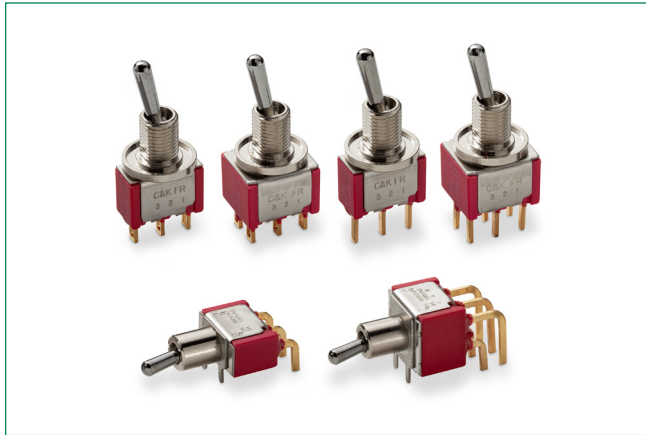


# Military/Aerospace/Hi-REL

## MIL-DTL-83731F Toggle Switches



### Description

The Military series toggle switches are high-quality, resilient switches qualified to the MIL-DTL-83731F specification. The switches are made of flame-retardant housing material with 50  $\mu$  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-DTL-83731F Cage code FBHV6
- 50  $\mu$  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-DTL-83731F/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 $\mu$ 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 <sub>2</sub> 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

# Military/Aerospace/Hi-REL

## MIL-DTL-83731F Toggle Switches



### Materials

<b>Case</b>	Diallyl phthalate (DAP) (UL 94 V-0)
<b>Actuator</b>	Brass, chrome plated
<b>Bushing</b>	Brass, nickel plated
<b>Housing</b>	Stainless, steel
<b>Switch Support</b>	Brass, tin plated
<b>Terminals</b>	Gold over nickel over copper alloy
<b>Terminal Seal</b>	Epoxy
<b>Contacts</b>	Gold over nickel over silver over brass
<b>Panel Seal</b>	Silicone rubber
<b>Mounting Hardware</b>	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)		

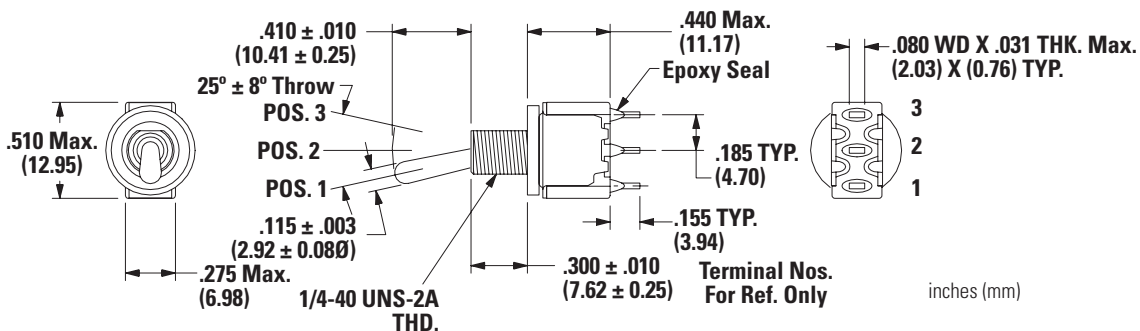
### Ordering Number

Complete part numbers for MIL-DTL-83731F 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.				
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	



# Military/Aerospace/Hi-REL

## MIL-DTL-83731F Toggle Switches

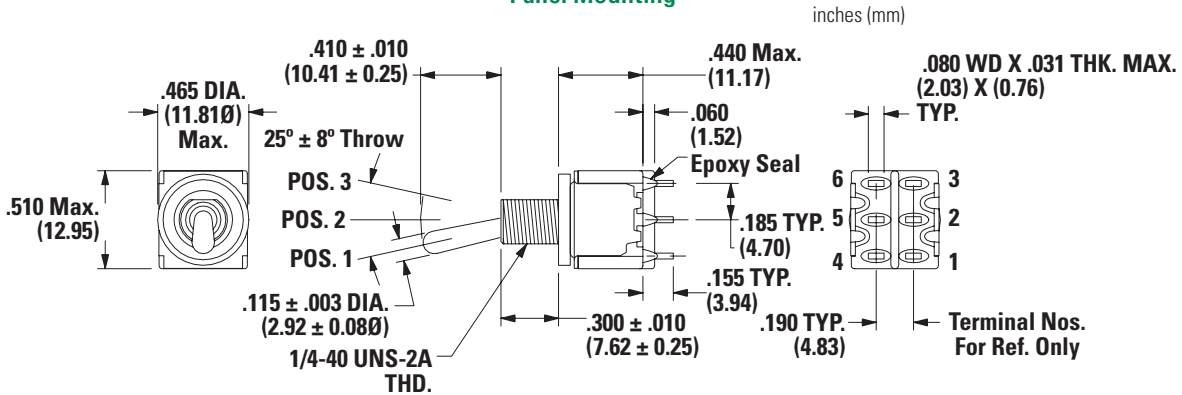


### DPDT

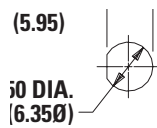


No. Poles	Model No.	Switch Function			Connected Terminals			Schematic
		POS. 1	POS. 2	POS. 3	POS. 1	POS. 2	POS. 3	
DP	M83731/10-211	ON	OFF	ON	2-3, 5-6	OPEN	2-1,5-4	
	M83731/10-231	ON	NONE	ON	2-3, 5-6	OPEN	2-1,5-4	
	M83731/10-261	ON		MOM.	2-3, 5-6		2-1,5-4	
	M83731/10-271	MOM.	OFF	MOM.	2-3, 5-6	OPEN	2-1,5-4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

### Panel Mounting

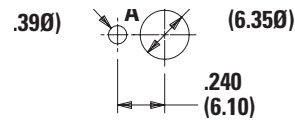


#### Without locking ring.



inches (mm)

#### With standard locking ring.



inches (mm)

# Military/Aerospace/Hi-REL

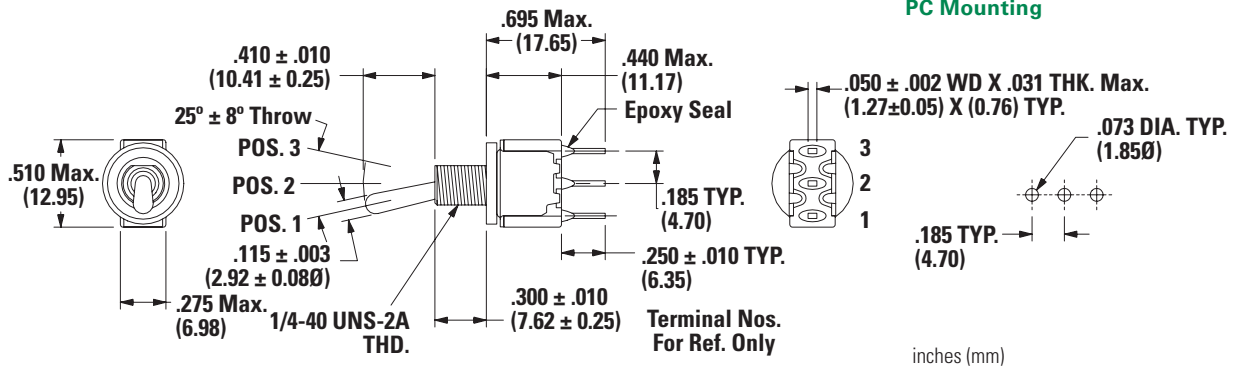
## MIL-DTL-83731F Toggle Switches



### 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	SPDT 
	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		



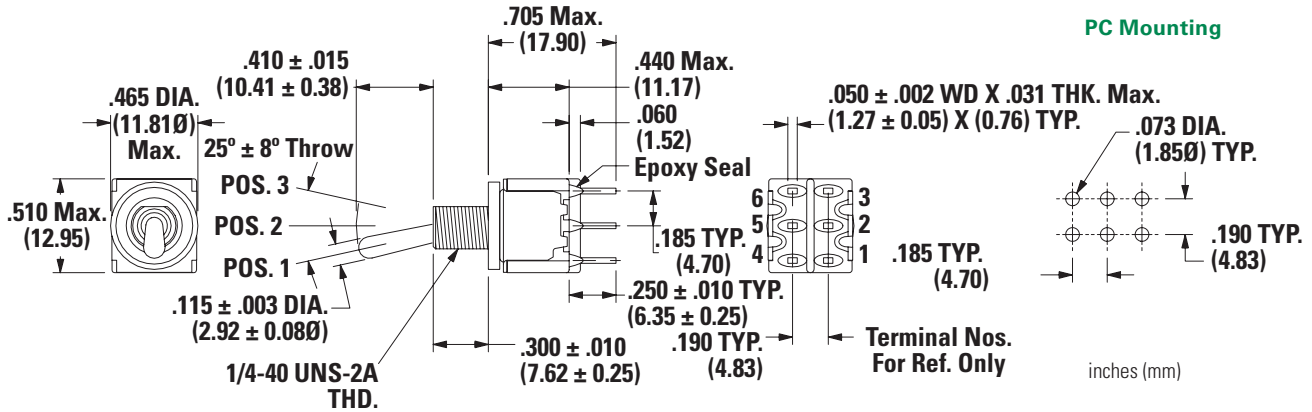
# Military/Aerospace/Hi-REL

## MIL-DTL-83731F 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	
	M83731/10-232	ON	NONE	ON	2-3, 5-6	OPEN	2-1,5-4	
	M83731/10-262			MOM.				
	M83731/10-272	MOM.	OFF	MOM.	2-3, 5-6	OPEN	2-1,5-4	
	M83731/10-312	ON						
	M83731/10-322	ON	ON	ON	2-3, 5-6	2-3,5-4	2-1,5-4	
	M83731/10-332	ON		MOM.				
	M83731/10-342	NONE		N/A	2-3,5-6			
M83731/10-352	MOM.			2-3,5-6	2-3,5-4			



# Military/Aerospace/Hi-REL

## MIL-DTL-83731F Toggle Switches

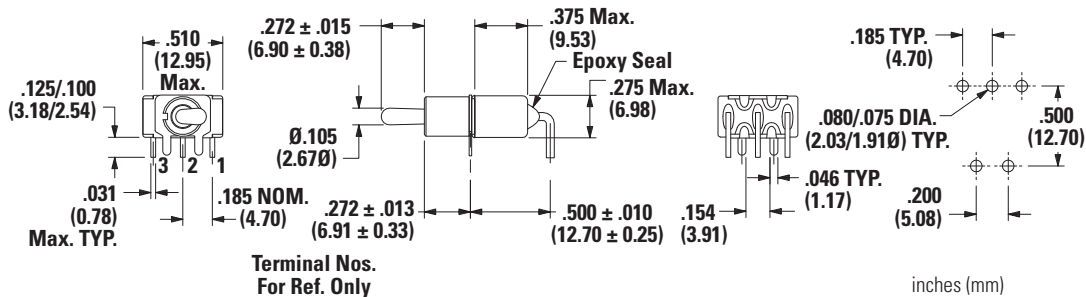


### SPDT

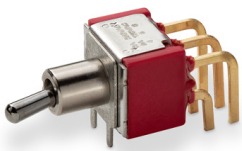


No. Poles	Model No.	Switch Function			Connected Terminals			Schematic
		POS. 1	POS. 2	POS. 3	POS. 1	POS. 2	POS. 3	
SP	M83731/15-211	ON	OFF	ON	2-3	OPEN	2-1	
	M83731/15-231	ON	NONE	ON	2-3	OPEN	2-1	
	M83731/15-261			MOM.				
	M83731/15-271	MOM.	OFF	MOM.	2-3	OPEN	2-1	
	M83731/15-311	ON						
	M83731/15-341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

### PC Mounting

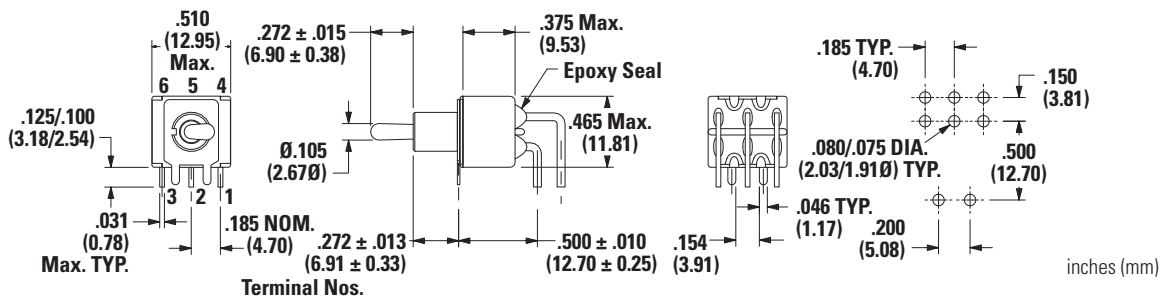


### DPDT



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	
	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						
	M83731/16-321	ON	ON	ON	2-3, 5-6	2-3, 5-4	2-1, 5-4	
	M83731/16-331	ON		MOM.	N/A	2-3, 5-6		
	M83731/16-341	NONE		MOM.	2-3, 5-6	2-3, 5-4		
	M83731/16-351	MOM.						

### PC Mounting



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