

INCH-POUND

MS24168T  
w/AMENDMENT 1  
25 February 2005  
SUPERSEDING  
MS24168T  
15 April 2003

## DETAIL SPECIFICATION SHEET

RELAYS, ELECTROMAGNETIC, 100 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.

The requirements for acquiring the relay described herein shall  
consist of this specification and the latest issue of MIL-PRF-6106.

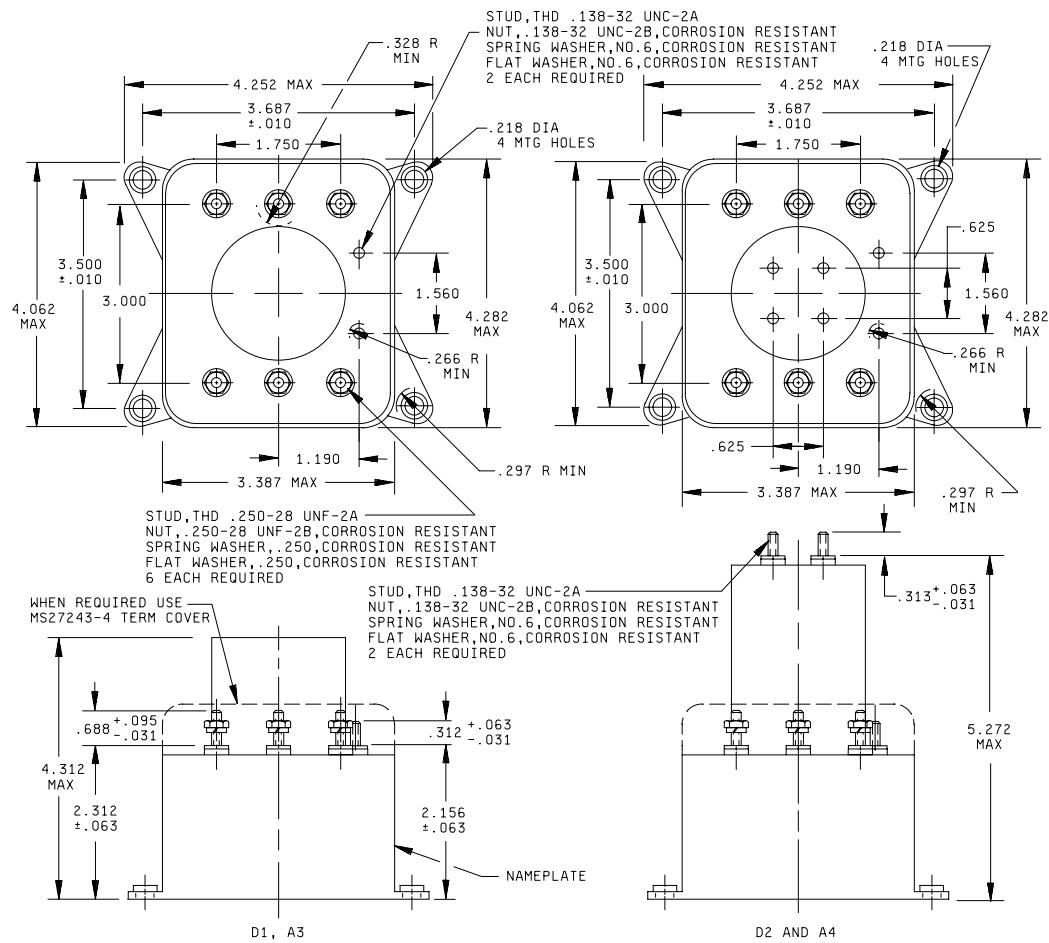
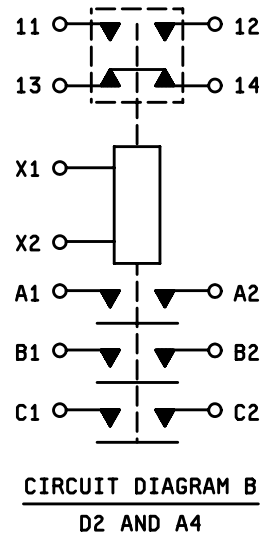
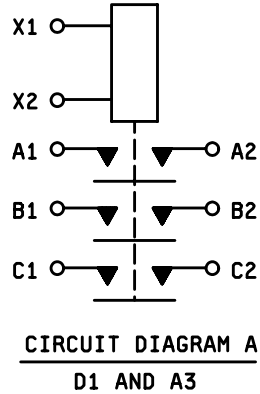


FIGURE 1. Dimensions and configurations.

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Inches	mm	Inches	mm	Inches	mm
.010	0.25	.328	8.33	3.387	86.03
.031	0.79	.625	15.88	3.500	88.90
.063	1.60	.688	17.48	3.687	93.65
.095	2.41	1.190	30.23	4.062	103.48
.138	3.51	1.560	39.62	4.282	108.76
.218	5.54	1.718	43.64	4.312	109.52
.250	6.35	1.750	44.45	5.272	133.91
.266	6.76	2.156	54.76		
.297	7.54	2.312	58.72		
.312	7.92	3.000	76.20		

## NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is  $\pm 0.031$  (0.79 mm).
4. Coil and auxiliary terminals may use an additional flat washer for terminal seat.
5. Break all sharp edges and remove all burrs.
6. In the event of a conflict between the text of this specification and the references cited herein, this specification shall take precedence.
7. Referenced Government documents of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation form a part of this document to the extent specified herein.
8. There shall be affixed to the relay a legible circuit diagram that permanently and positively identifies each terminal location specified.
9. Cadmium or cadmium compounds are prohibited on external hardware. A transition period to non-cadmium hardware is authorized for up to 1 year from the date of this revision.
10. Spring washer on drawing is a spring lock washer.

FIGURE 1. Dimensions and configurations - Continued.

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REQUIREMENTS:

Dimensions and configurations: See figure 1.

Part or Identifying Numbers (PIN's) 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): 800 amperes. 1/

Rupture current (NO): 1,000 amperes. 1/

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 test: 50 megohms.

Dielectric strength: 2/

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 V rms	1,500 V rms	1,000 V rms	1,125 V rms
Aux. contacts:	1,250 V rms	1,500 V rms	1,000 V rms	1,125 V rms
All other points:	1,250 V rms	1,800 V rms	1,000 V rms	1,350 V rms

Altitude, 1 minute: 3/

	28 V dc	115 V ac
Coil to case:	500 V rms	500 V rms
Aux. contacts:	500 V rms	500 V rms
All other points:	700 V rms	700 V rms

1/ For 50/60 Hz, overload and rupture currents (NO) are 200 amperes.

2/ For A3 and A4, coil terminals X1 and X2 shall be shorted together for all dielectric testing.

3/ Use terminal cover MS27243-4 during dielectric testing at altitude.

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Environmental characteristics:

Temperature range: -70°C to +125°C. 1/

Maximum altitude rating: 80,000 feet.

Shock, g-level: 25 g's.

Duration: 6-9 ms.

Maximum duration contact opening: 2 ms.

Vibration, sinusoidal: See table IV.

Vibration, random: Not applicable.

High shock: Not applicable.

Acceleration: 15 g's.

PIN: MS24168- (plus applicable dash number from table I).

Qualification by similarity: See MIL-PRF-6106.

TABLE I. PIN's and general characteristics.

PIN MS24168-	Type	Coil type	Auxiliary contacts	Maximum weight (pounds) <u>1/</u>
D1	I	dc	None	3.4
D2	I	dc	Yes	3.6
A3	I	ac	None	3.8
A4	I	ac	Yes	3.8

1/ Weight includes covers and barriers.

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1/ Coils operated at either 50, 60, or 400 Hz require ambient temperature not to exceed +71°C.

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TABLE II. Rated contact load (amperes per pole) case grounded. 1/

Type of load	Life operating cycles x 10 <sup>3</sup>	28 V dc				115 V ac, 1 phase				115/200 V ac, 3 phase <u>2/</u>			
		Main		Aux		Main		Aux		Main		Aux	
		NO	NC	NO	NC	400 Hz	50/60 Hz	400 Hz	50/60 Hz	400 Hz	50/60 Hz	400 Hz	50/60 Hz
Resistive	50	100		5	5	100	50	5	2	100	50		
Inductive	10	100		5	5						50		
Motor	50	100				100	20			100	40		
Lamp	50			.75	.75			.75	.75				
Transfer load <u>3/</u>													
Mechanical Life reduced current	100	25		1.25	1.25	25	12.5	1.25	1.25	25	12.5		
Mixed loads	50	10		<u>4/</u>	<u>4/</u>	10	10			10	10		

1/ Absence of value indicates that parameter is not applicable to this specification sheet.

2/ Absence of value indicates that relay is not rated for three phase applications.

3/ Transfer load indicates relay is suitable for transfer between unsynchronized ac power supplies at the rating indicated.

4/ In accordance with MIL-PRF-6106.

TABLE III. Operating characteristics.

PIN MS24168-	Coil	Coil data										Time (milliseconds Max)					
		Rated			Max		Max pick-up voltage			Hold volt- Age <u>2/</u> <u>3/</u>	Drop- Out volt- age <u>2/</u> <u>3/</u>	Oper- ate <u>4/</u>	Re- Release <u>5/</u>	Contact bounce <u>4/</u>			
		Volts <u>1/</u>	Freq. Hz	Res +15% -10% (Ω)	Volts	Coil cur- rent	Nor- mal <u>2/</u>	High temp test	Cont cur- rent test					Main		Aux	
														NO	NC	NO	NC
		D1	X1,X2	28	dc	55	29	0.6	18	21	22.5	7	1.5	60	25	2.5	n/a
D2	X1,X2	28	dc	55	29	0.6	18	21	22.5	7	1.5	60	25	2.5	n/a	4.5	4.5
A3	X1,X2	115	400/50/60 <u>6/</u>		120	0.25	90	100	104	40	10	65	80	5	n/a	n/a	n/a
A4	X1,X2	115	400/50/60 <u>6/</u>		120	0.25	90	100	104	40	10	65	115	5	n/a	7	7

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/ At 50 and 60 Hz, chattering may occur at or near dropout voltage when voltage is slowly decreased.

4/ With rated coil voltage.

5/ From rated coil voltage.

6/ Coils will operate at either 50, 60, or 400 Hz; however, ambient temperature must not exceed +71°C.

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TABLE IV. Vibration levels.

PIN MS24168-	Frequency				
	5-10 Hz	10-55 Hz	55-250 Hz	250-500 Hz	500-1,500 Hz
D1	.08 DA	.06 DA	8 g's	5 g's	3 g's
D2				3 g's	3 g's
A3				5 g's	3 g's
A4				3 g's	3 g's

Referenced documents. In addition to MIL-PRF-6106, this document references the following:

MS27243      MIL-STD-461

Changes from previous issue. The margins of this specification are marked with vertical lines to indicate where changes from the previous issue 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 and relationship to the last previous issue.

Custodians:  
Navy - AS  
Air Force - 11  
DLA - CC

Preparing activity:  
DLA - CC

(Project 5945-1305)

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 ASSIST Online database at <http://assist.daps.dla.mil/>.