

ITT Cannon is the foremost manufacturer of MS and MS type connectors with the widest range of connector styles, sizes and variations in the industry. These connectors utilize the finest materials, which, along with precision manufacturing and rigid quality control, assure ITT Cannon customers of the finest quality connectors.

These circular connectors were originally designed for aircraft, but are now widely used in many other fields. They are particularly suitable for commercial applications requiring low cost and high reliability.



### ENVIRONMENTAL RESISTANT MS-E, MS-F, MS-R AND F80 (Solder/Crimp Termination)

MS-E, MS-F and MS-R are similar to MS-A and MS-B connectors but have resilient insulators and wire sealing grommets for extreme environmental conditions and high altitude sealing. MS-E's and MS-F's have a mechanical cable clamp; the MS-R has a shorter, lighter weight endbell without the cable clamp. Both the MS-F and MS-R have O rings to supplement the interfacial seal. Shells are aluminum alloy. Contacts are silver plated copper alloy. The F80 modification (crimp contact termination) is available in E, R, F and BFR styles with resilient insulators.

### POTTING ER CONNECTORS (Solder Contact Termination)

These lightweight potting connectors provide resistance to salt water, fuels, etc., and will withstand the effects of high vibration. 3100 and 3106 connectors with plastic potting cups and resilient inserts meet the requirements of MS3103 and MS25183. Contacts are silver plated copper or brass. ER insulators are resilient; shells are aluminum alloy. A 90° plug (3108ER) is also available.



### ACCESSORIES

Accessories to fit MS connectors include junction shells, protective caps, dummy or stowage receptacles, cable clamps, telescoping bushings.

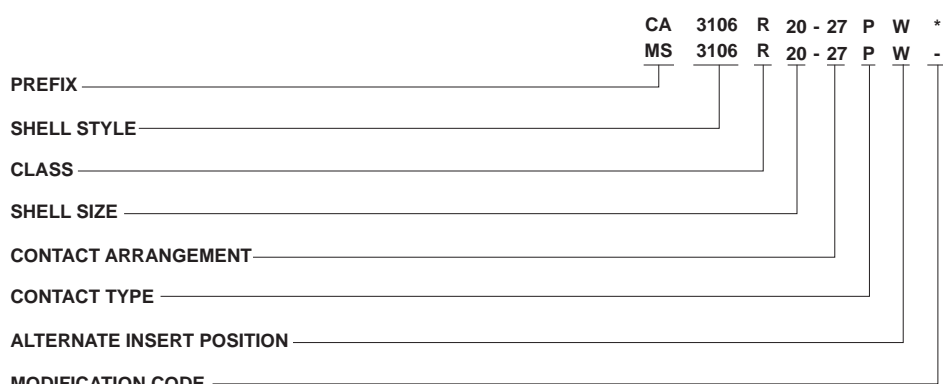
## How to Order

In the latest revision of MIL-C-5015, a new class of environment-resistant connectors was added. This new class F connector supersedes the previous class E connector. The MS3106F is identical to the MS3106E except that the MS3106F has an "O" ring under the coupling nut. The class E will still be available upon request for existing programs, and upon ordering will also bear the E nomenclature on the shell.

MS-F and MS-R connectors are designed to operate in the extreme environmental conditions of high altitude flight and must be completely sealed to withstand moisture, condensation, vibration, corona and flashover caused by high altitude environments. They have resilient grommet with internal restrictions in the wire cavities which act as O rings around the wires. This allows the wires to slide thru the grommet with a minimum of friction, yet when the ferrule is seated and the endbell tightened it provides a perfect wire seal thru a wide variety of wire diameters. This seal at the rear, plus the interfacial seal at the front, effects a completely environment-resistant assembly when the plug is mated to an F or R receptacle. Sockets are of the closed-entry type.

The temperature range for this connector is -55°C (-67°F) to +125°C (+257°F) and meets the requirements of MIL-C-5015.

The F80 modification (crimp contact termination) is available in resilient insulators in the E, R, F, and BFR styles, creating a large selection of insert assemblies and hardware. Components are identical to the MS-5015 except that the contacts are modified for crimp termination providing an inexpensive crimp contact connector with the proven reliability of and complete interchangeability with the MS-5015 series. See page 187 for assembly instructions. Cable clamps have been integrally designed with the endbell on MS-E and MS-F connectors. Class R is without the cable clamp.



- PREFIX**
- SHELL STYLE**
- CLASS**
- SHELL SIZE**
- CONTACT ARRANGEMENT**
- CONTACT TYPE**
- ALTERNATE INSERT POSITION**
- MODIFICATION CODE**
- PREFIX**  
MS - Conforms to latest MIL-C-5015 revision  
CA - Cannon designation (for any modification)
- SHELL STYLE**  
3100 - Wall mounting receptacle  
3101 - Cable connecting plug  
3102 - Box mounting receptacle  
\* 3106 - Straight plug  
3108 - 90° angle plug
- CLASS**  
E/F - Environmental with resilient insulators and integral cable clamp.  
R - Environmental with resilient insulators and shortened light weight endbell; also additional sealing with O ring seal under coupling nut in styles 3106 and 3108

- SHELL SIZE**  
Coupling thread diameter in sixteenths of an inch
- CONTACT ARRANGEMENTS**  
See pages 171-174
- CONTACT TYPE**  
P for Pin; S for Socket
- ALTERNATE INSERT POSITION**  
W, X, Y and Z (omit for "Normal")
- MODIFICATION CODE**  
(applies to CA numbers only, not MS)  
F80 - Crimp type contacts. See page 187 for assembly instructions.

\* When ordering MS3106F to the Cannon part number, designate CA06R. See pages 177 and 181.

## Performance and Material Specifications

### MATERIALS AND FINISHES

|                  |             |  |
|------------------|-------------|--|
| <b>Shell</b>     | Material    | Aluminum alloy                             |
|                  | Finish      | O.D. Chromate coating over cadmium plating |
| <b>Insulator</b> | Material    | Polychloroprene (resilient)                |
| <b>Contacts</b>  | Material    | Brass or copper alloy                      |
|                  | Finish      | Silver plate                               |
|                  | Termination | Tinned solder pot                          |

### WIRING

For class E, R and F connectors, satisfactory moisture sealing will be obtained if AWG and MS wire sizes and insulation outside diameters are governed by this table.

| Contact Size | Wire Size (MIL-W-5086) | Insulation OD Limit (inches)           |
|--------------|------------------------|--|
| 16           | 16 thru 20             | .064 (1.63) min. to .130 (3.30) max.   |
| 12           | 12 thru 14             | .114 (2.90) min. to .170 (4.32) max.   |
| 8            | 8 thru 10              | .164 (4.17) min. to .255 (6.48) max.   |
| 4            | 4 thru 6               | .275 (6.98) min. to .370 (9.40) max.   |
| 0            | 0 thru 2               | .415 (10.54) min. to .550 (13.97) max. |

### ELECTRICAL SERVICE DATA

Test current ratings of contacts and allowable voltage drop under test conditions when assembled as in service are shown below. Maximum total current to be carried per connector is the same as the allowable in wire bundles as specified in MIL-W-5088.

| Contact Size | Test Current (amps) | Potential Drop (millivolts) |
|--------------|---------------------|-----------------------------|
| 16           | 13                  | 49                          |
| 12           | 23                  | 42                          |
| 8            | 46                  | 26                          |
| 4            | 80                  | 23                          |
| 0            | 150                 | 21                          |

### CONTACTS

Pin and socket contacts are designed to resist severe vibration and repeated connection and disconnection. The average force to either engage or separate pin and socket contacts will not exceed the average values given in the latest revision of MIL-C-5015.

| FORCE In lbs. | Contact Sizes |      |       |       |       |
|---------------|---------------|------|-------|-------|-------|
|               | 16            | 12   | 8     | 4     | 0     |
| Maximum       | 3.00          | 5.00 | 10.00 | 15.00 | 20.00 |
| Average       | 2.10          | 3.50 | 7.00  | 10.50 | 14.00 |
| Minimum       | .25           | .50  | .75   | 1.00  | 2.00  |

### THERMOCOUPLE CONTACTS

Sizes 12 and 16 contacts, machined from matching thermocouple lead wire alloys, can be supplied in ITT Cannon connectors. These thermocouple contacts maintain continuity from thermal-sensor leads thru a bulkhead of other closures in temperature measuring applications.

These contacts for matching lead wires are detailed by the standards of the Instrument Society of America (I.S.A.);

| I.S.A Standards | Material              |
|-----------------|-----------------------|
| J and Y         | Iron and constantan   |
| K               | Chromel and alumel    |
| T               | Copper and constantan |

Since the thermocouple connector applications determines the soldering methods and materials to be used, thermocouple contacts, identified by permanent markings, are normally supplied with untinned solder pots. Thermocouple contacts are supplied only in connectors having resilient insulators.

### HIGH POTENTIAL TEST VOLTAGE

MS connectors show no evidence of breakdown when the test voltage given below is applied between the two closest contacts and between the shell and the contacts closest to the shell for a period of one minute.

| MS Service Rating | Test Voltage (RMS) 60 cps | Suggested * Operating Voltages |          | Air Spacing Nom. (inches) | Creepage Distance Nom. (inches) |
|-------------------|---------------------------|--------------------------------|----------|---------------------------|---------------------------------|
|                   |                           | DC                             | AC (rms) |                           |                                 |
| Inst.             | 1000                      | 250                            | 200      |                           | 1/16                            |
| A                 | 2000                      | 700                            | 500      | 1/16                      | 1/8                             |
| D                 | 2800                      | 1250                           | 900      | 1/8                       | 3/16                            |
| E                 | 3500                      | 1750                           | 1250     | 3/16                      | 1/4                             |
| B                 | 4500                      | 2450                           | 1750     | 1/4                       | 5/16                            |
| C                 | 7000                      | 4200                           | 3000     | 5/16                      | 1                               |

\* As indicated in previous MS Specification and to be used by designer only as a guide.

## High Voltage Cartridges for MS-E and MS-R (HV310\*E/R Series)



- Standard contact arrangements are adaptable to high voltage applications.
- Eliminates need for a separate high voltage connector.
- Assembly time is reduced.

High voltage conductors as well as power and/or control signal conductors can now be connected simultaneously in standard MS connectors. Previously, MS connectors involved in high voltage circuitry required individual design considerations and could only be ordered as a "special." The new high voltage cartridge allows conversion of a standard connectors to one capable of handling up to 15,000 volts DC (Test Voltage - mated), operating voltage - See level 5,000 VDC or 3,500 VAC. These cartridges are molded of nylon and provide as high degree of arc-over protection between adjacent contacts or between a contact and the connector shell. Unmated, each cartridge provides a nylon isolating barrier capable of withstanding up to 10,000 volts DC (or peak).

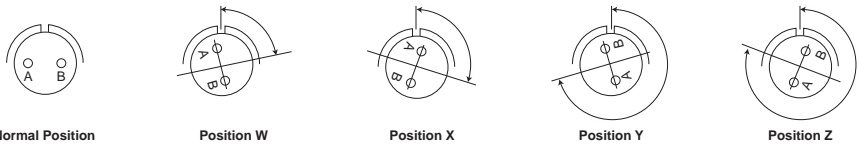
The contact within the cartridge is a 7.5 amp. size 20, crimp snap-in type with dielectric rear release clip retention. This contact is removable with the plastic CIET20 insertion/extraction tool provided the insulation is .084 (22.45) or less. The contact may be crimped with the standard MS-3191 tool and MS-3191-20A locator and hand inserted into the nylon cartridge. The cartridge body is installed in the connector at the factory.

High voltage cartridges now available fit the space normally occupied by a #4 or #8 size contact in an MS-E, MS-R or MS-F type connector.

Over forty-nine contact arrangements are currently available in which these high voltage cartridges may be used. Consult factory for ordering information.

MS Alternate Insert Positions

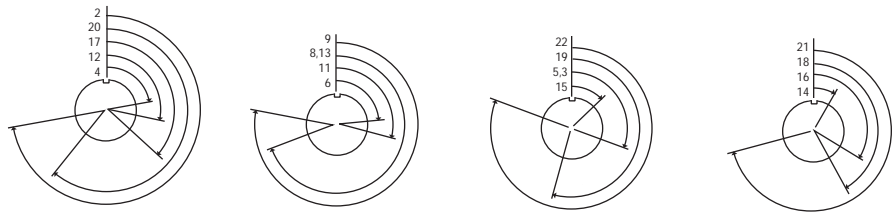
All views are looking into front of pin insert of rear of socket insert.



| Normal Position |                     |           |                                 |    |     |     |     | Position W |                     |               |                           |    |     |     |     | Position X |                     |                       |                       |    |     |     |     | Position Y |                         |                         |                                  |    |     |     |     | Position Z |                                  |                                  |                |     |     |     |     |  |  |  |  |
|-----------------|---------------------|-----------|---------------------------------|----|-----|-----|-----|------------|---------------------|---------------|---------------------------|----|-----|-----|-----|------------|---------------------|-----------------------|-----------------------|----|-----|-----|-----|------------|-------------------------|-------------------------|----------------------------------|----|-----|-----|-----|------------|----------------------------------|----------------------------------|----------------|-----|-----|-----|-----|--|--|--|--|
| Shell Size      | Contact Arrangement | Wire Size | Service Rating                  | W  | X   | Y   | Z   | Shell Size | Contact Arrangement | Wire Size     | Service Rating            | W  | X   | Y   | Z   | Shell Size | Contact Arrangement | Wire Size             | Service Rating        | W  | X   | Y   | Z   | Shell Size | Contact Arrangement     | Wire Size               | Service Rating                   | W  | X   | Y   | Z   | Shell Size | Contact Arrangement              | Wire Size                        | Service Rating | W   | X   | Y   | Z   |  |  |  |  |
| 8S              | 8S-1                | 1 #16     | A                               | -  | -   | -   | -   | 20         | 20-22               | 3 #16<br>3 #8 | A                         | 80 | 110 | 250 | 280 | 28         | 28-10               | 3 #12<br>2 #8<br>2 #4 | D(G)<br>A(all others) | 80 | 110 | 250 | 280 | 32         | * 32-1                  | 3 #12<br>2 #0           | E(A)<br>D(all others)            | 80 | 110 | 250 | 280 | 36         | * 36-4                           | 3 #0                             | A(B,C)<br>D(A) | 70  | 145 | 215 | 290 |  |  |  |  |
| 10S             | 10S-2               | 1 #16     | A                               | -  | -   | -   | -   | 20-23      | 2 #8                | 2 #8          | A                         | 35 | 110 | 250 | 325 | 28-11      | 18 #16<br>4 #12     | A                     | A                     | 80 | 110 | 250 | 280 | 28-12      | 26 #16                  | 26 #16                  | A                                | 90 | 180 | 270 | -   | 32-2       | 2 #0                             | D                                | 35             | 110 | 250 | 280 |     |  |  |  |  |
|                 | 10SL-4              | 2 #16     | A                               | -  | -   | -   | -   | 20-24      | 2 #16               | 2 #8          | A                         | 35 | 110 | 250 | 325 | 28-15      | 35 #16              | 35 #16                | A                     | 80 | 110 | 250 | 280 | 28-16      | 20 #16                  | 20 #16                  | A                                | 80 | 110 | 250 | 280 | * 32-6     | 16 #16<br>2 #12<br>3 #8<br>2 #4  | A                                | 80             | 110 | 250 | 280 |     |  |  |  |  |
|                 | 10SL-3              | 3 #16     | A                               | -  | -   | -   | -   | 20-27      | 14 #16              | 2 #8          | A                         | 35 | 110 | 250 | 325 | 28-17      | 15 #16              | 15 #16                | A(A-L),B(R)<br>D(M-P) | 80 | 110 | 250 | 280 | 32-7       | 28 #16<br>7 #12         | 28 #16<br>7 #12         | Inst. (A,B,h,j)<br>A(all others) | 80 | 125 | 235 | 280 | 32-8       | 24 #16<br>6 #12                  | 24 #16<br>6 #12                  | A              | 80  | 125 | 235 | 280 |  |  |  |  |
| 12              | 12-5                | 1 #12     | D                               | -  | -   | -   | -   | 20-29      | 17 #16              | 1 #16         | A                         | 80 | -   | -   | 280 | * 28-17    | 15 #16              | 15 #16                | A(A-L),B(R)<br>D(M-P) | 80 | 110 | 250 | 280 | 32-8       | 24 #16<br>6 #12         | 24 #16<br>6 #12         | A                                | 80 | 125 | 235 | 280 | * 32-9     | 12 #16<br>2 #4                   | D                                | 80             | 110 | 250 | 280 |     |  |  |  |  |
| 12S             | 12S-4               | 1 #16     | D                               | -  | -   | -   | -   | 20-33      | 11 #16              | 2 #8          | A                         | -  | -   | -   | -   | 28-21      | 37 #16              | 37 #16                | A                     | 80 | 110 | 250 | 280 | 32-15      | 2 #0<br>6 #12           | 2 #0<br>6 #12           | D                                | 35 | 110 | 250 | 280 | 32-17      | 4 #4                             | D                                | 45             | 110 | 250 | -   |     |  |  |  |  |
|                 | 12S-3               | 2 #16     | A                               | 70 | 145 | 215 | 290 | 22         | 22-2                | 3 #8          | D                         | 70 | 145 | 215 | 290 | * 28-22    | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 | 32-17      | 4 #4                    | 4 #4                    | D                                | 45 | 110 | 250 | -   | 36         | * 36-4                           | 3 #0                             | A(B,C)<br>D(A) | 70  | 145 | 215 | 290 |  |  |  |  |
| 14              | 14-3                | 1 #8      | A                               | -  | -   | -   | -   | * 22-4     | 2 #12               | 2 #8          | A                         | 35 | 110 | 250 | 325 | 28-22      | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 | 36-5       | 4 #0                    | 4 #0                    | A                                | -  | 120 | 240 | -   | 36-6       | 4 #4                             | 4 #4                             | A              | 35  | 110 | 250 | 325 |  |  |  |  |
| 14S             | 14S-1               | 3 #16     | A                               | -  | -   | -   | -   | 22-5       | 4 #16               | 2 #12         | D                         | 35 | 110 | 250 | 325 | 28-20      | 10 #16              | 10 #16                | A                     | 80 | 110 | 250 | 280 | 36-7       | 40 #16<br>7 #12         | 40 #16<br>7 #12         | A                                | 80 | 110 | 250 | 280 | 36-8       | 46 #16<br>1 #12                  | 46 #16<br>1 #12                  | A              | 80  | 110 | 250 | 280 |  |  |  |  |
|                 | 14S-2               | 4 #16     | Inst.                           | -  | 120 | 240 | -   | * 22-6     | 1 #16               | 2 #8          | D                         | 80 | 110 | 250 | 280 | 28-21      | 37 #16              | 37 #16                | A                     | 80 | 110 | 250 | 280 | * 36-15    | 35 #16                  | 35 #16                  | D (m)<br>A(all others)           | 60 | 125 | 245 | 305 | 36-9       | 14 #16<br>14 #12<br>2 #8<br>1 #4 | 14 #16<br>14 #12<br>2 #8<br>1 #4 | A              | 80  | 125 | 235 | 280 |  |  |  |  |
|                 | 14S-5               | 5 #16     | Inst.                           | -  | 110 | -   | -   | 22-7       | 2 #8                | 1 #0          | E                         | -  | -   | -   | -   | 28-22      | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 | 36-10      | 48 #16<br>5 #12<br>5 #8 | 48 #16<br>5 #12<br>5 #8 | A                                | 80 | 125 | 235 | 280 | 36-14      | 6 #16<br>5 #12<br>5 #8           | 6 #16<br>5 #12<br>5 #8           | D              | 90  | 180 | 270 | -   |  |  |  |  |
|                 | 14S-6               | 6 #16     | Inst.                           | -  | -   | -   | -   | 22-9       | 3 #12               | 1 #0          | E                         | 70 | 145 | 215 | 290 | 28-22      | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 | 40         | 40-10                   | 16 #16<br>9 #8<br>4 #4  | A                                | 65 | 125 | 225 | 310 | * 40-56    | 85 #16                           | 85 #16                           | A              | 72  | 144 | 216 | 288 |  |  |  |  |
|                 | 14S-7               | 3 #16     | A                               | 90 | 180 | 270 | -   | 22-10      | 4 #16               | 2 #8          | E                         | 35 | 110 | 250 | 325 | 28-22      | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 | 44         | 44-1                    | 36 #16<br>6 #12         | 36 #16<br>6 #12                  | D  | 65  | 125 | 225 | 310        |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | 14S-9               | 2 #16     | A                               | 70 | 145 | 215 | 290 | 22-11      | 2 #16               | 2 #8          | B                         | 35 | 110 | 250 | 325 | 28-22      | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 | 48         | 48-5                    | 90 #16<br>1 #8<br>9 #12 | 90 #16<br>1 #8<br>9 #12          | A  | 65  | 125 | 225 | 310        |                                  |                                  |                |     |     |     |     |  |  |  |  |
| 16              | 16-9                | 2 #16     | A                               | 35 | 110 | 250 | 325 | 22-12      | 3 #16               | 4 #12         | D                         | 80 | 110 | 250 | 280 | 28-22      | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | 16-10               | 3 #12     | A                               | 90 | 180 | 270 | -   | 22-13      | 1 #16               | 4 #12         | A(A-D)<br>D(E)            | 35 | 110 | 250 | 325 | 28-22      | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | 16-12               | 1 #4      | A                               | -  | -   | -   | -   | 22-14      | 19 #16              | 4 #12         | A                         | 80 | -   | -   | 280 | 28-22      | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | 16-11               | 2 #12     | A                               | 35 | 110 | 250 | 325 | * 22-15    | 1 #16               | 4 #12         | A(A-C,E,F)<br>E(D)        | 80 | 110 | 250 | 280 | 28-22      | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | 16-13               | 2 #12     | A                               | 35 | 110 | 250 | 325 | 22-17      | 8 #16               | 4 #12         | D(A)                      | 80 | 110 | 250 | 280 | 28-22      | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
| 16S             | 16S-1               | 7 #16     | A                               | 80 | -   | -   | 280 | 22-18      | 8 #16               | 4 #12         | A(all others)<br>D(J)     | 80 | -   | -   | 280 | 28-22      | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | * 16S-4             | 2 #16     | D                               | 35 | 110 | 250 | 325 | 22-19      | 14 #16              | 4 #12         | A                         | 80 | 110 | 250 | 280 | 28-22      | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | 16S-5               | 3 #16     | A                               | 70 | 145 | 215 | 290 | 22-20      | 9 #16               | 4 #12         | A                         | 35 | 110 | 250 | 325 | 28-22      | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | 16S-6               | 3 #16     | A                               | 90 | 180 | 270 | -   | 22-22      | 4 #8                | 4 #12         | A                         | -  | 110 | 250 | -   | 28-22      | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | 16S-8               | 5 #16     | A                               | -  | 170 | 265 | -   | 22-23      | 8 #12               | 4 #12         | D(H)                      | 35 | -   | 250 | -   | 28-22      | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
| 18              | 18-1                | 10 #16    | A(B,C,F,G)<br>Inst.(all others) | 70 | 145 | 215 | 290 | * 22-27    | 8 #16               | 4 #12         | A(all others)<br>D(J)     | 80 | -   | -   | 280 | 28-22      | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | 18-3                | 2 #12     | D                               | 35 | 110 | 250 | 325 | 22-28      | 7 #12               | 4 #12         | A                         | 80 | -   | -   | 280 | 28-22      | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | 18-4                | 4 #16     | D                               | 35 | 110 | 250 | 325 | 24         | 24-2                | 7 #12         | D                         | 80 | -   | -   | 280 | 28-22      | 3 #4                | 3 #4                  | D                     | 70 | 145 | 215 | 290 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | 18-5                | 1 #16     | D                               | 80 | 110 | 250 | 280 | * 24-5     | 16 #16              | 7 #12         | A                         | 80 | 110 | 250 | 280 | 24-2       | 2 #4                | 2 #4                  | A                     | 35 | 110 | 250 | 325 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | 18-7                | 1 #8      | B                               | -  | -   | -   | -   | * 24-6     | 8 #12               | 7 #12         | D(A,G,H)<br>A(all others) | 80 | 110 | 250 | 280 | 24-2       | 2 #4                | 2 #4                  | A                     | 35 | 110 | 250 | 325 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | 18-8                | 7 #16     | A                               | 70 | -   | -   | 290 | 24-7       | 14 #16              | 2 #12         | A                         | 80 | 110 | 250 | 280 | 24-2       | 2 #4                | 2 #4                  | A                     | 35 | 110 | 250 | 325 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | 18-9                | 5 #16     | Inst.                           | 80 | 110 | 250 | 280 | * 24-9     | 2 #4                | 2 #12         | A                         | 35 | 110 | 250 | 325 | 24-2       | 2 #4                | 2 #4                  | A                     | 35 | 110 | 250 | 325 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | 18-10               | 4 #12     | A                               | -  | 120 | 240 | -   | * 24-10    | 7 #8                | 2 #12         | A                         | 80 | -   | -   | 280 | 24-2       | 2 #4                | 2 #4                  | A                     | 35 | 110 | 250 | 325 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | 18-11               | 5 #12     | A                               | -  | 170 | 265 | -   | * 24-11    | 6 #12               | 2 #12         | A                         | 35 | 110 | 250 | 325 | 24-2       | 2 #4                | 2 #4                  | A                     | 35 | 110 | 250 | 325 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | 18-12               | 6 #16     | A                               | 80 | -   | -   | 280 | 24-12      | 3 #12               | 2 #12         | A                         | 80 | 110 | 250 | 280 | 24-2       | 2 #4                | 2 #4                  | A                     | 35 | 110 | 250 | 325 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | * 18-13             | 3 #12     | A                               | 80 | 110 | 250 | 280 | 24-20      | 9 #16               | 2 #12         | D                         | 80 | 110 | 250 | 280 | 24-2       | 2 #4                | 2 #4                  | A                     | 35 | 110 | 250 | 325 |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |
|                 | * 18-15             | 4 #12     | A                               | -  | 120 | 240 | -   | 24-22      | 4 #8                | 2 #12         | D                         | 45 | 110 | 250 | -   | 24-2       |                     |                       |                       |    |     |     |     |            |                         |                         |                                  |    |     |     |     |            |                                  |                                  |                |     |     |     |     |  |  |  |  |

ITT Cannon Designated Alternate Insert Positions

Not MS approved



NOTE: Front view of pin insulator rotates as shown.

| Shell Size | Contact Arrangement | Wire Size | Service Rating | Available Position |    |    |    |    |    |    |    |    |  |
|------------|---------------------|-----------|----------------|--------------------|----|----|----|----|----|----|----|----|--|
| 10SL       | 10SLA4              | 5 #20     | A              | 2                  | 3  | 5  | 8  | 12 | 13 |    |    |    |  |
| 12S        | 12SA10              | 4 #16     | Inst.          | 3                  | 5  | 8  | 13 |    |    |    |    |    |  |
| 20         | 20A37               | 4 #8      | D              |                    |    |    |    |    |    |    |    |    |  |
| 24         | 24A24               | 12 #12    | A              | 2                  | 4  | 9  | 12 |    |    |    |    |    |  |
| 28         | 28A16               | 5 #16     | A              | 2                  | 3  | 5  | 8  | 9  | 13 |    |    |    |  |
|            | 28A51               | 4 #4      |                |                    |    |    |    |    |    |    |    |    |  |
|            |                     | 43 #16    | A              | 3                  | 4  | 5  | 8  | 9  | 12 | 13 |    |    |  |
| 32         | 32A10               | 54 #16    | A              | 2                  | 3  | 4  | 5  | 8  | 9  | 12 | 13 |    |  |
|            | 32A47               | 47 #16    | A              | 2                  | 3  | 4  | 5  | 8  | 9  | 12 | 13 |    |  |
| 36         | 36A16               | 18 #12    | A              | 2                  | 3  | 4  | 5  | 8  | 9  | 12 | 13 | 15 |  |
|            | 36A34               | 52 #16    | A              | 2                  | 3  | 4  | 5  | 8  | 9  | 12 | 13 | 20 |  |
|            | 36A46               | 27 #12    | A              | 2                  | 3  | 4  | 5  | 8  | 9  | 12 | 13 |    |  |
|            | 36A66               | 52 #16    | A              | 2                  | 3  | 5  | 8  | 9  | 13 | 17 | 18 |    |  |
|            |                     | 4 #12     |                |                    |    |    |    |    |    |    |    |    |  |
| 40         | 40A27               | 60 #16    | A              | 4                  | 14 | 17 | 20 | 22 |    |    |    |    |  |
|            | 40A33               | 7 #8      | A              | 2                  | 3  | 5  | 8  | 13 |    |    |    |    |  |
|            |                     | 6 #4      |                |                    |    |    |    |    |    |    |    |    |  |

Note: For ITT Cannon contact arrangements not listed, consult factory.

| Position | Angle (degrees) |
|----------|-----------------|
| Normal   | 0               |
| 2        | 260             |
| 3        | 110             |
| 4        | 80              |
| 5        | use pos. 3      |
| 6        | 85              |
| 8        | 250             |
| 9        | 280             |
| 11       | 105             |
| 12       | 100             |
| 13       | use pos. 8      |
| 14       | 30              |
| 15       | 45              |
| 16       | 120             |
| 17       | 130             |
| 18       | 150             |
| 19       | 195             |
| 20       | 220             |
| 21       | 255             |
| 22       | 290             |
| 23       | 165             |
| 24       | 330             |
| 25       | 235             |
| 26       | 125             |

Contact Arrangements (Face View Pin Insert)

LEGEND

- Resilient only
- ▲ Resilient & Plastic

⌀ High Volume Layouts - readily available from Cannon Distributors

|                 |                        |       |        |        |                          |  |       |       |                              |                        |        |        |                            |       |       |       |       |                           |                               |                           |                             |                        |                             |       |
|-----------------|------------------------|-------|--------|--------|--------------------------|--|-------|-------|------------------------------|------------------------|--------|--------|----------------------------|-------|-------|-------|-------|---------------------------|-------------------------------|---------------------------|-----------------------------|------------------------|-----------------------------|-------|
|                 |                        |       |        |        |                          |  |       |       |                              |                        |        |        |                            |       |       |       |       |                           |                               |                           |                             |                        |                             |       |
| Shell Size      | 8S-1                   | 10S-2 | 10SL-4 | 10SL-3 | 10SLA4                   | 12S-4                                    | 12-5  | 12S-3 | 12SA10                       | 14-3                   | 14S-9  |        |                            |       |       |       |       |                           |                               |                           |                             |                        |                             |       |
| No. of Contacts | 1 #16                  | 1 #16 | 2 #16  | 3 #16  | 5 #20                    | 1 #16                                    | 1 #12 | 2 #16 | 4 #16                        | 1 #8                   | 2 #16  |        |                            |       |       |       |       |                           |                               |                           |                             |                        |                             |       |
| Service Rating  | A                      | A     | A      | A      | A                        | D  | D     | A     | Inst.                        | A                      | A      |        |                            |       |       |       |       |                           |                               |                           |                             |                        |                             |       |
|                 |                        |       |        |        |                          |  |       |       |                              |                        |        |        |                            |       |       |       |       |                           |                               |                           |                             |                        |                             |       |
| Shell Size      | 14S-1                  | 14S-7 | 14S-2  | 14S-5  | 14S-6                    | 16-12                                    | 16-11 | 16S-4 | 16-13                        | 16S-5                  | 16S-6  | 16-10  | 16-9                       | 16S-8 | 16S-1 | 18-7  | 18-3  |                           |                               |                           |                             |                        |                             |       |
| No. of Contacts | 3 #16                  | 3 #16 | 4 #16  | 5 #16  | 6 #16                    | 1 #4                                     | 2 #12 | 2 #16 | 2 #12 (A-Iron B-Constantan)  | 3 #16                  | 3 #16  | 3 #12  | 2 #16 (B,D)<br>2 #12 (A,C) | 5 #16 | 7 #16 | 1 #8  | 2 #12 |                           |                               |                           |                             |                        |                             |       |
| Service Rating  | A                      | A     | Inst.  | Inst.  | Inst.                    | A  | A     | D     | A                            | A                      | A      | A      | A                          | A     | A     | B     | D     |                           |                               |                           |                             |                        |                             |       |
|                 |                        |       |        |        |                          |  |       |       |                              |                        |        |        |                            |       |       |       |       |                           |                               |                           |                             |                        |                             |       |
| Shell Size      | 18-5                   | 18-22 | 18-4   | 18-10  | 18-13                    | 18-15                                    | 18-11 | 18-12 | 18-9                         | 18-8                   | 18-1   | 18-19  | 20-2                       | 20-23 | 20-3  | 20-19 | 20-4  | 20-24                     | 20A37                         | 20-14                     | 20-8                        | 20-17                  | 20-22                       | 20-15 |
| No. of Contacts | 1 #16(A)<br>2 #12(B,C) | 3 #16 | 4 #16  | 4 #12  | 3 #12 (B,C,C)<br>1 #8(A) | 4 #12<br>(A, C-Iron;<br>B, D-Constantan) | 5 #12 | 6 #16 | 5 #16(B,C,E-G)<br>2 #12(A,D) | 7 #16(A-G)<br>1 #12(H) | 10 #16 | 10 #16 | 1 #0                       | 2 #8  | 3 #12 | 3 #8  | 4 #12 | 2 #16 (A,C)<br>2 #8 (B,D) | ITT Cannon pos.<br>#8 of 20-4 | 3 #12(C,D,E)<br>2 #8(A,B) | 4 #16(B,C,E,F)<br>2 #8(A,D) | 1 #16(F)<br>5 #12(A-E) | 3 #16(B,D,F)<br>3 #8(A,C,E) | 7 #12 |
| Service Rating  | D                      | D     | D      | A      | A                        | A  | A     | A     | D                            | D                      | Inst.  | A      | D                          | D     | A     | D     | D     | A                         | D                             | A                         | Inst.                       | A                      | A                           | A     |

Contact Arrangements (Continued)

LEGEND

- Resilient only
- ▲ Resilient & Plastic
- ⊕ High Volume Layouts - readily available from Cannon Distributors

|                 |                        |                              |                                  |                              |                         |                           |                            |                             |
|-----------------|------------------------|------------------------------|----------------------------------|------------------------------|-------------------------|---------------------------|----------------------------|-----------------------------|
|                 |                        |                              |                                  |                              |                         |                           |                            |                             |
| Shell Size      | 20-7                   | 20-16                        | 20-18                            | 20-33                        | 20-11                   | 20-27                     | 20-29                      | 22-7                        |
| No. of Contacts | 8 #16                  | 7 #16(A-G)<br>2 #12(H,I)     | 6 #16(A,C-E,G,H)<br>3 #12(B,F,I) | 11 #16                       | 13 #16                  | 14 #16                    | 17 #16                     | 1 #0                        |
| Service Rating  | A(C-F)<br>D(A,B,G,H)   | A                            | A                                | A                            | Inst.                   | A                         | A                          | E                           |
|                 |                        |                              |                                  |                              |                         |                           |                            |                             |
| Shell Size      | 22-11                  | 22-2                         | 22-6                             | 22-9                         | 22-4                    | 22-10                     | 22-22                      | 22-12                       |
| No. of Contacts | 2 #16                  | 3 #8                         | 1 #16(B)<br>2 #8(A,C)            | 3 #12                        | 2 #12(A,C)<br>2 #8(B,D) | 4 #16                     | 4 #8                       | 3 #16(A,C,D)<br>2 #8(B,E)   |
| Service Rating  | B                      | D                            | D                                | E                            | A                       | E                         | A                          | D                           |
|                 |                        |                              |                                  |                              |                         |                           |                            |                             |
| Shell Size      | 22-13                  | 22-5                         | 22-15                            | 22-28                        | 22-18                   | 22-23                     | 22-17                      | 22-20                       |
| No. of Contacts | 1 #16(E)<br>4 #12(A-D) | 4 #16(A,C,D,F)<br>2 #12(B,E) | 1 #16(D)<br>5 #12(A-C,E,F)       | 7 #12                        | 8 #16                   | 8 #12                     | 8 #16(A-D,F-J)<br>1 #12(E) | 9 #16                       |
| Service Rating  | A(A-D), D(E)           | D                            | A(A-C,E,F),E(D)                  | A                            | A(C-E)<br>D(all others) | D(H)<br>A(all others)     | D(A), A(all others)        | A                           |
|                 |                        |                              |                                  |                              |                         |                           |                            |                             |
| Shell Size      | 22-27                  | 22-19                        | 22-14                            | 24-9                         | 24-22                   | 24-12                     | 24-2                       | 24-10                       |
| No. of Contacts | 8 #16(A-H)<br>1 #8(J)  | 14 #16                       | 19 #16                           | 2 #4                         | 4 #8                    | 3 #12(B,D,E)<br>2 #4(A,C) | 7 #12                      | 7 #8                        |
| Service Rating  | D(J), A (all others)   | A                            | A                                | A                            | D                       | A                         | D                          | A                           |
|                 |                        |                              |                                  |                              |                         |                           |                            |                             |
| Shell Size      | 24-27                  | 24-6                         | 24-11                            | 24-20                        | 24-19                   | 24A24                     | 24-5                       | 24-7                        |
| No. of Contacts | 7 #16                  | 8 #12                        | 6 #12(A-C,G-I)<br>3 #8(D-F)      | 9 #16(A-D,G-L)<br>2 #12(E,F) | 12 #16                  | 12 #12                    | 16 #16                     | 14 #16(A-M,O)<br>2 #12(P,N) |
| Service Rating  | E                      | D(A,G,H)<br>A(all others)    | A                                | D                            | A                       | A                         | A                          | A                           |

Contact Arrangements (Continued)

LEGEND

- Resilient only
- ▲ Resilient & Plastic

⌀ High Volume Layouts - readily available from Cannon Distributors

|                 |        |      |                         |  |                                 |                                 |                                    |
|-----------------|--------|------|-------------------------|--|---------------------------------|---------------------------------|------------------------------------|
|                 |        |      |                         |  |                                 |                                 |                                    |
| Shell Size      | 24-28  | 28-7 | 28-22                   | 28-10                                  | 28-1                            | 28A16                           | 28-19                              |
| No. of Contacts | 24 #16 | 2 #4 | 3 #16(D-F)<br>3 #4(A-C) | 3 #12(A,F,G)<br>2 #8(B,E)<br>2 #4(C,D) | 6 #12(A,B,D-F,H)<br>3 #8(C,J,G) | 5 #16(A,D-F,J)<br>4 #4(B,C,G,H) | 6 #16(A-C,H,L,M)<br>4 #12(E,G,J,K) |
| Service Rating  | Inst.  | D    | D                       | D(G), A(all others)                    | D(A,E,J)<br>A(all others)       | A                               | A(C,E,G,J,K,L)<br>B(H,M),D(A,B)    |

|                 |                            |                             |                             |                        |        |                                |        |
|-----------------|----------------------------|-----------------------------|-----------------------------|------------------------|--------|--------------------------------|--------|
|                 |                            |                             |                             |                        |        |                                |        |
| Shell Size      | 28-9                       | 28-2                        | 28-20                       | 28-17                  | 28-16  | 28-11                          | 28-12  |
| No. of Contacts | 6 #16(A,H-M)<br>6 #12(B-G) | 12 #16(A,L,N)<br>2 #12(M,P) | 4 #16(K-N)<br>10 #12(A-J,P) | 15 #16                 | 20 #16 | 18 #16(A-I, N-X)<br>4 #12(J-M) | 26 #16 |
| Service Rating  | D                          | D                           | A                           | A(A-L), B(R)<br>D(M-P) | A      | A                              | A      |

|                 |                                      |        |        |       |                           |                                 |                          |
|-----------------|--------------------------------------|--------|--------|-------|---------------------------|---------------------------------|--------------------------|
|                 |                                      |        |        |       |                           |                                 |                          |
| Shell Size      | 28-15                                | 28-21  | 28A51  | 32-17 | 32-1                      | 32-15                           | 32-9                     |
| No. of Contacts | 35 #16                               | 37 #16 | 43 #16 | 4 #4  | 3 #12(A,C,D)<br>2 #0(B,E) | 2 #0(A,G)<br>6 #12(B,C,D,E,F,H) | 12 #16(C-N)<br>2 #4(A,B) |
| Service Rating  | A<br>For MIL equip design, use 28-21 | A      | A      | D     | E(A),D(all others)        | D                               | D                        |

|                 |   |  |                                   |        |        |             |
|-----------------|---|--|-----------------------------------|--------|--------|-------------|
|                 |   |  |                                   |        |        |             |
| Shell Size      | 32-6  | 32-8   | 32-7                              | 32A47  | 32A10  | 36-4        |
| No. of Contacts | 16 #16(A-O,S)<br>2 #12(U,V)<br>3 #8(P,R,T)<br>2 #4(W,X) | 24 #16(A-L,T-Z,a-e)<br>6 #12(M-S)<br>2 #8(O,R) | 28 #16(A-N,W-Z,a-k)<br>7 #12(O-V) | 47 #16 | 54 #16 | 3 #0        |
| Service Rating  | A   | A<br>For new MIL equip. design, use 32-7       | Inst. (A,B,h,j)<br>A(all others)  | A      | A      | A(B,C),C(A) |

\*NOTE: Additional layouts are the same as shown but in unique alternate positions. Please consult the factory.

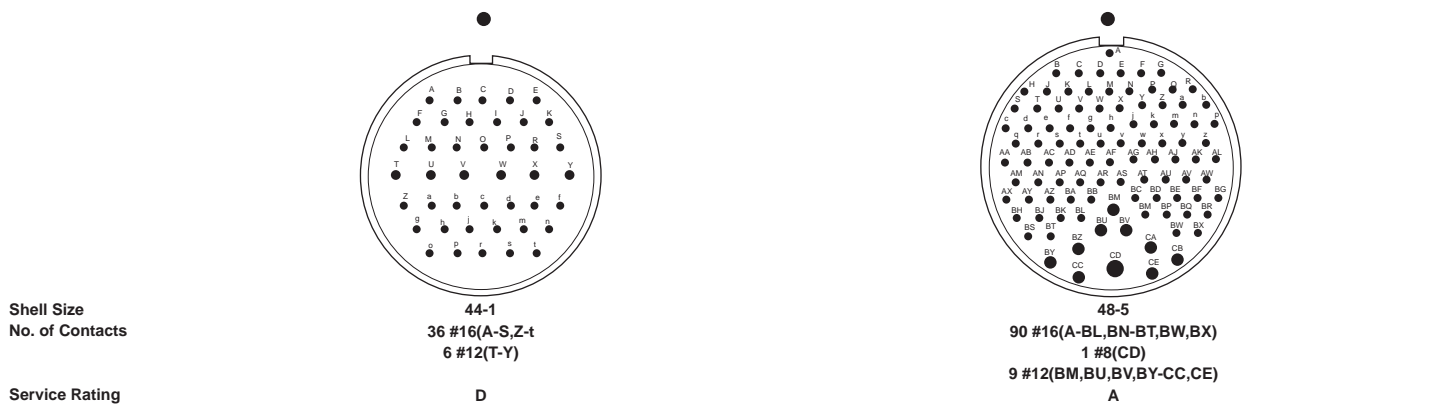
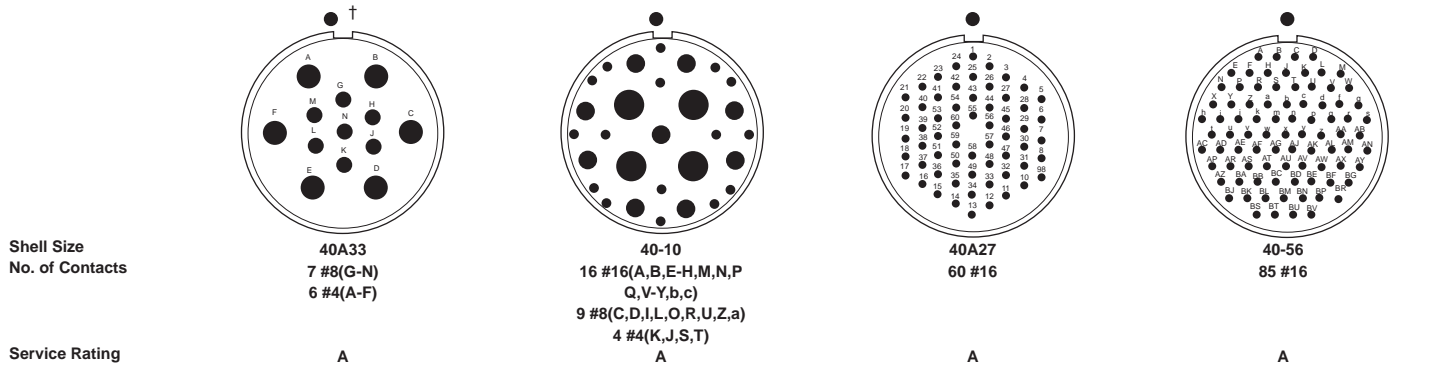
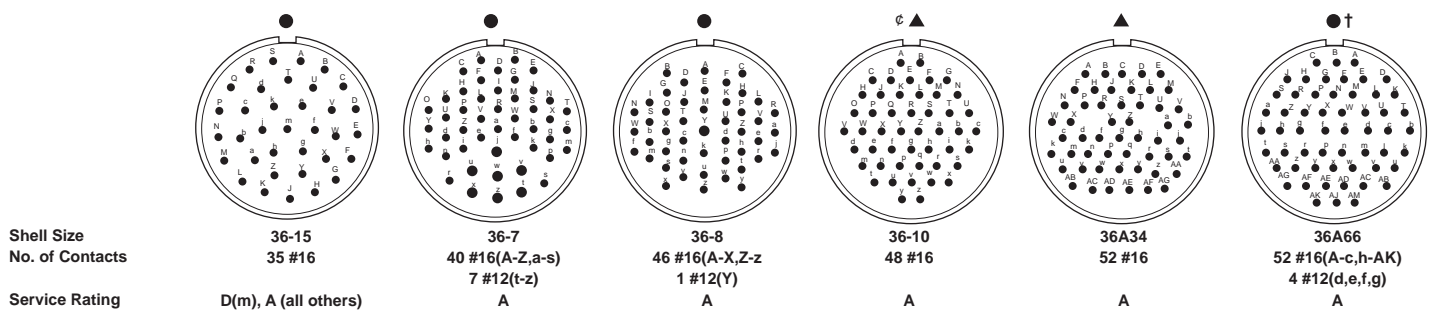
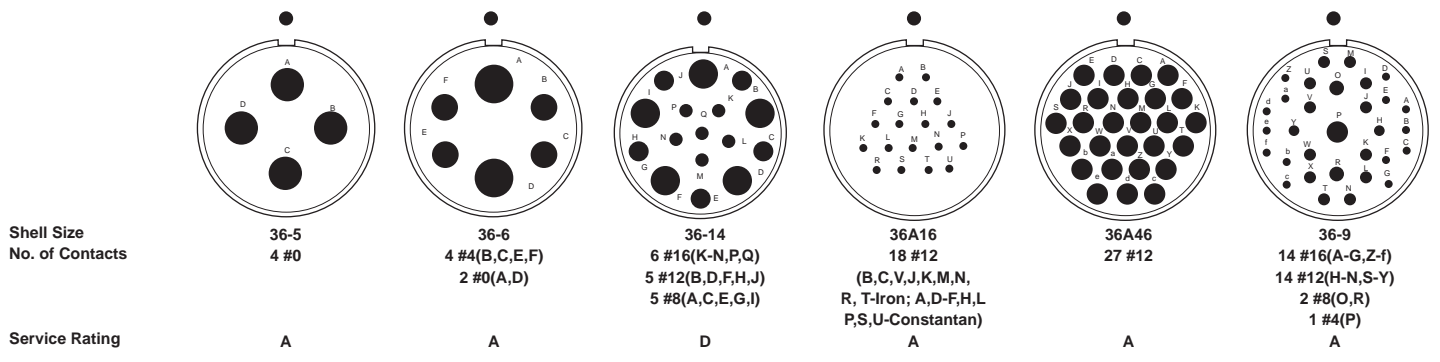
## Contact Arrangements (Continued)

### LEGEND

- Resilient only
- ▲ Resilient & Plastic

∅ High Volume Layouts - readily available from Cannon Distributors

† Grommet not available. Consult factory for ordering connectors with this arrangement.





## Cable Connecting Plug (Receptacle with no mounting flange)

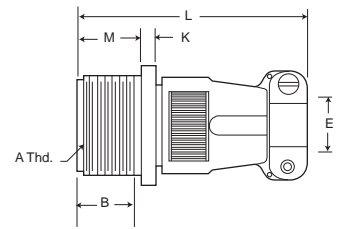
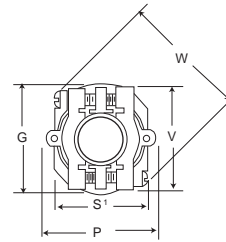
**MS3101E/MS3101F**  
Integral Cable Clamp



**CA3101E/CA3101E**

MS3101E cable connecting plugs are used for cable extension requirements, where mounting provisions are unnecessary.

MS3101E plugs mate with 3106, 3107 and 3108 plugs. Note: the D revision of MIL-C-5015 has changed the nomenclature of the 3101 from receptacle to plug.

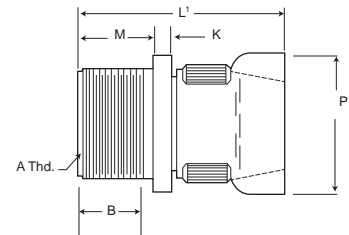
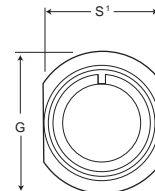


**MS3101R**



**CA3101R**

MS3101R cable connecting plug is identical in purpose to the MS3101E. The MS3101R features a shorter lightweight endbell and mates with 3106, 3107 and 3108 plugs. Note: The D revision of the MIL-C-5015 specification has changed the nomenclature of the 3101 from receptacle to plug.



| Shell Size  | B Min.       | E Max.        | E Min.       | G Max.        | K Max.      | L Max.         | L' Max.        | M +.031(0.79) -0.000(0.00) | P Max.        | S' Max.       | V Max.        | W Max.        |
|-------------|--------------|---------------|--------------|---------------|-------------|----------------|----------------|----------------------------|---------------|---------------|---------------|---------------|
| <b>8S</b>   | .375 (9.53)  | .235 (5.97)   | .102 (2.59)  | .844 (21.44)  | .125 (3.18) | 2.250 (57.15)  | 1.838 (46.69)  | .562 (14.27)               | .890 (22.61)  | .515 (13.08)  | .840 (21.34)  | 1.046 (26.57) |
| <b>10S</b>  | .375 (9.53)  | .235 (5.97)   | .102 (2.59)  | .969 (24.61)  | .125 (3.18) | 2.250 (57.15)  | 1.838 (46.69)  | .562 (14.27)               | .890 (22.61)  | .640 (16.26)  | .840 (21.34)  | 1.046 (26.57) |
| <b>10SL</b> | .375 (9.53)  | .297 (7.54)   | .140 (3.56)  | 1.062 (26.97) | .125 (3.18) | 2.250 (57.15)  | 1.838 (46.69)  | .562 (14.27)               | .970 (24.64)  | .640 (16.26)  | .900 (22.86)  | 1.125 (28.58) |
| <b>12S</b>  | .375 (9.53)  | .297 (7.54)   | .140 (3.56)  | 1.062 (26.97) | .140 (3.56) | 2.250 (57.15)  | 1.838 (46.69)  | .562 (14.27)               | .970 (24.64)  | .765 (19.43)  | .900 (22.86)  | 1.125 (28.58) |
| <b>14S</b>  | .375 (9.53)  | .422 (10.72)  | .195 (4.95)  | 1.156 (29.36) | .140 (3.56) | 2.250 (57.15)  | 1.838 (46.69)  | .562 (14.27)               | 1.150 (29.21) | .890 (22.61)  | 1.00 (27.94)  | 1.343 (34.11) |
| <b>16S</b>  | .375 (9.53)  | .547 (13.89)  | .255 (6.48)  | 1.281 (32.54) | .140 (3.56) | 2.250 (57.15)  | 1.838 (46.69)  | .562 (14.27)               | 1.250 (31.75) | 1.015 (25.78) | 1.200 (30.48) | 1.484 (37.69) |
| <b>12</b>   | .625 (15.88) | .297 (7.54)   | .140 (3.56)  | 1.062 (26.97) | .146 (3.71) | 2.625 (66.68)  | 2.181 (55.40)  | .750 (19.05)               | .970 (24.64)  | .765 (19.43)  | .900 (22.86)  | 1.125 (28.58) |
| <b>14</b>   | .625 (15.88) | .422 (10.72)  | .195 (4.95)  | 1.156 (29.36) | .146 (3.71) | 2.625 (66.58)  | 2.181 (55.40)  | .750 (19.05)               | 1.150 (29.21) | .890 (22.61)  | 1.100 (27.94) | 1.343 (34.11) |
| <b>16</b>   | .625 (15.88) | .547 (13.89)  | .255 (6.48)  | 1.281 (32.54) | .146 (3.71) | 2.625 (66.58)  | 2.181 (55.40)  | .750 (19.05)               | 1.250 (31.75) | 1.015 (25.78) | 1.200 (30.48) | 1.484 (37.69) |
| <b>18</b>   | .625 (15.88) | .610 (15.49)  | .285 (7.24)  | 1.344 (34.14) | .180 (4.57) | 2.688 (68.28)  | 2.281 (55.40)  | .750 (19.05)               | 1.450 (36.83) | 1.140 (28.96) | 1.300 (33.02) | 1.609 (40.87) |
| <b>20</b>   | .625 (15.88) | .735 (18.67)  | .350 (8.89)  | 1.500 (38.10) | .180 (4.57) | 2.750 (69.85)  | 2.281 (55.40)  | .750 (19.05)               | 1.570 (39.88) | 1.265 (32.13) | 1.500 (38.10) | 1.890 (48.01) |
| <b>22</b>   | .625 (15.88) | .740 (18.80)  | .350 (8.89)  | 1.625 (41.28) | .180 (4.57) | 2.750 (69.85)  | 2.281 (55.40)  | .750 (19.05)               | 1.570 (39.88) | 1.390 (35.31) | 1.500 (38.10) | 1.890 (48.01) |
| <b>24</b>   | .625 (15.88) | .922 (23.42)  | .468 (11.89) | 1.750 (44.45) | .203 (5.16) | 2.969 (75.44)  | 2.281 (55.40)  | .812 (20.62)               | 1.880 (47.75) | 1.515 (38.48) | 1.740 (44.20) | 2.170 (55.12) |
| <b>28</b>   | .625 (15.88) | .922 (23.42)  | .468 (11.89) | 2.000 (50.80) | .203 (5.16) | 3.031 (76.99)  | 2.281 (55.40)  | .812 (20.62)               | 1.880 (47.75) | 1.765 (44.83) | 1.740 (44.20) | 2.170 (55.12) |
| <b>32</b>   | .625 (15.88) | 1.235 (31.37) | .664 (15.87) | 2.250 (57.15) | .203 (5.16) | 3.031 (76.99)  | 2.322 (58.98)  | .875 (22.23)               | 2.205 (56.01) | 2.015 (51.18) | 2.075 (52.71) | 2.656 (67.46) |
| <b>36</b>   | .625 (15.88) | 1.360 (34.54) | .694 (17.63) | 2.500 (63.50) | .203 (5.16) | 3.281 (83.34)  | 2.322 (58.98)  | .875 (22.23)               | 2.400 (60.96) | 2.270 (57.66) | 2.300 (58.42) | 2.922 (74.22) |
| <b>*40</b>  | .625 (15.88) | 1.628 (41.35) | .911 (23.14) | 2.750 (69.85) | .203 (5.16) | 3.560 (89.66)† | 2.427 (61.65)† | .875 (22.23)               | 2.840 (72.14) | 2.427 (61.65) | 2.688 (68.28) | -             |

†Not to MS specification

\*Not Available in MS3101E and MS3101R.

| Shell Size  | A Thread      |
|-------------|---------------|
| <b>8S</b>   | 1/2-28UNEF-2A |
| <b>10S</b>  | 5/8-24UNEF-2A |
| <b>10SL</b> | 5/8-24UNEF-2A |
| <b>12S</b>  | 3/4-20UNEF-2A |
| <b>14S</b>  | 7/8-20UNEF-2A |
| <b>16S</b>  | 1-20UNEF-2A   |
| <b>12</b>   | 3/4-20UNEF-2A |
| <b>14</b>   | 7/8-20UNEF-2A |

| Shell Size | A Thread        |
|------------|-----------------|
| <b>16</b>  | 1-20UNEF-2A     |
| <b>18</b>  | 1-1/8-18UNEF-2A |
| <b>20</b>  | 1-1/4-18UNEF-2A |
| <b>22</b>  | 1-3/8-18UNEF-2A |
| <b>24</b>  | 1-1/2-18UNEF-2A |
| <b>28</b>  | 1-3/4-18UNS-2A  |
| <b>32</b>  | 2-18UNS-2A      |
| <b>36</b>  | 2-1/4-16UN-2A   |
| <b>40</b>  | 2-1/2-16UN-2A   |

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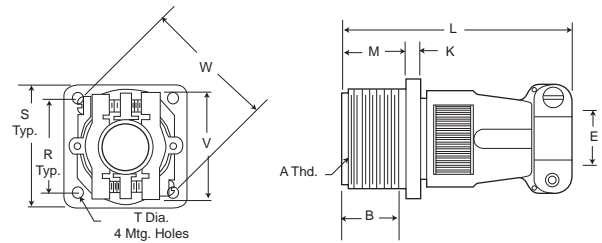
## Wall Mounting Receptacle

**MS3100E/MS3100F**  
Integral Cable Clamp



**CA3100E/CA3100E**

MS3100F wall mounting receptacles are used to carry wires thru walls or bulkheads, or to provide a means of disconnection at a bulkhead. MS3100F receptacles mate with 3106 and 3108 plugs. MS3100E is identical to MS3100F and is available upon request. For new equipment, customer should specify MS3100F.

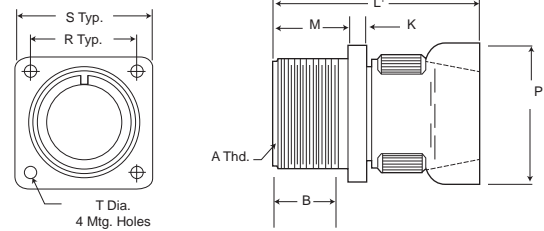


**MS3100R**



**CA3100R**

The MS3100R receptacle is identical in purpose to the MS3100F. The MS3100R features a shorter light weight endbell and mates with 3106 and 3108 plugs.



| Shell Size | B Min.       | E Max.        | E Min.       | K Max.      | L Max.         | L' Max.        | M +.031 -0.000 | P Max.        | R ±.005       | S ±.031       | T +.010 -0.005 | V Max.        | W Max.        |
|------------|--------------|---------------|--------------|-------------|----------------|----------------|----------------|---------------|---------------|---------------|----------------|---------------|---------------|
| 8S         | .375 (9.53)  | .235 (5.97)   | .102 (2.59)  | .125 (3.18) | 2.250 (57.15)  | 1.838 (46.69)  | .562 (14.27)   | .890 (22.61)  | .594 (15.09)  | .875 (22.23)  | .120 (3.05)    | .840 (21.34)  | 1.046 (26.57) |
| 10S        | .375 (9.53)  | .235 (5.97)   | .102 (2.59)  | .125 (3.18) | 2.250 (57.15)  | 1.838 (46.69)  | .562 (14.27)   | .890 (22.61)  | .719 (18.26)  | 1.000 (25.40) | .120 (3.05)    | .840 (21.34)  | 1.046 (26.57) |
| 10SL       | .375 (9.53)  | .297 (7.54)   | .140 (3.56)  | .125 (3.18) | 2.250 (57.15)  | 1.838 (46.69)  | .562 (14.27)   | .970 (24.64)  | .719 (18.26)  | 1.000 (25.40) | .120 (3.05)    | .900 (22.86)  | 1.125 (28.58) |
| 12S        | .375 (9.53)  | .297 (7.54)   | .140 (3.56)  | .140 (3.56) | 2.250 (57.15)  | 1.838 (46.69)  | .562 (14.27)   | .970 (24.64)  | .812 (20.62)  | 1.094 (27.79) | .120 (3.05)    | .900 (22.86)  | 1.125 (28.58) |
| 14S        | .375 (9.53)  | .422 (10.72)  | .195 (4.95)  | .140 (3.56) | 2.250 (57.15)  | 1.838 (46.69)  | .562 (14.27)   | 1.150 (29.21) | .906 (23.01)  | 1.188 (30.18) | .120 (3.05)    | 1.100 (27.94) | 1.343 (34.11) |
| 16S        | .375 (9.53)  | .547 (13.89)  | .255 (6.48)  | .140 (3.56) | 2.250 (57.15)  | 1.838 (46.69)  | .562 (14.27)   | 1.250 (31.75) | .969 (24.61)  | 1.281 (32.54) | .120 (3.05)    | 1.200 (30.48) | 1.484 (37.69) |
| 12         | .625 (15.88) | .297 (7.54)   | .140 (3.56)  | .146 (3.71) | 2.625 (66.68)  | 2.181 (55.40)  | .750 (19.05)   | .970 (24.64)  | .812 (20.62)  | 1.094 (27.79) | .120 (3.05)    | .900 (22.86)  | 1.125 (28.58) |
| 14         | .625 (15.88) | .422 (10.72)  | .195 (4.95)  | .146 (3.71) | 2.625 (66.58)  | 2.181 (55.40)  | .750 (19.05)   | 1.150 (29.21) | .906 (23.01)  | 1.188 (30.18) | .120 (3.05)    | 1.100 (27.94) | 1.343 (34.11) |
| 16         | .625 (15.88) | .547 (13.89)  | .255 (6.48)  | .146 (3.71) | 2.625 (66.58)  | 2.181 (55.40)  | .750 (19.05)   | 1.250 (31.75) | .969 (24.61)  | 1.281 (32.54) | .120 (3.05)    | 1.200 (30.48) | 1.484 (37.69) |
| 18         | .625 (15.88) | .610 (15.49)  | .285 (7.24)  | .180 (4.57) | 2.688 (68.28)  | 2.281 (55.40)  | .750 (19.05)   | 1.450 (36.83) | 1.062 (26.97) | 1.375 (34.93) | .120 (3.05)    | 1.300 (33.02) | 1.609 (40.87) |
| 20         | .625 (15.88) | .735 (18.67)  | .350 (8.89)  | .180 (4.57) | 2.750 (69.85)  | 2.281 (55.40)  | .750 (19.05)   | 1.570 (39.88) | 1.156 (29.36) | 1.500 (38.10) | .120 (3.05)    | 1.500 (38.10) | 1.890 (48.01) |
| 22         | .625 (15.88) | .740 (18.80)  | .350 (8.89)  | .180 (4.57) | 2.750 (69.85)  | 2.281 (55.40)  | .750 (19.05)   | 1.570 (39.88) | 1.250 (31.75) | 1.625 (41.28) | .120 (3.05)    | 1.500 (38.10) | 1.890 (48.01) |
| 24         | .625 (15.88) | .922 (23.42)  | .468 (11.89) | .203 (5.16) | 2.969 (75.44)  | 2.281 (55.40)  | .812 (20.62)   | 1.880 (47.75) | 1.375 (34.93) | 1.750 (44.45) | .147 (3.73)    | 1.740 (44.20) | 2.170 (55.12) |
| 28         | .625 (15.88) | .922 (23.42)  | .468 (11.89) | .203 (5.16) | 3.031 (76.99)  | 2.281 (55.40)  | .812 (20.62)   | 1.880 (47.75) | 1.562 (39.67) | 2.000 (50.80) | .147 (3.73)    | 1.740 (44.20) | 2.170 (55.12) |
| 32         | .625 (15.88) | 1.235 (31.37) | .664 (15.87) | .203 (5.16) | 3.031 (76.99)  | 2.322 (58.98)  | .875 (22.23)   | 2.205 (56.01) | 1.750 (44.45) | 2.250 (57.15) | .173 (4.39)    | 2.075 (52.71) | 2.656 (67.46) |
| 36         | .625 (15.88) | 1.360 (34.54) | .694 (17.63) | .203 (5.16) | 3.281 (83.34)  | 2.322 (58.98)  | .875 (22.23)   | 2.400 (60.96) | 1.938 (49.23) | 2.500 (63.50) | .173 (4.39)    | 2.300 (58.42) | 2.922 (74.22) |
| *40        | .625 (15.88) | 1.628 (41.35) | .911 (23.14) | .203 (5.16) | 3.560 (89.66)† | 2.427 (61.65)† | .875 (22.23)   | 2.840 (72.14) | 2.188 (55.58) | 2.750 (69.85) | .173 (4.39)    | 2.688 (68.28) | -             |

†Not to MS specification

\*Not Available in MS3101E and MS3101R.

| Shell Size | A Thread      |
|------------|---------------|
| 8S         | 1/2-28UNEF-2A |
| 10S        | 5/8-24UNEF-2A |
| 10SL       | 5/8-24UNEF-2A |
| 12S        | 3/4-20UNEF-2A |
| 14S        | 7/8-20UNEF-2A |
| 16S        | 1-20UNEF-2A   |
| 12         | 3/4-20UNEF-2A |
| 14         | 7/8-20UNEF-2A |

| Shell Size | A Thread        |
|------------|-----------------|
| 16         | 1-20UNEF-2A     |
| 18         | 1-1/8-18UNEF-2A |
| 20         | 1-1/4-18UNEF-2A |
| 22         | 1-3/8-18UNEF-2A |
| 24         | 1-1/2-18UNEF-2A |
| 28         | 1-3/4-18UNEF-2A |
| 32         | 2-18UNEF-2A     |
| 36         | 2-1/4-16UN-2A   |
| 40         | 2-1/2-16UN-2A   |

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## Straight Plug

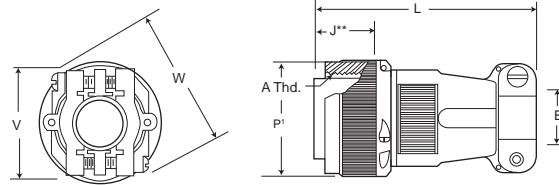
**MS3106E/MS3106F**  
Integral Cable Clamp



**CA3106E/CA06R**

MS3106F straight plugs mate with 3100 and 3102 receptacles and 3101 plugs.

The MS3106E is available upon request. For new equipment, customer should specify MS3106F. MS3106E is identical to MS3106F except to O ring under the coupling nut.

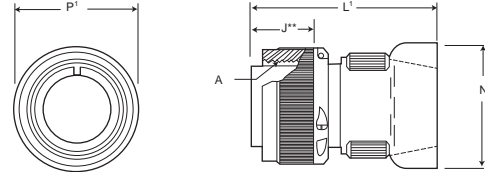


**MS3106R**



**CA3106R**

The MS3106R straight plug is identical in purpose to the MS3106F. The MS3106R has the shorter endbell. This plug will mate with 3100 and 3102 receptacles and 3101 plugs.



| Shell Size | E Max.        | E Min.       | J** Max.     | L Max.         | L' Max.        | N Max.        | P1 Max.        | V Max.        | W Max.        |
|------------|---------------|--------------|--------------|----------------|----------------|---------------|----------------|---------------|---------------|
| 8S         | .235 (5.97)   | .102 (2.59)  | .536 (13.61) | 2.250 (57.15)  | 1.838 (46.69)  | .890 (22.61)  | .844 (21.44)   | .840 (21.34)  | 1.046 (26.57) |
| 10S        | .235 (5.97)   | .102 (2.59)  | .536 (13.61) | 2.250 (57.15)  | 1.838 (46.69)  | .890 (22.61)  | .969 (24.61)   | .840 (21.34)  | 1.046 (26.57) |
| 10SL       | .297 (7.54)   | .140 (3.56)  | .536 (13.61) | 2.250 (57.15)  | 1.838 (46.69)  | .970 (24.64)  | .969 (24.61)   | .900 (22.86)  | 1.125 (28.58) |
| 12S        | .297 (7.54)   | .140 (3.56)  | .536 (13.61) | 2.250 (57.15)  | 1.838 (46.69)  | .970 (24.64)  | 1.062 (26.97)  | .900 (22.86)  | 1.125 (28.58) |
| 14S        | .422 (10.72)  | .195 (4.95)  | .536 (13.61) | 2.250 (57.15)  | 1.838 (46.69)  | 1.150 (29.21) | 1.156 (29.36)  | 1.00 (27.94)  | 1.343 (34.11) |
| 16S        | .547 (13.89)  | .255 (6.48)  | .536 (13.61) | 2.250 (57.15)  | 1.838 (46.69)  | 1.250 (31.75) | 1.250 (31.75)  | 1.200 (30.48) | 1.484 (37.69) |
| 12         | .297 (7.54)   | .140 (3.56)  | .724 (18.39) | 2.625 (66.68)  | 2.181 (55.40)  | .970 (24.64)  | 1.062 (26.97)  | .900 (22.86)  | 1.125 (28.58) |
| 14         | .422 (10.72)  | .195 (4.95)  | .724 (18.39) | 2.625 (66.68)  | 2.181 (55.40)  | 1.150 (29.21) | 1.156 (29.36)  | 1.100 (27.94) | 1.343 (34.11) |
| 16         | .547 (13.89)  | .255 (6.48)  | .724 (18.39) | 2.625 (66.68)  | 2.181 (55.40)  | 1.250 (31.75) | 1.250 (31.75)  | 1.200 (30.48) | 1.484 (37.69) |
| 18         | .610 (15.49)  | .285 (7.24)  | .724 (18.39) | 2.688 (68.28)  | 2.281 (55.40)  | 1.450 (36.83) | 1.344 (34.14)  | 1.300 (33.02) | 1.609 (40.87) |
| 20         | .735 (18.67)  | .350 (8.89)  | .724 (18.39) | 2.750 (69.85)  | 2.281 (55.40)  | 1.570 (39.88) | 1.469 (37.31)  | 1.500 (38.10) | 1.890 (48.01) |
| 22         | .740 (18.80)  | .350 (8.89)  | .724 (18.39) | 2.750 (69.85)  | 2.281 (55.40)  | 1.570 (39.88) | 1.594 (40.49)  | 1.500 (38.10) | 1.890 (48.01) |
| 24         | .922 (23.42)  | .468 (11.89) | .724 (18.39) | 2.969 (75.41)  | 2.281 (55.40)  | 1.880 (47.75) | 1.719 (43.66)  | 1.740 (44.20) | 2.170 (55.12) |
| 28         | .922 (23.42)  | .468 (11.89) | .724 (18.39) | 3.031 (76.99)  | 2.281 (55.40)  | 1.880 (47.75) | 1.969 (50.01)  | 1.740 (44.20) | 2.170 (55.12) |
| 32         | 1.235 (31.37) | .664 (15.87) | .724 (18.39) | 3.031 (76.99)  | 2.322 (58.98)  | 2.205 (56.01) | 2.219 (56.36)  | 2.075 (52.71) | 2.656 (67.46) |
| 36         | 1.360 (34.54) | .694 (17.63) | .724 (18.39) | 3.281 (83.34)  | 2.322 (58.98)  | 2.400 (60.96) | 2.469 (62.71)  | 2.300 (58.42) | 2.922 (74.22) |
| * 40       | 1.628 (41.35) | .911 (23.14) | .724 (18.39) | 3.560 (89.66)† | 2.427 (61.65)† | 2.840 (72.14) | 2.723 (69.16)† | 2.688 (68.28) | -             |

†Not to MS specification

\*\* Barrel engaging face to shoulder.

| Shell Size | A Thread      |
|------------|---------------|
| 8S         | 1/2-28UNEF-2B |
| 10S        | 5/8-24UNEF-2B |
| 10SL       | 5/8-24UNEF-2B |
| 12S        | 3/4-20UNEF-2B |
| 14S        | 7/8-20UNEF-2B |
| 16S        | 1-20UNEF-2B   |
| 12         | 3/4-20UNEF-2B |
| 14         | 7/8-20UNEF-2B |

| Shell Size | A Thread        |
|------------|-----------------|
| 16         | 1-20UNEF-2B     |
| 18         | 1-1/8-18UNEF-2B |
| 20         | 1-1/4-18UNEF-2B |
| 22         | 1-3/8-18UNEF-2B |
| 24         | 1-1/2-18UNEF-2B |
| 28         | 1-3/4-18UNEF-2B |
| 32         | 2-18UNEF-2B     |
| 36         | 2-1/4-16UNEF-2B |
| 40         | 2-1/2-16UNEF-2B |

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## Box Mounting Receptacle

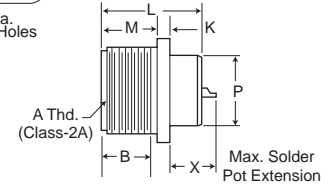
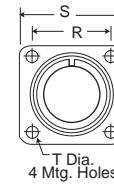
MS3102E/MS3102R

CA3102E/CA3102R



MS3102E and MS3102R box mounting receptacles are used in junction boxes or as an integral part of equipment. These connectors are identical in construction and will mate with 3106, 3107 and 3108 plugs. For new equipment, customer should specify MS3102R.

| X DIMENSION                          |              |      |      |      |      |
|--------------------------------------|--------------|------|------|------|------|
| Max. Solder Pot Ext. - Pin or Socket |              |      |      |      |      |
| Shell Size                           | Contact Size |      |      |      |      |
|                                      | 16           | 12   | 8    | 4    | 0    |
| 8S, 10S, 10SL                        | .534         | -    | -    | -    | -    |
| 12S, 14S, 16S                        | .518         | -    | -    | -    | -    |
| 12                                   | .705         | .705 | -    | -    | -    |
| 14                                   | .705         | .705 | .767 | -    | -    |
| 16                                   | .705         | .705 | .767 | .767 | -    |
| 18                                   | .674         | .674 | .736 | .736 | -    |
| 20,22                                | .674         | .674 | .736 | .736 | .971 |
| 24,28                                | .612         | .612 | .674 | .674 | .909 |
| 32,36                                | .549         | .549 | .611 | .611 | .846 |



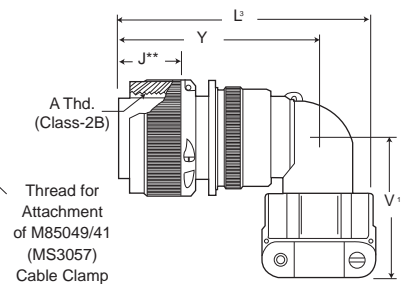
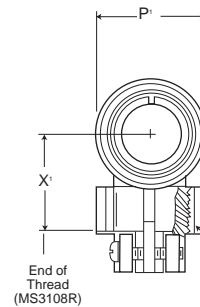
## 90° Angle Plug

MS3108E/MS3108R

CA3108E/CA3108R



MS3108R 90° angle plugs with O ring seal less cable clamp) and the MS3108E 90° angle plugs (less O ring seal with cable clamp) are used where there is limited space and where wires must be brought at abrupt angles. This plugs will mate with 3100 and 3102 receptacles and 3101 plugs.



See page 185 for cable clamp dimensions.

| Shell Size | B Min.       | J** Max.     | K Max.      | L Max.        | L' Max.         | M            |               | P Max.         | P' Max.       | R ±.005       | S ±.031     | T              |               | V' Max.        | X' Max. | Y Max. |
|------------|--------------|--------------|-------------|---------------|-----------------|--------------|---------------|----------------|---------------|---------------|-------------|----------------|---------------|----------------|---------|--------|
|            |              |              |             |               |                 | +.031 (0.79) | -.000 (0.00)  |                |               |               |             | +.010          | -.005         |                |         |        |
| 8S         | .375 (9.53)  | .536 (13.61) | .125 (3.18) | 1.040 (26.42) | 2.156 (54.76)   | .562 (14.27) | .426 (10.82)  | .844 (21.44)   | .594 (15.09)  | .875 (22.23)  | .120 (3.05) | 1.281 (30.94)  | .811 (20.60)  | 1.640 (41.66)  |         |        |
| 10S        | .375 (9.53)  | .536 (13.61) | .125 (3.18) | 1.040 (26.42) | 2.156 (54.76)   | .562 (14.27) | .520 (13.21)  | .969 (24.61)   | .719 (18.26)  | 1.000 (25.40) | .120 (3.05) | 1.250 (31.75)  | .842 (21.39)  | 1.640 (41.66)  |         |        |
| 10SL       | .375 (9.53)  | .536 (13.61) | .125 (3.18) | 1.040 (26.42) | 2.188 (55.58)   | .562 (14.27) | .614 (15.60)  | .969 (24.61)   | .719 (18.26)  | 1.000 (25.40) | .120 (3.05) | 1.281 (32.54)  | .873 (22.17)  | 1.703 (43.26)  |         |        |
| 12S        | .375 (9.53)  | .536 (13.61) | .140 (3.56) | 1.040 (26.42) | 2.188 (55.58)   | .562 (14.27) | .614 (15.60)  | 1.062 (26.97)  | .812 (20.62)  | 1.094 (27.79) | .120 (3.05) | 1.281 (32.54)  | .873 (22.17)  | 1.703 (43.26)  |         |        |
| 14S        | .375 (9.53)  | .536 (13.61) | .140 (3.56) | 1.040 (26.42) | 2.312 (58.72)   | .562 (14.27) | .739 (18.77)  | 1.156 (29.36)  | .906 (23.01)  | 1.188 (30.18) | .120 (3.05) | 1.406 (35.71)  | .936 (23.77)  | 1.765 (44.83)  |         |        |
| 16S        | .375 (9.53)  | .536 (13.61) | .140 (3.56) | 1.040 (26.42) | 2.406 (61.11)   | .562 (14.27) | .864 (21.95)  | 1.250 (31.75)  | .969 (24.61)  | 1.281 (32.54) | .120 (3.05) | 1.531 (38.89)  | .998 (25.35)  | 1.796 (45.62)  |         |        |
| 12         | .625 (15.88) | .724 (18.39) | .146 (3.71) | 1.400 (35.56) | 2.531 (64.29)   | .750 (19.05) | .614 (15.60)  | 1.062 (26.97)  | .812 (20.62)  | 1.094 (27.79) | .120 (3.05) | 1.281 (32.54)  | .873 (22.17)  | 2.062 (52.37)  |         |        |
| 14         | .625 (15.88) | .724 (18.39) | .146 (3.71) | 1.400 (35.56) | 2.688 (68.28)   | .750 (19.05) | .739 (18.77)  | 1.156 (29.36)  | .906 (23.01)  | 1.188 (30.18) | .120 (3.05) | 1.406 (35.71)  | .936 (23.77)  | 2.125 (53.98)  |         |        |
| 16         | .625 (15.88) | .724 (18.39) | .146 (3.71) | 1.400 (35.56) | 2.781 (70.64)   | .750 (19.05) | .864 (21.95)  | 1.250 (31.75)  | .969 (24.61)  | 1.281 (32.54) | .120 (3.05) | 1.531 (38.89)  | .998 (25.35)  | 2.156 (54.76)  |         |        |
| 18         | .625 (15.88) | .724 (18.39) | .180 (4.57) | 1.400 (35.56) | 2.844 (72.24)   | .750 (19.05) | .989 (25.12)  | 1.344 (34.14)  | 1.062 (26.97) | 1.375 (34.93) | .120 (3.05) | 1.593 (40.46)  | 1.061 (26.95) | 2.250 (57.15)  |         |        |
| 20         | .625 (15.88) | .724 (18.39) | .180 (4.57) | 1.400 (35.56) | 3.250 (82.55)   | .750 (19.05) | 1.145 (29.08) | 1.469 (37.31)  | 1.156 (29.36) | 1.500 (38.10) | .120 (3.05) | 1.656 (42.06)  | 1.123 (28.52) | 2.312 (58.72)  |         |        |
| 22         | .625 (15.88) | .724 (18.39) | .180 (4.57) | 1.400 (35.56) | 3.250 (82.55)   | .750 (19.05) | 1.270 (32.26) | 1.594 (40.49)  | 1.250 (31.75) | 1.625 (41.28) | .120 (3.05) | 1.718 (43.64)  | 1.186 (30.12) | 2.312 (58.72)  |         |        |
| 24         | .625 (15.88) | .724 (18.39) | .203 (5.16) | 1.400 (35.56) | 3.719 (94.46)   | .812 (20.62) | 1.395 (35.43) | 1.719 (43.66)  | 1.375 (34.93) | 1.750 (44.45) | .147 (3.73) | 1.890 (48.01)  | 1.263 (32.08) | 2.531 (64.29)  |         |        |
| 28         | .625 (15.88) | .724 (18.39) | .203 (5.16) | 1.400 (35.56) | 3.719 (94.46)   | .812 (20.62) | 1.614 (41.00) | 1.969 (50.01)  | 1.562 (39.67) | 2.000 (50.80) | .147 (3.73) | 1.968 (49.99)  | 1.342 (34.09) | 2.531 (64.29)  |         |        |
| 32         | .625 (15.88) | .724 (18.39) | .203 (5.16) | 1.400 (35.56) | 4.188 (106.38)  | .875 (22.23) | 1.864 (47.35) | 2.219 (56.36)  | 1.750 (44.45) | 2.250 (57.15) | .173 (4.39) | 2.187 (55.55)  | 1.561 (39.65) | 2.750 (69.85)  |         |        |
| 36         | .625 (15.88) | .724 (18.39) | .203 (5.16) | 1.400 (35.56) | 4.297 (109.14)  | .875 (22.23) | 2.051 (52.10) | 2.469 (62.71)  | 1.938 (49.23) | 2.500 (63.50) | .173 (4.39) | 2.406 (61.11)  | 1.780 (45.21) | 2.875 (73.02)  |         |        |
| 40         | .625 (15.88) | .724 (18.39) | .203 (5.16) | 1.400 (35.56) | 7.211 (183.16)† | .875 (22.23) | 2.390 (60.71) | 2.723 (69.16)† | 2.188 (55.58) | 2.750 (69.85) | .173 (4.39) | 5.875 (149.22) | -             | 5.690 (144.53) |         |        |

†Not to MS specification

\*\* Barrel engaging face to shoulder.

| Shell Size | A Thread                |                |
|------------|-------------------------|----------------|
|            | Box Mounting Receptacle | 90° Angle Plug |
| 8S         | 1/2-28UNEF-2A           | 1/2-28UNEF-2B  |
| 10S        | 5/8-24UNEF-2A           | 5/8-24UNEF-2B  |
| 10SL       | 5/8-24UNEF-2A           | 5/8-24UNEF-2B  |
| 12S        | 3/4-20UNEF-2A           | 3/4-20UNEF-2B  |
| 14S        | 7/8-20UNEF-2A           | 7/8-20UNEF-2B  |
| 16S        | 1-20UNEF-2A             | 1-20UNEF-2B    |
| 12         | 3/4-20UNEF-2A           | 3/4-20UNEF-2B  |
| 14         | 7/8-20UNEF-2A           | 7/8-20UNEF-2B  |

| Shell Size | A Thread                |                 |
|------------|-------------------------|-----------------|
|            | Box Mounting Receptacle | 90° Angle Plug  |
| 16         | 1-20UNEF-2A             | 1-20UNEF-2B     |
| 18         | 1-1/8-18UNEF-2A         | 1-1/8-18UNEF-2B |
| 20         | 1-1/4-18UNEF-2A         | 1-1/4-18UNEF-2B |
| 22         | 1-3/8-18UNEF-2A         | 1-3/8-18UNEF-2B |
| 24         | 1-1/2-18UNEF-2A         | 1-1/2-18UNEF-2B |
| 28         | 1-3/4-18UNS-2A          | 1-3/4-18UNS-2B  |
| 32         | 2-18UNS-2A              | 2-18UNS-2B      |
| 36         | 2-1/4-16UN-2A           | 2-1/4-16UN-2B   |
| 40         | 2-1/2-16UN-2A           | 2-1/2-16UN-2B   |

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## How to Order

MS type potting connectors are available with nylon cups, 00 and 06 shell styles with plastic cups and resilient insulators meet the requirements of MS3103 and MS25183. Also available is the 08 plug with resilient insulator and 90° angle nylon potting cup.

ITT Cannon provides for a 1/4" clearance for potting on all contact sizes.

MS 25183 - 18 - 10 P  
 MS 3103 - 18 - 10 P  
 CA 3100 ER 18 - 10 P

**PREFIX** \_\_\_\_\_

**SHELL STYLE** \_\_\_\_\_

**CLASS** \_\_\_\_\_

**SHELL SIZE** \_\_\_\_\_

**CONTACT ARRANGEMENT** \_\_\_\_\_

**CONTACT TYPE** \_\_\_\_\_

**PREFIX**  
 CA - ITT Cannon prefix indicating special application or variation of MS

**SHELL STYLE**  
 Coupling thread diameter figured in sixteenths of an inch

**SHELL STYLE**  
 3100 - Wall mounting receptacle (MS3103)  
 3106 - Straight plug (MS25183)  
 3108 - 90° angle plug

**COTNACT ARRANGEMENTS**  
 See pages 171-174

**CLASS**  
 ER - Resilient insulator, nylon potting cup and thread attachment ring  
 No class designator for MS types.

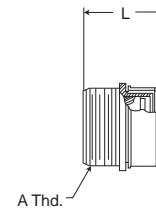
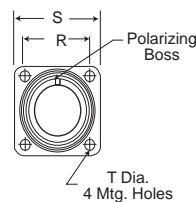
**COTNACT TYPE**  
 P for Pin; S for Socket

## Wall Mounting Receptacle

**MS3103**  
 Nylon Potting Cup  
 Threaded Attachment Ring



**CA3100ER**



The CA3100ER receptacle (MS3103) is supplied with a resilient insulator and nylon potting cup with a threaded attachment ring. This receptacle mates with 3106, 3107, and 3108 plugs.

| Shell Size | L Max.        | R ±.005 (+0.13) | S Max.        | R +.010 (+0.25) - .005 (+0.13) | A Thread       |
|------------|---------------|-----------------|---------------|--------------------------------|----------------|
| 8S         | 1.531 (38.89) | .594 (15.09)    | .906 (23.01)  | .120 (3.05)                    | 1/2-28UNEF-2A  |
| 10S        | 1.531 (38.89) | .719 (18.26)    | 1.031 (26.19) | .120 (3.05)                    | 5/8-24NEF-2A   |
| 10SL       | 1.531 (38.89) | .719 (18.26)    | 1.031 (26.19) | .120 (3.05)                    | 5/8-24NEF-2A   |
| 12S        | 1.531 (38.89) | .812 (20.62)    | 1.125 (28.58) | .120 (3.05)                    | 3/4-20UNEF-2A  |
| 14S        | 1.531 (38.89) | .906 (23.01)    | 1.219 (30.96) | .120 (3.05)                    | 7/8-20UNEF-2A  |
| 16S        | 1.531 (38.89) | .969 (24.61)    | 1.312 (33.32) | .120 (3.05)                    | 1-20UNEF-2A    |
| 12         | 1.968 (49.99) | .812 (20.62)    | 1.125 (28.58) | .120 (3.05)                    | 3/4-20UNEF-2A  |
| 14         | 1.968 (49.99) | .906 (23.01)    | 1.219 (30.96) | .120 (3.05)                    | 3/4-20UNEF-2A  |
| 16         | 1.968 (49.99) | .968 (24.59)    | 1.312 (33.32) | .120 (3.05)                    | 1-20UNEF-2A    |
| 18         | 1.968 (49.99) | 1.062 (26.97)   | 1.406 (35.71) | .120 (3.05)                    | 1-1/8-18NEF-2A |
| 20         | 2.188 (55.58) | 1.156 (29.36)   | 1.531 (38.89) | .120 (3.05)                    | 1-1/4-18NEF-2A |
| 22         | 2.188 (55.58) | 1.250 (31.75)   | 1.656 (42.06) | .120 (3.05)                    | 1-3/8-18NEF-2A |
| 24         | 2.188 (55.58) | 1.375 (34.92)   | 1.781 (45.24) | .147 (3.73)                    | 1-1/2-18NEF-2A |
| 28         | 2.188 (55.58) | 1.562 (39.67)   | 2.031 (51.59) | .173 (4.39)                    | 1-3/4-18NS-2A  |
| 32         | 2.188 (55.58) | 1.750 (44.45)   | 2.281 (57.94) | .173 (4.39)                    | 2-18NS-2A      |
| 36         | 2.188 (55.58) | 1.938 (49.23)   | 2.531 (64.29) | .173 (4.39)                    | 2-1/4-16UN-2A  |

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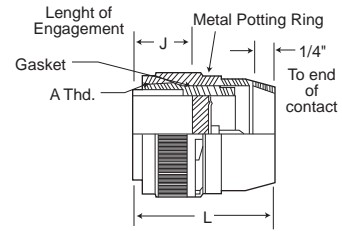
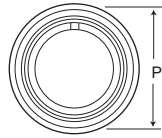
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## Straight Plug

MS25183  
Nylon Potting Cup  
Rubber Gasket

CA3106ER

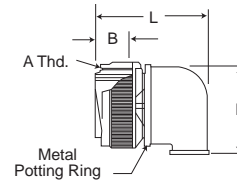
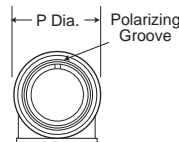


The CA3106ER plug is supplied with resilient insulators, nylon potting cups with threaded attachment rings, and a rubber gasket under the coupling nut. This plug mates with 3100 and 3102 receptacles and 3101 plugs.

## 90° Angle Plug

Nylon Potting Cup  
Rubber Gasket

CA3108ER



The CA3108ER is supplied with resilient insulator, 90° nylon potting cup and threaded attachment ring with a rubber gasket under the coupling nut. This plug mates with 3100 and 3102 receptacles and 3101 plugs.

| CA3106ER   |              |               |               |                 | CA3108ER     |               |                               |                             |               |                 |
|------------|--------------|---------------|---------------|-----------------|--------------|---------------|-------------------------------|-----------------------------|---------------|-----------------|
| Shell Size | J Max.       | L Max.        | P Max.        | A Thread        | B Max.       | D Max.        | L Max.                        |                             | P Max.        | A Thread        |
|            |              |               |               |                 |              |               | For Arr. w/#16 & #12 Contacts | For Arr. w/#8 & #4 Contacts |               |                 |
| 8S         | .536 (13.61) | 1.562 (39.67) | .844 (21.44)  | 1/2-28UNEF-2B   | -            | -             | -                             | -                           | -             | -               |
| 10S        | .536 (13.61) | 1.562 (39.67) | .969 (24.61)  | 5/8-24UNEF-2B   | -            | -             | -                             | -                           | -             | -               |
| 10SL       | .536 (13.61) | 1.562 (39.67) | .969 (24.61)  | 5/8-24UNEF-2B   | .563 (13.61) | 1.040 (26.42) | 1.463 (37.16)                 | -                           | .969 (24.61)  | 5/8-24UNEF-2B   |
| 12S        | .536 (13.61) | 1.562 (39.67) | 1.062 (26.97) | 3/4-20UNEF-2B   | .563 (13.61) | 1.040 (26.42) | 1.600 (40.64)                 | -                           | 1.062 (26.97) | 3/4-24UNEF-2B   |
| 14S        | .536 (13.61) | 1.562 (39.67) | 1.156 (29.36) | 7/8-20UNEF-2B   | .563 (13.61) | 1.040 (26.42) | 1.600 (40.64)                 | 2.300 (58.42)               | 1.156 (29.36) | 7/8-20UNEF-2B   |
| 16S        | .536 (13.61) | 1.562 (39.67) | 1.250 (31.75) | 1-20UNEF-2B     | .563 (13.61) | 1.290 (32.77) | 1.600 (40.64)                 | 2.550 (64.77)               | 1.250 (31.75) | 1-20UNEF-2B     |
| 12         | .724 (18.39) | 2.000 (50.80) | 1.062 (26.97) | 3/4-20UNEF-2B   | .724 (18.39) | 1.040 (26.42) | 1.910 (48.51)                 | -                           | 1.062 (26.97) | 3/4-20UNEF-2B   |
| 14         | .724 (18.39) | 2.000 (50.80) | 1.156 (29.36) | 7/8-20UNEF-2B   | .724 (18.39) | 1.040 (26.42) | 1.910 (48.51)                 | 2.610 (66.29)               | 1.156 (29.36) | 7/8-20UNEF-2B   |
| 16         | .724 (18.39) | 2.000 (50.80) | 1.250 (31.75) | 1-20UNEF-2B     | .724 (18.39) | 1.290 (32.77) | 1.910 (48.51)                 | 2.850 (72.39)               | 1.250 (31.75) | 1-20UNEF-2B     |
| 18         | .724 (18.39) | 2.000 (50.80) | 1.344 (34.14) | 1-1/8-18UNEF-2B | .724 (18.39) | 1.290 (32.77) | 2.100 (53.34)                 | 2.850 (72.39)               | 1.344 (34.14) | 1-1/8-18UNEF-2B |
| 20         | .724 (18.39) | 2.125 (53.98) | 1.469 (37.31) | 1-1/4-18UNEF-2B | .724 (18.39) | 1.540 (39.12) | 2.100 (53.34)                 | 2.850 (72.39)               | 1.469 (37.31) | 1-1/4-18UNEF-2B |
| 22         | .724 (18.39) | 2.125 (53.98) | 1.594 (40.49) | 1-3/8-18UNEF-2B | .724 (18.39) | 1.540 (39.12) | 2.100 (53.34)                 | 2.850 (72.39)               | 1.594 (40.49) | 1-3/8-18UNEF-2B |
| 24         | .724 (18.39) | 2.125 (53.98) | 1.719 (43.66) | 1-1/2-18UNEF-2B | .724 (18.39) | 1.790 (45.47) | 2.281 (57.94)                 | 2.985 (75.82)               | 1.719 (43.66) | 1-1/2-18UNEF-2B |
| 28         | .724 (18.39) | 2.125 (53.98) | 1.969 (50.01) | 1-3/4-18UNS-2B  | .724 (18.39) | 2.040 (51.82) | 2.485 (63.12)                 | 2.985 (75.82)               | 1.969 (50.01) | 1-3/4-18UNS-2B  |
| 32         | .724 (18.39) | 2.180 (55.37) | 1.219 (30.96) | 2-18UNS-2B      | .724 (18.39) | 2.290 (58.17) | 2.485 (63.12)                 | 2.985 (75.82)               | 1.219 (30.96) | 2-18UNS-2B      |
| 36         | .724 (18.39) | 2.180 (55.37) | 2.469 (62.71) | 2-1/4-16UN-2B   | .724 (18.39) | 2.540 (64.52) | 2.485 (63.12)                 | 2.985 (75.82)               | 2.469 (62.71) | 2-1/4-16UN-2B   |
| 40         | .724 (18.39) | 2.180 (55.37) | 2.723 (69.16) | 2-1/2-16UN-2B   |              |               |                               |                             |               |                 |

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## Components

|              | MS3106R<br>CA3106R<br>Straight Plug | MS3106F<br>CA06R<br>Straight Plug | MS3106E*<br>CA3106E<br>Straight Plug | MS3108E<br>CA3108E<br>90° Angle Plug | MS3108R<br>CA3108R<br>90° Angle Plug |
|--------------|-------------------------------------|-----------------------------------|--------------------------------------|--------------------------------------|--------------------------------------|
| Endbell      |                                     |                                   |                                      |                                      |                                      |
| Ferrule      |                                     |                                   |                                      |                                      |                                      |
| Grommet      |                                     |                                   |                                      |                                      |                                      |
| Pin Contacts |                                     |                                   |                                      |                                      |                                      |
| Insulator    |                                     |                                   |                                      |                                      |                                      |
| Coupling Nut |                                     |                                   |                                      |                                      |                                      |
| Barrel       |                                     |                                   |                                      |                                      |                                      |
| O Ring       |                                     |                                   |                                      |                                      |                                      |

Note: Class F is not applicable to MS3108 shell style.

\* Class E inactive for new design. Use Class F or R.

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