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

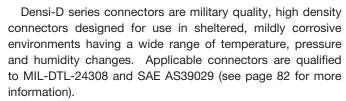
PosiBand® Closed Entry

MIL-DTL-24308 and SAE AS39029

**UL Recognized** File #E49351

**CSA Recognized** File #LR54219

**Telecommunication** UL File #E140980



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



nations, 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.

Contact Plating:

Military performance - 0.000050 inch [1.27  $\mu$ ] gold over nickel plate. Industrial performance 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.

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

tin plate; stainless steel, passivated.

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

plate.

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.

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.

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.

**Contact Retention** In Insulator:

**Contact Terminations:** Closed barrel crimp, wire sizes 22 AWG [0.3mm²] through 30 AWG [0.05mm²] per IEC

Right Angle (90°) Printed Board Mount con-

tact terminations.

Shells: Male shells may be dimpled for EMI/ESD

ground paths.

Polarization: Trapezoidally shaped shells and polarized

jackscrews.

**Mounting To** 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 Rapid installation push-on fasteners and

Printed Board: 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

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

Working Voltage: 300 V r.m.s.

#### **CLIMATIC CHARACTERISTICS:**

-55°C to +125°C. Temperature Range:

Damp Heat, Steady State: 21 days.

#### THERMOCOUPLE CONTACTS:

Size 22 crimp contacts are available, see page 56 for details.

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

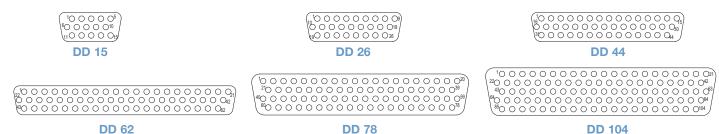
# **DD SERIES**

# MILITARY QUALITY FIXED AND REMOVABLE CONTACTS HIGH DENSITY D-SUBMINIATURE

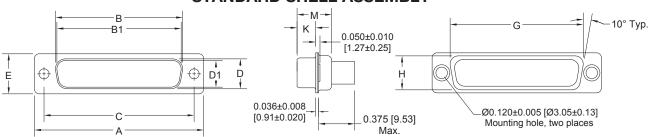


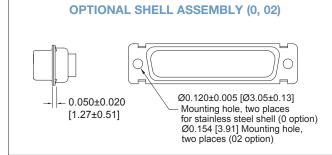
#### **CONTACT VARIANTS**

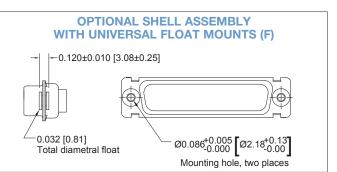
#### FACE VIEW OF MALE OR REAR VIEW OF FEMALE



#### STANDARD SHELL ASSEMBLY







										1	
CONNECTOR VARIANT 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 <u>±0.010</u> [0.25]	H ±0.010 [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	<u>1.213</u> [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	<u>1.541</u> [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]	<u>1.083</u> [27.51]	<u>0.422</u> [10.72]	<u>0.233</u> [5.92]	<u>0.422</u> [10.72]
DD 26 S	<u>1.541</u> [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]	<u>1.083</u> [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]		1.852 [47.04]	<u>0.311</u> [7.90]		<u>0.494</u> [12.55]	1.625 [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]		2.182 [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]
DD 62 S	2.729 [69.32]	2.159 [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]		2.079 [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]	0.230 [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]	2.178 [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]		2.212 [56.18]	2.500 [63.50]		<u>0.503</u> [12.78]	<u>0.668</u> [16.97]	<u>2.302</u> [58.47]	<u>0.596</u> [15.14]	<u>0.230</u> [5.84]	<u>0.426</u> [10.82]
DD 104 S	2.729 [69.32]	2.189 [55.60]		2.500 [63.50]	<u>0.485</u> [12.32]		<u>0.668</u> [16.97]	<u>2.302</u> [58.47]	<u>0.596</u> [15.14]	0.243 [6.17]	<u>0.429</u> [10.90]



### REMOVABLE CRIMP CONTACT

CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

#### **QUALIFIED TO SAE AS39029**

### \*MILITARY SPECIFICATION CONTACTS

STANDARD FINISH:

per SAE AS39029 specifications

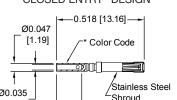
COLOR CODE: MALE CONTACT: ORANGE/BLUE/BLACK

FEMALE CONTACT:
ORANGE/GREEN/YELLOW

FEM PART N

\*M39029/57-354

### FEMALE CONTACT "CLOSED ENTRY" DESIGN



[0.3/0.25/0.12/0.08]

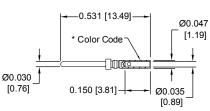
Ø0.03 [0.89	→   Sproud
ALE JMBER	WIRE SIZE AWG/[mm²]
/57_354	22 / 24 / 26 / 28

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.

#### applicable crimp/solder contacts, contact Technical Sales for connector part number.

Note: Connectors can be kitted with all





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

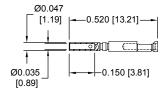
CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.



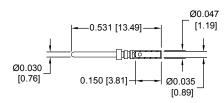
Note: Connectors can be kitted with all applicable crimp/solder contacts, contact Technical Sales for connector part number.

#### **FEMALE CONTACT**

"CLOSED ENTRY" DESIGN



#### MALE CONTACT



FEMALE PART NUMBER	WIRE SIZE 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 78.

# Positronic stpositronic.com

# MILITARY QUALITY FIXED AND REMOVABLE CONTACTS HIGH DENSITY D-SUBMINIATURE



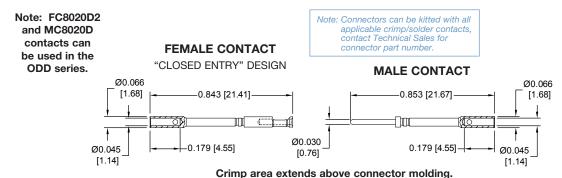
#### REMOVABLE CRIMP CONTACT

#### **20 AWG CONTACTS**

20 AWG [0.5 mm<sup>2</sup>]

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

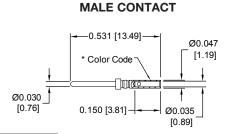
#### CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

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



# "CLOSED ENTRY" DESIGN Ø0.047 [1.19] \* Color Code 00.035 0.150 [3.81]

**FEMALE CONTACT** 



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

[0.89]

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.

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



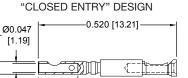
### REMOVABLE SOLDER CUP CONTACTS CODE 2

CONTACTS MAY BE SUPPLIED WITH CONNECTOR OR ORDERED SEPARATELY.

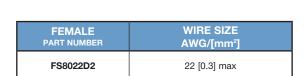


Note: Connectors can be kitted with all applicable crimp/solder contacts, contact Technical Sales for connector part number.

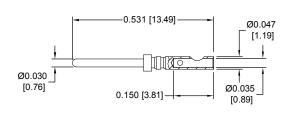
#### **FEMALE CONTACT**



-0.150 [3.81]



#### **MALE CONTACT**



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

#### **PLATING:**

Ø0.035

[0.89]

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

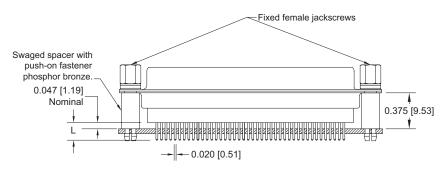
For information regarding INSERTION & REMOVAL TOOLS, see page 78.

#### 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]

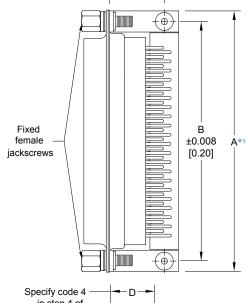
For straight printed board mount contacts specify code no. in step 4 of ordering information.



Typical Part Number: DD62S3S60T2X



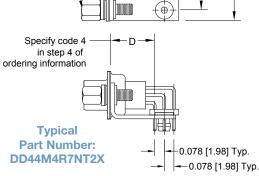


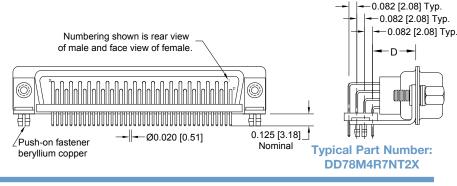


DD**4**** 0.450 [11.43] CONTACT EXTENSION								
PART NUMBER	A*1	В	С	D				
DD15*4****	1.204	<u>0.984</u>	<u>0.528</u>	<u>0.450</u>				
	[30.58]	[24.99]	[13.41]	[11.43]				
DD26*4***	1.532	<u>1.312</u>	<u>0.528</u>	<u>0.450</u>				
	[38.91]	[33.32]	[13.41]	[11.43]				
DD44*4***	2.072	<u>1.852</u>	<u>0.528</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***	<u>2.626</u>	<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.





Fixed female jackscrews

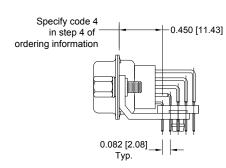
### RIGHT ANGLE (90°) PRINTED BOARD MOUNT TERMINATION, SIZE 104 CODE 4, 0.450 [11.43] CONTACT EXTENSION

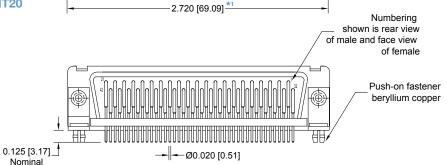
0.614 [15.60]

#### NOTE:

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

#### Typical Part Number: DD104M4R7NT20



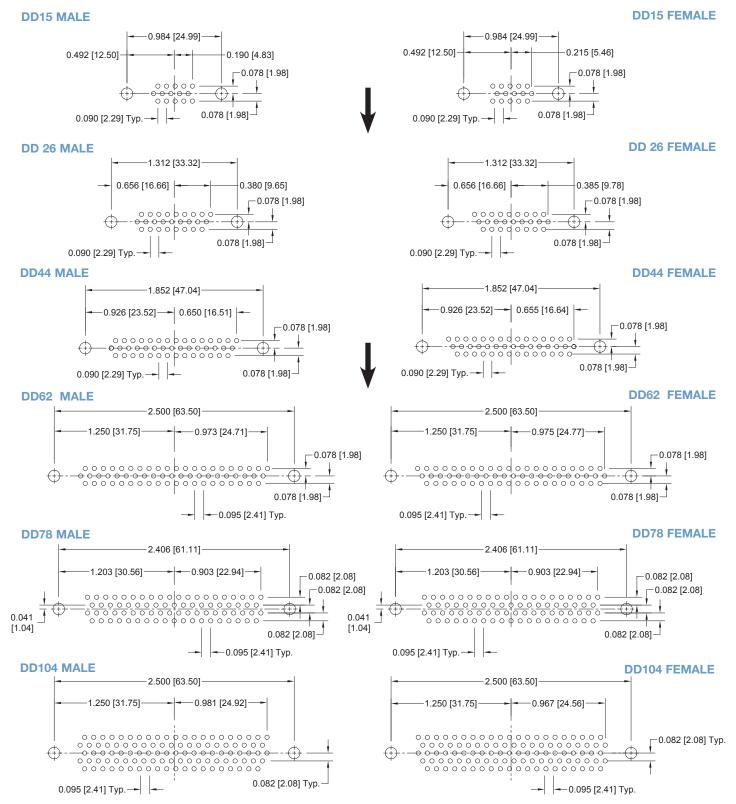


2.500±0.008 [63.50±0.20]



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

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



**DD SERIES** 



#### 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	ERIES									STEP 10 - SPECIAL OPTIONS -14 - 0.000030 [0.76µ] gold over nickel.
STEP 2 - CONNEC		RIANTS								-15 - 0.000050 [1.27µ] gold over nickel. -50 - 0.000050 [1.27µ] gold over copper. CONTACT TECHNICAL SALES FOR ORDERING DETAILS OF
STEP 3 - CONNEC M - Male S - Female - PosiBa			ntacts							THE FOLLOWING: Other Special Requirements. Straight and Right Angle (90°) Thermocouple printed circuit board mount contacts
STEP 4 - CONTAC 0 - Contacts ordere 1 - Crimp, 22 AWG 2 - Removable, Sol 0.05mm²l.	ed separati -30 AWG	tely, see p [0.3mm²-	oages 55- 0.05mm²].							9 - ENVIRONMENTAL COMPLIANCE OPTIONS RoHS Compliant
3 - Solder, Straight [3.81] Tail Lengt 32 - Solder, Straight Tail Length.	<ul> <li>3 - Solder, Straight Printed Board Mount with 0.150</li> <li>[3.81] Tail Length.</li> <li>32 - Solder, Straight Printed Board Mount with 0.300 [7.62]</li> </ul>								legisla	: If compliance to environmental tion is not required, this step will used. Example: DD62S4R7NT6S
<ul> <li>33 - Solder, Straight         [12.70] Tail Leng</li> <li>4 - Solder, Right Ar         0.450 [11.43] Co</li> </ul>	th. igle (90°) f	Printed Bo						STEP 8 -SHELL OPTIONS  0 - Zinc plated with chromate seal.  *4 S - Stainless steel, passivated.  X - Tin plated.		
*1 STEP 5 - MOUN 0 - Mounting Hole								Z - T	in plated	and dimpled (male connectors only). with chromate seal.
02 - Mounting Hole B3 - Bracket, Mour F - Float Mounts, P - Threaded Pos P2 - Threaded Pos R2 - Bracket, Mour Connector wit Cross Bar. R6 - Bracket, Mour Connector wit R7 - Bracket, Mour Connector wit R8 - Bracket, Mour Connector wit R8 - Bracket, Mour Connector wit	e, 0.154 [3 hting, Righ thing, Righ Universal. t, Brass, 0 t, Nylon, 0 hting, Righ h 4-40 Th hting, Righ h 4-40 Th hting, Righ h 4-40 Th hting, Righ	.91] Ø.  at Angle (9	30°) Plastic B] Length. B] Length. O°) Metal, Department Door) Metal, Door) Metal, Door) Metal, Door) Metal,	Swaged Jackscrev Swaged ble with Ci Swaged ar. Swaged	to vs with to ross Bar. to		0 - *3 V3 - *3 V5 - *3 VL - T - T2 - T6 - E - E2 - E3 -	None. Lock Tate Lock Late Fixed Fixed Fixed Fixed Motating Rotating Rotatin	ab, conneab, conneab, conneab, conneab, conneab, acceptable and Farage Male Scran Male Scran Male with	ckscrews. emale Polarized Jackscrews.

### \*1 STEP 6 - HOODS AND PUSH-ON FASTENERS

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

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

Swaged Spacer with Push-on Fastener for use with Ferrite

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

- \*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.

For information regarding CRIMP TOOLS & CRIMPING TOOL TECHNIQUES, see page 78.