MIL-DTL-38999 Series IV connectors and cable assemblies
MIL-DTL-38999 Series IV general purpose connectors

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An extensive array of mil-circular connectors

NASA SSQ 21635 NATC connectors are available in 53 standard contact patterns including MIL-DTL-1553 high speed data and bussed configurations.

Power-Breech™ connectors are rated up to 900 amps. These shell size 33 – 57 solutions utilize MIL-DTL-38999 Series IV derived coupling mechanisms.

Micro-military circular connectors incorporate latest-generation designs to deliver significantly smaller sizes, lower weights and higher contact densities that MIL-DTL-38999 solutions.

MIL-DTL-38999 Series III and IV solutions include QPL, general purpose, hermetic, filtered, lanyard released and Wing-Lok™ plugs.

Custom cables and wiring harnesses

Eaton can provide custom cables and wiring harnesses for turnkey design, collaborative co-development, or build-to-print programs.

End-to-end connectivity capabilities include:
- Application-specific solutions for high currents and voltages, Ethernet, and RF applications
- Single and multiple-layer foil and braided EMI/RFI shielding
- Extreme temperatures, shock, vibration, radiation, corrosive media and vacuum
- Integrated fluid and gas delivery and cable separation
- NASA NHB 5300 soldering and NASA-STD-8739.4 cable manufacturing compliances
Custom Breech-Lok™ connector capabilities

Breech-Lok™ custom lanyard solutions require significantly lower separation forces than D38999/31-compliant connectors

- Straight pull releases with as low as 90 pounds of force.
- 15° off-angle separations with as low as 100 pounds of force.
- Designed to withstand 500 harsh-environment mating cycles and 100 snatch releases.
- Additional lanyard-plug modifications include redundant releases and custom and adjustable lanyard lengths.
- Breech-Lok™ lanyard release, flight heritage includes the Bell Helicopter V22 Osprey and the Eurocopter Tiger.

Custom inserts, shells, and accessories deliver high contact densities and application-optimized performance

- High-speed data including: fiber optic, MIL-DTL-1553, USB, and 10/100/1000/10GBASE-T Ethernet.
- Contact configurations include split-pair quadax, standard quadax, differential twinax, and controlled impedance.
- A readily-available library of custom inserts such as four #8 power and eight #16 contacts in a size 23 shell.
- Power-Breech™ custom solutions providing up to 900 amps.
- Additional customer-defined features: custom shell materials, platings, mounting flanges, backshells, strain reliefs, and extended coupling rings.

Space rated, Breech-Lok™ technologies accelerate EVA and IVA custom-solution development

- Custom solutions available with Class G finish, space-rated materials.
- Space-rated materials provide a total-mass loss of < 1% and contain < 0.1% volatile materials.
- Breech-Lok™ products have been space-flight approved by the NASA Goddard Space Flight Center.
- Flight heritage includes multiple space shuttle and satellite programs.
- Custom configurations available with the ergonomic Wing-Lok™ design are ideal for EVA and IVA applications.
Modified MIL-DTL-38999 and full-custom solutions

D38999 Series III and Series IV custom shells, inserts, and accessories

- High-speed data including MIL-DTL-1553, USB, Ethernet and fiber optic.
- Standard and split-pair quadrax, differential twinax and controlled impedance contacts.
- Power solutions include D38999 Series IV derived Power-Breech™ connectors rated up to 900 amps.
- Additional application-specific features include custom materials, platings, mounting flanges, backshells, strain reliefs and extended coupling rings.

Space rated technologies accelerate EVA and IVA custom-solution development

- Custom solutions are available with Class G finishes and space-rated materials that contain <0.1% volatile materials with a total-mass loss of <1%.
- D38999 Series IV, Breech-Lok™ connectors have been approved for space flight by the NASA Goddard Space Flight Center.
- Ergonomic Wing-Lok™ coupling rings (depicted to the left) facilitate rapid mating and demating when wearing bulky gloves in EVA and IVA applications.
- NATC-derived custom solution capabilities include thermally and electrically deadfaced connectors.

Heritage-proven design platforms can be leveraged to quickly provide a wide range of custom solutions

Eaton’s heritage-proven array of technologies and design platforms can be quickly leveraged to provide a wide range of harsh-environment interconnects:
- Cryogenic and high temperature
- Electrically and/or mechanically released
- EVA and IVA quick disconnecting
- Integrated electrical, gas and fluid
- Interstage raceway
- Low-imparted shock and zero-separation force
- Positive-mate monitoring
- Thermally and electrically deadfaced
- Vertical launch
Innovative engineering facilitates cost effective, reusable solutions

Heritage-proven technologies and design platforms can be leveraged to quickly provide a wide range of custom, harsh-environment solutions for interconnect applications ranging from shoulder-fired missile launchers to deep space probes. One example of Eaton’s track record of innovation is the umbilical connector described below.

- MIL-DTL-38999 Series III derived shells and inserts reduce costs and leverage proven reliability and availability. Inserts can be upgraded to support changing mission requirements.
- A resettable release mechanism was developed based on a separation-nut design with over 40 years of flight heritage.

Connector pins mate with the umbilical cable. The opposing ends of these feedthroughs mate to connectors mounted on the stationary plate.

1 Lanyard-actuated separation nut with double-shear dowel pin redundancy initiates umbilical separation.

2 Force-balanced spring towers work in conjunction with an ejector plate located in between the two connector plates to power separation.

3 The six sets of connectors simultaneously demate facilitating damage-free decoupling and reusability.

Connector sockets mate with the host system wiring harness. The opposing ends of these feedthroughs connect to the umbilical-cable plate.
Power-Breech™ custom solutions up to 900 amps

Meets MIL-DTL-38999 Series IV performance requirements

Custom Power-Breech™ solutions provide MIL-DTL-38999 Series IV performance in configurations with large contacts and shell sizes that are not available in QPL solutions. A Series IV derived, breech-lock-coupling mechanism provides quick, positive engagements.

These heritage-proven design platforms can be customized to meet a wide range of mission-specific requirements:

- Current ratings up to 900 amps.
- Extreme shock, vibration, temperature, humidity, and EMI/RFI environments.
- Harsh-environment cable assemblies.

- ICBM program heritage; meets Boeing specifications 280-36501, 280-36503, 280-36505, and 280-36507.
- High-current capabilities include solutions configured with four, #4/0 contacts.
- Available with 2024 Al-alloy shells and CAD/OD (per QQ-P-416) finishes that withstand 500 hours salt spray.
- MIL-DTL-38999 Series IV derived, breech-mating designs survive 500 engagement cycles.
- Vibration and shock capabilities include MIL-STD-202, Method 204, Condition D and MIL-STD-38999H, Series IV.
- Positive-detent mechanism utilizes 270° of engagement rotation and provides visual, audible, and tactile mating indications.
- Shell designs are 100% scoop proof and are available in ten polarization configurations.
- Please contact Eaton at 800.840.0502 to discuss your high-current requirements.

This Power-Breech™ solution utilizes four #4/0 contacts in a size 57 shell to provide 900 amps.

These shell-size 41 connectors mate with 14 #8 contacts to provide a 640-amp current rating.
## Power-Breech™ technical specifications

### Heritage-proven designs in shell sizes 33 - 57

The specifications listed below have been confirmed through customer qualifications of Power-Breech™ connectors designed for their harsh-environment applications. These heritage-proven specifications are presented as capabilities references. Please contact Eaton to discuss how quickly custom Power-Breech™ solutions can be developed to meet your specific requirements.

### Materials, Finish, and Mechanical

<table>
<thead>
<tr>
<th>Material/Property</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shell and Coupling Ring Material</td>
<td>2024 Aluminum</td>
</tr>
<tr>
<td>Shell and Coupling Ring Plating</td>
<td>CAD/OD per QQ-P-416</td>
</tr>
<tr>
<td>Contact Material &amp; Plating</td>
<td>Copper Alloy with Gold Plating, 50 Micro-Inches Minimum</td>
</tr>
<tr>
<td>Insulator</td>
<td>Hard Dielectric Wafer</td>
</tr>
<tr>
<td>Grommet and Seal</td>
<td>Fluorosilicone</td>
</tr>
<tr>
<td>Grounding Springs</td>
<td>Beryllium Copper</td>
</tr>
<tr>
<td>Mating Life</td>
<td>500 Cycles Minimum</td>
</tr>
<tr>
<td>Contact Retention</td>
<td>Up to 25 Pounds</td>
</tr>
<tr>
<td>Polarization</td>
<td>270° Engagement Rotation Available with Ten Different Polarizations</td>
</tr>
</tbody>
</table>

### Electrical and Environmental

<table>
<thead>
<tr>
<th>Property</th>
<th>Specification/Details</th>
</tr>
</thead>
<tbody>
<tr>
<td>Current Ratings</td>
<td>Up to 900 amps</td>
</tr>
<tr>
<td>Service Ratings</td>
<td>Up to 2800 VRMS at Sea Level</td>
</tr>
<tr>
<td>Emi Leakage Attenuation</td>
<td>&gt; 85dB from 0.1 to 1,000MHz, 10dB Per Octave from 1,000 to 10,000MHz</td>
</tr>
<tr>
<td>Shell-to-Shell Conductivity</td>
<td>2.5 Millivolt Maximum Drop</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>-65°C to 200°C (-85°F to 392°F)</td>
</tr>
<tr>
<td>Sealing</td>
<td>Sand and Dust as per MIL-STD-202 and Ice Resistance</td>
</tr>
<tr>
<td>Corrosion Resistance</td>
<td>Withstands 500 Hours Salt Spray</td>
</tr>
<tr>
<td>Fluid Immersion</td>
<td>Various Fuels, Solvents, Coolants, and Oils as per EIA-364-10</td>
</tr>
<tr>
<td>Vibration</td>
<td>Per MIL-STD-202, Method 204, Condition B</td>
</tr>
</tbody>
</table>
General purpose QPL and modified connectors

Field-proven performance in mission-critical applications

- Comprehensive range of QPL and modified solutions include Class G, space-rated connectors.
- High-speed-data configurations include MIL-STD-1553.
- Grounding occurs 0.050 inch (1.27mm) before electrical-contact engagement.
- 360° grounding fingers provide up to 65dB protection at 1GHz.
- -65°C to 200°C operating temperatures.
- Finish options include 500 hour salt-spray-rated platings.
- Please contact customer service at 805.484.0543 to order products or receive additional information.

Breech-Lok™ solutions comprise one of the industry’s largest installed bases of MIL-DTL-38999 Series IV connectors. This track record of uncompromised reliability has been proven in harsh-environment applications ranging from weapons systems to spacecraft.

Breech-Lok™ products can be quickly customized to meet a broad array of mission-specific requirements:
- Special insert patterns and shell configurations.
- Customer-defined EMI/RFI compliances.
- Custom connector/cable assemblies.

Harsh-environment design features

EMI ring

Metal contact retainer clips

High-strength coupling ring
# General-purpose connectors technical specifications

## Materials, Finish, and Mechanical

<table>
<thead>
<tr>
<th>Class</th>
<th>Shell and Coupling Ring Material</th>
<th>Shell and Coupling Ring Plating</th>
<th>Contact Material &amp; Plating</th>
<th>Insulator</th>
<th>Grommet and Seal</th>
<th>Grounding Springs</th>
<th>Mating Life</th>
<th>Contact Retention</th>
<th>Polarization</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>2024 Al</td>
<td>Anodize</td>
<td>Copper Alloy with Gold Plating, 50 Micro-Inches Minimum</td>
<td>Hard Dielectric Wafer - All Finish Classes</td>
<td>Fluorosilicone - All Finish Classes</td>
<td>Beryllium Copper - All Finish Classes</td>
<td>500 Cycles Minimum - All Finish Classes</td>
<td>Up to 25 Pounds - All Finish Classes</td>
<td>Per MIL-STD-38999 Series IV; N, A, B, C, D, K, L, M, R, and U - All Finish Classes</td>
</tr>
<tr>
<td>F</td>
<td>2024 Al</td>
<td>Nickel per ASTM B733*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G</td>
<td>2024 Al</td>
<td>Passivated</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>K</td>
<td>Corrosion Resistant Steel</td>
<td>Electrodeposited Nickel</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>S</td>
<td>2024 Al</td>
<td>Nickel Fluorocarbon Polymer</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>T</td>
<td>2024 Al</td>
<td>CAD/OD per QQ-P-416</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>W</td>
<td>2024 Al</td>
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</tr>
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</table>

*Contact Eaton to Discuss Additional Finish Classes

## Environmental, Shock, Vibration, and EMI/RFI

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<thead>
<tr>
<th>Class</th>
<th>Operating Temperature</th>
<th>Sealing</th>
<th>Corrosion Resistance</th>
<th>Fluid Immersion</th>
<th>Sine Vibration</th>
<th>Random Vibration</th>
<th>Shock</th>
<th>EMI Attenuation @ 100 MHz</th>
<th>EMI Attenuation @ 10 GHz</th>
<th>Shell-to-Shell Conductivity</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-65°C to 200°C (-85°F to 392°F)</td>
<td>Sand and Dust as per MIL-STD-202 and Ice Resistance - All Finish Classes</td>
<td>Withstands 500 Hours Salt Spray</td>
<td>Various Fuels, Solvents, Coolants, and Oils as per EIA-364-10 - All Finish Classes</td>
<td>30g at Ambient Temperature - All Finish Classes</td>
<td>50g at Ambient Temperature - All Finish Classes</td>
<td>300g +/- 15% Half-Sine-Wave Magnitude for 3 +/- 1mS - All Finish Classes</td>
<td>No EMI Shielding &gt; 90dB &gt; 80dB &gt; 80dB</td>
<td>No EMI Shielding &gt; 65 dB &gt; 65 dB &gt; 50 dB</td>
<td>1.0 Millivolt Max. Drop 1.0 Millivolt Max. Drop 1.0 Millivolt Max. Drop 2.5 Millivolt Max. Drop 1.0 Millivolt Max. Drop 2.5 Millivolt Max. Drop 2.5 Millivolt Max. Drop</td>
</tr>
<tr>
<td>F</td>
<td>-65°C to 200°C (-85°F to 392°F)</td>
<td></td>
<td>Withstands 48 Hours Salt Spray</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.0 Millivolt Max. Drop 1.0 Millivolt Max. Drop</td>
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<tr>
<td>G</td>
<td>-65°C to 200°C (-85°F to 392°F)</td>
<td></td>
<td>Withstands 500 Hours Salt Spray</td>
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<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.0 Millivolt Max. Drop 2.5 Millivolt Max. Drop</td>
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<tr>
<td>K</td>
<td>-65°C to 200°C (-85°F to 392°F)</td>
<td></td>
<td>Withstands 48 Hours Salt Spray</td>
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<td></td>
<td>1.0 Millivolt Max. Drop 2.5 Millivolt Max. Drop</td>
</tr>
<tr>
<td>S</td>
<td>-65°C to 200°C (-85°F to 392°F)</td>
<td></td>
<td>Withstands 500 Hours Salt Spray</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1.0 Millivolt Max. Drop 2.5 Millivolt Max. Drop</td>
</tr>
<tr>
<td>T</td>
<td>-65°C to 175°C (-85°F to 347°F)</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td>1.0 Millivolt Max. Drop 2.5 Millivolt Max. Drop</td>
</tr>
<tr>
<td>W</td>
<td>-65°C to 175°C (-85°F to 347°F)</td>
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<td></td>
<td></td>
<td></td>
<td>1.0 Millivolt Max. Drop 2.5 Millivolt Max. Drop</td>
</tr>
</tbody>
</table>

*Class G thermal vacuum outgassing: total mass loss 1.0%, collected volatile condensible material 0.1% maximum.

**Finish Class K configurations provide 2000°F firewall protection for 20 minutes minimum.
### Designator Descriptions

<table>
<thead>
<tr>
<th>Designator Type</th>
<th>Military</th>
<th>Eaton</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIL-DTL-38999/40</td>
<td>O0</td>
<td>Wall-Mount Receptacle (Finish Class C, F, W, &amp; K Configurations are QPL Certified)</td>
<td></td>
</tr>
<tr>
<td>MIL-DTL-38999/42</td>
<td>O2</td>
<td>Box-Mount Receptacle (Finish Class C, F, &amp; W Configurations are QPL Certified)</td>
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</tr>
<tr>
<td>MIL-DTL-38999/44</td>
<td>O7</td>
<td>Jam-Nut Receptacle (Finish Class C, F, W, &amp; K Configurations are QPL Certified)</td>
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<tr>
<td>MIL-DTL-38999/46</td>
<td>G6</td>
<td>EMI Straight Plug (Finish Class F, W, &amp; K Configurations are QPL Certified)</td>
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<tr>
<td>MIL-DTL-38999/47</td>
<td>06</td>
<td>Non-EMI Straight Plug (Finish Class C, &amp; W Configurations are QPL Certified)</td>
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<tr>
<td>MIL-DTL-38999/49</td>
<td>03</td>
<td>In-Line Receptacle (Finish Class C, F, &amp; W Configurations are QPL Certified)</td>
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<td>N/A</td>
<td>05</td>
<td>Bulkhead-Feed-Through Receptacle</td>
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#### Finish Class

<table>
<thead>
<tr>
<th>Finish Class</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>C</td>
<td>Anodize, -65°C to 200°C (-85°F to 392°F)</td>
</tr>
<tr>
<td>F</td>
<td>Nickel per ASTM B733*, -65°C to 200°C (-85°F to 392°F)</td>
</tr>
<tr>
<td>G</td>
<td>Nickel per ASTM B733, -65°C to 200°C (-85°F to 392°F)</td>
</tr>
<tr>
<td>K</td>
<td>CRES (Passivated), -65°C to 200°C (-85°F to 392°F)</td>
</tr>
<tr>
<td>S</td>
<td>Electrodeposited Nickel, -65°C to 200°C (-85°F to 392°F)</td>
</tr>
<tr>
<td>T</td>
<td>Nickel Fluorocarbon Polymer, -65°C to 175°C (-85°F to 347°F)</td>
</tr>
<tr>
<td>W</td>
<td>CAD/DD per QQ-P-416, -65°C to 175°C (-85°F to 347°F)</td>
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#### Contact Style

<table>
<thead>
<tr>
<th>Contact Style**</th>
<th>Description</th>
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<tbody>
<tr>
<td>P</td>
<td>Pin</td>
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<tr>
<td>S</td>
<td>Socket</td>
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<tr>
<td>H</td>
<td>Pin, 1500 cycle</td>
</tr>
<tr>
<td>J</td>
<td>Socket, 1500 cycle</td>
</tr>
<tr>
<td>A</td>
<td>Pin, Connector Shipped Without Contacts</td>
</tr>
<tr>
<td>B</td>
<td>Socket, Connector Shipped Without Contacts</td>
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#### Feedthrough Receptacle Contact Styles

<table>
<thead>
<tr>
<th>Contact Styles</th>
<th>Description</th>
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<tbody>
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<tr>
<td>S</td>
<td>Socket/Socket</td>
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<tr>
<td>A</td>
<td>Socket/Pin</td>
</tr>
<tr>
<td>B</td>
<td>Pin/Socket</td>
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</table>

*Class F coupling rings are anodized
**PCB terminated contact part numbers are listed in the PCB Tail Terminations section.
### General-purpose connectors standard shell & insert configurations

#### Shell-Size Conversions

<table>
<thead>
<tr>
<th>Military Designation</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>G</th>
<th>H</th>
<th>J</th>
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<tbody>
<tr>
<td>Shell Size &amp; Eaton Designation</td>
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<td>13</td>
<td>15</td>
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<td>19</td>
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Please contact Eaton to discuss custom shells and inserts

<table>
<thead>
<tr>
<th>Shell Size</th>
<th>Insert #</th>
<th>SR</th>
<th>Total # Contacts</th>
<th># 22D</th>
<th># 20</th>
<th># 16</th>
<th># 12</th>
<th># 8</th>
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<tr>
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<td>6</td>
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**SR = Service Rating, T=Twinax, C=Coax, P=Power**

* Not a MIL-STD-1560 defined insert arrangement.
## Insert and contact ratings

### Insert Service Ratings

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<tr>
<th>Service Rating</th>
<th>Suggested Operating Voltage (Sea Level)</th>
<th>Test Voltage (Sea level)</th>
<th>Test Voltage 50,000 Ft.</th>
<th>Test Voltage 70,000 Ft.</th>
<th>Test Voltage 100,000 Ft.</th>
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### Contact Part Number Cross Reference - PC tail contact information is listed on pages 53 and 54

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<th>Contact Size</th>
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<th>Military Part Number</th>
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<td>M39029/58-360</td>
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<td>M39029/58-528</td>
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### Crimp Well Data

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<th>Contact Size</th>
<th>Well Diameter</th>
<th>Minimum Well Depth</th>
<th>Crimp Well Data</th>
<th>Recommended Contact Rating (Amps)</th>
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<tr>
<td>22D</td>
<td>.0345 ± .001</td>
<td>.141</td>
<td>1.5</td>
<td>20.0</td>
</tr>
<tr>
<td>20</td>
<td>.047 ± .001</td>
<td>.209</td>
<td>2.0</td>
<td>23.0</td>
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<tr>
<td>16</td>
<td>.067 ± .001</td>
<td>.209</td>
<td>3.0</td>
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<tr>
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<td>.100 ± .002</td>
<td>.209</td>
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<td>33.0</td>
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<td>10</td>
<td>.137 ± .003</td>
<td>.355</td>
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</table>
Insert drawings 19-32 to 25-4

Insert Arrangement:
Quantity and Size:
Service Rating:

19-32
32 No. 20 Contacts
I

19-35
66 No. 22D Contacts
M

21-5 †
5 No. 8 Contacts
M

21-11
11 No. 12 Contacts
I

Insert Arrangement:
Quantity and Size:
Service Rating:

21-16
16 No. 16 Contacts
II

21-26 †
23 No. 20 Contacts
2 No. 8 Contacts
M

21-35
79 No. 22D Contacts
2 No. 16 Contacts
M

21-39
37 No. 20 Contacts
2 No. 16 Contacts
I

Insert Arrangement:
Quantity and Size:
Service Rating:

21-41
41 No. 20 Contacts
I

23-21
21 No. 16 Contacts
II

23-35
100 No. 22D Contacts
M

23-53
53 No. 20 Contacts
I

Insert Arrangement:
Quantity and Size:
Service Rating:

23-55
55 No. 20 Contacts
I

23-97
16 No. 16 Contacts
I

23-99
11 No. 16 Contacts
II

25-4
48 No. 20 Contacts
8 No. 16 Contacts
I

Legend:
† = Not MIL-Standard
| = Main Key, Key Way Polarization

Contact Size
No. 8 (TWINAX)
No. 8 Power Contacts
No. 10
No. 12
No. 16
No. 20
No. 22D

Front Face of Pin Insert Shown)
Insert drawings 25-8 to 33-58

Legend:
† = Not MIL-Standard
‖ = Main Key, Key Way Polarization

Insert Arrangement: 25-8
Quantity and Size: 8 No. 8 Contacts
Service Rating: Twinax

Insert Arrangement: 25-11
Quantity and Size: 2 No. 20 Contacts, 9 No. 10 Contacts
Service Rating: N

Insert Arrangement: 25-19
Quantity and Size: 19 No. 12 Contacts
Service Rating: I

Insert Arrangement: 25-20
Quantity and Size: 10 No. 20 Contacts, 13 No. 16 Contacts
Service Rating: N

Insert Arrangement: 25-24
Quantity and Size: 12 No. 16 Contacts, 12 No. 12 Contacts
Service Rating: I

Insert Arrangement: 25-29
Quantity and Size: 29 No. 16 Contacts
Service Rating: I

Insert Arrangement: 25-35
Quantity and Size: 128 No. 22D Contacts
Service Rating: M

Insert Arrangement: 25-43
Quantity and Size: 23 No. 20 Contacts, 20 No. 16 Contacts
Service Rating: I

Insert Arrangement: 25-46
Quantity and Size: 40 No. 20 Contacts, 4 No. 16 Contacts, 2 No. 8 Contacts
Service Rating: I

Insert Arrangement: 25-61
Quantity and Size: 61 No. 20 Contacts
Service Rating: I

Insert Arrangement: 33-54
Quantity and Size: 30 No. 20 Contacts, 14 No. 16 Contacts, 6 No. 12 Contacts, 4 No. 8 Power Contacts
Service Rating: I

Insert Arrangement: 33-58
Quantity and Size: 34 No. 20 Contacts, 14 No. 16 Contacts, 10 No. 12 Contacts
Service Rating: I

Legend:
† = Not MIL-Standard
‖ = Main Key, Key Way Polarization

Contact Size
- No. 8 (TWINAX)
- No. 8 Power Contacts
- No. 10
- No. 12
- No. 16
- No. 20
- No. 22D

Front Face of Pin Insert Shown:
## Polarization tables

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<tr>
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**Plugs**

**Receptacles**
D38999/46 & 47 straight plugs, Eaton types G6 & 06

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Dimensions are stated as inches (mm).
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<th>ØD Max</th>
<th>ØJ Boss Max</th>
<th>ØM Ref</th>
<th>ØP Min</th>
<th>R BSC</th>
<th>S Max</th>
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Dimensions are stated as inches (mm).
### D38999/42 box-mount receptacles, Eaton type 02

**Dimensions are stated as inches (mm).**

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**Notes:**
- ØP (4 Holes)
- ØM (Key Major)
- U (91°)
- ØJ (Boss)
- ØD, ØV, ØW (Max.
- S (Reference Socket Pin)
- Blue Full Mate Indicator
- Wire Sealing Grommet
- Blue Color Band

**Diagram:**
- 1.26" Max. (32.00 mm)
- 0.04" Max. (1.02 mm)
- 0.09" Max. (2.29 mm)
- 0.14" Max. (3.56 mm)
- 0.81" Max. (20.57 mm)
- 0.14" Max. (3.56 mm)

**Eaton MIL-DTL-38999 Series IV**
D38999/49 in-line receptacles, Eaton type 03

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Dimensions are stated as inches (mm).
### D38999/44 Jam-Nut Receptacles, Eaton Type 07

**Dimensions are stated as inches (mm).**

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### Bulkhead-feed-through receptacles, Eaton type 05

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Dimensions are stated as inches (mm).

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**Note:**

- ØA: Diameter of A Typ.
- ØC: Maximum Diameter
- ØC Max: Maximum Diameter
- B: Maximum Width
- D: Maximum Height
- E: Thread
- Flat: Flat Dimension
- O-Ring: O-Ring Diameter
- Metric Thread: Metric Thread
- B: Maximum Width

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**EATON MIL-DTL-38999 Series IV**

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**EATON MIL-DTL-38999 Series IV**
Connector accessories meet all Series IV requirements

Protective covers, dummy-stowage receptacles, and connector savers

Breech-Lok™ accessories extend the service lives of connectors and cable assemblies by providing protection from contaminant intrusion, electrical and mechanical damage, and repeated engagement cycles.

**Receptacle and Plug Covers**
Breech-Lok™ dust covers feature rugged chains constructed from passivated, stainless steel. A wide range of chain lengths and eyelet configurations are available.

**Dummy-Stowage Receptacles**
Series IV dummy receptacles are available in QPL compliant and modified configurations to protect pins, sockets, and mating mechanisms when connectors are demated. These products can also be used as anchor points when cable assemblies are not mated to receptacles.

**Connector Savers**
Breech-Lok™ connector savers significantly extend the service life of cables assemblies by isolating connectors from repeated engagement cycles.
- Available in gender-changer configurations.
- One-piece pin/socket assemblies minimize resistance and maximize reliability.
- Comprehensive range of protective accessories in shell sizes 9 to 33.

- QPL compliant and modified configurations are available with MIL-DTL-38999 defined materials and finish classes including 500 hour salt-spray-rated platings.
- Rugged designs meet MIL-DTL-38999 Series IV shock and vibration requirements.
- Quick turn, custom capabilities include application-specific materials, mechanical configurations, and EMI/RFI compliances.
Receptacle and plug covers ordering information

Part number configuration

- Breech-Lok™ Connector
- Cover Type (Table Below)
- Finish Class (Table Below)
- Shell Size (Pages 27 & 28)
- EMI Code (Table Below)
- Chain Type (Table Below)
- Chain Length (Whole-Number Inches)
- Modification Code (Custom Solutions Only)
- Eyelet Size Code (Table Below)

**Eyelet-Size Codes**

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Code</th>
<th>Description</th>
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<tr>
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<td>No Eyelet</td>
<td>5</td>
<td>0.219 Eyelet</td>
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<tr>
<td>1</td>
<td>0.125 dia. Eyelet</td>
<td>6</td>
<td>0.250 Eyelet</td>
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<tr>
<td>2</td>
<td>0.140 dia. Eyelet</td>
<td>R</td>
<td>Ring</td>
</tr>
<tr>
<td>3</td>
<td>0.167 dia. Eyelet</td>
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<td>Split Ring</td>
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<td>4</td>
<td>0.188 dia. Eyelet</td>
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**Designator Descriptions**

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<td>PC</td>
<td>Plug Cover</td>
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<td>Finish Class</td>
<td>C</td>
<td>Anodize, -65°C to 200°C (-85°F to 392°F)</td>
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<td></td>
<td>F</td>
<td>Nickel per ASTM B733, -65°C to 200°C (-85°F to 392°F)</td>
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<td></td>
<td>G</td>
<td>Nickel per ASTM B733, -65°C to 200°C (-85°F to 392°F)</td>
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<td>K</td>
<td>CRES (Passivated), -65°C to 200°C (-85°F to 392°F)</td>
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<td>N</td>
<td>Nickel Plate per ASTM B733, -65°C to 200°C (-85°F to 392°F)</td>
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<td></td>
<td>S</td>
<td>Electrodeposited Nickel, -65°C to 200°C (-85°F to 392°F)</td>
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<tr>
<td></td>
<td>T</td>
<td>Nickel Fluorocarbon Polymer, -65°C to 175°C (-85°F to 347°F)</td>
</tr>
<tr>
<td></td>
<td>W</td>
<td>CAD/OD per QQ-P-416, -65°C to 175°C (-85°F to 347°F)</td>
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<td>Y</td>
<td>Passivated per SAE-AMS-QQ-P-35, -65°C to 200°C (-85°F to 392°F)</td>
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<td>EMI Codes</td>
<td>G</td>
<td>EMI grounding, Receptacle Covers Only</td>
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<td>O</td>
<td>No EMI Grounding</td>
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**Chain-Type Codes**

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<th>Description</th>
<th>Code</th>
<th>Description</th>
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<tbody>
<tr>
<td>0</td>
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<td>P</td>
<td>CRES Cable, PVC Jacket</td>
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<tr>
<td>L</td>
<td>CRES Link Chain</td>
<td>T</td>
<td>CRES Cable, Teflon Jacket</td>
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<tr>
<td>B</td>
<td>CRES Bead Chain</td>
<td>U</td>
<td>CRES Cable, Nylon Jacket</td>
</tr>
<tr>
<td>C</td>
<td>CRES Cable, No Jacket</td>
<td>V</td>
<td>CRES Cable, Viton Jacket</td>
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Receptacle covers mechanical drawings

### Finish Classes

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<tr>
<th>Shell Size</th>
<th>All</th>
<th>All Except N &amp; Y</th>
<th>N &amp; Y</th>
<th>N &amp; Y</th>
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<tbody>
<tr>
<td>ØA Max</td>
<td>ØB Max</td>
<td>ØD Min</td>
<td>ØE Min</td>
<td>ØD Min</td>
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<tr>
<td>9</td>
<td>0.880 (22.35)</td>
<td>0.650 (16.51)</td>
<td>0.685 (17.40)</td>
<td>0.722 (18.34)</td>
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<tr>
<td>11</td>
<td>0.922 (23.42)</td>
<td>0.775 (19.69)</td>
<td>1.006 (25.55)</td>
<td>0.880 (22.35)</td>
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<tr>
<td>13</td>
<td>1.047 (26.59)</td>
<td>0.900 (22.86)</td>
<td>1.124 (28.55)</td>
<td>0.959 (24.36)</td>
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<tr>
<td>15</td>
<td>1.219 (30.96)</td>
<td>1.040 (26.42)</td>
<td>1.248 (31.70)</td>
<td>1.057 (26.85)</td>
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<tr>
<td>17</td>
<td>1.344 (34.14)</td>
<td>1.150 (29.21)</td>
<td>1.367 (34.72)</td>
<td>1.057 (26.85)</td>
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<tr>
<td>19</td>
<td>1.469 (37.31)</td>
<td>1.275 (32.39)</td>
<td>1.524 (38.71)</td>
<td>1.156 (29.36)</td>
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<tr>
<td>21</td>
<td>1.579 (40.11)</td>
<td>1.400 (35.56)</td>
<td>1.642 (41.71)</td>
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<td>23</td>
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<td>1.760 (44.70)</td>
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<td>25</td>
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<tr>
<td>33</td>
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<td>2.200 (55.88)</td>
<td>2.282 (57.96)</td>
<td>1.565 (39.75)</td>
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Dimensions are stated as inches (mm).
Plug covers mechanical drawings

Dimensions are stated as inches (mm).
Dummy-stowage receptacles mechanical drawings and ordering information

<table>
<thead>
<tr>
<th>Shell Size</th>
<th>C Ref</th>
<th>ØE Max</th>
<th>ØF Max</th>
<th>ØG Ref</th>
<th>R BSC</th>
<th>S Max</th>
<th>U Ref</th>
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<tr>
<td>9</td>
<td>0.102</td>
<td>0.384</td>
<td>0.461</td>
<td>0.137</td>
<td>0.328</td>
<td>0.950</td>
<td>0.065</td>
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<tr>
<td>11</td>
<td>0.102</td>
<td>0.509</td>
<td>0.589</td>
<td>0.137</td>
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Dimensions are stated as inches (mm).
Connector savers mechanical drawings and ordering information

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<th>ØC Max</th>
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<td>(26.77)</td>
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<tr>
<td>13</td>
<td>1.226</td>
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<td></td>
<td>(31.14)</td>
<td>(16.10)</td>
<td>(26.42)</td>
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<tr>
<td>15</td>
<td>1.351</td>
<td>0.759</td>
<td>1.165</td>
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<td></td>
<td>(34.32)</td>
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<td>1.711</td>
<td>1.134</td>
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<td>33</td>
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<tr>
<td></td>
<td>(63.88)</td>
<td>(46.00)</td>
<td>(55.83)</td>
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</table>

Dimensions are stated as inches (mm).
Wing-Lok™ plugs meet all Series IV requirements

Ergonomic designs facilitate rapid connector mating and demating

- Meets all MIL-DTL-38999 Series IV physical and electrical requirements.
- High-speed data configurations include MIL-STD-1553.
- Easily mated and demated, even when wearing bulky military or space-grade gloves.
- Rugged coupling design will not demate or loosen due to shock or vibration.
- Comprehensive range of solutions includes Class G, space-rated connectors.
- -65°C to 200°C operating temperatures.
- Please contact customer service at 800.840.0502 to order products or receive additional information.

Wing-Lok™ plugs feature non-slip-grip designs that significantly reduce the amount of effort needed to perform rapid and repetitive connector engagements. Wing-Lok™ plugs can be quickly customized to meet a broad array of mission-specific requirements:
- Special insert and shell configurations.
- Customer-defined EMI/RFI compliances.
- Custom connector/cable assemblies.

Harsh-environment design features:
- EMI ring
- Metal contact retainer clips
- High-strength coupling ring

Standard wing (W6 shell)

Low-profile (WL6 shell)
# Wing-Lok™ Plugs Technical Specifications

## Materials, Finish, and Mechanical - Contact Eaton to Discuss Additional Finish Classes

<table>
<thead>
<tr>
<th>Class C</th>
<th>Class F</th>
<th>Class G</th>
<th>Class K</th>
<th>Class S</th>
<th>Class T</th>
<th>Class W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shell and Coupling Ring Material</td>
<td>2024 Al</td>
<td>2024 Al</td>
<td>2024 Al</td>
<td>Corrosion Resistant Steel</td>
<td>Corrosion Resistant Steel</td>
<td>2024 Al</td>
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<tr>
<td>Shell and Coupling Ring Plating</td>
<td>Anodize</td>
<td>Nickel per ASTM B733</td>
<td>Nickel per ASTM B733</td>
<td>Passivated</td>
<td>Electroplated Nickel</td>
<td>Nickel Fluorocarbon Polymer</td>
</tr>
<tr>
<td>Contact Material &amp; Plating</td>
<td>Copper Alloy with Gold Plating, 50 Micro-Inches Minimum - All Finish Classes</td>
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<td>Insulator</td>
<td>Hard Dielectric Wafer - All Finish Classes</td>
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<td>Grommet and Seal</td>
<td>Fluorosilicone - All Finish Classes</td>
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<td>Grounding Springs</td>
<td>Beryllium Copper - All Finish Classes</td>
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<td>Mating Life</td>
<td>500 Cycles Minimum - All Finish Classes</td>
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<td>Contact Retention</td>
<td>Up to 25 Pounds - All Finish Classes</td>
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<td>Polarization</td>
<td>Per MIL-STD-38999 Series IV; N, A, B, C, D, K, L, M, R, and U - All Finish Classes</td>
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## Environmental, Shock, Vibration, and EMI/RFI

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<tr>
<th>Class C</th>
<th>Class F</th>
<th>Class G*</th>
<th>Class K**</th>
<th>Class S</th>
<th>Class T</th>
<th>Class W</th>
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</thead>
<tbody>
<tr>
<td>Operating Temperature</td>
<td>-65°C to 200°C (-85°F to 392°F)</td>
<td>-65°C to 200°C (-85°F to 392°F)</td>
<td>-65°C to 200°C (-85°F to 392°F)</td>
<td>-65°C to 200°C (-85°F to 392°F)</td>
<td>-65°C to 175°C (-85°F to 347°F)</td>
<td>-65°C to 175°C (-85°F to 347°F)</td>
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<td>Sealing</td>
<td>Sand and Dust as per MIL-STD-202 and Ice Resistance - All Finish Classes</td>
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<tr>
<td>Corrosion Resistance</td>
<td>Withstands 500 Hours Salt Spray</td>
<td>Withstands 48 Hours Salt Spray</td>
<td>Withstands 48 Hours Salt Spray</td>
<td>Withstands 500 Hours Salt Spray</td>
<td>Withstands 48 Hours Salt Spray</td>
<td>Withstands 500 Hours Salt Spray</td>
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<tr>
<td>Fluid Immersion</td>
<td>Various Fuels, Solvents, Coolants, and Oils as per EIA-364-10 - All Finish Classes</td>
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<td>Sine Vibration</td>
<td>30g at Ambient Temperature - All Finish Classes</td>
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<td>Random Vibration</td>
<td>50g at Ambient Temperature - All Finish Classes</td>
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<td>Shock</td>
<td>300g +/- 15% Half-Sine-Wave Magnitude for 3 +/- 1mS - All Finish Classes</td>
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<tr>
<td>EMI Attenuation @ 100 MHz</td>
<td>No EMI Shielding</td>
<td>&gt; 90 dB</td>
<td>&gt; 90 dB</td>
<td>&gt; 80 dB</td>
<td>&gt; 90 dB</td>
<td>&gt; 90 dB</td>
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<td>EMI Attenuation @ 10 GHz</td>
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<td>&gt; 65 dB</td>
<td>&gt; 45 dB</td>
<td>&gt; 65 dB</td>
<td>&gt; 50 dB</td>
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<tr>
<td>Shell-to-Shell Conductivity</td>
<td>1.0 Millivolt Max. Drop</td>
<td>1.0 Millivolt Max. Drop</td>
<td>1.0 Millivolt Max. Drop</td>
<td>2.5 Millivolt Max. Drop</td>
<td>1.0 Millivolt Max. Drop</td>
<td>2.5 Millivolt Max. Drop</td>
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</tbody>
</table>

*Class G thermal vacuum outgassing: total mass loss 1.0%, collected volatile condensible material 0.1% maximum.

**Finish Class K configurations provide 2000°F firewall protection for 20 minutes minimum.
## Designator Descriptions

<table>
<thead>
<tr>
<th>Designator Type</th>
<th>Eaton</th>
<th>Description</th>
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<td>W6</td>
<td>Full Wing</td>
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<td>WL6</td>
<td>Low-Profile Wing</td>
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<td>Finish Class</td>
<td>C</td>
<td>Anodize, -65°C to 200°C (-85°F to 392°F)</td>
</tr>
<tr>
<td></td>
<td>F</td>
<td>Nickel per ASTM B733, -65°C to 200°C (-85°F to 392°F)</td>
</tr>
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<td></td>
<td>G</td>
<td>Nickel per ASTM B733, -65°C to 200°C (-85°F to 392°F)</td>
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<td></td>
<td>K</td>
<td>CRES (Passivated), -65°C to 200°C (-85°F to 392°F)</td>
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<td></td>
<td>S</td>
<td>Electrodeposited Nickel, -65°C to 200°C (-85°F to 392°F)</td>
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<td></td>
<td>T</td>
<td>Nickel Fluorocarbon Polymer, -65°C to 175°C (-85°F to 347°F)</td>
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<td>W</td>
<td>CAD/OD per QQ-P-416, -65°C to 175°C (-85°F to 347°F)</td>
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<tr>
<td>Contact Style</td>
<td>P</td>
<td>Pin</td>
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<tr>
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<td>S</td>
<td>Socket</td>
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<tr>
<td></td>
<td>H</td>
<td>Pin, 1500 cycle</td>
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<td>J</td>
<td>Socket, 1500 cycle</td>
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<tr>
<td></td>
<td>A</td>
<td>Pin, Connector Shipped Without Contacts</td>
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Wing-Lok™ plugs shell & insert configurations

Please contact Eaton to discuss custom shells and inserts

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SR = Service Rating, T=Twinax, C=Coax, P=Power
* Not a MIL-STD-1560 defined insert arrangement.
### Standard-wing plugs mechanical drawings

#### Dimensions
- Dimensions are stated as inches (mm).

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Dimensions are stated as inches (mm).
## Low-profile-wing plugs mechanical drawings

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<td>M47x1.0-6g-0.1R</td>
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**Dimensions are stated as inches (mm).**
Filtered connectors for noise-sensitive applications

High-density designs meet MIL-DTL-38999 shock and vibration with no deratings

Breech-Lok™ filtered connectors utilize unique planar-capacitor designs that facilitate high-density solutions for noise-sensitive applications including: avionics, communications, SIGINT, and ISR.

These rugged connectors can be quickly modified to meet a broad array of mission-specific requirements:

- Filters optimized for any frequency, voltage, and impedance requirements.
- Special insert and shell configurations.
- Shielded connector/cable assemblies.

- Rugged design survives 500 cycles of mating and demating.
- -55°C to 125°C operating temperatures.
- Configurations include shell sizes 9 to 33 and most insert arrangements.
- Self-locking coupling nuts and end-bell accessory hardware.
- Finish options include platings rated for 500-hours salt-spray exposure.
- Class K configurations provide 2000°F firewall protection.

A rugged design enables meeting MIL-DTL-38999 shock and vibration requirements with no deratings.

C, L, T and Pi-type filters are available

Ground springs
Encapsulation
Ferrite beads
Planar capacitors

Box mount
Jam-nut mount
C filter
Pi filter

EATON MIL-DTL-38999 Series IV 37
## Filtered connectors technical specifications

### Materials, Finish, and Mechanical - Contact Eaton to Discuss Additional Finish Classes

<table>
<thead>
<tr>
<th></th>
<th>Class F</th>
<th>Class K</th>
<th>Class W</th>
</tr>
</thead>
<tbody>
<tr>
<td>Shell and Coupling Ring Material</td>
<td>2024 Aluminum</td>
<td>Corrosion Resistant Stainless Steel</td>
<td>2024 Aluminum</td>
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<tr>
<td>Shell and Coupling Ring Plating</td>
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<td>Passivated</td>
<td>CAD/OD per QQ-P-416</td>
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<td>Contact Material &amp; Plating</td>
<td>Copper Alloy With Gold Plating, 50 Micro-Inches Minimum - All Finish Classes</td>
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<td>Insulator</td>
<td>Hard Dielectric Wafer - All Finish Classes</td>
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<td>Grommet and Seal</td>
<td>Fluorosilicone - All Finish Classes</td>
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<td>Grounding Springs</td>
<td>Beryllium Copper - All Finish Classes</td>
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<td>Mating Life</td>
<td>500 Cycles Minimum - All Finish Classes</td>
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<td>Contact Retention</td>
<td>Up to 25 Pounds - All Finish Classes</td>
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<tr>
<td>Polarization</td>
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### Environmental, Shock, Vibration, and EMI/RFI

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<tbody>
<tr>
<td>Operating Temperature</td>
<td>-55°C to 125°C (-67°F to 257°F)</td>
<td>-55°C to 125°C (-67°F to 257°F)</td>
<td>-55°C to 125°C (-67°F to 257°F)</td>
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<td>Dust (Fine Sand) per MIL-STD-202 and Ice Resistance - All Finish Classes</td>
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<td>Corrosion Resistance</td>
<td>Withstands 48 Hours Salt Spray</td>
<td>Withstands 500 Hours Salt Spray</td>
<td>Withstands 500 Hours Salt Spray</td>
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<td>Various Fuels, Solvents, Coolants, and Oils as per EIA-364-10 - All Finish Classes</td>
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<td>Sine Vibration</td>
<td>30g at Ambient Temperature</td>
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<td>300g +/- 15% Half-Sine-Wave Magnitude for 3 +/- 1mS - All Finish Classes</td>
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<tr>
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<td>&gt; 65 dB @ 10GHz</td>
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<td>Shell-to-Shell Conductivity</td>
<td>2.5 Millivolt Maximum Drop</td>
<td>2.5 Millivolt Maximum Drop</td>
<td>1.0 Millivolt Maximum Drop</td>
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*Finish Class K configurations provide 2000°F firewall protection for 20 minutes minimum.*
An estimate of insertion loss can be made using the following formula:

\[
IL (\text{dB}) = 20 \log \left[ 1 + \frac{Z_s Z_1}{Z_t (Z_s + Z_1)} \right]
\]

\[Z_s = \text{Source impedance in ohms}\]
\[Z_1 = \text{Load impedance in ohms}\]
\[Z_t = \text{Transfer impedance in 50 ohm system}\]

Please contact Eaton for L and T filter performance information.
Filter types and attenuation ratings

The C filter is a low inductance, feed-thru capacitor. It is used to attenuate high-frequency signals.

The Pi filter consists of two capacitive elements and one inductive element. The Pi filter provides better high-frequency performance than the C filter due to sharper roll-off and is designed for high source and load impedances.

### Electrical Ratings - Pi and C Filters

<table>
<thead>
<tr>
<th>Metric</th>
<th>Pi Filter</th>
<th>C Filter</th>
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<tbody>
<tr>
<td>Capacitance Code</td>
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### Electrical Ratings - Pi and C Filters

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### Attenuation Minimums

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Attenuation Minimums per MIL-STD-220 @25°C Without Bias Voltage or Current
# Filtered connectors ordering information

## Designator Descriptions

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<tr>
<th>Designator Type</th>
<th>Eaton</th>
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*Contact Eaton for L and T-Type filter specifications.*  
**Contact Eaton to discuss customer-specific part numbers that designate PC tail contact lengths.*

---

*Part number configuration:

BL  F2  W  15  -  35  P  N  -  P  A

Breech-Lok™ Connectors

Shell Type (Table Below)

Finish Class (Table Below)

Contact Style (Table Below)

Filter Type (Table Below)

Termination Type (Table Below)

Capacitance Code (Page 40)

Shell Size (Page 42)

Insert Arrangement (Page 42)

Polarization (Page 18)
Filtered connectors insert and shell arrangements

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SR = Service Rating. Insert drawings are located in the General-Purpose Products section.

*Please contact factory for lead times.
Box-mount filtered receptacles mechanical drawings

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<th>D Max</th>
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<th>ØM Ref</th>
<th>ØP Min</th>
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<th>S Type</th>
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Dimensions are stated as inches (mm).
### Jam-nut filtered receptacles mechanical drawings

#### Dimensions are stated as inches (mm).

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Breech-Lok™ hermetic connectors

Breech-Lok™ hermetic connectors meet all MIL-DTL-38999 Series IV requirements

Breech-Lok™ hermetic connectors are designed for use in pressurized applications and harsh environments. These rugged solutions provide the wide range of features offered by non-hermetic Breech-Lok™ products.

Breech-Lok™ hermetic connectors can be quickly customized to meet a broad array of mission-specific requirements:

- Shell and seal materials optimized for specific environmental requirements.
- Special insert patterns.
- Custom connector/cable assemblies.

- No Helium leakage greater than 1 E-7 CC/S per EIA-364-02.
- Rugged design survives 500 cycles of mating and demating.
- Proven performance at -65°C to 200°C operating temperatures.
- Configurations include shell sizes 9 to 33 and most insert arrangements.
- Finish options include 500 hour, salt-spray-rated nickel plating as per ASTM B733.
- Please contact customer service at 800.840.0502 to order products or receive additional information.

---

Harsh-environment design features

- Fluorosilicone interfacial seal
- Hermetic glass seal
- PC tail, solder cup, or eyelet terminations
- Stainless-steel shell

---

Weld-mount receptacles

Box-mount receptacles

Solder-mount receptacles

Jam-nut receptacles
# Hermetic connectors technical specifications

## Materials, Finish, and Mechanical - Contact Eaton to Discuss Additional Finish Classes

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<td>Shell</td>
<td>Stainless Steel</td>
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<td>Passivated per SAE-AMS-QQ-P-35</td>
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<td>Copper Alloy with Gold Plating, 50 Micro-Inches Minimum</td>
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## Environmental, Shock, Vibration, and EMI/RFI

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<td>Corrosion Resistance</td>
<td>Withstands 48 Hours Salt Spray</td>
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<td>Fluid Immersion</td>
<td>Various Fuels, Solvents, Coolants, and Oils as per EIA-364-10</td>
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<td>Sine Vibration</td>
<td>30g at Ambient Temperature</td>
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<td>Random Vibration</td>
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<td>Shock</td>
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<td>Shell-to-Shell Conductivity</td>
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Hermetic connectors ordering information

**Designator Cross References**

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*N and Y finish classes are QPL certified.

**Contact Eaton to discuss customer-specific part numbers that designate PC tail contact lengths.**
Hermetic connectors shell and insert configurations

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**Shell-Size Conversions**

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Please contact Eaton to discuss inserts for shell size 33 and custom requirements.

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SR = Service Rating. Insert drawings are located in the General Purpose Products section.
D38999/43 jam-nut hermetic receptacles, Eaton type H7

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Dimensions are stated as inches (mm).
D38999/41 box-mount hermetic receptacles, Eaton type H2

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Dimensions are stated as inches (mm).
D38999/45 solder-mount hermetic receptacles, Eaton type H1

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Dimensions are stated as inches (mm).
D38999/48 weld-mount hermetic receptacles, Eaton type H4

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Dimensions are stated as inches (mm).
**Printed-circuit-board contact terminations**

**PC tail contact terminations solder directly to printed circuit boards**

- Available for general-purpose connectors in contact sizes 22D through 12. For hermetic and filtered connectors, please refer to the ordering-information table on the next page.
- Contact material: Copper alloy per QQ-C-530.
- Contact finish: Gold plate per MIL-G-45204, Type II, Grade C, Class 1 over nickel per QQ-N-290.
- Mating portions of pin per MIL-C-39029/58 and socket per MIL-C-39029/56 as applicable.
- Solders directly to printed-circuit boards using standard through-hole-soldering processes.

**Printed circuit board contacts - sockets**

![Socket Diagram]

<table>
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<tr>
<th>Contact Size</th>
<th>Socket Part Number</th>
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<th>B (in)</th>
<th>C (in)</th>
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Dimensions are stated as inches (mm).
Ordering information

Printed circuit board contacts - pins

How To Order

Hermetic Connectors
Contact Eaton to discuss customer-specific part numbers that designate PC tail lengths.

Filtered Connectors
Contact Eaton to discuss customer-specific part numbers that designate PC tail lengths.

All Other Connectors
Select “A” or “B” contact styles when ordering connectors and specify the appropriate PCB-terminated contact part numbers on your purchase order.

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Dimensions are stated as inches (mm).
Assembly instructions and tools

Crimp Tools and Positioners

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<th>Crimp Tool Part Number</th>
<th>Positioner Part Number</th>
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<table>
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<tr>
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<th>Crimp Tool Part Number</th>
<th>Positioner Part Number</th>
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Contact Eaton for Power-Breech™ contact-tool information.

Wire stripping
Strip insulation from end of wire to be crimped. Do not cut or damage wire strands.

Contact crimping
1. Insert stripped wire into contact crimp pot. Wire must be visible through inspection hole.
2. Using correct crimping tool and locator. Cycle the tool once to be sure the indenters are open. Insert contact and wire into locator. Squeeze tool handle firmly and completely to insure a proper crimp. The tool will not release unless the crimp indenters of tool is fully actuated.
3. Release crimped contact and wire from tool. Inspect the wire to be certain wire is visible through inspection hole in contact.

Contact insertion

1. Insert wire into the insertion tool.
2. Slide insertion tool to the shoulder of the contact.
3. Stop insertion tool at the shoulder of the contact.
4. Use isopropyl alcohol to lubricate the grommet seal. Insert contact through grommet seal and wiggle until the contact locks in retainer clip.

Contact extraction

1. Insert wire into insertion tool.
2. Use isopropyl alcohol to lubricate the grommet seal. Slide insertion tool along wire into grommet seal.
3. Press the insertion tool until seated firmly. Pull wire and insertion tool out to remove contact.