INCH-POUND

MS27751K
25 September 2012
SUPERSEDING
MS27751J
27 November 2003

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 product described herein shall consist of this specification sheet and the latest issue of MIL-PRF-6106.

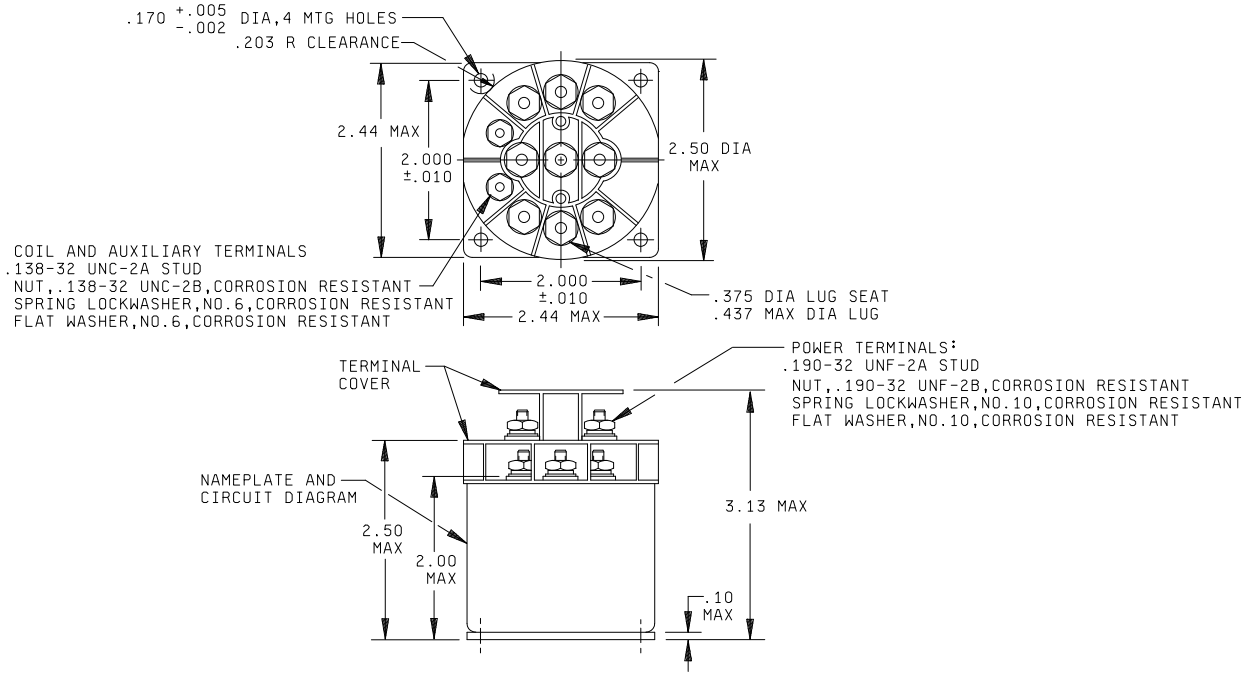
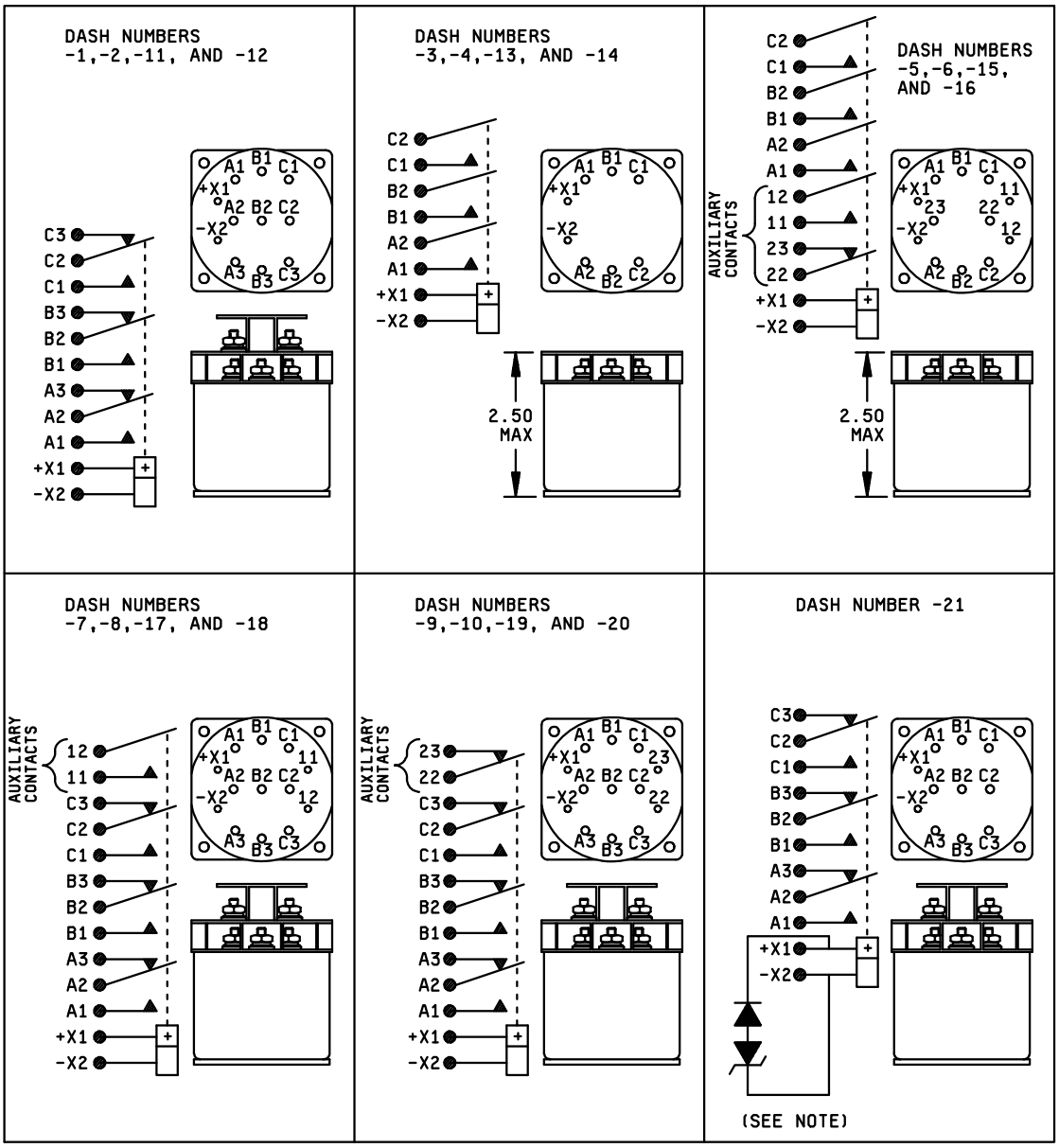


FIGURE 1. Dimensions and configuration.

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. DC versions of this relay must not operate or be damaged by reverse polarity. Semiconductors shall not be used for this purpose.
7. Permanent magnet drive consists of a permanent magnet with its flux path switched and combined with the electromagnetic flux.
8. Additional flat washer may be used for terminal seat.
9. 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.
10. Terminal covers and barriers are required on power terminals.
11. 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.



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.

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.

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.

TABLE I. PINs and general characteristics.

PIN MS27751-	Type	coil	Contacts		Terminal type	Max weight in pounds 1/
			Main	Aux		
1	I	dc	3PDT	None	Stud	.938
2	I	ac	3PDT	None	Stud	.938
3	I	dc	3PNO	None	Stud	.875
4	I	ac	3PNO	None	Stud	.875
5	I	dc	3PNO	1NO-1NC	Stud	.875
6	I	ac	3PNO	1NO-1NC	Stud	.875
7	I	dc	3PDT	1NO	Stud	.938
8	I	ac	3PDT	1NO	Stud	.938
9	I	dc	3PDT	1NC	Stud	.938
10	I	ac	3PDT	1NC	Stud	.938
11	I	dc	3PDT	NONE	Stud	.938
12	I	ac	3PDT	NONE	Stud	.938
13	I	dc	3PNO	NONE	Stud	.875
14	I	ac	3PNO	NONE	Stud	.875
15	I	dc	3PNO	1NO-1NC	Stud	.875
16	I	ac	3PNO	1NO-1NC	Stud	.875
17	I	dc	3PDT	1NO	Stud	.938
18	I	ac	3PDT	1NO	Stud	.938
19	I	dc	3PDT	1NC	Stud	.938
20	I	ac	3PDT	1NC	Stud	.938
21	I	dc	3PDT	NONE	Stud	.938

1/ Weight includes terminal barriers.

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 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 data											Time - (milliseconds maximum)					
	Coil	Nominal			Max		Max pick-up voltage			Hold voltage 4	Drop out voltage 4/	Operate 5/	Release 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.

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

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 last previous issue.

Referenced documents. In addition to MIL-PRF-6106, this document references the following:

MIL-STD-461

Custodians:
Air Force – 85
DLA – CC

Preparing activity:
DLA - CC

Review activity:
Air Force - 99

(Project 5945-2012-031)

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/.