D-SUBMINIATURE

Professional, Industrial and Military Performance

THREE PERFORMANCE LEVELS FOR BEST COST/PERFORMANCE RATIO

Catalog C-001 Rev. F
Experience

- Founded in 1966
- Involvement in the development of international connector specifications through EIA®, IEC and ISO as well as PICMG® and VITA.
- Introduction of new and unique connector products to the electronics industry.
- Patent holder for many unique connector features and manufacturing techniques.
- Vertically integrated manufacturing – raw materials to finished connectors.

Technology

- Expertise with solid machined contacts provides a variety of high reliability connectors including high current density power connectors.
- Quality Assurance lab is capable of testing to IEC, EIA, UL, C.Ul, military and customer-specified requirements.
- In-house design and development of connectors based on market need or individual customer requirements.
- Internal manufacturing capabilities include automatic precision contact machining, injection molding, stamping, plating operations and connector assembly.
- Manufacturing locations in southwest Missouri, U.S.A. (headquarters); Puerto Rico, France, China, Singapore, and India. Total square footage: 369,000.

Support

- Compliance to a variety of international and customer specific environmental requirements.
- Large in-house inventory of finished connectors. Customer specific stocking programs.
- Factory direct technical sales support in major cities worldwide.
- One-on-one customer support from worldwide factory locations.
- World class web site.
- Value-added solutions and willingness to develop custom products with reasonable price and delivery.

Regional Headquarters

Springfield, MO  Auch, France  Singapore

Products described within this catalog may be protected by one or more of the following US patents:
#4,900,261  #5,255,580  #5,329,697
#6,260,268  #6,835,079  #7,115,002
Patented in Canada, 1992  Other Patents Pending

Positronic Industries’ FEDERAL SUPPLY CODE (Cage Code) FOR MANUFACTURERS is 28198

Unless otherwise specified, dimensional tolerances are:
1) ±0.001 inches [0.03 mm] for male contact mating diameters.
2) ±0.003 inches [0.08 mm] for contact termination diameters.
3) ±0.005 inches [0.13 mm] for all other diameters.
4) ±0.015 inches [0.38 mm] for all other dimensions.

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Positronic®, Positronic Industries, Inc.®, P+ logo, Positronic Global Connector Solutions®, Connector Excellence® and their logo designs are registered trademarks of Positronic Industries, Inc.
CONNECTOR DESCRIPTIONS

MELO-D and EURO-D CONNECTORS
MD series and ED series, professional level, fixed contacts. Solder cup, wrap post, and printed board contact terminations for inch and metric printed board hole patterns. Six connector variants, 9 through 50 contacts. Female open entry contacts. Connectors conform to IEC 60807-2, Performance Level Two.

MDX SERIES CONNECTORS
MDX series, industrial level, fixed contacts. Solder cup, straight and right angle (90°) printed board mount contact terminations. Five connector variants, 9 through 50 contacts. PosiBand closed entry female contacts. Connectors conform to IEC 60807-2, Performance Level One.

SOLI-D CONNECTORS
SD series, professional level, removable contacts. Solder cup, crimp and straight printed board mount contact terminations. Five connector variants, 9 through 50 contacts. PosiBand closed entry female contacts. Connectors conform to IEC 60807-3, Performance Level Two.

ORD SERIES CONNECTORS
ORD series, professional and industrial levels, removable contacts. Crimp contact terminations. Thermocouple contact options available. Six connector variants, 9 through 50 contacts. IEC 60807-3, Performance Level One or Two.

HARMO-D CONNECTORS
HDC series, MIL-DTL-24308 level, fixed contact. Solder cup, wrap post and straight and right angle (90°) printed board contact terminations. Thermocouple contact options available. Five connector variants, 9 through 50 contacts.

RHAPSO-D CONNECTORS
RD series, MIL-DTL-24308 / SAE AS39029 levels, removable contacts. Crimp contact terminations. Thermocouple contact options available. Six connector variants, 9 through 50 contacts.

ODD SERIES CONNECTORS
ODD series, professional and industrial levels, removable contacts. Solder cup, crimp and straight and right angle (90°) printed board contact terminations. Thermocouple contact options available. Six connector variants, 15 through 104 contacts.

DENSI-D CONNECTORS
DD series, MIL-DTL-24308 / SAE AS39029 levels, removable contacts. Solder cup, crimp and straight and right angle (90°) printed board contact terminations. Thermocouple contact options available. Six connector variants, 15 through 104 contacts.

STANDARD DENSITY COMPLIANT PRESS-FIT CONNECTORS
PCD series, professional, industrial and military levels, machined contact, compliant termination. Five connector variants, 9 through 50 contacts. IEC 60807-2, Performance Levels One or Two. Military contact plating optional.

HIGH DENSITY COMPLIANT PRESS-FIT CONNECTORS
PCDD series, professional, industrial and military levels, machined contact, compliant termination. Five connector variants, 15 through 104 contacts. Military contact plating optional.
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<th>Section</th>
<th>Page</th>
</tr>
</thead>
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</tr>
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<td>95</td>
</tr>
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POSITRONIC CABLIZED CONNECTORS

SAVE TIME AND MONEY!

Let Positronic support you by cablizing your SD / RD / ORD / ODD / DD connector selection.

Cable Assembly Design Support

We work closely with customers to:

1. Design assemblies in accordance with customer specifications.
2. Prepare cablized connector configuration and performance specifications.
3. Design each system in accordance with applicable customer, domestic, and international standards.
4. Define and conduct performance and verification testing.

FOR MORE DETAILS CONTACT TECHNICAL SALES OR VISIT OUR WEB SITE AT:
HTTP://WWW.CONNECTPOSITRONIC.COM/PRODUCTS/47/CABLEASSEMBLIES
What Makes Positronic’s New “PosiBand®” Contact Interface a Significant Improvement?

High reliability connectors utilize female closed entry contacts that provide an unbroken ring of solid material at the face of the contact. The closed entry feature is crucial in preventing damage to female contacts used in harsh environments, repeated mating cycles, blind mate applications and applications requiring highest reliability.

The most common closed entry design utilized by connector manufacturers is a split tine and sleeve concept. See figure 1. With this design, both the mechanical forces and electrical interface are provided only at the tip of the female contact.

Positronic’s new PosiBand technology takes a unique approach to closed entry female contacts. PosiBand contacts utilize a two-piece contact design. See figure 2. Each piece serves a separate function, providing a more mechanically robust contact and more consistent electrical performance.

The main body of the PosiBand contact provides a true closed entry opening to enhance robustness. The PosiBand spring clip provides normal force on the male contact. Consistent electrical performance is supported through a larger area of contact interface between the male and female contact along the entire “floor” of the contact body. PosiBand contacts are QPL listed under SAE AS39029 and qualified under GSFC S-311-P4.

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The PosiBand® contact system has many advantages over the legacy split tine design.

- **PosiBand** is more robust than the split tine contact, which can be pried open in harsh environments, resulting in reduced normal force and degradation of electrical performance.
- **PosiBand** has greater surface area at the male and female contact interface, resulting in more consistent electrical performance.
- **PosiBand** has lower average insertion forces, resulting in greater ease in mating, especially in larger high density connectors. The average lower insertion force is accomplished while meeting or exceeding performance requirements.
- The PosiBand’s contact body does not require annealing of the crimp barrels, as does the split tine design. This eliminates concern of unintentionally heat-treating the mating end of the contact, which can cause electrical failure.
- **PosiBand** is qualified under SAE AS39029 specification. PosiBand is also qualified under GSFC S-311-P4/08 Rev C and GSFC S-311-P4/10 Rev C.

For more details about the advantages of the PosiBand® system, please view the detailed white paper at www.connectpositronic.com/content/37/ or visit our website at www.connectpositronic.com.

---

**TEMPERATURE RISE CURVES**
Test conducted in accordance with UL1977.

**Size 20 PosiBand Contacts**

**Initial Contact Resistance:** 0.004 ohms, maximum.
Curve developed using Standard Density D-subminiature connectors loaded with size 20 crimp contacts terminated to size 20 AWG wire.

**Size 22 PosiBand Contacts**

**Initial Contact Resistance:** 0.005 ohms, maximum.
Curve developed using High Density D-subminiature connectors loaded with size 22 crimp contacts terminated to size 22 AWG wire.
EXPLODED VIEWS OF TYPICAL MATED D-SUBMINIATURE CONNECTOR ASSEMBLIES
CONNECTOR COMPONENT DESCRIPTION AND TERMINOLOGY

A1 - Male and female signal contacts, size 22. Terminations may be crimp, solder cup and printed board mount.
A2 - Male and female signal contacts, size 20. Terminations may be crimp, solder cup, wrap post, compliant press-fit and printed board mount.
B1 - Unloaded connector insulators, male and female. Insulator retention system retains all contact termination types. Insulator may be used as a free or fixed connector.
B2 - Loaded connector insulators, male and female. Insulators may be preloaded per customer requirements with contacts having terminations of right angle (90°) or straight solder printed board mount, wrap post, solder cup and press-fit. Insulator contact positions may be selectively loaded with contacts. Connectors are normally fixed panel or printed board connectors.
C1 - Fixed female jackscrews are the stationary threaded members of the non-polarized jackscrew system.
C2 - Fixed male and female jackscrews are the stationary threaded members of the polarized jackscrew system.
C3 - Rotating male jackscrews and screwlocks are the rotating threaded members of the non-polarized jackscrew system.
C4 - Rotating male and female jackscrews are the rotating threaded members of the polarized jackscrew system.
C5 - Vibration locking system consists of lock tabs on fixed connector and slide lock lever on free cable connector.
C6 - Blind mating connector system with pilot probes on free connector and receptacle guides on panel mounted fixed connector.
C7 - Cable adapters [Hoods] are used on the free cable connector to provide cable support and contact protection.
C8 - Knobs of the polarized rotating jackscrew system are affixed to the rotating jackscrew by a set screw.
Melo-D series connectors are professional quality connectors recommended for use in sheltered, non-corrosive indoor or outdoor environments having normal ventilation, but without temperature or humidity controls. These fixed contact connectors meet the dimensional and performance requirements of IEC 60807-2, Performance Level Two.

Melo-D series connectors utilize precision machined contacts which are fixed within the connector body. The female contact is an open entry design contact, precision machined of high tensile phosphor bronze.

Six standard connector variants are offered in arrangements of 9, 15, 25, 29, 37 and 50 contacts. Each Melo-D connector variant is available with contact terminations for solder cup, wrap post, and straight and right angle (90°) printed board mount terminations featuring a choice of three printed board footprints. Melo-D series connectors are mateable and compatible with all D-subminiature connectors conforming to IEC 60807-2, IEC 60807-3 and MIL-DTL-24308.

A wide assortment of printed board mounting hardware, cable support hoods and locking systems is available from stock.

---

**MELO-D SERIES TECHNICAL CHARACTERISTICS**

**MATERIALS AND FINISHES:**

- **Insulator:** Nylon resin, UL 94V-0, black color.
- **Contacts:** Precision machined copper alloy.
- **Contact Plating:** Professional performance Gold flash over nickel plate. Other finishes available upon request.
- **Shells:** Steel with tin plate; zinc plate with chromate seal; stainless steel passivated. Other materials and finishes available upon request.
- **Mounting Spacers and Brackets:** Nylon; copper alloy or steel with zinc plate and chromate seal or tin plate; phosphor bronze with tin plate; stainless steel, passivated; polyester.
- **Push-On Fasteners:** Phosphor bronze or beryllium copper with tin plate.
- **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.

**MECHANICAL CHARACTERISTICS:**

- **Contact Terminations:**
  - Solder cup contacts - 0.042 inch [1.06mm] minimum hole diameter for 20 AWG [0.5mm²] wire maximum.
  - Straight Printed Board Mount - 0.028 inch [0.71mm] termination diameter.
  - Right Angle (90°) Printed Board Mount - 0.028 inch [0.71mm] termination diameter for all printed board footprints.
  - Wrap Post - 0.025 inch [0.64mm] square.

- **Shells:** Male shells may be dimpled for EMI/ESD ground paths.
- **Polarization:** Trapezoidally shaped shells and polarized jackscrews.
- **Mounting To Angle Brackets:** Jackscrews and riveted fasteners with a 0.120 inch [3.05mm] clearance hole, and threaded riveted fasteners with 4-40 threads and polyester lock inserts.
- **Mounting To Printed Board:** Rapid installation push-on fasteners and threaded posts.
- **Locking Systems:** Jackscrews and vibration locking systems.
- **Mechanical Operations:** 500 operations minimum per IEC 60512-5.

**ELECTRICAL CHARACTERISTICS:**

- **Contact Current Rating:** 7.5 amperes nominal.
- **Initial Contact Resistance:** 0.008 ohms maximum.
- **Insulator Resistance:** 5 G ohms.
- **Proof Voltage:** 1000 V r.m.s.
- **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:** 10 days.

**DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.
## CONTACT VARIANTS

FACE VIEW OF MALE OR REAR VIEW OF FEMALE

![Diagram of MD Series Connectors](image)

### STANDARD SHELL ASSEMBLY

![Diagram of Standard Shell Assembly](image)

### OPTIONAL SHELL ASSEMBLY (0, 02)

![Diagram of Optional Shell Assembly](image)

### OPTIONAL SHELL ASSEMBLY WITH UNIVERSAL FLOAT MOUNTS (F)

![Diagram of Optional Shell Assembly with Float Mounts](image)

### Connector Variant Sizes

<table>
<thead>
<tr>
<th>Connector Variant Sizes</th>
<th>A ±0.015 [0.38]</th>
<th>B ±0.005 [0.13]</th>
<th>B1 ±0.005 [0.13]</th>
<th>C ±0.005 [0.13]</th>
<th>D ±0.005 [0.13]</th>
<th>D1 ±0.005 [0.13]</th>
<th>E ±0.015 [0.38]</th>
<th>G ±0.010 [0.25]</th>
<th>H ±0.010 [0.25]</th>
<th>I ±0.010 [0.25]</th>
<th>J ±0.010 [0.25]</th>
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</thead>
<tbody>
<tr>
<td>9 M</td>
<td>1.213 [30.81]</td>
<td>0.666 [16.33]</td>
<td>0.984 [24.99]</td>
<td>0.329 [8.36]</td>
<td>0.494 [12.55]</td>
<td>0.759 [19.28]</td>
<td>0.422 [10.72]</td>
<td>0.233 [5.92]</td>
<td>0.422 [10.72]</td>
<td>0.422 [10.72]</td>
<td>0.422 [10.72]</td>
</tr>
<tr>
<td>37 M</td>
<td>2.729 [69.32]</td>
<td>2.082 [52.42]</td>
<td>2.500 [63.50]</td>
<td>0.395 [9.96]</td>
<td>0.494 [12.55]</td>
<td>2.732 [71.71]</td>
<td>0.422 [10.72]</td>
<td>0.230 [6.17]</td>
<td>0.426 [10.82]</td>
<td>0.426 [10.82]</td>
<td>0.426 [10.82]</td>
</tr>
<tr>
<td>37 F</td>
<td>2.729 [69.32]</td>
<td>2.159 [54.84]</td>
<td>2.500 [63.50]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
<td>2.732 [71.71]</td>
<td>0.422 [10.72]</td>
<td>0.243 [6.17]</td>
<td>0.429 [10.90]</td>
<td>0.429 [10.90]</td>
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<tr>
<td>50 M</td>
<td>2.635 [66.93]</td>
<td>2.079 [52.81]</td>
<td>2.406 [61.11]</td>
<td>0.411 [10.20]</td>
<td>0.605 [15.37]</td>
<td>2.178 [51.32]</td>
<td>0.534 [13.56]</td>
<td>0.230 [5.84]</td>
<td>0.426 [10.82]</td>
<td>0.426 [10.82]</td>
<td>0.426 [10.82]</td>
</tr>
</tbody>
</table>

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
SOLDER CUP TERMINATION

**CODE 2**

For solder cup contacts, specify code 2 in step 4 of ordering information.

Typical Part Number: MD15M200T2Z

**STRAIGHT PRINTED BOARD MOUNT TERMINATION**

**CODE 3, 32 AND 33**

For straight printed board mount contacts, specify code number in step 4 of ordering information.

Typical Part Number: MD25F3S60T0

**FILTERING CHARACTERISTICS**

<table>
<thead>
<tr>
<th>SERIES</th>
<th>CODE NO.</th>
<th>A [ΩM]</th>
<th>L [ΩM]</th>
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<tbody>
<tr>
<td>MD, MD, HDC</td>
<td>32</td>
<td>0.375 [9.53]</td>
<td>0.240 [8.10]</td>
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<tr>
<td>ODD</td>
<td>32</td>
<td>0.375 [9.53]</td>
<td>0.165 [4.19]</td>
</tr>
<tr>
<td>DD</td>
<td>32</td>
<td>0.515 [13.08]</td>
<td>0.165 [4.19]</td>
</tr>
<tr>
<td>ED, HDC</td>
<td>36</td>
<td>0.375 [9.53]</td>
<td>0.101 [2.57]</td>
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<tr>
<td>MD, MDX</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>ODD</td>
<td>5</td>
<td>5</td>
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</tr>
<tr>
<td>MD</td>
<td>59</td>
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<tr>
<td>MD, HDC</td>
<td>6</td>
<td>0.375 [9.53]</td>
<td>0.360 [9.14]</td>
</tr>
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Specify code F or Q in step 6 of ordering information. F for ferrite inductor and Q for ferrite inductor with push-on fastener.

**WRAP POST TERMINATION**

**CODE 6**

For wrap post contacts, specify code 6 in step 4 of ordering information.

Typical Part Number: MD15F600T20
RIGHT ANGLE (90°) PRINTED BOARD MOUNT TERMINATION

**CODE 5, 0.283 [7.19] CONTACT EXTENSION**

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>MD9&quot;S****</td>
<td>1.204 [30.58]</td>
<td>0.984 [24.99]</td>
<td>0.339 [8.61]</td>
<td>0.283 [7.19]</td>
</tr>
<tr>
<td>MD15&quot;S****</td>
<td>1.532 [38.91]</td>
<td>1.312 [33.32]</td>
<td>0.339 [8.61]</td>
<td>0.283 [7.19]</td>
</tr>
<tr>
<td>MD25&quot;S****</td>
<td>2.072 [52.63]</td>
<td>1.852 [47.04]</td>
<td>0.339 [8.61]</td>
<td>0.283 [7.19]</td>
</tr>
<tr>
<td>MD29&quot;S****</td>
<td>1.754 [44.55]</td>
<td>1.534 [38.96]</td>
<td>0.396 [10.03]</td>
<td>0.283 [7.19]</td>
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<tr>
<td>MD37&quot;S****</td>
<td>2.720 [69.09]</td>
<td>2.500 [63.50]</td>
<td>0.339 [8.61]</td>
<td>0.283 [7.19]</td>
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<td>2.406 [61.11]</td>
<td>0.396 [10.03]</td>
<td>0.283 [7.19]</td>
</tr>
</tbody>
</table>

**NOTE:**
*1 "A" dimension applies for metal angle brackets only. Consult Accessories D-subminiature catalog for “A” dimension when plastic brackets are used.

**DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.**
RIGHT ANGLE (90°) PRINTED BOARD MOUNT TERMINATION

CODE 4, 0.450 [11.43] CONTACT EXTENSION

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>A**</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
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<tr>
<td>MD9**4****</td>
<td>1.204 [30.58]</td>
<td>0.984 [24.99]</td>
<td>0.506 [12.85]</td>
<td>0.450 [11.43]</td>
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<tr>
<td>MD15**4****</td>
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<td>1.312 [33.33]</td>
<td>0.506 [12.85]</td>
<td>0.450 [11.43]</td>
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<td>MD25**4****</td>
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<td>0.450 [11.43]</td>
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<tr>
<td>MD29**4****</td>
<td>1.754 [44.55]</td>
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<td>0.562 [14.27]</td>
<td>0.450 [11.43]</td>
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<tr>
<td>MD37**4****</td>
<td>2.720 [69.06]</td>
<td>2.500 [63.50]</td>
<td>0.506 [12.85]</td>
<td>0.450 [11.43]</td>
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<tr>
<td>MD50**4****</td>
<td>2.626 [66.70]</td>
<td>2.406 [61.11]</td>
<td>0.562 [14.27]</td>
<td>0.450 [11.43]</td>
</tr>
</tbody>
</table>

**NOTE:**

*“A” dimension applies for metal angle brackets only. Consult Accessories D-subminiature catalog for “A” dimension when plastic brackets are used.

Typical Part Number: MD25M4B0T20

Typical Part Number: MD50M4B0T20

RIGHT ANGLE (90°) AND STRAIGHT PRINTED BOARD CONTACT HOLE PATTERN

MOUNT CONNECTOR WITH MATING FACE POSITIONED TO FOLLOW DIRECTION OF ARROW.

SUGGESTED PRINTED BOARD HOLE SIZES:

Suggest 0.045 [1.14] Ø hole for contact termination positions.
Suggest 0.123 ±0.003 [3.12 ±0.08] Ø hole for mounting connector with push-on fasteners.
**ORDERING INFORMATION - CODE NUMBERING SYSTEM**

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

### STEP 1 - BASIC SERIES

<table>
<thead>
<tr>
<th>Example</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>6</th>
<th>7</th>
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<th>10</th>
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<tr>
<td>MD Series.</td>
<td>MD</td>
<td>25</td>
<td>F</td>
<td>59</td>
<td>R7</td>
<td>N</td>
<td>T6</td>
<td>X</td>
<td>/AA</td>
<td>-14</td>
</tr>
</tbody>
</table>

### STEP 2 - CONNECTOR VARIANTS

| 9, 15, 25, 29, 37, 50 |

### STEP 3 - CONNECTOR GENDER

| M - Male | F - Female |

### STEP 4 - CONTACT TERMINATION TYPE

| 2 - Solder cup. | 3 - Solder, Straight Printed Board Mount with 0.150 [3.81] Tail Length. | 32 - Solder, Straight Printed Board Mount with 0.375 [9.52] Tail Length. | 33 - Solder, Straight Printed Board Mount with 0.500 [12.70] Tail length. | 4 - Solder, Right Angle (90°) Printed Board Mount with 0.450 [11.43] Contact Extension. | 5 - Solder, Right Angle (90°) Printed Board Mount with 0.283 [7.19] Contact Extension. | 59 - Solder, Right Angle (90°) Printed Board Mount with 0.545 [13.84] Contact Extension. | 6 - Wrap Post. |

### STEP 5 - MOUNTING STYLE


### STEP 7 - LOCKING AND POLARIZING SYSTEMS


### STEP 10 - SPECIAL OPTIONS

| -14 - 0.000030 [0.76µ] gold over nickel. | -15 - 0.000050 [1.27µ] gold over nickel. |

**CONTACT TECHNICAL SALES FOR SPECIAL OPTIONS**

### STEP 8 - SHELL OPTIONS

| 0 - Zinc plated, with chromate seal. | S - Stainless steel, passivated. | X - Tin plated. | Z - Tin plated and dimpled (male connectors only). |

### STEP 6 - HOODS AND PUSH-ON FASTENERS

| 0 - None. | V3 - Lock Tab, connector front panel mounted. | V5 - Lock Tab, connector rear panel mounted. | VL - Lock Lever, used with Hoods only. |

**NOTE:** If compliance to environmental legislation is not required, this step will not be used. Example: MD25F59R7NT6X

### STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS

| /AA - Compliant per EU Directive 2002/95/EC (RoHS) |

**DIMENSIONS ARE IN INCHES [MILLIMETERS].**

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

**$** Ferrite inductor is available on contact types 32, 33, 4, 59 and 6 only. For more information on ferrite inductors, see page 7.

**$** VL, V3 and V5 locking systems are not available for connector variants 37 and 50. Jackscrews are highly recommended to minimize damage to contacts on variants with high mating forces.

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

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

**SITRONIC INDUSTRIES**

**ALL DIMENSIONS ARE SUBJECT TO CHANGE.**

**connectpositronic.com**

**Positronic Industries**
MDX series connectors are industrial quality connectors recommended for use in sheltered, non-corrosive indoor or outdoor environments having normal ventilation, but without temperature or humidity controls. These fixed contact connectors meet the dimensional and performance requirements of IEC 60807-2, Performance Level One.

MDX series connectors utilize precision machined contacts which are fixed within the connector body. The female utilizes Positronic’s unique PosiBand closed entry contact system, see page 1 for details.

Five standard connector variants are offered in arrangements of 9, 15, 25, 37 and 50 contacts. Each variant is available with contact terminations for solder cup and straight and right angle (90°) printed board mount terminations. MDX series connectors are mateable and compatible with all D-subminiature connectors conforming to IEC 60807-2, IEC 60807-3 and MIL-DTL-24308.

A wide assortment of printed board mounting hardware, cable support hoods and locking systems is available from stock.

MDX SERIES TECHNICAL CHARACTERISTICS

MATERIALS AND FINISHES:

- **Insulator:** Glass filled polyester per ASTM D5927, UL 94V-0, blue color.
- **Contacts:** Precision machined copper alloy.
- **Contact Plating:** Professional performance Gold flash over nickel plate. Other finishes available upon request.
- **Shells:** Steel with tin plate; zinc plate with chromate seal, stainless steel passivated. Other materials and finishes available upon request.
- **Mounting Spacers and Brackets:** Nylon; copper alloy or steel with zinc plate and chromate seal or tin plate; phosphor bronze with tin plate; stainless steel, passivated; polyester.
- **Push-On Fasteners:** Phosphor bronze or beryllium copper with tin plate.
- **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:

- **Fixed Contacts:** Size 20 contact, female contact - PosiBand closed entry design, see page 1 for details.
- **Contact Retention in Insulator:** 6 lbs. [27N]

Contact Terminations:

- Solder cup contacts - 0.042 inch [1.06mm] minimum hole diameter for 20 AWG [0.5mm²] wire maximum.
- Straight Printed Board Mount - 0.028 inch [0.71mm] termination diameter.
- Right Angle (90°) Printed Board Mount - 0.028 inch [0.71mm] termination diameter for all printed board footprints.

Polarization:

- Trapezoidally shaped shells and polarized jackscrews.

Mounting To Jackscrews and Riveted Fasteners with Angle Brackets:

- 0.120 inch [3.05mm] clearance hole, and threaded riveted fasteners with 4-40 threads and polyester lock inserts.

Mounting To Printed Board:

- Rapid installation push-on fasteners and threaded posts.

Locking Systems:

- Jackscrews and vibration locking systems.

Mechanical Operations:

- 1000 operations minimum per IEC 60512-5.

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.
- **Insulator Resistance:** 5 G ohms.
- **Proof Voltage:** 1000 V r.m.s.
- **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:** 10 days.

For RoHS options see page 15.
CONTACT VARIANTS
FACE VIEW OF FEMALE

STANDARD SHELL ASSEMBLY

OPTIONAL SHELL ASSEMBLY (0, 02)

OPTIONAL SHELL ASSEMBLY WITH UNIVERSAL FLOAT MOUNTS (F)

<table>
<thead>
<tr>
<th>CONNECTOR VARIANT SIZES</th>
<th>A ±0.015 [0.38]</th>
<th>B ±0.005 [0.13]</th>
<th>C ±0.005 [0.13]</th>
<th>D ±0.005 [0.13]</th>
<th>E ±0.015 [0.38]</th>
<th>G ±0.010 [0.25]</th>
<th>H ±0.010 [0.25]</th>
<th>K ±0.005 [0.13]</th>
<th>M ±0.010 [0.25]</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 S</td>
<td>1.213 [30.81]</td>
<td>0.643 [16.33]</td>
<td>0.984 [24.99]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
<td>0.759 [19.28]</td>
<td>0.422 [10.72]</td>
<td>0.243 [6.17]</td>
<td>0.429 [10.90]</td>
</tr>
<tr>
<td>15 S</td>
<td>1.541 [39.14]</td>
<td>0.971 [24.66]</td>
<td>1.312 [33.32]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
<td>1.083 [27.51]</td>
<td>0.422 [10.72]</td>
<td>0.243 [6.17]</td>
<td>0.429 [10.90]</td>
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<tr>
<td>25 S</td>
<td>2.088 [53.04]</td>
<td>1.511 [38.38]</td>
<td>1.852 [47.04]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
<td>1.625 [41.28]</td>
<td>0.422 [10.72]</td>
<td>0.243 [6.17]</td>
<td>0.429 [10.90]</td>
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<tr>
<td>37 S</td>
<td>2.729 [69.32]</td>
<td>2.159 [54.84]</td>
<td>2.500 [63.50]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
<td>2.272 [57.71]</td>
<td>0.422 [10.72]</td>
<td>0.243 [6.17]</td>
<td>0.429 [10.90]</td>
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<tr>
<td>50 S</td>
<td>2.635 [66.93]</td>
<td>2.084 [52.43]</td>
<td>2.406 [61.11]</td>
<td>0.403 [10.74]</td>
<td>0.605 [15.37]</td>
<td>2.178 [55.32]</td>
<td>0.534 [13.56]</td>
<td>0.243 [6.17]</td>
<td>0.429 [10.90]</td>
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</table>
**SOLDER CUP TERMINATION**

**CODE 2**

For solder cup contacts, specify code 2 in step 4 of ordering information.

Typical Part Number: MDX15S200T2Z

**STRAIGHT PRINTED BOARD MOUNT TERMINATION**

**CODE 3, 32 AND 33**

For straight printed board mount contacts, specify code number in step 4 of ordering information.

Typical Part Number: MDX25S3S60T0

**RIGHT ANGLE (90°) PRINTED BOARD MOUNT TERMINATION**

**CODE 4, 0.450 [11.43] CONTACT EXTENSION**

Typical Part Number: MDX25S4B0T20

**NOTE:**

1. “A” dimension applies for metal angle brackets only. Consult Accessories D-subminiature catalog for “A” dimension when plastic brackets are used.
RIGHT ANGLE (90°) PRINTED BOARD MOUNT TERMINATION
CODE 5, 0.283 [7.19] CONTACT EXTENSION

<table>
<thead>
<tr>
<th>PART NUMBER</th>
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<th>D</th>
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<tbody>
<tr>
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<td>1.204 [30.58]</td>
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<td>0.339 [8.61]</td>
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<tr>
<td>MDX15S*****</td>
<td>1.532 [38.91]</td>
<td>1.312 [33.32]</td>
<td>0.339 [8.61]</td>
<td>0.283 [7.19]</td>
</tr>
<tr>
<td>MDX25S*****</td>
<td>2.072 [52.63]</td>
<td>1.852 [47.04]</td>
<td>0.339 [8.61]</td>
<td>0.283 [7.19]</td>
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<tr>
<td>MDX37S*****</td>
<td>2.720 [69.08]</td>
<td>2.500 [63.50]</td>
<td>0.339 [8.61]</td>
<td>0.283 [7.19]</td>
</tr>
<tr>
<td>MDX50S*****</td>
<td>2.628 [66.70]</td>
<td>2.408 [61.11]</td>
<td>0.396 [10.03]</td>
<td>0.283 [7.19]</td>
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</tbody>
</table>

NOTE:
*"A" dimension applies for metal angle brackets only. Consult Accessories D-subminiature catalog for "A" dimension when plastic brackets are used.

MDX SERIES

SUGGESTED PRINTED BOARD HOLE SIZES:
Suggest 0.045 [1.14] Ø hole for contact termination positions.
Suggest 0.123 ±0.003 [3.12 ±0.08] Ø hole for mounting connector with push-on fasteners.

Typical Part Number: MDX25S5R4NT2X
Typical Part Number: MDX50S5R4NT2X
### ORDERING INFORMATION - CODE NUMBERING SYSTEM

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

<table>
<thead>
<tr>
<th>STEP</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<td>EXAMPLE</td>
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<td>S</td>
<td>5</td>
<td>R7</td>
<td>N</td>
<td>T6</td>
<td>X</td>
<td>/AA</td>
<td>-14</td>
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</tbody>
</table>

#### STEP 1 - BASIC SERIES

MDX series.

#### STEP 2 - CONNECTOR VARIANTS

9, 15, 25, 37, 50

#### STEP 3 - CONNECTOR GENDER

S - Female - Industrial Level
PosiBand closed entry contacts

#### STEP 4 - CONTACT TERMINATION TYPE

- 2 - Solder cup.
- 3 - Solder, Straight Printed Board Mount with 0.170 [4.32] Tail Length.
- **32** - Solder, Straight Printed Board Mount with 0.375 [9.52] Tail Length.
- **33** - Solder, Straight Printed Board Mount with 0.500 [12.70] tail length.
- **4** - Solder, Right Angle (90°) Printed Board Mount with 0.450 [11.43] Contact Extension.
- 5 - Solder, Right Angle (90°) Printed Board Mount with 0.283 [7.19] Contact Extension.

#### STEP 5 - MOUNTING STYLE

- 0 - Mounting Hole, 0.120 [3.05] Ø.
- 02 - Mounting Hole, 0.154 [3.91] Ø.
- B - Bracket, Mounting, Right Angle (90°) Metal.
- B3 - Bracket, Mounting, Right Angle (90°) Metal with Cross Bar.
- B7 - Bracket, Mounting, Right Angle (90°) Plastic.
- B8 - Bracket, Mounting, Right Angle (90°) Plastic with Cross Bar.
- F - Float Mounts, Universal.
- P - Threaded Post, Brass, 0.225 [5.71] Length.
- P2 - Threaded Post, Nylon, 0.225 [5.71] Length.
- R - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Thread Fixed Female Jackscrews.
- R2 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Thread Fixed Female Jackscrews with Cross Bar.
- R3 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 0.120 [3.05] Ø Mounting Hole.
- R4 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Threads.
- R5 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Locknut.
- R6 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 0.120 [3.05] Ø Mounting Hole with Cross Bar.
- R7 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Threads with Cross Bar.
- R8 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Locknut with Cross Bar.
- S - Swaged Spacer, 4-40 Threads, 0.225 [5.71] Length.
- S2 - Swaged Spacer, 4-40 Threads, 0.125 [3.18] Length.
- S5 - Swaged Locknut, 4-40 Threads.
- S6 - Swaged Spacer with Push/on Fastener, 4-40 Threads, 0.225 [5.71] Length.
- S7 - Swaged Spacer with Push/on Fastener for use with Ferrite Inductor, 4-40 Threads, 0.375 [9.53] Length.

---

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

**For more information on ferrite inductors, see page 7.**

**Ferrite Inductor is available on contact types 32, 33, 4, 59 and 6 only.**

**VL, V3 and V5 locking systems are not available for connector variants 37 and 50. Jackscrews are highly recommended to minimize damage to contacts on variants with high mating forces.**

**Consult technical sales for availability.**
Euro-D series connectors are professional quality connectors recommended for use in sheltered, non-corrosive indoor or outdoor environments having normal ventilation, but without temperature or humidity controls. These fixed contact connectors meet the dimensional and performance requirements of IEC 60807-2, Performance Level Two.

Euro-D series connectors utilize precision machined contacts which are fixed within the connector body. The female contact is an open entry design contact, precision machined of high tensile phosphor bronze.

Six standard connector variants are offered in arrangements of 9, 15, 25, 29, 37 and 50 contacts. Each Euro-D connector variant is available with contact terminations for solder cup, wrap post and straight and right angle (90°) printed board mount terminations per standard European metric footprints. Euro-D series connectors are mateable and compatible with all D-subminiature connectors conforming to IEC 60807-2, IEC 60807-3 and MIL-DTL-24308.

A wide assortment of printed board mounting hardware, cable support hoods and locking systems is available from stock.

---

**EURO-D SERIES TECHNICAL CHARACTERISTICS**

**MATERIALS AND FINISHES:**

- **Insulator:** Nylon resin, UL 94V-0, black color.
- **Contacts:** Precision machined copper alloy.
- **Contact Plating:** Professional performance Gold flash over nickel plate. Other finishes available upon request.
- **Shells:** Steel with tin plate; zinc plate with chromate seal, stainless steel passivated. Other materials and finishes available upon request.
- **Mounting Spacers and Brackets:** Nylon; copper alloy or steel with zinc plate and chromate seal or tin plate; phosphor bronze with tin plate; stainless steel, passivated; polyester.
- **Push-On Fasteners:** Phosphor bronze or beryllium copper with tin plate.
- **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.

**MECHANICAL CHARACTERISTICS:**

- **Fixed Contacts:** Size 20 contact, male - 0.040 inch [1.02mm] mating diameter. Female contact - rugged open entry design.
- **Contact Retention in Insulator:** 6 lbs. [27N]

**CONTACT TERMINATIONS:**

- **Solder cup contacts - 0.042 inch [1.06mm] minimum hole diameter for 20 AWG [0.5mm²] wire maximum.**
- **Straight Printed Board Mount - 0.024 inch [0.61mm] termination diameter.**
- **Right Angle (90°) Printed Board Mount - 0.024 inch [0.61mm] termination diameter for European Metric Footprints.**

**Polarization:**

- Male shells may be dimpled for EMI/ESD ground paths.
- Trapezoidally shaped shells and polarized jackscrews.

**Mounting To Jackscrew Angle Brackets:**

- Rapid installation push-on fasteners and threaded riveted fasteners with 4-40 threads and polyester lock inserts.
- Jackscrews and vibration locking systems.

**CONTACT CURRENT RATING:**

- 7.5 amperes nominal.
- 0.008 ohms maximum.
- 5 G ohms.
- 1000 V r.m.s.
- 0.039 inch [1.0mm].
- 300 V r.m.s.

**CLIMATIC CHARACTERISTICS:**

- Temperature Range: -55°C to +125°C.
- Damp Heat, Steady State: 10 days.

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For RoHS options see page 20.
CONTACT VARIANTS
FACE VIEW OF MALE OR REAR VIEW OF FEMALE

STANDARD SHELL ASSEMBLY

OPTIONAL SHELL ASSEMBLY
WITH UNIVERSAL FLOAT MOUNTS (F)

<table>
<thead>
<tr>
<th>CONNECTOR VARIANT SIZES</th>
<th>A ±0.015 [0.38]</th>
<th>B ±0.005 [0.13]</th>
<th>B1 ±0.005 [0.13]</th>
<th>D ±0.005 [0.13]</th>
<th>D1 ±0.005 [0.13]</th>
<th>E ±0.015 [0.38]</th>
<th>G ±0.010 [0.25]</th>
<th>H ±0.010 [0.25]</th>
<th>I ±0.005 [0.13]</th>
</tr>
</thead>
<tbody>
<tr>
<td>9 F</td>
<td>1.213 [30.81]</td>
<td>0.643 [16.33]</td>
<td>0.984 [24.99]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
<td>0.759 [19.28]</td>
<td>0.422 [10.72]</td>
<td>0.233 [6.17]</td>
<td>0.422 [10.90]</td>
</tr>
<tr>
<td>37 M</td>
<td>2.729 [69.32]</td>
<td>2.182 [55.42]</td>
<td>2.500 [63.50]</td>
<td>0.329 [8.36]</td>
<td>0.494 [12.55]</td>
<td>2.272 [57.71]</td>
<td>0.422 [10.72]</td>
<td>0.230 [6.17]</td>
<td>0.426 [10.82]</td>
</tr>
<tr>
<td>37 F</td>
<td>2.729 [69.32]</td>
<td>2.159 [54.84]</td>
<td>2.500 [63.50]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
<td>2.272 [57.71]</td>
<td>0.422 [10.72]</td>
<td>0.230 [6.17]</td>
<td>0.426 [10.82]</td>
</tr>
</tbody>
</table>
SOLDER CUP TERMINATION

CODE 2

For solder cup contacts, specify code 2 in step 4 of ordering information.

Typical Part Number: ED15M200T6Z

STRAIGHT PRINTED BOARD MOUNT TERMINATION

CODE 36

For straight printed board mount contacts, specify code number in step 4 of ordering information.

Typical Part Number: ED25F36S60T0

RIGHT ANGLE (90°) PRINTED BOARD MOUNT TERMINATION

CODE 42 AND 52, 0.370 [9.40] CONTACT EXTENSION

ED***(42 or 52)** 0.370 [9.40] CONTACT EXTENSION

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>A*1</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED9*(42 or 52)**</td>
<td>1.04 [26.41]</td>
<td>0.984 [24.99]</td>
<td>0.420 [10.67]</td>
<td>0.370 [9.40]</td>
</tr>
<tr>
<td>ED16*(42 or 52)**</td>
<td>1.532 [38.91]</td>
<td>1.312 [33.32]</td>
<td>0.420 [10.67]</td>
<td>0.370 [9.40]</td>
</tr>
<tr>
<td>ED25*(42 or 52)**</td>
<td>2.072 [52.63]</td>
<td>1.852 [47.04]</td>
<td>0.420 [10.67]</td>
<td>0.370 [9.40]</td>
</tr>
<tr>
<td>ED29*(42 or 52)**</td>
<td>1.754 [44.55]</td>
<td>1.534 [38.96]</td>
<td>0.470 [11.94]</td>
<td>0.370 [9.40]</td>
</tr>
<tr>
<td>ED37*(42 or 52)**</td>
<td>2.720 [69.09]</td>
<td>2.500 [63.50]</td>
<td>0.420 [10.67]</td>
<td>0.370 [9.40]</td>
</tr>
<tr>
<td>ED50*(42 or 52)**</td>
<td>2.826 [71.85]</td>
<td>2.406 [61.11]</td>
<td>0.470 [11.94]</td>
<td>0.370 [9.40]</td>
</tr>
</tbody>
</table>

NOTE:
*1 “A” dimension applies for metal angle brackets only. Consult Accessories D-subminiature catalog for “A” dimension when plastic brackets are used.

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
SUGGESTED PRINTED BOARD HOLE SIZES:

Suggest 0.040 [1.02] Ø hole for contact termination positions.
Suggest 0.123 ±0.003 [3.12 ±0.08] Ø hole for mounting connector with push-on fasteners.

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
PROFESSIONAL QUALITY
FIXED CONTACT
STANDARD DENSITY D-SUBMINIATURE

ORDERING INFORMATION - CODE NUMBERING SYSTEM
Specify Complete Connector By Selecting An Option From Step 1 Through 8

<table>
<thead>
<tr>
<th>STEP</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ED</td>
<td>9</td>
<td>M</td>
<td>36</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0/AA</td>
<td>-14</td>
</tr>
</tbody>
</table>

**STEP 1 - BASIC SERIES**
ED series.

**STEP 2 - CONNECTOR VARIANTS**
9, 15, 25, 29, 37, 50

**STEP 3 - CONNECTOR GENDER**
M - Male
F - Female

**STEP 4 - CONTACT TERMINATION TYPE**
2 - Solder cup.
36 - Solder, Straight Printed Board Mount with 0.236 [5.99] Tail Length.
42 - Solder, Right Angle (90°) Printed Board Mount with 0.370 [9.40] Contact Extension.
44 - Solder, Inverted Right Angle (90°) Printed Board Mount with 0.370 [9.40] Contact Extension.
52 - Solder, Right Angle (90°) Printed Board Mount with 0.370 [9.40] Contact Extension.

*STEP 5 - MOUNTING STYLE*
0 - Mounting Hole, 0.120 [3.05] Ø.
02 - Mounting Hole, 0.154 [3.91] Ø.
B - Bracket, Mounting, Right Angle (90°) Metal.
B3 - Bracket, Mounting, Right Angle (90°) Metal with Cross Bar.
B7 - Bracket, Mounting, Right Angle (90°) Plastic.
B8 - Bracket, Mounting, Right Angle (90°) Plastic with Cross Bar.
P - Threaded Post, Brass, 0.225 [5.71] Length.
P2 - Threaded Post, Nylon, 0.225 [5.71] Length.
R - Bracket, Mounting, Right Angle (90°) Metal, Swaged to 4-40 Thread Fixed Female Jackscrews.
R2 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Thread Fixed Female Jackscrews with Cross Bar.
R3 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 0.120 [3.05] Ø Mounting Hole.
R4 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Threads.
R5 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Locknut.
R6 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 0.120 [3.05] Ø Mounting Hole with Cross Bar.
R7 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Threads with Cross Bar.
R8 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Locknut.
S - Swaged Spacer, 4-40 Threads, 0.225 [5.71] Length.
S2 - Swaged Spacer, 4-40 Threads, 0.125 [3.18] Length.
S3 - Swaged Locknut, 4-40 Threads.
S6 - Swaged Spacer with Push-on Fastener, 4-40 Threads, 0.225 [5.71] Length.
S7 - Swaged Spacer with Push-on Fastener for use with Ferrite Inductor, 4-40 Threads, 0.375 [9.53] Length.

*STEP 6 - HOODS AND PUSH-ON FASTENERS*
0 - None.
J - Hood, Top Opening, Plastic.
L - Hood, Side Opening, Plastic.
Y6 - Hood, Top Opening, Plastic with Rotating Male and Female Polarized Jackscrews. Available in size 50 only.
Z - 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 50 only.
**AN** - Lightweight Aluminum Hood, nickel finish.
**AC** - Lightweight Aluminum Hood, no finish.
W - Hood, Top or Side Opening, Plastic. Available in size 9, 15, and 25 only.
N - Push-on Fastener, for Right Angle (90°) Mounting Brackets.
**F** - Ferrite inductor.
**Q** - Ferrite inductor for use with Push-on Fastener and Right Angle (90°) Mounting Brackets.

**NOTE:** If compliance to environmental legislation is not required, this step will not be used. Example: ED9M360000

**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.

**STEP 8 - SHELL OPTIONS**
0 - Zinc plated with chromate seal.
**S** - Stainless steel, passivated.
X - Tin plated.
Z - Tin plated and dimpled (male connectors only).

**STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS**
/AA - Compliant per EU Directive 2002/95/EC (RoHS)

**STEP 10 - SPECIAL OPTIONS**
-14 - 0.000030 [0.76µ] gold over nickel.
-15 - 0.000050 [1.27µ] gold over nickel.

CONTACT TECHNICAL SALES FOR SPECIAL OPTIONS

* For additional information on accessories listed in steps 5, 6 and 7, see Accessory Catalog.
* Ferrite inductor is available on contact types 36 only. For more information on ferrite inductors, see page 7.
* VL, V3 and V5 locking systems are not available for connector variants 37 and 50. Jackscrews are highly recommended to minimize damage to contacts on variants with high mating forces.
* For stainless steel dimpled male versions contact Technical Sales.
* AN and AC hoods are not available for connector variant 29. Consult Technical Sales for availability.

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
**Soli-D Series Technical Characteristics**

<table>
<thead>
<tr>
<th>Materials and Finishes:</th>
<th>Mechanical Characteristics:</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Insulator:</strong> Glass filled nylon resin, UL 94V-0, black color.</td>
<td><strong>Removable Contacts:</strong> Insert contact to rear face of insulator and release from rear face of insulator. Size 20 contacts, male - 0.040 inch [1.02mm] mating diameter. Female - Robi-D contact open entry design.</td>
</tr>
<tr>
<td><strong>Contacts:</strong> Precision machined copper alloy.</td>
<td><strong>Contact Retention In Insulator:</strong> 6 lbs. [27 N].</td>
</tr>
<tr>
<td><strong>Contact Plating:</strong> Professional performance - gold flash over nickel plate. Other finishes available upon request.</td>
<td><strong>Contact Terminations:</strong> Closed barrel crimp, wire sizes 18 AWG [1.0mm] through 32 AWG [0.03mm]. Straight printed board mount terminations.</td>
</tr>
<tr>
<td><strong>Shells:</strong> Steel with tin plate; zinc plate with chrome seal; stainless steel passivated. Other materials and finishes available upon request.</td>
<td><strong>Shells:</strong> Male shells may be dimpled for EMI/ESD ground paths.</td>
</tr>
<tr>
<td><strong>Mounting Spacers:</strong> Nylon; copper alloy or steel with zinc plate and chrome seal or tin plate; phosphor bronze with tin plate; stainless steel, passivated.</td>
<td><strong>Polarization:</strong> Trapezoidally shaped shells and polarized jackscrews.</td>
</tr>
<tr>
<td><strong>Push-On Fasteners:</strong> Phosphor bronze with tin plate.</td>
<td><strong>Printed Board Mount:</strong> Rapid installation push-on fasteners.</td>
</tr>
<tr>
<td><strong>Jackscrew Systems:</strong> Brass or steel with zinc plate and chrome seal or clear zinc plate or tin plate; stainless steel, passivated.</td>
<td><strong>Locking Systems:</strong> J ackscrews and vibration locking systems.</td>
</tr>
<tr>
<td><strong>Vibration Lock Systems:</strong> Slide lock and lock tabs, steel with nickel plate.</td>
<td><strong>Mechanical Operations:</strong> 500 operations minimum per IEC 60512-5.</td>
</tr>
<tr>
<td><strong>Hoods:</strong> Composite and plastic, UL 94V-0; brass or steel with zinc plate and chrome seal. Aluminum; aluminum with electroless nickel plate. For aluminum hoods, zinc content is 1% maximum. Die cast zinc.</td>
<td><strong>ELECTRICAL CHARACTERISTICS:</strong></td>
</tr>
<tr>
<td><strong>Low magnetic versions are available, contact Technical Sales.</strong></td>
<td><strong>Contact Current Rating:</strong> 7.5 amperes nominal.</td>
</tr>
</tbody>
</table>

**CLIMATIC CHARACTERISTICS:**

- Temperature Range: -55°C to +125°C.
- Damp Heat, Steady State: 10 days.

**DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.
CONTACT VARIANTS
FACE VIEW OF MALE OR REAR VIEW OF FEMALE

STANDARD SHELL ASSEMBLY

OPTIONAL SHELL ASSEMBLY (0, 02)

OPTIONAL SHELL ASSEMBLY WITH UNIVERSAL FLOAT MOUNTS (F)
### PROFESSIONAL QUALITY
### REMOVABLE CONTACT
### STANDARD DENSITY D-SUBMINIATURE

**D-SUB**

---

**REMOVABLE CRIMP CONTACTS**

**CODE 1 AND 12**

CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

---

**FEMALE CONTACT**

**MALE CONTACT**

---

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>WIRE SIZE AWG/mm²</th>
<th>ØA</th>
<th>ØB</th>
<th>ØC</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC7520D</td>
<td>20 / 22 / 24</td>
<td>0.612</td>
<td>0.045</td>
<td>0.066</td>
</tr>
<tr>
<td>FC7526D</td>
<td>26 / 28 / 30</td>
<td>0.612</td>
<td>0.026</td>
<td>0.066</td>
</tr>
</tbody>
</table>

---

**PART NUMBER**

<table>
<thead>
<tr>
<th>WIRE SIZE AWG/mm²</th>
<th>ØA</th>
<th>ØB</th>
<th>ØC</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC7520D</td>
<td>0.612</td>
<td>0.066</td>
<td></td>
</tr>
<tr>
<td>FC7526D</td>
<td>0.612</td>
<td>0.066</td>
<td></td>
</tr>
</tbody>
</table>

---

**Note:** *C75*D contacts can not be used in the RD series.

---

**PLATING:**

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

**OPTIONAL FINISHES:**

- 0.000030 [0.76 µ] gold over nickel by adding “-14” suffix onto part number. Example: FC7520D-14
- 0.000050 inch [1.27µ] gold over nickel by adding “-15” suffix onto part number. Example: MC7526D-15

---

**REMOVABLE CRIMP CONTACTS**

**18 AWG CRIMP CONTACTS**

**18 AWG [1.0mm²]**

CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

---

**FEMALE CONTACT**

**MALE CONTACT**

---

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>WIRE SIZE AWG/mm²</th>
<th>ØA</th>
<th>ØB</th>
<th>ØC</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC7520D</td>
<td>20 / 22 / 24</td>
<td>0.618</td>
<td>0.045</td>
<td>0.066</td>
</tr>
<tr>
<td>MC7526D</td>
<td>26 / 28 / 30</td>
<td>0.618</td>
<td>0.026</td>
<td>0.066</td>
</tr>
</tbody>
</table>

---

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>WIRE SIZE AWG/mm²</th>
<th>ØA</th>
<th>ØB</th>
<th>ØC</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC7520D</td>
<td>0.618</td>
<td>0.066</td>
<td></td>
<td></td>
</tr>
<tr>
<td>MC7526D</td>
<td>0.618</td>
<td>0.066</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

**PLATING:**

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

**OPTIONAL FINISHES:**

- 0.000030 [0.76 µ] gold over nickel by adding “-14” suffix onto part number. Example: FC7518D-14
- 0.000050 inch [1.27µ] gold over nickel by adding “-15” suffix onto part number. Example: MC7518D-15

---

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

---

**For information regarding CRIMP TOOLS & CRIMPING TOOL TECHNIQUES, see page 78.**

---

**DIMENSIONS ARE IN INCHES [MILLIMETERS].**

**ALL DIMENSIONS ARE SUBJECT TO CHANGE.**
STRAIGHT PRINTED BOARD MOUNT TERMINATION

CODE 3 AND 32

<table>
<thead>
<tr>
<th>CODE NUMBER</th>
<th>L</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0.125 [3.18]</td>
</tr>
<tr>
<td>32</td>
<td>0.188 [4.78]</td>
</tr>
</tbody>
</table>

For straight printed board mount contacts specify code number in Step 4 of ordering information.

Typical Part Number: SD37F3S60T2X

Connectors Designed To Customer Specifications

Positronic D-subminiature connectors can be modified to customer specifications.

Examples: select loading of contacts for cost savings or to gain creepage and clearance distances; longer printed circuit board terminations; customer specified hardware; sealing for water resistance.

Contact Technical Sales with your particular requirements.
STRAIGHT PRINTED BOARD CONTACT HOLE PATTERN

SD9

0.492 [12.50] Sym.
0.216 [5.49] 0.108 [2.74] Typ.
0.054 [1.37] Typ.
0.112 [2.84]
0.162 [4.11]

SD15

0.656 Sym.
0.378 [9.60] 0.054 [1.37] Typ.
0.108 [2.74]
0.112 [2.84]
0.324 [8.23]

SD25

0.926 [23.52] Sym.
0.652 [16.56] 0.109 [2.77] Typ.
0.055 [1.37] Typ.
0.598 [15.19]
0.112 [2.84]

SD37

1.250 [31.75] Sym.
0.978 [24.84]
0.109 [2.77] Typ.
0.055 [1.40] Typ.
0.924 [23.47]

SD50

1.203 [30.56] Sym.
0.870 [22.10]
0.109 [2.77] Typ.
0.055 [1.40] Typ.
0.815 [21.70]

SUGGESTED PRINTED BOARD HOLE SIZES:
Suggest 0.045 [1.14] Ø hole for contact termination positions.
Suggest 0.123 ±0.003 [3.12 ±0.08] Ø hole for mounting connector with push-on fasteners.

SD37M3S600Z

SD25F3S600X
ORDERING INFORMATION - CODE NUMBERING SYSTEM

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

<table>
<thead>
<tr>
<th>STEP</th>
<th>EXAMPLE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SD 15</td>
</tr>
<tr>
<td>2</td>
<td>F 0</td>
</tr>
<tr>
<td>3</td>
<td>0</td>
</tr>
<tr>
<td>4</td>
<td>0</td>
</tr>
<tr>
<td>5</td>
<td>0</td>
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<td>6</td>
<td>0</td>
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<td>7</td>
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</tr>
<tr>
<td>9</td>
<td>-14</td>
</tr>
<tr>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

STEP 1 - BASIC SERIES
SD series.

STEP 2 - CONNECTOR VARIANTS
9, 15, 25, 37, 50

STEP 3 - CONNECTOR GENDER
M - Male
F - Female

STEP 4 - CONTACT TERMINATION TYPE
0 - Contacts ordered separately, see page 23.
1 - Crimp, 20 AWG-24 AWG [0.5mm²-0.25mm²].
12 - Crimp, 26 AWG-30 AWG [0.12mm²-0.05mm²].
3 - Solder, Straight Printed Board Mount with 0.125 [3.18] Tail Length.
32 - Solder, Straight Printed Board Mount with 0.188 [4.78] Tail Length.

*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.
P - Threaded Post, Brass, 0.437 [11.10] Length.
P2 - Threaded Post, Nylon, 0.437 [11.10] Length.
S - Swaged Spacer, 4-40 Threads, 0.437 [11.10] Length.
S2 - Swaged Spacer, 4-40 Threads, 0.125 [3.18] Length.
S5 - Swaged Locknut, 4-40 Threads.
S6 - Swaged Spacer with Push-on Fastener, 4-40 Threads, 0.437 [11.10] Length.

*1 STEP 6 - HOODS
0 - None.
J - Hood, Top Opening, Plastic.
L - Hood, Side Opening, Plastic.
Y6 - Hood, Top Opening, Plastic with Rotating Male and Female Polarized Jackscrews. Available in size 50 only.
Z - Hood, Top or Side Opening, Robust and Extended Height. Composite and Plastic with Rotating Male Jackscrews.
H - Hood, Top Opening, Metal. Available in size 15, 25, 37, and 50 only.
G - Hood, EMI/RFI, Die Cast Zinc.
AN - Lightweight Aluminum Hood, nickel finish.
AC - Lightweight Aluminum Hood, no finish.
W - Hood, Top or Side Opening, Plastic. Available in size 9,15, and 25 only.

*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.

*1 For additional information on accessories listed in steps 5, 6 and 7, see Accessory Catalog.
**VL, V3 and V5 locking systems are not available for connector variants 37 and 50. Jackscrews are highly recommended to minimize damage to contacts on variants with high mating forces.
**S For stainless steel dimpled male versions contact Technical Sales.

For information regarding CRIMP TOOLS & CRIMPING TOOL TECHNIQUES, see page 78.
Harmo-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 fixed contact connectors are qualified to MIL-DTL-24308 (see page 82 for more information) and meet the performance requirements of IEC 60807-2, Performance Level One.

Harmo-D series connectors utilize precision machined contacts which are fixed within the connector body. The female contact features Positronic’s unique PosiBand closed entry design, see page 1 for details.

Five standard connector variants are offered in arrangements of 9, 15, 25, 37 and 50 contacts. Each connector variant is available with contact terminations for solder cup, wrap post and straight and right angle (90°) printed board mount terminations with Inch and Metric footprints. Harmo-D series connectors are mateable and compatible with all D-subminiature connectors conforming to IEC 60807-2, IEC 60807-3 and MIL-DTL-24308.

A wide assortment of printed board mounting hardware, cable support hoods and locking systems is available from stock.

HARMO-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 microns] gold over copper plate. IEC 60807-2, 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 and Brackets:** Nylon; copper alloy or steel with zinc plate and chromate seal or tin plate; phosphor bronze with tin plate; stainless steel, passivated; polyester.
- **Push-On Fasteners:** 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:

- **Fixed Contacts:** Size 20 contact, male - 0.040 inch [1.02mm] mating diameter. Female contact - PosiBand closed entry design, see page 1 for details.
- **Contact Retention In Insulator:** 9 lbs. [40 N].
- **Contact Terminations:** Solder cup contacts - 0.042 inch [1.06mm] minimum hole diameter in solder style contact for 20 AWG [0.5mm²] wire maximum. Straight Printed Board Mount - 0.028 inch [0.71mm] termination diameter and 0.024 inch [0.61mm] termination diameter.

Right Angle (90°) Printed Board Mount - 0.028 [0.71mm] termination diameter for Inch System footprint, and 0.024 [0.61mm] termination diameter for European Metric footprint.

- **Mounting To Angle Brackets:** Jackscrews and riveted fasteners with 0.120 inch (3.05mm) clearance hole, and threaded riveted fasteners with 4-40 threads and polyester lock inserts.
- **Mounting To Printed Board:** Rapid installation push-on fasteners an mounting posts.
- **Locking Systems:** Jackscrews and vibration locking systems.
- **Mechanical Operations:** 1000 operations minimum per IEC 60512-5.

ELECTRICAL CHARACTERISTICS:

- **Contact Current Rating, Tested per UL 1977:**
  - 18 amperes, 2 contacts energized.
  - 14 amperes, 6 contacts energized.
  - 11 amperes, 10 contacts energized.
  - 9 amperes, 25 contacts energized.
  - 5 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.
- **Insulator 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:** 56 days.

THERMOCOUPLE CONTACTS:

- Straight and right angle (90°) printed circuit board mount contacts are available, please contact Technical Sales for details.
- Size 20 crimp contacts are available in RD series, see page 36 for details.

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
**CONTACT VARIANTS**

FACE VIEW OF MALE OR REAR VIEW OF FEMALE

**STANDARD SHELL ASSEMBLY**

**OPTIONAL SHELL ASSEMBLY (0, 02)**

**OPTIONAL SHELL ASSEMBLY WITH UNIVERSAL FLOAT MOUNTS (F)**

**CONNECTOR VARIANT SIZES**

<table>
<thead>
<tr>
<th>CONNECTOR VARIANT SIZES</th>
<th>A ±0.015 [0.38]</th>
<th>B ±0.005 [0.13]</th>
<th>B1 ±0.005 [0.13]</th>
<th>C ±0.005 [0.13]</th>
<th>D ±0.005 [0.13]</th>
<th>D1 ±0.005 [0.13]</th>
<th>E ±0.015 [0.38]</th>
<th>G ±0.010 [0.25]</th>
<th>H ±0.010 [0.25]</th>
<th>K ±0.005 [0.13]</th>
<th>M ±0.010 [0.25]</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDC 9 S</td>
<td>1.213 [30.81]</td>
<td>0.643 [16.33]</td>
<td>0.984 [24.99]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
<td>0.759 [19.28]</td>
<td>0.422 [10.72]</td>
<td>0.233 [5.92]</td>
<td>0.422 [10.72]</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HDC 37 S</td>
<td>2.729 [69.32]</td>
<td>2.159 [54.84]</td>
<td>2.600 [63.50]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
<td>2.272 [57.71]</td>
<td>0.422 [10.72]</td>
<td>0.243 [6.17]</td>
<td>0.429 [10.90]</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**DIMENSIONS ARE IN INCHES [MILLIMETERS].**

ALL DIMENSIONS ARE SUBJECT TO CHANGE.
SOLDER CUP TERMINATION
CODE 2

For solder cup contacts, specify code 2 in step 4 of ordering information.

Typical Part Number: HDC15M200T2Z

STRAIGHT PRINTED BOARD MOUNT TERMINATION
CODE 3, 32, 33, AND 36

<table>
<thead>
<tr>
<th>CODE NUMBER</th>
<th>L</th>
<th>ØD</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>0.170 [4.32]</td>
<td>0.028 [0.71]</td>
</tr>
<tr>
<td>32</td>
<td>0.375 [9.53]</td>
<td>0.028 [0.71]</td>
</tr>
<tr>
<td>33</td>
<td>0.500 [12.70]</td>
<td>0.028 [0.71]</td>
</tr>
<tr>
<td>36</td>
<td>0.236 [6.00]</td>
<td>0.024 [0.61]</td>
</tr>
</tbody>
</table>

For straight printed board mount contacts, specify code no. in step 4 of ordering information.

Typical Part Number: HDC25S33S60T0

WRAP POST TERMINATION
CODE 6

For wrap post contacts, specify code 6 in step 4 of ordering information.

Typical part number: HDC15S600T0
RIGHT ANGLE (90°) PRINTED BOARD MOUNT TERMINATION
CODE 5, 0.283 [7.19] CONTACT EXTENSION

HDC**5**** 0.283 [7.19] CONTACT EXTENSION

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>A****</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDC95****</td>
<td>1.204</td>
<td>0.984</td>
<td>0.339</td>
<td>0.283</td>
<td>0.112</td>
</tr>
<tr>
<td>HDC155****</td>
<td>1.532</td>
<td>1.312</td>
<td>0.339</td>
<td>0.283</td>
<td>0.112</td>
</tr>
<tr>
<td>HDC255****</td>
<td>2.072</td>
<td>1.852</td>
<td>0.339</td>
<td>0.283</td>
<td>0.112</td>
</tr>
<tr>
<td>HDC375****</td>
<td>2.720</td>
<td>2.500</td>
<td>0.339</td>
<td>0.283</td>
<td>0.112</td>
</tr>
<tr>
<td>HDC505****</td>
<td>3.266</td>
<td>3.046</td>
<td>0.396</td>
<td>0.283</td>
<td>0.112</td>
</tr>
</tbody>
</table>

NOTE:
*1 "A" dimension applies for metal angle brackets only. Consult Accessories D-subminiature catalog for "A" dimension when plastic brackets are used.

Typical Part Number: HDC25M5R7NT2X

RIGHT ANGLE (90°) PRINTED BOARD MOUNT TERMINATION
CODE 42, 0.370 [9.40] CONTACT EXTENSION

HDC**42**** 0.370 [9.40] CONTACT EXTENSION

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>A****</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>HDC942****</td>
<td>1.204</td>
<td>0.984</td>
<td>0.420</td>
<td>0.370</td>
<td>0.100</td>
</tr>
<tr>
<td>HDC1542****</td>
<td>1.532</td>
<td>1.312</td>
<td>0.420</td>
<td>0.370</td>
<td>0.100</td>
</tr>
<tr>
<td>HDC2542****</td>
<td>2.072</td>
<td>1.852</td>
<td>0.420</td>
<td>0.370</td>
<td>0.100</td>
</tr>
<tr>
<td>HDC3742****</td>
<td>2.720</td>
<td>2.500</td>
<td>0.420</td>
<td>0.370</td>
<td>0.100</td>
</tr>
<tr>
<td>HDC5042****</td>
<td>3.266</td>
<td>3.046</td>
<td>0.470</td>
<td>0.370</td>
<td>0.100</td>
</tr>
</tbody>
</table>

NOTE:
*1 "A" dimension applies for metal angle brackets only. Consult Accessories D-subminiature catalog for "A" dimension when plastic brackets are used.

Typical Part Number: HDC25M42B30T2X
HDC SERIES

RIGHT ANGLE (90°) AND STRAIGHT PRINTED BOARD CONTACT HOLE PATTERN
MOUNT CONNECTOR WITH MATING FACE POSITIONED TO FOLLOW DIRECTION OF ARROW.

SUGGESTED PRINTED BOARD HOLE SIZES:
Suggest 0.039 [0.99] Ø hole for 0.024 [0.61] Ø contact termination positions.
Suggest 0.045 [1.14] Ø hole for 0.028 [0.71] Ø contact termination positions.
Suggest 0.123 ±0.003 [3.12 ±0.08] Ø hole for mounting connector with push-on fasteners.

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.
# Ordering Information - Code Numbering System

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

| STEP 1 - BASIC SERIES | HDC | 37 | S | 5 | B3 | 0 | T | 0 | /AA |

**NOTE:** If compliance to environmental legislation is not required, this step will not be used. Example: HDC37S5B30T0

**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 ORDERING DETAILS OF THE FOLLOWING:
Other Special Requirements.
Straight and Right Angle (90°) Thermocouple printed circuit board mount contacts

**STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS**
/AA - Compliant per EU Directive 2002/95/EC (RoHS)

**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.

**STEP 6 - HOODS AND PUSH-ON FASTENERS**
0 - None.
J - Hood, Top Opening, Plastic.
L - Hood, Side Opening, Plastic.
Y6 - Hood, Top Opening, Plastic with Rotating Male and Female Polarized Jackscrews. Available in size 50 only.
Z - Hood, Top or Side Opening, Robust and Extended Height, Composite and Plastic with Rotating Male Jackscrews.
H - Hood, Top Opening, Metal. Available in size 15, 25, 37 and 50 only.
G - Hood, EMI/RFI, Die Cast Zinc.
AN - Lightweight Aluminum Hood, nickel finish.
AC - Lightweight Aluminum Hood, no finish.
W - Hood, Top or Side Opening, Plastic. Available is size 9, 15, and 25 only.
N - Push-on Fastener, for Right Angle (90°) Mounting Brackets.
**F** - Ferrite Inductor.

**STEP 5 - MOUNTING STYLE**
0 - Mounting Hole, 0.120 [3.05] Ø.
02 - Mounting Hole, 0.154 [3.91] Ø.
B3 - Bracket, Mounting, Right Angle (90°) Metal with Cross Bar.
B8 - Bracket, Mounting, Right Angle (90°) Plastic with Cross Bar.
F - Float Mounts, Universal.
P - Threaded Post, Brass, 0.225 [5.71] Length.
P2 - Threaded Post, Nylon, 0.225 [5.71] Length.
R2 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Thread Fixed Female Jackscrews with Cross Bar.
R6 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 0.120 [3.05] Ø Mounting Hole with Cross Bar.
R7 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Threads with Cross Bar.
R8 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Locknut with Cross Bar.
S - Swaged Spacer, 4-40 Threads, 0.225 [5.71] Length.
S2 - Swaged Spacer, 4-40 Threads, 0.125 [3.18] Length.
S5 - Swaged Locknut, 4-40 Threads.
S6 - Swaged Spacer with Push-on Fastener, 4-40 Threads, 0.225 [5.71] Length.
S7 - Swaged Spacer with Push-on Fastener for use with Ferrite Inductor, 4-40 Threads, 0.375 [9.53] Length.

**STEP 4 - CONTACT TERMINATION TYPE**
2 - Solder cup.
3 - Solder, Straight Printed Board Mount with 0.170 [4.32] Tail Length.
32 - Solder, Straight Printed Board Mount with 0.375 [9.52] Tail Length.
33 - Solder, Straight Printed Board Mount with 0.500 [12.70] tail length.
36 - Solder, Straight Printed Board Mount with 0.236 [5.99] Tail Length.
42 - Solder, Metric System Right Angle (90°) Printed Board Mount with 0.370 [9.40] Contact Extension.
5 - Solder, Right Angle (90°) Printed Board Mount with 0.283 [7.19] Contact Extension.
6 - Wrap Post.

**STEP 3 - CONNECTOR GENDER**
M - Male
S - Female - PosiBand closed entry contacts

**STEP 2 - CONNECTOR VARIANTS**
9, 15, 25, 37, 50

**STEP 1 - BASIC SERIES**
HDC series.

**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.

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

**Ferrite Inductor is available on contact types 32, 33, 36 and 6 only. For more information on ferrite inductors, see page 7.

**For stainless steel dimpled male versions contact Technical Sales.**
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 PosisBand closed entry system, see page 1 for details. “Robi-D” 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.

### 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 microns] 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 - PosisBand closed entry design, see page 1 for details.

### ELECTRICAL CHARACTERISTICS:
- **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 PosisBand closed entry female contact.

### CLIMATIC CHARACTERISTICS:
- **Temperature Range:** -55°C to +125°C.
- **Damp Heat, Steady State:** 21 days.

### DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
CONTACT VARIANTS
FACE VIEW OF MALE OR REAR VIEW OF FEMALE

STANDARD SHELL ASSEMBLY

OPTIONAL SHELL ASSEMBLY (0, 02)

OPTIONAL SHELL ASSEMBLY WITH UNIVERSAL FLOAT MOUNTS (F)

DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.
### REMOVABLE CRIMP CONTACTS
#### CODE 1 AND 12

**CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.**

**QUALIFIED TO SAE AS39029**

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

<table>
<thead>
<tr>
<th>CONTACT</th>
<th>COLOR CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALE CONTACT</td>
<td>ORANGE/BLUE/WHITE</td>
</tr>
<tr>
<td>FEMALE CONTACT</td>
<td>ORANGE/BLUE/GRAY</td>
</tr>
</tbody>
</table>

**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

**For information regarding CRIMP TOOLS & CRIMPING TOOL TECHNIQUES, see page 78.**

---

**FEMALE CONTACT**

**"CLOSED ENTRY" DESIGN**

<table>
<thead>
<tr>
<th>FEMALE PART NUMBER</th>
<th>WIRE SIZE AWG/(\text{mm}^2)</th>
<th>(\varnothing_A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FC6020D2</td>
<td>20 / 22 / 24 (0.5/0.3/0.25)</td>
<td>0.045 [1.14]</td>
</tr>
<tr>
<td>FC6026D2</td>
<td>26 / 28 / 30 (0.12/0.08/0.06)</td>
<td>0.027 [0.69]</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MALE CONTACT</th>
<th>WIRE SIZE AWG/(\text{mm}^2)</th>
<th>(\varnothing_A)</th>
</tr>
</thead>
<tbody>
<tr>
<td>MC6020D</td>
<td>20 / 22 / 24 (0.5/0.3/0.25)</td>
<td>0.045 [1.14]</td>
</tr>
<tr>
<td>MC6026D</td>
<td>26 / 28 / 30 (0.12/0.08/0.06)</td>
<td>0.027 [0.69]</td>
</tr>
</tbody>
</table>

**Note:** FC602*D2 and MC602*D contacts can be used in the SD series.
REMOVABLE CRIMP CONTACTS
18 AWG CRIMP CONTACTS
18 AWG [1.0mm²]

CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

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

REMOVABLE THERMOCOUPLE CRIMP CONTACT
CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

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

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.

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For information regarding CRIMP TOOLS & CRIMPING TOOL TECHNIQUES, see page 78.
# ORDERING INFORMATION - CODE NUMBERING SYSTEM

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

## RD SERIES

### STEP 1 - BASIC SERIES

<table>
<thead>
<tr>
<th>EXAMPLE</th>
<th>RD</th>
<th>25</th>
<th>S</th>
<th>1</th>
<th>0</th>
<th>J</th>
<th>VL</th>
<th>0</th>
<th>/AA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Example</strong></td>
<td>RD</td>
<td>25</td>
<td><strong>S</strong></td>
<td>1</td>
<td>0</td>
<td><strong>J</strong></td>
<td><strong>VL</strong></td>
<td>0</td>
<td><strong>/AA</strong></td>
</tr>
</tbody>
</table>

### STEP 2 - CONNECTOR VARIANTS

<table>
<thead>
<tr>
<th><strong>9, 15, 25, 29, 37, 50</strong></th>
</tr>
</thead>
</table>

### STEP 3 - CONNECTOR GENDER

- **M** - Male
- **S** - Female - PosiBand closed entry contacts

### STEP 4 - CONTACT TERMINATION TYPE

- **0** - Contacts ordered separately, see pages 35-36.
- **1** - Crimp, 20 AWG-24 AWG [0.5mm²-0.25mm²].
- **12** - Crimp, 26 AWG-30 AWG [0.12mm²-0.05mm²].

### 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.

### STEP 6 - HOODS

- **0** - None.
- **J** - Hood, Top Opening, Plastic.
- **L** - Hood, Side Opening, Plastic.
- **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.
- **AN** - Lightweight Aluminum Hood, nickel finish.
- **AC** - Lightweight Aluminum Hood, no finish.
- **W** - Hood, Top or Side Opening, Plastic. Available in size 9,15, and 25 only.

### 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.

### STEP 8 - SHELL OPTIONS

- **0** - Zinc Plated with Chromate Seal.
- **S** - Stainless steel, passivated.
- **X** - Tin Plated.
- **Z** - Tin Plated and Dimpled (male connectors only).
- **C** - Cadmium plated with Chromate Seal.

### STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS

**/AA** - Compliant per EU Directive 2002/95/EC (RoHS)

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

### 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**

**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.

For information regarding **CRIMP TOOLS & CRIMPING TOOL TECHNIQUES**, see page 78.
Polarization:
Trapezoidally shaped shells and polarized jackscrews.

Locking Systems:
Jackscrews and vibration locking systems.

Mechanical Operations:
500 operations minimum per IEC 60512-5 for "Robi-D" Open Entry design.
1000 operations minimum per IEC 60512-5 for PosiBand closed entry female contact.

ELECTRICAL CHARACTERISTICS:
Contact Current Rating:
Open Entry Contacts: 7.5 amperes nominal
Closed Entry Contacts, 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: 0.008 ohms maximum for open entry
Proof Voltage: 1000 V r.m.s.
Insulator Resistance: 5 G ohms.
Clearance and Creepage Distance [minimum]: 0.039 inch [1.0mm].
Working Voltage: 300 V r.m.s.

CLIMACTIC CHARACTERISTICS:
Temperature Range: -55°C to +125°C.
Damp Heat, Steady State: 10 days.

THERMOCOUPLE CONTACTS:
Size 20 crimp contacts are available. See page 41 for details.
Printed circuit board mount contacts are available in HDC series, see page 27 for details.

ORD SERIES TECHNICAL CHARACTERISTICS

MATERIALS AND FINISHES:
Insulators: Glass filled DAP per ASTM-D-5948, SDG-F, UL 94V-0, green color.
Contacts: Precision machined copper alloy.
Contact Plating: Industrial performance - gold flash over nickel plate. Other finishes available upon request.
Shells: Steel with tin plate; zinc 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.
Vibration Lock Systems: Slide lock and lock tabs, steel with nickel plate.
Jackscrew Systems: Brass or steel with zinc plate and chromate seal or clear zinc plate or tin plate; stainless steel, passivated.
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 contacts - rugged "Robi-D" open entry design or 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 24 AWG [0.25mm²].
Shells: Tin-plated male shells may be dimpled for EMI/ESD ground paths.

Six standard contact variants are offered in arrangements of 9, 15, 25, 29, 37, and 50 contacts. ORD 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.

For RoHS options see page 42.
CONTACT VARIANTS
FACE VIEW OF MALE OR REAR VIEW OF FEMALE

STANDARD SHELL ASSEMBLY

OPTIONAL SHELL ASSEMBLY (0, 02)

OPTIONAL SHELL ASSEMBLY WITH UNIVERSAL FLOAT MOUNTS (F)
D-Sub

PROFESSIONAL / INDUSTRIAL QUALITY
REMOVABLE CONTACT
STANDARD DENSITY D-SUBMINIATURE

REMOVABLE CRIMP CONTACTS
CODE 1
CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

FEMALE CONTACT
“CLOSED ENTRY” DESIGN

MALE CONTACT

<table>
<thead>
<tr>
<th>FEMALE CONTACT</th>
<th>MALE CONTACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>PART NUMBER</td>
<td>PART NUMBER</td>
</tr>
<tr>
<td>FC6020D2</td>
<td>MC6020D</td>
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<tr>
<td>FC6026D2</td>
<td>MC6026D</td>
</tr>
<tr>
<td>WIRE SIZE</td>
<td>WIRE SIZE</td>
</tr>
<tr>
<td>AWG/ [mm²]</td>
<td>AWG/ [mm²]</td>
</tr>
<tr>
<td>ØA</td>
<td>ØA</td>
</tr>
<tr>
<td>20 / 22 / 24</td>
<td>20 / 22 / 24</td>
</tr>
<tr>
<td>[0.5 / 0.3 / 0.25]</td>
<td>[0.5 / 0.3 / 0.25]</td>
</tr>
<tr>
<td>0.045</td>
<td>0.045</td>
</tr>
<tr>
<td>0.027</td>
<td>0.027</td>
</tr>
</tbody>
</table>

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

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: FC6120D2-14
0.000050 inch [1.27] gold over nickel by adding “-15” suffix onto part number. Example: FC6120D-15

FEMALE CONTACT
“ROBI-D OPEN ENTRY” DESIGN

<table>
<thead>
<tr>
<th>FEMALE CONTACT</th>
</tr>
</thead>
<tbody>
<tr>
<td>PART NUMBER</td>
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<tr>
<td>FC6120D</td>
</tr>
<tr>
<td>WIRE SIZE</td>
</tr>
<tr>
<td>AWG/ [mm²]</td>
</tr>
<tr>
<td>ØA</td>
</tr>
<tr>
<td>20 / 22 / 24</td>
</tr>
<tr>
<td>[0.5 / 0.3 / 0.25]</td>
</tr>
</tbody>
</table>

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

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: FC6120D-14
0.000050 inch [1.27] gold over nickel by adding “-15” suffix onto part number. Example: FC6120D-15

For information regarding CRIMP TOOLS & CRIMPING TOOL TECHNIQUES, see page 78.
**REMOVABLE CRIMP CONTACTS**

**18 AWG CRIMP CONTACTS**

18 AWG [1.0mm²]

**FEMALE CONTACT**

*ROBI-D OPEN ENTRY* DESIGN

**MALE CONTACT**

**PLATING:**

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

**OPTIONAL FINISHES:**
- 0.000030 [0.000076] gold over nickel by adding “-14” suffix onto part number. Example: FC6118D-14
- 0.000050 inch [0.000127] gold over nickel by adding “-15” suffix onto part number. Example: MC6018D-15

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

**REMOVABLE THERMOCOUPLE CRIMP CONTACTS**

CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

**FEMALE CONTACT**

*“CLOSED ENTRY”* DESIGN

**MALE CONTACT**

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.

**TYPE**

**MATERIAL**

**FEMALE PART NUMBER**

**MALE PART NUMBER**

**COLOR CODE**

**WIRE SIZE AWG [mm²]**

**ØA**

**ØB**

K

CHROMEL (+)

FC6020D2CH††

MC6020DCH†

WHITE

20 / 22 / 24 [0.5 / 0.3 / 0.25]

0.066 [1.68]

0.045 [1.14]

ALUMEL (-)

FC6020D2AL††

MC6020DAL†

GREEN

20 / 22 / 24 [0.5 / 0.3 / 0.25]

0.066 [1.68]

0.045 [1.14]

COPPER (+)

FC6020D2CU††

MC6020DCU†

RED

20 / 22 / 24 [0.5 / 0.3 / 0.25]

0.066 [1.68]

0.045 [1.14]

CONSTANTAN (-)

FC6020D2CO††

MC6020DCO†

YELLOW

20 / 22 / 24 [0.5 / 0.3 / 0.25]

0.066 [1.68]

0.045 [1.14]

T

CHROMEL (+)

FC6020D2CH††

MC6020DCH†

WHITE

26 / 28 / 30 [0.12 / 0.08 / 0.05]

0.048 [1.23]

0.027 [0.69]

ALUMEL (-)

FC6020D2AL††

MC6020DAL†

GREEN

26 / 28 / 30 [0.12 / 0.08 / 0.05]

0.048 [1.23]

0.027 [0.69]

CONSTANTAN (-)

FC6020D2CO††

MC6020DCO†

YELLOW

26 / 28 / 30 [0.12 / 0.08 / 0.05]

0.048 [1.23]

0.027 [0.69]

E

CHROMEL (+)

FC6020D2CH††

MC6020DCH†

WHITE

26 / 28 / 30 [0.12 / 0.08 / 0.05]

0.048 [1.23]

0.027 [0.69]

CONSTANTAN (-)

FC6020D2CO††

MC6020DCO†

YELLOW

26 / 28 / 30 [0.12 / 0.08 / 0.05]

0.048 [1.23]

0.027 [0.69]

†Dimensionally equivalent to M39029/64-369

††Dimensionally equivalent to M39029/63-368

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

For more information on CRIMP TOOLS & CRIMPING TOOL TECHNIQUES, see page 78.
**ORDERING INFORMATION - CODE NUMBERING SYSTEM**

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

<table>
<thead>
<tr>
<th>STEP</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
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<td>EXAMPLE</td>
<td>ORD</td>
<td>9</td>
<td>M</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Z</td>
<td>/AA</td>
<td>-14</td>
</tr>
</tbody>
</table>

**STEP 1 - BASIC SERIES**

ORD series

**STEP 2 - CONNECTOR VARIANTS**

9, 15, 25, 29, 37, 50

**STEP 3 - CONNECTOR GENDER**

M - Male  
F - Female - Professional Level  
S - Female - Industrial Level  
PosiBand closed entry contacts

**STEP 4 - CONTACT TERMINATION TYPE**

0 - Contacts ordered separately, see pages 40-41.  
1 - Crimp, 20 AWG-24 AWG [0.5mm²-0.25mm²].

**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.

**STEP 6 - HOODS**

0 - None.  
J - Hood, Top Opening, Plastic.  
L - Hood, Side Opening, Plastic.  
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 50 only.  
**AN - Lightweight Aluminum Hood, nickel finish.**  
**AC - Lightweight Aluminum Hood, no finish.**  
W - Hood, Top or Side Opening, Plastic. Available in size 9, 15, and 25 only.

**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 Male Jackscrews.  
T2 - Fixed Male 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.

**STEP 8 - SHELL OPTIONS**

0 - Zinc plated, with chromate seal.  
C - Cadmium plated with chromate seal.  
**S - Stainless steel, passivated.**  
X - Tin plated.  
Z - Tin plated and dimpled (male connectors only).

**STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS**

/AA - Compliant per EU Directive 2002/95/EC (RoHS)

**NOTE:** If compliance to environmental legislation is not required, this step will not be used. Example: ORD9M0000Z

**STEP 10 - SPECIAL OPTIONS**

-14 - 0.000030 [0.76µ] gold over nickel.  
-15 - 0.000050 [1.27µ] gold over nickel.

**CONTACT TECHNICAL SALES FOR SPECIAL OPTIONS**

**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.

For information regarding **CRIMP TOOLS & CRIMPING TOOL TECHNIQUES**, see page 78.
ODD series connectors are professional / industrial quality high density connectors recommended for use in sheltered, non-corrosive indoor environments having normal ventilation.

ODD series connectors utilize precision machined, removable contacts having closed barrel crimp terminations and solder cup wire terminations. For printed board mount application, straight solder printed board mount and right angle (90°) angled solder terminations are available.

Six standard contact variants are offered in arrangements of 15, 26, 44, 62, 78, and 104 contacts. ODD series connectors are mateable and compatible with other high density D-subminiature connectors conforming to MIL-DTL-24308, and are UL and CSA recognized.

A wide variety of unique accessories are available.

**ODD SERIES TECHNICAL CHARACTERISTICS**

**MATERIALS AND FINISHES:**
- **Insulators:** Glass filled polyester per ASTM D5927. UL 94V-0, black color.
- **Contacts:** Precision machined copper alloy.
- **Contact Plating:** Professional quality - gold flash over nickel plate. Other finishes available upon request.
- **Shells:** Steel with tin plate; zinc 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 clear zinc plate or tin plate; stainless steel, passivated.
- **Vibration Lock Systems:** Slide lock and lock tabs, steel with nickel plate.
- **Push-On Fasteners:** Phosphor bronze or beryllium copper with tin plate.
- **Jackscrew Systems:** Brass or steel with zinc plate and chromate seal or clear zinc plate or tin plate; stainless steel, passivated.
- **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.

**MECHANICAL CHARACTERISTICS:**
- **Removable Contacts:** Insert contact to rear face of insulator and release from rear face of insulator. Size 22 contact, male - 0.030 inch [0.76mm] mating diameter. Female contacts - rugged "Robi-D" open entry design or PosiBand closed entry design, see page 1 for details.
- **Fixed Contacts, Board Mounted Applications:** Female open entry contacts - both rugged Robi-D design and standard design available to customer requirements. Close entry contacts are PosiBand design, see page 1 for details.
- **Contact Retention In Insulator:** 9 lbs. [40 N].

**ELECTRICAL CHARACTERISTICS:**
- **Contact Terminations:** Closed barrel crimp, wire sizes 22 AWG [0.3mm²] through 30 AWG [0.05mm²]. Solder cup wire, 0.035 inch [0.89mm] hole diameter for 22 AWG [0.3mm²] wire maximum. 0.020 inch [0.5mm] or 0.030 inch [0.76mm] termination diameter straight and Right Angle (90°) printed board mount contact terminations.
- **Shells:** Male shells may be dimpled for EMI/ESD ground paths.
- **Polarization:** Trapezoidally shaped shells and polarized jackscrews.
- **Mounting To Angle Brackets:** Jackscrews and vibration locking systems.
- **Mounting To Printed Board:** Rapid installation push-on fasteners and mounting posts.
- **Locking Systems:** Jackscrews and vibration locking systems.
- **Mechanical Operations:** 500 operations minimum per IEC 60512-5 for open entry female contact. 1000 operations minimum per IEC 60512-5 for PosiBand closed entry female contact.

**DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.**
### CONTACT VARIANTS

**FACE VIEW OF MALE OR REAR VIEW OF FEMALE**

![Connectors Diagram](image)

### STANDARD SHELL ASSEMBLY

![Shell Assembly Diagram](image)

### OPTIONAL SHELL ASSEMBLY [0, 02]

![Optional Shell Assembly Diagram](image)

### OPTIONAL SHELL ASSEMBLY WITH UNIVERSAL FLOAT MOUNTS [F]

![Optional Shell Assembly with Float Mnt Diagram](image)

---

<table>
<thead>
<tr>
<th>CONNECTOR VARIANT SIZES</th>
<th>A [+0.015 [0.38]</th>
<th>B [+0.005 [0.13]</th>
<th>B1 [+0.005 [0.13]</th>
<th>C [+0.005 [0.13]</th>
<th>D [+0.005 [0.13]</th>
<th>D1 [+0.005 [0.13]</th>
<th>E [+0.010 [0.25]</th>
<th>G [+0.010 [0.25]</th>
<th>H [+0.005 [0.13]</th>
<th>M [+0.010 [0.25]</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODD 15 F</td>
<td>1.213 [30.81]</td>
<td>0.643 [16.33]</td>
<td>0.984 [24.99]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
<td>0.759 [19.28]</td>
<td>0.422 [10.72]</td>
<td>0.233 [5.92]</td>
<td>0.429 [10.90]</td>
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<tr>
<td>ODD 15 S</td>
<td>1.213 [30.81]</td>
<td>0.643 [16.33]</td>
<td>0.984 [24.99]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
<td>0.759 [19.28]</td>
<td>0.422 [10.72]</td>
<td>0.233 [5.92]</td>
<td>0.429 [10.90]</td>
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<tr>
<td>ODD 44 M</td>
<td>2.088 [53.04]</td>
<td>1.534 [38.96]</td>
<td>1.852 [47.04]</td>
<td>0.329 [8.36]</td>
<td>0.494 [12.55]</td>
<td>1.625 [41.28]</td>
<td>0.422 [10.72]</td>
<td>0.230 [5.84]</td>
<td>0.426 [10.82]</td>
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<tr>
<td>ODD 44 F</td>
<td>2.088 [53.04]</td>
<td>1.534 [38.96]</td>
<td>1.852 [47.04]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
<td>1.625 [41.28]</td>
<td>0.422 [10.72]</td>
<td>0.230 [5.84]</td>
<td>0.426 [10.82]</td>
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<tr>
<td>ODD 44 S</td>
<td>2.088 [53.04]</td>
<td>1.534 [38.96]</td>
<td>1.852 [47.04]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
<td>1.625 [41.28]</td>
<td>0.422 [10.72]</td>
<td>0.230 [5.84]</td>
<td>0.426 [10.82]</td>
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<tr>
<td>ODD 62 M</td>
<td>2.729 [69.32]</td>
<td>2.182 [55.42]</td>
<td>2.500 [63.50]</td>
<td>0.329 [8.36]</td>
<td>0.494 [12.55]</td>
<td>2.272 [57.71]</td>
<td>0.422 [10.72]</td>
<td>0.230 [5.84]</td>
<td>0.426 [10.82]</td>
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<tr>
<td>ODD 62 F</td>
<td>2.729 [69.32]</td>
<td>2.159 [54.84]</td>
<td>2.500 [63.50]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
<td>2.272 [57.71]</td>
<td>0.422 [10.72]</td>
<td>0.230 [5.84]</td>
<td>0.426 [10.82]</td>
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</tr>
<tr>
<td>ODD 62 S</td>
<td>2.729 [69.32]</td>
<td>2.159 [54.84]</td>
<td>2.500 [63.50]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
<td>2.272 [57.71]</td>
<td>0.422 [10.72]</td>
<td>0.230 [5.84]</td>
<td>0.426 [10.82]</td>
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<tr>
<td>ODD 78 M</td>
<td>2.635 [66.93]</td>
<td>2.079 [52.81]</td>
<td>2.406 [61.11]</td>
<td>0.441 [11.20]</td>
<td>0.605 [15.37]</td>
<td>2.178 [55.32]</td>
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<td>0.230 [5.84]</td>
<td>0.426 [10.82]</td>
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<tr>
<td>ODD 78 F</td>
<td>2.635 [66.93]</td>
<td>2.064 [52.43]</td>
<td>2.406 [61.11]</td>
<td>0.423 [10.74]</td>
<td>0.605 [15.37]</td>
<td>2.178 [55.32]</td>
<td>0.534 [13.56]</td>
<td>0.230 [5.84]</td>
<td>0.426 [10.82]</td>
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<tr>
<td>ODD 78 S</td>
<td>2.635 [66.93]</td>
<td>2.064 [52.43]</td>
<td>2.406 [61.11]</td>
<td>0.423 [10.74]</td>
<td>0.605 [15.37]</td>
<td>2.178 [55.32]</td>
<td>0.534 [13.56]</td>
<td>0.230 [5.84]</td>
<td>0.426 [10.82]</td>
<td></td>
</tr>
<tr>
<td>ODD 104 M</td>
<td>2.729 [69.32]</td>
<td>2.212 [56.18]</td>
<td>2.500 [63.50]</td>
<td>0.503 [12.78]</td>
<td>0.668 [16.97]</td>
<td>2.302 [58.47]</td>
<td>0.596 [15.14]</td>
<td>0.230 [5.84]</td>
<td>0.426 [10.82]</td>
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<tr>
<td>ODD 104 F</td>
<td>2.729 [69.32]</td>
<td>2.189 [55.60]</td>
<td>2.500 [63.50]</td>
<td>0.485 [12.32]</td>
<td>0.668 [16.97]</td>
<td>2.302 [58.47]</td>
<td>0.596 [15.14]</td>
<td>0.230 [5.84]</td>
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<tr>
<td>ODD 104 S</td>
<td>2.729 [69.32]</td>
<td>2.189 [55.60]</td>
<td>2.500 [63.50]</td>
<td>0.485 [12.32]</td>
<td>0.668 [16.97]</td>
<td>2.302 [58.47]</td>
<td>0.596 [15.14]</td>
<td>0.230 [5.84]</td>
<td>0.426 [10.82]</td>
<td></td>
</tr>
</tbody>
</table>

*This dimension is for crimp removable connectors. ±0.010 [0.25] maximum for all other connectors.

**Dimensions are in inches [millimeters]. All dimensions are subject to change.**
REMOVABLE CRIMP CONTACTS
CODE 1
CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

Part Number: FC8122D

<table>
<thead>
<tr>
<th>FEMALE PART NUMBER</th>
<th>WIRE SIZE AWG/[mm²]</th>
<th>A</th>
<th>ØB</th>
<th>ØC</th>
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<tbody>
<tr>
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<td>22 / 24 / 26 / 28 / 30 [0.3/0.25/0.12/0.08/0.05]</td>
<td>0.529</td>
<td>0.035</td>
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Part Number: MC8122D

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<tr>
<th>MALE PART NUMBER</th>
<th>WIRE SIZE AWG/[mm²]</th>
<th>A</th>
<th>ØB</th>
<th>ØC</th>
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<tr>
<td>MC8122D</td>
<td>22 / 24 / 26 / 28 / 30 [0.3/0.25/0.12/0.08/0.05]</td>
<td>0.531</td>
<td>0.035</td>
<td>0.047</td>
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</tbody>
</table>

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: FC8122D-14
0.000050 inch [1.27] gold over nickel by adding "-15" suffix onto part number. Example: MC8122D-15

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

REMOVABLE CRIMP CONTACTS
CODE 1
CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

For information regarding CRIMP TOOLS & CRIMPING TOOL TECHNIQUES, see page 78.
REMOVABLE CRIMP CONTACTS
20 AWG CONTACTS
20 AWG [0.5 mm²]

*FEMALE CONTACT

**MALE CONTACT**

<table>
<thead>
<tr>
<th>Part Number: FC8120D</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>WIRE SIZE AWG/mm²</td>
<td>A</td>
<td>ØB</td>
<td>ØC</td>
</tr>
<tr>
<td>20 max</td>
<td>0.852</td>
<td>0.045</td>
<td>0.066</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Part Number: MC8020D</th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>WIRE SIZE AWG/mm²</td>
<td>A</td>
<td>ØB</td>
<td>ØC</td>
</tr>
<tr>
<td>20 max</td>
<td>0.853</td>
<td>0.045</td>
<td>0.066</td>
</tr>
</tbody>
</table>

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: FC8120D-14
0.000050 inch [1.27] gold over nickel by adding “-15” suffix onto part number. Example: MC8020D-15

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

REMOVABLE THERMOCOUPLE CRIMP CONTACTS
CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

**FEMALE CONTACT**

*CLOSED ENTRY* DESIGN

<table>
<thead>
<tr>
<th>TYPE</th>
<th>MATERIAL</th>
<th>FEMALE PART NUMBER</th>
<th>MALE PART NUMBER</th>
<th>COLOR CODE*</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>CHROMEL (+)</td>
<td>FC8022D2CH</td>
<td>MC8022DCH</td>
<td>WHITE 22 / 24 / 26 [0.37 / 0.25 / 0.12]</td>
</tr>
<tr>
<td></td>
<td>ALUMEL (-)</td>
<td>FC8022D2AL</td>
<td>MC8022DAL</td>
<td>GREEN 22 / 24 / 26 [0.37 / 0.25 / 0.12]</td>
</tr>
<tr>
<td>T</td>
<td>COPPER (+)</td>
<td>FC8022D2CU</td>
<td>MC8022DCU</td>
<td>RED 22 / 24 / 26 [0.37 / 0.25 / 0.12]</td>
</tr>
<tr>
<td></td>
<td>CONSTANTAN (-)</td>
<td>FC8022D2CO</td>
<td>MC8022DCO</td>
<td>YELLOW 22 / 24 / 26 [0.37 / 0.25 / 0.12]</td>
</tr>
<tr>
<td>E</td>
<td>CHROMEL (+)</td>
<td>FC8022D2CH</td>
<td>MC8022DCH</td>
<td>WHITE 22 / 24 / 26 [0.37 / 0.25 / 0.12]</td>
</tr>
<tr>
<td></td>
<td>CONSTANTAN (-)</td>
<td>FC8022D2CO</td>
<td>MC8022DCO</td>
<td>YELLOW 22 / 24 / 26 [0.37 / 0.25 / 0.12]</td>
</tr>
</tbody>
</table>

For more information on the availability of Type J thermocouple contacts, please contact Technical Sales.

For more information about thermocouple contacts with printed circuit board solder termination, please contact Technical Sales.

Chrome® and Alumel® are registered trademarks of Hoskins Manufacturing Company.
REMOVABLE SOLDER CUP CONTACTS

CODE 2

CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

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

FEMALE CONTACT

MALE CONTACT

Part Number: FS8122D

Part Number: MS8122D

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: FS8122D-14
0.000050 inch [1.27] gold over nickel by adding “-15” suffix onto part number. Example: MS8122D-15

REMOVABLE SOLDER CUP CONTACTS

CODE 2

CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

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

FEMALE CONTACT

“CLOSED ENTRY” DESIGN

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: FS8022D-14
0.000050 inch [1.27] gold over nickel by adding “-15” suffix onto part number. Example: MS8122D-15

For information regarding INSERTION & REMOVAL TOOLS, see page 78.
FIXED SOLDER CUP TERMINATION
CODE 21

Typical Part Number: ODD26F2100T2X

Fixed male and female polarized jackscrews available. Specify code T6 in step 7 of ordering information.

Typical Part Number: ODD26F2100T6X

STRAIGHT PRINTED BOARD MOUNT TERMINATION
CODE 3 AND 32

Typical Part Number: ODD62F3S60T6X

For straight printed board mount contacts specify code no. in step 4 of ordering information
### RIGHT ANGLE (90°) PRINTED BOARD MOUNT TERMINATION

CODE 5, 0.450 [11.43] CONTACT EXTENSION

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>A*1</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODD15S****</td>
<td>1.204 [30.58]</td>
<td>0.984 [24.99]</td>
<td>0.528 [13.41]</td>
<td>0.450 [11.43]</td>
</tr>
<tr>
<td>ODD26S****</td>
<td>1.532 [38.91]</td>
<td>1.312 [33.32]</td>
<td>0.528 [13.41]</td>
<td>0.450 [11.43]</td>
</tr>
<tr>
<td>ODD44S****</td>
<td>2.072 [52.63]</td>
<td>1.852 [47.04]</td>
<td>0.528 [13.41]</td>
<td>0.450 [11.43]</td>
</tr>
<tr>
<td>ODD62S****</td>
<td>2.720 [68.99]</td>
<td>2.500 [63.50]</td>
<td>0.528 [13.41]</td>
<td>0.450 [11.43]</td>
</tr>
</tbody>
</table>

See next page for size 104 Right Angle (90°) Connectors.

**NOTE:**

*1 “A” dimension applies for metal angle brackets only. Consult Accessories D-subminiature catalog for “A” dimension when plastic brackets are used.

### RIGHT ANGLE (90°) PRINTED BOARD MOUNT TERMINATION

CODE 4, 0.314 [7.98] CONTACT EXTENSION

<table>
<thead>
<tr>
<th>PART NUMBER</th>
<th>A*1</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODD154****</td>
<td>1.204 [30.58]</td>
<td>0.984 [24.99]</td>
<td>0.414 [10.52]</td>
<td>0.314 [7.98]</td>
</tr>
<tr>
<td>ODD264****</td>
<td>1.532 [38.91]</td>
<td>1.312 [33.32]</td>
<td>0.414 [10.52]</td>
<td>0.314 [7.98]</td>
</tr>
<tr>
<td>ODD444****</td>
<td>2.072 [52.63]</td>
<td>1.852 [47.04]</td>
<td>0.414 [10.52]</td>
<td>0.314 [7.98]</td>
</tr>
<tr>
<td>ODD624****</td>
<td>2.720 [68.99]</td>
<td>2.500 [63.50]</td>
<td>0.414 [10.52]</td>
<td>0.314 [7.98]</td>
</tr>
<tr>
<td>ODD784****</td>
<td>2.626 [66.70]</td>
<td>2.406 [61.11]</td>
<td>0.414 [10.52]</td>
<td>0.314 [7.98]</td>
</tr>
</tbody>
</table>

See next page for size 104 Right Angle (90°) Connectors.

**NOTE:**

*1 “A” dimension applies for metal angle brackets only. Consult Accessories D-subminiature catalog for “A” dimension when plastic brackets are used.
RIGHT ANGLE (90°) PRINTED BOARD MOUNT TERMINATION

CODE 5, 0.450 [11.43] CONTACT EXTENSION
CONTACT VARIANT 104

Typical Part Number: ODD104M5R7NT2X

Specify code 5 in step 4 of ordering information

Fixed female jackscrews

0.614 [15.60] inches

Numbering shown is rear view of male and face view of female

Numbering shown is rear view of male and face view of female

NOTE:

*1 Dimension applies for metal angle brackets only. Consult Accessories D-subminiature catalog for dimension when plastic brackets are used.

RIGHT ANGLE (90°) PRINTED BOARD MOUNT TERMINATION

CODE 4, 0.314 [7.98] CONTACT EXTENSION
CONTACT VARIANT 104

Typical Part Number: ODD104M4R7NT2X

Specify code 4 in step 4 of ordering information

Fixed female jackscrews

0.514 [13.06] inches

NOTE:

*1 Dimension applies for metal angle brackets only. Consult Accessories D-subminiature catalog for dimension when plastic brackets are used.
RIGHT ANGLE (90°) AND STRAIGHT PRINTED BOARD CONTACT HOLE PATTERN
MOUNT CONNECTOR WITH MATING FACE POSITIONED TO FOLLOW DIRECTION OF ARROWS.

**ODD SERIES**

**D-Sub**

**SUGGESTED PRINTED BOARD HOLE SIZES:**
Suggest 0.123 ±0.003 [3.12 ±0.08] Ø hole for mounting connector with push-on fasteners.

<table>
<thead>
<tr>
<th>CODE NUMBER</th>
<th>A</th>
<th>B</th>
<th>ØC</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>0.100 [2.54]</td>
<td>0.100 [2.54]</td>
<td>0.045 [1.14]</td>
<td>0.100 [2.54]</td>
</tr>
<tr>
<td>3, 32, 5</td>
<td>0.078 [1.98]</td>
<td>0.082 [2.08]</td>
<td>0.035 [0.89]</td>
<td>0.123 [3.12]</td>
</tr>
</tbody>
</table>

DIMENSIONS ARE IN INCHES [ MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
**ORDERING INFORMATION - CODE NUMBERING SYSTEM**

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

<table>
<thead>
<tr>
<th>EXAMPLE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>ODD</td>
<td>62</td>
<td>F</td>
<td>5</td>
<td>R7</td>
<td>N</td>
<td>T6</td>
<td>S</td>
<td>/AA</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**STEP 1 - BASIC SERIES**
ODD series

**STEP 2 - CONNECTOR VARIANTS**
15, 26, 44, 62, 78, 104

**STEP 3 - CONNECTOR GENDER**
M - Male
F - Female - Professional Level
S - Female - Industrial Level
PosiBand closed entry contacts

**STEP 4 - CONTACT TERMINATION TYPE**

| 0 - Contacts ordered separately, see pages 45-47. |
| 1 - Crimp, 22 AWG-30 AWG [0.3mm²-0.05mm²]. |
| 2 - Removable, solder cup, 22 AWG-30 AWG [0.3mm²-0.05mm²]. |
| 21 - Fixed, solder cup, 22 AWG-30 AWG [0.3mm²-0.05mm²]. |
| 3 - Solder, Straight Printed Board Mount with 0.150 [3.81] Tail Length. |
| 32 - Solder, Straight Printed Board Mount with 0.300 [7.62] Tail Length. |
| 4 - Solder, Right Angle (90°) Printed Board Mount with 0.314 [7.98] Contact Extension. |
| 5 - Solder, Right Angle (90°) Printed Board Mount with 0.450 [11.43] Contact Extension. |

**STEP 5 - MOUNTING STYLE**

| 0 - Mounting Hole, 0.120 [3.05] Ø. |
| 02 - Mounting Hole, 0.154 [3.91] Ø. |
| B3 - Bracket, Mounting, Right Angle (90°) Metal with Cross Bar. |
| B8 - Bracket, Mounting, Right Angle (90°) Plastic with Cross Bar. |
| F - Float Mounts, Universal. |
| P - Threaded Post, Brass, 0.225 [5.71] Length. |
| P2 - Threaded Post, Nylon, 0.225 [5.71] Length. |
| R2 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Thread Fixed Female Jackscrews with Cross Bar. |
| R6 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 0.120 [3.05] Ø Mounting Hole with Cross Bar. |
| R7 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Threads with Cross Bar. |
| R8 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Locknut with Cross Bar. |
| S - Swaged Spacer, 4-40 Threads, 0.225 [5.71] Length. |
| S2 - Swaged Spacer, 4-40 Threads, 0.125 [3.18] Length. |
| S5 - Swaged Locknut, 4-40 Threads. |
| S6 - Swaged Spacer with Push-on Fasteners, 4-40 Threads, 0.225 [5.71] Length. |
| S7 - Swaged Spacer with Push-on Fastener for use with Ferrite Inductor, 4-40 Threads, 0.375 [9.53] Length. |

**STEP 6 - HOODS**

| 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. |

**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. |

**STEP 8 - SHELL OPTIONS**

| 0 - Zinc plated with chromate seal. |
| **S** - Stainless steel, passivated. |
| X - Tin plated. |
| Z - Tin plated and dimpled (male connectors only). |

**STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS**

| /AA - Compliant per EU Directive 2002/95/EC (RoHS) |
| -15 - 0.000050 [1.27µ] gold over nickel. |

**STEP 10 - SPECIAL OPTIONS**

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

**CONTACT TECHNICAL SALES FOR SPECIAL OPTIONS**

For information regarding CRIMP TOOLS & CRIMPING TOOL TECHNIQUES, see page 78.

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

*2 Ferrite inductor is available on contact types 32 and 5 only.

*3 For more information on ferrite inductors, see page 7.

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

*5 VL, V3 and V5 locking systems are not available for connector variants 62, 78 and 104. Jackscrews are highly recommended to minimize damage to contacts on variants with high mating forces.

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

For stainless steel dimpled female versions contact Technical Sales.

For information regarding CRIMP TOOLS & CRIMPING TOOL TECHNIQUES, see page 78.
**DD SERIES TECHNICAL CHARACTERISTICS**

**MATERIALS AND FINISHES:**

- **Insulators:** Glass filled polyester per ASTM D5927, UL 94V-0, blue color.
- **Contacts:** Precision machined copper alloy.
- **Contact Plating:**
  - Military performance: 0.000050 inch [1.27 microns] gold over nickel plate.
  - Industrial performance: Gold flash over nickel plate.
  - Other finishes available upon request.
- **Shells:**
  - Steel with tin plate; zinc 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; stainless steel, passivated.
- **Push-On Fastener:**
  - Phosphor bronze or beryllium copper with tin plate.
- **Vibration Lock Systems:**
  - Slide lock and lock tabs, steel with nickel plate.
- **Jack screw Systems:**
  - Brass or steel with zinc plate and chromate seal or clear zinc plate or tin plate; stainless steel, passivated.
- **Hoods:**
  - Composite and plastic, UL 94V-0; brass or steel with zinc plate and chromate seal.
  - Aluminum; aluminum with electrolytic 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 22 contacts, male - 0.030 inch [0.76mm] mating diameter. Female contacts - PosiBand closed entry design, see page 1 for details.
- **Contact Retention In Insulator:** 9 lbs. [40 N].

**ELECTRICAL CHARACTERISTICS:**

- **Contact Terminations:**
  - Closed barrel crimp, wire sizes 22 AWG [0.3mm] through 30 AWG [0.05mm] per IEC 352-2.
  - Right Angle (90°) Printed Board Mount contact terminations.
- **Shells:**
  - Male shells may be dimpled for EMI/ESD ground paths.
- **Polarization:**
  - Trapezoidally shaped shells and polarized jackscrews.
- **Mounting To Angle Brackets:**
  - Jackscrews and riveted fasteners with 0.120 inch [3.05mm] clearance hole, and threaded riveted fasteners with 4-40 threads and polyester lock inserts.
- **Mounting To Printed Board:**
  - Rapid installation push-on fasteners and mounting posts.
- **Locking Systems:**
  - Jackscrews and vibration locking systems.
- **Mechanical Operations:**
  - 1000 operations minimum per IEC 60512-5.

**CLIMATIC CHARACTERISTICS:**

- **Temperature Range:** -55°C to +125°C.
- **Damp Heat, Steady State:** 21 days.

**THERMOCOUPLE CONTACTS:**

- Size 22 crimp contacts are available, see page 56 for details.
- Printed circuit board mount contacts are available, please consult Accessories D-subminiature catalog for details.
CONTACT VARIANTS

FACE VIEW OF MALE OR REAR VIEW OF FEMALE

STANDARD SHELL ASSEMBLY

OPTIONAL SHELL ASSEMBLY (0, 02)

OPTIONAL SHELL ASSEMBLY WITH UNIVERSAL FLOAT MOUNTS (F)

CONNECTOR VARIANT SIZES

<table>
<thead>
<tr>
<th>CONNECTOR</th>
<th>A ±0.015</th>
<th>B ±0.005</th>
<th>B1 ±0.005</th>
<th>C ±0.005</th>
<th>D ±0.005</th>
<th>D1 ±0.005</th>
<th>E ±0.015</th>
<th>G ±0.010</th>
<th>H ±0.010</th>
<th>K ±0.005</th>
<th>M ±0.020</th>
</tr>
</thead>
<tbody>
<tr>
<td>DD 15 M</td>
<td>1.213</td>
<td>0.606</td>
<td>0.984</td>
<td>0.329</td>
<td>0.494</td>
<td>0.759</td>
<td>0.422</td>
<td>0.233</td>
<td>0.422</td>
<td>0.233</td>
<td>0.422</td>
</tr>
<tr>
<td>DD 15 S</td>
<td>1.213</td>
<td>0.643</td>
<td>0.984</td>
<td>0.311</td>
<td>0.494</td>
<td>0.759</td>
<td>0.422</td>
<td>0.243</td>
<td>0.429</td>
<td>0.243</td>
<td>0.429</td>
</tr>
<tr>
<td>DD 26 M</td>
<td>1.541</td>
<td>0.994</td>
<td>1.312</td>
<td>0.329</td>
<td>0.494</td>
<td>1.083</td>
<td>0.422</td>
<td>0.233</td>
<td>0.429</td>
<td>0.233</td>
<td>0.429</td>
</tr>
<tr>
<td>DD 26 S</td>
<td>1.541</td>
<td>0.971</td>
<td>1.312</td>
<td>0.311</td>
<td>0.494</td>
<td>1.083</td>
<td>0.422</td>
<td>0.243</td>
<td>0.429</td>
<td>0.243</td>
<td>0.429</td>
</tr>
<tr>
<td>DD 44 M</td>
<td>2.088</td>
<td>1.534</td>
<td>1.852</td>
<td>0.329</td>
<td>0.494</td>
<td>1.625</td>
<td>0.422</td>
<td>0.230</td>
<td>0.428</td>
<td>0.230</td>
<td>0.428</td>
</tr>
<tr>
<td>DD 44 S</td>
<td>2.088</td>
<td>1.511</td>
<td>1.852</td>
<td>0.311</td>
<td>0.494</td>
<td>1.625</td>
<td>0.422</td>
<td>0.243</td>
<td>0.429</td>
<td>0.243</td>
<td>0.429</td>
</tr>
<tr>
<td>DD 62 M</td>
<td>2.729</td>
<td>2.182</td>
<td>2.500</td>
<td>0.329</td>
<td>0.494</td>
<td>2.272</td>
<td>0.422</td>
<td>0.243</td>
<td>0.429</td>
<td>0.243</td>
<td>0.429</td>
</tr>
<tr>
<td>DD 62 S</td>
<td>2.729</td>
<td>2.159</td>
<td>2.500</td>
<td>0.311</td>
<td>0.494</td>
<td>2.272</td>
<td>0.422</td>
<td>0.243</td>
<td>0.429</td>
<td>0.243</td>
<td>0.429</td>
</tr>
<tr>
<td>DD 78 M</td>
<td>2.635</td>
<td>2.079</td>
<td>2.406</td>
<td>0.441</td>
<td>0.605</td>
<td>2.178</td>
<td>0.534</td>
<td>0.230</td>
<td>0.426</td>
<td>0.230</td>
<td>0.426</td>
</tr>
<tr>
<td>DD 78 S</td>
<td>2.635</td>
<td>2.064</td>
<td>2.406</td>
<td>0.423</td>
<td>0.605</td>
<td>2.178</td>
<td>0.534</td>
<td>0.243</td>
<td>0.429</td>
<td>0.243</td>
<td>0.429</td>
</tr>
<tr>
<td>DD 104 M</td>
<td>2.729</td>
<td>2.212</td>
<td>2.500</td>
<td>0.503</td>
<td>0.668</td>
<td>2.302</td>
<td>0.596</td>
<td>0.230</td>
<td>0.426</td>
<td>0.230</td>
<td>0.426</td>
</tr>
<tr>
<td>DD 104 S</td>
<td>2.729</td>
<td>2.189</td>
<td>2.500</td>
<td>0.485</td>
<td>0.668</td>
<td>2.302</td>
<td>0.596</td>
<td>0.243</td>
<td>0.429</td>
<td>0.243</td>
<td>0.429</td>
</tr>
</tbody>
</table>

Dimensions are in inches [millimeters].
All dimensions are subject to change.
**REMOVABLE CRIMP CONTACT**

**CODE 1**

CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

QUALIFIED TO SAE AS39029

---

### FEMALE CONTACT

“CLOSED ENTRY” DESIGN

- Ø0.047 [1.19]
- Ø0.035 [0.89]
- Ø0.150 [3.81]

**WIRE SIZE**

<table>
<thead>
<tr>
<th>AWG/[mm²]</th>
</tr>
</thead>
<tbody>
<tr>
<td>22 / 24 / 26 / 28 / 30&lt;br&gt;[0.3/0.25/0.12/0.08/0.05]</td>
</tr>
</tbody>
</table>

---

### MALE CONTACT

- Ø0.047 [1.19]
- Ø0.035 [0.89]
- Ø0.150 [3.81]

**WIRE SIZE**

<table>
<thead>
<tr>
<th>AWG/[mm²]</th>
</tr>
</thead>
<tbody>
<tr>
<td>22 / 24 / 26 / 28 / 30&lt;br&gt;[0.3/0.25/0.12/0.08/0.05]</td>
</tr>
</tbody>
</table>

---

## 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: FC8022D2-14
- 0.000050 inch [1.27] gold over nickel by adding “-15” suffix onto part number. Example: MC8022D-15

---

Note: Connectors can be kitted with all applicable crimp contacts, contact Technical Sales for connector part number.
MILITARY QUALITY
FIXED AND REMOVABLE CONTACTS
HIGH DENSITY D-SUBMINIATURE

REMovable CRimp CONTACT
20 AWG CONTACTS
20 AWG [0.5 mm²]

CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

Note: FC8020D2 and MC8020D contacts can be used in the ODD series.

¢ Female Contact
“CLOSED ENTRY” DESIGN

¢ Male Contact

Crimp area extends above connector molding.

<table>
<thead>
<tr>
<th>FEMALE CONTACT</th>
<th>WIRE SIZE</th>
<th>MALE CONTACT</th>
<th>WIRE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>PART NUMBER</td>
<td>AWG/mm²</td>
<td>PART NUMBER</td>
<td>AWG/mm²</td>
</tr>
<tr>
<td>FC8020D2</td>
<td>20 [0.5] max</td>
<td>MC8020D</td>
<td>20 [0.5] max</td>
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</table>

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: FC8020D2-14
0.000050 inch \([1.27]\) gold over nickel by adding “-15” suffix onto part number. Example: MC8020D-15

REMovable THERmocouple CRIMP CONTACT
CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

¢ Female Contact
“CLOSED ENTRY” DESIGN

¢ Male Contact

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

<table>
<thead>
<tr>
<th>TYPE</th>
<th>MATERIAL</th>
<th>FEMALE PART NUMBER</th>
<th>MALE PART NUMBER</th>
<th>COLOR CODE</th>
<th>WIRE SIZE</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>CHROMEL (+)</td>
<td>FC8022D2CH</td>
<td>MC8022DCH</td>
<td>WHITE</td>
<td>22 / 24 / 26 [0.3 / 0.25 / 0.12]</td>
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<tr>
<td></td>
<td>ALUMEL (-)</td>
<td>FC8022D2AL</td>
<td>MC8022DAL</td>
<td>GREEN</td>
<td>22 / 24 / 26 [0.3 / 0.25 / 0.12]</td>
</tr>
<tr>
<td>T</td>
<td>COPPER (+)</td>
<td>FC8022D2CU</td>
<td>MC8022DCU</td>
<td>RED</td>
<td>22 / 24 / 26 [0.3 / 0.25 / 0.12]</td>
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<tr>
<td></td>
<td>CONSTANTAN</td>
<td>FC8022D2CO</td>
<td>MC8022DCO</td>
<td>YELLOW</td>
<td>22 / 24 / 26 [0.3 / 0.25 / 0.12]</td>
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<tr>
<td>E</td>
<td>CHROMEL (+)</td>
<td>FC8022D2CH</td>
<td>MC8022DCH</td>
<td>WHITE</td>
<td>22 / 24 / 26 [0.3 / 0.25 / 0.12]</td>
</tr>
<tr>
<td></td>
<td>CONSTANTAN</td>
<td>FC8022D2CO</td>
<td>MC8022DCO</td>
<td>YELLOW</td>
<td>22 / 24 / 26 [0.3 / 0.25 / 0.12]</td>
</tr>
</tbody>
</table>

For more information on the availability of Type J thermocouple contacts, please contact Technical Sales.

For more information about thermocouple contacts with printed circuit board solder termination, please contact Technical Sales.

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

For information regarding CRIMP TOOLS & CRIMPING TOOL TECHNIQUES, see page 78.
REMOVABLE SOLDER CUP CONTACTS

CODE 2

CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

FEMALE CONTACT
“CLOSED ENTRY” DESIGN

MALE CONTACT

<table>
<thead>
<tr>
<th>FEMALE PART NUMBER</th>
<th>WIRE SIZE AWG/[mm²]</th>
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<tbody>
<tr>
<td>FS8022D2</td>
<td>22 [0.3] max</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MALE PART NUMBER</th>
<th>WIRE SIZE AWG/[mm²]</th>
</tr>
</thead>
<tbody>
<tr>
<td>MS8022D</td>
<td>22 [0.3] max</td>
</tr>
</tbody>
</table>

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: FS8022D2-14
0.000050 inch [1.27] gold over nickel by adding “-15” suffix onto part number. Example: MS8022D-15

For information regarding INSERTION & REMOVAL TOOLS, see page 78.

STRAIGHT PRINTED BOARD MOUNT TERMINATION

CODE 3, 32 AND 33

<table>
<thead>
<tr>
<th>CODE NUMBER</th>
<th>L</th>
</tr>
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<tbody>
<tr>
<td>3</td>
<td>0.150 [3.81]</td>
</tr>
<tr>
<td>32</td>
<td>0.300 [7.62]</td>
</tr>
<tr>
<td>33</td>
<td>0.500 [12.70]</td>
</tr>
</tbody>
</table>

For straight printed board mount contacts specify code no. in step 4 of ordering information.

Swaged spacer with push-on fastener phosphor bronze.

Typical Part Number: DD62S3S60T2X
RIGHT ANGLE (90°) PRINTED BOARD MOUNT TERMINATION

**DD**4*** 0.450 [11.43] CONTACT EXTENSION

**PART NUMBER**  
**A**  
**B**  
**C**  
**D**  
**DD15**4****  
1.294 [30.58] 0.084 [2.13] 0.528 [13.41] 0.450 [11.43]  
**DD26**4****  
1.532 [38.91] 1.312 [33.32] 0.528 [13.41] 0.450 [11.43]  
**DD44**4****  
2.072 [52.63] 1.852 [47.04] 0.528 [13.41] 0.450 [11.43]  
**DD62**4****  
2.720 [69.09] 2.500 [63.50] 0.528 [13.41] 0.450 [11.43]  
**DD78**4****  

**NOTE:**  
*“A” dimension applies for metal angle brackets only. Consult Accessories D-subminiature catalog for “A” dimension when plastic brackets are used.

**DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.**
RIGHT ANGLE (90°) AND STRAIGHT PRINTED BOARD CONTACT HOLE PATTERN
MOUNT CONNECTOR WITH MATING FACE POSITIONED TO FOLLOW DIRECTION OF ARROWS.

DD15 MALE

DD15 FEMALE

DD 26 MALE

DD 26 FEMALE

DD44 MALE

DD44 FEMALE

DD62 MALE

DD62 FEMALE

DD78 MALE

DD78 FEMALE

DD104 MALE

DD104 FEMALE

SUGGESTED PRINTED BOARD HOLE SIZES:
Suggest 0.035 [0.89] Ø hole for contact termination positions.
Suggest 0.123 ±0.003 [3.12 ±0.08] Ø hole for mounting connector with push-on fasteners.
**ORDERING INFORMATION - CODE NUMBERING SYSTEM**

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

<table>
<thead>
<tr>
<th>STEP</th>
<th>EXAMPLE</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>STEP 1 - BASIC SERIES</strong></td>
<td>DD</td>
<td>62</td>
<td>S</td>
<td>4</td>
<td>R7</td>
<td>N</td>
<td>T6</td>
<td>S</td>
<td>/AA</td>
<td>-50</td>
<td></td>
</tr>
<tr>
<td><strong>STEP 2 - CONNECTOR VARIANTS</strong></td>
<td>15, 26, 44, 62, 78, 104</td>
<td></td>
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<tr>
<td><strong>STEP 3 - CONNECTOR GENDER</strong></td>
<td>M - Male</td>
<td>S - Female - PosiBand closed entry contacts</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STEP 4 - CONTACT TERMINATION TYPE</strong></td>
<td>0 - Contacts ordered separately, see pages 55-57.</td>
<td>1 - Crimp, 22 AWG-30 AWG [0.3mm²-0.05mm²].</td>
<td>2 - Removable, Solder cup, 22 AWG-30 AWG [0.3mm²-0.05mm²].</td>
<td>3 - Solder, Straight Printed Board Mount with 0.150 [3.81] Tail Length.</td>
<td>32 - Solder, Straight Printed Board Mount with 0.300 [7.62] Tail Length.</td>
<td>33 - Solder, Straight Printed Board Mount with 0.500 [12.70] Tail Length.</td>
<td>4 - Solder, Right Angle (90°) Printed Board Mount with 0.450 [11.43] Contact Extension.</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS</strong></td>
<td>/AA - Compliant per EU Directive 2002/95/EC (RoHS)</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>STEP 10 - SPECIAL OPTIONS</strong></td>
<td>-14 - 0.000030 [0.76µ] gold over nickel.</td>
<td>-15 - 0.000050 [1.27µ] gold over nickel.</td>
<td>-50 - 0.000050 [1.27µ] gold over copper.</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

**NOTE:** If compliance to environmental legislation is not required, this step will not be used. Example: DD62S4R7NT6S

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* For additional information on accessories listed in steps 5, 6 and 7, see Accessory Catalog.
* Ferrite inductor is available on contact types 32 and 33 only. For more information on ferrite inductors, see page 7.
* VL, V3 and V5 locking systems are not available for connector variants 62, 78 and 104. Jackscrews are highly recommended to minimize damage to contacts on variants with high mating forces.
* For stainless steel dimpled male versions contact Technical Sales.

---

For information regarding CRIMP TOOLS & CRIMPING TOOL TECHNIQUES, see page 78.
MATERIALS AND FINISHES:

Insulator: Glass filled polyester per ASTM D5927, UL 94V-0, blue color.

Contacts: Precision machined copper alloy.

Contact Plating: Professional performance - Gold flash over nickel plate. Other finishes available upon request.

Shells: Steel with tin plate; zinc plate with chromate seal, stainless steel passivated. Other materials and finishes available upon request.

Mounting Spacers and Brackets: Copper alloy or steel with zinc plate and chromate seal or tin plate; stainless steel, passivated.

Jackscrew System: Brass or steel with zinc plate and chromate seal or clear zinc plate or tin plate; stainless steel, passivated.


Low magnetic versions are available, contact Technical Sales.

MECHANICAL CHARACTERISTICS:

Contacts Solid Metal Construction: Size 20 contact, male - 0.040 inch [1.02mm] mating diameter. Female contact - rugged open entry design or PosiBand closed entry design, see page 1 for details.

Contact Retention: 5 lbs. [21 N] minimum.

Connector Polarization: Trapezoidal shaped shells and polarized jackscrews.

Locking System: Jackscrews and vibration locking systems.

Mechanical Operations: 500 operations per IEC 60512-5 for open entry
1000 operations per IEC 60512-5 for closed entry

ELECTRICAL CHARACTERISTICS:

Contact Current Rating:

Open Entry Contacts: 7.5 amperes nominal
Closed Entry Contacts, 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.

Initial Contact Resistance: 0.008 ohms maximum per IEC 60512-2, Test 2a for open entry.
0.004 ohms maximum for closed entry.

Proof Voltage: 1000 V r.m.s.

Insulator Resistance: 5 G ohms.

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

Working Voltage: 300 V.

ELECTRICAL CHARACTERISTICS OF COMPLIANT CONNECTION TO PLATED-THROUGH-HOLE OF PRINTED BOARD:

Initial Contact Resistance of Connection: Less than 0.001 ohms per IEC 60512-2, Test 2a.

Change in Contact Resistance of Connection after Mechanical, Electrical or Climatic Conditioning:
Gas-tight Connections Test: Less than 0.001 ohms increase per IEC 60512-2, Test 2a.

CLIMATIC CHARACTERISTICS:

Temperature Range: -55°C to +125°C.
CONTACT VARIANTS

FACE VIEW OF MALE CONNECTOR OR REAR VIEW OF FEMALE CONNECTOR

STANDARD SHELL ASSEMBLY

**CONNECTOR VARIANT SIZES**

<table>
<thead>
<tr>
<th>CONNECTOR</th>
<th>A ±0.015 [0.38]</th>
<th>B ±0.005 [0.13]</th>
<th>B1 ±0.005 [0.13]</th>
<th>C ±0.005 [0.13]</th>
<th>D ±0.005 [0.13]</th>
<th>D1 ±0.005 [0.13]</th>
<th>E ±0.015 [0.38]</th>
<th>G ±0.010 [0.25]</th>
<th>H ±0.010 [0.25]</th>
<th>K ±0.010 [0.25]</th>
<th>M ±0.010 [0.25]</th>
</tr>
</thead>
<tbody>
<tr>
<td>PCD 9 M</td>
<td>1.213 (30.81)</td>
<td>0.666 (16.92)</td>
<td>0.984 (24.99)</td>
<td>0.329 (8.36)</td>
<td>0.494 (12.55)</td>
<td>0.759 (19.28)</td>
<td>0.423 (10.72)</td>
<td>0.233 (6.17)</td>
<td>0.429 (10.90)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCD 9 F</td>
<td>1.213 (30.81)</td>
<td>0.643 (16.33)</td>
<td>0.984 (24.99)</td>
<td>0.311 (7.90)</td>
<td>0.494 (12.55)</td>
<td>0.759 (19.28)</td>
<td>0.423 (10.72)</td>
<td>0.233 (6.17)</td>
<td>0.429 (10.90)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCD 9 S</td>
<td>1.541 (39.14)</td>
<td>0.294 (7.52)</td>
<td>1.312 (33.32)</td>
<td>0.329 (8.36)</td>
<td>0.494 (12.55)</td>
<td>1.083 (27.51)</td>
<td>0.429 (10.92)</td>
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<tr>
<td>PCD 15 M</td>
<td>1.541 (39.14)</td>
<td>0.971 (24.66)</td>
<td>1.312 (33.32)</td>
<td>0.311 (7.90)</td>
<td>0.494 (12.55)</td>
<td>1.083 (27.51)</td>
<td>0.429 (10.90)</td>
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<tr>
<td>PCD 15 F</td>
<td>1.541 (39.14)</td>
<td>0.971 (24.66)</td>
<td>1.312 (33.32)</td>
<td>0.311 (7.90)</td>
<td>0.494 (12.55)</td>
<td>1.083 (27.51)</td>
<td>0.429 (10.90)</td>
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<tr>
<td>PCD 15 S</td>
<td>1.541 (39.14)</td>
<td>0.971 (24.66)</td>
<td>1.312 (33.32)</td>
<td>0.311 (7.90)</td>
<td>0.494 (12.55)</td>
<td>1.083 (27.51)</td>
<td>0.429 (10.90)</td>
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</tr>
<tr>
<td>PCD 25 M</td>
<td>2.088 (53.04)</td>
<td>1.534 (38.96)</td>
<td>1.852 (47.04)</td>
<td>0.329 (8.36)</td>
<td>0.494 (12.55)</td>
<td>1.625 (41.28)</td>
<td>0.429 (10.82)</td>
<td>0.230 (6.08)</td>
<td>0.429 (10.82)</td>
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</tr>
<tr>
<td>PCD 25 F</td>
<td>2.088 (53.04)</td>
<td>1.511 (38.36)</td>
<td>1.852 (47.04)</td>
<td>0.311 (7.90)</td>
<td>0.494 (12.55)</td>
<td>1.625 (41.28)</td>
<td>0.429 (10.82)</td>
<td>0.230 (6.08)</td>
<td>0.429 (10.82)</td>
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<tr>
<td>PCD 25 S</td>
<td>2.088 (53.04)</td>
<td>1.511 (38.36)</td>
<td>1.852 (47.04)</td>
<td>0.311 (7.90)</td>
<td>0.494 (12.55)</td>
<td>1.625 (41.28)</td>
<td>0.429 (10.82)</td>
<td>0.230 (6.08)</td>
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<td>PCD 37 M</td>
<td>2.729 (69.29)</td>
<td>2.159 (54.84)</td>
<td>2.500 (63.50)</td>
<td>0.329 (8.36)</td>
<td>0.494 (12.55)</td>
<td>2.272 (57.71)</td>
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<td>0.230 (6.08)</td>
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<tr>
<td>PCD 37 F</td>
<td>2.729 (69.29)</td>
<td>2.159 (54.84)</td>
<td>2.500 (63.50)</td>
<td>0.329 (8.36)</td>
<td>0.494 (12.55)</td>
<td>2.272 (57.71)</td>
<td>0.429 (10.82)</td>
<td>0.230 (6.08)</td>
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</tr>
<tr>
<td>PCD 37 S</td>
<td>2.729 (69.29)</td>
<td>2.159 (54.84)</td>
<td>2.500 (63.50)</td>
<td>0.329 (8.36)</td>
<td>0.494 (12.55)</td>
<td>2.272 (57.71)</td>
<td>0.429 (10.82)</td>
<td>0.230 (6.08)</td>
<td>0.429 (10.82)</td>
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</tr>
<tr>
<td>PCD 50 M</td>
<td>2.635 (66.93)</td>
<td>2.079 (52.81)</td>
<td>2.406 (61.11)</td>
<td>0.441 (11.20)</td>
<td>0.805 (20.43)</td>
<td>2.178 (55.23)</td>
<td>0.534 (13.56)</td>
<td>0.243 (6.17)</td>
<td>0.429 (10.90)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>PCD 50 F</td>
<td>2.635 (66.93)</td>
<td>2.079 (52.81)</td>
<td>2.406 (61.11)</td>
<td>0.441 (11.20)</td>
<td>0.805 (20.43)</td>
<td>2.178 (55.23)</td>
<td>0.534 (13.56)</td>
<td>0.243 (6.17)</td>
<td>0.429 (10.90)</td>
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<tr>
<td>PCD 50 S</td>
<td>2.635 (66.93)</td>
<td>2.079 (52.81)</td>
<td>2.406 (61.11)</td>
<td>0.441 (11.20)</td>
<td>0.805 (20.43)</td>
<td>2.178 (55.23)</td>
<td>0.534 (13.56)</td>
<td>0.243 (6.17)</td>
<td>0.429 (10.90)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

DIMENSIONS ARE IN INCHES [MILLIMETERS], ALL DIMENSIONS ARE SUBJECT TO CHANGE.
RIGHT ANGLE (90°) COMPLIANT PRESS-FIT TERMINATION
CODE 62

Positronic recommends the practice of using mounting hardware to secure connector to printed circuit board.

SUGGESTED PRINTED BOARD HOLE SIZES:
For right angle (90°) printed board contact hole pattern, see page 64.

STRAIGHT COMPLIANT PRESS-FIT TERMINATION
CODE 98

Positronic recommends the practice of using mounting hardware to secure connector to printed circuit board.

SUGGESTED PRINTED BOARD HOLE SIZES:
For straight compliant press-fit contacts, specify code 98 in step 4 of ordering information.

NOTE:
*1 The effective length of the compliant section may also be varied (longer or shorter) and can be selectively positioned and centered at several points along the contact termination length, permitting high or low profile mounting of the connector on printed boards.
RIGHT ANGLE (90°) AND STRAIGHT COMPLIANT PRESS-FIT PRINTED BOARD CONTACT HOLE PATTERN

MOUNT CONNECTOR WITH MATING FACE POSITIONED TO FOLLOW DIRECTION OF ARROW.

SUGGESTED PRINTED BOARD HOLE SIZES:
Suggest 0.120 [3.05] Ø hole for connector mounting holes

NOTE: For suggested printed board recommended drill hole sizes, plating and finished hole sizes for compliant contact termination positions, see page 81. For compliant press-fit connector installation tools, see page 80.
### ORDERING INFORMATION - CODE NUMBERING SYSTEM

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

<table>
<thead>
<tr>
<th>STEP</th>
<th>EXAMPLE</th>
<th>PCD</th>
<th>25</th>
<th>F</th>
<th>98</th>
<th>S</th>
<th>0</th>
<th>0</th>
<th>X</th>
<th>/AA</th>
<th>-14</th>
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</thead>
</table>

**STEP 1 - BASIC SERIES**
PCD series

**STEP 2 - CONNECTOR VARIANTS**
9, 15, 25, 37, 50

**STEP 3 - CONNECTOR GENDER**
- **M** - Male
- **F** - Female - Professional Level: open entry contacts
- **S** - Female - Industrial Level: PosiBand closed entry contacts

Military plating options available.

**STEP 4 - CONTACT TERMINATION TYPE**
- **62** - Right angle (90°) printed circuit board mount, compliant press-fit
- **98** - Straight printed circuit board mount, compliant press-fit

**STEP 5 - MOUNTING STYLE**
- **B3** - Bracket, Mounting, Right Angle (90°) Metal with Cross Bar.
- **R2** - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Thread Fixed Female Jackscrews with Cross Bar.
- **R6** - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 0.120 [3.05] Ø Mounting Hole with Cross Bar.
- **R7** - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Threads with Cross Bar.
- **R8** - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Locknut with Cross Bar.
- **S** - Swaged Mounting Post 4-40 Threads 0.265 [6.73] Length.

**STEP 6 - HOODS**
- **0** - None.

**STEP 7 - LOCKING AND POLARIZING SYSTEMS**
- **0** - None.
- **V3** - Lock Tab.
- **T6** - Fixed Male and Female Polarized Jackscrews.
- **T2** - Fixed Female Jackscrews, 4-40 Thread.

*Note: These options must be ordered with connector and cannot be ordered separately.*

**STEP 8 - SHELL OPTIONS**
- **0** - Zinc plated, with chromate seal.
- **S** - Stainless steel, passivated.
- **X** - Tin plated.
- **Z** - Tin plated and dimpled (male connectors only).

**STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS**
- **/AA** - Compliant per EU Directive 2002/95/EC (RoHS)

*Note: If compliance to environmental legislation is not required, this step will not be used. Example: PCD25F98S00X

**STEP 10 - SPECIAL OPTIONS**
- **-14** - 0.000030 [0.76µ] gold over nickel.
- **-15** - 0.000050 [1.27µ] gold over nickel.

**CONTACT TECHNICAL SALES FOR SPECIAL OPTIONS**

*Available in 25 and 50 female variants only, contact Technical Sales for availability of other variants.

*V3 locking systems are not available for connector variants 37 and 50. Jackscrews are highly recommended to minimize damage to contacts on variants with high mating forces.

*For stainless steel dimpled male versions contact Technical Sales.

**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.

*For information regarding COMPLIANT PRESS-FIT INSTALLATION TOOLS, see pages 80.*
PCDD series connectors are quality connectors with compliant terminations. The low press-in force required to install the contacts into the board eliminates printed board pressure-warp and twisting stresses which can result in expensive repair or replacement of printed boards and back panels.

Six standard connector variants are offered in arrangements of 15, 26, 44, 62, 72, and 104 contacts.

PCDD connectors are mateable and compatible with all D-subminiature connectors conforming to dimensional requirements of MIL-DTL-24308.

For RoHS options see page 70.
CONTACT VARIANTS
FACE VIEW OF MALE AND REAR VIEW OF FEMALE

STANDARD SHELL ASSEMBLY

<table>
<thead>
<tr>
<th>CONNECTOR VARIANT SIZES</th>
<th>A ±0.015</th>
<th>B ±0.005</th>
<th>D1 ±0.005</th>
<th>C ±0.013</th>
<th>D ±0.015</th>
<th>E ±0.005</th>
<th>G ±0.010</th>
<th>H ±0.010</th>
<th>K ±0.005</th>
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<tbody>
<tr>
<td>PCDD 104 M</td>
<td>78</td>
<td>26</td>
<td>44</td>
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<td>44</td>
<td>15</td>
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<td>44</td>
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<tr>
<td>PCDD 104 F</td>
<td>78</td>
<td>26</td>
<td>44</td>
<td>15</td>
<td>78</td>
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<td>15</td>
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<tr>
<td>PCDD 104 S</td>
<td>78</td>
<td>26</td>
<td>44</td>
<td>15</td>
<td>78</td>
<td>44</td>
<td>15</td>
<td>78</td>
<td>44</td>
<td>15</td>
</tr>
</tbody>
</table>

DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.
RIGHT ANGLE (90°) COMPLIANT PRESS-FIT TERMINATION

**CODE 62**

Positronic recommends the practice of using mounting hardware to secure connector to printed circuit board.

**NOTE:**
- *1 Currently available in 78 female variants only, contact Technical Sales for availability of other variants.
- *2 Dimension applies for metal angle brackets only. Consult Accessories D-subminiature Catalog for dimension when plastic brackets are used.

**SUGGESTED PRINTED BOARD HOLE SIZES:**
For right angle (90°) printed board contact hole pattern, see page 69.

STRAIGHT COMPLIANT PRESS-FIT TERMINATION

**CODE 98**

Positronic recommends the practice of using mounting hardware to secure connector to printed circuit board.

**NOTE:**
- *1 The effective length of the compliant section may also be varied (longer or shorter) and can be selectively positioned and centered at several points along the contact termination length, permitting high or low profile mounting of the connector on printed boards.

**SUGGESTED PRINTED BOARD HOLE SIZES:**
For right angle (90°) printed board contact hole pattern, see page 69.
**PCDD SERIES**

RIGHT ANGLE (90°) AND STRAIGHT COMPLIANT PRESS-FIT PRINTED BOARD CONTACT HOLE PATTERN

MOUNT CONNECTOR WITH MATING FACE POSITIONED TO FOLLOW DIRECTION OF ARROW.

---

### CODE NUMBER

<table>
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<tr>
<th>CODE NUMBER</th>
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<th>B</th>
<th>C</th>
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<tr>
<td>62</td>
<td>0.100</td>
<td>0.100</td>
<td>0.100</td>
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<tr>
<td>98</td>
<td>0.078</td>
<td>0.082</td>
<td>0.123</td>
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</table>

DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.

SUGGESTED PRINTED BOARD HOLE SIZES:

Suggest 0.120 [3.05] Ø hole for connector mounting holes.

NOTE: For suggested printed board recommended drill hole sizes, plating and finished hole sizes for compliant contact termination positions, see page 81. For compliant press-fit connector installation tools, see page 80.
ORDERING INFORMATION - CODE NUMBERING SYSTEM
Specify Complete Connector By Selecting An Option From Step 1 Through 8

<table>
<thead>
<tr>
<th>STEP</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
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</thead>
<tbody>
<tr>
<td>EXAMPLE</td>
<td>PCDD</td>
<td>15</td>
<td>M</td>
<td>98</td>
<td>S</td>
<td>0</td>
<td>T2</td>
<td>0</td>
<td>/AA</td>
<td>-14</td>
</tr>
</tbody>
</table>

**STEP 1 - BASIC SERIES**
PCDD series

**STEP 2 - CONNECTOR VARIANTS**
15, 26, 44, 62, 78, 104

**STEP 3 - CONNECTOR GENDER**
M - Male
F - Female - Professional Level
S - Female - Industrial Level
open entry contacts
PosiBand closed entry contacts.
Military plating options available.

**STEP 4 - CONTACT TERMINATION TYPE**
*62 - Right angle (90°) printed circuit board mount, compliant press-fit
98 - Straight printed circuit board mount, compliant press-fit

**STEP 5 - MOUNTING STYLE**
B3 - Bracket, Mounting, Right Angle (90°) Metal with Cross Bar.
R2 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Thread Fixed Female Jackscrews with Cross Bar.
R6 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 0.120 [3.05] Ø Mounting Hole with Cross Bar.
R7 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Threads with Cross Bar.
R8 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Locknut with Cross Bar.
S - Swaged Mounting Post 4-40 Threads 0.265 [6.73] Length.

**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.

**STEP 6 - HOODS**
0 - None.

**STEP 7 - LOCKING AND POLARIZING SYSTEMS**
0 - None.
*V3 - Lock Tab.
T6 - Fixed Male and Female Polarized Jackscrews.
T2 - Fixed Female Jackscrews, 4-40 Thread.

Note: These options must be ordered with connector and cannot be ordered separately.

**STEP 8 - SHELL OPTIONS**
0 - Zinc plated, with chromate seal.
** - Stainless steel, passivated.
X - Tin plated.
Z - Tin plated and dimpled (male connectors only).

**STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS**
/AA - Compliant per EU Directive 2002/95/EC (RoHS)

Note: If compliance to environmental legislation is not required, this step will not be used. Example: PCDD15M98S0T20

**STEP 10 - SPECIAL OPTIONS**
-14 - 0.000030 [0.76µ] gold over nickel.
-15 - 0.000050 [1.27µ] gold over nickel.

CONTACT TECHNICAL SALES FOR SPECIAL OPTIONS

**NOTE:** If available in 78 female variant only, contact Technical Sales for availability of other variants.

**V3 locking systems are not available for connector variants 62 and 78. Jackscrews are highly recommended to minimize damage to contacts on variants with high mating forces.
** For stainless steel dimpled male versions contact Technical Sales.

For information regarding COMPLIANT PRESS-FIT INSTALLATION TOOLS, see pages 80.
AD Series
Size 20 “Open Entry” Contact Design

HAD Series
Size 20 PosiBand® “Closed Entry” Contact Design

Connector Saver

AD and HAD series connectors are suitable for use in any applications requiring high performance characteristics. The normal density AD and HAD series are available in five standard connector variants of 9, 15, 25, 37 and 50 contacts.

AD and HAD series connectors utilize precision machined contacts for strength and durability. AD series female contact features a rugged open entry design. HAD series female contact features the PosiBand closed entry design for even higher reliability, see page 1 for details.

AD and HAD series connectors can be mated to a connector which would normally experience high numbers of mating cycles. The AD/HAD connector can be easily replaced, “saving” a connector which is not easily replaced.

These connectors can also be used as a “gender changer”. Connectors are available in high density versions, see page 75.

For RoHS options see page 74.

TECHNICAL CHARACTERISTICS

MATERIALS AND FINISHES:

- **Insulator:**
  - AD series: Nylon resin, UL 94V-0, black color.
  - HAD series: Glass-filled DAP per ASTM-D-5948, UL 94V-0.

- **Contacts:** Precision machined copper alloy.

- **Contact Plating:** Gold flash over nickel plate. Other finishes available upon request.

- **Shells:** Steel with tin plate; zinc plate with chromate seal, stainless steel passivated. Other materials and finishes available upon request.

Low magnetic versions are available, contact Technical Sales.

MECHANICAL CHARACTERISTICS:

- **Fixed Contacts:**
  - Size 20 contacts, male - 0.040 inch [1.02 mm] mating diameter. AD series female contact offers open entry design. HAD series female contact features PosiBand closed entry design, see page 1 for details.

- **Connector Saver:** Male to female or male to male.

- **Contact Retention:** 9 lbs. [40 N].

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

Polarization: Trapezoidally shaped shells.

Mechanical Operations:
- AD series: 500 operations, minimum, per IEC 60512-5.
- HAD series: 1,000 operations, minimum, per IEC 60512-5.

ELECTRICAL CHARACTERISTICS:

- **Contact Current Rating:**
  - Open Entry Contacts: 7.5 amperes nominal
  - Closed Entry Contacts, 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:**
  - 0.008 ohms, maximum for AD series.
  - 0.004 ohms, maximum for HAD series.

- **Proof Voltage:**
  - 1,000 V r.m.s.

- **Insulator Resistance:**
  - 5 G ohms.

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

- **Working Voltage:**
  - 300 V r.m.s.

CLIMATIC CHARACTERISTICS:

- **Temperature Range:** -55°C to +125°C.


**AD AND HAD SERIES SIZE 20 CONTACT CONNECTOR SAVER**

**CONTACT VARIANTS**

FACE VIEW OF MALE OR USE MIRROR IMAGE FOR FEMALE

![Diagram of Connector Variants]

**STANDARD SHELL ASSEMBLY DIMENSIONS**

**SIZE 20 CONTACTS**

![Diagram of Shell Assembly Dimensions]

<table>
<thead>
<tr>
<th>Connector Variant Sizes</th>
<th>A ±0.015 [0.38]</th>
<th>B ±0.005 [0.13]</th>
<th>B1 ±0.005 [0.13]</th>
<th>C ±0.005 [0.13]</th>
<th>D ±0.005 [0.13]</th>
<th>D1 ±0.005 [0.13]</th>
<th>E ±0.015 [0.38]</th>
<th>K1 ±0.005 [0.13]</th>
<th>K ±0.005 [0.13]</th>
<th>Width ±0.005 [0.13]</th>
<th>±0.005 [0.13] Ø Thru Hole, 2 places</th>
</tr>
</thead>
<tbody>
<tr>
<td>25 M</td>
<td>2.088 [53.04]</td>
<td>1.534 [38.96]</td>
<td>1.852 [47.04]</td>
<td>0.329 [8.36]</td>
<td>0.494 [12.55]</td>
<td>0.230 [5.84]</td>
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<tr>
<td>25 F</td>
<td>1.588 [40.32]</td>
<td>1.511 [38.38]</td>
<td>1.852 [47.04]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
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<td>37 M</td>
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<td>2.182 [55.42]</td>
<td>2.500 [63.50]</td>
<td>0.329 [8.36]</td>
<td>0.494 [12.55]</td>
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<tr>
<td>37 F</td>
<td>2.729 [69.22]</td>
<td>2.159 [54.84]</td>
<td>2.500 [63.50]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
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<td>50 M</td>
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<td>2.079 [52.81]</td>
<td>2.406 [61.11]</td>
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<td>0.605 [15.37]</td>
<td>0.230 [5.84]</td>
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</tr>
<tr>
<td>50 F</td>
<td>2.635 [66.93]</td>
<td>2.064 [52.43]</td>
<td>2.406 [61.11]</td>
<td>0.423 [10.74]</td>
<td>0.605 [15.37]</td>
<td>0.243 [6.17]</td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
</tbody>
</table>

**DIMENSIONS ARE IN INCHES [MILLIMETERS].**

**ALL DIMENSIONS ARE SUBJECT TO CHANGE.**
Connectors Designed To Customer Specifications

Positronic D-subminiature connectors can be modified to customer specifications.

Examples: select loading of contacts for cost savings or to gain creepage and clearance distances; longer printed circuit board terminations; customer specified hardware; sealing for water resistance.

Contact Technical Sales with your particular requirements.
ORDERING INFORMATION - CODE NUMBERING SYSTEM
Specify Complete Connector By Selecting An Option From Step 1 Through 9

<table>
<thead>
<tr>
<th>STEP</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<th>11</th>
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<tbody>
<tr>
<td>EXAMPLE</td>
<td>AD</td>
<td>9</td>
<td>F</td>
<td>S</td>
<td>X</td>
<td>9</td>
<td>M</td>
<td>S</td>
<td>X</td>
<td>/AA</td>
<td>-14</td>
</tr>
</tbody>
</table>

**STEP 1 - BASIC SERIES**
AD series - Open entry female contacts, nylon insulator
HAD series - PosiBand closed entry female contacts, DAP insulator.

**STEP 2 - CONNECTOR VARIANT**
9, 15, 25, 37, 50

**STEP 3 - 1ST CONNECTOR GENDER**
M - Male
F - Female

**STEP 4 - 1ST CONNECTOR MATING STYLE**
0 - Swaged spacer 0.120 [3.05µ] mounting hole
S - Swaged spacer 4-40 UNC-2B threads
**E** - Rotating male and female jackscrews (Select 0 in Step 8)
**E6** - Rotating male and female polarized jackscrew (Select 0 in Step 8)
**T** - Fixed male and female jackscrews (Select 0 in Step 8)
**T6** - Fixed male and female polarized jackscrew (Select 0 in Step 8)

**STEP 5 - 1ST CONNECTOR SHELL OPTION**
0 - Zinc plated, with chromate seal.
**S** - Stainless steel, passivated.
X - Tin plated.
Z - Tin plated and dimpled (male connectors only).

**STEP 6 - 2ND CONNECTOR SHELL OPTION**
0 - Zinc plated, with chromate seal.
**S** - Stainless steel, passivated.
X - Tin plated.
Z - Tin plated and dimpled (male connectors only).

**STEP 7 - 2ND CONNECTOR GENDER**
M - Male

**STEP 8 - 2ND CONNECTOR MATING STYLE**
0 - Swaged spacer 0.120 [3.05µ] mounting hole
S - Swaged spacer 4-40 UNC-2B threads
**E** - Rotating male and female jackscrews (Select 0 in Step 4)
**E6** - Rotating male and female polarized jackscrew (Select 0 in Step 4)
**T** - Fixed male and female jackscrews (Select 0 in Step 4)
**T6** - Fixed male and female polarized jackscrew (Select 0 in Step 4)

**STEP 9 - 2ND CONNECTOR SHELL OPTION**
0 - Zinc plated, with chromate seal.
**S** - Stainless steel, passivated.
X - Tin plated.
Z - Tin plated and dimpled (male connectors only).

**STEP 10 - ENVIRONMENTAL COMPLIANCE OPTIONS**
/AA - Compliant per EU Directive 2002/95/EC (RoHS)

**NOTE:** If compliance to environmental legislation is not required, this step will not be used. Example: AD9FSX9MSX

**STEP 11 - SPECIAL OPTIONS**
-14 - 0.000030 [0.76µ] gold over nickel.
-15 - 0.000050 [1.27µ] gold over nickel.

CONTACT TECHNICAL SALES FOR SPECIAL OPTIONS

*1 Connector mating style for both connectors must be the same if 0 or S is used. If E, E6, T or T6 is used in either Step 4 or 8 the other step must be 0.
*2 Connector variant for both connectors must be the same.
*3 For hardware information, see page 73.
*4 For stainless steel dimpled male versions contact Technical Sales.

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.
DAD series connectors are suitable for use in any applications requiring high performance characteristic. The high density DAD series is available in six standard connector variants of 15, 26, 44, 62, 78 and 104 contacts.

DAD series connectors utilize precision machined contacts for strength and durability. The female contact features a rugged open entry design. Female PosiBand closed entry contacts can be chosen for even higher reliability, see page 1 for details.

DAD series connectors can be mated to a connector which would normally experience high numbers of mating cycles. The DAD connector can be easily replaced, “saving” a connector which is not easily replaced.

Connectors are available in standard density versions, see page 71.

TECHNICAL CHARACTERISTICS

MATERIALS AND FINISHES:
- Insulator: Polyester glass-filled per ASTM D5927, UL 94V-0.
- Contacts: Precision machined copper alloy.
- Contact Plating: Gold flash over nickel plate. Other finishes available upon request.
- Shells: Steel or brass with tin plate; zinc plate with chromate seal, stainless steel passivated. Other materials and finishes available upon request.

Low magnetic versions are available, contact Technical Sales.

MECHANICAL CHARACTERISTICS:
- Fixed Contacts: Size 22 contacts - male 0.030 inch [0.76 mm] mating diameter. Female Contact: open entry or PosiBand closed entry design, see page 1 for details.
- Connector Saver: Male to female.
- Contact Retention: 9 lbs. [40 N].
- Shells: Male shells may be dimpled for EMI/ESD ground paths.
- Polarization: Trapeziodally shaped shells.

Mechanical Operations: 500 operations, minimum, per IEC 60512-5 for open entry.
1000 operations, minimum, per IEC 60512-5 for closed entry.

ELECTRICAL CHARACTERISTICS:
- Contact Current Rating:
  - Open Entry Contacts: 5 amperes nominal
  - Closed Entry Contacts, tested per UL 1977:
    - 12 amperes, 2 contacts energized.
    - 10 amperes, 6 contacts energized.
    - 7.5 amperes, 26 contacts energized.
    - 6.5 amperes, 65 contacts energized.
    - 5.0 amperes, 104 contacts energized.

See temperature rise curves on page 2 for details.

Initial Contact Resistance: 0.010 ohms, maximum for open entry
0.005 ohms, maximum for closed entry

Proof Voltage: 1,000 V r.m.s.
Insulator Resistance: 5 G ohms.
Clearance and Creepage Distance: 0.042 inch [1.06 mm], minimum.
Working Voltage: 300 V r.m.s.

CLIMATIC CHARACTERISTICS:
- Temperature Range: -55°C to +125°C.
## CONTACT VARIANTS

**FACE VIEW OF MALE OR USE MIRROR IMAGE FOR FEMALE**

<table>
<thead>
<tr>
<th>CONNECTOR VARIANT SIZES</th>
<th>A ±0.015 (0.38)</th>
<th>B ±0.005 (0.13)</th>
<th>B1 ±0.005 (0.13)</th>
<th>C ±0.005 (0.13)</th>
<th>D ±0.005 (0.13)</th>
<th>D1 ±0.005 (0.13)</th>
<th>E ±0.015 (0.38)</th>
<th>K ±0.005 (0.13)</th>
<th>K1 ±0.005 (0.13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>44 M</td>
<td>2.088 [53.04]</td>
<td>1.534 [38.96]</td>
<td>1.852 [47.04]</td>
<td>0.329 [8.36]</td>
<td>0.494 [12.55]</td>
<td>0.230 [6.84]</td>
<td></td>
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<tr>
<td>44 F 44 S</td>
<td>2.088 [53.04]</td>
<td>1.511 [38.38]</td>
<td>1.852 [47.04]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
<td>0.243 [6.17]</td>
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<tr>
<td>62 M</td>
<td>2.729 [69.22]</td>
<td>2.182 [55.42]</td>
<td>2.500 [63.50]</td>
<td>0.329 [8.36]</td>
<td>0.494 [12.55]</td>
<td>0.230 [6.84]</td>
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<tr>
<td>62 F 62 S</td>
<td>2.729 [69.22]</td>
<td>2.159 [54.84]</td>
<td>2.500 [63.50]</td>
<td>0.311 [7.90]</td>
<td>0.494 [12.55]</td>
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<tr>
<td>78 M</td>
<td>2.635 [66.93]</td>
<td>2.079 [52.81]</td>
<td>2.406 [61.11]</td>
<td>0.441 [11.20]</td>
<td>0.605 [15.37]</td>
<td>0.230 [6.84]</td>
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<tr>
<td>78 F 78 S</td>
<td>2.635 [66.93]</td>
<td>2.064 [52.43]</td>
<td>2.406 [61.11]</td>
<td>0.423 [10.74]</td>
<td>0.605 [15.37]</td>
<td>0.243 [6.17]</td>
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<td>2.729 [69.22]</td>
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<td>2.500 [63.50]</td>
<td>0.503 [12.78]</td>
<td>0.668 [16.97]</td>
<td>0.230 [6.84]</td>
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<td>2.729 [69.22]</td>
<td>2.189 [55.60]</td>
<td>2.500 [63.50]</td>
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## ORDERING INFORMATION - CODE NUMBERING SYSTEM

Specify Complete Connector By Selecting An Option From Step 1 Through 9

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<tr>
<th>STEP</th>
<th>EXAMPLE</th>
<th>1</th>
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### STEP 1 - BASIC SERIES

DAD series

### STEP 2 - CONNECTOR VARIANT

15, 26, 44, 62, 78, 104

### STEP 3 - 1ST CONNECTOR GENDER

M - Male

**STEP 4 - 1ST CONNECTOR MATING STYLE**

- 0 - Swaged spacer 0.120 [3.05µ] mounting hole
- S - Swaged spacer 4-40 UNC-2B threads
- **E** - Rotating male and female jackscrews
  (Select 0 in Step 8)
- **E6** - Rotating male and female polarized jackscrew
  (Select 0 in Step 8)
- **T** - Fixed male and female jackscrews
  (Select 0 in Step 8)
- **T6** - Fixed male and female polarized jackscrew
  (Select 0 in Step 8)

**STEP 5 - 1ST CONNECTOR SHELL OPTION**

- 0 - Zinc plated, with chromate seal.
- **S** - Stainless steel, passivated.
- X - Tin plated.
- Z - Tin plated and dimpled (male connectors only).

**STEP 6 - 2ND CONNECTOR SHELL OPTION**

- 0 - Zinc plated, with chromate seal.
- **S** - Stainless steel, passivated.
- X - Tin plated.
- Z - Tin plated and dimpled (male connectors only).

**STEP 7 - 2ND CONNECTOR GENDER**

- **M** - Male
- F - Female - Professional Level - open entry contacts
- S - Female - Industrial Level - PosiBand closed entry contacts

Military plating options available.

**STEP 8 - 2ND CONNECTOR MATING STYLE**

- 0 - Swaged spacer 0.120 [3.05µ] mounting hole
- S - Swaged spacer 4-40 UNC-2B threads
- **E** - Rotating male and female jackscrews
  (Select 0 in Step 4)
- **E6** - Rotating male and female polarized jackscrew
  (Select 0 in Step 4)
- **T** - Fixed male and female jackscrews
  (Select 0 in Step 4)
- **T6** - Fixed male and female polarized jackscrew
  (Select 0 in Step 4)

**STEP 9 - 2ND CONNECTOR VARIANT**

15, 26, 44, 62, 78, 104

**STEP 10 - ENVIRONMENTAL COMPLIANCE OPTIONS**

/AA - Compliant per EU Directive 2002/95/EC (RoHS)

NOTE: If compliance to environmental legislation is not required, this step will not be used. Example: DAD15MSX15FSX

**STEP 11 - SPECIAL OPTIONS**

- 14 - 0.000030 [0.76µ] gold over nickel.
- 15 - 0.000050 [1.27µ] gold over nickel.

CONTACT TECHNICAL SALES FOR SPECIAL OPTIONS

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.

Military plating options available.
APPLICATION TOOLS

APPLICATION TOOLS SECTION

SD / RD / ORD / ODD / DD connectors are offered with removable crimp contacts.

Positronic Industries recognizes the importance of supplying application tooling to support our customers’ use of our products.

Information on application tooling is available on our web site at http://www.connectpositronic.com/products/157/ApplicationTooling

There you will find downloadable PDF cross reference charts for removable and compliant press-fit contacts. These charts will supply part numbers for insertion, removal and crimping tools, along with information regarding use of tools and techniques.

REELS FOR AUTOMATIC PNEUMATIC CRIMP TOOLS

Contacts may be supplied in plastic carriers, packaged in reels holding 2,000 contacts for use with the automatic pneumatic crimp tools, catalog part number 9550-1. The same type carrier is used for both male and female contacts.

All male and female crimp contacts can be ordered in reels by adding letter “R” after the contact part number, such as MC6020DR for a male contact and FC6020D2R for female contact.
### APPLICATION TOOLS CROSS REFERENCE LIST

<table>
<thead>
<tr>
<th>Tool</th>
<th>Oil</th>
<th>Cross</th>
<th>Oil</th>
<th>Cross</th>
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<tr>
<td>M81969/1-04</td>
<td>M22520/2-01</td>
<td>9507-0-0-0</td>
<td>M81969/1-04</td>
<td>M22520/2-01</td>
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<td>M22520/2-06</td>
<td>9502-4-0-0</td>
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*See Note*
### POSITRONIC RECOMMENDED TOOLS FOR PCD SERIES AND PCDD SERIES CONNECTORS AND CONTACTS

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<tr>
<th>SERIES</th>
<th>CONNECTOR SEATING</th>
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<td>MALE</td>
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<tr>
<td>PCD 9</td>
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<td>PCD 15</td>
<td>9512-2-0-41</td>
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<td>PCD 25</td>
<td>9512-3-0-41</td>
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<tr>
<td>PCD 37</td>
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<td>PCDD 78</td>
<td>9512-5-0-41</td>
</tr>
<tr>
<td>PCDD 104</td>
<td>9512-16-0-41</td>
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</tbody>
</table>

Arbor press for connector seating tools-9530-1-0 1 ton capacity 4 inch throat

- **PCD series** - Replacement pins for connector seating tools. Female - 855-658-0-41
- **PCDD series** - Replacement pins for connector seating tools. Female - 855-751-0-41
SUGGESTED PRINTED BOARD HOLE SIZES FOR COMPLIANT PRESS-FIT TERMINATION

Traditionally, tin-lead has been a popular plating for printed circuit board (PCB) holes. However, many PCB hole platings must now be RoHS compliant. Positronic is pleased to offer PCB HOLE SIZE FOR RoHS PCB plating as shown below.

<table>
<thead>
<tr>
<th>BOARD TYPE</th>
<th>CONTACT SIZE / TYPE</th>
<th>RECOMMENDED DRILL HOLE SIZE</th>
<th>RECOMMENDED PLATING</th>
<th>FINISHED HOLE SIZES</th>
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</thead>
<tbody>
<tr>
<td>TIN-LEAD SOLDER PCB</td>
<td>22 OMEGA</td>
<td>ø0.0453±0.0010 [ø1.150±0.025]</td>
<td>0.0006 [15µ] minimum solder over 0.0010 [25µ] min. copper</td>
<td>ø0.0394±0.0035-0.0024 [ø1.000±0.090-0.060]</td>
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<tr>
<td></td>
<td>20 OMEGA</td>
<td>ø0.0453±0.0010 [ø1.150±0.025]</td>
<td>0.0006 [15µ] minimum solder over 0.0010 [25µ] min. copper</td>
<td>ø0.0394±0.0035-0.0024 [ø1.000±0.090-0.060]</td>
</tr>
</tbody>
</table>

RoHS PCB PLATING OPTIONS

| COPPER PCB | 22 OMEGA | ø0.047±0.001 [ø1.19±0.025] | 0.0010 [25µ] min. copper | ø0.043±0.002 [ø1.09±0.05] |
| | 20 OMEGA | ø0.047±0.001 [ø1.19±0.025] | 0.0010 [25µ] min. copper | ø0.043±0.002 [ø1.09±0.05] |
| IMMERSION TIN PCB | 22 OMEGA | ø0.047±0.001 [ø1.19±0.025] | 0.0003±0.000006 [0.85±0.15µ] immersion tin over 0.0010 [25µ] min. copper | ø0.043±0.002 [ø1.09±0.05] |
| | 20 OMEGA | ø0.047±0.001 [ø1.19±0.025] | 0.0003±0.000006 [0.85±0.15µ] immersion tin over 0.0010 [25µ] min. copper | ø0.043±0.002 [ø1.09±0.05] |
| IMMERSION SILVER PCB | 22 OMEGA | ø0.047±0.001 [ø1.19±0.025] | 0.0000002 [0.34±0.17µ] immersion silver over 0.0010 [25µ] min. copper | ø0.043±0.002 [ø1.09±0.05] |
| | 20 OMEGA | ø0.047±0.001 [ø1.19±0.025] | 0.0000002 [0.34±0.17µ] immersion silver over 0.0010 [25µ] min. copper | ø0.043±0.002 [ø1.09±0.05] |
| ELECTROLESS NICKEL / IMMERSION GOLD PCB | 22 OMEGA | ø0.047±0.001 [ø1.19±0.025] | 0.000017±0.000059 [4.5±1.5µ] electroless nickel per IPC-4552 over 0.0010 [25µ] min. copper | ø0.043±0.002 [ø1.09±0.05] |
| | 20 OMEGA | ø0.047±0.001 [ø1.19±0.025] | 0.000017±0.000059 [4.5±1.5µ] electroless nickel per IPC-4552 over 0.0010 [25µ] min. copper | ø0.043±0.002 [ø1.09±0.05] |

“Omega” Termination

When properly used, Positronic Industries Omega signal compliant press-fit terminations provide reliable service even under severe conditions.

Connectors utilizing this leading technology compliant press-fit contact are easy to install:

1. Inexpensive installation tooling is available from Positronic, to choose the proper installation tool refer to page 83 for part number ordering information.
2. Insert the connector into the printed circuit board or backplane and seat connector fully.
3. Secure the connector to the printed circuity board or backplane using two self-tapping screws. The screws should be 4-40 threads supplied by customer.

NOTE: For PCB plating compositions not shown, consult Technical Sales.

COMPLIANT PRESS-FIT USER INFORMATION

When properly used, Positronic Industries Omega signal compliant press-fit terminations provide reliable service even under severe conditions.

Connectors utilizing this leading technology compliant press-fit contact are easy to install:

1. Inexpensive installation tooling is available from Positronic, to choose the proper installation tool refer to page 83 for part number ordering information.
2. Insert the connector into the printed circuit board or backplane and seat connector fully.
3. Secure the connector to the printed circuit board or backplane using two self-tapping screws. The screws should be 4-40 threads supplied by customer.

NOTE: For PCB plating compositions not shown, consult Technical Sales.
Positronic® offers a variety of QPL connector products

### D - S U B M I N I A T U R E C O N N E C T O R S

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<tr>
<th>MIL PREFIX</th>
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<tr>
<td>MIL-DTL-24308/1</td>
<td>HDC</td>
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<td>MIL-DTL-24308/4</td>
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### R E C T A N G U L A R C O N N E C T O R S

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</table>

For a complete QPL listing available to download in PDF format, visit the desired connector family home page and click on link “Qualified Product Listing (PDF)” on our website at:

www.connectpositronic.com

or enter the URL link below to download the QPL PDF file immediately!

http://www.connectpositronic.com/pdf_view/222/
Positronic Industries offers full line of D-subminiature connectors in a wide variety of contact variants and package sizes with compliant press-fit, solder and cable terminations. All Positronic connector products provide quality, reliability, and flexibility.

**HIGH PERFORMANCE D-SUBMINIATURE CONNECTORS**

Standard and high density connectors manufactured to MIL-PRF-24308, Class M; Goddard Space Flight Center S-311-P-4 and Goddard Space Flight Center S-311-P-10.

**ENVIRONMENTAL-D CONNECTORS**

Standard and high density connectors with environmental protection features to IP67. Straight and right angle (90°), and cable terminations available.

**COMBO-D CONNECTORS**

Connectors with signal, shielded, power, thermocouple or high voltage contacts in a single package. Power compliant press-fit terminations now available.

**DUAL PORT CONNECTORS**

Right angle (90°) p.c. board mount connectors assembled stacked to maximize real estate; contact variants 9 through 62; available in standard density, high density, and mixed density.
Positronic HIGH RELIABILITY Products

**POWER**
- Contact Sizes: 0, 8, 12, 16, 20, 22, and 24
- Current Ratings: To 200 amperes per contact
- Terminations: Crimp and panel mount, straight solder, right angle (90°) solder, straight compliant press-in, and right angle (90°) compliant press-in
- Configurations: Multiple variants in a variety of package sizes
- Compliance: PICMG 2.11, PICMG 3.0, VITA 41, DSCC, GSFC S-311-P-4, GSFC S-311-P-10

**FEATURES:**
- High current density
- Energy saving - low contact resistance
- Hot swap capability
- AC/DC operation in a single connector
- Signal contacts for hardware management
- Blind mating
- Sequential mating
- Modular tooling which produces a single piece connector insert
- Large surface area contact mating system
- Wide variety of accessories
- Customer-specified contact arrangements

**D-SUBMINIATURE**
- Contact Sizes: 8, 16, 20, and 22
- Current Ratings: To 100 amperes
- Terminations: Crimp, wire solder, straight solder, right angle (90°) solder, straight compliant press-in, and right angle (90°) compliant press-in
- Configurations: Multiple variants in both standard and high densities, thirty package sizes
- Qualifications: MIL-DTL-28748, SAE AS39029, CCITT V.35

**FEATURES:**
- Two performance levels available: industrial quality and military quality
- A wide variety of accessories
- Broad selection of contact variants and package sizes
- Connector keying options
- Environmentally sealed versions
- Rear insertion/ front release of removable contacts
- Two level sequential mating
- Overmolding available on full assemblies

**RECTANGULAR**
- Contact Sizes: 8, 16, 20, and 22
- Current Ratings: To 100 amperes nominal
- Terminations: Crimp, wire solder, straight solder, right angle (90°) solder, straight compliant press-in and right angle (90°) compliant press-in
- Configurations: Multiple variants in both standard and high densities, thirty package sizes
- Qualifications: MIL-DMT-28748, SAE AS39029, CCITT V.35

**FEATURES:**
- Two performance levels available: industrial quality and military quality
- A wide variety of accessories
- Broad selection of contact variants and package sizes
- Connector keying options

**CIRCULAR**
- Contact Sizes: 8, 12, 16, 20, and 22
- Current Ratings: To 40 amperes nominal
- Terminations: Feedthrough is standard; flying leads and board mount available upon request
- Configurations: See D-subminiature and circular configurations above
- Qualifications: MIL-DMT-24306, GSFC S-311-P-4, GSFC S-311-P-10, DSCC

**FEATURES:**
- Non-composite / lightweight composite construction
- EMI/RFI shielded versions
- Thermocouple contacts
- Environmentally sealed versions
- Rear insertion/ front release of removable contacts
- Two level sequential mating
- Overmolding available on full assemblies

**CABLE**
- Current Ratings: To 200 amperes per contact
- Terminations: Crimp and panel mount, straight solder, right angle (90°) solder, straight compliant press-in, and right angle (90°) compliant press-in
- Configurations: Multiple variants in both standard and high densities, thirty package sizes
- Qualifications: MIL-DMT-24306, GSFC S-311-P-4, GSFC S-311-P-10, DSCC

**FEATURES:**
- Shorten the supply chain and reduce additional costs and delays by “cabling” your Positronic connector selection
- Overmolding available
- Shielded and environmentally sealed versions available
- Power cables and access boxes which meet the SAE J2496 specification

For more information, visit [www.connectpositronic.com](http://www.connectpositronic.com) or call your nearest Positronic sales office listed on the back of this catalog.
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