

# COMBO

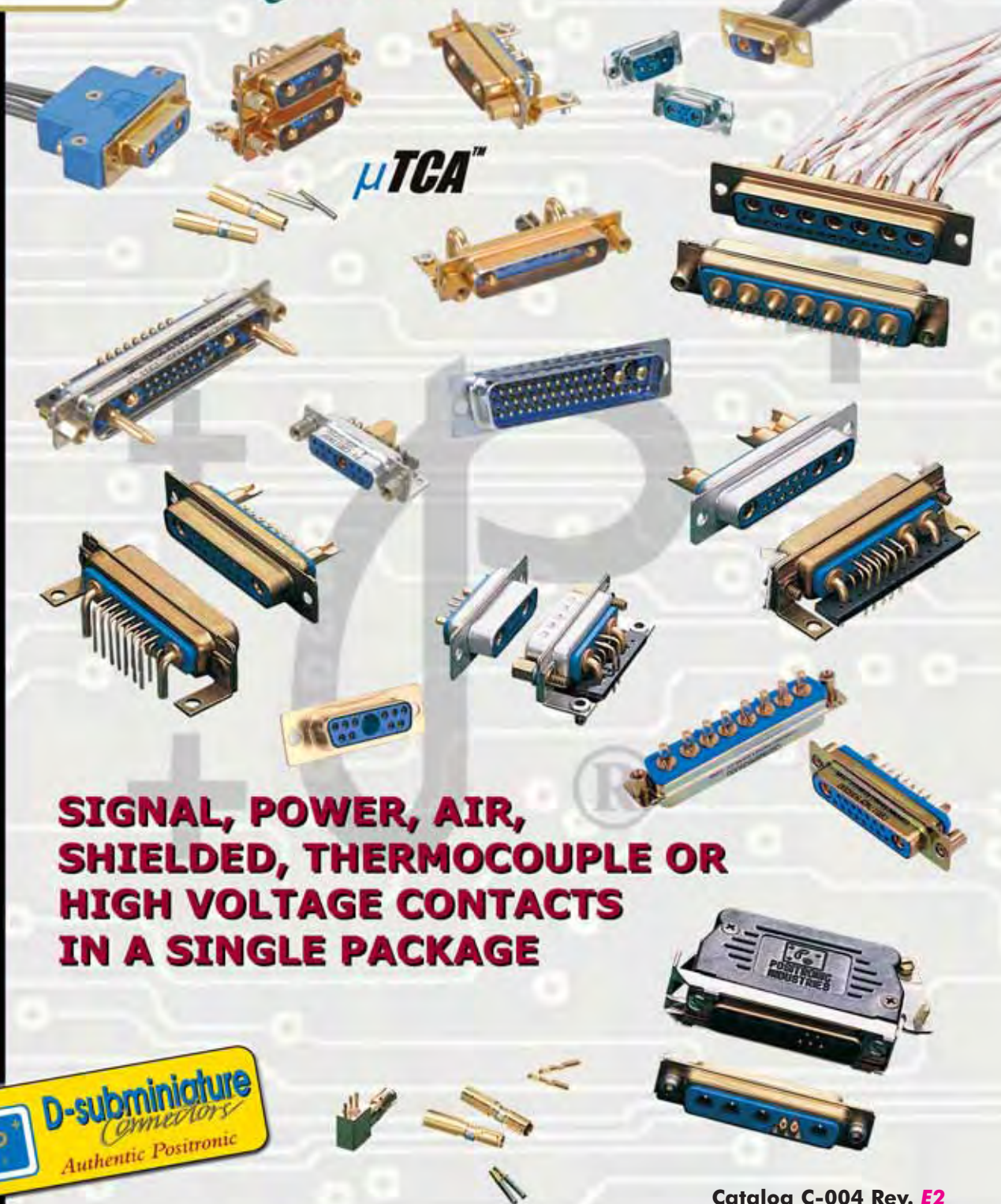
D-subminiature Connectors



**POSITRONIC™**  
GLOBAL *Connector* SOLUTIONS



LOOK  
FOR OUR  
NEW PRODUCTS!



**μTCA™**

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



Catalog C-004 Rev. **E2**

[www.connectpositronic.com](http://www.connectpositronic.com)



# Connector Excellence®

## POSITRONIC INDUSTRIES

### ABOUT US

Founded in 1966, Positronic Industries is a vertically integrated manufacturer of high quality interconnect products. Positronic has earned the worldwide reputation as a service oriented, quick-reaction, top quality connector supplier. We are committed to maintaining this reputation by continuous implementation of our **Complete Capability** concept.

### COMPLETE CAPABILITY

#### Design & Development

- Designs new connectors and modifies existing connectors to meet industry requirements
- Continuously conducts marketing studies to identify industry needs for new products
- Ongoing interest in unique connector designs

#### Tooling

- Tooling support for all manufacturing areas within company
- Provides 80% of new tooling, punch press dies, molds, jigs and fixtures used at Positronic factory locations worldwide

#### Machining

- Automatic screw machines produce finely crafted contacts and hardware for connector bodies
- Trained technicians operate machines from Tornos, Bechler and Brown & Sharpe

#### Molding

- Molds all plastic connector components such as insulators, hoods, angle brackets and more
- Overmold capability available

#### Plating

- Applies gold and other metal finishes to connector components to any required thickness
- Plating conforms to all military specifications

#### Quality Assurance

- Select factories certified to ISO 9001:2000, AS9100 Rev.B 2004 and ISO 14001 (Singapore)
- Maintains aggressive TQM program
- Able to test to IEC, EIA, UL, MIL-DTL-24308, MIL-DTL-28748, SAE AS 39029 and MIL-C-85049 requirements

#### Finished Stock Inventory

- Each main factory location maintains a large inventory of connector components and accessories
- Same day shipments available on many standard connector products
- Stocking agreements available for qualified customers

#### Worldwide Sales & Service

- One-on-one customer service
  - Factory sales
  - Factory direct local sales representatives
- World class web site
- Facilities located in USA, France, India, Puerto Rico, and Singapore.



Machining



Molding



Finished Stock Inventory

POSITRONIC IS AN ITAR REGISTERED COMPANY

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

Products described within this catalog may be protected by one or more of the following US. patents:

#4,900,261   #5,255,580   #5,329,697  
#6,260,268   #6,835,079   #7,115,002

Patented in Canada, 1992   Other Patents Pending

Unless otherwise specified, **dimensional tolerances** are:

- 1)  $\pm 0.001$  inches [0.03 mm] for male contact mating diameters.
- 2)  $\pm 0.003$  inches [0.08 mm] for contact termination diameters.
- 3)  $\pm 0.005$  inches [0.13 mm] for all other diameters.
- 4)  $\pm 0.015$  inches [0.38 mm] for all other dimensions.

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## CONNECTOR DESCRIPTIONS

### 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.



**RoHS Compliant  
options available!**

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



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D-Sub

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**NEW!**

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NEW!

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NEW!

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NEW!

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# POSITRONIC CABLIZED CONNECTORS

***SAVE TIME AND MONEY!*** Let Positronic support your connector requirements by cablizing your **Combo-D** connector selection. Positronic offers technical support and manufacturing capability for cablized connectors. Contact your factory direct sales representative for details!



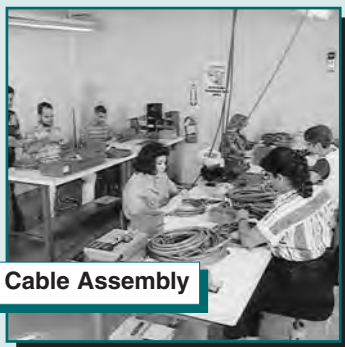
**Springfield Cable Assembly**



**Engineering Management**



**Quality Assurance**



**Puerto Rico Cable Assembly**

## **Design and Testing Service**

*Positronic Industries' Engineering Department:*

1. Works closely with customers.
2. Prepares component and cablized connector systems, hardware design, and performance specifications.
3. Designs each system in accordance with applicable customer, domestic, and international standards.
4. Defines and directs required performance and verification testing.



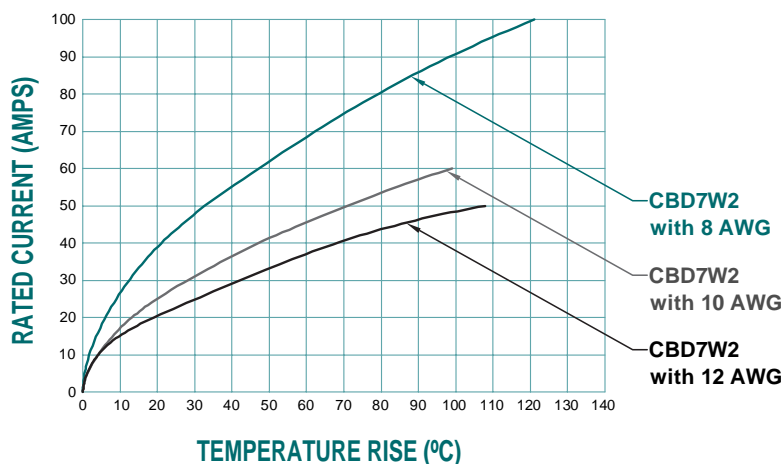
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## GENERAL INFORMATION

Combo-D  
D-Sub

### TEMPERATURE RISE CURVES FOR SIZE 8, 10 AND 12 AWG WIRE

#### 7W2



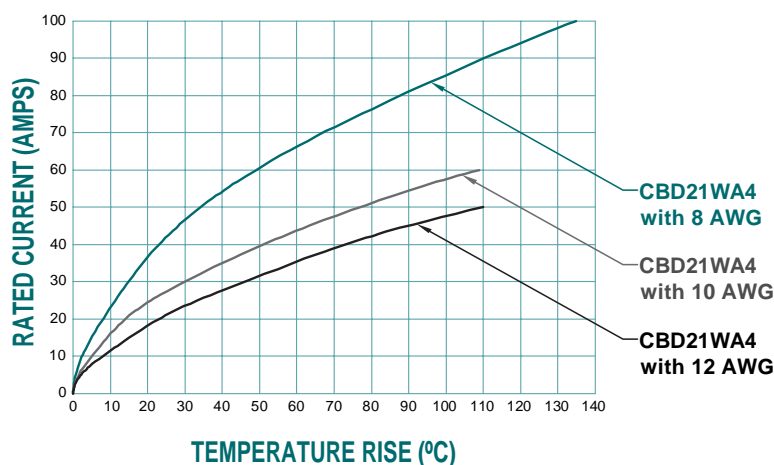
**Test conducted in accordance with UL1977.**  
**All power contacts under load.**

**MC4008D:** Curve developed using a mated CBD7W2F57 and CBC7W2M loaded with MC4008D contacts terminated to 8 AWG wire.

**MC4010D:** Curve developed using a mated CBD7W2F36 and CBC7W2M loaded with MC4010D contacts terminated to 10 AWG wire.

**MC4012D:** Curve developed using a mated CBD7W2F55 and CBC7W2M loaded with MC4012D contacts terminated to 12 AWG wire.

#### 21WA4



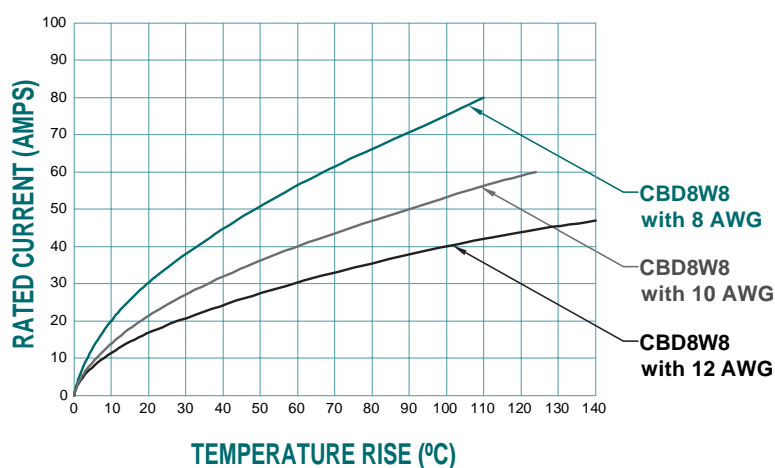
**Test conducted in accordance with UL1977.**  
**All power contacts under load.**

**MC4008D:** Curve developed using a mated CBD21WA4F57 and CBC21WA4M loaded with MC4008D contacts terminated to 8 AWG wire.

**MC4010D:** Curve developed using a mated CBD21WA4F36 and CBC21WA4M loaded with MC4010D contacts terminated to 10 AWG wire.

**MC4012D:** Curve developed using a mated CBD21WA4F55 and CBC21WA4M loaded with MC4012D contacts terminated to 12 AWG wire.

#### 8W8



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

**MC4008D:** Curve developed using a mated CBD8W8F57 and CBC8W8M loaded with MC4008D contacts terminated to 8 AWG wire.

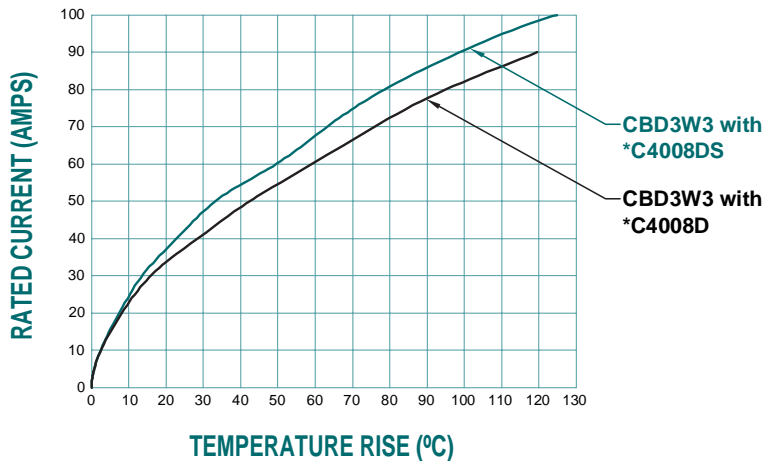
**MC4010D:** Curve developed using a mated CBD8W8F36 and CBC8W8M loaded with MC4010D contacts terminated to 10 AWG wire.

**MC4012D:** Curve developed using a mated CBD8W8F55 and CBC8W8M loaded with MC4012D contacts terminated to 12 AWG wire.



## TEMPERATURE RISE CURVE FOR STANDARD AND HIGH CONDUCTIVITY CONTACT MATERIAL

### 3W3



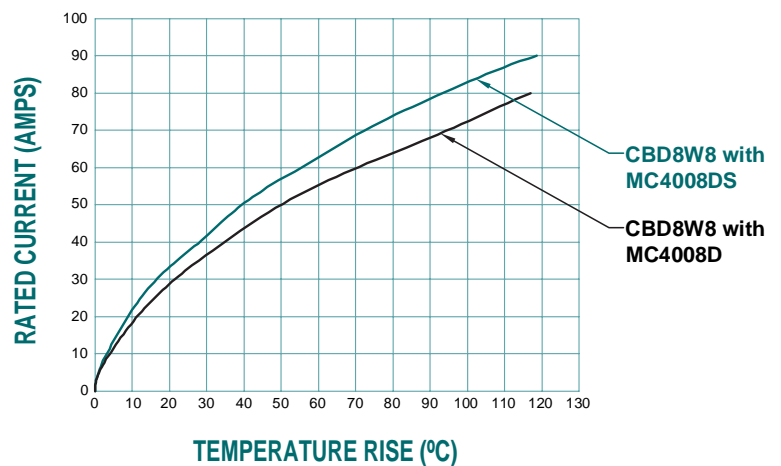
**Test conducted in accordance with UL1977.**  
**All power contacts under load.**

**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



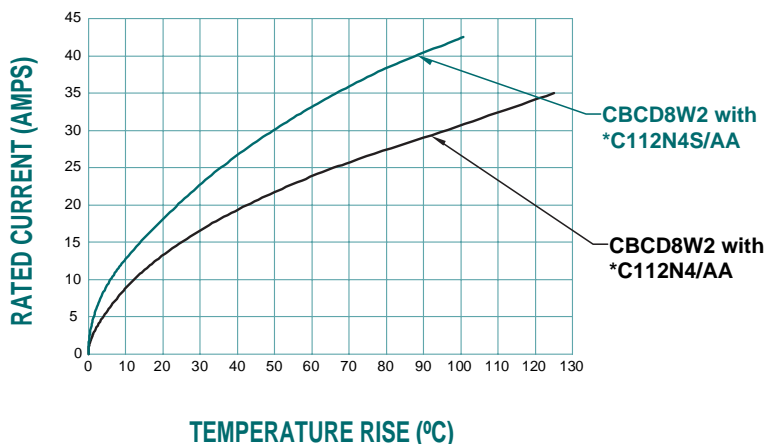
**Test conducted in accordance with UL1977.**  
**All power contacts under load.**

**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 12 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.



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**PROFESSIONAL, INDUSTRIAL AND MILITARY QUALITY**  
**THREE PERFORMANCE LEVELS FOR BEST COST/PERFORMANCE RATIO**  
**STANDARD DENSITY PCB MOUNT**

**Combo-D**  
**D-Sub**

**Size 20 Fixed Signal and  
Thermocouple Contacts**  
**Size 8 Removable Power, Shielded,  
Air and High Voltage Contacts**

**U.L. Recognized**  
**File #E49351**

**CSA Recognized**  
**File #LR54219**

**D.E.S.C. 85039**

**Telecommunication U.L. File #E140980**



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 I.E.C. 807-2, 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 D.E.S.C. 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.



**For RoHS options  
see page 21.**



## TECHNICAL CHARACTERISTICS

### MATERIALS AND FINISHES:

<b>Insulator:</b>	Glass filled polyester per MIL-M-24519 UL 94V-0, blue color, and composite.
<b>Contacts:</b>	Precision machined copper alloy.
<b>Contact Plating:</b>	
<b>Signal:</b>	Gold flash over nickel plate and gold 0.000050 [1.27μ] over nickel plate. Other finishes available upon request, see page 89.
<b>Power:</b>	Gold flash over nickel. Other finishes available upon request, see page 89.
<b>Shielded:</b>	For contact platings, see pages 68.
<b>High Voltage:</b>	For contact platings, see pages 68.
<b>Shells:</b>	Steel or brass with tin plate; zinc plate with chromate seal; stainless steel passivated. Other materials and finishes available upon request.
<b>Mounting Spacers and Brackets:</b>	Nylon; copper alloy or steel with zinc plate and chromate seal or tin plate; phosphor bronze with tin plate; stainless steel, passivated.
<b>Push-On Fasteners:</b>	Phosphor bronze and beryllium copper with tin plate.
<b>Jackscrew Systems:</b>	Brass or steel with zinc plate and chromate seal or clear zinc plate or tin plate; stainless steel, passivated.
<b>Hoods:</b>	Composite and plastic, UL 94V-0; brass or steel with zinc plate and chromate seal; aluminum or aluminum with electroless nickel plate; die cast zinc.

Non-magnetic versions are available, contact Technical Sales.

### MECHANICAL CHARACTERISTICS:

<b>Signal Contacts, Fixed:</b>	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 69 for details.
<b>Contact Retention in Insulator:</b>	Signal: 9 lbs. [40N]. Power, shielded and high voltage: 22 lbs [98N].
<b>Resistance to Solder Iron Heat:</b>	500°F [260°C] for 10 seconds duration per IEC 512-6.
<b>Signal Contact Terminations:</b>	Solder contacts - 0.042 inch [1.06mm] minimum hole diameter for 20 AWG [0.5 mm <sup>2</sup> ] wire maximum. Straight Printed Board Mount – 0.028 inch [0.71mm] termination diameter. Right Angle (90°) Printed Board Mount – 0.028 inch [0.71 mm] termination diameter.
<b>Power Contacts, Removable, Crimp or Solder Termination:</b>	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.
<b>Power Contacts, Printed Board Mount:</b>	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.
<b>Shielded Contacts, Removable:</b>	See table of cable sizes for contact termination dimensions, page 78.

<b>High Voltage Contacts:</b>	Straight and right angle (90°) terminations – 0.041 inch [1.04mm] minimum hole diameter.
<b>Shells:</b>	Male shells may be dimpled for EMI/ESD ground paths.
<b>Polarization:</b>	Trapezoidally shaped shells and polarized jackscrews.
<b>Mounting to Angle Brackets:</b>	Jackscrews and riveted fasteners with 0.120 inch [3.05mm] diameter hole, and threaded riveted fasteners with 4-40 threads and nylon inserts.
<b>Mounting to Printed Board:</b>	Rapid installation push-on fasteners and threaded posts.
<b>Locking Systems:</b>	Jackscrews and vibration locking systems.
<b>Mechanical Operations:</b>	CBD series, open entry contacts, 500 operations. CBD series, PosiBand closed entry and CBM series, 1,000 operations. Per IEC 512-5.

### ELECTRICAL CHARACTERISTICS:

#### SIZE 20 CONTACTS

<b>Contact Current Rating:</b>	7.5 amperes nominal.
<b>Initial Contact Resistance:</b>	0.008 ohms maximum.
<b>Proof Voltage:</b>	1000 V r.m.s.

#### SIZE 8 CONTACTS

##### POWER CONTACTS

**Contact Current Rating - Tested per U.L. 1977:**

**Standard Contact Material:**

<b>0.078 inches diameter / 12 AWG terminations:</b>	39 amperes.
<b>0.094 inches diameter / 10 AWG terminations:</b>	50 amperes.
<b>0.125 inches diameter / 8 AWG terminations:</b>	70 amperes.

See Temperature Rise Curves on page 1 for details.

**High Conductivity Contact Material:**

<b>8 AWG terminations:</b>	80 amperes.
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See Temperature Rise Curves on page 2 for details.

**Initial Contact Resistance:**

<b>Standard Contact Material:</b>	0.0005 ohms max. per IEC 512-2, Test 2b.
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<b>High Conductivity Contact Material:</b>	0.00035 ohms max. per IEC 512-2, Test 2b.
--	---

<b>Proof Voltage:</b>	1000 V r.m.s.
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#### SHIELDED CONTACTS

For electrical characteristics, see pages 69.

#### HIGH VOLTAGE CONTACTS

For electrical characteristics, see pages 69.

#### CONNECTOR

<b>Insulator Resistance:</b>	5 G ohms.
<b>Clearance and Creepage Distance:</b>	0.039 [1.0mm] minimum.
<b>Working Voltage:</b>	300 V r.m.s.

### CLIMATIC CHARACTERISTICS:

<b>Temperature Range:</b>	-55°C to +125°C.
<b>Damp Heat, Steady State:</b>	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.





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# PROFESSIONAL, INDUSTRIAL AND MILITARY QUALITY

## THREE PERFORMANCE LEVELS FOR BEST COST/PERFORMANCE RATIO

### STANDARD DENSITY PCB MOUNT

Combo-D  
D-Sub

## CONTACT VARIANTS

FACE VIEW OF MALE OR REAR VIEW OF FEMALE

### SHELL SIZE 1



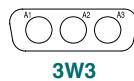
\*1 2WK2



5W1

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

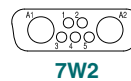
### SHELL SIZE 2



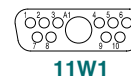
3W3



\*2 3WK3

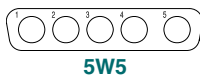


7W2

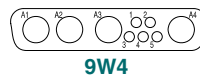


11W1

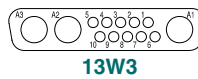
### SHELL SIZE 3



5W5



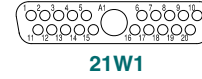
9W4



13W3

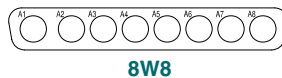


17W2

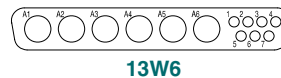


21W1

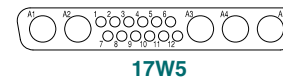
### SHELL SIZE 4



8W8



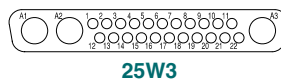
13W6



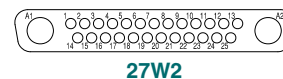
17W5



21WA4

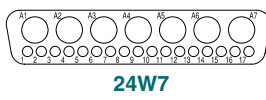


25W3

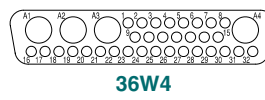


27W2

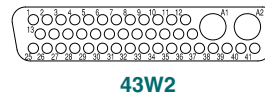
### SHELL SIZE 5



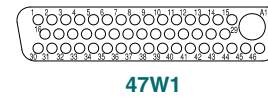
24W7



36W4

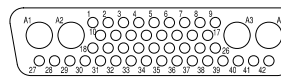


43W2



47W1

### SHELL SIZE 6



46W4

#### Notes:

\*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

## STANDARD SHELL ASSEMBLY

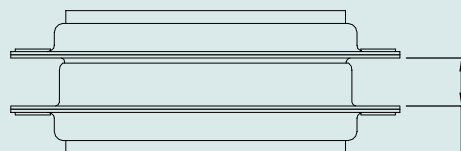


CBD3W3M00000

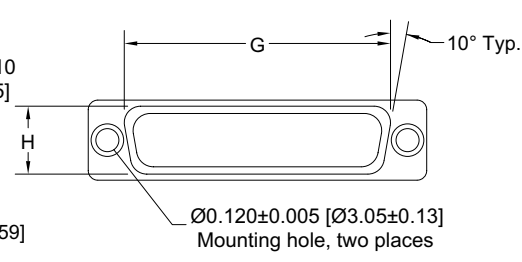
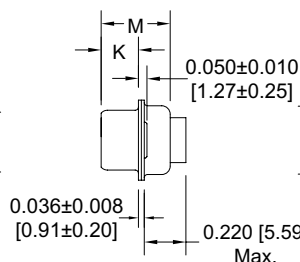
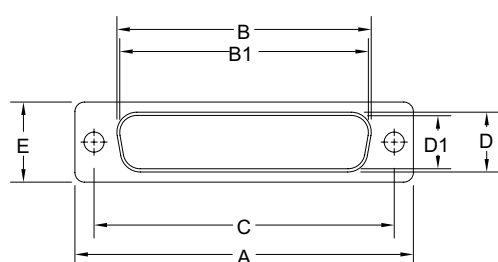
CBD5W5M00000



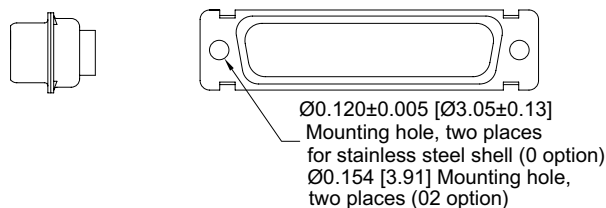
### RECOMMENDED MATING DIMENSIONS



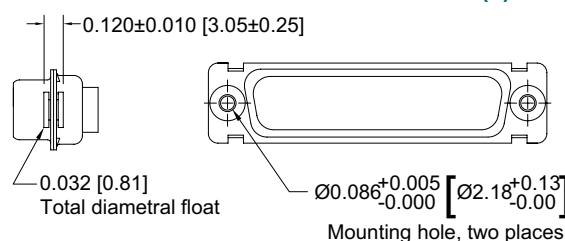
Shell Sizes 1 & 2 =  
0.265±0.015 [6.73±0.38]  
Shell Sizes 3, 4, 5 & 6 =  
0.256±0.015 [6.50±0.38]



### OPTIONAL SHELL ASSEMBLY (0, 02)



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



SHELL SIZES	A ±0.015 [0.38]	B ±0.005 [0.13]	B1 ±0.005 [0.13]	C ±0.005 [0.13]	D ±0.005 [0.13]	D1 ±0.005 [0.13]	E ±0.015 [0.38]	G ±0.010 [0.25]	H ±0.010 [0.25]	K ±0.005 [0.13]	M ±0.010 [0.25]
SHELL SIZE 1 MALE	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]
SHELL SIZE 1 FEMALE	1.213 [30.81]	0.643 [16.33]		0.984 [24.99]	0.311 [7.90]		0.494 [12.55]	0.759 [19.28]	0.422 [10.72]	0.243 [6.17]	0.429 [10.90]
SHELL SIZE 2 MALE	1.541 [39.14]		0.994 [25.25]	1.312 [33.32]		0.329 [8.36]	0.494 [12.55]	1.083 [27.51]	0.422 [10.72]	0.233 [5.92]	0.422 [10.72]
SHELL SIZE 2 FEMALE	1.541 [39.14]	0.971 [24.66]		1.312 [33.32]	0.311 [7.90]		0.494 [12.55]	1.083 [27.51]	0.422 [10.72]	0.243 [6.17]	0.429 [10.90]
SHELL SIZE 3 MALE	2.088 [53.04]		1.534 [38.96]	1.852 [47.04]		0.329 [8.36]	0.494 [12.55]	1.625 [41.28]	0.422 [10.72]	0.230 [5.84]	0.426 [10.82]
SHELL SIZE 3 FEMALE	2.088 [53.04]	1.511 [38.38]		1.852 [47.04]	0.311 [7.90]		0.494 [12.55]	1.625 [41.28]	0.422 [10.72]	0.243 [6.17]	0.429 [10.90]
SHELL SIZE 4 MALE	2.729 [69.32]		2.182 [55.42]	2.500 [63.50]		0.329 [8.36]	0.494 [12.55]	2.272 [57.71]	0.422 [10.72]	0.230 [5.84]	0.426 [10.82]
SHELL SIZE 4 FEMALE	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]
SHELL SIZE 5 MALE	2.635 [66.93]		2.079 [52.81]	2.406 [61.11]		0.441 [11.20]	0.605 [15.37]	2.178 [55.32]	0.534 [13.56]	0.230 [5.84]	0.426 [10.82]
SHELL SIZE 5 FEMALE	2.635 [66.93]	2.064 [52.43]		2.406 [61.11]	0.423 [10.74]		0.605 [15.37]	2.178 [55.32]	0.534 [13.56]	0.243 [6.17]	0.429 [10.90]
SHELL SIZE 6 MALE	2.729 [69.32]		2.212 [56.18]	2.500 [63.50]		0.503 [12.78]	0.668 [16.97]	2.302 [58.47]	0.596 [15.14]	0.230 [5.84]	0.426 [10.82]
SHELL SIZE 6 FEMALE	2.729 [69.32]	2.189 [55.60]		2.500 [63.50]	0.485 [12.32]		0.668 [16.97]	2.302 [58.47]	0.596 [15.14]	0.243 [6.17]	0.429 [10.90]

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

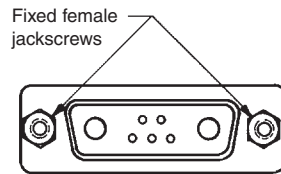
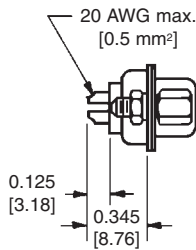


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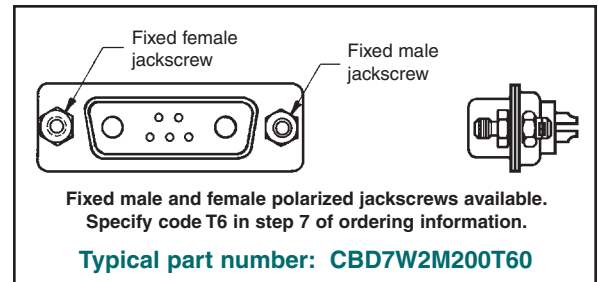
# PROFESSIONAL, INDUSTRIAL AND MILITARY QUALITY THREE PERFORMANCE LEVELS FOR BEST COST/PERFORMANCE RATIO STANDARD DENSITY PCB MOUNT

Combo-D  
D-Sub

## SOLDER CUP CONNECTOR CODE 2



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



Typical part number: **CBD7W2M200T0**



**CBD17W2F200E0 with FS4008D contacts.**

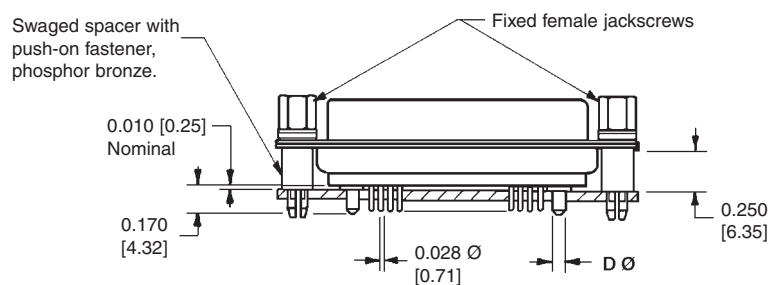
**CBD17W2M55B30T20**

## STRAIGHT PRINTED BOARD MOUNT CONNECTOR CODE 3, 35, 36 AND 37

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

CONTACT CODE	D Ø
3	-----
35	0.078 [1.98]
36	0.094 [2.39]
37	0.125 [3.18]

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



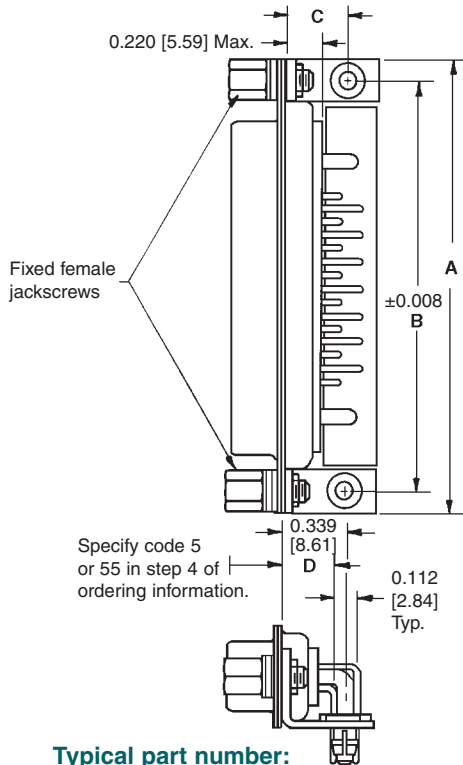
Typical part number: **CBD17W2F35S60T2X**



**RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR  
WITH 0.078 [1.98] Ø POWER CONTACTS**

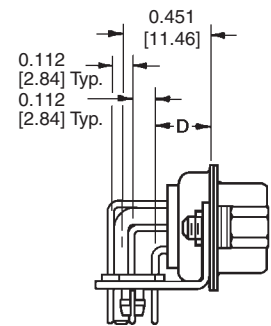
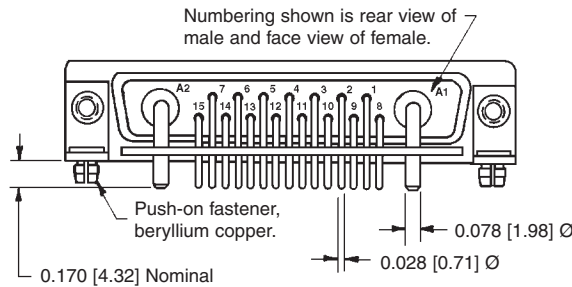
**CODE 5 AND 55, 0.283 [7.19] CONTACT EXTENSION**

*See temperature rise curves on pages 1 and 2.*



**Typical part number:  
CBD17W2M55R7NT20**

CBD***R7*** 0.283 [7.19] CONTACT EXTENSION				
SHELL SIZE	A	B	C	D
SHELL SIZE 1	1.204 [30.58]	0.984 [24.99]	0.339 [8.61]	0.283 [7.19]
SHELL SIZE 2	1.532 [38.91]	1.312 [33.32]	0.339 [8.61]	0.283 [7.19]
SHELL SIZE 3	2.072 [52.63]	1.852 [47.04]	0.339 [8.61]	0.283 [7.19]
SHELL SIZE 4	2.720 [69.09]	2.500 [63.50]	0.339 [8.61]	0.283 [7.19]
SHELL SIZE 5	2.626 [66.70]	2.406 [61.11]	0.395 [10.03]	0.283 [7.19]

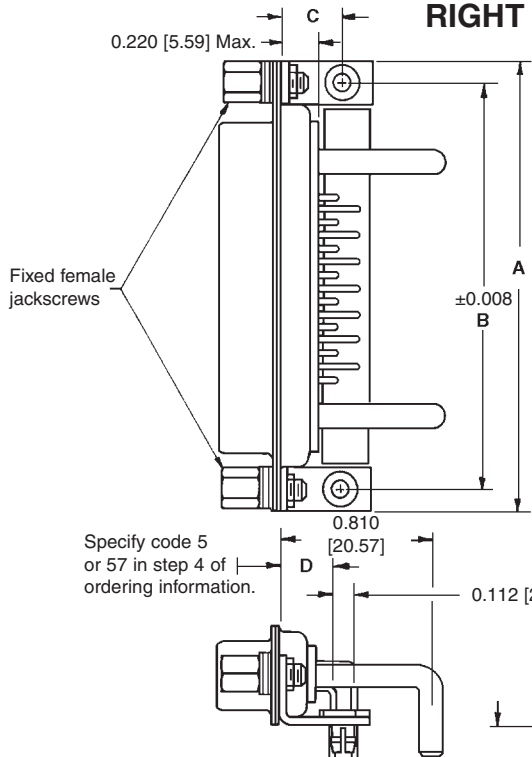


**Typical part number:  
CBD36W4F55R7NT2X**

**RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR  
WITH 0.125 [3.18] Ø POWER CONTACTS**

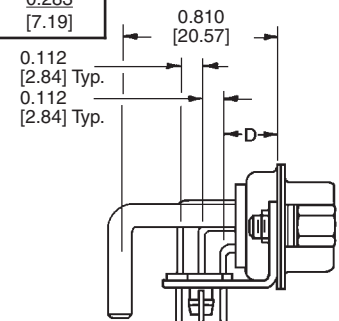
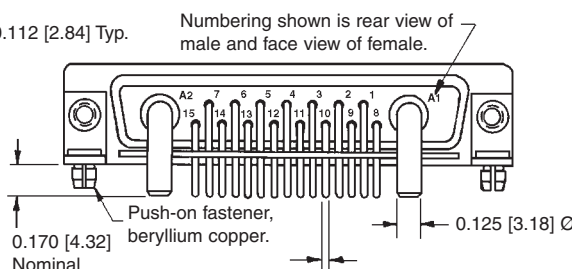
**CODE 5 AND 57, 0.283 [7.19] CONTACT EXTENSION**

*See temperature rise curves on pages 1 and 2.*



**Typical part number:  
CBD17W2M57R7NT20**

CBD***R7*** 0.283 [7.19] CONTACT EXTENSION				
SHELL SIZE	A	B	C	D
SHELL SIZE 1	1.204 [30.58]	0.984 [24.99]	0.339 [8.61]	0.283 [7.19]
SHELL SIZE 2	1.532 [38.91]	1.312 [33.32]	0.339 [8.61]	0.283 [7.19]
SHELL SIZE 3	2.072 [52.63]	1.852 [47.04]	0.339 [8.61]	0.283 [7.19]
SHELL SIZE 4	2.720 [69.09]	2.500 [63.50]	0.339 [8.61]	0.283 [7.19]
SHELL SIZE 5	2.626 [66.70]	2.406 [61.11]	0.395 [10.03]	0.283 [7.19]



**Typical part number:  
CBD36W4F57R7NT2X**

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THREE PERFORMANCE LEVELS FOR BEST COST/PERFORMANCE RATIO  
STANDARD DENSITY PCB MOUNT

Combo-D  
D-Sub

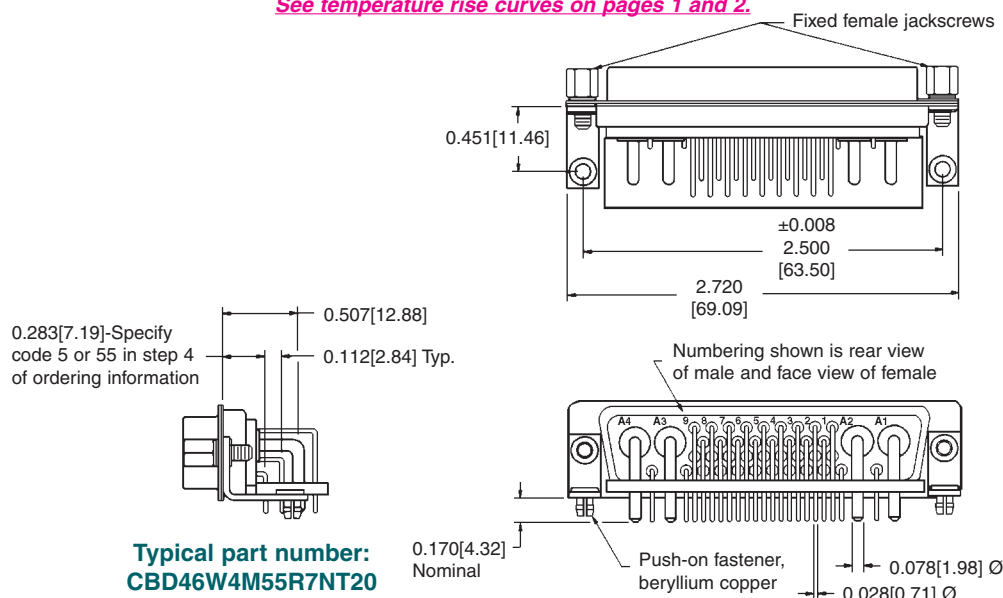
CBD/CBM SERIES

**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.*

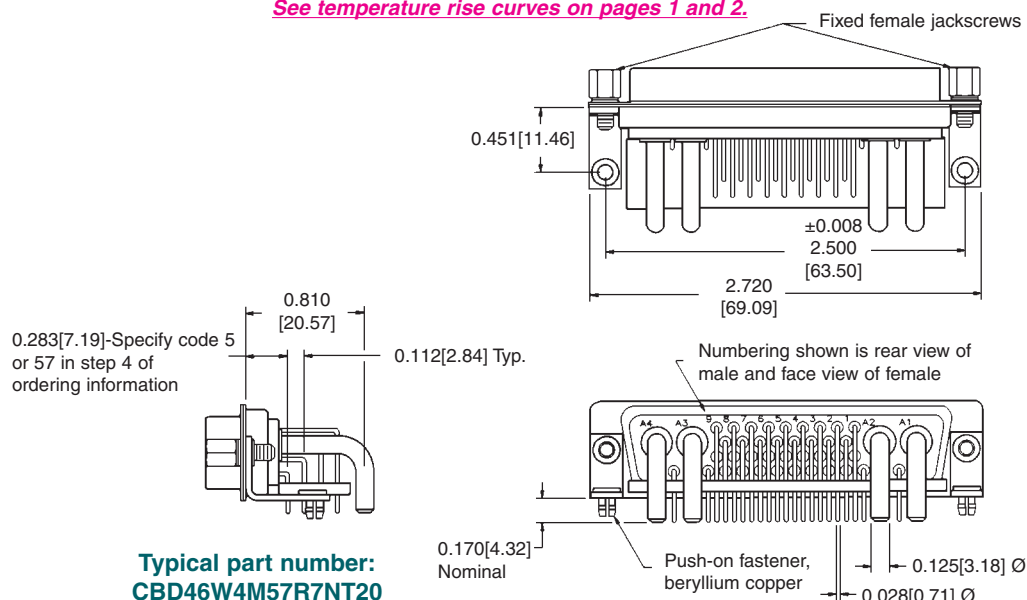


**SHELL SIZE 6**  
**RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR**  
**WITH 0.125 [3.18] Ø POWER CONTACTS**

**CODE 5 OR 57, 0.283 [7.19] CONTACT EXTENSION**

**CONNECTOR VARIANT 46W4**

*See temperature rise curves on pages 1 and 2.*



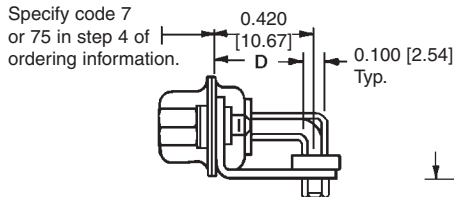
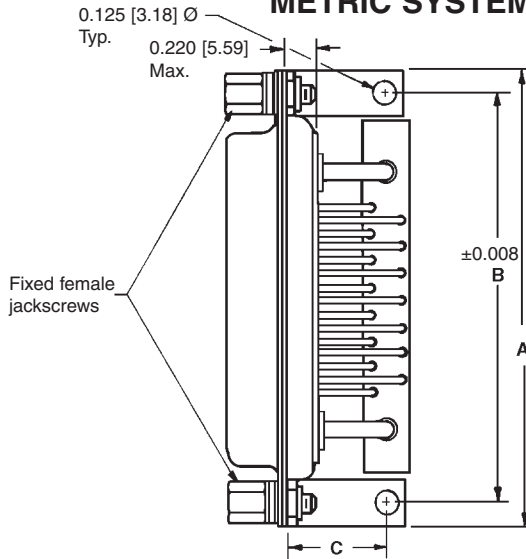
**METRIC SYSTEM RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR  
WITH 0.078 [1.98] Ø POWER CONTACTS**

**CODE 7 AND 75, 0.370 [9.40] CONTACT EXTENSION**

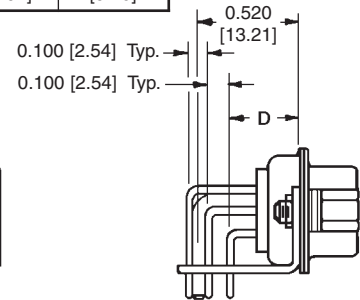
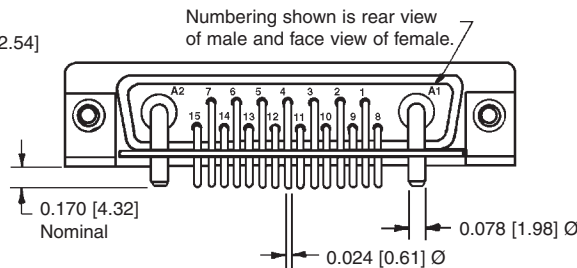
*See temperature rise curves on pages 1 and 2.*

**CBD\*\*\*R7\*\*\* 0.370 [9.40] CONTACT EXTENSION**

SHELL SIZE	A	B	C	D
SHELL SIZE 1	1.204 [30.58]	0.984 [24.99]	0.420 [10.67]	0.370 [9.40]
SHELL SIZE 2	1.532 [38.91]	1.312 [33.32]	0.420 [10.67]	0.370 [9.40]
SHELL SIZE 3	2.072 [52.63]	1.852 [47.04]	0.420 [10.67]	0.370 [9.40]
SHELL SIZE 4	2.720 [69.09]	2.500 [63.50]	0.420 [10.67]	0.370 [9.40]
SHELL SIZE 5	2.626 [66.70]	2.406 [61.11]	0.470 [11.94]	0.370 [9.40]



**Typical part number:  
CBD17W2M75R70T20**



**Typical part number:  
CBD36W4M75R70T20**

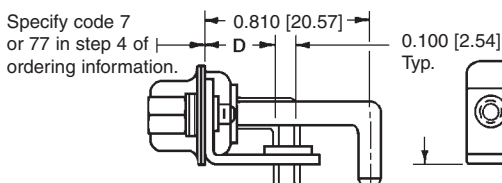
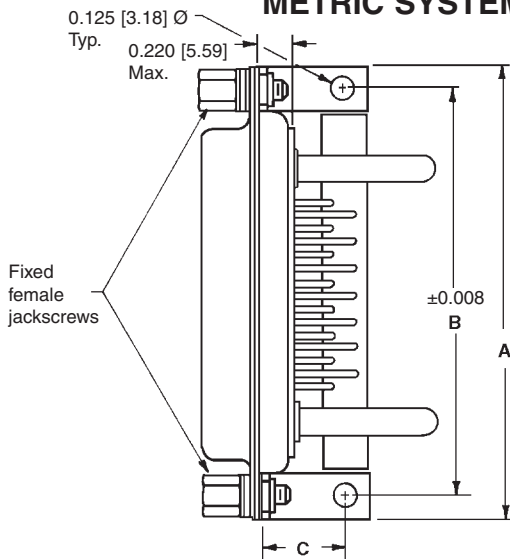
**METRIC SYSTEM RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR  
WITH 0.125 [3.18] Ø POWER CONTACTS**

**CODE 7 AND 77, 0.370 [9.40] CONTACT EXTENSION**

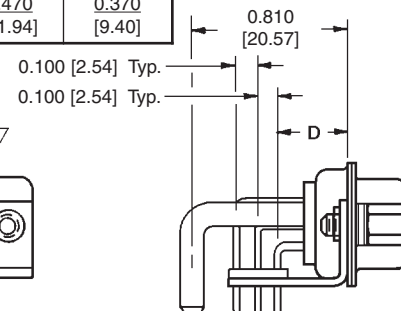
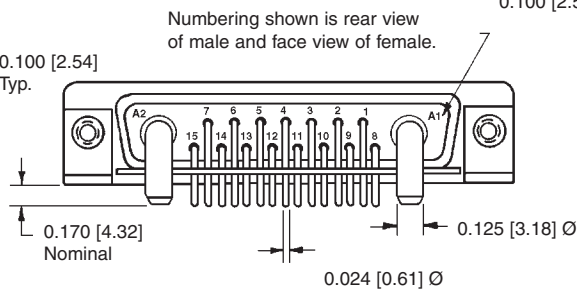
*See temperature rise curves on pages 1 and 2.*

**CBD\*\*\*R7\*\*\* 0.370 [9.40] CONTACT EXTENSION**

SHELL SIZE	A	B	C	D
SHELL SIZE 1	1.204 [30.58]	0.984 [24.99]	0.420 [10.67]	0.370 [9.40]
SHELL SIZE 2	1.532 [38.91]	1.312 [33.32]	0.420 [10.67]	0.370 [9.40]
SHELL SIZE 3	2.072 [52.63]	1.852 [47.04]	0.420 [10.67]	0.370 [9.40]
SHELL SIZE 4	2.720 [69.09]	2.500 [63.50]	0.420 [10.67]	0.370 [9.40]
SHELL SIZE 5	2.626 [66.70]	2.406 [61.11]	0.470 [11.94]	0.370 [9.40]



**Typical part number:  
CBD17W2M77R70T20**



**Typical part number:  
CBD36W4M77R70T20**





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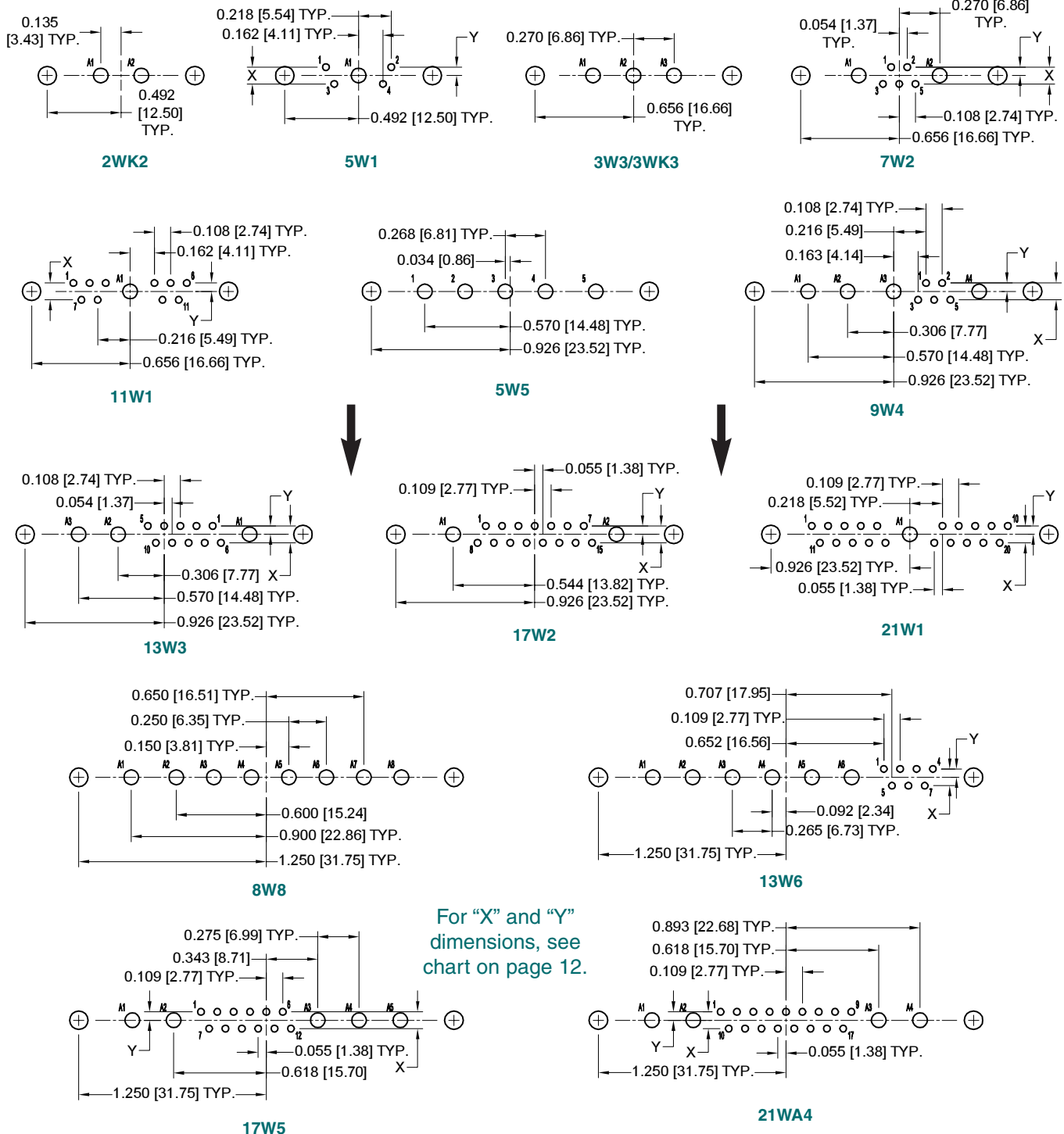
### STANDARD DENSITY PCB MOUNT

Combo-D  
D-Sub

## RIGHT ANGLE (90°) PRINTED BOARD CONTACT HOLE PATTERN WITH 0.078 [1.98] Ø, 0.094 [2.39] 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 87.

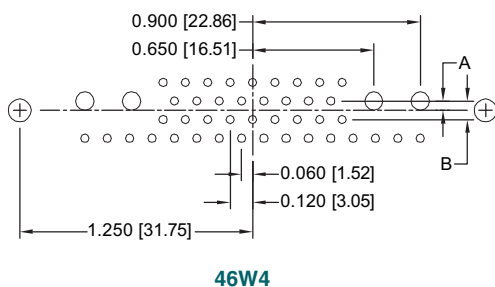
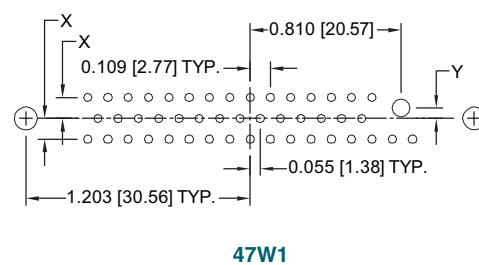
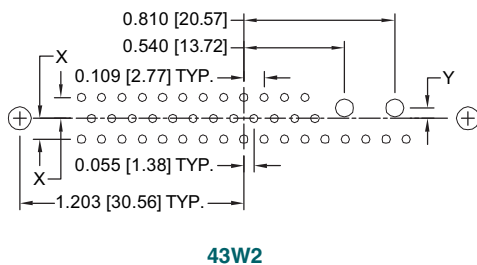
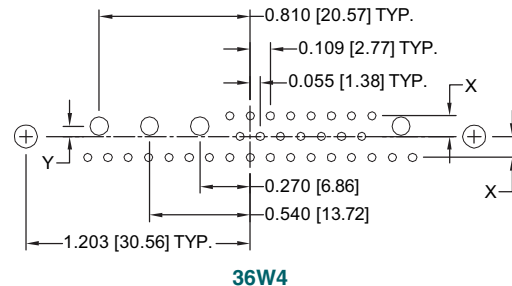
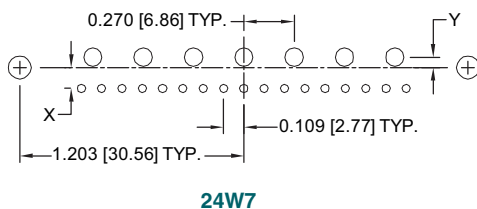
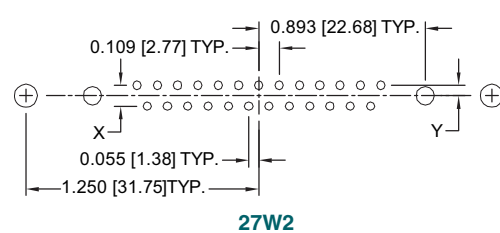
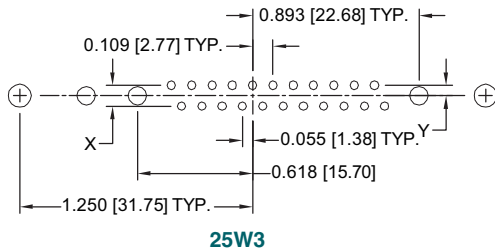
For press-fit connector installation tools, see page 88.

### 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.

**RIGHT ANGLE (90°) PRINTED BOARD CONTACT HOLE PATTERN WITH 0.078 [1.98] Ø, 0.094 [2.39] 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.

CODE NO.	X	Y	A	B
3				
35	0.112 [2.84]	0.056 [1.42]	0.050 [1.27]	0.100 [2.54]
<b>NEW</b> 36				
37				
5	0.112 [2.84]	0.056 [1.42]	0.056 [1.42]	0.112 [2.84]
55				
7	0.100 [2.54]	0.050 [1.27]	0.050 [1.27]	0.100 [2.54]
75				

**NOTE:** For suggested printed board recommended drill hole sizes, plating and finished hole sizes for compliant contact termination positions, see page 87.

For press-fit connector installation tools, see page 88.

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



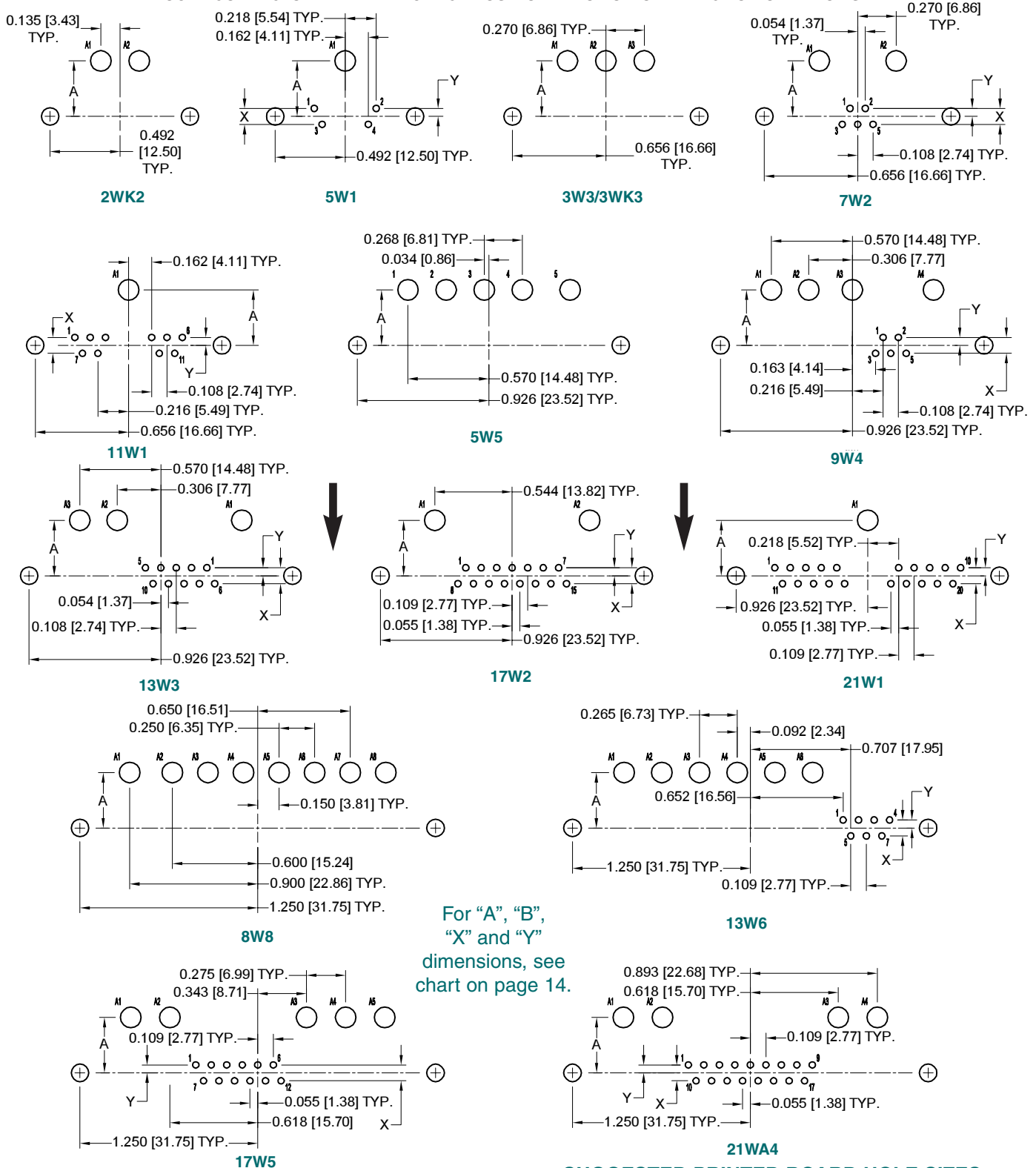
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**D-Sub**

**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.



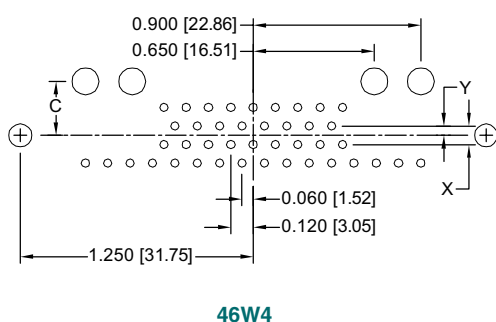
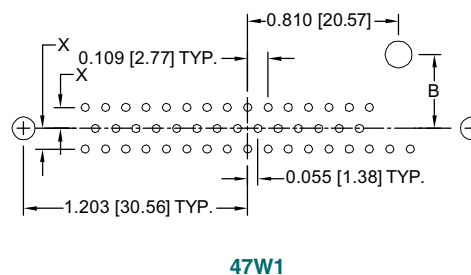
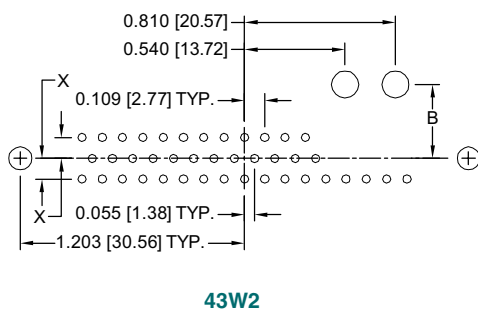
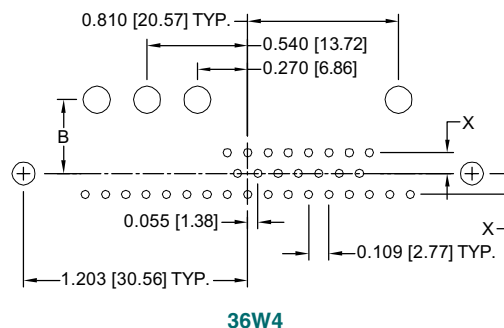
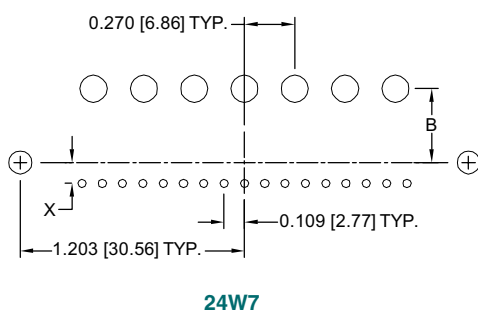
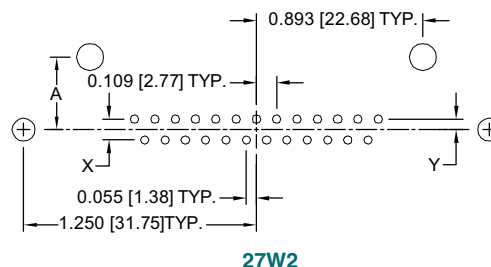
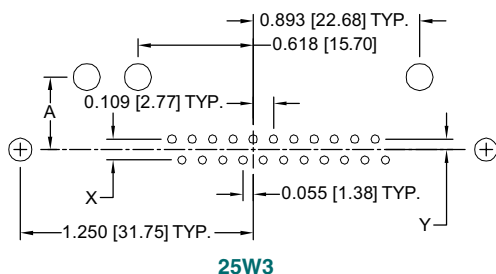
**SUGGESTED PRINTED BOARD HOLE SIZES:**

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.



## 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.

CODE NO.	5 & 57	7 & 77
A	0.471 [11.96]	0.390 [9.91]
B	0.415 [10.54]	0.340 [8.64]
C	0.359 [9.12]	0.290 [7.37]
X	0.112 [2.84]	0.100 [2.54]
Y	0.056 [1.42]	0.050 [1.27]

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



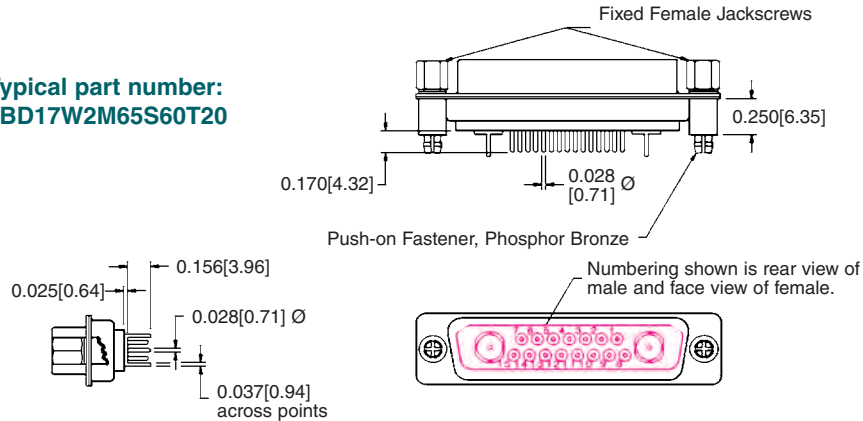
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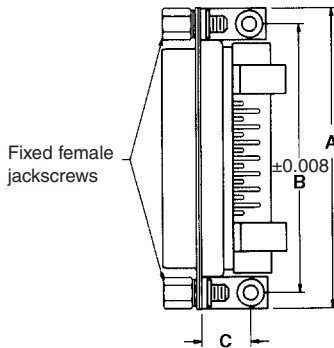
**Combo-D**  
**D-Sub**

**STRAIGHT PRINTED BOARD MOUNT CONNECTOR**  
**WITH FDS4201D OR MDS4201D SHIELDED CONTACTS**  
**CODE 65**

**Typical part number:**  
**CBD17W2M65S60T20**

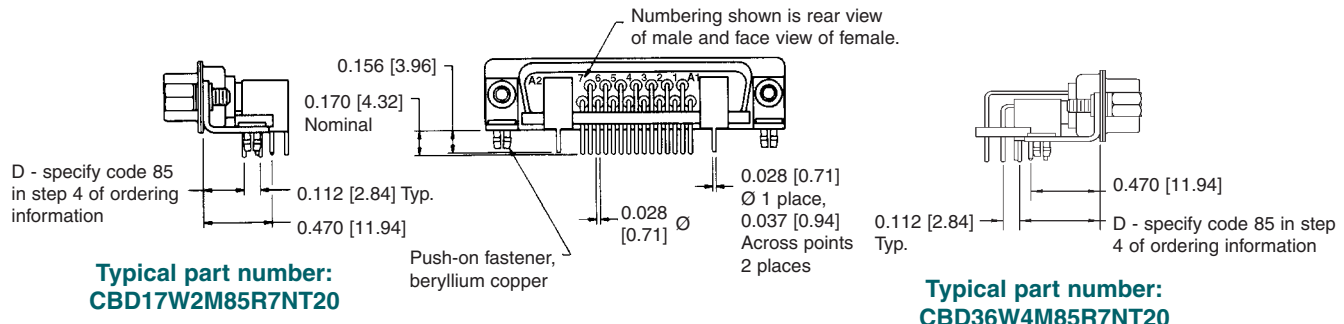


**RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR**  
**WITH *FRT*4201D OR *MRT*4201D SHIELDED CONTACTS**  
**CODE 85**



CBD**85*** 0.283 [7.19] CONTACT EXTENSION				
SHELL SIZE	A	B	C	D
SHELL SIZE 1	1.204 [30.58]	0.984 [24.99]	0.339 [8.61]	0.283 [7.19]
SHELL SIZE 2	1.532 [38.91]	1.312 [33.32]	0.339 [8.61]	0.283 [7.19]
SHELL SIZE 3	2.072 [52.63]	1.852 [47.04]	0.339 [8.61]	0.283 [7.19]
SHELL SIZE 4	2.720 [69.09]	2.500 [63.50]	0.339 [8.61]	0.283 [7.19]
*SHELL SIZE 5	2.626 [66.70]	2.406 [61.11]	0.395 [10.03]	0.545 [13.84]

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

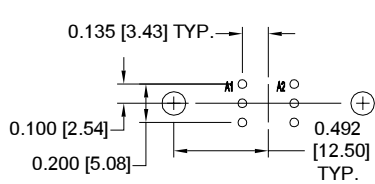


**Typical part number:**  
**CBD17W2M85R7NT20**

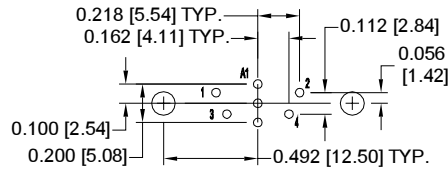
**Typical part number:**  
**CBD36W4M85R7NT20**

**STRAIGHT PRINTED BOARD MOUNT CONTACT HOLE PATTERN  
WITH FDS4201D AND MDS4201D SHIELDED CONTACTS**

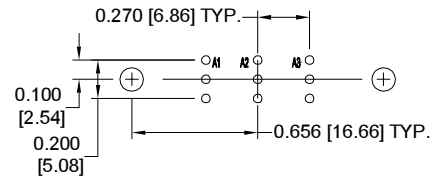
HOLE IDENTIFICATION SHOWN FOR MALE CONNECTOR; USE MIRROR IMAGE FOR FEMALE CONNECTOR.



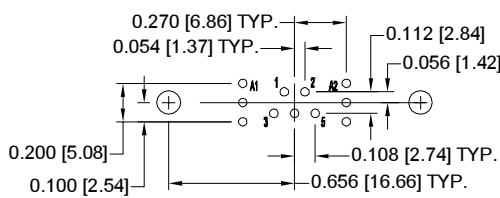
2WK2



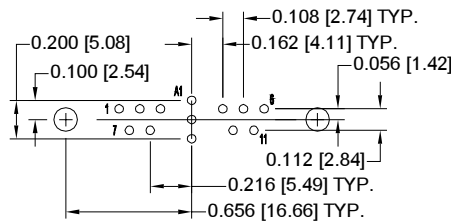
5W1



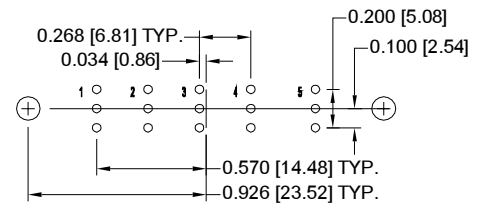
3W3/3WK3



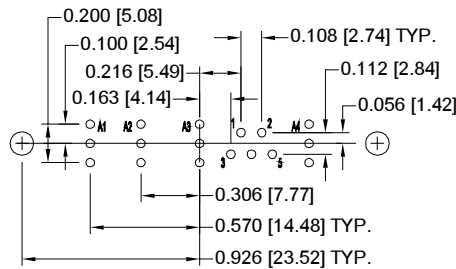
7W2



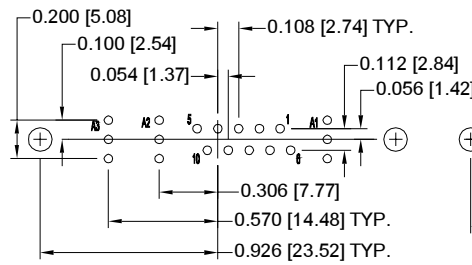
11W1



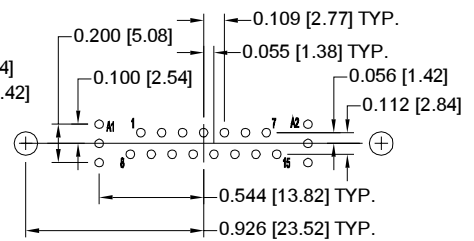
5W5



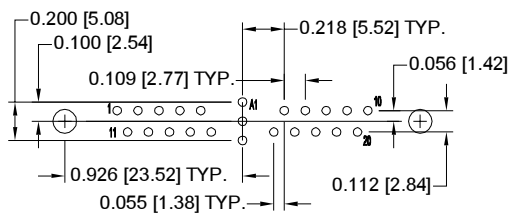
9W4



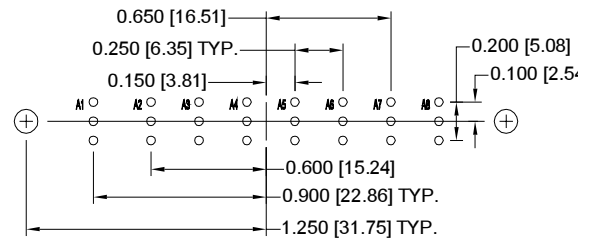
13W3



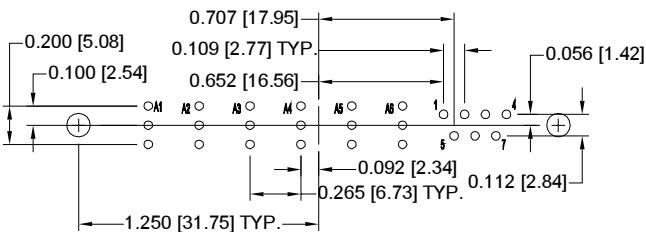
17W2



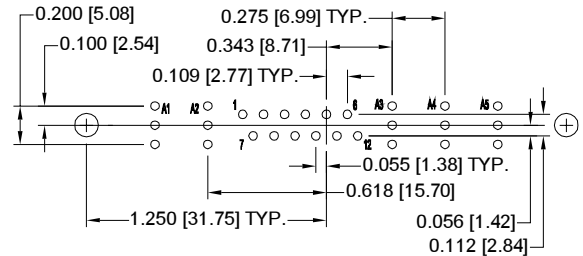
21W1



8W8



13W6



17W5

**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.



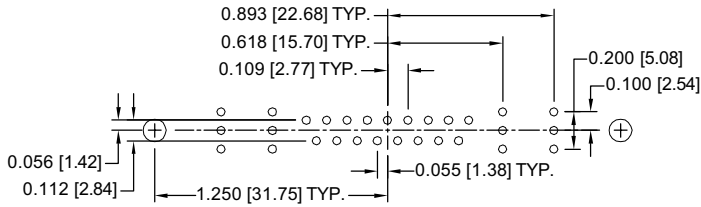
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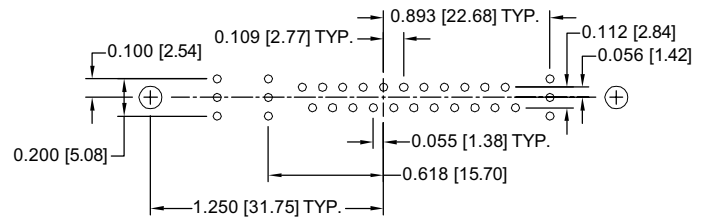
Combo-D  
D-Sub

## STRAIGHT PRINTED BOARD MOUNT CONTACT HOLE PATTERN WITH FDS4201D AND MDS4201D SHIELDED CONTACTS

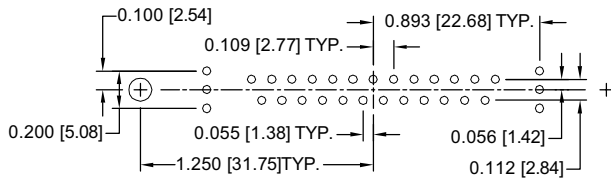
HOLE IDENTIFICATION SHOWN FOR MALE CONNECTOR; USE MIRROR IMAGE FOR FEMALE CONNECTOR.



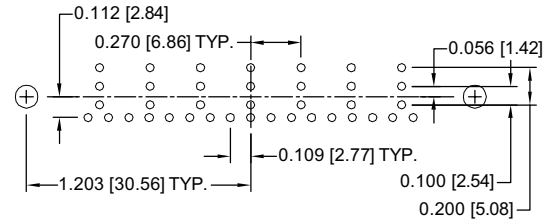
21WA4



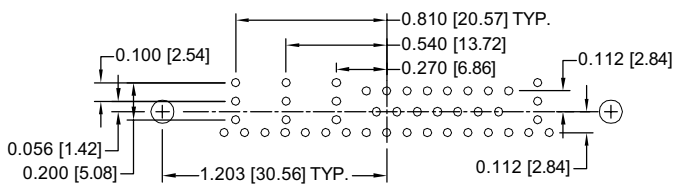
25W3



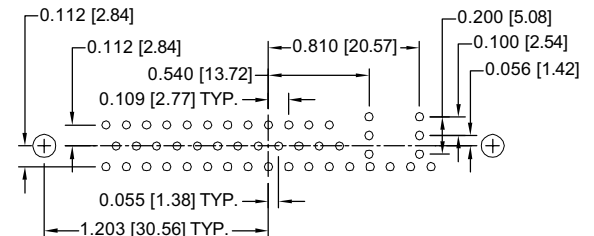
27W2



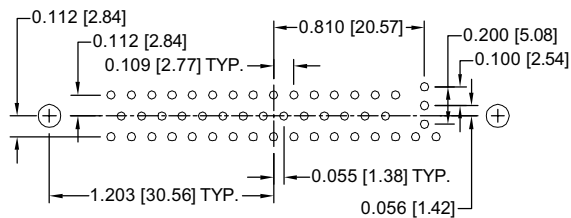
24W7



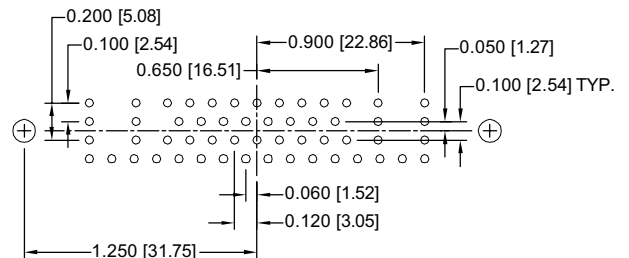
36W4



43W2



47W1



46W4

### 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.







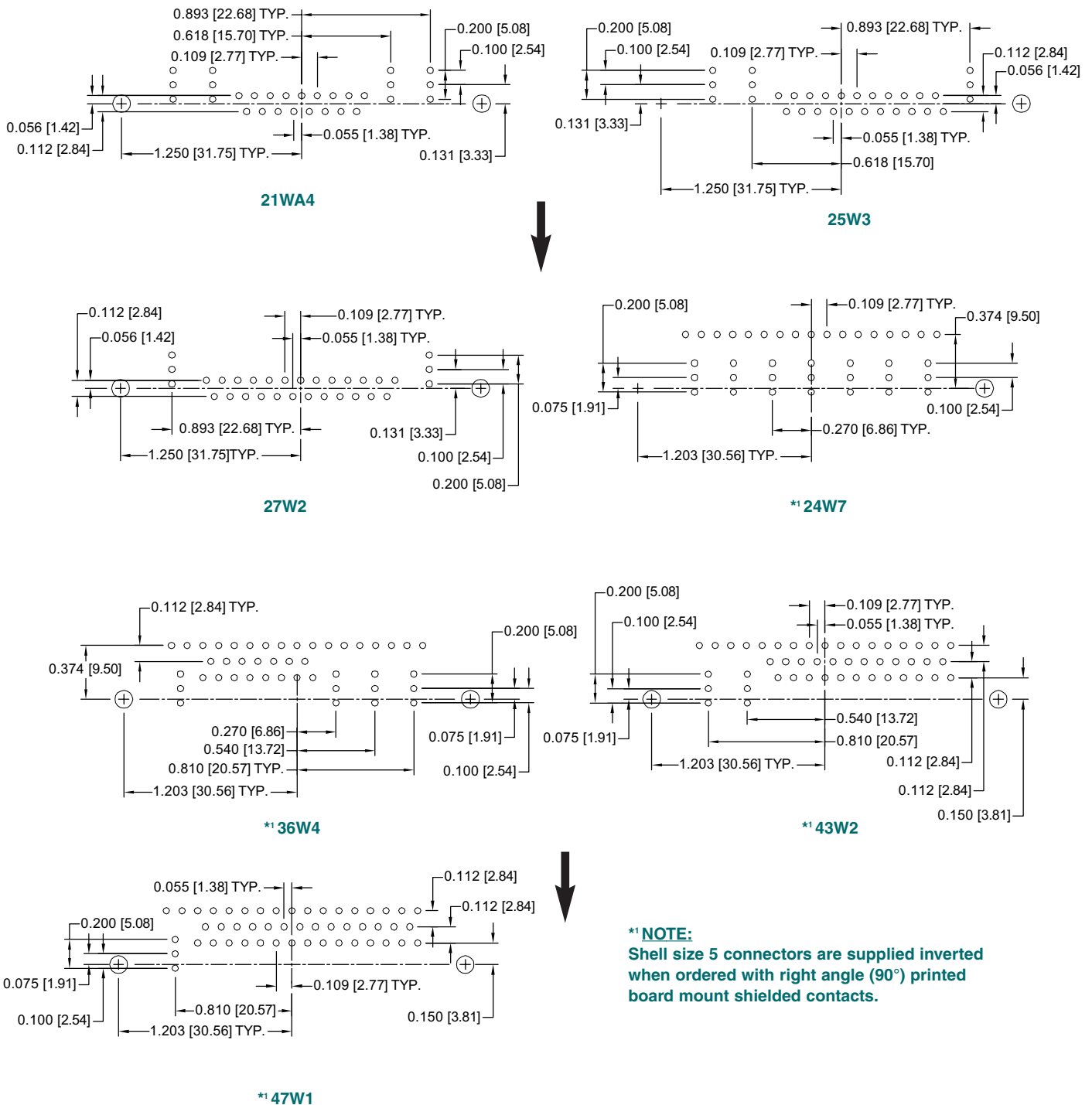
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**STANDARD DENSITY PCB MOUNT**

**Combo-D**  
**D-Sub**

**RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONTACT HOLE PATTERN**  
**WITH FRT4201D AND MRT4201D SHIELDED CONTACTS**

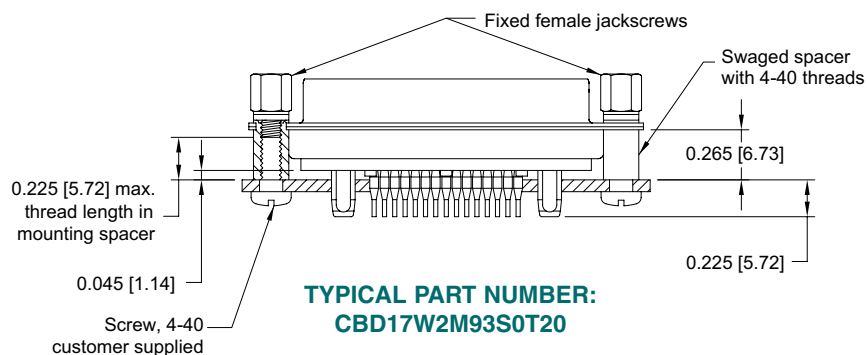
HOLE IDENTIFICATION SHOWN FOR MALE CONNECTOR; USE MIRROR IMAGE FOR FEMALE CONNECTOR.  
MOUNT CONNECTOR WITH MATING FACE POSITIONED TO FOLLOW DIRECTION OF ARROWS.



**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.

## COMPLIANT PRESS-FIT CONNECTOR CODE 93



### SUGGESTED PRINTED BOARD HOLE SIZES:

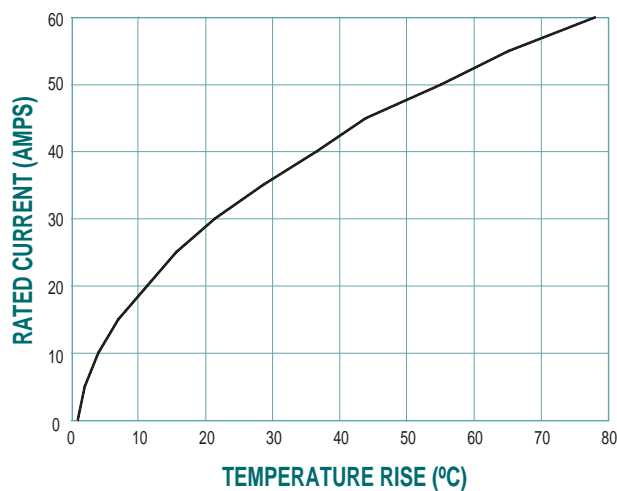
Suggest 0.123 [3.12] Ø hole for connector mounting holes.

**NOTE:** For suggested printed board recommended drill hole sizes, plating and finished hole sizes for compliant contact termination positions, see page 87.

For press-fit connector installation tools, see page 88.

FOR STRAIGHT PRINTED BOARD  
CONTACT HOLE PATTERNS,  
SEE PAGE 11 AND 12.

## 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.



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# PROFESSIONAL, INDUSTRIAL AND MILITARY QUALITY

## THREE PERFORMANCE LEVELS FOR BEST COST/PERFORMANCE RATIO

### STANDARD DENSITY PCB MOUNT

Combo-D  
D-Sub

## ORDERING INFORMATION - CODE NUMBERING SYSTEM

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

STEP	1	2	3	4	5	6	7	8	9	10
EXAMPLE	CBD	17W2	F	55	R7	N	T2	X	/AA	-14

### STEP 1 - BASIC SERIES

**CBD** – Professional/Industrial Quality, see Step 3.

**CBM** – 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 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

**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 60-88 for contact part numbers. Available on 2WK2, 3W3, 3WK3, 5W5 and 8W8.
- 2 – 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.
- 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.
- 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.
- 57 – Solder, Right Angle (90°) Printed Board Mount with Signal and 0.125 [3.18] 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, 0.370 [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.
- 77 – Solder, Metric System Right Angle (90°) Printed Board Mount with Signal and 0.125 [3.18] Ø Power Contacts, 0.370 [9.40] Signal Contact Extension.
- \*1 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

\*1 Not available on shell size 6, CBD 46W4.

\*2 For additional information on accessories listed in steps 5, 6, 7 and 10, see Accessory Catalog.

\*3 When using G hood with CBD variants, use the extended height hood. See Accessory Catalog for extended G hood options.

\*4 For stainless steel dimpled male versions, contact Technical Sales.

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

### \*2 STEP 10 - SPECIAL OPTIONS

FOR SPECIAL OPTIONS, SEE SPECIAL OPTIONS APPENDIX ON PAGE 89.

CONTACT TECHNICAL SALES FOR ORDERING DETAILS OF THE FOLLOWING:

Other Special Requirements.  
Straight / Right Angle Thermocouple PCB mount contacts.



### STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS

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

NOTE: If compliance to environmental legislation is not required, this step will not be used. Example: CBD17W2F55R7NT2X

### STEP 8 - SHELL OPTIONS

0 – Zinc Plated, with Chromate Seal.

\*4 S – Stainless Steel, passivated.

X – Tin Plated.

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

### \*2 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.

### \*2 STEP 6 - HOODS AND PUSH-ON FASTENERS

0 – None

AN – Lightweight Aluminum Hood, nickel finish.

AC – Lightweight Aluminum Hood, no finish.

Z – Hood, Top or Side Opening, robust extended height, plastic and composite, with rotating male jackscrews, shell sizes 1 through 5

H – Hood, Top Opening, Metal, shell sizes 2 through 5

\*3 G – Hood, EMI/RFI, Metal, shell sizes 1 through 6

N – Push-on Fastener, for Right Angle (90°) Mounting Brackets

### \*2 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

R2 – Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Thread Fixed Female Jackscrews with Cross Bar

R6 – Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 0.120 [3.05] Ø Mounting Hole with Cross Bar

R7 – Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Threads with Cross Bar

R8 – Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Locknut with Cross Bar

S – Swaged Spacer, 4-40 Threads, 0.250 [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



Size 20 Removable Signal and  
Thermocouple Crimp Contacts

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

D.E.S.C. 85039

IEC 807-3

U.L. Recognized  
File #E49351

CSA Recognized  
File #LR54219

Telecommunication U.L. File #E140980



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 807-3, Performance Levels One and Two, D.E.S.C. 85039 and MIL-DTL-24308.



For RoHS options  
see page 26.

# 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.**



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# PROFESSIONAL, INDUSTRIAL AND MILITARY QUALITY THREE PERFORMANCE LEVELS FOR BEST COST/PERFORMANCE RATIO STANDARD DENSITY CRIMP REMOVABLE CONTACTS

Combo-D  
D-Sub

## TECHNICAL CHARACTERISTICS

### MATERIALS AND FINISHES:

<b>Insulator:</b>	Glass filled polyester per MIL-M-24519, UL 94V-0, blue color.
<b>Contacts:</b>	Precision machined copper alloy.
<b>Signal:</b>	Gold flash over nickel plate and gold 0.000050 [1.27μ] over nickel plate. Other finishes available upon request, see page 69.
<b>Power:</b>	Gold flash over nickel. Other finishes available upon request, see page 69.
<b>Shielded:</b>	For contact platings, see pages 68.
<b>High Voltage:</b>	For contact platings, see pages 68.
<b>Shells:</b>	Steel or brass with tin plate; zinc plate with chromate seal; stainless steel passivated. Other materials and finishes available upon request.
<b>Mounting Spacers:</b>	Nylon; copper alloy or steel with zinc plate and chromate seal or tin plate; phosphor bronze with tin plate; stainless steel, passivated.
<b>Jackscrew Systems:</b>	Brass or steel with zinc plate and chromate seal or clear zinc plate or tin plate; stainless steel, passivated.
<b>Hoods:</b>	Composite and plastic UL94V-0; brass or steel with zinc plate and chromate seal; aluminum or aluminum with electroless nickel plate; die cast zinc.
Non-magnetic versions are available, contact Technical Sales.	

### 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:

500 operations for open entry contact, 1000 operations for PosiBand closed entry contact with 0.000050 [1.27μ] gold plating. Per IEC 512-5.

### ELECTRICAL CHARACTERISTICS:

#### SIZE 20 CONTACTS

<b>Contact Current Rating:</b>	7.5 amperes nominal.
<b>Initial Contact Resistance:</b>	0.008 ohms maximum.
<b>Proof Voltage:</b>	1000 V r.m.s.

#### SIZE 8 CONTACTS

##### POWER CONTACTS

For electrical characteristics, see page 4.

##### SHIELDED CONTACTS

For electrical characteristics, see pages 69.

##### HIGH VOLTAGE CONTACTS

For electrical characteristics, see pages 69.

### CONNECTOR

<b>Insulator Resistance:</b>	5 G ohms.
<b>Clearance and Creepage Distance:</b>	0.039 [1.0mm] minimum.
<b>Working Voltage:</b>	300 V r.m.s.

### MECHANICAL CHARACTERISTICS:

<b>Signal Contacts, Crimp Removable:</b>	Size 20 contacts, male – 0.040 inch [1.02mm] mating diameter; Female Robi-D open entry or PosiBand closed entry contact design, see page 69 for details.
<b>Contact Retention In Insulator:</b>	Signal: 9 lbs. [40N]. Power, shielded and high voltage: 22 lbs. [98N]
<b>Crimp Contact Terminations:</b>	Closed barrel crimp, wire sizes 18 AWG [1.0mm <sup>2</sup> ] through 30 AWG [0.05 mm <sup>2</sup> ]
<b>Power Contacts, Removable, Crimp or Solder Termination:</b>	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.
<b>Shielded Contacts, Removable:</b>	See table of cable sizes for contact termination dimensions, page 78.
<b>High Voltage Contacts:</b>	Straight and right angle (90°) terminations – 0.041 inch [1.04mm] min. hole diameter.

### CLIMATIC CHARACTERISTICS:

<b>Temperature Range:</b>	-55°C to +125°C.
<b>Damp Heat, Steady State:</b>	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.



CBC11W1M10Z00  
WITH MS4012D CONTACT

CBC11W1S100T20  
WITH FC4008D CONTACT

**\*1 CONTACT VARIANTS**

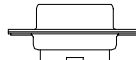
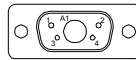
FACE VIEW OF MALE OR REAR VIEW OF FEMALE

**NOTES:**

- \*1 Additional contact variants may be tooled at customer request.
- \*2 13W6 and 27W2 variant currently available in female only. Contact Technical Sales for availability of male connector.

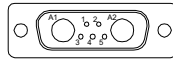
Note: Connectors can be kitted with all applicable crimp contacts, contact Technical Sales for connector part number.

**— SHELL SIZE 1 —**

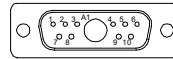


5W1

**— SHELL SIZE 2 —**

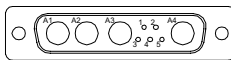


7W2

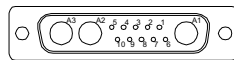


11W1

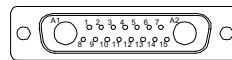
**— SHELL SIZE 3 —**



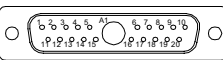
9W4



13W3

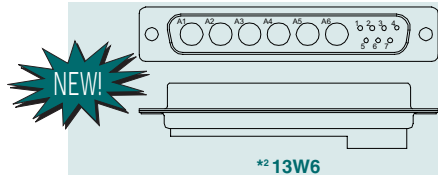


17W2

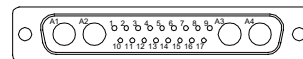


21W1

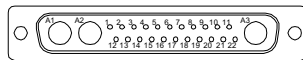
**— SHELL SIZE 4 —**



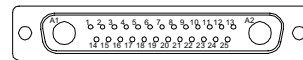
\*2 13W6



21WA4

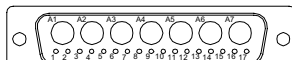


25W3

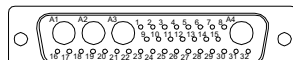


\*2 27W2

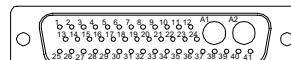
**— SHELL SIZE 5 —**



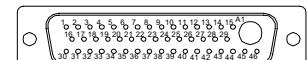
24W7



36W4

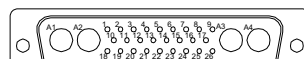


43W2



47W1

**— SHELL SIZE 6 —**



46W4



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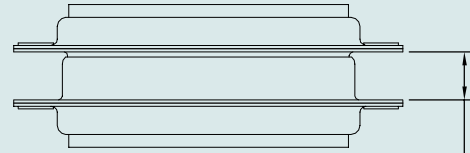
# PROFESSIONAL, INDUSTRIAL AND MILITARY QUALITY THREE PERFORMANCE LEVELS FOR BEST COST/PERFORMANCE RATIO STANDARD DENSITY CRIMP REMOVABLE CONTACTS

Combo-D  
D-Sub

## STANDARD SHELL ASSEMBLY



### RECOMMENDED MATING DIMENSIONS



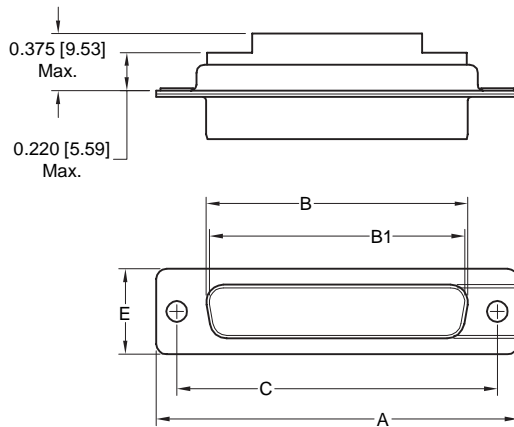
Shell Sizes 1 & 2 =  
0.265±0.015 [6.73±0.38]  
Shell Sizes 3, 4, 5 & 6 =  
0.256±0.015 [6.50±0.38]



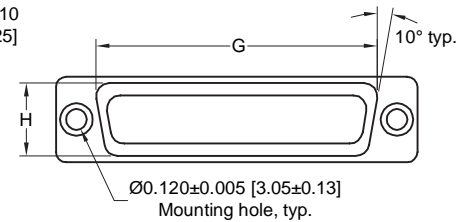
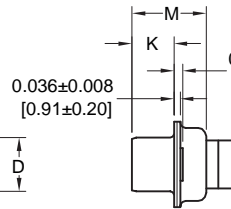
CBC7W2S00000

CBC17W2M00000

### TYPICAL CONNECTOR TOP VIEW



See page 6 for Optional Shell Assemblies (F, 0, 02)



CBC SERIES

SHELL SIZES	A ±0.015 [0.38]	B ±0.005 [0.13]	B1 ±0.005 [0.13]	C ±0.005 [0.13]	D ±0.005 [0.13]	D1 ±0.005 [0.13]	E ±0.015 [0.38]	G ±0.010 [0.25]	H ±0.010 [0.25]	K ±0.005 [0.13]	M ±0.010 [0.25]
SHELL SIZE 1 MALE	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]
SHELL SIZE 1 FEMALE	1.213 [30.81]	0.643 [16.33]		0.984 [24.99]	0.311 [7.90]		0.494 [12.55]	0.759 [19.28]	0.422 [10.72]	0.243 [6.17]	0.429 [10.90]
SHELL SIZE 2 MALE	1.541 [39.14]		0.994 [25.25]	1.312 [33.32]		0.329 [8.36]	0.494 [12.55]	1.083 [27.51]	0.422 [10.72]	0.233 [5.92]	0.422 [10.72]
SHELL SIZE 2 FEMALE	1.541 [39.14]	0.971 [24.66]		1.312 [33.32]	0.311 [7.90]		0.494 [12.55]	1.083 [27.51]	0.422 [10.72]	0.243 [6.17]	0.429 [10.90]
SHELL SIZE 3 MALE	2.088 [53.04]		1.534 [38.96]	1.852 [47.04]		0.329 [8.36]	0.494 [12.55]	1.625 [41.28]	0.422 [10.72]	0.230 [5.84]	0.426 [10.82]
SHELL SIZE 3 FEMALE	2.088 [53.04]	1.511 [38.38]		1.852 [47.04]	0.311 [7.90]		0.494 [12.55]	1.625 [41.28]	0.422 [10.72]	0.243 [6.17]	0.429 [10.90]
SHELL SIZE 4 MALE	2.729 [69.32]		2.182 [55.42]	2.500 [63.50]		0.329 [8.36]	0.494 [12.55]	2.272 [57.71]	0.422 [10.72]	0.230 [5.84]	0.426 [10.82]
SHELL SIZE 4 FEMALE	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]
SHELL SIZE 5 MALE	2.635 [66.93]		2.079 [52.81]	2.406 [61.11]		0.441 [11.20]	0.605 [15.37]	2.178 [55.32]	0.534 [13.56]	0.230 [5.84]	0.426 [10.82]
SHELL SIZE 5 FEMALE	2.635 [66.93]	2.064 [52.43]		2.406 [61.11]	0.423 [10.74]		0.605 [15.37]	2.178 [55.32]	0.534 [13.56]	0.243 [6.17]	0.429 [10.90]
SHELL SIZE 6 MALE	2.729 [69.32]		2.212 [56.18]	2.500 [63.50]		0.503 [12.78]	0.668 [16.97]	2.302 [58.47]	0.596 [15.14]	0.230 [5.84]	0.426 [10.82]
SHELL SIZE 6 FEMALE	2.729 [69.32]	2.189 [55.60]		2.500 [63.50]	0.485 [12.32]		0.668 [16.97]	2.302 [58.47]	0.596 [15.14]	0.243 [6.17]	0.429 [10.90]



## ORDERING INFORMATION - CODE NUMBERING SYSTEM

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

STEP	1	2	3	4	5	6	7	8	9	10
EXAMPLE	CBC	7W2	M	1	0	Z	0	0	/AA	-14

**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**  
\*113W6, 21WA4, 25W3, \*127W2  
**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  
*Professional Level female open entry contacts are available and can be ordered separately, see page 73.*

**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 [0.5mm<sup>2</sup>-0.25mm<sup>2</sup>].  
11 - Signal contacts, 20 AWG-24 AWG [0.5mm<sup>2</sup>-0.25mm<sup>2</sup>] with MC/FC 4012D Power Contact.  
12 - Signal contacts, 20 AWG-24 AWG [0.5mm<sup>2</sup>-0.25mm<sup>2</sup>] with MC/FC 4016D power contact.  
13 - Signal contacts, 20 AWG-24 AWG [0.5mm<sup>2</sup>-0.25mm<sup>2</sup>] with MCC/FCC 4101D shielded contacts.  
14 - Signal contacts, 20 AWG-24 AWG [0.5mm<sup>2</sup>-0.25mm<sup>2</sup>] with MCC/FCC 4102D shielded contacts.

**\*2 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

**\*2 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.  
\*3 G - Hood, EMI/RFI, Metal, 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

**\*2 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.

**\*2 STEP 8 - SHELL OPTIONS**  
0 - Zinc Plated, with Chromate Seal.  
\*4 S - Stainless Steel, passivated.  
X - Tin Plated.  
Z - Tin Plated and Dimpled (male connectors only)

**\*2 STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS**  
/AA - Compliant per EU Directive 2002/95/EC (RoHS)  
**NOTE:** If compliance to environmental legislation is not required, this step will not be used. Example: CBC7W2M10Z00

**\*2 STEP 10 - SPECIAL OPTIONS**  
**FOR SPECIAL OPTIONS, SEE SPECIAL OPTIONS APPENDIX ON PAGE 89.**

### NOTES

\*1 Connector variant 13W6 and 27W2 are currently available in female only, contact Technical Sales for availability of male connector.

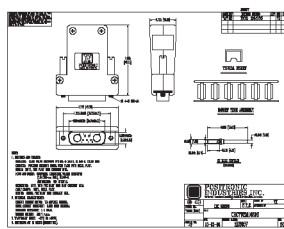
\*2 For additional information on accessories listed in steps 5, 6, 7 and 10, see Accessory Catalog.

\*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, pages 81-89.

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



SK Drawing



3-dimensional model



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**PROFESSIONAL, INDUSTRIAL AND MILITARY QUALITY**  
**THREE PERFORMANCE LEVELS FOR BEST COST/PERFORMANCE RATIO**  
**HIGH DENSITY PCB MOUNT**

**Combo-D**  
**D-Sub**

**Size 22 Fixed Signal and  
Thermocouple Contacts**

**Size 16 Fixed Power Contacts**

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

**U.L. and CSA Recognition,  
for status contact Technical Sales**



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 CBCD 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 807-7, MIL-DTL-24308 and MIL-DTL-28748.



**For RoHS options  
see page 38.**

## TECHNICAL CHARACTERISTICS

### MATERIALS AND FINISHES:

<b>Insulator:</b>	Glass filled polyester per MIL-M-24519 UL 94V-0, blue color.
<b>Contacts:</b>	Precision machined copper alloy.
<b>Contact Plating:</b>	
<b>Signal:</b>	Gold flash over nickel plate. Other finishes available upon request, see page 89.
<b>Power:</b>	Gold flash over nickel. Other finishes available upon request, see page 89.
<b>Shielded:</b>	For contact platings, see pages 68.
<b>High Voltage:</b>	For contact platings, see pages 68.
<b>Shells:</b>	Steel or brass with tin plate; zinc plate with chromate seal; stainless steel passivated. Other materials and finishes available upon request.

<b>Mounting Spacers and Brackets:</b>	Nylon; copper alloy or steel with zinc plate and chromate seal or tin plate; phosphor bronze with tin plate; stainless steel, passivated.
<b>Push-On Fasteners:</b>	Phosphor bronze and beryllium copper with tin plate.
<b>Jackscrew Systems:</b>	Brass or steel with zinc plate and chromate seal or clear zinc plate or tin plate; stainless steel, passivated.
<b>Hoods:</b>	Composite and plastic, UL 94V-0; brass or steel with zinc plate and chromate seal; aluminum or aluminum with electroless nickel plate; die cast zinc.

**Non-magnetic versions are available, contact Technical Sales.**

*continued on next page. . .*

## TECHNICAL CHARACTERISTICS, *continued*

*continued from previous page. . .*

### 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.

#### Power Contacts,

**Fixed:** Size 16 contacts, male – 0.062 inch [1.57 mm] 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 [260°C] for 10 seconds duration per IEC 512-6.

**Signal Contact Terminations:** Solder contacts - 0.035 inch [0.89mm] minimum hole diameter for 22 AWG [0.3 mm<sup>2</sup>] 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 512-5.

### 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 U.L. 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 512-2, Test 2b.

**High Conductivity**

**Contact Material:** 0.001 ohms max. Per IEC 512-2, 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 pages 69.*

##### HIGH VOLTAGE CONTACTS

*For electrical characteristics, see pages 69.*

#### CONNECTOR

**Insulator 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 CBDD series, see page 71 for details.



Positronic Industries  
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# PROFESSIONAL, INDUSTRIAL AND MILITARY QUALITY THREE PERFORMANCE LEVELS FOR BEST COST/PERFORMANCE RATIO HIGH DENSITY PCB MOUNT

Combo-D  
D-Sub

## \*1 CONTACT VARIANT

FACE VIEW OF MALE OR REAR VIEW OF FEMALE

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

<p>— SHELL SIZE 1 —</p> <p><b>NEW!</b></p>  <p><b>8W2</b> Six Size 22 Signal Contacts and Two Size 16 Power Contacts</p>	<p>— SHELL SIZE 2 —</p> <p><b>NEW!</b></p>  <p><b>19W1</b> Eighteen Size 22 Signal Contacts and One Size 8 Power Contact</p>	<p>— SHELL SIZE 4 —</p>  <p><b>*2 45W2</b> Forty-three Size 22 Signal Contacts and Two Size 8 Power Contacts</p>
---	---	--

### NOTES:

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

\*2 45W2 variant currently available in male only. Contact Technical Sales for availability of female connector.

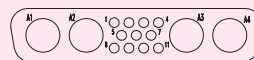
OTHER VARIANTS WILL BE ADDED, CONSULT OUR WEBSITE FOR UPDATED INFORMATION:  
<http://www.connectpositronic.com/catalogs/updates.html>

NEW VARIANT TOOLED SINCE LAST PRINTING

# NOW AVAILABLE!!!!



## — SHELL SIZE 3 —



**15W4**

Eleven Size 22 Signal Contacts and Four Size 16 Power Contacts

**CONTACT TECHNICAL SALES FOR TECHNICAL, DIMENSIONAL, AND PCB LAYOUT INFORMATION!**



## STANDARD SHELL ASSEMBLY



### RECOMMENDED MATING DIMENSIONS

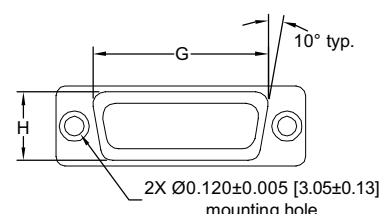
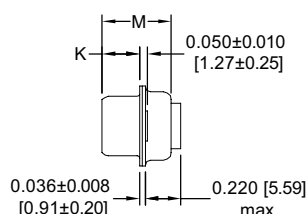
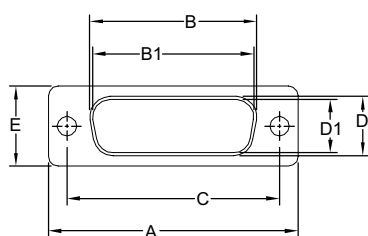


Shell Sizes 1 & 2 =  
0.265±0.015 [6.73±0.38]  
Shell Sizes 3, 4, 5 & 6 =  
0.256±0.015 [6.50±0.38]

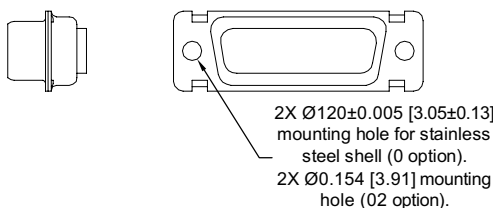


CBDD8W2M3S000

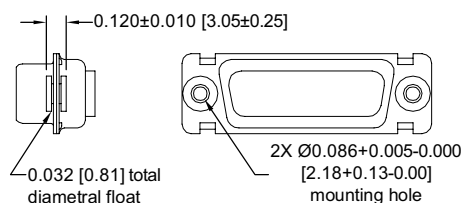
CBDD45W2M30000



### OPTIONAL SHELL ASSEMBLY (0, 02)



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



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	NEW! 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]
	NEW! 8W2F 8W2S	1.213 [30.81]	0.643 [16.33]		0.984 [24.99]	0.311 [7.90]		0.494 [12.55]	0.759 [19.28]	0.422 [10.72]	0.243 [6.17]	0.429 [10.90]
	NEW! 19W1M	1.541 [39.14]		0.994 [25.25]	1.312 [33.32]		0.329 [8.36]	0.494 [12.55]	1.083 [27.51]	0.422 [10.72]	0.233 [5.92]	0.422 [10.72]
2	NEW! 19W1F 19W1S	1.541 [39.14]	0.971 [24.66]		1.312 [33.32]	0.311 [7.90]		0.494 [12.55]	1.083 [27.51]	0.422 [10.72]	0.243 [6.17]	0.429 [10.90]
	45W2M	2.729 [69.32]		2.182 [55.42]	2.500 [63.50]		0.329 [8.36]	0.494 [12.55]	2.272 [57.71]	0.422 [10.72]	0.230 [5.84]	0.426 [10.82]



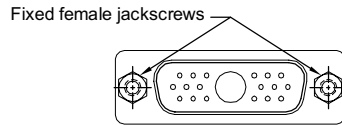
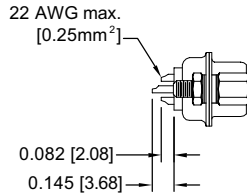
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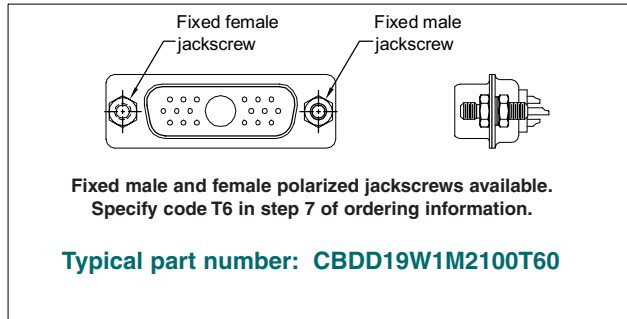
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**HIGH DENSITY PCB MOUNT**

**Combo-D**  
**D-Sub**

## SOLDER CUP CONNECTOR CODE 21



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

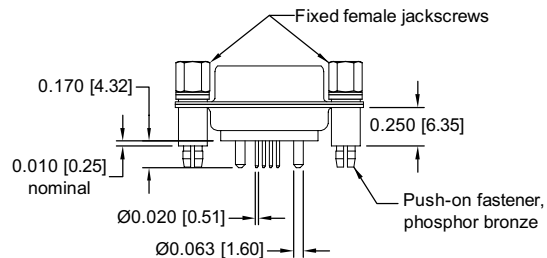


Typical part number: **CBDD19W1M2100T0**

## STRAIGHT PRINTED BOARD MOUNT CONNECTOR CODE 3, 35, 36, AND 37

CONTACT CODE	D Ø
3	-----

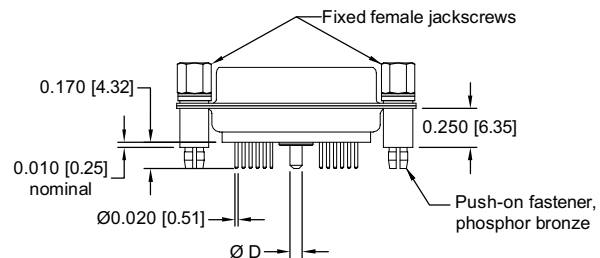
For straight printed board  
mount contacts, specify  
code 3 in step 4 of  
ordering information.



Typical part number: **CBDD8W2F3S60T2X**

CONTACT CODE	D Ø
3	-----
35	0.078 [1.98]
36	0.094 [2.39]
37	0.125 [3.18]

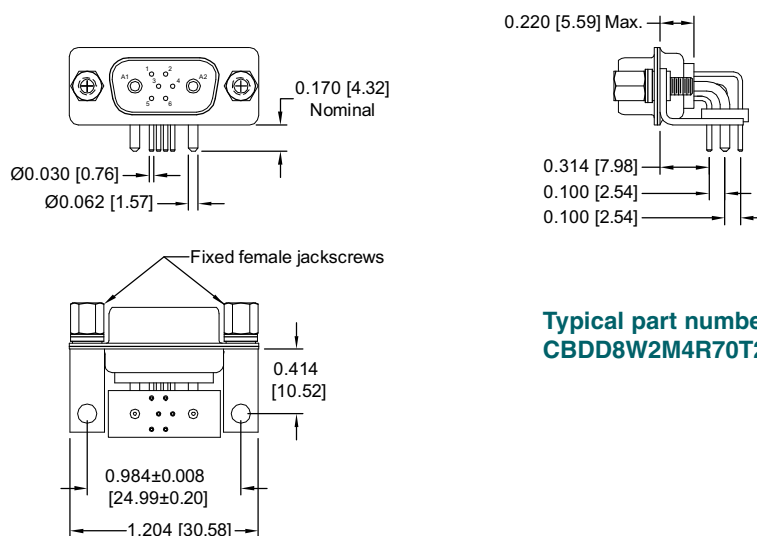
For straight printed board  
mount contacts, specify  
code no. in step 4 of  
ordering information.



Typical part number: **CBDD19W1F35S60T2X**

**RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR**  
**SIZE 16 POWER CONTACTS WITH 0.062 [1.57] Ø TERMINATIONS**  
**CODE 4, 0.314 [7.98] CONTACT EXTENSION**

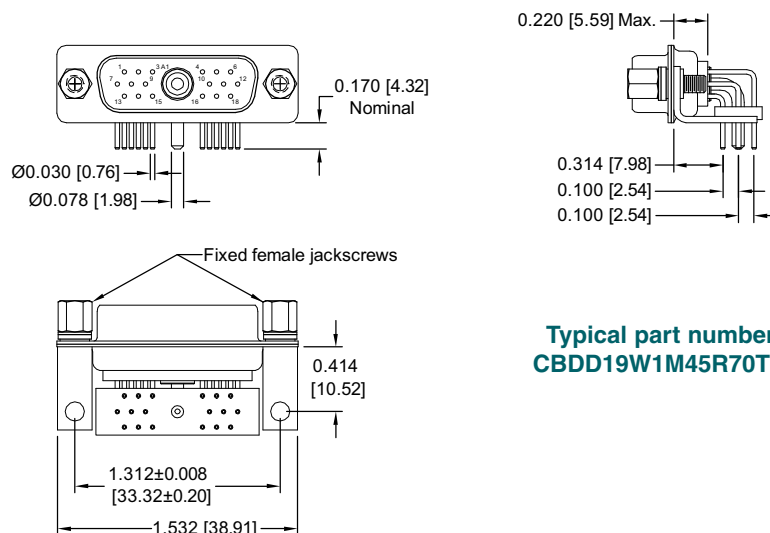
*See temperature rise curves on pages 1 and 2.*



**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**



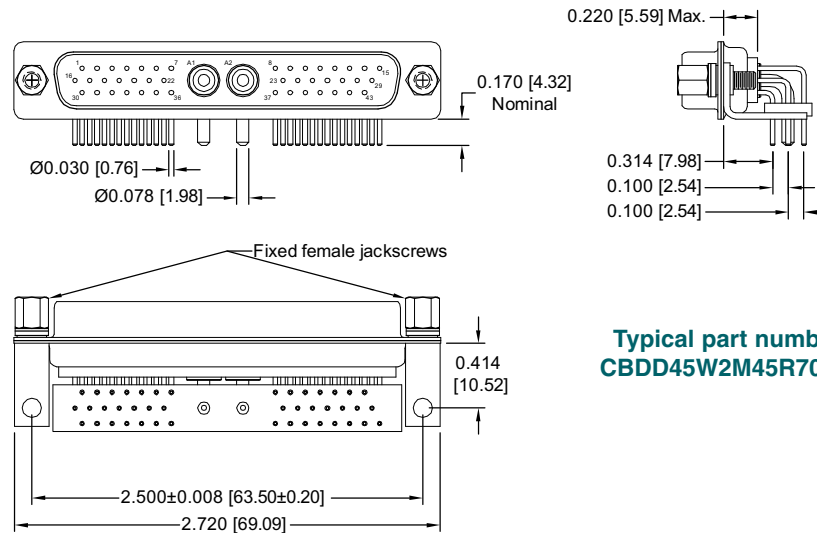
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**Combo-D**  
**D-Sub**

**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**

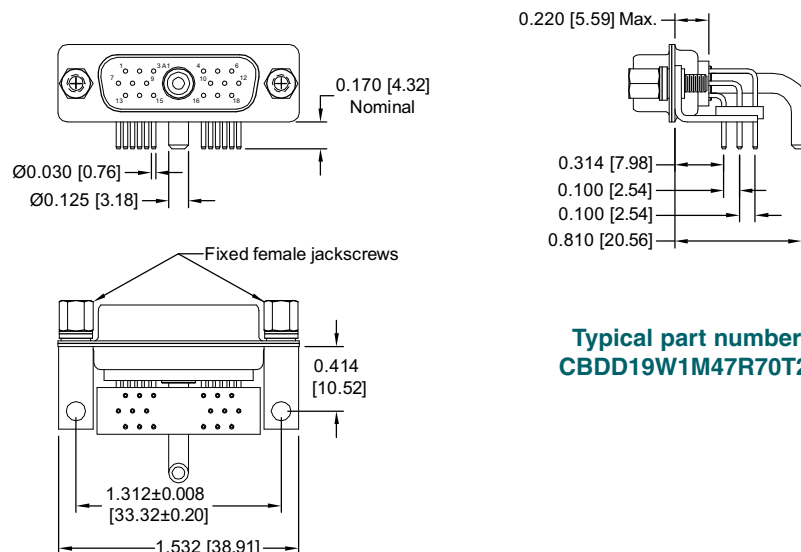
*See temperature rise curves on pages 1 and 2.*



**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.*



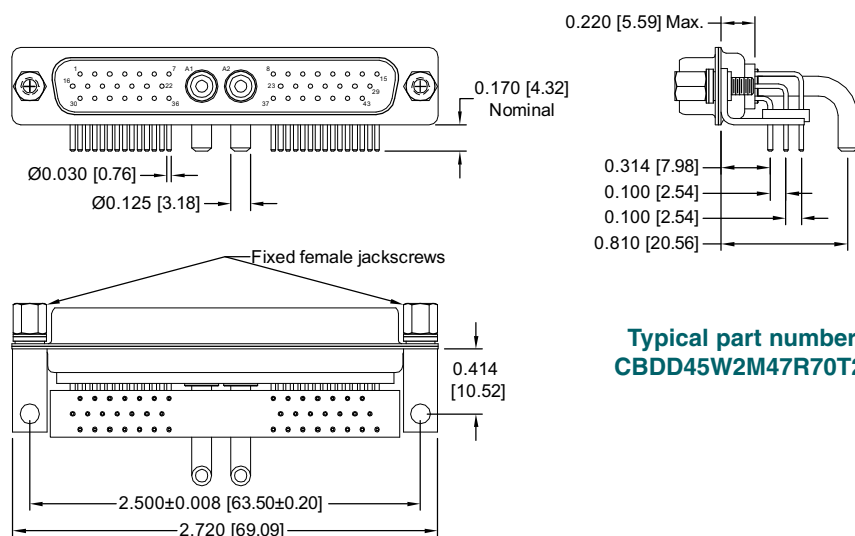
**Typical part number:**  
**CBDD19W1M47R70T20**



**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.**

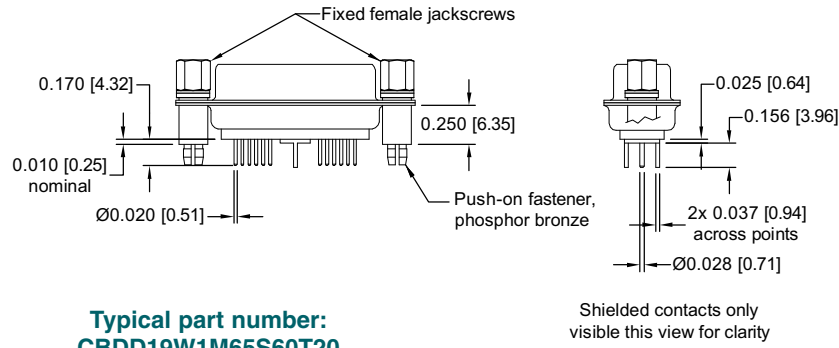


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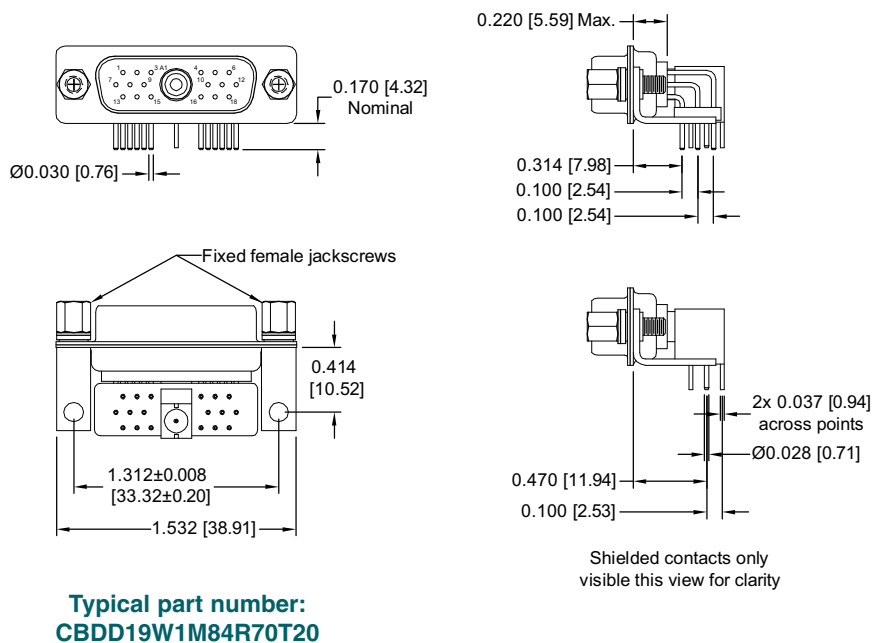
**PROFESSIONAL, INDUSTRIAL AND MILITARY QUALITY**  
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**Combo-D**  
**D-Sub**

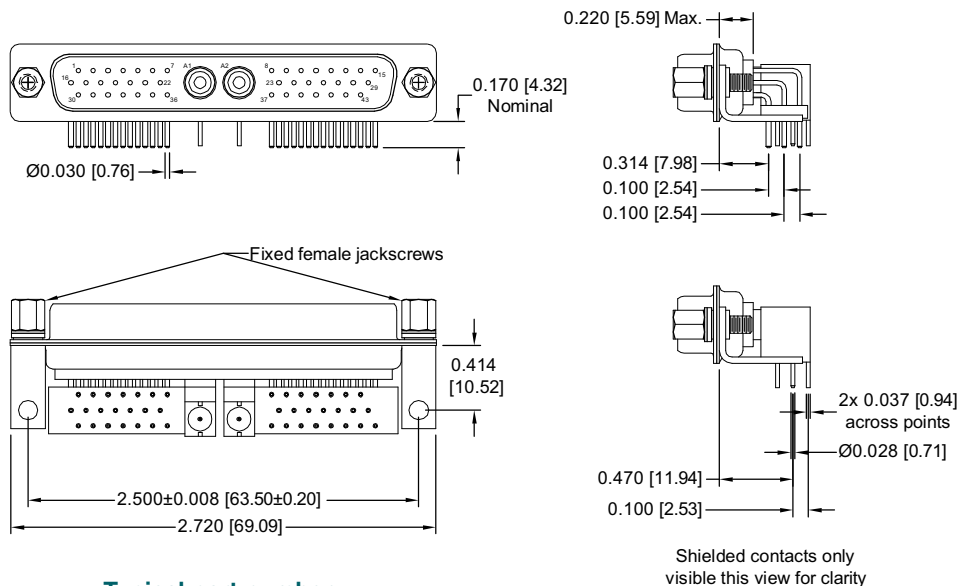
## STRAIGHT PRINTED BOARD MOUNT CONNECTOR WITH FDS4201D OR MDS4201D SHIELDED CONTACTS CODE 65



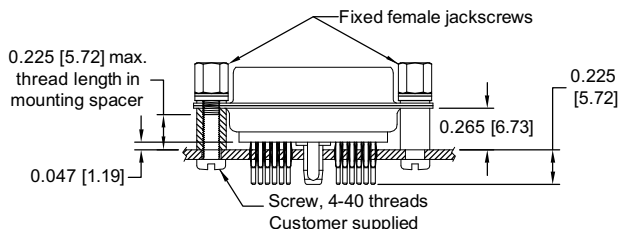
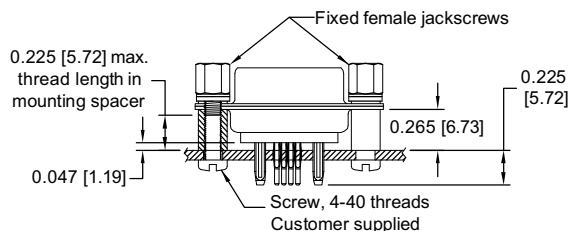
## RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR WITH *FRT*4201D OR *MRT*4201D SHIELDED CONTACTS CODE 84



RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR  
WITH **FRT**4201D OR **MRT**4201D SHIELDED CONTACTS  
CODE 84



COMPLIANT PRESS-FIT CONNECTOR  
CODE 93





# PROFESSIONAL, INDUSTRIAL AND MILITARY QUALITY

## THREE PERFORMANCE LEVELS FOR BEST COST/PERFORMANCE RATIO

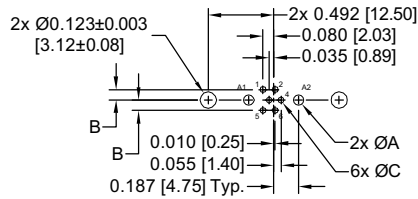
### HIGH DENSITY PCB MOUNT

Combo-D  
D-Sub

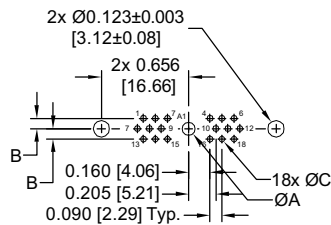
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## PRINTED BOARD MOUNT CONTACT HOLE PATTERN

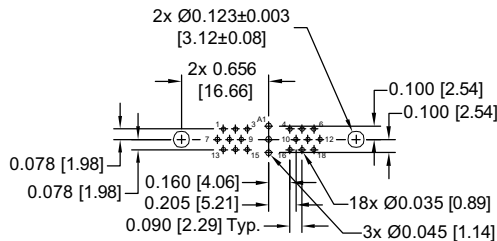
HOLE IDENTIFICATION SHOWN FOR MALE CONNECTOR; USE MIRROR IMAGE FOR FEMALE CONNECTOR.  
MOUNT RIGHT ANGLE (90°) CONNECTOR WITH MATING FACE POSITIONED TO FOLLOW DIRECTION OF ARROWS.



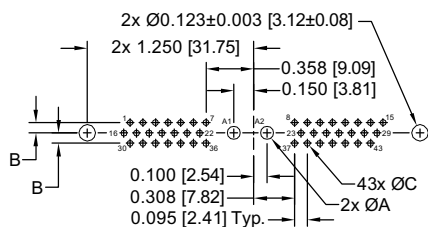
**CBDD8W2M3**  
**CBDD8W2M4**  
**CBDD8W2M93**



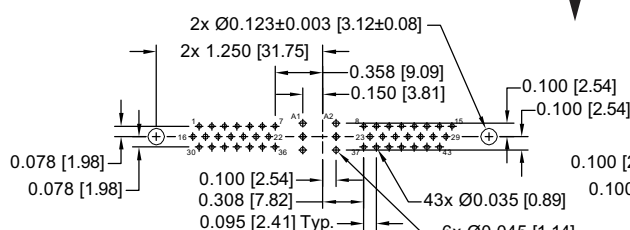
**CBDD19W1M3, 35, 36, 37**  
**CBDD19W1M4, 45**  
**CBDD19W1M93**



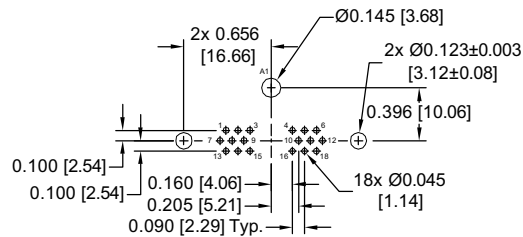
**CBDD19W1M65**



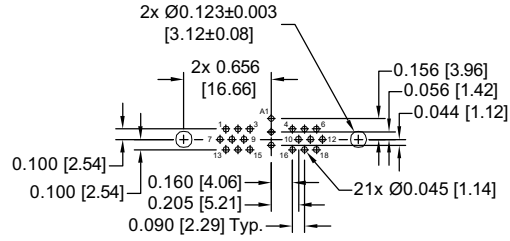
**CBDD45W2M3, 35, 36, 37**  
**CBDD45W2M4, 45**  
**CBDD45W2M93**



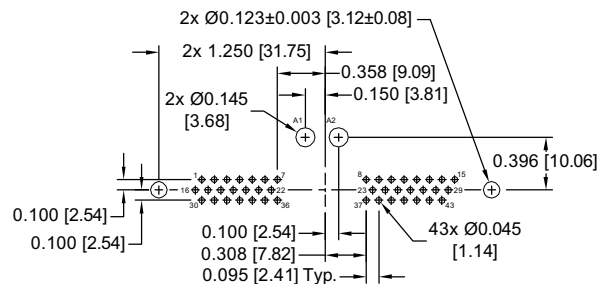
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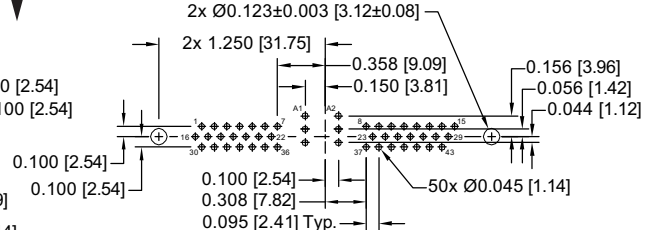
**CBDD19W1M47**



**CBDD19W1M84**



**CBDD45W2M47**



**CBDD45W2M84**

SUGGESTED BOARD HOLE SIZES	VARIANT	CODE	ØA	B	ØC
	8W2	3	0.080 [2.03]	0.078 [1.98]	0.035 [0.89]
		4	0.080 [2.03]	0.100 [2.54]	0.045 [1.14]
		93	See chart for size 16 contact on page 87.	0.078 [1.98]	See chart for size 22 contact on page 87.
	19W1 AND 45W2	3, 35	0.098 [2.49]	0.078 [1.98]	0.035 [0.89]
		36	0.114 [2.90]		
		37	0.145 [3.68]		
		4, 45	0.098 [2.49]	0.100 [2.54]	0.045 [1.14]
		47	N/A	N/A	N/A
		65	N/A	N/A	N/A
		84	N/A	N/A	N/A
		93	See chart for size 8 contact on page 87.	0.078 [1.98]	See chart for size 22 contact on page 87.



## ORDERING INFORMATION - CODE NUMBERING SYSTEM

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

# FOR CONNECTORS NOT INCLUDING SIZE 8 CONTACTS

STEP	1	2	3	4	5	6	7	8	9	10
EXAMPLE	CBDD	8W2	M	93	S	0	0	0	/AA	-14
<div> <div> <b>STEP 1 - BASIC SERIES</b>            CBDD Series -            CBHD Series - High Conductivity            Power Contacts         </div> <div> <b>STEP 2 - CONNECTOR VARIANTS</b>            Shell Size 1 - 8W2  <i>See next page for ordering information for            other shell size options.</i> </div> <div> <b>STEP 3 - CONNECTOR GENDER</b>            *1 F - Female - Professional Level -            Open Entry Signal Contacts            M - Male            *1 S - Female - Industrial / Military Level -            PosiBand Closed Entry Signal Contacts         </div> <div> <b>STEP 4 - CONTACT TERMINATION TYPE</b>            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].         </div> <div> <b>*2 STEP 5 - MOUNTING STYLE</b>            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            R2 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector            with 4-40 Thread Fixed Female Jackscrews with Cross Bar            R6 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector            with 0.120 [3.05] Ø Mounting Hole with Cross Bar            R7 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector            with 4-40 Threads with Cross Bar            R8 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector            with 4-40 Locknut with Cross Bar            S - Swaged Spacer, 4-40 Threads, 0.250 [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         </div> </div>										
<div> <div> <b>*2 STEP 10 - SPECIAL OPTIONS</b>            FOR SPECIAL OPTIONS, SEE            SPECIAL OPTIONS APPENDIX            ON PAGE 89.            CONTACT TECHNICAL SALES            FOR ORDERING DETAILS OF            THE FOLLOWING:            Other Special Requirements.            Straight and Right Angle Thermocouple            PCB mount contacts         </div> <div> <b>STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS</b>            /AA - Compliant per EU Directive            2002/95/EC (RoHS)  <b>NOTE:</b> If compliance to environmental            legislation is not required, this step will not            be used. Example: CBDD8W2M93S000         </div> <div> <b>STEP 8 - SHELL OPTIONS</b>            0 - Zinc Plated, with Chromate Seal.            *4 S - Stainless Steel, passivated.            X - Tin Plated.            Z - Tin Plated and Dimpled (male connectors only).         </div> <div> <b>*2 STEP 7 - LOCKING AND POLARIZING SYSTEMS</b>            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.         </div> <div> <b>*2 STEP 6 - HOODS AND PUSH-ON FASTENERS</b>            0 - None            AN - Lightweight Aluminum Hood, nickel finish            AC - Lightweight Aluminum Hood, no finish            H - Hood, Top Opening, Metal            *3 G - Hood, EMI/RFI, Metal            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         </div> </div>										

### NOTES

- \*1 Power contacts are always supplied with "Closed Entry" female contacts.  
 \*2 For additional information on accessories listed in steps  
 5, 6, 7 and 10, see Accessory Catalog.  
 \*3 When using G hood with CBDD variants, use the extended height hood.  
 See Accessories Catalog for extended G hood options.  
 \*4 For stainless steel dimpled male versions, contact Technical Sales.



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# PROFESSIONAL, INDUSTRIAL AND MILITARY QUALITY THREE PERFORMANCE LEVELS FOR BEST COST/PERFORMANCE RATIO HIGH DENSITY PCB MOUNT



Combo-D  
D-Sub

## ORDERING INFORMATION - CODE NUMBERING SYSTEM

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

## FOR CONNECTORS INCLUDING SIZE 8 CONTACTS

STEP	1	2	3	4	5	6	7	8	9	10
EXAMPLE	CBDD	19W1	M	93	S	0	0	0	/AA	-14
<div> <div> <h3>STEP 1 - BASIC SERIES</h3> <p>CBDD Series - CBHD Series - High Conductivity Power Contacts</p> </div> <div> <h3>STEP 2 - CONNECTOR VARIANTS</h3> <p>Shell Size 2 - 19W1 *6 Shell Size 3 - 15W4 *1 Shell Size 4 - 45W2</p> </div> <div> <h3>STEP 3 - CONNECTOR GENDER</h3> <p>*2 F - Female - Professional Level - Open Entry Signal Contacts M - Male *2 S - Female - Industrial / Military Level - PosiBand Closed Entry Signal Contacts</p> </div> <div> <h3>STEP 4 - CONTACT TERMINATION TYPE</h3> <p>21 - Fixed Solder Cup, 22 AWG-30 AWG [0.3mm2-0.05mm2]. 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 MDS4201D footprint, 0.170 [4.32] Signal Contact Tail Length. 84 - Solder, Right Angle (90°) Printed Board Mount with Signal and Shielded Contacts MRT4201D 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].</p> </div> <div> <h3>*3. STEP 5 - MOUNTING STYLE</h3> <p>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 R2 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Thread Fixed Female Jackscrews with Cross Bar R6 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 0.120 [3.05] Ø Mounting Hole with Cross Bar R7 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Threads with Cross Bar R8 - Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Locknut with Cross Bar S - Swaged Spacer, 4-40 Threads, 0.250 [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</p> </div> <div> <h3>*3 STEP 10 - SPECIAL OPTIONS</h3> <p>FOR SPECIAL OPTIONS, SEE SPECIAL OPTIONS APPENDIX ON PAGE 89. CONTACT TECHNICAL SALES FOR ORDERING DETAILS OF THE FOLLOWING: Other Special Requirements. Straight and Right Angle Thermocouple PCB mount contacts</p> </div> <div> <h3>STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS</h3> <p>/AA - Compliant per EU Directive 2002/95/EC (RoHS) NOTE: If compliance to environmental legislation is not required, this step will not be used. Example: CBDD8W2M93S000</p> </div> <div> <h3>STEP 8 - SHELL OPTIONS</h3> <p>0 - Zinc Plated, with Chromate Seal. *5 S - Stainless Steel, passivated. X - Tin Plated. Z - Tin Plated and Dimpled (male connectors only).</p> </div> <div> <h3>*3 STEP 7 - LOCKING AND POLARIZING SYSTEMS</h3> <p>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.</p> </div> <div> <h3>*3 STEP 6 - HOODS AND PUSH-ON FASTENERS</h3> <p>0 - None AN - Lightweight Aluminum Hood, nickel finish AC - Lightweight Aluminum Hood, no finish H - Hood, Top Opening, Metal *4 G - Hood, EMI/RFI, Metal 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</p> </div> <div> <h3>NOTES</h3> <p>*1 45W2 variant currently available in male only. *2 Power contacts are always supplied with "Closed Entry" female contacts. *3 For additional information on accessories listed in steps 5, 6, 7 and 10, see Accessory Catalog. *4 When using G hood with CBDD variants, use the extended height hood. See Accessories Catalog for extended G hood options. *5 For stainless steel dimpled male versions, contact Technical Sales. *6 See page 29 for more information on CBDD15W4 variants</p> </div> </div>										



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## PROFESSIONAL, INDUSTRIAL AND MILITARY QUALITY THREE PERFORMANCE LEVELS FOR BEST COST/PERFORMANCE RATIO HIGH DENSITY CRIMP / SOLDER REMOVABLE CONTACTS

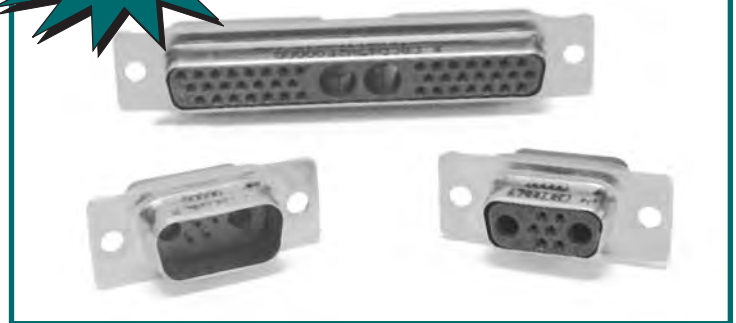
Combo-D  
D-Sub

**Size 22 Removable Signal and  
Thermocouple Crimp Contacts**

**Size 16 Removable Power Contacts**

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

**U.L. and CSA Recognition,  
for status contact Technical Sales**



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 807-7, MIL-DTL-24308 and SAE AS 39029.



**For RoHS options  
see page 42.**

## TECHNICAL CHARACTERISTICS

### MATERIALS AND FINISHES:

<b>Insulator:</b>	Glass filled polyester per MIL-M-24519 UL 94V-0, blue color.
<b>Contacts:</b>	Precision machined copper alloy.
<b>Contact Plating:</b>	
<b>Signal:</b>	Gold flash over nickel plate and gold 0.000050 [1.27µ] over nickel plate. Other finishes available upon request, see page 69.
<b>Power:</b>	Gold flash over nickel. Other finishes available upon request, see page 69.
<b>Shielded:</b>	For contact platings, see pages 68.
<b>High Voltage:</b>	For contact platings, see pages 68.
<b>Shells:</b>	Steel or brass with tin plate; zinc plate with chromate seal; stainless steel passivated. Other materials and finishes available upon request.
<b>Mounting Spacers:</b>	Copper alloy or steel with zinc plate and chromate seal or tin plate; stainless steel, passivated.
<b>Jackscrew Systems:</b>	Brass or steel with zinc plate and chromate seal or clear zinc plate or tin plate; stainless steel, passivated.
<b>Hoods:</b>	Composite and plastic, UL 94V-0; brass or steel with zinc plate and chromate seal; aluminum or aluminum with electroless nickel plate; die cast zinc.

Non-magnetic versions are available, contact Technical Sales.

### MECHANICAL CHARACTERISTICS:

<b>Signal Contacts, Crimp Removable:</b>	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.
<b>Power Contacts, Crimp Removable:</b>	Size 16 contacts, male – 0.062 inch [1.57mm] 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.
<b>Contact Retention In Insulator:</b>	
<b>Signal Size 22</b>	9 lbs. [40N].
<b>Power Size 16</b>	15 lbs. [67N]
<b>Power Size 8</b>	22 lbs. [98N] - power, shielded and high voltage.

*continued on next page. . .*

## TECHNICAL CHARACTERISTICS, *continued*

*continued from previous page. . .*

### MECHANICAL CHARACTERISTICS, *continued*:

<b>Shells:</b>	Male shells may be dimpled for EMI/ESD ground paths.
<b>Polarization:</b>	Trapezoidally shaped shells and polarized jackscrews.
<b>Locking Systems:</b>	Jackscrews and vibration locking systems.
<b>Mechanical Operations:</b>	1000 operations minimum per IEC 512-5.

### ELECTRICAL CHARACTERISTICS:

#### SIZE 22 CONTACTS

<b>Contact Current Rating:</b>	5 amperes nominal.
<b>Initial Contact Resistance:</b>	0.005 ohms maximum.
<b>Proof Voltage:</b>	1000 V r.m.s.

#### SIZE 16 CONTACTS

##### POWER CONTACTS

**Contact Current Rating - Tested per U.L. 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 512-2, Test 2b.

**High Conductivity**

**Contact Material:** 0.001 ohms max. Per IEC 512-2, 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 pages 69.*

##### HIGH VOLTAGE CONTACTS

*For electrical characteristics, see pages 69.*

#### CONNECTOR

<b>Insulator Resistance:</b>	5 G ohms.
<b>Clearance and</b>	
<b>Creepage Distance:</b>	0.042 inch [1.06mm] minimum.
<b>Working Voltage:</b>	300 V r.m.s.

### CLIMATIC CHARACTERISTICS:

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

**Damp Heat, Steady State:** 10 days.

### THERMOCOUPLE CONTACTS:

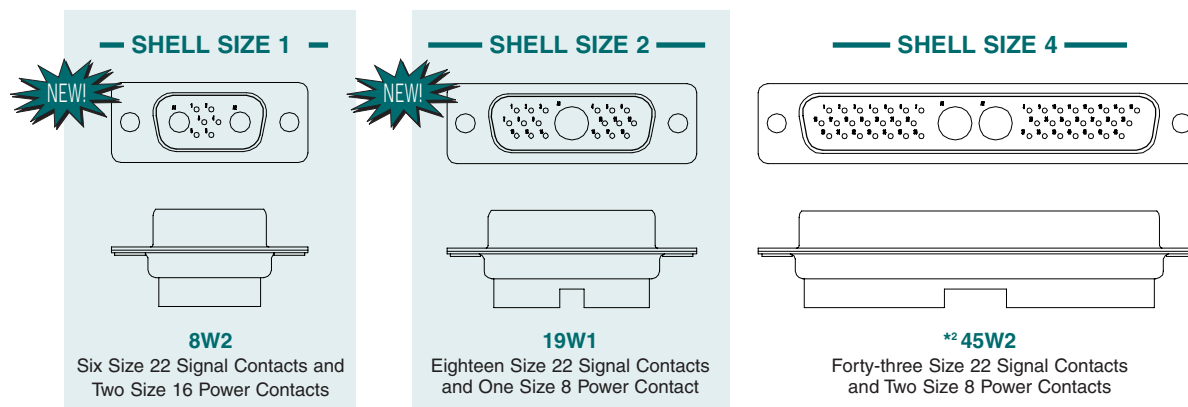
Size 22 crimp contacts are available. See page 71 for details.

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

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



#### NOTES:

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

\*2 45W2 variant currently available in female only. Contact Technical Sales for availability of male connector.

OTHER VARIANTS WILL BE ADDED, CONSULT OUR WEBSITE FOR UPDATED INFORMATION:  
<http://www.connectpositronic.com/catalogs/updates.html>





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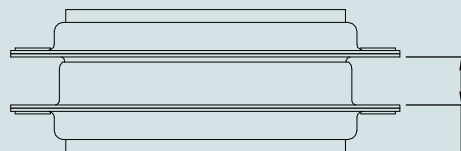
**PROFESSIONAL, INDUSTRIAL AND MILITARY QUALITY**  
**THREE PERFORMANCE LEVELS FOR BEST COST/PERFORMANCE RATIO**  
**HIGH DENSITY CRIMP / SOLDER REMOVABLE CONTACTS**

**Combo-D**  
**D-Sub**

## STANDARD SHELL ASSEMBLY



### RECOMMENDED MATING DIMENSIONS



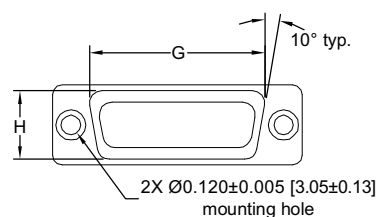
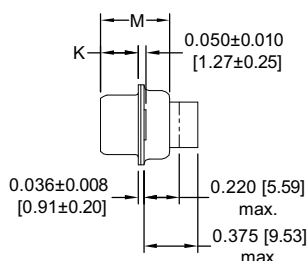
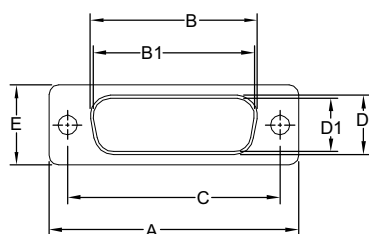
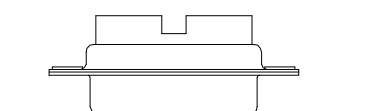
Shell Sizes 1 & 2 =  
0.265±0.015 [6.73±0.38]  
Shell Sizes 3, 4, 5 & 6 =  
0.256±0.015 [6.50±0.38]



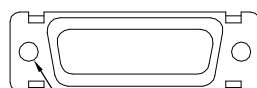
**CBCD45W2S00000**

**CBCD8W2S00000**

### TYPICAL CONNECTOR TOP VIEW

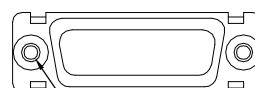
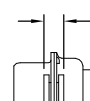


### OPTIONAL SHELL ASSEMBLY (0, 02)



2X Ø120±0.005 [3.05±0.13]  
mounting hole for stainless  
steel shell (0 option).  
2X Ø0.154 [3.91] mounting  
hole (02 option).

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



0.120±0.010 [3.05±0.25]  
0.032 [0.81] total  
diametral float  
2X Ø0.086±0.005-0.000  
[2.18+0.13-0.00]  
mounting hole

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	<b>NEW!</b> 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]
	<b>NEW!</b> 8W2S	1.213 [30.81]	0.643 [16.33]		0.984 [24.99]	0.311 [7.90]		0.494 [12.55]	0.759 [19.28]	0.422 [10.72]	0.243 [6.17]	0.429 [10.90]
2	<b>NEW!</b> 19W1M	1.541 [39.14]		0.994 [25.25]	1.312 [33.32]		0.329 [8.36]	0.494 [12.55]	1.083 [27.51]	0.422 [10.72]	0.233 [5.92]	0.422 [10.72]
	<b>NEW!</b> 19W1S	1.541 [39.14]	0.971 [24.66]		1.312 [33.32]	0.311 [7.90]		0.494 [12.55]	1.083 [27.51]	0.422 [10.72]	0.243 [6.17]	0.429 [10.90]
4	<b>45W2S</b>	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.

C-004 Rev. E2

## ORDERING INFORMATION - CODE NUMBERING SYSTEM

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

STEP	1	2	3	4	5	6	7	8	9	10
EXAMPLE	CBCD	8W2	S	0	0	0	0	S	/AA	-14

### STEP 1 - BASIC SERIES

CBCD Series

### STEP 2 - CONNECTOR VARIANTS

Shell Size 1 - 8W2

Shell Size 2 - 19W1

\*1 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 [0.03mm<sup>2</sup>-0.05mm<sup>2</sup>].

\*2 11 - Signal contacts, 22 AWG-30 AWG [0.03mm<sup>2</sup>-0.05mm<sup>2</sup>] with MC/FC 4012D power contact.

\*2 12 - Signal contacts, 22 AWG-30 AWG [0.03mm<sup>2</sup>-0.05mm<sup>2</sup>] with MC/FC 4016D power contact.

\*2 13 - Signal contacts, 22 AWG-30 AWG [0.03mm<sup>2</sup>-0.05mm<sup>2</sup>] with MCC/FCC 4101D shielded contacts.

\*2 14 - Signal contacts, 22 AWG-30 AWG [0.03mm<sup>2</sup>-0.05mm<sup>2</sup>] with MCC/FCC 4102D shielded contacts.

### \*3 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

\*3 STEP 10 - SPECIAL OPTIONS  
FOR SPECIAL OPTIONS, SEE SPECIAL OPTIONS APPENDIX ON PAGE 89.



### STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS

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

NOTE: If compliance to environmental legislation is not required, this step will not be used. Example: CBCD8W2S0000S

### 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).

### \*3 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.

### \*3 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 G - Hood, EMI/RFI, Metal

Z - Hood, Top or Side Opening, robust extended height, plastic and composite, with rotating male jackscrews

### NOTES

\*1 45W2 variant currently available in female only.

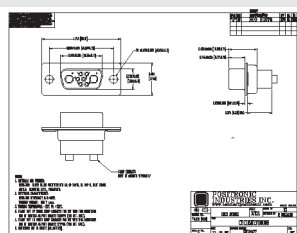
\*2 Available on 19W1 and 45W2 connectors only.

\*3 For additional information on accessories listed in steps 5, 6, 7 and 10, see Accessory Catalog.

\*4 When using G hood with CBCD variants, use the extended height hood. See Accessories Catalog for extended G hood options.

\*5 For stainless steel dimpled male versions, contact Technical Sales.

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



SK Drawing



3-dimensional model

For crimping information and crimp tools, see Application Tools section, pages 81-89.



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# PROFESSIONAL, INDUSTRIAL AND MILITARY QUALITY THREE PERFORMANCE LEVELS FOR BEST COST/PERFORMANCE RATIO VERTICALLY STACKED STANDARD DENSITY PCB MOUNT

Combo-D  
D-Sub

Size 20 Signal Contacts

Size 8 Power Contacts

U.L. Recognized  
File #E49351

CSA Recognized  
File #LR54219

Telecommunication  
U.L. File #14095



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 **15-ampere** 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 807-2 and DESC 85039.



For RoHS options  
see page 48.

## TECHNICAL CHARACTERISTICS

### MATERIALS AND FINISHES:

<b>Insulator:</b>	Glass filled polyester per MIL-M-24519 UL 94, blue color, and composite.
<b>Contacts:</b>	Precision machined copper alloy.
<b>Contact Plating:</b>	
<b>Signal:</b>	Gold flash over nickel plate. Other finishes available upon request.
<b>Power:</b>	Gold flash over nickel. Other finishes available upon request.
<b>Shells:</b>	Steel or brass with tin plate; zinc plate with chromate seal; stainless steel passivated. Other materials and finishes available upon request.
<b>Mounting Spacers and Brackets:</b>	Nylon; copper alloy or steel with zinc plate and chromate seal or tin plate; phosphor bronze with tin plate; stainless steel, passivated.
<b>Cross Bar:</b>	Nylon, UL 94V-0, black color.
<b>Push-On Fasteners:</b>	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.

## TECHNICAL CHARACTERISTICS, *continued*

*continued from previous page. . .*

### MECHANICAL CHARACTERISTICS, *continued*:

<b>Contact Retention</b>	
<b>In Insulator:</b>	22 lbs. [98N]
<b>Contact Terminations:</b>	Printed board mount with right angle (90°) terminations of 0.078 inch [1.98mm] diameter.
<b>Shells:</b>	Male connector shells may be dimpled for EMI/ESD ground paths.
<b>Polarization:</b>	Trapezoidally shaped shells and polarized jackscrews.
<b>Mounting Bracket</b>	Riveted fasteners with 0.120 inch [3.05mm] diameter clearance hole, with 4-40 threads or 4-40 threads with nylon lock insert.
<b>Riveted to Connector:</b>	
<b>Mounting To</b>	
<b>Printed Board:</b>	Rapid installation push-on fasteners.
<b>Locking Systems:</b>	Jackscrews and vibration locking system for either front or rear panel mounted connectors.
<b>Mechanical Operations:</b>	500 operations minimum per IEC 512-5.

### ELECTRICAL CHARACTERISTICS:

#### SIZE 20 CONTACTS

<b>Contact Current Rating:</b>	7.5 amperes nominal.
<b>Initial Contact Resistance:</b>	0.008 ohms maximum.
<b>Proof Voltage:</b>	1000 V r.m.s.

#### Size 8 CONTACTS

#### POWER CONTACTS

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

#### CONNECTOR

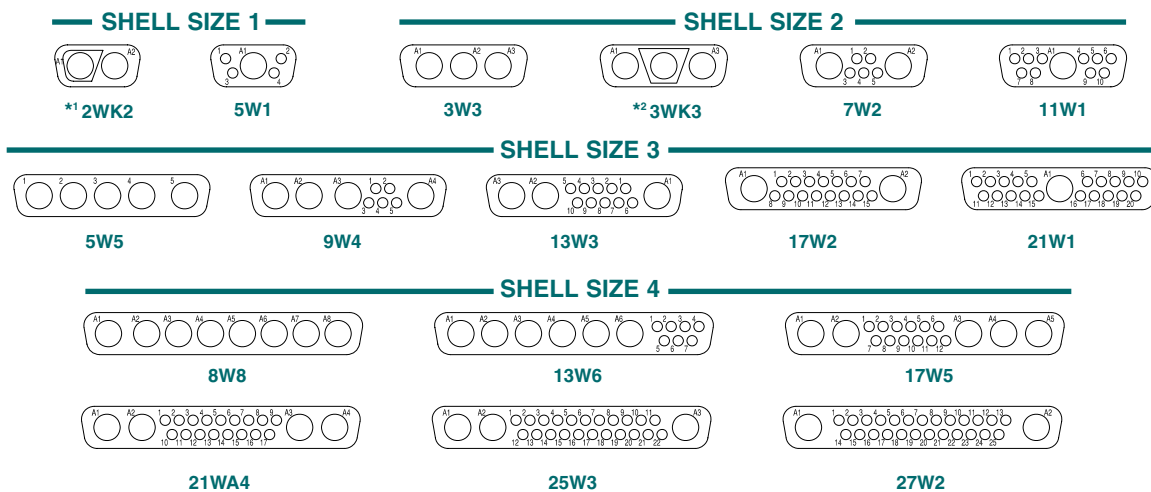
<b>Insulator Resistance:</b>	5 G ohms.
<b>Clearance and Creepage</b>	
<b>Distance (minimum):</b>	0.039 inch [1.0mm]
<b>Working Voltage:</b>	300 V r.m.s.

### CLIMATIC CHARACTERISTICS:

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

## CONTACT VARIANTS

FACE VIEW OF MALE OR REAR VIEW OF FEMALE



#### 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





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**THREE PERFORMANCE LEVELS FOR BEST COST/PERFORMANCE RATIO**  
**VERTICALLY STACKED STANDARD DENSITY PCB MOUNT**

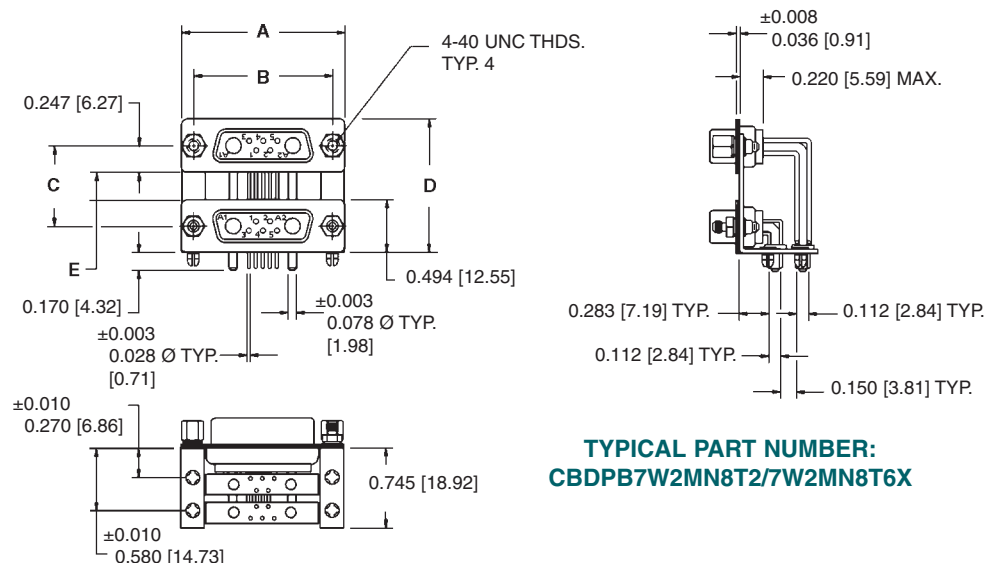
**Combo-D**  
**D-Sub**

**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**

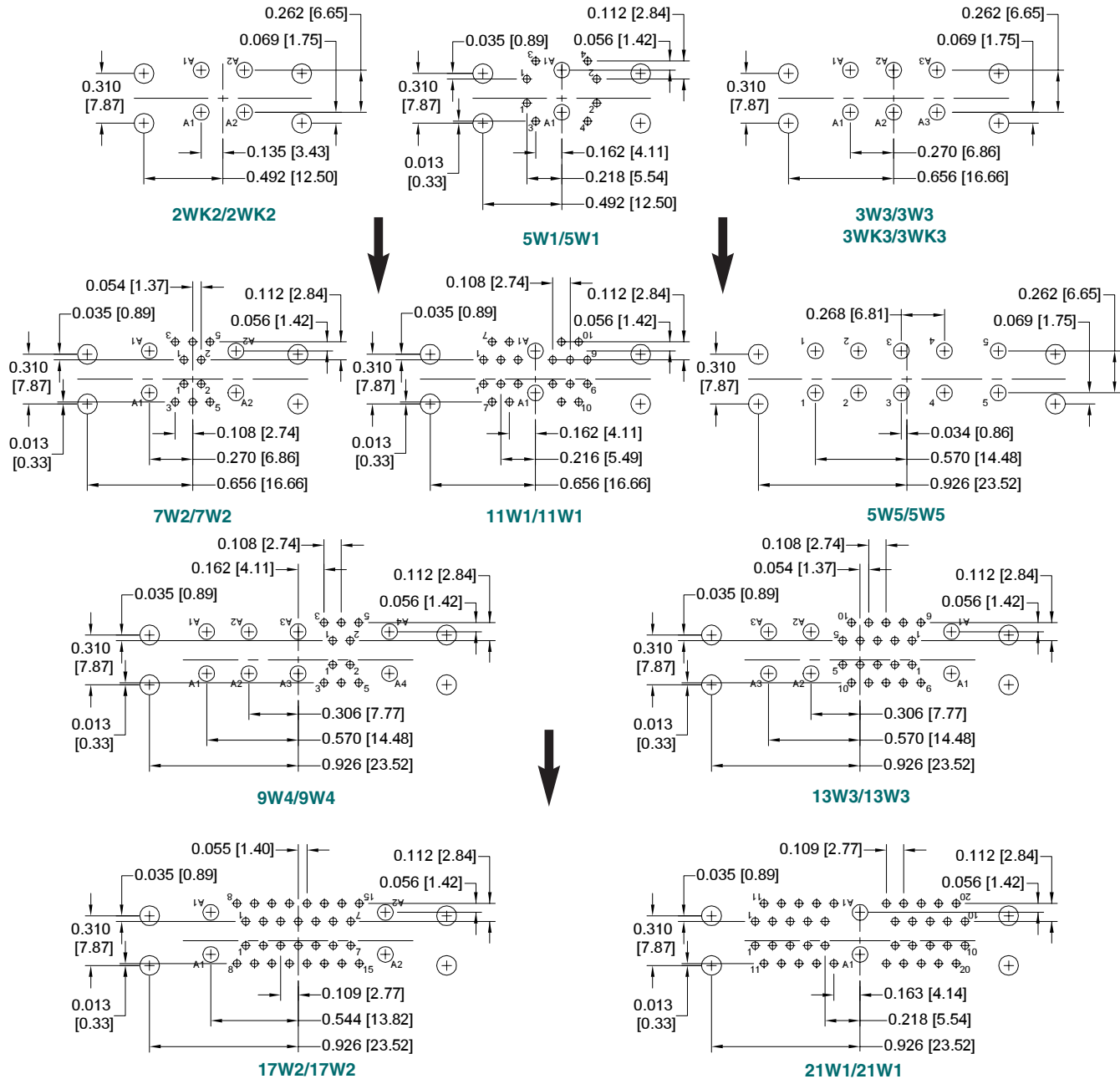
CONNECTOR DESIGNATION	C	D	E
CBDPB	0.750 [19.05]	1.244 [31.60]	0.256 [6.50]
CBDPC	0.900 [22.86]	1.394 [35.41]	0.406 [10.31]

CONNECTOR VARIANT	A	B
SHELL SIZE 1	1.213 [30.81]	0.984 [24.99]
SHELL SIZE 2	1.541 [39.14]	1.312 [33.32]
SHELL SIZE 3	2.088 [53.04]	1.852 [47.04]
SHELL SIZE 4	2.729 [69.32]	2.500 [63.50]

**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.

## 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 unrveted mounting bracket with connectors.



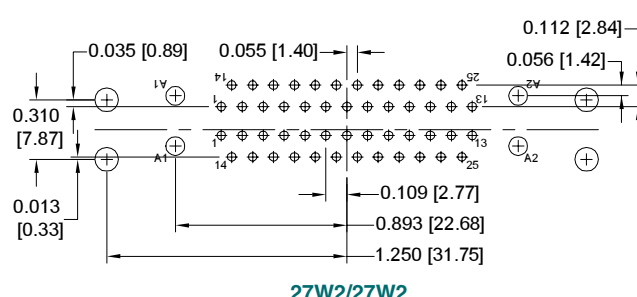
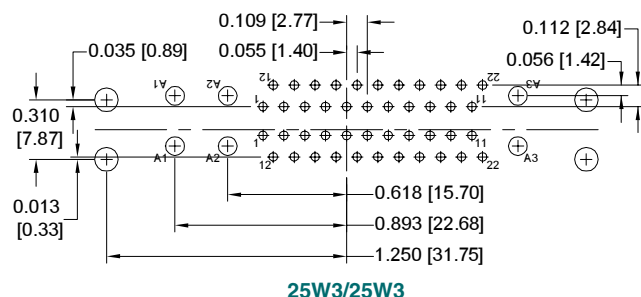
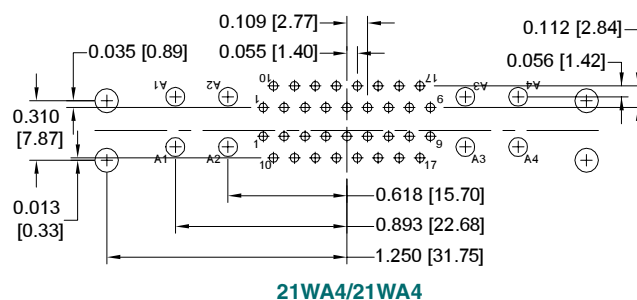
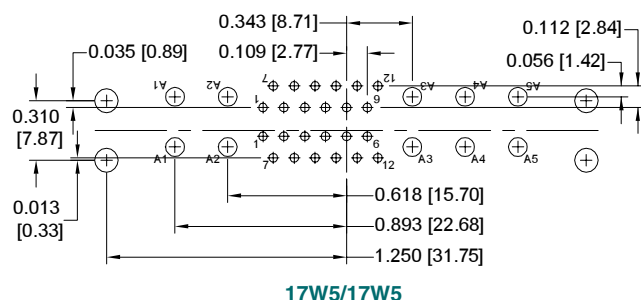
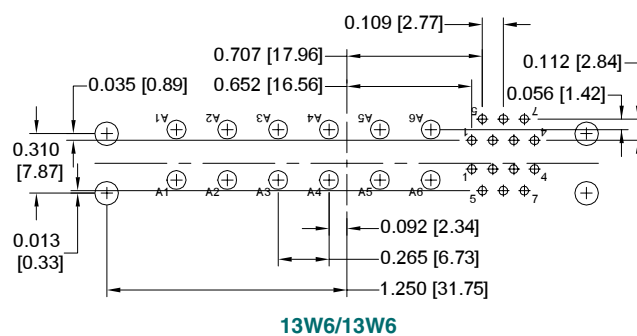
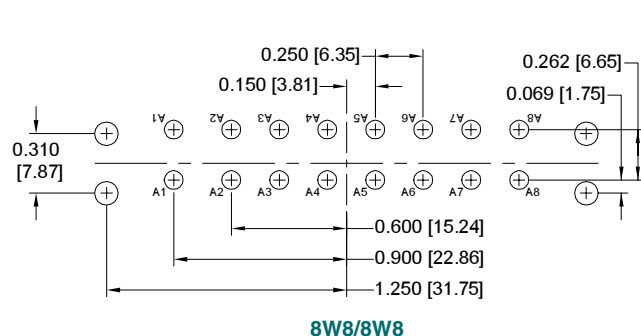
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**VERTICALLY STACKED STANDARD DENSITY PCB MOUNT**

**Combo-D**  
**D-Sub**

**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

STEP	1	2	3	4	5	6	7	8	9	10
EXAMPLE	CBDPB	9W4	F	N7T	9W4	F	N7T	0	/AA	-14

### UPPER CONNECTOR

#### STEP 1 - BASIC SERIES

- \*1 CBDPB Series
- \*1 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 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

### LOWER CONNECTOR

OPTIONS ARE THE SAME AS FOR UPPER CONNECTOR STEPS 2, 3, AND 4



#### STEP 10 - SPECIAL OPTIONS

FOR SPECIAL OPTIONS, SEE SPECIAL OPTIONS APPENDIX ON PAGE 89.

#### STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS

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

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

#### STEP 8 - SHELL OPTIONS

- 0 - Zinc Plated, with Chromate Seal.
- \*2 S - Stainless Steel, passivated.
- X - Tin Plated.
- Z - Tin Plated and Dimpled (male connectors only)

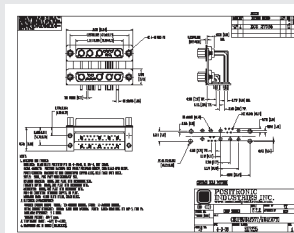
#### NOTE

- \*1 Contacts can be supplied with Military contact plating, see page 89.
- \*2 For stainless steel dimpled male versions, contact Technical Sales.

For crimping information and crimp tools, see Application Tools section, pages 81-89.

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



SK Drawing



3-dimensional model





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## MicroTCA POWER INPUT CONNECTORS

Combo-D  
D-Sub

Size 20  
Signal Contacts

Size 8  
Power Contacts

Compliant to MTCA.0 R1.0 for  
48 volt and 24 volt systems and  
MTCA.1 R1.0 for 12 volt systems



Positronic Industries is known throughout the PCI Industrial Computer Manufacturers 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.

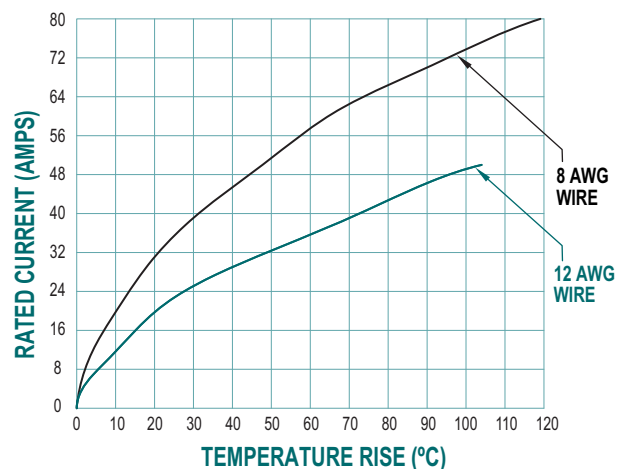
QB series offers board mount connectors for power modules, and cable connectors for bringing power to modules. QB series meet requirements of the MicroTCA Specification for 48V, 24V **and 12V** systems.

To learn more about PICMG or to get specifications, visit [www.picmg.org](http://www.picmg.org).



For RoHS options  
see page 55-56.

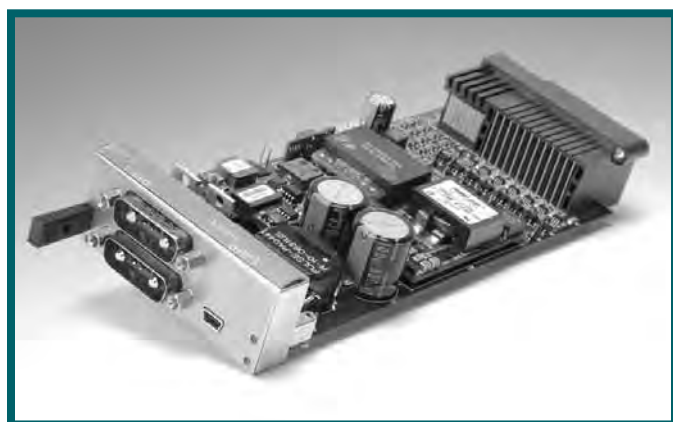
### TEMPERATURE RISE CURVE 7W2 VARIANT



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

**8 AWG:** Curve developed using QB7W2MR7T2/7W2MR7T20 and QB7W2S00000 connectors with FC4008D-1817.0 contacts terminated to 8 AWG wire.

**12 AWG:** Curve developed using QB7W2MR7T2/7W2MR7T20 and QB7W2S00000 connectors with FC4012D-1817.0 contacts terminated to 12 AWG wire.



MTCA power module shown above is compliments of  
Actel Corp. ([www.actel.com](http://www.actel.com)) and Signal Stream  
Technologies, LLC. ([www.signalstreamtechnologies.com](http://www.signalstreamtechnologies.com)).

## TECHNICAL CHARACTERISTICS

### MATERIALS AND FINISHES:

<b>Insulator:</b>	Glass filled polyester per MIL-M-24519 UL 94V-0, blue color.
<b>Contacts:</b>	Precision machined copper alloy.
<b>Contact Plating:</b>	
<b>Signal:</b>	Gold flash over nickel plate and 0.000050 [1.27μ] gold over nickel plate. Other finishes available upon request.
<b>Power:</b>	Gold flash over nickel. Other finishes available upon request.
<b>Shells:</b>	Steel or brass with tin plate; zinc plate with chromate seal; stainless steel pas- sivated. Other materials and finishes available upon request.
<b>Brackets:</b>	Copper alloy or steel with zinc plate and chromate seal or tin plate; phos- phor bronze with tin plate; stainless steel, passivated.
<b>Push-On Fasteners:</b>	Beryllium copper with tin plate.
<b>Jackscrew Systems:</b>	Brass or steel with zinc plate and chromate seal or clear zinc plate or tin plate; stainless steel, passivated.
<b>Hoods:</b>	Glass filled polyester, UL 94V-0, blue color.

### MECHANICAL CHARACTERISTICS:

<b>Signal Contacts, Fixed:</b>	Size 20 contacts, male - 0.040 inch [1.02mm] mating diameter. Female contacts are PosiBand closed entry design.
<b>Power Contacts, Fixed:</b>	Size 8 contacts, male - 0.142 inch [3.61mm] mating diameter. Female contacts are closed entry "Large Surface Area" design.
<b>Contact Retention in Insulator:</b>	Signal: 9 lbs [40N]. Power: 22 lbs [98N].
<b>Locking Systems:</b>	Jackscrews.
<b>Mechanical Operations:</b>	200 operations, minimum.

### ELECTRICAL CHARACTERISTICS:

#### SIZE 20 CONTACTS

<b>Contact Current Rating:</b>	7.5 amperes nominal.
<b>Initial Contact Resistance:</b>	0.008 ohms maximum.
<b>Proof Voltage:</b>	1000 V r.m.s.

#### SIZE 8 CONTACTS

##### POWER CONTACTS

**Contact Current Rating - Tested per U.L. 1977:**

<b>QB7W2 MTCA.0 48V:</b>	70 amperes nominal.
<i>See Temperature Rise Curve on page 49 for details.</i>	

<b>QB9W4 MTCA.0 24V:</b>	85 amperes nominal.
--------------------------	---------------------

*Table 7-32 of MTCA.0 R1.0 - MicroTCA 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 Positronic QB9W4 connector meets this requirement.*

<b>QBH5W5 / QBH15W4 MTCA.1 12V:</b>	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 meet this requirement.*

<b>Initial Contact Resistance:</b>	0.0005 ohms max. per IEC 512-2, Test 2b.
------------------------------------	---

<b>Proof Voltage:</b>	1000 V r.m.s.
-----------------------	---------------

#### CONNECTOR

<b>Insulator Resistance:</b>	5 G ohms.
<b>Working Voltage:</b>	300 V r.m.s.

#### CLEARANCE AND CREEPAGE DISTANCE:

<b>Between Power Contacts:</b>	0.06 inch [1.5 mm], minimum
<b>Between Signal Contacts:</b>	0.02 inch [0.4 mm], minimum
<b>Between Power and Signal Contacts:</b>	0.06 inch [1.5 mm], minimum
<b>Between Power Contacts and Shelf GND:</b>	0.06 inch [1.5 mm], minimum
<b>Between Signal Contacts and Shelf GND:</b>	0.06 inch [1.5 mm], minimum

**NEW!**

## AIR COOLED RUGGEDIZED MicroTCA® SYSTEMS

12 VOLT INPUT POWER CONNECTORS PER MTCA.1, R1.0



**5W5**  
Five (5) Size 8 Contacts

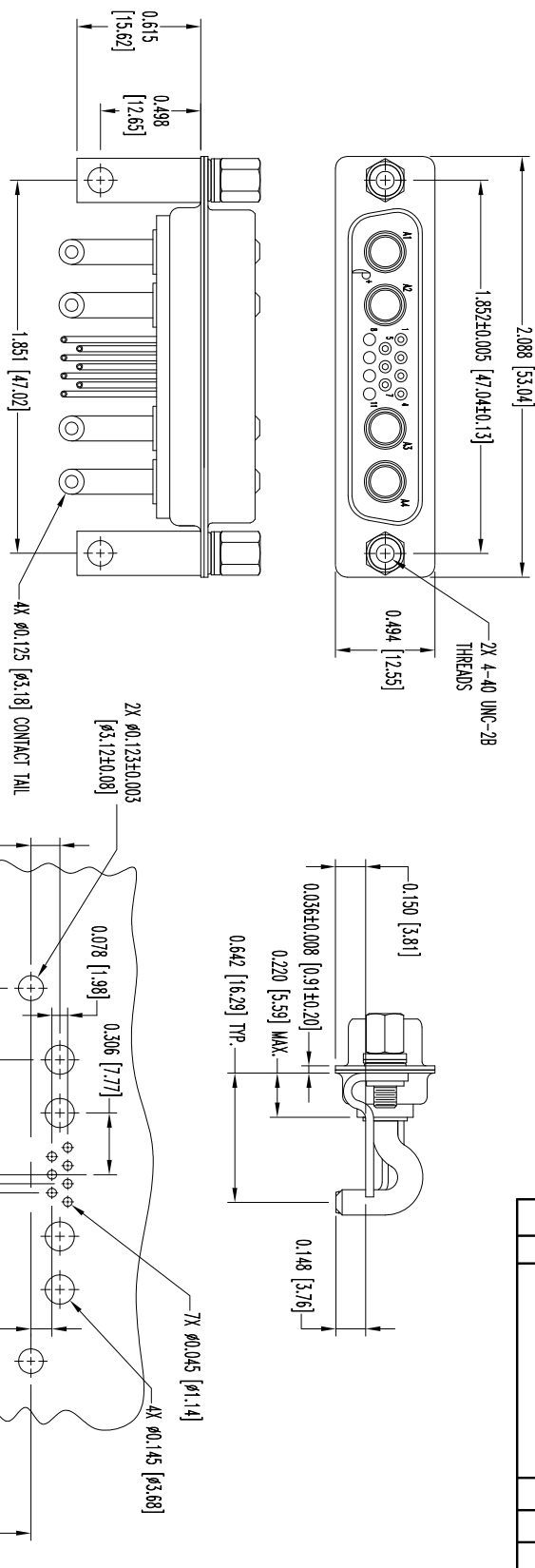


**15W4**  
Four (4) Size 8 Contacts and  
Eleven (11) Size 22 Contacts

**REVIEW THE FOLLOWING FIVE PAGES!**

Contact Technical Sales for additional information.

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- NOTES:
- 1. MATERIALS AND FINISHES:**  
INSULATOR: GLASS FILLED POLYESTER PER MIL-M-24519, UL 94V-0, COLOR: BLUE.  
CONTACTS: COPPER ALLOY, GOLD FLASH OVER NICKEL PLATE.  
SHEATHS: STEEL, ZINC PLATE WITH CHROMATE SEAL.  
MOUNTING BRACKETS: BRASS, ZINC PLATE WITH CHROMATE SEAL.  
JACKSCREWS: STEEL, ZINC PLATE WITH CHROMATE SEAL.
  - 2. ELECTRICAL CHARACTERISTICS:**  
SIGNAL CONTACTS:  
CONTACT CURRENT RATING: 10 AMPS NOMINAL.  
INITIAL CONTACT RESISTANCE: 0.008 OHMS MAX.  
POWER CONTACTS:  
CONTACT CURRENT RATING: 50 AMPS MIN. AT 30°C RISE.  
INITIAL CONTACT RESISTANCE: 0.0005 OHMS MAX.  
INSULATOR RESISTANCE: 5 G OHMS.  
WORKING VOLTAGE: 300 V r.m.s.  
TEMPERATURE RANGE: -55°C TO +125°C
  - 3. TEMPERATURE RANGE:** -55°C TO +125°C
  - 4. CONNECTOR IS ROHS COMPLIANT PER ROHS DIRECTIVE 2002/95/EC OF 27 JAN 2003.**
  - 5. DIMENSIONS ARE IN INCHES [MILLIMETERS]**

SK10923

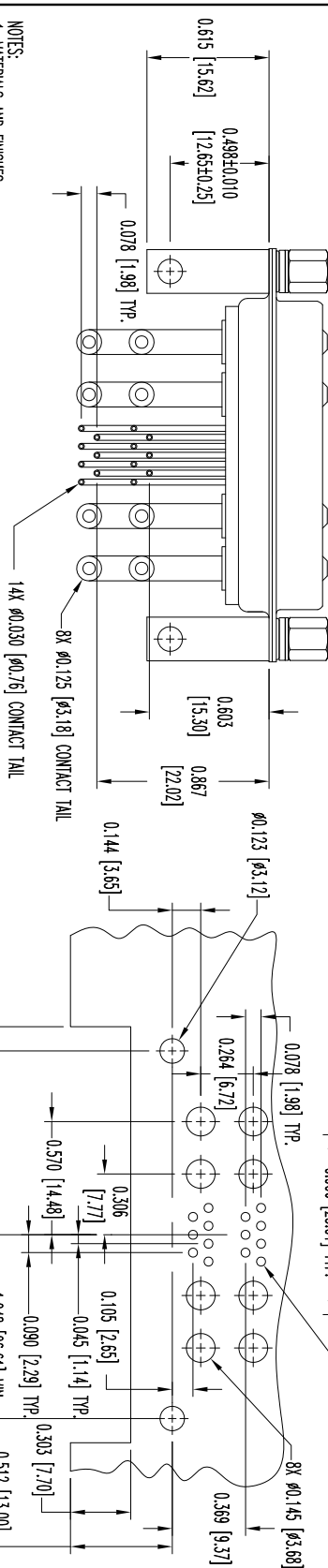
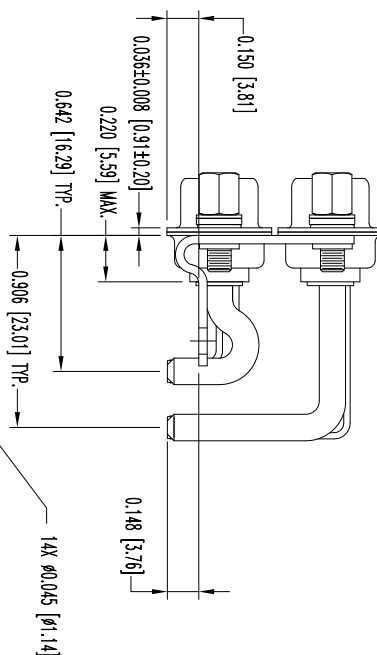
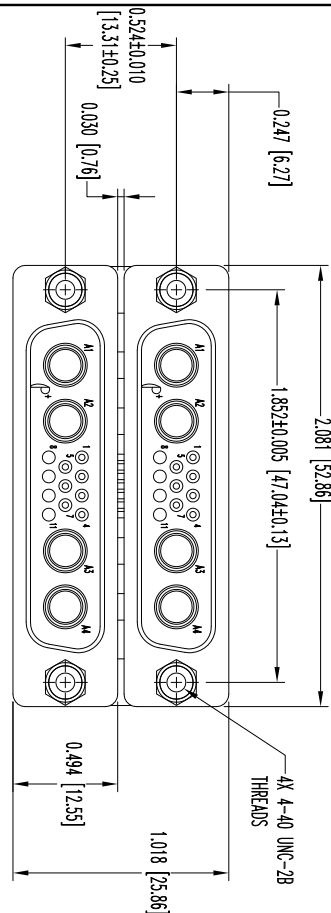
DATE/REV	REVISION RECORD	APP	DR	CK
7/16/09	ECO 31320	RCW	BS	COLB

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www.connectpositronic.com			
QD SERIES	SCALE	DRAWN BY	APPROVED BY
±0.015 [0.38]	N.T.S.	B. SHREVELEY	R. WILLIAMS
TITLE	QD SERIES	QD SERIES	QD SERIES
DATE	7-16-09	DRAWING NUMBER	SK10923
ANGULAR TOL.	±5°	REV.	NC

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CONTACT HOLE PATTERN

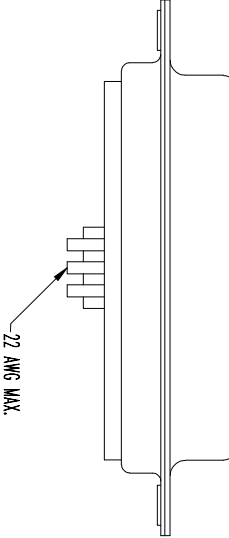
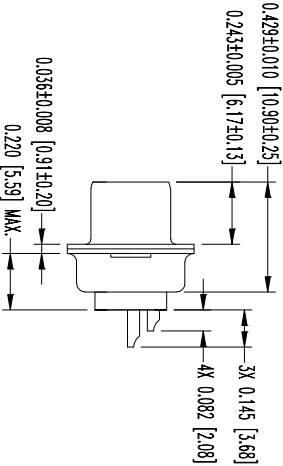
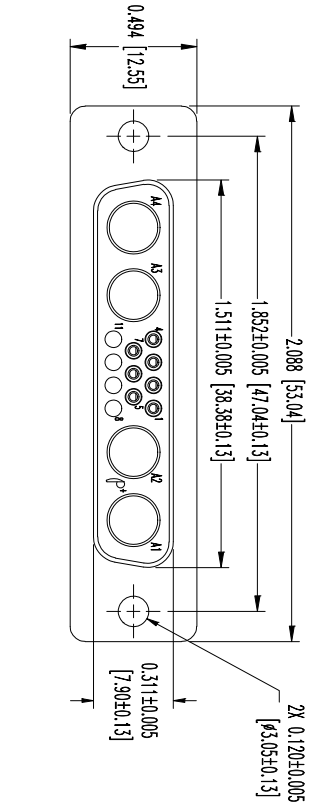
- NOTES:
1. MATERIALS AND FINISHES:  
INSULATORS: GLASS FILLED POLYESTER PER MIL-M-24519,  
UL 94V-0, BLUE COLOR.  
CONTACTS: PRECISION MACHINED COPPER ALLOY, GOLD FLASH OVER NICKEL PLATE.  
SHEETS: STEEL WITH ZINC PLATE WITH CHROMATE SEAL.  
MOUNTING BRACKETS: BRASS WITH ZINC PLATE WITH CHROMATE SEAL.
  2. ELECTRICAL CHARACTERISTICS:  
SIGNAL CONTACTS: 10 AMPS NOMINAL.  
INITIAL CONTACT RESISTANCE: 0.008 OHMS MAXIMUM.  
POWER CONTACTS: 50 AMPS MINIMUM AT 30° C RISE.  
INITIAL CONTACT RESISTANCE: 0.0005 OHMS MAXIMUM.  
INSULATOR RESISTANCE: 5 G OHMS.  
WORKING VOLTAGE: 300 V r.m.s.  
TEMPERATURE RANGE: -55°C TO +125°C.
  3. CONNECTORS ARE ROHS COMPLIANT PER ROHS DIRECTIVE 2002/95/EC OF 27 JAN. 2003.
  4. DIMENSIONS ARE IN INCHES [MILLIMETERS].

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QD SERIES	SCALE	N.T.S.	DRAWN BY	TK	
QD15W4MR7T2/15W4MR7T20/AA	TITLE		APPROVED BY	TK	
6-22-09	DATE	SK10856	DRAWING NUMBER		REV.
					NC





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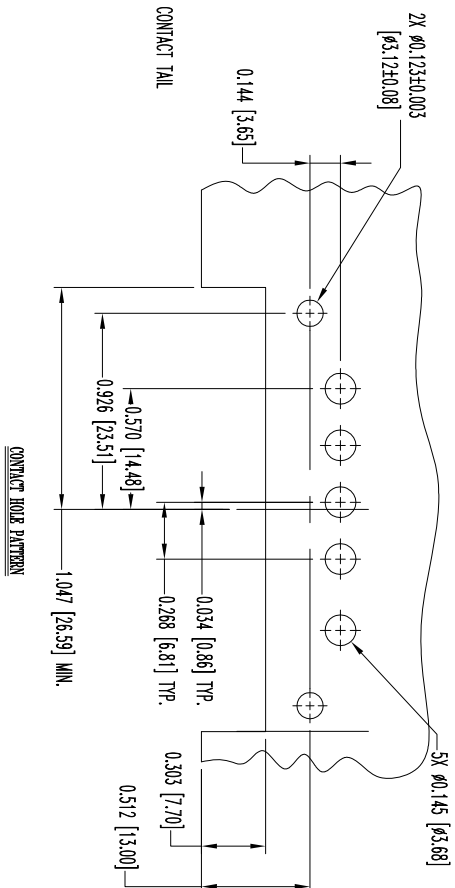
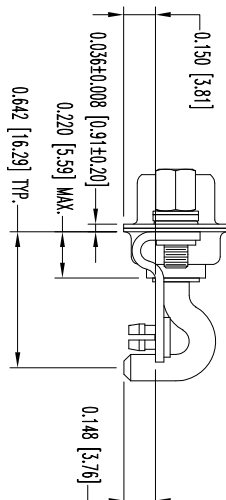
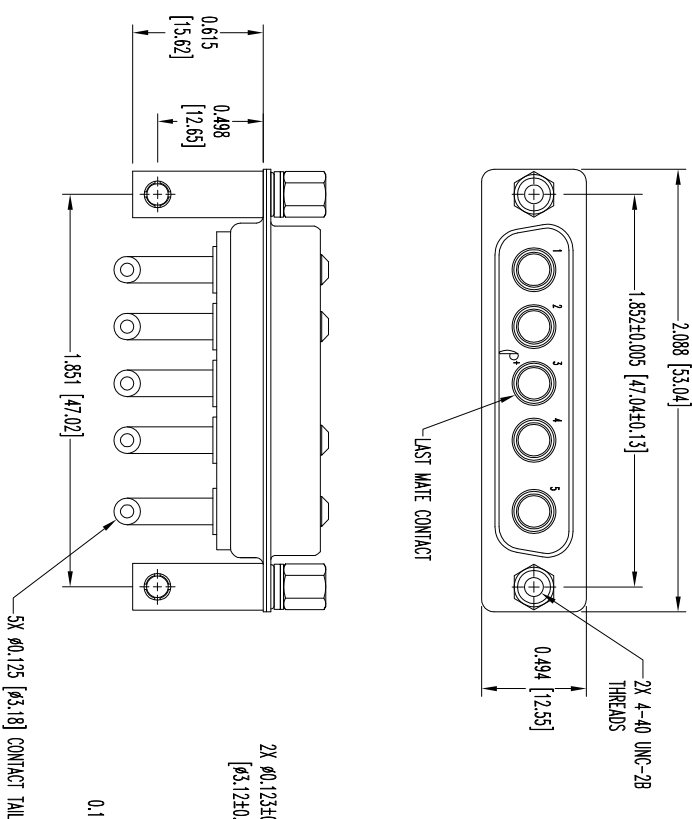


- NOTES:
1. MATERIALS AND FINISHES:  
INSULATOR: GLASS FILLED POLYESTER PER MIL-W-24519, BLUE.  
CONTACTS: BRASS, GOLD FLASH OVER NICKEL PLATE.  
SHELS: STEEL, ZINC PLATED WITH DICHROMATE SEAL.
  2. ELECTRICAL CHARACTERISTICS:  
SIGNAL CONTACTS: CONTACT CURRENT RATING: 10 AMPERES NOMINAL.  
INITIAL CONTACT RESISTANCE: 0.008 OHMS MAXIMUM.
  3. CONNECTORS ARE RoHS COMPLIANT PER ROHS DIRECTIVE 2002/95/EC OF 27 JAN. 2003.
  4. DIMENSIONS ARE IN INCHES [MILLIMETERS].

DATE	REV	REVISION	RECORD	APP	DR	CK
6-23-09	NC	ECO	31215	TK	TK	TK
6-23-09	A	ECO	31397	RCM	TK	TK

SK10857

		POSITRONIC INDUSTRIES INC.	
SPRINGFIELD, MISSOURI 65801			
DEQUAL TOL. ± 0.015 [0.38]	QB SERIES	SCALE N.T.S.	DRAWN BY T. MEYER
ANGULAR TOL. ± 3°	DATE 6-23-09	DRAWING NUMBER SK10857	REV. NC






## NOTES

1. MATERIALS AND FINISHES:  
INSULATORS: GLASS FILLED POLYESTER PER MIL-W-24519, UL 94V-0, COLOR: BLUE.  
POWER CONTACTS: HIGH CONDUCTIVITY COPPER ALLOY, GOLD FLASH OVER NICKEL PLATE.  
SHELLS: STEEL, ZINC PLATE WITH CHROMATE SEAL.  
MOUNTING BRACKETS: BRASS, ZINC PLATE WITH CHROMATE SEAL.  
JACKSCREWS: STEEL, ZINC PLATE WITH CHROMATE SEAL.  
WASHERS: BRASS, ZINC PLATE WITH CHROMATE SEAL.  
RIVETS: BRASS, ZINC PLATE WITH CHROMATE SEAL.  
PUSH FASTENERS: BERYLLIUM COPPER WITH TIN PLATE.
2. ELECTRICAL CHARACTERISTICS:  
POWER CONTACTS: 50 AMPS MIN AT 30°C RISE.  
INITIAL CONTACT RESISTANCE: 0.0005 OHMS MAX.  
INSULATOR RESISTANCE: 5 G OHMS.  
WORKING VOLTAGE: 300 V rms.
3. TEMPERATURE RANGE: -55°C TO +125°C
4. CONNECTORS ARE ROHS COMPLIANT PER ROHS DIRECTIVE 2002/95/EC OF 27 JAN 2003.
5. DIMENSIONS ARE IN INCHES [MILLIMETERS].

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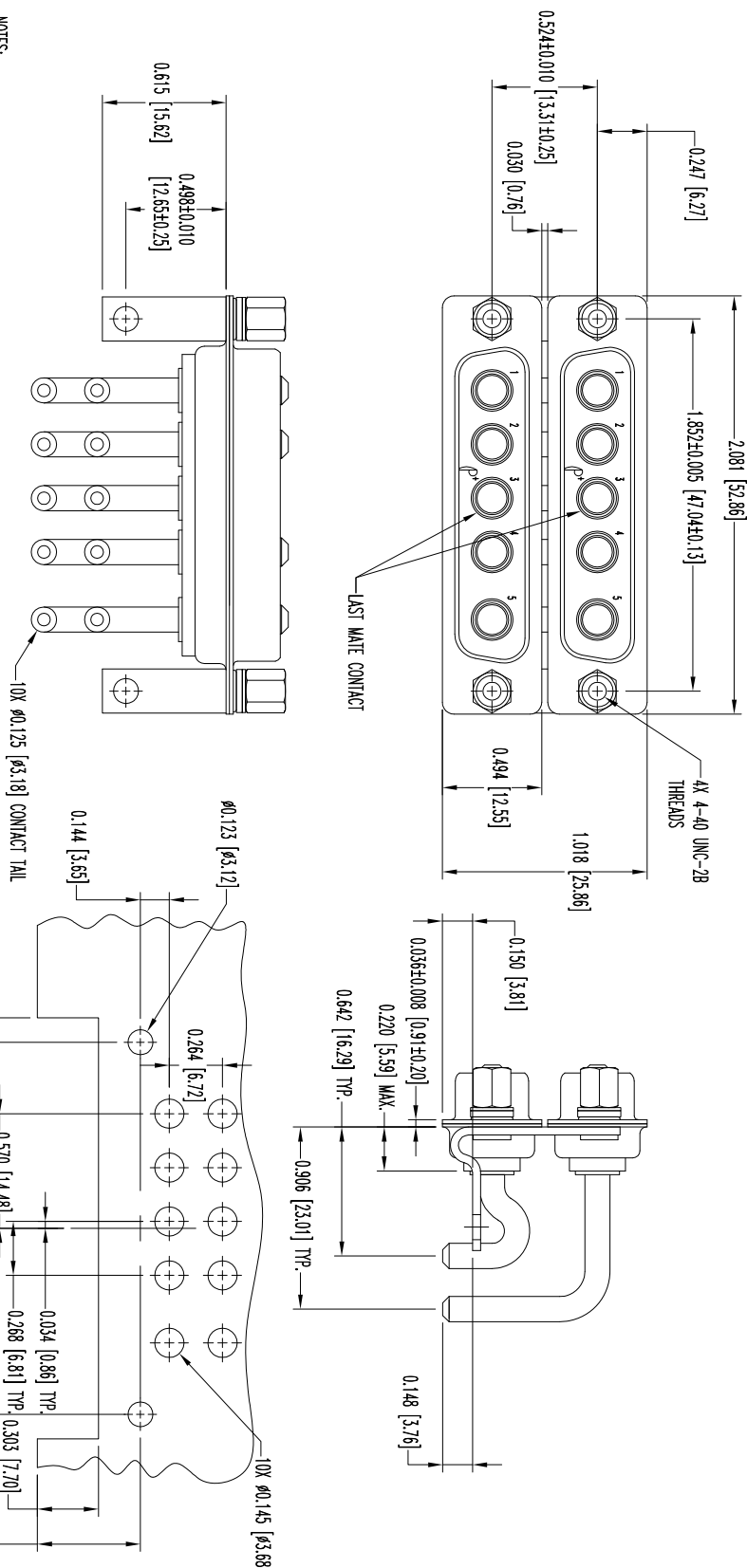
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4-9-69	NC	ECO 30914	RCW	TK	TK
7-22-69	A	ECO 31338	TK	BS	TK

		<b>POSITRONIC INDUSTRIES INC.</b> www.connectpositronic.com FSCM 261968	
 DECIMAL TOL. $\pm 0.015$ [0.38]		QP SERIES	
TITLE QBH5W5M57R7N7P20/AA		SCALE N.T.S.	DRAWN BY T. KAPPELY
DATE 4-9-09		APPROVED BY RCW	
ANGLE/TOL. $\pm 0^\circ$		DRAWING NUMBER SK10527	
REV. A			



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SK10526

DATE	REV	REVISION RECORD	APP	DR	CK
4-9-09	NC	ECO 30914	RCW	TK	TK
7-22-09	A	ECO 31338	TK	BS	TK



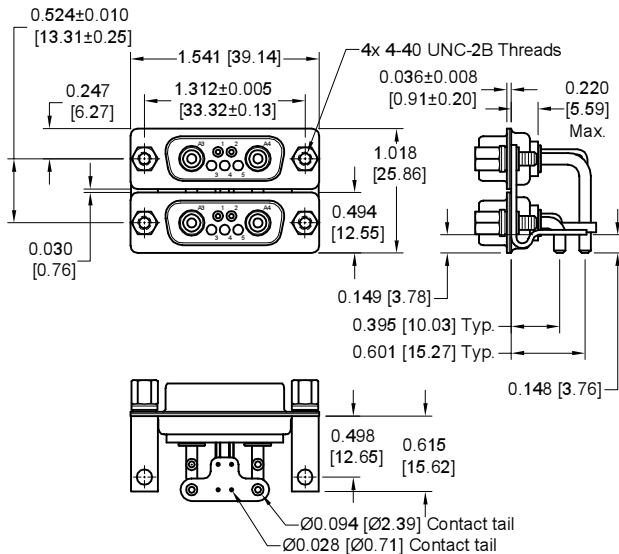
- NOTES:
1. MATERIALS AND FINISHES:  
INSULATORS: GLASS FILLED POLYESTER PER MIL-W-24719, UL 94V-0, COLOR: BLUE.  
CONTACTS: PRECISION MACHINED COPPER ALLOY, GOLD FLASH OVER NICKEL PLATE.  
SHELLS: STEEL, ZINC PLATE WITH CHROMATE SEAL.  
MOUNTING BRACKETS: BRASS, ZINC PLATE WITH CHROMATE SEAL.
  2. ELECTRICAL CHARACTERISTICS:  
POWER CONTACTS: 50 AMPS MIN AT 30°C RISE.  
INITIAL CONTACT RESISTANCE: 0.0005 OHMS MAX.  
INSULATOR RESISTANCE: 5 G OHMS.  
WORKING VOLTAGE: 300 V r.m.s.  
TEMPERATURE RANGE: -55°C TO +125°C  
4. CONNECTORS ARE ROHS COMPLIANT PER ROHS DIRECTIVE 2002/95/EC OF 27 JAN 2003.  
5. DIMENSIONS ARE IN INCHES [MILLIMETERS].

		<b>POSITRONIC INDUSTRIES INC.</b> www.connectpositronic.com		PSC# 26108	
		QP SERIALS		SCALE	
DECIMAL TOL. $\pm$ 0.015 [0.38]		TITLE		N.T.S.	
		QBH5W5MR7T2 / 5W5MR7T20 / AA		DRAWN BY T. KAPLEY	
				APPROVED BY RCW	
ANGLE TOL. $\pm$ 5°		DATE 4-9-09		DRAWING NUMBER SK10526	
				REV. A	



### RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR - 48 VOLT

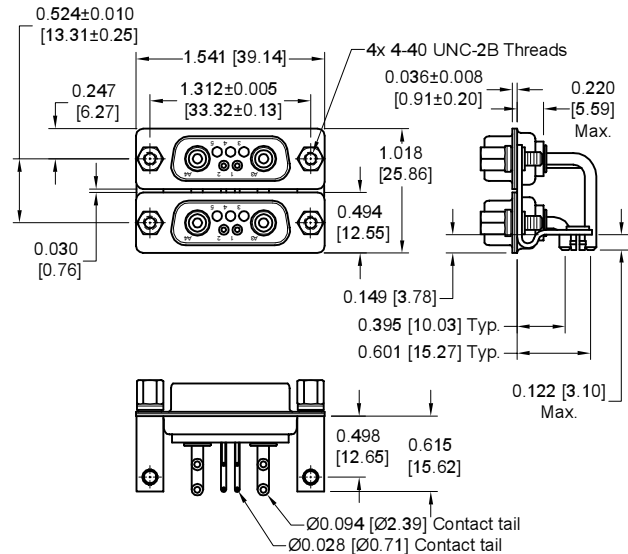
CONTACT POSITIONS A1 AND A2 ARE FIRST TO MATE. CONTACT POSITIONS 1 AND 2 ARE LAST TO MATE.



#### DUAL PORT

Typical part number:

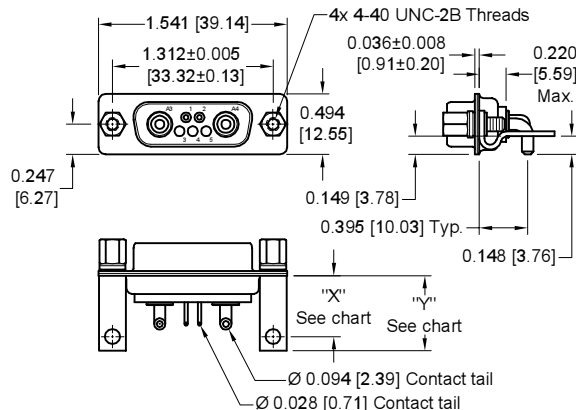
**QB7W2MR7T2/7W2MR7T20/AA**



#### INVERTED DUAL PORT

Typical part number:

**QB7W2MN7T2/7W2MN7T20/AA-1845.0**



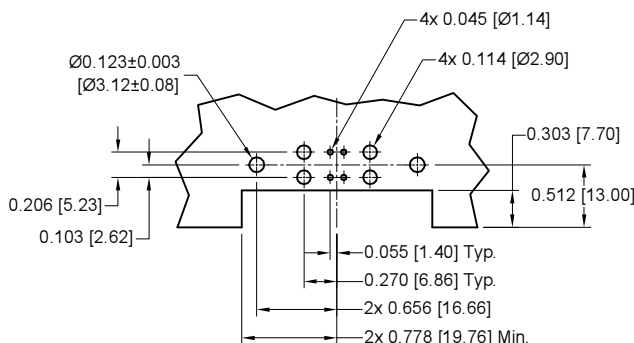
#### UNI PORT

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

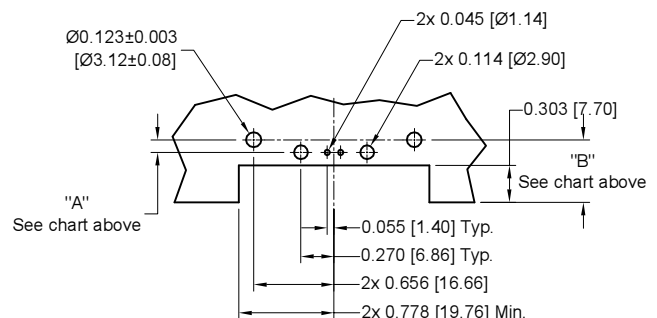
#### UNI PORT TYPICAL PART NUMBERS CODE 56

TYPICAL PART NUMBER	X	Y	A	B
QB7W2M56R70T20	0.498 [12.65]	0.615 [15.62]	0.103 [2.62]	0.512 [13.00]
QB7W2M56R70T20-1865.0	0.395 [10.03]	0.512 [13.00]	0.000 [0.00]	0.409 [10.39]

### RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONTACT HOLE PATTERN - 48 VOLT



#### DUAL PORT

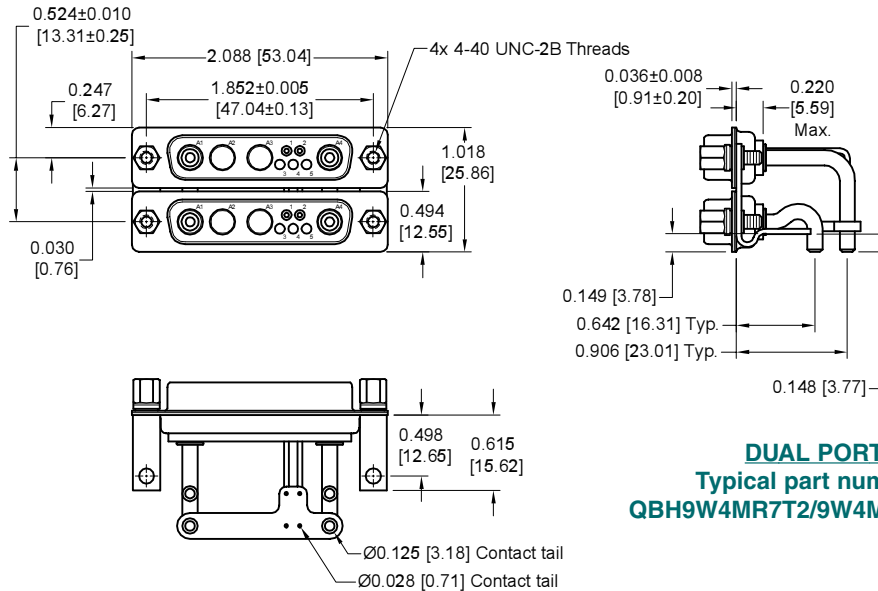


#### UNI PORT

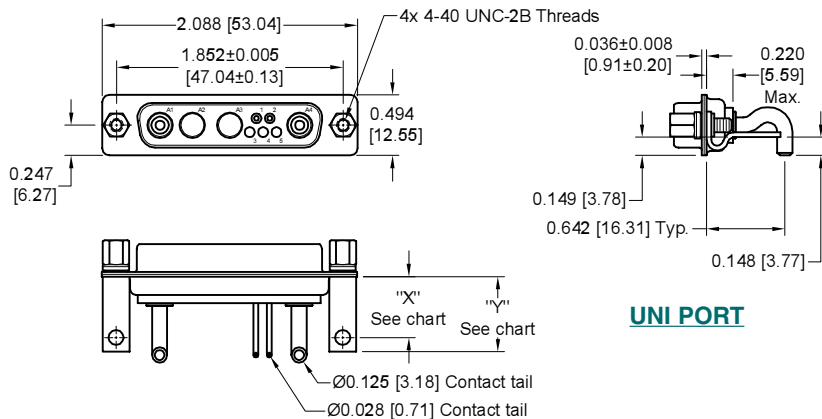


## RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR - 24 VOLT

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



**DUAL PORT**  
Typical part number:  
QBH9W4MR7T2/9W4MR7T20/AA

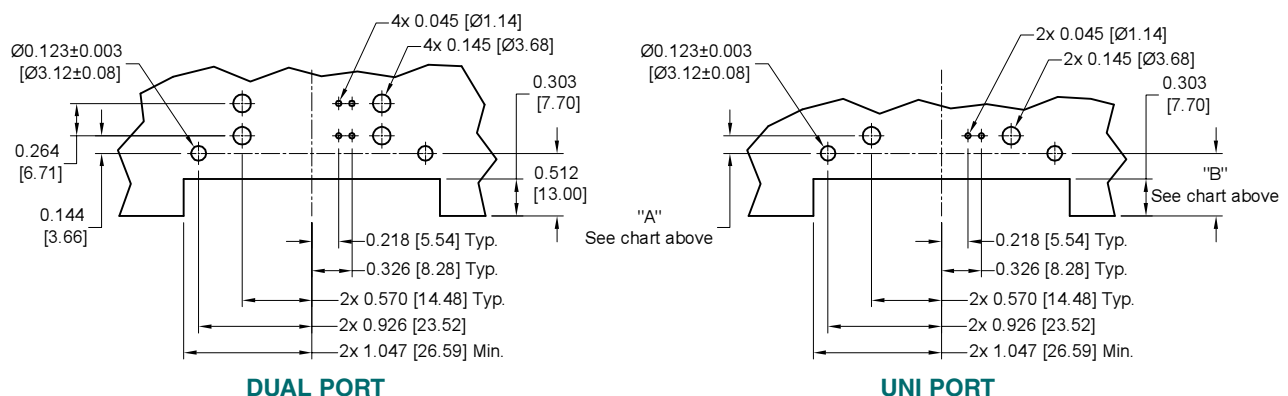


**UNI PORT**

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 CODE 57				
TYPICAL PART NUMBER	X	Y	A	B
QBH9W4M57R70T20/AA	0.498 [12.65]	0.615 [15.62]	0.144 [3.66]	0.512 [13.00]
QBH9W4M57R70T20/AA-1865.0	0.395 [10.03]	0.512 [13.00]	0.247 [6.27]	0.409 [10.39]

## RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONTACT HOLE PATTERN - 24 VOLT



**DUAL PORT**

**UNI PORT**

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



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## MicroTCA POWER INPUT CONNECTORS

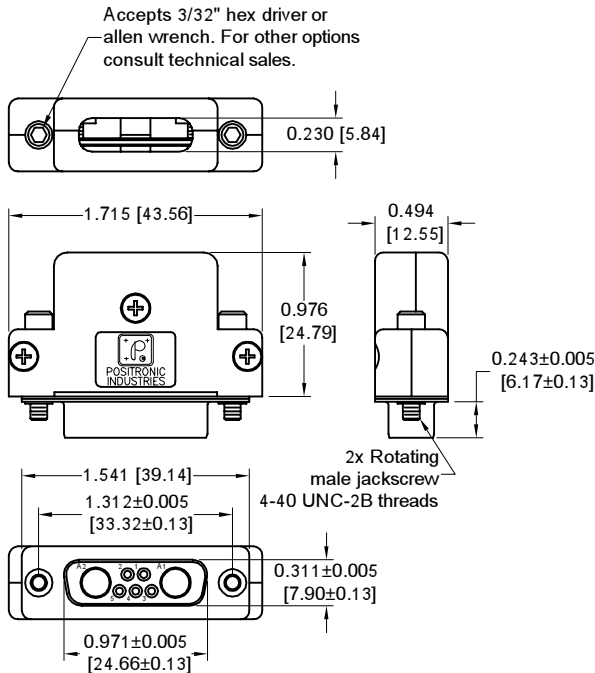
Combo-D  
D-Sub

### CABLE CONNECTOR

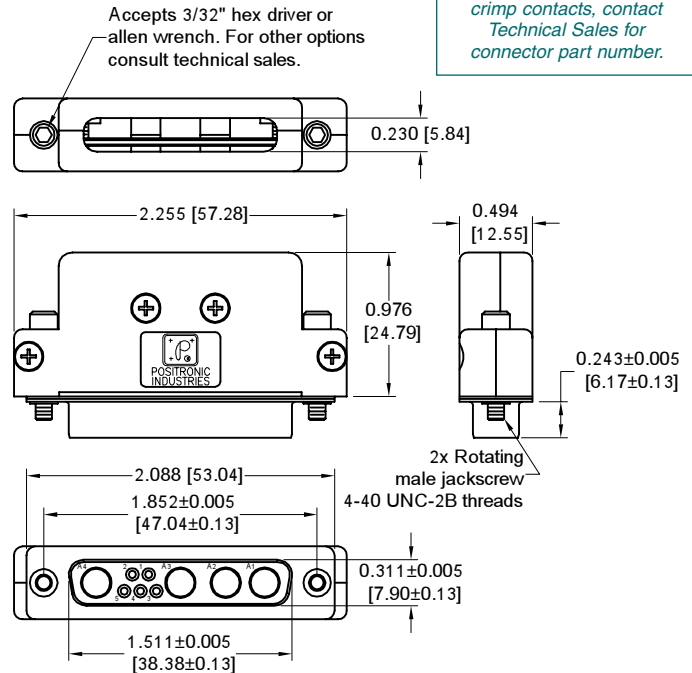
\*1 CONTACTS ARE NOT SUPPLIED IN CONNECTOR AND NEED TO BE ORDERED SEPARATELY  
SEE PAGES 54 FOR CONTACT PART NUMBERS

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

\*1 Note: Connectors can be kitted with all applicable crimp contacts, contact Technical Sales for connector part number.



Typical part number: QB7W2S00QH0/AA

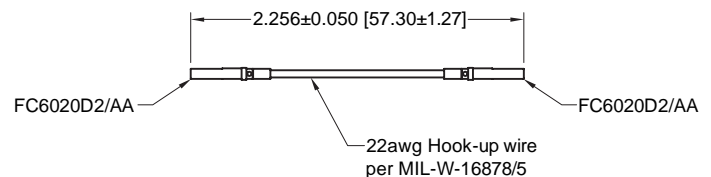


Typical part number: QB9W4S00QH0/AA

### ELECTRICAL BRIDGE

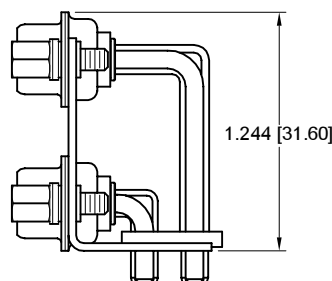
MicroTCA applications may require contact positions 1 and 2 be electrically bridged.

Order part number **CC2805/AA-V01**

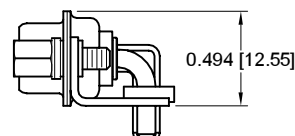


### STANDARD D-SUBMINIATURE MOUNTING BRACKET

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.

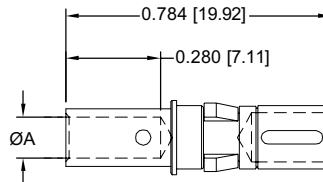
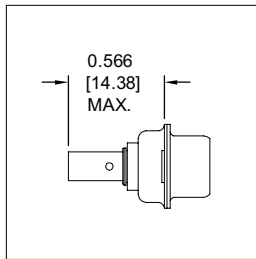
## REMOVABLE CRIMP POWER CONTACTS

### CODE 11 AND 12

\*1 CONTACTS ARE NOT SUPPLIED IN CONNECTOR AND NEED TO BE ORDERED SEPARATELY

#### \*1 FEMALE CONTACT

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



PART NUMBER	WIRE SIZE [AWG] mm <sup>2</sup>	ØA
FC4012D/AA-1817.0	12 [4.0]	0.101 [2.57]
FC4008D/AA-1817.0	8 [10.0]	0.181 [4.60]

\*1 Note: Connectors can be kitted with all applicable crimp contacts, contact Technical Sales for connector part number.

**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

\*1 **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 81-89.

## REMOVABLE CRIMP SIGNAL CONTACTS

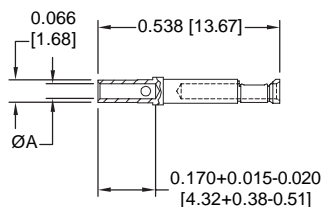
### CODE 0, 11 AND 12

\*1 CONTACTS ARE NOT SUPPLIED IN CONNECTOR AND NEED TO BE ORDERED SEPARATELY

#### CLOSED CRIMP BARREL

#### FEMALE CONTACT

"CLOSED ENTRY" DESIGN



PART NUMBER	WIRE SIZE AWG/[mm <sup>2</sup> ]	AØ
FC6020D2/AA	20 / 22 / 24 [0.5/0.3/0.25]	0.045 [1.14]

\*1 Note: Connectors can be kitted with all applicable crimp contacts, contact Technical Sales for connector part number.

**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: FC6020D/AA-14.  
0.000050 inch [1.27µ] gold over nickel by adding "-15" suffix onto part number. Example: Example: FC6020D/AA-15.

For crimping information and crimp tools, see Application Tools section, page 81-89.



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## MicroTCA POWER INPUT CONNECTORS

Combo-D  
D-Sub

### MALE ORDERING INFORMATION - CODE NUMBERING SYSTEMS

SPECIFY COMPLETE CONNECTOR BY SELECTING AN OPTION FROM STEP 1 THROUGH 9

### DUAL PORT CONNECTORS

STEP	1	2	3	4	5	6	7	8	9	10	
EXAMPLE	QB	7W2	M	R7T2	7W2	M	R7T2	0	/AA	-14	
<b>UPPER CONNECTOR</b>					<b>LOWER CONNECTOR</b>						
<b>STEP 1 - BASIC SERIES</b> QB Series (7W2 variant) QBH Series (5W5, 9W4 and 15W4 variant)											
<b>STEP 2 - CONNECTOR VARIANTS</b> 5W5, 7W2, 9W4, 15W4											
<b>STEP 3 - CONNECTOR GENDER</b> M - Male											
<b>STEP 4 - LOCKING, POLARIZING, MOUNTING AND PUSH-ON FASTENER SYSTEMS</b> 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 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 T2 - Fixed Female Jackscrews											
<b>OPTIONS ARE THE SAME AS FOR UPPER CONNECTOR STEPS 2, 3, AND 4</b>											
<b>STEP 10 - SPECIAL OPTIONS</b> FOR SPECIAL OPTIONS, SEE SPECIAL OPTIONS APPENDIX ON PAGE 89.											
<b>STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS</b> /AA - Compliant per EU Directive 2002/95/EC (RoHS)											
<b>NOTE: This step should be included to create a standard part number.</b> Example: QB7W2MR7T2/7W2MR7T20/AA											
<b>STEP 8 - SHELL OPTIONS</b> 0 - Zinc Plated, with Chromate Seal. *S - Stainless Steel, passivated. X - Tin Plated. Z - Tin Plated and Dimpled (male connectors only).											



**NOTE:** \*1 For stainless steel dimpled male versions, contact Technical Sales.

For crimping information and crimp tools, see Application Tools section, pages 81-89.

### MALE ORDERING INFORMATION - CODE NUMBERING SYSTEMS

SPECIFY COMPLETE CONNECTOR BY SELECTING AN OPTION FROM STEP 1 THROUGH 9

### UNI PORT CONNECTORS

STEP	1	2	3	4	5	6	7	8	9	10
EXAMPLE	QB	7W2	M	56	R7	0	T2	0	/AA	-14
<b>STEP 1 - BASIC SERIES</b> QB Series (7W2 variant) QBH Series (5W5, 9W4 and 15W4 variant)										
<b>STEP 2 - CONNECTOR VARIANTS</b> 5W5, 7W2, 9W4, 15W4										
<b>STEP 3 - CONNECTOR GENDER</b> M - Male										
<b>STEP 4 - CONTACT TERMINATION</b> 56 - Solder, Right Angle (90°) Printed Board Mount with Signal and 0.094 [2.39] Ø Power Contacts, 0.395 [10.03] Signal Contact Extension. <i>Available for 7W2 variant.</i> 57 - Solder, Right Angle (90°) Printed Board Mount with Signal and 0.125 [3.18] Ø Power Contacts, 0.642 [16.29] Signal Contact Extension. <i>Available for 5W5, 9W4 and 15W4 variants.</i>										
<b>STEP 5 - MOUNTING STYLE</b> 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										
<b>STEP 10 - SPECIAL OPTIONS</b> FOR SPECIAL OPTIONS, SEE SPECIAL OPTIONS APPENDIX ON PAGE 89.										
<b>STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS</b> /AA - Compliant per EU Directive 2002/95/EC (RoHS)										
<b>Note: This step should be included to create a standard part number.</b> Example: QB7W2M56R70T20/AA										
<b>STEP 8 - SHELL OPTIONS</b> 0 - Zinc Plated, with Chromate Seal. *S - Stainless Steel, passivated. X - Tin Plated. Z - Tin Plated and Dimpled (male connectors only).										
<b>STEP 7 - LOCKING AND POLARIZING SYSTEMS</b> T2 - Fixed Female Jackscrews.										
<b>STEP 6 - HOODS AND PUSH-ON FASTENERS</b> 0 - None N - Push-on Fastener, for Right Angle (90°) Mounting Brackets										



**NOTE:** \*1 For stainless steel dimpled male versions, contact Technical Sales.



## FEMALE ORDERING INFORMATION - CODE NUMBERING SYSTEM

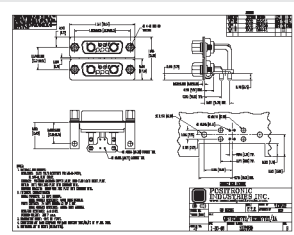
Specify Complete Connector By Selecting An Option From Step 1 Through 9

### CABLE CONNECTORS

STEP	1	2	3	4	5	6	7	8	9	10
EXAMPLE	QB	7W2	S	0	0	Q	H	0	/AA	-14
<b>STEP 1 - BASIC SERIES</b> QB Series										
<b>STEP 2 - CONNECTOR VARIANTS</b> 7W2 9W4										
<b>STEP 3 - CONNECTOR GENDER</b> S - Female PosiBand Closed Entry Signal Contacts <i>Open Entry Signal Contacts are available and can be ordered separately, see page 73.</i>										
<b>STEP 4 - CONTACT TERMINATION</b> 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 [0.5mm <sup>2</sup> -0.25mm <sup>2</sup> ]. 11 - Signal contacts, 20 AWG-24 AWG [0.5mm <sup>2</sup> -0.25mm <sup>2</sup> ] with FC4012D-1817.0 power contacts. 12 - Signal contacts, 20 AWG-24 AWG [0.5mm <sup>2</sup> -0.25mm <sup>2</sup> ] with FC4008D-1817.0 power contacts.										
<b>STEP 5 - MOUNTING STYLE</b> 0 - None										
<b>STEP 6 - HOODS</b> Q - Hood, Top Opening, Plastic										
<b>STEP 7 - LOCKING AND POLARIZING SYSTEMS</b> H - Rotating male jackscrew with internal hex for 3/32 hex drives.										
<b>STEP 8 - SHELL OPTIONS</b> 0 - Zinc Plated, with Chromate Seal. S - Stainless Steel, passivated. X - Tin Plated.										
<b>STEP 9 - ENVIRONMENTAL COMPLIANCE OPTIONS</b> /AA - Compliant per EU Directive 2002/95/EC (RoHS)   <b>Note: This step should be included to create a standard part number. Example: QB7W2S00QH0/AA</b>										
<b>STEP 10 - SPECIAL OPTIONS</b>  <b>FOR SPECIAL OPTIONS, SEE SPECIAL OPTIONS APPENDIX ON PAGE 89.</b>										

For crimping information and crimp tools, see Application Tools section, pages 81-89.

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



SK Drawing



3-dimensional model

**Contact Technical Sales for ordering information for cable versions of the 5W5 and 15W4 variants.**



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## COMBO-D CONNECTOR SAVERS GENDER CHANGERS

Combo-D  
D-Sub

**Professional Quality Connectors**  
**ACBDP Series**  
**Size 20 "Open Entry" or**  
**PosiBand® "Closed Entry"**  
**Contact Design**

**Industrial /Military Quality**  
**Connectors - ACBMP Series**  
**Size 20 PosiBand®**  
**"Closed Entry" Contact Design**  
**Connector Saver**



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.



**For RoHS options**  
**see page 60.**

## TECHNICAL CHARACTERISTICS

### MATERIALS AND FINISHES:

**Insulator:** Glass filled polyester per MIL-M-24519 UL 94V-0, blue color.

### SIGNAL CONTACTS

**ACBDP Series:** Precision machined high tensile copper alloy open entry design.

**ACBMP Series:** Precision machined copper alloy *PosiBand closed entry design.*

**POWER CONTACTS:** Precision machined copper alloy closed entry design.

### Contact Plating:

**ACBDP Series:** Gold flash over nickel plate.

**ACBMP Series:** 0.000050 [1.27µ] gold over nickel plate.

### Shells:

Steel or brass with tin plate; zinc plate with chromate seal; stainless steel passivated. Other materials and finishes available upon request.

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

Non-magnetic versions are available, contact Technical Sales.

### MECHANICAL CHARACTERISTICS:

#### FIXED CONTACTS:

##### Signal Contacts:

Size 20 contacts, male - 0.040 inch [1.02 mm] diameter. ACBDP series has female open entry contact or PosiBand closed entry contacts optional, see page 69 for details. ACBMP series offer female PosiBand closed entry contacts.

##### Power Contacts:

Size 8 contacts, male - 0.142 inch [3.61 mm] diameter. Female contact features Large Surface Area (L.S.A.) closed entry contact design utilizing BeCu mechanical retention member.

## TECHNICAL CHARACTERISTICS, *continued*

*continued from previous page. . .*

### MECHANICAL CHARACTERISTICS, *continued*:

<b>Connector Saver:</b>	Male to female or male to male.
<b>Contact Retention:</b>	
<b>Signal:</b>	9 lbs. [40 N].
<b>Power:</b>	22 lbs. [98 N].
<b>Shells:</b>	Male shells may be dimpled for EMI/ESD ground paths.
<b>Polarization:</b>	Trapezoidally shaped shells.
<b>Mechanical Operations:</b>	
<b>ACBDP Series:</b>	500 operations, minimum, per IEC 512-5.
<b>ACBMP Series:</b>	1,000 operations, minimum, per IEC 512-5.

### ELECTRICAL CHARACTERISTICS:

#### SIZE 20 CONTACTS

<b>Contact Current Rating:</b>	7.5 amperes, nominal.
<b>Initial Contact Resistance:</b>	0.008 ohms, maximum.
<b>Proof Voltage:</b>	1,000 V r.m.s.

#### SIZE 8 CONTACTS

#### POWER CONTACTS

<b>Contact Current Rating:</b>	70 amperes, per U.L. 1977.
<b>See Temperature Rise Curves on pages 1-2.</b>	
<b>Initial Contact Resistance:</b>	0.0005 ohms, maximum
<b>Proof Voltage:</b>	1,000 V r.m.s.

#### CONNECTOR

<b>Insulator Resistance:</b>	5 G ohms.
<b>Clearance and Creepage Distance:</b>	0.039 inch [1.0 mm], minimum.
<b>Working Voltage:</b>	300 V r.m.s.

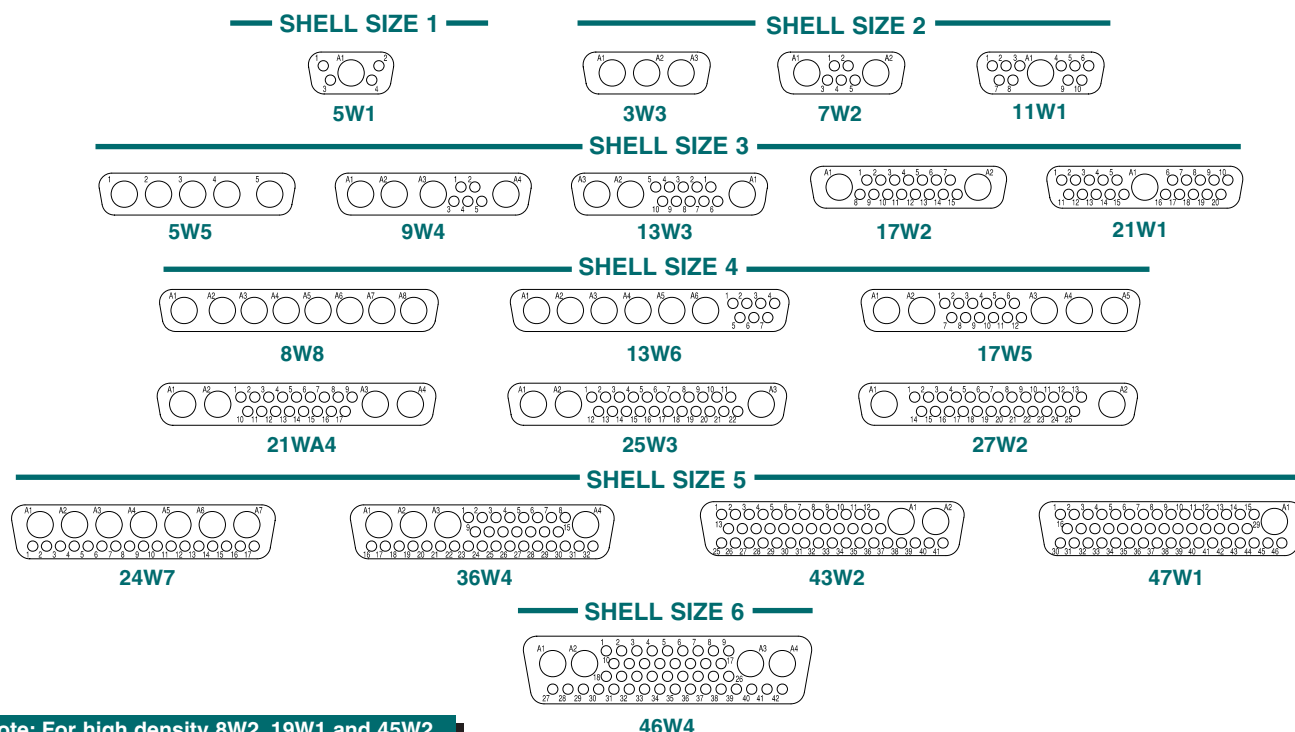
### CLIMATIC CHARACTERISTICS:

<b>Temperature Range:</b>	-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



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

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



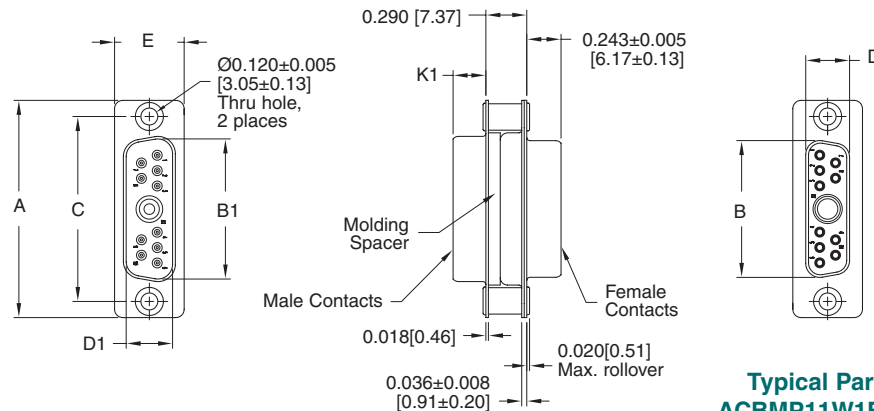
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## COMBO-D CONNECTOR SAVERS GENDER CHANGER

Combo-D  
D-Sub

### MALE TO FEMALE CONNECTOR SAVER SIZE 20 AND SIZE 8 CONTACTS CODE 0 AND S

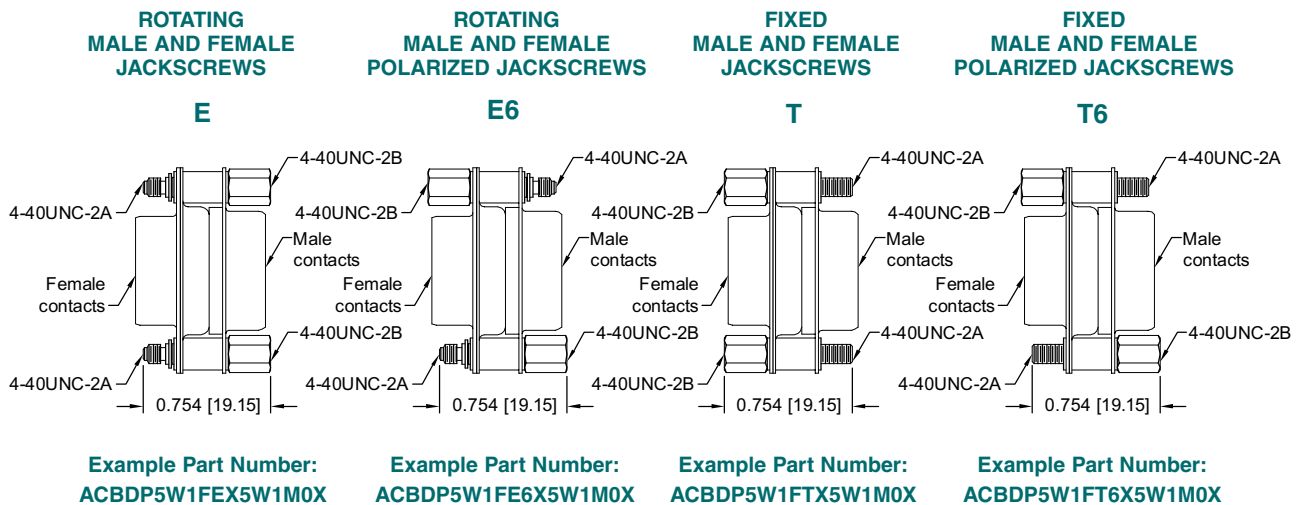
**NOTE:**  
Code S = Swaged  
spacer with 4-40  
UNC-2B threads.



**Typical Part Number:**  
**ACBMP11W1F0011W1M00**

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 [5.92]
SHELL SIZE 2	1.541 [39.14]	0.971 [24.66]	0.994 [25.25]	1.312 [33.32]	0.311 [7.90]	0.329 [8.36]	0.494 [12.55]	0.233 [5.92]
SHELL SIZE 3	2.088 [53.04]	1.511 [38.38]	1.534 [38.96]	1.852 [47.04]	0.311 [7.90]	0.329 [8.36]	0.494 [12.55]	0.230 [5.84]
SHELL SIZE 4	2.729 [69.32]	2.159 [54.84]	2.182 [55.42]	2.500 [63.50]	0.311 [7.90]	0.329 [8.36]	0.494 [12.55]	0.230 [5.84]
SHELL SIZE 5	2.635 [66.93]	2.064 [52.43]	2.079 [52.81]	2.406 [61.11]	0.423 [10.74]	0.441 [11.20]	0.605 [15.37]	0.230 [5.84]
SHELL SIZE 6	2.729 [69.32]	2.189 [55.60]	2.212 [56.18]	2.500 [63.50]	0.485 [12.32]	0.503 [12.78]	0.668 [16.97]	0.230 [5.84]

### JACKSCREW SYSTEMS CODE E, E6, T AND T6





## ORDERING INFORMATION - CODE NUMBERING SYSTEM

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

STEP	1	2	3	4	5	6	7	8	9	10	11
EXAMPLE	ACBDP	11W1	F	S	X	11W1	M	S	X	/AA	-14

### 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 - 1<sup>ST</sup> CONNECTOR GENDER

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

### \*2 STEP 4 - 1<sup>ST</sup> CONNECTOR MATING STYLE

0 - Swaged spacer 0.120 [3.05µ] mounting hole  
S - Swaged spacer 4-40 UNC-2B threads  
\*3 E - Rotating male and female jackscrews (Select 0 in Step 8)  
\*3 E6 - Rotating male and female polarized jackscrew (Select 0 in Step 8)  
\*3 T - Fixed male and female jackscrews (Select 0 in Step 8)  
\*3 T6 - Fixed male and female polarized jackscrew (Select 0 in Step 8)

### STEP 5 - 1<sup>ST</sup> CONNECTOR SHELL OPTION

0 - Zinc Plated, with Chromate Seal.  
\*4 S - Stainless Steel, passivated.  
X - Tin Plated.  
Z - Tin Plated and Dimpled (male connectors only).

### STEP 11 - SPECIAL OPTIONS

FOR SPECIAL OPTIONS, SEE SPECIAL OPTIONS APPENDIX ON PAGE 89.

### STEP 10 - ENVIRONMENTAL COMPLIANCE OPTIONS

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

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

### STEP 9 - 2<sup>ND</sup> CONNECTOR SHELL OPTION

0 - Zinc Plated, with Chromate Seal.  
\*4 S - Stainless Steel, passivated.  
X - Tin Plated.  
Z - Tin Plated and Dimpled (male connectors only).

### \*2 STEP 8 - 2<sup>ND</sup> CONNECTOR MATING STYLE

0 - Swaged spacer 0.120 [3.05µ] mounting hole  
S - Swaged spacer 4-40 UNC-2B threads  
\*3 E - Rotating male and female jackscrews (Select 0 in Step 4)  
\*3 E6 - Rotating male and female polarized jackscrew (Select 0 in Step 4)  
\*3 T - Fixed male and female jackscrews (Select 0 in Step 4)  
\*3 T6 - Fixed male and female polarized jackscrew (Select 0 in Step 4)

### STEP 7 - 2<sup>ND</sup> CONNECTOR GENDER

M - Male

### \*5 STEP 6 - 2<sup>ND</sup> CONNECTOR VARIANT

Select same variant as chosen in STEP 2.

### NOTES

\*1 Male option in Step 3 available only on connector variants 5W1, 3W3, 7W2, 11W1, 17W2, 21W1, 21WA4, 27W2, 24W7, 46W4.

\*2 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.

\*3 For hardware information, see page 59.

\*4 For stainless steel dimpled male versions, contact Technical Sales.

\*5 Connector variant for both connectors must be the same.



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## UNIQUE FEATURES

Combo-D  
D-Sub

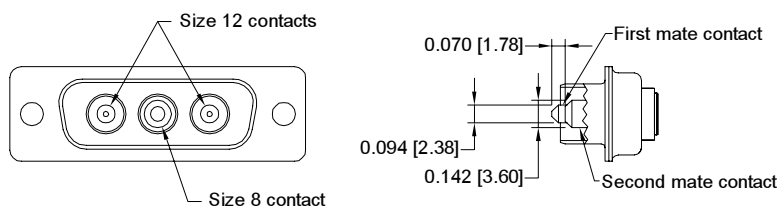


Positronic Industries is **known** around the world **for offering** our customers **flexibility** when choosing connectors.

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, we will be **happy to assist** you.

## SEQUENTIAL MATING CONTACTS



**Note:** A third level can be accomplished with signal contacts where applicable.

### Three levels of sequential mating are possible:

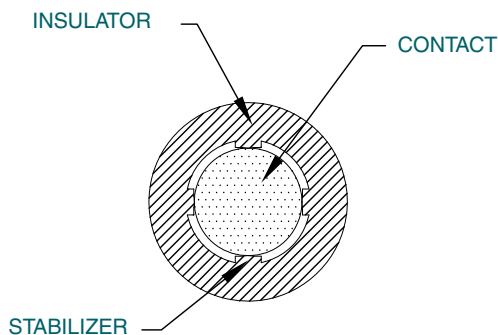
- First mate accomplished by a size 12 power contact. Male contact diameter is 0.094 inch.
- Second mate accomplished by a size 8 power contact. Male contact diameter is 0.142 inch.
- Third mate accomplished by size 20 signal contacts, as applicable.

**CONTACT TECHNICAL SALES FOR MORE INFORMATION!**

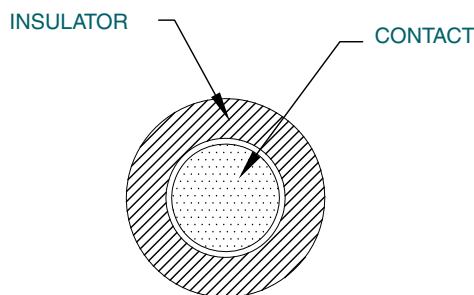


## SIZE 8 CONTACT STABILIZATION FEATURE

MINIMIZES FLOAT IN SIZE 8 CONTACT POSITIONS



WITH STABILIZER

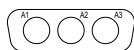


WITHOUT STABILIZER

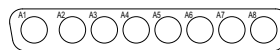
CBD size 8 male contacts are removed toward the rear after utilizing front release tooling. Space must be provided between the contact and the connector molding so the tooling can slide over the mating portion of the contact. This fact allows the contact to float.

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.

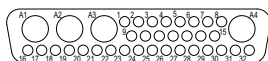
The stabilization feature is currently available for the following male contact variants:



CBD/CBM3W3M



CBD/CBM8W8M



CBC36W4M



CBC43W2M

Add MOS -1570.4 to end of part number. Example: CBD3W3M00000-1570.4



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## UNIQUE FEATURES

Combo-D  
D-Sub

### 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  $\mu$ ] gold over nickel by adding "-14" suffix onto part number. Example: FC4006D-14  
0.000050 inch [1.27  $\mu$ ] gold over nickel by adding "-15" suffix onto part number. Example: MC4006D-14

### CLIMATIC CHARACTERISTICS:

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

\*1 per UL 1977 Testing

### ELECTRICAL CHARACTERISTICS:

#### POWER CONTACTS

**Contact Current Rating:** See Temperature Rise Curve on page 64.  
**Initial Contact Resistance:** 0.0003 ohms max. per IEC 512-2, 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.

### 100 AMP HIGH CURRENT REMOVABLE CRIMP POWER CONTACT

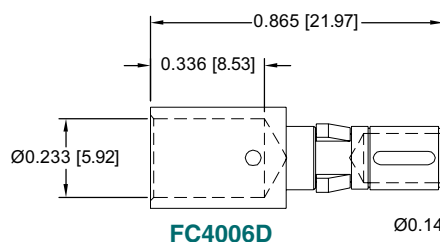
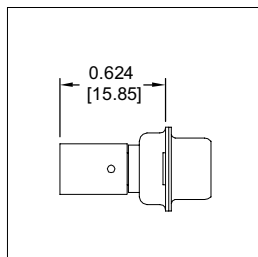
CONTACTS USED WITH 6 AWG WIRE  
6 AWG [16.0mm<sup>2</sup>] max.

\*1 CONTACTS ORDERED SEPARATELY  
SIZE 8

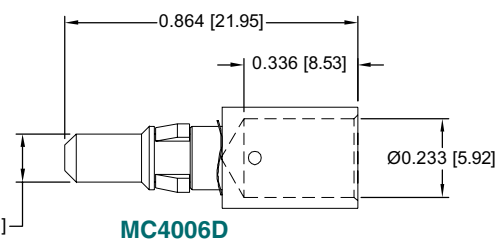
*\*1 Note: Connectors can be kitted with all applicable crimp on contacts, contact Technical Sales for connector part number.*

#### \*2 FEMALE CONTACT

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



#### MALE CONTACT



\*2 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.

**MATERIAL:** High conductivity copper alloy.

#### PLATING:

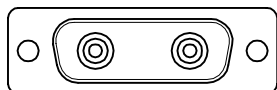
**STANDARD FINISH:** Gold flash over nickel plate.  
**OPTIONAL FINISHES:** 0.000030 [0.76  $\mu$ ] gold over nickel by adding "-14" suffix onto part number. Example: FC4006D-14  
0.000050 inch [1.27  $\mu$ ] gold over nickel by adding "-15" suffix onto part number. Example: MC4006D-15.



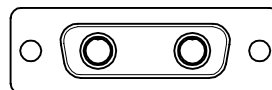


## SELECTIVELY LOADED COMBO-D CONNECTORS FOR USE WITH 100 AMP\* HIGH CURRENT REMOVABLE CRIMP POWER CONTACT

### COMBO-D CONNECTORS WITH TWO CONTACT POSITIONS

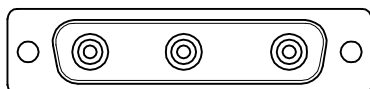


CBD3W3M00000-1841.0

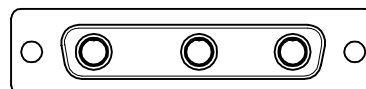


CBD3W3F00000-1841.0

### COMBO-D CONNECTORS WITH THREE CONTACT POSITIONS

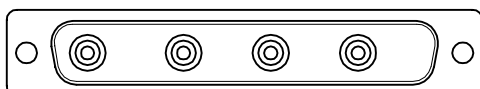


CBD5W5M00000-1841.1

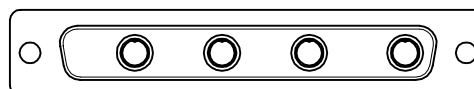


CBD5W5F00000-1841.1

### COMBO-D CONNECTORS WITH FOUR CONTACT POSITIONS

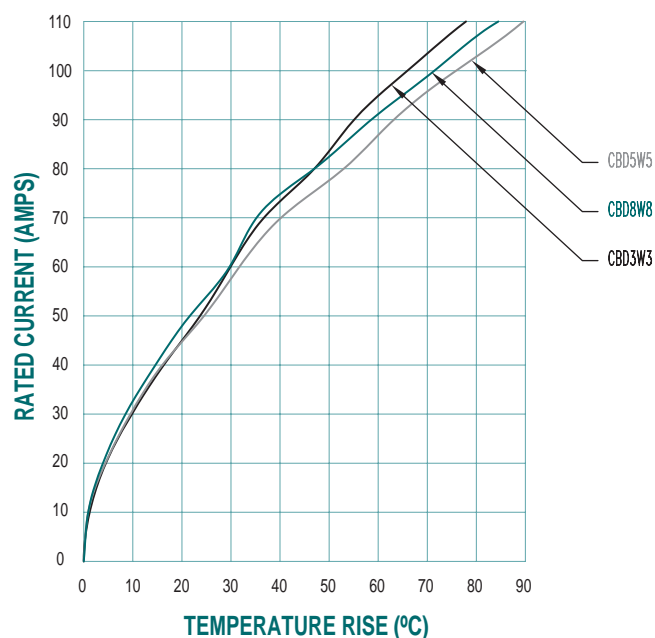


CBD8W8M00000-1841.2



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.



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## UNIQUE FEATURES

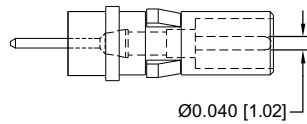
Combo-D  
D-Sub

### STRAIGHT PRINTED BOARD MOUNT HIGH VOLTAGE CONTACT SIZE 8

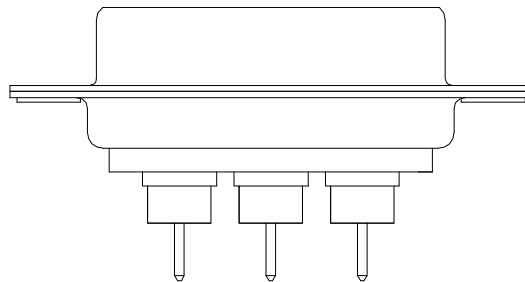
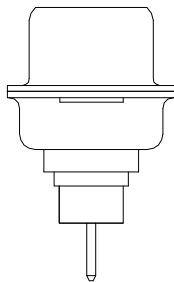
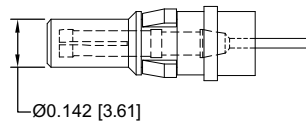
**\*\*NOTE:** Female contacts feature Large Surface Area (L.S.A.) closed entry contact design which provides maximum mating surfaces between male and female contact and reduced contact resistance during operation.

#### \*\* FEMALE CONTACT

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



#### MALE CONTACT



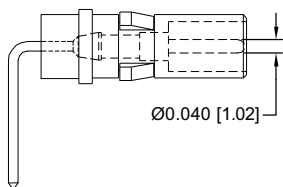
[CONTACT TECHNICAL SALES FOR MORE INFORMATION!](#)

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

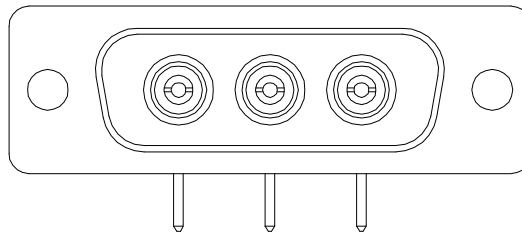
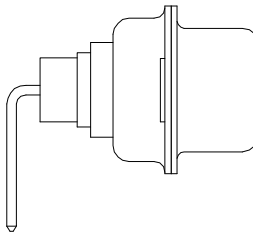
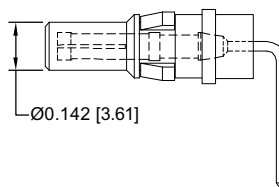
**\*\*NOTE:** Female contacts feature Large Surface Area (L.S.A.) closed entry contact design which provides maximum mating surfaces between male and female contact and reduced contact resistance during operation.

#### \*\* FEMALE CONTACT

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

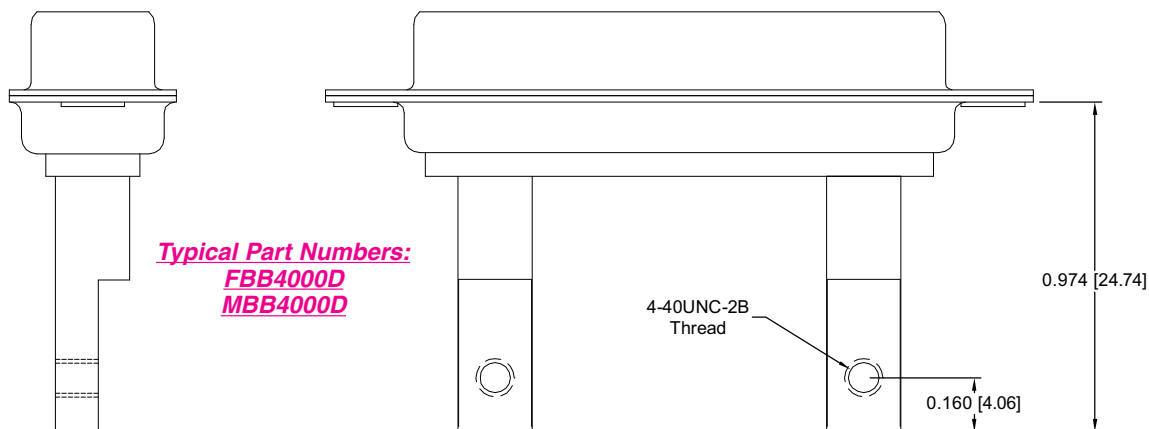


#### MALE CONTACT



[CONTACT TECHNICAL SALES FOR MORE INFORMATION!](#)

## BUS BAR CONTACT SIZE 8 POWER CONTACT

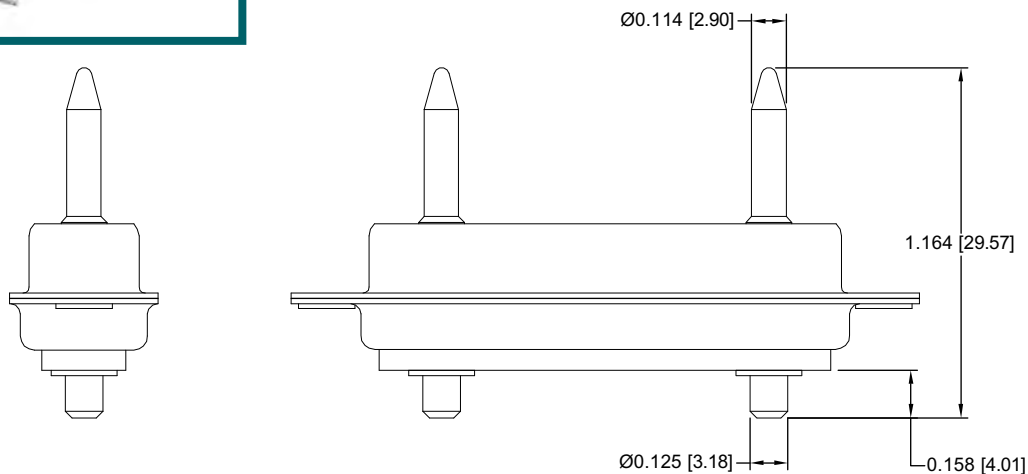


Power contacts can be offered with terminations suitable for use with bus bars.

**CONTACT TECHNICAL SALES FOR MORE INFORMATION!**



## INTEGRAL BLIND MATE GUIDE SIZE 8



**CONTACT TECHNICAL SALES FOR MORE INFORMATION!**



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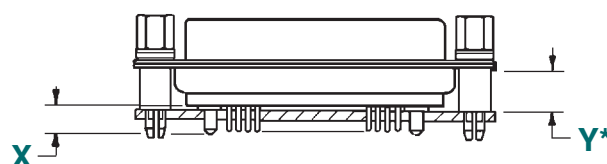
## UNIQUE FEATURES

Combo-D  
D-Sub

### CUSTOMER SPECIFIED CONTACT TERMINATION LENGTH

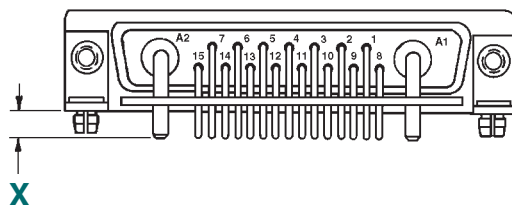
Positronic can supply CB series connectors with customer specified termination lengths. We have a wide variety of options available.

#### 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 page 69 for optional finishes.

#### MECHANICAL CHARACTERISTICS:

Insert contact to rear face of insulator, release from rear face of insulator. Size 22 contacts, 0.030 inch [0.76 mm] mating diameter male contacts. Female PosiBand closed entry contact design. Terminations for 20, 22, 24, 26, 28, 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 22 crimp contacts are available, see page 71 for details.

### SIZE 20 REMOVABLE CONTACT

#### MATERIALS AND FINISHES:

Precision machined copper alloy with gold flash over nickel. Other finishes are available, see page 69 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 "Robi-D" open entry contact design.

#### ELECTRICAL CHARACTERISTICS:

**Contact Current Rating:** 7.5 amperes nominal.  
**Initial Contact Resistance:** 0.008 ohms max. per IEC 512-2, test 2b.

#### THERMOCOUPLE CONTACTS:

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

Size 20 crimp contacts are available, see page 74 for details.

### SIZE 16 REMOVABLE CONTACT



#### MATERIALS AND FINISHES:

**STANDARD:** Precision machined copper alloy with gold flash over nickel. Other finishes are available, see page 69 for optional finishes.

**HIGH CONDUCTIVITY:** High conductivity copper alloy, gold flash over nickel. Other finishes are available, see page 69 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, 0.062 inch [1.57 mm] mating diam-

eter male contacts. Female PosiBand closed entry contact design. Terminations for 12, 14, 16, 18, 20, 22, 24, 26, and 28 AWG.

#### ELECTRICAL CHARACTERISTICS:

##### Contact Current Rating - Tested per U.L. 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 512-2, Test 2b.

**High Conductivity Contact Material:** 0.001 ohms max. Per IEC 512-2, Test 2b.

### SIZE 8 REMOVABLE CONTACT

#### MATERIALS AND FINISHES:

**STANDARD:** Precision machined copper alloy with gold flash over nickel. Other finishes are available, see page 69 for optional finishes.

**HIGH CONDUCTIVITY:** High conductivity copper alloy, gold flash over nickel. Other finishes are available, see page 69 for optional finishes.

##### HIGH VOLTAGE:

**Insulator Material:** PTFE teflon  
**Contacts:** Precision machined copper alloy with 0.000030 inch [0.76μ] gold over nickel. Other finishes are available, see page 69 for optional finishes.

##### SHIELDED:

**Dielectric Material:** PTFE teflon  
**Inner Contacts:** Precision machined copper alloy with 0.000030 inch [0.76μ] gold over nickel. Other finishes are available, see page 69 for optional finishes.

**Outer Contacts:** Precision machined copper alloy with gold flash over nickel. Other finishes are available, see page 69 for optional finishes.

**AIR LINE COUPLER:** Stainless steel, see page 80.

#### 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.

##### HIGH VOLTAGE:

Insert contact to rear face of insulator, release from front face of insulator. Size 8 contacts. Straight and right angle (90°) terminations. 0.041 inch [1.04 mm] minimum hole diameter.

**Durability:** 500 cycles minimum.

**Vibration:** 20g from 10 Hz to 500 Hz.

**Shock:** 30g-11ms.

... continued on next page

For information regarding crimp tool and crimping tool techniques, see Application Tools section, pages 81-89.





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## REMOVABLE CONTACTS

Combo-D  
D-Sub

### REMOVABLE CONTACT TECHNICAL CHARACTERISTICS

*continued from previous page . . .*

#### MECHANICAL CHARACTERISTICS, continued:

**SHIELDED:** Insert contact to rear face of insulator, release from front face of insulator. Size 8 contacts. See page 78 table of cable sizes for contact termination dimensions.

**Durability:** 500 cycles minimum.  
**Vibration:** 20g from 10 Hz to 500 Hz.  
**Shock:** 30g-11ms.

**AIR LINE COUPLER:** Insert contact to rear face of insulator, release from front face of insulator.

#### ELECTRICAL CHARACTERISTICS:

##### POWER CONTACTS:

*For electrical characteristics, see page 4.*

##### HIGH VOLTAGE:

**Flash over Voltage:** 3600 V r.m.s.  
**Proof Voltage:** 2700 V r.m.s.  
**Initial Contact Resistance:** 0.008 ohms maximum.

##### SHIELDED:

**Initial Contact Resistance:** 0.008 ohms maximum.  
**Nominal Impedance:** 50 ohms.  
**Insertion Loss:** -0.46 dB at 1 GHz  
-1.5 dB at 2 GHz

##### VSWR:

1.15 average at 1 GHz  
1.56 average at 2 GHz

Above values measured using frequency domain techniques.

##### Proof Voltage:

1000 V r.m.s.

#### OPTIONAL PLATING FINISHES

**-14** 0.000030 [0.76  $\mu$ ] gold over nickel by adding "-14" suffix onto part number. *Example:* FC120N4-14.

**-15** 0.000050 inch [1.27 $\mu$ ] gold over nickel by adding "-15". *Example:* FC120N4-15.

#### RoHS OPTIONS:

##### /AA

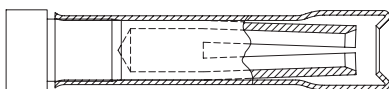
Environmental Compliance Option (RoHS), compliant per EU Directive 2002/95/EC can be achieved by adding "/AA" suffix onto part number. *Examples:* FC120N4/AA or for optional finishes use FC120N4/AA-14.

## What makes Positronic's PosiBand® contact interface significant?

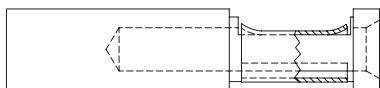


Authentic POSITRONIC®  
**PosiBand®**

These contacts utilize authentic Positronic™ PosiBand® technology.



Legacy "split tine" contact with sleeve



PosiBand spring member placed on base contact

- ✓ 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.

**For a detailed white paper visit: [www.connectpositronic.com/content/37/](http://www.connectpositronic.com/content/37/)**

*For information regarding crimp tool and crimping tool techniques, see Application Tools section, pages 81-89.*



## REMOVABLE CRIMP SIGNAL CONTACT

FOR USE WITH CBCD SERIES CONNECTORS

SIZE 22

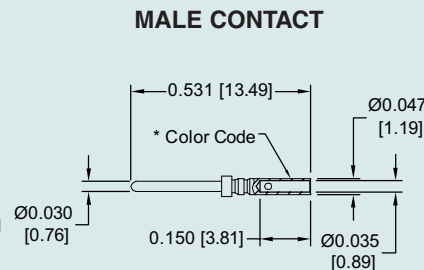
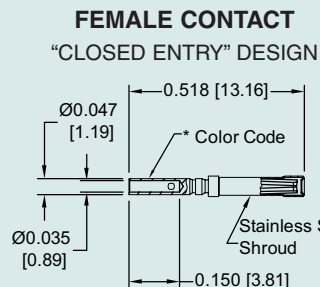
CLOSED CRIMP BARREL

### \*MILITARY SPECIFICATION CONTACTS

**STANDARD FINISH:**  
0.000050 inch [1.27μ] gold over  
nickel.

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

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



FEMALE PART NUMBER	WIRE SIZE AWG/[mm <sup>2</sup> ]
*M39029/57-354	22 / 24 / 26 / 28 [0.3/0.25/0.12/0.08]

MALE PART NUMBER	WIRE SIZE AWG/[mm <sup>2</sup> ]
*M39029/58-360	22 / 24 / 26 / 28 [0.3/0.25/0.12/0.08]

## REMOVABLE CRIMP SIGNAL CONTACT

FOR USE WITH CBCD SERIES CONNECTORS

SIZE 22

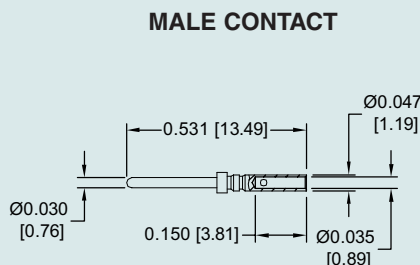
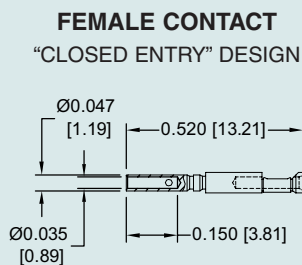
CLOSED CRIMP BARREL



Authentic POSITRONIC™  
**PosiBand®**

These contacts utilize authentic Positronic™ PosiBand® technology.

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



FEMALE PART NUMBER	WIRE SIZE AWG/[mm <sup>2</sup> ]
FC8022D2	22 / 24 / 26 / 28 / 30 [0.3/0.25/0.12/0.08/0.05]

MALE PART NUMBER	WIRE SIZE AWG/[mm <sup>2</sup> ]
MC8022D	22 / 24 / 26 / 28 / 30 [0.3/0.25/0.12/0.08/0.05]

*For information regarding crimp tool and crimping tool techniques, see Application Tools section, pages 81-89.*



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## REMOVABLE CONTACTS

Combo-D  
D-Sub

### REMOVABLE CRIMP SIGNAL CONTACT FOR USE WITH CBCD SERIES CONNECTORS

CONTACTS USED WITH 20 AWG WIRE

SIZE 22

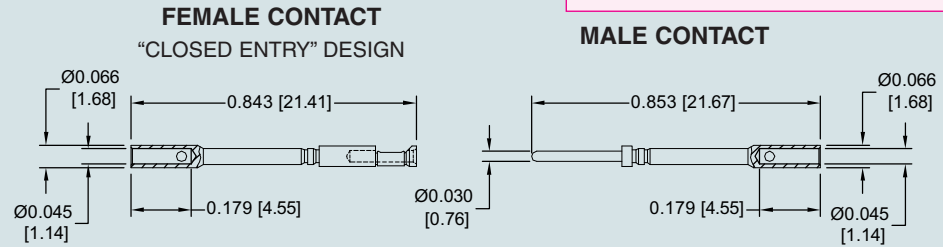


Authentic POSITRONIC™  
PosiBand®

These contacts utilize authentic Positronic™ PosiBand® technology.

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

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



Crimp area extends above connector molding.

FEMALE PART NUMBER	WIRE SIZE AWG/[mm²]
FC8020D2	20 [0.5] max

MALE PART NUMBER	WIRE SIZE AWG/[mm²]
MC8020D	20 [0.5] max

### REMOVABLE THERMOCOUPLE CRIMP SIGNAL CONTACT FOR USE WITH CBCD SERIES CONNECTORS

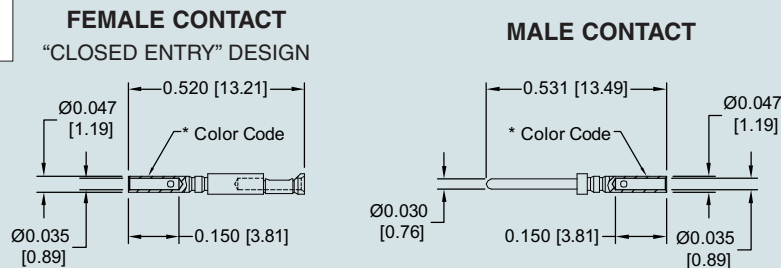
SIZE 22



Authentic POSITRONIC™  
PosiBand®

These contacts utilize authentic Positronic™ PosiBand® technology.

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



TYPE	MATERIAL	FEMALE PART NUMBER	MALE PART NUMBER	COLOR CODE*	WIRE SIZE AWG [mm²]
K	CHROMEL (+)	FC8022D2CH	MC8022DCH	WHITE	22 / 24 / 26 [ 0.3 / 0.25 / 0.12]
	ALUMEL (-)	FC8022D2AL	MC8022DAL	GREEN	22 / 24 / 26 [ 0.3 / 0.25 / 0.12]
T	COPPER (+)	FC8022D2CU	MC8022DCU	RED	22 / 24 / 26 [ 0.3 / 0.25 / 0.12]
	CONSTANTAN (-)	FC8022D2CO	MC8022DCO	YELLOW	22 / 24 / 26 [ 0.3 / 0.25 / 0.12]
E	CHROMEL (+)	FC8022D2CH	MC8022DCH	WHITE	22 / 24 / 26 [ 0.3 / 0.25 / 0.12]
	CONSTANTAN (-)	FC8022D2CO	MC8022DCO	YELLOW	22 / 24 / 26 [ 0.3 / 0.25 / 0.12]

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..

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For information regarding crimp tool and crimping tool techniques, see Application Tools section, pages 81-89.



## MILITARY LEVEL REMOVABLE CRIMP SIGNAL CONTACT

FOR USE WITH CBC SERIES CONNECTORS

SIZE 20

CLOSED CRIMP BARREL

### \*MILITARY SPECIFICATION CONTACTS

**STANDARD FINISH:**  
0.000050 inch [1.27μ] gold over  
nickel

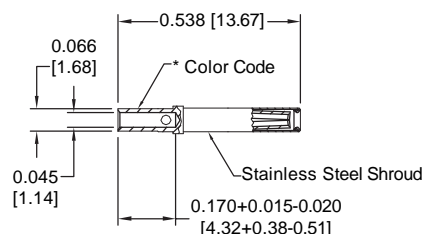
**COLOR CODE:**

**MALE CONTACT:**  
ORANGE/BLUE/WHITE

**FEMALE CONTACT:**  
ORANGE/BLUE/GRAY

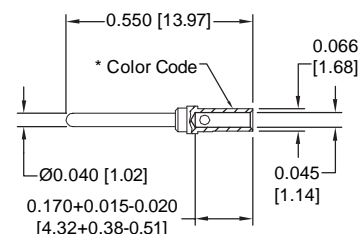
*Note: Connectors can be kitted with  
all applicable crimp contacts,  
contact Technical Sales for  
connector part number.*

### FEMALE CONTACT "CLOSED ENTRY" DESIGN



FEMALE PART NUMBER	WIRE SIZE AWG/[mm <sup>2</sup> ]
*M39029/63-368	20 / 22 / 24 [0.5/0.3/0.25]

### MALE CONTACT



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

## INDUSTRIAL / MILITARY LEVEL REMOVABLE CRIMP SIGNAL CONTACT

FOR USE WITH CBC SERIES CONNECTORS

SIZE 20

CLOSED CRIMP BARREL

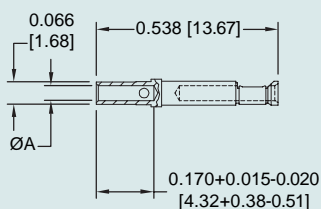


Authentic POSITRONIC™  
PosiBand®

These contacts utilize authentic Positronic™ PosiBand® technology.

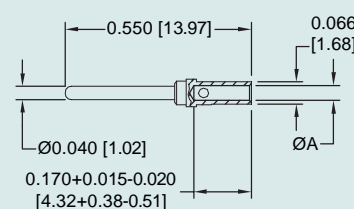
*Note: Connectors can be kitted with  
all applicable crimp contacts,  
contact Technical Sales for  
connector part number.*

### FEMALE CONTACT "CLOSED ENTRY" DESIGN



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

### MALE CONTACT



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

*For information regarding crimp tool and crimping tool techniques, see Application Tools section, pages 81-89.*



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## REMOVABLE CONTACTS

Combo-D  
D-Sub

### INDUSTRIAL / MILITARY LEVEL REMOVABLE CRIMP SIGNAL CONTACT

FOR USE WITH CBC SERIES CONNECTORS

CONTACTS USED WITH 18 AWG WIRE

SIZE 20



Authentic POSITRONIC™

PosiBand®

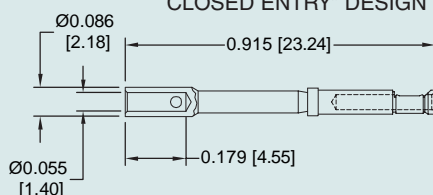
These contacts utilize authentic Positronic™ PosiBand® technology.

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

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

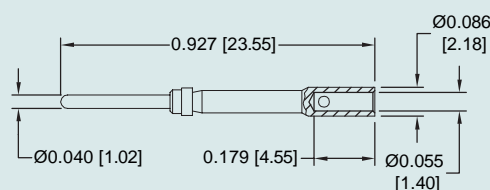
#### FEMALE CONTACT

“CLOSED ENTRY” DESIGN



FEMALE PART NUMBER	WIRE SIZE AWG/[mm²]
FC6018D2	18 [1.0] max

#### MALE CONTACT



MALE PART NUMBER	WIRE SIZE AWG/[mm²]
MC6018D	18 [1.0] max

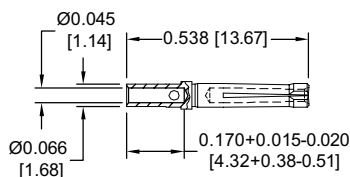
### PROFESSIONAL LEVEL REMOVABLE CRIMP SIGNAL CONTACT

FOR USE WITH CBC AND QB SERIES CONNECTORS

SIZE 20

#### FEMALE CONTACT

“ROBI-D OPEN ENTRY” DESIGN



FEMALE PART NUMBER	WIRE SIZE AWG/[mm²]
FC6520D	20 / 22 / 24 [0.5/0.3/0.25]

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

For information regarding crimp tool and crimping tool techniques, see Application Tools section, pages 81-89.





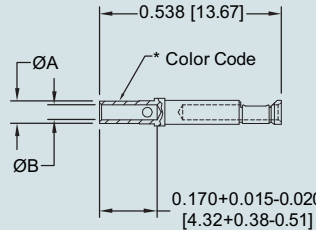
## REMOVABLE THERMOCOUPLE CRIMP SIGNAL CONTACT

FOR USE WITH CBC SERIES CONNECTORS

SIZE 20

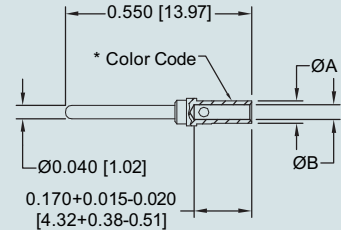
FEMALE CONTACT

"CLOSED ENTRY" DESIGN



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

MALE CONTACT



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

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

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<sup>†</sup>Dimensionally equivalent to M39029/64-369

<sup>††</sup>Dimensionally equivalent to M39029/63-368

## REMOVABLE CRIMP POWER CONTACT

FOR USE WITH CBCD SERIES CONNECTORS

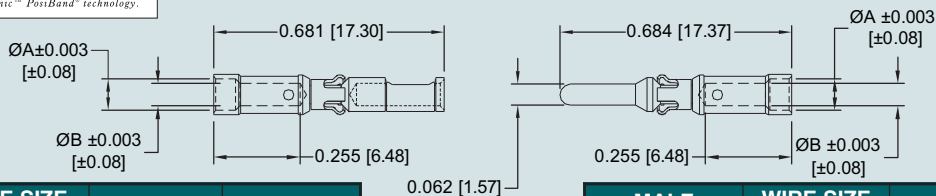
SIZE 16

\*1 FEMALE CONTACT

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

MALE CONTACT

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



FEMALE PART NUMBER	WIRE SIZE [AWG] mm <sup>2</sup>	ØA	ØB
FC112N4S	12 / [4.0]	N/A	0.098 [2.49]
FC112N4	12 / [4.0]	N/A	0.098 [2.49]
FC114N4	14-16 [2.5-1.5]	0.105 [2.67]	0.081 [2.06]
FC116N4	16-18 [1.5-1.0]	0.093 [2.36]	0.067 [1.70]
FC120N4	20-22-24 [0.5-0.3-0.25]	0.065 [1.65]	0.045 [1.14]

"S" in part number indicates high conductivity copper alloy material.

MALE PART NUMBER	WIRE SIZE [AWG] mm <sup>2</sup>	ØA	ØB
MC112NS-133.0	12 / [4.0]	N/A	0.098 [2.49]
MC112N-133.0	12 / [4.0]	N/A	0.098 [2.49]
MC114N-133.0	14-16 [2.5-1.5]	0.105 [2.67]	0.081 [2.06]
MC116N-133.0	16-18 [1.5-1.0]	0.093 [2.36]	0.067 [1.70]
MC120N-133.0	20-22-24 [0.5-0.3-0.25]	0.065 [1.65]	0.045 [1.14]

\*1 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, pages 81-89.



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## REMOVABLE CONTACTS

Combo-D  
D-Sub

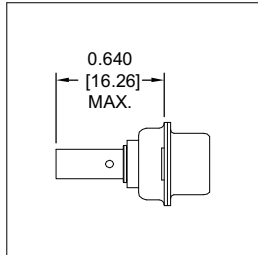
### REMOVABLE CRIMP POWER CONTACT

FOR USE WITH CBD, CBC, CBCD AND CBDD SERIES CONNECTORS

SIZE 8

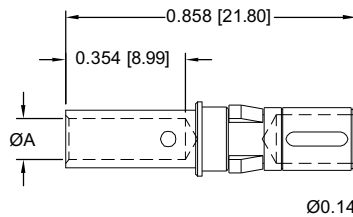
Note: Connectors can be kitted with all applicable crimp contacts, contact Technical Sales for connector part number.

For contact current rating, see page 4.

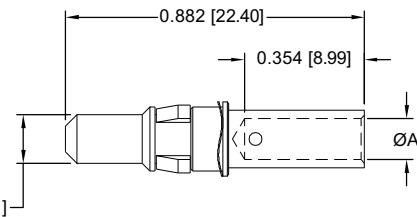


#### \*1 FEMALE CONTACT

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



#### MALE CONTACT



FEMALE PART NUMBER	WIRE SIZE [AWG] mm <sup>2</sup>	Ø A
FC4008DS	8 [10.0]	0.181 [4.60]
FC4008D	8 [10.0]	0.181 [4.60]
FC4010D	10 [5.3]	0.122 [3.10]
FC4012D	12 [4.0]	0.101 [2.57]
FC4016D	16 [1.5]	0.067 [1.70]

"S" in part number indicates high conductivity copper alloy material.

MALE PART NUMBER	WIRE SIZE [AWG] mm <sup>2</sup>	Ø A
MC4008DS	8 [10.0]	0.181 [4.60]
MC4008D	8 [10.0]	0.181 [4.60]
MC4010D	10 [5.3]	0.122 [3.10]
MC4012D	12 [4.0]	0.101 [2.57]
MC4016D	16 [1.5]	0.067 [1.70]

\*1 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.

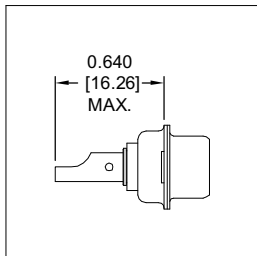
### REMOVABLE SOLDER CUP POWER CONTACT

FOR USE WITH CBD, CBC, CBCD AND CBDD SERIES CONNECTORS

SIZE 8

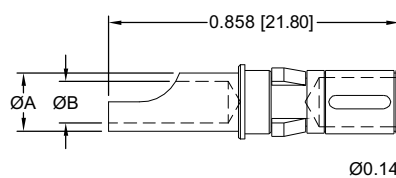
Note: Connectors can be kitted with all applicable crimp contacts, contact Technical Sales for connector part number.

For contact current rating, see page 4.

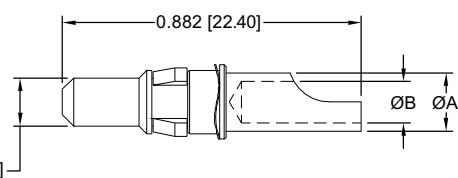


#### \*1 FEMALE CONTACT

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



#### MALE CONTACT



FEMALE PART NUMBER	WIRE SIZE [AWG] mm <sup>2</sup>	Ø A	Ø B
FS4008D	8 [10.0]	0.219 [5.56]	0.188 [4.78]
FS4012D	12 [4.0]	0.143 [3.63]	0.112 [2.84]
FS4016D	16 [1.5]	0.100 [2.54]	0.069 [1.75]

MALE PART NUMBER	WIRE SIZE [AWG] mm <sup>2</sup>	Ø A	Ø B
MS4008D	8 [10.0]	0.219 [5.56]	0.188 [4.78]
MS4012D	12 [4.0]	0.143 [3.63]	0.112 [2.84]
MS4016D	16 [1.5]	0.100 [2.54]	0.069 [1.75]

\*1 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, pages 81-89.



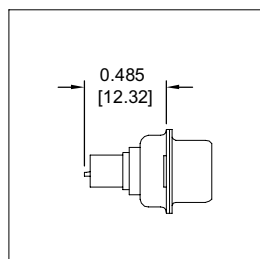
## REMOVABLE HIGH VOLTAGE POWER CONTACT

FOR USE WITH CBD, CBC, CBCD AND CBDD SERIES CONNECTORS

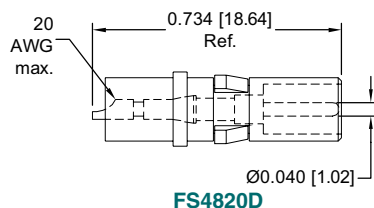
SIZE 8

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

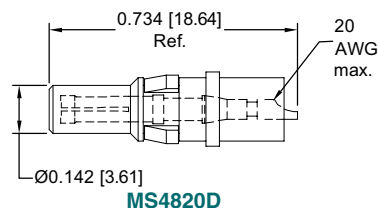
### STRAIGHT SOLDER WIRE TERMINATION



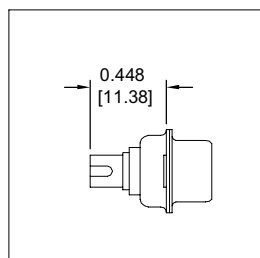
#### FEMALE CONTACT



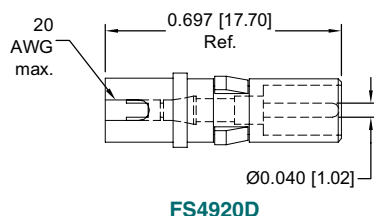
#### MALE CONTACT



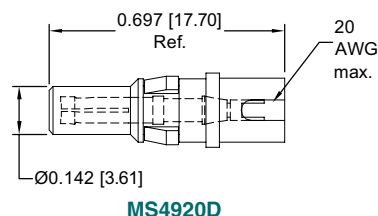
### RIGHT ANGLE (90°) SOLDER WIRE TERMINATION



#### FEMALE CONTACT



#### MALE CONTACT



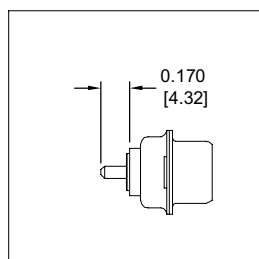
## STRAIGHT PRINTED BOARD MOUNT POWER CONTACT

FOR USE WITH CBD AND CBDD SERIES CONNECTORS

SIZE 8

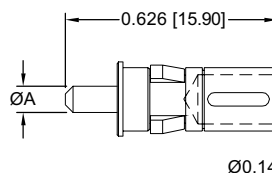
For contact current rating, see page 4.

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

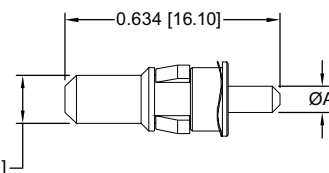


#### \*1 FEMALE CONTACT

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



#### MALE CONTACT



FEMALE PART NUMBER	A Ø	CONTACT CODE
FDS4314D	0.078 [1.98]	35
FDS4312D	0.094 [2.39]	36
FDS4310D	0.125 [3.18]	37

MALE PART NUMBER	A Ø	CONTACT CODE
MDS4314D	0.078 [1.98]	35
MDS4312D	0.094 [2.39]	36
MDS4310D	0.125 [3.18]	37

\*1 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, pages 81-89.



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## REMOVABLE CONTACTS

Combo-D  
D-Sub

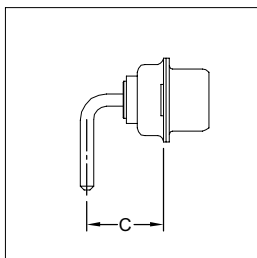
### RIGHT ANGLE (90°) PRINTED BOARD MOUNT POWER CONTACT

FOR USE WITH CBD AND CBDD SERIES CONNECTORS

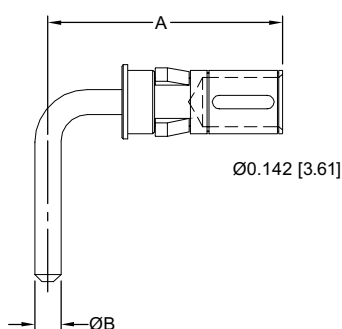
SIZE 8

For contact current rating, see page 4.

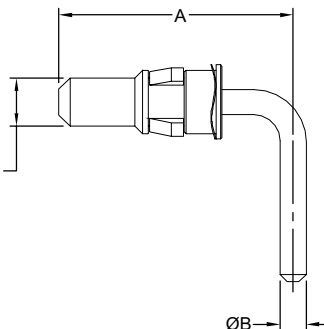
Note: Connectors can be kitted with all applicable crimp contacts, contact Technical Sales for connector part number.



**\*1 FEMALE CONTACT**  
“CLOSED ENTRY” DESIGN, L.S.A.



**MALE CONTACT**



FEMALE PART NUMBER	A REF.	Ø B	C	SHELL SIZE	CONTACT CODE
FRT4314D	0.580 [14.73]	0.078 [1.98]	0.339 [8.61]	1, 2, 3 & 4	55
FRT4414D	0.692 [17.58]	0.078 [1.98]	0.451 [11.46]	5	55
FRT4714D	0.661 [16.79]	0.078 [1.98]	0.420 [10.67]	1, 2, 3 & 4	75
FRT4814D	0.773 [19.63]	0.078 [1.98]	0.520 [13.21]	5	75
FRT4310D	1.051 [26.70]	0.125 [3.18]	0.810 [20.57]	1, 2, 3 & 4	57
FRT4410D	1.051 [26.70]	0.125 [3.18]	0.810 [20.57]	5	57

MALE PART NUMBER	A REF.	Ø B	C	SHELL SIZE	CONTACT CODE
MRT4314D	0.580 [14.73]	0.078 [1.98]	0.339 [8.61]	1, 2, 3 & 4	55
MRT4414D	0.692 [17.58]	0.078 [1.98]	0.451 [11.46]	5	55
MRT4714D	0.661 [16.79]	0.078 [1.98]	0.420 [10.67]	1, 2, 3 & 4	75
MRT4814D	0.773 [19.63]	0.078 [1.98]	0.520 [13.21]	5	75
MRT4310D	1.051 [26.70]	0.125 [3.18]	0.810 [20.57]	1, 2, 3 & 4	57
MRT4410D	1.051 [26.70]	0.125 [3.18]	0.810 [20.57]	5	57

**\*1 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, pages 81-89.



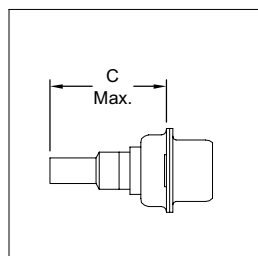
## REMOVABLE SHIELDED CONTACT

FOR USE WITH CBD, CBC, CBCD AND CBDD SERIES CONNECTORS

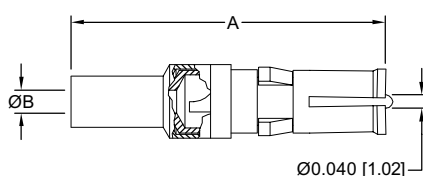
SIZE 8

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

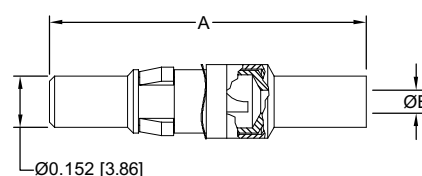
### STRAIGHT SOLDER/CRIMP CONTACTS



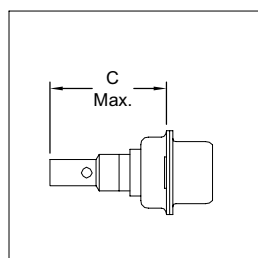
FEMALE CONTACT



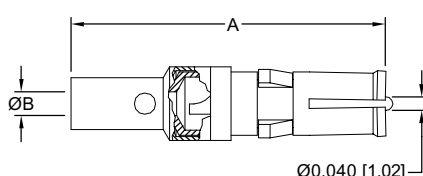
MALE CONTACT



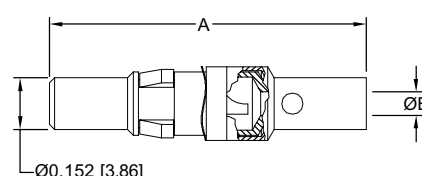
### STRAIGHT SOLDER/SOLDER CONTACTS



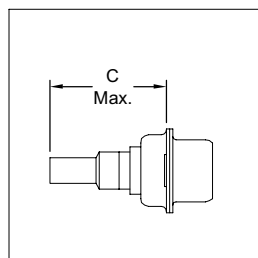
FEMALE CONTACT



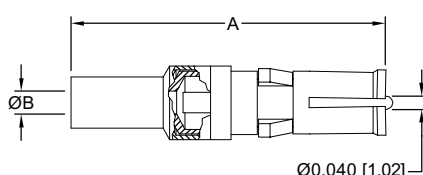
MALE CONTACT



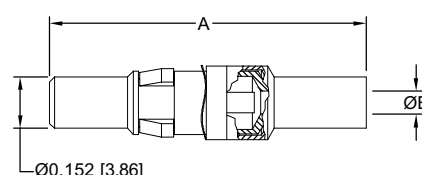
### STRAIGHT CRIMP/CRIMP CONTACTS



FEMALE CONTACT



MALE CONTACT



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]	0.067 [1.70]	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	FCC4103D	MCC4103D	1.037 [26.34]	0.108 [2.74]	0.847 [21.51]	180 B/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.

*For information regarding crimp tool and crimping tool techniques, see Application Tools section, pages 81-89.*





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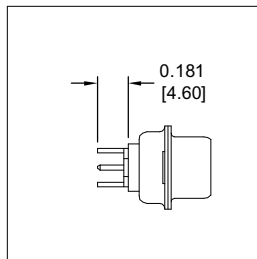
## REMOVABLE CONTACTS

Combo-D  
D-Sub

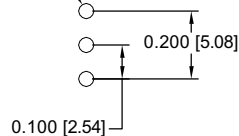
### STRAIGHT PRINTED BOARD MOUNTED SHIELDED CONTACT FOR USE WITH CBD AND CBDD SERIES CONNECTORS

SIZE 8

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

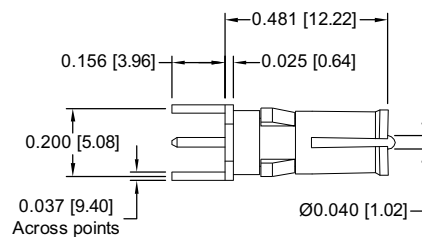


Suggest  $\varnothing 0.045$   
[1.14] hole



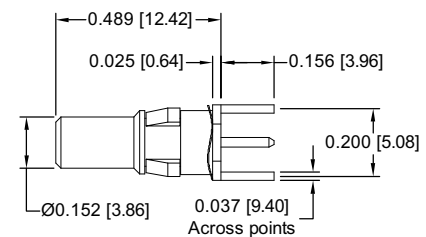
CONTACT HOLE PATTERN

#### FEMALE CONTACT



FDS4201D

#### MALE CONTACT

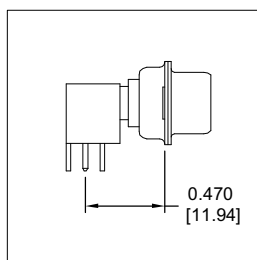


MDS4201D

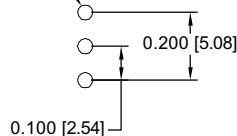
### RIGHT ANGLE (90°) PRINTED BOARD MOUNT SHIELDED CONTACTS FOR USE WITH CBD AND CBDD SERIES CONNECTORS

SIZE 8

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

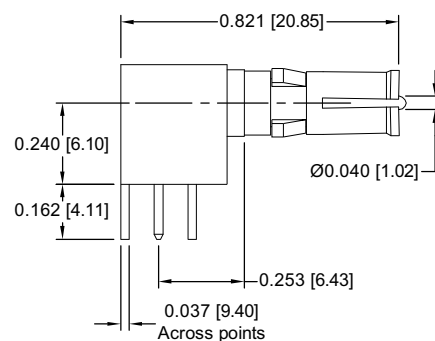


Suggest  $\varnothing 0.045$   
[1.14] hole



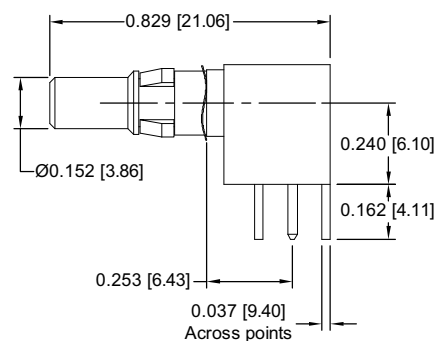
CONTACT HOLE PATTERN

#### FEMALE CONTACT



FRT4201D

#### MALE CONTACT



MRT4201D

*For information regarding crimp tool and crimping tool techniques, see Application Tools section, pages 81-89.*



## REMOVABLE AIR LINE COUPLERS

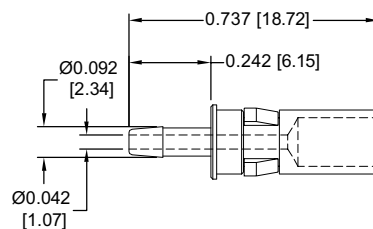
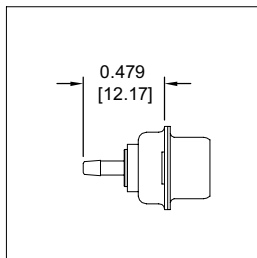
FOR USE WITH CBD, CBC, CBCD AND CBDD SERIES CONNECTORS

SIZE 8

AIR LINE COUPLER CONTACTS  
REQUIRE JACKSCREWS TO  
COUPLE MATING CONNECTORS

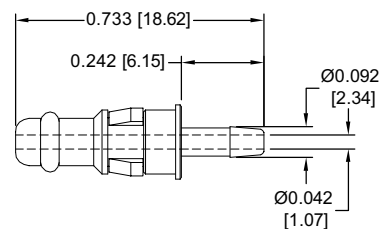
*Note: Connectors can be kitted with all applicable crimp contacts, contact Technical Sales for connector part number.*

### FEMALE CONTACT



FA4063S

### MALE CONTACT



MA4063S



## 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, pages 81-89.*



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## APPLICATION TOOLS

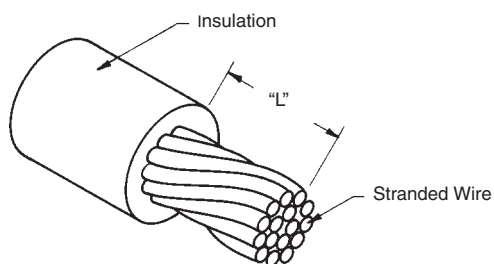
Combo-D  
D-Sub

### CRIMPING INFORMATION FOR REMOVABLE CRIMP CONTACTS

USE INDICATED POSITRONIC TOOLS FOR BEST RESULTS

#### STEP 1: STRIP WIRE TO INDICATED LENGTH.

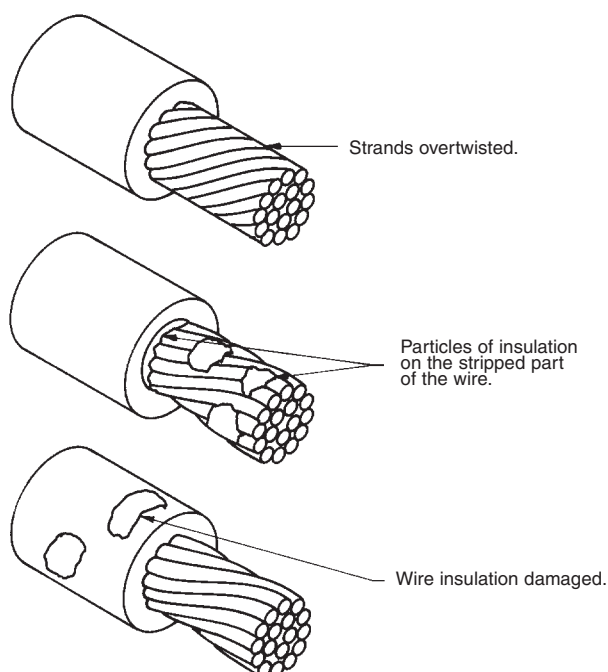
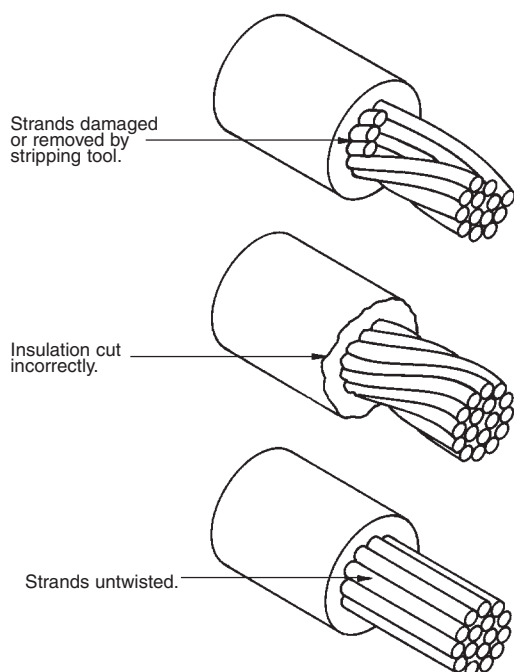
##### Correctly Stripped Wire



- Take Care Not To:
- Damage or remove strands.
  - Untwist or overtwist strands.
  - Leave insulation particles on strands.
  - Damage insulation.

CONTACT SIZE	CONTACT PART NUMBER		"L"
	FEMALE P/N	MALE P/N	
22	FC8020D2	MC8020D	0.150±0.010 [3.81±0.25]
	FC8022D2** thermocouple	MC8022D** thermocouple	0.150±0.010 [3.81±0.25]
	FC8022D2	MC8022D	0.150±0.010 [3.81±0.25]
	M39029/57-354	M39029/58-360	0.150±0.010 [3.81±0.25]
20	FC6018D2	MC6018D	0.160±0.020 [4.06±0.51]
	FC6020D2	MC6020D	0.160±0.020 [4.06±0.51]
	FC6020D2** thermocouple	MC6020D** thermocouple	0.160±0.020 [4.06±0.51]
	FC6026D2	MC6026D	0.160±0.020 [4.06±0.51]
	FC6026D2** thermocouple	MC6026D** thermocouple	0.160±0.020 [4.06±0.51]
	FC6520D	-	0.160±0.020 [4.06±0.51]
	M39029/63-368	M39029/64-369	0.160±0.020 [4.06±0.51]
16	FC11*N4	MC11*N-133.0	0.230±0.020 [5.84±0.51]
	FC112N4S	MC112NS-133.0	0.230±0.020 [5.84±0.51]
	FC120N4	MC120N-133.0	0.230±0.020 [5.84±0.51]
8	FC4008D	MC4008D	0.350±0.020 [8.89±0.51]
	FC4008D-1817.0	-	0.350±0.020 [8.89±0.51]
	FC4008DS	MC4008DS	0.350±0.020 [8.89±0.51]
	FC401*D	MC401*D	0.350±0.020 [8.89±0.51]
	FC4012D-1817.0	-	0.350±0.020 [8.89±0.51]
	FS4*20D	MS4*20D	0.100±0.020 [2.54±0.51]
	FS4008D	MS4008D	0.350±0.020 [8.89±0.51]
	FS401*D	MS401*D	0.350±0.020 [8.89±0.51]

##### Examples of Stripping Faults



## CRIMPING INFORMATION FOR REMOVABLE CRIMP CONTACTS

USE INDICATED POSITRONIC TOOLS FOR BEST RESULTS

### STEP 2: CRIMP WIRE TO CONTACT.

- For Hand Crimp Tool:**
- Place contact into crimping tool.
  - Insert wire into contact.
  - Center contact by slowly closing the crimping tool until the crimp indenters make contact with the crimp barrel.
  - Complete the cycle of the crimping tool in one smooth motion.
  - Remove the crimped contact.
- For Automatic Crimp Tool:**
- Insert the wire into the contact, positioned in the crimp tool by the plastic carrier.
  - Depress the activating device of the crimping tool to start the crimping cycle.
  - Remove the crimped contact.

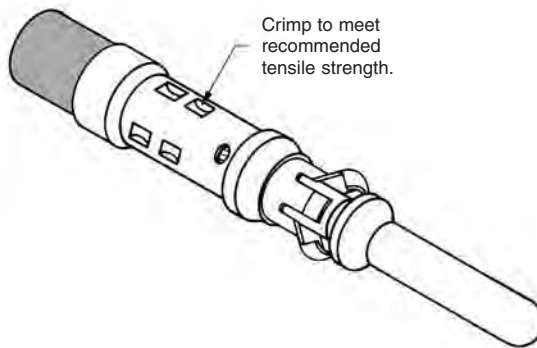
Positronic Recommended Conductor Tensile Strength	
WIRE SIZE AWG/[mm <sup>2</sup> ]	AXIAL LOAD POUNDS/[N]
6 / [16.0]	110 / [489]
8 / [10.0]	110 / [489]
10 / [5.3]	110 / [489]
12 / [4.0]	110 / [489]
14 / [2.5]	70 / [311]
16 / [1.5]	50 / [222]
18 / [1.0]	28 / [125]
20 / [0.5]	20 / [89]
22 / [0.3]	12 / [53]
24 / [0.25]	8 / [36]
26 / [0.12]	5 / [22]
28 / [0.08]	3 / [13]
30 / [0.05]	1.5 / [6.7]

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

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

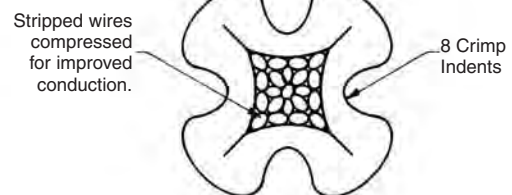
### STEP 3: INSPECT THE CRIMP.

#### Correctly Crimped Contact

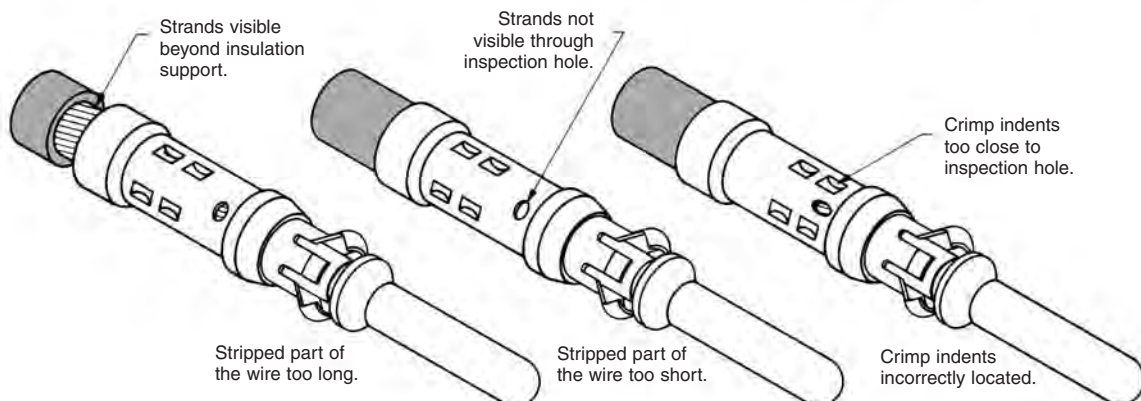


- For All Tools:**
- Strands to be visible through the inspection hole.
  - Strands not to be visible beyond the insulation support.
  - Crimped contact to meet recommended conductor tensile force shown in chart.
  - Check for peeled gold and bent contacts.

#### Cross Section of Correctly Crimped Contact



#### Examples of Crimping Faults





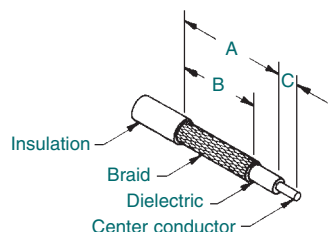
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## APPLICATION TOOLS

Combo-D  
D-Sub

### SOLDERING AND CRIMPING INFORMATION FOR COMBINATION D SERIES SHIELDED CONTACTS

#### STEP 1: STRIP WIRE TO INDICATED LENGTH



#### TAKE CARE NOT TO:

- Damage or remove strands.
- Untwist or overtwist strands.
- Leave insulation particles on strands.
- Damage insulation.

#### STEP 2: CRIMP WIRE TO CONTACT

- Trim cable.
- Slide ferrule over jacket. Insert dielectric and center conductor into barrel. Crimp center conductor into contact.
- Butt ferrule against shoulder. Crimp ferrule over braid.

#### STEP 2: SOLDER WIRE TO CONTACT

- Trim cable. Tin center conductor.
- Slide ferrule over jacket. Insert dielectric and center conductor into barrel. Solder center conductor into contact.
- Butt ferrule against shoulder. Solder cable to barrel through hole in ferrule. Solder cap into body.

#### STEP 2: SOLDER/CRIMP WIRE TO CONTACT

- Trim cable. Tin center conductor.
- Slide ferrule over jacket. Insert dielectric and center conductor into barrel. Solder center conductor into contact.
- Butt ferrule against shoulder. Crimp ferrule over braid. Solder cap into body.



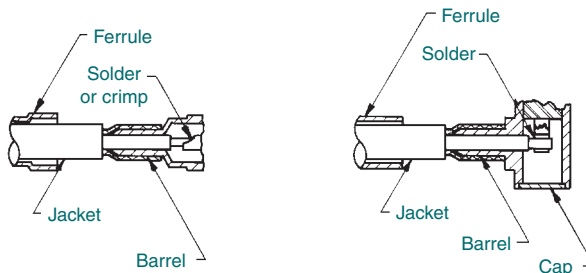
#### Shielded Contact Hand Crimp Tool

For crimp tool part numbers, see Contact Application Tools Cross Reference Chart on pages 85-86.

CONTACT SIZE	PART NUMBER	RG CABLE NUMBER	A	B	C
8	*C4101D	178 B/U	0.281 [7.14]	0.250 [6.35]	0.078 [1.98]
	*S4101D				
8	*C4102D	179 B/U 316 /U	0.281 [7.14]	0.250 [6.35]	0.078 [1.98]
	*S4102D				
8	*C4103D	180 B/U	0.375 [9.53]	0.312 [7.92]	0.078 [1.98]
	*S4103D				
8	*C4104D	58 B/U	0.375 [9.53]	0.312 [7.92]	0.078 [1.98]
	*S4104D				
8	*CC4101D	178 B/U	0.281 [7.14]	0.250 [6.35]	0.120 [3.05]
8	*CC4102D	179 B/U 316 /U	0.281 [7.14]	0.250 [6.35]	0.120 [3.05]
8	*CC4103D	180 B/U	0.375 [9.53]	0.312 [7.92]	0.120 [3.05]
8	*CC4104D	58 B/U	0.375 [9.53]	0.312 [7.92]	0.120 [3.05]

\*Contact gender is designated by M for male contacts and F for female contacts.

Typical Part Number:  
FC4101D





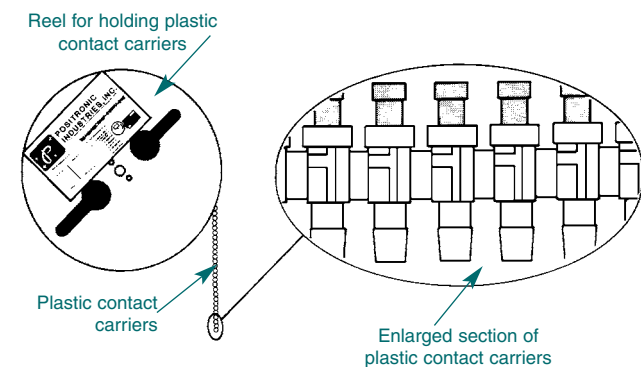
## CRIMPING TOOLS AND ACCESSORIES



**AUTOMATIC CRIMP TOOL,  
PNEUMATICALLY ACTUATED  
(SHOWN FOR REFERENCE ONLY)**

This fast cycling automatic crimp tool produces a four double-indent crimp on wire sizes. For use with size 22, 20, 16 and 8 contacts. Contacts must be ordered on reels. Foot control valve is supplied as a standard accessory.

For complete automatic crimp tool selection part numbers, see Contact Application Tools Cross Reference Chart on pages 85-86.



### 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 numbers 9550-0 and 9550-1; packaged in reels holding 1,000 contacts for use with the automatic pneumatic crimp tools, catalog part number 9555-0-2. 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 a female contact.

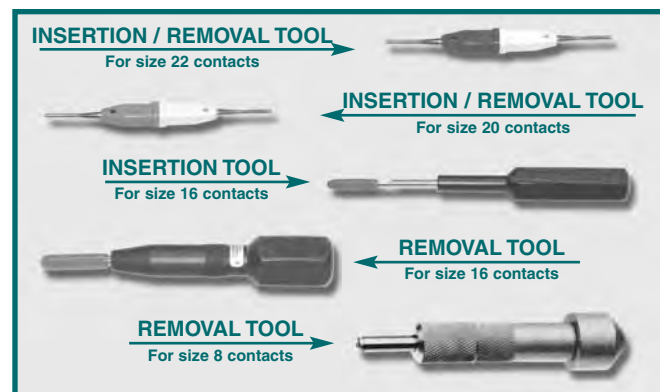


**CYCLE-CONTROLLED HAND CRIMP TOOLS  
(SHOWN FOR REFERENCE ONLY)**

The hand crimp tool, pictured at the top left of the image uses 8 AWG wire with produces a hex shaped crimp.

All other wires use hand crimping tools to produce a four double-indent crimp configuration. Each positioner is equipped with a data plate which gives the correct crimp-depth setting for each wire size.

For complete crimp tool and positioner selection part numbers, see Contact Application Tools Cross Reference Chart on pages 85-86.



**INSERTION AND REMOVAL TOOLS  
(SHOWN FOR REFERENCE ONLY)**

An easy-to-use contact insertion tool used for rear insertion of contacts into connector.

The contact removal tool facilitates the extraction of removable contacts from the connector insulators. For size 8, 12 and 16 contact removal, simply insert the hollow tool tip over the contact from the front face of the insulator, rotate the tool slightly while increasing the pushing force against the butt of the extraction tool. The contact will be released from the insulator retention system and will "pop out" of the rear face of the insulator. For size 20 and 22 contact removal, simply insert the hollow tool tip over the wire of the contact until it bottoms against the contact from the rear face of the insulator, rotate the tool slightly while increasing the pushing force against the butt of the extraction tool. A slight rotation while pushing will release the contact, which then is extracted by simultaneously pulling on the wire from the rear face of the insulator.

For insertion and removal tool selection part numbers, see Contact Application Tools Cross Reference Chart on pages 85-86.

# APPLICATION TOOLS



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## CONTACT APPLICATION TOOLS CROSS REFERENCE LIST

USE INDICATED POSITRONIC TOOLS FOR BEST RESULTS

Contact Size	Positronic Contact P/N	Handle & Positioner P/N	Hand Crimp P/N	Mfg. Cross	Mil Equiv	Positioner	Mfg. Cross	Mil Equiv	Insertion Tool	Mfg. Cross	Mil Equiv	Removal Tool	Mfg. Cross	Mil Equiv	Automatic Crimp Tool ** See Note
8	FA4063S											4311-0-0-0	P+		
8	FC4008D	9504-19-0-0	9504-1-0-0	HX4	M22520/5-01	9504-19-1-0	Y524		N/A			4311-0-0-0	P+		9555-0-2-0
8	FC4008D-1817.0	9504-19-0-0	9504-1-0-0	HX4	M22520/5-01	9504-19-1-0	Y524		N/A			4311-0-0-0	P+		9555-0-2-0
8	FC4008DS	9504-19-0-0	9504-1-0-0	HX4	M22520/5-01	9504-19-1-0	Y524		N/A			4311-0-0-0	P+		9555-0-2-0
8	FC4011D	9509-0-0-0	9509-1-0-0	M310		9509-2-0-0	TP-974		N/A			4311-0-0-0	P+		9555-0-2-0
8	FC4012D-1817.0	9509-0-0-0	9509-1-0-0	M310		9509-2-0-0	TP-974		N/A			4311-0-0-0	P+		9555-0-2-0
8	FC4101D	9504-0-0-0	9504-1-0-0	HX4	M22520/5-01	9504-2-0-0	Y322		N/A			4311-0-0-0	P+		
8	FC4102D	9504-13-0-0	9504-1-0-0	HX4	M22520/5-01	9504-13-1-0	Y322		N/A			4311-0-0-0	P+		
8	FC4103D	9504-15-0-0	9504-1-0-0	HX4	M22520/5-01	9504-15-1-0	Y877		N/A			4311-0-0-0	P+		
8	FC4104D	9504-15-0-0	9504-1-0-0	HX4	M22520/5-01	9504-15-1-0	Y877		N/A			4311-0-0-0	P+		
8	FDS410D											4311-0-0-0	P+		
8	FRT4201D											4311-0-0-0	P+		
8	FRT411D											4311-0-0-0	P+		
8	FS4008D											4311-0-0-0	P+		
8	FS4011D											4311-0-0-0	P+		
8	FS4101D											4311-0-0-0	P+		
8	FS4102D											4311-0-0-0	P+		
8	MA4063S											4311-0-0-0	P+		
8	MC4008D	9504-19-0-0	9504-1-0-0	HX4	M22520/5-01	9504-19-1-0	Y524		N/A			4311-0-0-0	P+		9555-0-2-0
8	MC4008DS	9504-19-0-0	9504-1-0-0	HX4	M22520/5-01	9504-19-1-0	Y524		N/A			4311-0-0-0	P+		9555-0-2-0
8	MC4011D	9509-0-0-0	9509-1-0-0	M310		9509-2-0-0	TP-974		N/A			4311-0-0-0	P+		9555-0-2-0
8	MC4101D	9504-0-0-0	9504-1-0-0	HX4	M22520/5-01	9504-2-0-0	Y322		N/A			4311-0-0-0	P+		
8	MC4101D	9504-14-0-0	9504-1-0-0	HX4	M22520/5-01	9504-14-1-0	Y878		N/A			4311-0-0-0	P+		
8	MC4102D	9504-13-0-0	9504-1-0-0	HX4	M22520/5-01	9504-13-1-0	Y322		N/A			4311-0-0-0	P+		
8	MC4103D	9504-15-0-0	9504-1-0-0	HX4	M22520/5-01	9504-15-1-0	Y877		N/A			4311-0-0-0	P+		
8	MC4104D	9504-15-0-0	9504-1-0-0	HX4	M22520/5-01	9504-15-1-0	Y877		N/A			4311-0-0-0	P+		
8	MDS4201D											4311-0-0-0	P+		
8	MDS411D											4311-0-0-0	P+		
8	MS4008D											4311-0-0-0	P+		
8	MS4011D											4311-0-0-0	P+		
8	MS4101D											4311-0-0-0	P+		
8	MS420D											4311-0-0-0	P+		

\*1 All male and female crimp contacts can be ordered on reels in quantities of 2,000 by adding letter "R" after the contact part number, see page 84 for more information.



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## APPLICATION TOOLS

Combo-D  
D-Sub

### CONTACT APPLICATION TOOLS CROSS REFERENCE LIST

USE INDICATED POSITRONIC TOOLS FOR BEST RESULTS

Contact Size	Positronic Contact P/N	Handle & Positioner P/N	Hand Crimp Tool P/N	Mfg. Cross	Mill Equiv	Positioner	Mfg. Cross	Mill Equiv	Insertion Tool	Mfg. Cross	Mill Equiv	Removal Tool	Mfg. Cross	Mill Equiv	Automatic Crimp Tool ** See Note
22	FC8020D2		9507-0-0-0	AFM8	M2520/2-01	9502-29-0-0	K1665								
22	FC8022D2		9507-0-0-0	AFM8	M2520/2-01	9502-3-0-0	K-41	M2520/2-06	M81969/1-04	91067-1	M81969/1-04	M81969/1-04	91067-1	M81969/1-04	9550-1-0-0
22	FC8022D2** Thermocouple		9507-0-0-0	AFM8	M2520/2-01	9502-3-0-0	K-41	M2520/2-06	M81969/1-04	91067-1	M81969/1-04	M81969/1-04	91067-1	M81969/1-04	9550-1-0-0
22	MC8020D		9507-0-0-0	AFM8	M2520/2-01	9502-29-0-0	K1665		M81969/1-04	91067-1	M81969/1-04	M81969/1-04	91067-1	M81969/1-04	9550-1-0-0
22	MC8022D		9507-0-0-0	AFM8	M2520/2-01	9502-4-0-0	K-42	M2520/2-09	M81969/1-04	91067-1	M81969/1-04	M81969/1-04	91067-1	M81969/1-04	9550-1-0-0
22	MC8022D** Thermocouple		9507-0-0-0	AFM8	M2520/2-01	9502-4-0-0	K-42	M2520/2-09	M81969/1-04	91067-1	M81969/1-04	M81969/1-04	91067-1	M81969/1-04	9550-1-0-0
22	M39029/57-354		9507-0-0-0	AFM8	M2520/2-01	9502-3-0-0	K41	M2520/2-06	M81969/1-04	91067-1	M81969/1-04	M81969/1-04	91067-1	M81969/1-04	
22	M39029/58-360		9507-0-0-0	AFM8	M2520/2-01	9502-4-0-0	K42	M2520/2-09	M81969/1-04	91067-1	M81969/1-04	M81969/1-04	91067-1	M81969/1-04	
20	FC6018D2		9507-0-0-0	AFM8	M2520/2-01	9502-11-0-0	K774		M81969/1-02	91067-2	M81969/1-02	M81969/1-02	91067-2	M81969/1-02	
20	FC6020D2		9507-0-0-0	AFM8	M2520/2-01	9502-5-0-0	K13-1	M2520/2-08	M81969/1-02	91067-2	M81969/1-02	M81969/1-02	91067-2	M81969/1-02	9550-1-0-0
20	FC6020D2** Thermocouple		9507-0-0-0	AFM8	M2520/2-01	9502-5-0-0	K13-1	M2520/2-08	M81969/1-02	91067-2	M81969/1-02	M81969/1-02	91067-2	M81969/1-02	9550-1-0-0
20	FC6026D2		9507-0-0-0	AFM8	M2520/2-01	9502-5-0-0	K13-1	M2520/2-08	M81969/1-02	91067-2	M81969/1-02	M81969/1-02	91067-2	M81969/1-02	9550-1-0-0
20	FC6026D2** Thermocouple		9507-0-0-0	AFM8	M2520/2-01	9502-5-0-0	K13-1	M2520/2-08	M81969/1-02	91067-2	M81969/1-02	M81969/1-02	91067-2	M81969/1-02	9550-1-0-0
20	FC6520D		9507-0-0-0	AFM8	M2520/2-01	9502-5-0-0	K13-1	M2520/2-08	M81969/1-02	91067-2	M81969/1-02	M81969/1-02	91067-2	M81969/1-02	9550-1-0-0
20	M39029/6--36*		9507-0-0-0	AFM8	M2520/2-01	9502-5-0-0	K13-1	M2520/2-08	M81969/1-02	91067-2	M81969/1-02	M81969/1-02	91067-2	M81969/1-02	
20	MC6018D		9507-0-0-0	AFM8	M2520/2-01	9502-11-0-0	K774		M81969/1-02	91067-2	M81969/1-02	M81969/1-02	91067-2	M81969/1-02	9550-1-0-0
20	MC6020D		9507-0-0-0	AFM8	M2520/2-01	9502-5-0-0	K13-1	M2520/2-08	M81969/1-02	91067-2	M81969/1-02	M81969/1-02	91067-2	M81969/1-02	9550-1-0-0
20	MC6020D** Thermocouple		9507-0-0-0	AFM8	M2520/2-01	9502-5-0-0	K13-1	M2520/2-08	M81969/1-02	91067-2	M81969/1-02	M81969/1-02	91067-2	M81969/1-02	9550-1-0-0
20	MC6026D		9507-0-0-0	AFM8	M2520/2-01	9502-5-0-0	K13-1	M2520/2-08	M81969/1-02	91067-2	M81969/1-02	M81969/1-02	91067-2	M81969/1-02	9550-1-0-0
20	MC6026D** Thermocouple		9507-0-0-0	AFM8	M2520/2-01	9502-5-0-0	K13-1	M2520/2-08	M81969/1-02	91067-2	M81969/1-02	M81969/1-02	91067-2	M81969/1-02	9550-1-0-0
16	FC11*N4		9501-0-0-0	AF8	M2520/1-01	T.B.D.	T.B.D.		9099-0-0-0	ITH 1094	M81969/18-01	9081-0-0-0	FTG 2103	M81969/20-01	
16	FC112N4S		9509-4-0-0	GS222		9509-5-0-0	TP1366		9099-0-0-0	ITH 1094	M81969/18-01	9081-0-0-0	FTG 2103	M81969/20-01	
16	FC120N4		9501-0-0-0	AF8	M2520/1-01	T.B.D.	T.B.D.		9099-0-0-0	ITH 1094	M81969/18-01	9081-0-0-0	FTG 2103	M81969/20-01	
16	MC11*N-133.0		9501-0-0-0	AF8	M2520/1-01	9502-17-0-0	TP1110		9099-0-0-0	ITH 1094	M81969/18-01	9081-0-0-0	FTG 2103	M81969/20-01	9550-0-0-0
16	MC112NS-133.0		9509-4-0-0	GS222		9509-5-0-0	TP1366		9099-0-0-0	ITH 1094	M81969/18-01	9081-0-0-0	FTG 2103	M81969/20-01	
16	MC120N-133.0		9501-0-0-0	AF8	M2520/1-01	9502-17-0-0	TP1110		9099-0-0-0	ITH 1094	M81969/18-01	9081-0-0-0	FTG 2103	M81969/20-01	9550-0-0-0

\*1 All male and female crimp contacts can be ordered on reels in quantities of 2,000 by adding letter "R" after the contact part number, see page 84 for more information.

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













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## APPLICATION TOOLS

Combo-D  
D-Sub

## SUGGESTED PRINTED BOARD HOLE SIZES FOR COMPLIANT PRESS-FIT CONNECTORS

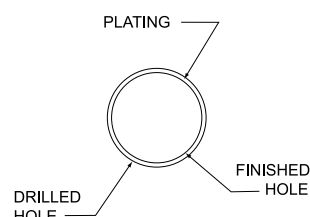
Traditionally, tin-lead has been a popular plating for PBC holes. However, many PCB hole platings must now be RoHS Compliant. Positronic is pleased to offer **PCB HOLE SIZE FOR RoHS** PCB plating as shown below.

OMEGA & BI-SPRING COMPLIANT PRESS-FIT CONTACT HOLE				
BOARD TYPE	CONTACT SIZE / TYPE	RECOMMENDED DRILL HOLE SIZE	RECOMMENDED PLATING	FINISHED HOLE SIZES
TIN-LEAD SOLDER PCB	 22 OMEGA	$\phi 0.0453 \pm 0.0010$ [ $\phi 1.150 \pm 0.025$ ]	0.0006 [15μ] minimum solder over 0.0010 [25μ] min. copper	$\phi 0.0394 + 0.0035 - 0.0024$ [ $\phi 1.000 + 0.090 - 0.060$ ]
	20 OMEGA	$\phi 0.0453 \pm 0.0010$ [ $\phi 1.150 \pm 0.025$ ]		$\phi 0.0394 + 0.0035 - 0.0024$ [ $\phi 1.000 + 0.090 - 0.060$ ]
	 16 BI-SPRING	$\phi 0.069 \pm 0.001$ [ $\phi 1.750 \pm 0.025$ ]		$\phi 0.0630 + 0.0035 - 0.0024$ [ $\phi 1.600 + 0.090 - 0.060$ ]
	8 BI-SPRING	$\phi 0.125 \pm 0.001$ [ $\phi 3.180 \pm 0.025$ ]		$\phi 0.119 \pm 0.002$ [ $\phi 3.02 \pm 0.05$ ]
RoHS PCB PLATING OPTIONS				
COPPER PCB	 22 OMEGA	$\phi 0.047 \pm 0.001$ [ $\phi 1.19 \pm 0.025$ ]	0.0010 [25μ] min. copper	$\phi 0.043 \pm 0.002$ [ $\phi 1.09 \pm 0.05$ ]
	20 OMEGA	$\phi 0.047 \pm 0.001$ [ $\phi 1.19 \pm 0.025$ ]		$\phi 0.043 \pm 0.002$ [ $\phi 1.09 \pm 0.05$ ]
	 16 BI-SPRING	$\phi 0.069 \pm 0.001$ [ $\phi 1.750 \pm 0.025$ ]		$\phi 0.0630 + 0.0035 - 0.0024$ [ $\phi 1.600 + 0.090 - 0.060$ ]
	8 BI-SPRING	$\phi 0.125 \pm 0.001$ [ $\phi 3.180 \pm 0.025$ ]		$\phi 0.119 \pm 0.002$ [ $\phi 3.02 \pm 0.05$ ]
IMMERSION TIN PCB	 22 OMEGA	$\phi 0.047 \pm 0.001$ [ $\phi 1.19 \pm 0.025$ ]	0.000033±0.000006 [0.85±0.15μ] immersion tin over 0.0010 [25μ] min. copper	$\phi 0.043 \pm 0.002$ [ $\phi 1.09 \pm 0.05$ ]
	20 OMEGA	$\phi 0.047 \pm 0.001$ [ $\phi 1.19 \pm 0.025$ ]		$\phi 0.043 \pm 0.002$ [ $\phi 1.09 \pm 0.05$ ]
	 16 BI-SPRING	$\phi 0.069 \pm 0.001$ [ $\phi 1.750 \pm 0.025$ ]		$\phi 0.0630 + 0.0035 - 0.0024$ [ $\phi 1.600 + 0.090 - 0.060$ ]
	8 BI-SPRING	$\phi 0.125 \pm 0.001$ [ $\phi 3.180 \pm 0.025$ ]		$\phi 0.119 \pm 0.002$ [ $\phi 3.02 \pm 0.05$ ]
IMMERSION SILVER PCB	 22 OMEGA	$\phi 0.047 \pm 0.001$ [ $\phi 1.19 \pm 0.025$ ]	0.000013±0.000007 [0.34±0.17μ] immersion silver over 0.0010 [25μ] min. copper	$\phi 0.043 \pm 0.002$ [ $\phi 1.09 \pm 0.05$ ]
	20 OMEGA	$\phi 0.047 \pm 0.001$ [ $\phi 1.19 \pm 0.025$ ]		$\phi 0.043 \pm 0.002$ [ $\phi 1.09 \pm 0.05$ ]
	 16 BI-SPRING	$\phi 0.069 \pm 0.001$ [ $\phi 1.750 \pm 0.025$ ]		$\phi 0.0630 + 0.0035 - 0.0024$ [ $\phi 1.600 + 0.090 - 0.060$ ]
	8 BI-SPRING	$\phi 0.125 \pm 0.001$ [ $\phi 3.180 \pm 0.025$ ]		$\phi 0.119 \pm 0.002$ [ $\phi 3.02 \pm 0.05$ ]
ELECTROLESS NICKEL / IMMERSION GOLD PCB	 22 OMEGA	$\phi 0.047 \pm 0.001$ [ $\phi 1.19 \pm 0.025$ ]	0.000002 [0.05μ] min. immersion gold over 0.000177±0.000059 [4.5±1.5μ] electroless nickel per IPC-4552 over 0.0010 [25μ] min. copper	$\phi 0.043 \pm 0.002$ [ $\phi 1.09 \pm 0.05$ ]
	20 OMEGA	$\phi 0.047 \pm 0.001$ [ $\phi 1.19 \pm 0.025$ ]		$\phi 0.043 \pm 0.002$ [ $\phi 1.09 \pm 0.05$ ]
	 16 BI-SPRING	$\phi 0.069 \pm 0.001$ [ $\phi 1.750 \pm 0.025$ ]		$\phi 0.0630 + 0.0035 - 0.0024$ [ $\phi 1.600 + 0.090 - 0.060$ ]
	8 BI-SPRING	$\phi 0.125 \pm 0.001$ [ $\phi 3.180 \pm 0.025$ ]		$\phi 0.119 \pm 0.002$ [ $\phi 3.02 \pm 0.05$ ]

## "Omega" Termination



## "Bi-Spring" Termination



## COMPLIANT PRESS-FIT TERMINATION CONTACT HOLE

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

## PRESS-FIT USER INFORMATION

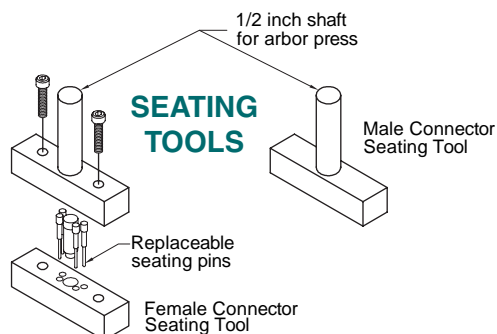
When properly used, Positronic Industries Bi-Spring Power or Omega Signal Press-Fit terminations provide reliable service even under severe conditions.

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

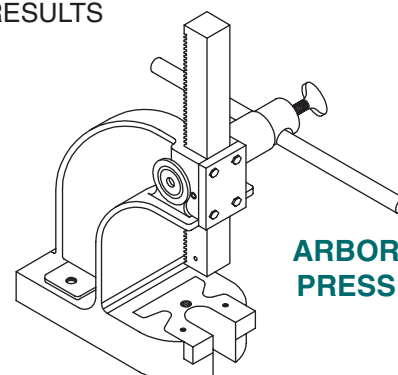
1. Inexpensive installation tooling is available from Positronic, to choose the proper installation tool refer to page 88 for part number ordering information.
2. Insert the connector into the P.C. board or backplane and seat connector fully.
3. Secure the connector to the P.C. board or backplane using two self-tapping screws. The screws should be 4-40 threads supplied by customer.

## COMPLIANT PRESS-FIT CONNECTOR INSTALLATION TOOLS

USE INDICATED POSITRONIC TOOLS FOR BEST RESULTS



Positronic offers expert assistance in adapting application tooling to your manufacturing environment. Contact our application tooling specialist for assistance.



## POSITRONIC RECOMMENDED TOOLS FOR COMPLIANT PRESS-FIT CONNECTORS AND CONTACTS

SHELL SIZE	CONNECTOR VARIANT	CONNECTOR SEATING TOOL WITH ARBOR PRESS SHAFT		ARBOR PRESS FOR SEATING TOOLS	REPLACEMENT PINS FOR CONNECTOR SEATING TOOL
		FEMALE P / N	MALE P / N		
1	2WK2	9512-41-0-41	9512-40-0-41	Use p / n  9530-1-0  1 ton capacity  4 inch throat	For <b>8W2 Size 22</b> Female contacts use pin p / n <b>855-751-0-41</b>
	5W1	9512-18-0-41	9512-1-0-41		
	8W2	9512-41-0-41	9512-40-0-41		
2	3W3	9512-19-0-41	9512-2-0-41		For <b>19W1 Size 22</b> Female contacts use pin p / n <b>855-347-29-41</b>
	3WK3	9512-39-0-41	9512-38-0-41		
	7W2	9512-20-0-41	9512-2-0-41		
	11W1	9512-21-0-41	9512-2-0-41		
	19W1	9512-42-0-41	9512-2-0-41		
3	5W5	9512-22-0-41	9512-3-0-41		For <b>Size 20</b> Female contacts use pin p / n <b>855-347-18-41</b>
	9W4	9512-23-0-41	9512-3-0-41		
	13W3	9512-24-0-41	9512-3-0-41		
	17W2	9512-25-0-41	9512-3-0-41		
	21W1	9512-26-0-41	9512-3-0-41		
4	8W8	9512-27-0-41	9512-4-0-41		For <b>Size 16</b> Female contacts use pin p / n <b>855-347-28-41</b>
	13W6	9512-28-0-41	9512-4-0-41		
	17W5	9512-29-0-41	9512-4-0-41		
	21WA4	9512-30-0-41	9512-4-0-41		
	25W3	9512-31-0-41	9512-4-0-41		
	27W2	9512-32-0-41	9512-4-0-41		
5	24W7	9512-33-0-41	9512-5-0-41		For <b>Size 8</b> Female contacts use pin p / n <b>855-347-19-41</b>
	36W4	9512-34-0-41	9512-5-0-41		
	43W2	9512-35-0-41	9512-5-0-41		
	47W1	9512-36-0-41	9512-5-0-41		
6	46W4	9512-37-0-41	9512-16-0-41		Male contacts don't use replaceable pins





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## SPECIAL OPTIONS APPENDIX

Combo-D  
D-Sub

### MODIFICATIONS (MOS)

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)*

SERIES	CONNECTOR VARIANT	GENDER	TERMINATION TYPE AVAILABLE	MODIFICATION OF STANDARD (MOS) NUMBER	DESCRIPTION OF MODIFICATION
CBD	3W3	F / M	0	-1841.0	Allows for molding to have positions A1 and A3 tooled only. Position A2 not molded but numbering will remain.
CBD	5W5	F / M	0	-1841.1	Allows for molding to have positions 1, 3 and 5 tooled only. Positions 2 and 4 not molded but numbering will remain.
CBD	8W8	F / M	0	-1841.2	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.
<b>CBD, CBM</b>	<b>3W3, 8W8</b>	M	0	-1570.4	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.
<b>CBC</b>	<b>36W4, 43W2</b>				
CBD, CBC, CBDD, CBHD, CBCD, CBDP*, ACBDP, ACBMP	ALL	F / M	ALL	-14	Allows connector with signal contacts installed, for signal contacts only to be plated 0.000030 [0.76 µ] gold over nickel.
CBD, CBC, CBDD, CBHD, CBCD, ACBDP, ACBMP	ALL	F / M	ALL	-14-1062.1	Allows connector with signal and power contacts installed, for both signal and power contacts to be plated 0.00030 [0.76 µ] gold over nickel
CBD, CBC, CBDD, CBHD, CBCD, CBDP*, ACBDP, ACBMP	ALL	F / M	ALL	-15	Allows connector with signal contacts installed, for signal contacts only to be plated 0.000050 inch [1.27µ] gold over nickel.
CBD, CBC, CBDD, CBHD, CBCD, ACBDP, ACBMP	ALL	F / M	ALL	-15-1062.0	Allows connector with signal and power contacts installed, for both signal and power contacts to be plated 0.000050 inch [1.27µ] gold over nickel.
CBD, CBM, CBC, CBDD, CBHD, CBCD	ALL	F / M	ALL	-1062.0	Allows connector with power contacts installed, for the power contacts only to be plated 0.000050 inch [1.27µ] gold over nickel.
CBD, CBM, CBC, CBDD, CBHD, CBCD	ALL	F / M	ALL	-1062.1	Allows connector with power contacts installed, for the power contacts only to be plated 0.00030 [0.76 µ] gold over nickel.
CBD, CBM, CBC, CBDD, CBHD, CBCD	ALL	F / M	ALL	-759.0	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.
CBD, CBM, CBC, CBDD, CBHD, CBCD	ALL	F / M	ALL	-759.1	Allows connector, with any contacts to include blind mate mounting plate. See D-subminiature Accessories catalog for more details.
QB	FOR CONTACTS	F	FC40**D CONTACTS	-1817.0	Allows for contacts to have a crimp barrel with a length of 0.310 [7.87].
QB	7W2, 9W4	M	56, 57	-1865.0	Connector with standard right angle (90°) brackets replaced with 4535-78-0 right angle (90°) brackets.
QB	7W2	M	N/A	-1845.0	Allows for a connector to be supplied with inverted bend. Contact tail length below bracket of 0.122 [3.10] max. Alignment bar not required.

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



**\*1 NOTE:** Parts are to be ordered to the DESC number,  
the Positronic part number is for reference only.

Removable contacts were tested for shock and vibration using connectors as the holding fixture.  
Tests were performed to the connector specifications.

DESC PART NUMBER	*1 REFERENCE NUMBER	DESC PART NUMBER	*1 REFERENCE NUMBER	DESC PART NUMBER	*1 REFERENCE NUMBER
85040DAEPT	CBC7W2M1F000-50-799.2	85041MAEST	CBC11W1F1F000-50-403.4	85045GBEPR	CBM13W3M2000C-50
85040DAEST	CBC7W2F1F000-50-799.2	85041MAEPR	CBC11W1M10000-50-403.3	85045GBESR	CBM13W3F2000C-50
85040DAEPR	CBC7W2M10000-50-799.0	85041MAESR	CBC11W1F10000-50-403.3	85045NAEPT	CBC13W3M1F000-50-403.0
85040DAESR	CBC7W2F10000-50-799.0	85043GULPT	CBM5W5M0F00C	85045NAEST	CBC13W3F1F000-50-403.0
85040GAEPT	CBC7W2M1F00C-50	85043GULST	CBM5W5F0F00C	85045NAEPR	CBC13W3M10000-50-403.0
85040GAEST	CBC7W2F1F00C-50	85043GULPR	CBM5W5M0000C	85045NAESR	CBC13W3F10000-50-403.0
85040GAEPR	CBC7W2M1000C-50	85043GULSR	CBM5W5F0000C	85045MAEPT	CBC13W3M1F000-50-403.4
85040GAESR	CBC7W2F1000C-50	85044DAEPT	CBC17W2M1F000-50-799.2	85045MAEST	CBC13W3F1F000-50-403.4
85040GBEPT	CBM7W2M2F00C-50	85044DAEST	CBC17W2F1F000-50-799.2	85045MAEPR	CBC13W3M10000-50-403.3
85040GBEST	CBM7W2F2F00C-50	85044DAEPR	CBC17W2M10000-50-799.0	85045MAESR	CBC13W3F10000-50-403.3
85040GBEPR	CBM7W2M2000C-50	85044DAESR	CBC17W2F10000-50-799.0	85047GULPT	CBM8W8M0F00C
85040GBESR	CBM7W2F2000C-50	85044GAEPT	CBC17W2M1F00C-50	85047GULST	CBM8W8F0F00C
85040NAEPT	CBC7W2M1F000-50-403.0	85044GAEST	CBC17W2F1F00C-50	85047GULPR	CBM8W8M0000C
85040NAEST	CBC7W2F1F000-50-403.0	85044GAEPR	CBC17W2M1000C-50	85047GULSR	CBM8W8F0000C
85040NAEPR	CBC7W2M10000-50-403.0	85044GAESR	CBC17W2F1000C-50	85048GBEPT	CBM21WA4M2F00C-50
85040NAESR	CBC7W2F10000-50-403.0	85044GBEPT	CBM17W2M2F00C-50	85048GBEST	CBM21WA4F2F00C-50
85040MAEPT	CBC7W2M1F000-50-403.4	85044GBEST	CBM17W2F2F00C-50	85048GBEPR	CBM21WA4M2000C-50
85040MAEST	CBC7W2F1F000-50-403.4	85044GBEPR	CBM17W2M2000C-50	85048GBESR	CBM21WA4F2000C-50
85040MAEPR	CBC7W2M10000-50-403.3	85044GBESR	CBM17W2F2000C-50	85049	NOT OFFERED
85040MAESR	CBC7W2F10000-50-403.3	85044NAEPT	CBC17W2M1F000-50-403.0	85050	NOT OFFERED
85041DAEPT	CBC11W1M1F000-50-799.2	85044NAEST	CBC17W2F1F000-50-403.0	85051	NOT OFFERED
85041DAEST	CBC11W1F1F000-50-799.2	85044NAEPR	CBC17W2M10000-50-403.0	85052	NOT OFFERED
85041DAEPR	CBC11W1M10000-50-799.0	85044NAESR	CBC17W2F10000-50-403.0	85053	NOT OFFERED
85041DAESR	CBC11W1F10000-50-799.0	85044MAEPT	CBC17W2M1F000-50-403.4	85054GBEPT	CBM24W7M2F00C-50
85041GAEPT	CBC11W1M1F00C-50	85044MAEST	CBC17W2F1F000-50-403.4	85054GBEST	CBM24W7F2F00C-50
85041GAEST	CBC11W1F1F00C-50	85044MAEPR	CBC17W2M10000-50-403.3	85054GBEPR	CBM24W7M2000C-50
85041GAEPR	CBC11W1M1000C-50	85044MAESR	CBC17W2F10000-50-403.3	85054GBESR	CBM24W7F2000C-50
85041GAESR	CBC11W1F1000C-50	85045DAEPT	CBC13W3M1F000-50-799.2	89046-001	MS4016D-50
85041GBEPT	CBM11W1M2F00C-50	85045DAEST	CBC13W3F1F000-50-799.2	89047-001	FS4016D-50
85041GBEST	CBM11W1F2F00C-50	85045DAEPR	CBC13W3M10000-50-799.0	89048-001	NOT OFFERED
85041GBEPR	CBM11W1M2000C-50	85045DAESR	CBC13W3F10000-50-799.0	89049-001	NOT OFFERED
85041GBESR	CBM11W1F2000C-50	85045GAEPT	CBC13W3M1F00C-50	89050-001	MS4008D-50
85041NAEPT	CBC11W1M1F000-50-403.0	85045GAEST	CBC13W3F1F00C-50	89051-001	FS4008D-50
85041NAEST	CBC11W1F1F000-50-403.0	85045GAEPR	CBC13W3M1000C-50	89052-001	NOT OFFERED
85041NAEPR	CBC11W1M10000-50-403.0	85045GAESR	CBC13W3F1000C-50	89053-001	NOT OFFERED
85041NAESR	CBC11W1F10000-50-403.0	85045GBEPT	CBM13W3M2F00C-50	89054-001	MS4820-50
85041MAEPT	CBC11W1M1F000-50-403.4	85045GBEST	CBM13W3F2F00C-50	89055-001	FS4820-50



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## DESC CROSS REFERENCE

Combo-D  
D-Sub

**\*1 NOTE:** Parts are to be ordered to the DESC number,  
the Positronic part number is for reference only.

Removable contacts were tested for shock and vibration using connectors as the holding fixture.  
Tests were performed to the connector specifications.

DESC PART NUMBER	*1 REFERENCE NUMBER	DESC PART NUMBER	*1 REFERENCE NUMBER	DESC PART NUMBER	*1 REFERENCE NUMBER
89056-001	FS4920-50	89074MAESR	CBC5W1F10000-50-403.3	89080MAEPT	CBC25W3M1F000-50-403.4
89057-001	MS4920-50	89075GULPT	CBM3W3M0F00C	89080MAEST	CBC25W3F1F000-50-403.4
89058-A	MC4101M	89075GULST	CBM3W3F0F00C	89080MAEPR	CBC25W3M10000-50-403.3
89058-B	MC4102M	89075GULPR	CBM3W3M0000C	89080MAESR	CBC25W3F10000-50-403.3
89058-C	MC4103M	89075GULSR	CBM3W3F0000C	89081GBEPT	CBM27W2M2F00C-50
89058-D	MC4104M	89076GBEPT	CBM9W4M2F00C-50	89081GBEST	CBM27W2F2F00C-50
89059-A	FC4101M	89076GBEST	CBM9W4F2F00C-50	89081GBEPR	CBM27W2M2000C-50
89059-B	FC4102M	89076GBEPR	CBM9W4M2000C-50	89081GBESR	CBM27W2F2000C-50
89059-C	FC4103M	89076GBESR	CBM9W4F2000C-50	89082GBEPT	CBM36W4M2F00C-50
89059-D	FC4104M	89077GBEPT	CBM21W1M2F00C-50	89082GBEST	CBM36W4F2F00C-50
89060-A	MC4201M	89077GBEST	CBM21W1F2F00C-50	89082GBEPR	CBM36W4M2000C-50
89060-B	MC4202M	89077GBEPR	CBM21W1M2000C-50	89082GBESR	CBM36W4F2000C-50
89060-C	MC4203M	89077GBESR	CBM21W1F2000C-50	89083DAEPT	CBC43W2M1F000-50-799.2
89060-D	MC4204M	89078GBEPT	CBM13W6M2F00C-50	89083DAEST	CBC43W2F1F000-50-799.2
89061-A	FC4201M	89078GBEST	CBM13W6F2F00C-50	89083DAEPR	CBC43W2M10000-50-799.0
89061-B	FC4202M	89078GBEPR	CBM13W6M2000C-50	89083DAESR	CBC43W2F10000-50-799.0
89061-C	FC4203M	89078GBESR	CBM13W6F2000C-50	89083GAEPT	CBC43W2M1F00C-50
89061-D	FC4204M	89079GBEPT	CBM17W5M2F00C-50	89083GAEST	CBC43W2F1F00C-50
89074DAEPT	CBC5W1M1F000-50-799.2	89079GBEST	CBM17W5F2F00C-50	89083GAEPR	CBC43W2M1000C-50
89074DAEST	CBC5W1F1F000-50-799.2	89079GBEPR	CBM17W5M2000C-50	89083GAESR	CBC43W2F1000C-50
89074DAEPR	CBC5W1M10000-50-799.0	89079GBESR	CBM17W5F2000C-50	89083GBEPT	CBM43W2M2F00C-50
89074DAESR	CBC5W1F10000-50-799.0	89080DAEPT	CBC25W3M1F000-50-799.2	89083GBEST	CBM43W2F2F00C-50
89074GAEPT	CBC5W1M1F00C-50	89080DAEST	CBC25W3F1F000-50-799.2	89083GBEPR	CBM43W2M2000C-50
89074GAEST	CBC5W1F1F00C-50	89080DAEPR	CBC25W3M10000-50-799.0	89083GBESR	CBM43W2F2000C-50
89074GAEPR	CBC5W1M1000C-50	89080DAESR	CBC25W3F10000-50-799.0	89083NAEPT	CBC43W2M1F000-50-403.0
89074GAESR	CBC5W1F1000C-50	89080GAEPT	CBC25W3M1F00C-50	89083NAEST	CBC43W2F1F000-50-403.0
89074GBEPT	CBM5W1M2F00C-50	89080GAEST	CBC25W3F1F00C-50	89083NAEPR	CBC43W2M10000-50-403.0
89074GBEST	CBM5W1F2F00C-50	89080GAEPR	CBC25W3M1000C-50	89083NAESR	CBC43W2F10000-50-403.0
89074GBEPR	CBM5W1M2000C-50	89080GAESR	CBC25W3F1000C-50	89083MAEPT	CBC43W2M1F000-50-403.4
89074GBESR	CBM5W1F2000C-50	89080GBEPT	CBM25W3M2F00C-50	89083MAEST	CBC43W2F1F000-50-403.4
89074NAEPT	CBC5W1M1F000-50-403.0	89080GBEST	CBM25W3F2F00C-50	89083MAEPR	CBC43W2M10000-50-403.3
89074NAEST	CBC5W1F1F000-50-403.0	89080GBEPR	CBM25W3M2000C-50	89083MAESR	CBC43W2F10000-50-403.3
89074NAEPR	CBC5W1M10000-50-403.0	89080GBESR	CBM25W3F2000C-50		
89074NAESR	CBC5W1F10000-50-403.0	89080NAEPT	CBC25W3M1F000-50-403.0		
89074MAEPT	CBC5W1M1F000-50-403.4	89080NAEST	CBC25W3F1F000-50-403.0		
89074MAEST	CBC5W1F1F000-50-403.4	89080NAEPR	CBC25W3M10000-50-403.0		
89074MAEPR	CBC5W1M10000-50-403.3	89080NAESR	CBC25W3F10000-50-403.0		

## POSITRONIC PRODUCTS

### Power

**Contact Sizes:** 0, 8, 12, 16, 20 and 22  
**Current Ratings:** To 100 amperes  
**Terminations:** Crimp, wire solder, straight solder, right angle (90°) solder, straight press-fit and right angle (90°) press-fit  
**Configurations:** Multiple variants in a variety of package sizes  
**Compliance:** PICMG 2.11, PICMG 3.0, VITA 41



**FEATURES:** Hot swap capability • AC/DC operation in a single connector • Signal contacts for hardware management • Blind mating • Sequential mating • Large surface area contact mating system • Wide variety of accessories • Customer specified contact arrangements

### D-subminiature

**Contact Sizes:** 8, 16, 20 and 22  
**Current Ratings:** To 40 amperes nominal  
**Terminations:** Crimp, wire solder, straight solder, right angle (90°) solder and straight press-fit  
**Configurations:** Multiple variants in both standard and high densities  
**Qualifications:** MIL-DTL-24308, Goddard Space Flight S-311-P, SAE AS 39029, IP65, IP67



**FEATURES:** Four performance levels available: professional, industrial, military and space-flight quality for best cost/performance ratio • Options include thermocouple contacts, air coupling, environmentally sealed and dual port package including mixed density • Broad selection of accessories

### Rectangular

**Contact Sizes:** 16, 20 and 22  
**Current Ratings:** To 13 amperes  
**Terminations:** Crimp, wire solder, straight solder and right angle (90°) solder  
**Configurations:** Multiple variants in both standard and high densities  
**Qualifications:** MIL-DTL-28748, SAE AS 39029, CCITT V.35



**FEATURES:** Two performance levels available: industrial quality and military quality provide two performance to cost choices • Large surface area contact mating system • A wide variety of accessories • Broad selection of contact variants and package sizes

### Circular

**Contact Sizes:** 12, 16, 20 and 22  
**Current Ratings:** To 25 amperes nominal  
**Terminations:** Crimp, wire solder, straight solder and right angle (90°) solder  
**Configurations:** Multiple variants  
**Qualifications:** Environmental protection to IP67



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

### Cable

All Positronic connector products can be supplied as part of cable assemblies whose technical characteristics would reflect those of the connectors being used within the assembly.



**FEATURES:** Shorten the supply chain and reduce additional costs and delays by "cablizing" • Overmolding available • Shielded and environmentally sealed versions available • Power cables and access boxes which meet the SAE J2496 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:** Space-D32



**FEATURES:** Intended for use as an electrical feedthrough in high vacuum applications • Leakage rate:  $5 \times 10^{-9}$  mbar.l/s @ vacuum  $1.5 \times 10^{-5}$  atm • 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](http://www.connectpositronic.com) or call your nearest Positronic sales office as given on the back of this catalog.



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