

# PBA series

Piezo switches Ø 22 mm



## DISTINCTIVE FEATURES

- Bushing diameter 16 (.630), 19 (.748), 22 (.866) or 30 mm (1.181)
- Sealed to IP68 and IP69K (switches mounted on panel)
- Easy to clean metal surface
- Very long life expectancy
- Ring or dot illumination



## ENVIRONMENTAL SPECIFICATIONS

- Sealing : IP68 per IEC 60529, IP69K per DIN 40050-9 (switches mounted on panel)
- Vibration resistance : 10-500 Hz / 10 g per IEC 60068-2-6
- Operating temperature : -40 °C to +75 °C (-40 °F to + 167 °F)
- EMC compatibility according to EN 61058-1 for the whole range
- EMC compatibility according to EN 61000-4 & EN61000-6-2 for model 1A (code 002)
- Extreme thermal shock may briefly trigger the switch



## ELECTRICAL SPECIFICATIONS

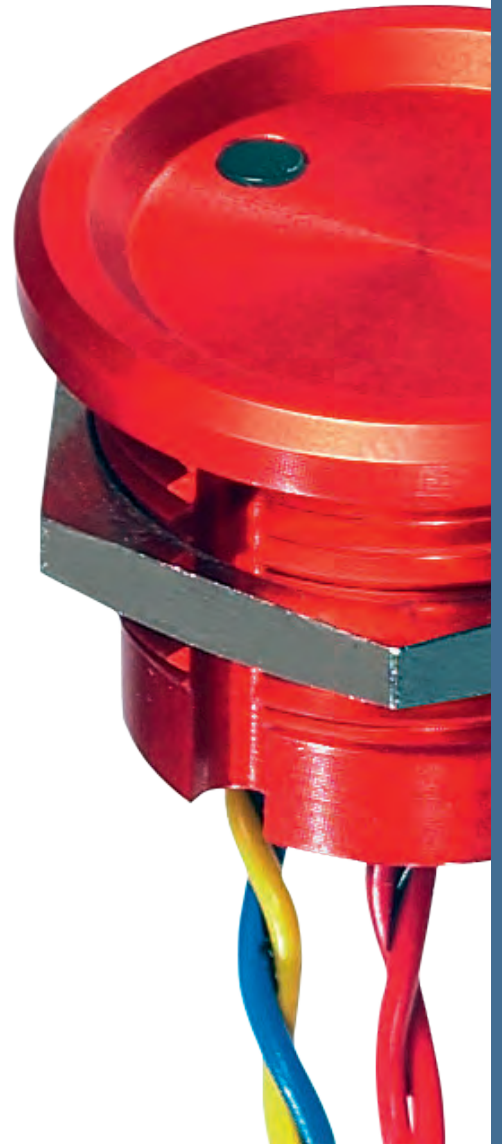
- Max. current/voltage rating with resistive load :
  - Function A : standard 200 mA 24 VAC/DC - option 1 A 24 VAC/DC
  - Function B : standard 100 mA 24 VAC/DC
- Switch resistance ON : 10 Ω max.
- Switch resistance OFF : 5 MΩ min.
- Life expectancy : 50 million cycles
- LED consumption : Illuminated dot 10 mA max.  
Illuminated ring 20 mA max. (functions A-B)
- Power consumption for function 1 :  
non-illuminated 10 mA - illuminated 30 mA



## GENERAL SPECIFICATIONS

- Operating force : 2 to 6 N
- Torque : 2.5 Nm min. - 3 Nm max.

The company reserves the right to change specifications without notice.



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## MATERIALS

- Case : aluminum, anodized or stainless steel 316L
- Multi-wire leads section 0.22 mm<sup>2</sup> length 300 mm, twisted by pair
- Cable, length 300 mm, section depending on switch model
- PC terminals : bronze, tin plated

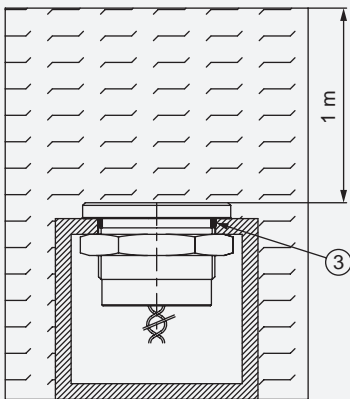
APEM products may be recycled at end-of-life for the re-claiming of valuable metal components.

**Note :** to maintain the ESD performance, always add a ground washer when the panel is made of non-conductive material (PVC, polycarbonate).  
For part numbers, see "Mounting accessories" on the following pages.



## SEALING

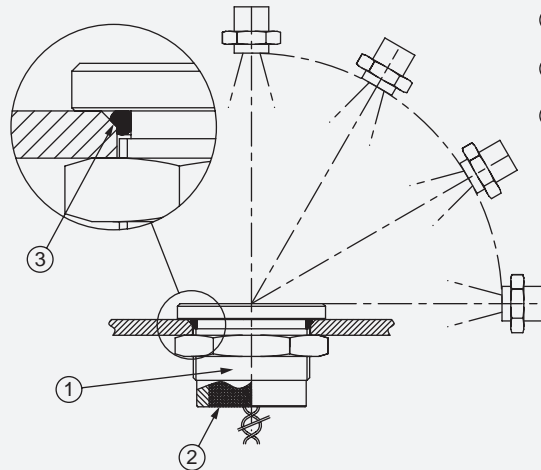
### SEALING IP68



#### Continuous immersion in water IP68 test conditions

Continuous immersion in water  
(1 m, 24 hours)

### SEALING IP69K



- ① - One-piece bushing
- ② - Epoxy sealed terminals
- ③ - O-ring

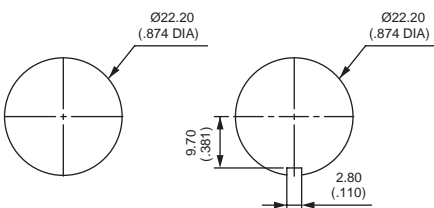
#### High pressure, high temperature wash down IP69K test conditions

- . Pressure : 80 - 120 bars
- . Distance : 15 cm
- . Temperature : 80 °C ± 5 °C (176 °F ± 41 °F)
- . Flow : 14 - 16 l/mn
- . Duration : 30 seconds per position



## PANEL CUT-OUT

MODELS Ø22 (.866)

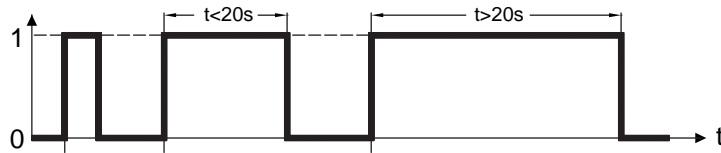




## ELECTRICAL FUNCTIONS

FINGER PRESSURE APPLIED TO SWITCH

1 : pressure / 0 : no pressure

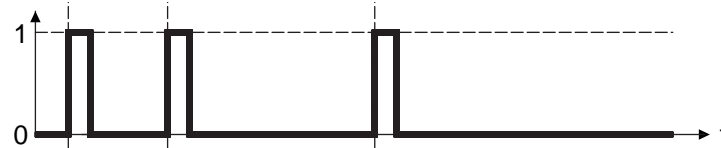


OUTPUT

1 : closed output / 0 : open output

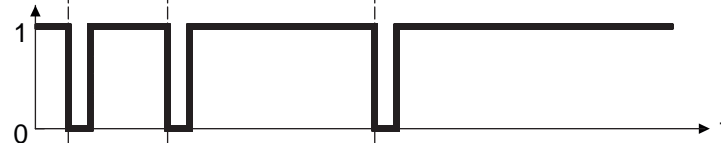
Momentary NO (pulse)

No external power supply required



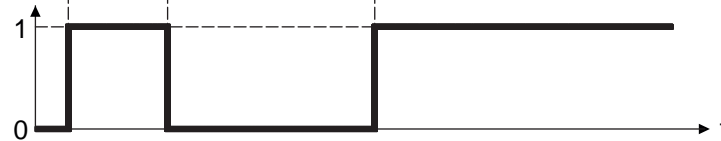
Momentary NC (pulse)

No external power supply required



Latching (ON - OFF)

Requires external power supply



## WIRING DIAGRAMS

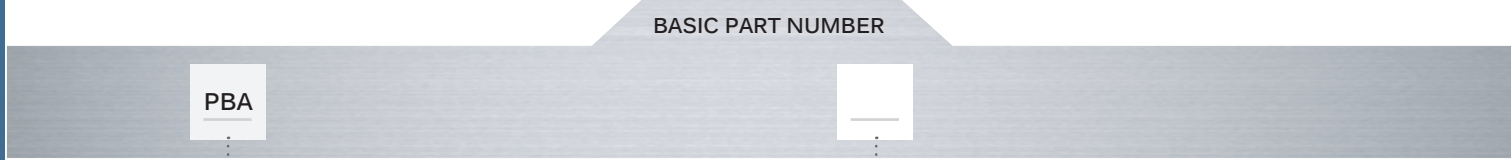
	Non-illuminated	1 LED *	2 LEDs	3 LEDs
Momentary NO				
Momentary NC				
Latching (ON - OFF)				

Legend : C : yellow, D : blue, B : black , A : same color as LED \* LED color is indicated by protective resin color on bottom of unit.

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## BUILD YOUR PART NUMBER



SERIES

BUSHINGS / OPERATORS

**R2**

Flat, operator height 3 mm (.118) - Not available w. illuminated ring.

**RY**

With chamfer, operator height 4.5 mm (.177). Available with thin or large illuminated ring only.

**R6**

With finger location, operator height 3 mm (.118). Not available with illuminated ring.

**RZ**

Flat, operator height 4.5 mm (.177). Available with thin or large illuminated ring only.

### OPTIONS



#### ELECTRICAL FUNCTIONS

<b>A</b>	NO (pulse)
<b>B</b>	NC (pulse)
<b>1</b>	ON - OFF (requires external power supply - Illumination types V, Y and Z only - only one LED color)

#### TERMINALS

<b>F</b>	Flying leads
<b>C</b>	Cable

#### COLORS / MATERIALS

<b>0</b>	Natural anodized
<b>1</b>	Blue anodized
<b>2</b>	Black anodized
<b>3</b>	Green anodized
<b>5</b>	Gold anodized
<b>6</b>	Red anodized
<b>B</b>	Stainless steel 316L

Bold = standard

#### RATINGS

<b>000</b>	Standard
<b>002</b>	1 A 24 VAC/DC (NO pulse only, function A)

#### TYPE OF ILLUMINATION/VOLTAGE

<b>Blank</b>	Non-illuminated
<b>C</b>	thin ring - 5 VDC
<b>D</b>	thin ring - 12 VDC
<b>E</b>	thin ring - 24 VDC
<b>F</b>	large ring - 5 VDC
<b>G</b>	large ring - 12 VDC
<b>H</b>	large ring - 24 VDC
<b>L*</b>	dot - 5 VDC
<b>P*</b>	dot - 12 VDC
<b>J*</b>	dot - 24 VDC
<b>V*</b>	dot - µcontroller driven
<b>Y</b>	thin ring - µcontroller driven
<b>Z</b>	large ring - µcontroller driven

\*Dot illumination only available with LED colors 0B, 0G, 0S, 0Y, 0W and SG.

#### LED COLORS

<b>Blank</b>	Non-illum.	<b>SG</b>	Red/green (dot only)
<b>0B</b>	Blue	<b>2A</b>	Red/green
<b>0G</b>	Green	<b>2B</b>	Red/yellow
<b>0S</b>	Red	<b>2C</b>	Red/blue
<b>0Y</b>	Yellow	<b>2D</b>	Red/white
<b>0W</b>	White		

#### LED COLORS (CONTINUED)

<b>2E</b>	Green/blue	<b>3A</b>	Red/green/blue	<b>3H</b>	Green/blue/yellow
<b>2F</b>	Green/yellow	<b>3B</b>	Red/green/yellow	<b>3I</b>	Green/blue/white
<b>2G</b>	Green/white	<b>3D</b>	Red/green/white	<b>3J</b>	Green/yellow/white
<b>2H</b>	Blue/yellow	<b>3E</b>	Red/blue/yellow	<b>3K</b>	Blue/yellow/white
<b>2I</b>	Blue/white	<b>3F</b>	Red/blue/white		
<b>2K</b>	Yellow/white	<b>3G</b>	Red/yellow/white		

## ABOUT THIS SERIES

**Notice** : please note that not all combinations of above numbers are available. Refer to the following pages for further information.

**Mounting accessories** : standard hardware supplied : 1 hex nut 10-856-0 (25 mm ac. flats) and 1 O-ring  
Always add a ground washer U5737 when the panel is non-conductive (PVC, polycarbonate).

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## NON-ILLUMINATED OPERATOR HEIGHT 3 MM



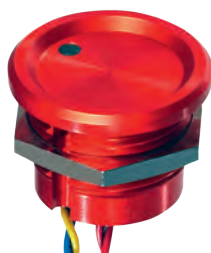
Flat

PBAR2

With finger location

PBAR6

## WITH ILLUMINATED DOT OPERATOR HEIGHT 3 MM



Flat

PBAR2

With finger location

PBAR6

## WITH THIN ILLUMINATED RING OPERATOR HEIGHT 4.50



Flat

PBARZ

With chamfer

PBARY

## WITH LARGE ILLUMINATED RING OPERATOR HEIGHT 4.50

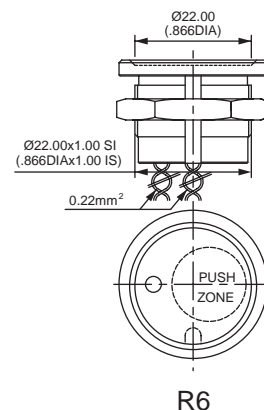
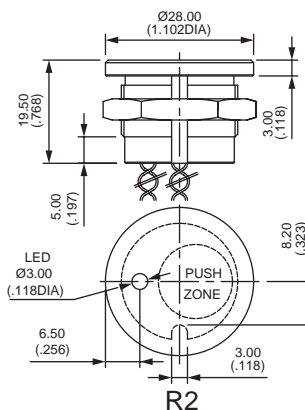
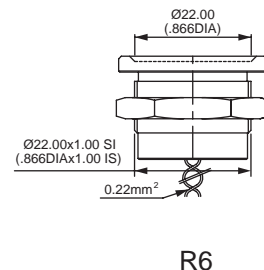
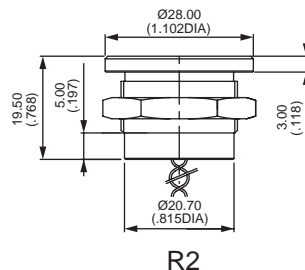


Flat

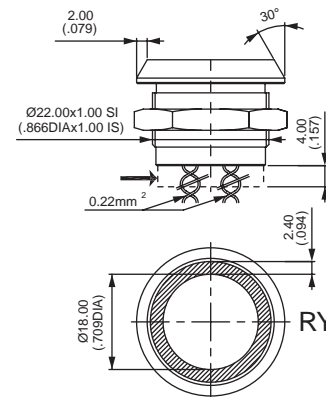
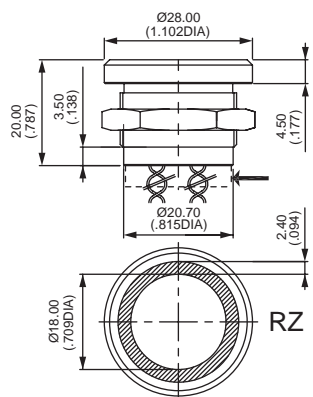
PBARZ

With chamfer

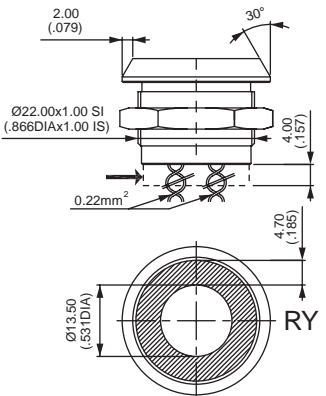
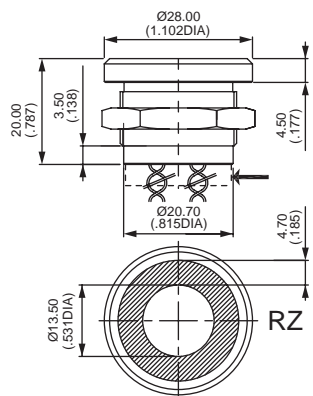
PBARY



### → DIMENSION OF ON-OFF MODELS



### → DIMENSION OF ON-OFF MODELS



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## ELECTRICAL FUNCTIONS

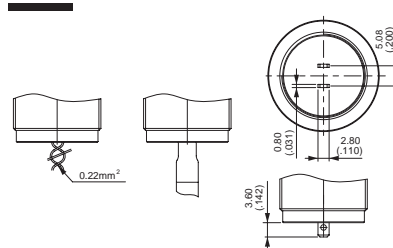


- A NO pulse
- B NC pulse
- 1 ON - OFF - Requires external power supply - Illumination types V, Y and Z only - one LED color only.

## TERMINALS



- F Flying leads
- C Cable



## CASE COLORS / MATERIALS



- 0 **Natural anodized aluminum**
- 1 Blue anodized aluminum
- 2 **Black anodised aluminum**
- 3 Green anodized aluminum
- 5 Gold anodized aluminum
- 6 Red anodised aluminum
- B **Stainless steel 316L**

Bold = standard



0 1 2 3 5 6 B

## RATINGS



- 000 Standard
- 002 1 A 24 VAC or DC (NO pulse only, function A)

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## TYPE OF ILLUMINATION / VOLTAGE



Blank Non-illuminated



**C** Thin ring - 5 VDC  
**D** Thin ring - 12 VDC  
**E** Thin ring - 24 VDC  
**Y** Thin ring -  $\mu$ controller driven



**F** Large ring - 5 VDC  
**G** Large ring - 12 VDC  
**H** Large ring - 24 VDC  
**Z** Large ring -  $\mu$ controller driven



**L** Dot - 5 VDC  
**P** Dot - 12 VDC  
**J** Dot - 24 VDC  
**V** Dot -  $\mu$ controller driven

⚠ Dot illumination only available with LED colors : 0B, 0G, 0S, 0Y, 0W and SG.

## LED COLORS



Blank Non-illuminated

Integrated LED resistor

### Illuminated 1 LED \*

**0B** : blue - **0G** : green - **0S** : red - **0Y** : yellow - **0W** : white  
**SG** : red/green (reversed polarity LED - for dot illumination only)

### Illuminated 2 LEDs

**2A** : red/green - **2B** : red/yellow - **2C** : red/blue - **2D** : red/white - **2E** : green/blue - **2F** : green/yellow - **2G** : green/white  
**2H** : blue/yellow - **2I** : blue/white - **2K** : yellow/white

### Illuminated 3 LEDs

**3A** : red/green/blue - **3B** : red/green/yellow - **3D** : red/green/white - **3E** : red/blue/yellow - **3F** : red/blue/white  
**3G** : red/yellow/white - **3H** : green/blue/yellow - **3I** : green/blue/white - **3J** : green/yellow/white - **3K** : blue/yellow/white

\* LED color is indicated by protective resin color on bottom of unit.



0B



0G



0S



0Y



0W



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