AMP Circular Connectors for Commercial Signal & Power Applications

Tyco Electronics
Our commitment. Your advantage.

Note: All part numbers are RoHS Compliant.

Introduction

Product Facts

- Lightweight, all-plastic and metal-shell connectors
- CPC connectors are UL 94V-0 rated and made of stabilized, heat resistant, self-extinguishing thermoplastic material
- Metal-shell CPC connector housings made of UL 94V-0 rated thermoplastic
- Operating temperature range: -40°C to +105°C
- Available in panel or chassis mount and free-hanging configurations
- Quick connect/disconnect capability with thread assist, positive detent coupling
- Built-in pin and socket protection
- Polarized for proper mating of connector halves
- Special connector configurations offer special solder and posted contacts, special receptacles with or without threaded inserts
- Full complement of optional accessories
- Recognized under the Component Program of Underwriters Laboratories Inc. for 250 VAC, rms or 250 VDC, Service‡; Series 1 and Series 3 (600 V); Series 4 (600 V) and Series 2, Series 6 (250 V) File No. E28476

‡Select connectors are recognized for 600 volts service.

- Certified by Canadian Standards Association, File No. LR 7189
- Produced under a Quality Management System certified to ISO 9001

  A copy of the certificate is available upon request.
- Certain products meet VDE Standard 062

Six connector series for different interconnection requirements:

- Series 1—Standard density, signal and low-current applications using durable Multimate contacts (.062 [1.57] pin diameter)
- Series 2—High density applications using Size 20 DM and 20 DF contacts (.040 [1.02] pin diameter)
- Series 3—Low density, power applications with Type XII contacts capable of carrying up to 35 amperes of current
- Series 4—Combination of standard and power density application with Type III+ and Type XII contacts
- Series 5—Power density application with Size 8 screw machined and precision formed contacts
- Series 6—Combination of standard and power density application with Type III+ and Size 8 contacts

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

Product Facts

- Intermateable with Metal-Shell sizes 20-14 and 18-10, MIL-C-5015 Style connectors
- High impact resistant plastic housing made of UL 94V-0 rated material
- Lightweight
- Lower cost than standard MIL-C-5015 connectors
- Industry accepted Type III+ pin and socket contacts, available on reels in strip form for high volume, low cost, automatic machine terminations, or in loose piece form for low volume, prototype or maintenance and repair
- Improved alignment (U.S. Standard MIL-C-5015 Connectors) prevents mismating with other housing insert arrangements
- Recognized under the Component Program of Underwriters Laboratories Inc., File No. E28476
- Certified by Canadian Standards Association, File No. LR 7189

Miniature CPC Connectors

Product Facts

- Compact, high contact density, environmentally sealed connectors
- Uses existing Mini-Universal MATE-N-LOK stamped and formed pin and socket contacts
- Two shell sizes—available in 1 to 4 and 5 to 9 position configurations

Need more information?

Call Technical Support.

They are staffed with specialists well versed in Tyco Electronics products. They can provide:

- Technical Support
- Catalogs
- Technical Documents
- Product Samples
- Authorized Tyco Electronics Distributor Locations

Restriction on the use of Hazardous Substances (RoHS)

At Tyco Electronics, we're ready to support your RoHS requirements. We've assessed more than 1.5 million end items/components for RoHS compliance, and issued new part numbers where any change was required to eliminate the restricted materials.

Part numbers in this catalog are RoHS Compliant, unless marked otherwise. These products comply with European Union Directive 2002/95/EC as amended 1 January 2006 that restricts the use of lead, mercury, cadmium, hexavalent chromium, PBB, and PBDE in certain electrical and electronic products sold into the EU as of 1 July 2006.

Note - For purposes of this Catalog, included within the definition of RoHS Compliant are products that are clearly "Out of Scope" of the RoHS Directive such as hand tools and other non-electrical accessories. Information regarding RoHS compliance is provided based on reasonable inquiry of our suppliers and represents our current actual knowledge based on the information provided by our suppliers. This information is subject to change. For latest compliance status, refer to our website referenced at right.

Getting the Information You Need

Our comprehensive on-line RoHS Customer Support Center provides a forum to answer your questions and support your RoHS needs. A RoHS FAQ (Frequently Asked Questions) is available with links to more detailed information. You can also submit RoHS questions and receive a response within 24 hours during a normal work week. The Support Center also provides:

- Cross-Reference from Non-compliant to Compliant Products
- Ability to browse RoHS Compliant Products in our on-line catalog
- Downloadable Technical Data
- Customer Information Presentation
- More detailed information regarding the definitions used above

So whatever your questions when it comes to RoHS, we've got the answers at **www.tycoelectronics.com/leadfree**

RoHS Customer Support Center

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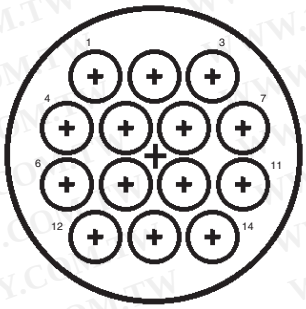
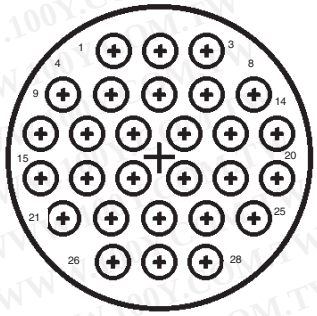
Connector Series and Types



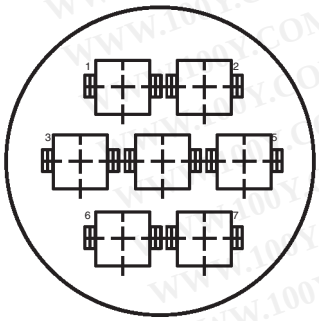
Series 1—Size 16 Contacts

Series 1 connectors permit the use of multiple combinations of signal and coaxial circuits in the same housing by accepting durable Multimate contacts. These pin and socket contacts include Type III+ and subminiature coaxial contacts, interchangeable in the same Multimate contact cavity. Type III+ contacts (.062 [1.57] pin diameter) are capable of carrying a maximum of 13 amperes when crimped in wire. Type III solder contacts and posted contacts for pc board applications are also available. Many connector arrangements offer both standard and reverse sex contact loading—**from 4 thru 37 positions.**



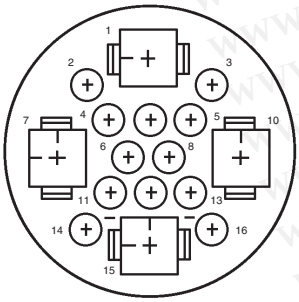
Series 2—Size 20 Contacts

Series 2 connectors accept Size 20 DF (precision formed) and Size 20 DM (screw-machined) pin and socket contacts with a .040 [1.02] pin diameter, Size 20 DF contacts are available in crimp and solder versions, as well as a posted version for wrap-type and pc board applications. Maximum current carrying capability is 7.5 amperes. Many connector arrangements offer both standard and reverse sex contact loading—**from 8 thru 63 positions.**



Series 3—Power Contacts

Series 3 connectors accept Type XII power contacts which can carry up to 25 amps per contact. These contacts will accommodate a wire size range of 16 to 10 AWG [1.4 to 5 mm^2]. Two connector sizes are available in both standard and reverse sex connector arrangements **3 and 7 positions.**



Series 4—Combination Size 16 and Power Contacts

Series 4 connectors accept Size 16 Multimate and Type XII power contacts, combining the signal and coaxial circuit capabilities of Series 1 connectors with the power circuit capabilities of Series 3 connectors. Available in two connector sizes offering power mixing combinations totaling **16 and 22 positions.**

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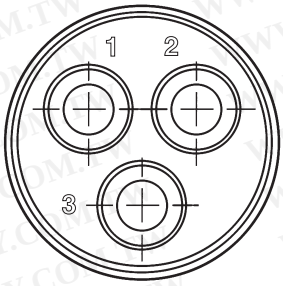
Connector Series and Types (Continued)

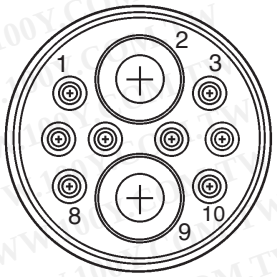


Series 5—Power Contacts .125 POWERBAND

Series 5 connectors combine the revolutionary performance of the new AMP POWERBAND Contact, high current contact in configurations similar to the Series 3 connectors. AMP POWERBAND contacts offer the electrical performance of the best Mil Spec Size 8 screw-machined contacts with the economy and productivity of strip-fed, precision formed contacts.

Series 5 connectors are environmentally sealable to meet IEC IP 65 and IP 67 specifications.

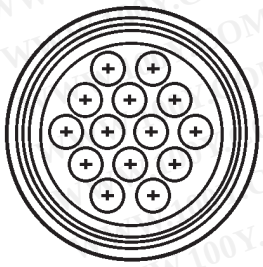
Rated at 600 VAC or VDC, 45 amperes maximum in a single contact, the connectors are available in free-hanging and panel-mount applications—**one connector configuration containing three .125 POWERBAND contacts.**



Series 6—Combination, Size 16 and .125 POWERBAND Contacts

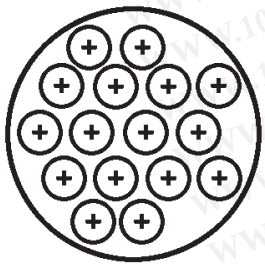
Series 6 combines the high current and environmental sealing capability of Series 5, POWERBAND contacts, and the reliability of signal carrying, low current Type III+ contacts.

This combination of power and signal contacts is offered in **one connector configuration containing two .125 POWERBAND contacts and eight Type III+ signal pin and socket contacts.**



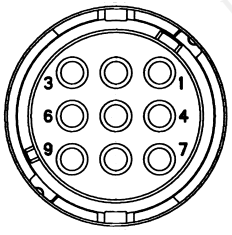
MIL-C-5015 Style—Size 16 Contacts

This new addition to the AMP Circular Plastic Connector Line is specifically designed to be **intermateable with Metal-Shell size 20-14 and 18-10, MIL-C-5015 Style connector systems.** The high impact resistant plastic housing offers the advantages of light weight and lower cost than existing metal-shell connectors. In addition the connector design prevents mismating when used with other insert arrangements. As part of the AMP Multimate family of connectors, the MIL-C-5015 style connector offers the 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.



Metal-Shell, Circular Plastic Connectors

Metal-Shell CPC connectors consist of a black thermoplastic insert in a nickel-plated, zinc alloy shell. These connectors are currently available in **shell sizes 14, 22 and 28, and in two basic configurations consisting of plugs and square flange receptacles.**



Miniature CPC Connectors

These compact connectors accept existing Mini-Universal MATE-N-LOK pin and socket contacts, 30-18 AWG [.05-.8 mm^2].

Two shell sizes (8 or 11) are available, accommodating **from 1 to 4 and 5 to 9 positions**.

Featuring high contact density and IP67 sealing, these durable connectors are well suited for many wire-to-wire, wire-to-board, and wire-to-panel applications.

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Performance Characteristics — CPC and Metal-Shell CPC Connectors

More information on the performance of AMP CPC and metal-shell CPC connectors is available by requesting the following AMP Product Specifications:

108-10024— CPC Connectors
108-10037— Type XII Contacts
108-10020— Size 20 DM and 20 DF Contacts
108-10040— Metal-Shell CPC Connectors
108-10042— Type III+ Contacts
108-1579— Sealed CPC Connectors with Removeable Contacts

Test Description	Procedure	Requirements
Maintenance Aging	Contacts removed and reinserted 10 times using applicable tools	No damage to contacts or housings. Contact retention maintained
Contact Retention	Axial load applied to contact to displace to the rear of the connector	Contacts remain in place when subjected to a minimum 10 lb. load*
Dielectric Withstanding Voltage (MIL-STD-1344, Method 3001)	Connectors subjected to 1500 volts rms at sea level	No breakdown or flashover
Thermal Shock	Connectors subjected to five cycles of temperature change (-55°C and +125°C)	No damage
Vibration (MIL-STD-202, Method 204, Test Condition B)	Connectors vibrated (wired and mated). Contacts wired in series with 100 milliamperes flowing during the test	No damage or loosening of parts. No interruption of electrical continuity longer than 10 microseconds
Physical Shock (MIL-STD-202, Method 213A, Test Condition A)	Connectors shocked 50 G (wired and mated). Contacts wired in series with 100 milliamperes flowing during the test	No damage or loosening of parts. No interruption of electrical continuity longer than 10 microseconds
Durability	Connectors mated and unmated 25 times with tin plated contacts and 500 times with gold plated contacts	No wear through damage to plating
Corrosion (Salt Spray) (MIL-STD-202, Method 101, Test Condition B)	Mated connectors subjected to 5% salt spray for 48 hours	No damage
Protection Against Solids	a. Test wire is pushed into mated connectors b. Mated connectors subjected to circulating talcum powder	a. Must not touch live parts b. No dust deposits observed on mating surfaces
Protection Against Water	Water is projected through jets against mated connector from any direction and then temporarily immersed in water	No water deposits shall be observed on mating surfaces of contacts or housings
Temperature Life	Mated connectors subjected to a temperature of +125°C for 200 hours	No damage
Insulation Resistance (MIL-STD-1344, Method 3003)	Measurement made between adjacent contacts with connector mated	5000 megohms minimum ambient temperature
Humidity (MIL-STD-202, Method 103, Test Condition B)	Mated connectors subjected to 10 days moisture test	Minimum insulation resistance of 100 megohms

*For size 16 contacts. Size 8 contacts 25 lb. load, min.

Note: All part numbers are RoHS Compliant.

Levels of Protection for Electric Operating Material According to IEC 60529 and IEC 60947, Appendix C

Environmentally Protected Circular Plastic Connectors, for Mated CPC Connectors Utilizing Peripheral Seals and either Wire Entry Seals (for Discrete Wire Applications) or Heat Shrink Boots (for Jacketed Cable Applications). Available are Various Sizes, Series 1, 5 and 6.

Internal Protection (IP) Definition:

- **Per IEC 60947, Appendix C**—Pertains to low voltage switchgear and control gear.
- **Per IEC 60529**—Pertains to degrees of protection provided by enclosures (IP code).

Sample Designation:

(Where x is a numeral value), i.e. IP 65

IP Codes

IP

Index Letter

X_1

Degree of Protection against ingress of solid foreign objects

X_2

Degree of Protection against ingress of water

Degree of Protection, X_1	Protection against ingress of solid foreign objects	Degree of Protection, X_2	Protection against ingress of water
	No Protection	0	No Protection
1	Protection against objects >50mm diameter—including inadvertently touched by hands	1	Vertical Dripping—Protection against vertical drops of water
2	Protection against objects >12.5mm—including fingers	2	Dripping <15°—Protection against dripping water when the enclosure is tilted 15° from vertical
3	Protection against objects >2.5mm diameter including tools	3	Spraying at an angle up to 60° from vertical
4	Protection against objects >1.0mm diameter—including grains	4	Splashing—Protection against water splashed from any direction
5	Protection against ingress of solid foreign bodies	5	Jetting—Protection against water stream out of a nozzle, from any direction
6	Protection against ingress of dust	6	Powerful Jetting—Protection against temporary flooding due to powerful jet streams out of a nozzle from any direction
		7	Temporary immersion—Protection against temporary immersion

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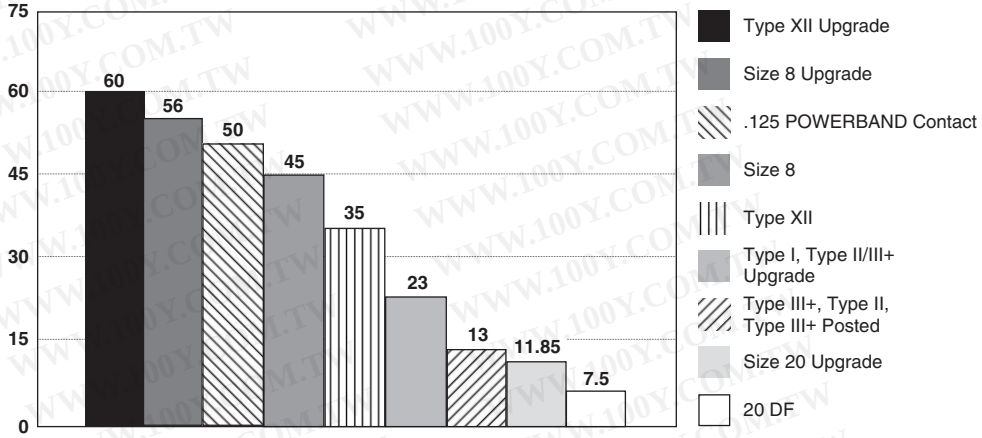
Current Carrying Capabilities

The total current capacity of each contact in a given connector is dependent upon the heat rise resulting from the combination of electrical loads of the contacts in the connector arrangement and the maximum ambient temperature in which the connector will be operating. Caution must be taken so that this combination of conditions does not cause the internal temperature of the connector to exceed the maximum operating temperature of the housing material. Several variables which must be considered when determining this maximum current capability for your application are:

CONTACT CURRENT GUIDE Maximum Current (Amperes) for Largest Wire Size



- **Wire Size**—Larger wire will carry more current since it has less internal resistance to current flow and generates less heat. The wire also conducts heat away from the connector.
- **Connector Size**—In general, with more circuits in a connector, less current per contact can be carried.
- **Current Load Distribution**—Spreading those lines with greater current loads throughout the connector, particularly around the outer perimeter, will enhance heat dissipation.
- **Ambient Temperature**—With higher ambient temperatures, less current can be carried.

Current Rating Verification Can a contact rated at 10 amps carry 10 amps?

Maybe yes, but probably not. The reason lies in the test conditions used to rate the contact. If these conditions do not adequately reflect the application conditions, the actual allowable current levels may be lower than specified levels. For example, many manufacturers, including Tyco Electronics, test a single contact in air. This gives an accurate measure of the basic current-carrying capacity of the contact. Use the contact alone in air and it can certainly carry 10 ampere. Use it in a multi-position connector surrounded by other current-carrying contacts or in high ambient temperatures, and the contact should carry less current.

Similarly, as the contact ages and stress relaxation, environmental cycling, and other degradation factors take their toll, the contact's current-carrying capacity decreases. A prudent design must set current levels for such end-of-design-life (EODL) conditions. Practical current-carrying capacity is not an absolute, but an application-dependent condition.

New Method Simplifies Ratings

To help the designer set the appropriate current level, Tyco Electronics has developed a method of specifying current-carrying capacity. This method takes into account the various application factors that influence current rating.

The method can be summarized as follows:

- The contact is aged to EODL conditions by durability cycling, thermal cycling, and environmental exposure.
- The contact's resistance stability is verified.
- The current necessary to produce the specified temperature rise is measured. This T-rise is usually 30°C.
- A rating factor is determined to allow derating of multiple contacts in the same housing and for different conductor sizes.

Temperature

One other factor influencing current levels is the maximum operating temperature, for example, 105°C. If the application has a high ambient temperature (over 75°C) the contact's T-rise is limited by the maximum operating temperature. For example, an application temperature of 90°C limits the contact T-rise to 15°C. Since current produces heat (the I^2R law), the current must be lowered to limit the T-rise.

A contact's T-rise depends not only on its I^2R Joule heating, but also on its ability to dissipate the heat. Consider a contact in a multi-contact housing. Joule heating in multiple contacts will raise the local ambient temperature. Since the contact will not be able to dissipate its own heat as well by convection, the maximum T-rise will be realized at a lower current level. Consequently, the allowable current level must be lower to maintain an acceptable T-rise.

For a given connector, the current level will be set by the loading density. A connector containing 50% current-carrying contacts will permit higher currents (per contact) than a connector will at 75% loading. The loading percentage assumes an even distribution of contacts within the housing. If all 10 contacts are grouped together in one section of a 20-position connector, the loading density may approach 100%.

The Importance of EODL

As stated, T-rise in a contact depends on both resistance and current. As it ages, a contact's resistance will increase. The contact designer will specify a maximum resistance for the contact, this level is the end-of-design-life resistance. Before the contact is tested for current, Tyco Electronics subjects it to a sequence of tests that exercises the major failure mechanisms and thereby simulates EODL conditions. Conditioning includes mating cycling, industrial mixed-flowing gases, humidity and temperature cycling, and vibration to sequentially introduce wear, corrosion, stress relaxation, and mechanical disturbance.

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Presentation — An Example*

Current Rating

The presentation of current-carrying capacity in AMP product specifications includes two parts:

- First, a base curve showing current levels versus T-rise for a single circuit and the largest wire size (See figure 1). This represents the maximum current capacity of the contact. The curve is usually flat up to 75°C ambient and then drops off. Up to 75°C, the 30°C T-rise limits the amount of current, and above 75°C the current must be reduced to keep the combination of ambient temperature and T-rise from exceeding the maximum operating temperature of 105°C.
- Next are rating factors, a table of multipliers to account for connector loading and for smaller wire sizes (See figure 2). The designer first determines the base current for the ambient conditions of the application; then multiplies this base current by the rating factors to find the current level for the application's loading factor and wire size.

Practical Values

The current-rating method gives designers practical values applicable to their applications. While the specified current levels for a contact may be lower than for other testing methods, they are more practical and simplify the system design process.

"Spec-manship" is replaced by a realistic assessment of the current-carrying capacity of a contact under varying conditions of temperature, connector loading, and wire size.

Specific current-carrying data based on EOL and % loading is available from Tyco Electronics. Please contact your local Tyco Electronics Sales Engineer or call Tyco Electronics.

Connector/Contact Acceptability

As previously stated, choosing the correct connector/contact combination is fundamental to the successful function of all connectors. The Selector Chart shown at right, is designed to simplify your choice of connectors and their acceptable contacts. Once you have selected the wire size, current-carrying capacity need, number of positions required, and the type of contacts needed in your choice of connector, refer to this matrix for a quick look at exactly what is acceptable in a given connector type.

***Note:** Data is *not* typical of a specific CPC connector configuration. For specific current rating information based on % connector loading, contact Tyco Electronics.

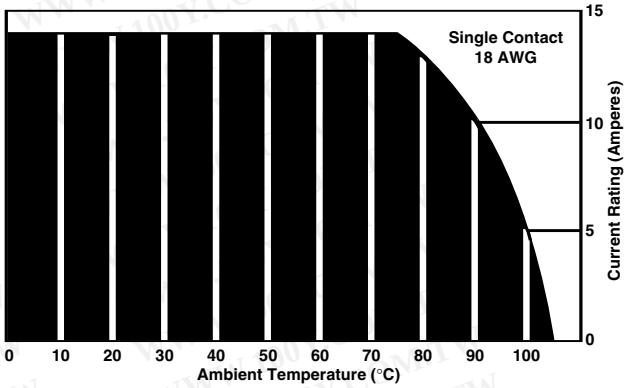
To demonstrate the method of specifying current, consider the following application conditions; an ambient temperature of 65°C, a 50% loading of contacts in the housing, and 20 AWG [0.6mm²] wire.

- From Figure 1, the base current rating is 14 ampere with 18 AWG [0.8mm²] wire.
- Figure 2, the rating factor for 50% loading and 20 AWG [0.6mm²] wire is 0.68.
- The specific rating for this application is the product of the base rating and the rating factor:

  14 x 0.68 = 9.5 ampere
- Each of the contacts can carry 9.5 ampere.
- However, if the ambient temperature is 80°C the allowable T-rise becomes 25°C. The base current must be lowered to 12.8 ampere so that the 105°C maximum operating temperature is not exceeded. The current rating then becomes:

  12.8 x 0.68 = 8.7 ampere.

Figure 1



Graph shows the relationship between base current, ambient temperature, and contact T-rise.

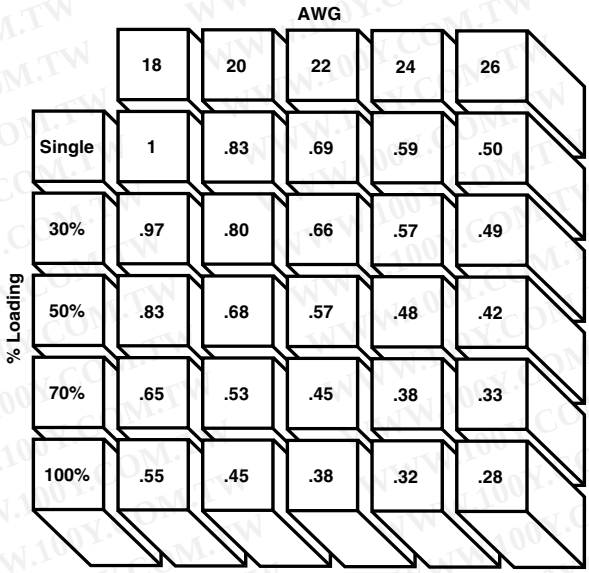


Figure 2

Rating factors allow the base current to be adjusted for various connector loading and wire sizes.

Contact Selector Chart

Connector Type	20 DF	Type I	Type II	Type III+	Posted Type III+	Type XII	Sub-Mini Coax	POWERBAND Contacts
CPC Series 1			✔	✔	✔		✔	
CPC Series 2	✔							
CPC Series 3						✔		
CPC Series 4			✔	✔		✔	✔	
CPC Series 5								✔
CPC Series 6		✔	✔	✔				✔
CPC 5015				✔				
CMC Series 1			✔	✔	✔		✔	
CMC Series 2	✔							
CMC Series 3						✔		
CMC Series 4			✔	✔		✔	✔	

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Circular Plastic Connectors, Size 1

CPC Connectors, Series 1 for Cable or Panel Mount

(Accepts Type III+, High-Current Power, Type II and Subminiature Coax Contacts)

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

Material

Housing—Thermoplastic, 94V-0 rated, black

Related Product Data

Contacts—Pages 17-23
Contact Arrangement—Page 24
Component Dimensions—Page 25*
Accessories—Pages 38-42, 52-54
Performance Characteristics—Page 6
Application Tooling—Pages 76-79
Technical Documents—Page 80

Replacement Coupling Rings

Shell Size	Part No.
11	213811-1
13	213813-1
17	213810-1
23	213812-1

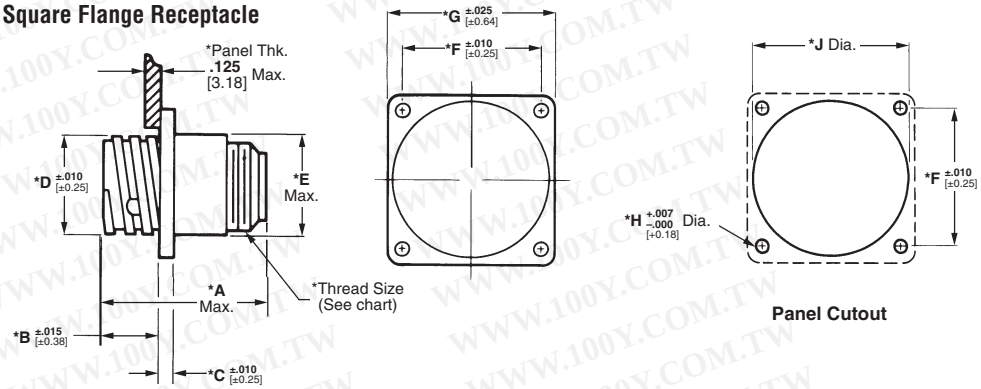
Keying

Molded-in keying in two configurations:

A—Standard Configuration: 5 Keys

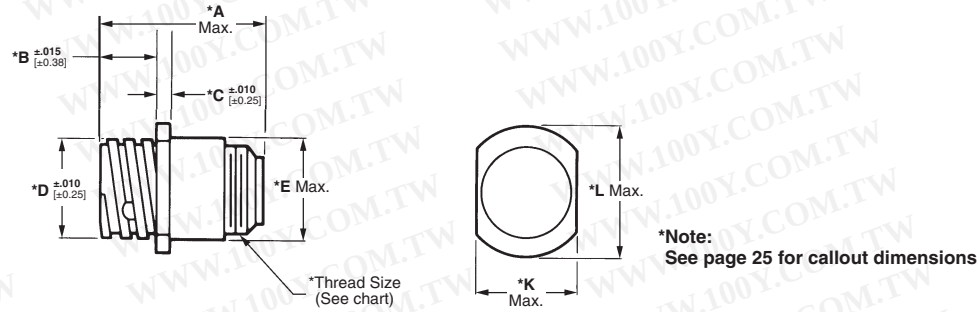
B—Optional Configuration: 4 Keys to prevent mismating of standard and reverse sex.

Square Flange Receptacle



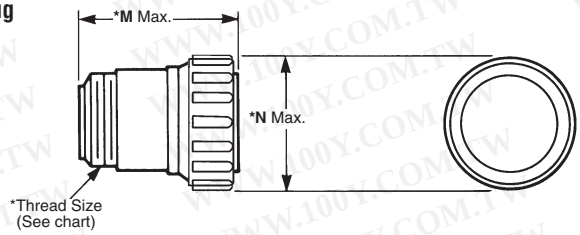
Panel Cutout

Free-Hanging Receptacle



***Note:**
See page 25 for callout dimensions

Plug



Standard Sex Connectors (Receptacles accept pin contacts, Plugs accept socket contacts)

Arrangement: Shell Size	Arrangement: No. of Positions	Keying	Square Flange Receptacle: With Threaded Inserts[1]	Square Flange Receptacle: With Mounting Holes	Free-Hanging Receptacle	Plug
11	4	A	208130-1	206061-1	206153-1	206060-1
13	9	A	208131-1	206705-1	206705-2	206708-1
17	16	A	206036-8	206036-1	206036-3	206037-1
		B	—	213862-1	—	213849-1
23	24	A	211839-1	206838-1	206838-2	206837-1
		B	—	213866-1	—	213851-1
23	37	A	787610-1	206151-1	206151-2	206150-1
		B	—	213860-1	—	213848-1

[1]Four 4-40 threaded inserts per receptacle.

Reverse Sex Connectors (Receptacles accept socket contacts, Plugs accept pin contacts)

Arrangement: Shell Size	Arrangement: No. of Positions	Keying	Square Flange Receptacle: With Threaded Inserts[1]	Square Flange Receptacle: With Mounting Holes	Free-Hanging Receptacle	Plug
11	4	A	211102-1	206430-1	206430-2	206429-1
17	14	A	211103-1	206043-1	206043-3	206044-1
		B	—	796437-2	—	796449-1
23	37	A	206306-5	206306-1	206306-2	206305-1
		B	—	213864-1	—	213850-1

[1]Four 4-40 threaded inserts per receptacle.
Key Style "A" is the Standard 5 Locating Key arrangement. Key Style "B" is the 4 Locating Key arrangement.

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Revised 7-07

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Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

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Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

Circular Plastic Connectors, Series 1, VDE Tested

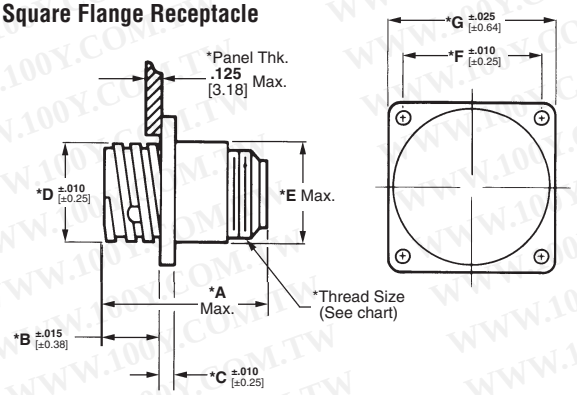
CPC Connectors, Series 1, for Cable or Panel Mount

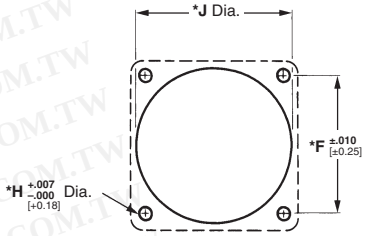
(Accepts Type III+, High-Current Power, Type II and Subminiature Coax Contacts)

- Designed to meet requirements of VDE as shown in DIN Specification 57627
- Recognized under the Component Program of Underwriters Laboratories Inc. for 600 VAC and 600 VDC service, File No. E28476
- Certified by Canadian Standards Association, File No. LR 7189

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

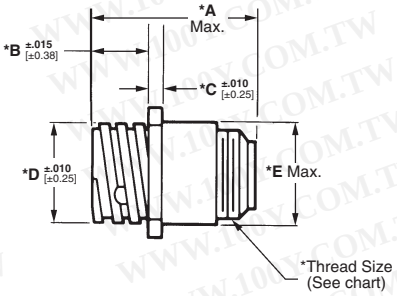
Square Flange Receptacle

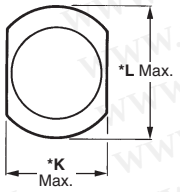




Panel Cutout

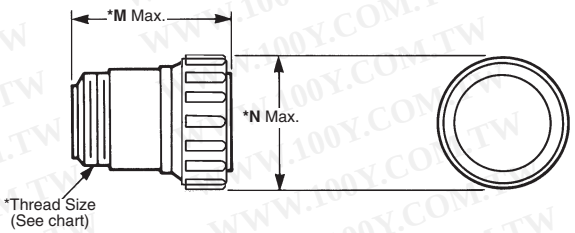
Free-Hanging Receptacle





***Note:**
See page 25 for callout dimensions

Plug



Material

Housing—Thermoplastic, 94V-0 rated, black

Related Product Data

Contacts—Pages 17-23
Contact Arrangement—Page 24
Component Dimensions—Page 25*
Accessories—Pages 38-42, 52-54
Performance Characteristics—Page 6
Application Tooling—Pages 76-79
Technical Documents—Page 80

Replacement Coupling Rings

Shell Size	Part No.
13	213813-1
17	213810-1
23	213812-1

Keying

A—Standard Configuration: 5 Keys
B—Optional Configuration: 4 Keys

Standard Sex Connectors (Receptacles accept pin contacts, Plugs accept socket contacts)

Arrangement: Shell Size	Arrangement: No. of Positions	Keying	Square Flange Receptacle: With Threaded Inserts[1]	Square Flange Receptacle: With Mounting Holes	Plug
13	7	A	211401-4	211401-1	211399-1
17	9	A	211767-2	211767-1	211766-1
23	19	A	211771-2	211771-1	211770-2
		B	—	213870-1	213853-1

[1]Four 4-40 threaded inserts per receptacle.

Reverse Sex Connectors (Receptacles accept socket contacts, Plugs accept pin contacts)

Arrangement: Shell Size	Arrangement: No. of Positions	Keying	Square Flange Receptacle: With Threaded Inserts[1]	Square Flange Receptacle: With Mounting Holes	Free-Hanging Receptacle	Plug
13	7	A	211398-4	211398-1	211398-2	211400-1
17	9	A	—	211769-1	211769-3	211768-1
		B	—	796439-2	—	796450-1
23	19	A	—	211773-1	—	211772-1
		B	—	213868-1	—	213852-1

[1]Four 4-40 threaded inserts per receptacle.
Key Style "A" is the Standard 5 Locating Key arrangement. Key Style "B" is the 4 Locating Key arrangement.

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Revised 7-07

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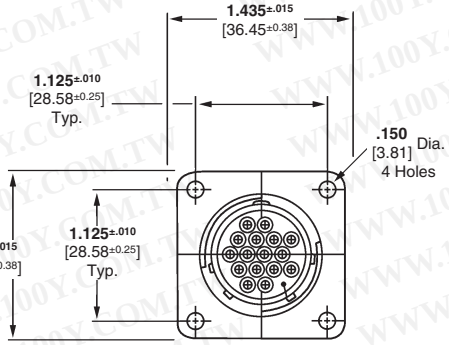
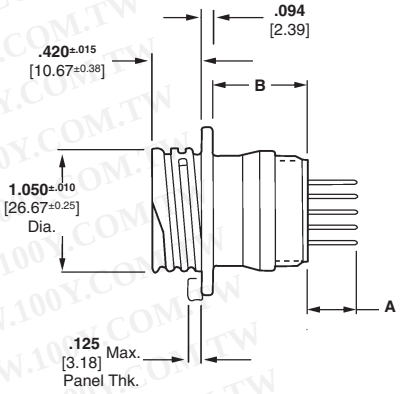
Circular Plastic Connectors, Series 1

Square Flange Receptacles, Printed Circuit Board Mount

with .025 [0.64] sq. solder tails





Material and Finish

Housing—Thermoplastic, 94V-0 rated, black

Contacts—
A—Duplex plated gold flash on entire contact with .000030 [0.00076] min. gold on contact engagement area, tin on the termination area
C—Plated tin on the entire contact, tin on the termination area

Related Product Data

Contact Arrangement—Page 24
Performance Characteristics—Page 6
Technical Documents—Page 80

Keying

Molded-in keying in two configurations:

A—Standard Configuration: 5 Keys

B—Optional Configuration: 4 Keys to prevent mismating of standard and reverse sex.

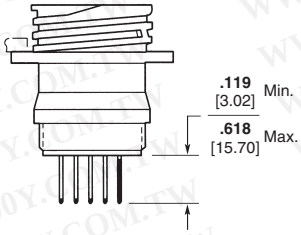
Other Available Posted Contacts

Tyco Electronics can make available contacts with various solder tail lengths for loading into the standard or reverse sex, square flange receptacles for applications requiring custom solder tail lengths.

Standard Sex (Posted Pin Contacts)

Arrangement No.	Receptacle Assemblies		Keying Style	Dimensions		Contact Finish Code	Peripheral Seal
	Mounting Holes	4-40 Threaded Inserts		A	B		
11-4	—	207825-9	A	**.119** 3.02	**.816** 20.73	A	N
13-7	—	1-796433-1	A	**.220** 5.59	**.816** 20.73	A	N
13-9	208223-9	—	A	**.220** 5.59	**.816** 20.73	A	N
	—	1-208223-0	A	**.220** 5.59	**.816** 20.73	A	N
17-16	—	1-207303-4	A	**.220** 5.59	**.816** 20.73	A / C	N
	1-207303-5	—					
	1-207303-3	—	A	**.220** 5.59	**.816** 20.73	A	N
	213855-4	213855-3	B				
23-19	213782-4	—	A	**.429** 10.90	**.679** 17.24	A	N
	213859-2	—	B	**.618** 15.70	**.674** 17.12	A	N
23-24	—	213588-2	A	**.220** 5.59	**.654** 16.61	C	N
	213798-3	—	A	**.618** 15.70	**.679** 17.24	A	N
	213780-2	—	A	**.220** 5.59	**.654** 16.61	A	N
	213857-2	—	B	**.429** 10.90	**.679** 17.24	A	N
23-37	1-206934-1	—	A	**.220** 5.59	**.654** 16.61	A	N
	206934-5	—	A	**.119** 3.02	**.654** 16.61	A	N
	—	1-206934-7					Y
	208132-2	—	A	**.429** 10.90	**.654** 16.61	C / A / A	N
	1-206934-8	—	A				
	213854-3	—	B				
	1-206934-9	—	A	**.618** 15.70	**.654** 16.61	A	N

Note: Posts are .017 [0.43] offset from centerline of contacts. All posts must be oriented in the same plane for proper contact/post location.



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Revised 7-07

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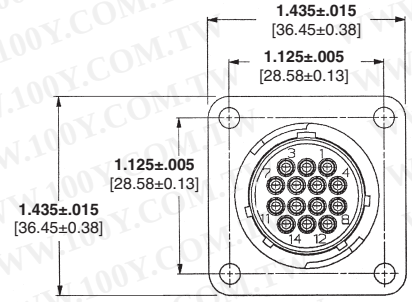
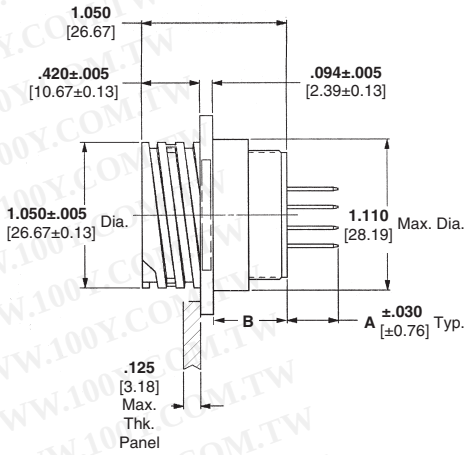
Circular Plastic Connectors, Series 1 (Continued)

Square Flange Receptacles, Printed Circuit Board Mount

with .025 [0.64] sq. solder tails





Material and Finish

Housing—Thermoplastic, 94V-0 rated, black

Contacts—

A—Duplex plated gold flash on entire contact with .000030 [0.00076] min. gold on contact engagement area, tin on the termination area

C—Plated tin on the entire contact, tin on the termination area

Related Product Data

Contact Arrangement—Page 24

Performance Characteristics—Page 6

Technical Documents—Page 80

Keying—Page 12

Reverse Sex (Posted Socket Contacts)

Arrangement No.	Receptacle Assemblies		Keying Style	Dimensions		Contact Finish Code	Peripheral Seal
	Mounting Holes	4-40 Threaded Inserts		A	B		
11-4	208283-4	—	A	**.159** 4.04	**.536** 13.61	A	N
	1-788130-1	—	A	**.704** 17.88	**.541** 13.74	C	N
17-9	1-213826-1	—	A	**.220** 5.59	**.536** 13.61	C	Y
17-14	213729-9	213729-6	A	**.368** 9.35	**.536** 13.61	A	N
	1-213825-7	—	A	**.220** 5.59	**.536** 13.61	C	Y
	—	213729-8	A	**.159** 4.04	**.536** 13.61	C	N
23-19	213858-3	—	B	**.645** 16.38	**.394** 10.00	A	N
	213781-9	—	A	**.557** 14.15	**.374** 9.50	C	N
	213827-8	—	A	**.368** 9.35	**.374** 9.50	C	Y
23-37	2-208224-1	—	A	**.557** 14.15	**.374** 9.50	A	N
	213856-4	—	B				
	1-208224-2	—	A	**.368** 9.35	**.374** 9.50	C	N
	1-213828-6	—	A	**.368** 9.35	**.374** 9.50	C	Y
	207890-2	—	A	**.159** 4.04	**.374** 9.50	A	N

Note: Posts are .017 [0.43] offset from centerline of contacts. All posts must be oriented in the same plane for proper contact/post location.

Special CPC Connectors, Square Flange Receptacles, Printed Circuit Board Mount With Round Posted Contacts (Size 16), Contact Arrangement 17-16

Material and Finish

Housing—Thermoplastic, 94V-0 rated, heat-stabilized, fire-resistant, self-extinguishing, black

Contacts—Brass

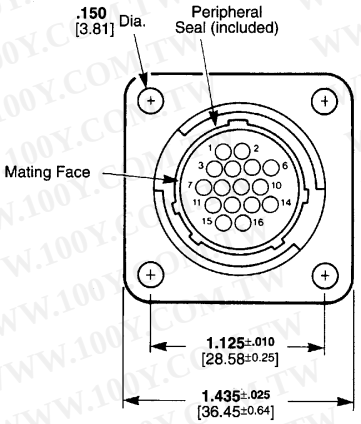
Plating—

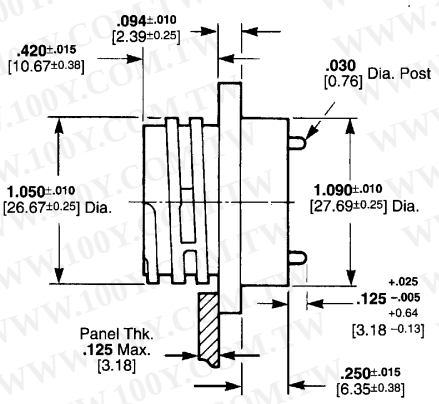
Connector Part No. 207292-1—Plated tin over .000050 [0.00127] min. nickel on entire contact

Connector Part No. 207292-2—Plated .000030 [0.00076] min. gold over .000050 [0.00127] min. nickel on entire contact

Notes: 1. Connector can be used for pressure bulkhead feed-thru (sealed) applications.

2. Receptacle is **Standard Sex**, supplied preloaded with 16 special round posted pin contacts, .030 [0.76] diameter.





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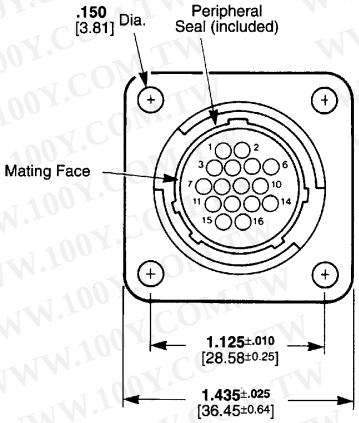
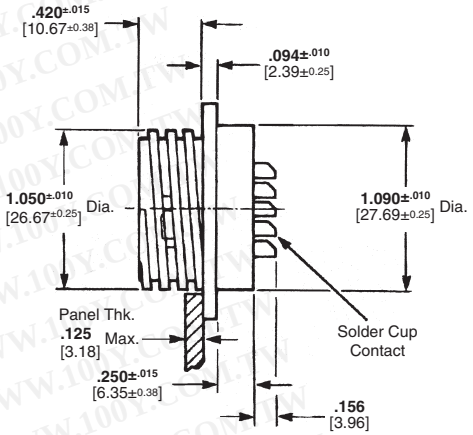
Circular Plastic Connectors, Series 1 (Continued)

Special CPC Connectors, Square Flange Receptacles, With Solder Type Contacts (Size 16), Contact Arrangement 17-16

Material and Finish

Housing—Thermoplastic, 94V-0 rated, heat-stabilized, fire-resistant, self-extinguishing, black
Contacts—Brass
Plating—
Connector Part No. 206404-1—Plated .000030 [0.00076] min. gold over .000030 [0.00076] min. nickel on entire contact
Connector Part No. 206404-2—Plated tin over .000100 [0.00254] min. copper on entire contact





Notes: 1. Connector can be used for pressure bulkhead feed-thru (sealed) applications.
2. Receptacle is standard sex, supplied preloaded with 16 special solder cup pin contacts.

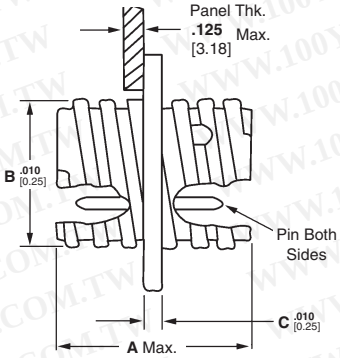
Special CPC Connectors, Feed-Thru

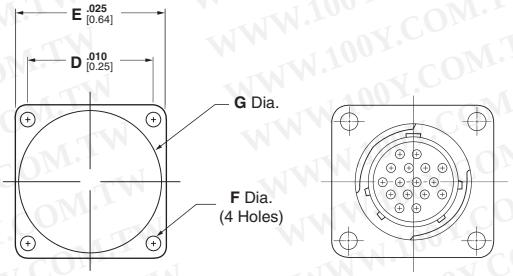
Pressure Rating up to 30 psi

Material and Finish

Housing—Thermoplastic, 94V-0 rated, black
Contacts—Copper alloy, gold over nickel plated

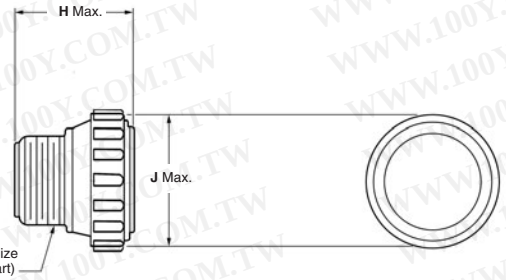
Receptacle, Feed-Thru





Plug

Panel Cutout



Part Numbers

Arrangement	Standard Numbering Plug	Reverse Numbering Plug	Feed-Thru Receptacle
11-4	206060-1	206516-1	206518-2
17-16	206037-1	206554-1	206552-1

Dimensions

Arrangement	Dimensions									Thread Size
	A	B	C	D	E	F	G	H	J	
11-4	**1.209** 30.71	**.687** 17.45	**.094** 2.39	**.844** 21.44	**1.125** 28.58	**.125** 3.18	**.840** 21.34	**1.080** 27.43	**.975** 24.77	5/8-24 UNEF-2A
17-16	**1.209** 30.71	**1.050** 26.67	**.094** 2.39	**1.125** 28.58	**1.435** 36.45	**.150** 3.81	**1.210** 30.73	**1.080** 27.43	**1.349** 34.26	15/16-20 UNEF-2A

Note: Feed-Thru Receptacles are **fully loaded** with Size 16, feed-thru pin contacts. Order Size 16 crimp, snap-in socket contacts for plugs separately.

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UK: 44-208-420-8341

Circular Plastic Connectors, Series 1 (Continued)

Square Flange Receptacles, Right-Angle, Posted

with **.025 [0.64] sq.** solder tails

Material and Finish

Housing—Thermoplastic, 94V-0 rated, black

Location Wafer—Phenolic, black

Contact Posts—.000100 [0.00254] min. tin over .000100 [0.00254] min. copper

Contact Body—

A—.000100 [0.00254] min. tin over .000050 [0.00127] min. nickel

B—.000030 [0.000762] min. gold for a length of .200 [5.08] min. from mating end, with remainder gold flash, both over .000050 [0.00127] min. nickel

Related Product Data

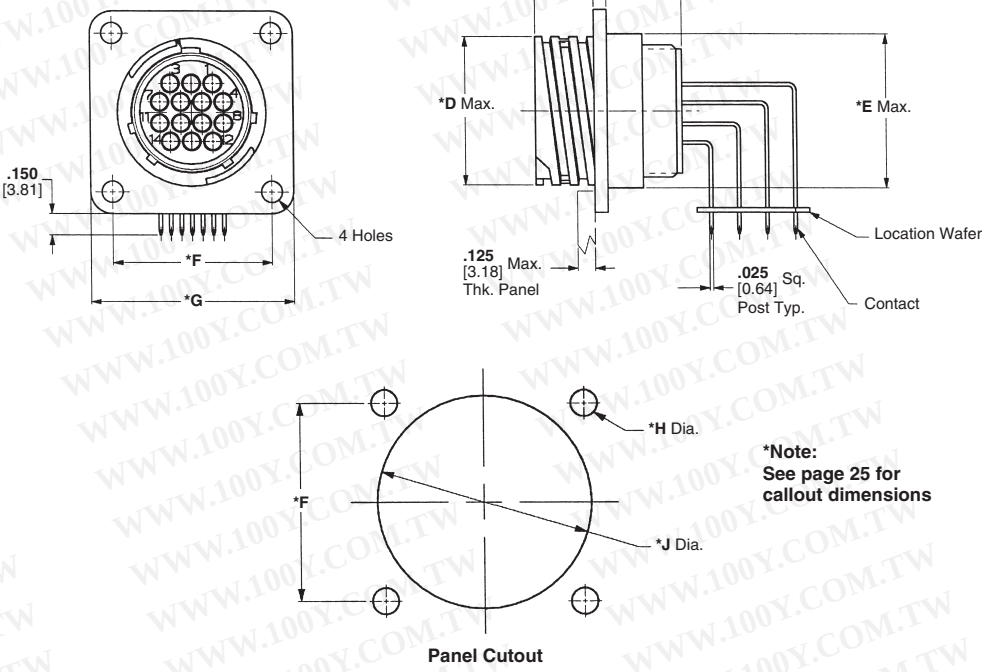
Contact Arrangements—Page 24

Component Dimensions—Page 25*

Performance Characteristics—Page 6

Keying—Standard Configuration: 5 Keys

Technical Documents—Page 80



Panel Cutout

***Note:**
See page 25 for callout dimensions

Standard Sex (Posted Pin Contacts)

Arrangement No.	Receptacle Assemblies		Contact Body Finish Code	Mating Plug Part No.
	Mounting Holes	4-40 Threaded Inserts		
11-4	1-796403-1	1-796403-2	B	206060-1
13-7	1-796435-1	1-796435-2	B	211399-1
13-9	1-796375-1	1-796375-2	B	206708-1
17-9	1-796497-1	—	B	211766-1
17-16	1-796404-1	—	B	206037-1
23-19	1-796405-1	—	B	211770-2
23-24	1-796387-1	—	A	206837-1
	1-796387-2	—	B	
23-37	1-796406-1	—	B	206150-1

Reverse Sex (Posted Socket Contacts)

Arrangement No.	Receptacle Assemblies		Contact Body Finish Code	Mating Plug Part No.
	Mounting Holes	4-40 Threaded Inserts		
11-4	1-796407-1	—	B	206429-1
13-7	1-796500-1	—	B	211400-1
17-9	1-796501-1	—	B	211768-1
17-14 (shown)	796348-3	—	A	206044-1
	796348-2	—	B	
23-19	1-796502-1	—	B	211772-1
23-37	1-796409-1	—	B	206305-1

Catalog 82021
Revised 7-07

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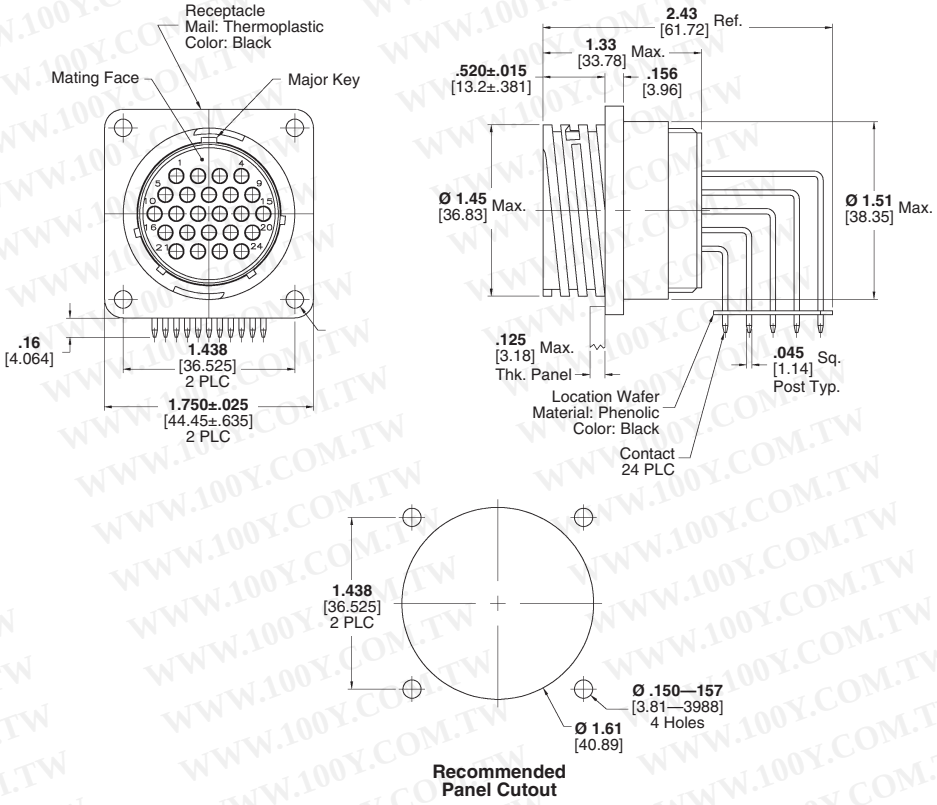
C. America: 57-1-254-4444

South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-208-420-8341

Circular Plastic Connectors, Series 1 (Continued)

Square Flange Receptacles, Right-Angle, Posted

with **.045 [1.14] sq.** solder tails.
For Higher Current Applications



Material and Finish

Housing—Thermoplastic, 94V-0 rated, black
Location Wafer—Phenolic, black
Contact Posts—.000100 [0.00254] min. tin over .000100 [0.00254] min. copper
Contact Body—
A—.000100 [0.00254] min. tin over .000050 [0.00127] min. nickel
B—.000030 [0.000762] min. gold for a length of .200 [5.08] min. from mating end, with remainder gold flash, both over .000050 [0.00127] min. nickel

Technical Documents—Page 80

Standard Sex (Posted Pin Contacts)

Arrangement No.	Receptacle Assemblies Mounting Holes	Contact Body Finish Code	Mating Plug Part No.
13-7	1776903-1	B	211399-1
17-16	1776904-1	B	206037-1
23-24	1776905-1	B	206837-1
23-37	1776906-1	B	206150-1

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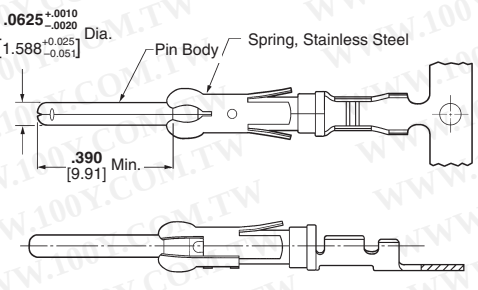
Signal Contacts

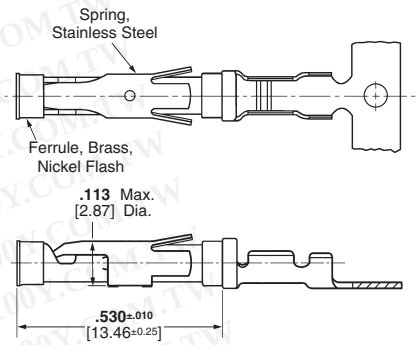
Type III+, Crimp, Snap-In

Pin

Socket



Pin



Socket

Material and Finish — See chart.
Contact Body—Brass or phosphor bronze
Retention Spring—Stainless steel

Application Tooling—Pages 76-79
Technical Documents
114-10004 Application Specification
108-10042 Product Specification

Contact Size 16—Pin Diameter .062 [1.57] (Test Current, 13 Ampere)‡

‡Single contact, free-air test current is not to be construed as contact rating current. Use only for testing. Refer to contact current carrying capability information on page 8.

Wire Size Range AWG	Wire Size Range mm²	Ins. Dia. Range	Contact Finish	Strip Form Contact No. Pin	Strip Form Contact No. Socket	Loose Piece Contact No. Pin	Loose Piece Contact No. Socket	Tooling Part No. Loose Piece Hand Tool	Tooling Part No. Strip Form Applicators
30-28	0.05-0.09	**.015-.030** 0.38-0.76	Gold/Nickel[2]	788085-3	788088-2	—	—	90716-1	567867-1*** or 567947-1*** or 680602-□***
			Sel. Gold/Nickel[3]	788085-1	788088-1	788085-4	788088-3		
30-26	0.05-0.15	**.040-.060**[1] 1.02-1.52	Bright Tin	1-66425-2	1-66424-1	—	—	91515-1[6]	466598-□***
			Gold/Nickel[2]	66425-7	66424-7	66429-3	66428-3		
			Sel. Gold/Nickel[3]	66425-8	66424-8	66429-4	66428-4		
		.014-.030[1] 0.36-0.76	Gold/Nickel[2]	66393-7	66394-7	—	—	90225-2[6]	466585-3***
			Sel. Gold/Nickel[3]	66393-8	66394-8	66406-4	66405-4		
26-24	0.12-0.2	**.035-.055**[1] 0.89-1.40	Bright Tin	1-66106-5	1-66108-5	1-66107-1	1-66109-7	91515-1[6] or 58495-1*	466321-□*** or 466908-2***
			Gold/Nickel[2]	66106-7	66108-7	66107-3	66109-3		
			Sel. Gold/Nickel[3]	66106-8	66108-8	66107-4	66109-4		
			Sel. Gold/Nickel[4]	—	66108-1	—	66109-1		
24-20	0.2-0.6	**.040-.080**[1] 1.02-2.03	Bright Tin	2-66102-5	3-66104-0	1-66103-8	1-66105-9	91515-1[6] or 58495-1*	466323-□*** or 466907-2***
			Gold/Nickel[2]	66102-8	66104-8	66103-3	66105-3		
			Sel. Gold/Nickel[3]	66102-9 2-66102-2	66104-9 2-66104-3	66103-4 1-66103-2	66105-4 1-66105-3		
			Sel. Gold/Nickel[4]	—	66104-1	—	66105-1		
		.060-.120[5] 1.52-3.05	Bright Tin	1-66564-2	1-66563-1	66566-7	66565-7	91542-1[6]	466383-4*** or 466979-1*** or 567363-□***
			Sel. Gold/Nickel[3]	66564-8	66563-8	66566-4	66565-4		
		.080-.100[1] 2.03-2.54	Bright Tin	1-66332-4	1-66331-4	1-66400-0	1-66399-0	91523-1[6] or 90225-2[6]	466324-□*** or 466942-1***
			Gold/Nickel[2]	66332-7	66331-7	66400-3	66399-3		
			Sel. Gold/Nickel[3]	66332-8	66331-8	66400-4	66399-4		
			Sel. Gold/Nickel[4]	—	66331-2	—	66399-2		
18-16	0.8-1.4	**.080-.100**[1] 2.03-2.54	Bright Tin	1-66098-9[5] 1-66098-8	1-66100-9	1-66099-5	1-66101-9	91505-1[6] or 91523-1[6] or 58495-1*	466325-□*** or 466906-1***
			Gold/Nickel[2]	66098-8	66100-8	66099-3	66101-3		
			Sel. Gold/Nickel[3]	66098-9	66100-9	66099-4	66101-4		
			Sel. Gold/Nickel[4]	66098-6	—	66099-1	—		
18-14	0.8-2.0	**.080-.100**[1] 2.03-2.54	Bright Tin	1-66359-4 1-66359-5	1-66358-6 1-66358-8	1-66361-2 66361-7	1-66360-2 66360-7	91519-1[6]	466326-□*** or 466923-2***
			Gold/Nickel[2]	66359-9	66358-9	66361-3	66360-3		
			Sel. Gold/Nickel[3]	1-66359-0 1-66359-2	1-66358-0 1-66358-3	66361-4 66361-8	66360-4 66360-8		
			Sel. Gold/Nickel[4]	—	66358-1	—	66360-1		
		.110-.150[5] 2.79-3.81	Bright Tin	66597-8	66598-9 1-66598-0	66602-8	66601-9	91521-1[6]	466958-1*** or 567364-□***
			Sel. Gold/Nickel[3]	66597-2	66598-2	66602-2	66601-2		

[1]Overall insulation crimp diameter, including crimp barrel, must not exceed .125 [3.18].
[2].000015 [0.00038] gold in the mating area over .000050 [0.00127] min. nickel.
[3].000030 [0.00076] gold in the mating area, with gold flash on remainder, over .000050 [0.00127] min. nickel.
[4].000030 [0.00076] gold in the mating area, with gold gradient on remainder, over .000050 [0.00127] min. nickel.
[5]**Contacts can ONLY be used in: Metrimate; CPC Series 1 (Arr. 23-24), Series 4 (Arr. 23-13M, 23-16M, 23-22M), and VDE connectors.**
[6]To use with the 626 Pneumatic Tool: remove crimping head from Straight Action Hand Tool (SAHT), 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).
[S]Standard reeling of strip form contacts.
*Commercial PRO-CRIMPER II hand tool for field repair only. **Note:** Die Set can be adapted for use with 626 Pneumatic Tool System. **Insertion Tool Part No. 91002-1** (for insulation diameters .070 [1.78] or less), **No. 200893-2** (for insulation diameters .090 [2.29] max.). **Extraction Tool Part No. 305183.** (Instruction Sheet 408-1216)
***Call Technical Support for Machine Applicator Part Numbers.

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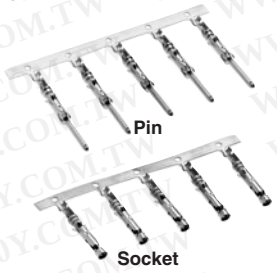
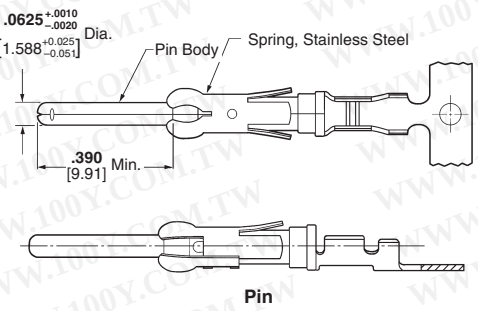
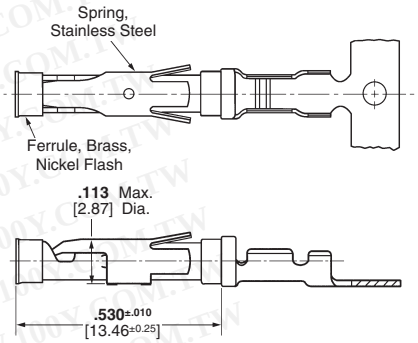
Signal Contacts (Continued)

Enhanced High Current Type III+, Crimp, Snap-In







Material and Finish — See chart.
Contact Body—Copper Nickel Alloy
Retention Spring—Stainless steel

Related Product Data
Application Tooling — Pages 76-79
Technical Documents
114-10004 Application Specification
108-10024-2 Product Specification

Contact Size 16—Pin Diameter .062 [1.57]

Wire Size Range AWG	Wire Size Range mm²	Ins. Dia. Range	Contact Finish	Strip Form Contact No. Pin	Strip Form Contact No. Socket	Loose Piece Contact No. Pin	Loose Piece Contact No. Socket	Tooling Part No. Loose Piece Hand Tool	Tooling Part No. Strip Form Applicators
18-14	0.8-2.0	**.080-.100**[1] 2.03-2.54	Gold	1-66359-6	1-66358-9	1-66361-4	1-66360-4	91519-1[3]	466326-□*** or 466923-2***
			Tin	1-66359-9	2-66358-1	1-66361-6	1-66360-6		
		.110-.150[2] 2.79-3.81	Gold	1-66597-0	1-66598-1	66602-9	1-66601-0	91521-1[3]	466958-1*** or 567364-□***
			Tin	1-66597-1	1-66598-2	1-66602-0	1-66601-2		

1 Overall insulation crimp diameter, including crimp barrel, must not exceed .125 [3.18].
2 Contacts can ONLY be used in CPC, Series 1 (Arr. 23-24), Series 4 (Arr. 23-13M, 23-16M, 23-22M), and VDE connectors.
3 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).
*** Call Technical Support for Automatic Machine Applicator Part Numbers.

Ratings

Voltage: 250 Volts AC/DC
600 Volts AC/DC, Series I, VDE tested and select loaded only
Base Current: Type III+ contacts: 17 amperes, 30˚C temperature rise with single contact on 14 AWG wire
Enhanced High Current Type III+ contacts: **25 amperes**, 30˚C temperature rise with single contact on 14 AWG wire
Temperature: -55˚C to +105˚C
VDE 0627: XA/630/4KV/2 - Series I, VDE tested only

Multiplication Rating Factor (F)

Type III+ Contacts (Note: 1 = 17 amperes)

Shell Size	Percent Connector Loading: Single Circuit, Wire Size 30 AWG	Single Circuit, Wire Size 14 AWG	≅ 50%, Wire Size 30 AWG	≅ 50%, Wire Size 14 AWG	100%, Wire Size 30 AWG	100%, Wire Size 14 AWG
11-4	.291	1	.212	.905	.140	.684
13-9	.278	.995	.175	.750	.134	.567
17-16	.270	.990	.146	.625	.127	.472
23-24	.281	.985	.138	.550	.120	.416
23-37	.275	.985	.131	.497	.114	.376

Enhanced High Current Type III+ Contacts (14 AWG wire only - Note: 1 = 25 amperes)

Shell Size	Percent Connector Loading: Single Circuit, 14 AWG	≅ 50%, 14 AWG	100%, 14 AWG
11-4	.880	.840	.640
13-9	.880	.640	.480
17-16	.880	.520	.400
23-24	.880	.520	.400
23-37	.880	.440	.320

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Signal Contacts (Continued)

Type III+ (Precision Formed, Crimp)

Contact Size—16
Pin Diameter—.062 [1.57]

Material and Finish

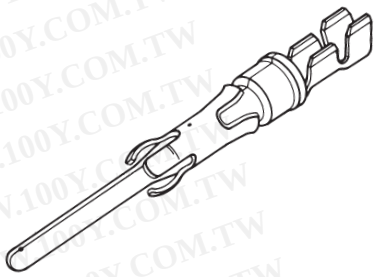
Contact Body—Copper alloy, plated tin or gold
Spring—Stainless steel

Grounding Pin

(make first - break last)

Related Product Data

Performance Characteristics—Page 6
Application Tooling—Pages 76-79
Technical Documents—Page 80



Wire Size Range mm²	Wire Size Range AWG	Ins. Dia. Range[1]	Contact Finish	Grounding Pin Part No. Strip Form	Grounding Pin Part No. Loose Piece	Strip Form Applicator Part No.	Loose Piece Hand Tool Part No.
0.12-0.2	26-24	**.035-.055** 0.89-1.4	Tin	164159-3	164162-1	—	91515-1[5] or 58495-1*
			Sel. Gold/Nickel[4]	164159-4	164162-2		
0.2-0.6	24-20	**.045-.070** 1.14-1.78	Bright Tin	164160-3	164163-1	466323-□*** or 466907-2***	91515-1[5] or 91505-1[5] or 58495-1*
			Sel. Gold/Nickel[4]	164160-4	164163-2		
0.8-1.4	18-16	**.078-.098** 1.98-2.49	Tin	164161-3	164164-1	466741-□*** or 680114-3***	91523-1[5] or 91505-1[5] or 58495-1*
			Sel. Gold/Nickel[4]	164161-4	164164-2		

[1]Overall insulation crimp diameter, including crimp barrel, must not exceed .125 [3.18].
[4]Gold flash over .000030 [0.00076] min. nickel on entire contact, with .000030 [0.00076] gold in contact area.
[5]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).
*Commercial PRO-CRIMPER II hand tool for field repair only. **Note:** Die Set can be adapted for use with the 626 Pneumatic Tool System.
***Call Technical Support for Automatic Machine Applicator Part Numbers.
Extraction Tool Part No. 539972-1.

High Current Power Contact—Size 16

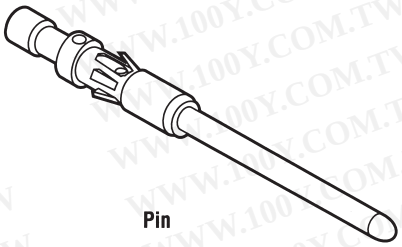
The features of the High Current Size 16 contact have been designed to retrofit into the existing AMP Connectors such as CPC (Circular Plastic Connector), CMC (Circular Metal Connector), G Series, M Series, Metrimate Square Grid and Drawer Connector housings. An initial T-Rise test in free air has shown a 23 amp capability with a 30° T-Rise. The contact may be crimped onto 14 AWG wire with an AMP hand tool **Part No. 601967-1**. Use turret TH502 **(1-601967-6)** for the pin and turret TH501 **(1-601967-5)** for the socket.

Material

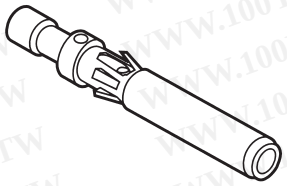
Body—Copper alloy
Louvertac Band—Beryllium copper
Retention Spring—Stainless steel

Finish

Body—Silver
Louvertac Band—Gold



Pin



Socket

Wire Range mm²	Wire Range AWG	Contact Part Nos. Pin Loose Piece	Contact Part Nos. Pin Tape Mounted	Contact Part Nos. Socket Loose Piece	Contact Part Nos. Socket Tape Mounted	Crimping Tool Tool	Crimping Tool Turret for Pins	Crimping Tool Turret for Sockets
0.8-1.4	18-16	796964-1	796964-2	796966-1	796966-2	601967-1	1-601967-5	1-601967-5
2	14	193844-1	193844-2	193846-1	193846-2	601967-1	1-601967-6	1-601967-5

Extraction Tool Part No. 305183

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UK: 44-208-420-8341

Signal Contacts (Continued)

Type III+ (Precision Formed, Solder)

Contact Size—16

Pin Diameter—.062 [1.57]

Material and Finish

Contact Body—Copper alloy, plated tin or gold

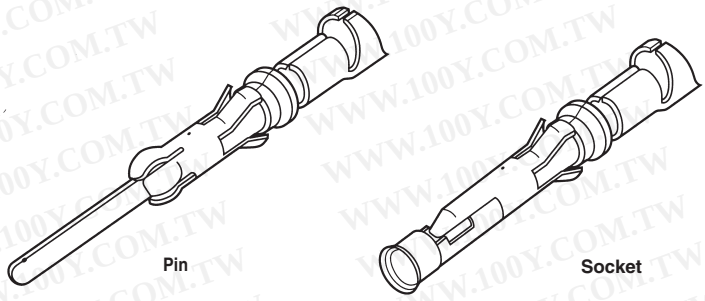
Spring—Stainless steel

Related Product Data

Performance Characteristics—Page 6

Technical Documents—Page 80

Solder-Type
(with Preformed Wire Barrel/Insulation Support)

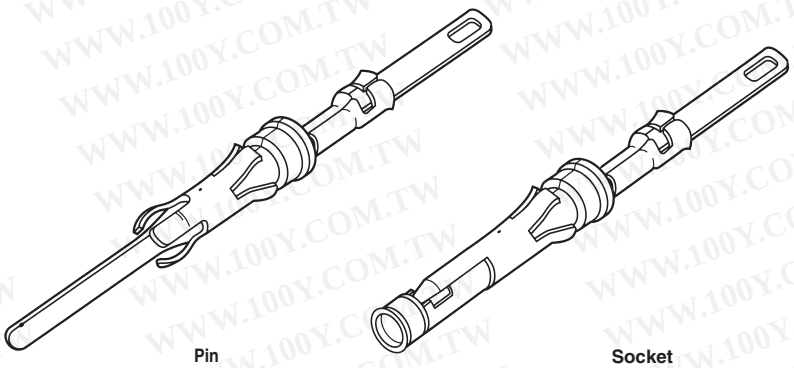


Pin Socket

Pin Socket

Solder-Type

Solder-Tab



Pin Socket

Pin Socket

Solder-Tab

Contact Size 16—Pin Diameter .062 [1.57] (Test Current, 13 Ampere)‡

Wire Size Range		Contact Finish	Loose Piece Contact No.	
AWG	mm²		Pin	Socket
26-20	0.12-0.6	Gold/Nickel[1]	66182-1	66183-1
18-16	0.8-1.4	Gold/Nickel[1]	66180-1	66181-1
Solder Tab[4]		Duplex[2]	202236-7	202237-7
		Bright Tin	202236-5	202237-5

[1].000030 [0.00076] gold in mating area over .000030 [0.00076] min. nickel.
[2]Duplex plated .000030 [0.00076] gold in mating area over .000030 [0.00076] min. nickel on contact body; bright tin on solder tab.
[3]Bright tin on entire contact.
[4]Designed for up to 14 AWG; but, not to exceed current limitation of contact.
Note: These contacts can be used in Multimate contact cavities of all connector housings.
‡Single contact, free-air test current is not to be construed as contact rating current. Use only for testing. Refer to contact current carrying capability information on page 8.
Extraction Tool Part No. 305183

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Japan: 81-44-844-8013
UK: 44-208-420-8341

Signal Contacts (Continued)

Type II, Screw Machined, Crimp

Material

Contact Body—Brass
Retention Spring—Stainless steel

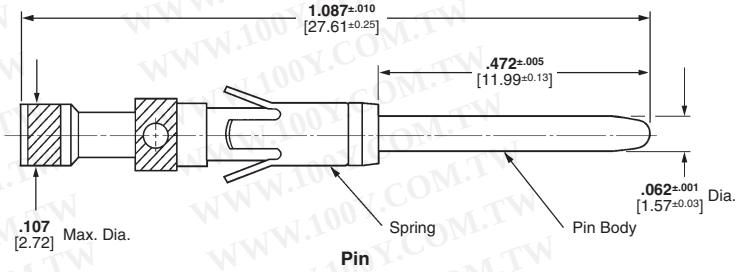
Finish

Contact Body—.000030 [0.00076] gold over .000050 [0.00127] nickel. Gold thickness controlled on socket O.D.
Retention Spring—Stainless steel

Related Product Data

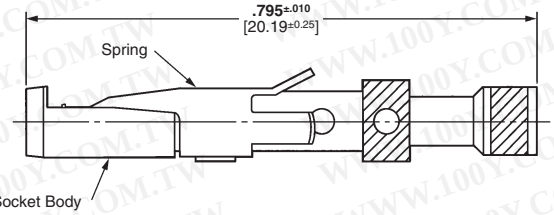
Application Tooling—Pages 76-79

Pin



Pin

Socket



Socket

Contact Size 16—Pin Diameter .062 [1.57] (Test Current, 13 Ampere)‡

Wire Size Range AWG	Wire Size Range mm²	Ins. Dia. Range[1]	Tape Mounted Contact No.[2] Pin	Tape Mounted Contact No.[2] Socket	Loose Piece Contact No. Pin	Loose Piece Contact No. Socket	Contact Color Code	Tooling Part No. Tape Mounted: Dies for AMP-TAPETRONIC Machine 69875	Tooling Part No. Loose Piece: Die Set for 626 Pneumatic Tool System	Tooling Part No. Loose Piece: Hand Tool
28-24	0.08-0.20	**.035-.055** 0.89-1.40	201611-4	—	201611-1[4]	201613-1[5]	Red/Red	90249-2	90230-1[7]	91538-1 or 601967-1
		.048-.065 1.22-1.65	—	—	201334-1[4]	201332-1[5]	Red/Red			
		.095-.110 2.41-2.79	—	—	202410-1[4]	202411-1[5]	Green		—	601967-1
24-20	0.2-0.6	**.040-.062** 1.02-1.57	201578-4	—	201578-1[4]	201580-1[5]	Yellow/Red	90249-2	90230-1[7]	91538-1 or 58541-1*
		.055-.088 1.40-2.16	201330-6	201328-9	201330-1[4]	201328-1[5]	Yellow/Red			or 601967-1
18 (Two)	0.9-0.9 (Two)	No. Ins. Support	—	—	202725-1[4]	202726-1[4]	Blue	—	90231-2[7]	91539-1 or 601967-1
18-16	0.8-1.4	**.080-.105** 2.03-2.67	—	—	202507-1[4]	202508-1[5]	—	—	—	90136-1 or 601967-1
		No Ins. Support	200336-6	200333-8	200336-1[4]	200333-1[4]	Blue/Blue	90250-1	90231-2[7]	91539-1
			—	—	204219-1[5,6]	—	Blue/Blue	—	—	58541-1* or 601967-1
14	2	No Ins. Support	212618-2[3]	201568-3	201570-1[4]	201568-1[5]	Violet/Blue	90250-1	90231-2[7]	91539-1
			201570-2	—	212618-1[3,6,†]	—	—	—	—	58541-1* or 601967-1

[1]Overall insulation crimp diameter, including crimp barrel, must not exceed .125 [3.18].
[2]For AMP-TAPETRONIC Machine No. 69875, order contacts by Tape Mounted Contact No., plus packaging code "IM REEL" (5000 parts per reel).
[3]Grounding pin is used to provide a make-first/break-last condition when mating and unmating connector halves.
[4]Use turret TH502 (**1-601967-6**) with hand tool **601967-1**.
[5]Use turret TH501 (**1-601967-5**) with hand tool **601967-1**.
[6]Pin length is .630±.005 [16.002±.127] on these two pins.
[7]Die Set requires "C" Head Adapter **Part No. 318161-1**; Adapter Holder **Part No. 356304-1** (with ratchet) or **189928-1** (without); and Power Unit **Part No. 189721-2** (hand actuated) or **189722-2** (foot actuated).
*Commercial PRO-CRIMPER II Hand Tool for field repair use only. **Note:** Die Set can be adapted for use with the 626 Pneumatic Tool System.
†Does not use Hand Tool 91539-1 or 601967-1.
‡Single contact, free-air test current is not to be construed as contact rating current. Use only for testing. Refer to contact current carrying capability information on page 8.
Insertion Tool Part No. 200893-2 (for insulation diameters .070 [1.78] or less).
Extraction Tool Part No. 305183.

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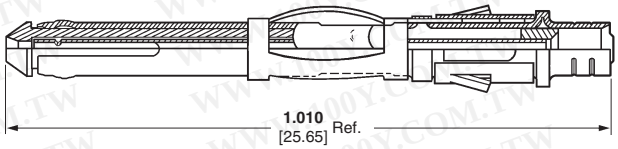
UK: 44-208-420-8341

Coaxial Contacts

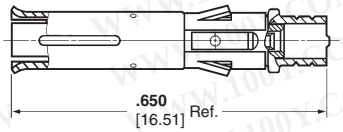
Subminiature Coax, Size 16 Precision Formed, Crimp

Pin

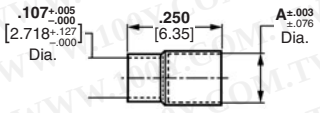
Socket



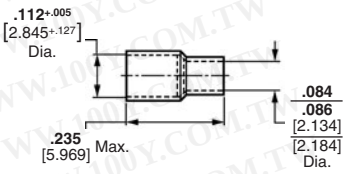
Pin



Socket



Ferrule
Part No. 5-225088-1— A .120 [3.05] Dia.
225088-3— A .123 [3.12] Dia.



Ferrule
Part No. 1-332057-0

Material

Outer Shell—Brass per MIL-C-50
Center Conductor—Beryllium copper per QQ-C-533 (Pin); Brass per QQ-B-626 (Socket)
Inner Dielectric—Polypropylene
Retention Spring—Stainless steel per QQ-S-766
Ferrule—Copper per QQ-C-576

Finish

Outer Shell, Center Conductor—See charts
Ferrule†—Bright tin per MIL-T-10727

Related Product Data

Application Tooling—Pages 76-79

Selection Chart for Coaxial Cable

Cable Size (RG/U)	Contact Finish	Loose Piece Contact No.		Ferrule Part No.	Tooling Part No.	
		Pin	Socket		Die Sets for Hand Tool 69710-1 or 626 Pneumatic Tool System	Hand Tool or Die Set*
178, 196	Gold/Nickel Gold/Copper[1]	226537-2	51565-2	1-332057-0†	69690-2[7]	69656-2
	Gold/Nickel Gold/Copper[2]	—	51565-5			
196 (Double Braid)	Gold/Nickel Gold/Copper[1]	226537-2	51565-2	5-225088-1†	—	69656-9
	Gold/Nickel Gold/Copper[2]	—	51565-5			
174, 188, 316	Gold/Nickel Gold/Copper[1]	226537-1	51565-1	1-332056-0	69690[7]	91911-3*
	Gold/Nickel Gold/Copper[2]	226537-4	51565-4			
174 (Double Braid)	Gold/Nickel Gold/Copper[1]	226537-1	51565-1	5-225088-3	—	69656-7
	Gold/Nickel Gold/Copper[2]	226537-4	51565-4			
179, 187	Gold/Nickel Gold/Copper[1]	226537-1	51565-1	1-332056-0	69690-1[7]	91911-4*
	Gold/Nickel Gold/Copper[2]	226537-4	51565-4			
187 (Double Braid)	Gold/Nickel Gold/Copper[1]	226537-1	51565-1	5-225088-1†	—	69656-8
	Gold/Nickel Gold/Copper[2]	226537-4	51565-4			
161	Gold/Nickel Gold/Copper[1]	226537-1	51565-1	1-332056-0	—	—
	Gold/Nickel Gold/Copper[2]	226537-4	51565-4			

[1].000030 [0.00076] gold over .000050 [0.00127] nickel—outer shell and socket center conductor; .000030 [0.00076] gold over .000100 [0.00254] copper—pin center conductor.
[2].000050 [0.00127] gold over .000050 [0.00127] nickel—outer shell and socket center conductor; .000050 [0.00127] gold over .000100 [0.00254] copper—pin center conductor.
[7]Die Set requires "C" Head Adapter **Part No. 318161-1**; Adapter Holder **Part No. 356304-1** (with ratchet) or **189928-1** (without); and Power Unit **Part No. 189721-2** (hand actuated) or **189722-2** (foot actuated).
†Does not use Hand Tool 91539-1 or 601967-1.
*Used with PRO-CRIMPER II Hand Tool Frame **Part No. 354940-1**.
Extraction Tool Part No. 305183

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UK: 44-208-420-8341

Coaxial Contacts (Continued)

Subminiature Coax, Size 16 Precision Formed, Crimp (Continued)

Finish

Ferrule†—Bright tin per MIL-T-10727

Related Product Data

Application Tooling—Pages 76-79

Selection Chart for Twisted Pair and Shielded Wire

Wire Size AWG	Wire Size mm²	Contact Finish	Loose Piece Contact No. Pin	Loose Piece Contact No. Socket	Ferrule Part No.	Tooling Part No. Die Sets for Hand Tool 69710-1 or 626 Pneumatic Tool System	Tooling Part No. Hand Tool or Die Set*
30	0.05 (Twisted Pair, Solid)	Gold/Nickel Gold/Copper[1]	226537-3	51565-3	1-332057-0†	69690-2[7]	69656-2
		Gold/Nickel Gold/Copper[2]	226537-6	51565-6			
28	0.08-0.09 (Twisted Pair, Solid)	Gold/Nickel Gold/Copper[1]	226537-3	51565-3	1-332057-0†	69690[7]	91911-3*
		Gold/Nickel Gold/Copper[2]	226537-6	51565-6			
28	0.08-0.09 (Twisted Pair, Stranded 7 Str., .0050 [0.13] Dia.)	Gold/Nickel Gold/Copper[1]	226537-3	51565-3	1-332057-0†	69690-1[7] or 69690-2[7]	91911-4* or 69656-2
		Gold/Nickel Gold/Copper[2]	226537-6	51565-6			
26	0.12-0.15 (Twisted Pair, Solid or Stranded 7 Str., .0063 [0.16] Dia.)	Gold/Nickel Gold/Copper[1]	226537-3	51565-3	1-332057-0†	69690[7]	91911-3*
		Gold/Nickel Gold/Copper[2]	226537-6	51565-6			
26	0.12-0.15 (Shielded, .075 [1.91] Max. O.D.)	Gold/Nickel Gold/Copper[1]	226537-1	51565-1	1-332057-0†	69690-3[7]	69656-3
		Gold/Nickel Gold/Copper[2]	226537-4	51565-4			

[1].000030 [0.00076] gold over .000050 [0.00127] nickel—outer shell and socket center conductor; .000030 [0.00076] gold over .000100 [0.00254] copper—pin center conductor.
[2].000050 [0.00127] gold over .000050 [0.00127] nickel—outer shell and socket center conductor; .000050 [0.00127] gold over .000100 [0.00254] copper—pin center conductor.
[7]Die Set requires "C" Head Adapter **Part No. 318161-1**; Adapter Holder **Part No. 356304-1** (with ratchet) or **189928-1** (without); and Power Unit **Part No. 189721-2** (hand actuated) or **189722-2** (foot actuated).
*Used with PRO-CRIMPER II Hand Tool Frame **Part No. 354940-1**.
Note: A ferrule is required for each pin and socket.
Extraction Tool Part No. 305183.

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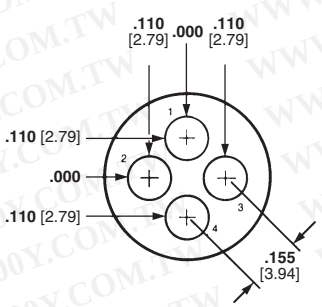
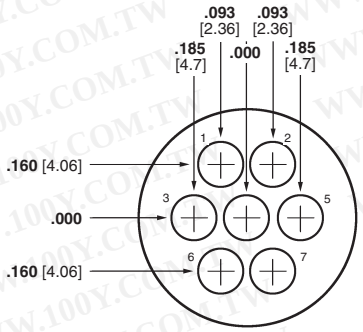
Contact Arrangements, Series 1

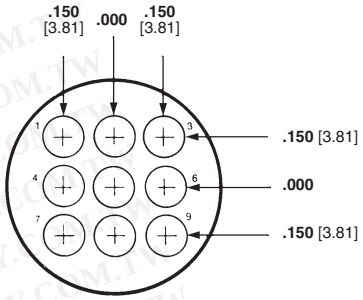
Shell Sizes 11 and 13



Arrangement 11-4
Max. Wire Ins. Dia. = .100 [2.54]

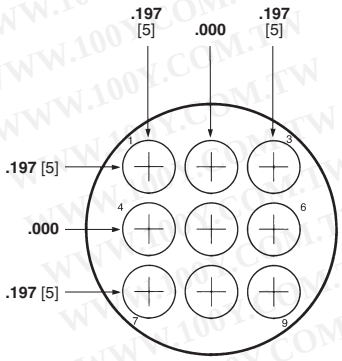


Arrangement 13-7
Max. Wire Ins. Dia. = .100 [2.54]

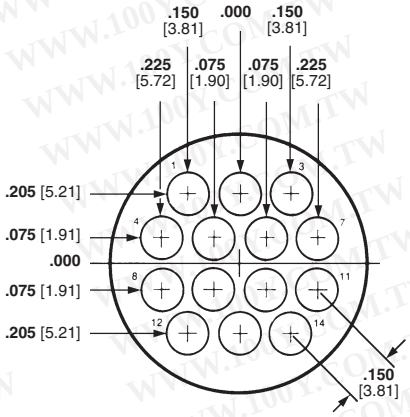


Arrangement 13-9
Max. Wire Ins. Dia. = .100 [2.54]

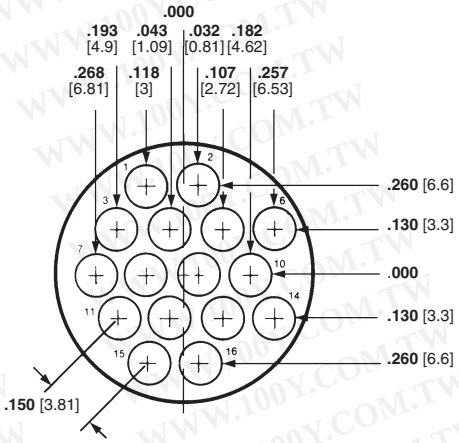
Shell Size 17



Arrangement 17-9
Max. Wire Ins. Dia. = .150 [3.81]

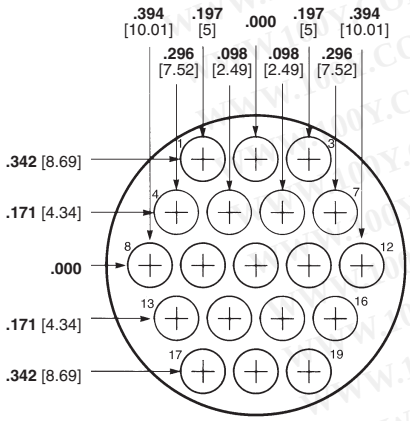


Arrangement 17-14
Max. Wire Ins. Dia. = .100 [2.54]

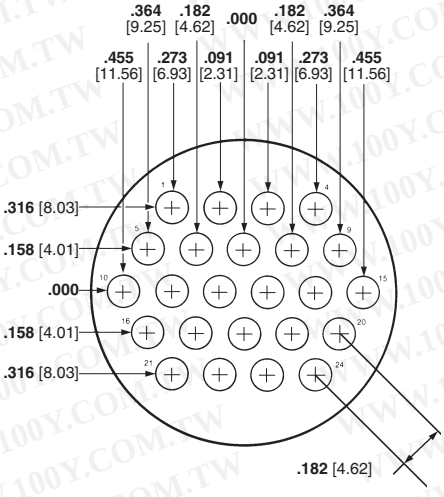


Arrangement 17-16
Max. Wire Ins. Dia. = .100 [2.54]

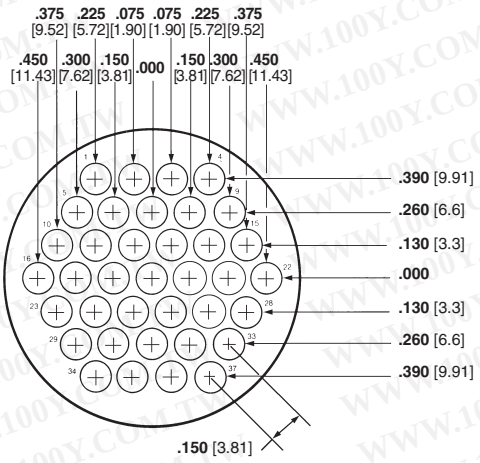
Shell Size 23



Arrangement 23-19
Max. Wire Ins. Dia. = .150 [3.81]



Arrangement 23-24
Max. Wire Ins. Dia. = .150 [3.81]



Arrangement 23-37
Max. Wire Ins. Dia. = .100 [2.54]

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

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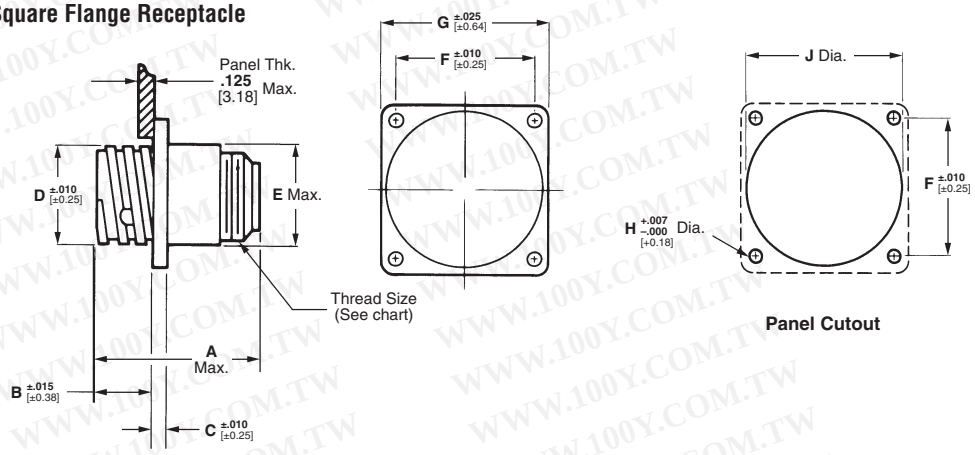
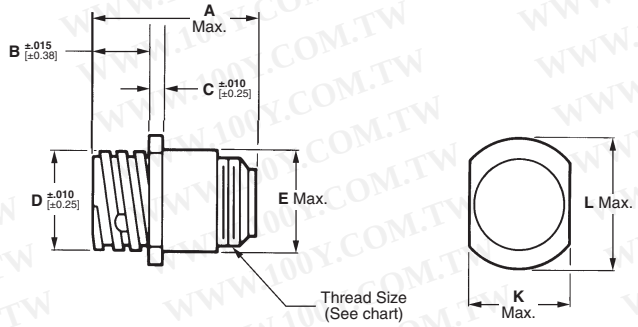
Component Dimensions, Series 1

Square Flange Receptacle

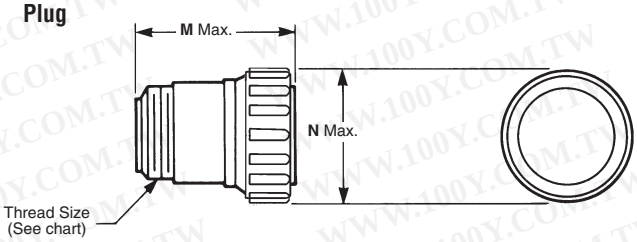


Panel Cutout

Free-Hanging Receptacle



Plug



Shell Size	Sex	Dimensions													Thread Size
		A	B	C	D	E	F	G	H	J	K	L	M	N	
11	Rev.	**1.070** 27.18	**.420** 10.67	**.094** 2.39	**.687** 17.45	**.740** 18.8	**.844** 21.44	**1.125** 28.58	**.125** 3.18	**.840** 21.34	**.817** 20.75	**.935** 23.75	**1.365** 34.67	**.975** 24.77	5/8-24 UNEF-2A
	Std.	**1.350** 34.29											**1.080** 27.43		
13	Std.	**1.350** 34.29	**.420** 10.67	**.094** 2.39	**.812** 20.62	**.879** 22.33	**.969** 24.61	**1.281** 32.54	**.125** 3.18	**.979** 24.87	**.874** 22.2	**1.072** 27.23	**1.080** 27.43	**1.105** 28.07	3/4-20 UNEF-2A
17	Rev.	**1.070** 27.18	**.420** 10.67	**.094** 2.39	**1.050** 26.67	**1.110** 28.19	**1.125** 28.58	**1.435** 36.45	**.150** 3.81	**1.210** 30.73	**1.161** 29.49	**1.310** 33.27	**1.365** 34.67	**1.349** 34.26	15/16-20 UNEF-2A
	Std.	**1.350** 34.29											**1.080** 27.43		
23	Rev.	**1.070** 27.18	**.520** 13.21	**.156** 3.96	**1.438** 36.53	**1.510** 38.35	**1.438** 36.53	**1.750** 44.45	**.150** 3.81	**1.610** 40.89	**1.505** 38.23	**1.733** 44.02	**1.365** 34.67	**1.788** 45.42	1-3/8-18 UNEF-2A
	Std.	**1.350** 34.29											**1.080** 27.43		

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Note: All part numbers are RoHS Compliant.

Circular Plastic Connectors, Series 2

CPC Connectors, Series 2 for Cable or Panel Mount

(Accepts Size 20 DM or DF Crimp, Snap-In Contacts)

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

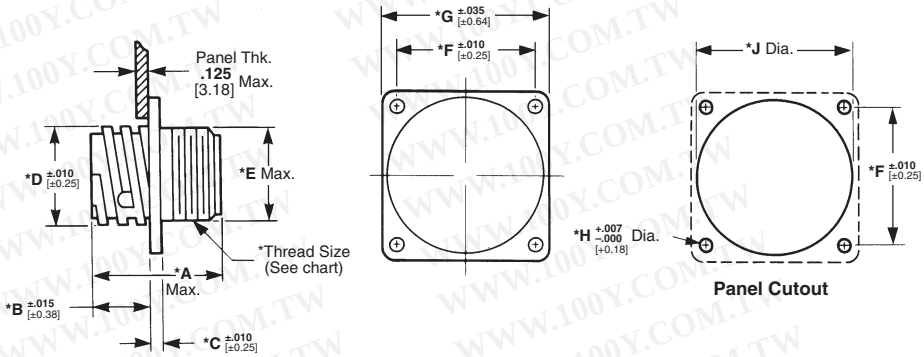
Material

Housing—Thermoplastic, 94V-0 rated, black

Related Product Data

Contacts—Pages 29-30
Contact Arrangement—Page 31
Component Dimensions—Page 32*
Accessories—Pages 38-42
Performance Characteristics—Page 6
Application Tooling—Pages 76-79
Technical Documents—Page 80

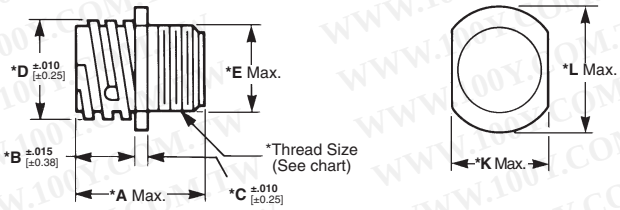
Square Flange Receptacle



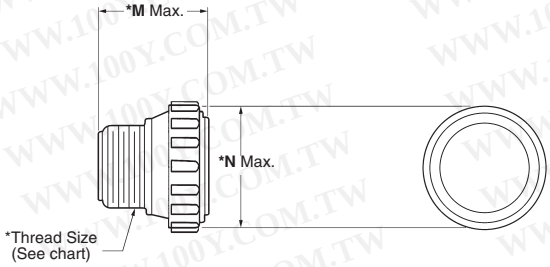
Panel Cutout

***Note:**
See page 32 for callout dimensions

Free-Hanging Receptacle



Plug



Standard Sex Connectors

(Receptacles accept Size 20 DM or DF pin contacts, Plugs accept Size 20 DM or DF socket contacts)

Arrangement	Square Flange Receptacle		Free-Hanging Receptacle	Plug
	With Mounting Holes	With Threaded Inserts[1]		
11-8	205841-1	205841-3	205841-2	205838-1
11-9	206486-1	206852-8	206486-2	206485-1
17-28	205840-3	205840-4	206152-1	205839-3
23-63	205843-1	—	205843-2	205842-1

[1]Four 4-40 threaded inserts per receptacle.

Reverse Sex Connectors

(Receptacles accept Size 20 DM or DF socket contacts, Plugs accept Size 20 DM or DF pin contacts)

Arrangement	Square Flange Receptacle		Free-Hanging Receptacle	Plug
	With Mounting Holes	With Threaded Inserts[1]		
11-8	206433-1	206433-3	206433-2	206434-1
17-28	206038-1	206038-4	206038-2	206039-1
23-57	206438-1	—	206438-2	206437-1

[1]Four 4-40 threaded inserts per receptacle.

Note: For Standard and Reverse Sex Connectors the maximum wire insulation diameter is .068 [1.73].

Replacement Coupling Rings

Shell Size	Part No.
11	213811-1
17	213810-1
23	213812-1

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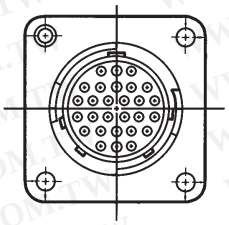
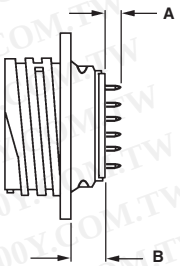
Circular Plastic Connectors, Series 2 (Continued)

Receptacles, Printed Circuit Board Mount

with .025 [0.64] sq. solder tails





Material and Finish

Housing—Thermoplastic, 94V-0 rated, black

Contacts—
A—Duplex plated gold flash on entire contact with .000030 [0.00076] min. gold on contact engagement area, tin on the termination area, all over .000050 [0.00127] min. nickel under-plating
B—Plated gold flash on the entire contact, tin on the termination area

Related Product Data

Contact Arrangement—Page 31
Performance Characteristics—Page 6
Technical Documents—Page 80
Accessories—Pages 38-42

Standard Sex (Posted Pin Contacts)

Arrangement		Receptacle Assemblies		Dimensions		Contact Finish Code
Shell Size	No. of Positions	Mounting Holes	4-40 Threaded Inserts[1]	A	B	
11-9		1-206852-2	—	**.125** 3.18	**.230** 5.84	A
		1-206852-1	—	**.352** 8.94	**.230** 5.84	A
17-28		1-207369-1	—	**.125** 3.18	**.230** 5.84	A
		1-207369-3	—	**.352** 8.94	**.230** 5.84	A
23-63		1-206455-2	—	**.227** 5.77	**.338** 8.59	A
		1-206455-1	—	**.449** 11.40	**.338** 8.59	A

[1]Four 4-40 threaded inserts per receptacle.

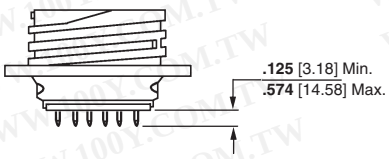
Reverse Sex (Posted Socket Contacts)

Arrangement		Receptacle Assemblies		Dimensions		Contact Finish Code
Shell Size	No. of Positions	Mounting Holes	4-40 Threaded Inserts[1]	A	B	
11-8		1-208657-1	—	**.352** 8.94	**.285** 7.24	A
		—	1-208657-0	**.574** 14.58	**.230** 7.24	A
17-28		1-207216-6	—	**.125** 3.18	**.230** 5.84	B
		1-207216-7	—	**.352** 8.94	**.230** 5.84	A
23-57		1-796329-1	—	**.232** 5.89	**.333** 8.46	A

[1]Four 4-40 threaded inserts per receptacle.

Other Available Posted Contacts

Tyco Electronics can make available contacts with various solder tail lengths for loading into the standard or reverse sex, square flange receptacles for applications requiring custom solder tail lengths.



Catalog 82021
Revised 7-07

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Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-208-420-8341

Circular Plastic Connectors, Series 2 (Continued)

Special CPC Connectors, Series 2

(Pressure rated up to 30 psi)

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

Material

Housing—Thermoplastic, 94V-0 rated, black

Feed-Thru Contacts—Copper alloy, plated gold over nickel

Related Product Data

Socket Contacts (for Plugs)—Pages 29-30

Contact Arrangement—Page 31

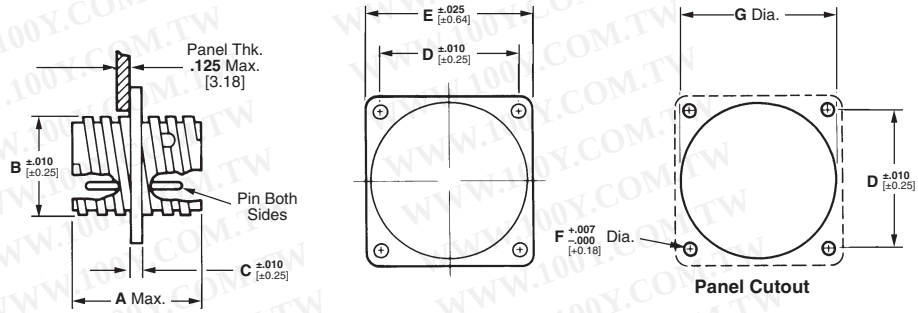
Performance Characteristics—Page 6

Accessories—Pages 38-42

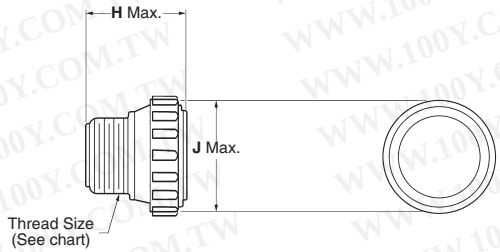
Technical Documents—Page 80

Square Flange Feed-Thru Receptacles

(with Permanently Sealed .040 [1.02] Dia. Solid Pins)



Plug



Arrangement No.	Dimensions									Thread Size
	A	B	C	D	E	F	G	H	J	
11-8	**1.035** 26.29	**.688** 17.48	**.188** 4.78	**.844** 21.44	**1.125** 28.58	**.125** 3.18	**.840** 21.34	**.800** 20.32	**.975** 24.77	5/8-24 UNEF-2A
17-28	**1.040** 26.42	**1.050** 26.67	**.188** 4.78	**1.125** 28.58	**1.435** 36.45	**.150** 3.81	**1.210** 30.73	**.800** 20.32	**1.349** 34.26	15/16-20 UNEF-2A

Part Numbers

Arrangement No.	Standard Numbering Plug	Reverse Numbering Plug	Square Flange Feed-Thru Receptacle
11-8	205838-1	206460-1	206458-1
17-28	206125-1	206126-1	206127-1

Note: One plug must have standard numbering of cavities, and the other plug must have reverse numbering of cavities.

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Japan: 81-44-844-8013
UK: 44-208-420-8341

Signal Contacts

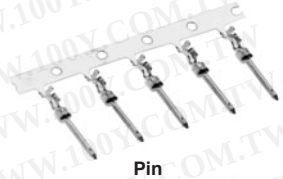
Size 20 DF, Precision Formed, Crimp Contacts

Contact Size—20

Pin Diameter—.040 [1.02]

***Test Current**—7.5 ampere (Single contact, free-air test current; not to be construed as contact rating current. Use only for testing.)

***Note:** Total current capacity of each contact in any given connector is dependent on the heat rise resulting from the combination of electrical loads of all contacts in the connector arrangement and the maximum ambient temperature in which the connector will be operating. **See page 8.**



Pin

Socket

Material

Pin Body—Brass

Socket—Phosphor bronze

Contact Finish

A—Select gold flash over nickel on entire contact, with additional .000030 [0.00076] gold on mating end

B—Duplex plated .000030 [0.00076] gold on mating end, tin on termination end, with entire contact nickel underplated

C—Gold flash over nickel on entire contact

D—Duplex plated gold flash on mating end, tin on termination end, with entire contact nickel underplated

Related Product Data

Application Tooling—Pages 76-79

Technical Documents—Page 80

Product Specification—108-40005

Insertion/Extraction Tool
Part No. 91285-1
Instruction Sheet—408-9404

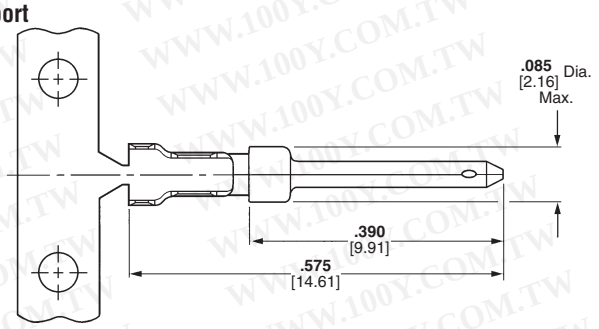
This tool includes interchangeable tips to Insert/Extract:

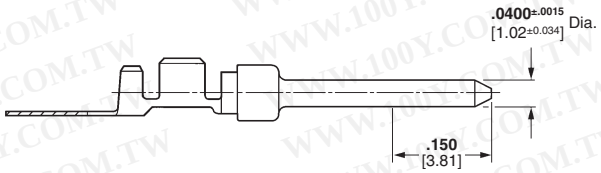
Size 22, 28-22 AWG [0.08-0.03 mm²] Crimp Contacts

Size 20, 28-20 AWG [0.08-0.6 mm²] Crimp and Solder Cup Contacts

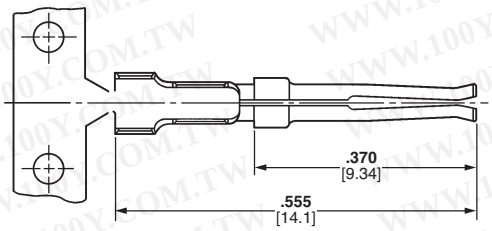
Size 20, Posted Contacts

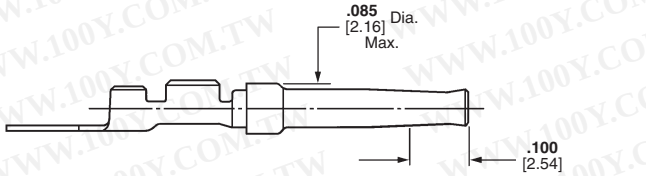
With Insulation Support





Pin





Socket

Wire Size Range	Ins. Dia. Max.	Contact Code Finish	Contact Part Nos. Pin Strip Form	Pin Loose Piece	Socket Strip Form	Socket Loose Piece	Tooling Strip Form Applicator††	Tooling Hand Tool	Color Code (Loose Piece)
28-24 AWG [0.08-0.2 mm²]	.040 1.02	A	66507-3	66507-9	66505-3	66505-9	466423-□†† or 466901-1†† or 1016015-1††	91503-1[5]	Blue Dot
		B	1658540-4	1658540-5	1658538-2	—			
		C	66507-4	1-66507-0	66505-4	1-66505-0			
		D	1658540-1	1658540-2	1658538-3	5-66505-9			
	.060 1.52	A	66682-2	66682-4	66683-2	66683-4	466758-2†† or 466963-1†† or 567804-1††	91549-1[5]	Black Dot
		B	5066682-9	—	1-5066683-0	—			
		D	5066682-6	—	5066683-7	—			
26-22 AWG [0.12-0.4 mm²]	.050 1.27	A	745254-2	745254-6	745253-2	745253-6	466968-1†† or 567036-□†† or 567849-1††	91525-1[5]	Yellow Dot
		B	1658544-2	1658544-1	1658543-2	1658543-1			
		C	745254-3	745254-7	745253-3	745253-7			
		D	1658544-3	1-745254-6	1658543-3	1-745253-6			
24-20 AWG [0.2-0.6 mm²]	.060 1.52	A	66506-3	66506-9	66504-3	66504-9	466422-□†† or 466900-1†† or 567801-1†† or 1016002-1††	91503-1[5]	Red Dot
		B	1658539-1	1658539-3	1658537-3	1658537-4			
		C	66506-4	1-66506-0	66504-4	1-66504-0			
		D	1658539-2	1658539-4	1658537-1	1658537-2			

[5]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).

††For complete information on AMP Strip Form Applicators for fully automatic and semiautomatic machines, contact Technical Support.

Note: Commercial PRO-CRIMPER III Maintenance and Repair Hand Tool for Wire Size 28-24 AWG [0.08-0.2 mm²] (Ins. Dia. Max. .040 [1.02]), and Wire Size 24-20 AWG [0.2-0.6 mm²] (Ins. Dia. Max. .060 [1.52])—**Part No. 58448-2.**

Note: Die Set **Part No. 58448-3** can be adapted for use with the 626 Pneumatic Tool System.

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UK: 44-208-420-8341

Signal Contacts (Continued)

Size 20 DM, Screw-Machined, Crimp Contacts

Pin Diameter—.040 [1.02]

Test Current*—7.5 amperes (Single contact, free-air test current; not to be construed as contact rating current. Use only for testing.)

Material and Finish

Pin Body—Copper alloy per QQ-B-626

Socket Body—Beryllium copper per QQ-C-530

Socket Sleeve—Passivated stainless steel per QQ-S-766

Plating pin and socket body—.000050-.000100 [0.00127-0.00254] min. gold over .000100-.000150 [0.00254-0.00381] min. copper

Gold plating per MIL-G-45204
Copper plating per MIL-C-14550

Type 20 DF, Solder Contacts

Pin Diameter—.040 [1.02]

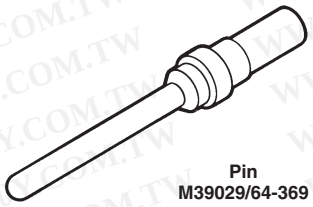
Test Current*—7.5 amperes (Single contact, free-air test current; not to be construed as contact rating current. Use only for testing.)

Material and Finish

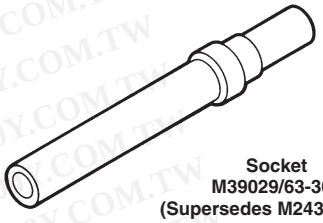
Pin—Brass, plated gold flash over nickel on entire contact with additional .000030 [0.00076] min. gold on mating end

Socket—Phosphor bronze, plated gold flash over nickel on entire contact with additional .000030 [0.00076] min. gold on mating end

***Note:** Total current capacity of each contact in a given connector is dependent on the heat rise resulting from the combination of electrical loads of all contacts in the connector arrangement and the maximum ambient temperature in which the connector will be operating. See page 8.



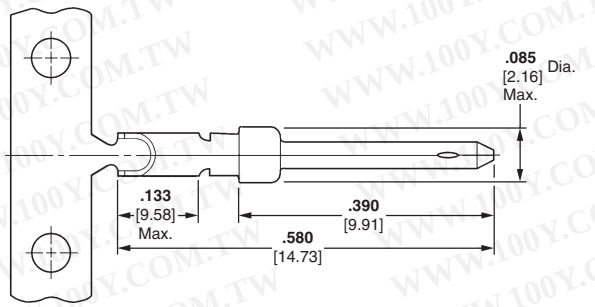
Pin
M39029/64-369
(Supersedes M24308/11-1)

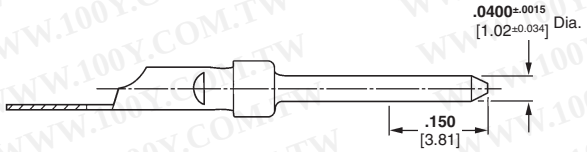


Socket
M39029/63-368
(Supersedes M24308/10-1)

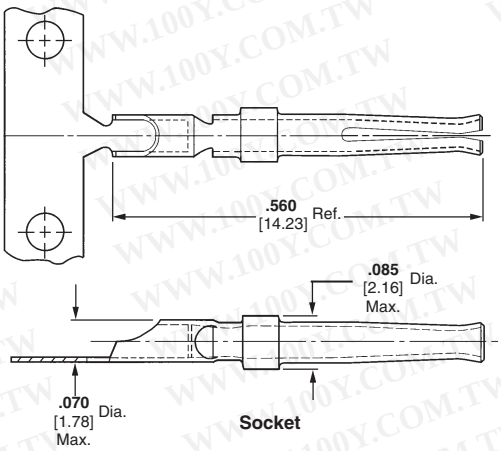
Wire Size Range[1] AWG	mm²	Ins. Dia. (Max.)	Contact Configuration	Tape Mounted Contacts[2] Part No.	Loose Piece Contacts Military No. (M39029/)	Loose Piece Contacts Part No.	Hand Tool Nos. Military (M22520/)	Hand Tool Nos. Part No.	Positioner Nos. Military (M22520/)	Positioner Nos. Part No.
24-20	0.2-0.6	.068 1.73	Pin	205089-2	64-369	205089-1	02-01	601966-1	2-08	601966-5
			Socket	205090-2	63-368	205090-1				

[1]Overall insulation crimp diameter, including crimp barrel, must not exceed .125 [3.18].
[2].000015 [0.00038] gold in the mating area over .000050 [0.00127] nickel.





Pin



Socket

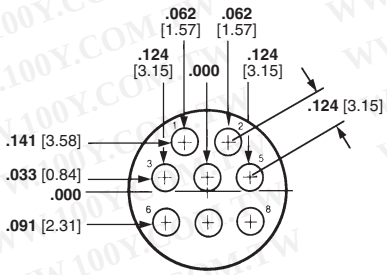
Strip Form Contact No. Pin	Strip Form Contact No. Socket	Loose Piece Contact No. Pin	Loose Piece Contact No. Socket
66570-2	66569-2	66570-3	66569-3

Note: Contacts to be soldered to wire before being inserted into housing, 18 AWG [0.8 - 0.9 mm²] max. wire size.

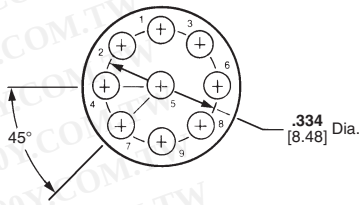
Contact Arrangements, Series 2

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

Shell Size 11

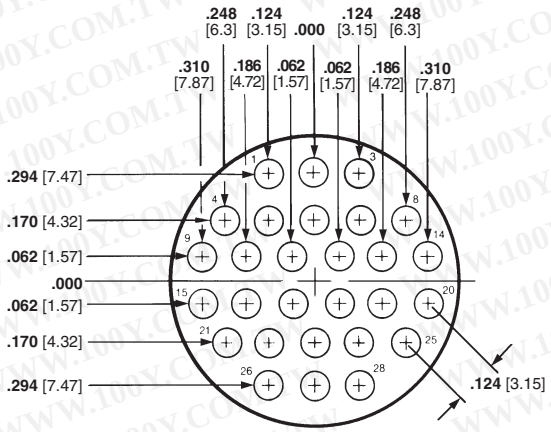


Arrangement 11-8
Max. Wire Ins. Dia. = .068 [1.73]



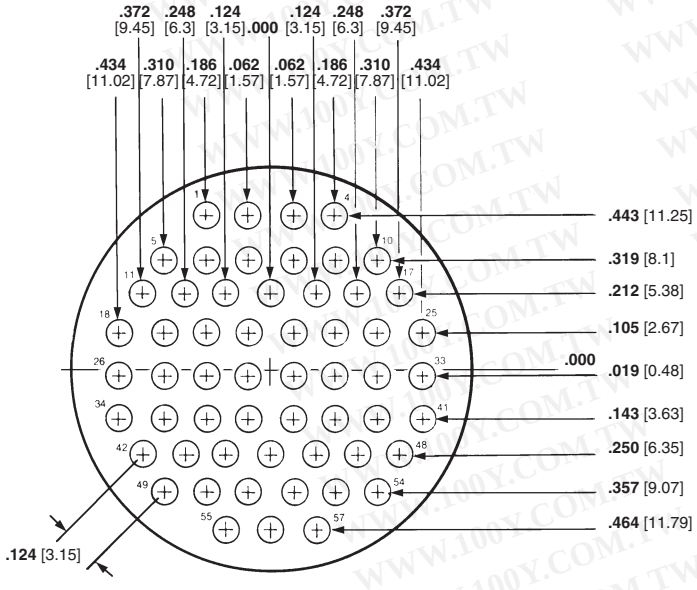
Arrangement 11-9
Max. Wire Ins. Dia. = .068 [1.73]

Shell Size 17

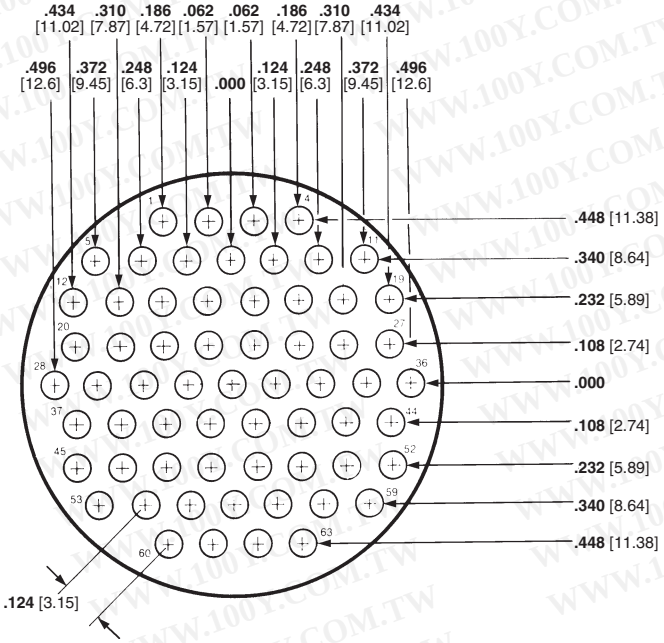


Arrangement 17-28
Max. Wire Ins. Dia. = .068 [1.73]

Shell Size 23



Arrangement 23-57
Max. Wire Ins. Dia. = .068 [1.73]



Arrangement 23-63
Max. Wire Ins. Dia. = .068 [1.73]

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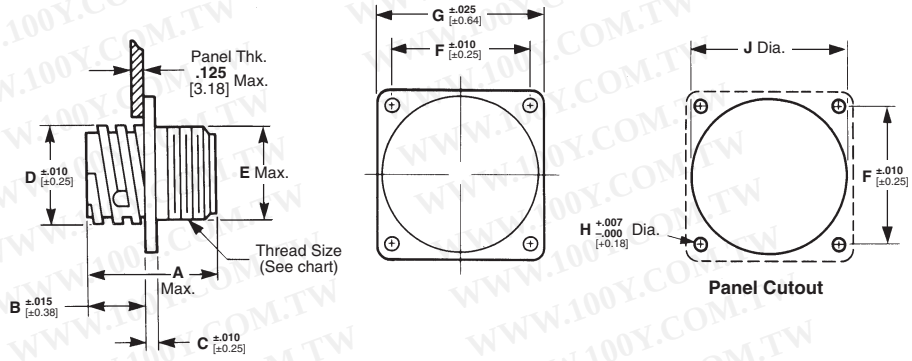
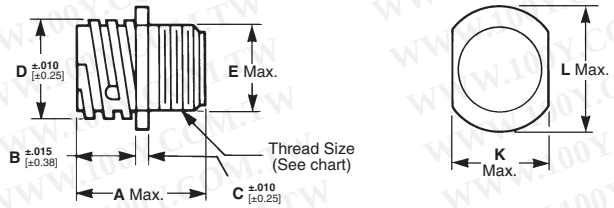
UK: 44-208-420-8341

Component Dimensions, Series 2

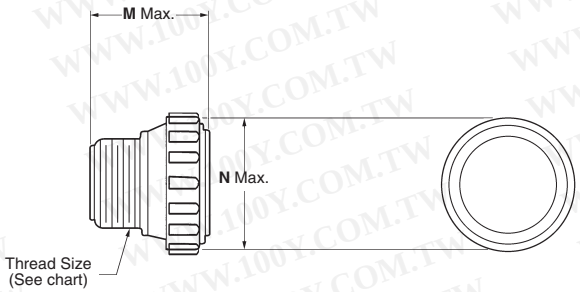
Square Flange Receptacle



Free-Hanging Receptacle



Plug



Arrangement No.	Dimensions													Thread Size
	A	B	C	D	E	F	G	H	J	K	L	M	N	
11-8	**.809**	**.420**	**.094**	**.688**	**.630**	**.844**	**1.125**	**.125**	**.840**	**.817**	**.935**	**.800**	**.975**	5/8-24
11-9	20.55	10.67	2.39	17.48	16	21.44	28.58	3.18	21.34	20.75	23.75	20.32	24.77	UNEF-2A
17-28	**.809**	**.420**	**.094**	**1.050**	**.943**	**1.125**	**1.435**	**.150**	**1.210**	**1.161**	**1.310**	**.800**	**1.349**	15/16-20
	20.55	10.67	2.39	26.67	23.95	28.58	36.45	3.81	30.73	29.49	33.27	20.32	34.26	UNEF-2A
23-57	**.924**	**.420**	**.156**	**1.438**	**1.515**	**1.438**	**1.750**	**.150**	**1.610**	**1.500**	**1.733**	**.915**	**1.788**	1-3/8-18
23-63	23.47	10.67	3.96	36.53	38.48	36.53	44.45	3.81	40.89	38.1	44.02	23.24	45.42	UNEF-2A

Note: All dimensions apply to both standard and reverse sex connectors.

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South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

Circular Plastic Connectors, Series 3

CPC Connectors, Series 3

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

Material

Housing—Thermoplastic, 94V-0 rated, black

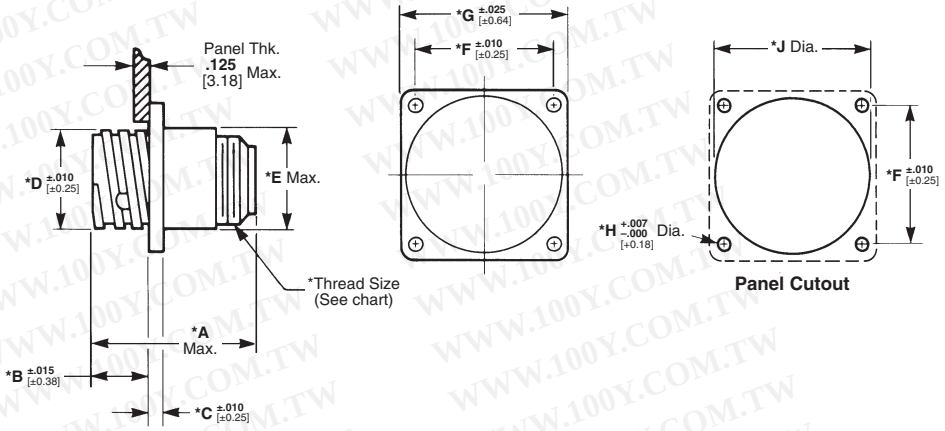
Related Product Data

Contacts—Page 34–35
Contact Arrangement—Page 35
Component Dimensions—Page 36*
Accessories—Pages 38-42
Performance Characteristics—Page 6
Application Tooling—Pages 76-79
Technical Documents—Page 80

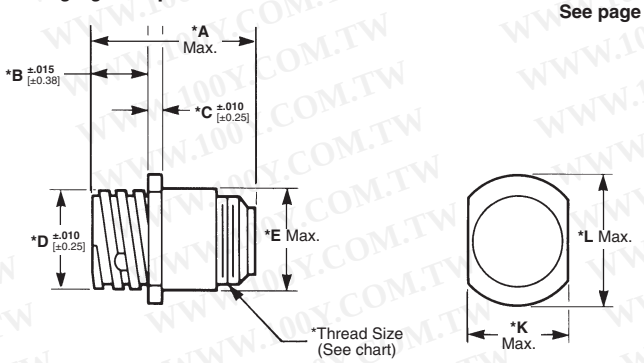
Replacement Coupling Rings

Shell Size	Part No.
17	213810-1
23	213812-1

Square Flange Receptacle

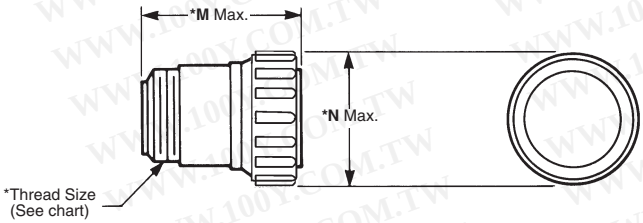


Free-Hanging Receptacle



*Note:
See page 36 for Callout Dimensions

Plug



Standard Sex Connectors

(Receptacles accept Type XII Male/pin contacts, Plugs accept Type XII Female/socket contacts)

Arrangement	Square Flange Receptacle		Free-Hanging Receptacle	Plug
	With Mounting Holes	With Threaded Inserts[1]		
17-3	206036-2	213581-1	206207-1	206037-2
23-7	206137-1	206137-5	206137-2	206136-1

[1]Four 4-40 threaded inserts per receptacle.

Reverse Sex Connectors

(Receptacles accept Type XII Female/socket contacts, Plugs accepts Type XII Male/pin contacts)

Arrangement	Square Flange Receptacle		Free-Hanging Receptacle	Plug
	With Mounting Holes	With Threaded Inserts[1]		
17-3	206425-1	206425-5	206425-2	206426-1
23-7	206227-1	206227-6	206227-2	206226-1

[1]Four 4-40 threaded inserts per receptacle.
Note: Maximum wire insulation diameter is .220 [5.59].

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South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

Power Contacts, Series 3

Type XII, Precision Formed, Crimp

Material

Copper

Finish

A—Tin
B—.000030 [0.00076] selective gold over .000030 [0.00076] nickel
C—.000100 [0.00254] silver plated contacts with lubricant added

Test Current Rating

Silver or Gold—35 amperes ‡
Tin—15 amperes ‡

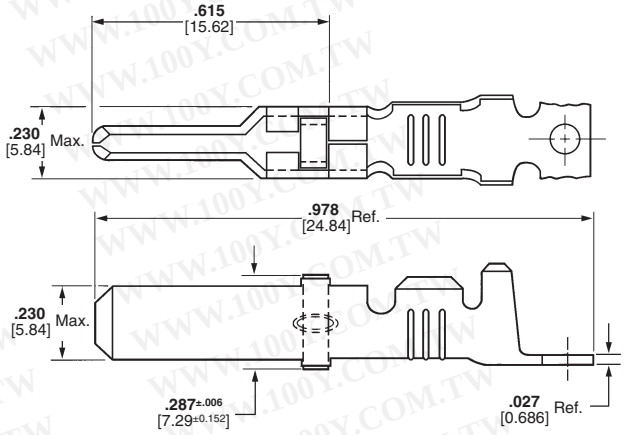
‡Single contact, free-air test current; not to be construed as contact rating current. Use only for testing. Refer to contact current carrying capability information, page 8.

Related Product Data

Application Tooling—Pages 76-79
Technical Documents—Page 80

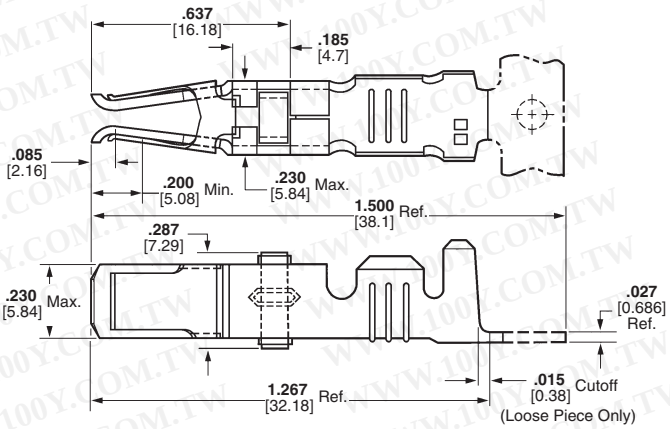
Extraction Tool Part No. 91019-3

Male



Male

Female



Female

Wire Size Range[1] AWG	Wire Size Range[1] mm²	Ins. Dia. Range	Contact Finish	Strip Form Contact Part Nos. Standard*** Male	Strip Form Contact Part Nos. Standard*** Female	Strip Form Contact Part Nos. Heavy Duty Miniature*** Male	Strip Form Contact Part Nos. Heavy Duty Miniature*** Female	Loose Piece Contact Part Nos. Male	Loose Piece Contact Part Nos. Female	Tooling: Heavy Duty Miniature Applicator	Tooling: Die Set for Hand Tool 69710-1 or 626 Pneumatic Tool System
16 and 14-12	1.25-1.4 and 2-3	**.135-.160** 3.43-4.06	A	66255-1	66740-7	66255-5	1-66740-2	66261-1	66740-8	567455-□***	90145-2[3,7] and 90145-1[4,7]
				66256-1[2]	—	66256-5[2]	—	66262-1[2]	—		
			B	66255-2	66740-5	66255-6	1-66740-1	66261-2	66740-6		
				66256-2[2]	—	66256-4[2]	—	66262-2[2]	—		
			C[5]	66255-7	66740-1	66255-8	66740-9	66261-4	66740-2		
				66256-6[2]	—	66256-7[2]	—	66262-4[2]	—		
10	5-6	**.190-.220** 4.83-5.59	A	66253-1	66741-7	66253-5	1-66741-2	66259-1	66741-8	567021-□***	90140-1[7]
				66254-1[2]	—	—	—	66260-1[2]	—		
			B	66253-2	66741-5	66253-6	1-66741-1	66259-2	66741-6		
				66254-2[2]	—	—	—	66260-2[2]	—		
			C[5]	66253-4	66741-1	66253-8	66741-9	66259-4	66741-2		
				66254-4[2]	—	—	—	66260-4[2]	—		

[1]Wire strip length—.281 [7.14].
[2]Ground contact.
[3]Die insert **Part No. 90145-2** is for crimping 16 AWG [1.25-1.4 mm²] wire.
[4]Die insert **Part No. 90145-1** is for crimping 14-12 AWG [2-3 mm²] wire.
[5]Recommended for high current/vibration applications where fretting corrosion is a problem.
[7]Die Set requires "C" Head Adapter **Part No. 318161-1**; Adapter Holder **Part No. 356304-1** (with ratchet) or **189928-1** (without); and Power Unit **Part No. 189721-2** (hand actuated) or **189722-2** (foot actuated).
Extraction Tool No. 91019-3.
***Call Technical Support for Automatic Machine Applicator Part Numbers.

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Power Contacts, Series 3 (Continued)

High Current Type XII Crimp Contacts

The Multimate features of the High Current Type XII contact have been designed to fit into the existing AMP Connectors such as CPC (Circular Plastic Connector), CMC (Circular Plastic Metal-Shell Connector), G Series, M Series, and CMPC (Circular Multipin Connector) housings. An initial T-Rise test in free air has shown a 60 amp capability with a 30° T-Rise with 8 gage wires. The contact may be crimped onto 8 AWG wire with a Daniels Hand Tool M310 or AMP P/N 356114-1 and Positioner TP1068 or AMP P/N 356119-1.

Current-Carrying Capacity

The graph shows current-carrying capacity versus temperature rise for a fully energized 3 position CPC plug P/N 206037-2 and receptacle P/N 206036-2. These initial representative amperage ratings were conducted with 8 AWG wires that were 3 feet long.

High Current Type XII Socket
Part No. 193990-2

High Current Type XII Pin
Part No. 193991-4

Material

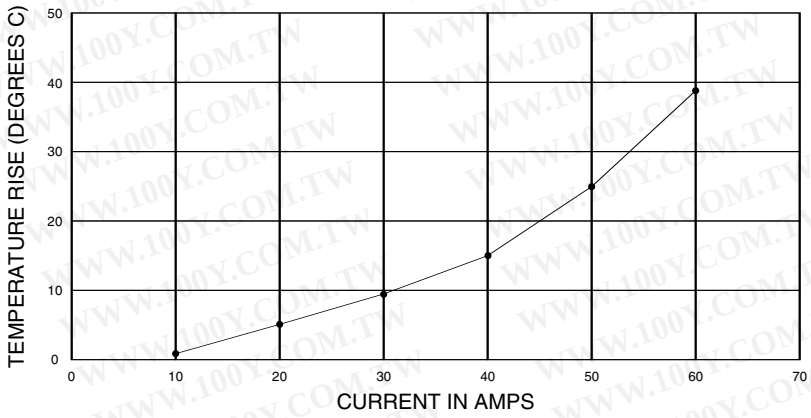
Body — Copper Alloy
Louvertac Band — Beryllium Copper
Retention Spring — Stainless Steel

Finish

Body — Silver
Louvertac Band — Gold

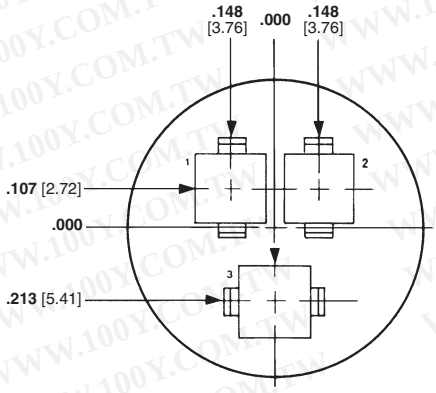
Extraction Tool Part No. 224155-1

Current Rating for 30°C Temperature Rise
100% Energized
3 Circuit Connector (Wire-to-Wire)



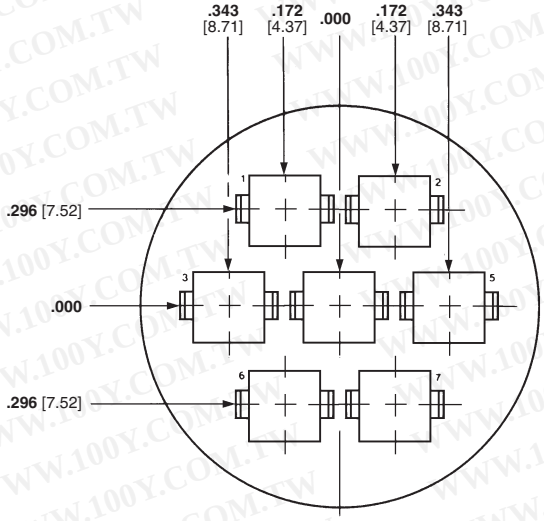
Contact Arrangements, Series 3

Shell Size 17



Arrangement 17-3
Max. Wire Ins. Dia. = .220 [5.59]

Shell Size 23



Arrangement 23-7
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.

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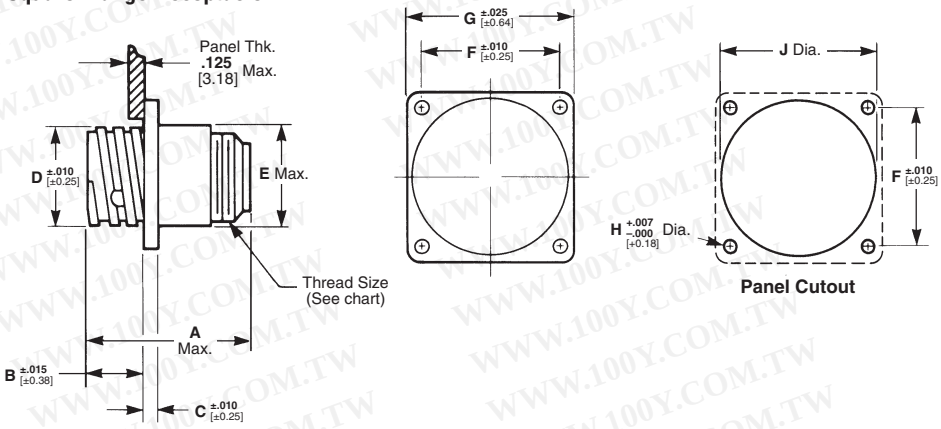
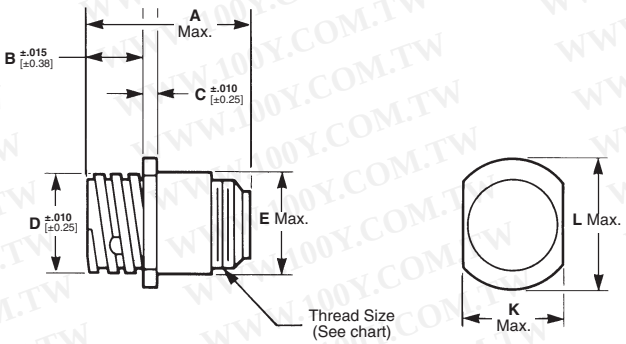
UK: 44-208-420-8341

Component Dimensions, Series 3

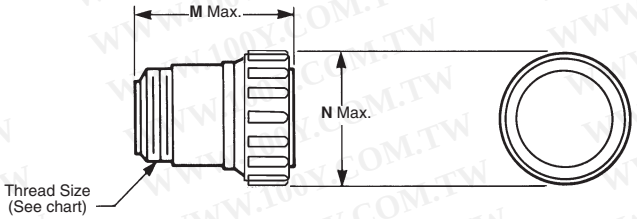
Square Flange Receptacle



Free Hanging Receptacle



Plug



Arrangement No.	Dimensions													Thread Size
	A	B	C	D	E	F	G	H	J	K	L	M	N	
17-3	**1.635** 41.53	**.420** 10.67	**.094** 2.39	**1.050** 26.67	**1.110** 28.19	**1.125** 28.58	**1.435** 36.45	**.150** 3.81	**1.210** 30.73	**1.161** 29.49	**1.310** 33.27	**1.645** 41.78	**1.349** 34.26	15/16-20 UNEF-2A
23-7	**1.635** 41.53	**.520** 13.21	**.156** 3.96	**1.438** 36.53	**1.510** 38.35	**1.438** 36.53	**1.750** 44.45	**.150** 3.81	**1.610** 40.89	**1.505** 38.23	**1.733** 44.02	**1.645** 41.78	**1.788** 45.42	1-3/8-18 UNEF-2A

Note: All dimensions apply to both standard and reverse sex.

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UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

Circular Plastic Connectors, Series 4

CPC Connectors, Series 4, Standard Sex

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

Material

Housing—Thermoplastic, 94V-0 rated, black; 23-9M – Nylon 6/6, glass filled, black

Related Product Data

Contacts—Pages 17-21 and 34–35
Contact Arrangements—Below
Accessories—Pages 38-42
Performance Characteristics—Page 6
Application Tooling—Pages 76-79
Technical Documents—Page 80

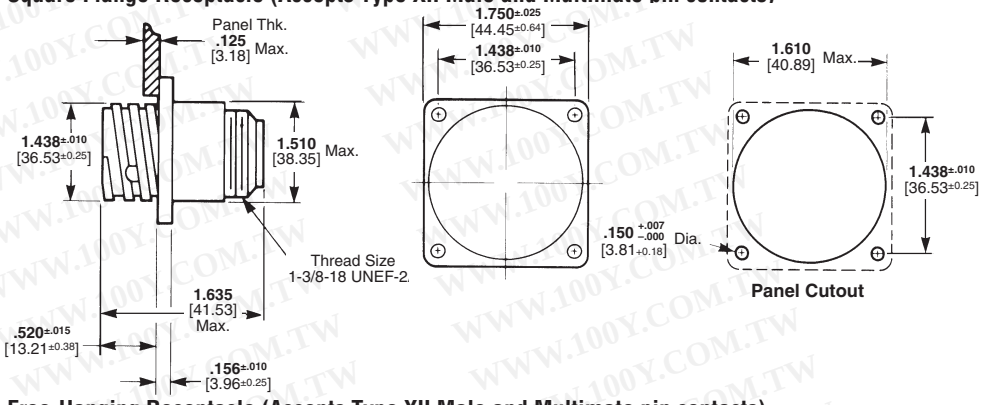
Replacement Coupling Ring

Shell Size	Part No.
23	213812-1

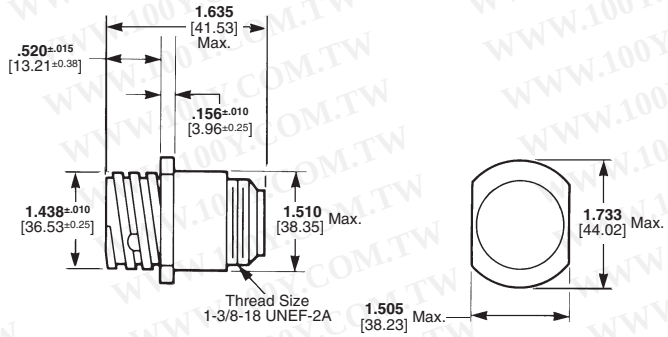
Contact Arrangements, Series 4 Shell Size 23

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

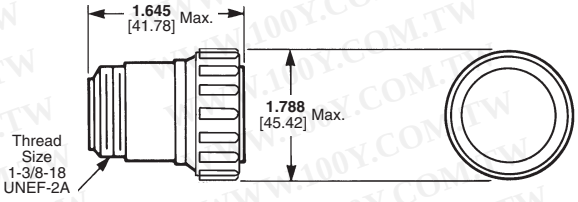
Square Flange Receptacle (Accepts Type XII Male and Multimate pin contacts)

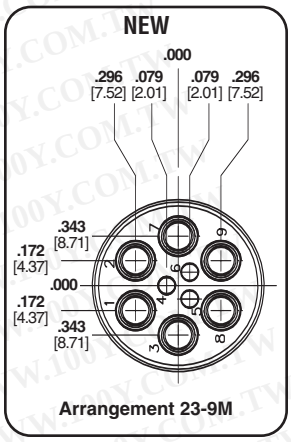


Free-Hanging Receptacle (Accepts Type XII Male and Multimate pin contacts)



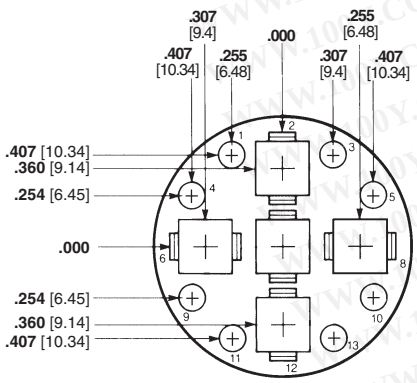
Plug (Accepts Type XII Female and Multimate socket contacts)



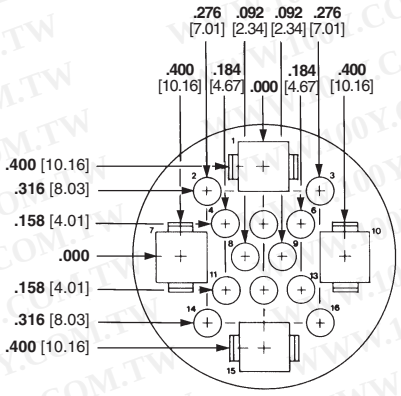


Arrangement	No. of Cavities		Square Flange Receptacle	Free-Hanging Receptacle	Plug
	Power	Multimate			
23-9M	6 (POWERBAND)	3	1776247-2[1]	—	206136-4
23-13M	5 (Type XII)	8	211825-1	211825-2	211824-1
23-16M	4 (Type XII)	12	207486-1	207486-2	207485-1
23-22M	2 (Type XII)	20	206613-1	206613-3	206612-1

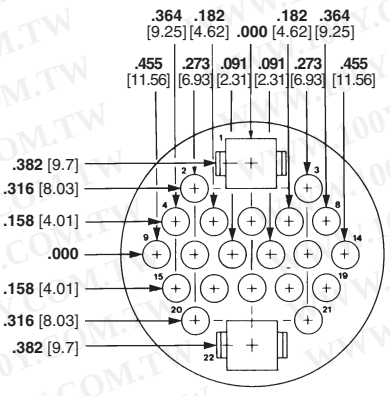
[1]Four 4-40 threaded inserts per receptacle.
Note: Maximum wire insulation diameter is .150 [3.81] for Multimate contacts; .220 [5.59] for Power contacts.



Arrangement 23-13M
Max. Wire Ins. Dia. =
.150 [3.81] for Multimate Contacts,
.220 [5.59] for Power Contacts



Arrangement 23-16M
Max. Wire Ins. Dia. =
.150 [3.81] for Multimate Contacts,
.220 [5.59] for Power Contacts



Arrangement 23-22M
Max. Wire Ins. Dia. =
.150 [3.81] for Multimate Contacts,
.220 [5.59] for Power Contacts

CPC Series 4

Catalog 82021
Revised 7-07

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Japan: 81-44-844-8013
UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

CPC Connector Accessories

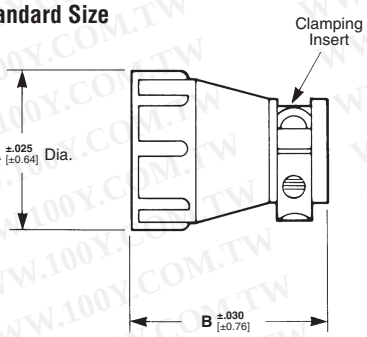
Cable Clamps

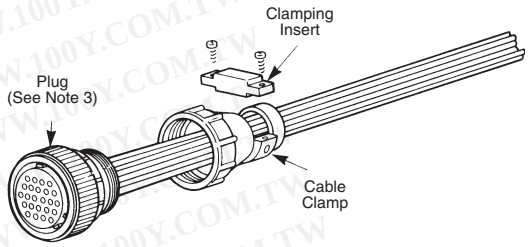
Cable clamps provide strain relief and can be used on all series receptacles and plugs.

Material

Black thermoplastic heat-stabilized, fire-resistant, self-extinguishing, UL 94V-0 rated

Standard Size



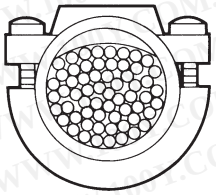


Shell Size	Dimensions A	Dimensions B	Cable O.D. (Max.)	Thread Size	Part No. Individually Packaged	Part No. Bulk Packaged*
11	**.825** 20.96	**1.250** 31.75	**.329** 8.36	5/8-24 UNEF-2B	1-206062-4	1-206062-7** (400)
13	**.950** 24.13	**1.400** 35.56	**.453** 11.51	3/4-20 UNEF-2B	206966-7	206966-9** (200)
17	**1.125** 28.58	**1.400** 35.56	**.453** 11.51	15/16-20 UNEF-2B	206070-8	1-206070-0** (200)
23	**1.600** 40.64	**1.555** 39.5	**.703** 17.86	1-3/8-18 UNEF-2B	206138-8	1-206138-0** (100)

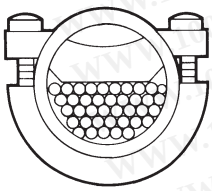
*Numbers in parentheses specify, in multiples, the minimum quantity of parts that can be ordered.
**Packaging includes two screws: shell sizes 11-17, screw length .500 [12.7]; shell size 23, screw length .625 [15.88].

Notes: 1. Clamping areas adjustable by inverting or changing clamping inserts. The quantity of inserts supplied with each assembly is as follows: for size 11 cable clamps, one insert; for all other cable clamps, two inserts.
2. Components for all cable clamps are packaged unassembled. This includes the cable clamp, two screws and the clamping inserts.

Notes: 3. Cable clamps can be threaded directly onto plugs or receptacles, or onto back-shell extenders (page 40).
4. Replacement screws are available in the following sizes: 3/8 in. [9.52]—**5019024-1,** 1/2 in. [12.7]—**5019024-2,** 5/8 in. [15.88]—**5019024-3,** 1 in. [25.4]—**5019024-4**, 3/4 in. [19.05]—**5019024-5.**
5. Cable clamp inserts not sold separately.

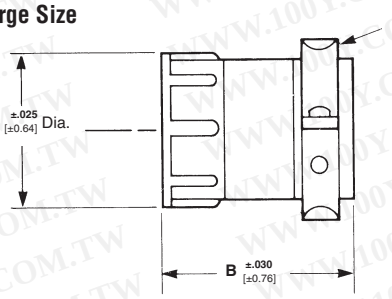


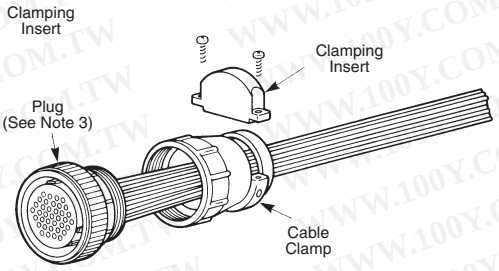
The clamping area can be adjusted by reversing the clamping insert as shown below.



For additional information concerning cable clamps, refer to Instruction Sheet 408-7582.

Large Size





Shell Size	Dimensions A	Dimensions B	Cable O.D. (Max.)	Thread Size	Part No. Individually Packaged	Part No. Bulk Packaged*
11	**.850** 21.59	**1.450** 36.83	**.453** 11.51	5/8-24 UNEF-2B	206358-5	206358-6** (200)
13	**1.131** 28.73	**1.655** 42.04	**.703** 17.86	3/4-20 UNEF-2B	207008-5	207008-6** (100)
17	**1.131** 28.73	**1.655** 42.04	**.703** 17.86	15/16-20 UNEF-2B	206322-9	1-206322-0** (100)
23	**1.600** 40.64	**1.655** 42.04	**1.125** 28.58	1-3/8-18 UNEF-2B	206512-5	206512-6** (75)

*Numbers in parentheses specify, in multiples, the minimum quantity of parts that can be ordered.
**Packaging includes two screws: shell size 11, screw length .500 [12.7]; shell sizes 13-23, screw length .625 [15.88].

Notes: 1. Clamping areas adjustable by inverting or changing clamping inserts. The quantity of inserts supplied with each assembly is as follows: for size 23 cable clamps, four inserts; for all other cable clamps, two inserts.
2. Components for all cable clamps are packaged unassembled. This includes the cable clamp, two screws and the clamping inserts.

Notes: 3. Cable clamps can be threaded directly onto plugs or receptacles, or onto back-shell extenders (page 40).
4. Replacement screws are available in the following sizes: 3/8 in. [9.52]—**5019024-1,** 1/2 in. [12.7]—**5019024-2,** 5/8 in. [15.88]—**5019024-3,** 1 in. [25.4]—**5019024-4**, 3/4 in. [19.05]—**5019024-5.**
5. Cable clamp inserts not sold separately.

CPC Connector Accessories (Continued)

Self-Centering Cable Clamp (for Shell Size 23)

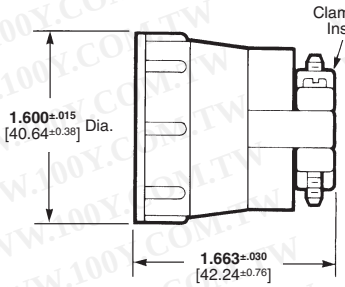
The self-centering cable clamp is used in applications where strain relief protection is required and the cable or wire bundle is large and/or stiff.

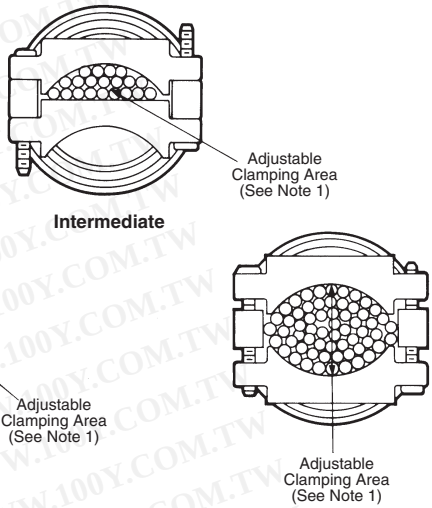
Material

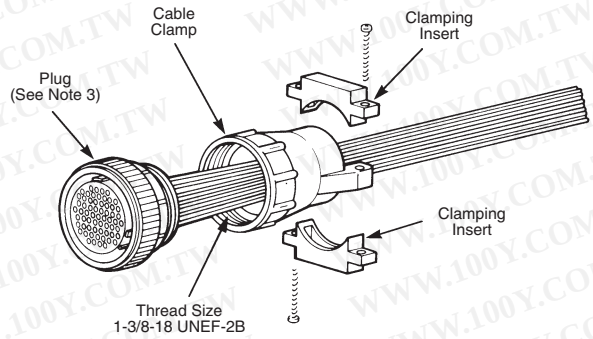
Black thermoplastic, UL 94V-0 rated

Part Numbers

207774-3 (individually packaged)
207774-4 (bulk packaged)







Notes:
1. Clamping area is adjustable by inverting clamping inserts; maximum cable diameter is 1.125 [28.58].
2. Components for cable clamp are packaged unassembled. This includes the cable clamp, two screws (1.00 [25.4]) and the clamping inserts.
3. Cable clamp can be threaded directly onto plugs or receptacles, or onto back-shell extenders (page 40).

Right-Angle Cable Clamps

Right-angle cable clamps are used in tight areas where typical 180° cable clamp strain reliefs will not fit.

Material

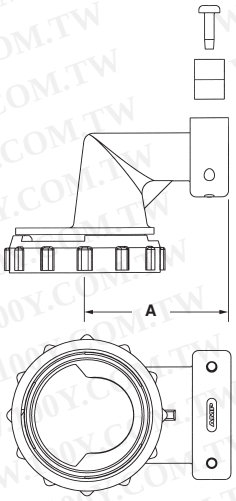
Black thermoplastic, UL 94V-0 rated

Related Product Data

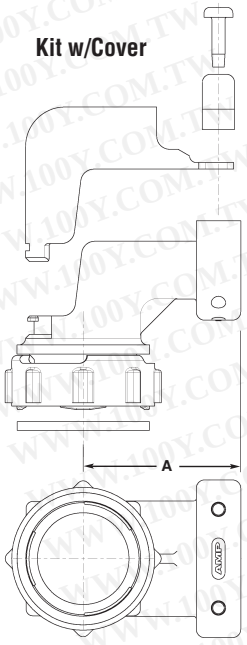
Technical Documents — page 80

Style A

Kit



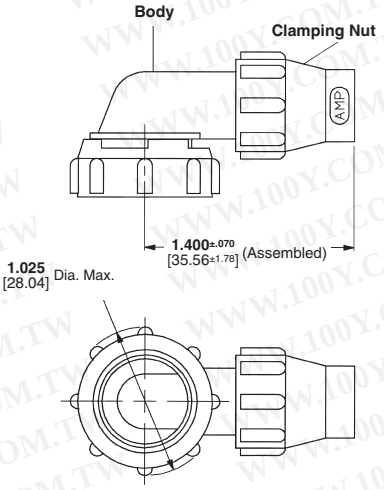
Kit w/Cover



Shell Size	Dim. A	Cable O.D. Max.	Coupling Ring Thread Size	Part Number Kit	Part Number Kit w/Cover
11	**.900** [22.86]	**.329** [8.36]	5/8-24 UNEF-2B	796379-2	1546347-2
13	**1.100** [27.94]	**.453** [11.51]	3/4-20 UNEF-2B	796380-2	1546348-2
17	**1.200** [30.48]	**.453** [11.51]	15/16-20 UNEF-2B	796381-2	1546349-2
23	**1.500** [38.10]	**.703** [17.86]	1-3/8-18 UNEF-2B	796382-2	1546350-2

Style B

Part Number 213982-1 (for Shell Size 13)



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Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-208-420-8341

CPC Connector Accessories (Continued)

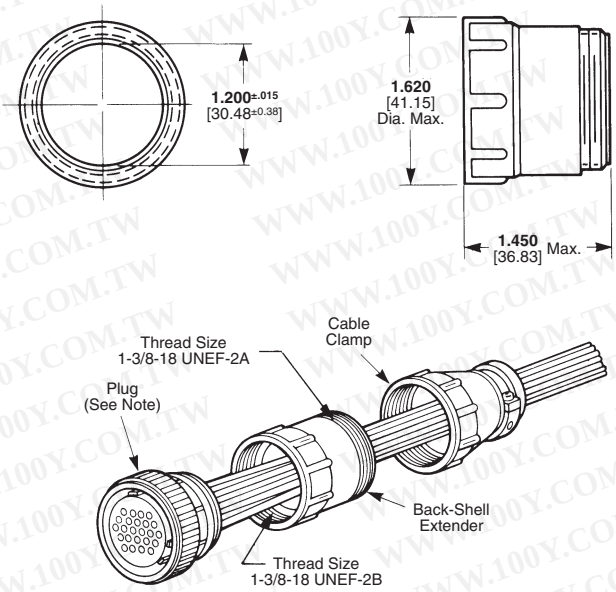
Back-Shell Extender (for Shell Size 23)

A back-shell extender is used with a cable clamp in applications where added length and/or additional wire breakout are required.

Material

Black glass-filled thermoplastic

Part No. 207055-1



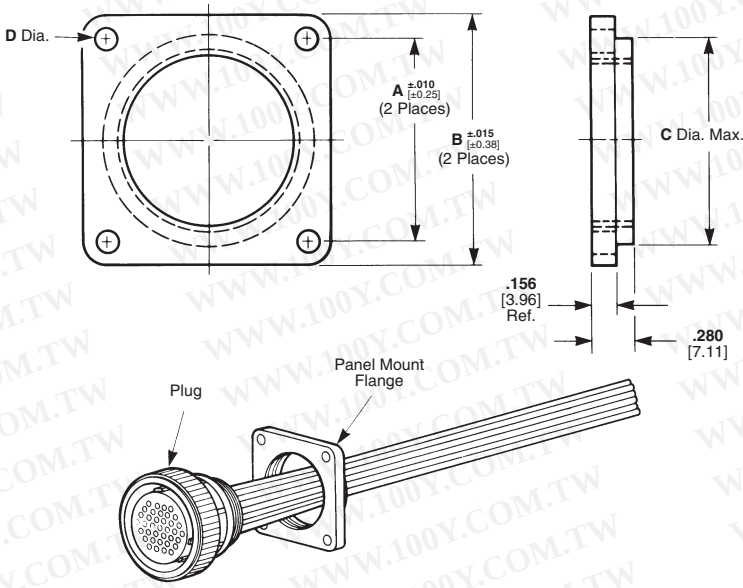
Note: Back-shell extenders can be threaded directly onto plugs or receptacles and will accept cable clamps of the appropriate size (pages 38 and 39).

Panel Mount Flanges (for Plugs only)

A panel mount flange is used in applications that require the plug half of a connector to be panel mounted.

Material

Black thermoplastic



Shell Size	Dimensions A	B	C	D	Part No.
11	**.844** 21.44	**1.125** 28.58	**.750** 19.05	**.125** 3.18	207299-1
13	**.969** 24.61	**1.280** 32.51	**.875** 22.22	**.125** 3.18	207299-2
17	**1.125** 28.58	**1.435** 36.45	**1.110** 28.19	**.150** 3.81	207299-3
23	**1.438** 36.53	**1.750** 44.45	**1.510** 38.35	**.150** 3.81	207299-4

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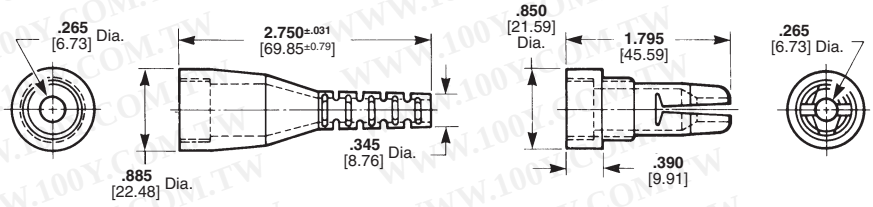
CPC Connector Accessories (Continued)

Flexible Cable Boot and Internal Cable Grip (for Shell Size 11)

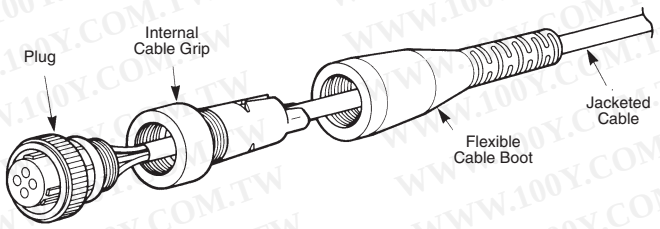
Flexible cable boots, with internal cable grip installed, provide strain relief capabilities for jacketed cable in applications where aesthetic appearance is essential. They can be threaded onto plugs or receptacles.



Flexible Cable Boot **Internal Cable Grip**

Material

Black thermoplastic



Cable Range

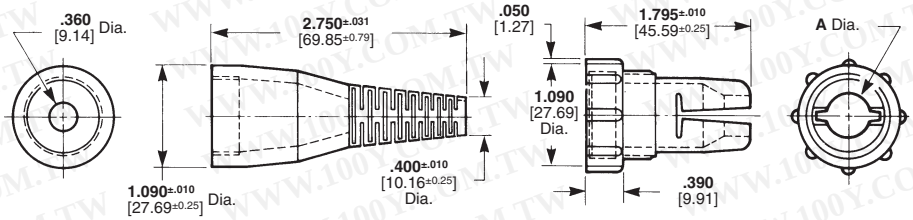
.150-.250 [3.81-6.35] Dia.

Part Numbers

207489-1 (Cable Boot)
207490-1 (Cable Grip)

Flexible Cable Boot and Internal Cable Grip (for Shell Size 17)

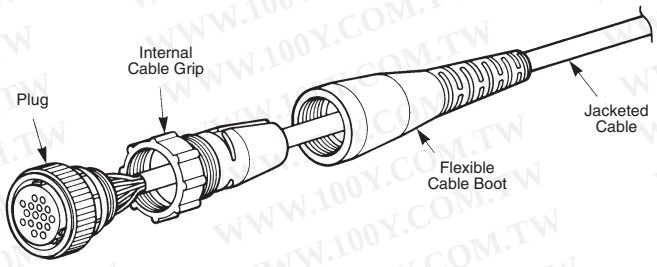
Flexible cable boots, with internal cable grip installed, provide strain relief capabilities for jacketed cable in applications where aesthetic appearance is essential. They can be threaded onto plugs or receptacles.



Flexible Cable Boot **Internal Cable Grip**

Material

Black thermoplastic



Part Numbers

207241-1 (Cable Boot)
207387-1 (Cable Grip)
A Dia. = .325 [8.26] for cable range of .200-.250 [5.08-6.35]
207387-2 (Cable Grip)
A Dia. = .385 [9.78] for cable range of .250-.350 [6.35-8.89]

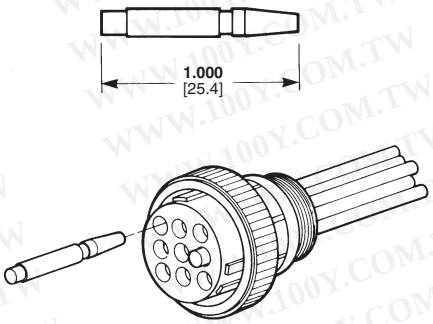
CPC Connector Accessories (Continued)

Keying Plugs

Keying plugs are used to provide keying capabilities for all connector series. Keying plugs are used in socket cavities of standard sex plugs and reverse sex receptacles, except when used with sealing caps.

Material

Nylon, natural, UL 94V-2 rated

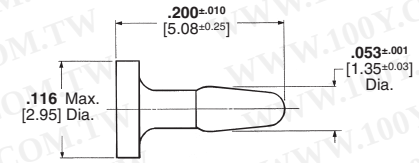


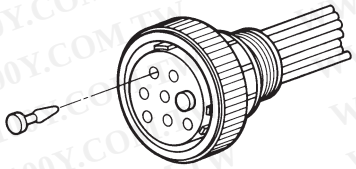
Series 1 and Series 4 Keying Plug
(for Types III+ and Subminiature COAXICON Contacts)

Part No. 200821-1

Material

Polyphenylene oxide, white, UL 94V-1 rated





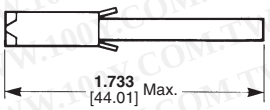
Series 2 Keying Plug
(for Size 20 DM and 20 DF Contacts)

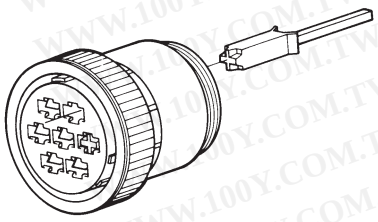
Part No. 206509-1

Material

(206508-1) Nylon, natural, UL 94V-2 rated

(207597-1) Thermoplastic, black, UL 94V-0 rated





Series 3 and Series 4 Keying Plugs
(for Type XII Contacts)

Part Nos. 206508-1 (Socket Cavities)—Shown Above
207597-1 (Pin Cavities)

Note: All part numbers are RoHS Compliant.

One-Piece Sealed Circular Plastic Connectors

Product Facts

- **Economical environmentally sealed connector designed for industrial applications**
- **Meets major Industrial Standards**
- **High strength, impact resistant thermoplastic housing, rated UL 94V-0**
- **Contains wire entry and peripheral seals**
- **AMP POWERBAND precision formed power contact (Series 5 and 6)**
- **Type III+ precision formed signal/low current contacts (Series 1 and Series 6)**
- **Other configurations in Series 1 can be made available, contact your local Tyco Electronics Sales Engineer or Tyco Electronics, Harrisburg, PA**

The new Sealed One-Piece Circular Plastic Connectors are the latest product innovation to the sealed CPC product family. This design allows for easy assembly. The housing and the seal are attached. A newly designed wire entry seal protects the rear of the connector and a peripheral seal protects the connector interface. Simply crimp the contact onto a wire and insert the crimped wire contact through the seal and into the housing cavity. The connector loads the same as if the seal wasn't there. All connector cavities come in a sealed condition. No plugs are required if you do not use a position cavity. We have the capability to provide this product sealing to you in all the shell sizes. If you don't see your particular size configuration, contact your local Tyco Electronics Sales Engineer or call Tyco Electronics for the latest information.

Industry Standards

One-Piece Sealed CPC products meet –

- IP 67 (Temporary immersion)

Fluid Protection Against – diesel fuel, gear and engine lubricants, gasoline, anti-freeze, hydraulic fluid, water, salt sprays, etc.

Performance Characteristics meets the same performance characteristics as shown on page 6.

Operating Temperature Range—
-50°C to +125°C [-58˚F to +257˚F]

UL Voltage Rating—
Series 1 600 V (AC or DC)
Series 6 250 V (AC or DC)

.125 POWERBAND Power Contact –
45 amps, single contact rating at 30°C T-Rise

Type III+ Contacts –
13 amps, single contact rating at 30°C T-Rise

Flammability Rating—
UL 94V-0 rated

Sealing Capability—
Per IP 67

Housing Material—
High strength, impact resistant thermoplastic

Fluid Resistance—
Diesel fuel, gear and engine lubricants, gasoline, anti-freeze, hydraulic fluid, water

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Japan: 81-44-844-8013
UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

One-Piece Sealed Circular Plastic Connectors, Series 1

Sealed CPC Receptacles, Special Series 1 with Pre-Installed, Bonded Peripheral Seal

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

Material and Finish

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

Seal—Elastomer, gray

Related Product Data

Contacts—Pages 17-22

Contact Arrangement—Page 24

Component Dimensions—Size 11-4 shown; request Customer Drawings for other sizes

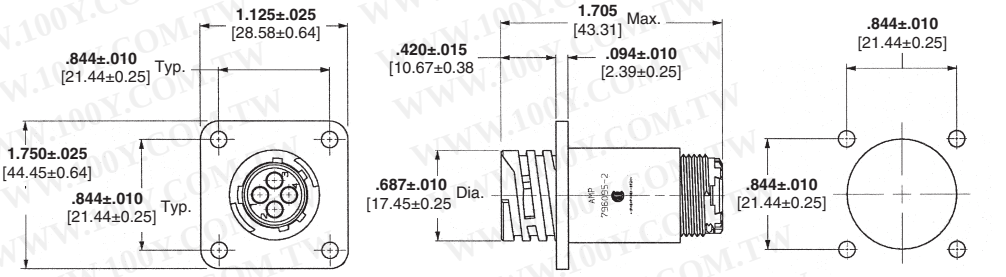
Accessories—Pages 38-42 and 51-54

Performance Characteristics—Page 6

Application Tooling—Pages 76-79

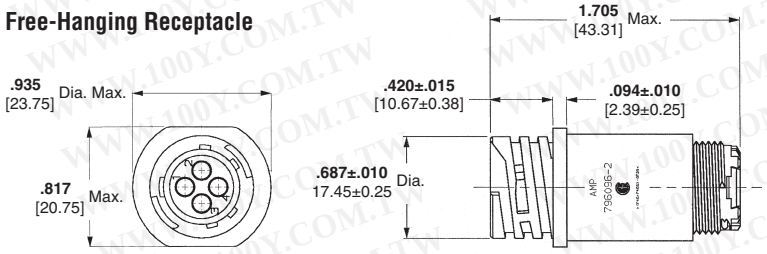
Technical Documents—Page 80

Square Flange Receptacle (Uses Flange Seal **Part No. 81665-**☐ on page 51)

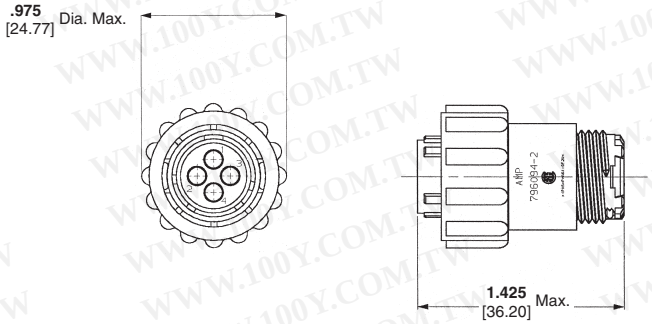


Recommended Panel Cutout

Free-Hanging Receptacle



Plug



Arrangement Shell Size	Arrangement No. of Positions	Sex	Square Flange Recptacle With Mounting Holes	Square Flange Recptacle With Threaded Inserts[1]	Free-Hanging Receptacle	Plug	Insulation Diameter
11-4		Standard	796095-2	–	796096-2	796094-2	**.065-.100** [1.65-2.54]
		Reverse	788154-2	–	788155-2	788153-2	**.065-.100** [1.65-2.54]
13-9		Standard	788158-2	–	788159-2	788157-2	**.065-.100** [1.65-2.54]
17-14		Reverse	796272-1	–	796273-1	796271-1	**.065-.100** [1.65-2.54]
17-16		Standard	796275-1	796275-3	796276-1	796274-1	**.065-.100** [1.65-2.54]
		Standard	796275-2	–	796276-2	796274-2	**.040-.080** [1.01-2.03]
23-24		Standard	796190-1	–	796291-1	796188-1	**.065-.120** [1.65-3.04]
23-37		Standard	796286-1	–	796287-1	796288-1	**.065-.100** [1.65-2.54]

[1]Four 4-40 threaded inserts per receptacle.

Assembly Accessories

Seal Protectors are recommended to aid contact insertion through the wire entry seal. They are reusable.

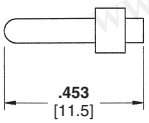
Part Number 208337-1 (Insert Pins)

Part Number 208338-1 (Insert Sockets)

Wire Entry Seal Plug

Part Number 796075-1 (6 per carrier strip)

Material—Polypropylene, natural



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UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

One-Piece Sealed Circular Plastic Connectors, Series 5

CPC Connectors, Series 5 Sealed – Reverse Sex

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

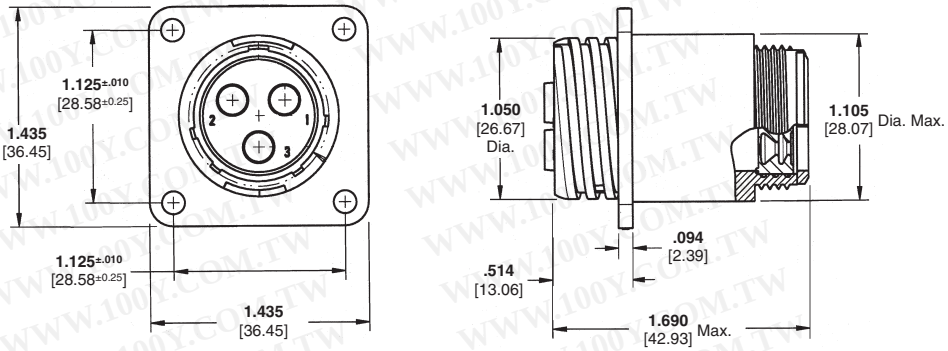
Material

Housing—Nylon, glass-filled UL rated 94V-0, black

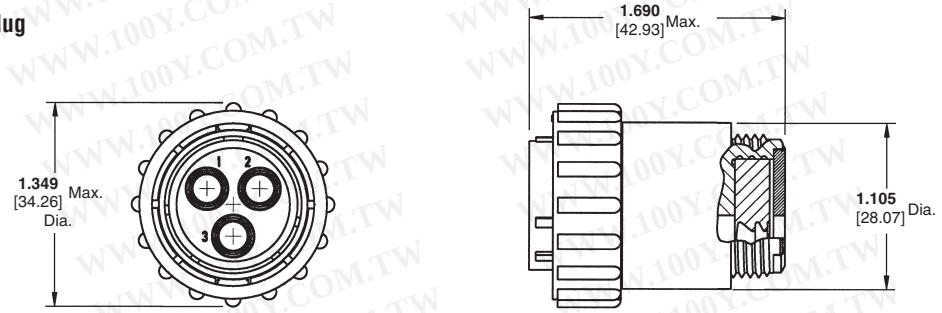
Related Product Data

Contacts—Page 47
Accessories—Page 51
Application Tooling—Pages 76-79
Technical Documents—Page 80

Square Flange Receptacle (Uses Flange Seal **Part No. 81665-2** on page 51)



Plug



Arrangement		Insulation Diameter	Square Flange Receptacle	Free-Hanging Receptacle	Plug
Shell Size	No. of Positions				
17-3		**.095-.205** [2.41-5.21]	788189-1	796112-1	788188-1
		.150-.265 [3.81-6.73]	788189-2	796112-2	788188-2

One-Piece Sealed Circular Plastic Connectors, Series 6

CPC Connectors, Series 6 Sealed

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

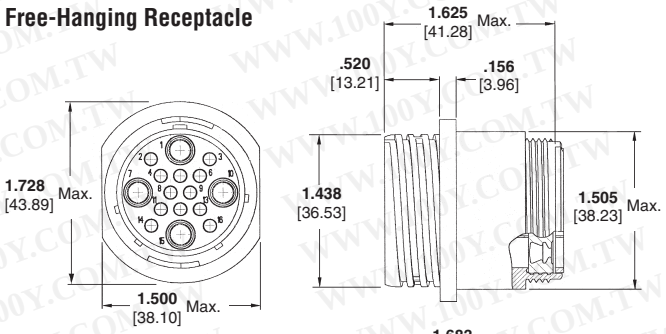
Material

Housing—Nylon, glass-filled UL rated 94V-0, black

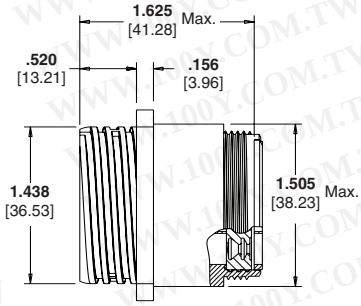
Related Product Data

Contacts—Pages 17-23 and 47
Application Tooling—Pages 76-79
Technical Documents—Page 80

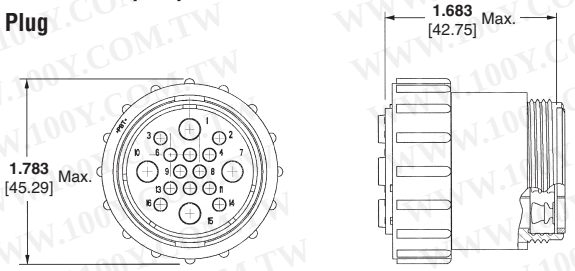
Free-Hanging Receptacle

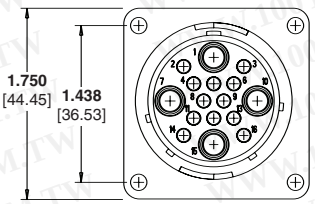


Square Flange Receptacle



Plug





Arrangement		Insulation Diameter		Sex	Square Flange Receptacle w/Mounting Holes	Free-Hanging Receptacle	Plug
Shell Size	No. of Positions	Power	Signal				
23-16		**.095-.205** [2.41-5.21]	**.065-.100** [1.65-2.54]	Standard	796466-1	796207-1	796203-1
				Reverse	—	796330-1	796332-1

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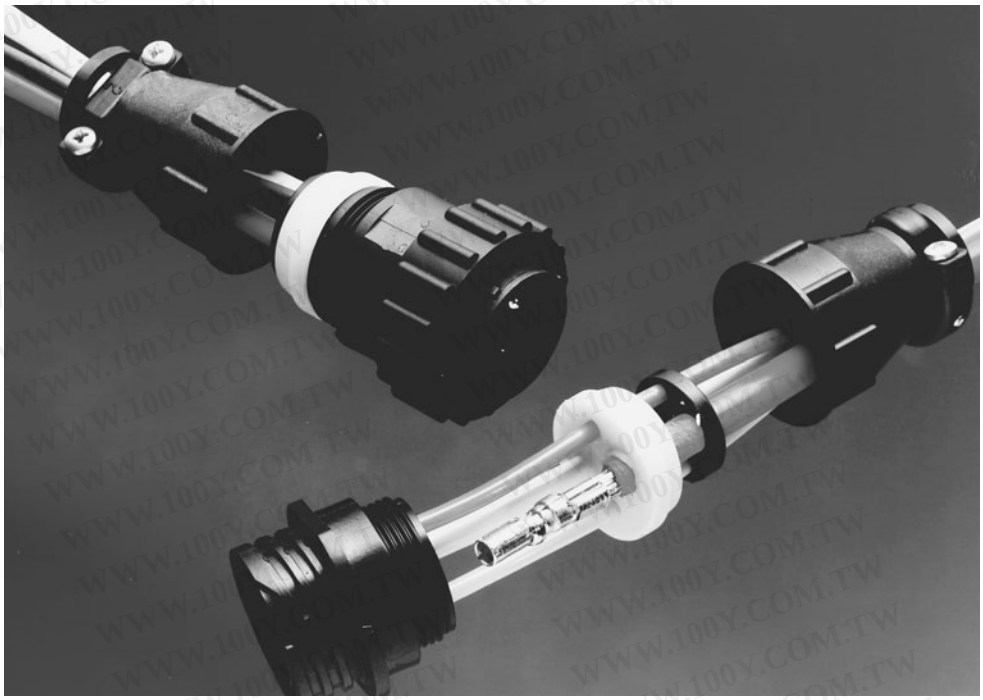
Japan: 81-44-844-8013
UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

Two-Piece Sealed Circular Plastic Connectors

Product Facts

- **Economical environmentally sealed connector designed for industrial applications**
- **Meets major Industrial Standards**
- **High strength, impact resistant thermoplastic housing, rated UL 94V-0**
- **Contains wire entry, peripheral, and full interfacial seals**
- **AMP POWERBAND precision formed power contact (Series 5 and 6)**
- **Type III+ precision formed signal/low current contacts (Series 6)**
- **Other configurations in Series 1 can be made available, contact your local Tyco Electronics Sales Engineer or Tyco Electronics, Harrisburg, PA**



Technical Documents

Instruction Sheet

408-4317 Two-Piece Sealed CPC Connectors

Product Specification

108-1579 Sealed CPC Connectors with Removable Contacts

Sealed CPC connectors are the latest additions to the growing family of AMP Circular Plastic Connectors. Sealed CPC connectors were developed as part of the Series 5 and 6 product line, specifically to meet the increasing demand for an economical environmentally sealed connector.

Sealed CPC connectors are designed to meet the requirements of UL, CSA, and VDE for environmentally sealed connectors used in industrial applications.

In addition, sealed CPC connectors are designed to meet the latest SAE and ASAE requirements as outlined in the standards listed here.

Sealed CPC connectors incorporated the latest technology in thermoplastic design and use the new AMP POWERBAND precision formed high current contact.

Illustrated above are the Series 5 (power) and Series 6 (power/signal mix) sealed connector configurations. Other sizes are available in a Series 1 (signal/low current) configuration. Contact your local Tyco Electronics Sales Engineer, or call Tyco Electronics for the latest design information.

Industry Standards

Two-Piece Sealed CPC connectors meet—

- IP65

Performance Characteristics

Operating Temperature Range—
-50°C to +125°C [-58°F to +257°F]

UL Voltage Rating—
Series 5 600 V (AC or DC)
Series 6 250 V (AC or DC)

.125 POWERBAND Power Contact – 45 amps, single contact rating at 30°C T-Rise

Type III+ Contacts – 13 amps, single contact rating at 30°C T-Rise

Flammability Rating—
UL 94V-0 rated

Sealing Capability—
Per IP 65

Housing Material—
High strength, impact resistant thermoplastic

Fluid Resistance—
Diesel fuel, gear and engine lubricants, gasoline, anti-freeze, hydraulic fluid, water

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Note: All part numbers are RoHS Compliant.

Sealed Circular Plastic Connectors

Multimate Size 16 Contacts

Precision formed signal/low current

Pin Diameter—.062 [1.57]
Test Current—13 amps max.

.125 POWERBAND Contacts

Precision formed high current

Pin Diameter—.125 [3.175]
Test Current—50 amps max.

Extraction Tool Part Number 318813-1

(Instruction Sheet 408-4374)

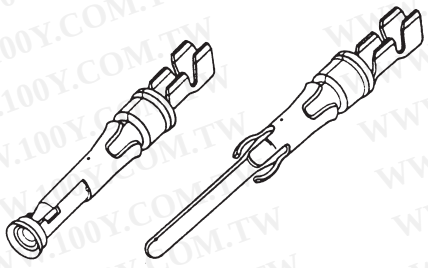
Material and Finish

Contacts—Copper with beryllium copper spring

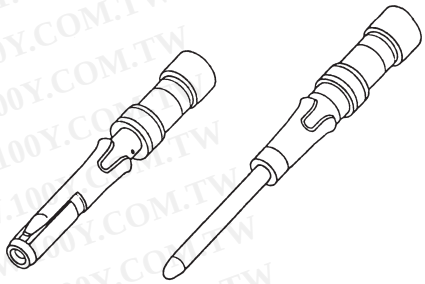
Plating Code
A — Post plated .000200 [0.00508] min. silver in mating area with .000050 [0.00127] min. silver on remainder of contact, all over .000050 [0.00127] min. nickel
B — Post plated .000030 [0.00076] min. gold in mating area with gold flash on remainder of contact, all over .000050 [0.00127] min. nickel

Related Product Data

Application Tooling—Pages 76-79
Technical Documents—Page 80

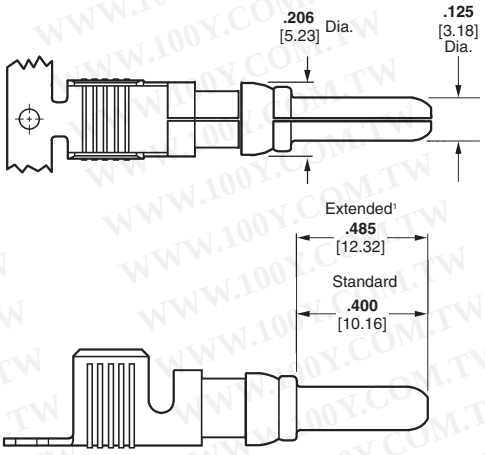


Type III+
Precision Formed Contacts

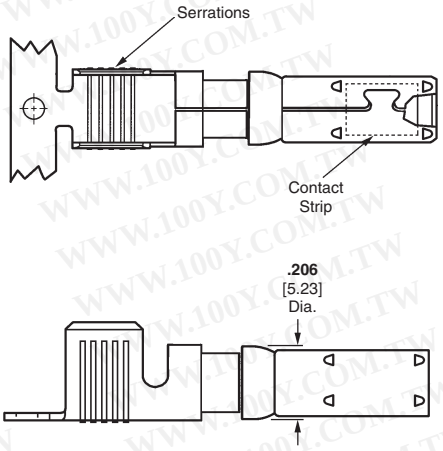


Type II
Screw-Machined Contacts

See pages 17-23 for complete product information and part numbers of Size 16 contacts applicable in Sealed CPC Connectors.



.125 POWERBAND
Pin Contact



.125 POWERBAND
Socket Contact

Wire Size AWG/mm²	Contact Finish	Pin Length	Contact Part No. Strip Pin	Strip Socket	Loose Piece Pin	Loose Piece Socket	Tooling Part No. Heavy Duty Miniature (HDM) Applicators (for AMP-O-LECTRIC Model G Machine, Base Part No. 354500)	Tooling Part No. Die Sets for Hand Tool 69710-1 or 626 Pneumatic Tool System*
14-12 2-3	A	Standard	213845-1	213847-1	213845-3	213847-3	680195-3	356612-1
	B	Standard	213845-2	213847-2	213845-4	213847-4		
	A	Extended¹	213845-5	—	213845-7	—		
	B	Extended¹	213845-6	—	213845-8	—		
10-8 5-8	A	Standard	213841-1	213843-1	213841-3	213843-3	680197-3	356611-1 (8 AWG) 356611-2 (10 AWG)
	B	Standard	213841-2	213843-2	213841-4	213843-4		
	A	Extended¹	213841-5	—	213841-7	—		
	B	Extended¹	213841-6	—	213841-8	—		

¹For use in One-Piece or Two-Piece Sealed Circular Plastic Connectors (CPC), Series 5 and 6.

‡Single contact, free-air test current; not to be construed as contact rating current. Use only for testing. Refer to contact current carrying capability information, page 8.

Note: Standard Size 8, High Current Upgrade Size 8, and .125 POWERBAND contacts are **no**t intermateable.

*A typical 626 Pneumatic Tool System requires: a power unit (**Part No. 189721-2**, hand actuated or **189722-2**, foot actuated), an adapter holder (**Part No. 356304-1**, with ratchet), and "C" Head adapter **Part No. 318161-1**.

Specifically designed for AMP CPC Connectors, Series 5 and 6, the new .125 POWERBAND contact offers the performance of a MIL-Spec screw machined Size 8 contact with the economy of a stamped and formed, strip-feed contact. Strip-feed contacts offer maximum production capabilities using standard AMP bench-mount, semi-automatic termination equipment. For low volume, prototype or maintenance and repair requirements, the .125 POWERBAND contact is available in loose piece form.

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Canada: 1-905-470-4425
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Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

Two-Piece Sealed Circular Plastic Connectors, Series 5

CPC Connectors, Series 5 Sealed – Reverse Sex

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

Material

Housing—Nylon, glass-filled UL rated 94V-0, black

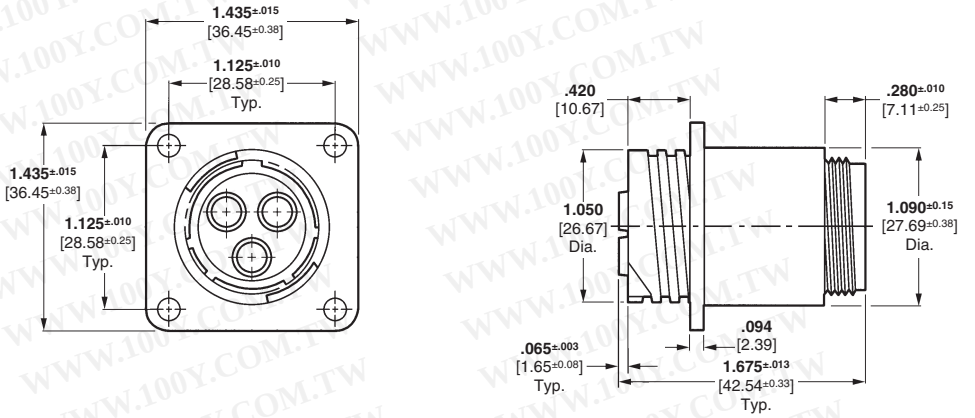
Related Product Data

Contacts—Pages 47
Accessories—Page 51
Application Tooling—Pages 76-79
Technical Documents—Page 80

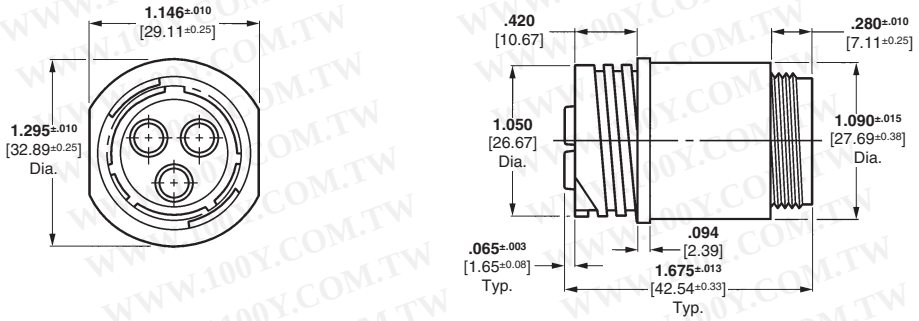
Replacement Coupling Ring

Shell Size	Part No.
17-3	213810-1

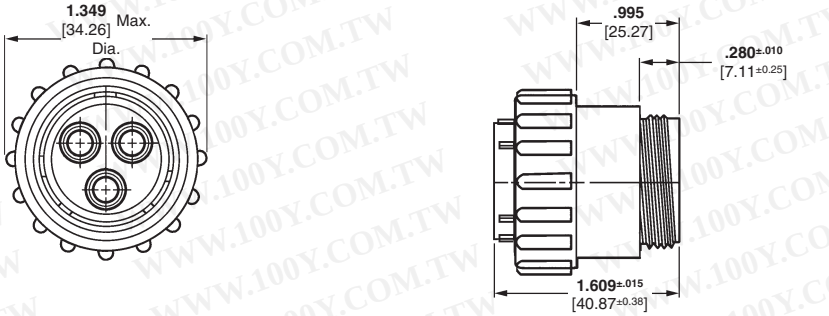
Square Flange Receptacle (Uses Flange Seal **Part No. 81665-2** on page 51)



Free-Hanging Receptacle



Plug (With Full Interfacial Seal)



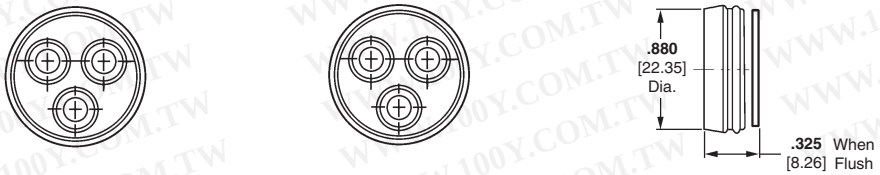
Reverse Sex (Receptacles accept socket contacts, Plugs accept pin contacts)

Arrangement	Square Flange Receptacle	Free-Hanging Receptacle	Plug
17-3 - Connector	213889-2	213890-2	213905-1
17-3 - Wire Entry Seal Kit	213899-1	213899-1	213899-1

Kit includes (1) Silicon Wire Entry Seal and (1) Pressure Plate.
*Wire entry seals require cable clamp kits.

Wire Entry Seals*

*Cable clamp kit 213902-3 required. (Similar to 206322-9. See page 38 for dimensional detail of cable clamp) or cable clamp kit 213904-3. (Similar to 206070-8. See page 38 for dimensional detail of cable clamp).



Rear View Receptacles | **Rear View Plugs** | **Side View Plugs/Receptacles**

Note: Minimum insulation diameter is .156 [3.96]; Maximum insulation diameter is .260 [6.60].

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Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

Two-Piece Sealed Circular Plastic Connectors, Series 6

CPC Connectors, Series 6 Sealed – Reverse Sex

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

Material

Housing—Nylon, glass-filled UL rated 94V-0, black

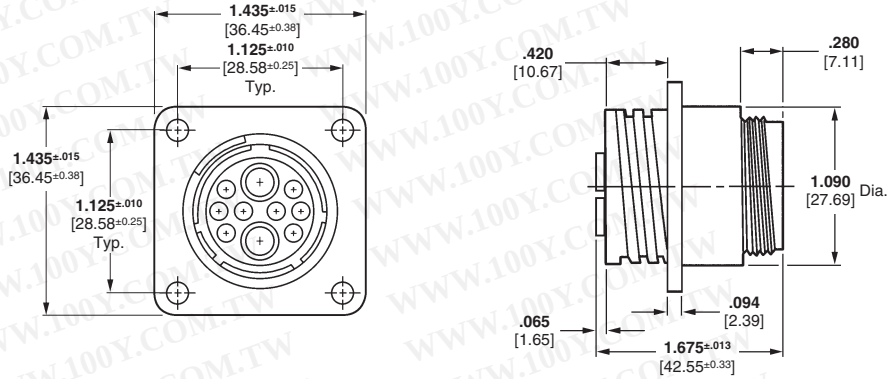
Related Product Data

Contacts—Pages 17-21 and 47
Accessories—Page 51
Application Tooling—Pages 76-79
Technical Documents—Page 80

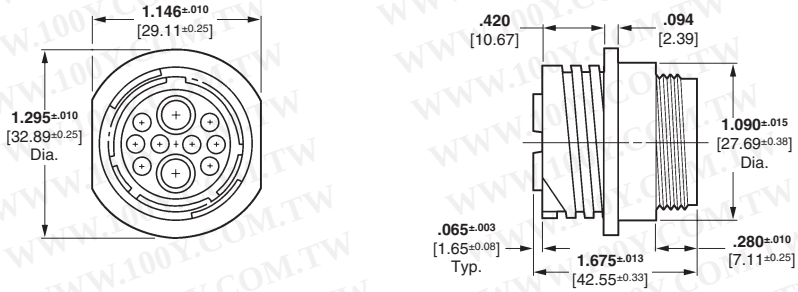
Replacement Coupling Ring

Shell Size	Part No.
17-10	213810-1

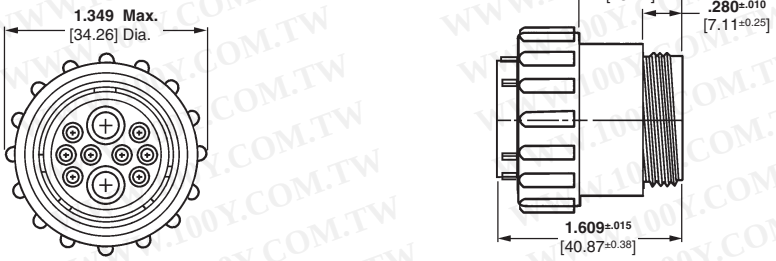
Square Flange Receptacle (Uses Flange Seal **Part No. 81665-2** on page 51)



Free-Hanging Receptacle



Plug



Reverse Sex (Receptacles accept socket contacts, Plugs accept pin contacts)

Arrangement	Square Flange Receptacle	Free-Hanging Receptacle	Plug
17-10 Connector	213893-2	213894-2	213906-1
17-10 Wire Entry Seal Kit	213900-1	213900-1	213900-1

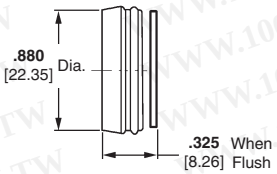
Kit includes (1) Silicon Wire Entry Seal and (1) Pressure Plate.
*Wire entry seals require cable clamp kits.

Wire Entry Seal*

*Cable clamp kit 213902-3 required. (Similar to 206322-9. See page 38 for dimensional detail of cable clamp) or cable clamp kit 213904-3. (Similar to 206070-8. See page 38 for dimensional detail of cable clamp).

Rear View Receptacles

Rear View Plugs



Side View Plugs/Receptacles

Note: Minimum insulation diameter is .156 [3.96]; maximum insulation diameter is .260 [6.60] for power contacts.
Minimum insulation diameter is .060 [1.50]; maximum insulation diameter is .130 [3.30] for signal contacts.

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Japan: 81-44-844-8013
UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

Two-Piece Sealed Circular Plastic Connectors, Special Series 1

Sealed CPC Receptacles, Special Series 1 with Pre-Installed, Bonded Peripheral Seal

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

Material and Finish

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

Seal—Elastomer, gray

Related Product Data

Contacts—Pages 17-21

Contact Arrangement—Page 24

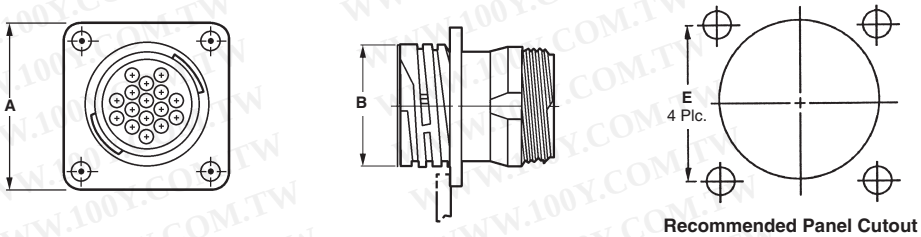
Accessories—Pages 38-42 and 51

Performance Characteristics—Page 6

Application Tooling—Pages 76-79

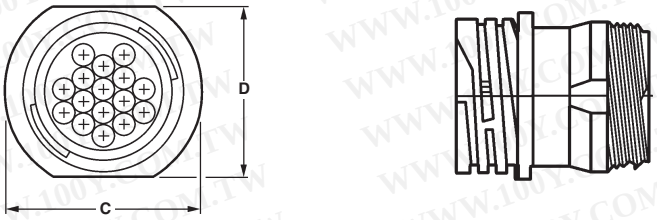
Technical Documents—Page 80

Square Flange Receptacle (Uses Flange Seal **Part No. 81665-** □ on page 51)



Recommended Panel Cutout

Free-Hanging Receptacle



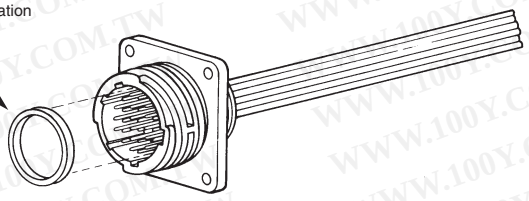
Shell Size	Dimension E
11	**.844** 21.44
13	**.969** 24.61
17	**1.125** 28.58
23	**1.438** 36.53

Arrangement		Series I Receptacles with Peripheral Seal								
		Dimensions		Sex	Square Flange Part No.		Dimensions		Free-Hanging Part No.	Mates with Plug Part No.
Shell Size	No. of Positions	A	B		With Mounting Holes	With Threaded Inserts[1]	C	D		
11-4		**1.125** 28.58	**.607** 15.42	Std.	206061-2	–	**.935** 23.75	**.817** 20.75	206153-2	206060-1
				Rev.	206430-3	–			206430-4	206429-1
13-7		**1.281** 32.54	**.812** 20.62	Std.	211401-3	–	**1.072** 27.23	**.874** 22.20	–	211399-1
13-9				Std.	206705-3	208131-2			206705-4	206708-1
17-16		**1.435** 36.45	**1.050** 26.67	Std.	206036-4	–	**1.310** 33.27	**1.161** 29.49	206036-5	206037-1
17-14				Rev.	206043-4	–			206043-5	206044-1
23-24		**1.750** 44.45	**1.438** 36.53	Std.	206838-3	–	**1.733** 44.02	**1.505** 38.23	206838-4	206837-1
23-37				Std.	206151-3	–			206151-4	206150-1
				Rev.	206306-3	–			206306-4	206305-1

[1]Four 4-40 threaded inserts per receptacle.

Notes: 1. For detailed performance data on peripheral seals, refer to Product Specification No. 108-10024.
2. Receptacles mate with Series 1 plugs found on page 10.

Seal shown outside of connector for illustration purposes only.



Receptacles with pre-installed, bonded peripheral seals are recommended for use in sealing/splash-proof applications, or where connectors will be subjected to vibration.

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Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-208-420-8341

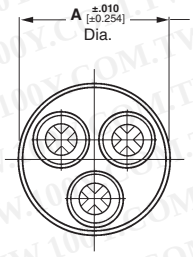
Note: All part numbers are RoHS Compliant.

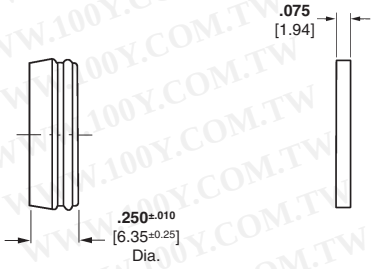
Two-Piece Circular Plastic Connector Sealing Accessories

Wire Entry Seal Kits
for Plug and Receptacle Housings

Material and Finish

Seal—Silicon, black
Pressure Plate—Nylon, black





Seal

Pressure Plate

Arrangement No.	Insulation Dia. Range	Dimension A	Kit for Pins	Kit for Sockets
13-9	**.075-.125** 1.91-3.18	**.681** 17.30	213926-1	213925-1
17-3	**.178-.265** 4.52-6.73	**.790** 20.07	213899-1	213899-1
17-10	**.178-.265** 4.52-6.73 **.075-.125** 1.91-3.18	**.790** 20.07	213900-1	213900-1
17-14	**.075-.125** 1.91-3.16	**.790** 20.07	213919-2	213919-1
17-16	**.075-.125** 1.91-3.16	**.790** 20.07	213920-2	213920-1

Notes: 1. Kits include one Gang Seal and one Pressure Plate marked for cavity identification.
2. Arrangement No. 17-10 Insulation Dia. Range **.176-.265** [4.52-6.73] for two holes, **.075-125** [1.95-3.18] for eight holes.

One-Piece or Two-Piece Sealed CPC Sealing Accessories

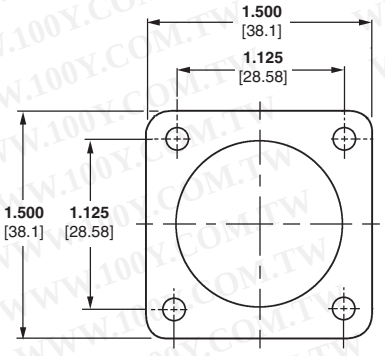
Flange Seals

Material Neoprene, black

Related Product Data

Dimensions—Shell Size 17 shown; request Customer Drawings for other sizes

Shell Size	Part No.
11	81665-3
13	81665-4
17 (shown)	81665-2
23	81665-5



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UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

Circular Plastic Connector Sealing Accessories

Sealing Caps
for Receptacles only

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

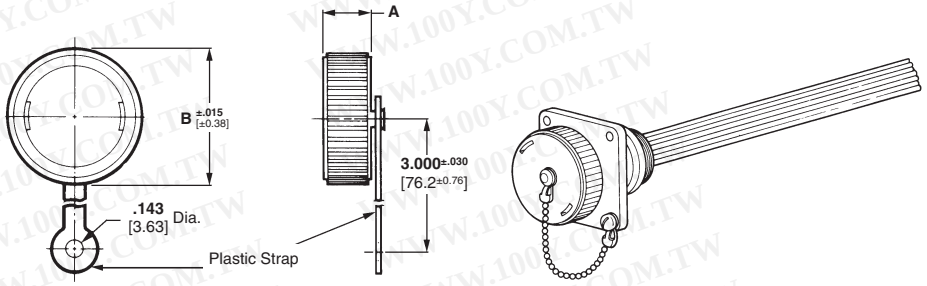
Material and Finish

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

Sealing Gasket—Neoprene, black

Bead Chain—Steel, nickel plated

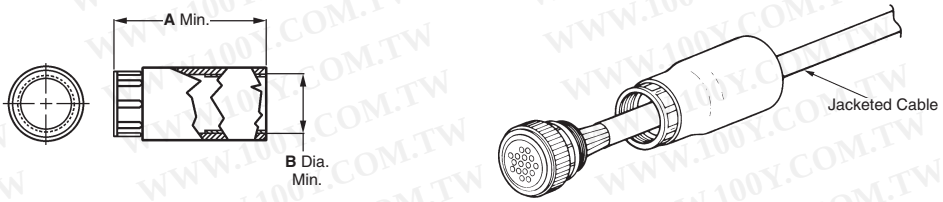
Bead Chain Coupling—Brass, plated nickel



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



Thick Wall Boots

Material

Internal Sleeve—Nylon

Outer Tubing—Polyolefin, black

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

Thin Wall Boot

Material

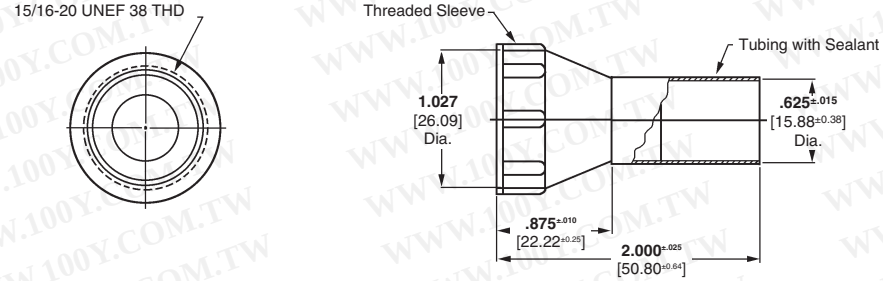
Inter Sleeve—Nylon

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

CPC Sealing Accessories

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Revised 7-07

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Japan: 81-44-844-8013
UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

Circular Plastic Connector Sealing Accesories (Continued)

Jacketed Cable Seals (for Shell Size 23)

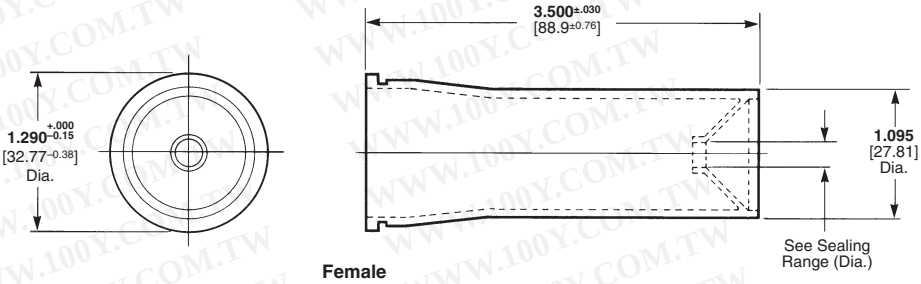
A jacketed cable seal kit provides an environmentally sealed connection for jacketed cable.

Material

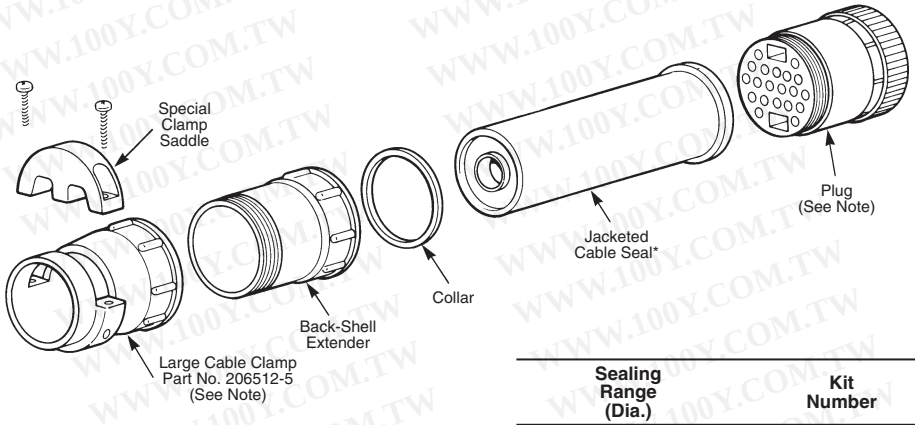
Peripheral Seal—Grey elastomer
Collar—Aluminum
Jacketed Cable Seal—Black rubber
Back-Shell Extender—Black glass-filled thermoplastic
Special Clamp Saddle—Black thermoplastic

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



Female



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

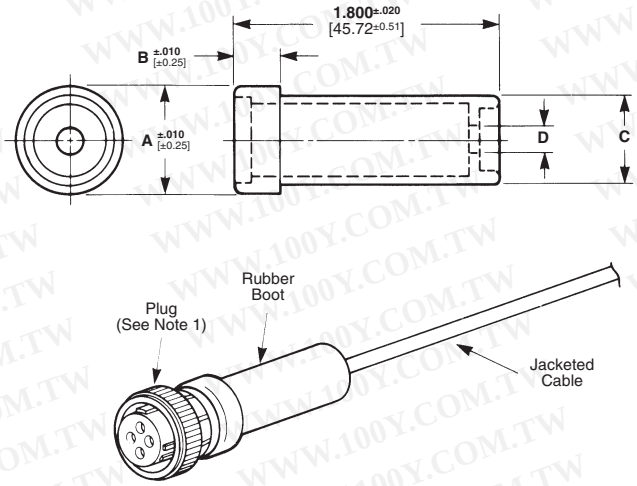
Sealing Range (Dia.)	Kit Number
.300-.450 7.62-11.43	207052-1
.450-.600 11.43-15.24	207052-2
.600-.875 15.24-22.22	207052-3

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 A	B	C	D	Part No.
11	.219-.438 5.56-11.13	.750 19.05	.300 7.62	.600 15.24	.170 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.

Catalog 82021
Revised 7-07

www.tycoelectronics.com

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UK: 44-208-420-8341

Circular Plastic Connector Sealing Accesories (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

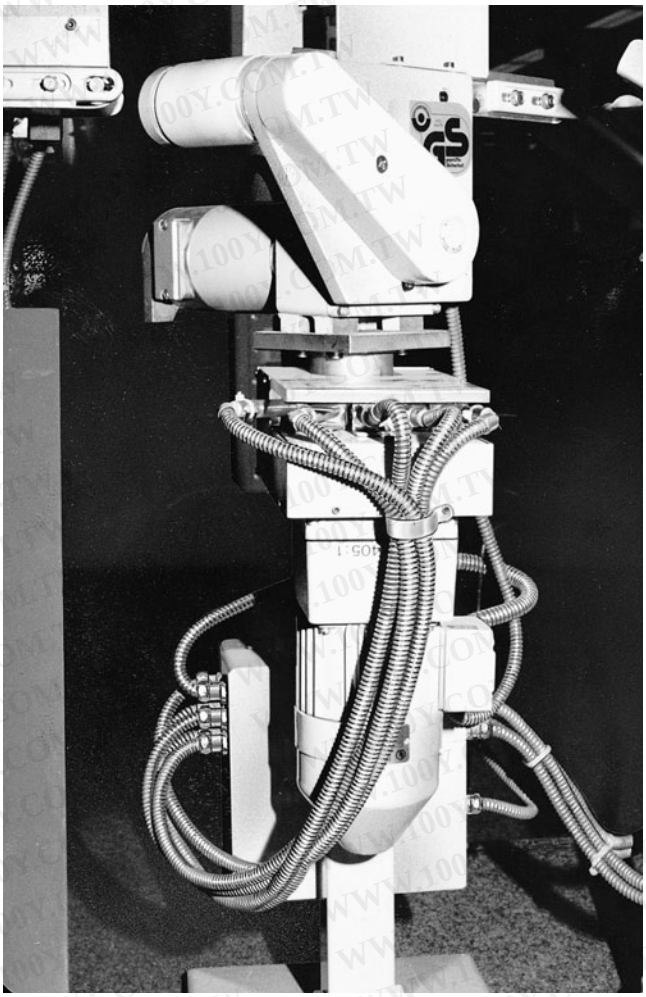
Technical Documents

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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UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

Engineering Notes

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UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

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 mismating 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 mismating 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

Note: All part numbers are RoHS Compliant.

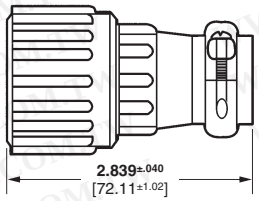
MIL-C-5015 Style Circular Plastic Connectors (CPC), Shell Size 20-14

Plug Kit, Unassembled

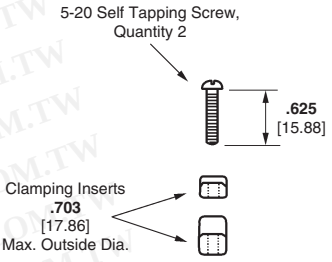
Reverse Sex (Accepts pins)
Part Number 213571-2
without Cable Clamp

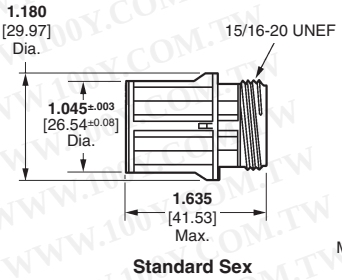
Standard Sex (Accepts sockets)
Part Number 213652-1
without Cable Clamp

Cable Clamps		O.D.
Part No.	Type	Max.
206070-8	standard	.453 [11.51]
206322-9	large	.703 [17.86]

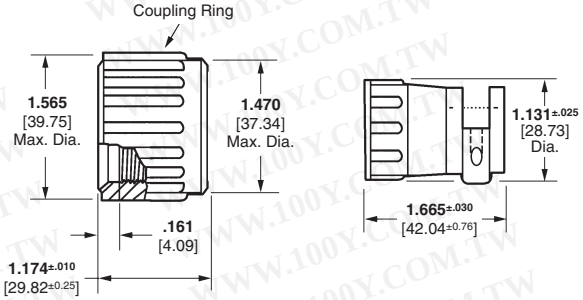


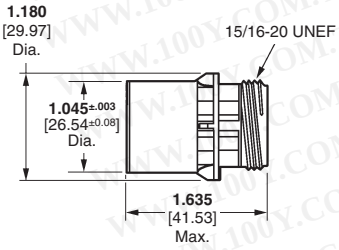
Assembled with Cable Clamp





Standard Sex



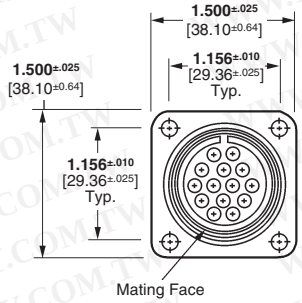


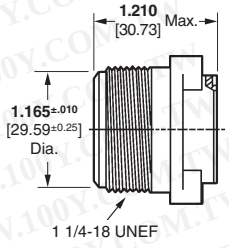
Reverse Sex

Receptacle, Square Flange

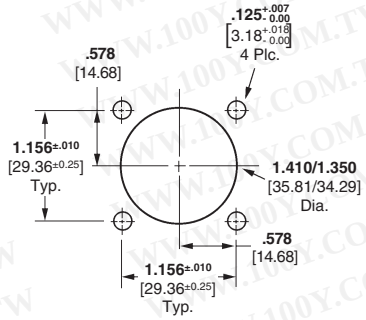
Reverse Sex (Accepts sockets)
Part Number 213570-1

Standard Sex (Accepts pins)
Part Number 213651-1

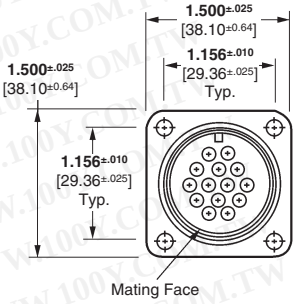


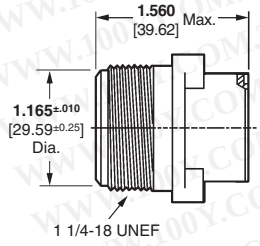


Reverse Sex



Panel Cutout

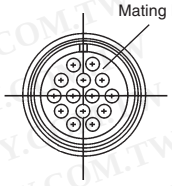


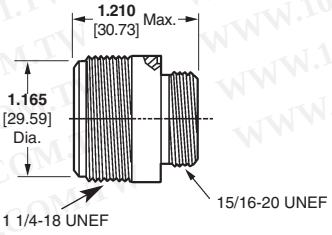


Standard Sex

Receptacle, Free-Hanging

Reverse Sex (Accepts sockets)
Part Number 213650-1





Catalog 82021
Revised 7-07

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Japan: 81-44-844-8013
UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

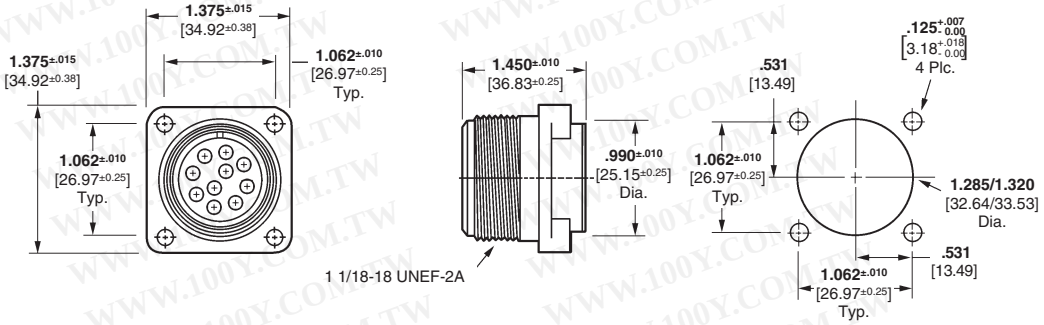
MIL-C-5015 Style Circular Plastic Connectors (CPC), Shell Size 18-10

Plug Kit, Unassembled

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

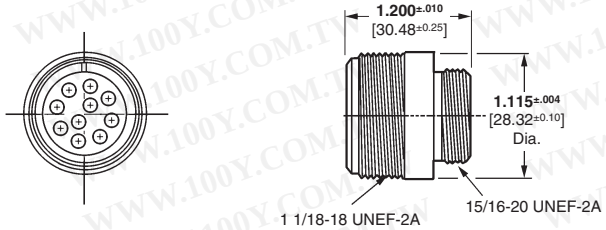
Receptacle, Square Flange

Reverse Sex (Accepts sockets)
Part Number 213667-1



Receptacle, Free-Hanging

Reverse Sex (Accepts sockets)
Part Number 213668-1



Type III+ Contacts

Material

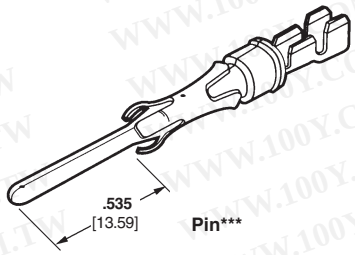
Contact—Brass
Spring—Stainless Steel

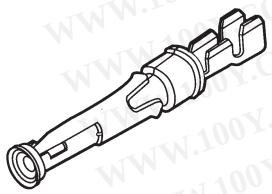
Contact Finish

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 AWG	Wire Size Range mm²	Ins. Dia. Range	Contact Finish Code	Strip Form Contact No. Pin	Strip Form Contact No. Socket	Loose Piece Contact No. Pin	Loose Piece Contact No. Socket	Strip Form Applicator	Hand Tool Part No.
24-20	0.2-0.6	**.060-.135** 1.52-3.43	B	213605-7	1-66563-1	—	66565-7	567363-□††	91542-1[5]
			A	—	66563-8	—	66565-4		
18-14	0.8-2	**.110-.150** 2.79-3.81	B	213603-5	66598-9	213603-6	66601-9	466958-1†† (for Sockets) or 567364-□†† or 567834-1†† (for Sockets)	91521-1[5]
			A	213603-3	66598-2	213603-4	66601-2		

††**Note:** Applicators for AMP semiautomatic or fully-automatic termination equipment are available. Contact Technical Support.
***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.
[5]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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Japan: 81-44-844-8013
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Note: All part numbers are RoHS Compliant.

Engineering Notes

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Note: All part numbers are RoHS Compliant.

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 mismating 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.

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Note: All part numbers are RoHS Compliant.

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

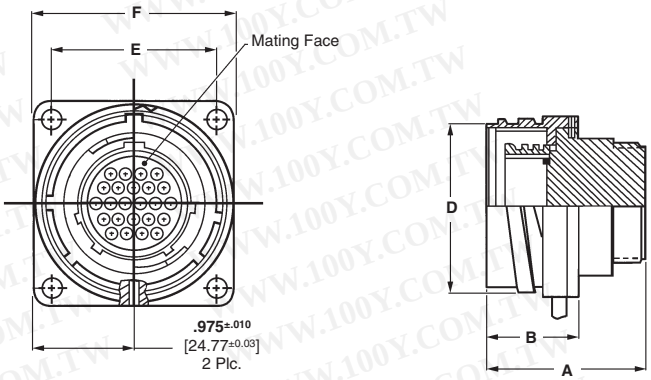
Square Flange Receptacle—
Housing—Thermoplastic, UL 94V-0 rated, black
Metal-Shell—Zinc alloy, plated nickel
Grooved Pin—Steel alloy, plated nickel

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

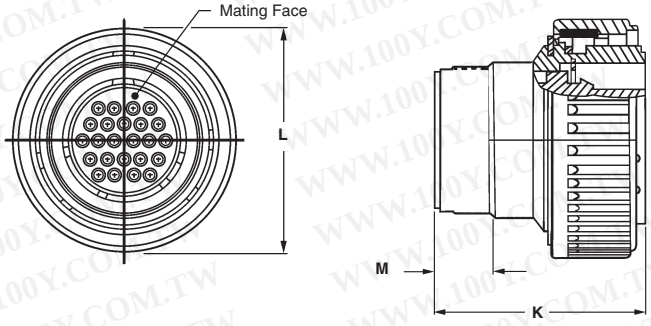
Related Product Data

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)

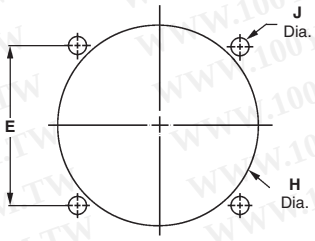


Plugs
(Accepts Multimate Sockets)

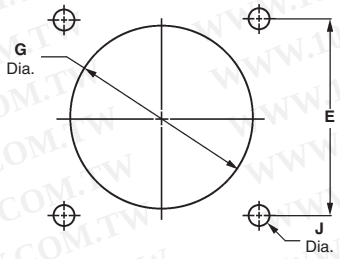


Arrangement	Square Flange Receptacle	Plug Part No.	
		without TETRASEALS Ring	with TETRASEALS Ring
14-5	208719-1	208718-1	208718-2
14-7	208715-1	208714-1	208714-2
22-16	208489-1	208488-1	208488-3
28-24	208459-1	208457-1	208457-3
28-37	208471-1	208470-1	208470-3

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



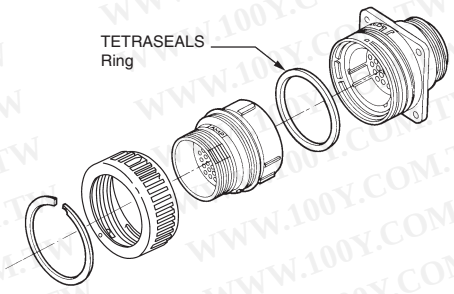
Rear Mount Panel Cutout



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.



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UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

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

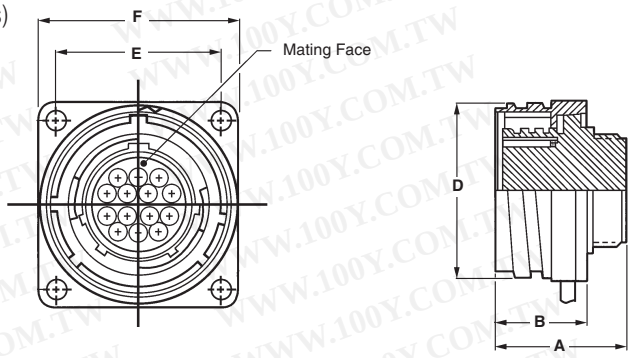
Plug—
Housing—Thermoplastic, UL 94V-0 rated, black
Metal-Shell—Zinc alloy, plated nickel
Tetraseal Seal—Fluorocarbon
Retainer Ring—Retainer Ring
Coupling Ring—Zinc alloy, plated nickel

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

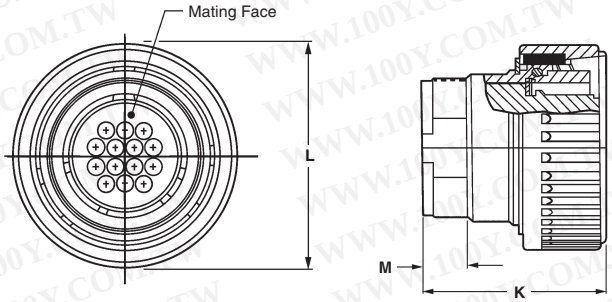
Square Flange Receptacles

(Accepts Multimate Sockets)



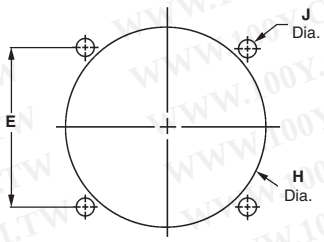
Plugs

(Accepts Multimate Pins)

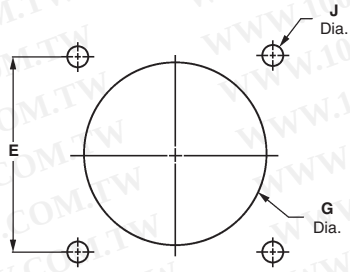


Arrangement	Square Flange Receptacle	Plug Part No.	
		without TETRASEALS Ring	with TETRASEALS Ring
14-5	208721-1	208720-1	—
14-7	208717-1	208716-1	208716-2
22-14	208487-1	208486-1	208486-3
28-37	208473-1	208472-1	208472-3

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



Rear Mount Panel Cutout

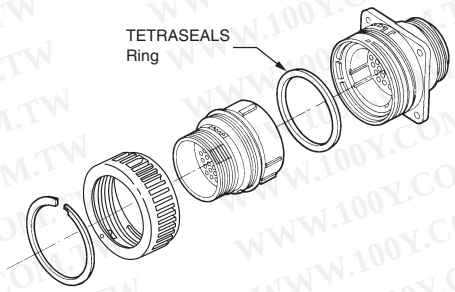


Front Mount Panel Cutout

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.



Catalog 82021
Revised 7-07

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USA: 1-800-522-6752
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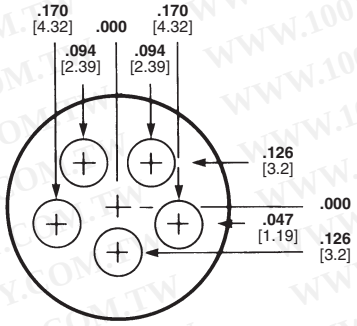
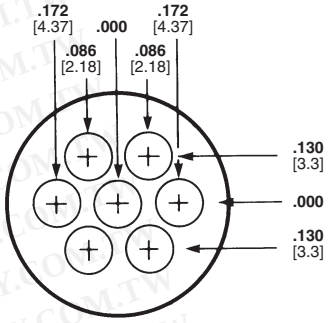
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-208-420-8341

Metal-Shell CPC Connectors, Series 1, Contact Arrangements

Shell Size 14

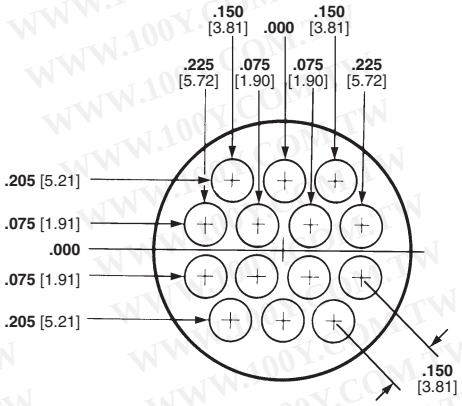


Arrangement 14-5
Max. Wire Ins. Dia. = .150 [3.81]

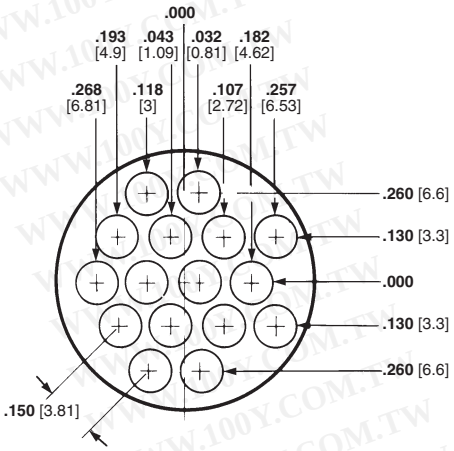


Arrangement 14-7
Max. Wire Ins. Dia. = .100 [2.54]

Shell Size 22



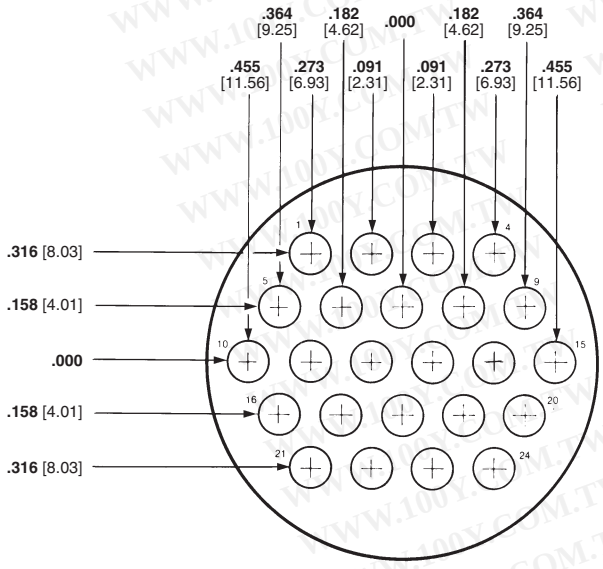
Arrangement 22-14
Max. Wire Ins. Dia. = .100 [2.54]



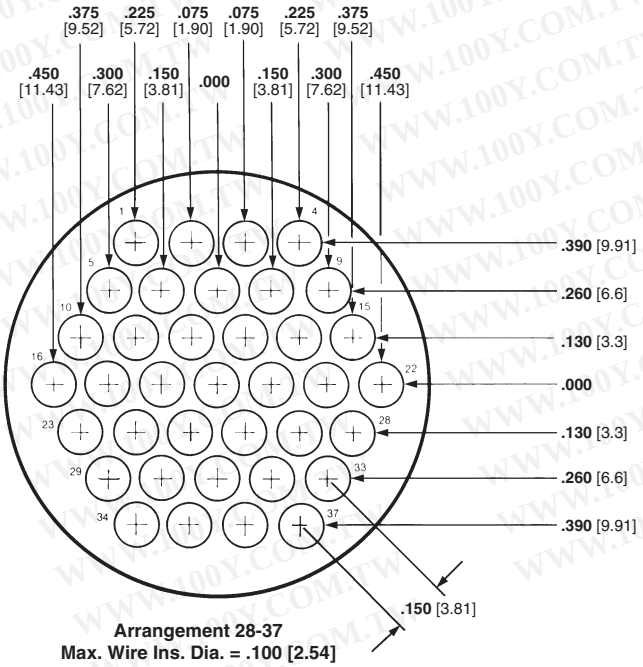
Arrangement 22-16
Max. Wire Ins. Dia. = .100 [2.54]

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]

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Japan: 81-44-844-8013
UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

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

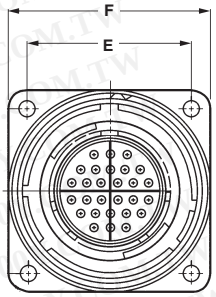
Square Flange Receptacle—
Housing and Retention Insert—Thermoplastic, UL 94V-0 rated, black
Metal-Shell—Zinc alloy, plated nickel
Grooved Pin—Steel alloy, plated nickel

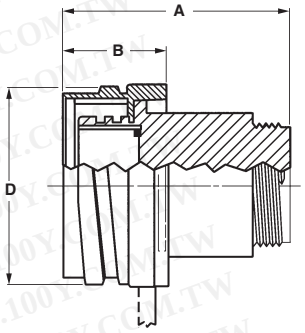
Plug—
Housing—Thermoplastic, UL 94V-0 rated, black
Metal-Shell—Zinc alloy, plated nickel
Tetraseal Seal—Fluorocarbon
Retainer Ring—Stainless steel
Coupling Ring—Zinc alloy, plated nickel

Related Product Data

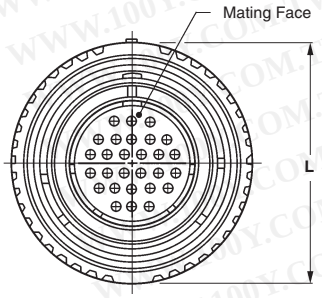
Contacts—Pages 29-30
Contact Arrangement—Page 64
Component Dimensions—Page 70
Accessories—Pages 38, 39 and 71
Performance Characteristics—Page 6
Application Tooling—Pages 76-79
Technical Documents—Page 80

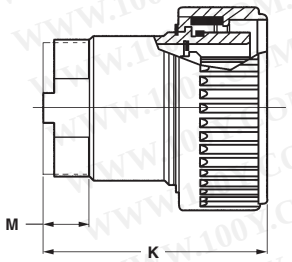
Square Flange Receptacles
(Accepts 20 DF and 20 DM Pins)



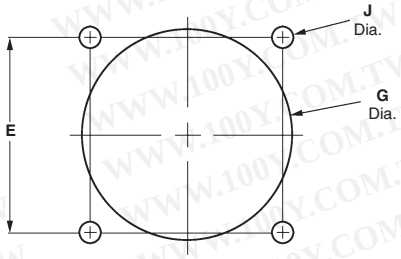


Plugs
(Accepts 20 DF and 20 DM Sockets)





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



Recommended Panel Cutout

Catalog 82021
Revised 7-07

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UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

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

Related Product Data

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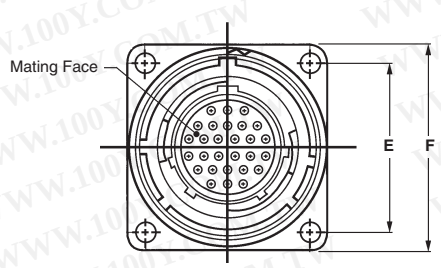
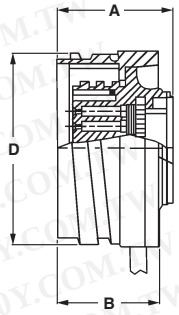
Component Dimensions—Page 70
Accessories—Pages 38, 39 and 71
Performance Characteristics—Page 6
Application Tooling—Pages 76-79
Technical Documents—Page 80

Square Flange Receptacles

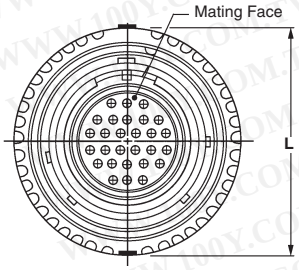
(Accepts 20 DF and 20 DM Sockets)

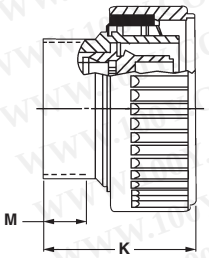




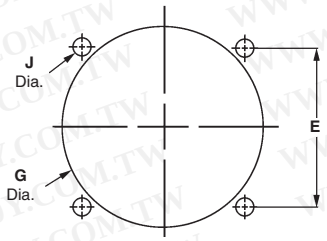
Plugs

(Accepts 20 DF and 20 DM Pins)

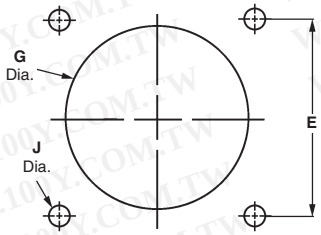




Arrangement	Part No.	
	Square Flange Receptacle	Plug without Tetraseals Ring
22-28	208493-1	208492-1
28-57	208475-1	208474-1



Rear Mount Panel Cutout



Front Mount Panel Cutout

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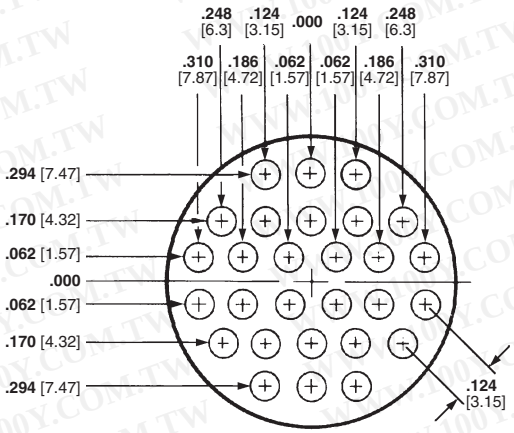
Japan: 81-44-844-8013
UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

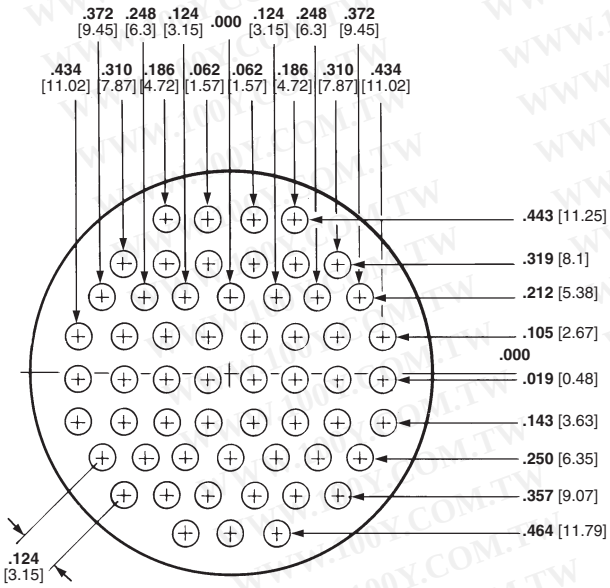
Metal-Shell CPC Connectors, Series 2, Contact Arrangements

Shell Size 22

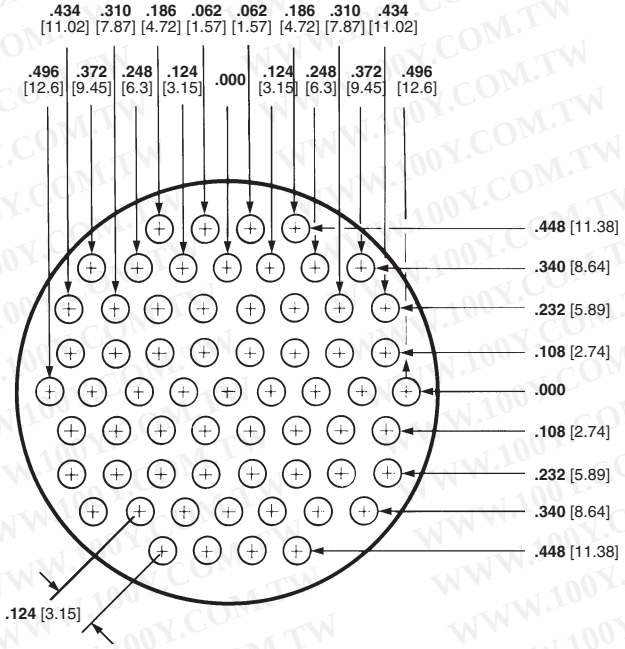


Arrangement 22-28
Max. Wire Ins. Dia. = .068 [1.73]

Shell Size 28



Arrangement 28-57
Max. Wire Ins. Dia. = .068 [1.73]



Arrangement 28-63
Max. Wire Ins. Dia. = .068 [1.73]

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

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UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

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

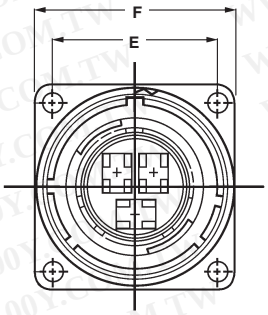
Plug—
Housing—Thermoplastic, UL 94V-0 rated, black
Metal-Shell—Zinc alloy, plated nickel
Tetraseal Seal—Fluorocarbon
Retainer Rings—Stainless Steel
Coupling Ring—Zinc alloy, plated nickel

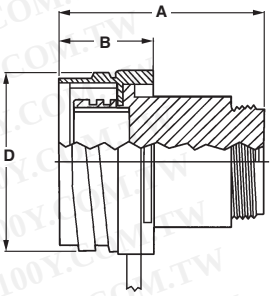
Related Product Data

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

Square Flange Receptacles

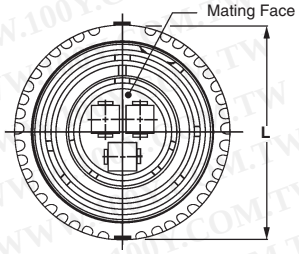
(Accepts Type XII Male Pins)

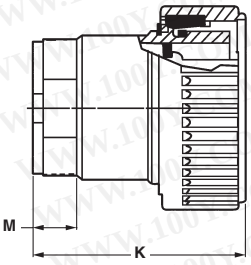




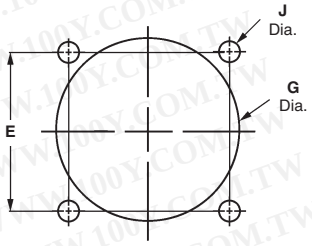
Plugs

(Accepts Type XII Female Sockets)





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

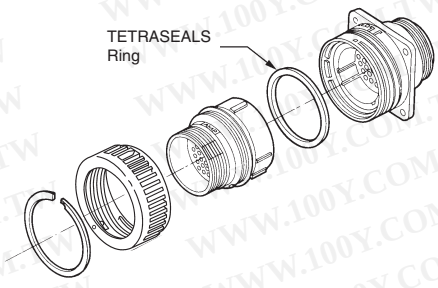


Recommended Panel Cutout

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.



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Japan: 81-44-844-8013
UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

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

Related Product Data

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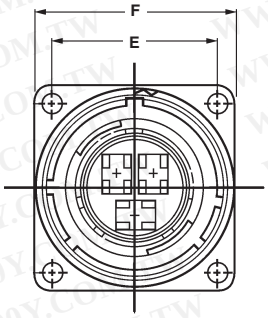
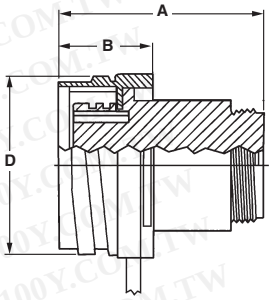
Accessories—Pages 38, 39 and 71
Performance Characteristics—Page 6
Application Tooling—Pages 76-79
Technical Documents—Page 80

Square Flange Receptacles

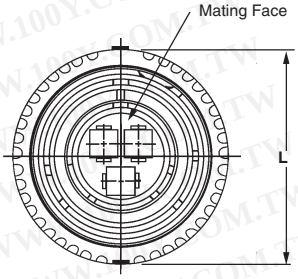
(Accepts Type XII Female Sockets)

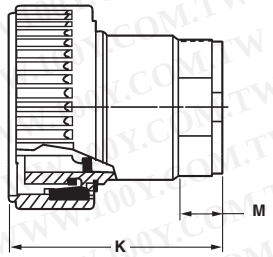




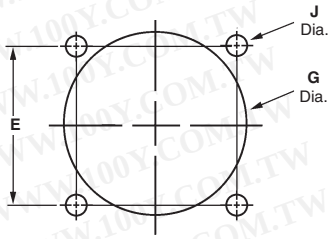
Plugs

(Accepts Type XII Male Pins)





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

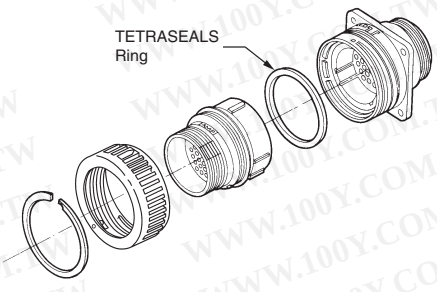


Recommended Panel Cutout

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.



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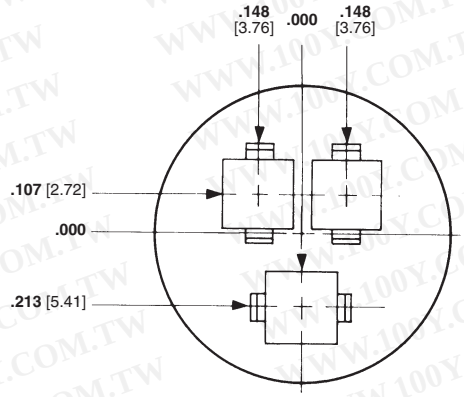
UK: 44-208-420-8341

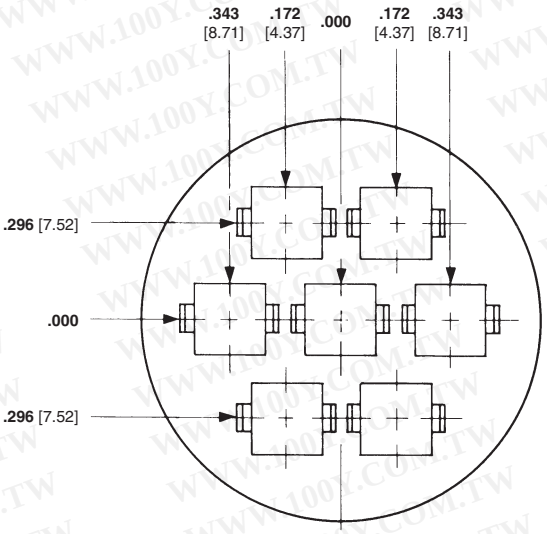
Metal-Shell CPC Connectors, Series 3, Contact Arrangements

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.

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Revised 7-07

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South America: 55-11-2103-6000
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

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

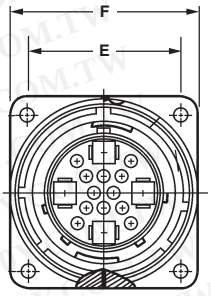
Plug—
Housing—Thermoplastic, UL 94V-0 rated, black
Metal-Shell—Zinc alloy, plated nickel
Tetraseal Seal—Fluorocarbon
Retainer Rings—Stainless Steel
Coupling Ring—Zinc alloy, plated nickel

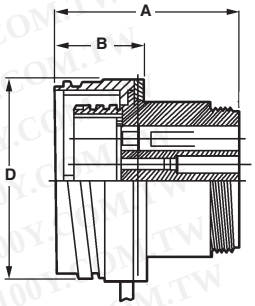
Related Product Data

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

Square Flange Receptacles

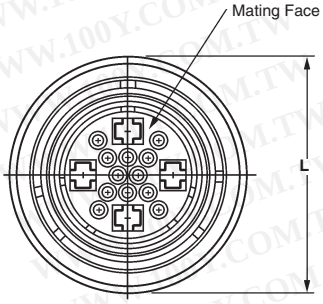
(Standard Sex Receptacles accept Type XII Male and Multimate Pins. Reverse Sex Receptacles accept Type XII Female and Multimate Sockets.)

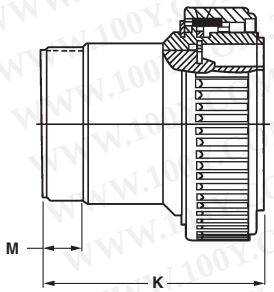




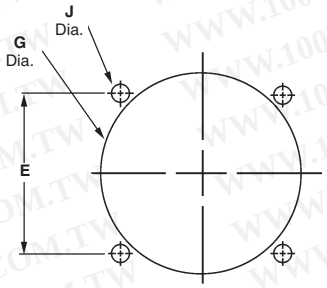
Plugs

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

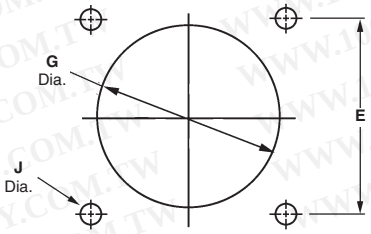




Arrangement	Square Flange Receptacle		Plug Part No.		
			without TETRASEALS Ring		with TETRASEALS Ring
	Standard Sex	Reverse Sex	Standard Sex	Reverse Sex	Standard Sex
28-16M	208479-1	1776088-1	208478-1	1776089-1	208478-3
28-22M	208481-1	—	208480-1	—	208480-3



Rear Mount Panel Cutout

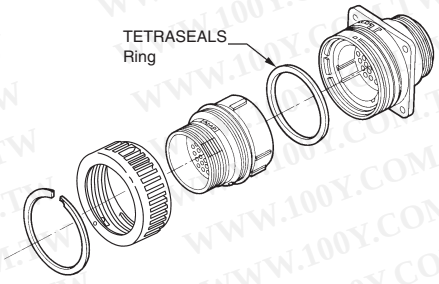


Front Mount Panel Cutout

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.



Catalog 82021
Revised 7-07

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Dimensions are in inches and millimeters unless otherwise specified. Values in brackets are metric equivalents.

Dimensions are shown for reference purposes only. Specifications subject to change.

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C. America: 57-1-254-4444

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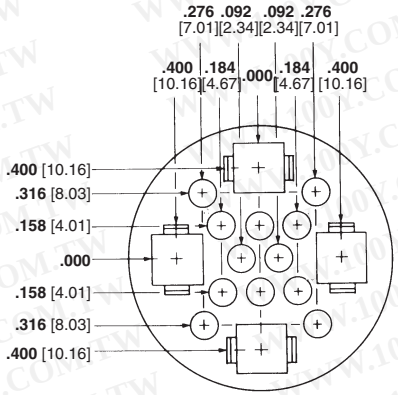
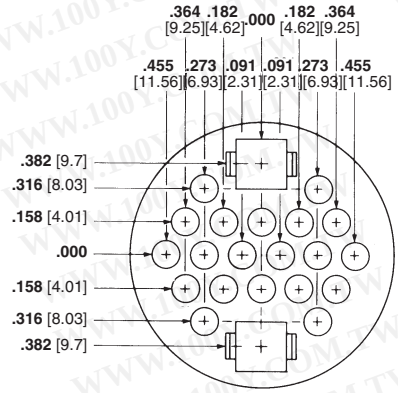
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-208-420-8341

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.

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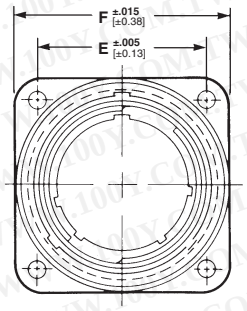
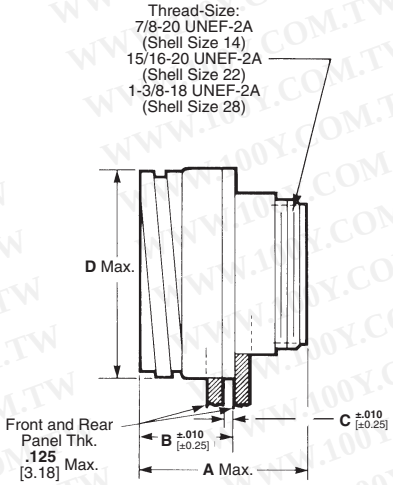
UK: 44-208-420-8341

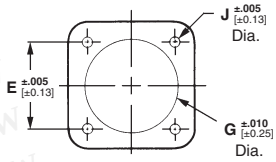
Note: All part numbers are RoHS Compliant.

Metal-Shell CPC Connectors Component Dimensions

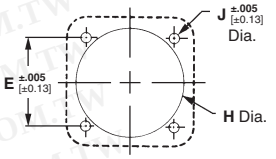
Square Flange Receptacles





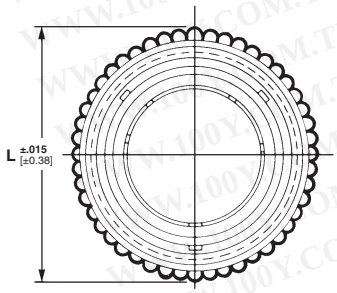


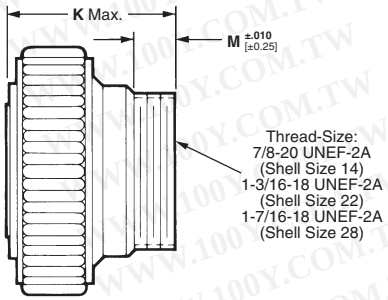
Panel Cutout, Front Mounted Receptacle



Panel Cutout, Rear Mounted Receptacle

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**	**.790**	**.103**	**1.503**	**1.250**	**1.534**	**1.156**	**1.554**	**.120**	**1.560**	**1.750**	**.380**
			30.22	20.07	2.62	38.18	31.75	38.96	29.36	39.47	3.05	39.62	44.45	9.65
	22-16	Std.	**1.470**	**.790**	**.103**	**1.503**	**1.250**	**1.534**	**1.156**	**1.554**	**.120**	**1.265**	**1.750**	**.380**
			37.34	20.07	2.62	38.18	31.75	38.96	29.36	39.47	3.05	32.13	44.45	9.65
	28-24	Std.	**1.555**	**.875**	**.125**	**1.900**	**1.562**	**1.950**	**1.610**	**1.970**	**.145**	**1.560**	**2.170**	**.380**
			39.5	22.23	3.18	48.26	39.67	49.53	40.89	50.04	3.68	39.62	55.12	9.65
	28-37	Std.	**1.540** 39.12	**.875**	**.125**	**1.900**	**1.562**	**1.950**	**1.610**	**1.970**	**.145**	**1.560** 39.62	**2.170**	**.380**
		Rev.	**1.260** 31.00	22.23	3.18	48.26	39.67	49.53	40.89	50.04	3.68	**1.840** 46.74	55.12	9.65
2	22-28	Std.	**.934**	**.790**	**.103**	**1.503**	**1.250**	**1.534**	**1.156**	**1.554**	**.120**	**1.295**	**1.750**	**.380**
		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**	**.875**	**.125**	**1.900**	**1.562**	**1.950**	**1.610**	**1.970**	**.145**	**1.408**	**2.170**	**.380**
			31.22	22.22	3.18	48.26	39.67	49.53	40.89	50.04	3.68	35.76	55.12	9.65
	28-63	Std.	**1.229**	**.875**	**.125**	**1.900**	**1.562**	**1.950**	**1.610**	**1.970**	**.145**	**1.408**	**2.170**	**.380**
			31.22	22.22	3.18	48.26	39.67	49.53	40.89	50.04	3.68	35.76	55.12	9.65
3	22-3	Std.	**1.755**	**.790**	**.103**	**1.503**	**1.250**	**1.534**	**1.156**	**1.554**	**.120**	**1.805**	**1.750**	**.380**
		Rev.	44.58	20.07	2.62	38.18	31.75	38.96	29.36	39.47	3.05	45.85	44.45	9.65
	28-7	Std.	**1.825**	**.875**	**.125**	**1.900**	**1.562**	**1.950**	**1.610**	**1.970**	**.145**	**2.125**	**2.170**	**.380**
		Rev.	46.36	22.22	3.18	48.26	39.67	49.53	40.89	50.04	3.68	53.98	55.12	9.65
4	28-13M	Std.	**1.825**	**.875**	**.125**	**1.900**	**1.562**	**1.950**	**1.610**	**1.970**	**.145**	**2.125**	**2.170**	**.380**
			46.36	22.22	3.18	48.26	39.67	49.53	40.89	50.04	3.68	53.98	55.12	9.65
	28-16M	Std.	**1.825**	**.875**	**.125**	**1.900**	**1.562**	**1.950**	**1.610**	**1.970**	**.145**	**2.125**	**2.170**	**.380**
			46.36	22.22	3.18	48.26	39.67	49.53	40.89	50.04	3.68	53.98	55.12	9.65
	28-22M	Std.	**1.825**	**.875**	**.125**	**1.900**	**1.562**	**1.950**	**1.610**	**1.970**	**.145**	**2.125**	**2.170**	**.380**
			46.36	22.22	3.18	48.26	39.67	49.53	40.89	50.04	3.68	53.98	55.12	9.65

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UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

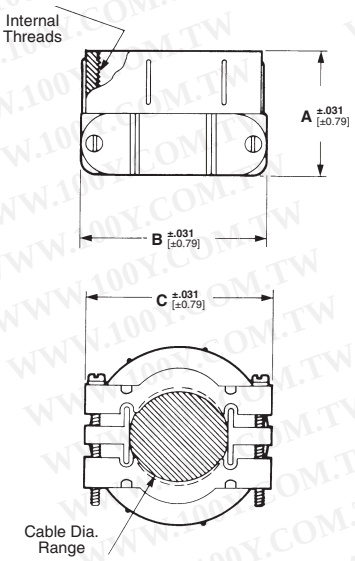
Metal-Shell CPC Connector Accessories

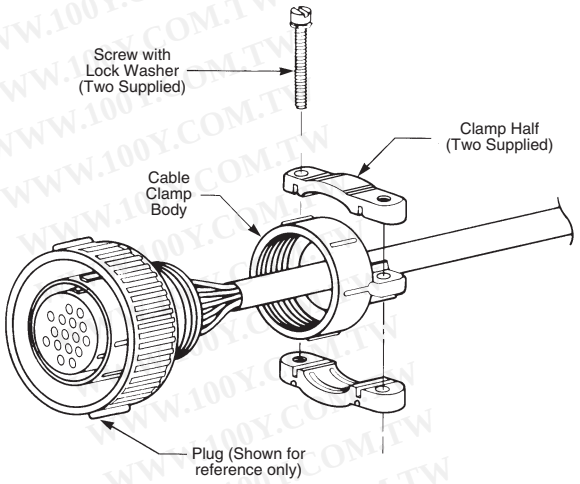
Cable Clamps

Material and Finish

Body and Clamp Halves—Zinc alloy, nickel plated

Screws and Washers—Stainless steel





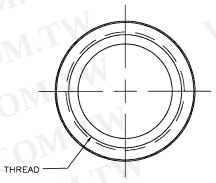
Shell Size	Dimensions A	B	C	Cable O.D. Range	Thread Size	Part No.
14	**.938** 23.83	**1.175** 29.85	**1.165** 29.59	**.225-.562** 5.71-14.27	7/8-20 UNEF-3B	208945-5
22	**.938** 23.83	**1.432** 36.37	**1.469** 37.31	**.325-.750** 8.26-19.05	1-3/16-18 UNEF-3B	208945-7
28	**1.031** 26.19	**1.593** 40.46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

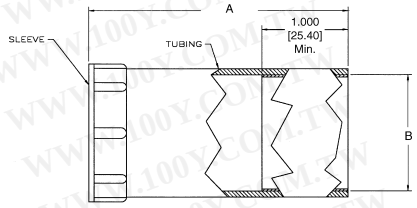
Notes: 1. For Shell Size 22 Receptacle use plastic cable clamp Size 17 (See page 38), for Shell Size 28 Receptacle use plastic cable clamp Size 23 (See pages 38-39). Use Size 14 metal cable clamp for both plug and receptacle Size 14 connectors.
2. Metal cable clamps (Sizes 22 and 28) are for use with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

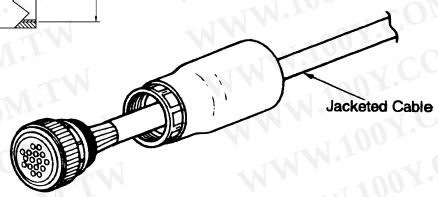
Cable Entry Seals

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

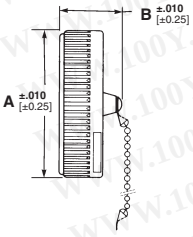
Shell Size	Dimensions A	B	Expanded Wall Thickness	Sealing Range (Dia.)	Max. Recovered Inside Dia.	Part No.
22	**3.000** 76.20	**1.250** 31.75	**.070** 1.78	**.550 - 1.250** 13.97 - 31.75	**.500** 12.70	54012-3
28						54012-4

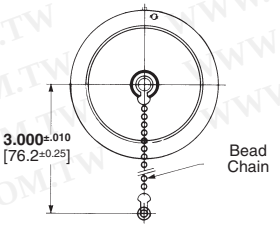
Protective Cap Assemblies (for Metal-Shell CPC Receptacles Only)

Material and Finish

Zinc alloy, nickel plated

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





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Note: All part numbers are RoHS Compliant.

Engineering Notes

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Note: All part numbers are RoHS Compliant.

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**

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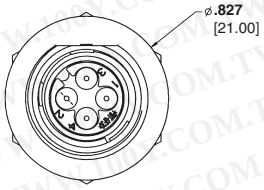
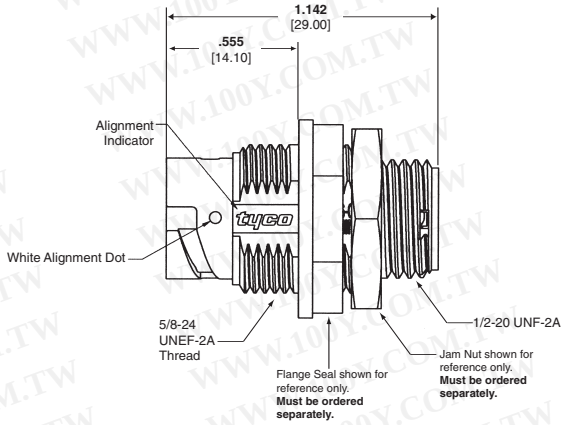
Japan: 81-44-844-8013
UK: 44-208-420-8341

Miniature Circular Plastic Connectors (CPC) (Continued)

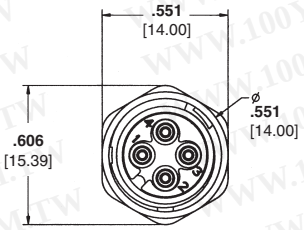
Shell Size 8
(4 Position shown)

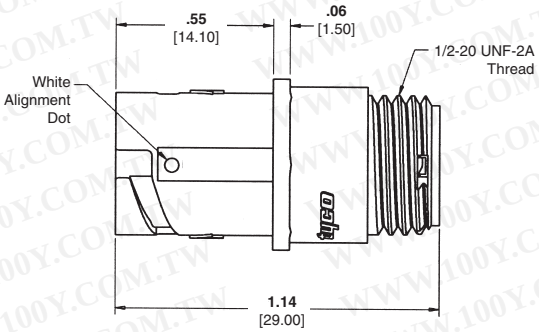
Receptacle Assembly, Panel Mount (Order pin contacts separately — see page 75)



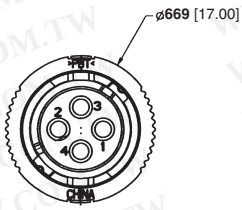


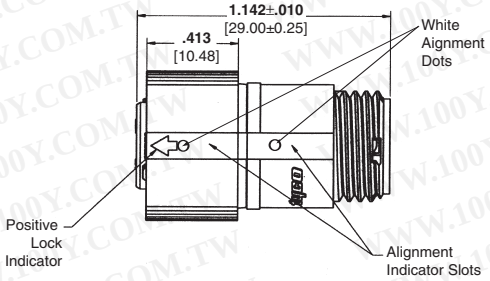
Receptacle Assembly, Free-Hanging (Order pin contacts separately — see page 75)





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





Related Product Data

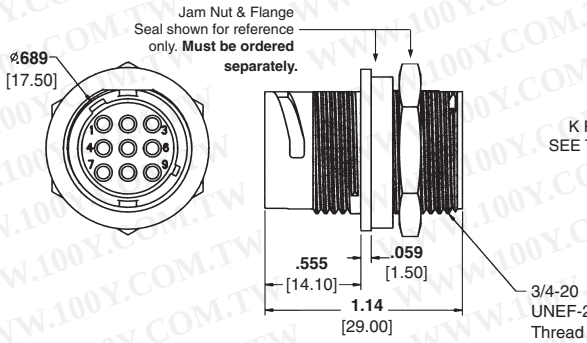
Part Numbers—Page 74
Contacts—Page 75
Accessories—Page 75

Note: All part numbers are RoHS Compliant.

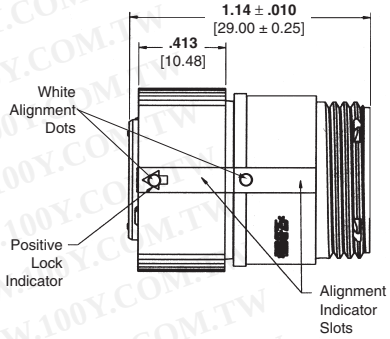
Miniature Circular Plastic Connectors (CPC) (Continued)

Shell Size 11
(9 Position shown)

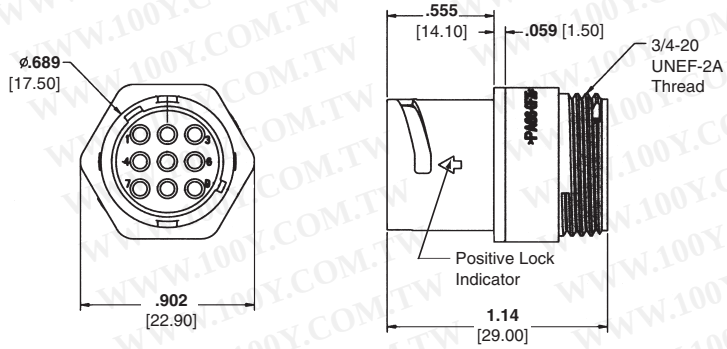
Receptacle Assembly, Panel-Mount (Order pin contacts separately — see page 75)



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 Diameter Range	Housing Part Numbers		
Shell Size	No. of Pos.		Panel Mount Receptacle	Free-Hanging 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]*	**1445421-1**	**1445389-1**	**1445390-1**
		.059-.110 [1.5-2.39]	**1445421-3**	**1445389-3**	**1445390-3**
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]*	**1445816-1**	**1445825-1**	**1445807-1**
		.059-.110 [1.5-2.39]	**1445816-3**	**1445825-3**	**1445807-3**

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.

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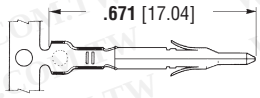
Hong Kong: 852-2735-1628
Japan: 81-44-844-8013
UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

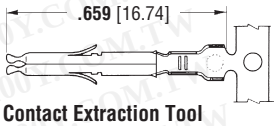
Miniature Circular Plastic Connectors (CPC) (Continued)

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

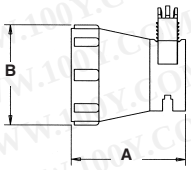
[1]Duplex Finish – Plated with .000030 [.000762] min. gold in mating area and .000100 [.00254] min. tin in crimping area over .000050 [.00127] min. nickel underplate on entire contact.
[2]HDM Applicator part number ending in -1 is used on AMPOMATOR CLS Machine with T or G Terminators, -2 is used on AMP-O-LECTRIC Model K Machine, -3 is used on AMP-O-LECTRIC Model G Machine. See page 133 for further information.
[3]HDM Applicator part number ending in -3 is used on AMPOMATOR CLS Machine with T or G Terminators, -4 is used on AMP-O-LECTRIC Model K Machine, -5 is used on AMP-O-LECTRIC 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

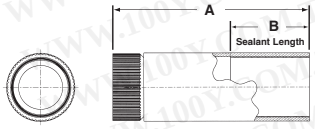
Shell Size	Dimensions A	Dimensions B	Part Number Straight	Part Number Right-Angle
8	.925 [23.5]	.709 [18.0]	1445730-1	1445771-1
11	1.10 [28.0]	.964 [24.5]	1445856-1	1546746-3[1]
				1546746-4[2]

[1] Open Style [2] With Cover



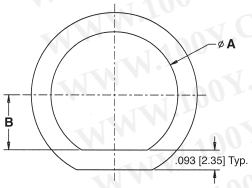
Heat Shrink Boots

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



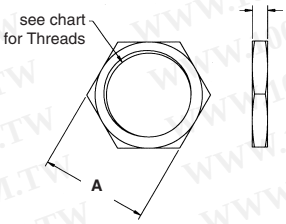
Flange Seals

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



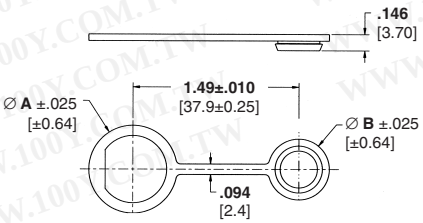
Jam Nuts

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



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Note: All part numbers are RoHS Compliant.

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)

112076

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

92936-8

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

112383

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^2], 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**.

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Application Tooling (Continued)

Crimp Machines

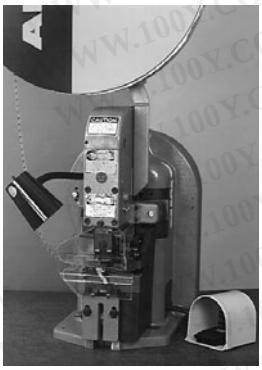
AMP-O-LECTRIC Model "G" Terminating Machines, Part Nos. 354500-1, -9, -11

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



103330

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 stye 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

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.

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

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.**

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.

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).

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**.

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**.

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.

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Application Tooling (Continued)

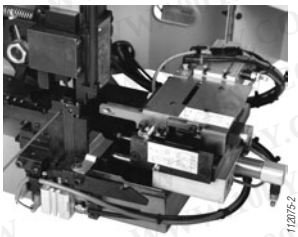
Side-Feed Heavy-Duty Miniature Applicators (coded HDM)

89828

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)



112075-2

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)

89827

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.

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UK: 44-208-420-8341

Note: All part numbers are RoHS Compliant.

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
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

Part Number Index

Note: This part number index lists all cataloged parts by base number only. Complete part numbers (with prefixes and/or suffixes) are shown on the pages indicated.

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Part Number Index (Continued)

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Fax: +90-212-281-8184

Ukraine – Kiev
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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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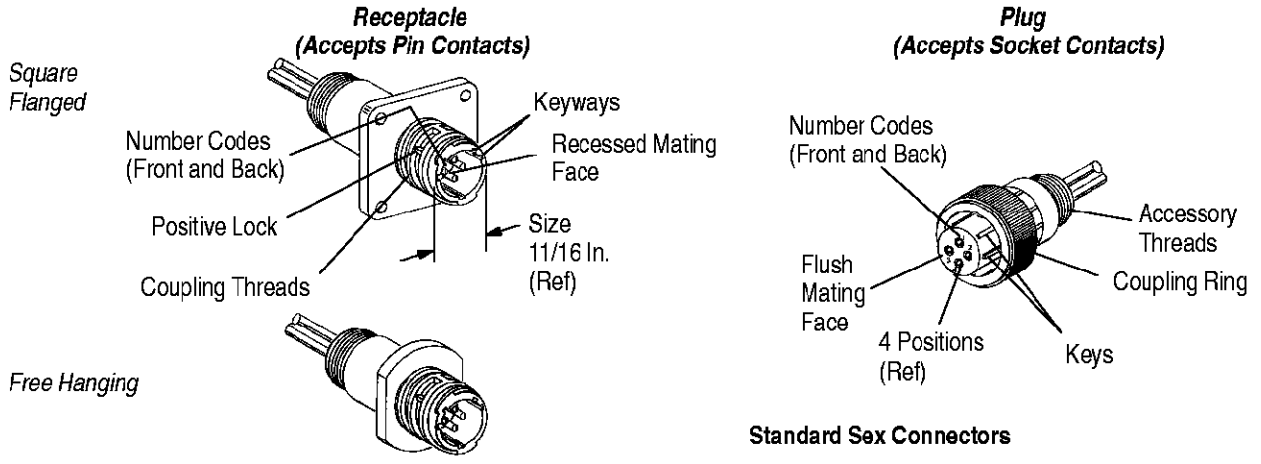


Figure 1

1. INTRODUCTION

This instruction sheet covers the assembly procedures for the AMP Circular Plastic Connectors (CPC) listed in Selection Charts 1 through 4. Typical connector configurations are shown in Figure 1.

Assembly procedures for CPC accessories—such as shield and strain relief, environmental sealing, keying plugs, and coupling rings—are covered on instruction sheet 408–7582.

Read this sheet carefully, and applicable referenced material, before assembling connectors, installing accessories, or panel mounting a connector.

Reasons for reissue are provided in Section 7, REVISION SUMMARY.

2. DESCRIPTION

There are four connector series. Series 1 connectors (Selection Chart 1) are available in four shell sizes (11, 13, 17, and 23) and accept Type III+, and Subminiature COAXICON* contacts. Series 2 connectors (Selection Chart 2) are available in three shell sizes (11, 17, and 23) and accept size 20 DM (screw machined) and 20 DF (precision formed) contacts. Series 3 connectors (Selection Chart 3) are available in two shell sizes (17 and 23) and accept Type XII power contacts. Series 4 connectors (Selection Chart 4) are available in one shell size (23) and accept a mixture of Type XII contacts from series 3 and size 16 contacts previously mentioned for Series 1 connectors.

The connector designator indicates the size and contact positions of the connector. For example, 11/4 – size 11, meaning the outside diameter in 16ths of an inch as measured across the coupling threads, and contact positions 4, meaning the number of contact cavities in the connector.

SERIES 1 CONNECTORS				RECOMMENDED CONTACTS
DES	SEX	HOUSING DESCR	HOUSING PART NO.	
11/4	Std	Plug	206060–1	Type III+ and Subminiature COAXICON Contacts (See Figure 2) (See 408–1379 and Catalog 82021)
		Rcpt (PM)	206061–1	
		Rcpt (FH)	206153–1	
	Rvs	Plug	206429–1	
		Rcpt (PM)	206430–1	
		Rcpt (FH)	206430–2	
13/9	Std	Plug	206708–1	
		Rcpt (PM)	206705–1	
		Rcpt (FH)	206705–2	
17/14	Rvs	Plug	206044–1	
		Rcpt (PM)	206043–1	
		Rcpt (FH)	206043–3	
17/16	Std	Plug	206037–1	
		Rcpt (PM)	206036–1	
		Rcpt (FH)	206036–3	
23/24		Plug	206837–1	
23/24		Rcpt (PM)	206838–1	
23/37		Plug	206150–1	
		Rcpt (PM)	206151–1	
		Rcpt (FH)	206151–2	
	Rvs	Plug	206305–1	
		Rcpt (PM)	206306–1	
		Rcpt (FH)	206306–2	

Selection Chart 1

SERIES 3 CONNECTORS				RECOMMENDED CONTACTS
DES	SEX	HOUSING DESCR	HOUSING PART NO.	
17/3	Std	Plug	206037–2	Type XII (See Figure 4) (See 408–1379 and Catalog 82021)
		Rcpt (PM)	206036–2	
		Rcpt (FH)	206207–1	
	Rvs	Plug	206426–1	
		Rcpt (PM)	206425–1	
		Rcpt (FH)	206425–2	
23/7	Std	Plug	206136–1	
		Rcpt (PM)	206137–1	
		Rcpt (FH)	206137–2	
	Rvs	Plug	206226–1	
		Rcpt (PM)	206227–1	
		Rcpt (FH)	206227–2	

Selection Chart 3

There are two connector styles, standard and reverse sex. Standard plugs have a **flush** mating face and standard receptacles have a **recessed** mating face. Reverse sex connectors are just the opposite — plugs have a **recessed** mating face and receptacles have a **flush** mating face. Note that socket contacts should be installed in a connector that has a **flush** mating face.

Receptacle connectors are available with mounting flanges for FRONT or REAR panel mount (PM) applications, and without mounting flanges for free hanging (FH) applications.

SERIES 2 CONNECTORS				RECOMMENDED CONTACTS
DES	SEX	HOUSING DESCR	HOUSING PART NO.	
11/8	Std	Plug	205838–1	Size 20 DF and 20 DM (See Figure 3) (See 408–1379 and Catalog 82021)
		Rcpt (PM)	205841–1	
		Rcpt (FH)	205841–2	
	Rvs	Plug	206434–1	
		Rcpt (PM)	206433–1	
		Rcpt (FH)	206433–2	
11/9	Std	Plug	206485–1	
		Rcpt (PM)	206486–1	
		Rcpt (FH)	206486–2	
17/28		Plug	205839–3	
		Rcpt (PM)	205840–3	
		Rcpt (FH)	206152–1	
	Rvs	Plug	206039–1	
		Rcpt (PM)	206038–1	
		Rcpt (FH)	206038–2	
23/57		Plug	206437–1	
		Rcpt (PM)	206438–1	
		Rcpt (FH)	206438–2	
23/63	Std	Plug	205842–1	
		Rcpt (PM)	205843–1	
		Rcpt (FH)	205843–2	

Selection Chart 2

SERIES 4 CONNECTORS				RECOMMENDED CONTACTS
DES	SEX	HOUSING DESCR	HOUSING PART NO.	
23/13M	Std	Plug	211824–1	Type XII and Size 16 Multimate● (See Figures 2 and 4) (See 408–1379 and Catalog 82021)
		Rcpt (PM)	211825–1	
		Rcpt (FH)	211825–2	
23/16M	Std	Plug	207485–1	
		Rcpt (PM)	207486–1	
		Rcpt (FH)	207486–2	
23/22M	Std	Plug	206612–1	
		Rcpt (PM)	206613–1	
		Rcpt (FH)	206613–3	

● III+ and Subminiature COAXICON Contacts

Selection Chart 4

Each receptacle has polarizing keys to assure proper mating. To provide circuit identification, contact cavities are numbered on the FRONT and BACK of each connector.

3. CONNECTOR SELECTION

Using the Selection Charts and Section 2, DESCRIPTION, determine the appropriate connectors to be used by the following method:

1. Determine application requirements (Series 1, 2, 3, or 4).
2. Determine number of contact positions required.
3. Determine which connector style (standard or reverse) is desired.
4. Select plug housing. Determine whether or not panel mount application is to be used and select applicable receptacle housing.

4. CONTACTS

Selection – When selecting contacts according to the Selection Charts on this sheet, refer to Catalog 82021. For visual identification of the proper contacts to be used in the various connector series, see Figures 2, 3, and 4.

For contacts used in Series 1 connectors, Multimate contacts, see Figure 2. Due to the large selection available for crimp type contacts and hand crimping tools, refer to instruction sheet 408–1379.

For contacts used in Series 2 connectors, size 20 DM and 20 DF contacts, see Figure 3.

For contacts used in Series 3 connectors, Type XII contacts, see Figure 4.

For contacts used in Series 4 connectors, Multimate and Type XII contacts, see Figures 2 and 4.

Recommendation – Socket contacts should be attached to wires leading to power source and installed in housing that has flush mating surface. This procedure provides maximum protection for both the pin and the socket contact, and minimizes the possibility of electrical shock.

Crimping – Strip form contacts are designed to be crimped with a semi–automatic or automatic machine. Consult your local Tyco Electronics representative for assistance in selecting the machine that will best suit your needs.

Loose piece contacts are designed to be crimped with crimp tooling (hand tools, die assemblies, or crimping heads). The applicable crimp tooling for the contacts is listed on 408–1379. Read the material packaged with the crimp tooling for the proper crimping procedure.

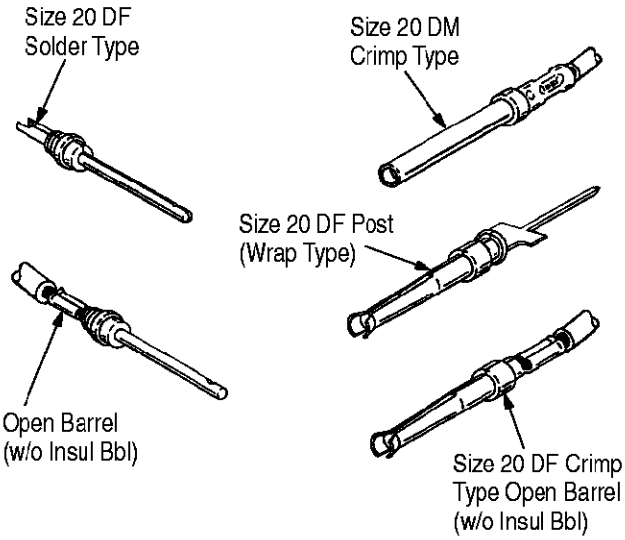


Figure 3

Power Contacts

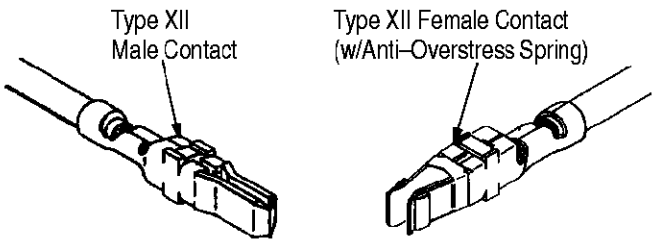
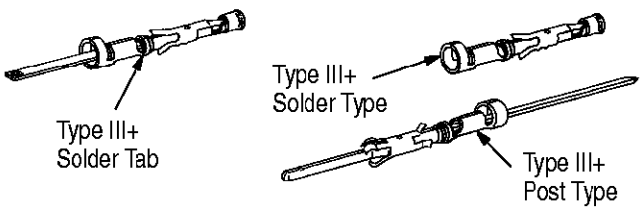
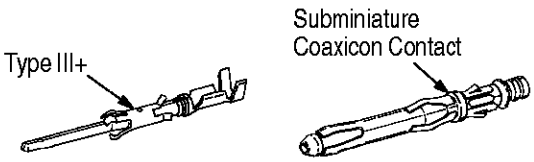


Figure 4

Multimate Contacts





Crimp–Type Contacts (Typ)

Figure 2

Contact Insertion (Typical)

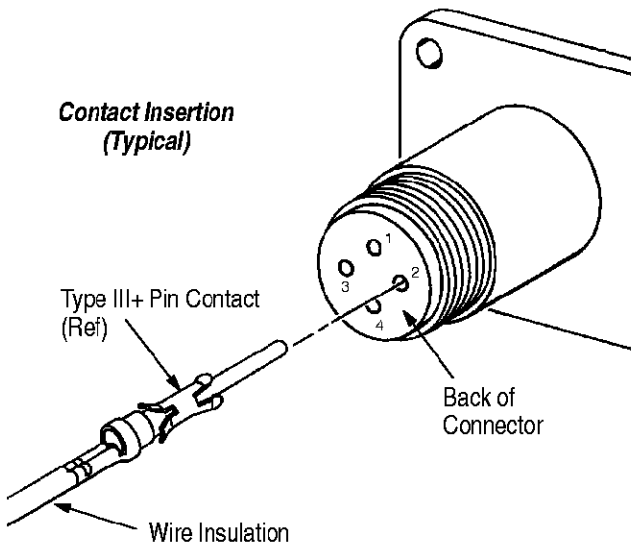


Figure 5

Insertion – Normally, an insertion tool is not required to insert contacts into the housings. However, if the wire bundle is large, or if the wire is fragile, an insertion tool is recommended. Refer to 408–1379 for the appropriate insertion tool.

To insert a contact, grip insulation of wire (directly behind contact) and align contact with BACK of desired contact cavity. Insert contact straight into cavity until it bottoms. Pull back lightly on wire to be sure contact is locked in place.(See Figure 5).

Extraction – Extraction tools, (refer to 408–1379), are designed for removing pin and socket contacts from the connectors. Refer to the instruction material packaged with the tool for the proper extraction procedure.

Release the contact from the FRONT of Series 1, 3 and 4 connectors, and from the BACK of Series 2 connectors. (See Figure 6).

Contact Extraction

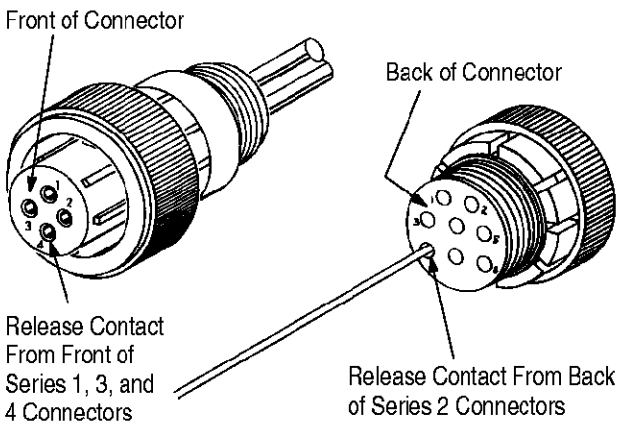


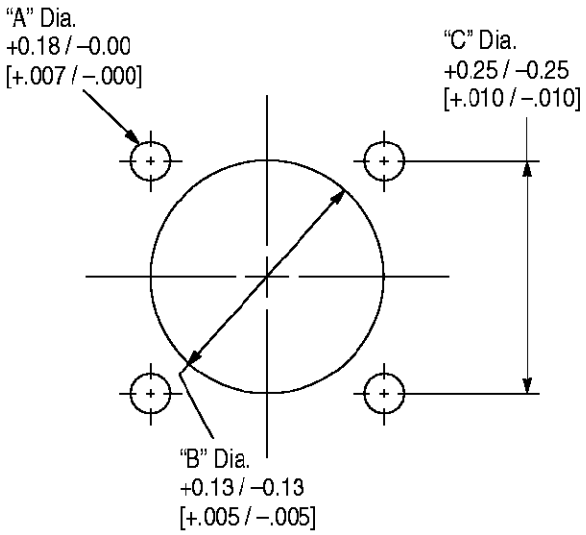
Figure 6

5. PANEL MOUNTING

The receptacle may be either FRONT or REAR panel mounted. When REAR mounted, the panel thickness must not exceed 3.18 mm [1/8 inch], otherwise plug will bottom on panel before it is secure.

Determine size of connector to be mounted. Refer to the applicable dimensions provided in Figure 7 and make the panel cutout. Secure connector to panel using commercially available hardware (No. 4 screws).

Panel Cutout



NOTE: *Dimensions are in millimeters [with inches in brackets].*

CONNECTOR SIZE	DIMENSIONS		
	A	B	C
11	3.18 [.125]	21.59 [.850]	21.44 [.844]
13	3.18 [.125]	24.49 [.964]	24.61 [.969]
17	3.81 [.150]	29.36 [1.156]	28.58 [1.125]
23	3.81 [.150]	40.89 [1.610]	36.53 [1.438]

Figure 7

6. MATING CONNECTORS

These connectors have a positive lock feature which prevents accidental disengagement. Align polarizing keys and keyways and start plug into receptacle. Rotate coupling ring CLOCKWISE until positive lock snaps into position.

NOTE *Do not use for blind mating applications.*

7. REVISION SUMMARY

Revisions to this document include:

Per EC 0990–0417–01:

- Updated document to corporate requirements
- Replaced Catalog CPC/CMC 73–204 with Catalog 82021

Miniature Circular Plastic Connector (CPC)

NOTE

All numerical values are in metric units [with U.S. customary units in brackets]. Dimensions are in millimeters [and inches]. Unless otherwise specified, dimensions have a tolerance of ±0.13 [±.005] and angles have a tolerance of ±2°. Figures and illustrations are for identification only and are not drawn to scale.

1. INTRODUCTION

This specification covers the requirements for application of the Miniature Circular Plastic Connector (CPC). The connector system is available in wire-to-wire, wire-to-board (vertical and right-angle), and wire-to-panel configurations. The connector is available in two shell sizes: Size 8 (1-4), or Size 11 (5-9) contact positions. The Mini-Universal MATE-N-LOK* contacts used in these connectors are designed to accept a wire size range of 30 through 18 AWG and application may be done by machine for reel-mounted contacts, or by hand for replacement of loose-piece contacts.

NOTE

Refer to Application Specifications 114-13089 or 114-16017 for all termination, application information, and procedures for the contacts which are used in the Miniature CPC.

When corresponding with TE Connectivity personnel, use the terminology provided on this specification to help facilitate your inquiry for information. Basic terms and features of components are provided in.Figure 1.

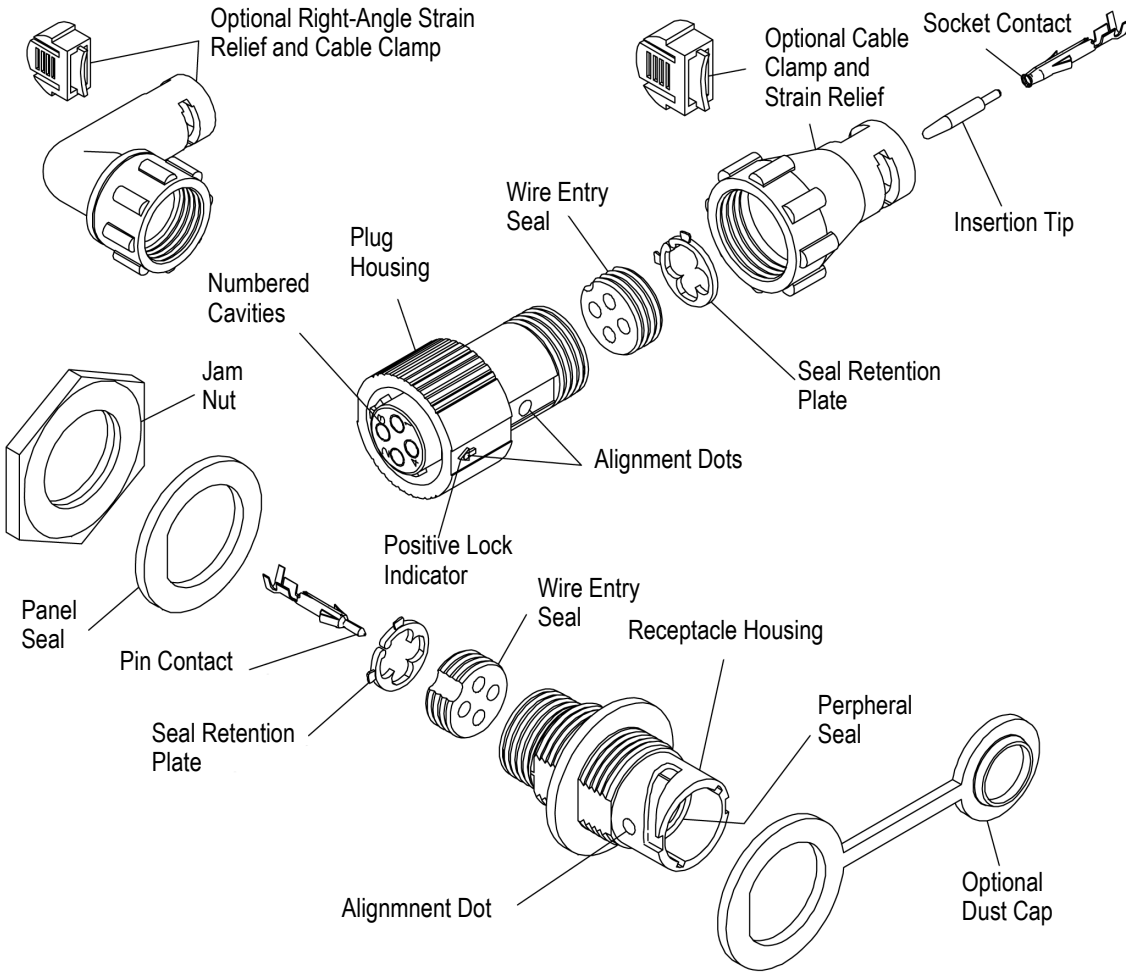


Figure 1

2. REFERENCE MATERIAL

2.1. Revision Summary

Change the company logo

2.2. Customer Assistance

Reference base part numbers 1445390 and 1445421, and product code H314 are representative numbers of Miniature CPC. Use of these numbers will identify the product line and expedite your inquiries through a service network established to help you obtain product and tooling information. Such information can be obtained through a local TE representative or, after purchase, by calling the Tooling Assistance Center or the Product Information number at the bottom of page 1.

2.3. Drawings

Customer Drawings for specific products are available from the responsible TE Engineering Department via the service network. The information contained in the customer drawings takes priority if there is a conflict with this specification or with any other technical documentation supplied by TE.

2.4. Specifications

Application Specifications 114-13089 and 114-16017 provide information for termination and crimp requirements of the contacts used in these connector assemblies. Product Specification 108-2079 provides product performance and test results.

2.5. Instructional Material

The following list includes available instruction sheets (408-series) that provide assembly procedures for product, operation, maintenance and repair of tooling, as well as setup and operation procedures of applicators; and customer manuals (409-series) that provides setup, operation, and maintenance of machines.

408-3295	Preparing Reel of Contacts for Application Tooling
408-4118	Extraction Tool 189727-1
408-4443	Straight Action Hand Tool 90717-2
408-7347	Insertion Tool 91002-1
408-7424	Checking Terminal Crimp Height or Gaging Die Closure
408-7984	Insertion Tool 455830-1
408-8040	Heavy Duty Miniature Quick-Change Applicators (Side-Feed Type)
408-8322	Heavy Duty Industrial (HD-I) Side-Feed Type Applicators
408-10359	Ocean Side-Feed Applicators
408-8490	Fine Adjust Assembly 879103-[ ] for Heavy Duty Industrial (HD-I) Type Applicators
408-8547	CERTI-CRIMP* II Straight Action Hand Tools 91522-1 and 91529-1
408-9640	Crimp Quality Monitor Applicators for Side-Feed and End-Feed Applications
408-9816	Handling of Reeled Products
408-9930	PRO-CRIMPER* III Hand Crimping Tool Frame Assembly 354940-1
408-9938	PRO-CRIMPER III Hand Tool Assembly 90758-1 with Die Assembly 90758-2
408-9962	PRO-CRIMPER III Hand Tool Assembly 90759-1 with Die Assembly 90759-2
408-9965	PRO-CRIMPER III Hand Tool Assembly 90870-1 with Die Assembly 90870-2

409-5128	Basic AMP-O-LECTRIC* Model "K" Terminating Machines, and Accessories
409-5842	AMP-O-LECTRIC Model "G" Terminating Machines 354500-[ ]
409-5852	AMPOMATOR* CLS III-G Lead Making Machine 122500-[ ]
409-5866	AMPOMATOR CLS IV Lead Making Machine 217500-[ ]
409-5878	AMPOMATOR CLS IV+ Lead-making Machine 356500-[ ]
409-10012	AMP-O-MATIC* Side Feed Stripper-Crimper III Machine 1320895-[ ]
409-10016	AMP-3K/40* Terminating Machine 2119683-[ ] and AMP-5K/40* 2119684-[ ]
409-10027	Stripping Modules 1490500 and 1490502
409-10029	Stripping Modules 1490501 and 1490503

3. REQUIREMENTS

3.1. Safety

Do not stack product shipping containers so high that the containers buckle or deform.

3.2. Storage

A. Reeled Contacts

When using reeled contacts, store coil wound reels horizontally and traverse wound reels vertically.

B. Ultraviolet Light

Prolonged exposure to ultraviolet light may deteriorate the chemical composition used in the connector material.

C. Shelf Life

The contacts and connectors should remain in the shipping containers until ready for use to prevent deformation to components. The components should be used on a first in, first out basis to avoid storage contamination that could adversely affect performance.

D. Chemical Exposure

Do not store the contacts or connectors near any chemical listed below as they may cause stress corrosion cracking in the components.

Alkalies	Ammonia	Citrates	Phosphates Citrates	Sulfur Compounds
Amines	Carbonates	Nitrites	Sulfur Nitrites	Tartrates

NOTE

Where the above environmental conditions exist, phosphor-bronze contacts are recommended.

3.3. Materials

The wire entry seals are made of yellow or white elastomer, the peripheral seal is made from gray elastomer. The housing, coupling ring, and seal retention plate are made from black thermoplastic, the jam nut is made from nickel plated brass. The contacts are available in either a pre-tinned duplex finish plated with gold in the mating areas and tin-lead plated in the crimping area over nickel underplate on entire contact. The sockets are also available in brass or phosphor bronze.

3.4. Characteristics

The wire entry seals are color-coded for identification of the correct wire insulation range. The connectors have a pre-positioned 1/4 turn coupling ring with positive lock and alignment feature. As the coupling ring on the plug is threaded onto the receptacle it engages the positive lock. A slight turn beyond that point locks the connector together. The unique contact pattern for each position size helps prevent accidental mating with other position sizes. Connector housings with recessed mating faces have polarizing slots and those with flush mating faces have polarizing embossments to assure proper mating of circuits. Front or rear jam nut mounting is available, and alternate keys are available. No keying plugs are required since specific cavity amounts from 1 to 9-positions are available. See Figure 1.

3.5. Component Selection

Each connector must be used with specific seals and related components to ensure a sealed assembly for the required application. Mating connectors must have identical number of positions. A cross-reference of connector-to-seal and connector-to-connector is listed in Figure 2.

SHELL SIZE	PLUG HOUSING	RECEPT ASSY	RECEPT ASSY (PANEL MOUNT)	PANEL SEAL	STRAIN RELIEF		DUST CAP	JAM NUT	SOCKET INSRTN TIP
					STRAIGHT	RIGHT ANGLE			
8	1445390-[ ]	1445389-[ ]	1445421-[ ]	1445420-1	1445730-1	1445771-1	1604089-1	1604196-1	1604816-1
11	1445807[ ]	1445825-[ ]	1445816-[ ]	1445420-2	1445856-1	1546746-1 • 1546746-2 ‡	1604089-2	1445904-1	

• Open Style ‡ With Cover

Figure 2

3.6. Circuit Identification

Contact cavities are numbered on the plug and receptacle assembly on the wire entry and mating face of the housing. See Figures 1 and 5.

3.7. Wire Selection and Preparation

A. Type

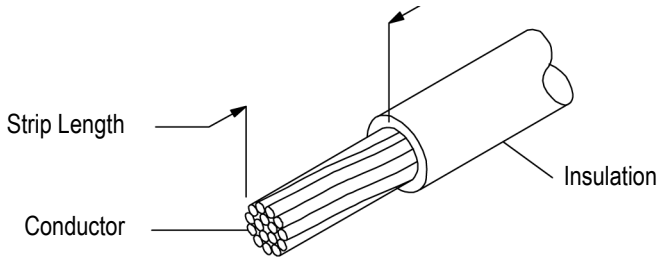
The wire size range for Miniature CPC is 30 to 18 AWG stranded wire with an insulation diameter range of 0.89-2.39 [.035-.110]. See Figure 3.

B. Preparation

Strip the wires according to the dimensions given in Figure 3.

CAUTION

Reasonable care should be taken not to nick, scrape, or cut any strands during the stripping operation.



WIRE SIZE RANGE	STRIP LENGTH	CRIMP HEIGHT
30 - 18	3.20-3.71 [.126-.146]	Refer to the documentation supplied with the application tooling provided in SECTION 5 of this document or in Application Specifation(s) 114-13089 or 114-16017.

Figure 3

3.8. Contact Termination

Strip form contacts are designed to be crimped with a miniature applicator in a semi-automatic or automatic machine. Loose piece contacts are designed to be crimped with a hand crimping tool. Refer to the table in Figure 10 for the appropriate hand tools, applicators, and machines. Refer to Paragraph 2.5, Instructional Material, for information on crimp tooling and instructions. Terminate the contacts according to the dimensions and procedures provided in Application Specifications 114-13089 and 114-16017, and the referenced tooling documentation.

NOTE

If strain reliefs are used, make sure they have been slid over the wires and out of the way before wire termination.

3.9. Panel Mount Layout

Miniature CPC can be mounted to the front or back of a panel using the layout dimensions shown in Figure 4.

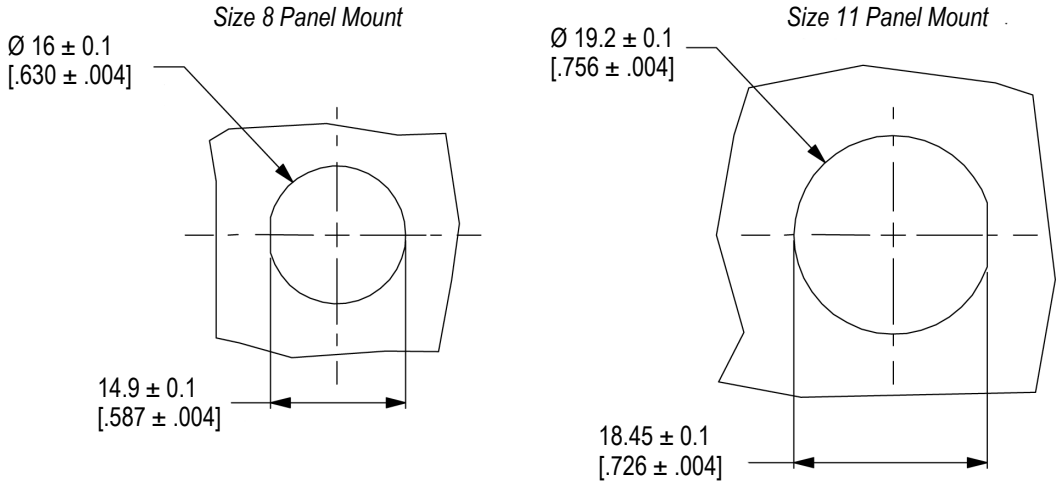


Figure 4

3.10. Housing Assemblies

Plug and receptacle housing assemblies are available in Size 8 (4-position), or Size 11 (9-position) configurations. Figure 5 shows these housings and numbered cavities for contacts.

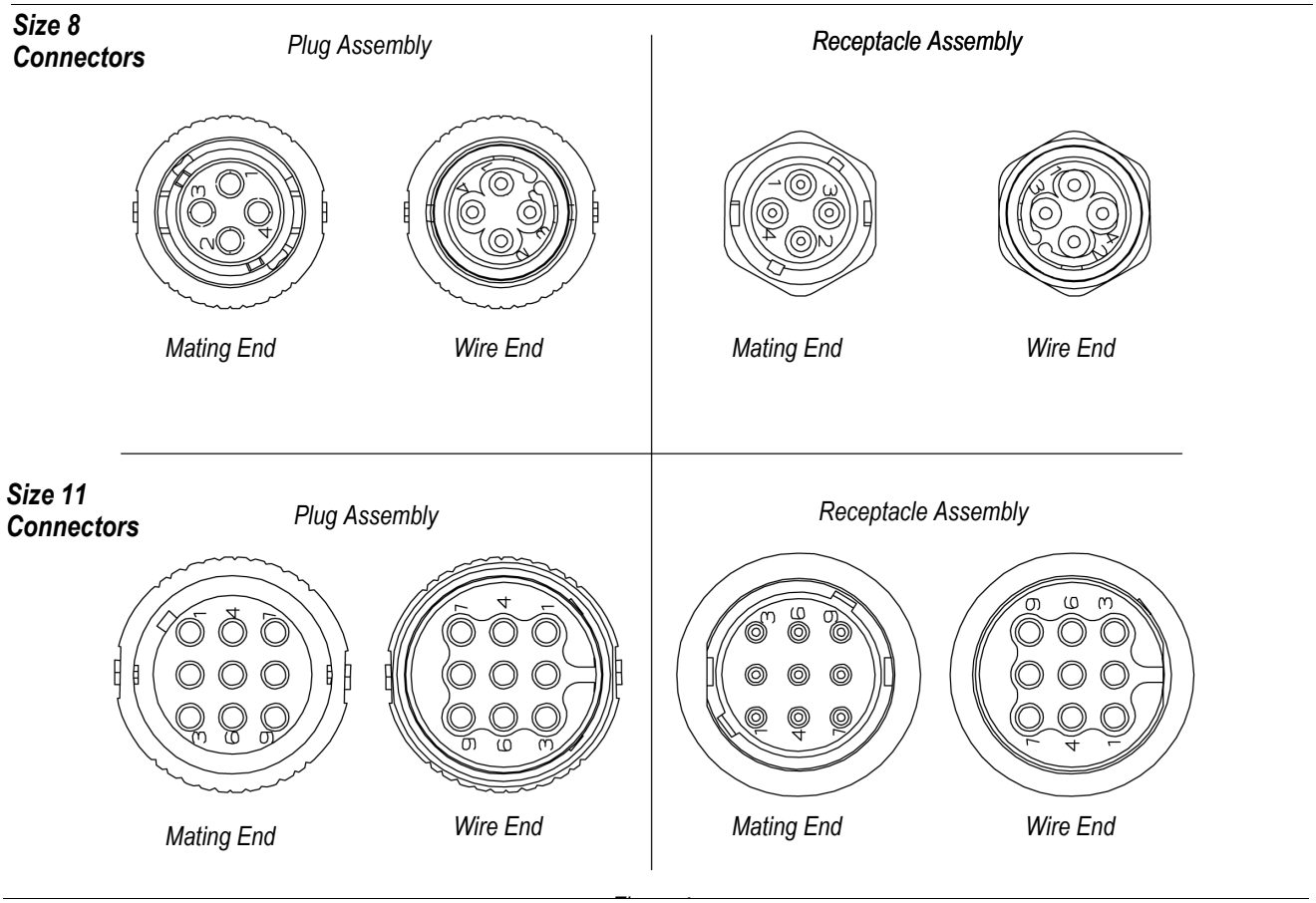


Figure 5

3.11. Installing Contacts into Housing

Locate the desired circuit into which the individual contact will be loaded, (refer to the circuit cavity numbers on the seal retention plate). The pin contact is inserted into the receptacle housing and the socket contact is inserted into the plug housing.

The contact must be inserted through the gland in the wire entry seal, thereby puncturing the gland and into the contact cavity from the wire end of the plug or receptacle housing until it bottoms (there should be an audible "click"). Each contact must be locked into place. Gently pull on the wire to ensure proper contact locking.

TE recommends using a socket insertion tip, (Part Number 1604816-1), to insert the socket contacts into the plug housing with small insulation diameters of 0.89-1.5 [.035-.059]. The insertion tip prevents the mating end (blunt end) of the socket contact from being damaged when insertion into the seal is made. Once the contact is fully seated, the insertion tip is removed from the front of the connector and reused for the remaining socket contacts. Refer to Figure 6.

NOTE

The insertion tip is inserted into the socket body prior to inserting the socket contact into the seal.

Normally an insertion tool is not required to insert contacts into housings. However if the contact and frail wires need some assistance, the use of an insertion tool is recommended. Refer to the information provided on Instruction Sheet 7984 for contact insertion using Insertion Tool 455830-1.

3.12. Strain Relief

If wire at the rear of the housing is subjected to strain, then strain relief kits are available for each connector size. Each includes a strain relief housing and two clamps. They can be attached to free-hanging or panel-mounted plug and receptacle connectors, and they can be placed on the cable before or after crimping contacts to the conductors; however, the strain relief must be placed on the cable before the contacts are inserted into the housing. After all the contacts have been inserted into their respective housing, slide the strain relief body up the cable and thread it onto the back of the connector before the clamp is secured. Select the proper locking insert clamp based on cable diameter and press in into the strain relief body until it locks in place with the desired clamping force. See Figure 7.

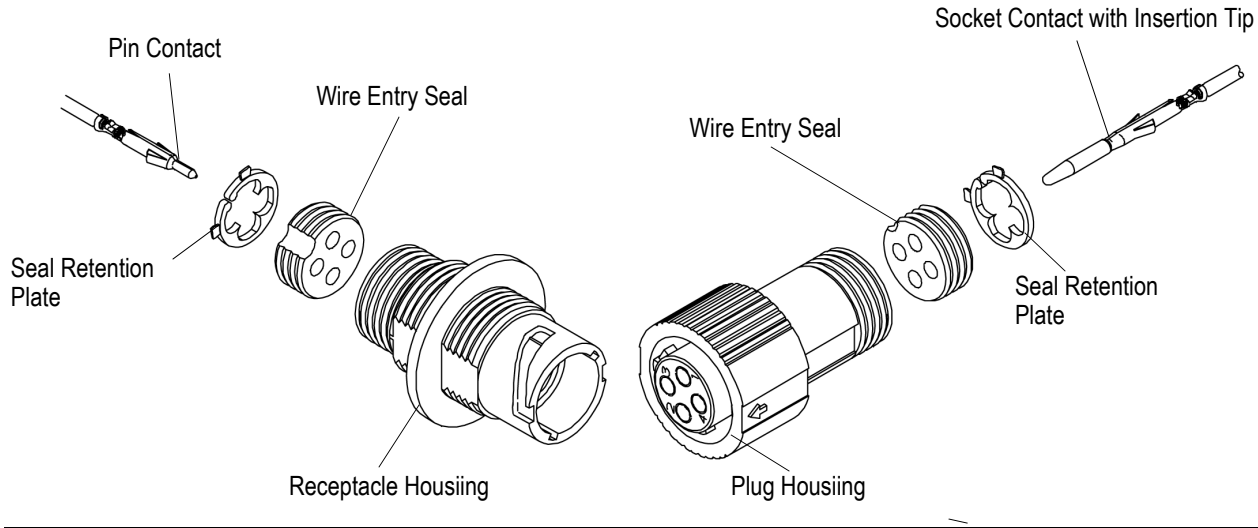


Figure 6

NOTE

Pliers may be required to push the locking insert into the strain relief body to the desired clamping location.

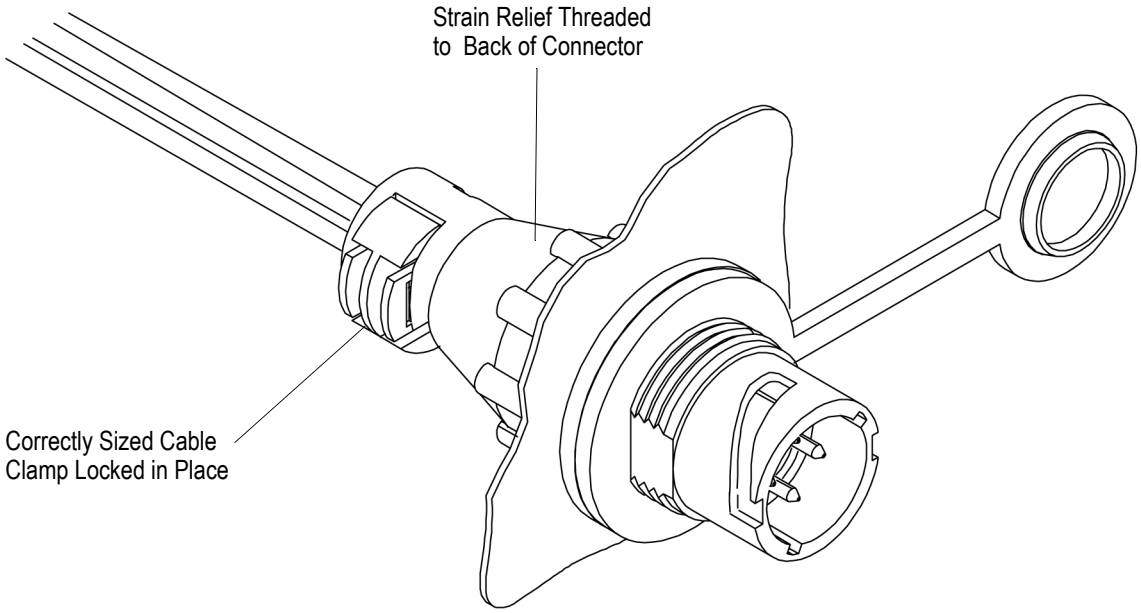


Figure 7

3.13. Wire Dress

NOTE

If a strain relief is used on the connector, the wires may be dressed to an angle at the end of the strain relief. However, without use of a strain relief, the wires should not be dressed closer than 2.50 inches from the back of the housing. To prevent damage to contacts and/or housing, avoid exerting stress on wire.

If necessary, wires can be bundled together and supported with cable ties or similar device. Wires must not be stretched or confined in any way. Therefore, the wires must remain perpendicular to the connector and avoid an excessively sharp bend radius. The minimum distance for the cable tie off, measured from the housing at the wire end of the connector to the cable tie is shown in Figure 8. It is also recommended that individual wires be dressed to a bend radius of at least ten times the wire outside diameter. Likewise, cable bundles should be dressed to a bend radius of at least ten times the diameter of the bundle.

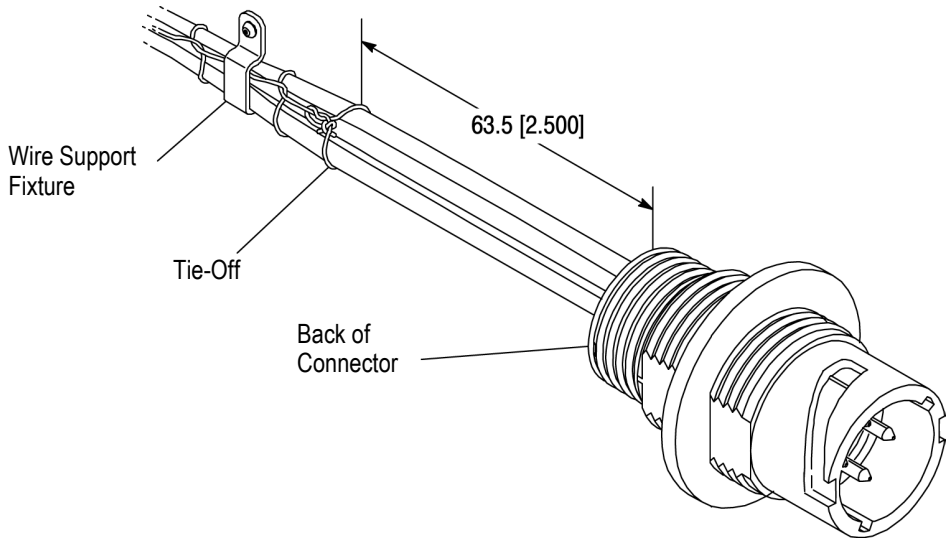


Figure 8

3.14. Connector Mating

When mating the plug and receptacle connector, make sure the alignment dots are aligned prior to mating the connectors. This ensures proper alignment and mating without damage to the connectors. See Figure 9

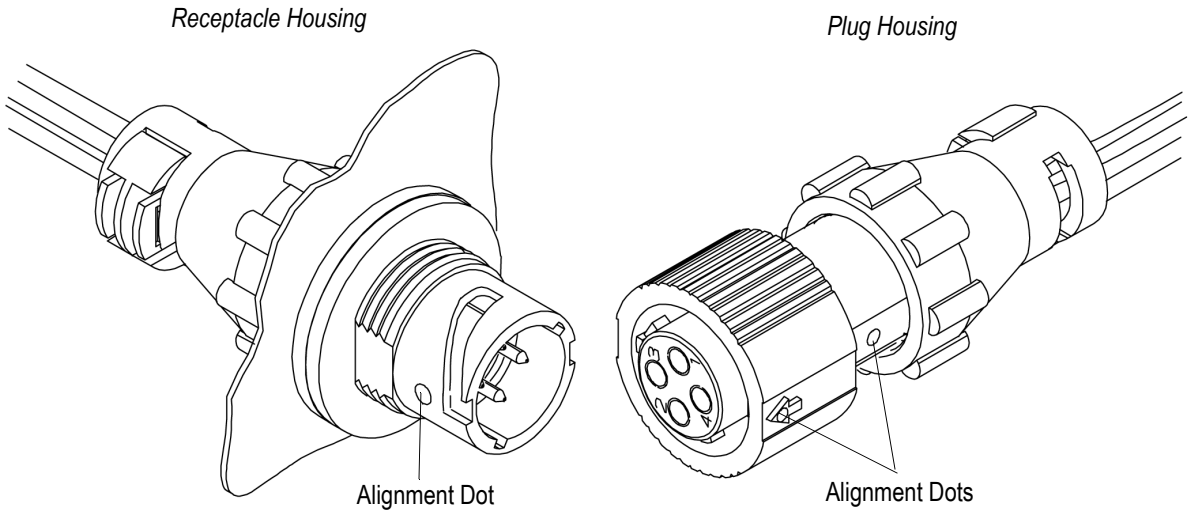


Figure 9

3.15. Repair/Removal

NOTE

If a damaged contact is apparent before the contacts are inserted into the housing, cut the wire in back of the contact, strip the wire end, and apply a new contact on the wire.

Contacts are not repairable once a termination has been made. Any defective contact should be removed and replaced with a new one. Connector housings, retention plate seals, wire entry seals, panel seals, or cavity plug seals are not repairable. Any damaged or defective component MUST NOT be used.

The following procedures should be observed when disassembling the Miniature CPC for contact removal or termination:

1. Remove wire entry seal locking plate by using a small, flat blade screwdriver to disengage the seal retention plate from the connector housing.
2. Use the same screwdriver to unseat the wire entry seal from the connector housing. The screwdriver is pushed down between the seal and the connector housing, then pried loose. Care should be taken not to tear the seal.
3. Slide the seal back along the wires.
4. Extract the contacts using Extraction Tool 189727-1. Refer to Instruction Sheet 408-4118.
5. Cut off the contact to be replaced, and re-terminate a new contact.
6. Insert the contacts back in the correct respective circuits.
7. Slide the seal back down the wires and seat it into the connector housing. The screwdriver can be used to push the seal edges down to ensure proper seating.
8. Replace the seal retention plate by snapping it into the slots in the connector housing.

4. QUALIFICATIONS

Miniature CPC have been Recognized by Underwriters Laboratories, Inc. (UL) in File E28476, and have been Investigated to CSA International Standards by UL.

5. TOOLING

This section provides a selection of tools for various application requirements. Modified designs and additional tooling concepts may be available to meet other application requirements. For additional information, contact one of the service groups at the bottom of page 1. A listing of tooling recommendations covering the full wire size range is provided in Figure 10.

NOTE

TE tooling engineers have designed machines for a variety of application requirements. For assistance in setting up prototype and production line equipment, contact TE Tooling Engineering through your local TE representative or call the Tooling Assistance Center number at the bottom of page 1.

5.1. Hand Crimping Tool

Hand crimping tools that accommodate the full wire size range are designed for prototype and low-volume applications such as repair of damaged contacts.

5.2. Applicator

Applicators are designed for the full wire size range of strip-fed, precision formed contacts, and provide for high volume, heavy duty, production requirements. The applicators can be used in bench or floor model power units.

NOTE

Each applicator is shipped with a metal identification tag attached. DO NOT remove this tag or disregard the information on it. Also, a packet of associated paperwork is included in each applicator shipment. This information should be read before using the applicator; then it should be stored in a clean, dry area near the applicator for future reference. Some changes may have to be made to the applicators to run in all related power units. Contact the Tooling Assistance Center number located at the bottom of page 1 for specific changes.

5.3. Power Units

A power unit is an automatic or semi-automatic device used to assist in the application of a product. Power unit includes the power source used to supply the force or power to an applicator.

5.4. Insertion/Extraction Tooling

Insertion Tools are designed for contacts crimped to small fragile wire. They are designed to stabilize the contact during insertion. For use of Insertion Tool 91002-1 which may be used with these contacts, refer to Instruction Sheet 408-7347; or Insertion Tool 455830-1, use Instruction Sheet 408-7984. Extraction Tools are designed to release the locking lance inside the connector housing without damaging the housing or contacts. For use of Extraction Tool 189727-1 which may be used with these contacts, refer to Instruction Sheet 408-4118.

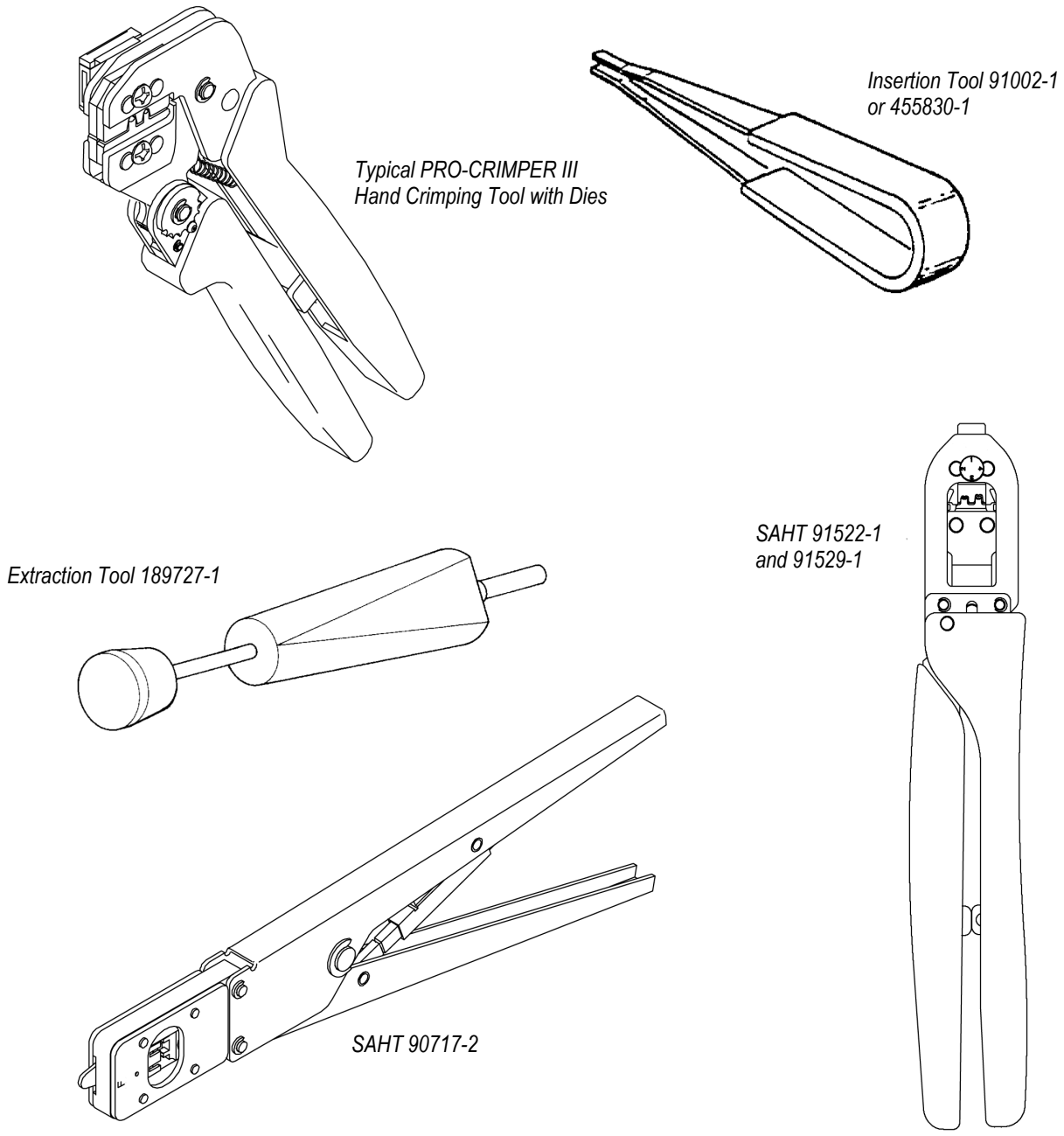
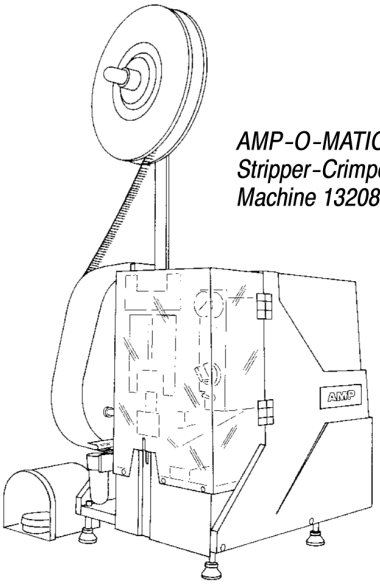
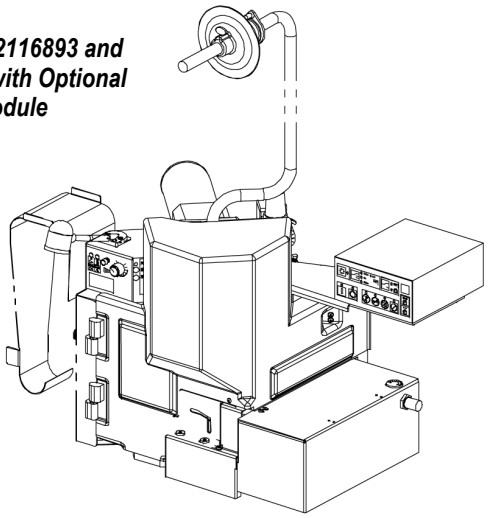


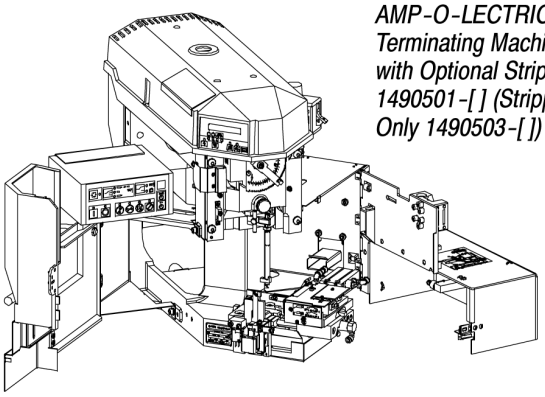
Figure 10 (Cont'd)



AMP-O-MATIC Side Feed Stripper-Crimper II Machine 1320895-[ ]

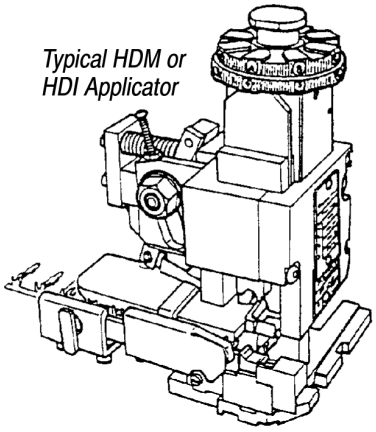
AMP-3K/5K 2116893 and 2116894-[ ] with Optional Stripping Module

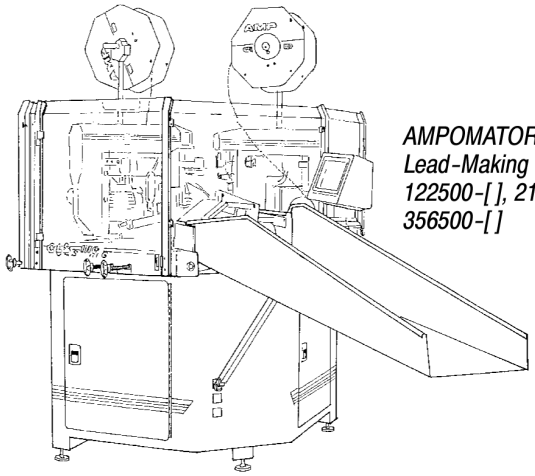




AMP-O-LECTRIC Model "G" Terminating Machine 354500-[ ] with Optional Stripping Module 1490501-[ ] (Stripping Module Only 1490503-[ ])

Typical HDM or HDI Applicator





AMPOMATOR CLS Lead-Making Machines 122500-[ ], 217500-[ ], and 356500-[ ]

AMP-O-LECTRIC Model "K" Terminating Machine 565435-5

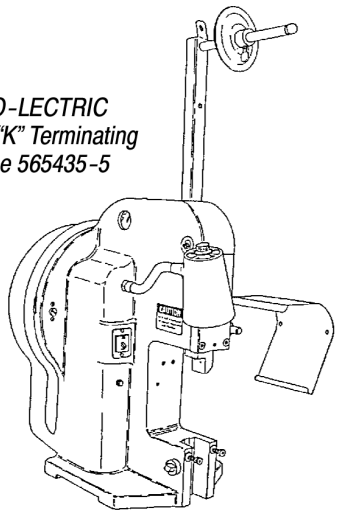


Figure 10 (Con'td)

WIRE SIZE RANGE, AWG	INSULATION DIAMETER	APPLICATOR (Document)	POWER UNIT (Document)	HAND TOOL (Document)	INSERTION TOOL (Document)	EXTRACTION TOOL (Document)
30 - 26	0.89 - 1.27 [.035 - .050]	567418-1 (408-8040)	122500-2, -3 (409-5852)	90717-2 (408-4443) or 90870-1 (408-9965)	91002-1 (408-7347) or 455830-1 (408-7984)	189727-1 (408-4118)
			217500-1 (409-5856)			
			356500-1, -2 (409-5878)			
		567418-2 (408-8040)	565435-5 (409-5128)			
			1338600-3, -4 (409-10016)			
		567418-3 (408-8040)	3543500--[ ] (409-5842)			
			1338600-[ ] (409-10016)			
26 - 22	1.19 - 1.75 [.047 - .069]	466990-2	1320895-1, -3 (409-10012)	90758-1 (408-9938) or 91529-1 (408-8547)		
		567066-3	122500-2, -3 (409-5852)			
			217500-1 (409-5866)			
			356500-1, -2 (409-5878)			
		567066-4 (408-8040)	565435-5 (409-5128)			
			1338600-3, -4 (409-10016)			
		567829-1	1320895-2, -4 (409-10012)			
22 - 18	1.50 - 2.39 [.059 - .110]	466986-1	1320895-1 -2 (409-10012)	90759-1 (408-9962) or 91522-1 (408-8547)	91002-1 (408-7347) or 455830-1 408-7984)	189727-1 (408-4118)
		567067-1 (408-8040)	122500-2, -3 (409-5852)			
			21500-1 (409-5866)			
			356500-1 -2 (409-5878)			
		567067-2 408-8040)	565435-5 (409-5128			
			1338600-3, -4 (409-10016)			

Figure 10 (Cont'd)

WIRE SIZE RANGE, AWG	INSULATION DIAMETER	APPLICATOR (Document)	POWER UNIT (Document)	HAND TOOL (Document)	INSERTION TOOL (Document)	EXTRACTION TOOL (Document)
22 - 18	1.50 -2.39 [.259 - .110]	567067-3 (408-8040)	354500-[ ] 409-5842)	90759-1 (408-9962) or 91522-1 (408-8547)	91002-1 (408-7347) or 455830-1 408-7984)	189727-1 (408-4118)
			1338600-[ ] (409-10016)			
		567608-1 (408-8040	122500-2, -3 (409-5842)			
			217500-1 (409-5856)			
			356500-2 (409-5878)			
		567850-1	1320895-2 -4 (409-10012)			
		1238050-1, -6, -71, and -76 (408-8322)	122500-2, -3 (409-5852)			
			217500-1 (409-5866)			
			356500-1 -2 (4095878)			
		1238050-2, -72 (408-8322)	354500-[ ] 409-5842)			
			133600-[ ] 409-10016)			
		1528003-1, -6, -71, and -76 (408-8322)	122500-2, -3 (409-5852)			
			217500-1 (409-5866)			
			356500-1 -2 409-5878)			
		1528003-2 -72	354500-[ ] ($09-5842)			
			1338600-[ ] (409-10016)			

Figure 10 (End)

6. VISUAL AID

Figure 11 shows a typical application of a Miniature CPC. This illustration should be used by production personnel to ensure a correctly applied product. Applications which DO NOT appear correct should be inspected using the information in the preceding pages of this specification and in the instructional material shipped with the product or toolin

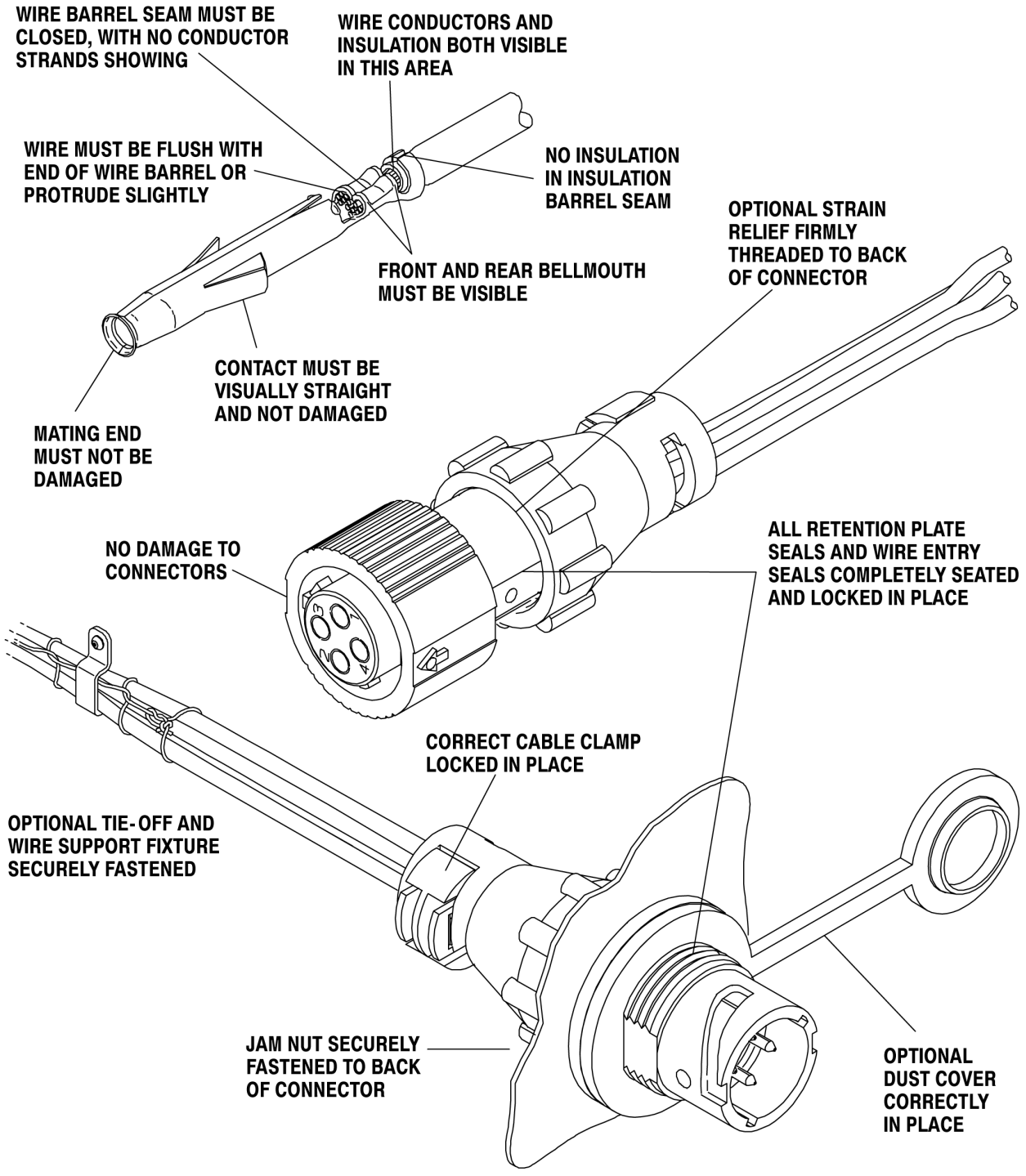


FIGURE 11. VISUAL AID