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**ACCESSORIES FOR RECTANGULAR CONNECTORS  
3401/001, 3401/002 AND CONNECTOR SAVERS 3401/020,  
3401/080**

**ESCC Detail Specification No. 3401/022**

Issue 4	September 2009
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DCR No.	CHANGE DESCRIPTION
466, 473, 530	Specification upissued to include editorial and technical changes per DCRs.

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## 1. **GENERAL**

### 1.1 **SCOPE**

This specification details the ratings, physical and electrical characteristics, test and inspection data for Accessories for Rectangular Connectors (D\*M and D\*MA) and Connector Savers (D\*BM and D\*BMA). It shall be read in conjunction with ESCC Generic Specification No. 3401, the requirements of which are supplemented herein and ESCC Detail Specifications Nos. 3401/001, 3401/002, 3401/020 and 3401/080.

### 1.2 **COMPONENT TYPE VARIANTS**

The type variants of accessories covered by this specification are given in Table 1(a).

### 1.3 **MAXIMUM RATINGS**

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

### 1.4 **PARAMETER DERATING INFORMATION**

Not applicable.

### 1.5 **PHYSICAL DIMENSIONS**

The physical dimensions of the accessories 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) ESCC Generic Specification No. 3401, Connectors, Electrical, Circular and Rectangular.
- (b) ESCC Detail Specification No. 3401/001, Connectors, Electrical, Rectangular, Miniature, Non-removable Solder and Wire-Wrap-Type Contacts and, Removable Coaxial and Power, Crimp-Type and Solder-Type Contacts, based on Type D\*M.
- (c) ESCC Detail Specification No. 3401/002, Connectors, Electrical, Rectangular, Miniature, Removable Crimp Type Contacts and, Removable Coaxial and Power Crimp-Type and Solder-Type Contacts, based on type D\*MA.
- (d) ESCC Detail Specification 3401/020, Connector Savers, Electrical, Rectangular, Miniature, Removable Contacts, based on type D\*BMA.
- (e) ESCC Detail Specification No. 3401/080, Connector Savers, Electrical, Rectangular, Miniature, Non-removable Signal Contacts and Removable Coaxial and Power Contacts.
- (f) QQ-BB-613, Brass Material.
- (g) QQ-S-764/766 and QQ-P-35, Stainless steel material.
- (h) MIL-G-45204, Gold Plating, Electro-deposited.
- (i) MIL-C-14550, Copper Plating, electro-deposited.

## 3. **TERMS, DEFINITIONS, ABBREVIATIONS, SYMBOLS AND UNITS**

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

TABLE 1(a) - TYPE VARIANTS

VARIANT	DESCRIPTION	WEIGHT (g)	
01	Screw Lock Assembly Brass (Female)	1.9	
02	Screw Lock Assembly Brass (Male/slotted head screw)	Without Back Shell	0.85
03	Screw Lock Assembly Brass (Male/slotted head screw)	Without Back Shell	0.85
04	Screw Lock Assembly Brass (Male/slotted head screw)	Without Back Shell	1
05	Screw Lock Assembly Brass (Male/slotted head screw)	Without Back Shell	1
06	Screw Lock Assembly Brass (Female) for Savers		2
07	Dust Cap (Female)	Size E	N/A
08	Dust Cap (Male)	Size E	N/A
09	Dust Cap (Female)	Size A	N/A
10	Dust Cap (Male)	Size A	N/A
11	Dust Cap (Female)	Size B	N/A
12	Dust Cap (Male)	Size B	N/A
13	Dust Cap (Female)	Size C	N/A
14	Dust Cap (Male)	Size C	N/A
15	Dust Cap (Female)	Size D	N/A
16	Dust Cap (Male)	Size D	N/A
17	Potting Shell	Size A	N/A
18	Potting Shell	Size B	N/A
19	Potting Shell	Size C	N/A
20	Potting Shell	Size D	N/A
21	Back-Shell for Strapped Connections	Size A	8.4
22	Back-Shell for Strapped Connections	Size B	11.6
23	Back-Shell for Strapped Connections	Size C	15.5
24	Back-Shell for Strapped Connections	Size D	16.6
25	Cable Clamp, Straight	Size A	10.6
26	Cable Clamp, Straight	Size B	13.7
27	Cable Clamp, Straight	Size C	18.4
28	Cable Clamp, Straight	Size D	19.8
29	Cable Clamp, Round	Size E	9
30	Cable Clamp, Round	Size A	11
31	Cable Clamp, Round	Size B	13
32	Cable Clamp, Round	Size C	15
33	Cable Clamp, Round	Size D	16
34	Deep Straight Clamp	Size E	13
35	Deep Straight Clamp	Size A	16.3
36	Deep Straight Clamp	Size B	26.5

VARIANT	DESCRIPTION	WEIGHT (g)
37	Deep Straight Clamp	Size C 35
38	Deep Straight Clamp	Size D 38.5
39	Right Angle Clamp	Size E 14.6
40	Right Angle Clamp	Size A 17.2
41	Right Angle Clamp	Size B 21.4
42	Right Angle Clamp	Size C 33.3
43	Right Angle Clamp	Size D 38.7
44	Screw Lock Assembly Brass (Male/slotted head screw)	With Back Shell 0.85
45	Screw Lock Assembly Brass (Male/slotted head screw)	With Back Shell 0.85
46	Screw Lock Assembly Brass (Male/slotted head screw)	With Back Shell 1
47	Screw Lock Assembly Brass (Male/slotted head screw)	With Back Shell 1
48	Screw Lock Assembly Stainless Steel (Female)	1.8
49	Screw Lock Assembly Stainless Steel (Male/slotted head screw)	Without Back Shell 0.8
50	Screw Lock Assembly Stainless Steel (Male/slotted head screw)	Without Back Shell 0.8
51	Screw Lock Assembly Stainless Steel (Male/slotted head screw)	Without Back Shell 1
52	Screw Lock Assembly Stainless Steel (Male/slotted head screw)	Without Back Shell 1
53	Screw Lock Assembly Stainless Steel (Female) for Savers	1.9
54	Screw Lock Assembly Stainless Steel (Male/slotted head screw)	With Back Shell 0.8
55	Screw Lock Assembly Stainless Steel (Male/slotted head screw)	With Back Shell 0.8
56	Screw Lock Assembly Stainless Steel (Male/slotted head screw)	With Back Shell 1
57	Screw Lock Assembly Stainless Steel (Male/slotted head screw)	With Back Shell 1
58	Screw Lock Assembly Brass (Female) for Feedthrough	2
59	Screw Lock Assembly Stainless Steel (Female) for Feedthrough	1.86
60	60° Angled Clamp	Size E 9
61	60° Angled Clamp	Size A 11
62	60° Angled Clamp	Size B 12
63	60° Angled Clamp	Size C 15
64	60° Angled Clamp	Size D 16
65	Screw Lock Assembly Brass (male/hex. hole head screw)	Without Back Shell 0.85
66	Screw Lock Assembly Brass (male/hex. hole head screw)	Without Back Shell 0.85
67	Screw Lock Assembly Brass (male/hex. hole head screw)	Without Back Shell 1
68	Screw Lock Assembly Brass (male/hex. hole head screw)	Without Back Shell 1

VARIANT	DESCRIPTION		WEIGHT (g)
69	Screw Lock Assembly Brass (male/hex. hole head screw)	With Back Shell	0.85
70	Screw Lock Assembly Brass (male/hex. hole head screw)	With Back Shell	0.85
71	Screw Lock Assembly Brass (male/hex. hole head screw)	With Back Shell	1
72	Screw Lock Assembly Brass (male/hex. hole head screw)	With Back Shell	1
73	Screw Lock Assembly Stainless Steel (Male/hex. hole head screw)	Without Back Shell	0.8
74	Screw Lock Assembly Stainless Steel (Male/hex. hole head screw)	Without Back Shell	0.8
75	Screw Lock Assembly Stainless Steel (Male/hex. hole head screw)	Without Back Shell	1
76	Screw Lock Assembly Stainless Steel (Male/hex. hole head screw)	Without Back Shell	1
77	Screw Lock Assembly Stainless Steel (Male/hex. hole head screw)	With Back Shell	0.8
78	Screw Lock Assembly Stainless Steel (Male/hex. hole head screw)	With Back Shell	0.8
79	Screw Lock Assembly Stainless Steel (Male/hex. hole head screw)	With Back Shell	1
80	Screw Lock Assembly Stainless Steel (Male/hex. hole head screw)	With Back Shell	1
81	Potting shell	Size E	N/A
82	Back-Shell for Strapped Connections	Size E	6.3
83	Cable Clamp, Straight	Size E	8.3
84	Dust Cap (Female)	Size F	N/A
85	Dust Cap (Male)	Size F	N/A

**TABLE 1(b) - MAXIMUM RATINGS**

No.	Characteristic	Symbol	Maximum Ratings		Unit	Remarks
1	Operating Temperature Range	T <sub>op</sub>	-55 to +125 (1)		°C	T <sub>amb</sub>
2	Storage Temperature Range	T <sub>stg</sub>	-55 to +125 (1)		°C	
3	Torque Value for Screws	T <sub>qe</sub>	BRASS 5.5 3.3	S.S. 6.6 4.4	cm.daN cm.daN	For Female (2) For Male

**NOTES:**

1. Except for dust cap: +100°C.
2. Except for Variants 6, 53, 58 and 59 which shall be tightened to the torque specified for the Male.

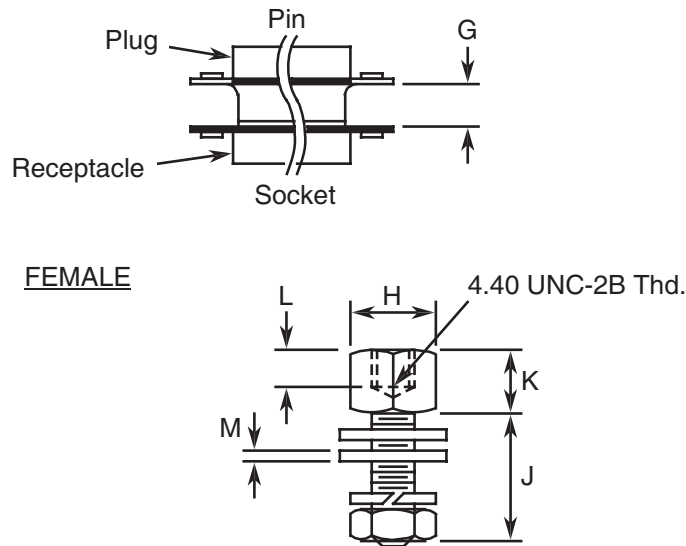
**FIGURE 1 - PARAMETER DERATING INFORMATION**

Not applicable.



**FIGURE 2 - PHYSICAL DIMENSIONS**

**FIGURE 2(a) - SCREW LOCK ASSEMBLIES (All dimensions in millimetres)  
MATED SPACING BETWEEN SHELL FRONT SURFACES**

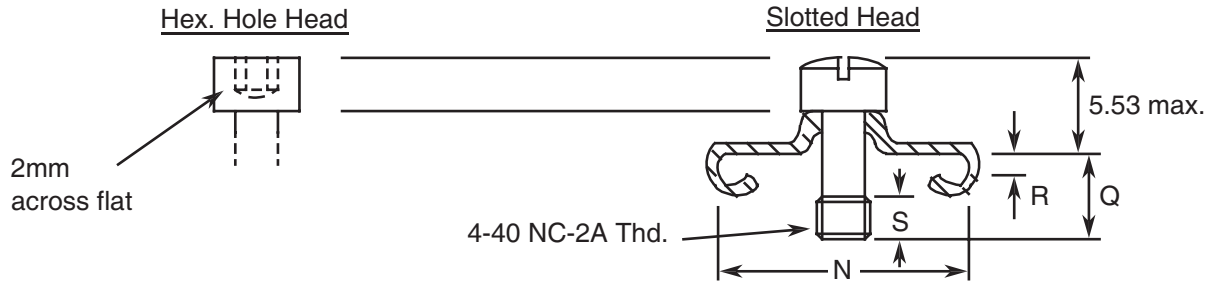


DIMENSION	MIN.	MAX.	NOTES
G	6.35	7.11	1
	6.12	6.88	2
H	4.37	5.13	-
J	7.54	8.3	3
	14.35	14.65	4
	15.49	16.25	5
K	4.6	5.1	-
L	3.18	-	-
M	0.66	0.86	6

**NOTES:**

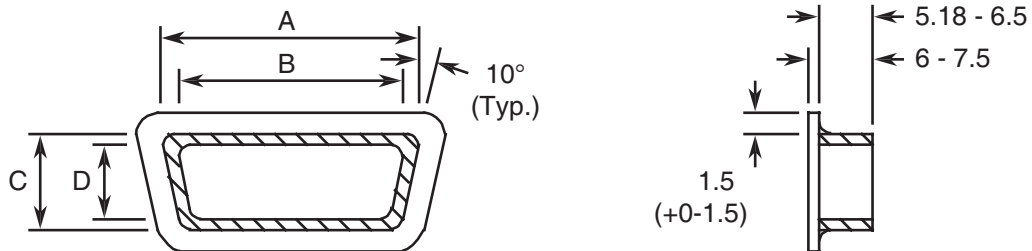
1. For shell sizes E and A.
2. For shell sizes B, C and D.
3. Variants 01 and 48 (standard). To be used with all sizes of shells, P or S, with or without backshell.
4. Variants 06 and 53 (for savers). To be used with all sizes of shells.
5. Variants 58 and 59 (for feedthrough). To be used with all sizes of shells.
6. The spacing between the reference planes of 2 mated connectors shall be adjusted by the use of 3 washers maximum so the spacing equals to dimension G.

MALE



VARIANT		USE WITH SHELL SIZE	N		Q		R		S
BRASS	S.S.		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.
		Without Back Shell							
02-65	49-73	DA DE: (P or S) DB, DC: S	12.96	13.72	3.22	3.98	0.75	0.95	2.8
03-65	50-74	DB DC: P	12.96	13.72	3.22	3.98	0.95	1.15	2.8
04-67	51-75	DD: S	15.75	16.26	4.02	4.78	0.75	0.95	2.8
05-68	52-76	DD: P	15.75	16.26	4.02	4.78	0.95	1.15	2.8
		With Back Shell							
44-69	54-77	DA DE: (P or S) DB, DC: S	12.96	13.72	4.02	4.78	1.75	1.95	2.8
45-70	55-78	DB DC: P	12.96	13.72	4.02	4.78	2	2.2	2.8
46-71	55-79	DD: S	15.75	16.26	4.02	4.78	1.75	1.95	2.8
47-72	57-80	Dd: P	15.75	16.26	4.02	4.78	2	2.2	2.8

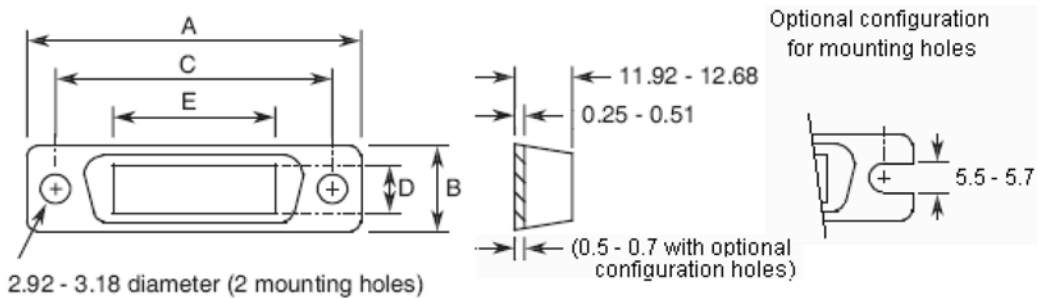
FIGURE 2(b) - DUST CAPS (All dimensions in millimetres)



VARIANT	A		B		C		D	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
07	17.3	17.9	15.6	16.2	8.9	9.5	7.2	7.8
08	18.7	19.3	17	17.6	10.2	10.8	8.5	9.1
09	25.7	26.3	24	24.6	8.9	9.5	7.2	7.8

VARIANT	A		B		C		D	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
10	27.1	27.7	25.4	26	10.2	10.8	8.5	9.1
11	39.4	40	37.7	38.3	8.9	9.5	7.2	7.8
12	41.2	41.8	39.5	40.1	10.2	10.8	8.9	9.6
13	55.8	56.4	54.1	54.7	8.9	9.5	7.2	7.8
14	57.6	58.2	56	56	10.2	10.8	8.9	9.6
15	53.4	54	51.7	52.3	11.7	12.3	10	10.6
16	55	55.6	53.3	53.9	13.3	13.9	11.6	12.2
84	57	57.6	55.3	55.9	13.4	14	11.7	12.3
85	58.9	59.5	57.2	57.8	15.4	16	13.7	14.3

FIGURE 2(c) - POTTING SHELLS (All dimensions in millimetres)

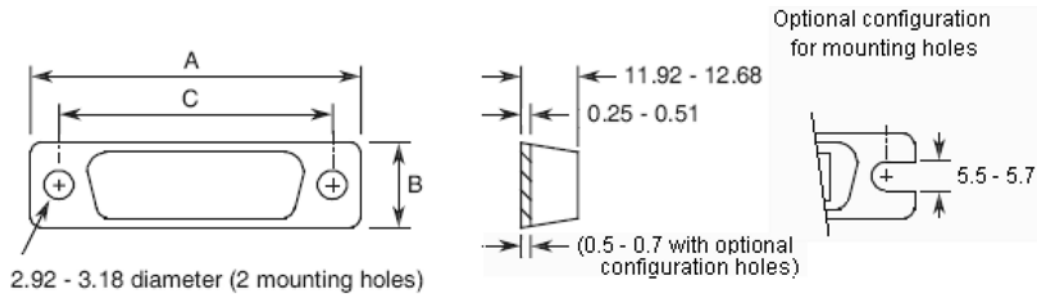


**NOTES:**

1. Weight: Not applicable because not on board.

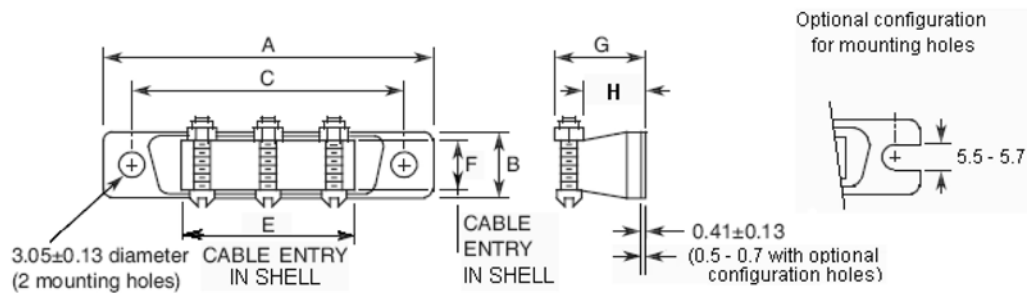
VARIANT	A		B		C		D		E	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
81	30.32	31.08	12.32	13.08	24.74	25.24	7.1	8.1	8.48	9.52
17	38.51	39.27	12.32	13.08	33.08	33.58	7.1	8.1	14.4	15.44
18	52.4	53.16	12.32	13.08	46.79	47.29	7.1	8.1	28	29.08
19	68.66	69.42	12.32	13.08	63.25	63.75	7.1	8.1	43.94	45
20	66.29	67.05	15.09	15.85	60.86	61.36	9.4	10.4	43.94	45

FIGURE 2(d) - BACK SHELLS (FOR STRAPPED CONNECTIONS) (All dimensions in millimetres)



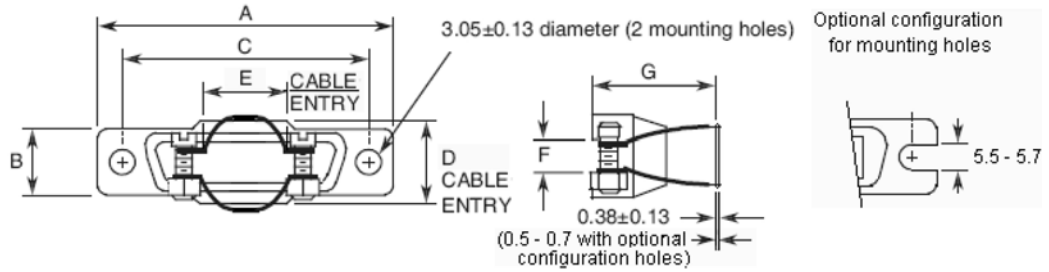
VARIANT	A		B		C	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
82	30.32	31.08	12.32	13.08	24.74	25.24
21	38.51	39.27	12.32	13.08	33.08	33.58
22	52.4	53.16	12.32	13.08	46.79	47.29
23	68.66	69.42	12.32	13.08	63.25	63.75
24	66.29	67.05	15.09	15.85	60.86	61.36

FIGURE 2(e) - CABLE CLAMPS (All dimensions in millimetres)  
STRAIGHT CLAMP



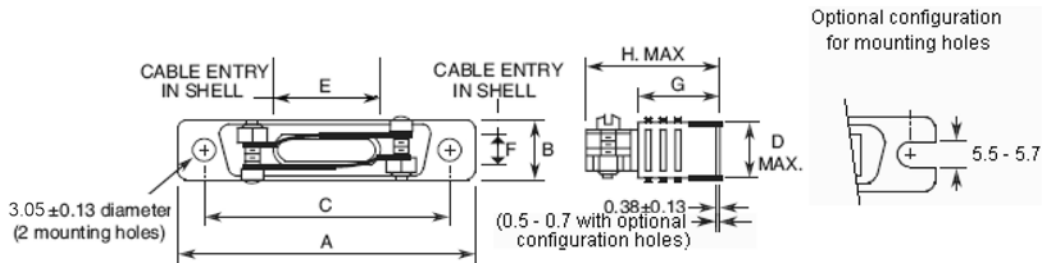
VARIANT	No. of Cable Locking Screws Required	A		B		C		E		F		G		H	
		MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
83	2	30.32	31.08	12.32	13.08	24.74	25.24	10.62	11.38	7.12	7.88	15.7	16.7	10.32	11.08
25	2	38.51	39.27	12.32	13.08	33.08	33.58	18.62	19.38	7.12	7.88	15.7	16.7	10.32	11.08
26	2	52.4	53.16	12.32	13.08	46.79	47.29	31.62	32.38	7.12	7.88	15.7	16.7	10.32	11.08
27	3	68.66	69.42	12.32	13.08	63.25	63.75	47.62	48.38	7.12	7.88	15.7	16.7	10.32	11.08
28	3	66.29	67.05	15.09	15.85	60.86	61.36	45.62	46.38	9.52	10.28	17.3	18.3	11.92	12.68

**ROUND CLAMP**



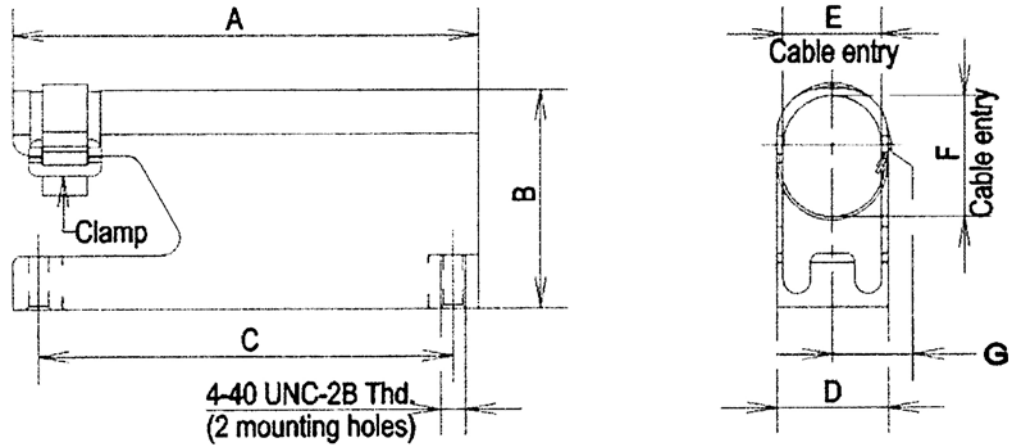
VARIANT	A		B		C		D		E		F		G	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
29	30.32	31.08	12.32	13.08	24.74	25.24	10.12	10.88	10.12	10.88	2.82	3.58	25.4	27
30	38.51	39.27	12.32	13.08	33.08	33.58	10.72	11.48	10.72	11.48	2.82	3.58	25.4	27
31	52.4	53.16	12.32	13.08	46.79	47.29	10.72	11.48	17.72	18.48	4.32	5.08	26.2	27.8
32	68.66	69.42	12.32	13.08	63.25	63.75	10.72	11.48	24.72	25.48	5.92	6.73	26.2	27.8
33	66.29	67.05	15.09	15.85	60.86	61.36	13.62	14.28	26.52	27.28	7.52	8.28	26.2	27.8

**DEEP STRAIGHT CLAMP**



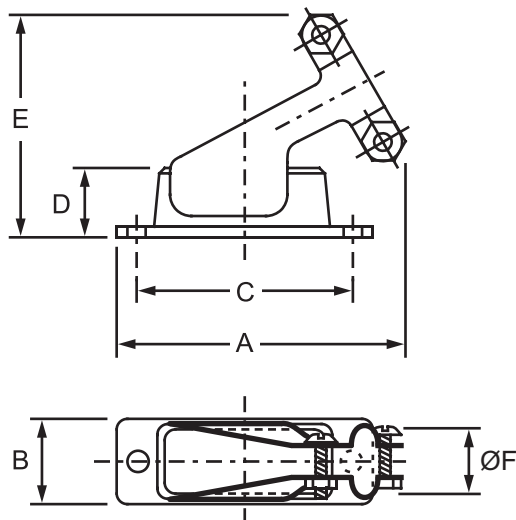
VARIANT	A		B		C		D	E		F		G		H
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.
34	30.32	31.08	12.32	13.08	24.74	25.24	14.7	10.62	11.38	7.12	7.88	18.62	19.38	31.7
35	38.51	39.27	12.32	13.08	33.08	33.58	14.7	18.62	19.38	7.12	7.88	18.62	19.38	31.7
36	52.4	53.16	12.32	13.08	46.79	47.29	14.7	31.62	32.38	7.12	7.88	25.02	25.78	39.7
37	68.66	69.42	12.32	13.08	63.25	63.75	14.7	47.62	48.38	7.12	7.88	25.02	25.78	39.7
38	66.29	67.05	15.09	15.85	60.86	61.36	17.4	45.62	46.38	9.52	10.28	28.22	28.98	42.9

RIGHT ANGLE CLAMP



VARIANT	A		B		C		D		E		F		G
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MAX.
39	30.32	31.08	17.4	19	24.74	25.24	12.32	13.08	10.3	11.9	10.3	11.9	7.9
40	38.51	39.27	17.4	19	33.08	33.58	12.32	13.08	10.3	11.9	10.3	11.9	7.9
41	52.4	53.16	23.8	25.4	46.79	47.29	12.32	13.08	10.3	11.9	15.1	16.7	7.9
42	68.66	69.42	29.3	30.9	63.25	63.75	12.32	13.08	10.3	11.9	19.8	21.4	7.9
43	66.29	67.05	30.9	32.5	60.86	61.36	15.09	15.85	13.5	15.1	22.3	23.9	7.9

60° ANGLED CLAMP



VARIANT	A		B		C		D		E		ØF	
	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.	MIN.	MAX.
60	38.75	39.25	12.45	12.95	24.74	25.24	12.05	12.55	30.35	30.85	9.75	10.25
61	42.85	43.35	12.45	12.95	32.07	32.57	12.05	12.55	32.25	32.75	9.75	10.25
62	55.15	55.65	12.45	12.95	46.79	47.29	12.05	12.55	34.25	34.75	14.75	15.25
63	75.05	75.55	12.45	12.95	63.25	63.75	12.05	12.55	37.25	37.75	17.75	18.25
64	72.55	73.05	15.15	15.65	60.86	61.36	12.05	12.55	37.35	37.85	19.75	20.25

#### 4. **REQUIREMENTS**

##### 4.1 GENERAL

The complete requirements for procurement of the accessories specified herein are stated in this specification and ESCC 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 ESCC 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. 5.2.2, Gold Plating Porosity: Not applicable.
- (b) Para. 5.2.3, Plating Thickness: Not applicable.

###### 4.2.2 Deviations from Final Production Tests (Chart II)

Only the following tests shall be performed:

- (a) Para. 4.4, Marking.
- (b) Para. 9.6, Dimension Check.
- (c) Para. 9.7, External Visual Inspection. The magnification shall be X3.

###### 4.2.3 Deviations from Burn-in and Electrical Measurements (Chart III)

Not applicable.

###### 4.2.4 Deviations from Qualification Tests (Chart IV)

Not applicable.

###### 4.2.5 Deviations from Lot Acceptance Tests (Chart V)

Not applicable.

### 4.3 MECHANICAL REQUIREMENTS

#### 4.3.1 Dimension Check

The dimensions of the accessories specified herein shall be verified in accordance with the requirements set out in Para. 9.6 of ESCC Generic Specification No. 3401 and shall conform to those shown in Figure 2 of this specification.

#### 4.3.2 Weight

The maximum weight of the accessories specified herein shall be as shown in Table 1(a) of this specification.

#### 4.3.3 Torque Value

The torque value to be used for tightening the screws of the accessories specified herein shall be as mentioned in Table 1(b) of this specification.

### 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 components 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 Screw Lock Assemblies (Male and Female)

Potting shells and back-shells:

Material : Brass in accordance with QQ-B-613, Composition II.  
Stainless steel in accordance with QQ-S-764/766 for screw Lock Variants 48 to 57.

Finish : Gold (0.7µm minimum) over copper (1µm minimum) in accordance with MIL-C-14450 and MIL-G-45204.  
Passivated in accordance with QQ-P-35 for screw Lock Variants 48 to 57.

#### 4.4.2 Dust Caps

Material : Red, black or white polyethelene.

#### 4.4.3 Magnetism Level

The allowable value of magnetism shall not exceed that specified for the relevant level (see Para. 4.5.3.1).

### 4.5 MARKING

#### 4.5.1 General

The marking of components delivered to this specification shall be in accordance with the requirements of ESCC Basic Specification No. 21700 and the following paragraphs. When the component is too small to accommodate all of the marking as 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 ESCC Component Number.
- (b) Characteristics.
- (c) Traceability Information.

#### 4.5.2 The ESCC Component Number

Each components shall bear the ESCC Component Number which shall be constituted and marked as follows:

340102201B

- Detail Specification Number: 3401022
- Type Variant (See Table 1(a)): 01
- Testing Level: B

#### 4.5.3 Characteristics

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

- (a) Magnetism Level.

##### 4.5.3.1 *Magnetism Level (For Variants 01 to 06, 17 to 47, 58, 60 to 72 and 81 to 83)*

The following codes shall be used for magnetism level:

CODE	DEFINITION
NMA	Magnetism Level: ≤ 2000 gamma
NMB	Magnetism Level: ≤ 200 gamma
NMC	Magnetism Level: ≤ 20 gamma
NMD	Magnetism Level: ≤ 2 gamma

#### 4.5.4 Traceability Information

Traceability information shall be marked in accordance with ESCC Basic Specification No. 21700.

#### 4.6 ELECTRICAL MEASUREMENTS (TABLES 2 AND 3)

Not applicable.

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

Not applicable.

#### 4.8 ENVIRONMENTAL AND ENDURANCE TESTS (TABLE 6)

Not applicable.