

## Circular Plastic Connector Sealing Accessories

### Sealing Caps

for Receptacles only

Sealing caps are used to protect exposed contacts of unmated receptacles.

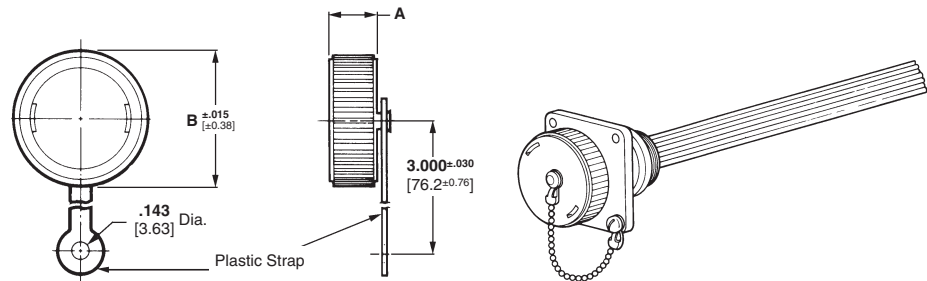
### Material and Finish

**Cap**—Thermoplastic, heat stabilized, fire resistant, self-extinguishing, 94V-1 rated, black

**Sealing Gasket**—Neoprene, black

**Bead Chain**—Steel, nickel plated

**Bead Chain Coupling**—Brass, plated nickel

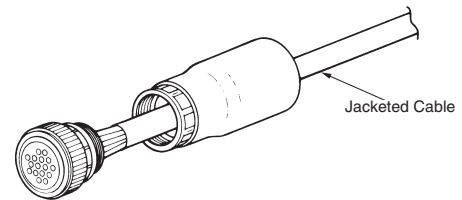
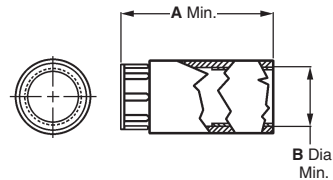


| Shell Size | Series    | Dimensions    |                | Plastic Strap Part No. | Metal Bead Chain Part No. |
|------------|-----------|---------------|----------------|------------------------|---------------------------|
|            |           | A             | B              |                        |                           |
| 11         | 1 & 2     | .360<br>9.14  | .927<br>23.55  | 206903-1               | 208800-1                  |
| 13         | 1         | .360<br>9.14  | 1.055<br>26.80 | 211870-1               | 213485-1                  |
| 17         | 1,2,& 3   | .360<br>9.14  | 1.295<br>32.89 | 207445-1               | 208652-1                  |
| 23         | 1, 3, & 4 | .460<br>11.68 | 1.728<br>43.89 | 207446-1               | 208680-1                  |
|            | 2         |               |                | 207446-2               | 208680-2                  |

### Cable Entry Seals

Heat Shrinkable Sealing Boots

Cable entry seals are used with jacketed cable to provide an environmentally sealed wire-to-connector system. They can be used with either plugs or receptacles.



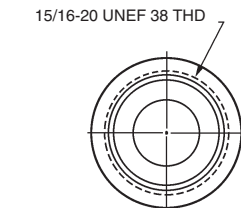
| Shell Size | Dimensions     |                | Expanded Wall Thickness | Sealing Range (Dia.)          | Max. Recovered Inside Diameter | Part No. |
|------------|----------------|----------------|-------------------------|-------------------------------|--------------------------------|----------|
|            | A              | B              |                         |                               |                                |          |
| 11         | 2.500<br>63.50 | .625<br>15.88  | .050<br>1.27 Ref.       | .250 - .600<br>6.35 - 15.24   | .160<br>4.06                   | 54010-4  |
|            |                |                |                         |                               | .250<br>6.35                   | 54010-1  |
| 13         | 2.500<br>63.50 | .775<br>19.68  | .060 Ref.<br>1.52       | .250 - .375<br>6.35 - 9.53    | .220<br>5.59                   | 54123-2  |
|            |                |                |                         | .375 - .725<br>9.53 - 18.42   | .300<br>7.62                   | 54123-1  |
| 17         | 2.500<br>63.50 | .975<br>24.76  | .060 Ref.<br>1.52       | .400 - .875<br>10.16 - 22.22  | .375<br>9.52                   | 54011-1  |
|            | 3.000<br>76.20 |                |                         |                               |                                | 54011-3  |
| 23         | 3.000<br>76.20 | 1.250<br>31.75 | .070 Ref.<br>1.78       | .550 - 1.250<br>13.97 - 31.75 | .500<br>12.70                  | 54012-1  |

### Thick Wall Boots

#### Material

**Internal Sleeve**—Nylon

**Outer Tubing**—Polyolefin, black



### Thin Wall Boot

#### Material

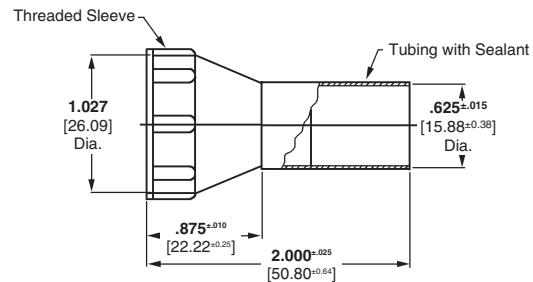
**Inter Sleeve**—Nylon

**Outer Tubing**—Polyolefin

**Expanded Wall Thickness**—.020 [0.51]

**Max. Recovered Wall Thickness**—.040 [10.16]

**Sealing Range**—.250 [6.35]-.500 [12.70] Dia.



Shell Size 17  
Part No. 213933-1

## Circular Plastic Connector Sealing Accessories (Continued)

### Jacketed Cable Seals (for Shell Size 23)

A jacketed cable seal kit provides an environmentally sealed connection for jacketed cable.

#### Material

**Peripheral Seal**—Grey elastomer

**Collar**—Aluminum

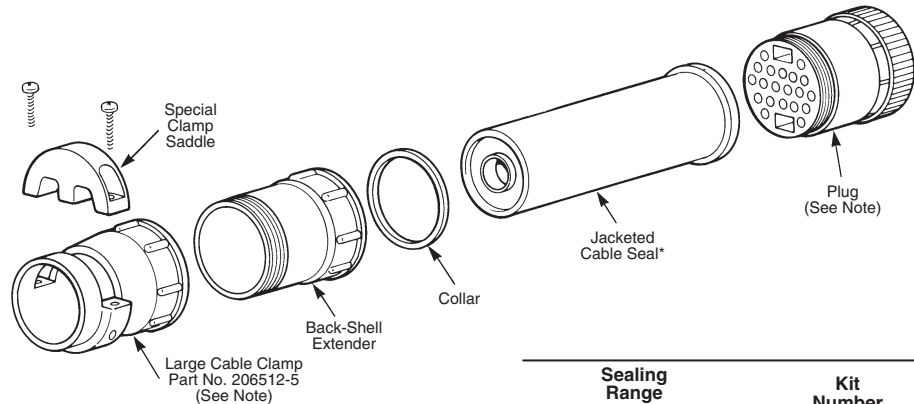
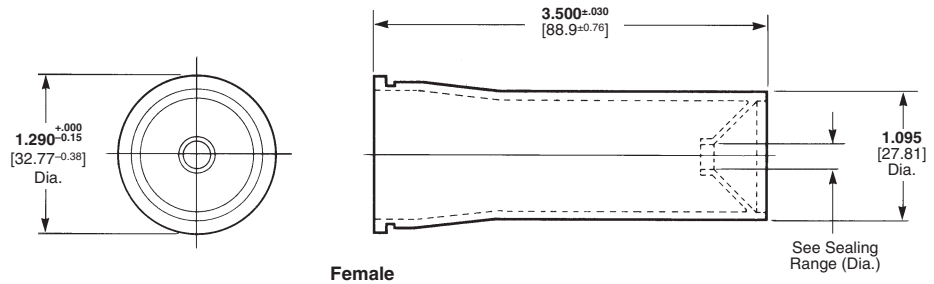
**Jacketed Cable Seal**—Black rubber

**Back-Shell Extender**—Black glass-filled thermoplastic

**Special Clamp Saddle**—Black thermoplastic

**Note:** Jacketed cable seals must be used with large cable clamps and can be used on plugs or receptacles. Large cable clamps are to be ordered separately (see page 38). Each jacketed cable seal kit includes:

- Peripheral Seal—to be discarded if kit is used on plug. Additional seals may be purchased (see page 51)
- Collar—provides bearing surface for back-shell extender
- Jacketed Cable Seal
- Back-Shell Extender
- Special Clamp Saddle—to be used in lieu of clamping insert supplied with large cable clamp



\*Jacketed cable seal is pressed flush against rear connector face when back-shell extender is threaded onto rear of connector.

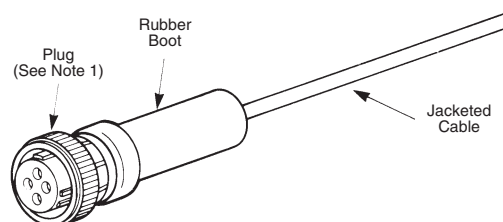
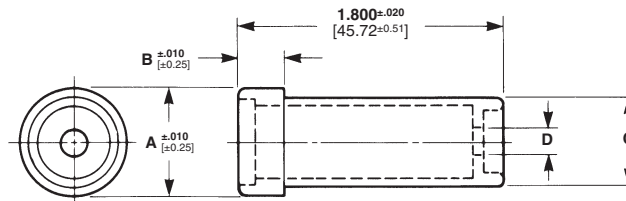
| Sealing Range (Dia.)     | Kit Number |
|--------------------------|------------|
| .300-.450<br>7.62-11.43  | 207052-1   |
| .450-.600<br>11.43-15.24 | 207052-2   |
| .600-.875<br>15.24-22.22 | 207052-3   |

### Rubber Boot

Rubber boots are used with jacketed cable to provide splash-proof connections for Series 1 and Series 3 connectors. (Not for Metal Shell Connectors.)

#### Material

Black neoprene



| Shell Size | Cable Dia. Sealing Range | Dimensions    |              |               |              | Part No. |
|------------|--------------------------|---------------|--------------|---------------|--------------|----------|
|            |                          | A             | B            | C             | D            |          |
| 11         | .219-.438<br>5.56-11.13  | .750<br>19.05 | .300<br>7.62 | .600<br>15.24 | .170<br>4.32 | 206304-1 |

- Notes:**
1. Rubber boots are recommended for use with jacketed cable and can be used on plugs or receptacles, except Series 2 connectors.
  2. For detailed performance data on rubber boots, refer to Product Specification No. 108-10024.

## Circular Plastic Connector Sealing Accessories (Continued)

### Flexible Cable Protection System

#### Product Facts

- For cables that require better protection
- Fittings allow more reliable connections to be made
- Sealed fittings enhance reliability of machinery operating under many extreme environmental conditions encountered in manufacturing and construction industries
- High-quality, complete systems are available combining innovative technology with rapid in-stock availability
- Conforms with the latest industry standards
- Recognized under the Component Program of Underwriters Laboratories Inc.  on applied products as marked.
- Certified by Canadian Standards Association on applied products as marked. 
- Certified by VDE on applied products as marked. 

#### Related Product Data

Catalog 1654227  
Identification Products

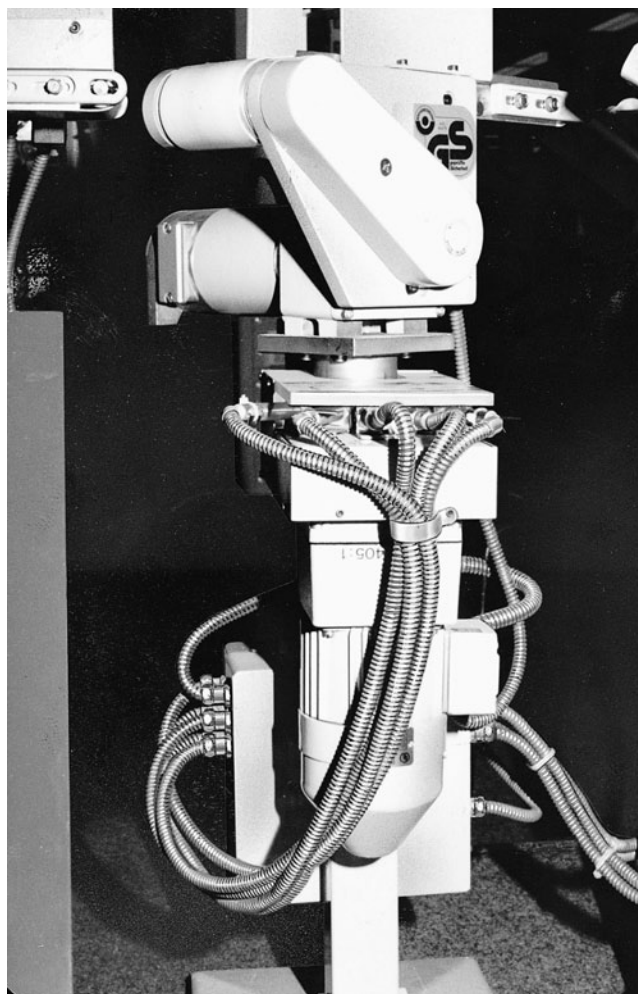
#### Technical Documents

##### Product Specifications

108-1696 FLEXAgraff Metal Conduits  
108-1696-1 ROHRflex Plastic Tubing  
108-1696-2 AIRflex Plastic Conduits

##### Application Specifications

114-18274 FLEXAgraff-AS, -PU-AS, -ME-ASF Metal Conduits  
114-18275 FLEXAgraff-CU Metal Conduits  
114-18276 AIRflex-KUW-PU Plastic Conduits  
114-18277 ROHRflex-PA 6, ROHRflex-PA 6 S, ROHRflex-PA 12 Plastic Tubing



Typical Industrial Application



### Circular Plastic Connectors (CPC) / FLEXAquick-System Selection Aid

| CPC Shell Size | Female ROHRflex quick Connector | ROHRflex-PA 6 Plastic Tubing | Male ROHRflex quick Connector | Male ROHRflex quick Elbow Connector | Counternut | Flat Sealing Washer |
|----------------|---------------------------------|------------------------------|-------------------------------|-------------------------------------|------------|---------------------|
| 11             | 1-969807-2                      | 969789-2                     | 969803-2                      | 969817-2                            | 796260-2   | 796257-2            |
| 13             | 1-969809-3                      | 969789-3                     | 969803-3                      | 969817-3                            | 796260-3   | 796257-7            |
| 17             | 1-969811-4                      | 969789-4                     | 969803-4                      | 969817-4                            | 796260-5   | 796257-8            |
| 23             | 2-969813-5                      | 969789-5                     | 969803-5                      | 969817-5                            | 796260-6   | 796257-9            |

#### NOTE:

Request Flexible Cable Protection System Catalog 1307244.

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## Engineering Notes

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## MIL-C-5015 Style Circular Plastic Connectors (CPC)

### Product Facts

- Intermateable with other manufacturers' Metal-Shell Sizes 20-14 and 18-10, MIL-C-5015 Style Connectors
- High impact resistant plastic housing
- Lighter weight
- Lower cost
- Industry accepted, Type III+ pin and socket contacts, available on reels in strip-form for high volume, low cost, automatic machine terminations
- Contacts also available in loose piece form for low volume, prototype or maintenance and repair
- Housing designed to prevent mismatching with other insert arrangements
- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476 
- Certified by Canadian Standards Association, File No. LR 7189 



This new addition to the AMP Circular Plastic Connector Line is specifically designed to be intermateable with other manufacturers' Metal-Shell sizes 20-14 and 18-10, MIL-C-5015 Style Connector Systems. The high impact resistant plastic housing offers the advantages of lighter weight and lower cost than existing metal shell connectors. In addition, the connector design prevents mismatching when used with other insert arrangements. As part of the AMP Multimate Family of Connectors, the MIL-C-5015 style connector offers the additional economies of crimp Type III+ Pin and Socket contacts in reel-mounted, strip-form for high volume automatic machine termination, as well as in loose piece form for low volume, prototype or maintenance and repair.

### Technical Documents

**Application Specification**  
114-10004 Contacts, Type III+

**Product Specifications**  
108-10024 CPC Connectors  
108-10042 Contacts, Type III+

**Instruction Sheets**  
408-7582 Accessories for CPC Connectors  
408-7592-A Improved Strain Relief Clamps for CPC Connectors  
408-7593 CPC Connectors

## MIL-C-5015 Style Circular Plastic Connectors (CPC), Shell Size 20-14

### Plug Kit, Unassembled

Reverse Sex (Accepts pins)

**Part Number 213571-2**

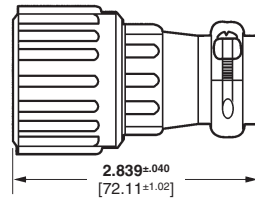
without Cable Clamp

Standard Sex (Accepts sockets)

**Part Number 213652-1**

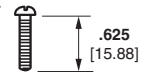
without Cable Clamp

| Cable Clamps | O.D.     |
|--------------|----------|
| Part No.     | Type     |
| 206070-8     | standard |
| 206322-9     | large    |



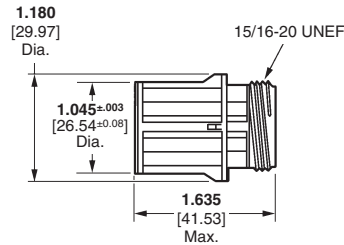
Assembled with Cable Clamp

5-20 Self Tapping Screw,  
Quantity 2

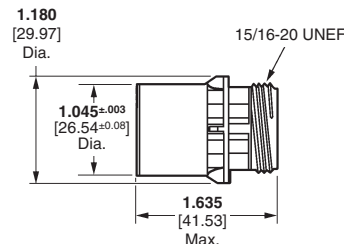


Clamping Inserts

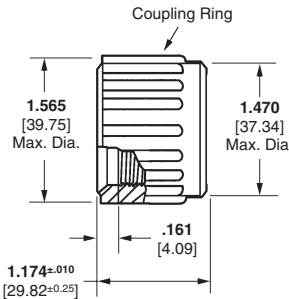
.703  
[17.86]  
Max. Outside Dia.



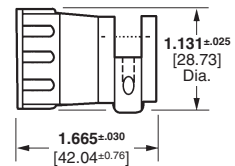
Standard Sex



Reverse Sex



Coupling Ring



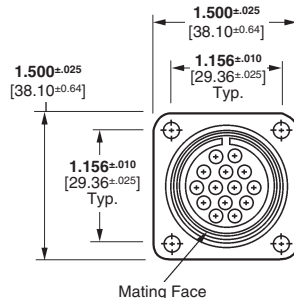
### Receptacle, Square Flange

Reverse Sex (Accepts sockets)

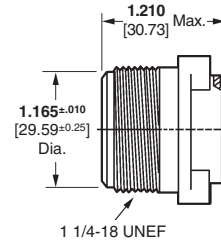
**Part Number 213570-1**

Standard Sex (Accepts pins)

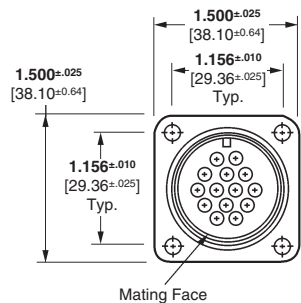
**Part Number 213651-1**



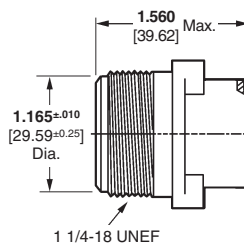
Mating Face



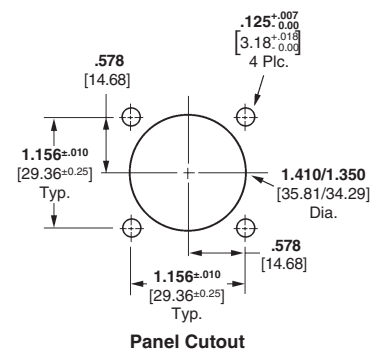
Reverse Sex



Mating Face



Standard Sex

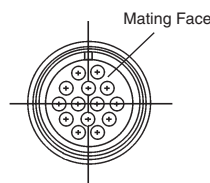


Panel Cutout

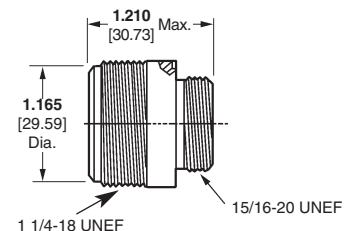
### Receptacle, Free-Hanging

Reverse Sex (Accepts sockets)

**Part Number 213650-1**



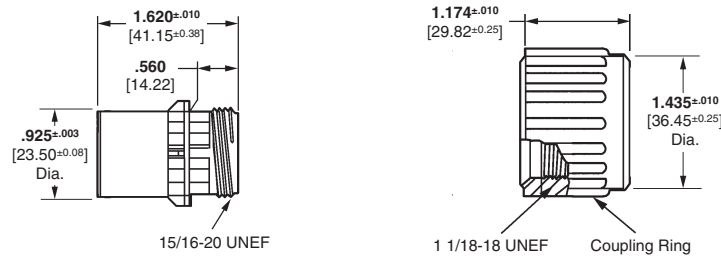
Mating Face



## MIL-C-5015 Style Circular Plastic Connectors (CPC), Shell Size 18-10

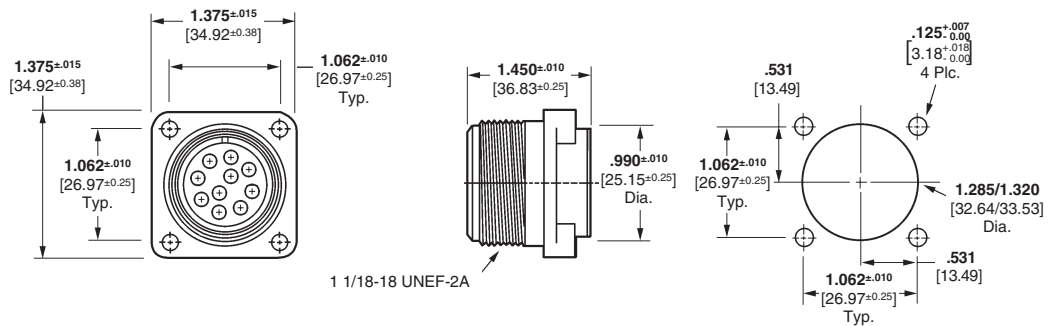
### Plug Kit, Unassembled

Reverse Sex (Accepts pins)  
**Part Number 213671-1**  
without Cable Clamp



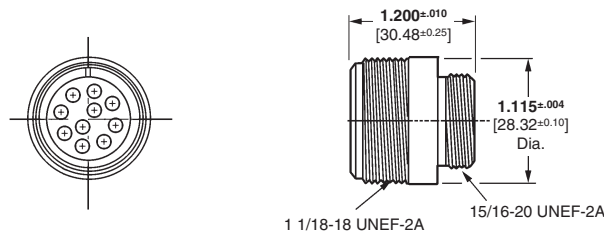
### Receptacle, Square Flange

Reverse Sex (Accepts sockets)  
**Part Number 213667-1**



### Receptacle, Free-Hanging

Reverse Sex (Accepts sockets)  
**Part Number 213668-1**



### Type III+ Contacts

#### Material

**Contact**—Brass

**Spring**—Stainless Steel

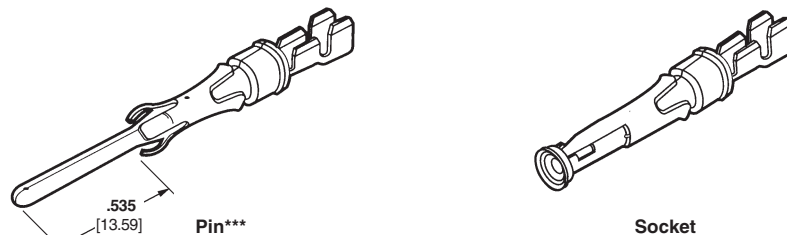
#### Contact Finish

**A**—.000030 [0.00076] gold on the electrical engagement area over .000030 [0.00076] min. nickel

**B**—Tin

#### Related Product Data

**Application Tooling**—Pages 76-79



| Wire Size Range<br>AWG    mm <sup>2</sup> | Ins. Dia.<br>Range     | Contact<br>Finish Code | Strip Form Contact No. |           | Loose Piece Contact No. |         | Strip Form<br>Applicator                                                                                     | Hand Tool<br>Part No. |
|-------------------------------------------|------------------------|------------------------|------------------------|-----------|-------------------------|---------|--------------------------------------------------------------------------------------------------------------|-----------------------|
|                                           |                        |                        | Pin                    | Socket    | Pin                     | Socket  |                                                                                                              |                       |
| 24-20    0.2-0.6                          | .060-.135<br>1.52-3.43 | B                      | 213605-7               | 1-66563-1 | —                       | 66565-7 | 567363-□ <sup>††</sup>                                                                                       | 91542-1 <sup>§</sup>  |
|                                           |                        | A                      | —                      | 66563-8   | —                       | 66565-4 |                                                                                                              |                       |
| 18-14    0.8-2                            | .110-.150<br>2.79-3.81 | B                      | 213603-5               | 66598-9   | 213603-6                | 66601-9 | 466958-1 <sup>††</sup> (for Sockets)<br>or 567364-□ <sup>††</sup><br>or 567834-1 <sup>††</sup> (for Sockets) | 91521-1 <sup>§</sup>  |
|                                           |                        | A                      | 213603-3               | 66598-2   | 213603-4                | 66601-2 |                                                                                                              |                       |

<sup>††</sup>**Note:** Applicators for AMP semiautomatic or fully-automatic termination equipment are available. Contact Technical Support.

<sup>\*\*\*</sup>MIL-C-5015 style connectors require a longer Multimate pin contact. This contact is .145 [3.68] longer than the standard Multimate pin contacts. It is **not** for use in other Multimate connectors, socket contacts are standard Multimate Type III+ contacts.

**Extraction Tool Part No. 305183**

**Note:** Gold-plated contacts should not be mated with tin or silver plated contacts.

<sup>§</sup>To use with the 626 Pneumatic Tool System: remove the crimping head from the Straight Action Hand Tool (SAHT) Assembly, order SAHT Adapter **Part No 217201-1**, Adapter Holder **Part No. 356304-1** (with ratchet) or **189928-1** (without), and Power Unit **Part No. 189721-1** (hand actuated) or **189722-1** (foot actuated).

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## Engineering Notes

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## Metal-Shell Circular Plastic Connectors

### Product Facts

- Economical combination of thermoplastic UL 94V-0 rated connector housings and metal shells
- Available in three sizes:
  - Series 1—Accepts Multimate contacts, shell sizes 14-5, 14-7, 22-16, 28-24, and 28-37 standard sex; 14-5, 14-7, 22-14, and 28-37 reverse sex
  - Series 2—Accepts 20 DF and 20 DM contacts, shell sizes 22-28 and 28-63 standard sex; 22-28 and 28-57 reverse sex
  - Series 3—Accepts Type XII power contacts, shell sizes 22-3 and 28-7 standard and reverse sex
- Series 4—Accepts Multimate contacts, and Type XII power contacts, shell size 28-16M and 28-22M standard sex
- Compatible with MIL Spec metal housing type connectors
- Choice of application tooling to meet all production requirements



AMP Metal-Shell Circular Plastic Connectors offer the reliability of higher priced all metal connectors at a fraction of the cost, and are offered in the more popular contact configurations.

Connector housings are made of lightweight, sturdy, thermoplastic material that are UL 94V-0 rated, with zinc alloy, nickel plated shells for added strength and protection. These connectors are available in a variety of configurations to meet your signal, low current and high current requirements. Operating temperatures range from -55°C to +125°C [-67°F to +257°F].

Signal and low current is provided by a choice of AMP Multimate contacts: .062 [1.57] pin diameter and 20 DF and 20 DM contacts, .040 [1.02] pin diameter. High current requirements are met by the Type XII capable of carrying up to 35 amperes of current.

These quick connect/disconnect circular connectors feature polarized housings to prevent mismatching with other insert arrangements.

AMP Metal-Shell Circular Plastic Connectors are available in square flange receptacles and free-hanging plug connectors.

For additional economy, industry accepted AMP Type III+ pin and socket contacts are available on reels in strip-form for high volume, low cost, automatic machine terminations. For low volume, prototype or maintenance and repair Type III+ contacts are also available in loose piece form.

## Metal-Shell Circular Plastic Connectors, Series 1

### Metal-Shell CPC Connectors, Series 1, Standard Sex



Listed part numbers are for  
connectors only; **contacts must  
be ordered separately.**

#### Material and Finish

##### Square Flange Receptacle—

**Housing**—Thermoplastic, UL 94V-0  
rated, black

**Metal-Shell**—Zinc alloy, plated nickel

**Grooved Pin**—Steel alloy, plated nickel

##### Plug—

**Housing**—Thermoplastic, UL 94V-0  
rated, black

**Metal-Shell**—Zinc alloy, plated nickel

**Tetraseal Seal**—Fluorocarbon

**Retainer Ring**—Stainless steel

**Coupling Ring**—Zinc alloy, plated  
nickel

#### Related Product Data

**Contacts**—Pages 17-21

**Contact Arrangement**—Page 61

**Component Dimensions**—Page 70

**Accessories**—Page 71

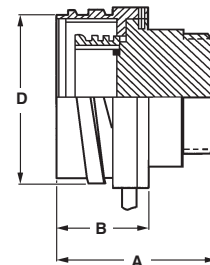
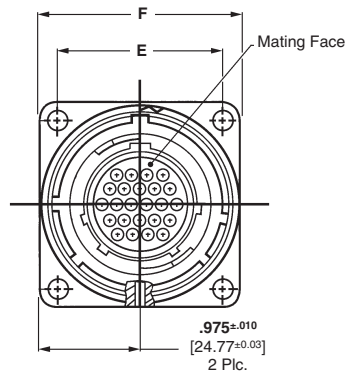
**Performance Characteristics**—  
Page 6

**Application Tooling**—Pages 76-79

**Technical Documents**—Page 80

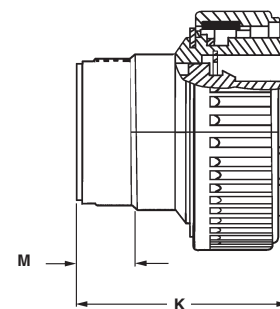
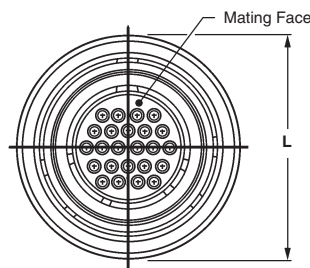
### Square Flange Receptacles

(Accepts Multimate Pins)



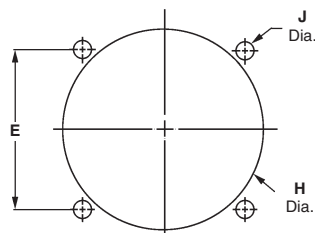
### Plugs

(Accepts Multimate Sockets)

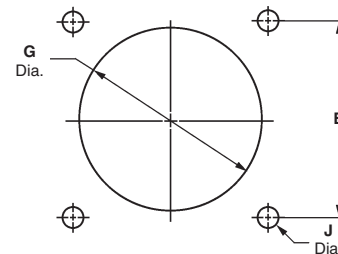


| Arrangement | Square Flange<br>Receptacle | Plug Part No.           |                      |
|-------------|-----------------------------|-------------------------|----------------------|
|             |                             | without TETRASEALS Ring | with TETRASEALS Ring |
| 14-5        | 208719-1                    | 208718-1                | 208718-2             |
| 14-7        | 208715-1                    | 208714-1                | 208714-2             |
| 22-16       | 208489-1                    | 208488-1                | 208488-3             |
| 28-24       | 208459-1                    | 208457-1                | 208457-3             |
| 28-37       | 208471-1                    | 208470-1                | 208470-3             |

**Note:** Maximum wire insulation diameter is .100 [2.54], except arrangements 14-5 and 28-24 are .150 [3.81] max.



Rear Mount Panel Cutout

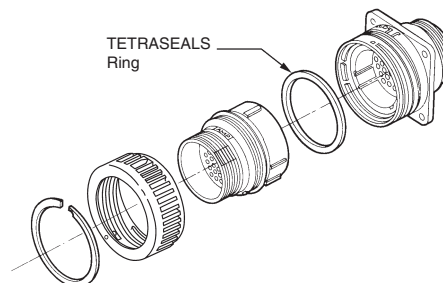


Front Mount Panel Cutout

### TETRASEALS Ring

(Installed in plugs only.)

The TETRASEALS Ring provides splash-  
proof sealing between mating metal  
shells. It is located behind the plug shell  
external keys (under the coupling ring).  
When mated with a receptacle, the ring  
is compressed against the inside  
diameter of the mating end edge of the  
receptacle shell.



## Metal-Shell Circular Plastic Connectors, Series 1 (Continued)

### Metal-Shell CPC Connectors, Series 1, Reverse Sex



Listed part numbers are for connectors only; **contacts must be ordered separately.**

#### Material and Finish

##### Square Flange Receptacle—

**Housing**—Thermoplastic, UL 94V-0 rated, black

**Metal-Shell**—Zinc alloy, plated nickel

**Grooved Pin**—Steel alloy, plated nickel

##### Plug—

**Housing**—Thermoplastic, UL 94V-0 rated, black

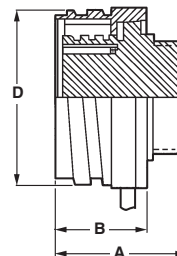
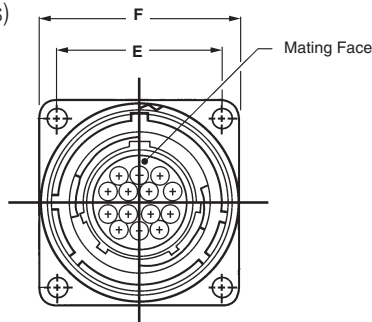
**Metal-Shell**—Zinc alloy, plated nickel

**Tetraseal Seal**—Fluorocarbon

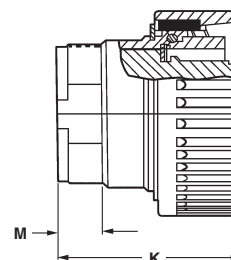
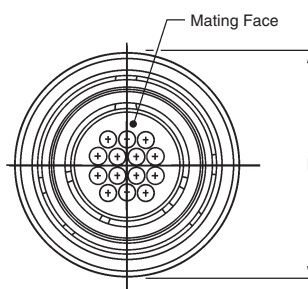
**Retainer Ring**—Retainer Ring

**Coupling Ring**—Zinc alloy, plated nickel

### Square Flange Receptacles (Accepts Multimate Sockets)



### Plugs (Accepts Multimate Pins)



| Arrangement | Square Flange Receptacle | Plug Part No.           |                      |
|-------------|--------------------------|-------------------------|----------------------|
|             |                          | without TETRASEALS Ring | with TETRASEALS Ring |
| 14-5        | 208721-1                 | 208720-1                | —                    |
| 14-7        | 208717-1                 | 208716-1                | 208716-2             |
| 22-14       | 208487-1                 | 208486-1                | 208486-3             |
| 28-37       | 208473-1                 | 208472-1                | 208472-3             |

**Note:** Maximum wire insulation diameter is .100 [2.54], except arrangements 14-5 and 28-24 are .150 [3.81] max.

#### Related Product Data

**Contacts**—Pages 17-21

**Contact Arrangement**—Page 61

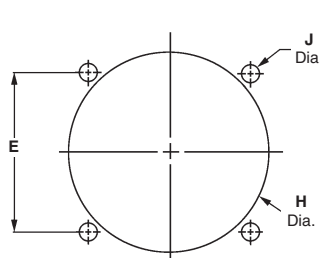
**Component Dimensions**—Page 70

**Accessories**—Page 71

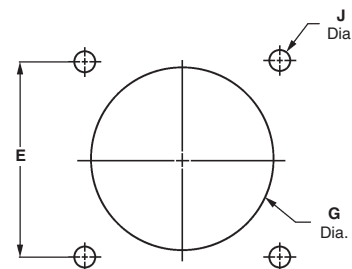
**Performance Characteristics**—Page 6

**Application Tooling**—Pages 76-79

**Technical Documents**—Page 80



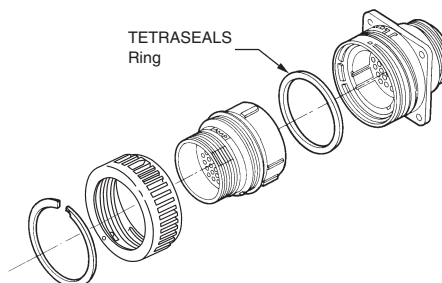
Rear Mount Panel Cutout



Front Mount Panel Cutout

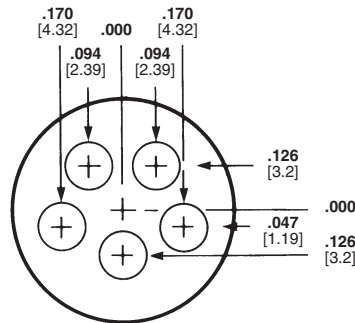
### TETRASEALS Ring (Installed in plugs only.)

The TETRASEALS Ring provides splash-proof sealing between mating metal shells. It is located behind the plug shell external keys (under the coupling ring). When mated with a receptacle, the ring is compressed against the inside diameter of the mating end edge of the receptacle shell.

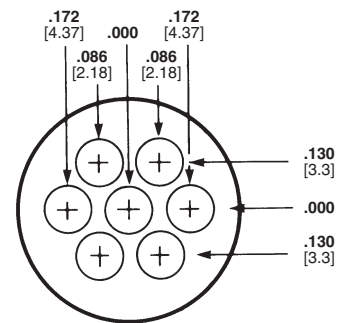


## Metal-Shell CPC Connectors, Series 1, Contact Arrangements

### Shell Size 14

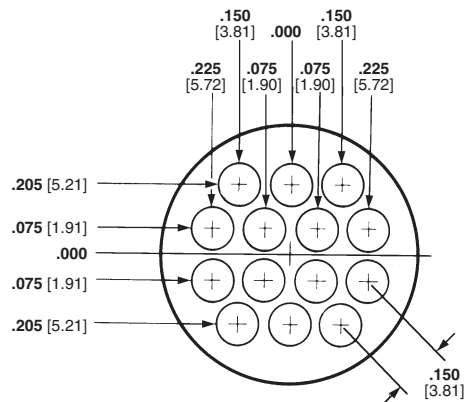


**Arrangement 14-5**  
Max. Wire Ins. Dia. = .150 [3.81]

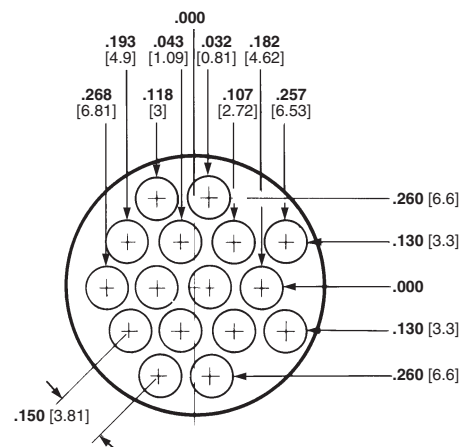


**Arrangement 14-7**  
Max. Wire Ins. Dia. = .100 [2.54]

### Shell Size 22



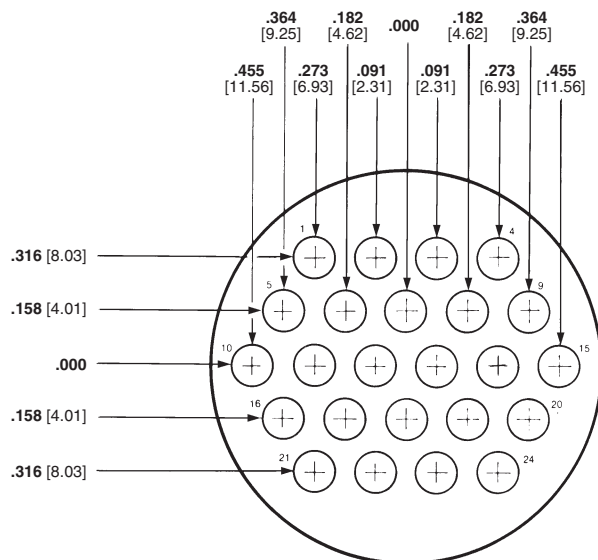
**Arrangement 22-14**  
Max. Wire Ins. Dia. = .100 [2.54]



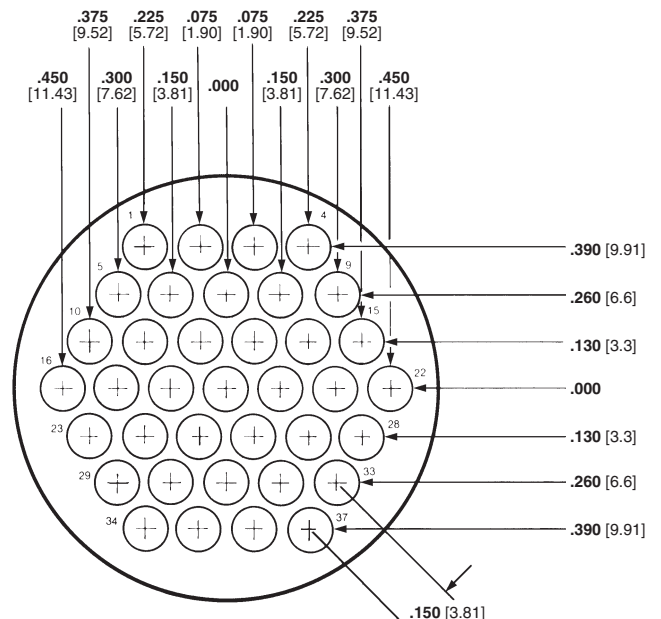
**Arrangement 22-16**  
Max. Wire Ins. Dia. = .100 [2.54]

**Note:** Contact arrangements shown are of pin mating face (plug or receptacle). Socket mating face is mirror image.

### Shell Size 28



**Arrangement 28-24**  
Max. Wire Ins. Dia. = .150 [3.81]



**Arrangement 28-37**  
Max. Wire Ins. Dia. = .100 [2.54]

## Metal-Shell Circular Plastic Connectors, Series 2

### Metal-Shell CPC Connectors, Series 2, Standard Sex



Listed part numbers are for  
connectors only; **contacts must  
be ordered separately.**

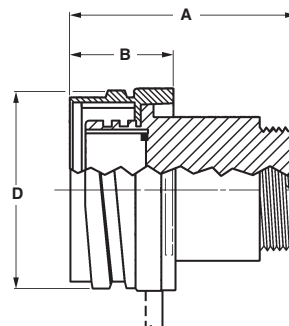
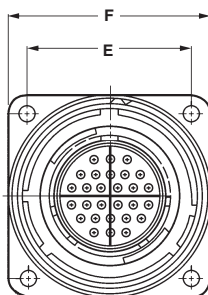
#### Material and Finish

**Square Flange Receptacle**—  
**Housing and Retention Insert**—  
Thermoplastic, UL 94V-0 rated, black  
**Metal-Shell**—Zinc alloy, plated nickel  
**Grooved Pin**—Steel alloy, plated nickel

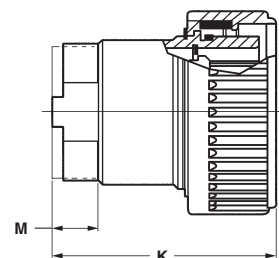
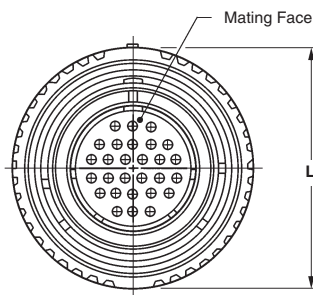
#### Plug

**Housing**—Thermoplastic, UL 94V-0  
rated, black  
**Metal-Shell**—Zinc alloy, plated nickel  
**Tetraseal Seal**—Fluorocarbon  
**Retainer Ring**—Stainless steel  
**Coupling Ring**—Zinc alloy, plated  
nickel

### Square Flange Receptacles (Accepts 20 DF and 20 DM Pins)



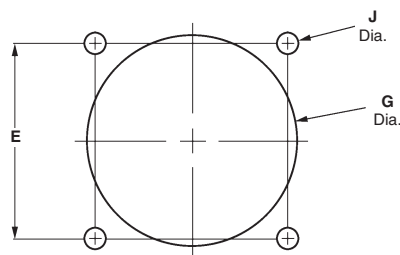
### Plugs (Accepts 20 DF and 20 DM Sockets)



#### Related Product Data

**Contacts**—Pages 29-30  
**Contact Arrangement**—Page 64  
**Component Dimensions**—Page 70  
**Accessories**—Pages 38, 39 and 71  
**Performance Characteristics**—  
Page 6  
**Application Tooling**—Pages 76-79  
**Technical Documents**—Page 80

| Arrangement | Part No.                    |                                 |
|-------------|-----------------------------|---------------------------------|
|             | Square Flange<br>Receptacle | Plug<br>without Tetraseals Ring |
| 22-28       | 208491-1                    | 208490-1                        |
| 28-63       | 208477-1                    | 208476-1                        |



Recommended Panel Cutout

## Metal-Shell Circular Plastic Connectors, Series 2 (Continued)

### Metal-Shell CPC Connectors, Series 2, Reverse Sex



Listed part numbers are for  
connectors only; **contacts must  
be ordered separately.**

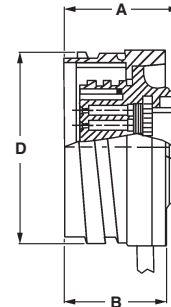
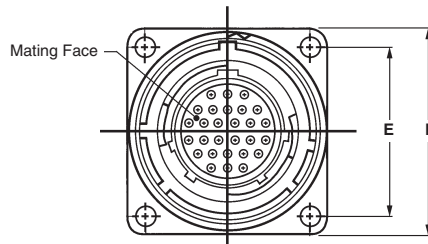
#### Material and Finish

**Square Flange Receptacle—**  
**Housing and Retention Insert—**  
Thermoplastic, UL 94V-0 rated, black  
**Metal-Shell—**Zinc alloy, plated nickel  
**Grooved Pin—**Steel alloy, plated nickel

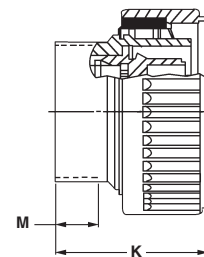
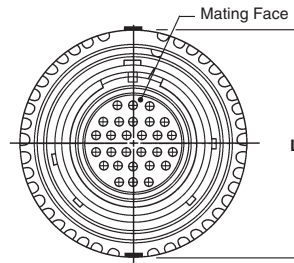
#### Plug—

**Housing—**Thermoplastic, UL 94V-0  
rated, black  
**Metal-Shell—**Zinc alloy, plated nickel  
**Tetraseal Seal—**Fluorocarbon  
**Retainer Ring—**Stainless steel  
**Coupling Ring—**Zinc alloy, plated  
nickel

### Square Flange Receptacles (Accepts 20 DF and 20 DM Sockets)



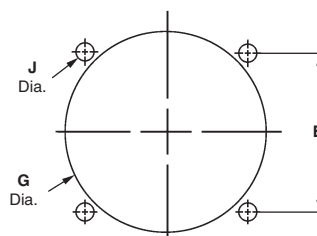
### Plugs (Accepts 20 DF and 20 DM Pins)



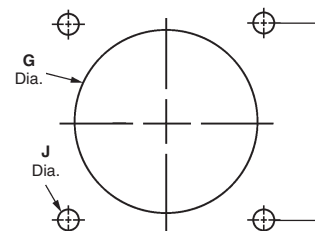
#### Related Product Data

**Contacts—**Pages 29-30  
**Contact Arrangement—**Page 64  
**Component Dimensions—**Page 70  
**Accessories—**Pages 38, 39 and 71  
**Performance Characteristics—**  
Page 6  
**Application Tooling—**Pages 76-79  
**Technical Documents—**Page 80

| Arrangement | Part No.                    |                                 |
|-------------|-----------------------------|---------------------------------|
|             | Square Flange<br>Receptacle | Plug<br>without Tetraseals Ring |
| 22-28       | 208493-1                    | 208492-1                        |
| 28-57       | 208475-1                    | 208474-1                        |



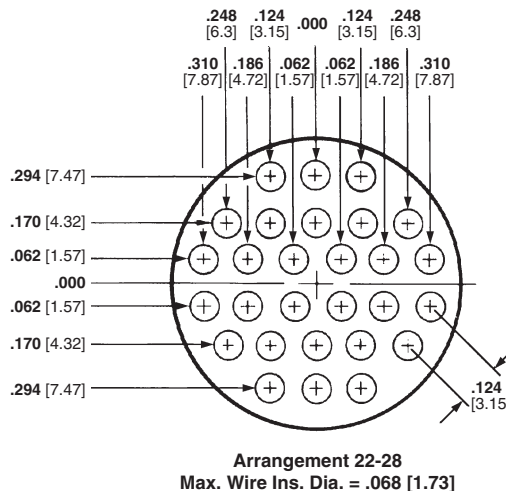
Rear Mount Panel Cutout



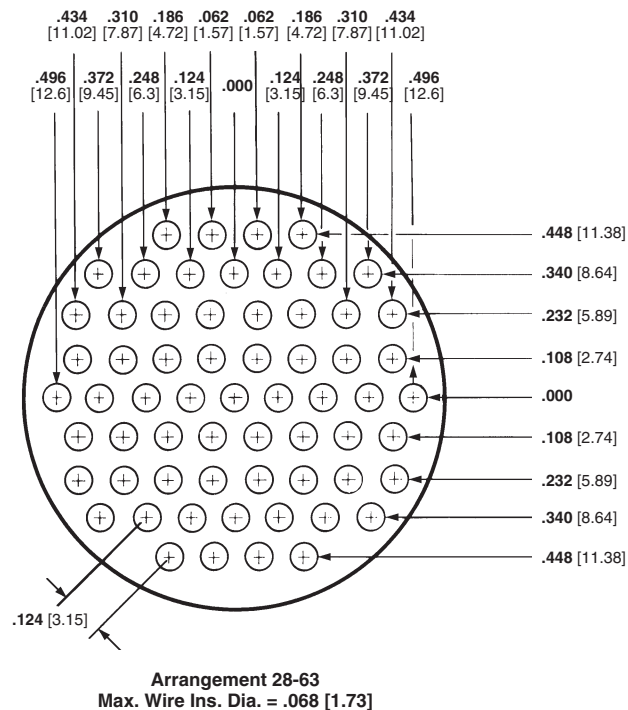
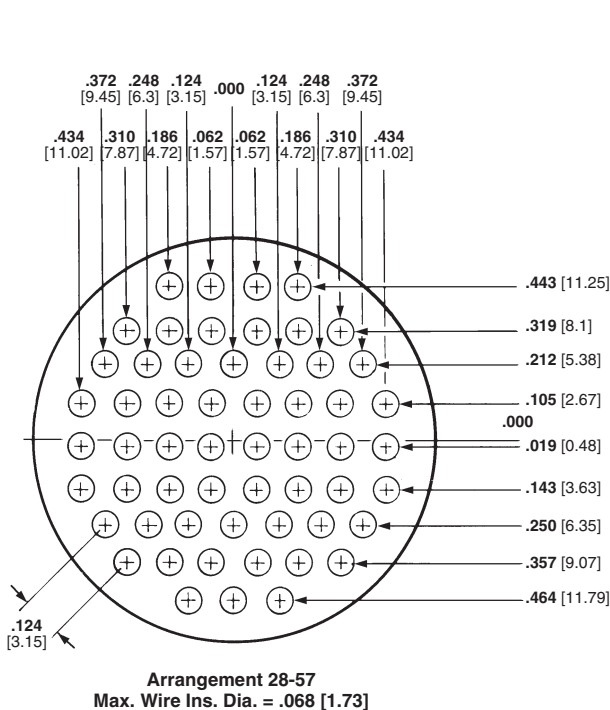
Front Mount Panel Cutout

## Metal-Shell CPC Connectors, Series 2, Contact Arrangements

### Shell Size 22



### Shell Size 28



**Note:** Contact arrangements shown are of pin mating face (plug or receptacle). Socket mating face is mirror image.

## Metal-Shell Circular Plastic Connectors, Series 3

### Metal-Shell CPC Connectors, Series 3, Standard Sex



Listed part numbers are for  
connectors only; **contacts must  
be ordered separately.**

#### Material and Finish

##### Square Flange Receptacle—

**Housing**—Thermoplastic, UL 94V-0  
rated, black

**Metal-Shell**—Zinc alloy, plated nickel

**Peripheral Seal**—Elastomer, grey

**Grooved Pin**—Stainless steel

##### Plug—

**Housing**—Thermoplastic, UL 94V-0  
rated, black

**Metal-Shell**—Zinc alloy, plated nickel

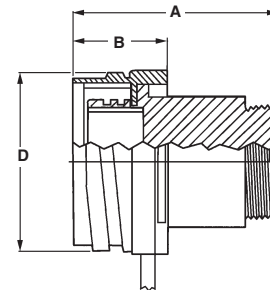
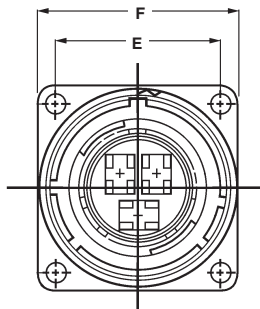
**Tetraseal Seal**—Fluorocarbon

**Retainer Rings**—Stainless Steel

**Coupling Ring**—Zinc alloy, plated  
nickel

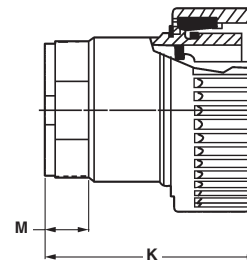
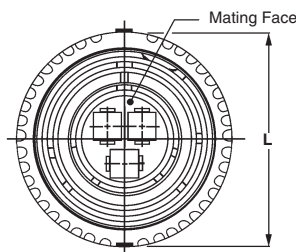
### Square Flange Receptacles

(Accepts Type XII Male Pins)



### Plugs

(Accepts Type XII Female Sockets)



#### Related Product Data

**Contacts**—Page 34-35

**Contact Arrangement**—Page 67

**Component Dimensions**—Page 70

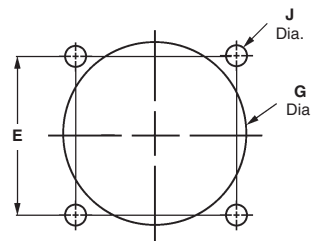
**Accessories**—Pages 38, 39 and 71

**Performance Characteristics**—  
Page 6

**Application Tooling**—Pages 76-79

**Technical Documents**—Page 80

| Arrangement | Square Flange<br>Receptacle | Plug Part No.           |                      |
|-------------|-----------------------------|-------------------------|----------------------|
|             |                             | without TETRASEALS Ring | with TETRASEALS Ring |
| 22-3        | 208495-1                    | 208494-1                | 208494-3             |
| 28-7        | 208483-1                    | 208482-1                | —                    |

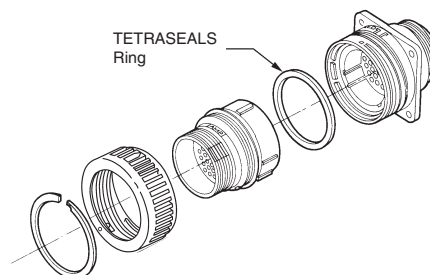


Recommended Panel Cutout

### TETRASEALS Ring

(Installed in Plugs only)

The TETRASEALS Ring provides splash-  
proof sealing between connector metal-  
shells. It is located behind the plug-shell  
external keys (under the coupling ring).  
When mated with a receptacle, the ring is  
compressed against the inside diameter  
of the mating end edge of the receptacle  
shell.



## Metal-Shell Circular Plastic Connectors, Series 3 (Continued)

### Metal-Shell CPC Connectors, Series 3, Reverse Sex



Listed part numbers are for connectors only; **contacts must be ordered separately.**

#### Material and Finish

##### Square Flange Receptacle—

**Housing**—Thermoplastic, UL 94V-0 rated, black

**Metal-Shell**—Zinc alloy, plated nickel

**Peripheral Seal**—Elastomer, grey

**Grooved Pin**—Stainless steel

##### Plug—

**Housing**—Thermoplastic, UL 94V-0 rated, black

**Metal-Shell**—Zinc alloy, plated nickel

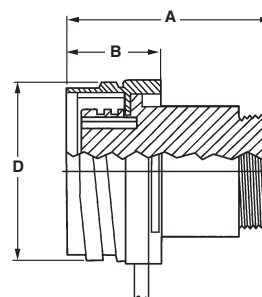
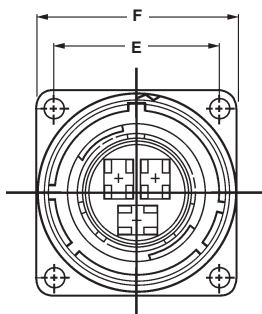
**Tetraseal Seal**—Fluorocarbon

**Retainer Rings**—Stainless Steel

**Coupling Ring**—Zinc alloy, plated nickel

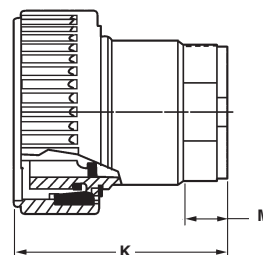
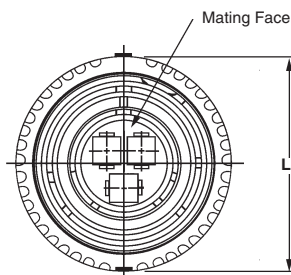
### Square Flange Receptacles

(Accepts Type XII Female Sockets)



### Plugs

(Accepts Type XII Male Pins)



#### Related Product Data

**Contacts**—Page 34-35

**Contact Arrangement**—Page 67

**Component Dimensions**—Page 70

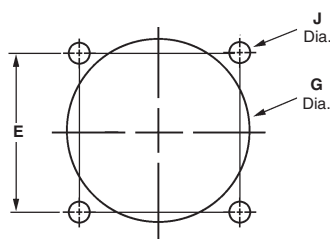
**Accessories**—Pages 38, 39 and 71

**Performance Characteristics**—Page 6

**Application Tooling**—Pages 76-79

**Technical Documents**—Page 80

| Arrangement | Square Flange Receptacle | Plug Part No.           |                      |
|-------------|--------------------------|-------------------------|----------------------|
|             |                          | without TETRASEALS Ring | with TETRASEALS Ring |
| 22-3        | 208497-1                 | 208496-1                | —                    |
| 28-7        | 208485-1                 | 208484-1                | 208484-3             |

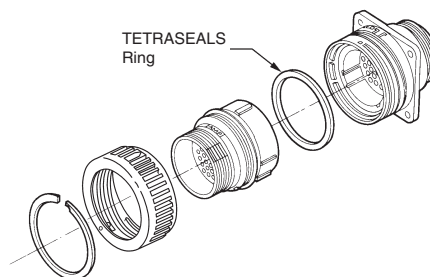


Recommended Panel Cutout

### TETRASEALS Ring

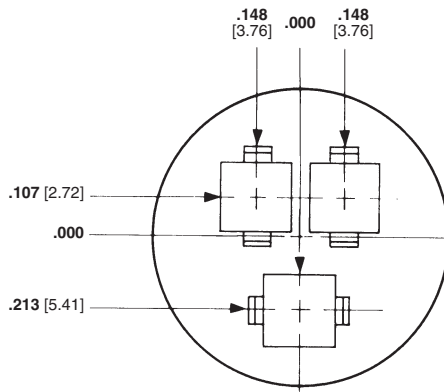
(Installed in Plugs only)

The TETRASEALS Ring provides splash-proof sealing between connector metal-shells. It is located behind the plug-shell external keys (under the coupling ring). When mated with a receptacle, the ring is compressed against the inside diameter of the mating end edge of the receptacle shell.



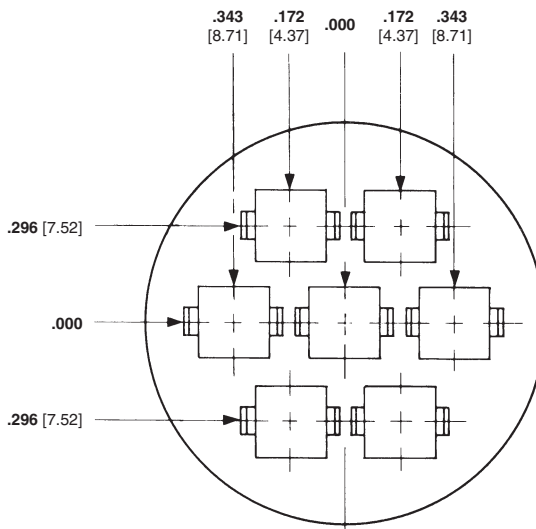
## Metal-Shell CPC Connectors, Series 3, Contact Arrangements

### Shell Size 22



**Arrangement 22-3**  
Max. Wire Ins. Dia. = .220 [5.59]

### Shell Size 28



**Arrangement 28-7**  
Max. Wire Ins. Dia. = .220 [5.59]

**Note:** Contact arrangements shown are of pin mating face (plug or receptacle). Socket mating face is mirror image.

## Metal-Shell Circular Plastic Connectors, Series 4

### Metal-Shell CPC Connectors, Series 4



Listed part numbers are for connectors only; **contacts must be ordered separately.**

#### Material and Finish

##### Square Flange Receptacle—

**Housing**—Thermoplastic, UL 94V-0 rated, black

**Metal-Shell**—Zinc alloy, plated nickel

**Grooved Pin**—Stainless steel

##### Plug—

**Housing**—Thermoplastic, UL 94V-0 rated, black

**Metal-Shell**—Zinc alloy, plated nickel

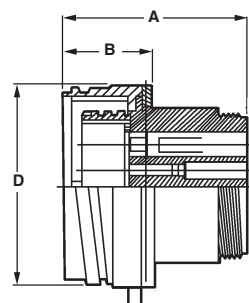
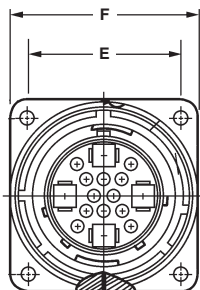
**Tetraseal Seal**—Fluorocarbon

**Retainer Rings**—Stainless Steel

**Coupling Ring**—Zinc alloy, plated nickel

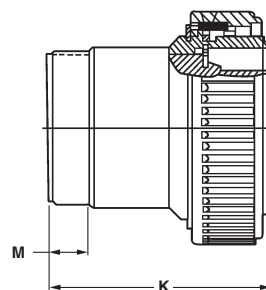
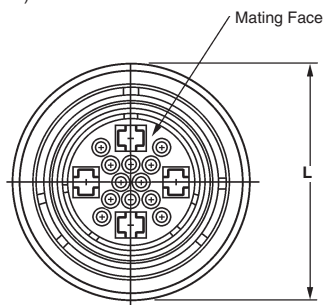
### Square Flange Receptacles

(Standard Sex Receptacles accept Type XII Male and Multimate Pins. Reverse Sex Receptacles accept Type XII Female and Multimate Sockets.)



### Plugs

(Standard Sex Plugs accept Type XII Female and Multimate Sockets. Reverse Sex Plugs accept Type XII Male and Multimate Pins.)



#### Related Product Data

**Contacts**—Pages 17-23 and 34-35

**Contact Arrangement**—Page 69

**Component Dimensions**—Page 70

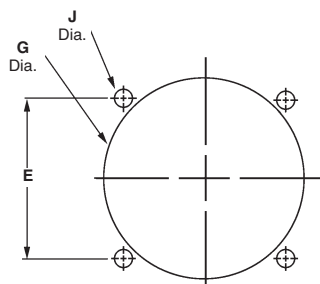
**Accessories**—Pages 38, 39 and 71

**Performance Characteristics**—Page 6

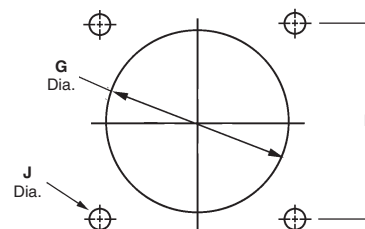
**Application Tooling**—Pages 76-79

**Technical Documents**—Page 80

| Arrangement | Square Flange Receptacle |             | Plug Part No.           |                      |              |
|-------------|--------------------------|-------------|-------------------------|----------------------|--------------|
|             | Standard Sex             | Reverse Sex | without TETRASEALS Ring | with TETRASEALS Ring | Standard Sex |
| 28-16M      | 208479-1                 | 1776088-1   | 208478-1                | 1776089-1            | 208478-3     |
| 28-22M      | 208481-1                 | —           | 208480-1                | —                    | 208480-3     |



Rear Mount Panel Cutout

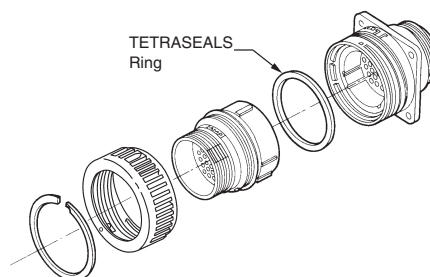


Front Mount Panel Cutout

### TETRASEALS Ring

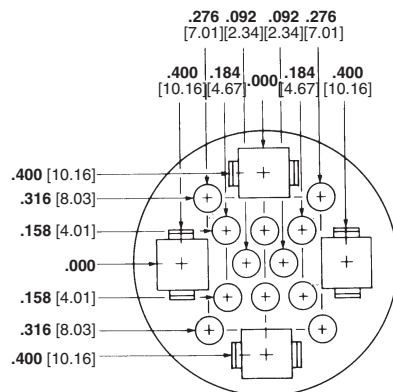
(Installed in Plugs only)

The TETRASEALS Ring provides splash-proof sealing between connector metal-shells. It is located behind the plug-shell external keys (under the coupling ring). When mated with a receptacle, the ring is compressed against the inside diameter of the mating end edge of the receptacle shell.

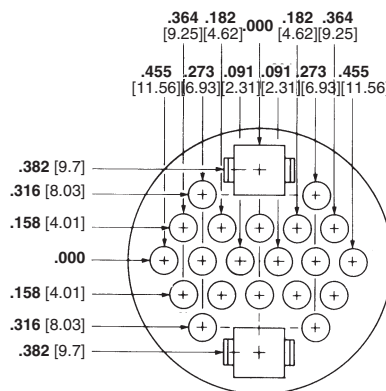


## Metal-Shell CPC Connectors, Series 4, Contact Arrangements

### Shell Size 28



**Arrangement 28-16M**  
Max. Wire Ins. Dia. =  
.150 [3.81] for Multimate Contacts,  
.220 [5.59] for Power Contacts

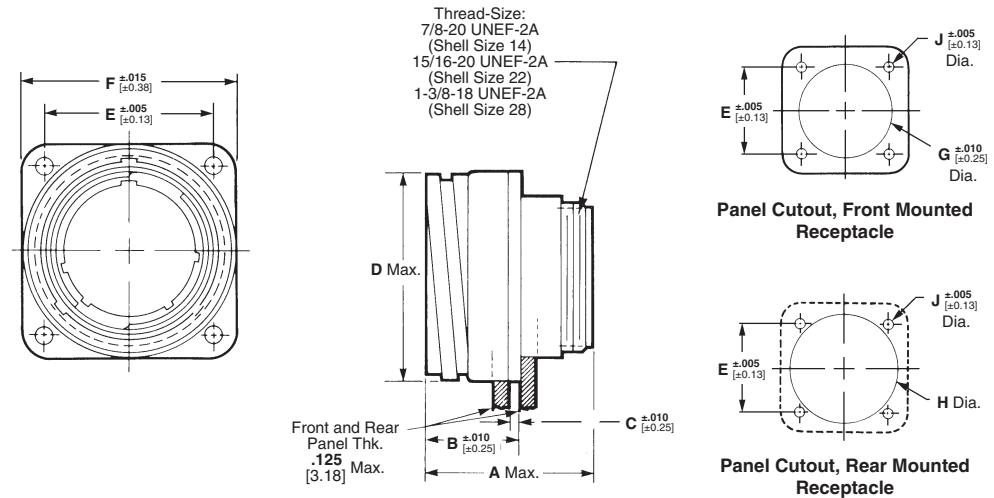


**Arrangement 28-22M**  
Max. Wire Ins. Dia. =  
.150 [3.81] for Multimate Contacts,  
.220 [5.59] for Power Contacts

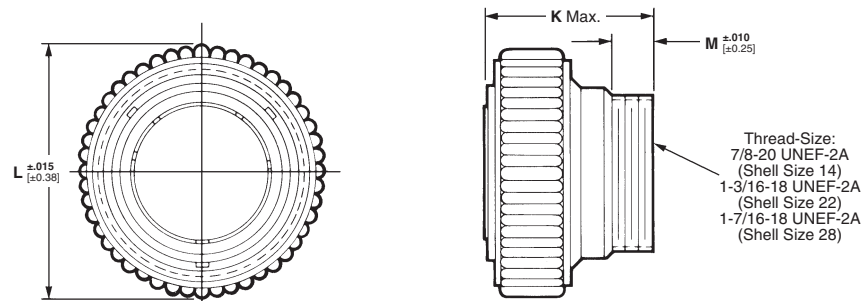
**Note:** Contact arrangements shown are of pin mating face (plug or receptacle). Socket mating face is mirror image.

## Metal-Shell CPC Connectors Component Dimensions

### Square Flange Receptacles



### Plugs



For drawings, technical data or samples, contact your sales engineer or call Technical Support.

| Series | Arrangement No. | Sex            | Dimensions     |               |                |                |                |                |                |                |                |                |                |              |
|--------|-----------------|----------------|----------------|---------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|--------------|
|        |                 |                | A              | B             | C              | D              | E              | F              | G              | H              | J              | K              | L              | M            |
| 1      | 14-5            | Std.           | 1.415          | .745          | .100           | 1.031          | .906           | 1.185          | 1.070          | 1.070          | .125           | 1.400          | 1.225          | .380         |
|        |                 | Rev.           | 35.94          | 18.92         | 2.54           | 26.19          | 23.01          | 30.1           | 27.18          | 27.18          | 3.18           | 35.56          | 31.12          | 9.65         |
|        | 14-7            | Std.           | 1.415          | .745          | .100           | 1.031          | .906           | 1.185          | 1.070          | 1.070          | .125           | 1.400          | 1.225          | .380         |
|        |                 | Rev.           | 35.94          | 18.92         | 2.54           | 26.19          | 23.01          | 30.1           | 27.18          | 27.18          | 3.18           | 35.56          | 31.12          | 9.65         |
|        | 22-14           | Rev.           | 1.190<br>30.22 | .790<br>20.07 | .103<br>2.62   | 1.503<br>38.18 | 1.250<br>31.75 | 1.534<br>38.96 | 1.156<br>29.36 | 1.554<br>39.47 | .120<br>3.05   | 1.560<br>39.62 | 1.750<br>44.45 | .380<br>9.65 |
|        | 22-16           | Std.           | 1.470<br>37.34 | .790<br>20.07 | .103<br>2.62   | 1.503<br>38.18 | 1.250<br>31.75 | 1.534<br>38.96 | 1.156<br>29.36 | 1.554<br>39.47 | .120<br>3.05   | 1.265<br>32.13 | 1.750<br>44.45 | .380<br>9.65 |
|        | 28-24           | Std.           | 1.555<br>39.5  | .875<br>22.23 | .125<br>3.18   | 1.900<br>48.26 | 1.562<br>39.67 | 1.950<br>49.53 | 1.610<br>40.89 | 1.970<br>50.04 | .145<br>3.68   | 1.560<br>39.62 | 2.170<br>55.12 | .380<br>9.65 |
|        | 28-37           | Std.           | 1.540<br>39.12 | .875<br>22.23 | .125<br>3.18   | 1.900<br>48.26 | 1.562<br>39.67 | 1.950<br>49.53 | 1.610<br>40.89 | 1.970<br>50.04 | .145<br>3.68   | 1.560<br>39.62 | 2.170<br>55.12 | .380<br>9.65 |
|        |                 | Rev.           | 1.260<br>31.00 |               |                |                |                |                |                |                |                | 1.840<br>46.74 |                |              |
|        | 2               | 22-28          | Std.           | .934          | .790           | .103           | 1.503          | 1.250          | 1.534          | 1.156          | 1.554          | .120           | 1.295          | 1.750        |
| Rev.   |                 |                | 23.72          | 20.07         | 2.62           | 38.18          | 31.75          | 38.96          | 29.36          | 39.47          | 3.05           | 32.89          | 44.45          | 9.65         |
| 28-57  |                 | Rev.           | 1.229<br>31.22 | .875<br>22.22 | .125<br>3.18   | 1.900<br>48.26 | 1.562<br>39.67 | 1.950<br>49.53 | 1.610<br>40.89 | 1.970<br>50.04 | .145<br>3.68   | 1.408<br>35.76 | 2.170<br>55.12 | .380<br>9.65 |
| 28-63  | Std.            | 1.229<br>31.22 | .875<br>22.22  | .125<br>3.18  | 1.900<br>48.26 | 1.562<br>39.67 | 1.950<br>49.53 | 1.610<br>40.89 | 1.970<br>50.04 | .145<br>3.68   | 1.408<br>35.76 | 2.170<br>55.12 | .380<br>9.65   |              |
| 3      | 22-3            | Std.<br>Rev.   | 1.755<br>44.58 | .790<br>20.07 | .103<br>2.62   | 1.503<br>38.18 | 1.250<br>31.75 | 1.534<br>38.96 | 1.156<br>29.36 | 1.554<br>39.47 | .120<br>3.05   | 1.805<br>45.85 | 1.750<br>44.45 | .380<br>9.65 |
|        | 28-7            | Std.<br>Rev.   | 1.825<br>46.36 | .875<br>22.22 | .125<br>3.18   | 1.900<br>48.26 | 1.562<br>39.67 | 1.950<br>49.53 | 1.610<br>40.89 | 1.970<br>50.04 | .145<br>3.68   | 2.125<br>53.98 | 2.170<br>55.12 | .380<br>9.65 |
| 4      | 28-13M          | Std.           | 1.825<br>46.36 | .875<br>22.22 | .125<br>3.18   | 1.900<br>48.26 | 1.562<br>39.67 | 1.950<br>49.53 | 1.610<br>40.89 | 1.970<br>50.04 | .145<br>3.68   | 2.125<br>53.98 | 2.170<br>55.12 | .380<br>9.65 |
|        | 28-16M          | Std.           | 1.825<br>46.36 | .875<br>22.22 | .125<br>3.18   | 1.900<br>48.26 | 1.562<br>39.67 | 1.950<br>49.53 | 1.610<br>40.89 | 1.970<br>50.04 | .145<br>3.68   | 2.125<br>53.98 | 2.170<br>55.12 | .380<br>9.65 |
|        | 28-22M          | Std.           | 1.825<br>46.36 | .875<br>22.22 | .125<br>3.18   | 1.900<br>48.26 | 1.562<br>39.67 | 1.950<br>49.53 | 1.610<br>40.89 | 1.970<br>50.04 | .145<br>3.68   | 2.125<br>53.98 | 2.170<br>55.12 | .380<br>9.65 |

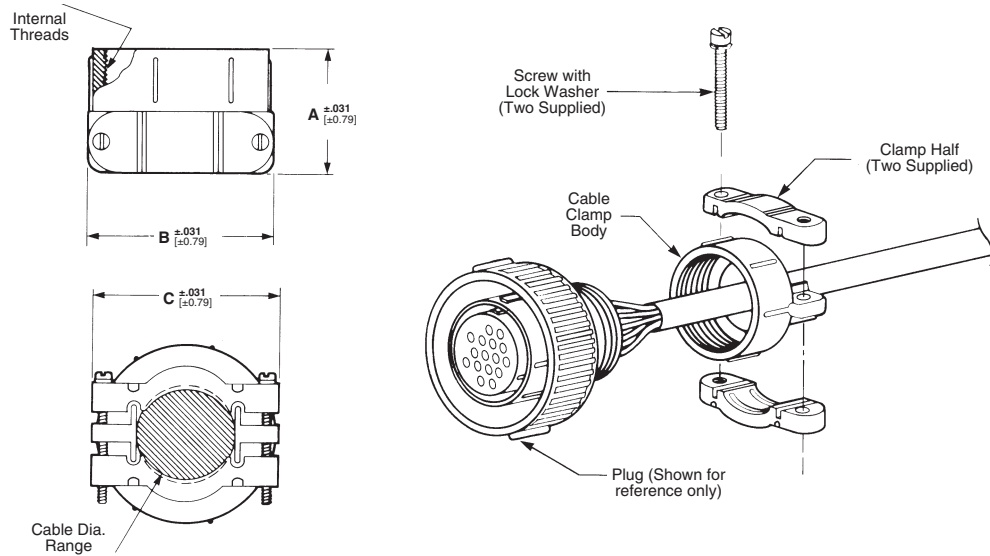
## Metal-Shell CPC Connector Accessories

### Cable Clamps

#### Material and Finish

**Body and Clamp Halves**—Zinc alloy,  
nickel plated

**Screws and Washers**—Stainless  
steel



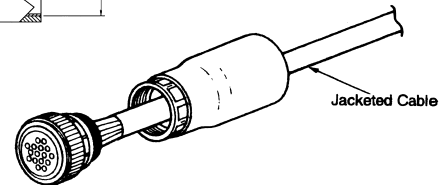
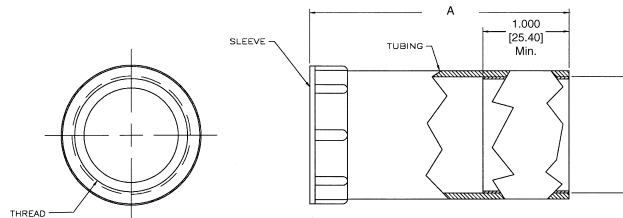
| Shell Size | Dimensions     |                |                | Cable O.D. Range         | Thread Size       | Part No. |
|------------|----------------|----------------|----------------|--------------------------|-------------------|----------|
|            | A              | B              | C              |                          |                   |          |
| 14         | .938<br>23.83  | 1.175<br>29.85 | 1.165<br>29.59 | .225-.562<br>5.71-14.27  | 7/8-20 UNEF-3B    | 208945-5 |
| 22         | .938<br>23.83  | 1.432<br>36.37 | 1.469<br>37.31 | .325-.750<br>8.26-19.05  | 1-3/16-18 UNEF-3B | 208945-7 |
| 28         | 1.031<br>26.19 | 1.593<br>40.46 | 1.688<br>42.88 | .450-.938<br>11.43-23.83 | 1-7/16-18 UNEF-3B | 208945-8 |

**Notes:** 1. For Shell Size 22 Receptacle use plastic cable clamp Size 17 (See page 38), for Shell Size 28 Receptacle use plastic cable clamp Size 23 (See pages 38-39). Use Size 14 metal cable clamp for both plug and receptacle Size 14 connectors.  
2. Metal cable clamps (Sizes 22 and 28) are for use with Metal-Shell CPC plugs ONLY.

### Cable Entry Seals

Heat Shrinkable Sealing Boots

Cable entry seals are used with jacketed cable to provide an environmentally sealed wire-to-connector system. They can be used with plugs.



### Thick Wall Boots

#### Material

**Internal Sleeve**—Nylon

**Outer Tubing**—Polyolefin, black

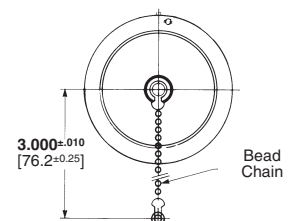
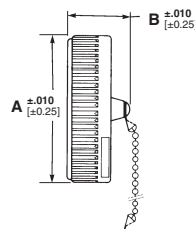
| Shell Size | Dimensions |       | Expanded Wall Thickness | Sealing Range (Dia.) | Max. Recovered Inside Dia. | Part No. |
|------------|------------|-------|-------------------------|----------------------|----------------------------|----------|
|            | A          | B     |                         |                      |                            |          |
| 22         | 3.000      | 1.250 | .070                    | .550 - 1.250         | .500                       | 54012-3  |
| 28         | 76.20      | 31.75 | 1.78                    | 13.97 - 31.75        | 12.70                      | 54012-4  |

### Protective Cap Assemblies (for Metal-Shell CPC Receptacles Only)

#### Material and Finish

Zinc alloy, nickel plated

| Shell Size | Dimensions     |               | Part No. |
|------------|----------------|---------------|----------|
|            | A              | B             |          |
| 14         | 1.225<br>31.11 | .515<br>13.08 | 213823-2 |
| 22         | 1.750<br>44.45 | .635<br>16.13 | 211903-1 |
| 28         | 2.170<br>55.12 | .635<br>16.13 | 211904-1 |



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## Engineering Notes

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## Miniature Circular Plastic Connectors (CPC)

### Product Facts

- Two shell sizes: Size 8 (1-4) or Size 11 (5-9) contact positions
- Pre-positioned 1/4 turn coupling ring with positive lock and alignment feature
- Unique contact pattern for each position size helps prevent accidental mating with other position sizes
- Sealed to IP67 (Protected against immersion in water up to 1 meter for 1/2 hour)
- Front or rear jam nut panel mounting
- No assembly required
- Receptacle available in free-hanging or panel mount versions
- Alternate keys available



AMP Miniature Circular Plastic Connectors (CPC) are available in wire-to-wire and wire-to-panel configurations.

Utilizes existing Mini-Universal MATE-N-LOK stamped and formed contacts designed for up to 500 mating cycles when plated with gold or up to 50 cycles with tin plating.

Nylon housings offer good resistance to a wide range of chemical agents while the IP67 sealing helps prevent ingress of dirt or fluids that could have an adverse effect on the contact interface.

Ideal for Industrial, Instrumentation and Transportation applications where size, contact density and environmental exposure are primary concerns.

### Technical Documents

#### Product Specification

108-2079 Miniature CPC Connectors

#### Material and Finish

**Seal, Wire Entry**—Elastomer, yellow or white

**Seal, Peripheral**—Elastomer, gray

**Housing**—Thermoplastic, black or red

**Protector, Seal**—Thermoplastic, natural

**Ring, Coupling**—Thermoplastic, black

**Nut, Jam**—Brass, nickel plated

**Plate, Seal Retention**—Thermoplastic, black

### Cable Assemblies



- Wide variety of custom discrete type cable assemblies, terminated with Terminals and Splices, Soft Shell, and Circular Plastic Connectors and other crimp and mass-terminated products.

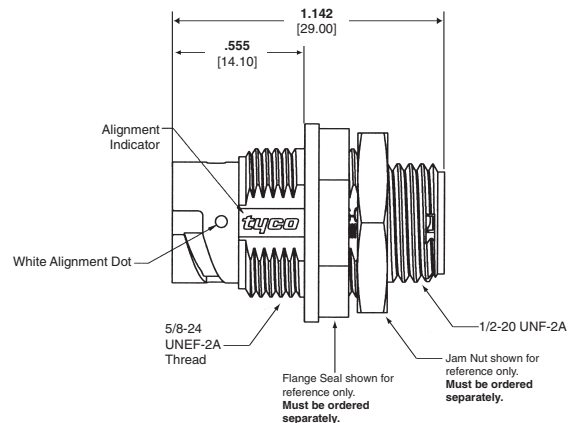
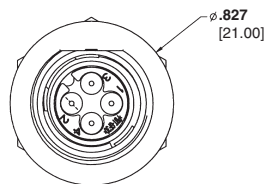
- Capability to produce custom overmolded assemblies and insert and injection molding.
- Jacketed cable assemblies and discrete wire: Subminiature-D, SCSI, Circular Plastic, VHDCI, USB and Shielded Data Link

- For more information on our cable assembly capabilities, see our website at [www.tycoelectronics.com/cables](http://www.tycoelectronics.com/cables)

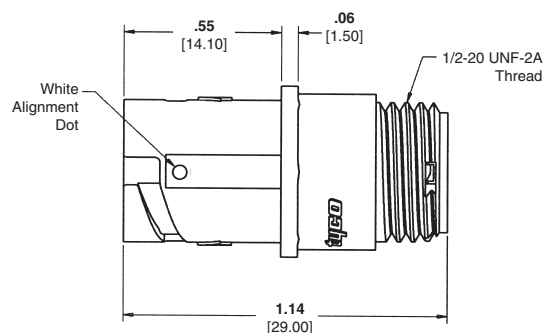
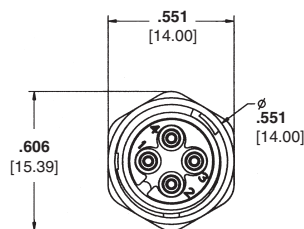
## Miniature Circular Plastic Connectors (CPC) (Continued)

### Shell Size 8 (4 Position shown)

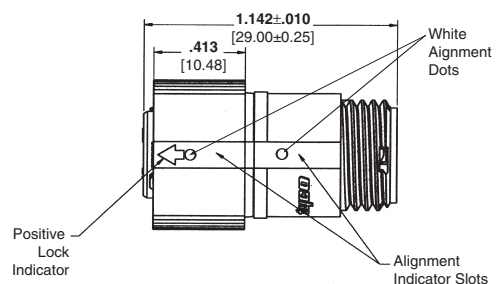
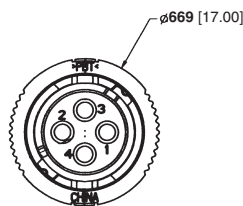
Receptacle Assembly,  
Panel Mount  
(Order pin contacts separately  
— see page 75)



Receptacle Assembly,  
Free-Hanging  
(Order pin contacts separately  
— see page 75)



Plug Assembly  
(Order socket contacts  
separately — see page 75)



### Related Product Data

Part Numbers—Page 74

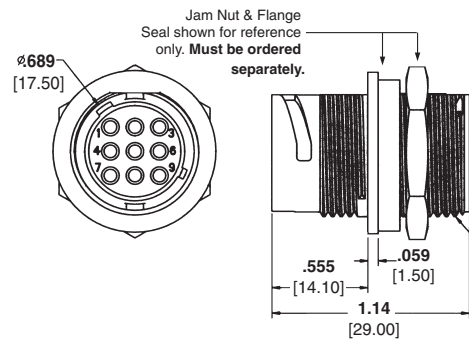
Contacts—Page 75

Accessories—Page 75

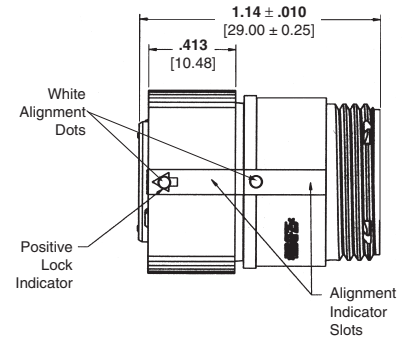
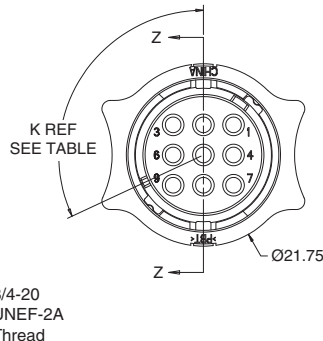
## Miniature Circular Plastic Connectors (CPC) (Continued)

### Shell Size 11 (9 Position shown)

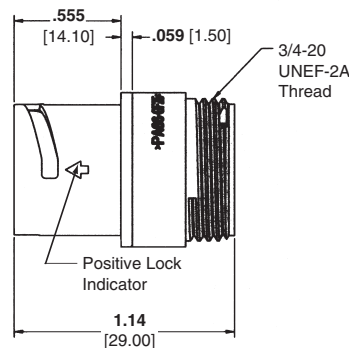
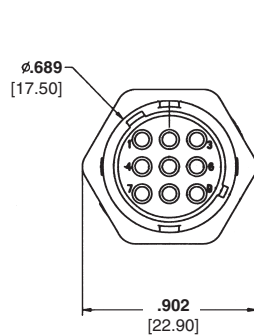
**Receptacle Assembly,  
Panel-Mount**  
(Order pin contacts separately  
— see page 75)



**Plug Assembly**  
(Order socket contacts  
separately — see page 75)



### Receptacle Assembly, Free-Hanging (Order pin contacts separately — see page 75)



### Housing Part Numbers

Standard stocked Part  
Numbers in **BOLD** type.

| Arrangement   |                | Insulation<br>Diameter Range | Housing Part Numbers      |                            |                  |
|---------------|----------------|------------------------------|---------------------------|----------------------------|------------------|
| Shell<br>Size | No. of<br>Pos. |                              | Panel Mount<br>Receptacle | Free-Hanging<br>Receptacle | Plug             |
| 8             | 1              | .035-.059 [.89-1.5]*         | 1445539-1                 | 1445526-1                  | 1445536-1        |
|               |                | .059-.110 [1.5-2.39]         | 1445539-3                 | 1445526-3                  | 1445536-3        |
| 8             | 2              | .035-.059 [.89-1.5]*         | 1445538-1                 | 1445522-1                  | 1445535-1        |
|               |                | .059-.110 [1.5-2.39]         | 1445538-3                 | 1445522-3                  | 1445535-3        |
| 8             | 3              | .035-.059 [.89-1.5]*         | 1445537-1                 | 1445510-1                  | 1445534-1        |
|               |                | .059-.110 [1.5-2.39]         | 1445537-3                 | 1445510-3                  | 1445534-3        |
| 8             | 4              | .035-.059 [.89-1.5]*         | <b>1445421-1</b>          | <b>1445389-1</b>           | <b>1445390-1</b> |
|               |                | .059-.110 [1.5-2.39]         | <b>1445421-3</b>          | <b>1445389-3</b>           | <b>1445390-3</b> |
| 11            | 5              | .035-.059 [.89-1.5]*         | 1445824-1                 | 1445829-1                  | 1445820-1        |
|               |                | .059-.110 [1.5-2.39]         | 1445824-3                 | 1445829-3                  | 1445820-3        |
| 11            | 6              | .035-.059 [.89-1.5]*         | 1445823-1                 | 1445828-1                  | 1445819-1        |
|               |                | .059-.110 [1.5-2.39]         | 1445823-3                 | 1445828-3                  | 1445819-3        |
| 11            | 7              | .035-.059 [.89-1.5]*         | 1445822-1                 | 1445827-1                  | 1445818-1        |
|               |                | .059-.110 [1.5-2.39]         | 1445822-3                 | 1445827-3                  | 1445818-3        |
| 11            | 8              | .035-.059 [.89-1.5]*         | 1445821-1                 | 1445826-1                  | 1445817-1        |
|               |                | .059-.110 [1.5-2.39]         | 1445821-3                 | 1445826-3                  | 1445817-3        |
| 11            | 9              | .035-.059 [.89-1.5]*         | <b>1445816-1</b>          | <b>1445825-1</b>           | <b>1445807-1</b> |
|               |                | .059-.110 [1.5-2.39]         | <b>1445816-3</b>          | <b>1445825-3</b>           | <b>1445807-3</b> |

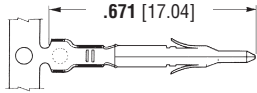
Note: Alternate keys available (115" part numbers shown in above chart)

\*Insertion Tip (Seal Protector) Part No. 1604816-1 recommended for use when inserting socket contacts within this insulation range.

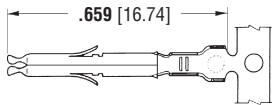
## Miniature Circular Plastic Connectors (CPC) (Continued)

### Contacts and Application Tooling

#### Pin (for Receptacles)



#### Socket (for Plugs)



#### Contact Extraction Tool

Part No. 189727-1  
Instruction Sheet 408-4118

#### Contact Insertion Tool

Part No. 455830-1  
Instruction Sheet 408-7984  
(For inserting contacts applied to small diameter wire)

#### Insertion Tip (Seal Protector)

Part No. 1604816-1  
(For inserting socket contacts applied to small diameter wire)

| Wire Size<br>Range<br>AWG [mm²]            | Ins. Dia.<br>Range                                               | Material<br>and Finish          | Contact Part Numbers |                |               |                | HDM<br>Applicator<br>Part No. | Hand<br>Tool<br>Part No. |
|--------------------------------------------|------------------------------------------------------------------|---------------------------------|----------------------|----------------|---------------|----------------|-------------------------------|--------------------------|
|                                            |                                                                  |                                 | Pin                  |                | Socket        |                |                               |                          |
|                                            |                                                                  |                                 | Strip<br>Form        | Loose<br>Piece | Strip<br>Form | Loose<br>Piece |                               |                          |
| 30-26<br>[.05-.12]                         | <b>.035-.050</b><br>.889-1.27                                    | Brass, Pre-tin                  | 770835-1             | 794059-1       | 770834-1      | 794058-1       | 567418-1 <sup>2</sup>         | 90717-2                  |
|                                            |                                                                  | Phos. Brz., Pre-tin             | —                    | —              | 770834-4      | —              | 567418-2 <sup>2</sup>         |                          |
|                                            |                                                                  | Brass, Duplex <sup>1</sup>      | 1-770835-0           | 1-794059-0     | 1-770834-0    | 1-794058-0     | 567418-3 <sup>2</sup>         |                          |
|                                            |                                                                  | Phos. Brz., Duplex <sup>1</sup> | —                    | —              | 1-770834-1    | —              |                               |                          |
| 26-22<br>[.12-.3]                          | <b>.047-.069</b><br>1.19-1.75                                    | Brass, Pre-tin                  | 770901-1             | 770985-1       | 770902-1      | 770986-1       | 567066-3 <sup>3</sup>         | 91529-1                  |
|                                            |                                                                  | Phos. Brz., Pre-tin             | —                    | —              | 770902-4      | —              | 567066-4 <sup>3</sup>         |                          |
|                                            |                                                                  | Brass, Duplex <sup>1</sup>      | 1-770901-0           | 1-770985-0     | 1-770902-0    | 1-770986-0     | 567066-5 <sup>3</sup>         |                          |
|                                            |                                                                  | Phos. Brz., Duplex <sup>1</sup> | —                    | —              | 1-770902-1    | —              |                               |                          |
| 22-18<br>[.3-.8]<br>or<br>22 x (2)<br>[.3] | <b>.059-.094</b><br>1.50-2.39<br>or<br><b>.067 x (2)</b><br>3.38 | Brass, Pre-tin                  | 770903-1             | 770987-1       | 770904-1      | 770988-1       | 567067-1 <sup>2</sup>         | 91522-1                  |
|                                            |                                                                  | Phos. Brz., Pre-tin             | —                    | —              | 770904-4      | —              | 567067-2 <sup>2</sup>         |                          |
|                                            |                                                                  | Brass, Duplex <sup>1</sup>      | 1-770903-0           | 1-770987-0     | 1-770904-0    | 1-770988-0     | 567067-3 <sup>2</sup>         |                          |
|                                            |                                                                  | Phos. Brz., Duplex <sup>1</sup> | —                    | —              | 1-770904-1    | —              |                               |                          |

<sup>1</sup>Duplex Finish — Plated with .000030 [.000762] min. gold in mating area and .000100 [.00254] min. tin in crimping area over .000050 [.00127] min. nickel underplate on entire contact.

<sup>2</sup>HDM Applicator part number ending in -1 is used on AMPOMATOR CLS Machine with T or G Terminators, -2 is used on AMP-O-ELECTRIC Model K Machine, -3 is used on AMP-O-ELECTRIC Model G Machine. See page 133 for further information.

<sup>3</sup>HDM Applicator part number ending in -3 is used on AMPOMATOR CLS Machine with T or G Terminators, -4 is used on AMP-O-ELECTRIC Model K Machine, -5 is used on AMP-O-ELECTRIC Model G Machine. See page 133 for further information.

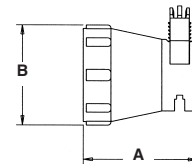
**Note:** All part numbers are RoHS Compliant.

## Accessories (All accessories must be ordered separately.)

### Strain Reliefs

| Shell<br>Size | Dimensions  |             | Part Number |                                                  |
|---------------|-------------|-------------|-------------|--------------------------------------------------|
|               | A           | B           | Straight    | Right-Angle                                      |
| 8             | .925 [23.5] | .709 [18.0] | 1445730-1   | 1445771-1                                        |
| 11            | 1.10 [28.0] | .964 [24.5] | 1445856-1   | 1546746-3 <sup>1</sup><br>1546746-4 <sup>2</sup> |

<sup>1</sup> Open Style

<sup>2</sup> With Cover


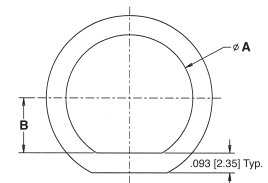
### Heat Shrink Boots

| Shell<br>Size | Dimensions  |             | Part<br>Number |
|---------------|-------------|-------------|----------------|
|               | A           | B           |                |
| 8             | 2.00 [50.8] | .75 [19.0]  | 1546997-1      |
| 11            | 2.50 [63.5] | 1.00 [25.4] | 1546921-1      |



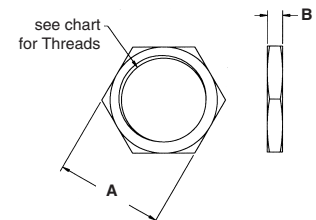
### Flange Seals

| Shell<br>Size | Dimensions |           | Part<br>Number |
|---------------|------------|-----------|----------------|
|               | A          | B         |                |
| 8             | .60 [15.3] | .26 [6.6] | 1445420-1      |
| 11            | .73 [18.5] | .33 [8.5] | 1445420-2      |



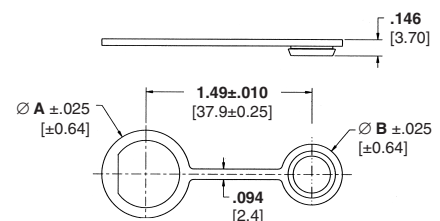
### Jam Nuts

| Shell<br>Size | Dimensions   |            | Thread         | Part<br>Number |
|---------------|--------------|------------|----------------|----------------|
|               | A            | B          |                |                |
| 8             | .75 [19.0]   | .125 [3.2] | 5/8-24 UNEF-2B | 1604196-1      |
| 11            | .875 [22.25] | .125 [3.2] | 3/4-20 UNEF-2B | 1445904-1      |



### Dust Caps

| Shell<br>Size | Dimensions  |             | Part<br>Number |
|---------------|-------------|-------------|----------------|
|               | A           | B           |                |
| 8             | .795 [20.2] | .551 [14.0] | 1604089-1      |
| 11            | .89 [22.6]  | .736 [18.7] | 1604089-2      |



## Application Tooling

### Mechanical Hand Tools for Interchangeable Die Sets

These tools are ideal for small production, prototype and experimental applications. They are used for terminating pin and socket contacts to wire and feature a ratchet device to provide consistently formed crimps.

#### SDE (Standard Die Envelope) Die Sets



SDE die sets provide cost-effective flexibility, through many options for a common die-set outline. The SDE die sets can be adapted for use with CERTI-CRIMP hand tools, PRO-CRIMPER III hand tools, the SDE Terminator and the 626 Pneumatic Tool System.

For more information, request Catalog **1654003**.

#### PRO-CRIMPER III Hand Tool, Part No. 58495-1



Commercial grade hand tool for crimping various products. Features ratchet control to provide complete crimp cycle. Accepts both pinned- and shouldered-style die sets. Locators are provided with pinned-style die sets for proper contact and wire positioning, and to

help minimize contact rotation and bending during crimping. Approximate weight 1.3 lb [0.60 kg].

For use with Type III+ contacts, see pages 17-19.

For more information, request Catalog **1773380**, Instruction Sheet **408-9930**.

#### CERTI-CRIMP Straight Action Hand Tools (SAHT)



Premium grade hand tools. Feature ratchet control to provide complete crimp cycle. Die sets close in a straight line. Include a contact locator and wire stop, plus an insulation crimp

adjustment lever, when applicable. Approximate weight 1.3 lb [0.59 kg]

For Type III+ contacts, see pages 17-19. For more information, request Catalog **65780**.

#### CERTI-CRIMP "C" Head Straight Action Hand Tool (SAHT), Part No. 69710-1



Premium grade hand tool. Features ratchet control to provide complete crimp cycle. The interchangeable die sets close in a straight line to minimize contact or terminal rotation during crimping. When applicable, user-assist features such as

a contact or terminal locator and a wire stop, are built into the die set. Approximate weight 1.9 lb [0.86 kg].

For subminiature coaxial contacts, see pages 22-23.

For more information, request Catalog **65780**, Instruction Sheet **408-2095**.

### Electric Machine for Interchangeable Die Sets

#### SDE Terminator, Part No. 1490076-2



An electric crimp terminator with compact design features a die set holder that is compatible with all AMP SDE (PRO-CRIMPER III Tool) die sets. Hand- or foot-actuated options are available. CE Approved.

For more information, request Catalog **1654714**.

### Pneumatic Hand Tool for Interchangeable Die Sets

#### 626 Pneumatic Tool System



Lightweight, air-operated modular tooling system. Accepts a wide variety of interchangeable heads for crimping various types of contacts, terminals and splices onto wires ranging 6-26 AWG [13-0.12 mm<sup>2</sup>], plus coaxial and fiber optic cable. Available with either

hand- or foot-actuation switch. Optional ratchet control available to provide complete crimp cycle.

For subminiature coaxial contacts, see pages 22-23.

For more information, request Catalog **124208**.

## Application Tooling (Continued)

### Crimp Machines

#### AMP-O-LECTRIC Model "G" Terminating Machines, Part Nos. 354500-1, -9, -11

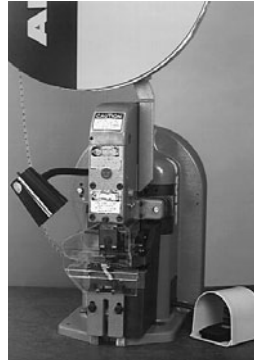


Semiautomatic bench machines for crimping reeled terminals and contacts, featuring a quiet and reliable direct motor drive, microprocessor controls for ease of setup and operation, and guarding and lighting designed for operator convenience and safety. All models are equipped with either manual or automatic precision adjustment of crimp height. Machine-mounted sensors are available for crimp quality monitoring using conventional miniature-style applicators.

For more information, request Catalog **1654956-2**, Video **198116**, Catalog **82275 [Crimp Quality Monitor (CQM)]**, Video **198094**.

**Note:** New Stripping Module available, see page 79.

#### AMP-TAPETRONIC Machine, Part No. 69875



AMP-O-LECTRIC Model "K" Terminating Machine with a permanently-mounted applicator that accepts interchangeable die sets to apply a variety of tape-mounted terminals and splices. Many of the die sets can also be used in AMP-O-LECTRIC Terminating Machines with a tape applicator.

For more information, contact Tyco Electronics.

#### Crimp Quality Monitor (CQM) Part No. 1320420-2



The unique system provides 100% on-the-fly crimp inspection. It measures the crimp height of each termination, and evaluates the quality of each crimp. If a crimp is questionable, the monitor alerts the operator with both visual and audible alarms. It also provides ports for printing and networking. When used with AMP-O-LECTRIC Model "G" Termination Machines, the monitor is mounted to the machine. When used with AMPOMATOR CLS IV Lead Making Machines, it is integrated into the machine's operating system.

For more information, request Catalog **82275**.

#### AMP 3K/40 and AMP 5K/40 Terminating Machines



- **3,000 lb [1361 kg] max. crimp force (AMP 3K/40); 5,000 lb [2268 kg] max. crimp force (AMP 5K/40)**
- **Toolless removal of applicators and guards**
- **Jog capability**
- **Quiet, fast operation — 80/76 dBA and cycle time less than 0.400 seconds**
- **Accepts Heavy Duty Mini style applicators**
- **Wide range of optional equipment such as toolless precision crimp height adjust, batch counter, CQM capability and work light**

The AMP 3K/40 and AMP 5K/40 Terminators are designed for customers that require the increased output and quality of a semiautomatic machine at a competitive price. By incorporating the most commonly requested features as standard and offering a long list of optional equipment, these terminators offer flexibility to meet the specific needs of various applications at the lowest possible cost.

For more information, request Catalog **1654956-2**.

**Note:** New Stripping Module available, see page 79.

#### System III Applicator



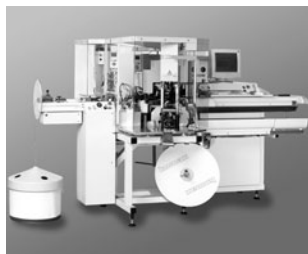
For more information, request Catalog **1654956-8**

The System III Applicator introduces several new technologies into the applicator including a precision servo-electric motorized feeding system, a built-in data module for storing terminal crimp and set-up information, a precision fit round ram, and a newly designed terminal depressor. It still utilizes the proven quality of the HD-M crimper and anvil tooling.

## Application Tooling (Continued)

### Lead Makers

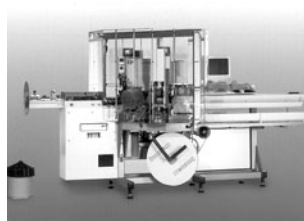
#### Komax gamma 333 PC Lead-Making Machine



This fully-automatic, PC-controlled leadmaker can be equipped with up to three processing stations enabling the crimping of both ends of the wire, double-crimp connections with three different contacts, single-ended seal applications, tinning or ink-jet marking. Features include ultra-short conversions times, easy-to-use graphic-based TopWin interface with multiple-language capability, crimp force analyzer with statistical analysis, seal monitoring, and integrated good/bad sorting.

For more information, request  
Catalog **1307901**.

#### Komax 433-S alpha Lead-Making Machine



The 433-S alpha offers maximum flexibility for applying seals to one or both ends of the wire with the corresponding terminal. When equipped with the mci 711 crimp terminator and mci 761 seal applicator, the fully-automated 433-S alpha forms a highly compact system with optimum accessibility. Dynamic servo-drives provide fine travel settings on all motor axes and the wire straightening unit with quick-release lock and automatic lead-in feature reduces wire changeover time. The TopWin software provides for fast, simple data input.

For more information, request  
Catalog **1307801**.

#### AMPOMATOR System III Leadmaker



The AMPOMATOR System III Leadmaker is designed for the demands of low-volume/high mix manufacturing and precision quality. This leadmaker combines the best wire processing capabilities with new technologies in terminal feeding and machine set-up found in the System III Applicator to offer significant advantages for higher throughput and efficiencies.

See catalog **1654956-5** for more  
information.

### Applicators

#### End-Feed Heavy-Duty Miniature Applicators (coded HDM)



Interchangeable applicators for crimping products reeled end-to-end (primarily open-barrel terminals). Used in bench and lead-making machines; most designs can be used, or adapted for use with minor tooling changes, dial-in settings for different wire sizes and insulation diameters. Mechanical or air-powered feed systems, depending on the product applied.

For more information, request  
Catalog **296393-2** and  
Instruction Sheet **408-8039**.

#### AMPOMATOR CLS IV+ Lead-Making Machines, Part Nos. 356500-1, -2; 1213400-1, -2



Fully-automatic machines that measure, cut, strip and terminate single leads. Microprocessor-controlled, and programmed and operated using an easy-to-follow, menu-driven touch-screen. Features include direct-drive terminating units with precision crimp height adjustment, fully programmable setups, wire runout and splice detection, and motorized pre-feed with wire straightener. Crimp quality monitoring is also available.

For more information, request  
Catalog **124324**, Video **198142**  
(NTSC), **199609** (PAL).

#### EDGE Applicator Counter



The new EDGE counter tracks wearable tool usage for the most effective maintenance planning. The completely electronic counter, with clear LCD display, indicates cycles since installation. By performing maintenance at measured intervals with pre-set limits, operators avoid breakdowns and rejects caused by tool wear or mis-adjustment. A wireless interface transfers counters to a PC running the optional Edge Counter Software Pack.

The EDGE is standard on all new applicators and can be retrofitted to most existing Tyco Electronics applicators.

See catalog **1773385** for more information.

## Application Tooling (Continued)

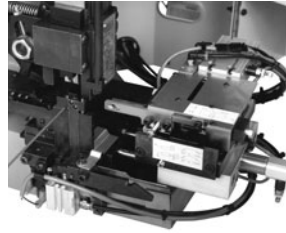
### Side-Feed Heavy-Duty Miniature Applicators (coded HDM)



Interchangeable applicators for crimping products reeled side-by-side on single or dual carrier strips (primarily closed-barrel terminals and open-barrel contacts). Similar design as the end-feed version. All side-feed applicators include a wire stop to help correctly position the wire end in the crimping target area.

For more information, request Catalog **296393-2** and Instruction Sheet **408-8040**.

### Stripping Module (for the AMP 3K/40 and AMP 5K/40 Terminating Machines and AMP-O-LECTRIC Model "G" Terminator on page 77)



For more information, request Catalog **1309085**.

The combination of the Stripping Module with the AMP 3K/40 and AMP 5K/40 Terminating Machines or the AMP-O-LECTRIC Model "G" Terminator provides an economic and proficient method of stripping the wire and crimping terminals on the same machine. The module accepts End- and Side-Feed HDM Applicators (32-14 AWG) and operates in three modes: crimp only, strip only, or strip and crimp. It can be installed on existing machines in the field or purchased as one unit from the factory.

### Stripper-Crimper Applicators (coded SCA)



Interchangeable applicators for crimping products in AMP-O-MATIC Stripper-Crimper Machines. Consist of separate ram and lower tooling assemblies. Similar dial-in settings for different wire sizes and insulation diameters as HDM applicators. Available with sensors for use with the Crimp Quality Monitor.

For more information, request Catalog **65004 (AMP-O-MATIC Stripper-Crimper Machines)**, Catalog **82275 [Crimp Quality Monitor (CQM)]**.

### Komax Delta 60 Wire Stripper



The semiautomatic Delta 60 is designed to strip single- and multiple-pole conductors with pull-off lengths of .984 [25] or 3.78 [96]. Thanks to the electric drive and non-pneumatic design, the device is quick and quiet in operation and can be utilized virtually anywhere. The Delta 60 can desheath or strip stranded conductors and multiple wire cables with external diameters of up to .433 [11].

See catalog **1654956** for more information.

### Stripper-Crimper Machines

#### AMP-O-MATIC Stripper- Crimper Machines, Part Nos. 1320895-1, -2



Semiautomatic bench crimping machines that also strip the wire, and are therefore used for terminating jacketed cable. Feature manual precision adjustment of crimp height, keyed strip blades for faster, more accurate setups, and an efficient scrap removal system. All adjustments can be made from the front of the machines without special tools. Available with crimp quality monitoring.

For more information, request Catalog **65004**, Video **198075**, Catalog **82275 [Crimp Quality Monitor (CQM)]**, Video **198094**.

### Cosmic 30M Wire Stripping Machine, 5-528367-0



The Cosmic 30M is a high precision, high speed electrical wire stripper that is very easy to operate. It's equipped with a four blade system and an optional gripper for more difficult wires. There is a digital display for the wire diameter that can be set at 0.01 mm increments.

See catalog **1773385-2** for more information.

### Cosmic 927R Micro-Cable Stripper



The compact, lightweight, benchtop Cosmic 927R was designed and developed to reliably strip various insulation materials and micro-cable. From conductor diameter 36 to 10 AWG, the stripping diameter display can be set to within 0.1 mm increments.

See catalog **1773385-4** for more information.

## Technical Documents

Various technical documents are available for your use:

**Product Specifications** describe technical performance characteristics and verification tests. They are intended for the Design, Component and Quality Engineer.

- 108-1579** Sealed CPC Connectors with Removable Contacts
- 108-2079** Miniature CPC Connectors
- 108-10024** CPC Connectors
- 108-10024-2** (Series 1)
- 108-10024-3** (Series 2)
- 108-10024-4** (Series 3 & 4)
- 108-10037** Contacts, Type XII
- 108-10040** Metal-Shell CPC Connectors
- 108-10042** Contacts, Type III +
- 108-40005** Contacts, Size 20 DF

**Application Specifications** describe requirements for using the product in its intended application and/or crimping information. They are intended for the Packaging and Design Engineer and the Machine Setup Person.

- 114-10000** Contacts, Size 20 DF
- 114-10004** Contacts, Type III +
- 114-10005** Contacts, Type XII
- 114-10038** CPC Connectors

**Instruction Sheets** provide instructions for assembling or applying the product. They are intended for the Manufacturing Assembler or Operator.

- 408-4317** Two-Piece Sealed CPC Connectors
- 408-6641** Metal-Shell CPC Connectors
- 408-7582** Accessories for CPC Connectors
- 408-7593** CPC Connectors
- 408-7901** Application and Maintenance for AMP Hand Crimp Tool
- 408-8416** CPC Right-Angle Cable Clamp Assembly

### Application Tooling/Instruction Sheet Cross Reference

| Tool Part No. | Instruction Sheet |
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| 58495-1       | 408-9819          |
| 69710-1       | 408-2095          |
| 91019-3       | 408-7276          |
| 91067-2       | 408-7508          |

| Tool Part No. | Instruction Sheet |
|---------------|-------------------|
| 91285-1       | 408-9404          |
| 305183        | 408-1216          |
| 318813-1      | 408-4374          |

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Fax: +84-8 930-3443

## Europe/Middle East/Africa

**Austria** – Vienna  
Phone: +43-1 90 5 60-0  
Fax: +43-1 90 5 60-1333

**Belgium** – Kessel-Lo  
Phone: +32-16-35-23-00  
Fax: +32-16-35-23-52

**Bulgaria** – Sofia  
Phone: +359-2-971-2152  
Fax: +359-2-971-2153

**Czech Republic** – Kurim  
Phone: +420-5-41-162-111  
Fax: +420-5-41-162-223

**Denmark** – Glostrup  
Phone: +45-43-480-452  
Fax: +45-43-441-414

**Egypt** – Cairo  
Phone: +20-2-29 04 281  
Fax: +20-2-41 92 334

**Estonia** – Tartu  
Phone: +372-5138-274  
Fax: +372-7400-779

**Finland** – Helsinki  
Phone: +358-95-12-34-20  
Fax: +358-95-12-34-250

**France** – Cergy-Pontoise  
Phone: +33-1-3420-8888  
Fax: +33-1-3420-8600  
**Product Information Center:**  
**(Technical Support)**  
Phone: +33-1-3420-8943  
Fax: +33-1-3420-8623

**Germany** – Bensheim  
Phone: +49-6251-133-0  
Fax: +49-6251-133-1600  
**Product Information Center:**  
**(Technical Support)**  
Phone: +49-6251-133-1999  
Fax: +49-6251-133-1988

**Germany** – Langen  
Phone: +49-6103-709-0  
Fax: +49-6103-709-1223

**Germany** – Speyer  
Phone: +49-6232-30-0  
Fax: +49-6232-30-2243

**Germany - HTS Division** – Neunkirchen  
Phone: +49-2247-305-0  
Fax: +49-2247-305-122

**Greece** – Athens  
Phone: +30-210-9370-396/397  
Fax: +30-210-9370-655

**Hungary** – Budapest  
Phone: +36-1-289-1000  
Fax: +36-1-289-1010

**Ireland** – Dublin  
Phone: +353-1-820-3000  
Fax: +353-1-820-9790

**Israel** – Yokneam  
Phone: +972-4-959-0508  
Fax: +972-4-959-0506

**Italy** – Collegno (Torino)  
Phone: +39-011-4012-111  
Fax: +39-011-4031116

**Lithuania** – Vilnius  
Phone: +370-5-2131-402  
Fax: +370-5-2131-403

**Netherlands** – 's-Hertogenbosch  
Phone: +31-73-624-62-46  
Fax: +31-73-621-23-65  
**Product Information Center:**  
**(Technical Support)**  
Phone: +31-73-6246-999  
Fax: +31-73-6246-998

**Norway** – Nesbru  
Phone: +47-66-77-8886  
Fax: +47-66-77-8855

**Poland** – Warsaw  
Phone: +48-22-45-76-700  
Fax: +48-22-45-76-720

**Romania** – Bucharest  
Phone: +40-21-311-3479/3596  
Fax: +40-21-312-0574

**Russia** – Moscow  
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Fax: +7-495-926-5505

**Russia** – St. Petersburg  
Phone: +7-812-718-8192  
Fax: +7-812-718-8193

**Slovenia** – Ljubljana  
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Fax: +386-1561-3240

**South Africa** – Port Elizabeth  
Phone: +2741-503-4500  
Fax: +2741-581-0440

**Spain** – Barcelona  
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Fax: +34-93-201-7879

**Product Information Center:**  
**(Technical Support):**  
Phone: +34-93-291-0330  
Fax: +34-93-200-3779

**Sweden** – Upplands Väsby  
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**Switzerland** – Steinach  
Phone: +41-71-447-0447  
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**Turkey** – Istanbul  
Phone: +90-212-281-8181/2/3  
Fax: +90-212-281-8184

**Ukraine** – Kiev  
Phone: +380-044-206-2265  
Fax: +380-044-206-2264

**United Kingdom** – Swindon  
Phone: +44-8706-080-208  
Fax: +44-1793-572-109  
**Product Information Center:**  
**(Technical Support)**  
Freephone GB: 0800-267-666  
Phone: +44-208-420-8341 or 8343  
+44-208-420-8081

**United Kingdom – Raychem & Identification Products**  
Phone: +44-1793-528171  
Fax: +44-1793-572-516

**For Middle East/African Countries Not Shown**  
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