INCH-POUND

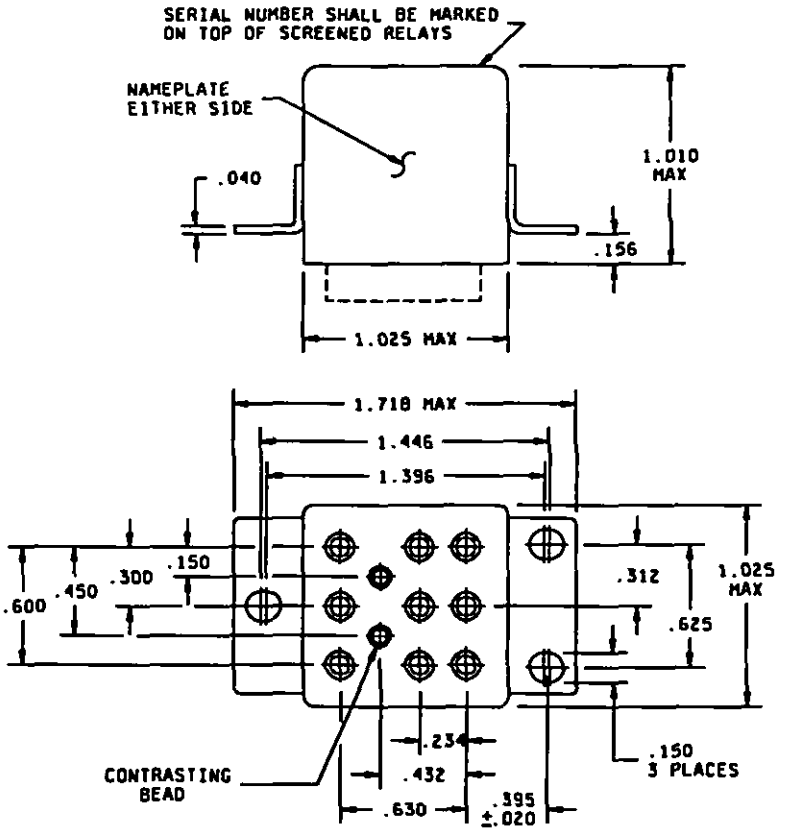
MS27743K(USAP)
12 March 1996
SUPERSEDING
MS27743J(USAP)
18 January 1990

MILITARY SPECIFICATION SHEET

(K) RELAYS, ELECTROMAGNETIC, 25 AMPERES, 3 PDT,
TYPE I, HERMETICALLY SEALED,
PERMANENT MAGNET DRIVE

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

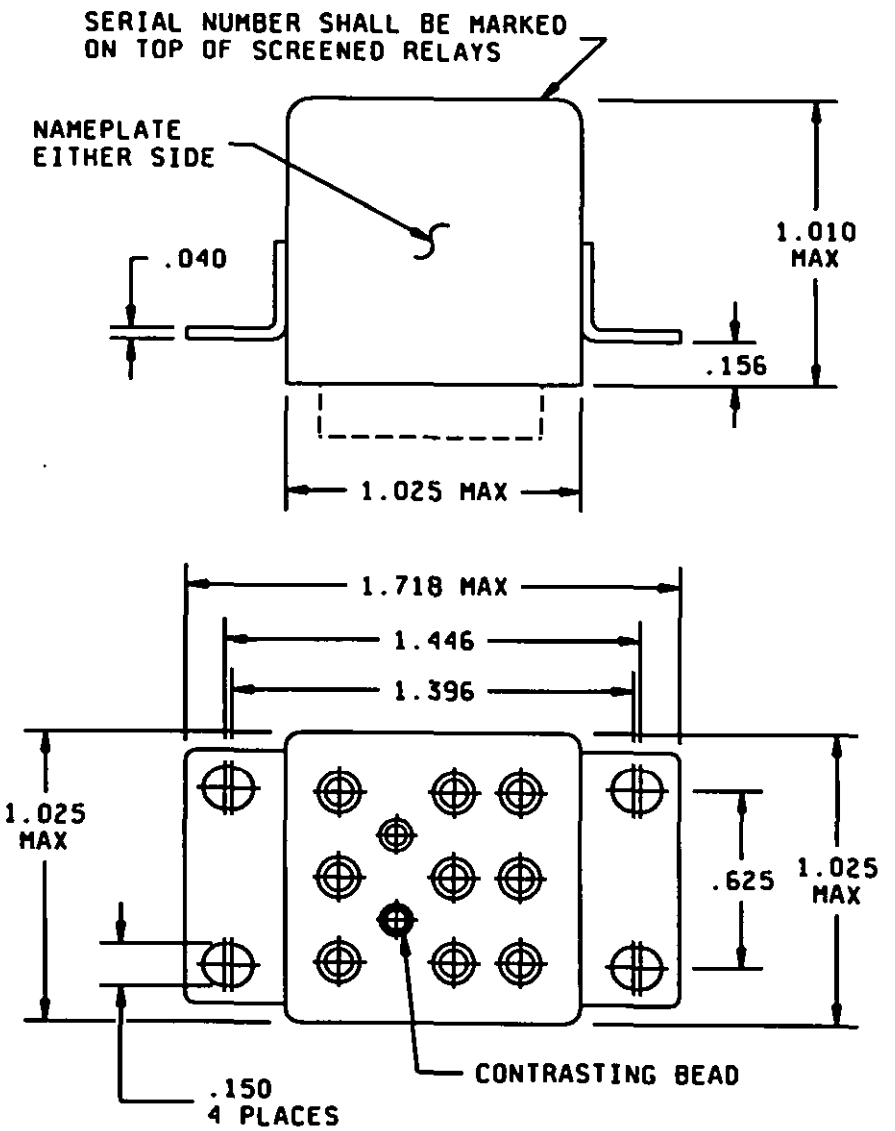
The requirements for acquiring the product described herein shall consist of this specification sheet and the issue of the following specification listed in that issue of the Department of Defense Index of Specifications and Standards (DODISS) specified in the solicitation: MIL-R-6106.



CONFIGURATION A
(SOLDER HOOK, DC SOLDER PIN, AND SOCKET PIN RELAYS)

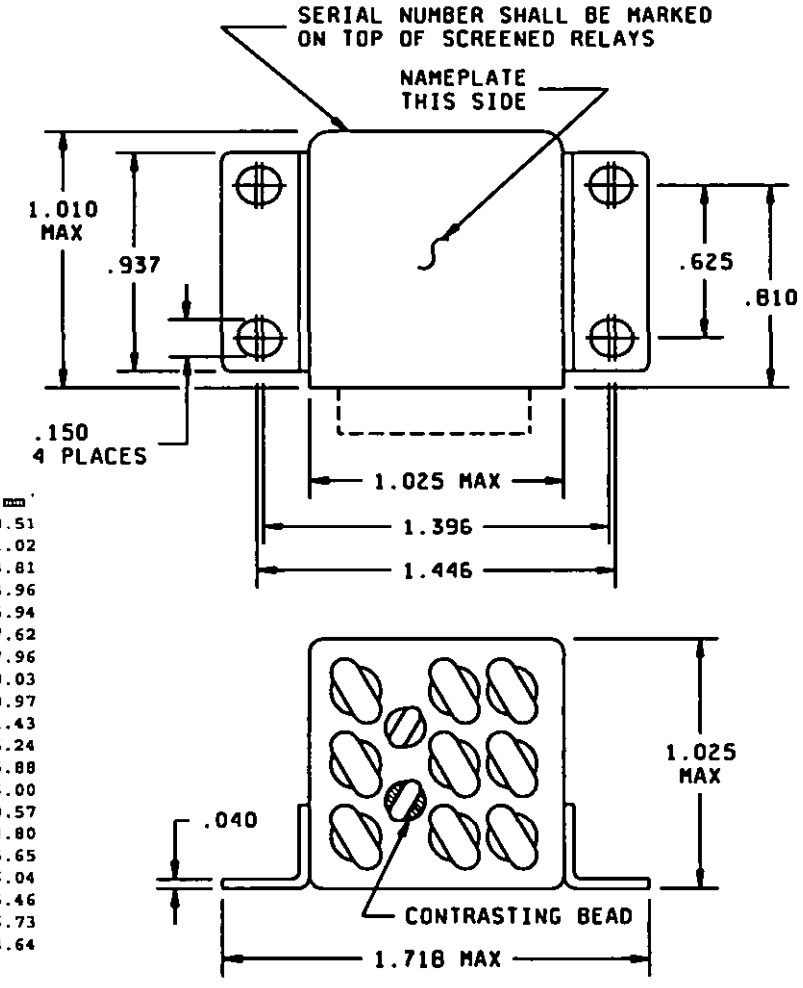
FIGURE 1. Configurations and dimensions.

(K) denotes changes



CONFIGURATION B
(AC SOCKET PIN RELAYS, GOLD PLATED)

FIGURE 1. Configurations and dimensions - Continued.

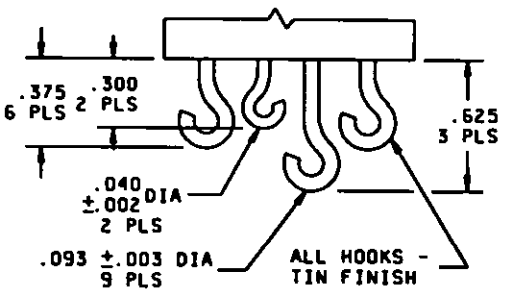


Inches	mm
.020	0.51
.040	1.02
.150	3.81
.156	3.96
.234	5.94
.300	7.62
.312	7.96
.395	10.03
.432	10.97
.450	11.43
.600	15.24
.625	15.88
.630	16.00
.810	20.57
.937	23.80
1.010	25.65
1.025	26.04
1.396	35.46
1.446	36.73
1.718	43.64

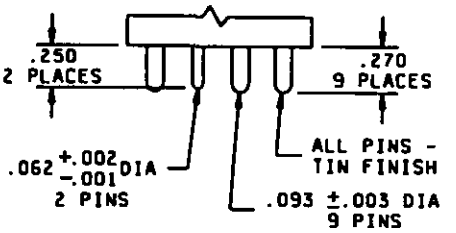
Ⓚ CONFIGURATION C
(SOLDER HOOK AND SOLDER PIN RELAYS, TIN PLATE FINISH)

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. There shall be affixed to the relay a legible circuit diagram that identifies each terminal location specified.
5. For design feature purposes, this specification takes precedence over acquisition documents referenced herein.
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 document to the extent specified herein.
Ⓚ 7. Shape of flanges is optional within the envelope dimensions shown.

FIGURE 1. Configurations and dimensions - Continued.

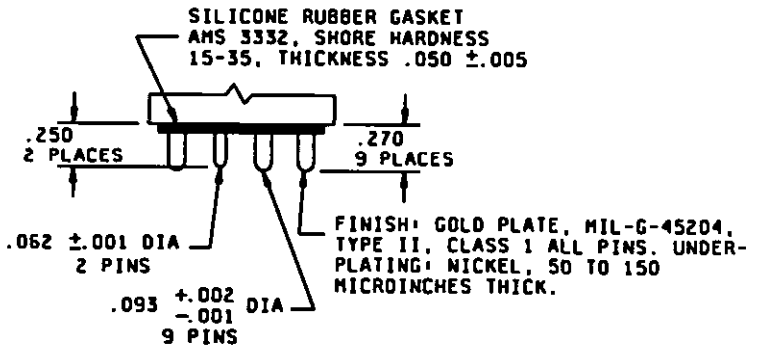


Ⓚ SOLDER-HOOK TERMINAL

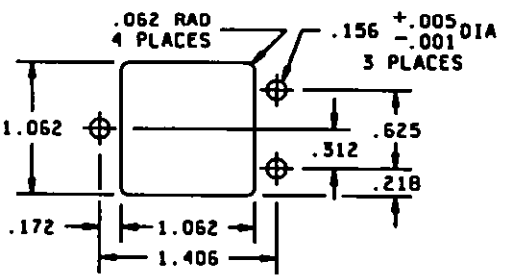


Ⓚ SOLDER PIN TERMINAL

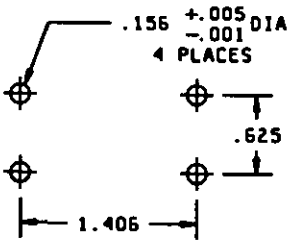
Inches	mm
.001	0.03
.002	0.05
.003	0.08
.005	0.13
.040	1.02
.050	1.27
.062	1.57
.093	2.36
.156	3.96
.172	4.37
.218	5.54
.250	6.35
.270	6.86
.300	7.62
.312	7.92
.375	15.24
.625	15.88
1.062	26.98
1.406	35.71



Ⓚ SOCKET PIN TERMINAL



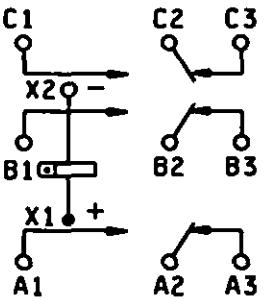
MOUNTING HOLE LAYOUT
(CONFIGURATION A)



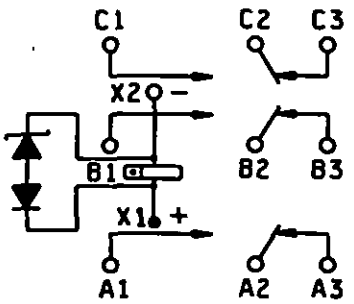
Ⓚ MOUNTING HOLE LAYOUT
(CONFIGURATIONS B AND C)

NOTES:
1. Dimensions are inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is ±.010 (0.25 mm).

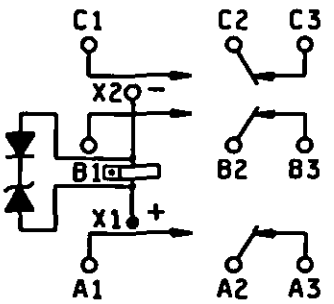
FIGURE 2. Terminal types and mounting hole layouts.



CIRCUIT A
Ⓚ (POLARIZED MONOSTABLE)
(SEE NOTES 1,2, AND 3)



CIRCUIT B



Ⓚ CIRCUIT B
(ALTERNATE INTERNAL
DIODE CONFIGURATION)

NOTES:
1. Coil polarity is not applicable to ac versions of dash numbers 7, 8, 9, 13, 14, 15, 19, 20, 21, 25, 26, and 27.
2. DC versions of this relay must not operate or be damaged by reverse polarity. Semiconductors shall not be used for this purpose.
3. Permanent magnet drive consists of a permanent magnet with its flux path switched and combined with the electromagnetic flux.

FIGURE 3. Circuit diagrams.

REQUIREMENTS:

Configurations and dimensions: See figure 1.

Terminal types and mounting hole layouts: See figure 2.

Circuit diagrams: See figure 3.

Dash numbers 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: 50 amperes dc; 80 amperes ac.

Rupture current: 60 amperes dc; 100 amperes ac.

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 test: 50 megohms.

Time-current relay characteristics: See table IV.

Dielectric strength:

Sea level, 2-5 seconds: 1/

	Initial	After life tests
Coil to case:	1,000 V rms	1,000 V rms
Aux. contacts:	N/A	N/A
All other points:	1,250 V rms	1,000 V rms

Altitude, 1 minute.

	80,000 ft.	300,000 ft.
Coil to case:	350 V rms	500 V rms
Aux. contacts:	N/A	N/A
All other points:	350 V rms	500 V rms

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

Environmental characteristics:

Temperature range: -70°C to +125°C.

Maximum altitude rating: 300,000 feet.

Shock, g-level: Configurations A and B: 200 g's; configuration C: 100 g's.

Duration: 6 ms.

Maximum duration contact opening: 10 µs.

Vibration, sinusoidal:

G-level: Configurations A and B: 30 g's; configuration C: 20 g's.

Frequency range curve: 10 to 3,000 Hz.

Vibration, random: MIL-STD-202, method 214. Configurations A and B: Test condition IG (0.4 G^2/Hz). Configuration C: Test condition IE (0.2 G^2/Hz).

Acceleration: 15 g's.

Terminal strength (high temperature pull and torque test): Not applicable.

Physical data:

(K) Seal: Hermetic; relays shall be sealed by welding (laser, tungsten inert gas, or other means approved by the qualifying activity).

(K) Construction (internal and external): All welded, except that coil magnet wire to coil lead wire shall be soldered.

Weight: 0.18 pound (82 grams) maximum.

Part or Identifying Number (PIN): MS27743- (plus applicable dash number from table I).

Cross-reference for Government logistical support: See table V.

(K) Supersession data: See table VI.

(K) TABLE I. Dash number and general characteristics.

PIN MS27743-	Type	Coil frequency (Hz) 1/ 2/	Coil 1/ suppression (transient voltage, back EMF)	Terminal type 3/	Mounting config-uration	Mating socket	Circuit diagram
4 4/	I	dc	N/A	Solder hook	A	N/A	A
5 4/	I	dc	N/A	Solder hook	C	N/A	A
6 4/	I	dc	N/A	Socket pin	A	MIL-S-12883/48	A
7 4/	I	400	N/A	Solder hook	A	N/A	A
8 4/	I	400	N/A	Solder hook	C	N/A	A
9 4/	I	400	N/A	Socket pin	B	MIL-S-12883/48	A
10 5/	I	dc	N/A	Solder hook	A	N/A	A
11 "	I	dc	N/A	Solder hook	C	N/A	A
12 "	I	dc	N/A	Socket pin	A	MIL-S-12883/48	A
13 "	N/A I	400		Solder hook	A	N/A	A
14 "	I	400	N/A	Solder hook	C	N/A	A
15 5/	I	400	N/A	Socket pin	B	MIL-S-12883/48	A
16 4/	I	dc	42 V dc max	Solder hook	A	N/A	B
17 "	I	dc	42 V dc max	Solder hook	C	N/A	B
18 "	I		42 V dc max	Socket pin	A	MIL-S-12883/48	B
19 "	I	50/400	N/A	Solder hook	A	N/A	A
20 "	I	50/400	N/A	Solder hook	C	N/A	A
21 4/	I	50/400	N/A	Socket pin	B	MIL-S-12883/48	A
22 5/	I	dc	42 V dc max	Solder hook	A	N/A	B
23 "	I	dc	42 V dc max	Solder hook	C	N/A	B
24 "	I	dc	42 V dc max	Socket pin	A	MIL-S-12883/48	B
25 "	I	50/400	N/A	Solder hook	A	N/A	A
26 "	I	50/400	N/A	Solder hook	C	N/A	A
27 5/	I	50/400	N/A	Socket pin	B	MIL-S-12883/48	A
28 4/	I	dc	N/A	Solder pin	A	N/A	A
29 4/	I	dc	N/A	Solder pin	C	N/A	A
30 5/	I	dc	N/A	Solder pin	A	N/A	A
31 5/	I	dc	N/A	Solder pin	C	N/A	A
32 4/	I	dc	42 V dc max	Solder pin	A	N/A	B
33 4/	I	dc	42 V dc max	Solder pin	C	N/A	B
34 5/	I	dc	42 V dc max	Solder pin	A	N/A	B
35 5/	I	dc	42 V dc max	Solder pin	C	N/A	B

1/ JAN TX or equivalent screened semiconductors shall be used in screened relays with internal coil suppression or ac coil ratings after 30 December 1980. Relays using suppression devices shall continue to operate with the suppression circuit in a failure mode.
2/ Diodes shall have a peak inverse voltage of 600 V dc minimum when used.
3/ All solder pins shall be tin plated. All socket pins shall be gold plated in accordance with MIL-G-45204, type II, class 1.
4/ For Government logistic support, see table V.
5/ Screened relays shall be tested to the group A ER requirements only; additional life testing is not required. For group A inspection, operational reliability shall be performed at the alternate low level run in.

(K) 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/				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				25				
Inductive	10	12	12											
Inductive	20					15				15				
Motor	50	10	10			10				10				
Lamp	50	5	5			5				5				
Transfer load														3/
Mechanical life (reduced current)	200	6	6			6				6				
Intermediate current		Applicable per MIL-R-6106												

1/ Absence of value indicates that the relay is not rated for 3 phase applications.
2/ For full rated load, maximum temperature, and altitude use number 12 wire or larger. Relays shall be mounted so as to limit mounting bracket temperature to +160°C maximum.
3/ Transfer load indicates that the relay is suitable for transfer between unsynchronized ac power supplies at the rating indicated.

(K) TABLE III. Operating characteristics.

PIN MS27743-	Coil data											Time - (milliseconds maximum)						
	Coil	Rated			Max		Max pickup voltage			Hold voltage 2/	Drop-out voltage 2/	Operate 3/	Release 4/	Contact bounce				Break bounce NO only
		Volts 1/	Freq. (Hz)	Res (Ω) ±10% at +25°C	Volts	A	Normal test 2/	High temp test	Cont current test					Main		Aux		
														NO	NC	NO	NC	
4,5,6,10,11,12,28,29,30,31	X1,X2	28	dc	290	29	0.12	18	19.8	22.5	7.0	1.5	15	15	1	1			
7,8,9,13,14,15	X1,X2	115	400		122	0.04	90	95.4	103.5	30	5.0	20	50	1	1			0.1
16,17,18,22,23,24,32,33,34,35	X1,X2	28	dc	290	29	0.12	18	19.8	22.5	7.0	1.5	15	15	1	1			0.1
19,20,21,25,26,27	X1,X2	115	50/400		122	0.03	95	100	105	40	5	20	50	1	1			0.1

1/ CAUTION: Use of any coil voltage less than the rated coil voltage will compromise the operation of the relay.
2/ Over the temperature range.
3/ With rated coil voltage.
4/ From rated coil voltage.

TABLE IV. Time-current relay characteristics at +25°C. 1/ 2/

1	30 A - hour
2	50 A - 5.0 seconds
3	100 A - 1.2 seconds
4	250 A - 0.2 seconds
5	350 A - 0.1 second

1/ Caution: Compare with time-current characteristics of the associated circuit protective device.

2/ Time-current relay characteristics at 25°C: Relays must be able to sustain five applications (make and carry only) of power concurrently on adjacent poles at each of five different current levels and 115/200 V ac, 400 Hz 3-phase. Cooling time between successive applications shall be 30 minutes. Tests shall be performed on both normally open and normally closed contacts of each relay. There shall be no failures or evidence of welding or sticking, and relays shall pass the contact voltage drop test at the conclusion.

TABLE V. Cross-reference for Government logistical support.

PIN MS27743-	Support with PIN MS27443-
4	10
5	11
6	12
7	13
8	14
9	15
16	22
17	23
18	24
19	25
20	26
21	27
28	30
29	31
32	34
33	35

(K) TABLE VI. Supersession data.

Superseded PIN MS27443-	Replacement PIN MS27743-
1	4
2	5
3	6

CONCLUDING MATERIAL

Custodian:
Air Force - 85

Review activity:
Air Force - 99

Preparing activity:
Air Force - 85

Agent:
DLA - ES

(Project 5945-F783)