

INCH-POUND

MIL-S-83731/22B(USAF)

29 March 1991

SUPERSEDING

MIL-S-83731/22A(USAF)

20 March 1987

MILITARY SPECIFICATION SHEET

SWITCHES, TOGGLE, MINIATURE, LEVER-LOCK, FOUR POLE,  
UNSEALED, LOGIC LOAD TO 5 AMPERES

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-S-83731.

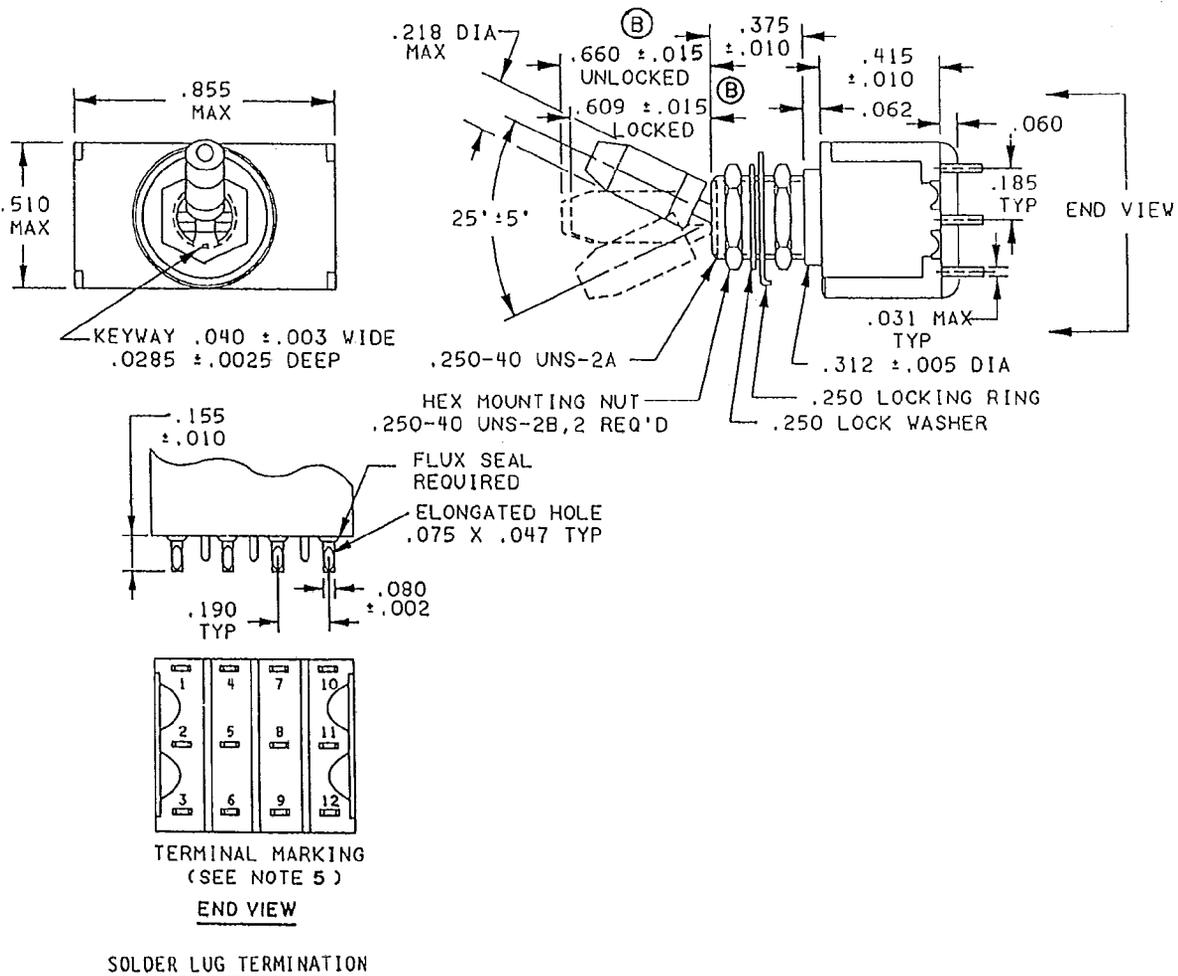
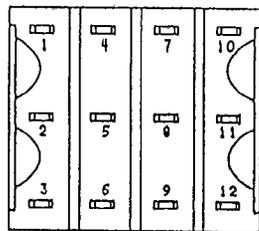
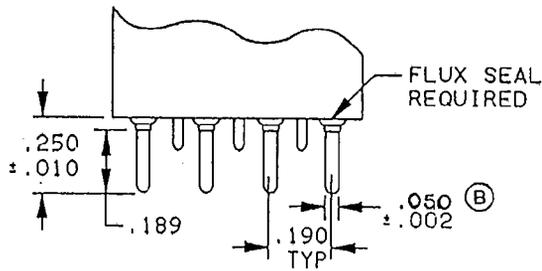
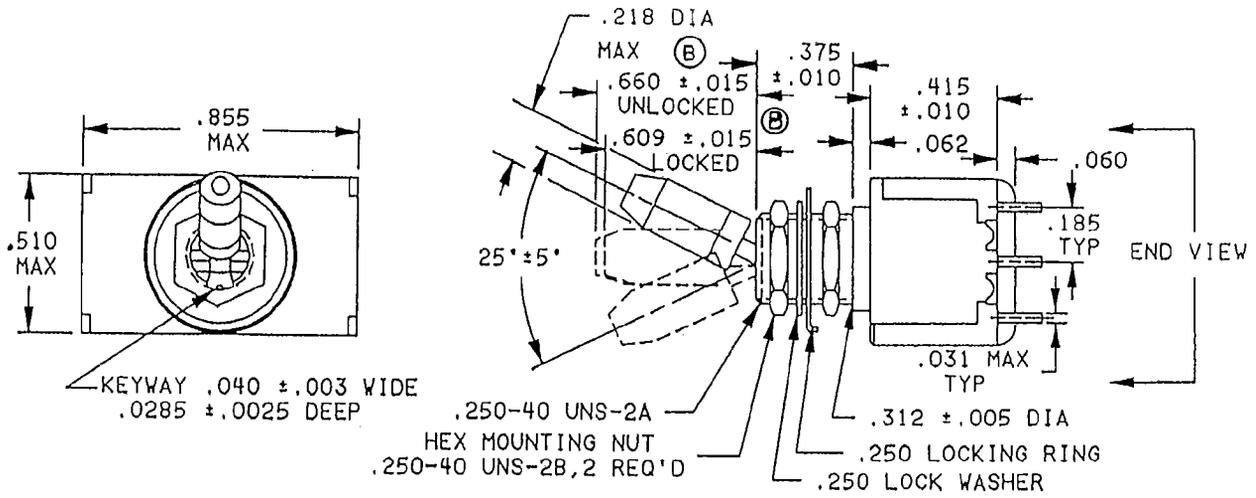


FIGURE 1. Dimensions and configurations.

ⓑ denotes changes

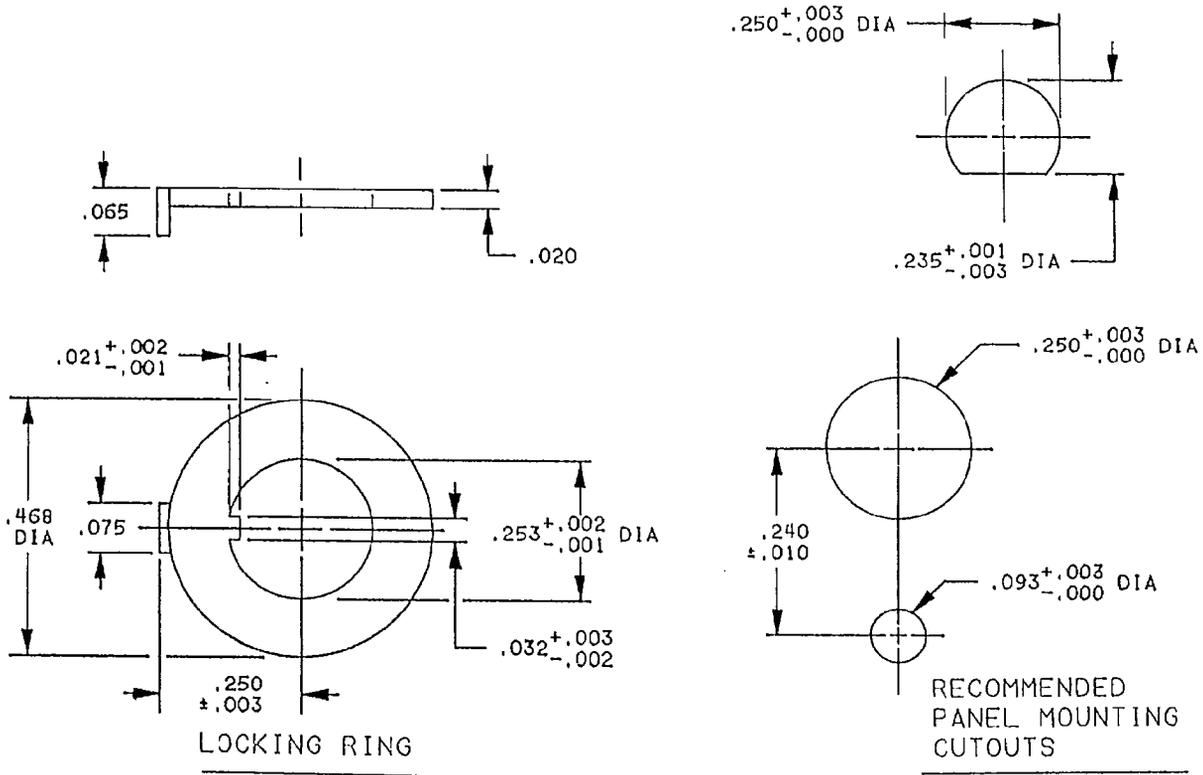


TERMINAL MARKING  
(SEE NOTE 5)

END VIEW

PRINTED CIRCUIT TERMINATION

FIGURE 1. Dimensions and configurations - Continued.



Inches	mm	Inches	mm	Inches	mm
.001	0.03	.046	1.17	.240	6.10
.002	0.05	.047	1.19	.250	6.35
.0025	0.06	.060	1.52	.253	6.43
.003	0.08	.062	1.57	.312	7.92
.005	0.13	.065	1.65	.375	9.53
.010	0.25	.075	1.91	.415	10.54
.015	0.38	.080	2.03	.468	11.89
.020	0.51	.093	2.36	.510	12.95
.021	0.53	.155	3.94	.600	15.24
.0285	0.72	.185	4.70	.609	15.47
.031	0.78	.189	4.80	.660	16.76
.032	0.81	.218	5.54	.695	17.65
.040	1.02	.235	5.97	.855	21.72

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.
3. Unless otherwise specified, tolerance is  $\pm 0.005$  (0.13 mm).
4. Direction of internal mechanism movement is opposite to direction of toggle movement.
5. Terminal identification may be marked on sides of switch body. Terminal numbers 4 through 9 need not be identified.

FIGURE 1. Dimensions and configurations - Continued.

REQUIREMENTS:

Dimensions and configurations: See figure 1.

Material and finish: Bushing shall be brass, nickel plated. Toggle lever shall be brass, nickel plated with an anodized aluminum cap. Frame shall be stainless steel. The contacts shall be gold plate over nickel over silver over brass.

Mounting hardware: Each switch shall be supplied with two hexagon nuts and one internal-tooth lock washer in accordance with the appendix of MIL-S-83731 and one locking ring (see figure 1). The locking ring shall be brass with bright nickel finish.

Weight: .024 pound maximum.

Electrical ratings: See table I.

Strength of terminals: Method 211 of MIL-STD-202, test condition A. The applied force shall be 1 pound.

Strength of toggle lever, pivot, and lever stop: Test (a) shall use a 10 pound load; test (b) shall use an 8 pound load.

Dielectric withstanding voltage: Test at atmospheric pressure only.

ⓑ Mechanical endurance: 20,000 cycles of operation. One-half of the cycles shall be at  $-25^{\circ}\text{C}$ ,  $+0^{\circ}\text{C}$ ,  $-4^{\circ}\text{C}$ , while the other half of the cycles shall be at  $+71^{\circ}\text{C}$ ,  $+4^{\circ}\text{C}$ ,  $-0^{\circ}\text{C}$ .

Electrical endurance, electrical overload, electronic logic, and temperature rise: Multipole switches are to be tested with a load on each pole and with the same polarity on adjacent poles in accordance with figure 2.

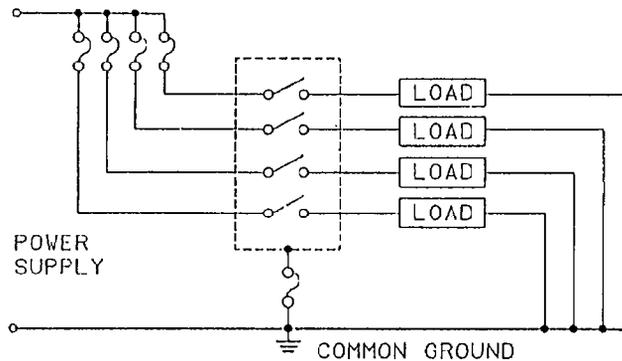


FIGURE 2. Test circuit.

TABLE I. Electrical ratings.

Type of load	High level (current in amperes)			Electronic logic
	28 V dc	125 V ac, 60 Hz	115 V ac, 400 Hz	
Resistive	5	5	5	0.010 ampere
Inductive	2	2	2	
Lamp	1	1	1	

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High level resistive load (dc and ac): 10,000 cycles. Altitude testing not applicable.

Logic level load: 10,000 cycles, tested in accordance with ANSI/EIA RS-448, method 17. Rate of actuation in accordance with MIL-S-83731 electrical endurance. Fifty percent of test cycles at room ambient conditions. Fifty percent of test cycles at 71°C, +4°, -0°C. No "sticks" or "misses" allowed.

Inductive load (dc and ac): 10,000 cycles. Altitude testing not applicable.

Lamp load: Switches shall make and break the rated lamp load for 10,000 operating cycles.

Intermediate current: Not applicable.

Short circuit: Use 100 amperes at 28 V dc.

Flux sealed: The sealing is obtained when the base is sealed to prevent flux from entering the switch case during the wave soldering process.

Flux seal test: Three additional switches shall be tested as follows during qualification and group B inspection: Measure and record initial contact resistances. Place switches, terminals down, into shallow pan. Pour flux at 80 F ±5 F, type RMA of MIL-F-14256, specific gravity 0.896, into pan without splashing until level of flux is approximately .063 inch (1.59 mm) above bottom of the plastic switch case and let switches soak for 10 minutes. Remove switches from flux, clean with flux cleaning solvent, and immediately place into oven for drying at 175 F ±10 F for 2 hours. After switches have cooled to room temperature, repeat initial measurements. Contact resistance shall not increase by more than 10 mΩ over the initial reading. Disassemble the switch and visually examine the contact area for evidence of flux. Any evidence of flux shall be cause for rejection.

Sand and dust: Not applicable.

Explosion: Not applicable.

Part or Identifying Number (PIN): The PIN shall consist of the prefix M83731/22 followed in order by the appropriate two-digit number from table II and the number from table III as shown in the following example:

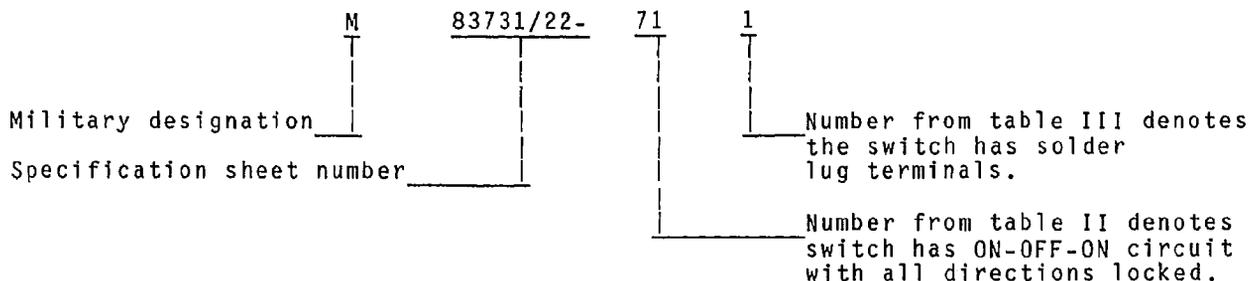
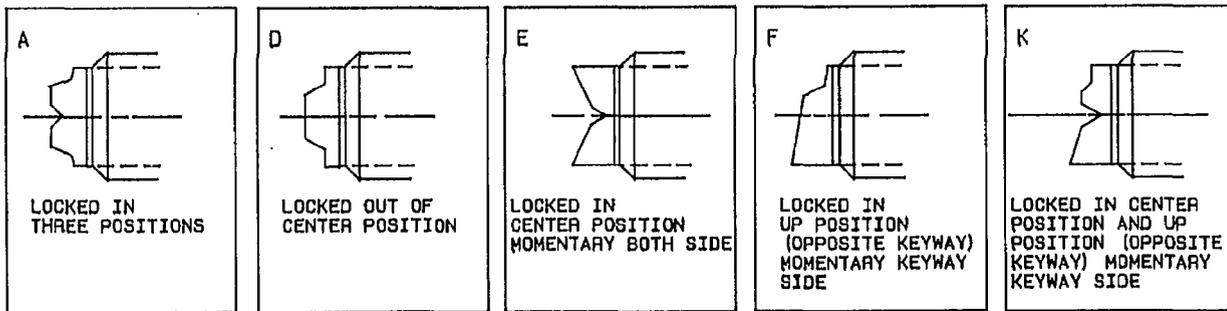


TABLE II. Circuit and locking arrangement.

Circuit number	Locking arrangement (see figure 3)	Circuit with toggle in					
		Keyway side (down position)		Center	Opposite keyway side (up position)		
71	A	1-2 4-5	ON 7-8 10-11	OFF	2-3 5-6	ON 8-9 11-12	
73	D	1-2 4-5	ON 7-8 10-11	NONE	2-3 5-6	ON 8-9 11-12	
76	F	1-2 4-5	MOM-ON 7-8 10-11	NONE	2-3 5-6	ON 8-9 11-12	
77	E	1-2 4-5	MOM-ON 7-8 10-11	OFF	2-3 5-6	MOM-ON 8-9 11-12	
81	K	1-2 4-5	MOM-ON 7-8 10-11	OFF	2-3 5-6	ON 8-9 11-12	
82	A	1-2 4-5	ON 7-8 10-11	2-3 4-5	ON 8-9 10-11	2-3 5-6	ON 8-9 11-12

ⓑ



ⓑ FIGURE 3. Locking arrangements.

TABLE III. Termination type.

Solder lug	1
Printed circuit	2

CONCLUDING MATERIAL

Review activities:  
Air Force - 99  
DLA - ES

Preparing activity:  
Air Force - 85

Agent:  
DLA - ES

(Project 5930-F695)