

INCH-POUND

MIL-PRF-39016/44E  
19 August 2006  
SUPERSEDING  
MIL-PRF-39016/44D  
20 July 1988

PERFORMANCE SPECIFICATION SHEET

RELAYS, ELECTROMAGNETIC, ESTABLISHED RELIABILITY, DPDT,  
LOW LEVEL TO 2 AMPERES, TERMINALS 0.200-INCH GRID PATTERN  
(SENSITIVE, 100/125 MILLIWATTS, COIL OPERATE POWER AT 25°C)

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-39016.

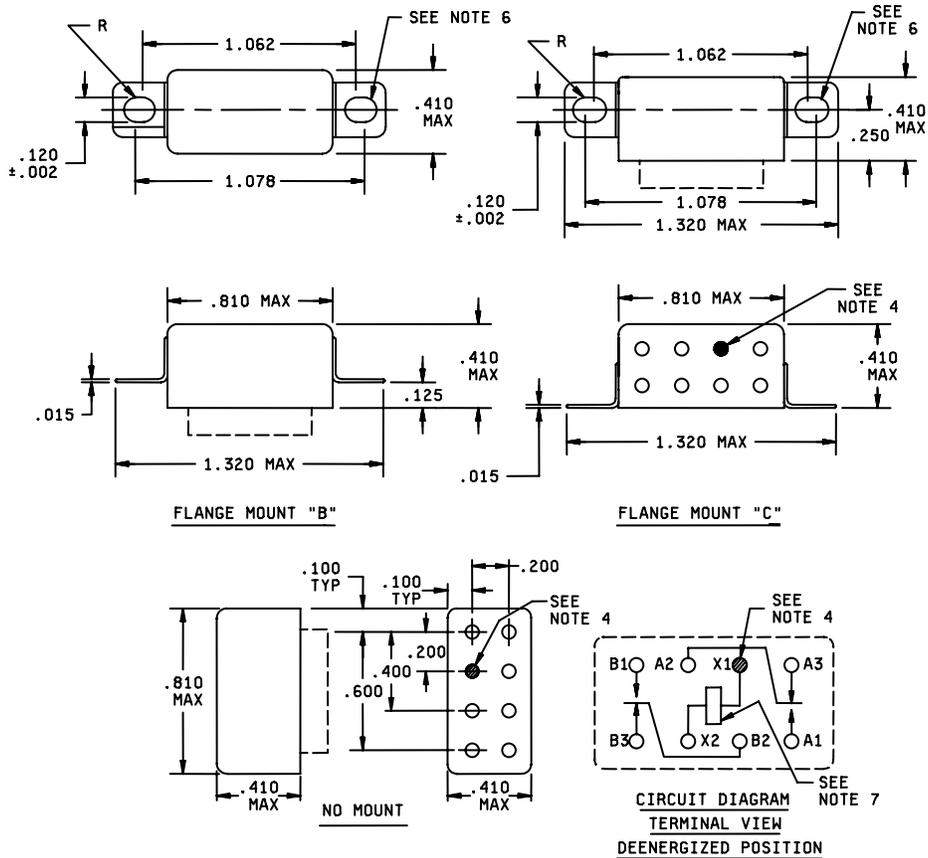
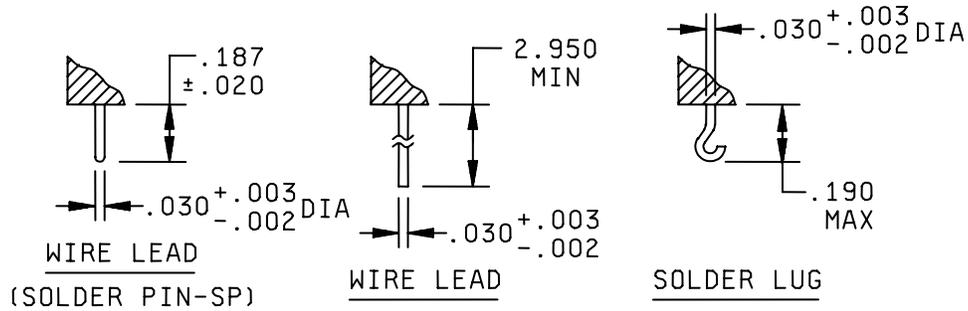


FIGURE 1. Dimensions and configuration.



Inches	mm
.002	0.05
.003	0.08
.015	0.38
.020	0.51
.030	0.76
.100	2.54
.120	3.05
.125	3.18
.187	4.75
.190	4.83
.200	5.08
.250	6.35
.400	10.16
.410	10.41
.600	15.24
.810	20.57
1.062	26.97
1.078	27.38
1.320	33.53
2.950	74.93

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is  $\pm .010$  (0.25 mm).
4. Indicated terminal shall be marked with a contrasting bead.
5. Circuit diagram marked on top if legible from the mounted position, otherwise marking surface is optional.
6. Mounting screw head clearance based on use of No. 4 fillister head screws.
7. Coil symbols are optional in accordance with MIL-STD-1285.
8. Mounting surface finish shall be compatible with aluminum (duralumin type) as defined by MIL-STD-889.
9. Terminal numbers in circuit diagram are for reference only. Numbers do not appear on relay.

FIGURE 1. Dimensions and configuration - Continued.

REQUIREMENTS:

Contact data:

Load ratings:

High level (relay case grounded).

Resistive: 2 amperes at 28 V dc; 0.10 ampere maximum at 115 V ac, (60 and 400 Hz).

Inductive: 0.50 ampere maximum at 28 V dc maximum with 200 millihenries.

Lamp: 0.10 ampere at 28 V dc (life test not required).

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: 0.050 ohm maximum.

High level:

During life: Not more than 5 percent of open circuit voltage.

After life: 0.100 ohm maximum.

Low level:

During life: 33 ohms maximum.

After life: 0.100 ohm maximum.

Intermediate current:

During intermediate current: 1 ohm maximum.

After intermediate current: 0.200 ohm maximum.

Contact bounce: 2 milliseconds (ms) maximum. (Applicable to failure rate level "L").

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

Overload (high level only): Two times rated current.

Coil data: (See table I).

Operate time: 6 milliseconds maximum over temperature range with rated coil voltage.

Release time: 5 milliseconds maximum over temperature range from rated coil voltage.

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Electrical data:

Insulation resistance: 1,000 megohms minimum.

Dielectric withstanding voltage:

	Sea level V rms (60 Hz)	Altitude V rms (60 Hz)
Between case, frame, or enclosure, and between all contacts in the energized and deenergized positions -	1,000	} 350 All terminals to case
Between case, frame, or enclosure and coil(s) -----	500	
Between all contacts and coil(s) -----	1,000	
Between open contacts in the energized and deenergized positions -----	500	
Between contact poles -----	1,000	

Environmental data:

Temperature range: -65°C to +125°C.

Vibration (sinusoidal): MIL-STD-202, method 204, test condition D (except 10 to 2,500 Hz). 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 for qualification and group C testing only).

Shock (specified pulse): MIL-STD-202, method 213, test condition A (50 g). Contact chatter shall not exceed 10 microseconds maximum for closed contacts and 1 microsecond maximum closure for open contacts.

Magnetic interference: Applicable.

Resistance to soldering heat: Applicable.

Acceleration: Applicable.

Physical:

Dimensions and configurations: See figure 1.

Weight: 13 grams (0.46 ounce) maximum.

Terminals: See figure 1 and table I.

Terminal strength: 3 ±0.3 pounds pull.

Solderability: Applicable.

Terminal twist test: Applicable to wire leads.

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Life test requirements:

High level: 100,000 cycles.

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

Part or Identifying Number (PIN): M39016/44-(dash number from table I and suffix letter designating failure rate level).

TABLE I. Dash number and characteristics. 1/

Dash number 2/			Mount	Coil voltage V dc 3/		At 25°C				Over temperature range		
						Coil resistance ohms ±10%	Specified pickup value (voltage) (V dc)	Specified hold value (voltage) (V dc)	Specified dropout value (voltage) (V dc)	Specified pickup value (voltage) (V dc)	Specified hold value (voltage) (V dc)	Specified dropout value (voltage) (V dc)
Solder lug	Wire lead (SP)	Wire lead		Rated	Max							
001 004 007	002 005 008	003 006 009	B C None	5.0	7.0	47	2.2 4/	1.32	0.21	3.2	1.9	0.12
010 013 016	011 014 017	012 015 018	B C None	6.0	9.0	75	2.75 4/	1.65	0.27	4.0	2.4	0.17
019 022 025	020 023 026	021 024 027	B C None	12.0	20.0	310	5.6 4/	3.35	0.55	8.0	4.8	0.35
028 031 034	029 032 035	030 033 036	B C None	26.5	35.0	1,030	11.4 5/	6.9	1.1	16.5	10.0	0.70
046 049 052	047 050 053	048 051 054	B C None	30.0	44.0	1,620	14.3 5/	8.6	1.4	21.0	12.5	0.90
037 040 043	038 041 044	039 042 045	B C None	36.0	56.0	2,640	18.0 5/	10.9	1.8	26.0	15.8	1.10

1/ Each relay possesses high level and low level capabilities. However, relays previously tested or used above 10 mA resistive at 6 V dc or peak or 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, 004L - - - 004R.

3/ CAUTION: The use of any coil voltage less than the rated coil voltage will compromise the operation of the relay.

4/ The sensitivity is 100 milliwatts.

5/ The sensitivity is 125 milliwatts.

Qualification inspection:

Qualification inspection and sample size: See tables II and III.

TABLE II. Qualification inspection and sample size. 1/

Single submission	Group submission	
20 units plus 1 open unit for level L at C = 0 1/ 33 units plus 1 open unit for level M at C = 0 1/ Qualification inspection as applicable.	M39016/44-028	20 units plus 1 open unit for level L at C = 0 1/ 33 units plus 1 open unit for level M at C = 0 1/ Qualification inspection as applicable.
	M39016/44-033	2 units qualification inspection table, Q1, and shock, vibration, acceleration, terminal strength, and seal.
	M39016/44-008 -017 -026 -044	2 units, qualification inspection table, Q1.

1/ The number of units required for qualification testing shall be increased as required in Q5, table II, 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 (reduced testing): See table III.

If the relays produced for MIL-PRF-39016/44 are similar in construction and design, except for the coils, to the relays produced for MIL-PRF-39016/6, then reduced testing for qualification of MIL-PRF-39016/44 relays may be performed concurrent with or subsequent to successful qualification of MIL-PRF-39016/6 relays.

TABLE III. Qualification inspection (reduced testing).

Dash number	Examination or test
M39016/44-037	4 units, qualification inspection table, Q1. 1 unit each, life load test, electrical post tests, seal, visual and mechanical examination.
M39106/44-032	2 units, qualification inspection table, Q1, shock, vibration, acceleration, electrical post tests, seal, visual and mechanical examination.
M39016/44-XXX	2 units of each remaining coil voltages, qualification inspection table, Q1, 1 open unit, any coil voltage.

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Referenced documents: In addition to MIL-PRF-39016, this document references the following:

MIL-PRF-39016/6  
MIL-STD-202

MIL-STD-889  
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 - 11  
DLA - CC

Preparing activity:  
DLA - CC

(Project 5945-1294-000)

Review activities:

Navy - AS, OS, SH

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 <http://assist.daps.dla.mil>.