



**LIGHTWEIGHT ACCESSORIES FOR
RECTANGULAR CONNECTORS
3401/001 AND 3401/002**

ESCC Detail Specification No. 3401/072

| | |
|----------|------------|
| Issue 11 | March 2023 |
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DOCUMENTATION CHANGE NOTICE

(Refer to <https://escies.org> for ESCC DCR content)

| DCR No. | CHANGE DESCRIPTION |
|---------|--|
| 1538 | Specification upissued to incorporate changes per DCR. |

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1 GENERAL

1.1 SCOPE

This specification details the ratings, physical and electrical characteristics, test and inspection data for Lightweight Accessories for Rectangular Connectors (D*M and D*MA). 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 and 3401/002.

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, Non-Filtered, Circular and Rectangular.
- (b) ESCC Detail Specification No. 3401/001, Connectors, Electrical, Rectangular, Miniature, Non-removable Solder Bucket, PCB and Wire-Wrap Contacts and Removable Coaxial and Power 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.

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 (Male/hex. hole 2.38 head screw) | With Back Shell | 1.5 |
| 02 | Screw Lock Assembly Brass (Male/hex. hole 2.38 head screw) | With Back Shell | 1.5 |
| 03 | Screw Lock Assembly Stainless Steel (Male/hex. hole 2.38 head screw) | With Back Shell | 1.5 |
| 04 | Screw Lock Assembly Stainless Steel (Male/hex. hole 2.38 head screw) | With Back Shell | 1.5 |
| 05 | Backshell: Lightweight Design with Saddle Clamps for Strain Relief | Size E | 15.5 |
| 06 | Backshell: Lightweight Design with Saddle Clamps for Strain Relief | Size A | 19 |
| 07 | Backshell: Lightweight Design with Saddle Clamps for Strain Relief | Size B | 23 |
| 08 | Backshell: Lightweight Design with Saddle Clamps for Strain Relief | Size C | 29 |
| 09 | Backshell: Lightweight Design with Saddle Clamps for Strain Relief | Size D | 33 |
| 10 | Backshell: Lightweight D–SUB Shorting Can | Size E | 8 |
| 11 | Backshell: Lightweight D–SUB Shorting Can | Size A | 10 |
| 12 | Backshell: Lightweight D–SUB Shorting Can | Size B | 14 |
| 13 | Backshell: Lightweight D–SUB Shorting Can | Size C | 20 |
| 14 | Backshell: Lightweight D–SUB Shorting Can | Size D | 26 |
| 15 | Backshell: EMI Shielded Straight Cable Outlet - Front Mount | Size E | 21 |
| 16 | Backshell: EMI Shielded Straight Cable Outlet - Front Mount | Size A | 26 |
| 17 | Backshell: EMI Shielded Straight Cable Outlet - Front Mount | Size B | 30 |
| 18 | Backshell: EMI Shielded Straight Cable Outlet - Front Mount | Size C | 35 |
| 19 | Backshell: EMI Shielded Straight Cable Outlet - Front Mount | Size D | 40 |
| 20 | Backshell: EMI Shielded Straight Cable Outlet - Rear Mount | Size E | 21 |
| 21 | Backshell: EMI Shielded Straight Cable Outlet - Rear Mount | Size A | 26 |
| 22 | Backshell: EMI Shielded Straight Cable Outlet - Rear Mount | Size B | 30 |
| 23 | Backshell: EMI Shielded Straight Cable Outlet - Rear Mount | Size C | 35 |
| 24 | Backshell: EMI Shielded Straight Cable Outlet - Rear Mount | Size D | 40 |
| 25 | Backshell: Lightweight Shielded Backshell – 90° Longitudinal Right Cable Outlet | Size E | 7 |
| 26 | Backshell: Lightweight Shielded Backshell – 90° Longitudinal Right Cable Outlet | Size A | 10 |
| 27 | Backshell: Lightweight Shielded Backshell – 90° Longitudinal Right Cable Outlet | Size B | 13.5 |
| 28 | Backshell: Lightweight Shielded Backshell – 90° Longitudinal Right Cable Outlet | Size C | 18 |
| 29 | Backshell: Lightweight Shielded Backshell – 90° Longitudinal Right Cable Outlet | Size D | 23 |
| 30 | Backshell: Lightweight Shielded Backshell – 90° Longitudinal Left Cable Outlet | Size E | 7 |
| 31 | Backshell: Lightweight Shielded Backshell – 90° Longitudinal Left Cable Outlet | Size A | 10 |

| VARIANT | DESCRIPTION | | WEIGHT (g) |
|---------|--|--------|------------|
| 32 | Backshell: Lightweight Shielded Backshell – 90° Longitudinal Left Cable Outlet | Size B | 13.5 |
| 33 | Backshell: Lightweight Shielded Backshell – 90° Longitudinal Left Cable Outlet | Size C | 18 |
| 34 | Backshell: Lightweight Shielded Backshell – 90° Longitudinal Left Cable Outlet | Size D | 23 |
| 35 | Backshell: Lightweight Shielded Backshell Straight Cable Outlet | Size E | 6.5 |
| 36 | Backshell: Lightweight Shielded Backshell Straight Cable Outlet | Size A | 8.5 |
| 37 | Backshell: Lightweight Shielded Backshell Straight Cable Outlet | Size B | 11.5 |
| 38 | Backshell: Lightweight Shielded Backshell Straight Cable Outlet | Size C | 13.5 |
| 39 | Backshell: Lightweight Shielded Backshell Straight Cable Outlet | Size D | 14.5 |
| 40 | Backshell: Lightweight Dual Entry Band Termination, 15 Pin | Size A | 23 |
| 41 | Castellated Backshell | Size E | 2 |
| 42 | Castellated Backshell | Size A | 2.5 |
| 43 | Castellated Backshell | Size B | 3 |
| 44 | Castellated Backshell | Size C | 3.9 |
| 45 | Castellated Backshell | Size D | 4 |
| 46 | Backshell: Straight Lightweight Backshell Ultra Elliptical Band Termination | Size E | 8 |
| 47 | Backshell: Straight Lightweight Backshell Ultra Elliptical Band Termination | Size A | 13 |
| 48 | Backshell: Straight Lightweight Backshell Ultra Elliptical Band Termination | Size B | 18 |
| 49 | Backshell: Straight Lightweight Backshell Ultra Elliptical Band Termination | Size C | 23 |
| 50 | Backshell: Straight Lightweight Backshell Ultra Elliptical Band Termination | Size D | 28 |
| 51 | Backshell: 45° Lightweight Backshell Ultra Elliptical Band Termination, Right | Size E | 10 |
| 52 | Backshell: 45° Lightweight Backshell Ultra Elliptical Band Termination, Right | Size A | 14 |
| 53 | Backshell: 45° Lightweight Backshell Ultra Elliptical Band Termination, Right | Size B | 20 |
| 54 | Backshell: 45° Lightweight Backshell Ultra Elliptical Band Termination, Right | Size C | 26 |
| 55 | Backshell: 45° Lightweight Backshell Ultra Elliptical Band Termination, Right | Size D | 33 |
| 56 | Backshell: 45° Lightweight Backshell Ultra Elliptical Band Termination, Left | Size E | 10 |
| 57 | Backshell: 45° Lightweight Backshell Ultra Elliptical Band Termination, Left | Size A | 14 |
| 58 | Backshell: 45° Lightweight Backshell Ultra Elliptical Band Termination, Left | Size B | 20 |
| 59 | Backshell: 45° Lightweight Backshell Ultra Elliptical Band Termination, Left | Size C | 26 |

| VARIANT | DESCRIPTION | | WEIGHT (g) |
|---------|--|-----------------|------------|
| 60 | Backshell: 45° Lightweight Backshell Ultra Elliptical Band Termination, Left | Size D | 33 |
| 61 | Backshell: Lightweight D-SUB Extra-Shorting Can | Size E | 8 |
| 62 | Backshell: Lightweight D-SUB Extra-Shorting Can | Size A | 10 |
| 63 | Backshell: Lightweight D-SUB Extra-Shorting Can | Size B | 14 |
| 64 | Backshell: Lightweight D-SUB Extra-Shorting Can | Size C | 20 |
| 65 | Backshell: Lightweight D-SUB Extra-Shorting Can | Size D | 26 |
| 66 | Screw Lock Assembly Brass (Male/hex. hole 2 head screw) | With Back Shell | 1.5 |
| 67 | Screw Lock Assembly Brass (Male/hex. hole 2 head screw) | With Back Shell | 1.5 |
| 68 | Screw Lock Assembly Stainless Steel (Male/hex. hole 2 head screw) | With Back Shell | 1.5 |
| 69 | Screw Lock Assembly Stainless Steel (Male/hex. hole 2 head screw) | With Back Shell | 1.5 |
| 70 | Screw Lock Assembly Stainless Steel (Male/slotted head screw) | | 1 |
| 71 | Screw Lock Assembly Stainless Steel (Male/hex. hole head screw) | | 1 |
| 72 | Backshell: Lightweight Design with Saddle Clamps for Strain Relief | Size F | 37 |
| 73 | Backshell: Lightweight D-SUB Shorting Can | Size F | 30 |
| 74 | Backshell: EMI Shielded Straight Cable Outlet - Front Mount | Size F | 45 |
| 75 | Backshell: EMI Shielded Straight Cable Outlet - Rear Mount | Size F | 45 |
| 76 | Backshell: Lightweight Shielded Backshell – 90° Longitudinal Right And Left Cable Outlet | Size F | 28 |
| 77 | Backshell: Lightweight Shielded Backshell Straight Cable Outlet | Size F | 16.5 |
| 78 | Backshell: Straight Lightweight Backshell Ultra Elliptical Band Termination | Size F | 33 |
| 79 | Backshell: 45° Lightweight Backshell Ultra Elliptical Band Termination, Right and Left | Size F | 40 |
| 80 | Backshell: Lightweight D-SUB Extra-Shorting Can | Size F | 30 |
| 81 | Screw Lock Assembly Brass (Female) (4-40) | - | 2 |
| 82 | Screw Lock Assembly Stainless Steel (Female) (4-40) | - | 2 |
| 83 | Haloring (see Note 1) | Size E | 1.3 |
| 84 | Haloring (see Note 1) | Size A | 1.9 |
| 85 | Haloring (see Note 1) | Size B | 2.9 |
| 86 | Haloring (see Note 1) | Sizes C & D | 4 |
| 87 | Haloring (see Note 1) | Size F | 5.2 |
| 88 | Backshell: Lightweight without entry | Size E | 10.7 |
| 89 | Backshell: Lightweight without entry | Size A | 13.5 |
| 90 | Backshell: Lightweight without entry | Size B | 18 |
| 91 | Backshell: Lightweight without entry | Size C | 23.6 |
| 92 | Backshell: Lightweight without entry | Size D | 24.6 |
| 93 | Backshell: Lightweight without entry | Size F | 26.2 |
| 94 | Backshell: Lightweight Straight Circular entry | Size E | 12 |

| VARIANT | DESCRIPTION | | WEIGHT (g) |
|---------|--|--------|------------|
| 95 | Backshell: Lightweight Straight Circular entry | Size A | 14.8 |
| 96 | Backshell: Lightweight Straight Circular entry | Size B | 19.3 |
| 97 | Backshell: Lightweight Straight Circular entry | Size C | 24.9 |
| 98 | Backshell: Lightweight Straight Circular entry | Size D | 26.1 |
| 99 | Backshell: Lightweight Straight Circular entry | Size F | 27.8 |
| 100 | Backshell: Lightweight Straight Elliptical entry | Size E | 12.4 |
| 101 | Backshell: Lightweight Straight Elliptical entry | Size A | 15.5 |
| 102 | Backshell: Lightweight Straight Elliptical entry | Size B | 20 |
| 103 | Backshell: Lightweight Straight Elliptical entry | Size C | 25.6 |
| 104 | Backshell: Lightweight Straight Elliptical entry | Size D | 27 |
| 105 | Backshell: Lightweight Straight Elliptical entry | Size F | 28.8 |
| 106 | Backshell: Lightweight 45° Circular entry | Size E | 13.3 |
| 107 | Backshell: Lightweight 45° Circular entry | Size A | 15.9 |
| 108 | Backshell: Lightweight 45° Circular entry | Size B | 19.2 |
| 109 | Backshell: Lightweight 45° Circular entry | Size C | 24.7 |
| 110 | Backshell: Lightweight 45° Circular entry | Size D | 25.7 |
| 111 | Backshell: Lightweight 45° Circular entry | Size F | 27.7 |
| 112 | Backshell: Lightweight 45° Elliptical entry | Size E | 13.6 |
| 113 | Backshell: Lightweight 45° Elliptical entry | Size A | 16.6 |
| 114 | Backshell: Lightweight 45° Elliptical entry | Size B | 19.9 |
| 115 | Backshell: Lightweight 45° Elliptical entry | Size C | 25.4 |
| 116 | Backshell: Lightweight 45° Elliptical entry | Size D | 26.7 |
| 117 | Backshell: Lightweight 45° Elliptical entry | Size F | 28.7 |
| 118 | Backshell: Lightweight 90° Circular entry | Size E | 14.7 |
| 119 | Backshell: Lightweight 90° Circular entry | Size A | 18.1 |
| 120 | Backshell: Lightweight 90° Circular entry | Size B | 23.6 |
| 121 | Backshell: Lightweight 90° Circular entry | Size C | 30.5 |
| 122 | Backshell: Lightweight 90° Circular entry | Size D | 31.7 |
| 123 | Backshell: Lightweight 90° Circular entry | Size F | 33.8 |
| 124 | Backshell: Lightweight 90° Elliptical entry | Size E | 15.1 |
| 125 | Backshell: Lightweight 90° Elliptical entry | Size A | 18.8 |
| 126 | Backshell: Lightweight 90° Elliptical entry | Size B | 24.3 |
| 127 | Backshell: Lightweight 90° Elliptical entry | Size C | 31.3 |
| 128 | Backshell: Lightweight 90° Elliptical entry | Size D | 32.9 |
| 129 | Backshell: Lightweight 90° Elliptical entry | Size F | 35 |
| 130 | Backshell: Lightweight 90° Top Circular entry | Size E | 8.2 |
| 131 | Backshell: Lightweight 90° Top Circular entry | Size A | 10 |

| VARIANT | DESCRIPTION | | WEIGHT (g) |
|---------|---|--------|------------|
| 132 | Backshell: Lightweight 90° Top Circular entry | Size B | 12.9 |
| 133 | Backshell: Lightweight 90° Top Circular entry | Size C | 16.6 |
| 134 | Backshell: Lightweight 90° Top Circular entry | Size D | 17.6 |
| 135 | Backshell: Lightweight 90° Top Circular entry | Size F | 18.9 |
| 136 | Backshell: Lightweight 90° Top Elliptical entry | Size E | 8.3 |
| 137 | Backshell: Lightweight 90° Top Elliptical entry | Size A | 10.3 |
| 138 | Backshell: Lightweight 90° Top Elliptical entry | Size B | 13.6 |
| 139 | Backshell: Lightweight 90° Top Elliptical entry | Size C | 17.3 |
| 140 | Backshell: Lightweight 90° Top Elliptical entry | Size D | 18.6 |
| 141 | Backshell: Lightweight 90° Top Elliptical entry | Size F | 20 |
| 142 | Backshell: Lightweight 45° Top Circular entry | Size E | 8 |
| 143 | Backshell: Lightweight 45° Top Circular entry | Size A | 9.9 |
| 144 | Backshell: Lightweight 45° Top Circular entry | Size B | 12.9 |
| 145 | Backshell: Lightweight 45° Top Circular entry | Size C | 16.8 |
| 146 | Backshell: Lightweight 45° Top Circular entry | Size D | 16.2 |
| 147 | Backshell: Lightweight 45° Top Circular entry | Size F | 17.6 |
| 148 | Backshell: Lightweight 45° Top Elliptical entry | Size E | 8.1 |
| 149 | Backshell: Lightweight 45° Top Elliptical entry | Size A | 10.2 |
| 150 | Backshell: Lightweight 45° Top Elliptical entry | Size B | 13.6 |
| 151 | Backshell: Lightweight 45° Top Elliptical entry | Size C | 17.4 |
| 152 | Backshell: Lightweight 45° Top Elliptical entry | Size D | 17.8 |
| 153 | Backshell: Lightweight 45° Top Elliptical entry | Size F | 18.7 |
| 154 | Backshell: Lightweight Straight Top Dual Circular entry | Size E | 12 |
| 155 | Backshell: Lightweight Straight Top Dual Circular entry | Size A | 14.8 |
| 156 | Backshell: Lightweight Straight Top Dual Circular entry | Size B | 19.3 |
| 157 | Backshell: Lightweight Straight Top Dual Circular entry | Size C | 24.9 |
| 158 | Backshell: Lightweight Straight Top Dual Circular entry | Size D | 26.1 |
| 159 | Backshell: Lightweight Straight Top Dual Circular entry | Size F | 27.8 |

NOTES:

- Halorings are not compatible with every specified backshell type of the appropriate shell size:
 Variant 83 is only compatible with Variants 88, 94, 100, 106, 112, 118, 124, 130, 136, 142, 148.
 Variant 84 is only compatible with Variants 89, 95, 101, 107, 113, 119, 125, 131, 137, 143, 149.
 Variant 85 is only compatible with Variants 90, 96, 102, 108, 114, 120, 126, 132, 138, 144, 150.
 Variant 86 is only compatible with Variants 91, 92, 97, 98, 103, 104, 109, 110, 115, 116, 121, 122, 127, 128, 133, 134, 139, 140, 145, 146, 151, 152.
 Variant 87 is only compatible with Variants 93, 99, 105, 111, 117, 123, 129, 135, 141, 147, 153.

TABLE 1(b) – MAXIMUM RATINGS

| No. | Characteristic | Symbol | Maximum Ratings | | Unit | Remarks |
|-----|-----------------------------|------------------|-----------------|-------------|--------|------------------|
| 1 | Operating Temperature Range | T _{op} | -55 to +125 | | °C | T _{amb} |
| 2 | Storage Temperature Range | T _{stg} | -55 to +125 | | °C | |
| 3 | Torque Value for Screws | T _{qe} | Brass 3.3 | S.S. 4.4 | cm.daN | For Male |

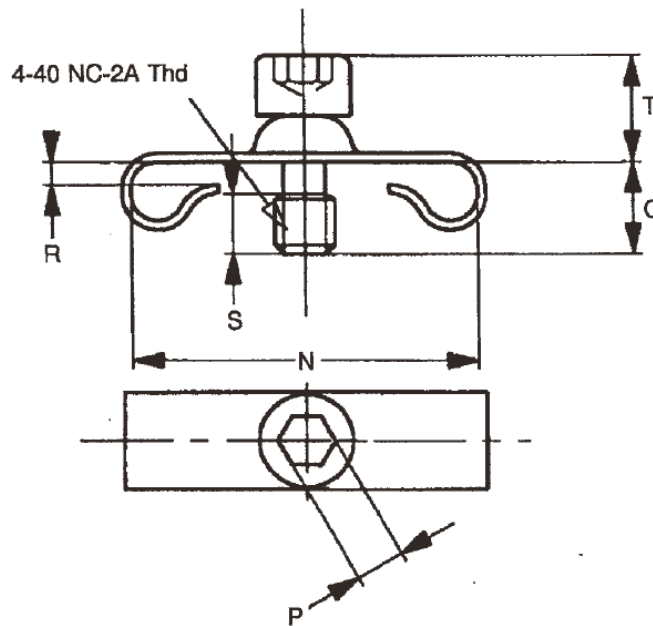
FIGURE 1 – PARAMETER DERATING INFORMATION

Not applicable.

FIGURE 2 – PHYSICAL DIMENSIONS

FIGURE 2(a) – MALE SCREW LOCK ASSEMBLIES

Hex. Hole Head

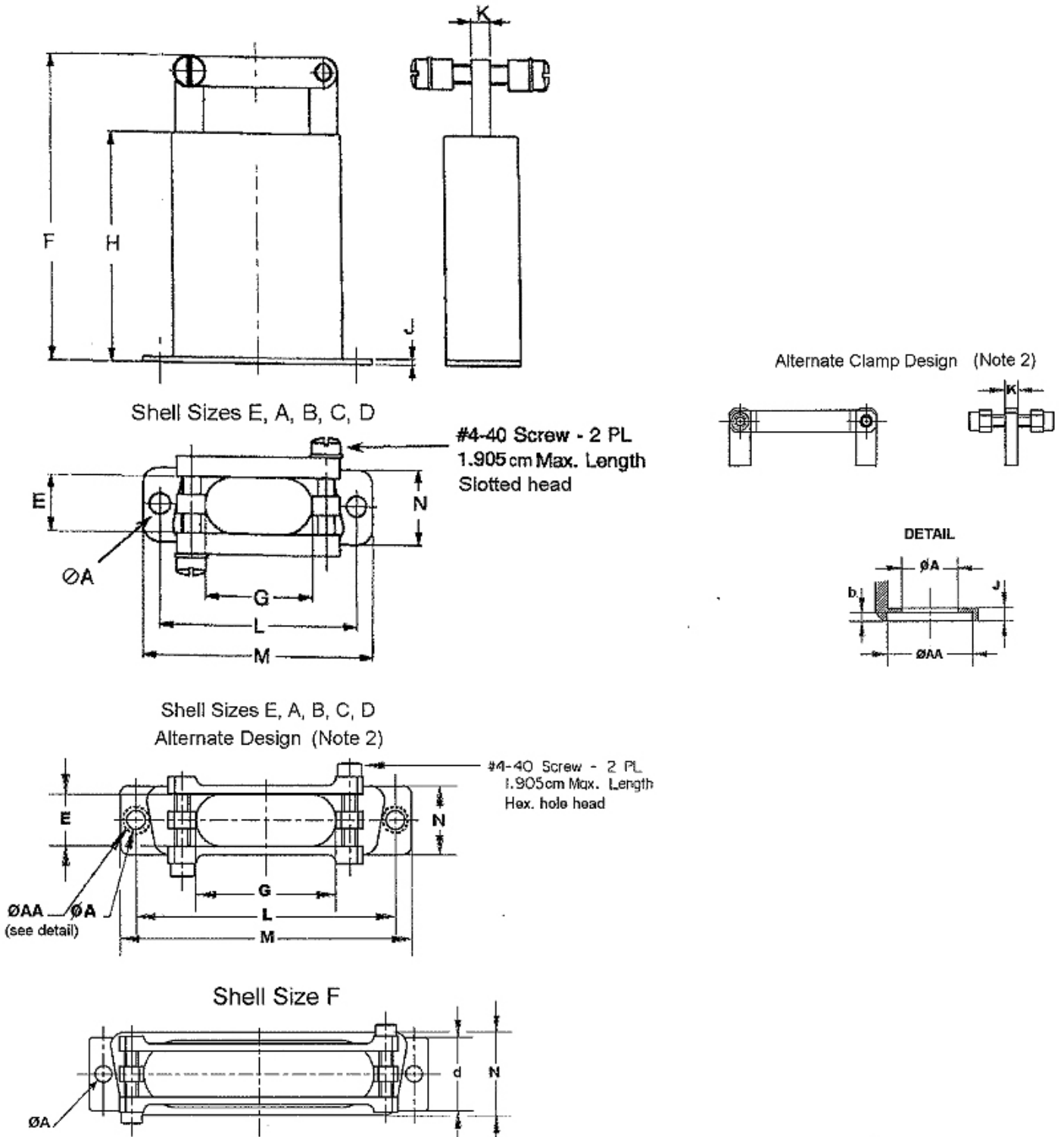


| Variants | | Use With Shell Size | N | | P (2) TYP. | Q | | R | | S MIN. | T MAX. |
|----------|--------|--|-------------|-------|------------|------|------|------|------|--------|--------|
| Brass | S.S. | | MIN. | MAX. | | MIN. | MAX. | MIN. | MAX. | | |
| 01, 66 | 03, 68 | With Lightweight Backshell DA to DC: (P or S) | 12.96 | 13.72 | 2.38 | 4.4 | 5.16 | 2.25 | 2.45 | 2.8 | 5.53 |
| 02, 67 | 04, 69 | | DD (P or S) | 15.75 | 16.26 | 2.38 | 4.4 | 5.16 | 2.25 | 2.45 | 2.8 |

NOTES:

2. All dimensions are in millimetres.
3. 2 for Variants 66 to 69.

FIGURE 2(b) – LIGHTWEIGHT BACKSHELL WITH SADDLE CLAMPS FOR STRAIN RELIEF



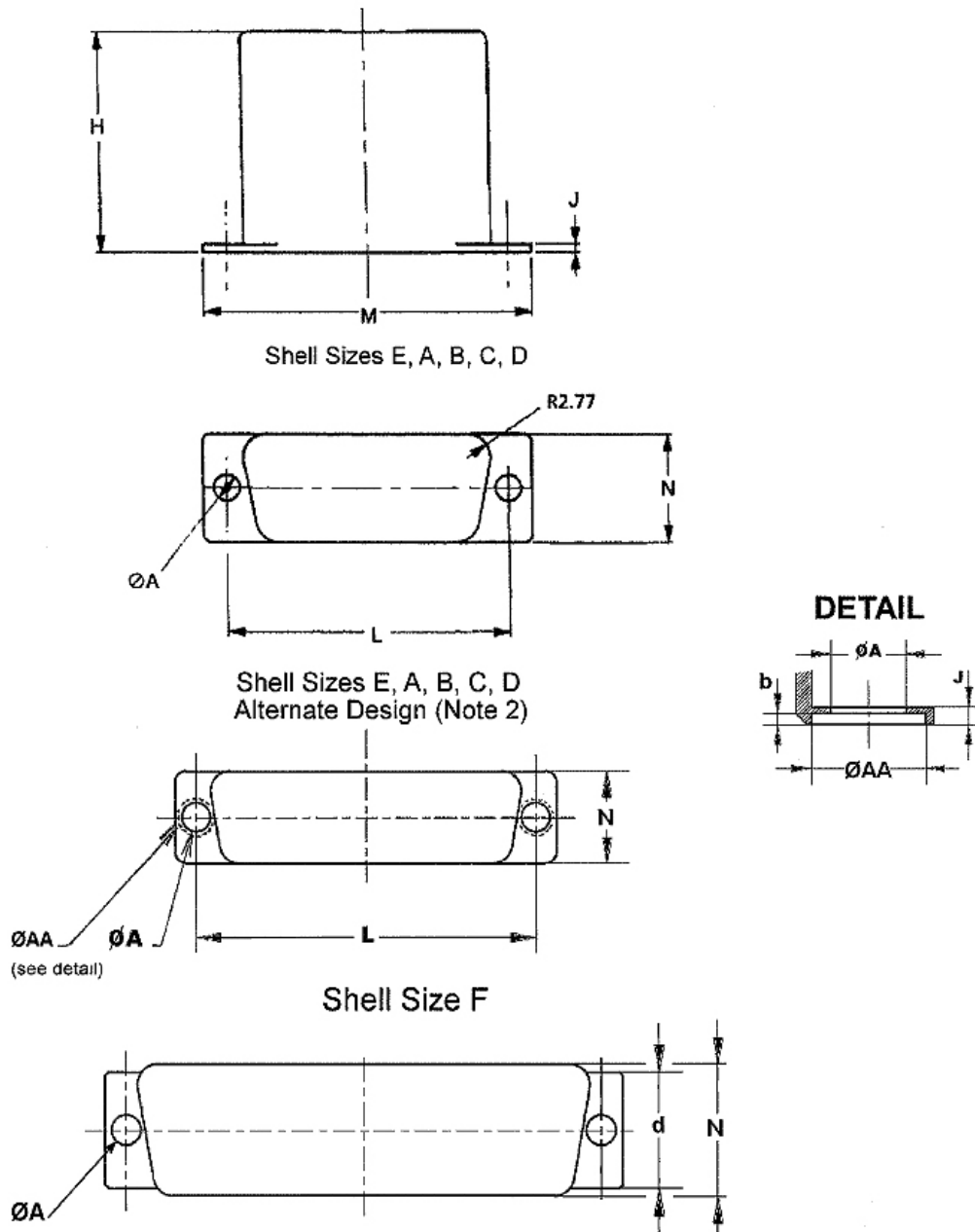
| Shell Size | Variant | ØA | | E | | F | | G | | H | | J | | K |
|------------|---------|------|------|------|-------|-------|-------|-------|-------|-------|-------|------|------|------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | |
| E | 05 | 3.32 | 3.58 | 9.14 | 9.9 | 65.95 | 67.56 | 9.14 | 9.9 | 54.48 | 55.24 | 0.68 | 0.94 | 3.17 |
| A | 06 | 3.32 | 3.58 | 9.14 | 9.9 | 65.95 | 67.56 | 17.73 | 18.49 | 54.48 | 55.24 | 0.68 | 0.94 | 3.17 |
| B | 07 | 3.32 | 3.58 | 9.14 | 9.9 | 67.55 | 69.16 | 25.02 | 25.78 | 54.48 | 55.24 | 0.68 | 0.94 | 3.17 |
| C | 08 | 3.32 | 3.58 | 9.14 | 9.9 | 67.55 | 69.16 | 34.54 | 35.3 | 54.48 | 55.24 | 0.68 | 0.94 | 3.17 |
| D | 09 | 3.32 | 3.58 | 11.5 | 12.26 | 67.55 | 69.16 | 35.33 | 36.09 | 54.48 | 55.24 | 0.68 | 0.94 | 3.17 |
| F | 72 | 3.32 | 3.58 | 13.5 | 14.26 | 67.55 | 69.16 | 46.63 | 47.39 | 54.48 | 55.24 | 0.68 | 0.94 | 3.17 |

| Shell Size | Variant | L | | M | | N | | ØAA | | b | | d | |
|------------|---------|-------|-------|-------|-------|-------|-------|------|------|------|------|-------|-------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 05 | 24.86 | 25.12 | 30.18 | 30.94 | 12.32 | 13.08 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| A | 06 | 33.19 | 33.45 | 38.51 | 39.27 | 12.32 | 13.08 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| B | 07 | 46.91 | 47.17 | 52.4 | 53.16 | 12.32 | 13.08 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| C | 08 | 63.37 | 63.63 | 68.66 | 69.42 | 12.32 | 13.08 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| D | 09 | 60.98 | 61.24 | 66.29 | 67.05 | 15.09 | 15.85 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| F | 72 | 63.37 | 63.63 | 68.94 | 69.7 | 17.09 | 17.85 | - | - | - | - | 15.15 | 15.35 |

NOTES:

1. All dimensions are in millimetres.
2. For Shell Sizes E, A, B, C and D, Backshells are available with an 'Alternate' (characteristic code 'A') design. See Para. 4.5.3.2.

FIGURE 2(c) – LIGHTWEIGHT D-SUB SHORTING CAN

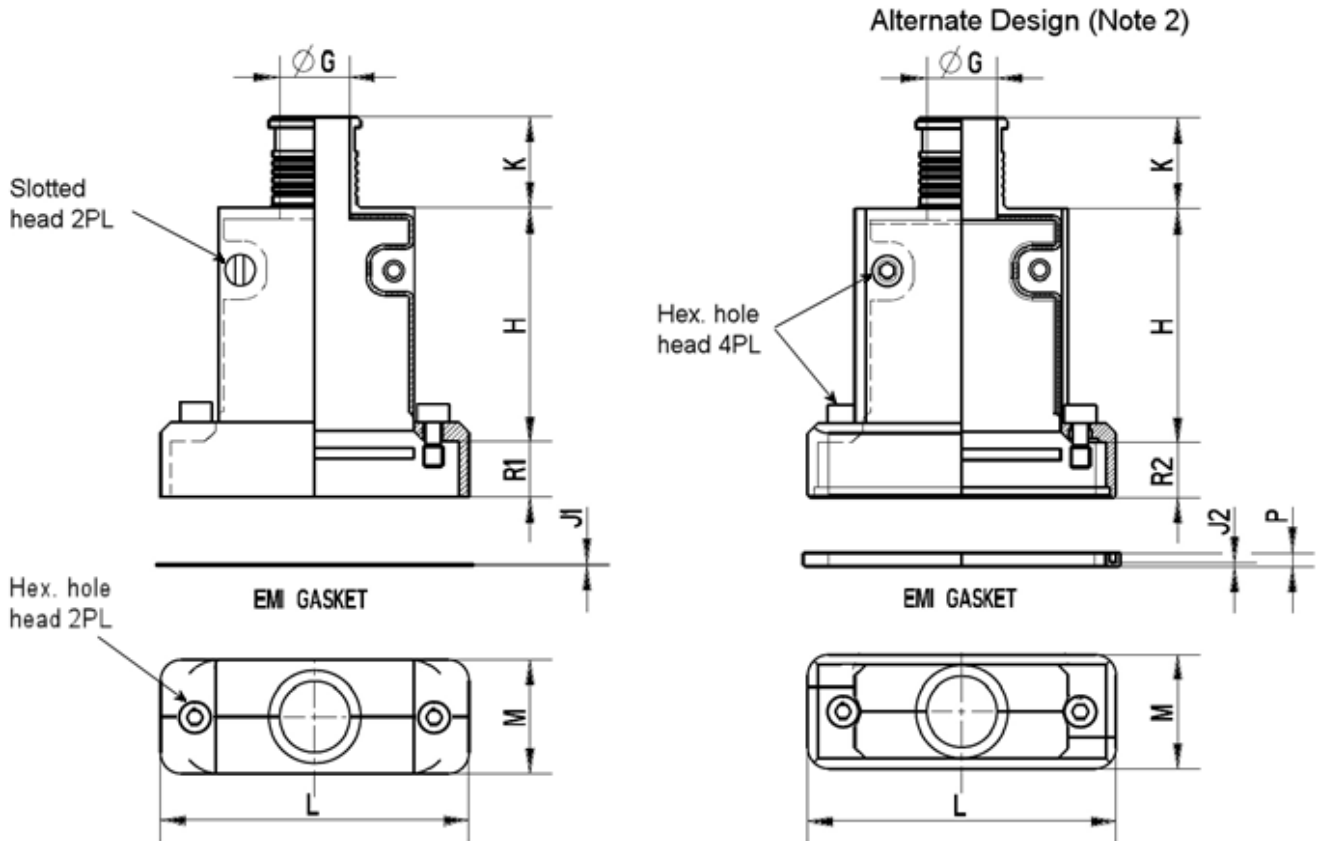


| Shell Size | Variant | ØA | | H | J | L | | M | | N | | ØAA | | b | | d | |
|------------|---------|------|------|------|-----|-------|-------|-------|-------|-------|-------|------|------|------|------|-------|-------|
| | | MIN | MAX | | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | | |
| E | 10 | 3.92 | 4.04 | 25.4 | 0.9 | 24.86 | 25.12 | 30.18 | 30.94 | 12.32 | 13.08 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| A | 11 | 3.92 | 4.04 | 25.4 | 0.9 | 33.19 | 33.45 | 38.51 | 39.27 | 12.32 | 13.08 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| B | 12 | 3.92 | 4.04 | 25.4 | 0.9 | 46.91 | 47.17 | 52.4 | 53.16 | 12.32 | 13.08 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| C | 13 | 3.92 | 4.04 | 25.4 | 0.9 | 63.37 | 63.63 | 68.66 | 69.42 | 12.32 | 13.08 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| D | 14 | 3.92 | 4.04 | 25.4 | 0.9 | 60.98 | 61.24 | 66.29 | 67.05 | 15.09 | 15.85 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| F | 73 | 3.92 | 4.04 | 25.4 | 0.9 | 63.37 | 63.63 | 68.94 | 69.7 | 17.09 | 17.85 | - | - | - | - | 15.15 | 15.35 |

NOTES:

1. All dimensions are in millimetres.
2. For Shell Sizes E, A, B, C and D, D-SUB Shorting Cans are available with an 'Alternate' (characteristic code 'A') design. See Para. 4.5.3.2.

FIGURE 2(d) – EMI SHIELDED BACKSHELL – STRAIGHT CABLE OUTLET



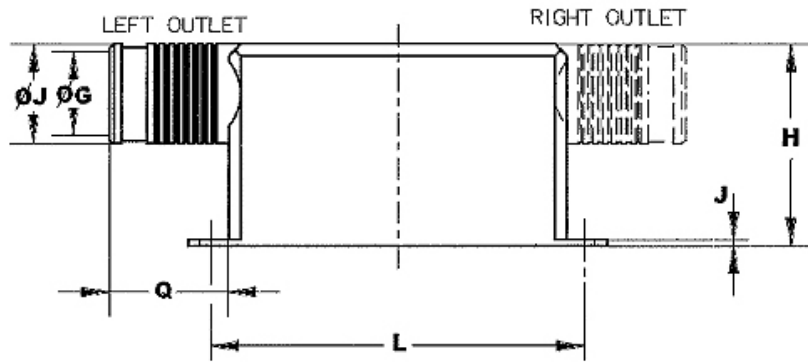
| Shell Size | Variant | | ØG | | H MAX. | J1 | J2 | | K | M | | P MAX |
|------------|-------------|------------|-------|-------|-----------|------|------|------|------|-------|-------|----------|
| | FRONT MOUNT | REAR MOUNT | MIN | MAX | | | MIN | MAX | | MIN | MAX | |
| E | 15 | 20 | 6.48 | 6.98 | 33.02 | 0.51 | 0.55 | 0.65 | 12.7 | 15.73 | 16.23 | 2.2 |
| A | 16 | 21 | 9.65 | 10.15 | 33.02 | 0.51 | 0.55 | 0.65 | 12.7 | 15.73 | 16.23 | 2.2 |
| B | 17 | 22 | 10.29 | 10.79 | 38.61 | 0.51 | 0.55 | 0.65 | 12.7 | 15.73 | 16.23 | 2.2 |
| C | 18 | 23 | 10.29 | 10.79 | 38.61 | 0.51 | 0.55 | 0.65 | 12.7 | 15.73 | 16.23 | 2.2 |
| D | 19 | 24 | 13.08 | 13.58 | 38.61 | 0.51 | 0.55 | 0.65 | 12.7 | 18.45 | 19.04 | 2.2 |
| F | 74 | 75 | 15.15 | 15.65 | 38.61 | - | 0.55 | 0.65 | 12.7 | 20.55 | 21.05 | 2.2 |

| Shell Size | Variant | | L | | R1 | | | | R2 | | | |
|------------|-------------|------------|-------|-------|-------------|------|------------|------|-------------|-----|------------|-----|
| | FRONT MOUNT | REAR MOUNT | MIN | MAX | FRONT MOUNT | | REAR MOUNT | | FRONT MOUNT | | REAR MOUNT | |
| | | | | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 15 | 20 | 34.48 | 35.28 | 7.61 | 7.87 | 6.19 | 6.45 | 7.75 | 7.8 | 5.25 | 5.3 |
| A | 16 | 21 | 43.11 | 43.61 | 7.61 | 7.87 | 6.19 | 6.45 | 7.75 | 7.8 | 5.25 | 5.3 |
| B | 17 | 22 | 57 | 57.5 | 7.61 | 7.87 | 6.19 | 6.45 | 7.75 | 7.8 | 5.25 | 5.3 |
| C | 18 | 23 | 73.28 | 73.78 | 7.61 | 7.87 | 6.19 | 6.45 | 7.75 | 7.8 | 5.25 | 5.3 |
| D | 19 | 24 | 70.89 | 71.39 | 7.61 | 7.87 | 6.19 | 6.45 | 7.75 | 7.8 | 5.25 | 5.3 |
| F | 74 | 75 | 73.25 | 73.75 | - | - | - | - | 7.75 | 7.8 | 5.25 | 5.3 |

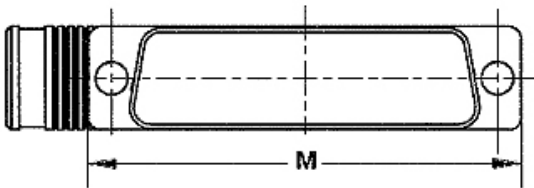
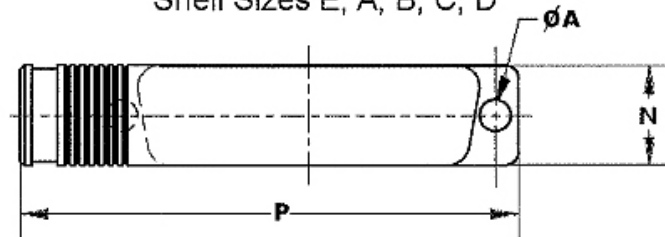
NOTES:

1. All dimensions are in millimetres.
2. For Shell Sizes E, A, B, C and D, EMI Shielded Backshells are available with an 'Alternate' (characteristic code 'A') design. See Para. 4.5.3.2.

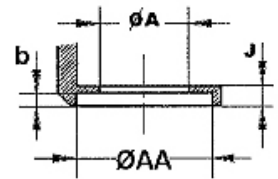
FIGURE 2(e) – LIGHTWEIGHT SHIELDED BACKSHELL – 90° LONGITUDINAL CABLE OUTLET



Shell Sizes E, A, B, C, D



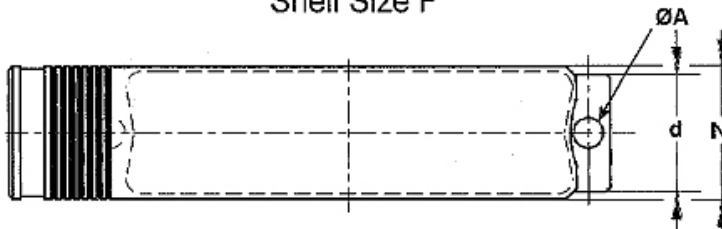
DETAIL



Shell Sizes E, A, B, C, D Alternate Design (Note 2)
(combined left and right configuration)



Shell Size F



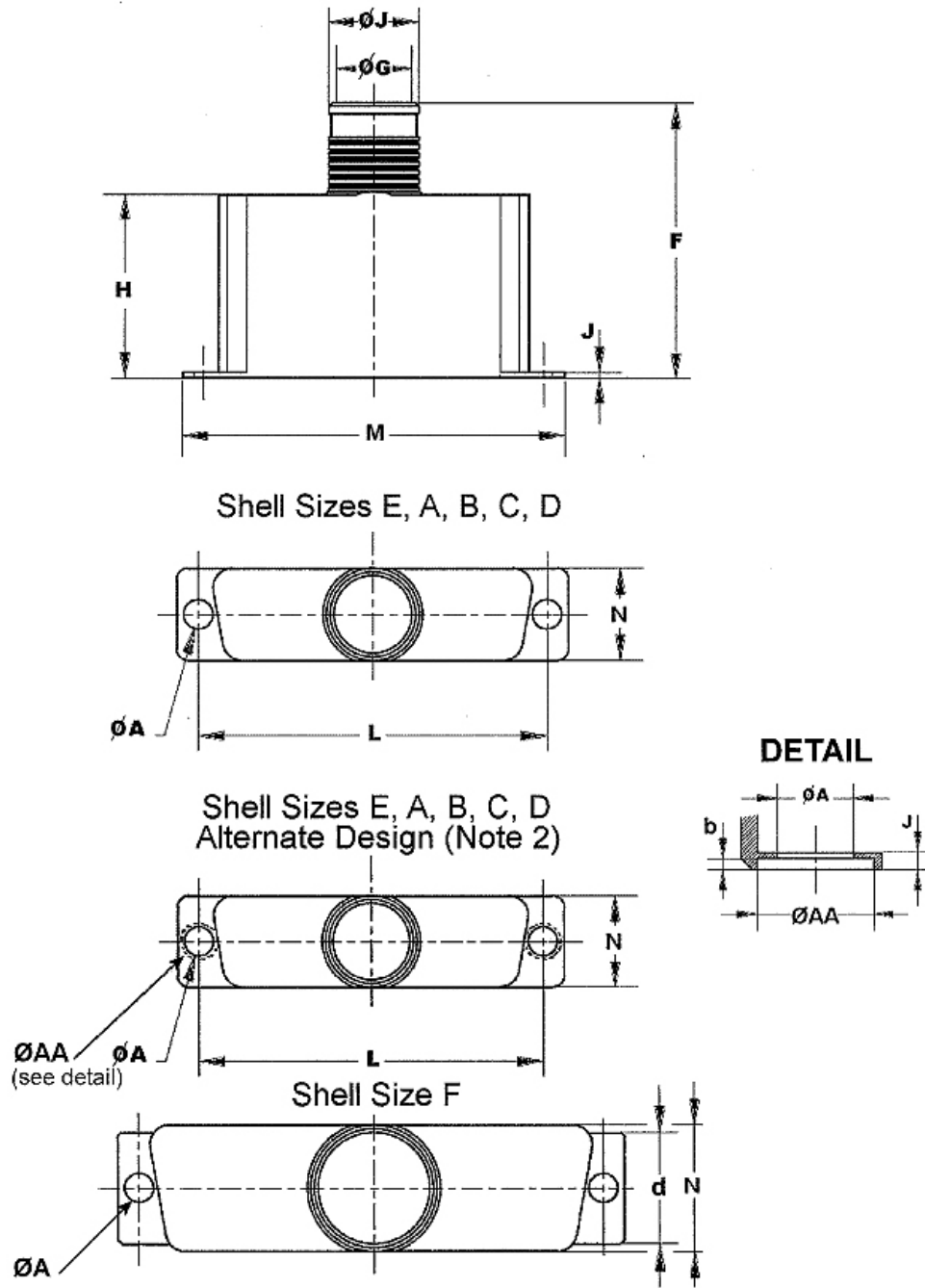
| Shell Size | Variant | | ØA | | ØG | | ØJ | | H | | J | L | |
|------------|--------------|-------------|------|------|-------|-------|-------|-------|-------|-------|------|-------|-------|
| | Right Outlet | Left Outlet | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | | MIN | MAX |
| E | 25 | 30 | 3.91 | 4.03 | 6.47 | 7.23 | 8.51 | 9.26 | 24.64 | 26.16 | 0.89 | 24.86 | 25.12 |
| A | 26 | 31 | 3.91 | 4.03 | 9.65 | 10.41 | 11.68 | 12.44 | 24.64 | 26.16 | 0.89 | 33.19 | 33.45 |
| B | 27 | 32 | 3.91 | 4.03 | 10.28 | 11.04 | 12.32 | 13.08 | 24.64 | 26.16 | 0.89 | 46.91 | 47.17 |
| C | 28 | 33 | 3.91 | 4.03 | 10.28 | 11.04 | 12.32 | 13.08 | 24.64 | 26.16 | 0.89 | 63.37 | 63.63 |
| D | 29 | 34 | 3.91 | 4.03 | 13.05 | 13.81 | 15.08 | 15.84 | 24.64 | 26.16 | 0.89 | 60.98 | 61.25 |
| F | 76 | 76 | 3.91 | 4.03 | 15.05 | 15.81 | 17.08 | 17.84 | 34.64 | 36.16 | 0.89 | 63.37 | 63.63 |

| Shell Size | Variant | | M | | N | | P MAX | Q | ØAA | | b | | d | |
|------------|--------------|-------------|-------|-------|-------|-------|----------|----|------|------|------|------|-------|-------|
| | Right Outlet | Left Outlet | MIN | MAX | MIN | MAX | | | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 25 | 30 | 30.18 | 30.94 | 12.32 | 13.08 | 41.1 | 15 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| A | 26 | 31 | 38.51 | 39.27 | 12.32 | 13.08 | 49.5 | 15 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| B | 27 | 32 | 52.4 | 53.16 | 12.32 | 13.08 | 63.2 | 15 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| C | 28 | 33 | 68.66 | 69.42 | 12.32 | 13.08 | 81 | 15 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| D | 29 | 34 | 66.29 | 67.16 | 15.09 | 15.85 | 77.2 | 15 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| F | 76 | 76 | 68.94 | 69.7 | 17.09 | 17.85 | 80.4 | 15 | - | - | - | - | 15.15 | 15.35 |

NOTES:

1. All dimensions are in millimetres.
2. For Shell Sizes E, A, B, C and D, Shielded Backshells are available with an 'Alternate' (characteristic code 'A') design. See Para. 4.5.3.2.

FIGURE 2(f) – LIGHTWEIGHT SHIELDED BACKSHELL – STRAIGHT CABLE OUTLET



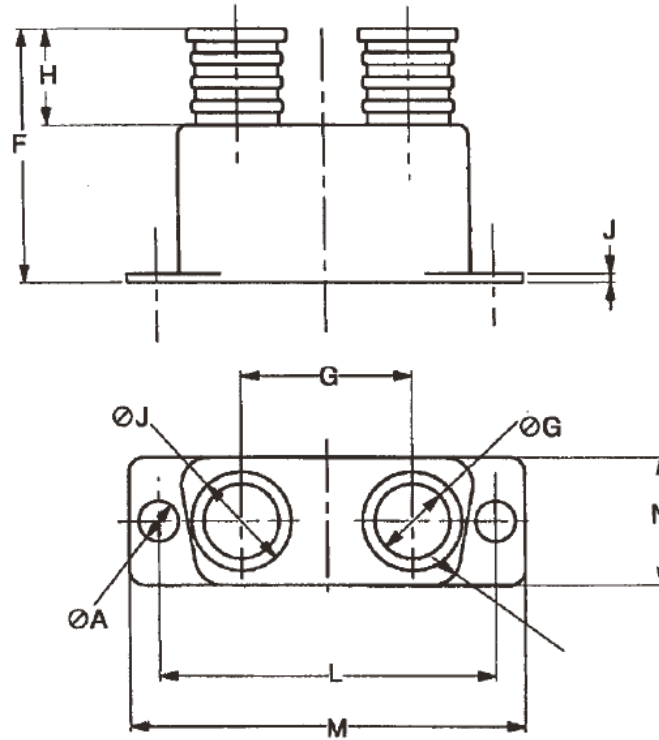
| Shell Size | Variant | ØA | | ØG | | ØJ | | F | H | J | L | |
|------------|---------|------|------|-------|-------|-------|-------|------|------|------|-------|-------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | | | | MIN | MAX |
| E | 35 | 3.91 | 4.03 | 6.47 | 7.23 | 8.51 | 9.27 | 38.1 | 25.4 | 0.89 | 24.86 | 25.12 |
| A | 36 | 3.91 | 4.03 | 9.65 | 10.41 | 11.68 | 12.44 | 38.1 | 25.4 | 0.89 | 33.19 | 33.45 |
| B | 37 | 3.91 | 4.03 | 10.28 | 11.04 | 12.32 | 13.08 | 38.1 | 25.4 | 0.89 | 46.91 | 47.17 |
| C | 38 | 3.91 | 4.03 | 10.28 | 11.04 | 12.32 | 13.08 | 38.1 | 25.4 | 0.89 | 63.37 | 63.63 |
| D | 39 | 3.91 | 4.03 | 13.05 | 13.81 | 15.08 | 15.84 | 38.1 | 25.4 | 0.89 | 60.98 | 61.25 |
| F | 77 | 3.91 | 4.03 | 15.05 | 15.81 | 17.08 | 17.84 | 38.1 | 25.4 | 0.89 | 63.37 | 63.63 |

| Shell Size | Variant | M | | N | | ØAA | | b | | d | |
|------------|---------|-------|-------|-------|-------|------|------|------|------|-------|-------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 35 | 30.18 | 30.94 | 12.32 | 13.08 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| A | 36 | 38.51 | 39.27 | 12.32 | 13.08 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| B | 37 | 52.4 | 53.16 | 12.32 | 13.08 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| C | 38 | 68.66 | 69.42 | 12.32 | 13.08 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| D | 39 | 66.29 | 67.16 | 15.09 | 15.85 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| F | 77 | 68.94 | 69.7 | 17.09 | 17.85 | - | - | - | - | 15.15 | 15.35 |

NOTES:

1. All dimensions are in millimetres.
2. For Shell Sizes E, A, B, C and D, Shielded Backshells are available with an 'Alternate' (characteristic code 'A') design. See Para. 4.5.3.2.

FIGURE 2(g) – LIGHTWEIGHT BACKSHELL, DUAL ENTRY BAND TERMINATION, 15 PIN



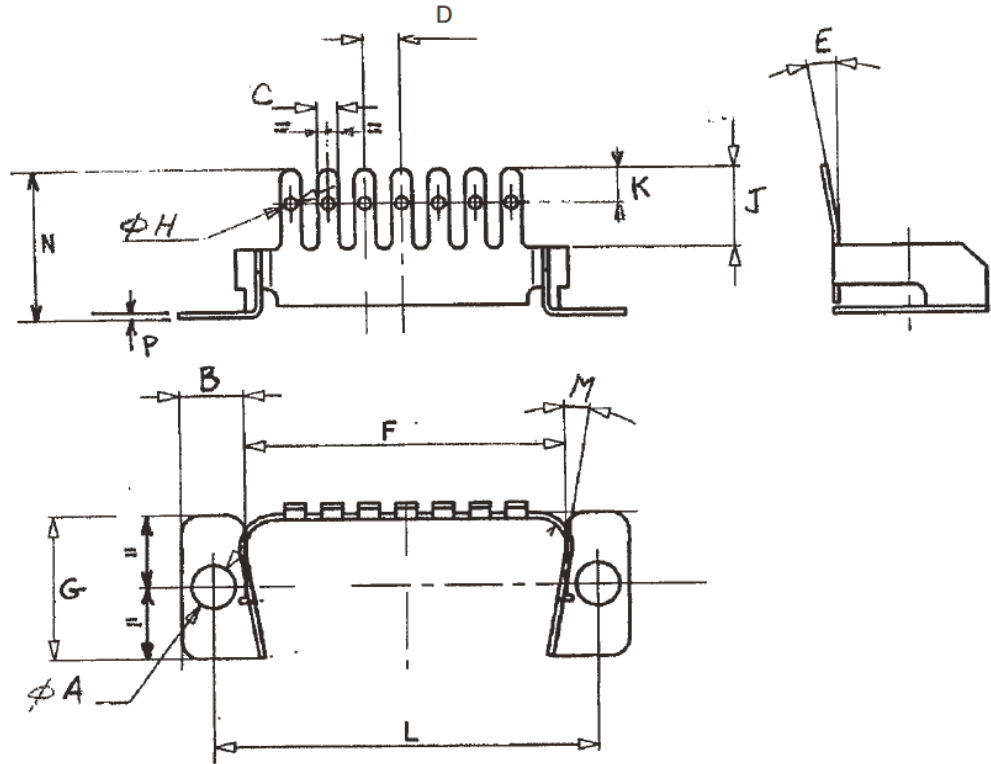
| Shell Size | Variant | ØA | | ØG | | ØJ | | F | G | H |
|------------|---------|------|------|------|------|-----|-------|------|-------|------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | | | |
| A | 40 | 3.92 | 4.02 | 6.99 | 7.75 | 9.4 | 10.16 | 25.4 | 16.89 | 9.65 |

| Shell Size | Variant | J | L | | M | | N | |
|------------|---------|-----|-------|-------|-------|-------|-------|-------|
| | | | MIN | MAX | MIN | MAX | MIN | MAX |
| A | 40 | 0.9 | 33.07 | 33.57 | 38.51 | 39.27 | 12.32 | 13.08 |

NOTES:

1. All dimensions are in millimetres.

FIGURE 2(h) - CASTELLATED BACKSHELL



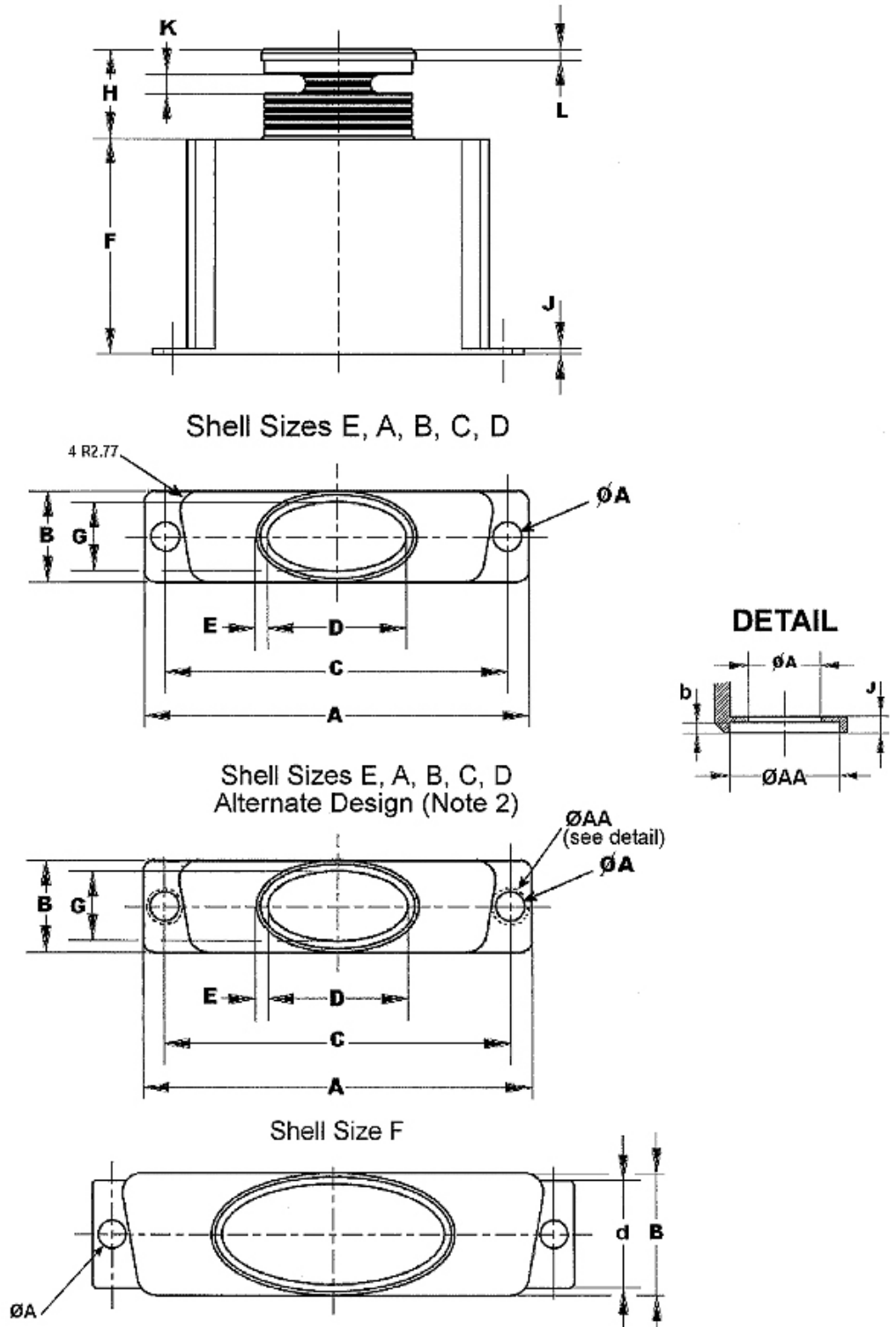
| Shell Size | Variant | ϕA | | B | | C | | D | | No. of Plates | E | | F | |
|------------|---------|----------|-----|------|------|-----|-----|-----|-----|---------------|-----|-----|-------|-------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | | MIN | MAX | MIN | MAX |
| E | 41 | 3.7 | 3.9 | 5.25 | 5.45 | 1.7 | 1.9 | 3.1 | 3.3 | 5 | 10 | 15 | 19.45 | 19.75 |
| A | 42 | 3.7 | 3.9 | 5.25 | 5.45 | 1.7 | 1.9 | 3.1 | 3.3 | 7 | 10 | 15 | 27.7 | 28 |
| B | 43 | 3.7 | 3.9 | 5.25 | 5.45 | 1.7 | 1.9 | 3.1 | 3.3 | 11 | 10 | 15 | 41.35 | 41.65 |
| C | 44 | 3.7 | 3.9 | 5.25 | 5.45 | 1.7 | 1.9 | 3.1 | 3.3 | 16 | 10 | 15 | 57.95 | 58.25 |
| D | 45 | 3.7 | 3.9 | 5.25 | 5.45 | 1.7 | 1.9 | 3.1 | 3.3 | 15 | 10 | 15 | 55.6 | 55.9 |

| Shell Size | Variant | G | | ϕH | | J | | K | | L | | M | | N | | P | |
|------------|---------|------|------|----------|-----|-----|-----|------|------|-------|-------|-----|-----|------|------|-----|-----|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 41 | 12.6 | 12.8 | 0.9 | 1.1 | 6.8 | 7.2 | 2.75 | 3.25 | 24.86 | 25.12 | 9 | 11 | 12.3 | 13.7 | 0.4 | 0.6 |
| A | 42 | 12.6 | 12.8 | 0.9 | 1.1 | 6.8 | 7.2 | 2.75 | 3.25 | 33.19 | 33.45 | 9 | 11 | 12.3 | 13.7 | 0.4 | 0.6 |
| B | 43 | 12.6 | 12.8 | 0.9 | 1.1 | 6.8 | 7.2 | 2.75 | 3.25 | 46.91 | 47.17 | 9 | 11 | 12.3 | 13.7 | 0.4 | 0.6 |
| C | 44 | 12.6 | 12.8 | 0.9 | 1.1 | 6.8 | 7.2 | 2.75 | 3.25 | 63.37 | 63.63 | 9 | 11 | 12.3 | 13.7 | 0.7 | 0.9 |
| D | 45 | 15.3 | 15.5 | 0.9 | 1.1 | 6.8 | 7.2 | 2.75 | 3.25 | 60.98 | 61.24 | 9 | 11 | 12.3 | 13.7 | 0.7 | 0.9 |

NOTES:

1. All dimensions are in millimetres.
2. All angles are in degrees.

FIGURE 2(i) – STRAIGHT LIGHTWEIGHT BACKSHELL ULTRA ELLIPTICAL BAND TERMINATION



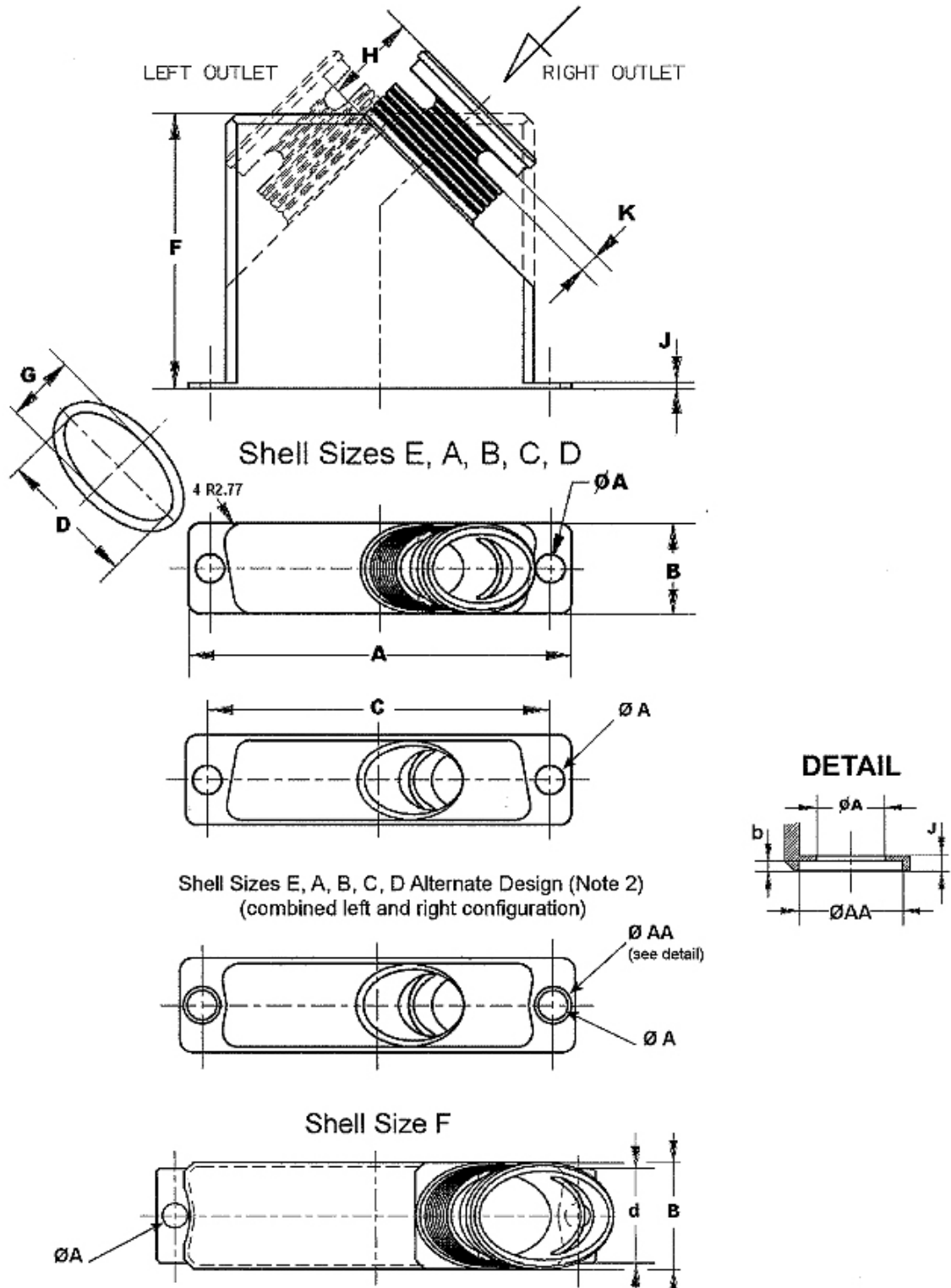
| Shell Size | Variant | ØA | | A | | B | | C | | D | | E | F | G | H | J |
|------------|---------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|-------|------|-------|-----|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | | | | | |
| E | 46 | 3.91 | 4.03 | 30.16 | 30.94 | 12.32 | 13.08 | 24.86 | 25.12 | 12.32 | 13.08 | 1.52 | 30.48 | 9.53 | 12.67 | 0.9 |
| A | 47 | 3.91 | 4.03 | 38.51 | 39.27 | 12.32 | 13.08 | 33.19 | 33.45 | 15.49 | 16.25 | 1.52 | 30.48 | 9.53 | 12.67 | 0.9 |
| B | 48 | 3.91 | 4.03 | 52.4 | 53.16 | 12.32 | 13.08 | 46.89 | 47.17 | 18.67 | 19.43 | 1.52 | 30.48 | 9.53 | 12.67 | 0.9 |
| C | 49 | 3.91 | 4.03 | 68.66 | 69.42 | 12.32 | 13.08 | 63.37 | 63.63 | 25.02 | 25.78 | 1.52 | 30.48 | 9.53 | 12.67 | 0.9 |
| D | 50 | 3.91 | 4.03 | 66.29 | 67.05 | 15.09 | 15.85 | 60.98 | 61.24 | 21.84 | 22.6 | 1.52 | 30.48 | 12.3 | 12.67 | 0.9 |
| F | 78 | 3.91 | 4.03 | 68.94 | 69.7 | 17.09 | 17.85 | 63.37 | 63.63 | 31.62 | 32.38 | 1.52 | 30.48 | 14.3 | 12.67 | 0.9 |

| Shell Size | Variant | K | L | ØAA | | b | | d | |
|------------|---------|------|------|------|------|------|------|-------|-------|
| | | | | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 46 | 2.77 | 1.52 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| A | 47 | 2.77 | 1.52 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| B | 48 | 2.77 | 1.52 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| C | 49 | 2.77 | 1.52 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| D | 50 | 2.77 | 1.52 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| F | 78 | 2.77 | 1.52 | - | - | - | - | 15.15 | 15.35 |

NOTES:

1. All dimensions are in millimetres.
2. For Shell Sizes E, A, B, C and D, Backshells are available with an 'Alternate' (characteristic code 'A') design. See Para. 4.5.3.2.

FIGURE 2(j) – 45° LIGHTWEIGHT BACKSHELL ULTRA ELLIPTICAL BAND TERMINATION



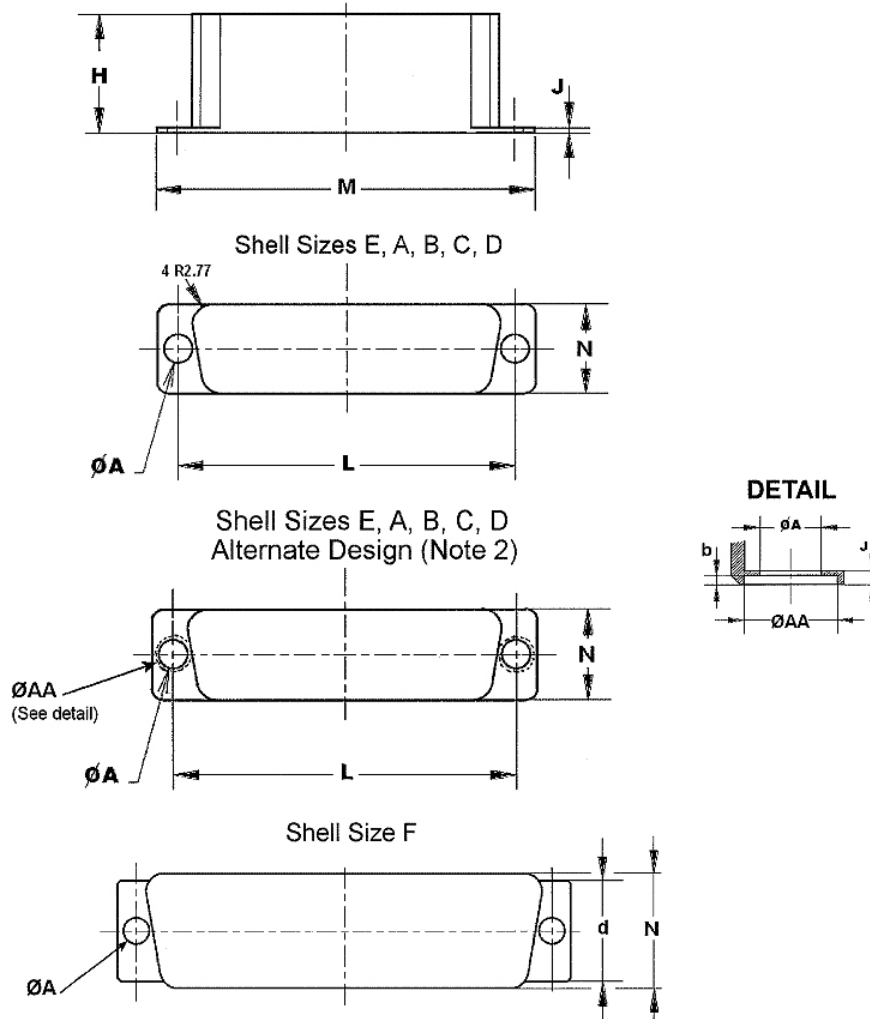
| Shell Size | Variant | | ØA | | A | | B | | C | | D | | F | G |
|------------|--------------|-------------|------|------|-------|-------|-------|-------|-------|-------|-------|-------|------|------|
| | Right Outlet | Left Outlet | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | | |
| E | 51 | 56 | 3.91 | 4.03 | 30.18 | 30.94 | 12.32 | 13.08 | 24.66 | 25.12 | 12.32 | 13.08 | 38.1 | 9.53 |
| A | 52 | 57 | 3.91 | 4.03 | 38.51 | 39.27 | 12.32 | 13.08 | 33.19 | 33.45 | 15.49 | 16.25 | 38.1 | 9.53 |
| B | 53 | 58 | 3.91 | 4.03 | 52.4 | 53.16 | 12.32 | 13.08 | 46.81 | 47.17 | 18.67 | 19.43 | 38.1 | 9.53 |
| C | 54 | 59 | 3.91 | 4.03 | 68.56 | 69.42 | 12.32 | 13.08 | 63.37 | 63.63 | 25.02 | 25.78 | 38.1 | 9.53 |
| D | 55 | 60 | 3.91 | 4.03 | 66.29 | 67.05 | 15.09 | 15.85 | 60.98 | 61.24 | 21.84 | 22.6 | 38.1 | 12.3 |
| F | 79 | 79 | 3.91 | 4.03 | 68.94 | 69.7 | 17.09 | 17.85 | 63.37 | 63.63 | 28.62 | 29.38 | 38.1 | 14.3 |

| Shell Size | Variant | | H | J | K | ØAA | | b | | d | |
|------------|--------------|-------------|-------|-----|------|------|------|------|------|-------|-------|
| | Right Outlet | Left Outlet | | | | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 51 | 56 | 12.67 | 0.9 | 2.77 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| A | 52 | 57 | 12.67 | 0.9 | 2.77 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| B | 53 | 58 | 12.67 | 0.9 | 2.77 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| C | 54 | 59 | 12.67 | 0.9 | 2.77 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| D | 55 | 60 | 12.67 | 0.9 | 2.77 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| F | 79 | 79 | 12.67 | 0.9 | 2.77 | - | - | - | - | 15.15 | 15.35 |

NOTES:

1. All dimensions are in millimetres.
2. For Shell Sizes E, A, B, C and D, Backshells are available with an 'Alternate' (characteristic code 'A') design. See Para. 4.5.3.2.

FIGURE 2(k) – LIGHTWEIGHT D-SUB EXTRA SHORTING CAN



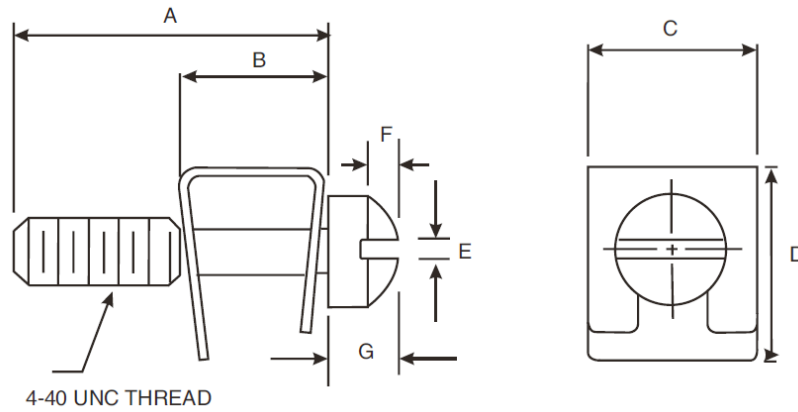
| Shell Size | Variant | ØA | | H | J | L | | M | | N | |
|------------|---------|------|------|-------|-----|-------|-------|-------|-------|-------|-------|
| | | MIN | MAX | | | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 61 | 3.92 | 4.04 | 12.67 | 0.9 | 24.86 | 25.12 | 30.18 | 30.94 | 12.32 | 13.08 |
| A | 62 | 3.92 | 4.04 | 12.67 | 0.9 | 33.19 | 33.45 | 38.51 | 39.27 | 12.32 | 13.08 |
| B | 63 | 3.92 | 4.04 | 12.67 | 0.9 | 46.91 | 47.17 | 52.4 | 53.16 | 12.32 | 13.08 |
| C | 64 | 3.92 | 4.04 | 12.67 | 0.9 | 63.37 | 63.63 | 68.56 | 69.42 | 12.32 | 13.08 |
| D | 65 | 3.92 | 4.04 | 12.67 | 0.9 | 60.98 | 61.24 | 66.29 | 67.05 | 15.09 | 15.85 |
| F | 80 | 3.92 | 4.04 | 12.67 | 0.9 | 63.63 | 68.96 | 68.94 | 69.7 | 17.09 | 17.85 |

| Shell Size | Variant | ØAA | | b | | d | |
|------------|---------|------|------|------|------|-------|-------|
| | | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 61 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| A | 62 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| B | 63 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| C | 64 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| D | 65 | 5.15 | 5.25 | 0.45 | 0.55 | - | - |
| F | 80 | - | - | - | - | 15.15 | 15.35 |

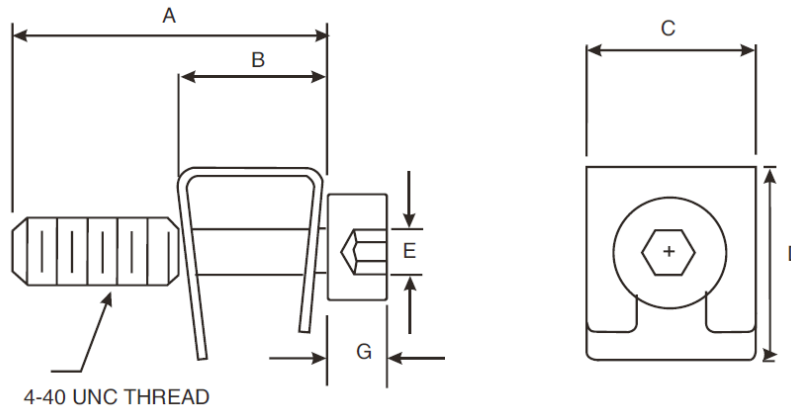
NOTES:

1. All dimensions are in millimetres.
2. For Shell Sizes E, A, B, C and D, D-SUB Extra Shorting Cans are available with an 'Alternate' (characteristic code 'A') design. See Para. 4.5.3.2.

FIGURE 2(L) – MALE SCREW LOCK ASSEMBLY
SLOTTED HEAD



HEX. HEAD

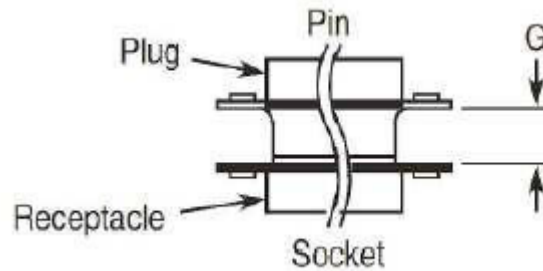


| Variant | Head Type | A | | B | C | | D MAX | E | | F | | G |
|---------|-----------|------|-----|------|------|------|----------|-----------|------|------|------|------|
| | | MIN | MAX | | MIN | MAX | | MIN | MAX | MIN | MAX | |
| 70 | Slotted | 5.97 | 6.5 | 3.35 | 5.58 | 7.11 | 6.8 | 0.78 | 0.99 | 0.89 | 1.22 | 2.75 |
| 71 | Hex. | 5.97 | 6.5 | 3.35 | 5.58 | 7.11 | 6.8 | 2.38 TYP. | | - | - | 2.85 |

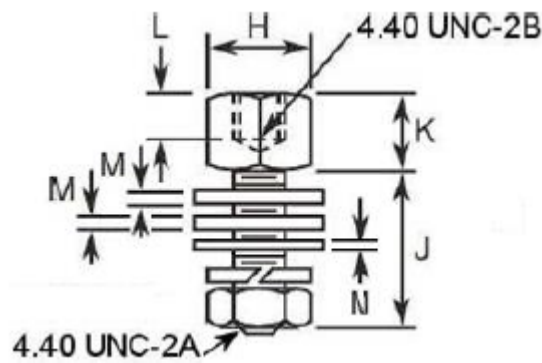
NOTES:

1. All dimensions are in millimetres.

**FIGURE 2(m) – FEMALE SCREW LOCK ASSEMBLY
MATED SPACING BETWEEN SHELL FRONT SURFACES**



FEMALE SCREW LOCK ASSEMBLY (VARIANTS 81 AND 82)

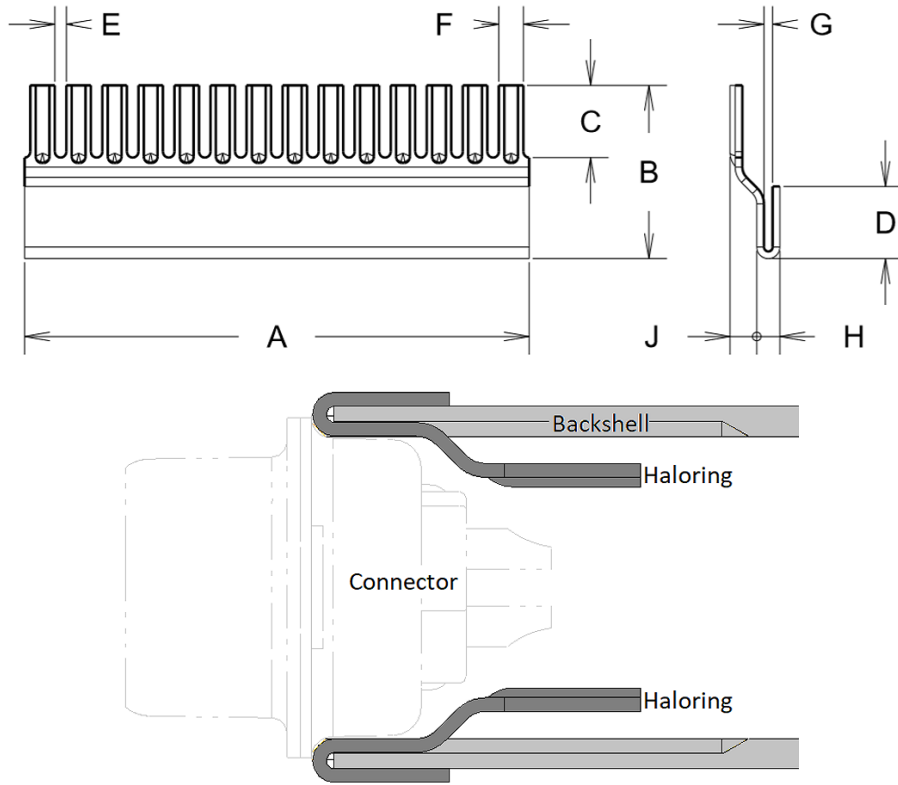


| Dimension | Min | Max | Notes |
|-----------|------|------|-------|
| G | 6.35 | 7.11 | 1 |
| | 6.12 | 6.88 | 2 |
| H | 4.52 | 4.62 | - |
| J | 7.8 | 8.04 | - |
| K | 4.8 | 4.9 | - |
| L | 3.18 | - | - |
| M | 0.78 | 0.82 | 3 |
| N | 0.38 | 0.42 | 3 |

NOTES

1. For shell sizes E and A.
2. For shell sizes B, C and D
3. The spacing between the reference planes of 2 mated connectors shall be adjusted by the use of 3 washers maximum so the spacing is equal to dimension G.
 - Front mounting : Use 2 washers with M thickness
 - Rear mounting panel thickness 1.55 min. / 1.98 max. : No washer is required
 - Rear mounting panel thickness 1.16 min / 1.55 max. : Use 1 washer with N thickness
 - Rear mounting panel thickness 0.77 min. / 1.16 max. : Use 1 washer with M thickness

FIGURE 2(n) – HALORING



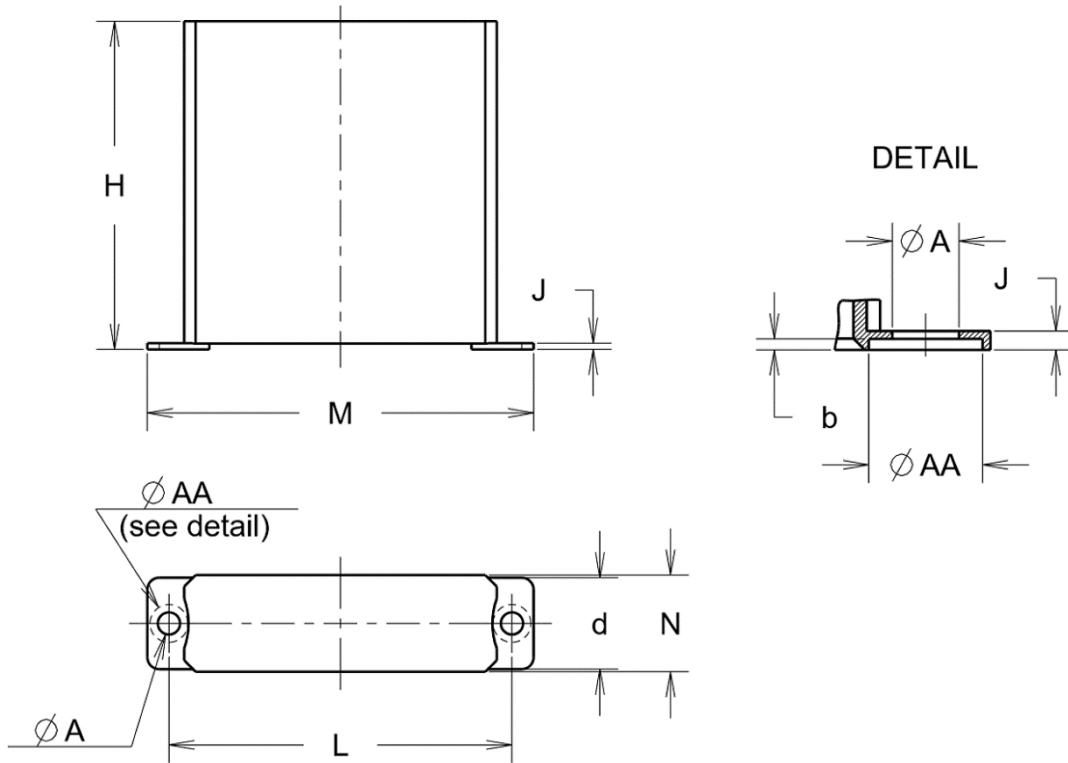
| Shell Size | Variant | A | | B | | C | | D | | E | | F | |
|------------|---------|------|------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 83 | 14.8 | 15.2 | 11.7 | 12.3 | 4.8 | 5.2 | 4.7 | 5.3 | 0.7 | 0.9 | 1.6 | 1.8 |
| A | 84 | 22.3 | 22.7 | 11.7 | 12.3 | 4.8 | 5.2 | 4.7 | 5.3 | 0.7 | 0.9 | 1.6 | 1.8 |
| B | 85 | 34.8 | 35.2 | 11.7 | 12.3 | 4.8 | 5.2 | 4.7 | 5.3 | 0.7 | 0.9 | 1.6 | 1.8 |
| C & D | 86 | 47.3 | 47.7 | 11.7 | 12.3 | 4.8 | 5.2 | 4.7 | 5.3 | 0.7 | 0.9 | 1.6 | 1.8 |
| F | 87 | 52.3 | 52.7 | 14.7 | 15.3 | 4.8 | 5.2 | 4.7 | 5.3 | 0.7 | 0.9 | 1.6 | 1.8 |

| Shell Size | Variant | G | | H | | J | | Number of Plates |
|------------|---------|-----|-----|-----|-----|-----|-----|------------------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | |
| E | 83 | 0.5 | 0.7 | 1.5 | 1.7 | 1.7 | 2 | 6 |
| A | 84 | 0.5 | 0.7 | 1.5 | 1.7 | 1.7 | 2 | 9 |
| B | 85 | 0.5 | 0.7 | 1.5 | 1.7 | 1.7 | 2 | 14 |
| C & D | 86 | 0.5 | 0.7 | 1.5 | 1.7 | 1.7 | 2 | 19 |
| F | 87 | 0.5 | 0.7 | 1.5 | 1.7 | 1.7 | 2 | 21 |

NOTES:

1. All dimensions are in millimetres.

FIGURE 2(o) – HALORING BACKSHELL - LIGHTWEIGHT D-SUB SHORTING CAN

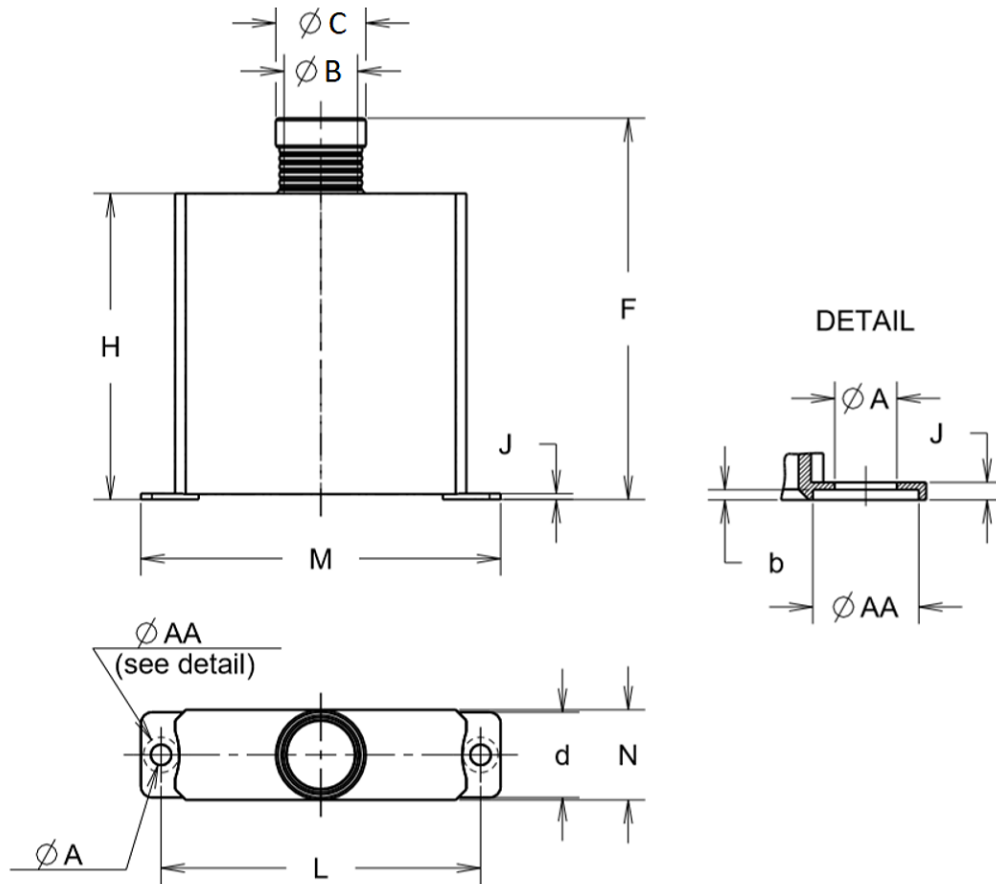


| Shell Size | Variant | ØA | | H | J | L | | M | | N | | ØAA | | b | | d | |
|------------|---------|-----|-----|----|-----|-------|-------|-------|-------|-------|-------|------|------|------|------|-------|-------|
| | | MIN | MAX | | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 88 | 3 | 3.1 | 45 | 0.9 | 24.86 | 25.12 | 30.18 | 30.94 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| A | 89 | 3 | 3.1 | 45 | 0.9 | 33.19 | 33.45 | 38.51 | 39.27 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| B | 90 | 3 | 3.1 | 45 | 0.9 | 46.91 | 47.17 | 52.4 | 53.16 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| C | 91 | 3 | 3.1 | 45 | 0.9 | 63.37 | 63.63 | 68.66 | 69.42 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| D | 92 | 3 | 3.1 | 45 | 0.9 | 60.98 | 61.25 | 66.29 | 67.05 | 15.26 | 15.46 | 5.15 | 5.25 | 0.45 | 0.55 | 15.25 | 15.45 |
| F | 93 | 3 | 3.1 | 45 | 0.9 | 63.37 | 63.63 | 68.94 | 69.7 | 17.96 | 18.16 | - | - | - | - | 17.25 | 17.45 |

NOTES:

1. All dimensions are in millimetres.

FIGURE 2(p) – HALORING BACKSHELL - STRAIGHT CIRCULAR CABLE OUTLET



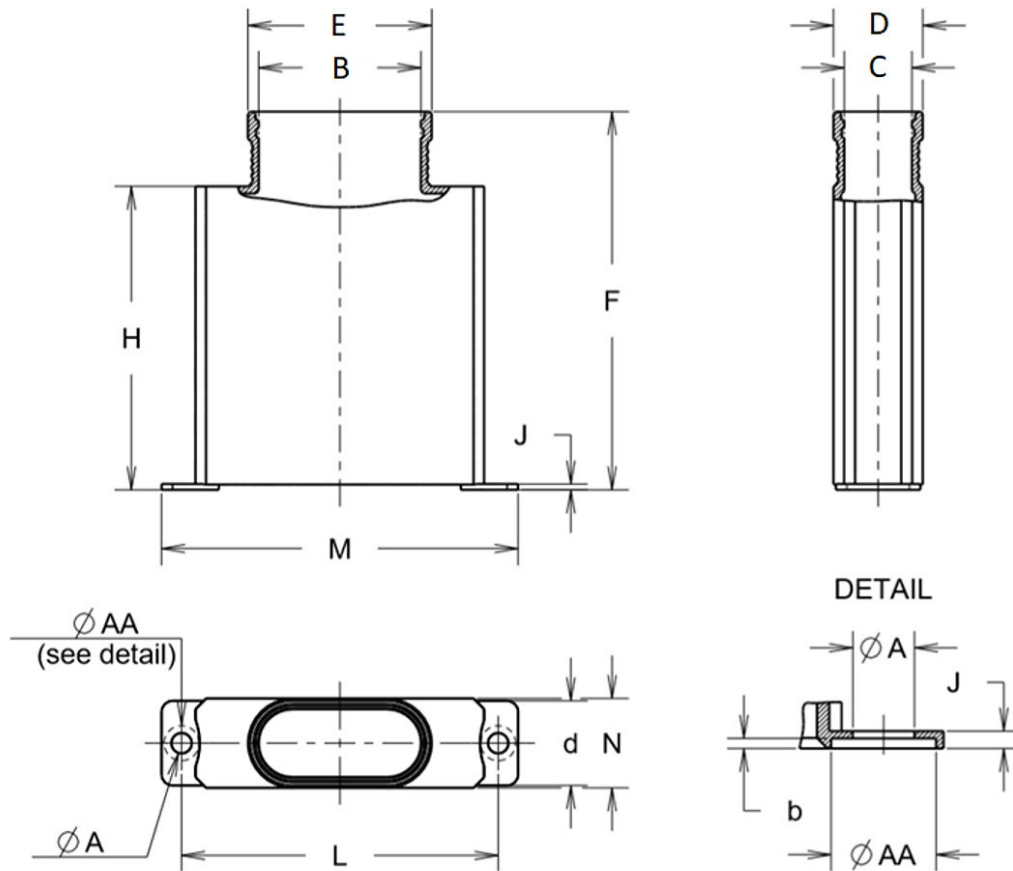
| Shell Size | Variant | ØA | | ØB | | ØC | | F | H | J | L | |
|------------|---------|-----|-----|-------|-------|-------|-------|------|----|-----|-------|-------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | | | | MIN | MAX |
| E | 94 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 56.1 | 45 | 0.9 | 24.86 | 25.12 |
| A | 95 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 56.1 | 45 | 0.9 | 33.19 | 33.45 |
| B | 96 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 56.1 | 45 | 0.9 | 46.91 | 47.17 |
| C | 97 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 56.1 | 45 | 0.9 | 63.37 | 63.63 |
| D | 98 | 3 | 3.1 | 12.75 | 12.95 | 15.26 | 15.46 | 56.1 | 45 | 0.9 | 60.98 | 61.25 |
| F | 99 | 3 | 3.1 | 14.75 | 14.95 | 17.96 | 18.16 | 56.1 | 45 | 0.9 | 63.37 | 63.63 |

| Shell Size | Variant | M | | N | | ØAA | | b | | d | |
|------------|---------|-------|-------|-------|-------|------|------|------|------|-------|-------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 94 | 30.18 | 30.94 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| A | 95 | 38.51 | 39.27 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| B | 96 | 52.4 | 53.16 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| C | 97 | 68.66 | 69.42 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| D | 98 | 66.29 | 67.05 | 15.26 | 15.46 | 5.15 | 5.25 | 0.45 | 0.55 | 15.25 | 15.45 |
| F | 99 | 68.94 | 69.7 | 17.96 | 18.16 | - | - | - | - | 17.25 | 17.45 |

NOTES:

1. All dimensions are in millimetres.

FIGURE 2(q) – HALORING BACKSHELL - STRAIGHT ELLIPTICAL CABLE OUTLET



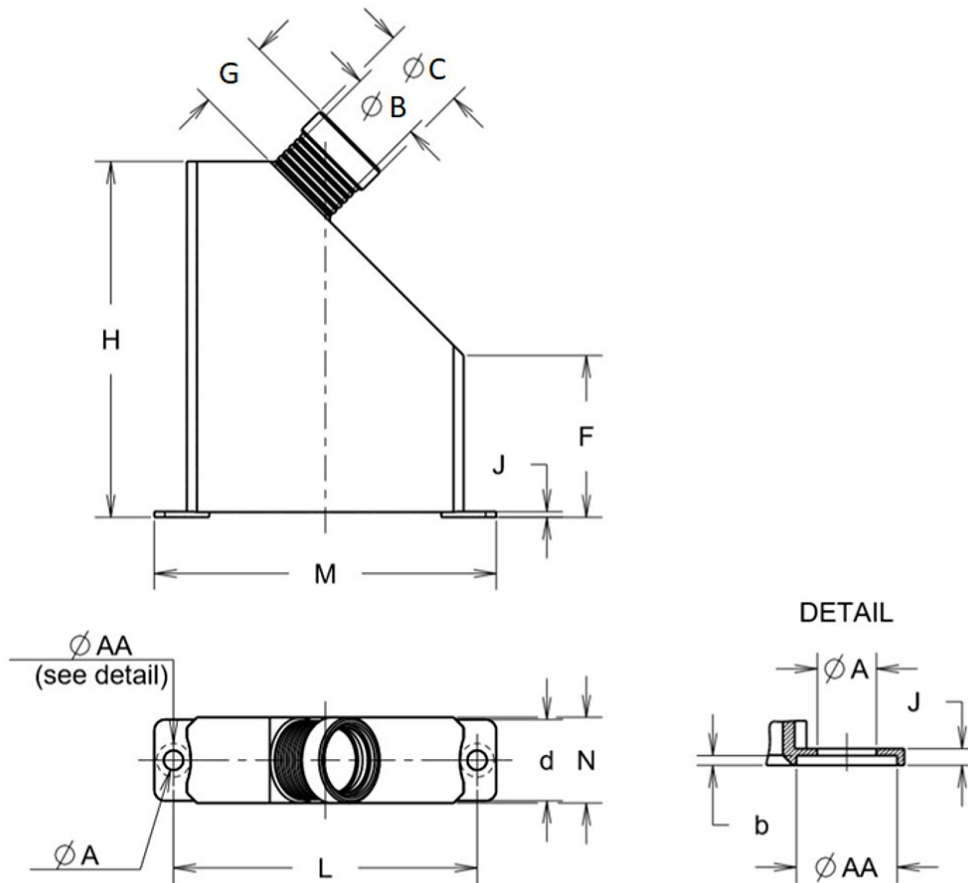
| Shell Size | Variant | ØA | | B | | C | | D | | E | | F | H | J |
|------------|---------|-----|-----|-------|-------|------|-------|-------|-------|-------|-------|------|----|-----|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | | | |
| E | 100 | 3 | 3.1 | 16.45 | 16.75 | 9.95 | 10.15 | 13.16 | 13.36 | 19.66 | 19.96 | 56.1 | 45 | 0.9 |
| A | 101 | 3 | 3.1 | 23.95 | 24.25 | 9.95 | 10.15 | 13.16 | 13.36 | 27.16 | 27.46 | 56.1 | 45 | 0.9 |
| B | 102 | 3 | 3.1 | 23.95 | 24.25 | 9.95 | 10.15 | 13.16 | 13.36 | 27.16 | 27.46 | 56.1 | 45 | 0.9 |
| C | 103 | 3 | 3.1 | 23.95 | 24.25 | 9.95 | 10.15 | 13.16 | 13.36 | 27.16 | 27.46 | 56.1 | 45 | 0.9 |
| D | 104 | 3 | 3.1 | 33.95 | 34.25 | 9.95 | 10.15 | 13.16 | 13.36 | 37.16 | 37.46 | 56.1 | 45 | 0.9 |
| F | 105 | 3 | 3.1 | 37.45 | 37.75 | 9.95 | 10.15 | 13.16 | 13.36 | 40.66 | 40.96 | 56.1 | 45 | 0.9 |

| Shell Size | Variant | L | | M | | N | | ØAA | | b | | d | |
|------------|---------|-------|-------|-------|-------|-------|-------|------|------|------|------|-------|-------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 100 | 24.86 | 25.12 | 30.18 | 30.94 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| A | 101 | 33.19 | 33.45 | 38.51 | 39.27 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| B | 102 | 46.91 | 47.17 | 52.4 | 53.16 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| C | 103 | 63.37 | 63.63 | 68.66 | 69.42 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| D | 104 | 60.98 | 61.25 | 66.29 | 67.05 | 15.26 | 15.46 | 5.15 | 5.25 | 0.45 | 0.55 | 15.25 | 15.45 |
| F | 105 | 63.37 | 63.63 | 68.94 | 69.7 | 17.96 | 18.16 | - | - | - | - | 17.25 | 17.45 |

NOTES:

1. All dimensions are in millimetres.

FIGURE 2(r) – HALORING BACKSHELL - 45° CIRCULAR LONGITUDINAL CABLE OUTLET



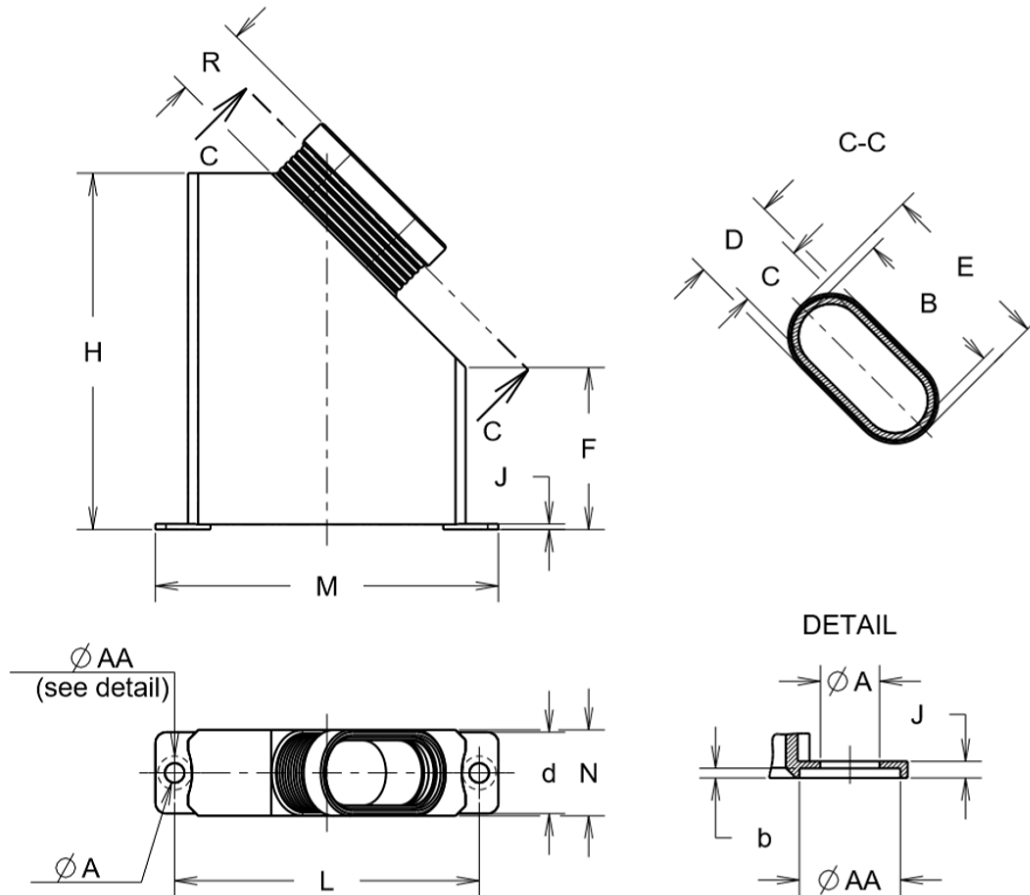
| Shell Size | Variant | ϕA | | ϕB | | ϕC | | F | G | | H | J |
|------------|---------|----------|-----|----------|-------|----------|-------|----|-----|------|----|-----|
| | | MIN | MAX | MIN | MAX | MIN | MAX | | MIN | MAX | | |
| E | 106 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 40 | 11 | 11.2 | 55 | 0.9 |
| A | 107 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 35 | 11 | 11.2 | 55 | 0.9 |
| B | 108 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 25 | 11 | 11.2 | 55 | 0.9 |
| C | 109 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 20 | 11 | 11.2 | 55 | 0.9 |
| D | 110 | 3 | 3.1 | 12.75 | 12.95 | 15.26 | 15.46 | 20 | 11 | 11.2 | 55 | 0.9 |
| F | 111 | 3 | 3.1 | 14.75 | 14.95 | 17.96 | 18.16 | 20 | 11 | 11.2 | 55 | 0.9 |

| Shell Size | Variant | L | | M | | N | | ϕAA | | b | | d | |
|------------|---------|-------|-------|-------|-------|-------|-------|-----------|------|------|------|-------|-------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 106 | 24.86 | 25.12 | 30.18 | 30.94 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| A | 107 | 33.19 | 33.45 | 38.51 | 39.27 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| B | 108 | 46.91 | 47.17 | 52.4 | 53.16 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| C | 109 | 63.37 | 63.63 | 68.66 | 69.42 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| D | 110 | 60.98 | 61.25 | 66.29 | 67.05 | 15.26 | 15.46 | 5.15 | 5.25 | 0.45 | 0.55 | 15.25 | 15.45 |
| F | 111 | 63.37 | 63.63 | 68.94 | 69.7 | 17.96 | 18.16 | - | - | - | - | 17.25 | 17.45 |

NOTES:

1. All dimensions are in millimetres.

FIGURE 2(s) – HALORING BACKSHELL - 45° ELLIPTICAL LONGITUDINAL CABLE OUTLET



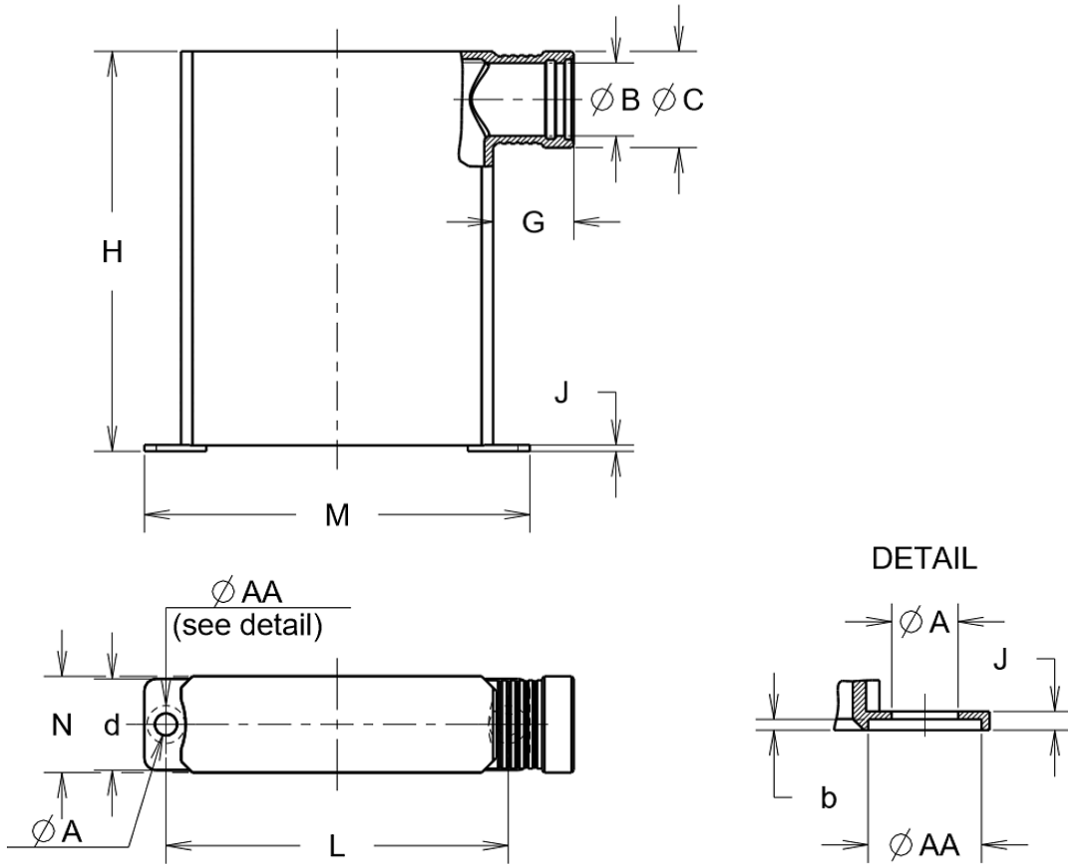
| Shell Size | Variant | ØA | | B | | C | | D | | E | | F | H | J |
|------------|---------|-----|-----|-------|-------|------|-------|-------|-------|-------|-------|----|----|-----|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | | | |
| E | 112 | 3 | 3.1 | 16.45 | 16.75 | 9.95 | 10.15 | 13.16 | 13.36 | 19.66 | 19.96 | 40 | 55 | 0.9 |
| A | 113 | 3 | 3.1 | 23.95 | 24.25 | 9.95 | 10.15 | 13.16 | 13.36 | 27.16 | 27.46 | 35 | 55 | 0.9 |
| B | 114 | 3 | 3.1 | 23.95 | 24.25 | 9.95 | 10.15 | 13.16 | 13.36 | 27.16 | 27.46 | 25 | 55 | 0.9 |
| C | 115 | 3 | 3.1 | 23.95 | 24.25 | 9.95 | 10.15 | 13.16 | 13.36 | 27.16 | 27.46 | 20 | 55 | 0.9 |
| D | 116 | 3 | 3.1 | 33.95 | 34.25 | 9.95 | 10.15 | 13.16 | 13.36 | 37.16 | 37.46 | 20 | 55 | 0.9 |
| F | 117 | 3 | 3.1 | 37.45 | 37.75 | 9.95 | 10.15 | 13.16 | 13.36 | 40.66 | 40.96 | 20 | 55 | 0.9 |

| Shell Size | Variant | L | | M | | N | | ØAA | | b | | d | |
|------------|---------|-------|-------|-------|-------|-------|-------|------|------|------|------|-------|-------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 112 | 24.86 | 25.12 | 30.18 | 30.94 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| A | 113 | 33.19 | 33.45 | 38.51 | 39.27 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| B | 114 | 46.91 | 47.17 | 52.4 | 53.16 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| C | 115 | 63.37 | 63.63 | 68.66 | 69.42 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| D | 116 | 60.98 | 61.25 | 66.29 | 67.05 | 15.26 | 15.46 | 5.15 | 5.25 | 0.45 | 0.55 | 15.25 | 15.45 |
| F | 117 | 63.37 | 63.63 | 68.94 | 69.7 | 17.96 | 18.16 | - | - | - | - | 17.25 | 17.45 |

NOTES:

1. All dimensions are in millimetres.

FIGURE 2(t) – HALORING BACKSHELL - 90° CIRCULAR LONGITUDINAL CABLE OUTLET



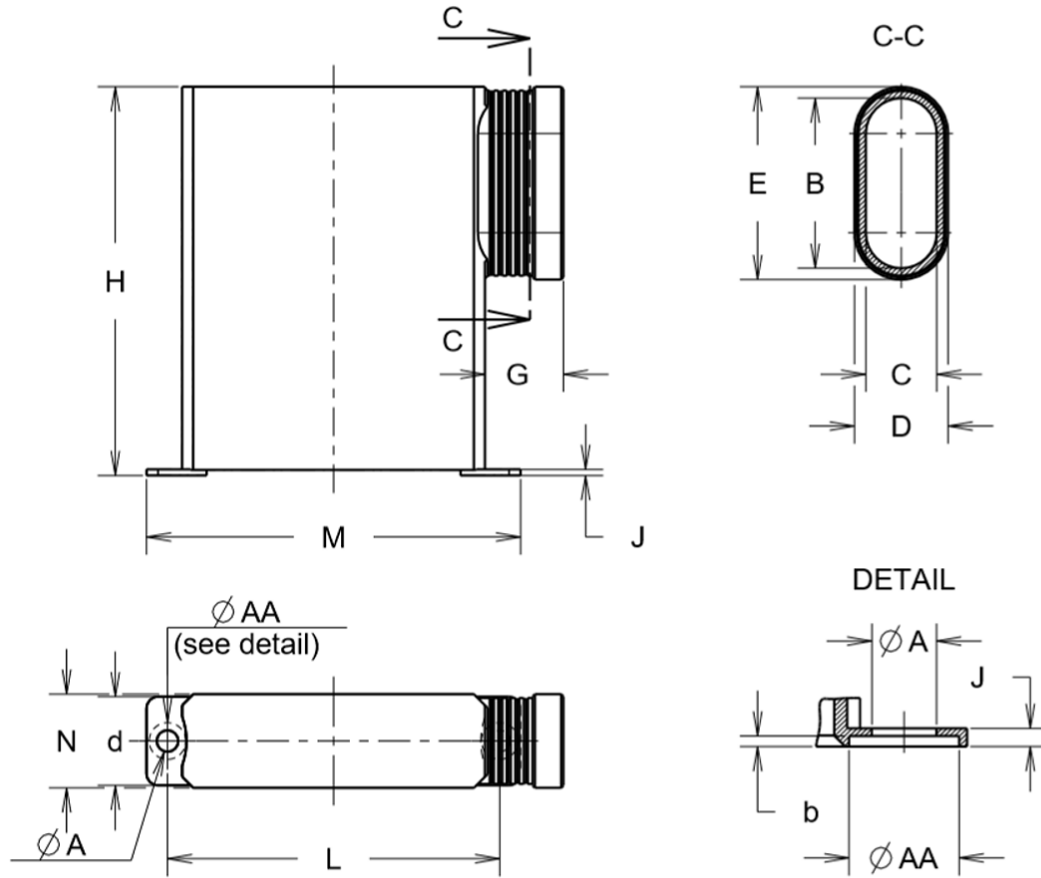
| Shell Size | Variant | ØA | | ØB | | ØC | | G | | H | J |
|------------|---------|-----|-----|-------|-------|-------|-------|-----|------|----|-----|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | | |
| E | 118 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 11 | 11.2 | 55 | 0.9 |
| A | 119 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 11 | 11.2 | 55 | 0.9 |
| B | 120 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 11 | 11.2 | 55 | 0.9 |
| C | 121 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 11 | 11.2 | 55 | 0.9 |
| D | 122 | 3 | 3.1 | 12.75 | 12.95 | 15.26 | 15.46 | 11 | 11.2 | 55 | 0.9 |
| F | 123 | 3 | 3.1 | 14.75 | 14.95 | 17.96 | 18.16 | 11 | 11.2 | 55 | 0.9 |

| Shell Size | Variant | L | | M | | N | | ØAA | | b | | d | |
|------------|---------|-------|-------|-------|-------|-------|-------|------|------|------|------|-------|-------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 118 | 24.86 | 25.12 | 30.18 | 30.94 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| A | 119 | 33.19 | 33.45 | 38.51 | 39.27 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| B | 120 | 46.91 | 47.17 | 52.4 | 53.16 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| C | 121 | 63.37 | 63.63 | 68.66 | 69.42 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| D | 122 | 60.98 | 61.25 | 66.29 | 67.05 | 15.26 | 15.46 | 5.15 | 5.25 | 0.45 | 0.55 | 15.25 | 15.45 |
| F | 123 | 63.37 | 63.63 | 68.94 | 69.7 | 17.96 | 18.16 | - | - | - | - | 17.25 | 17.45 |

NOTES:

1. All dimensions are in millimetres.

FIGURE 2(u) – HALORING BACKSHELL - 90° ELLIPTICAL LONGITUDINAL CABLE OUTLET



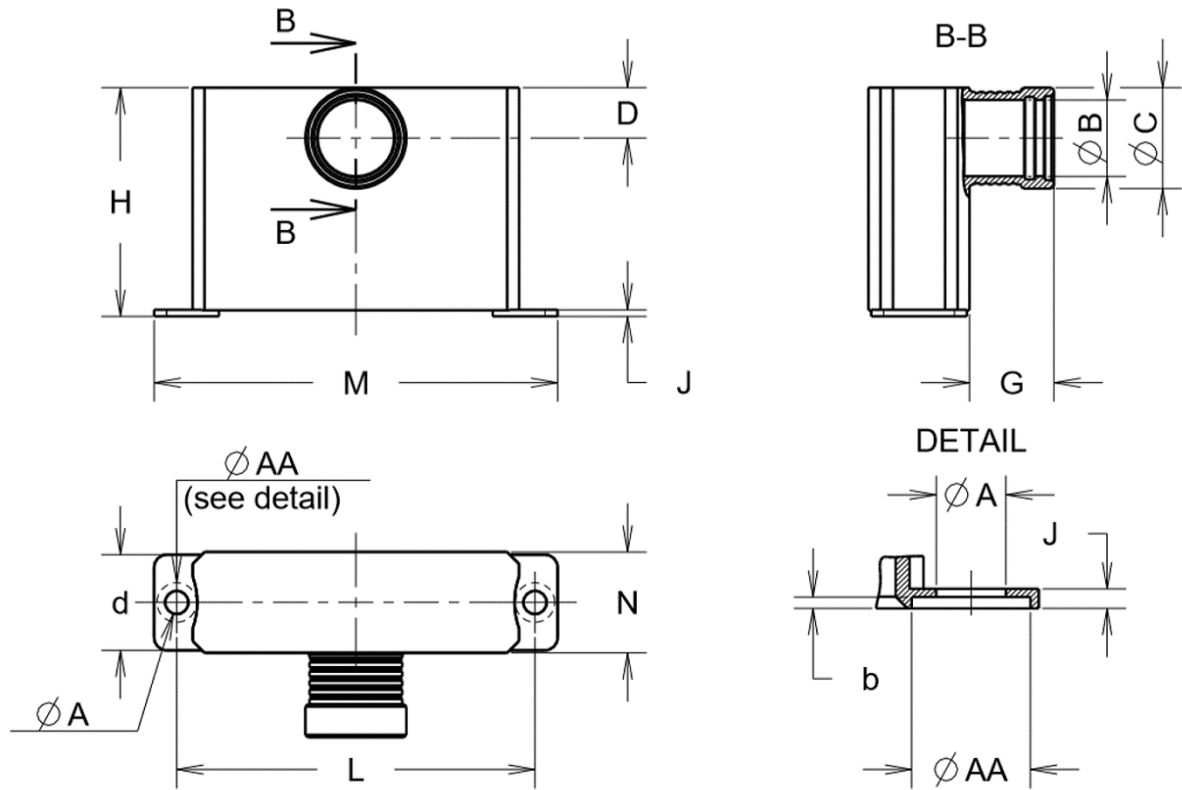
| Shell Size | Variant | ØA | | B | | C | | D | | E | | G | | H |
|------------|---------|-----|-----|-------|-------|------|-------|-------|-------|-------|-------|-----|------|----|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | |
| E | 124 | 3 | 3.1 | 16.45 | 16.75 | 9.95 | 10.15 | 13.16 | 13.36 | 19.66 | 19.96 | 11 | 11.2 | 55 |
| A | 125 | 3 | 3.1 | 23.95 | 24.25 | 9.95 | 10.15 | 13.16 | 13.36 | 27.16 | 27.46 | 11 | 11.2 | 55 |
| B | 126 | 3 | 3.1 | 23.95 | 24.25 | 9.95 | 10.15 | 13.16 | 13.36 | 27.16 | 27.46 | 11 | 11.2 | 55 |
| C | 127 | 3 | 3.1 | 23.95 | 24.25 | 9.95 | 10.15 | 13.16 | 13.36 | 27.16 | 27.46 | 11 | 11.2 | 55 |
| D | 128 | 3 | 3.1 | 33.95 | 34.25 | 9.95 | 10.15 | 13.16 | 13.36 | 37.16 | 37.46 | 11 | 11.2 | 55 |
| F | 129 | 3 | 3.1 | 33.95 | 34.25 | 9.95 | 10.15 | 13.16 | 13.36 | 37.16 | 37.46 | 11 | 11.2 | 55 |

| Shell Size | Variant | J | L | | M | | N | | ØAA | | b | | d | |
|------------|---------|-----|-------|-------|-------|-------|-------|-------|------|------|------|------|-------|-------|
| | | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 124 | 0.9 | 24.86 | 25.12 | 30.18 | 30.94 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| A | 125 | 0.9 | 33.19 | 33.45 | 38.51 | 39.27 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| B | 126 | 0.9 | 46.91 | 47.17 | 52.4 | 53.16 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| C | 127 | 0.9 | 63.37 | 63.63 | 68.66 | 69.42 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| D | 128 | 0.9 | 60.98 | 61.25 | 66.29 | 67.05 | 15.26 | 15.46 | 5.15 | 5.25 | 0.45 | 0.55 | 15.25 | 15.45 |
| F | 129 | 0.9 | 63.37 | 63.63 | 68.94 | 69.7 | 17.96 | 18.16 | - | - | - | - | 17.25 | 17.45 |

NOTES:

1. All dimensions are in millimetres.

FIGURE 2(v) – HALORING BACKSHELL - 90° CIRCULAR TOP CABLE OUTLET



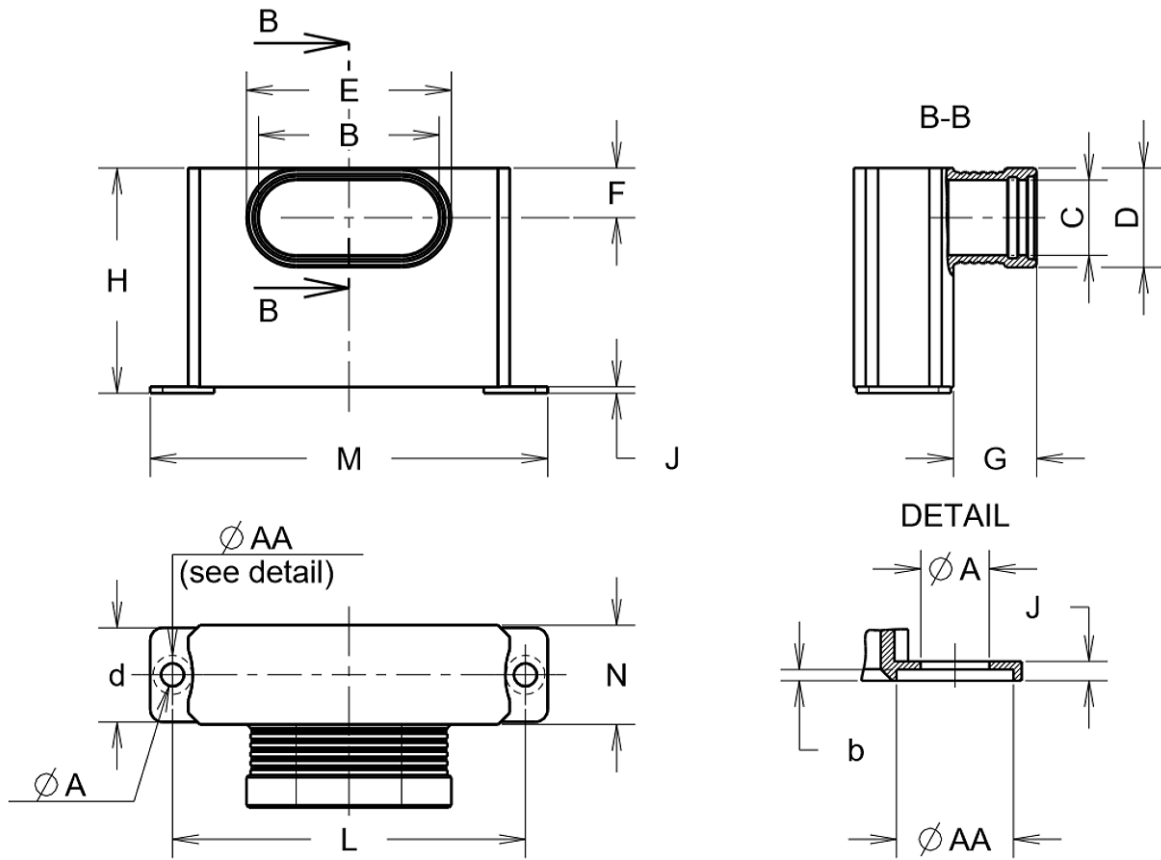
| Shell Size | Variant | ØA | | ØB | | ØC | | D | | G | | H | J |
|------------|---------|-----|-----|-------|-------|-------|-------|-----|-----|-----|------|----|-----|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | | |
| E | 130 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 6.5 | 6.7 | 11 | 11.2 | 30 | 0.9 |
| A | 131 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 6.5 | 6.7 | 11 | 11.2 | 30 | 0.9 |
| B | 132 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 6.5 | 6.7 | 11 | 11.2 | 30 | 0.9 |
| C | 133 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 6.5 | 6.7 | 11 | 11.2 | 30 | 0.9 |
| D | 134 | 3 | 3.1 | 12.75 | 12.95 | 15.26 | 15.46 | 7.9 | 8.1 | 11 | 11.2 | 30 | 0.9 |
| F | 135 | 3 | 3.1 | 14.75 | 14.95 | 17.96 | 18.16 | 8.9 | 9.1 | 11 | 11.2 | 30 | 0.9 |

| Shell Size | Variant | L | | M | | N | | ØAA | | b | | d | |
|------------|---------|-------|-------|-------|-------|-------|-------|------|------|------|------|-------|-------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 130 | 24.86 | 25.12 | 30.18 | 30.94 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| A | 131 | 33.19 | 33.45 | 38.51 | 39.27 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| B | 132 | 46.91 | 47.17 | 52.4 | 53.16 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| C | 133 | 63.37 | 63.63 | 68.66 | 69.42 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| D | 134 | 60.98 | 61.25 | 66.29 | 67.05 | 15.26 | 15.46 | 5.15 | 5.25 | 0.45 | 0.55 | 15.25 | 15.45 |
| F | 135 | 63.37 | 63.63 | 68.94 | 69.7 | 17.96 | 18.16 | - | - | - | - | 17.25 | 17.45 |

NOTES:

1. All dimensions are in millimetres.

FIGURE 2(w) – HALORING BACKSHELL - 90° ELLIPTICAL TOP CABLE OUTLET



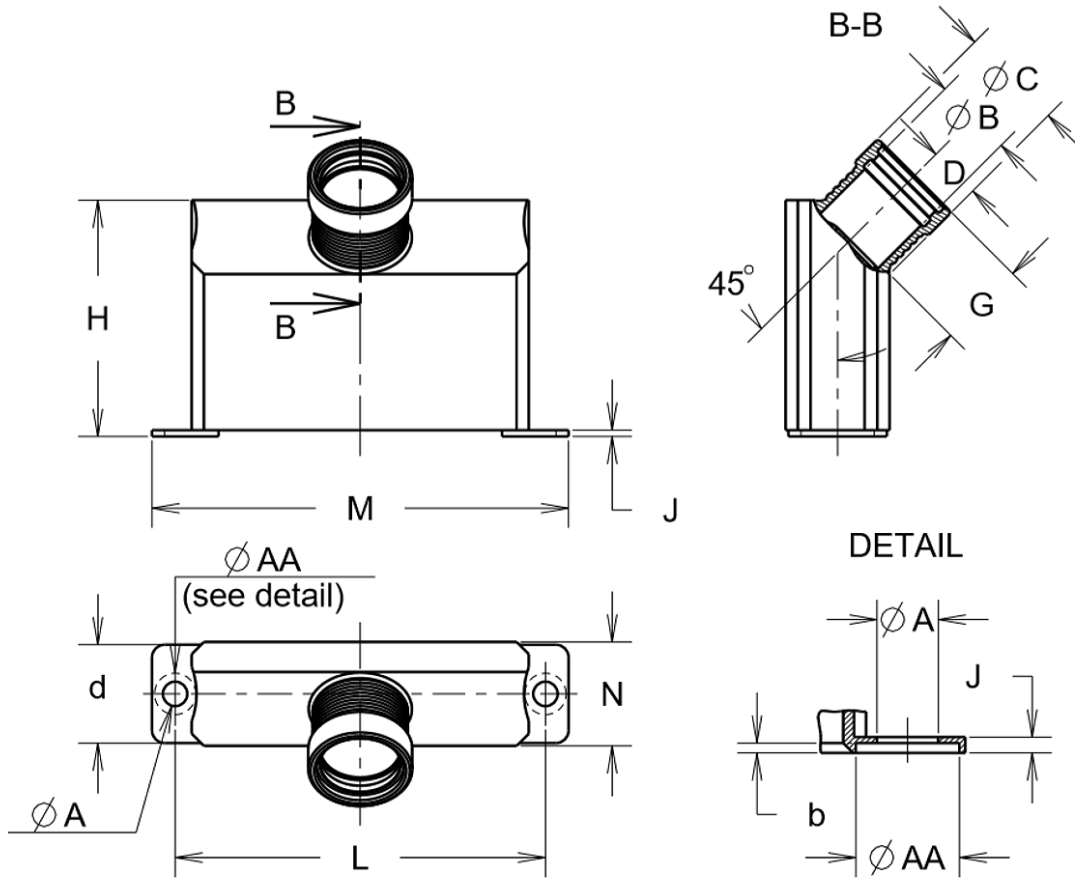
| Shell Size | Variant | ØA | | B | | C | | D | | E | | F | | G | | H |
|------------|---------|-----|-----|-------|-------|------|-------|-------|-------|-------|-------|-----|-----|-----|------|----|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | |
| E | 136 | 3 | 3.1 | 11.7 | 12 | 9.95 | 10.15 | 13.16 | 13.36 | 14.91 | 15.21 | 6.5 | 6.7 | 11 | 11.2 | 30 |
| A | 137 | 3 | 3.1 | 16.45 | 16.75 | 9.95 | 10.15 | 13.16 | 13.36 | 19.66 | 19.96 | 6.5 | 6.7 | 11 | 11.2 | 30 |
| B | 138 | 3 | 3.1 | 23.95 | 24.25 | 9.95 | 10.15 | 13.16 | 13.36 | 27.16 | 27.46 | 6.5 | 6.7 | 11 | 11.2 | 30 |
| C | 139 | 3 | 3.1 | 23.95 | 24.25 | 9.95 | 10.15 | 13.16 | 13.36 | 27.16 | 27.46 | 6.5 | 6.7 | 11 | 11.2 | 30 |
| D | 140 | 3 | 3.1 | 33.95 | 34.25 | 9.95 | 10.15 | 13.16 | 13.36 | 37.16 | 37.46 | 6.5 | 6.7 | 11 | 11.2 | 30 |
| F | 141 | 3 | 3.1 | 33.95 | 34.25 | 9.95 | 10.15 | 13.16 | 13.36 | 37.16 | 37.46 | 6.5 | 6.7 | 11 | 11.2 | 30 |

| Shell Size | Variant | J | L | | M | | N | | ØAA | | b | | d | |
|------------|---------|-----|-------|-------|-------|-------|-------|-------|------|------|------|------|-------|-------|
| | | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 136 | 0.9 | 24.86 | 25.12 | 30.18 | 30.94 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| A | 137 | 0.9 | 33.19 | 33.45 | 38.51 | 39.27 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| B | 138 | 0.9 | 46.91 | 47.17 | 52.4 | 53.16 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| C | 139 | 0.9 | 63.37 | 63.63 | 68.66 | 69.42 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| D | 140 | 0.9 | 60.98 | 61.25 | 66.29 | 67.05 | 15.26 | 15.46 | 5.15 | 5.25 | 0.45 | 0.55 | 15.25 | 15.45 |
| F | 141 | 0.9 | 63.37 | 63.63 | 68.94 | 69.7 | 17.96 | 18.16 | - | - | - | - | 17.25 | 17.45 |

NOTES:

1. All dimensions are in millimetres.

FIGURE 2(x) – HALORING BACKSHELL - 45° CIRCULAR TOP CABLE OUTLET



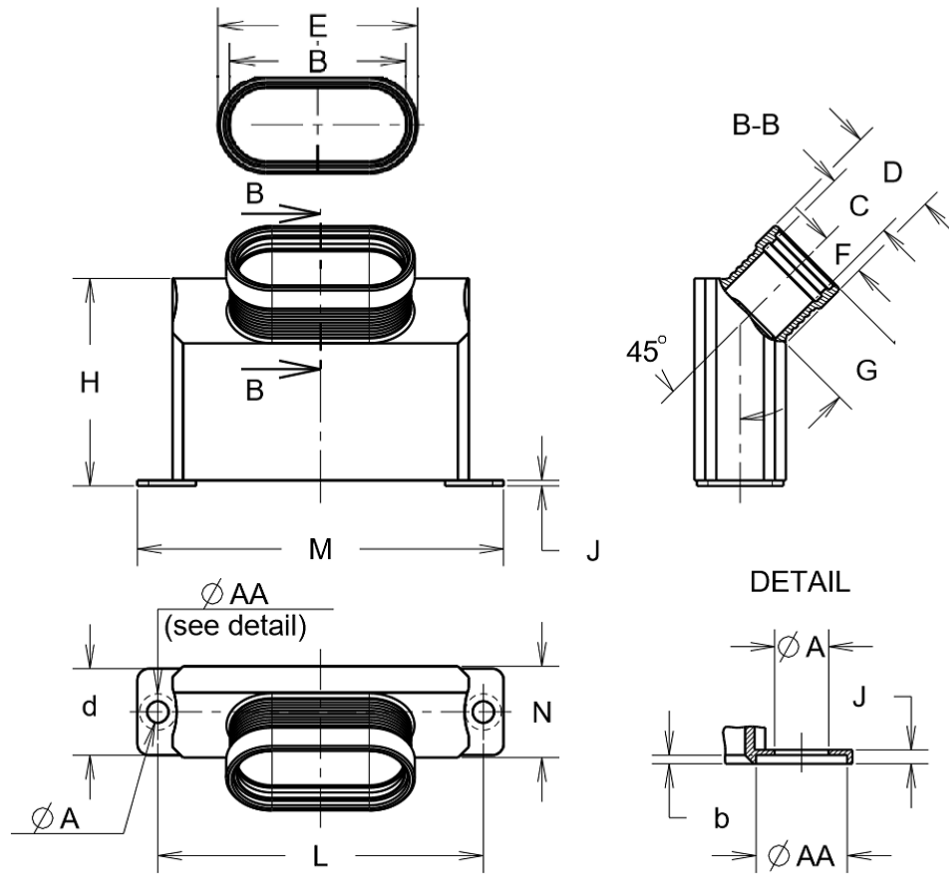
| Shell Size | Variant | ØA | | ØB | | ØC | | D | | G | | H | J |
|------------|---------|-----|-----|-------|-------|-------|-------|------|------|-----|------|----|-----|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | | |
| E | 142 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 6.5 | 6.7 | 11 | 11.2 | 30 | 0.9 |
| A | 143 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 6.5 | 6.7 | 11 | 11.2 | 30 | 0.9 |
| B | 144 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 6.5 | 6.7 | 11 | 11.2 | 30 | 0.9 |
| C | 145 | 3 | 3.1 | 9.95 | 10.15 | 13.16 | 13.36 | 6.5 | 6.7 | 11 | 11.2 | 30 | 0.9 |
| D | 146 | 3 | 3.1 | 12.75 | 12.95 | 15.26 | 15.46 | 7.55 | 7.75 | 11 | 11.2 | 30 | 0.9 |
| F | 147 | 3 | 3.1 | 14.75 | 14.95 | 17.96 | 18.16 | 8.9 | 9.1 | 11 | 11.2 | 30 | 0.9 |

| Shell Size | Variant | L | | M | | N | | ØAA | | b | | d | |
|------------|---------|-------|-------|-------|-------|-------|-------|------|------|------|------|-------|-------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 142 | 24.86 | 25.12 | 30.18 | 30.94 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| A | 143 | 33.19 | 33.45 | 38.51 | 39.27 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| B | 144 | 46.91 | 47.17 | 52.4 | 53.16 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| C | 145 | 63.37 | 63.63 | 68.66 | 69.42 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| D | 146 | 60.98 | 61.25 | 66.29 | 67.05 | 15.26 | 15.46 | 5.15 | 5.25 | 0.45 | 0.55 | 15.25 | 15.45 |
| F | 147 | 63.37 | 63.63 | 68.94 | 69.7 | 17.96 | 18.16 | - | - | - | - | 17.25 | 17.45 |

NOTES:

1. All dimensions are in millimetres.

FIGURE 2(y) – HALORING BACKSHELL - 45° ELLIPTICAL TOP CABLE OUTLET



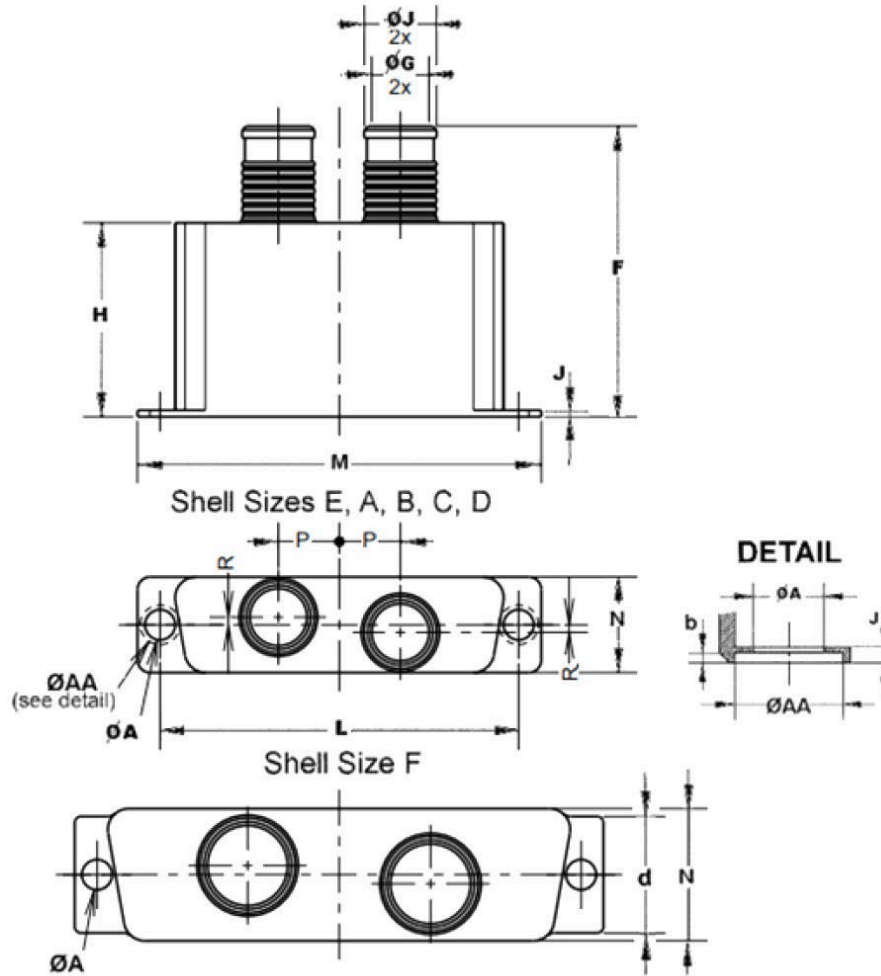
| Shell Size | Variant | ØA | | B | | C | | D | | E | | F | | G | | H |
|------------|---------|-----|-----|-------|-------|------|-------|-------|-------|-------|-------|------|------|-----|------|----|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | |
| E | 148 | 3 | 3.1 | 11.7 | 12 | 9.95 | 10.15 | 13.16 | 13.36 | 14.91 | 15.21 | 6.5 | 6.7 | 11 | 11.2 | 30 |
| A | 149 | 3 | 3.1 | 16.45 | 16.75 | 9.95 | 10.15 | 13.16 | 13.36 | 19.66 | 19.96 | 6.5 | 6.7 | 11 | 11.2 | 30 |
| B | 150 | 3 | 3.1 | 23.95 | 24.25 | 9.95 | 10.15 | 13.16 | 13.36 | 27.16 | 27.46 | 6.5 | 6.7 | 11 | 11.2 | 30 |
| C | 151 | 3 | 3.1 | 23.95 | 24.25 | 9.95 | 10.15 | 13.16 | 13.36 | 27.16 | 27.46 | 6.5 | 6.7 | 11 | 11.2 | 30 |
| D | 152 | 3 | 3.1 | 33.95 | 34.25 | 9.95 | 10.15 | 13.16 | 13.36 | 37.16 | 37.46 | 7.55 | 7.75 | 11 | 11.2 | 30 |
| F | 153 | 3 | 3.1 | 33.95 | 34.25 | 9.95 | 10.15 | 13.16 | 13.36 | 37.16 | 37.46 | 8.9 | 9.1 | 11 | 11.2 | 30 |

| Shell Size | Variant | J | L | | M | | N | | ØAA | | b | | d | |
|------------|---------|-----|-------|-------|-------|-------|-------|-------|------|------|------|------|-------|-------|
| | | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 148 | 0.9 | 24.86 | 25.12 | 30.18 | 30.94 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| A | 149 | 0.9 | 33.19 | 33.45 | 38.51 | 39.27 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| B | 150 | 0.9 | 46.91 | 47.17 | 52.4 | 53.16 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| C | 151 | 0.9 | 63.37 | 63.63 | 68.66 | 69.42 | 13.16 | 13.36 | 5.15 | 5.25 | 0.45 | 0.55 | 12.45 | 12.65 |
| D | 152 | 0.9 | 60.98 | 61.25 | 66.29 | 67.05 | 15.26 | 15.46 | 5.15 | 5.25 | 0.45 | 0.55 | 15.25 | 15.45 |
| F | 153 | 0.9 | 63.37 | 63.63 | 68.94 | 69.7 | 17.96 | 18.16 | - | - | - | - | 17.25 | 17.45 |

NOTES:

1. All dimensions are in millimetres.

FIGURE 2(z) – LIGHTWEIGHT SHIELDED BACKSHELL - STRAIGHT TOP DUAL CIRCULAR CABLE OUTLET



| Shell Size | Variant | ØA | | ØG | | ØJ | | F | H | J | L | | M | |
|------------|---------|------|------|-------|-------|------|------|------|------|------|-------|-------|-------|-------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | | | | MIN | MAX | MIN | MAX |
| E | 154 | 3.91 | 4.03 | 3.95 | 4.05 | 5.9 | 6.1 | 38.1 | 25.4 | 0.89 | 24.86 | 25.12 | 30.18 | 30.94 |
| A | 155 | 3.91 | 4.03 | 5.95 | 6.05 | 7.9 | 8.1 | 38.1 | 25.4 | 0.89 | 33.19 | 33.45 | 38.51 | 39.27 |
| B | 156 | 3.91 | 4.03 | 7.45 | 7.55 | 9.4 | 9.6 | 38.1 | 25.4 | 0.89 | 46.91 | 47.17 | 52.4 | 53.16 |
| C | 157 | 3.91 | 4.03 | 7.45 | 7.55 | 9.4 | 9.6 | 38.1 | 25.4 | 0.89 | 63.37 | 63.63 | 68.66 | 69.42 |
| D | 158 | 3.91 | 4.03 | 10.45 | 10.55 | 12.4 | 12.6 | 38.1 | 25.4 | 0.89 | 60.98 | 61.24 | 66.29 | 67.16 |
| F | 159 | 3.91 | 4.03 | 10.95 | 11.05 | 12.9 | 13.1 | 38.1 | 25.4 | 0.89 | 63.37 | 63.63 | 68.94 | 69.7 |

FIGURE 2(z) – LIGHTWEIGHT SHIELDED BACKSHELL - STRAIGHT TOP DUAL CIRCULAR CABLE OUTLET (CONTINUED)

| Shell Size | Variant | N | | ØAA | | P | | R | | b | | d | |
|------------|---------|-------|-------|------|------|------|------|-----|-----|------|------|-------|-------|
| | | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX | MIN | MAX |
| E | 154 | 12.32 | 13.08 | 5.15 | 5.25 | 4.8 | 5.2 | 1.8 | 2.2 | 0.45 | 0.55 | - | - |
| A | 155 | 12.32 | 13.08 | 5.15 | 5.25 | 6.8 | 7.2 | 0.8 | 1.2 | 0.45 | 0.55 | - | - |
| B | 156 | 12.32 | 13.08 | 5.15 | 5.25 | 7.8 | 8.2 | 0.8 | 1.2 | 0.45 | 0.55 | - | - |
| C | 157 | 12.32 | 13.08 | 5.15 | 5.25 | 9.8 | 10.2 | 0.8 | 1.2 | 0.45 | 0.55 | - | - |
| D | 158 | 15.09 | 15.85 | 5.15 | 5.25 | 11.8 | 12.2 | 0.3 | 0.7 | 0.45 | 0.55 | - | - |
| F | 159 | 17.09 | 17.85 | - | - | 11.8 | 12.2 | 1 | 1.4 | - | - | 15.15 | 15.35 |

NOTES:

1. All dimensions are in millimetres.

4 REQUIREMENTS

4.1 GENERAL

The complete requirements for procurement of the accessories specified herein shall be as 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 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. 9.5, Magnetism Level (applies to Variants 01, 02, 05 to 67, 72 to 81, 83 to 159).
- (b) Para. 4.4, Marking.
- (c) Para. 9.6, Dimension Check.
- (d) Para. 9.7, External Visual Inspection. The magnification shall be ×3.

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)

Material shall be brass plated with gold (0.7µm minimum) over copper (1µm minimum) or passivated stainless steel.

4.4.2 Lightweight Backshell

4.4.2.1 Shell and Clamps (if applicable)

Material shall be aluminium alloy with:

(a) Standard finish, for all lightweight backshell Variants: gold (0.7µm minimum) over nickel (20µm minimum)

or

(b) Alternate finish, for Variants 05 to 39, 46 to 65, 72 to 80 (characteristic code 'A174'; see Para. 4.5.3.3): nickel (25.4µm minimum)

4.4.2.2 Screws

Material shall be brass plated with gold (0.7µm minimum) over copper (1µm minimum).

4.4.3 Castellated Backshell

Material shall be copper alloy plated with gold (0.7µm minimum) over copper (1µm minimum).

4.4.4 EMI Gasket

Material shall be conductive silicone elastomer.

4.4.5 Magnetism Level

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

4.4.6 Haloring

Material shall be copper alloy plated with Silver (5µm minimum).

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

Example: 340107205B

- Detail Specification Number: 3401072
- Type Variant (see Table 1(a)): 05
- Testing Level: B (Note: this is mandatory, as Testing Level 'C' is not applicable).

4.5.3 Characteristics

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

- (a) Magnetism Level.
- (b) Alternate Design.
- (c) Alternate Finish

Where applicable, the information shall be constituted and marked as follows:

Example: NMBA A174

- Magnetism level: NMB
- Alternate design code: A
- Alternate finish code: A174

4.5.3.1 *Magnetism Level (for all Variants, except Variants 03, 04, 68 to 71, 82)*

The following code shall be used for magnetism level:

| CODE | DEFINITION |
|------|-----------------------------------|
| NMB | Magnetism Level: ≤ 200 gamma |

4.5.3.2 *Alternate Design*

Variants 05 to 39, 46 to 65 are available in 'Standard' and 'Alternate' designs. If the alternate design is required, the code letter "A" must be included in the characteristics marking. If the "A" is omitted, it shall be assumed that the 'Standard' design is required.

4.5.3.3 *Alternate Finish*

Variants 05 to 39, 46 to 65, 72 to 80 are available with 'Standard' and 'Alternate' finishes. If the 'alternate' finish is required, the code "A174" must be included in the characteristics marking. If the "A174" is omitted, it shall be assumed that the 'Standard' finish is required.

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.