

INCH-POUND

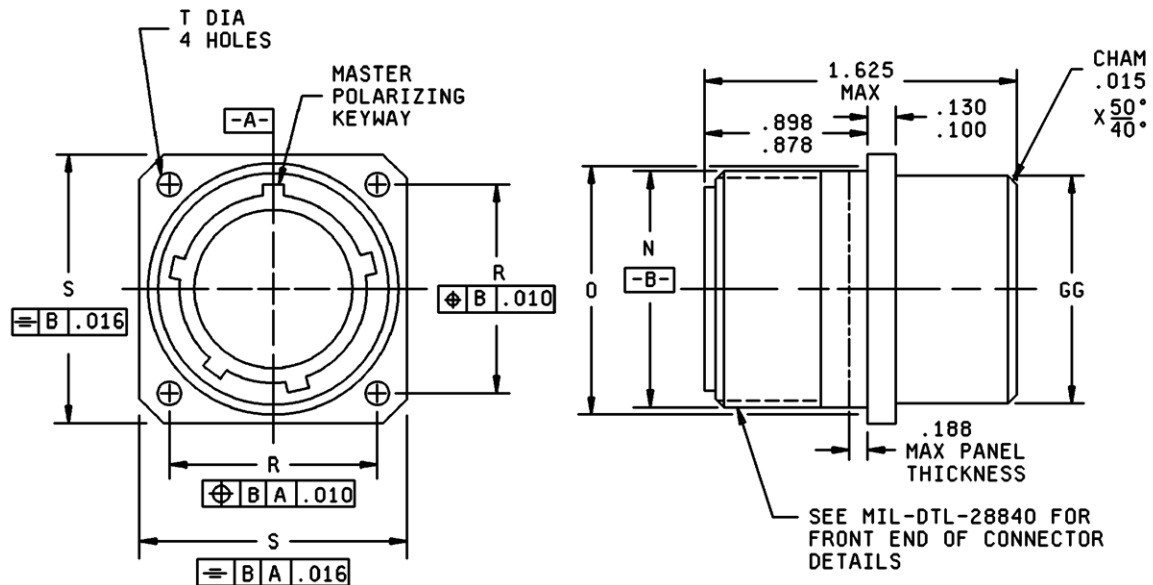
MIL-DTL-28840/12F
w/AMENDMENT 3
2 July 2024
SUPERSEDING
MIL-DTL-28840/12F
w/AMENDMENT 2
5 August 2019

DETAIL SPECIFICATION SHEET

CONNECTORS, ELECTRICAL, CIRCULAR, THREADED, HIGH SHOCK,
HIGH DENSITY, SHIPBOARD, CRIMP CONTACTS, RECEPTACLE,
BOX MOUNTING, CLASSES D, DS, P, T AND Z

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-28840.



Inches	mm	Inches	mm	Inches	mm
.010	0.25	.100	2.54	.878	22.30
.015	0.38	.130	3.30	.898	22.81
.016	0.41	.188	4.78	1.625	41.28

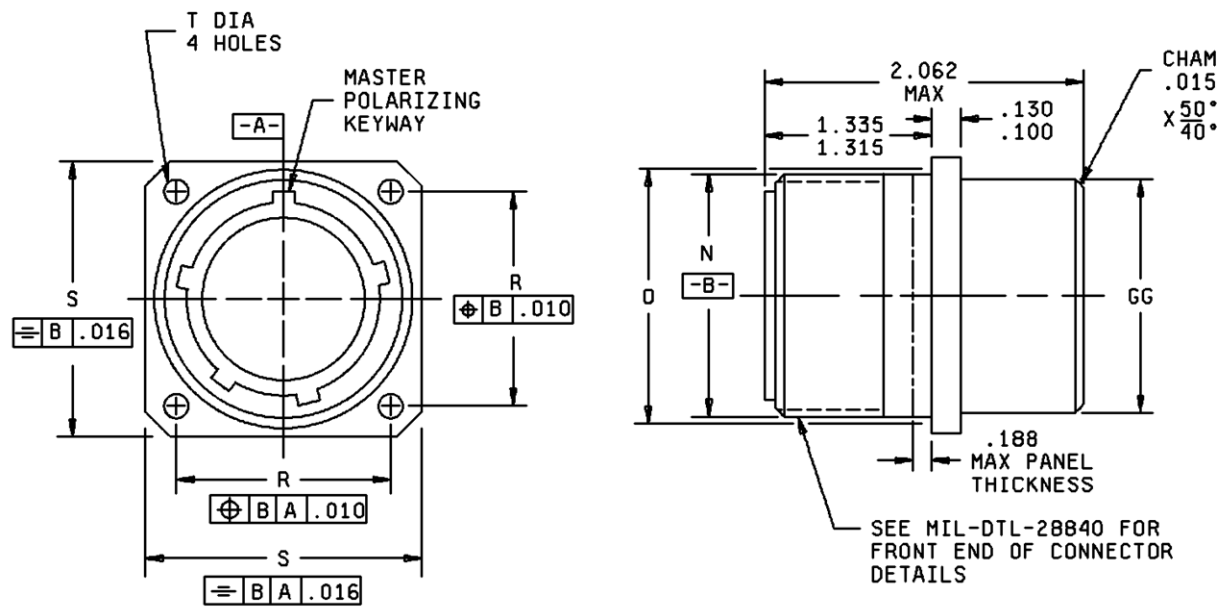
NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for information only.

FIGURE 1. Dimensions and configurations for the 1.625 inch max length.



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Inches	mm	Inches	mm	Inches	mm
.010	0.25	.100	2.54	1.315	33.40
.015	0.38	.130	3.30	1.335	33.91
.016	0.41	.188	4.78	2.062	52.37

NOTES:

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FIGURE 2. Dimensions and configurations for the 2.062 inch max length.

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TABLE I. Dimensions and configurations. 1/ 2/

Shell size designator 3/	N dia max	O reference mating hole	R true position centerline to centerline	S	T	GG dia max
A (11)	.750 (19.05)	.812 (20.62)	.750 (19.05)	1.043 (26.49) 1.003 (25.48)	.130 (3.30) .115 (2.92)	.758 (19.25)
B (13)	.875 (22.22)	.937 (23.80)	.843 (21.41)	1.158 (29.41) 1.118 (28.40)		.880 (22.35)
C (15)	1.062 (26.97)	1.124 (28.55)	.968 (24.59)	1.278 (32.46) 1.238 (31.45)		1.005 (25.53)
D (17)	1.125 (28.58)	1.187 (30.15)	1.015 (25.78)	1.403 (35.64) 1.363 (34.62)		1.130 (28.70)
E (19)	1.312 (33.32)	1.374 (34.90)	1.140 (28.96)	1.528 (38.81) 1.488 (37.80)		1.255 (31.88)
F (23)	1.500 (38.10)	1.562 (39.67)	1.281 (32.54)	1.738 (44.15) 1.698 (43.13)		1.443 (36.65)
G (25)	1.625 (41.28)	1.687 (42.85)	1.392 (35.36)	1.838 (46.69) 1.798 (45.67)	.157 (3.99) .142 (3.61)	1.567 (39.80)
H (29)	1.812 (46.02)	1.874 (47.60)	1.568 (39.83)	2.158 (54.81) 2.118 (53.80)		1.880 (47.75)
J (33)	2.000 (50.80)	2.062 (52.37)	1.734 (44.04)	2.348 (59.64) 2.308 (58.62)	.183 (4.65) .168 (4.27)	2.067 (52.50)

1/ Dimensions are in inches.

2/ Metric equivalents are given for information only.

3/ Shell sizes are provided within parentheses for information and are not a part of the designator.

REQUIREMENTS:

Dimensions and configurations: See figures 1 and 2, and tables I through IV.

This connector mates with MIL-DTL-28840/16, MIL-DTL-28840/17, MIL-DTL-28840/18, MIL-DTL-28840/19, MIL-DTL-28840/26, MIL-DTL-28840/28 and MIL-DTL-28840/29.

Insert arrangements: See the figure of MIL-STD-1698 corresponding to the desired shell size.

Connector accessories: See MIL-DTL-28840 supplement.

Class code letters:

TABLE II. Class code letter for figures 1 and 2.

Class	Class code letter
D	A
DS	B
P	F
T	L
Z	S

Contacts: Pin or socket, crimp type, styles P, S, D, E, F or G, in accordance with MIL-DTL-28840.

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Shell polarization: 1 through 6, key position.

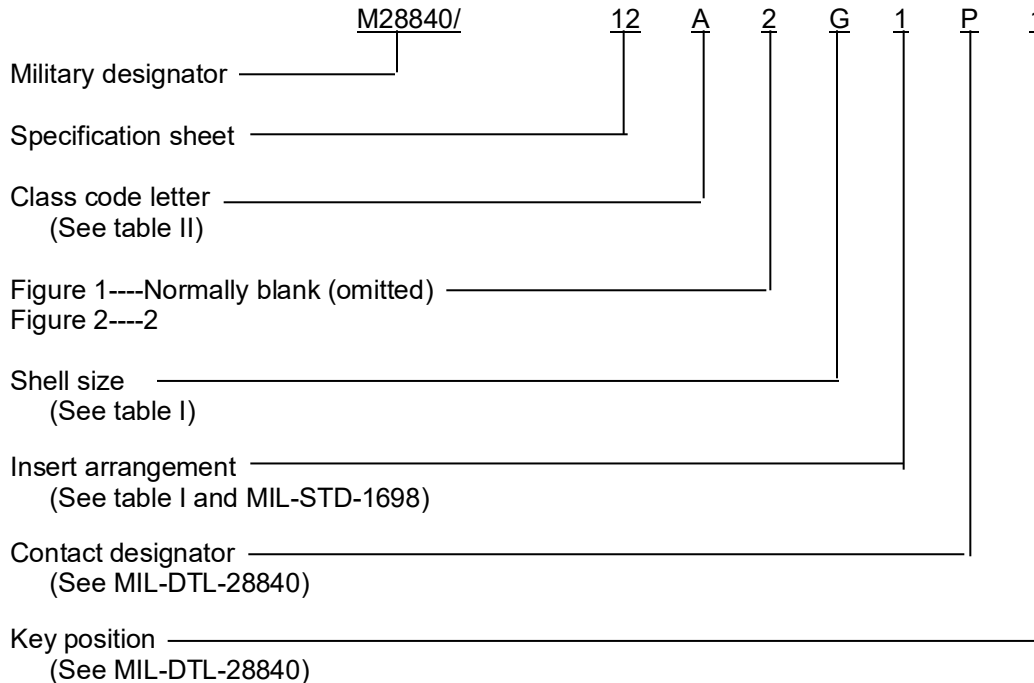
Installation and removal tool: In accordance with SAE-AS81969/33 and SAE-AS81969/34.

Normal mating keyway position is shown on figures 1 and 2. For alternate keyway positions, see MIL-DTL-28840.

Figure 1 connector shall be supplied with resilient wire separator in lieu of a wire seal grommet. Pin contact stability test not applicable.

Figure 2 connector shall be supplied with a wire seal grommet.

Part or Identifying Number (PIN) example.



QUALIFICATION:

Qualification samples (for figure 2 only). Two connectors small, medium, and large (A, E, J) shell size with insert arrangements representing typical manufacturing, shall be subjected to the tests listed herein. One sample shall have the pin inserts in the plug and the socket inserts in the box mounting receptacle. The other sample pair shall have the contact gender reverse. One receptacle sample shall be terminated with wire approaching the minimum outside diameter (OD) specified in table IV, and the other with maximum OD wire. The mating connectors shall be PIN M28840/26. Qualification of small, medium, large, (A, E, J) shell sizes shall grant qualification of remaining sizes by similarity.

Vibration (for figure 2 only). Complete mated connectors shall be mounted as follows and subjected to the applicable vibration test. Each receptacle shall be mounted on a suitable fixture, which, in turn, shall be attached to a vibration table. A suitable sensor shall monitor the vibration of the receptacle at a point on or near the receptacle. A counterpart plug shall be engaged with the receptacle and held by normal coupling means without the use of safety wire, with the following exception: For EIA-364-28 testing of mated plug and receptacle pairs only, safety wire is permissible. The wire bundles or cable shall be clamped to nonvibrating points at least 36 inches from the rear of the connectors. The clamping length shall be chosen to avoid resonance of the wire bundles or cables. Mated connector shall be tested in accordance with test procedure EIA-364-28, test condition III and also in accordance

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with the endurance test of MIL-STD-167-1. All contacts shall be wired in series and a current of 100 ± 10 milliamperes shall be employed to monitor current flow and indicate discontinuity of contact or interruption of current flow of one microsecond or longer.

High impact shock (for figure 2 only). The connector assemblies that have passed vibration shall then be tested in accordance with MIL-DTL-901, grade A. The mounting shall be in accordance with the standard mounting for electrical switchboard instruments and other panel mounted equipment in accordance with MIL-DTL-901, fixture 6D-1. All contacts shall be wired in a series circuit with 100 ± 10 milliamperes flowing through the series circuit during the high impact shock. A suitable device shall be used to monitor the current flow and to indicate any discontinuity of current flow which is one microsecond or longer. The mated connectors shall be held together only by the normal locking device. Cable or wires shall be supported on a stationary frame not closer than 36 inches from the connector assembly.

TABLE III. Test cable and accessory size.

Designator ^{1/}	Cable M24643	M28840/6 backshell	Tensile load (pounds)
A (11)	/52-02UN	-01WB	50
E (19)	/45-03UO	-11WB	75
J (33)	/31-09UN	-23WB	100

^{1/} Shell sizes are provided within parentheses for information and are not a part of the designator.

Pin contact stability. The unmated connector shall have 10 percent of their pin contacts subjected to this test. Gauge pins conforming dimensionally to the test gauge pin of MIL-DTL-28840 shall be used. The connector shall be held in a holding device. The forces specified in the pin contact stability in accordance with MIL-DTL-28840 shall be applied to the exposed rod as shown on the pin contact stability test of MIL-DTL-28840. The rate of load application shall not exceed 1 inch (25.4 mm) per minute. The total pin tip displacement shall be measured as shown in pin contact stability test in accordance with MIL-DTL-28840. The unmated connector shall have all cavities loaded with contacts in which minimum OD wire (see table IV) has been crimped. The unmated connectors shall have no backshell attached.

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TABLE IV. Wire range accommodations.

Contact size	Wire size	Outside diameter of finished wire (inch) <u>1/</u>	
		Minimum	Maximum
20-20	24	.040 (1.02)	.070 (1.78)
	22		
	20		
20-22	24		
	22		
	20		
20-28 <u>2/</u>	32		
	30		
	28		

1/ In accordance with MIL-DTL-24643 and MIL-DTL-16878.

2/ To obtain sealing, wires must be built up to finished wire diameter.

RESTRICTIONS:

Classes D and DS are inactive for NAVSEA new design, unless approved by NAVSEA.

Amendment notations. The margins of this specification are marked with vertical lines to indicate modifications generated by this amendment. 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-28840, this document references the following:

MIL-DTL-901
MIL-DTL-16878
MIL-DTL-24643
MIL-DTL-28840/16
MIL-DTL-28840/17
MIL-DTL-28840/18
MIL-DTL-28840/19
MIL-DTL-28840/26
MIL-DTL-28840/28
MIL-DTL-28840/29
MIL-STD-167-1
MIL-STD-1698
EIA-364-28
SAE-AS81969/33
SAE-AS81969/34

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CONCLUDING MATERIAL

Custodians:

Army - AT
Navy - EC
Air Force - 85
DLA - CC

Preparing activity:

DLA - CC

(Project 5935-2024-139)

Review activities:

Army – AV, MI

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>.