

[INCH-POUND]

MS24140L

9 June 1992

SUPERSEDING

MS24140K

20 February 1990

MILITARY SPECIFICATION SHEET

RELAYS, ELECTROMAGNETIC, 50 AMPERES, 1 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 product described herein shall consist of
this specification sheet and the issue of the following specification listed
in that issue of the Department of Defense Index of Specifications and Standards
(DODISS) specified in the solicitation: MIL-R-6106.

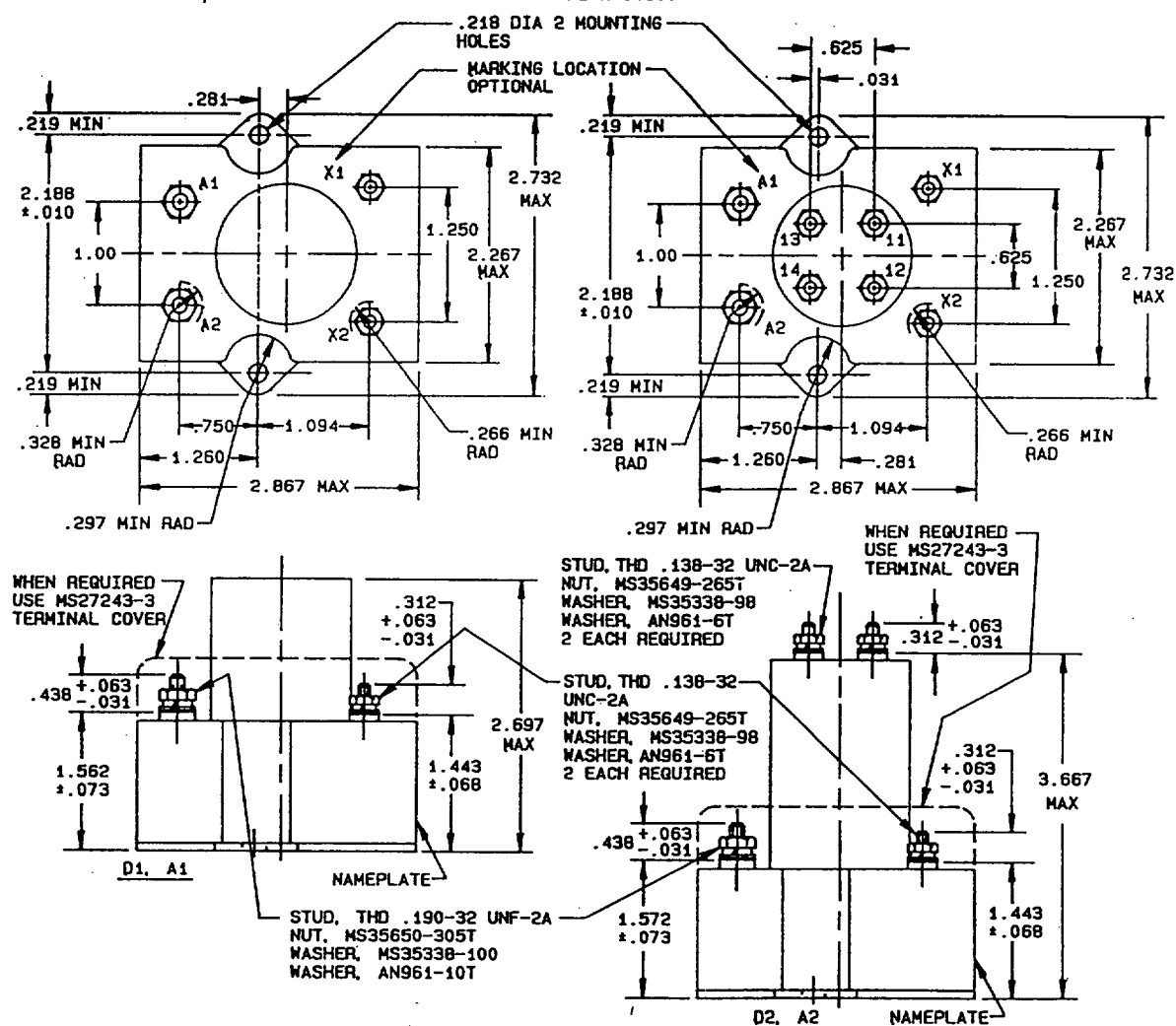
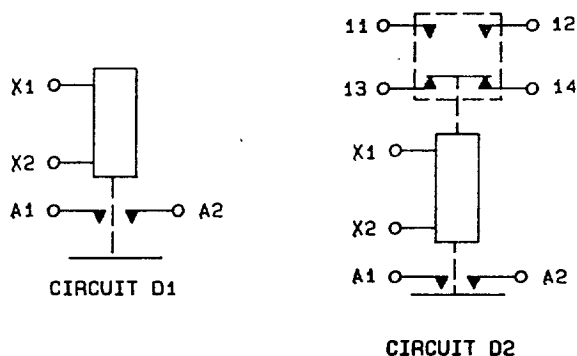


FIGURE 1. Dimensions and configurations.

(L) denotes changes

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CIRCUIT DIAGRAMS

| Inches | mm | Inches | mm |
|--------|-------|--------|-------|
| .010 | 0.25 | .625 | 15.86 |
| .031 | 0.79 | .750 | 19.05 |
| .063 | 1.60 | 1.000 | 25.40 |
| .068 | 1.73 | 1.094 | 27.79 |
| .073 | 1.85 | 1.250 | 31.75 |
| .138 | 3.51 | 1.260 | 32.00 |
| .190 | 4.83 | 1.443 | 36.65 |
| .218 | 5.54 | 1.562 | 39.67 |
| .219 | 6.96 | 1.572 | 39.93 |
| .240 | 6.10 | 2.188 | 55.58 |
| .266 | 6.76 | 2.267 | 57.68 |
| .281 | 7.14 | 2.697 | 68.50 |
| .297 | 7.54 | 2.732 | 69.39 |
| .312 | 7.92 | 2.867 | 72.82 |
| .328 | 8.33 | 3.667 | 93.14 |
| .438 | 11.13 | | |

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is $\pm .031$.
4. This specification sheet takes precedence over documents referenced herein.
5. Referenced documents shall be of the issue in effect on date of invitation for bid.
6. Coil and auxiliary terminals may use additional flat washer for terminal seat.

FIGURE 1. Dimensions and configurations - 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 volt.

After life test: 0.175 volt.

Overload current (NO): 400 amperes.

Rupture current (NO): 500 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 (see table IV).

Dielectric strength (altitude): 1 minute (see table V).

Environmental characteristics:

Temperature range: -70°C to +125°C.

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 VI.

Acceleration: 15 g's.

Qualification by similarity: See table VII.

Part or Identifying Number (PIN): MS24140 - (plus dash number from table I).

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TABLE I. Dash numbers and general characteristics. 1/

| PIN MS24140- | Type | Coil | Terminal type | Mounting or mating socket | Auxiliary contacts | Maximum weight in pounds 2/ |
|-----------------|------|------|---------------|------------------------------|-----------------------|--------------------------------|
| D1 | I | dc | Stud | Flange | None | .95 |
| D2 | | | | | Yes | 1.10 |

1/ Dash numbers A1 and A2 have been cancelled without replacement.

2/ Weights include covers and barriers.

L 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/ | | | |
|------------------------------------|--|---------|----|------|------|-------------------|-------|--------|-------|--------------------------|-------|--------|-------|
| | | 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 | | 5 | 5 | 50 | | 5 | | | | | |
| Inductive | 10 | 50 | | 5 | 5 | 50 | | 5 | | | | | |
| Inductive | | | | | | | | | | | | | |
| Motor | 50 | 50 | | | | 50 | | | | | | | |
| Lamp | 50 | 25 | | .75 | .75 | 10 2/ | | .75 | | | | | |
| Transfer load | | | | | | | | | | | | | |
| Mechanical life reduced current | 100 | 12.5 | | 1.25 | 1.25 | 1.25 | | 1.25 | | | | | |
| Intermediate current | 50 | 5 | | Per | spec | 5 | | | | | | | |

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

2/ Test requirement: 100 amperes inrush current with 2 seconds off-time.

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Ⓛ TABLE III. Operating characteristics.

| PIN MS24140- | Coil data | | | | | | | | | | | Time - milliseconds max | | | | | |
|-----------------|-----------|-------------|------------|--------------------------------|-------|--------------|---------------------|----------------------|-------------------------|-----------------------|------------------------------|-------------------------|---------------|--------|-----|-----|-----|
| | Coil | Rated | | | Max | | Max pick-up voltage | | | Hold voltage 2/ | Drop out voltage 2/ | Operate 3/ | Release 4/ | Bounce | | | |
| | | Volts 1/ | Freq Hz | Ω Res +15% -10 | Volts | Am- peres | Normal 2/ | High temp test | Cont current test | | | | | Main | | Aux | |
| | | | | | | | | | | | | | | NO | NC | NO | NC |
| D1 | X1,X2 | 28 | dc | 78 | 29 | .50 | 18 | 21 | 22.5 | 7 | 1.5 | 20 | 10 | 2 | --- | --- | --- |
| D2 | X1,X2 | 28 | dc | 78 | 29 | .50 | 18 | 21 | 22.5 | 7 | 1.5 | 20 | 10 | 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. Dielectric strength (sea level).

| | 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 | 1,000 V rms | 1,125 |
| Auxiliary contacts | 1,250 V rms | 1,500 | 1,000 V rms | 1,125 |
| All other points | 1,250 V rms | 1,500 | 1,000 V rms | 1,125 |

TABLE V. Dielectric strength (altitude).

| | 28 V dc | 115 V ac |
|--------------------|-----------|----------|
| Coil to case | 500 V rms | 500 |
| Auxiliary contacts | 500 V rms | 500 |
| All other points | 500 V rms | 500 |

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TABLE VI. Vibration Levels (sinusoidal).

| PIN MS24140- | 5-10 Hz | 10-55 Hz | 55-250 Hz | 250-500 Hz | 500-1,500 Hz |
|-----------------|---------|----------|-----------|------------|--------------|
| D1 | .08 DA | .06 DA | 10 g's | 10 g's | 8 g's |
| D2 | .08 DA | .06 DA | 10 g's | 6 g's | 6 g's |

TABLE VII. Qualification by similarity.

| PIN MS24140- | Loads | | | | | | Dynamics <u>1/</u> <u>3/</u> | | | Environmental | | |
|-----------------|-------------|---|---|-----------|---|---|------------------------------|---|---|---------------|---|---|
| | Type 1 | | | Type 1 ER | | | | | | | | |
| | A | B | C | D | E | F | A | B | C | A | B | C |
| D1 | 4 | | | | | | 2 | | | 4 | | |
| D2 | 4 <u>2/</u> | | | | | | 2 | | | 4 <u>2/</u> | | |

1/ For group C testing, each dash number shall be tested to meet vibration requirements.

2/ For testing of relays with auxiliary contacts see MIL-R-6106, Appendix I.

3/ All relays must be tested. Reference MIL-R-6106, Appendix I.

CONCLUDING MATERIAL

Custodians:
Navy - AS
Air Force - 85

Review activities:
Navy - EC
DLA - ES

Preparing activity:
Air Force - 85

Agent:
DLA - ES

(Project 5945-0873)