

INCH-POUND
MIL-PRF-39016/8J
27 June 2016
SUPERSEDING
MIL-PRF-39016/8H
1 July 2010

PERFORMANCE SPECIFICATION SHEET

RELAYS, ELECTROMAGNETIC, ESTABLISHED RELIABILITY, SPDT,
LOW LEVEL TO 0.5 AMPERE (LATCHING)

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 [MIL-PRF-39016](#).

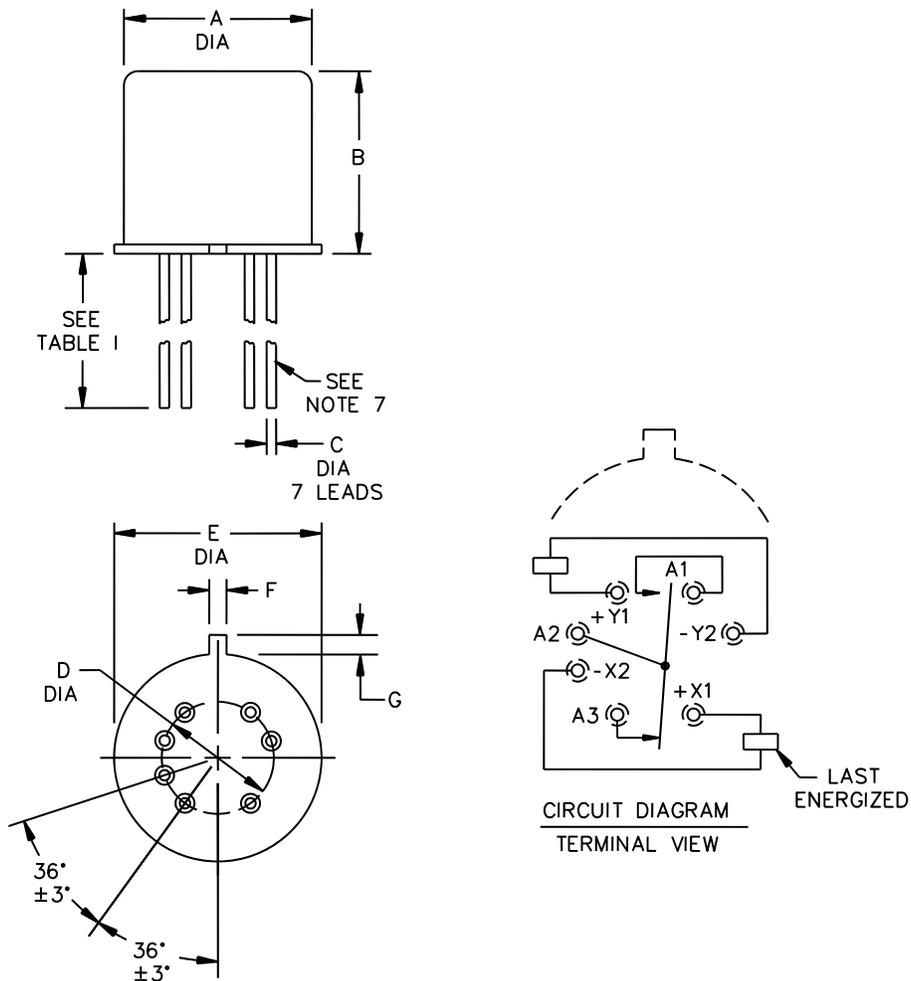


FIGURE 1. Dimensions and configuration.



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Ltr	Inches		mm	
	Min	Max	Min	Max
A	.275	.335	6.99	8.51
B	---	.280	---	7.11
C	.016	.019	0.41	0.48
D	.190	.210	4.83	5.33
E	---	.370	---	9.40
F	.028	.034	0.71	0.86
G	.024	.044	0.61	1.12

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is ± 0.010 (0.25 mm).
4. Terminal numbers shown above for reference only. Numbers do not appear on relays.
5. Relays shall have a plus (+) sign placed on the circuit diagram as shown.
6. All leads shall be electrically insulated from the case.
7. Coil symbol optional in accordance with [MIL-STD-1285](#).
8. Circuit diagram shown on part is the terminal view.

FIGURE 1. Dimensions and configuration - Continued.

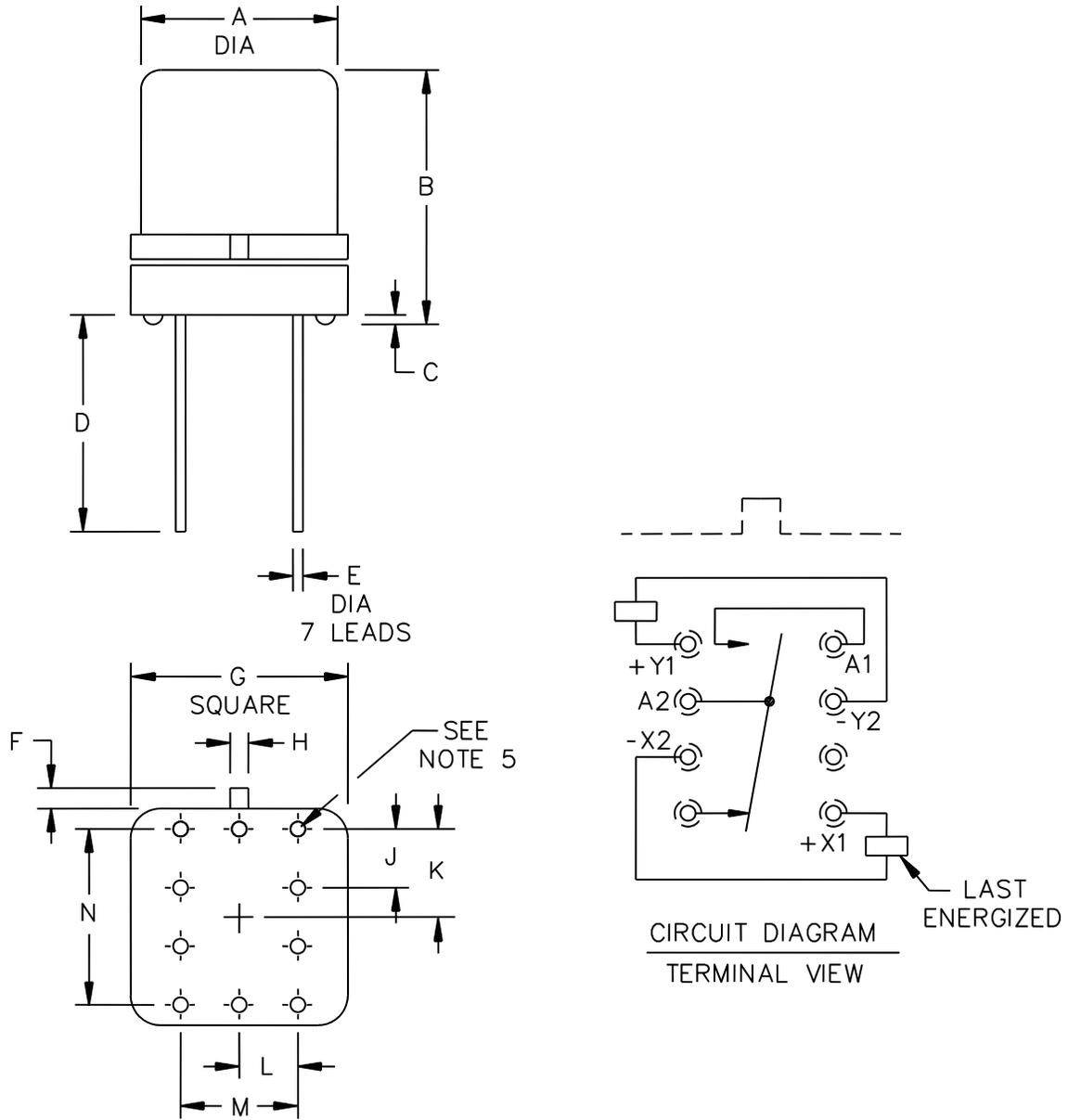


FIGURE 2. Dimensions and configuration relay with spreader mounting pad attached.

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Ltr	Inches		mm	
	Min	Max	Min	Max
A	.275	.335	6.99	8.51
B	---	.398	---	10.11
C	.012	.016	0.30	0.41
D	.370	---	9.40	---
E	.016	.019	0.41	0.48
F	.025	.045	0.64	1.02
G	---	.370	---	9.40
H	.028	.034	0.71	0.86
J	.090	.110	2.29	2.79
K	.140	.160	3.56	4.06
L	.090	.110	2.29	2.79
M	.190	.210	4.83	5.33
N	.290	.310	7.37	7.87

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is ± 0.010 (0.25 mm).
4. Spreader mounting pads shall comply with the requirements of [A-A-55485](#), [A-A-55485/5-003](#), or [A-A-55485/5-013](#).
5. Dimensions and tolerance shown for the bottom view of the spreader mounting pad are for the center-to-center locations of the holes in the spreader mounting pad.
6. Shape optional within the envelope dimension.
7. Coil symbol optional in accordance with [MIL-STD-1285](#).
8. Relays shall have a (+) sign placed on circuit diagram as shown.
9. All leads shall be electrically insulated from the case.
10. Circuit diagram shown on part is the terminal view.
11. Terminal numbers shown above for reference only. Numbers do not appear on relay.

FIGURE 2. Dimensions and configuration relay with spreader mounting pad attached -Continued.

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REQUIREMENTS:

CONTACT DATA:

Load ratings:

High level (relay case grounded):

Resistive:

0.5 ampere at 28 V dc.

250 milliamperes at 115 V ac 60 and 400 Hz case not grounded.

100 milliamperes at 115 V ac 60 and 400 Hz case grounded.

Inductive load: 0.2 ampere at 28 V dc with 0.32 henry inductance.

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: 0.125 ohm maximum (0.150 ohm maximum with spreader mounting pad attached).

High level:

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

After life: 0.225 ohm maximum (0.250 ohm maximum with spreader mounting pad attached).

Low level:

During life: 33 ohms maximum.

After life: 0.175 ohm maximum (0.200 ohm maximum with spreader mounting pad attached).

Intermediate current:

During: 1 ohm maximum.

After: 0.225 ohm maximum (0.250 ohm maximum with spreader mounting pad attached).

Contact bounce: 1.5 milliseconds maximum (applicable to failure rate level "L").

Contact stabilization time: 2.0 milliseconds maximum (applicable to failure rate levels "M", "P", and "R").

Overload (high level only): Two times rated current. Not applicable to ac load ratings.

Neutral screen: Applicable.

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

Operate time: 1.5 ms maximum over temperature range with rated voltage.

Release time: Not applicable.

ELECTRICAL DATA:

Insulation resistance: 10,000 megohms minimum at 500 V dc, 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)	Post intermediate current life test 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	500	
Between case, frame, or enclosure and coil.	500	500	125
Between all contacts and coil.	500	500	All terminals to case
Between open contacts in the energized and de-energized positions.	500	375	
Between contact poles.	N/A	N/A	
Between coils of dual coil relays.	500	500	

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.

Salt atmosphere (corrosion): In accordance with [MIL-STD-750](#), method 1041.

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PHYSICAL DATA:

Terminal strength: [MIL-STD-202-211](#).

Pull test: Test condition A, 1 pound pull.

Bend test: Test condition C, ½ pound load.

Twist test: As specified in [MIL-PRF-39016](#).

Solderability: Applicable.

Dimensions and configuration: See [figure 1](#) and [figure 2](#).

Weight: 2.27 grams (0.08 ounce) maximum, 2.52 grams (0.089 ounce) maximum with spreader mounting pad attached.

Seal: Hermetic.

Minimum marking: Military part number, "J" with the date code (example J0430), circuit diagram, manufacturer's name or source code.

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): M39016/8- (dash number from table I and suffix letter designating failure rate level).

TABLE I. Dash numbers and applicable characteristics. [1/](#) [2/](#)

Dash numbers 3/				Coil voltage (V dc) 4/		At +25°C		At 125°C
Lead length 1.500 min 5/	Q Lead length .187 ±.010	Lead length .500 min	Spreader mounting pad (fig. 2) 6/	Rated	Max	Coil resist- ance ohms ±10 %	Speci- fied pickup (latch/ reset) value (voltage) (V dc)	Speci- fied pickup (latch/ reset) value (voltage) (V dc)
013	014	025	031	5.0	6.0	61	2.5	3.5
015	016	026	032	6.0	8.0	120	3.5	4.5
017	018	027	033	9.0	12.0	280	5.3	6.8
019	020	028	034	12.0	16.0	500	7.0	9.0
021	022	029	035	18.0	24.0	1,130	10.5	13.5
023	024	030	036	26.5	32.0	2,000	14.5	18.0

See footnotes next page.

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- 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 not recommended for subsequent use in low level applications.
- 2/ WARNING: When latching relays are installed in equipment. The latch and reset coils should not be pulsed simultaneously. Coils should not be pulsed with less than the nominal coil voltage and the pulse width should be a minimum of three times the specified operate time of the relay. If these conditions are not followed, it is possible for the relay to be in the magnetically neutral position.
- 3/ 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: 013L - - - - - 030R.
- 4/ CAUTION: The use of any coil voltage less than the rated coil voltage will compromise the operation of the relay.
- 5/ 1.500 leads are inactive for new design.
- 6/ Relays supplied with spreader mounting pads (-031 through -036) shall have the spreader mounting pad rigidly attached.

QUALIFICATION INSPECTION:

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

TABLE II. [Qualification inspection and sample size](#). 1/

Single submission	Group submission	
18 units plus 1 open unit for level L at C = 0 2/	M39016/8-030	18 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
	M39016/8-025	2 units each part number
	M39016/8-026	Qualification inspection, Q1.
	M39016/8-027	
	M39016/8-028	
	M39016/8-029	

- 1/ For retention of qualification or extension of qualification to lower failure rate levels, all life test data accumulated on [MIL-PRF-39016/12](#), [/27](#), [/28](#), [/29](#) and [/30](#) may be used in addition to MIL-PRF-39016/8 data. Prior to performance of retention of qualification testing, the relay manufacturer shall pre-select the sampling plan.
- 2/ The number of units required for qualification testing will be increased as required in Q4, [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, the relay manufacturer shall pre-select the sampling plan.

QUALIFICATION INSPECTION:

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

Initial qualification of relays supplied with spreader mounting pads (-031 through -036), shall be tested as specified below:

Perform the following tests as specified in the qualification inspection table of [MIL-PRF-39016](#), in the order shown below:

Before installation of spreader mounting pad, screening, visual and mechanical examination (internal), thermal shock, resistance to solvents, vibration (sinusoidal), vibration (random), shock (specified pulse), acceleration, terminal strength, magnetic interference (when specified), capacitance (when specified), coil life (applicable to continuous duty relays only), resistance to soldering heat, salt spray (corrosion), overload (applicable to high level relays only), life, terminal strength, and intermediate current.

After installation of spreader mounting pad, perform the following tests as specified in the qualification inspection table of [MIL-PRF-39016](#), in the order shown below:

Insulation resistance, dielectric withstanding voltage, static contact resistance, specified pickup (latch/reset) value (voltage), coil resistance, operate and release time, contact dynamic characteristics, coil transient suppression (when specified), solderability, seal, visual and mechanical inspection (external).

Qualification inspection (reduced testing for previously qualified relays) for relays supplied with spreader mounting pads (-031 through -036): Two units of the 26.5 volt rated coil voltage (-036) shall be tested as specified below:

Before installation of spreader mounting pad perform the following tests as specified in the qualification inspection table of [MIL-PRF-39016](#) in the order shown below:

For failure rate level L only: Screening.

For failure rate levels M, P, and R: Vibration (sinusoidal) test duration shall be 10 minutes, vibration (random), and screening.

After installation of spreader mounting pad perform the following tests as specified in the qualification inspection table of [MIL-PRF-39016](#) in the order shown below:

Insulation resistance, dielectric withstanding voltage, static contact resistance; specified pickup (latch/reset), hold, and value (voltage), coil resistance, operate and release time, contact dynamic characteristics, coil transient suppression (when specified), solderability, seal, visual and mechanical inspection (external).

Group A testing for relays supplied with spreader mounting pads (-031 through -036) shall be tested as specified below:

Perform seal test immediately, preceding the A2 electrical tests. Relay leads shall be formed and the spreader mounting pad removed before the seal test. After the seal test, the spreader mounting pad shall be rigidly attached to the relay and the remaining group A tests performed.

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

If the relays produced for MIL-PRF-39016/8 are similar in construction and design except for the contact arrangement, diodes, and headers, as applicable, to the relays produced for [MIL-PRF-39016/12](#), [/27](#), [/28](#), [/29](#), or [/30](#), then reduced testing for qualification of MIL-PRF-39016/8 relays may be performed concurrent with or subsequent to successful qualification of [MIL-PRF-39016/12](#), [/27](#), [/28](#), [/29](#), or [/30](#). For reduced testing, see [table III](#).

TABLE III. Qualification inspection (reduced testing).

Inspection
2 units each coil voltage - Q1 of qualification inspection table.
1 unsealed sample unit for internal examination.

SUPERSESSION DATA:

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

TABLE IV. Supersession data. [1/](#)

Superseded part no. M5757/39-	New part no. M39016/8- 2/	Superseded part no. M39016/8-	New part no. M39016/8- 2/
001	015	001	013
002	017	002	014
003	019	003	015
004	021	004	016
005	023	005	017
006	016	006	018
007	018	007	019
008	020	008	020
009	022	009	021
010	024	010	022
011	013	011	023
012	014	012	024

[1/](#) Dash numbers -013, -015, -017, -019, -021, and -023 are inactive for new design and are for support of existing equipment design only.

[2/](#) Complete part number shall contain suffix letter L, M, P, or R to designate failure rate level (see [3/ of table I](#)). A part with any failure rate supersedes the applicable [MIL-DTL-5757](#) part.

Cross-reference for Government logistical support: See [table V](#).

TABLE V. Cross-reference for Government logistical support.

Superseded part no. M5757/39-	New part no. M39016/8-	Support with part no. M39016/8-	Superseded part no. M39016/8-	New part no. M39016/8-	Support with part no. M39016/8-	New part no. M39016/8-	Support with part no. M39016/8-
001	015	015	001	013	013	025	025
002	017	017	002	014	025	026	026
003	019	019	003	015	015	027	027
004	021	021	004	016	026	028	028
005	023	023	005	017	017	029	029
006	016	026	006	018	027	030	030
007	018	027	007	019	019	031	031
008	020	028	008	020	028	032	032
009	022	029	009	021	021	033	033
010	024	030	010	022	029	034	034
011	013	013	011	023	023	035	035
012	014	025	012	024	030	036	036

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.

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

A-A-55485	A-A-55485/5	MIL-PRF-39016/12	MIL-PRF-39016/27	MIL-PRF-39016/28
MIL-PRF-39016/29	MIL-PRF-39016/30	MIL-STD-202 -204	MIL-STD-202-211	MIL-STD-202-213
MIL-STD-202-214	MIL-STD-750	MIL-STD-1285	MIL-DTL-5757	

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

Preparing activity:
 DLA - CC
 (Project 5945-2016-029)

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

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/>.