

INCH-POUND

MS27709J

05 January 2022

SUPERSEDING

MS27709H

1 November 2011

## MILITARY SPECIFICATION SHEET

RELAYS, ELECTROMAGNETIC, 10 AMPERES, 4 PDT,  
TYPE I, HERMETICALLY SEALED

Reactivated after 05 January 2022 and may be  
used for new and existing design acquisitions

This specification is approved for use by all  
Departments and Agencies of the Department of Defense.

The requirements for acquiring the relays described herein shall  
consist of this specification sheet and [MIL-PRF-6106](#).

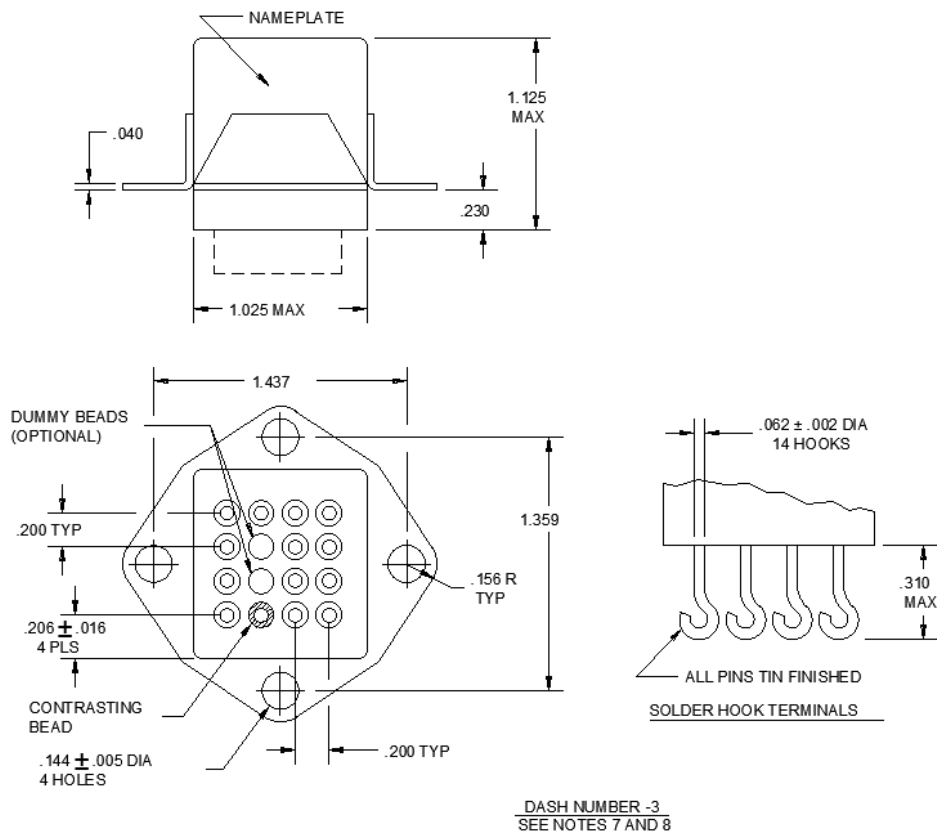


FIGURE 1. Configurations and dimensions.

AMSC N/A

DISTRIBUTION STATEMENT A. Approved for public release; distribution is unlimited.

FSC 5945



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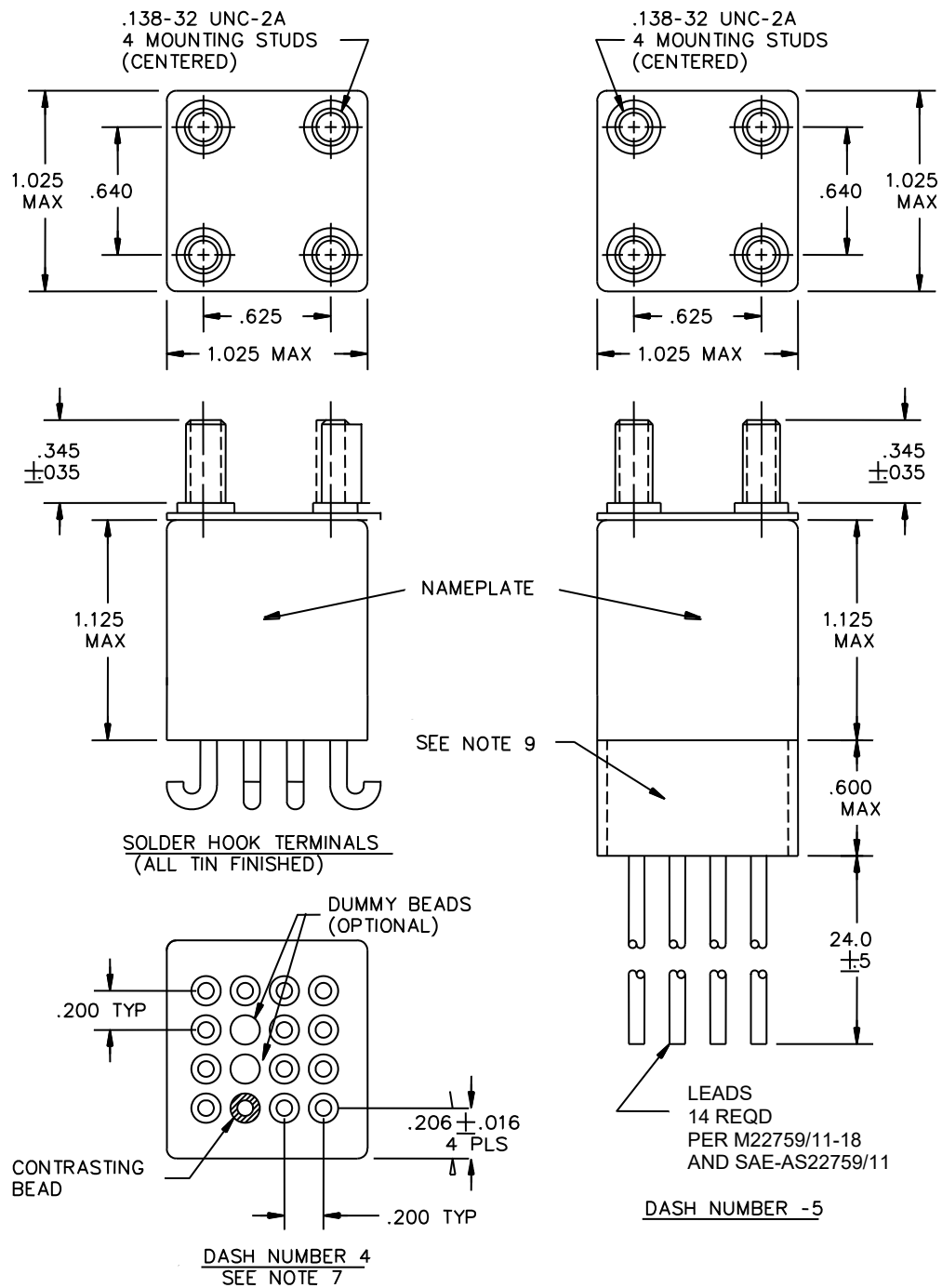


FIGURE 1. Configurations and dimensions - Continued.

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| Inches | mm   | Inches | mm    | Inches | mm    |
|--------|------|--------|-------|--------|-------|
| .002   | 0.05 | .156   | 3.96  | .625   | 15.88 |
| .005   | 0.13 | .200   | 5.08  | .640   | 16.26 |
| .010   | 0.25 | .206   | 5.23  | 1.025  | 26.04 |
| .016   | 0.41 | .230   | 5.84  | 1.125  | 28.58 |
| .035   | 0.89 | .300   | 7.62  | 1.359  | 34.52 |
| .040   | 1.02 | .310   | 7.87  | 1.437  | 36.50 |
| .062   | 1.57 | .345   | 8.76  | 24.0   | 610   |
| .138   | 3.51 | .500   | 12.70 |        |       |
| .144   | 3.66 | .600   | 15.24 |        |       |

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is  $\pm 0.010$  (0.25 mm).
4. Terminal numbers shall not appear on relay header. There shall be affixed to the relay legible circuit diagram that identifies each terminal location specified.
5. In the event of a conflict between the test of this document and the references cited herein, the text of this document shall take preference.
6. Referenced Government documents of the issue listed in that issue of the Acquisition Streamlining and Standardization Information System (ASSIST) specified in the solicitation forms a part of this specification sheet to the extent specified herein.
7. Orientation of solder lugs is optional.
8. Shape of flange is optional within the envelope dimensions shown.
9. Shell material shall be diallyl phthalate type SDG in accordance with [ASTM-D5948](#), or equivalent material as approved by the qualifying activity. Shell shall be filled with encapsulation in accordance with [MIL-PRF-23586](#), grade B, type II, class II, or equivalent filler as approved by the qualifying activity.

FIGURE 1. Configurations and dimensions - Continued.

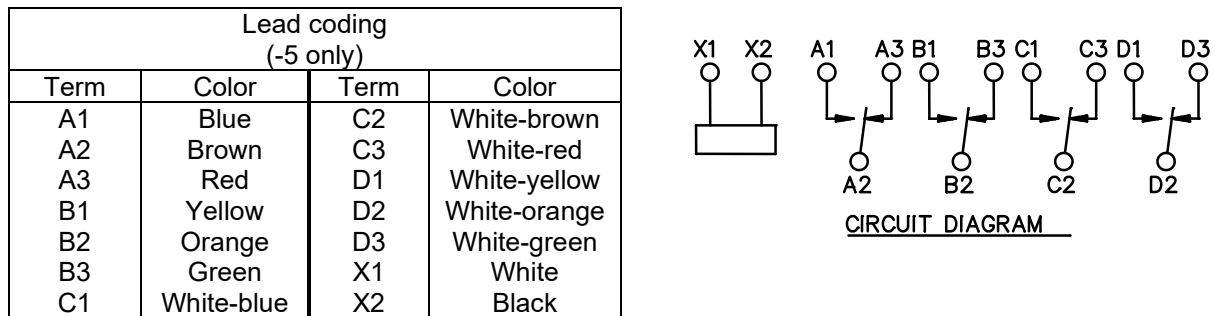


FIGURE 2. Lead coding and circuit diagram.

## REQUIREMENTS:

Configurations and dimensions: See [figure 1](#).

Lead coding and circuit diagram: See [figure 2](#).

Dash numbers and general characteristics: See [table I](#).

## Contact data:

Rated contact load: See [table II](#).

Maximum contact drop, initial: 0.150 V.

After life test: 0.175 V.

Overload current (NO): 40 amperes dc.

Rupture current (NO): 50 amperes dc.

Operating characteristics: See [table III](#).

Duty rating: Continuous.

RFI specification: Not applicable.

## 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 |
|---------------------|-------------|------------------|
| Coil to case:       | 1,000 V rms | 1,000 V rms      |
| Auxiliary contacts: | N/A         | N/A              |
| All other points:   | 1,250 V rms | 1,000 V rms      |

Altitude, 1 minute (80,000 ft.): [1/](#)

|                     | N/A | 250 V rms |
|---------------------|-----|-----------|
| Coil to case:       | N/A | N/A       |
| Auxiliary contacts: | N/A | 350 V rms |
| All other points:   | N/A |           |

[1/](#) Dielectric may be improved by suitable insulation of terminals and wiring after installation.

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### Environmental characteristics:

Temperature range: -70°C to +125°C.

Maximum altitude rating: 80,000 feet.

Shock, g-level: 50 g's.

Duration: 10 ms.

Maximum duration contact opening: 1 ms.

### Vibration, sinusoidal:

G-level: 20 g's.

Frequency range curve: 10 Hz to 2,000 Hz.

Vibration, random: Not applicable.

High shock: Not applicable.

Acceleration: 15 g's.

Terminal strength (high temperature pull and torque test): Not applicable.

Part or Identifying Number (PIN): MS27709- (plus applicable dash number from [table I](#)).

Quality assurance provisions: Group B and group C testing are not required. The manufacturer shall notify the qualifying activity in the event of any design or construction changes, and shall impose additional testing requirements as necessary.

Qualification by similarity: See [MIL-PRF-6106](#).

Supersession data: See [table IV](#).

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TABLE I. Dash numbers and general characteristics.

| PIN<br>MS27709- | Type | Coil | Terminal type | Mounting or<br>mating socket | Max weight<br>(pound) |
|-----------------|------|------|---------------|------------------------------|-----------------------|
| 3               | I    | dc   | Solder hook   | Flange (4 hole)              | 0.2                   |
| 4               | I    | dc   | Solder hook   | Stud                         | 0.2                   |
| 5               | I    | dc   | Potted leads  | Stud                         | 0.5                   |

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

| Type of load                               | Life<br>operating<br>cycles x<br>10 <sup>3</sup> | 28 V dc                                                      |     |     |    | 115 V ac, 1 phase |          |           |          | 115/200 V ac,<br>3 phase <a href="#">1/</a> |          |           |          | See<br>appro-<br>priate<br>notes |
|--------------------------------------------|--------------------------------------------------|--------------------------------------------------------------|-----|-----|----|-------------------|----------|-----------|----------|---------------------------------------------|----------|-----------|----------|----------------------------------|
|                                            |                                                  | Main                                                         |     | Aux |    | Main              |          | Aux       |          | Main                                        |          | Aux       |          |                                  |
|                                            |                                                  | NO                                                           | NC  | NO  | NC | 400<br>Hz         | 60<br>Hz | 400<br>Hz | 60<br>Hz | 400<br>Hz                                   | 60<br>Hz | 400<br>Hz | 60<br>Hz |                                  |
| Resistive                                  | 100                                              | 10                                                           | 10  |     |    | 10                |          |           |          | 10                                          |          |           |          |                                  |
| Inductive                                  | 50                                               | 8                                                            | 8   |     |    | 8                 |          |           |          | 8                                           |          |           |          |                                  |
| Motor                                      | 100                                              | 4                                                            | 4   |     |    | 4                 |          |           |          | 4                                           |          |           |          |                                  |
| Lamp                                       | 100                                              | 2                                                            | 2   |     |    | 2                 |          |           |          | 2                                           |          |           |          |                                  |
| Transfer<br>load                           |                                                  |                                                              |     |     |    |                   |          |           |          |                                             |          |           |          | <a href="#">2/</a>               |
| Mechanical'<br>life<br>(reduced<br>current | 400                                              | 2.5                                                          | 2.5 |     |    | 2.5               |          |           |          | 2.5                                         |          |           |          |                                  |
| Mixed loads                                |                                                  | Applicable in accordance with <a href="#">MIL-PRF-6106</a> . |     |     |    |                   |          |           |          |                                             |          |           |          |                                  |

[1/](#) Absence of value indicates that the relay is not rated for 3 phase applications.

[2/](#) Transfer load indicates that the relay is suitable for transfer between unsynchronized ac power supplies at the rating indicated.

TABLE III. Operating characteristics.

| PIN<br>MS27709- | Coil data |             |               |                   |       |      |                    |                      |                         |                       |                               | Time - (milliseconds maximum) |                    |                |    |     |    |
|-----------------|-----------|-------------|---------------|-------------------|-------|------|--------------------|----------------------|-------------------------|-----------------------|-------------------------------|-------------------------------|--------------------|----------------|----|-----|----|
|                 | Coil      | Rated       |               |                   | Max   |      | Max pickup voltage |                      |                         | Hold<br>voltage<br>2/ | Drop-<br>out<br>voltage<br>2/ | Oper-<br>ate<br>3/            | Re-<br>lease<br>4/ | Contact bounce |    |     |    |
|                 |           | Volts<br>1/ | Freq.<br>(Hz) | Res<br>(Ω)<br>min | Volts | A    | Normal<br>2/       | High<br>temp<br>test | Cont<br>current<br>test |                       |                               |                               |                    | Main           |    | Aux |    |
|                 |           |             |               |                   |       |      |                    |                      |                         |                       |                               |                               |                    | NO             | NC | NO  | NC |
| 3               | X1,X2     | 28          | dc            | 260               | 29    | .200 | 18                 | 19.8                 | 22.5                    | 7.0                   | 1.5                           | 15                            | 15                 | 2              | 2  |     |    |
| 4               | X1,X2     | 28          | dc            | 260               | 29    | .200 | 18                 | 19.8                 | 22.5                    | 7.0                   | 1.5                           | 15                            | 15                 | 2              | 2  |     |    |
| 5               | X1,X2     | 28          | dc            | 260               | 29    | .200 | 18                 | 19.8                 | 22.5                    | 7.0                   | 1.5                           | 15                            | 15                 | 2              | 2  |     |    |

1/ CAUTION: Use of any coil voltage less than the 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.

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TABLE IV. Supersession data.

| Superseded PIN<br>MS27709- | Replacement PIN<br>M83536/15- |
|----------------------------|-------------------------------|
| 1                          | 021                           |
| 2                          | 022                           |
| 6                          | No replacement                |

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 previous issue.

Referenced documents. In addition to [MIL-PRF-6106](#), this document references the following:

[MIL-PRF-23586](#)   [ASTM-D5948](#)   [SAE-AS22759/11](#)

Custodians:

Navy - AS

Air Force - 85

DLA - CC

Preparing activity:

DLA - CC

(Project 5945-2022-005)

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 the ASSIST Online database at <https://assist.dla.mil/>.