

INCH-POUND

MS24143X
W/AMENDMENT 1
16 March 2004
SUPERSEDING
MS24143X
15 April 2003

DETAIL SPECIFICATION SHEET

RELAYS, ELECTROMAGNETIC, 3 PST (N.O.), 25 AMPERES,
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.

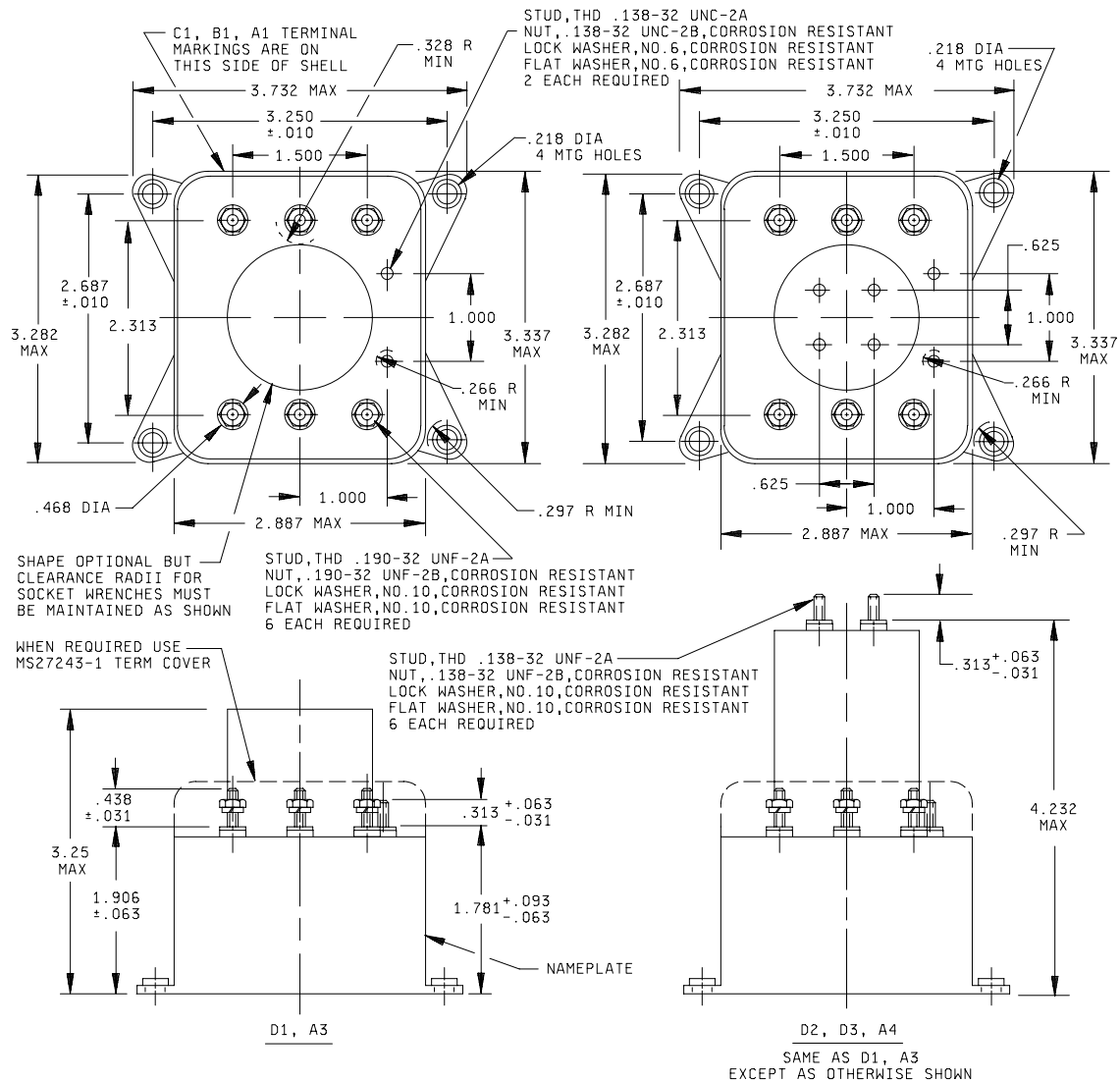
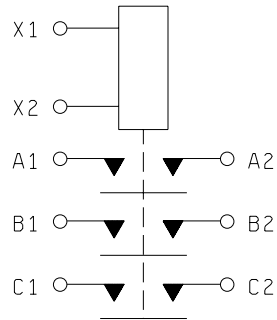


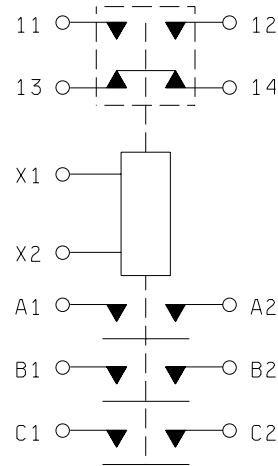
FIGURE 1. Dimensions and configurations.

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CIRCUIT DIAGRAM A

APPLICABLE TO RELAYS
WITHOUT AUXILIARY CONTACTS



CIRCUIT DIAGRAM B

APPLICABLE TO RELAYS
WITH AUXILIARY CONTACTS

Inches	mm	Inches	mm	Inches	mm
.010	0.25	.313	7.95	2.313	58.75
.031	0.79	.328	8.33	2.687	68.25
.063	1.60	.438	11.13	2.887	73.33
.093	2.36	.468	11.89	3.250	82.55
.138	3.51	.625	15.88	3.282	83.36
.190	4.83	1.000	25.40	3.337	84.76
.218	5.54	1.500	38.10	3.732	94.79
.266	6.76	1.781	45.24	4.232	107.49
.297	7.54	1.906	48.41		

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. In the event of a conflict between the text of this specification and the references cited herein, the text of this specification shall take precedence.
6. 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 forms a part of this standard to the extent specified herein.
7. 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.
8. 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.

Environmental characteristics:

Temperature range <u>1/</u> :	-70°C to +125°C
Max altitude rating:	80,000 ft
Shock G-level:	25 g's
Duration:	6-9 ms
Max duration contact opening:	2 ms
Vibration - Sinusoidal:	See table I.
Vibration - Random:	Not applicable.
High shock:	Not applicable.
Acceleration	15 g's

Electrical characteristics (See tables II, III, IV):

Minimum insulation resistance, initial: 100 megohms.

After life or environmental tests: 50 megohms.

Dielectric strength (sea level): 2-5 seconds.

	Initial <u>2/</u>		After life tests <u>2/</u>	
	28 V dc	115 V ac	28 V dc	115 V ac
Coil to case	1,250 V rms	1,500	1,000 V rms	1,125
Aux contacts	1,250 V rms	1,500	1,000 V rms	1,125
All other points	1,250 V rms	1,800	1,000 V rms	1,350

Dielectric strength (altitude) 4/: 1 minute.

	Initial	After life tests
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

Max contact drop initial: 0.150 volt.

After life test: 0.175 volt.

Overload current (NO): 200 amperes dc, 3/.

Rupture current (NO): 250 amperes dc, 3/.

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

2/ For A3 and A4, coil terminals X1 and X2 must be shorted together for all dielectric testing between coil to case, coil to main or auxiliary contacts, and coil to all other points.

3/ For A3 and A4, rupture and overload current (NO) is 75 A.

4/ Use MS27243-1 terminal cover during dielectric testing at altitude.

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Duty rating: Continuous.

RFI specification: MIL-STD-461 (Applicable to coil circuits of ac operated relays).

TABLE I. Vibration levels.

Dash number	5-10 Hz	10-55 Hz	55-250 Hz	250-500 Hz	500-1,500 Hz
D1	.06 DA	.06 DA	10 g's	6 g's	6 g's
D2				4 g's	3 g's
D3				4 g's	3 g's
A3,A4				4 g's	3 g's

TABLE II. Operating characteristics.

PIN MS 24143-	Coil data											Time - (milliseconds maximum)					
	Coil	Rated			Max		Max pick-up voltage			Drop out voltage 2/ 3/	Hold voltage 2/	Oper- ate 4/	Rel- ease 5/	Contact Bounce			
		Volts 1/	Freq Hz	Res Ω +15% -10%	Volts	Amp	Nor- mal 2/	High temp test	Cont current test					Main		Aux	
														NO	NC	NO	NC
D1	X1,X2	28	dc	52	29	0.6	18	21	22.5	1.5	7.0	25	10	2			
D2, D3	X1,X2	28	dc	52	29	0.6	18	21	22.5	1.5	7.0	25	10	2		4	4
A3	X1,X2	115	50/60/400 6/		124	0.225	90	100	104	10	40	30	65	5			
A4	X1,X2	115	60/60/400 6/		124	0.225	90	100	104	10	40	30	65	5		6	6

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 50/60 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 on either 50, 60, or 400 Hz except ambient temperature must be derated to +71°C maximum.

TABLE III. Rated contact load (amperes per pole) case grounded (applicable to -D1, -D2, -A3, and -A4).

Type of load	Life operating cycles x 10 ³	28 V dc				115 V ac, 1 phase				115/200 V ac, 3 phase 1/			
		Main		Aux		Main		Aux		Main 2/		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	25		5	5	25	25	5		25	15		
Inductive	50												
Inductive	10 3/	25		5	5	25		5		25	12.5		
Motor	50	25				25	15			25	12.5		
Lamp	50			.75	.75			.75					
Transfer load													
Mechanical life reduced current	100	6.25		1.25	1.25	6.25	6.25	1.25		6.25	3.75		
Mixed loads	50	5		Per spec	Per spec								

1/ Absence of value indicates relay is not rated for 3-phase application.

2/ Derated contact loads at 50/60 Hz are applicable to A3 and A4 only.

3/ Derate cycles by 50 percent for A3 and A4 only.

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TABLE IV. Rated contact load (amperes per pole) case grounded (applicable to –D3 only).

Type of load	Life operating cycles x 10 ³	28 V dc				115 V ac, 1 phase				115/200 V ac, 3 phase <u>1/</u>				See appro- priate 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	100	12		1.25	1.25	12		1.25		12				
Inductive	100	12		.75	.75	12		.75		12				
Motor	100	6				6				6				
Lamp														
Transfer load														<u>2/</u>
Mechanical life reduced current	100	3		.25	.25	3		.25		3				
Mixed loads	100	1.2		Per spec	Per spec	1.2				1.2				

^{1/} Absence of value indicates relay is not rated for 3-phase application.

^{2/} Transfer load indicates relay is suitable for transfer between unsynchronized ac power supplies at rating indicated.

Part or identification number (PIN): MS24143- (plus dash number from table V).

General characteristics: See table V.

TABLE V. Dash numbers and characteristics.

Dash number MS24143-	Type	Coil	Terminal type	Mounting or mating socket	Auxiliary contacts	Max weight in pounds
D1	I	dc	Stud	Flange	None	1.5
D2					Yes	1.7
D3					Yes	1.7
A3		ac			None	1.7
A4					Yes	1.9

^{1/} Dash number A1 and A2 have been superseded by A3 and A4.

^{2/} Weights include covers and barriers.

Supersession data: MS24143-D3 supersedes MS21330-D2.

Qualification by similarity: See MIL-PRF-6106.

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

MS27243

MIL-STD-461

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.

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

Preparing activity:
DLA - CC

(Project 5945-1224)

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