

# General Specifications

## Electrical Capacity (Resistive Load)

**Power Level (silver):** 2A @ 125V AC  
**Logic Level (gold):** 0.4VA maximum @ 28V AC/DC maximum (Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)

### Other Ratings

**Contact Resistance:** 20 milliohms maximum for silver; 30 milliohms maximum for gold  
**Insulation Resistance:** 1,000 megohms minimum @ 500V DC  
**Dielectric Strength:** 1,000V AC minimum between contacts for 1 minute minimum;  
 1,500V AC minimum between contacts & case for 1 minute minimum  
**Mechanical Life:** 200,000 operations minimum  
**Electrical Life:** 25,000 operations minimum for silver; 100,000 operations minimum for gold  
**Nominal Operating Force:** Single pole 2.45N; double pole 3.92N  
**Nominal Travel:** Pretravel .024" (0.6mm); Overtravel .016" (0.4mm); Total Travel .039" (1.0mm)

## Materials & Finishes

**Plunger:** Brass with nickel plating  
**Bushing:** Brass with nickel plating  
**Frame:** Stainless steel  
**Guide:** Polybutylene terephthalate (PBT) (UL94V-0)  
**Case:** Diallyl phthalate resin (UL94V-0)  
**Movable Contactor:** Phosphor bronze with silver or gold plating  
**Movable Contacts:** Silver alloy (code W); copper with gold plating (code G)  
**Stationary Contacts:** Silver alloy with silver plating (code W); copper or brass with gold plating (code G)  
**Terminals:** Copper or brass with silver plating; copper or brass with gold plating

## Environmental Data

**Operating Temperature Range:** -30°C through +85°C (-22°F through +185°F)  
**Humidity:** 90 ~ 95% humidity for 240 hours @ 40°C (104°F)  
**Vibration:** 10 ~ 55Hz with peak-to-peak amplitude of 1.5mm traversing the frequency range & returning in 1 minute; 3 right angled directions for 2 hours  
**Shock:** 500m/s<sup>2</sup> acceleration (tested in 6 right angled directions, with 3 shocks in each direction)

## Installation

**Mounting Torque:** 1.5Nm (13.0 lb•in) for double nut; 0.7Nm (6.0 lb•in) for single nut  
**Cap Installation Force:** 80.0N (18.0 lbf) maximum downward force on actuator  
**Soldering:** Wave Soldering (PC version): See Profile B in Supplement section.  
 Manual Soldering: See Profile B in Supplement section.  
**Cleaning:** These devices are not process sealed. Hand clean locally using alcohol based solution.  
 See Cleaning Specifications in Supplement section.

## Standards & Certifications

**Flammability Standards:** UL94V-0 Guide & Case  
**UL:** Contact NNK Switches for UL or CUL marking option requirements.

# Distinctive Characteristics

Snap-acting mechanism gives smooth actuation, short stroke, light touch, and audible feedback. This mechanism also provides long mechanical life.

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

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

Compatible companions with M series toggles. Body, bushing, and footprint dimensions ideal for mounting MBNR pushbuttons and M toggles next to one another.

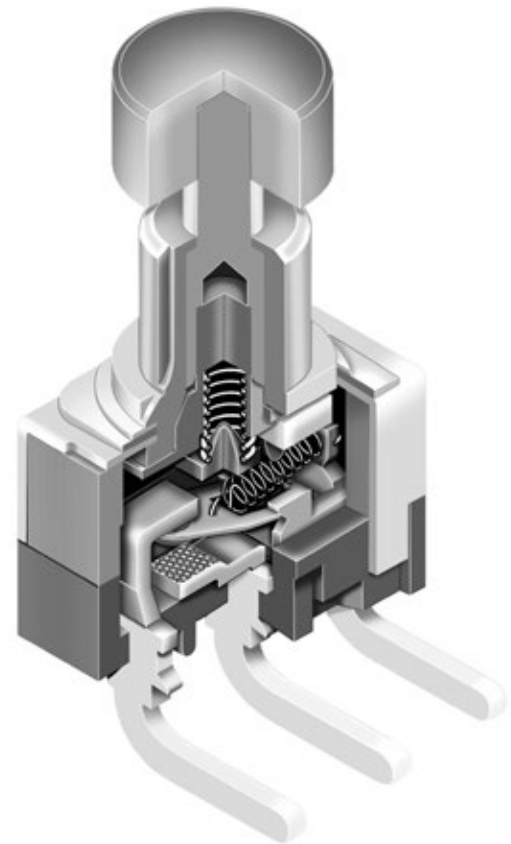
Stainless steel frame resists corrosion.

Longer center solder lug terminal simplifies wiring and soldering.

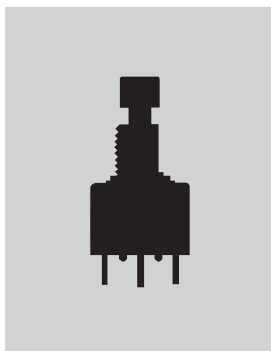
Silver contacts of specially composed alloy for hardness.


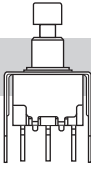
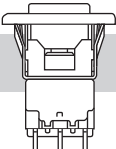
Epoxy sealed terminals prevent entry of solder flux and other contaminants.

Prominent external insulating barriers increase insulation resistance and dielectric strength.



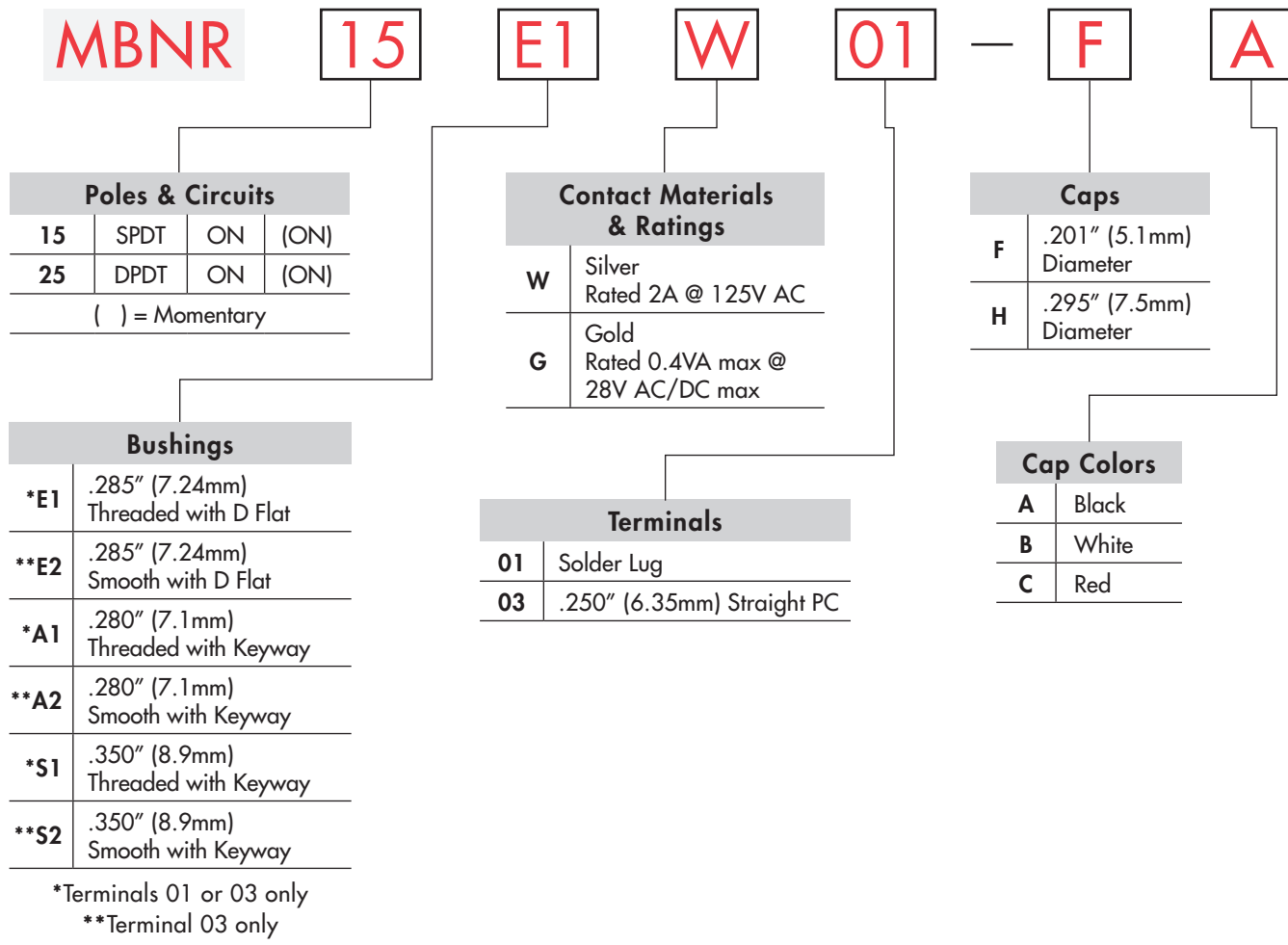
Actual Size



	Bushing Mount	Page C98
	Bracket PC Mount	Page C102
	Snap-in Mount	Page C106

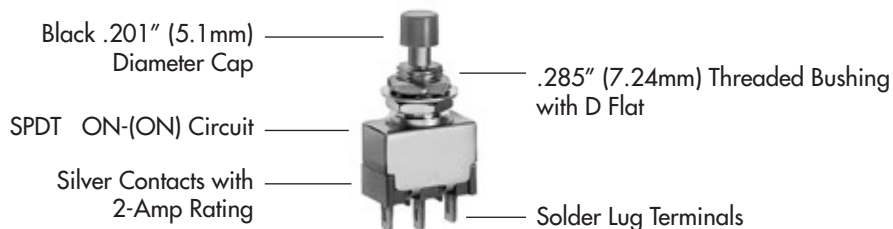
- Toggle
- Rockers
- Pushbuttons**
- Illuminated PB
- Programmable
- Keylocks
- Rotaries
- Slides
- Tactiles
- Tilt
- Touch
- Indicators
- Accessories
- Supplement

### TYPICAL SWITCH ORDERING EXAMPLE



### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

#### MBNR15E1W01-FA



Toggles  
 Rockers  
 Pushbuttons  
 Illuminated PB  
 Programmable  
 Keylocks  
 Rotaries  
 Slides  
 Tactiles  
 Tilt  
 Touch  
 Indicators  
 Accessories  
 Supplement

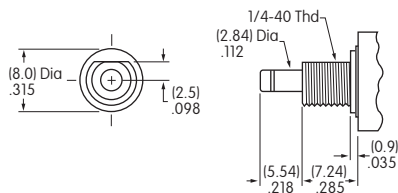
## POLES & CIRCUITS

Pole	Model	Plunger Position ( ) = Momentary		Connected Terminals		Throw & Switch Schematics
		Normal	Down	Normal	Down	
						Note: Terminal numbers are not actually on the switch.
SP	MBNR15	ON	(ON)	1-3	1-2	SPDT 
DP	MBNR25	ON	(ON)	1-3 4-6	1-2 4-5	DPDT 

## BUSHINGS

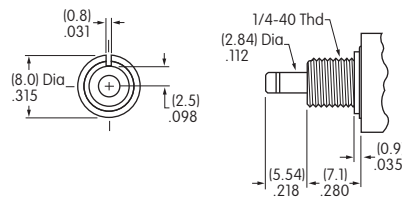
Note: Plunger selection is not required for MBNR pushbuttons. The plunger can be used with or without a cap.

**E1** .285" (7.24mm)  
Threaded with D Flat



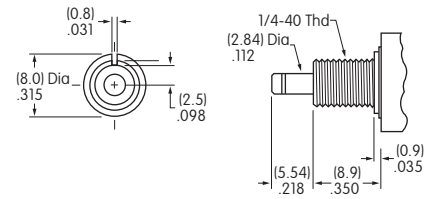
Maximum Panel Thickness with Standard Hardware: .068" (1.74mm)

**A1** .280" (7.1mm)  
Threaded with Keyway



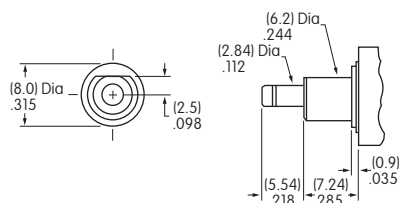
Maximum Panel Thickness with Standard Hardware: .068" (1.74mm)

**S1** .350" (8.9mm)  
Threaded with Keyway

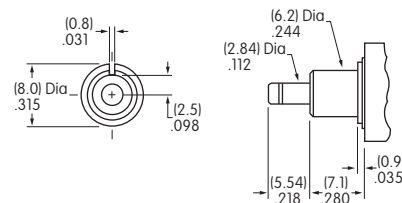


Maximum Panel Thickness with Standard Hardware: .134" (3.40mm)

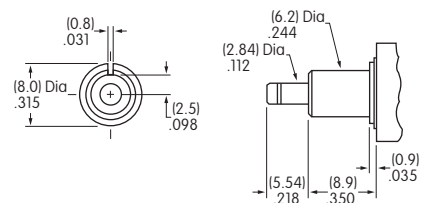
**E2** .285" (7.24mm)  
Smooth with D Flat



**A2** .280" (7.1mm)  
Smooth with Keyway

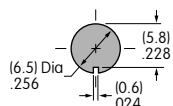


**S2** .350" (8.9mm)  
Smooth with Keyway

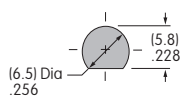


### Panel Cutouts

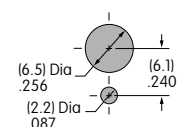
For A1, A2, S1, or S2 Bushing with Keyway



For E1 or E2 Bushing with D Flat



With Optional Locking Ring



Standard hardware includes 2 hex nuts & 1 lockwasher.  
Hardware is illustrated following the Typical Switch Dimension drawings.

### CONTACT MATERIALS & RATINGS

**W**

Silver

Power Level

2A @ 125V AC

**G**

Gold

Logic Level

0.4VA maximum @ 28V AC/DC maximum

Note: Complete explanation of operating range in Supplement section.

Gold over Silver

Power Level  
or Logic Level

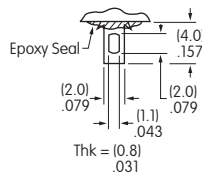
2A @ 125V AC  
or 0.4VA maximum @ 28V AC/DC maximum

Note: Gold over silver is available as a custom option. This dual rated option is suitable when two or more identical switches are used in logic and in power circuits within the same application. See Supplement section to find complete explanation of dual rating and operating range.

### TERMINALS

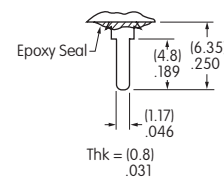
**01**

Solder Lug

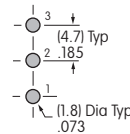


**03**

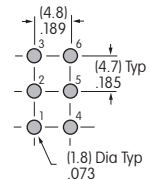
.250" (6.35mm)  
Straight PC



Single Pole



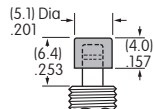
Double Pole



### CAPS & CAP COLORS

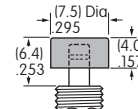
**F**

AT475  
.201" (5.1mm)  
Diameter Cap



**H**

AT496  
.295" (7.5mm)  
Diameter Cap



Material: Polyamide

Finish: Glossy



Material: Polyamide

Finish: Glossy



Cap Colors  
Available:

**A**

Black

**B**

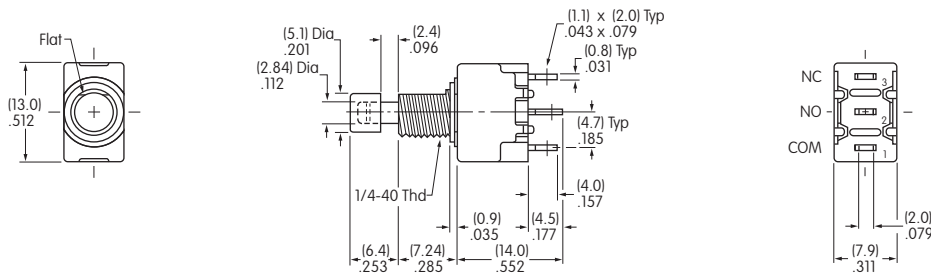
White

**C**

Red

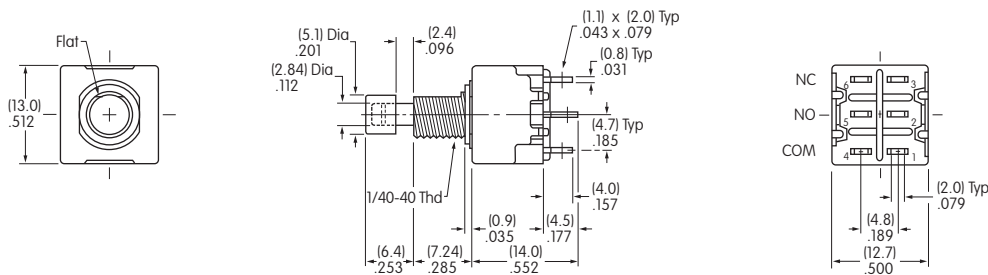
## TYPICAL SWITCH DIMENSIONS

### Single Pole



**MBNR15E1W01-FA**

### Double Pole



**MBNR25E1W01-FA**

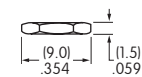
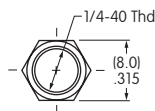
## HARDWARE

### Standard Hardware

#### AT513H Inch Threaded Hexagon Nut

2 included with each switch

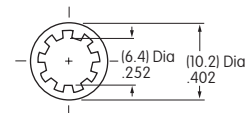
Material:  
Brass with Nickel Plating



#### AT509 Lockwasher

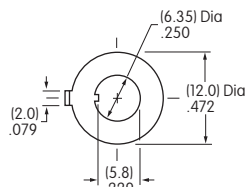
1 included with each switch

Material:  
Steel with Zinc/Chromate



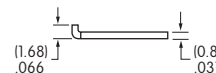
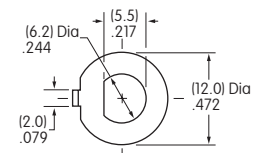
#### AT507H Locking Ring for A1 or S1 Bushing

Material:  
Steel with Zinc/Chromate



#### AT515 Locking Ring for E1 Bushing

Material:  
Steel with Zinc/Chromate



### TYPICAL SWITCH ORDERING EXAMPLE

**MBNR**

**15**

**A2**

**W**

**40**

**F**

**A**

#### Poles & Circuits

15	SPDT	ON	(ON)
25	DPDT	ON	(ON)

( ) = Momentary

#### Contact Materials & Ratings

<b>W</b>	Silver Rated 2A @ 125V AC
<b>G</b>	Gold Rated 0.4VA max @ 28V AC/DC max

#### Caps

<b>F</b>	.201" (5.1mm) Dia.
<b>H</b>	.295" (7.5mm) Dia.

#### Bushings

<b>A2</b>	.280" (7.1mm) Smooth with Keyway
<b>E2</b>	.285" (7.24mm) Smooth with D Flat
<b>S2</b>	.350" (8.9mm) Smooth with Keyway

#### Cap Colors

<b>A</b>	Black
<b>B</b>	White
<b>C</b>	Red

#### Terminals

##### With Bracket

<b>13</b>	.250" (6.35mm) Straight PC with .465" (11.8mm) Bracket
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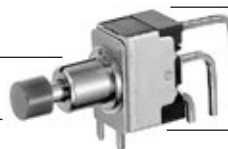
##### With Terminal Support

<b>30</b>	Right Angle PC
<b>40</b>	Vertical PC

### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

**MBNR15A2W40-FA**

.280" (7.1mm) Smooth Bushing  
with Keyway  
Black .201" (5.1mm)  
Diameter Cap



SPDT  
ON-(ON) Circuit  
Vertical PC Terminals  
Silver Contacts with  
2A Rating

## POLES & CIRCUITS

Pole	Model	Plunger Position ( ) = Momentary		Connected Terminals		Throw & Switch Schematics
		Normal	Down	Normal	Down	
						Note: Terminal numbers are not actually on the switch.
SP	MBNR15	ON	(ON)	1-3	1-2	SPDT 
DP	MBNR25	ON	(ON)	1-3 4-6	1-2 4-5	DPDT 

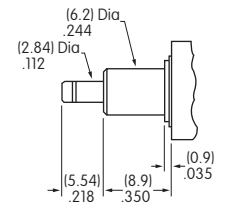
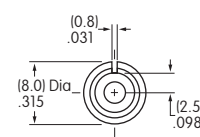
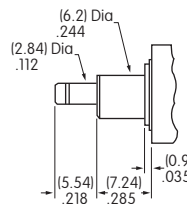
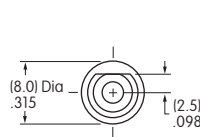
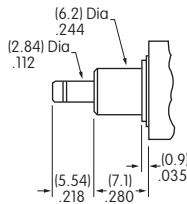
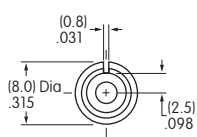
## BUSHINGS

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

**A2** .280" (7.1mm)  
Smooth with Keyway

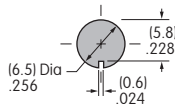
**E2** .285" (7.24mm)  
Smooth with D Flat

**S2** .350" (8.9mm)  
Smooth with Keyway

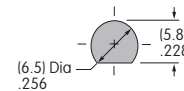


## Panel Cutouts

For A2 or S2 Bushing  
with Keyway



For E2 Bushing  
with D Flat



## CONTACT MATERIALS & RATINGS

**W**

Silver

Power Level

2A @ 125V AC

**G**

Gold

Logic Level

0.4VA maximum @ 28V AC/DC maximum

Note: Complete explanation of operating range in Supplement section.

Gold over Silver

Power Level  
or Logic Level

2A @ 125V AC  
or 0.4VA maximum @ 28V AC/DC maximum

Note: Gold over silver is available as a custom option. This dual rated option is suitable when two or more identical switches are used in logic and in power circuits within the same application. See Supplement section to find complete explanation of dual rating and operating range.

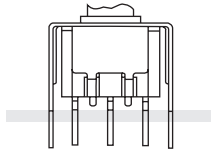
Toggles  
Rockers  
Pushbuttons  
Illuminated PB  
Programmable  
Keylocks  
Rotaries  
Slides  
Tactiles  
Tilt  
Touch  
Indicators  
Accessories  
Supplement



### TERMINALS

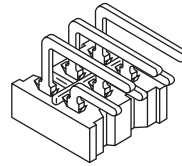
**13**

**Straight PC Mount with Bracket  
.250" (6.35mm) Terminal  
with .465" (11.8mm) Bracket**



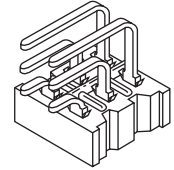
**30**

**Right Angle PC**



**40**

**Vertical PC**

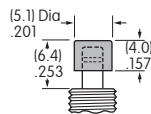


PCB footprints are on the following Typical Switch Dimension pages.

### CAPS & CAP COLORS

**F**

**AT475  
.201" (5.1mm)  
Diameter Cap**

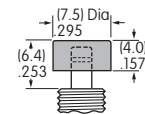


Material: Polyamide  
Finish: Glossy



**H**

**AT496  
.295" (7.5mm)  
Diameter Cap**



Material: Polyamide  
Finish: Glossy



Cap Colors Available:

**A**

Black

**B**

White

**C**

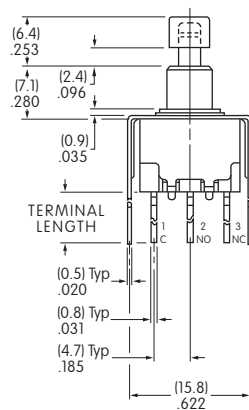
Red

### TYPICAL SWITCH DIMENSIONS

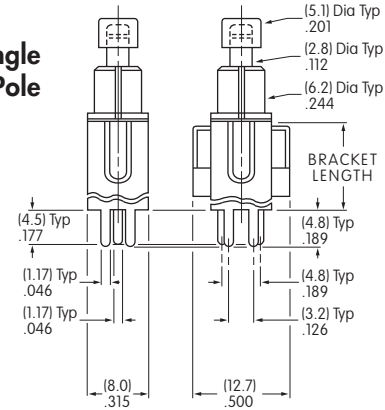
#### Straight PC • Bracket



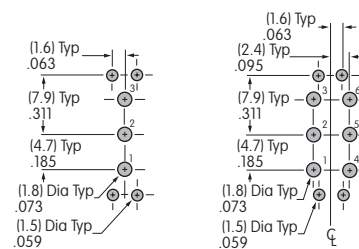
**MBNR15A2G13-FA**



**Single Pole**



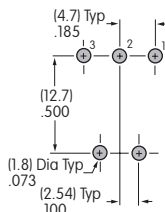
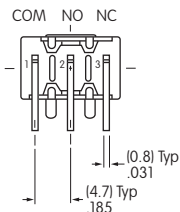
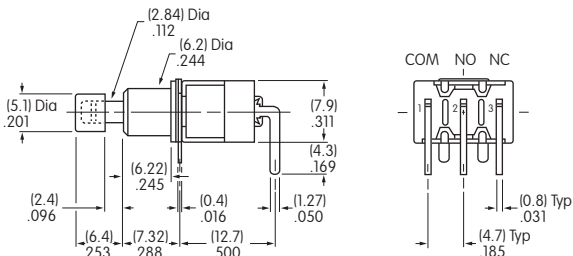
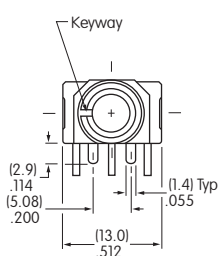
**Double Pole**



Terminal Code:	Terminal Length:	Bracket Length:
<b>13</b>	.250 (6.35mm)	.465 (11.8mm)

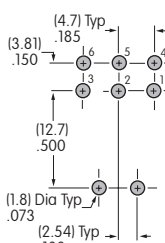
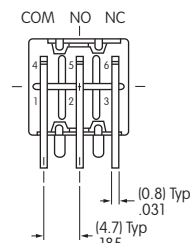
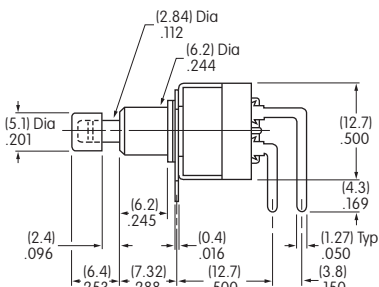
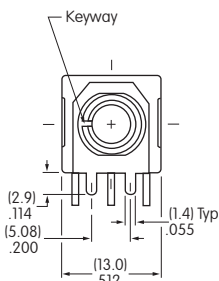
## TYPICAL SWITCH DIMENSIONS

### Single Pole



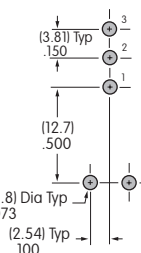
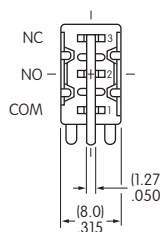
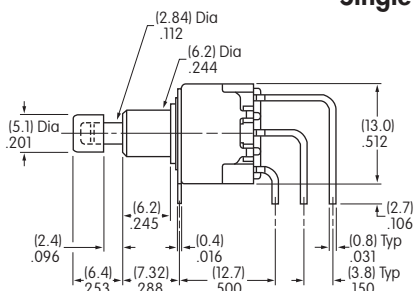
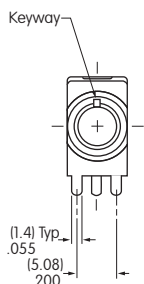
**MBNR15A2G30-FA**

### Double Pole



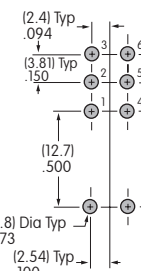
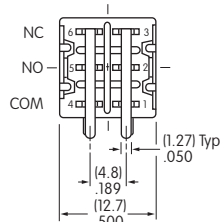
**MBNR25A2W30-FA**

### Single Pole

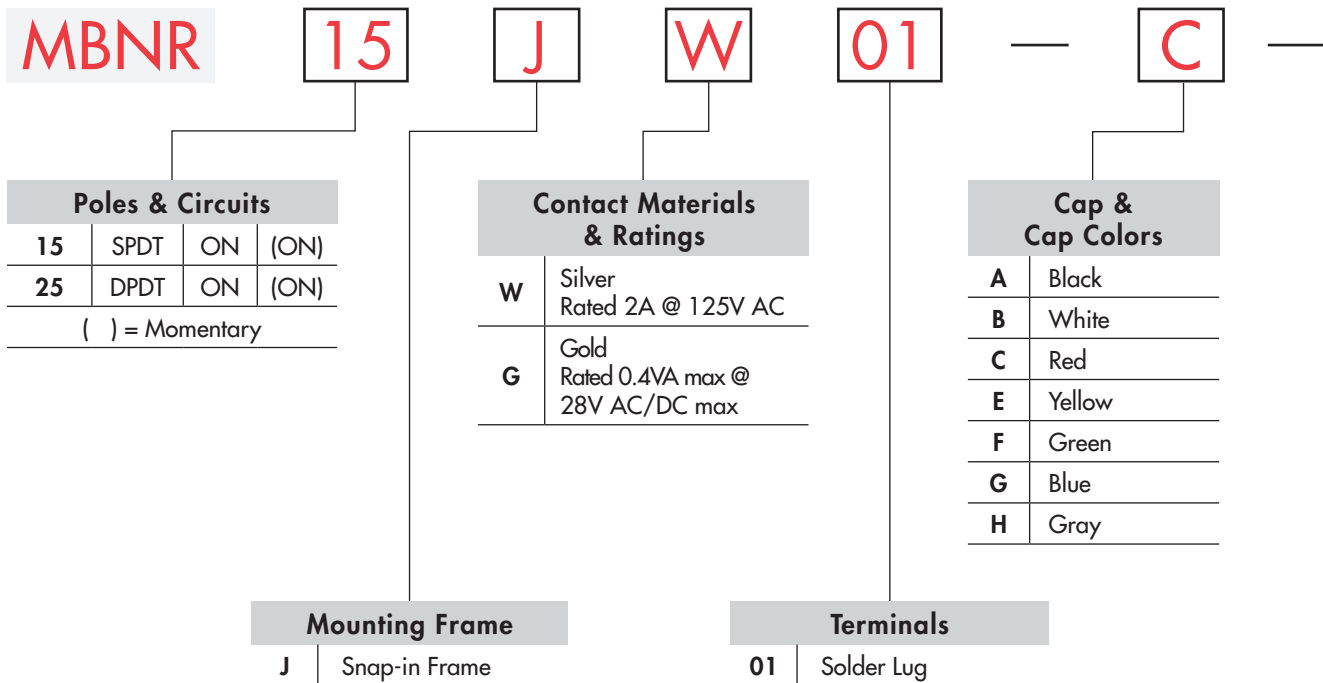


**MBNR15A2W40-FA**

### Double Pole

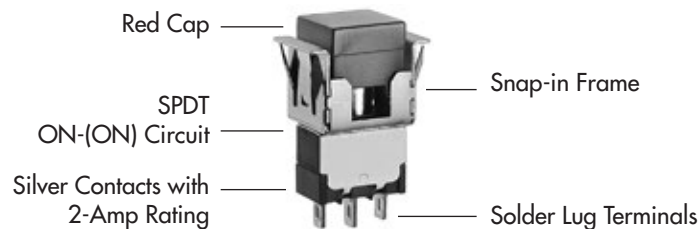


### TYPICAL SWITCH

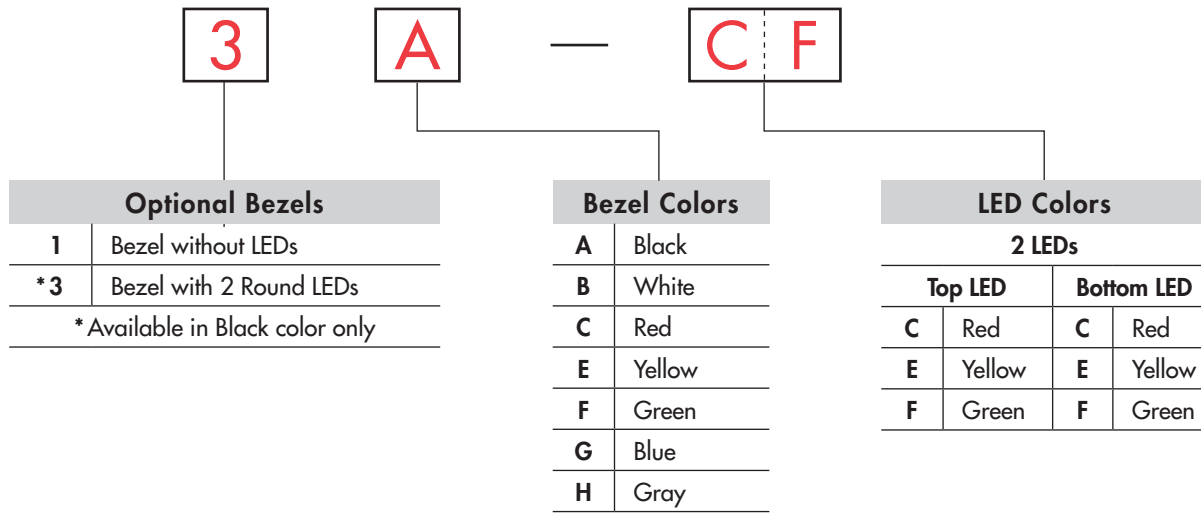


#### DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

**MBNR15JW01-C**



## ORDERING EXAMPLE



- Toggles
- Rockers
- C Pushbuttons**
- Illuminated PB
- Programmable
- Keylocks
- Rotaries
- Slides
- Tactiles
- Tilt
- Touch
- Indicators
- Accessories
- Supplement

Toggle

Rockers

Pushbuttons

Programmable Illuminated PB

Keylocks

Rotaries

Slides

Tactiles

Tilt






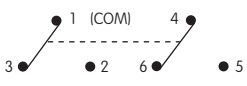
Touch

Indicators

Accessories

Supplement

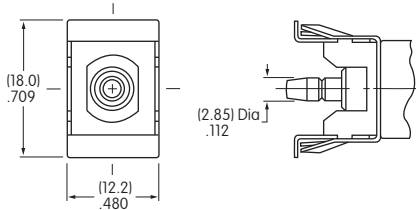
### POLES & CIRCUITS

		Plunger Position ( ) = Momentary		Connected Terminals		Throw & Switch Schematics
Pole	Model	Normal	Down	Normal	Down	
						Note: Terminal numbers are not actually on the switch.
SP	<b>MBNR15</b>	ON	(ON)	1-3	1-2	SPDT 
DP	<b>MBNR25</b>	ON	(ON)	1-3 4-6	1-2 4-5	DPDT 

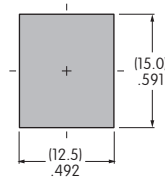
### MOUNTING FRAME

**J**

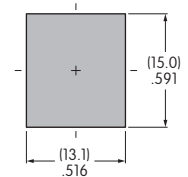
#### Snap-in Frame



Panel Cutout for Single Pole without Bezel



Panel Cutout for Double Pole without Bezel



Panel Thickness without Bezel: .039" ~ .157" (1.0mm ~ 4.0mm)  
Panel Thickness with Bezel: .039" ~ .126" (1.0mm ~ 3.2mm)

### CONTACT MATERIALS & RATINGS

**W**

Silver

Power Level

2A @ 125V AC

**G**

Gold

Logic Level

0.4VA maximum @ 28V AC/DC maximum

Note: Complete explanation of operating range in Supplement section.

Gold over Silver

Power Level  
or Logic Level

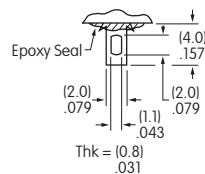
2A @ 125V AC  
or 0.4VA maximum @ 28V AC/DC maximum

Note: Gold over silver is available as a custom option. This dual rated option is suitable when two or more identical switches are used in logic and in power circuits within the same application. See Supplement section to find complete explanation of dual rating and operating range.

### TERMINALS

**01**

Solder Lug

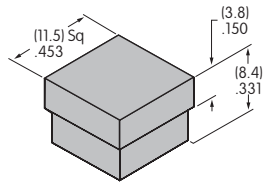


## CAP & CAP COLORS

### AT465 .453" (11.5mm) Square Cap

Material: Polycarbonate  
Finish: Glossy

Contact factory for  
matte finish.



<b>A</b> Black	<b>E</b> Yellow	<b>H</b> Gray
<b>B</b> White	<b>F</b> Green	
<b>C</b> Red	<b>G</b> Blue	

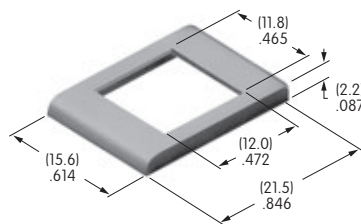
Legend details are on the following page.

## OPTIONAL SNAP-IN BEZELS & BEZEL COLORS

### 1 AT207 Bezel

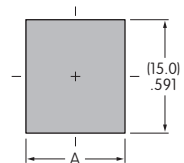
Material: Polycarbonate  
Finish: Glossy

Contact factory for  
matte finish.



<b>A</b> Black	<b>E</b> Yellow	<b>H</b> Gray
<b>B</b> White	<b>F</b> Green	
<b>C</b> Red	<b>G</b> Blue	

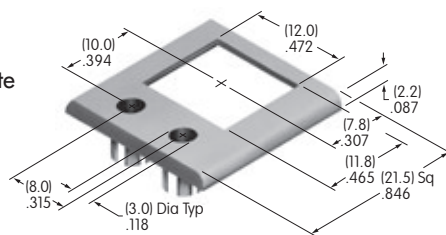
	Single Pole	Double Pole
A	(12.5)mm .492"	(13.1)mm .516"



### 3 AT212 Bezel for AT617 LED

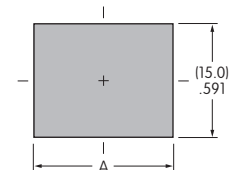
Material: Polycarbonate

Finish: Semi-glossy



<b>A</b> Black
----------------

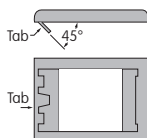
	Single Pole	Double Pole
A	(18.4)mm .724"	(18.7)mm .736"



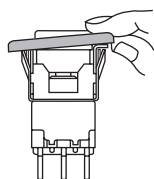
LED colors and specifications are on the following page.

## Bezel Assembly

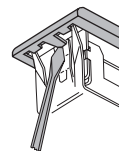
1. Pry out  
tab on  
bezel to a  
45° angle.



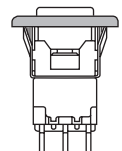
2. Insert  
switch frame  
under tab  
and snap  
on the bezel.



3. Push tab  
back into  
place.



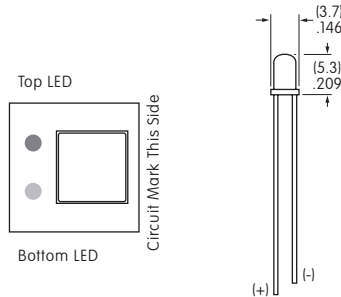
4. Snap  
assembled  
bezel and  
switch into  
panel.



### LED COLORS & SPECIFICATIONS

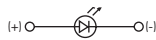
#### Bezel Orientation on Switch

**AT617 LED**  
For Bezel AT212  
with 2 Round LEDs



Note: Lead lengths may differ from manufacturing lot to lot. The longer lead is the anode (+).

The electrical specifications shown are determined at a basic temperature of 25°C. The LED circuit is independent of switch operation. LED is colored in OFF state.



Color

**C**

Red

#### AT617 LED

**E**

Yellow

**F**

Green

Maximum Forward Current

$I_{FM}$

30mA

30mA

30mA

Typical Forward Current

$I_F$

20mA

20mA

20mA

Forward Voltage

$V_F$

2.1V

2.1V

2.2V

Maximum Reverse Voltage

$V_{RM}$

5V

5V

5V

Current Reduction Rate Above 25°C

$\Delta I_F$

0.40mA/°C

0.40mA/°C

0.40mA/°C

Ambient Temperature Range  
(when used with a bezel)

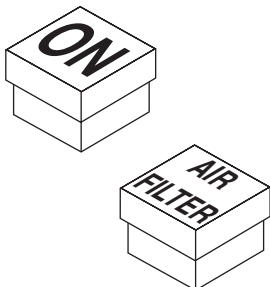
-15° ~ +70°C

If the source voltage is greater than the rated voltage of the LED, a ballast resistor must be connected in series with the lamp. The ballast resistor calculation and more lamp detail are shown in the Supplement section.

### LEGENDS

NKK Switches can provide custom legends for caps. Contact factory for more information.

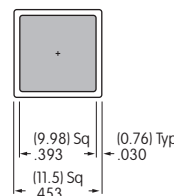
#### Suggested Printable Area for Cap



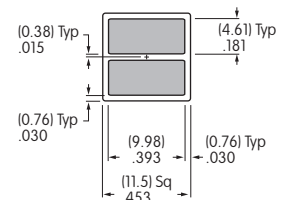
#### Recommended Print Method:

Screen Print or Pad Print

Epoxy based ink is recommended.



AT465



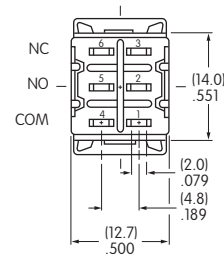
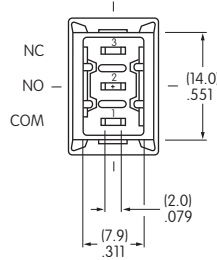
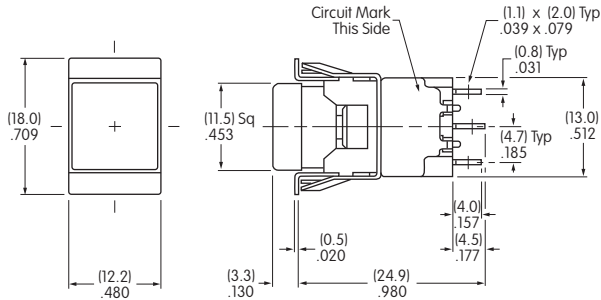
AT465

Shaded areas are printable areas.

## TYPICAL SWITCH DIMENSIONS

### Single & Double Pole

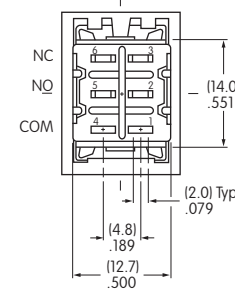
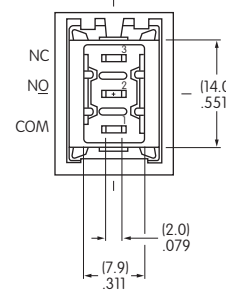
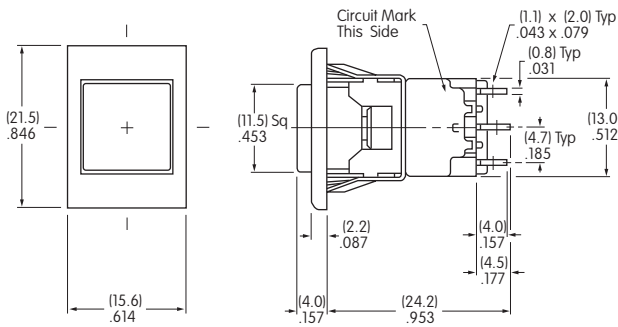
### Solder Lug



**MBNR15JW01-C**

### Single & Double Pole

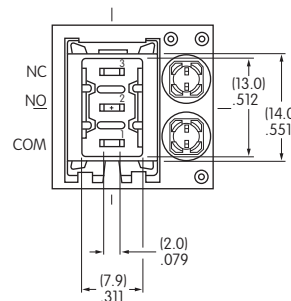
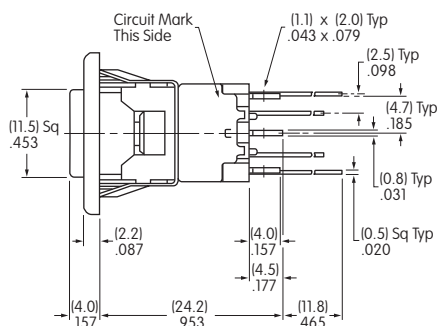
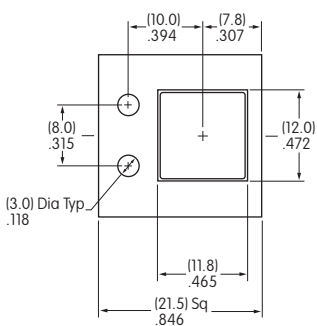
### Solder Lug • AT207 Bezel



**MBNR15JW01-C-1A**

### Single Pole

### Solder Lug • AT212 Bezel



**MBNR15JW01-C-3A-CF**