

# PBA series

## Piezo switches

### Specifications

UG1410-A-R3



- Bushing diameter 16 mm, 19 mm or 22 mm
- 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
- 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)

#### ELECTRICAL SPECIFICATIONS

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

#### GENERAL SPECIFICATIONS

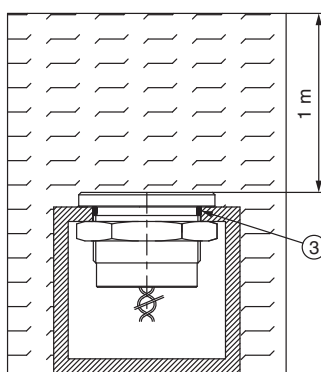
- Operating force : 2 to 6N
- Torque : 2,5Nm min. - 3Nm max.

#### MATERIALS

- Case : aluminium, 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

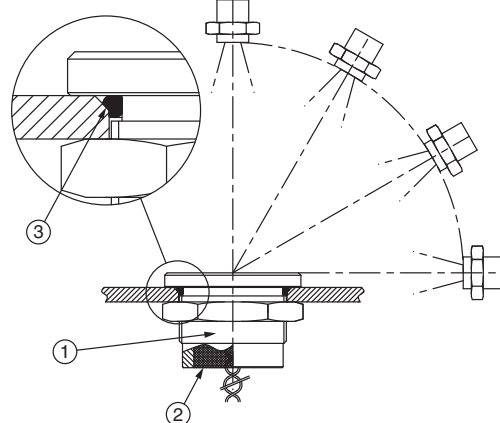
**Note** : to maintain the ESD performance, always add a ground washer when the panel is made of non-conductive material (PVC, polycarbonate).  
For part numbers, see «Mounting accessories» on the following pages.

#### SEALING IP68



**Continuous immersion in water**  
**IP68 test conditions**  
Continuous immersion in water  
(1m, 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  
• Flow : 14 - 16 l/mn  
• Duration : 30 seconds per position

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

The company reserves the right to change specifications without notice.

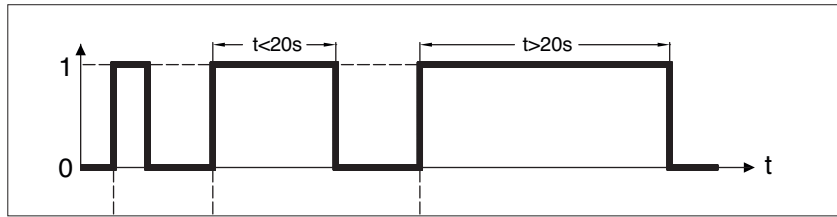
# PBA series

## Piezo switches

### Electrical functions

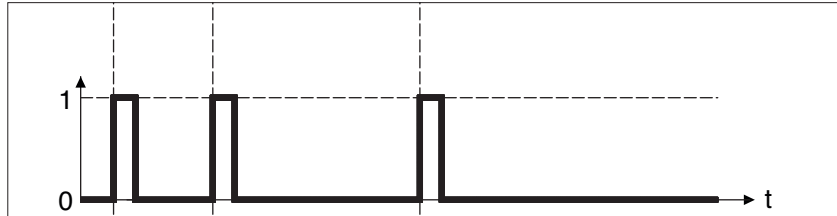
#### FINGER PRESSURE applied to switch

1 = pressure  
0 = no pressure

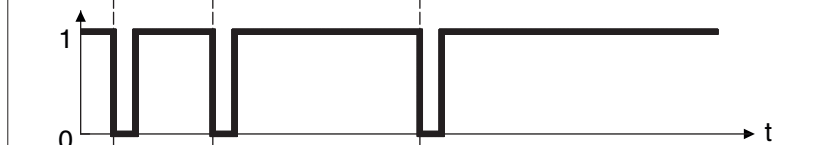


#### OUTPUT

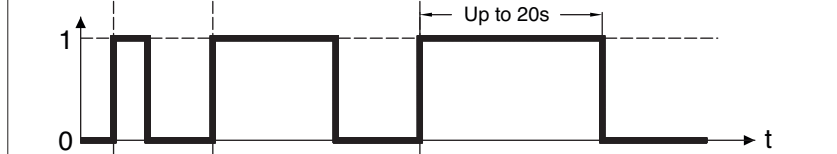
- Momentary NO (pulse)  
No external power supply required



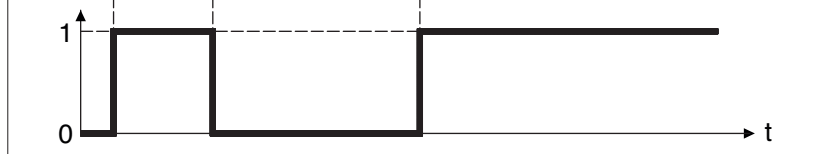
- Momentary NC (pulse)  
No external power supply required



- Momentary NO prolonged pulse - *On request*  
No external power supply required



- Latching (ON - OFF)  
Requires external power supply



1 = closed output 0 = open output

#### Wiring diagrams

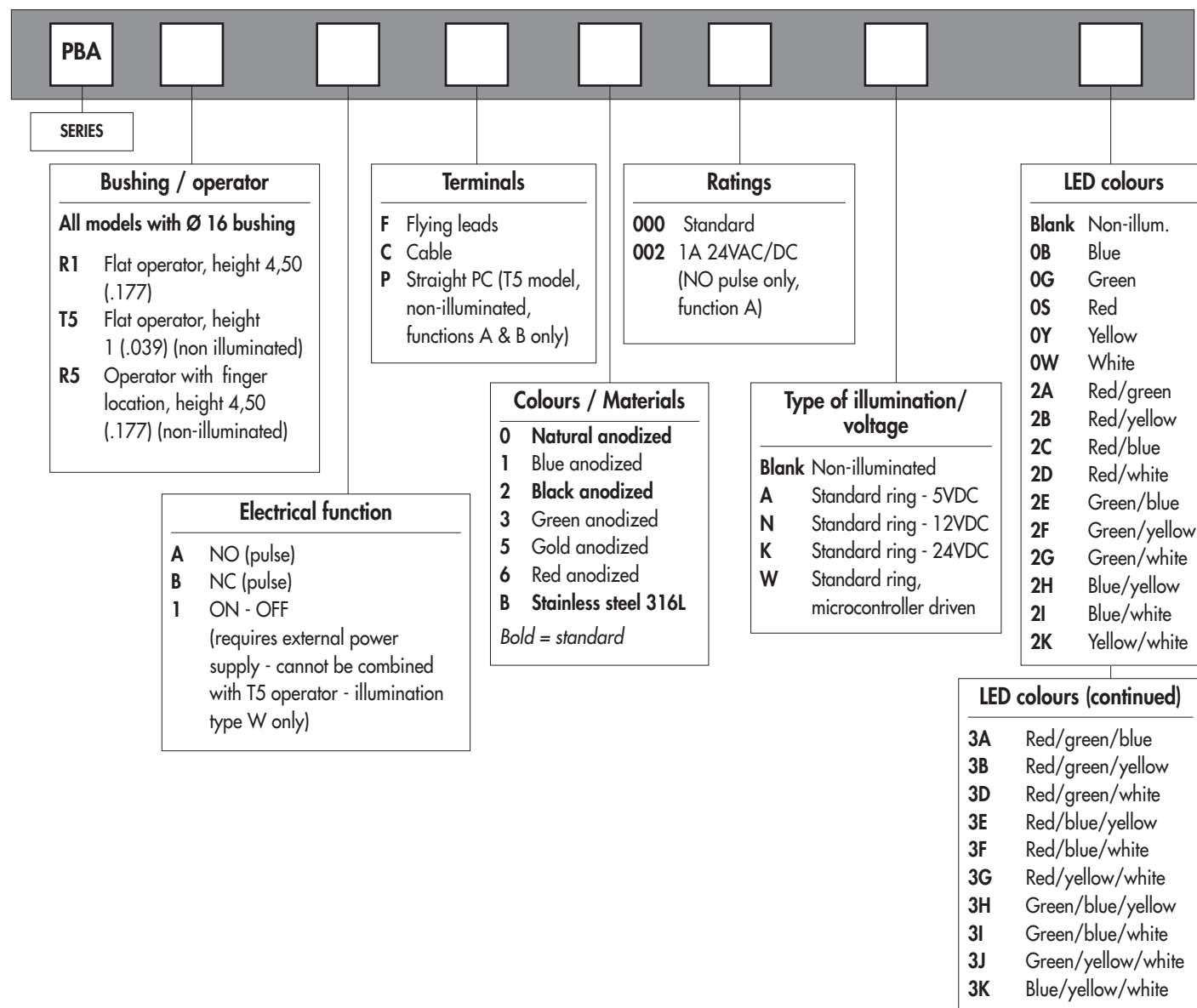
	Non-illuminated	1 LED *	2 LEDs	3 LEDs
Momentary NO				
Momentary NC				
Momentary NO prolonged pulse				
Latching (ON - OFF)				

Legend : C = yellow, D = blue, B = black, A = same colour as LED \* LED colour is indicated by the bottom of the product.

# PBA series

Piezo switches Ø 16 (.630)

Overview



B2

For options not listed above, please contact APEM.

**Dimensions** : first dimensions are in mm while inches are shown as bracketed numbers.



**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 U5735 when the panel is non-conductive (PVC, polycarbonate).



**Packaging unit** : 20 pieces (flying lead terminals) or 25 pieces (cable terminals)

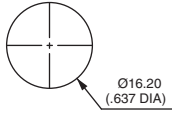
# PBA series

Piezo switches  $\varnothing$  16 (.630)

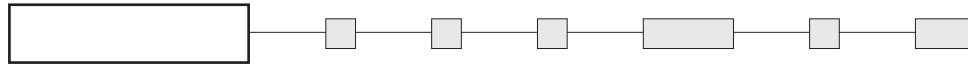
Illuminated or non-illuminated

- Operator  $\varnothing$  18 mm (.708)

Shown with flying lead terminals.



MODEL STRUCTURE



B2

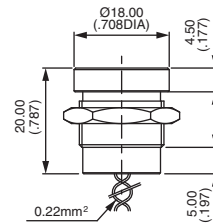
Non-illuminated, operator height 4,50 mm (.177)



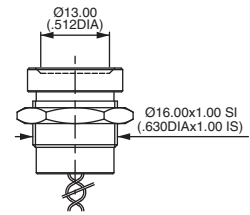
PBAR1AF2000

Flat  
PBAR1

With finger location  
PBAR5



R1



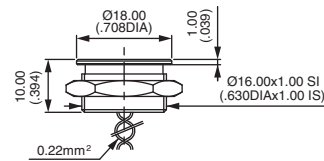
R5

Non-illuminated, operator height 1 mm (.039)

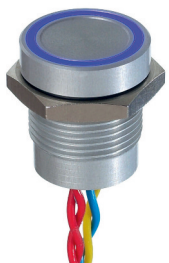


PBAT5AF0000

Flat  
PBAT5

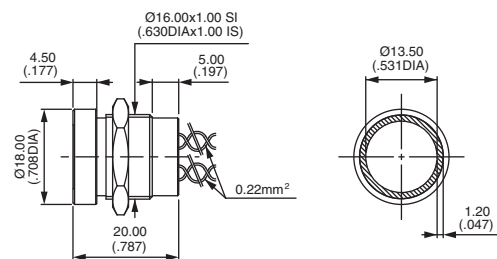


With standard illuminated ring



PBAR1AF0000A0B

Flat operator, height 4,50 (.177)  
PBAR1



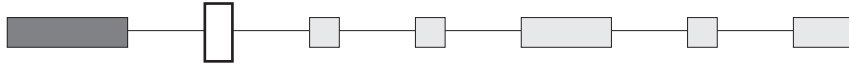
Wire colours : see "Electrical functions"

# PBA series

Piezo switches Ø 16 (.630)

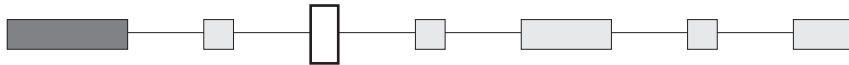
Options

## ELECTRICAL FUNCTION

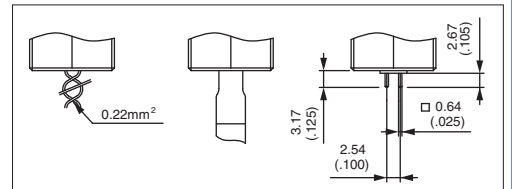


- A NO pulse
- B NC pulse
- 1 ON - OFF - Requires external power supply - Cannot be combined with T5 operator.  
Illumination type W only.

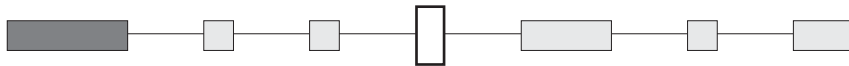
## TERMINALS



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



## CASE COLOURS / MATERIALS

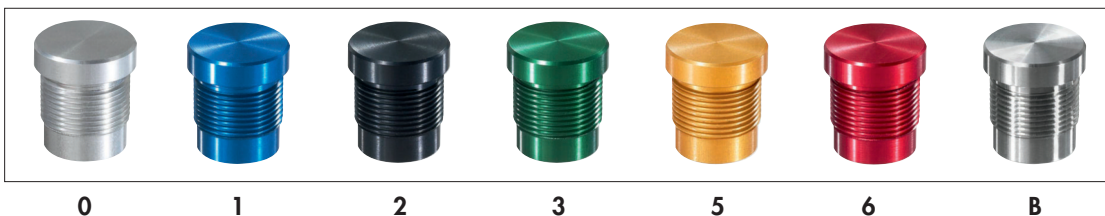


Code	Colour
<b>0</b>	<b>Natural anodized aluminium</b>
1	Blue anodized aluminium
2	<b>Black anodised aluminium</b>

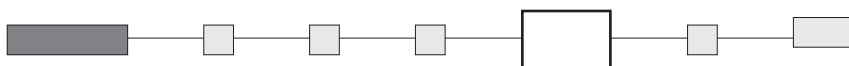
Code	Colour
3	Green anodized aluminium
5	Gold anodized aluminium
6	Red anodised aluminium

Code	Colour
<b>B</b>	<b>Stainless steel 316L</b>

*Bold = standard*



## RATINGS



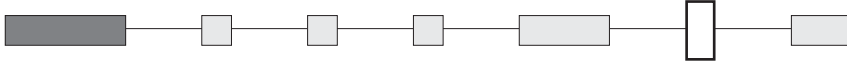
- 000 Standard
- 002 1A 24VAC or DC (NO pulse only, function A)

# PBA series

## Piezo switches Ø 16 (.630)

### Options

#### TYPE OF ILLUMINATION / VOLTAGE

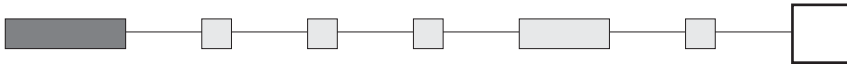


Blank : non-illuminated

	5VDC	12VDC	24VDC	Microcontroller driven
○	A	N	K	W

B2

#### LED COLOURS



Integrated LED resistor

Blank : non-illuminated



OB

OG

OS

OY

OW

#### Illuminated 1 LED \*

OB : blue - OG : green - OS : red - OY : yellow - OW : 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

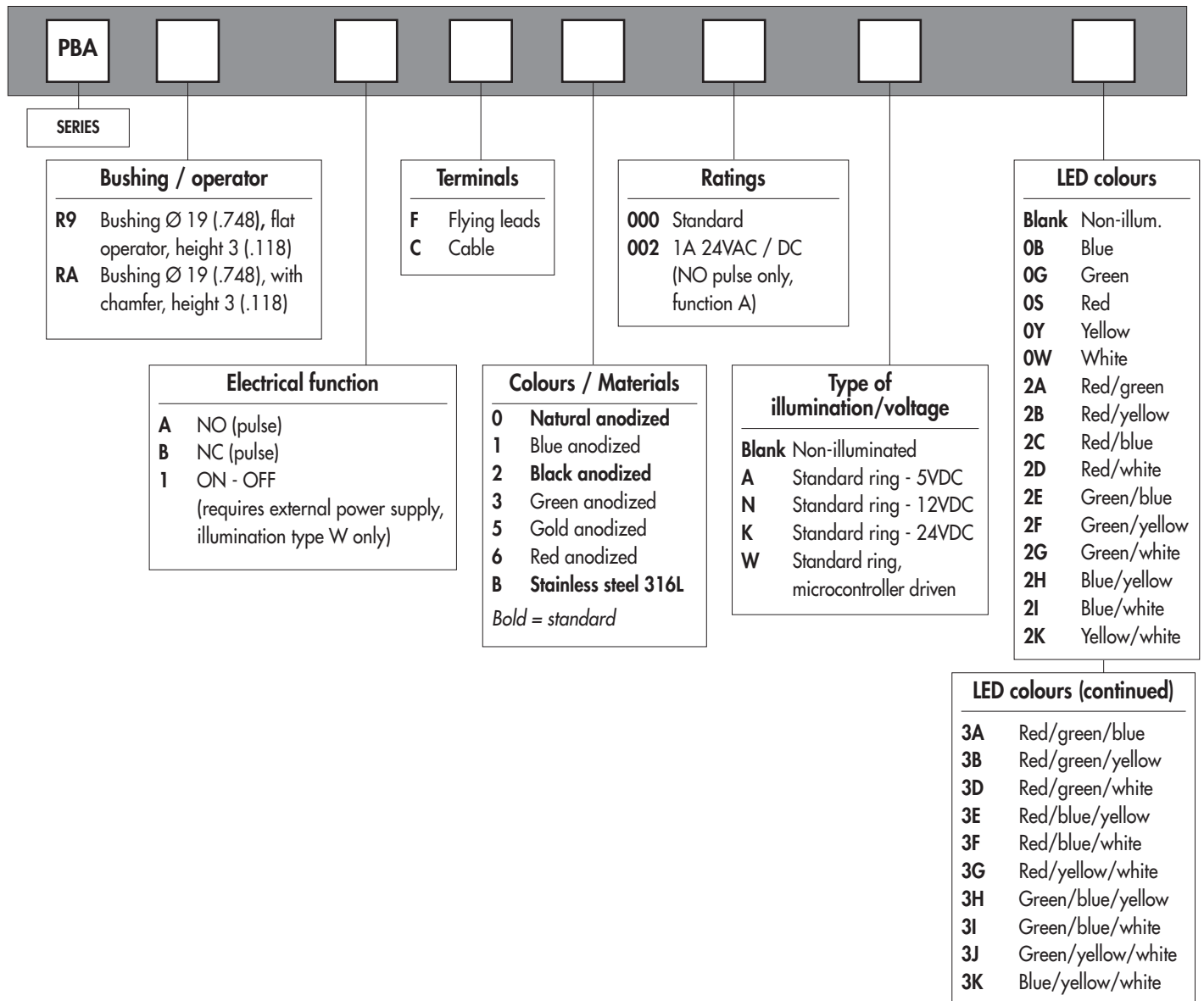
3A : red/green/blue - 3B : red/green/yellow - 3D : red/green/white - 3E : red/blue/yellow - 3F : red/blue/white  
3G : red/yellow/white - 3H : green/blue/yellow - 3I : green/blue/white - 3J : green/yellow/white - 3K : blue/yellow/white

\* LED colour is indicated by the bottom of the product.

# PBA series

Piezo switches Ø 19 (.748)

Overview



B2

For options not listed above, please contact APEM.

**Dimensions** : first dimensions are in mm while inches are shown as bracketted numbers.



**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 10-855-0 (22 mm ac. flats) and 1 O-ring. Always add a ground washer U5736 when the panel is non-conductive (PVC, polycarbonate).

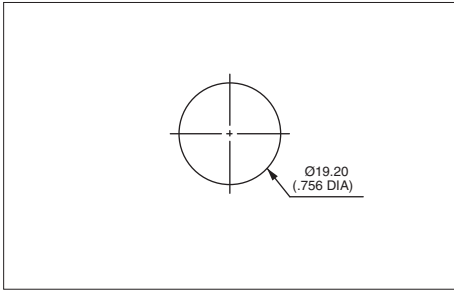


**Packaging unit** : 20 pieces (flying lead terminals) or 25 pieces (cable terminals)

# PBA series

Piezo switches  $\varnothing$  19 (.748)

*Illuminated or non-illuminated*

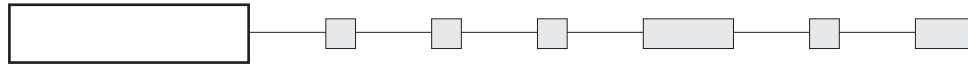


- Operator  $\varnothing$  22 mm (.866)

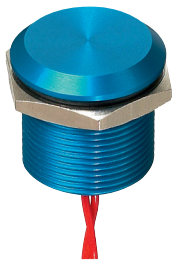
Shown with flying lead terminals.

B2

MODEL STRUCTURE



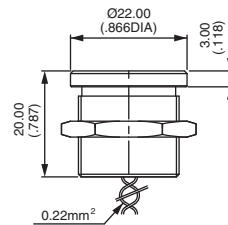
Non-illuminated - operator height 3 mm (.118)



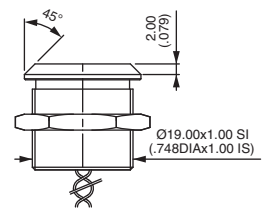
PBARAAF1000

Flat  
PBAR9

With chamfer  
PBARA

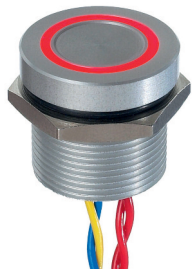


R9



RA

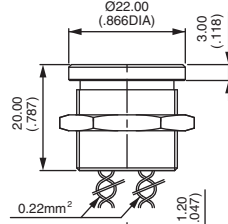
With standard illuminated ring - operator height 3 mm



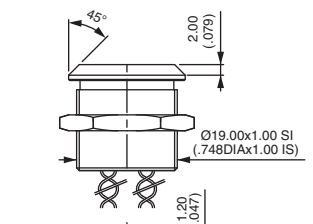
PBAR9AF0000A0S

Flat  
PBAR9

With chamfer  
PBARA



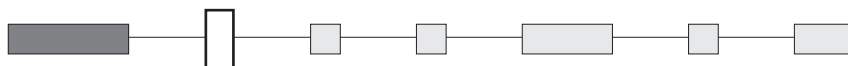
R9



RA

Wire colours : see "Electrical functions".

## ELECTRICAL FUNCTIONS



- A NO pulse
- B NC pulse
- 1 ON - OFF - Requires external power supply - Illumination type W only.

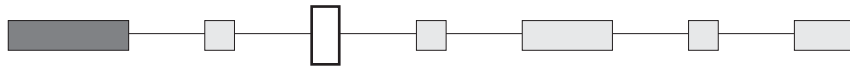


# PBA series

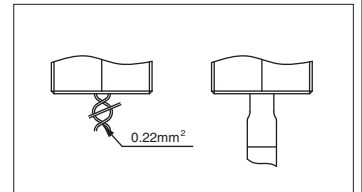
Piezo switches Ø 19 (.748)

Options

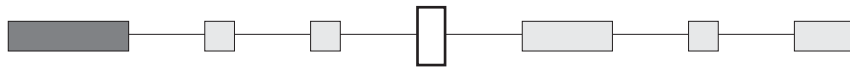
## TERMINALS



F Flying leads  
C Cable



## CASE COLOURS / MATERIALS

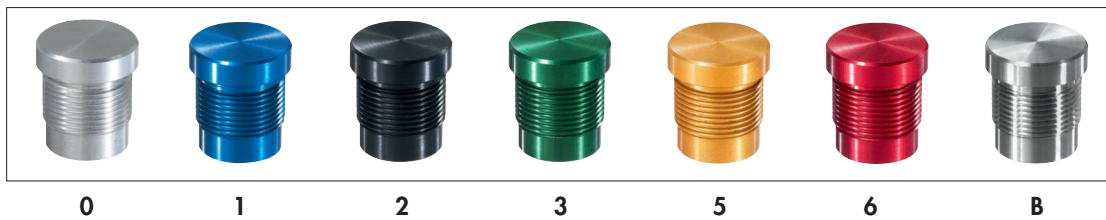


Code	Colour
<b>0</b>	<b>Natural anodized aluminium</b>
<b>1</b>	Blue anodized aluminium
<b>2</b>	<b>Black anodised aluminium</b>

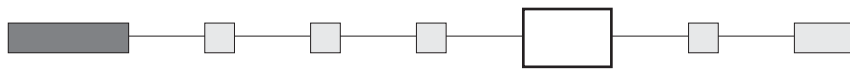
Code	Colour
<b>3</b>	Green anodized aluminium
<b>5</b>	Gold anodized aluminium
<b>6</b>	Red anodised aluminium

Code	Colour
<b>B</b>	<b>Stainless steel 316L</b>

*Bold = standard*

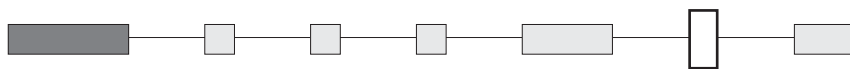


## RATINGS



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

## TYPE OF ILLUMINATION / VOLTAGE



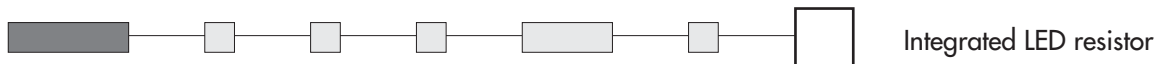
	5VDC	12VDC	24VDC	Microcontroller driven
○	<b>A</b>	<b>N</b>	<b>K</b>	<b>W</b>

# PBA series

Piezo switches Ø 19 (.748)

Options

## LED COLOURS



Blank : non-illuminated



OB

OG

OS

OY

OW

### Illuminated 1 LED \*

OB : blue - OG : green - OS : red - OY : yellow - OW : 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

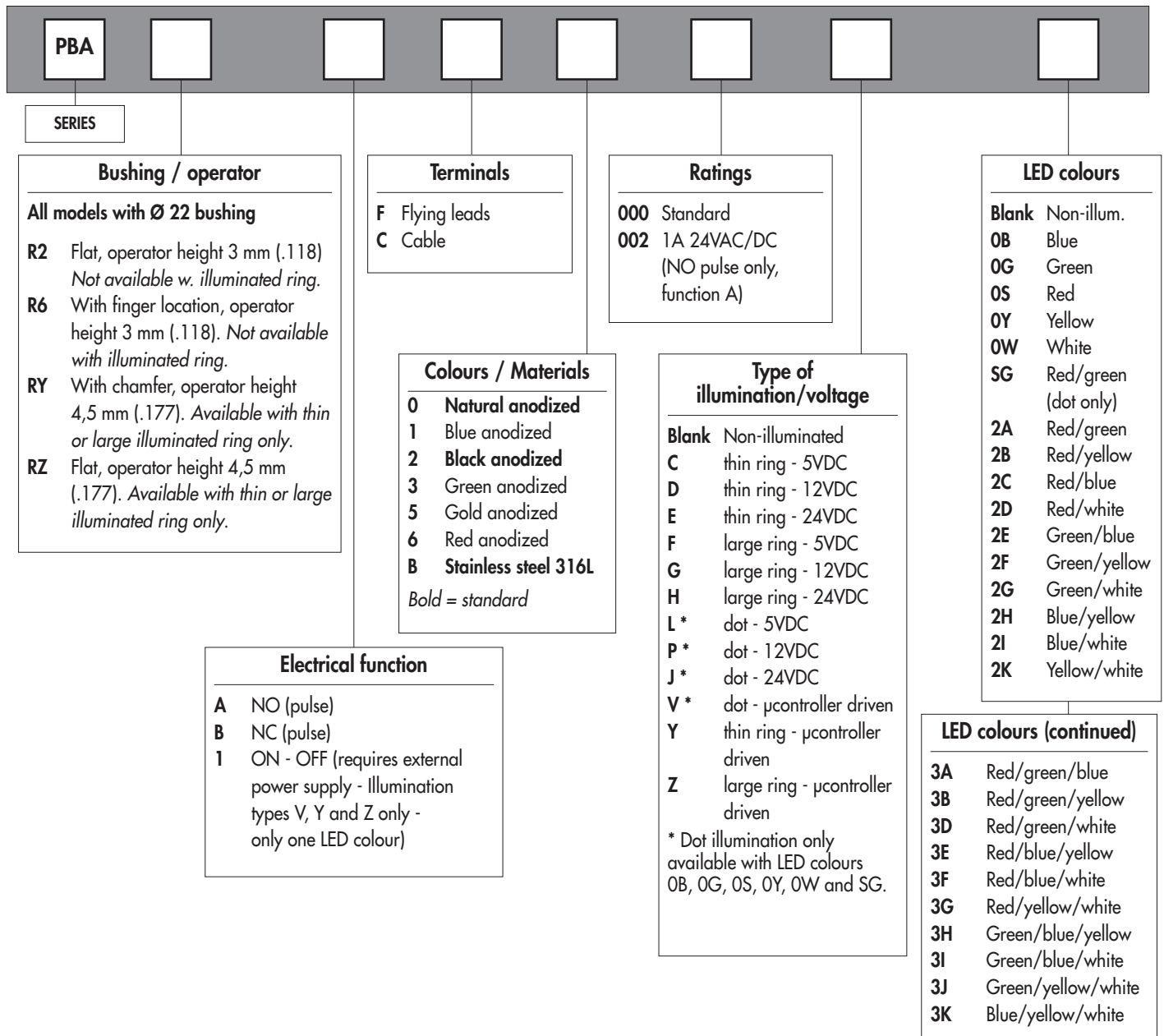
3A : red/green/blue - 3B : red/green/yellow - 3D : red/green/white - 3E : red/blue/yellow - 3F : red/blue/white  
3G : red/yellow/white - 3H : green/blue/yellow - 3I : green/blue/white - 3J : green/yellow/white - 3K : blue/yellow/white

\* LED colour is indicated by the bottom of the product.

# PBA series

Piezo switches Ø 22 (.866)

Overview



B2

For options not listed above, please contact APEM.



**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).



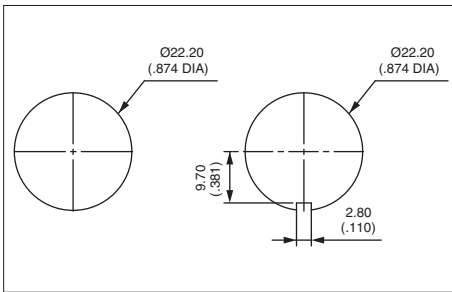
**Packaging unit** : 20 pieces (flying lead terminals) or 25 pieces (cable terminals)

# PBA series

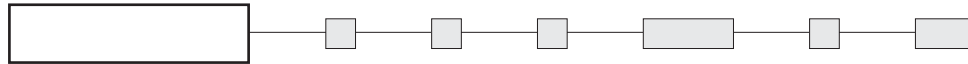
Piezo switches  $\varnothing 22$  (.866)

Illuminated or non-illuminated

- Operator  $\varnothing 28$  mm (1.102)



MODEL  
STRUCTURE



Wire colours : see "Electrical functions".

B2

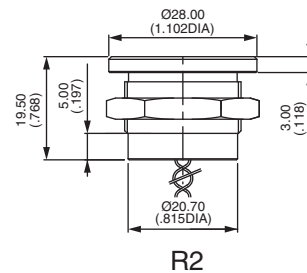
## Non-illuminated - operator height 3 mm (.118)



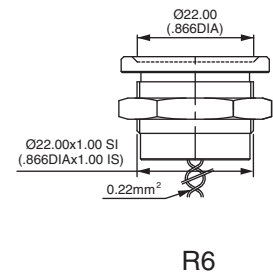
Flat  
PBAR2

With finger location  
PBAR6

PBAR2AF6000



R2



R6

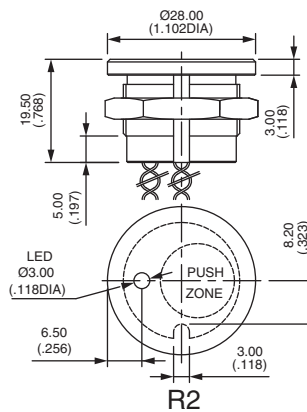
## With illuminated dot - operator height 3 mm (.118)



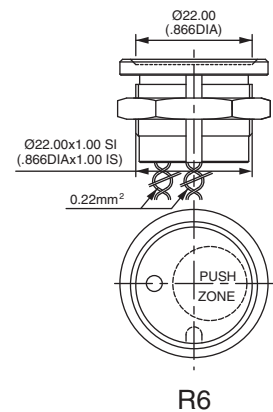
Flat  
PBAR2

With finger location  
PBAR6

PBAR6AF6000LOG



R2



R6

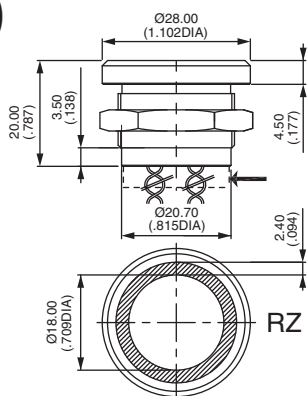
## With thin illuminated ring - operator height 4,50 (.177)



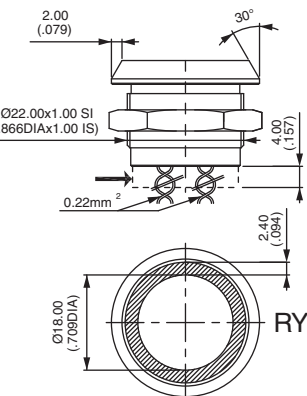
Flat  
PBARZ

With chamfer  
PBAR Y

PBARYAF0000COB



RZ



RY

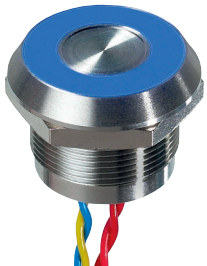
→ Dimension of ON-OFF models

# PBA series

Piezo switches Ø 22 (.866)

Illuminated or non-illuminated

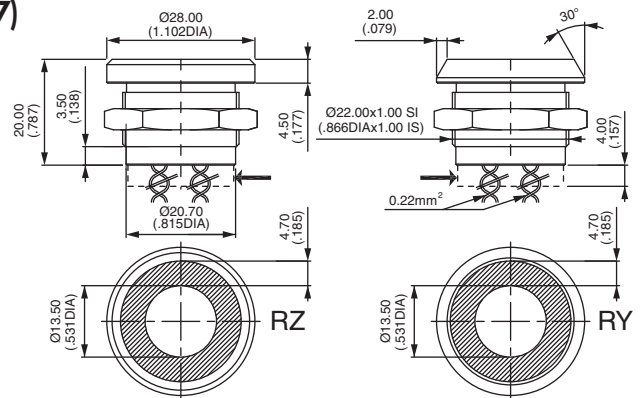
With large illuminated ring - operator height 4,50 (.177)



PBARYAF0000FOB

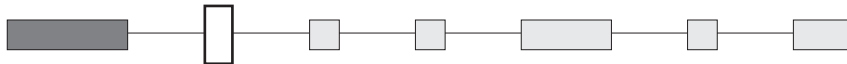
Flat  
PBARZ

With chamfer  
PBARY



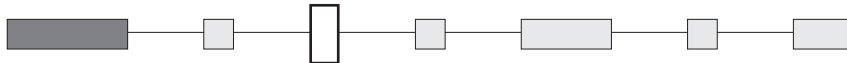
→ Dimension of ON-OFF models

## ELECTRICAL FUNCTIONS

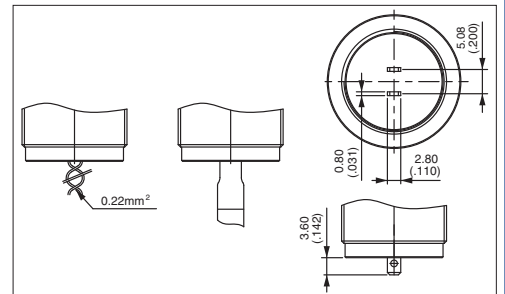


- A NO pulse
- B NC pulse
- 1 ON - OFF - Requires external power supply - Illumination types V, Y and Z only - one LED colour only.

## TERMINALS



- F Flying leads
- C Cable



## CASE COLOURS / MATERIALS



Code	Colour
0	Natural anodized aluminium
1	Blue anodized aluminium
2	Black anodised aluminium

Code	Colour
3	Green anodized aluminium
5	Gold anodized aluminium
6	Red anodised aluminium

Code	Colour
B	Stainless steel 316L



0

1

2

3

5

6

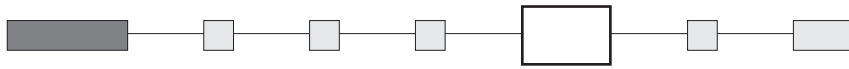
B

# PBA series

Piezo switches Ø 22 (.866)

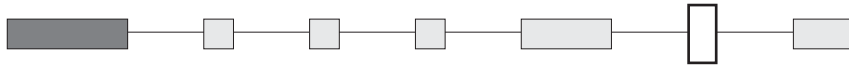
Options

## RATINGS



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

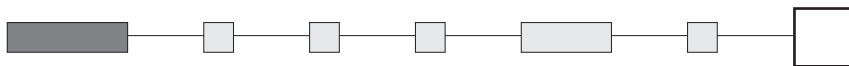
## TYPE OF ILLUMINATION / VOLTAGE



	5V	12V	24V	Microcontroller driven
	C	D	E	Y
	F	G	H	Z
	L	P	J	V

Dot illumination only available with LED colours OB, OG, OS, OY, OW and SG.

## LED COLOURS



Integrated LED resistor

Blank : non-illuminated



OB

OG

OS

OY

OW

### Illuminated 1 LED \*

OB : blue - OG : green - OS : red - OY : yellow - OW : 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 colour is indicated by the bottom of the product.

B2



# PBA series

## ATEX approved piezo switches

Distinctive features - Specifications - Overview

- Approved according to the ATEX 2014/34/EU directive
- Sealed to IP66 (mounted on panel)
- Easy to clean metal surface
- Long life
- Illuminated models

### ELECTRICAL SPECIFICATIONS

- Rated voltage : 5V to 24 VAC/DC max.
- Rated current : 200mA max. at 6VAC/DC  
50mA max. at 24VAC/DC  
(power limited to 1,2W for user group II)
- Contact resistance (ON) : 10Ω max.
- Insulation resistance (OFF) : 5MΩ min.
- Make impulse time : depending on actuating force and speed
- LED : 5VDC, 10mA to 20mA depending on model

### MATERIALS

- Case : 316L stainless steel
- Terminals : multi-wire leads  
0,22 mm<sup>2</sup>, length 300 mm (11.81)

**Standard hardware supplied:** 1 hex nut 10-621 (19 mm ac. flats), 10-855-0 (22 mm ac. flats) or 10-856-0 (25 mm ac. flats), 1 O-Ring and 1 ground connector U5735, U5736 or U5737.

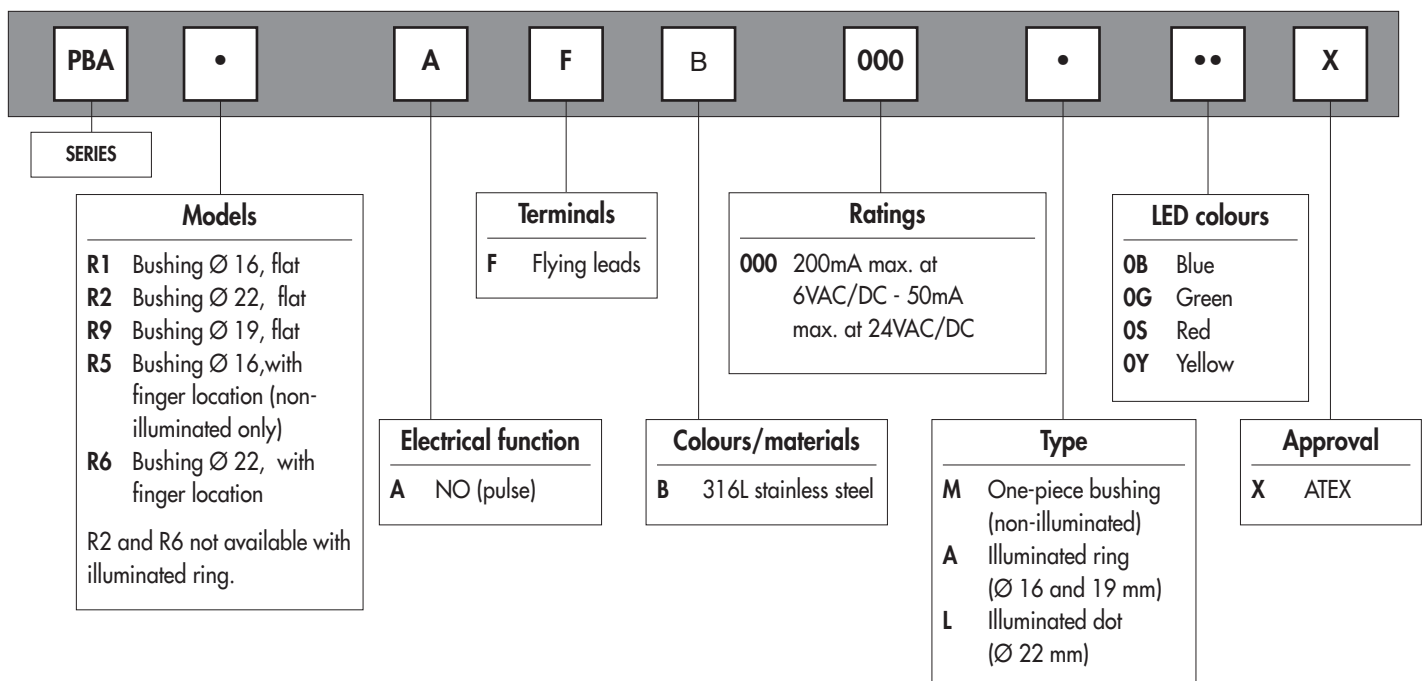
**Packaging units :** 20 pieces

**Instructions for use :**  
see instruction notice NTPBA007.

### GENERAL SPECIFICATIONS

- Operating force : 2 to 6N
- Torque : 2,5 Nm max.
- Life expectancy : 50 million cycles
- Operating temperature : -40°C to +55°C
- EMC compatibility according to EN 61058-1
- In accordance with EN 60079-0:2009\*, EN 60079-26:2007, EN 60079-11:2012, EN 50303:2000
- Sealing : IP66 per IEC 60529 (switches mounted on panel)

\* Changes to the latest standards EN 60079-0:2012 do not affect compliance with the essential requirements.



# PBA series

ATEX approved piezo switches

Illuminated or non-illuminated



- Highest classifications
- Universal



II 1 G D ; I M 1

Ex ia IIC T4 Ga ; Ex ia I Ma  
Ex ia IIIC T135°C Da IP66

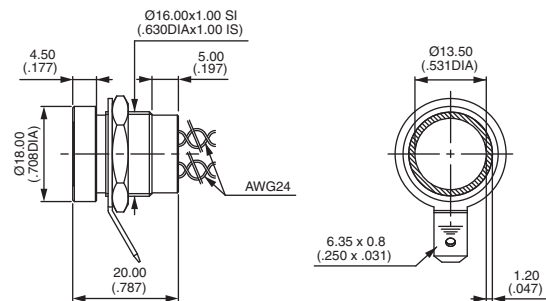
Usage : mines full of fire damp and potentially explosive atmospheres of groups IIC, IIB et IIA in T4 temperature class and/or in the presence of combustible dust (T135°C).

B2

## Dia. 16 (.630) bushing - illuminated ring



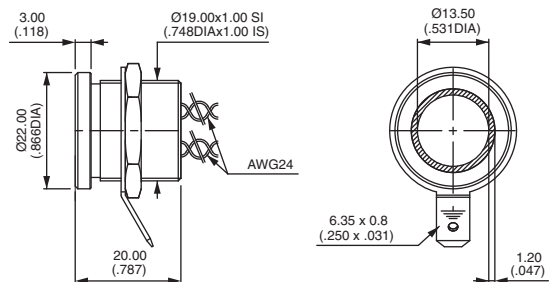
Stainless steel 316L, blue LED  
PBAR1AFB000A0BX



## Dia. 19 (.748) bushing - illuminated ring



Stainless steel 316L, blue LED  
PBAR9AFB000A0BX



## Dia. 22 (.866) bushing - non-illuminated



Stainless steel 316L  
PBAR2AFB000MX

