

INCH-POUND

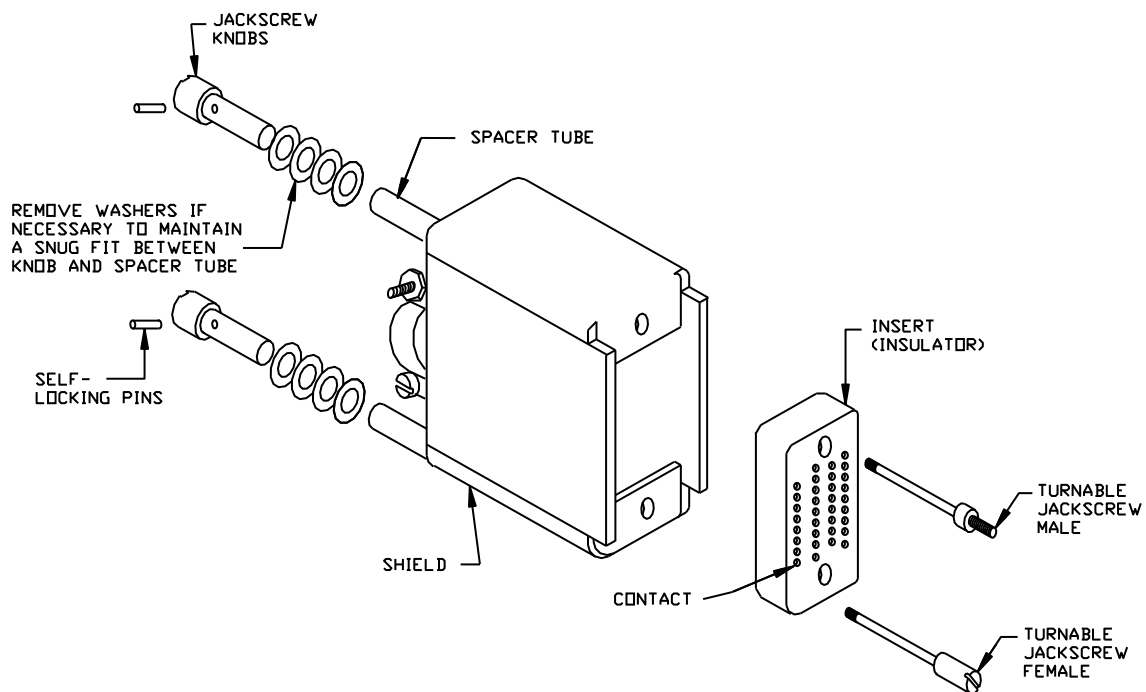
MIL-DTL-28748/8F
w/AMENDMENT 2
8 August 2012
SUPERSEDING
MIL-DTL-28748/8F
w/AMENDMENT 1
18 July 2011

DETAIL SPECIFICATION SHEET

CONNECTORS, ELECTRICAL, RECTANGULAR, RACK AND PANEL, SOLDER TYPE SOCKET CONTACTS, SIZE 22

This specification is approved for use by all Departments
and Agencies of the Department of Defense.

The requirements for acquiring the product described herein shall consist
of this specification sheet and MIL-DTL-28748.



Connector

Configuration A

FIGURE 1. Connector with shields, jackscrews, and guidepins.

AMSC N/A

FSC 5935

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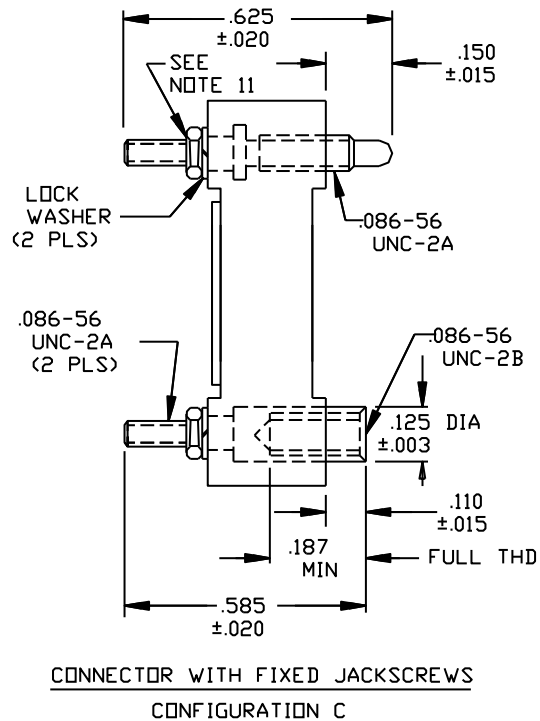
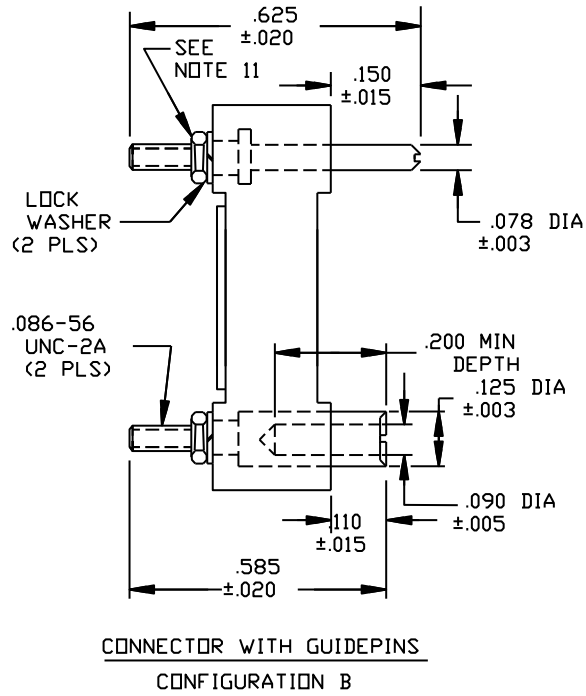
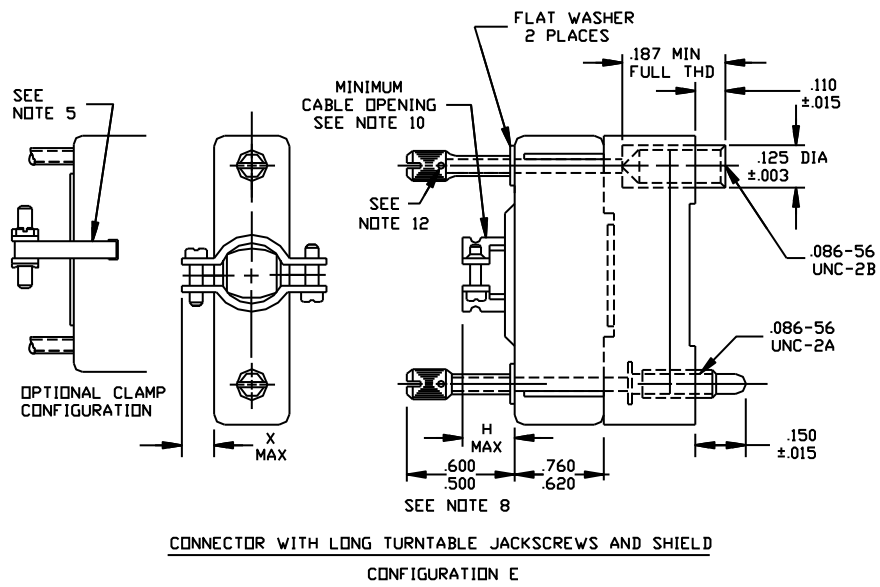
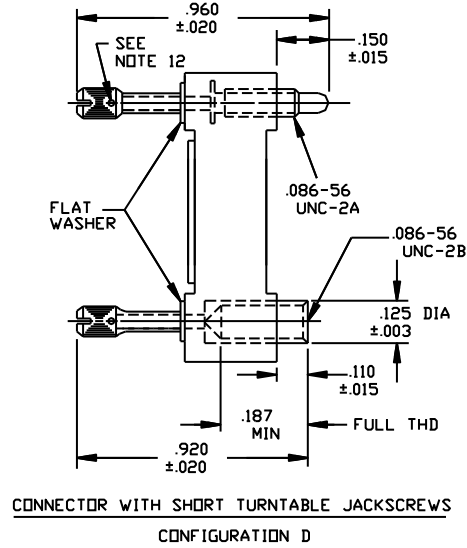


FIGURE 1. Connector with shields, jackscrews, and guidepins – Continued.

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Contact position	X max	H max
4	.210	.300
7	.210	.300
14	.210	.350
20	.210	.350
26	.150	.400
34	.100	.400
44	.100	.500
50	.100	.500

FIGURE 1. Connector with shields, jackscrews, and guidepins – Continued.

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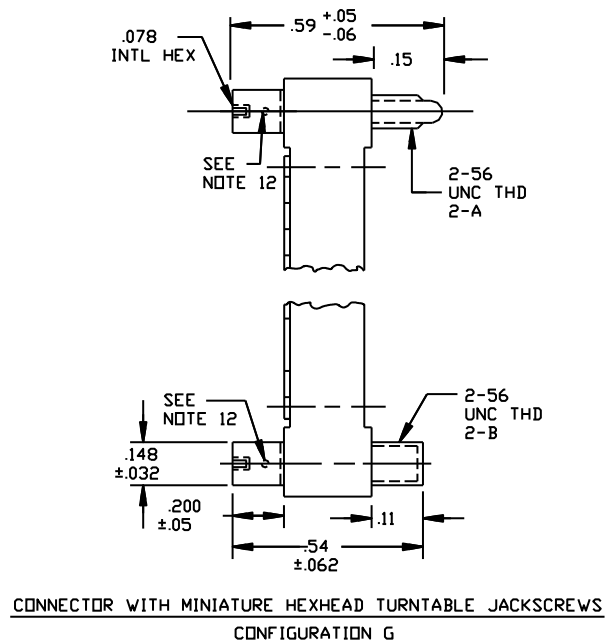
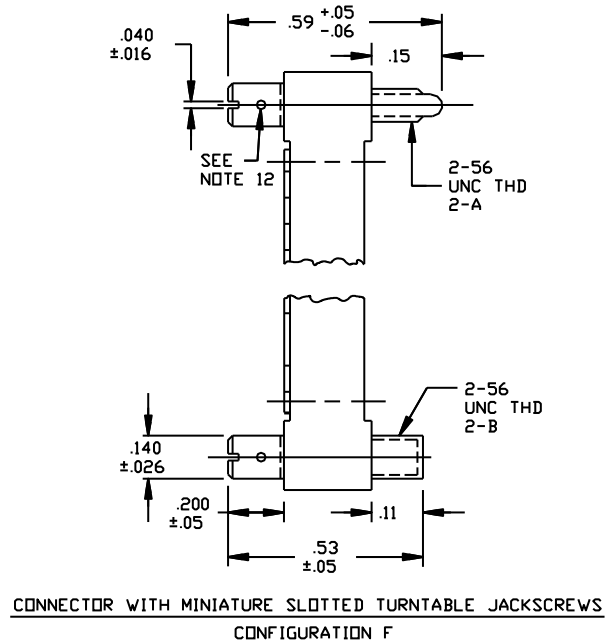


FIGURE 1. Connector with shields, jackscrews, and guidepins – Continued.

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Inches	mm	Inches	mm	Inches	mm
.003	0.08	.078	1.98	.500	12.70
.005	0.13	.090	2.29	.53	13.5
.015	0.38	.11	2.7	.54	13.7
.016	0.41	.110	2.79	.585	14.86
.020	0.51	.125	3.18	.59	15.0
.026	0.66	.140	3.56	.600	15.24
.032	0.81	.148	3.76	.620	15.75
.040	1.02	.15	3.8	.625	15.88
.05	1.3	.150	3.81	.760	19.30
.06	1.5	.187	4.75	.920	23.37
.062	1.57	.200	5.08	.960	24.38

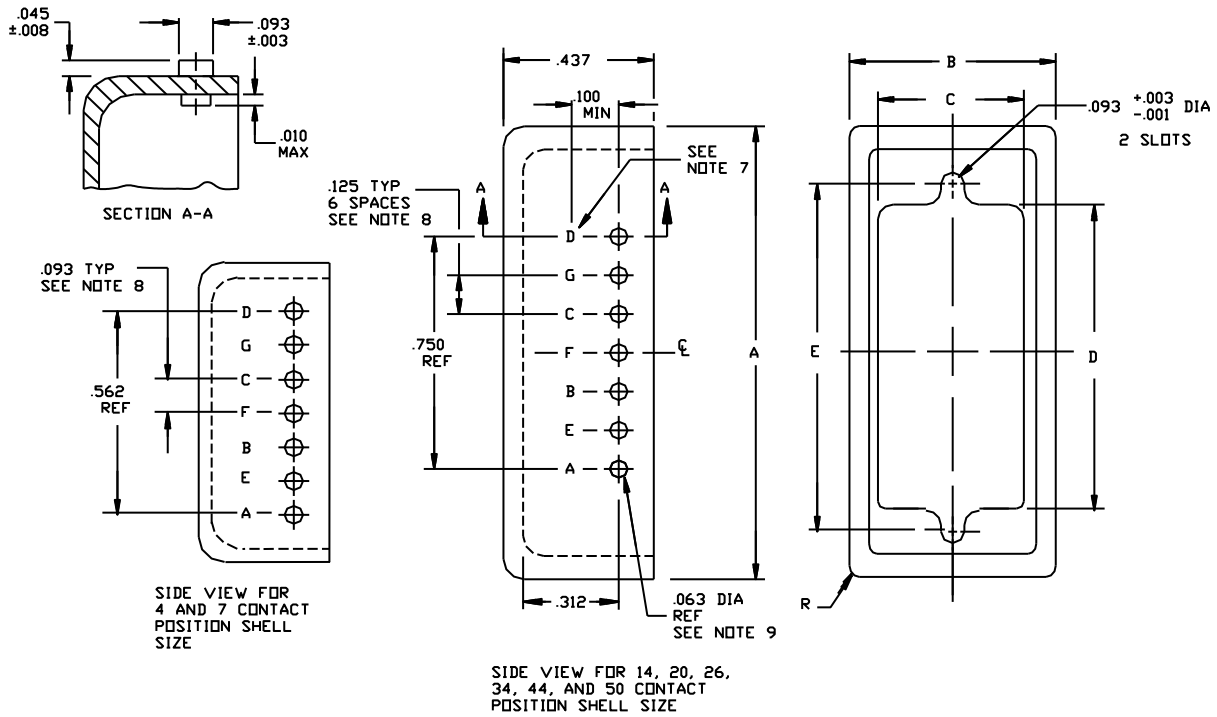
NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise specified, tolerances are $\pm .02$ inch (0.5 mm) for two place decimals and $\pm .015$ inch (0.38 mm) for three place decimals.
4. Dimensions and configuration shall be as specified on figures 1 through 4.
5. Cable clamp configuration has optional mounting method.
6. Materials for jackscrews and guidepins: Corrosion resistance steel in accordance with ASTM A276 or ASTM A582/A582M, class 302, 303, 3038E, 304, 316, or 420 except knobs, washers, and spacers shall be either aluminum alloy or corrosion resistance steel. Finish for washers and spacers shall be passivated or anodized.
7. No side clamp available with insert arrangements A, B, D, E, and F.
8. .730 inch (18.54 mm) maximum for 14-contact connector with side opening shield.
.630 inch (16.00 mm) maximum for 50-contact connector.
9. 1.200 inch (30.48 mm) maximum for 44-contact arrangement.
1.520 inch (38.61 mm) maximum for 50-contact arrangement.
10.

Number of contacts	Minimum cable opening
4	.027 (0.69 mm) in
7	.027 (0.69 mm) in
14	.070 (1.80 mm) in
20	.081 (2.06 mm) in
26	.089 (2.26 mm) in
34	.110 (2.79 mm) in
44	.160 (4.06 mm) in
50	.170 (4.32 mm) in
11. Flat washers are required between lockwashers and insert material.
12. For jackscrew assemblies (excluding one piece constructions) setscrew, groove or roll pin shall be used. Setscrew requires a torque of 2 inch-pound minimum. No parts of the connector assembly shall be permanently displaced from their original, normal, fitted position at the completion of the specified tests.

FIGURE 1. Connector with shields, jackscrews, and guidepins – Continued.

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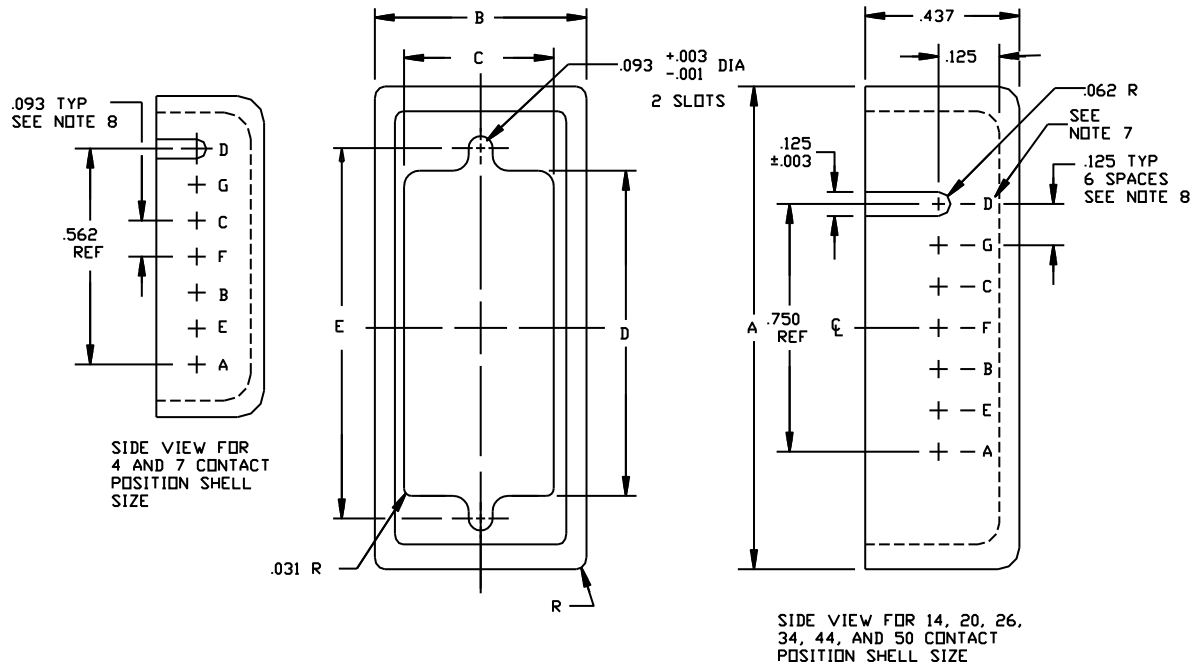
Insert designator	Connector size (number of contacts)	A max	B max	C min	D min	E ± .005 (0.13)	R
N	4	.870 (22.10)	.300 (7.62)	.230 (5.84)	.430 (10.92)	.562 (14.27)	.031 (0.79)
P	7	.870 (22.10)	.300 (7.62)	.230 (5.84)	.430 (10.92)	.562 (14.27)	.031 (0.79)
Q	14	.970 (24.64)	.370 (9.40)	.300 (7.62)	.530 (13.46)	.625 (15.88)	.062 (1.57)
R	20	1.160 (29.46)	.370 (9.40)	.300 (7.62)	.730 (18.54)	.814 (20.68)	.062 (1.57)
S	26	1.345 (34.16)	.370 (9.40)	.300 (7.62)	.910 (23.11)	1.000 (25.40)	.062 (1.57)
T	34	1.340 (34.04)	.480 (12.19)	.410 (10.41)	.900 (22.86)	1.032 (26.21)	.062 (1.57)
U	44	1.590 (40.39)	.480 (12.19)	.410 (10.41)	1.140 (28.96)	1.281 (32.54)	.062 (1.57)
V	50	1.710 (43.43)	.480 (12.19)	.410 (10.41)	1.270 (32.26)	1.408 (35.76)	.062 (1.57)

Plug shell

Configuration A

FIGURE 2. Shell configurations.

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Insert designator	Connector size (number of contacts)	A max	B max	C min	D min	E ± .005 (0.13)	R
N	4	.875 (22.23)	.305 (7.75)	.230 (5.84)	.430 (10.92)	.562 (14.27)	.031 (0.79)
P	7	.875 (22.23)	.305 (7.75)	.230 (5.84)	.430 (10.92)	.562 (14.27)	.031 (0.79)
Q	14	.975 (24.77)	.375 (9.53)	.300 (7.62)	.530 (13.46)	.625 (15.88)	.062 (1.57)
R	20	1.165 (29.59)	.375 (9.53)	.300 (7.62)	.730 (18.54)	.814 (20.68)	.062 (1.57)
S	26	1.350 (34.29)	.375 (9.53)	.300 (7.62)	.910 (23.11)	1.000 (25.40)	.062 (1.57)
T	34	1.344 (34.14)	.480 (12.19)	.410 (10.41)	.900 (22.86)	1.032 (26.21)	.062 (1.57)
U	44	1.595 (40.51)	.480 (12.19)	.410 (10.41)	1.140 (28.96)	1.281 (32.54)	.062 (1.57)
V	50	1.715 (43.56)	.480 (12.19)	.410 (10.41)	1.270 (32.26)	1.408 (35.76)	.062 (1.57)

Receptacle shell

Configuration B

FIGURE 2. Shell configurations – Continued.

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Inches	mm
.001	0.03
.003	0.08
.008	0.20
.010	0.25
.031	0.79
.045	1.14
.062	1.57
.063	1.60
.093	2.36
.100	2.54
.125	3.18
.312	7.92
.437	11.10
.562	14.27
.750	19.05

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information.
3. Unless otherwise specified, tolerance is $\pm .016$ inch (0.41 mm).
4. Metric equivalents are in parentheses.
5. Material: Aluminum alloy in accordance with ASTM B209, Alloy 6061, or Alloy 7075, temper O; .025 inch (0.64 mm) thick.
6. Finish: Anodize in accordance with MIL-A-8625 type I or II.
7. Polarization position letter is .06 inch (1.5 mm) height minimum as shown using permanent marking slot and letter for applicable location only.
8. The location may vary $\pm .005$ inch (0.13 mm) from the centerline.
9. One polarization pin is used when applicable.
10. Insert designators are informational and used only when ordering a shield or shell as a piece part.
Example: M28748/7-ROL01L is a plug shell with C polarization for a 20-contact position insert, "no shield, no jackscrews, and no contacts".
11. The polarization feature (pin or groove) shall be adjacent to the side closest to the A contact position.

FIGURE 2. Shell configurations – Continued.

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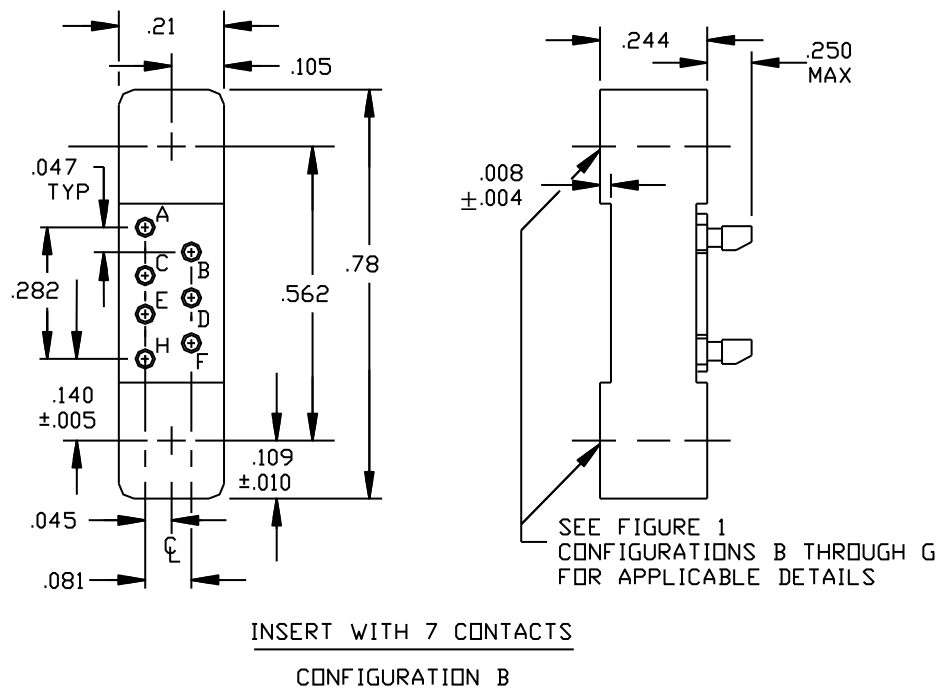
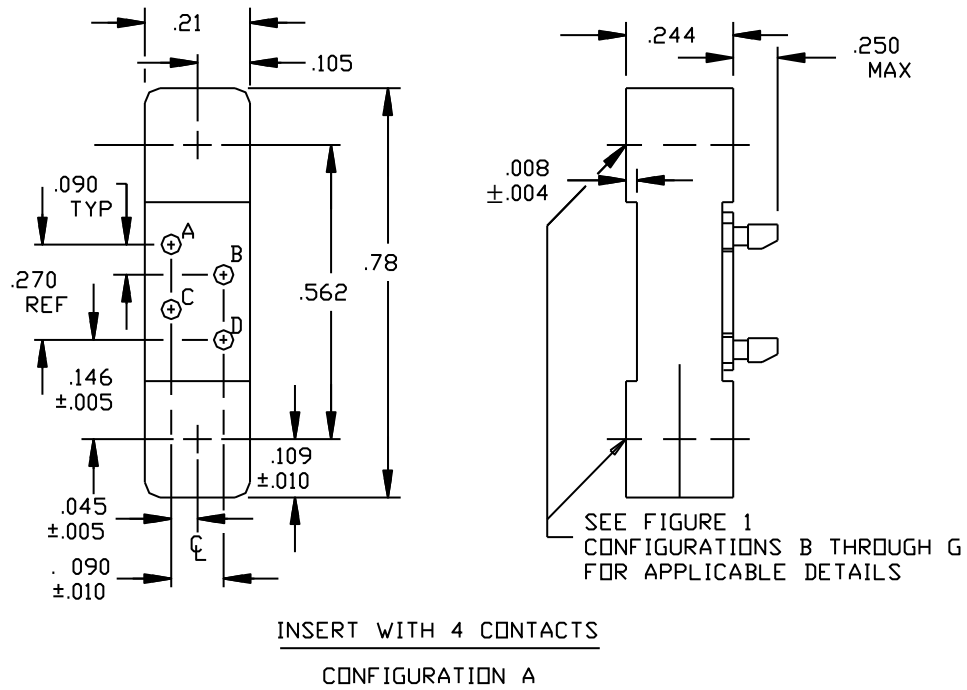


FIGURE 3. Insert arrangements.

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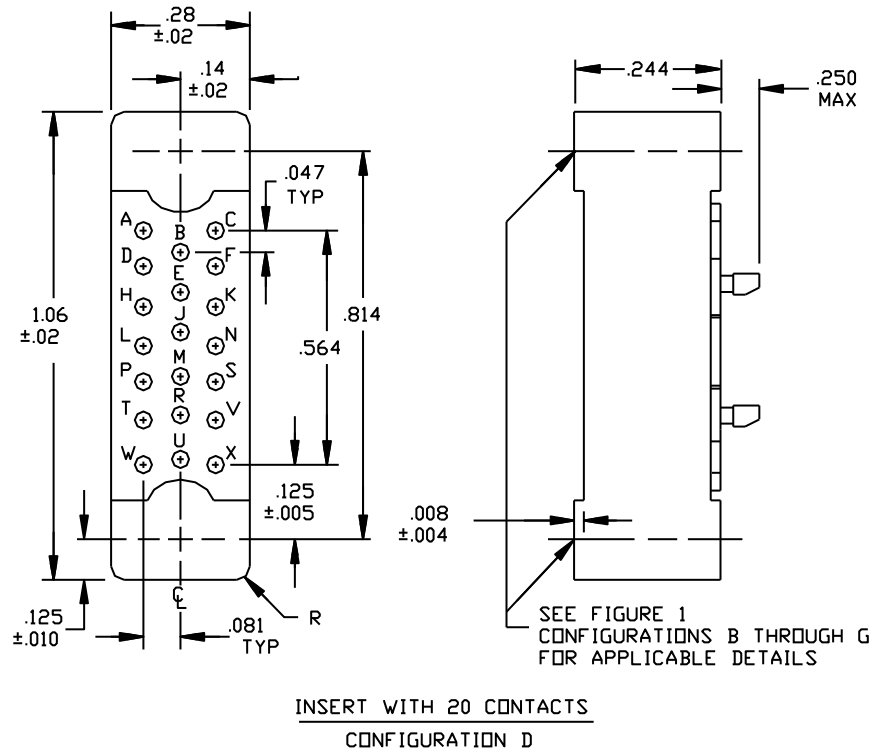
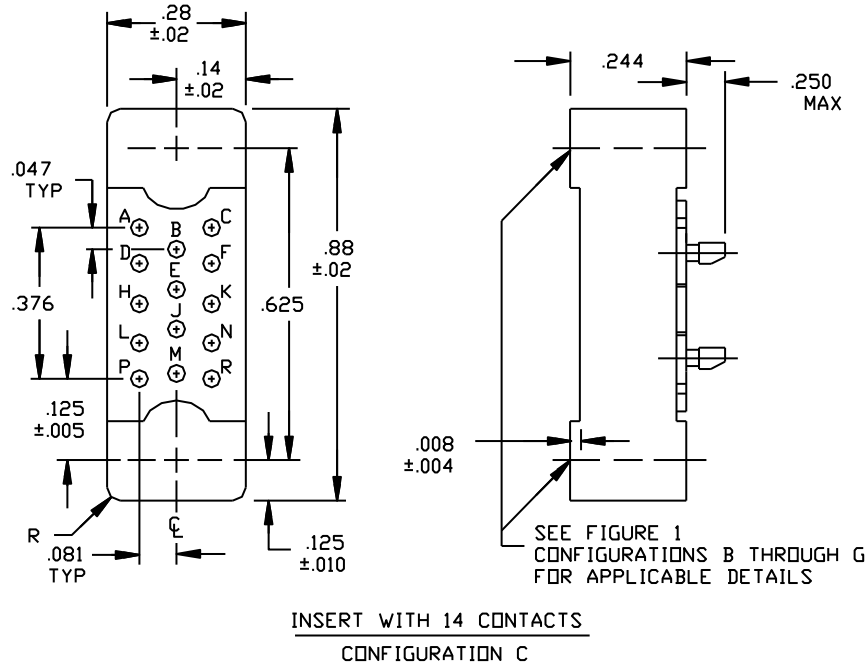


FIGURE 3. Insert arrangements – Continued.

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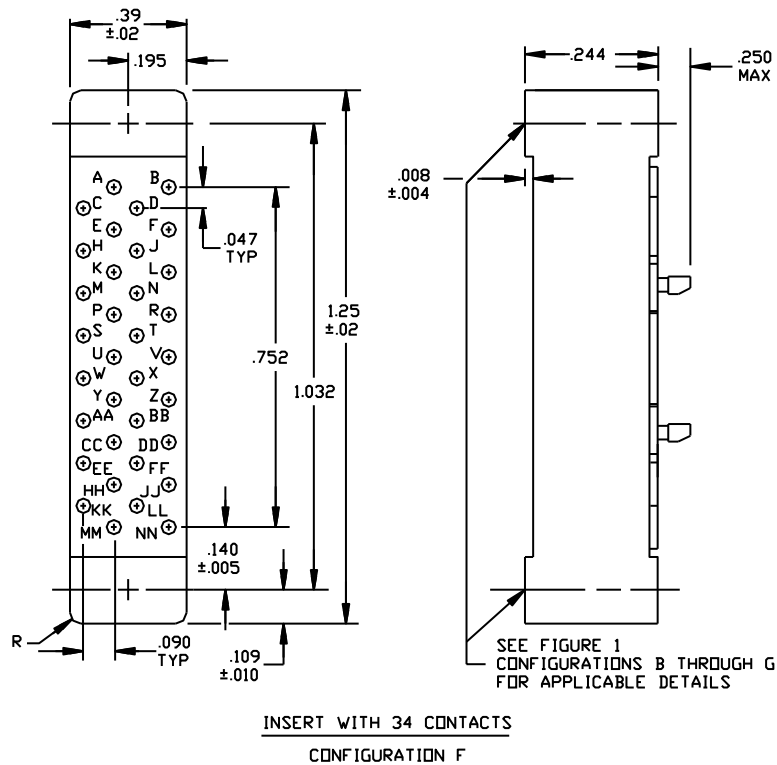
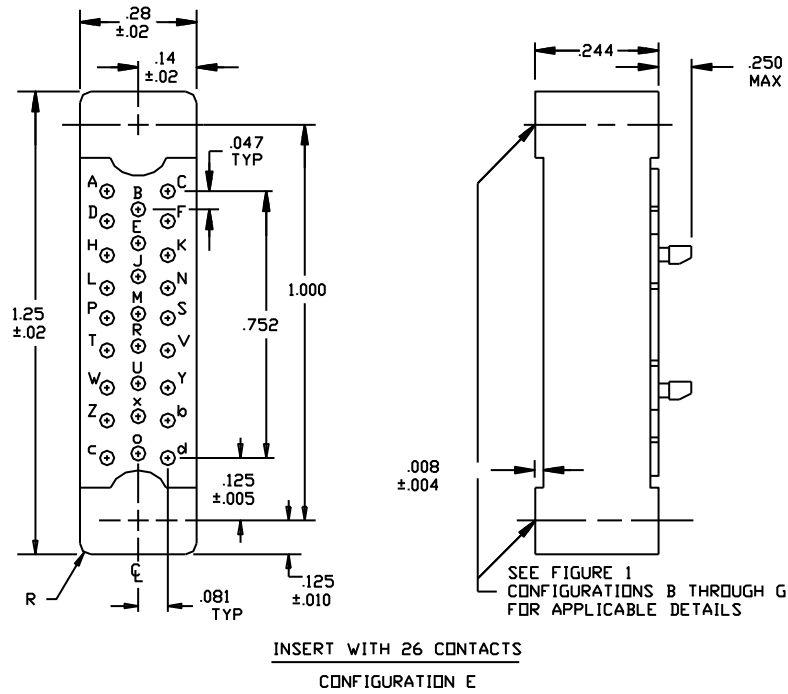
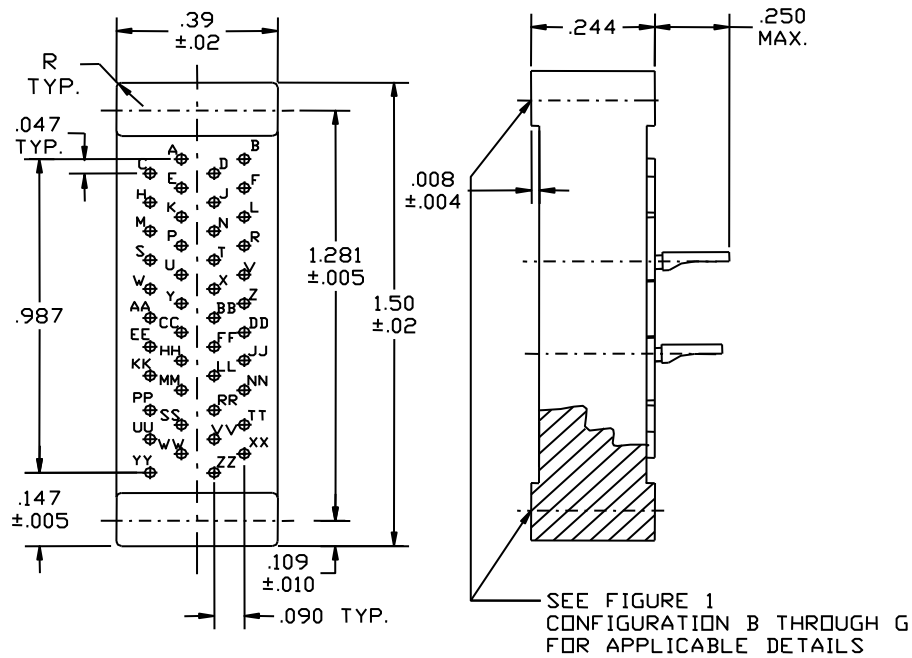
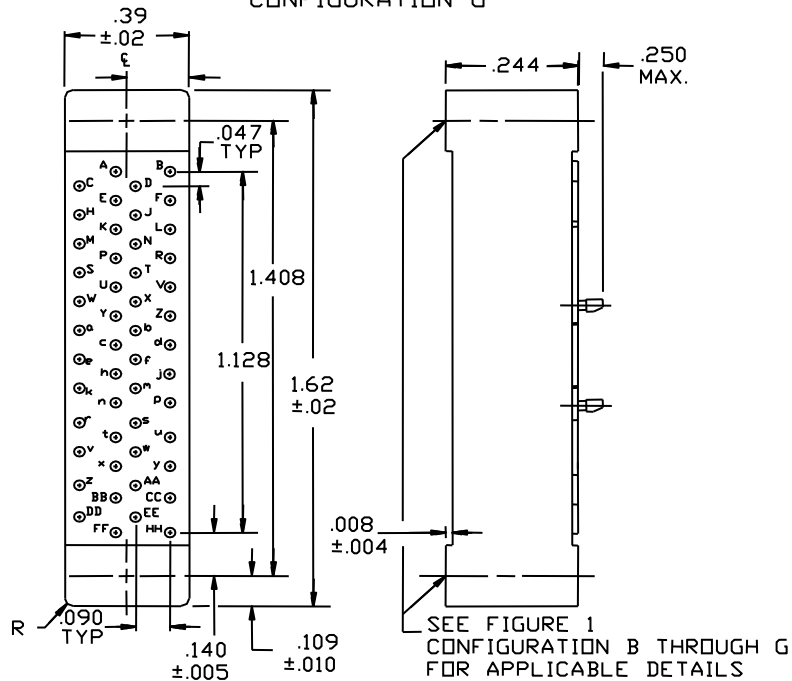


FIGURE 3. Insert arrangements – Continued.

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INSERT WITH 44 CONTACTS
CONFIGURATION G



INSERT WITH 50 CONTACTS
CONFIGURATION H

FIGURE 3. Insert arrangements – Continued.

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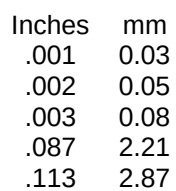
Inches	mm	Inches	mm	Inches	mm
.004	0.10	.146	3.71	.752	19.10
.005	0.13	.147	3.73	.78	19.81
.008	0.20	.195	4.95	.814	20.68
.010	0.25	.21	5.3	.88	22.4
.02	0.5	.244	6.20	.987	25.07
.0405	1.029	.250	6.35	1.000	25.40
.045	1.14	.270	6.86	1.032	26.21
.047	1.19	.28	7.1	1.06	26.9
.081	2.06	.282	7.16	1.128	28.65
.090	2.29	.376	9.55	1.25	31.8
.105	2.67	.39	9.9	1.281	32.54
.109	2.77	.562	14.27	1.408	35.76
.125	3.18	.564	14.33	1.50	38.1
.140	3.56	.625	15.88	1.62	41.1
.14	3.6				

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise specified, tolerances are $\pm .02$ inch (0.5 mm) for two place decimals and $\pm .015$ inch (0.38 mm) for three place decimals.
4. Tolerance between any two adjacent contact centers shall be $\pm .004$ inch (0.10 mm). Tolerance between any two contact centers, other than adjacent contacts, shall be $\pm .006$ inch (0.15 mm).
5. Contact letter identification may be located on either side of the contact hole. All letters shall appear on the front and rear face of each insert.
6. Inserts shall be used with guide pin assemblies or jackscrew assemblies.
7. Insert material: Shall be in accordance with MIL-DTL-28748.

FIGURE 3. Insert arrangements – Continued.

CLAMP SHAPE OPTIONAL
MAY BE ATTACHED TO
SIDE OF SHIELD



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Insert designator	Cable opening	Connector size	A max min	B	C	D ± .015 (0.38)	F min cable opening	G ± .05 (1.3)	H max
N	1	4	.760 (19.30) .620 (15.75)	.780 (19.81)	.268 (6.81)	.562 (14.27)	.027 (0.69)	.20 (5.1)	.300 (7.62)
P	1	7	.760 (19.30) .620 (15.75)	.780 (19.81)	.268 (6.81)	.562 (14.27)	.027 (0.69)	.20 (5.1)	.300 (7.62)
Q	1 or 2	14	.760 (19.30) .620 (15.75)	.875 (22.23)	.348 (8.84) .334 (8.48) ± .030 (0.76)	.625 (15.88)	.07 (1.8) .037 (0.94)	.20 (5.1)	.350 (8.89)
R	1	20	.760 (19.30) .620 (15.75)	1.064 (27.03)	.348 (8.84)	.814 (20.68)	.081 (2.06)	.215 (5.46)	.350 (8.89)
S	1 or 2	26	.760 (19.30) .620 (15.75)	1.250 (31.75)	.348 (8.84)	1.000 (25.40)	.089 (2.26)	.20 (5.1)	.400 (10.16)
T	1	34	.760 (19.30) .620 (15.75)	1.250 (31.75)	.452 (11.48)	1.032 (26.21)	.11 (2.8)	.20 (5.1)	.400 (10.16)
U	1 or 2	44	1.20 (30.5) max	1.50 (38.1)	.452 (11.48)	1.281 (32.54)	.16 (4.1)	.215 (5.46)	.500 (12.70)
V	1 or 2	50	1.52 (38.61) max	1.625 (41.28)	.452 (11.48)	1.408 (35.76)	.17 (4.3)	.215 (5.46)	.500 (12.70)

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information.
3. Unless otherwise specified, tolerance is ± 0.16 inch (0.41 mm).
4. Metric equivalents are in parentheses.
5. Material: Aluminum alloy in accordance with ASTM B209, Alloy 5052, temper H32, .032 inch (0.81 mm) thick.
6. Finish: Anodized in accordance with MIL-A-8625 type I or type II.
7. Referenced documents shall be of the issue in effect on date of invitation for bid.
8. Edges of cable entry hole to be rounded to prevent insulation chafing.
9. Shield supplied on connector which also has protective shell must be without aprons.
10. Insert designator are informational and used only when ordering shield/shell as piece parts.
Example: M28748/7-Q1001L is a shield for a 14-position insert, with top cable opening, "no polarization, no jackscrews and no contact".

FIGURE 4. Shield – Continued.

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REQUIREMENTS:

Dimensions and configuration: See figures 1, 2, 3, and 4.

Mating connector: See MIL-DTL-28748/7.

Part or Identifying Number (PIN): As shown in the following example: 1/

<u>M28748/8-</u>	<u>A</u>	<u>0</u>	<u>0</u>	<u>F</u>	<u>1A</u>
Basic number of specification sheet	Insert designator (see figure 3)	Shield and shield clamp location (see figure 4)	Shell polarization (see figure 2)	Jackscrews or guidepins (see figure 1)	Contacts

Pin code:

<u>Insert designators</u>	<u>Number of contact positions</u>	<u>Shield and shield clamp locations</u>	<u>Polarization designators</u>	<u>Polarization positions 2/</u>
A			A	A
B	4	1-top opening	B	B
C	7	2-side opening 3/	C	C
D	14	0-none included	D	D
E	20		E	E
F	26		F	F
G	34		G	G
H	44		H	H
0 4/	50		J	A
	No insert included		K	B
			L	C
			M	D
			N	E
			P	F
			Q	G
			R	H
			0	

<u>Insert 5/ designators for piece part orders</u>	<u>Connector sizes</u>	
N	4	
P	7	
Q	14	Jackscrews
R	20	or
S	26	guidepins 4/
T	34	L – long jackscrews, configuration E, figure 1
U	44	F – fixed jackscrews, configuration C, figure 1
V	50	S – short jackscrews, configuration D, figure 1
		E – miniature jackscrews slotted head, configuration F, figure 1
		H – miniature jackscrews hex head, configuration G, figure 1
		G – guidepins, configuration B, figure 1
		0 – none included

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Jack and guide location: The jackscrew male (turning or fixed) or guide socket shall be located by the A socket contact.

Contacts: In accordance with MIL-DTL-28748.

1A – 100 percent size 22

1L – none included 6/

- 1/ The number zero (0) is used to indicate which parts are not included.
- 2/ Polarization positions are for location of plug and receptacle shell pins and slots (see figure 2)
- 3/ No side clamps available with insert arrangements A, B, D, E, and F.
- 4/ Manufacturers, mold bodies, and hardware will not necessarily interchange with each other.
- 5/ These designator are informational and used for insert reference (connector size) to order an appropriate shield or shell as a piece part. Shields and shells may be ordered together or separately.
- 6/ The “1L” ordering code shall be used in conjunction with insert designator zero “0” or with the insert designators for piece part orders for which no insert is included.

Superseding information. See table I.

TABLE I. Superseding information.

Superseded documents	Dated	Superseding documents
MS14013C	28 January 1980	MIL-C-28748/8
MS14015C	28 January 1980	
MS14017C	28 January 1980	
MS14019C	28 January 1980	
MS14021C	28 January 1980	
MS14023C	28 January 1980	
MS14025C	28 January 1980	
MS14027C	28 January 1980	
MS14071A	1 May 1986	
MS14072	3 April 1978	

Amendment notations. The margins of this specification are marked with vertical lines to indicate where modifications from this amendment were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations.

Referenced documents. In addition to MIL-DTL-28748, this document references the following:

MIL-A-8625

MIL-DTL-28748/7

ASTM A276

ASTM A582/A582M

ASTM B209

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CONCLUDING MATERIAL

Custodians:

Army – CR
Navy – EC
Air Force – 85
DLA - CC

Preparing activity:
DLA - CC

Review activities:

Army – AM, AR
Navy – MC
Air Force – 84

(Project 5935-2012-072)

NOTE: The activities listed above were interested in this document as of the date of this document. Since organizations and responsibilities can change, you should verify the currency of the information above using the ASSIST Online database at <https://assist.dla.mil>.