

INCH-POUND

MIL-PRF-6106/20C  
10 November 2000  
SUPERSEDING  
MIL-PRF-6106/20B(USAF)  
24 October 1990

PERFORMANCE SPECIFICATION SHEET

RELAYS, ELECTROMAGNETIC, MAGNETIC LATCH,  
25 AMPERES, SPDT, HERMETICALLY SEALED

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

The requirements for acquiring the relay described herein shall  
consist of this specification and the latest issue of MIL-PRF-6106

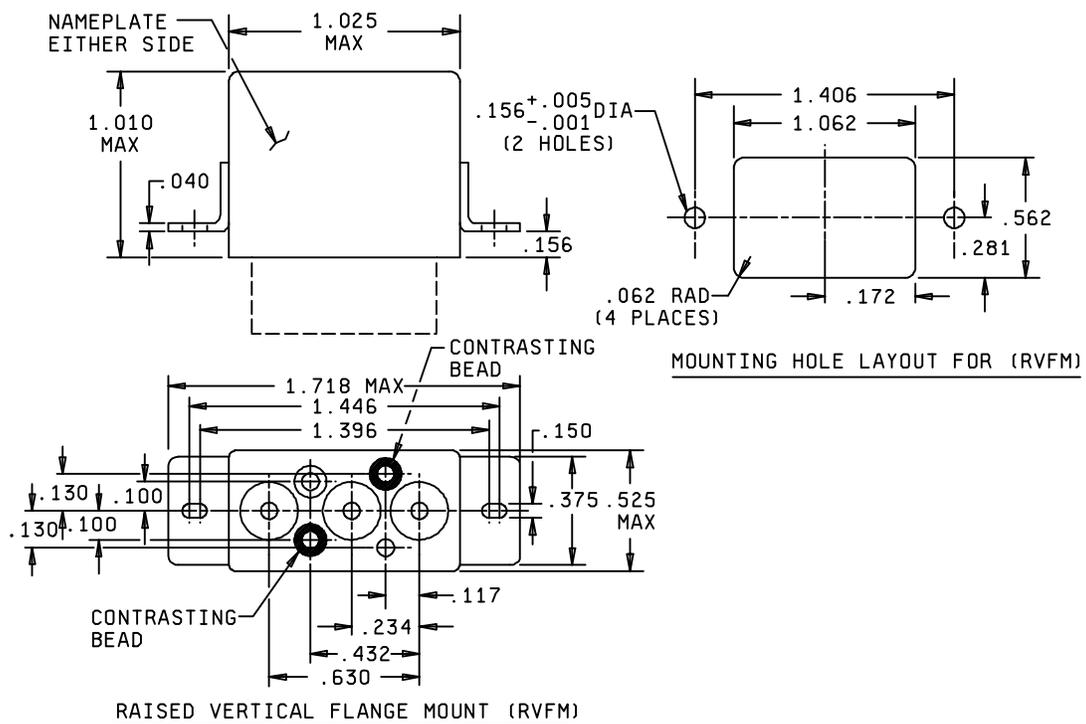


FIGURE 1. Relay, outline drawing.

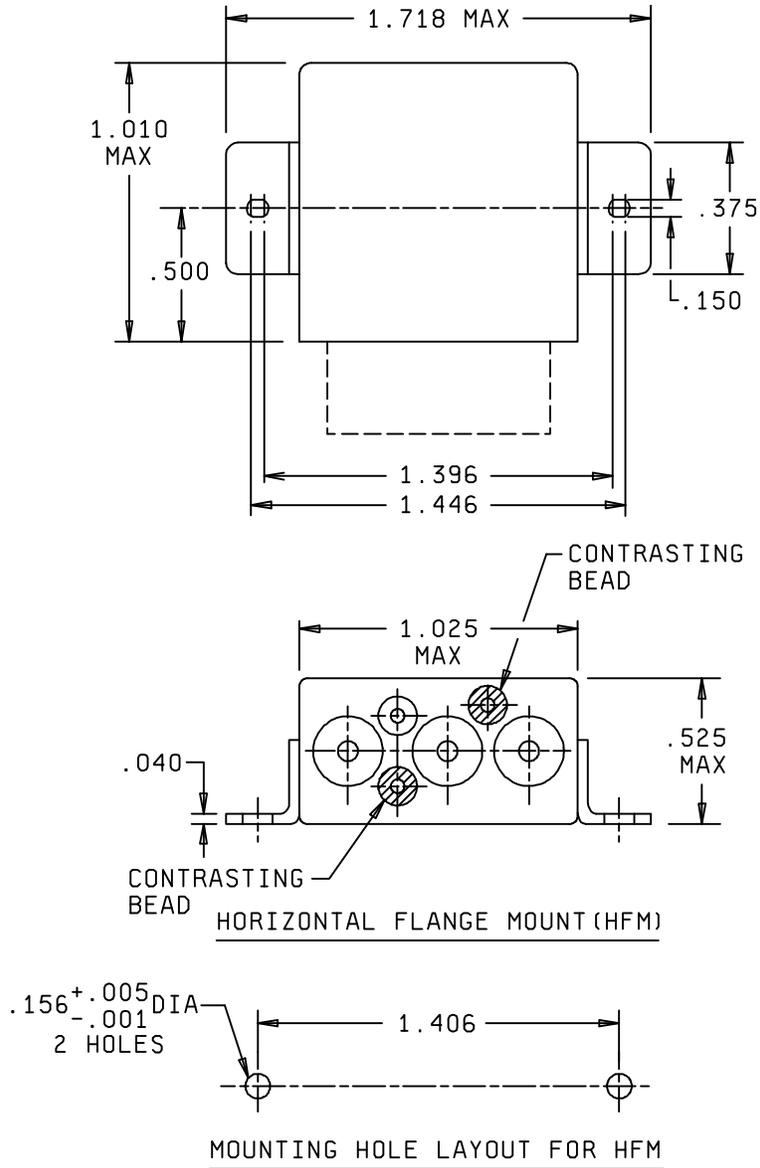
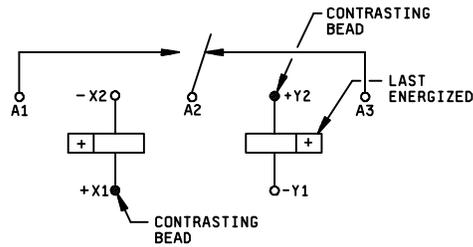


FIGURE 1. Relay, outline drawing - Continued.

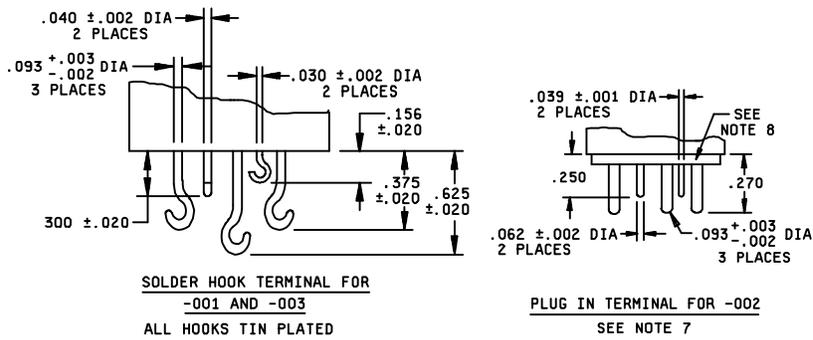
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CIRCUIT DIAGRAM

(POLARIZED BISTABLE)

- TO CLOSE NO.1 CONTACTS (OPERATE)  
ENERGIZE X1 AND X2
- TO CLOSE NO.3 CONTACTS (RESET)  
ENERGIZE Y1 AND Y2



SOLDER HOOK TERMINAL FOR  
-001 AND -003  
ALL HOOKS TIN PLATED

PLUG IN TERMINAL FOR -002  
SEE NOTE 7

Inches	mm	Inches	mm	Inches	mm
.001	0.03	.156	3.96	.525	13.34
.002	0.05	.172	4.37	.562	14.27
.003	0.08	.234	5.94	.625	15.88
.005	0.13	.250	6.35	.630	16.00
.020	0.51	.270	6.86	1.010	25.65
.040	1.02	.281	7.14	1.025	26.04
.050	1.27	.300	7.62	1.062	26.97
.062	1.57	.375	9.52	1.396	35.46
.093	2.36	.432	10.97	1.406	35.71
.100	2.54	.485	12.32	1.446	36.73
.150	3.61	.500	12.70	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  $\pm 0.010$  (0.25 mm).
4. Terminal numbers need not appear on the relay header provided there is affixed to the relay a suitable legible circuit diagram that identifies each terminal location specified.
5. Note to observe polarity must appear on relays.
6. Hook terminals will accept one No. 12 AWG stranded wire.
7. 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. Gold plating of the polarizing pin is optional. 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.
8. 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  $20 \pm 5$ , thickness  $.050 \pm .005$ . Gasket material according to AMS 3332 has been considered acceptable.

REQUIREMENTS

Weight: 0.10 pound maximum.

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

Maximum altitude-rating: 80,000 feet.

Shock g-level: 200 g.

Duration: 6 milliseconds.

Maximum duration contact opening: 10 microseconds.

Vibration-sinusoidal:

G-level: 30 g.

Frequency range: 10-3,000 Hz.

Vibration-random:

Applicable specification: MIL-STD-202, method 214, test condition IG.

Duration: 15 minutes, each plane.

Strength of terminals and mounting studs: Applicable.

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

Acceleration: 15 g.

Insulation resistance, initial: 100 megohms.

Afterlife or environmental tests: 50 megohms.

Dielectric withstanding voltage (sea level):

	Initial	After life tests
Coil to case and coil to coil	1,000 V rms	1,000 V rms
All other points	1,250 V rms	1,000 V rms

Dielectric withstanding voltage (altitude) 2/:

	80,000 feet	300,000 feet
Coil to case and coil to coil	250 V rms	500 V rms
All other points	350 V rms	500 V rms

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

2/ Dielectric withstanding voltage rating may be improved by suitable insulation of terminals and wiring after installation. Plug in relays, with suitable gasket compressed, will have dielectric withstanding voltage capabilities at 80,000 feet over 500 V rms.

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Maximum contact drop, initial: 0.150 volt.

After life test: 0.175 volt.

Overload current: 50 amperes dc, 80 amperes ac, 400 Hz.

Rupture current: 60 amperes dc, 100 amperes ac, 400 Hz.

Duty rating: Continuous.

Part or Identifying Number (PIN): M6106/20- (plus dash number from table I). Example: M6106/20-001.

Qualification by similarity: See MIL-PRF-6106.

TABLE I. Dash numbers and operating characteristics.

Dash numbers	Coil data								Time-milliseconds maximum <sup>1/</sup>				Terminal type	Mounting style
	Coil	Nominal		Max		Max pick-up voltage			Ope-rate	Re-set	Bounce			
		Volts (V dc)	Res $\Omega$ $\pm 10\%$	Volts	Amp	Nominal <sup>3/</sup>	High temp test	Cont current test			Main			
											NO	NC		
.001	X1-X2 Y1-Y2	28	600	29	.050	18	19.8	22.5	10	10	1.0	1.0	Solder hook	RVFM
-002	X1-X2 Y1-Y2	28	600	29	.050	18	19.8	22.5	10	10	1.0	1.0	Plug-in	RVFM
-003	X1-X2 Y1-Y2	28	600	29	.050	18	19.8	22.5	10	10	1.0	1.0	Solder hook	HFM

<sup>1/</sup> With nominal coil voltage.

<sup>2/</sup> Caution: Use of any coil voltage less than nominal coil voltage will compromise the operation of the relay.

<sup>3/</sup> Over temperature range.

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

Type of load	Life operating cycles X 10 <sup>3</sup>	28 V dc				115 V ac, 1 phase				115/200 V ac, 3 phase <sup>1/</sup>				See appropriate notes
		Main		Aux		Main		Aux		Main		Aux		
		NO	NC	NO	NC	400 Hz	60 Hz	400 Hz	60 Hz	400 Hz	60 Hz	400 Hz	60 Hz	
Resistive	50	25	25			25								<u>2/</u>
Inductive	10	12	12											
Inductive	20					15								
Motor	50	10	10			10								
Lamp	50	5	5			5								
Transfer, load														<u>3/</u>
Mechanical life reduced current	200	6	6			6								
Intermediate current		APPLICABLE (See MIL-PRF-6106)												
Mixed loads		APPLICABLE (See MIL-PRF-6106)												

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 135°C.

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

Qualification by similarity: If the relays produced in accordance with this specification sheet are similar in design and construction to those covered by MIL-PRF-6106/19 (except for the coils, which shall be similar to MS27745), then reduced qualification by similarity is authorized. Manufacturers shall be qualified to MIL-PRF-6106/19 and MS27745. Qualification by similarity requirements are listed in table III.

TABLE III. Qualification by similarity.

Inspection	Number of units
Group A acceptance tests Vibration <u>2/</u> Resistive load, ac Group A acceptance tests	7 <u>1/</u>
Shock <u>2/</u> Inductive load, dc Group A acceptance tests	2
Acceleration <u>2/</u> Intermediate current <u>3/</u> Group A acceptance test	3

1/ Four units of dash number -002 and three units of dash number -003. All seven relays shall receive group A acceptance testing in accordance with MIL-PRF-6106. The seven relays shall then be subdivided into three groups as shown above for the remaining inspections.

2/ One unit of dash number -002 and one unit of dash number -003.

3/ Three units required for mixed loads testing.

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Custodian:  
Air Force - 11  
DLA - CC

Preparing activity:  
DLA - CC

Review activities:  
Air Force - 99

(Project 5945-1113-09)