

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 with chromate

seal; stainless steel passivated. Other materials

and finishes available upon request.

Mounting Spacers
and Brackets:

Nylon; polyester; copper alloy or steel with zinc plate and chromate seal or tin plate; phosphor

bronze with tin plate; stainless steel, passivated. **Push-On Fasteners:** Phosphor bronze and beryllium copper with tin

plate.

Jackscrew Systems: Brass or steel with zinc plate and chromate seal

or clear zinc plate or tin plate; stainless steel,

passivated.

Hoods: Composite and plastic, UL 94V-0; brass

or steel with zinc plate and chromate seal Aluminum; aluminum with 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:

xed: 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 500°F [260°C] for 10 seconds duration per

Solder Iron Heat: IEC 60512-6.

Signal Contact Solder contacts - 0.035 inch [0.89mm]

Terminations: minimum hole diameter for 22 AWG

[0.3 mm²] wire maximum.



TECHNICAL CHARACTERISTICS, continued

continued from previous page. . . .

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.

Size 16 contacts- printed board terminations 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.

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

Shells: Male shells may be dimpled for EMI/ESD

ground paths.

Trapezoidally shaped shells and polarized Polarization:

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

Mounting to

Printed Board: Rapid installation push-on fasteners and

threaded posts.

Locking Systems: Jackscrews and vibration locking systems.

Open entry, 500 operations. PosiBand closed Mechanical Operations:

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:

0.0016 ohms max. Per IEC Standard Contact Material:

60512-2, Test 2b.

High Conductivity

Contact Material: 0.001 ohms max. Per IEC

60512-2, Test 2b.

Proof Voltage: 1000 V r.m.s.

SIZE 8 CONTACTS

POWER CONTACTS

For electrical characteristics, see page 4.

SHIELDED CONTACTS

For electrical characteristics, see page 69.

HIGH VOLTAGE CONTACTS

For electrical characteristics, see page 69.

CONNECTOR

Insulation Resistance: 5 G ohms.

Clearance and

Creepage Distance: 0.042 inch [1.06mm] minimum.

Working Voltage: 300 V r.m.s.

CLIMATIC CHARACTERISTICS:

-55°C to +125°C. Temperature Range:

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

*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 4 —



*345W2

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

SHELL SIZE 2 -



Eighteen Size 22 Signal Contacts and One Size 8 Power Contact

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.

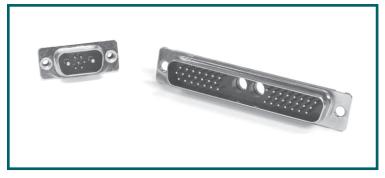


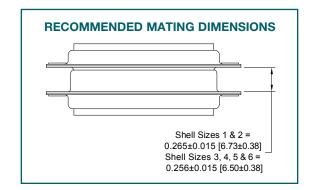
Note: Connectors can be kitted with all applicable removable contacts, contact Technical Sales for connector part number.



Combo-D D-Sub

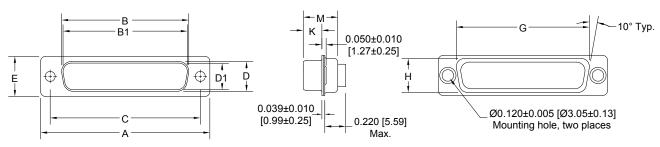
STANDARD SHELL ASSEMBLY

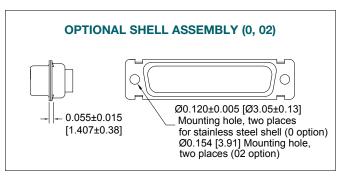


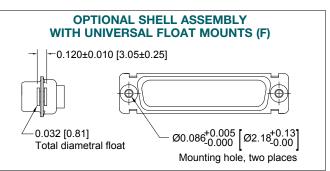


CBDD8W2M3S000

CBDD45W2M30000

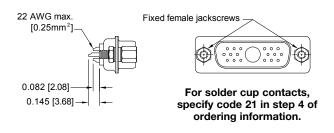


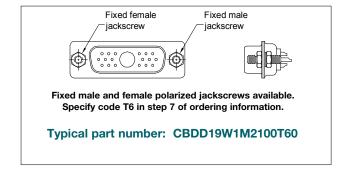




SHELL SIZES	VARIANT	A <u>±0.015</u> [0.38]	B <u>±0.005</u> [0.13]	B1 <u>±0.005</u> [0.13]	C <u>±0.005</u> [0.13]	D <u>±0.005</u> [0.13]	D1 <u>±0.005</u> [0.13]	E <u>±0.015</u> [0.38]	G <u>±0.010</u> [0.25]	H <u>±0.010</u> [0.25]	K <u>±0.005</u> [0.13]	M ±0.010 [0.25]
	8W2M	<u>1.213</u> [30.81]		<u>0.666</u> [16.92]	<u>0.984</u> [24.99]		<u>0.329</u> [8.36]	<u>0.494</u> [12.55]	<u>0.759</u> [19.28]	<u>0.422</u> [10.72]	<u>0.233</u> [5.92]	<u>0.422</u> [10.72]
1	8W2F 8W2S	1.213 [30.81]	<u>0.643</u> [16.33]		<u>0.984</u> [24.99]	<u>0.311</u> [7.90]		<u>0.494</u> [12.55]	<u>0.759</u> [19.28]	<u>0.422</u> [10.72]	<u>0.243</u> [6.17]	<u>0.429</u> [10.90]
	19W1M	1.541 [39.14]		<u>0.994</u> [25.25]	1.312 [33.32]		<u>0.329</u> [8.36]	<u>0.494</u> [12.55]	1.083 [27.51]	<u>0.422</u> [10.72]	<u>0.233</u> [5.92]	<u>0.422</u> [10.72]
2	19W1F 19W1S	1.541 [39.14]	<u>0.971</u> [24.66]		1.312 [33.32]	<u>0.311</u> [7.90]		<u>0.494</u> [12.55]	1.083 [27.51]	<u>0.422</u> [10.72]	<u>0.243</u> [6.17]	<u>0.429</u> [10.90]
4	45W2M	<u>2.729</u> [69.32]		<u>2.182</u> [55.42]	<u>2.500</u> [63.50]		<u>0.329</u> [8.36]	<u>0.494</u> [12.55]	<u>2.272</u> [57.71]	<u>0.422</u> [10.72]	<u>0.230</u> [5.84]	<u>0.426</u> [10.82]

SOLDER CUP CONNECTOR CODE 21





Typical part number: CBDD19W1M2100T0

STRAIGHT PRINTED BOARD MOUNT CONNECTOR

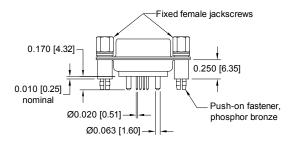
CODE 3, 35, 36, AND 37

CONTACT CODE	DØ
3	

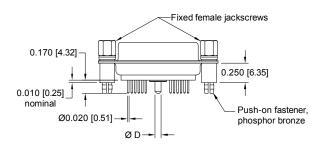
For straight printed board mount contacts, specify code 3 in step 4 of ordering information.

CONTACT CODE	DØ
3	
35	<u>0.078</u> [1.98]
36	<u>0.094</u> [2.39]
37	<u>0.125</u> [3.18]

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



Typical part number: CBDD8W2F3S60T2X

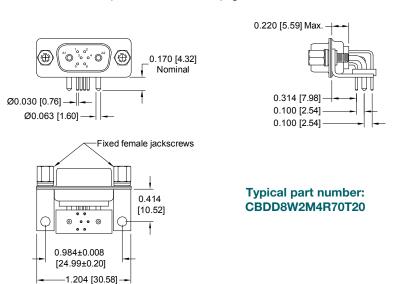


Typical part number: CBDD19W1F35S60T2X



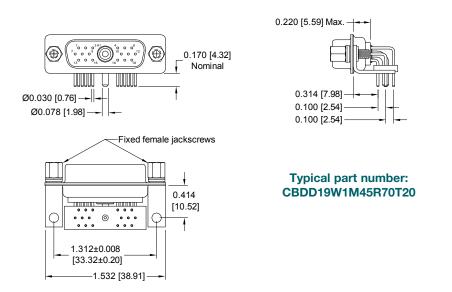
RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR SIZE 16 POWER CONTACTS WITH 0.063 [1.60] Ø TERMINATIONS CODE 4, 0.314 [7.98] CONTACT EXTENSION

See temperature rise curves on pages 1 and 2



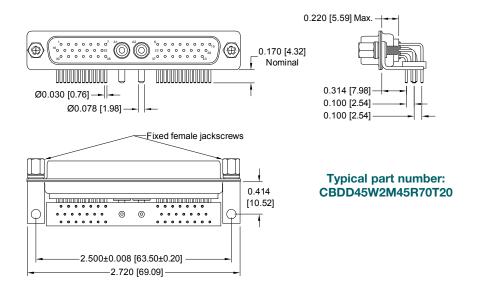
RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR SIZE 8 POWER CONTACTS WITH 0.078 [1.98] Ø TERMINATIONS CODE 4 AND 45, 0.314 [7.98] CONTACT EXTENSION

See temperature rise curves on pages 1 and 2



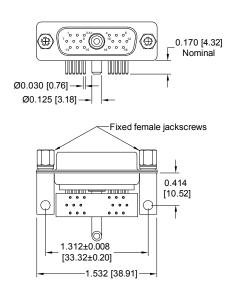
RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR SIZE 8 POWER CONTACTS WITH 0.078 [1.98] Ø TERMINATIONS **CODE 4 AND 45, 0.314 [7.98] CONTACT EXTENSION**

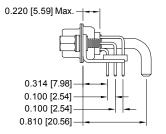
See temperature rise curves on pages 1 and 2



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



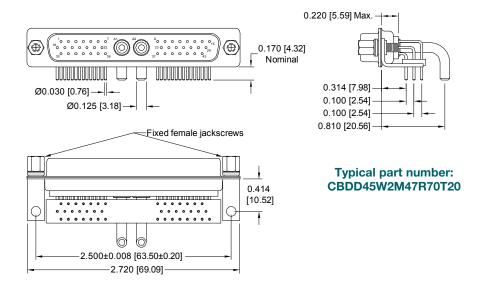


Typical part number: CBDD19W1M47R70T20



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



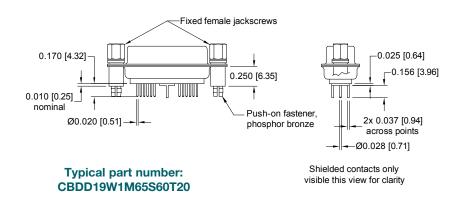
Connectors Designed To Customer Specifications

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

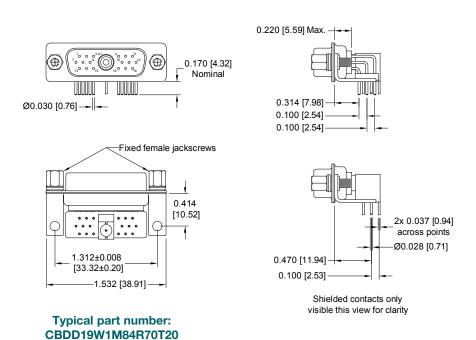
Examples: select loading of contacts for cost savings or to gain creepage and clearance distances; longer PCB terminations; customer specified hardware; sealing for water resistance.

Contact Technical Sales with your particular requirements.

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

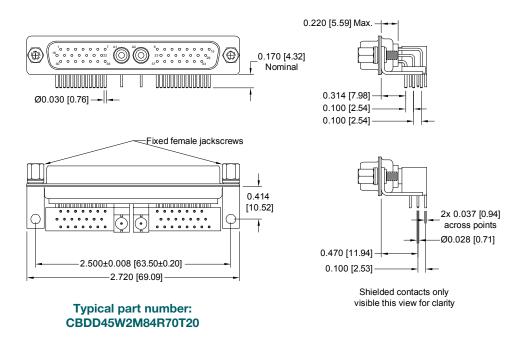


RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR WITH FRT4201D OR MRT4201D SHIELDED CONTACTS **CODE 84**



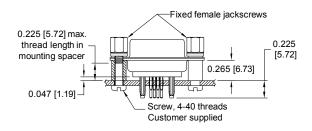


RIGHT ANGLE (90°) PRINTED BOARD MOUNT CONNECTOR WITH FRT4201D OR MRT4201D SHIELDED CONTACTS CODE 84

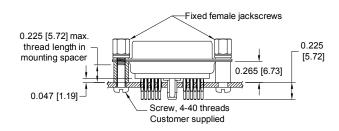


COMPLIANT PRESS-FIT CONNECTOR CODE 93

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



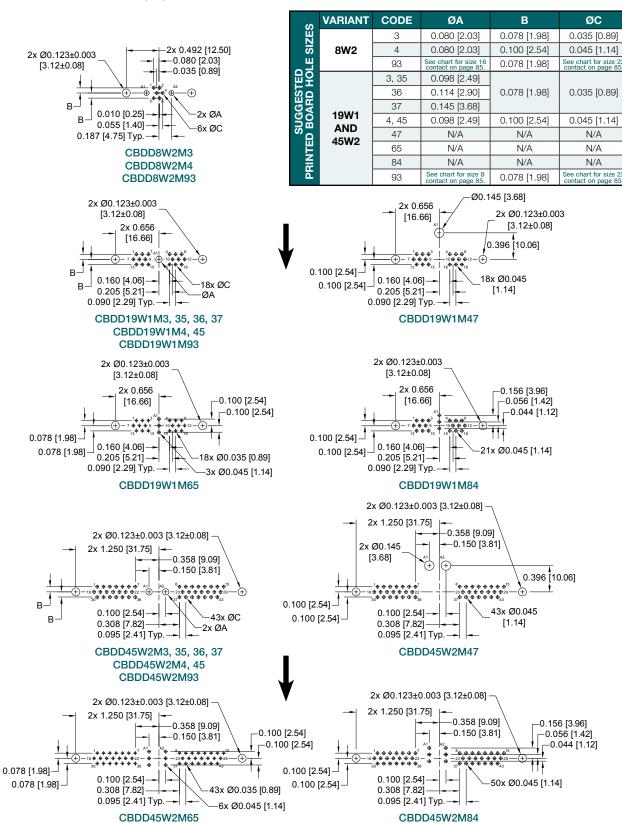
TYPICAL PART NUMBER: CBDD8W2M93S0T20



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.



CBDD/CBHD SERIES



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	8W2	M	93	S	0	0	0	/AA	_	-14
										*2 STE	P 10 - SPECIAL OPTIONS
STEP 1 - BASIC SEF CBDD Series - CBHD Series - High Conc										SPEC	SPECIAL OPTIONS, SEE IAL OPTIONS APPENDIX IGE 81.
Power Col	ntacts	ANTS								FOR O	ACT TECHNICAL SALES RDERING DETAILS OF OLLOWING: Special Requirements.
Shell Size 1 - 8W2 See next page for order for other shell size optic		ation								Straigh:	t and Right Angle Thermocouple 3 mount contacts
*1F - Female - Profession Open Entr M - Male *1S - Female - Industrial /	OR GENI al Level - y Signal Co	ntacts /el -	ontacts						/AA NOTE	- RoHS (: If completion is not	WIRONMENTAL ANCE OPTIONS Compliant iance to environmental required, this step will not be CBDD8W2M93S000
*521 – Fixed Solder Cup, 2 *521 – Fixed Solder Cup, 2 *53 – Solder, Straight Printength. *54 – Solder, Right Angle [7.98] Signal Contact 93 – Signal Omega type compliant, terminat	22 AWG-30 nted Board (90°) Printe t Extension compliant a	AWG [0.3 Mount, 0.1 ed Board M and Power	mm²-0.05r 170 [4.32] ¹ Mount, 0.31 Bi-Spring	Tail 1			0 -	0 *4 S X Z EP 7 - - None.	- Zinc P - Stainle - Tin Pla - Tin Pla	ess Steel, pated. ated and D	o Chromate Seal. classivated. Dimpled (male connectors only). POLARIZING SYSTEMS
*2 STEP 5 - MOUNTI 0 - Mounting Hole, 0 02 - Mounting Hole, 0 B3 - Bracket, Mountin B8 - Bracket, Mountin	.120 [3.05] .154 [3.91] g, Right An g, Right An	Ø Ø gle (90°) M	letal with C lastic with	Cross Bar Cross Bar			V5 - VL - T - T2 - T6 -	LockLockFixedFixedFixed	Tab, coni Lever, us Female J Female J Male and	nector rea ed with Ho ackscrew ackscrew	s. Polarized Jackscrews.

- Float Mounts, Universal

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

 - 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
- Swaged Spacer, 4-40 Threads, 0.125 [3.18] Length
- Swaged Locknut, 4-40 Threads
- Swaged Spacer with Push-on Fastener, 4-40 Threads, 0.250 [6.35] Length

*2 STEP 6 - HOODS AND PUSH-ON FASTENERS

Rotating Male Screw Locks

0 - None

E2 E3

- AN Lightweight Aluminum Hood, nickel finish
- AC Lightweight Aluminum Hood, no finish
- H Hood, Top Opening, Metal
- *3G Hood, EMI/RFI, Die Cast Zinc
 - N Push-on Fastener, for Right Angle (90°) Mounting Brackets
 - Hood, Top or Side Opening, robust extended height, plastic and composite, with rotating male jackscrews

Rotating Male with Internal Hex for 3/32 Hex Drives Rotating Male and Female Polarized 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.

Combo-D D-Sub

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





ORDERING INFORMATION - CODE NUMBERING SYSTEM

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

OR CONNECTORS INCLUDING SIZE 8 CONTACTS

S	ГЕР	1	2	3	4	5	6	7	8	9
EXAMI	PLE	CBDD	19W1	M	93	S	0	0	0	/AA
STEP 1 - BAS	IC SER	RIES								
CBDD Series - CBHD Series - Hi	igh Cond ower Cor									
STEP 2 - CON	INECT	OR VARIA	ANTS							
Shell Size 2 - 19 *6 Shell Size 3 - 19 *1 Shell Size 4 - 45	5W4									
STEP 3 - CON	NECT	OR GENI	DER							
M - Male *2S - Female - In	pen Entry dustrial /	y Signal Co Military Lev	vel -							STE (
STEP 4 - CON		Closed Entr	, ,		l					NOT legisla used
21 – Fixed Sold 3 – Solder, Str 0.170 [4.32	aight Prir	nted Board	AWG [0.3 Mount with	mm²-0.05r n Signal Co	mm²]. ontacts				STEF	9 8 - SI
35 – Solder, Str [1.98] Ø Po	aight Prir ower Cor	nted Board ntacts, 0.17	0 [4.32] Ta	il Length.					*5 S	Zinc FStainle
36 – Solder, Str [2.39] Ø Po	aight Prir ower Cor	nted Board ntacts. 0.17	Mount with 0 [4.32] Ta	n Signal ar il Lenath.						– Tin Pla – Tin Pla
37 – Solder, Str [3.18] Ø Po 4 – Solder, Rig	ower Cor	ntacts, 0.17	0 [4.32] Ta	il Length.						LOCKI
Contacts, (45 – Solder, Rig	0.314 [7.	98] Śignal (Contact Ex	tension.	Ü			V3 -	NoneLock	Tab, con
	[1.98] Ø	Power Con						VL -	Lock	Tab, con Lever, us
47 - Solder, Rig	ht Angle	(90°) Printe Power Con			Signal			T2 -	- Fixed	Female .
Signal Con	tact Éxte	ension.	,		ما			Е -	 Rotati 	Male and ing Male
	ontacts I	MDS/FDS 4						E2 - E3 -	RotatiRotati	ing Male ing Male
Signal Con 84 – Solder, Rig	ht Angle	(90°) Printe	ed Board M	ount with	Signal					ing Male
[7.98] Sign	al Conta	acts MRT/FI ct Extension	٦.				*3 S	TEP 6		DS AN
93 – Signal Ome compliant,		compliant a ion length 0			type		Д	0 – Nor N – Ligh		Aluminur
*3 STEP 5 - M	OLINITU	NC STVI	E			J		.C – Ligh H – Hoc		
0 – Mounting	g Hole, 0	.120 [3.05]	Ø				*4	G – Hoo N – Pus	od, EMI/F h-on Fas	RFI, Die (stener, fo
02 – Mountino B3 – Bracket, B8 – Bracket,	Mountin	g, Right An	gle (90°) M	etal with C astic with	ross Bar Cross Bar			Z – Hoo	od, Top (or Side C site, with

- B8 Bracket, Mounting, Right Angle (90°) Plastic with Cross Bar
- Float Mounts, Universal

- F Float Mounts, Universal
 P Threaded Post, Brass, 0.250 [6.35] Length
 P2 Threaded Post, Nylon, 0.250 [6.35] Length
 P3 Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Thread Fixed Female Jackscrews with Cross Bar
 P6 Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 0.120 [3.05] Ø Mounting Hole with Cross Bar
 P7 Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Threads with Cross Bar
- with 4-40 Threads with Cross Bar
- R8 Bracket, Mounting, Right Angle (90°) Metal, Swaged to Connector with 4-40 Locknut with Cross Bar
- 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
- Swaged Spacer, 4-40 Threads, 0.125 [3.18] Length
- Swaged Locknut, 4-40 Threads
- Swaged Spacer with Push-on Fastener, 4-40 Threads, 0.250 [6.35]

NOTES

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