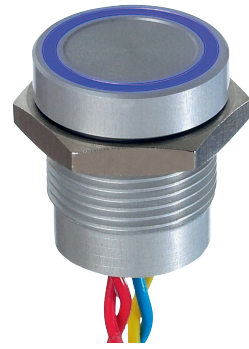# PBA series

Piezo switches Ø 16 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.

PBA series

Piezo switches Ø 16 mm

MATERIALS

• Case : aluminum, anodized or stainless steel 316L

• Multi-wire leads section 0.22 mm² 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).
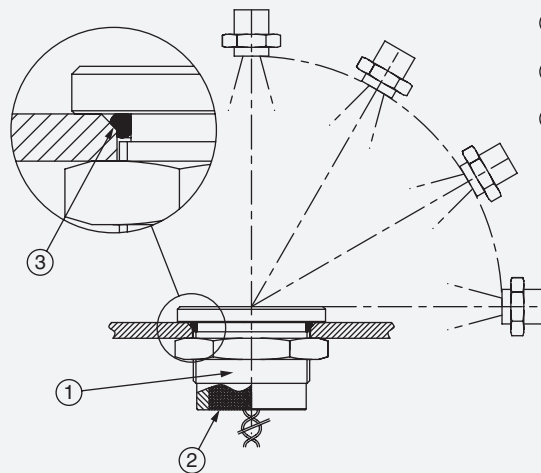For part numbers, see "Mounting accessories" on the following pages.

SEALING

SEALING IP68	SEALING IP69K

① - One-piece bushing

② - Epoxy sealed terminals

③ - O-ring
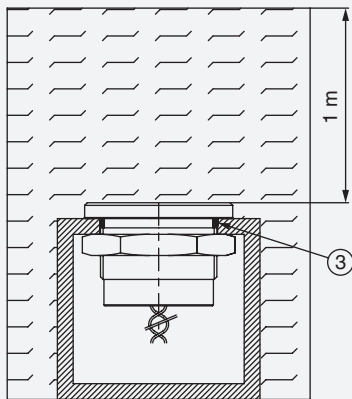
Continuous immersion in water
IP68 test conditions
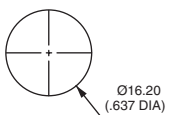Continuous immersion in water
(1 m, 24 hours)

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
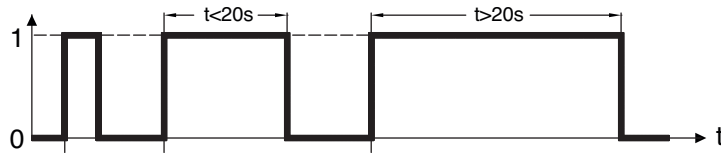. Duration : 30 seconds per position

PANEL CUT-OUT

MODELS Ø16 (.630)

Ø16.20
(.637 DIA)

PBA series

Piezo switches Ø 16 mm

⚡ ELECTRICAL FUNCTIONS

FINGER PRESSURE APPLIED TO SWITCH
1 : pressure / **0** : no pressure
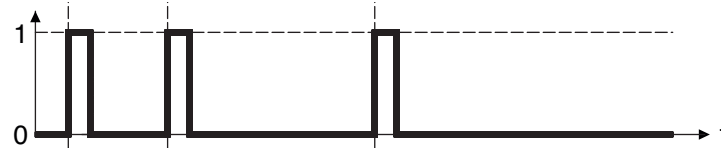
t<20s   t>20s

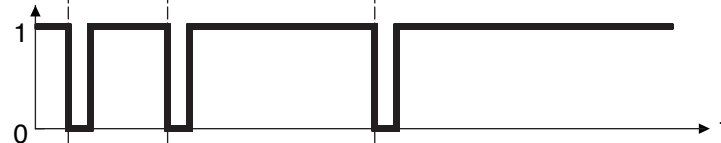**OUTPUT**
1 : closed output / **0 :** open output

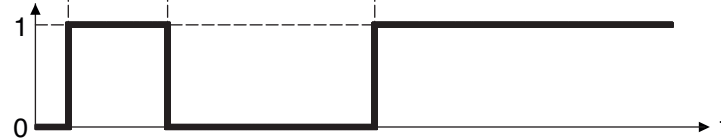**Momentary NO (pulse)**
No external power supply required

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	RED RED	RED RED — C D	RED RED — A B A B	RED RED — A B A B A B
Momentary NC	GREEN GREEN	GREEN GREEN — C D	GREEN GREEN — A B A B	GREEN GREEN — A B A B A B
Latching (ON - OFF)	WHITE 9-24V AC/DC WHITE — RED RED	WHITE 9-24V AC/DC WHITE — RED RED		

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

PBA series

Piezo switches Ø 16 mm

⚙ BUILD YOUR PART NUMBER

BASIC PART NUMBER
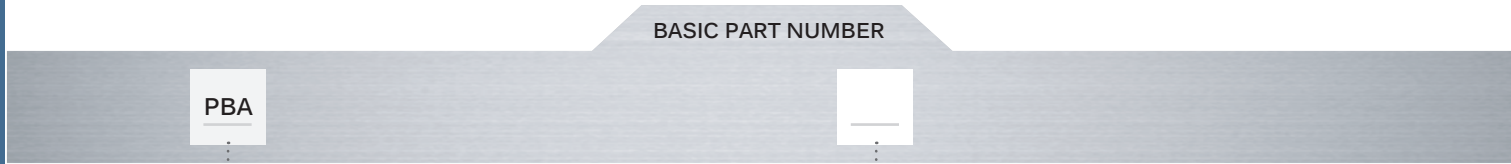
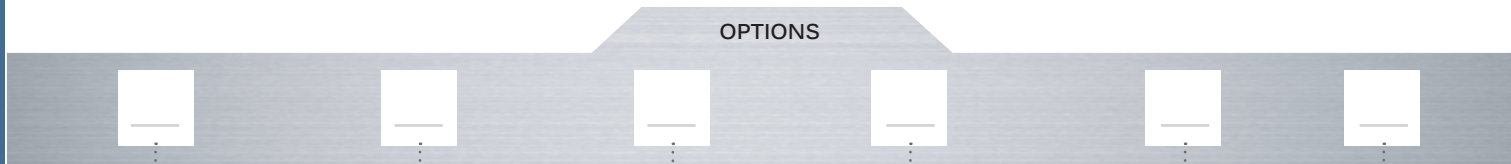| PBA		☐
SERIES		BUSHINGS / OPERATORS

BUSHINGS / OPERATORS

R1	Flat operator, height 4.50 (.177)
T5	Flat operator, height 1 (.039) (non illuminated)
R5	Operator with finger location, height 4.50 (.177) (non-illuminated)

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

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

LED COLORS (CONTINUED)

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 and 1 O-ring.
Always add a ground washer U5735 (Ø16 mm) when the panel is non-conductive (PVC, polycarbonate).

PBA series

Piezo switches Ø 16 mm

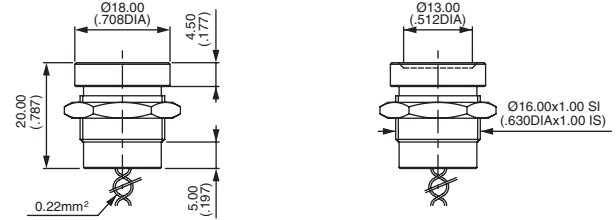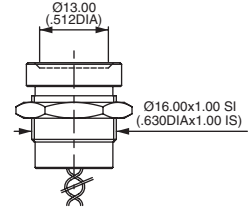## Ø16 (.630) - NON-ILLUMINATED
OPERATOR HEIGHT 4.50 MM
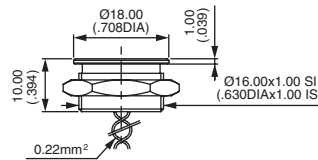
Flat

PBAR1

With finger location

PBAR5

R1

R5

Ø16 (.630) - NON-ILLUMINATED
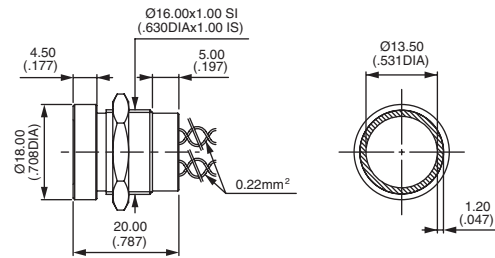## OPERATOR HEIGHT 1 MM

Flat

PBAT5

Ø16 (.630) - STANDARD ILLUMINATED RING
OPERATOR HEIGHT 4.5 MM

Flat
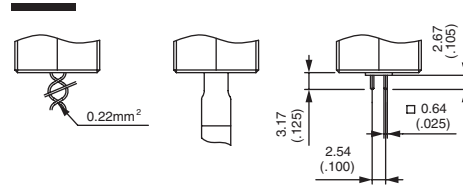
PBAR1

PBA series

Piezo switches Ø 16 mm

ELECTRICAL FUNCTIONS

BASIC P/N							

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

TERMINALS

BASIC P/N							

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

0.22mm²   3.17 (.125)   2.67 (.105)   0.64 (.025)   2.54 (.100)

CASE COLORS / MATERIALS

BASIC P/N							

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

BASIC P/N							

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

PBA series

Piezo switches Ø 16 mm

TYPE OF ILLUMINATION / VOLTAGE

BASIC P/N

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

LED COLORS

BASIC P/N

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 |