

### TYPICAL BRACKETED SWITCH ORDERING EXAMPLE

**MB24** **11** **A2** **G** **13** — **F** **C**

POLES & CIRCUITS			
11*	SPDT	ON	(ON)
61	DPDT	ON	(ON)
( ) = Momentary			
*Reverse circuit available with terminal code 32			

CONTACT MATERIALS & RATINGS	
W	Silver Rated 3A @ 125V AC
A	Gold over Silver Rated 3A @ 125V AC & 0.4VA maximum @ 28V AC/DC maximum
G	Gold Rated 0.4VA maximum @ 28V AC/DC maximum

CAPS	
F	.201" Dia.
H	.295" Dia.

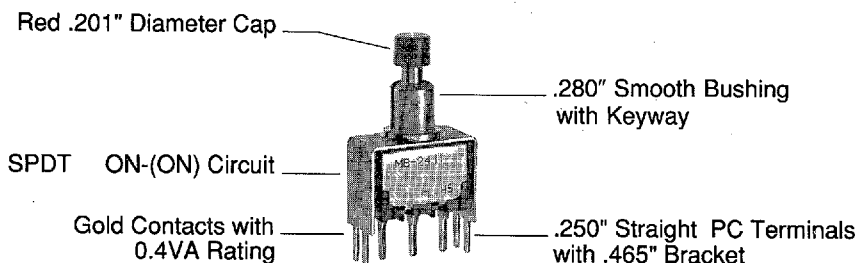
CAP COLORS	
A	Black
B	White
C	Red

BUSHINGS	
A1	.280" Threaded with Keyway
A2	.280" Smooth with Keyway
S1	.350" Threaded with Keyway
S2	.350" Smooth with Keyway
E1	.285" Threaded with D Flat
E2	.285" Smooth with D Flat
T1	.410" Threaded with Keyway
H2	.180" Smooth without Keyway Combines with bracketed straight PC terminals only

TERMINALS	
With Bracket	
13	.250" Straight PC with .465" Bracket
15	.425" Straight PC with .630" Bracket
17	.964" Straight PC with 1.150" Bracket
With Reinforced Bracket	
23	.250" Straight PC with .465" Bracket
25	.425" Straight PC with .630" Bracket
26	.750" Straight PC with .953" Bracket
With Terminal Support	
30	Right Angle PC
33	Right Angle PCB Single pole & 0.4VA rating only
32	Right Angle PCB with Reverse Circuit Single pole & 0.4VA rating only
40	Vertical PC

#### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE (MB2411A2G13-FC):

#### SERIES M PUSHBUTTON






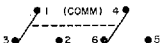
**IMPORTANT:** Switches are supplied without UL & CSA marking unless specified. See Supplement for instructions.

# NKK® SERIES M PUSHBUTTON SWITCHES

## SNAP ACTION/MOMENTARY/BRACKETED & ANGLE PC

Pushbuttons

### POLES & CIRCUITS

POLE & THROW	MODEL	PLUNGER POSITION & TERMINAL NUMBERS	
		( ) = Momentary	
		Normal 	Down 
SPDT	MB2411*	ON	(ON)
CONNECTED TERMINALS		1-3	1-2
SCHEMATIC			
DPDT	MB2461	ON	(ON)
CONNECTED TERMINALS		1-3    4-6	1-2    4-5
SCHEMATIC			

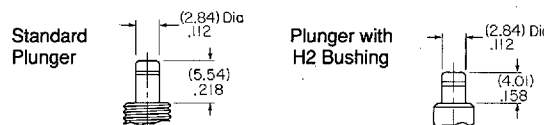
\*Reverse circuit used with terminal code 32. Terminal numbers are not on the switch.

### CONTACT MATERIALS & RATINGS

- W** Silver over Silver  
Rated 3A @ 125V AC
- A** Gold over Silver  
Rated 3A @ 125V AC &  
0.4VA maximum @ 28V AC/DC maximum
- G** Gold over Brass or Copper  
Rated 0.4VA maximum @ 28V  
AC/DC maximum

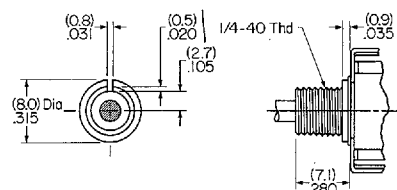
### PLUNGER

Plunger selection is not required for MB2400 pushbuttons. The plunger can be used with or without a cap.

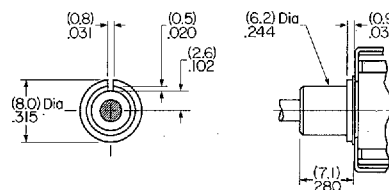


### BUSHINGS

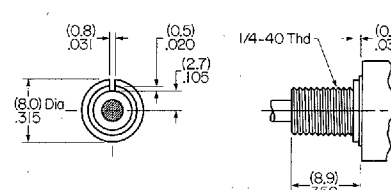
#### A1 .280" Threaded with Keyway



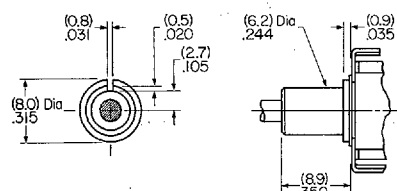
#### A2 .280" Smooth with Keyway



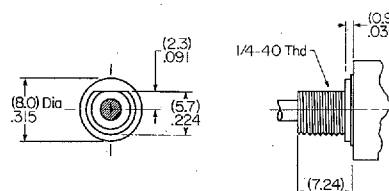
#### S1 .350" Threaded with Keyway



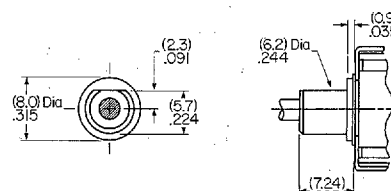
#### S2 .350" Smooth with Keyway



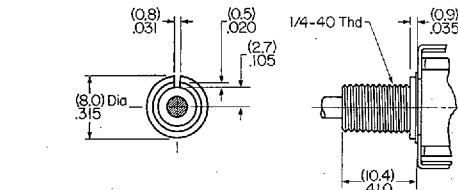
#### E1 .285" Threaded with D Flat



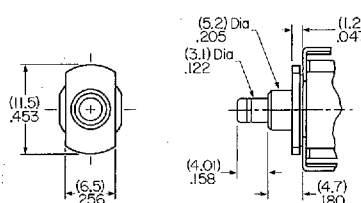
#### E2 .285" Smooth with D Flat



#### T1 .410" Threaded with Keyway



#### H2 .180" Smooth without Keyway



H2 bushings are available only with bracketed straight PC terminals and are supplied with a .158" long plunger.

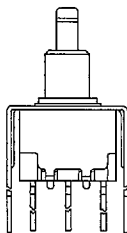


# SERIES M PUSHBUTTON SWITCHES

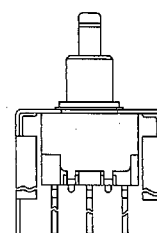
## SNAP ACTION/MOMENTARY/BRACKETED & ANGLE PC

### TERMINALS

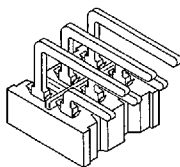
- 13** .250" Straight PC with .465" Bracket
- 15** .425" Straight PC with .630" Bracket
- 17** .964" Straight PC with 1.150" Bracket



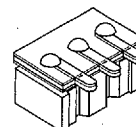
- 23** .250" Straight PC with .465" Reinforced Brkt.
- 25** .425" Straight PC with .630" Reinforced Brkt.
- 26** .750" Straight PC with .953" Reinforced Brkt.



- 30** Right Angle PC

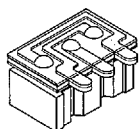


- 33** Right Angle PCB



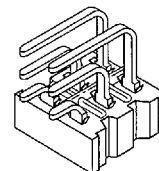
Available only in single pole with 0.4VA rating

- 32** Right Angle PCB with Reverse Circuit



Available only in single pole with 0.4VA rating

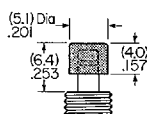
- 40** Vertical PC



### CAPS

- F** AT475  
.201" Diameter Cap

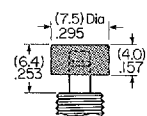
Polycarbonate



With Std. Bushing

- H** AT496  
.295" Diameter Cap

Polycarbonate



With Std. Bushing

Colors Available:

A Black

B White

C Red

### HARDWARE

Standard hardware included with each threaded bushing is: two hex nuts, AT513 (H or M) and one lockwasher, AT509. Optional locking rings, AT507 (H or M) and AT515 are also available. This hardware appears in the previous bushing mount section. Decorative hardware: conical nut, AT512, two sizes of dress nuts, AT532 or AT533, and a knurled face nut, AT501, are suitable for use with these switches. Detailed illustrations of this hardware is included in the hardware section.

### SOLDERING

3 seconds @ 350°C

5 seconds @ 270°C

### PANEL THICKNESS

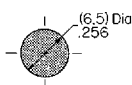
With Standard Hardware:

For .280" Bushing: 1.74mm (.068") max.

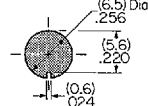
For .350" Bushing: 3.40mm (.134") max.

### PANEL CUTOUTS

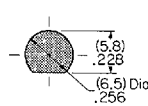
Without Keyway



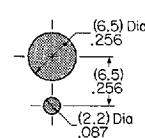
With Keyway



With D Flat



With Locking Ring

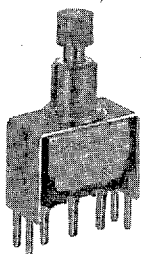


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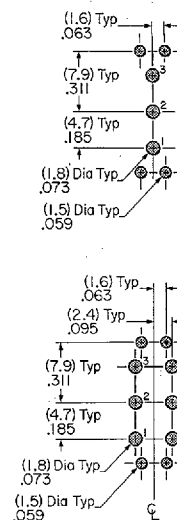
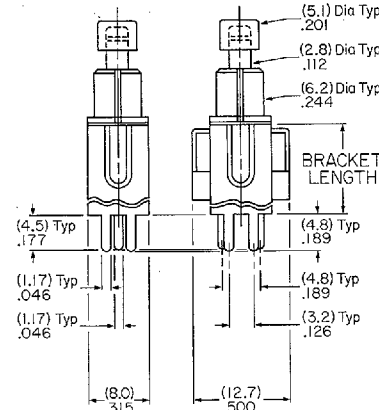
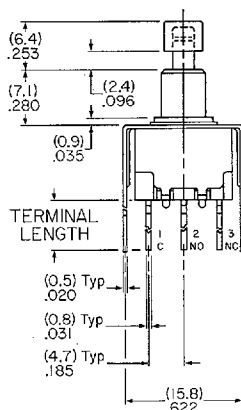
M77

### Straight PC with Bracket/Single & Double Pole

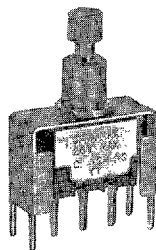


MB2411A2G13-FC Model Shown

Terminal Code	Terminal Length	Bracket Length
13	.250" (6.4mm)	.465" (11.8mm)
15	.425" (10.8mm)	.630" (16.0mm)
17	.964" (24.5mm)	1.150" (29.2mm)

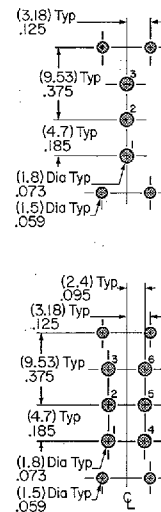
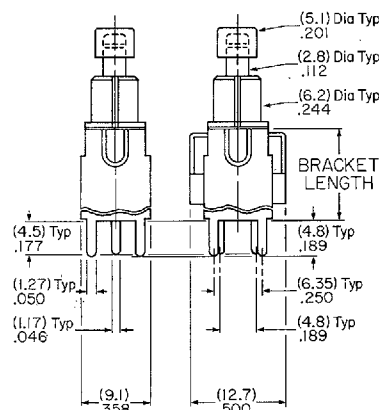
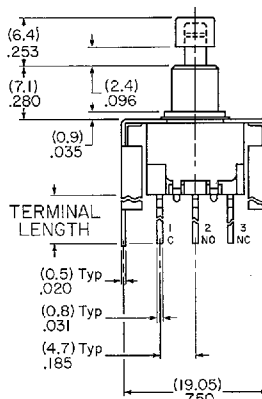


### Straight PC with Reinforced Bracket/Single & Double Pole

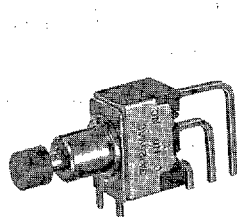


MB2411A2G23-FC Model Shown

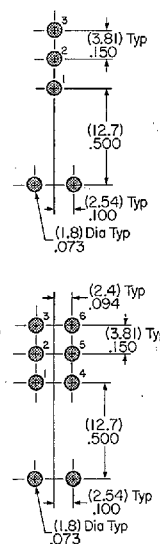
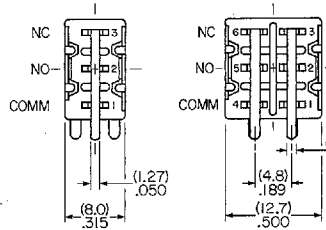
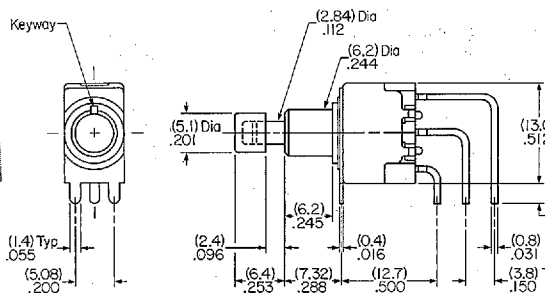
Terminal Code	Terminal Length	Bracket Length
23	.250" (6.4mm)	.465" (11.8mm)
25	.425" (10.8mm)	.630" (16.0mm)
26	.750" (19.05mm)	.953" (24.2mm)



### Vertical PC/Single & Double Pole

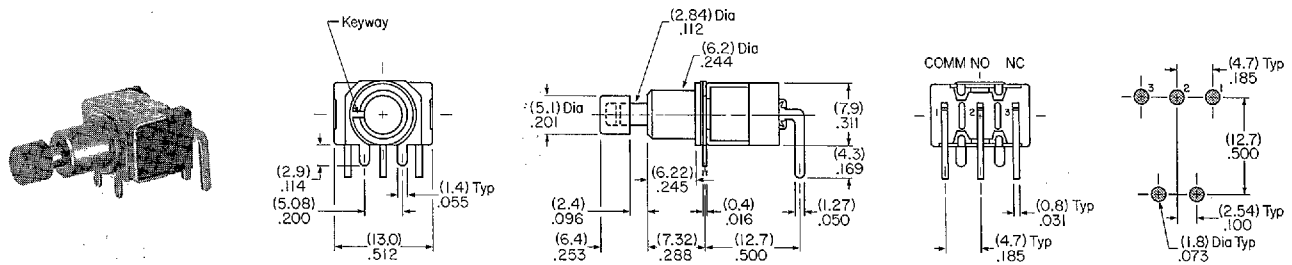


MB2411A2G40-FC Model Shown



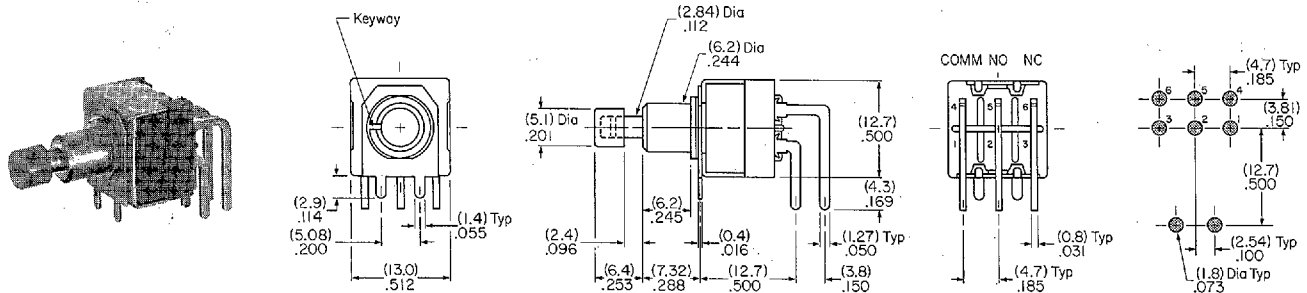
## SNAP ACTION/MOMENTARY/BRACKETED & ANGLE PC

### Right Angle PC/Single Pole



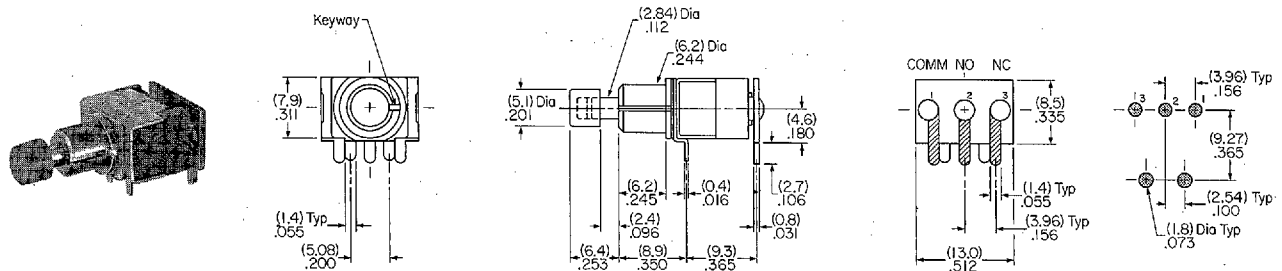
MB2411A2G30-FC Model Shown

### Right Angle PC/Double Pole



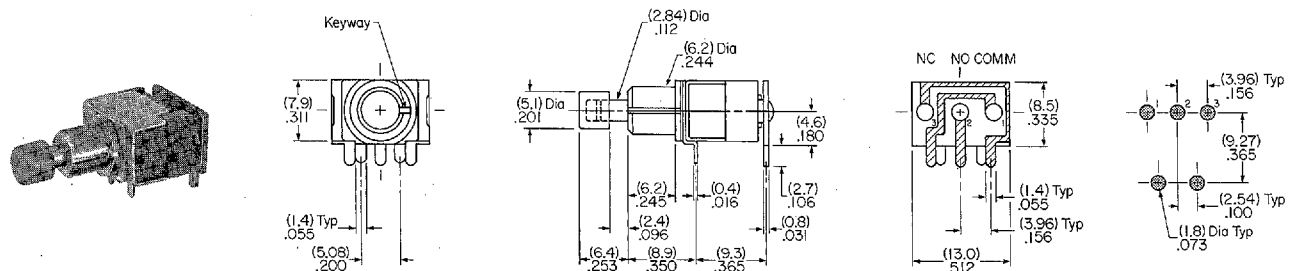
MB2461A2G30-FC Model Shown

### Right Angle PCB/Single Pole



MB2411A2G33-FC Model Shown

### Right Angle PCB/Single Pole/Reverse Circuit



MB2411A2G32-FC Model Shown



# SERIES M PUSHBUTTON SWITCHES

## SUBMINIATURE/MOMENTARY & ALTERNATE/1-4 POLE

### GENERAL SPECIFICATIONS

<b>Electrical Capacity:</b> (Resistive Load)	6A @ 125V AC or 3A @ 250V AC		
	6A @ 30V DC		
	0.4VA maximum @ 28V maximum AC/DC		
	(Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)		
<b>Contact Resistance:</b>	10 milliohms maximum for silver		
	20 milliohms maximum for gold		
<b>Insulation Resistance:</b>	1,000 megohms minimum @ 500V DC		
<b>Dielectric Strength:</b>	1,000V AC minimum between contacts		
	1,500V AC minimum between contacts and case		
<b>Mechanical Life:</b>	100,000 operations minimum		
	50,000 operations minimum for splashproof devices		
<b>Electrical Life:</b>	25,000 operations minimum for silver		
	50,000 operations minimum for gold		
<b>Nominal Operating Force:</b>		<u>Momentary</u>	<u>Alternate Action</u>
	Single Pole	950 grams	450 grams
	Double Pole	1,650 grams	720 grams
	Four Pole	2,400 grams	1,200 grams
<b>Ambient Temp Range:</b>	-15°C through +85°C (+5°F through +185°F)		
	Optional low temperature lubricant available		

### MATERIALS & FINISHES

Plunger	Brass w/nickel plating; polyacetal resin (B1 bushing)
Bushing	Brass with nickel plating
Frame	Stainless steel
Case	Diallylphthalate resin (UL 94V-0 flammability rating)
Movable Contactor	Phosphor bronze with silver or gold plating*
Movable Contacts	Silver alloy (code W); silver alloy with gold plating* over nickel (code A); or copper with gold plating* over nickel (code G)
Stationary Contacts	Silver with silver plating (code W); silver with gold plating* over nickel (code A); or copper or brass with gold plating* over nickel (code G)
Terminals	Copper or brass with silver plating; copper or brass with gold plating over nickel

\* Gold plating on contacts is 1 micron minimum.

### UL & CSA

#### UL File No. E44145

All models with ratings of 6A @ 125V AC, 3A @ 250V AC, and 0.4VA @ 28V AC/DC are recognized by Underwriters Laboratories Inc.

#### CSA File Nos.

#### LR 23535 and LR56017

Models rated 6A @ 125V AC, 3A @ 250V AC, and 0.4VA @ 28V AC/DC certified by Canadian Standards Association: 1-pole with PC, solder lug, and wirewrap; 2- and 4-pole with PC, solder lug, wirewrap, and quick connect.

### PLUNGER TRAVEL

	With Screw-on Cap		With Snap-on Caps Momentary & Alternate Action
	Momentary	Alternate Action	
Pretravel	0.71mm (.028")	2.80mm (.110")	3.19mm (.125")
Overtravel	1.09mm (.043")	1.10mm (.043")	1.26mm (.050")
Total Travel	1.80mm (.071")	3.90mm (.153")	4.45mm (.175")

A-25-13

### DISTINCTIVE FEATURES

Antirotation feature is standard on noncylindrical levers.

Antijamming design on toggle switches protects contacts from damage due to excessive downward force on the actuator.

High torque bushing construction prevents rotation or separation from frame during installation.

Stainless steel frame resists corrosion.

Patented silver contacts of specially composed alloy for hardness.

High insulating barriers, formed in the molded diallylphthalate case, increase isolation of circuits in multipole devices and provide added protection to contact points.

Epoxy sealed terminals prevent entry of solder flux and other contaminants.

Prominent external insulating barriers increase insulation resistance and dielectric strength.

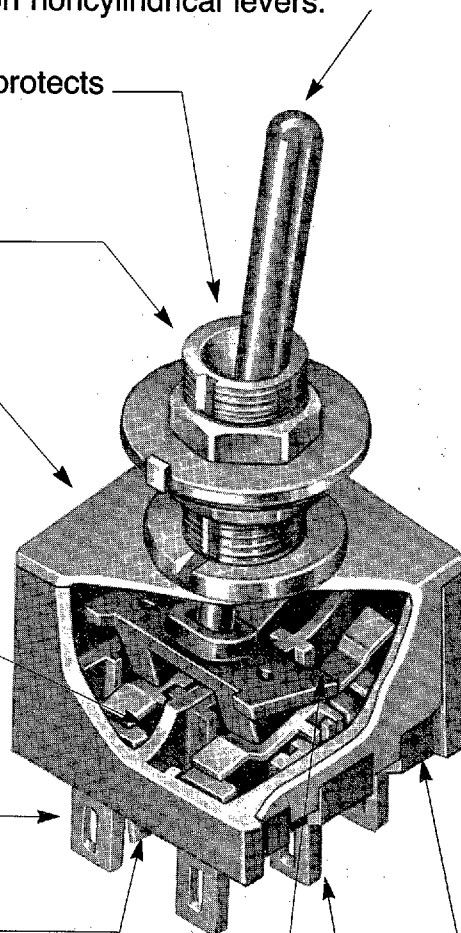
#### Actual Size



Interlocked actuator block prevents switch failure due to biased lever movement.

Longer center solder lug terminal simplifies wiring and soldering.

Clinching of the frame to the case well above the base and terminals provides 1500V dielectric strength.



# Mouser Electronics

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## NKK Switches:

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