

Military/Aerospace/Hi-REL

MIL-S-83731 Toggle Switches



Description

The Military series toggle switches are high-quality, resilient switches qualified to the MIL-S-83731 specification. The switches are made of flame-retardant housing material with 50 μ inch selective gold contact plating and epoxy sealed terminals for process compatibility. With a long lifecycle of 10,000 cycles, military series switches successfully operate at both high and low temperatures, even in the harshest of environments.

Features & Benefits

- Qualified to MIL-S-83731
Cage code FBHV6
- 50 μ inch selective gold contact plating
- Epoxy sealed terminals for process compatibility
- Rated for logic level to 5 amp resistive loads and 2 amp inductive loads
- Flame retardant housing material
- RoHS compliant and compatible

Test Requirement	MIL-S-83731/9, 10, 15, 16
Strength of Terminal	1 lb. – solder lug
Strength of Actuating Lever Pivot and Stop	10 lbs. & 8 lbs. throughout range
Strength of Mounting Means	15 lbs. in. torque on bushing
Dielectric (Sea Level) Indication	1000 VAC Group B, 750 VAC after electrical endurance. 500 μ A max. leakage
Contact Voltage Drop	2.5 millivolt initial, 5.0 millivolt after mechanical endurance @ 2-6 VDC 0.1 amp
Temperature Rise	50° C rise max. @ rated resistive load after endurance test
Short Circuit	10 operations carry 100 amps resistive load @ lowest DC volts
Mechanical Life	20K operations at specified high and low temperatures
Electrical Endurance	10K operations at specified high and low temperatures
Overload	50 operations @ 150% of rated resistive load
Electrical Endurance at Sea Level	10K operations resistive load @ room temperature 10K operations inductive load @ room temperature 10K operations lamp load @ room temperature Performed on different test samples
Vibration	Method 204 of MIL-STD-202, test condition A .06 D. A. or 10 G's 10-500 Hz, 10 usec. max. chatter
Shock	Fuse-method 213 or MIL-STD-202, 10 usec. max. chatter
Salt Spray Test Upon Completion	48 hours – method 101 of MIL-STD-202, test condition B 10 operations resistive load (toggle sealed switches only)
Moisture Resistance Test Upon Completion	Method 106 of MIL-STD-202 100 VDC potential between current carrying parts and panel
Sand & Dust	Method 110 of MIL-STD-202, test condition B 6 hours @ 23 °C 2.5K operations mechanical life (toggle sealed switches only)
Explosion	Method 109 of MIL-STD-202, maximum rated DC inductive load (toggle sealed switches only)
Sealing	Toggle seal – 5 operations under 0.5 inches of H ₂ O above top of bushing
A.) Toggle Seal B.) Bushing Seal	(Toggle sealed switches only) (Panel sealed switches only)
Temperature Operation	Mechanical life, –25 to 71 °C
Life Low Cur. Level	No requirement
Fungus	No requirement
Intermediate Current	20K operations, 35/40 milliamps @ 5 VDC resistive load @ 71°C
Thermal Shock	Method 107 of MIL-STD-202 test condition A; 5 cycles @ –55 /+85 °C

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Materials

Case	Diallyl phthalate (DAP) (UL 94 V-0)
Actuator	Brass, chrome plated
Bushing	Brass, nickel plated
Housing	Stainless, steel
Switch Support	Brass, tin plated
Terminals	Gold over nickel over copper alloy
Terminal Seal	Epoxy
Contacts	Gold over nickel over silver over brass
Panel Seal	Silicone rubber
Mounting Hardware	Two hexagon nut, brass with nickel plating; one lockwasher, steel with nickel plating; one locking ring, brass with nickel plating

Ratings - Current Ratings - High Level

Current Capacity in Amperes - Per Pole		
28V dc	115V ac, 400 Hz	125V ac
Lamp Load Hz		
1	1	1
Resistive Load		
5	5	5
Inductive Load		
2	2	2
Current Ratings - Logic Level		
0.5 Volt - Amp (VA) Max. @ 28 V Max. (AC or DC)		

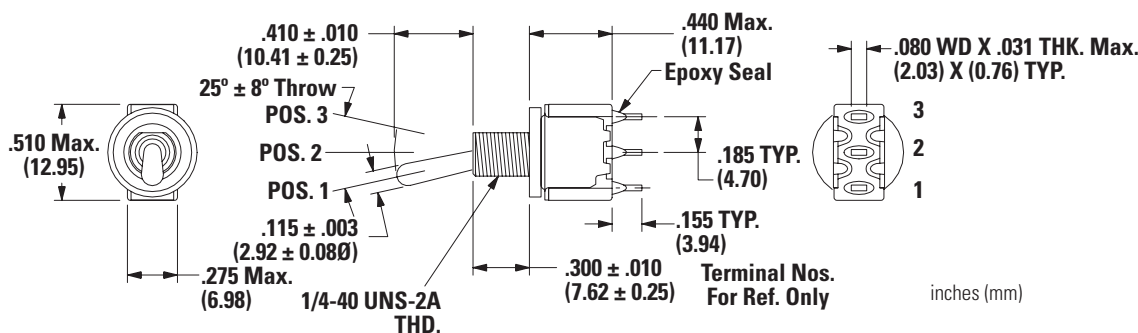
Ordering Number

Complete part numbers for MIL-S-83731 toggle switches shown on following pages.

SPDT



No. Poles	Model No.	Switch Function			Connected Terminals			Schematic
		POS. 1 	POS. 2 	POS. 3 	POS. 1 	POS. 2 	POS. 3 	
SP	M83731/9-211	ON	OFF	ON	2-3	OPEN	2-1	
SP	M83731/9-231	ON	NONE	ON	2-3	OPEN	2-1	
	M83731/9-261			MOM.	2-3			
SP	M83731/9-271	MOM.	OFF	MOM.	2-3	OPEN	2-1	
	M83731/9-311	ON		MOM.				
SP	M83731/9-341	NONE	ON	MOM.	N/A	2-3	2-1	



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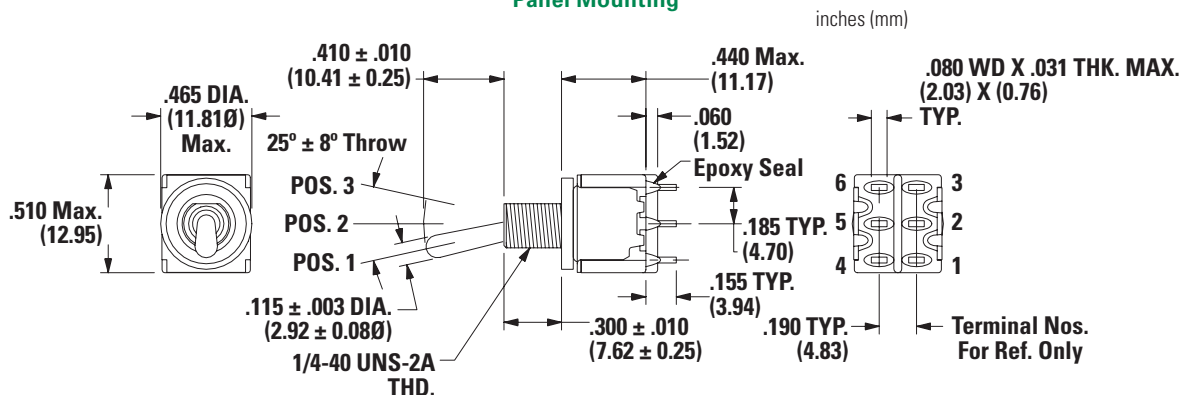


DPDT

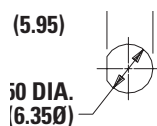


No. Poles	Model No.	Switch Function			Connected Terminals			Schematic	
		POS. 1 	POS. 2 	POS. 3 	POS. 1 	POS. 2 	POS. 3 		
DP	M83731/10-211	ON	OFF	ON	2-3, 5-6	OPEN	2-1,5-4	DPDT 	
	M83731/10-231	ON	NONE	ON	2-3, 5-6	OPEN	2-1,5-4		
	M83731/10-261	ON		MOM.	2-3, 5-6		2-1,5-4		
	M83731/10-271	MOM.	OFF	MOM.	2-3, 5-6	OPEN	2-1,5-4		
	M83731/10-311	ON		MOM.	2-3, 5-6		2-1,5-4		
	M83731/10-321	ON	ON	ON	2-3, 5-6	2-3,5-4	2-1,5-4		
	M83731/10-331	ON		MOM.	N/A	2-3,5-6			
	M83731/10-341	NONE							
	M83731/10-351	MOM.			2-3,5-6	2-3,5-4			

Panel Mounting

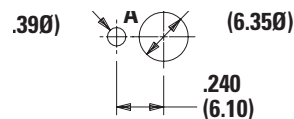


Without locking ring.



inches (mm)

With standard locking ring.



inches (mm)

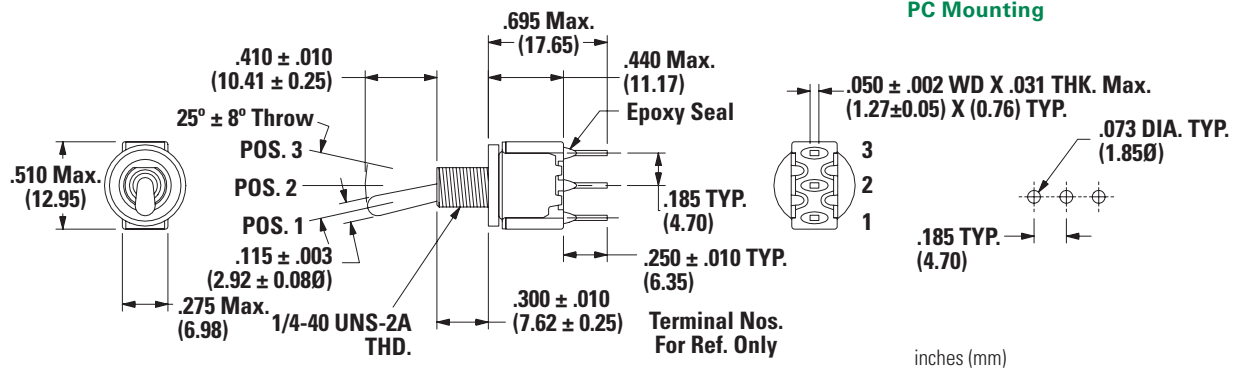
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SPDT

No. Poles	Model No.	Switch Function			Connected Terminals			Schematic
		POS. 1 	POS. 2 	POS. 3 	POS. 1 	POS. 2 	POS. 3 	
SP	M83731/9-212	ON	OFF	ON	2-3	OPEN	2-1	 2 (COMM) 1 • 3
	M83731/9-232	ON	NONE	ON	2-3	OPEN	2-1	
	M83731/9-262			MOM.				
	M83731/9-272	MOM.	OFF	MOM.	2-3	OPEN	2-1	
	M83731/9-312	ON						
	M83731/9-342	NONE	ON	MOM.	N/A	2-3	2-1	



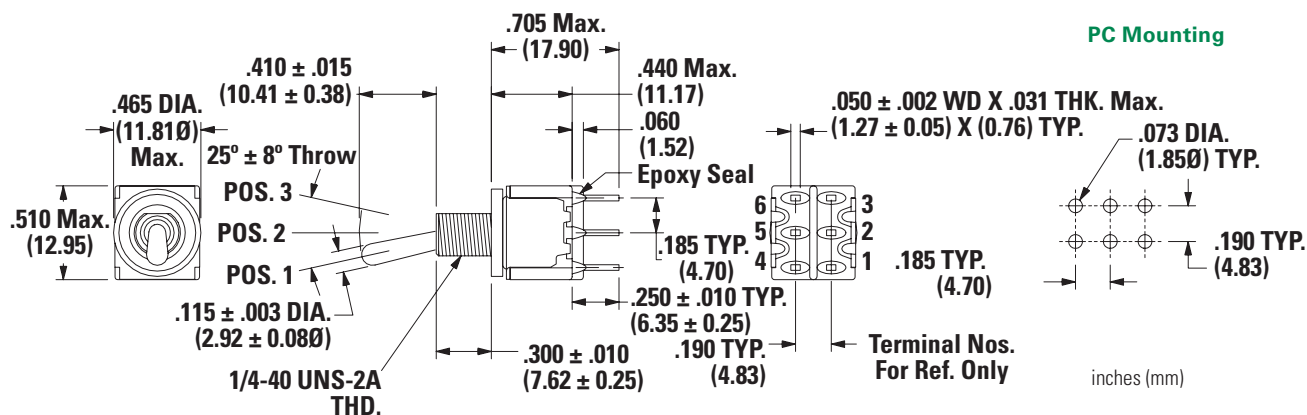
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MIL-S-83731 Toggle Switches



DPDT

No. Poles	Model No.	Switch Function			Connected Terminals			Schematic
		POS. 1	POS. 2	POS. 3	POS. 1	POS. 2	POS. 3	
DP	M83731/10-212	ON	OFF	ON	2-3, 5-6	OPEN	2-1,5-4	DPDT
	M83731/10-232	ON	NONE	ON MOM.	2-3, 5-6	OPEN	2-1,5-4	
	M83731/10-262	ON	NONE	MOM.	2-3, 5-6	OPEN	2-1,5-4	
	M83731/10-272	MOM.	OFF	MOM.	2-3, 5-6	OPEN	2-1,5-4	
	M83731/10-312	ON	OFF	MOM.	2-3, 5-6	OPEN	2-1,5-4	
	M83731/10-322	ON	ON	ON	2-3, 5-6	2-3,5-4	2-1,5-4	
	M83731/10-332	ON	ON	MOM.	N/A	2-3,5-6	2-1,5-4	
	M83731/10-342	NONE	ON	MOM.	2-3,5-6	2-3,5-4	2-1,5-4	
	M83731/10-352	MOM.	ON	MOM.	2-3,5-6	2-3,5-4	2-1,5-4	

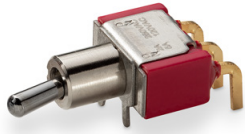


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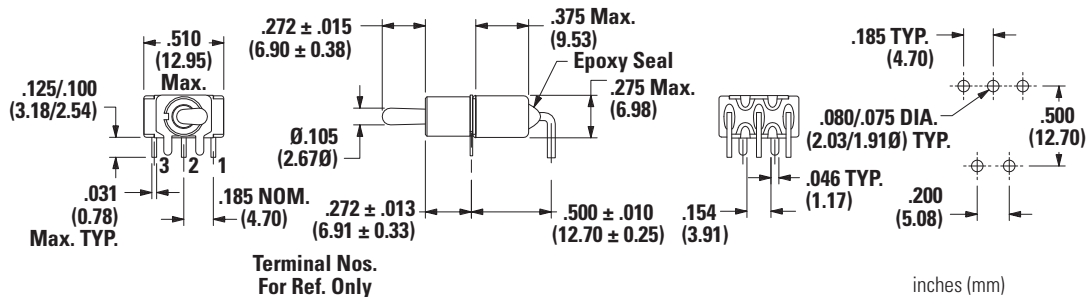


SPDT

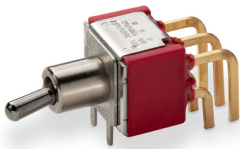


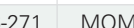
No. Poles	Model No.	Switch Function			Connected Terminals			Schematic
		POS. 1 	POS. 2 	POS. 3 	POS. 1 	POS. 2 	POS. 3 	
SP	M83731/15-211	ON	OFF	ON	2-3	OPEN	2-1	SPDT 
	M83731/15-231	ON	NONE	ON	2-3	OPEN	2-1	
	M83731/15-261			MOM.				
	M83731/15-271	MOM.	OFF	MOM.	2-3	OPEN	2-1	
	M83731/15-311	ON		MOM.				
	M83731/15-341	NONE	ON	MOM.	N/A	2-3	2-1	

PC Mounting

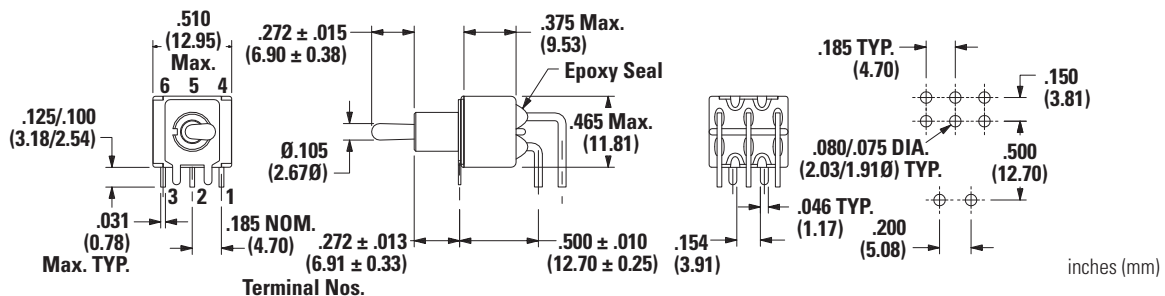


DPDT



No. Poles	Model No.	Switch Function			Connected Terminals			Schematic	
		POS. 1 	POS. 2 	POS. 3 	POS. 1 	POS. 2 	POS. 3 		
DP	M83731/16-211	ON	OFF	ON	2-3, 5-6	OPEN	2-1,5-4	DPDT 	
	M83731/16-231	ON	NONE	ON	2-3, 5-6	OPEN	2-1,5-4		
	M83731/16-261			MOM.					
	M83731/16-271	MOM.	OFF	MOM.	2-3, 5-6	OPEN	2-1,5-4		
	M83731/16-311	ON		MOM.					
	M83731/16-321	ON	ON	ON	2-3, 5-6	2-3,5-4	2-1,5-4		
	M83731/16-331			MOM.					
	M83731/16-341	NONE		N/A	2-3,5-6				
	M83731/16-351	MOM.		MOM.	2-3,5-6	2-3,5-4			

PC Mounting



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