

# IP series

Pushbutton switches for harsh environments •  
bushing Ø 12 mm • latching



## DISTINCTIVE FEATURES

Latching action  
Illuminated or non-illuminated  
Compact  
Flat round actuator for optional marking  
Sealed to IP67



## ENVIRONMENTAL SPECIFICATIONS

- Front panel sealing : IP67 according to IEC 60529
- Shock resistance : 100 g according to IEC 512-4, test 6c
- Vibration resistance : 10-500Hz - 10 g according to IEC 512-4, test 6d
- Salt spray : IEC 512-6, test 11f
- Robustness (non-illuminated) : IK06 according to EN 62262 (1 joule)
- Operating temperature : -40 °C to +85 °C (-40 °F to +185 °F)



## ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load:

4 A 12 VDC, 200,000 cycles

1 A 48 VDC, 200,000 cycles

2 A 48 VDC, 100,000 cycles

3 A 48 VDC, 75,000 cycles

1 A 72 VDC, 15,000 cycles

For W terminals, current has  
to be limited to 400 mA.

- Initial contact resistance : 100 mΩ max.
- Insulation resistance : 1 GΩ min. at 500 VDC
- Dielectric strength : 1,500 Vrms between terminals  
1,000 Vrms between terminals and frame



### LED COMPONENT SPECIFICATIONS

LED color	Forward current	Typ. forward voltage	Max. forward voltage
Super red (LOS)	20 mA	1.95 V	1.95 V
Yellow (LOY)	20 mA	2 V	2.05 V
Green (LOG)	20 mA	2.1 V	2.5 V
Blue (LOB)	20 mA	3.2 V	4 V

A resistor must be series-connected by the user.  
Resistor value =  $\frac{\text{supply voltage} - \text{LED forward voltage}}{\text{LED forward current}}$

The company reserves the right to change specifications without notice.

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## GENERAL SPECIFICATIONS

- Panel thickness : 1.5 mm (.059) min.  
5.5 mm (.217) max.
- Total travel : 2.5 mm (.098) ± 0.3 mm
- Typical operating force : 10 N
- Low level/mech. life : 200.000 cycles
- Torque : 1.5 Nm max. applied to nut
- Soldering : 320 °C (608 °F) max. for 3 sec.



## MATERIALS

- Case : thermoplastic, UL 94-V0
- Actuator : polyamide 6/6
- Bushing/bezel : zinc die-cast (zamak), black painted
- Contacts : silver, gold plated
- Output wires (flying lead terminals) :  
**F version** : AWG20, section 0.6 mm<sup>2</sup>  
**W version** : AWG24, section 0.23 mm<sup>2</sup>
- LED wires :
- F version** : AWG26, section 0.12 mm<sup>2</sup>  
**W version** : AWG24, section 0.23 mm<sup>2</sup>
- Lens : polycarbonate
- Terminal seal : epoxy

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

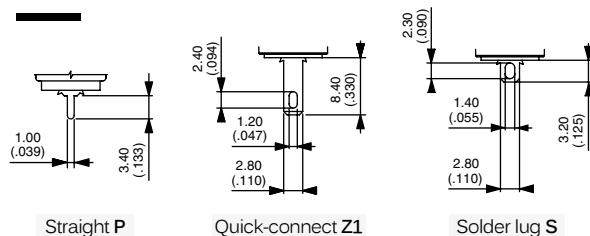
## AGENCY APPROVAL



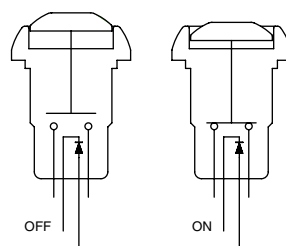
2 A 125 VAC/250 VAC  
File E83438  
See following pages.



## TERMINALS

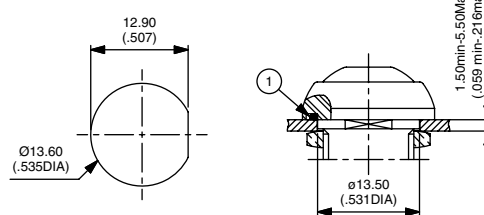


## ELECTRICAL FUNCTION



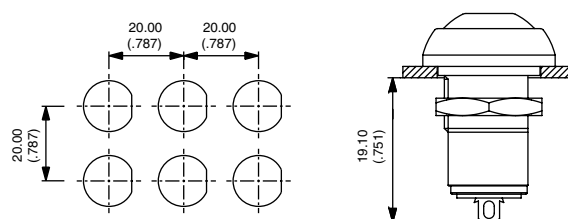
## MOUNTING

### PANEL CUT-OUT



① - Flat seal

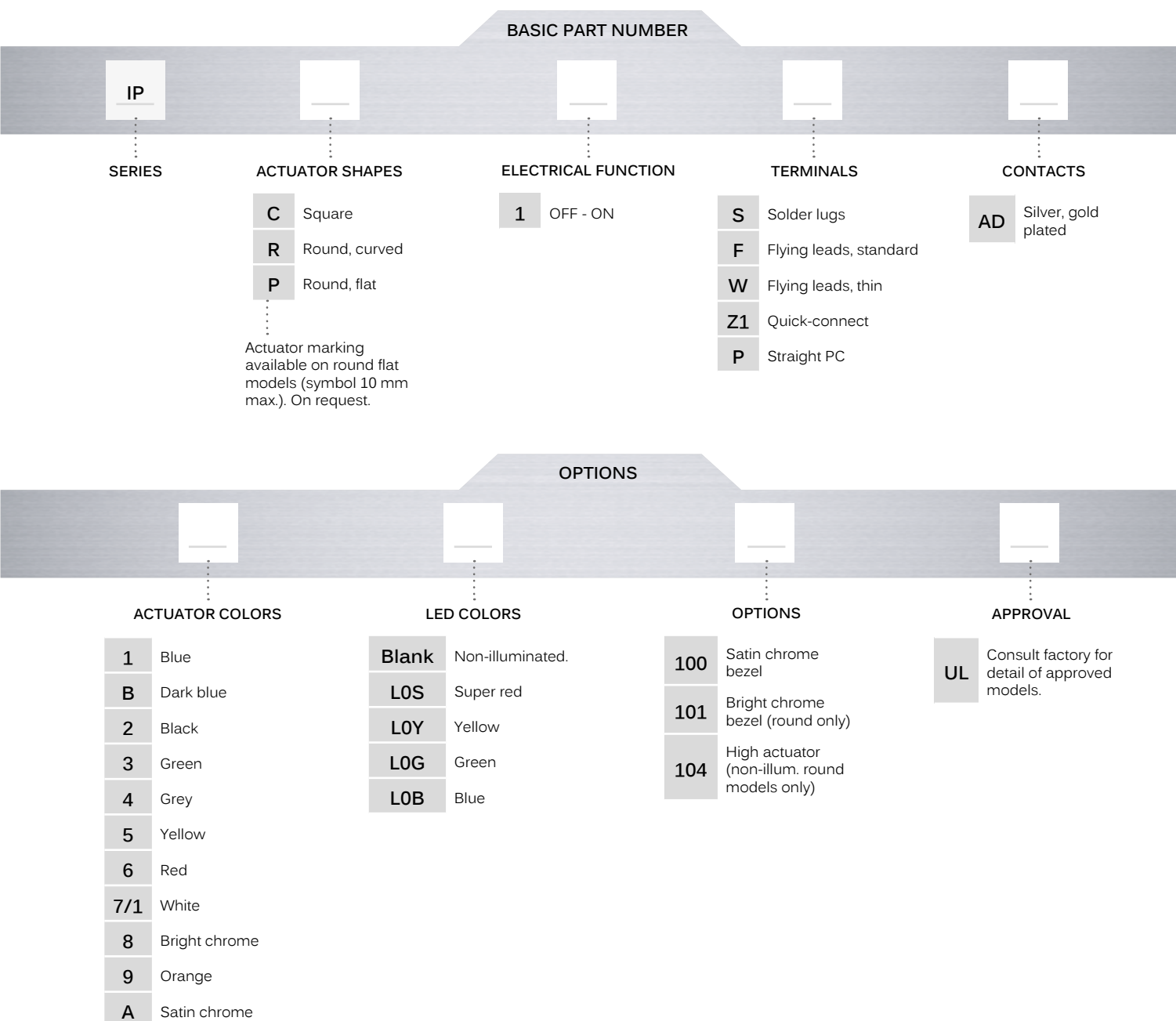
### MATRIX MOUNTING - BACK OF PANEL SPACE REQUIREMENT



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## BUILD YOUR PART NUMBER



## 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.
- A sealing boot** is available to protect the switches against frost and sand (P/N U5125). See "Sealing Boots" section of website.
- Mounting accessories** : Standard hardware supplied : 1 hex nut 14 mm (.551) across flats and 1 O-Ring.

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## ILLUMINATED - SQUARE MODELS



Solder lug terminals

**IPC1SAD**

OFF - ON

Flying lead terminals

**IPC1FAD**

OFF - ON

For THIN flying leads, replace F with W.

Also available with straight PC : **IPC1PAD** or quick-connect terminals : **IPC1Z1AD**.

Wire colors : black : contact, red : LED anode(+), blue : LED cathode(-)

## ILLUMINATED - ROUND MODELS



Solder lug terminals

**IPR1SAD**

OFF - ON

Flying lead terminals

**IPR1FAD**

OFF - ON

For THIN flying leads, replace F with W.

Also available with straight PC : **IPR1PAD** or quick-connect terminals : **IPR1Z1AD**.

Wire colors : black : contact, red : LED anode(+), blue : LED cathode(-)

## NON-ILLUMINATED - SQUARE MODELS



Solder lug terminals

**IPC1SAD**

OFF - ON

Flying lead terminals

**IPC1FAD**

OFF - ON

For THIN flying leads, replace F with W.

Also available with straight PC : **IPR1PAD** or quick-connect terminals : **IPC1Z1AD**.

## NON-ILLUMINATED - ROUND MODELS



CURVED ACTUATOR

Solder lug terminals

**IPR1SAD**

OFF - ON

Flying lead terminals

**IPR1FAD**

OFF - ON

FLAT ACTUATOR

Solder lug terminals

**IPP1SAD**

OFF - ON

Flying lead terminals

**IPP1FAD**

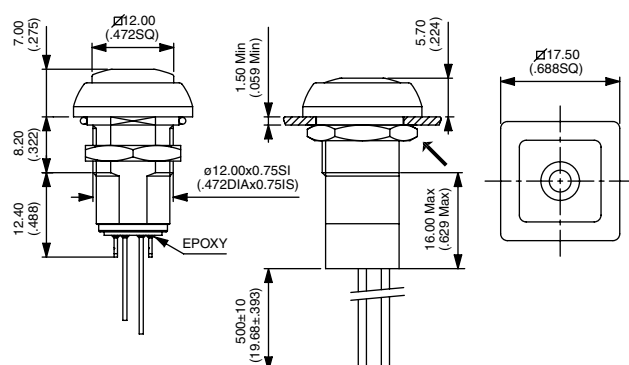
OFF - ON

For THIN flying leads, replace F with W.

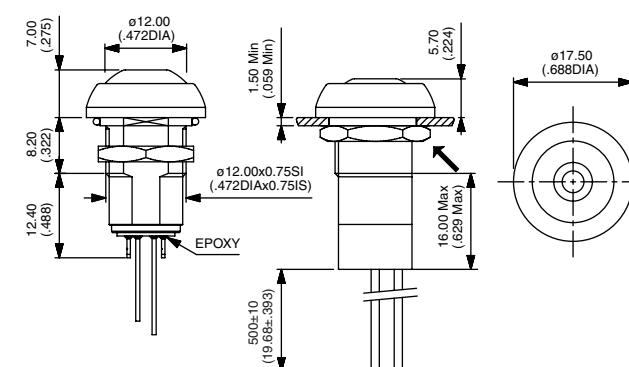
Also available with straight PC : **IP•1PAD** or quick-connect terminals : **IP•1Z1AD**

→ FLAT

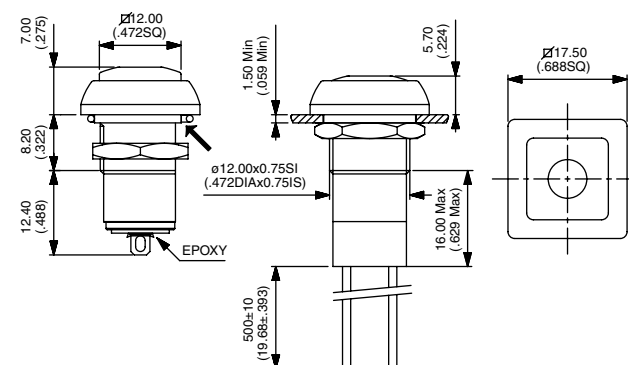
All drawings with standard flying lead terminals.



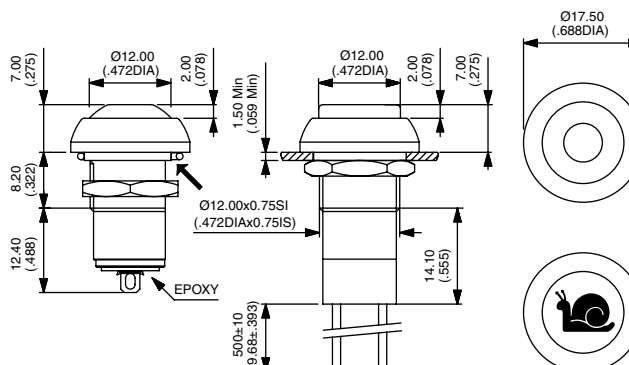
→ FLAT



→ FLAT



→ FLAT



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## ACTUATOR COLORS

BASIC P/N

1	Blue	6	Red
B	Dark blue	7/1	White
2	Black	8	Bright chrome
3	Green	9	Orange
4	Grey	A	Satin chrome
5	Yellow		

## LED COLORS

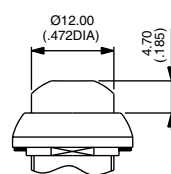
BASIC P/N

Blank	Non-illuminated
L0S	Super red
L0Y	Yellow
L0G	Green
L0B	Blue

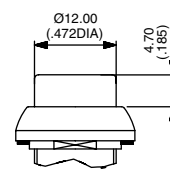
## OPTIONS

BASIC P/N

100	Satin chrome bezel
101	Bright chrome bezel (round only)
104	High actuator - For round, non-illuminated only



104 IPR



104 IPP

## AGENCY APPROVAL

BASIC P/N

**UL**  
Consult factory for details of approved models.  
To order switches marked UL, complete above box with "UL".

# Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Apem:](#)

[IPC1FAD2](#) [IPC1SAD2](#) [IPC1SAD6](#) [IPR1FAD2](#) [IPR1FAD2L0G](#) [IPR1FAD3L0G](#) [IPR1FAD6](#) [IPR1FAD6L0S](#)  
[IPR1SAD2L0G](#) [IPR1SAD2L0S](#) [IPR1SAD3](#) [IPR1SAD3L0G](#) [IPR1SAD5](#) [IPR1SAD5104](#) [IPR1SAD5L0S](#) [IPR1SAD6](#)  
[IPR1SAD6104](#) [IPR1SAD6L0S](#) [IPR1SAD2](#) [IPR1FAD2L0S](#) [IPR1SAD2101](#) [IPR1SAD2L0B](#) [IPR1Z1AD2](#)  
[IPP1SAD3100](#) [IPR1SAD3L0S](#) [IPC1FAD3](#)