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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**

**UL 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 60807-7, MIL-DTL-24308 and AS39029.

TECHNICAL CHARACTERISTICS

MATERIALS AND FINISHES:

Insulator:	Glass filled polyester per ASTM D 5927 UL 94V-0, blue color.
Contacts:	Precision machined copper alloy.
Contact Plating:	
SIGNAL:	Gold flash over nickel plate. Other finishes available upon request, see page 81.
POWER:	Gold flash over nickel. Other finishes available upon request, see page 81.
SHIELDED:	For contact platings, see page 68.
HIGH VOLTAGE:	For contact platings, see page 68.
Shells:	Steel with tin plate; zinc plate; stainless steel passivated. Other materials and finishes available upon request.
Mounting Spacers and Brackets:	Nylon; polyester; copper alloy or steel with zinc plate or tin plate; phosphor bronze with tin plate; stainless steel, passivated.
Push-On Fasteners:	Phosphor bronze and beryllium copper with tin plate.
Jackscrew Systems:	Brass or steel with zinc plate or clear zinc plate or tin plate; stainless steel, passivated.
Hoods:	Composite and plastic, UL 94V-0; brass or steel with zinc plate. Aluminum; aluminum with electroless nickel plate. For aluminum hoods, zinc content is 1% maximum. Die cast zinc.
Non-magnetic versions are available, contact Technical Sales.	

MECHANICAL CHARACTERISTICS:

Signal Contacts, Fixed:	Size 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 – 0.0625 inch [1.588mm] mating diameter. Female contacts - closed entry design. Size 8 contacts, male - 0.142 inch [3.61mm] mating diameter. Female contact features Large Surface Area (L.S.A.) closed entry contact design utilizing BeCu mechanical retention member. Closed crimp barrel.
Contact Retention in Insulator:	
SIGNAL SIZE 22	5 lbs. [21N] minimum
POWER SIZE 16	6 lbs [26N] minimum
SIZE 8	22 lbs [98N] for power, shielded and high voltage.
Resistance to Solder Iron Heat:	500°F [260°C] for 10 seconds duration per IEC 60512-6.
Signal Contact Terminations:	Solder contacts - 0.035 inch [0.89mm] minimum hole diameter for 22 AWG [0.3 mm ²] wire maximum. Straight Printed Board Mount – 0.020 inch [0.51mm] diameter.

TECHNICAL CHARACTERISTICS, continued

continued from previous page. . . .

Power Contacts, Terminations:

Right Angle (90°) Printed Board Mount –
0.030 inch [0.76 mm] diameter.

Size 16 contacts- printed board terminations
with 0.063 inch [1.60mm] diameters.

Size 8 contacts - printed board terminations
with 0.078 inch [1.98mm], 0.094 inch
[2.39mm] and 0.125 inch [3.18mm]
termination diameters.

Shielded Contacts, Removable:

See table of cable sizes for contact
termination dimensions, page 78.

High Voltage Contacts:

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

Shells:

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

Polarization:

Trapezoidally shaped shells and polarized
jackscrews.

Mounting to Angle Brackets:

Jackscrews and riveted fasteners with 0.120
inch [3.05mm] diameter hole, and threaded
riveted fasteners with 4-40 threads and nylon
inserts.

Mounting to Printed Board:

Rapid installation push-on fasteners and
threaded posts.

Locking Systems:

Jackscrews and vibration locking systems.

Mechanical Operations:

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

ELECTRICAL CHARACTERISTICS:

SIZE 22 CONTACT

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

SIZE 16 CONTACTS

POWER CONTACTS

Contact Current Rating - Tested per UL 1977:

Standard Contact Material: 28 amperes.

High Conductivity Contact Material: 40 amperes.

See Temperature Rise Curves on page 2 for details.

Initial Contact Resistance:

Standard Contact Material: 0.0016 ohms max. Per IEC
60512-2, Test 2b.

High Conductivity

Contact Material: 0.001 ohms max. Per IEC
60512-2, Test 2b.
1000 V r.m.s.

Proof Voltage:

SIZE 8 CONTACTS

POWER CONTACTS

For electrical characteristics, see page 4.

SHIELDED CONTACTS

For electrical characteristics, see page 69.

HIGH VOLTAGE CONTACTS

For electrical characteristics, see page 69.

CONNECTOR

Insulation Resistance: 5 G ohms.

Clearance and

Creepage Distance: 0.042 inch [1.06mm] minimum.

Working Voltage: 300 V r.m.s.

CLIMATIC CHARACTERISTICS:

Temperature Range: -55°C to +125°C.

Damp Heat, Steady State: 10 days.

THERMOCOUPLE CONTACTS:

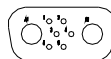
Straight and right angle PCB mount contacts are available, please contact
Technical Sales for details.

Size 22 crimp contacts are available in CBCD series, see page 71 for
details.

*1 CONTACT VARIANT

FACE VIEW OF MALE OR REAR VIEW OF FEMALE

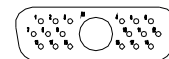
— SHELL SIZE 1 —



8W2

Six Size 22 Signal Contacts and
Two Size 16 Power Contacts

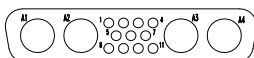
— SHELL SIZE 2 —



19W1

Eighteen Size 22 Signal Contacts
and One Size 8 Power Contact

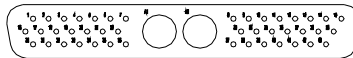
— SHELL SIZE 3 —



***2 15W4**

Eleven Size 22 Signal Contacts
and Four Size 8 Power Contacts

— SHELL SIZE 4 —



***3 45W2**

Forty-three Size 22 Signal Contacts
and Two Size 8 Power Contacts

NOTES:

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

*2 For technical, dimensional and PCB layout
information on 15W4 variants, contact
Technical Sales.

*3 45W2 variant currently available in male
only. Contact Technical Sales for availability
of female connector.

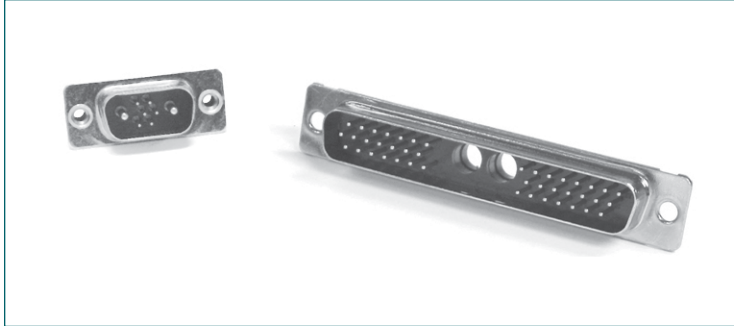


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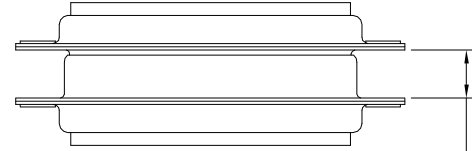
STANDARD SHELL ASSEMBLY



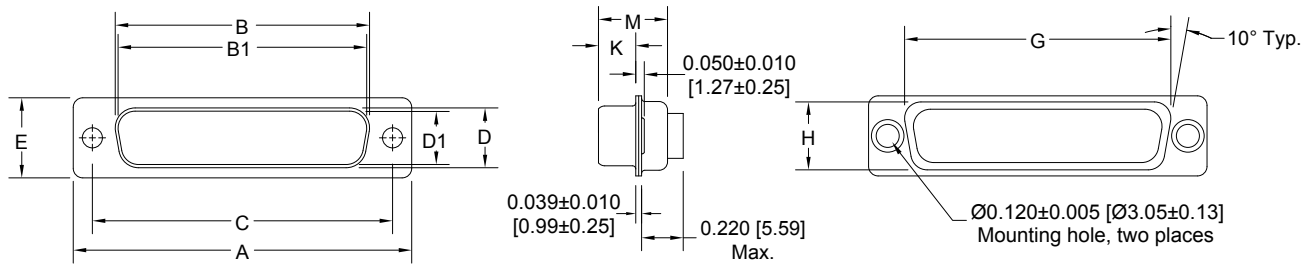
CBDD8W2M3S000

CBDD45W2M30000

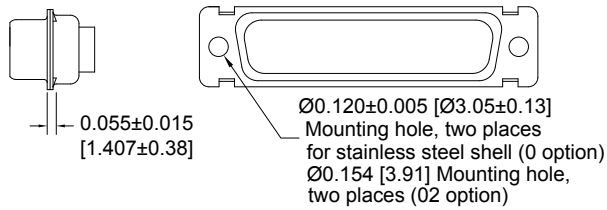
RECOMMENDED MATING DIMENSIONS



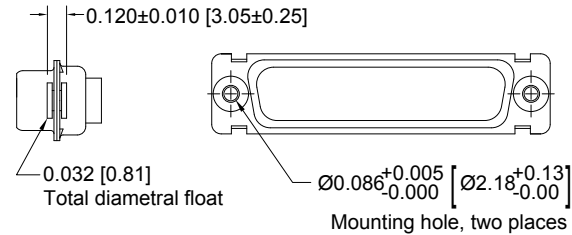
Shell Sizes 1 & 2 =
0.265±0.015 [6.73±0.38]
Shell Sizes 3, 4, 5 & 6 =
0.256±0.015 [6.50±0.38]



OPTIONAL SHELL ASSEMBLY (0, 02)

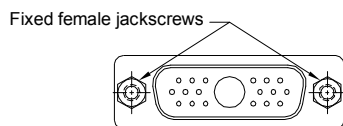
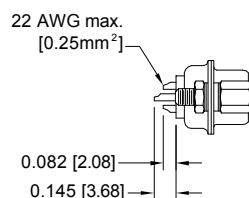


OPTIONAL SHELL ASSEMBLY WITH UNIVERSAL FLOAT MOUNTS (F)

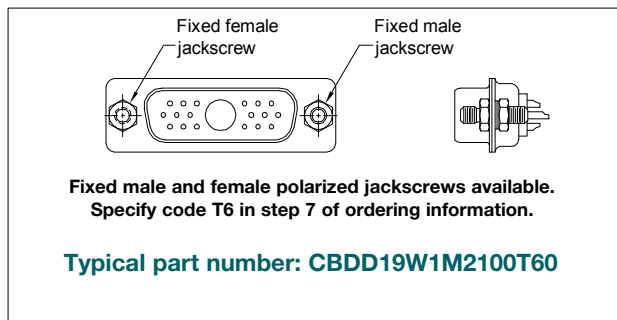


SHELL SIZES	VARIANT	A ±0.015 [0.38]	B ±0.005 [0.13]	B1 ±0.005 [0.13]	C ±0.005 [0.13]	D ±0.005 [0.13]	D1 ±0.005 [0.13]	E ±0.015 [0.38]	G ±0.010 [0.25]	H ±0.010 [0.25]	K ±0.005 [0.13]	M ±0.010 [0.25]
1	8W2M	1.213 [30.81]		0.666 [16.92]	0.984 [24.99]		0.329 [8.36]	0.494 [12.55]	0.759 [19.28]	0.422 [10.72]	0.233 [5.92]	0.422 [10.72]
	8W2F	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]
	8W2S											
2	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]
	19W1F	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]
	19W1S											
4	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]

SOLDER CUP CONNECTOR CODE 21



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

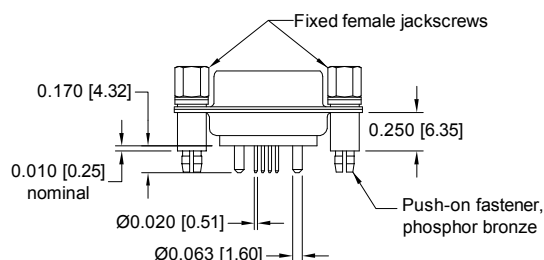


Typical part number: CBDD19W1M2100T0

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

CONTACT CODE	D Ø
3	-----

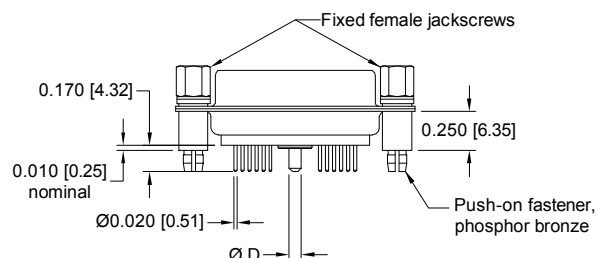
For straight printed board mount contacts, specify code 3 in step 4 of ordering information.



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



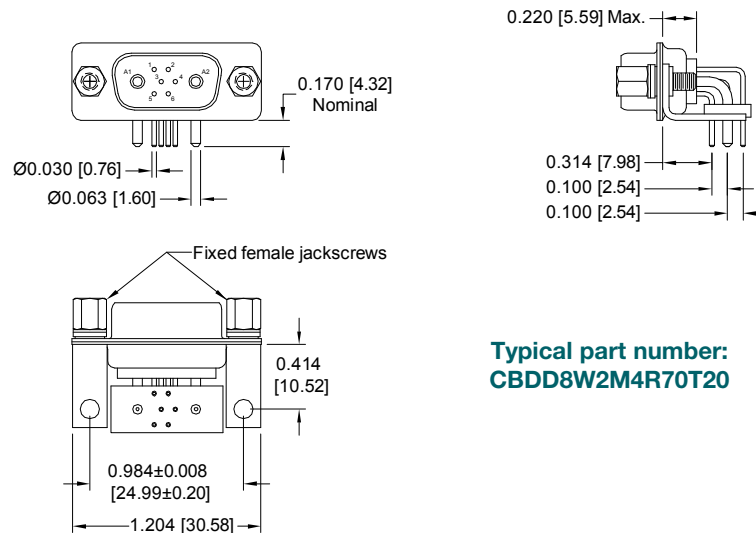
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RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR
SIZE 16 POWER CONTACTS WITH 0.063 [1.60] Ø TERMINATIONS
CODE 4, 0.314 [7.98] CONTACT EXTENSION

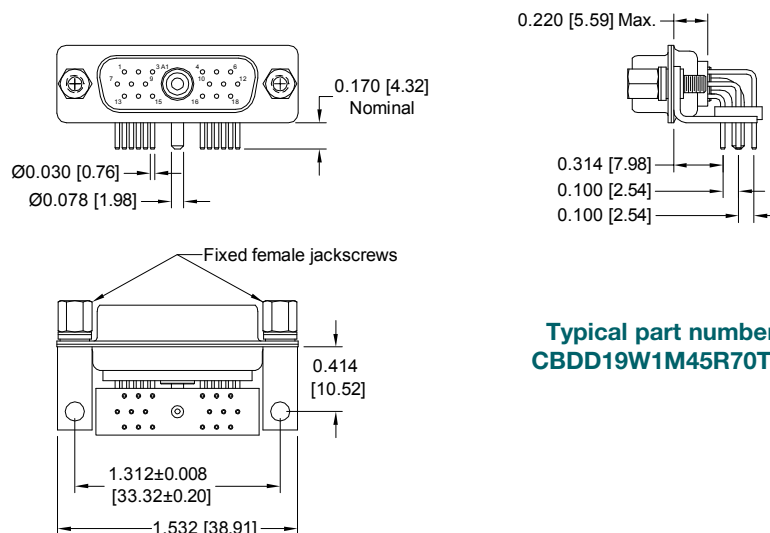
See temperature rise curves on pages 1 and 2



Typical part number:
CBDD8W2M4R70T20

RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR
SIZE 8 POWER CONTACTS WITH 0.078 [1.98] Ø TERMINATIONS
CODE 4 AND 45, 0.314 [7.98] CONTACT EXTENSION

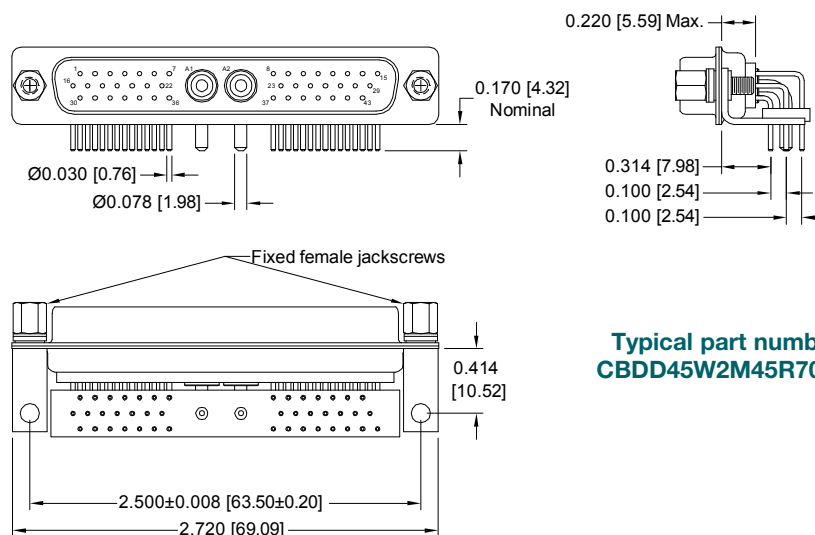
See temperature rise curves on pages 1 and 2



Typical part number:
CBDD19W1M45R70T20

RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR
SIZE 8 POWER CONTACTS WITH 0.078 [1.98] Ø TERMINATIONS
CODE 4 AND 45, 0.314 [7.98] CONTACT EXTENSION

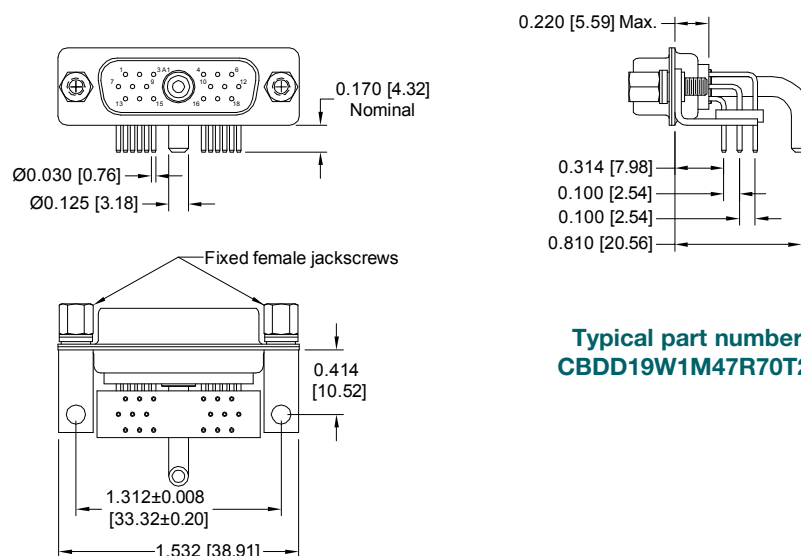
See temperature rise curves on pages 1 and 2



Typical part number:
CBDD45W2M45R70T20

RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR
SIZE 8 POWER CONTACTS WITH 0.125 [3.18] Ø TERMINATIONS
CODE 4 AND 47, 0.314 [7.98] CONTACT EXTENSION

See temperature rise curves on pages 1 and 2



Typical part number:
CBDD19W1M47R70T20



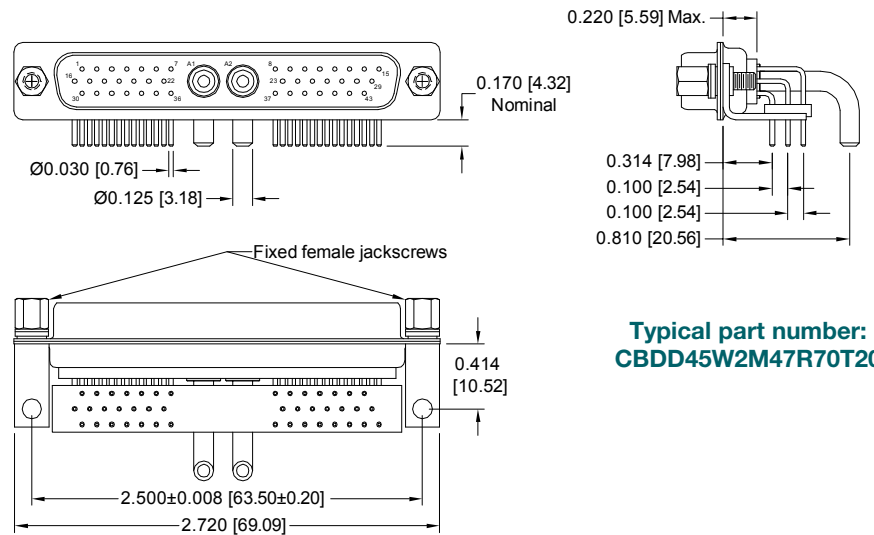
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RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR
SIZE 8 POWER CONTACTS WITH 0.125 [3.18] Ø TERMINATIONS
CODE 4 AND 47, 0.314 [7.98] CONTACT EXTENSION

See temperature rise curves on pages 1 and 2



Typical part number:
CBDD45W2M47R70T20

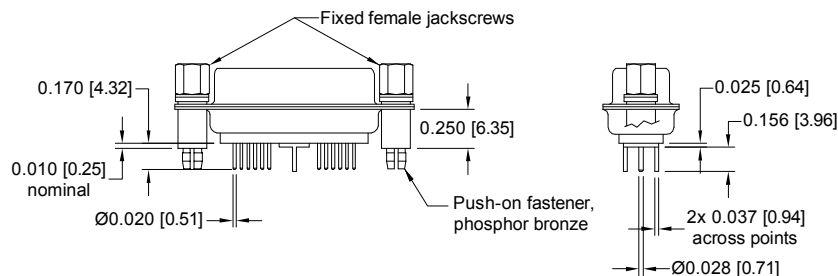
Connectors Designed To Customer Specifications

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

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

Contact Technical Sales with your particular requirements.

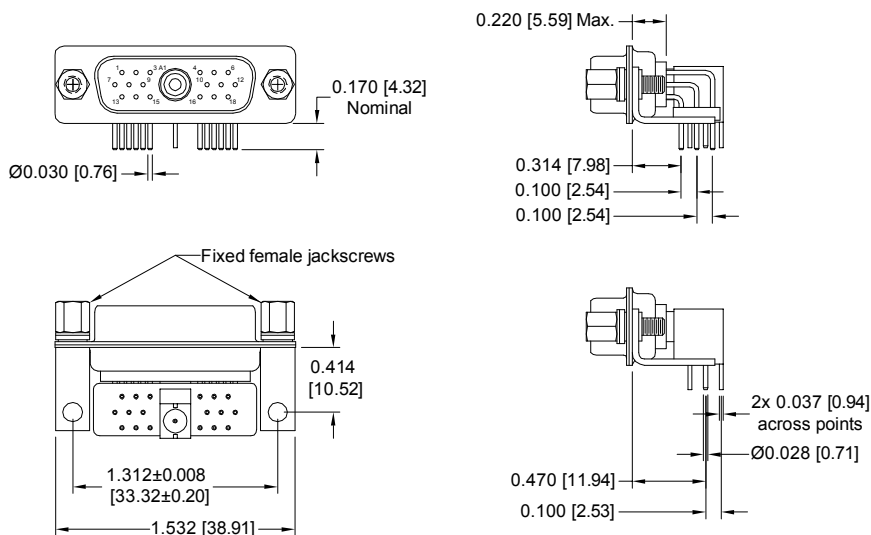
**STRAIGHT PRINTED BOARD MOUNT CONNECTOR
WITH FDS4201D OR MDS4201D SHIELDED CONTACTS
CODE 65**



Typical part number:
CBDD19W1M65S60T20

Shielded contacts only
visible this view for clarity

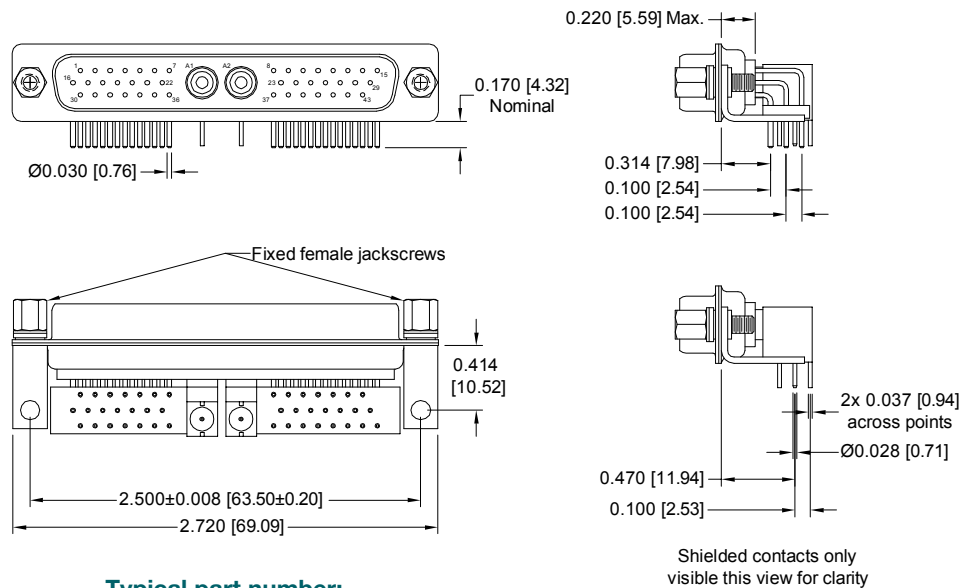
**RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR
WITH FRT4201D OR MRT4201D SHIELDED CONTACTS
CODE 84**



Typical part number:
CBDD19W1M84R70T20

Shielded contacts only
visible this view for clarity

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

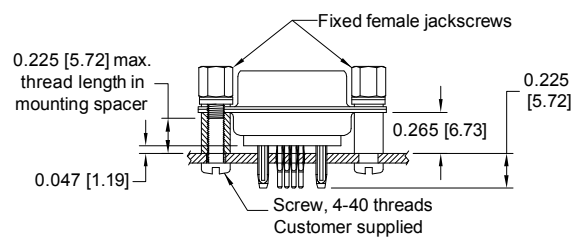
CODE 84

Typical part number:
CBDD45W2M84R70T20

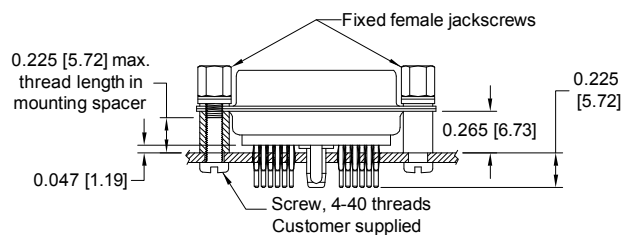
COMPLIANT PRESS-FIT CONNECTOR

CODE 93

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



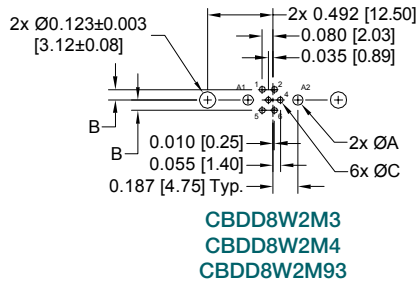
TYPICAL PART NUMBER: CBDD8W2M93S0T20



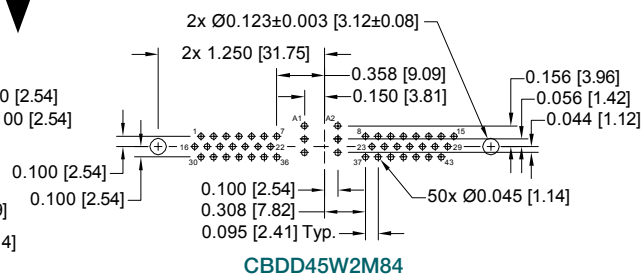
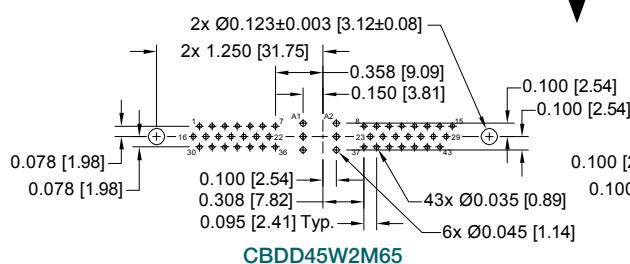
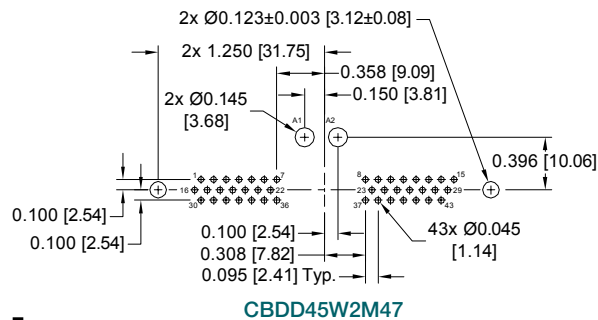
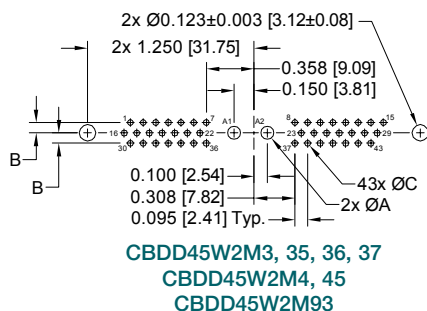
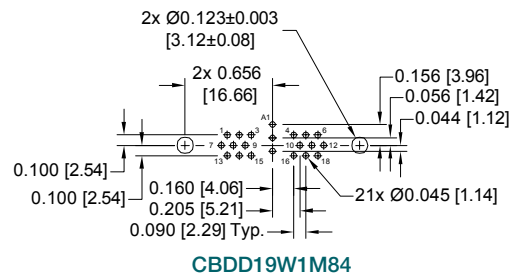
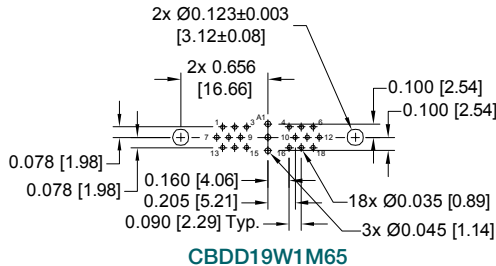
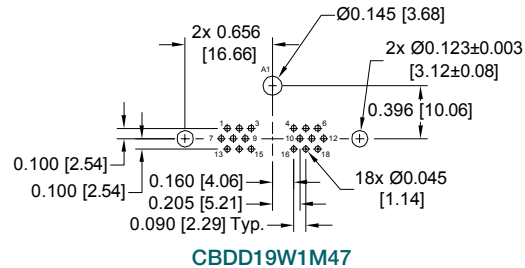
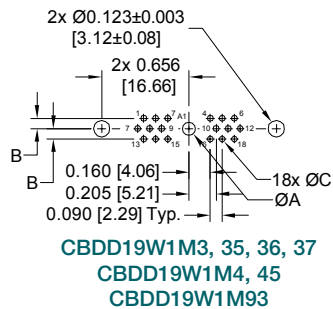
TYPICAL PART NUMBER: CBDD19W1M93S0T20

PRINTED BOARD MOUNT CONTACT HOLE PATTERN

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



SUGGESTED 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 85.	0.078 [1.98]	See chart for size 22 contact on page 85.
	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 85.	0.078 [1.98]	See chart for size 22 contact on page 85.





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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
EXAMPLE	CBDD	8W2	M	93	S	0	0	0	/AA

10
-14

STEP 1 - BASIC SERIES

CBDD Series -
CBHD Series - High Conductivity
Power Contacts

STEP 2 - CONNECTOR VARIANTS

Shell Size 1 - 8W2

*See next page for ordering information
for other shell size options.*

STEP 3 - CONNECTOR GENDER

***1 F** - Female - Professional Level -
Open Entry Signal Contacts

M - Male

***1 S** - Female - Industrial / Military Level -
PosiBand Closed Entry Signal Contacts

STEP 4 - CONTACT TERMINATION TYPE

***5 21** - Fixed Solder Cup, 22 AWG-30 AWG [0.3mm²-0.05mm²].

***5 3** - Solder, Straight Printed Board Mount, 0.170 [4.32] Tail
length.

***5 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].

***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

***2 STEP 10 - SPECIAL OPTIONS**

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

**CONTACT TECHNICAL SALES
FOR ORDERING DETAILS OF
THE FOLLOWING:**

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

**STEP 9 - ENVIRONMENTAL
COMPLIANCE OPTIONS**

/AA - RoHS Compliant

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

STEP 8 - SHELL OPTIONS

0 - Zinc Plated.

***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

H - Hood, Top Opening, Metal

***3 G** - Hood, EMI/RFI, Die Cast Zinc

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

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

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.

***5** Size 16 power contact are included.