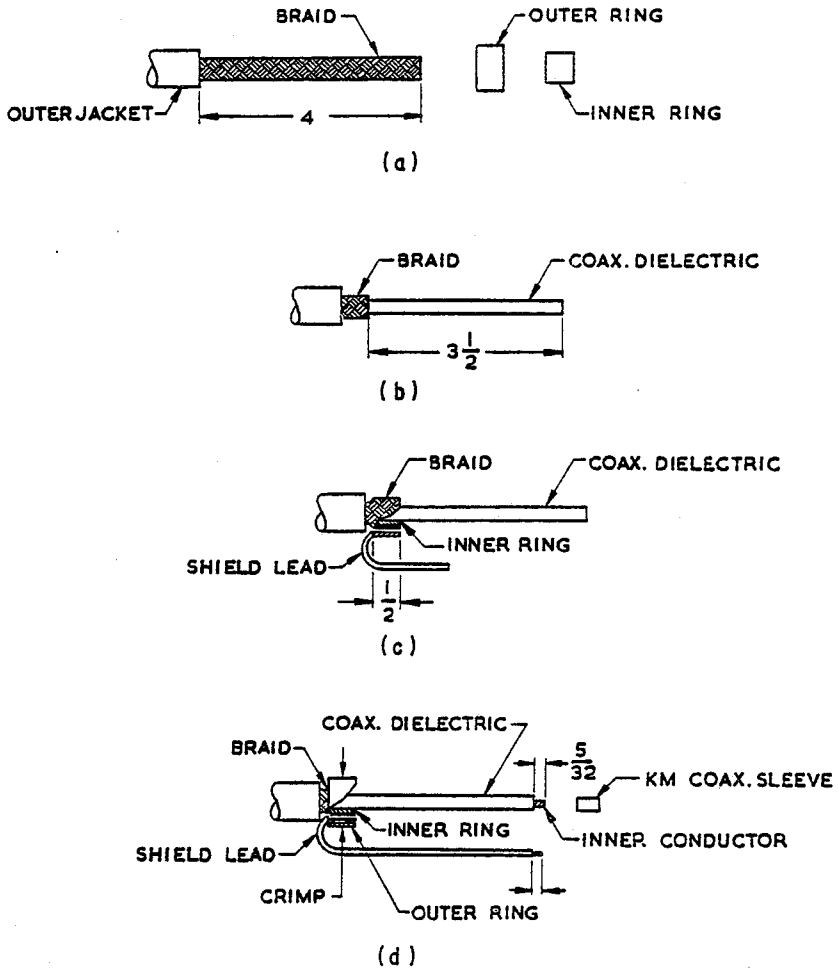


Fig. 6. Coaxial sleeve fitting

(2) *When installing the endbell on a plug a mating receptacle must be used to prevent the barrel from turning when tightening the endbell.*

Contact removal

Extraction tools

18. The tips of extraction tools are reversible (fig.8). There is a solid pin end for socket contacts and a tubular pin for pin contacts. To reverse the tips unscrew and re-assemble with the required tip in position.

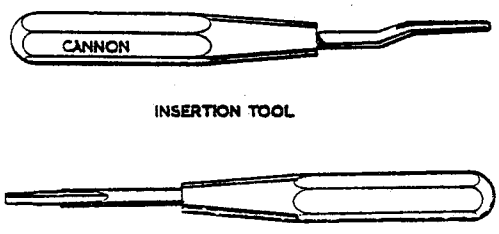


Fig. 7. Insertion tool

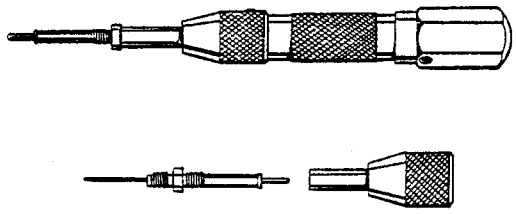


Fig. 8. Extraction tool

Removal procedure

19. (1) Release endbell and ferrule from connector shell. Select the appropriate tool. Insert the tool over pin contact or into socket contact.

(2) Hold the connector firmly and apply an even pressure on the tool, keeping it at right angles to the face of the grommet, until it impacts.

(3) If the contact fails to extract after the first impact, repeat the process.

Note . . .

(1) *If the tool is tilted a bent contact could result.*

(2) *Replace bent contacts. Do not attempt to straighten bent contacts.*

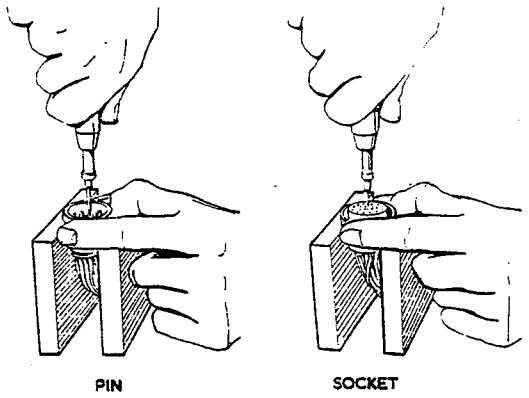


Fig. 9. Use of extraction tool