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MIL-PRF-39016/48B
20 JULY 1988
 SUPERSEDING
 MIL-R-39016/48A(EC)
 13 August 1985

PERFORMANCE SPECIFICATION SHEET

- (B) RELAYS, ELECTROMAGNETIC, ESTABLISHED RELIABILITY, DPDT, LOW LEVEL TO 0.5 AMPERE (.100 D.I.P. TERMINAL SPACING) ONE-TENTH SIZE, SENSITIVE, MONOSTABLE
- (B) 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 and the latest issue of MIL-R-39016.

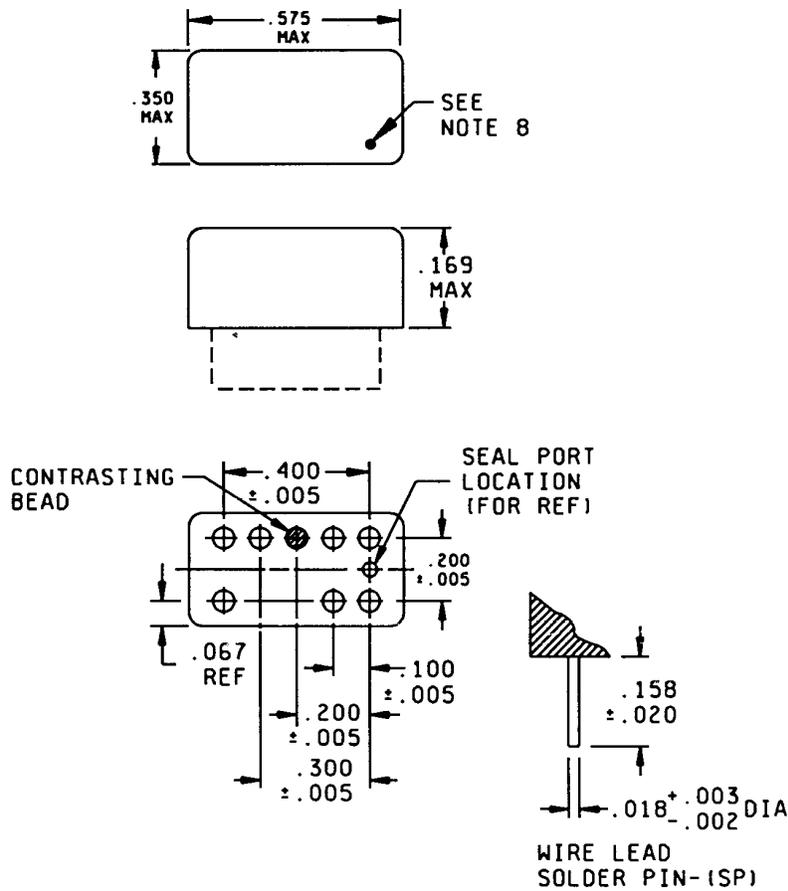
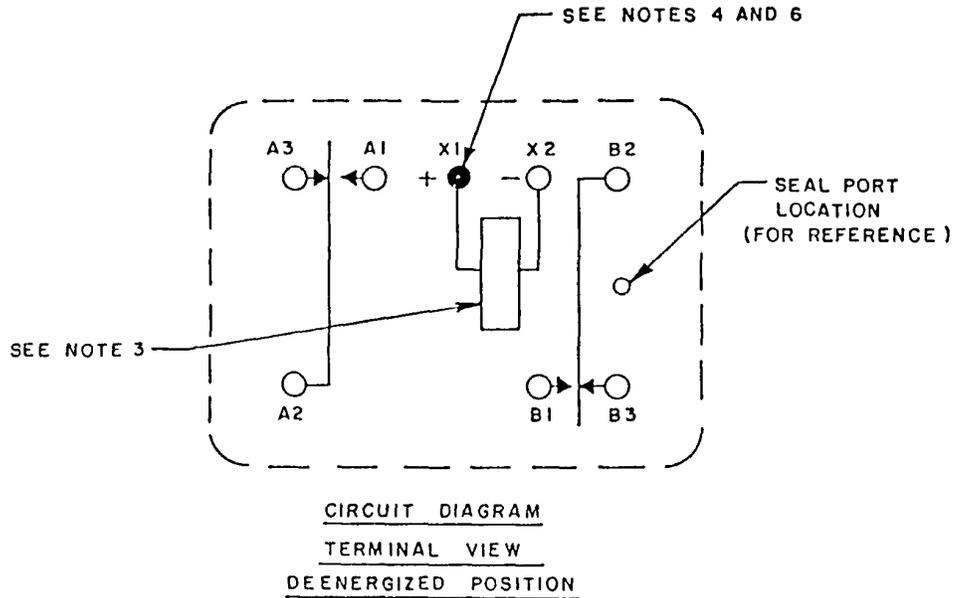


FIGURE 1. Dimensions and configuration.

(B) denotes changes



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 configurations - 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: 10-50 μ A at 10-50 mV dc or peak ac.

Intermediate current: Applicable.

Contact resistance or voltage drop:

Initial: .200 ohm maximum.

High level:

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

After life: .300 ohm maximum.

Low level:

During life: 100 ohms maximum.

After life: .300 ohms 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 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 position- - - - -	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). 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: 100 g.

Physical data:

Seal: Hermetic.

Terminal: See figure 1.

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

- ⓑ Solderability: Applicable.

Terminal twist test: Not applicable.

Dimensions and configuration: See figure 1.

Weight: 2.0 grams (0.07 ounce) maximum.

Minimum marking: Applicable.

Life test requirements:

High level: 100,000 cycles per relay.

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

Part number: M39016/48 (dash number from table I and suffix letter designating failure rate level).

ⓑ TABLE I. Dash number and characteristics. 1/

Dash number 2/	Coil voltage 3/ V dc		Coil ohms ±15%	At 20°C			Over temperature range		
	Rated	Max		Specified pickup value (voltage) (V dc) 4/	Speci- fied hold value (volt- age) (V dc)	Specified dropout value (voltage) (V dc)	Speci- fied pickup value (volt- age) 4/ (V dc)	Spec- fied hold value (volt- age) (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	3100	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 application.
- 2/ The suffix letter L, M, P, or R to designate the applicable failure rate level that 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 voltage less than the rated 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. 1/

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

- 1/ For retention of qualification or extension of qualification to lower failure rate levels all life test data accumulated on MIL-R-39016/47 may be used in addition to MIL-R-39016/48 data. Prior to retention of qualification inspection testing; the relay manufacturer shall preselect the sample size.
- 2/ The number of units required for qualification testing will be increased as required in group V, table II, MIL-R-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-R-39016/48 are similar in construction and design except for the coil and residual shim to the relays produced for MIL-R-39016/47 and 48, then reduced testing for qualification of MIL-R-39016/48 relays may be performed concurrent with or subsequent to successful qualification of MIL-R-39016/47 relays.

ⓑ TABLE III. Qualification inspection (reduced testing).

Examination or test
2 units each coil voltage - Group II of qualification inspection table.
1 unsealed sample unit - Internal examination.

CONCLUDING MATERIAL

ⓑ Custodians:
 Army - ER
 Navy - EC
 Air Force - 85

ⓑ User activity:
 Air Force - 11

Preparing activity:
 Navy - EC

Agent:
 DLA - ES

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