

MS27997P
10 December 2020
SUPERSEDING
MS27997N
27 November 2003

RELAYS, ELECTROMAGNETIC, 25 AMPERES, 3 PST
N.O. TYPE I, HERMETICALLY SEALED

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

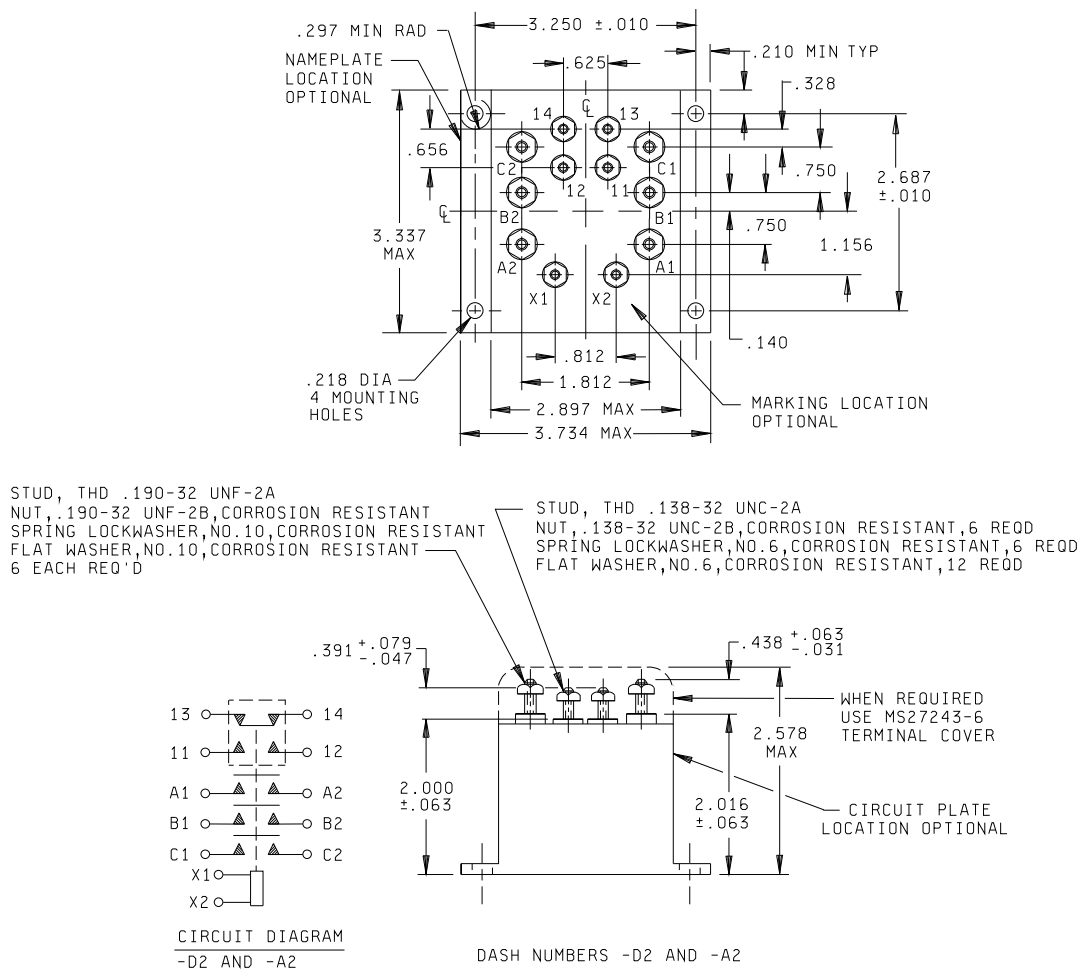
Technical drawing of the rear view of the 1000 Series PCB. The drawing shows the following dimensions and features:

- Top Edge:** .297 MIN RAD (radius) at the top-left corner.
- Left Edge:** 3.337 MAX (height) from the bottom edge to the center of the top-left mounting hole.
- Mounting Holes:** Four mounting holes are shown, labeled A1, A2, B1, and B2. They are arranged in a 2x2 grid. The diameter of each hole is .218 DIA.
- Dimensions:**
 - Horizontal distance between the center of the leftmost hole (A2) and the center of the rightmost hole (A1) is 3.734 MAX.
 - Horizontal distance between the center of the leftmost hole (A2) and the center of the hole X1 is 1.812.
 - Horizontal distance between the center of the hole X1 and the center of the hole X2 is .812.
 - Horizontal distance between the center of the hole X2 and the center of the rightmost hole (A1) is .140.
 - Vertical distance between the center of the top row of holes (B2, B1) and the center of the bottom row of holes (A2, A1) is 1.156.
 - Vertical distance between the center of the top row of holes (B2, B1) and the top edge is 2.687 ± .010.
 - Vertical distance between the center of the bottom row of holes (A2, A1) and the bottom edge is .750.
 - Vertical distance between the center of the top row of holes (B2, B1) and the center of the bottom row of holes (A2, A1) is .750.
 - Horizontal distance from the left edge to the center of the leftmost hole (A2) is 3.250 ± .010.
 - Horizontal distance from the center of the leftmost hole (A2) to the center of the rightmost hole (A1) is 2.897 MAX.
- Optional Features:**
 - NAMEPLATE LOCATION OPTIONAL: Indicated by a dashed line and an arrow pointing to the top-left corner.
 - MARKING LOCATION OPTIONAL: Indicated by a dashed line and an arrow pointing to the bottom-right corner.
- Other Dimensions:**
 - .210 MIN TYP (typical) for the distance from the top edge to the center of the top row of holes.
 - .210 MIN TYP (typical) for the distance from the right edge to the center of the rightmost hole.

STUD, THD .138-32 UNC-2A
NUT, .138-32 UNC-2B, CORROSION RESISTANT, 2 REQD
SPRING LOCKWASHER, NO. 6, CORROSION RESISTANT, 2 REQD
FLAT WASHER, NO. 6, CORROSION RESISTANT, 4 REQD



MS27997P



Inches	mm	Inches	mm	Inches	mm
.010	0.25	.297	7.54	1.812	46.02
.031	0.79	.328	8.33	2.000	50.80
.047	1.19	.375	9.52	2.167	51.21
.063	1.60	.391	9.93	2.578	65.48
.079	2.01	.438	11.13	2.687	68.25
.138	3.51	.625	15.88	2.897	73.58
.140	3.56	.656	16.66	3.250	82.55
.190	4.83	.750	19.05	3.337	84.76
.210	5.33	.812	20.62	3.734	94.84
.218	5.54	1.156	29.36		

FIGURE 1. Dimensions and configuration - Continued.

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is ± 0.031 (0.79 mm).
4. Coil and auxiliary terminals may use additional washer for terminal seat.
5. Terminal covers and barriers may be required at power or auxiliary terminals.

FIGURE 1. Dimensions and configuration - Continued.

REQUIREMENTS:

Dimensions and configuration: See [figure 1](#).

Dash numbers and general characteristics: See [table I](#).

Contact data:

Load ratings: See [table II](#).

Maximum contact drop, initial: 0.150 V.

After life test: 0.175 V.

Overload current (NO): 200 amperes.

Rupture current (NO): 250 amperes.

Coil data: See table III.

Duty rating: Continuous.

RFI specification: [MIL-STD-461](#) (applicable to coil circuits of ac operated relays).

Electrical data:

Minimum insulation resistance:

Initial: 100 megohms.

After life or environmental tests: 50 megohms.

Dielectric strength:

Sea level, 2 - 5 seconds:

	Initial		After life tests	
	28 V dc	115 V ac	28 V dc	115 V ac
Coil to case	1,250	1,500	1,000	1,125
Auxiliary contacts	1,250	1,500	1,000	1,125
All other points	1,250	1,800	1,000	1,350

Altitude, 1 minute:

	28 V dc	115 V ac
Coil to case	500	500
Auxiliary contacts	500	500
All other points	700	700

MS27997P

Environmental characteristics:

Temperature range: -70°C to +125°C.

Maximum altitude rating: 80,000 feet.

Shock g level: 50 g's.

Duration: 6-9 ms.

Maximum duration contact opening: 2 ms.

Vibration (sinusoidal): See [table IV](#).

Nonoperate:

G-level: 15 g's.

Frequency range curve: 20 to 2,000 Hz.

Acceleration: 15 g's.

Terminal strength (high temperature pull and torque test): Not applicable.

Qualification by similarity: See [MIL-PRF-6106](#).

Group B and group C testing are not required. The manufacturer shall notify the qualifying activity in the event of any design or construction changes, and shall impose additional testing requirements as necessary.

Part or Identifying Number (PIN): MS27997- (plus applicable dash number from [table I](#)).

TABLE I. Dash numbers and general characteristics.

MS PIN- MS27997-	Type	Coil type	Terminal type	Mounting or mating socket	Auxiliary terminals	Max weight in pounds 1/
D1	I	dc	Stud	Flange	None	1.20
D2	I	dc	Stud	Flange	Yes	1.25
A1	I	ac	Stud	Flange	None	1.25
A2	I	ac	Stud	Flange	Yes	1.30

1/ Weights include covers and barriers.

MS27997P

TABLE II. Rated contact load (amperes per pole) (case grounded).

Type of load	Life operating cycles x 10 ³	28 V dc				115 V ac, 1 phase				115/200 V ac, 3 phase 1/				See appropriate notes
		Main		Aux		Main		Aux		Main		Aux		
		NO	NC	NO	NC	400 Hz	60 Hz	400 Hz	60 Hz	400 Hz	60 Hz	400 Hz	60 Hz	
Resistive	50	25		5	5	25		5		25				
Inductive	10	25		5	5	25		5		25				
Motor	50	25				25				25				
Lamp	50			1	1			1						
Transfer, load														2/
Mechanical life reduced current	100	6.3		1.25	1.25	6.3		1.25		6.3				
Mixed loads	50	Applicable according to MIL-PRF-6106												

^{1/} Absence of value indicates relay is not rated for 3 phase applications.^{2/} Transfer load indicates relay is suitable for transfer between unsynchronized ac power supplies at rating indicated.TABLE III. Operating characteristics.

PIN MS 27997-	Coil data											Time - (milliseconds maximum)					
	Coil	Rated			Max		Max pick-up voltage				Drop out voltage <u>2/</u>	Oper-ate <u>3/</u>	Re-release <u>4/</u>	Contact Bounce <u>3/</u>			
		Volts <u>1/</u>	Freq Hz	Res Ω ±10%	Volts	Amp	Nor-mal <u>2/</u>	High Temp test	Cont current test					Main		Aux	
														NO	NC	NO	NC
D1	X1,X2	28	dc	51	29	.6	18	21	22.5	7.0	1.5	25	10	2			
D2	X1,X2	28	dc	51	29	.6	18	21	22.5	7.0	1.5	25	10	2		4	4
A1	X1,X2	115	60/400	N/A	124	.2	90	100	104	40	10	30	50	2			
A2	X1 X2	115	60/400	N/A	124	2	90	100	104	40	10	30	50	2		4	4

^{1/} CAUTION: Use of any coil voltage less than rated coil voltage will compromise the operation of the relay.^{2/} Over the temperature range.^{3/} With rated coil voltage.^{4/} From rated coil voltage.TABLE IV. Vibration levels (sinusoidal).

PIN MS27997-	Frequency			
	5-10 Hz	10-55 Hz	55-750 Hz	750-1500 Hz
D1	.08 DA	.06 DA	15 g's	12 g's
D2	.08 DA	.06 DA	10 g's	10 g's
A1	.08 DA	.06 DA	15 g's	12 g's
A2	.08 DA	.06 DA	10 g's	10 g's

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Referenced documents. In addition to [MIL-PRF-6106](#), this document references the following:
[MS27243](#) [MIL-STD-461](#)

Custodians:

Navy - AS
Air Force - 85
DLA - CC

Preparing activity:

DLA - CC

(Project 5945-2020-065)

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/>.