COMBO D
D-subminiature Connectors

SIGNAL, POWER, AIR, SHIELDED, THERMOCOUPLE OR HIGH VOLTAGE CONTACTS IN A SINGLE PACKAGE

Catalog C-004 Rev. F

www.connectpositronic.com
Experience

• Founded in 1966
• Involvement in the development of international connector specifications through EIA®, IEC and ISO as well as PICMG®.
• 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, CUL, 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: 407,441.

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.

Mission Statement

“To utilize product flexibility and application assistance to present quality interconnect solutions which represent value to customers worldwide.”

Regional Headquarters

Springfield, MO  Auch, France  Singapore

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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COMBINATION D-SUBMINIATURE STANDARD AND HIGH DENSITY

CB series connectors are available in standard density versions, which have fixed size 20 signal contacts and size 8 power, shielded, high voltage and air contacts. High density CB series connectors offer fixed size 22 signal contacts, size 8 contacts or size 16 power contacts. These connectors are available in various performance levels for best cost/performance ratio. Thermocouple contact options are also available.

COMBINATION D-SUBMINIATURE CRIMP CONTACTS STANDARD AND HIGH DENSITY

CBC series connectors offer crimp removable contacts for signal, power, shielded, high voltage and air contacts applications. These connectors are available in standard and high density versions. Thermocouple contact options are also available.

COMBINATION CONTACT DUAL PORT CONNECTORS

CBDP series. Offers seventeen different combinations of power and signal contact stacked assemblies. Size 20 signal contacts and size 8 power contacts.

INPUT POWER CONNECTORS (MicroTCA) - QB SERIES

QB series. Positronic was privileged to have participated in the development of the MicroTCA specification. Positronic is proud to announce the release of connectors for use in MicroTCA modules for power input. QB series offers board mount connectors for power modules, and cable connectors for bringing power to modules. QB series meet requirements of the MicroTCA Specification for 48V and 24V systems.

COMBO-D CONNECTOR SAVERS - ACBDP and ACBMP SERIES

ACBDP and ACBMP series. Combo-D connector savers with size 20 and size 8 contacts. Available for all standard Combo-D variants in shell sizes 1 through 6.
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SAVE TIME AND MONEY! Let Positronic support you by cablizing your CBD / CBM / CBC / CBCD / QB connector selection.

For more details contact Technical Sales or visit our web site at: http://www.connectpositronic.com/cable-assemblies
TEMPERATURE RISE CURVES FOR SIZE 8, 10 AND 12 AWG WIRE

**7W2**

| Curve developed using a mated CBD7W2F57 and CBC7W2M loaded with MC4008D contacts terminated to 8 AWG wire. |
| **MC4008D:** 8 AWG |
| Curve developed using a mated CBD7W2F36 and CBC7W2M loaded with MC4010D contacts terminated to 10 AWG wire. |
| **MC4010D:** 10 AWG |
| Curve developed using a mated CBD7W2F55 and CBC7W2M loaded with MC4012D contacts terminated to 12 AWG wire. |
| **MC4012D:** 12 AWG |

**Test conducted in accordance with UL1977.**
All power contacts under load.

**21WA4**

| Curve developed using a mated CBD21WA4F57 and CBC21WA4M loaded with MC4008D contacts terminated to 8 AWG wire. |
| **MC4008D:** 8 AWG |
| Curve developed using a mated CBD21WA4F36 and CBC21WA4M loaded with MC4010D contacts terminated to 10 AWG wire. |
| **MC4010D:** 10 AWG |
| Curve developed using a mated CBD21WA4F55 and CBC21WA4M loaded with MC4012D contacts terminated to 12 AWG wire. |
| **MC4012D:** 12 AWG |

**Test conducted in accordance with UL1977.**
All power contacts under load.

**8W8**

| Curve developed using a mated CBD8W8F57 and CBC8W8M loaded with MC4008D contacts terminated to 8 AWG wire. |
| **MC4008D:** 8 AWG |
| Curve developed using a mated CBD8W8F36 and CBC8W8M loaded with MC4010D contacts terminated to 10 AWG wire. |
| **MC4010D:** 10 AWG |
| Curve developed using a mated CBD8W8F55 and CBC8W8M loaded with MC4012D contacts terminated to 12 AWG wire. |
| **MC4012D:** 12 AWG |

**Test conducted in accordance with UL1977.**
All power contacts under load.

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
TEMPERATURE RISE CURVE FOR STANDARD AND HIGH CONDUCTIVITY CONTACT MATERIAL

**3W3**

**Test conducted in accordance with UL1977.**

**All power contacts under load.**

**Standard Material:** Curve developed using a mated CBD3W3F loaded with FC4008D contacts and CBD3W3M loaded with MC4008D contacts terminated to 8 AWG wire.

**High Conductivity:** Curve developed using a mated CBD3W3F loaded with FC4008DS contacts and CBD3W3M loaded with MC4008DS contacts terminated to 8 AWG wire.

* indicates contact gender

**8W8**

**Test conducted in accordance with UL1977.**

**All power contacts under load.**

**Standard Material:** Curve developed using a mated CBD8W8F loaded with FC4008D contacts and CBD8W8M loaded with MC4008D contacts terminated to 8 AWG wire.

**High Conductivity:** Curve developed using a mated CBD8W8F loaded with FC4008DS contacts and CBD8W8M loaded with MC4008DS contacts terminated to 8 AWG wire.

* indicates contact gender

**HIGH DENSITY 8W2**

**Test conducted in accordance with UL1977.**

**All power contacts under load.**

**Standard Material:** Curve developed using a mated CBCD8W2M loaded with MC112N/AA-133.0 contacts and CBCD8W2S loaded with FC112N4/AA contacts terminated to 8 AWG wire.

**High Conductivity:** Curve developed using a mated CBCD8W2M loaded with MC112NS-133.0 contacts and CBCD8W2S loaded with FC112N4S/AA contacts terminated to 12 AWG wire.

* indicates contact gender

DIMENSIONS ARE IN INCHES [MILLIMETERS], ALL DIMENSIONS ARE SUBJECT TO CHANGE.
Combo-D series connectors permit mixed contact combinations of power, shielded, air, high voltage and signal contacts within the same connector body. Twenty-two connector variants are offered in six standard shell sizes.

Three performance levels of Combo-D series connectors are offered: professional, industrial and military. CBD series connectors are quality connectors recommended for use in sheltered, non-corrosive indoor and outdoor environments having normal ventilation, but without temperature or humidity controls. Signal contacts are offered with open entry professional level or PosiBand closed entry industrial level signal contacts. CBD series connectors meet performance requirements of IEC 60807-2, Performance Level One or Two. CBM series connectors are military quality connectors recommended for use in sheltered, mildly corrosive environments having a wide range of temperature, pressure and humidity changes. CBM series connectors will meet the applicable performance requirements of DSCC 85039.

Combo-D series connectors utilize precision machined signal contacts. Connector variants are available with contact terminations for solder and straight and right angle (90°) printed board mount terminations featuring a choice of inch or metric printed board footprints.

Power, shielded and high voltage contacts are removable, having solder and straight and right angle (90°) printed board mount terminations. Power and shielded contacts are available with crimp terminations. Air contact options are also available, see page 80 for details.

For low level shielding requirements, ferrite inductors may be attached to both signal and power contacts of connectors having contact terminations which are straight or right angle (90°) for printed board mounting applications. For additional information contact Technical Sales.

The female power contacts feature the Large Surface Area (L.S.A.) closed entry contact design which provides maximum mating surfaces between male and female contacts and reduced contact resistance during operation.

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

A blind mating system is available for applications requiring connector coupling in recessed areas or mobile power coupling systems.

Straight and right angle (90°) PCB mount thermocouple contacts are available, please contact Technical Sales for details.
TECHNICAL CHARACTERISTICS

MATERIALS AND FINISHES:
- Insulator: Glass filled polyester per ASTM D 5927 UL 94V-0, blue color, and composite.
- Contacts: Precision machined copper alloy.
- Contact Plating:
  - SIGNAL: Gold flash over nickel plate and gold 0.000050 [1.27μm] over nickel plate. Other finishes available upon request, see page 81.
  - POWER: Gold flash over nickel. Other finishes available upon request, see page 81.
  - SHIELDED: For contact plating, see page 68.
  - HIGH VOLTAGE: For contact plating, see page 68.
- 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; polyester; copper alloy or steel with zinc plate and chromate seal or tin plate; phosphor bronze with tin plate; stainless steel, passivated.
- Push-On Fasteners: 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 electrolitc nickel plate. For aluminum hoods, zinc content is 1% maximum. Die cast zinc.
- Non-magnetic versions are available, contact Technical Sales.

MECHANICAL CHARACTERISTICS:
- Signal Contacts, Fixed: Size 20 contacts, male - 0.040 inch [1.02mm] diameter. CBD series has open entry female contacts. PosiBand closed entry female options are also available. CBM series has PosiBand closed entry female contacts, see page 68 for details.
- Contact Retention in Insulator: Signal: 9 lbs. [40N]. Power, shielded and high voltage: 22 lbs [98N].
- Signal Contact Terminations: Solder contacts - 0.042 inch [1.06mm] minimum hole diameter for 20 AWG [0.5 mm] wire maximum.
- Power Contacts, Removable, Crimp or Solder Termination: Size 8 contact, male - 0.142 inch [3.61mm] mating diameter. Terminations for 6, 8, 10, 12, and 16 AWG. Female contact features Large Surface Area (L.S.A.) closed entry contact design utilizing BeCu mechanical retention member. Closed crimp barrel.
- Power Contacts, Printed Board Mount: Size 8 contact, male - 0.142 inch [3.61mm] mating diameter. Printed board terminations with 0.078 inch [1.98mm], 0.094 inch [2.39mm] and 0.125 inch [3.18mm] termination diameters.
- Shielded Contacts, Removable: See table of cable sizes for contact termination dimensions, page 78.

High Voltage Contacts: Straight and right angle (90°) terminations – 0.041 inch [1.04mm] minimum hole diameter.
- 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] diameter hole, and threaded riveted fasteners with 4-40 threads and nylon inserts.
- Electrical Characteristics:
  - SIZE 20 CONTACTS
    - Contact Current Rating: 7.5 amperes nominal.
    - Initial Contact Resistance: 0.008 ohms maximum.
    - Proof Voltage: 1000 V r.m.s.
  - SIZE 8 CONTACTS
    - POWER CONTACTS
      - Contact Current Rating - Tested per UL 1977: Standard Contact Material:
        - 0.078 inches diameter / 12 AWG terminations: 39 amperes.
        - 0.094 inches diameter / 10 AWG terminations: 50 amperes.
        - 0.125 inches diameter / 8 AWG terminations: 70 amperes.
      - See Temperature Rise Curves on page 1 for details.
    - High Conductivity Contact Material:
      - 8 AWG terminations: 80 amperes.
      - See Temperature Rise Curves on page 2 for details.
    - Initial Contact Resistance:
      - Standard Contact Material: 0.0005 ohms max. per IEC 60512-2, Test 2b.
      - High Conductivity Contact Material: 0.00035 ohms max. per IEC 60512-2, Test 2b.
      - Proof Voltage: 1000 V r.m.s.
  - SHIELDED CONTACTS
    - For electrical characteristics, see page 69.
  - HIGH VOLTAGE CONTACTS
    - For electrical characteristics, see page 69.

CONNECTOR
- Insulation Resistance: 5 G ohms.
- Clearance and Creepage Distance: 0.039 [1.0mm] minimum.
- Working Voltage: 300 V r.m.s.

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

THERMOCOUPLE CONTACTS:
- Straight and right angle PCB mount contacts are available, please contact Technical Sales for details.

Size 20 crimp contacts are available in CBC series, see page 74 for details.
CONTACT VARIANTS
FACE VIEW OF MALE OR REAR VIEW OF FEMALE

**SHELL SIZE 1**

- 2WK2
- 5W1

**SHELL SIZE 2**

- 3W3
- 3WK3
- 7W2
- 11W1

**SHELL SIZE 3**

- 5W5
- 9W4
- 13W3
- 17W2
- 21W1

**SHELL SIZE 4**

- 8W8
- 13W6
- 17W5
- 21WA4
- 25W3
- 27W2

**SHELL SIZE 5**

- 24W7
- 36W4
- 43W2
- 47W1

**SHELL SIZE 6**

- 46W4

Notes:
* 2WK2 connectors have 1 male and 1 female contacts. Female connector should be loaded with female contact in A2 position.
* 3WK3 male variant contains 2 male contacts and 1 female contact. Female variant contains 2 female contacts and 1 male contact.
## STANDARD SHELL ASSEMBLY

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

- \(Ø0.120±0.005\) [Ø0.305±0.13] Mounting hole, two places for stainless steel shell (0 option)
- \(Ø0.154\) [3.91] Mounting hole, two places (02 option)

**RECOMMENDED MATING DIMENSIONS**

- Shell Sizes 1 & 2 = 0.265±0.015 [Ø6.73±0.38]
- Shell Sizes 3, 4, 5 & 6 = 0.256±0.015 [Ø6.50±0.38]

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### SHELL SIZES

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<th>SHELL SIZE</th>
<th>A ±0.015</th>
<th>B ±0.005</th>
<th>B1 ±0.005</th>
<th>C ±0.015</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 ±0.010</th>
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<tr>
<td>1 MALE</td>
<td>1.213</td>
<td>0.666</td>
<td>0.984</td>
<td>0.329</td>
<td>0.494</td>
<td>0.759</td>
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<td>1.541</td>
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<td>1.083</td>
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<td>3 MALE</td>
<td>2.086</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>0.426</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 FEMALE</td>
<td>2.086</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>0.230</td>
<td>0.426</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 MALE</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>0.230</td>
<td>0.426</td>
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<tr>
<td>4 FEMALE</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>0.230</td>
<td>0.426</td>
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</tr>
<tr>
<td>5 MALE</td>
<td>2.635</td>
<td>2.079</td>
<td>2.406</td>
<td>0.423</td>
<td>0.605</td>
<td>2.178</td>
<td>0.584</td>
<td>0.230</td>
<td>0.426</td>
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<td></td>
</tr>
<tr>
<td>5 FEMALE</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>0.584</td>
<td>0.230</td>
<td>0.426</td>
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<td></td>
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<tr>
<td>6 MALE</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></td>
<td></td>
</tr>
<tr>
<td>6 FEMALE</td>
<td>2.729</td>
<td>2.189</td>
<td>2.500</td>
<td>0.465</td>
<td>0.668</td>
<td>2.302</td>
<td>0.596</td>
<td>0.230</td>
<td>0.426</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

---

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

---

Positronic

Professional, Industrial and Military Quality

Three Performance Levels for Best Cost/Performance Ratio

Standard Density PCB Mount
**SOLDER CUP CONNECTOR**

**CODE 2**

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

Typical part number: CBD7W2M200T0

**STRAIGHT PRINTED BOARD MOUNT CONNECTOR**

**CODE 3, 35, 36 AND 37**

For Code 93 Press-Fit Board Mount Connectors, see page 20.

<table>
<thead>
<tr>
<th>CONTACT CODE</th>
<th>D Ø</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>--</td>
</tr>
<tr>
<td>35</td>
<td>0.078 [1.98]</td>
</tr>
<tr>
<td>36</td>
<td>0.094 [2.39]</td>
</tr>
<tr>
<td>37</td>
<td>0.125 [3.18]</td>
</tr>
</tbody>
</table>

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

Typical part number: CBD17W2F35S60T2X
RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR
WITH 0.078 [1.98] Ø POWER CONTACTS
CODE 5 AND 55, 0.283 [7.19] CONTACT EXTENSION

Typical part number: CBD17W2M55R7NT20

Typical part number: CBD36W4F55R7NT2X

RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR
WITH 0.125 [3.18] Ø POWER CONTACTS
CODE 5 AND 57, 0.283 [7.19] CONTACT EXTENSION

Typical part number: CBD17W2M57R7NT20

Typical part number: CBD36W4F57R7NT2X

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
SHELL SIZE 6
RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR
WITH 0.078 [1.98] Ø POWER CONTACTS
CODE 5 AND 55, 0.283 [7.19] CONTACT EXTENSION
CONNECTOR VARIANT 46W4
See temperature rise curves on pages 1 and 2

Typical part number:
CBD46W4M55R7NT20

0.283[7.19]-Specify code 5 or 55 in step 4 of ordering information
0.112[2.84] Typ.

0.078[1.98] Ø
0.028[0.71] Ø

SHELL SIZE 6
RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR
WITH 0.125 [3.18] Ø POWER CONTACTS
CODE 5 OR 57, 0.283 [7.19] CONTACT EXTENSION
CONNECTOR VARIANT 46W4
See temperature rise curves on pages 1 and 2

Typical part number:
CBD46W4M57R7NT20

0.283[7.19]-Specify code 5 or 57 in step 4 of ordering information
0.112[2.84] Typ.

0.125[3.18] Ø
0.028[0.71] Ø

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
METRIC SYSTEM RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR
WITH 0.078 [1.98] Ø POWER CONTACTS
CODE 7 AND 75, 0.370 [9.40] CONTACT EXTENSION
See temperature rise curves on pages 1 and 2

<table>
<thead>
<tr>
<th>SHELL SIZE</th>
<th>A</th>
<th>B</th>
<th>C</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL SIZE 1</td>
<td>1.204</td>
<td>0.984</td>
<td>0.420</td>
<td>0.370</td>
</tr>
<tr>
<td>(30.58)</td>
<td>(24.99)</td>
<td>(10.67)</td>
<td>(9.40)</td>
<td></td>
</tr>
<tr>
<td>SHELL SIZE 2</td>
<td>1.532</td>
<td>1.312</td>
<td>0.420</td>
<td>0.370</td>
</tr>
<tr>
<td>(38.91)</td>
<td>(33.32)</td>
<td>(10.67)</td>
<td>(9.40)</td>
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</tr>
<tr>
<td>SHELL SIZE 3</td>
<td>2.072</td>
<td>1.852</td>
<td>0.420</td>
<td>0.370</td>
</tr>
<tr>
<td>(52.63)</td>
<td>(47.04)</td>
<td>(10.67)</td>
<td>(9.40)</td>
<td></td>
</tr>
<tr>
<td>SHELL SIZE 4</td>
<td>2.720</td>
<td>2.600</td>
<td>0.420</td>
<td>0.370</td>
</tr>
<tr>
<td>(69.09)</td>
<td>(63.50)</td>
<td>(10.67)</td>
<td>(9.40)</td>
<td></td>
</tr>
<tr>
<td>SHELL SIZE 5</td>
<td>2.626</td>
<td>2.406</td>
<td>0.470</td>
<td>0.370</td>
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<tr>
<td>(66.70)</td>
<td>(61.11)</td>
<td>(11.94)</td>
<td>(9.40)</td>
<td></td>
</tr>
</tbody>
</table>

Typical part number: CBD17W2M75R70T20

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
RIGHT ANGLE (90°) PRINTED BOARD CONTACT HOLE PATTERN WITH 0.078 [1.98] Ø POWER CONTACTS AND STRAIGHT PRINTED BOARD CONTACT HOLE PATTERN WITH 0.078 [1.98] Ø, 0.094 [2.39] Ø AND 0.125 [3.18] Ø POWER CONTACTS

HOLE IDENTIFICATION SHOWN FOR MALE CONNECTOR; USE MIRROR IMAGE FOR FEMALE CONNECTOR. MOUNT CONNECTOR WITH MATING FACE POSITIONED TO FOLLOW DIRECTION OF ARROWS.

NOTE: For suggested printed board recommended drill hole sizes, plating and finished hole sizes for compliant contact termination positions, see page 85. For press-fit connector installation tools, see page 86.

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

SUGGESTED PRINTED BOARD HOLE SIZES:
Suggest 0.045 [1.14] Ø hole for signal contact termination positions.
Suggest 0.098 [2.49] Ø hole for 0.078 [1.98] Ø power contact termination positions.
Suggest 0.114 [2.90] Ø hole for 0.094 [2.39] Ø power contact termination positions.
Suggest 0.145 [3.68] Ø hole for 0.125 [3.18] Ø power contact termination positions.
Suggest 0.123 ±0.003 [3.12] Ø hole for mounting connector with push-on fasteners.

DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.
RIGHT ANGLE (90°) PRINTED BOARD CONTACT HOLE PATTERN WITH 0.078 [1.98] Ø POWER CONTACTS AND STRAIGHT PRINTED BOARD CONTACT HOLE PATTERN WITH 0.078 [1.98] Ø, 0.094 [2.39] Ø AND 0.125 [3.18] Ø POWER CONTACTS

HOLE IDENTIFICATION SHOWN FOR MALE CONNECTOR; USE MIRROR IMAGE FOR FEMALE CONNECTOR.
MOUNT CONNECTOR WITH MATING FACE POSITIONED TO FOLLOW DIRECTION OF ARROWS.

SUGGESTED PRINTED BOARD HOLE SIZES:
Suggest 0.045 [1.14] Ø hole for signal contact termination positions.
Suggest 0.098 [2.49] Ø hole for 0.078 [1.98] Ø power contact termination positions.
Suggest 0.114 [2.90] Ø hole for 0.094 [2.39] Ø power contact termination positions.
Suggest 0.145 [3.68] Ø hole for 0.125 [3.18] Ø power contact termination positions.
Suggest 0.123 ±0.003 [3.12] Ø hole for mounting connector with push-on fasteners.

NOTE: For suggested printed board recommended drill hole sizes, plating and finished hole sizes for compliant contact termination positions, see page 85.
For press-fit connector installation tools, see page 86.

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
RIGHT ANGLE (90°) PRINTED BOARD CONTACT HOLE PATTERN WITH 0.125 [3.18] Ø POWER CONTACTS

HOLE IDENTIFICATION SHOWN FOR MALE CONNECTOR; USE MIRROR IMAGE FOR FEMALE CONNECTOR. MOUNT CONNECTOR WITH MATING FACE POSITIONED TO FOLLOW DIRECTION OF ARROWS.

For “A”, “B”, “X” and “Y” dimensions, see chart on page 14.

SUGGESTED PRINTED BOARD HOLE SIZES:
Suggest 0.045 [1.14] Ø hole for signal contact termination positions.
Suggest 0.145 [3.68] Ø hole for power contact termination positions.
Suggest 0.123±0.003 [3.12] Ø hole for mounting connector with push-on fasteners.
RIGHT ANGLE (90°) PRINTED BOARD CONTACT HOLE PATTERN
WITH 0.125 [3.18] Ø POWER CONTACTS

HOLE IDENTIFICATION SHOWN FOR MALE CONNECTOR; USE MIRROR IMAGE FOR FEMALE CONNECTOR.
MOUNT CONNECTOR WITH MATING FACE POSITIONED TO FOLLOW DIRECTION OF ARROWS.

SUGGESTED PRINTED BOARD HOLE SIZES:

Suggest 0.045 [1.14] Ø hole for signal contact termination positions.
Suggest 0.145 [3.68] Ø hole for power contact termination positions.
Suggest 0.123±0.003 [3.12] Ø hole for mounting connector with push-on fasteners.

DIMENSIONS ARE IN INCHES [MILLIMETERS],
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
**Fixed Female Jackscrews**

- **0.250 [6.35]**
- **0.028 [0.71]** Ø

- Push-on Fastener, Phosphor Bronze

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

**Typical part number:**

CBD17W2M65S60T20

---

**Right Angle (90°) Printed Board Mount Connector**

**with FRT4201D or MRT4201D Shielded Contacts**

**Code 85**

**Table:**

<table>
<thead>
<tr>
<th></th>
<th></th>
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<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>SHELL SIZE 1</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>SHELL SIZE 2</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>SHELL SIZE 3</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>SHELL SIZE 4</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>
</tr>
<tr>
<td>SHELL SIZE 5</td>
<td>2.626 [66.70]</td>
<td>2.406 [61.11]</td>
<td>0.395 [10.03]</td>
<td>0.545 [13.84]</td>
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</tbody>
</table>

**NOTE:**

Shell size 5 connectors are supplied inverted when ordered with right angle (90°) printed board mount shielded contacts.

**Typical part number:**

CBD17W2M85R7NT20

---

---
SUGGESTED PRINTED BOARD HOLE SIZES:

Suggest 0.045 [1.14] Ø hole for signal contact termination position.
Suggest 0.123±0.003 [3.12] Ø hole for mounting connector with push-on fasteners.
STRAIGHT PRINTED BOARD MOUNT CONTACT HOLE PATTERN
WITH FDS4201D AND MDS4201D SHIELDED CONTACTS
HOLE IDENTIFICATION SHOWN FOR MALE CONNECTOR; USE MIRROR IMAGE FOR FEMALE CONNECTOR.

STRAIGHT PRINTED BOARD MOUNT CONTACT HOLE PATTERN
WITH FDS4201D AND MDS4201D SHIELDED CONTACTS
HOLE IDENTIFICATION SHOWN FOR MALE CONNECTOR; USE MIRROR IMAGE FOR FEMALE CONNECTOR.

SUGGESTED PRINTED BOARD HOLE SIZES:
Suggest 0.045 [1.14] Ø hole for signal contact termination position.
Suggest 0.123±0.003 [3.12] Ø hole for mounting connector with push-on fasteners.
RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONTACT HOLE PATTERN
WITH FRT4201D AND MRT4201D SHIELDED CONTACTS

HOLE IDENTIFICATION SHOWN FOR MALE CONNECTOR; USE MIRROR IMAGE FOR FEMALE CONNECTOR.
MOUNT CONNECTOR WITH MATING FACE POSITIONED TO FOLLOW DIRECTION OF ARROWS.

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

DIMENSIONS ARE IN INCHES [MILLIMETERS].
ALL DIMENSIONS ARE SUBJECT TO CHANGE.
RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONTACT HOLE PATTERN WITH FRT4201D AND MRT4201D SHIELDED CONTACTS

HOLE IDENTIFICATION SHOWN FOR MALE CONNECTOR; USE MIRROR IMAGE FOR FEMALE CONNECTOR. MOUNT CONNECTOR WITH MATING FACE POSITIONED TO FOLLOW DIRECTION OF ARROWS.

**NOTE:** Shell size 5 connectors are supplied inverted when ordered with right angle (90°) printed board mount shielded contacts.

SUGGESTED PRINTED BOARD HOLE SIZES:
Suggest 0.045 [1.14] Ø hole for signal contact termination position.
Suggest 0.123±0.003 [3.12] Ø hole for mounting connector with push-on fasteners.
COMPLIANT PRESS-FIT CONNECTOR
CODE 93

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

SUGGESTED PRINTED BOARD HOLE SIZES:
Suggest 0.123 [3.12] 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 85.
For press-fit connector installation tools, see page 86.

TEMPERATURE RISE CURVE

Test conducted in accordance with UL1977.
All power contacts under load.

Curve developed using CBD8W8M00000 and CBD8W8F93S000 connectors with MC4008D contacts terminated to 8 AWG wire.
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><strong>10</strong></th>
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<tbody>
<tr>
<td><strong>EXAMPLE</strong></td>
<td>CBD</td>
<td>17W2</td>
<td>F</td>
<td>55</td>
<td>R7</td>
<td>N</td>
<td>T2</td>
<td>X</td>
<td>/AA</td>
<td><strong>-14</strong></td>
</tr>
</tbody>
</table>

**STEP 1 - BASIC SERIES**

CBD – Professional/Industrial Quality, see Step 3.

CBM – Military conformance with “closed entry” female signal contacts plated 0.000050 [0.27µ] gold over nickel plate. Choose “S” or “M” in Step 3.

**STEP 2 - CONNECTOR VARIANTS**

| Shell Size 1 | 2WK2, 5W1 |
| Shell Size 2 | 2W3, 3WK3, 7WK2, 11W1 |
| Shell Size 3 | 5W4, 9W4, 13W3, 17W2, 21W1 |
| Shell Size 4 | 8W8, 13W6, 17W5, 21W4, 25W3, 27W2 |
| Shell Size 5 | 24W7, 36W4, 43W2, 47W1 |
| Shell Size 6 | 46W4 |

**STEP 3 - CONNECTOR GENDER**

F - Female - Professional Level -

Open Entry Signal Contacts

M - Male

S - Female - Industrial / Military Level -

PosiBand Closed Entry Signal Contacts

**STEP 4 - CONTACT TERMINATION TYPE**

0 – Connector ordered without size 8 power, shielded, air or high voltage removable contacts. See pages 60-68 for contact part numbers. Available on 2WK2, 3WK3, 5W5 and 8W8.

2 – Fixed Solder Cup, Signal Contacts only.

3 – Solder, Straight Printed Board Mount with Signal Contacts, 0.170 [4.32] Tail Length.

35 – Solder, Straight Printed Board Mount with Signal and 0.078 [1.98] Ø Power Contacts, 0.170 [4.32] Tail Length.


5 – Solder, Right Angle (90°) Printed Board Mount with Signal Contacts only, 0.283 [7.19] Signal Contact Extension.

55 – Solder, Right Angle (90°) Printed Board Mount with Signal and 0.078 [1.98] Ø Power Contacts, 0.283 [7.19] Signal Contact Extension.


65 – Solder, Straight Printed Board Mount with Signal and Shielded Contacts MDS/FDS 4201D footprint, 0.170 [4.32] Signal Contact Tail Length.

7 – Solder, Metric System Right Angle (90°) Printed Board Mount with Signal Contacts only, 0.570 [9.40] Signal Contact Extension.

75 – Solder, Metric System Right Angle (90°) Printed Board Mount with Signal and 0.078 [1.98] Ø Power Contacts, 0.370 [9.40] Signal Contact Extension.


**85** – Solder, Right Angle (90°) Printed Board Mount with Signal and Shielded Contacts MRT/FRT 4201D footprint, 0.283 [7.19] Signal Contact Extension.

93 – Size 20 Omega type compliant and Size 8 Bi-Spring type compliant, termination length 0.225 [5.72].

**NOTES**

* Not available on shell size 6, CBD 46W4.

* For additional information on accessories listed in steps 5, 6, 7 and 10, see Accessory Catalog.

* When using G hood with CBD variants, use the extended height hood. See Accessory Catalog for extended G hood options.

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

**DIMENSIONS ARE IN INCHES (MILLIMETERS).**

ALL DIMENSIONS ARE SUBJECT TO CHANGE.
CBC series connectors offer professional, industrial and military performance levels. Connectors are designed for use in sheltered, mildly corrosive environments having a wide range of temperature, pressure and humidity changes. CBC series connectors offer mixed crimp-removable contact combinations of power, shielded, air, high voltage, signal, and thermocouple contacts within the same connector body. Refer to size 8 removable contacts power, shielded, air and high voltage section, pages 68-80 for technical characteristics. Sixteen connector variants are offered in six standard shell sizes.

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

CBC series connectors also offer a Blind Mating connector system for applications requiring connector couplings in recessed areas or for mobile power coupling systems.

CBC series connectors utilize precision machined contacts and they meet the applicable performance and dimensional requirements of IEC 60807-3, Performance Levels One and Two, DSCC 85039 and MIL-DTL-24308.

Connectors Designed To Customer Specifications

Positronic Combo-D connectors can be modified to customers specifications.

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

Contact Technical Sales with your particular requirements.
TECHNICAL CHARACTERISTICS

MATERIALS AND FINISHES:
Insulator: Glass filled polyester per ASTM D 5927, UL 94V-0, blue color.
Contacts: Precision machined copper alloy.
SIGNAL: Gold flash over nickel plate and gold 0.000050 [1.27µ] over nickel plate. Other finishes available upon request, see page 81.
POWER: Gold flash over nickel. Other finishes available upon request, see page 81.
SHIELDED: For contact platings, see page 68.
HIGH VOLTAGE: For contact platings, see page 68.
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.
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 UL94V-0; brass or steel with zinc plate and chromate seal. Aluminum; aluminum with electrolessel zinc plate. For aluminum hoods, zinc content is 1% maximum. Die cast zinc.
Non-magnetic versions are available, contact Technical Sales.

MECHANICAL CHARACTERISTICS:
Signal Contacts, Crimp Removable: Size 20 contacts, male – 0.040 inch [1.02mm] mating diameter; Female rugged open entry or PosiBand closed entry contact design, see page 69 for details.
Contact Retention In Insulator: Signal: 9 lbs. [40N]. Power, shielded and high voltage: 22 lbs. [98N]
Crimp Contact Terminations: Closed barrel crimp, wire sizes 18 AWG [1.0mm²] through 30 AWG [0.05 mm²]
Power Contacts, Removable, Crimp or Solder Termination: Size 8 contacts, male – 0.142 inch [3.61mm] mating diameter. Terminations for 6, 8, 10, 12, and 16 AWG. Female contact features Large Surface Area (L.S.A.) closed entry contact design utilizing BeCu mechanical retention member. Closed crimp barrel.
Shielded Contacts, Removable: See table of cable sizes for contact termination dimensions, page 78.
High Voltage Contacts: Straight and right angle (90°) terminations – 0.041 inch [1.04mm] min. hole diameter.

ELECTRICAL CHARACTERISTICS:
SIZE 20 CONTACTS
Contact Current Rating: 7.5 amperes nominal.
6850Initial Contact Resistance: 0.008 ohms maximum.
Proof Voltage: 1000 V r.m.s.
SIZE 8 CONTACTS
POWER CONTACTS
For electrical characteristics, see page 4.
SHIELDED CONTACTS
For electrical characteristics, see page 69.
HIGH VOLTAGE CONTACTS
For electrical characteristics, see page 69.
CONNECTOR
Insulation Resistance: 5 G ohms.
Clearance and Creepage Distance: 0.039 [1.0mm] minimum.
Working Voltage: 300 V r.m.s.

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

THERMOCOUPLE CONTACTS:
Size 20 crimp contacts are available. See page 74 for details.
PCB mount contacts are available in CBD/CBM series, see page 4 for details.
NOTES:

*1 Additional contact variants may be tooled at customer request.

**13W6 and 27W2 variant currently available in female only. Contact Technical Sales for availability of male connector.

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

**1 CONTACT VARIANTS
FACE VIEW OF MALE OR REAR VIEW OF FEMALE

SHELL SIZE 1

5W1

SHELL SIZE 2

7W2
11W1

SHELL SIZE 3

9W4
13W3
17W2
21W1

SHELL SIZE 4

*13W6
21WA4

25W3

**27W2

SHELL SIZE 5

24W7
36W4
43W2
47W1

SHELL SIZE 6

46W4
**STANDARD SHELL ASSEMBLY**

**TYPICAL CONNECTOR TOP VIEW**

**RECOMMENDED MATING DIMENSIONS**

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

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

---

**SHELL SIZES**

| SHELL SIZE 1 MALE | A [±0.015 [0.038] | B [±0.005 [0.13] | B1 [±0.005 [0.13] | C [±0.005 [0.13] | D [±0.005 [0.13] | D1 [±0.005 [0.13] | E [±0.015 [0.038] | G [±0.010 [0.025] | H [±0.010 [0.025] | K [±0.010 [0.025] | M [±0.010 [0.025] |
|------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| SHELL SIZE 1 FEMALE | 2.13 [30.81] | 0.666 [16.92] | 0.984 [24.99] | 0.324 [8.66] | 0.494 [12.55] | 0.759 [19.28] | 0.422 [10.72] | 0.233 [6.07] | 0.422 [10.72] |
| SHELL SIZE 3 FEMALE | 2.086 [53.04] | 1.511 [38.50] | 1.852 [47.04] | 0.320 [8.12] | 0.494 [12.55] | 1.625 [41.28] | 0.422 [10.72] | 0.239 [6.17] | 0.426 [10.82] |
| SHELL SIZE 4 MALE | 2.729 [69.44] | 2.182 [55.42] | 2.500 [63.50] | 0.329 [8.36] | 0.494 [12.55] | 2.722 [69.22] | 0.422 [10.72] | 0.239 [6.17] | 0.426 [10.82] |
| SHELL SIZE 4 FEMALE | 2.729 [69.44] | 2.159 [54.84] | 2.500 [63.50] | 0.329 [8.36] | 0.494 [12.55] | 2.722 [69.22] | 0.422 [10.72] | 0.239 [6.17] | 0.426 [10.82] |
| SHELL SIZE 6 MALE | 2.729 [69.44] | 2.212 [56.18] | 2.500 [63.50] | 0.503 [12.78] | 0.666 [16.97] | 2.302 [58.47] | 0.596 [15.14] | 0.230 [6.07] | 0.429 [10.90] |
| SHELL SIZE 6 FEMALE | 2.729 [69.44] | 2.189 [55.60] | 2.500 [63.50] | 0.482 [12.22] | 0.666 [16.97] | 2.302 [58.47] | 0.596 [15.14] | 0.230 [6.07] | 0.429 [10.90] |
ORDERING INFORMATION - CODE NUMBERING SYSTEM
Specify Complete Connector By Selecting An Option From Step 1 Through 8

**STEP 1 - BASIC SERIES**
CBC Series

**STEP 2 - CONNECTOR VARIANTS**
Shell Size 1
5W1
Shell Size 2
7W2, 11W1
Shell Size 3
9W4, 13W3, 17W2, 21W1
Shell Size 4
**13W6, 21WA4, 25W3, *1 27W2**
Shell Size 5
24W7, 36W4, 43W2, 47W1
Shell Size 6
46W4

**STEP 3 - CONNECTOR GENDER**
M  - Male
S  - Female - Industrial or Military Level
    PosiBand Closed Entry Signal Contacts

**STEP 4 - CONTACT TERMINATION TYPE**
0  – Connector ordered without contacts. Order signal, power, shielded, high voltage, air and thermocouple contacts separately. See pages 68-80 for contact part numbers.
1  – Signal contacts, 20 AWG-24 AWG [0.5mm² - 0.25mm²].
11 – Signal contacts, 20 AWG-24 AWG [0.5mm² - 0.25mm²] with MC/FC 4012D Power Contact.
12 – Signal contacts, 20 AWG-24 AWG [0.5mm² - 0.25mm²] with MC/FC 4016D Power contact.
13 – Signal contacts, 20 AWG-24 AWG [0.5mm² - 0.25mm²] with MCC/FCC 4101D Shielded contacts.
14 – Signal contacts, 20 AWG-24 AWG [0.5mm² - 0.25mm²] with MCC/FCC 4102D Shielded contacts.

**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
H  – Hood, Top Opening, Metal, shell sizes 2 through 5
AN – Lightweight Aluminum Hood, nickel finish.
AC – Lightweight Aluminum Hood, no finish.
**G** – Hood, EM/RFI Die Cast Zinc, shell sizes 1 through 6
Z  – Hood, Top or Side Opening, robust extended height, plastic and composite, with rotating jackscrews, shell sizes 1 through 5

**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 - RoHS Compliant

NOTE: If you would like a 2D drawing or 3D model, once you’ve made your connector selection, please visit www.connectpositronic.com. If you can’t find your specific part number on our web site, contact Technical Sales to have one created.

NOTES
*1 Connector variant 13W6 and 27W2 are currently available in female only, contact Technical Sales for availability of male connector.
*2 For additional information on accessories listed in steps 5, 6, 7 and 10, see Accessory Catalog.
*3 When using G hood with CBC variants, use the extended height hood. See Accessories Catalog for extended G hood options.
*4 For stainless steel dimpled male versions, contact Technical Sales.
For crimping information and crimp tools, see Application Tools section, page 82.
MATERIALS AND FINISHES:

Insulator: Glass filled polyester per ASTM D 5927 UL 94V-0, blue color.

Contacts: Precision machined copper alloy.

Contact Plating:
- **Silk**: Gold flash over nickel plate. Other finishes available upon request, see page 81.
- **Pow**: Gold flash over nickel. Other finishes available upon request, see page 81.
- **Shielded**: For contact platings, see page 68.
- **High Voltage**: For contact platings, see page 68.

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; polyester; copper alloy or steel with zinc and Brackets: tin plate and chromate seal or tin plate; phosphor bronze with tin plate; stainless steel, passivated.

Push-On Fasteners: Phosphor bronze and 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 electrolytically nickel plate. For aluminum hoods, zinc content is 1% maximum. Die cast zinc.

Positronic’s Combo-D connectors are a popular choice for a wide variety of applications. Many options make the Combo-D a versatile connector choice.

CBDD high density series connectors are quality connectors recommended for use in sheltered, non-corrosive indoor and outdoor environments having normal ventilation, but without temperature or humidity controls.

CBDD series connectors offer mixed contact combinations of power, signal, and thermocouple contacts within the same connector body.

CBDD series connectors utilize precision machined contacts offering high reliability. Connector variants are available with straight and right angle (90°) printed board mount terminations, including compliant press-fit. For cable connectors see CBDD section, page 39.

Female power contacts feature the Large Surface Area (L.S.A.) closed entry contact design, which provides maximum mating surfaces between male and female contacts and reduced contact resistance during operation.

Fixed signal contacts are available with open entry female contacts, professional level or PosiBand closed entry female contacts, industrial level. Military contact plating is optional.

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

A blind mating system is available for applications requiring connector coupling in recessed areas or mobile power coupling systems.

Straight and right angle PCB mount thermocouple contacts are available, please contact Technical Sales for details.

CBDD series connectors utilize precision machined contacts and meet applicable performance and dimensional requirements of IEC 60807-7, MIL-DTL-24308 and AS39029.

TECHNICAL CHARACTERISTICS

Positronic.com

Size 22 Fixed Signal and Thermocouple Contacts

Size 16 Fixed Power Contacts

Size 8 Removable Power, Shielded, Air and High Voltage Contacts

UL and CSA Recognition, for status contact Technical Sales

Non-magnetic versions are available, contact Technical Sales.

MECHANICAL CHARACTERISTICS:

Signal Contacts, Fixed:
- Size 22 contacts, male – 0.030 inch [0.76mm] mating diameter. Female – open entry or PosiBand closed entry design, see page 69 for details.
- Size 16 contacts, male – 0.0625 inch [1.588mm] mating diameter. Female contacts - closed entry design.
- Size 8 contacts, male - 0.142 inch [3.61mm] mating diameter. Female contact features Large Surface Area (L.S.A.) closed entry contact design utilizing BeCu mechanical retention member. Closed crimp barrel.

Power Contacts, Fixed:
- Size 22 contacts, male – 0.030 inch [0.76mm] mating diameter. Female – open entry or PosiBand closed entry design, see page 69 for details.
- Size 16 contacts, male – 0.0625 inch [1.588mm] mating diameter. Female contacts - closed entry design.
- Size 8 contacts, male - 0.142 inch [3.61mm] mating diameter. Female contact features Large Surface Area (L.S.A.) closed entry contact design utilizing BeCu mechanical retention member. Closed crimp barrel.

Contact Retention in Insulator:
- **Signal Size 22**: 5 lbs. [21N] minimum
- **Power Size 16**: 6 lbs [26N] minimum
- **Size 8**: 22 lbs [98N] for power, shielded and high voltage.

Resistance to Solder Iron Heat:
- 500˚F [280˚C] for 10 seconds duration per IEC 60512-6.

Signal Contact Terminations:
- Solder contacts - 0.035 inch [0.89mm] minimum hole diameter for 22 AWG [0.3 mm²] wire maximum.
Straight Printed Board Mount – 0.020 inch [0.51mm] diameter.
Right Angle (90°) Printed Board Mount – 0.030 inch [0.76 mm] diameter.

Power Contacts,
Terminations:
Size 16 contacts - printed board terminations with 0.063 inch [1.60mm] diameters.
Size 8 contacts - printed board terminations with 0.078 inch [1.98mm], 0.094 inch [2.39mm] and 0.125 inch [3.18mm] termination diameters.

Shielded Contacts,
Removable:
See table of cable sizes for contact termination dimensions, page 78.

High Voltage Contacts:
Straight and right angle (90°) terminations – 0.041 inch [1.04mm] minimum hole diameter.

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] diameter hole, and threaded riveted fasteners with 4-40 threads and nylon inserts.

Mounting to
Printed Board:
Rapid installation push-on fasteners and threaded posts.

Locking Systems:
Jackscrews and vibration locking systems.

Mechanical Operations:
Open entry, 500 operations. PosiBand closed entry, 1000 operations minimum. Per IEC 60512-5.

ELECTRICAL CHARACTERISTICS:

SIZE 22 CONTACT
Contact Current Rating: 5 amperes nominal.
Initial Contact Resistance: 0.010 ohms maximum for open entry
0.005 ohms maximum for closed entry
Proof Voltage: 1000 V r.m.s.

SIZE 16 CONTACTS

POWER CONTACTS
Contact Current Rating - Tested per UL 1977:
Standard Contact Material: 28 amperes.
High Conductivity Contact Material: 40 amperes.
See Temperature Rise Curves on page 2 for details.
Initial Contact Resistance:
Standard Contact Material: 0.0016 ohms max. Per IEC 60512-2, Test 2b.
High Conductivity Contact Material: 0.001 ohms max. Per IEC 60512-2, Test 2b.
Proof Voltage: 1000 V r.m.s.

SIZE 8 CONTACTS

POWER CONTACTS
For electrical characteristics, see page 4.

SHIELDED CONTACTS
For electrical characteristics, see page 69.

HIGH VOLTAGE CONTACTS
For electrical characteristics, see page 69.

CONNECTOR
Insulation Resistance: 5 G ohms.
Clearance and Creepage Distance: 0.042 inch [1.06mm] minimum. Working Voltage: 300 V r.m.s.

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

THERMOCOUPLE CONTACTS:
Straight and right angle PCB mount contacts are available, please contact Technical Sales for details.
Size 22 crimp contacts are available in CBCD series, see page 71 for details.

*1 CONTACT VARIANT
FACE VIEW OF MALE OR REAR VIEW OF FEMALE

SHELL SIZE 1
8W2
Six Size 22 Signal Contacts and Two Size 16 Power Contacts

SHELL SIZE 2
19W1
Eighteen Size 22 Signal Contacts and One Size 8 Power Contact

SHELL SIZE 3
*1 15W4
Eleven Size 22 Signal Contacts and Four Size 8 Power Contacts

SHELL SIZE 4
*4 45W2
Forty-three Size 22 Signal Contacts and Two Size 8 Power Contacts

NOTES:
* Additional contact variants may be tooled at customer request.
** For technical, dimensional and PCB layout information on 15W4 variants, contact Technical Sales.
** 45W2 variant currently available in male only. Contact Technical Sales for availability of female connector.

*1 CONTACT VARIANT
FACE VIEW OF MALE OR REAR VIEW OF FEMALE

SHELL SIZE 1
8W2
Six Size 22 Signal Contacts and Two Size 16 Power Contacts

SHELL SIZE 2
19W1
Eighteen Size 22 Signal Contacts and One Size 8 Power Contact

SHELL SIZE 3
*1 15W4
Eleven Size 22 Signal Contacts and Four Size 8 Power Contacts

SHELL SIZE 4
*4 45W2
Forty-three Size 22 Signal Contacts and Two Size 8 Power Contacts

NOTES:
* Additional contact variants may be tooled at customer request.
** For technical, dimensional and PCB layout information on 15W4 variants, contact Technical Sales.
** 45W2 variant currently available in male only. Contact Technical Sales for availability of female connector.

DIMENSIONS ARE IN INCHES [MILLIMETERS], ALL DIMENSIONS ARE SUBJECT TO CHANGE.
### STANDARD SHELL ASSEMBLY

![Image of a cylindrical object with dimensions labeled]

#### RECOMMENDED MATING DIMENSIONS

<table>
<thead>
<tr>
<th>Shell 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>1 8W2M</td>
<td>1.213</td>
<td>0.666</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>1 8W2F</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>
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<tr>
<td>1 8W2S</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>
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<tr>
<td>2 19W1M</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>0.422</td>
<td>0.233</td>
<td>0.422</td>
</tr>
<tr>
<td>2 19W1F</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>2 19W1S</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>
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<td>0.429</td>
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<td>4 45W2M</td>
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<td>2.500</td>
<td>0.329</td>
<td>0.494</td>
<td>2.272</td>
<td>0.422</td>
<td>0.230</td>
<td>0.426</td>
<td>0.230</td>
<td>0.426</td>
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</tbody>
</table>

**Optional Shell Assembly (0, 02)**

- Ø0.120±0.005 [Ø3.05±0.13] Mounting hole, two places for stainless steel shell (0 option)
- Ø0.154 [3.91] Mounting hole, two places
- Ø0.086±0.005 [Ø2.18±0.13] Total diametral float
- Ø0.265±0.015 [6.73±0.38] Shell Sizes 1 & 2
- Ø0.256±0.015 [6.50±0.38] Shell Sizes 3, 4, 5 & 6

**Dimensions**

- All dimensions are subject to change.

---

**Recommended Mating Dimensions**

- Shell Sizes 1 & 2 = 0.265±0.015 [6.73±0.38]
- Shell Sizes 3, 4, 5 & 6 = 0.256±0.015 [6.50±0.38]

**Shell Sizes**

- 8W2M
- 8W2F
- 8W2S
- 19W1M
- 19W1F
- 19W1S
- 45W2M

**Variants**

- Combo-D
- D-Sub

**Recommended Matings**

- Combo-D
- D-Sub

**Shell Dimensions**

- Shell Sizes 1 & 2 = 0.265±0.015 [6.73±0.38]
- Shell Sizes 3, 4, 5 & 6 = 0.256±0.015 [6.50±0.38]

**Recommended Mating Dimensions**

- 0.265±0.015 [6.73±0.38]
- 0.256±0.015 [6.50±0.38]

**Mounting Holes**

- 0.220 [5.59] Max.
- 0.050±0.010 [1.27±0.25]
## SOLDER CUP CONNECTOR

**CODE 21**

For solder cup contacts, specify code 21 in step 4 of ordering information.

Typical part number: CBDD19W1M2100T0

## STRAIGHT PRINTED BOARD MOUNT CONNECTOR

**CODE 3, 35, 36, AND 37**

### CONTACT CODE | D Ø
--- | ---
3 | [1.98]
35 | [2.39]
36 | [3.18]
37 | [3.18]

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

Typical part number: CBDD19W1F35S60T2X

### CONTACT CODE | D Ø
--- | ---
3 | [1.98]
35 | [2.39]
36 | [3.18]
37 | [3.18]

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

Typical part number: CBDD19W1F35S60T2X

---

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

SIZE 16 POWER CONTACTS WITH 0.063 [1.60] Ø TERMINATIONS
CODE 4, 0.314 [7.98] CONTACT EXTENSION

See temperature rise curves on pages 1 and 2

Typical part number:
CBDD8W2M4R70T20

RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR

SIZE 8 POWER CONTACTS WITH 0.078 [1.98] Ø TERMINATIONS
CODE 4 AND 45, 0.314 [7.98] CONTACT EXTENSION

See temperature rise curves on pages 1 and 2

Typical part number:
CBDD19W1M45R70T20
RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR
SIZE 8 POWER CONTACTS WITH 0.078 [1.98] Ø TERMINATIONS
CODE 4 AND 45, 0.314 [7.98] CONTACT EXTENSION
See temperature rise curves on pages 1 and 2

Typical part number:
CBDD45W2M45R70T20

RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR
SIZE 8 POWER CONTACTS WITH 0.125 [3.18] Ø TERMINATIONS
CODE 4 AND 47, 0.314 [7.98] CONTACT EXTENSION
See temperature rise curves on pages 1 and 2

Typical part number:
CBDD19W1M47R70T20
RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR
SIZE 8 POWER CONTACTS WITH 0.125 [3.18] Ø TERMINATIONS
CODE 4 AND 47, 0.314 [7.98] CONTACT EXTENSION
See temperature rise curves on pages 1 and 2

Typical part number: CBDD45W2M47R70T20

Connectors Designed To Customer Specifications

Positronic Combo-D connectors can be modified to customers specifications.

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

Contact Technical Sales with your particular requirements.
STRAIGHT PRINTED BOARD MOUNT CONNECTOR
WITH FDS4201D OR MDS4201D SHIELDED CONTACTS
CODE 65

 Typical part number:
CBDD19W1M65S60T20

RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR
WITH FRT4201D OR MRT4201D SHIELDED CONTACTS
CODE 84

 Typical part number:
CBDD19W1M84R70T20
COMPLIANT PRESS-FIT CONNECTOR

Code 93

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

Typical part number: CBDD8W2M93S0T20

Typical part number: CBDD19W1M93S0T20

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

35
PRINTED BOARD MOUNT CONTACT HOLE PATTERN

HOLE IDENTIFICATION SHOWN FOR MALE CONNECTOR; USE MIRROR IMAGE FOR FEMALE CONNECTOR.
MOUNT RIGHT ANGLE (90°) CONNECTOR WITH MATING FACE POSITIONED TO FOLLOW DIRECTION OF ARROWS.

SUGGESTED PRINTED BOARD HOLE SIZES

<table>
<thead>
<tr>
<th>VARIANT</th>
<th>CODE</th>
<th>ØA</th>
<th>B</th>
<th>ØC</th>
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</thead>
<tbody>
<tr>
<td>8W2</td>
<td>3</td>
<td>0.080 [2.03]</td>
<td>0.078 [1.98]</td>
<td>0.035 [0.89]</td>
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<td>0.100 [2.54]</td>
<td>0.045 [1.14]</td>
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<td></td>
<td>93</td>
<td>See chart for size 16 contact on page 86</td>
<td>0.078 [1.98]</td>
<td>See chart for size 22 contact on page 86</td>
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<td>10W1 AND 45W2</td>
<td>3, 35</td>
<td>0.098 [2.49]</td>
<td>0.078 [1.98]</td>
<td>0.035 [0.89]</td>
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<td>36</td>
<td>0.114 [2.90]</td>
<td>0.078 [1.98]</td>
<td>0.035 [0.89]</td>
</tr>
<tr>
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<td>37</td>
<td>0.145 [3.68]</td>
<td>0.078 [1.98]</td>
<td>0.035 [0.89]</td>
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<td>0.100 [2.54]</td>
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<td>N/A</td>
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<tr>
<td></td>
<td>93</td>
<td>See chart for size 8 contact on page 86</td>
<td>0.078 [1.98]</td>
<td>See chart for size 22 contact on page 86</td>
</tr>
</tbody>
</table>

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

CBDD/CBHD SERIES
ORDERING INFORMATION - CODE NUMBERING SYSTEM

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

FOR CONNECTORS NOT INCLUDING SIZE 8 CONTACTS

<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>
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<td>8W2</td>
<td>M</td>
<td>93</td>
<td>S</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>/AA</td>
<td>-14</td>
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</table>

**STEP 1 - BASIC SERIES**
- CBDD Series - Professional Level - Power Contacts
- CBHD Series - High Conductivity Power Contacts

**STEP 2 - CONNECTOR VARIANTS**
- Shell Size 1 - 8W2
  - See next page for ordering information for other shell size options.

**STEP 3 - CONNECTOR GENDER**
- *F* - Female - Professional Level - Open Entry Signal Contacts
- *M* - Male
- *S* - Female - Industrial / Military Level - PosiBand Closed Entry Signal Contacts

**STEP 4 - CONTACT TERMINATION TYPE**
- **21** - Fixed Solder Cup, 22 AWG-30 AWG [0.3mm2-0.05mm2]
- **3** - Solder, Straight Printed Board Mount, 0.170 [4.32] Tail length
- **4** - Solder, Right Angle (90°) Printed Board Mount, 0.314 [7.98] Signal Contact Extension
- 93 - Signal Omega type compliant and Power Bi-Spring type compliant, termination length 0.225 [5.72]

**STEP 5 - MOUNTING STYLE**
- 0 - Mounting Hole, 0.120 [3.05] Ø
- Q2 - 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, 0.250 [6.35] Length
- P2 - Threaded Post, Nylon, 0.250 [6.35] 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 4-40 Thread Female Jackscrews 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, 0.250 [6.35] Length, Spacer length changes to 0.265 [6.73] when used in conjunction with Code 93 contacts
- 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, 0.250 [6.35] Length

**STEP 6 - HOODS AND PUSH-ON FASTENERS**
- 0 - None
- AN - Lightweight Aluminum Hood, nickel finish
- AC - Lightweight Aluminum Hood, no finish
- H - Hood, Top Opening, Metal
- *G* - Hood, EMI/RFI, Die Cast Zinc
- N - Push-on Fastener, for Right Angle (90°) Mounting Brackets
- Z - Hood, Top or Side Opening, robust extended height, plastic and composite, with rotating male 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 - RoHS Compliant

NOTE: If compliance to environmental legislation is not required, this step will not be used. Example: CBDD8W2M93S000

**NEW!**

**DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.
**STEP 1 - BASIC SERIES**

| EXAMPLE | CBDD | 19W1 | M | 93 | S | 0 | 0 | 0 | /AA |

**STEP 2 - CONNECTOR VARIANTS**

- Shell Size 2 - 19W1
- **Shell Size 3 - 15W4**
- **Shell Size 4 - 45W2**

**STEP 3 - CONNECTOR GENDER**

- **F** - Female - Professional Level - Open Entry Signal Contacts
- **M** - Male
- **S** - Female - Industrial / Military Level - PosiBand Closed Entry Signal Contacts

**STEP 4 - CONTACT TERMINATION TYPE**

| 21 - Fixed Solder Cup, 22 AWG-30 AWG [0.3mm-0.055mm²], 3 – Solder, Straight Printed Board Mount with Signal Contacts | 0.170 [4.32] Tail Length. | 35 – Solder, Straight Printed Board Mount with Signal and 0.078 [1.98] Ø Power Contacts, 0.170 [4.32] Tail Length. | 36 – Solder, Straight Printed Board Mount with Signal and 0.094 [2.39] Ø Power Contacts, 0.170 [4.32] Tail Length. | 37 – Solder, Straight Printed Board Mount with Signal and 0.125 [3.18] Ø Power Contacts, 0.170 [4.32] Tail Length. | 4 – Solder, Right Angle (90°) Printed Board Mount with Signal Contacts, 0.314 [7.98] Signal Contact Extension. | 45 – Solder, Right Angle (90°) Printed Board Mount with Signal and 0.078 [1.98] Ø Power Contacts, 0.314 [7.98] Signal Contact Extension. | 47 – Solder, Right Angle (90°) Printed Board Mount with Signal and 0.125 [3.18] Ø Power Contacts, 0.314 [7.98] Signal Contact Extension. | 65 – Solder, Straight Printed Board Mount with Signal and Shielded Contacts MDS/FDS 4201D footprint, 0.170 [4.32] Signal Contact Tail Length. | 84 – Solder, Right Angle (90°) Printed Board Mount with Signal and Shielded Contacts MRT/FRF 4201D footprint, 0.314 [7.98] Signal Contact Extension. | 93 – Signal Omega type compliant and Power Bi-Spring type compliant, termination length 0.225 [5.72]. |

**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, 0.250 [6.35] Length | P2 – Threaded Post, Nylon, 0.250 [6.35] Length | R6 – Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Thread Fixed Female Jackscrews 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, 0.250 [6.35] Length, Spacer length changes to 0.265 [6.73] when used in conjunction with Code 93 contacts | 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, 0.250 [6.35] Length |

**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.
- 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**

| O – None. | AC – Lightweight Aluminum Hood, no finish | H – Hood, Top Opening, Metal |

**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 – RoHS Compliant |

**STEP 10 - SPECIAL OPTIONS**

FOR SPECIAL OPTIONS, SEE SPECIAL OPTIONS APPENDIX ON PAGE 81.

CONTACT TECHNICAL SALES FOR ORDERING DETAILS OF THE FOLLOWING:

- Other Special Requirements.
- Straight and Right Angle Thermocouple PCB mount contacts

NOTES:

- **45W2 variant currently available in male only.**
- **Power contacts are always supplied with “Closed Entry” female contacts.**
- **For additional information on accessories listed in steps 5, 6, 7 and 10, see Accessory Catalog.**
- **When using G hood with CBDD variants, use the extended height hood. Example: CBDD8W2M93S000**
- **For stainless steel dimpled male versions, contact Technical Sales.**
- **For technical, dimensional and PCB layout information on 15W4 variants, contact Technical Sales.**

**NOTICE**

DIMENSIONS ARE IN INCHES [MILLIMETERS], ALL DIMENSIONS ARE SUBJECT TO CHANGE.
CBCD high density series connectors are quality connectors designed for use in sheltered, mildly corrosive environments having a wide range of temperature, pressure and humidity changes. CBCD series connectors offer mixed crimp-removable contact combinations of power, signal, and thermocouple contacts within the same connector body. A wide assortment of cable support hoods and locking systems is available from stock.

CBCD series connectors also offer a blind mating connector system for applications requiring connector couplings in recessed areas or for mobile power coupling systems. CBCD series connectors utilize precision machined contacts and meet applicable performance and dimensional requirements of IEC 60807-7, MIL-DTL-24308 and AS39029.

**TECHNICAL CHARACTERISTICS**

**MATERIALS AND FINISHES:**

- **Insulator:** Glass filled polyester per ASTM D 5927 UL 94V-0, blue color.
- **Contacts:** Precision machined copper alloy.
- **Contact Plating:**
  - **SIGNAL:** Gold flash over nickel plate and gold 0.000050 [1.27µ] over nickel plate. Other finishes available upon request, see page 81.
  - **POWER:** Gold flash over nickel. Other finishes available upon request, see page 81.
  - **SHIELDED:** For contact platings, see page 68.
  - **HIGH VOLTAGE:** For contact platings, see page 68.

- **Shells:** Steel with tin plate; zinc plate with chromate seal; stainless steel passivated. Other materials and finishes available upon request.
- **Mounting Spacers:** Copper alloy or steel with zinc plate and chromate seal or 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.
- **Hoods:** Composite and plastic, UL 94V-0; brass or steel with zinc plate and chromate seal. Aluminum; aluminum with electrolless nickel plate. For aluminum hoods, zinc content is 1% maximum. Die cast zinc.

Non-magnetic versions are available, contact Technical Sales.

**MECHANICAL CHARACTERISTICS:**

**Signal Contacts, Crimp Removable:**

- Size 22 contacts, male – 0.030 inch [0.76mm] mating diameter. Terminations for 20, 22, 24, 26, 28 and 30 AWG. Female PosiBand closed entry design, see page 69 for details. Closed crimp barrel.

**Power Contacts, Crimp Removable:**

- Size 16 contacts, male – 0.0625 inch [1.588mm] mating diameter. Terminations for 12, 14, 16, 18, 20, 22, and 24 AWG. Female closed entry design. Closed crimp barrel.

- Size 8 contacts, male – 0.142 inch [3.61mm] mating diameter. Terminations for 6, 8, 10, 12, and 16 AWG. Female contact features Large Surface Area (L.S.A.) closed entry contact design utilizing BeCu mechanical retention member. Closed crimp barrel.

**Contact Retention In Insulator:**

- **SIGNAL SIZE 22**
  - 9 lbs. [40N].
- **POWER SIZE 16**
  - 15 lbs. [67N].
- **POWER SIZE 8**
  - 22 lbs. [98N] - power, shielded and high voltage.

continued on next page...
MECHANICAL CHARACTERISTICS, continued:

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.

ELECTRICAL CHARACTERISTICS:

SIZE 22 CONTACTS
- Contact Current Rating: 5 amperes nominal.
- Initial Contact Resistance: 0.005 ohms maximum.
- Proof Voltage: 1000 V r.m.s.

SIZE 16 CONTACTS
- Contact Current Rating - Tested per UL 1977:
  - Standard Contact Material: 28 amperes.
  - High Conductivity Contact Material: 40 amperes.
- See Temperature Rise Curves on page 2 for details.
- Initial Contact Resistance:
  - Standard Contact Material: 0.0016 ohms max. Per IEC 60512-2, Test 2b.
  - High Conductivity Contact Material: 0.001 ohms max. Per IEC 60512-2, Test 2b.
- Proof Voltage: 1000 V r.m.s.

POWER CONTACTS
- Contact Current Rating - Tested per UL 1977:
  - Standard Contact Material: 28 amperes.
  - High Conductivity Contact Material: 40 amperes.
- See Temperature Rise Curves on page 2 for details.
- Initial Contact Resistance:
  - Standard Contact Material: 0.0016 ohms max. Per IEC 60512-2, Test 2b.
  - High Conductivity Contact Material: 0.001 ohms max. Per IEC 60512-2, Test 2b.
- Proof Voltage: 1000 V r.m.s.

SIZE 8 CONTACTS
- Power Contacts
  For electrical characteristics, see page 4.
- Shielded Contacts
  For electrical characteristics, see page 69.
- High Voltage Contacts
  For electrical characteristics, see page 69.

CONNECTOR
- Insulation Resistance: 5 G ohms.
- Clearance and Creepage Distance: 0.042 inch [1.06mm] minimum.
- Working Voltage: 300 V r.m.s.

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

THERMOCOUPLE CONTACTS:
Size 22 crimp contacts are available. See page 71 for details.
PCB mount contacts are available in CBDD series, see page 27 for details.

**1 CONTACT VARIANT
FACE VIEW OF MALE OR REAR VIEW OF FEMALE

** SHELL SIZE 1 **
- 8W2
  - Six Size 22 Signal Contacts and Two Size 16 Power Contacts

** SHELL SIZE 2 **
- 19W1
  - Eighteen Size 22 Signal Contacts and One Size 8 Power Contact

** SHELL SIZE 4 **
- **45W2
  - Forty-three Size 22 Signal Contacts and Two Size 8 Power Contacts

** NOTES:**
- **1** Additional contact variants may be tooled at customer request.
- **45W2** variant currently available in female only. Contact Technical Sales for availability of male connector.
### STANDARD SHELL ASSEMBLY

![Typical Connector Top View](CBCD45W2S000000_CBCD8W2S000000)

### RECOMMENDED MATING DIMENSIONS

- Shell Sizes 1 & 2 = 0.265±0.015 [6.73±0.38]
- Shell Sizes 3, 4, 5 & 6 = 0.256±0.015 [6.50±0.38]

---

### OPTIONAL SHELL ASSEMBLY (0, 02)

- 0.055±0.015 [1.407±0.38] 2X Ø120±0.005 [3.05±0.13] mounting hole for stainless steel shell (0 option).
- 0.039±0.010 [0.99±0.25] 2X Ø0.154 [3.91] mounting hole (02 option).

---

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

- 0.032 [0.81] total diametral float
- 0.120±0.010 [3.05±0.25] 2X Ø0.120±0.005 [3.05±0.13] mounting hole

---

### SHELL SIZES

| SHELL SIZES | VARIANT | A ±0.015 [0.38] | B ±0.005 [0.13] | B1 ±0.005 [0.13] | C ±0.005 [0.13] | D ±0.005 [0.13] | D1 ±0.005 [0.13] | E ±0.015 [0.38] | G ±0.010 [0.25] | H ±0.010 [0.25] | K ±0.005 [0.13] | M ±0.010 [0.25] |
|-------------|---------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| **1**       | 8W2M    | 1.213 [30.81]  | 0.666 [16.92]  | 0.984 [24.99]  | 0.329 [8.36]   | 0.494 [12.55]  | 0.759 [19.28]  | 0.422 [10.72]  | 0.233 [5.92]   | 0.422 [10.72]  |                 |                 |
| **4**       | 45W2S   | 2.729 [69.32]  | 2.159 [54.84]  | 2.500 [63.50]  | 0.311 [7.90]   | 0.494 [12.55]  | 2.272 [57.71]  | 0.422 [10.72]  | 0.243 [6.17]   | 0.429 [10.90]  |                 |                 |

---

**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>
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<tr>
<th>STEPS</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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<td><strong>EXAMPLE</strong></td>
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<td>8W2</td>
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<td>0</td>
<td>S</td>
<td>/AA</td>
<td>/-14</td>
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**STEP 1 - BASIC SERIES**
CBCD Series

**STEP 2 - CONNECTOR VARIANTS**
Shell Size 1 - 8W2
Shell Size 2 - 19W1
*Shell Size 4 - 45W2

**STEP 3 - CONNECTOR GENDER**
M - Male
S - Female - PosiBand Closed Entry Signal Contacts

**STEP 4 - CONTACT TERMINATION TYPE**
0 – Connector ordered without contacts. Order signal, power, thermocouple, shielded, high voltage or air contacts separately. See pages 68-80 for contact part numbers.
1 – Signal contacts, 22 AWG-30 AWG [0.03mm²-0.055mm²]
*11 – Signal contacts, 22 AWG-30 AWG [0.03mm²-0.055mm²] with MC/FC 4012D power contact.
*12 – Signal contacts, 22 AWG-30 AWG [0.03mm²-0.055mm²] with MC/FC 4016D power contact.
*13 – Signal contacts, 22 AWG-30 AWG [0.03mm²-0.055mm²] with MCC/FCC 4101D shielded contacts.
*14 – Signal contacts, 22 AWG-30 AWG [0.03mm²-0.055mm²] with MCC/FCC 4102D shielded contacts.

**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

**NOTE:**
If you would like a 2D drawing or 3D model, once you’ve made your connector selection, please visit www.connectpositronic.com. If you can’t find your specific part number on our website, contact Technical Sales to have one created.

**STEP 6 - HOODS AND PUSH-ON FASTENERS**
0 – None
AN – Lightweight Aluminum Hood, nickel finish.
AC – Lightweight Aluminum Hood, no finish.
H – Hood, Top Opening, Metal
**4** – Hood, EMI/RFI, Die Cast Zinc
Z – Hood, Top or Side Opening, robust extended height, plastic and composite, with rotating male 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 - RoHS Compliant

**STEP 10 - SPECIAL OPTIONS**
FOR SPECIAL OPTIONS, SEE SPECIAL OPTIONS APPENDIX ON PAGE 81.

**NOTES:**
* 45W2 variant currently available in female only.
* Available on 19W1 and 45W2 connectors only.
* For additional information on accessories listed in steps 5, 6, 7 and 10, see Accessory Catalog.
* When using G hood with CBCD variants, use the extended height hood. See Accessories Catalog for extended G hood options.
* For stainless steel dimpled male versions, contact Technical Sales.

For crimping information and crimp tools, see Application Tools section, page 82.
The Combo-Dual Port connector series offers several combinations of power and signal contacts within the same connector assembly. Seventeen different combinations of power and signal contact stacked assemblies are available within four standard shell sizes. The connector assembly can be partially populated with either signal or power contacts installed in the connector bodies to customer selected contact positions. The stacked connectors may be spaced apart to two dimensional spacings.

On special order, the right angle (90°) printed board mount contacts may be replaced with size 8 power, shielded or high voltage contacts having crimp or solder cup terminations. Signal contacts remain in dual port configuration.

Mounting angle brackets can be ordered riveted to the connector by specifying R2, R6, R7 and R8 options. Locking systems are available utilizing 4-40 threaded jackscrew systems, polarized or non-polarized, or with a quick-release vibration lock system for rear panel mounted connectors.

Combo-Dual Port series connectors comply with the dimensional requirements of IEC 60807-2 and DSCC 85039.

**TECHNICAL CHARACTERISTICS**

**MATERIALS AND FINISHES:**

- **Insulator:** Glass filled polyester per ASTM D 5927 UL 94, blue color, and composite.
- **Contacts:** Precision machined copper alloy.
- **Contact Plating:**
  - **SIGNAL:** Gold flash over nickel plate. Other finishes available upon request.
  - **POWER:** Gold flash over nickel. 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; polyester; copper alloy or steel with zinc plate and chromate seal or tin plate; phosphor bronze with tin plate; stainless steel, passivated.
- **Cross Bar:** Nylon, UL 94V-0, black color.
- **Push-On Fasteners:** Beryllium copper, tin plated.

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

**Vibration Lock Systems:** Lock tabs, steel with nickel plate. Non-magnetic versions are available, contact Technical Sales.

**MECHANICAL CHARACTERISTICS:**

- **Signal Contacts:** Size 20 contacts, male – 0.040 inch [1.02mm] mating diameter. Female contact – rugged open entry. PosiBand closed entry female options are also available.
- **Contact Retention In Insulator:** 9 lbs. [40N]
- **Contact Terminations:** Printed board mount with right angle (90°) terminations supported by alignment bar. Termination diameter 0.028 inch [0.71mm].
- **Power Contacts:** Size 8 contact, male – 0.142 inch [3.61mm] mating diameter.

DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.
TECHNICAL CHARACTERISTICS, continued

MECHANICAL CHARACTERISTICS, continued:

Contact Retention
In Insulator: 22 lbs. [98N]

Contact Terminations: Printed board mount with right angle (90°) terminations of 0.078 inch [1.98mm] diameter.

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

Polarization: Trapezoidally shaped shells and polarized jackscrews.

Mounting Bracket: Riveted fasteners with 0.120 inch [3.05mm] diameter clearance hole, with 4-40 threads or 4-40 threads with nylon lock insert.

Mounting To Printed Board: Rapid installation push-on fasteners.

Locking Systems: Jackscrews and vibration locking system for either front or rear panel mounted connectors.

Mechanical Operations: 500 operations minimum per IEC 60512-5.

ELECTRICAL CHARACTERISTICS:

SIZE 20 CONTACTS
- Contact Current Rating: 7.5 amperes nominal.
- Initial Contact Resistance: 0.008 ohms maximum.
- Proof Voltage: 1000 V r.m.s.

SIZE 8 CONTACTS

POWER CONTACTS
- Electrical characteristics for 0.078 inch diameter terminations, see page 4.

CONNECTOR
- Insulation Resistance: 5 G ohms.
- Clearance and Creepage Distance (minimum): 0.039 inch [1.0mm]
- Working Voltage: 300 V r.m.s.

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

CONTACT VARIANTS

FACE VIEW OF MALE OR REAR VIEW OF FEMALE

SHELL SIZE 1

| **2WK2** | 5W1 |

SHELL SIZE 2

| 3W3 | **3WK3** |

SHELL SIZE 3

| 5W5 | 9W4 | 13W3 | 17W2 | 21W1 |

SHELL SIZE 4

| 8W8 | 13W6 | 17W5 |

| 21WA4 | 25W3 | 27W2 |

Notes:

*1 2WK2 connectors have 1 male and 1 female contacts. Female connector should be loaded with female contact in A2 position.

*2 3WK3 male variant contains 2 male contacts and 1 female contact. Female variant contains 2 female contacts and 1 male contact.
RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR

4 ROW CONNECTOR UNIT, 0.283 [7.19] CONTACT EXTENSION

See temperature rise curves on pages 1 and 2

NOTE:
30 ampere 0.125 [3.18] Ø power contacts may be ordered at special request for a limited number of CBDP variants. Contact technical sales for details.

Typical Part Number:
CBDPB7W2MN8T2/7W2MN8T6X

<table>
<thead>
<tr>
<th>CONNECTOR DESIGNATION</th>
<th>C</th>
<th>D</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBDPB</td>
<td>0.750 [19.05]</td>
<td>1.244 [31.60]</td>
<td>0.256 [6.50]</td>
</tr>
<tr>
<td>CBDPC</td>
<td>0.900 [22.86]</td>
<td>1.394 [35.41]</td>
<td>0.406 [10.31]</td>
</tr>
</tbody>
</table>

Note: Printed board power contacts (size 8) may be replaced with a size 8 removable power, shielded, air or high voltage contact having solder or crimp terminations.
SUGGESTED PRINTED BOARD HOLE SIZES:
Suggest 0.045 [1.14] Ø hole for signal contact termination positions.
Suggest 0.098 [2.49] Ø hole for 0.078 [1.98] Ø power contact termination positions.
Suggest 0.123 ±0.003 [3.12] Ø hole for mounting connector with push-on fasteners.

Mounting holes must move 0.020 [0.51] ±0.010 opposite direction of arrow for use of unriveted mounting bracket with connectors.
RIGHT ANGLE (90°) PRINTED BOARD CONTACT HOLE PATTERN

HOLE IDENTIFICATION SHOWN IS FOR FEMALE CONNECTOR OVER MALE CONNECTOR. MOUNT CONNECTOR WITH MATING FACE POSITIONED TO FOLLOW DIRECTION OF ARROW.

SUGGESTED PRINTED BOARD HOLE SIZES:

- Suggest 0.045 [1.14] Ø hole for signal contact termination positions.
- Suggest 0.098 [2.49] Ø hole for 0.078 [1.98] Ø power contact termination positions.
- Suggest 0.123 ±0.003 [3.12] Ø hole for mounting connector with push-on fasteners.

Mounting holes must move 0.020 [0.51] ±0.010 opposite direction of arrow for use of unriveted mounting bracket with connectors.
### 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>
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<tr>
<td>UPPER CONNECTOR</td>
<td>CBDPB</td>
<td>9W4</td>
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<td>N7T</td>
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<td>9W4</td>
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<td>N7T</td>
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<td>-14</td>
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</table>

**STEP 1 - BASIC SERIES**

*CBDPB Series*
*CBDPC Series*

**STEP 2 - CONNECTOR VARIANTS**

- Shell Size 1: 2WK2, 5W1
- Shell Size 2: 3W3, 3WK3, 7W2, 11W1
- Shell Size 3: 5W5, 9W4, 13W3, 17W2, 21W1
- Shell Size 4: 8W8, 13W6, 17W5, 21WA4, 25W3, 27W2

**STEP 3 - CONNECTOR GENDER**

- F - Female - Professional Level - Open Entry Signal Contacts
- M - Male
- S - Female - Industrial / Military Level - PosiBand Closed Entry Signal Contacts
  - Military gold plating is optional.

**STEP 4 - LOCKING, POLARIZING, MOUNTING AND PUSH-ON FASTENER SYSTEMS**

- 0 – None
- R2 – Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Thread, Fixed Female Jackscrews and 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 Fixed Female Jackscrews and Cross Bar
- N2 – Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Thread, Fixed Female Jackscrews with Cross Bar and Push-On Fastener
- N6 – Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 0.120 [3.05] Ø Mounting Hole with Cross Bar and Push-On Fastener
- N7 – Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Threads with Cross Bar and Push-On Fastener
- N8 – Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Locknut with Cross Bar and Push-On Fastener
- V3 – Lock Tab
- V5 – Lock Tab, connector rear panel mounted.
- T – Fixed Female Jackscrews
- T2 – Fixed Female Jackscrews
- T6 – Fixed Male and Female Polarized Jackscrews

**STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS**

/AA - RoHS Compliant

**NOTE:** If compliance to environmental legislation is not required, this step will not be used. Example: CBDPB9W4FN7T/9W4FN7T0

**STEP 10 - SPECIAL OPTIONS**

For special options, see Special Options Appendix on Page 81.

**NOTE:**

* Contacts can be supplied with Military contact plating, see page 81.
* For stainless steel dimpled male versions, contact Technical Sales.

For crimping information and crimp tools, see Application Tools section, page 82.

**NOTE:**

Size 8 removable power contacts with solder or crimp terminations with power ratings of 10, 20 and 40 amperes may be ordered in lieu of the right angle (90°) board mounted power contact. Removable size 8 shielded, air and high voltage contacts may also be ordered separately in lieu of the power contact. See pages 68-80 for contact part numbers.

**NOTE:**

If you would like a 2D drawing or 3D model, once you’ve made your connector selection, please visit www.connectpositronic.com.

If you can’t find your specific part number on our web site, contact Technical Sales to have one created.
Positronic Industries is known throughout the PCI Industrial Computer Manufactures Group (PICMG) community as a value supplier of AdvancedTCA Zone 1 and Compact PCI power connectors, as well as a wide variety of other power distribution interconnects.

Positronic has been privileged to participate in PICMG specification work, including MicroTCA. Positronic is a proud supplier of power input connectors for use in MicroTCA power modules.

QB series offers board mount connectors for power modules, and cable connectors for bringing power to modules. QB series meet requirements of the MicroTCA Specification for 48V, 24V and 12V systems.

To learn more about PICMG or to get specifications, visit www.picmg.org.
MATERIALS AND FINISHES:

Insulator: Glass filled polyester per ASTM D 5927 UL 94V-0, blue color.

Contacts: Precision machined copper alloy.

Contact Plating:
- **SIGNAL:** Gold flash over nickel plate and 0.000050 [1.27µ] gold over nickel plate. Other finishes available upon request.
- **POWER:** Gold flash over nickel. 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.

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

Push-On Fasteners: 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: Glass filled polyester, UL 94V-0, blue color.

MECHANICAL CHARACTERISTICS:

Signal Contacts, Fixed:
- Size 20 contacts, male - 0.040 inch [1.02mm] mating diameter. Female contacts are PosiBand closed entry design.

Power Contacts, Fixed:
- Size 8 contacts, male - 0.142 inch [3.61mm] mating diameter. Female contacts are closed entry “Large Surface Area” design.

Contact Retention in Insulator:
- Signal: 9 lbs [40N]. Power: 22 lbs [98N].

Locking Systems:
- Jackscrews.

Mechanical Operations:
- 200 operations, minimum.

ELECTRICAL CHARACTERISTICS:

**SIZE 20 CONTACTS**
- Contact Current Rating: 7.5 amperes nominal.
- Initial Contact Resistance: 0.008 ohms maximum.
- Proof Voltage: 1000 V r.m.s.

**SIZE 8 CONTACTS**
- POWER CONTACTS
  - Contact Current Rating - Tested per UL 1977:
    - QB7W2 MTCA.0 48V: 70 amperes nominal. See Temperature Rise Curve on page 49 for details.
    - QBH9W4 MTCA.0 24V: 85 amperes nominal. MTCA.0 R1.0 specification requires each power contact in the 24V input connector to carry 49 amps minimum at a 30°C temperature rise prior to derating. The QB9W4 connector meets this requirement.
    - QBH5W5 / QBH15W4 MTCA.1 12V: 75 amperes nominal. MTCA.1 R1.0 specification requires each power contact in the 12V input connector to carry 50 amps minimum at a 30°C temperature rise prior to derating. The QBH5W5 and QBH15W4 connectors meets this requirement.
  - Initial Contact Resistance: 0.0005 ohms max. per IEC 60512-2, Test 2b.
  - Proof Voltage: 1000 V r.m.s.

CONNECTOR
- Insulation Resistance: 5 G ohms.
- Working Voltage: 300 V r.m.s.

CLEARANCE AND CREEPAGE DISTANCE:

- Between Power Contacts: 0.06 inch [1.5 mm], minimum
- Between Signal Contacts: 0.02 inch [0.4 mm], minimum
- Between Power and Signal Contacts: 0.06 inch [1.5 mm], minimum
- Between Power Contacts and Shelf GND: 0.06 inch [1.5 mm], minimum
- Between Signal Contacts and Shelf GND: 0.06 inch [1.5 mm], minimum

AIR COOLED RUGGEDIZED MicroTCA® SYSTEMS
12 VOLT INPUT POWER CONNECTORS PER MTCA.1, R1.0

Consult Technical Sales for more information about Positronic connector compliant to the latest MicroTCA® specification, MTCA.1, R1.0.
RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR - 48 VOLT

CONTACT POSITIONS A1 AND A2 ARE FIRST TO MATE. CONTACT POSITIONS 1 AND 2 ARE LAST TO MATE.

DUAL PORT
Typical part number:
QB7W2M72T2/7W2M72T20/AA

INVERTED DUAL PORT
Typical part number:
QB7W2M72T2/7W2M72T20/AA-1845.0

The Dual Port and Uni Port connectors can also be supplied with standard D-subminiature mounting brackets, see page 53.

UNI PORT TYPICAL PART NUMBERS

<table>
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<th>CODE 50</th>
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<tr>
<td>TYPICAL PART NUMBER</td>
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<tr>
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<tr>
<td>QB7W2M56R70T20-1865.0</td>
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DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.
RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR - 24 VOLT

CONTACT POSITIONS A1 AND A4 ARE FIRST TO MATE. CONTACT POSITIONS 1 AND 2 ARE LAST TO MATE.

The Dual Port and Uni Port connectors can also be supplied with standard D-subminiature mounting brackets, see page 53.

**UNI PORT TYPICAL PART NUMBERS**

<table>
<thead>
<tr>
<th>TYPICAL PART NUMBER</th>
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<td>[13.00]</td>
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<td>[10.39]</td>
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</table>

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

*CONTACTS ARE NOT SUPPLIED IN CONNECTOR AND NEED TO BE ORDERED SEPARATELY
SEE PAGE 54 FOR CONTACT PART NUMBERS

FEMALE CONTACTS ARE "TOUCH-SAFE" PER IEC 60950-1, Figure 2A.

MicroTCA applications may require contact positions 1 and 2 be electrically bridged.
Order part number CC2805/AA-V01

ELECTRICAL BRIDGE

STANDARD D-SUBMINIATURE MOUNTING BRACKET
OPTIONAL MOUNTING BRACKET FOR DUAL PORT AND UNI PORT CONNECTORS

For more information on Dual Port connectors, see CBDP series on page 43.
For more information on Uni Port connectors, see CBD series on page 3.
REMovable CRIMP POWER CONTACTS

**CODE 11 AND 12**

**FEMALE CONTACT**
“CLOSED ENTRY” DESIGN, L.S.A.

**MATERIAL:** Copper alloy.

**PLATING:** (choose contact plating based on individual application requirements)

- **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: FC4012D/AA-14-1817.0.
  - 0.000050 inch [1.27µ] gold over nickel by adding “-15” suffix onto part number. Example: FC4008D/AA-15-1817.0.

**NOTE:** Female contacts feature Large Surface Area (L.S.A.) closed entry contact design which provides maximum mating surfaces between male and female contact and reduced contact resistance during operation.

For crimping information and crimp tools, see Application Tools section, page 82.

---

**REMovable CRIMP CONTACTS**

**CODE 0, 11 AND 12**

**FEMALE CONTACT**
“CLOSED ENTRY” DESIGN

**MATERIAL:** Copper alloy.

**PLATING:** (choose contact plating based on individual application requirements)

- **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: FC4012D/AA-14-1817.0.
  - 0.000050 inch [1.27µ] gold over nickel by adding “-15” suffix onto part number. Example: FC4008D/AA-15-1817.0.

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

For crimping information and crimp tools, see Application Tools section, page 82.
### Male Ordering Information - Code Numbering Systems

#### Dual Port Connectors

**Step 1 - Basic Series**
- QB Series (7W2 variant)
- QBH Series (SWS, 9W4 and 15W4 variant)

**Step 2 - Connector Variants**
- SWS\*, 7W2, 9W4, 15W4\*

**Step 3 - Connector Gender**
- M - Male

**Step 4 - Locking, Polarizing, Mounning and Push-on Fastener Systems**

- **0** - None
- **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
- **N6** - Bracket, Mounting, right angle (90°) Metal, Swaged to connector with 0.120 [3.05] Ø mounting hole with cross bar and push-on fastener
- **N8** - Bracket, Mounting, right angle (90°) Metal, Swaged to connector with 4-40 threads with cross bar and push-on fastener
- **N7** - Bracket, Mounting, right angle (90°) Metal, Swaged to connector with 4-40 locknut with cross bar and push-on fastener
- **T2** - Fixed Female Jackscrews

**Step 6 - Hoods and Push-on Fasteners**
- **0** - None
- **N** - Push-on Fastener, for Right Angle (90°) Mounting Brackets

#### Complete Connector

**Step 10 - Special Options**

**Step 9 - Environmental Compliance Options**
- /AA - RoHS Compliant

**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 7 - Locking and Polarizing Systems**
- T2 - Fixed Female Jackscrews

---

### Male Ordering Information - Code Numbering Systems

#### Uni Port Connectors

**Step 1 - Basic Series**
- QB Series (7W2 variant)
- QBH Series (SWS, 9W4 and 15W4 variant)

**Step 2 - Connector Variants**
- SWS\*, 7W2, 9W4, 15W4\*

**Step 3 - Connector Gender**
- M - Male

**Step 4 - Contact Termination**
- **S6** - Solder, Right Angle (90°) Printed Board Mount with Signal and 0.064 [2.39] Ø Power Contacts, 0.396 [10.03] Signal Contact Extension, Available for 7W2 variant.
- **S7** - Solder, Right Angle (90°) Printed Board Mount with Signal and 0.125 [3.18] Ø Power Contacts, 0.642 [16.29] Signal Contact Extension, Available for SWS, 9W4 and 15W4 variants.

**Step 5 - Mouting Style**
- **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

**Step 6 - Hoods and Push-on Fasteners**
- **0** - None
- **N** - Push-on Fastener, for Right Angle (90°) Mounting Brackets

**Step 7 - Locking and Polarizing Systems**
- T2 - Fixed Female 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 - RoHS Compliant

**Step 10 - Special Options**

---

**NOTE:**
- \*1 For stainless steel dimpled male versions, contact Technical Sales.
- \*2 For technical, dimensional and PCB layout information on SWS and 15W4 variants, contact Technical Sales.

---

**Dimensions are in inches [millimeters]. All dimensions are subject to change.
**FEMALE ORDERING INFORMATION - CODE NUMBERING SYSTEM**

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

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<tr>
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<tbody>
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<td>2</td>
<td>7W2</td>
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<td>9</td>
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<tr>
<td>10</td>
<td>-14</td>
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</table>

**STEP 1 - BASIC SERIES**

QB Series

**STEP 2 - CONNECTOR VARIANTS**

7W2
9W4

**STEP 3 - CONNECTOR GENDER**

S - Female PosiBand Closed Entry Signal Contacts
Open Entry Signal Contacts are available and can be ordered separately, see page 73.

**STEP 4 - CONTACT TERMINATION**

0 – Connector ordered without contacts. Order signal and power contacts separately. See page 54 for contact part numbers.
1 – Signal contacts, 20 AWG-24 AWG [0.5mm²-0.25mm²].
11 – Signal contacts, 20 AWG-24 AWG [0.5mm²-0.25mm²] with FC4012D-1817.0 power contacts.
12 – Signal contacts, 20 AWG-24 AWG [0.5mm²-0.25mm²] with FC4008D-1817.0 power contacts.

**STEP 5 - MOUNTING STYLE**

0 – None

**STEP 6 - HOODS**

Q – Hood, Top Opening, Plastic

**STEP 7 - LOCKING AND POLARIZING SYSTEMS**

H – Rotating male jackscrew with internal hex for 3/32 hex drives.

**STEP 8 - SHELL OPTIONS**

0 – Zinc Plated, with Chromate Seal.
S – Stainless Steel, passivated.
X – Tin Plated.

**STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS**

/AA - RoHS Compliant

Note: This step should be included to create a standard part number.
Example: QB7W2S00QH0/AA

**STEP 10 - SPECIAL OPTIONS**

FOR SPECIAL OPTIONS, SEE SPECIAL OPTIONS APPENDIX ON PAGE 81.

**NOTE:**
If you would like a 2D drawing or 3D model, once you’ve made your connector selection, please visit www.connectpositronic.com.
If you can’t find your specific part number on our web site, contact Technical Sales to have one created.

Contact Technical Sales for ordering information for cable versions of the 5W5 and 15W4 variants.
ACBDP and ACBMP series connectors are suitable for use in any applications requiring high performance characteristic. The normal density ACBDP and ACBMP series are available in standard Combo-D connector variants.

ACBDP and ACBMP series connectors utilize precision machined contacts for strength and durability. The ACBDP female contact features a rugged “Open Entry” design or PosiBand “Closed Entry” design for even higher reliability. ACBMP connectors features PosiBand “Closed Entry” contacts and military contact plating.

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

These connectors can also be used as a “gender changer”. Connector Savers are also available in standard and high density D-subminiature versions, please consult our Professional, Industrial and Military Performance D-subminiature Connectors catalog for more information.

For high density 8W2, 19W1 and 45W2 adapter variants contact Technical Sales.
MECHANICAL CHARACTERISTICS, continued:

Connector Saver: Male to female or male to male.
Contact Retention:
Signal: 9 lbs. [40 N].
Power: 22 lbs. [98 N].
Shells: Male shells may be dimpled for EMI/ESD ground paths.
Polarization: Trapezoidally shaped shells.
Mechanical Operations:
ACBDP Series: 500 operations, minimum, per IEC 60512-5.
ACBMP Series: 1,000 operations, minimum, per IEC 60512-5.

ELECTRICAL CHARACTERISTICS:

SIZE 20 CONTACTS
Contact Current Rating: 7.5 amperes, nominal.
Initial Contact Resistance: 0.008 ohms, maximum.
Proof Voltage: 1,000 V r.m.s.

SIZE 8 CONTACTS
POWER CONTACTS
Contact Current Rating: 70 amperes, per UL 1977.
See Temperature Rise Curves on pages 1-2.
Initial Contact Resistance: 0.0005 ohms, maximum
Proof Voltage: 1,000 V r.m.s.

CONNECTOR
Insulation 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.

ACBDP/ACBMP SERIES SIZE 20 AND SIZE 8 CONTACT CONNECTOR SAVER

CONTACT VARIANTS
FACE VIEW OF MALE OR REAR VIEW OF FEMALE

SHELL SIZE 1
5W1

SHELL SIZE 2
3W3
7W2
11W1

SHELL SIZE 3
5W5
9W4
13W3
17W2
21W1

SHELL SIZE 4
8W8
13W6
17W5
21WA4
25W3
27W2

SHELL SIZE 5
24W7
36W4
43W2
47W1

SHELL SIZE 6
46W4

Note: For high density 8W2, 19W1 and 45W2 variants contact Technical Sales for availability.
COMBO-D
CONNECTOR SAVERS
GENDER CHANGERS

STANDARD SHELL ASSEMBLY DIMENSIONS
SIZE 20 AND SIZE 8 CONTACTS
CODE 0 AND S

NOTE:
Code S = Swaged spacer with 4-40 UNC-2B threads.

CONNECTOR SIZE | A ±0.015 | B ±0.005 | B1 ±0.005 | C ±0.005 | D ±0.005 | D1 ±0.005 | E ±0.015 | K1 ±0.005
--- | --- | --- | --- | --- | --- | --- | --- | ---
SHELL SIZE 1 | 1.213 [30.81] | 0.643 [16.33] | 0.666 [16.92] | 0.984 [24.99] | 0.311 [7.90] | 0.329 [8.36] | 0.494 [12.55] | 0.233
SHELL SIZE 2 | 1.541 [39.14] | 0.901 [23.46] | 0.904 [23.51] | 1.312 [33.32] | 0.311 [7.90] | 0.329 [8.36] | 0.494 [12.55] | 0.233
SHELL SIZE 3 | 1.534 [38.96] | 1.852 [47.04] | 2.500 [63.50] | 3.90 [10.00] | 0.329 [8.36] | 0.494 [12.55] | 0.230
SHELL SIZE 4 | 2.729 [69.32] | 2.159 [54.84] | 2.182 [55.42] | 2.500 [63.50] | 0.329 [8.36] | 0.494 [12.55] | 0.230
SHELL SIZE 5 | 2.651 [67.33] | 2.064 [52.43] | 2.079 [52.81] | 2.406 [61.11] | 0.441 [11.20] | 0.605 [15.37] | 0.230
SHELL SIZE 6 | 2.729 [69.32] | 2.189 [55.60] | 2.212 [56.18] | 2.500 [63.50] | 0.485 [12.32] | 0.668 [16.97] | 0.230

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 9

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<td>S</td>
<td>X</td>
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</table>

**STEP 1 - BASIC SERIES**
ACBDP – Professional / Industrial Quality, see Step 3.
ACBMP – Military conformance with “closed entry” female signal contacts plated 0.000050 [1.27µ] gold over nickel plate. Choose “S” or “M” in Step 3.

**STEP 2 - CONNECTOR VARIANT**
Shell Size 1
5W1
Shell Size 2
3W3, 7W2, 11W1
Shell Size 3
5W5, 9W4, 13W3, 17W2, 21W1
Shell Size 4
8W8, 13W6, 17W5, 21WA4, 25W3, 27W2
Shell Size 5
24W7, 36W4, 43W2, 47W1
Shell Size 6
46W4

**Note:** For high density 8W2, 19W1 and 45W2 variants contact Technical Sales for availability.

**STEP 3 - 1ST CONNECTOR GENDER**
F - Female - Professional Level - Open Entry Signal Contacts
M - Male
S - Female - Industrial / Military Level - PosiBand Closed Entry Signal Contacts. Military gold plating is optional.

**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 - RoHS Compliant

**Note:** If compliance to environmental legislation is not required, this step will not be used. Example: ACBDP11W1FSX11W1MSX

**STEP 11 - SPECIAL OPTIONS**
FOR SPECIAL OPTIONS, SEE SPECIAL OPTIONS APPENDIX ON PAGE 81.

**NOTES**
* Male option in Step 3 available only on connector variants 5W1, 3W3, 7W2, 11W1,17W2, 21W1, 21WA4, 27W2, 24W7, 46W4.
* 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.
* For hardware information, see page 59.
* For stainless steel dimpled male versions, contact Technical Sales.
* For both connectors must be the same.
Positronic Industries is known around the world for offering our customers flexibility when choosing connectors.

In addition to allowing customers to create part numbers for particular applications, Positronic offers a wide variety of features and accessories within our products.

Positronic is also eager to modify existing products to meet unique customer requirements. If you do not find what you need with this catalog, please contact us for assistance.

**SEQUENTIAL MATING CONTACTS**

Three levels of sequential mating are possible:

- First mate accomplished by a size 12 power contact. Male contact diameter is 0.094 inch.
- Second mate accomplished by a size 8 power contact. Male contact diameter is 0.142 inch.
- Third mate accomplished by size 20 signal contacts, as applicable.

Note: A third level can be accomplished with signal contacts where applicable.
SIZE 8 CONTACT STABILIZATION FEATURE
MINIMIZES FLOAT IN SIZE 8 CONTACT POSITIONS

CBD size 8 male contacts are removed toward the rear after utilizing front release tooling. Space must be provided between the contact and the connector molding so the tooling can slide over the mating portion of the contact. This fact allows the contact to float.

In some applications this float creates problems in alignment during mating. Many male contact CBD variants offer an integral stabilizing feature to minimize problems created by float in size 8 contacts. An alternate tool is used to remove the contact if necessary. Tool number is 4311-0-1-0.

The stabilization feature is currently available for the following male contact variants:

- CBD/CBM3W3M
- CBD/CBM8W8M
- CBC36W4M
- CBC43W2M

Add MOS -1570.4 to end of part number. Example: CBD3W3M00000-1570.4
COMBO-D CONNECTORS WITH
*1 100 AMP HIGH CURRENT REMOVABLE CRIMP POWER CONTACT

HIGH CONDUCTIVITY SIZE 8 CONTACTS
WHICH CAN BE TERMINATED TO 6 AWG
WIRE ALLOW VERY HIGH CURRENTS
TO BE CARRIED THROUGH COMBO-D
TYPE CONNECTORS.

TECHNICAL CHARACTERISTICS

MATERIALS AND FINISHES:
Contacts: High conductivity copper alloy.
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: FC4006D-14
0.000050 inch [1.27µ] gold over nickel by adding "-15" suffix onto part number.
Example: MC4006D-14

ELECTRICAL CHARACTERISTICS:
POWER CONTACTS
Contact Current Rating: See Temperature Rise Curve on page 64.
Initial Contact Resistance: 0.0003 ohms max. per IEC 60512-2, Test 2b.
Proof Voltage: 1900 V r.m.s.
Working Voltage: 450 V r.m.s.

MECHANICAL CHARACTERISTICS:
Size 8 Removable
Contacts: Rear insertion, front release.
Durability: 500 cycles minimum.
Vibration: 20g from 10 Hz to 500 Hz.
Shock: 30g-11ms.

CLIMATIC CHARACTERISTICS:
Temperature Range: -55˚C to +125˚C.

**NOTE:** per UL 1977 Testing

100 AMP HIGH CURRENT REMOVABLE CRIMP POWER CONTACT
CONTACTS USED WITH 6 AWG WIRE
6 AWG [16.0mm²] max.

*1 CONTACTS ORDERED SEPARATELY

SIZE 8

**FEMALE CONTACT**
"CLOSED ENTRY" DESIGN, L.S.A.

**MALE CONTACT**

**NOTE:** Female contacts feature Large Surface Area (L.S.A.) closed entry contact design which provides maximum mating surfaces between male and female contact and reduced contact resistance during operation.

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

MATERIAL: High conductivity copper alloy.

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: FC4006D-14
0.000050 inch [1.27µ] gold over nickel by adding "-15" suffix onto part number. Example: MC4006D-15.
SELECTIVELY LOADED COMBO-D CONNECTORS FOR USE WITH 100 AMP* HIGH CURRENT REMOVABLE CRIMP POWER CONTACT

COMBO-D CONNECTORS WITH TWO CONTACT POSITIONS

CBD3W3M00000-1841.0
CBD3W3F00000-1841.0

COMBO-D CONNECTORS WITH THREE CONTACT POSITIONS

CBD5W5M00000-1841.1
CBD5W5F00000-1841.1

COMBO-D CONNECTORS WITH FOUR CONTACT POSITIONS

CBD8W8M00000-1841.2
CBD8W8F00000-1841.2

TEMPERATURE RISE CURVE

Test conducted in accordance with UL1977. All power contacts under load.

Curves were developed using CBD3W3, 5W5, and 8W8 connectors with MC/FC4006D contacts terminated with 6 AWG wire.
STRAIGHT PRINTED BOARD MOUNT HIGH VOLTAGE CONTACT
SIZE 8

FEMALE CONTACT

MALE CONTACT

Ø0.040 [1.02]

Ø0.142 [3.61]

CONTACT TECHNICAL SALES FOR MORE INFORMATION!

RIGHT ANGLE (90°) PRINTED BOARD MOUNT HIGH VOLTAGE CONTACT
SIZE 8

FEMALE CONTACT

MALE CONTACT

Ø0.040 [1.02]

Ø0.142 [3.61]

CONTACT TECHNICAL SALES FOR MORE INFORMATION!
Power contacts can be offered with terminations suitable for use with bus bars.

CONTACT TECHNICAL SALES FOR MORE INFORMATION!
CUSTOMER SPECIFIED CONTACT TERMINATION LENGTH

Positronic can supply CB series connectors with customer specified termination lengths. We have a wide variety of options available.

STRAIGHT PRINTED BOARD MOUNT

*Note:
PCB spacer height can be adjusted according to contact termination length

RIGHT ANGLE (90°) PRINTED BOARD MOUNT

X and Y contact termination lengths can be custom designed to fit your application requirements.

CONTACT TECHNICAL SALES FOR MORE INFORMATION!

Connectors Designed To Customer Specifications

Positronic Combo-D connectors can be modified to customers specifications. Examples: select loading of contacts for cost savings or to gain creepage and clearance distances; longer PCB terminations; customer specified hardware; sealing for water resistance.

Contact Technical Sales with your particular requirements.
REMOVABLE CONTACT TECHNICAL CHARACTERISTICS

SIZE 22 REMOVABLE CONTACT

MATERIALS AND FINISHES:
Precision machined copper alloy with gold flash over nickel. Other finishes are available, see pages 69 and 81 for optional finishes.

MECHANICAL CHARACTERISTICS:
Insert contact to rear face of insulator, release from rear face of insulator. Size 22 contacts, 0.040 inch [1.02 mm] mating diameter male contacts. Female PosiBand closed entry or rugged open entry contact design. Terminations for 20, 22, 24, 26, and 30 AWG. Closed barrel crimp.

ELECTRICAL CHARACTERISTICS:
- Contact Current Rating: 5 amperes nominal.
- Initial Contact Resistance: 0.010 ohms maximum.

THERMOCOUPLE CONTACTS:
Straight and right angle (90°) PCB mount contacts are available, contact Technical Sales for details.

SIZE 20 REMOVABLE CONTACT

MATERIALS AND FINISHES:
Precision machined copper alloy with gold flash over nickel. Other finishes are available, see pages 69 and 81 for optional finishes.

MECHANICAL CHARACTERISTICS:
Insert contact to rear face of insulator, release from rear face of insulator. Size 20 contacts, 0.040 inch [1.02 mm] mating diameter male contacts. Female PosiBand closed entry or rugged open entry contact design.

ELECTRICAL CHARACTERISTICS:
- Contact Current Rating: 7.5 amperes nominal.
- Initial Contact Resistance: 0.008 ohms max. per IEC 60512-2, test 2b.

THERMOCOUPLE CONTACTS:
Straight and right angle (90°) PCB mount contacts are available, contact Technical Sales for details.

SIZE 16 REMOVABLE CONTACT

MATERIALS AND FINISHES:
- STANDARD: Precision machined copper alloy with gold flash over nickel. Other finishes are available, see pages 69 and 81 for optional finishes.
- HIGH CONDUCTIVITY: High conductivity copper alloy, gold flash over nickel. Other finishes are available, see pages 69 and 81 for optional finishes.

MECHANICAL CHARACTERISTICS:
- STANDARD AND HIGH CONDUCTIVITY: Insert contact to rear face of insulator, release from front face of insulator. Size 16 contacts, 0.0625 inch [1.588mm] mating diameter male contacts. Female PosiBand closed entry contact design. Terminations for 12, 14, 16, 18, 20, 22, 24, 26, and 28 AWG.

SIZE 8 REMOVABLE CONTACT

MATERIALS AND FINISHES:
- STANDARD: Precision machined copper alloy with gold flash over nickel. Other finishes are available, see pages 69 and 81 for optional finishes.
- HIGH CONDUCTIVITY: High conductivity copper alloy, gold flash over nickel. Other finishes are available, see pages 69 and 81 for optional finishes.

MECHANICAL CHARACTERISTICS:
- STANDARD AND HIGH CONDUCTIVITY: Insert contact to rear face of insulator, release from front face of insulator. Size 8 contacts, 0.142 inch [3.61 mm] mating diameter male contacts, closed entry female contacts.

ELECTRICAL CHARACTERISTICS:
- Contact Current Rating - Tested per UL 1977:
  - Standard Contact Material: 28 amperes.
  - High Conductivity Contact Material: 40 amperes.

For information regarding crimp tool and crimping tool techniques, see Application Tools section, page 82.
Higher reliability in harsh environments and repeated mating cycles.

PosiBand crimp contacts do not need to be annealed. Split tine D-subminiature contacts are commonly annealed at the crimp barrel, with the possibility of reliability problems at the contact interface if the annealing is performed incorrectly.

Electrical and mechanical function of the contact interface are separated since the PosiBand contact is a two-piece design. Contact normal force is provided by the “Posiband spring member”, which allows higher mechanical reliability. The electrical continuity path is supported through the base contact, which allows a greater number of electrical paths on a “micro” level when compared to split tine contact design.

Higher reliability at prices comparable to the “split tine” design.

PosiBand is protected by US Patent 7,115,002.
**REMOVABLE CRIMP SIGNAL CONTACT**

**FOR USE WITH CBCD SERIES CONNECTORS**

**SIZE 22**

**QUALIFIED TO AS39029**

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

---

**FEMALE CONTACT**

"CLOSED ENTRY" DESIGN

- **Ø0.047 [1.19]**
- **0.518 [13.16]**
- **Ø0.035 [0.89]**
- **0.150 [3.81]**

**Stainless Steel Shroud**

---

**MALE CONTACT**

- **Ø0.047 [1.19]**
- **0.531 [13.49]**
- **Ø0.035 [0.89]**
- **0.150 [3.81]**

**M39029/57-354**

**WIRE SIZE**

**AWG [mm²]**

- 22 / 24 / 26 / 28 / 30
- 0.3/0.25/0.12/0.08/0.05

---

**FEMALE CONTACT**

"CLOSED ENTRY" DESIGN

- **Ø0.047 [1.19]**
- **0.520 [13.21]**
- **Ø0.035 [0.89]**
- **0.150 [3.81]**

---

**MALE CONTACT**

- **Ø0.047 [1.19]**
- **0.531 [13.49]**
- **Ø0.035 [0.89]**
- **0.150 [3.81]**

**M39029/58-360**

**WIRE SIZE**

**AWG [mm²]**

- 22 / 24 / 26 / 28 / 30
- 0.3/0.25/0.12/0.08/0.05

---

**FEMALE CONTACT**

"CLOSED ENTRY" DESIGN

- **Ø0.047 [1.19]**
- **0.520 [13.21]**
- **Ø0.035 [0.89]**
- **0.150 [3.81]**

---

**MALE CONTACT**

- **Ø0.047 [1.19]**
- **0.531 [13.49]**
- **Ø0.035 [0.89]**
- **0.150 [3.81]**

**FEMALE CONTACT**

"CLOSED ENTRY" DESIGN

- **Ø0.047 [1.19]**
- **0.520 [13.21]**
- **Ø0.035 [0.89]**
- **0.150 [3.81]**

---

**MALE CONTACT**

- **Ø0.047 [1.19]**
- **0.531 [13.49]**
- **Ø0.035 [0.89]**
- **0.150 [3.81]**

---

**For information regarding crimp tool and crimping tool techniques, see Application Tools section, page 82.**

---

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

**ALL DIMENSIONS ARE SUBJECT TO CHANGE.**
CRIMP SIGNAL CONTACT

FOR USE WITH CBCD SERIES CONNECTORS

CONTACTS USED WITH 20 AWG WIRE

SIZE 22

**FEMALE CONTACT**

“CLOSED ENTRY” DESIGN

**MALE CONTACT**

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

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

Crimp area extends above connector molding.

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

REMOVABLE THERMOCOUPLE SIGNAL CRIMP SIGNAL CONTACT

FOR USE WITH CBCD SERIES CONNECTORS

SIZE 22

**FEMALE CONTACT**

“CLOSED ENTRY” DESIGN

**MALE CONTACT**

Note: Connectors can be kitted with all applicable removable 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 AWG [mm²]</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>CHROMEL (+)</td>
<td>FC8022D2CH</td>
<td>MC8022DCH</td>
<td>WHITE</td>
<td>22 / 24 / 26 [0.37 / 0.25 / 0.12]</td>
</tr>
<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 (+) with gold flash</td>
<td>FC8022D2CU</td>
<td>MC8022DCU</td>
<td>RED</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>
<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 PCB solder termination, please contact Technical Sales.

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

For information regarding crimp tool and crimping tool techniques, see Application Tools section, page 82.
MILITARY LEVEL REMOVABLE CRIMP SIGNAL CONTACT
FOR USE WITH CBC SERIES CONNECTORS

SIZE 20
QUALIFIED TO AS39029

FEMALE CONTACT
"CLOSED ENTRY" DESIGN

MALE CONTACT

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

INDUSTRIAL / MILITARY LEVEL REMOVABLE CRIMP SIGNAL CONTACT
FOR USE WITH CBC SERIES CONNECTORS

SIZE 20

FEMALE CONTACT
"CLOSED ENTRY" DESIGN

MALE CONTACT

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

For information regarding crimp tool and crimping tool techniques, see Application Tools section, page 82.
INDUSTRIAL / MILITARY LEVEL CRIMP SIGNAL CONTACT
FOR USE WITH CBC SERIES CONNECTORS
CONTACTS USED WITH 18 AWG WIRE

SIZE 20

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

FEMALE CONTACT
“CLOSED ENTRY” DESIGN

MALE CONTACT

FEMALE CONTACT

MALE CONTACT

FEMALE CONTACT
“CLOSED ENTRY” DESIGN

MALE CONTACT

FEMALE CONTACT

MALE CONTACT

FEMALE CONTACT
“CLOSED ENTRY” DESIGN

MALE CONTACT

FEMALE CONTACT

MALE CONTACT

FEMALE PART NUMBER | WIRE SIZE
--- | ---
FC6018D2 | 18 [1.0] max

MALE PART NUMBER | WIRE SIZE
--- | ---
MC6018D | 18 [1.0] max

PROFESSIONAL LEVEL REMOVABLE CRIMP SIGNAL CONTACT
FOR USE WITH CBC AND QB SERIES CONNECTORS

SIZE 20

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

FEMALE CONTACT
“RUGGED OPEN ENTRY” DESIGN

MALE CONTACT

FEMALE CONTACT

MALE CONTACT

FEMALE PART NUMBER | WIRE SIZE
--- | ---
FC6520D | 20 / 22 / 24 [0.5/0.3/0.25]
### REMOVABLE THERMOCOUPLE CRIMP CONTACT

**FOR USE WITH CBC SERIES CONNECTORS**

**SIZE 20**

**FEMALE CONTACT**

*"CLOSED ENTRY" DESIGN*

**MALE CONTACT**

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

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<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 [AWG/mm²]</th>
<th>ØA [inch/mm]</th>
<th>ØB [inch/mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>CHROMEL (+)</td>
<td>FC0202DCH††</td>
<td>MC0202DCH†</td>
<td>WHITE</td>
<td>20 / 22 / 24 [0.5 / 0.3 / 0.25]</td>
<td>0.066 [1.68]</td>
<td>0.045 [1.14]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FC0202DCH</td>
<td>MC0202DCH</td>
<td></td>
<td>26 / 28 / 30 [0.12 / 0.08 / 0.05]</td>
<td>0.048 [1.23]</td>
<td>0.027 [0.69]</td>
</tr>
<tr>
<td></td>
<td>ALUMEL (-)</td>
<td>FC0202DAL††</td>
<td>MC0202DAL†</td>
<td>GREEN</td>
<td>20 / 22 / 24 [0.5 / 0.3 / 0.25]</td>
<td>0.066 [1.68]</td>
<td>0.045 [1.14]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FC0202DAL</td>
<td>MC0202DAL</td>
<td></td>
<td>26 / 28 / 30 [0.12 / 0.08 / 0.05]</td>
<td>0.048 [1.23]</td>
<td>0.027 [0.69]</td>
</tr>
<tr>
<td>T</td>
<td>COPPER (+) with gold flash</td>
<td>FC0202DCU††</td>
<td>MC0202DCU†</td>
<td>RED</td>
<td>20 / 22 / 24 [0.5 / 0.3 / 0.25]</td>
<td>0.066 [1.68]</td>
<td>0.045 [1.14]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FC0202DCU</td>
<td>MC0202DCU</td>
<td></td>
<td>26 / 28 / 30 [0.12 / 0.08 / 0.05]</td>
<td>0.048 [1.23]</td>
<td>0.027 [0.69]</td>
</tr>
<tr>
<td></td>
<td>CONSTANTAN (-)</td>
<td>FC0202DC0††</td>
<td>MC0202DC0†</td>
<td>YELLOW</td>
<td>20 / 22 / 24 [0.5 / 0.3 / 0.25]</td>
<td>0.066 [1.68]</td>
<td>0.045 [1.14]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FC0202DC0</td>
<td>MC0202DC0</td>
<td></td>
<td>26 / 28 / 30 [0.12 / 0.08 / 0.05]</td>
<td>0.048 [1.23]</td>
<td>0.027 [0.69]</td>
</tr>
<tr>
<td>E</td>
<td>CHROMEL (+)</td>
<td>FC0202DCH††</td>
<td>MC0202DCH†</td>
<td>WHITE</td>
<td>20 / 22 / 24 [0.5 / 0.3 / 0.25]</td>
<td>0.066 [1.68]</td>
<td>0.045 [1.14]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FC0202DCH</td>
<td>MC0202DCH</td>
<td></td>
<td>26 / 28 / 30 [0.12 / 0.08 / 0.05]</td>
<td>0.048 [1.23]</td>
<td>0.027 [0.69]</td>
</tr>
<tr>
<td></td>
<td>CONSTANTAN (-)</td>
<td>FC0202DC0††</td>
<td>MC0202DC0†</td>
<td>YELLOW</td>
<td>20 / 22 / 24 [0.5 / 0.3 / 0.25]</td>
<td>0.066 [1.68]</td>
<td>0.045 [1.14]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FC0202DC0</td>
<td>MC0202DC0</td>
<td></td>
<td>26 / 28 / 30 [0.12 / 0.08 / 0.05]</td>
<td>0.048 [1.23]</td>
<td>0.027 [0.69]</td>
</tr>
</tbody>
</table>

†Dimensionally equivalent to M39029/64-369  ††Dimensionally equivalent to M39029/63-368

For information regarding crimp tool and crimping tool techniques, see Application Tools section, page 82.

### REMOVABLE CRIMP POWER CONTACT

**FOR USE WITH CBCD SERIES CONNECTORS**

**SIZE 16**

**FEMALE CONTACT**

*"CLOSED ENTRY" DESIGN, L.S.A.*

**MALE CONTACT**

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

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<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 [AWG/mm²]</th>
<th>ØA [inch/mm]</th>
<th>ØB [inch/mm]</th>
</tr>
</thead>
<tbody>
<tr>
<td>K</td>
<td>CHROMEL (+)</td>
<td>FC112N4S</td>
<td>MC112N4S</td>
<td>WHITE</td>
<td>12 / 14-16 [0.5 / 0.3 / 0.25]</td>
<td>0.068 [1.73]</td>
<td>0.045 [1.14]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FC112N4</td>
<td>MC112N4</td>
<td></td>
<td>16-18-20 [1.5 / 1.0 / 0.5]</td>
<td>0.068 [1.73]</td>
<td>0.045 [1.14]</td>
</tr>
<tr>
<td></td>
<td>ALUMEL (-)</td>
<td>FC114N4</td>
<td>MC114N4</td>
<td>WHITE</td>
<td>12 / 14-16 [0.5 / 0.3 / 0.25]</td>
<td>0.068 [1.73]</td>
<td>0.045 [1.14]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FC116N4</td>
<td>MC116N4</td>
<td></td>
<td>16-18-20 [1.5 / 1.0 / 0.5]</td>
<td>0.068 [1.73]</td>
<td>0.045 [1.14]</td>
</tr>
<tr>
<td></td>
<td>CONSTANTAN (-)</td>
<td>FC120N4</td>
<td>MC120N4</td>
<td>WHITE</td>
<td>12 / 14-16 [0.5 / 0.3 / 0.25]</td>
<td>0.068 [1.73]</td>
<td>0.045 [1.14]</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FC124N4</td>
<td>MC124N4</td>
<td></td>
<td>16-18-20 [1.5 / 1.0 / 0.5]</td>
<td>0.068 [1.73]</td>
<td>0.045 [1.14]</td>
</tr>
</tbody>
</table>

**NOTE:** Female contacts feature Large Surface Area (L.S.A.) closed entry contact design which provides maximum mating surfaces between male and female contact and reduced contact resistance during operation.

For information regarding crimp tool and crimping tool techniques, see Application Tools section, page 82.

**DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.**
REMOVABLE CRIMP POWER CONTACT
FOR USE WITH CBD, CBC, CBCD AND CBDD SERIES CONNECTORS
SIZE 8

For contact current rating, see page 4.

!*FEMALE CONTACT
“CLOSED ENTRY” DESIGN, L.S.A.

MALE CONTACT

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

**NOTE:** Female contacts feature Large Surface Area (L.S.A.) closed entry contact design which provides maximum mating surfaces between male and female contact and reduced contact resistance during operation.

For information regarding crimp tool and crimping tool techniques, see Application Tools section, page 82.

REMOVABLE SOLDER CUP POWER CONTACT
FOR USE WITH CBD, CBC, CBCD AND CBDD SERIES CONNECTORS
SIZE 8

For contact current rating, see page 4.

!*FEMALE CONTACT
“CLOSED ENTRY” DESIGN, L.S.A.

MALE CONTACT

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

**NOTE:** Female contacts feature Large Surface Area (L.S.A.) closed entry contact design which provides maximum mating surfaces between male and female contact and reduced contact resistance during operation.

For information regarding crimp tool and crimping tool techniques, see Application Tools section, page 82.

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

REMOVABLE HIGH VOLTAGE POWER CONTACT
FOR USE WITH CBD, CBC, CBCD AND CBDD SERIES CONNECTORS

SIZE 8

STRAIGHT SOLDER WIRE TERMINATION

FEMALE CONTACT

MALE CONTACT

FS4820D

MS4820D

0.734 [18.64] Ref.

20 AWG max.

0.040 [1.02]

Ø0.142 [3.61]

0.734 [18.64] Ref.

20 AWG max.

0.040 [1.02]

Ø0.142 [3.61]

STRAIGHT PRINTED BOARD MOUNT POWER CONTACT
FOR USE WITH CBD AND CBDD SERIES CONNECTORS

SIZE 8

Positronic recommends printed circuit board termination contacts be supplied installed in the connector. Contact technical sales for part number information.

For contact current rating, see page 4.

**FEMALE CONTACT**

“CLOSED ENTRY” DESIGN, L.S.A.

FS4920D

MS920D

0.697 [17.70] Ref.

20 AWG max.

0.040 [1.02]

Ø0.142 [3.61]

0.697 [17.70] Ref.

20 AWG max.

0.040 [1.02]

Ø0.142 [3.61]

**NOTE:** Female contacts feature Large Surface Area (L.S.A.) closed entry contact design which provides maximum mating surfaces between male and female contact and reduced contact resistance during operation.

<table>
<thead>
<tr>
<th>FEMALE PART NUMBER</th>
<th>Ø A</th>
<th>CONTACT CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FDS4314D</td>
<td>0.078 [1.98]</td>
<td>35</td>
</tr>
<tr>
<td>FDS4312D</td>
<td>0.094 [2.39]</td>
<td>36</td>
</tr>
<tr>
<td>FDS4310D</td>
<td>0.125 [3.18]</td>
<td>37</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MALE PART NUMBER</th>
<th>Ø A</th>
<th>CONTACT CODE</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0.078 [1.98]</td>
<td>35</td>
</tr>
<tr>
<td>MDS4312D</td>
<td>0.094 [2.39]</td>
<td>36</td>
</tr>
<tr>
<td>MDS4310D</td>
<td>0.125 [3.18]</td>
<td>37</td>
</tr>
</tbody>
</table>

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

For information regarding crimp tool and crimping tool techniques, see Application Tools section, page 82.
**RIGHT ANGLE (90°) PRINTED BOARD MOUNT POWER CONTACT**

**FOR USE WITH CBD AND CBDD SERIES CONNECTORS**

**SIZE 8**

Positronic **recommends** printed circuit board termination contacts be supplied installed in the connector. **Contact technical sales** for part number information.

For contact current rating, see page 4.

**FEMALE CONTACT**

"CLOSED ENTRY" DESIGN, L.S.A.

**MALE CONTACT**

<table>
<thead>
<tr>
<th>FEMALE PART NUMBER</th>
<th>A REF.</th>
<th>Ø B</th>
<th>C</th>
<th>SHELL SIZE</th>
<th>CONTACT CODE</th>
</tr>
</thead>
<tbody>
<tr>
<td>FRT4314D</td>
<td>0.580</td>
<td>0.078</td>
<td>0.339</td>
<td>1, 2, 3 &amp; 4</td>
<td>55</td>
</tr>
<tr>
<td>FRT4414D</td>
<td>0.692</td>
<td>0.078</td>
<td>0.451</td>
<td>5</td>
<td>55</td>
</tr>
<tr>
<td>FRT4714D</td>
<td>0.661</td>
<td>0.078</td>
<td>0.420</td>
<td>1, 2, 3 &amp; 4</td>
<td>75</td>
</tr>
<tr>
<td>FRT4814D</td>
<td>0.773</td>
<td>0.078</td>
<td>0.520</td>
<td>5</td>
<td>75</td>
</tr>
<tr>
<td>FRT4310D</td>
<td>1.051</td>
<td>0.125</td>
<td>0.810</td>
<td>1, 2, 3 &amp; 4</td>
<td>57</td>
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<tr>
<td>FRT4410D</td>
<td>1.051</td>
<td>0.125</td>
<td>0.810</td>
<td>5</td>
<td>57</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>MALE PART NUMBER</th>
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<th>C</th>
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<td>75</td>
</tr>
<tr>
<td>MRT4814D</td>
<td>0.773</td>
<td>0.078</td>
<td>0.520</td>
<td>5</td>
<td>75</td>
</tr>
<tr>
<td>MRT4310D</td>
<td>1.051</td>
<td>0.125</td>
<td>0.810</td>
<td>1, 2, 3 &amp; 4</td>
<td>57</td>
</tr>
<tr>
<td>MRT4410D</td>
<td>1.051</td>
<td>0.125</td>
<td>0.810</td>
<td>5</td>
<td>57</td>
</tr>
</tbody>
</table>

**NOTE:** Female contacts feature Large Surface Area (L.S.A.) closed entry contact design which provides maximum mating surfaces between male and female contact and reduced contact resistance during operation.

For information regarding crimp tool and crimping tool techniques, see Application Tools section, page 82.
REMOVABLE SHIELDED CONTACT
FOR USE WITH CBD, CBC, CBCD AND CBDD SERIES CONNECTORS
SIZE 8

STRAIGHT SOLDER/CRIMP CONTACTS

REMOVABLE CONTACTS

STRAIGHT SOLDER/SOLDER CONTACTS

STRAIGHT CRIMP/CRIMP CONTACTS

TYPE OF CONTACT | FEMALE PART NUMBER | MALE PART NUMBER | A | Ø B | C MAX. | RG CABLE NUMBER
--- | --- | --- | --- | --- | --- | ---
SOLDER/CRIMP | FC4101D | MC4101D | 0.929 [23.60] | 0.040 [1.02] | 0.739 [18.77] | 178 B/U 196 B/U
SOLDER/CRIMP | FC4102D | MC4102D | 0.929 [23.60] | 0.067 [1.70] | 0.739 [18.77] | 179 B/U 316 /U
SOLDER/CRIMP | FC4103D | MC4103D | 1.037 [26.34] | 0.108 [2.74] | 0.847 [21.51] | 180 B/U
SOLDER/CRIMP | FC4104D | MC4104D | 1.037 [26.34] | 0.120 [3.05] | 0.847 [21.51] | 58 B/U
SOLDER/SOLDER | FS4101D | MS4101D | 0.929 [23.60] | 0.040 [1.02] | 0.739 [18.77] | 178 B/U 196 B/U
SOLDER/SOLDER | FS4102D | MS4102D | 0.929 [23.60] | 0.108 [2.74] | 0.739 [18.77] | 179 B/U 316 /U
SOLDER/SOLDER | FS4103D | MS4103D | 1.037 [26.34] | 0.108 [2.74] | 0.847 [21.51] | 180 B/U
SOLDER/SOLDER | FS4104D | MS4104D | 1.037 [26.34] | 0.120 [3.05] | 0.847 [21.51] | 58 B/U
CRIMP/CRIMP | FCC4101D | MCC4101D | 0.929 [23.60] | 0.040 [1.02] | 0.739 [18.77] | 178 B/U 196 B/U
CRIMP/CRIMP | FCC4102D | MCC4102D | 0.929 [23.60] | 0.067 [1.70] | 0.739 [18.77] | 179 B/U 316 /U
CRIMP/CRIMP | FCC4104D | MCC4104D | 1.037 [26.34] | 0.120 [3.05] | 0.847 [21.51] | 58 B/U

SHIELDED CONTACTS
Two-step crimping action for signal and shielding conductors.

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

For information regarding crimp tool and crimping tool techniques, see Application Tools section, page 82.

Dimensions are in inches [millimeters]. All dimensions are subject to change.
STRAIGHT PRINTED BOARD MOUNTED SHIELDED CONTACT
FOR USE WITH CBD AND CBDD SERIES CONNECTORS
SIZE 8
Positronic recommends printed circuit board termination contacts be supplied installed in the connector. Contact technical sales for part number information.

RIGHT ANGLE (90°) PRINTED BOARD MOUNT SHIELDED CONTACT
FOR USE WITH CBD AND CBDD SERIES CONNECTORS
SIZE 8
Positronic recommends printed circuit board termination contacts be supplied installed in the connector. Contact technical sales for part number information.

For information regarding crimp tool and crimping tool techniques, see Application Tools section, page 82.
REMOVABLE AIR LINE COUPLERS
FOR USE WITH CBD, CBC, CBDD AND CBDD SERIES CONNECTORS

SIZE 8

AIR LINE COUPLER CONTACTS REQUIRE JACKSCREWS TO COUPLE MATING CONNECTORS

FEMALE CONTACT

MALE CONTACT

FA4063S

MA4063S

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

TECHNICAL CHARACTERISTICS

MATERIALS AND FINISHES:
Contacts: Stainless steel

MECHANICAL CHARACTERISTICS:
Size 8 Removable
Contacts: Rear insertion, front release.

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

CONTACT TECHNICAL SALES FOR MORE INFORMATION!

For information regarding crimp tool and crimping tool techniques, see Application Tools section, page 82.

DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.
MODIFICATION (MOS) SUFFIXES

Specify complete connector by selecting a base part number from the desired series Ordering Information Page. Once base part number is selected, add desired modifications (MOS) number below to the end of the part number.

Example part number: CBD17W2F55R7NT2X/AA-14-1062.1

(Ordering information pages can be found at the end of each series)

<table>
<thead>
<tr>
<th>SERIES</th>
<th>CONNECTOR VARIANT</th>
<th>GENDER</th>
<th>TERMINATION TYPE AVAILABLE</th>
<th>MODIFICATIONS OF STANDARD (MOS) SUFFIXES</th>
<th>DESCRIPTION OF MODIFICATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBD</td>
<td>3W3</td>
<td>F / M</td>
<td>0</td>
<td>-1841.0</td>
<td>Allows for molding to have positions A1 and A3 tooled only. Position A2 not molded but numbering will remain.</td>
</tr>
<tr>
<td>CBD</td>
<td>5W5</td>
<td>F / M</td>
<td>0</td>
<td>-1841.1</td>
<td>Allows for molding to have positions 1, 3 and 5 tooled only. Positions 2 and 4 not molded but numbering will remain.</td>
</tr>
<tr>
<td>CBD</td>
<td>8W8</td>
<td>F / M</td>
<td>0</td>
<td>-1841.2</td>
<td>Allows for molding to have positions A1,A3,A5 and A7 tooled only. Positions A2,A4,A6 and A8 not molded but numbering will remain.</td>
</tr>
<tr>
<td>CBD, CBM</td>
<td>3W3, 8W8</td>
<td>M</td>
<td>0</td>
<td>-1570.4</td>
<td>Integral stabilizing feature used to minimize size 8 contacts from floating in the molding. Use tool number 4311-0-1-0 to remove contact if necessary.</td>
</tr>
<tr>
<td>CBC</td>
<td>36W4, 43W2</td>
<td>M</td>
<td>0</td>
<td>-1570.4</td>
<td>Integral stabilizing feature used to minimize size 8 contacts from floating in the molding. Use tool number 4311-0-1-0 to remove contact if necessary.</td>
</tr>
<tr>
<td>CBD, CBC, CBDD, CBCD, CBDP, ACBDP, ACBMP</td>
<td>ALL</td>
<td>F / M</td>
<td>ALL</td>
<td>-14</td>
<td>Allows connector with signal contacts installed, for signal contacts only to be plated 0.000030 [0.76 µ] gold over nickel.</td>
</tr>
<tr>
<td>CBD, CBC, CBDD, CBCD, CBDP, ACBDP, ACBMP</td>
<td>ALL</td>
<td>F / M</td>
<td>ALL</td>
<td>-14-1062.1</td>
<td>Allows connector with signal and power contacts installed, for both signal and power contacts to be plated 0.000030 [0.76 µ] gold over nickel.</td>
</tr>
<tr>
<td>CBD, CBC, CBDD, CBCD, CBDP, ACBDP, ACBMP</td>
<td>ALL</td>
<td>F / M</td>
<td>ALL</td>
<td>-15</td>
<td>Allows connector with signal contacts installed, for signal contacts only to be plated 0.000050 [1.27 µ] gold over nickel.</td>
</tr>
<tr>
<td>CBD, CBC, CBDD, CBCD, CBDP, ACBDP, ACBMP</td>
<td>ALL</td>
<td>F / M</td>
<td>ALL</td>
<td>-15-1062.0</td>
<td>Allows connector with signal and power contacts installed, for both signal and power contacts to be plated 0.000050 [1.27 µ] gold over nickel.</td>
</tr>
<tr>
<td>CBD, CBM, CBC, CBDD, CBHD, CBBD</td>
<td>ALL</td>
<td>F / M</td>
<td>ALL</td>
<td>-1062.0</td>
<td>Allows connector with power contacts installed, for the power contacts only to be plated 0.000050 [1.27 µ] gold over nickel.</td>
</tr>
<tr>
<td>CBD, CBM, CBC, CBDD, CBHD, CBBD</td>
<td>ALL</td>
<td>F / M</td>
<td>ALL</td>
<td>-1062.1</td>
<td>Allows connector with power contacts installed, for the power contacts only to be plated 0.000030 [0.76 µ] gold over nickel.</td>
</tr>
<tr>
<td>CBD, CBM, CBC, CBDD, CBHD, CBBD</td>
<td>ALL</td>
<td>F / M</td>
<td>ALL</td>
<td>-759.0</td>
<td>Allows connectors to be supplied with blind mate guides, lockwashers and hexnuts installed. For connectors with a 4-40 threaded mounting style install blind mate guides only. For connectors with a R3/R6 mounting style install special blind mate guides with lockwashers and hexnuts. See D-subminiature Accessories catalog for more details.</td>
</tr>
<tr>
<td>CBD, CBM, CBC, CBDD, CBHD, CBBD</td>
<td>ALL</td>
<td>F / M</td>
<td>ALL</td>
<td>-759.1</td>
<td>Allows connector, with any contacts to include blind mate mounting plate. See D-subminiature Accessories catalog for more details.</td>
</tr>
<tr>
<td>QB</td>
<td>FOR CONTACTS</td>
<td>F</td>
<td>FC40**/D CONTACTS</td>
<td>-1817.0</td>
<td>Allows for contacts to have a crimp barrel with a length of 0.310 [7.87].</td>
</tr>
<tr>
<td>QB</td>
<td>7W2, 9W4</td>
<td>M</td>
<td>56, 57</td>
<td>-1865.0</td>
<td>Connector with standard right angle (90°) brackets replaced with 4535-78-0 right angle (90°) brackets.</td>
</tr>
<tr>
<td>QB</td>
<td>7W2</td>
<td>M</td>
<td>N/A</td>
<td>-1845.0</td>
<td>Allows for a connector to be supplied with inverted bend. Contact tail length below bracket of 0.120 [3.05] max. Alignment bar not required.</td>
</tr>
</tbody>
</table>

MANY OTHER SPECIAL OPTIONS ARE AVAILABLE REFER TO D-SUBMINIATURE ACCESSORIES CATALOG, CONSULT TECHNICAL SALES OR VISIT OUR WEBSITE AT WWW.CONNECTPOSITRONIC.COM

DIMENSIONS ARE IN INCHES [MILLIMETERS]. ALL DIMENSIONS ARE SUBJECT TO CHANGE.
CBD / CBM / CBC / CBCD / QB connectors are offered with removable crimp contacts. Positronic 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 www.connectpositronic.com/design-tools/tooling

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.

CONTACT 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 9550-0-0-0 and 9550-1-0-0; packaged in reels holding 1,000 contacts for use with the automatic pneumatic crimp tools, catalog part number 9550-0-2-0. 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 MC8022DR for a male contact and FC112N4R for female contact.
## CONTACT APPLICATION TOOLS CROSS REFERENCE LIST

USE INDICATED POSITRONIC TOOLS FOR BEST RESULTS

<table>
<thead>
<tr>
<th>Cross</th>
<th>Tool</th>
<th>Contact P/N</th>
<th>Tool</th>
<th>Contact P/N</th>
<th>Tool</th>
<th>Contact P/N</th>
<th>Tool</th>
<th>Contact P/N</th>
<th>Tool</th>
<th>Contact P/N</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note:** All male and female crimp contacts can be crimped on reel in quantities of 1,000 and 2,000. 

**All Dimensions are Subject to Change.**
<table>
<thead>
<tr>
<th>Tool</th>
<th>Stamping</th>
<th>Cross Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>M81969/1-02</td>
<td>91067-2</td>
<td>M22520/2-08</td>
</tr>
<tr>
<td>M81969/1-02</td>
<td>91067-2</td>
<td>M22520/2-01</td>
</tr>
<tr>
<td>M81969/1-02</td>
<td>91067-2</td>
<td>K13-1</td>
</tr>
<tr>
<td>M81969/1-02</td>
<td>91067-1</td>
<td>M22520/2-09</td>
</tr>
<tr>
<td>M81969/1-02</td>
<td>91067-1</td>
<td>K13-1</td>
</tr>
<tr>
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<td>91067-1</td>
<td>M22520/2-01</td>
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<td>91067-1</td>
<td>M22520/2-01</td>
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</table>

*All dimensions are subject to change.*

For contact inquiries, refer to the contact number provided on the page for more information.
SUGGESTED PRINTED BOARD HOLE SIZES FOR COMPLIANT PRESS-FIT CONNECTORS

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>
</tr>
</thead>
<tbody>
<tr>
<td>TIN-LEAD SOLDER PCB</td>
<td>22 OMEGA</td>
<td>ø0.045±0.0010 [ø1.15±0.25]</td>
<td>0.0006 [15µ] min. solder over 0.0010 [25µ] min. copper</td>
<td>ø0.039±0.003-0.005 [ø1.00±0.090-0.20]</td>
</tr>
<tr>
<td></td>
<td>20 OMEGA</td>
<td>ø0.045±0.0010 [ø1.15±0.25]</td>
<td></td>
<td>ø0.039±0.003-0.005 [ø1.00±0.090-0.20]</td>
</tr>
<tr>
<td></td>
<td>16 BI-SPRING</td>
<td>ø0.069±0.0011 [ø1.75±0.25]</td>
<td></td>
<td>ø0.063±0.003-0.005 [ø1.60±0.090-0.20]</td>
</tr>
<tr>
<td></td>
<td>8 BI-SPRING</td>
<td>ø0.125±0.0011 [ø3.18±0.25]</td>
<td></td>
<td>ø0.119±0.002 [ø3.02±0.05]</td>
</tr>
</tbody>
</table>

**RoHS PCB PLATING OPTIONS**

<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>
</tr>
</thead>
<tbody>
<tr>
<td>COPPER PCB</td>
<td>22 OMEGA</td>
<td>ø0.047±0.0011 [ø1.19±0.25]</td>
<td>0.0010 [25µ] min. copper</td>
<td>ø0.043±0.002 [ø1.09±0.05]</td>
</tr>
<tr>
<td></td>
<td>20 OMEGA</td>
<td>ø0.047±0.0011 [ø1.19±0.25]</td>
<td></td>
<td>ø0.043±0.002 [ø1.09±0.05]</td>
</tr>
<tr>
<td></td>
<td>16 BI-SPRING</td>
<td>ø0.069±0.0011 [ø1.75±0.25]</td>
<td></td>
<td>ø0.063±0.003-0.005 [ø1.60±0.090-0.20]</td>
</tr>
<tr>
<td></td>
<td>8 BI-SPRING</td>
<td>ø0.125±0.0011 [ø3.18±0.25]</td>
<td></td>
<td>ø0.119±0.002 [ø3.02±0.05]</td>
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</tbody>
</table>

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<tr>
<th>BOARD TYPE</th>
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<th>FINISHED HOLE SIZES</th>
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</thead>
<tbody>
<tr>
<td>IMMERSION TIN PCB</td>
<td>22 OMEGA</td>
<td>ø0.047±0.0011 [ø1.19±0.25]</td>
<td>0.000033±0.000006 [0.85±0.15µ] immersion tin over 0.0010 [25µ] min. copper</td>
<td>ø0.043±0.002 [ø1.09±0.05]</td>
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<tr>
<td></td>
<td>20 OMEGA</td>
<td>ø0.047±0.0011 [ø1.19±0.25]</td>
<td></td>
<td>ø0.043±0.002 [ø1.09±0.05]</td>
</tr>
<tr>
<td></td>
<td>16 BI-SPRING</td>
<td>ø0.069±0.0011 [ø1.75±0.25]</td>
<td></td>
<td>ø0.063±0.003-0.005 [ø1.60±0.090-0.20]</td>
</tr>
<tr>
<td></td>
<td>8 BI-SPRING</td>
<td>ø0.125±0.0011 [ø3.18±0.25]</td>
<td></td>
<td>ø0.119±0.002 [ø3.02±0.05]</td>
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</tbody>
</table>

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<th>RECOMMENDED DRILL HOLE SIZE</th>
<th>RECOMMENDED PLATING</th>
<th>FINISHED HOLE SIZES</th>
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<tbody>
<tr>
<td>IMMERSION SILVER PCB</td>
<td>22 OMEGA</td>
<td>ø0.047±0.0011 [ø1.19±0.25]</td>
<td>0.0000013±0.0000007 [0.34±0.17µ] immersion silver over 0.0010 [25µ] min. copper</td>
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<tr>
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<td>20 OMEGA</td>
<td>ø0.047±0.0011 [ø1.19±0.25]</td>
<td></td>
<td>ø0.043±0.002 [ø1.09±0.05]</td>
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<tr>
<td></td>
<td>16 BI-SPRING</td>
<td>ø0.069±0.0011 [ø1.75±0.25]</td>
<td></td>
<td>ø0.063±0.003-0.005 [ø1.60±0.090-0.20]</td>
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<tr>
<td></td>
<td>8 BI-SPRING</td>
<td>ø0.125±0.0011 [ø3.18±0.25]</td>
<td></td>
<td>ø0.119±0.002 [ø3.02±0.05]</td>
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<table>
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<tr>
<th>BOARD TYPE</th>
<th>CONTACT SIZE / TYPE</th>
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<th>RECOMMENDED PLATING</th>
<th>FINISHED HOLE SIZES</th>
</tr>
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<tbody>
<tr>
<td>ELECTROLESS NICKEL / IMMERSION GOLD PCB</td>
<td>22 OMEGA</td>
<td>ø0.047±0.0011 [ø1.19±0.25]</td>
<td>0.000002 [0.55µ] min. immersion gold over 0.00017±0.000059 [4.5±1.5µ] electroless nickel per IPC-4552 over 0.0010 [25µ] min. copper</td>
<td>ø0.043±0.002 [ø1.09±0.05]</td>
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<tr>
<td></td>
<td>20 OMEGA</td>
<td>ø0.047±0.0011 [ø1.19±0.25]</td>
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<td>ø0.043±0.002 [ø1.09±0.05]</td>
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<td>16 BI-SPRING</td>
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<td>ø0.063±0.003-0.005 [ø1.60±0.090-0.20]</td>
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<td></td>
<td>ø0.119±0.002 [ø3.02±0.05]</td>
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</tbody>
</table>

**“Omega” Termination**
Utilized on signal contacts

**“Bi-Spring” Termination**
Utilized on signal contacts

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

**COMPLIANT PRESS-FIT TERMINATION CONTACT HOLE**

When properly used, Positronic Industries Bi-Spring Power or Omega Signal Press-Fit terminations provide reliable service even under severe conditions.

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

1. Inexpensive installation tooling is available from Positronic, to choose the proper installation tool refer to page 86 for part number ordering information.
2. Insert the connector into the P.C. board or backplane and seat connector fully.
3. Secure the connector to the P.C. board or backplane using two self-tapping screws. The screws should be 4-40 threads supplied by customer.
# Positronic Recommended Tools for Compliant Press-Fit Connectors and Contacts

<table>
<thead>
<tr>
<th>SHELL SIZE</th>
<th>CONNECTOR VARIANT</th>
<th>CONNECTOR SEATING TOOL WITH ARBOR PRESS SHAFT</th>
<th>ARBOR PRESS FOR SEATING TOOLS</th>
<th>REPLACEMENT PINS FOR CONNECTOR SEATING TOOL</th>
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<tbody>
<tr>
<td>1</td>
<td>2WK2</td>
<td>9512-44-0-41</td>
<td>9512-44-0-41</td>
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<td></td>
<td>5W1</td>
<td>9512-18-0-41</td>
<td>9512-1-0-41</td>
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<td></td>
<td>8W2</td>
<td>9512-41-0-41</td>
<td>9512-40-0-41</td>
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<tr>
<td>2</td>
<td>3W3</td>
<td>9512-19-0-41</td>
<td>9512-2-0-41</td>
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<tr>
<td></td>
<td>3WK3</td>
<td>9512-39-0-41</td>
<td>9512-38-0-41</td>
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<tr>
<td></td>
<td>7W2</td>
<td>9512-20-0-41</td>
<td>9512-2-0-41</td>
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<td>9512-21-0-41</td>
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<td>19W1</td>
<td>9512-42-0-41</td>
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<td>3</td>
<td>5W5</td>
<td>9512-22-0-41</td>
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<td>13W3</td>
<td>9512-24-0-41</td>
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<td></td>
<td>17W2</td>
<td>9512-25-0-41</td>
<td>9512-3-0-41</td>
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<td></td>
<td>21W1</td>
<td>9512-26-0-41</td>
<td>9512-3-0-41</td>
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<tr>
<td>4</td>
<td>8W8</td>
<td>9512-27-0-41</td>
<td>9512-4-0-41</td>
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<td>21WA4</td>
<td>9512-30-0-41</td>
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<td>25W3</td>
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<td>47W1</td>
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<td>5</td>
<td>46W4</td>
<td>9512-37-0-41</td>
<td>9512-16-0-41</td>
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</tbody>
</table>

Note: For 8W2 Size 22, Female contacts use pin p / n 855-751-0-41.
For 19W1 Size 22, Female contacts use pin p / n 855-347-29-41.
For Size 20, Female contacts use pin p / n 855-347-18-41.
For Size 16, Female contacts use pin p / n 855-347-28-41.
For Size 8, Female contacts use pin p / n 855-347-19-41.
Male contacts don’t use replaceable pins.

Positronic offers expert assistance in adapting application tooling to your manufacturing environment. Contact our application tooling specialist for assistance.
Positronic® offers a variety of QPL connector products

### RECTANGULAR CONNECTORS

<table>
<thead>
<tr>
<th>MIL PREFIX</th>
<th>POSITRONIC SERIES</th>
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</thead>
<tbody>
<tr>
<td>MIL-DTL-28748/3</td>
<td>GMCT</td>
</tr>
<tr>
<td>MIL-DTL-28748/4</td>
<td>GMCT</td>
</tr>
<tr>
<td>MIL-DTL-28748/5</td>
<td>GM</td>
</tr>
<tr>
<td>MIL-DTL-28748/6</td>
<td>GM</td>
</tr>
<tr>
<td>MIL-DTL-28748/7</td>
<td>SGM</td>
</tr>
<tr>
<td>MIL-DTL-28748/8</td>
<td>SGM</td>
</tr>
<tr>
<td>MIL-C-28748/13</td>
<td>SGMC</td>
</tr>
<tr>
<td>MIL-C-28748/14</td>
<td>SGMC</td>
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<tr>
<td>SAE AS39029/34</td>
<td>SGMC, GMCT</td>
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<td>SAE AS39029/35</td>
<td>SGMC, GMCT</td>
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### D-SUBMINIATURE CONNECTORS

<table>
<thead>
<tr>
<th>MIL PREFIX</th>
<th>POSITRONIC SERIES</th>
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<tbody>
<tr>
<td>MIL-DTL-24308/1</td>
<td>HDC</td>
</tr>
<tr>
<td>MIL-DTL-24308/2</td>
<td>RD, DD</td>
</tr>
<tr>
<td>MIL-DTL-24308/3</td>
<td>HDC</td>
</tr>
<tr>
<td>MIL-DTL-24308/4</td>
<td>RD, DD</td>
</tr>
<tr>
<td>MIL-DTL-24308/5</td>
<td>HDC</td>
</tr>
<tr>
<td>MIL-DTL-24308/6</td>
<td>RD, DD</td>
</tr>
<tr>
<td>MIL-DTL-24308/7</td>
<td>HDC</td>
</tr>
<tr>
<td>MIL-DTL-24308/8</td>
<td>RD, DD</td>
</tr>
<tr>
<td>MIL-DTL-24308/23</td>
<td>HDC, DD</td>
</tr>
</tbody>
</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!

www.connectpositronic.com/qpl/catalog
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 fixed cable connector, straight solder, right angle (90°) compliant press-in, straight 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
  - AC/DC operation in a single connector
  - Signal contacts for hardwire management
  - Blind mating
  - Sequential mating
  - Large surface area contact mating system
  - Wide variety of accessories
  - Customer-specified contact arrangements
  - Modular tooling which produces a single piece connector insert

**D-SUB MINIATURE**
- **Contact Sizes:** 8, 16, 20 and 22
- **Current Ratings:** To 13 amperes nominal
- **Terminations:** Crimp, wire solder, straight solder, right angle (90°) solder, and straight compliant press-in
- **Configurations:** Multiple variants in both standard and high densities, thirty package sizes
- **Qualifications:** MIL-DTL-28748, AS39029, CCITT V.35
- **FEATURES:**
  - Two performance levels available: industrial quality and military quality
  - A wide variety of accessories
  - Broad selection of contact arrangement and package sizes
  - Connector coding device (keying) options

**RECTANGULAR**
- **Contact Sizes:** 16, 20 and 22
- **Current Ratings:** To 13 amperes nominal
- **Terminations:** Crimp, wire solder, straight solder, right angle (90°) solder, and straight compliant press-in
- **Configurations:** Multiple variants in both standard and high densities, thirty package sizes
- **Qualifications:** MIL-DTL-28748, AS39029, CQT7 V.35
- **FEATURES:**
  - Two performance levels available: industrial quality and military quality
  - A wide variety of accessories
  - Broad selection of contact arrangement and package sizes
  - Connector coding device (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-DTL-24308, GSFC S-311-P-4, GSFC S-311-P-10, AS39029, DSCC
- **FEATURES:**
  - Intended for use as an electrical feedthrough in high vacuum applications
  - Helium leakage rate at ambient temperature: < 5 x 10^-9 mbar-l/s under a vacuum of 1.5 x 10^-2 mbar
  - Signal, power, coax and high voltage versions available
  - Connectors can be mounted on flange assembly per customer specification

**CABLE**
- **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-DTL-24308, GSFC S-311-P-4, GSFC S-311-P-10, AS39029, DSCC
- **FEATURES:**
  - Intended for use as an electrical feedthrough in high vacuum applications
  - Helium leakage rate at ambient temperature: < 5 x 10^-9 mbar-l/s under a vacuum of 1.5 x 10^-2 mbar
  - Signal, power, coax and high voltage versions available
  - Connectors can be mounted on flange assembly per customer specification

**HERMETIC**
- **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-DTL-24308, GSFC S-311-P-4, GSFC S-311-P-10, AS39029, DSCC
- **FEATURES:**
  - Intended for use as an electrical feedthrough in high vacuum applications
  - Helium leakage rate at ambient temperature: < 5 x 10^-9 mbar-l/s under a vacuum of 1.5 x 10^-2 mbar
  - Signal, power, coax and high voltage versions available
  - Connectors can be mounted on flange assembly per customer specification

For more information, visit www.connectpositronic.com or call your nearest Positronic sales office listed on the back of this catalog.
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