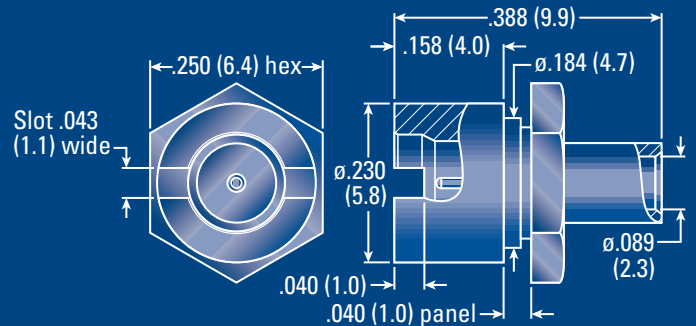
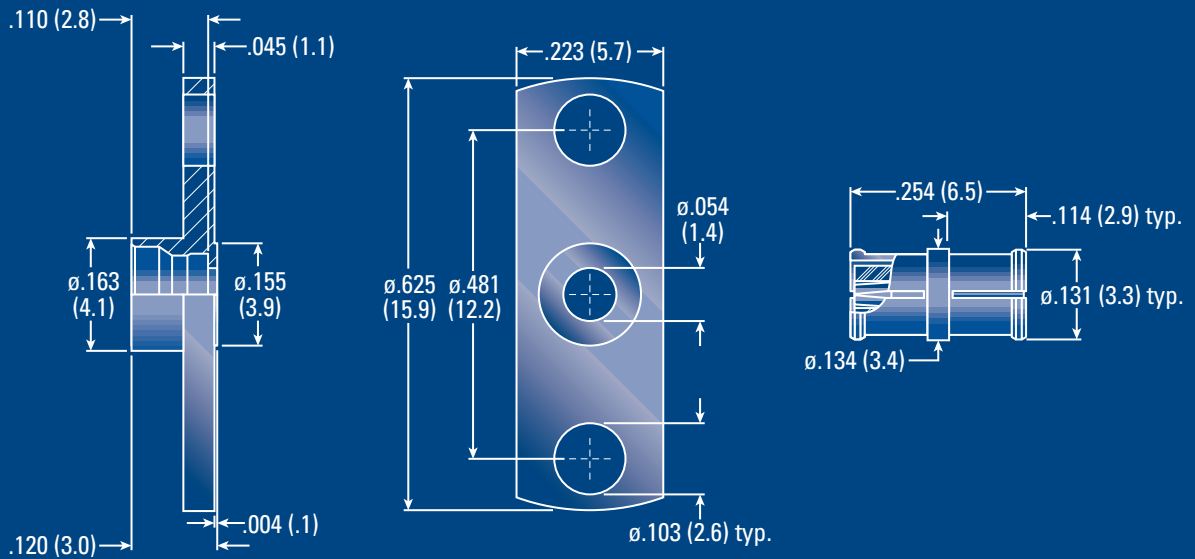
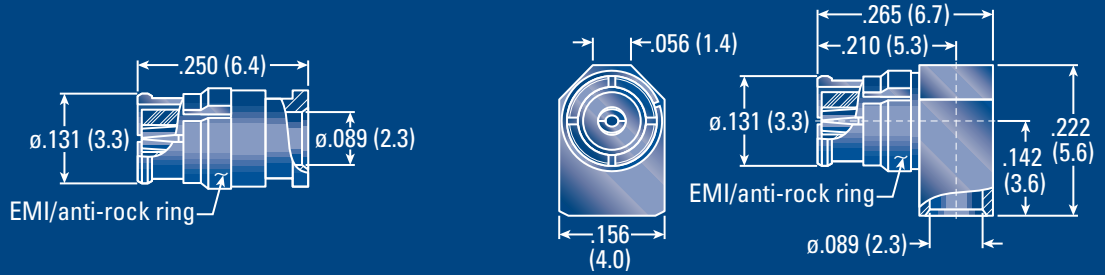


# SMP Series Microminiature Coaxial Connectors



## APPLIED ENGINEERING PRODUCTS

104 John W. Murphy Drive • P.O. Box 510 • New Haven, CT 06513  
 (203) 776-2813 • FAX (203) 776-8294  
 www.aep.us • e-mail: aepsales@aep.us



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### Assembly Procedures

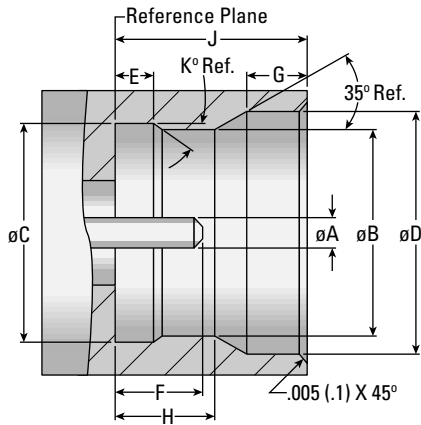
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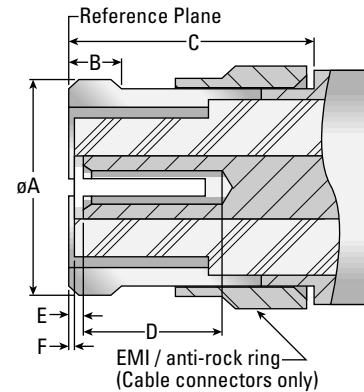


## SMP Male Interface Dimensions



| Dimension | Full Detent |       | Limited Detent |       | Smooth Bore |      |
|-----------|-------------|-------|----------------|-------|-------------|------|
|           | Min.        | Max.  | Min.           | Max.  | Min.        | Max. |
| øA        | .014        | .016  | .014           | .016  | .014        | .016 |
| øB        | .114        | .118  | .118           | .122  | .123        | .127 |
| øC        | .124        | .126  | .124           | .126  | N/A         | N/A  |
| øD        | .139        | .145  | .139           | .145  | .139        | .145 |
| E         | .0205       | .0235 | .0205          | .0235 | N/A         | N/A  |
| F         | .045        | .055  | .045           | .055  | .045        | .055 |
| G         | .033        | .037  | .033           | .037  | .033        | .037 |
| H         | .051        | .057  | .054           | .060  | .059        | .065 |
| J         | .108        | .112  | .108           | .112  | .108        | .112 |
| K         | 28°         | 32°   | 28°            | 32°   | N/A         | N/A  |

## SMP Female Interface Dimensions



| Dimension | Cabled |      | Uncabled |      |
|-----------|--------|------|----------|------|
|           | Min.   | Max. | Min.     | Max. |
| øA        | —      | .135 | —        | .135 |
| B         | .025   | .035 | .018     | .025 |
| C         | .132   | —    | .112     | —    |
| D         | .070   | —    | .070     | —    |
| E         | .000   | .008 | .000     | .008 |
| F         | .000   | .010 | .000     | .010 |

## SMP Specifications

### Materials:

**Body Components:** Beryllium copper per ASTM B196, Condition HT, or stainless steel per ASTM A582, type 303.  
**Contacts:** Beryllium copper per ASTM B196, Condition HT.  
**Insulators:** Teflon (PTFE) per ASTM D1710.

### Finish:

**Center contacts:** Gold plated per MIL-G-45204, Type II, Class 1, Grade C.  
**Other metal parts:** Gold plated (beryllium copper or stainless steel) or passivated (stainless steel) to meet current MIL-PRF-39012 corrosion requirements.

### Electrical:

**Impedance:** 50Ω.  
**Frequency range:** DC–40 GHz.  
**Voltage Rating:** 335V RMS max. @ sea level; 65 V RMS max. @ 70,000 feet.  
**Dielectric Withstanding Voltage:** 500V RMS min. @ sea level; 125 V RMS min. @ 70,000 feet.  
**VSWR:** DC–23 GHz: 1.10:1 max; 23–26.5 GHz: 1.15:1 max; 26.5–40 GHz: 1.35:1 max.\*  
**Insertion Loss:** .10 √F (GHz) (female bullets); .12 √F (GHz) (cable connectors).  
**Insulation Resistance:** 5,000 megohms minimum.  
**Contact Resistance:** Center contact: 6.0 milliohms maximum. Outer contact: 2.0 milliohms maximum.  
**Corona Level:** 190V min. @ 70,000 feet.  
**RF Highpot:** 325V RMS @ 5 MHz.  
**RF Leakage:** -80 dB min. to 3 GHz; -65 dB min. 3 GHz–26.5 GHz.

### Mechanical:

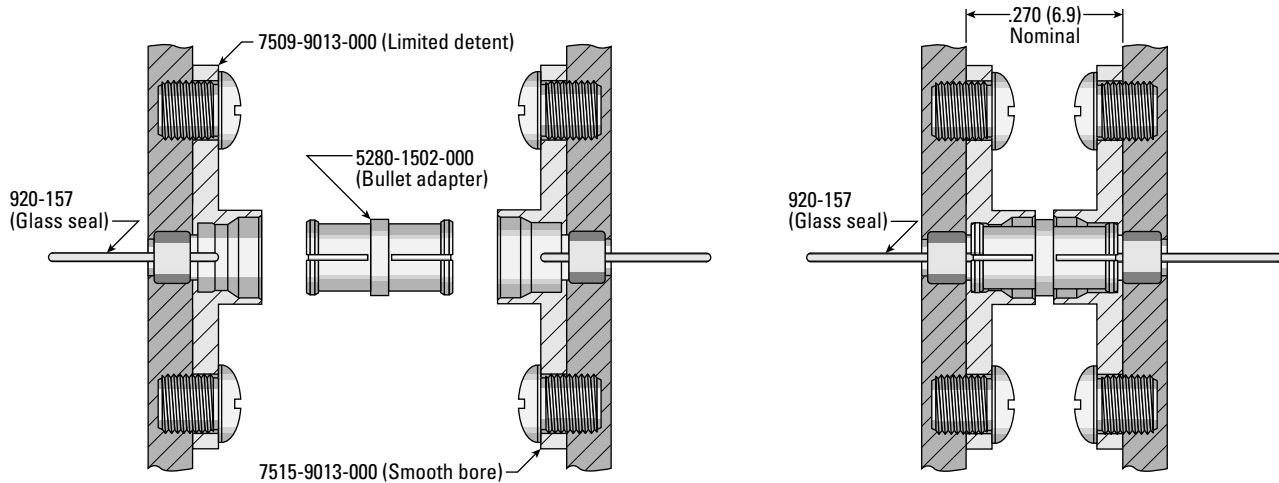
**Force to Engage:** Full Detent, 15 pounds. Limited Detent, 10 pounds. Smooth Bore, 2 pounds.  
**Force to Disengage:** Full Detent, 5 pounds. Limited Detent, 2 pounds. Smooth Bore, .5 pounds.  
**Contact Retention:** 1.5 pounds min. axial force.  
**Axial Misalignment:** .000 / .010".  
**Radial Misalignment:** .010" centerline to centerline (.020" with special shrouds).  
**Durability:** Full Detent, 100 mating cycles min. Limited Detent, 500 mating cycles min. Smooth Bore, 1,000 mating cycles min.  
**Environmental (MIL-STD-202):**  
**Temperature Range:** -65° C to +165° C.  
**Vibration:** Method 204, condition D.  
**Mechanical Shock:** Method 213, condition I.  
**Thermal shock:** Method 107, condition B.

\*VSWR for P/N 5280-1502-000 "bullet" adapter. Performance of other configurations may vary. Contact factory for additional information.

These specifications change periodically with updates to MIL-PRF-39012 requirements. Contact factory for latest specifications.

## Panel Mounted Shrouds

### With Bullet Adapter



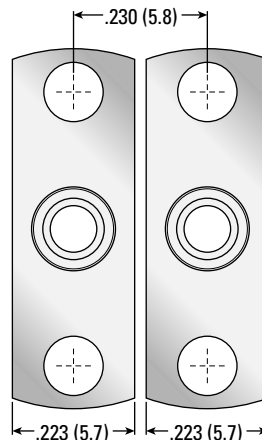
In low-profile, blind-mate applications, flange-mount shrouds are used with “bullet” adapters to provide axial and radial “float” for proper mating.

The bullet adapter mates with the pins of glass-to-metal hermetic seals soldered into the panels.

In these applications, one of the shrouds is typically a “limited detent” type, and the other a “smooth bore” type. This pairing keeps mating and unmating forces to a minimum, and retains the bullet adapter in the “limited detent” shroud when the panels are separated.

The space between panels when mated can be changed by the use of different-length bullet adapters.

### Spacing for Mounted Shrouds

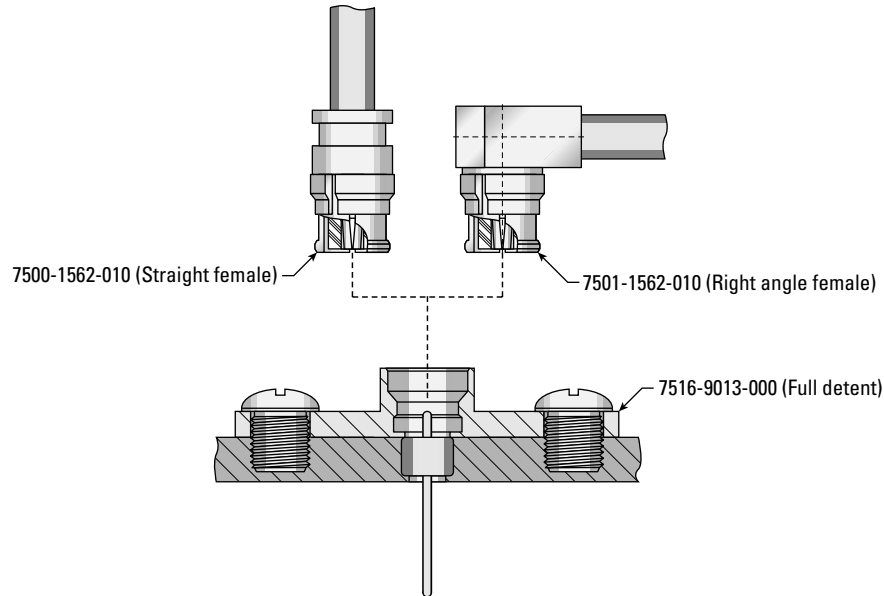


Shrouds may be mounted with centerline spacing as little as .230" for units with .223" wide flanges. Narrower flanges can be provided to allow for spacing as little as .170" (4.3 mm).

See next page for cable connector applications

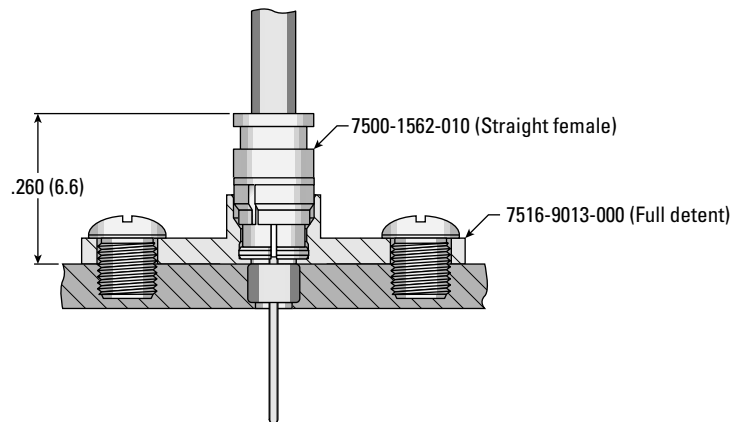
## Panel Mounted Shrouds

### With Cable Connectors

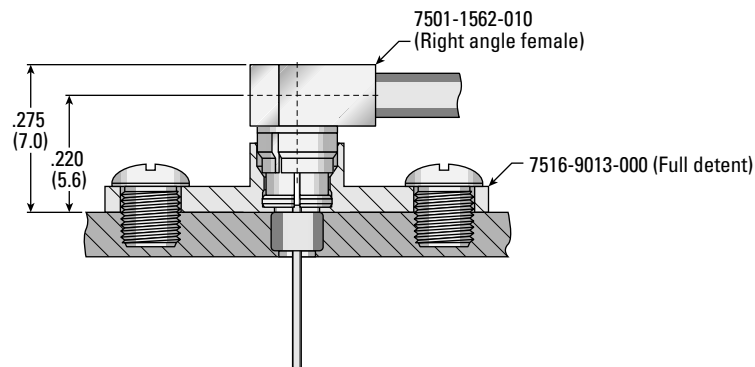


A "full-detent" shroud is used in applications with cable connectors to provide secure mating.

### Height above panel for typical straight cable connector



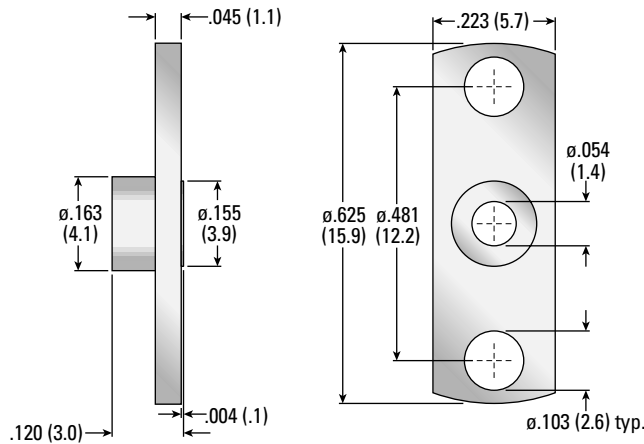
### Height above panel for typical right angle cable connector



# SMP Shrouds and Adapters



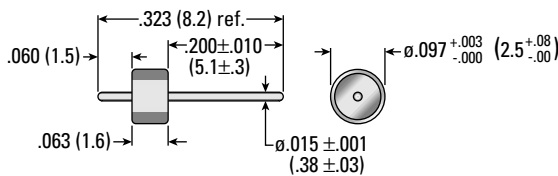
## Male Shrouds For Use With Hermetic Seals



| Detent Type    | AEP P/N       |
|----------------|---------------|
| Full Detent    | 7516-9013-000 |
| Limited Detent | 7509-9013-000 |
| Smooth Bore    | 7515-9013-000 |

Body material: Stainless steel

## Hermetic Seal



| AEP P/N |
|---------|
| 920-157 |

### Materials:

**Outer Ring and Pin:** Kovar.

**Glass Bead:** Corning 7070 or equivalent.

### Finish:

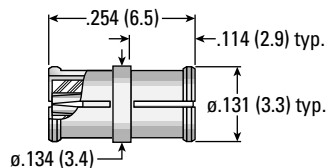
**Outer Ring and Pin:** Gold plated per MIL-G-45204, type II, Grade C, Class 1, over nickel per MIL-C-26074, Class I, over copper per MIL-C-14550.

### Hermeticity:

**Leak Rate:** Less than  $1 \times 10^{-8}$  cc/second.

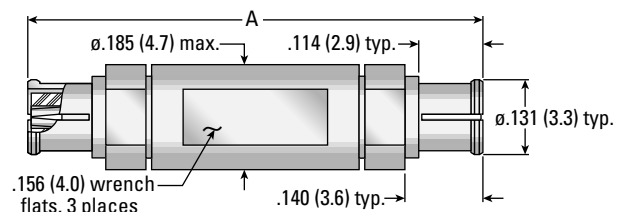
See page 9 for hermetic seal installation instructions.

## Female-to-Female Straight Bullet Adapters For Use With Shrouds



| AEP P/N       |
|---------------|
| 5280-1502-000 |

Body material: Beryllium copper

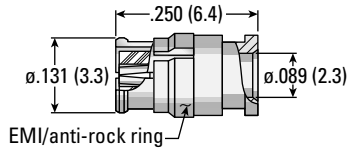


| A            | AEP P/N       |
|--------------|---------------|
| .805 (20.4)  | 5280-1502-001 |
| 1.142 (29.0) | 5280-1502-002 |

Body material: Beryllium copper

## Straight Female Cable Connectors (Direct Solder for Semi-Rigid Cable)

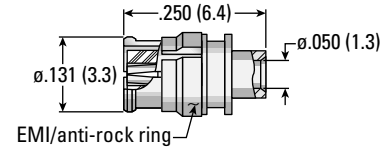
For .086" semi-rigid cable



| TYPE           | AEP P/N       |
|----------------|---------------|
| Standard       | 7500-1562-010 |
| High Frequency | 7500-1262-010 |

Body material: Beryllium copper

For .047" semi-rigid cable

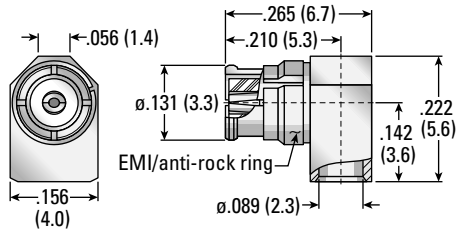


| AEP P/N       |
|---------------|
| 7500-1582-011 |

Body material: Beryllium copper

## Right Angle Female Cable Connectors (Direct Solder for Semi-Rigid Cable)

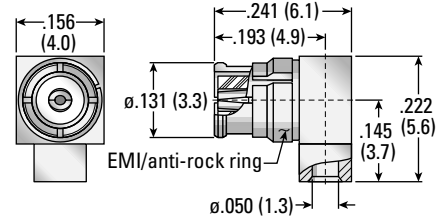
For .086" semi-rigid cable



| AEP P/N       |
|---------------|
| 7501-1562-010 |

Body material: Beryllium copper

For .047" semi-rigid cable

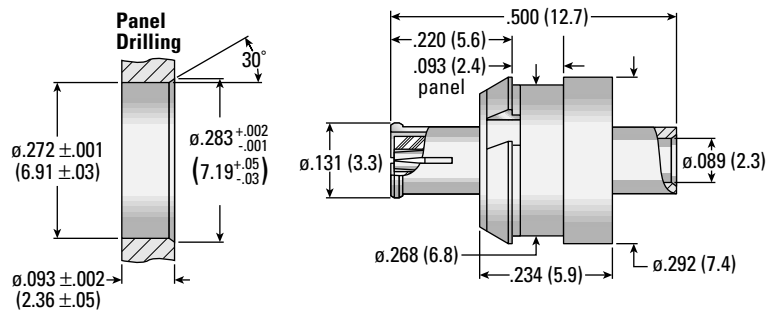


| AEP P/N       |
|---------------|
| 7501-1562-011 |

Body material: Beryllium copper

## Straight Female Cable Connector (Direct Solder for Semi-Rigid Cable)

For .086" semi-rigid cable—Snap-In panel mounting (float Mount)



| AEP P/N       |
|---------------|
| 7504-2282-010 |

Body material: Beryllium copper

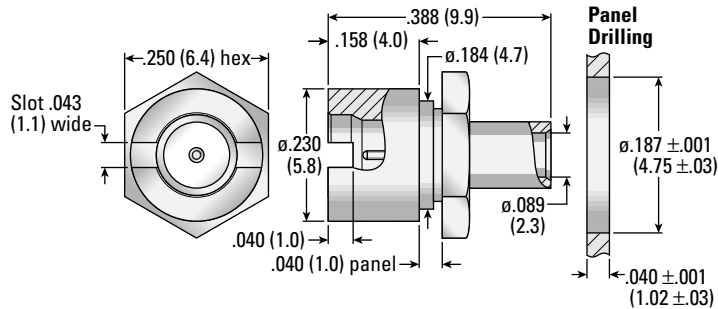
Cable assembly instructions are shipped with each connector.

# SMP Cable Connectors



## Straight Male Cable Connector (Direct Solder for Semi-Rigid Cable)

Captive Contact, for .086" semi-rigid / .040" thick panel

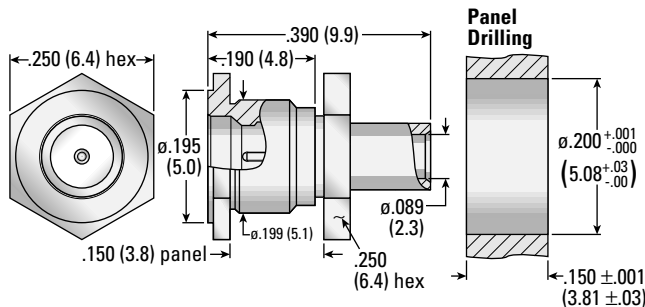


| Detent Type    | AEP P/N       |
|----------------|---------------|
| Full Detent    | 7503-1582-010 |
| Limited Detent | 7506-1582-010 |
| Smooth Bore    | 7502-1582-010 |

Body material: Beryllium copper

## Straight Male Cable Connector (Direct Solder for Semi-Rigid Cable)

Captive Contact, for .086" semi-rigid / .150" thick panel

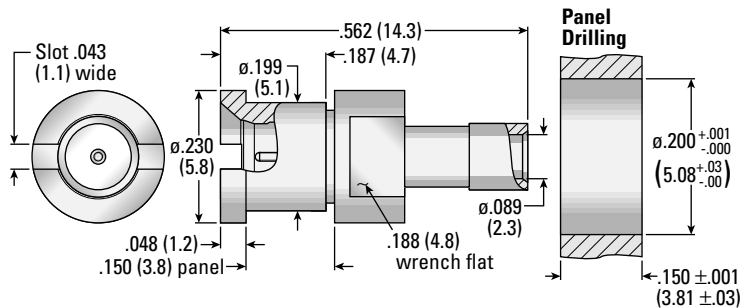


| Detent Type    | AEP P/N       |
|----------------|---------------|
| Full Detent    | 7503-1582-110 |
| Limited Detent | 7506-1582-110 |
| Smooth Bore    | 7502-1582-110 |

Body material: Beryllium copper

## Straight Male Cable Connector (Catcher's Mitt\* Direct Solder for Semi-Rigid Cable)

Non-Captive Contact, for .086" semi-rigid / .150" thick panel



| Detent Type    | AEP P/N       |
|----------------|---------------|
| Full Detent    | 7503-1083-010 |
| Limited Detent | 7506-1083-010 |
| Smooth Bore    | 7502-1083-010 |

Body material: Stainless Steel

\*The "Catcher's Mitt" configuration features a wider-than-standard flare at the mating end, increasing its ability to "capture" a misaligned mating connector and guide it to center for proper mating.

These panel connectors have two-piece bodies; after the rear assembly is inserted through the panel, the front shroud is assembled and tightened with a screwdriver or wrench.

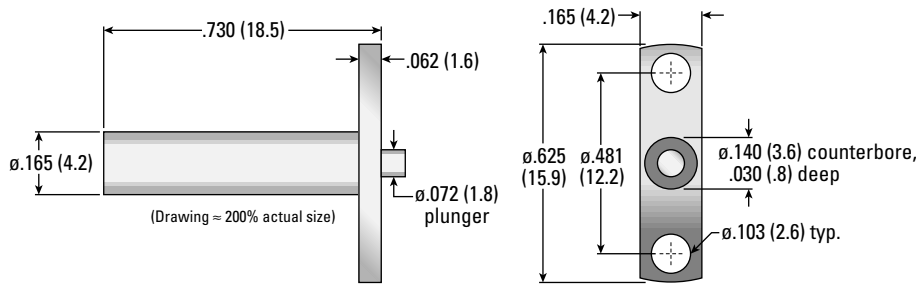
**Cable assembly instructions are shipped with each connector.**



# SMP Hermetic Seal Installation



## Hermetic Seal Fixturing Tool

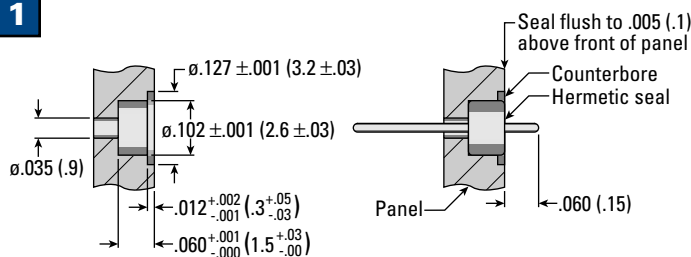


AEP P/N  
TA-0453

Body material: Tool steel

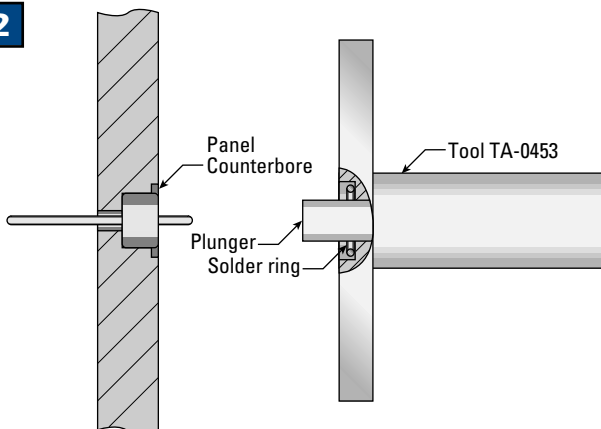
## Hermetic Seal Installation

1



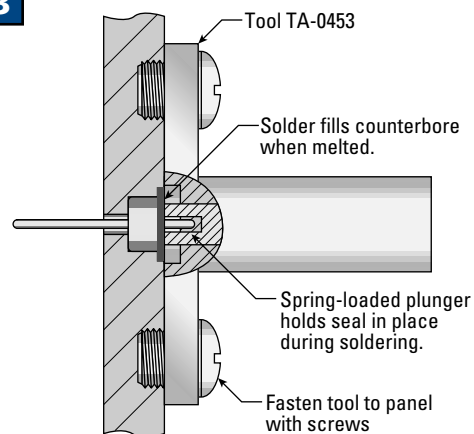
- Drill panel as shown.
- Front of seal should be as close to flush as possible with front surface of panel; if front of seal is below panel surface, an air gap is created which adversely affects electrical performance.
- Front of seal should be flush with front surface of panel, but may protrude up to .005" without affecting performance.

2



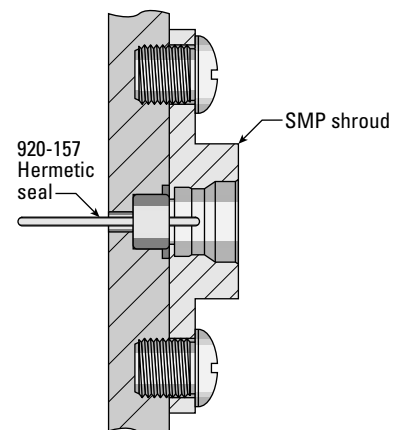
- Form solder ring of a size to completely fill panel counterbore when melted.
- Place preformed solder ring into counterbore of tool.

3



- Secure tool to panel with screws.
- Apply heat to completely melt solder.
- Remove tool only after solder joint has cooled.

4



- Secure SMP shroud flange to panel with screws.



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# Index by Part Number



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| 5280-1502-002        | Straight female-to-female adapter  | 6    |
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| 7500-1562-010        | Straight female, direct solder, .086" semi-rigid                                       | 7    |
| 7500-1582-011        | Straight female, direct solder, .047" semi-rigid                                       | 7    |
| 7501-1562-010        | Right angle female (soldered center contact), direct solder, .086" semi-rigid          | 7    |
| 7501-1562-011        | Right angle female (soldered center contact), direct solder, .047" semi-rigid          | 7    |
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| 7503-1582-010        | Straight male bulkhead, full detent, direct solder, .086" semi-rigid                   | 8    |
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| 7506-1083-010        | Straight male bulkhead, limited detent, catchers mitt, direct solder, .086" semi-rigid | 8    |
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| 7509-9013-000        | Straight male shroud (no center contact), limited detent, 2-hole flange mount          | 6    |
| 7515-9013-000        | Straight male shroud (no center contact), smooth bore, 2-hole flange mount             | 6    |
| 7516-9013-000        | Straight male shroud (no center contact), full detent, 2-hole flange mount             | 6    |
| 920-157              | Male 50 ohm hermetic glass seal for use with shrouds                                   | 6    |
| TA-0453              | Glass seal soldering fixture   | 9    |

## Disclaimer

All information in this brochure is correct and factual to the best of our knowledge at the time of preparation. We reserve the right to make changes in products and / or specifications at any time, including (but not limited to) changes required by updates to applicable military specifications. This catalog may have been updated since the time of printing; please call or visit our website at [www.aep.us](http://www.aep.us) for latest version.





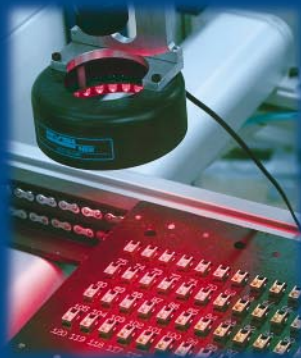
| Competitive Cross-Reference |  |               |
|-----------------------------|--|---------------|
| Gilbert P/N                 | Description  | AEP P/N       |
| 0119-422-3                  | Straight male bulkhead, full detent, catcher's mitt, direct solder, .086" semi-rigid   | 7503-1083-010 |
| 0119-435-3                  | Straight male bulkhead, smooth bore, catcher's mitt, direct solder, .086" semi-rigid   | 7502-1083-010 |
| 0119-447-1                  | Straight male bulkhead, smooth bore, direct solder, .086" semi-rigid                   | 7502-1582-010 |
| 0119-447-1-FD               | Straight male bulkhead, full detent, direct solder, .086" semi-rigid                   | 7503-1582-010 |
| 0119-447-1-LD               | Straight male bulkhead, limited detent, direct solder, .086" semi-rigid                | 7506-1582-010 |
| 0119-487-3                  | Straight male bulkhead, limited detent, catchers mitt, direct solder, .086" semi-rigid | 7506-1083-010 |
| 0119-611-1                  | Straight male bulkhead, full detent, direct solder, .086" semi-rigid                   | 7503-1582-110 |
| 0119-668-3                  | Straight female bulkhead, snap-in float mount, direct solder, .086" semi-rigid         | 7504-2282-010 |
| 0119-815-1                  | Right angle female (soldered center contact), direct solder, .086" semi-rigid          | 7501-1562-010 |
| 0119-833-3                  | Straight male shroud (no center contact), limited detent, 2-hole flange mount          | 7509-9013-000 |
| 0119-845-1                  | Right angle female (soldered center contact), direct solder, .047" semi-rigid          | 7501-1562-011 |
| 0119-872-1                  | Straight male bulkhead, smooth bore, direct solder, .086" semi-rigid                   | 7502-1582-110 |
| 0119-925-1                  | Straight female, direct solder, .086" semi-rigid, high frequency                       | 7500-1262-010 |
| 0119-930-1                  | Straight female, direct solder, .047" semi-rigid                                       | 7500-1582-011 |
| 0119-945-1                  | Straight female-to-female "bullet" adapter   | 5280-1502-000 |
| 0119-948-3                  | Straight male shroud (no center contact), full detent, 2-hole flange mount             | 7516-9013-000 |
| 0119-955-3                  | Straight male shroud (no center contact), smooth bore, 2-hole flange mount             | 7515-9013-000 |
| 0270-012-1                  | Male 50 ohm hermetic glass seal for use with shrouds                                   | 920-157       |
| A014-B11-01                 | Straight female, direct solder, .047" semi-rigid                                       | 7500-1582-011 |
| A014-D11-01                 | Straight female, direct solder, .086" semi-rigid                                       | 7500-1562-010 |
| A016-D73-01                 | Straight male bulkhead, full detent, direct solder, .086" semi-rigid                   | 7503-1582-010 |
| A016-D74-01                 | Straight male bulkhead, limited detent, direct solder, .086" semi-rigid                | 7506-1582-010 |
| A016-D76-01                 | Straight male bulkhead, smooth bore, direct solder, .086" semi-rigid                   | 7502-1582-010 |
| A018-D11-01                 | Straight female bulkhead, snap-in float mount, direct solder, .086" semi-rigid         | 7504-2282-010 |
| A1A1-0001-01                | Straight female-to-female "bullet" adapter   | 5280-1502-000 |
| Y007-L42-04                 | Male 50 ohm hermetic glass seal for use with shrouds                                   | 920-157       |



## About AEP

Since our foundation in 1973, our goal has been to tailor our equipment and processes toward satisfying customer and market demand, no matter how circumstances change. To that end, our modern plant, with recent expansion, provides vertically-integrated machining, assembly, and testing to ensure the product quality and on-time delivery that have always been our hallmark.

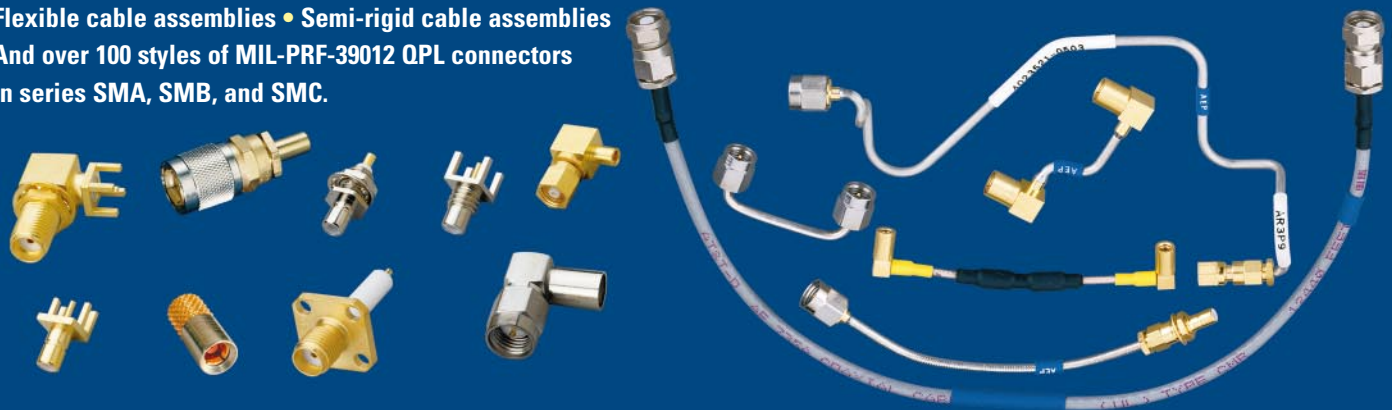
"Continuous Improvement Equals Customer Satisfaction" is not just a slogan; we believe it's the best and only way to do business.



## Other AEP Products

The SMP connectors in this brochure are only part of our complete line of coaxial connectors and cable assemblies, including:

- SMA • SMB • SMC • SSMA • SSMB • SSMC • SLB (Slide-on version of SMB) • SSLB (Slide-on version of SSMB)
- MCX • MMCX • 75Ω Miniature SMB • 75Ω Snap-on mating • 75Ω Screw-on mating • Adapters within and between series
- Flexible cable assemblies • Semi-rigid cable assemblies
- And over 100 styles of MIL-PRF-39012 QPL connectors in series SMA, SMB, and SMC.



## APPLIED ENGINEERING PRODUCTS

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