

Pushbutton Switches

SPST Sealed Round Pushbutton Switches

PB16 Series



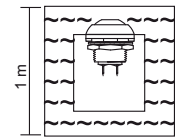
FEATURES :

- > Sealed Protection Degree IP67
- > Snap-in and threaded bushing
- > Compact and light weight
- > Tactile feeling
- > Plating gold over silver
- > Vapor phase solderable

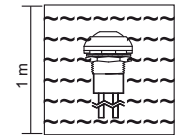
IP67

ACCORDING TO
EN 60529:1991+A1:2001
IEC 60529:2001

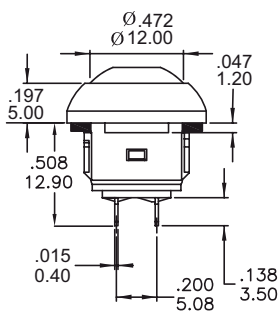
Protected against the effects of immersion up to 1 m water(30mn)



Sealed Type 1:
IP67 for Panel Surface

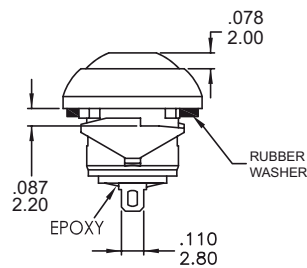


Sealed Type 2:
IP67 for Whole Body



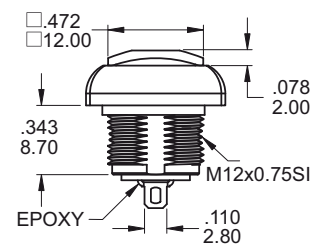
PB16B1TS1...

OFF-MOM
Flat Top Actuator
Snap-in Bushing
Solder Lug Terminals
IP67 for Panel Surface



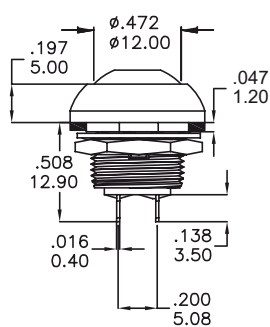
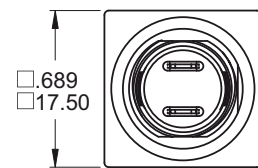
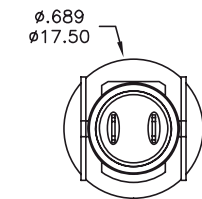
PB16D1TS1...

OFF-MOM
Flat Top Actuator
Square Threaded Bushing
Solder Lug Terminals
IP67 for Panel Surface



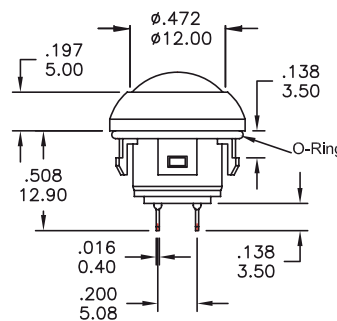
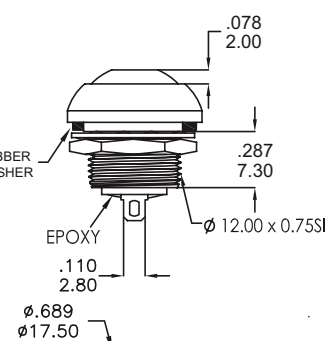
PB16B2TS1...

OFF-MOM
Flat Top Actuator
Threaded Bushing
Solder Lug Terminals
IP67 for Panel Surface



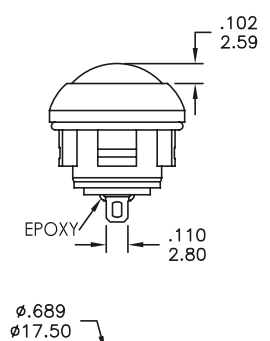
PB16B3TS1...

OFF-MOM
Flat Top Actuator
Threaded Bushing
Solder Lug Terminals
IP67 for Panel Surface



PB16B3TS1...

OFF-MOM
Spherical Top Actuator
Snap-in Bushing
Solder Lug Terminals
IP67 for Panel Surface



How to order:

PB16

- 1 CIRCUITS:**
1 OFF-MOM
2 ON-MOM (without LED)
3 OFF-ON (only with Bushing B2)

- 2 ACTUATOR:**
blank Flat Top
R Spherical Top (only without LED)

- 3 BUSHING:**
B1 Snap-in
B2 Threaded Bushing
B3 Snap-in
D1... Square Threaded Bushing (die-casting, see page 2)
D2... Threaded Bushing (die-casting, see page 2)

- 4 TERMINALS:**
TS Solder Lug
W1 Wire Type 1 (See Drawing)
W2 Wire Type 2 (See Drawing)

- 5 SEAL**
1 O-Ring & Epoxy (IP67 for Panel Surface)
2 O-Ring & Wire Type 2 Terminals (IP67 for whole body)

- 6 ACTUATOR COLOR:**
A Black B White
C Red D Orange
E Yellow F Green
G Blue

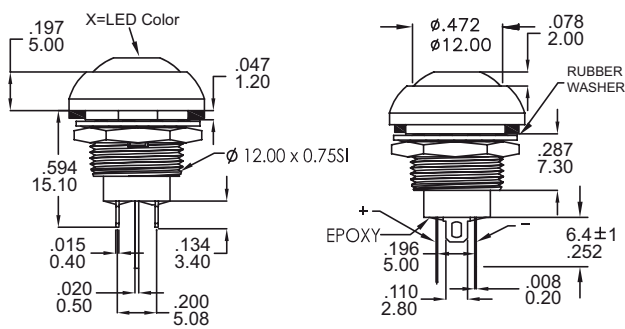
- 7 LED COLOR:**
N No LED B White
C Red E Yellow
F Green G Blue

- 8 ADDITIONAL CAP:**
blank No Cap
W With Cap

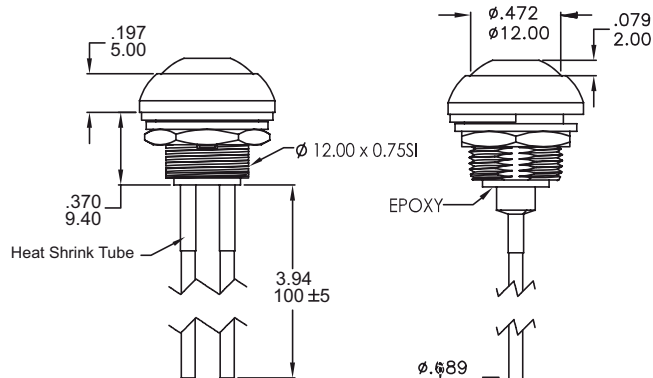
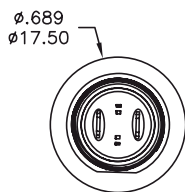
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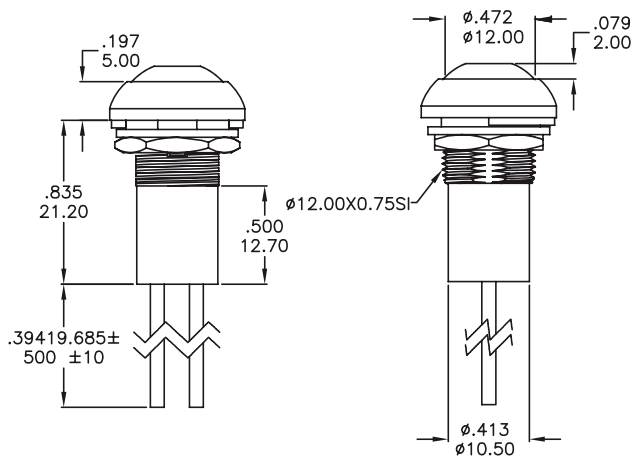
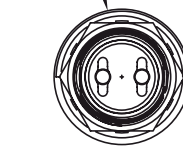
PB16 Series



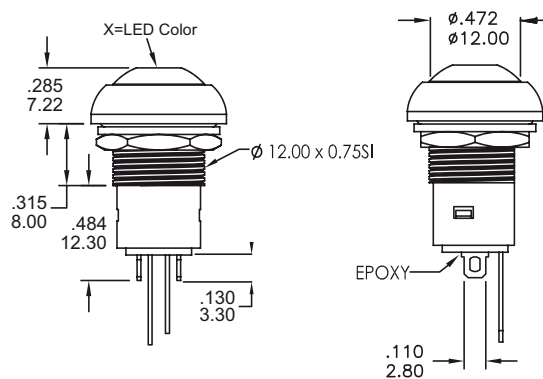
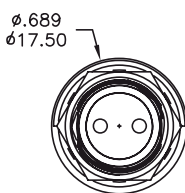
PB161B2TS1...X
OFF-MOM
Flat Top Actuator
Threaded Bushing
Solder Lug Terminals
Illuminated with LED
IP67 for Panel Surface



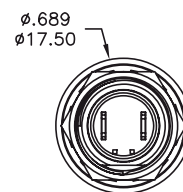
PB161B2W11...
OFF-MOM
Flat Top Actuator
Threaded Bushing
Wire Terminals Type 1
IP67 for Panel Surface



PB161B2W22...
OFF-MOM
Flat Top Actuator
Threaded Bushing
Wire Terminals Type 2
IP67 for Whole Body



PB163B2TS1...X
OFF-ON
Flat Top Actuator
Threaded Bushing
Solder Lug Terminals
Illuminated with LED
IP67 for Panel Surface



BUSHING PLATING

NEW



- PLATING
- A Chromium
 - B Tin-nickel Alloy
 - C Stain-chromium
 - D Stain-nickel



Chromium



Tin-nickel Alloy



Stain-chromium



Stain-nickel

LED ELECTRO-OPTICAL DATA

	Lens Appearance	Color	Electro-optical Data (AT 20mA)				Viewing Angle 2θ 1/2 (deg)
			Vf(V)		Iv(mcd)		
			Typ.	Max.	Min.	Typ.	
PB161 (OFF-MOM)	Water Clear	Super Red	2.1	2.6	42.0	100.0	35°
		Super Yellow Green	2.0	2.6	42.0	80.0	
		Super Yellow	2.1	2.6	94.0	200.0	
		Super Blue	2.8	3.2	28.0	70.0	
		Super White	3.5	4.0	140.0	300.0	
PB163 (OFF-ON)	Water Clear	Super Red	2.0	2.6		3.5	60°
		Super Green	2.2	2.6		3.5	
		Super Yellow	2.1	2.6		3.5	

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SWITCH FUNCTION

NO. POLES	MODEL NO.	SWITCH FUNCTION		CONNECTED TERMINALS		SCHEMATIC
		POS.1	POS.2	POS.1	POS.2	
SP	PB161	OFF	MOM	OPEN	1-3	
SP	PB162	ON	OFF(MOM)	1-3	OPEN	
SP	PB163	OFF	ON	OPEN	1-3	

MOM=MOMENTARY

GENERAL SPECIFICATIONS

RATING:

PB16 1 / 2	400mA 32VAC-100mA 50VDC-125mA 125VAC
PB16 3	100mA 24VDC-life expectancy 200,000 cycles 2A 125VAC-life expectancy 10,000 cycles

INITIAL CONTACT RESISTANCE:

PB16 1 / 2	50mΩmax.
PB16 3	100mΩmax.

INSULATION RESISTANCE: 1GΩmin.at 500VDC.

DIELECTRIC STRENGTH: 1,000 VAC rms.

ELECTRICAL LIFE AT FULL LOAD: 500,000 cycles.

OPERATING TEMPERATURE: -30°C to 85°C.

PANEL THICKNESS:

PB16 1 / 2	- B1 bushing : 0.8 mm (.031) min. -1.8 mm (.071) max.
	- B2 bushing : 1.5 mm (.059) min. -4 mm (.157) max.
	- B3 bushing : 3.0±0.25 mm (.118)
PB16 3	- B2 bushing : 1.5 mm (.059) min. -5.5 mm (.217) max.

TOTAL TRAVEL:

PB16 1 / 2	1.5 mm(.59)
PB16 3	2.5 mm(.98)

OPERATING FORCE:

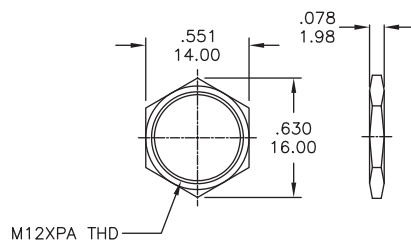
PB16 1 / 2	2N~5N
PB16 3	5.5N+/-1.5N.

CONTACT BOUNCE:10 ms.

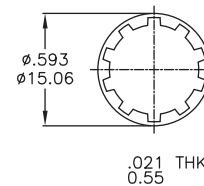
MECHANICAL LIFE:1,000,000 cycles.

TORQUE:1.5 Nm max.applied to nut.

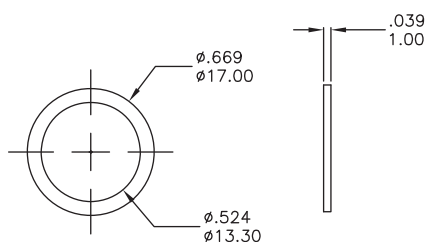
HARDWARE



M12 PA Nuts



Locking Washer



Rubber Washer



Cap

GENERAL SPECIFICATIONS

1. Style

This specification describes “Snap-Acting Pushbutton Switches”, mainly used as signal switch of electric devices, with the general requirements of mechanical and electrical characteristic.

Operating Temperature Range : -30 °C~+85°C.

2. Current Range :

2.1 Silver Plating Standard :

Plating		Rating
Gold over silver	Fixed Terminal : Copper alloy with silver plated over gold plate. Movable contact : Copper alloy with silver plated over gold plate.	3Amps @120VAC or 28VDC.

3. Type of Actuation: Snap-Acting Pushbutton Switches.

4. Test Sequence:

ELECTRIC PERFORMANCE	ITEM	DESCRIPTION	TEST CONDITIONS	REQUIREMENTS
	1	Visual Examination	By Visual Examination check without and out pressure & testing.	
2	Contact Resistance	@2-4VDC 100mA. For silver plated contacts.		50mΩ Max.

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	ITEM	DESCRIPTION	TEST CONDITIONS	REQUIREMENTS
ELECTRIC PERFORMANCE	3	Insulation Resistance	Measurements shall be made following application of 1000 V/DC 100mA potential across terminals and cover.	1000MΩ min/1000V.
	4	Dielectric Withstanding Voltage	1500 VAC(50Hz or 60Hz) shall be applied across terminals and cover for 1 minute.	There shall be no breakdown or flashover.
MECHANICAL PERFORMANCE	5	Solder Heat Resistance	Through Hole Type ■ Wave Soldering : ①Soldering Temperature : 260±5℃. ②Duration of Solder Immersion : 5 ±1 seconds. ③PCB is 1.6mm in thickness ■ Manual Soldering : ①Soldering Temperature : 350±5℃. ②Duration of Solder Heated : 5±1 seconds.	①Shall be free from pronounced backlash and falling-off or breakage terminals. ②As shown in item 2~4.
	6	Actuation Force	MODEL-1305N MECHANICAL TEST 500gram 、 1000gram 、 2000gram. OFF TO ON Total Travel	①At for test the force. Force : 2N~5N. ②Total Travel : 1.5 mm±0.25 mm
OPERATING LIFE	7	Operating Life	Measurements shall be made following the test forth below : ①3A,120VAC resistive load — silver plated. Electronics Life Test: 5,000 cycles. ②200mA,50VDC resistive load — gold plated. Electronics Life Test: 500,000 cycles. ③Rate of Operation: 6-8 operation cycles per minute. ④Mechanical Life Test: 1,000,000 cycles.	①Electronics Life Test : As shown in item 3~4. ②Mechanical Life Test : As shown in item 2~4.

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	ITEM	DESCRIPTION	TEST CONDITIONS	REQUIREMENTS
HUMIDITY RESISTANCE	8	Resistance Low Temperature	<p>Following the test set forth below the sample shall be left in normal temperature and humidity conditions for 1 hour before the measurements are made:</p> <p>①Temperature : $-40\pm 3^{\circ}\text{C}$. ②Time : 96 hours.</p>	As shown in item 2~4.
	9	Resistance High Temperature	<p>Following the test set forth below the sample shall be left in normal temperature and humidity conditions for an hour before the measurements are made:</p> <p>①Temperature : $85\pm 3^{\circ}\text{C}$. ②Time : 96 hours.</p>	As shown in item 2~4.
	10	Resistance Humidity	<p>Following the test set forth below the sample shall be left in normal temperature and humidity conditions for an hour before the measurements are made:</p> <p>①Temperature : $40\pm 2^{\circ}\text{C}$. ②Relative Humidity : 90~95%. ③Time : 96 hours.</p>	<p>①Contact Resistance : $10\text{m}\Omega$ Max. ②Insulation Resistance : $1000\text{M}\Omega$ min.</p>
	11	The Salt Testing	<p>Following the test set forth below the sample shall be left in normal temperature and humidity conditions for an hour before the measurements are made :</p> <p>①Temperature : $35\pm 2^{\circ}\text{C}$. ②The ratio of salt-water : 5%. ③The spray amount of salt- water : 1~2 ml/h. ④Time : 48 hours.</p>	The testing standard based on bubble,crack, And magnifying glass with gauge.

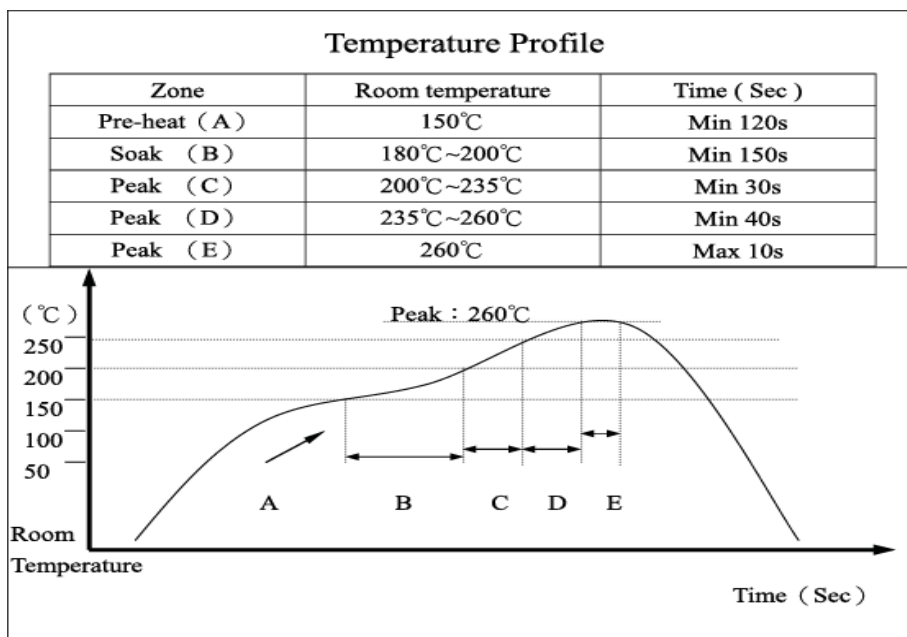
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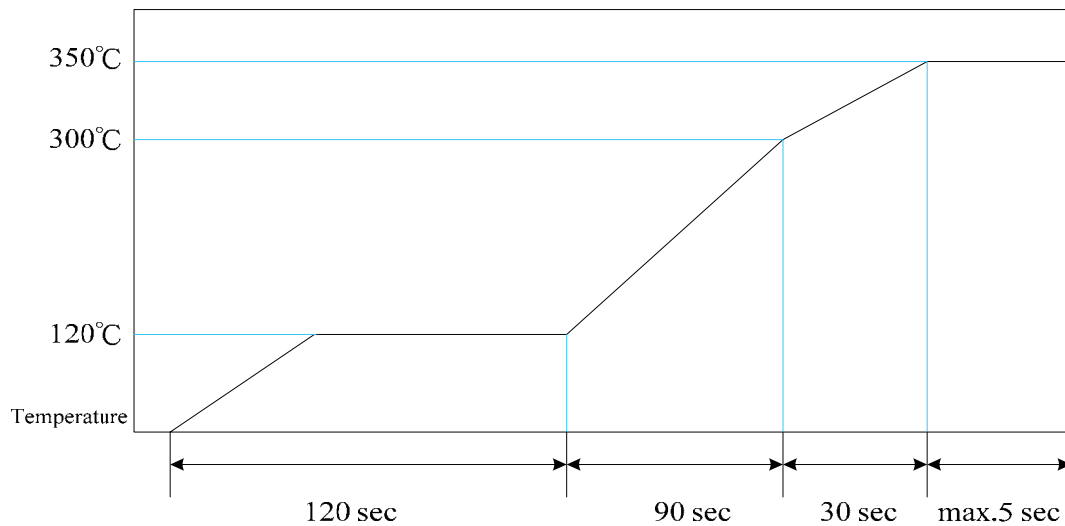
HUMIDITY RESISTANCE	ITEM	DESCRIPTION	TEST CONDITIONS	REQUIREMENTS																																												
	12	HSF	Refer RoHS Standard : The electronic electrical machinery product limits with six big chemical materials.	Cd : 100ppm Pb : 1000ppm Hg : 1000ppm Cr6+ : 1000ppm PBB · PBDE : 1000ppm																																												
	13	Test of IP 67	Upper side : Protected against the effects of temporary immersion in water. (1m below the surface of the water for a duration of 30 min)	IP67 According to EN 60529 : 1991 + A1 : 2000 IEC 60529 : 2001																																												
	14	WITH LED ELECTRO OPTICAL	<table border="1"> <thead> <tr> <th rowspan="2">Lens Appearance</th> <th rowspan="2">Color</th> <th colspan="4">Electro-optical Data (AT 20mA)</th> <th rowspan="2">Viewing Angle 2θ 1/2 (deg)</th> </tr> <tr> <th colspan="2">Vf(V)</th> <th colspan="2">Iv(mcd)</th> </tr> <tr> <th></th> <th></th> <th>Typ.</th> <th>Max.</th> <th>Min.</th> <th>Typ.</th> <th></th> </tr> </thead> <tbody> <tr> <td rowspan="5">Water Clear</td> <td>Super Red</td> <td>2.1</td> <td>2.6</td> <td>42.0</td> <td>100.0</td> <td rowspan="5">35°</td> </tr> <tr> <td>Super Yellow Green</td> <td>2.0</td> <td>2.6</td> <td>42.0</td> <td>80.0</td> </tr> <tr> <td>Super Yellow</td> <td>2.1</td> <td>2.6</td> <td>94.0</td> <td>200.0</td> </tr> <tr> <td>Super Blue</td> <td>2.8</td> <td>3.2</td> <td>28.0</td> <td>70.0</td> </tr> <tr> <td>Super White</td> <td>3.5</td> <td>4.0</td> <td>140.0</td> <td>300.0</td> </tr> </tbody> </table>	Lens Appearance	Color	Electro-optical Data (AT 20mA)				Viewing Angle 2θ 1/2 (deg)	Vf(V)		Iv(mcd)				Typ.	Max.	Min.	Typ.		Water Clear	Super Red	2.1	2.6	42.0	100.0	35°	Super Yellow Green	2.0	2.6	42.0	80.0	Super Yellow	2.1	2.6	94.0	200.0	Super Blue	2.8	3.2	28.0	70.0	Super White	3.5	4.0	140.0	300.0
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5. WAVE SOLDERING CONDITIONS :



Manual Soldering

Soldering Temperature	Max.350°C
Continuous Soldering Time	Max.5 seconds



Precautions in Handling :

Care should be exercised so that flux from the upper part of the printed circuit board does not adhere to the switch.