

INCH-POUND

MS24376P  
w/AMENDMENT 3  
27 April 2006  
SUPERSEDING  
MS24376P  
w/AMENDMENT 2  
8 February 2006

## DETAIL SPECIFICATION SHEET

RELAYS, ELECTROMAGNETIC, 50 AMPERES, 3PST (NO), 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 MIL-PRF-6106.

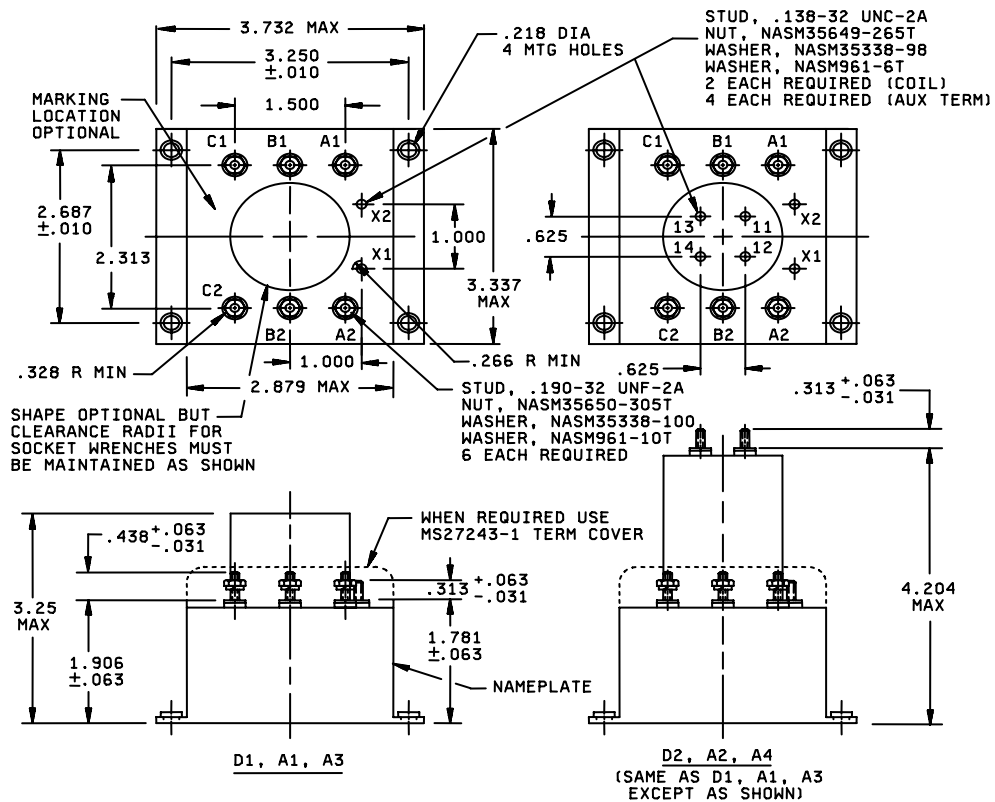
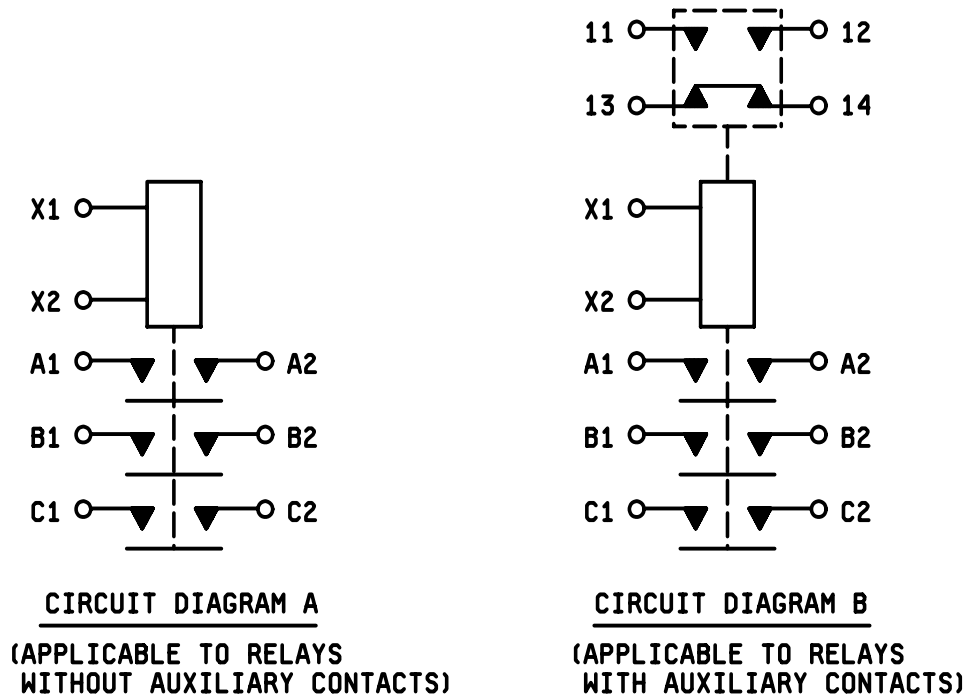


FIGURE 1. Dimensions and configurations.

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| Inches | mm    | Inches | mm     |
|--------|-------|--------|--------|
| .010   | 0.25  | 1.000  | 25.40  |
| .031   | 0.79  | 1.500  | 38.10  |
| .063   | 1.60  | 1.781  | 45.24  |
| .138   | 3.51  | 1.906  | 48.41  |
| .190   | 4.83  | 2.313  | 58.75  |
| .218   | 5.54  | 2.687  | 68.25  |
| .266   | 6.76  | 2.897  | 73.58  |
| .313   | 7.95  | 3.250  | 82.55  |
| .328   | 8.33  | 3.337  | 84.76  |
| .438   | 11.13 | 3.732  | 94.79  |
| .625   | 15.88 | 4.204  | 106.78 |

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. This specification sheet takes precedence over documents referenced herein.
5. Referenced documents shall be of the issue in effect on the date of invitation for bid.
6. Coil and auxiliary terminals may use an additional flat washer for terminal seating.

FIGURE 1. Dimensions and configurations - Continued.

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REQUIREMENTS:

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

ENVIRONMENTAL CHARACTERISTICS:

Temperature range: -70°C to +125°C for dc operated relays; -70°C to +71°C for ac operated relays.

Maximum altitude rating: 80,000 feet.

Shock g-level: 25 g's.

Duration: 6 ms to 9 ms.

Maximum 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 [table II](#), [table III](#), and [table IV](#)):

Insulation resistance, initial: 100 megohms.

After life or environmental tests: 50 megohms.

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

|                  | Initial <sup>1/</sup> |          | After life tests <sup>1/</sup> |          |
|------------------|-----------------------|----------|--------------------------------|----------|
|                  | 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) (80,000 feet): 1 minute. <sup>2/</sup>

|                  | <u>28 V dc</u> <sup>1/</sup> | <u>115 V ac</u> <sup>1/</sup> |
|------------------|------------------------------|-------------------------------|
| Coil to case     | 500 V rms                    | 500                           |
| Aux contacts     | 500 V rms                    | 500                           |
| All other points | 700 V rms                    | 500                           |

<sup>1/</sup> For A1, A2, 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.

<sup>2/</sup> Use MS27243-1 terminal cover during dielectric testing at altitude.

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TABLE I. Vibration levels.

| Dash number | 5 Hz to 10 Hz | 10 Hz to 55 Hz | 55 Hz to 250 Hz | 250 Hz to 500 Hz | 500 Hz to 1,500 Hz |
|-------------|---------------|----------------|-----------------|------------------|--------------------|
| D1          | .08 DA        | .06 DA         | 10 g's          | 6 g's            | 4 g's              |
| D2          | .08 DA        | .06 DA         | 10 g's          | 4 g's            | 3 g's              |
| A1          | .08 DA        | .06 DA         | 10 g's          | 6 g's            | 4 g's              |
| A2, A3, A4  | .08 DA        | .06 DA         | 10 g's          | 4 g's            | 3 g's              |

Maximum contact drop initial: .150 volt.

After life test: .175 volt.

Overload current (NO): 400 amperes. 3/

Rupture current (NO): 500 amperes. 3/

Duty rating: Continuous.

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

Part or Identifying Number (PIN): MS24376 (plus dash number from [table IV](#)).

General characteristics: See [table IV](#).

Qualification by similarity: See MIL-PRF-6106.

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3/ Rupture and overload current (NO): 100 amperes for A3 and A4. For A1, A2, D1, and D2: 60 amperes.

TABLE II. Operating characteristics.

| Dash<br>number<br>MS24376- | Coil data |             |                 |                     |       |                     |                   |                      |                         |                               |                                      | Time-milliseconds max |                    |                |     |     |     |
|----------------------------|-----------|-------------|-----------------|---------------------|-------|---------------------|-------------------|----------------------|-------------------------|-------------------------------|--------------------------------------|-----------------------|--------------------|----------------|-----|-----|-----|
|                            | Coil      | Rated       |                 | Max                 |       | Max pick-up voltage |                   |                      |                         | Hold<br>volt-<br>age<br>2/ 3/ | Drop<br>out<br>volt-<br>age<br>2/ 3/ | Oper-<br>ate<br>4/    | Re-<br>lease<br>5/ | Contact bounce |     |     |     |
|                            |           | Volts<br>1/ | Frequency<br>Hz | Res.<br>+15%<br>-10 | Volts | Ampere              | Nor-<br>mal<br>2/ | High<br>temp<br>test | Cont<br>current<br>test |                               |                                      |                       |                    | Main           |     | Aux |     |
|                            |           |             |                 |                     |       |                     |                   |                      |                         |                               |                                      |                       |                    | NO             | NC  | NO  | NC  |
| D1                         | X1, X2    | 28          | dc              | 52                  | 29    | 0.6                 | 18                | 21                   | 22.5                    | 7                             | 1.5                                  | 25                    | 10                 | 2              | --- | --- | --- |
| D2                         | X1, X2    | 28          | dc              | 52                  | 29    | 0.6                 | 18                | 21                   | 22.5                    | 7                             | 1.5                                  | 25                    | 10                 | 2              | --- | 4   | 4   |
| A1                         | X1, X2    | 115         | 7/<br>400/60    | ---                 | 124   | .225                | 90                | 100                  | 104                     | 40                            | 10                                   | 30                    | 65                 | 2              | --- | --- | --- |
| A2                         | X1, X2    | 115         | 7/<br>400/60    | ---                 | 124   | .225                | 90                | 100                  | 104                     | 40                            | 10                                   | 30                    | 65                 | 2              | --- | 4   | 4   |
| A3                         | X1, X2    | 115         | 7/<br>400/50/60 | ---                 | 124   | .225                | 90                | 100                  | 104                     | 40                            | 10                                   | 30                    | 65                 | 5              | --- | --- | --- |
| A4                         | X1, X2    | 115         | 7/<br>400/50/60 | ---                 | 124   | .225                | 90                | 100                  | 104                     | 40                            | 10                                   | 30                    | 65                 | 5              | --- | 6   | 6   |

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1/ CAUTION: The 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/ Duration of auxiliary contact bounce is the maximum cumulative open time of the auxiliary contacts.7/ Coils will operate on 50 Hz, 60 Hz, and 400 Hz, except that relay ambient temperature must be derated to +71°C maximum.MS24376P  
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TABLE III. Rated contact load (amperes per pole) case grounded.

| 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 |                     |        |          |
|-----------------------------------|---|---------|-----|--|------|-------------------|----------|--------|----------|-----------------------|---------------------|--------|----------|
|                                   |   | 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                                      | 50      | --- | 5  | 5    | 50                | 25       | 5      | 2        | 50                    | <sup>2/</sup><br>20 | ---    | ---      |
| Inductive                         | 10                                      | 50      | --- | 5  | 5    | 50                | ---      | 5      | ---      | 50                    | <sup>2/</sup><br>15 | ---    | ---      |
| Motor                             | 50                                      | 50      | --- | ---  | ---  | 50                | 20       | ---    | ---      | 50                    | <sup>3/</sup><br>15 | ---    | ---      |
| Lamp                              | 50                                      | ---     | --- | .75  | .75  | ---               | ---      | .75    | .75      | ---                   | ---                 | ---    | ---      |
| <sup>4/</sup><br>Transfer load    |   | ---     | --- | ---  | ---  | ---               | ---      | ---    | ---      | ---                   | ---                 | ---    | ---      |
| Mechanical life (reduced current) | 100                                     | 12.5    | --- | 1.25                                       | 1.25 | 12.5              | 10       | 1.25   | 1.25     | 12.5                  | 10                  | ---    | ---      |
| Mixed loads                       | 50                                      | 5       | --- | Applicable in accordance with MIL-PRF-6106 |      | 5                 | 5        | ---    | ---      | 5                     | 5                   | ---    | ---      |

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

<sup>2/</sup> 25 amperes for A3. 33 amperes for A4.

<sup>3/</sup> 20 amperes for A3 and A4.

<sup>4/</sup> Transfer load indicates that the relay is suitable for transfer between unsynchronized ac power supplies at the rating indicated.

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TABLE IV. Dash numbers and general characteristics.

| PIN<br>MS24376- | Type | Coil<br>type | Terminal<br>type | Mounting or<br>mating socket | Auxiliary<br>contacts | Maximum<br>weight<br>(pounds) <u>1/</u> |
|-----------------|------|--------------|------------------|------------------------------|-----------------------|---|
| D1              | I    | dc           | Stud             | Flange                       | None                  | 1.6                                     |
| D2              | I    | dc           | Stud             | Flange                       | Yes                   | 1.7                                     |
| A1              | I    | ac           | Stud             | Flange                       | None                  | 1.7                                     |
| A2              | I    | ac           | Stud             | Flange                       | Yes                   | 1.9                                     |
| A3              | I    | ac           | Stud             | Flange                       | None                  | 1.8                                     |
| A4              | I    | ac           | Stud             | Flange                       | Yes                   | 2.0                                     |

1/ Weights include covers and barriers.

NOTES:

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

NASM961  
MS27243  
NASM35338  
NASM35649  
NASM35650  
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.

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