



Positronic
connectpositronic.com

MILITARY QUALITY CRIMP REMOVABLE CONTACT STANDARD DENSITY D-SUBMINIATURE

D-Sub

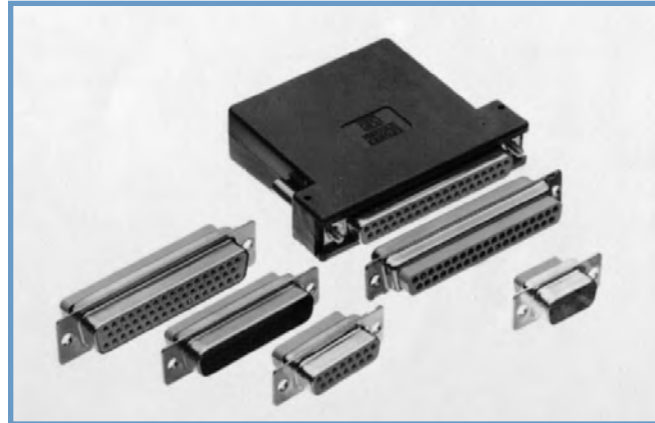
Size 20 Signal and
Thermocouple Contacts,
Crimp Removable

PosiBand® Closed Entry
IEC Publication 60807-3
Performance Level One,
MIL-DTL-24308 & SAE AS39029

UL Recognized
File #E49351

CSA Recognized
File #LR54219

Telecommunication
UL File #E140980



Rhapso-D series connectors are military quality connectors designed for use in sheltered, mildly corrosive environments having a wide range of temperature, pressure and humidity changes. Applicable crimp removable contact connectors are qualified to MIL-DTL-24308 and SAE AS39029 (see page 82 for more information), and will meet the performance requirements of IEC 60807-3, Performance Level One. Rhapso-D series connectors utilize precision machined contacts with closed barrel, crimp terminations. The

female utilizes Positronic's unique PosiBand closed entry system, see page 1 for details. Rugged open entry female contacts are also available.

Six standard connector variants are offered in arrangements of 9, 15, 25, 29, 37 and 50 contacts. Rhapso-D series connectors are mateable and compatible with all D-subminiature connectors conforming to MIL-DTL-24308, IEC 60807-2 and IEC 60807-3.

A wide assortment of cable support hoods and locking systems is available from stock.

RHAPSO-D SERIES TECHNICAL CHARACTERISTICS

MATERIALS AND FINISHES:

| | |
|--------------------------------|---|
| Insulator: | Glass filled DAP per ASTM-D-5948, SDG-F, UL 94V-0, green color. |
| Contacts: | Precision machined copper alloy. |
| Contact Plating: | Military performance - 0.000050 inch [1.27 µ] gold over nickel plate. IEC 60807-3, Performance Level One - gold flash over nickel plate. Other finishes available upon request. |
| Shells: | Steel with tin plate; zinc and cadmium plate with chromate seal, stainless steel passivated. Other materials and finishes available upon request. |
| Mounting Spacers: | Nylon; copper alloy or steel with zinc plate and chromate seal or tin plate; phosphor bronze with tin plate; stainless steel, passivated. |
| Jackscrew Systems: | Brass or steel with zinc plate and chromate seal or clear zinc plate or tin plate; stainless steel, passivated. |
| Vibration Lock Systems: | Slide lock and lock tabs, steel with nickel plate. |
| Hoods: | Composite and plastic, UL 94V-0; brass or steel with zinc plate and chromate seal. Aluminum; aluminum with electroless nickel plate. For aluminum hoods, zinc content is 1% maximum. Die cast zinc. |

Low magnetic versions are available, contact Technical Sales.

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 [1.02mm] mating diameter. Female - PosiBand closed entry design, see page 1 for details. |
|----------------------------|---|

Contact Retention

In Insulator: 9 lbs. [40 N].

Contact Terminations: Closed barrel crimp, wire sizes 18 AWG [1.0mm²] through 30 AWG [0.05mm²].

Shells: Male shells may be dimpled for EMI/ESD ground paths.

Polarization: Trapezoidally shaped shells and polarized jackscrews.

Locking Systems: Jackscrews and vibration locking systems.

Mechanical Operations: 1000 operations minimum per IEC 60512-5 for PosiBand closed entry female contact.

ELECTRICAL CHARACTERISTICS:

Contact Current Rating, Tested per UL 1977:

| |
|------------------------------------|
| 18 amperes, 2 contacts energized. |
| 14 amperes, 6 contacts energized. |
| 11 amperes, 15 contacts energized. |
| 10 amperes, 25 contacts energized. |
| 9 amperes, 50 contacts energized. |

See temperature rise curves on page 2 for details.

Initial Contact Resistance: 0.004 ohms maximum.

Proof Voltage: 1000 V r.m.s.

Insulation Resistance: 5 G ohms.

Clearance and Creepage Distance [minimum]: 0.039 inch [1.0mm].

Working Voltage: 300 V r.m.s.

CLIMATIC CHARACTERISTICS:

Temperature Range: -55°C to +125°C.

Damp Heat, Steady State: 21 days.

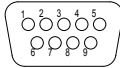
THERMOCOUPLE CONTACTS:

Size 20 crimp contacts are available, see page 31 for details.

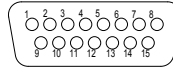
Printed circuit board mount contacts are available in HDC series, see page 22 for details.

CONTACT VARIANTS

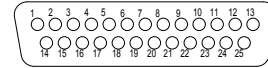
FACE VIEW OF MALE OR REAR VIEW OF FEMALE



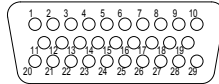
RD 9



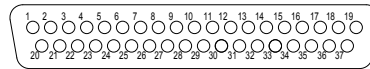
RD 15



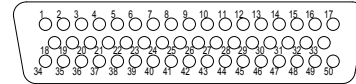
RD 25



RD 29

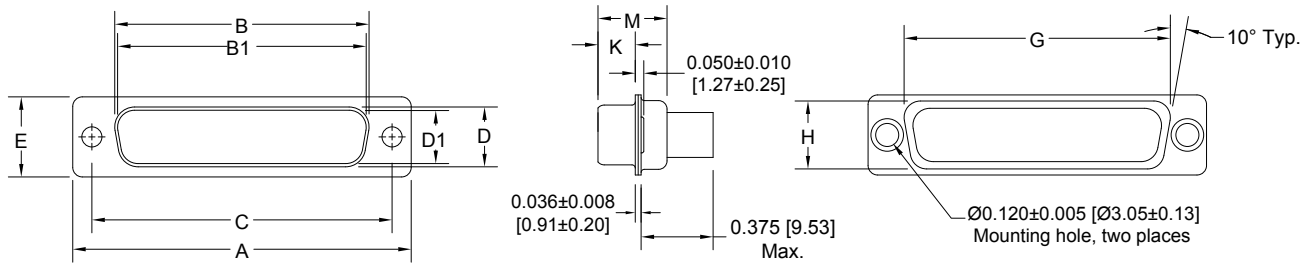


RD 37

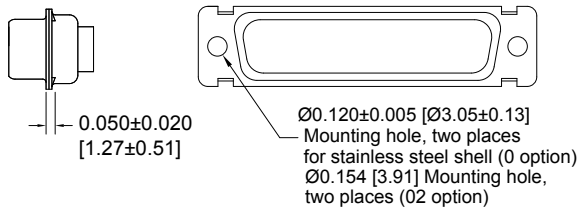


RD 50

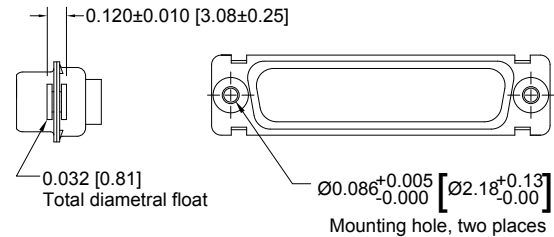
STANDARD SHELL ASSEMBLY



OPTIONAL SHELL ASSEMBLY (0, 02)



OPTIONAL SHELL ASSEMBLY WITH UNIVERSAL FLOAT MOUNTS (F)



| CONNECTOR VARIANT SIZES | A ±0.015 [0.38] | B ±0.005 [0.13] | B1 ±0.005 [0.13] | C ±0.005 [0.13] | D ±0.005 [0.13] | D1 ±0.005 [0.13] | E ±0.015 [0.38] | G ±0.010 [0.25] | H ±0.010 [0.25] | K ±0.005 [0.13] | M ±0.010 [0.25] |
|----------------------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| RD 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] |
| RD 9 S | 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] |
| RD 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] |
| RD 15 S | 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] |
| RD 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] |
| RD 25 S | 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] |
| RD 29 M | 1.770 [44.96] | | 1.274 [32.36] | 1.534 [38.96] | | 0.450 [11.43] | 0.605 [15.37] | 1.322 [33.58] | 0.539 [13.69] | 0.230 [5.84] | 0.426 [10.82] |
| RD 29 S | 1.770 [44.96] | 1.251 [31.78] | | 1.534 [38.96] | 0.431 [10.95] | | 0.605 [15.37] | 1.322 [33.58] | 0.539 [13.69] | 0.237 [6.02] | 0.429 [10.90] |
| RD 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] |
| RD 37 S | 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] |
| RD 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] |
| RD 50 S | 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] |



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MILITARY QUALITY CRIMP REMOVABLE CONTACT STANDARD DENSITY D-SUBMINIATURE

D-Sub

REMOVABLE CRIMP CONTACTS

CODE 1 AND 12

CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

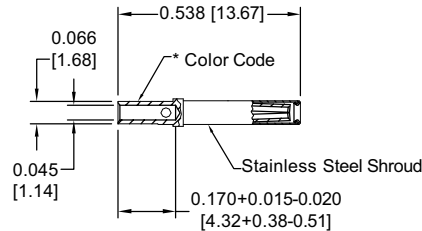
QUALIFIED TO SAE AS39029

*MILITARY SPECIFICATION CONTACTS

STANDARD FINISH:
per SAE AS39029 specifications

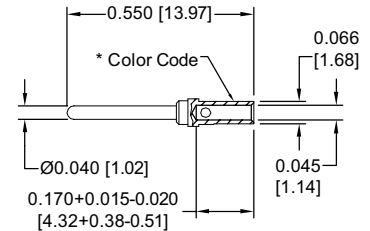
COLOR CODE:
MALE CONTACT:
ORANGE/BLUE/WHITE
FEMALE CONTACT:
ORANGE/BLUE/GRAY

FEMALE CONTACT "CLOSED ENTRY" DESIGN



| FEMALE PART NUMBER | WIRE SIZE AWG/[mm ²] |
|---|-------------------------------------|
| *M39029/63-368 | 20 / 22 / 24 [0.5/0.3/0.25] |
| Positronic is qualified to supply the legacy design, as well as, the PosiBand design. If the requirement is for the PosiBand design exclusively, notify sales at time of quotation for order placement when requesting M39029 contacts. | |

MALE CONTACT



| MALE PART NUMBER | WIRE SIZE AWG/[mm ²] |
|---------------------|-------------------------------------|
| *M39029/64-369 | 20 / 22 / 24 [0.5/0.3/0.25] |

Note: Connectors can be kitted with all applicable crimp/solder contacts, contact Technical Sales for connector part number.

REMOVABLE CRIMP CONTACTS

CODE 1 AND 12

CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.



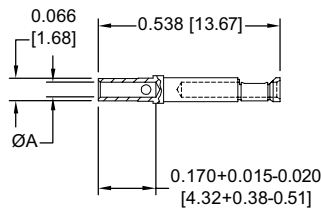
Authentic POSITRONIC
PosiBand®
These contacts utilize authentic Positronic PosiBand® technology.
Protected by U.S. Patent 7,115,002

PLATING:

STANDARD FINISH:
Gold flash over nickel plate.

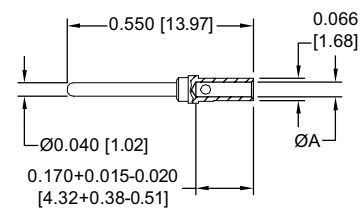
OPTIONAL FINISHES:
0.000030 [0.76] gold over nickel by adding "-14" suffix onto part number. Example: FC6020D2-14
0.000050 inch [1.27] gold over nickel by adding "-15" suffix onto part number. Example: MC6026D-15

FEMALE CONTACT "CLOSED ENTRY" DESIGN



| FEMALE PART NUMBER | WIRE SIZE AWG/[mm ²] | ØA |
|-----------------------|-------------------------------------|-----------------|
| FC6020D2 | 20 / 22 / 24 [0.5/0.3/0.25] | 0.045 [1.14] |
| FC6026D2 | 26 / 28 / 30 [0.12/0.08/0.05] | 0.027 [0.69] |

MALE CONTACT



| MALE PART NUMBER | WIRE SIZE AWG/[mm ²] | ØA |
|---------------------|-------------------------------------|-----------------|
| MC6020D | 20 / 22 / 24 [0.5/0.3/0.25] | 0.045 [1.14] |
| MC6026D | 26 / 28 / 30 [0.12/0.08/0.05] | 0.027 [0.69] |

Note: Connectors can be kitted with all applicable crimp/solder contacts, contact Technical Sales for connector part number.

Note: FC602*D2 and MC602*D contacts can be used in the SD series.

For information regarding **CRIMP TOOLS & CRIMPING TOOL TECHNIQUES**, see page 73.



Authentic POSITRONIC®

PosiBand®

These contacts utilize authentic Positronic PosiBand® technology.
Protected by U.S. Patent 7,115,002

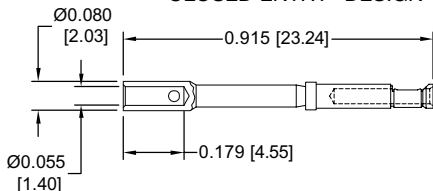
REMOVABLE CRIMP CONTACTS 18 AWG CRIMP CONTACTS 18 AWG [1.0mm²]

The crimp area of this contact is not protected when fully seated in the connector molding. These contacts require shrink tubing after installation. Wire cannot be removed from molding after insertion. Not suitable for fully loaded connector.

CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

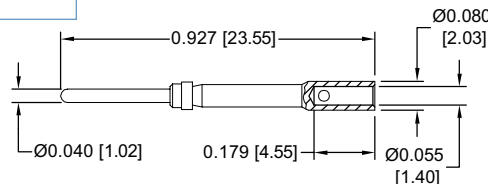
FEMALE CONTACT

"CLOSED ENTRY" DESIGN



Note: Connectors can be kitted with all applicable crimp/solder contacts, contact Technical Sales for connector part number.

Note: FC6018D2 and MC6018D contacts can be used in the ORD series.

MALE CONTACT

| FEMALE PART NUMBER | WIRE SIZE AWG/[mm ²] |
|-----------------------|-------------------------------------|
| FC6018D2 | 18 [1.0] max |

| MALE PART NUMBER | WIRE SIZE AWG/[mm ²] |
|---------------------|-------------------------------------|
| MC6018D | 18 [1.0] max |

PLATING:**STANDARD FINISH:** Gold flash over nickel plate.

OPTIONAL FINISHES: 0.000030 [0.76] gold over nickel by adding "-14" suffix onto part number. Example: FC6018D2-14
0.000050 inch [1.27] gold over nickel by adding "-15" suffix onto part number. Example: MC6018D-15

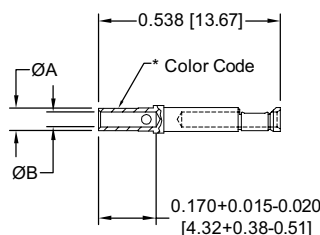
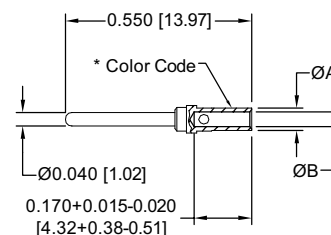
REMOVABLE THERMOCOUPLE CRIMP CONTACT

CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

Note: Connectors can be kitted with all applicable crimp/solder contacts, contact Technical Sales for connector part number..

FEMALE CONTACT

"CLOSED ENTRY" DESIGN

**MALE CONTACT**

| TYPE | MATERIAL | FEMALE PART NUMBER | MALE PART NUMBER | COLOR CODE | WIRE SIZE AWG [mm ²] | ØA | ØB |
|------|-------------------------------|--------------------------|------------------------|---------------|-------------------------------------|--------------|--------------|
| K | CHROMEL (+) | FC6020D2CH ^{††} | MC6020DCH [†] | WHITE | 20 / 22 / 24 [0.5 / 0.3 / 0.25] | 0.066 [1.68] | 0.045 [1.14] |
| | | FC6026D2CH | MC6026DCH | | 26 / 28 / 30 [0.12 / 0.08 / 0.05] | 0.048 [1.23] | 0.027 [0.69] |
| | ALUMEL (-) | FC6020D2AL ^{††} | MC6020DAL [†] | GREEN | 20 / 22 / 24 [0.5 / 0.3 / 0.25] | 0.066 [1.68] | 0.045 [1.14] |
| | | FC6026D2AL | MC6026DAL | | 26 / 28 / 30 [0.12 / 0.08 / 0.05] | 0.048 [1.23] | 0.027 [0.69] |
| T | COPPER (+) with gold flash | FC6020D2CU ^{††} | MC6020DCU [†] | RED | 20 / 22 / 24 [0.5 / 0.3 / 0.25] | 0.066 [1.68] | 0.045 [1.14] |
| | | FC6026D2CU | MC6026DCU | | 26 / 28 / 30 [0.12 / 0.08 / 0.05] | 0.048 [1.23] | 0.027 [0.69] |
| | CONSTANTAN (-) | FC6020D2CO ^{††} | MC6020DCO [†] | YELLOW | 20 / 22 / 24 [0.5 / 0.3 / 0.25] | 0.066 [1.68] | 0.045 [1.14] |
| | | FC6026D2CO | MC6026DCO | | 26 / 28 / 30 [0.12 / 0.08 / 0.05] | 0.048 [1.23] | 0.027 [0.69] |
| E | CHROMEL (+) | FC6020D2CH ^{††} | MC6020DCH [†] | WHITE | 20 / 22 / 24 [0.5 / 0.3 / 0.25] | 0.066 [1.68] | 0.045 [1.14] |
| | | FC6026D2CH | MC6026DCH | | 26 / 28 / 30 [0.12 / 0.08 / 0.05] | 0.048 [1.23] | 0.027 [0.69] |
| | CONSTANTAN (-) | FC6020D2CO ^{††} | MC6020DCO [†] | YELLOW | 20 / 22 / 24 [0.5 / 0.3 / 0.25] | 0.066 [1.68] | 0.045 [1.14] |
| | | FC6026D2CO | MC6026DCO | | 26 / 28 / 30 [0.12 / 0.08 / 0.05] | 0.048 [1.23] | 0.027 [0.69] |

For more information on the availability of Type J thermocouple contacts, and information about thermocouple contacts with printed circuit board solder termination, please contact Technical Sales.

Chromel® and Alumel® are registered trademarks of Hoskins Manufacturing Company.

[†]Dimensionally equivalent to M39029/64-369^{††}Dimensionally equivalent to M39029/63-368

For information regarding **CRIMP TOOLS & CRIMPING TOOL TECHNIQUES**, see page 73.



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MILITARY QUALITY CRIMP REMOVABLE CONTACT STANDARD DENSITY D-SUBMINIATURE

D-Sub

ORDERING INFORMATION - CODE NUMBERING SYSTEM

Specify Complete Connector By Selecting An Option From Step 1 Through 8

| STEP | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---------|----|----|---|---|---|---|----|---|-----|-----|
| EXAMPLE | RD | 25 | S | 1 | 0 | J | VL | 0 | /AA | -50 |

STEP 1 - BASIC SERIES

RD series.

STEP 2 - CONNECTOR VARIANTS

9, 15, 25, 29, 37, 50

STEP 3 - CONNECTOR GENDER

M - Male

S - Female - PosiBand closed entry contacts

STEP 4 - CONTACT TERMINATION TYPE

0 - Contacts ordered separately, see pages 30-31.

1 - Crimp, 20 AWG-24 AWG [0.5mm²-0.25mm²].

12 - Crimp, 26 AWG-30 AWG [0.12mm²-0.05mm²].

*1 STEP 5 - MOUNTING STYLE

0 - Mounting Hole, 0.120 [3.05] Ø.

02 - Mounting Hole, 0.154 [3.91] Ø.

F - Float Mounts, Universal.

S2 - Swaged Spacer, 4-40 Threads, 0.125 [3.18] Length.

S5 - Swaged Locknut, 4-40 Threads.

*1 STEP 6 - HOODS

0 - None.

J - Hood, Top Opening, Plastic.

L - Hood, Side Opening, Plastic.

Y - Hood, Top Opening, Plastic with Rotating Male Jackscrews. Available in size 50 only.

Y6 - Hood, Top Opening, Plastic with Rotating Male and Female Polarized Jackscrews. Available in size 50 only.

Z - Hood, Top or Side Opening, Robust Extended Height, Composite and Plastic with Rotating Male Jackscrews. Available in size 9, 15, 25, 37, and 50 only.

H - Hood, Top Opening, Metal. Available in size 15, 25, 37, and 50 only.

G - Hood, EMI/RFI, Die Cast Zinc. Available in size 9, 15, 25, 37, and size 50 only.

*3 AN - Lightweight Aluminum Hood, nickel finish.

*3 AC - Lightweight Aluminum Hood, no finish.

W - Hood, Top or Side Opening, Plastic. Available in size 9, 15, and 25 only.

*1 For additional information on accessories listed in steps 5, 6 and 7, see Accessory Catalog.

*2 For stainless steel dimpled male versions contact Technical Sales.

*3 AN and AC hood are not available for connector variant 29. Consult Technical Sales for availability.

STEP 10 - SPECIAL OPTIONS

-14 - 0.000030 [0.76µ] gold over nickel.

-15 - 0.000050 [1.27µ] gold over nickel.

-50 - 0.000050 [1.27µ] gold over copper.

CONTACT TECHNICAL SALES FOR SPECIAL OPTIONS

STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS

/AA - RoHS Compliant

NOTE: If compliance to environmental legislation is not required, this step will not be used. Example: RD25S10JVLO

STEP 8 - SHELL OPTIONS

0 - Zinc Plated with Chromate Seal.

*2 S - Stainless steel, passivated.

X - Tin Plated.

Z - Tin Plated and Dimpled (male connectors only).

C - Cadmium plated with Chromate Seal.

*1 STEP 7 - LOCKING AND POLARIZING SYSTEMS

0 - None.

V3 - Lock Tab, connector front panel mounted.

V5 - Lock Tab, connector rear panel mounted.

VL - Lock Lever, used with Hoods Only.

T - Fixed Female Jackscrews.

T2 - Fixed Female Jackscrews.

T6 - Fixed Male and Female Polarized Jackscrews.

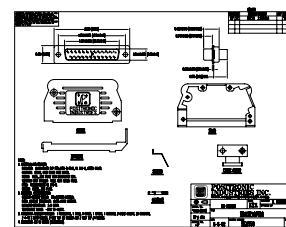
E - Rotating Male Jackscrews.

E2 - Rotating Male Screw Locks.

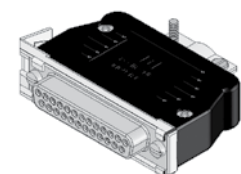
E3 - Rotating Male with internal hex for 3/32 hex drives

E6 - Rotating Male and Female Polarized Jackscrews.

NOTE: Once you have made a connector selection, contact Technical Sales if you would like to receive a drawing in DXF, PDF format or a 3-dimensional IGES, STEP, or SOLIDWORKS file.



2-D Drawing



3-D Model

For information regarding **CRIMP TOOLS & CRIMPING TOOL TECHNIQUES**, see page 73.