

| INCH-POUND |

MIL-R-39016/40F
4 June 1992
SUPERSEDING
MIL-R-39016/40E
29 January 1991

MILITARY SPECIFICATION SHEET

(F) RELAYS, ELECTROMAGNETIC, 4PDT, LOW LEVEL
TO 2.0 AMPERES (0.100-INCH TERMINAL SPACING)

(F) Inactive for new design after 29 January 1991.
For new designs refer to MIL-R-39016/14.

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 the issue of the following
specification listed in that issue of the Department of Defense
Index of Specifications and Standards (DODISS) specified in the
solicitation: MIL-R-39016.

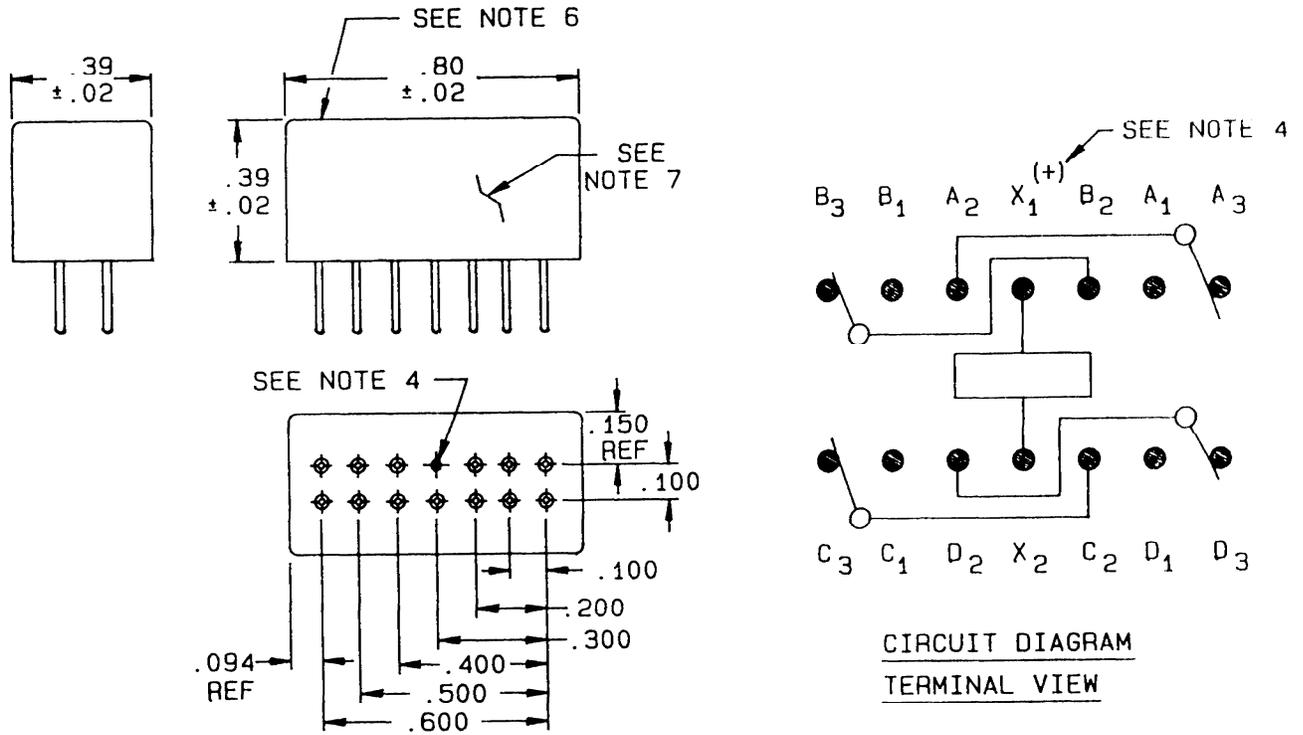


FIGURE 1. Dimensions and configurations.

(F) denotes changes

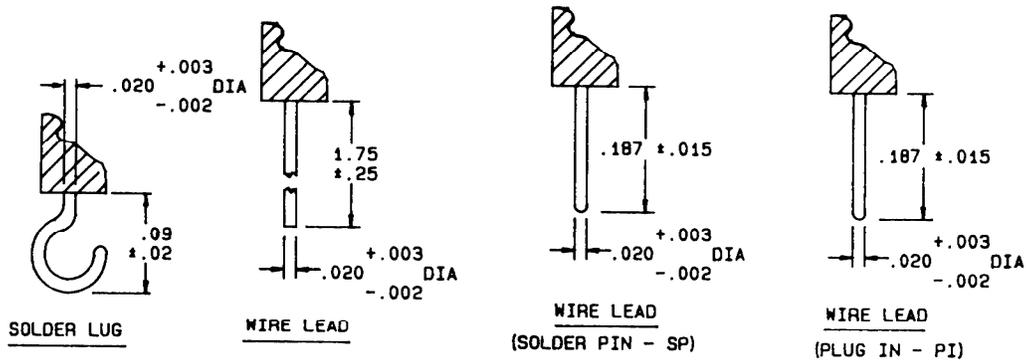
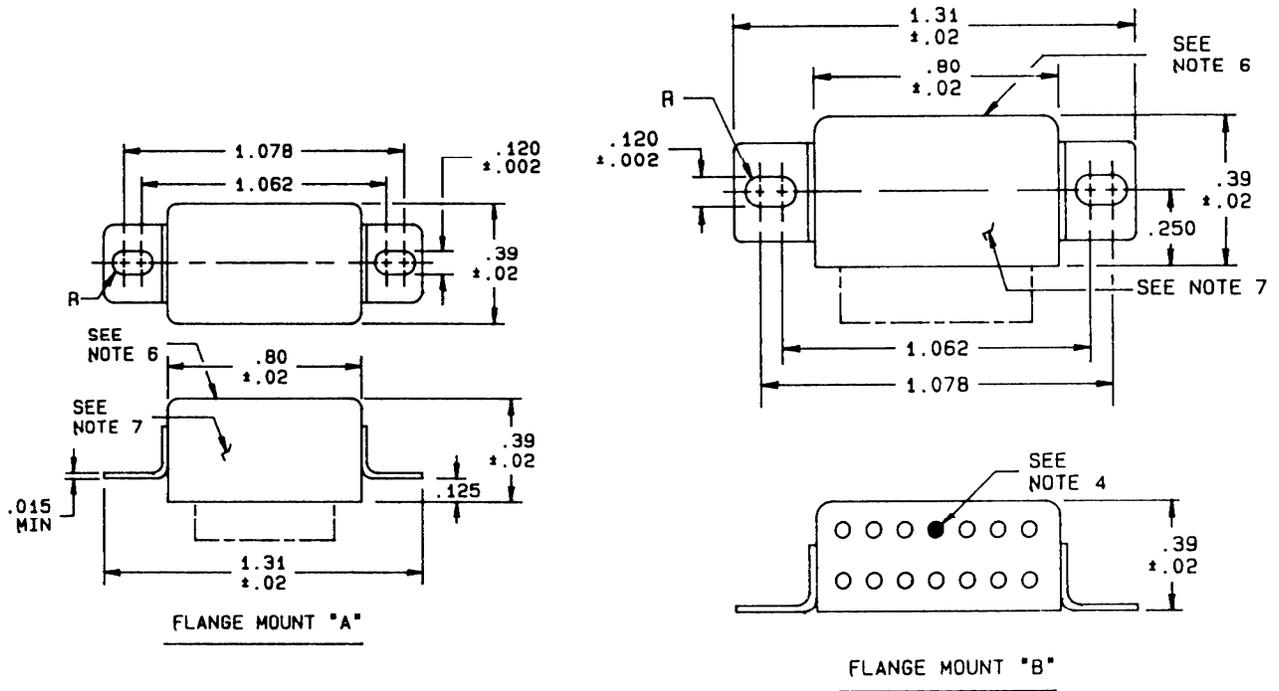


FIGURE 1. Dimensions and configurations - Continued.

Inches	mm	Inches	mm	Inches	mm
.002	0.05	.120	3.05	.500	12.70
.003	0.08	.125	3.18	.600	15.24
.005	0.13	.150	3.81	.800	20.32
.015	0.38	.187	4.75	1.062	26.97
.020	0.51	.200	5.08	1.078	27.38
.090	2.29	.250	6.35	1.310	33.27
.094	2.39	.300	7.62	1.750	44.45
.100	2.54	.390	9.91		
.110	2.79	.400	10.16		

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. X1 terminal shall be identified with a contrasting bead. Relays which require coil polarity observance shall have a plus (+) sign placed on the schematic diagram as shown.
5. Shape of lug (solder) terminals is optional.
6. Schematic diagram shall be marked on this surface.
7. Identification marking shall be marked on this surface.
8. Terminal numbers in circuit diagram are for reference only. Numbers shall not appear on relay.
9. Wire lead, plug-in (PI), shall be gold-plated in accordance with MIL-G-45204, type II, class I, nickel underplating, 50 to 150 microinches.

FIGURE 1. Dimensions and configurations - Continued.

MIL-R-39016/40F

REQUIREMENTS:

CONTACT DATA:

Load ratings:

High level (relay case grounded):

Resistive: 2 amperes at 28 V dc maximum; 0.3 ampere at 115 V ac, (60 and 400 Hz). 400 Hz life test not required for qualification testing.

Inductive: 0.75 ampere maximum at 28 V dc maximum with 200 millihenries minimum.

Lamp: 0.200 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 and 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: 50 ohms maximum.

After life: 0.150 ohm maximum.

Intermediate current:

During intermediate current: 3 ohms maximum.

After intermediate current: .100 ohm maximum.

Ⓢ Contact bounce: 2.0 milliseconds (ms) maximum.

Ⓢ Contact stabilization time: 2.5 milliseconds (ms) maximum.

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

COIL DATA: (See table I.)

Operate time: 5 ms maximum over temperature range with rated coil voltage.

Release time: 5 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 500 megohms, or greater.

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

ENVIRONMENTAL DATA:

Temperature range: -65°C to +125°C.

Vibration (sinusoidal): MIL-STD-202, method 204 (20 g, 10 to 2,000 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 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, except for plug-in relays.

Acceleration: 100 g.

MIL-R-39016/40F

PHYSICAL DATA:

Termination: See figure 1 and table I.

Solderability: Applicable, except for plug-in terminals.

Terminal strength: Applicable (1.0 ±0.3 pounds pull).

Dimensions and configuration: See figure 1.

Weight: 0.35 ounce maximum.

Identification marking (full): Applicable, except marking surface for date code is optional.

LIFE TEST REQUIREMENTS:

- Ⓕ Intermediate current: 50,000 cycles.
- Ⓕ Electrical: 100,000 cycles.
- Ⓕ Mechanical: 1,000,000 cycles.
- Ⓕ Part or Identifying Number (PIN): M39016/40- (plus dash number from table I).

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

Dash number				Mounting	Coil voltage (V dc)		Coil resistance ($\pm 10\%$) (+25°C) Ohms	Specified pickup value (voltage) (V dc) (over temp. range)	Specified hold value (voltage) (V dc) (over temp. range)	Specified dropout value (voltage) (V dc) (over temp. range)
Terminals					Rated $\frac{3}{2}$	Max				
Solder Lug	Wire Lead (SP) $\frac{2}{2}$	Wire Lead	Wire Lead (PI)							
-001	-007	-013	-019	Flange A						
-002	-025	-014	---	Flange B	26.5	32.0	390	18.0	14.0	1.2
---	-008	-028	-020	No mount						
-003	-009	-015	-021	Flange A						
-004	-026	-016	---	Flange B	12.0	15.0	100	9.0	5.8	0.6
---	-010	-029	-022	No mount						
-005	-011	-017	-023	Flange A						
-006	-027	-018	---	Flange B	6.0	8.0	25	4.5	2.9	0.3
---	-012	-030	-024	No mount						

- 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/ CAUTION: Solder pin relays are not intended for plug-in socket use.
- 3/ CAUTION: The use of any coil voltage less than the rated voltage will compromise the operation of the relay.

QUALIFICATION INSPECTION:

Qualification inspection and sample size: See table II.

(F) TABLE II. Qualification inspection and sample size.

Single submission		Group submission
50 units plus 1 open unit. One failure allowed.	M39016/40-001	50 units plus 1 open unit. One failure allowed.
Qualification inspection as applicable.		Qualification inspection as applicable.
	M39016/40-009 M39016/40-024	2 units each PIN, qualification inspection table, group II. No failures allowed.
	M39016/40-014	2 units, qualification inspection table, group II, and shock, vibration, acceleration, terminal strength, and seal. No failures allowed.

SUPERSESSION DATA: See table III.

(F) TABLE III. Supersession data.

Superseded PIN	New PIN	Superseded PIN	New PIN
M5757/90-	M39016/40-	M5757/90-	M39016/40-
001 and 002	001	025 and 026	013
003 and 004	002	027 and 028	014
005 and 006	003	029 and 030	015
007 and 008	004	031 and 032	016
009 and 010	005	033 and 034	017
011 and 012	006	035 and 036	018
013 and 014	025	037 and 038	007
015 and 016	008	039 and 040	009
017 and 018	026	041 and 042	011
019 and 020	010	043 and 044	028
021 and 022	027	045 and 046	029
023 and 024	012	047 and 048	030

(F) QUALITY ASSURANCE PROVISIONS:

Group B not required.
 Groups A and C required. Group C testing shall be performed on normal production relays.
 Lots shall not be generated solely for group C testing, unless requested by the qualifying activity.

MIL-R-39016/40F

CONCLUDING MATERIAL

Custodians:

Army - ER
Navy - EC
Air Force - 85

Review activities:

Army - AT, ME
Navy - AS, OS
DLA - ES

User activity:

Army - AV
Navy - SH

Preparing activity:

Navy - EC

Agent:

DLA - ES

(Project 5945-0872-15)