

NOTE: The document identifier and heading has been changed on this page to reflect that this is a performance specification. There are no other changes to this document. The document identifier on subsequent pages has not been changed, but will be changed the next time this document is revised.

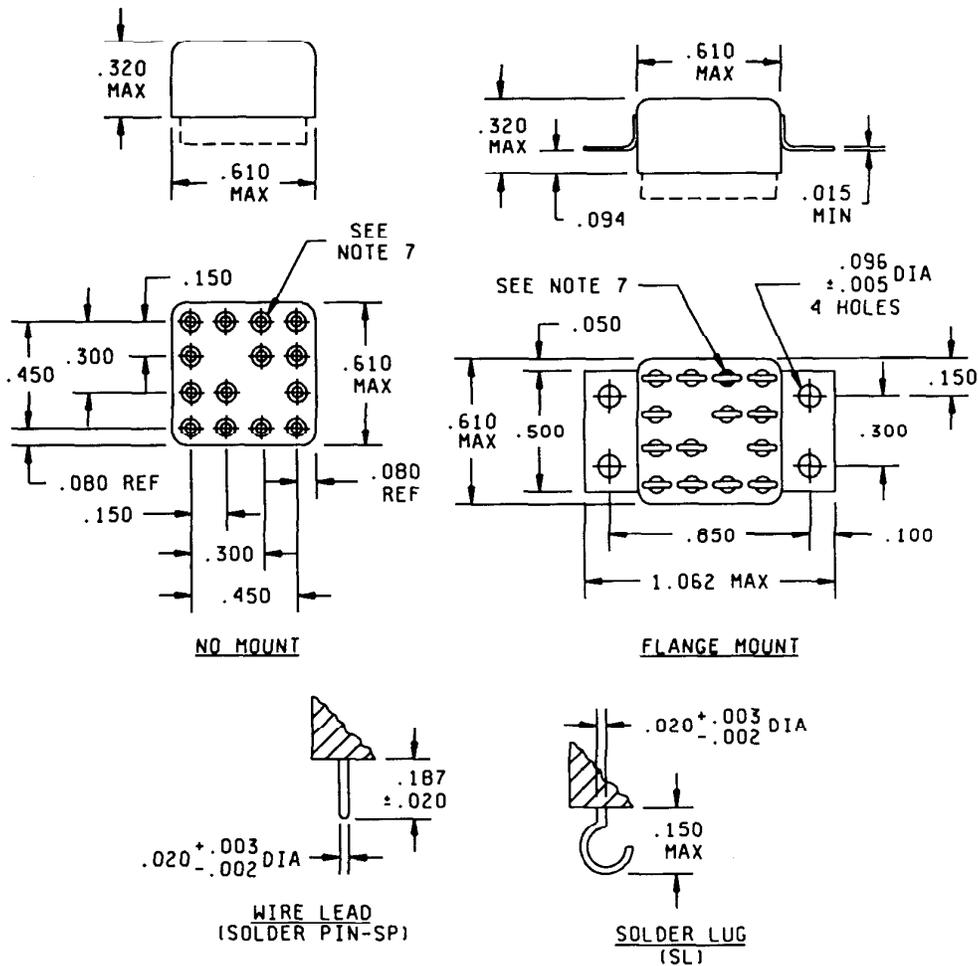
MIL-PRF-39016/14D
 20 JULY 1988
 SUPERSEDING
 MIL-R-39016/14C
 13 March 1984

PERFORMANCE SPECIFICATION SHEET

RELAYS, ELECTROMAGNETIC, ESTABLISHED RELIABILITY, 4PDT,
 LOW LEVEL TO 2 AMPERES (0.150-INCH TERMINAL SPACING)

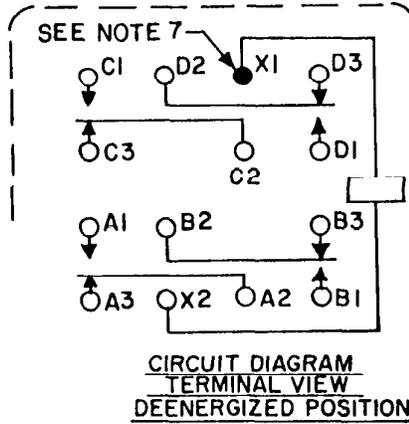
This specification is approved for use by all Departments and Agencies of the Department of Defence.

The requirements for acquiring the relays described herein shall consist of this specification and the latest issue of MIL-R39016.



(D) FIGURE 1. Dimensions and configuration.

(D) denotes changes



Inches	mm	Inches	mm
.001	0.03	.150	8.81
.003	0.08	.187	4.75
.005	0.13	.300	7.62
.020	0.51	.320	8.13
.050	1.27	.450	11.43
.080	2.03	.500	12.70
.094	2.39	.610	15.49
.096	2.44	.850	21.59
.100	2.54	1.062	26.97

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, the tolerance is ± 0.010 (0.25 mm).
4. Terminal locating dimensions shown are applicable to all type mounts.
5. The shape of solder lugs is optional.
6. Terminal numbers in circuit diagram are for reference only. Numbers do not appear on relay.
7. Indicated terminal shall be identified with a contrasting bead.
8. Coil symbol optional in accordance with MIL-STD-1285.

Ⓓ FIGURE 1. Dimensions and configuration - Continued.

REQUIREMENTS:

CONTACT DATA:

Load ratings:

High level (relay case grounded):

Ⓓ Resistive: 2 amperes at 28 V dc; 0.125 ampere at 115 V ac, (60 and 400 Hz) with case grounded. 0.5 ampere at 115 V ac, (60 and 400 Hz) with case not grounded. 400 Hz life test not required for qualification testing.

Ⓓ Inductive: 0.5 ampere at 200 millihenries inductive at 28 V dc.

Lamp: 0.10 ampere at 28 V dc.

Low level: 10 to 50 μ A at 10 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: 0.150 ohm maximum.

Low level:

During life: 33 ohms maximum.

Ⓓ After life: 0.150 ohm maximum.

Ⓓ Intermediate current:

During intermediate current: 1 ohm maximum.

After intermediate current: 3 ohm maximum.

Contact bounce: 2.0 milliseconds (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): 4 amperes resistive at 28 V dc. 1.0 ampere inductive at 28 V dc (ac not applicable).

COIL DATA: See table I.

Operate time: 4.0 ms maximum over temperature range with rated coil voltage.

Release time: 4.0 ms maximum over temperature range from rated coil voltage.

ELECTRICAL DATA:

Insulation resistance: 10,000 megohms minimum, except the resistance between coil and case at high temperature shall be 1,000 megohms minimum.

MIL-R-39016/14D

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	750	} 350 All terminals to case
Between case, frame, or enclosure and coil(s) - - - -	500	
Between all contacts and coil(s)- - - - -	750	
Between open contacts in the energized and deenergized positions - - - - -	500	
Between contact poles - - - - -	750	

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 B (75 g's). 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:

Terminals: See figure 1 and table I.

Terminal strength: 1.5 ±0.2 lbs. (pull).

- Ⓓ Solderability: Applicable.

Terminal twist test: Applicable to wire lead terminals.

Dimensions and configuration: See figure 1.

Weight: 8.5 grams (0.30 ounce) maximum.

Identification marking (full): Applicable.

LIFE TEST REQUIREMENTS:

High level: 100,000 cycles per relay.

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

PART NUMBER: M39016/14-(dash number from table I and suffix letter designating failure rate level).

(D) TABLE I. Dash numbers and characteristics. 1/

Dash number 2/	Mount	Leads	Coil voltage V dc 3/		At 25°C				Over temperature range		
			Rated	Max	Coil resistance Ohms ±10%	Speci- fied pickup value (volt- age) (V dc)	Speci- fied hold value (volt- age) (V dc)	Speci- fied dropout value (volt- age) (V dc)	Speci- fied pickup value (volt- age) (V dc)	Speci- fied hold value (volt- age) (V dc)	Speci- fied dropout value (volt- age) (V dc)
004 005	Flange No mount	Lug Wire (SP)	6	7	28	2.7	1.6	0.3	3.8	2.2	0.18
009 010	Flange No mount	Lug Wire (SP)	9	11	73	4.2	2.5	0.4	5.6	3.4	0.25
006 007	Flange No mount	Lug Wire (SP)	12	14	115	5.4	3.2	0.6	7.6	4.3	0.36
011 012	Flange No mount	Lug Wire (SP)	18	22	280	8.4	5.0	0.8	11.2	6.7	0.5
013 003	Flange No mount	Lug Wire (SP)	22	27	430	10.3	6.0	1.0	14.0	8.0	0.6
001 008 002	Flange Flange No mount	Lug Wire (SP) Wire (SP)	26.5	35	720	13.5	8.1	1.5	18.0	10.8	0.9
014 015	Flange No mount	Lug Wire (SP)	36	42	1040	17.1	10.5	1.9	22.8	14.0	1.1

- 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 operations): L, 3.0; M, 1.0; P, 0.1; R, 0.01. Example, 001L - - - - 003R.
- 3/ CAUTION: The use of any coil voltage less than the rated coil voltage will compromise the operation of the relay."

Ⓓ TABLE II. Qualification inspection and sample size.

Single submission		Group submission
units plus 1 open unit for level L at C = 0 <u>2/</u>	M39016/14-001	units plus 1 open unit for level L at C = 0 <u>2/</u>
33 units plus 1 open unit for level M at C = 0 <u>2/</u>		33 units plus 1 open unit for level M at C = 0 <u>2/</u>
Qualification inspection as applicable.		Qualification inspection as applicable.
	M39016/14-004	2 units, each part number, qualification inspection table, group II.
	M39016/14-006	
	M39016/14-009	
	M39016/14-011	
	M39016/14-014	
	M39016/14-003	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 low failure failure rate levels, all life test data accumulated on MIL-R-39016/53 and MIL-R-39016/54 may be used in addition to MIL-R-39016/14 data. Prior to retention of qualification testing, the relay manufacturer shall preselect the sampling plans.
- 2/ The number of units required for qualification testing will be increased as required in group IV, table II, MIL-R-39016, if the relay manufacturer elects to test the number of units permitting one or more failures. Prior to qualification testing, the relay manufacturer shall preselect the sampling plan.

Qualification inspection (reduced testing) and sample size: See table III. If the relays produced for MIL-R-39016/14 are similar in construction and design except for the diodes and coils to the relays produced for MIL-R-39016/53 and /54, then reduced testing for qualification of MIL-R-39016/14 relays may be performed concurrent with or subsequent to successful qualification of MIL-R-39016/53 and /54.

Ⓓ TABLE III. Qualification inspection (reduced testing).

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

Supersession data: See table IV.

④ TABLE IV. Supersession data.

New part no. M39016/14- <u>1/</u>	Superseded part no. M5757/80-
004	016
006	017
001	018
005	025
007	026
002	027

1/ Complete part number shall contain suffix letter L, M, P or R to designate failure level rate (see 2/ of table I). A part with any failure rate supersedes the applicable MIL-R-5757 part.

CONCLUDING MATERIAL

Custodians:
 Army - ER
 Navy - EC
 ④ Air Force - 85

Review activities:
 Army - AR
 Navy - AS, OS, SH
 ④ Air Force - 99
 DLA - ES

User activities:
 Navy - MC
 ④ Air Force - 11, 19

Preparing activity:
 Navy - EC

Agent:
 DLA - ES
 (Project 5945-0757-08)