

MIL-DTL-38999
Features and Application
Series III



Features and Application

MIL-DTL-38999 Series III is the newest cylindrical connector designed for highest performance capabilities used in both general purpose and severe environment applications.

These connectors feature an improved "one-turn" coupling system, utilizing self-locking acme thread. Acme threads provide coupling durability, while thicker wall sections and greater coupling surface area improve strength and shock resistance. Blunting of the threads on both receptacle and plug coupling nut eliminates cross threading.

Elongated mounting holes permit the Series III Connector to intermount with various existing Mil-spec flange mounted receptacles, giving it a design replacement advantage.

Wall mount receptacle, jam nut receptacle and straight self-locking RFI plug are offered in 9 shell sizes and 54 insert arrangements utilizing M39029 contacts in sizes 22D, 20, 16, 12, 10 power and 8 twinax.

These connectors are available in wide range of shell materials and finishes. Aluminum shells are offered in electroless nickel and olive drab cadmium. Other finishes such as anodic and zinc cobalt are available upon request to commercial callouts only. In addition, we offer stainless steel shells (both passivated and electro-deposited nickel plated) with firewall inserts, and for highly corrosive environments, nickel-aluminum-bronze shells with standard environment-resisting inserts (commercial callouts only).

MIL-STD-1560 Insert Arrangements – Series III connectors use insert patterns and contacts common to Series I, making for an easy transition from bayonet to triple-lead, acme-thread, self-locking coupling.

Metal-to-Metal Bottoming – This feature precludes relative shell-to-shell motion, which may result in ordinary connector wear and moisture entrapment.

Lockwiring Eliminated – Self-locking quick coupling plug eliminates the need for lockwiring.

Firewall Capability - Stainless steel shells in both K and S firewall classes are offered.



Twinax Contacts – Aero Electric is Qualified to make and supply M39029/90-529 and M39029/91-530 size 8 Twinax contacts used in 38999 III connectors. Please consult factory even when needing to buy just the contacts.

Metric Accessory Thread – Metric thread results in additional wall thickness giving greater strength and shock resistance.

Superior Contact Stability – Rear release crimp contact system features a stamped beryllium-copper retaining clip captivated by molded-in shoulders of each contact cavity in the insulator. A rear-inserted M81969 plastic tool expands the times beyond the shoulder, releasing the contact.

Elastomer Wire Sealing Grommet – Sealing over a wide range of wire diameters is assured by a triple wire seal in each cavity at the rear of the connector.

Interfacial Pin Insert Seal – Raised moisture barriers around each pin, which mate into lead-in chamfers of hard face socket insert, provide individual contact sealing. Interfacial seal is never touched by service tools.

Closed-Entry Socket Insert – Hard dielectric socket face has lead-in chamfers for positive alignment of pins (even partially bent within pre-established limits) with sockets.

Scoop-Proof Design – Recessed pins in elongated shells minimize the possibility for contact damage. In a blind mating application, mating shells cannot "scoop" the pins, and cause a shorting or bending of contacts.

Universal I/R Tool – A single, expendable plastic tool is used for both insertion and removal of contacts.

MIL-DTL-38999
Part Number Development
Series III



Military and Aero-Electric Part Number Development

Mil. Prefix	Aero Prefix	Shell Type (Specification Sheet Number)	Class (Material & Finish)	Shell Size	Insert Arrangement	Contact Style	Polarization (Keying)	Modification (applies to Aero part numbers only)
D38999/	AE3	20	F = Aluminum shell, electroless nickel finish W = Aluminum shell, olive drab cadmium over electroless nickel base T = Aluminum shell, nickel flourocarbon polymer finish (consult factory for availability) Z = Aluminum shell, zinc nickel finish (consult factory for availability) K = Stainless steel shell, passivated, with firewall insert S = Stainless steel shell, electroplated nickel, with firewall insert BN* = Aluminum shell, black nickel finish, (RoHS), (Aero p/n/ only) BZ* = Aluminum nickel bronze shell with standard insert (Aero p/n/ only) ZC* = Aluminum shell, zinc cobalt plating, (RoHS), (Aero p/n/ only)	A, B, C, D, E, F, G, H or J	See pages 60 thru 62	P = Pin S = Socket A = Pin connector less pins (with intent to use non-std pin contacts) B = Socket connector less sockets (with intent to use non-std socket contacts)	N = Normal (included in part number) A, B, C, D, or E	01 = Less contacts (is not marked on the part) 340 = Connector kitted with M85049/15-XXX 341 = Connector kitted with M85049/38-XXX straight clamp 342 = Connector kitted with M85049/39-XXX right angle clamp Consult factory for other modifications
		20	W					
		35	C					
		35	P					
		-340	N					

* Not on QPL, can be supplied to Aero-Electric part number only.

Note 1: Each connector is furnished with contacts unless ordered less contacts (I/C) as follows: One spare contact for inserts requiring 2 through 26 of each contact and two spares for inserts with 27 or more contacts, and a minimum of one sealing plug up to 10% of the number contacts. Spare Coax and Twimax contacts are not supplied. One insertion/extraction tool for each contact size is also included.

Note 2: Proper part number marking has no "0" in front of single digit layout. Example: J D38999/20WB5SN, "N" for normal is included. In addition, J or JAN must be marked immediately in front of MIL part number.

	A	B	C	D	F	G	H	J
Shell	±.016	±.004	±.006	±.024	±.000	±.035	±.004	±.010
	mm	mm	mm	mm	mm	mm	mm	mm
	inch	inch	inch	inch	inch	inch	inch	inch
Jam Nut Thread	Maximum							
	0.100R							
A	1.063	27.00	16.53	24.00/21.82	.555	14.10	12	.299
B	1.252	31.80	19.07	27.00/24.99	.555	14.10	16	.427
C	1.374	34.90	23.82	32.00/29.77	.555	14.10	20	.541
D	1.500	38.10	26.97	36.00/32.91	.555	14.10	24	.666
E	1.626	41.30	30.15	37.00/36.12	.555	14.10	28	.791
F	1.811	46.00	33.32	41.00/39.26	.555	14.10	32	.897
G	1.937	49.20	36.50	46.00/42.47	.555	14.10	36	1.022
H	2.063	52.40	39.67	50.00/45.61	.555	14.10	40	1.147
J	2.189	55.60	42.85	51.23/49.25	.555	14.10	44	1.272

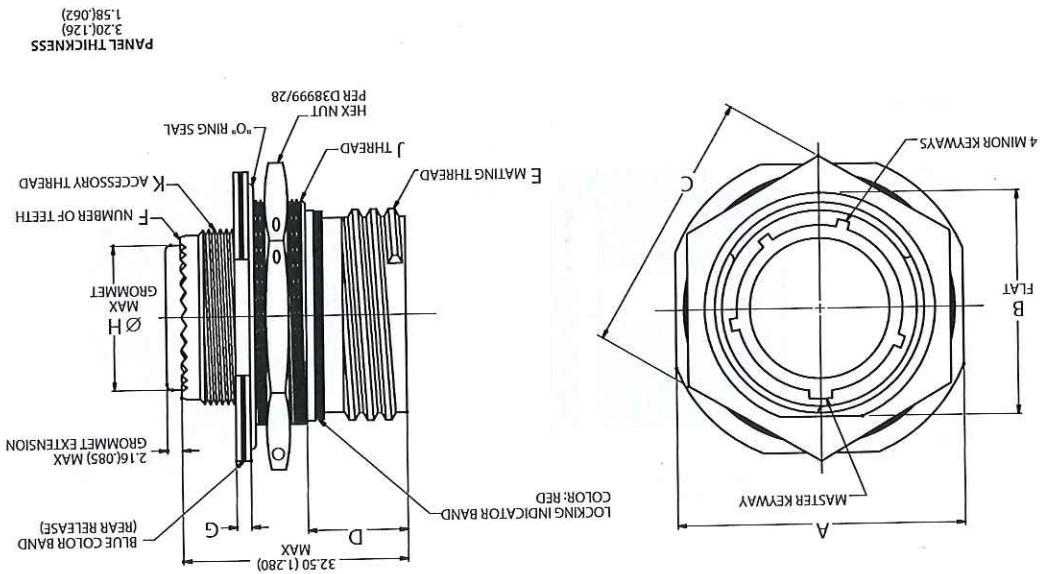
Note 1: "K" Accessory Thread for AE324 is same as AE326 ("D" Accessory Thread) on page 49.

Note 2: "E" Mating Thread for AE324 is same as AE326 ("E" Mating Thread) on page 49 except it is Class 2A.

Note 3: Maximum Grommet Extension for insert layouts incorporating size 8 and 10 contacts = 5.95(.234).

Page 46 Completed Part Number
 Page 52 Contacts, Sealing Plugs and Tools
 Pages 60-62 Insert Arrangements
 Page 45 Performance Specifications
 Pages 58, 59 Insert Availability and Contact Information
 Page 50 Polarization

Triple Start Threaded Coupling, Crimp Removable, Rear Release, Scoop-Proof



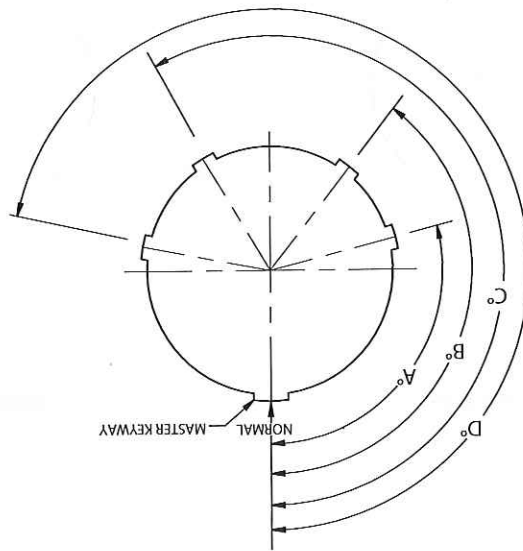
D38999/24
Jam Nut Receptacle
AE324



Shell Size	Key/Keyway	Identification Letter	A°	B°	C°	D°	
A (9)	N	N	105	140	215	265	
	A	A	102	132	248	320	
	B	B	80	118	230	312	
	C	C	35	140	205	275	
	D	D	64	155	234	304	
	E	E	91	131	197	240	
	N	N	95	141	208	236	
	A	A	113	156	182	292	
	B	B	90	145	195	252	
	C	C	53	156	220	255	
B (11) C (13) D (15)	D	D	119	146	176	298	
	E	E	51	141	184	242	
	N	N	80	142	196	293	
	A	A	135	170	200	310	
	B	B	49	169	200	244	
	C	C	66	140	200	257	
	D	D	62	145	180	280	
	E	E	79	153	197	272	
	Key/Keyway Positions	BSC					

Notes:

1. Mating face of receptacle shown (plug is opposite).
2. All minor keyways (keys) are rotated to provide shell polarization while master keyway (key) remains fixed as shown.
3. The angles for a given connector are the same whether it contains pin or socket inserts.
4. Insert arrangement does not rotate relative to the master keyway (key).



Keying Positions

MIL-DTL-38999
Polarization
Series III



† MS3348 bushing required with 12 gauge wire.
 * When tested with silver-plated wire.
 ** Insertion tool is not required.
 *** Dummy contact, used in lieu of unwired contact and seal plug.
 **** Aero Electric is Qualified for Twinax contacts, consult factory for a quote.

Note: Size 8 coax contacts are used with M17/095-RG180 cable, while size 8 Twinax contacts are used with M17/176-00002 cable.

Contact Size	DC Test	Max. Drop	Well Dia.	Minimum Well Dept	Crimp Well Data			Wire Range	Finished Wire Ø Range
					Amps	Millivolts	Well Dia.		
10	33.0	33	.137 ±.003	.355	9.02	12-104	3.31-5.26	.135 3.42 .162 4.12	
12	23.0	42	.100 ±.002	.209	5.31	14-12	2.08-3.31	.097 2.46 .142 3.61	
16	13.0	49	.067 ±.001	.209	5.31	20-16	.52-1.31	.065 1.65 .109 2.77	
20	7.5	55	.047 ±.001	.209	5.31	24-20	.20-.52	.040 1.02 .083 2.11	
22D	5.0	73	.0345 ±.0010	.141	3.58	28-22	.08-.33	.030 .76 .054 1.37	

Contact and Wire Data

Contact Size/Type	Crimp Tool	Positioner	Positioner	Insertion Tool	Extraction Tool	Contact	
						Military No.	For Pin Contacts
8 Twinax Outer	M22520/5-01	M22520/5-200	M22520/5-200	M22520/5-200			
8 Twinax Center	M22520/2-01	M22520/2-37	M22520/2-37	M22520/2-37			
8 Coax Outer	M22520/5-01	M22520/5-05	M22520/5-05	M22520/5-05			
8 Coax Inner	M22520/2-01	M22520/2-31	M22520/2-31	M22520/2-31			
10 (Power)							
12 Coax Outer	M22520/31-01	M22520/31-02	M22520/31-02	M22520/31-02			
12 Coax Inner	M22520/2-01	M22520/2-34	M22520/2-34	M22520/2-34			
12	M22520/1-01	M22520/1-04	M22520/1-04	M22520/1-04			
16	M22520/1-01	M22520/1-04	M22520/1-04	M22520/1-04			
20	M22520/2-01	M22520/2-10	M22520/2-10	M22520/2-10			
22D	M22520/2-01	M22520/2-09	M22520/2-07	M22520/2-07			
	Military No.	Military No.	Military No.	Military No.	Military No.		
		For Socket Contacts					

Crimping and Metal Insertion/Extraction Tools

Contact Size	Application	Pin Contacts	Socket Contacts	Seal Plugs	Insertion/Removal Tools	Contact	
						Military No.	Type
8 Twinax****	Twinax	M39029/90-529	M39029/91-530	MS27488-8-1	M81969/14-12		
8 Coax	Coax	M39029/60-367	M39029/59-366	MS27488-8-1	M81969/14-06		
10 (Power)	Power	M39029/58-528	M39029/56-527	M85049/81-10***	M81969/14-05		
12 Coax	Coax	M39029/102-558	M39029/103-559	MS27488-12-1	M81969/14-04		
12 Coax	Coax	M39029/28-211	M39029/75-416				
12	Power/Signal	M39029/58-365	M39029/56-353				
16	Power/Signal	M39029/58-364	M39029/56-352	MS27488-16-1	M81969/14-03		
20	Power/Signal	M39029/58-363	M39029/56-351	MS27488-20-1	M81969/14-10		
22D	Power/Signal	M39029/58-360	M39029/56-348	MS27488-22-1	M81969/14-01		
		Military No.	Military No.	Military No.	Military No.		

Contacts, Plastic Insertion/Removal Tools and Seal Plugs

MIL-DTL-38999 Series III Contacts, Tools and Seal Plugs

conesys

38999 S III

* Not on QPL, can be supplied to Aero-Electric part number only.

MIL. Prefix	Aero Prefix	Shell Type	Shell Size	Material Finish	Style
D38999/	AE3	32	9, 11, 13, 15, 17, 19, 21, 23, 25	W = Aluminum Shell, Olive Drab Cadmium Finish F = Aluminum, Electroless Nickel Finish K = Stainless Steel, Passivated S = Stainless Steel, Electrodeposited Nickel BN* = Aluminum Shell, Black Nickel Finish (Aero p/n only)	R = Wire Rope Assembly N = Wire Rope/Ring Assembly
11	W	32			
11	W	32			
R	W	32			
R	W	32			

Part Number Configuration
Protective Metal Caps

* Not on QPL, can be supplied to Aero-Electric part number only.
 ** Shell size code A is for use with plugs with mating key polarizations "C", "E" or "N".
 Shell size code AA is for use with plugs with mating key polarizations "A", "B" or "D".

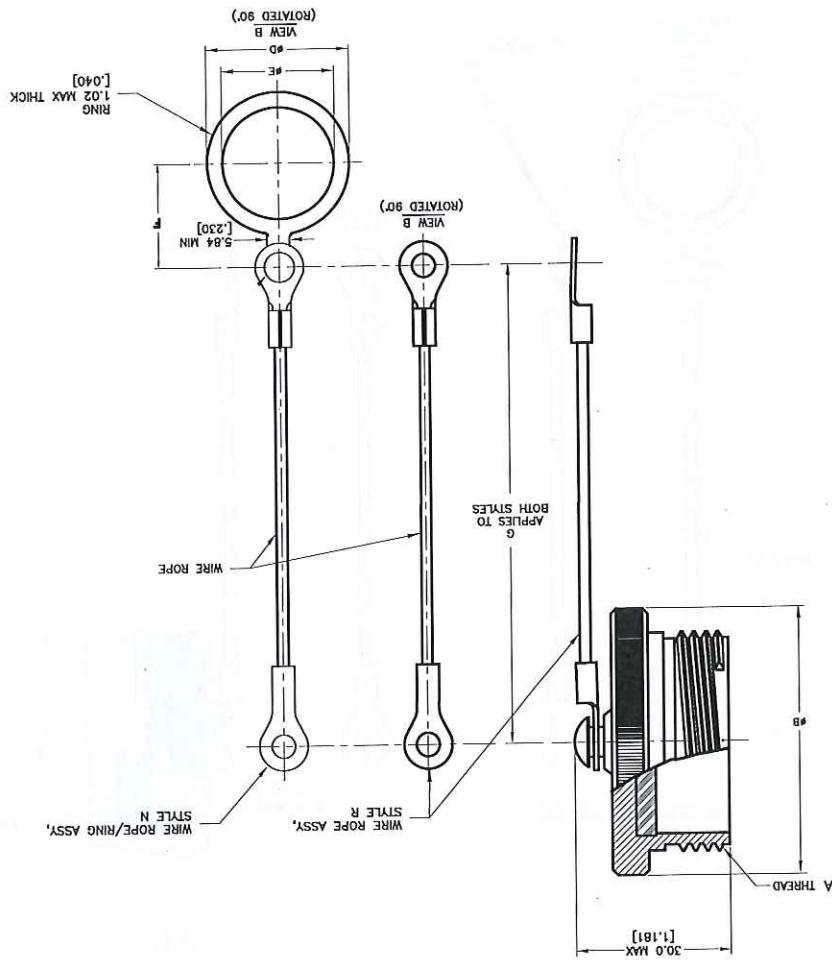
MIL. Prefix	Aero Prefix	Shell Type	Shell Size**	Material Finish
D38999/	AE3	22	A, B, C, D, E, F, G, H or J	W = Aluminum Shell, Olive Drab Cadmium Finish F = Aluminum, Electroless Nickel Finish K = Stainless Steel, Passivated S = Stainless Steel, Electrodeposited Nickel BN* = Aluminum Shell, Black Nickel Finish (Aero p/n only)
22	C	22		
22	C	22		
W	C	22		
W	C	22		

Part Number Configuration
Dummy Stowage Receptacle



38999 S III

SHELL SIZE	A THREAD CLASS 2A TRIPLE START		Ø B MAX		Ø D MAX		Ø E MAX		G		
	INCH	MM	INCH	MM	INCH	MM	INCH	MM			
9	.906	23.0	.945	24.0	.512	13.0	5.000	127.00	.6250-0.1P-0.3L	5.000	127.00
11	1.024	26.0	1.063	27.0	.709	18.0	5.000	127.00	.7500-0.1P-0.3L	5.000	127.00
13	1.221	31.0	1.181	30.0	.787	20.0	5.000	127.00	.8750-0.1P-0.3L	5.000	127.00
15	1.299	33.0	1.221	31.0	.906	23.0	5.000	127.00	1.0000-0.1P-0.3L	5.000	127.00
17	1.457	37.0	1.457	37.0	1.024	26.0	5.000	127.00	1.1875-0.1P-0.3L	5.000	127.00
19	1.575	40.0	1.575	40.0	1.142	29.0	5.000	127.00	1.2500-0.1P-0.3L	5.000	127.00
21	1.732	44.0	1.732	44.0	1.260	32.0	5.000	127.00	1.3750-0.1P-0.3L	5.000	127.00
23	1.811	46.0	1.811	46.0	1.339	34.0	5.000	127.00	1.5000-0.1P-0.3L	5.000	127.00
25	1.969	50.0	1.929	49.0	1.535	39.0	5.000	127.00	1.6250-0.1P-0.3L	5.000	127.00



Protective Cover Plug

D38999/32
Protective Cover, Plug
AE332



38999 S III

See next page for Shell Sizes G thru J layouts.

Insert Arrangement	Aero-Electric		Service	Total	Quantity of Contacts (by Size)				
	QPL'd	Tooled			Rating	Contacts	22D	20	16
Series III	Yes	Yes	M	6	6				
A35	Yes	Yes	I	3	3				
A98	Yes	Yes	I	2	2				
B2	Yes	Yes	I	4	4				
B4	Yes	Yes	I	5	5				
B5	Yes	Yes	M	13	13				
B35	Yes	Yes	I	6	6				
B98	Yes	Yes	I	7	7				
B99	Yes	Yes	I	4	4				
C4	Yes	Yes	I	8	8				
C8	Yes	Yes	M	22	22				
C35	Yes	Yes	I	10	10				
C98	Yes	Yes	II	5	5				
D5	Yes	Yes	I	14	14				
D15	Yes	Yes	I	18	18				
D18	Yes	Yes	I	19	19				
D19	Yes	Yes	M	37	37				
D35	Yes	Yes	I	12	12				
D97	Yes	Yes	I	6	6				
E6	Yes	Yes	II	8	8				
E8	Yes	Yes	I	26	26				
E26	Yes	Yes	M	55	55				
E35	Yes	Yes	I	21	21				
E99	Yes	Yes	II	11	11				
F11	Yes	Yes	I	26	26				
F28	Yes	Yes	I	29	29				
F30	Yes	Yes	I	32	32				
F32	Yes	Yes	M	66	66				
F35	Yes	Yes							

Insert Availability and Contact Information

MIL-DTL-38999 Series III
 Insert Availability and Contact Information
 per MIL-STD-1560

conesys

38999 S III

Insert Arrangements Views

MIL-STD-1560

Insert Arrangements (Pin Front View)

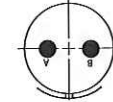
for MIL-DTL-38999 Series III Connectors



A35, M
6 # 22D, M



A98,
3 # 20, I



B2,
2 # 16, I



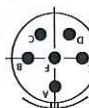
B4,
4 # 20, I



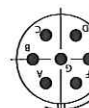
B5,
5 # 20, I



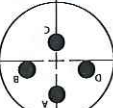
B35,
13 # 22D, M



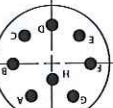
B98,
6 # 20, I



B99,
7 # 20, I



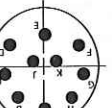
C4,
4 # 16, I



C8,
8 # 20, I



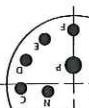
C35,
22 # 22D, M



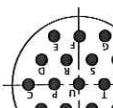
C98,
10 # 20, I



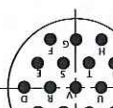
D5,
5 # 16, II



D15,
1 # 16, 14 # 20, I



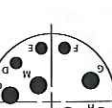
D18,
18 # 20, I



D19,
19 # 20, I



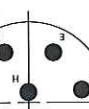
D35,
37 # 22D, M



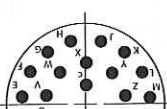
D97,
4 # 16, 8 # 20, I



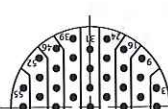
E6,
6 # 12, I



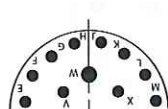
E8,
8 # 16, II



E26,
26 # 20, I



E35,
55 # 22D, M

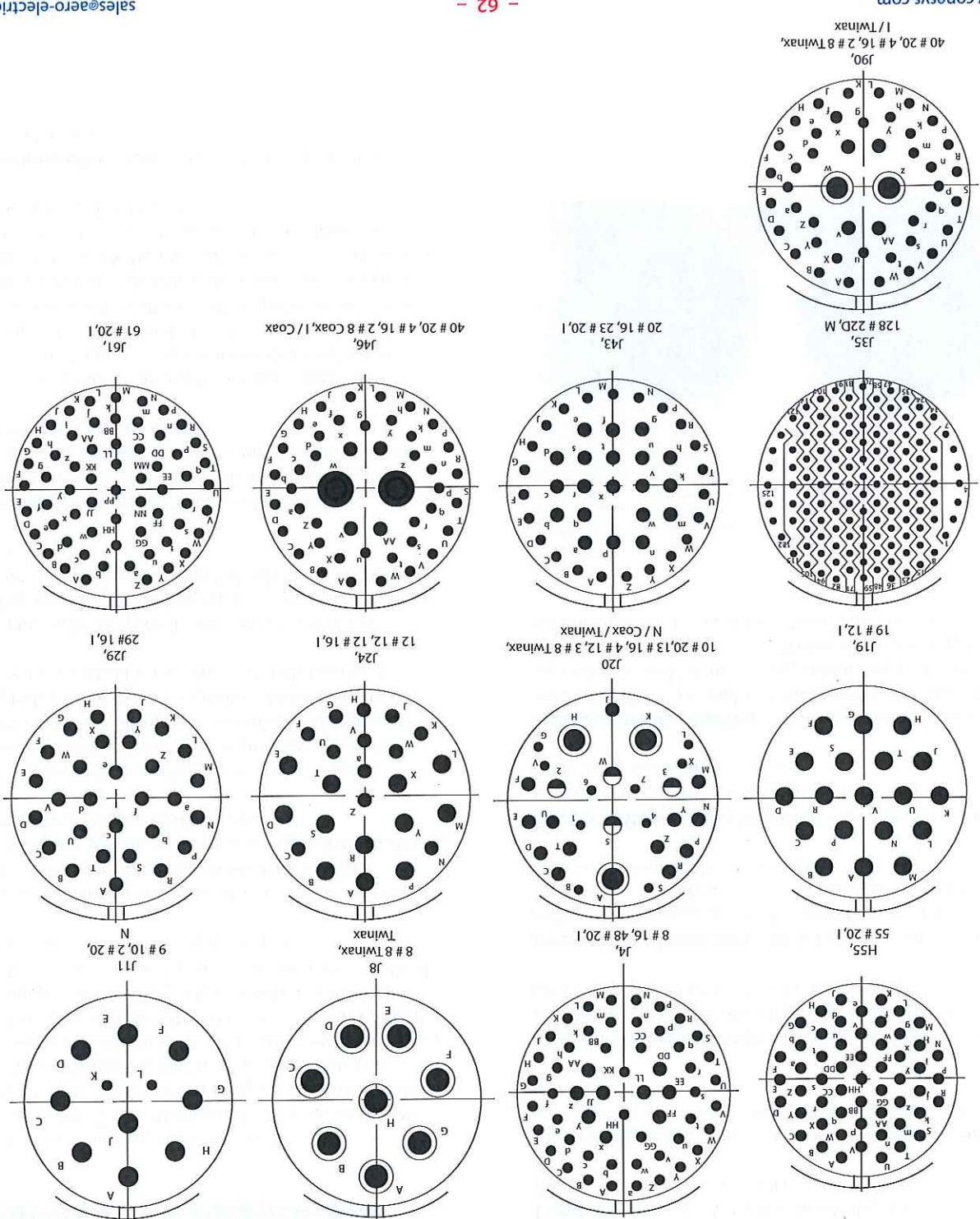


E99,
2 # 16, 21 # 20, I

MIL-STD-1560
Insert Arrangements (Pin Front View)
 for MIL-DTL-38999 Series III Connectors



Insert Arrangements Views



38999 S III

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[60-042022-23P](#) [60-042217-10P](#) [0114-201-1278](#) [012-0467-000](#) [602GB06EG24-61SN](#) [0134-201-1207](#) [0134-213-1006](#) [6104-207-2302](#) [6104-](#)
[208-1902](#) [61-168211-04P](#) [61-168617-10P](#) [6131-202-19149P](#) [6131-204-21149P](#) [6131-208-13149P](#) [6131-209-17149P](#) [6131-210-11149P](#) [6131-](#)
[211-19149P](#) [6131-216-19149P](#) [6131-259-21149P](#) [6131-259-23149P](#) [6131-265-17149P](#) [6131-265-19149P](#) [CS3100A18-1P-472](#) [CS3100A-36-](#)
[77P](#) [CS3101A-16-55P](#) [CS3102A-10SL-55P](#) [CS3102A-14S-58P](#) [CS3102A-32-17P](#) [CS3102A32-25S](#) [CS3102C18-4P-472](#)
[CS3106A10SL3S004](#) [CS3106A-18-73S](#) [CS3108A-14S-52S](#) [CS3108A-28-51S](#) [6162-233-1277](#) [6162-324-1231](#) [M243082296Z](#)
[M2884010AC1S1](#) [CT0-24-10SC](#) [CT0M20-7PCAU](#) [M28840/17AC1G3](#)