

INCH-POUND  
MIL-PRF-39016/14F  
8 December 2016  
SUPERSEDING  
MIL-PRF-39016/14E  
31 July 2006

PERFORMANCE SPECIFICATION SHEET

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

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

The complete requirements for acquiring the relays described herein  
shall consist of this specification sheet and the latest issue of [MIL-PRF-39016](#).

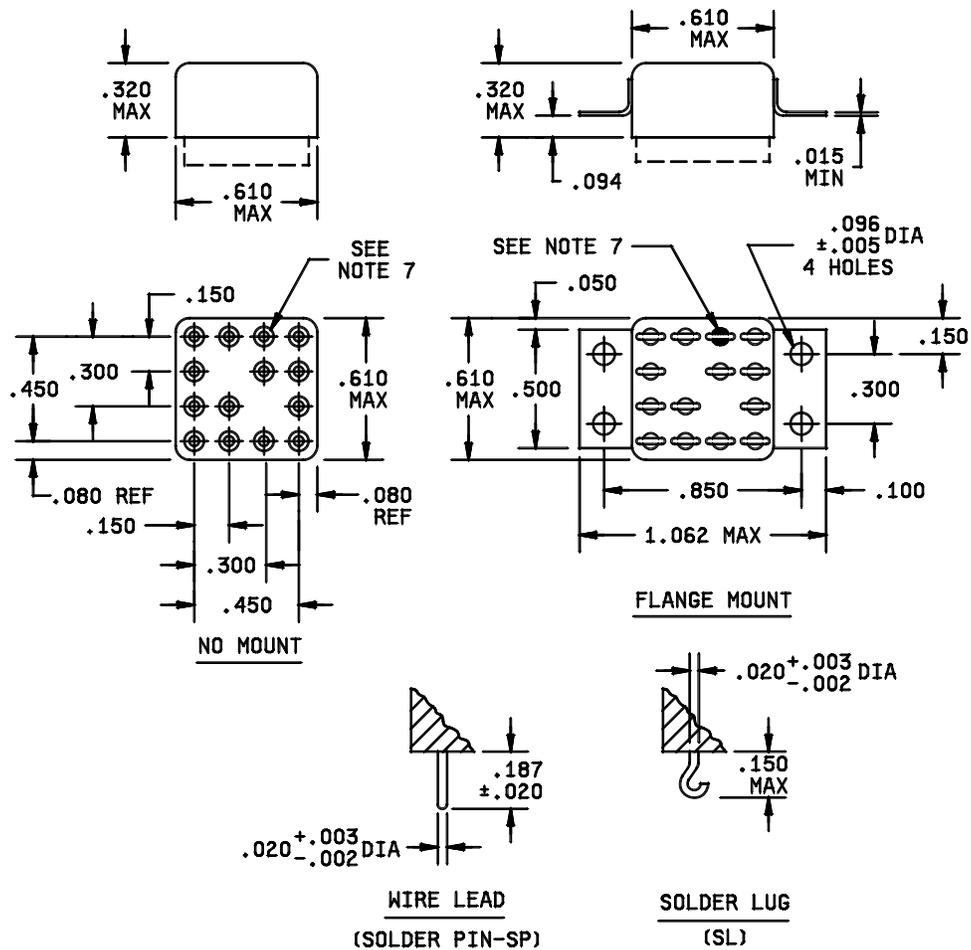
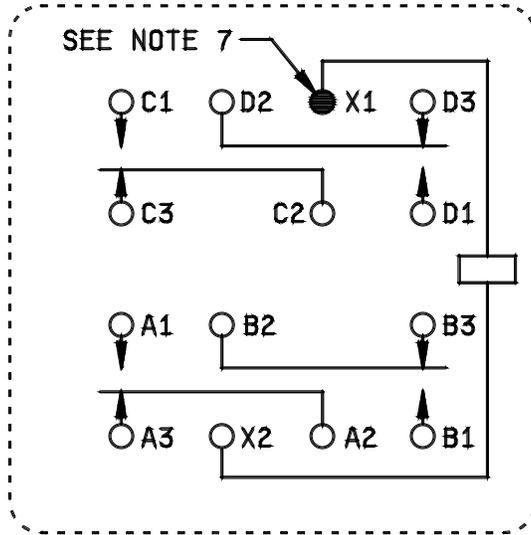


FIGURE 1. Dimensions and configuration.





**CIRCUIT DIAGRAM**  
**TERMINAL VIEW**  
**DEENERGIZED POSITION**

Inches	mm	Inches	mm	Inches	mm
.001	0.03	.094	2.39	.320	8.13
.003	0.08	.096	2.44	.450	11.43
.005	0.13	.100	2.54	.500	12.70
.020	0.51	.150	3.81	.610	15.49
.050	1.27	.187	4.75	.850	21.59
.080	2.03	.300	7.62	1.062	26.97

**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 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.

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

Lamp: 0.10 ampere at 28 V dc.

Low level: 10 to 50  $\mu$ 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 ohms maximum.

Contact bounce: 2.0 milliseconds maximum. (Applicable to failure rate levels "L").

Contact stabilization time: 2.5 milliseconds 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.

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Electrical Data:

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

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.	750	
Between case, frame, or enclosure and coils.	500	350
Between all contacts and coils.	750	All terminals to case
Between open contacts in the energized and de-energized positions.	500	
Between contact poles.	750	

Environmental Data:

Temperature range: -65°C to +125°C.

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

Vibration (random): [MIL-STD-202-214](#), 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-202-213](#), 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 DATA:

Terminals: See [figure 1](#) and [table I](#).

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

Solderability: Applicable.

Terminal twist test: Applicable for 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 or Identifying Number (PIN): M39016/14- (dash number from [table I](#) and suffix letter designating failure rate level).

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

Dash no. <a href="#">2/</a>	Mount	Leads	Coil voltage V dc <a href="#">3/</a>		At 25°C				Over temperature range		
			Rated	Max	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)
004	Flange	Lug	6	7	28	2.7	1.6	0.3	3.8	2.2	0.18
005	No mount	Wire (SP)									
009	Flange	Lug	9	11	73	4.2	2.5	0.4	5.6	3.4	0.25
010	No mount	Wire (SP)									
006	Flange	Lug	12	14	115	5.4	3.2	0.6	7.6	4.3	0.36
007	No mount	Wire (SP)									
011	Flange	Lug	18	22	280	8.4	5.0	0.8	11.2	6.7	0.5
012	No mount	Wire (SP)									
013	Flange	Lug	22	27	430	10.3	6.0	1.0	14.0	8.0	0.6
003	No mount	Wire (SP)									
001	Flange	Lug	26.5	35	720	13.5	8.1	1.5	18.0	10.8	0.9
008	Flange	Wire (SP)									
002	No mount	Wire (SP)									
014	Flange	Lug	36	42	1,040	17.1	10.5	1.9	22.8	14.0	1.1
015	No mount	Wire (SP)									

[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 circuits 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. [1/](#)

Single submission	Group submission	
18 units plus 1 open unit for level L at C = 0 <a href="#">2/</a>	M39016/14-001	18 units plus 1 open unit for level L at C = 0 <a href="#">2/</a>
33 units plus 1 open unit for level M at C = 0 <a href="#">2/</a>		33 units plus 1 open unit for level M at C = 0 <a href="#">2/</a>
Qualification inspection as applicable.		Qualification inspection as applicable.
	M39016/14-004 M39016/14-006	2 units, each part number, qualification inspection table Q1.
	M39016/14-009 M39016/14-011 M39016/14-014	
	M39016/14-003	2 units, qualification inspection table, Q1, and shock, vibration, acceleration, terminal strength, and seal.

[1/](#) For retention of qualification or extension of qualification to lower failure rate, all life test data accumulated on [MIL-PRF-39016/53](#) and [MIL-PRF-39016/54](#) may be used in addition to MIL-PRF-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 shall be increased as required in group IV, table II, [MIL-PRF-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-PRF-39016/14 are similar in construction and design except for the diodes and coils to the relays produced for [MIL-PRF-39016/53](#) and [MIL-PRF-39016/54](#), then reduced testing for qualification of MIL-PRF-39016/14 relays may be performed concurrent with or subsequent to successful qualification of [MIL-PRF-39016/53](#) and [MIL-PRF-39016/54](#).

TABLE III. Qualification inspection (reduced testing).

Examination or test
2 units each coil voltage – Q1 of qualification inspection table.
1 unsealed sample unit for internal examination.

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

TABLE IV. Supersession data.

New PIN M39016/14- <a href="#">1/</a>	Superseded PIN M5757/80-
004	016
006	017
001	018
005	025
007	026
002	027

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

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

[MIL-DTL-5757](#)      [MIL-PRF-39016/53](#)      [MIL-PRF-39016/54](#)      [MIL-STD-202-204](#)  
[MIL-STD-202-213](#)      [MIL-STD-202-214](#)      [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 previous issue.

Custodians:  
 Army - CR  
 Navy - EC  
 Air Force - 85  
 DLA - CC

Preparing activity:  
 DLA - CC

Review activities:  
 Army - AR  
 Navy - AS, OS, MC, SH  
 Air Force - 19, 99

(Project 5945-2017-001)

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/>.