

# PBA series

Piezo switches Ø 19 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 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

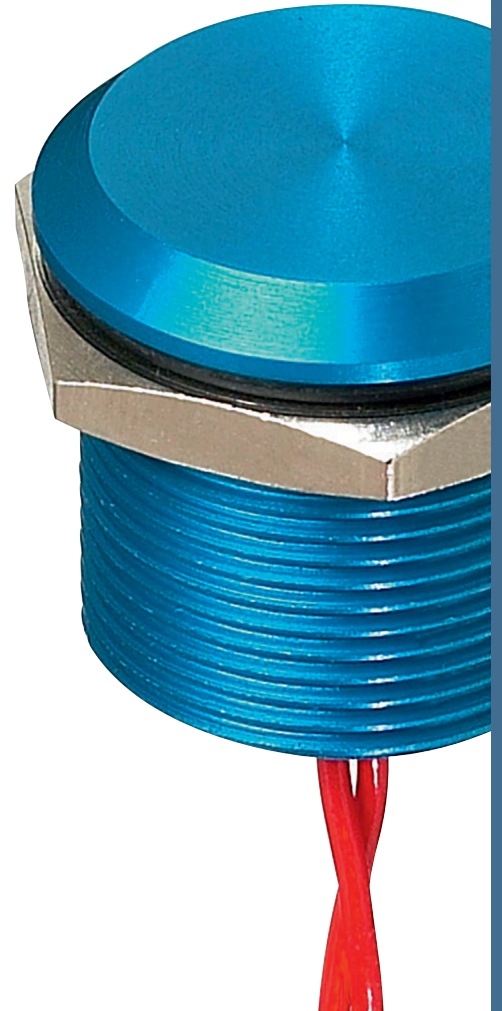
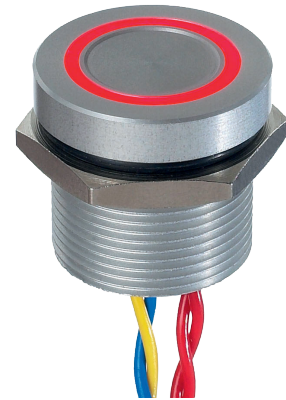
- Max. current/voltage rating with resistive load :
  - Function A : standard 200 mA 24 VAC/DC - option 1 A 24 VAC/DC
  - Function B : standard 100 mA 24 VAC/DC
- Switch resistance ON : 10 Ω max.
- Switch resistance OFF : 5 MΩ min.
- Life expectancy : 50 million cycles
- LED consumption : 20 mA max. (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

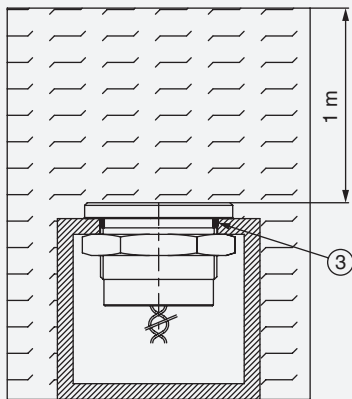
APEM products may be recycled at end-of-life for the re-claiming of valuable metal components.

**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

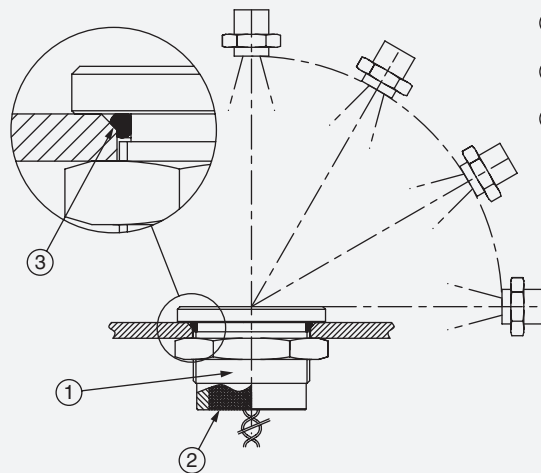
### SEALING IP68



#### Continuous immersion in water IP68 test conditions

Continuous immersion in water  
(1 m, 24 hours)

### SEALING IP69K



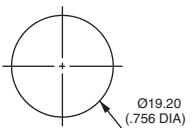
#### High pressure, high temperature wash down IP69K test conditions

- . 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 Ø19 (.748)

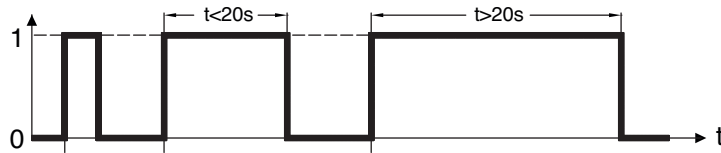




## ELECTRICAL FUNCTIONS

FINGER PRESSURE APPLIED TO SWITCH

1 : pressure / 0 : no pressure

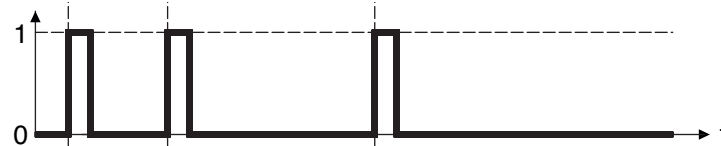


OUTPUT

1 : closed output / 0 : open output

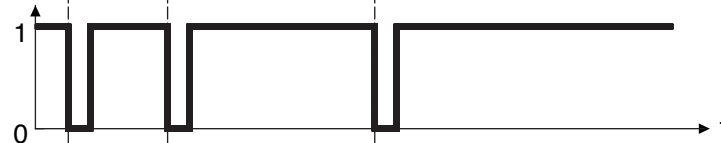
Momentary NO (pulse)

No external power supply required



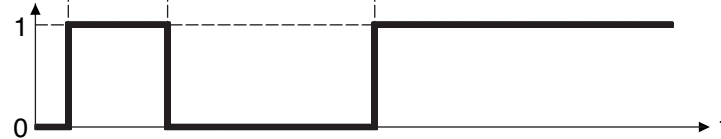
Momentary NC (pulse)

No external power supply required



Latching (ON - OFF)

Requires external power supply



## WIRING DIAGRAMS

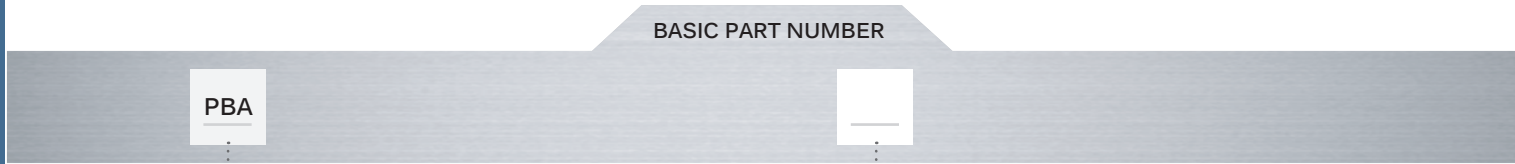
	Non-illuminated	1 LED *	2 LEDs	3 LEDs
Momentary NO				
Momentary NC				
Latching (ON - OFF)				

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



**PBA**

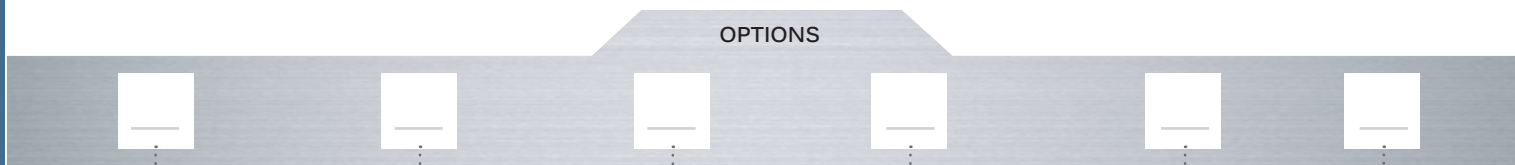
SERIES

### BASIC PART NUMBER

[Blank Box]

BUSHINGS / OPERATORS

- R9** Flat operator, height 3 (.118)
- RA** With chamfer, height 3 (.118)



### OPTIONS

#### ELECTRICAL FUNCTIONS

- A** NO (pulse)
- B** NC (pulse)
- 1** ON - OFF (requires external power supply - cannot be combined with T5 operator - illumination type W only)

#### TERMINALS

- F** Flying leads
- C** Cable
- P** Straight PC (T5 model, non-illuminated, functions A & B only)

#### COLORS / MATERIALS

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

Bold = standard

#### RATINGS

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

#### TYPE OF ILLUMINATION/ VOLTAGE

- Blank** Non-illuminated
- A** Standard ring - 5 VDC
- N** Standard ring - 12 VDC
- K** Standard ring - 24 VDC
- W** Standard ring, microcontroller driven

#### LED COLORS

- Blank** Non-illum.
- 0B** Blue
- 0G** Green
- 0S** Red
- 0Y** Yellow
- 0W** White
- 2A** Red/green
- 2B** Red/yellow
- 2C** Red/blue
- 2D** Red/white
- 2E** Green/blue
- 2F** Green/yellow


#### LED COLORS (CONTINUED)


- 2G** Green/white
- 2H** Blue/yellow
- 2I** Blue/white
- 2K** Yellow/white
- 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

For options not listed above, please contact APEM.

## ABOUT THIS SERIES

On the following pages, you will find successively basic part numbers of switches and options in the same order as in above chart.

 **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 10-621 (19 mm ac. flats) and 1 O-ring.  
Always add a ground washer U5736 (Ø19 mm) when the panel is non-conductive (PVC, polycarbonate).

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## Ø19 (.748) - NON-ILLUMINATED OPERATOR HEIGHT 3 MM



- Flat
  - PBAR9
- With chamfer
  - PBARA

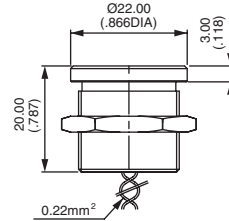
Wire colors : see "Wiring diagrams".

## Ø19 (.748) - ILLUMINATED RING OPERATOR HEIGHT 3 MM

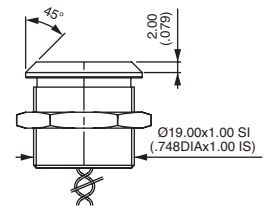


- Flat
  - PBAR9
- With chamfer
  - PBARA

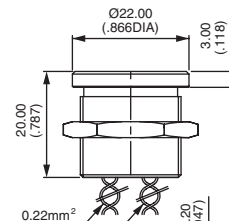
Wire colors : see "Wiring diagrams".



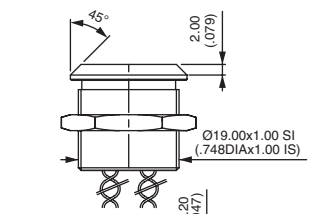
R9



RA



R9



RA

### ELECTRICAL FUNCTIONS

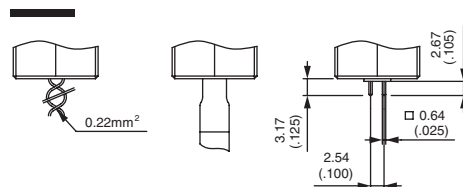


- A NO pulse
- B NC pulse
- 1 ON - OFF - Requires external power supply - Cannot be combined with T5 operator - Illumination type W only.

### TERMINALS



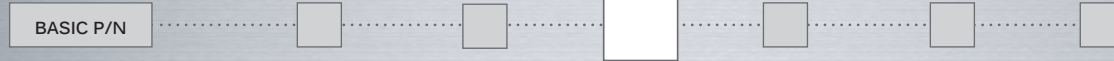
- F Flying leads
- C Cable
- P Straight PC (T5 model, non-illuminated, functions A and B only)



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## 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)

## TYPE OF ILLUMINATION / VOLTAGE

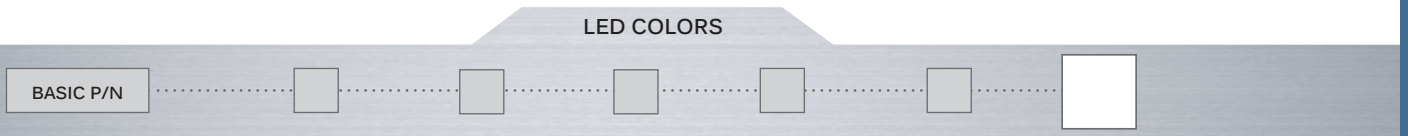


## O

- Blank Non-illuminated
- A Thin ring - 5 VDC
- N Thin ring - 12 VDC
- K Thin ring - 24 VDC
- W Thin ring - µcontroller driven

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**Blank** Non-illuminated

Integrated LED resistor

## Illuminated 1 LED \*

**0B** : blue - **0G** : green - **0S** : red - **0Y** : yellow - **0W** : white

## 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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CORRECTNESS PROCEDURE

Changes applied: Page 1 - warnign about extreme thermal shock

This datasheet have been approved and can be officially released.

DATE AND SIGNATURE

PRODUCT MANAGER

DATE AND SIGNATURE

COMMUNICATION  
DEPARTMENT