

INCH-POUND

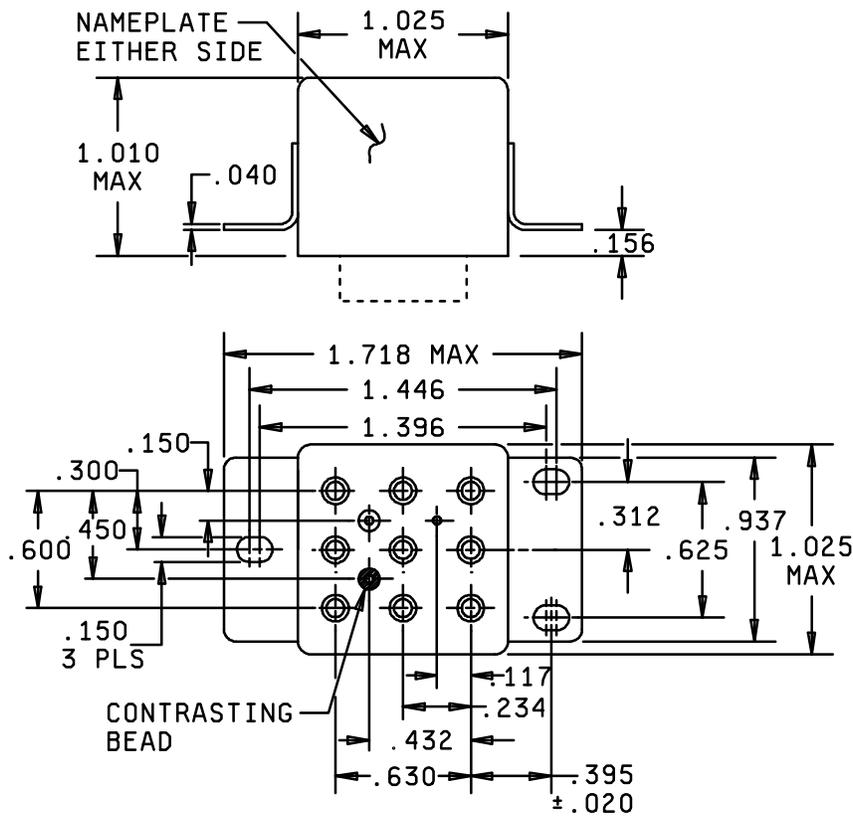
MIL-PRF-6106/13E
10 November 2000
SUPERSEDING
MIL-PRF-6106/13D
26 Nov 1986

PERFORMANCE SPECIFICATION

RELAY, ELECTROMAGNETIC, 25 AMPERE, 3PST, NO, WITH 2 AMPERE
1PDT AUXILIARY CONTACTS, HERMETICALLY SEALED,
PERMANENT MAGNET DRIVE, TYPE I

This specification 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 and the latest issue of MIL-PRF-6106.



RAISED VERTICAL FLANGE MOUNT I AND TERMINAL LAYOUT
FOR -001, -002, -003, -005, -007, -008, -016 AND -017

FIGURE 1. Relay, outline drawing.

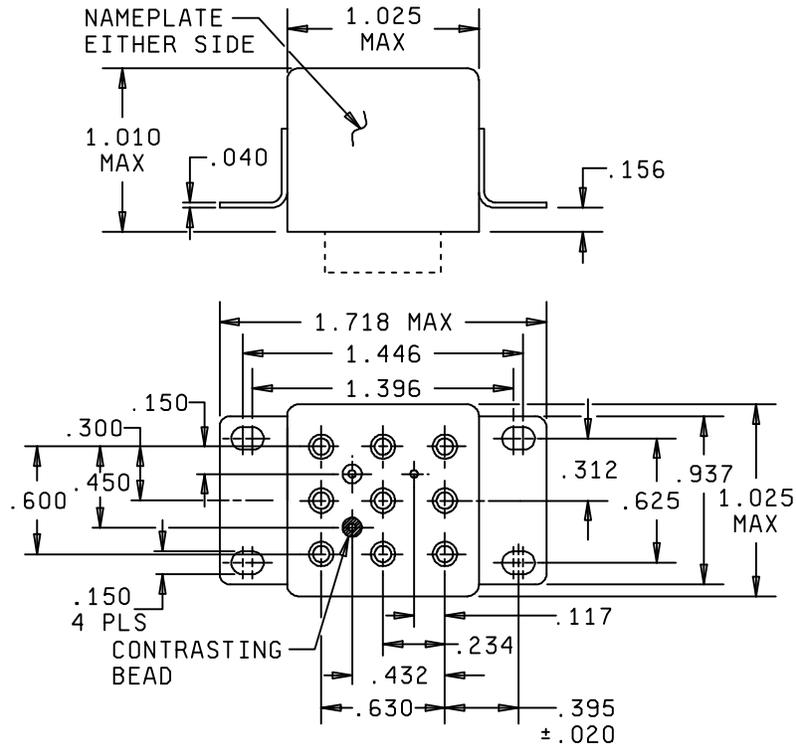
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Inches	mm	Inches	mm	Inches	mm
.000	0.00	.150	3.81	.625	15.88
.001	0.03	.156	3.96	.630	16.00
.002	0.05	.234	5.94	.937	23.80
.003	0.08	.300	7.62	1.010	25.65
.020	0.51	.312	7.92	1.025	26.04
.040	1.02	.395	10.03	1.396	35.46
.062	1.57	.432	10.97	1.446	36.73
.093	2.36	.450	11.43	1.718	43.64
.117	2.97	.600	15.24		

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).

FIGURE 1. Relay, outline drawing - Continued.



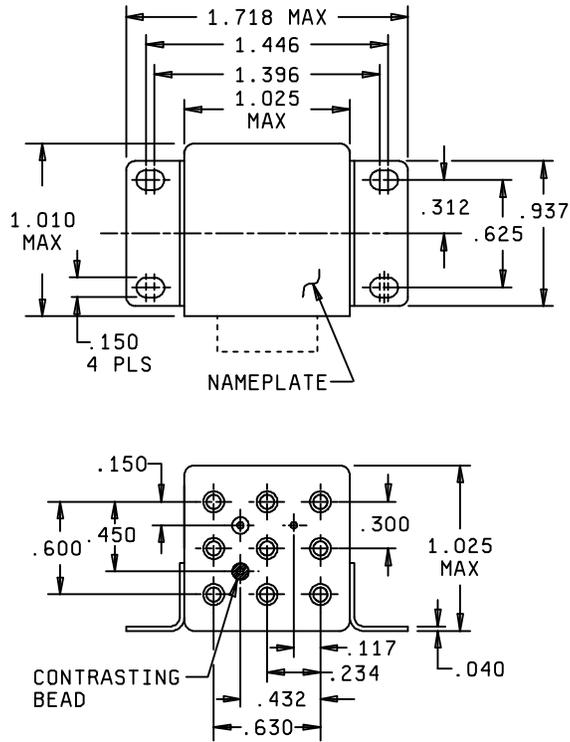
RAISED VERTICAL FLANGE MOUNT 2 AND TERMINAL LAYOUT FOR -.004

Inches	mm	Inches	mm	Inches	mm
.000	0.00	.150	3.81	.600	15.24
.001	0.03	.156	3.96	.625	15.88
.002	0.05	.234	5.94	.630	16.00
.020	0.51	.300	7.62	.937	23.80
.040	1.02	.312	7.92	1.010	25.65
.062	1.57	.395	10.03	1.025	26.04
.093	2.36	.432	10.97	1.396	35.46
.117	2.97	.450	11.43	1.446	36.73
				1.718	43.64

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is $\pm .010$ (.25 mm).

FIGURE 2. Relay, outline drawing.



HORIZONTAL FLANGE MOUNT 3 AND TERMINAL LAYOUT FOR -006, -009 AND -018.

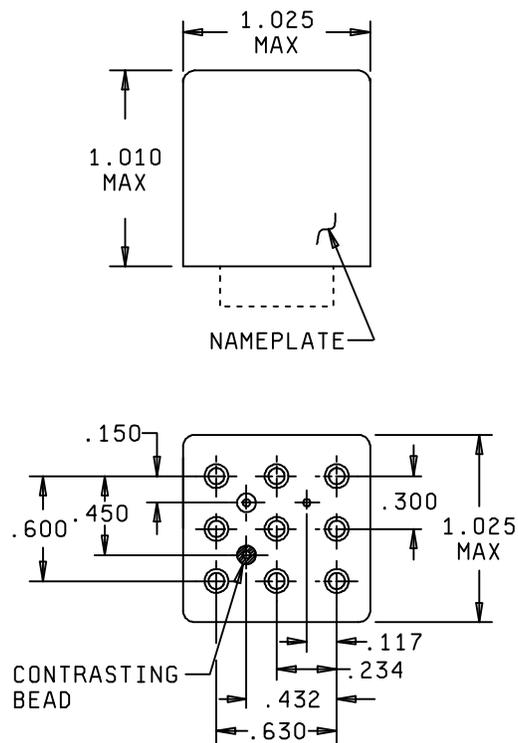
Inches	mm	Inches	mm	Inches	mm
.001	0.03	.150	3.81	.625	15.88
.002	0.05	.234	5.94	.630	16.00
.003	0.08	.300	7.62	.937	23.80
.040	1.02	.312	7.92	1.010	25.65
.062	1.57	.432	10.97	1.025	26.04
.093	2.36	.450	11.43	1.396	35.46
.117	2.97	.600	15.24	1.446	36.73
				1.718	43.64

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is ± 0.010 (.25 mm).

FIGURE 3. Relay, outline drawing.

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NO MOUNT 4 AND TERMINAL LAYOUT FOR -010, -011, -012, -013, -014, AND -015.

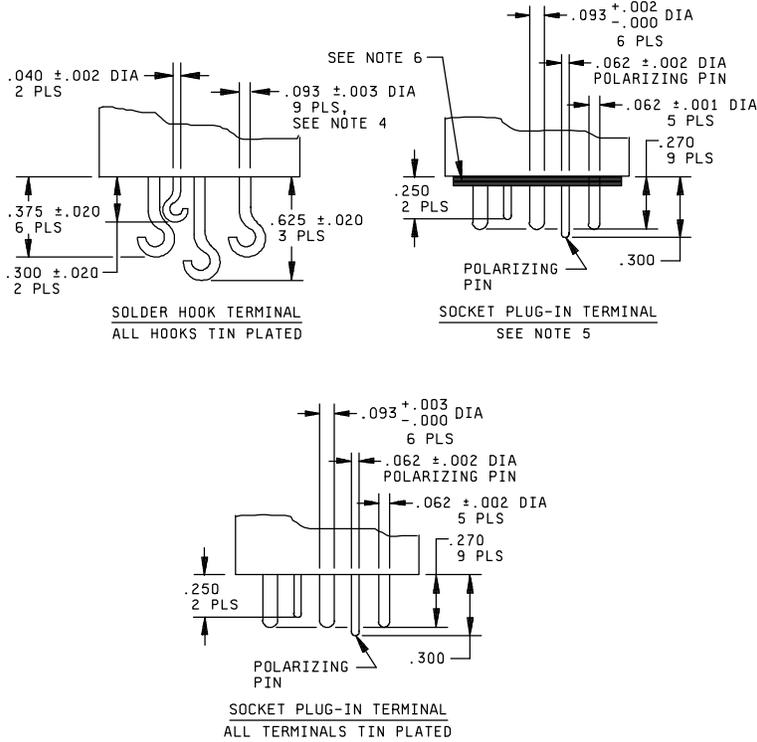
Inches	mm	Inches	mm
.001	0.03	.234	5.94
.002	0.05	.300	7.62
.003	0.08	.432	10.97
.062	1.57	.450	11.43
.093	2.36	.600	15.24
.117	2.97	.630	16.00
.150	3.81	1.010	25.65
		1.025	26.04

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is ± 0.010 (.25 mm).

FIGURE 4. Relay, outline drawing.

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SOLDER PIN TERMINALS

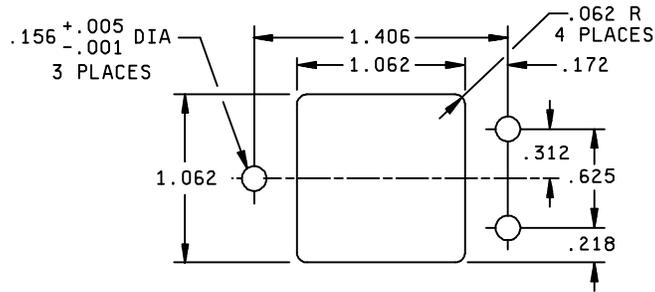
Inches	mm	Inches	mm	Inches	mm
.000	0.00	.020	0.51	.250	6.35
.001	0.03	.040	1.02	.270	6.86
.002	0.05	.050	1.27	.300	7.62
.003	0.08	.062	1.57	.375	9.52
.005	0.13	.093	2.36	.625	15.88

NOTES:

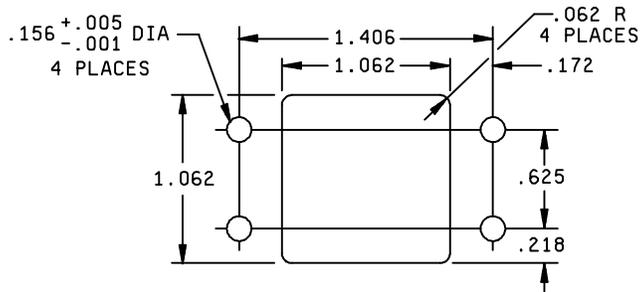
1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is ±.010 (0.25 mm).
4. Hook terminals will accept (1) one number 12 AWG stranded wire.
5. Socket pin terminals shall provide the operational, environmental, and interface characteristics to provide a reliable interconnect to gold-plated contacts. Terminals shall be gold plated, except the polarizing pin. One system for gold plating that may be used is ASTM B488, type 3, class 1.25 with a nickel underplate of 50 to 150 microinches thick. The gold plating system shall enable the product to meet the performance requirements of this specification and shall be approved by the qualifying activity.
6. Gasket shall provide a reliable seal between the relay and mating socket that will meet the environmental, operational, and interface requirements of the relay with the mating socket. The gasket shall have shore hardness 20 ±5, thickness .050 ±.005. Gasket material according to AMS 3332 has been considered acceptable.

FIGURE 5. Relay, termination styles.

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MOUNTING HOLE LAYOUT FOR FIGURE 1



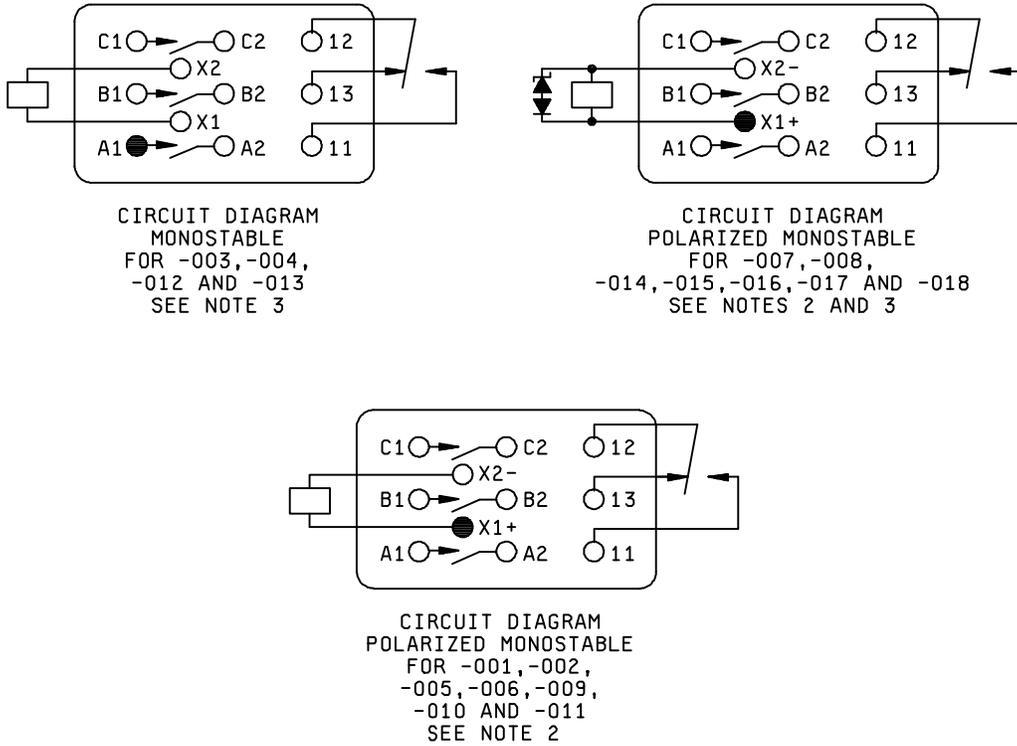
MOUNTING HOLE LAYOUT FOR FIGURES 2 AND 3

Inches	mm	Inches	mm
.001	0.03	.218	5.54
.005	0.13	.312	7.92
.062	1.57	.625	15.88
.156	3.96	1.062	26.97
.172	4.37	1.406	35.71

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is ± 0.010 (.25 mm).

FIGURE 6. Relay, mounting hole layouts.



NOTES:

1. There shall be affixed to the relay a suitable legible circuit diagram that identifies each terminal location specified.
2. DC versions of this relay must not operate or be damaged by reverse polarity, semiconductors shall not be used for this purpose.
3. Coil polarity not applicable to AC versions -003, -004, -012, and -013.
4. When semiconductors are required, JANTX or equivalent screened semiconductors shall be used. Relays using suppression devices shall continue to operate should the suppression circuit be in a failure mode. Diodes shall have a peak inverse voltage of 600 V dc minimum.

FIGURE 7. Relay, circuit diagrams.

REQUIREMENTS

Coil data:

Coil data: See table I.

Duty rating: Continuous.

Operational data:

Rated contact load: See table II.

Operate time: See table I.

Release time: See table I.

Physical:

Dimensions and configuration: See figure 1 through 6.

Weight (maximum): 0.18 pound, 81.64 grams.

Thermal type: See figure 5 and table I.

Strength of terminals and mounting studs: Applicable.

Terminal solderability: Applicable to solder pin and solder hook terminals only.

ENVIRONMENTAL CHARACTERISTICS:

Temperature range: -70°C to +125°C 1/.

Maximum altitude: 300,000 feet.

Shock g-level: 200 g, 100 g for -006, -009, and -018 only.

Duration: 6 ms.

Maximum duration contact opening: 10 μ s.

Vibration-sinusoidal:

G level: 30 g, 20 g for -006, -009, and -018 only.

Frequency range: 10 to 3,000 Hz.

Vibration (random):

Applicable standard: MIL-STD-202, method 214.

Test condition: IG, IE for -006, -009, and -018 only.

1/ For full rated load, maximum temperature, and altitude use no. 12 wire or larger. Solder hook relays are to be mounted to limit mounting bracket temperature to 160°C for dc units and 135°C for ac units.

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Power spectral density: 0.4 G²/Hz, 50 to 2,000 Hz (0.2 G²/Hz for -006, -009, and -018 only).

Duration: 15 minutes, each plane.

Acceleration: 15 g's.

ELECTRICAL CHARACTERISTICS:

Insulation resistance, initial: 100 megohms.

After life or environmental tests: 50 megohms.

Dielectric withstanding voltage (seal level): 2 to 5 seconds.

	<u>Initial</u>	<u>After life tests</u>
Coil to case	1000 V rms	1000 V rms
Auxiliary contacts	1000 V rms	750 V rms
All other points	1250 V rms	1000 V rms

Dielectric withstanding voltage (altitude) 2/: 1 minute.

	<u>80,000 feet</u>	<u>300,000 feet</u>
Coil to case	350 V rms	500 V rms
Auxiliary contacts	350 V rms	500 V rms
All other points	350 V rms	500 V rms

Maximum contact drop, initial: 0.150 volt.

After life test: 0.175 volt.

Overload current: 50 amperes dc, 80 amperes ac.

Rupture current: 60 amperes dc, 100 amperes ac.

RF1 specification (applicable to coil circuits of ac operated relays): MIL-STD-461.

Part Number: M6106/13-(dash number from table I).

Qualification by similarity: See MIL-PRF-6106.

2/ Dielectric rating may be improved by suitable insulation of terminals and wiring after installation.

TABLE I. Mounting, termination, and operating characteristics.

Dash No.	Coil terminal	Coil data										Time (milliseconds) (max)				Terminals	Mount figure		
		Nominal			Maximum		Max pickup voltage			Drop out voltage	Hold voltage	Oper	Rel	Bounce					
		Volts	Freq Hz	Res	Volts	Amp	Norm ^{1/}	High temp test	Cont. curr test					Main				Aux	
														NO	NC			NO	NC
-001 -002 -005 ^{4/} -006 ^{4/} -009 -010 -011	DC	28	DC	-	29	.12	18	19.8	22.5	1.5	7.0	15	15	1.0	-	4	4	Solder-hook Socket plug-in Solder pin Solder pin Solder-hook Solder pin Socket plug-in	1 1 1 3 3 4 4
-003 -004 -012 -013	AC	115	400	-	122	.04	90	95	103	5	30	20	50	1.0	-	4	4	Solder-hook Socket plug-in Solder pin Socket-plug-in	1 2 4 4
-007 ^{5/} -008 ^{5/} -014 ^{5/} -015 ^{5/} -016 ^{5/} -017 ^{4/} -018 ^{5/}	DC	28	DC	-	29	.12	18	19.8	22.5	1.5	7.0	15	15	1.0	-	4	4	Solder-hook Socket plug-in Solder pin Socket plug-in Solder pin Solder pin Solder-hook	1 1 4 4 1 1 3

^{1/} Over temperature range.

^{2/} With nominal coil voltage.

^{3/} From nominal coil voltage.

^{4/} For -005, -006, and -017, relays shall be tested to group A, type 1, ER screening requirements only, additional life testing, is not required. The alternate low level method shall be used.

^{5/} Coil suppression (transient voltage back EMF) 42 V dc maximum.

TABLE II. Rated contact load (amperes per pole) (case grounded).

Type of load	Life operating cycles x 10 ³	28 V dc				115 V ac, 1 phase				115/200 V ac, 3 phase ^{1/}			
		Main		Aux		Main		Aux		Main		Aux	
		NO	NC	NO	NC	400 Hz	60 Hz	400 Hz	60 Hz	400 Hz	50 Hz	400 Hz	60 Hz
Resistive ^{1/}	50	25		2	2	25		2		25			
Inductive	10	12		1	1								
Inductive	20					15		1		15			
Motor	50	10				10				10			
Lamp	50	5		.5	.5	5		.5		5			
Transfer load ^{3/}													
Mechanical life Reduced current	200	6				6				6			
Intermediate current	Applicable per specification (main contacts only)												
Mixed loads	Applicable per specification												

^{1/} Absence of value indicates relay is not rated for 3 phase application.

^{2/} For full rated load, maximum temperature, and altitude use no. 12 wire or larger. Solder hook relays to be mounted to limit mounting bracket temperature to 160°C for dc units and 135°C for ac units.

^{3/} Transfer load indicates relay suitable for transfer between unsynchronized ac power supplies at rating indicated.

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Custodian:
Air Force - 11
DLA-CC

Preparing activity:
DLA - CC

Review activities:
Air Force - 99

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