

Features and Application

MIL-DTL-38999 Series II connectors feature a bayonet coupling mechanism with lower profile design and rear-removable crimp contact retention system.

These connectors were designed for military and commercial applications where the prime requirements are lower profile and lighter weight.

Reduction of both size and weight were achieved through the use of thinner shell walls and length restrictions. These design restrictions reduced the RFI attenuation characteristics and the “scoop” protection, while yielding an excellent general purpose, lightweight connector. Compared to Series I, Series II connectors achieve up to 20% reduction in mated pair length, up to 39% reduction in outside diameter and up to 40% reduction in weight (128 pin mated pair).

This family of connectors is offered in six receptacle-mounting styles. They include square flange receptacles, for both front and rear panel (wall) mounting; square flange receptacles, for both front and rear panel (box) mounting; square flange receptacle with extended grommet, for front of panel (box) mounting; and jam nut receptacles which incorporate “O” ring seals, designed for rear panel “D” hole mounting.

Plugs are available in two designs, with and without RFI grounding.

Fifty-two insert arrangement per MIL-STD-1560 are tooled and qualified to MIL-DTL-38999 Series II, utilizing 3 to 128 M39029 contacts. Contacts come in sizes 22D, 22M, 22, 20, 16 and 12, terminating wire sizes from 28 to 12 gauge.

These connectors are available in wide range of shell materials and finishes. Aluminum shells are offered in electroless nickel, bright cadmium, anodized, and olive drab cadmium. Other finishes such as zinc nickel are available upon request to commercial callouts only. In addition, we offer passivated stainless steel shells with standard environment-resisting inserts (commercial callouts only).

Universal I/R Tool – A single, expendable plastic tool is used for both insertion and removal of contacts.

Closed-Entry Socket Insert – Hard dielectric socket face has lead-in chamfers for positive alignment of pins (even partially bent within pre-established limits) with sockets.

Interfacial Pin Insert Seal – Raised moisture barriers around each pin, which mate into lead-in chamfers of hard face socket insert, provide individual contact sealing. Interfacial seal is never touched by service tools.

Elastomer Wire Sealing Grommet – Sealing over a wide range of wire diameters is assured by a triple wire seal in each cavity at the rear of the connector.

Superior Contact Stability – Rear release crimp contact system features a stamped beryllium-copper retaining clip captivated by molded-in shoulders of each contact cavity in the insulator. A rear-inserted M81969 plastic tool expands the tines beyond the shoulder, releasing the contact.

Shell Polarization – Alternate key/keyway positions prevent cross mating of adjacent connectors having same insert arrangement.





Performance Specifications

Operating Temperature Range

Finish B: -65°C to +175°C (-85°F to +347°F)
 Finishes C and F: -65°C to +200°C (-85°F to +392°F)
 Finish A: -65°C to +150°C (-85°F to 302°F)

Material and Plating Data (Finish)

B – aluminum shell, olive drab cadmium over nickel base
 C – aluminum shell, black anodized finish
 F – aluminum shell, electroless nickel finish
 A – aluminum shell, silver to light iridescent yellow color (bright) cadmium over electroless nickel base

Corrosion Resistance

Finishes A, B and C withstand 500-hour salt spray.
 Finish F withstands 48-hour salt spray.

Durability

Mated connectors withstand a minimum of 250 mating cycles for RFI plug (MS27484) and 500 cycles for MS27473 and MS27500 plugs.

Environmental Seal

Wired, mated connectors with specified accessories attached, shall meet the altitude-immersion test specified by MIL-DTL-38999.

Fluid Resistance

Connectors resist specified immersions in MIL-PRF-7808, MIL-PRF-23699, MIL-PRF-5606, M2-V Chevron oil, Coolanol 25, MIL-DTL-83133 (JP-8), MIL-DTL-5624 (JP-4, JP-5), SAE-AMS1424 Type I, and other solvents and cleaning agents.

Voltage Rating

| Service Rating | Suggested Operating Voltage | | Test Voltage | Test Voltage | Test Voltage | Test Voltage |
|----------------|-----------------------------|------|--------------|--------------|--------------|--------------|
| | (Sea Level) | | Sea Level | 50,000 Ft. | 70,000 Ft. | 100,000 Ft. |
| | AC (RMS) | DC | V RMS | V RMS | V RMS | V RMS |
| M | 400 | 550 | 1300 | 550 | 350 | 200 |
| N | 300 | 450 | 1000 | 400 | 260 | 200 |
| I | 600 | 850 | 1800 | 600 | 400 | 200 |
| II | 900 | 1250 | 2300 | 800 | 500 | 200 |

Note: The establishment of electrical safety factors is left entirely to the designer, as he is in the best position to know

Shell-to-Shell Conductivity

Maximum potential drop shall not exceed:

- With RFI spring fingers, finish F = 1.0 millivolt, while finishes A and B = 2.5 millivolts.
- Without spring fingers = 200 millivolts.
- Finish C = nonconductive.

Shielding Effectiveness

RFI and EMI attenuation at the specified frequencies meet the requirements of MIL-DTL-38999.

- RFI shielding effectiveness of mated connectors with RFI backshells is measured in a triaxial radio frequency leakage fixture.
- EMI shielding effectiveness is measured at the interface of mated connectors and tested by the mode-stirred technique specified in method 3008 of MIL-STD-1344.

Shock and Vibration Requirements

Wired, mated connectors shall not be damaged, nor shall there be a current interruption longer than one microsecond when subjected to the following:

Standard Shock

Mated connectors withstand a pulse of approximate half sine wave of 300 G magnitude with duration of three milliseconds applied in three axes per MIL-STD-1344, method 2004.

Vibration

Mated connectors withstand the following vibration levels:

- Random vibration per MIL-STD-1344, method 205 test condition VI, Letter “J”.

exactly what peak voltages, switching currents, transients, etc., can be expected in a particular circuit.

MIL-DTL-38999
Part Number Development
Series II



Military and Aero-Electric Part Number Development

| Mil. Prefix | MS | 27473 | T | 12 | B | 35 | P | A | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------|---|----|---|----|---|---|------|
| Aero Prefix | AE | 273 | T | 12 | B | 35 | P | A | -340 |
| Shell Type | | | | | | | | | |
| 27472 = Front, wall mount receptacle = 272 (Aero p/n) | | | | | | | | | |
| 27473 = Straight plug = 273 (Aero p/n) | | | | | | | | | |
| 27474 = Jam nut receptacle = 274 (Aero p/n) | | | | | | | | | |
| 27484 = RFI grounding plug = 284 (Aero p/n) | | | | | | | | | |
| 27497 = Rear, wall mount receptacle = 297 (Aero p/n) | | | | | | | | | |
| 27499 = Front, box mount receptacle = 299 (Aero p/n) | | | | | | | | | |
| 27500 = Standard plug with 90° backshell = 200 (Aero p/n) | | | | | | | | | |
| 27508 = Rear, box mount receptacle = 208 (Aero p/n) | | | | | | | | | |
| 27513 = Front, box mount rec. (long grommet) = 213 (Aero p/n) | | | | | | | | | |
| Class | | | | | | | | | |
| T = With accessory thread (MS27472, 27473, 27474, 27484 & 27497) | | | | | | | | | |
| E = Same as T in line above except connector is kitted with E-Nut = No accessory thread, box mount (MS27499 & MS27508) = No accessory thread, box mount, long grommet (MS27513) | | | | | | | | | |
| P = Supplied with ring and potting boot (same shell types as "T" class) | | | | | | | | | |
| Shell Size | | | | | | | | | |
| 8, 10, 12, 14, 16, 18, 20, 22 or 24 | | | | | | | | | |
| Finish (Material & Plating) | | | | | | | | | |
| A = Aluminum shell, silver to light iridescent yellow (bright) cadmium over electroless nickel base | | | | | | | | | |
| B = Aluminum shell, olive drab cadmium over electroless nickel base | | | | | | | | | |
| C = Aluminum shell, black anodized finish (not available in MS27484) | | | | | | | | | |
| F = Aluminum shell, electroless nickel finish | | | | | | | | | |
| E = Stainless steel shell, passivated (Aero p/n only, n/a in AE284) | | | | | | | | | |
| Insert Arrangement | | | | | | | | | |
| See page 15 thru 19 | | | | | | | | | |
| Contact Designator | | | | | | | | | |
| P = Pin A = Pin connector less pins (with intent to use non-std pin contacts) | | | | | | | | | |
| S = Socket B = Socket connector less sockets (with intent to use non-std socket contacts) | | | | | | | | | |
| Polarization (Keying) | | | | | | | | | |
| N = Normal (Omitted in part number) | | | | | | | | | |
| A, B, C, or D (B & C keyways are not available in shell size 8) | | | | | | | | | |
| Modification (applies to Aero part numbers only) | | | | | | | | | |
| 01 = Less contacts (is not marked on the part) | | | | | | | | | |
| 340 = Connector kitted with M85049/27-XXX E-nut | | | | | | | | | |
| 341 = Connector kitted with M85049/49-2-XXX straight clamp | | | | | | | | | |
| 342 = Connector kitted with M85049/47XXX right angle clamp | | | | | | | | | |
| Consult factory for other modifications | | | | | | | | | |

Note 1: Each connector is furnished with contacts unless ordered less contacts (L/C) as follows: One spare contact for inserts requiring 2 through 26 of each contact and two spares for inserts with 27 or more contacts, and a minimum of one sealing plug up to 10% of the number contacts. One insertion/extraction tool for each contact size is also included.

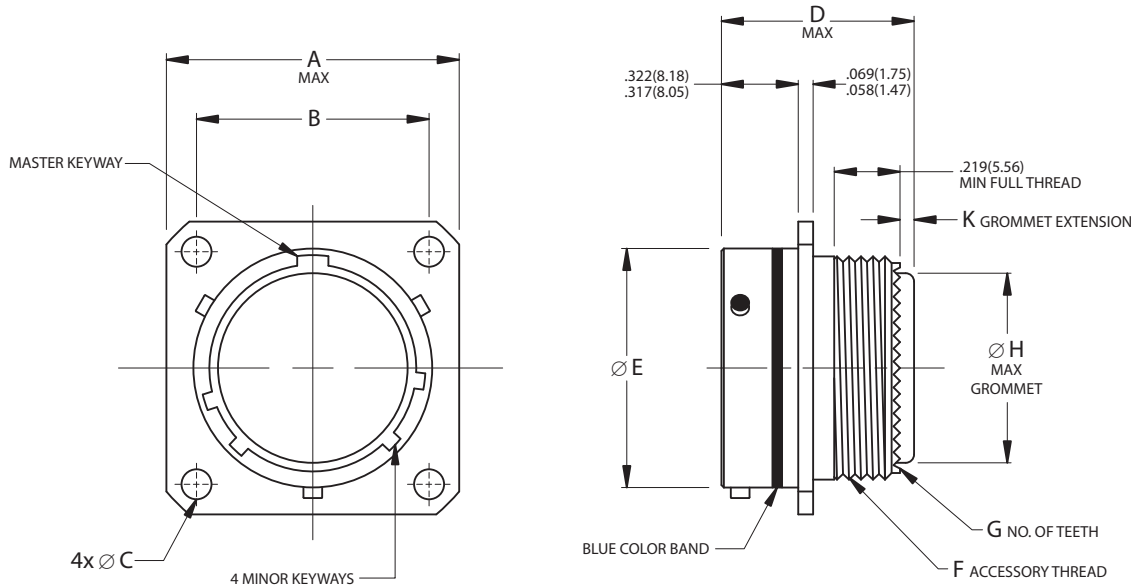
Note 2: Proper part number marking has no "0" in front of single digit shell size (8) and no "0" in front of single digit layout. Example of each: J MS27472T8B35S and J MS27472T10B5S. In both "N" for normal is omitted. Please note that JAN or J marking is required immediately in front of MS number.

MIL-DTL-38999 S II



MS27472
Front, Wall Mounting Receptacle
AE272

Bayonet Coupling, Crimp Removable, Rear Release, Low Profile/Light Weight



MIL-DTL-38999 S II

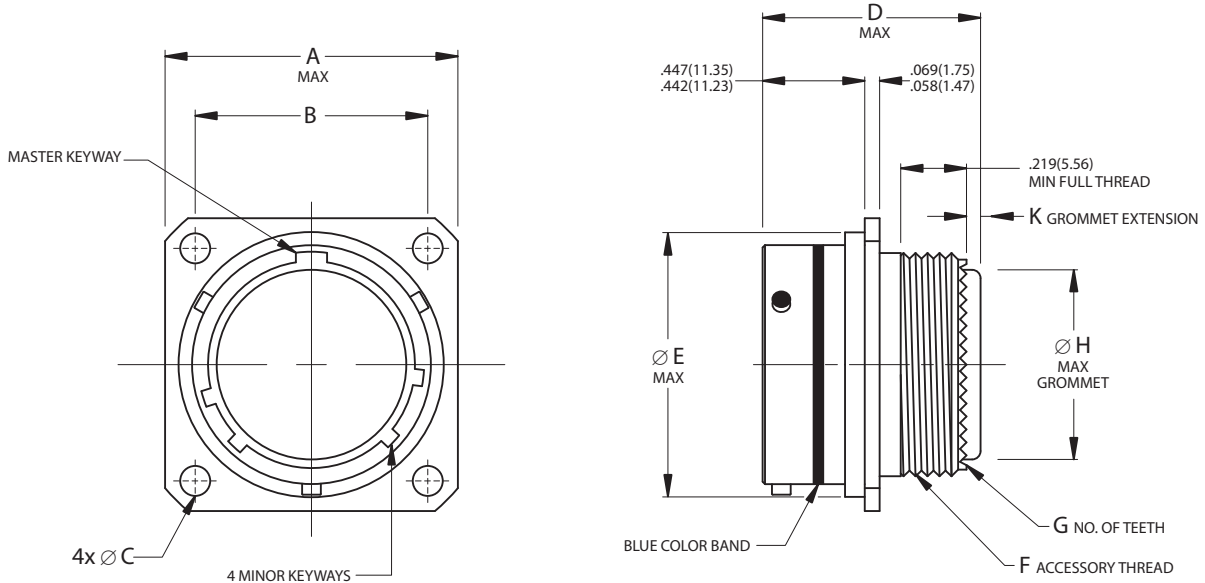
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| Shell Size | A | | B | | Ø C | | D | | Ø E | | F | G | Ø H | | K | |
|------------|---------|-------|-------|-------|--------|-------|---------|-------|--------|-------|------------------|--------------|---------|-------|-------------------|-----------|
| | Maximum | | (TP) | | +0.010 | +0.25 | Maximum | | ±0.003 | ±0.08 | Accessory Thread | No. of Teeth | Maximum | | Grommet Extension | |
| | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | UNEF-2A | | inch | mm | inch | mm |
| 8 | .828 | 21.03 | .594 | 15.09 | .120 | 3.05 | .932 | 23.67 | .471 | 11.96 | 7/16-28 | 12 | .299 | 7.59 | .150/.090 | 3.81/2.29 |
| 10 | .954 | 24.23 | .719 | 18.26 | .120 | 3.05 | .932 | 23.67 | .588 | 14.94 | 9/16-24 | 16 | .427 | 10.85 | .150/.090 | 3.81/2.29 |
| 12 | 1.047 | 26.59 | .812 | 20.62 | .120 | 3.05 | .932 | 23.67 | .748 | 19.00 | 11/16-24 | 20 | .541 | 13.74 | .150/.090 | 3.81/2.29 |
| 14 | 1.141 | 28.98 | .906 | 23.01 | .120 | 3.05 | .932 | 23.67 | .873 | 22.17 | 13/16-20 | 24 | .666 | 16.92 | .150/.090 | 3.81/2.29 |
| 16 | 1.234 | 31.34 | .969 | 24.61 | .120 | 3.05 | .932 | 23.67 | .998 | 25.35 | 15/16-20 | 28 | .791 | 20.09 | .150/.090 | 3.81/2.29 |
| 18 | 1.328 | 33.73 | 1.062 | 26.97 | .120 | 3.05 | .932 | 23.67 | 1.123 | 28.52 | 1-1/16-18 | 32 | .897 | 22.78 | .150/.090 | 3.81/2.29 |
| 20 | 1.453 | 36.91 | 1.156 | 29.36 | .120 | 3.05 | .932 | 23.67 | 1.248 | 31.70 | 1-3/16-18 | 36 | 1.022 | 25.96 | .150/.090 | 3.81/2.29 |
| 22 | 1.578 | 40.08 | 1.250 | 31.75 | .120 | 3.05 | .932 | 23.67 | 1.373 | 34.87 | 1-5/16-18 | 40 | 1.147 | 29.13 | .150/.090 | 3.81/2.29 |
| 24 | 1.703 | 43.26 | 1.375 | 34.93 | .147 | 3.73 | 1.000 | 25.40 | 1.498 | 38.05 | 1-7/16-18 | 44 | 1.272 | 32.31 | .140/.040 | 3.56/1.02 |

MS27497
Rear, Wall Mounting Receptacle
AE297



Bayonet Coupling, Crimp Removable, Rear Release, Low Profile/Light Weight



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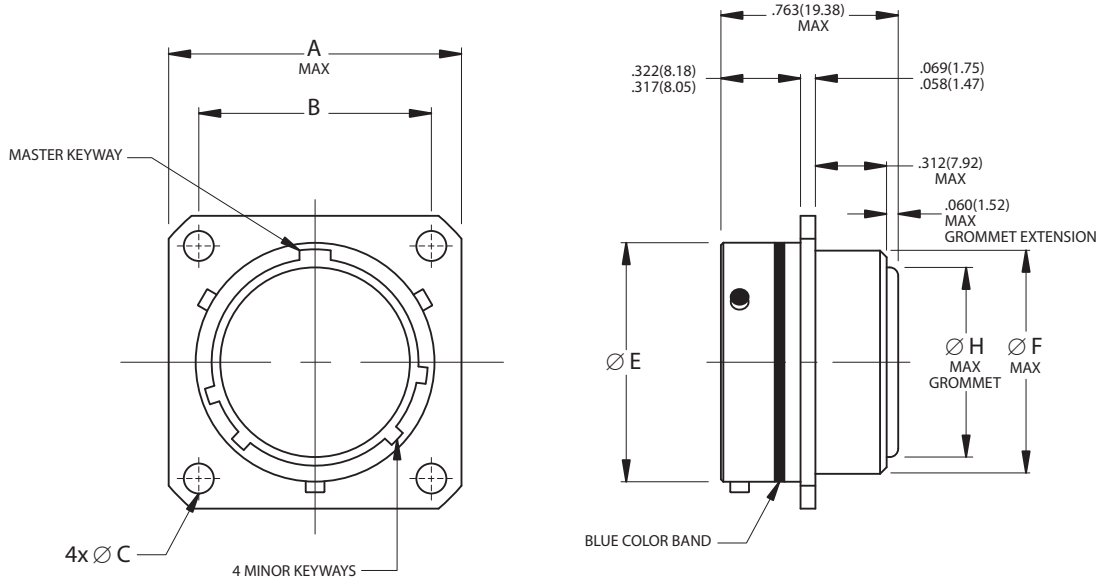
Note: See page 33 for panel thickness.

| Shell Size | A | | B | | Ø C | | D | | Ø E | | F | G | Ø H | | K | |
|------------|---------|-------|-------|-------|--------|-------|---------|-------|---------|-------|------------------|--------------|---------|-------|-------------------|-----------|
| | Maximum | | (TP) | | +0.010 | +0.25 | Maximum | | Maximum | | Accessory Thread | No. of Teeth | Maximum | | Grommet Extension | |
| | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | UNEF-2A | | inch | mm | inch | mm |
| 8 | .828 | 21.03 | .594 | 15.09 | .120 | 3.05 | .988 | 25.10 | .547 | 13.89 | 7/16-28 | 12 | .299 | 7.59 | .150/.090 | 3.81/2.29 |
| 10 | .954 | 24.23 | .719 | 18.26 | .120 | 3.05 | .988 | 25.10 | .672 | 17.07 | 9/16-24 | 16 | .427 | 10.85 | .150/.090 | 3.81/2.29 |
| 12 | 1.047 | 26.59 | .812 | 20.62 | .120 | 3.05 | .988 | 25.10 | .844 | 21.44 | 11/16-24 | 20 | .541 | 13.74 | .150/.090 | 3.81/2.29 |
| 14 | 1.141 | 28.98 | .906 | 23.01 | .120 | 3.05 | .988 | 25.10 | .969 | 24.61 | 13/16-20 | 24 | .666 | 16.92 | .150/.090 | 3.81/2.29 |
| 16 | 1.234 | 31.34 | .969 | 24.61 | .120 | 3.05 | .988 | 25.10 | 1.094 | 27.79 | 15/16-20 | 28 | .791 | 20.09 | .150/.090 | 3.81/2.29 |
| 18 | 1.328 | 33.73 | 1.062 | 26.97 | .120 | 3.05 | .988 | 25.10 | 1.219 | 30.96 | 1-1/16-18 | 32 | .897 | 22.78 | .150/.090 | 3.81/2.29 |
| 20 | 1.453 | 36.91 | 1.156 | 29.36 | .120 | 3.05 | .988 | 25.10 | 1.344 | 34.14 | 1-3/16-18 | 36 | 1.022 | 25.96 | .150/.090 | 3.81/2.29 |
| 22 | 1.578 | 40.08 | 1.250 | 31.75 | .120 | 3.05 | .988 | 25.10 | 1.469 | 37.31 | 1-5/16-18 | 40 | 1.147 | 29.13 | .150/.090 | 3.81/2.29 |
| 24 | 1.703 | 43.26 | 1.375 | 34.93 | .147 | 3.73 | 1.056 | 26.82 | 1.594 | 40.49 | 1-7/16-18 | 44 | 1.272 | 32.31 | .140/.040 | 3.56/1.02 |



MS27499
Front, Box Mounting Receptacle
AE299

Bayonet Coupling, Crimp Removable, Rear Release, Low Profile/Light Weight



MIL-DTL-38999 S II

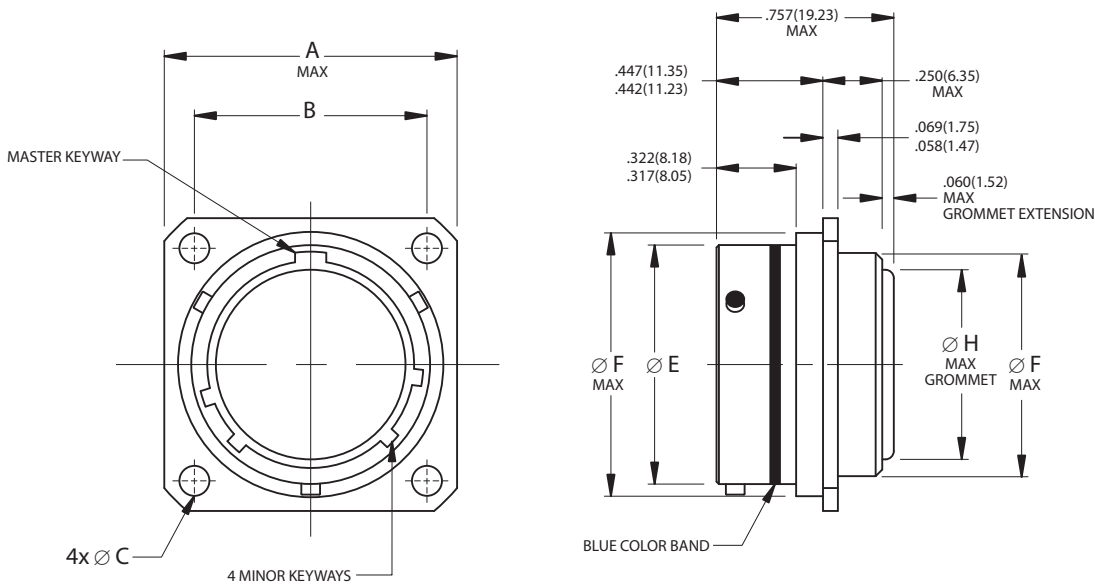
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| Shell Size | A | | B | | Ø C | | Ø E | | Ø F | | Ø H | |
|------------|---------|-------|-------|-------|--------|-------|--------|-------|---------|-------|---------|-------|
| | Maximum | | (TP) | | +0.010 | +0.25 | ±0.003 | | Maximum | | Maximum | |
| | inch | mm | inch | mm | -0.005 | -0.13 | inch | mm | inch | mm | inch | mm |
| 8 | .828 | 21.03 | .594 | 15.09 | .120 | 3.05 | .471 | 11.96 | .453 | 11.51 | .299 | 7.59 |
| 10 | .954 | 24.23 | .719 | 18.26 | .120 | 3.05 | .588 | 14.94 | .578 | 14.68 | .427 | 10.85 |
| 12 | 1.047 | 26.59 | .812 | 20.62 | .120 | 3.05 | .748 | 19.00 | .703 | 17.86 | .541 | 13.74 |
| 14 | 1.141 | 28.98 | .906 | 23.01 | .120 | 3.05 | .873 | 22.17 | .828 | 21.03 | .666 | 16.92 |
| 16 | 1.234 | 31.34 | .969 | 24.61 | .120 | 3.05 | .998 | 25.35 | .953 | 24.21 | .791 | 20.09 |
| 18 | 1.328 | 33.73 | 1.062 | 26.97 | .120 | 3.05 | 1.123 | 28.52 | 1.062 | 26.97 | .897 | 22.78 |
| 20 | 1.453 | 36.91 | 1.156 | 29.36 | .120 | 3.05 | 1.248 | 31.70 | 1.188 | 30.18 | 1.022 | 25.96 |
| 22 | 1.578 | 40.08 | 1.250 | 31.75 | .120 | 3.05 | 1.373 | 34.87 | 1.312 | 33.32 | 1.147 | 29.13 |
| 24 | 1.703 | 43.26 | 1.375 | 34.93 | .147 | 3.73 | 1.498 | 38.05 | 1.438 | 36.53 | 1.272 | 32.31 |

MS27508
Rear, Box Mounting Receptacle
AE208



Bayonet Coupling, Crimp Removable, Rear Release, Low Profile/Light Weight



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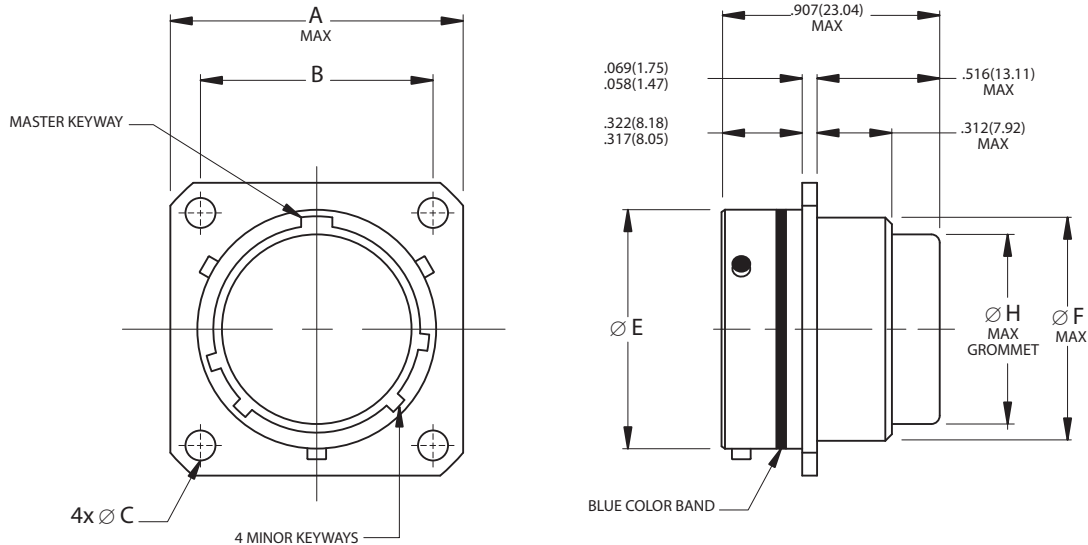
Note: See page 33 for panel thickness.

| Shell Size | A | | B | | Ø C | | Ø E | | Ø F | | Ø H | |
|------------|---------|-------|-------|-------|-------|-------|--------|-------|---------|-------|---------|-------|
| | Maximum | | (TP) | | +0.01 | +0.25 | ±0.003 | ±0.08 | Maximum | | Maximum | |
| | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm |
| 8 | .828 | 21.03 | .594 | 15.09 | .120 | 3.05 | .471 | 11.96 | .547 | 13.89 | .299 | 7.59 |
| 10 | .954 | 24.23 | .719 | 18.26 | .120 | 3.05 | .588 | 14.94 | .672 | 17.07 | .427 | 10.85 |
| 12 | 1.047 | 26.59 | .812 | 20.62 | .120 | 3.05 | .748 | 19.00 | .844 | 21.44 | .541 | 13.74 |
| 14 | 1.141 | 28.98 | .906 | 23.01 | .120 | 3.05 | .873 | 22.17 | .969 | 24.61 | .666 | 16.92 |
| 16 | 1.234 | 31.34 | .969 | 24.61 | .120 | 3.05 | .998 | 25.35 | 1.094 | 27.79 | .791 | 20.09 |
| 18 | 1.328 | 33.73 | 1.062 | 26.97 | .120 | 3.05 | 1.123 | 28.52 | 1.219 | 30.96 | .897 | 22.78 |
| 20 | 1.453 | 36.91 | 1.156 | 29.36 | .120 | 3.05 | 1.248 | 31.70 | 1.344 | 34.14 | 1.022 | 25.96 |
| 22 | 1.578 | 40.08 | 1.250 | 31.75 | .120 | 3.05 | 1.373 | 34.87 | 1.469 | 37.31 | 1.147 | 29.13 |
| 24 | 1.703 | 43.26 | 1.375 | 34.93 | .147 | 3.73 | 1.498 | 38.05 | 1.594 | 40.49 | 1.272 | 32.31 |



MS27513
Long Grommet, Front, Box Mount Receptacle
AE213

Bayonet Coupling, Crimp Removable, Rear Release, Low Profile/Light Weight



MIL-DTL-38999 S II

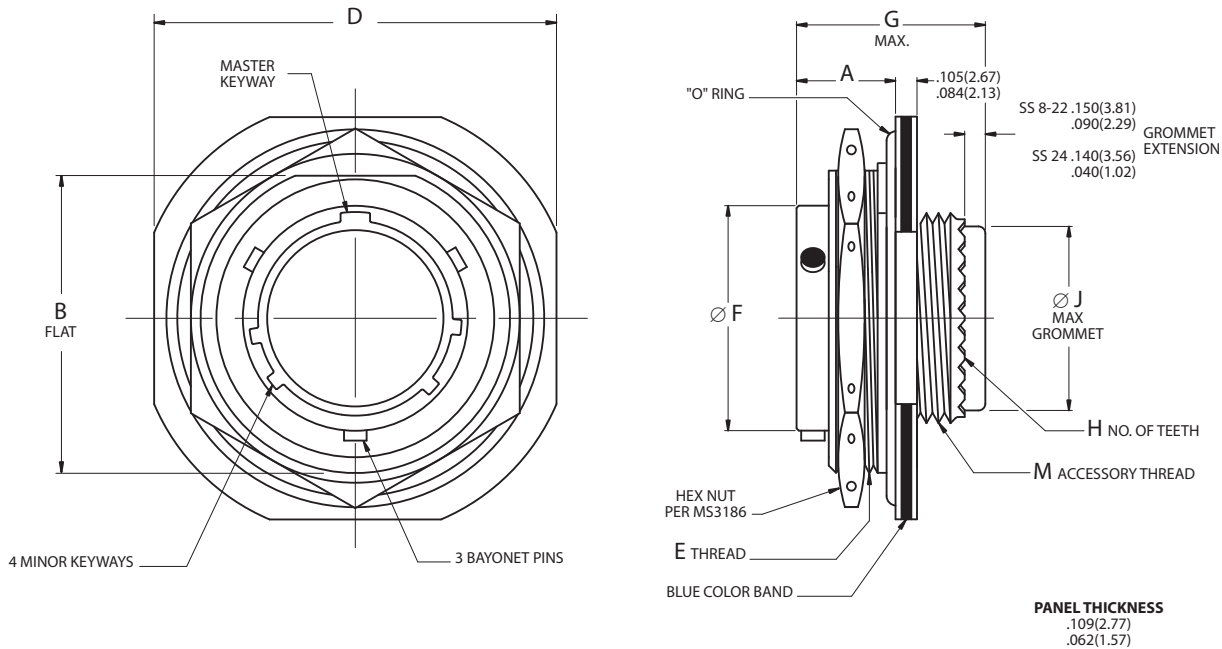
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| Shell Size | A | | B | | Ø C | | Ø E | | Ø F | | Ø H | |
|------------|---------|-------|-------|-------|--------|-------|------------|-------|---------|-------|---------|-------|
| | Maximum | | (TP) | | +0.010 | +0.25 | ±.003 ±.08 | | Maximum | | Maximum | |
| | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm |
| 8 | .828 | 21.03 | .594 | 15.09 | .120 | 3.05 | .471 | 11.96 | .453 | 11.51 | .299 | 7.59 |
| 10 | .954 | 24.23 | .719 | 18.26 | .120 | 3.05 | .588 | 14.94 | .578 | 14.68 | .427 | 10.85 |
| 12 | 1.047 | 26.59 | .812 | 20.62 | .120 | 3.05 | .748 | 19.00 | .703 | 17.86 | .541 | 13.74 |
| 14 | 1.141 | 28.98 | .906 | 23.01 | .120 | 3.05 | .873 | 22.17 | .828 | 21.03 | .666 | 16.92 |
| 16 | 1.234 | 31.34 | .969 | 24.61 | .120 | 3.05 | .998 | 25.35 | .953 | 24.21 | .791 | 20.09 |
| 18 | 1.328 | 33.73 | 1.062 | 26.97 | .120 | 3.05 | 1.123 | 28.52 | 1.062 | 26.97 | .897 | 22.78 |
| 20 | 1.453 | 36.91 | 1.156 | 29.36 | .120 | 3.05 | 1.248 | 31.70 | 1.188 | 30.18 | 1.022 | 25.96 |
| 22 | 1.578 | 40.08 | 1.250 | 31.75 | .120 | 3.05 | 1.373 | 34.87 | 1.312 | 33.32 | 1.147 | 29.13 |
| 24 | 1.703 | 43.26 | 1.375 | 34.93 | .147 | 3.73 | 1.498 | 38.05 | 1.438 | 36.53 | 1.272 | 32.31 |

MS27474
Jam Nut Receptacle
AE274



Bayonet Coupling, Crimp Removable, Rear Release, Low Profile/Light Weight

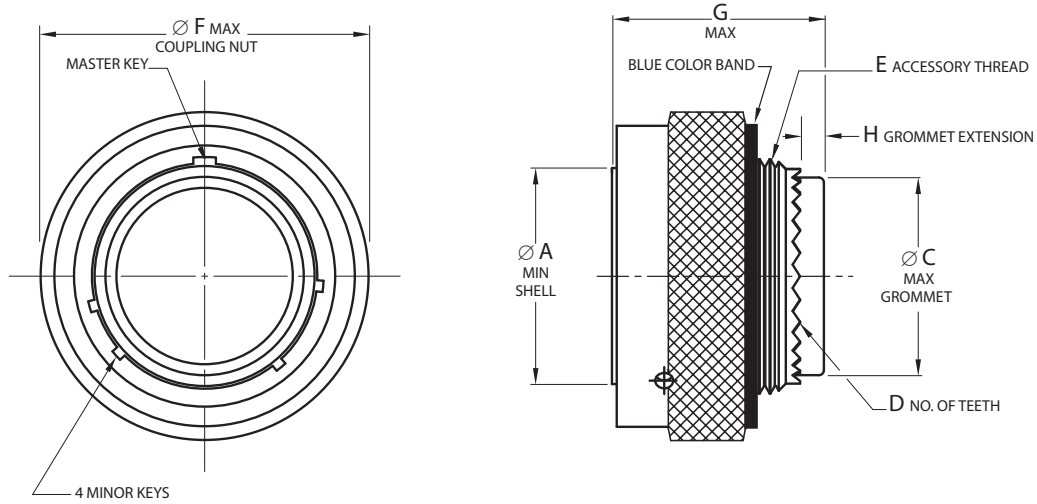


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| Shell Size | A | | B | | D | | E Jam Nut Thread Class 2A | Ø F | | G | | H No. of Teeth | Ø J | | M Accessory Thread UNEF-2A |
|------------|-------|-------|-------|-------|-------|-------|---------------------------------|-------|-------|---------|---------|-------------------|-------|-------|----------------------------------|
| | ±.005 | ±.13 | +.001 | +.03 | ±.016 | ±.41 | | ±.003 | ±.08 | Maximum | Maximum | | | | |
| | inch | mm | inch | mm | inch | mm | | inch | mm | inch | mm | | | | |
| 8 | .438 | 11.13 | .817 | 20.75 | 1.250 | 31.75 | 7/8-20UNEF | .471 | 11.96 | .937 | 23.80 | 12 | .299 | 7.59 | 7/16-28 |
| 10 | .438 | 11.13 | .941 | 23.90 | 1.375 | 34.93 | 1-20UNEF | .588 | 14.94 | .937 | 23.80 | 16 | .427 | 10.85 | 9/16-24 |
| 12 | .438 | 11.13 | 1.065 | 27.05 | 1.500 | 38.10 | 1-1/8-18UNEF | .748 | 19.00 | .937 | 23.80 | 20 | .541 | 13.74 | 11/16-24 |
| 14 | .438 | 11.13 | 1.190 | 30.23 | 1.625 | 41.28 | 1-1/4-18UNEF | .873 | 22.17 | .937 | 23.80 | 24 | .666 | 16.92 | 13/16-20 |
| 16 | .438 | 11.13 | 1.320 | 33.53 | 1.781 | 45.24 | 1-3/8-18UNEF | .998 | 25.35 | .937 | 23.80 | 28 | .791 | 20.09 | 15/16-20 |
| 18 | .438 | 11.13 | 1.440 | 36.58 | 1.890 | 48.01 | 1-1/2-18UNEF | 1.123 | 28.52 | .937 | 23.80 | 32 | .897 | 22.78 | 1-1/16-18 |
| 20 | .464 | 11.79 | 1.565 | 39.75 | 2.016 | 51.21 | 1-5/8-18UNEF | 1.248 | 31.70 | .931 | 23.65 | 36 | 1.022 | 25.96 | 1-3/16-18 |
| 22 | .464 | 11.79 | 1.690 | 42.93 | 2.140 | 54.36 | 1-3/4-18UNS | 1.373 | 34.87 | .931 | 23.65 | 40 | 1.147 | 29.13 | 1-5/16-18 |
| 24 | .464 | 11.79 | 1.815 | 46.10 | 2.265 | 57.53 | 1-7/8-16UN | 1.498 | 38.05 | .984 | 24.99 | 44 | 1.272 | 32.31 | 1-7/16-18 |

Bayonet Coupling, Crimp Removable, Rear Release, Low Profile/Light Weight



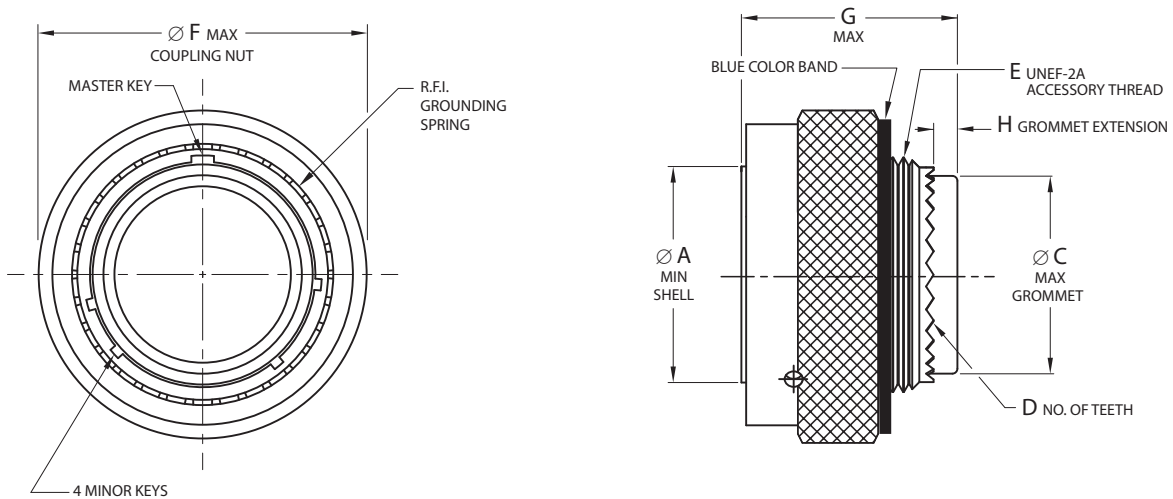
Page 22 Completed Part Number
 Page 34 Contacts, Sealing Plugs and Tools
 Pages 17-19 Insert Arrangements
 Page 21 Performance Specifications
 Pages 15, 16 Insert Availability and Contact Information
 Page 32 Polarization

| Shell Size | Ø A | | Ø C | | D | E | Ø F | | G | | H | |
|------------|---------|--------------|---------|--------------|-------------|------------------|---------|--------------|---------|--------------|-------------------|------------------|
| | Minimum | | Maximum | | No of Teeth | Accessory Thread | Maximum | | Maximum | | Grommet Extension | |
| | inch | mm | inch | mm | | UNEF-2A | inch | mm | inch | mm | inch | mm |
| 8 | .337 | 8.56 | .299 | 7.59 | 12 | 7/16-28 | .750 | 19.05 | .916 | 23.27 | .150/.090 | 3.81/2.29 |
| 10 | .465 | 11.81 | .427 | 10.85 | 16 | 9/16-24 | .859 | 21.82 | .916 | 23.27 | .150/.090 | 3.81/2.29 |
| 12 | .557 | 14.15 | .541 | 13.74 | 20 | 11/16-24 | 1.031 | 26.19 | .916 | 23.27 | .150/.090 | 3.81/2.29 |
| 14 | .702 | 17.83 | .666 | 16.92 | 24 | 13/16-20 | 1.156 | 29.36 | .916 | 23.27 | .150/.090 | 3.81/2.29 |
| 16 | .827 | 21.01 | .791 | 20.09 | 28 | 15/16-20 | 1.281 | 32.54 | .916 | 23.27 | .150/.090 | 3.81/2.29 |
| 18 | .927 | 23.55 | .897 | 22.78 | 32 | 1-1/16-18 | 1.406 | 35.71 | .916 | 23.27 | .150/.090 | 3.81/2.29 |
| 20 | 1.052 | 26.72 | 1.022 | 25.96 | 36 | 1-3/16-18 | 1.531 | 38.89 | .916 | 23.27 | .150/.090 | 3.81/2.29 |
| 22 | 1.177 | 29.90 | 1.147 | 29.13 | 40 | 1-5/16-18 | 1.641 | 41.68 | .916 | 23.27 | .150/.090 | 3.81/2.29 |
| 24 | 1.302 | 33.07 | 1.272 | 32.31 | 44 | 1-7/16-18 | 1.766 | 44.86 | .984 | 24.99 | .140/.040 | 3.56/1.02 |

MS27484
RFI Grounding Plug
AE284



Bayonet Coupling, Crimp Removable, Rear Release, Low Profile/Light Weight

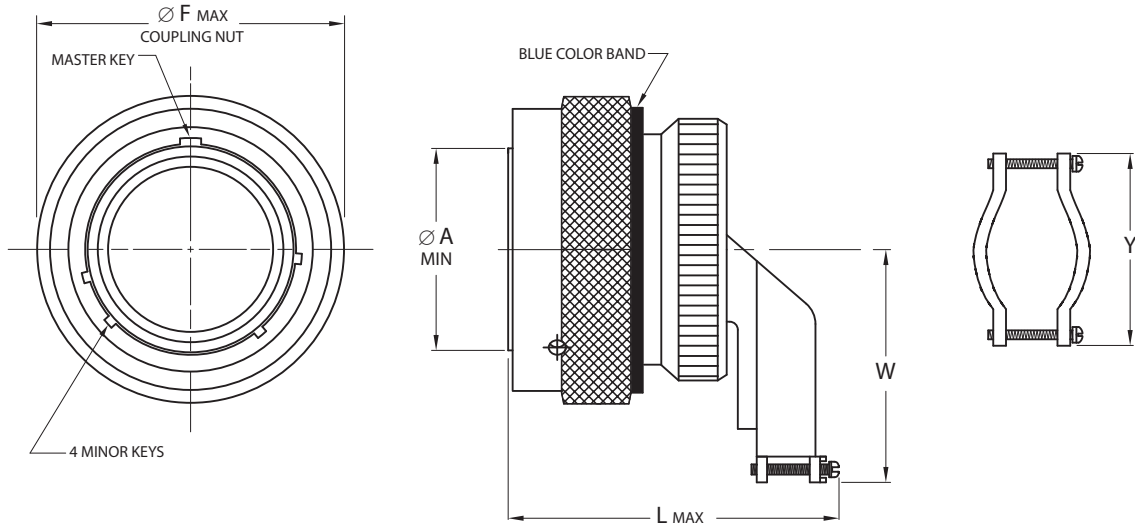


MIL-DTL-38999 S II

| | |
|--------------|---------------------------------------------|
| Page 22 | Completed Part Number |
| Page 34 | Contacts, Sealing Plugs and Tools |
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| Pages 15, 16 | Insert Availability and Contact Information |
| Page 32 | Polarization |

| Shell Size | Ø A | | Ø C | | D | E | Ø F | | G | | H | |
|------------|---------|--------------|---------|--------------|---------|-----------|-------------|------------------|---------|--------------|-----------|------------------|
| | Minimum | | Maximum | | | | No of Teeth | Accessory Thread | Maximum | | Maximum | |
| | inch | mm | inch | mm | UNEF-2A | inch | | | mm | inch | mm | inch |
| 8 | .337 | 8.56 | .299 | 7.59 | 12 | 7/16-28 | .750 | 19.05 | .916 | 23.27 | .150/.090 | 3.81/2.29 |
| 10 | .465 | 11.81 | .427 | 10.85 | 16 | 9/16-24 | .859 | 21.82 | .916 | 23.27 | .150/.090 | 3.81/2.29 |
| 12 | .557 | 14.15 | .541 | 13.74 | 20 | 11/16-24 | 1.031 | 26.19 | .916 | 23.27 | .150/.090 | 3.81/2.29 |
| 14 | .702 | 17.83 | .666 | 16.92 | 24 | 13/16-20 | 1.156 | 29.36 | .916 | 23.27 | .150/.090 | 3.81/2.29 |
| 16 | .827 | 21.01 | .791 | 20.09 | 28 | 15/16-20 | 1.281 | 32.54 | .916 | 23.27 | .150/.090 | 3.81/2.29 |
| 18 | .927 | 23.55 | .897 | 22.78 | 32 | 1-1/16-18 | 1.406 | 35.71 | .916 | 23.27 | .150/.090 | 3.81/2.29 |
| 20 | 1.052 | 26.72 | 1.022 | 25.96 | 36 | 1-3/16-18 | 1.531 | 38.89 | .916 | 23.27 | .150/.090 | 3.81/2.29 |
| 22 | 1.177 | 29.90 | 1.147 | 29.13 | 40 | 1-5/16-18 | 1.641 | 41.68 | .916 | 23.27 | .150/.090 | 3.81/2.29 |
| 24 | 1.302 | 33.07 | 1.272 | 32.31 | 44 | 1-7/16-18 | 1.766 | 44.86 | .984 | 24.99 | .140/.040 | 3.56/1.02 |

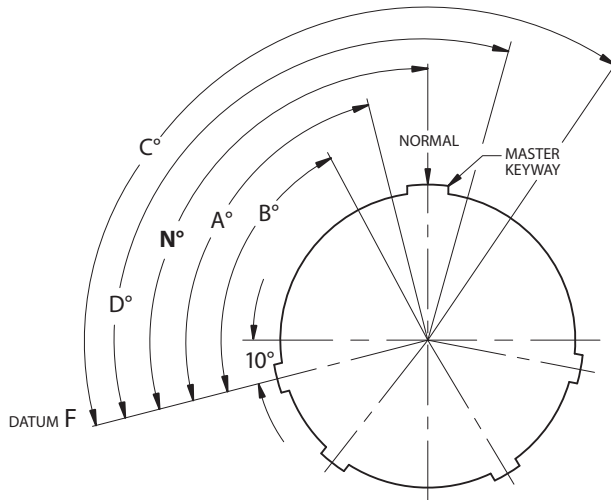
Bayonet Coupling, Crimp Removable, Rear Release, Low Profile/Light Weight



| | |
|--------------|---------------------------------------------|
| Page 22 | Completed Part Number |
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| Shell Size | Ø A | | Ø F | | L | | W | | Y | |
|------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|---------|--------------|
| | Minimum | | Maximum | | Maximum | | Maximum | | Maximum | |
| | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm |
| 8 | .337 | 8.56 | .750 | 19.05 | 1.859 | 47.22 | 1.000 | 25.40 | .828 | 21.03 |
| 10 | .465 | 11.81 | .859 | 21.82 | 1.859 | 47.22 | 1.032 | 26.21 | .891 | 22.63 |
| 12 | .557 | 14.15 | 1.031 | 26.19 | 1.938 | 49.23 | 1.094 | 27.79 | 1.016 | 25.81 |
| 14 | .702 | 17.83 | 1.156 | 29.36 | 2.125 | 53.98 | 1.219 | 30.96 | 1.141 | 28.98 |
| 16 | .827 | 21.01 | 1.281 | 32.54 | 2.281 | 57.94 | 1.281 | 32.54 | 1.255 | 31.88 |
| 18 | .927 | 23.55 | 1.406 | 35.71 | 2.312 | 58.72 | 1.344 | 34.14 | 1.469 | 37.31 |
| 20 | 1.052 | 26.72 | 1.531 | 38.89 | 2.375 | 60.33 | 1.375 | 34.93 | 1.550 | 39.37 |
| 22 | 1.177 | 29.90 | 1.641 | 41.68 | 2.531 | 64.29 | 1.438 | 36.53 | 1.675 | 42.55 |
| 24 | 1.302 | 33.07 | 1.766 | 44.86 | 2.828 | 71.83 | 1.719 | 43.66 | 1.800 | 45.72 |

Keying Positions

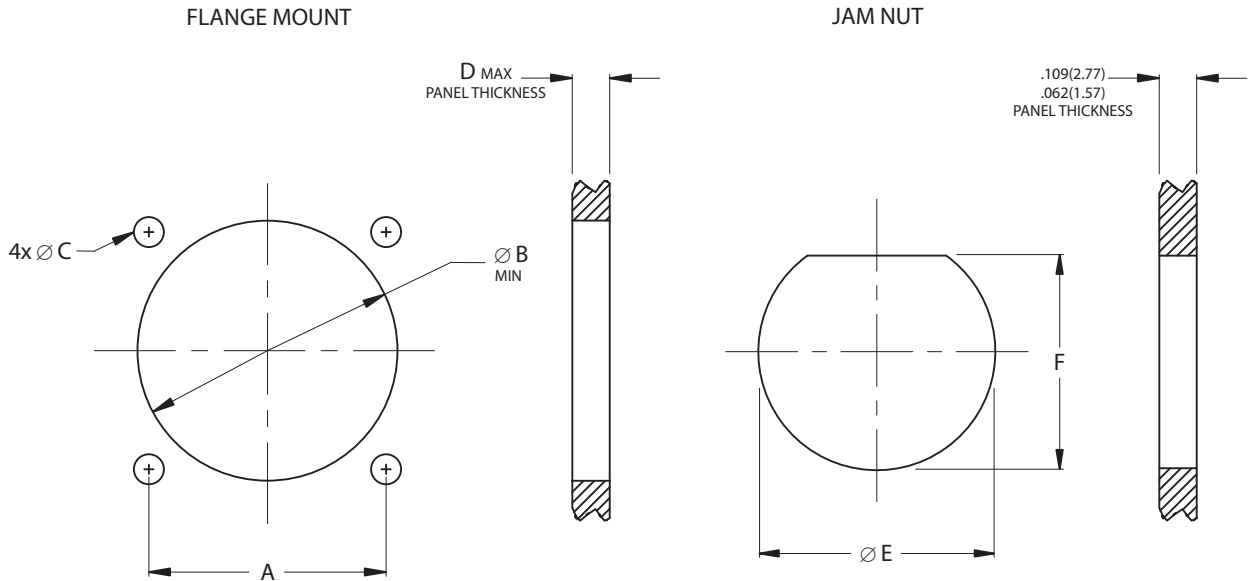


Notes:

1. Mating face of receptacle shown (plug is opposite).
2. The master keyway (key) has various positions relative to DATUM **F**; the minor keyways (keys) remain fixed as shown. In the Normal position, the master keyway (key) is 100° from DATUM **F**.
3. The angles for a given connector are the same whether it contains pin or socket inserts.
4. The insert arrangement does not rotate relative to master keyway (key).

| Shell Size | Keying Positions | | | | |
|------------|------------------|----|----|-----|-----|
| | BSC | | | | |
| | N° | A° | B° | C° | D° |
| 8 | 100 | 82 | - | - | 118 |
| 10 | 100 | 86 | 72 | 128 | 114 |
| 12 | 100 | 80 | 68 | 132 | 120 |
| 14 | 100 | 79 | 66 | 134 | 121 |
| 16 | 100 | 82 | 70 | 130 | 118 |
| 18 | 100 | 82 | 70 | 130 | 118 |
| 20 | 100 | 82 | 70 | 130 | 118 |
| 22 | 100 | 85 | 74 | 126 | 115 |
| 24 | 100 | 85 | 74 | 126 | 115 |

Panel Cutouts



Note 1: Flange Mounting Dimensions (\varnothing B cutout and D MAX) listed only for back of panel mounting (MS27497 and MS27508).

Note 2: D MAX includes mounting hardware.

Flange and Jam Nut Mounting Dimensions

| Shell Size | A | | \varnothing B | | \varnothing C | | D | | \varnothing E | | F | |
|------------|-------|-------|-----------------|-------|-----------------|------------|---------|------|-----------------|-------|--------|-------|
| | (TP) | | Minimum | | ± 0.005 | ± 0.13 | Maximum | | +0.010 | +0.25 | +0.000 | +0.00 |
| | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm | inch | mm |
| 8 | .594 | 15.09 | .557 | 14.15 | .128 | 3.25 | .146 | 3.71 | .885 | 22.48 | .830 | 21.08 |
| 10 | .719 | 18.26 | .682 | 17.32 | .128 | 3.25 | .146 | 3.71 | 1.010 | 25.65 | .955 | 24.26 |
| 12 | .812 | 20.62 | .854 | 21.69 | .128 | 3.25 | .146 | 3.71 | 1.135 | 28.83 | 1.085 | 27.56 |
| 14 | .906 | 23.01 | .979 | 24.87 | .128 | 3.25 | .146 | 3.71 | 1.260 | 32.01 | 1.210 | 30.73 |
| 16 | .969 | 24.61 | 1.104 | 28.04 | .128 | 3.25 | .146 | 3.71 | 1.385 | 35.18 | 1.335 | 33.91 |
| 18 | 1.062 | 26.97 | 1.229 | 31.22 | .128 | 3.25 | .146 | 3.71 | 1.510 | 38.35 | 1.460 | 37.08 |
| 20 | 1.156 | 29.36 | 1.354 | 34.39 | .128 | 3.25 | .168 | 4.27 | 1.635 | 41.53 | 1.585 | 40.26 |
| 22 | 1.250 | 31.75 | 1.479 | 37.57 | .128 | 3.25 | .168 | 4.27 | 1.760 | 44.70 | 1.709 | 43.42 |
| 24 | 1.375 | 34.93 | 1.604 | 40.74 | .154 | 3.91 | .168 | 4.27 | 1.885 | 47.88 | 1.835 | 46.61 |

MIL-DTL-38999

Contacts, Tools and Seal Plugs Series II



Contacts, Plastic Insertion/Removal Tools and Seal Plugs

| Contact Size | Application | Pin Contacts | Socket Contacts | Seal Plugs | Insertion/Removal Tools |
|--------------|--------------|---------------|-----------------|--------------|-------------------------|
| | Type | Military No. | Military No. | Military No. | Military No. |
| 22D | Power/Signal | M39029/58-360 | M39029/57-354 | MS27488-22-1 | M81969/14-01 |
| 22M* | Power/Signal | M39029/58-361 | M39029/57-355 | | — |
| 22* | Power/Signal | M39029/58-362 | M39029/57-356 | | — |
| 20 | Power/Signal | M39029/58-363 | M39029/57-357 | MS27488-20-1 | M81969/14-10 |
| 16 | Power/Signal | M39029/58-364 | M39029/57-358 | MS27488-16-1 | M81969/14-03 |
| 16 Coax | Coax | M39029/76-424 | M39029/78-432 | | M81969/14-04 |
| 12 | Power/Signal | M39029/58-365 | M39029/57-359 | MS27488-12-1 | M81969/14-04 |

Crimping and Metal Insertion/Extraction Tools

| Contact Size/Type | Crimp Tool | Positioner | Positioner | Insertion Tool | Extraction Tool |
|-------------------|--------------|--------------|--------------|----------------|-----------------|
| | Military No. | Military No. | Military No. | Military No. | Military No. |
| 22D, 22M* | M22520/2-01 | M22520/2-09 | M22520/2-06 | M81969/8-01 | M81969/8-02 |
| 22* | M22520/2-01 | M22520/2-09 | M22520/2-06 | M81969/8-03 | M81969/8-04 |
| 20 | M22520/1-01 | M22520/1-04 | M22520/1-04 | M81969/8-05 | M81969/8-06 |
| | M22520/2-01 | M22520/2-10 | M22520/2-10 | | |
| 16 | M22520/1-01 | M22520/1-04 | M22520/1-04 | M81969/8-07 | M81969/8-08 |
| 16 Coax Inner | M22520/2-01 | M22520/2-35 | M22520/2-35 | | |
| 16 Coax Outer | M22520/4-01 | M22520/4-02 | M22520/4-02 | | |
| 12 | M22520/1-01 | M22520/1-04 | M22520/1-04 | M81969/8-09 | M81969/8-10 |

Contact and Wire Data

| Contact Size | Test Current | Voltage | Crimp Well Data | | | Wire Range | | Finished Wire Ø Range | | | |
|--------------|--------------|------------|-----------------|-------------------|------|------------|-----------------|-----------------------|------|---------|------|
| | DC Test | Max. Drop | Well Dia. | Minimum Well Dept | | AWG | mm ² | Minimum | | Maximum | |
| | Amps | Millivolts | inch | inch | mm | | | inch | mm | inch | mm |
| 22D | 5.0 | 73 | .0345 ±.0010 | .141 | 3.58 | 28-22 | .08-.33 | .030 | .76 | .054 | 1.37 |
| 22M* | 3.0 | 45 | .028 ±.001 | .141 | 3.58 | 28-24 | .08-.20 | .030 | .76 | .050 | 1.27 |
| 22* | 5.0 | 73 | .0365 ±.0010 | .141 | 3.58 | 26-22 | .13-.33 | .034 | .86 | .060 | 1.52 |
| 20 | 7.5 | 55 | .047 ±.001 | .209 | 5.31 | 24-20 | .20-.52 | .040 | 1.02 | .083 | 2.11 |
| 16 | 13.0 | 49 | .067 ±.001 | .209 | 5.31 | 20-16 | .52-1.31 | .065 | 1.65 | .109 | 2.77 |
| 12 | 23.0 | 42 | .100 ±.002 | .209 | 5.31 | 14-12 | 2.08-3.31 | .097 | 2.46 | .142 | 3.61 |

* Inactive for new design

Note 1: Test Current and Maximum Voltage Drop when tested with silver-plated wire at 25°C.

Note 2: Size 16 coax contacts purchased in bulk.

MIL-DTL-38999 S II



Contact Installation Instructions

Crimping Contacts

1. Select the appropriate crimp tool and ensure that the proper crimp head positioner is used.
2. Cycle the tool to be sure the indentors are open.
3. Determine the correct selector setting for the wire size from the data plate on the positioner (turret head assembly) and set the selector knob on the crimp tool to match.
4. Place the contact, mating end first, into the tool.
5. Insert the stripped wire into the hollow end of the contact. Be sure the wire is inserted as far as it will go.
6. Close the tool completely to crimp. Unless the tool is closed completely, the tool will not release the contact.
7. Remove the crimped contact from the tool. Check the inspection hole to verify that the wire is fully inserted.

Insertion of Contacts

1. Before inserting the contacts, unscrew the accessories (clamps, backshells or adapters) from rear of plug or receptacle. Slide the hardware over the wire bundle in the proper order for reassembly after all the contacts are inserted.
2. To assist insertion of contacts, lubricate insulator (grommet) cavities with isopropyl alcohol. Alcohol will evaporate and will not leave a conductive film. **Caution: Never use any lubricant other than isopropyl alcohol.**

3. Place the correct insertion tool on the contact so that the wire runs along the groove in the tool. (Tool tip will butt against the shoulder.) Hold the plug or receptacle body firmly.
4. Beginning with a center cavity, insert the contact into the insulator with a slow, even pressure until the contact snaps into position. Make sure the contact and tool are held perpendicular to the face of the insert during the contact installation or the grommet could be damaged.
 - 4.1 If contacts are not inserted all the way prior to removing insertion tool, do not try to reinsert the insertion tool. Instead, remove the contact and try again; otherwise reinserting the insertion tool may damage the inside of the contact cavity.
5. Remove tool and check the face of the connector for proper contact installation. Proper installation may also be checked by pulling back lightly on the wire to make sure the contact is properly seated.

Completion

After all the cavities have been filled, slide the hardware back into position on the connector and tighten.

Extraction of Contacts (Rework)

1. Slide the hardware back over the wire bundle.
2. Select the appropriate tool. Place the wire into the extraction tool of the pin or socket.
3. Slowly slide the extraction tool down wire into the contact cavities until the tool tip bottoms against the contact shoulder, expanding the clip retaining tines. Hold the wire firmly in the tool and pull the wired contact and tool straight out of the rear of the insulator.

| Size | Pin Contact | Socket Contact | Basic Crimp Tool | Pin Positioner | Socket Positioner | Insertion/Removal Tool |
|------|---------------|----------------|------------------|--------------------|--------------------|------------------------|
| 22D | M39029/58-360 | M39029/57-354 | M22520/2-01 | M22520/2-09 | M22520/2-06 | M81969/14-01 |
| 22M | M39029/58-361 | M39029/57-355 | M22520/2-01 | M22520/2-09 | M22520/2-06 | M81969/14-01 |
| 22 | M39029/58-362 | M39029/57-356 | M22520/2-01 | M22520/2-09 | M22520/2-06 | M81969/14-01 |
| 20 | M39029/58-363 | M39029/57-357 | M22520/1-01 | M22520/1-04 Red | M22520/1-04 Red | M81969/14-10 |
| | | | M22520/2-01 | M22520/2-10 | M22520/2-10 | |
| 16 | M39029/58-364 | M39029/57-358 | M22520/1-01 | M22520/1-04 Blue | M22520/1-04 Blue | M81969/14-03 |
| 12 | M39029/58-365 | M39029/57-359 | M22520/1-01 | M22520/1-04 Yellow | M22520/1-04 Yellow | M81969/14-04 |

For coax contacts refer to instructions supplied with contacts.