PBA series

Piezo switches

Specifications

UG1006-A

- ❑ **Sealed to IP 68 and IP69K (switches mounted on panel)**
- ❑ **Easy to clean metal surface**
- ❑ **Very long life expectancy**
- ❑ **Ring or dot illumination**

B

ENVIRONMENTAL SPECIFICATIONS

- Sealing : IP68 per IEC 529, IP69K per DIN 40050-9 (switches mounted on panel or not)
- 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)

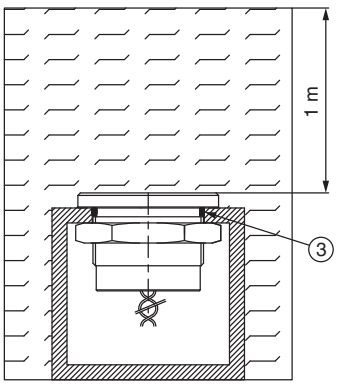
MATERIALS

- Case : aluminium, anodized or stainless steel 316L
- Multi-wire leads section 0,22 mm^2 length 300 mm, twisted by pair
- Cable, length 300 mm, section depending on switch model
- PC terminals : bronze, tin plated

ELECTRICAL AND GENERAL SPECIFICATIONS

- Max. current/voltage rating :
  - 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.
- Operating force : 2 to 6N
- Life expectancy : 50 million cycles
- LED consumption : Illuminated dot : 10mA - Illuminated ring : 20mA

SEALING IP68

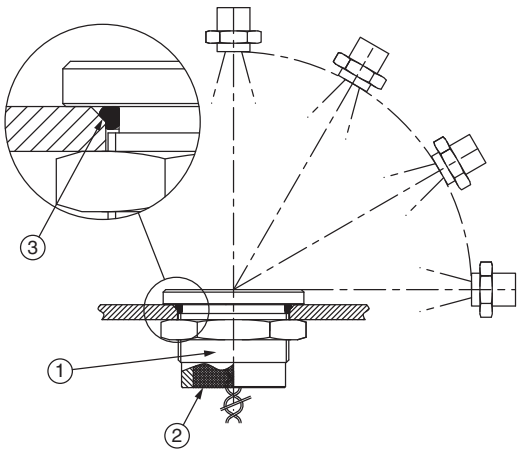


Continuous immersion in water

IP68 test conditions

Continuous immersion in water (1m, 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
. Flow : 14 - 16 l/mn
. Duration : 30 seconds per position

PBA series

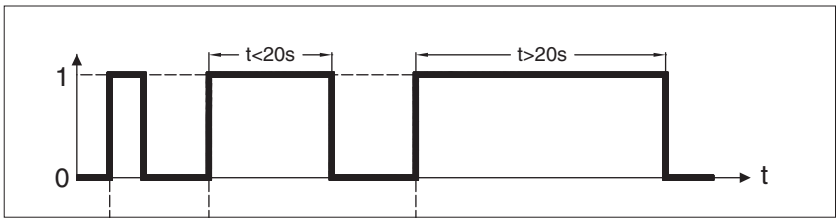
New!

Piezo switches

Electrical functions

FINGER PRESSURE applied to switch

1 = pressure
0 = no pressure



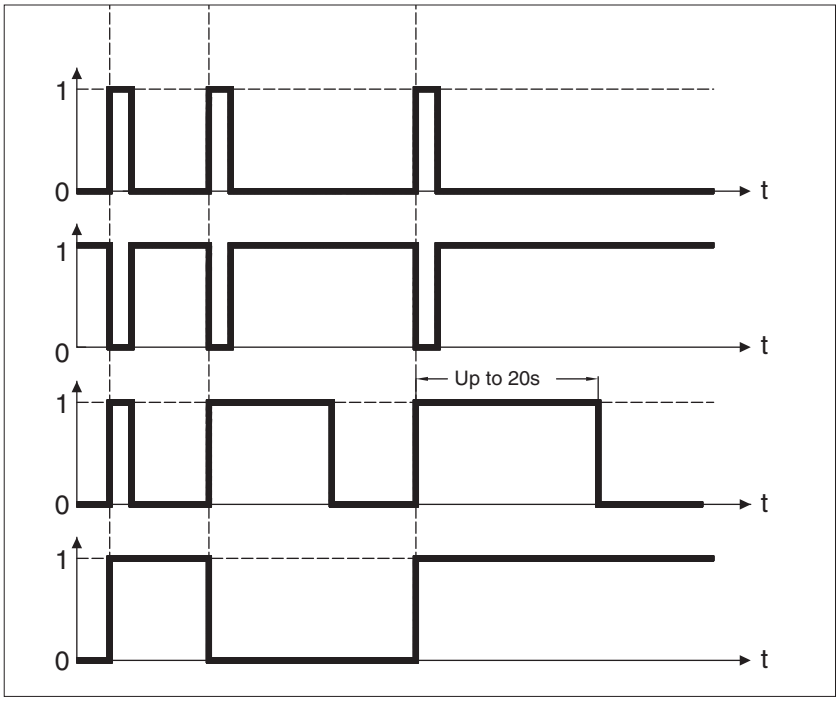
OUTPUT

- Momentary NO (pulse)
No external power supply required

- Momentary NC (pulse)
No external power supply required

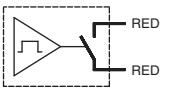
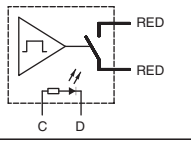
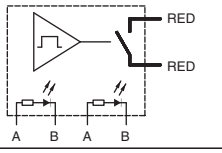
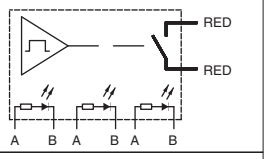
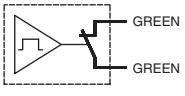
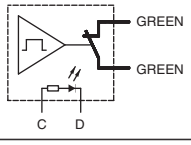
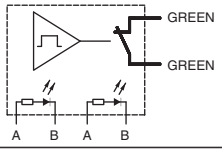
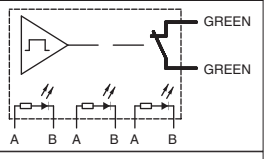
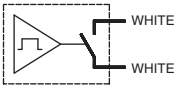
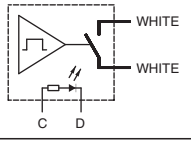
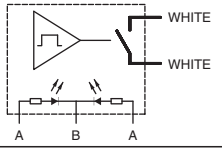
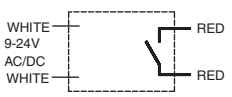
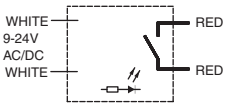
- Momentary NO prolongated pulse
No external power supply required

- 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 prolongated pulse				
Latching (ON - OFF)				

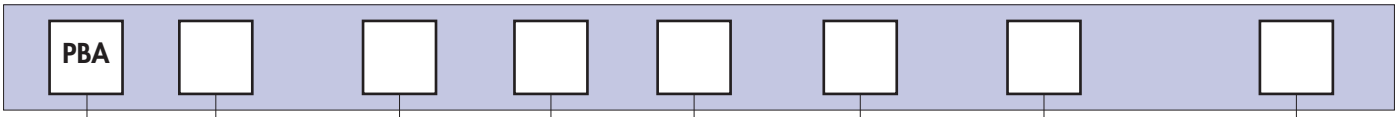
Legend : C = yellow, D = blue, B = black, A = same colour as LED * LED colour is indicated by the bottom of the product.

New!

PBA series

Piezo switches Ø 16 (.630)

Overview



SERIES

Bushing / operator

All models with Ø 16 bushing

- **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)

Terminals

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

Ratings

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

LED colours

- **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

Colours / Materials

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

Type of illumination/ voltage

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

Electrical function

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

LED colours (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.

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 10-621 (19 mm ac. flats) and 1 O-ring

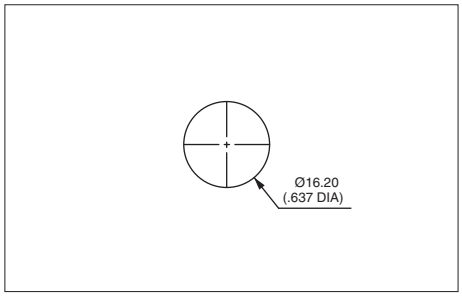
Packaging unit : 20 or 40 pieces

PBA series

New!

Piezo switches Ø 16 (.630)

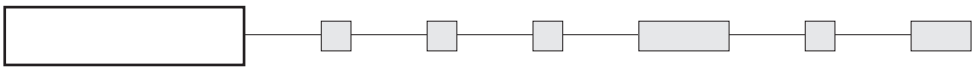
Illuminated or non-illuminated



• Operator Ø 18 mm (.708)

Shown with flying lead terminals.

MODEL STRUCTURE



B

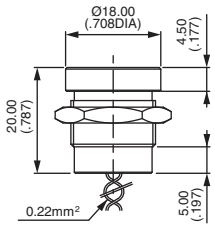
Non-illuminated, operator height 4,50 mm (.177)



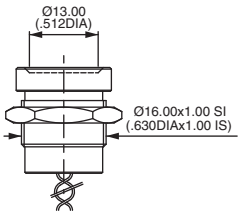
PBAR1AF2000

Flat
PBAR1

With finger location
PBAR5



R1



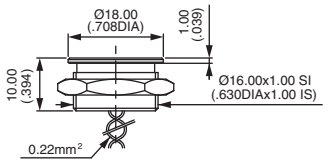
R5

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



PBAT5AF0000

Flat
PBAT5

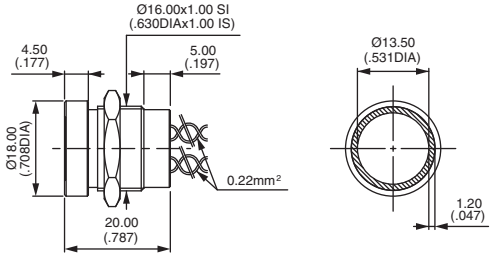


With standard illuminated ring



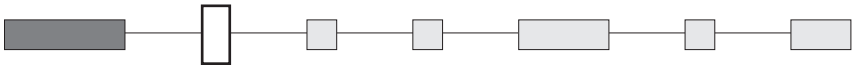
PBAR1AF000A0B

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



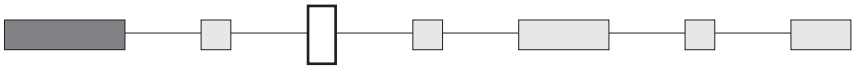
Wire colours : see "Electrical functions" page.

ELECTRICAL FUNCTION

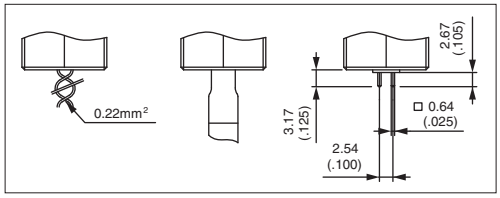


A NO pulse
B NC pulse
C NO prolongated pulse - Ground connector U5735 compulsory, order separately.
1 ON - OFF - Requires external power supply - Cannot be combined with T5 operator. Illumination type W only.

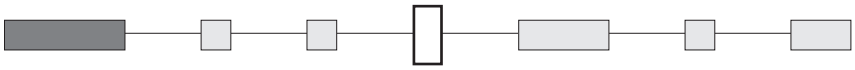
TERMINALS



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



CASE COLOURS / MATERIALS



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

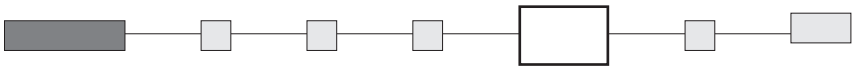
Code	Colour
3	Green anodized aluminium
5	Gold anodized aluminium
6	Red anodised aluminium

Code	Colour
B	**Stainless steel 316L**



0 **1** **2** **3** **5** **6** **B**

RATINGS



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

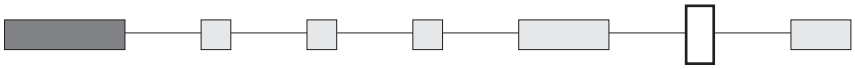
PBA series

New!

Piezo switches Ø 16 (.630)

Options

TYPE OF ILLUMINATION / VOLTAGE

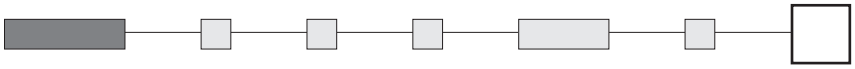


Blank : non-illuminated

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

B

LED COLOURS



Integrated LED resistor

Blank : non-illuminated



0B **0G** **0S** **0Y** **0W**

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

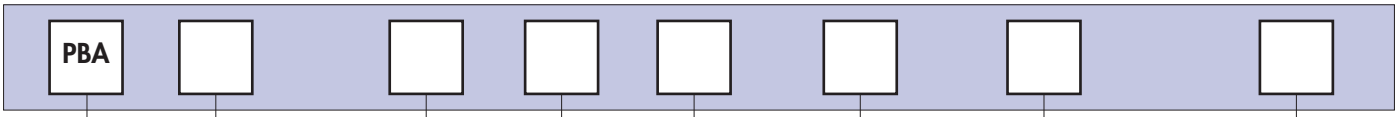
* LED colour is indicated by the bottom of the product.

New!

PBA series

Piezo switches Ø 19 (.748)

Overview



Bushing / operator

R9	Bushing Ø 19 (.748), flat operator, height 3 (.118)
RA	Bushing Ø 19 (.748), with chamfer, height 3 (.118)

Terminals

F	Flying leads
C	Cable

Ratings

000	Standard
002	1A 24VAC / DC (NO pulse only)

LED colours

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

Colours / Materials

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

Type of illumination/voltage

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

Electrical function

A	NO (pulse)
B	NC (pulse)
C	NO prolongated pulse (ground connector compulsory)
1	ON - OFF (requires external power supply, illumination type W only)

LED colours (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.

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

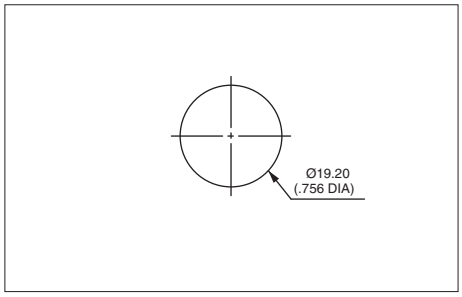
Packaging unit : 20 pieces

PBA series

New!

Piezo switches Ø 19 (.748)

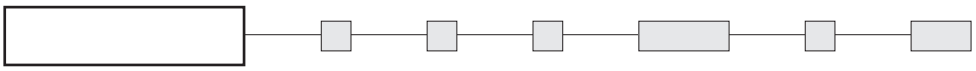
Illuminated or non-illuminated



- Operator Ø 22 mm (.866)

Shown with flying lead terminals.

MODEL STRUCTURE



B

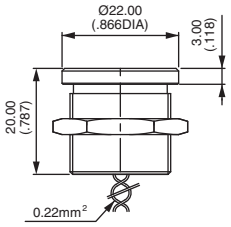
Non-illuminated - operator height 3 mm (.118)



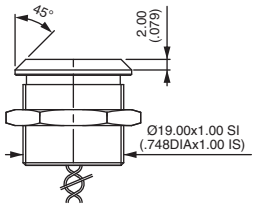
PBARAAF1000

Flat
PBAR9

With chamfer
PBARA



R9



RA

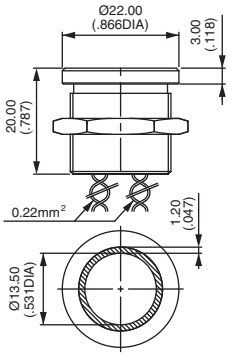
With standard illuminated ring - operator height 3 mm



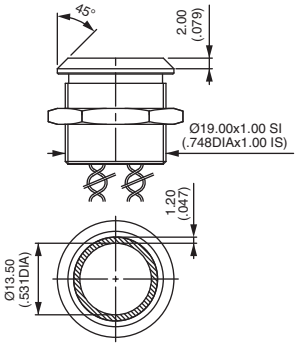
PBAR9AF0000A0S

Flat
PBAR9

With chamfer
PBARA



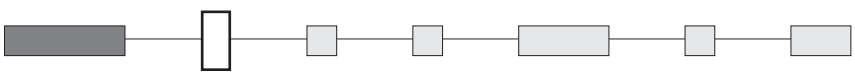
R9



RA

Wire colours : see "Electrical functions" page.

ELECTRICAL FUNCTION



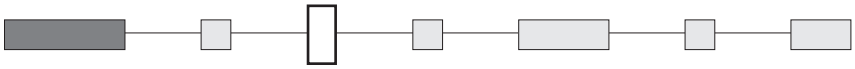
A NO pulse
B NC pulse
C NO prolongated pulse - Ground connector U5736 compulsory, order separately.
1 ON - OFF - Requires external power supply - Illumination type W only.

PBA series

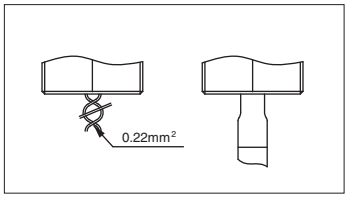
Piezo switches Ø 19 (.748)

Options

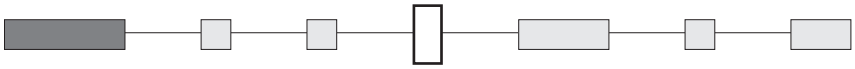
TERMINALS



F Flying leads
C Cable



CASE COLOURS / MATERIALS



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

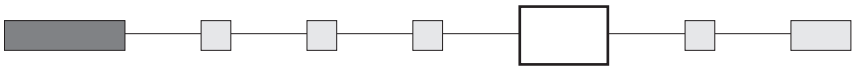
Code	Colour
3	Green anodized aluminium
5	Gold anodized aluminium
6	Red anodised aluminium

Code	Colour
B	**Stainless steel 316L**



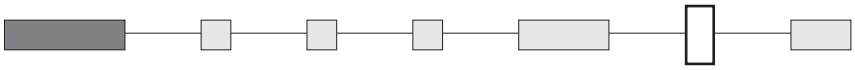
0 **1** **2** **3** **5** **6** **B**

RATINGS



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

TYPE OF ILLUMINATION / VOLTAGE



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

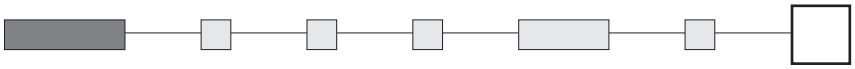
PBA series

New!

Piezo switches Ø 19 (.748)

Options

LED COLOURS



Integrated LED resistor

Blank : non-illuminated



0B **0G** **0S** **0Y** **0W**

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

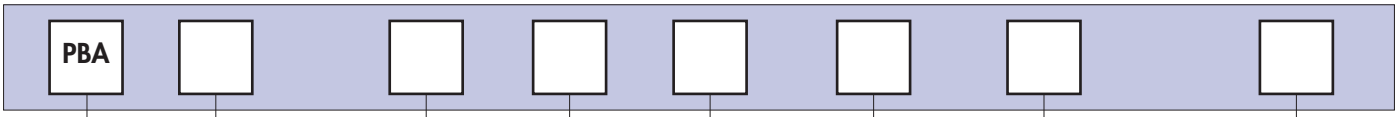
* LED colour is indicated by the bottom of the product.

New!

PBA series

Piezo switches Ø 22 (.866)

Overview



Bushing / operator

All models with Ø 22 bushing

- **R2** Flat, operator height 3 mm (.118) *Not available w. illuminated ring.*
- **R6** With finger location, operator height 3 mm (.118). *Not available with illuminated ring.*
- **RY** With chamfer, operator height 4,5 mm (.177). *Available with thin or large illuminated ring only.*
- **RZ** Flat, operator height 4,5 mm (.177). *Available with thin or large illuminated ring only.*

Terminals

- **F** Flying leads
- **C** Cable
- **Z** Solder lug/quick-connect (non-illum. functions A & B only) On request.

Ratings

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

LED colours

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

Colours / Materials

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

Type of illumination/voltage

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

Electrical function

- **A** NO (pulse)
- **B** NC (pulse)
- **C** NO prolongated pulse (illuminated ring only - ground connector compulsory)
- **1** ON - OFF (requires external power supply - Illumination types V, Y and Z only - only one LED colour)

LED colours (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.

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

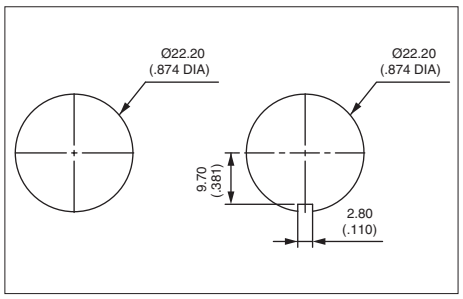
Packaging unit : 20 pieces

PBA series

Piezo switches Ø 22 (.866)

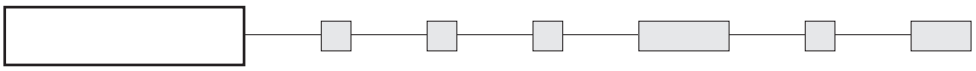
Illuminated or non-illuminated

New!



- Operator Ø 28 mm (1.102)

MODEL STRUCTURE



Wire colours : see "Electrical functions" page.

B

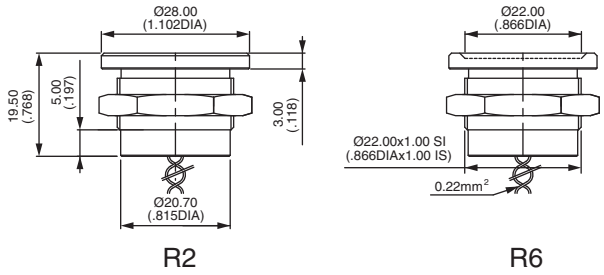
Non-illuminated - operator height 3 mm (.118)



PBAR2AF6000

Flat
PBAR2

With finger location
PBAR6



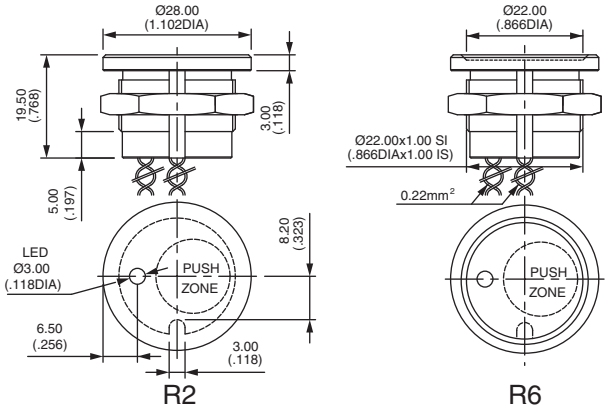
With illuminated dot - operator height 3 mm (.118)



PBAR6AF6000L0G

Flat
PBAR2

With finger location
PBAR6



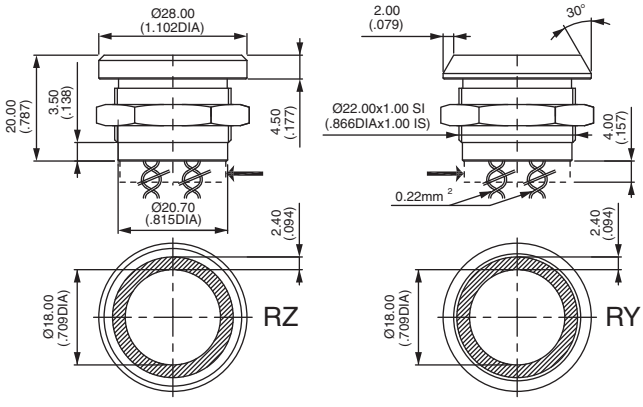
With thin illuminated ring - operator height 4,50 (.177)



PBARYAF0000C0B

Flat
PBARZ

With chamfer
PBARY



→ Dimension of ON-OFF models

New!

PBA series

Piezo switches Ø 22 (.866)

Illuminated or non-iluminated

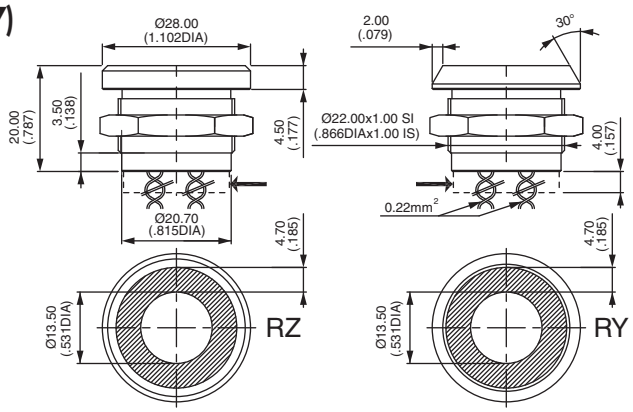
With large illuminated ring - operator height 4,50 (.177)



PBARYAF0000F0B

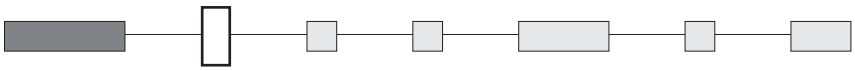
Flat
PBARZ

With chamfer
PBARY



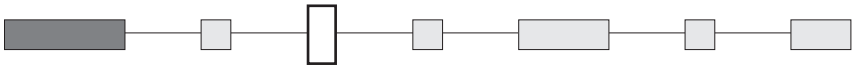
→ Dimension of ON-OFF models

ELECTRICAL FUNCTION

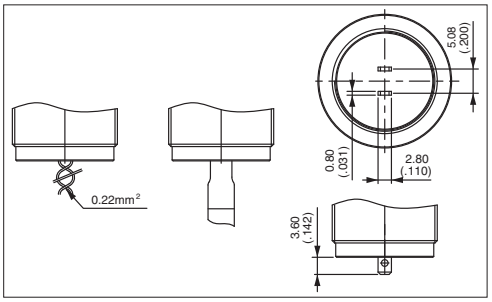


A NO pulse
B NC pulse
C NO prolongated pulse (illuminated ring only) - Ground connector U5737 compulsory, order separately.
1 ON - OFF - Requires external power supply - Illumination types V, Y and Z only - one LED colour only.

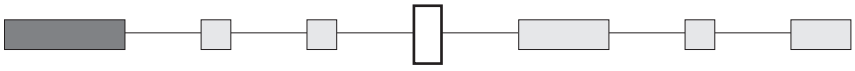
TERMINALS



F Flying leads
C Cable
Z Solder lug / quick-connect (non-illuminated, functions A and B only) On request.



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**

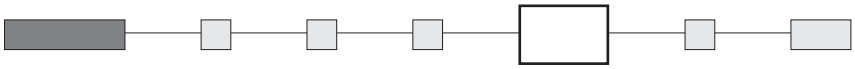
PBA series

New!

Piezo switches Ø 22 (.866)

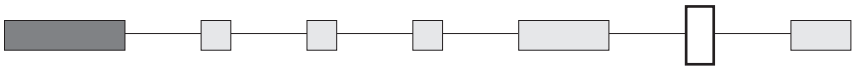
Options

RATINGS



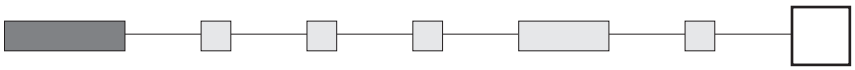
000 Standard
002 1A 24VAC or DC (NO pulse only)

TYPE OF ILLUMINATION / VOLTAGE



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

LED COLOURS



Integrated LED resistor

Blank : non-illuminated



0B **0G** **0S** **0Y** **0W**

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 colour is indicated by the bottom of the product.

New!

PBA series

ATEX approved piezo switches

Distinctive features - Specifications - Overview

- ❑ **Approved according to the ATEX 94/9/CE directive**
- ❑ **Sealed to IP66 (mounted on panel)**
- ❑ **Easy to clean metal surface**
- ❑ **Long life**
- ❑ **Illuminated models**

B

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

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, EN 60079-11, EN 61241-0, EN 61241-11, EN 60079-26 and EN 50303
- Sealing : IP66 per IEC 60529 (switches mounted on panel)

MATERIALS

- Case : 316L stainless steel
- Terminals : multi-wire leads
  0,22 mm², 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 :
- bushing Ø 16 : 40 pieces
- illuminated bushing Ø 16 : 20 pieces
- bushing Ø 19 : 20 pieces
- bushing Ø 22 : 20 pieces

Instructions for use :
see instruction notice NTPBA006.

PBA	•	A	F	•	000	•	••	X

SERIES

Models

R1	Bushing Ø 16, flat
R2	Bushing Ø 22, flat
R9	Bushing Ø 19, flat
R5	Bushing Ø 16,with finger location (non-illuminated only)
R6	Bushing Ø 22, with finger location

R2 and R6 not available with illuminated ring.

Terminals

F	Flying leads

Ratings

000	200mA max. at 6VAC/DC - 50mA max. at 24VAC/DC

LED colours

0B	Blue
0G	Green
0S	Red
0Y	Yellow

Electrical function

A	NO (pulse)

Colours/materials

B	316L stainless steel

Type

M	One-piece bushing (non-illuminated)
A	Illuminated ring (Ø 16, 19 & 22 mm)
L	Illuminated dot (Ø 22 mm)

Approval

X	ATEX

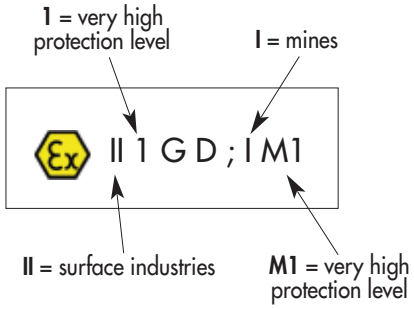
PBA series

ATEX approved piezo switches

Illuminated or non-illuminated

New!

- **Highest classifications**
- **Universal**

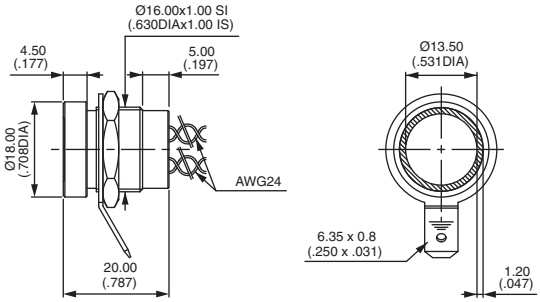


B

Dia. 16 (.630) bushing - illuminated ring



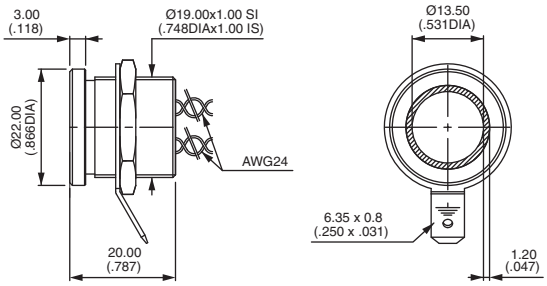
Stainless steel 316L, blue LED
PBAR1AFB000A0BX



Dia. 19 (.748) bushing - illuminated ring



Stainless steel 316L, blue LED
PBAR9AFB000A0BX



Dia. 22 (866) bushing - non-illuminated



Stainless steel 316L
PBAR2AFB000MX

