

INCH-POUND

MS24187N
15 April 2003
SUPERSEDING
MS24187M
8 March 1993

DETAIL SPECIFICATION SHEET

RELAYS, ELECTROMAGNETIC, 50/25 AMPERES, 1 PDT (N.O./N.C.),
TYPE II, NON-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.

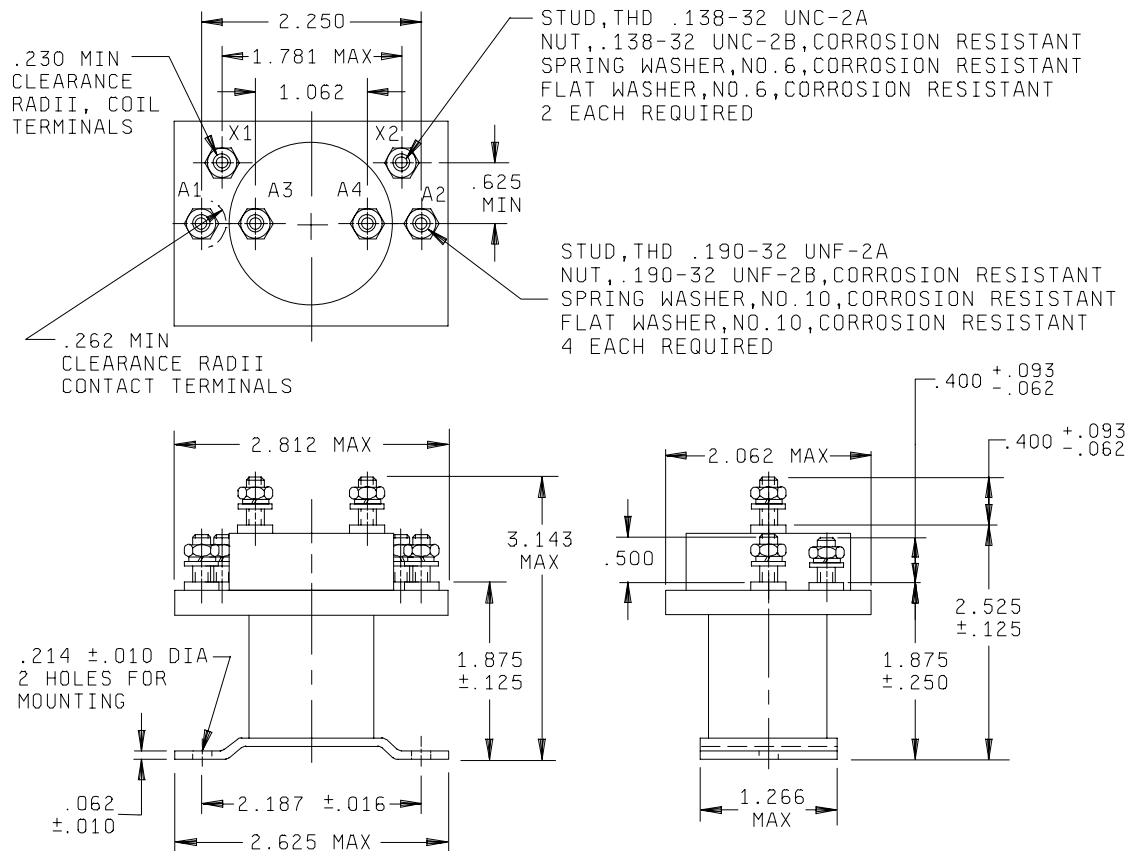
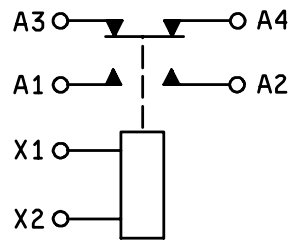


FIGURE 1. Dimensions and configuration.

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CIRCUIT DIAGRAM

| Inches | mm | Inches | mm | Inches | mm |
|--------|------|--------|-------|--------|-------|
| .010 | 0.25 | .230 | 5.84 | 1.875 | 47.62 |
| .016 | 0.40 | .250 | 6.35 | 2.062 | 52.37 |
| .062 | 1.57 | .343 | 8.71 | 2.187 | 55.55 |
| .093 | 2.36 | .400 | 10.16 | 2.250 | 57.15 |
| .125 | 3.18 | .500 | 12.70 | 2.525 | 64.14 |
| .138 | 3.51 | .625 | 15.88 | 2.812 | 71.42 |
| .190 | 4.83 | 1.062 | 26.97 | 3.143 | 79.83 |
| .214 | 5.44 | 1.781 | 45.24 | | |

NOTES:

1. Dimensions are in inches.
2. Unless otherwise specified, tolerance is $\pm .061$ (1.57 mm).
3. Metric equivalents are given for general information only.
4. Additional flat washer may be used 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 form 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 configuration - Continued.

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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: 400 amperes; NC: 200 amperes.

Rupture current NO: 500 amperes; NC: 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 test: 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 V | N/A | 1,000 V | N/A |
| Aux contacts | 1,250 V | N/A | 1,000 V | N/A |
| All other points | 1,250 V | 1,250 V | 1,000 V | 1,000 V |

Dielectric strength (altitude): 1 minute.

| | Initial | |
|------------------|---------|----------|
| | 28 V dc | 115 V ac |
| Coil to case | 500 V | 700 V |
| Aux contacts | 500 V | 700 V |
| All other points | 500 V | 700 V |

Environmental characteristics:

Temperature range: -55°C to + 71°C.

Maximum altitude rating: 50,000 feet.

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Shock g-level: (NO) 25 g's, (NC) 15 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: 10 g's.

TABLE I. PIN and general characteristics.

| Part number MS24187- | Type | Coil type | Terminal type | Mounting or mating socket | Auxiliary contacts | Maximum weight in pounds |
|-------------------------|------|-----------|------------------|------------------------------|-----------------------|--------------------------------|
| D1 and D2 | II | dc | Stud | Bracket | None | 0.66 |

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

| Type of load | Life operat ing cycles x 10 ³ | 28 V dc | | | | 115 V ac, 1 phase | | | | 115/200 V ac, 3 phase 2/ | | | | 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 | 50 | 50 | 25 | | | 25 | | | | 400 Hz | 60 Hz | | | |
| Inductive | 10 | 50 | 25 | | | | | | | | | | | |
| Motor | 50 | 50 | 25 | | | | | | | | | | | |
| Lamp | | | | | | | | | | | | | | |
| Transfer load | | | | | | | | | | | | | | 3/ |
| Mechanical life reduced current | 4/ | 12.5 | 6.3 | | | 6.3 5/ | | | | | | | | |
| Mixed loads | 50 | 5 | 5 | | | 5 5/ | | | | | | | | |

1/ Normally closed contacts shall operate 20 percent of the maximum operating cycles for the motor load test. For resistive load tests, the normally open contacts shall be cycled with the rated dc resistive load and the normally closed contacts shall be cycled with the rated ac resistive load. For no other load tests shall both sets of contacts be cycled simultaneously. It is not required that the relay operate when the contact enclosure is removed. Contact enclosures of MS24187 relays shall be provided with resilient gaskets at mating surfaces and shall prevent entrance of all airborne particles of sand and dust.

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

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

4/ Mechanical life: 100,000 cycles for MS24187-D1 and 500,000 cycles for MS24187-D2.

5/ Normally open only.

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TABLE III. Operating characteristics.

| PIN MS 24187- | Coil data | | | | | | | | | | Time - milliseconds maximum <u>2/</u> | | | | | | |
|---------------------|-----------|-----------------|---------|-------------------------|-------|------|---------------------|----------------|-------------------|------------------------|---------------------------------------|--------------------|--------------------|--------|----|-----|-----|
| | Coil | Rated | | | Max | | Max pick-up voltage | | | Hold voltage <u>2/</u> | Drop out voltage <u>2/</u> | Oper-ate <u>3/</u> | Rel-ease <u>4/</u> | Bounce | | | |
| | | Volts <u>1/</u> | Freq Hz | Ω Res +10 -15 % at 25°C | Volts | Amp | Nor-mal <u>2/</u> | High temp test | Cont current test | | | | | Main | | Aux | |
| | | | | | | | | | | | | | | NO | NC | NO | NC |
| D1 | X1,X2 | 28 | dc | 94.2 | 29 | 0.36 | 18 | 21 | 22.5 | 9.0 | 1.5 | 20 | 15 | 5.0 | 10 | --- | --- |
| D2 | X1,X2 | 28 | dc | 94.2 | 29 | 0.36 | 18 | 21 | 22.5 | 9.0 | 1.5 | 20 | 15 | 5.0 | 10 | --- | --- |

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 MS24187- | Frequency | | | | |
|-----------------|-----------|----------|-----------|------------|--------------|
| | 5-10 Hz | 10-55 Hz | 55-250 Hz | 250-500 Hz | 500-1,500 Hz |
| D1, D2 | .08 DA | .06 DA | 2 g's | 2 g's | N/A |

Part or Identifying Number (PIN): MS24187- (plus applicable dash number from table I).

Qualification by similarity: See MIL-PRF-6106.

Supersession data: See table V.

TABLE V. Supersession data.

| Superseding (new) | Superseded (old) |
|-------------------|------------------|
| MS24187-D2 | AN3353-1 |
| MS24187-D2 | AN3353-2 |

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

Preparing activity:
DLA - CC

(Project 5945-1196)

Review activities:
Navy - EC