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CONNECTORS, ELECTRICAL, RECTANGULAR, MICROMINIATURE, BASED ON TYPE MDM

ESCC Detail Specification No. 3401/029

ISSUE 1 October 2002





ESCC Detail Specification

PAGE ii

ISSUE 1

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Pages 1 to 40

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BASED ON TYPE MDM

ESA/SCC Detail Specification No. 3401/029



space components coordination group

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Issue 3	August 2001	71.200	Am							
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ISSUE 3

DOCUMENTATION CHANGE NOTICE

Letter Date Reference Item This Issue supersedes Issue 2 and incorporates all modifications defined in Revisions 'A', 'B' and 'C' to Issue 2 and the changes agreed in the following DCRs:- Cover page DCN Para. 1.1 : Reference to ESA/SCC Detail Spec. No. 3401/028 deleted : Item (b) deleted and Item (c) renumbered Table 1(a) : FR136, FR136A weight added to Table, Column split and Shell Size 9 amended Table 1(b) : Rated Current details added as new Items 2 and 3, existing Items renumbered Figure 1 Figure 1 : Retitled as Figure 1(a) and completely amended Figure 2.1 : Split into Figures 2.1A and 2.1B Figure 2.1A : Dimension L in drawing and Dimensions B, F and G in Table underlined Rote 2 added Figure 2.1B : Split into Figures 2.1A and 2.2B : Side Elevation deleted, Elevation added Detail A extracted to separate drawing Dimensions B, C, D and E in Table underlined Values for Dimension J added Figure 2.2B : Split into Figures 2.2 and 2.2D : Side Elevation deleted, Elevation added Detail A extracted to separate drawing Dimensions B, C, D and E in Table underlined Values for Dimension J added Figure 2.2C and 2.2D : Side Elevation deleted, Elevation added Detail A extracted to separate drawing Dimensions B, C, D and E in Table underlined Values for Dimension J added Figure 2.2C Split into Figures 2.2 and 2.2P Figure 2.2C Split into Figures 2.2 and 2.2F Figure 2.2E Side Elevation deleted, Elevation added Detail A extracted to separate drawing Dimensions B, C, D and E in Table underlined Detail A extracted to separate drawing Dimensions Nmin, Nmax, Pmin and U amended Detail A extracted to separate drawing Dimensions B, C, D and E in Table underlined Detail A extracted to separate drawing Dimensions B, C, D and E in Table underlined Detail A extracted to separate drawing Dimensions B, C, D, E, F, and N in Table underlined	
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Figure 2.2G : Side Elevation deleted, Elevation added	221610



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DOCUMENTATION CHANGE NOTICE

Rev.	Rev.			CHANGE	Approved
Letter	Date	Reference		Item	DCR No.
			:	Dimensions D, E, Gmin, Gmax, J, K1, Mmin, Mmax, Nmin, Nmax, Pmin and U amended Detail A extracted to separate drawing	221610 221610
			:	Dimensions B, C, D, E, F and N underlined	221610
		Figure 2.2H	:	Side Elevation deleted, Elevation added	221610
			:	Dimensions D, E, Gmin, Gmax, J, K1, Mmin, Mmax, Nmin, Nmax, Pmin and U amended	221610
i			:	Detail A extracted to separate drawing	221610
			:	Dimensions B, C, D and E in Table underlined	221610
		Figure 2.3B	:	Figure deleted	221610
		Figure 2.3.1	:	New Figure added	221610
		Figure 2.3.2	:	New Figure added	221610
		Figure 2.3.3	:	New Figure added	221610
		Figure 2.6	:	Table added	221610
		Figure 3	:	Figure 3 inserted	221610
		l	:	"Typical" added to Notes to Contact Centre drawing	221610
		Para. 4.0	:	Items (b), (h) and (i) deleted and remaining Items renumbered	221610
		Para. 4.2		Existing deviations deleted for all Charts and New Deviations added	221610
		Para. 4.3.1	:	New sentence added	221610
		Para. 4.3.2	:	References to ESA/SCC Detail Spec. No. 3401/028 deleted	221610
		Para. 4.3.3	:	Contact Capability added	23941
		Para. 4.3.4	:	(In insert) added to title	23941
			:	Force amended	23941
		Para. 4.3.5	:	Mating and Unmating Forces added	23941
		Para. 4.3.6	:	Insertion Retention (In shell) added	23941
i I		Para. 4.3.7	:	In DCR 221610 renumbered to 4.3.9	23941
		Dawa 400	:	Jackscrew Retention added	23941
		Para. 4.3.8	:	Contact Insertion and Withdrawal Force (Male Contacts) added	23941
		Para. 4.3.9	:	Engagement and Separation Forces (Male Contacts) added	221610
		Para. 4.3.10	:	Oversize Pin Exclusion added	23941
		Para. 4.3.11	:	Probe Damage added	23941
		Para. 4.3.12	:	Solderability added	23941
		Para. 4.4.1	:	Text amended	221610
		Para. 4.4.2 Para. 4.4.3	:	Text amended	221610
		rara. 4.4.3	:	New paragraph added and all paragraphs subsequent	221610/
		Para. 4.4.7		to "4.4.3" renumbered	23941
		Para. 4.5.3	:	(Was 4.4.6) Text amended Text amended to "Mounting" in 2 places from "Electing Mount or Contine North	221610 23941
		Para. 4.5.3.4		"Floating Mount or Captive Nut" Title amended to "Mounting"	004040
		Table 2		Old Table deleted	221610
		TUDIO &	•	New table inserted and amended	221610
			•	Mem fanie inserten dim silietiden	221610/
		Figure 4		New figure inserted	23941
		Table 6	•	Old Table deleted New Table inserted	221610
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Rev. 'B'

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DOCUMENTATION CHANGE NOTICE

		DOCUMENTATION CHANGE NOTICE	
Rev. Letter	Rev. Date	CHANGE Reference Item	Approved DCR No.
'A'	Mar. '02	P1. Cover page P3A DCN P6. Para. 2(c) : Voltage amended to 600V P21. Fig 2.2F : Title amended; "Plug" deleted, "Receinserted P22. Fig 2.2F (Cont) : Title amended; "Plug" deleted, "Receinserted P24. : Shell size 9, dimension D amended to Dimension E1 underlined P26. : Shell size 9, dimension D amended to Dimension E1 underlined P27. Fig. 2.3.2 : Dimension E1 underlined P28. : Dimension E1 underlined P29. Fig. 2.3.2 : Diagram amended P32. Para. 4.3.4 : New sentence added P40. Table 6 : No. 19, "Maintenance Ageing" "Not Ainserted in Limits Column	23950 23950 23950 23950 23950 23950 23950 23950 23950 23950 23950
'B'	Sept. '02	P1. Cover page P3A. DCN P7. Table 1(a) : Last two Table Column Headings of present the provided street of the prov	max. corrected 23961 max. corrected 23961 md separation" 23961 " 23961 CC 3601" and 23961 dd 23961 corrected to 23961



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1(a) 1(b) 2 3 4 5	Range of Components Maximum Ratings Electrical Measurements at Room Temperature Not applicable Not applicable Not applicable Not applicable Measurements and Inspections on Completion of Environmental and Endurance Tests	7 7 36 39
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APPENDICES (Applicable to specific Manufacturers only)

None.



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1. GENERAL

1.1 SCOPE

This specification details the ratings, physical and electrical characteristics, test and inspection data of Electrical, Rectangular, Microminiature Connectors with Non-removable Crimp-type Contacts and their associated insulated wires and uninsulated solid wires, based on Type MDM.

It shall be read in conjunction with:

- (a) ESA/SCC Generic Specification No. 3401, Connectors, Electrical, Rectangular and Circular.
- (b) ESA/SCC Detail Specification No. 3401/032, Accessories for Connectors, Microminiature, 3401/029.

the requirements of which are supplemented herein.

1.2 RANGE OF COMPONENTS

The different sizes of the basic type connectors specified herein, which are also covered by this specification, together with their mechanical characteristics, are scheduled in Table 1(a). The different sizes of associated insulated wires and uninsulated solid wires are given in Figure 2.

1.3 MAXIMUM RATINGS

The maximum ratings, which shall not be exceeded at any time during use or storage, applicable to the contacts specified herein, are scheduled in Table 1(b).

1.4 PARAMETER DERATING INFORMATION

The derating information applicable to the contacts specified herein is shown in Figure 1.

1.5 PHYSICAL DIMENSIONS

The physical dimensions of the connectors, insulated wires and uninsulated solid wires specified herein are shown in Figure 2.

1.6 CONTACT ARRANGEMENTS

Contact arrangement are shown in Figure 3.

2. APPLICABLE DOCUMENTS

The following documents form part of this specification and shall be read in conjunction with it:-

- (a) ESA/SCC Generic Specification No. 3401, Connectors, Electrical, Circular and Rectangular.
- (b) ESA/SCC Detail Specification No. 3401/032, Accessories for Connectors, Microminiature for 3401/029.
- (c) ESA/SCC Detail Specification No. 3901/013, PTFE Insulated Wires and Cables, 600V, -100 to +200°C.
- (d) QQ-W-343, Wires, Electrical Uninsulated.
- (e) MIL-G-45204, Gold Plating, Electro-deposited.
- (f) MIL-C-14550, Copper Plating, Electro-deposited.
- (g) MIL-PRF-83513, Connectors Electrical, Rectangular, Microminiature, Polarised Shell, Generic Specification for.

3. TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS

For the purpose of this specification, the terms, definitions, abbreviations, symbols and units specified in ESA/SCC Basic Specification No. 21300 shall apply.



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TABLE 1(a) - RANGE OF COMPONENTS

Var	iant		Max.	Weight (gr	N4 .:	Unmating Force				
Shell Finish		Shell Size	FR112 to 116	FR136	FR136A	FR139	Mating Force (N.max)			
Nickel	Gold		and FR123 (1)	(2)	(2)	(2)	(N.IIIax)	N. Max.	N. Min.	
01	02	9	2.2	7.4	7.4 4.6		20	20	1.3	
01	02	15	3.0	7.8	N/A	5.0	33	33	2.0	
01	02	21	3.8	8.5	N/A	5.4	47	47	2.9	
01	02	25	4.3	10.2	N/A	6.5	55	55	3.5	
01	02	31	5.1	12.2	N/A	7.7	69	69	4.3	
01	02	37	5.9	14.4	N/A	9.2	82	82	5.1	
01	02	51	7.2	16.5	N/A	N/A	113	113	7.1	

NOTES

- 1. Connector contacts and rear potting, without cables, without floating eyelets and without captive nut. Add 0.4 grammes for connectors with floating mounts and 1.0 gramme for connectors with captive nuts. See Figures 2-4 and 2-5 for the weight of cable.
- 2. Connector with contacts and rear potting.

TABLE 1(b) - MAXIMUM RATINGS

NO.	CHARACTERISTICS	SYMBOL	MAXIMUM RATING	UNIT	REMARKS
1	Working Voltage Sea Level	U _R	150	Vrms	Note 1
2	Rated Current: (AWG26 and uninsulated solid wire)	I _R	2.5	Α	
3	Rated Current (AWG28)	I _R	1.5	Α	1
4	Operating Temperature Range	T _{op}	-55 to +125	°C	
5	Storage Temperature Range	T _{stg}	-55 to +125	°C	

NOTES

1. Between contacts, and contact and shell.

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FIGURE 1 - PARAMETER DERATING INFORMATION

FIGURE 1(a) - WORKING VOLTAGE VERSUS ALTITUDE

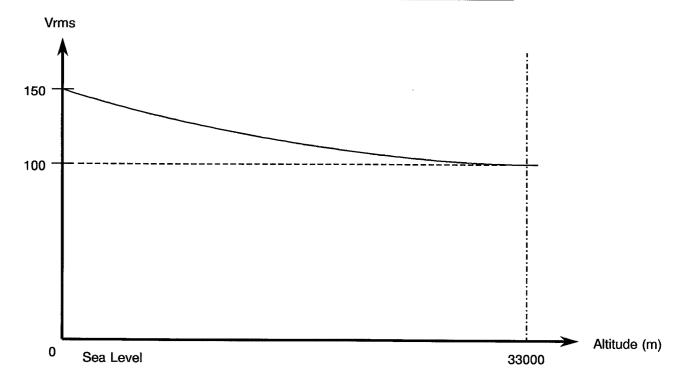


FIGURE 1(b) - MAXIMUM CURRENT VERSUS NUMBER OF CONTACTS

	MAXIMUM CURRENT PER CONTACT								
NUMBER OF CONTACTS	WIRE SIZE								
PER CONNECTOR	AWG 26 AND UNINSULATED SOLID WIRE	AWG 28							
2 - 4	2.0	1.4							
5 - 14	1.8	1.2							
15 and over	1.4	0.9							



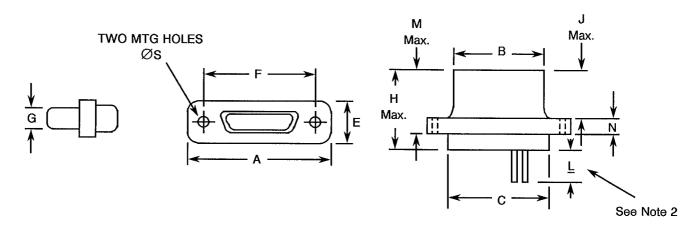
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FIGURE 2 - PHYSICAL DIMENSIONS

FIGURE 2.1A - CONNECTOR SHELLS

PLUG MALE CONTACTS



Shell	Α	<u>B</u>	С	D	Ε	ļ	<u>F</u>		Н	J	М	N		Øs	
Size	Max.	Max.	Max.	Max.	Max.	Min.	Max.	Max.	Мах.	Max.	Max.	Min.	Max.	Min.	Max.
9	19.94	8.46	10.16	6.86	7.82	14.22	14.48	4.69	10.57	4.72	7.26	2.23	2.49	2.23	2.39
15	23.75	12.27	13.97	6.86	7.82	18.03	18.29	4.69	10.57	4.72	7.26	2.23	2.49	2.23	2.39
21	27.56	16.08	17.78	6.86	7.82	21.84	22.10	4.69	10.57	4.72	7.26	2.23	2.49	2.23	2.39
25	30.10	18.62	20.32	6.86	7.82	24.38	24.64	4.69	10.57	4.72	7.26	2.23	2.49	2.23	2.39
31	33.91	22.43	24.13	6.86	7.82	28.19	28.45	4.69	10.57	4.72	7.26	2.23	2.49	2.23	2.39
37	37.72	26.24	27.94	6.86	7.82	32.0	32.26	4.69	10.57	4.72	7.26	2.23	2.49	2.23	2.39
51	36.45	24.97	26.67	7.87	8.92	30.73	30.99	5.78	10.57	4.72	7.26	2.23	2.49	2.23	2.39

- 1. All dimensions are in millimetres.
- 2. For minimum length of 'L' refer to Para. 4.5.3.3 of this specification.



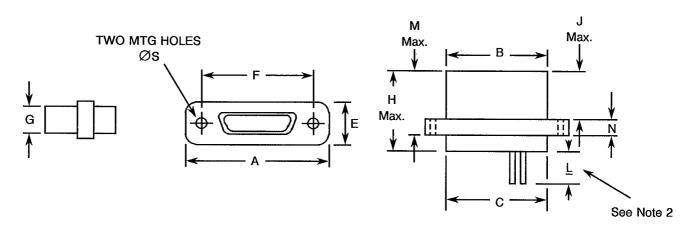
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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.1B - CONNECTOR SHELLS

RECEPTACLE FEMALE CONTACTS



Shell	Α	<u>B</u>	С	D	Е	į	<u>F</u>		<u>G</u> H		М	N		Øs	
Size	Max.	Max.	Max.	Max.	Max.	Min.	Max.	Max.	Max.	Max.	Max.	Min.	Max.	Min.	Max.
9	19.94	10.16	10.16	6.86	7.82	14.22	14.48	6.38	10.90	5.05	7.59	2.23	2.49	2.23	2.39
15	23.75	13.97	13.97	6.86	7.82	18.03	18.29	6.38	10.90	5.05	7.59	2.23	2.49	2.23	2.39
21	27.56	17.78	17.78	6.86	7.82	21.84	22.10	6.38	10.90	5.05	7.59	2.23	2.49	2.23	2.39
25	30.10	20.32	20.32	6.86	7.82	24.38	24.64	6.38	10.90	5.05	7.59	2.23	2.49	2.23	2.39
31	33.91	24.13	24.13	6.86	7.82	28.19	28.45	6.38	10.90	5.05	7.59	2.23	2.49	2.23	2.39
37	37.72	27.94	27.94	6.86	7.82	32.00	32.26	6.38	10.90	5.05	7.59	2.23	2.49	2.23	2.39
51	36.45	26.67	26.67	7.87	8.92	30.73	30.99	7.47	10.90	5.05	7.59	2.23	2.49	2.23	2.39

- 1. All dimensions are in millimetres.
- 2. For minimum length of 'L' refer to Para. 4.5.3.3 of this specification.

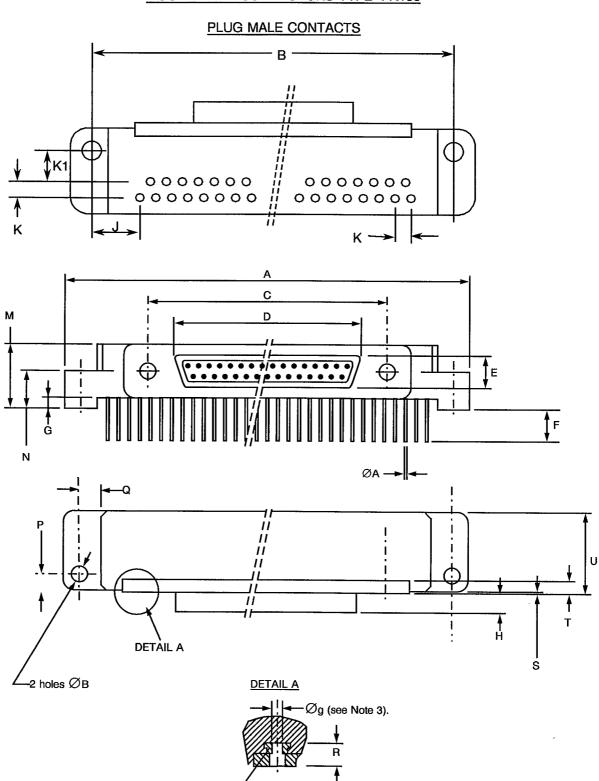


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ISSUE 3

FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.2A - CONNECTORS TYPE -FR136



Sealed nut



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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.2A - CONNECTOR TYPE - FR136 (CONTINUED)

PLUG MALE CONTACTS (CONTINUED)

								-								
									n	Мах.	11.56	11.56	11.56	11.56	11.56	11.56
Ŋ	Тур.	9.53	7.62	5.72	4.45	3.81	3.81		L	Max.	2.49	2.49	2.49	2.49	2.49	2.49
H	Max.	4.72	4.72	4.72	4.72	4.72	4.72			Min.	2.23	2.23	2.23	2.23	2.23	2.23
G	Мах.	1.7	1.7	1.7	1.7	1.7	1.7		S	Max.	4.0	0.4	0.4	0.4	4.0	0.4
0	Min.	1.3	1.3	1 .3	د .	1.3	1.3			Min.	0.2	0.2	0.2	0.2	0.2	0.2
F	Мах.	4.85	4.85	4.85	4.85	4.85	4.85		Ж	Min.	4.6	4.6	4.6	4.6	4.6	4.6
ш,	Min.	4.15	4.15	4.15	4.15	4.15	4.15		Q	Мах.	2.1	2.1	2.1	2.1	2.1	2.1
Ш	Max.	4.69	4.69	4.69	4.69	4.69	4.69		0	Min.	2.0	2.0	2.0	2.0	2.0	2.0
ō	Мах.	8.46	12.27	16.08	18.62	22.43	26.24		Р	Max.	3.55	3.55	3.55	3.55	3.55	3.55
(2)	Max.	14.48	18.29	22.1	24.64	28.45	32.26			Min.	2.79	2.79	2.79	2.79	2.79	2.79
OI	Min.	14.22	18.03	21.84	24.38	28.19	32		낌	Max.	5.45	5.45	5.45	5.45	5.45	5.45
ØB (4)	Max.	2.59	2.59	2.59	2.59	2.59	2.59		- -I	Min.	5.15	5.15	5.15	5.15	5.15	5.15
ØB	Min.	2.31	2.31	2.31	2.31	2.31	2.31	ļ	Z	Мах.	9.2	9.5	9.5	9.2	9.2	9.2
81	Max.	29.39	33.2	37.01	39.52	45.9	53.52		_	Min.	9.0	9.0	9.0	9.0	9.0	9.0
B I	Min.	29.03	32.84	36.65	39.19	45.54	53.16		1	Мах.	4.06	4.06	4.06	4.06	4.06	4.06
A	Мах.	35.31	39.12	42.93	45.47	51.82	59.44		7.	Min.	3.56	3.56	3.56	3.56	3.56	3.56
Shell	Shell		15	21	25	31	37		ス	Тур.	2.54	2.54	2.54	2.54	2.54	2.54
							Shell	Size	6	15	21	22	31	37		

- NOTES

 1. All dimensions are in millimetres.
 2. For ØA refer to Para. 4.5.3.3 of this specification.
 3. Øg: 2-56-UNC-2B.
 4. Maximum torque 0.44 Nm.

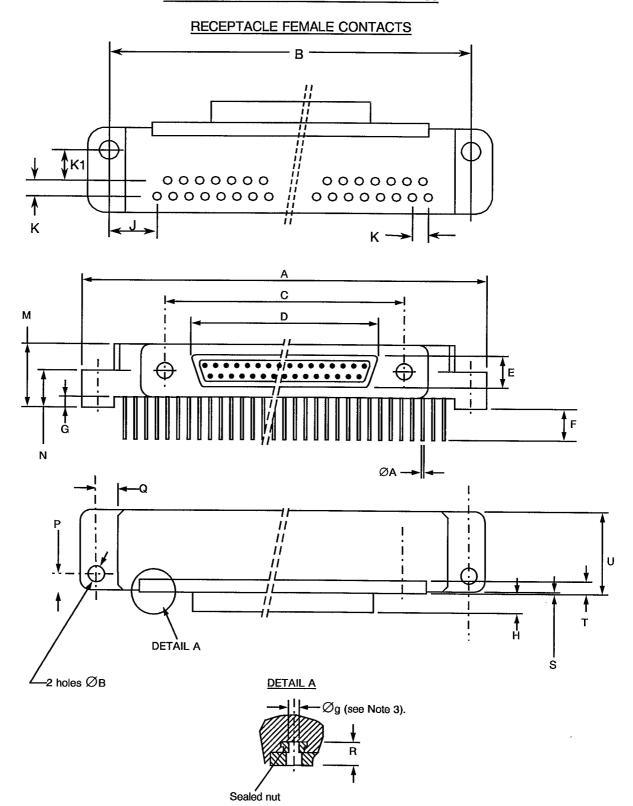


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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.2B - CONNECTORS TYPE -FR136





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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.2B - CONNECTOR TYPE - FR136 (CONTINUED)

RECEPTACLE FEMALE CONTACTS (CONTINUED)

								1			_					_
									n	Max.	11.56	11.56	11.56	11.56	11.56	11.56
っ	Typ.	9.53	7.62	5.72	4.45	3.81	3.81		-	Max.	2.49	2.49	2.49	2.49	2.49	2.49
I	Max.	5.05	5.05	5.05	5.05	5.05	5.05		•	Min.	2.23	2.23	2.23	2.23	2.23	2.23
45	Max.	1.7	1.7	1.7	1.7	1.7	1.7		S	Мах.	0.4	0.4	0.4	0.4	0.4	0.4
9	Min.	1.3	1.3	1.3	6.	6.	1.3			Min.	0.2	0.2	0.2	0.2	0.2	0.2
1. 1	Мах.	4.85	4.85	4.85	4.85	4.85	4.85		щ	Min.	4.6	4.6	4.6	4.6	4.6	4.6
ЩI	Min.	4.15	4.15	4.15	4.15	4.15	4.15		Ø	Max.	2.1	2.1	2.1	2.1	2.1	2.1
шІ	Max.	6.38	6.38	6.38	6.38	6.38	6.38			Min.	2.0	2.0	2.0	2.0	2.0	2.0
ō	Max.	10.16	13.97	17.78	20.32	24.13	27.94		Ь	Мах.	3.55	3.55	3.55	3.55	3.55	3.55
	Max.	14.48	18.29	22.1	24.64	28.45	32.26		Min.	2.79	2.79	2.79	2.79	2.79	2.79	
OI	Min.	14.22	18.03	21.84	24.38	28.19	32.0		ZI	Max.	5.45	5.42	5.45	5.42	5.42	5.42
(4)	Мах.	2.59	2.59	2.59	2.59	2.59	2.59		_ ,	Min.	5.15	5.15	5.15	5.15	5.15	5.15
ØB (4)	Min.	2.31	2.31	2.31	2.31	2.31	2.31		Σ	Max.	9.5	9.5	9.2	9.5	9.2	9.5
	Max.	29.39	33.2	37.01	39.55	45.9	53.52			Min.	9.0	9.0	9.0	9.0	9.0	9.0
ŒΙ	Min.	29.03	32.84	36.65	39.19	45.54	53.16		K1	Max.	4.06	4.06	4.06	4.06	4.06	4.06
٧	Max.	35.31	39.12	42.93	45.47	51.82	59.44		<u></u>	Min.	3.56	3.56	3.56	3.56	3.56	3.56
Shell	Size	6	15	2	52	31	37		ス	Тур.	2.54	2.54	2.54	2.54	2.54	2.54
									Shell	Size	တ	15	2	52	31	37

NOTES

1. All dimensions are in millimetres.

For ØA refer to Para. 4.5.3.3 of this specification. Øg: 2-56-UNC-2B. Maximum torque 0.44Nm.

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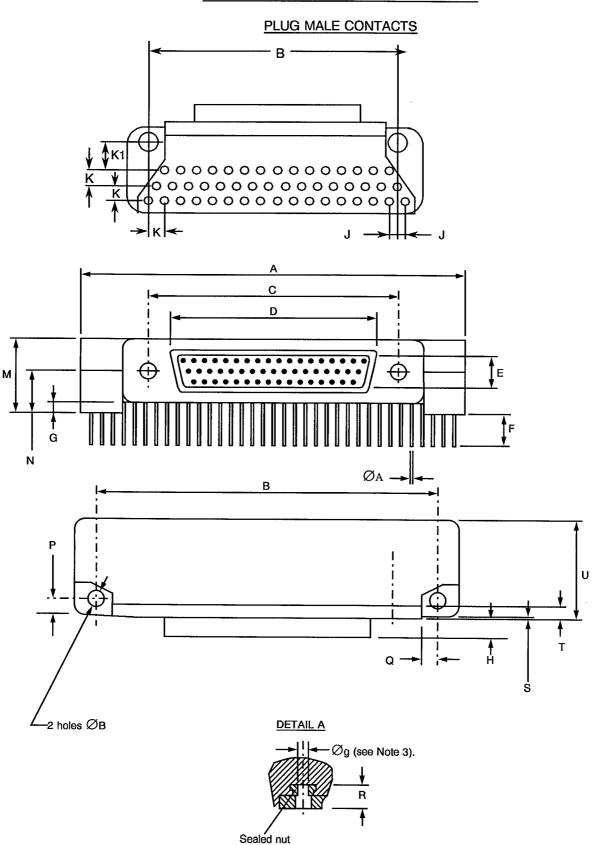


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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.2C - CONNECTORS TYPE -FR136





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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.2C - CONNECTOR TYPE - FR136 (CONTINUED)

PLUG MALE CONTACTS (CONTINUED)

٦	Typ.	1.27
エ	Мах.	4.72
	Мах.	1.7
ŋ	Min.	1.3
	Мах.	4.85
Ш	Min.	4.15
旦	Max.	5.78
ū	Max.	24.97
	Max.	30.99
Ol	Min.	30.73
(4)	Max.	2.59
ØB (4)	Min.	2.31
81	Max.	40.82
8 1	Min.	40.46
4	Max.	47.63
Shell	51	

⊃	Max.	14.35
	Max.	2.49
	Min.	2.23
	Max.	0.4
S	Min.	0.2
Œ	Min.	4.5
٥	Max.	2.15
	Min.	2.05
Р	Max.	3.55
	Min.	2.79
zl	Мах.	6.11
<i>Z</i> -1	Min.	5.81
M	Max.	10.10 10.40
	Min.	10.10
K1	Max.	4.06
x	Min.	3.56
ス	Typ.	2.54
Shell	51	

- All dimensions are in millimetres.
 For ØA refer to Para. 4.5.3.3 of this specification.
 Øg: 2-56-UNC-2B.
 Maximum torque 0.44Nm.
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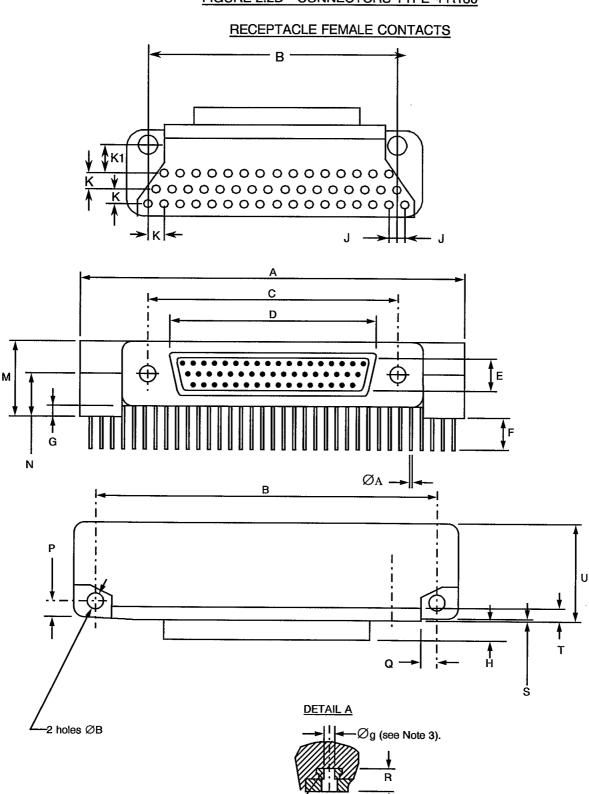


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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.2D - CONNECTORS TYPE -FR136



Sealed nut



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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.2D - CONNECTOR TYPE - FR136 (CONTINUED)

RECEPTACLE FEMALE CONTACTS (CONTINUED)

J	Тур.	1.27
П	Max.	5.05
(5	Мах.	1.7
5	Min.	1.3
HI.	Мах.	4.85
Ī	Min.	4.15
Ш	Max.	7.47
D	Max.	26.67
ا ت	Max.	30.99
Ō	Min.	30.73
: (4)	Мах.	2.59
ØВ	Min.	2.31
M1	Max.	40.82
<u>a</u>	Min.	40.46
٧	Max.	47.63
Shell	Size	51

<u> </u>	Max.	14.35		
	Max.	2.49		
	Min.	2.23		
	Мах.	0.4		
S	Min.	0.2		
æ	Min.	4.5		
O	Max.	2.15		
	Min.	2.05		
Ь	Max.	3.55		
	Min.	2.79		
ZI	Max.	6.11		
2.1	Min.	5.81		
M	Max.	10.40		
~	Min.	10.10 10.40		
K1	Мах.	4.06		
x	Min.	3.56		
ᅩ	Typ.	2.54		
Shell	Shell Size			

- NOTES

 1. All dimensions are in millimetres.
 2. For ØA refer to Para. 4.5.3.3 of this specification.
 3. Øg: 2-56-UNC-2B.
 4. Maximum torque 0.44Nm.

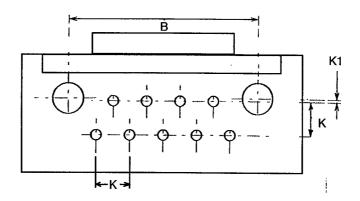


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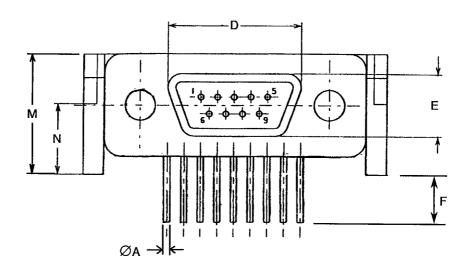
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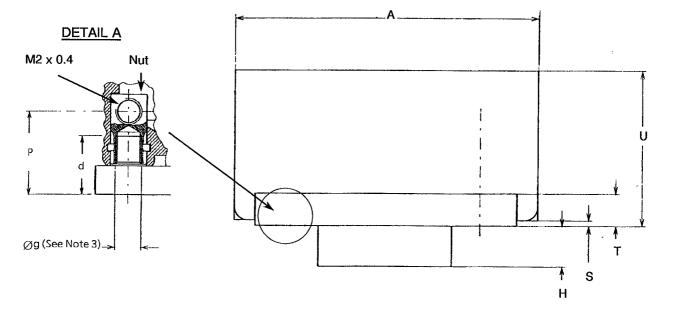
FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.2E - CONNECTORS TYPE - FR136A PLUG MALE CONTACTS



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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.2E - CONNECTOR TYPE - FR136A (CONTINUED)

PLUG MALE CONTACTS (CONTINUED)

74	0.2	
К	Typ.	2.54
Н	Max.	4.72
뙤	Max.	3.7
3	Min.	3.3
Ξ	Мах.	4.69
ū	Max.	8.46
þ	Min.	4.6
В	Max.	14.48
Ш	Min.	14.22
4	23.12	
Shell	Size	6

_		_
n	Max.	11.5
1	Max.	2.49
	Min.	2.23
S	Max.	0.4
0,	Min.	0.2
a.	Max.	7.24
-	Min.	6.48
ZI	Max.	5.45
4 1	Min.	5.15
_	Max.	9.2
W	Min.	9.0
Shell	6	

- NOTES

 1. All dimensions are in millimetres.
 2. For ØA refer to Para. 4.5.3.3 of this specification.
 3. Øg: 2-56-UNC-2B.



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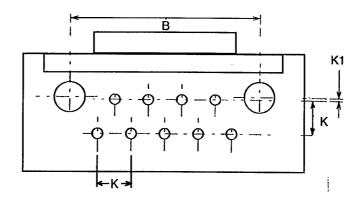
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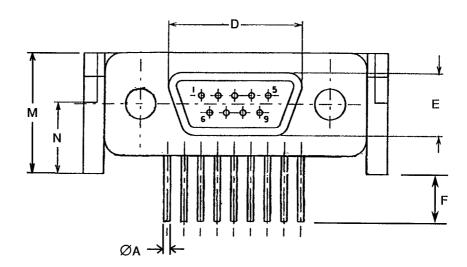
FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

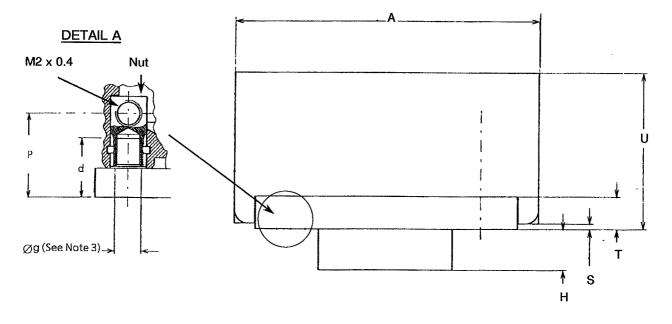
FIGURE 2.2F - CONNECTORS TYPE - FR136A (CONTINUED)

RECEPTACLE FEMALE CONTACTS



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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.2F - CONNECTOR TYPE - FR136A (CONTINUED)

RECEPTACLE FEMALE CONTACTS (CONTINUED)

2	0.2			
К	Тур.	2.54		
Н	Max.	5.05		
	Max.	3.7		
J	Min.	3.3		
Ē	6.38			
O	10.16			
d	d Min.			
81	Max.	14.48		
<u>B</u>	Min.	14.22		
٧	23.12			
Shell	Size	6		

S -
Z -
ZI -
Velv
Z ig

- NOTES

 1. All dimensions are in millimetres.
 2. For ØA refer to Para. 4.5.3.3 of this specification.
 3. Øg: 2-56-UNC-2B.



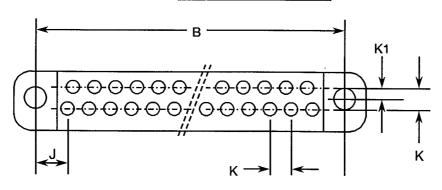
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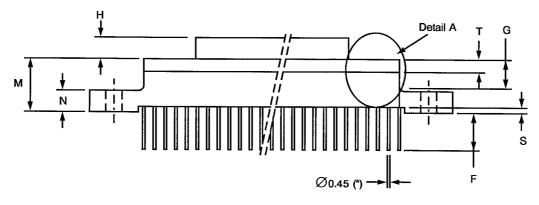
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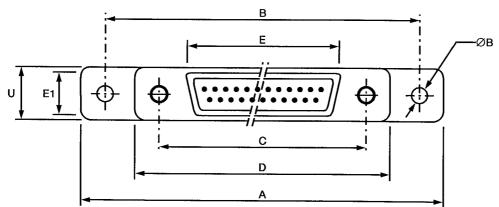
FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.2G - CONNECTORS TYPE -FR139

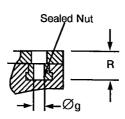
PLUG MALE CONTACTS







DETAIL A





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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.2G - CONNECTOR TYPE - FR139 (CONTINUED)

PLUG MALE CONTACTS (CONTINUED)

	_						
Ŋ	Typ.	9.53	5.72	5.72	3.81	3.81	3.81
エ	Мах.	4.72	4.72	4.72	4.72	4.72	4.72
В	Min.	4.6	4.6	4.6	4.6	4.6	4.6
	Max.	4.85	4.85	4.85	4.85	4.85	4.85
Ш	Min.	4.15	4.15	4.15	4.15	4.15	4.15
回	Max.	4.69	4.69	4.69	4.69	4.69	4.69
Ш	Max.	8.46	12.27	16.08	18.62	22.43	26.24
ō	Мах.	19.94	23.75	27.56	30.10	33.91	37.72
C	Max.	14.48	18.29	22.1	24.64	28.45	32.26
5	Min.	14.22	18.03	21.84	24.38	28.19	32.0
ØB (4)	Max.	2.59	2.59	2.59	2.59	2.59	2.59
ØB	Min.	2.31	2.31	2.31	2.31	2.31	2.31
BI	Max.	29.39	29.39	37.01	38.28	45.9	53.52
Ш	Min.	29.03	29.03	36.65	37.92	45.54	53.16
A	Max.	35.31	35.31	42.93	44.2	51.82	59.44
Shell		6	15	2	22	31	37

. Max.	7.82	7.82	7.82	.82	82	દ્ભ
				7	7.	7.8
Мах.	2.49	2.49	2.49	2.49	2.49	2.49
Min.	2.23	2.23	2.23	2.23	2.23	2.23
Max.	1.1	1.1	7:	1:	1.1	1.1
Min.	6.0	6.0	6.0	6.0	6.0	0.9
Min.	4.6	4.6	4.6	4.6	4.6	4.6
Мах.	4.2	4.2	4.2	4.2	4.2	4.2
Min.	4.0	4.0	4.0	4.0	4.0	4.0
Мах.	9.05	9.05	9.02	9.02	9.05	9.02
Min.	8.62	8.62	8.62	8.62	8.62	8.62
Тур.	1.27	1.27	1.27	1.27	1.27	1.27
Тур.	2.54	2.54	2.54	2.54	2.54	2.54
Size	6	15	21	22	33	37
	Typ. Typ. Min. Max. Min. Max. Min. Max. Min.	Typ. Typ. Min. Max. Min. Max. Min. Max. Min. Min. Min. Min. Min. 2.54 1.27 8.62 9.02 4.0 4.2 4.6 0.9 1.1 2.23	Typ. Min. Max. Min. Max. Min. Max. Min. Max. Min. Max. Min. Min. <th< td=""><td>Typ. Min. Max. Min. Max. Min. Max. Min. <th< td=""><td>Typ. Min. Max. Min. Max. Min. 2.23 2.54 1.27 8.62 9.</td><td>Typ. Min. Max. Min. Max. Min. Max. Min. 2.23 2.54 1.27 8.</td></th<></td></th<>	Typ. Min. Max. Min. Max. Min. Max. Min. Min. <th< td=""><td>Typ. Min. Max. Min. Max. Min. 2.23 2.54 1.27 8.62 9.</td><td>Typ. Min. Max. Min. Max. Min. Max. Min. 2.23 2.54 1.27 8.</td></th<>	Typ. Min. Max. Min. Max. Min. 2.23 2.54 1.27 8.62 9.	Typ. Min. Max. Min. Max. Min. Max. Min. 2.23 2.54 1.27 8.

- All dimensions are in millimetres.
 For ØA refer to Para. 4.5.3.3 of this specification.
 Øg: 2-56-UNC-2B.
 Maximum torque 0.44Nm.



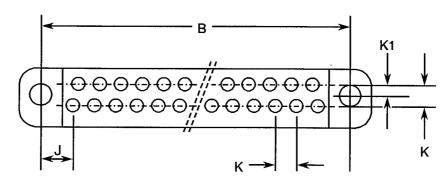
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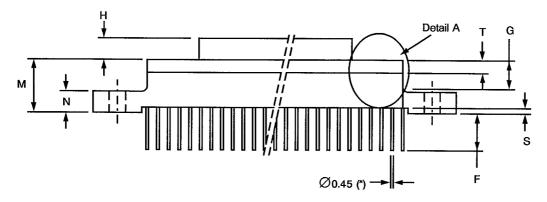
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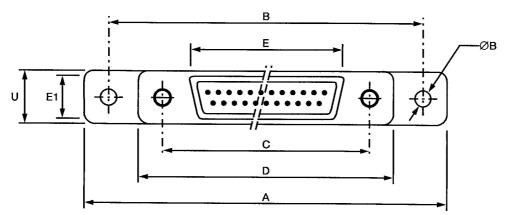
FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.2H - CONNECTORS TYPE -FR139

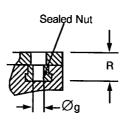
RECEPTACLE FEMALE CONTACTS







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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.2H - CONNECTOR TYPE - FR139 (CONTINUED)

RECEPTACLE FEMALE CONTACTS (CONTINUED)

ᅩ	Тур.	2.54	2.54	2.54	2.54	2.54	2.54
7	Typ.	9.53	5.72	5.72	3.81	3.81	3.81
ェ	Мах.	5.05	5.05	5.05	5.05	5.05	5.05
Ø	Min.	4.6	4.6	4.6	4.6	4.6	4.6
11.1	Max.	4.85	4.85	4.85	4.85	4.85	4.85
	Min.	4.15	4.15	4.15	4.15	4.15	4.15
피	Max.	6.38	6.38	6.38	6.38	6.38	6.38
шІ	Max.	10.16	13.97	17.78	20.32	24.13	27.94
۵۱	Max.	19.94	23.35	27.56	30.10	33.91	37.72
O	Max.	14.48	18.29	22.1	24.64	28.45	32.26
0	Min.	14.22	18.03	21.84	24.38	28.19	32.0
ØB (4)	Мах.	2.59	2.59	2.59	2.59	2.59	2.59
ØB	Min.	2.31	2.31	2.31	2.31	2.31	2.31
B	Max.	29.39	29.39	37.01	38.28	45.9	53.52
Ш	Min.	29.03	29.03	36.65	37.92	45.54	53.16
A	Max.	35.31	35.31	42.93	44.2	51.82	59.44
Shell	Size	တ	15	21	22	31	37

	2	×	ZI		R	3	S	<u>-</u>		n
Min. Max.	Мах.		Min.	Max.	Min.	Min.	Max.	Min.	Max.	Мах.
	9.05		4.0	4.2	4.6	6.0	1.1	2.23	2.49	7.82
	9.05		4.0	4.2	4.6	0.9	1:1	2.23	2.49	7.82
8.62 9.02	9.02		4.0	4.2	4.6	0.9	1.1	2.23	2.49	7.82
	9.05		4.0	4.2	4.6	6.0	1.1	2.23	2.49	7.82
8.62 9.02	9.05		4.0	4.2	4.6	6.0	1.1	2.23	2.49	7.82
8.62 9.02	9.05		4.0	4.2	4.6	0.9	1.1	2.23	2.49	7.82

- All dimensions are in millimetres.
 For ØA refer to Para. 4.5.3.3 of this specification.
 Øg: 2-56-UNC-2B.
 Maximum torque 0.44Nm.



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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.3 - CONTACT POSITION

Figure 2.3.1 - Mounting Condition

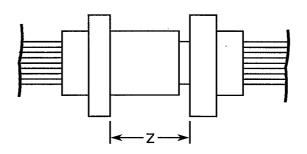


Figure 2.3.2 - Plug Male Contact

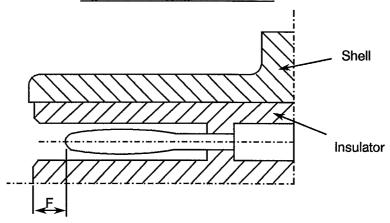
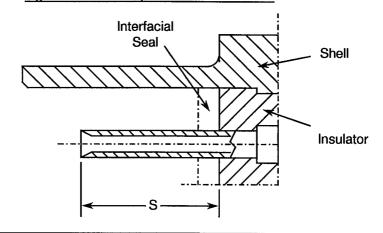


Figure 2.3.3 - Receptacle Female Contact



ĺ	=		3	Z
Min.	Max.	Min.	Max.	Мах.
0.25	0.91	3.30	3.66	5.49

NOTES

1. All dimensions are in millimetres.

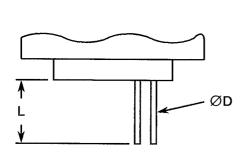


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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2-4 - UNINSULATED SOLID WIRES

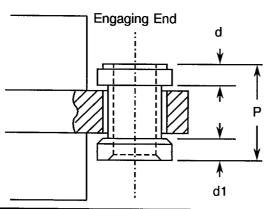


Wire Size (AWG)	25
Max. Diameter 'D' (mm)	0.46
Min. Diameter 'D' (mm)	0.45
Min. Gold Plating Thickness (μm)	0.5
Max. Weight (g/m)	1.6
Min. Length 'L'	See Para. 4.5.3.3

FIGURE 2-5 INSULATED WIRES

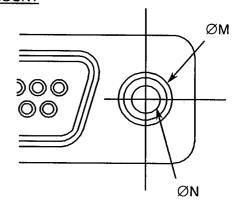
Wire Size AWG		26	28
Conductor Characteristics	Maximum diameter (mm)	0.50	0.42
Onaracteristics	Nominal cross-section (mm²)	0.14	0.10
	Maximum diameter (mm)	0.89	0.82
Wire Characteristics	Maximum weight (g/m)	2.3	1.8
Orial acteristics	Colour	Natural	Natural
	Minimum Length	See Para	a. 4.5.3.3

FIGURE 2-6 - FLOATING MOUNT



Р Мах.	d	d1	ØM Max.	ØN Min.
4.70	1.0	0.8	4.0	2.26

- 1. All dimensions are in millimetres.
- 2. Total Lateral Float 0.4 typical.
- 3. Total Axial Float 0.4 typical.



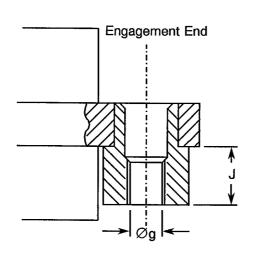


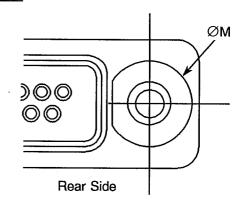
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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.7 - CAPTIVE NUT





Øg	J Max.	ØM Max.
Note 2	2.60	5.1

- 1. All dimensions are in millimetres.
- 2. \varnothing g: 2-56 UNC 2B, Maximum Torque 0.44Nm.

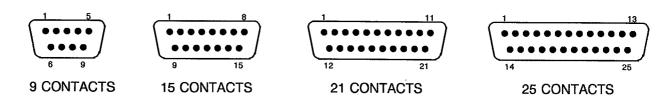


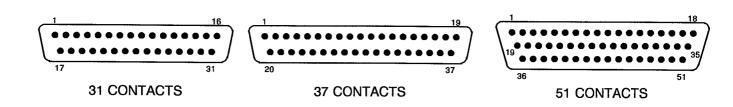
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FIGURE 3 - CONTACT ARRANGEMENTS

FRONT VIEW OF MALE INSERT - USE MIRROR VIEW FOR FEMALE INSERT

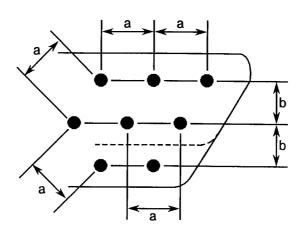




NOTES

 Only the outside contact cavities on each row are identified in the drawing, the remainder follow sequentially. Contact numbers are shown outside the insert for readability.

Contact Centres



- 1. a = Distance between contact centres: 1.27mm typical.
- 2. b = Distance between rows: 1.09mm typical.



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4. **REQUIREMENTS**

4.1 GENERAL

The complete requirements for procurement of the connectors specified herein are stated in this specification and ESA/SCC Generic Specification No. 3401. Deviations from the Generic Specification, applicable to this specification only, are listed in Para. 4.2.

Deviations from the applicable Generic Specification and this Detail Specification, formally agreed with specific Manufacturers on the basis that the alternative requirements are equivalent to the ESA/SCC requirements and do not affect the components' reliability, are listed in the appendices attached to this specification.

4.2 <u>DEVIATIONS FROM GENERIC SPECIFICATION</u>

4.2.1 <u>Deviations from Special In-process Controls</u>

Para. 9.15, Joint Strength: The contacts shall be crimped to insulated stranded wire AWG26 and AWG28, and to uninsulated solid wire AWG25. The value of failure shall be recorded together with the information as to whether the failure was "pull-out", "break in crimp" or "break in wire". The minimum tensile strength shall be as follows:

WIRE	N	/ALE AND FI	EMALE CONTACTS
VVIEL	AWG26	AWG28	AWG25 - Solid Uninsulated
Tensile Strength (N)	22	13	22

4.2.2 <u>Deviations from Final Production Tests (Chart II)</u>

- (a) Para. 9.4, Contact Capability: This test shall be performed on the male contacts. For details see Para. 4.3.3 of this specification.
- (b) Para. 9.5, Magnetism Level: Not applicable.

4.2.3 <u>Deviations from Burn-in and Electrical Measurements (Chart III)</u>

None.

4.2.4 Deviations from Qualification Tests (Chart IV)

- (a) Para. 9.15, Joint Strength: Not applicable.
- (b) Para. 9.17, Contact Retention (In insert): Not applicable with male contact.
- (c) Para. 9.27, Maintenance Ageing: Not applicable.
- (d) Para. 9.29, Oversize Pin Exclusion: Not applicable.
- (e) Para. 9.30, Probe Damage: Not applicable.

4.2.5 <u>Deviations from Lot Acceptance Tests (Chart V)</u>

- (a) Para. 9.15, Joint Strength: Not applicable.
- (b) Para. 9.17, Contact Retention (In insert): Not applicable with male contact.
- (c) Para. 9.27, Maintenance Ageing: Not applicable.
- (d) Para. 9.29, Oversize Pin Exclusion: Not applicable.
- (e) Para. 9.30, Probe Damage: Not applicable.



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4.3 MECHANICAL REQUIREMENTS

4.3.1 <u>Dimension Check</u>

The dimensions of the connectors specified herein shall be verified in accordance with the requirements set out in Para. 9.6 of ESA/SCC Generic Specification No. 3401 and shall conform to those shown in Figure 2 of this specification. Only the underlined dimensions shall be checked during procurement.

4.3.2 Weight

The maximum weight of the connectors specified herein shall be calculated on the basis of, and be in accordance with the values given in Table 1(a) and in Figures 2-4 and 2-5 of this specification.

4.3.3 Contact Capability

For the purpose of this test, the pick-up and drop weights shall be as follows.

MEASUREMEINTS	PICK-UP WEIGHT	DROP WEIGHT
Weight (g)	14	170
Inner Gauge Diameter (mm) (1)	0.582 - 0.587	0.559 - 0.564
Insertion Depth (mm)	1.5	1.5

NOTES

1. See Figure 4 for ØA.

4.3.4 Contact Retention (In insert)

Contact retention within the insert shall be 22.25 Newtons. There shall be no displacement of the contact. Not applicable to male contacts.

4.3.5 Mating and Unmating Forces

The forces applied for the mating and unmating of the connectors shall conform to the values specified in Table 1(a).

4.3.6 <u>Insert Retention (In shell)</u>

Connector inserts shall withstand a pressure of 34.4N/cm² applied from the mating side to the rear side.

4.3.7 <u>Jackscrew Retent on</u>

Not applicable.

4.3.8 <u>Contact Insertion and Withdrawal Forces</u>

Not applicable.

4.3.9 Engagement and Separation Forces (Male Contacts)

The contact engagement and separation forces of the male contacts shall be tested to a depth of 1.5mm with the applicable test gauge fixtures specified in Figure 4 of this specification, and shall not exceed the values of the table hereunder.

MEASUREMENTS	INNER DIAM	IETER (mm)	SEPARATION FORCE	ENGAGEMENT FORCE
WILAGOTTLIVILITY	Min.	Max.	Min. (N)	Max. (N)
Max. Gauge Fixture	0.559	0.564	-	1.667
Min. Gauge Fixture	0.582	0.587	0.137	-



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4.3.10 Oversize Pin Exclusion

Not applicable.

4.3.11 Probe Damage

Not applicable.

4.3.12 Solderability

Not applicable.

4.4 <u>MATERIALS AND FINISHES</u>

The materials and finishes shall be as specified herein. Where a definite material is not specified, a material which will enable the connectors specified herein to meet the performance requirements of this specification shall be used. Acceptance or approval of any constituent material does not guarantee acceptance of the finished product.

4.4.1 Shells

Shells shall be made of aluminium alloy. The plating shall be 25.4µm minimum of electroless nickel (Variant 01) or with a minimum thickness of 2.54µm of gold over an electroless nickel underlay (Variant 02).

4.4.2 Inserts

Inserts shall be made of glass fibre-filled diallylphtalate resin or suitable thermoplastic material.

4.4.3 Contacts

4.4.3.1 Female Contacts

The contact body shall be made of copper alloy with an underplate of $1.0\mu m$ minimum of copper to MIL-C-14550, gold plated with $1.27\mu m$ minimum of gold, Type 2, Grade C of MIL-G-45204. Measurement of thickness shall be performed at a distance of 1.5mm from the engagement end.

4.4.3.2 Male Contacts

The contact body and the bundle shall be made of copper alloy with an underplate of $1.0\mu m$ minimum of copper to MIL-C-14550, gold plated with 1.27 μm minimum of gold, Type 2, Grade C of MIL-G-45204. Measurement of thickness shall be performed at a distance of 1.5mm from the engagement end.

4.4.4 Seals Interfacial

Interfacial seals shall be made of silicon base rubber.

4.4.5 <u>Insulated Wires</u>

Wire materials and finishes shall be in accordance with the requirements specified in Para. 4.4 of ESA/SCC Detail Specification No. 3901/013.

4.4.6 Uninsulated Solid Wire

Uninsulated solid wires shall be made of copper alloy in accordance with Type 'S' as specified in QQ-W-343. They shall be gold-plated in accordance with Class $\varnothing\varnothing$, Grade C or D, as specified in MIL-G-45204.

4.4.7 Rear Potting

Rear potting shall be made of epoxy resin. For connectors Type FR136, Type FR136A and Type FR139, the rear container shall be made from glass-fibre filled diallyphthalate resin.



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4.5 MARKING

4.5.1 General

The marking of all components delivered to this specification shall be in accordance with the requirements of ESA/SCC Basic Specification No. 21700 and the following paragraphs. Each component shall be marked in respect of:-

- (a) The SCC Component Number.
- (b) Characteristics.
- (c) Traceability Information.

4.5.2 The SCC Component Number

Each component shall bear the SCC Component Number which shall be constituted and marked as follows:
340102901B

	
Detail Specification Number	
Type Variant (see Table 1(a))	
Testing Level	

N.B.

Marking of the Type Variant is mandatory. No further reference to type variant is made in this specification.

4.5.3 Characteristics

The characteristics to be marked in the following order of precedence are:-

- (a) Shell Size.
- (b) Contact Type.
- (c) Termination Type.
- (d) Mounting.

The information shall be constituted and marked as for	follows:- 51PFR112	2F
	TIT	T
Shell size ————————		
Contact type —		
Termination type		
Mounting ————————————————————————————————————		

4.5.3.1 Shell Size

Shell size shall be designated by the number of contacts.

Specified numbers are: 9, 15, 21, 25, 31, 37 and 51.

4.5.3.2 Contact Type

Contact types shall be indicated by the following code letters.

Code Letter	Contact Type
Р	Male
S	Female



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4.5.3.3 Termination Type

Termination codes define the length of insulate wire or uninsulated wire according to Figures 2-1 to 2-5 as follows:-

CODE	TYPE	MIN. LENGTH (mm)
FR112	AWG 26 Wire	508
FR113	AWG 26 Wire	914
FR114	AWG 28 Wire	508
FR115	AWG 28 Wire	914
FR116	UNINSULATED WIRE	25.4
FR123	AWG 26 Wire	4000
FR136 FR136A	90° mounting on P.C.B.	-
FR139	Straight mounting on P.C.B.	-

4.5.3.4 Mounting

The letter "E" indicates a captive nut.

The letter "F" shall indicate a floating mount.

If the shell has fixed mounting holes, these letters shall be omitted.

4.5.4 <u>Traceability Information</u>

Traceability information shall be marked in accordance with the requirements of ESA/SCC Basic Specification No. 21700.

4.6 <u>ELECTRICAL MEASUREMENTS</u>

4.6.1 <u>Electrical Measurements at Room Temperature</u>

The parameters to be measured in respect of electrical characteristics are scheduled in Table 2. Unless otherwise specified, the measurements shall be performed at $T_{amb} = +22\pm3$ °C.

4.6.2 <u>Electrical Measurements at High and Low Temperatures</u>

Not applicable.

4.6.3 <u>Circuits for Electrical Measurements (Figure 4)</u>

Not applicable.

4.7 BURN-IN AND ELECTRICAL MEASUREMENTS (TABLES 4 AND 5)

Not applicable.



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TABLE 2 - ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE

No.	Characteristic	Symbol	ESA/SCC 3401	Test Condition	Limits		Lloit
	Characteristic	Cymbol	Test Method	nod Test Condition		Max.	Unit
1	Insulation Resistance	Ri	Para. 9.1.1.1	Para. 9.1.1.1	5 000	-	МΩ
2	Voltage Proof Leakage Current	lι	Para. 9.1.1.2	600 Vrms	-	2.0	mA
3	Mated Shell Conductivity (Voltage Drop) (1)	Vd	Para. 9.1.1.4	Para. 9.1.1.4	Not applicable		mV
4	Contact Resistance (Low Level Current)	Rcl max.	Para. 9.1.1.3	Para. 9.1.1.3	<u>-</u>	6.0	mΩ
5	Contact Resistance (Rated Current)	Rcr max.	Para. 9.1.1.3	Table 1(b)	-	5.0	mΩ

NOTES

1. Applicable to mated connectors with grounding option.

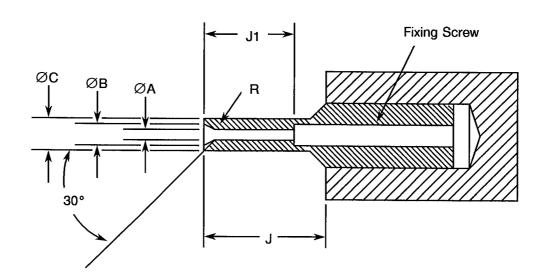
TABLES 3, 4 AND 5

Not applicable

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FIGURE 4 - GAUGE FIXTURE



MAXIMUM GAUGE

W	REMARKS				
	MIN. MAX.				
ØA	0.559	0.564	-		
ØB	0.749	0.775	-		
ØC	0.813	0.825	-		
J	4.0	-	-		
J1	3.13	3.23	-		
R	0.381	0.483	Note 1		

MINIMUM GAUGE

V	WEIGHT (g) 14 MIN. MAX.				
ØA	0.582	0.587	-		
ØB	0.749	0.775	-		
ØC	0.813	0.825	-		
J	4.0	-	-		
J1	3.13	3.23	1		
R	0.381	0.483	Note 1		

NOTES

- 1. Radius 'R', must be tangent to entry chamfer and $\emptyset A$.
- 2. \emptyset A and entry chamfer must be polished to $\frac{N8}{}$.



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4.8 <u>ENVIRONMENTAL AND ENDURANCE TESTS (CHARTS IV AND V OF ESA/SCC GENERIC SPECIFICATION NO. 3401)</u>

4.8.1 <u>Measurements and Inspections on Completion of Environmental Tests</u>

The parameters to be measured and inspections to be performed on completion of environmental testing shall be those specified in Table 6. Unless otherwise specified, these measurements shall be performed at T_{amb} = +22 ± 3 °C.

4.8.2 <u>Measurements and Inspections at Intermediate Points during Endurance Tests</u>

Not applicable.

4.8.3 <u>Measurement and Inspections on Completion of Endurance Tests</u>

The parameters to be measured and inspections to be performed on completion of endurance testing shall be those specified in Table 6. Unless otherwise specified, these measurements shall be performed at $T_{amb} = +22 \pm 3$ °C.

4.8.4 Conditions for Operating Life Tests (Part of Endurance Testing)

Not applicable.

4.8.5 <u>Electrical Circuits for Operating Life Tests (Figure 5)</u>

Not applicable.

4.8.6 Conditions for High Temperature Storage Test (Part of Endurance Testing)

The requirements for the high temperature storage test are specified in Section 9 of ESA/SCC Generic Specification No. 3401. The temperature to be applied shall be the maximum storage temperature specified in Table 1(b) of this specification.



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TABLE 6 - MEASUREMENTS AND INSPECTIONS ON COMPLETION OF ENVIRONMENTAL AND ENDURANCE TESTING

	ESA/SCC GENERIC S	SPEC. NO. 3401	MEASUREMENTS ANI	D INSPECTIONS		LIN	NITS	
No.	ENVIRONMENTAL AND ENDURANCE TESTS (1)	TEST METHOD AND CONDITIONS	IDENTIFICATION	CONDITIONS	SYMBOL	MIN.	MAX.	UNIT
01	Seal Test	Para. 9.9	ESA/SCC 3401 Para. 9.9	_	-	Not ap	plicable	-
02	Wiring	Para. 9.10 and Table 1(a) of this spec.	Low Level Contact Resistance	Table 2 Item 4	Rcl	Table 2	2, Item 4	-
03	Vibration	Para. 9.11	Initial Measurements Coupling screw(s) Unlocking Torque Final Measurements Full Engagement Coupling screw(s) Unlocking Torque Drift Visual Examination	-	- Δτqe/Tqe		cord lues - + 25	- %
04	Shock or Bump	Para. 9.12	Full Engagement Visual Examination	-	-	-	-	-
05	Climatic Sequence	Para. 9.13	Dry Heat Insulation Resistance Low Air Pressure Voltage Proof Leakage Current Damp Heat Insulation Resistance Final Measurements External Visual Inspection Insulation Resistance Voltage Proof Leakage Current	Immediately after test Table 2, Item 1 After 1-24 hrs Recovery ESA/SCC 3401 Para. 9.7 Table 2, Item 1		9.1 100 ESA/S0 Para Table 2	- 3.5 - CC 3401 a. 9.7 c, Item 1	мΩ
06	Plating Thickness	Para. 9.14	Thickness	-	-		4.4.3 spec.	
07	Joint Strength (N/A to solder contacts)	Para. 9.15	ESA/SCC 3401 Para. 9.15	-	-	Not ap	plicable	-
08	Rapid Change of Temperature	Para. 9.16	Visual Examination Insulation Resistance Voltage Proof Leakage Current	- Table 2, Item 1 Table 2, Item 2	- Ri I _L		- 2, Item 1 2, Item 2	-
09	Contact Retention (In Insert)	Para. 9.17 & Para. 4.3.4 of this spec.	Contact Displacement	-	-		CC 3401 9.17	-
10	Endurance		Initial Measurements Mating/Unmating Forces Low Level Contact Resistance Mated Shell Conductivity Final Measurements Visual Examination Mating/Unmating Forces Low Level Contact Drift Resistance Mated Shell Conductivity Insulation Resistance Voltage Proof Leakage Current	Table 2, Item 4 Table 2, Item 3 Table 2, Item 4 Table 2, Item 5 Table 2, Item 3 Table 2, Item 1 Table 2, Item 2	F Rcl Vd - F ∆Rcl Vd Ri I _L	this: Record Not ap Para. of this Not ap Not ap Table 2	I.3.5 of spec. Values plicable - 4.3.5 spec. 3.0 plicable , Item 1	- mΩ

NOTES

1. The tests in this table refer to either Chart IV or V and shall be used as applicable.



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TABLE 6 - MEASUREMENTS AND INSPECTIONS ON COMPLETION OF ENVIRONMENTAL AND ENDURANCE TESTING (CONTINUED)

	ESA/SCC GENERIC S	SPEC. NO. 3401	MEASUREMENTS AN	D INSPECTIONS		LIN	/ITS	
No.	ENVIRONMENTAL AND ENDURANCE TESTS (1)	TEST METHOD AND CONDITIONS	IDENTIFICATION	CONDITIONS	SYMBOL	MIN.	MAX.	UNIT
11	Permanence of Marking	Para. 9.19	<u>-</u>	-	-	-	-	-
12	Mating/Unmating Forces	Para. 9.20	Force	-	F		4.3.5 of spec.	-
13	High Temperature Storage	Para. 9.21	Initial Measurements Low Level Contact Resistance Mated Shell Conductivity Final Measurements Visual Examination	Table 2 Item 4	Rcl Vd -		d Values oplicable	-
			Mating/Unmating Forces	-	F		4.3.5 of	
			Low Level Contact Resistance Drift	Table 2 Item 4	Δ Rcl	this -	spec. 3.0	Ω^{m}
			Rated Current Contact Resis. Mated Shell Conductivity Insulation Resistance Voltage Proof Leakage Current Contact Retention (In insert)	Table 2 Item 5 Table 2 Item 3 Table 2 Item 1 Table 2 Item 2 Para. 4.3.4 of this spec.	Rcr Vd Ri I _L	Not ap Table 2 Table 2 ESA/S0	2, Item 5 plicable 2, Item 1 2, Item 2 CC 3401 . 9.17	
14	Corrosion	Para. 9.22	Visual Examination	_	-	-	-	_
15	Insert Retention (In Shell)	Para. 9.23 & Para. 4.3.6 of this spec.	Visual Examination	-	-		4.3.6 s spec.	-
16	Jackscrew Retention	Para. 9.24 and Para. 4.2.7 of this spec.	Visual Examination	-	<u>-</u>	Not ap	plicable	-
17	High Temperature Measurements	Para. 9.25	Insulation Resistance	Table 2 Item 1	Ri	5000	-	мΩ
18	Overload Test		Internal Temperature Rated Current Contact Resis. Mated Shell Conductivity Insulation Resistance Voltage Proof Leakage Current	- Table 2 Item 5 Table 2 Item 3 Table 2 Item 1 Table 2 Item 2	T Rcr Vd Ri I _L	Not ap Table 2	+ 100 2, Item 5 plicable 2, Item 1 2, Item 2	°C
19	Maintenance Ageing	-	Visual Examination Contact Retention (In insert)	Para. 4.3.4 of this spec.	-	Not ap	plicable	-
20	Engage/Separation Forces	Para. 9.28 & Para. 4.3.9 of this spec.	Force	-	F		4.3.9 spec.	-
21	Oversize Pin Exclusion	Para. 9.29 and Para. 4.3.10 of this spec.	-	-	-	Not ap	plicable	-
22	Probe Damage	Para. 9.30 and Para. 4.3.11 of this spec.	Contact Separation Force	-	F	Not ap	plicable	~
23	Solderability	Para. 9.31 & Para. 4.3.12 of this spec.	-	-	-	Not ap	plicable	-

NOTES

1. The tests in this table refer to either Chart IV or V and shall be used as applicable.



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CONNECTORS, ELECTRICAL, SINGLE-IN-LINE, MICROMINIATURE,

BASED ON TYPE MTB 1

ESA/SCC Detail Specification No. 3401/031



space components coordination group

		Approved by		
Issue/Rev.	Date	SCCG Chairman	ESA Director General or his Deputy	
Issue 2	September 2002	91.360 _x	Am	



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ISSUE 2

DOCUMENTATION CHANGE NOTICE

			ENTATION CHANGE NOTICE	
Rev.	Rev.		CHANGE	Approved
Letter	Date	Reference	Item	DCR No.
			Issue 1 and incorporates all modifications defined in	
			and 'D' to Issue 1 and the changes agreed in the	
		following DCRs:-		
		Cover nage	÷	None
		Cover page DCN		None
		Para. 1.1	: Second document deleted	221664
		Para. 1.:2	: Title amended and text rearranged and amended	221664
		Para. 1.3	: In the text, Table reference amended to "1(d)"	221664
		Para. 2	: Items (b), (e) and (f) deleted, Item (c) renumbered	221664
		i ara. Z	as (b), Item (g) renumbered as (c) and new Item	221004
			(e) added	
		Table 1(a)	: New Table added	221664
		Table 1(b)	: New Table added	221664
		Table 1(c)	: New Table added	221664/
		(0)		23960
		Table 1	: Renumbered as Table 1(d) and expanded	221664
		Figure 1	: Existing Figure amended and Title added	221664
		Figure 1(b)	: New Figure added	221664
		Figure 2-1	: Split into separate drawings for Plug and	221664
			Receptacle	
		Figure 2-3	: Minimum length paragraph reference amended	23960
		Figure 2-4	: New Figure added	221664
		Figure 2-5	: New Figure added	221664
		Para. 4.2.1	: Deviation added	221664
		Para. 4.2.2	: Existing text deleted and deviations (a) to (d) added	221664
		Para. 4.:2.4	: Existing text deleted and deviations (a) to (h) added	221664
		Para. 4.2.5	: "None" deleted and deviations (a) to (h) added	221664
		Para. 4.3.1	: Text amended	221664
		Para. 4.3.2	: Existing text deleted and new text added	221664
		Para. 4.3.3	: Existing text deleted and new text added	221664
		Para. 4.3.4	: Title expanded and text amended	221664
		Para. 4.3.5	: New paragraph added	221664/
			÷	23960
		Paras. 4.3.6 to 4.3.8	: New paragraphs added	221664
		Paras. 4.3.9	: New paragraph added	221664/
				23960
		Paras. 4.3.10 to 4.3.13	: New paragraphs added	221664
		Para. 4.4.1	: Title and text amended	221664
		Para. 4.4.2	 New paragraph added and existing paragraph renumbered as "4.4.3" 	221664
		Para. 4.4.3	: Renumbered as "4.4.5"	221664
		Para. 4.4.4	: New paragraph added and existing paragrpah	221664
		Dave 4.17	renumbered as "4.4.6"	
		Para. 4.4.7	: New paragraph added	221664
		Para. 4.5.1	: Text amended	221664
		Para. 4.5.2	: New paragraph added. Existing paragraph	221664/
			renumbered as "4.5.3", "Type Variant" amended and Note deleted.	23960
	<u> </u>		and note deleted.	L



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ISSUE 2

	DOCUMENTATION CHANGE NOTICE (CONTINUED)				
Rev. Letter	Rev. Date	Reference	CHANGE Item	Approved DCR No.	
		Para. 4.5.3 Para. 4.5.4 Para. 4.7 Table 2 Figure 3 Para. 4.8.3 Para. 4.8.6 Table 6	: Renumbered as "4.5.4" : First sub-paragraph amended : Last sub-paragraph amended : Renumbered as "4.5.5" : Title amended : Table expanded : Figure added : Text amended : Second sentence amended : Table rewritten	221664 221664 221664 221664 221664 221664 221664 221664/ 23960	



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4	Not Applicable	N/A
5	Not Applicable	N/A

APPENDICES (Applicable to specific Manufacturers only) None.



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1. GENERAL

1.1 SCOPE

This specification details the ratings, physical and electrical characteristics, test and inspection data for Connectors, Electrical, Single-in-Line, Microminiature, based on Type MTB 1, with non-removable crimp-type contacts and their associated insulated wires and uninsulated solid wires.

It shall be read in conjunction with:

(a) ESA/SCC Generic Specification No. 3401 for Connectors, Electrical, Non-filtered, Circular and Rectangular,

the requirements of which are supplemented herein.

1.2 <u>COMPONENT TYPE VARIANTS / RANGE OF COMPONENTS</u>

The single-in-line connectors specified herein are scheduled in Table 1(a). Alignment is effected by 2 guide posts; the posts are located at either end of the receptacle.

1.2.1 Shell sizes for Variant 01

These range from 5 to 81. Since 4 cavities are used (2 guide posts and 2 epoxy-filled cavities at either end) the number of available contact positions ranges from 1 to 77.

1.2.2 Shell sizes for Variant 02

These range from 6 to 81. Since 5 cavities are used (2 guide posts and 2 epoxy-filled cavities at either end plus 1 cavity for latching) the number of available contact positions ranges from 1 to 76.

Polarisation may be achieved by means of additional guide posts (according to Customer requirements). The different sizes of associated insulated wires and uninsulated solid wires are given in Figure 2. For bodies with more than 41 cavities, additional back-potting is necessary.

1.3 MAXIMUM RATINGS

The maximum ratings, which shall not be exceeded at any time during use or storage, applicable to the connectors specified herein, are scheduled in Table 1(d).

1.4 PARAMETER DERATING INFORMATION

The applicable derating information for the contacts specified herein is shown in Figure 1(a).

1.5 PHYSICAL DIMENSIONS

The physical dimensions of the connectors, insulated wires and uninsulated solid wires specified herein are shown in Figure 2.

2. APPLICABLE DOCUMENTS

The following documents form part of this specification and shall be read in conjunction with it:-

- (a) ESA/SCC Generic Specification No. 3401, Connectors, Electrical, Non-filtered, Circular and Rectangular.
- (b) ESA/SCC Detail Specification No. 3901/013, PTFE Insulated Wires and Cables, 600V -100 to +200 °C.
- (c) QQ-W-343, Wires, Electrical, Uninsulated.
- (d) MIL-G-45204, Gold-plating, Electro-deposited.
- (e) MIL-C-14550, Copper-plating, Electro-deposited.



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TABLE 1(a) - TYPE VARIANTS

VARIANT	LATCHING OPTION
01	Without latching
02	With latching

TABLE 1(b) - MAXIMUM WEIGHTS

DESCRIPTION	WEIGHT (g)	
Control	Male	0.02
Contact	Female	0.02
Body (per contact cavity)	Plug	0.21
Body (per contact cavity)	Receptacle	0.006
Guide Post, Stainless Steel (2 per connector)	-	0.035
Wire	Figures 2.	2 and 2.3

TABLE 1(c) - MATING AND UNMATING FORCES

DESCRIPTION	МАТ	TING	UNMA	ATING
	MIN.	MAX.	MIN.	MAX.
Per contact	-	2.2N	0.14N	2.2N

TABLE 1(d) - MAXIMUM RATINGS

No.	CHARACTERISTICS	SYMBOL	MAXIMUM RATING	UNIT
1	Working Voltage (Sea Level)	U _R	150	Vrms
2	Rated Current (AWG26 and Uninsulated Solid Wire)	I _R	2.5	А
3	Rated Current (AWG28)	I _R	1.5	A.
4	Operating Temperature Range	T _{op}	-55 to +125	°C
5	Storage Temperature Range	T _{stg}	-55 to +125	°C



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FIGURE 1 - PARAMETER DERATING INFORMATION

FIGURE 1(a) - WORKING VOLTAGE VERSUS ALTITUDE

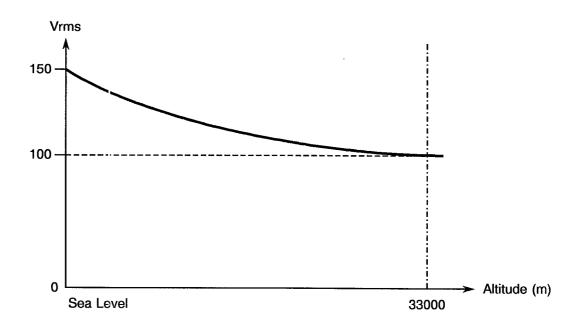


FIGURE 1(b) - MAXIMUM CURRENT VERSUS NUMBER OF CONTACTS

	MAXIMUM CURRENT PER CONTACT						
NUMBER OF CONTACTS	WIRE	SIZE					
PER CONNECTOR	AWG26 AND UNINSULATED SOLID WIRE	AWG28					
2-4	2.0	1.4					
5-14	1.8	1.2					
15 and over	1.4	0.9					

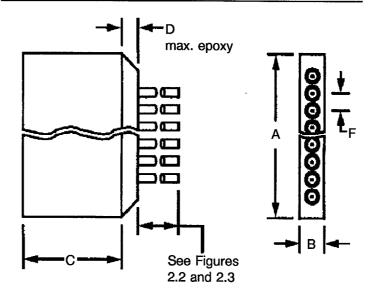


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FIGURE 2 - PHYSICAL DIMENSIONS

FIGURE 2.1(a) - CONNECTORS PLUG - MALE CONTACTS



Chall Ci-a		<u> </u>	E	3	()	D	F
Shell Size	Min.	Max.	Min.	Max.	Min.	Max.	Max.	Typical
5	6.47	7.23	1.9	2.16	7.06	7.32	3.18	1.27
6	7.75	8.51	1.9	2.16	7.06	7.32	3.18	1.27
7	9.02	9.78	1.9	2.16	7.06	7.32	3.18	1.27
8	10.29	11.05	1.9	2.16	7.06	7.32	3.18	1.27
9	11.56	12.32	1.9	2.16	7.06	7.32	3.18	1.27
10	12.82	13.58	1.9	2.16	7.06	7.32	3.18	1.27
11	14.10	14.86	1.9	2.16	7.06	7.32	3.18	1.27
12	15.37	16.13	1.9	2.16	7.06	7.32	3.18	1.27
13	16.64	17.40	1.9	2.16	7.06	7.32	3.18	1.27
14	17.91	18.67	1.9	2.16	7.06	7.32	3.18	1.27
15	19.18	20.04	1.9	2.16	7.06	7.32	3.18	1.27
16	20.45	21.21	1.9	2.16	7.06	7.32	3.18	1.27
17	21.72	22.48	1.9	2.16	7.06	7.32	3.18	1.27
18	22.99	23.75	1.9	2.16	7.06	7.32	3.18	1.27
19	24.26	25.02	1.9	2.16	7.06	7.32	3.18	1.27
20	25.53	26.29	1.9	2.16	7.06	7.32	3.18	1.27
21	26.8	27.56	1.9	2.16	7.06	7.32	3.18	1.27
22	28.07	28.83	1.9	2.16	7.06	7.32	3.18	1.27
23	29.34	30.10	1.9	2.16	7.06	7.32	3.18	1.27
24	30.61	31.47	1.9	2.16	7.06	7.32	3.18	1.27
25	31.88	32.64	1.9	2.16	7.06	7.32	3.18	1.27

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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.1(a) - CONNECTORS PLUG - MALE CONTACTS (CONTINUED)

O1# O1	į	7	E	3	()	D	F
Shell Size	Min.	Max.	Min.	Max.	Min.	Max.	Max.	Typical
26	33.15	33.91	1.9	2.16	7.06	7.32	3.18	1.27
27	34.42	35.18	1.9	2.16	7.06	7.32	3.18	1.27
28	35.69	46.45	1.9	2.16	7.06	7.32	3.18	1.27
29	36.96	37.72	1.9	2.16	7.06	7.32	3.18	1.27
30	38.23	38.99	1.9	2.16	7.06	7.32	3.18	1.27
31	39 5	40.26	1.9	2.16	7.06	7.32	3.18	1.27
32	40.77	41.53	1.9	2.16	7.06	7.32	3.18	1.27
33	42.04	42.8	1.9	2.16	7.06	7.32	3.18	1.27
34	43.31	44.07	1.9	2.16	7.06	7.32	3.18	1.27
35	44.58	45.34	1.9	2.16	7.06	7.32	3.18	1.27
36	45.85	46.61	1.9	2.16	7.06	7.32	3.18	1.27
37	47.12	47.88	1.9	2.16	7.06	7.32	3.18	1.27
38	48.39	49.15	1.9	2.16	7.06	7.32	3.18	1.27
39	49.66	50.42	1.9	2.16	7.06	7.32	3.18	1.27
40	50.93	51.69	1.9	2.16	7.06	7.32	3.18	1.27
41	52.2	52.96	1.9	2.16	7.06	7.32	3.18	1.27
42	53.47	54.23	1.9	2.16	7.06	7.32	3.18	1.27
43	54.74	55.5	1.9	2.16	7.06	7.32	3.18	1.27
44	56.01	56.77	1.9	2.16	7.06	7.32	3.18	1.27
45	57.28	58.04	1.9	2.16	7.06	7.32	3.18	1.27
46	58.55	59.31	1.9	2.16	7.06	7.32	3.18	1.27
47	59.82	60.58	1.9	2.16	7.06	7.32	3.18	1.27
48	61.09	61.85	1.9	2.16	7.06	7.32	3.18	1.27
49	62.36	63.12	1.9	2.16	7.06	7.32	3.18	1.27
50	63.63	64.39	1.9	2.16	7.06	7.32	3.18	1.27
51	64.9	65.66	1.9	2.16	7.06	7.32	3.18	1.27
52	66.13	66.89	1.9	2.16	7.06	7.32	3.18	1.27
53	67.44	68.2	1.9	2.16	7.06	7.32	3.18	1.27
54	68.71	69.47	1.9	2.16	7.06	7.32	3.18	1.27
55	69.98	70.74	1.9	2.16	7.06	7.32	3.18	1.27
56	71.25	72.01	1.9	2.16	7.06	7.32	3.18	1.27
57	72.52	73.28	1.9	2.16	7.06	7.32	3.18	1.27
58	73.79	74.54	1.9	2.16	7.06	7.32	3.18	1.27
59	75.06	75.82	1.9	2.16	7.06	7.32	3.18	1.27
60	76.33	77.09	1.9	2.16	7.06	7.32	3.18	1.27
61	76.6	78.36	1.9	2.16	7.06	7.32	3.18	1.27
62	78.87	79.53	1.9	2.16	7.06	7.32	3.18	1.27
63	80.14	80.9	1.9	2.16	7.06	7.32	3.18	1.27
64	81.41	82.37	1.9	2.16	7.06	7.32	3.18	1.27
65	82.68	83.44	1.9	2.16	7.06	7.32	3.18	1.27

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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.1(a) - CONNECTORS PLUG - MALE CONTACTS (CONTINUED)

0, 10	E	4	E	3	C	;	D	F
Shell Size	Min.	Max.	Min.	Max.	Min.	Max.	Max.	Typical
66	83.95	84.71	1.9	2.16	7.06	7.32	3.18	1.27
67	85.22	86.08	1.9	2.16	7.06	7.32	3.18	1.27
68	86.39	87.15	1.9	2.16	7.06	7.32	3.18	1.27
69	87.76	88.52	1.9	2.16	7.06	7.32	3.18	1.27
70	89.)3	89.79	1.9	2.16	7.06	7.32	3.18	1.27
71	90 3	91.06	1.9	2.16	7.06	7.32	3.18	1.27
72	91.57	92.33	1.9	2.16	7.06	7.32	3.18	1.27
73	92.34	93.6	1.9	2.16	7.06	7.32	3.18	1.27
74	94.11	94.87	1.9	2.16	7.06	7.32	3.18	1.27
75	95.38	96.14	1.9	2.16	7.06	7.32	3.18	1.27
76	96.65	97.41	1.9	2.16	7.06	7.32	3.18	1.27
77	97.92	98.68	1.9	2.16	7.06	7.32	3.18	1.27
78	98.19	99.05	1.9	2.16	7.06	7.32	3.18	1.27
79	100.46	101.22	1.9	2.16	7.06	7.32	3.18	1.27
80	101.73	102.49	1.9	2.16	7.06	7.32	3.18	1.27
81	103	103.76	1.9	2.16	7.06	7.32	3.18	1.27

NOTES

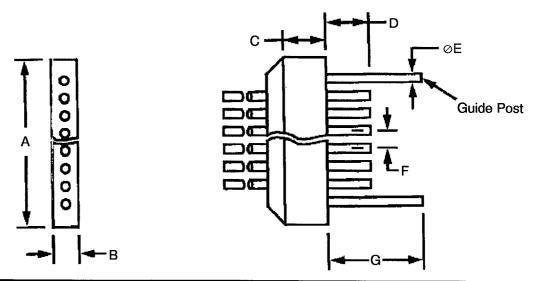


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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.1(b) - CONNECTORS RECEPTACLE - FEMALE CONTACTS



Shell	<u> </u>	Ī	E	3	([)	0	E	F		9
Size	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Мах.	Min.	Мах.	Typical	Min.	Max.
5	6.47	7.23	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
6	7.75	8.51	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
7	9.02	9.78	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
8	10.29	11.05	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
9	11.56	12.32	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
10	12.82	13.58	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
11	14.1	14.86	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
12	15.37	16.13	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
13	16.64	17.4	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
14	17.91	18.67	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
15	19.18	20.04	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
16	20.45	21.21	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
17	21.72	22.48	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
18	22.99	23.75	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
19	24.26	25.02	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
20	25.53	26.29	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
21	26.8	27.56	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
22	28.07	28.83	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
23	29.34	30.1	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
24	30.61	31.47	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
25	31.88	32.64	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33

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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.1(b) - CONNECTORS RECEPTACLE - FEMALE CONTACTS (CONTINUED)

Shell		4	E	3	(>)	0	·Ε	F	(3
Size	Min.	Мах.	Min.	Мах.	Min.	Мах.	Min.	Мах.	Min.	Max.	Typical	Min.	Max.
26	33.15	33.91	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
27	34.42	35.18	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
28	35.69	46.45	19	2.16	2.41	2.67	3.07	3:33	0.78	0.84	1.27	4.83	5.33
29	36.96	37.72	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
30	38.23	38.99	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
31	39.5	40.26	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
32	40.77	41.53	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
33	42.04	42.8	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
34	43.31	44.07	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
35	44.58	45.34	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
36	45.85	46.61	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
37	47.12	47.88	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
38	48.39	49.15	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
39	49.66	50.42	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
40	50.93	51.69	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
41	52.2	52.96	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
42	53.47	54.23	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
43	54.74	55.5	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
44	56.01	56.77	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
45	57.28	58.04	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
46	58.55	59.31	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
47	59.82	60.58	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
48	61.09	61.85	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
49	62.36	63.12	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
50	63.63	64.39	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
51	64.9	65.66	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
52	66.13	66.89	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
53	67.44	68.2	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
54	68.71	69.47	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
55	69.98	70.74	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
56	71.25	72.01	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
57	72.52	73.28	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
58	73.79	74.54	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
59	75.06	75.82	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
60	76.33	77.09	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
61	77.6	78.36	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
62	78.87	79.53	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
63	80.14	80.9	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
64	81.41	82.37	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
65	82.68	83.44	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33

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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.1(b) - CONNECTORS RECEPTACLE - FEMALE CONTACTS (CONTINUED)

Shell		4	E	3	())	0	E	F	(3
Size	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Min.	Max.	Typical	Min.	Max.
66	83.95	84.71	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
67	85.22	86.08	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
68	86.39	87.15	1.9	2.16	2.41	2.67	3.07	3:33	0.78	0.84	1.27	4.83	5.33
69	87.76	88.52	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
70	89.03	89.79	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
71	90.3	91.06	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
72	91.57	92.33	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
73	92.84	93.6	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
74	94.11	94.87	19	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
75	95.38	96.14	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
76	96.65	97.41	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
77	97.92	98.68	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
78	98.19	99.05	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
79	100.46	101.22	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
80	101.73	102.49	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33
81	103	103.76	1.9	2.16	2.41	2.67	3.07	3.33	0.78	0.84	1.27	4.83	5.33

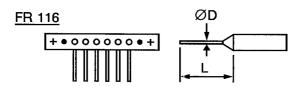


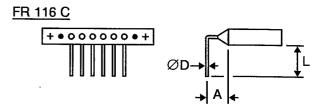
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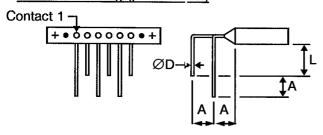
FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.2 - UNINSULATED SOLID WIRES

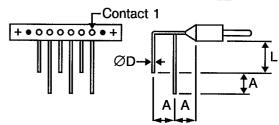




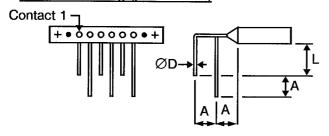
FR 116 D1 - Plug (pin contacts)



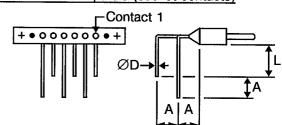
FR 116 D1 - Receptacle (socket contacts)



FR 116 D2 - Plug (pin contacts)



FR 116 D2 - Receptacle (socket contacts)



TERMINATIONS CODE	FR 116	FR 116 C	FR 116 D1	FR 116 D2
Wire Size (AWG)	25	25	25	25
Max. Diameter 'D' (mm)	0.46	0.46	0.46	0.46
Min. Diameter 'D' (mm)	0.45	0.45	0.45	0.45
Max. Weight (g/m)	1.60	1.60	1.60	1.60
Min. Gold-plating Thickness (µm)	0.50	0.50	0.50	0.50
<u>L</u> (mm)	25	4	4	4
<u>A</u> (mm)	-	2.54	2.54	2.54

FIGURE 2.3 - INSULATED WIRES

WIRE SIZE AWG		26	28
Conductor Characteristics	Maximum diameter (mm)	0.50	0.42
	Nominal cross-section (mm²)	0.14	0.10
Finished Wire	Maximum diameter (mm)	0.89	0.82
Characteristics	Maximum weight (g/m)	2.3	1.8
	Colour	Natural	Natural
	Minimum length	See Para	a. 4.5.4.3

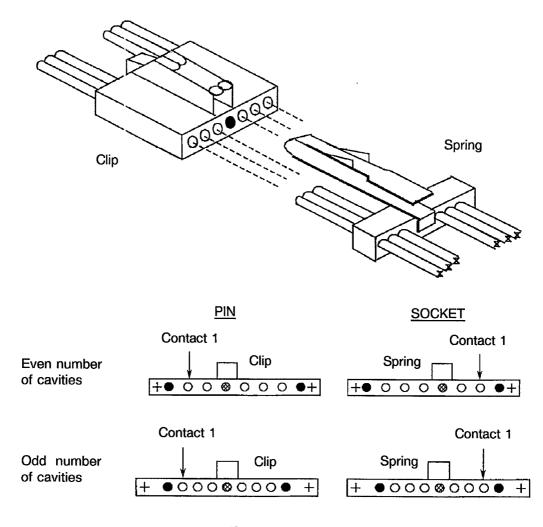


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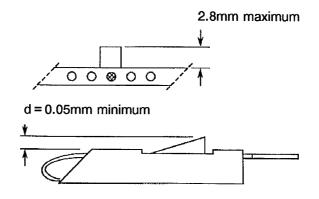
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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.4 - LATCHING



(Seen from contact side)



Latching force = 10N maximum



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FIGURE 2 - PHYSICAL DIMENSIONS (CONTINUED)

FIGURE 2.5 - CONTACT POSITION

Figure 2.5.1 - Mounting Condition

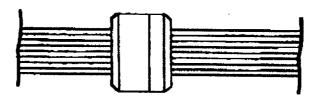


Figure 2.5.2 - Plug Male Contact

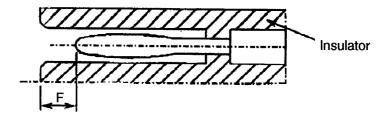
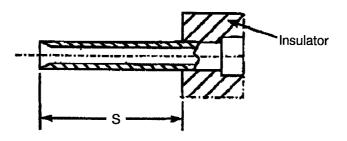


Figure 2.5.3 - Receptacle Female Contact



	F		S
Min.	Min. Max.		Max.
0.25	0.91	3.07	3.33

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3. TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS

For the purpose of this specification, the terms, definitions, abbreviations, symbols and units specified in ESA/SCC Basic Specification No. 21300 shall apply.

4. REQUIREMENTS

4.1 GENERAL

The complete requirements for procurement of the connectors specified herein are as stated in this specification and ESA/SCC Generic Specification No. 3401. Deviations from the Generic Specification, applicable to this specification only, are listed in Para. 4.2.

Deviations from the applicable Generic Specification and this Detail Specification, formally agreed with specific Manufacturers on the basis that the alternative requirements are equivalent to the ESA/SCC requirements and do not affect the components' reliability, are listed in the appendices attached to this specification.

4.2 DEVIATIONS FROM GENERIC SPECIFICATION

4.2.1 Deviations from Special In-process Controls

(a) Para. 9.15, Joint Strength: The contacts shall be crimped to insulated stranded wire AWG26 and AWG28 and to uninsulated solid wire AWG25. The value of failure shall be recorded together with the information as to whether the failure was "pull-out", "break in crimp" or "break in wire". The minimum tensile strength shall be as follows.

WIRE	MALE AND FEMALE CONTACTS					
WIRE	AWG26	AWG28	AWG25 - Solid Uninsulated			
Tensile Strength (N)	22	13	22			

4.2.2 Deviations from Final Production Tests (Chart II)

- (a) Para. 9.1.1.4, Mated Shell Conductivity: Not applicable.
- (b) Para. 9.3, Contact Retainer Test: Not applicable.
- (c) Para. 9.4, Contact Capability: This test shall be performed on male contacts. For details see Para. 4.3.3 of this specification.
- (d) Para. 9.5, Magnetism Level: Not applicable.

4.2.3 <u>Deviations from Burn-in and Electrical Measurements (Chart III)</u>

Not applicable.

4.2.4 <u>Deviations from Qualification Tests</u> (Chart IV)

- (a) Para. 9.1.1.4, Mated Shell Conductivity: Not applicable.
- (b) Para. 9.9, Seal Test: Not applicable.
- (c) Para. 9.15, Joint Strength: Not applicable.
- (d) Para. 9.17, Contact Retention (In Insert): Not applicable with male contact.
- (e) Para. 9.27, Maintenance Ageing: Not applicable.



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- (f) Para. 9.29, Oversize Pin Exclusion: Not applicable.
- (g) Para. 9.30, Probe Damage: Not applicable.
- (h) Latching shall be performed as specified in Para. 4.3.13 of this specification.

4.2.5 Deviations from Lot Acceptance Tests (Chart V)

- (a) Para. 9.1.1.4, Mated Shell Conductivity: Not applicable.
- (b) Para. 9.9, Seal Test: Not applicable.
- (c) Para. 9.15, Joint Strength: Not applicable.
- (d) Para. 9.17, Contact Retention (In Insert): Not applicable with male contact.
- (e) Para. 9.27, Maintenance Ageing: Not applicable.
- (f) Para. 9.29, Oversize Pin Exclusion: Not applicable.
- (g) Para. 9.30, Probe Damage: Not applicable.
- (h) Latching shall be performed as specified in Para. 4.3.13 of this specification.

4.3 MECHANICAL REQUIREMENTS

4.3.1 Dimension Check

The dimensions of the connectors specified herein shall be verified in accordance with the requirements set out in Para. 9.6 of ESA/SCC Generic Specification No. 3401 and shall conform to those shown in Figure 2 of this specification. Only the underlined dimensions shall be checked during procurement.

4.3.2 Weight

The maximum weight of the connectors specified herein shall be calculated on the basis of, and be in accordance with, the values given in Table 1(b) and in Figures 2.2 and 2.3 of this specification.

4.3.3 Contact Capability

For the purpose of this test, the pick-up and drop weights shall be as follows.

MEASUREMENTS	PICK-UP WEIGHT	DROP WEIGHT
Weight (g)	14	170
Inner Gauge Diameter (mm) (1)	0.582 - 0.587	0.559 - 0.564
Insertion Depth (mm)	1.5	1.5

NOTES

See Figure 3 for ∅A.

4.3.4 Contact Retention (In Insert)

Contact retention within the insert shall be 22.25 Newtons. There shall be no displacement of the contact. Not applicable to male contacts.

4.3.5 <u>Mating and Unmating Forces</u>

The forces applied for the mating and unmating of the connectors shall conform to the values specified in Table 1(c).



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4.3.6 Insert Retention (In Shell)

Not applicable.

4.3.7 <u>Jackscrew Retention</u>

Not applicable.

4.3.8 Contact Insertion and Withdrawal Forces

Not applicable.

4.3.9 Engagement and Separation Forces (Male Contacts)

The contact engagement and separation forces of the male contacts shall be tested to a depth of 1.5mm with the applicable test gauge fixture specified in Figure 3 of this specification, and shall not exceed the values of the table hereunder.

MEASUREMENTS	INNER DI		SEPARATION FORCE Min. (N)	ENGAGEMENT FORCE		
	Min.	Max.	iviiri. (iv)	Max. (N)		
Max. Gauge Fixture	0.559	0.564	-	1.667		
Min. Gauge Fixture	0.582	0.587	0.137	-		

4.3.10 Oversize Pin Exclusion

Not applicable.

4.3.11 Probe Damage

Not applicable.

4.3.12 Solderability

Not applicable.

4.3.13 Latching

Unlocking is achieved by applying a force of 3N minimum, perpendicular to the connector at the end of the spring.

The endurance test (10 cycles of mating/unmating) shall be performed with the force, applied at the end of the spring, necessary to achieve a travel of 1mm (unlocking travel = 0.5mm, total travel = 1.15mm). The requirement after the endurance test is that dimension d = 0.05mm, minimum.

4.4 MATERIALS AND FINISHES

The materials and finishes shall be as specified herein. Where a definite material is not specified, a material which will enable the connectors specified herein to meet the performance requirements of this specification shall be used. Acceptance or approval of any constituent material does not guarantee acceptance of the finished product.

4.4.1 <u>Inserts</u>

Inserts shall be made of glass fibre-filled diallylphtalate resin or suitable thermoplastic material.



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4.4.2 Contacts

4.4.2.1 Female Contacts

The contact body shall be made of copper alloy with an underplate of 1.0µm minimum of copper to MIL-C-14550, gold plated with 1.27µm minimum of gold, Type 2, Grade C of MIL-G-45204. Measurement of thickness shall be performed at a distance of 1.5mm from the engagement end.

4.4.2.2 Male Contacts

The contact body and the bundle shall be made of copper alloy with an underplate of $1.0\mu m$ minimum of copper to MIL-C-14550, gold plated with $1.27\mu m$ minimum of gold, Type 2, Grade C of MIL-G-45204. Measurement of thickness shall be performed at a distance of 1.5mm from the engagement end.

4.4.3 Guide Posts

Guide posts shall be made from passivated stainless steel, Type 303.

4.4.4 Latching

Clip and spring shall be made of passivated stainless steel.

4.4.5 Insulated Wires

Wire materials and finishes shall be in accordance with the requirements specified in Para. 4.4 of ESA/SCC Detail Specification No. 3901/013.

4.4.6 Uninsulated Solid Wires

Uninsulated solid wires shall be made of copper alloy in accordance with Type 'S' as specified in QQ-W-343. They shall be gold-plated in accordance with Class $\Phi\Phi$, Grade C or D, as specified in MIL-G-45204.

4.4.7 Rear Potting

Rear potting shall be made of epoxy resin.

4.5 MARKING

4.5.1 General

The marking of all components delivered to this specification shall be in accordance with the requirements of ESA/SCC Basic Specification No. 21700 and the following paragraphs.

When the component is too small to accommodate all of the marking specified, as much as space permits shall be marked and the marking information, in full, shall accompany the component in its primary package.

The information to be marked and the order of precedence shall be as follows:-

- (a) The SCC Component Number.
- (b) Characteristics.
- (c) Traceability Information.



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4.5.2 Contact Identification

Not applicable.

4.5.3 The SCC Component Number

The SCC Component Number shall be constituted and marked as follows:

	<u>3401031</u> 0	<u>)1</u> E	3
Detail Specification Number		\prod	
Type Variant (see Table 1a)		J	
Testing Level ————	n-smuon.		

4.5.4 Characteristics

The characteristics to be marked in the following order of precedence are:-

- (a) Shell Size.
- (b) Contact Type.
- (c) Termination Type.
- (d) Polarisation (optional).

The information shall be constituted and marked as follows:-

	81 P FR112 *
Shell Size ————	
Contact Type ————	
Termination Type —	
Polarisation —————	

4.5.4.1 Shell Size

The shell size shall be designated by 2 digits representing the number of available cavities plus 4 additional cavities plus (see Para. 1.2):-

- (a) 4 additional cavities for Variant 01 The specified numbers range from 05 through to 87 maximum.
- (b) 5 additional cavities for Variant 02 The specified numbers range from 06 through to 87 maximum.

4.5.4.2 Contact Types

Contact types shall be indicated by the following code letters.

Code Letter	Contact Type
Р	Male
S	Female



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4.5.4.3 Termination Types

Termination types define length of insulated wire or uninsulated solid wire according to Figures 2.2 and 2.3 as follows.

Code	Type (see Figure 2)	Min. Length (mm)
FR 112	Wire AWG 26	508
FR 113	Wire AWG 26	914
FR 114	Wire AWG 28	508
FR 115	Wire AWG 28	918
FR 116	Uninsulated Solid Wire	25
FR 116 C	Uninsulated Solid 90°C Formed Wire	4
FR 116 D1	Uninsulated Solid 90°C Formed Wire (Long Terminations on Odd Contacts)	4
FR 116 D2	Uninsulated Solid 90°C Formed Wire (Long Terminations on Even Contacts)	4

4.5.4.4 Polarisation

The marking of the cavity number used for the polarisation is optional and is used only in case the Orderer wishes to specify his own polarisation means by epoxy-filled cavities or guide posts (see Para. 1.2). There is no mandatory requirement for this part of the marking.

4.5.5 Traceability Information

Traceability information shall be marked in accordance with the requirements of ESA/SCC Basic Specification No. 21700.

4.6 <u>ELECTRICAL MEASUREMENTS</u>

4.6.1 <u>Electrical Measurements at Room Temperature</u>

The parameters to be measured in respect of electrical characteristics are scheduled in Table 2. Unless otherwise specified, the measurements shall be performed at $T_{amb} = +22 \pm 3$ °C.

4.6.2 <u>Electrical Measurements at High and Low Temperatures</u> Not applicable.

4.6.3 <u>Circuits for Electrical Measurements (Figure 4)</u>

Not applicable

4.7 BURN IN AND ELECTRICAL MEASUREMENTS

Not applicable.



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TABLE 2 - ELECTRICAL MEASUREMENTS AT ROOM TEMPERATURE

No.	CHARACTERISTICS	SYMBOL	ESA/SCC 3401	TEST	LIV	UNIT	
110.	OT IN INCITED HOTO	OTWIDOL	TEST METHOD	CONDITIONS	MIN.	MAX.	UNIT
1	Insulation Resistance	Ri	Para. 9.1.1.1	Para. 9.1.1.1	5000	•	МΩ
2	Voltage Proof Leakage Current	ΙL	Para. 9.1.1.2	600 Vrms	-	2.0	mA
3	Mated Shell Conductivity (Voltage Drop) (1)	Vd	Para. 9.1.1.4	Para. 9.1.1.4	Not ap	plicable	mV
4	Contact Resistance (Low Level Current)	Rcl max.	Para. 9.1.1.3	Para. 9.1.1.3	-	6.0	mΩ
5	Contact Resistance (Rated Current)	Rcr max.	Para. 9.1.1.3	Table 1(d)	-	5.0	mΩ

NOTES

1. Applicable to mated connectors with grounding option.

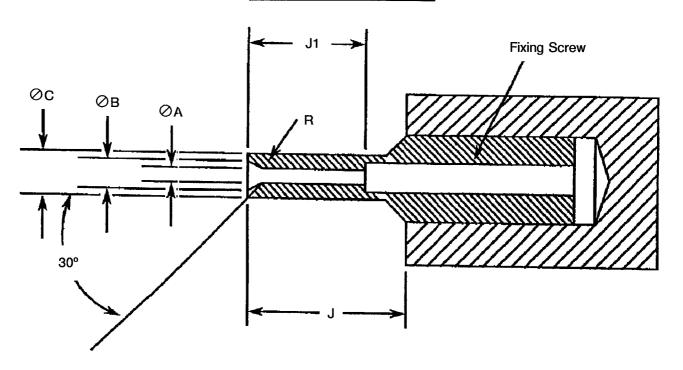
TABLES 3, 4 AND 5

Not applicable.

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FIGURE 3 - GAUGE FIXTURE



MAXIMUM GAUGE

w	EIGHT (g) 17	REMARKS		
	MIN.	MAX.	HEWARKS	
ØA	0.559	0.564	-	
⊘в	0.749	0.775	-	
⊘c	0.813	0.825	-	
J	4.0	-	-	
J1	3.13	3.23	-	
R	0.381	0.483	Note 1	

MINIMUM GAUGE

V	VEIGHT (g) 1	REMARKS		
	MIN.	MAX.	TILIVIANNO	
ØA	0.582	0.587	-	
⊘в	0.749	0.775	-	
Øc	0.813	0.825	-	
J	4.0	-	-	
J1	3.13	3.23	-	
R	0.381	0.483	Note 1	

<u>NOTES</u>

- 1. Radius "R" must be tangent to entry chamfer and OA.
- 2. \bigcirc A and entry chamfer must be polished to $\stackrel{N8}{\smile}$.



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4.8 <u>ENVIRONMENTAL AND ENDURANCE TESTS (CHARTS IV AND V OF ESA/SCC GENERIC SPECIFICATION NO. 3401)</u>

4.8.1 Measurements and Inspections on Completion of Environmental Tests

The parameters to be measured and inspections to be performed on completion of environmental tests shall be those scheduled in Table 6. Unless otherwise stated, the measurements shall be performed at $T_{amt} = +22 \pm 3$ °C.

4.8.2 <u>Measurements and Inspections at Intermediate Points during Endurance Tests</u>

Not applicable.

4.8.3 <u>Measurements and Inspections on Completion of Endurance Tests</u>

The parameters to be measured and inspections to be performed on completion of endurance tests shall be those scheduled in Table 6. Unless otherwise stated, the measurements shall be performed at $T_{amb} = +22 \pm 3$ °C.

4.8.4 <u>Conditions for Operating Life Tests (Part of Endurance Testing)</u>

Not applicable.

4.8.5 Electrical Circuits for Operating Life Tests (Figure 5)

Not applicable.

4.8.6 Conditions for High Temperature Storage Test (Part of Endurance Testing)

The requirements for the high temperature storage test are specified in Section 9 of ESA/SCC Generic Specification No. 3401. The temperature to be applied shall be the maximum storage temperature specified in Table 1(b) of this specification.



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TABLE 6 - MEASUREMENTS AND INSPECTIONS ON COMPLETION OF ENVIRONMENTAL AND ENDURANCE TESTS

NO.	ESA/SCC GENERIC SPEC. NO. 3401		MEASUREMENTS AND INSPECTIONS			LIMITS		
	ENVIRONMENTAL AND ENDURANCE TESTS (1)	TEST METHOD AND CONDITIONS	IDENTIFICATION	CONDITIONS	SYMBOL	MIN.	MAX.	UNIT
01	Seal Test	Para. 9.9	ESA/SCC 3401 Para. 9.9	-	-	Not applicable		-
02	Wiring	Para. 9.10 and Table 1(d) of this specification	Low Level Contact Resistance	Table 2 Item 4	Rcl	Table 2, Item 4		-
03	Vibration	Para. 9.11	Final Measurements Full Engagement Visual Examination		- -	-	-	-
04	Shock or Bump	Par. 3. 9.12	Full Engagement Visual Examination	- -	- -	-	-	-
05	Climatic Sequence	Para. 9.13	Dry Heat Insulation Resistance	At High Temperature Table 2, Item 1	Ri	1000	-	МΩ
			Low Air Pressure Voltage Proof Leakage Current	Figure 1	Ιι	ESA/SCC 3401 Para 9.13.5		-
			Damp Heat Insulation Resistance	Immediately after test Table 2, Item 1	Ri	100	-	МΩ
			Final Measurements External Visual Inspection Insulation Resistance Voltage Proof Leakage Current	After 1-24 hrs Recovery ESA/SCC 3401 Para. 9.7 Table 2, Item 1 Table 2, Item 2	- Ri I _L	ESA/SC Para Table 2 Table 2	9.7 , Item 1	
06	Plating Thickness	Para. 9.14	Thickness	-	-	Para 4.4.2 of this spec.		-
07	Joint Strength (N/A to solder contacts)	Para. 9.15	ESA/SCC 3401 Para. 9.15	-	-	Not applicable		
08	Rapid Change of Temperature	Para. 9.16	Visual Examination Insulation Resistance Voltage Proof Leakage Current	- Table 2, Item 1 Table 2, Item 2	- Ri I _L	- Table 2 Table 2	, Item 1 , Item 2	<u>-</u>
09	Contact Retention (In Insert)	Para. 9.17 and Para. 4.3.4 of this spec.	Contact Displacement	Not applicable for male contacts	-	ESA/SC Para.		-

NOTES

1. The tests in this Table refer to either Chart IV or V and shall be used as applicable.



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TABLE 6 - MEASUREMENTS AND INSPECTIONS ON COMPLETION OF ENVIRONMENTAL AND ENDURANCE TESTS (CONTINUED)

	ESA/SCC GENERIC SPEC. NO. 3401 MEASUREMENTS AND INSPECTIONS		ND INSPECTIONS		LIMITS			
NO.	ENVIRONMENTAL AND ENDURANCE TESTS (1)	TEST METHOD AND CONDITIONS	IDENTIFICATION	CONDITIONS	SYMBOL	MIN.	MAX.	UNIT
10	Endurance	Para. 9.18	Initial Measurements Mating/Unmating Forces Low Level Contact Resistance Mated Shell Conductivity	Table 2, Item 4 Table 2, Item 3	F Rel Vd	Para of this Record Not ap	spec. Values	
			Final Measurements Visual Examination Mating/Unmating Forces Low Level Contact Drift Resistance Mated Shell Conductivity Insulation Resistance Voltage Proof Leakage Current	Table 2, Item 4 Table 2, Item 5 Table 2, Item 3 Table 2, Item 1 Table 2, Item 2	F ΔRcl Vd Ri I _L	Para. of this - Not ap Table 2	spec. 3.0 olicable	mΩ
11	Permanence of Marking	Para. 9.19	-	-	-	-	-	-
12	Mating/Unmating Forces	Para. 9.20	Force	-	F	Para 4.3.5 of this spec.		
13	High Temperature Storage	Para. 9.21	Initial Measurements Low Level Contact Resistance Mated Shell Conductivity	Table 2, Item 4	Rcl Vd		Values plicable	
			Final Measurements Visual Examination Mating/Unmating Forces Low Level Contact Drift Resistance Rated Current Contact	- - Table 2, Item 4 Table 2, Item 5	- F ΔRcl Rcr	of this -	4.3.5 spec. 3.0	mΩ
			Resistance Mated Shell Conductivity Insulation Resistance Voltage Proof Leakage Current Contact Retention (In	Table 2, Item 3 Table 2, Item 1 Table 2, Item 1 Table 2, Item 2 Para. 4.3.4 of this spec.	Vd Ri I _L	Not ap Table 2 Table 2 ESA/S0	plicable t, Item 1 t, Item 2 CC 3401 9.17	
14	Corrosion	Para. 9.22	Visual Examination	-	-	-	-	-
15	Insert Retention (In Shell)	Para. 9.23 and Para. 4.3.6 of this spec.	Visual Examination	-	-	Not ap	plicable	-
16	Jackscrew Retention	Para. 9.24 and Para. 4.3.7 of this spec.	Visual Examination	-	-	Not ap	plicable	

NOTES

1. The tests in this Table refer to either Chart IV or V and shall be used as applicable.



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TABLE 6 - MEASUREMENTS AND INSPECTIONS ON COMPLETION OF ENVIRONMENTAL AND ENDURANCE TESTS (CONTINUED)

	ESA/SCC GENERIC SPEC. NO. 3401		MEASUREMENTS AND INSPECTIONS			LIMITS		
NO.	ENVIRONMENTAL AND ENDURANCE TESTS (1)	TEST METHOD AND CONDITIONS	IDENTIFICATION	CONDITIONS	SYMBOL	MIN.	MAX.	UNIT
17	High Temperature Measurements	Para. 9.25	Insulation Resistance	Table 2, Item 1	Ri	5000	-	МΩ
18	Overload Test	Para. 9.26	Internal Temperature Rated Current Contact Resistance Mated Shell Conductivity Insulation Resistance Voltage Proof Leakage Current	Table 2, Item 5 Table 2, Item 3 Table 2, Item 1 Table 2, Item 2	T Rcr Vd Ri I _L	- Table 2 Not ap Table 2 Table 2	olicable	°င
19	Maintenance Ageing	Para. 9.27 and Paras. 4.2.4 and 4.2.5 of this spec.	Visual Examination Contact Retention (In Insert)	-	-	Not applicable Not applicable		
20	Engagement/Separation Forces	Para. 9.28 and Para. 4.3.9 of this spec.	Force	-	F	Para. 4.3.9 of this spec.		
21	Oversize Pin Exclusion	Para. 9.29 and Para. 4.3.10 of this spec.	<u>-</u>	-	-	Not applicable		
22	Probe Damage	Para. 9.30 and Para. 4.3.11 of this spec.	Contact Separation Force	-	-	Not applicable		
23	Solderability	Para. 9.31 and Para. 4.3.12 of this spec.	-	-	-	Not ap	olicable	

NOTES

1. The tests in this Table refer to either Chart IV or V and shall be used as applicable.