# Amphenol® Heavy Duty Cylindrical Connectors

12-052-9

Amphenol

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Amphenol Aerospace is a Certified ISO 9001 Manufacturer

This catalog covers Amphenol® Heavy Duty/ Power Connectors covered by MIL-C-22992.

The first section covers Class L Power Connectors, complete with insert arrangements, accessories and assembly instructions.

The second part covers our QWLD Heavy Duty Connectors. This second part is made up of 3 sections, including QWLD insert arrangements, connector shell styles and accessories.

If more information is needed concerning our Heavy Duty/Power Connectors, please contact:

Amphenol Corporation
Amphenol Aerospace
40-60 Delaware Avenue
Sidney, New York 13838-1395
Telephone: 607-563-5011
Fax: 607-563-5157

This catalog and other product literature from Amphenol Aerospace and Amphenol Industrial Operations can be viewed, saved, and down-loaded from our website: www.amphenol-aerospace.com.

Due to space limitations, metric equivalents of dimensional data in this catalog have not been included. All dimensions given may be converted to the metric system by the standard formula; Dimension (inches) x 25.40 = dimension (millimeters).

# Amphenol® Heavy Duty Cylindrical Connectors
## MIL-C-22992/Proprietary

- **High Current Capacity**
- **Rugged Construction**
- **Safety**
- **Serviceability**

Amphenol meets the demands for heavy duty connectors by providing three cylindrical connector series, each with unique design characteristics for reliable operation in specific industrial environments.

**Class "L" –** for the heaviest electrical loads (Pages 2 – 19)
- Current range from 40 to 200 amperes
- Direct current or single/three phase, 60/400 Hertz alternating current
- Automatic grounding for safety
- MIL-C-22992 qualification

**QWLD –** for most power and control circuits (Pages 21 – 77)
- Military (MIL-C-22992) qualified connectors and industrial equivalents available
- Increased shell size for greater durability than similar standard connectors

**QWL –** a more compact heavy duty design for industrial power and control applications (Page 78, references Amphenol Catalog 12-053)

These three series share the following common characteristics which are critical to reliable heavy duty connectors:
- Resistance to the operating environment. Refer to environmental data, below.
- Double stub coupling threads for faster connections; no cross threading, easy cleaning.
- Left hand accessory threads to minimize cable twisting, wire breakage, accidental connector disassembly.
- Gaskets or O-rings at appropriate surfaces for perfect weathertight connections.

Amphenol® heavy duty connectors have been exposed to the following environmental conditions, without compromise of mechanical integrity or degradation of electrical performance.

| Condition | Configuration | Description | Reference |
|---|---|---|---|
| Thermal Shock | Unmated | Five complete one hour temperature cycles of –55°C to +125°C | MIL-STD-1344, method 1003, test condition A |
| Moisture Resistance (Cable mounted connectors) | Mated | Ten complete 24 hour cycles of +25°C to +65°C temperature at 90% to 98% humidity | MIL-STD-202, method 106 |
| Durability | Mated | 500 complete mating/unmating cycles | MIL-C-22992 |
| Salt Spray (Corrosion) | Unmated | 48 hour exposure to atomized 5% saline solution at +35°C | MIL-STD-1344, method 1001 |
| Vibration | Mated | 10 to 55 Hz, .06 inch total excursion in 1 minute cycles for 6 hours, 55 to 2000 Hz, 10G peak amplitude sweep | MIL-STD-1344, method 2005 |
| High Impact | Mated | Nine hammer blows from 1, 3 and 5 feet, three each in three axes on mounting panel | MIL-STD-202, method 207 |
| Heat Rise (Class L only) | Mated | Maximum rated DC current for four hours at +25°C in still air | MIL-C-22992 |
| Fluid Immersion | Unmated | 20 hours immersion in hydraulic fluid and lubricating oil | MIL-C-22992 |
| Water Immersion | Mated and Unmated | 4 hours immersion at 1 atmosphere pressure differential | MIL-C-22992 |

# Amphenol® Heavy Duty Cylindrical Connectors
MIL-C-22992, Class L

**The Amphenol® Class L* heavy duty connectors are the largest size cylindricals, highly suitable for industrial or military applications, and designed to meet the demands of heavy power interconnections.**

**The design features of this connector series provide:**

- **Greatest Capacity -**
  current ranges 40 to 200 amps, conductor sizes 6 to 4/0
- **Safety -**
  complete protection of personnel and equipment if connectors are inadvertently disconnected under load
- **Foolproof Mating -**
  design incorporates specific voltage, current, frequency, phase and grounding requirements
- **Standardization -**
  MIL-C-22992 Class L insert arrangements specify connector/cable combinations for maximum reliability
- **Serviceable Contacts -**
  contacts are normally crimped to the cable before connector assembly. No insertion tools required. Bushings are available to adapt smaller diameter wires to larger contacts

* Amphenol design is covered by one or more of the following U. S. Patent Numbers: 3,023,396; 3,221,292.

# Amphenol® Heavy Duty Cylindrical Connectors
## MIL-C-22992, Class L

Class L connectors are available only in the specific configurations prescribed by MIL-C-22992 for either military or industrial applications. This rigid configuration control assures correct interconnection of electrical circuits for maximum safety and reliability. Controlled parameters include:

**Connector shell style and contact type -** wall mount and cable connecting receptacles are supplied with socket contacts only and always lead from the power source. Plugs (with coupling rings) have pin contacts only and always lead to the equipment end.

**Shell size -** the direct relationship of shell size to current carrying capability reduces the possibility of inadequate wiring for heavy electrical loads.†

| Shell Size | Current Rating (Amperes) | Contact Size |
|---|---|---|
| 28 | 40 | 6 |
| 32 | 60 | 4 |
| 44 | 100 | 1/0 |
| 52 | 200 | 4/0 |

**Keyway position -** four positions of the main keyway are used to discriminate between the following power sources:

two wire D.C
two wire single phase A.C.
three wire single phase A.C.
four wire three phase A.C.

**Insert rotation -** when carrying alternating current (A.C), different angular rotations of the insert within the connector shell are used to distinguish between 60 Hertz and 400 Hertz circuits.

**Other outstanding design features:**

**Arc quenching design -** recessed socket contacts within the insert create an arc suppressing chamber which protects the user when connectors are separated under load.

**Programmed coupling sequence -** grounding and neutral contacts engage before power contacts.

**Waterproof design -** a unique combination of grommets and seals provides waterproofing in any condition - mated or unmated, capped or uncapped.

**Rugged construction -** machined from high strength aluminum. Straight-line attachment of accessories eliminates possibility of cable twisting or misalignment.

**Accessories -** supplied with all Class L connectors as indicated on the individual connector descriptions. Replacement accessories may be ordered separately. See pages 12 through 15.

† MIL-C-22992 includes shell size 48, rated at 150 amperes. Consult your local Amphenol sales representative or Amphenol, Sidney, NY for availability.

# MIL-C-22992, Class L
## how to order

Connectors are supplied with removable contacts unassembled and applicable accessories as listed in the individual connector style descriptions, pages 8 through 11. Additional/replacement contacts or accessories may be ordered by their MS designations.

Connectors are ordered by MS designation. To illustrate the ordering procedure, part number MS90555 C32412SY is shown as follows:

PART NUMBER

| MS90555 | C | 32 | 4 | 12 | S | Y |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

1. **MS Number -**
   MS90555 designates wall mount receptacle *(power source)*
   MS90556 designates straight plug
   MS90557 designates cable connecting receptacle without coupling ring
   MS90558 designates wall mount plug with coupling ring *(equipment end)*
2. **Shell Finish -** C (conductive) for AC or N (nonconductive) for DC circuits.

**Grounding Assemblies: Finish C**

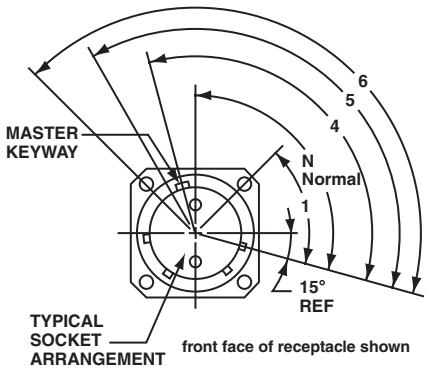
| Shell Size | Current Rating Amps | Shell Master Key/Keyway Position | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | 60Hz & 400Hz | | | | | | |
| | | 1 Phase | | | 3 Phase | | | |
| | | 2 Wire | | 3 Wire | 3 Wire | 4 Wire | | |
| | | 120 VAC | 240 VAC | 120/240 VAC | 450/480 VAC | 120/208 VAC | 240/416 VAC | 277/480 VAC |
| 28 | 40 | 4 (120°) | 5 (135°) | 4 (120°) | --- | 4 (120°) | 5 (135°) | 6 (150°) |
| 32 | 60 | 4 (120°) | 5 (135°) | 4 (120°) | --- | 4 (120°) | 5 (135°) | 6 (150°) |
| 44 | 100 | 4 (120°) | --- | 4 (120°) | 1 (60°) | 4 (120°) | 5 (135°) | 6 (150°) |
| 52 | 200 | --- | --- | 4 (120°) | --- | 4 (120°) | 5 (135°) | 6 (150°) |

**Non-grounding Assemblies: Finish N**

| Shell Size | Current Rating Amps | Shell Master/Key Keyway Position |
|---|---|---|
| | | DC |
| | | 2 Wire |
| | | 28 VDC |
| 28 | 40 | N (105°) |
| 32 | 60 | N (105°) |
| 44 | 100 | N (105°) |
| 52 | 200 | N (105°) |

3. **Shell Size -** related directly to current carrying capability.
   Size 28 - 40 amperes
   Size 32 - 60 amperes
   Size 44 - 100 amperes
   Size 52 - 200 amperes
4. **Master Key/Keyway Position -** N designates normal position. Positions 1, 4, 5 and 6 of the master key/keyway prevent cross-mating of incompatible voltages. Refer to the adjacent illustration.
5. **Insert Arrangement -** determined by connector size (current carrying capability) and cable configuration to be accommodated. Refer to pages 5 & 6.
6. **Contact Type -** P for pin, S for socket. MS90555 and MS90557 are supplied with socket contacts **only**. MS90556 and MS90558 are supplied with pin contacts **only**.
7. **Alternate Insert Rotation -** used to prevent cross-mating of incompatible frequencies. Absence of a letter in this space indicates normal (0°) position of the insert. Refer to page 7.

**MASTER KEY/KEYWAY POSITION**

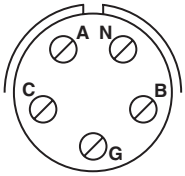



Note that insert arrangement does not rotate with master key/keyway

Amphenol Federal Vendor Identification
FSCM77820

# MIL-C-22992, Class L
## contact arrangements

### Shell Size 28, 40 amp rating




28-12, 28-13
Three phase AC, 4 wire, grounding

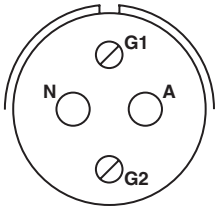
Cable:

| | |
|---|---|
| 28-12 | IPCEA, type G, round, four #8 conductors |
| 28-13 | CO-04 HDF, (4/6-4/12R) 1090 per MIL-C-3432 |

Contacts:

| Position | Size | Pin M39029/48 | Socket M39029/49 |
|---|---|---|---|
| A, B, C | 6 | -317 | -329 |
| N, G | 6N | -318 | -329 |

### Shell Size 32, 60 amp rating




32-04, 32-05
Single phase AC, 2 wire, grounding

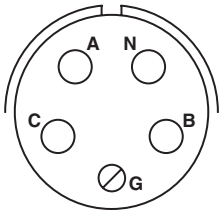
Cable:

| | |
|---|---|
| 32-04 | IPCEA, type G, round, two #6 conductors |
| 32-05 | CO-02 HDF, (2/4-2/8R) 1100 per MIL-C-3432 |

Contacts:

| Position | Size | Pin M39029/48 | Socket M39029/49 |
|---|---|---|---|
| A | 4 | -320 | -331 |
| N | 4N | -321 | -331 |
| G1, G2 | 6N | -318 | -329 |

### Shell Size 32, 60 amp rating




32-12, 32-13
Three phase AC, 4 wire, grounding

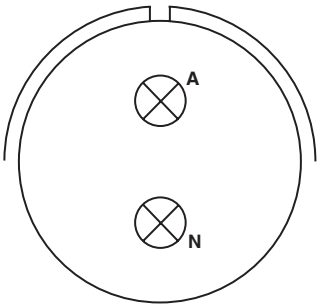
Cable:

| | |
|---|---|
| 32-12 | IPCEA, type G, round, four #6 conductors |
| 32-13 | CO-04 HDF, (4/4-4/12R) 1290 per MIL-C-3432 |

Contacts:

| Position | Size | Pin M39029/48 | Socket M39029/49 |
|---|---|---|---|
| A, B, C | 4 | -320 | -331 |
| N | 4N | -321 | -331 |
| G | 6N | -318 | -329 |

### Shell Size 44, 100 amp rating




44-02, 44-03
28 Volts DC, 2 wire

Cable:

| | |
|---|---|
| 44-02 | IPCEA, type W, round, two #2 conductors |
| 44-03 | CO-02 HDF, (2/1) 1385 per MIL-C-3432 |

Contacts:

| Position | Size | Pin M39029/48 | Socket M39029/49 |
|---|---|---|---|
| A | 1/0-1 | -323 | -333 |
| N | 1/0N-1 | -324 | -333 |

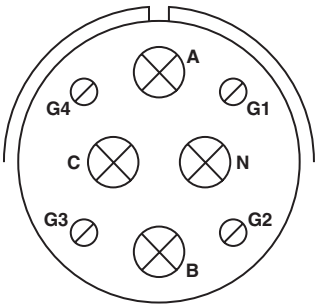
IPCEA – Insulated Power Cable Engineers Association



**CONTACT LEGEND** 6 4 1/0 4/0

# MIL-C-22992, Class L
## contact arrangements

### Shell Size 44, 100 amp rating




44-12, 44-13
Three phase AC, 4 wire, grounding

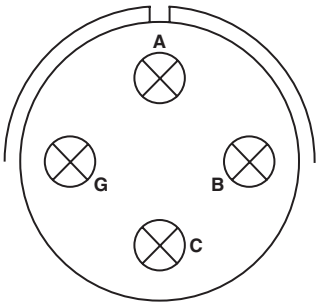
Cable:

| | |
|---|---|
| 44-12 | IPCEA, type G, round, four #2 conductors |
| 44-13 | CO-04 HDF, (4/1-4/8R) 1620<br>per MIL-C-3432 |

Contacts:

| Position | Size | Pin M39029/48 | Socket M39029/49 |
|---|---|---|---|
| A, B, C | 1/0-1 | -323 | -333 |
| N | 1/0N-1 | -324 | -333 |
| G1, G2, G3, G4 | 6G | -319 | -330 |

### Shell Size 44, 100 amp rating
### For Navy Ground Support Equipment use only.




44-50, 44-51, 44-52, 44-56
Three phase AC, 3 wire, grounding

| | |
|---|---|
| 44-50 | Available in MS90555 & MS90558 only<br>4 each # 1 conductors |

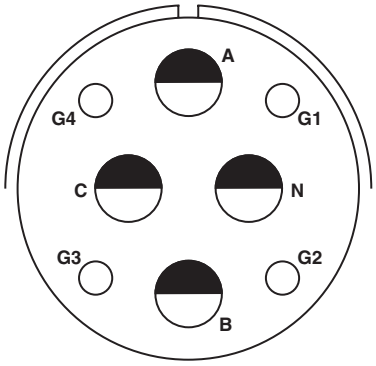
Cable:

| | |
|---|---|
| 44-51 | Available in MS90556 & MS90557 only<br>IPCEA, type W, round, four # 1 conductors |
| 44-52 | Available in MS90556 only<br>IPCEA, type W, round, four # 2 conductors |
| 44-56 | Available in MS90556 only<br>IPCEA, type W, round, four # 6 conductors |

Contacts:

| Position | Size | Pin M39029/48 | Socket M39029/49 |
|---|---|---|---|
| A, B, C | 1/0-1 | -323 | -333 |
| G | 1/0N-1 | -324 | -333 |

### Shell Size 52, 200 amp rating




52-12, 52-13
Three phase AC, 4 wire, grounding

Cable:

| | |
|---|---|
| 52-12 | IPCEA, type G, round, four #4/0 conductors |
| 52-13 | CO-04 HDE, (4/0000-4/4R) 2380<br>per MIL-C-3432 |

Contacts:

| Position | Size | Pin M39029/48 | Socket M39029/49 |
|---|---|---|---|
| A, B, C | 4/0 | -327 | -335 |
| N | 4/0N | -328 | -335 |
| G1, G2, G3, G4 | 4G | -322 | -332 |

IPCEA – Insulated Power Cable Engineers Association

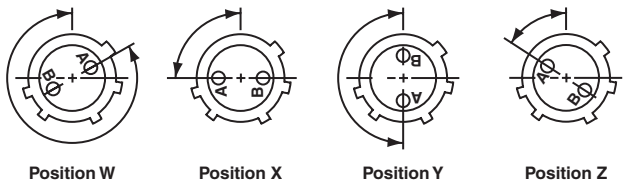


**CONTACT LEGEND** 6 4 1/0 4/0

# MIL-C-22992, Class L
## alternate insert rotations

To avoid cross-plugging problems in applications requiring the use of more than one connector of the same size and arrangement, alternate insert rotations are available as indicated in the accompanying chart.

As shown in the diagram below, the front face of the pin insert is rotated within the shell in a clockwise direction from the normal shell key. The socket insert would be rotated counterclockwise the same number of degrees in respect to the normal shell key.

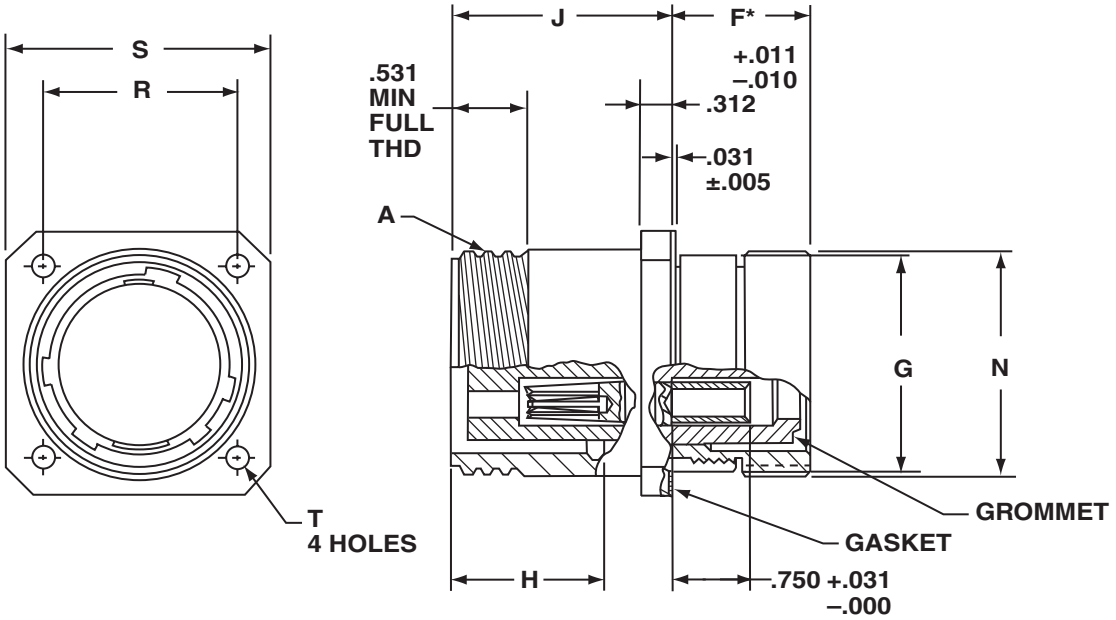



**Position W** **Position X** **Position Y** **Position Z**

**Views looking into front face of pin insert or rear of socket insert.**

| Insert Arrangements | Keying Position (degrees from normal position) | | | | |
|---|---|---|---|---|---|
| | DC or 60 Hz Normal | 400 Hz | | | |
| | | W | X | Y | Z |
| 28-12 | 0 | – | – | 180 | – |
| 28-13 | 0 | – | – | 180 | – |
| 32-04 | 0 | – | 90 | – | – |
| 32-05 | 0 | – | 90 | – | – |
| 32-12 | 0 | – | – | 180 | – |
| 32-13 | 0 | – | – | 180 | – |
| 44-12 | 0 | – | – | – | 60 |
| 44-13 | 0 | – | – | – | 60 |
| 44-50 | 0 | – | – | – | – |
| 44-51 | 0 | – | – | – | – |
| 44-52 | 0 | – | – | – | – |
| 44-56 | 0 | – | – | – | – |
| 52-12 | 0 | 300 | – | – | – |
| 52-13 | 0 | 300 | – | – | – |

# MIL-C-22992, Class L
# MS90555
## wall mount receptacle *(power source)*

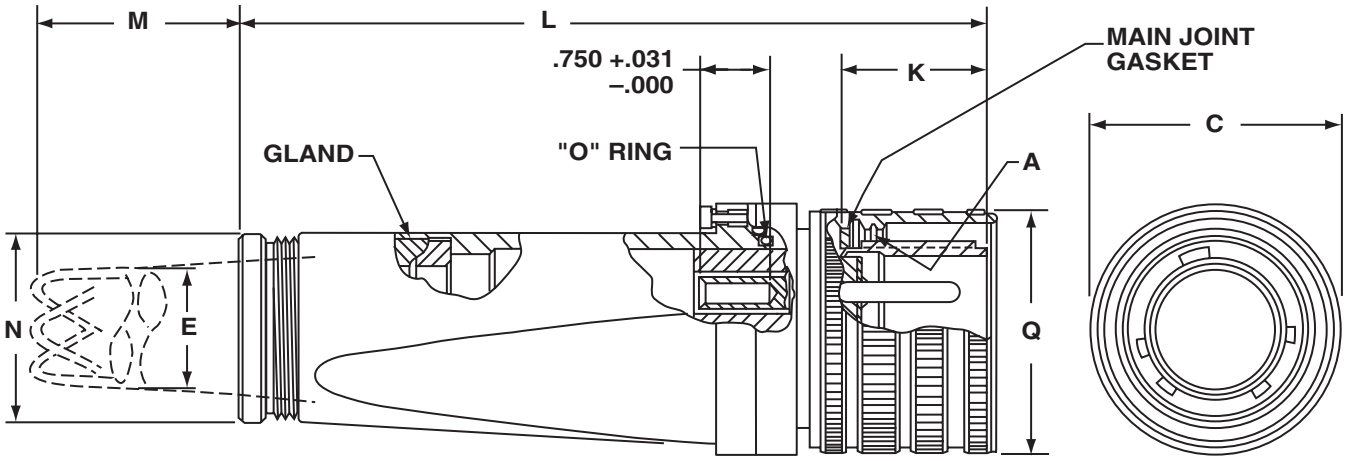



All dimensions for reference only.

| Shell Size | A Thread Class 2A .1428P-.2857L Double Stub | F* ±.031 | G Dia. +.006 –.010 | H ±.005 | J +.016 –.000 | N Dia. +.011 –.020 | R (BSC) | S +.021 –.020 | T Dia. ±.005 |
|---|---|---|---|---|---|---|---|---|---|
| 28 | 2.000 | 1.376 | 1.938 | 1.514 | 2.188 | 2.000 | 1.844 | 2.375 | .177 |
| 32 | 2.250 | 1.376 | 2.188 | 1.514 | 2.188 | 2.250 | 2.062 | 2.625 | .209 |
| 44 | 3.000 | 1.438 | 3.062 | 1.733 | 2.532 | 3.125 | 2.812 | 3.375 | .281 |
| 52 | 3.500 | 1.438 | 3.562 | 1.733 | 2.532 | 3.625 | 3.156 | 3.875 | .281 |

To complete MS Part number see how to order, pg. 4.
Protective cover MS90563 is supplied as part of this connector assembly. Refer to page 15 for dimensions.
*F dimension applies only when rear nut is fully tightened

# MIL-C-22992, Class L
# MS90556
## straight plug

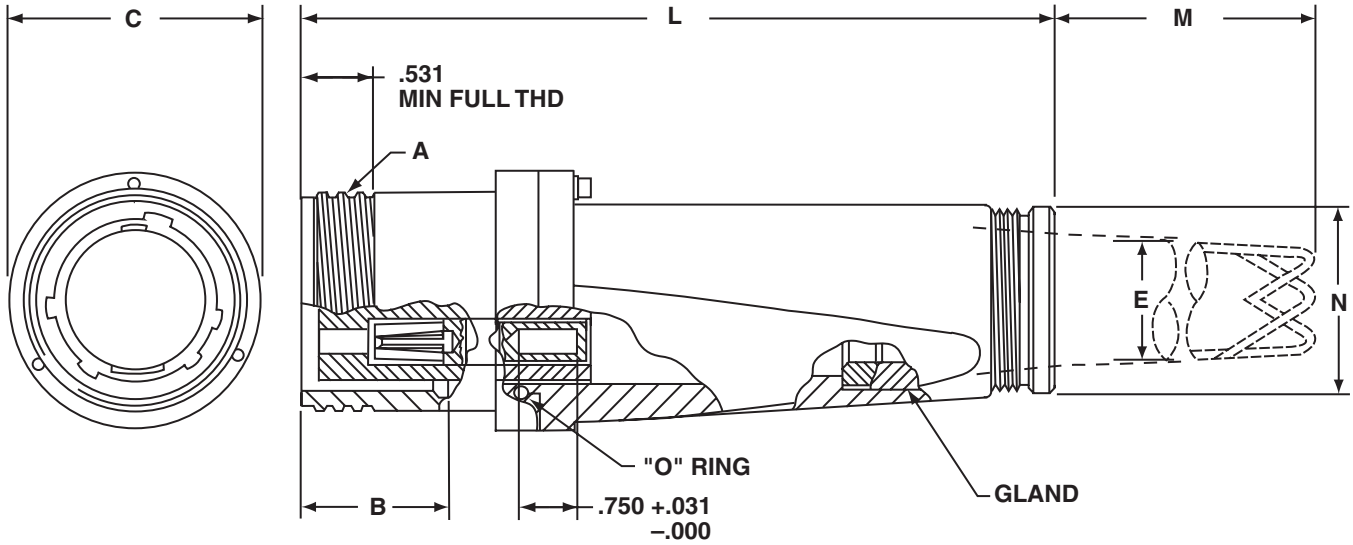



All dimensions for reference only.

| Shell Size and Arrangement | A Thread Class 2B .1428P-.2857L Double Stub | C Dia. Max | E Cable Range | K ±.005 | L Max Free Length | M Approx. Free Length | N Dia +.011 –.020 | Q Dia. Max |
|---|---|---|---|---|---|---|---|---|
| 28-12 | 2.000 | 2.439 | 1.047-.922 | 1.557 | 8.188 | 7.188 | 2.000 | 2.312 |
| 28-13 | | | 1.130-1.005 | | | 7.188 | | |
| 32-04 | 2.250 | 2.689 | .969-.844 | 1.557 | 8.188 | 7.188 | 2.000 | 2.562 |
| 32-05, -12 | | | 1.130-1.005 | | | 7.188 | | |
| 32-13 | | | 1.342-1.217 | | | 8.688 | | |
| 44-02 | 3.000 | 3.667 | 1.312-1.187 | 1.776 | 10.172 | 10.688 | 2.500 | 3.531 |
| 44-03 | | | 1.438-1.313 | | | 9.688 | | |
| 44-12 | | | 1.516-1.391 | | | 10.688 | | |
| 44-13 | | | 1.672-1.547 | | | 12.688 | | |
| 44-51 | 3.000 | 3.667 | 1.734-1.609 | 1.776 | 10.172 | 11.688 | 2.500 | 3.531 |
| 44-52 | | | 1.525-1.435 | | | 11.188 | | |
| 44-56 | | | 1.135-1.065 | | | 7.188 | | |
| 52-12 | 3.500 | 4.167 | 2.328-2.183 | 1.776 | 11.109 | 17.188 | 3.250 | 4.016 |
| 52-13 | | | 2.453-2.308 | | | 18.188 | | |

To complete MS Part number see how to order, pg. 4.
Protective cover MS90564 is supplied as part of this connector assembly. Refer to page 15 for dimensions.
Contact brushings MS3348 are supplied as part of connector as required. Refer to page 13 for dimensions.

# MIL-C-22992, Class L
# MS90557
## cable connecting receptacle *without coupling ring*

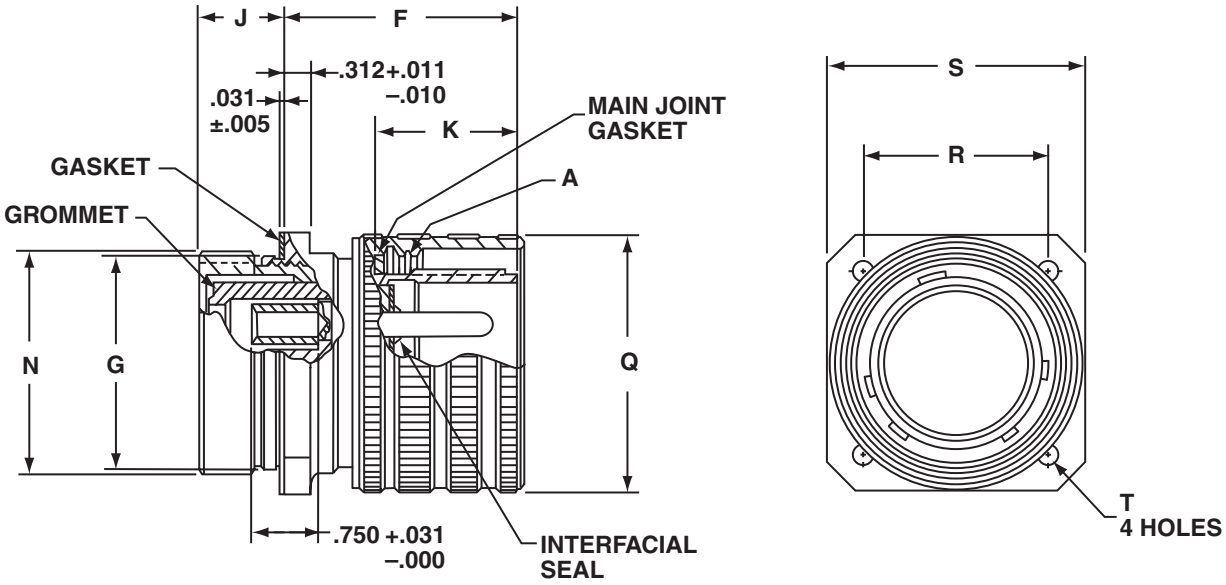



All dimensions for reference only.

| Shell Size and Arrangement | A Thread Class 2A .1428P-.2857L Double Stub | B ±.005 | C Dia. Max. | E Cable Range | L Max Free Length | M Approx. Free Length | N Dia +.011 –.020 |
|---|---|---|---|---|---|---|---|
| 28-12 | 2.000 | 1.514 | 2.439 | 1.047-.922 | 8.156 | 7.188 | 2.000 |
| 28-13 | | | | 1.130-1.005 | | 7.188 | |
| 32-04 | 2.250 | 1.514 | 2.689 | .969-.844 | 8.156 | 7.188 | 2.000 |
| 32-05, -12 | | | | 1.130-1.005 | | 7.188 | |
| 32-13 | | | | 1.342-1.217 | | 8.688 | |
| 44-02 | 3.000 | 1.733 | 3.667 | 1.312-1.187 | 10.125 | 10.688 | 2.500 |
| 44-03 | | | | 1.438-1.313 | | 9.688 | |
| 44-12 | | | | 1.516-1.391 | | 10.688 | |
| 44-13 | | | | 1.672-1.547 | | 12.688 | |
| 44-51 | | | | 1.734-1.609 | | 11.688 | |
| 52-12 | 3.500 | 1.733 | 4.167 | 2.328-2.183 | 11.062 | 17.188 | 3.250 |
| 52-13 | | | | 2.453-2.308 | | 18.188 | |

To complete MS Part number see how to order, pg. 4.
Protective cover MS90563 is supplied as part of this connector assembly. Refer to page 15 for dimensions.
Contact bushings MS3348 are supplied as part of connector as required. Refer to page 13 for dimensions.

# MIL-C-22992, Class L
# MS90558
## wall mount plug with coupling ring *(equipment end)*



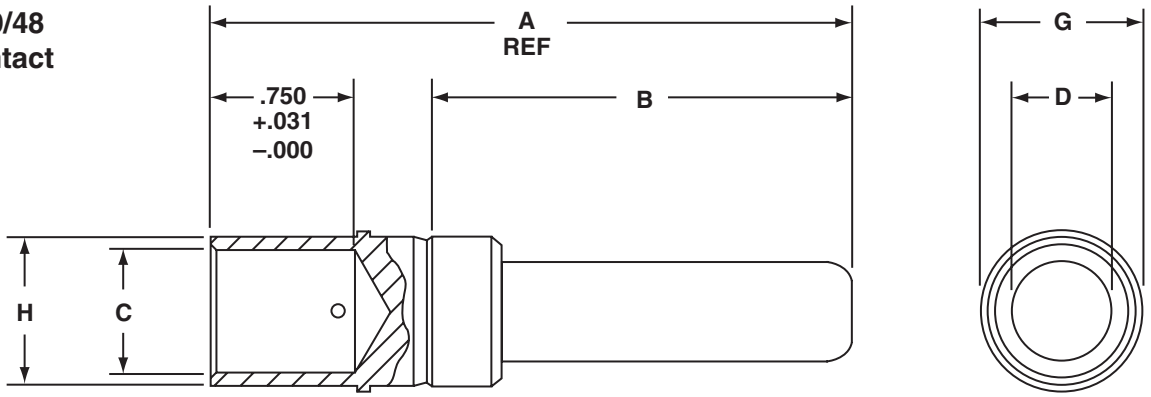

All dimensions for reference only.

| Shell Size | A Thread Class 2B .1428P-.2857L Double Stub | J ±.031 | G Dia +.006 –.010 | F* +.016 –.000 | K ±.005 | N +.011 –.020 | Q Dia. Max | R (BSC) | S +.021 –.020 | T Dia. ±.005 |
|---|---|---|---|---|---|---|---|---|---|---|
| 28 | 2.000 | .959 | 1.938 | 2.639 | 1.557 | 2.000 | 2.312 | 1.844 | 2.375 | .177 |
| 32 | 2.250 | .959 | 2.188 | 2.639 | 1.557 | 2.250 | 2.562 | 2.062 | 2.625 | .209 |
| 44 | 3.000 | 1.021 | 3.062 | 2.998 | 1.776 | 3.125 | 3.531 | 2.812 | 3.375 | .281 |
| 52 | 3.500 | 1.021 | 3.562 | 2.998 | 1.776 | 3.625 | 4.016 | 3.156 | 3.875 | .281 |

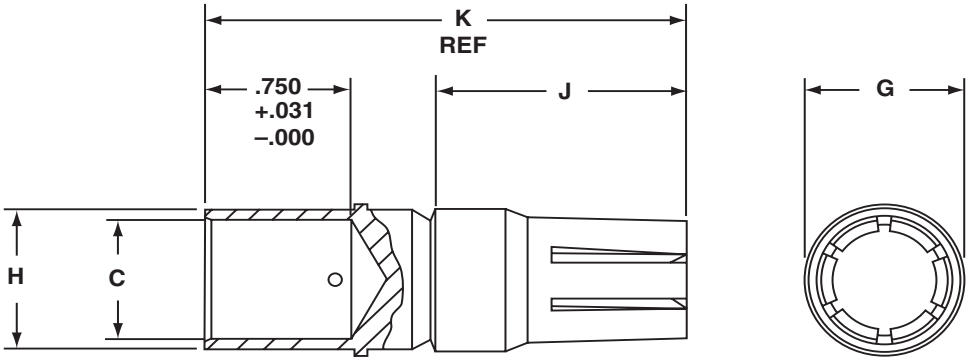
To complete MS part number see how to order, pg. 4.
Protective cover MS90564 is supplied as part of this connector assembly. Refer to page 15 for dimensions.
* F dimension applies only when rear nut is fully tightened.

# MIL-C-22992, Class L Accessories
contacts

**M39029/48**
**pin contact**




**M39029/49**
**socket contact**




All dimensions for reference only.

| Socket MS Part Number* | Pin MS Part Number | Contact Size | Wire Well Size | A Ref. | B ±.005 | C Dia | D Dia ±.001 | G Dia | H Dia | J ±.005 | K Ref |
|---|---|---|---|---|---|---|---|---|---|---|---|
| M39029/49-335 | M39029/48-327 | 4/0 | 4/0 | 3.207 | 2.097 | .641 +.004 –.003 | .500 | .781 ± .003 | .750 +.004 –.003 | 1.283 | 2.393 |
| --- | M39029/48-328 | 4/0N | 4/0 | 3.325 | 2.215 | .641 +.004 –.003 | .500 | .781 ± .003 | .750 +.004 –.003 | --- | --- |
| M39029/49-333 | M39029/48-323 | 1/0 | 1 | 3.207 | 2.097 | .406 +.004 –.003 | .357 | .609 ± .003 | .506 +.004 –.003 | 1.283 | 2.393 |
| --- | M39029/48-324 | 1/0N | 1 | 3.325 | 2.215 | .406 +.004 –.003 | .357 | .609 ± .003 | .506 +.004 –.003 | --- | --- |
| M39029/49-331 | M39029/48-320 | 4 | 4 | 2.786 | 1.738 | .281 ±.002 | .225 | .417 ± .002 | .374 ± .002 | 1.158 | 2.206 |
| --- | M39029/48-321 | 4N | 4 | 2.904 | 1.856 | .281 ±.002 | .225 | .417 ± .002 | .374 ± .002 | --- | --- |
| M39029/49-329 | M39029/48-317 | 6 | 6 | 2.786 | 1.738 | .234 ±.002 | .178 | .342 ± .002 | .312 ± .002 | 1/158 | 2.206 |
| --- | M39029/48-318 | 6N | 6 | 2.904 | 1.856 | .234 ±.002 | .178 | .342 ± .002 | .312 ± .002 | --- | --- |
| M39029/49-332 | M39029/48-322 | 4G | 4 | 2.856 | 1.746 | .281 ±.002 | .225 | .417 ± .002 | .374 ± .002 | 1.752 | 2.862 |
| M39029/49-330 | M39029/48-319 | 6G | 6 | 2.856 | 1.746 | .234 ±.002 | .178 | .342 ± .002 | .312 ± .002 | 1.752 | 2.862 |

*Order by MS part number listed for either socket or pin.

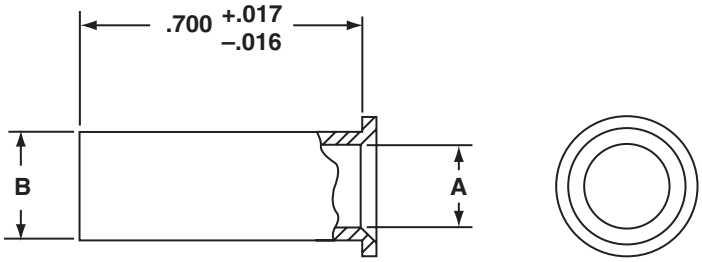
# MIL-C-22992, Class L Accessories
contact bushing/removal tool

### MS3348
### contact bushing

All dimensions for reference only.

| MS Part Number* | Contact Wire Barrel Size (Ref) | Wire Size (Ref) | A Dia +.010 –.003 | B Dia +.002 –.003 |
|---|---|---|---|---|
| MS3348-1 - 2L | 1 | 2 | .359 | .396 |
| MS3348-4 - 5L | 4 | 5 | .250 | .272 |
| MS3348-4 - 6L | 4 | 6 | .225 | .272 |
| MS3348-6 - 8L | 6 | 8 | .185 | .225 |
| MS3348-6 - 9L | 6 | 9 | .155 | .225 |
| MS3348-1 - 6L | 1 | 6 | .225 | .396 |
| MS3348-4 - 8L | 4 | 8 | .185 | .272 |
| MS3348-6 -10L | 6 | 10 | .136 | .225 |
| MS3348-4/0-2/0L | 4/0 | 2/0 | .500 | .629 |

* Order by MS part number listed.

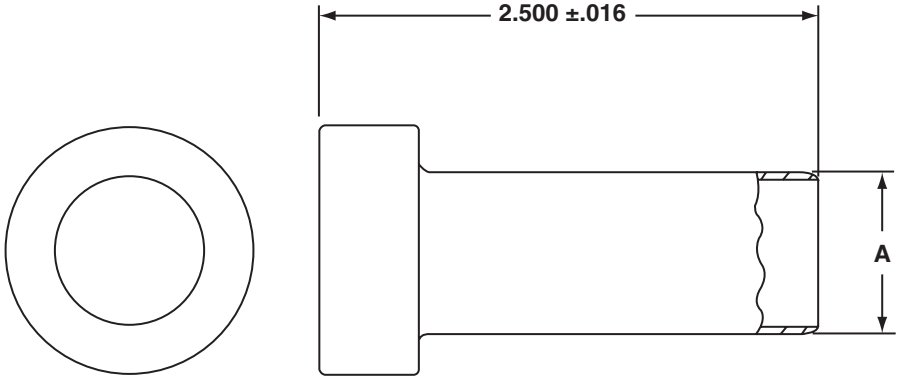



### MS90562
### contact removal tool

All dimensions for reference only.

| MS Part Number* | Contact Size | A Dia +.000 –.002 |
|---|---|---|
| MS90562-1 | 4/0 | .790 |
| MS90562-2 | 2/0 | .696 |
| MS90562-3 | 1/0 | .558 |
| MS90562-4 | 2 | .462 |
| MS90562-5 | 4 | .376 |
| MS90562-6 | 6 | .354 |

* Order by MS part number listed.



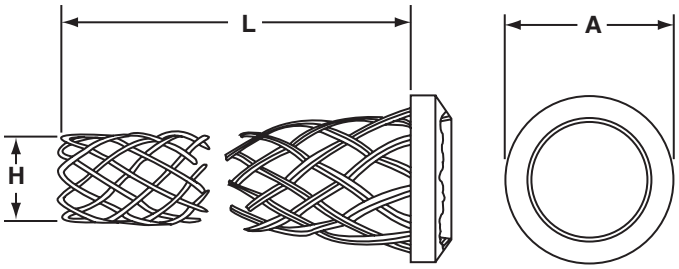
# MIL-C-22992, Class L Accessories
cable strain relief/cable sealing gland

## MS90561
## cable strain relief

All dimensions for reference only.

| MS Part Number* | Arrange-ment Number | A Dia +.000 –.010 | H Dia Cable Range | | L Approx. |
|---|---|---|---|---|---|
| | | | Max | Min | |
| MS90561-2 | 28-13, 32-12 | 1.797 | 1.145 | 1.003 | 8.000 |
| MS90561-4 | 28-02, -04 | 1.797 | .844 | .688 | 7.500 |
| MS90561-12 | 28-12 | 1.797 | 1.047 | .891 | 8.000 |
| MS90561-13 | 32-13 | 1.797 | 1.342 | 1.185 | 9.500 |
| MS90561-15 | 44-12 | 2.235 | 1.516 | 1.360 | 11.500 |
| MS90561-16 | 44-13 | 2.235 | 1.688 | 1.531 | 13.500 |
| MS90561-17 | 52-12 | 2.922 | 2.328 | 2.039 | 18.000 |
| MS90561-18 | 52-13 | 2.922 | 2.500 | 2.211 | 19.000 |
| MS90561-19 | 44-51 | 2.235 | 1.750 | 1.550 | 12.500 |
| MS90561-20 | 44-52 | 2.235 | 1.578 | 1.375 | 12.000 |
| MS90561-21 | 44-56 | 2.235 | 1.160 | 1.010 | 8.000 |

* Order by MS part number listed.



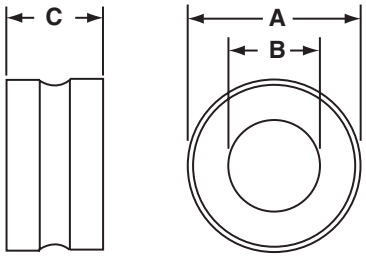

## MS23747
## cable sealing gland

All dimensions for reference only.

This gland must be used with MS90561 strain relief.

| MS Part Number* | Arrange-ment Number | A Dia +.000 –.020 | B Dia +.020 –.000 | C ±.010 | Min Cable Dia Ref. |
|---|---|---|---|---|---|
| MS23747-2 | 28-13, 32-05, -12 | 1.805 | 1.130 | 1.034 | 1.005 |
| MS23747-12 | 28-12 | 1.805 | 1.047 | 1.034 | .922 |
| MS23747-13 | 32-13 | 1.805 | 1.342 | 1.034 | 1.217 |
| MS23747-14 | 44-03 | 2.242 | 1.438 | 1.160 | 1.313 |
| MS23747-15 | 44-12 | 2.242 | 1.516 | 1.160 | 1.391 |
| MS23747-16 | 44-13 | 2.242 | 1.672 | 1.160 | 1.547 |
| MS23747-18 | 52-12 | 2.927 | 2.328 | 1.284 | 2.183 |
| MS23747-19 | 52-13 | 2.927 | 2.453 | 1.284 | 2.308 |
| MS23747-20 | 44-51 | 2.242 | 1.734 | 1.160 | 1.609 |
| MS23747-21 | 44-52 | 2.242 | 1.562 | 1.160 | 1.437 |
| MS23747-22 | 44-56 | 2.242 | 1.150 | 1.160 | 1.025 |

* Order by MS part number listed.



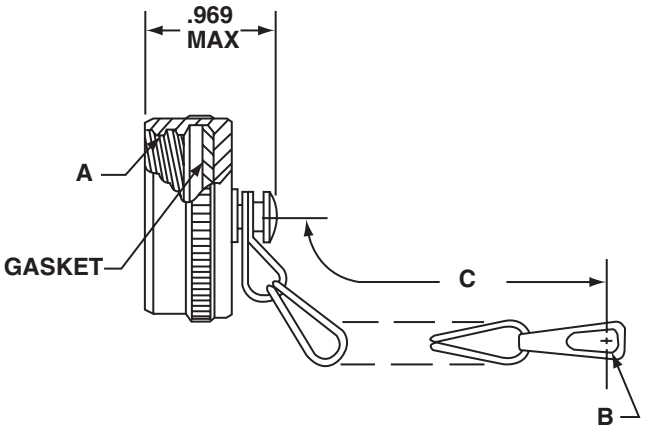
# MIL-C-22992, Class L Accessories
protective covers

### MS90563 protective covers
### used with: MS90555 wall mount receptacle
### MS90557 cable connecting receptacle

All dimensions for reference only.

| MS Part Number* | Use with Shell Size | A Thread Class 2B .1428P-.2857L Double Stub | B Dia Ref | | C Approx. |
|---|---|---|---|---|---|
| | | | For MS90555 | For MS90557 | |
| MS90563-1( ) | 28 | 2.000 | .177 | .177 | 6.000 |
| MS90563-3( ) | 32 | 2.250 | .209 | – | 4.500 |
| MS90563-4( ) | 32 | 2.250 | – | .177 | 6.000 |
| MS90563-7( ) | 44 | 3.000 | .281 | .281 | 7.500 |
| MS90563-11( ) | 52 | 3.500 | .281 | .281 | 7.500 |

* To complete MS part number, add letter C (Conductive) for AC or N (Non-conductive) for DC connector assemblies.

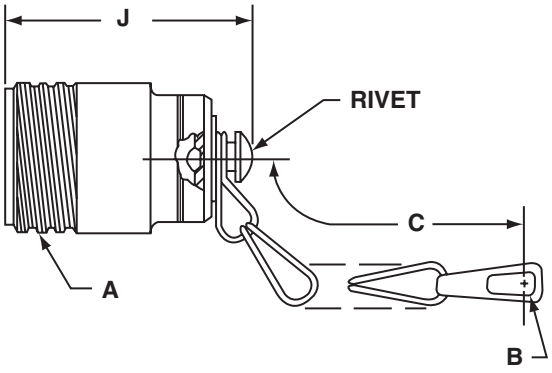



### MS90564 protective covers
### used with: MS90556 straight plug
### MS90558 wall mount plug

All dimensions for reference only.

| MS Part Number* | Use with Shell Size | A Thread Class 2A (Plated) .1428P-.2857L Double Stub | B Dia Ref | | C Approx. | J Max |
|---|---|---|---|---|---|---|
| | | | For MS90556 | For MS90558 | | |
| MS90564-1( ) | 28 | 2.000 | .177 | .177 | 7.500 | 2.266 |
| MS90564-3( ) | 32 | 2.250 | – | .209 | 6.000 | 2.266 |
| MS90564-4( ) | 32 | 2.250 | .177 | – | 7.500 | 2.266 |
| MS90564-7( ) | 44 | 3.000 | .281 | .281 | 8.500 | 2.484 |
| MS90564-11( ) | 52 | 3.500 | .281 | .281 | 8.500 | 2.484 |

* To complete MS part number, add letter C (Conductive) for AC or N (Non-conductive) for DC connector assemblies.



# MIL-C-22992, Class L
installation instructions

Complete installation instructions (L-1014) for Class L connectors are available on request. Reproduced below are condensed assembly instructions to familiarize the user with the installation procedure and tooling required.

**Cable Preparation** (MS90556 and MS90557 connectors only)
The following table shows the standard wire color coding, generator terminal markings, and connector contact identification used with Class L connectors.

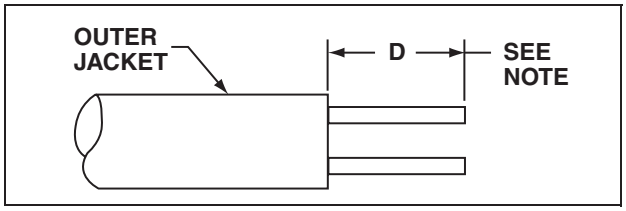
**Standardized Generator Wiring and Connections**

| Generator Terminal Marking | Current | Contact Designation | Conductor Circuit | Wire Color |
|---|---|---|---|---|
| + (POS) | 28Vdc | A | Positive | Black |
| – (NEG) ground | 28Vdc | N | Negative | White |
| $L_1$ | AC | A | Phase A | Black |
| $L_2$ | AC | B | Phase B | Red |
| $L_3$ | AC | C | Phase C | Blue (Commercial may be orange) |
| $L_0$ | AC | N | Neutral | White |
| G (or Gnd) | AC | G | Safety grounding | Green (Commercial may be bare) |

**Step 1)** Determine cable lay to facilitate alignment of contacts and insert holes without wire crossing.

**Step 2)** Strip cable jacket to dimension shown. Avoid cutting or nicking individual conductor insulation.

| Connector Size | D Inches Approx. |
|---|---|
| 28 | 3.000 |
| 32 | 3.000 |
| 44 | 4.250 |
| 52 | 5.000 |




**Note**

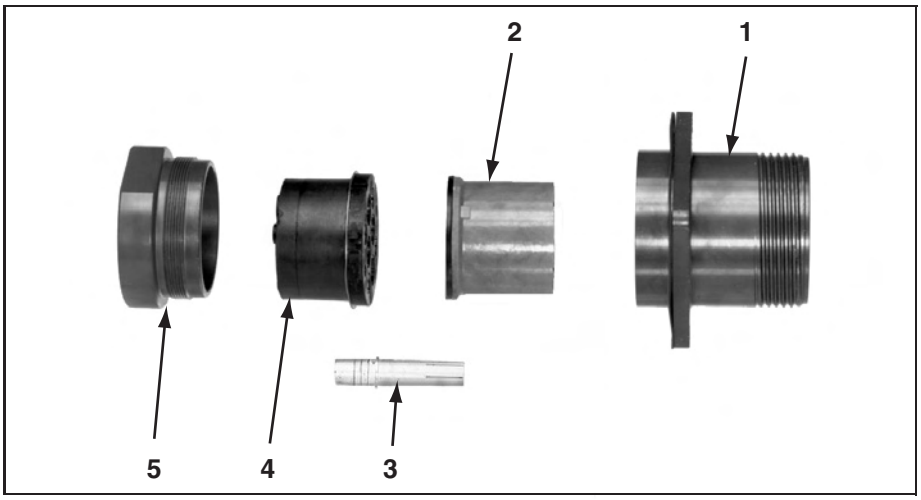
Some insert arrangements require that two or more ground wires be terminated into one contact. Dimension D must therefore be increased to permit routing these wires around the larger conductors.

**Step 3)** Install connector components in the order shown in the applicable assembly view illustrated on pages17 and 18.

**Step 4)** Strip insulation of individual conductors to 3/4 inch from end of conductor.

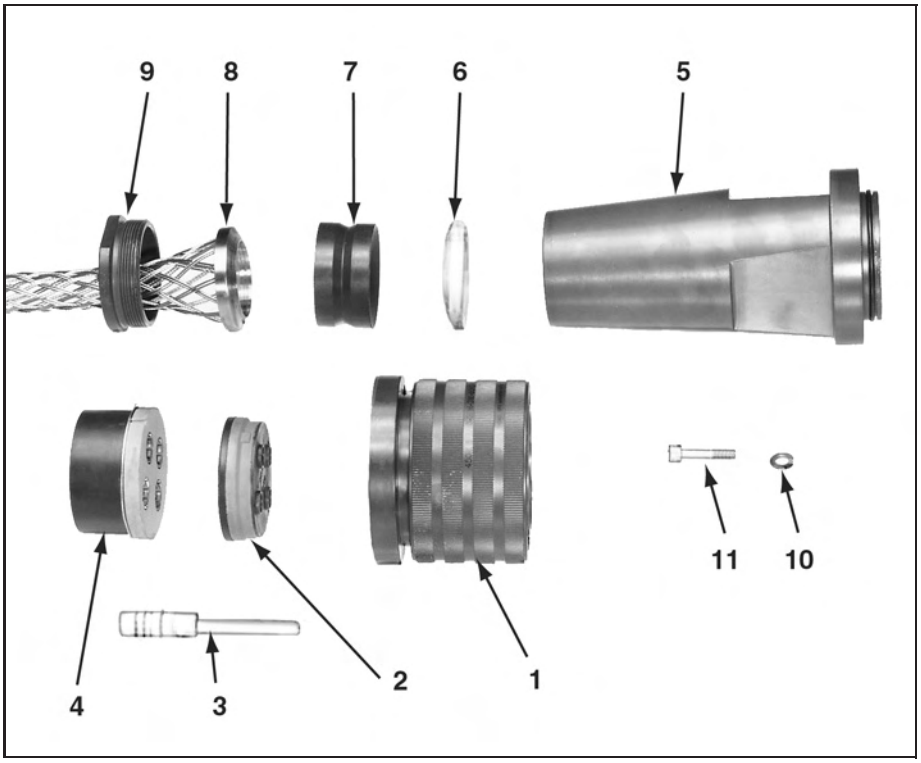
# MIL-C-22992, Class L
installation instructions

**MS90555 Connector**




Wall Mount Receptacle Components:
1. Shell
2. Insert Assembly, Socket
3. Contact, Socket
4. Grommet Assembly, Socket
5. Nut, Retaining
6. Protective Cap Assembly (Not Shown)
7. Flange Gasket (Not Shown)

**MS90556 Connector**

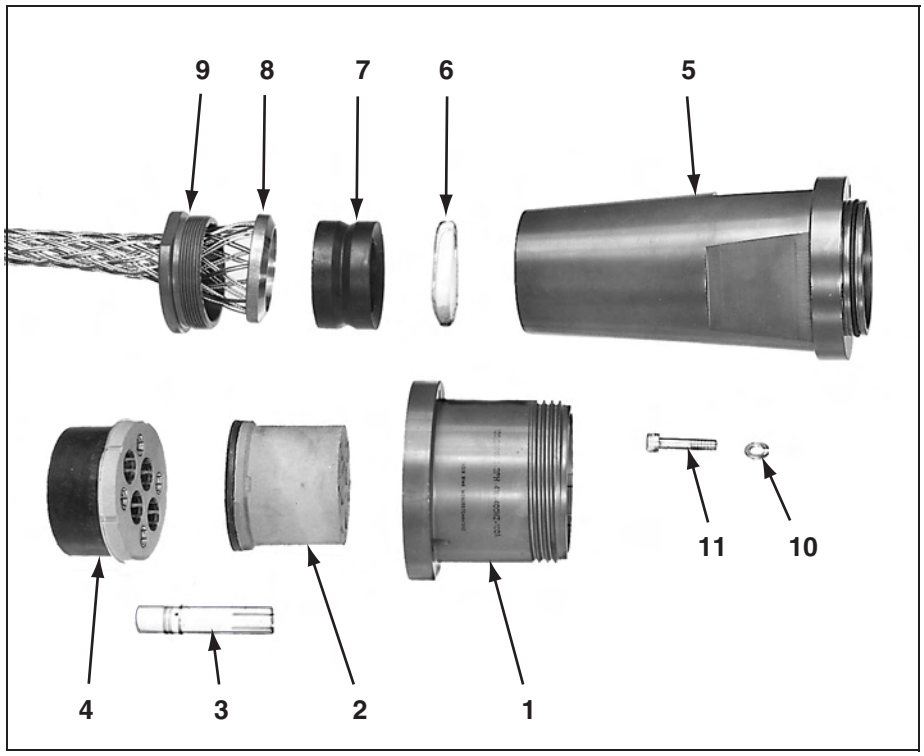



Straight Plug Components:
1. Shell and Coupling Nut Assembly
2. Insert Assembly, Pin
3. Contact, Pin
4. Spacer Assembly, Pin
5. Back Adapter
6. Gland Washer
7. Gland
8. Cable Grip
9. Gland Nut
10. Lockwasher (3 each)
11. Screw (3 each)
12. Protective Cap Assembly (Not Shown)

Note: On shell size 32 connectors, item #6 (Gland Washer) is contained within item #5 (Back Adaper).

# MIL-C-22992, Class L
installation instructions

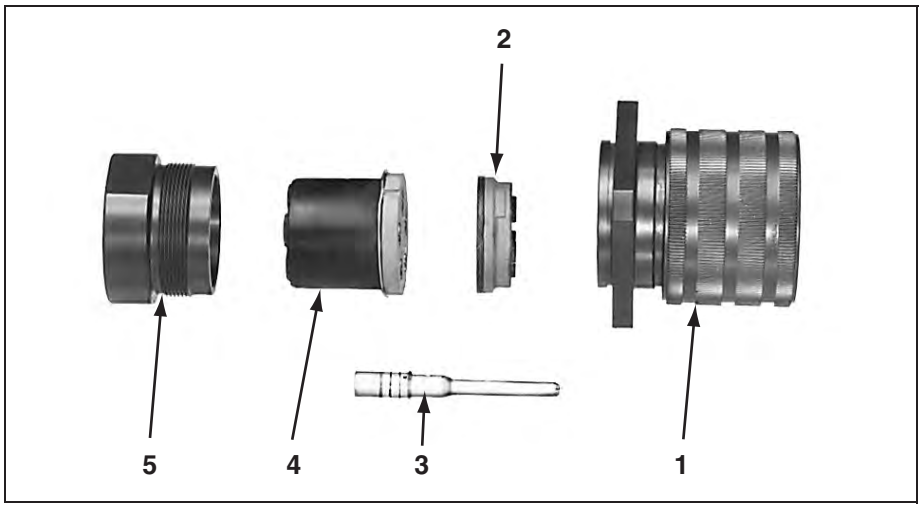
**MS90557 Connector**




Note: On shell size 32 connectors, item #6 (Gland Washer) is contained within item #5 (Back Adaper).

Cable Connecting Receptacle Components:
1. Shell
2. Insert Assembly, Socket
3. Contact, Socket
4. Spacer Assembly, Socket
5. Back Adapter
6. Gland Washer
7. Gland
8. Cable Grip
9. Gland Nut
10. Lockwasher (3 each)
11. Screw (3 each)
12. Protective Cap Assembly (Not shown)

**MS90558 Connector**




Wall Mount Plug Components:
1. Shell and Coupling Nut Assembly
2. Insert Assembly, Pin
3. Contact, Pin
4. Grommet Assembly, Pin
5. Nut, Retaining
6. Protective Cap Assembly (Not Shown)
7. Flange Gasket (Not Shown)

# MIL-C-22992, Class L
installation instructions

### Contact Installation

**Step 1)** Insert stripped conductors in contact wirewells. If contact bushing is used, insert conductor in bushing and bushing in contact wirewell. If two or more ground wires are inserted into a single contact, make sure all wires are fully seated in wirewell.

**Step 2)** Select correct crimping tool, locater and die combination from the table for contacts to be installed. With conductor or contact bushing in place, insert contact into tool. Close crimping die fully to form a uniform crimp.

| Contact Part Number | Size | Type | Crimping Tool* | Locator* | Die* | Removal Tool |
|---|---|---|---|---|---|---|
| M39029/48-327 | 4/0 | P | Pico Model | | | |
| M39029/49-335 | 4/0 | S | 400B or | 4297-1 | 414DA-4/0N-1 | MS90562-1 |
| M39029/48-328 | 4/0N | P | 400B-1 | | | |
| M39029/48-323 | 1/0 | P | Pico Model | | | |
| M39029/49-333 | 1/0 | S | 400B or | 4297-3 | 414DA-1/0N | MS90562-3 |
| M39029/48-324 | 1/0N | P | 400B-1 | | | |
| M39029/48-320 | 4 | P | | | | |
| M39029/49-331 | 4 | S | Pico Model | | | |
| M39029/48-321 | 4N | P | 400B or | 4297-5 | 414DA-4N | MS90562-5 |
| M39029/48-322 | 4G | P | 400B-1 | | | |
| M39029/49-332 | 4G | S | | | | |
| M39029/48-317 | 6 | P | | | | |
| M39029/49-329 | 6 | S | Pico Model | | | |
| M39029/48-318 | 6N | P | 400B or | 4297-6 | 414DA-6N | MS90562-6 |
| M39029/48-319 | 6G | P | 400B-1 | | | |
| M39029/49-330 | 6G | S | | | | |

* Available from Pico Crimping Tools Co.,
9832 Jersey Ave.
Santa Fe Springs, CA 90670
Phone: 805-388-5510

If crimping tools are available, contacts may be affixed to conductors by soldering. Use rosin-alcohol solder flux, a good grade of 60/40 solder and a 500 watt soldering iron or probe type resistance soldering equipment. Pre-tin conductors before soldering. Solder must not be present on shoulder or retention area of contact.

### Connector Assembly

**Step 1)** If inserts are not already positioned in the connector shell, align large tab on insert with large slot in shell and push insert in until it bottoms in shell.

**Step 2)** Apply a thin coating of Dow Corning DC-4 lubricant to the periphery of contact holes in spacer or grommet assembly. Push contacts into rear of spacer or grommet assembly until locked into contact retainer bushing.

**Step 3)** Align contacts with proper holes in insert. Small key of insert must be aligned with appropriate keyway in spacer or grommet assembly. Slide contacts into insert holes until spacer or grommet assembly butts against insert. A thin film of Dow Corning DC-4 lubricant applied to the periphery of insert contact holes will provide maximum sealing efficiency.

**Step 4)** Assemble accessories to connector. The back adapter “O” ring should have a very thin film of Dow Corning DC-4 lubricant applied. Outer surfaces only of gland should be lubricated with a thin film of UniTemp Grease EP. Avoid getting grease on inside surfaces of gland and on cable jacket.

**Step 5)** Tighten retaining nut or gland nut on shell or adapter. A metal-to-metal seating condition is desireable, but may not be attainable with maximum cable diameters.

### Contact Removal

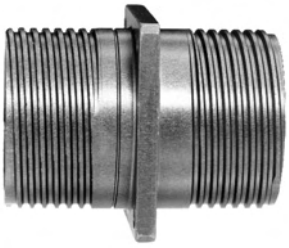
**Step 1)** Loosen all rear accessories and slide back along cable.

**Step 2)** Remove spacer or grommet assembly with contacts from connector insert.

**Step 3)** Using the appropriate size contact removal tool, push tool over front of contact until it bottoms in spacer or grommet assembly hole. This will open contact retaining bushing and allow contact to be removed from the spacer or grommet assembly from the rear. When using jacketed cable, all contacts should be released from contact retention bushings before removal from spacer or grommet assembly is accomplished.

# Amphenol® Heavy Duty Cylindrical Connectors
## MIL-C-22992, QWLD

wall mount receptacle



thru bulkhead receptacle

cable connecting plug

straight plug

box mount receptacle

jam nut receptacle (box mount)

jam nut receptacle (wall mount)

**Amphenol® QWLD Series heavy duty cylindrical connectors provide reliable power and control functions in hostile environments where ordinary connectors cannot survive.**

**Design features of this connector series provide:**

- **High Durability -** water and explosion proof, resistant to abrasion, corrosion, vibration and shock
- **Quick, Positive Mating -** double stub threads per MIL-STD-1373 for fast coupling, easily cleaned
- **Selection -** over 300 industrial and MS-approved insert patterns available, including coaxial and thermocouple

On the drilling platform in the North Sea, pump and motor generator controls run smoothly, although constantly exposed to salt spray.

At Prudhoe Bay where the nights are six months long, portable lighting systems permit operation regardless of temperature plummeting to 50° below zero.

The circus ferris wheel runs continuously despite the fact that it has rained for five days and all power connections are lying in six inches of mud.

These situations are typical of the extreme conditions under which thousands of Amphenol QWLD connectors are operating daily. Outstanding design features that make these cylindricals a necessity for difficult applications include:

- Alumilite 225* hard anodic finish for abrasion and corrosion resistance or conductive cadmium plate
- Resilient inserts for moisture sealing, positive proof against shock and vibration
- Sealing gaskets at every joint for waterproof assembly
- Cable strain relief provided by clamp bar type accessories
- Left hand accessory threads to prevent damage from disconnect torque applied in the wrong direction
- Closed entry socket contact design in solder or replaceable crimp contacts

* Registered trademark of Aluminum Company of America

# MIL-C-22992, QWLD
## how to order

**MS-APPROVED CONNECTORS**

To illustrate the ordering procedure, part number MS17343R20N27PW is shown as follows:

PART NUMBER

| MS17343 | R | 20 | N | 27 | P | W |
|---|---|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 | 6 | 7 |

1. **MS Number -**
   MS17343 designates wall mount receptacle
   MS17344 designates straight plug
   MS17345 designates cable connecting plug
   MS17346 designates box mount receptacle
   MS17347 designates jam nut receptacle with rear accessory threads (wall mount)
   MS17348 designates jam nut receptacle (box mount)
2. **Class -**
   C designates pressurized - used where circuit integrity is protected by a pressure differential
   R designates environmental - see table, page 1
3. **Shell Size -** available in shell sizes 12 through 44. Refer to pages 53 through 59 for dimensional data.
4. **Shell Finish -** C for conductive or N for non-conductive
5. **Insert Arrangement -** current MS insert arrangements are shown in black in the QWLD insert arrangements section of this catalog. Only these arrangements are available in MS-approved connectors.
6. **Contact Type -** P for pin, S for socket
7. **Alternate Insert Rotation -** used to prevent cross-mating of connectors. Absence of a letter in this space indicates normal (0°) position of the insert. Refer to page 26 for alternate insert rotation illustrations.

**QWLD INDUSTRIAL VERSIONS**

These heavy duty connectors are identical to MS-approved types except for the added flexibility of connector shell and contact type and finish options, plus added insert arrangements. To illustrate the ordering procedure, part number 10-194622-14S is shown as follows:

PART NUMBER

| 10 | – | 194 | 6 | 22-14 | S |
|---|---|---|---|---|---|
| 1 | | 2 | 3 | 4 | 5 |

1. **Base Number Prefix -** used to define connector shell finish and contact type and finish
   10 - Solder type contacts, silver plated
   75- Crimp type contacts, silver plated
   81- Crimp type contacts, plated .0001 gold over silver
   82- Crimp type contacts for MIL-C-13777 cable, silver plated
   83- Crimp type contacts for MIL-C-13777 cable, plated .0001 gold over silver
   85- Crimp type contacts, plated .00005 gold over silver
   *All above prefix numbers utilize connector shells with Alumilite* non-conductive finish*
   88- Solder type contacts, silver plated. Connector shell utilizes olive drab cadmium plate over nickel conductive finish.
2. **Base Number -** QWLD Series Heavy Duty Cylindrical Connector
3. **Shell Style -**
   0 designates wall mount receptacle
   1 designates cable connecting plug
   2 designates box mount receptacle
   3 designates jam nut receptacle with rear accessory threads (wall mount)
   4 designates thru bulkhead receptacle
   6 designates straight plug
   9 designates jam nut receptacle (box mount)
4. **Shell Size/Insert Arrangement -** Amphenol® QWLD connectors are available in equivalent MS shell sizes with all current MS insert arrangements as well as a large selection of special arrangements for power and signal circuits. Select the required insert arrangement number from those shown in black (MS arrangements) or red (industrial arrangements).
5. **Contact Type/Alternate Insert Rotation -** P for pin, S for socket. When an alternate position of the connector insert is required to prevent cross-mating of connectors, a different letter (other than P or S) is used. Select from the table below the Amphenol® letter which indicates both type of contact and insert rotation desired. Refer to page 26 for alternate insert rotation illustrations.

| Pin Contacts | | Socket Contacts | |
|---|---|---|---|
| **MS Letters** | **Amphenol® Letters** | **MS Letters** | **Amphenol® Letters** |
| P | P (normal) | S | S (normal) |
| PW | G | SW | H |
| PX | I | SX | J |
| PY | K | SY | L |
| PZ | M | SZ | N |

Alumilite is a registered trademark of Aluminum Co. of America

# MIL-C-22992, QWLD
## insert arrangements

| Insert Arrangement | | Service Rating | Total Con-tacts | Contact Size | | | | |
|---|---|---|---|---|---|---|---|---|
| MS Approved | Industrial | | | 0 | 4 | 8 | 12 | 16 |
| 12-5 | | D | 1 | | | | 1 | |
| | 12-48 | A | 3 | | | | | 3 |
| | 12-49 | A | 2 | | | | | 2 |
| 14-3 | | A | 1 | | | 1 | | |
| | 14-53 | Inst. | 6 | | | | | 6 |
| 16-2 | | E | 1 | | | | 1 | |
| 16-7 | | A | 3 | | | 1 | | 2 |
| 16-9 | | A | 4 | | | | 2 | 2 |
| 16-10 | | A | 3 | | | | 3 | |
| 16-11 | | A | 2 | | | | 2 | |
| 16-12 | | A | 1 | | 1 | | | |
| 16-13 | | A | 2 | | | | 2 | |
| | 16-61 | A | 7 | | | | 7 | |
| 18-1 | | B, C, F, G = A; Bal. = Inst. | 10 | | | | | 10 |
| | 18-3 | D | 2 | | | | 2 | |
| 18-4 | | D | 4 | | | | | 4 |
| 18-5 | | D | 3 | | | | 2 | 1 |
| 18-6 | | D | 1 | | 1 | | | |
| 18-7 | | B | 1 | | | 1 | | |
| 18-8 | | A | 8 | | | | 1 | 7 |
| 18-9 | | Inst. | 7 | | | | 2 | 5 |
| | 18-10 | A | 4 | | | | 4 | |
| 18-11 | | A | 5 | | | | 5 | |
| | 18-12 | A | 6 | | | | | 6 |
| 18-13 | | A | 4 | | | 1 | 3 | |
| 18-14 | | A | 2 | | 1 | | | 1 |
| 18-15 | | A | 4 | | | | 4 | |
| 18-16 | | C | 1 | | | | 1 | |
| | 18-17 | Inst. | 7 | | | | 2 | 5 |
| | 18-19 | A | 10 | | | | | 10 |
| | 18-20 | A | 5 | | | | | 5 |
| | 18-22 | D | 3 | | | | | 3 |
| | 18-24 | B, C, F, G = A; Bal. = Inst. | 10 | | | | | 10 |
| | 18-29 | A | 5 | | | | | 5 |
| | 18-30 | A | 5 | | | | | 5 |
| | 18-31 | A | 5 | | | | | 5 |
| 20-2 | | D | 1 | 1 | | | | |
| | 20-3 | D | 3 | | | | 3 | |
| 20-4 | | D | 4 | | | | 4 | |
| | 20-6 | D | 3 | | | | | 3 |
| 20-7 | | A, B, H, G = D; C, D, E, F = A | 8 | | | | | 8 |
| 20-8 | | Inst. | 6 | | | 2 | | 4 |

| Insert Arrangement | | Service Rating | Total Con-tacts | Contact Size | | | | |
|---|---|---|---|---|---|---|---|---|
| MS Approved | Industrial | | | 0 | 4 | 8 | 12 | 16 |
| 20-9 | | H = D; Bal. = A | 8 | | | | 1 | 7 |
| | 20-11 | Inst. | 13 | | | | | 13 |
| | 20-12 | A | 2 | | 1 | | | 1 |
| 20-14 | | A | 5 | | | 2 | 3 | |
| 20-15 | | A | 7 | | | | 7 | |
| 20-16 | | A | 9 | | | | 2 | 7 |
| 20-17 | | A | 6 | | | | 5 | 1 |
| 20-18 | | A | 9 | | | | 3 | 6 |
| | 20-19 | A | 3 | | | 3 | | |
| | 20-20 | A | 4 | | 1 | | 3 | |
| 20-21 | | A | 9 | | | | 1 | 8 |
| 20-22 | | A | 6 | | | 3 | | 3 |
| | 20-23 | A | 2 | | | 2 | | |
| 20-24 | | A | 4 | | | 2 | | 2 |
| | 20-25 | Inst. | 13 | | | | | 13 |
| 20-27 | | A | 14 | | | | | 14 |
| 20-29 | | A | 17 | | | | | 17 |
| | 20-30 | Inst. | 13 | | | | | 13 |
| 20-33 | | A | 11 | | | | | 11 |
| | 22-1 | D | 2 | | | 2 | | |
| 22-2 | | D | 3 | | | 3 | | |
| | 22-4 | A | 4 | | | 2 | 2 | |
| 22-5 | | D | 6 | | | | 2 | 4 |
| | 22-6 | D | 3 | | | 2 | | 1 |
| 22-7 | | E | 1 | 1 | | | | |
| | 22-8 | E | 2 | | | | 2 | |
| 22-9 | | E | 3 | | | | 3 | |
| 22-10 | | E | 4 | | | | | 4 |
| 22-11 | | B | 2 | | | | | 2 |
| 22-12 | | D | 5 | | | 2 | | 3 |
| | 22-13 | E = D; A, B, C, D = A | 5 | | | | 4 | 1 |
| 22-14 | | A | 19 | | | | | 19 |
| 22-15 | | D = E; A, B, C, E, F = A | 6 | | | | 5 | 1 |
| | 22-16 | A | 9 | | | | 3 | 6 |
| 22-17 | | A = D; Bal. = A | 9 | | | | 1 | 8 |
| 22-18 | | A, B, F, G, H = D; C, D, E = A | 8 | | | | | 8 |
| 22-19 | | A | 14 | | | | | 14 |
| | 22-20 | A | 9 | | | | | 9 |
| 22-21 | | A | 3 | 1 | | | | 2 |
| 22-22 | | A | 4 | | | 4 | | |
| 22-23 | | H = D; Bal. = A | 8 | | | | 8 | |
| | 22-24 | C, D, E = D; A, B, F = A | 6 | | | | 2 | 4 |

# MIL-C-22992, QWLD
## insert arrangements

| Insert Arrangement | | Service Rating | Total Con-tacts | Contact Size | | | | |
|---|---|---|---|---|---|---|---|---|
| MS Approved | Industrial | | | 0 | 4 | 8 | 12 | 16 |
| 22-27 | | J = D; Bal. = A | 9 | | | 1 | | 8 |
| | 22-28 | A | 7 | | | | 7 | |
| | 22-33 | A, B, C, D = D; E, F, G = A | 7 | | | | | 7 |
| | 22-34 | D | 5 | | | | 3 | 2 |
| 22-36 | | H = D; Bal. = A | 8 | | | | 8 | |
| 24-2 | | D | 7 | | | | 7 | |
| | 24-3 | D | 7 | | | | 2 | 5 |
| | 24-5 | A | 16 | | | | | 16 |
| 24-6 | | A, G, H = D; Bal. = A | 8 | | | | 8 | |
| 24-7 | | A | 16 | | | | 2 | 14 |
| | 24-9 | A | 2 | | 2 | | | |
| 24-10 | | A | 7 | | | 7 | | |
| 24-11 | | A | 9 | | | 3 | 6 | |
| 24-12 | | A | 5 | | 2 | | 3 | |
| 24-16 | | A, B, F, G = D; C, D, E = A | 7 | | | 1 | 3 | 3 |
| | 24-17 | D | 5 | | | | 2 | 3 |
| 24-20 | | D | 11 | | | | 2 | 9 |
| 24-21 | | D | 10 | | | 1 | | 9 |
| 24-22 | | D | 4 | | | 4 | | |
| 24-27 | | E | 7 | | | | | 7 |
| 24-28 | | Inst. | 24 | | | | | 24 |
| 28-1 | | A, J, E = D; Bal. = A | 9 | | | 3 | 6 | |
| 28-2 | | D | 14 | | | | 2 | 12 |
| 28-3 | | E | 3 | | | 3 | | |
| 28-4 | | G, P, S = E; Bal. = D | 9 | | | | 2 | 7 |
| 28-5 | | D | 5 | | 2 | | 1 | 2 |
| | 28-6 | D | 3 | | 3 | | | |
| | 28-7 | D | 2 | | 2 | | | |
| 28-8 | | L, M = E; B = D; Bal. = A | 12 | | | | 2 | 10 |
| 28-9 | | D | 12 | | | | 6 | 6 |
| 28-10 | | G = D; Bal. = A | 7 | | 2 | 2 | 3 | |
| 28-11 | | A | 22 | | | | 4 | 18 |
| 28-12 | | A | 26 | | | | | 26 |
| | 28-13 | A | 26 | | | | | 26 |
| 28-15 | | A | 35 | | | | | 35 |
| | 28-16 | A | 20 | | | | | 20 |
| 28-17 | | R = B; M, N, P = D; A to L = A | 15 | | | | | 15 |
| 28-18 | | M = C; G, H, J, K, L = D; A, B = H; Bal. = Inst. | 12 | | | | | 12 |
| 28-19 | | H, M = B; A, B = D; Bal. = A | 10 | | | | 4 | 6 |
| 28-20 | | A | 14 | | | | 10 | 4 |

| Insert Arrangement | | Service Rating | Total Con-tacts | Contact Size | | | | |
|---|---|---|---|---|---|---|---|---|
| MS Approved | Industrial | | | 0 | 4 | 8 | 12 | 16 |
| 28-21 | | A | 37 | | | | | 37 |
| 28-22 | | D | 6 | | 3 | | | 3 |
| 32-1 | | A = E; Bal. =D | 5 | 2 | | | 3 | |
| 32-2 | | E | 5 | | 3 | | | 2 |
| 32-3 | | D | 9 | 1 | 2 | | 2 | 4 |
| | 32-4 | F, J, K, N = A; Bal. = D | 14 | | | | 2 | 12 |
| | 32-5 | D | 2 | 2 | | | | |
| 32-6 | | A | 23 | | 2 | 3 | 2 | 16 |
| 32-7 | | A, B, h, j = Inst.; Bal. = A | 35 | | | | 7 | 28 |
| | 32-8 | A | 30 | | | | 6 | 24 |
| 32-9 | | D | 14 | | 2 | | | 12 |
| | 32-10 | A, F = E; G = B; B, E = D; C, D = A | 7 | | 2 | 2 | | 3 |
| | 32-12 | C, D, E, F, G = A; Bal. = D | 15 | | | | 5 | 10 |
| 32-13 | | D | 23 | | | | 5 | 18 |
| 32-15 | | D | 8 | 2 | | | 6 | |
| | 32-16 | A | 23 | | 2 | 3 | 2 | 16 |
| 32-17 | | D | 4 | | 4 | | | |
| 32-73 | | A | 46 | | | | | 46 |
| | 36-1 | D | 22 | | | | 4 | 18 |
| 36-3 | | D | 6 | 3 | | | 3 | |
| | 36-4 | A = D; B, C = A | 3 | 3 | | | | |
| 36-5 | | A | 4 | 4 | | | | |
| 36-6 | | A | 6 | 2 | 4 | | | |
| 36-7 | | A | 47 | | | | 7 | 40 |
| 36-8 | | A | 47 | | | | 1 | 46 |
| 36-9 | | A | 31 | | 1 | 2 | 14 | 14 |
| 36-10 | | A | 48 | | | | | 48 |
| | 36-11 | A | 48 | | | | | 48 |
| | 36-12 | A | 48 | | | | | 48 |
| | 36-13 | N, P, Q = E; Bal. = A | 17 | | | | 2 | 15 |
| | 36-14 | D | 16 | | | 5 | 5 | 6 |
| 36-15 | | M = D; Bal. = A | 35 | | | | | 35 |
| | 36-16 | A | 47 | | | | 7 | 40 |
| | 36-17 | A | 47 | | | | 7 | 40 |
| | 36-18 | A | 31 | | 1 | 2 | 14 | 14 |
| | 36-20 | A | 34 | | | 2 | 2 | 30 |
| 36-52 | | A | 52 | | | | | 52 |
| 40-1 | | D | 30 | | | | 6 | 24 |
| 40-9 | | A | 47 | | | 1 | 22 | 24 |
| 40-56 | | A | 85 | | | | | 85 |
| 44-52 | | A | 104 | | | | | 104 |

# QWLD
## special insert arrangements

| Insert Arrangement | Service Rating | Total Contacts | Contact Size | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Coax** | | | |
| | | | 0 | 4 | 8 | 12 | 16 | 0 | 4 | 8 | 12 |
| 16-59 | A | 4 | | | | 4 | | | | | |
| 20-51 | A | 3 | | | 3 | | | | | | |
| 20-57 | A | 7 | | | | 7* | | | | | |
| 20-58 | A | 10 | | | | 5 | 5 | | | | |
| 20-59 | A | 3 | | | 3* | | | | | | |
| 20-66 | A | 6 | | | | 5* | 1 | | | | |
| 20-79 | A/D | 8 | | | | 1 | 7 | | | | |
| 22-63 | A | 12 | | | | 4 | 8 | | | | |
| 22-65 | A/D | 8 | | | | 8* | | | | | |
| 22-70 | A | 13 | | | | 8 | 5 | | | | |
| 22-80 | A | 3 | | | 3* | | | | | | |
| 24-51 | A | 5 | | | 5 | | | | | | |
| 24-52 | Hi Volt. | 1 | | | | 1 | | | | | |
| 24-53 | A | 5 | | | 5 | | | | | | |
| 24-58 | A | 13 | | | 3 | 3 | 7 | | | | |
| 24-59 | A | 14 | | | | 7 | 7 | | | | |
| 24-60 | A | 7 | | | 7* | | | | | | |
| 24-65 | A | 15 | | | | 11 | 4 | | | | |
| 24-66 | D | 7 | | | | 7 | | | | | |
| 24-67 | Inst. | 19 | | | | 19 | | | | | |
| 24-71 | A | 7 | | | 7* | | | | | | |
| 24-75 | A | 7 | | | 7* | | | | | | |
| 24-79 | A | 5 | | | 5 | | | | | | |
| 24-80 | Inst. | 23 | | | | | 23 | | | | |
| 24-84 | A | 19 | | | | 1 | | | | | 18 |
| 28-51 | A | 12 | | | | 12 | | | | | |
| 28-59 | A | 17 | | | | 7 | 10 | | | | |
| 28-66 | A | 16 | | | 2 | 14 | | | | | |
| 28-72 | Coax | 3 | | | | | | | 3 | | |
| 28-74 | A | 16 | | | 7* | | 9 | | | | |
| 28-75 | A | 16 | | | 7* | | 9 | | | | |
| 28-79 | A | 16 | | | 7 | | 9 | | | | |
| 28-82 | D | 6 | | | 2 | 4 | | | | | |
| 28-84 | A | 9 | | | 9 | | | | | | |
| 32-52 | D | 8 | 2 | | | 6 | | | | | |
| 32-53 | Inst./E | 42 | | | | 5 | 37 | | | | |
| 32-56 | A | 30 | | | | 6* | 24 | | | | |
| 32-57 | Coax | 8 | | | | 6 | | 2 | | | |
| 32-58 | Coax | 4 | | | | | | | 4 | | |
| 32-60 | A | 23 | | | | | 15 | | | 8 | |
| 32-62 | Coax | 23 | | 2 | 1 | 2 | 16 | | | 2 | |
| 32-64 | Inst. | 54 | | | | | 54 | | | | |
| 32-68 | A | 16 | | | | | 12 | | 4 | | |
| 32-75 | Coax | 9 | | | | 2 | | | | 7 | |
| 32-76 | A | 19 | | | | 19 | | | | | |
| 32-79 | D | 5 | | 4 | 1 | | | | | | |

| Insert Arrangement | Service Rating | Total Contacts | Contact Size | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Coax** | | | |
| | | | 0 | 4 | 8 | 12 | 16 | 0 | 4 | 8 | 12 |
| 36-51 | D | 4 | 2 | 2 | | | | | | | |
| 36-54 | A | 39 | | | 8 | | 31 | | | | |
| 36-55 | A | 39 | | | 8* | | 31 | | | | |
| 36-59 | A | 53 | | | | 3* | 50 | | | | |
| 36-60 | A | 47 | | | | 7* | 40 | | | | |
| 36-64 | Coax | 4 | | | | | | 4 | | | |
| 36-65 | Coax | 4 | | | | | | 4 | | | |
| 36-71 | A | 53 | | | | 3 | 50 | | | | |
| 36-73 | Coax | 7 | | | | | | | 7 | | |
| 36-74 | A | 44 | | | | | 43 | | | 1 | |
| 36-75 | A | 48 | | | | | 48* | | | | |
| 36-76 | A | 47 | | | | | 47 | | | | |
| 36-77 | D | 7 | | 7 | | | | | | | |
| 36-78 | A | 14 | | | 12 | | 2 | | | | |
| 36-79 | A | 20 | | | | 20 | | | | | |
| 36-80 | A | 20 | | | | 20* | | | | | |
| 36-83 | Coax | 7 | | | | | | | 7 | | |
| 36-85 | A/D | 35 | | | | | 35* | | | | |
| 40-53 | A | 60 | | | | | 60 | | | | |
| 40-57 | E | 4 | 4 | | | | | | | | |
| 40-61 | A | 59 | | | 1 | 3 | 55 | | | | |
| 40-62 | A | 60 | | | | | 60 | | | | |
| 40-63 | A | 61 | | | | | 61* | | | | |
| 40-64 | Coax | 36 | | | | 3 | 20 | | | 13 | |
| 40-66 | Coax | 4 | | | | | | 4 | | | |
| 40-67 | A | 11 | | | | | 1 | | 10 | | |
| 40-68 | A | 21 | | | 21 | | | | | | |
| 40-70 | A | 61 | | | | | 61 | | | | |
| 40-72 | A | 11 | | | | | 1 | | 10 | | |
| 40-73 | A | 61 | | | | | 61 | | | | |
| 40-74 | A | 6 | | | | 1 | | 4 | 1 | | |
| 40-75 | E | 5 | 4 | | | 1 | | | | | |
| 40-80 | A | 11 | | 10 | | | 1 | | | | |
| 40-81 | A | 62 | | | | | 62* | | | | |
| 40-82 | A | 62 | | | | | 62 | | | | |
| 40-85 | A | 60 | | | | | 60* | | | | |
| 40-86 | E | 4 | | | | | | 4 | | | |
| 40-87 | D | 7 | | 7 | | | | | | | |
| 44-53 | A | 36 | | | | | 18 | | | 18 | |
| 48-51† | A | 56 | | | 10 | | 42 | 4 | | | |
| 48-52† | A | 61 | | | | | 56 | 5 | | | |
| 48-53† | D | 37 | | | | 37 | | | | | |
| 48-54† | A | 56 | | | 10 | | 42 | 4 | | | |
| 48-55† | A | 78 | | 6 | 2 | 2 | 68 | | | | |
| 48-57† | A | 56 | 4 | | 10 | | 42 | | | | |
| 48-60† | A | 56 | | | 10 | | 42 | 4 | | | |

* Crimp contacts accommodate wire the same size as the contact as well as wire of the next smaller, even size. Arrangements identified with an asterisk (*) are exceptions. See insert arrangement drawings on pages 39-47 for application wire size.

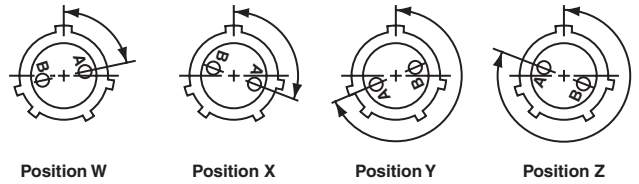
** Coaxial cable data can be found on insert arrangement drawings, pages 39-47. For further information on coaxial contacts and cable see catalog 12-130.

† Consult Sidney, NY for availability.

# MIL-C-22992, QWLD
## alternate insert rotations

To avoid cross-plugging problems in applications requiring the use of more than one connectror of the same size and arrangement, alternate insert rotations are available as indicated in the accompanying chart.

As shown in the diagram below, the front face of the pin insert is rotated within the shell in a clockwise direction from the normal shell key. The socket insert would be rotated counterclockwise the same number of degrees in respect to the normal shell key.




**Views looking into front face of pin insert or rear of socket insert.**

The following insert arrangements have the same alternate insert rotations for W, X, Y and Z which are:

| Degrees | | | |
|---|---|---|---|
| W | X | Y | Z |
| 80 | 110 | 250 | 280 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 16-7 | 20-14 | 22-16 | 24-3 | 24-21 | 28-16 | 32-9 |
| 18-5 | 20-16 | 22-17 | 24-4 | 24-28 | 28-17 | 32-10 |
| 18-9 | 20-20 | 22-18 | 24-5 | 28-1 | 28-19 | 32-12 |
| 18-13 | 20-22 | 22-19 | 24-6 | 28-4 | 28-20 | 32-13 |
| 18-14 | 22-3 | 22-21 | 24-7 | 28-8 | 28-21 | 36-1 |
| 20-7 | 22-6 | 22-24 | 24-12 | 28-9 | 32-1 | 36-7 |
| 20-8 | 22-12 | 22-25 | 24-16 | 28-10 | 32-3 | 36-8 |
| 20-9 | 22-14 | 22-33 | 24-17 | 28-11 | 32-4 | 36-13 |
| 20-12 | 22-15 | 22-34 | 24-20 | 28-15 | 32-6 | |

| Insert Arrangement | Degrees | | | |
|---|---|---|---|---|
| | W | X | Y | Z |
| 16-9 | 35 | 110 | 250 | 325 |
| 16-10 | 90 | 180 | 270 | – |
| 16-11 | 35 | 110 | 250 | 325 |
| 16-13 | 35 | 110 | 250 | 325 |
| 16-61 | 80 | – | – | 280 |
| 18-1 | 70 | 145 | 215 | 290 |
| 18-3 | 35 | 110 | 250 | 325 |
| 18-4 | 35 | 110 | 250 | 325 |
| 18-8 | 70 | – | – | 290 |
| 18-10 | – | 120 | 240 | – |
| 18-11 | – | 170 | 265 | – |
| 18-12 | 80 | – | – | 280 |
| 18-15 | – | 120 | 240 | – |
| 18-19 | – | 120 | 240 | – |
| 18-20 | 90 | 180 | 270 | – |
| 18-22 | 70 | 145 | 215 | 290 |
| 18-29 | 90 | 180 | 270 | – |
| 20-3 | 70 | 145 | 215 | 290 |
| 20-4 | 45 | 110 | 250 | – |
| 20-5 | 35 | 110 | 250 | 325 |
| 20-6 | 70 | 145 | 215 | 290 |
| 20-15 | 80 | – | – | 280 |
| 20-17 | 90 | 180 | 270 | – |
| 20-18 | 35 | 110 | 250 | 325 |
| 20-19 | 90 | 180 | 270 | – |
| 20-21 | 35 | 110 | 250 | 325 |
| 20-23 | 35 | 110 | 250 | 325 |

| Insert Arrangement | Degrees | | | |
|---|---|---|---|---|
| | W | X | Y | Z |
| 20-24 | 35 | 110 | 250 | 325 |
| 20-27 | 35 | 110 | 250 | 325 |
| 20-29 | 80 | – | – | 280 |
| 22-1 | 35 | 110 | 250 | 325 |
| 22-2 | 70 | 145 | 215 | 290 |
| 22-4 | 35 | 110 | 250 | 325 |
| 22-5 | 35 | 110 | 250 | 325 |
| 22-8 | 35 | 110 | 250 | 325 |
| 22-9 | 70 | 145 | 215 | 290 |
| 22-10 | 35 | 110 | 250 | 325 |
| 22-11 | 35 | 110 | 250 | 325 |
| 22-13 | 35 | 110 | 250 | 325 |
| 22-20 | 35 | 110 | 250 | 325 |
| 22-22 | – | 110 | 250 | – |
| 22-23 | 35 | – | 250 | – |
| 22-27 | 80 | – | 250 | 280 |
| 22-28 | 80 | – | – | 280 |
| 22-36 | 90 | – | 270 | – |
| 24-2 | 80 | – | – | 280 |
| 24-9 | 35 | 110 | 250 | 325 |
| 24-10 | 80 | – | – | 280 |
| 24-11 | 35 | 110 | 250 | 325 |
| 24-22 | 45 | 110 | 250 | – |
| 24-27 | 80 | – | – | 280 |
| 28-2 | 35 | 110 | 250 | 325 |
| 28-3 | 70 | 145 | 215 | 290 |
| 28-5 | 35 | 110 | 250 | 325 |

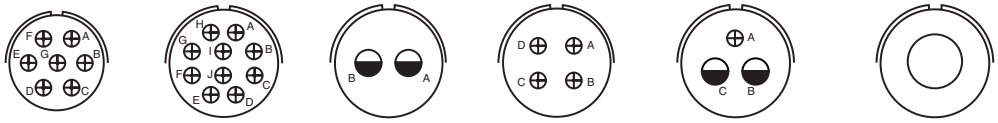
| Insert Arrangement | Degrees | | | |
|---|---|---|---|---|
| | W | X | Y | Z |
| 28-6 | 70 | 145 | 215 | 290 |
| 28-7 | 35 | 110 | 250 | 325 |
| 28-12 | 90 | 180 | 270 | – |
| 28-18 | 70 | 145 | 215 | 290 |
| 28-22 | 70 | 145 | 215 | 290 |
| 32-2 | 70 | 145 | 215 | 290 |
| 32-5 | 35 | 110 | 250 | 325 |
| 32-7 | 80 | 125 | 235 | 280 |
| 32-8 | 80 | 125 | 235 | 280 |
| 32-15 | 35 | 110 | 250 | 280 |
| 32-17 | 45 | 110 | 250 | – |
| 32-73 | 36 | – | – | – |
| 36-3 | 70 | 145 | 215 | 290 |
| 36-4 | 70 | 145 | 215 | 290 |
| 36-5 | – | 120 | 240 | – |
| 36-6 | 35 | 110 | 250 | 325 |
| 36-9 | 80 | 125 | 235 | 280 |
| 36-10 | 80 | 125 | 235 | 280 |
| 36-14 | 90 | 180 | 270 | – |
| 36-15 | 60 | 125 | 245 | 305 |
| 36-52 | 72 | 144 | 216 | 288 |
| 40-1 | 65 | 130 | 235 | 300 |
| 40-9 | 65 | 125 | 225 | 310 |
| 40-56 | 72 | 144 | 216 | 288 |
| 44-52 | 72 | 135 | 225 | 288 |
| | | | | |
| | | | | |

# MIL-C-22992, QWLD
## contact arrangements

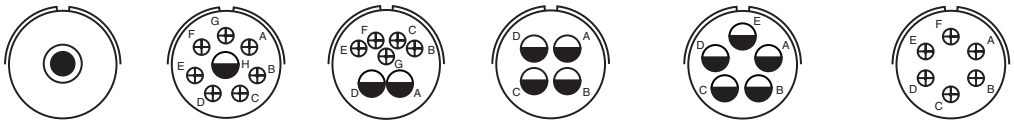
**front face of pin insert or rear of socket insert illustrated**

| | | | | | | |
|---|---|---|---|---|---|---|
| **Insert Arrangement** | 12-5 | 12-48 | 12-49 | 14-3 | 14-53 | 16-2 |
| **Service Rating** | D | A | A | A | Inst. | E |
| **Number of Contacts** | 1 | 3 | 2 | 1 | 6 | 1 |
| **Contact Size** | 12 | 16 | 16 | 8 | 16 | 12 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **Insert Arrangement** | 16-7 | 16-9 | 16-10 | 16-11 | 16-12 | 16-13 |
| **Service Rating** | A | A | A | A | A | A |
| **Number of Contacts** | 1 2 | 2 2 | 3 | 2 | 1 | 2* |
| **Contact Size** | 8 16 | 12 16 | 12 | 12 | 4 | 12 |



| | | | | | | |
|---|---|---|---|---|---|---|
| **Insert Arrangement** | 16-61 | 18-1 | 18-3 | 18-4 | 18-5 | 18-6 |
| **Service Rating** | A | B, C, F, G = A; Bal. = Inst. | D | D | D | D |
| **Number of Contacts** | 7 | 10 | 2 | 4 | 2 1 | 1 |
| **Contact Size** | 16 | 16 | 12 | 16 | 12 16 | 4 |



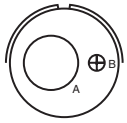
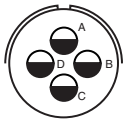
| | | | | | | |
|---|---|---|---|---|---|---|
| **Insert Arrangement** | 18-7 | 18-8 | 18-9 | 18-10 | 18-11 | 18-12 |
| **Service Rating** | B | A | Inst. | A | A | A |
| **Number of Contacts** | 1 | 1 7 | 2 5 | 4 | 5 | 6 |
| **Contact Size** | 8 | 12 16 | 12 16 | 12 | 12 | 16 |

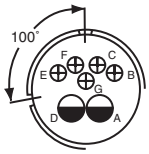
**CONTACT LEGEND** 16 12 8 4 0

*A = Iron; B = Constantan

# MIL-C-22992, QWLD
## contact arrangements

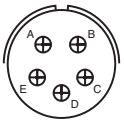
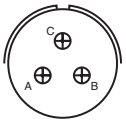
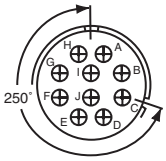
**front face of pin insert or rear of socket insert illustrated**

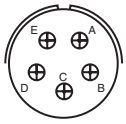
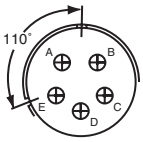



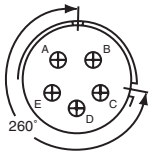


100° Rotation of 18-9

| | | | | | | |
|---|---|---|---|---|---|---|
| **Insert Arrangement** | **18-13** | **18-14** | **18-15** | **18-16** | **18-17** | **18-19** |
| **Service Rating** | **A** | **A** | **A** | **C** | **Inst.** | **A** |
| **Number of Contacts** | **1 3** | **1 1** | **4**** | **1** | **2 5** | **10** |
| **Contact Size** | **8 12** | **4 16** | **12** | **12** | **12 16** | **16** |

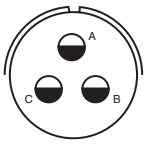
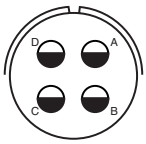
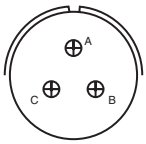
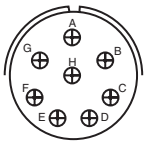
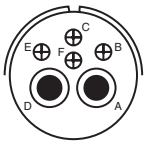







250° Rotation of 18-1 | 110° Rotation of 18-20 | 260° Rotation of 18-20

| | | | | | | |
|---|---|---|---|---|---|---|
| **Insert Arrangement** | **18-20** | **18-22** | **18-24** | **18-29** | **18-30** | **18-31** |
| **Service Rating** | **A** | **D** | **B, C, F, G = A, Bal. = Inst.** | **A** | **A** | **A** |
| **Number of Contacts** | **5** | **3** | **10** | **5** | **5** | **5** |
| **Contact Size** | **16** | **16** | **16** | **16** | **16** | **16** |

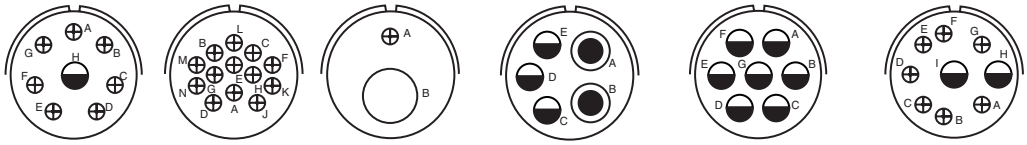
| | | | | | | |
|---|---|---|---|---|---|---|
| **Insert Arrangement** | **20-2** | **20-3** | **20-4** | **20-6** | **20-7** | **20-8** |
| **Service Rating** | **D** | **D** | **D** | **D** | **A, B, H, G = D; C, D, E, F = A** | **Inst.** |
| **Number of Contacts** | **1** | **3** | **4** | **3** | **8** | **2 4** |
| **Contact Size** | **0** | **12** | **12** | **16** | **16** | **8 16** |

**CONTACT LEGEND** **16** **12** **8** **4** **0**

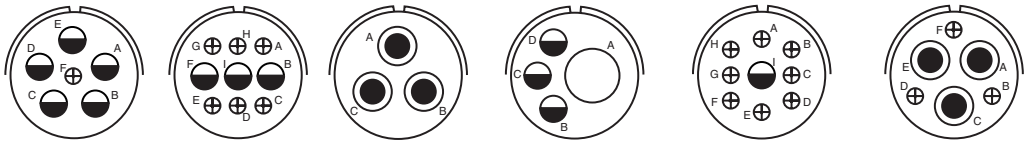
**A, C = Iron; B, D = Constantan

# MIL-C-22992, QWLD
## contact arrangements

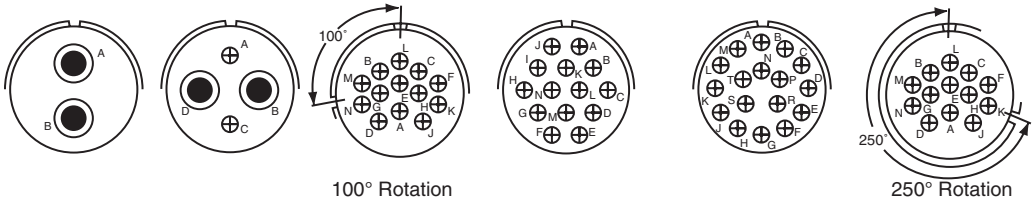
**front face of pin insert or rear of socket insert illustrated**



| | | | | | | |
|---|---|---|---|---|---|---|
| **Insert Arrangement** | **20-9** | **20-11** | **20-12** | **20-14** | **20-15** | **20-16** |
| **Service Rating** | **H = D; Bal. = A** | **Inst.** | **A** | **A** | **A** | **A** |
| **Number of Contacts** | **1 7** | **13** | **1 1** | **2 3** | **7** | **2 7** |
| **Contact Size** | **12 16** | **16** | **4 16** | **8 12** | **12** | **12 16** |



| | | | | | | |
|---|---|---|---|---|---|---|
| **Insert Arrangement** | **20-17** | **20-18** | **20-19** | **20-20** | **20-21** | **20-22** |
| **Service Rating** | **A** | **A** | **A** | **A** | **A** | **A** |
| **Number of Contacts** | **5 1** | **3 6** | **3** | **1 3** | **1 8** | **3 3** |
| **Contact Size** | **12 16** | **12 16** | **8** | **4 12** | **12 16** | **8 16** |




100° Rotation of 20-11

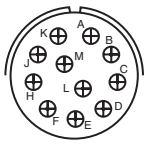
250° Rotation of 20-11

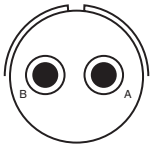
| | | | | | | |
|---|---|---|---|---|---|---|
| **Insert Arrangement** | **20-23** | **20-24** | **20-25** | **20-27** | **20-29** | **20-30** |
| **Service Rating** | **A** | **A** | **Inst.** | **A** | **A** | **Inst.** |
| **Number of Contacts** | **2** | **2 2** | **13** | **14** | **17** | **13** |
| **Contact Size** | **8** | **8 16** | **16** | **16** | **16** | **16** |

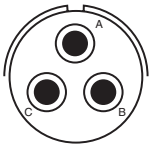
**CONTACT LEGEND** **16** **12** **8** **4** **0**

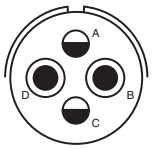
# MIL-C-22992, QWLD
## contact arrangements

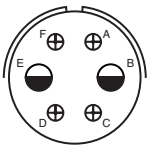
**front face of pin insert or rear of socket insert illustrated**



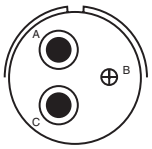



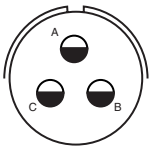



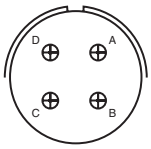



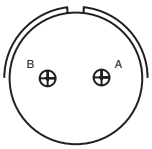

| | | | | | |
|---|---|---|---|---|---|
| **Insert Arrangements** | **20-33** | **22-1** | **22-2** | **22-4** | **22-5** |
| **Service Rating** | **A** | **D** | **D** | **A** | **D** |
| **Number of Contacts** | **11** | **2** | **3** | **2 2** | **2 4** |
| **Contact Size** | **16** | **8** | **8** | **8 12** | **12 16** |

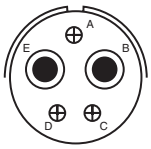


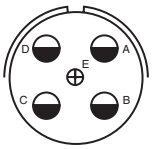


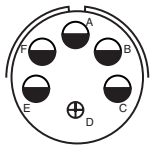




| | | | | | |
|---|---|---|---|---|---|
| **Insert Arrangement** | **22-6** | **22-7** | **22-8** | **22-9** | **22-10** |
| **Service Rating** | **D** | **E** | **E** | **E** | **E** |
| **Number of Contacts** | **2 1** | **1** | **2** | **3** | **4** |
| **Contact Size** | **8 16** | **0** | **12** | **12** | **16** |



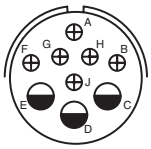
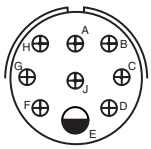
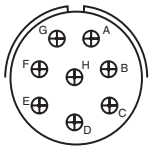
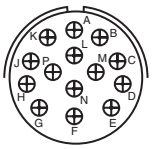
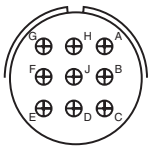



| | | | | | |
|---|---|---|---|---|---|
| **Insert Arrangement** | **22-11** | **22-12** | **22-13** | **22-14** | **22-15** |
| **Service Rating** | **B** | **D** | **E = D; A, B, C, D = A** | **A** | **D = E; A, B, C, E, F = A** |
| **Number of Contacts** | **2** | **2 3** | **4 1** | **19** | **5 1** |
| **Contact Size** | **16** | **8 16** | **12 16** | **16** | **12 16** |

| | | | | | |
|---|---|---|---|---|---|
| **CONTACT LEGEND** | **16** | **12** | **8** | **4** | **0** |

# MIL-C-22992, QWLD
## contact arrangements

**front face of pin insert or rear of socket insert illustrated**

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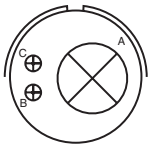
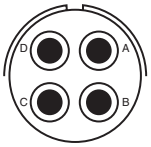
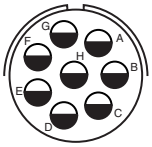
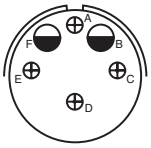
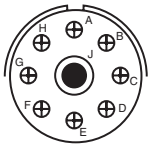
|---|---|---|---|---|---|
| **Insert Arrangement** | **22-16** | **22-17** | **22-18** | **22-19** | **22-20** |
| **Service Rating** | **A** | **A = D; Bal. = A** | **A, B, F, G, H = D; C, D, E = A** | **A** | **A** |
| **Number of Contacts** | **3 6** | **1 8** | **8** | **14** | **9** |
| **Contact Size** | **12 16** | **12 16** | **16** | **16** | **16** |

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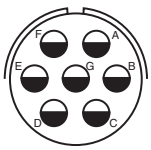
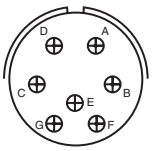
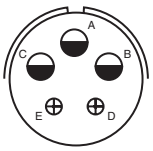
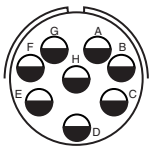
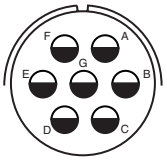
|---|---|---|---|---|---|
| **Insert Arrangement** | **22-21** | **22-22** | **22-23** | **22-24** | **22-27** |
| **Service Rating** | **A** | **A** | **H = D; Bal. = A** | **C, D, E = D; A, B, F = A** | **J = D; Bal. = A** |
| **Number of Contacts** | **1 2** | **4** | **8** | **2 4** | **1 8** |
| **Contact Size** | **0 16** | **8** | **12** | **12 16** | **8 16** |

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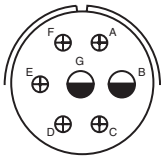
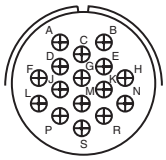
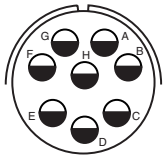
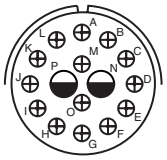
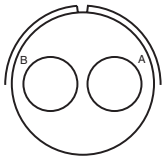
|---|---|---|---|---|---|
| **Insert Arrangement** | **22-28** | **22-33** | **22-34** | **22-36** | **24-2** |
| **Service Rating** | **A** | **A, B, C, D = D; E, F, G = A** | **D** | **H = D; Bal. = A** | **D** |
| **Number of Contacts** | **7** | **7** | **3 2** | **8** | **7** |
| **Contact Size** | **12** | **16** | **12 16** | **12** | **12** |

| | | | | | |
|---|---|---|---|---|---|
| **CONTACT LEGEND** | **16** | **12** | **8** | **4** | **0** |

# MIL-C-22992, QWLD
## contact arrangements

**front face of pin insert or rear of socket insert illustrated**

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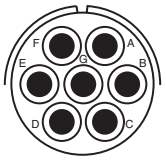
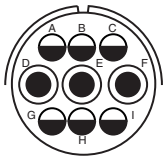
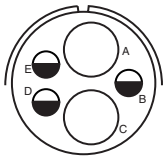
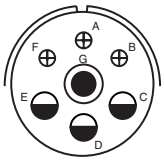
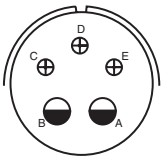
|---|---|---|---|---|---|
| **Insert Arrangement** | **24-3** | **24-5** | **24-6** | **24-7** | **24-9** |
| **Service Rating** | **D** | **A** | **A, G, H = D; Bal. = A** | **A** | **A** |
| **Number of Contacts** | **2 5** | **16** | **8** | **2 14** | **2** |
| **Contact Size** | **12 16** | **16** | **12** | **12 16** | **4** |

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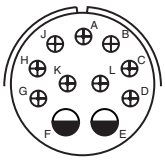
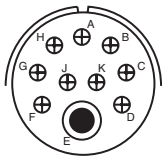
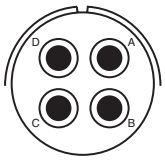
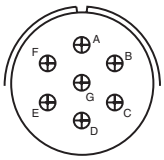
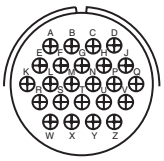
|---|---|---|---|---|---|
| **Insert Arrangement** | **24-10** | **24-11** | **24-12** | **24-16** | **24-17** |
| **Service Rating** | **A** | **A** | **A** | **A, B, F, G = D; C, D, E = A** | **D** |
| **Number of Contacts** | **7** | **3 6** | **2 3** | **1 3 3** | **2 3** |
| **Contact Size** | **8** | **8 12** | **4 12** | **8 12 16** | **12 16** |

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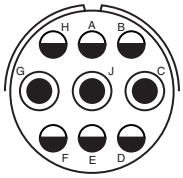
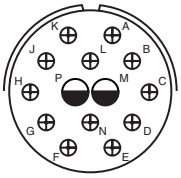
|---|---|---|---|---|---|
| **Insert Arrangement** | **24-20** | **24-21** | **24-22** | **24-27** | **24-28** |
| **Service Rating** | **D** | **D** | **D** | **E** | **Inst.** |
| **Number of Contacts** | **2 9** | **1 9** | **4** | **7** | **24** |
| **Contact Size** | **12 16** | **8 16** | **8** | **16** | **16** |

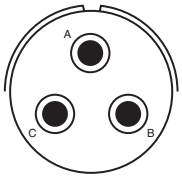
**CONTACT LEGEND** **16** **12** **8** **4** **0**

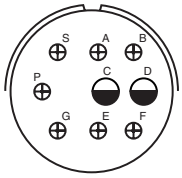
# MIL-C-22992, QWLD
## contact arrangements

**front face of pin insert or rear of socket insert illustrated**

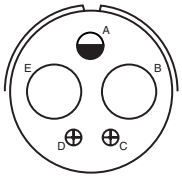


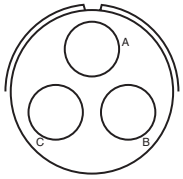



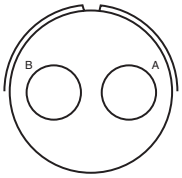



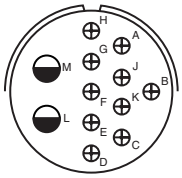




| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **28-1** | **28-2** | **28-3** | **28-4** |
| **Service Rating** | **A, J, E = D; Bal. = A** | **D** | **E** | **G, P, S = E; Bal. = D** |
| **Number of Contacts** | **3 6** | **2 12** | **3** | **2 7** |
| **Contact Size** | **8 12** | **12 16** | **8** | **12 16** |

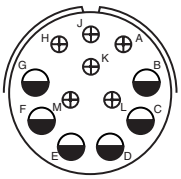


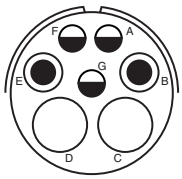



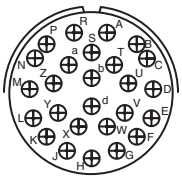




| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **28-5** | **28-6** | **28-7** | **28-8** |
| **Service Rating** | **D** | **D** | **D** | **L, M = E; B = D; Bal. = A** |
| **Number of Contacts** | **2 1 2** | **3** | **2** | **2 10** |
| **Contact Size** | **4 12 16** | **4** | **4** | **12 16** |



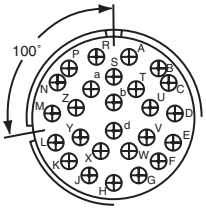



| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **28-9** | **28-10** | **28-11** | **28-12** |
| **Service Rating** | **D** | **G = D; Bal. = A** | **A** | **A** |
| **Number of Contacts** | **6 6** | **2 2 3** | **4 18** | **26** |
| **Contact Size** | **12 16** | **4 8 12** | **12 16** | **16** |

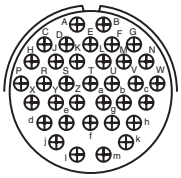
| | | | | | |
|---|---|---|---|---|---|
| **CONTACT LEGEND** | **16** | **12** | **8** | **4** | **0** |

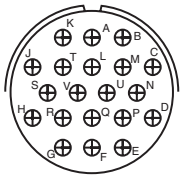
# MIL-C-22992, QWLD
## contact arrangements

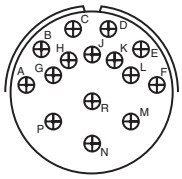
**front face of pin insert or rear of socket insert illustrated**



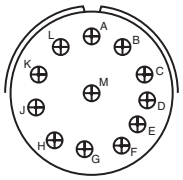

100° Rotation
of 28-12

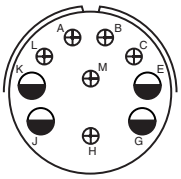


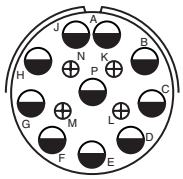


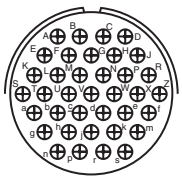


| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **28-13** | **28-15** | **28-16** | **28-17** |
| **Service Rating** | **A** | **A** | **A** | **R = B; M, N, P = D; A to L = A** |
| **Number of Contacts** | **26** | **35** | **20** | **15** |
| **Contact Size** | **16** | **16** | **16** | **16** |

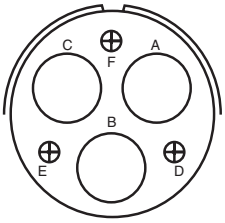


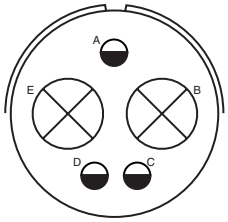


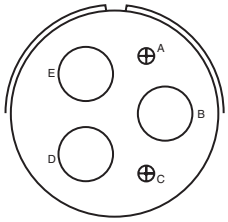


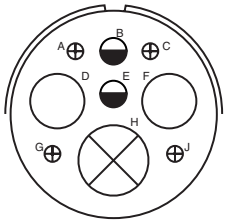


| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **28-18** | **28-19** | **28-20** | **28-21** |
| **Service Rating** | **M = C; G, H, J, K, L = D; A, B = H; Bal. = Inst.** | **H, M = B; A = D; Bal = A** | **A** | **A** |
| **Number of Contacts** | **12** | **4 6** | **10 4** | **37** |
| **Contact Size** | **16** | **12 16** | **12 16** | **16** |







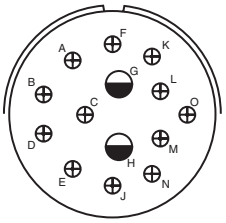
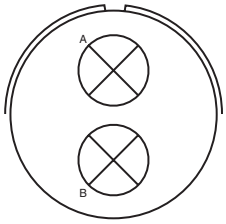
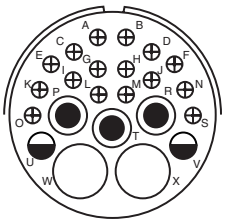
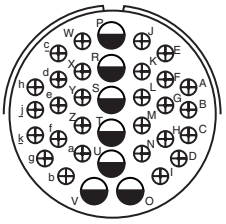


| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **28-22** | **32-1** | **32-2** | **32-3** |
| **Service Rating** | **D** | **A = E; Bal. = D** | **E** | **D** |
| **Number of Contacts** | **3 3** | **2 3** | **3 2** | **1 2 2 4** |
| **Contact Size** | **4 16** | **0 12** | **4 16** | **0 4 12 16** |

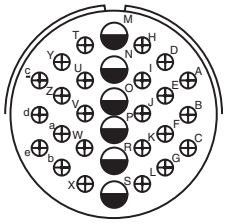
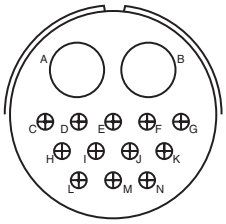
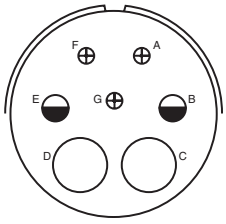
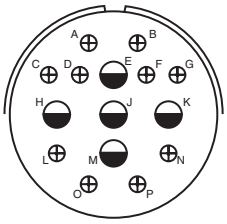
| | | | | | |
|---|---|---|---|---|---|
| **CONTACT LEGEND** | **16** | **12** | **8** | **4** | **0** |

# MIL-C-22992, QWLD
## contact arrangements

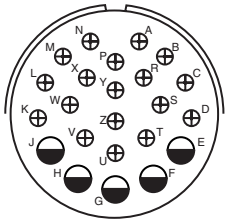
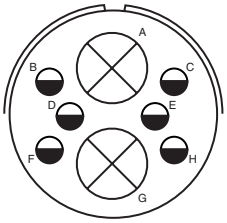
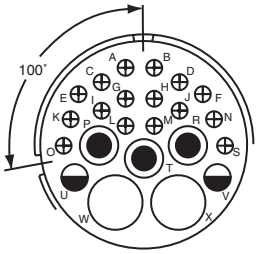
**front face of pin insert or rear of socket insert illustrated**

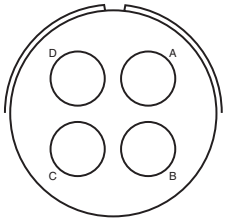





| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **32-4** | **32-5** | **32-6** | **32-7** |
| **Service Rating** | **F, J, K, N = A; Bal. = D** | **D** | **A** | **A, B,h , j = Inst; Bal. = A** |
| **Number of Contacts** | **2 12** | **2** | **2 3 2 16** | **7 28** |
| **Contact Size** | **12 16** | **0** | **4 8 12 16** | **12 16** |

| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **32-8** | **32-9** | **32-10** | **32-12** |
| **Service Rating** | **A** | **D** | **A, F = E, G = B; B, E = D; C, D = A** | **C, D, E, F, G = A; Bal. = D** |
| **Number of Contacts** | **6 24** | **2 12** | **2 2 3** | **5 10** |
| **Contact Size** | **12 16** | **4 16** | **4 8 16** | **12 16** |



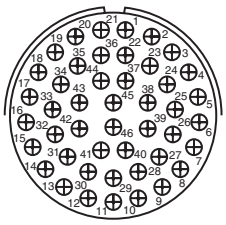
100° Rotation
of 32-6

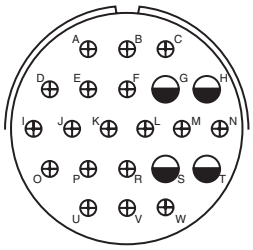
| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **32-13** | **32-15** | **32-16** | **32-17** |
| **Service Rating** | **D** | **D** | **A** | **D** |
| **Number of Contacts** | **5 18** | **2 6** | **2 3 2 16** | **4** |
| **Contact Size** | **12 16** | **0 12** | **4 8 12 16** | **4** |

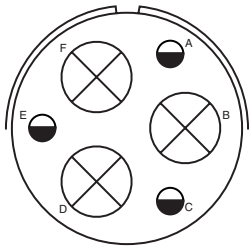
**CONTACT LEGEND** **16 12 8 4 0**

# MIL-C-22992, QWLD
## contact arrangements

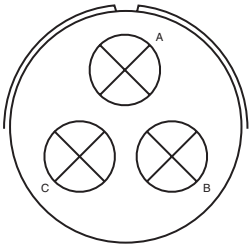
**front face of pin insert or rear of socket insert illustrated**

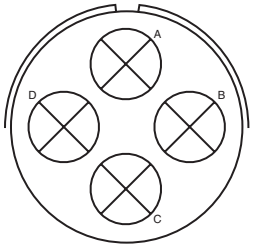


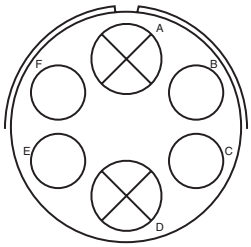




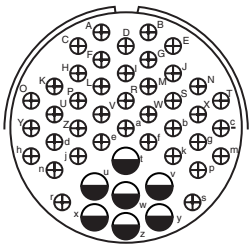
| | | | |
|---|---|---|---|
| **Insert Arrangement** | **32-73** | **36-1** | **36-3** |
| **Service Rating** | **A** | **D** | **D** |
| **Number of Contacts** | **46** | **4 18** | **3 3** |
| **Contact Size** | **16** | **12 16** | **0 12** |

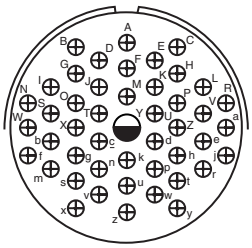


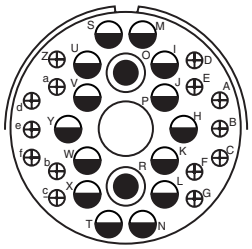




| | | | |
|---|---|---|---|
| **Insert Arrangement** | **36-4** | **36-5** | **36-6** |
| **Service Rating** | **A = D; B, C = A** | **A** | **A** |
| **Number of Contacts** | **3** | **4** | **2 4** |
| **Contact Size** | **0** | **0** | **0 4** |





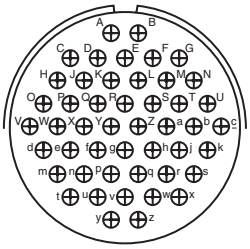


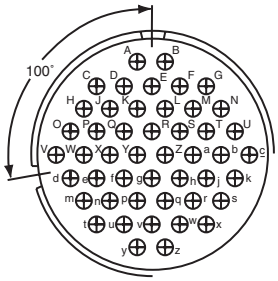
| | | | |
|---|---|---|---|
| **Insert Arrangement** | **36-7** | **36-8** | **36-9** |
| **Service Rating** | **A** | **A** | **A** |
| **Number of Contacts** | **7 40** | **1 46** | **1 2 14 14** |
| **Contact Size** | **12 16** | **12 16** | **4 8 12 16** |

| | | | | | |
|---|---|---|---|---|---|
| **CONTACT LEGEND** | **16** | **12** | **8** | **4** | **0** |

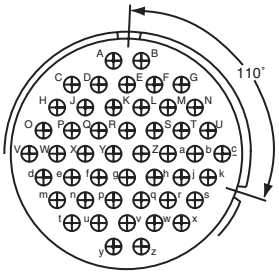
# MIL-C-22992, QWLD
## contact arrangements

**front face of pin insert or rear of socket insert illustrated**



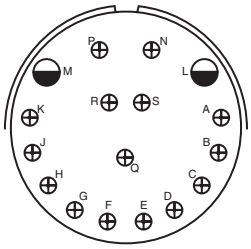


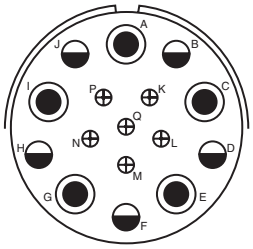

100° Rotation
of 36-10

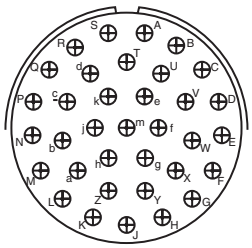



110° Rotation
of 36-10

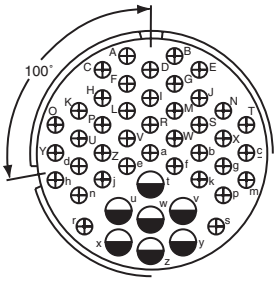
| | | | |
|---|---|---|---|
| **Insert Arrangement** | **36-10** | **36-11** | **36-12** |
| **Service Rating** | **A** | **A** | **A** |
| **Number of Contacts** | **48** | **48** | **48** |
| **Contact Size** | **16** | **16** | **16** |



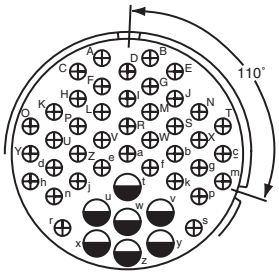




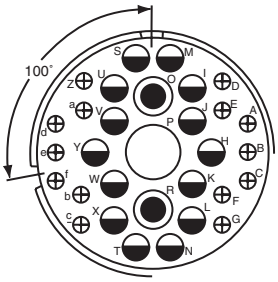
| | | | |
|---|---|---|---|
| **Insert Arrangement** | **36-13** | **36-14** | **36-15** |
| **Service Rating** | **N, P, Q = E; Bal. = A** | **D** | **M = D; Bal. = A** |
| **Number of Contacts** | **2 15** | **5 5 6** | **35** |
| **Contact Size** | **12 16** | **8 12 16** | **16** |




100° Rotation
of 36-7




110° Rotation
of 36-7



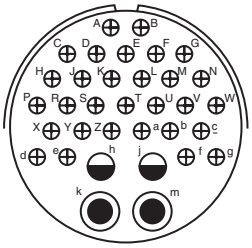

100° Rotation
of 36-9

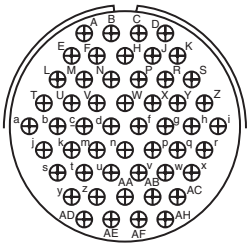
| | | | |
|---|---|---|---|
| **Insert Arrangements** | **36-16** | **36-17** | **36-18** |
| **Service Rating** | **A** | **A** | **A** |
| **Number of COntacts** | **7 40** | **7 40** | **1 2 14 14** |
| **Contact Size** | **12 16** | **12 16** | **4 8 12 16** |

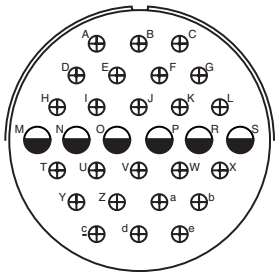
**CONTACT LEGEND** **16** **12** **8** **4** **0**

# MIL-C-22992, QWLD
## contact arrangements

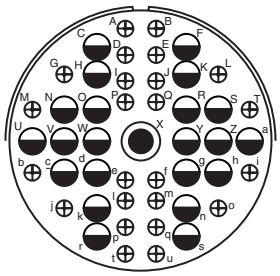
**front face of pin insert or rear of socket insert illustrated**

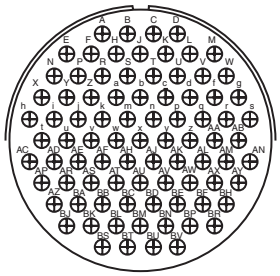


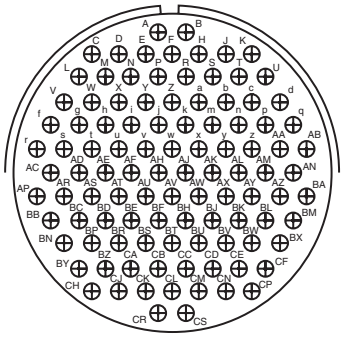




| | | | |
|---|---|---|---|
| **Insert Arrangement** | **36-20** | **36-52** | **40-1** |
| **Service Rating** | **A** | **A** | **D** |
| **Number of Contacts** | **2 2 30** | **52** | **6 24** |
| **Contact Size** | **8 12 16** | **16** | **12 16** |







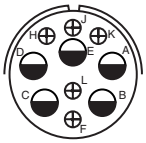
| | | | |
|---|---|---|---|
| **Insert Arrangement** | **40-9** | **40-56** | **44-52** |
| **Service Rating** | **A** | **A** | **A** |
| **Number of Contacts** | **1 22 24** | **85** | **104** |
| **Contact Size** | **8 12 16** | **16** | **16** |

| | | | | | |
|---|---|---|---|---|---|
| **CONTACT LEGEND** | **16** | **12** | **8** | **4** | **0** |

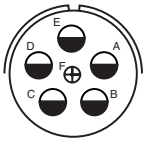
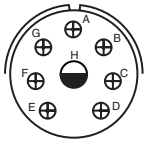
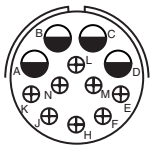
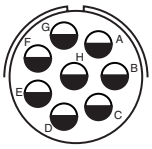
# QWLD
## special arrangements

Ever expanding requirements for more complex circuits in ground equipment and elevated altitude applications has prompted Amphenol to provide inserts not covered by the MS drawings. Pictured here and on the following pages are insert layouts which have anywhere from one contact (high tension) to the 78 contact insert in shell size 48. Many of these special inserts are also available in alternate keyway positions. Please contact Amphenol, Sidney, NY or your local Amphenol sales office for arrangements particular to your circuit application.

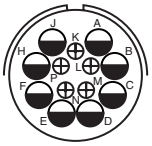
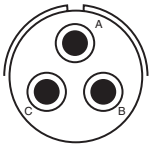
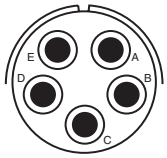
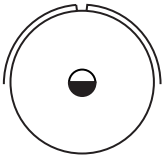
**front face of pin insert or rear of socket insert illustrated**



| | | | | | |
|---|---|---|---|---|---|
| **Insert Arrangement** | **16-59** | **20-51** | **20-57** | **20-58** | **20-59** |
| **Service Rating** | **A** | **A** | **A** | **A** | **A** |
| **Number of Contacts** | **4** | **3*** | **7*** | **5 5** | **3*** |
| **Contact Size** | **12** | **8** | **12 for #14 or 16 wire** | **12 16** | **8 for #10 or 12 wire** |

| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **20-66** | **20-79** | **22-63** | **22-65** |
| **Service Rating** | **A** | **H = D; Bal. = A** | **A** | **H = D; Bal. = A** |
| **Number of Contacts** | **1 5** | **7* 1*** | **4 8** | **8*** |
| **Contact Size** | **16 12 or #10 wire** | **16 12 for #16 wire** | **12 16** | **12 for #14 or 16 wire** |

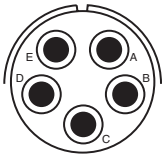
| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **22-70** | **22-80** | **24-51** | **24-52** |
| **Service Rating** | **A** | **A** | **A** | **Hi-Volt** |
| **Number of Contacts** | **8 5** | **3*** | **5*** | **1** |
| **Contact Size** | **12 16** | **8 for #10 or 12 wire** | **B, E for AN #10 or 12 wire**<br>**A, C, D for AN #8 wire** | **12** |

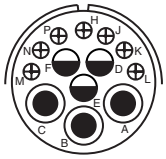
**CONTACT LEGEND** **16** **12** **8** **4** **0**

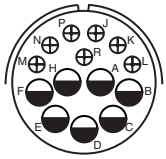
*Solderless

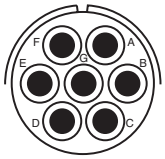
# QWLD
## special arrangements

**front face of pin insert or rear of socket insert illustrated**

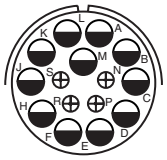


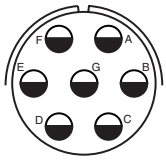



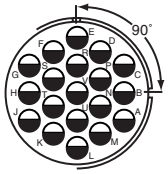



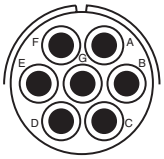




| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **24-53** | **24-58** | **24-59** | **24-60** |
| **Service Rating** | **A** | **A** | **A** | **A** |
| **Number of Contacts** | **5*** | **3 3 7** | **7 7** | **7*** |
| **Contact Size** | **8** | **8 12 16** | **12 16** | **8 for #10 or 12 wire** |

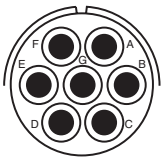


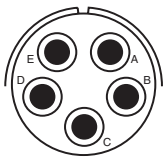



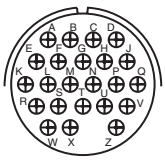



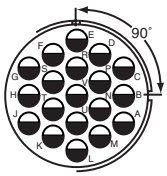




| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **24-65** | **24-66** | **24-67** | **24-71** |
| **Service Rating** | **A** | **D** | **Inst.** | **A** |
| **Number of Contacts** | **11 4** | **7** | **19** | **2* 5*** |
| **Contact Size** | **12 16** | **12** | **12** | **8 8 for #10 or 12 wire** |



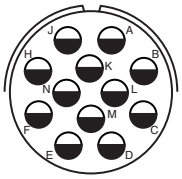
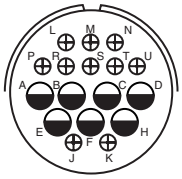
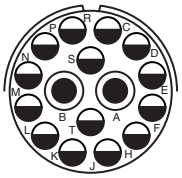
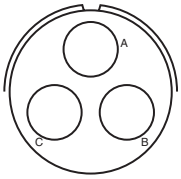

| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **24-75** | **24-79** | **24-80** | **24-84** |
| **Service Rating** | **A** | **A** | **Inst.** | **A** |
| **Number of Contacts** | **5 2** | **5** | **23** | **1 18** |
| **Contact Size** | **8 8 for #16 wire** | **8** | **16** | **12 12 (Coax) RG-188/U or RG-174/U** |

**CONTACT LEGEND** ⊕ **16** ◒ **12** ● **8** ○ **4** ⊗ **0**

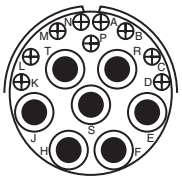
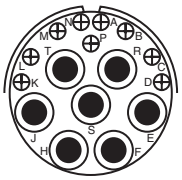
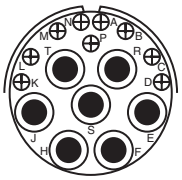
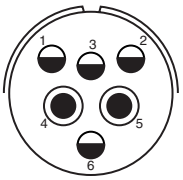
*Solderless

# QWLD
## special arrangements

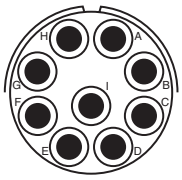
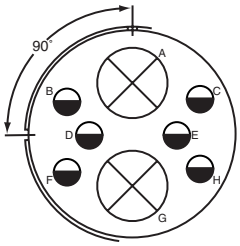
**front face of pin insert or rear of socket insert illustrated**

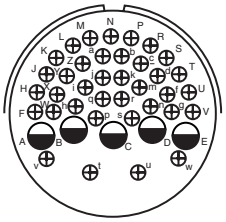
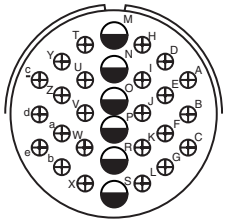





| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **28-51** | **28-59** | **28-66** | **28-72** |
| **Service Rating** | **A** | **A** | **A** | **–** |
| **Number of Contacts** | **12** | **7 10** | **2 14** | **3** |
| **Contact Size** | **12** | **12 16** | **8 12** | **4 (Coax) RG-59A/U or RG-62A/U** |

| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **28-74** | **28-75** | **28-79** | **28-82** |
| **Service Rating** | **A** | **A** | **A** | **D** |
| **Number of Contacts** | **9* 4* 3*** | **9* 7*** | **7 9** | **2 4** |
| **Contact Size** | **16 8 8 for #10 wire (S, T, R)** | **16 8for #10 wire** | **8 16** | **8 12** |

90° CW Rotation of 32-15

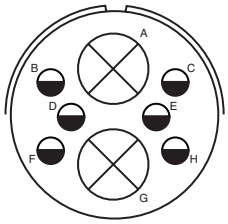
| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **28-84** | **32-52** | **32-53** | **32-56** |
| **Service Rating** | **A** | **D** | **t, u = E; Bal. = Inst.** | **A** |
| **Number of Contacts** | **9** | **6 2** | **5 37** | **24 6** |
| **Contact Size** | **8** | **12 0** | **12 16** | **16 12 for #10 wire** |

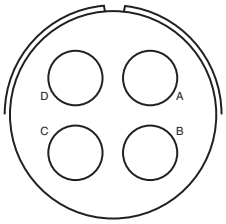
**CONTACT LEGEND** **16** **12** **8** **4** **0**

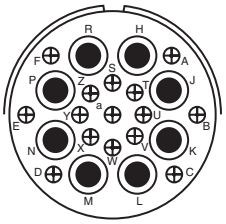
*Solderless

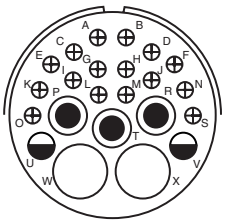
# QWLD
## special arrangements

**front face of pin insert or rear of socket insert illustrated**

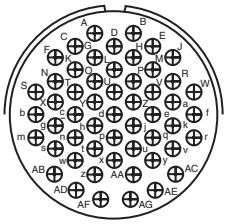


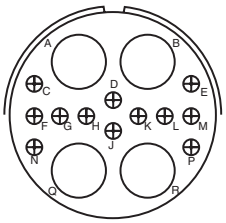



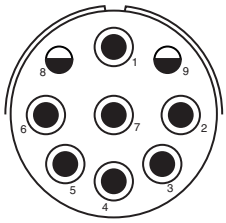



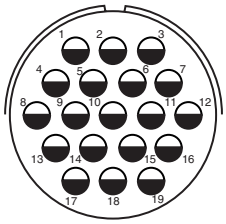


| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **32-57** | **32-58** | **32-60** | **32-62** |
| **Service Rating** | ** | – | A | ** |
| **Number of Contacts** | 6 2 | 4 | 15 8 | 2 1 2 16 2 |
| **Contact Size** | 12 0 (Coax) RG-71/U | 4 (Coax) RG-161U or RG-179/U | 16 8 (Coax) RG-124/U | 4 8 12 16 8 (Coax)RG-124/U |

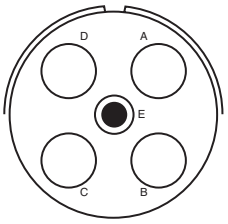


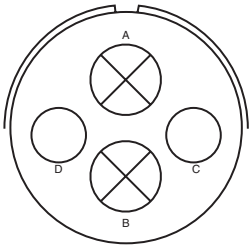


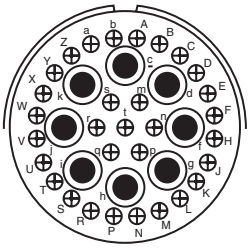



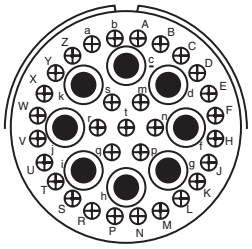




| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **32-64** | **32-68** | **32-75** | **32-76** |
| **Service Rating** | Inst. | A | 8, 9 = D | A |
| **Number of Contacts** | 54 | 12 4 | 2 7 | 19 |
| **Contact Size** | 16 | 16 4 (Coax) RG-58C/U | 12 8 (Coax) RG-180B/U | 12 |





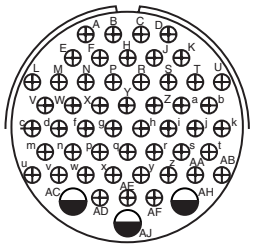
| | | | | |
|---|---|---|---|---|
| **Insert Arrangement** | **32-79** | **36-51** | **36-54** | **36-55** |
| **Service Rating** | D | D | A | A |
| **Number of Contacts** | 4 1 | 2 2 | 8 31 | 31 8 |
| **Contact Size** | 4 8 | 0 4 | 8 16 | 16 8 for #6 wire |

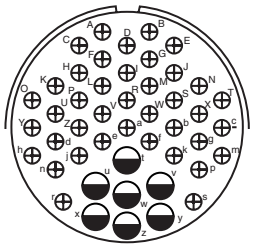
**CONTACT LEGEND** ⊕ **16** ◒ **12** ● **8** ○ **4** ⊗ **0**

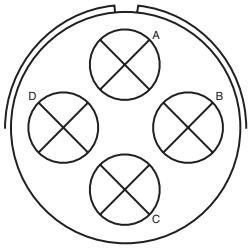
**Consult Sidney, NY for service rating of power contacts.

# QWLD
## special arrangements

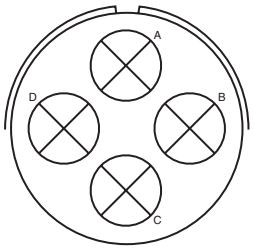
**front face of pin insert or rear of socket insert illustrated**

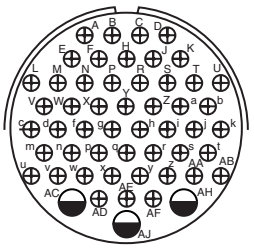


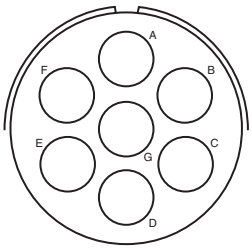




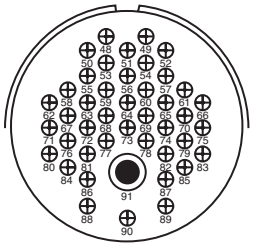

| | | | |
|---|---|---|---|
| **Insert Arrangement** | **36-59** | **36-60** | **36-64** |
| **Service Rating** | **A** | ****** | **–** |
| **Number of Contacts** | **50 3** | **40 7** | **4** |
| **Contact Size** | **16 12 for #10 wire** | **16 12 for #10 wire** | **0 (Coax) RG-11/U RG-12/U or RG-13/U** |

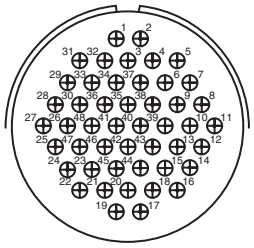


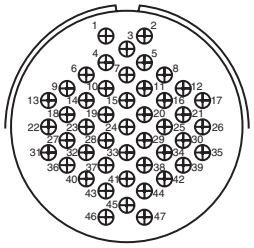






| | | | |
|---|---|---|---|
| **Insert Arrangement** | **36-65** | **36-71** | **36-73** |
| **Service Rating** | **–** | **A** | **–** |
| **Number of Contacts** | **4** | **3 50** | **7** |
| **Contact Size** | **0 (Coax) RG-59/U, RG-62/U or RG-71/U** | **12 16** | **4 (Coax) RG-62B/U** |







| | | | |
|---|---|---|---|
| **Insert Arrangement** | **36-74** | **36-75** | **36-76** |
| **Service Rating** | **A** | **A** | **A** |
| **Number of Contacts** | **43 1** | **48** | **47** |
| **Contact Size** | **16 8 (Coax) RG-187/U** | **16 for #14 wire** | **16** |

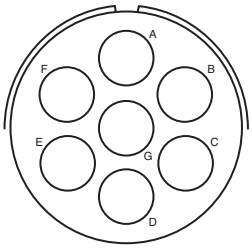
**CONTACT LEGEND**

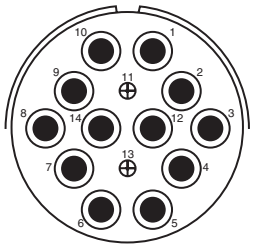
**16 12 8 4 0**

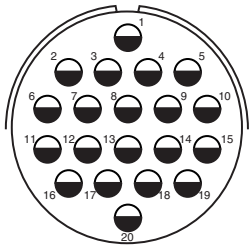
**Consult Sidney, NY for service rating of power contacts.

# QWLD
## special arrangements

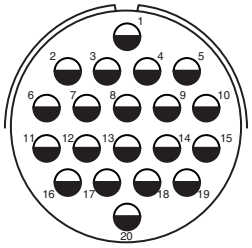
**front face of pin insert or rear of socket insert illustrated**

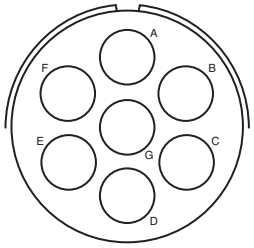


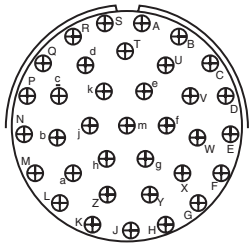



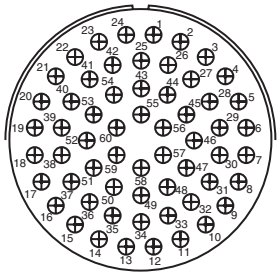

| | | | |
|---|---|---|---|
| **Insert Arrangement** | **36-77** | **36-78** | **36-79** |
| **Service Rating** | **D** | **A** | **A** |
| **Number of Contacts** | **7** | **2 12** | **20** |
| **Contact Size** | **4** | **16 8** | **12** |

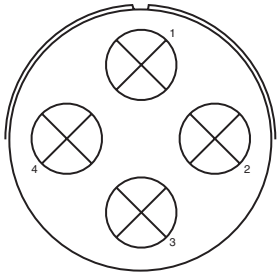


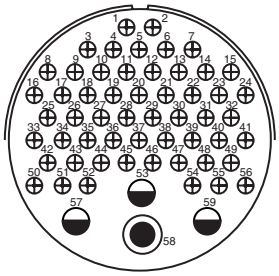



| | | | |
|---|---|---|---|
| **Insert Arrangement** | **36-80** | **36-83** | **36-85** |
| **Service Rating** | **A** | **–** | **M = D; Bal. = A** |
| **Number of Contacts** | **20** | **7** | **35** |
| **Contact Size** | **12 for #10 wire** | **4 (Coax) RG-58/U** | **16 for #12 wire** |





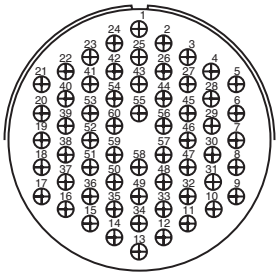



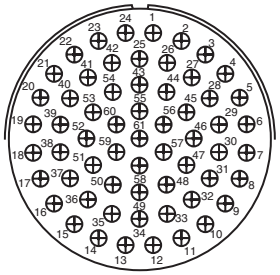
| | | | |
|---|---|---|---|
| **Insert Arrangement** | **40-53** | **40-57** | **40-61** |
| **Service Rating** | **A** | **E** | **A** |
| **Number of Contacts** | **60** | **4** | **1 3 55** |
| **Contact Size** | **16** | **0** | **8 12 16** |

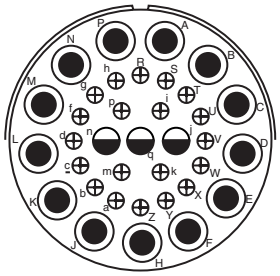
**CONTACT LEGEND** **16** **12** **8** **4** **0**

# QWLD
## special arrangements

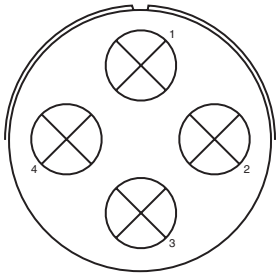
**front face of pin insert or rear of socket insert illustrated**

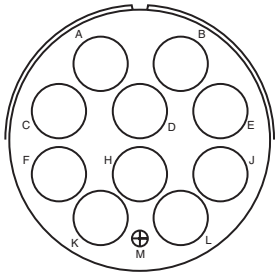


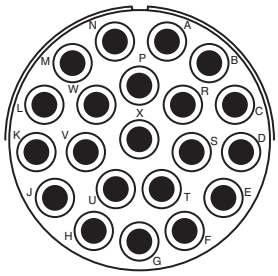




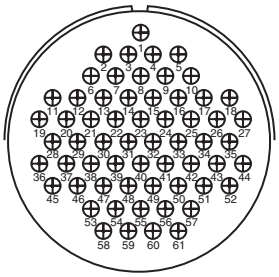
| | | | |
|---|---|---|---|
| **Insert Arrangement** | **40-62** | **40-63** | **40-64** |
| **Service Rating** | **A** | **A** | **–** |
| **Number of Contacts** | **60** | **61** | **3 20 13** |
| **Contact Size** | **16** | **16 for #14 wire** | **12 16 8 (Coax) RG-124/U** |

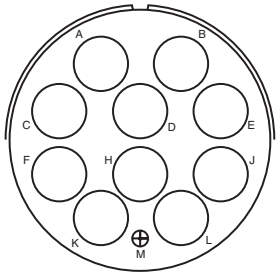


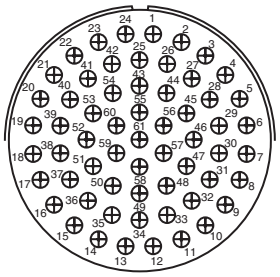




| | | | |
|---|---|---|---|
| **Insert Arrangement** | **40-66** | **40-67** | **40-68** |
| **Service Rating** | **–** | **A** | **A** |
| **Number of Contacts** | **4** | **1 10** | **21** |
| **Contact Size** | **0 (Coax) RG-63B/U** | **16 4 (Coax) RG-59/U** | **8** |





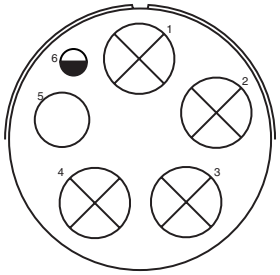


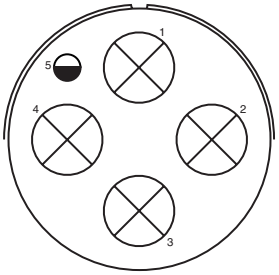
| | | | |
|---|---|---|---|
| **Insert Arrangement** | **40-70** | **40-72** | **40-73** |
| **Service Rating** | **A** | **A** | **A** |
| **Number of Contacts** | **61** | **1 10** | **61** |
| **Contact Size** | **16** | **16 4 (Coax) RG-9B/U** | **16** |

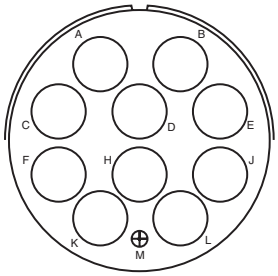
**CONTACT LEGEND** **16** **12** **8** **4** **0**

# QWLD
## special arrangements

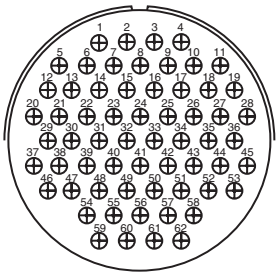
**front face of pin insert or rear of socket insert illustrated**

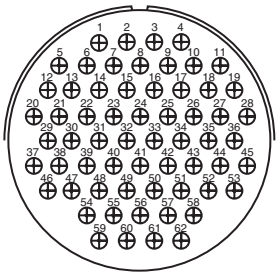


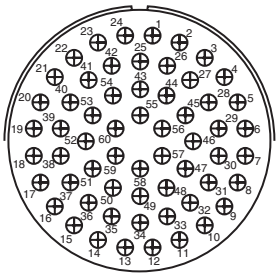



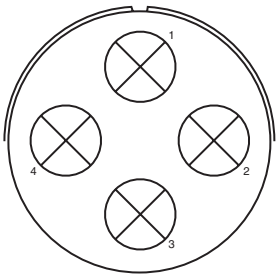

| | | | |
|---|---|---|---|
| **Insert Arrangement** | **40-74** | **40-75** | **40-80** |
| **Service Rating** | **A** | **E** | **A** |
| **Number of Contacts** | **1 1 4** | **1 4** | **1 10** |
| **Contact Size** | **12 4 (Coax) RG-62/U 0 (Coax) RG-9B/U or RG-214/U** | **12 0** | **16 4** |

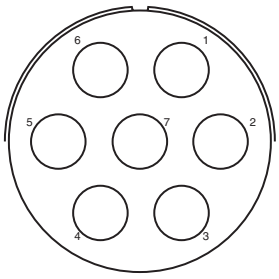


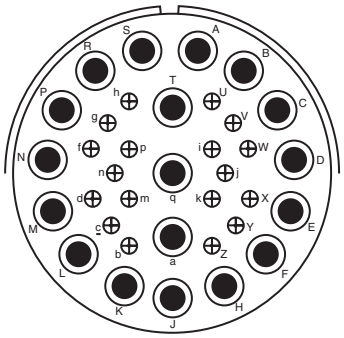




| | | | |
|---|---|---|---|
| **Insert Arrangement** | **40-81** | **40-82** | **40-85** |
| **Service Rating** | **A** | **A** | **A** |
| **Number of Contacts** | **62** | **62** | **60** |
| **Contact Size** | **16 for #14 wire** | **16** | **16 for #14 wire** |



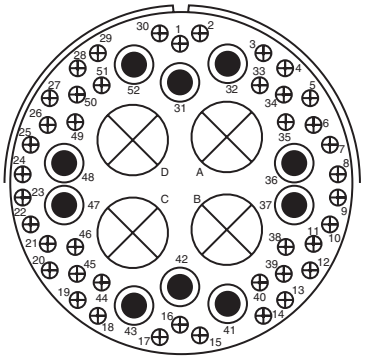



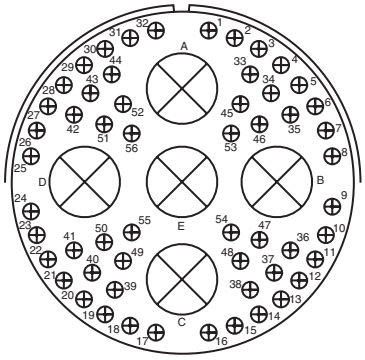

| | | | |
|---|---|---|---|
| **Insert Arrangement** | **40-86** | **40-87** | **44-53** |
| **Service Rating** | **–** | **D** | **A** |
| **Number of Contacts** | **4** | **7** | **18 18** |
| **Contact Size** | **0 (Coax) RG-115A/U** | **4** | **16 8(Coax) RG-124/U** |

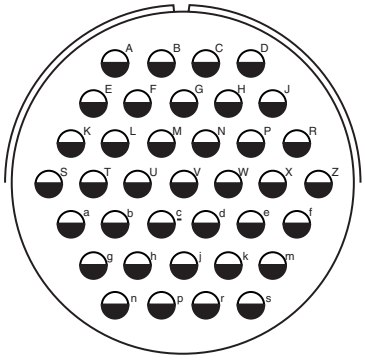
**CONTACT LEGEND** **16** **12** **8** **4** **0**

# QWLD
## special arrangements

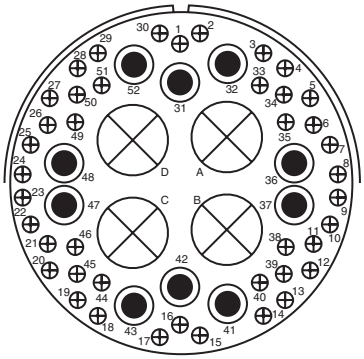
**front face of pin insert or rear of socket insert illustrated**

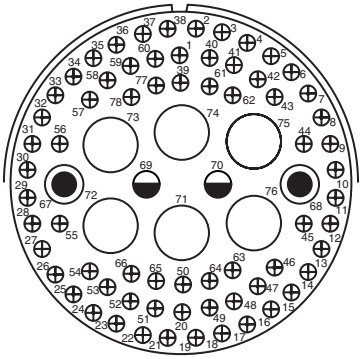


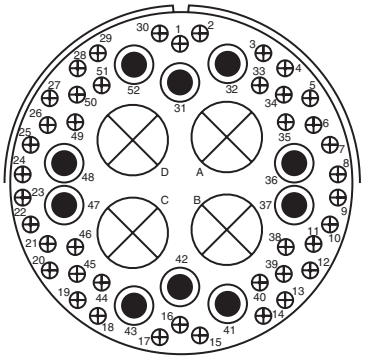




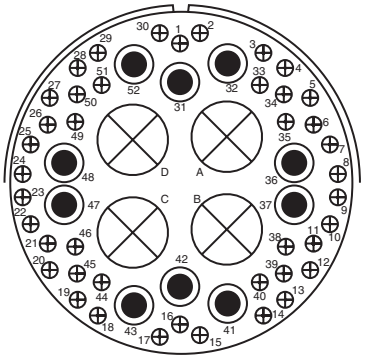
| | | | |
|---|---|---|---|
| **Insert Arrangement** | **48-51†** | **48-52†** | **48-53†** |
| **Service Rating** | **A** | **A** | **D** |
| **Number of Contacts** | **42 10 4** | **56 5** | **37** |
| **Contact Size** | **16 8 0 (Coax) RG-41/U** | **16 0 (Coax) RG-41/U** | **12** |







| | | | |
|---|---|---|---|
| **Insert Arrangement** | **48-54†** | **48-55†** | **48-57†** |
| **Service Rating** | **A** | **A** | **A** |
| **Number of Contacts** | **42 10 4** | **68 2 2 6** | **42 10 4** |
| **Contact Size** | **16 8 0 (Coax) RG-59/U** | **16 12 8 4** | **16 8 0** |



| | |
|---|---|
| **Insert Arrangement** | **48-60†** |
| **Service Rating** | **A** |
| **Number of Contacts** | **42 10 4** |
| **Contact Size** | **16 8 0 (Coax) RG-214/U** |

†Consult Sidney, NY for availablity

**CONTACT LEGEND** **16** **12** **8** **4** **0**

# QWLD
# thermocouple contact availability

A complete line of cylindrical connectors containing thermocouple insert arrangements is available. The contact layout for a particular arrangement will be found in either the MIL-C-22992, QWLD contact arrangement section, pages 27-38, or the Special contact arrangement section, pages 39-47. All thermocouple contact layouts may contain either iron, alumel, chromel, constantan, standard (copper) or brass (dummy) contacts. See the thermocouple tabulations on the following pages.

The following abbreviations are used in the contact material column in the charts that follow. Also, thermocouple contacts are color coded as shown. (This identification is made by means of small dots of stain on solder well end of the contact.)

| Abbreviation | Material | Color Code |
|---|---|---|
| Ir. | Iron | Black |
| Con | Constantan | Yellow |
| Cu. | Copper Alloy | N/A |
| Ch. | Chromel | White |
| Al. | Alumel | Green |
| Dummy | Brass | N/A |

### WIRE WELL DATA

| Contact Size | Well Inside Dia. + .004 – .002 | Well Depth + .031 – .000 | Solder Well Barrel Outside Dia. |
|---|---|---|---|
| 12 | .125 | .250 | .166 ±.003 |
| 16 | .094 | .188 | .125 +.002 –.004 |

### RECOMMENDED WIRE

| | |
|---|---|
| I Chromel-Alumel | Use wire in accordance with MIL-W-5848 |
| II Iron-Constantan | Use wire in accordance with MIL-W-5845 |

# QWLD
# thermocouple arrangements

| Shell Size and Arrg. | Similar to MS Arrg. | Total Contacts | Contact Size | | Pin Insert Rotation CW | Contact Material |
|---|---|---|---|---|---|---|
| | | | 12 | 16 | | |
| 14-59 | 14-53 | 6 | | 6 | None | A = Al.; B = Ch.; C = Ir.; D = Con.; E,F = Cu. |
| | | | | | | |
| 16-52 | 16-11 | 2 | 2 | | 90° | A = Al.; B = Ch. |
| 16-53 | 16-9 | 4 | 2 | 2 | 70° | A = Al.; C = Ch.; B, D = Cu. |
| 16-55 | 16-10 | 3 | 3 | | 45° | A = Al.; B = Ch.; C = Cu. |
| 16-56 | 16-13 | 2 | 2 | | 90° | A = Con.; B = Cu. |
| 16-57 | 16-10 | 3 | 3 | | None | A = Al.; B = Cu.; C = Ch. |
| 16-58 | 16-10 | 3 | 3 | | None | A = Con.; B, C = Cu. |
| 16-60 | 16-13 | 2 | 2 | | None | A = Al,; B = Ch. |
| 16-62 | 16-11 | 2 | 2 | | None | A = Con.; B = Cu. |
| 16-67 | 16-11 | 2 | 2 | | None | A = Al.; B = Ch. |
| 16-68 | 16-9 | 4 | 2 | 2 | None | A, B, C = Ch.; D = Al. |
| | | | | | | |
| 18-51 | 18-12 | 6 | | 6 | None | A = Ir.; B, E = Con.; D = Cu.; C, F = Dummy |
| 18-52 | 18-11 | 5 | 5 | | None | A = Ir.; B = Con.; C = Ch.; D = Al.; E = Dummy |
| 18-53 | 18-12 | 6 | | 6 | None | A, D = Ir.; B, E = Con.; C, F, = Dummy |
| 18-54 | 18-15 | 4 | 4 | | None | A, C = Al.; B, D = Ch. |
| 18-56 | 18-1 | 10 | | 10 | 45° | A, C, E, G, I = Ir.; B, D, F, H, J = Con |
| 18-57 | 18-12 | 6 | | 6 | 45° | A, C, E = Al.; B, D, F = Ch. |
| 18-59 | 18-12 | 6 | | 6 | 45° | A, C = Ir,; B, E, F, = Con.; D = Cu. |
| 18-60 | 18-11 | 5 | 5 | | 45° | A, D = Al.; B, C = Ch.; E = Al. |
| 18-61 | 18-12 | 6 | | 6 | None | A, C = Ir.; B, D = Con.; E = Ch.; F = Al. |
| 18-62 | 18-12 | 6 | | 6 | None | A, B, D = Ir.; D, E, F = Con. |
| 18-63 | 18-15 | 4 | 4 | | None | A, C = Con.; B, D = Cu. |
| 18-65 | 18-12 | 6 | | 6 | None | A = Ir.; B = Con.; Balance = Cu. |
| 18-66 | 18-1 | 10 | | 10 | None | A, C, E, G, I = Cu.; B, D, F, H, J = Con. |
| 18-67 | 18-12 | 6 | | 6 | None | A, C, E = Cu.; B, D, F = Con. |
| 18-68 | 18-11 | 5 | 5 | | None | A, D = Al.; B, C = Ch.; E = Cu. |
| 18-69 | 18-1 | 10 | | 10 | None | A = Al.; B = Ch.; Balance = Cu. |
| 18-70 | 18-11 | 5 | 5 | | None | A = Ir.; B = Con.;  C = Ch.; D = Al.; E = Cu. |
| 18-71 | 18-15 | 4 | 4 | | None | A = Con.; Balance = Cu. |
| 18-72 | 18-15 | 4 | 4 | | None | D = Con.; Balance = Cu. |
| 18-73 | 18-9 | 7 | 2 | 5 | None | A = Al.; D = Ch; Balance = Cu. |
| 18-74 | 18-12 | 6 | | 6 | None | A = Ch.; B = Al.; D = Ir.; E = Cu.; C, F = Con. |
| 18-76 | 18-1 | 10 | | 10 | None | A, C, E, G, I = Al.; B, D, F, H, J = Ch. |
| 18-77 | 18-1 | 10 | | 10 | None | A, C, E, G =  Al.; B, D, F, H = Ch.; Bal. = Cu. |
| 18-78 | 18-1 | 10 | | 10 | None | A = Al.; B = Ch.; D, F, H, J = Con.; Bal. = Cu. |
| 18-79 | 18-12 | 6 | | 6 | None | A, F, = Ir.; B, E = Con.; C, D, = Cu. |
| 18-80 | 18-15 | 4 | 4 | | None | A, C = Cu.; B, D = Con. |
| 18-81 | 18-1 | 10 | | 10 | None | E, G = Con.; Bal. = Cu. |
| 18-82 | 18-1 | 10 | | 10 | None | E, G = Con.; F, H = Ir.; Bal = Cu. |
| | | | | | | |
| 20-52 | 20-4 | 4 | 4 | | 315° | A= Ir.; B = Con.; C = Ch.; D = Al |
| 20-56 | 20-7 | 8 | | 8 | 45° | A, B, G, H = Ir.; C, D, E, F = Con. |
| 20-60 | 20-7 | 8 | | 8 | 45° | D = Ch.; E = Al.; Balance = Cu. |
| 20-61 | 20-29 | 17 | | 17 | 45° | A, B, M = Cu.; Balance = Con. |
| 20-62 | 20-15 | 7 | 7 | | 80° | A, C, E, = Al.; B, D, F, = Ch.; G = Cu. |

# QWLD
# thermocouple arrangements

| Shell Size and Arrg. | Similar to MS Arrg. | Total Contacts | Contact Size | | Pin Insert Rotation CW | Contact Material |
|---|---|---|---|---|---|---|
| | | | 12 | 16 | | |
| 20-64 | 20-27 | 14 | | 14 | None | A = Al.; C = Ch.; Balance = Cu. |
| 20-65 | 20-27 | 14 | | 14 | None | A, B, C, D, E, F, G = Ir.; H, I, J, K, L, M, N = Con. |
| 20-67 | 20-16 | 9 | 2 | 7 | None | H = Al.; I = Ch.; Balance = Cu. |
| 20-68 | 20-7 | 8 | | 8 | None | A, B, G, H = Con.; C, D, E, F, = Cu. |
| 20-69 | 20-27 | 14 | | 14 | None | A, B, C, D, E, F, G = Cu.; H, I, J, K, L, M, N = Con. |
| 20-70 | 20-29 | 17 | | 17 | None | A, C, E, G, J, L, N, R, T = Ir.; B, D, F, H, K, M, P, S = Con. |
| 20-71 | 20-29 | 17 | | 17 | None | S = Al.; R = Ch.; Balance = Cu. |
| 20-74 | 20-29 | 17 | | 17 | None | A, C, E, G, J, L, N, R = Ir.; B, D, F, H, K, M, P, S = Con.; T = Cu. |
| 20-75 | 20-15 | 7 | 7 | | None | G = Al.; Balance = Ch. |
| 20-77 | 20-16 | 9 | 2 | 7 | None | A = Con.; Balance = Std. |
| 20-80 | 20-27 | 14 | | 14 | None | A, C, E, G, I, K, M = Cu.; B, D, F, H, J, L, N = Con. |
| 20-81 | 20-27 | 14 | | 14 | None | A, C, E, G, I, K, M = Ch.; B, D, F, H, J, L, N = Al |
| 20-82 | 20-29 | 17 | | 17 | None | A, C, E, G, J, L, N, R = Al.; B, D, F, H, K, M, P, S = Ch.; T = Cu. |
| 20-85 | 20-33 | 11 | | 11 | None | K, L, = Al.; Bal. = Ch. |
| 20-87 | 20-29 | 17 | | 17 | None | A, C, E, G, J, L, N, R = Con.; Bal. = Cu. |
| 20-88 | 20-27 | 14 | | 14 | None | A, C, E = Al.; B, D, F, = Ch.; G, H, K, N = Con.; Bal. = Cu. |
| 20-89 | 20-27 | 14 | | 14 | None | B, D, F, H, J, L = Al,; A, C, E, G, I, K = Ch., M, N = Cu. |
| 20-90 | 20-27 | 14 | | 14 | None | C, G, I = Ch.; K, L, M = Al.; Bal. = Cu. |
| 20-91 | 20-27 | 14 | | 14 | None | I = Ch.; K = Al.; Bal. = Cu. |
| 20-92 | 20-7 | 8 | | 8 | None | A = Al.; H = Cu.; Bal. = Ch. |
| 20-93 | 20-27 | 14 | | 14 | None | A = Ch.; B = Al.; Bal. = Cu. |
| 20-94 | 20-15 | 7 | 7 | | None | A, C, E = Al.; B, D, F = Ch.; G = Cu. |
| 20-99 | 20-33 | 11 | | 11 | None | A = Al.; Bal. = Ch. |
| | | | | | | |
| 22-57 | 22-14 | 19 | | 19 | 45° | A, C, E, G, J, L, N, R = Ir.; B, D, F, H, K, M, P, S = Con.; T, U, V, = Cu. |
| 22-60 | 22-14 | 19 | | 19 | 45° | U = Al.; N = Ch.; Bal. = Cu. |
| 22-62 | 22-23 | 8 | 8 | | 60° | A, B, F, G = Al.; C, D, E, H = Ch. |
| 22-68 | 22-19 | 14 | | 14 | 45° | A, C, E, G, J, L, M = Ir.; B, D, F, H, K, P, N = Con. |
| 22-69 | 22-19 | 14 | | 14 | 45° | A, C, E, G, J, L, M = Cu.; B, D, F, H, K, P, N = Con. |
| 22-71 | 22-14 | 19 | | 19 | None | V = Al.; U = Ch.; Balance = Cu. |
| 22-72 | 22-5 | 6 | 2 | 4 | None | B = Al.; E = Ch.; Balance = Cu. |
| 22-73 | 22-5 | 6 | 2 | 4 | None | E = Al.; B = Ch.; Balance = Cu. |
| 22-74 | 22-23 | 8 | 8 | | None | A, C, E, G = Ir.; B, D, F, H = Con. |
| 22-75 | 22-23 | 8 | 8 | | None | A = Al.; B, D, G, H = Cu.; C = Ch.; E = Ir.; F = Con |
| 22-76 | | 21 | | 21 | None | W = Con.; Balance = Cu. |
| 22-77 | 22-19 | 14 | | 14 | None | B, D, F, H, J, K, M, P = Cu.; A, E, L = Ir.; C, G, N = Con. |
| 22-78 | 22-14 | 19 | | 19 | None | A, C, E, G, H, K, M, P, R, T = Con.; Balance = Cu. |
| 22-79 | 22-10 | 4 | | 4 | None | A, C = Con.; B, D = Cu. |
| 22-82 | 22-14 | 19 | | 19 | None | A, C, E, G, J, L, N, R, T = Ir.; B, D, F, H, K, M, P, S, U = Con.; V = Cu. |
| 22-83 | 22-18 | 8 | | 8 | None | A, C, E, G = Al.; B, D, F, H, = Ch. |
| 22-84 | 22-14 | 19 | | 19 | None | A, C, S, = Ch.; B, D, T = Al.; Bal. = Cu. |
| 22-85 | 22-19 | 14 | | 14 | None | A, C, E, G, J, L, N = Al.; B, D, F, H, K, M, P = Ch. |
| 22-89 | 22-88 | 7 | 7 | | None | A, C, E = Ir.; B, D, F = Con.; G = Cu. |
| | | | | | | |
| 24-56 | 24-20 | 11 | 2 | 9 | 45° | E = Al.; F = Ch.; Balance = Cu. |
| 24-57 | 24-26 | 24 | | 24 | 45° | A, C, J, V, Y, W, K, E, H, U, S, M = Ch.; Balance = Al |
| 24-62 | 24-28 | 24 | | 24 | None | A, C, E, G = Ir.; B, D, F, H = Con.; R, T = Ch.; S, U = Al.; Balance = Cu. |

# QWLD
# thermocouple arrangements

| Shell Size and Arrg. | Similar to MS Arrg. | Total Contacts | Contact Size | | Pin Insert Rotation CW | Contact Material |
|---|---|---|---|---|---|---|
| | | | 12 | 16 | | |
| 24-63 | 24-28 | 24 | | 24 | None | A, C, E, G, J, L, K, N, S, U, W, Y = Cu.; B, D, F, H, Q, R, M, P, T, V, X, Z = Con. |
| 24-64 | 24-5 | 16 | | 16 | None | A, B, C, D, E, F, G, H = Ir.; J, K, L, M, N, P, R, S = Con. |
| 24-68 | 24-28 | 24 | | 24 | None | D = Con.; Balance = Cu. |
| 24-81 | 24-7 | 16 | 2 | 14 | None | A, C, E, G, I, K, M, N, P = Cu.; B, D, F, H, J, L, O = Con. |
| 24-88 | 24-28 | 24 | | 24 | None | A, B, C, D, E, F, G, H, J, K, L, M = Con.; Bal. = Ir. |
| 24-91 | 24-5 | 16 | | 16 | None | A, B, C, D, E, F, G, H = Al.; J, K, L, M, N, P, R, S = Ch. |
| | | | | | | |
| 28-53 | 28-11 | 22 | 4 | 18 | 45° | J, L = Al.; K, M = Ch.; Balance = Cu. |
| 28-58 | 28-20 | 14 | 10 | 4 | 45° | A, C, E, G, K, M = Al.; B, D, F, H, L, N = Ch.; J, P = Cu. |
| 28-61 | 28-21 | 37 | | 37 | 45° | A, C, J, Z, m, r, n, a, K, F, H, X, k, h, T, M, N, d = Ir.; Balance = Con. |
| 28-63 | 28-20 | 14 | 10 | 4 | 45° | A, C, E, G, J = Al.; B, D, F, H, P = Ch.; Balance = Cu. |
| 28-64 | 28-15 | 35 | | 35 | None | A, d = Al.; B, j = Ch.; C, D, E, F, G, N, P, R, S, H, J, K, L, M, W, X, Y, Z = Con.; Balance = Cu. |
| 28-65 | 28-12 | 26 | | 26 | None | A, C, E, G, J, L, N, R, T, V = Ir.; X, Z = Al.; B, D, F, H, K, M, P, S, U, W = Con; Y, a = Ch.; b, d = Cu. |
| 28-67 | 28-16 | 20 | | 20 | None | U = Con.; Balance = Cu. |
| 28-68 | 28-15 | 35 | | 35 | 45° | T = Al.; U = Ch.; Balance = Cu. |
| 28-69 | 28-11 | 22 | 4 | 18 | None | G = Al.; R = Ch.; Balance = Cu. |
| 28-70 | 28-11 | 22 | 4 | 18 | None | A = Al.; B = Ch.; Balance = Cu. |
| 28-77 | 28-11 | 22 | 4 | 18 | None | J = Con.; Balance = Cu. |
| 28-81 | 28-21 | 37 | | 37 | None | A, D, S, Z, n, s = Ir.; B, J, K, f, g, r = Con.; G, L, P, b, e, j = Al.; F, H, T, X, h, k = Ch.; Balance = Cu. |
| 28-85 | 28-11 | 22 | 4 | 18 | 45° | K, M = Al.; J, L = Ch.; Bal. = Cu. |
| 28-91 | 28-9 | 12 | 6 | 6 | None | M = Ir.; L = Con.; Bal. = Cu. |
| 28-94 | 28-12 | 26 | | 26 | None | B, D, F, H, K, M, P, S, U, W, Y, a, d = Al.; Bal. = Ch. |
| 28-98 | 28-21 | 37 | | 37 | None | M = Al.; F = Ch.; Bal. = Cu. |
| 28-99 | 28-12 | 26 | | 26 | None | B, D, F, H, K, M, P, S, U, W, Y, a = Con.; Bal. = Cu. |
| 28-AC | 28-16 | 20 | | 20 | None | A, C, E, G, J, L = Ir.; B, D, F, N, K, M = Con.; Bal. = Cu. |
| 28-AD | 28-21 | 37 | | 37 | 45° | A, C, F, H, J, K, M, N, T, X, Z, a, d, h, k, m, n, r = Cu.; Bal. = Cu. |
| 28-AE | 28-21 | 37 | | 37 | None | A, C, E, G, J, L, N, R, T, V, X, a, c, e, g, j, m, p. s = Cu.; Bal. = Con. |
| 28-AF | 28-18 | 12 | | 12 | None | A, C, E, G, J, L = Ch.; Bal. = Al. |
| 28-AG | 28-12 | 26 | | 26 | None | A, C, E, G, J, L, N, R = Al.; B, D, F, H, K, M, P, S = Ch.; Bal. = Cu. |
| 28-AK | 28-21 | 37 | | 37 | 45° | A, B, C, D, J, K, L, M, N, P, a, b, c, d, e, m, p = Ch.; n = Cu.; Bal. = Al. |
| | | | | | | |
| 32-51 | 32-8 | 30 | 6 | 24 | 90° | M = Ch.; N = Al.; Balance = Cu. |
| 32-55 | 32-8 | 30 | 6 | 24 | 125° | M, N = Ch.; O, P = Al.; Balance = Cu. |
| 32-91 | 32-64 | 54 | | 54 | None | A, C, E, G, J, L, N, P, S, U, W, Y, a, c, e, g, j, m = Ir.; B, D, F, H, K, M, O, R, T, V, X, Z, b, d, f, h, k, n = Con.; Bal. = Cu. |
| | | | | | | |
| 36-53 | 36-7 | 47 | 7 | 40 | 45° | u, v, w = Al.; x, y, z = Ch.; Balance = Cu. |
| 36-56 | 36-10 | 48 | | 48 | None | A, C, E, G, L, J, H, P, R, T, V, X, Z, b, d, f, h, k, q, n, m, u, w, y = Con.; Bal. = Cu. |
| 36-57 | 36-8 | 47 | 1 | 46 | None | W = Al.; f = Ch.; Balance = Cu. |
| 36-58 | 36-15 | 35 | | 35 | None | H = Al.; G = Ch.; Balance = Cu. |
| 36-61 | 36-15 | 35 | | 35 | None | A, C, E, J, K, L, M, N, P, R, T, V, f, X, Y, h, j, c = Con.; Balance = Cu. |
| 36-62 | 36-10 | 48 | | 48 | None | A, C, E = Al.; B, D, F = Ch.; Balance = Cu. |
| 36-82 | 36-52* | 52 | | 52 | None | v, g = Ir.; p, y, c = Con.; x = Ch.; Balance = Cu. |

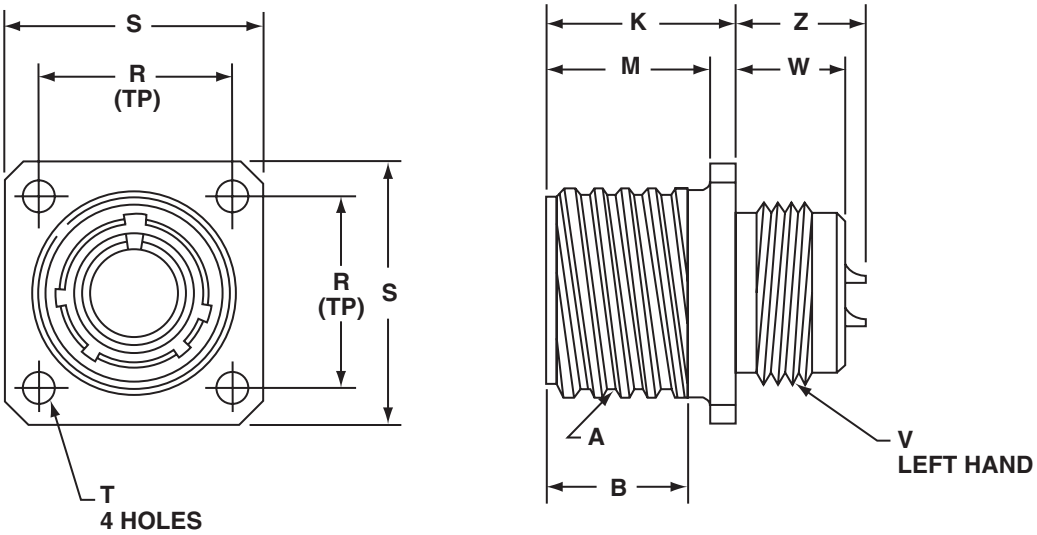
* Amphenol arrangement

# QWLD
# thermocouple arrangements

| Shell Size and Arrg. | Similar to MS Arrg. | Total Contacts | Contact Size | | Pin Insert Rotation CW | Contact Material |
|---|---|---|---|---|---|---|
| | | | 12 | 16 | | |
| 36-86 | 36-10 | 48 | | 48 | None | A, C, E, G, J, L, N, P, R, T, V, X = Al.; B, D, F, H, K, M, O, Q, S, U, W, Y = Ch.; z, b, d, f, h, k, n, q, s, u, w, y = Con.; a, c, e, g, j, m, p, r, t, v, x, z = Cu. |
| 36-88 | 36-52 | 52 | | 52 | None | A, C, E, H, K, M, P, S, U, W, Y, a, c, f, h, j, m, p, r, t, v, x, z, AB, AD, AF = Cu.; Bal. = Con. |
| | | | | | | |
| 40-58 | 40-56* | 85 | | 85 | None | A, C, E, H, K, M, P, S, U, W, Y, a, c, f, h, j, m, p, r, t, v, x, z, AB, AD, AF, AJ, AL, AN, AP, AS, AU, AW, AY, BA, BC, BE, BH, BK, BM, BP, BS, BU = Ir.; Balance = Con. |
| 40-59 | 40-56* | 85 | | 85 | None | B = Ch.; C = Con.; Balance = Cu. |
| 40-77 | 40-53* | 60 | | 60 | None | 55, 60 = Ir.; 57, 58, 59 = Con.; 56 = Ch.; Balance = Cu. |
| 40-78 | 40-53* | 60 | | 60 | None | 50, 51 = Ir.; 27, 28, 29, 31, 32, 34, 36, 37 = Con.; 25, 39, 40, 41 = Al.; 43, 44, 45, 46, 47, 48, 49, 52, 53, 54 = Ch.; Balance = Cu. |
| 40-88 | 40-53 | 60 | | 60 | None | 1, 3, 5, 7, 9, 11, 13, 15, 17, 19, 21, 23, 25, 27, 29, 31, 33, 35, 37, 39, 41, 43, 45, 47, 49, 51, 53, 55, 57, 59 = Con.; Bal. = Cu. |
| 40-AA | 40-56 | 85 | | 85 | None | A, C, E, H, K, M, P, S, U, W, Y, a, c, f, h, j, m, p, r, t, v, x, z, AB, AD, AF, AJ, AL, AN, AR, AT = Cu.; B, D, F, J, L, N, R, T, V, X, Z, b, d, g, i, k, n, q, s, u, w, y, AA, AC, AE, AH, AK, AM, AP, AS = Con.; AU, AW, AY, BA, BC, BE, BH, BK, BM, BP, BS, BU = Cu.; AV, AX, AZ, BB, BD, BF, BJ, BL, BN, BR, BT, BV = Al. |
| | | | | | | |
| 44-57 | 44-52 | 104 | | 104 | None | A, C, E, G, J, L, etc. = Cu.; B, D, F, H, K, M, etc. = Con. |
| 44-59 | 44-52 | 104 | | 104 | None | 34 = Con.; 70 = Cu. |
| 44-60 | 44-52 | 104 | | 104 | None | A, C, E, etc. = Ch., (52); B, D, F, etc. = Al., (52) |
| 44-62 | 44-52 | 104 | | 104 | None | BY, BZ, CA, CB, CC, CD, CE, CR = Al.; CH, CJ, CK, CL, CM, CN, CP, CS = Ch.; Bal. = Cu. |

* Amphenol arrangement

# MIL-C-22992, QWLD
# MS17343 or 10-1940XX
## wall mount receptacle

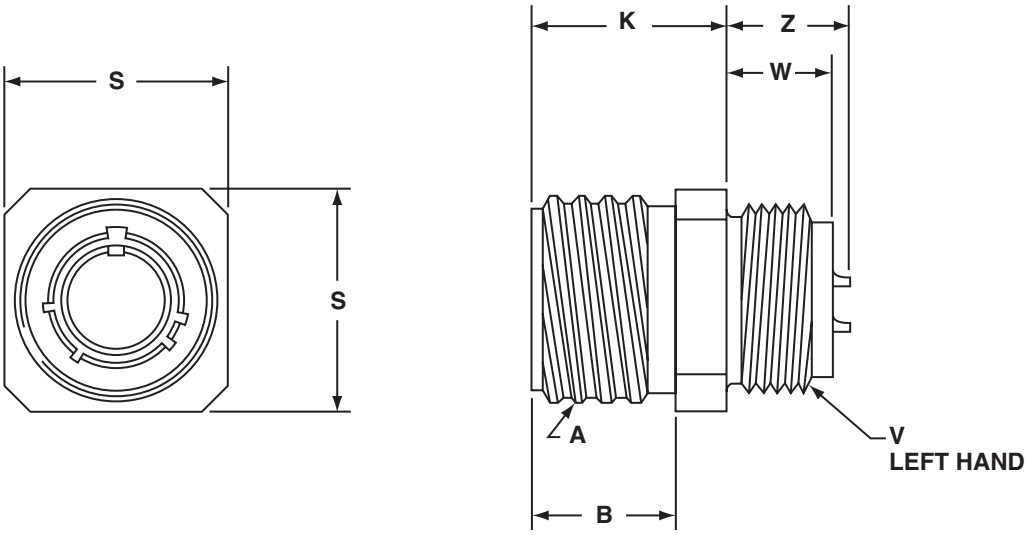



All dimensions for reference only.

| Part Number* | Shell Size | A Thread Class 2A (Plated) 0.1P-0.2L Double Stub | B Min Full Thd | K +.021 –.020 | M +.010 –.000 | R (TP) | S +.021 –.020 | T Dia +.004 –.003 | V Thread Class 2A-LH (Plated) | W ±.010 | Z Max |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 10-194013 | 12 | .8750 | .672 | .937 | .797 | .906 | 1.188 | .150 | .750-20UNEF | .640 | .700 |
| 10-194015 | 14 | 1.0000 | .672 | .937 | .797 | .969 | 1.281 | .150 | .875-20UNEF | .640 | .700 |
| 10-194017 | 16 | 1.1250 | .672 | .937 | .797 | 1.062 | 1.375 | .150 | 1.000-20UNEF | .640 | .700 |
| 10-194018 | 18 | 1.2500 | .672 | .953 | .797 | 1.156 | 1.500 | .177 | 1.125-18UNEF | .625 | .686 |
| 10-194020 | 20 | 1.3750 | .672 | .953 | .797 | 1.250 | 1.625 | .177 | 1.250-18UNEF | .625 | .686 |
| 10-194022 | 22 | 1.5000 | .672 | .953 | .797 | 1.375 | 1.750 | .177 | 1.375-18UNEF | .625 | .686 |
| 10-194024 | 24 | 1.7500 | .672 | 1.047 | .859 | 1.562 | 2.000 | .177 | 1.625-18UNEF | .594 | .585 |
| 10-194028 | 28 | 2.0000 | .672 | 1.047 | .859 | 1.750 | 2.250 | .177 | 1.875-16UN | .594 | .591 |
| 10-194032 | 32 | 2.2500 | .672 | 1.109 | .922 | 1.938 | 2.500 | .209 | 2.0625-16UNS | .530 | .528 |
| 10-194036 | 36 | 2.5000 | .672 | 1.109 | .922 | 2.188 | 2.750 | .209 | 2.3125-16UNS | .530 | .528 |
| 10-194040 | 40 | 2.7500 | .672 | 1.109 | .922 | 2.375 | 3.000 | .209 | 2.625-16UN | .703 | .528 |
| 10-194044 | 44 | 3.0000 | .672 | 1.109 | .922 | 2.625 | 3.250 | .209 | 2.875-16UN | .703 | .770 |
| 10-194048† | 48† | 3.2500 | .672 | 1.109 | .922 | 2.875 | 3.500 | .209 | 3.125-16UN | .703 | .770 |

*To complete 10- part number or to complete MS part number, see how to order, pg. 22.
†Shell size 48 available in proprietary versions only. Consult Sidney, NY for availability and ordering information.

# MIL-C-22992, QWLD
# MS17345 or 10-1941XX
## cable connecting plug

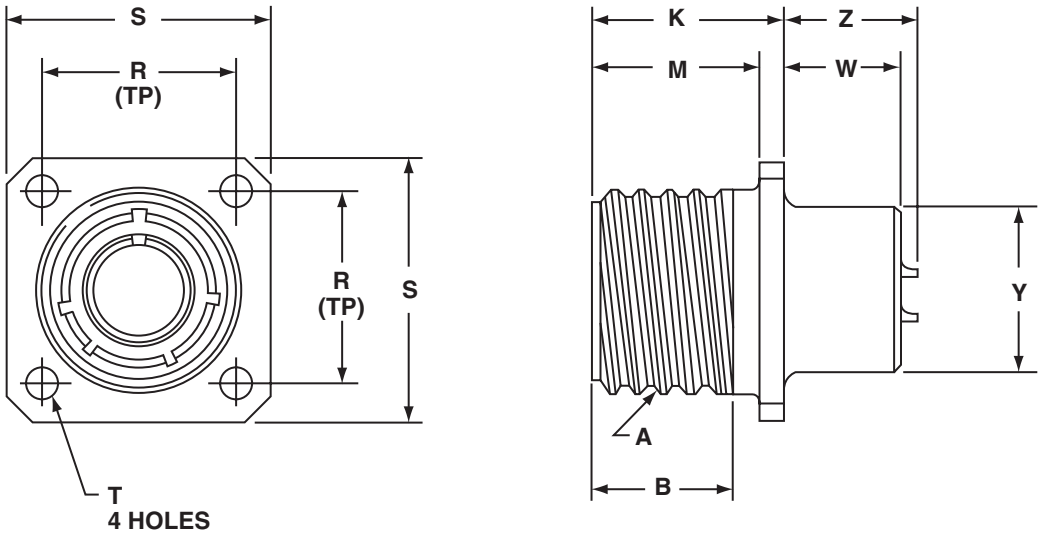



All dimensions for reference only.

| Part Number* | Shell Size | A Thread Class 2A (Plated) 0.1P-0.2L Double Stub | B +.016 –.000 | K +.021 –.020 | S +.021 –.020 | V Thread Class 2A-LH (Plated) | W ±.010 | Z Max |
|---|---|---|---|---|---|---|---|---|
| 10-194113 | 12 | .8750 | .688 | .938 | 1.000 | .750-20UNEF | .641 | .696 |
| 10-194115 | 14 | 1.0000 | .688 | .938 | 1.094 | .875-20UNEF | .641 | .696 |
| 10-194117 | 16 | 1.1250 | .688 | .938 | 1.281 | 1.000-20UNEF | .641 | .696 |
| 10-194118 | 18 | 1.2500 | .703 | .957 | 1.375 | 1.125-18UNEF | .625 | .680 |
| 10-194120 | 20 | 1.3750 | .703 | .957 | 1.500 | 1.250-18UNEF | .625 | .680 |
| 10-194122 | 22 | 1.5000 | .703 | .957 | 1.625 | 1.375-18UNEF | .625 | .680 |
| 10-194124 | 24 | 1.7500 | .766 | 1.016 | 1.875 | 1.625-18UNEF | .625 | .617 |
| 10-194128 | 28 | 2.0000 | .766 | 1.016 | 2.125 | 1.875-16UN | .625 | .617 |
| 10-194132 | 32 | 2.2500 | .703 | 1.078 | 2.375 | 2.0625-16UN | .563 | .555 |
| 10-194136 | 36 | 2.5000 | .703 | 1.078 | 2.625 | 2.3125-16UN | .563 | .555 |
| 10-194140 | 40 | 2.7500 | .703 | 1.078 | 3.000 | 2.625-16UN | .703 | .555 |
| 10-194144 | 44 | 3.0000 | .703 | 1.078 | 3.250 | 2.875-16UN | .703 | .805 |

*To complete 10- part number or to complete MS part number, see how to order, pg. 22.

# MIL-C-22992, QWLD
# MS17346 or 10-1942XX
box mount receptacle

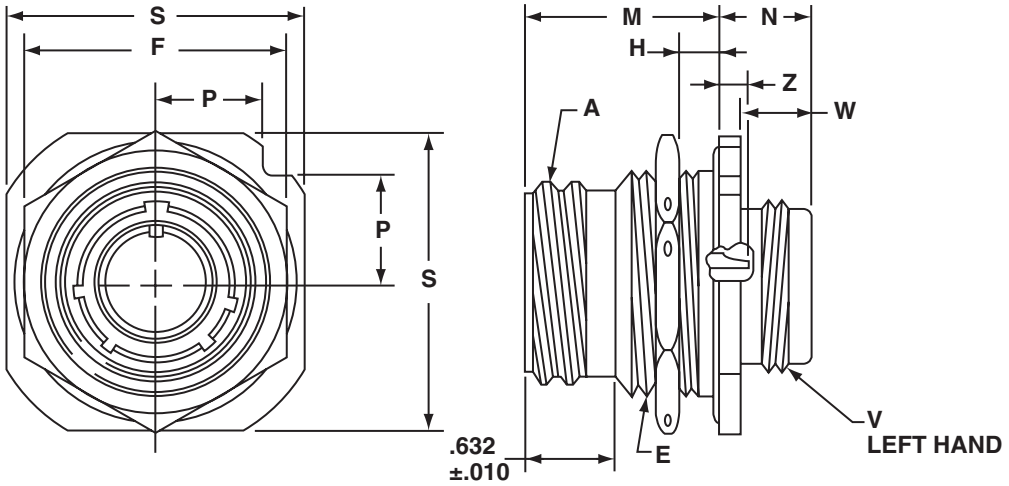



All dimensions for reference only.

| Part Number* | Shell Size | A Thread Class 2A (Plated) 0.1P-0.2L Double Stub | B Min Full Thd | K +.021 –.010 | M +.010 –.000 | R (TP) | S +.021 –.020 | T Dia +.004 –.003 | W +.020 –.030 | Y +.011 –.010 | Z Max |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 10-194213 | 12 | .8750 | .672 | .938 | .797 | .906 | 1.188 | .150 | .640 | .640 | .700 |
| 10-194215 | 14 | 1.0000 | .672 | .938 | .797 | .969 | 1.281 | .150 | .640 | .765 | .700 |
| 10-194217 | 16 | 1.1250 | .672 | .938 | .797 | 1.062 | 1.375 | .150 | .640 | .890 | .700 |
| 10-194218 | 18 | 1.2500 | .672 | .953 | .797 | 1.156 | 1.500 | .177 | .625 | 1.015 | .686 |
| 10-194220 | 20 | 1.3750 | .672 | .953 | .797 | 1.250 | 1.625 | .177 | .625 | 1.171 | .686 |
| 10-194222 | 22 | 1.5000 | .672 | .953 | .797 | 1.375 | 1.750 | .177 | .625 | 1.296 | .686 |
| 10-194224 | 24 | 1.7500 | .672 | 1.047 | .859 | 1.562 | 2.000 | .177 | .594 | 1.421 | .585 |
| 10-194228 | 28 | 2.0000 | .672 | 1.047 | .859 | 1.750 | 2.250 | .177 | .594 | 1.625 | .591 |
| 10-194232 | 32 | 2.2500 | .672 | 1.110 | .922 | 1.938 | 2.500 | .209 | .531 | 1.891 | .528 |
| 10-194236 | 36 | 2.5000 | .672 | 1.110 | .922 | 2.188 | 2.750 | .209 | .531 | 2.078 | .528 |
| 10-194240 | 40 | 2.7500 | .672 | 1.110 | .922 | 2.375 | 3.000 | .209 | .531 | 2.312 | .528 |
| 10-194244 | 44 | 3.0000 | .672 | 1.110 | .922 | 2.625 | 3.250 | .209 | .531 | 2.562 | .778 |

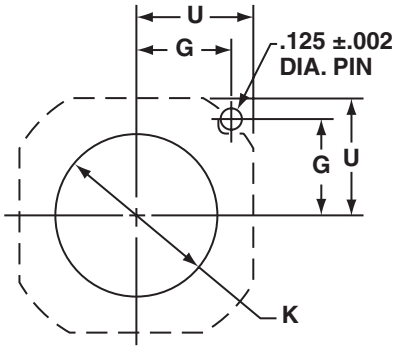
*To complete 10- part number or to complete MS part number, see how to order, pg. 22.

# MIL-C-22992, QWLD
# MS17347 or 10-1943XX
## jam nut receptacle (wall mount)




| Shell Size | K Dia. +.005 –.000 | G ±.003 | U ±.005 |
|---|---|---|---|
| 12,13 | 1.005 | .562 | .688 |
| 14,15 | 1.130 | .606 | .750 |
| 16,17 | 1.255 | .699 | .875 |
| 18 | 1.380 | .739 | .938 |
| 20 | 1.505 | .783 | 1.000 |
| 22 | 1.630 | .830 | 1.062 |
| 24 | 1.880 | .919 | 1.188 |
| 28 | 2.130 | 1.007 | 1.312 |
| 32 | 2.380 | 1.096 | 1.438 |
| 36 | 2.630 | 1.183 | 1.562 |
| 40 | 2.880 | 1.292 | 1.703 |

**MOUNTING DIMENSIONS**

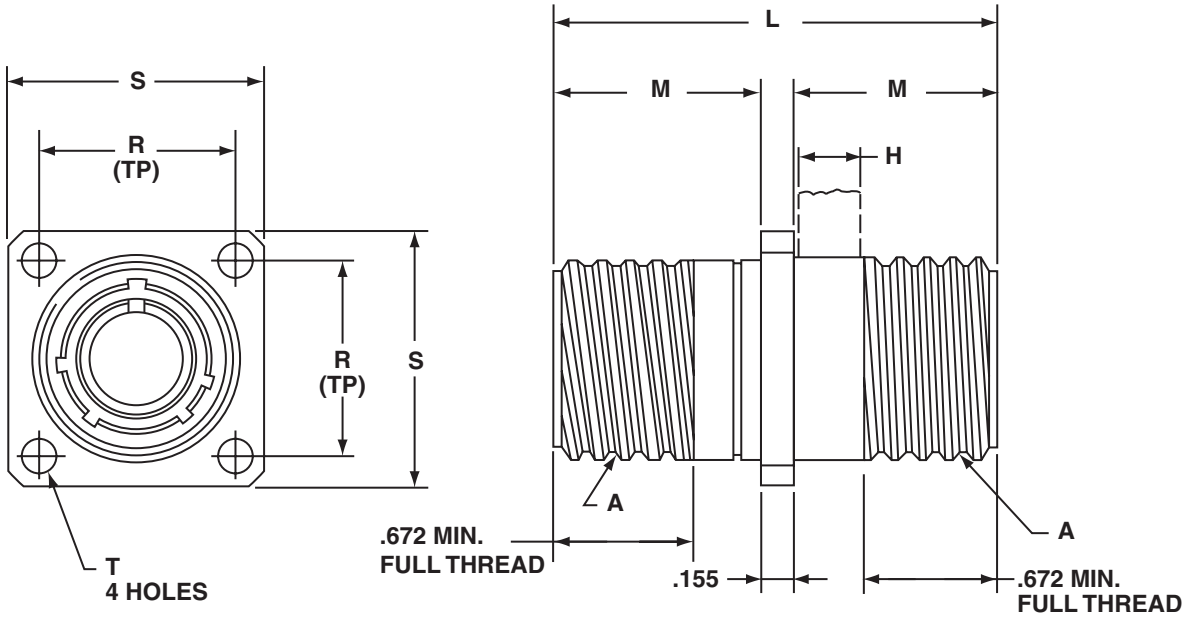



All dimensions for reference only.

| Part Number* | Shell Size | A Thread Class 2A (Plated) 0.1P-0.2L Double Stud | E Thread Class 2A (Plated) | F Hex +.017 –.016 | H Panel Thickness Min | H Panel Thickness Max | M ±.010 | N +.021 –.020 | P ±.010 | S +.011 –.010 | V Thread Class 2A-LH (Plated) | W ±.010 | Z Max |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10-194313 | 12 | .8750 | 1.000-20UNEF | 1.250 | .094 | .188 | 1.141 | .641 | .486 | 1.375 | .750-20UNEF | .516 | .483 |
| 10-194315 | 14 | 1.0000 | 1.125-18UNEF | 1.312 | .094 | .188 | 1.141 | .641 | .530 | 1.500 | .875-20UNEF | .516 | .483 |
| 10-194317 | 16 | 1.1250 | 1.250-18UNEF | 1.500 | .094 | .188 | 1.141 | .703 | .623 | 1.750 | 1.000-20UNEF | .516 | .483 |
| 10-194318 | 18 | 1.2500 | 1.375-18UNEF | 1.562 | .094 | .203 | 1.156 | .703 | .663 | 1.875 | 1.125-18UNEF | .516 | .467 |
| 10-194320 | 20 | 1.3750 | 1.500-18UNEF | 1.750 | .094 | .203 | 1.156 | .703 | .707 | 2.000 | 1.250-18UNEF | .516 | .467 |
| 10-194322 | 22 | 1.5000 | 1.625-18UNEF | 1.875 | .094 | .203 | 1.156 | .703 | .751 | 2.125 | 1.375-18UNEF | .516 | .467 |
| 10-194324 | 24 | 1.7500 | 1.875-16UN | 2.125 | .094 | .265 | 1.219 | .703 | .840 | 2.375 | 1.625-18UNEF | .516 | .404 |
| 10-194328 | 28 | 2.0000 | 2.125-16UN | 2.375 | .094 | .277 | 1.231 | .785 | .928 | 2.625 | 1.875-16UN | .516 | .392 |
| 10-194332 | 32 | 2.2500 | 2.375-16UN | 2.625 | .094 | .215 | 1.231 | .785 | 1.017 | 2.875 | 2.0625-16UN | .516 | .392 |
| 10-194336 | 36 | 2.5000 | 2.625-16UN | 2.875 | .094 | .215 | 1.231 | .785 | 1.104 | 3.125 | 2.3125-16UN | .516 | .392 |
| 10-194340 | 40 | 2.7500 | 2.875-16UN | 3.125 | .094 | .215 | 1.231 | .972 | 1.213 | 3.406 | 2.625-16UN | .703 | .392 |
| 10-194344 | 44 | 3.0000 | 3.125-16UN | 3.375 | .094 | .215 | 1.231 | .972 | 1.299 | 3.656 | 2.875-16UN | .703 | .642 |

*To complete 10- part number or to complete MS part number, see how to order, pg. 22.

# QWLD
# 10-1944XX
## thru bulkhead receptacle

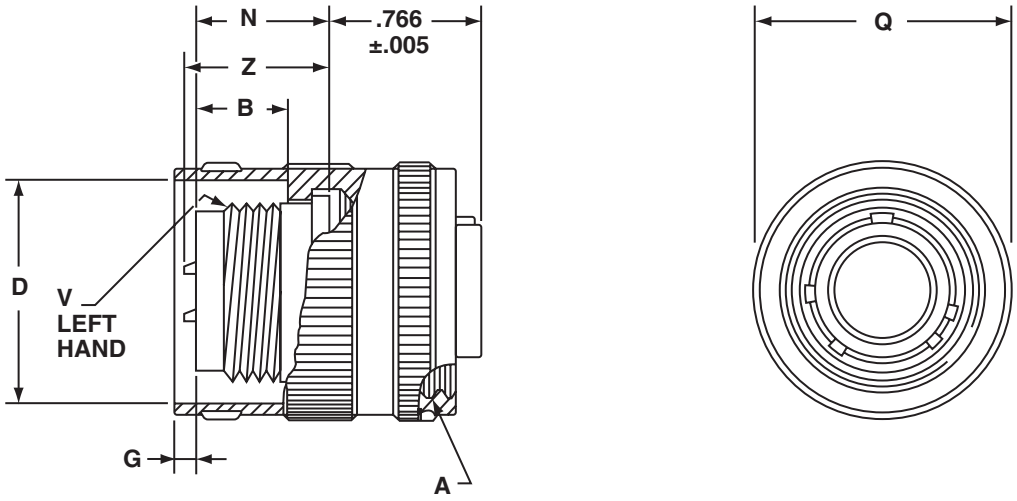



All dimensions for reference only.

| Part Number* | Shell Size | A Thread Class 2A (Plated) 0.1P-0.2L Double Stub | H Max | L ±.015 | M +.000 –.010 | R (TP) | S +.021 –.020 | T Dia +.004 –.003 |
|---|---|---|---|---|---|---|---|---|
| 10-194413 | 12 | .8750 | .312 | 2.219 | 1.032 | .906 | 1.188 | .150 |
| 10-194415 | 14 | 1.0000 | .312 | 2.219 | 1.032 | .969 | 1.281 | .150 |
| 10-194417 | 16 | 1.1250 | .312 | 2.219 | 1.032 | 1.062 | 1.375 | .150 |
| 10-194418 | 18 | 1.2500 | .312 | 2.219 | 1.032 | 1.156 | 1.500 | .177 |
| 10-194420 | 20 | 1.3750 | .312 | 2.219 | 1.032 | 1.250 | 1.625 | .177 |
| 10-194422 | 22 | 1.5000 | .312 | 2.219 | 1.032 | 1.375 | 1.750 | .177 |
| 10-194424 | 24 | 1.7500 | .312 | 2.219 | 1.032 | 1.562 | 2.000 | .177 |
| 10-194428 | 28 | 2.0000 | .312 | 2.219 | 1.032 | 1.750 | 2.250 | .177 |
| 10-194432 | 32 | 2.2500 | .312 | 2.219 | 1.032 | 1.938 | 2.500 | .209 |
| 10-194436 | 36 | 2.5000 | .312 | 2.219 | 1.032 | 2.188 | 2.750 | .209 |
| 10-194440 | 40 | 2.7500 | .312 | 2.219 | 1.032 | 2.375 | 3.000 | .209 |
| 10-194444 | 44 | 3.0000 | .447 | 2.469 | 1.157 | 2.625 | 3.250 | .209 |
| 10-194448† | 48† | 3.2500 | .447 | 2.469 | 1.157 | 2.875 | 3.500 | .209 |

*To complete 10- part number or to complete MS part number, see how to order, pg. 22.
†Shell size 48 available in proprietary versions only. Consult Sidney, NY for availability and ordering information.

# MIL-C-22992, QWLD
# MS17344 or 10-1946XX
## straight plug

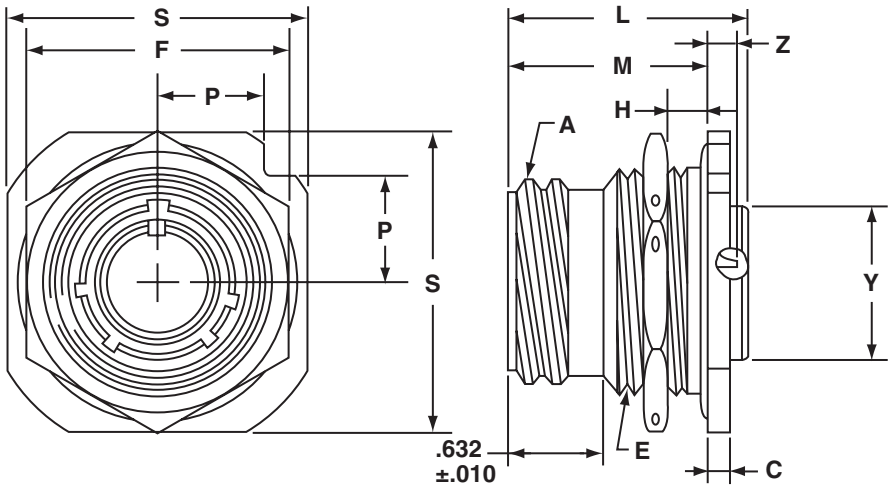



All dimensions for reference only.

| Part Number* | Shell Size | A Thread Class 2B 0.1P-0.2L Double Stub | B | D +.010 –.001 | G | N +.011 –.010 | Q Dia Max | V Thread Class 2A-LH (Plated) | Z Max |
|---|---|---|---|---|---|---|---|---|---|
| 10-194613 | 12 | .8750 | .519±.020 | .985 | .030±.030 | .738 | 1.156 | .750-20UNEF | .807 |
| 10-194615 | 14 | 1.0000 | .519±.020 | 1.109 | .013±.030 | .738 | 1.281 | .875-20UNEF | .807 |
| 10-194617 | 16 | 1.1250 | .519±.020 | 1.235 | .091±.030 | .738 | 1.469 | 1.000-20UNEF | .807 |
| 10-194618 | 18 | 1.2500 | .519±.020 | 1.359 | .216±.030 | .738 | 1.563 | 1.125-18UNEF | .807 |
| 10-194620 | 20 | 1.3750 | .519±.020 | 1.485 | .216±.030 | .738 | 1.688 | 1.250-18UNEF | .807 |
| 10-194622 | 22 | 1.5000 | .519±.020 | 1.609 | .216±.030 | .738 | 1.844 | 1.375-18UNEF | .807 |
| 10-194624 | 24 | 1.7500 | .519±.020 | 1.859 | .184±.030 | .800 | 2.094 | 1.625-18UNEF | .807 |
| 10-194628 | 28 | 2.0000 | .519±.020 | 2.109 | .184±.030 | .800 | 2.344 | 1.875-16UN | .807 |
| 10-194632 | 32 | 2.2500 | .525±.026 | 2.359 | .190±.033 | .875 | 2.594 | 2.0625-16UNS | .807 |
| 10-194636 | 36 | 2.5000 | .525±.026 | 2.609 | .234±.033 | .875 | 2.844 | 2.3125-16UNS | .807 |
| 10-194640 | 40 | 2.7500 | .710±.023 | 2.922 | .049±.030 | 1.041 | 3.156 | 2.625-16UN | .807 |
| 10-194644 | 44 | 3.0000 | .710±.023 | 3.172 | .049±.030 | 1.041 | 3.406 | 2.875-16UN | .957 |

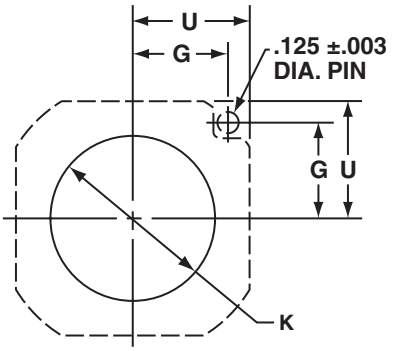
*To complete 10- part number or to complete MS part number, see how to order, pg. 22.

# MIL-C-22992, QWLD
# MS17348 or 10-1949XX
## jam nut receptacle (box mount)



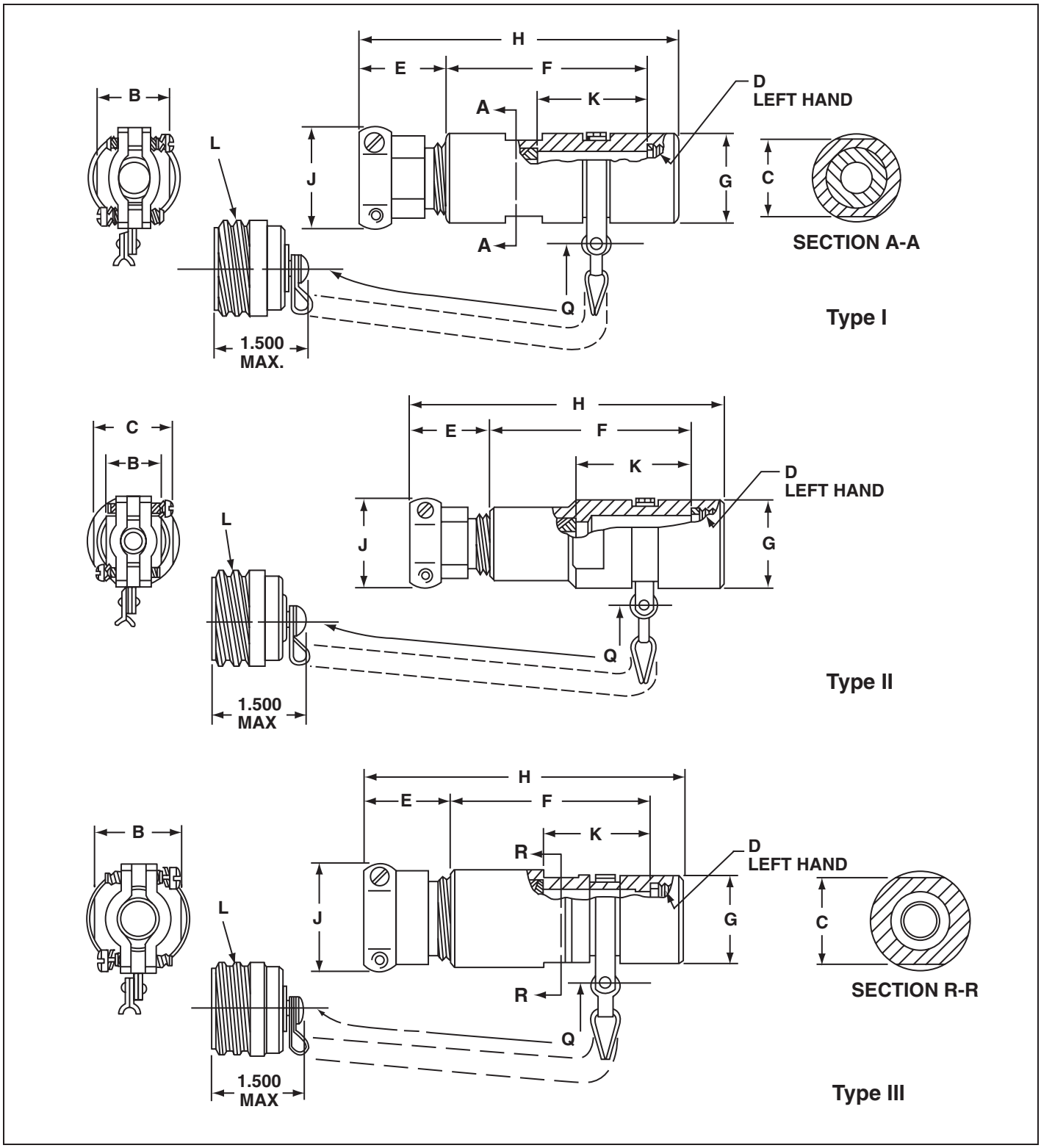

| Shell Size | K Dia. +.005 –.000 | G ±.003 | U ±.005 |
|---|---|---|---|
| 12,13 | 1.005 | .562 | .688 |
| 14,15 | 1.130 | .606 | .750 |
| 16,17 | 1.255 | .699 | .875 |
| 18 | 1.380 | .739 | .938 |
| 20 | 1.505 | .783 | 1.000 |
| 22 | 1.630 | .830 | 1.062 |
| 24 | 1.880 | .919 | 1.188 |
| 28 | 2.130 | 1.007 | 1.312 |
| 32 | 2.380 | 1.096 | 1.438 |
| 36 | 2.630 | 1.183 | 1.562 |
| 40 | 2.880 | 1.292 | 1.703 |

**MOUNTING DIMENSIONS**




All dimensions for reference only.

| Part Number | Shell Size | A Thread Class 2A (Plated) 0.1P-0.2L Double Stub | C +.006 –.005 | E Thread Class 2A (Plated) | F Hex +.017 –.016 | H Panel Thickness Min | H Panel Thickness Max | L +.011 –.010 | M ±.010 | P ±.010 | S +.011 –.010 | Y +.011 –.010 | Z Max |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 10-194913 | 12 | .8750 | .125 | 1.000-20UNEF | 1.250 | .094 | .297 | 1.578 | 1.235 | .486 | 1.375 | .640 | .389 |
| 10-194915 | 14 | 1.0000 | .125 | 1.125-18UNEF | 1.312 | .094 | .297 | 1.578 | 1.235 | .530 | 1.500 | .765 | .389 |
| 10-194917 | 16 | 1.1250 | .188 | 1.250-18UNEF | 1.500 | .094 | .297 | 1.578 | 1.235 | .623 | 1.750 | .890 | .389 |
| 10-194918 | 18 | 1.2500 | .188 | 1.375-18UNEF | 1.562 | .094 | .266 | 1.578 | 1.203 | .663 | 1.875 | 1.015 | .421 |
| 10-194920 | 20 | 1.3750 | .188 | 1.500-18UNEF | 1.750 | .094 | .266 | 1.578 | 1.203 | .707 | 2.000 | 1.171 | .421 |
| 10-194922 | 22 | 1.5000 | .188 | 1.625-18UNEF | 1.875 | .094 | .266 | 1.578 | 1.203 | .751 | 2.125 | 1.296 | .421 |
| 10-194924 | 24 | 1.7500 | .188 | 1.875-16UN | 2.125 | .094 | .328 | 1.641 | 1.266 | .840 | 2.375 | 1.421 | .358 |
| 10-194928 | 28 | 2.0000 | .219 | 2.125-16UN | 2.375 | .094 | .328 | 1.641 | 1.329 | .928 | 2.625 | 1.625 | .295 |
| 10-194932 | 32 | 2.2500 | .219 | 2.375-16UN | 2.625 | .094 | .328 | 1.641 | 1.329 | 1.017 | 2.875 | 1.891 | .295 |
| 10-194936 | 36 | 2.5000 | .219 | 2.625-16UN | 2.875 | .094 | .328 | 1.641 | 1.329 | 1.104 | 3.125 | 2.078 | .295 |
| 10-194940 | 40 | 2.7500 | .219 | 2.875-16UN | 3.125 | .094 | .328 | 1.641 | 1.329 | 1.213 | 3.406 | 2.312 | .295 |
| 10-194944 | 44 | 3.0000 | .219 | 3.125-16UN | 3.375 | .094 | .328 | 1.641 | 1.329 | 1.299 | 3.656 | 2.562 | .545 |

*To complete 10- part number or to complete MS part number, see how to order, pg. 22.

# MIL-C-22992, QWLD Accessories
# M85049 or 10-522958
cable sealing adapters (plug)