ITT Cannon CT / MS3100 Series
MIL-DTL-5015 Connectors

ITT Cannon CT series MIL-DTL-5015 connectors are manufactured to MIL-5015 for use in very harsh environments. ITT Cannon CT series heavy-duty connectors were originally designed as aerospace components and are popular, cost-effective, rugged commercial and military connectors. Hundreds of contact layouts are available, including common 2-pin connectors, 3-pin connectors, 4-pin connectors, 12-pin connectors and 16-pin connectors. The ITT Cannon CT series is a waterproof connector that is completely sealed to withstand condensation, vibration and flash-over. For full product details on the CT series, see the specifications below.

APPLICATIONS

Industrial environments requiring extreme environmental reliability with ease of mating and unmating such as:

- Power generators
- Battery systems
- Engines
- Sensors
- Motion control
- Off-road vehicles
- Earth-moving equipment
- Ships
- Railroad equipment
- Any mobile equipment
- Industrial machinery
- Telecommunications

FEATURES

FULL MILITARY TEMPERATURE RANGE
CT connectors will operate in temperatures from -55° to +125°C (-67° to +257°F) under the harshest possible conditions.

WIDE RANGE OF WIRE GAUGES AND CURRENT-CARRYING CAPABILITY
Up to 245 amps with wire gauges from size 26 up to size 0 AWG wire.

RESILIENT INSULATOR & GROMMET
A resilient polychloroprene insulator and rear-sealing grommet guarantees a liquid-tight assembly. Crimp contacts can be inserted and removed a minimum of five cycles for field service.

WIDE VARIETY OF CONTACTS
High-reliability screw machine contacts with silver or gold plating are available in sizes from 20 through 0 to accommodate wire gauges from 26 to 0 AWG. Solder, crimp, PC, and thermocouple contacts are available.

RUGGED SHELL
Aluminum alloy shell and hardware create a rugged connector with minimal weight. These connectors have been used extensively in the military for many years and have proven their reliability in a wide range of combat and industrial applications.

ENVIRONMENTAL
Vibration and water-proof. Will perform in the full range of MIL-DTL-5015 environments.

STANDARD SHIELDING INTERFACE
CT connectors meet requirements for MIL-DTL-5015 E/F/R styles of connectors. The threaded coupling provides superior EMI/RFI shielding without the need for special grounding spring components required for shielding bayonet style connectors. The threaded coupling nuts are used extensively in robotic applications where connectors and cables rock continually. The standard CT coupling nuts contain holes for lock wires used in high-vibration or security applications.

FEATURES (CONT.)

SEALED RECEPTACLES

All CT solder receptacles have inserts and contacts bonded in place in accordance to the MIL-DTL-5015 specifications. These receptacles are sealed and their air leakage rate is not greater than one atmospheric cubic inch per hour (4.55×10^{-3} cubic centimeters per second) through the interface. Gaskets and seal screws are used to seal the panel and protect from leaks around the connectors.

HIGH PERFORMANCE, LOW COST

Originally designed to the first military specification – Tri-Service connector for the Army, Air Force and Navy – these connectors are now widely used in industrial applications. These threaded connectors are easy to specify, purchase and assemble, providing long service life for applications needing minimum maintenance. PEI-Genesis assembles these in days to reduce the user's total cost of ownership.

AGENCY APPROVALS

- MIL-DTL-5015

TECH SPECS

MATERIALS & FINISHES

Shell	Aluminum alloy (shells can be grounded)
Shell Plating	Olive drab chromate coating over cadmium plating, black zinc cobalt, electroless nickel
Contacts	Copper alloy
Contact Platings	Hard silver plating or gold plating
Insulator*	Resilient polychloroprene (Neoprene)
Seals	Silicone or Neoprene

*Optional zero halogen and high-temperature insulators are available. Contact us for information.

ELECTRICAL DATA

Operating Voltage/Test Voltage According to MIL-DTL-5015

SERVICE RATING	OPERATING VOLTAGE		TEST VOLTAGE AC VRMS	AIR SPACING NOM. (INCHES)	CREEPAGE DISTANCE NOM. (INCHES)
	DC V	AC VRMS			
I	250	200	1,000	-	1/16
A	700	500	2,000	1/16	1/8
D	1,250	900	2,800	1/8	3/16
E	1,750	1,250	3,500	3/16	1/4
B	2,450	1,750	4,500	1/4	5/16

The indicated values for the Operating Voltage are limits concerning the electrical function. In any case when the working voltage exceeds 50V, safety precautions must be in accordance with the following standards: VDE 0100, IEC 309-1 or applicable national standards.

NOTE: High Voltage Cartridge Contacts are available. These cartridges are used in either size 8 or 4 contact cavities using 20 AWG contact rated 7.5 amps max and working voltages up to 5000 Vdc - 3500 Vac. Contact us for details.

CONTACT SIZE	(CT) TEST CURRENT (AMPS)	CONTACT RESISTANCE MILLIOHM MAX.	POTENTIAL DROP (MILLIVOLTS)
16/16S	13	16	49
12	23	3	42
8	46	1	26
4	80	0.5	23
0	150	0.2	21

**Maximum total current to be carried per connector in wire bundles as specified in MIL-W-5088. Contact resistance, when tested to MIL-C-39029, will not exceed voltage drops listed in above table.

NOTE: CB & CT current rating are tested differently. Please contact us for more information.

Wire Range Sizes	26 AWG to 0 AWG (⇨ See contact selection pg 130)
Insulation Resistance	CT/CA/MS: >5000 megaohms at 77°F (25°C) per MIL-DTL-5015, 3.18

TECH SPECS

MECHANICAL

Operating Temperature	-55° to +125°C (-67° to +257°F) Neoprene
Sealing	48 hours in 6 feet of water per MIL-DTL-5015, 4.6.19. Meets 20-day extreme humidity testing per
Wire Sealing Range	The connector is designed for individual wire sealing. Sealing of an outer cable jacket on multiconductor cables must be accomplished with an appropriate endbell. Sealing is only guaranteed if wires comply to MIL-W-5086 or within the listed ranges are used.

CONTACT SIZE	WIRE SIZE (MIL-W-5086)	INSULATION O.D. LIMIT			
		MIN. (INCHES)	MIN. (MM)	MAX. (INCHES)	MAX. (MM)
16	16	.064	1.63	.130	3.30
12	12	.114	2.90	.170	4.32
8	8	.164	4.17	.255	6.48
4	4	.275	6.98	.370	9.40
0	0	.415	10.54	.550	13.97

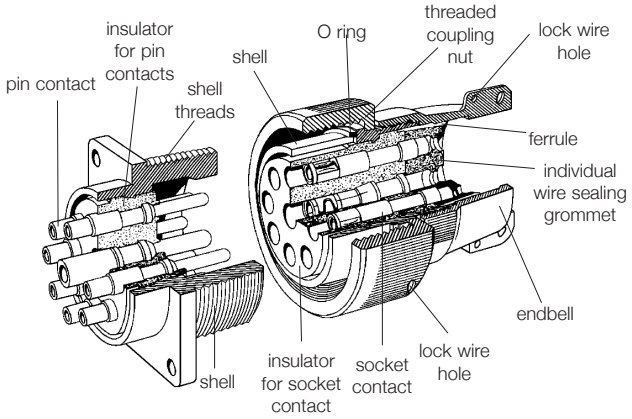
Mating Life	100 cycles minimum. To MIL-DTL-5015, 3.16
Salt Spray	CAD OD : MIL-STD-1344 Method 1001 Condition B. minimum. A206 : 48 hours
Heat	+125°C (+257°F) for 60 hours, +85°C (+185°F) for 1000 hours per MIL-DTL-5015, 4.6.14, minimum.
Chemical Resistance	20-hour full immersion unmated in hydraulic fluid and lubricating oil per MIL-DTL-5015 minimum.
Vibration	10 to 2,000Hz (15g's) 10 microseconds maximum discontinuity. To MIL-STD-1344 Method 2005 per MIL-DTL-5015.
Shock	50g 11ms duration, three major axes. 10 microseconds maximum discontinuity. To MIL-DTL-5015, 3.13.
Contact Type	Solder, crimp, PC or thermocouple. Hard silver or gold plating.
Number of Circuits	1 to 55
Contact Insertion	Solder contacts are bonded into insulator
Contact Retention	Pin and socket contacts are designed to resist severe vibration and repeated connection and disconnection.

CONTACT SIZE	RETENTION FORCE NEWTONS (LBS.)		SEPARATION FORCE MIN. NEWTONS (LBS.)		GAUGE	AXIAL LOAD NEWTONS (LBS.)		SEPARATION FORCE MIN. NEWTONS (LBS.)	
16	35	(7.9)	1	(.22)	G 1.56	44	(10)	1	(0.25)
12	55	(12.4)	1.5	(.34)	G 2.36	67	(15)	2	(0.5)
8	80	(18.0)	3	(.67)	G 3.58	89	(20)	3	(0.75)
4	90	(20.2)	4	(.90)	G 5.69	89	(20)	4	(1)
0	95	(21.4)	8.5	(1.9)	G 9.04	111	(25)	9	(2)

NOTE: CT/CA/MS receptacle contacts are bonded into the insulator.

Polarization	Key and keyway with optional rotational polarization
Approvals/Specifications	MIL-DTL-5015

CROSS SECTION

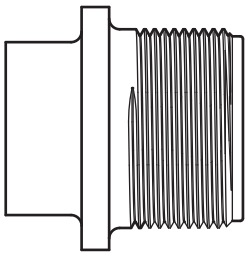


CREATE PART NUMBER

1	2	3	4	5	6	7	8	9
CT	6	E		10SL-3	P		S	
CONNECTOR TYPE	**SHELL STYLE**	**END BELLS** (If omitting endbell, enter -)	**CABLE CLAMP/BOOT** (If needed)	**LAYOUT**	**CONTACT**	**POSITION** (omit for normal)	**CONTACT TYPE**	**PLATING**

See page 150 for ITT Cannon order codes.

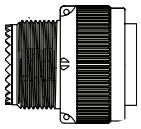
STEP 1: SELECT CONNECTOR TYPE



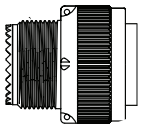
CT

STEP 2: SELECT SHELL STYLE, PLUG OR RECEPTACLE

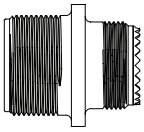
PLUGS ← Mates with → **RECEPTACLES**



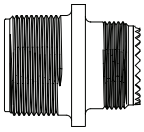
6 Standard



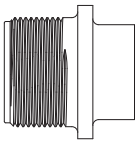
G6 Grounding Finger Barrel (EMI/RFI)



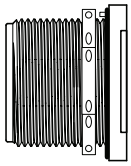
0 Wall Mount



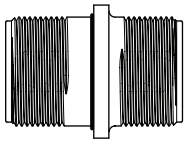
1 Cable Mount



2 Box Mount



7 Jam Nut

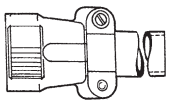


9 Thru Bulkhead

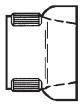
STEP 3: CHOOSE ENDBELLS

⇨ See "Endbells" on pages 140-142 for a description of each endbell.

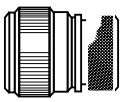
Mates with



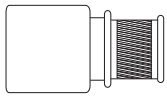
E
Standard Clamp (MS)



R
No Clamp (MS)

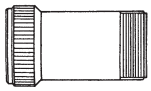


N
Heat Shrink



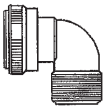
U/D
Low Cost for Shielded for Unshielded Cable
U - Potted (preferred)
D - Uses grommets and ferrules

M
Shielded Cable

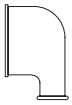


L
Long Extender

F
Standard Extender

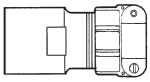


T
90° (MS)

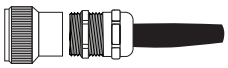


TP
Right Angle Endbell

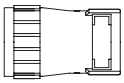
P
Potting (MS)



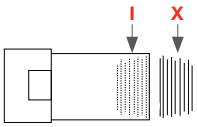
J
Gland Seal



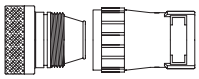
PG▲
Low-Cost Gland Seal



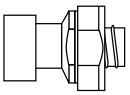
PMA▲
Conduit
⇨ see pages 202-203



NPT (I OR X)▲
I - Internal thread version
X - External thread version



PME▲
Shielded Conduit
⇨ see pages 202-203



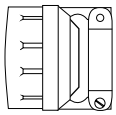
ST▲
Conduit

STEP 4: CHOOSE CABLE CLAMPS (IF APPLICABLE)

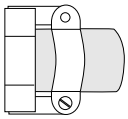
For Endbell Types: **N U/D M**

Heat Shrink Boot
⇨ See pages 196-201

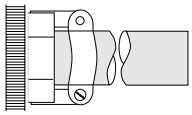
For Endbell Types: **L F T**



C
MS-3057-C



A
MS-3057-A



9767▲

STEP 5: CHOOSE LAYOUT

⇨ See pages 116-129

STEP 6: CHOOSE CONTACT

P = Pin **S** = Socket **PS** = Style 9 only

STEP 7: CHOOSE ROTATION

⇨ See pages 121-127

W **X** **Y** **Z**

STEP 8: CHOOSE CONTACT TYPE

S = Solder
C = Crimp*
H = PC**
0 = Less contacts

STEP 9: CHOOSE PLATING

CONTACTS:
Omit for silver contacts

AU = Gold
F127 = Less Pre-filled Solder Cups

SHELLS
Omit for standard***

A71 = Electroless Nickel
A206 = Conductive Black Zinc Cobalt (RoHS)

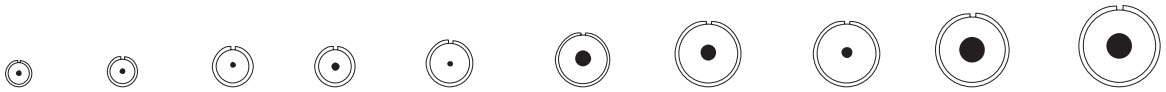
* When using a "C" in part number, the connector is supplied with the standard size crimp contacts for its layout (part number marked with "G#" in crimp Contact Selection Chart on ⇨ page 130. If reduced or enlarged crimp contacts are required, specify connector 0 (less contacts) and order contacts separately.
** Contact us for PC post diameters and lengths. Available for 16S, 16 and 12 size contacts.

▲Contact us with NPT thread size, Sealtite conduit diameter or cable OD for D, NPT, ST, PG or endbell part number.
***CT = Olive drab chromate over cadmium.

LAYOUTS BY NUMBER OF CONTACTS

Key ▼ = CA/MS ● = CB View from mating face of pin insulator (socket view is opposite) *= most popular layouts

1 CONTACT



LAYOUT	8S-1	10S-2	12S-4	12-5	14S-4	16-12	18-6	18-7	20-2	22-7
# OF CONTACTS	1-#16	1-#16	1-#16	1-#12	1-#16	1-#4	1-#4	1-#8	1-#0	1-#0
SERIES	▼	▼	▼●	▼	●	▼●	●	▼●	▼●	▼●
SERVICE RATING	A	A	D	D	D	A	D	B	D	E

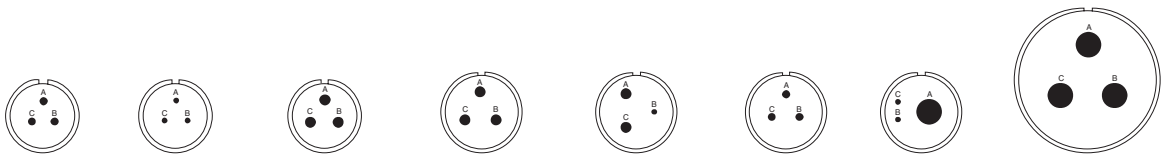
2 CONTACTS

LAYOUT	10SL-4*	12S-3*	14S-9*	16S-4	16-11	18-3	20-23
# OF CONTACTS	2-#16	2-#16	2-#16	2-#16	2-#12	2-#12	2-#8
SERIES	▼●	▼●	▼●	▼●	▼●	▼●	▼●
SERVICE RATING	A	A	D	A	A	D	A

LAYOUT	22-1	22-8	22-11	24-9	28-7	32-5
# OF CONTACTS	2-#8	2-#12	2-#16	2-#4	2-#4	2-#0
SERIES	●	▼●	▼	▼●	▼	▼●
SERVICE RATING	D	E	B	A	D	D

3 CONTACTS

LAYOUT	10SL-3*	14S-1	14S-7*	16S-5	16S-6	16-7	16-10*	18-5	18-21	18-22
# OF CONTACTS	3-#16	3-#16	3-#16	3-#16	3-#16	2-#16; 1-#8	3-#12	1-#16; 2-#12	3-#12	3-#16
SERIES	▼●	▼●	▼●	▼●	▼●	●	▼●	▼●	●	▼●
SERVICE RATING	A	A	A	A	A	A	A	D	D	D



LAYOUT	20-3	20-6	20-19	22-2	22-6	22-9	22-21	36-4
# OF CONTACTS	3-#12	3-#16	3-#8	3-#8	1-#16; 2-#8	3-#12	2-#16; 1-#0	3-#0
SERIES	▼●	●	▼●	▼●	▼	▼●	●	▼
SERVICE RATING	D	D	A	D	D	E	A	D(A); A(B,C)

4 CONTACTS

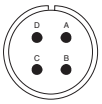
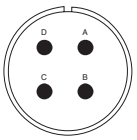
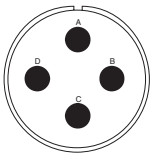
LAYOUT	12SA-10	14S-2*	16-9	18-4*	18-10*	18-13	20-4*	20-24	22-4
# OF CONTACTS	4-#16	4-#16	2-#16; 2-#12	4-#16	4-#12	3-#12; 1-#8	4-#12	2-#16; 2-#8	2-#12; 2-#8
SERIES	▼●	▼●	▼●	▼●	▼●	▼●	▼●	▼●	▼●
SERVICE RATING	I	I	A	D	A	A	D	A	A

LAYOUTS BY NUMBER OF CONTACTS

Key ▼ = CA/MS ● = CB View from mating face of pin insulator (socket view is opposite) *= most popular layouts

4 CONTACTS



LAYOUT	22-10	22-22*	24-4	24-22*	32-17	36-5
# OF CONTACTS	4-#16	4-#8	3-#16; 1-#0	4-#8	4-#4	4-#0
SERIES	▼ ●	▼ ●	●	▼ ●	▼ ●	▼ ●
SERVICE RATING	E	A	D	D	D	A

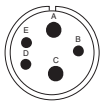
5 CONTACTS





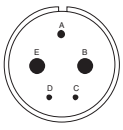
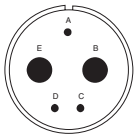






LAYOUT	10SLA4	14S-5*	16S-8*	18-11*	18-20	20-14	22-12	22-13	24-12
# OF CONTACTS	5-#20	5-#16	5-#16	5-#12	5-#16	3-#12; 2-#8	3-#16; 2-#8	1-#16; 4-#12	3-#12; 2-#4
SERIES	▼ ●	▼ ●	▼ ●	▼ ●	●	▼ ●	▼ ●	▼ ●	▼ ●
SERVICE RATING	A	I	A	A	A	A	D	A(A,D); D(E)	A

5 CONTACTS

LAYOUT	28-5	32-1
# OF CONTACTS	2-#16; 1-#12; 2-#4	3-#12; 2-#0
SERIES	▼ ●	▼ ●
SERVICE RATING	D	E(A); D(balance)

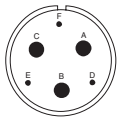
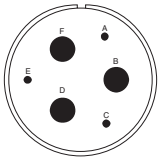
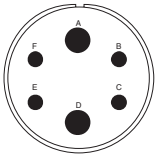
6 CONTACTS





LAYOUT	14S-6*	18-12	20-8	20-17	20-22
# OF CONTACTS	6-#16	6-#16	4-#16; 2-#8	1-#16; 5-#12	3-#16; 3-#8
SERIES	▼ ●	▼ ●	▼ ●	▼ ●	▼ ●
SERVICE RATING	I	A	I	A	A



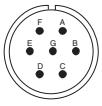
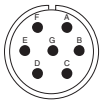
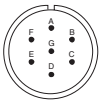
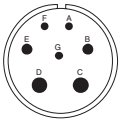




LAYOUT	22-5	22-15	28-22	36-3	36-6
# OF CONTACTS	4-#16; 2-#12	1-#16; 5-#12	3-#16; 3-#4	3-#12; 3-#0	4-#4; 2-#0
SERIES	▼ ●	▼ ●	▼ ●	▼ ●	▼ ●
SERVICE RATING	D	A (A,B,C,E,F); E (D)	D	D	A

7 CONTACTS





LAYOUT	14SA7	16S-1*	18-9	20-15*	22-28	24-2	24-10	24-27	28-10
# OF CONTACTS	7#16	7-#16	5-#16; 2-#12	7-#12	7-#12	7-#12	7-#8	7-#16	3-#12; 2-#8; 2-#4
SERIES	▼ ●	▼ ●	▼ ●	▼ ●	▼ ●	▼ ●	▼ ●	▼ ●	▼ ●
SERVICE RATING	I	A	I	A	A	D	A	E	D(G); A(balance)

8 CONTACTS




LAYOUT	18-8*	20-7*	22-18	22-23	24-6	32-15	36A35
# OF CONTACTS	7-#16; 1-#12	8-#16	8-#16	8-#12	8-#12	6-#12; 2-#0	4-#16; 4-#0
SERIES	▼ ●	▼ ●	▼ ●	▼ ●	●	▼ ●	●
SERVICE RATING	A	A(C-F) D(balance)	A(C-E)	D(H); A(balance)	D (A,G,H); A(balance)	D	A

LAYOUTS BY NUMBER OF CONTACTS

Key ▼ = CA/MS ● = CB View from mating face of pin insulator (socket view is opposite) *= most popular layouts

9 CONTACTS

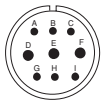
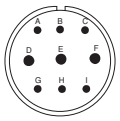
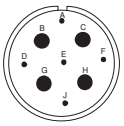






LAYOUT	20A9	20-16	20-18*	22-16	22-17	22-20	22-27
# OF CONTACTS	9-#12	7-#16; 2-#12	6-#16;3-#12	6-#16; 3-#12	8-#16; 1-#12	9-#16	8-#16; 1-#8
SERIES	●	▼ ●	▼ ●	●	▼	▼ ●	▼ ●
SERVICE RATING	D(J),all others I	A	A	A	D(A); A(balance)	A	D(J); A(balance)

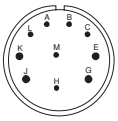
9 CONTACTS

LAYOUT	24-11*	28-1	28A16
# OF CONTACTS	6-#12; 3-#8	6-#12; 3-#8	5-#16; 4-#4
SERIES	▼ ●	▼	▼ ●
SERVICE RATING	A	D(A,E,J); A(balance)	A

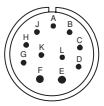
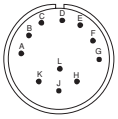
10 CONTACTS





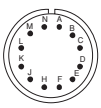
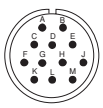
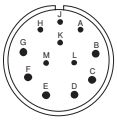
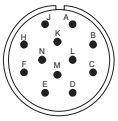
LAYOUT	18-1*	18-19	28-19
# OF CONTACTS	10-#16	10-#16	6-#16; 4-#12
SERIES	▼ ●	▼ ●	▼ ●
SERVICE RATING	A(B,C,F,G); I(balance)	A	A(C,E,G,J,K,L); B(H,M); D(A,B)

11 CONTACTS

LAYOUT	20-33	24-20	28-14
# OF CONTACTS	11-#16	9-#16; 2-#12	11-#16
SERIES	▼ ●	▼ ●	▼
SERVICE RATING	A	D	D

12 CONTACTS

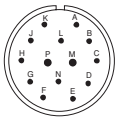
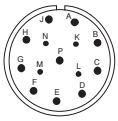
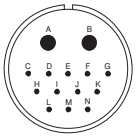
LAYOUT	24-19	24A24	28-9	28-51
# OF CONTACTS	12-#16	12-#12	6-#16; 6-#12	12-#12
SERIES	▼ ●	▼ ●	▼ ●	●
SERVICE RATING	A	A	D	D

13 CONTACTS

20-11
13-#16
●
I

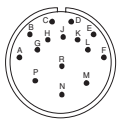
14 CONTACTS



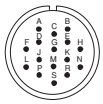
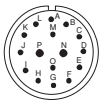
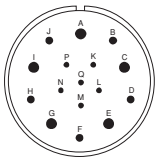
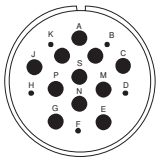
LAYOUT	20-27*	22-19*	28-2	28-20	32-9
# OF CONTACTS	14-#16	14-#16	12-#16; 2-#12	4-#16; 10-#12	12-#16; 2-#4
SERIES	▼	▼ ●	▼ ●	▼ ●	▼ ●
SERVICE RATING	A	A	D	A	D

15 CONTACTS



28-17*
15-#16
●
A(A-L); B(R); D(M-P)

16 CONTACTS

LAYOUT	24-5	24-7*	36-14	36A70
# OF CONTACTS	16-#16	14-#16; 2-#12	6-#16; 5-#12; 5-#8	5-#16; 11#4
SERIES	▼	▼ ●	▼ ●	▼ ●
SERVICE RATING	A	A	D	-

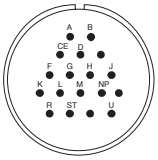
LAYOUTS BY NUMBER OF CONTACTS

Key ▼ = CA/MS ● = CB View from mating face of pin insulator (socket view is opposite) *= most popular layouts

17 CONTACTS

LAYOUT	20-29*
# OF CONTACTS	17-#16
SERIES	▼●
SERVICE RATING	A

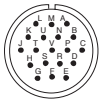
18 CONTACTS



LAYOUT	36A16
# OF CONTACTS	18-#12
SERIES	▼
SERVICE RATING	A

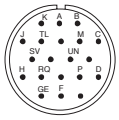
19 CONTACTS

LAYOUT	20A48
# OF CONTACTS	19-#16
SERIES	●
SERVICE RATING	I



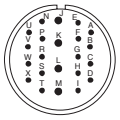
LAYOUT	22-14*
# OF CONTACTS	19-#16
SERIES	▼●
SERVICE RATING	A

20 CONTACTS



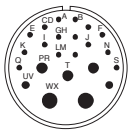
LAYOUT	28-16
# OF CONTACTS	20-#16
SERIES	▼●
SERVICE RATING	A

22 CONTACTS

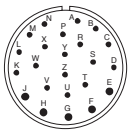


LAYOUT	28-11*
# OF CONTACTS	18-#16; 4-#12
SERIES	▼●
SERVICE RATING	A

23 CONTACTS

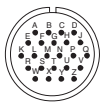


LAYOUT	32-6
# OF CONTACTS	16-#16; 2-#12; 3-#8; 2-#4
SERIES	▼●
SERVICE RATING	A



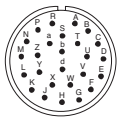
LAYOUT	32-13
# OF CONTACTS	18-#16; 5-#12
SERIES	●
SERVICE RATING	D

24 CONTACTS



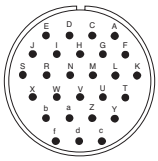
LAYOUT	24-28*
# OF CONTACTS	24-#16
SERIES	▼●
SERVICE RATING	I

26 CONTACTS



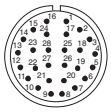
LAYOUT	28-12*
# OF CONTACTS	26-#16
SERIES	▼●
SERVICE RATING	A

27 CONTACTS

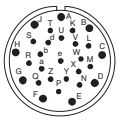


LAYOUT	36A46
# OF CONTACTS	27-#12
SERIES	▼●
SERVICE RATING	A

28 CONTACTS

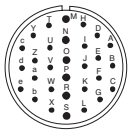


LAYOUT	24A28
# OF CONTACTS	28-#16
SERIES	●
SERVICE RATING	I



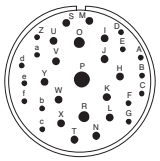
LAYOUT	28A63
# OF CONTACTS	9-#12; 19-#16
SERIES	●
SERVICE RATING	A

30 CONTACTS



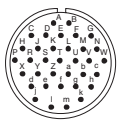
LAYOUT	32-8
# OF CONTACTS	24-#16; 6-#12
SERIES	▼●
SERVICE RATING	A

31 CONTACTS

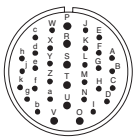


LAYOUT	36-9
# OF CONTACTS	14-#16; 14-#12; 2-#8; 1-#4
SERIES	▼●
SERVICE RATING	A

35 CONTACTS

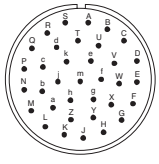


LAYOUT	28-15*
# OF CONTACTS	35-#16
SERIES	▼●
SERVICE RATING	A



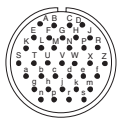
LAYOUT	32-7*
# OF CONTACTS	28-#16; 7-#12
SERIES	▼●
SERVICE RATING	I (A,B,H,J); A (balance)

35 CONTACTS



LAYOUT	36-15
# OF CONTACTS	35-#16
SERIES	▼●
SERVICE RATING	D(m); A(balance)

37 CONTACTS



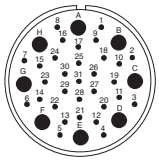
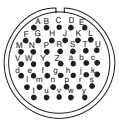
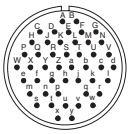
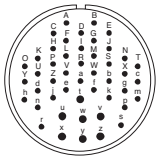
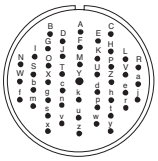
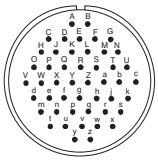
LAYOUT	28-21*
# OF CONTACTS	37-#16
SERIES	▼●
SERVICE RATING	A

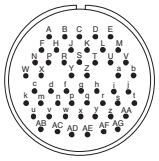
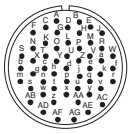
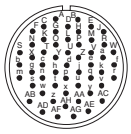
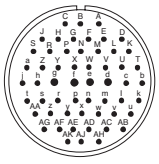
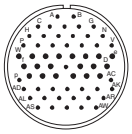
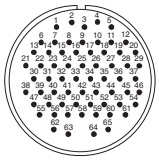
LAYOUTS BY NUMBER OF CONTACTS

Key ▼ = CA/MS ● = CB

View from mating face of pin insulator
(socket view is opposite)

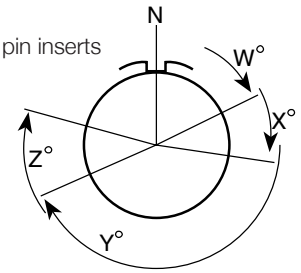
*= most popular layouts

	39 CONTACTS	43 CONTACTS	47 CONTACTS			48 CONTACTS
						
LAYOUT	36A98	28A51	32A47	36-7*	36-8	36-10*
# OF CONTACTS	8-#8; 31-#16	43-#16	47-#16	40-#16; 7-#12	46-#16; 1-#12	48-#16
SERIES	●	▼●	▼●	▼●	▼●	▼●
SERVICE RATING	I	A	A	A	A	A

	52 CONTACTS	54 CONTACTS	55 CONTACTS	56 CONTACTS	61 CONTACTS	65 CONTACTS
						
LAYOUT	36A34	32A10	32A55	36A66	32A69	36A99
# OF CONTACTS	52-#16	54-#16	55-#16	52-#16; 4-#12	20-#16; 41-#20	50-#20; 15-#16
SERIES	▼●	▼●	●	▼	●	●
SERVICE RATING	A	A	A	A	A	I

LAYOUTS BY SHELL SIZE

Mating Face view of pin inserts



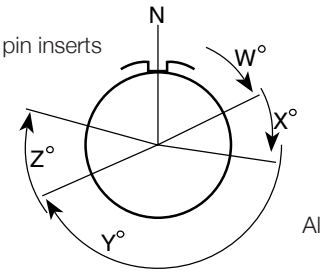
Alternate Insert Position (Rotation)

CONTACT METALLURGY KEY: **ALUMEL** (AL.) **CHROMEL** (CH.) **CONSTANTAN** (CON.) **COPPER** (CU) **IRON** (IR.) **THERMOCOUPLE** (🌡)

LAYOUT	SERIES				TOTAL	CONTACT SIZES						🌡	DEGREES OF ROTATION				SERVICE RATING
	MS	CT	CB	VG		20	16	12	8	4	0		W	X	Y	Z	
8S-1	△	▲			1		1						-	-	-	-	A
10S-2	△	▲			1		1						-	-	-	-	A
10SL-3	△	▲	●	○	3		3						-	-	-	-	A
10SL-4	△	▲	●	○	2		2						-	-	-	-	A
10SL-51		▲	●		2		2					🌡	10SL-4 45° A=IR.; B=CON.				
10SL-52		▲	●		2		2					🌡	10SL-4 45° A=CU; B=CON.				
10SL-53		▲	●		2		2					🌡	10SL-4 45° A=AL.; B=CH.				
10SL-54		▲	●		3		3					🌡	10SL-3 A=IR.; B=CON.; C=CU				
10SL-55		▲	●		3		3					🌡	10SL-3 A=AL.; B=CH.; C=CU				
10SL-56		▲	●		2		2					🌡	10SL-4 A=AL.; B=CH.				
10SL-57		▲	●		2		2					🌡	10SL-4 A=CH.; B=CON.				
10SL-58		▲	●		3		3					🌡	10SL-3 A=CH.; B=AL.; C=CU				
10SL-59		▲	●		2		2					🌡	10SL-4 A=CH.; B=AL.				
10SL-60		▲	●		2		2					🌡	10SL-4 A=IR.; B=CON.				
10SL-61		▲	●		2		2					🌡	10SL-4 A=CU; B=CON.				
10SL-62		▲	●		3		3					🌡	10SL-3 A=CU; B=AL.; C=IR.				
10SL-63		▲	●		3		3					🌡	10SL-3 A, C=CON.; B=CH.				
10SL-64		▲	●		3		3					🌡	10SL-3 A, C=CH.; B=AL.				
10SL-A4		▲	●		5	5							CONTACT US FOR VALID ROTATIONS				A
12S-1		▲	●		2		2						12S-3 100°				A
12S-2		▲	●		2		2						12S-3 250°				A
12S-3	△	▲	●		2		2						70	145	215	290	A
12S-4	△	▲	●		1		1						-	-	-	-	D
12S-51		▲	●		2		2					🌡	12S-3 315° A=CH.; B=AL.				
12S-54		▲	●		2		2					🌡	12S-3 315° A = IR.; B=CON.				
12S-55		▲	●		2		2					🌡	12S-3 45° A=CU; B=CON.				
12S-56		▲	●		2		2					🌡	12S-3 A=AL.; B=CH.				
12S-57		▲	●		2		2					🌡	12S-3 60° A=CH.; B=AL.				
12S-58		▲	●		2		2					🌡	12S-3 120° A=IR.; B=CON.				
12S-59		▲	●		2		2					🌡	12S-3 A=IR.; B=CON.				
12S-60		▲	●		2		2					🌡	12S-3 A=CU; B=CON.				
12S-61		▲	●		2		2					🌡	12S-3 A=CH.; B=CON.				
12S-62		▲	●		2		2					🌡	12S-3 A=CH.; B=AL.				
12SA10		▲	●										CONTACT US FOR VALID ROTATIONS				I
12-5	△	▲			1			1					-	-	-	-	D
14S-1	△	▲	●		3		3						-	-	-	-	A
14S-2	△	▲	●		4		4						-	120	240	-	I

LAYOUTS BY SHELL SIZE

Mating Face view of pin inserts



Alternate Insert Position (Rotation)

CONTACT METALLURGY KEY: **ALUMEL** (AL.) **CHROMEL** (CH.) **CONSTANTAN** (CON.) **COPPER** (CU) **IRON** (IR.) **THERMOCOUPLE** (🌡)

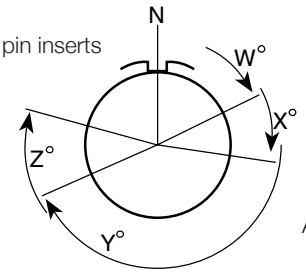
LAYOUT	SERIES				TOTAL	CONTACT SIZES						🌡	DEGREES OF ROTATION				SERVICE RATING
	MS	CT	CB	VG		20	16	12	8	4	0		W	X	Y	Z	
14S-4			●		1		1						-	-	-	-	D
14S-5	△	▲	●		5		5						-	110	-	-	I
14S-6	△	▲	●	○	6		6						-	-	-	-	I
14S-7	△	▲	●		3		3						90	180	270	-	A
14S-9	△	▲	●		2		2						70	145	215	290	A
14S-10		▲	●		4		4						14S-2 100°				I
14S-11		▲	●		4		4						14S-2 250°				I
14S-12		▲	●		3		3						14S-1 100°				A
14S-13		▲	●		3		3						14S-1 260°				A
14S-14		▲	●		4		4						14S-2 100°				I
14S-51		▲	●		2		2					🌡	14S-9 90° A=AL.; B=CH.				
14S-52		▲	●		4		4					🌡	14S-2 45° A, B=CU; C=AL.; D=CH.				
14S-53		▲	●		2		2					🌡	14S-9 90° A=IR.; B=CON.				
14S-54		▲	●		6		6					🌡	14S-6 45° A, C, E=IR.; B, D, F=CON.				
14S-55		▲	●		4		4					🌡	14S-2 45° A, C=IR.; B, D=CON.				
14S-56		▲	●		4		4					🌡	14S-2 45° A=IR.; B=CON.; C, D=CU				
14S-57		▲	●		4		4					🌡	14S-2 45° A, C=AL.; B, D=CH.				
14S-58		▲	●		3		3					🌡	14S-7 45° A=AL.; B=CH.; C=CU				
14S-59		▲	●		2		2					🌡	14S-9 90° A=CU; B=CON.				
14S-60		▲	●		2		2					🌡	14S-9 A=AL.; B=CH.				
14S-61		▲	●		6		6					🌡	14S-6 45° A=AL.; B=CH.; C=IR.; D=CON.; E, F=CU				
14S-63		▲	●		6		6					🌡	14S-6 A, C= AL.; B, D=CH.; E=IR.; F=CON.				
14S-64		▲	●		4		4					🌡	14S-2 A, C=CON.; B, D=CU				
14S-65		▲	●		6		6					🌡	14S-6 A, C, E= CU; B, D, F=CON.				
14S-67		▲	●		6		6					🌡	14S-6 A=AL.; B=CH.; BALANCE=CU				
14S-68		▲	●		4		4					🌡	14S-2 45° A=CH.; B=CON.; C, D=CU				
14S-69		▲	●		3		3					🌡	14S-7 A=CON.; B=CH.; C=CU				
14S-70		▲	●		4		4					🌡	14S-2 A, D=CH.; B, C=AL.				
14S-71		▲	●		4		4					🌡	14S-2 A, B, D=CU; C=CON.				
14S-72		▲	●		2		2					🌡	14S-9 A=CON.; B=CU				
14S-73		▲	●		4		4					🌡	14S-2 A, B=CU; C=AL.; D=CH.				
14S-74		▲	●		4		4					🌡	14S-2 A, B=CH.; C, D=AL.				
14S-75		▲	●		4		4					🌡	14S-2 A, B=CU; C, D=CON.				
14S-76		▲	●		4		4					🌡	14S-2 A, C=AL.; B, D=CH.				
14S-77		▲	●		4		4					🌡	14S-2 A, D=AL.; B, C=CH.				

LAYOUTS BY SHELL SIZE

CONTACT METALLURGY KEY: **ALUMEL** (AL.) **CHROMEL** (CH.) **CONSTANTAN** (CON.) **COPPER** (CU) **IRON** (IR.) **THERMOCOUPLE** (🌡)

LAYOUT	SERIES				TOTAL	CONTACT SIZES							DEGRESS OF ROTATION				SERVICE RATING
	MS	CT	CB	VG		20	16	12	8	4	0	🌡	W	X	Y	Z	
14S-78		▲	●		2		2					🌡	14S-9 A=CH.; B=AL.				
14SA7		▲	●		7		7						-	-	-	-	A
14-3	△	▲			1				1				-	-	-	-	A
16S-1	△	▲	●	○	7		7						80	-	-	280	A
16S-4	△	▲	●	○	2		2						35	110	250	325	D
16S-5	△	▲	●		3		3						70	145	215	290	A
16S-6	△	▲	●		3		3						90	180	270	-	A
16S-8	△	▲	●		5		5						-	170	265	-	A
16S-14		▲	●		3		3						16S-4 110°				A
16S-15		▲	●		2		2						16S-5 100°				D
16S-16		▲	●		2		2						16S-4 250°				D
16S-17		▲	●		3		3						16S-5 250°				A
16S-52		▲	●		2		2					🌡	16S-4 A=CH.; B= AL.				
16S-54		▲	●		7		7					🌡	16S-1 A=AL.; B=CH.; BALANCE=CU				
16S-55		▲	●		7		7					🌡	16S-1 A=CON.; BALANCE=CU				
16SA18		▲	●		7		7						16S-1 100°				A
16SA19		▲	●		7		7						16S-1 260°				A
16SA20		▲	●		7		7						16S-1 110°				A
16SA21		▲	●		7		7						16S-1 250°				A
16-7		▲	●	○	3		2		1				80	110	250	280	A
16-9	△	▲	●		4		2	2					35	110	250	325	A
16-10	△	▲	●	○	3			3					90	180	270	-	A
16-11	△	▲	●		2			2					35	110	250	325	A
16-12	△	▲	●	○	1					1			-	-	-	-	A
16-13	△	▲	●		2			2				🌡	35	110	250	325	A=IR ; B CON
16-52		▲	●		2			2				🌡	16-11 90° A=AL.; B=CH.				
16-53		▲	●		4		2	2				🌡	16-9 70° A=AL.; C=CH.; B, D=CU				
16-55		▲	●		3			3				🌡	16-10 45° A=AL.; B=CH.; C=CU				
16-56		▲	●		2			2				🌡	16-13 90° A=CON.; B=CU				
16-57		▲	●		3			3				🌡	16-10 A=AL.; B=CU; C=CH.				
16-58		▲	●		3			3				🌡	16-10 A=CON.; B, C=CU				
16-60		▲	●		2			2				🌡	16-13 A=AL.; B=CH.				
16-62		▲	●		2			2				🌡	16-11 A=CON.; B=CU				
18-1	△	▲	●	○	10		10						70	145	215	290	A(B,C,F,G); I (all others)
18-3	△	▲	●		2			2					35	110	250	325	D
18-4	△	▲	●		4		4						35	110	250	325	D
18-5	△	▲	●		3		1	2					80	110	250	280	D
18-6	△	▲	●		1					1			-	-	-	-	D
18-7	△	▲	●		1				1				-	-	-	-	B
18-8	△	▲	●		8		7	1					70	-	-	290	A
18-9	△	▲	●		7		5	2					80	110	250	280	I
18-10	△	▲	●		4			4					-	120	240	-	A
18-11	△	▲	●	○	5			5					-	170	265	-	A
18-12	△	▲	●		6		6						80	-	-	280	A
18-13	△	▲	●	○	4			3	1				80	110	250	280	A
18-15	△	▲	●		4			4				🌡	18-10 315° A, C=IR.; B, D=CON.				

LAYOUTS BY SHELL SIZE



CONTACT METALLURGY KEY: **ALUMEL** (AL.) **CHROMEL** (CH.) **CONSTANTAN** (CON.) **COPPER** (CU) **IRON** (IR.) **THERMOCOUPLE** (🌡)

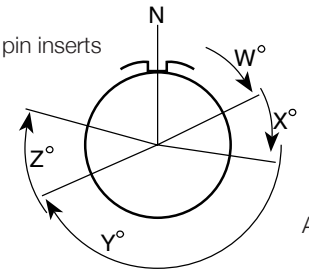
LAYOUT	SERIES				TOTAL	CONTACT SIZES						🌡	DEGREES OF ROTATION				SERVICE RATING
	MS	CT	CB	VG		20	16	12	8	4	0		W	X	Y	Z	
18-17		▲	●		7		5	2					18-9 100°				I
18-18		▲	●		7		5	2					18-9 250°				I
18-19		▲	●		10		10						-	120	240	-	A
18-20		▲	●		5		5						90	180	270	-	A
18-21			●		3			3					70	145	215	290	D
18-22	△	▲	●		3		3						70	145	215	290	D
18-23		▲	●		10		10						18-1 100°				A(B,C,F,G); I(all others)
18-24		▲	●		10		10						18-1 250°				A(B,C,F,G); I(all others)
18-25		▲	●		2			2					18-3 100°				D
18-26		▲	●		2			2					18-3 250°				D
18-27		▲	●		3		1	2					18-5 100°				D
18-28		▲	●		3		1	2					18-5 250°				D
18-29		▲			5		5						90	180	270	-	A
18-30		▲	●		5		5						18-20 110°				A
18-31		▲	●		5		5						18-20 260°				A
18-51		▲	●		6		6					🌡	18-12 A=IR.;B,E=CON.;D=CU;C, F=DUMMY				
18-52		▲	●		5			5				🌡	18-11 A=IR.;B=CON.;C=CH.;D=AL.;E=DUMMY				
18-53		▲	●		6		6					🌡	18-12 A, D=IR.; B, E=CON.; C, F=DUMMY				
18-54		▲	●		4			4				🌡	18-15 A, C=AL.; B, D=CH.				
18-56		▲	●		10		10					🌡	18-1 45° A, C, E, G, I=IR.; B, D, F, H, J=CON.				
18-57		▲	●		6		6					🌡	18-12 45° A, C, E=AL.; B, D, F=CH.				
18-59		▲	●		6		6					🌡	18-12 45° A, C=IR.; B, E, F=CON.; D=CU				
18-60		▲	●		5			5				🌡	18-11 45° A, D=AL.; B, C,=CH.; E=CU				
18-61		▲	●		6		6					🌡	18-12 A, C=IR.; B, D=CON.; E=CH.; F=AL.				
18-62		▲	●		6		6					🌡	18-12 A, B, C=IR.; D, E, F=CON.				
18-63		▲	●		4			4				🌡	18-15 A, C=CON.; B, D=CU				
18-65		▲	●		6		6					🌡	18-12 A=IR.; B=CON.; BALANCE=CU				
18-66		▲	●		10		10					🌡	18-1 A, C, E, G, I=CU; B, D, F, H, J=CON.				
18-67		▲	●		6		6					🌡	18-12 A, C, E=CU; B, D, F=CON.				
18-68		▲	●		5			5				🌡	18-11 A, D=AL.; B, C=CH.; E=CU				
18-69		▲	●		10		10					🌡	18-1 A=AL.; B=CH.; BALANCE=CU				
18-70		▲	●		5			5				🌡	18-11 A=IR.; B=CON.; C=CH.; D=AL.; E=CU				
18-71		▲	●		4			4				🌡	18-15 A=CON.; BALANCE=CU				
18-72		▲	●		4			4				🌡	18-15 D=CON.; BALANCE=CU				
18-73		▲	●		7		5	2				🌡	18-9 A=AL.; D=CH.; BALANCE=CU				
18-74		▲	●		6		6					🌡	18-12 A=CH.; B=AL.; D=IR.; E=CU; C, F=CON.				

LAYOUTS BY SHELL SIZE

CONTACT METALLURGY KEY: **ALUMEL** (AL.) **CHROMEL** (CH.) **CONSTANTAN** (CON.) **COPPER** (CU) **IRON** (IR.) **THERMOCOUPLE** (🌡)

LAYOUT	SERIES				TOTAL	CONTACT SIZES							DEGRESS OF ROTATION				SERVICE RATING
	MS	CT	CB	VG		20	16	12	8	4	0		W	X	Y	Z	
18A31		▲	●		10		10						18-1 110°				A(B,C,F,G); I(all others)
20-2	△	▲	●	○	1						1		-	-	-	-	D
20-3	△	▲	●		3			3					70	145	215	290	D
20-4	△	▲	●		4			4					45	110	250	-	D
20-6		▲	●		3		3						70	145	215	290	D
20-7	△	▲	●		8		8						80	110	250	280	A(B,C.F,G); I(all others)
20-8	△	▲	●	○	6		4		2				80	110	250	280	I
20-11	△	▲	●		13		13						-	-	-	-	I
20-14	△	▲			5			3	2				80	110	250	280	A
20-15	△	▲	●		7			7					80	-	-	280	A
20-16	△	▲	●		9		7	2					80	110	250	280	A
20-17	△	▲	●		6		1	5					90	180	270	-	A
20-18	△	▲	●		9		6	3					35	110	250	325	A
20-19	△	▲	●		3				3				90	180	270	-	A
20-22	△	▲	●		6		3		3				80	110	250	280	A
20-23	△	▲	●		2				2				35	110	250	325	A
20-24	△	▲	●		4		2		2				35	110	250	325	A
20-25		▲	●		13		13						20-11 100°				I
20-27	△	▲	●		14		14						35	110	250	325	A
20-29	△	▲	●		17		17						80	-	-	280	A
20-30		▲	●		13		13						20-11 250°				I
20-32		▲	●		8		8						20-7 260°				A(B,C,F,G); I(all others)
20-33	△	▲	●		11		11						-	-	-	280	A
20-52		▲	●		4			4				🌡	20-4 315° A=IR.; B=CON.; C=CH.; D=AL.				
20-56		▲	●		8		8					🌡	20-7 45° A, B, G, H=IR.; C, D, E, F=CON.				
20-60		▲	●		8		8					🌡	20-7 45° D=CH.; E=AL.; BALANCE=CU				
20-61		▲	●		17		17					🌡	20-29 45° A, B, M=CU; BALANCE=CON.				
20-62		▲	●		7			7				🌡	20-15 80° A, C, E=AL.; B, D, F=CH.; G=CU				
20-64		▲	●		14		14					🌡	20-27 A=AL.; C=CH.; BALANCE=CU				
20-65		▲	●		14		14					🌡	20-27 A, B, C, D, E, F, G=IR.; H, I, J, K, L, M, N=CON.				
20-67		▲	●		9		7	2				🌡	20-16 H=AL.; I=CH.; BALANCE=CU				
20-68		▲	●		8		8					🌡	20-7 A, B, G, H=CON.; C, D, E, F=CU				
20-69		▲	●		14		14					🌡	20-27 A, B, C, D, E, F, G=CU; H, I, J, K, L, M, N=CON.				
20-70		▲	●		17		17					🌡	20-29 A, C, E, G, J, L, N, R, T=IR.; B, D, F, H, K, M, P, S=CON.				
20-71		▲	●		17		17					🌡	20-29 S=AL.; R=CH.; BALANCE=CU				
20-74		▲	●		17		17					🌡	20-29 A, C, E, G, J, L, N, R=IR.; B, D, F, H, K,M, P, S=CON.;T=CU				
20-75		▲	●		7			7				🌡	20-15 G=AL.; BALANCE=CH.				
20-77		▲	●		9		7	2				🌡	20-16 A=CON.; BALANCE=CU				
20-80		▲	●		14		14					🌡	20-27 A, C, E, G, I, K, M=CU; B, D, F, H, J, L, N=CON.				
20-81		▲	●		14		14					🌡	20-27 A, C, E, G, I, K, M=CU; B, D, F, H, J, L, N=AL.				
20-82		▲	●		17		17					🌡	20-29 A, C, E, G, J, L,N, R=AL.; B,D, F, H, K,M, P, S=CH.;T=CU				
20A9		▲	●	○	9			9					-	110	250	-	D(J); (all others)
20A16		▲	●		13		13						20-11 182°				I
20A37		▲	●		4			4					20-4 250°				D

LAYOUTS BY SHELL SIZE



CONTACT METALLURGY KEY: **ALUMEL** (AL.) **CHROMEL** (CH.) **CONSTANTAN** (CON.) **COPPER** (CU) **IRON** (IR.) **THERMOCOUPLE** (🌡)

LAYOUT	SERIES				TOTAL	CONTACT SIZES						🌡	DEGREES OF ROTATION				SERVICE RATING
	MS	CT	CB	VG		20	16	12	8	4	0		W	X	Y	Z	
20A48			●	○	19		19						-	80	280	-	I
22-1		▲	●		2				2				35	110	250	325	D
22-2	△	▲	●	○	3				3				70	145	215	290	D
22-4	△	▲	●		4			2	2				35	110	250	325	A
22-5	△	▲	●		6		4	2					35	110	250	325	D
22-6	△	▲			3		1		2				80	110	250	280	D
22-7	△	▲	●		1						1		-	-	-	-	E
22-8	△	▲	●		2			2					35	110	250	325	E
22-9	△	▲	●		3			3					70	145	215	290	E
22-10	△	▲	●		4		4						35	110	250	325	E
22-11	△	▲			2		2						35	110	250	325	B
22-12	△	▲	●	○	5		3		2				80	110	250	280	A
22-13	△	▲			5		1	4					35	110	250	325	A(A-D); D(E)
22-14	△	▲	●	○	19		19						80	-	-	280	A
22-15	△	▲	●		6		1	5					80	110	250	280	A(A-C, E, F); E(D)
22-16		▲	●		9		6	3					80	110	250	280	A
22-17	△	▲			9		8	1					80	110	250	280	D(A); A(all others)
22-18	△	▲			8		8						80	110	250	280	A(C-E); D(all others)
22-19	△	▲	●		14		14						80	110	250	280	A
22-20	△	▲	●		9		9						35	110	250	325	A
22-21			●		3		2				1		80	110	250	280	A
22-22	△	▲	●	○	4				4				-	110	250	-	A
22-23	△	▲	●		8			8					35	-	250	-	D(H); A(all others)
22-27	△	▲	●	○	9		8		1				80	-	250	280	D(J); A(all others)
22-28	△	▲	●		7			7					80	-	-	280	A
22-30		▲	●		19		19						22-14 100°				A
22-31	△	▲			2		2						22-11 100°				B
22-32		▲	●		6		4	2					22-5 260°				D
22-57		▲	●		19		19					🌡	22-14 45° A, C, E, G, J, L, N, R=IR.; B, D, F, H, K, M, P, S=CON.; T, U, V=CU				
22-60		▲	●		19		19					🌡	22-14 45° U=AL.; N=CH.; BALANCE=CU				
22-62		▲	●		8			8				🌡	22-23 60° A, B, F, G=AL.; C, D, E, H=CH.				
22-68		▲	●		14		14					🌡	22-19 45° A, C, E, G, J, L, M=IR.; B, D, F, H, K, P, N=CON.				
22-69		▲	●		14		14					🌡	22-19 45° A, C, E, G, J, L, M=CU; B, D, F, H, K, P, N=CON.				
22-71		▲	●		19		19					🌡	22-14 V=AL.; U=CH.; BALANCE=CU				
22-72		▲	●		6		4	2				🌡	22-5 B=AL.; E=CH.; BALANCE=CU				

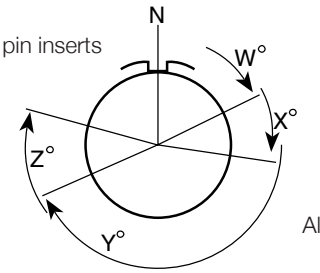
LAYOUTS BY SHELL SIZE

CONTACT METALLURGY KEY: **ALUMEL** (AL.) **CHROMEL** (CH.) **CONSTANTAN** (CON.) **COPPER** (CU) **IRON** (IR.) **THERMOCOUPLE** (🌡)

LAYOUT	SERIES				TOTAL	CONTACT SIZES							DEGRESS OF ROTATION				SERVICE RATING
	MS	CT	CB	VG		20	16	12	8	4	0	🌡	W	X	Y	Z	
22-73		▲	●		6		4	2				🌡	22-5 E=AL.; B=CH.; BALANCE=CU				
22-74		▲	●		8			8				🌡	22-23 A, C, E, G=IR.; B, D, F, H=CON.				
22-75		▲	●		8			8				🌡	22-23 A=AL.; B, D, G, H=CU; C=CH.; E=IR.; F=CON.				
22-77		▲	●		14		14					🌡	22-19 B, D, F, H, J, K, M, P=CU; A, E, L=IR.; C, G, N=CON.				
22-78		▲	●		19		19					🌡	22-14 A, C, E, G, H, K, M, P, R, T=CON.; BALANCE=CU				
22-79		▲	●		4		4					🌡	22-10 A, C,=CON.; B, D=CU				
24-2	△	▲	●		7			7					80	-	-	280	D
24-5	△	▲	●		16		16						80	110	250	280	A
24-6	△	▲			8			8					80	110	250	280	D(A,G,H); A(all others)
24-7	△	▲	●		16		14	2					80	110	250	280	A
24-9	△	▲	●		2					2			35	110	250	325	A
24-10	△	▲	●	○	7				7				80	-	-	280	A
24-11	△	▲	●	○	9			6	3				35	110	250	325	A
24-12	△	▲	●	○	5			3		2			80	110	250	280	A
24-15		▲	●		16		16						24-5 100°				A
24-19		▲	●		12		12						-	-	-	-	A
24-20	△	▲	●		11		9	2					80	110	250	280	D
24-22	△	▲	●		4				4				45	110	250	-	D
24-24		▲	●		16		16						24-5 250°				A
24-25		▲	●		8			8					24-6 100°				D(A,G,H); A(all others)
24-26		▲	●		8			8					24-6 250°				D(A,G,H); A(all others)
24-27	△	▲	●		7		7						80	-	-	280	E
24-28	△	▲	●		24		24						80	110	250	280	I
24-56		▲	●		11		9	2				🌡	24-20 45° E=AL.; F=CH.; BALANCE=CU				
24-57		▲	●		24		24					🌡	24-28 45° A, C, J, V, Y, W, K, E, H, U, S, M=CH.; BALANCE=AL.				
24-62		▲	●		24		24					🌡	24-28 A, C, E, G=IR.; B, D, F, H=CON.;R, T=CH.; S, U=AL.; BALANCE=CU				
24-63		▲	●		24		24					🌡	24-28 A, C, E, G, J, L, K, N, S, U, W, Y=CU; B, D, F, H, Q, R, M, P, T, V, X, Z=CON.				
24-64		▲	●		16		16					🌡	24-5 A, B, C, D, E, F, G, H=IR.; J, K, L, M, N, P, R, S=CON.				
24-68		▲	●		24		24					🌡	24-28 D=CON.; BALANCE=CU				
24-79					5				5				-	-	-	-	A
24-81		▲	●		16		14	2				🌡	24-7 A, C, E, G, I, K, M, N, P=CU; B, D, F, H, J, L, O=CON.				
24A24		▲	●		12			12					CONTACT FOR VALID ROTATIONS				A
24A28			●		28		28						65	146	235	-	I
24A35		▲	●		16		14	2					24-7 100°				A
28-1	△	▲			9			6	3				80	110	250	280	D(A, E, J); A(all others)
28-2	△	▲	●		14		12	2					35	110	250	325	D
28-4		▲			9		7	2					80	110	250	280	E(G,P, S); D(all others)
28-5		▲	●		5		2	1		2			35	110	250	325	D
28-7		▲			2					2			35	110	250	325	D
28-9	△	▲	●		12		6	6					80	110	250	280	D
22B22			●		4				4				-	110	250	-	A

LAYOUTS BY SHELL SIZE

Mating Face view of pin inserts



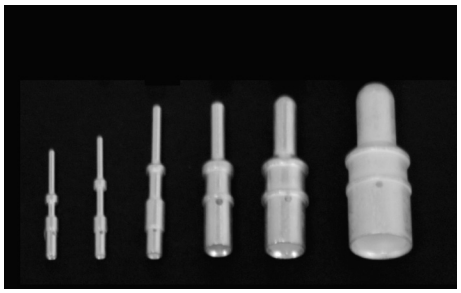
Alternate Insert Position (Rotation)

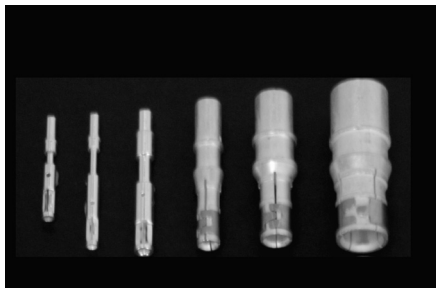
CONTACT METALLURGY KEY: **ALUMEL** (AL.) **CHROMEL** (CH.) **CONSTANTAN** (CON.) **COPPER** (CU) **IRON** (IR.) **THERMOCOUPLE** (🌡)

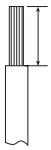
LAYOUT	SERIES				TOTAL	CONTACT SIZES						🌡	DEGREES OF ROTATION				SERVICE RATING
	MS	CT	CB	VG		20	16	12	8	4	0		W	X	Y	Z	
28-10	△	▲	●		7			3	2	2			80	110	250	280	D(G); A(all others)
28-11	△	▲	●	○	22		18	4					80	110	250	280	A
28-12	△	▲	●		26		26						90	180	270	-	A
28-13		▲	●		26		26						28-12 100°				A
28-14		▲			11		11						80	110	250	280	D
28-15	△	▲	●		35		35						80	110	250	280	A
28-16	△	▲	●		20		20						80	110	250	280	A
28-17	△	▲			15		15						80	110	250	280	A(A-L); B(R); D(M-P)
28-19	△	▲	●		10		6	4					80	110	250	280	A(C, E, G, J, K, L); B(H, M); D(A, B)
28-20	△	▲	●	○	14		4	10					80	110	250	280	A
28-21	△	▲	●	○	37		37						80	110	250	280	A
28-22	△	▲	●		6		3			3			70	145	215	290	D
28-51		▲	●		12			12					80	135	195	-	A
28-53		▲	●		22		18	4				🌡	28-11 45° J, L=AL.; K, M=CH.; BALANCE=CU				
28-58		▲	●		14		4	10				🌡	28-20 45° A, C, E, G, K, M=AL.; B, D, F, H, L, N=CH.; J, P=CU				
28-59		▲			17		10	7					-	-	-	-	A
28-61		▲	●		37		37					🌡	28-21 45° A, C, J, Z, M, R, N, A, K, F, H, X, K, H, T, M, N, D=IR.; BALANCE=CON.				
28-63		▲	●	○	14		4	10				🌡	28-20 45° A, C, E, G, J=AL.; B, D, F, H, P=CH.; BALANCE=CU				
28-64		▲	●		35		35					🌡	28-15 A, D=AL.; B, J=CH.; C, D, E, F, G, N, P, R, S, H, J, K, L, M, W, X, Y, Z=CON.; BALANCE=CU				
28-65		▲	●		26		26					🌡	28-12 A, C, E, G, J, L, N, R, T, V=IR.; X, Z=AL.; B, D, F, H, K, M, P, S, U, W=CON.; Y, A=CH.; B, D=CU				
28-67		▲	●		20		20					🌡	28-16 U=CON.; BALANCE=CU				
28-68		▲	●		35		35					🌡	28-15 45° T=AL.; U=CH.; BALANCE=CU				
28-69		▲	●		22		18	4				🌡	28-11 G=AL.; R=CH.; BALANCE=CU				
28-70		▲	●		22		18	4				🌡	28-11 A=AL.; B=CH.; BALANCE=CU				
28-77		▲	●		22		18	4				🌡	28-11 J=CON.; BALANCE=CU				
28-81		▲	●		37		37					🌡	28-21 A, D, S, Z, N, S=IR.; B, J, K, F, G, R=CON.; G, L, P, B, E, J=AL.; F, H, T, X, H, K=CH.; BALANCE=CU				
28A16		▲	●		9		5			4			CONTACT US FOR VALID ROTATION				A(E); I(all others)
28A51		▲	●		43		43						CONTACT US FOR VALID ROTATION				A
28A63			●		28		19	9					-	110	260	-	A
32-1	△	▲	●		5			3			2		80	110	250	280	E(A); D(all others)
32-2		▲			5		2			3			70	145	215	290	E

CONTACT METALLURGY KEY: **ALUMEL** (AL.) **CHROMEL** (CH.) **CONSTANTAN** (CON.) **COPPER** (CU) **IRON** (IR.) **THERMOCOUPLE** (🌡)

LAYOUT	SERIES				TOTAL	CONTACT SIZES							DEGRESS OF ROTATION				SERVICE RATING
	MS	CT	CB	VG		20	16	12	8	4	0	🌡	W	X	Y	Z	
32-5		▲	●		2						2		35	110	250	325	D
32-6	△	▲	●	○	23		16	2	3	2			80	110	250	280	A
32-7	△	▲	●	○	35		28	7					80	125	235	280	I(A,B,H,J); A(all others)
32-8	△	▲	●		30		24	6					80	125	235	280	A
32-9	△	▲	●		14		12			2			80	110	250	280	D
32-13	△	▲	●		23		18	5					80	110	250	280	D
32-15	△	▲	●		8			6			2		35	110	250	280	D
32-17	△	▲	●		4					4			45	110	250	-	D
32-19		▲	●		5			3			2		32-1 260°				E(A); D(all others)
32-20		▲	●		23		16	2	3	2			32-6 260°				A
32-51		▲	●		30		24	6				🌡	32-8 90° M=CH.; N= AL.; BALANCE=CU				
32-55		▲	●		30		24	6				🌡	32-8 125° M, N=CH.; O, P=AL.; BALANCE=CU				
32A10		▲	●		54		54						CONTACT US FOR VALID ROTATION				A
32A29		▲	●		23		16	2	3	2			32-6 250°				A
32A30		▲	●		5			3		2			32-1 100°				E(A); D(all others)
32A47		▲	●		47		47						CONTACT US FOR VALID ROTATION				A
32A55			●		55		55						80	110	250	280	A
32A69			●	○	61	41	20						-	110	250	-	I
36-3		▲	●		6			3			3		70	145	215	290	D
36-4	△	▲			3						3		70	145	215	290	A(B,C); D(A)
36-5	△	▲	●	○	4						4		45	120	240	-	A
36-6	△	▲	●	○	6					4	2		35	110	250	325	A
36-7	△	▲	●		47		40	7					80	110	250	280	A
36-8	△	▲	●		47		46	1					80	110	250	280	A
36-9	△	▲	●		31		14	14	2	1			80	125	235	280	A
36-10	△	▲	●	○	48		48						80	125	235	280	A
36-11		▲	●		48		48						36-10 100°				A
36-12		▲	●		48		48						36-10 250°				A
36-14	△	▲	●		16		6	5	5				90	180	270	-	D
36-15	△	▲	●		35		35						60	125	245	305	D(m); A(all others)
36-16		▲	●		47		40	7					36-7 100°				
36-17		▲	●		47		40	7					36-7 250°				A
36-18		▲	●		31		14	14	2	1			36-9 100°				A
36-21		▲	●		31		14	14	2	1			36-9 260°				A
36-53		▲	●		47		40	7				🌡	36-7 45° U, V, W=AL.; X, Y, Z=CH.; BALANCE=CU				
36A34		▲	●		52		52						CONTACT US FOR VALID ROTATION				A
36A35		▲	●		8		4				4		CONTACT US FOR VALID ROTATION				A
36A46		▲	●		27			27					CONTACT US FOR VALID ROTATION				A
36A98		▲	●		39		31		8				CONTACT US FOR VALID ROTATION				I
36A99			●		65	50	15						CONTACT US FOR VALID ROTATION				I
36A70		▲			16		5			11			-	-	-	-	I

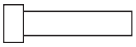


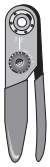


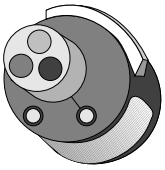


CONTACT SIZE	WIRE GAUGE (AWG)	CT CRIMP PINS PART NUMBER		CT CRIMP SOCKETS PART NUMBER		WIRE STRIP LENGTHS
		SILVER	GOLD	SILVER	GOLD	
16S	16-18	CT16S-16P	CT16S-16PG	CT16S-16S	CT16S-16SG	.250 (6.4)
16	16-20	CT16-16P	CT16-16PG	CT16-16S	CT16-16SG	.250 (6.4)
12	12-14	CT12-12P	CT12-12PG	CT12-12S	CT12-12SG	.250 (6.4)
8	8-10	CT8-8P	-	CT8-8S	CT8-8SG	.438 (11.1)
4	4	CT4-4P	-	CT4-4S	-	.625 (15.9)
0	0	CT0-0P	-	CT0-0S	-	.688 (17.5)

All dimensions are shown in inches (millimeters in parentheses)







400BHD Shown

CONTACT SIZE	WIRE RANGE INSULATION O.D. MIN	WIRE RANGE INSULATION O.D. MAX	ACCESSORIES WIRE HOLE FILLERS	ACCESSORIES HOLE FILLER COLOR	TOOLS HAND CRIMP TOOL	TOOLS HAND TOOL TURRET	TOOLS USE LOCATOR COLOR	TOOLS POWER CRIMP TOOL	TOOLS POWER CRIMP LOCATOR	TOOLS INSERTION/ EXTRACTION TOOL	TOOLS INSERTION GUIDE PINS
16S	.064 (1.6)	.130 (3.3)	225-0017-000	BLUE	AF8	TH70-1	BLUE△/RED♦	WA27F	USE HAND TOOL TURRET WITH POWER TOOL	CIT-F80-16* CET-F80-16†	226-1017-000
16	.064 (1.6)	.130 (3.3)	225-0017-000	BLUE	AF8	TH70-1	RED△/GREEN♦	WA27F			226-1017-000
12	.114 (2.9)	.170 (4.3)	225-0018-000	YELLOW	AF8	TP567	-	WA27F		CIT-F80-12*/ CET-F80-12†	226-1018-000
8	.164 (4.2)	.255 (6.5)	MS27488-8-3	RED	N/A	N/A	N/A	400BHD	CCH8-KIT	CIT-8*/CET-8†	N/A
4	.272 (6.9)	.370 (9.4)	MS27488-4-3	BLUE	N/A	N/A	N/A	400BHD	CCH4-KIT	CIT-4*/CET-4†	N/A
0	.415 (10.5)	.550 (14.0)	MS27488-0-3	YELLOW	N/A	N/A	N/A	400BHD	CCH0-KIT	CIT-0*/CET-0†	N/A

*Insertion Tool †Extraction Tool △ Pin ♦ Socket

All dimensions are shown in inches (millimeters in parentheses)

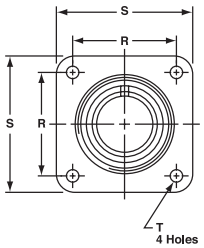
CRIMP KITS ARE AVAILABLE FOR 16S, 16, AND 12 SIZE CONTACTS - CT 16-12 KIT INCLUDES:

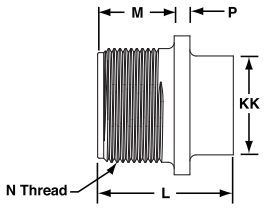
- Crimp tool
- Locator
- Insertion tool
- Insertion guide pins
- Extraction tool
- Assembly instructions
- Rugged case

COMPONENTS

	RECEPTACLE	PLUG
O-RING		
BARREL/SHELL		
INSERT/ INSULATOR		
CONTACTS		
COUPLING NUT		
INDIVIDUAL WIRE SEALING GROMMET		
FERRULE/SLEEVE COMPRESSION RING		
ENDBELL/ BACKSHELL/ CABLE CLAMP & BUSHING		

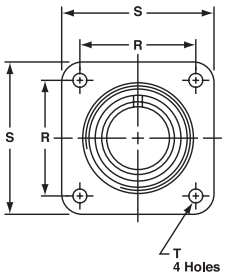
CT 2 STYLES

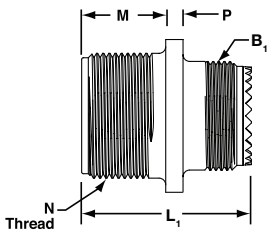




SHELL SIZE	M +.031(0.79) -.000(0.00)		N THREAD 2A	P MAX		R ±.005(0.13)		S ±.031(0.79)		T +0.10(0.25) -.005(0.13)		L MAX		KK MAX	
	IN	MM		IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM
8S	0.562	(14.3)	1/2-28UNEF	0.125	(3.2)	0.594	(15.1)	0.875	(22.2)	0.12	(3)	1.040	(26.4)	0.426	(10.8)
10S	0.562	(14.3)	5/8-24UNEF	0.125	(3.2)	0.719	(18.3)	1.000	(25.4)	0.120	(3.0)	1.040	(26.4)	0.520	(13.2)
10SL	0.562	(14.3)	5/8-24UNEF	0.125	(3.2)	0.719	(18.3)	1.000	(25.4)	0.120	(3.0)	1.040	(26.4)	0.614	(15.6)
12S	0.562	(14.3)	3/4-20UNEF	0.140	(3.6)	0.812	(20.6)	1.094	(27.8)	0.120	(3.0)	1.040	(26.4)	0.614	(15.6)
12	0.750	(19.1)	3/4-20UNEF	0.146	(3.7)	0.812	(20.6)	1.094	(27.8)	0.120	(3.0)	1.400	(35.6)	0.614	(15.6)
14S	0.562	(14.3)	7/8-20UNEF	0.140	(3.6)	0.906	(23.0)	1.188	(30.2)	0.120	(3.0)	1.040	(26.4)	0.739	(18.8)
14	0.750	(19.1)	7/8-20UNEF	0.146	(3.7)	0.906	(23.0)	1.188	(30.2)	0.120	(3.0)	1.400	(35.6)	0.739	(18.8)
16S	0.562	(14.3)	1-20UNEF	0.140	(3.6)	0.969	(24.6)	1.281	(32.5)	0.120	(3.0)	1.040	(26.4)	0.864	(21.9)
16	0.750	(19.1)	1-20UNEF	0.146	(3.7)	0.969	(24.6)	1.281	(32.5)	0.120	(3.0)	1.400	(35.6)	0.864	(21.9)
18	0.750	(19.1)	1-1/8-18UNEF	0.180	(4.6)	1.062	(27.0)	1.375	(34.9)	0.120	(3.0)	1.400	(35.6)	0.989	(25.1)
20	0.750	(19.1)	1-1/4-18UNEF	0.180	(4.6)	1.156	(29.4)	1.500	(38.1)	0.120	(3.0)	1.400	(35.6)	1.145	(29.1)
22	0.750	(19.1)	1-3/8-18UNEF	0.180	(4.6)	1.250	(31.8)	1.625	(41.3)	0.120	(3.0)	1.400	(35.6)	1.270	(32.3)
24	0.812	(20.6)	1-1/2-18UNEF	0.203	(5.2)	1.375	(34.9)	1.750	(44.5)	0.147	(3.7)	1.400	(35.6)	1.395	(35.4)
28	0.812	(20.6)	1-3/4-18UNEF	0.203	(5.2)	1.562	(39.7)	2.000	(50.8)	0.147	(3.7)	1.400	(35.6)	1.614	(41.0)
32	0.875	(22.2)	2-18UNS	0.203	(5.2)	1.750	(44.5)	2.250	(57.2)	0.173	(4.4)	1.400	(35.6)	1.864	(47.4)
36	0.875	(22.2)	2-1/4-16UNS	0.203	(5.2)	1.938	(49.2)	2.500	(63.5)	0.173	(4.4)	1.400	(35.6)	2.051	(52.1)

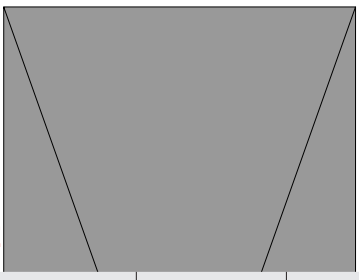
CT 0 STYLES



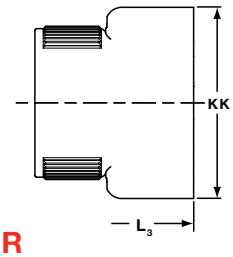


SHELL SIZE	M +.031(0.79) -.000(0.00)		N THREAD 2A	P MAX		R ±.005(0.13)		S ±.031(0.79)		T +0.10(0.25) -.005(0.13)		L_1 MAX		B_1 THREAD 2A
	IN	MM		IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	
8S	0.562	(14.3)	1/2-28UNEF	0.125	(3.2)	0.594	(15.1)	0.875	(22.2)	0.120	(3.0)	1.145	(29.1)	7/16-28UNEF
10S	0.562	(14.3)	5/8-24UNEF	0.125	(3.2)	0.719	(18.3)	1.000	(25.4)	0.120	(3.0)	1.145	(29.1)	1/2-28UNEF
10SL	0.562	(14.3)	5/8-24UNEF	0.125	(3.2)	0.719	(18.3)	1.000	(25.4)	0.120	(3.0)	1.145	(29.1)	9/16-24UNEF
12S	0.562	(14.3)	3/4-20UNEF	0.140	(3.6)	0.812	(20.6)	1.094	(27.8)	0.120	(3.0)	1.145	(29.1)	5/8-24UNEF
12	0.750	(19.1)	3/4-20UNEF	0.146	(3.7)	0.812	(20.6)	1.094	(27.8)	0.120	(3.0)	1.499	(38.1)	5/8-24UNEF
14S	0.562	(14.3)	7/8-20UNEF	0.140	(3.6)	0.906	(23.0)	1.188	(30.2)	0.120	(3.0)	1.145	(29.1)	3/4-20UNEF
14	0.750	(19.1)	7/8-20UNEF	0.146	(3.7)	0.906	(23.0)	1.188	(30.2)	0.120	(3.0)	1.499	(38.1)	3/4-20UNEF
16S	0.562	(14.3)	1-20UNEF	0.140	(3.6)	0.969	(24.6)	1.281	(32.5)	0.120	(3.0)	1.145	(29.1)	7/8-20UNEF
16	0.750	(19.1)	1-20UNEF	0.146	(3.7)	0.969	(24.6)	1.281	(32.5)	0.120	(3.0)	1.499	(38.1)	7/8-20UNEF
18	0.750	(19.1)	1-1/8-18UNEF	0.180	(4.6)	1.062	(27.0)	1.375	(34.9)	0.120	(3.0)	1.499	(38.1)	1-20UNEF
20	0.750	(19.1)	1-1/4-18UNEF	0.180	(4.6)	1.156	(29.4)	1.500	(38.1)	0.120	(3.0)	1.499	(38.1)	1-1/8-18UNEF
22	0.750	(19.1)	1-3/8-18UNEF	0.180	(4.6)	1.250	(31.8)	1.625	(41.3)	0.120	(3.0)	1.499	(38.1)	1-1/4-18UNEF
24	0.812	(20.6)	1-1/2-18UNEF	0.203	(5.2)	1.375	(34.9)	1.750	(44.5)	0.147	(3.7)	1.562	(39.7)	1-3/8-18UNEF
28	0.812	(20.6)	1-3/4-18UNEF	0.203	(5.2)	1.562	(39.7)	2.000	(50.8)	0.147	(3.7)	1.562	(39.7)	1-5/8-18UNEF
32	0.875	(22.2)	2-18UNS	0.203	(5.2)	1.750	(44.5)	2.250	(57.2)	0.173	(4.4)	1.624	(41.2)	1-7/8-16UN
36	0.875	(22.2)	2-1/4-16UNS	0.203	(5.2)	1.938	(49.2)	2.500	(63.5)	0.173	(4.4)	1.624	(41.2)	2-1/8-16UN

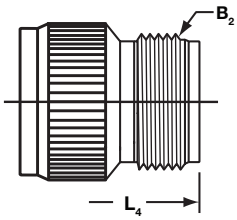
CT 0 ENDBELL STYLES



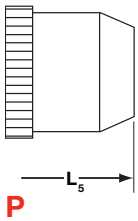
E



R



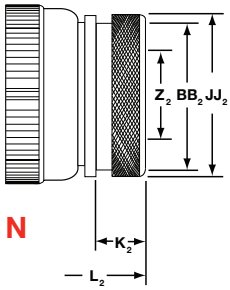
F



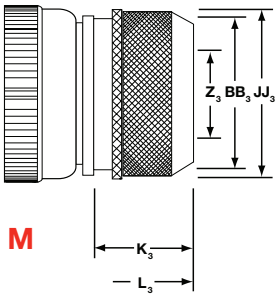
P

SHELL SIZE	L_2 MAX		XX_2 MAX+		XX_2 MIN+		L_3 MAX		KK		L_4 MAX		B_2 THREAD 2A	L_5 MAX	
	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM		IN	MM
8S	2.250	(57.2)	0.235	(6.0)	0.102	(2.6)	1.838	(46.7)	0.890	(22.6)	-	-	-	1.531	(38.9)
10S	2.250	(57.2)	0.235	(6.0)	0.102	(2.6)	1.838	(46.7)	0.890	(22.6)	-	-	-	1.531	(38.9)
10SL	2.250	(57.2)	0.297	(7.5)	0.140	(3.6)	1.838	(46.7)	0.970	(24.6)	1.772	(45.0)	5/8-24UNEF	1.531	(38.9)
12S	2.250	(57.2)	0.297	(7.5)	0.140	(3.6)	1.838	(46.7)	0.970	(24.6)	1.772	(45.0)	5/8-24UNEF	1.531	(38.9)
12	2.625	(66.7)	0.297	(7.5)	0.140	(3.6)	2.181	(55.4)	0.970	(24.6)	2.126	(54.0)	5/8-24UNEF	1.968	(50.0)
14S	2.250	(57.2)	0.422	(10.7)	0.195	(5.0)	1.838	(46.7)	1.150	(29.2)	1.772	(45.0)	3/4-20UNEF	1.531	(38.9)
14	2.625	(66.7)	0.422	(10.7)	0.195	(5.0)	2.181	(55.4)	1.150	(29.2)	-	-	-	1.968	(50.0)
16S	2.250	(57.2)	0.547	(13.9)	0.255	(6.5)	1.838	(46.7)	1.250	(31.8)	1.772	(45.0)	7/8-20UNEF	1.531	(38.9)
16	2.625	(66.7)	0.547	(13.9)	0.255	(6.5)	2.181	(55.4)	1.250	(31.8)	2.126	(54.0)	7/8-20UNEF	1.968	(50.0)
18	2.688	(68.3)	0.610	(15.5)	0.285	(7.2)	2.281	(57.9)	1.450	(36.8)	2.126	(54.0)	1-20UNEF	1.968	(50.0)
20	2.750	(69.9)	0.735	(18.7)	0.350	(8.9)	2.281	(57.9)	1.570	(39.9)	2.165	(55.0)	1-3/16-18UNEF	2.188	(55.6)
22	2.750	(69.9)	0.740	(18.8)	0.350	(8.9)	2.281	(57.9)	1.570	(39.9)	2.283	(58.0)	1-3/16-18UNEF	2.188	(55.6)
24	2.969	(75.4)	0.922	(23.4)	0.468	(11.9)	2.281	(57.9)	1.880	(47.8)	2.323	(59.0)	1-7/16-18UNEF	2.188	(55.6)
28	3.031	(77.0)	0.922	(23.4)	0.468	(11.9)	2.281	(57.9)	1.880	(47.8)	2.362	(60.0)	1-7/16-18UNEF	2.188	(55.6)
32	3.031	(77.0)	1.235	(31.4)	0.664	(16.9)	2.322	(59.0)	2.205	(56.0)	2.441	(62.0)	1-3/4-18NS	2.188	(55.6)
36	3.281	(83.3)	1.360	(34.5)	0.694	(17.6)	2.322	(59.0)	2.400	(61.0)	2.520	(64.0)	2-18NS	2.188	(55.6)

+ without bushings



N

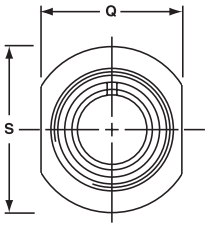


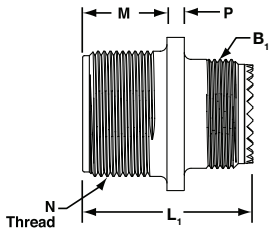
M

SHELL SIZE	L_2 MAX		K_2 MAX		Z_2 MIN		B_2 MAX		JJ_2 ±.008(0.20)	
	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM
8S	-	-	-	-	-	-	-	-	-	-
10S	-	-	-	-	-	-	-	-	-	-
10SL	2.244	(57.0)	0.461	(11.7)	0.303	(7.7)	0.524	(13.3)	0.610	(15.5)
12S	2.244	(57.0)	0.461	(11.7)	0.311	(7.9)	0.524	(13.3)	0.610	(15.5)
12	-	-	-	-	-	-	-	-	-	-
14S	2.244	(57.0)	0.461	(11.7)	0.417	(10.6)	0.669	(17.0)	0.752	(19.1)
14	-	-	-	-	-	-	-	-	-	-
16S	2.244	(57.0)	0.461	(11.7)	0.531	(13.5)	0.862	(21.9)	0.941	(23.9)
16	2.480	(63.0)	0.453	(11.5)	0.531	(13.5)	0.862	(21.9)	0.941	(23.9)
18	2.559	(65.0)	0.453	(11.5)	0.575	(14.6)	0.862	(21.9)	0.941	(23.9)
20	2.677	(68.0)	0.500	(12.7)	0.736	(18.7)	1.031	(26.2)	1.165	(29.6)
22	2.677	(68.0)	0.500	(12.7)	0.819	(20.8)	1.031	(26.2)	1.165	(29.6)
24	2.756	(70.0)	0.500	(12.7)	0.969	(24.6)	1.358	(34.5)	1.488	(37.8)
28	2.795	(71.0)	0.500	(12.7)	1.063	(27.0)	1.358	(34.5)	1.488	(37.8)
32	2.913	(74.0)	0.598	(15.2)	1.311	(33.3)	1.717	(43.6)	1.882	(47.8)
36	2.913	(74.0)	0.598	(15.2)	1.516	(38.5)	1.717	(43.6)	1.882	(47.8)

SHELL SIZE	L_3 MAX		K_3 MAX		Z_3 MIN		BB_3 MAX		JJ_3 ±.008(0.20)	
	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM
8S	-	-	-	-	-	-	-	-	-	-
10S	-	-	-	-	-	-	-	-	-	-
10SL	2.165	(55.0)	0.669	(17.0)	0.303	(7.7)	0.642	(16.3)	0.728	(18.5)
12S	2.283	(58.0)	0.669	(17.0)	0.366	(9.3)	0.669	(17.0)	0.787	(20.0)
12	-	-	-	-	-	-	-	-	-	-
14S	2.283	(58.0)	0.669	(17.0)	0.417	(10.6)	0.787	(20.0)	0.866	(22.0)
14	-	-	-	-	-	-	-	-	-	-
16S	2.756	(70.0)	0.709	(18.0)	0.531	(13.5)	0.906	(23.0)	0.984	(25.0)
16	2.756	(70.0)	0.709	(18.0)	0.531	(13.5)	0.906	(23.0)	0.984	(25.0)
18	2.756	(70.0)	0.709	(18.0)	0.575	(14.6)	0.965	(24.5)	1.102	(28.0)
20	2.756	(70.0)	0.709	(18.0)	0.728	(18.5)	1.122	(28.5)	1.260	(32.0)
22	2.756	(70.0)	0.709	(18.0)	0.819	(20.8)	1.201	(30.5)	1.339	(34.0)
24	2.756	(70.0)	0.709	(18.0)	0.969	(24.6)	1.358	(34.5)	1.496	(38.0)
28	2.756	(70.0)	0.709	(18.0)	1.063	(27.0)	1.476	(37.5)	1.614	(41.0)
32	2.953	(75.0)	0.709	(18.0)	1.311	(33.3)	1.732	(44.0)	1.890	(48.0)
36	3.346	(85.0)	0.709	(18.0)	1.516	(38.5)	2.008	(51.0)	2.165	(55.0)

CT 1 STYLES

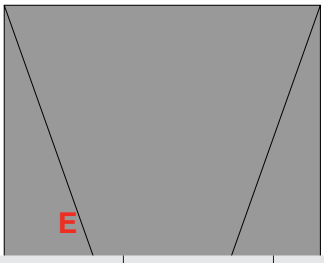




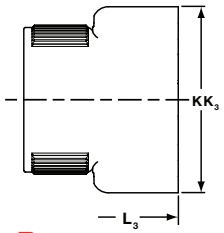
SHELL SIZE	M +.031(0.79) -.000(0.00)		N THREAD 2A	P MAX		Q MAX		S MAX		L_1 MAX		B_1 THREAD 2A
	IN	MM		IN	MM	IN	MM	IN	MM	IN	MM	
8S	0.562	(14.3)	1/2-28UNEF	0.125	(3.2)	0.515	(13.1)	0.844	(21.4)	1.145	(29.1)	7/16-28UNEF
10S	0.562	(14.3)	5/8-24UNEF	0.125	(3.2)	0.640	(16.3)	0.969	(24.6)	1.145	(29.1)	1/2-28UNEF
10SL	0.562	(14.3)	5/8-24UNEF	0.125	(3.2)	0.640	(16.3)	1.062	(27.0)	1.145	(29.1)	9/16-24UNEF
12S	0.562	(14.3)	3/4-20UNEF	0.140	(3.6)	0.765	(19.4)	1.062	(27.0)	1.145	(29.1)	5/8-24UNEF
12	0.750	(19.1)	3/4-20UNEF	0.146	(3.7)	0.765	(19.4)	1.062	(27.0)	1.499	(38.1)	5/8-24UNEF
14S	0.562	(14.3)	7/8-20UNEF	0.140	(3.6)	0.890	(22.6)	1.156	(29.4)	1.145	(29.1)	3/4-20UNEF
14	0.750	(19.1)	7/8-20UNEF	0.146	(3.7)	0.890	(22.6)	1.156	(29.4)	1.499	(38.1)	3/4-20UNEF
16S	0.562	(14.3)	1-20UNEF	0.140	(3.6)	1.015	(25.8)	1.281	(32.5)	1.145	(29.1)	7/8-20UNEF
16	0.750	(19.1)	1-20UNEF	0.146	(3.7)	1.015	(25.8)	1.281	(32.5)	1.499	(38.1)	7/8-20UNEF
18	0.750	(19.1)	1-1/8-18UNEF	0.180	(4.6)	1.140	(29.0)	1.344	(34.1)	1.499	(38.1)	1-20UNEF
20	0.750	(19.1)	1-1/4-18UNEF	0.180	(4.6)	1.265	(32.1)	1.500	(38.1)	1.499	(38.1)	1-1/8-18UNEF
22	0.750	(19.1)	1-3/8-18UNEF	0.180	(4.6)	1.390	(35.3)	1.625	(41.3)	1.499	(38.1)	1-1/4-18UNEF
24	0.812	(20.6)	1-1/2-18UNEF	0.203	(5.2)	1.515	(38.5)	1.750	(44.5)	1.562	(39.7)	1-3/8-18UNEF
28	0.812	(20.6)	1-3/4-18UNEF	0.203	(5.2)	1.765	(44.8)	2.000	(50.8)	1.562	(39.7)	1-5/8-18UNEF
32	0.875	(22.2)	2-18UNS	0.203	(5.2)	2.015	(51.2)	2.250	(57.2)	1.624	(41.3)	1-7/8-16UN
36	0.875	(22.2)	2-1/4-16UNS	0.203	(5.2)	2.270	(57.7)	2.500	(63.5)	1.624	(41.3)	2-1/8-16UN

+ without bushings

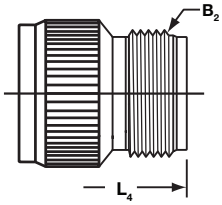
CT 1 STYLES



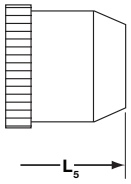
E



R



F

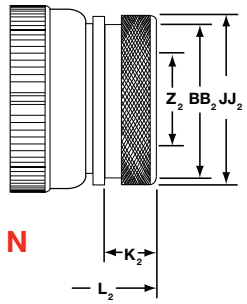


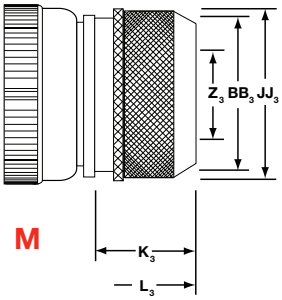
P

SHELL SIZE	L_2 MAX		XX_2 MAX+		XX_2 MIN+		L_3 MAX		KK_3		L_4 MAX		B_2 THREAD 2A	L_5 MAX	
	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM		IN	MM
8S	2.250	(57.2)	0.235	(6.0)	0.102	(2.6)	1.838	(46.7)	0.890	(22.6)	-	-	-	1.531	(38.9)
10S	2.250	(57.2)	0.235	(6.0)	0.102	(2.6)	1.838	(46.7)	0.890	(22.6)	-	-	-	1.531	(38.9)
10SL	2.250	(57.2)	0.297	(7.5)	0.140	(3.6)	1.838	(46.7)	0.970	(24.6)	1.772	(45.0)	5/8-24UNEF	1.531	(38.9)
12S	2.250	(57.2)	0.297	(7.5)	0.140	(3.6)	1.838	(46.7)	0.970	(24.6)	1.772	(45.0)	5/8-24UNEF	1.531	(38.9)
12	2.625	(66.7)	0.297	(7.5)	0.140	(3.6)	2.181	(55.4)	0.970	(24.6)	2.126	(54.0)	5/8-24UNEF	1.968	(50.0)
14S	2.250	(57.2)	0.422	(10.7)	0.195	(5.0)	1.838	(46.7)	1.150	(29.2)	1.772	(45.0)	3/4-20UNEF	1.531	(38.9)
14	2.625	(66.7)	0.422	(10.7)	0.195	(5.0)	2.181	(55.4)	1.150	(29.2)	-	-	-	1.968	(50.0)
16S	2.250	(57.2)	0.547	(13.9)	0.255	(6.5)	1.838	(46.7)	1.250	(31.8)	1.772	(45.0)	7/8-20UNEF	1.531	(38.9)
16	2.625	(66.7)	0.547	(13.9)	0.255	(6.5)	2.181	(55.4)	1.250	(31.8)	2.126	(54.0)	7/8-20UNEF	1.968	(50.0)
18	2.688	(68.3)	0.610	(15.5)	0.285	(7.2)	2.281	(57.9)	1.450	(36.8)	2.126	(54.0)	1-20UNEF	1.968	(50.0)
20	2.750	(69.9)	0.735	(18.7)	0.350	(8.9)	2.281	(57.9)	1.570	(39.9)	2.165	(55.0)	1-3/16-18UNEF	2.188	(55.6)
22	2.750	(69.9)	0.740	(18.8)	0.350	(8.9)	2.281	(57.9)	1.570	(39.9)	2.283	(58.0)	1-3/16-18UNEF	2.188	(55.6)
24	2.969	(75.4)	0.922	(23.4)	0.468	(11.9)	2.281	(57.9)	1.880	(47.8)	2.323	(59.0)	1-7/16-18UNEF	2.188	(55.6)
28	3.031	(77.0)	0.922	(23.4)	0.468	(11.9)	2.281	(57.9)	1.880	(47.8)	2.362	(60.0)	1-7/16-18UNEF	2.188	(55.6)
32	3.031	(77.0)	1.235	(31.4)	0.664	(16.9)	2.322	(59.0)	2.205	(56.0)	2.441	(62.0)	1-3/4-18NS	2.188	(55.6)
36	3.281	(83.3)	1.360	(34.5)	0.694	(17.6)	2.322	(59.0)	2.400	(61.0)	2.520	(64.0)	2-18NS	2.188	(55.6)

+ without bushings

CT 1 ENDBELL STYLES (CONTINUED)

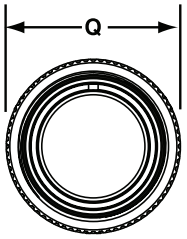


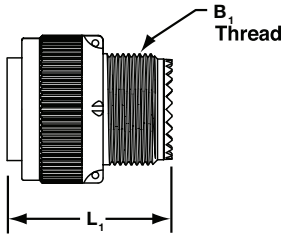


SHELL SIZE	L_2 MAX		K_2 MAX		Z_2 MIN		B_2 MAX		JJ_2 ±.008(0.20)	
	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM
8S	-	-	-	-	-	-	-	-	-	-
10S	-	-	-	-	-	-	-	-	-	-
10SL	2.244	(57.0)	0.461	(11.7)	0.303	(7.7)	0.524	(13.3)	0.610	(15.5)
12S	2.244	(57.0)	0.461	(11.7)	0.311	(7.9)	0.524	(13.3)	0.610	(15.5)
12	-	-	-	-	-	-	-	-	-	-
14S	2.244	(57.0)	0.461	(11.7)	0.417	(10.6)	0.669	(17.0)	0.752	(19.1)
14	-	-	-	-	-	-	-	-	-	-
16S	2.244	(57.0)	0.461	(11.7)	0.531	(13.5)	0.862	(21.9)	0.941	(23.9)
16	2.480	(63.0)	0.453	(11.5)	0.531	(13.5)	0.862	(21.9)	0.941	(23.9)
18	2.559	(65.0)	0.453	(11.5)	0.575	(14.6)	0.862	(21.9)	0.941	(23.9)
20	2.677	(68.0)	0.500	(12.7)	0.736	(18.7)	1.031	(26.2)	1.165	(29.6)
22	2.677	(68.0)	0.500	(12.7)	0.819	(20.8)	1.031	(26.2)	1.165	(29.6)
24	2.756	(70.0)	0.500	(12.7)	0.969	(24.6)	1.358	(34.5)	1.488	(37.8)
28	2.795	(71.0)	0.500	(12.7)	1.063	(27.0)	1.358	(34.5)	1.488	(37.8)
32	2.913	(74.0)	0.598	(15.2)	1.311	(33.3)	1.717	(43.6)	1.882	(47.8)
36	2.913	(74.0)	0.598	(15.2)	1.516	(38.5)	1.717	(43.6)	1.882	(47.8)

L_3 MAX		K_3 MAX		Z_3 MIN		BB_3 MAX		JJ_3 ±.008(0.20)	
IN	MM	IN	MM	IN	MM	IN	MM	IN	MM
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
2.165	(55.0)	0.669	(17.0)	0.303	(7.7)	0.642	(16.3)	0.728	(18.5)
2.283	(58.0)	0.669	(17.0)	0.366	(9.3)	0.669	(17.0)	0.787	(20.0)
-	-	-	-	-	-	-	-	-	-
2.283	(58.0)	0.669	(17.0)	0.417	(10.6)	0.787	(20.0)	0.866	(22.0)
-	-	-	-	-	-	-	-	-	-
2.756	(70.0)	0.709	(18.0)	0.531	(13.5)	0.906	(23.0)	0.984	(25.0)
2.756	(70.0)	0.709	(18.0)	0.531	(13.5)	0.906	(23.0)	0.984	(25.0)
2.756	(70.0)	0.709	(18.0)	0.575	(14.6)	0.965	(24.5)	1.102	(28.0)
2.756	(70.0)	0.709	(18.0)	0.728	(18.5)	1.122	(28.5)	1.260	(32.0)
2.756	(70.0)	0.709	(18.0)	0.819	(20.8)	1.201	(30.5)	1.339	(34.0)
2.756	(70.0)	0.709	(18.0)	0.969	(24.6)	1.358	(34.5)	1.496	(38.0)
2.756	(70.0)	0.709	(18.0)	1.063	(27.0)	1.476	(37.5)	1.614	(41.0)
2.953	(75.0)	0.709	(18.0)	1.311	(33.3)	1.732	(44.0)	1.890	(48.0)
3.346	(85.0)	0.709	(18.0)	1.516	(38.5)	2.008	(51.0)	2.165	(55.0)

CT 6 STYLES

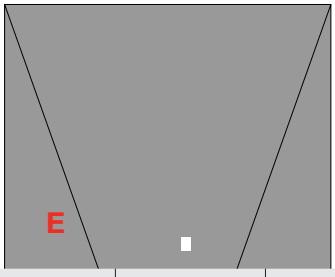


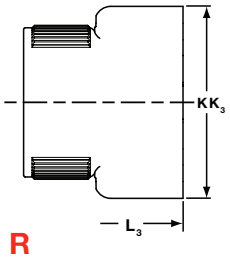


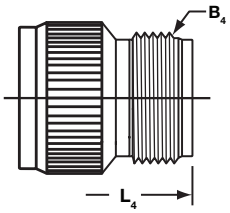
SHELL SIZE	Q MAX	
	IN	MM
8S	0.844	(21.4)
10S	0.969	(24.6)
10SL	0.969	(24.6)
12S	1.062	(27.0)
12	1.062	(27.0)
14S	1.156	(29.4)
14	1.156	(29.4)
16S	1.250	(31.8)
16	1.250	(31.8)
18	1.344	(34.1)
20	1.469	(37.3)
22	1.594	(40.5)
24	1.719	(43.7)
28	1.969	(50.0)
32	2.219	(56.4)
36	2.469	(62.7)

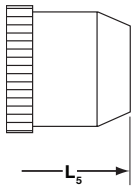
L_1 MAX		B_1 THREAD 2A
IN	MM	
1.145	(29.1)	7/16-28UNEF
1.145	(29.1)	1/2-28UNEF
1.145	(29.1)	9/16-24UNEF
1.145	(29.1)	5/8-24UNEF
1.499	(38.1)	5/8-24UNEF
1.145	(29.1)	3/4-20UNEF
1.499	(38.1)	3/4-20UNEF
1.145	(29.1)	7/8-20UNEF
1.499	(38.1)	7/8-20UNEF
1.499	(38.1)	1-20UNEF
1.499	(38.1)	1-1/8-18UNEF
1.499	(38.1)	1-1/4-18UNEF
1.562	(39.7)	1-3/8-18UNEF
1.562	(39.7)	1-5/8-18UNEF
1.624	(41.3)	1-7/8-16UN
1.624	(41.3)	2-1/8-16UN

CT 4, 6 STYLES





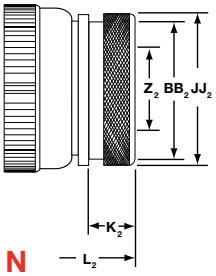


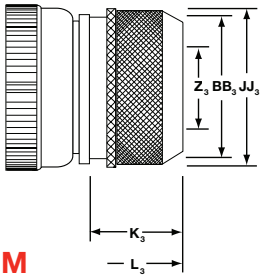


SHELL SIZE	L_2 MAX		XX_2 MAX+		XX_2 MIN+		L_3 MAX		KK_3		L_4 MAX		B_4 THREAD 2A	L_5 MAX	
	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM		IN	MM
8S	2.250	(57.2)	0.235	(6.0)	0.102	(2.6)	1.838	(46.7)	0.890	(22.6)	-	-	-	1.562	(39.7)
10S	2.250	(57.2)	0.235	(6.0)	0.102	(2.6)	1.838	(46.7)	0.890	(22.6)	-	-	-	1.562	(39.7)
10SL	2.250	(57.2)	0.297	(7.5)	0.140	(3.6)	1.838	(46.7)	0.970	(24.6)	1.772	(45.0)	5/8-24UNEF	1.562	(39.7)
12S	2.250	(57.2)	0.297	(7.5)	0.140	(3.6)	1.838	(46.7)	0.970	(24.6)	1.772	(45.0)	5/8-24UNEF	1.562	(39.7)
12	2.625	(66.7)	0.297	(7.5)	0.140	(3.6)	2.181	(55.4)	0.970	(24.6)	2.126	(54.0)	5/8-24UNEF	2.000	(50.8)
14S	2.250	(57.2)	0.422	(10.7)	0.195	(5.0)	1.838	(46.7)	1.150	(29.2)	1.772	(45.0)	3/4-20UNEF	1.562	(39.7)
14	2.625	(66.7)	0.422	(10.7)	0.195	(5.0)	2.181	(55.4)	1.150	(29.2)	-	-	-	2.000	(50.8)
16S	2.250	(57.2)	0.547	(13.9)	0.255	(6.5)	1.838	(46.7)	1.250	(31.8)	1.772	(45.0)	7/8-20UNEF	1.562	(39.7)
16	2.625	(66.7)	0.547	(13.9)	0.255	(6.5)	2.181	(55.4)	1.250	(31.8)	2.126	(54.0)	7/8-20UNEF	2.000	(50.8)
18	2.688	(68.3)	0.610	(15.5)	0.285	(7.2)	2.281	(57.9)	1.450	(36.8)	2.126	(54.0)	1-20UNEF	2.000	(50.8)
20	2.750	(69.9)	0.735	(18.7)	0.350	(8.9)	2.281	(57.9)	1.570	(39.9)	2.165	(55.0)	1-3/16-18UNEF	2.125	(54.0)
22	2.750	(69.9)	0.740	(18.8)	0.350	(8.9)	2.281	(57.9)	1.570	(39.9)	2.283	(58.0)	1-3/16-18UNEF	2.125	(54.0)
24	2.969	(75.4)	0.922	(23.4)	0.468	(11.9)	2.281	(57.9)	1.880	(47.8)	2.323	(59.0)	1-7/16-18UNEF	2.125	(54.0)
28	3.031	(77.0)	0.922	(23.4)	0.468	(11.9)	2.281	(57.9)	1.880	(47.8)	2.362	(60.0)	1-7/16-18UNEF	2.125	(54.0)
32	3.031	(77.0)	1.235	(31.4)	0.664	(16.9)	2.322	(59.0)	2.205	(56.0)	2.441	(62.0)	1-3/4-18NS	2.180	(55.4)
36	3.281	(83.3)	1.360	(34.5)	0.694	(17.6)	2.322	(59.0)	2.400	(61.0)	2.520	(64.0)	2-18NS	2.180	(55.4)

+ without bushings

CT 6 ENDBELL STYLES

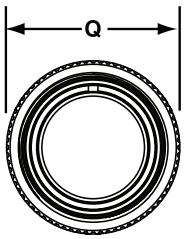


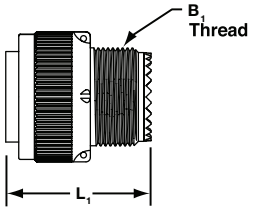


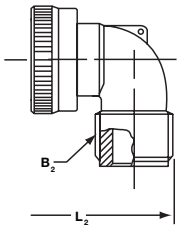
SHELL SIZE	L_2 MAX		K_2 MAX		Z_2 MIN		B_2 MAX		JJ_2 ±.008(0.20)	
	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM
8S	-	-	-	-	-	-	-	-	-	-
10S	-	-	-	-	-	-	-	-	-	-
10SL	2.244	(57.0)	0.461	(11.7)	0.303	(7.7)	0.524	(13.3)	0.610	(15.5)
12S	2.244	(57.0)	0.461	(11.7)	0.311	(7.9)	0.524	(13.3)	0.610	(15.5)
12	-	-	-	-	-	-	-	-	-	-
14S	2.244	(57.0)	0.461	(11.7)	0.417	(10.6)	0.669	(17.0)	0.752	(19.1)
14	-	-	-	-	-	-	-	-	-	-
16S	2.244	(57.0)	0.461	(11.7)	0.531	(13.5)	0.862	(21.9)	0.941	(23.9)
16	2.480	(63.0)	0.453	(11.5)	0.531	(13.5)	0.862	(21.9)	0.941	(23.9)
18	2.559	(65.0)	0.453	(11.5)	0.575	(14.6)	0.862	(21.9)	0.941	(23.9)
20	2.677	(68.0)	0.500	(12.7)	0.736	(18.7)	1.031	(26.2)	1.165	(29.6)
22	2.677	(68.0)	0.500	(12.7)	0.819	(20.8)	1.031	(26.2)	1.165	(29.6)
24	2.756	(70.0)	0.500	(12.7)	0.969	(24.6)	1.358	(34.5)	1.488	(37.8)
28	2.795	(71.0)	0.500	(12.7)	1.063	(27.0)	1.358	(34.5)	1.488	(37.8)
32	2.913	(74.0)	0.598	(15.2)	1.311	(33.3)	1.717	(43.6)	1.882	(47.8)
36	2.913	(74.0)	0.598	(15.2)	1.516	(38.5)	1.717	(43.6)	1.882	(47.8)

L_3 MAX		K_3 MAX		Z_3 MIN		BB_3 MAX		JJ_3 ±.008(0.20)	
IN	MM	IN	MM	IN	MM	IN	MM	IN	MM
-	-	-	-	-	-	-	-	-	-
-	-	-	-	-	-	-	-	-	-
2.165	(55.0)	0.669	(17.0)	0.303	(7.7)	0.642	(16.3)	0.728	(18.5)
2.165	(55.0)	0.669	(17.0)	0.366	(9.3)	0.669	(17.0)	0.787	(20.0)
-	-	-	-	-	-	-	-	-	-
2.165	(55.0)	0.669	(17.0)	0.417	(10.6)	0.787	(20.0)	0.866	(22.0)
-	-	-	-	-	-	-	-	-	-
2.362	(60.0)	0.709	(18.0)	0.531	(13.5)	0.906	(23.0)	0.984	(25.0)
2.756	(70.0)	0.709	(18.0)	0.531	(13.5)	0.906	(23.0)	0.984	(25.0)
2.756	(70.0)	0.709	(18.0)	0.575	(14.6)	0.965	(24.5)	1.102	(28.0)
2.756	(70.0)	0.709	(18.0)	0.728	(18.5)	1.122	(28.5)	1.260	(32.0)
2.756	(70.0)	0.709	(18.0)	0.819	(20.8)	1.201	(30.5)	1.339	(34.0)
2.756	(70.0)	0.709	(18.0)	0.969	(24.6)	1.358	(34.5)	1.496	(38.0)
2.756	(70.0)	0.709	(18.0)	1.063	(27.0)	1.476	(37.5)	1.614	(41.0)
2.756	(70.0)	0.709	(18.0)	1.311	(33.3)	1.732	(44.0)	1.890	(48.0)
3.150	(80.0)	0.709	(18.0)	1.516	(38.5)	2.008	(51.0)	2.165	(55.0)

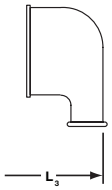
CT 6T STYLES







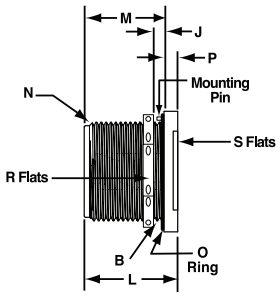
CT6T ENDBELL

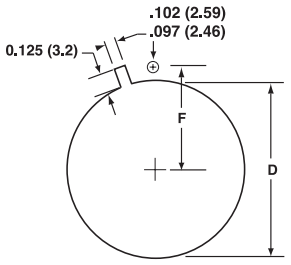


CT6TP

SHELL SIZE	Q MAX		L_1 MAX		B_1	L_2 MAX		B_2 THREAD 2A	L_3 MAX	
	IN	MM	IN	MM		IN	MM		IN	MM
8S	0.844	(21.4)	1.145	(29.1)	7/16-28UNEF	2.156	(54.8)	1/2-28UNEF	-	-
10S	0.969	(24.6)	1.145	(29.1)	1/2-28UNEF	2.156	(54.8)	1/2-28UNEF	-	-
10SL	0.969	(24.6)	1.145	(29.1)	9/16-24UNEF	2.188	(55.6)	5/8-24UNEF	1.463	(37.2)
12S	1.062	(27.0)	1.145	(29.1)	5/8-24UNEF	2.188	(55.6)	5/8-24UNEF	1.600	(40.6)
12	1.062	(27.0)	1.499	(38.1)	5/8-24UNEF	2.531	(64.3)	5/8-24UNEF	1.910	(48.5)
14S	1.156	(29.4)	1.145	(29.1)	3/4-20UNEF	2.312	(58.7)	3/4-20UNEF	1.600	(40.6)
14	1.156	(29.4)	1.499	(38.1)	3/4-20UNEF	2.688	(68.3)	3/4-20UNEF	1.910	(48.5)
16S	1.250	(31.8)	1.145	(29.1)	7/8-20UNEF	2.406	(61.1)	7/8-20UNEF	1.600	(40.6)
16	1.250	(31.8)	1.499	(38.1)	7/8-20UNEF	2.781	(70.6)	7/8-20UNEF	1.910	(48.5)
18	1.344	(34.1)	1.499	(38.1)	1-20UNEF	2.844	(72.2)	1-20UNEF	2.100	(53.3)
20	1.469	(37.3)	1.499	(38.1)	1-1/8-18UNEF	3.250	(82.6)	1-3/16-18UNEF	2.100	(53.3)
22	1.594	(40.5)	1.499	(38.1)	1-1/4-18UNEF	3.250	(82.6)	1-3/16-18UNEF	2.100	(53.3)
24	1.719	(43.7)	1.562	(39.7)	1-3/8-18UNEF	3.719	(94.5)	1-7/16-18UNEF	2.281	(57.9)
28	1.969	(50.0)	1.562	(39.7)	1-5/8-18UNEF	3.719	(94.5)	1-7/16-18UNEF	2.485	(63.1)
32	2.219	(56.4)	1.624	(41.3)	1-7/8-16UN	4.188	(106.4)	1-3/4-18NS	2.485	(63.1)
36	2.469	(62.7)	1.624	(41.3)	2-1/8-16UN	4.297	(109.1)	2-18NS	2.485	(63.1)

CT 7 STYLES

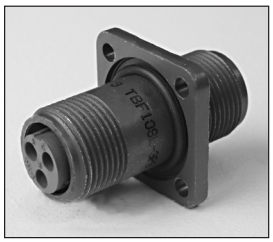


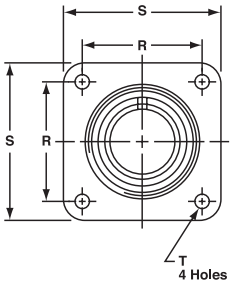


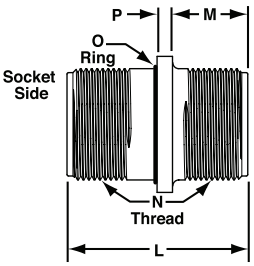
SHELL SIZE	B THREAD 2A	J MIN		J MAX		L MAX	M MAX	N THREAD 2A	P MAX	R MAX	S MAX	D +0.15(0.38) -.000(0.00)	F ± .005(0.13)
8S	1/2-28UNEF	-	-	0.250	(6.4)	1.087 (27.6)	0.853 (21.7)	1/2-28UNEF	0.234 (5.9)	0.820 (20.8)	0.895 (22.7)	0.500 (12.7)	0.323 (8.2)
10S	5/8-24UNEF	-	-	0.250	(6.4)	1.087 (27.6)	0.853 (21.7)	5/8-24UNEF	0.234 (5.9)	0.960 (24.4)	1.015 (25.8)	0.625 (15.9)	0.385 (9.8)
10SL	5/8-24UNEF	-	-	0.250	(6.4)	1.087 (27.6)	0.853 (21.7)	5/8-24UNEF	0.234 (5.9)	0.960 (24.4)	1.015 (25.8)	0.625 (15.9)	0.385 (9.8)
12S	3/4-20UNEF	-	-	0.250	(6.4)	1.087 (27.6)	0.853 (21.7)	3/4-20UNEF	0.234 (5.9)	1.110 (28.2)	1.077 (27.4)	0.750 (19.1)	0.448 (11.4)
12	3/4-20UNEF	-	-	0.375	(9.5)	1.525 (38.7)	1.244 (31.6)	3/4-20UNEF	0.281 (7.1)	1.110 (28.2)	1.077 (27.4)	0.750 (19.1)	0.448 (11.4)
14S	7/8-20UNEF	-	-	0.250	(6.4)	1.087 (27.6)	0.853 (21.7)	7/8-20UNEF	0.234 (5.9)	1.250 (31.8)	1.203 (30.6)	0.875 (22.2)	0.510 (13.0)
14	7/8-20UNEF	-	-	0.375	(9.5)	1.525 (38.7)	1.244 (31.6)	7/8-20UNEF	0.281 (7.1)	1.250 (31.8)	1.203 (30.6)	0.875 (22.2)	0.510 (13.0)
16S	1-20UNEF	-	-	0.250	(6.4)	1.087 (27.6)	0.853 (21.7)	1-20UNEF	0.234 (5.9)	1.460 (37.1)	1.327 (33.7)	1.000 (25.4)	0.573 (14.6)
16	1-20UNEF	-	-	0.375	(9.5)	1.525 (38.7)	1.244 (31.6)	1-20UNEF	0.281 (7.1)	1.460 (37.1)	1.327 (33.7)	1.000 (25.4)	0.573 (14.6)
18	1-1/8-18UNEF	-	-	0.375	(9.5)	1.525 (38.7)	1.244 (31.6)	1-1/8-18UNEF	0.281 (7.1)	1.610 (40.9)	1.453 (36.9)	1.125 (28.6)	0.635 (16.1)
20	1-1/4-18UNEF	-	-	0.375	(9.5)	1.525 (38.7)	1.244 (31.6)	1-1/4-18UNEF	0.281 (7.1)	1.750 (44.5)	1.577 (40.1)	1.250 (31.8)	0.698 (17.7)
22	1/3/8-18UNEF	-	-	0.375	(9.5)	1.525 (38.7)	1.244 (31.6)	1-3/8-18UNEF	0.281 (7.1)	1.900 (48.3)	1.577 (40.1)	1.375 (34.9)	0.760 (19.3)
24	1-1/2-18UNEF	-	-	0.375	(9.5)	1.525 (38.7)	1.244 (31.6)	1-1/2-18UNEF	0.281 (7.1)	2.030 (51.6)	1.927 (48.9)	1.500 (38.1)	0.823 (20.9)
28	1-3/4-18UNEF	-	-	0.375	(9.5)	1.525 (38.7)	1.244 (31.6)	1-3/4-18UNEF	0.281 (7.1)	2.330 (59.2)	1.953 (49.6)	1.750 (44.5)	0.948 (24.1)
32	2-18UNS	-	-	0.375	(9.5)	1.525 (38.7)	1.244 (31.6)	2-18UNS	0.281 (7.1)	2.550 (64.8)	2.203 (56.0)	2.000 (50.8)	1.073 (27.2)
36	2-1/4-16UNS	-	-	0.312	(7.9)	1.525 (38.7)	1.244 (31.6)	2-1/4-16UNS	0.281 (7.1)	2.840 (72.1)	2.577 (65.5)	2.250 (57.2)	1.198 (30.4)

All dimensions in inches (millimeters in parenthesis)

CT 9 STYLES

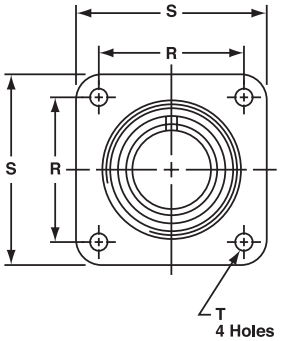


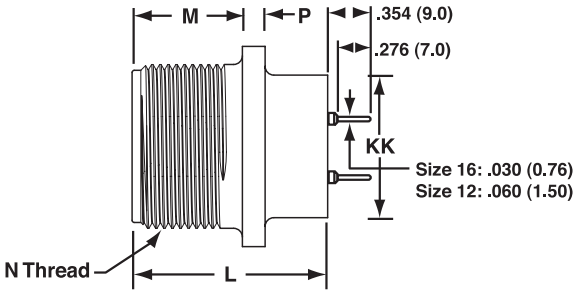




SHELL SIZE	M +.031(0.79) -.000(0.00)		N THREAD 2A	P MAX		R ± .005(0.13)		S ± .031(0.79)		T + .010(0.25) - .005(0.13)		L MAX		PANEL THICKNESS	
	IN	MM		IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM
8S	0.562	(14.3)	1/2-28UNEF	0.125	(3.2)	0.594	(15.1)	0.875	(22.2)	0.120	(3.0)	1.482	(37.6)	0.325	(8.2)
10S	0.562	(14.3)	5/8-24UNEF	0.125	(3.2)	0.719	(18.3)	1.000	(25.4)	0.120	(3.0)	1.482	(37.6)	0.325	(8.2)
10SL	0.562	(14.3)	5/8-24UNEF	0.125	(3.2)	0.719	(18.3)	1.000	(25.4)	0.120	(3.0)	1.482	(37.6)	0.325	(8.2)
12S	0.562	(14.3)	3/4-20UNEF	0.140	(3.6)	0.812	(20.6)	1.094	(27.8)	0.120	(3.0)	1.482	(37.6)	0.325	(8.2)
12	0.750	(19.1)	3/4-20UNEF	0.146	(3.7)	0.812	(20.6)	1.094	(27.8)	0.120	(3.0)	2.030	(51.6)	0.445	(11.3)
14S	0.562	(14.3)	7/8-20UNEF	0.140	(3.6)	0.906	(23.0)	1.188	(30.2)	0.120	(3.0)	1.482	(37.6)	0.325	(8.2)
14	0.750	(19.1)	7/8-20UNEF	0.146	(3.7)	0.906	(23.0)	1.188	(30.2)	0.120	(3.0)	2.030	(51.6)	0.445	(11.3)
16S	0.562	(14.3)	1-20UNEF	0.140	(3.6)	0.969	(24.6)	1.281	(32.5)	0.120	(3.0)	1.482	(37.6)	0.325	(8.2)
16	0.750	(19.1)	1-20UNEF	0.146	(3.7)	0.969	(24.6)	1.281	(32.5)	0.120	(3.0)	2.030	(51.6)	0.445	(11.3)
18	0.750	(19.1)	1-1/8-18UNEF	0.180	(4.6)	1.062	(27.0)	1.375	(34.9)	0.120	(3.0)	2.030	(51.6)	0.445	(11.3)
20	0.750	(19.1)	1-1/4-18UNEF	0.180	(4.6)	1.156	(29.4)	1.500	(38.1)	0.120	(3.0)	2.030	(51.6)	0.445	(11.3)
22	0.750	(19.1)	1/3/8-18UNEF	0.180	(4.6)	1.250	(31.8)	1.625	(41.3)	0.120	(3.0)	2.030	(51.6)	0.445	(11.3)
24	0.812	(20.6)	1-1/2-18UNEF	0.203	(5.2)	1.375	(34.9)	1.750	(44.5)	0.147	(3.7)	2.030	(51.6)	0.445	(11.3)
28	0.812	(20.6)	1-3/4-18UNEF	0.203	(5.2)	1.562	(39.7)	2.000	(50.8)	0.147	(3.7)	2.030	(51.6)	0.325	(8.2)
32	0.875	(22.2)	2-18UNS	0.203	(5.2)	1.750	(44.5)	2.250	(57.2)	0.173	(4.4)	2.030	(51.6)	0.320	(8.1)
36	0.875	(22.2)	2-1/4-16UNS	0.203	(5.2)	1.938	(49.2)	2.500	(63.5)	0.173	(4.4)	2.030	(51.6)	0.325	(8.2)

CT PC PIN STYLES

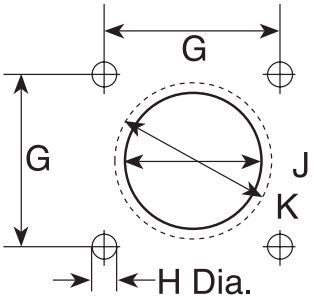




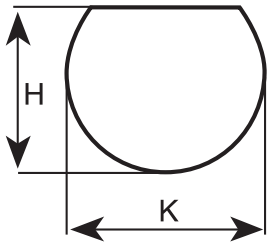
SHELL SIZE	M +.031(0.79) -.000(0.00)		N THREAD 2A	P MAX		R ± .005(0.13)		S ± .031(0.79)		T + .010(0.25) - .005(0.13)		L MAX		KK MAX	
	IN	MM		IN	MM	IN	MM	IN	MM	IN	MM	IN	MM	IN	MM
8S	0.562	(14.3)	1/2-28UNEF	0.125	(3.2)	0.594	(15.1)	0.875	(22.2)	0.120	(3.0)	1.040	(26.4)	0.426	(10.8)
10S	0.562	(14.3)	5/8-24UNEF	0.125	(3.2)	0.719	(18.3)	1.000	(25.4)	0.120	(3.0)	1.040	(26.4)	0.520	(13.2)
10SL	0.562	(14.3)	5/8-24UNEF	0.125	(3.2)	0.719	(18.3)	1.000	(25.4)	0.120	(3.0)	1.040	(26.4)	0.614	(15.6)
12S	0.562	(14.3)	3/4-20UNEF	0.140	(3.6)	0.812	(20.6)	1.094	(27.8)	0.120	(3.0)	1.040	(26.4)	0.614	(15.6)
12	0.750	(19.1)	3/4-20UNEF	0.146	(3.7)	0.812	(20.6)	1.094	(27.8)	0.120	(3.0)	1.400	(35.6)	0.614	(15.6)
14S	0.562	(14.3)	7/8-20UNEF	0.140	(3.6)	0.906	(23.0)	1.188	(30.2)	0.120	(3.0)	1.040	(26.4)	0.739	(18.8)
14	0.750	(19.1)	7/8-20UNEF	0.146	(3.7)	0.906	(23.0)	1.188	(30.2)	0.120	(3.0)	1.400	(35.6)	0.739	(18.8)
16S	0.562	(14.3)	1-20UNEF	0.140	(3.6)	0.969	(24.6)	1.281	(32.5)	0.120	(3.0)	1.040	(26.4)	0.864	(21.9)
16	0.750	(19.1)	1-20UNEF	0.146	(3.7)	0.969	(24.6)	1.281	(32.5)	0.120	(3.0)	1.400	(35.6)	0.864	(21.9)
18	0.750	(19.1)	1-1/8-18UNEF	0.180	(4.6)	1.062	(27.0)	1.375	(34.9)	0.120	(3.0)	1.400	(35.6)	0.989	(25.1)
20	0.750	(19.1)	1-1/4-18UNEF	0.180	(4.6)	1.156	(29.4)	1.500	(38.1)	0.120	(3.0)	1.400	(35.6)	1.145	(29.1)
22	0.750	(19.1)	1/3/8-18UNEF	0.180	(4.6)	1.250	(31.8)	1.625	(41.3)	0.120	(3.0)	1.400	(35.6)	1.270	(32.3)
24	0.812	(20.6)	1-1/2-18UNEF	0.203	(5.2)	1.375	(34.9)	1.750	(44.5)	0.147	(3.7)	1.400	(35.6)	1.395	(35.4)
28	0.812	(20.6)	1-3/4-18UNEF	0.203	(5.2)	1.562	(39.7)	2.000	(50.8)	0.147	(3.7)	1.400	(35.6)	1.614	(41.0)
32	0.875	(22.2)	2-18UNS	0.203	(5.2)	1.750	(44.5)	2.250	(57.2)	0.173	(4.4)	1.400	(35.6)	1.964	(49.9)
36	0.875	(22.2)	2-1/4-16UNS	0.203	(5.2)	1.938	(49.2)	2.500	(63.5)	0.173	(4.4)	1.400	(35.6)	2.051	(52.1)

Note: Please contact us for centerline spacing of individual layouts.

PANEL CUTOUTS



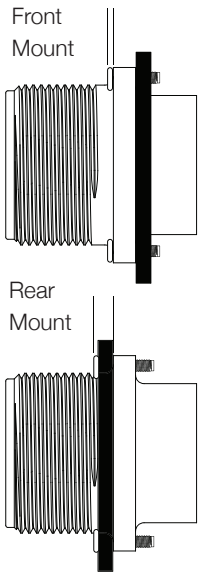
Dim. J=flange in front of panel
Dim. K=flange at rear of panel
⇨ See sealing screws on page 195



Note: for CB7 Panel cutouts
⇨ See page 137

SHELL SIZE	FLANGE MOUNT				STYLE CT7 REAR MOUNT	
	STYLE 0-2-9 HOLE DIAMETER		STYLE 0-2-9 FRONT MOUNT	STYLE 0-2-9 REAR MOUNT		
	G	H	J	K	H	K
8S	-	-	-	-	-	-
10SL/10S	0.717 (18.2)	0.134 (3.4)	0.646 (16.4)	0.728 (18.5)	0.823 (21)	0.894 (22.7)
12S/12	0.811 (20.6)	0.134 (3.4)	0.646 (16.4)	0.854 (21.7)	0.949 (24)	1.012 (25.7)
14S/14	0.906 (23.0)	0.134 (3.4)	0.776 (19.7)	0.980 (24.9)	1.071 (27)	1.134 (28.8)
16S	0.969 (24.6)	0.134 (3.4)	0.902 (22.9)	1.091 (27.7)	1.197 (30)	1.260 (32.0)
16	0.969 (24.6)	0.134 (3.4)	0.902 (22.9)	1.091 (27.7)	1.197 (30)	1.260 (32.0)
18	1.063 (27.0)	0.134 (3.4)	1.028 (26.1)	1.224 (31.1)	1.323 (34)	1.382 (35.1)
20	1.157 (29.4)	0.134 (3.4)	1.161 (29.5)	1.358 (34.5)	1.449 (37)	1.504 (38.2)
22	1.252 (31.8)	0.134 (3.4)	1.287 (32.7)	1.488 (37.8)	1.571 (40)	1.654 (42.0)
24	1.374 (34.9)	0.154 (3.9)	1.417 (36.0)	1.626 (41.3)	1.697 (43)	1.760 (44.7)
28	1.563 (39.7)	0.154 (3.9)	1.654 (42.0)	1.854 (47.1)	1.937 (49)	2.012 (51.1)
32	1.752 (44.5)	0.177 (4.5)	1.902 (48.3)	2.118 (53.8)	2.193 (56)	2.260 (57.4)
36	1.937 (49.2)	0.177 (4.5)	2.150 (54.6)	2.362 (60.0)	2.441 (62)	2.512 (63.8)

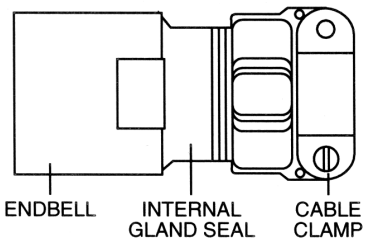
PANEL THICKNESS



SHELL SIZE	FRONT MOUNT	REAR MOUNT
8S	.187 (4.75)	.125 (3.18)
10S	.187 (4.75)	.125 (3.18)
10SL	.187 (4.75)	.125 (3.18)
12S	.187 (4.75)	.125 (3.18)
12	.125 (3.18)	.125 (3.18)
14S	.187 (4.75)	.125 (3.18)
14	.125 (3.18)	.125 (3.18)
16S	.187 (4.75)	.125 (3.18)
16	.125 (3.18)	.125 (3.18)
18	.125 (3.18)	.125 (3.18)
20	.125 (3.18)	.125 (3.18)
22	.125 (3.18)	.125 (3.18)
24	.187 (4.75)	.125 (3.18)
28	.187 (4.75)	.125 (3.18)
32	.250 (6.35)	.125 (3.18)
36	.250 (6.35)	.125 (3.18)

All dimensions in inches (millimeters in parenthesis)

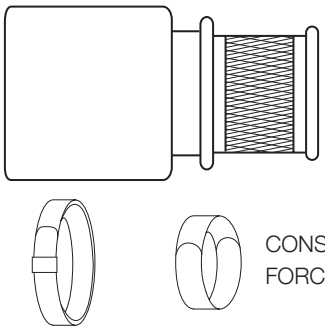
STYLE J



A high-reliability gland-seal endbell with an integrated compression disc that provides a watertight seal around the outside of a round, jacketed cable. Supplied with cable clamp. Wire sealing range is as follows:

SHELL SIZE	WIRE DIAMETER INCHES (MM)	
	MAX	MIN
10SL	.31 (8.0)	.13 (3.3)
14S	.44 (11.2)	.21 (5.3)
16S	.53 (13.5)	.32 (8.1)
16	.53 (13.5)	.32 (8.1)
18	.63 (15.9)	.43 (10.9)
20	.75 (19.1)	.49 (11.9)
22	.75 (19.1)	.49 (11.9)
24	.94 (23.9)	.67 (17.0)
28	.94 (23.9)	.67 (17.0)
32	1.25 (31.8)	.96 (24.4)
36	1.37 (34.9)	1.07 (27.4)

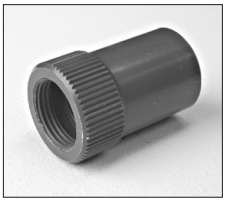
STYLE U (POTTED PREFERRED)
STYLE D (GROMMET & FERRULE, CONTACT US)

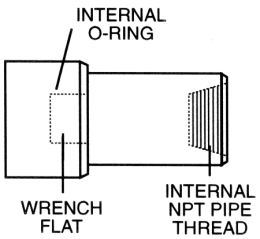


ZT93-03-003-1
EMI SHIELD TAPE

This endbell is for use with unshielded, braid-shield or cable to terminate and extend the shield through the connector. There are three basic ways to terminate the U and D style endbell. One version uses a metal, constant force spring to captivate the shield and can be reused/reworked if the connector needs to be serviced. The second version uses a stainless steel strap to lock the shield to the endbell. The third version is to use our conductive cloth EMI shield tape to easily tape the endbell to the shield. Heat shrink boots are used to environmentally seal the endbell and provide a smooth, finished appearance. ⇨ See pages 196-201 for boot

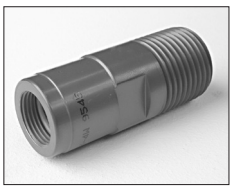
STYLE I

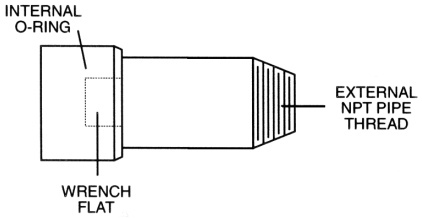




This endbell is internally threaded to accept externally threaded NPT pipe threads. A broad range of standard NPT thread sizes can be accommodated. Contact us for ordering information.

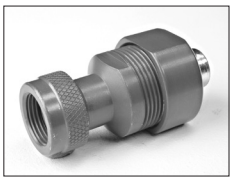
STYLE X

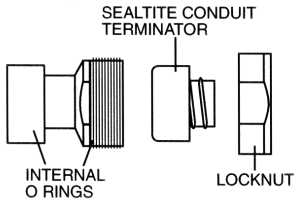




This endbell is externally threaded to accept internally threaded NPT pipe threads. A broad range of standard NPT thread sizes can be accommodated. Contact us for ordering information.

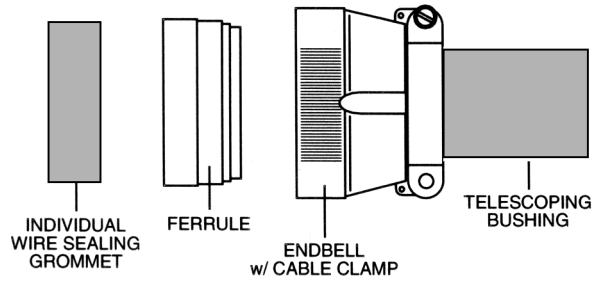
STYLE ST





These endbells directly accept Sealtite conduit. A locknut and O-ring insures a watertight connection. Normally supplied straight, right angle and 45° versions are also available. A broad range of Sealtite tubing diameters can be accommodated. Contact us for ordering information.

STYLE E

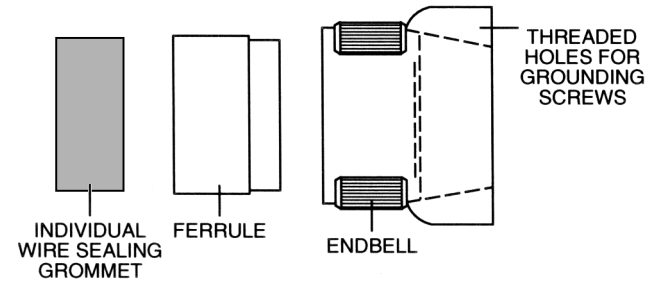


Supplied standard for CB only.

This endbell has an integrated cable clamp. Supplied with individual wire-sealing grommet and ferrule. A telescoping neoprene bushing is captivated by the clamp. If desired, these bushings can be stacked to provide the optimum inside diameter for your cable.

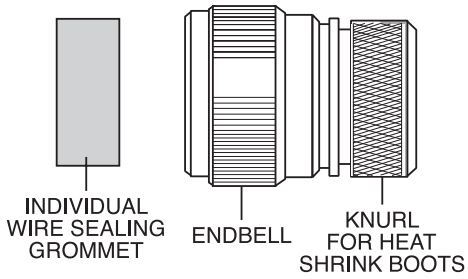
⇨ See page 150 or contact us for ordering information

STYLE R



This endbell does not have a cable clamp. Supplied with individual wire sealing grommet and ferrule. Rear section has two threaded holes to accommodate grounding screws or dust cap chains.

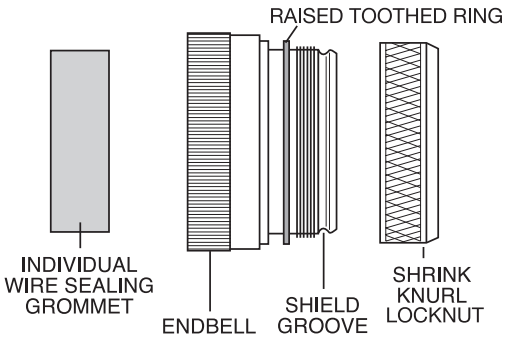
STYLE N



This endbell is designed for use with shrink boots or shrink tubing. A knurled rear section with ledge provides an excellent surface for the tubing to grab the metal endbell. Supplied with individual wire sealing grommet; ferrule not required.

⇨ See Heat Shrink Boots on pages 196-201

STYLE M



For use with braid-shielded cable to terminate and extend the shield through the connector. Typically used with a shrink boot. Supplied with individual wire sealing grommet; ferrule not required

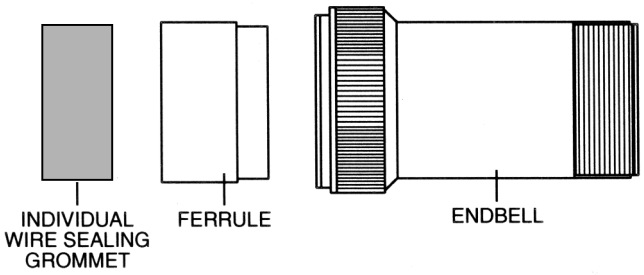
⇨ See Heat Shrink Boots on pages 196-201

ASSEMBLY OF SHIELDED ENDBELL (USING OPTIONAL SHRINK BOOT)

1. Remove the locknut and slide shrink boot and locknut over cable in proper sequence for re-assembly.
2. Slide screen meshing on cable over the endbell so that it covers the rounded groove and locknut threads.
3. Fasten the screen into the rounded groove with baling wire.
4. Fold back the protruding screen over the baling wire.
5. Slide the locknut over the folded back screen so that the meshing is clamped under the nut and appears under the locknut facing the cable.
6. Tighten locknut.
7. Slide shrink boot over knurled locknut and raised, toothed ring.
8. Shrink in place over the endbell first, then continue down the cable.

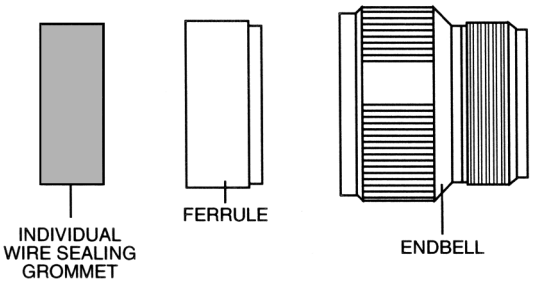
ENDBELLS

STYLE L



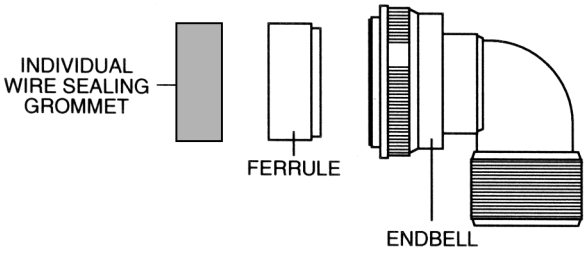
Long-extension endbell that allows additional room for wiring. Accepts Style A or C cable clamps.
➪ See pages 143-144 for cable clamp

STYLE F



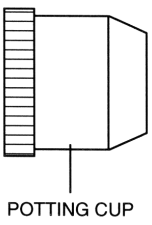
Standard endbell for use with Style A or C cable clamps. Supplied with individual wire sealing grommet and ferrule. This endbell can also be used with appropriately sized plastic flex tubing which is press-fit over the rear threads. ➪ See pages 143-144 for cable clamp

STYLE T



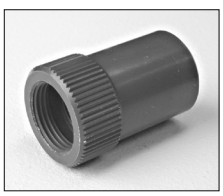
Right angle endbell supplied with individual wire sealing grommet and ferrule. Accepts Style A or C cable clamp. The internal teeth of the endbell mate with external teeth on the rear of the connector to allow the angled endbell to be locked into a specific orientation.
➪ See pages 143-144 for cable clamp

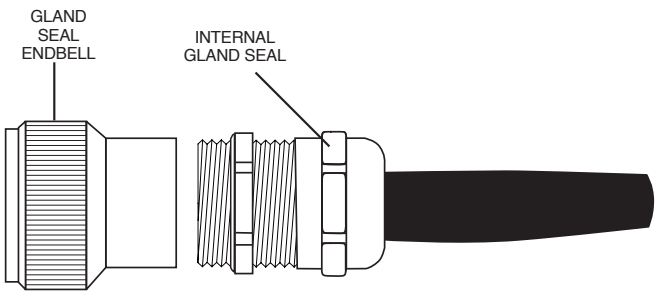
STYLE P



Potting cup endbell sealed with epoxy. After wire termination, the inside of the cup is filled with potting compound forming a solid, permanent, watertight seal around the wires.
➪ See pages 200 for potting compound and applicator

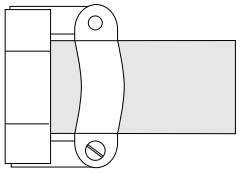
STYLE PG





Lower-cost, metal, gland-seal endbell comes in a variety of wire sealing ranges. contact us with your cable outside diameter for appropriate part number.
➪ See pages 206-207

MS3057-A CABLE CLAMP

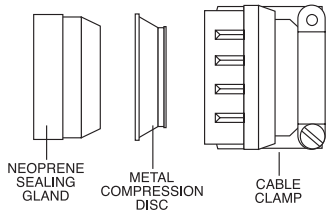


Standard MS3057 cable clamps have a dual clamping action to provide a balanced, positive hold on the wires and greatly reduce moisture transmission. This cable clamp accepts MS3420 bushings. MS3420 bushings can be nested to reduce the inside diameter to more closely match the diameter of the cable or wire bundle.

		STANDARD CLAMP				STANDARD CLAMP AND TELESCOPIC BUSHING		
SHELL SIZE	THREAD 2B	LOW COST CAST ZINC	ALUMINUM W/ BRASS SCREWS	ALUMINUM W/ STAINLESS STEEL SCREWS	MAXIMUM CABLE DIAMETER INCH (MM)	LOW COST ZINC WITH BUSHING	INCLUDES THIS BUSHING	BUSHING ID
8S/ 10S	1/2-28UNEF	97-3057-1003*	MS3057-3A	M85049/41-3A	.220 (5.58)	97-3057-1003*-1	MS3420-3	0.130 (3.3)
10SL	5/8-24UNEF	97-3057-1004*	MS3057-4A	M85049/41-4A	.312 (7.92)	97-3057-1004*-1	MS3420-4	0.220 (5.6)
12/12S/12SL	5/8-24UNEF	97-3057-1004*	MS3057-4A	M85049/41-4A	.312 (7.92)	97-3057-1004*-1	MS3420-4	0.220 (5.6)
14/14S	3/4-20UNEF	97-3057-1007*	MS3057-6A	M85049/41-6A	.438 (11.13)	97-3057-1007*-1	MS3420-6	0.312 (7.9)
16/16S	7/8-20UNEF	97-3057-1008*	MS3057-8A	M85049/41-8A	.562 (14.27)	97-3057-1008*-1	MS3420-8	0.437 (11.1)
18	1-20UNEF	97-3057-1010*	MS3057-10A	M85049/41-10A	.625 (15.88)	97-3057-1010*-1	MS3420-10	0.562 (14.3)
20/22	1 3/16-18UNEF	97-3057-1012*	MS3057-12A	M85049/41-12A	.750 (19.05)	97-3057-1012*-1	MS3420-12	0.625 (15.9)
24/28	1 7/16-18UNEF	97-3057-1016*	MS3057-16A	M85049/41-16A	.938 (23.83)	97-3057-1016*-1	MS3420-16, -12	0.625 (15.9)
32	1 3/4-18UNS	97-3057-1020*	MS3057-20A	M85049/41-20A	1.250 (31.75)	97-3057-1020*-1	MS3420-20, -16	0.750 (19.1)
36	2-18UNS	97-3057-1024*	MS3057-24A	M85049/41-24A	1.375 (34.92)	97-3057-1024*-1	MS3420-24, -20	0.937 (23.8)
40	2 1/4UNS-16	-	MS3057-28A	M85049/41-28A	1.625 (41.28)	-	-	-

*Default plating - Olive drab chromate over cadmium
-621 = Black Alloy (RoHS)
-640 = Conductive Black Alloy (RoHS)

MS3057-C WATERPROOF CABLE CLAMP

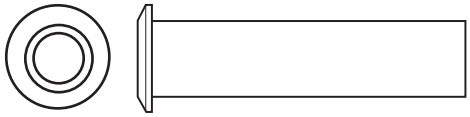


Standard MS3057-C waterproof cable clamp with mechanical strain relief for use with style F, L and T endbells. Internal neoprene gland and compression ring will seal a broad range of round cable diameters as listed below. For reduction of cable diameters, order the appropriate MS3420A bushing in table.

SHELL SIZE	PART NUMBER	WIRE DIAMETER		OPTIONAL BUSHINGS	
		MAX.	MIN.	PART NUMBER	MAX. WIRE DIA.
10SL/12S	MS3057-4C	.312 (7.93)	.188 (4.80)	MS3420-4A	.219 (5.56)
14S	MS3057-6C	.438 (11.12)	.281 (7.10)	MS3420-6A MS3420-4A	.312 (7.93) .219 (5.56)
16/16S	MS3057-8C	.530 (13.48)	.312 (.90)	MS3420-8A MS3420-6A	.438 (11.10) .312 (7.93)
18	MS3057-10C	.625 (15.87)	.375 (9.50)	MS3420-10A MS3420-6A	.438 (11.10) .312 (7.93)
20/22	MS3057-12C	.750 (19.00)	.500 (12.70)	MS3420-12A MS3420-8A	.540 (13.74) .438 (11.10)
24/28	MS3057-16C	.940 (23.8)	.625 (15.90)	MS3420-16A MS3420-12A MS3420-8A	.750 (19.00) .540 (13.74) .438 (11.10)
32	MS3057-20C	1.25 (31.75)	.921 (23.4)	MS3420-20A MS3420-16A MS3420-12A	.938 (23.80) .750 (19.00) .540 (13.74)
36	MS3057-24C	1.38 (35.00)	1.00 (25.40)	MS3420-24A MS3420-18A MS3420-16A	1.12 (28.5) .938 (23.80) .750 (19.00)
40	MS3057-28C	1.62 (41.25)	1.25 (31.80)	MS3420-28A MS3420-20A MS3420-16A	1.25 (31.75) .940 (23.80) .750 (19.00)

All dimensions in inches (millimeters in parenthesis)

MS3420 TELESCOPING BUSHINGS



For use with style A cable clamps and CB/CT style E/F endbells to eliminate dust, dirt and oil from entering the cable clamp. Bushings can be nested, one inside the other, to reduce the inside diameter and form a better seal against the cable jacket. Each bushing will accept the next smallest bushing.

SHELL SIZE	1ST BUSHING PART NUMBER	INSIDE DIAMETER	2ND NESTED BUSHING	INSIDE DIAMETER	FITS IN CABLE CLAMP
10SL	MS3420-4	.220 (5.59)	NONE	-	MS3057-4A
12S	MS3420-4	.220 (5.59)	NONE	-	MS3057-4A
14S	MS3420-6	.312 (7.92)	NONE	-	MS3057-6A
16S	MS3420-8	.437 (11.10)	NONE	-	MS3057-8A
16	MS3420-8	.437 (11.10)	NONE	-	MS3057-8A
18	MS3420-10	.562 (14.30)	NONE	-	MS3057-10A
20	MS3420-12	.625 (15.90)	NONE	-	MS3057-12A
22	MS3420-12	.625 (15.90)	NONE	-	MS3057-12A
24	MS3420-16	.750 (19.05)	MS3420-12	.625 (15.90)	MS3057-16A
28	MS3420-16	.750 (19.05)	MS3420-12	.625 (15.90)	MS3057-16A
32	MS3420-20	.937 (23.80)	MS3420-16	.750 (19.05)	MS3057-20A
36	MS3420-24	1.250 (31.75)	MS3420-20	.937 (23.80)	MS3057-24A
40	MS3420-28	1.375 (34.92)	MS3420-24	1.250 (31.75)	SE96-28A4

MS3420-A REDUCTION BUSHINGS

For use with MS3057-C cable clamps (Style C) to reduce the wire sealing diameter. Bushings can be nested, one inside the other, to progressively reduce the inside diameter of the cable clamp. The column labeled Optional Bushings shows the acceptable nesting options for each clamp.

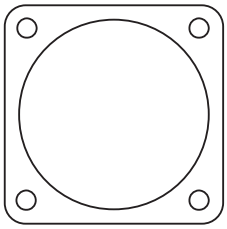
9767 CABLE CLAMPS

9767 waterproof cable clamp with mechanical strain relief. An internal, neoprene gland-seal bushing and compression washer will seal a broad range of round cable diameters as listed below.

SHELL SIZE	CABLE CLAMP PART NUMBER	MAX. CABLE OD		MIN. CABLE OD		THREAD 2B
		INCHES	(MM)	INCHES	(MM)	
10SL, 12S	9767-12-4*	0.219	(5.55)	0.020	(0.51)	5/8-24 UNEF
14S	9767-14-4*	0.219	(5.55)	0.020	(0.51)	3/4-20 UNEF
14S	9767-14-6*	0.344	(8.73)	0.176	(4.47)	3/4-20 UNEF
16S, 16	9767-16-4*	0.219	(5.55)	0.020	(0.51)	7/8-20 UNEF
16S, 16	9767-16-6*	0.344	(8.73)	0.176	(4.47)	7/8-20 UNEF
16S, 16	9767-16-8*	0.438	(11.12)	0.177	(4.50)	7/8-20 UNEF
18	9767-18-6*	0.344	(8.73)	0.176	(4.47)	1-20 UNEF
18	9767-18-8*	0.438	(11.12)	0.177	(4.50)	1-20 UNEF
18	9767-18-10*	0.563	(14.29)	0.292	(7.42)	1-20 UNEF
20, 22	9767-22-8*	0.438	(11.12)	0.177	(4.50)	1-3/16-18 UNEF
20, 22	9767-22-10*	0.563	(14.29)	0.292	(7.42)	1-3/16-18 UNEF
20, 22	9767-22-12*	0.688	(17.46)	0.370	(9.40)	1-3/16-18 UNEF
24, 28	9767-28-10*	0.563	(14.29)	0.292	(7.42)	1-7/16-18 UNEF
24, 28	9767-28-12*	0.688	(17.46)	0.370	(9.40)	1-7/16-18 UNEF
24, 28	9767-28-16*	0.844	(21.43)	0.536	(13.61)	1-7/16-18 UNEF
32	9767-32-20*	1.031	(26.19)	0.590	(14.99)	1-3/4-18 UNS
36	9767-36-16*	0.844	(21.43)	0.536	(13.61)	2-18 UNS

*Default plating - Olive drab chromate over cadmium -621=Black Alloy (RoHS) -640=Conductive Black Alloy (RoHS)
All dimensions in inches (millimeters in parenthesis)

GASKETS

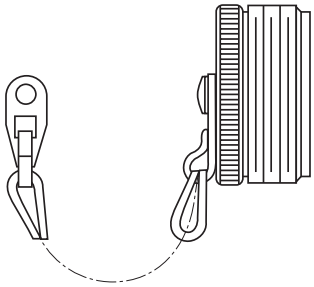


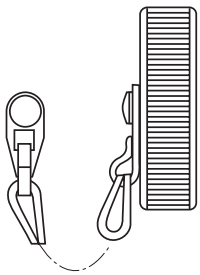
POLYCHLOROPRENE gaskets are used to ensure a moisture-tight seal between a receptacle and the panel. Gaskets are available for front or rear panel mounting of STYLE 0, 2 and 9 connectors. Gasket thickness is approximately .037" (1.0 mm).

ALU-FLEX gaskets contain an imbedded metal screen for EMI/RFI shielding in addition to moisture sealing. Gaskets are available for front or rear panel mounting of STYLE 0, 2 and 9 connectors. Gasket thickness is .019" (.5 mm).

SHELL SIZE	FRONT MOUNTING		REAR MOUNTING	
	NON-CONDUCTIVE	CONDUCTIVE	NON-CONDUCTIVE	CONDUCTIVE
10S, 10SL	MS52000-2	075-8512-001	075-8501-000	075-8501-001
12S, 12	MS52000-3	075-8513-001	075-8502-000	075-8502-001
14S, 14	MS52000-4	075-8514-001	075-8503-000	075-8503-001
16S	MS52000-5	075-8515-001	075-8504-000	075-8504-001
16	MS52000-5	075-8515-001	075-8504-000	075-8504-001
18	MS52000-6	075-8516-001	075-8505-000	075-8505-001
20	MS52000-7	075-8517-001	075-8506-000	075-8506-001
22	MS52000-8	075-8518-001	075-8507-000	075-8507-001
24	MS52000-9	075-8519-001	075-8508-000	075-8508-001
28	MS52000-10	075-8520-001	075-8509-000	075-8509-001
32	MS52000-12	075-8521-001	075-8510-000	075-8510-001
36	MS52000-13	075-8522-001	075-8511-000	075-8511-001

METAL DUST CAPS WITH SASH CHAIN





SHELL SIZE	FOR PLUG STYLES 4 & 6	FOR RECEPTACLE STYLES 0, 1, 2, 7, & 9
10SL	MS25042-10D*	MS25043-10D*
12S	MS25042-12D*	MS25043-12D*
14S	MS25042-14D*	MS25043-14D*
16S	MS25042-16D*	MS25043-16D*
16	MS25042-16D*	MS25043-16D*
18	MS25042-18D*	MS25043-18D*
20	MS25042-20D*	MS25043-20D*
22	MS25042-22D*	MS25043-22D*
24	MS25042-24D*	MS25043-24D*
28	MS25042-28D*	MS25043-28D*
32	MS25042-32D*	MS25043-32D*
36	MS25042-36D*	MS25043-36D*

* Select plating code A = Anodized Omit for chromate over cadmium

DUMMY RECEPTACLES

Dummy Receptacles are for front or rear panel mounting. CT/MS series have threaded ramps; the center of the connector is closed. Dummy receptacles mount on the same centers and have the same outside dimensions as a STYLE 2 receptacle. The material is aluminum alloy and has an olive chromate over cadmium plating. A version with a clearance hole through the middle of the connector is also available. Contact us for ordering information.

SHELL SIZE	CT/MS
10SL	MS3105-10S
12S/12	MS3105-12S
14S/14	MS3105-14S
16S	MS3105-16S
16	MS3105-16
18	MS3105-18
20	MS3105-20
22	MS3105-22
24	MS3105-24
28	MS3105-28
32	MS3105-32
36	MS3105-36

⇨ See Accessories section for sealing screws on page 195

1. SOLDER CONTACTS

STEP 1: Slide the rear accessories over the wire bundle in the proper sequence for reassembly: cable clamp and/or endbell first, then ferrule and (if used) coupling nut.

STEP 2: Insert individual wires through the proper holes in the grommet. Use isopropyl alcohol as a lubricant.

STEP 3: Solder wires to appropriate contacts on the rear of the connector. ITT Cannon document RPI234 covers standard soldering practices and is available upon request by fax or mail, please contact us.

STEP 4: Fixture the connector for reassembly using endbell assembly tools.

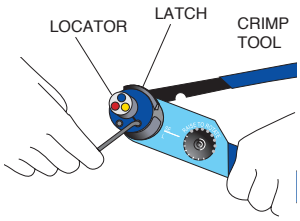
STEP 5: Slide the grommet down the wires (lubricating the grommet with isopropyl alcohol will help).

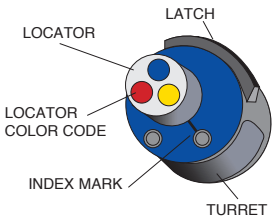
STEP 6: Fill all unused grommet cavities with a wire hole filler to maintain the sealing integrity of the connector.

STEP 7: Slide coupling nut, ferrule and endbell accessories over rear of the connector and tighten.

2. CRIMP TOOL OPERATION

NOTE: Hand crimp tools can be used with size 16S, 16 and 12 contacts. Size 8, 4 and 0 contacts require the use of air powered crimp tools. Contact us for assistance in the use of these tools.



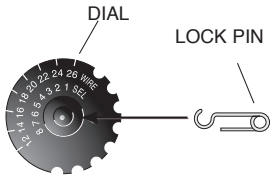


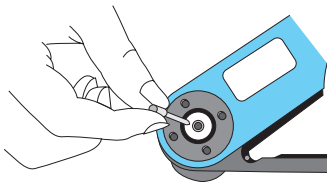
STEP1: Strip the wires to the appropriate length.

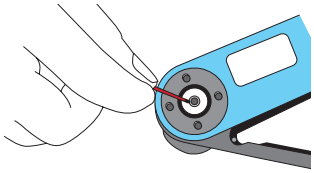
STEP 2: Open the AF8 crimp tool by squeezing the handles. Push the latch on the turret to pop up the locator. Attach the turret to the crimp tool using the two captive hex bolts in the turret.

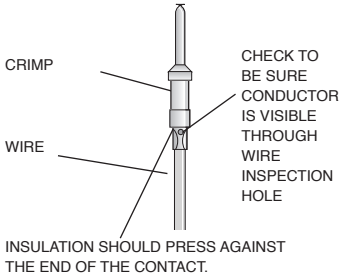
STEP 3: Select the proper locator position for your contact by rotating the locator until the proper color is aligned with the index mark. Push locator back down until it snaps into position.

TH70-1		
CONTACT SIZE	PIN LOCATOR COLOR	SOCKET LOCATOR COLOR
16S	BLUE	RED
16	RED	GREEN









STEP 4: Adjust dial for proper wire gauge. To change the dial setting, remove the lock pin and lift center of dial. Turn to the desired wire gauge. Replace lock pin on dial.

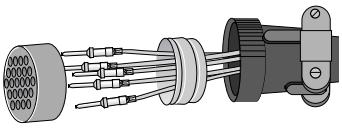
STEP 5: Cycle the tool before inserting the contact to be sure the tool is in the open position. Drop the contact, mating end first, into the crimp cavity of the tool. Squeeze the tool handle just enough to grip the contact without actually crimping it.

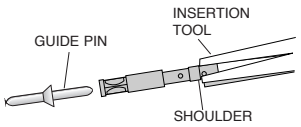
STEP 6: Insert the stripped wire into the contact with a slight twisting motion. Be sure all wire strands are inside the contact. Squeeze the handle to cycle the tool. The handle will not release until the contact is completely crimped.

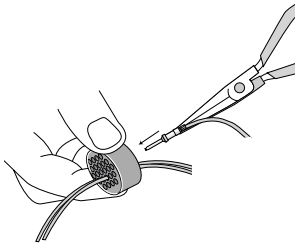
STEP 7: Remove the crimped contact. Pull on the wire slightly to be sure it is properly crimped. Be sure the contact is not bent or damaged in any way. Visually inspect the crimp.

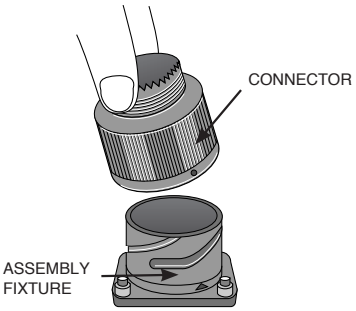
MICRO SECTIONS:
Enlargement of microsection allows for final judgement of crimp quality. This test is recommended whenever new tools or new types of wire or contacts are used.

3. INSERTION OF CONTACTS







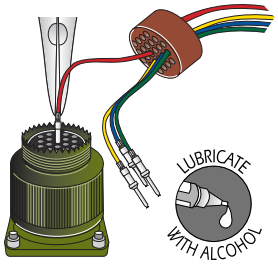


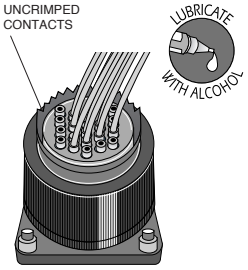
STEP 1: Slide the rear accessories over the wire bundle in the proper sequence for reassembly: cable clamp and/or endbell first, then ferrule and (if used) coupling nut.

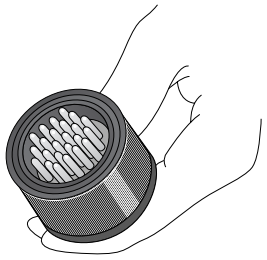
STEP 2: Use the proper insertion tool. Place the contact in the tool. The tool should press against the shoulder of the contact. Contact sizes 16S, 16 and 12 use a pliers style tool. Contact sizes 8, 4 and 0 use a tool with a 'C' shaped shaft.

STEP 3: Lubricate the grommet with isopropyl alcohol (do not use any lubricant other than isopropyl alcohol). Insert the contact through the appropriate cavity in the grommet. Sizes 16S, 16 and 12 SOCKET contacts must be installed using guide pins.

STEP 4: Place the connector into an assembly fixture (fixtures are available for production use, contact us). If you are not using a fixture, allow clearance on the mating face of the connector for the guide pins to come through during insertion. NOTE: CB assembly fixture shown.





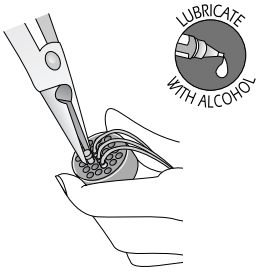


STEP 5: Lubricate the contact cavities of the connector insulator with isopropyl alcohol (do not use any other type of lubricant).

STEP 6: Using guide pins where necessary, push straight down with firm even pressure until the contact snaps into position in the proper cavity. Start at the center of the pattern and work toward the outer edges.

STEP 7: Fill any unused cavities with contacts.

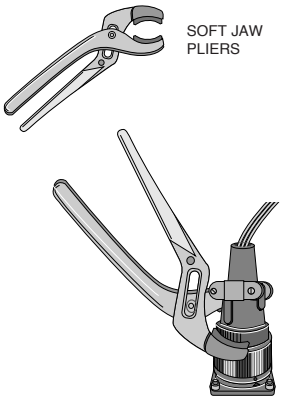
STEP 8: Check the mating face of the connector to insure that all the same size contacts are on the same plane (fully inserted). If not, the contact is not fully inserted. Remove the contact using the proper extraction tool and procedure and re-insert. Do not attempt to reinsert the insertion tool to correct the problem.

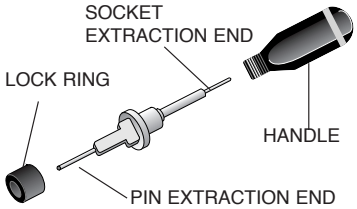


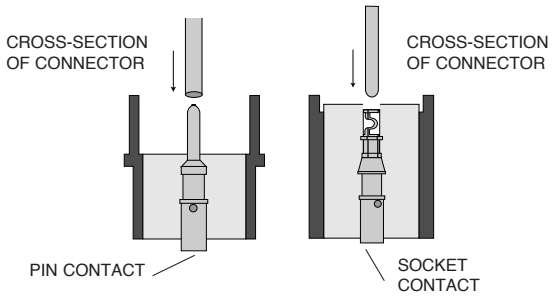
STEP 9: A wire hole filler must be inserted into the grommet behind the unused contacts to maintain the sealing integrity of the connector.

STEP 10: Place the connector back in the fixture for reassembly. Slide the connector accessories back down the cable over the rear of the connector and tighten.

4. EXTRACTION OF CONTACTS







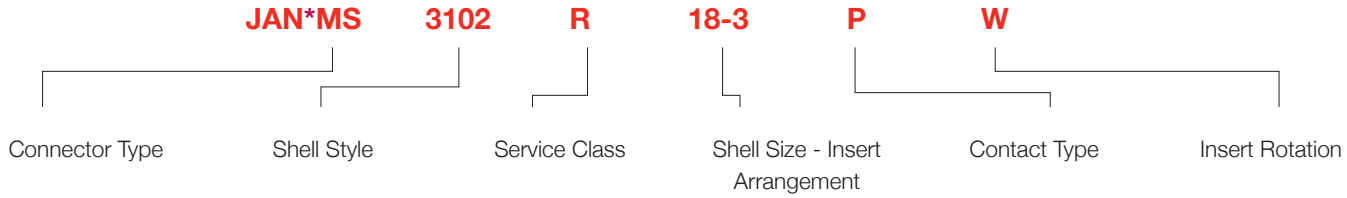
STEP 1: Remove the endbell accessories and slide them back over the wires.

STEP 2: Use the proper extraction tool. The extraction tool can be used for both pin and socket contacts by removing the shaft from the handle and reversing it for pin or socket extraction.

STEP 3: On the mating face of the connector, insert the tool over the pin contact or into the socket contact until the tool bottoms. Apply slow, continuous pressure to push the contact out the rear of the connector. When the shoulder of the tool "thunks" against the insulator, the contact is extracted.

STEP 4: Carefully remove the extraction tool from the connector to avoid damage to the insulator.

CT/MS SERIES CONNECTORS



EXPLANATION

CONNECTOR TYPE

MS Military Standard

SHELL STYLE

Mates with

- 3100 = Wall mounting receptacle
- 3101 = Cable connecting receptacle (plug†)
- 3102 = Box mounting receptacle

- 3106 = Straight plug
- 3108 = 90° plug

SERVICE CLASS

E - Environmentally resistant
F - Environmentally resistant with strain relief (JAN MS part number only)
R - Lightweight environmentally resistant (JAN MS part number only)

SHELL SIZE & INSERT ARRANGEMENT

⇨ See pages 116-129

† Note : The military changed the designation from cable receptacle to plug in the MIL-DTL-5015 specifications.

CONTACT TYPE

P - Pin
S - Socket
PS - One side pin, one side socket (only for TBF)

INSERT ROTATION

W, X, Y and Z designate that insert is rotated in its shell from normal position. No letter is required for normal (no rotation) position.

EXCERPT FROM MIL-DTL-5015H *3.30.3 JAN BRAND

The United States Government has adopted, and is exercising legitimate control over the certification marks, “JAN” and “J”, respectively, to indicate that items so marked or identified are manufactured to, and meet all, the requirements of specifications.
Accordingly, items acquired to, and meeting, all the criteria specified herein and in applicable specifications shall bear the certification mark “JAN” except that items too small to bear the certification mark “JAN” shall bear the letter “J”. The “JAN” or “J” shall be placed immediately before the part number except that if such location would place a hardship on the manufacturer. In connection with such marking, the “JAN” or “J” may be located on the first line above or below the part number. Items furnished under contracts or orders which either permit or require deviation from the conditions or requirements specified herein or in applicable specifications shall not bear “JAN” or “J”. In the event an item fails to meet the requirements of this specification and the applicable specification sheets or associated specifications, the manufacturer shall remove completely the military part number and the “JAN” or “J” from the sample tested and also from all items represented by the sample. The “JAN” or “J” certification mark shall not be used on products acquired to contractor drawings or specifications. The United States Government has obtained Certificate and Registration Number 504,860 for the certification mark “JAN” and Registration Number 1,586,261 for the certification mark “J”.

HAVE A UNIQUE REQUIREMENT?

Quick assembly of custom products is our specialty! Email us at sales@peigenesis.com or complete our online Technical Request at www.peigenesis.com/technical-support. To contact us by phone, please see the back cover for a complete listing of our branch offices and contact numbers.