

# IP series

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



## DISTINCTIVE FEATURES

Illuminated or non-illuminated

Tactile feedback

Wide variety of configurations

Flat round actuator for optional marking

Sealed to IP67 and IP69K



## ENVIRONMENTAL SPECIFICATIONS

- Front panel sealing: IP67 according to IEC 60529  
IP69K according to DIN 40050-9 (non-illuminated) with cap U5125
- 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 (gold plated silver contacts):  
5 A 28 VDC, 70,000 cycles (only function 3)  
0.2 A 48 VDC, 500,000 cycles  
0.5 A 48 VAC, 500,000 cycles
- Initial contact resistance: 100 mΩ max.
- Insulation resistance: 1 GΩ min. at 500 VDC
- Dielectric strength: 1,500 Vrms
- Contact bounce: 10 ms

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



### LED COMPONENT SPECIFICATIONS

| LED color          | Forward current | Typ. forward voltage       | Max. forward voltage |
|--------------------|-----------------|----------------------------|----------------------|
| Super red (L0S)    | 20 mA           | 2.1 V                      | 2.3 V                |
| Yellow (L0Y)       | 20 mA           | 2.1 V                      | 2.3 V                |
| Green (L0G)        | 20 mA           | 2.1 V                      | 2.3 V                |
| Blue (L0B)         | 20 mA           | 3.2 V                      | 3.8 V                |
| White (L0W)        | 20 mA           | 3.35 V                     | 4.25 V               |
| Red/green (LSG)    | 20 mA           | Red: 1.95 V / green: 2.1 V | 2.5 V                |
| Yellow/green (LYG) | 20 mA           | Yellow: 2 V / green: 2.1 V | 2.5 V                |

A resistor must be series-connected by the user.  

$$\text{Resistor value} = \frac{\text{supply voltage} - \text{LED forward voltage}}{\text{LED forward current}}$$

The company reserves the right to change specifications without notice.

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## GENERAL SPECIFICATIONS

- Panel thickness: 1.5 mm (.059) min.  
4 mm (.157 max.)
- Total travel:  
Function 3: 1.7 mm (.067) ± 0.3 mm (0.012)  
Function 5: 1.3 mm (.051) ± 0.3 mm (0.012)
- Typical operating force: 6 N ± 2 N
- Low level/mech. life: 1,000,000 cycles
- Torque: 1.5 Nm max. applied to nut
- Soldering: 320 °C (608 °F) max. for 3 sec.



## MATERIALS

- Case: thermoplastic UL94-V0
- Actuator: polyamide 6/6
- Bushing/bezel: zinc die-cast (zamak), black painted
- Contacts: - silver, gold plated (std)  
- brass, gold plated (for option 104)
- 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

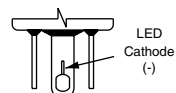


2 A 125 VAC/250 VAC  
File E83438  
See following pages.

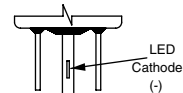


## TERMINALS

### ILLUMINATED MODELS

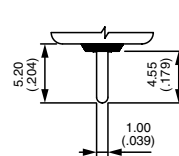


Solder lug **S**

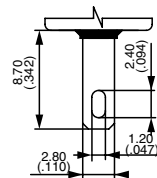


Straight **P**

### NON-ILLUMINATED MODELS



Straight **P**

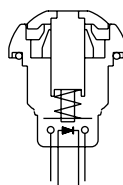


Quick-connect **Z1**



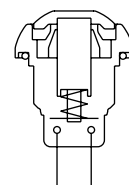
## ELECTRICAL FUNCTIONS

### ILLUMINATED MODELS

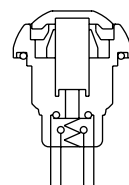


Function 3 (NO)

### NON-ILLUMINATED MODELS



Function 3 (NO)

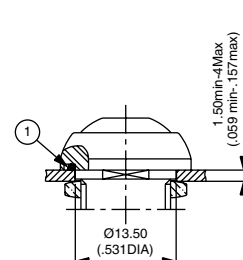
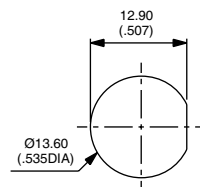


Function 5 (NC/NO)

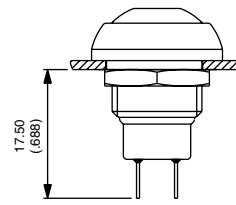
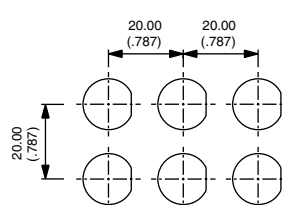


## MOUNTING

### PANEL CUT-OUT



### MATRIX MOUNTING - BACK OF PANEL SPACE REQUIREMENT

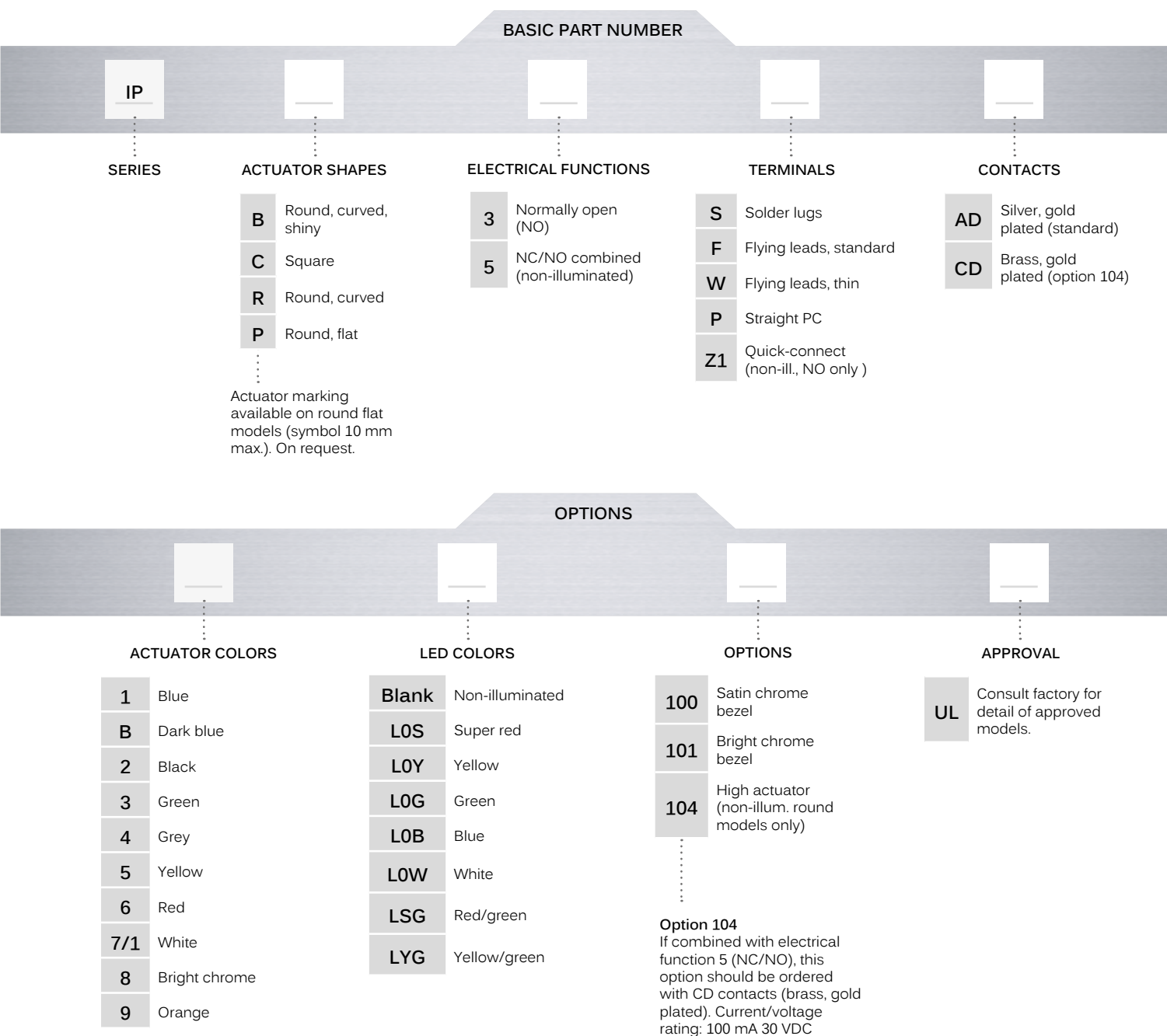


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## BUILD YOUR PART NUMBER



## 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. See "Sealing Boots" section of website.
- 🔩 **Mounting accessories:** Standard hardware supplied: 1 hex nut 14 mm (.551) across flats and 1 O-ring. Hex nut part number U166.

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## SQUARE - ILLUMINATED SOLDER LUG TERMINALS



IPC3SAD



Normally Open

Also available with straight PC terminals: **IPC3PAD**  
LED color is indicated by the bottom of the switch.

## SQUARE - ILLUMINATED FLYING LEAD TERMINALS



IPC3FAD



Normally Open

For THIN flying leads, replace F with W.

**Wire colors:** black: NO contact, red: LED anode(+), blue: LED cathode(-)  
Shown with standard flying lead terminals.

## SQUARE - NON ILLUMINATED SOLDER LUG TERMINALS



IPC3SAD



Normally Open

IPC5SAD



Normally Open

Also available with straight PC terminals: **IPC3PAD** (NO) or **IPC5PAD** (NC/NO)  
and quick-connect terminals: **IPC3Z1AD** (NO only)

## SQUARE - NON ILLUMINATED FLYING LEAD TERMINALS



IPC3FAD



Normally Open

IPC5FAD

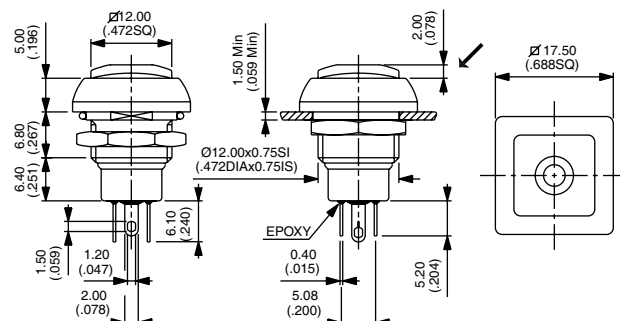


NC/NO combined

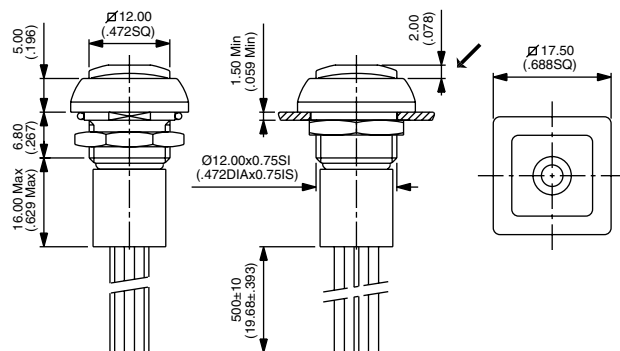
For THIN flying leads, replace F with W.

**Wire colors** (NC/NO): black: NO, blue: NC.  
Shown with standard flying lead terminals.

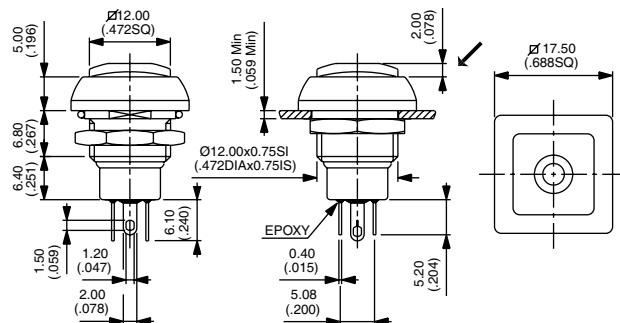
→ FLAT



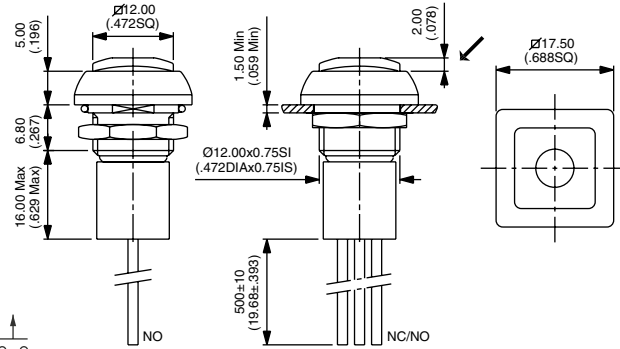
→ FLAT



→ FLAT



→ FLAT



NO

NC/NO

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## ROUND - ILLUMINATED SOLDER LUG TERMINALS



IPR3SAD



Normally Open

Also available with straight PC terminals: **IPR3PAD**  
LED colour is indicated by the bottom of the switch.

## ROUND - ILLUMINATED FLYING LEAD TERMINALS



IPR3FAD



Normally Open

For THIN flying leads, replace F with W.

**Wire colors:** black: NO contact, red: LED anode(+), blue: LED cathode(-)  
Shown with standard flying lead terminals.

## ROUND - NON ILLUMINATED SOLDER LUG TERMINALS



Curved actuator, NO

IPR3SAD



Curved actuator, NC/NO

IPR5SAD



Flat actuator, NO

IPP3SAD



Flat actuator, NC/NO

IPP5SAD



Also available with straight PC terminals: **IPC3PAD** (NO) or **IPC5PAD** (NC/NO)  
and quick-connect terminals: **IPC3Z1AD** (NO only)

## ROUND - NON ILLUMINATED FLYING LEAD TERMINALS



Curved actuator, NO

IPR3FAD



Curved actuator, NC/NO

IPR5FAD



Flat actuator, NO

IPP3FAD



Flat actuator, NC/NO

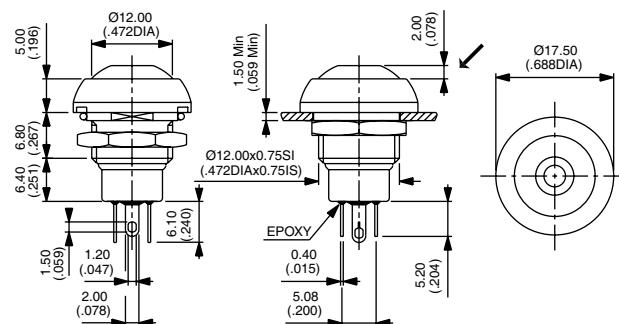
IPP5FAD



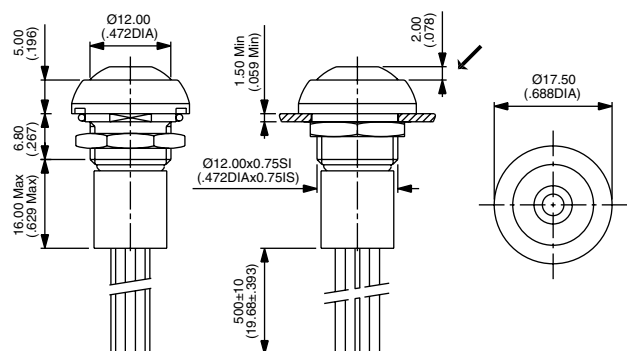
For THIN flying leads, replace F with W.

**Wire colors** (NC/NO): black: NO, blue: NC  
Shown with standard flying lead terminals.

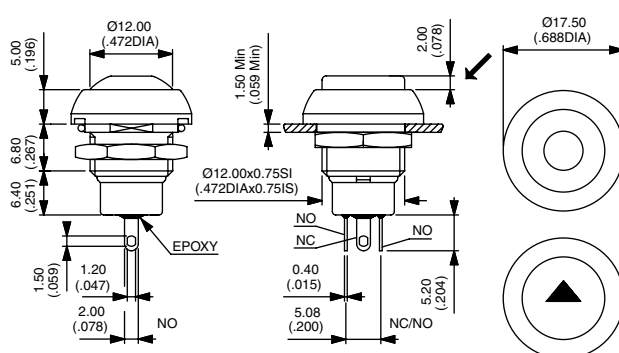
→ FLAT



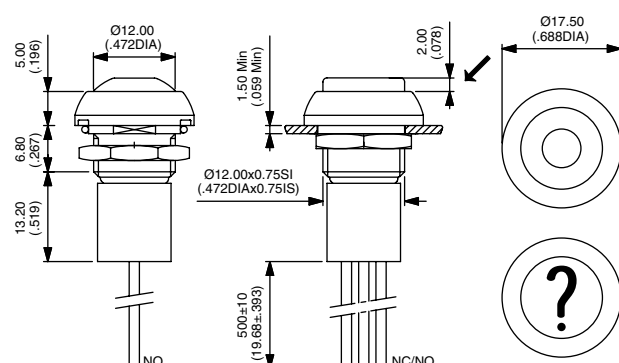
→ FLAT



→ 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

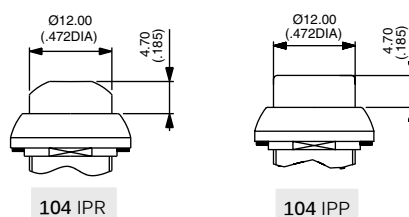
BASIC P/N

|       |                 |
|-------|-----------------|
| Blank | Non-illuminated |
| L0S   | Super red       |
| L0Y   | Yellow          |
| L0G   | Green           |
| L0B   | Blue            |
| L0W   | White           |
| LSG   | Red/green       |
| LYG   | Yellow/green    |

## OPTIONS

BASIC P/N

|     |                                                                                                                                             |
|-----|---------------------------------------------------------------------------------------------------------------------------------------------|
| 100 | Satin chrome bezel                                                                                                                          |
| 101 | Bright chrome bezel                                                                                                                         |
| 104 | High actuator - For round, non-illuminated only<br>If combined with function 5 (NC/NO), order with CD<br>contacts (instead of AD contacts). |



## AGENCY APPROVAL

BASIC P/N

### UL

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