

General Specifications

Electrical Capacity (Resistive Load)

Power Level (silver):	3A @ 125V AC & 2A @ 250V AC or 2A @ 30V DC
Logic Level (gold):	0.4VA maximum @ 28V AC/DC maximum (Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)

Other Ratings

Contact Resistance:	10 milliohms maximum for silver; 20 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:	50,000 operations minimum
Electrical Life:	25,000 operations minimum for silver; 50,000 operations minimum for gold

Nominal Operating Force: Momentary Action: 1-pole 9.32N; 2-pole 16.18N; 4-pole 25.54N;
Alternate Action: 1-pole 4.41N; 2-pole 7.06N; 4-pole 11.77N

Contact Timing:	Slow make, slow break		
Plunger Travel:	Screw-on Cap (Mom.)	Screw-on Cap (Alt.)	Snap-on Cap (Mom. & Alt.)
Pretravel:	.028" (0.71mm)	.110" (2.80mm)	.125" (3.19mm)
Overtravel:	.043" (1.09mm)	.043" (1.09mm)	.050" (1.26mm)
Total Travel	.071" (1.80mm)	.153" (3.90mm)	.175" (4.45mm)

Materials & Finishes

Plunger:	Brass w/nickel plating; polyacetal w/B1 bushing
Bushing:	Brass with nickel plating
Frame:	Stainless steel
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 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 Temp Range:	-30°C through +85°C (-22°F through +185°F)
Humidity:	90 ~ 95% humidity for 96 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:	50G (490m/s ²) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)
Sealing:	B3 & D3 bushing options equivalent to IP67

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 Time & Temp:	Wave Soldering (PC version): See Profile A in Supplement section. Manual Soldering: See Profile A in Supplement section.
Process Seal:	These devices are not process sealed. Hand clean locally using alcohol based solution.

Standards & Certifications

Flammability Standards:	UL94V-0 case
UL:	Contact NKK Switches for UL or CUL marking option requirements.

Distinctive Characteristics

Guide interlocked with actuator block prevents window locking and maintains correct plunger alignment to assure contact stability.

Employs an over-center actuator mechanism, which diminishes sparking and increases operating life in AC circuits.

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

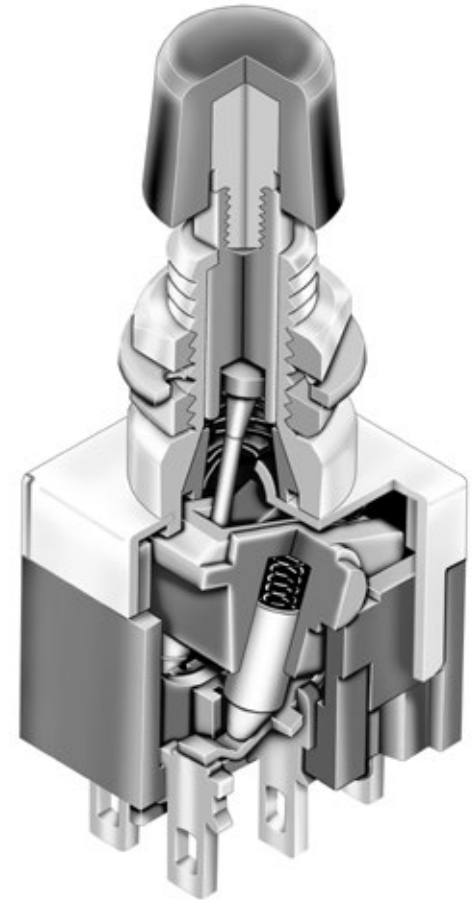
Splashproof option (D3 and B3 bushing codes) features an o-ring within the bushing and one under the face nut to protect from splashed, sprayed, or spilled liquids. Splashproof models meet IP67 of IEC 60529 Standards at front panel (dust tight and water protected from effects of temporary immersion).

High insulating barriers, formed in the molded diallyl phthalate case, increase isolation of circuits in multipole devices.

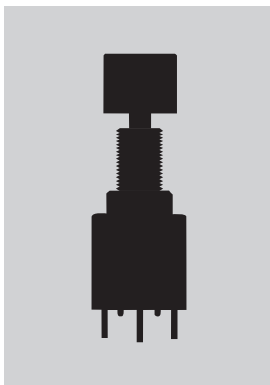
Prominent external insulating barriers increase insulation resistance and dielectric strength.




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

Clinching of the frame to the case well above the base and terminals provides 1,500V dielectric strength.



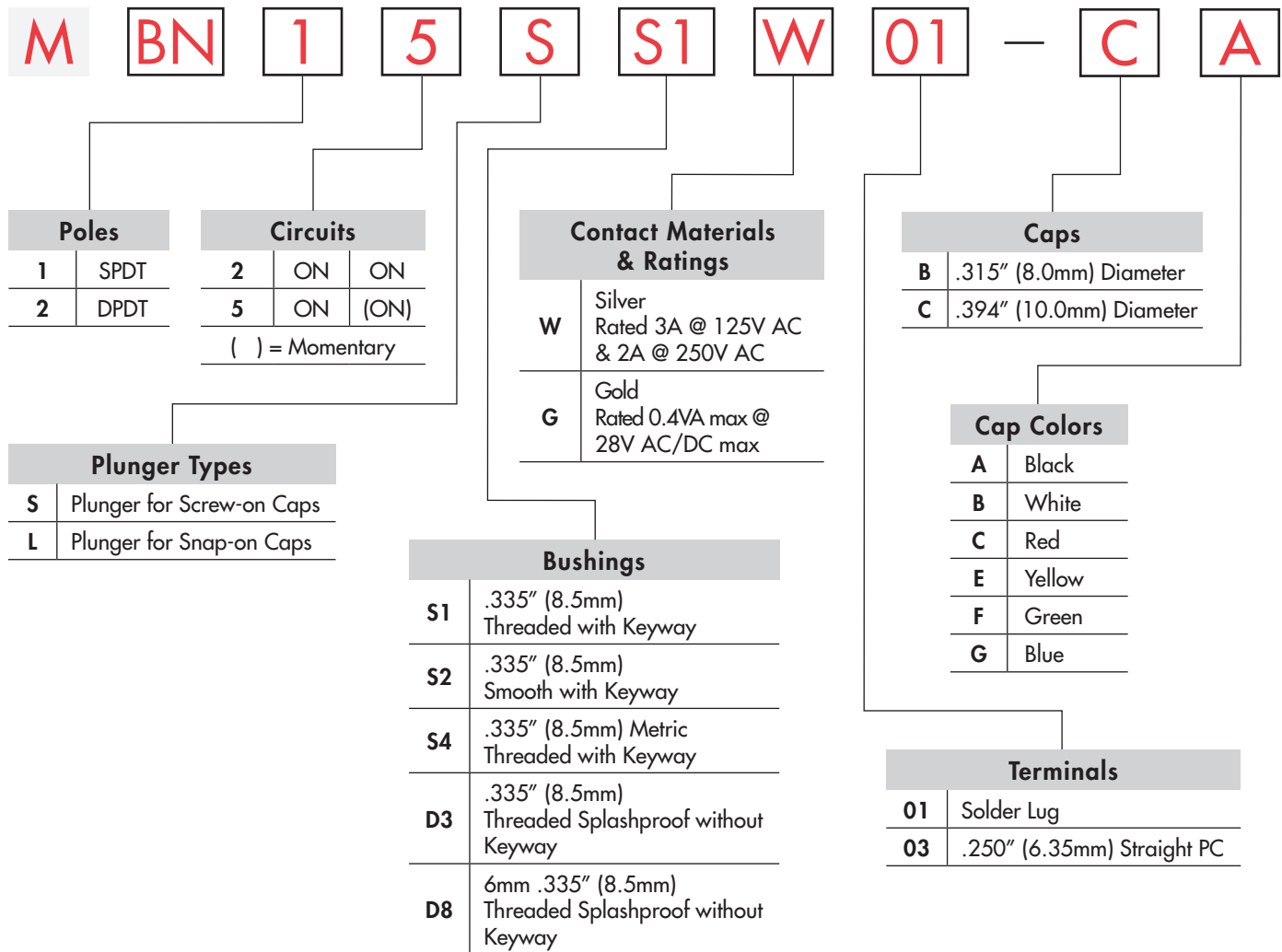
Actual Size



	Bushing Mount	Page C74
	Bracket PC Mount	Page C80
	Large Bushing	Page C85

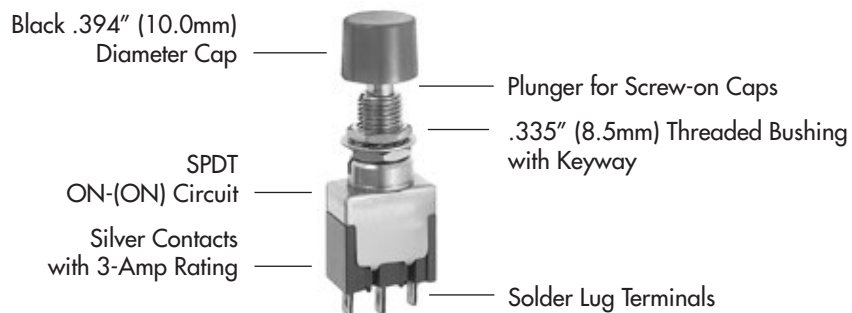
- Toggle
- Rockers
- Pushbuttons**
- Illuminated PB
- Programmable
- Keylocks
- Rotaries
- Slides
- Tactiles
- Tilt
- Touch
- Indicators
- Accessories
- Supplement

TYPICAL SWITCH ORDERING EXAMPLE






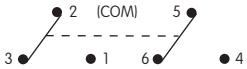


DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

MBN15SS1W01-CA



POLES & CIRCUITS

		Plunger Position () = Momentary		Connected Terminals		Throw & Switch Schematics
Pole	Model	Normal  Keyway	Down 	Normal  Keyway	Down 	Note: Terminal numbers are not actually on the switch.
SP	MBN12	ON	ON	2-3	2-1	SPDT 
	MBN15	ON	(ON)			
DP	MBN22	ON	ON	2-3 5-6	2-1 5-4	DPDT 
	MBN25	ON	(ON)			

PLUNGER TYPES

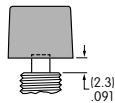
On alternate action models, after transferring circuit, the plunger returns to its original position and does not latch down.

S

Plunger for Screw-on Caps



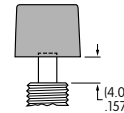
Momentary
Plunger Length



Momentary
Cap Location



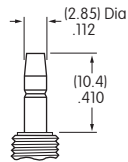
Alternate
Plunger Length



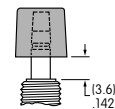
Alternate
Cap Location

L

Plunger for Snap-on Caps



Momentary & Alternate
Plunger Length

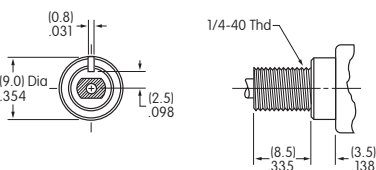


Momentary & Alternate
Cap Location

BUSHINGS

S1

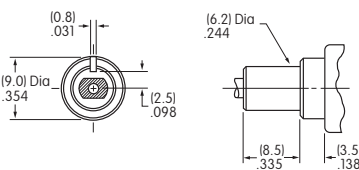
**.335" (8.5mm)
Threaded with Keyway**



Maximum Panel Thickness with
Standard Hardware: .154" (3.9mm)

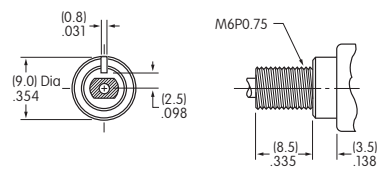
S2

**.335" (8.5mm)
Smooth with Keyway**



S4

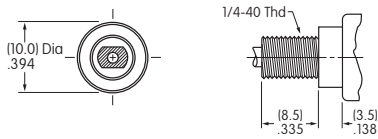
**.335" (8.5mm) Metric
Threaded with Keyway**



Maximum Panel Thickness with
Standard Hardware: .154" (3.9mm)

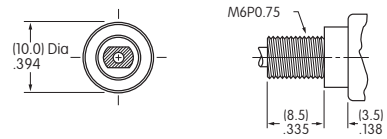
BUSHINGS

D3 .335" (8.5mm)
Threaded Splashproof without Keyway



Maximum Panel Thickness with Standard Hardware: .240" (6.1mm)

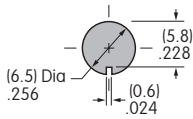
D8 .335" (8.5mm)
Threaded Splashproof without Keyway



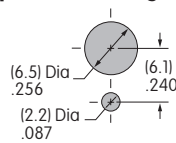
Maximum Panel Thickness with Standard Hardware: .240" (6.1mm)

Panel Cutouts

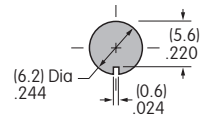
For S1, S2 Bushing with Keyway



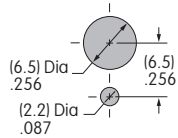
For S1 Bushing with Optional Locking Ring



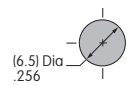
For S4 Bushing with Keyway



For S4 Bushing with Optional Locking Ring



For D3 or D8 Bushing without Keyway



Standard hardware for bushings S1 & S4 includes 2 hex nuts & 1 lockwasher; D3 bushing has 1 hex nut & 1 o-ring. Standard & optional hardware are illustrated following the Typical Switch Dimension drawings.

CONTACT MATERIALS & RATINGS

W Silver **Power Level** 3A @ 125V AC & 2A @ 250V AC

G Gold **Logic Level** 0.4VA maximum @ 28V AC/DC maximum

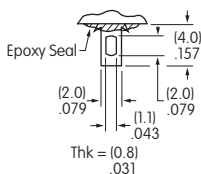
Note: Complete explanation of operating range in Supplement section.

Gold over Silver **Power Level or Logic Level** 3A @ 125V AC & 2A @ 250V AC or 0.4VA maximum @ 28V AC/DC maximum

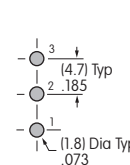
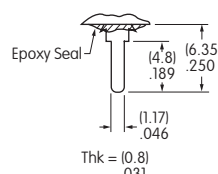
Note: Gold over silver is available as a custom option. This dual rated option is suitable when two or more identical switches are used in logic and in power circuits within the same application. See Supplement section to find complete explanation of dual rating and operating range.

TERMINALS

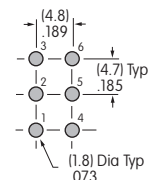
01 Solder Lug



03 .250" (6.35mm)
Straight PC



Single Pole



Double Pole

CAPS & CAP COLORS

B **AT413**
 .315" (8.0mm) Diameter
 Screw-on Cap

AT443
 .315" (8.0mm) Diameter
 Snap-on Cap

C **AT407**
 .394" (10.0mm) Diameter
 Screw-on Cap

AT442
 .394" (10.0mm) Diameter
 Snap-on Cap

For use with Plunger Code S

For use with Plunger Code L

For use with Plunger Code S

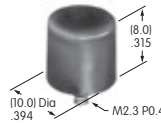
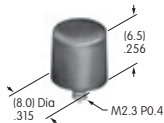
For use with Plunger Code L

Cap Material: PBT
 Finish: Glossy

Cap Material: Polycarbonate
 Finish: Glossy

Cap Material: PBT
 Finish: Glossy

Cap Material: Polycarbonate
 Finish: Glossy



Cap Colors Available:

A

Black

B

White

C

Red

E

Yellow

F

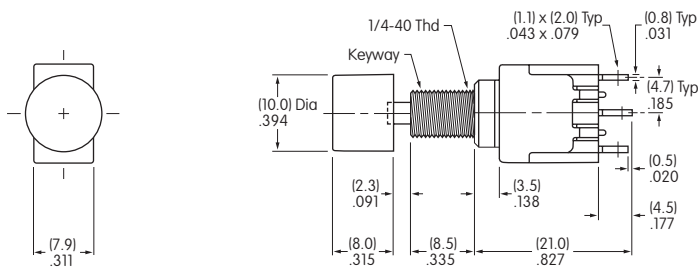
Green

G

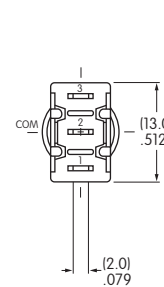
Blue

TYPICAL SWITCH DIMENSIONS

Single Pole

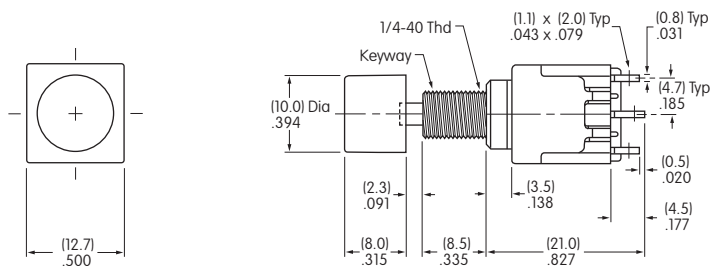


Solder Lug

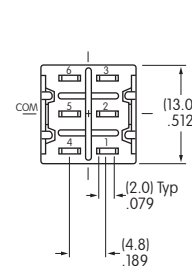


MBN15SS1W01-CA

Double Pole



Solder Lug



MBN25SS1W01-CA

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

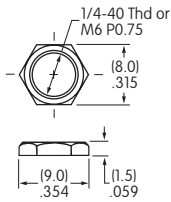
HARDWARE

Standard Hardware

AT513H for Inch AT513M for Metric Hexagon Nut

2 included with each switch
(1 with splashproof models)

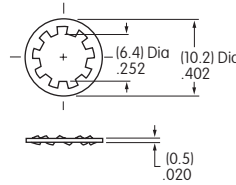
Material:
Brass with
Nickel plating



AT509 Lockwasher

1 included with each switch
(not with splashproof models)

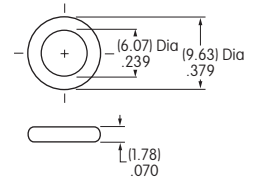
Material:
Steel with
Zinc/Chromate



AT516 O-ring for Splashproof Bushing

1 included with each
splashproof model

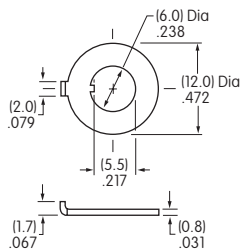
Material:
Nitrile butadiene
rubber



Optional Hardware

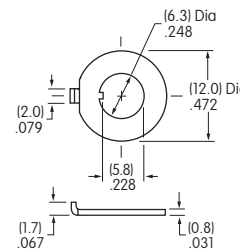
AT507M for Metric Locking Ring

Material:
Steel with
Zinc/Chromate



AT507H for Inch Locking Ring

Material:
Steel with
Zinc/Chromate



Optional Mounting Collars/Conical Nuts

AT512H for Inch AT512M for Metric Conical Nut

Used with .315" (8.0mm)
Diameter Cap (cap code B)
Material:
Brass with
chrome plating



AT512CH for Inch AT512CM for Metric Conical nut

Used with .394" (10.0mm)
Diameter Cap (cap code C)
Material:
Brass with
chrome plating



Optional Splashproof Boots for S Plunger

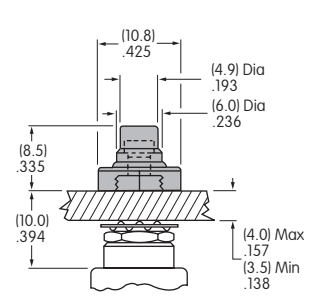
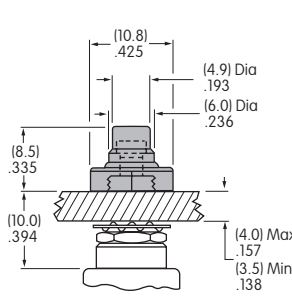
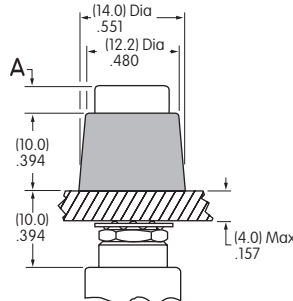
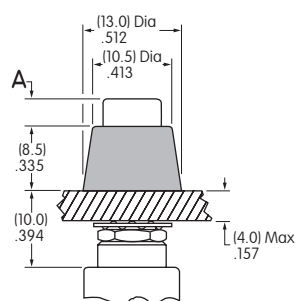
AT4041H for Inch AT4041M for Metric Boot for Momentary

Material:
Silicone rubber



AT4042H for Inch AT4042M for Metric Boot for Alternate

Material:
Silicone rubber



Dimension A = Cap Height

Operating Life 50,000

Operating Life 30,000

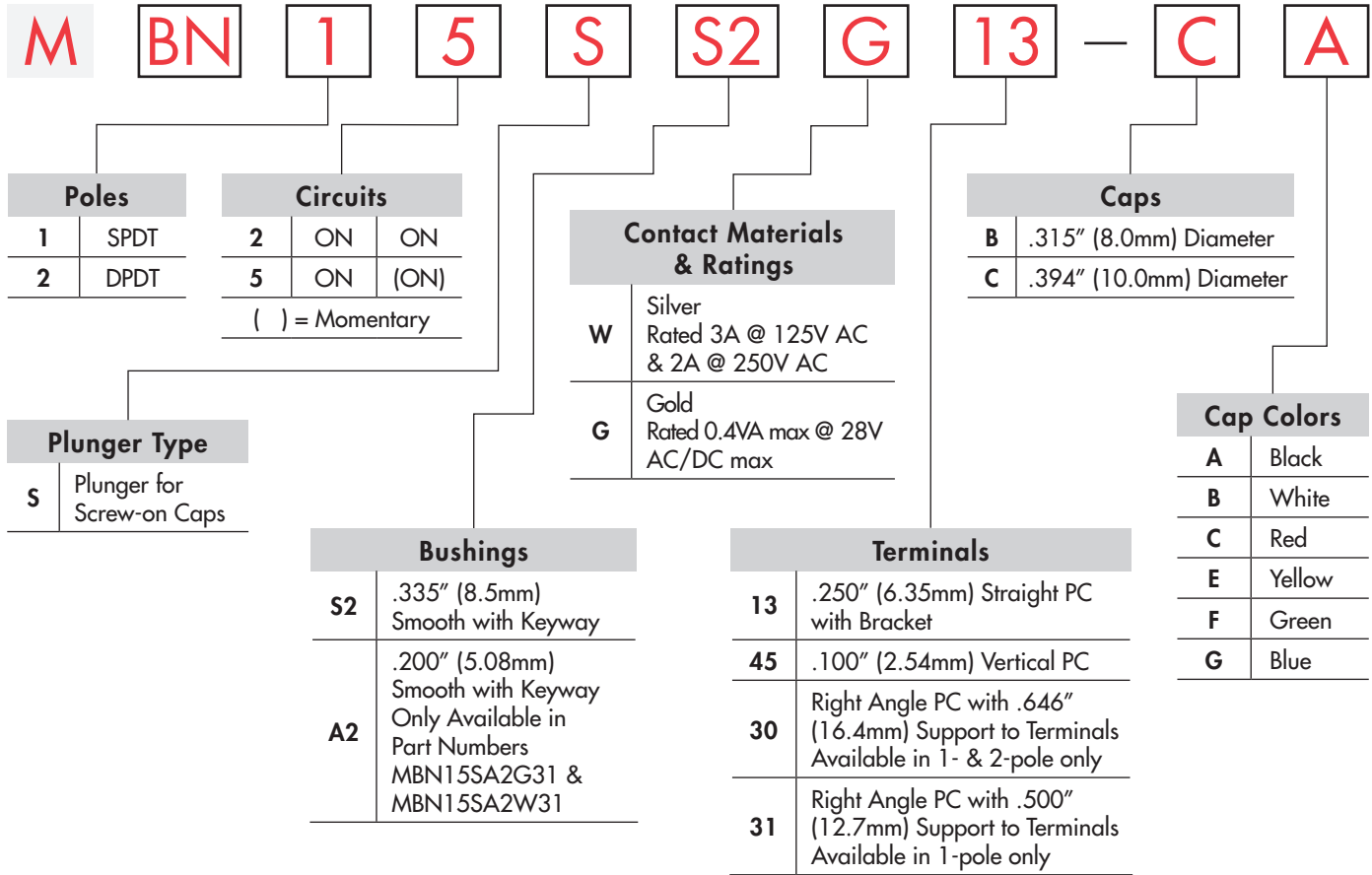
.091" (2.3mm) for Momentary with Plunger Code S
.157" (4.0mm) for Alternate with Plunger Code S
.142" (3.6mm) for Momentary & Alternate with Plunger Code L

Boots for momentary devices are accompanied by a threaded adaptor which extends the length of the plunger.

Optional Conical Nuts fit with all 8.5mm bushing options except the D3 & S2 bushings.

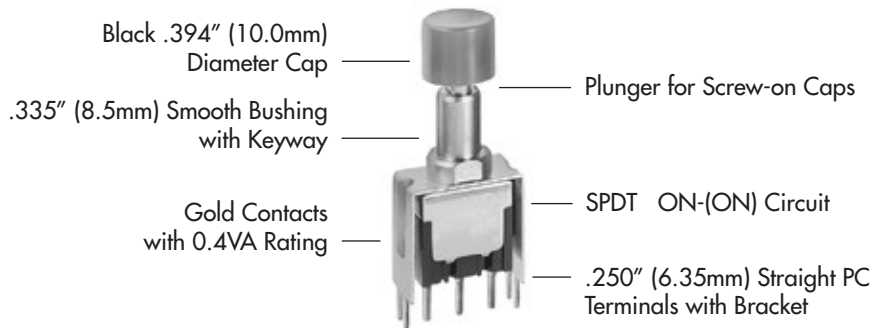
Toggles
Rockers
Pushbuttons
Illuminated PB
Programmable
Keylocks
Rotaries
Slides
Tactiles
Tilt
Touch
Indicators
Accessories
Supplement

TYPICAL SWITCH ORDERING EXAMPLE



DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

MBN15SS2G13-CA



POLES & CIRCUITS

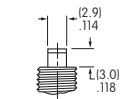
Pole	Model	Plunger Position () = Momentary		Connected Terminals		Throw & Switch Schematics
		Normal	Down	Normal	Down	
						Note: Terminal numbers are not actually on the switch.
SP	MBN12 MBN15	ON ON	ON (ON)	2-3	2-1	SPDT
DP	MBN22 MBN25	ON ON	ON (ON)	2-3 5-6	2-1 5-4	DPDT

PLUNGER TYPE

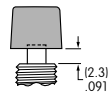
On alternate action models, after transferring circuit, the plunger returns to its original position and does not latch down.

S

Plunger for Screw-on Caps



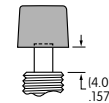
Momentary Plunger Length



Momentary Cap Location



Alternate Plunger Length

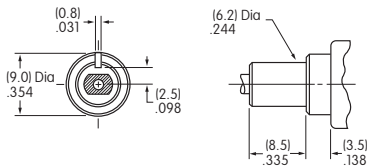


Alternate Cap Location

BUSHINGS

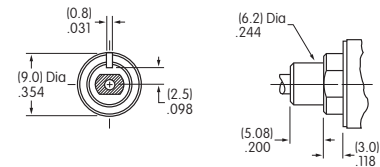
S2

.335" (8.5mm)
Smooth with Keyway



A2

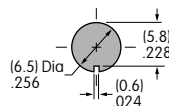
.200" (5.08mm)
Smooth with Keyway



Only available in part numbers
MBN15SA2W31 & MBN15SA2G31

Panel Cutout

For S2 or A2 Bushing with Keyway



CONTACT MATERIALS & RATINGS

W Silver **Power Level** 3A @ 125V AC & 2A @ 250V AC

G Gold **Logic Level** 0.4VA maximum @ 28V AC/DC maximum

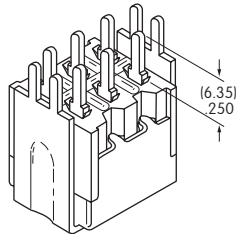
Note: Complete explanation of operating range in Supplement section.

Gold over Silver **Power Level or Logic Level** 3A @ 125V AC & 2A @ 250V AC or 0.4VA maximum @ 28V AC/DC maximum

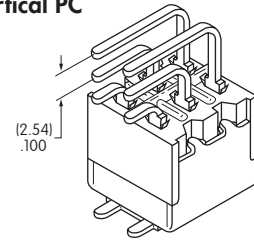
Note: Gold over silver is available as a custom option. This dual rated option is suitable when two or more identical switches are used in logic and in power circuits within the same application. See Supplement section to find complete explanation of dual rating and operating range.

TERMINALS

13 .250" (6.35mm) Straight PC with Bracket

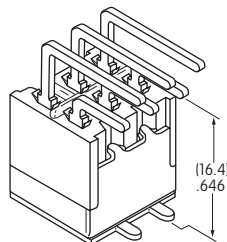


45 .100" (2.54mm) Vertical PC



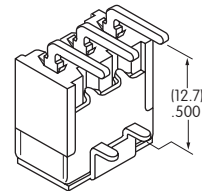
30 Right Angle PC with .646" (16.4mm) Support to Terminal

Only Available in 1 & 2 Pole



31 Right Angle PC with .500" (12.7mm) Support to Terminal

Only Available in 1 Pole



Note: Full dimensioned drawings appear on the following pages.

CAPS & CAP COLORS

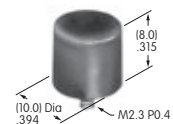
B AT413 .315" (8.0mm) Diameter Screw-on Cap

Cap Material: PBT
Finish: Glossy



C AT407 .394" (10.0mm) Diameter Screw-on Cap

Cap Material: PBT
Finish: Glossy



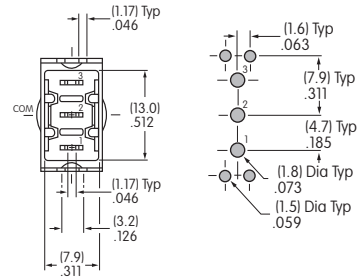
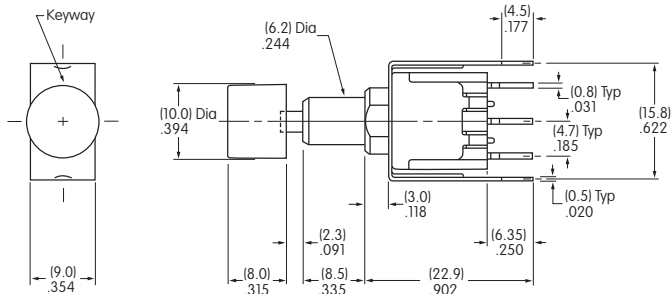
Cap Colors Available:

A Black **B** White **C** Red **E** Yellow **F** Green **G** Blue

TYPICAL SWITCH DIMENSIONS

Single Pole

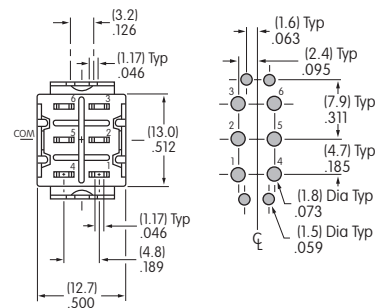
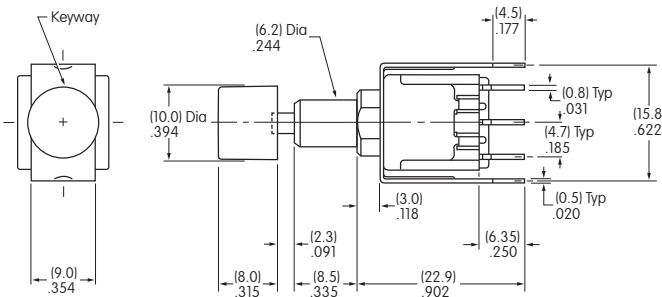
Straight PC with Bracket



MBN15SS2G13-CA

Double Pole

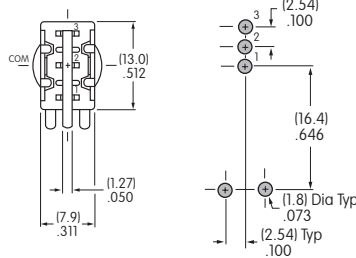
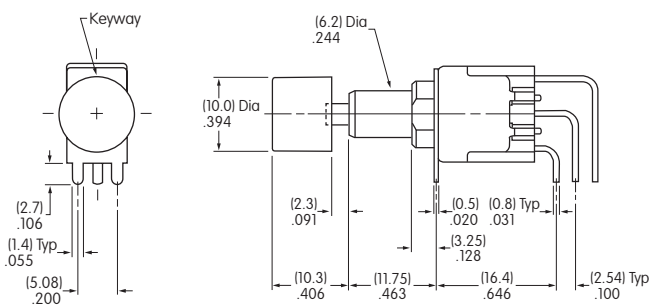
Straight PC with Bracket



MBN25SS2G13-CA

Single Pole

.100" (2.54mm) Vertical PC

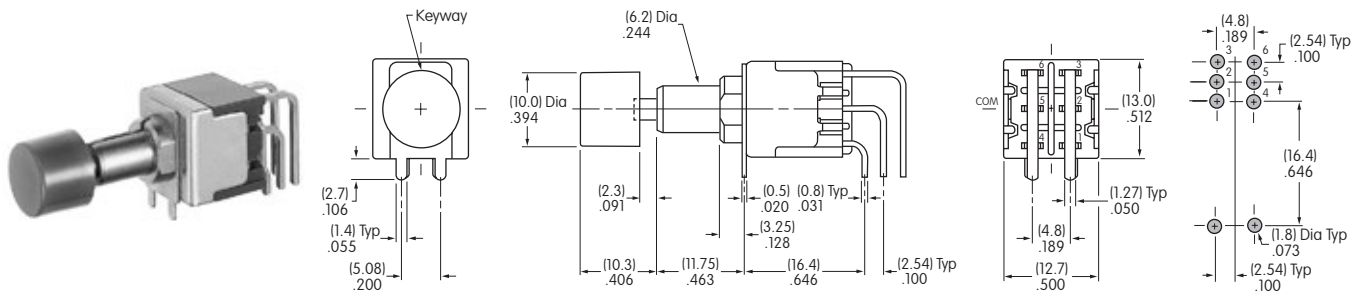


MBN15SS2G45-CA

TYPICAL SWITCH DIMENSIONS

.100" (2.54mm) Vertical PC

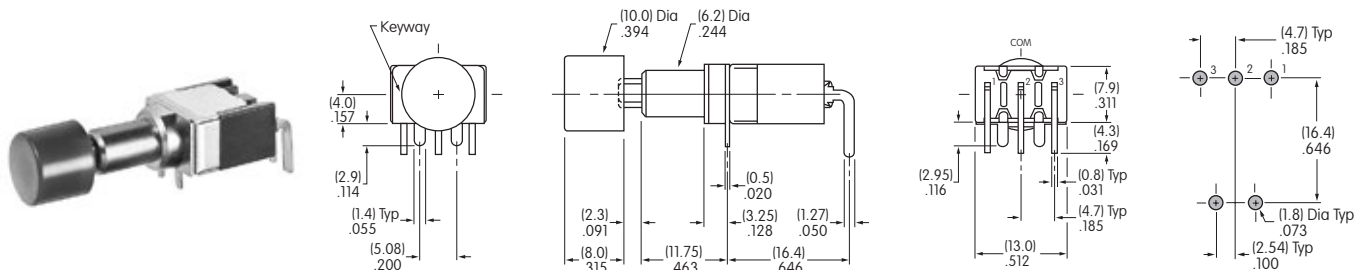
Double Pole



MBN25SS2G45-CA

Right Angle PC

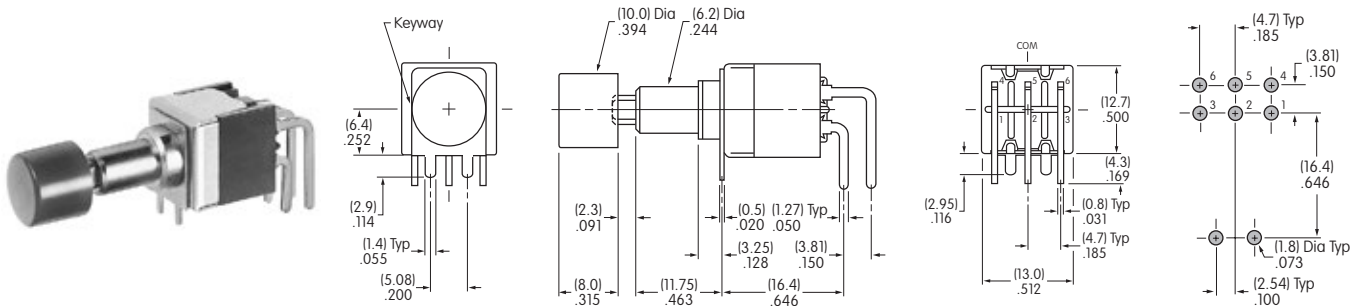
Single Pole



MBN12SS2G30-CA

Right Angle PC

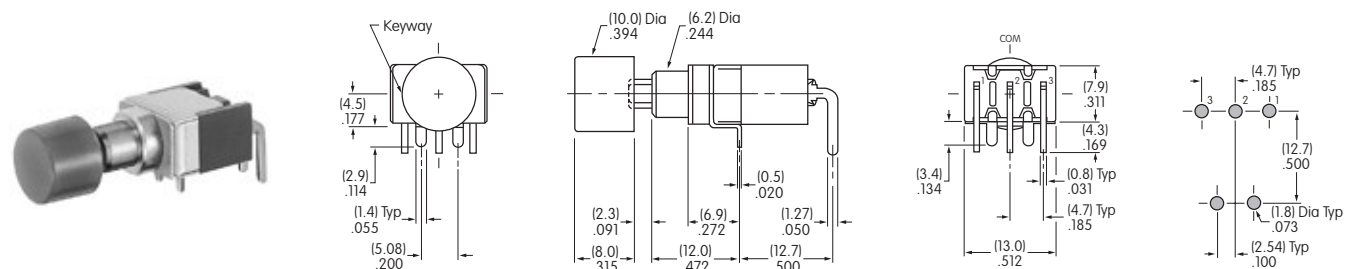
Double Pole



MBN22SS2G30-CA

Right Angle PC with .500" (12.7mm) Support to Terminal

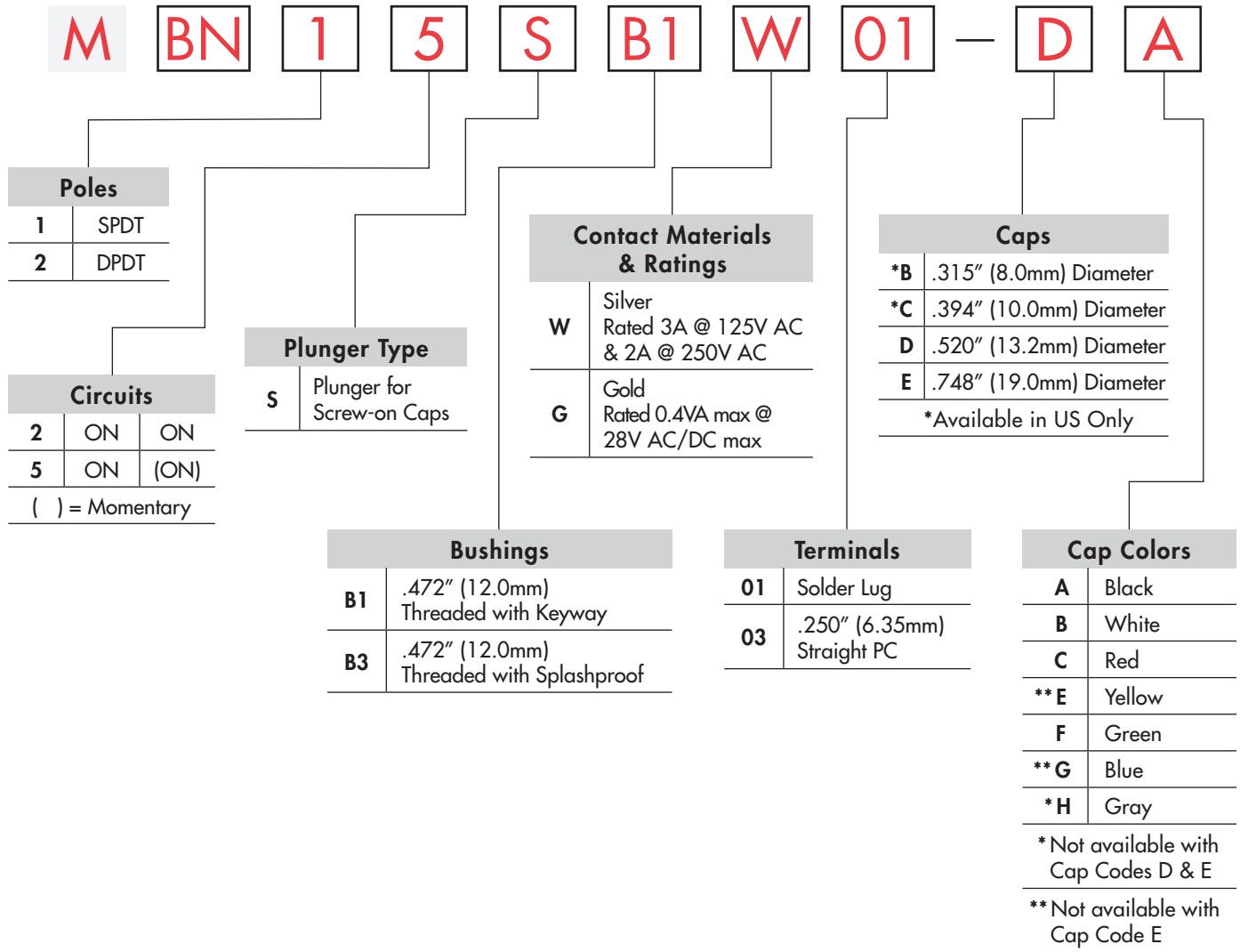
Single Pole



MBN15SA2G31-CA

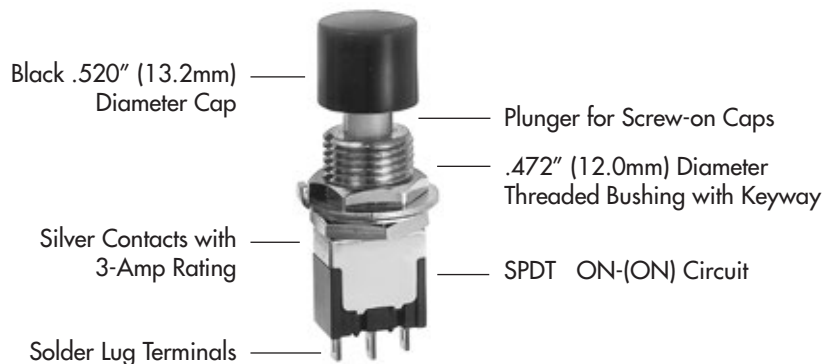
Toggles
Rockers
Pushbuttons
Illuminated PB
Programmable
Keylocks
Rotaries
Slides
Tactiles
Tilt
Touch
Indicators
Accessories
Supplement

TYPICAL SWITCH ORDERING EXAMPLE



DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

MBN15SB1W01-DA



Toggles

Rockers

Pushbuttons

Programmable Illuminated PB

Keylocks

Rotaries

Slides

Tactiles

Tilt






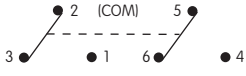
Touch

Indicators

Accessories

Supplement

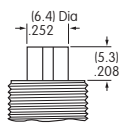
POLES & CIRCUITS

		Plunger Position () = Momentary		Connected Terminals		Throw & Switch Schematics
Pole	Model	Normal 	Down 	Normal 	Down 	Note: Terminal numbers are not actually on the switch.
SP	MBN12 MBN15	ON	ON (ON)	2-3	2-1	SPDT 
DP	MBN22 MBN25	ON	ON (ON)	2-3 5-6	2-1 5-4	DPDT 

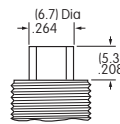
PLUNGER TYPE

S

Plunger for Screw-on Caps
Plunger is plastic for B1 bushing.



Plunger is metal for B3 bushing.



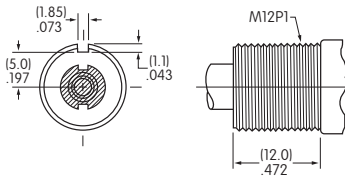
On alternate action models, after transferring circuit, the plunger returns to its original position, and does not latch down.

BUSHINGS

B1

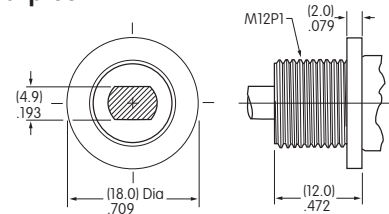
.472" (12.0mm) Diameter Threaded with Keyway

Maximum Panel Thickness with Standard Hardware: **.217" (5.5mm)**


B3

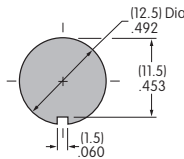
.472" (12.0mm) Diameter Threaded Splashproof

Maximum Panel Thickness with Standard Hardware: **.217" (5.5mm)**

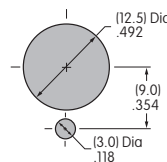


Panel Cutouts

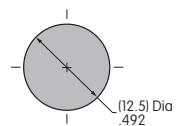
For B1 Bushing with Keyway



For B1 Bushing with Locking Ring



For B3 Bushing without Keyway



CONTACT MATERIALS & RATINGS

W

Silver

Power Level

3A @ 125V AC & 2A @ 250V AC

G

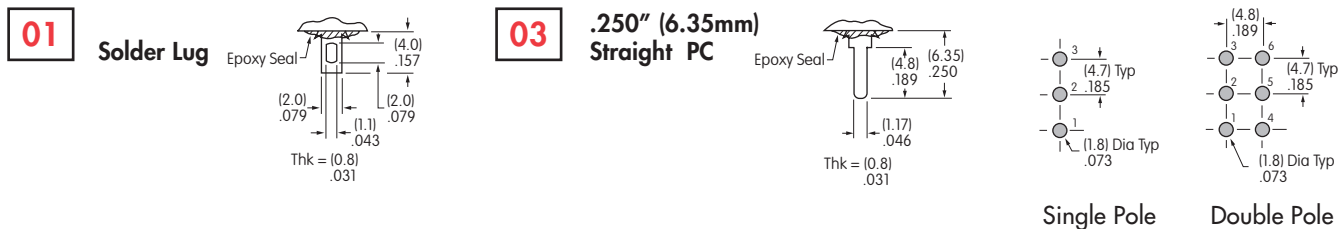
Gold

Logic Level

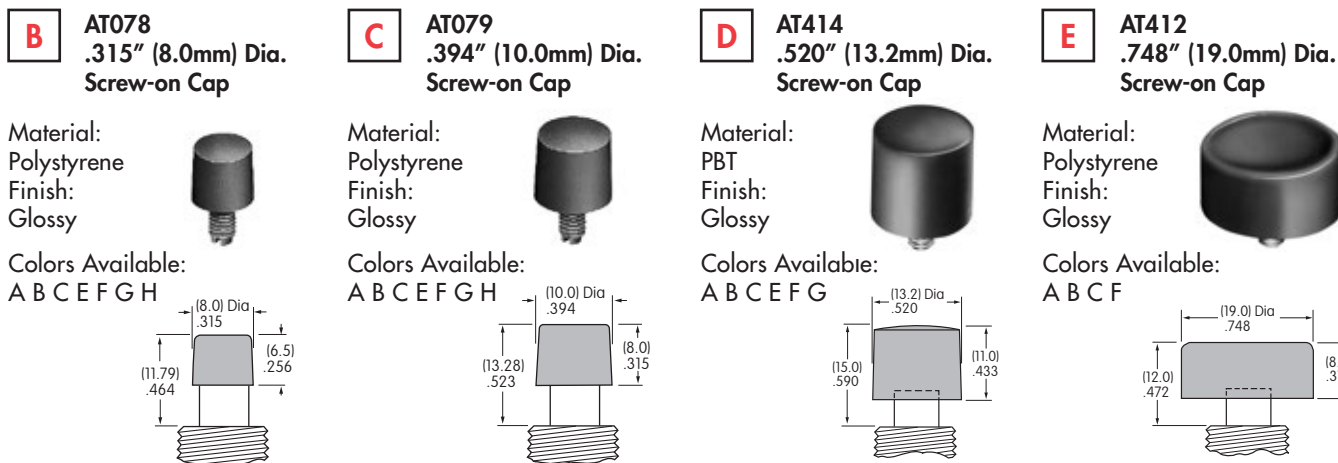
0.4VA maximum @ 28V AC/DC maximum

Note: Complete explanation of operating range in Supplement section.

TERMINALS

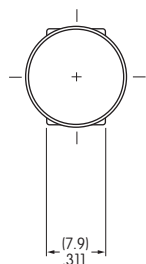


CAPS & CAP COLORS

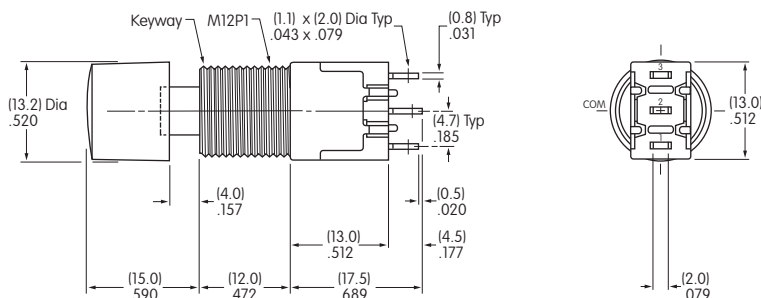


TYPICAL SWITCH DIMENSIONS

Solder Lug

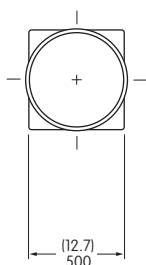


Single Pole

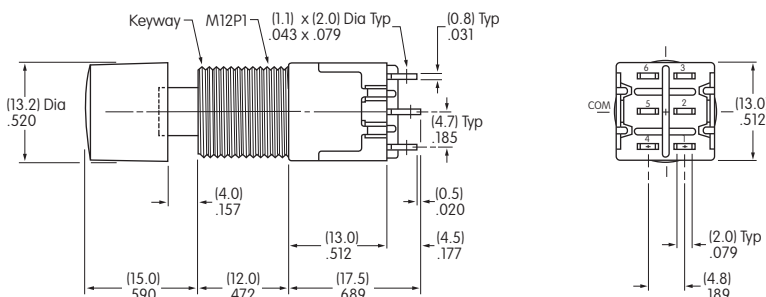


MBN15SB1W01-DA

Solder Lug



Double Pole



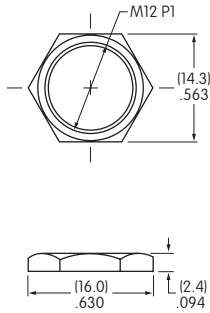
MBN25SB1W01-DA

HARDWARE

Standard Hardware for B1 Bushing

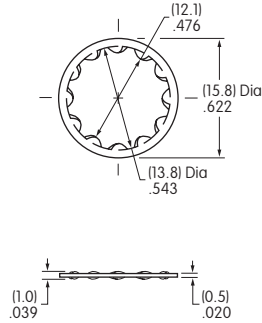
AT503M Hex Face Nut

Material:
Brass with Chrome plating



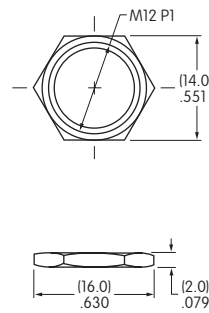
AT508 Lockwasher

Material:
Steel with Zinc/Chromate



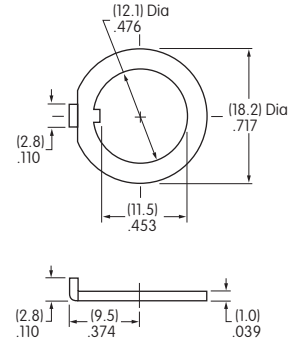
AT527M Hex Nut

Material:
Steel with Nickel plating



AT506M Locking Ring

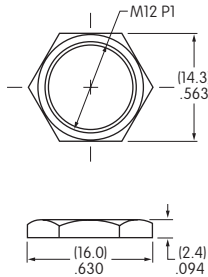
Material:
Steel with Zinc/Chromate



Standard Hardware for B3 Bushing

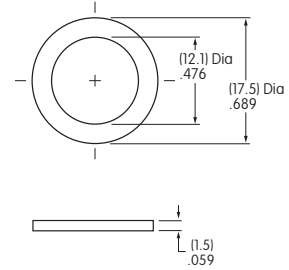
AT503M Hex Face Nut

Material:
Brass with Chrome plating



AT401P O-ring

Material:
Nitrile butadiene rubber



Optional Splashproof Boot for B1 Bushing

AT4043 Splashproof Boot

Material: Silicone Rubber
Operating Life (when installed on switch):
50,000 for momentary
50,000 for alternate action

When using a splashproof boot, no cap is required.

