INCH-POUND

DETAIL SPECIFICATION SHEET

RELAYS, ELECTROMAGNETIC, 50 AMPERES, DC/60
AMPERES AC, 3 PST OR 3 PDT, HERMETICALLY SEALED,
PERMANENT MAGNET DRIVE

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
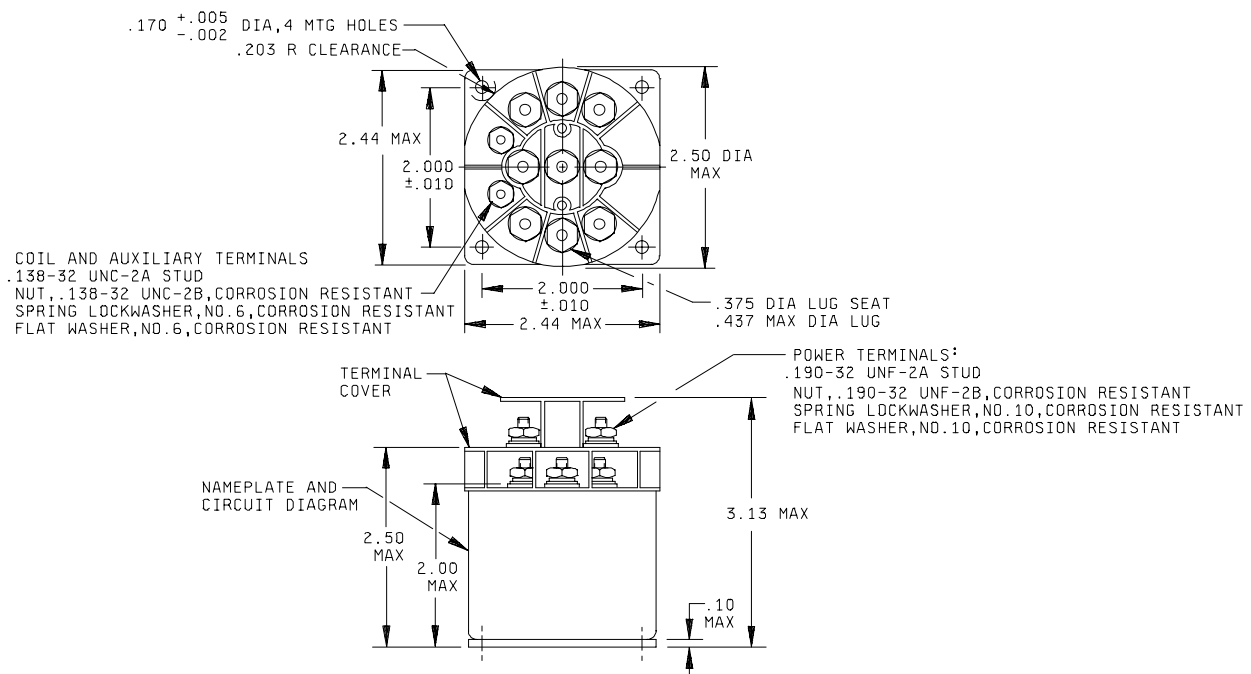consist of this specification and the latest issue of MIL-PRF-6106.

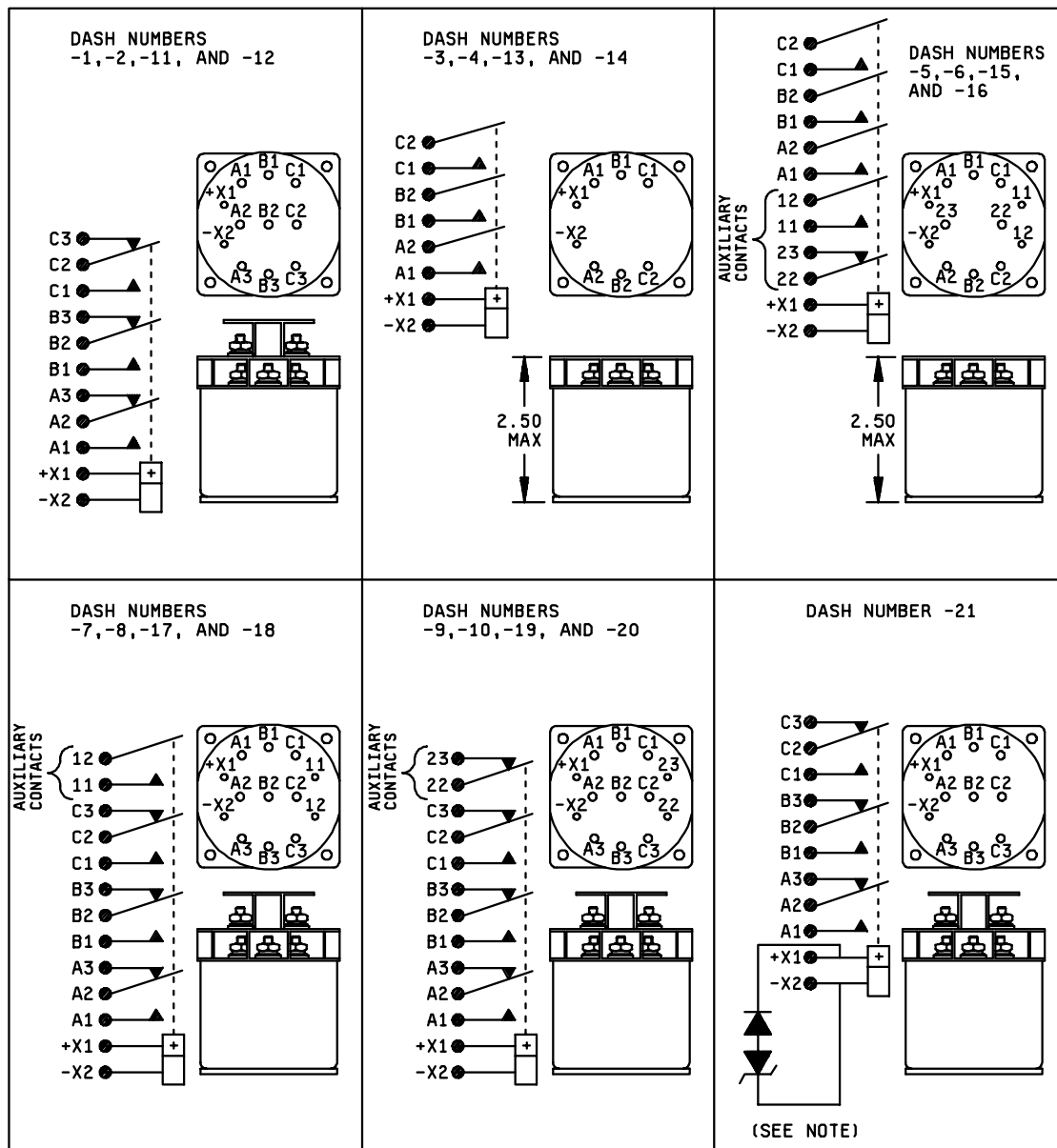FIGURE 1. Dimensions and configuration.

MS27751J

Inches	mm	Inches	mm
.002	0.05	.375	9.52
.005	0.13	.437	11.10
.010	0.25	1.91	48.5
.031	0.79	2.000	50.80
.10	2.5	2.44	62.0
.138	3.51	2.45	62.2
.170	4.32	2.50	63.5
.190	4.83	3.13	79.5
.203	5.16		

NOTES:

1. Dimensions are in inches.
2. Unless otherwise specified, tolerance is ±0.03 for 2 place decimals and ±0.010 for 3 place decimals.
3. Metric equivalents are given for general information only.
4. Polarity indication applies to dc coils only.
5. In the event of a conflict between the text of this specification sheet and the references cited herein, the text of this specification sheet shall take precedence.
6. Referenced Government documents of the issue listed in that issue of the Department of Defense Index of Specifications and Standards (DoDISS) specified in the solicitation form a part of this specification sheet to the extent specified herein.
7. DC versions of this relay must not operate or be damaged by reverse polarity. Semiconductors shall not be used for this purpose.
8. Permanent magnet drive consists of a permanent magnet with its flux path switched and combined with the electromagnetic flux.
9. Additional flat washer may be used for terminal seat.
10. Terminal numbers shall not appear on the relay header. There shall be affixed to the relay a legible circuit diagram that identifies each terminal location.
11. Terminal covers and barriers are required on power terminals.
12. No paint on either side of (2) diagonally opposite mounting flanges, the closest flange to the A1 terminal and the opposite flange.

FIGURE 1. Dimensions and configuration - Continued.

MS27751J

NOTE: When semiconductors are required, JANTX or equivalent screened semiconductors shall be used. Relays using suppression devices shall continue to operate if the suppression circuit is in a failure mode. Diodes shall have a peak inverse voltage of 600 V dc min.

FIGURE 2. Circuit and terminal layouts.

3

MS27751J

REQUIREMENTS:

Dimensions and configuration: See figure 1.

Circuit and terminal layouts: See figure 2.

Part or Identifying Numbers (PIN's) and general characteristics: See table I.

Contact data:

Load ratings: See table II.

Maximum contact drop:

Initial: 0.150 V.

After life test: 0.175 V.

Overload current (NO): 125 A dc, 115/200 V ac, 400 Hz, 400A.

Rupture current (NO): 150 A dc, 115/200 V ac, 400 Hz, 500 A.

Coil data: See table III.

Duty rating: continuous.

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

Electrical data:

Minimum insulation resistance:

Initial: 100 megohms.

After life or environmental tests: 50 megohms.

Dielectric strength (sea level): 2 - 5 seconds (see table IV).

Dielectric strength (altitude): 1 minute (see table V).

Environmental characteristics:

Operating temperature range: -55°C to +71°C.

Maximum altitude rating: 80,000 feet.

Shock g level: 50 g's.

Duration: 6 ms.

Maximum duration contact opening: 10 microseconds.

Vibration (sinusoidal): G-level, 10 g's; frequency range, 10-2,000 Hz.

Vibration (random): Not applicable.

Acceleration: 15 g's.

MS27751J

Physical data:

  Seal: Hermetic; relays are sealed by welding (laser, tungsten inert gas, or other suitable means, as approved by the qualifying activity).

  Identification of product: Applicable, except that resistive ratings for both ac and dc shall be marked as follows:

  50 A at 28 V dc and
  60 A at 115 V ac, 400 Hz

  Part or Identifying Number (PIN): MS27751- (plus dash number from table I).

  Qualification by similarity: See MIL-PRF-6106.

PIN MS27751-	Type	coil	Contacts		Terminal type	Max weight in pounds
			Main	Aux		
1	I	dc	3PDT	None	Stud	.85
2	I	ac	3PDT	None	Stud	.85
3	I	dc	3PNO	None	Stud	.85
4	I	ac	3PNO	None	Stud	.85
5	I	dc	3PNO	1NO-1NC	Stud	.85
6	I	ac	3PNO	1NO-1NC	Stud	.85
7	I	dc	3PDT	1NO	Stud	.85
8	I	ac	3PDT	1NO	Stud	.85
9	I	dc	3PDT	1NC	Stud	.85
10	I	ac	3PDT	1NC	Stud	.85
11	I	dc	3PDT	NONE	Stud	.85
12	I	ac	3PDT	NONE	Stud	.85
13	I	dc	3PNO	NONE	Stud	.85
14	I	ac	3PNO	NONE	Stud	.85
15	I	dc	3PNO	1NO-1NC	Stud	.85
16	I	ac	3PNO	1NO-1NC	Stud	.85
17	I	dc	3PDT	1NO	Stud	.85
18	I	ac	3PDT	1NO	Stud	.85
19	I	dc	3PDT	1NC	Stud	.85
20	I	ac	3PDT	1NC	Stud	.85
21	I	dc	3PDT	NONE	Stud	.85

  1/ Weight includes terminal barriers.

5

MS27751J

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

Type of load	Life operating cycles x 10³	28 V dc				115 V ac, 1 phase				115/200 V ac, 3 phase 2/				See appropriate notes
		Main		Aux 1/		Main		Aux 1/		Main		Aux		
		NO	NC	NO	NC	400 Hz	60 Hz	400 Hz	60 Hz	400 Hz	60 Hz	400 Hz	60 Hz	
Resistive	50	50	50	3	3	60		3		60				
Inductive	20	20	20	3	3			3						
Inductive	50			2	2	60		2		60				
Motor	50	20	20			40				40				
Lamp	50	10	10	1	1	15		1						
Transfer, load	10					12.5/ 60				12.5/ 60				3/
Mechanical life reduced current	200	7	7	1	1	14		1		14				
Mixed loads	60	1	1			5				5				

1/ Applicable to -5 through -10 and -15 through -20.
2/ Absence of value indicates relay is not rated for 3 phase application.
3/ Transfer load indicates relay is suitable for transfer between unsynchronized ac power supplies of rating indicated:
   12.5 amperes -1 through -10 and -21; 60 amperes -11 through -20.

Application notes:
1. Examination of product, external parts, shall be performed in accordance with MIL-PRF-6106, except that the case temperature shall be limited to 150°C maximum.
2. Strength of terminals shall be performed in accordance with MIL-PRF-6106, except that test shall be performed at room ambient temperature only.

TABLE III. Operating characteristics.

1/ PIN MS 27751-	Coil	Coil data										Time - (milliseconds maximum)					
		Nominal			Max		Max pick-up voltage			Hold voltage 4	Drop out voltage 4/	Oper-ate 5/	Rel-ease 6/	Contact Bounce			
														Main		Aux 2/	
		Volts 3/	Freq Hz	Ω Res	Volts 3/	Amp at 25°C	Rated 4/	High temp test	Cont current test					NO	NC	NO	NC
-1, -3, -5 -7, -9, -11, -13 -15, -17 -19, -21 7/	X1,X2	28	dc	200	29	.160	18	20	21	7.0	1.5	50	25	3	3	4	4
-2, -4, -6 -8, -10 -12, -14 -16, -18 -20 7/	X1,X2	115	400 8/	---	124	.100	90	95	100	35	5.0	50	80	3	3	4	4

1/ Contact transfer time at rated voltage is 1.8 milliseconds minimum for -11 through -20.
2/ Applicable to -5 through -10 and -15 through -20.
3/ Caution: The use of any coil voltage less than the rated coil voltage will compromise the operation of the relay.
4/ Over the temperature range.
5/ with rated coil voltage.
6/ From rated coil voltage.
7/ Applicable to -21 only. coil suppression (transient voltage back EMF) shall be 42 V dc max.
8/ Will operate on 115 V ac, 60 Hz with slightly higher coil current.

MS27751J

TABLE IV. Dielectric strength, sea level.

Dielectric strength	Initial	After life tests
Coil to case	1,000 V rms	1,000 V rms
Auxiliary contacts	1,000 V rms	1,000 v rms
All other points	1,500 V rms	1,150 V rms

TABLE V. Dielectric strength, altitude.
(50,000 feet)

Coil to case	500 V rms
Auxiliary contacts	500 V rms
All other points	700 V rms

NOTES

Referenced documents. In addition to MIL-PRF-6106, this specification sheet references the following documents. (Government documents are available on line at http://assist.daps.dla.mil/quicksearch or www.dodssp.daps.mil or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094).

STANDARDS

Department of Defense

MIL-STD-461   -   Requirements for the Control of Electromagnetic Interference Characteristics of Subsystems and Equipment

Custodians: Preparing activity:
  Air Force - 11
  DLA - CC   (Project 5945-1214-02)

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 ASSIST Online database at www.dodssp.daps.mil.