Elect Engr.

F.290

AIR PUBLICATION
113D-1840-1
(Formerly A.P.4343P Vol. 1, Bk. 2
Sect. 7, Chap. 9.)

THORN PT AND CPT CONNECTORS

GENERAL AND TECHNICAL INFORMATION

BY COMMAND OF THE DEFENCE COUNCIL

J. T. Dunnett

Ministry of Defence

FOR USE IN THE
ROYAL AIR FORCE

(Prepared by the Ministry of Technology)

AMENDMENT RECORD SHEET

To record the incorporation of an Amendment List in this publication, sign against the appropriate A.L. No. and insert the date of incorporation

A.L. No.	AMENDED BY	DATE
1	[illegible]	29/7/77
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
33		

A.L. No.	AMENDED BY	DATE
34		
35		
36		
37		
38		
39		
40		
41		
42		
43		
44		
45		
46		
47		
48		
49		
50		
51		
52		
53		
54		
55		
56		
57		
58		
59		
60		
61		
62		
63		
64		
65		
66		

MINISTRY OF DEFENCE

Amendment List No.1
to AP 113D-1840-1

Remove and destroy pages 3 and 4 (one leaf) and substitute new pages 3 and 4 (one leaf).
Record the incorporation of this amendment in the Amendment Record Sheet.

THORN PT AND CPT CONNECTORS

CONTENTS

	Page
Introduction	3
Description	4
Shells	4
Inserts	4
Contracts	4
Insert orientation	4
Keyway orientation	4
Contact arrangement	6
Significance of part numbers	6
Servicing	7
PT Connectors	7
CPT Connectors	7
Removal of contacts	7
Insertion of contacts	7

TABLES

No.		Page
1	*Shell styles and types*	9
2	*Contact data*	9
3	*Contact arrangement and insert orientation*	10
4	*Shell size and keyway orientation*	11
5	*Special tool data for CPT range*	11

ILLUSTRATIONS

Fig.		Page
1	*Sectional view of mated pair*	4
2	*Styles and types of shells*	5
3	*Insert orientation*	5
4	*Keyway orientation*	6
5	*Contact arrangements*	8

Introduction

1. The range of Thorn PT (Pygmy) connectors is designed to MIL-C-0026482A specification. These connectors employ a three-pin spring-loaded bayonet locking device. Visual indication of correct engagement of the coupling is provided by a bayonet catch on the plug protruding through an aperture in the coupling unit. In addition, when a coupling is mated, turning the coupling nut over the bayonet catch produces an audible click. A sectional view of a typical mated pair is illustrated in fig. 1. Provision is made to prevent mismating and alternate insert positions prevent cross connection.

2. The CPT range of connectors are similar to the PT range but have crimped contacts instead of solder type contacts. CPT connectors are interchangeable with PT types and the following description applies to both ranges.

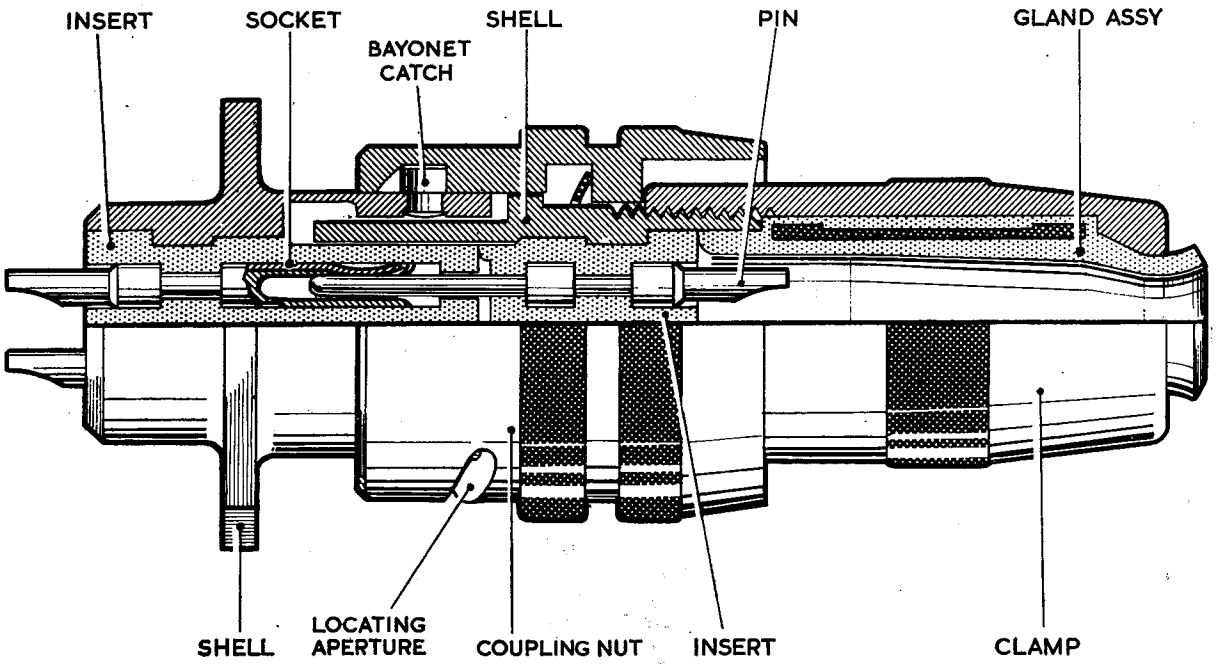

Fig. 1 Sectional view of mated pair

DESCRIPTION

Shells

3. The aluminum shells are supplied as wall mounting receptacles, cable connecting receptacles, box mounting receptacles or jam nut receptacles. In addition a pressurized through-bulkhead receptacle is available to provide for disconnecting circuits from both sides of a panel. The straight plug will mate with any of these receptacles. All these are illustrated in fig. 2 and listed under significance of part numbers in para. 10. Each of the shell styles is available in four types to suit environmental conditions. The differences between the four types are in the cable fittings on the rear of the assembly, and with the pressurization of the contacts and inserts within the shell. These types are illustrated in fig. 2 and listed in Table 1.

Inserts

4. The moulded polychlorophene insert is fitted in the shell and can be located in various alternate positions by placing the insert key in one of the five keyways in the shell (para. 6). Holes positioned axially in the insert house the contacts. Positive stops for the contacts are provided by shoulders moulded in the holes. When a plug and socket are coupled, the inner faces of their inserts are held in contact to provide a seal.

Contacts

5. Two sizes of contacts are used on both ranges ▶ of connectors, the No 20 (4 amp.) and the No. 16 (12 amp.). Both pins and sockets are machined from a low loss copper alloy, gold plated over silver. Contact data is detailed in Table 2. ◀

Insert Orientation

6. To avoid cross connection where similar connectors are mounted adjacent to each other, provision is made to assemble the insert in one of a number of positions relative to the normal position as shown in fig. 3. The angle of the various positions of the insert varies with the size of shell and the number of contacts. Full details are given in Table 3.

Keyway Orientation

7. Another method used to prevent cross plugging of similar connectors in adjacent positions is by varying the keyway positions in the metal housing (fig. 4). The major key is fixed and used as a datum, while the angular position of the five minor keyways is varied to provide a balanced five point mating of the connectors.

Note . . .

The insert of a connector using keyway orientation is always set in one fixed position within the shell, consequently connectors using keyway orientation cannot be used with connectors having insert orientation.

8. Table 4 lists the keyway orientations available

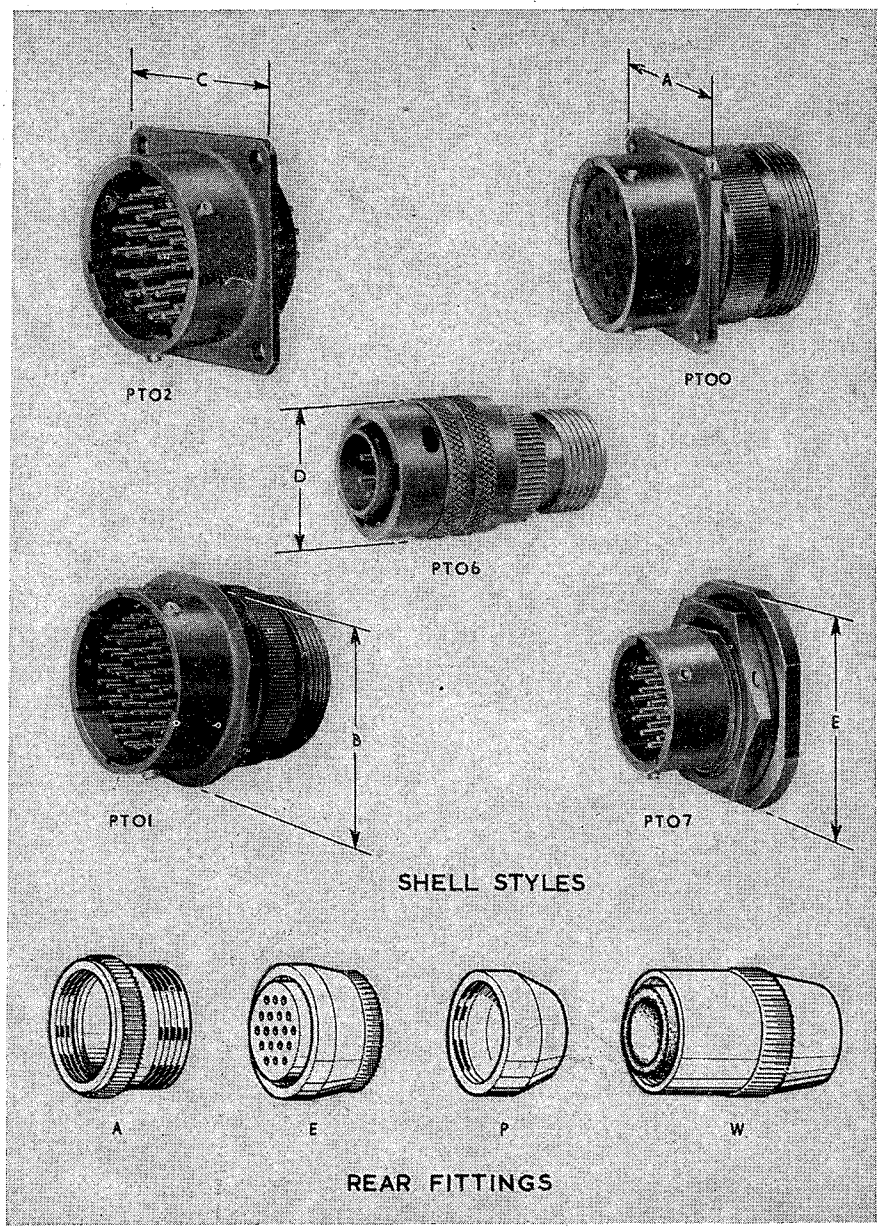

Fig. 2 Styles and types of shells

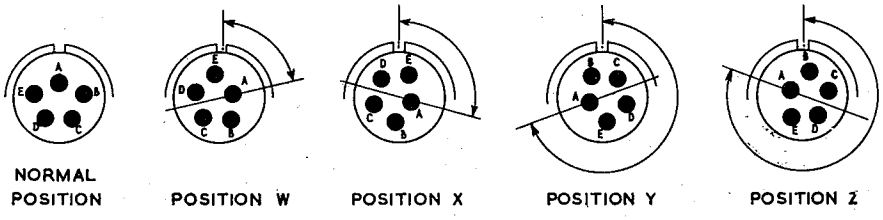

Fig. 3 Insert orientation

in the various shell sizes and the angular displacements of the minor keys for each particular orientation.

Contact Arrangement

9. The full range of contact arrangements, grouped in order of shell sizes, is shown in fig. 5. Additional details are included in Table 3.

Significance of Part Numbers

10. A typical part number is PT 06E-22-55SZ and the use of this number gives a complete identification of a specific connector. The significance of the component parts of this number is as follows:—

PT—specifies a connector made to MIL-C-0026482A.

06—specifies the shell style—in this instance a straight plug. Others are, 00 wall mounting receptacle, 01 cable connecting receptacle, 02 box mounting receptacle, 07 jam nut receptacle.

E—specifies the environmental type of the connector—in this instance an open wire sealing type.

22-55—specifies the shell size and insert arrangement—in this instance a size 22 shell with 55 contacts.

S—specifies socket contacts—P would specify pins.

Z—specifies the position of the insert in the shell as described in para. 5.

Note . . .

CPT denotes connector having crimped contacts.

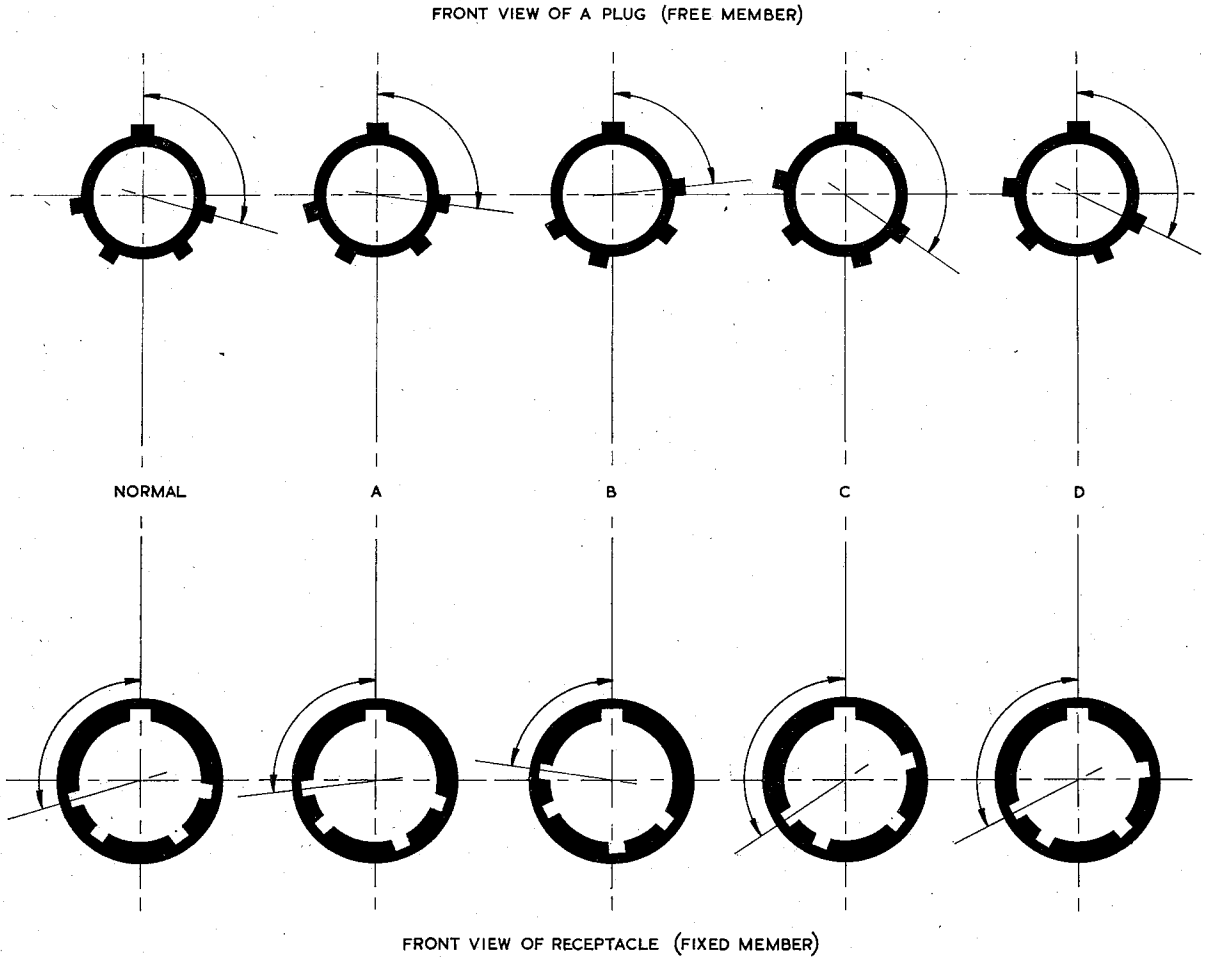

Fig. 4 Keyway orientation

SERVICING

PT Connectors

11. To solder conductors to contacts in the PT range proceed as follows:—

(1) Strip the cable to the correct length, $\frac{3}{16}$in. for size 20 contact or $\frac{1}{4}$in. for size 16 contact.

(2) Pass the cable through the dismantled end fittings and allow sufficient spare cable for working.

(3) Tin the stripped conductor stopping the tinning at least $\frac{1}{16}$in. from the insulation.

(4) Solder pots are pre-tinned and contain sufficient solder to make a good joint.

(5) Apply a resin base flux to the solder pot and conductor.

(6) Hold a hot soldering iron on the open side of the solder pot and insert the conductor when the solder has melted.

(7) Keep the iron in position until the solder has run through the conductor and a good joint is made. Applying the hot iron to the open side of the solder pot prevents solder from collecting on the outside of the contact.

CPT Connectors

12. When servicing CPT connectors special tools are required for the removal and insertion of contacts. These special tools are listed in Table 5.

Removal of Contacts

13. One or more contacts may be removed and replaced without disturbing other contacts. To remove contacts proceed as follows:—

(1) Dismantle the end fittings from the rear end of the connector.

(2) Remove the conductor(s) from the relevant contact(s).

(3) Using the correct tool, place over a pin contact or insert in a socket contact, apply an even pressure and push the contact from the front out through the back of the insert.

Insertion of Contacts

14. To insert new contacts, proceed as follows:—

(1) Before inserting contacts, remove the end fittings from the rear of the connector and pass them over the cable in the correct order for assembly.

(2) Hold the plug or receptacle firmly and begin inserting the wire or free contacts by hand. Insert the centre contacts first and continue with the adjacent contacts to the perimeter of the insert.

(3) Use the correct insertion tool to apply a gentle even pressure until the contact snaps home. Contacts are properly seated if they do not move when a force, equal to the force used to assemble them, is applied to the other end.

(4) Examine the front of the insert to ensure that the depth of insertion is equal for all contacts.

(5) Assemble the end fittings on the connector.

(6) Unused holes in grommets must be filled with the correct size of sealing plug, these are colour-coded, blue for size 16 and red for size 20.

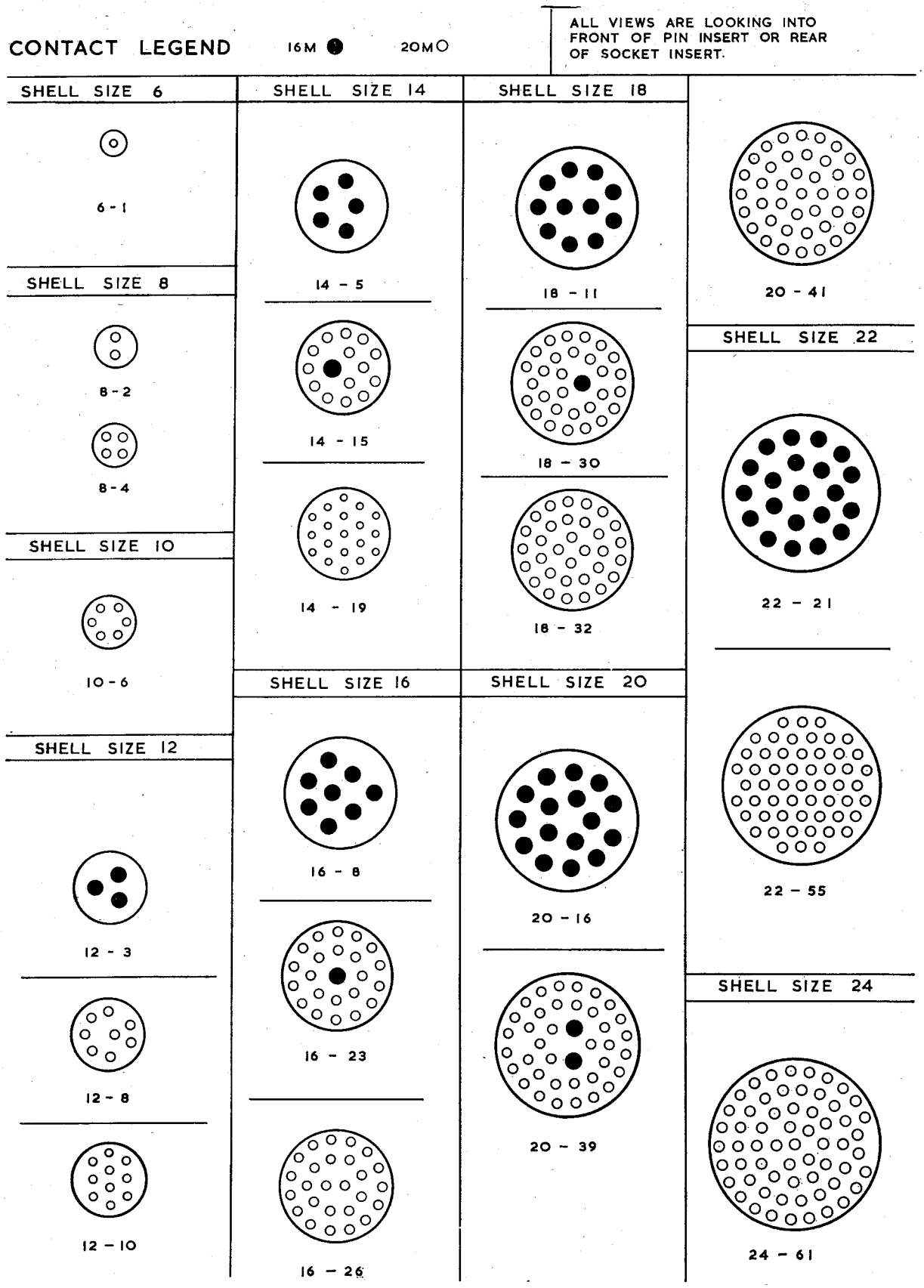

Fig. 5 Contact arrangements

TABLE 1

Shell styles and types

(see fig. 2)

Shell style	Types A	E	P	W
Wall mounting receptacle	PT00A	PT00E	PT00P	PT00W
Cable connecting receptacle	PT01A	PT01E	PT01P	PT01W
Box mounting receptacle	PT02A	PT02E	PT02P	PT02W
Straight plug	PT06A	PT06E	PT06P	PT06W
Jam nut receptacle	PT07A	PT07E	—	—

A— General duty, aluminium back shell with external threads for conduit attachment.

E— Open wire sealing, a webbed grommet provides moisture proofing for individual conductors, wire range 0·065in. to 0·100in.

P— Potting compound, translucent nylon boot retains potting compound and is secured by a threaded ring. Permits visual inspection during potting process.

W— Cable water proofing, multi-conductor jacketed cables waterproofed by radially compressed neoprene gland.

TABLE 2

Contact data

Contact size	Rated Current Amperes	Voltages at sea level a.c. r.m.s.	d.c.
20	7·5	500	700
16	22·0	900	1250

TABLE 3

Contact arrangement and insert orientation

(see fig. 3 and fig. 5)

Shell	Contact arrangement	Contact Size	Orientation (degrees) W	X	Y	Z
8	2	2 × 20	58	122	—	—
8	4	4 × 20	45	—	—	—
10	6	6 × 20	90	—	—	—
12	3	3 × 16	—	—	180	—
12	8	8 × 20	90	112	203	292
12	10	10 × 20	60	155	270	195
14	5	5 × 16	40	92	184	273
14	15	14 × 20 1 × 16	17	110	155	234
14	19	19 × 20	30	165	315	—
16	8	8 × 16	54	152	180	331
16	23	22 × 20 1 × 16	158	270	—	—
16	26	26 × 20	60	—	275	338
18	11	11 × 16	62	119	241	340
18	30	29 × 20 1 × 16	180	193	285	350
18	32	32 × 20	85	138	222	265
20	16	16 × 16L	238	318	333	347
20	39	37 × 20L 2 × 16L	63	144	252	333
20	41	41 × 16L	45	126	225	—
22	21	21 × 16L	16	135	175	349
22	55	55 × 20L	30	142	226	314
24	61	61 × 20L	90	180	270	324

L—longer contact but same characteristics.

TABLE 4

Shell size and keyway orientation

(see fig. 4)

Shell Size	Normal	Degrees A	B	C	D
8	105	92			118
10	105	95	85	125	115
12	105	97	89	121	113
14	105	98	91	119	112
16	105	99	93	117	111
18	105	100	95	115	110
20	105	100	95	115	110
22	105	101	97	113	109
24	105	101	97	113	109

TABLE 5

Special tool data for CPT range

Contact Size	Special tool Insertion	Removal
16	11-8107-16	11-7880-16
20	05-0027-20	11-7880-20

Printed for Her Majesty's Stationery Office by Qualitex Printing Limited, Cardiff

(M5131) 629244 800 8/68 483/8