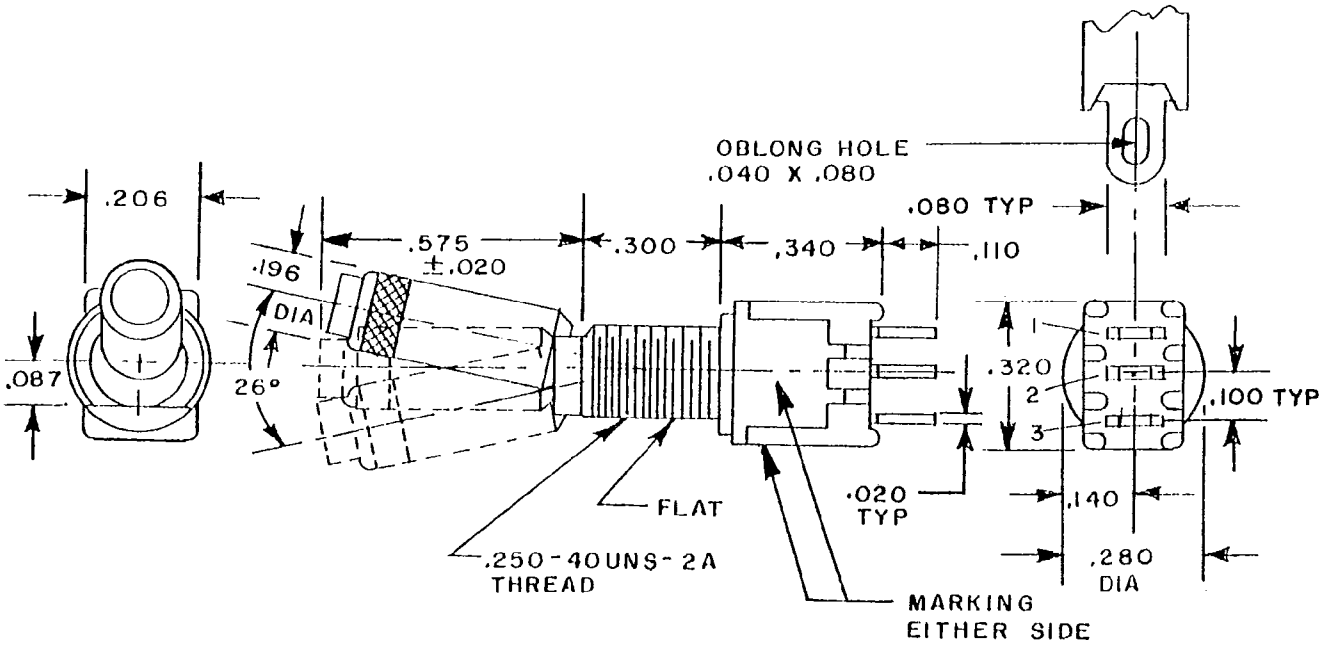
MILITARY SPECIFICATION SHEET

SWITCHES, TOGGLE, SUBMINIATURE, LEVER LOCK, SEALED LEVER, FLUX SEALED - ONE, TWO, AND FOUR POLE, HIGH AND LOW LEVEL CONTACTS

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.

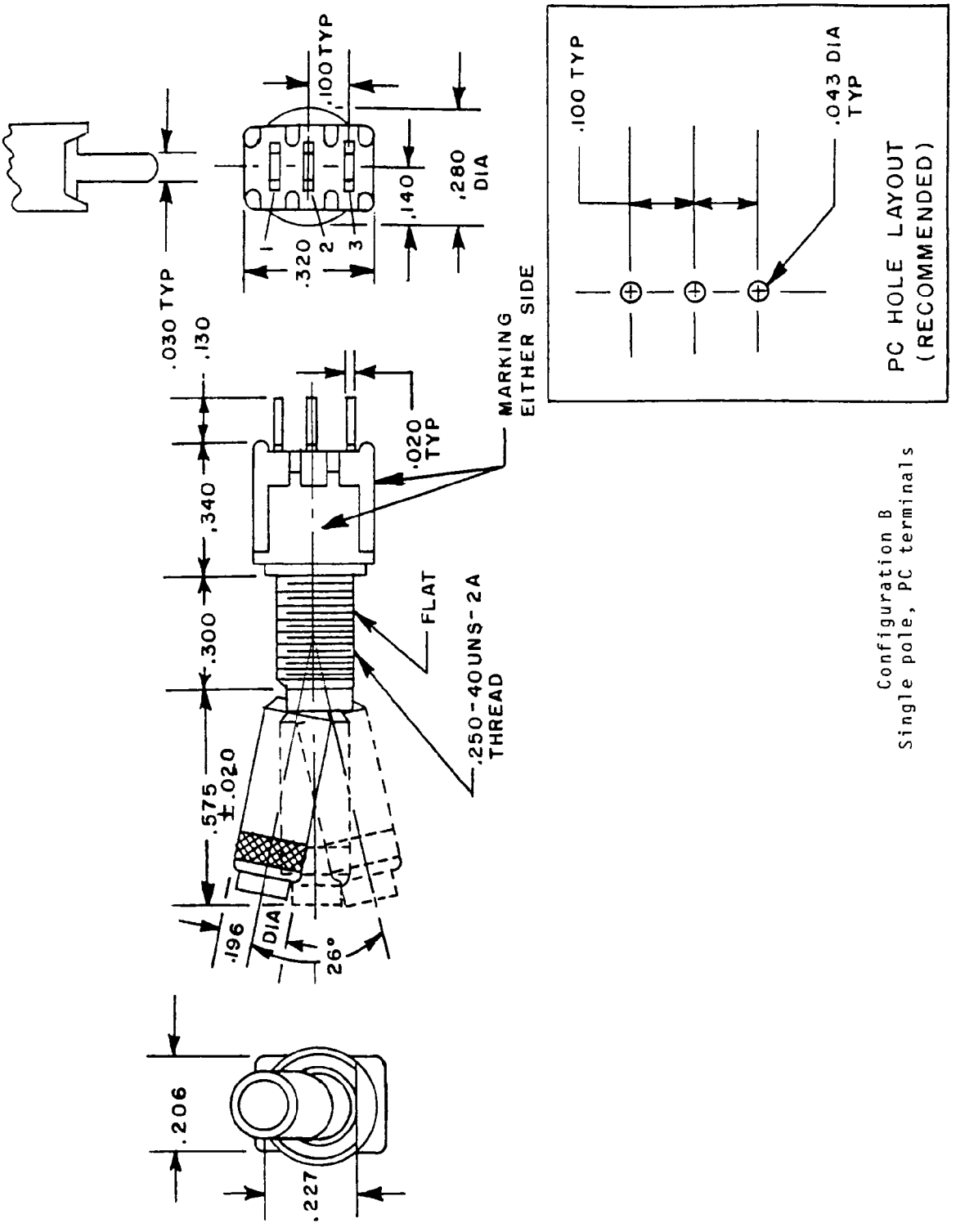
The requirements for acquiring the switches described herein shall consist of this specification and the latest issue of MIL-S-83731.



Configuration A
Single pole, wire terminals

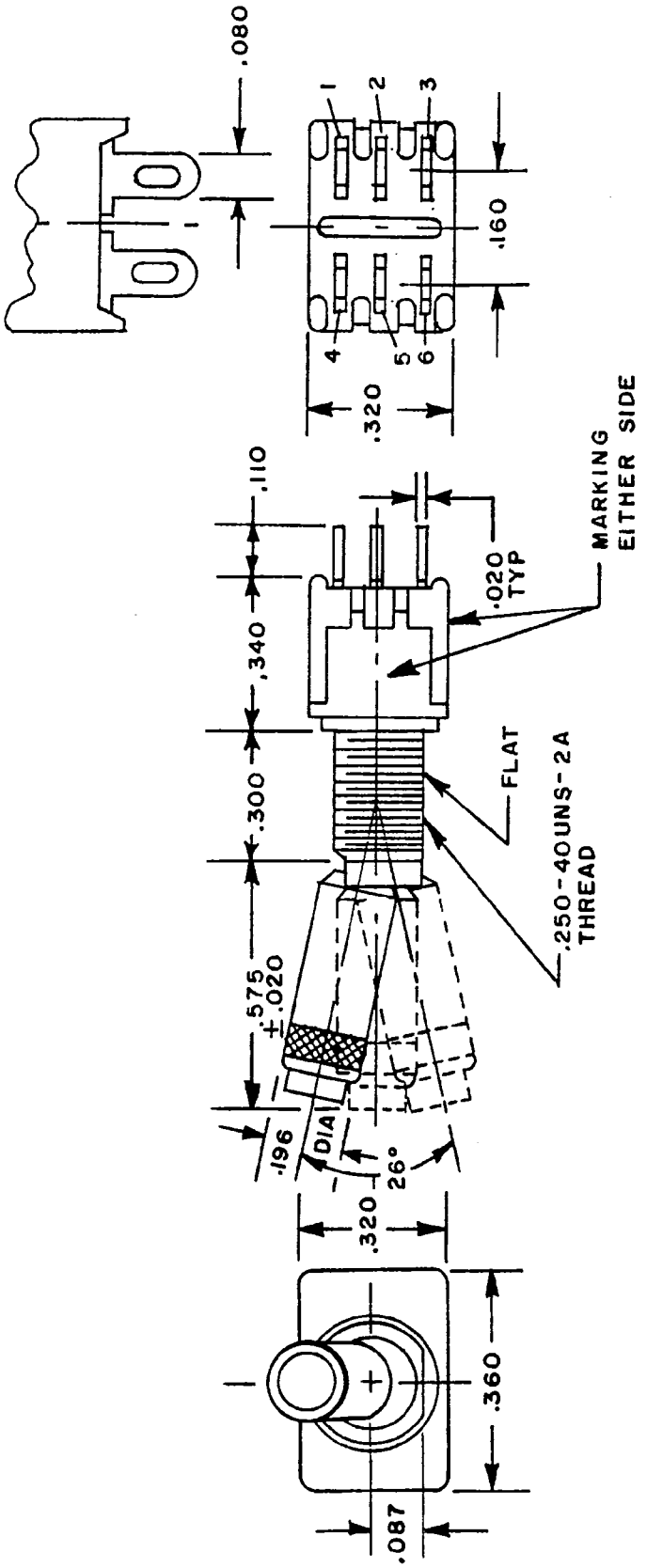
FIGURE 1. Dimensions and configurations.

(B) denotes changes



Configuration B
Single pole, PC terminals

Figure 1. Dimensions and configurations - Continued.



Configuration C
Two pole, wire terminals

FIGURE 1. Dimensions and configurations - Continued.

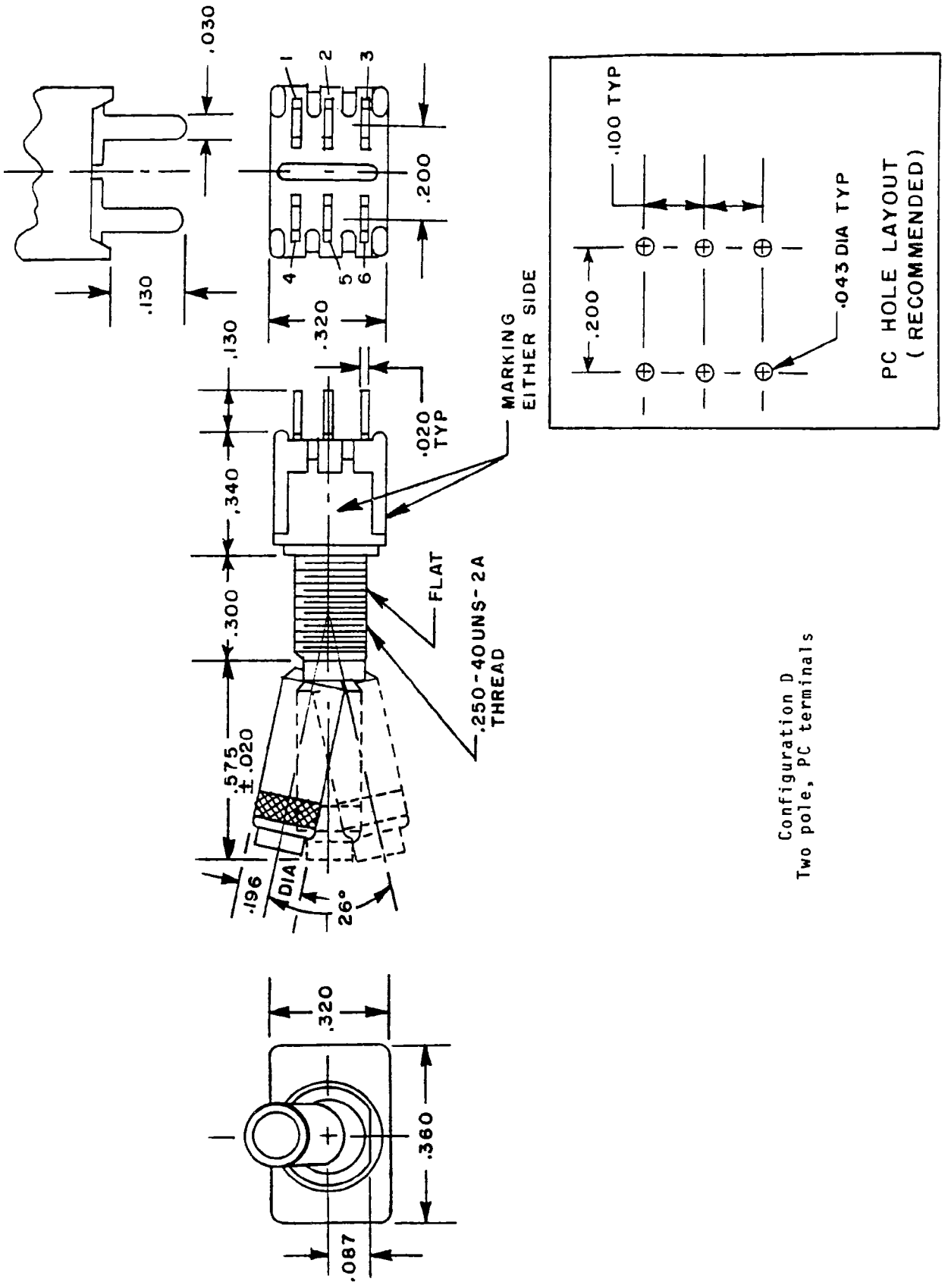
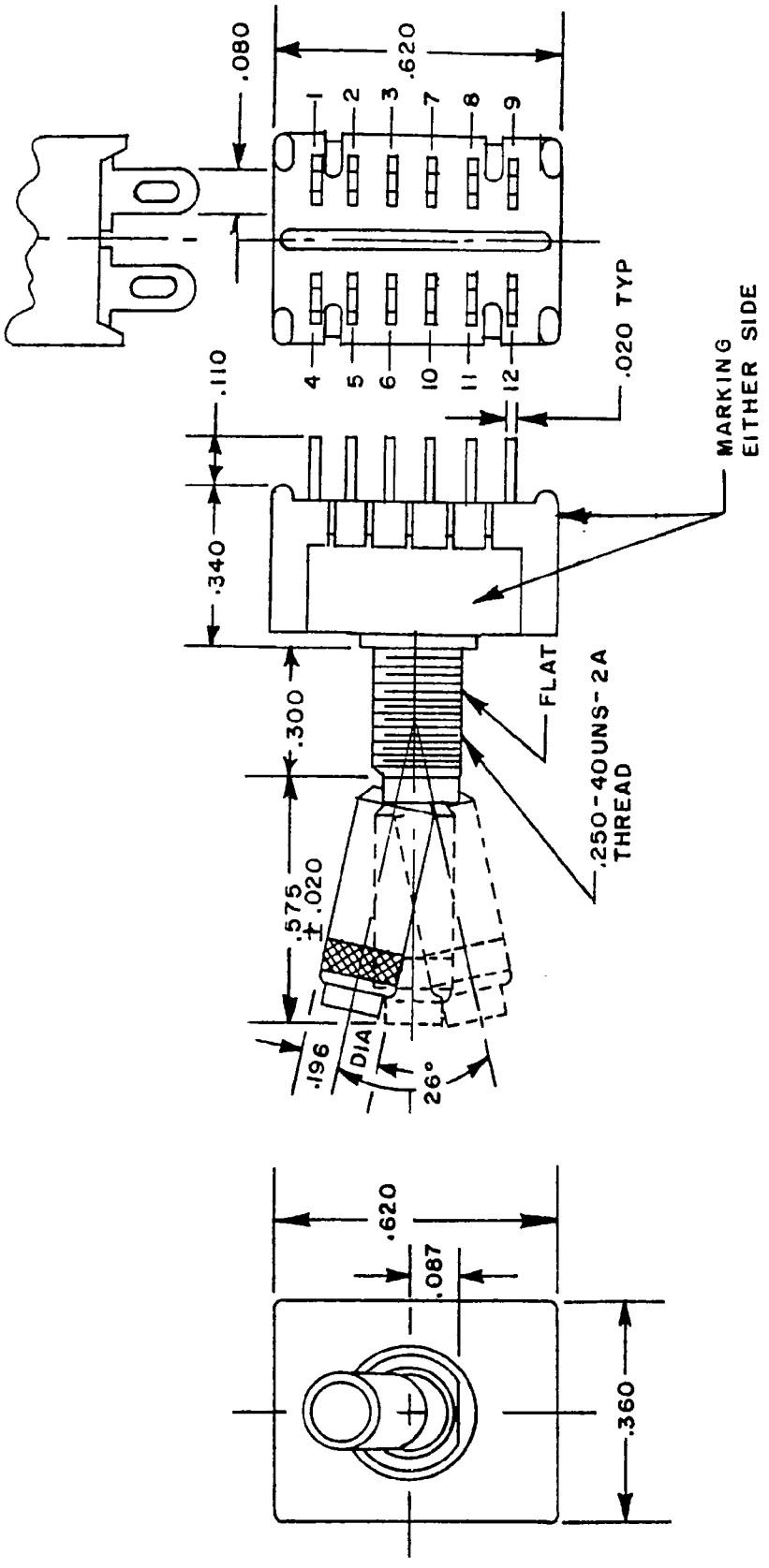
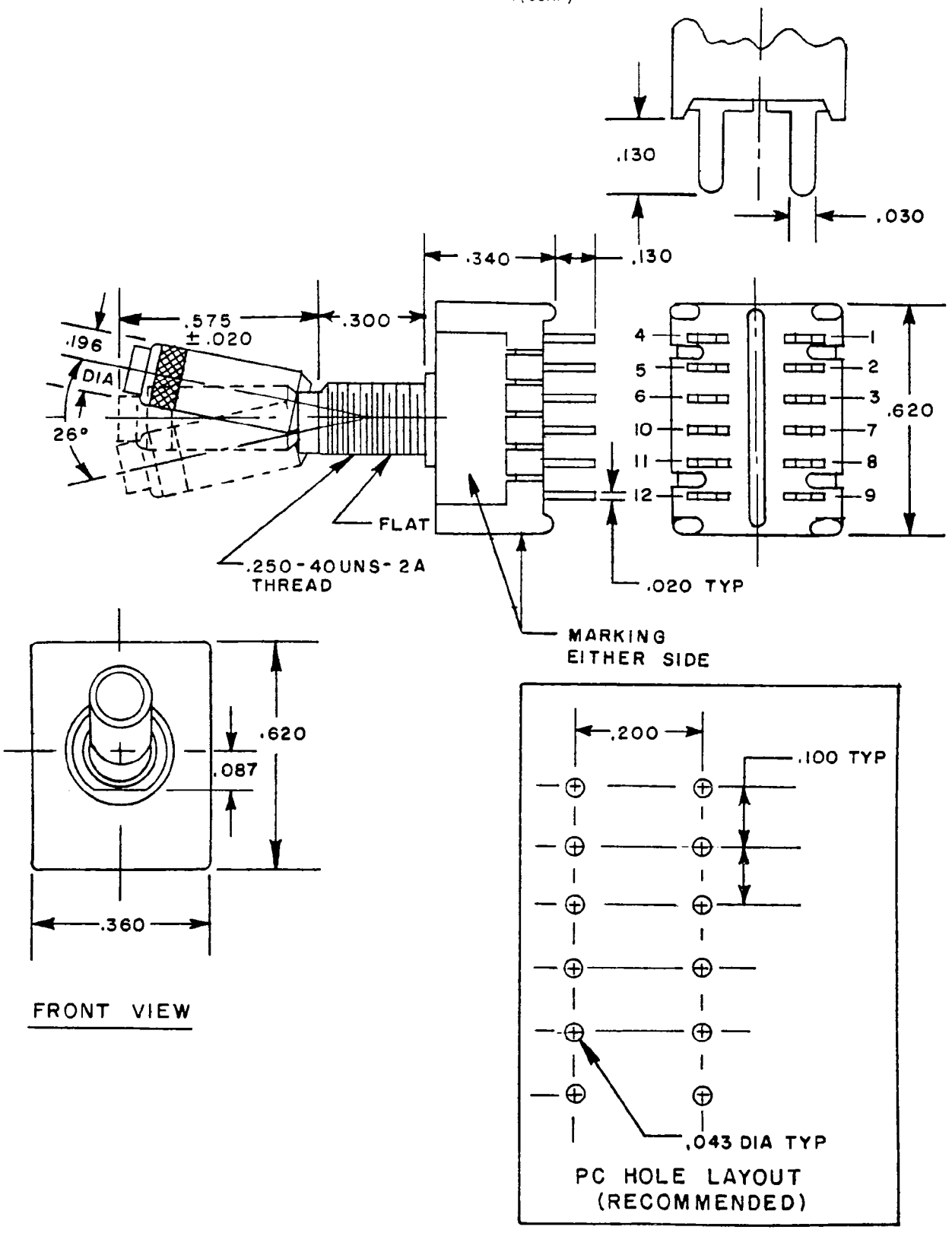


FIGURE 1. Dimensions and configurations - Continued.



Configuration E
Four pole, wire terminals

FIGURE 1. Dimensions and configurations - Continued.



Configuration F
Four pole, PC terminals

FIGURE 1. Dimensions and configurations - Continued.

Inches	mm
.020	0.51
.030	0.76
.043	1.09
.080	2.03
.087	2.21
.100	2.54
.110	2.79

Inches	mm
.130	3.30
.135	3.43
.140	3.56
.150	3.81
.160	4.06
.187	4.75
.196	4.98
.200	5.08

Inches	mm
.206	5.23
.227	5.77
.250	6.35
.280	7.11
.290	7.37
.300	7.62
.320	8.13
.340	8.64
.470	11.94
.575	14.61
.620	15.75

NOTES:
1. Dimensions are in inches.
2. Metric equivalents are given for information only.
3. Unless otherwise specified, tolerance is ±.005 (0.13 mm) and ±4°.
4. Action of internal mechanism movement is opposite to direction of toggle movement.
5. Terminal numbers are for reference only and may not appear on switch.

FIGURE 1. Dimensions and configurations - Continued.

TABLE I. Circuit for switching characteristics.

Circuit	Locking combinations (See figure 2)	Circuit with toggle in			
		Flat side 1-2 4-5	7-8 10-11	Center	Opposite flat side 2-3 5-6	8-9 11-12
21	A	ON		OFF	ON	
23	D	ON		NONE	ON	

FIGURE 2. Locking combinations.

TABLE II. Dash numbers and their characteristics.

M83731/19 Dash no.	No. of poles	Rating 1/	Circuit 2/ configuration	Type of terminal	Applicable figure
-001	1	H/I/LL	21	Wire	1A
-002	2	H/I/LL	21	Wire	1C
-003	4	H/I/LL	21	Wire	1E
-004	1	H/I/LL	21	PC	1B
-005	2	H/I/LL	21	PC	1D
-006	4	H/I/LL	21	PC	1F
-007	1	H/I/LL	23	Wire	1A
-008	2	H/I/LL	23	Wire	1C
-009	4	H/I/LL	23	Wire	1E
-010	1	H/I/LL	23	PC	1B
-011	2	H/I/LL	23	PC	1D
-012	4	H/I/LL	23	PC	1F

1/ H/I/LL indicates switch has capability at high level, intermediate level and low level. To prevent compromising the contact interface, a switch used at the intermediate level (100 mA maximum) or low level should not be used or tested at high level.
2/ Circuit configurations are described in table I.

REQUIREMENTS:

Dimensions and configurations: See figure 1 and configurations A through F as applicable.

Material and finish:

Contacts:

Moving: Gold-plate (40 microinches minimum thickness) over nickel-plate (80 microinches minimum) over silver inlay (.008 inch (.20 mm) minimum thickness) over copper-alloy.

Stationary: Gold-plate (40 microinches minimum thickness) over nickel-plate (80 microinches minimum thickness) with a .010 inch minimum silver edge lay over copper-alloy.

Terminals: Gold-flash (8 microinches minimum) over nickel-plate (80 microinches minimum) over copper-alloy.

Mounting hardware: Each switch shall be furnished with two hex nuts and an internal tooth lockwasher. In addition, a key D washer (see appendix of MIL-S-83731) shall be furnished.

Weight (maximum): 1 pole, 4.25 grams; 2 pole, 5.75 grams; 4 pole, 6.75 grams.

Temperature rating: -25°C to +71°C (operating); -55°C to +85°C (storage).

Electrical ratings:

High/intermediate load level (at 28 V dc; 125 V ac, 60 Hz, or 115 V ac, 400 Hz):

Resistive load: 3 amperes.

Inductive load: 1 ampere.

Lamp load: .25 ampere.

Intermediate load at 28 V (ac or dc): 0.5 V maximum.

Low level: 10 m maximum at open circuit voltage of 30 mV maximum (ac or dc).

Mechanical endurance: Except temperatures of cycling shall be -25°C +0°C, -4°C and +71°C +4°C, -0°C.

Electrical endurance (except as follows):

Resistive: 10,000 operating cycles for each required temperature extreme.

Inductive: 10,000 operating cycles for room atmosphere and 10,000 feet altitude.

Lamp load: 10,000 operating cycles.

Intermediate load: 10,000 operating cycles using 50 mA at 10 ±2 V dc.

Low level: In accordance with MIL-STD-202, method 311, using an open circuit test voltage of 30 mV (ac or dc) and a closed circuit current of 10 mA; 20,000 operating cycles at 20 cycles per minute minimum; no miss resistance in excess of 3 ohms. Monitoring of contacts for sticking is not applicable.

Short circuit: Use 50 A at 28 V dc as respective voltage and current levels.

Overload: Applicable to high/intermediate load level switches only.

Shock: Method I.

Terminal flux seal: These switches shall have their bases sealed to prevent flux from entering the switches during soldering processes. They shall be tested for this capability as follows: Measure and record initial contact resistances. Support switches, terminals down, in a shallow pan. Pour flux at 80°F ±5°F per type RMA of MIL-F-14256, specific gravity 0.896 into pan without splashing until the level of flux is approximately 1/16 inch above bottom of plastic switch case and let switches soak for 10 minutes. Remove switches from flux, clean with flux cleaning solvent, and immediately place in oven for drying at 175°F ±10°F for 2 hours. After switches have cooled to room temperature, repeat measurement of contact resistance. Contact resistance shall not increase by more than 10 milliohms over the initial reading. Disassemble switch and visually inspect the contact area for evidence of flux. Any evidence of flux shall be cause for rejection.

Ⓑ Sand and dust: Not applicable.

Ⓑ Explosion test: Not applicable.

Dielectric withstanding voltage:

Atmospheric pressure: 1,000 V rms.

Reduced barometric pressure (10,000 feet): 250 V rms.

Strength of terminals:

Solderable terminals: Applicable.

Printed circuit (PC) terminals: Shall be tested in accordance with method 211 of MIL-STD-202, condition B.

Strength of toggle lever:

For test (a) use 8 pound loads.

For test (b) use 5 pound loads.

Part number: The part number shall consist of the prefix M83731/19 followed by the appropriate three digit dash number from table II (e.g., M83731/19-001).

CONCLUDING MATERIAL

Custodian:
Air Force - 85

Review activities:
Air Force - 11, 99

Preparing activity:
Air Force - 85

Agent:
DLA - ES

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