

INCH-POUND

MIL-PRF-39016/48D  
25 February 2013  
SUPERSEDING  
MIL-PRF-39016/48C  
27 August 2006

PERFORMANCE SPECIFICATION SHEET

RELAYS, ELECTROMAGNETIC, ESTABLISHED RELIABILITY, DPDT,  
LOW LEVEL TO 0.5 AMPERE (.100 D.I.P. TERMINAL SPACING)  
ONE-TENTH SIZE, SENSITIVE, MONOSTABLE

Inactive for new design and is no longer  
used, except for replacement purposes.

This specification sheet 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 the latest issue of [MIL-PRF-39016](#).

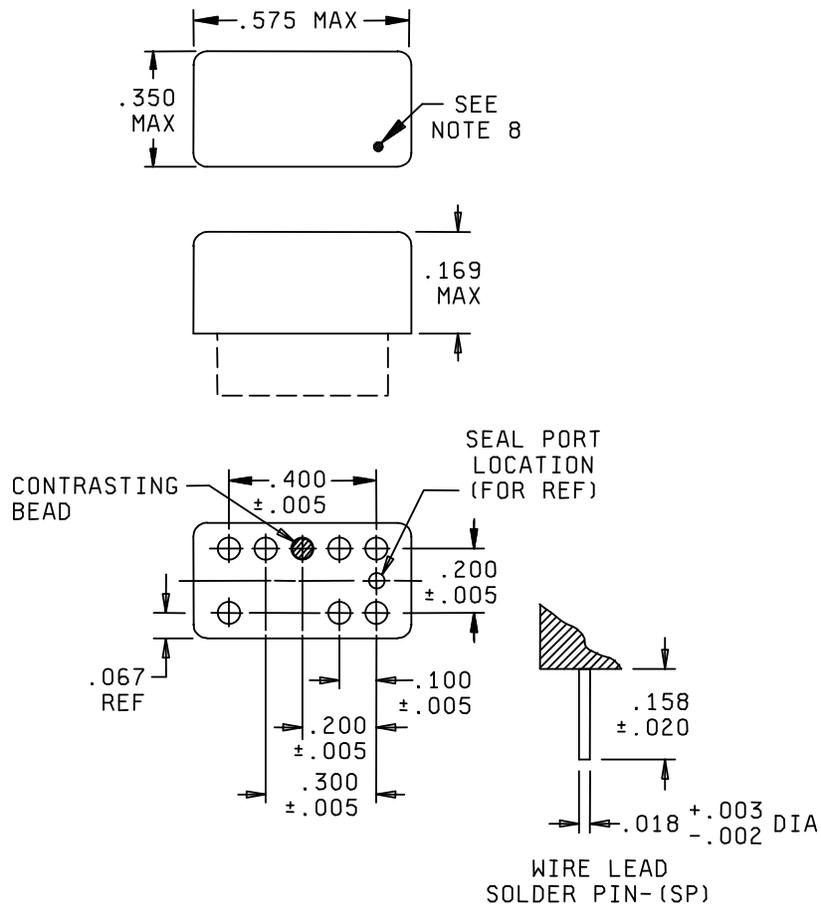
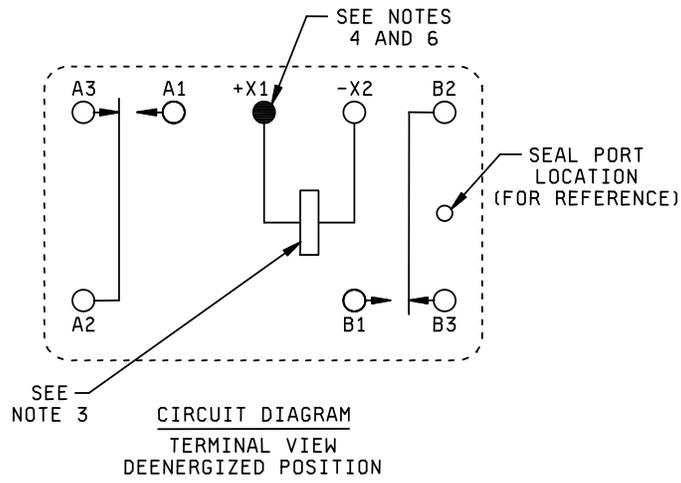


FIGURE 1. Dimensions and configuration.



Inches	mm	Inches	mm
.002	0.05	.100	2.54
.003	0.08	.158	4.01
.005	0.13	.169	4.29
.018	0.45	.200	5.08
.020	0.51	.300	7.62
.067	1.70	.350	8.90
.083	2.10	.400	10.16
		.575	14.60

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Coil symbol is optional per [MIL-STD-1285](#).
4. Indicated terminal X1 shall be identified with contrasting colored bead.
5. Terminal markings are for reference only.
6. To energize relay, apply plus (+) polarity to X1, and minus (-) to X2.
7. Relays shall have plus (+) and minus (-) signs placed on circuit diagram as shown above.
8. An orientation mark (position reference) will be on top of each relay above pin B2.

FIGURE 1. Dimensions and configuration - Continued.

REQUIREMENTS:

CONTACT DATA:

Load ratings:

High level: (case grounded 100,000 life cycles).

Resistive: 0.5 ampere at 28 V dc.

Inductive: 0.1 ampere at 28 V dc (200 mH).

Lamp: Not applicable.

Low level: 10  $\mu$ A to 50  $\mu$ A at 10 mV to 50 mV dc or peak ac.

Intermediate current: Applicable.

Contact resistance or voltage drop:

Initial: 0.200 ohm maximum.

High level:

During life: Maximum of 10 percent of open circuit voltage.

After life: 0.300 ohm maximum.

Low level:

During life: 100 ohms maximum.

After life: 0.300 ohm maximum.

Intermediate current:

During intermediate current: 3 ohms maximum.

After intermediate current: 0.500 ohm maximum.

Contact bounce: 2.0 ms maximum (applicable to failure rate level "L").

Contact stabilization time: 2.5 milliseconds (ms) maximum. (Applicable to failure rate levels "M", "P", and "R").

Overload (high level only): 1 ampere resistive at 28 V dc. 0.2 ampere inductive at 28 V dc. (ac not applicable).

COIL DATA: See [table I](#).

Operate time: 6.0 ms maximum over temperature range with rated coil voltage.

Release time: 6.0 ms maximum over temperature range from rated coil voltage.

ELECTRICAL DATA:

Insulation resistance: 1,000 megohms minimum, except the resistance between coil and case at high temperature shall be 100 megohms or greater. Measure at 100 V dc.

Dielectric withstanding voltage:

	Sea level V rms (60 Hz)	Altitude V rms (60 Hz)
Between case, frame, or enclosure and all contacts in the energized and de-energized positions -----	500	} 175 All terminals to case
Between case, frame, or enclosure and coil(s).	350	
Between all contacts and coil(s). -----	500	
Between open contacts in the energized and de-energized positions. -----	350	
Between contact poles. -----	500	

ENVIRONMENTAL DATA:

Temperature range: -65°C to +125°C.

Vibration (sinusoidal): [MIL-STD-202](#), method 204. Contact chatter shall not exceed 10 microseconds maximum for closed contacts and 1 microsecond maximum closure for open contacts.

Vibration (random): [MIL-STD-202](#), method 214, test condition IG. Contact chatter shall not exceed 10 microseconds maximum for closed contacts, and 1 microsecond maximum closure for open contacts (applicable to qualification and group C testing only).

Shock (specified pulse): [MIL-STD-202](#), method 213, test condition C (100 g's). Contact chatter shall not exceed 10 microsecond maximum for closed contacts, and 1 microsecond maximum closure for open contacts.

Magnetic interference: Applicable.

Resistance to soldering heat: Applicable.

Acceleration: 100 g.

PHYSICAL DATA:

Seal: Hermetic.

Terminals: See [figure 1](#).

Terminal strength: 1.0 ±0.1 pound pull (453 grams).

Solderability: Applicable.

Terminal twist test: Not applicable.

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

Weight: 2.0 grams (0.07 ounce) maximum.

Minimum marking: Applicable.

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LIFE TEST REQUIREMENTS:

High level: 100,000 cycles per relay.

Low level: 100,000 cycles plus 900,000 cycles mechanical life.

Part or Identifying Number (PIN): M39016/48 - (dash number from [table I](#) and suffix letter designation failure rate level).

TABLE I. [Dash number and characteristics.](#) [1/](#)

Dash number <a href="#">2/</a>	Coil voltage <a href="#">3/</a> V dc		At 20°C				Over temperature range		
	Rated	Max	Coil ohms ±15%	Specified pickup value (voltage) (V dc) <a href="#">4/</a>	Specified hold value (voltage) (V dc)	Specified dropout value (voltage) (V dc)	Specified pickup value (voltage) (V dc) <a href="#">4/</a>	Specified hold value (voltage) (V dc)	Specified dropout value (voltage) (V dc)
001	5	7	120	2.75	1.7	0.2	4.2	2.6	0.1
002	12	14	720	6.5	3.9	0.6	10.0	5.9	0.3
003	26.5	28	3,100	14.5	8.5	1.0	22.0	13.0	0.5

[1/](#) Each relay possesses high level and low level capabilities. However, relays previously tested or used above 10 mA resistive at 6 V dc maximum or peak ac open circuit are not recommended for subsequent use in low level applications.

[2/](#) The suffix letter L, M, P, or R to designate the applicable failure rate level shall be added to the applicable listed dash number. Failure rate level (percent per 10,000 cycles): L, 3.0; M, 1.0; P, 0.1; R, 0.01.  
EXAMPLE, 001L - - - - - 003M.

[3/](#) CAUTION: Use of any coil voltage less than the rated coil voltage will compromise the operation of the relay.

[4/](#) Allow 10 percent increase in maximum operate voltages after life tests.

QUALIFICATION INSPECTION:

Qualification inspection and sample size: See [table II](#).

TABLE II. Qualification inspection and sample size. <sup>1/</sup>

Single submission	Group submission	
24 units plus 1 open unit for level L at C = 0 <sup>2/</sup>	M39016/48-002	24 units plus 1 open unit. For level L at C = 0 <sup>2/</sup>
33 units plus 1 open unit for level M at C = 0 <sup>2/</sup>		33 units plus 1 open unit. For level M at C = 0 <sup>2/</sup>
Qualification inspection as applicable		Qualification inspection as applicable
	M39016/48-001	2 units, each part number, qualification inspection table, Q1.
	M39016/48-003	2 units, qualification inspection table , Q1, and shock, vibration, acceleration, terminal strength, and seal.

<sup>1/</sup> For retention of qualification or extension of qualification to lower failure rate levels all life test data accumulated on [MIL-PRF-39016/47](#) may be used in addition to [MIL-PRF-39016/48](#) data. Prior to retention of qualification inspection testing; the relay manufacturer shall preselect the sample size.

<sup>2/</sup> The number of units required for qualification testing will be increased as required in Q5, of [MIL-PRF-39016](#), if the relay manufacturer elects to test the number of units permitting one or more failures. Prior to performance of qualification inspection testing; the relay manufacturer shall preselect the sampling plan.

QUALIFICATION INSPECTION:

Qualification inspection (reduced testing): See [table III](#).

If the relays produced for [MIL-PRF-39016/48](#) are similar in construction and design except for the coil and residual shim to the relays produced for [MIL-PRF-39016/47](#) and [MIL-PRF-39016/48](#), then reduced testing for qualification of [MIL-PRF-39016/48](#) relays may be performed concurrent with or subsequent to successful qualification of [MIL-PRF-39016/47](#) relays.

TABLE III. Qualification inspection (reduced testing).

Examination or test
2 units each coil voltage: Q1 of qualification inspection table.
1 unsealed sample unit : Internal examination.

| Referenced documents. In addition to [MIL-PRF-39016](#), this document references the following:

[MIL-PRF-39016/47](#) [MIL-PRF-39016/48](#) [MIL-STD-202](#) [MIL-STD-1285](#)

| 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.

Custodians:

| Army - CR  
Navy - EC  
Air Force - 85  
DLA - CC

Preparing activity:

DLA - CC

(Project 5945-2013-020)

| 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/>.