Size 22 Signal and Thermocouple Contacts, Removable Crimp and **Printed Board Mount**

PosiBand® Closed Entry

MIL-DTL-24308 and SAE AS39029

UL Recognized File #E49351

CSA Recognized File #LR54219

Telecommunication UL File #E140980

Densi-D series connectors are military quality, high density connectors designed for use in sheltered, mildly corrosive environments having a wide range of temperature, pressure and humidity changes. Applicable connectors are qualified to MIL-DTL-24308 and SAE AS39029 (see page 82 for more information).

Densi-D series connectors utilize precision machined contacts with closed barrel crimp terminations, solder cup terminations,



straight and right angle (90°) printed board mount. All female contacts utilize Positronic's unique PosiBand closed entry design, see page 1 for details.

Six standard contact variants are offered in arrangements of 15, 26, 44, 62, 78 and 104 contacts. Densi-D series connectors are mateable and compatible with other high density D-subminiature connectors conforming to MIL-DTL-24308. A wide variety of unique accessories are available.

DENSI-D SERIES TECHNICAL CHARACTERISTICS

MATERIALS AND FINISHES:

Insulators: Glass filled polyester per ASTM D5927, UL

94V-0, blue color.

Contacts: Precision machined copper alloy.

Military performance - 0.000050 inch [1.27 μ] gold over nickel plate. Industrial performance **Contact Plating:**

gold flash over nickel plate. Other finishes

available upon request.

Shells: Steel with tin plate; zinc plate with chromate

seal, stainless steel passivated. Other materials and finishes available upon request.

Mounting Spacers: Nylon; copper alloy or steel with zinc plate and chromate seal or tin plate; phosphor bronze with

tin plate; stainless steel, passivated.

Push-On Fastener: Phosphor bronze or beryllium copper with tin

Vibration Lock Systems: Slide lock and lock tabs, steel with nickel

Jackscrew Systems: Brass or steel with zinc plate and chromate

seal or clear zinc plate or tin plate; stainless

steel, passivated.

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

or steel with zinc plate and chromate seal. Aluminum: aluminum with electroless nickel plate. For aluminum hoods, zinc content is

1% maximum. Die cast zinc.

Low magnetic versions are available, contact Technical Sales.

MECHANICAL CHARACTERISTICS:

Removable Contacts: Insert contact to rear face of insulator and

release from rear face of insulator. Size 22 contacts, male - 0.030 inch [0.76mm] mating diameter. Female contacts - PosiBand closed

entry design, see page 1 for details.

In Insulator: 9 lbs. [40 N].

Contact Retention

Contact Terminations: Closed barrel crimp, wire sizes 22 AWG

[0.3mm²] through 30 AWG [0.05mm²] per IEC

Right Angle (90°) Printed Board Mount contact terminations

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

Polarization: Trapezoidally shaped shells and polarized

jackscrews.

Mounting To Jackscrews and riveted fasteners with Angle Brackets: 0.120 inch [3.05mm] clearance hole, and

threaded riveted fasteners with 4-40 threads and polyester lock inserts.

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

mounting posts.

Locking Systems: Jackscrews and vibration locking systems. Mechanical Operations: 1000 operations minimum per IEC 60512-5.

ELECTRICAL CHARACTERISTICS:

Contact Current Rating, Tested per UL 1977:

12 amperes, 2 contacts energized. 10 amperes, 6 contacts energized. 7.5 amperes, 26 contacts energized. 6.5 amperes, 62 contacts energized. 5.0 amperes, 104 contacts energized.

See temperature rise curves on page 2 for details.

Initial Contact Resistance: 0.005 ohms maximum. **Proof Voltage:** 1000 V r.m.s. Insulation Resistance: 5 G ohms.

Clearance and Creepage

0.042 inch [1.06mm]. Distance [minimum]:

Working Voltage: 300 V r.m.s.

CLIMATIC CHARACTERISTICS:

Temperature Range: -55°C to +125°C.

Damp Heat, Steady State: 21 days.

THERMOCOUPLE CONTACTS:

Size 22 crimp contacts are available, see page 52 for details.

Printed circuit board mount contacts are available, please Consult Accessories D-subminiature catalog for details.

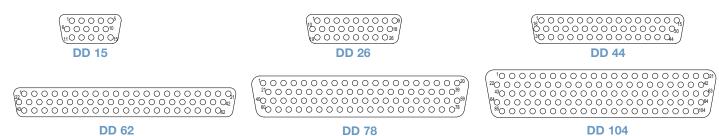
DD SERIES

MILITARY QUALITY FIXED AND REMOVABLE CONTACTS HIGH DENSITY D-SUBMINIATURE

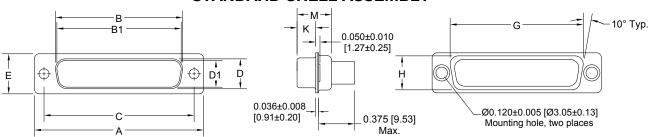


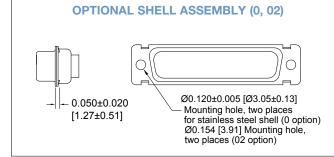
CONTACT VARIANTS

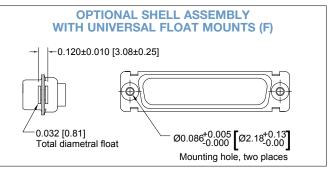
FACE VIEW OF MALE OR REAR VIEW OF FEMALE



STANDARD SHELL ASSEMBLY







CONNECTOR VARIANT SIZES	A ±0.015 [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 ±0.005 [0.13]	M ±0.010 [0.25]
DD 15 M	1.213 [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]
DD 15 S	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]
DD 26 M	1.541 [39.14]		<u>0.994</u> [25.25]	<u>1.312</u> [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]
DD 26 S	1.541 [39.14]	<u>0.971</u> [24.66]		<u>1.312</u> [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]
DD 44 M	2.088 [53.04]		1.534 [38.96]	<u>1.852</u> [47.04]		<u>0.329</u> [8.36]	<u>0.494</u> [12.55]	<u>1.625</u> [41.28]	<u>0.422</u> [10.72]	<u>0.230</u> [5.84]	<u>0.426</u> [10.82]
DD 44 S	2.088 [53.04]	1.511 [38.38]		<u>1.852</u> [47.04]	<u>0.311</u> [7.90]		<u>0.494</u> [12.55]	<u>1.625</u> [41.28]	<u>0.422</u> [10.72]	<u>0.243</u> [6.17]	<u>0.429</u> [10.90]
DD 62 M	2.729 [69.32]		<u>2.182</u> [55.42]	2.500 [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]
DD 62 S	2.729 [69.32]	<u>2.159</u> [54.84]		2.500 [63.50]	<u>0.311</u> [7.90]		<u>0.494</u> [12.55]	<u>2.272</u> [57.71]	<u>0.422</u> [10.72]	<u>0.243</u> [6.17]	<u>0.429</u> [10.90]
DD 78 M	2.635 [66.93]		<u>2.079</u> [52.81]	<u>2.406</u> [61.11]		<u>0.441</u> [11.20]	<u>0.605</u> [15.37]	2.178 [55.32]	<u>0.534</u> [13.56]	<u>0.230</u> [5.84]	<u>0.426</u> [10.82]
DD 78 S	2.635 [66.93]	2.064 [52.43]		<u>2.406</u> [61.11]	<u>0.423</u> [10.74]		<u>0.605</u> [15.37]	<u>2.178</u> [55.32]	<u>0.534</u> [13.56]	<u>0.243</u> [6.17]	<u>0.429</u> [10.90]
DD 104 M	2.729 [69.32]		<u>2.212</u> [56.18]	2.500 [63.50]		<u>0.503</u> [12.78]	<u>0.668</u> [16.97]	2.302 [58.47]	<u>0.596</u> [15.14]	0.230 [5.84]	<u>0.426</u> [10.82]
DD 104 S	2.729 [69.32]	<u>2.189</u> [55.60]		2.500 [63.50]	<u>0.485</u> [12.32]		<u>0.668</u> [16.97]	2.302 [58.47]	<u>0.596</u> [15.14]	<u>0.243</u> [6.17]	<u>0.429</u> [10.90]

REMOVABLE CRIMP CONTACT CODE 1

CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

QUALIFIED TO SAE AS39029

*MILITARY **SPECIFICATION CONTACTS**

STANDARD FINISH: per SAE AS39029 specifications

COLOR CODE:

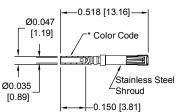
MALE CONTACT: ORANGE/BLUE/BLACK

FEMALE CONTACT:

ORANGE/GREEN/YELLOW

FEMALE CONTACT





-	ı	* Co
ess Steel d	Ø0.030 [0.76]	0.15

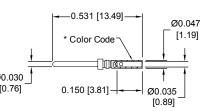
FEMALE PART NUMBER	WIRE SIZE AWG/[mm²]
*M39029/57-354	<u>22 / 24 / 26 / 28</u> [0.3/0.25/0.12/0.08]

Positronic is qualified to supply the legacy design, as well as, the PosiBand design. If the requirement is for the PosiBand design exclusively, notify sales at time of quotation for order placement when requesting M39029 contacts.

MALE CONTACT

Note: Connectors can be kitted with all applicable crimp/solder contacts, contact Technical Sales for

connector part number.



MALE	WIRE SIZE
PART NUMBER	AWG/[mm²]
*M39029/58-360	22 / 24 / 26 / 28 [0.3/0.25/0.12/0.08]

REMOVABLE CRIMP CONTACT CODE 1

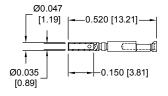
CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.



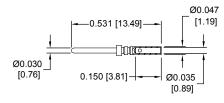
Note: Connectors can be kitted with all applicable crimp/solder contacts, contact Technical Sales for connector part number.

FEMALE CONTACT

"CLOSED ENTRY" DESIGN







FEMALE	WIRE SIZE
PART NUMBER	AWG/[mm²]
FC8022D2	22 / 24 / 26 / 28 / 30 [0.3/0.25/0.12/0.08/0.05]

MALE	WIRE SIZE
PART NUMBER	AWG/[mm²]
MC8022D	22 / 24 / 26 / 28 / 30 [0.3/0.25/0.12/0.08/0.05]

PLATING:

STANDARD FINISH: Gold flash over nickel plate.

OPTIONAL FINISHES: 0.000030 [0.76] gold over nickel by adding "-14" suffix onto part number. Example: FC8022D2-14

0.000050 inch [1.27] gold over nickel by adding "-15" suffix onto part number. Example: MC8022D-15

For information regarding CRIMP TOOLS & CRIMPING TOOL TECHNIQUES, see page 73.





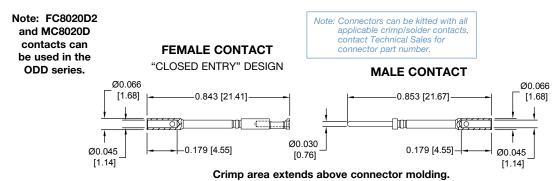
REMOVABLE CRIMP CONTACT

20 AWG CONTACTS

20 AWG [0.5 mm²]

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

CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.



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

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

PLATING:

STANDARD FINISH: Gold flash over nickel plate.

OPTIONAL FINISHES: 0.000030 [0.76] gold over nickel by adding "-14" suffix onto part number. Example: FC8020D2-14

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

REMOVABLE THERMOCOUPLE CRIMP CONTACT

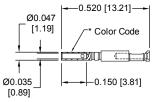
CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

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

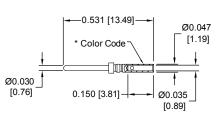


"CLOSED ENTRY" DESIGN 0.520 [13.21] Ø0.047 [1.19] Color Code

FEMALE CONTACT



MALE CONTACT



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]
Т	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]
Е	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 printed circuit board solder termination, please contact Technical Sales.

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REMOVABLE SOLDER CUP CONTACTS CODE 2

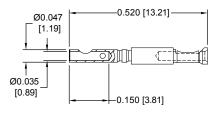
CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.



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

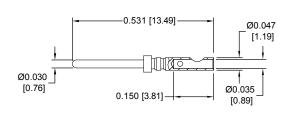
FEMALE CONTACT

"CLOSED ENTRY" DESIGN



FEMALE	WIRE SIZE
PART NUMBER	AWG/[mm²]
FS8022D2	22 [0.3] max

MALE CONTACT



MALE	WIRE SIZE
PART NUMBER	AWG/[mm²]
MS8022D	22 [0.3]max

PLATING:

STANDARD FINISH: Gold flash over nickel plate.

OPTIONAL FINISHES: 0.000030 [0.76] gold over nickel by adding "-14" suffix onto part number. Example: FS8022D2-14 0.000050 inch [1.27] gold over nickel by adding "-15" suffix onto part number. Example: MS8022D-15

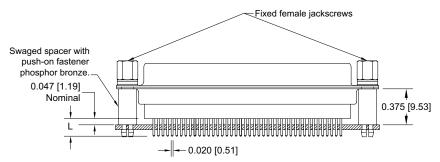
For information regarding INSERTION & REMOVAL TOOLS, see page 73.

STRAIGHT PRINTED BOARD MOUNT TERMINATION

CODE 3, 32 AND 33

CODE NUMBER	L
3	<u>0.150</u> [3.81]
32	<u>0.300</u> [7.62]
33	<u>0.500</u> (12.70]

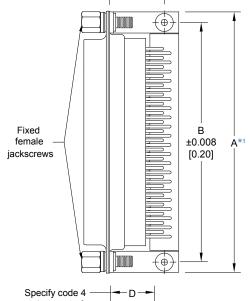
For straight printed board mount contacts specify code no. in step 4 of ordering information.



Typical Part Number: DD62S3S60T2X



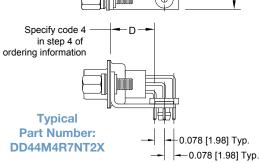
RIGHT ANGLE (90°) PRINTED BOARD MOUNT TERMINATION CODE 4, 0.450 [11.43] CONTACT EXTENSION

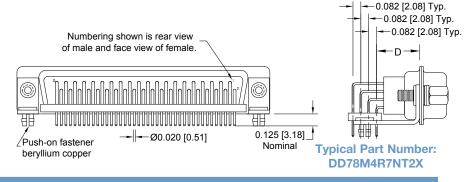


DD**4**** 0.450 [11.43] CONTACT EXTENSION										
PART NUMBER	A*1	В	С	D						
DD15*4****	1.204	<u>0.984</u>	<u>0.528</u>	<u>0.450</u>						
	[30.58]	[24.99]	[13.41]	[11.43]						
DD26*4***	<u>1.532</u>	<u>1.312</u>	<u>0.528</u>	<u>0.450</u>						
	[38.91]	[33.32]	[13.41]	[11.43]						
DD44*4***	2.072	<u>1.852</u>	<u>0.528</u>	<u>0.450</u>						
	[52.63]	[47.04]	[13.41]	[11.43]						
DD62*4****	<u>2.720</u>	<u>2.500</u>	<u>0.528</u>	<u>0.450</u>						
	[69.09]	[63.50]	[13.41]	[11.43]						
DD78*4****	2.626	<u>2.406</u>	<u>0.573</u>	<u>0.450</u>						
	[66.70]	[61.11]	[14.55]	[11.43]						

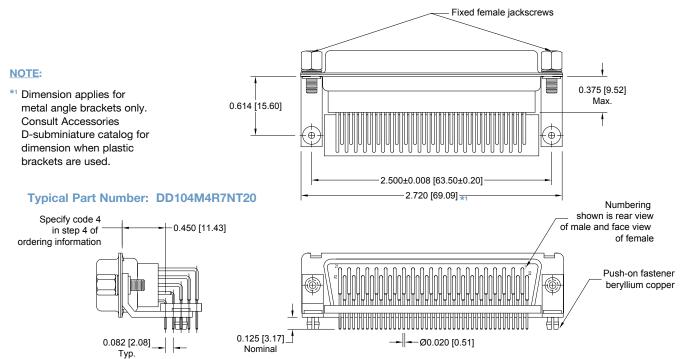
NOTE:

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



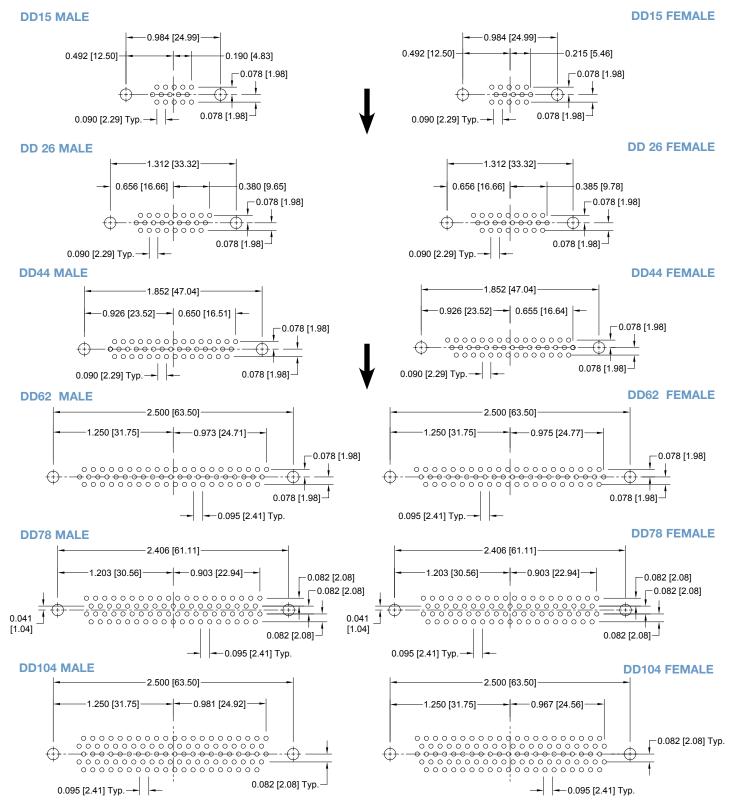


RIGHT ANGLE (90°) PRINTED BOARD MOUNT TERMINATION, SIZE 104 CODE 4, 0.450 [11.43] CONTACT EXTENSION



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

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



SUGGESTED PRINTED BOARD HOLE SIZES:

DD SERIES

DD SERIES

MILITARY QUALITY FIXED AND REMOVABLE CONTACTS HIGH DENSITY D-SUBMINIATURE



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	DD	62	S	4	R7	N	Т6	S	/AA	-50
STEP 1 - BASIC S DD series STEP 2 - CONNEC 15, 26, 44, 62, 78, 10 STEP 3 - CONNEC M - Male	CTOR G	ENDER								STEP 10 - SPECIAL OPTIONS -14 - 0.000030 [0.76µ] gold over nickel15 - 0.000050 [1.27µ] gold over nickel50 - 0.000050 [1.27µ] gold over copper. CONTACT TECHNICAL SALES FOR ORDERING DETAILS OF THE FOLLOWING: Other Special Requirements. Straight and Right Angle (90°) Thermocouple printed circuit board
S - Female - PosiBand closed entry contacts STEP 4 - CONTACT TERMINATION TYPE 0 - Contacts ordered separately, see pages 50-52. 1 - Crimp, 22 AWG-30 AWG [0.3mm²-0.05mm²]. 2 - Removable, Solder cup, 22 AWG-30 AWG [0.3mm²-0.05mm²]. 3 - Solder, Straight Printed Board Mount with 0.150 [3.81] Tail Length. 32 - Solder, Straight Printed Board Mount with 0.300 [7.62] Tail Length. 33 - Solder, Straight Printed Board Mount with 0.500 [12.70] Tail Length. 4 - Solder, Right Angle (90°) Printed Board Mount with 0.450 [11.43] Contact Extension.								0 - Z *4S - S X - T	/AA - NOTE legisla not be 8 -SHEI Zinc plated Stainless s Tin plated.	mount contacts 9 - ENVIRONMENTAL COMPLIANCE OPTIONS - RoHS Compliant : If compliance to environmental tion is not required, this step will rused. Example: DD62S4R7NT6S L OPTIONS d with chromate seal. steel, passivated. and dimpled (male connectors only).
** 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*5- Bracket, Mounting, Right Angle (90°) Plastic with Cross Bar. F - Float Mounts, Universal. P - Threaded Post, Brass, 0.375 [9.53] Length. P2 - Threaded Post, Nylon, 0.375 [9.53] 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					*1 STF	C - Cadmium with chromate seal. *1 STEP 7 -LOCKING AND POLARIZING SYSTEMS 0 - None. *3 V3 - Lock Tab, connector front panel mounted. *3 V5 - Lock Tab, connector rear panel mounted. *3 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.				

- 0 None.
- J Hood, Top Opening, Plastic.
- L Hood, Side Opening, Plastic.
 Y Hood, Top Opening, Plastic with Rotating Male Jackscrews. Available in size 78 and 104 only.
- Y6 Hood, Top Opening, Plastic with Rotating Male and Female Polarized Jackscrews. Available in size 78 and 104 only.

 Z Hood, Top or Side Opening, Robust and Extended Height,
 - Composite and Plastic with Rotating Male Jackscrews. Available in size 15, 26, 44, 62, and 78 only
 - H Hood, Top Opening, Metal. Available in size 26, 44, 62, and 78 only.
 - G Hood, EMI/RFI, Die Cast Zinc.
- AN Lightweight Aluminum Hood, nickel finish.
- AC Lightweight Aluminum Hood, no finish.

 W Hood, Top or Side Opening, Plastic. Available in size 15, 26, and 44 only.

 N Push-on Fastener, for Right Angle (90°) Mounting Brackets.
- *2 F Ferrite Inductor
- *1 For additional information on accessories listed in steps 5, 6 and 7, see Accessory Catalog.

Swaged Spacer with Push-on Fasteners, 4-40 Threads, 0.375

Swaged Spacer with Push-on Fastener for use with Ferrite

Connector with 4-40 Locknut with Cross Bar.

S2 - Swaged Spacer, 4-40 Threads, 0.125 [3.18] Length.

Inductor, 4-40 Threads, 0.515 [13.08] Length.

Swaged Locknut, 4-40 Threads.

[9.53] Length.

S6

- Swaged Spacer, 4-40 Threads, 0.375 [9.53] Length.

- *2 Ferrite inductor is available on contact types 32 and 33 only. For more information on ferrite inductors, see page 7.
- *3 VL, V3 and V5 locking systems are not available for connector variants 62, 78 and 104. Jackscrews are highly recommended to minimize damage to contacts on variants with high mating forces.
- *4 For stainless steel dimpled male versions contact Technical Sales.
- *5 Mounting style B8 bracket is not available for use with the 104 variant.

For information regarding CRIMP TOOLS & CRIMPING TOOL TECHNIQUES, see page 73.