

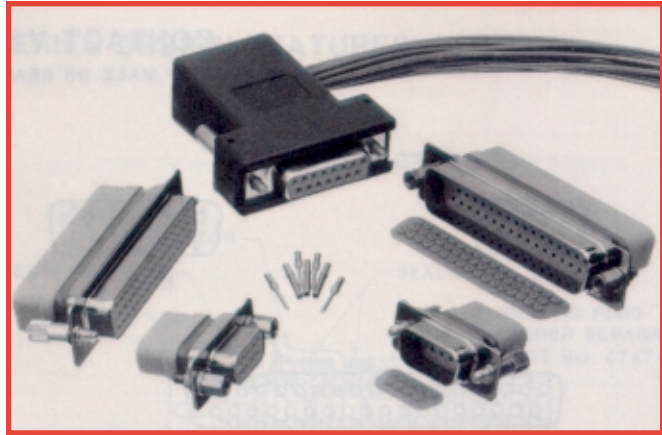
MILITARY QUALITY, REMOVABLE CONTACT, SUBMINIATURE-D CONNECTORS

FOR MILITARY AND SEVERE INDUSTRIAL ENVIRONMENTAL APPLICATIONS

Environmental-D
Series

Size 20 Contacts
Solder and Crimp
Removable

Military Quality and
Severe Industrial
Environmental Applications



Environmental-D Series connectors were designed specifically for severe environmental applications where the connector may be subjected to high humidity conditions, rain and/or immersed in water or organic liquids. Environmental protection of the connector is provided by the fluorosilicone grommet, interfacial seal and bonded connector components.

The connectors and contacts are compatible with

MIL-DTL-24308 and MIL-C-39029.

EVD Series connectors utilize precision machined contacts with closed crimp barrel terminations and solder wire terminations. Female contacts are of closed entry design featuring a stainless steel shroud or an "open entry" Robi-D design. Cable support and locking system accessories are available.

ENVIRONMENTAL-D SERIES TECHNICAL CHARACTERISTICS

MATERIALS AND FINISHES:

| | |
|--------------------------------------|--|
| Insulator: | Glass-filled DAP per ASTM-D-5948 type SDG-F, UL 94V-0, green color. |
| Contacts: | Male contacts - precision machined brass alloy. Female contacts - precision machined high tensile copper alloy with stainless steel shroud or Robi-D "open entry" style. |
| Contact Plating: | Military performance - 0.000050 inch (1.25 microns) gold over copper plate. Industrial performance - 0.000030 inch (0.75 microns) gold over nickel. |
| Shells: | Steel or brass with zinc plate with dichromate seal and stainless steel, passivated. |
| Mounting Spacers: | Steel or brass, zinc plate with dichromate seal. |
| Jackscrew Systems: | Steel with zinc plate and dichromate seal and stainless steel, passivated. |
| Hoods: | Composite. |
| Grommet and Interfacial Seal: | Fluorosilicone Rubber per MIL-R-25988. |
| Bonding Material: | Fluorosilicone based sealant/adhesive. |
| Sealing Plug: | Teflon. |

ELECTRICAL CHARACTERISTICS:

Dry Conditions, Basic Connector Body:

| | |
|---|-----------------------|
| Contact Current Rating: | 7.5 amperes, nominal. |
| Initial Contact Resistance: | 0.005 ohms maximum. |
| Proof Voltage: | 1,000 V r.m.s. |
| Insulation Resistance: | 5 G ohms. |
| Clearance and Creepage Distance (minimum): | 0.039 inch (1.0 mm). |
| Working Voltage: | 300 V r.m.s. |

MECHANICAL CHARACTERISTICS:

| | |
|--|--|
| Removable Contacts: | Insert contact to rear face of insulator and release from rear face of insulator. Size 20 contact, male - 0.040 inch (1.0 mm) diameter; female - closed entry design with stainless steel shroud or Robi-D "open entry" style. |
| Contact Retention in Insulator: | 9 lbs. (40 N). |
| Contact Terminations: | Closed barrel crimp, wire sizes 20 AWG (0.5 mm ²) through 24 AWG (0.25 mm ²); Solder contacts - 0.042 inch (1.06 mm) minimum hole diameter for 20 AWG (0.5 mm ²) through 24 AWG (0.25 mm ²) wire size. |
| Polarization: | Trapezoidally shaped shells. |
| Locking Systems: | Jackscrews. |
| Mechanical Operations: | 500 operations minimum per IEC 512-5. |

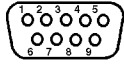
ENVIRONMENTAL CHARACTERISTICS:

EVD Connectors, having crimp contacts, meet all of the applicable requirements of MIL-DTL-24308 in addition to the requirements shown below:

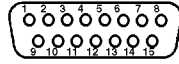
| Test | Requirements |
|--|--|
| Humidity Per MIL-STD 1344, Method 1002.2, Type II. | 1) No deterioration of performance. 2) Insulation resistance greater than 100 megaohms. 3) Withstand a potential of 1000 VAC (rms) without evidence of flashover or breakdown. |
| Fluid Immersion Per ANSI/EIA-364-10 Test Conditions A and D. | 1) No detrimental damage. 2) Meet mating and unmating requirements of MIL-DTL-24308. |
| Immersion, 2 hours at a depth of 36 inch (914.4 mm) in mated condition per MIL-STD 810 Method 512.3. Procedure 1. | While Immersed: 1) Insulation resistance greater than 100 megaohms. 2) Withstand a potential of 1000 VAC (rms) without evidence of flashover or breakdown. |
| Temperature Range: | -55°C to +125°C. |

CONTACT VARIANTS

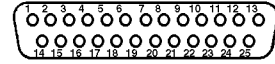
FACE VIEW OF MALE OR REAR VIEW OF FEMALE



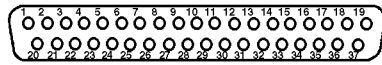
EVD9



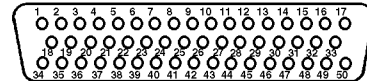
EVD15



EVD25



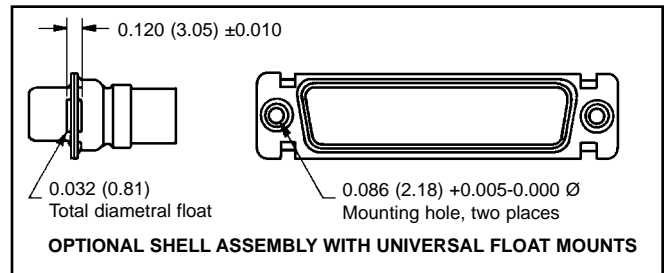
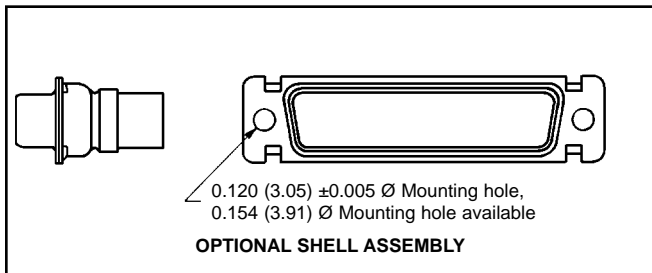
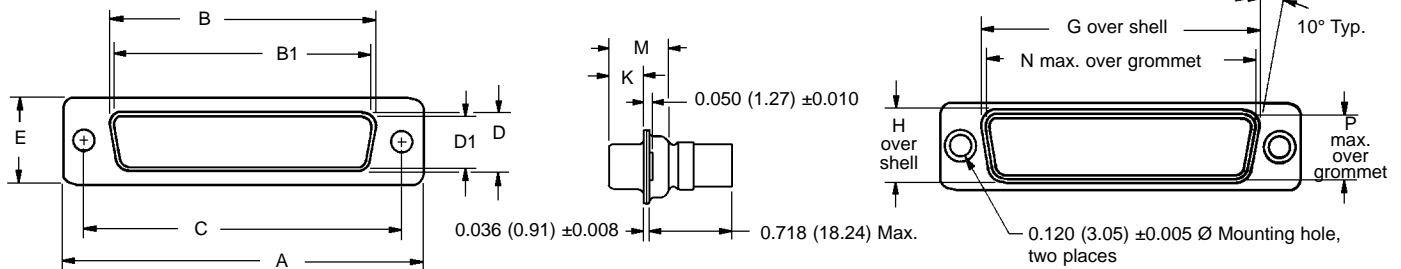
EVD37



EVD50

STANDARD SHELL ASSEMBLY

WITH REAR GROMMET
SOLDER AND CRIMP REMOVABLE CONTACTS

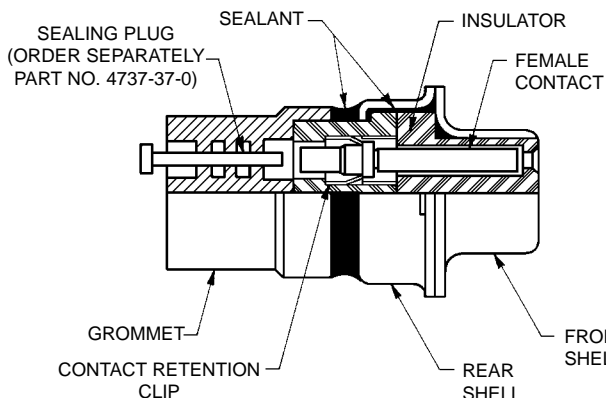


| CONNECTOR VARIANT SIZES | A ±0.015 | B ±0.005 | B1 ±0.005 | C ±0.005 | D ±0.005 | D1 ±0.005 | E ±0.015 | G ±0.010 | H ±0.010 | K ±0.005 | M ±0.010 | N Max. | P Max. |
|-------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|-----------------|------------------|------------------|------------------|
| EVD 9 M | 1.213 (30.81) | | 0.666 (16.92) | 0.984 (24.99) | | 0.329 (8.36) | 0.494 (12.55) | 0.759 (19.28) | 0.422 (10.72) | 0.233 (5.92) | 0.422 (10.72) | 0.769 (19.53) | 0.432 (10.97) |
| EVD 9 F | 1.213 (30.81) | 0.643 (16.33) | | 0.984 (24.99) | 0.311 (7.90) | | 0.494 (12.55) | 0.759 (19.28) | 0.422 (10.72) | 0.243 (6.17) | 0.429 (10.90) | 0.769 (19.53) | 0.432 (10.97) |
| EVD 15 M | 1.541 (39.14) | | 0.994 (25.25) | 1.312 (33.32) | | 0.329 (8.36) | 0.494 (12.55) | 1.083 (27.51) | 0.422 (10.72) | 0.233 (5.92) | 0.422 (10.72) | 1.093 (27.76) | 0.432 (10.97) |
| EVD 15 F | 1.541 (39.14) | 0.971 (24.66) | | 1.312 (33.32) | 0.311 (7.90) | | 0.494 (12.55) | 1.083 (27.51) | 0.422 (10.72) | 0.243 (6.17) | 0.429 (10.90) | 1.093 (27.76) | 0.432 (10.97) |
| EVD 25 M | 2.088 (53.04) | | 1.534 (38.96) | 1.852 (47.04) | | 0.329 (8.36) | 0.494 (12.55) | 1.625 (41.28) | 0.422 (10.72) | 0.230 (5.84) | 0.426 (10.82) | 1.635 (41.53) | 0.432 (10.97) |
| EVD 25 F | 2.088 (53.04) | 1.511 (38.38) | | 1.852 (47.04) | 0.311 (7.90) | | 0.494 (12.55) | 1.625 (41.28) | 0.422 (10.72) | 0.243 (6.17) | 0.429 (10.90) | 1.635 (41.53) | 0.432 (10.97) |
| EVD 37 M | 2.729 (69.32) | | 2.182 (55.42) | 2.500 (63.50) | | 0.329 (8.36) | 0.494 (12.55) | 2.272 (57.71) | 0.422 (10.72) | 0.230 (5.84) | 0.426 (10.82) | 2.282 (57.96) | 0.432 (10.97) |
| EVD 37 F | 2.729 (69.32) | 2.159 (54.84) | | 2.500 (63.50) | 0.311 (7.90) | | 0.494 (12.55) | 2.272 (57.71) | 0.422 (10.72) | 0.243 (6.17) | 0.429 (10.90) | 2.282 (57.96) | 0.432 (10.97) |
| EVD 50 M | 2.635 (66.93) | | 2.079 (52.81) | 2.406 (61.11) | | 0.441 (11.20) | 0.605 (15.37) | 2.178 (55.32) | 0.534 (13.56) | 0.230 (5.84) | 0.426 (10.82) | 2.188 (55.58) | 0.544 (13.82) |
| EVD 50 F | 2.635 (66.93) | 2.064 (52.43) | | 2.406 (61.11) | 0.423 (10.74) | | 0.605 (15.37) | 2.178 (55.32) | 0.534 (13.56) | 0.243 (6.17) | 0.429 (10.90) | 2.188 (55.58) | 0.544 (13.82) |

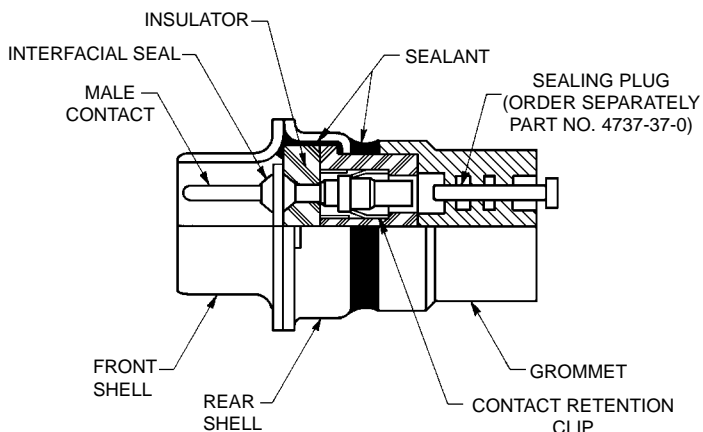
DIMENSIONS ARE IN INCHES (MILLIMETERS).
ALL DIMENSIONS ARE SUBJECT TO CHANGE.

ENVIRONMENTAL - D SERIES DESIGN FEATURES

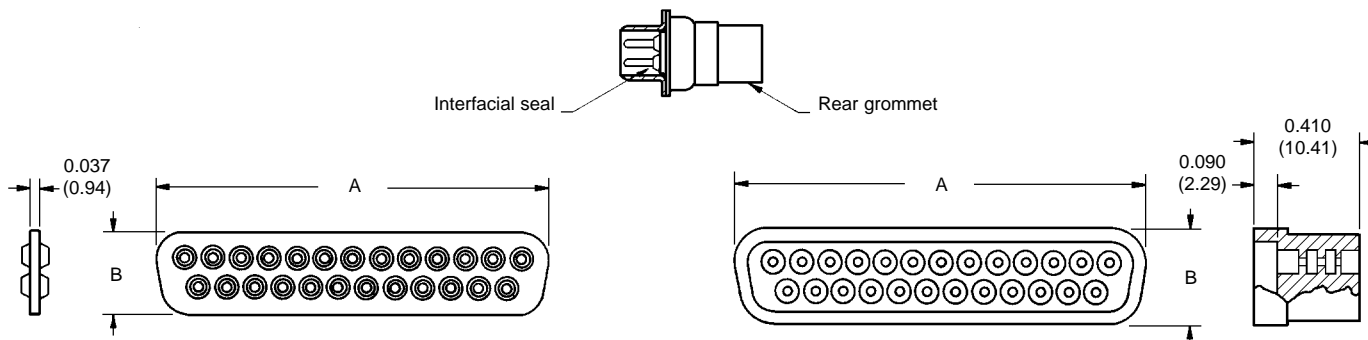
FEMALE CONNECTOR



MALE CONNECTOR



INTERFACIAL SEALS AND REAR GROMMETS



| CONNECTOR VARIANT | A | B |
|-------------------|------------------|------------------|
| 9 | 0.650 (16.51) | 0.318 (8.08) |
| 15 | 0.978 (24.84) | 0.318 (8.08) |
| 25 | 1.513 (38.43) | 0.318 (8.08) |
| 37 | 2.156 (54.76) | 0.318 (8.08) |
| 50 | 2.058 (52.27) | 0.425 (10.80) |

| CONNECTOR VARIANT | A | B |
|-------------------|------------------|------------------|
| 9 | 0.725 (18.42) | 0.375 (9.53) |
| 15 | 1.051 (26.70) | 0.375 (9.53) |
| 25 | 1.595 (40.51) | 0.375 (9.53) |
| 37 | 2.247 (57.07) | 0.375 (9.53) |
| 50 | 2.147 (54.53) | 0.490 (12.45) |

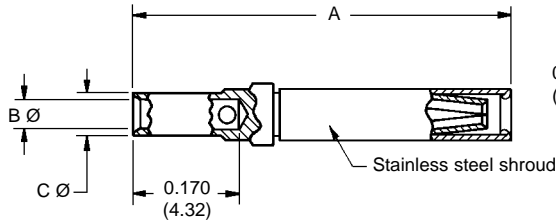
Material: Fluorosilicone and silicone blend.

Contact factory for ordering information.

DIMENSIONS ARE IN INCHES (MILLIMETERS).
ALL DIMENSIONS ARE SUBJECT TO CHANGE.

CRIMP CONTACTS CLOSED CRIMP BARREL

FEMALE CONTACT ("CLOSED ENTRY" DESIGN)

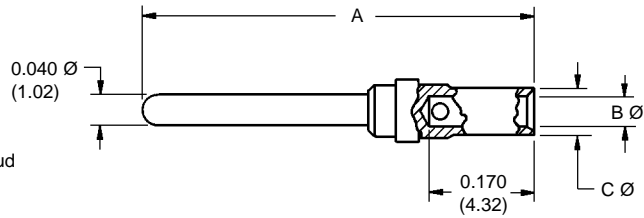


Material - Leaded nickel copper.

Plating - 0.000030 inch (0.75 μ) gold over nickel or 0.000050 inch (1.25 μ) gold over copper for military specification contacts.

| PART NUMBER | WIRE SIZE AWG/(mm ²) | A | B \varnothing | C \varnothing |
|---------------|-------------------------------------|------------------|-----------------|-----------------|
| FC6020D-14 | 20 / 22 / 24 (0.5/0.3/0.25) | 0.538 (13.67) | 0.044 (1.12) | 0.066 (1.68) |
| M39029/63-368 | 20 / 22 / 24 (0.5/0.3/0.25) | 0.538 (13.67) | 0.044 (1.12) | 0.066 (1.68) |

MALE CONTACT

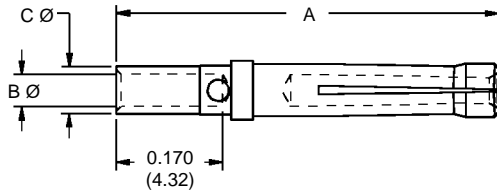


Material - Brass.

Plating - 0.000030 inch (0.75 μ) gold over nickel or 0.000050 inch (1.25 μ) gold over copper for military specification contacts.

| PART NUMBER | WIRE SIZE AWG/(mm ²) | A | B \varnothing | C \varnothing |
|---------------|-------------------------------------|------------------|-----------------|-----------------|
| MC6020D-14 | 20 / 22 / 24 (0.5/0.3/0.25) | 0.550 (13.97) | 0.044 (1.12) | 0.066 (1.68) |
| M39029/64-369 | 20 / 22 / 24 (0.5/0.3/0.25) | 0.550 (13.97) | 0.044 (1.12) | 0.066 (1.68) |

FEMALE CONTACT ("ROBI-D OPEN ENTRY" DESIGN)



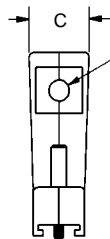
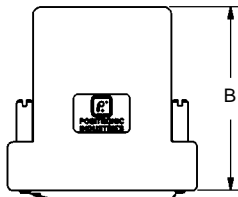
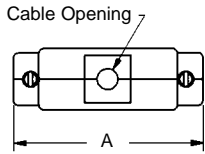
Material - Phosphor bronze.

Plating - 0.000030 inch (0.75 μ) gold over nickel.

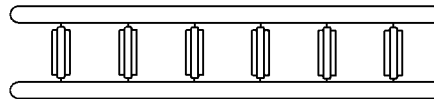
| PART NUMBER | WIRE SIZE AWG/(mm ²) | A | B \varnothing | C \varnothing |
|-------------|-------------------------------------|------------------|-----------------|-----------------|
| FC6520D-14 | 20 / 22 / 24 (0.5/0.3/0.25) | 0.538 (13.67) | 0.044 (1.12) | 0.066 (1.68) |

COMPOSITE HOODS

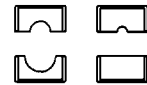
COMPOSITE HOOD WITH ROTATING MALE JACKSCREWS (Z) EMI ENVIRONMENT



Cable Opening
(Side cable opening not available for size 50 hood)



Insert Tree Assembly

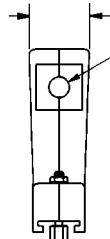
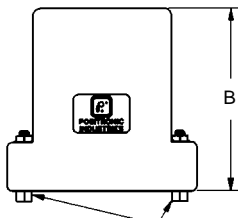
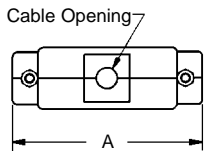


Typical inserts
Various inserts are provided to accommodate different cable sizes

Rotating Male Jackscrews
4-40 UNC Threads, Steel, Zinc plated or Stainless Steel, passivated

Example Part Number:
D25000Z00

COMPOSITE HOOD WITH FIXED FEMALE JACKSCREWS (Z4) EMI ENVIRONMENT



Cable Opening
(Side cable opening not available for size 50 hood)

Fixed Female Jackscrews
4-40 UNC Threads, Steel, Zinc plated or Stainless Steel, passivated

Example Part Number:
D25000Z400

| Part Number | A | B | C | Cable Opening | |
|-------------|--------|---------|---------|---------------|-----------------|
| | | | | Min | Max |
| D9000Z00 | 1.387 | 1.935 | 0.735 | 0.100 | 0.400 x 0.570 |
| D9000Z400 | (35.2) | (49.1) | (18.7) | (2.5) | (10.2) x (14.5) |
| D15000Z00 | 1.715 | 1.935 | 0.735 | 0.100 | 0.400 x 0.570 |
| D15000Z400 | (43.6) | (49.1) | (18.7) | (2.5) | (10.2) x (14.5) |
| D25000Z00 | 2.254 | 2.200 | 0.735 | 0.100 | 0.550 x 0.570 |
| D25000Z400 | (57.3) | (55.9) | (18.7) | (2.5) | (14.0) x (14.5) |
| D37000Z00 | 2.903 | 2.200 | 0.735 | 0.100 | 0.550 x 0.570 |
| D37000Z400 | (73.7) | (55.9) | (18.7) | (2.5) | (14.0) x (14.5) |
| D50000Z00 | 2.809 | 2.700 | 0.900 | 0.100 | ∅ 0.630 |
| D50000Z400 | (71.3) | (68.58) | (22.86) | (2.5) | (16.00) |

Material: Composite, conductive volume resistivity (1.0 OHM - cm max)

Attenuation: 40+ decibels

DIMENSIONS ARE IN INCHES (MILLIMETERS).
ALL DIMENSIONS ARE SUBJECT TO CHANGE.

ORDERING INFORMATION – CODE NUMBERING SYSTEM

Specify Complete Connector By Following Steps 1 Through 9
 Insert "0" When Step Is Not Used

| STEP | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|------|-----|----|---|---|---|---|---|---|---|
| | EVD | 25 | P | 0 | 0 | Z | 0 | S | |

STEP 1 - Basic Series
 EVD Series

STEP 2 - EVD Connector Variants
 9, 15, 25, 37, 50

STEP 3 - Connector Gender
 P - Male contact with interfacial seal
 F - Female contact

STEP 4 - Type of Contacts
 0 - Order contacts separately.
 1 - Crimp, 20 AWG - 24 AWG (0.5 mm² - 0.25 mm²) kitted with connector.
 2 - Solder, 20 AWG - 24 AWG (0.5 mm² - 0.25 mm²) kitted with connector.

***STEP 5 - Mounting Style**
 0 - Mounting hole, 0.120 (3.05) diameter.
 F - Float mounts, Universal.
 S2 - Swaged spacer, 4-40 threads, 0.125 (3.18) length.
 S5 - Swaged locknut, 4-40 threads.

STEP 9 - Special Options
 Consult Sales Department.

STEP 8 - Shell Options
 S - Stainless steel, passivated.
 0 - Zinc plated with dichromate seal.

***STEP 7 - Locking Systems**
 0 - None, specify only with 'Z' or 'Z4' hood option of STEP 6.
 T2 - Fixed female jackscrews.
 E - Rotating male jackscrews.

***STEP 6 - Hoods**
 0 - None.
 Z - Composite hood with rotating male jackscrews.
 Z4 - Composite hood with fixed female jackscrews.

Order sealing plugs separately, part number 4737-37-0.

*For additional information on accessories listed on STEP 5, 6 and 7, see Accessories catalog.

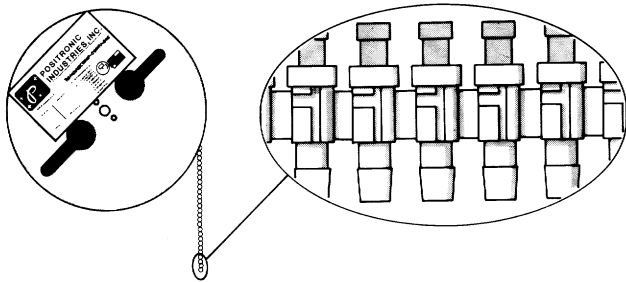
CONTACTS ORDERED SEPARATELY

Contacts may be ordered separately by specifying the appropriate catalog part number and quantity. See page 25 for part numbers.

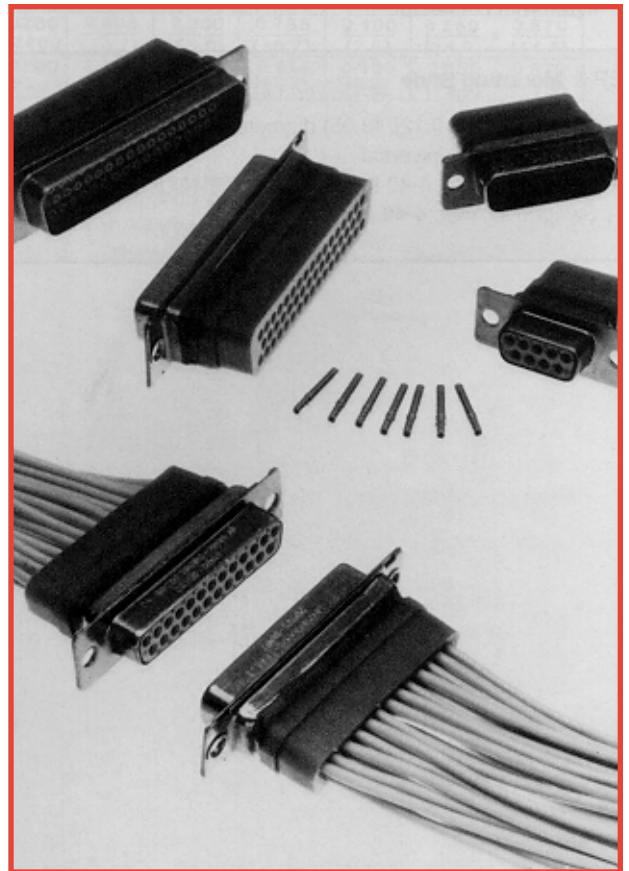
In addition, these contacts may be ordered in reels of 2,000 contacts for use with the Positronic automatic feed pneumatic crimp tool. The same carrier type is used for both male and female contacts.

To order contacts in reels, add the letter "R" after the contact part number. Example: MC6020DR-14 (male contact) and FC6020DR-14 (female contact).

The catalog part number of the Positronic automatic feed pneumatic crimp tool is 9550-1.



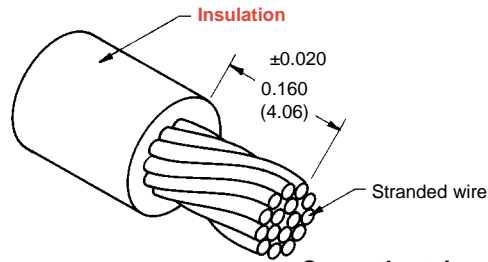
Enlarged section of plastic contact carriers



CRIMPING INFORMATION FOR EVD SERIES CRIMP CONTACTS

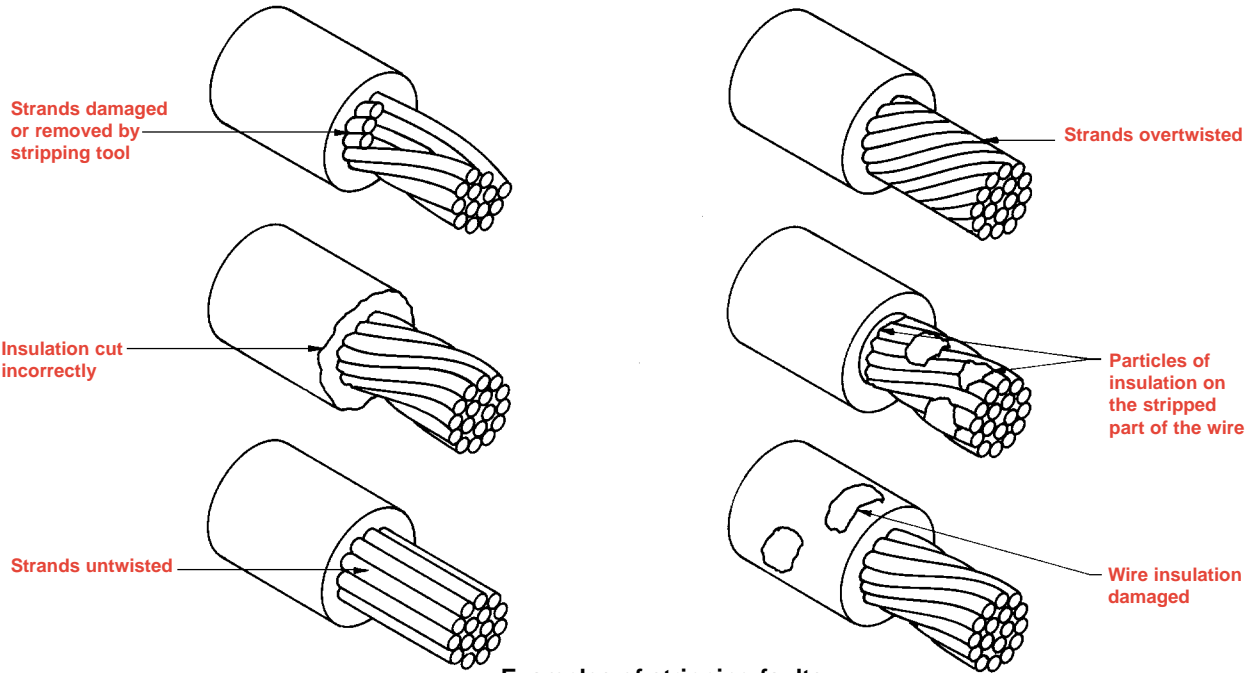
USE INDICATED POSITRONIC TOOLS FOR BEST RESULTS

Step 1: Strip wire to indicated length



- Take care not to:
- Damage or remove strands
 - Untwist or overtwist strands
 - Leave insulation particles on strands
 - Damage insulation

Correctly stripped wire



Examples of stripping faults

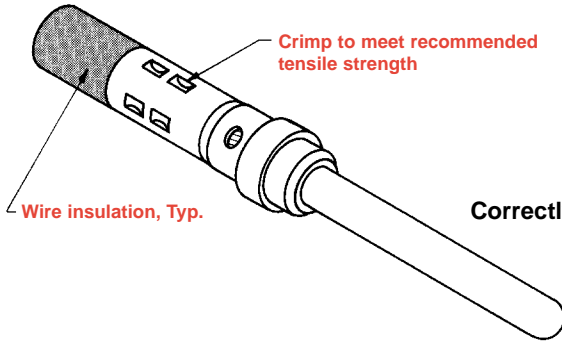
Step 2: Crimp wire to contact

- For hand crimp tool:
- Place contact into crimping tool
 - Insert wire into contact
 - Center contact by slowly closing crimping tool until crimp indenters make contact with crimp barrel
 - Complete the cycle of the crimping tool in one smooth motion
 - Remove crimped contact

- For automatic feed pneumatic crimp tool:
- Insert wire into the contact, positioned in the crimp tool by the plastic carrier
 - Depress the activating device of the crimping tool to start crimping cycle
 - Remove crimped contact

CRIMPING INFORMATION FOR EVD SERIES CRIMP CONTACTS

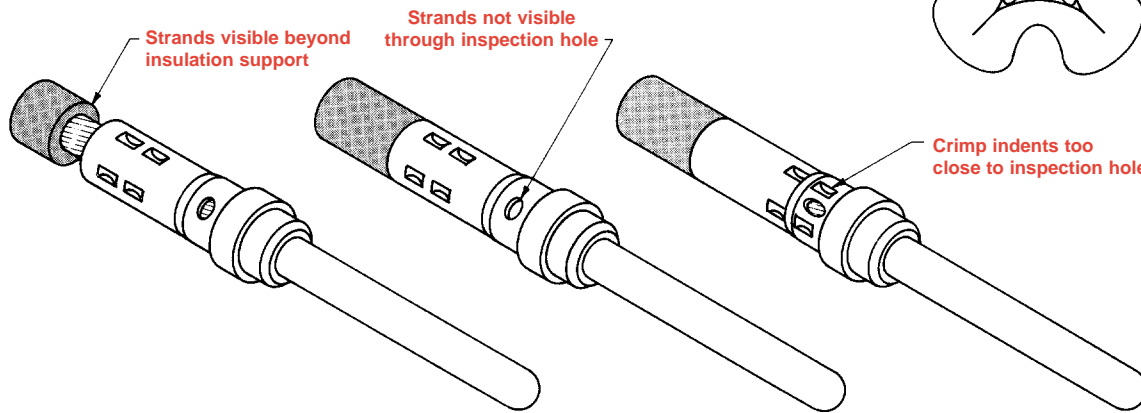
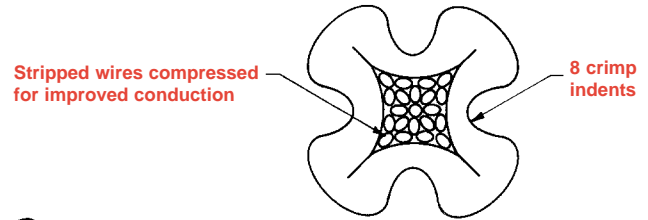
Step 3: Inspect crimp



Correctly crimped contact

- For all tools: - Strands to be visible through the inspection hole
 - Strands not to be visible beyond the insulation support
 - Crimped contact to meet recommended conductor tensile force shown in chart
 - Check for peeled gold and bent contact

Cross section of correctly crimped contact



Stripped part of the wire too long

Stripped part of the wire too short

Crimp indents incorrectly located

Examples of crimping faults

AUTOMATIC FEED, CRIMP TOOL, PNEUMATICALLY ACTUATED Part No. 9550-1

This fast cycling automatic feed strip and crimp tool produces an 8 indent crimp on wire sizes 20 AWG (0.5 mm²) through 24 AWG (0.3 mm²). EVD Series contacts must be ordered on reels.

To order, specify part number 9550-1. Foot control valve is supplied as a standard accessory.



Positronic Recommended Conductor Tensile Strength

| WIRE SIZE AWG/(mm ²) | AXIAL LOAD POUNDS/(N) |
|-------------------------------------|--------------------------|
| <u>20</u> (0.5) | <u>20</u> (89) |
| <u>22</u> (0.3) | <u>12</u> (53) |
| <u>24</u> (0.25) | <u>8</u> (36) |

Conductor tensile strength values are derived using silver-tin plated copper wires.

Values may change depending upon what type of wire is used.

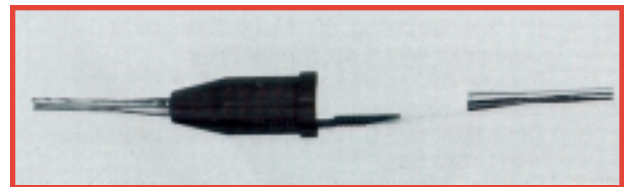
MINIATURE STEP ADJUSTABLE TOOL (M22520/2-01) Part No. 9507

This miniature 8 step adjustable hand crimping tool produces an 8 indent crimp configuration and will crimp wire sizes 20 AWG (0.5 mm²) through 24 AWG (0.3 mm²). To crimp wire size 20 AWG (0.5 mm²) through 24 AWG (0.3 mm²), order contact positioner 9502-5. Each positioner is equipped with a data plate which gives the correct crimp-depth setting for each wire size, and must be used with 9507 tool frame for best results when crimping EVD Series contacts.



INSERTION/REMOVAL TOOL (M81969/1-02)

One end of this tool is used to insert contacts into EVD Series connectors. The other end is used to extract contacts. This is accomplished by sliding the extraction tip down the wire into the connector until it bottoms against the contact. A slight rotation while pushing will release the contacts, which are then extracted by simultaneously pulling on the wire.



Positronic recommended tools for EVD series contacts.

| CRIMP TOOLS | POSITIONERS FOR FC6020D-14, MC6020D-14, M39029/63-368 M39029/64-369 |
|--|--|
| 9507, HAND CRIMP TOOL | 9502-5 |
| 9550-1, AUTOMATIC FEED, PNEUMATIC STRIP AND CRIMP TOOL | Supplied in reels |