Amphenol Star-Line® Series Connectors

HEAVY DUTY ELECTRONIC CONNECTORS FOR HARSH ENVIRONMENTS

Heavy-duty, multi-pin, electrical connector designed for rugged and harsh environments. One-piece, two-keyed shell, coupling nut, cable adapter, gland and clamp nut are constructed of high-grade machined aluminum with a hard coat finish for superior corrosion resistance. Formerly Pyle Star Line.

FEATURES

UL & CSA
Listed to UL1977/CSA C22.2 requirements.

ENVIRONMENTAL RESISTANCE
Design and materials withstand the most challenging operating conditions. Series has an IP68 rating.

EASILY ACCESSIBLE WIRE TERMINALS
Conductors are readily terminated to contacts. Cable housings are slipped over conductors or leads after terminating. Cumbersome handling and seating of inserts with conductors attached is eliminated.

LARGE WIRING SPACE
Ample wiring space is provided in cable housings and hardware.

REVERSIBLE INSERTS
A full range of contact inserts for power, signal and mixed applications are available. All are interchangeable and reversible to suit specific needs.

DOUBLE-LEAD THREAD COUPLING
Modified Acme Thread does not clog under adverse conditions of ice, snow, sand or mud and provides the quick coupling feature.

HARD ANODIC COATING
All machined aluminum parts finished with a hard, scratch-resistant coating per MIL-A-8625, Type III. Dielectric strength 1800 volts. Heat resistance of 750°F.

HIGH TENSILE STRENGTH ALUMINUM
Bar Stock Components precision machined. Points of impact designed for extra strength.

RADSOK® HIGH AMPERAGE CONTACTS
Special arrangements are available with RADSOK high amperage contacts. Standard Star-line EX inserts are not interchangeable with new RADSOK contact insert arrangements.

ROHS COMPLIANT PRODUCT AVAILABLE

TECHNICAL SPECIFICATIONS

MATERIALS AND FINISHES

Shell	Aluminium Alloy
Shell Plating	Hard Anodic
Contacts	Copper Alloy
Contact Platings	Silver or Gold Plated
Seals	Buna Rubber

ELECTRICAL DATA

Wire Range Sizes	18 to 777MCM

Current Rating

CONTACT SIZE	MAX. CURRENT RATING PER CONTACT AMPS
18	3
16	16
12	30
10	40
8	50
4	90
1/0	155
4/0	225
313MCM	325
350MCM	325
373MCM	Contact us
444MCM	Contact us
500MCM	750
535MCM	Contact us
646MCM	940
777MCM	1,135

MECHANICAL

Operating Temperature	-67°F to +257°F (-55°C to +125°C)

Insulation Strip Length

CONTACT SIZE	STRIP LENGTH - SOLDER		STRIP LENGTH - CRIMP	
	INCHES	MM	INCHES	MM
18	0.284	7.2	0.453	11.5
16	0.284	7.2	0.575	14.6
12	0.343	8.7	0.611	15.5
10	0.469	11.9	0.674	17.1
8	0.595	15.1	0.827	21.0
4	0.658	16.7	0.906	23.0
1/0	0.721	18.3	1.221	31.0
4/0	0.721	18.3	1.221	31.0
313MCM	0.843	21.4	1.319	33.5
350MCM	0.843	21.4	1.319	33.5
373MCM	0.843	21.4	1.319	33.5
444MCM	1.969	50.0	1.969	50.0
500MCM	1.969	50.0	1.969	50.0
535MCM	1.969	50.0	1.969	50.0
646-777MCM	1.969	50.0	1.969	50.0

Mating Life	500 cycles
Salt Spray	300 days
Vibration	10g
Shock	60g
Sealed	IP68
Contact Type	Solder, Crimp, Power, Signal and Coax
Number of Circuits	1 to 143
Polarization	Keyway with optional insert orientation
Approvals	UL #E184393

CREATE PART NUMBER - PANEL

	1	2	3	4	5	6	7	8	9
Z	R	E	P-	K	12-637	S	N	K	-01
SERIES PREFIX	SHELL TYPE	ENVIRONMENTAL COVER	MOUNTING TYPE	ENDBELL TYPE	LAYOUT	CONTACT TYPE	CONTACT TERMINATION	CONTACT PLATING	KEYING

STEP 1: SELECT SHELL TYPE

PLUG ← Mates with → **RECEPTACLE**

P = Panel Mount Plug

R = Square Flanged Receptacle

STEP 2: SELECT ENVIRONMENTAL COVER

E = Environmental Cover included

L = No Environmental Cover

C = Spring Cover
(receptacle only)

STEP 3: SELECT MOUNTING TYPE

P = Panel Mount
Examples: ZPEP, ZPLP

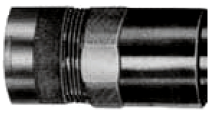
STEP 4: SELECT ENDBELL TYPE (OPTION FOR RECEPTACLES ONLY)

K = Kellems (Basketweave Grip)
Examples: ZREPK, ZRLPK, ZRCPK

KL = Long Kellems (Basketweave Grip)
Examples: ZREPKL, ZRLPKL, ZRCPKL

M = Mechanical Clamp
Examples: ZREPM, ZRLPM, ZRCPM

ML = Long Mechanical Clamp
Examples: ZREPML, ZRLPML, ZRCPML



D = Gland Nut
Examples: ZREPD, ZRLPD, ZRCPD

DL = Long Gland Nut
Examples: ZREPDL, ZRLPDL, ZRCPDL

STEP 5: SELECT LAYOUT

								AWG/MCM				18	16	12	10	8	4	Coax	1/0	4/0	313 MCM	350 MCM	373 MCM	444 MCM	500 MCM	535 MCM	646-777 MCM
								mm²				0.75	1.5	4	6	10	25		50	120	150	185	185	225	240	240	300 - 400
Layout	ATEX / IECEX Certified	ANSI / CSA Certified	Shell Size	Crimp Mod	Number of Contacts	Keying Available	Layout Description	Solder	Crimp	Pressured	Radsok																
12-10	•		12	-	7	Δ	7#12	X						7													
12-11	•		12	-	7	Δ	7#12	X						7													
12-14	•	†	12	-	4	Δ	4#10	X		X					4												
12-15	•	†	12	-	4	Δ	4#10	X		X					4												
12-16	•	†	12	-	4	Δ	4#10	X		X					4												
12-17	•	†	12	-	10	Δ	10#16	X					10														
12-21	•	†	12	-	5	Δ	5#12	X						5													
12-22	•	†	12	-	4	Δ	4#10	X		X					4												
12-23	•	†	12	-	17	Δ	17#18	X				17															
12-24	•	†	12	-	5	Δ	5#12	X						5													
12-27	•	†	12	-	3	Δ	3#12	X						3													
12-310	•	†	12	II	7	Δ	7#12		X					7													
12-311	•		12	II	7	Δ	7#12		X					7													
12-314	•	†	12	II	4	Δ	4#10		X						4												
12-316	•	†	12	II	4	Δ	4#10		X						4												
12-317	•		12	II	10	Δ	10#16		X				10														
12-322	•	†	12	II	4	Δ	4#10		X						4												
12-323	•	†	12	II	17	Δ	17#18		X			17															
12-324	•	†	12	II	5	Δ	5#12		X					5													
12-326	•	†	12	II	5	Δ	3#16,2#8		X				3			2											
12-327	•	†	12	II	3	Δ	3#12		X					3													
12-33	•	†	12	-	4	Δ	4#16	X					4														
12-330	•		12	II	3	Δ	3#12		X					3													
12-333	•	†	12	II	4	Δ	4#16		X				4														
12-334	•	†	12	II	10	Δ	10#16		X				10														
12-346	•	†	12	II	4	Δ	4#10		X						4												
12-348	•		12	II	7	Δ	7#16		X				7														
12-354	•	†	12	II	7	Δ	7#12		X					7													
12-355	•	†	12	II	10	Δ	10#16		X				10														
12-45	•		12	-	3	Δ	3#8	X								3											
12-46	•	†	12	-	4	Δ	4#10	X		X					4												
12-53	•	†	12	-	5		5#12	X						5													
12-56	•		12	-	3	Δ	3#8	X								3											
12-614	•	†	12	III	4	Δ	4#10		X						4												
12-616	•	†	12	III	4	Δ	4#10		X						4												
12-617	•		12	III	10	Δ	10#16		X				10														
12-624	•	†	12	III	5	Δ	5#12		X					5													
12-637	•		12	III	3	Δ	3#10		X						3												
12-648	•	†	12	III	7	Δ	7#16		X				7														
12-649	•	†	12	III	3	Δ	3#10		X						3												
12-651	•	†	12	III	3	Δ	3#10		X						3												
12-653	•	†	12	III	5		5#12		X					5													
12-654	•	†	12	III	7	Δ	7#12		X					7													
12-655	•	†	12	III	10	Δ	10#16		X				10														
16-11	•		16	-	19	Δ	19#12	X						19													
16-12	•	†	16	-	19	Δ	19#12	X						19													
16-16	•	†	16	-	5	Δ	5#8	X								5											
16-21	•	†	16	-	37	Δ	37#16	X					37														
16-22	•	†	16	-	4	Δ	4#4	X		X							4										
16-23	•	†	16	-	4	Δ	4#4	X		X							4										
16-24	•	†	16	-	18	Δ	16#16,2#10	X					16		2												
16-25	•		16	-	16	Δ	16#16	X					16														
16-26	•	†	16	-	4	Δ	4#8	X								4											
16-27	•	†	16	-	5	Δ	5#8	X								5											
16-28	•	†	16	-	4	Δ	4#8	X								4											
16-29	•	†	16	-	9	Δ	8#16,1#4	X					8				1										
16-31	•		16	-	5	Δ	5#8	X								5											
16-311	•		16	II	19	Δ	19#12		X					19													
16-312	•	†	16	II	19	Δ	19#12		X					19													
16-316	•	†	16	II	5	Δ	5#8		X							5											
16-321	•	†	16	II	37	Δ	37#16		X				37														
16-322	•	†	16	II	4	Δ	4#4		X								4										
16-324	•	†	16	II	18	Δ	16#16,2#10		X				16		2												

CREATE YOUR PART NUMBER

STEP 5: SELECT LAYOUT

Layout	ATEX / IECEX Certified	ANSI / CSA Certified	Shell Size	Crimp Mod	Number of Contacts	Keying Available	Layout Description	Solder	Crimp	Pressured	Radsok	AWG/MCM 18 (mm² 0.75)	16 (1.5)	12 (4)	10 (6)	8 (10)	4 (25)	Coax	1/0 (50)	4/0 (120)	313 MCM (150)	350 MCM (185)	373 MCM (185)	444 MCM (225)	500 MCM (240)	535 MCM (240)	646-777 MCM (300 - 400)
16-325	•	†	16	II	16	Δ	16#16		X				16														
16-328	•	†	16	II	4	Δ	4#8		X							4											
16-33	•	†	16	-	61	Δ	61#18	X				61															
16-333	•	†	16	II	61	Δ	61#18		X			61															
16-335	•	†	16	II	27	Δ	24#16,3#12		X				24	3													
16-344	•	†	16	II	21	Δ	11#16,10#12		X				11	10													
16-345	•	†	16	II	5	Δ	5#8		X							5											
16-346	•	†	16	II	9	Δ	6#12,3#8		X					6		3											
16-349	•	†	16	II	14	Δ	12#16,2#4		X				12				2										
16-355	•	†	16	II	19	Δ	19#16		X				19														
16-37	•	†	16	-	26	Δ	18#18, 4#16,4#12	X				18	4	4													
16-371	•	†	16	II	46		45#18,1#8		X			45				1											
16-373	•		16	II	27	Δ	24#16,3#12		X				24	3													
16-376	•		16	II	10	Δ	6#12,4#10		X					6	4												
16-377	•	†	16	II	19	Δ	19#12		X					19													
16-378	•	†	16	II	7	Δ	7#12		X					7													
16-38	•	†	16	-	4	Δ	4#4	X		X							4										
16-381	•		16	II	10	Δ	6#12,4#10		X					6	4												
16-40	•	†	16	-	55	Δ	55#18	X				55															
16-47	•	†	16	-	4	Δ	4#10	X							4												
16-51	•		16	-	3	Δ	3#4	X		X							3										
16-611	•		16	III	19	Δ	19#12		X					19													
16-616	•	†	16	III	5	Δ	5#8		X							5											
16-621	•	†	16	III	37	Δ	37#16		X				37														
16-622	•	†	16	III	4	Δ	4#4		X								4										
16-624	•	†	16	III	18	Δ	16#16,2#10		X				16		2												
16-628	•	†	16	III	4	Δ	4#8		X							4											
16-633	•	†	16	III	61	Δ	61#18		X			61															
16-635	•	†	16	III	27	Δ	24#16,3#12		X				24	3													
16-638	•	†	16	III	4	Δ	4#4		X								4										
16-640	•	†	16	III	55	Δ	55#18		X			55															
16-655	•	†	16	III	19	Δ	19#16		X				19														
16-673	•	†	16	III	27	Δ	24#16,3#12		X				24	3													
16-676	•	†	16	III	10	Δ	6#12,4#10		X					6	4												
16-677	•	†	16	III	19	Δ	19#12		X					19													
16-68	•		16	-	5	Δ	5#Coax	X										5									
16-681	•	†	16	III	10	Δ	6#12,4#10		X					6	4												
16-70	•	†	16	-	3	Δ	3#4	X		X							3										
16-74	•	†	16	-	3	Δ	3#4	X		X							3										
16-75	•	†	16	-	5		5#8	X								5											
20-10	•		20	-	37	Δ	37#12	X						37													
20-13	•		20	-	68	Δ	68#16	X					68														
20-23	•	†	20	-	38	Δ	35#16,3#10	X					35		3												
20-29	•	†	20	-	64	Δ	62#16,2#10	X					62		2												
20-31	•		20	-	22	Δ	20#16,2#8	X					20			2											
20-310	•	†	20	II	37	Δ	37#12		X					37													
20-313	•	†	20	II	68	Δ	68#16		X				68														
20-32	•	†	20	-	20	Δ	20#12	X						20													
20-323	•	†	20	II	38	Δ	35#16,3#10		X				35		3												
20-329	•	†	20	II	64	Δ	62#16,2#10		X				62		2												
20-331	•	†	20	II	22	Δ	20#16,2#8		X				20			2											
20-332	•	†	20	II	20	Δ	20#12		X					20													
20-334	•	†	20	II	20	Δ	16#16,4#8		X				16			4											
20-337	•		20	II	5	Δ	5#4		X								5										
20-34	•		20	-	20	Δ	16#16,4#8	X					16			4											
20-344	•	†	20	II	81	Δ	69#18,12#12		X			69		12													
20-345	•	†	20	II	90	Δ	90#18		X			90															
20-35	•	†	20	-	60	Δ	60#16	X					60														
20-350	•	†	20	II	37	Δ	37#12		X					37													
20-354	•	†	20	II	47	Δ	45#16,2#8		X				45			2											
20-357	•		20	II	22	Δ	20#16, 2#Coax		X				20					2									
20-358	•	†	20	II	16	Δ	16#8		X							16											

STEP 5: SELECT LAYOUT

								AWG/MCM				18	16	12	10	8	4	Coax	1/0	4/0	313 MCM	350 MCM	373 MCM	444 MCM	500 MCM	535 MCM	646-777 MCM
								mm²				0.75	1.5	4	6	10	25		50	120	150	185	185	225	240	240	300 - 400
Layout	ATEX / IECEX Certified	ANSI / CSA Certified	Shell Size	Crimp Mod	Number of Contacts	Keying Available	Layout Description	Solder	Crimp	Pressured	Radsok																
20-359	•		20	II	7	Δ	7#8		X							7											
20-36	•	†	20	-	5	Δ	5#4	X		X							5										
20-37	•	†	20	-	5	Δ	5#4	X		X							5										
20-374	•	†	20	II	27	Δ	25#12,2#4		X					25			2										
20-375	•	†	20	II	12	Δ	12#10		X						12												
20-376	•		20	II	19		19#12		X					19													
20-38	•	†	20	-	5	Δ	5#4	X		X							5										
20-384	•	†	20	II	5		5#4		X								5										
20-386	•	†	20	II	37		37#12		X					37													
20-387	•	†	20	II	20	Δ	20#12		X					20													
20-388	•		20	II	19		19#12		X					19													
20-39	•		20	-	4	Δ	4#1/0	X											4								
20-390	•		20	II	21	Δ	21#12		X					21													
20-41	•		20	-	4	Δ	4#1/0	X											4								
20-43	•	†	20	-	6	Δ	2#10,4#4	X		X					2		4										
20-44	•		20	-	81	Δ	69#18,12#12	X				69		12													
20-45	•		20	-	90	Δ	90#18	X				90															
20-46	•	†	20	-	6	Δ	4#4,2#1/0	X									4		2								
20-48	•	†	20	-	6	Δ	3#12,3#1/0	X						3					3								
20-49	•	†	20	-	5	Δ	3#12,2#1/0	X		X				3					2								
20-55	•	†	20	-	10	Δ	8#12,2#1/0	X						8					2								
20-56	•		20	-	7	Δ	7#Coax	X										7									
20-613	•	†	20	III	68	Δ	68#16		X				68														
20-623	•	†	20	III	38	Δ	35#16,3#10		X				35		3												
20-632	•	†	20	III	20	Δ	20#12		X					20													
20-639	•		20	III	4	Δ	4#1/0		X										4								
20-643	•	†	20	III	6	Δ	2#10,4#4		X						2					4							
20-646	•	†	20	III	6	Δ	4#4,2#1/0		X								4		2								
20-648	•	†	20	III	6	Δ	3#12,3#1/0		X					3					3								
20-649	•	†	20	III	5	Δ	3#12,2#1/0		X					3					2								
20-659	•	†	20	III	7	Δ	7#8		X							7											
20-672	•	†	20	III	6	Δ	4#12,2#4		X					4			2										
20-673	•	†	20	III	50	Δ	46#16,4#8		X				46			4											
20-674	•	†	20	III	27	Δ	25#12,2#4		X					25			2										
20-676	•	†	20	III	19		19#12		X					19													
20-680	•	†	20	III	10	Δ	6#12,4#4		X					6			4										
20-685	•	†	20	III	10	Δ	6#12,4#4		X					6			4										
20-686	•	†	20	III	37		37#12		X					37													
20-688	•		20	III	19		19#12		X					19													
20-84	•	†	20	-	5		5#4	X		X							5										
24-11	•		24	-	58	Δ	58#12	X						58													
24-13	•		24	-	100	Δ	100#16	X					100														
24-16	•	†	24	-	66	Δ	58#16, 5#12, 3#Coax	X					58	5				3									
24-31	•		24	-	60	Δ	53#16,7#12	X					53	7													
24-311	•		24	II	58	Δ	58#12		X					58													
24-313	•	†	24	II	100		100#16		X				100														
24-331	•	†	24	II	60	Δ	53#16, 7#12		X				53	7													
24-352	•	†	24	II	58	Δ	58#12		X					58													
24-354	•	†	24	II	75	Δ	61#16, 11#12,3#8		X				61	11		3											
24-362	•		24	II	62	Δ	62#16		X				62														
24-371	•	†	24	II	37	Δ	37#16		X				37														
24-384	•	†	24	II	58	Δ	58#12		X					58													
24-385	•	†	24	II	100		100#16		X				100														
24-388	•		24	II	72	Δ	72#16		X				72														
24-389	•		24	II	60	Δ	60#16		X				60														
24-40	•	†	24	-	15	Δ	10#16,5#1/0	X					10						5								
24-55	•	†	24	-	8	Δ	4#4,4#1/0	X									4		4								
24-57	•		24	-	8	Δ	8#Coax	X										8									
24-613	•	†	24	III	100	Δ	100#16		X				100														
24-655	•	†	24	III	8	Δ	4#4,4#1/0		X								4		4								
24-658	•	†	24	III	7	Δ	7#4		X								7										
24-673	•	†	24	III	10	Δ	8#8,2#4		X							8	2										

CREATE YOUR PART NUMBER

STEP 5: SELECT LAYOUT

Layout	ATEX / IECEX Certified	ANSI / CSA Certified	Shell Size	Crimp Mod	Number of Contacts	Keying Available	Layout Description	Solder	Crimp	Pressured	Radsok	AWG/MCM 18 (mm² 0.75)	16 (1.5)	12 (4)	10 (6)	8 (10)	4 (25)	Coax	1/0 (50)	4/0 (120)	313 MCM (150)	350 MCM (185)	373 MCM (185)	444 MCM (225)	500 MCM (240)	535 MCM (240)	646-777 MCM (300 - 400)
24-83	•	†	24	-	4	Δ	4#4/0	X												4							
24-84	•	†	24	-	58	Δ	58#12	X						58													
28-14	•	†	28	-	100	Δ	83#16,17#12	X					83	17													
28-22	•	†	28	-	143	Δ	143#16	X					143														
28-314	•	†	28	II	100	Δ	83#16,17#12		X				83	17													
28-322	•	†	28	II	143	Δ	143#16		X				143														
28-324	•	†	28	II	55	Δ	41#16,5#12, 3#8,6#4		X				41	5		3	6										
28-339	•	†	28	II	42	Δ	42#12		X					42													
C20-342	•	†	C20	II	4	Δ	4#1/0		X										4								
C20-379	•	†	C20	II	1		1#500MCM		X																1		
C20-40	•	†	C20	-	4	Δ	4#1/0	X		X									4								
C20-42	•	†	C20	-	4	Δ	4#1/0	X		X									4								
C20-640	•	†	C20	III	4	Δ	4#1/0		X										4								
C20-642	•	†	C20	III	4	Δ	4#1/0		X										4								
C24-26	•	†	C24	-	4	Δ	4#4/0	X		X										4							
C24-29	•	†	C24	-	5	Δ	5#1/0	X		X									5								
C24-313	•	†	C24	II	1		1#313MCM		X												1						
C24-353	•	†	C24	II	8	Δ	4#12,4#1/0		X					4					4								
C24-36	•	†	C24	-	37	Δ	35#12,2#1/0	X						35					2								
C24-373	•		C24	II	1		1#373MCM		X														1				
C24-38	•	†	C24	-	4	Δ	4#4/0	X		X										4							
C24-386	•	†	C24	II	1		1#777MCM		X																		1
C24-39	•		C24	-	4	Δ	4#4/0	X		X										4							
C24-42	•	†	C24	-	4	Δ	4#1/0	X											4								
C24-43	•	†	C24	-	4	Δ	4#1/0	X											4								
C24-44	•		C24	-	5	Δ	5#1/0	X		X									5								
C24-47	•	†	C24	-	15	Δ	10#12,5#1/0	X						10					5								
C24-48	•	†	C24	-	5	Δ	2#12,3#4/0	X						2						3							
C24-49	•	†	C24	-	5	Δ	5#1/0	X		X									5								
C24-50	•	†	C24	-	6	Δ	2#10, 1#4,3#1/0	X							2		1		3								
C24-535	•	†	C24	II	1		1#535MCM		X																	1	
C24-59	•	†	C24	-	7	Δ	7#1/0	X											7								
C24-659	•	†	C24	III	7	Δ	7#1/0		X										7								
C24-675	•	†	C24	III	10	Δ	6#12,4#1/0		X					6					4								
C24-680	•	†	C24	III	10	Δ	6#12,4#1/0		X					6					4								
C24-687	•		C24	III	9	Δ	2#12, 4#4,3#1/0		X					2			4		3								
C24-72	•	†	C24	-	6	Δ	3#12,3#4/0	X						3						3							
C24-79	•	†	C24	-	5	Δ	5#1/0	X		X									5								
C24-81	•	†	C24	-	15		10#12,5#1/0	X						10					5								
C24-R313	•	†	C24	II	1		1#313MCM		X		X										1						
C24-R373	•		C24	II	1		1#373MCM		X		X												1				
C24-R386	•	†	C24	II	1		1#777MCM		X	X	X																1
C24-R44	•		C24	-	7		1#10,3#8, 3#1/0	X		X	X				1	3			3								
C24-R535	•	†	C24	II	1		1#535MCM		X		X															1	
C28-12	•	†	C28	-	39	Δ	31#12,5#10, 1#8,2#1/0	X						31	5	1			2								
C28-15	•	†	C28	-	47	Δ	43#12, 3#4,1#1/0	X						43			3		1								
C28-17	•	†	C28	-	6	Δ	2#12,4#4/0	X						2						4							
C28-18	•	†	C28	-	6	Δ	2#12, 4#350MCM	X						2								4					
C28-19	•		C28	-	5	Δ	5#4/0	X		X										5							
C28-20	•	†	C28	-	5	Δ	5#4/0	X		X										5							
C28-21	•	†	C28	-	8	Δ	4#12, 4#350MCM	X						4								4					
C28-23	•	†	C28	-	5	Δ	5#4/0	X		X										5							
C28-327	•	†	C28	II	6	Δ	6#1/0		X										6								
C28-328	•	†	C28	II	29	Δ	23#12, 2#8,4#1/0		X					23		2			4								
C28-42	•	†	C28	-	6	Δ	2#10,4#4/0	X		X					2					4							
C28-43	•	†	C28	-	8	Δ	4#12, 4#350MCM	X						4								4					
C28-627	•	†	C28	III	6	Δ	6#1/0		X										6								
C28-628	•	†	C28	III	29	Δ	23#12, 2#8,4#1/0		X					23		2			4								
C28-R18	•	†	C28	-	6	Δ	2#12, 4#350MCM	X			X			2								4					
C28-R42	•	†	C28	-	6	Δ	2#10,4#4/0	X		X	X				2					4							
C28-R44	•		C28	-	7	Δ	1#10, 3#8,3#4/0	X		X	X				1	3				3							

Arrangements with RADSOK contacts are designated with an ‘R’ in front of the dash number. Example ZP-16-R322

STEP 6: SELECT CONTACT TYPE

P = Pin

S = Socket

STEP 7: SELECT CONTACT TERMINATION

Blank = Solder

N = Crimp

R = Pressure

See Layout Table for valid Termination Type

STEP 8: SELECT CONTACT PLATING

Blank = Silver

K = Gold

STEP 9: SELECT KEYING

Blank = Normal

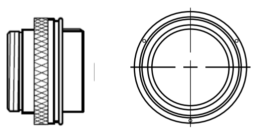
See Layout Table for valid Keying by Insert Layout

CREATE PART NUMBER - CABLE

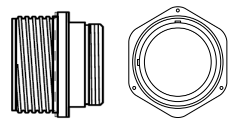
	1	2	3	4	5	6	7	8	9	10
Z	P	E	KL	J-	12	12-637	P	N	K	-01
SERIES PREFIX	SHELL TYPE	ENVIRONMENTAL COVER	ENDBELL TYPE	JACK NUT OPTION	GROMMET CODE	LAYOUT	CONTACT TYPE	CONTACT TERMINATION	CONTACT PLATING	KEYING

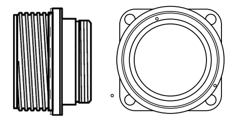
STEP 1: SELECT SHELL TYPE

PLUG ← Mates with → **RECEPTACLES**



P = Plug





R = Receptacle

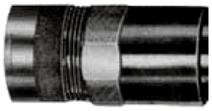
STEP 2: SELECT ENVIRONMENTAL COVER

E = Environmental Cover included

L = No Environmental Cover

C = Spring Cover
(For Flanged Receptacles only)

STEP 3: SELECT ENDBELL TYPE



K = Kellems (Basketweave Grip)
Examples: ZPEK, ZPLK, ZPEKL, ZPLKL
For Plug and In-line Receptacle

KL = Long Kellems (Basketweave Grip)
Examples: ZREK, ZRLK, ZREKL, ZRLKL
For Plug and In-line Receptacle

PK = Kellems (Basketweave Grip)
Examples: ZREPK, ZRLPK, ZRCPK
For Square Flanged Receptacles Only

PKL= Long Kellems (Basketweave Grip)
Examples: ZREPKL, ZRLPKL, ZRCPKL
For Square Flanged Receptacles Only

M = Mechanical Clamp
Examples: ZPEM, ZPLM, ZPEML, ZPLML
For Plug and In-line Receptacle

ML = Long Mechanical Clamp
Examples: ZREM, ZRLM, ZREML, ZRLML
For Plug and In-line Receptacle

PM = Mechanical Clamp
Examples: ZREPM, ZRLPM, ZRCPM
For Square Flanged Receptacles Only

PML= Long Mechanical Clamp
Examples: ZREPML, ZRLPML, ZRCPML
For Square Flanged Receptacles Only

D = Gland Nut
Examples: ZPED, ZPLD, ZPEDL, ZPLDL
For Plug and In-line Receptacle

DL = Long Gland Nut
Examples: ZRED, ZRLD, ZREDL, ZRLDL
For Plug and In-line Receptacle

STEP 4: SELECT JACK NUT OPTION (FOR PLUG ONLY)

J = Jack Nut
(37 conductors or more. Do not use for power applications 100A or greater.)

BLANK = No Jack Nut

STEP 5: SELECT GROMMET CODE

CABLE DIAMETER	SHELL SIZE				
	12	16	20 & C20	24 & C24	28 & C28
.062 to .125	02	-	-	-	-
.125 to .250	04	-	-	-	-
.250 to .375	06	06	-	-	-
.375 to .500	08	08	-	-	-
.500 to .625	10	10	10	-	-
.625 to .750	12	12	12	-	-
.750 to .875	14	14	14	-	-
.875 to .937	15	-	-	-	-
.937 to 1.000	-	16	16	16	-
1.000 to 1.125	-	18	18	18	-
1.125 to 1.250	-	20	20	20	-
1.250 to 1.375	-	22	22	22	-
1.375 to 1.437	-	23	-	-	-
1.437 to 1.500	-	-	24	24	24
1.500 to 1.625	-	-	26	26	26
1.625 to 1.750	-	-	28	28	28
1.750 to 1.875	-	-	30	30	30
1.875 to 1.937	-	-	31	-	-
1.875 to 2.000	-	-	-	32	32
2.000 to 2.125	-	-	-	34	34
2.125 to 2.250	-	-	-	36	36
2.250 to 2.375	-	-	-	38	38
2.375 to 2.437	-	-	-	39	-
2.437 to 2.500	-	-	-	-	40
2.500 to 2.625	-	-	-	-	42
2.625 to 2.750	-	-	-	-	44
2.750 to 2.875	-	-	-	-	46

STEP 6: SELECT LAYOUT

⇨See page 451-460

STEP 7: SELECT CONTACT TYPE

P = Pin   **S** = Socket

STEP 8: SELECT CONTACT TERMINATION

Blank = Solder   **N** = Crimp   **R** = Pressure

See Layout Table for valid Termination Type

STEP 9: SELECT CONTACT PLATING

Blank = Silver   **K** = Gold

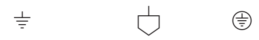
STEP 10: SELECT KEYING

Blank = Normal

See Layout Table for valid Keying by Insert Layout

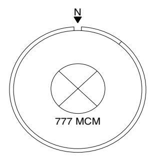
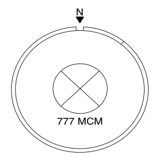
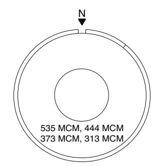
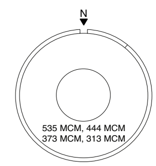
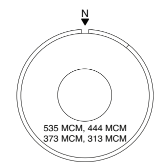
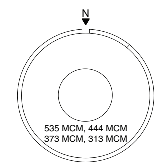
CREATE YOUR PART NUMBER

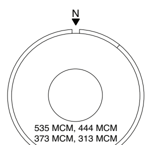
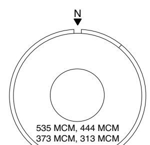
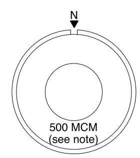
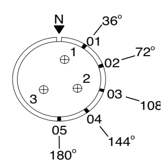
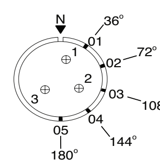
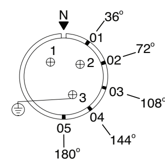
Grounding Contact Termination Symbol

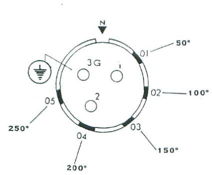
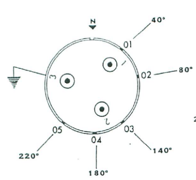
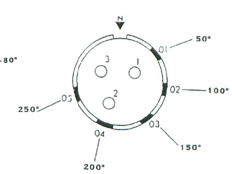
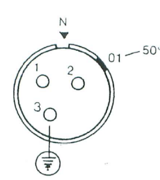
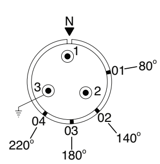
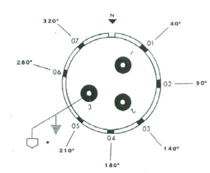


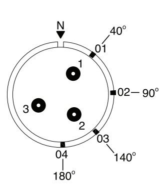
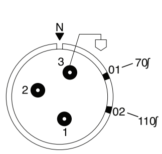
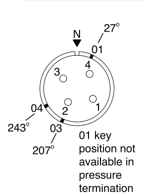
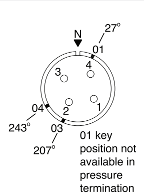
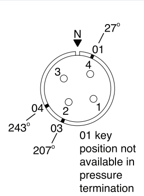
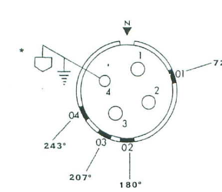
Solder Well | Pressure | Crimp

18 | 16 | 12 | 10 | 8 | 4 | 1/0 | 4/0 | 350 MCM | 500 MCM | 646-777

CONTACTS	1					
						
LAYOUT	C24-386	C24-R386	C24-535	C24-R535	C24-313	C24-R313
# OF CONTACTS	1#777MCM	1#777MCM	1#535MCM	1#535MCM	1#313MCM	1#313MCM

CONTACTS	1			3		
						
LAYOUT	C24-373	C24-R373	C20-379	12-27	12-327	12-330
# OF CONTACTS	1#373MCM	1#373MCM	1#500MCM	3#12	3#12	3#12

CONTACTS	3					
						
LAYOUT	12-637	12-45	12-649	12-651	12-56	16-51
# OF CONTACTS	3#10	3#8	3#10	3#10	3#8	3#4

CONTACTS	3		4			
						
LAYOUT	16-70	16-74	12-14	12-314	12-614	12-15
# OF CONTACTS	3#4	3#4	4#10	4#10	4#10	4#10

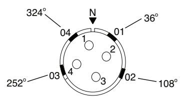
LAYOUT BY NUMBER OF CONTACTS

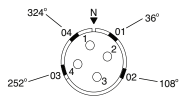
Grounding Contact Termination Symbol

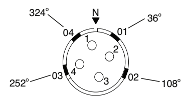
Solder Well   Pressure   Crimp

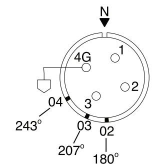
18   16   12   10   8   4   1/0   4/0   350 MCM   500 MCM   646-777

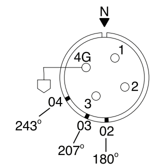
CONTACTS 4

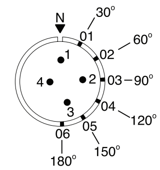






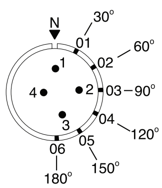


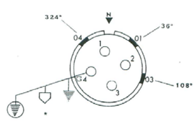
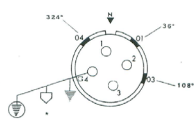
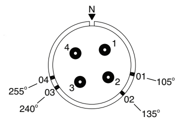


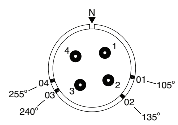


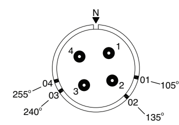
LAYOUT	12-16	12-316	12-616	12-22	12-322	12-33
# OF CONTACTS	4#10	4#10	4#10	4#10	4#10	4#16

CONTACTS 4



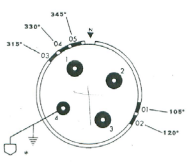
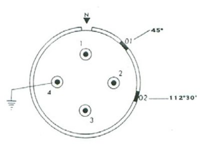
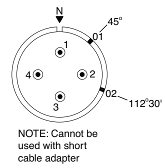




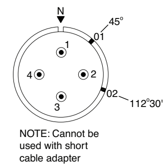


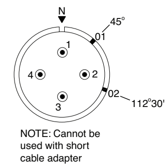


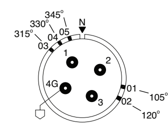
LAYOUT	12-333	12-46	12-346	16-22	16-322	16-622
# OF CONTACTS	4#16	4#10	4#10	4#4	4#4	4#4

CONTACTS 4

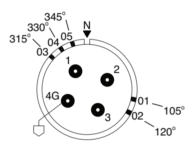


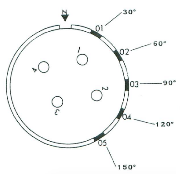
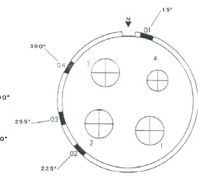
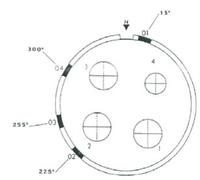
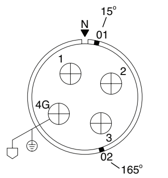


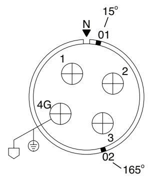


LAYOUT	16-23	16-26	16-28	16-328	16-628	16-38
# OF CONTACTS	4#4	4#8	4#8	4#8	4#8	4#4

CONTACTS 4



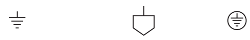







LAYOUT	16-638	16-47	20-39	20-639	C20-40	C20-640
# OF CONTACTS	4#4	4#10	4#1/0	4#1/0	4#1/0	4#1/0

CREATE YOUR PART NUMBER

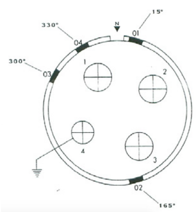
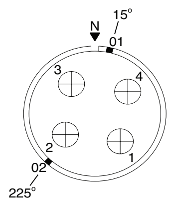
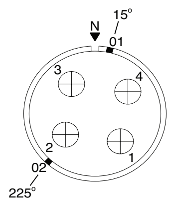
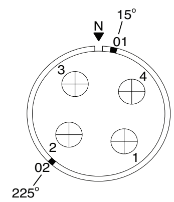
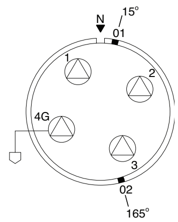
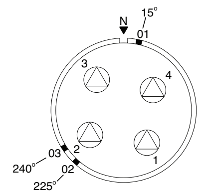
Grounding Contact Termination Symbol



Solder Well — Pressure — Crimp

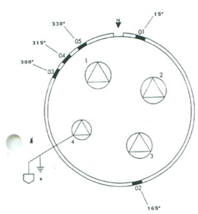
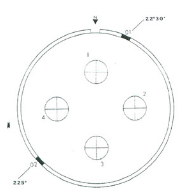
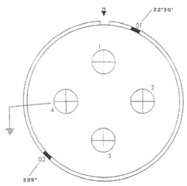
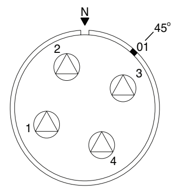
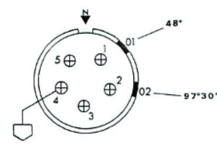
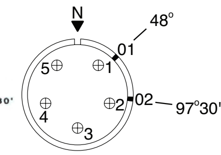
18 — 16 — 12 — 10 — 8 — 4 — 1/0 — 4/0 — 350 MCM — 500 MCM — 646-777

CONTACTS: 4

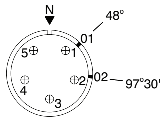
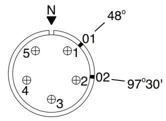
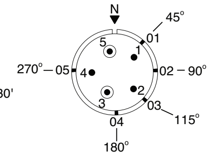
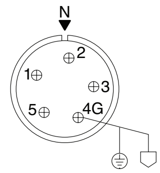
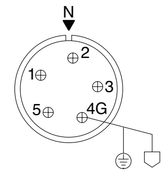
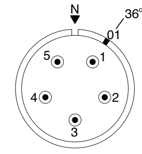
CONTACTS	4					
LAYOUT	20-41	C20-42	C20-342	C20-642	C24-26	C24-38
# OF CONTACTS	4#1/0	4#1/0	4#1/0	4#1/0	4#4/0	4#4/0

CONTACTS: 4 / 5

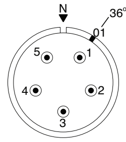
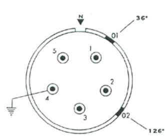
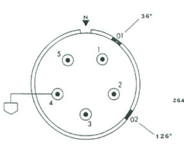
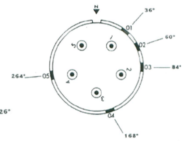
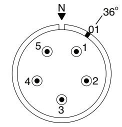
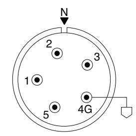
CONTACTS	4				5	
LAYOUT	C24-39	C24-42	C24-43	24-83	12-21	12-24
# OF CONTACTS	4#4/0	4#1/0	4#1/0	4#4/0	5#12	5#12

CONTACTS: 5

CONTACTS	5					
LAYOUT	12-324	12-624	12-326	12-53	12-653	16-16
# OF CONTACTS	5#12	5#12	3#16,2#8	5#12	5#12	5#8

CONTACTS: 5

     image not available 

CONTACTS	5						
LAYOUT	16-316	16-27	16-31	16-345	16-616	16-68	16-75
# OF CONTACTS	5#8	5#8	5#8	5#8	5#8	5#COAX	5#8

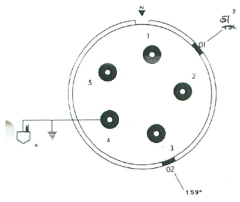
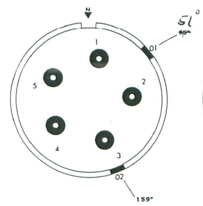
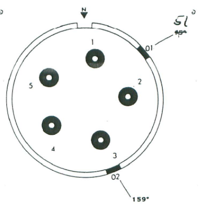
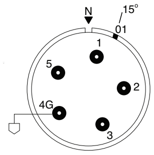
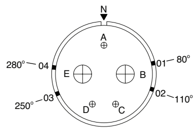
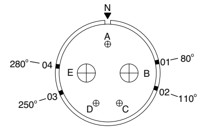
LAYOUT BY NUMBER OF CONTACTS

Grounding Contact Termination Symbol

Solder Well | Pressure | Crimp

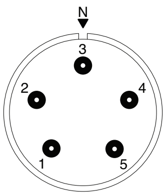
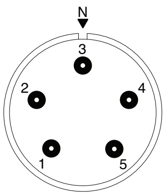
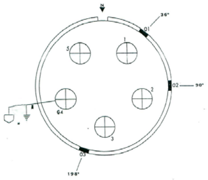
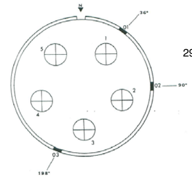
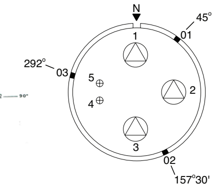
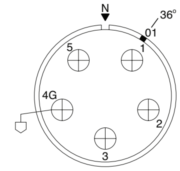
18 | 16 | 12 | 10 | 8 | 4 | 1/0 | 4/0 | 350 MCM | 500 MCM | 646-777

CONTACTS	5					

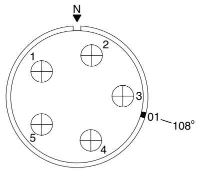
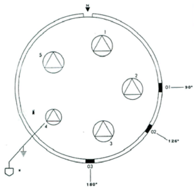
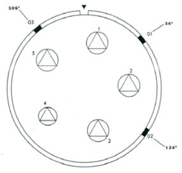
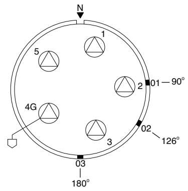
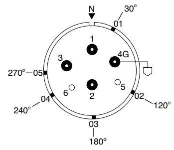
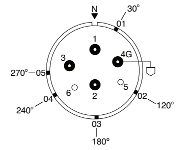
LAYOUT	20-36	20-37	20-337	20-38	20-49	20-649
# OF CONTACTS	5#4	5#4	5#4	5#4	3#12,2#1/0	3#12,2#1/0

CONTACTS	5					

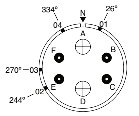
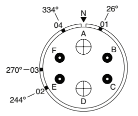
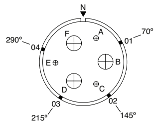
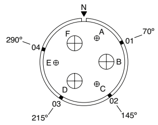
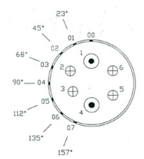
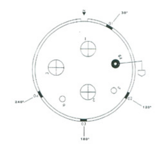
LAYOUT	20-84	20-384	C24-29	C24-44	C24-48	C24-49
# OF CONTACTS	5#4	5#4	5#1/0	5#1/0	2#12,3#4/0	5#1/0

CONTACTS	5				6	

LAYOUT	C24-79	C28-19	C28-20	C28-23	20-43	20-643
# OF CONTACTS	5#1/0	5#4/0	5#4/0	5#4/0	2#10,4#4	2#10,4#4

CONTACTS	6					

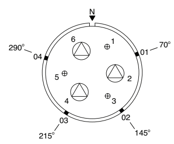
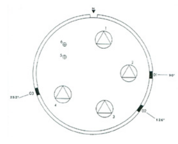
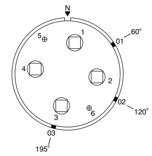
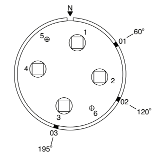
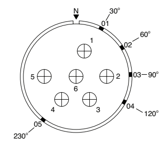
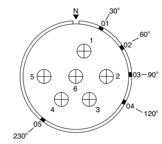
LAYOUT	20-46	20-646	20-48	20-648	20-672	C24-50
# OF CONTACTS	4#4,2#1/0	4#4,2#1/0	3#12,3#1/0	3#12,3#1/0	4#12,2#4	2#10,1#4,3#1/0

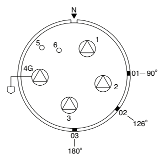
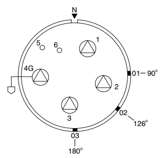
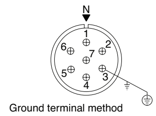
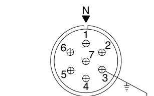
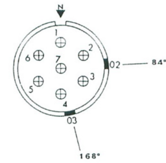
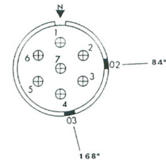
CREATE YOUR PART NUMBER

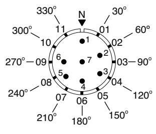
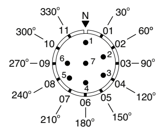
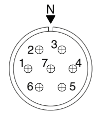
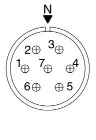
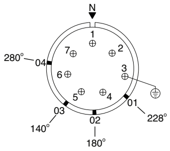
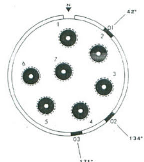
Grounding Contact Termination Symbol

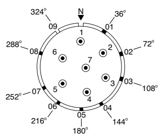
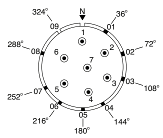
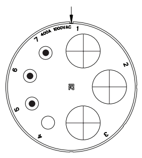
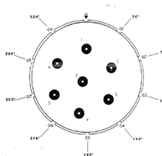
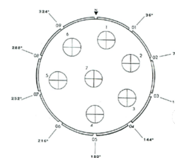
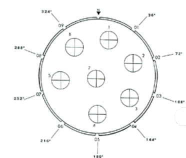
Solder Well	Pressure	Crimp

18	16	12	10	8	4	1/0	4/0	350 MCM	500 MCM	646-777

CONTACTS	6					
						
LAYOUT	C24-72	C28-17	C28-18	C28-R18	C28-327	C28-627
# OF CONTACTS	3#12,3#4/0	2#12,4#4/0	2#12,4#350MCM	2#12,4#350MCM	6#1/0	6#1/0

CONTACTS	6		7			
						
LAYOUT	C28-42	C28-R42	12-10	12-310	12-11	12-311
# OF CONTACTS	2#10,4#4/0	2#10,4#4/0	7#12	7#12	7#12	7#12

CONTACTS	7					
						
LAYOUT	12-348	12-648	12-354	12-654	16-378	20-56
# OF CONTACTS	7#16	7#16	7#12	7#12	7#12	7#COAX

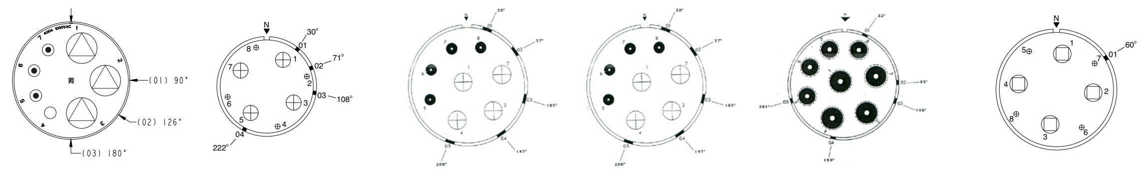
CONTACTS	7					
						
LAYOUT	20-359	20-659	C24-R44	24-658	C24-59	C24-659
# OF CONTACTS	7#8	7#8	3#1/0,3#8,1#10	7#4	7#1/0	7#1/0

LAYOUT BY NUMBER OF CONTACTS

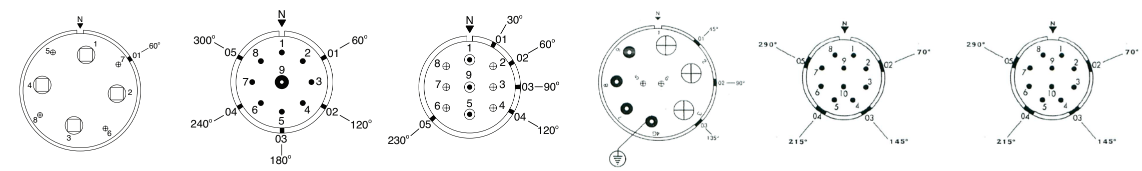
Grounding Contact Termination Symbol

Solder Well | Pressure | Crimp

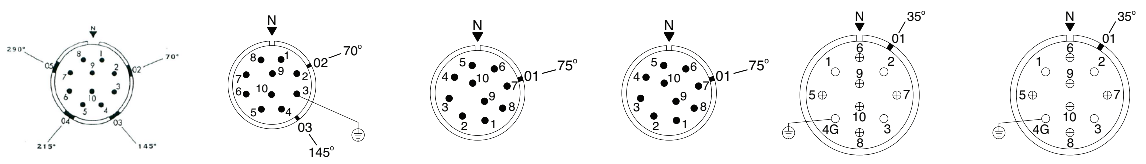
18	16	12	10	8	4	1/0	4/0	350 MCM	500 MCM	646-777



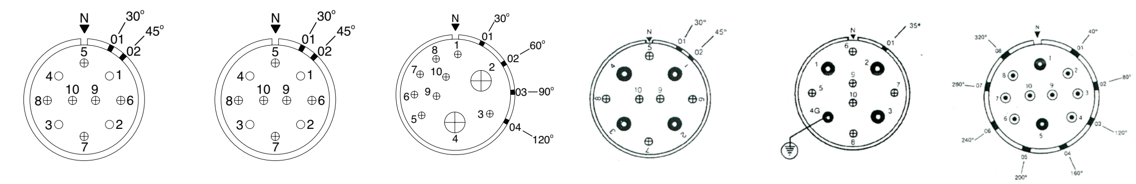
CONTACTS	7	8	8	8	8	8
LAYOUT	C28-R44	C24-353	24-55	24-655	24-57	C28-21
# OF CONTACTS	1#10,3#8,3#4/0	4#12,4#1/0	4#4,4#1/0	4#4,4#1/0	8#COAX	4#12,4#350MCM



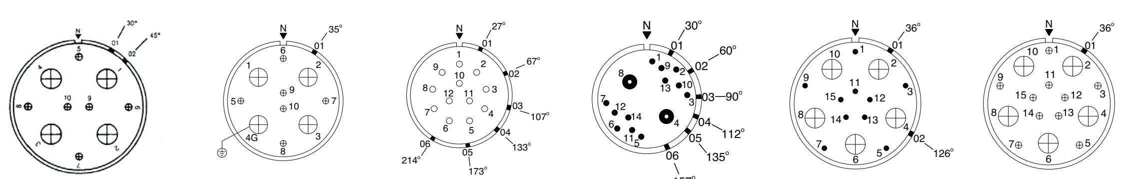
CONTACTS	8	9	9	9	10	10
LAYOUT	C28-43	16-29	16-346	C24-687	12-17	12-317
# OF CONTACTS	4#12,4#350MCM	8#16,1#4	6#12,3#8	2#12,4#4,3#1/0	10#16	10#16



CONTACTS	10	10	10	10	10	10
LAYOUT	12-617	12-334	12-355	12-655	16-376	16-676
# OF CONTACTS	10#16	10#16	10#16	10#16	6#12,4#10	6#12,4#10



CONTACTS	10	10	10	10	10	10
LAYOUT	16-381	16-681	20-55	20-680	20-685	24-673
# OF CONTACTS	6#12,4#10	6#12,4#10	8#12,2#1/0	6#12,4#4	6#12,4#4	8#8,2#4

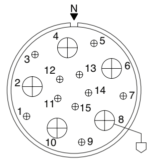
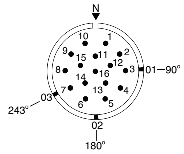
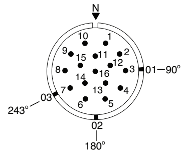
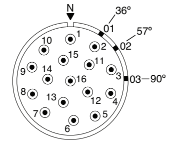
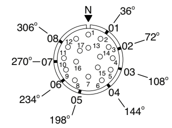
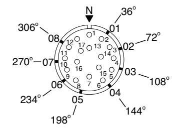


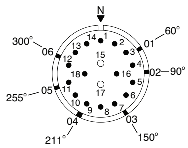
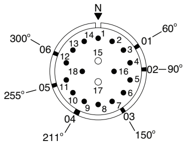
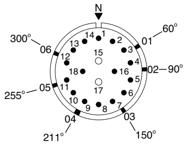
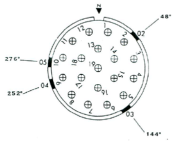
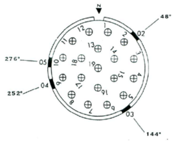
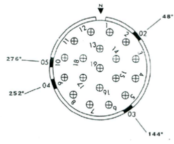
CONTACTS	10	10	12	14	15	15
LAYOUT	C24-675	C24-680	20-375	16-349	24-40	C24-47
# OF CONTACTS	6#12,4#1/0	6#12,4#1/0	12#10	12#16,2#4	10#16,5#1/0	10#12,5#1/0

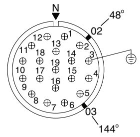
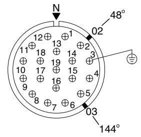
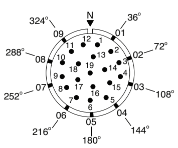
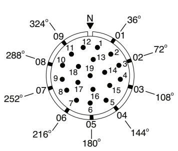
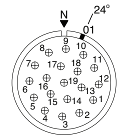
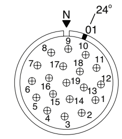
Grounding Contact Termination Symbol

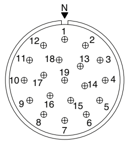
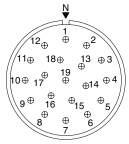
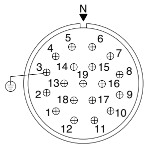
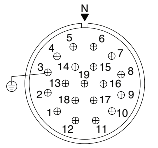
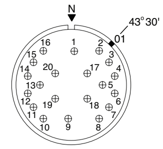
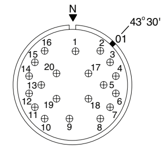
Solder Well | Pressure | Crimp

18 | 16 | 12 | 10 | 8 | 4 | 1/0 | 4/0 | 350 MCM | 500 MCM | 646-777

CONTACTS	15	16			17	
						
LAYOUT	C24-81	16-25	16-325	20-358	12-23	12-323
# OF CONTACTS	10#12,5#1/0	16#16	16#16	16#8	17#18	17#18

CONTACTS	18			19		
						
LAYOUT	16-24	16-324	16-624	16-11	16-311	16-611
# OF CONTACTS	16#16,2#10	16#16,2#10	16#16,2#10	19#12	19#12	19#12

CONTACTS	19					
						
LAYOUT	16-12	16-312	16-355	16-655	16-377	16-677
# OF CONTACTS	19#12	19#12	19#16	19#16	19#12	19#12

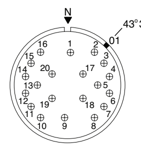
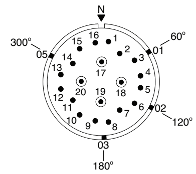
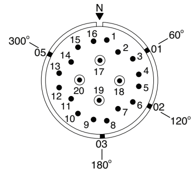
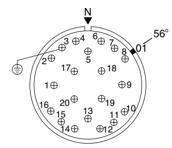
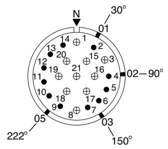
CONTACTS	19				20	
						
LAYOUT	20-376	20-676	20-388	20-688	20-32	20-332
# OF CONTACTS	19#12	19#12	19#12	19#12	20#12	20#12

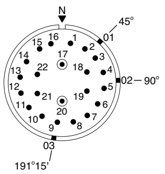
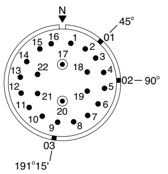
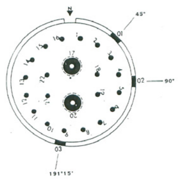
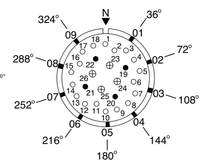
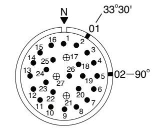
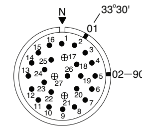
LAYOUT BY NUMBER OF CONTACTS

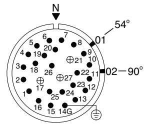
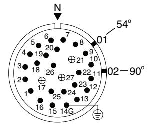
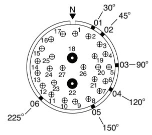
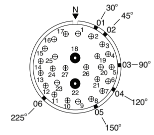
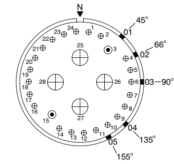
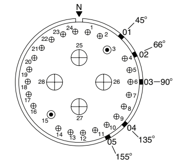
Grounding Contact Termination Symbol

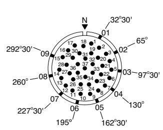
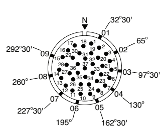
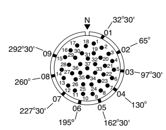
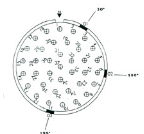
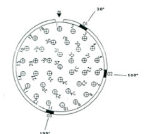
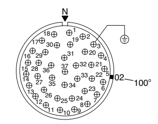
Solder Well | Pressure | Crimp

18 | 16 | 12 | 10 | 8 | 4 | 1/0 | 4/0 | 350 MCM | 500 MCM | 646-777

CONTACTS	20				21	
						image not available
LAYOUT	20-632	20-34	20-334	20-387	16-344	20-390
# OF CONTACTS	20#12	16#16,4#8	16#16,4#8	20#12	11#16,10#12	21#12

CONTACTS	22			26	27	
						
LAYOUT	20-31	20-331	20-357	16-37	16-335	16-635
# OF CONTACTS	20#16,2#8	20#16,2#8	20#16,2#COAX	18#18,4#16,4#12	24#16,3#12	24#16,3#12

CONTACTS	27				29	
						
LAYOUT	16-373	16-673	20-374	20-674	C28-328	C28-628
# OF CONTACTS	24#16,3#12	24#16,3#12	25#12,2#4	25#12,2#4	23#12,2#8,4#1/0	23#12,2#8,4#1/0

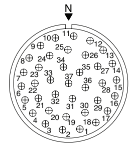
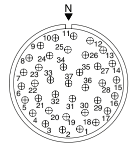
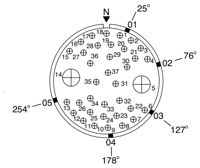
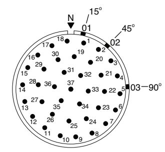
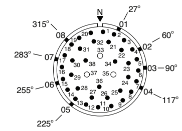
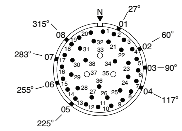
CONTACTS	37					
						
LAYOUT	16-21	16-321	16-621	20-10	20-310	20-350
# OF CONTACTS	37#16	37#16	37#16	37#12	37#12	37#12

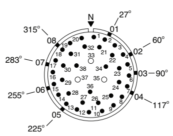
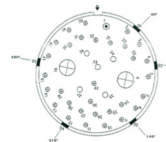
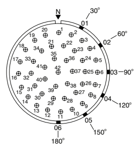
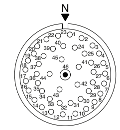
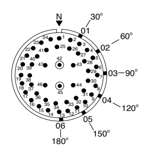
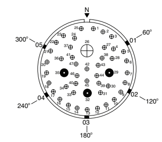
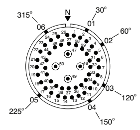
CREATE YOUR PART NUMBER

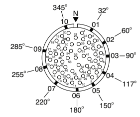
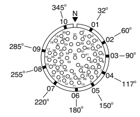
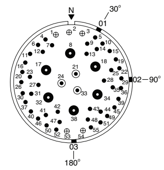
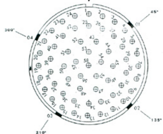
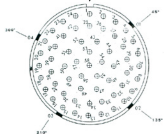
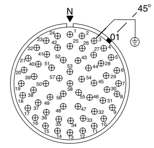
Grounding Contact Termination Symbol

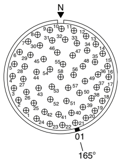
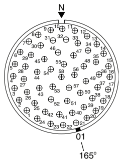
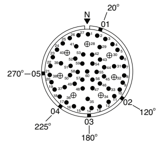
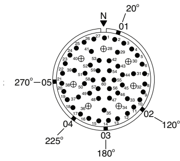
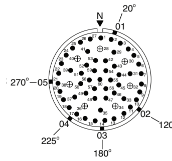
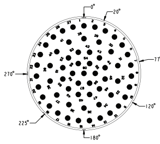
Solder Well	Pressure	Crimp

18	16	12	10	8	4	1/0	4/0	350 MCM	500 MCM	646-777

CONTACTS	37				38	
						
LAYOUT	20-386	20-686	C24-36	24-371	20-23	20-323
# OF CONTACTS	37#12	37#12	35#12,2#1/0	37#16	35#16,3#10	35#16,3#10

CONTACTS	38	39	42	46	47		50
							
LAYOUT	20-623	C28-12	28-339	16-371	20-354	C28-15	20-673
# OF CONTACTS	35#16,3#10	31#12,5#10,1#8,2#1/0	42#12	45#18,1#8	45#16,2#8	43#12,3#4,1#1/0	46#16,4#8

CONTACTS	55			58		
						
LAYOUT	16-40	16-640	28-324	24-11	24-311	24-352
# OF CONTACTS	55#18	55#18	41#16,5#12,3#8,6#4	58#12	58#12	58#12

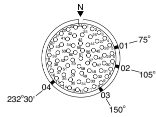
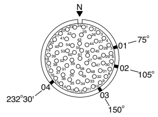
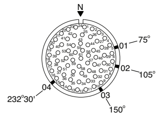
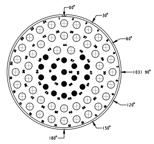
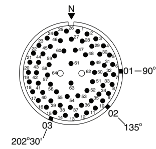
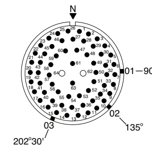
CONTACTS	58		60			
						
LAYOUT	24-84	24-384	20-35	24-31	24-331	24-389
# OF CONTACTS	58#12	58#12	60#16	53#16,7#12	53#16,7#12	60#16

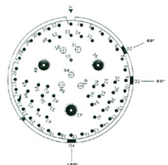
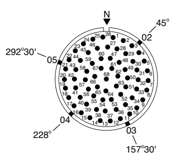
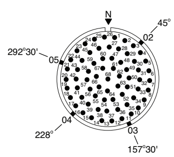
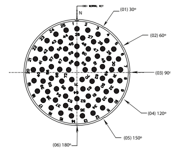
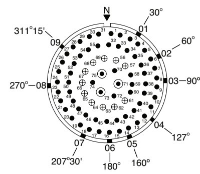
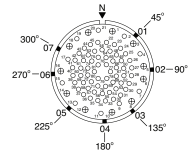
LAYOUT BY NUMBER OF CONTACTS

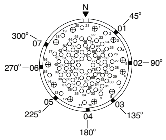
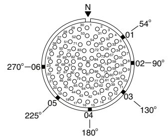
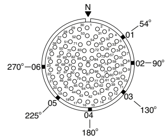
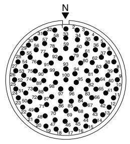
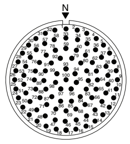
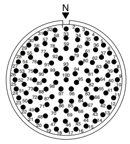
Grounding Contact Termination Symbol

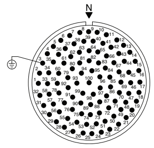
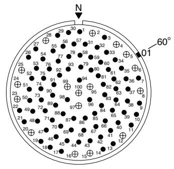
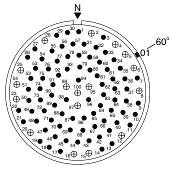
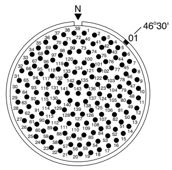
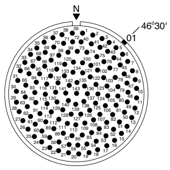
Solder Well | Pressure | Crimp

18 | 16 | 12 | 10 | 8 | 4 | 1/0 | 4/0 | 350 MCM | 500 MCM | 646-777

CONTACTS	61			62	64	
						
LAYOUT	16-33	16-333	16-633	24-362	20-29	20-329
# OF CONTACTS	61#18	61#18	61#18	62#16	62#16,2#10	62#16,2#10

CONTACTS	66	68		72	75	81
						
LAYOUT	24-16	20-13	20-313	24-388	24-354	20-44
# OF CONTACTS	58#16,5#12,3 COAX	68#16	68#16	72#16	61#16,11#12,3#8	69#18,12#12

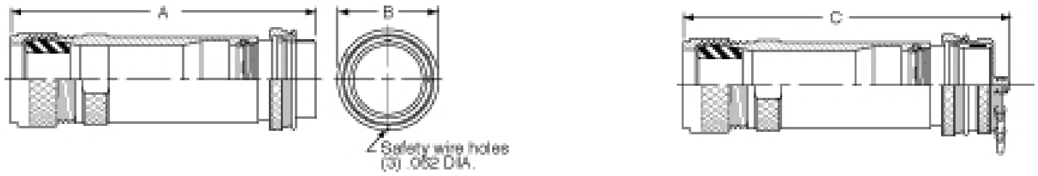
CONTACTS	81	90		100		
						
LAYOUT	20-344	20-45	20-345	24-13	24-313	24-613
# OF CONTACTS	69#18,12#12	90#18	90#18	100#16	100#16	100#16

CONTACTS	100			143	
					
LAYOUT	24-385	28-14	28-314	28-22	28-322
# OF CONTACTS	100#16	83#16,17#12	83#16,17#12	143#16	143#16

PLUGS

STRAIGHT PLUG WITH STANDARD COMPRESSION NUT

ZPLD Without Cover
ZPED With Environmental Plug Cover

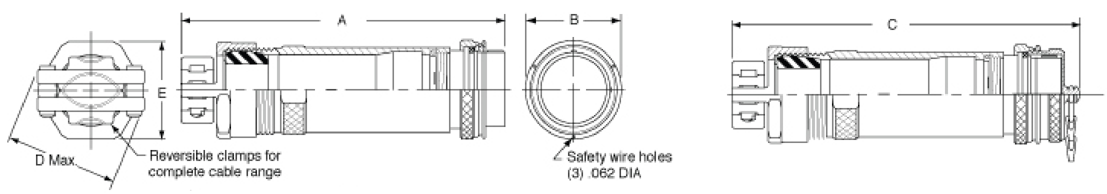


Shell Size	WITH STANDARD CABLE ADAPTER			WITH LONG CABLE ADAPTER		
	A	B	C	A	B	C
12	5-3/8	1-13/16	5-31/32	7-5/8	1-13/16	8-7/32
16	5-5/8	2-5/16	5-7/32	7-7/8	2-5/16	8-15/32
20	6-1/8	2-13/16	6-23/32	8-3/8	2-13/16	8-31/32
C20	6-5/8	2-13/16	7-7/32	8-7/8	2-13/16	9-15/32
24	6-5/8	3-5/16	7-7/32	8-7/8	3-5/16	9-15/32
C24	7-1/8	3-5/16	7-23/32	9-3/8	3-5/16	9-31/32
28	7-1/8	3-13/16	7-23/32	9-1/8	3-13/16	9-23/32
C28	7-5/8	3-13/16	8-7/32	9-5/8	3-13/16	10-7/32

Note: To specify plug with Environmental Cover, change third letter in Part No. "L" to "E"

STRAIGHT PLUG WITH MECHANICAL CLAMP NUT

ZPLM Without Cover
ZPEM With Environmental Plug Cover

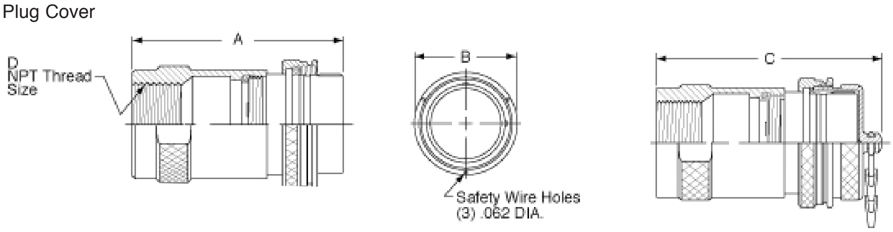


Shell Size	WITH STANDARD CABLE ADAPTER					WITH LONG CABLE ADAPTER				
	A	B	C	D	E	A	B	C	D	E
12	6-1/8	1-13/16	6-23/32	2-3/8	1-3/4	8-3/8	1-13/16	8-31/32	2-3/8	1-3/4
16	6-7/16	2-5/16	7-1/32	3	2-1/4	8-11/16	2-5/16	9-9/32	3	2-1/4
20	7	2-13/16	7-19/32	3-3/4	2-3/4	9-1/4	2-13/16	9-27/32	3-3/4	2-3/4
C20	7-1/2	2-13/16	8-3/32	3-3/4	2-3/4	9-3/4	2-13/16	10-11/32	3-3/4	2-3/4
24	7-9/16	3-5/16	8-5/32	4-1/2	3-1/4	9-13/16	3-5/16	10-13/32	4-1/2	3-1/4
C24	8-1/16	3-5/16	8-21/32	4-1/2	3-1/4	10-5/16	3-5/16	10-29/32	4-1/2	3-1/4
28	8-1/8	3-13/16	8-23/32	5-1/8	3-3/4	10-1/8	3-13/16	10-23/32	5-1/8	3-3/4
C28	8-5/8	3-13/16	9-7/32	5-1/8	3-3/4	10-5/8	3-13/16	11-7/32	5-1/8	3-3/4

Note: To specify plug with Environmental Cover, change third letter in Part No. "L" to "E"

STRAIGHT PLUG WITH CONDUIT ADAPTER

ZPLT Without Cover
ZPET With Environmental Plug Cover



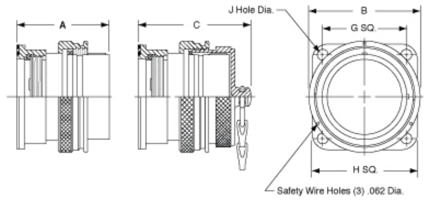
Shell Size	WITH STANDARD CABLE ADAPTER			
	A	B	C	D
12	4-1/4	1-13/16	4-27/32	3/4
16	4-3/8	2-5/16	4-31/32	1-1/4
20	4-1/2	2-13-16	5-3/32	1-1/2
C20	5	2-13/16	5-19/32	1-1/2
24	4-5/8	3-5/16	5-7/32	2
C24	5-1/8	3-5/16	5-23/32	2
28	5-3/32	3-13/16	5-11/16	2-1/2
C28	5-19/32	3-13/16	6-3/16	2-1/2

Note: To specify plug with Environmental Cover, change third letter in Part No. "L" to "E". Dimensions are shown in Inches.

PLUGS

STRAIGHT MALE PLUG PANEL MOUNT

ZPLP Without Cover
ZPEP With Environmental Plug Cover

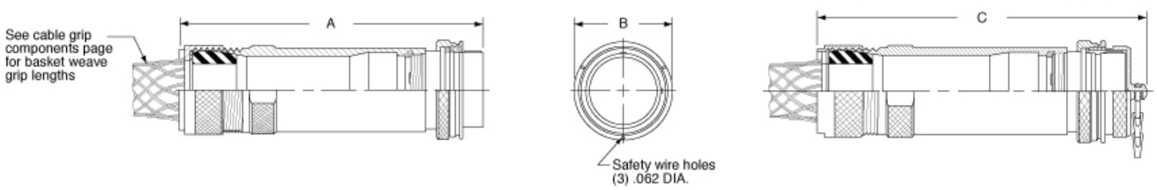


Shell Size	WITH STANDARD CABLE ADAPTER					
	A	B	C	G	H	J
12	2-3/8	1-13/16	2-31/32	1-17/64	1-5/8	3/16
16	2-13/32	2-5/16	3	1-11/16	2-1/8	7/32
20	2-7/16	2-13/16	3-1/32	2-3/32	2-5/8	9/32
C20	2-15/16	2-13/16	3-17/32	2-3/32	2-5/8	9/32
24	2-15/32	3-5/16	3-1/16	2-17/32	3-1/8	11/32
C24	2-31/32	3-5/16	3-9/16	2-17/32	3-1/8	11/32
28	2-15/32	3-13/16	3-1/16	3-1/32	3-3/4	11/32
C28	2-31/32	3-13/16	3-9/16	3-1/32	3-3/4	11/32

Note: To specify plug with Environmental Cover, change third letter in Part No. “L” to “E”

STRAIGHT PLUG WITH BASKETWEAVE CABLE GRIP

ZPLK Without Cover
ZPEK With Environmental Plug Cover



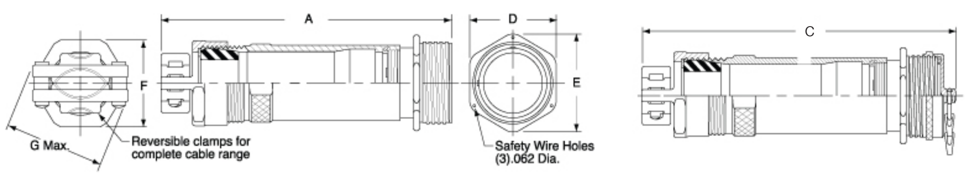
Shell Size	WITH STANDARD CABLE ADAPTER			WITH LONG CABLE ADAPTER		
	A	B	C	A	B	C
12	5-3/8	1-13/16	5-31/32	7-5/8	1-13/16	8-7/32
16	5-5/8	2-5/16	6-7/32	7-7/8	2-5/16	8-15/32
20	6-1/8	2-13/16	6-23/32	8-3/8	2-13/16	8-31/32
C20	6-5/8	2-13/16	7-7/32	8-7/8	2-13/16	9-15/32
24	6-5/8	3-5/16	7-7/32	8-7/8	3-5/16	9-15/32
C24	7-1/8	3-5/16	7-23/32	9-3/8	3-5/16	9-31/32
28	7-1/8	3-13/16	7-23/32	9-1/8	3-13/16	9-23/32
C28	7-5/8	3-13/16	8-7/32	9-5/8	3-13/16	10-7/32

Note: To specify plug with Environmental Cover, change third letter in Part No. “L” to “E”

RECEPTACLES

IN-LINE RECEPTACLE WITH MECHANICAL CLAMP NUT

ZRLM Without Cover
ZREM With Environmental Plug Cover



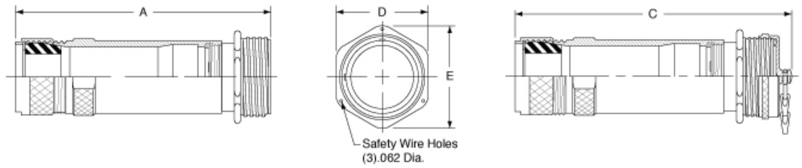
Shell Size	WITH STANDARD CABLE ADAPTER						WITH LONG CABLE ADAPTER					
	A	C	D	E	F	G	A	C	D	E	F	G
12	6-1/8	6-3/4	1-3/4	1-61/64	1-3/4	2-3/8	8-3/8	9	1-3/4	1-61/64	1-3/4	2-3/8
16	6-7/16	7-1/16	2-1/4	2-31/64	2-1/4	3	8-11/16	9-5/16	2-1/4	2-31/64	2-1/4	3
20	7	7-5/8	2-3/4	3-1/32	2-3/4	3-3/4	9-1/4	9-7/8	2-3/4	3-1/32	2-3/4	3-3/4
C20	7-1/2	8-1/8	2-3/4	3-1/32	2-3/4	3-3/4	9-3/4	10-3/8	2-3/4	3-1/32	2-3/4	3-3/4
24	7-9/16	8-3/16	3-1/4	3-9/16	3-1/4	4-1/2	9-13/16	10-7/16	3-1/4	3-9/16	3-1/4	4-1/2
C24	8-1/16	8-11/16	3-1/4	3-9/16	3-1/4	4-1/2	10-5/16	10-15/16	3-1/4	3-9/16	3-1/4	4-1/2
28	8-1/8	8-3/4	3-3/4	4-1/16	3-3/4	5-1/8	10-1/8	10-3/4	3-3/4	4-1/16	3-3/4	5-1/8
C28	8-5/8	9-1/4	3-3/4	4-1/16	3-3/4	5-1/8	10-5/8	11-1/4	3-3/4	4-1/16	3-3/4	5-1/8

Note: To specify plug with Environmental Cover, change third letter in Part No. “L” to “E”. Dimensions are shown in Inches

RECEPTACLES

IN-LINE RECEPTACLE WITH STANDARD COMPRESSION NUT

ZRLD Without Cover
ZRED With Environmental Plug Cover

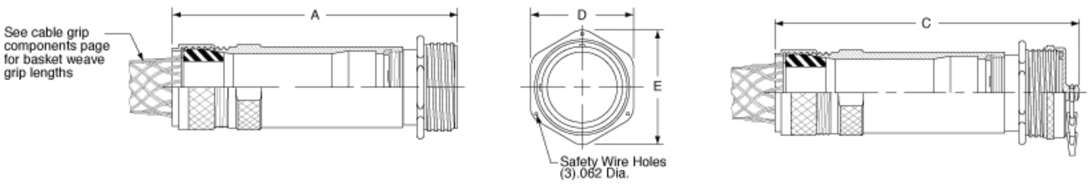


Shell Size	WITH STANDARD CABLE ADAPTER				WITH LONG CABLE ADAPTER			
	A	C	D	E	A	C	D	E
12	5-3/8	6	1-3/4	1-61/64	7-5/8	8-1/4	1-3/4	1-61/64
16	5-5/8	6-1/4	2-1/4	2-31/64	7-7/8	8-1/2	2-1/4	2-31/64
20	6-1/8	6-3/4	2-3/4	3-1/32	8-3/8	9	2-3/4	3-1/32
C20	6-5/8	7-1/4	2-3/4	3-1/32	8-7/8	9-1/2	2-3/4	3-1/32
24	6-5/8	7-1/4	3-1/4	3-9/16	8-7/8	9-1/2	3-1/4	3-9/16
C24	7-1/8	7-3/4	3-1/4	3-9/16	9-3/8	10	3-1/4	3-9/16
28	7-1/8	7-3/4	3-3/4	4-1/16	9-1/8	9-3/4	3-3/4	4-1/16
C28	7-5/8	8-1/4	3-3/4	4-1/16	9-5/8	10-1/4	3-3/4	4-1/16

Note: To specify plug with Environmental Cover, change third letter in Part No. “L” to “E”

IN-LINE RECEPTACLE WITH BASKETWEAVE CABLE GRIP

ZRLK Without Cover
ZREK With Environmental Plug Cover

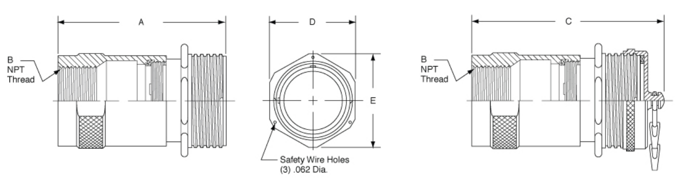


Shell Size	WITH STANDARD CABLE ADAPTER				WITH LONG CABLE ADAPTER			
	A	C	D	E	A	C	D	E
12	5-3/8	6	1-3/4	1-61/64	7-5/8	8-1/4	1-3/4	1-61/64
16	5-5/8	6-1/4	2-1/4	2-31/64	7-7/8	8-1/2	2-1/4	2-31/64
20	6-1/8	6-3/4	2-3/4	3-1/32	8-3/8	9	2-3/4	3-1/32
C20	6-5/8	7-1/4	2-3/4	3-1/32	8-7/8	9-1/2	2-3/4	3-1/32
24	6-5/8	7-1/4	3-1/4	3-9/16	8-7/8	9-1/2	3-1/4	3-9/16
C24	7-1/8	7-3/4	3-1/4	3-9/16	9-3/8	10	3-1/4	3-9/16
28	7-1/8	7-3/4	3-3/4	4-1/16	9-1/8	9-3/4	3-3/4	4-1/16
C28	7-5/8	8-1/4	3-3/4	4-1/16	9-5/8	10-1/4	3-3/4	4-1/16

Note: To specify plug with Environmental Cover, change third letter in Part No. “L” to “E”

IN-LINE RECEPTACLE WITH CONDUIT ADAPTER

ZRLT Without Cover
ZRET With Environmental Plug Cover



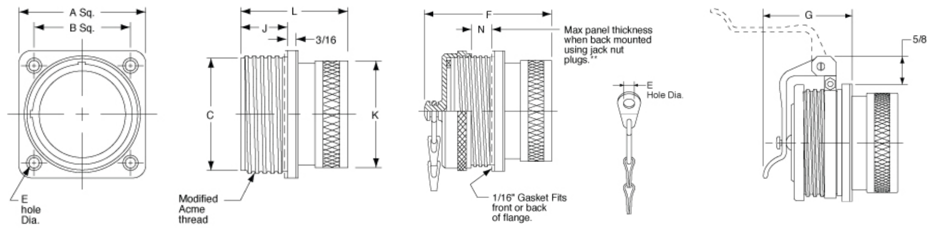
Shell Size	Conduit Size	WITH STANDARD CABLE ADAPTER				
		A	B	C	D	E
12	3/4	4-1/4	3/4	4-7/8	1-3/8	1-61/64
16	1-1/4	4-3/8	1-1/4	5	2-1/4	2-15/32
20	1-1/2	4-1/2	1-1/2	5-1/8	2-3/4	3-1/32
C20	1-1/2	5	1-1/2	5-5/8	2-3/4	3-1/32
24	2	4-5/8	2	5-1/4	3-1/4	3-9/16
C24	2	5-1/8	2	5-3/4	3-1/4	3-9/16
28	2-1/2	5-3/32	2-1/2	5-23/32	3-3/4	4-1/16
C28	2-1/2	5-19/32	2-1/2	6-7/32	3-3/4	4-1/16

Note: To specify plug with Environmental Cover, change third letter in Part No. “L” to “E”. Dimensions are shown in Inches

RECEPTACLES

SQUARE FLANGE RECEPTACLE

ZRLP Without Cover
ZREP With Environmental Plug Cover

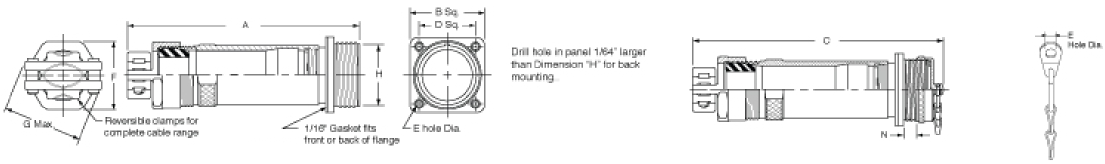


Shell Size	WITH STANDARD CABLE ADAPTER									
	A	B	C	E	F	G	J	K	L	N
12	1-3/4	1-3/8	1-1/12	11/64	2-15/16	2-1/8	1	1-11/32	2-21/64	1/4
16	2-1/4	1-11/16	2	13/64	2-15/16	2-1/8	1	1-27/32	2-21/64	1/4
20	2-3/4	2-3/32	2-1/2	7/32	2-15/16	2-3/16	1	2-11/32	2-21/64	1/4
C20	2-3/4	2-3/32	2-1/2	7/32	3-7/16	2-11/16	1-1/2	2-11/32	2-53/64	3/4
24	3-1/4	2-17/32	3	9/32	2-15/16	2-3/16	1	2-27/32	2-21/64	1/4
C24	3-1/4	2-17/32	3	9/32	3-7/16	2-11/16	1-1/2	2-27/32	2-53/64	3/4
28	3-3/4	3-1/32	3-1/2	11/32	2-15/16	2-3/16	1	3-11/32	2-21/64	1/4
C28	3-3/4	3-1/32	3-1/2	11/32	3-7/16	2-11/16	1-1/2	3-11/32	2-53/64	3/4

Note: To specify plug with Environmental Cover, change third letter in Part No. “L” to “E”

SQUARE FLANGE RECEPTACLE WITH MECHANICAL CLAMP NUT

ZRLPM Without Cover
ZREPM With Environmental Plug Cover
ZRCPM With Spring Door Cover



Shell Size	WITH STANDARD CABLE ADAPTER									WITH LONG CABLE ADAPTER								
	A	B	C	D	E	F	G	H	N	A	B	C	D	E	F	G	H	N
12	6-1/8	1-3/4	6-3/4	1-3/8	11/64	1-3/4	2-3/8	1-1/2	1/4	8-3/8	1-3/4	9	1-3/8	11/64	1-3/4	2-3/8	1-1/2	1/4
16	6-7/16	2-1/4	7-1/16	1-11/16	13/64	2-1/4	3	2	1/4	8-11/16	2-1/4	9-5/16	1-11/16	13/64	2-1/4	3	2	1/4
20	7	2-3/4	7-5/8	2-3/32	7/32	2-3/4	3-3/4	2-1/2	1/4	9-1/4	2-3/4	9-7/8	2-3/32	7/32	2-3/4	3-3/4	2-1/2	1/4
C20	7-1/2	2-3/4	8-1/8	2-3/32	7/32	2-3/4	3-3/4	2-1/2	3/4	9-3/4	2-3/4	10-3/8	2-3/32	7/32	2-3/4	3-3/4	2-1/2	3/4
24	7-9/16	3-1/4	8-3/16	2-17/32	9/32	4-1/2	4-1/2	3	1/4	9-13/16	3-1/4	10-7/16	2-17/32	9/32	4-1/2	4-1/2	3	1/4
C24	8-1/16	3-1/4	8-11/16	2-17/32	9/32	4-1/2	4-1/2	3	3/4	10-5/16	3-1/4	10-15/16	2-17/32	9/32	4-1/2	4-1/2	3	3/4
28	8-1/8	3-3/4	8-3/4	3-1/32	11/32	5-1/8	5-1/8	3-1/2	1/4	10-1/8	3-3/4	10-3/4	3-1/32	11/32	5-1/8	5-1/8	3-1/2	1/4
C28	8-5/8	3-3/4	9-1/4	3-1/32	11/32	5-1/8	5-1/8	3-1/2	3/4	10-5/8	3-3/4	11-1/4	3-1/32	11/32	5-1/8	5-1/8	3-1/2	3/4

Note: To specify plug with Environmental Cover, change third letter in Part No. “L” to “E”
To specify receptacle with Spring Door Cover, change third letter in Part No. “L” to “C”

SQUARE FLANGE RECEPTACLE WITH BASKETWEAVE CABLE GRIP

ZRLPK Without Cover
ZREPK With Environmental Plug Cover
ZRCPK With Spring Door Cover

Shell Size	WITH STANDARD CABLE ADAPTER							WITH LONG CABLE ADAPTER						
	A	B	C	D	E	F	G	A	B	C	D	E	F	G
12	5-3/8	1-3/4	6	1-3/8	11/64	1-1/2	1/4	7-5/8	1-3/4	8-1/4	1-3/8	11/64	1-1/2	1/4
16	5-5/8	2-1/4	6-1/4	1-11/16	13/64	2	1/4	7-7/8	2-1/4	8-1/2	1-11/16	13/64	2	1/4
20	6-1/8	2-3/4	6-3/4	2-3/32	7/32	2-1/2	1/4	8-3/8	2-3/4	9	2-3/32	7/32	2-1/2	1/4
C20	6-5/8	2-3/4	7-1/4	2-3/32	7/32	2-1/2	3/4	8-7/8	2-3/4	9-1/2	2-3/32	7/32	2-1/2	3/4
24	6-5/8	3-1/4	7-1/4	2-17/32	9/32	3	1/4	8-7/8	3-1/4	9-1/2	2-17/32	9/32	3	1/4
C24	7-1/8	3-1/4	7-3/4	2-17/32	9/32	3	3/4	9-3/8	3-1/4	10	2-17/32	9/32	3	3/4
28	7-1/8	3-3/4	7-3/4	3-1/32	11/32	3-1/2	1/4	9-1/8	3-3/4	9-3/4	3-1/32	11/32	3-1/2	1/4
C28	7-5/8	3-3/4	8-1/4	3-1/32	11/32	3-1/2	3/4	9-5/8	3-3/4	10-1/4	3-1/32	11/32	3-1/2	3/4

Note: To specify plug with Environmental Cover, change third letter in Part No. “L” to “E”
To specify receptacle with Spring Door Cover, change third letter in Part No. “L” to “C”
Dimensions are shown in Inches

MOD II CRIMP CONTACTS & TOOLING

CONTACT SIZE	CRIMP WIRE RANGE	PIN	"C" PIN*	GROUND PIN	SOCKET	WIRE STRIP LENGTH	HAND CRIMP TOOL	LOCATOR	POWER CRIMP TOOL	POWER CRIMP DIE	POWER CRIMP LOCATOR	"C" PIN LOCATOR	INSERTION TOOL	EXTRACTION TOOL
18	18-22 AWG	ZP-4018-36L	-	-	ZP-4118-36L	11.5mm	M300-25A	TP682-1	-	-	-	-	TP-201047-1	TP-201459 (pin) TP-201011-3 (skt)
16	16-20 AWG	ZP-4016-36L	-	ZP-4016-37L	ZP-4116-36L	14.6mm	M300-25A	TP682-1	-	-	-	-	TP-201048-1	TP-201459 (pin) TP-201010-3 (skt)
12	12-16 AWG	ZP-4012-36L	ZP-4012-36LB	ZP-4012-37L3	ZP-4112-36L	15.5mm	M300-25A	"TP683-1 (pin) TP684-1 (skt)"	400-B-1	414DA-12N	4150	4151	TP-201049-1	TP-201459 (pin) TP-201009-3 (skt)
10	10-14 AWG	ZP-4010-36L	-	ZP-4010-37L2	ZP-4110-36L	17.1mm	M300-25A	TP684-1	400-B-1	414DA-10N	4152	-	TP-201046-1	TP-201459 (pin) TP-201008-3 (skt)
8	8-10 AWG	ZP-4008-36L	-	-	ZP-4108-36L	21.0mm	-	-	400-B-1	414DA-8N	4154	-	TP-201007-A TP-201007-B	Contact us
4	4-6 AWG	ZP-4004-36L	-	-	ZP-4104-36L	23.0mm	-	-	400-B-1	414DA-4N	4156	-	TP-201033-A TP-201033-B	Contact us
1/0	1/0-2 AWG	-	ZP-4000-66LB	-	ZP-4100-66L	31.0mm	-	-	400-B-1	414DA-1/0PN 414DA-2PN	-	4158	-	Contact us
4/0	4/0-2/0 AWG	-	ZP-4041-76LB	-	ZP-4141-76L	31.6mm	Contact us	Contact us	Contact us	Contact us	Contact us	Contact us	Contact us	Contact us
313 MCM	313 MCM	-	RIG-C24-313PN	-	RIG-C24-313SN	33.5mm	Contact us	Contact us	Contact us	Contact us	Contact us	Contact us	Contact us	Contact us
373 MCM	373 MCM	-	RIG-C24-373PN	-	RIG-C24-373SN	33.5mm	Contact us	Contact us	Contact us	Contact us	Contact us	Contact us	Contact us	Contact us
500 MCM	500-535 MCM	-	P-206053-CP	-	P-206053-CS	33.5mm	Contact us	Contact us	Contact us	Contact us	Contact us	Contact us	Contact us	Contact us
535 MCM	535 MCM	-	RIG-C24-535PN	-	RIG-C24-535SN	33.5mm	Contact us	Contact us	Contact us	Contact us	Contact us	Contact us	Contact us	Contact us
646 MCM	646-777 MCM	-	RIG-C24-386PN	-	RIG-C24-386SN	33.5mm	Contact us	Contact us	Contact us	Contact us	Contact us	Contact us	Contact us	Contact us

MOD III CRIMP CONTACTS & TOOLING

CONTACT SIZE	CRIMP WIRE RANGE	PIN	"C" PIN*	GROUND PIN	SOCKET	WIRE STRIP LENGTH	HAND CRIMP TOOL	LOCATOR	POWER CRIMP TOOL	POWER CRIMP DIE	POWER CRIMP LOCATOR	"C" PIN LOCATOR	INSERTION TOOL	EXTRACTION TOOL
18	18-22 AWG	ZP-4018-50L	-	-	ZP-4108-50L	11.5mm	M300-25A	TP682-1	-	-	-	-	Not required	TP-201315-18
16	16-20 AWG	ZP-4016-50L	-	-	ZP-4106-50L	14.6mm	M300-25A	TP682-1	-	-	-	-	Not required	TP-201315-16
12	12-16 AWG	ZP-4012-50L	ZP-4012-50LB	ZP-4012-52LK	ZP-4102-50L	15.5mm	M300-25A	TP684-1 (skt) TP683-1 (pin)	400-B-1	414DA-12N	4002-3	4002-3	Not required	TP-201315-12
10	10-14 AWG	ZP-4010-50L		ZP-4010-52LK	ZP-4100-50L	17.1mm	M300-25A	TP684-1	400-B-1	414DA-10N	4003-3	4003-3	Not required	TP-201315-10
8	8-10 AWG	ZP-4008-50L	ZP-4008-50LB		ZP-4108-50L	21.0mm	-	-	400-B-1	414DA-8N	4004-3	4004-3	Not required	TP-201315-08
4	4-6 AWG	ZP-4004-50L		ZP-4004-52LK	ZP-4104-50L	23.0mm	-	-	400-B-1	414DA-4N	4005-3	4005-3	Not required	TP-201315-04
1/0	1/0-2 AWG	-	ZP-4000-50LB	ZP-4800-52LK	ZP-4100-50L	31.0mm	-	-	400-B-1	414DA-1/0PN 414DA-2PN	-	4006-3	Not required	TP-201260-00

* "C" pins are used in C length inserts and are 1/2 in. longer than standard.
Thermocouple contacts for Mod II size 16 (crimp) - contact us.

STAR-LINE CONNECTOR ASSEMBLY AND TERMINATION INSTRUCTIONS

Proper assembly of multiple-contact connectors, for the most part requires common sense. The simplicity of these instructions is perhaps the reason why they are easily overlooked or taken for granted. These 27 reminders can help eliminate connector failures caused by improper assembly.

1. Read the assembly instructions carefully before actually starting to assemble connectors. Besides the matter of instruction on correct procedures, there are two important reasons for this preliminary step: To identify the various component parts, and to check for any missing parts.

2. Cut cable jackets and sheathing squarely and to correct length, using only wire strippers that have been approved for the operation. In preparing the individual wires in cables and harnesses for assembly, make allowances in length for reaching the outermost circle of contact cavities in the connector insert. This, of course, means that the conductors and the insulation should be cut progressively longer as they extend out from the center of the cable or harness to assure sufficient length for any necessary forming.

3. Follow specifications covering maximum cable stripping lengths for efficient cable grommet sealing. All wires should be cut squarely so that they will fit into contact wire wells correctly.

4. Before starting actual termination wires, it is essential that cables and harnesses be laid out in a specified order in accordance with the wiring diagram. Proper layout will reduce the need for twisting and crossover of conductors. If the wiring layout is not correct, the termination operation will be difficult or even impossible and the chances for making errors will be increased. Cable and harness assemblies having a spiral layout also must be matched carefully to the correct contacts in both the male and female inserts.

5. Some cables have a soft filler or braid on the conductors which, compresses when external pressure is applied. As a result, the cable diameter may be reduced to a point where the sealing range of the grommet is exceeded. In addition, the seal may take a permanent set and further reduce sealing efficiency. To avoid leakage at the seal under these conditions, it is suggested that, where construction of the cable permits, a metal ferrule be slipped under the cable jacket at the stressed position. This ferrule will serve as a compression supporting member and enable the gland seal to withstand high external pressures.

6. Use only correct size sealing grommets to assure resistance to moisture and other contaminants. Make certain that cable jacket is smooth where grommet is to seal. Remove any grooves or ridges if present by sanding or scarfing.

7. Use only the proper crimping tools that have been set or calibrated with precision gages.

8. When contacts are to be soldered, avoid direct contact of soldering tools to inserts. An open flame or hot soldering tip can carbonize insulating materials and make them useless.

9. Make certain that all contacts are the correct size before attempting to assemble them into insert cavities. This point is particularly important when both power and control types of contacts are used in the same connector.

10. Be sure that grounding contacts are correctly located.

11. Seat all contacts properly so that they will not be damaged or become disengaged during connector mating operations.

12. Use only the proper insertion tools and be sure that they are aligned axially when pushing contacts into their fully seated position.

13. When inserts have more cavities than conductors, plug unused cavities with either plain contacts or special seal plugs designed for the purpose. Some connectors require both a contact and seal plug in unused cavities to meet military specifications and to assure complete internal environmental sealing.

14. After all terminated contacts are inserted in their respective cavities and inspected, the cable adapter or insert clamp nut should be tightened with a wrench. This assembly operation should be done by placing the components in a vise with smooth-faced jaws and using a strap wrench.

15. If for any reason terminated conductors have to be removed from an insert because of any assembly error or change in circuitry, be sure to remove the cable clamp or insert clamp nut first before extracting the contact and reinserting it. This step is important because any attempt to remove the contacts when the resilient insulator components are compressed will result in damage.

16. When handling cables, use adequate support to prevent damage to the internal wires. Gland nuts and grommets are intended for sealing purposes and should not be used as a cable grip.

17. If one of the connector poles is a grounding wire, make sure that it is grounded properly before the connector is actually engaged.

18. When connectors having the same configuration are to be mounted close together, different or alternate keying arrangements should be used to prevent mismating or cross-mating and possible damage to the electrical system or human injury.

19. Always inspect all aspects of connector assembly operations before putting connectors into actual operation.

20. Crimping and terminating of conductors to contacts must be done carefully. Make certain that wire strands are fully bottomed in contact wells by checking through inspection hole provided.

21. Soldering conductors to contacts must be done carefully and a non-conductive flux should be used to avoid corrosion or hygroscopic action. Do not use solder salts or acids because they may affect the dielectric properties of insulation materials.

22. Be careful not to damage wire grommets or contact retaining collets when inserting or extracting contacts.

23. Never try to straighten bent contacts. Straightening cannot be done properly and the plating on contacts will very likely be marred. This will result in a high resistance connection and will expose the base metal to possible corrosion.

24. Do not attempt to remove inserts that are bonded or locked in place in their shells.

25. Be certain that all components of connectors are assembled. Each part performs a vital function and it would not be included if it wasn't useful.

26. Each assembler of connectors should be his own inspector. Assembly workmanship is a significant factor in determining the quality of multiple-contact connectors. Quality cannot be "inspected" into connectors; it must be "built-in" during each and every assembly operation.

27. When potting connectors be sure to apply potting only in mated condition to assure that contacts will align properly.