# IP SERIES
## PUSHBUTTON SWITCHES FOR HARSH ENVIRONMENTS
## Overview

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• ***COMPACT & ILLUMINATED***

*The bushing and bezel assembly is made of a single piece of zinc die cast and fits into a Ø 13,6 mm (.535) panel cut-out. The round or square actuator is efficiently protected against mechanical shocks.*

***The status illumination is available with high brightness LED colours.***

• ***TACTILE FEEDBACK***

*The switching mechanism provides excellent tactile sensation, together with very precise actuation and has been designed for severe conditions (shocks, vibrations, high and low temperatures...).*

*Contacts have been tested for 1.000.000 cycles.*

• ***SEALED TO IP 67***

*For the whole range, the degree of protection is IP 67. The internal sealing of the switch is assured by an elastomer membrane.*

*Models with sealed flying lead terminals are suitable for multiple environments*

MODEL STRUCTURE

**IP** | ☐ | ☐ | ☐ | ☐

**SERIES**

**Bezel shape**
- **C** Square
- **R** Round

**Electrical function**
- **3** Normally open (NO)
- **5** NC/NO combined (non-illuminated)

**Terminals**
- **S** Solder lugs
- **F** Flying leads
- **P** Straight PC *
- **Z1** Quick-connect *

* Non-illum. only

**Contacts**
- **AD** Silver, gold plated

OPTIONS

**Plunger colour**
- **1** Blue
- **2** Black
- **3** Green
- **5** Yellow
- **6** Red
- **7/1** White
- **8** Chrome pl.
- **9** Orange

**LED colour**
- **Blank** Non-illum.
- **L0S** Super red
- **L0Y** Yellow
- **L0G** Green
- **L0B** Blue
- **L0W** White

**Option**
- **104** High Plunger

For non-illuminated round models only.

**ABOUT THIS SERIES**

On the following pages, you will find successively :
- specifications
- model structure of switches and options in the same order as in above chart

**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.

**A sealing boot** is available to protect the switches against frost and sand. It is presented at the end of the series and in section N.

**Mounting accessories** : Standard hardware supplied : 1 hex nut 14 mm (.551) across flats and 1 O-ring.
The hex nut is presented in section N (part number U166).

**Packaging unit** : 25 pieces

### ENVIRONMENTAL SPECIFICATIONS

- Degree of protection : IP 67
- 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 sw.) : IK06 according to EN 50102 (1 joule)
- Operating temperature : -40°C to +125°C

### ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load : 500mA 48VAC - 200mA 50VDC - 200mA 250VAC
- Initial contact resistance : 50 mΩ max.
- Insulation resistance : 1 GΩ min. at 500VDC
- Dielectric strength : 1.500 VAC rms
- Electrical life at full load : 500.000 cycles
- Contact bounce : 10 ms

| LED COMPONENT SPECIFICATIONS | | | |
|---|---|---|---|
| LED colour | Forward curent | Forward Voltage | Max. lumin. intensity |
| Super red (L0S) | 20mA | 2V | 125 mcd |
| Yellow (L0Y) | 20mA | 2V | 125 mcd |
| Green (L0G) | 10mA | 2V | 20 mcd |
| Blue (L0B) | 10mA | 3,5V | 20 mcd |
| White (L0W) | 20mA | 3,5V | 280 mcd |

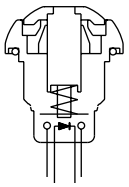
### GENERAL SPECIFICATIONS

- Panel thickness : 1,5 mm (.059) min. 4 mm (.157 max.)
- Total travel : 1,5 mm (.059)
- Operating force : 3N +/- 1N
- Mechanical life : 1.000.000 cycles
- Torque : 1,5 Nm max. applied to nut
- Soldering : 320°C max. for 3 sec.

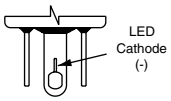
### MATERIALS

- Case : thermoplastic UL94-V0
- Plunger : polyamide 6/6
- Bushing/bezel : zinc die-cast (zamac), black painted
- Contacts : silver, gold plated
- Multi-wire lead AWG20, section 0,6 mm$^2$, UL approved
- Lens : polycarbonate
- Terminal seal : epoxy

# IP SERIES
## PUSHBUTTON SWITCHES FOR HARSH ENVIRONMENTS
## Square - illuminated



- High brightness illumination
- Three Led colours
- Tin plated Led terminals

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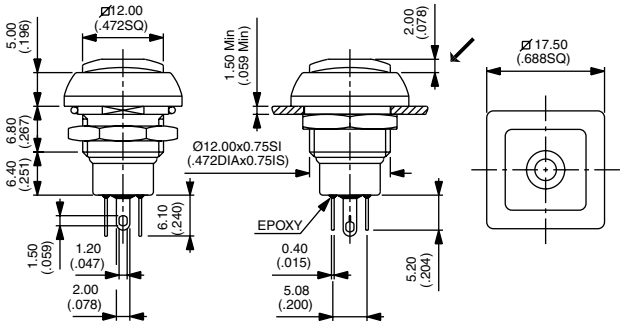
**MODEL STRUCTURE**

### Solder lug terminals

**IPC3SAD**  Normally Open

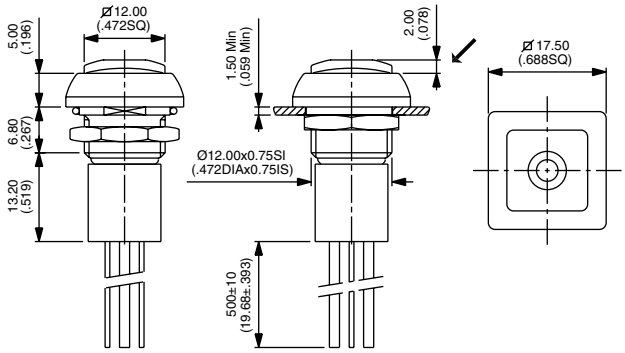
→ Flat




### Sealed flying lead terminals

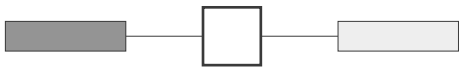
**IPC3FAD**  Normally Open

→ Flat



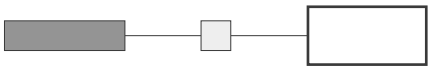

Wire colours : black : NO contact, red : LED anode(+), blue : LED cathode(-)

**PLUNGER COLOUR**



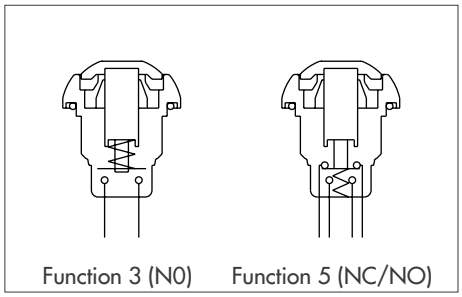
**1** : blue - **2** : black - **3** : green - **5** : yellow - **6** : red - **7/1** : white - **8** : chrome plated - **9** : orange

**LED COLOUR**

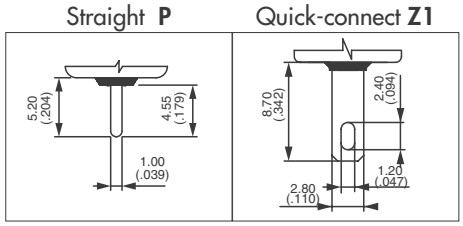


**L0S** : super red - **L0Y** : yellow - **L0G** : green - **L0B** : blue - **LOW** : white

# IP SERIES
## PUSHBUTTON SWITCHES FOR HARSH ENVIRONMENTS
## Square - non-illuminated




- Double function (NC/NO combined) with a short behind-panel depth

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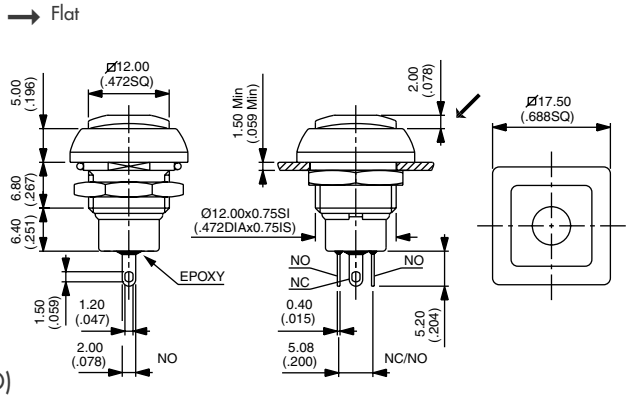
**MODEL STRUCTURE**

### Solder lug terminals

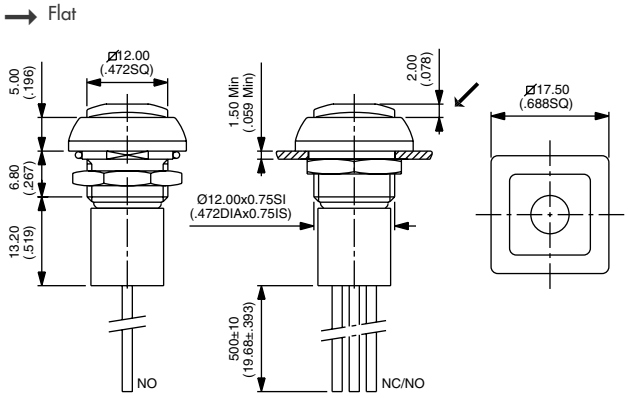
| | | |
|---|---|---|
| **IPC3SAD** | | Normally Open |
| **IPC5SAD** | | NC/NO combined |




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

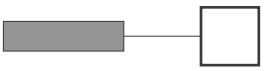
### Sealed flying lead terminals

| | | |
|---|---|---|
| **IPC3FAD** | | Normally Open |
| **IPC5FAD** | | NC/NO combined |



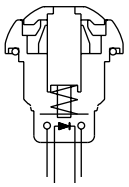

Wire colours (NC/NO) : black : NO, blue : NC

**PLUNGER COLOUR**

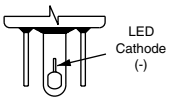


**1** : blue - **2** : black - **3** : green - **5** : yellow - **6** : red - **7/1** : white - **8** : chrome plated - **9** : orange

# IP SERIES
## PUSHBUTTON SWITCHES FOR HARSH ENVIRONMENTS
## Round - illuminated



- High brightness illumination
- Three Led colours
- Tin plated Led terminals

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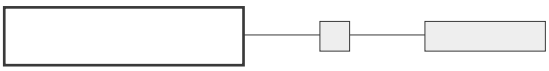
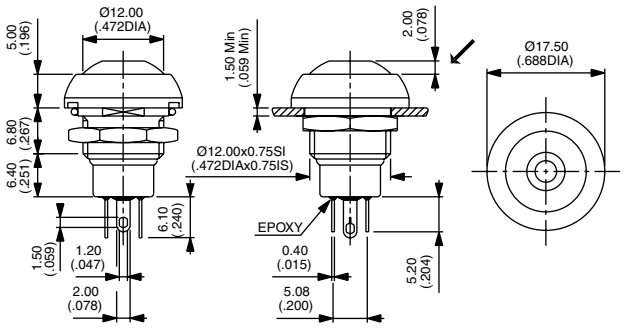
**MODEL STRUCTURE**



### Solder lug terminals

**IPR3SAD**  Normally Open

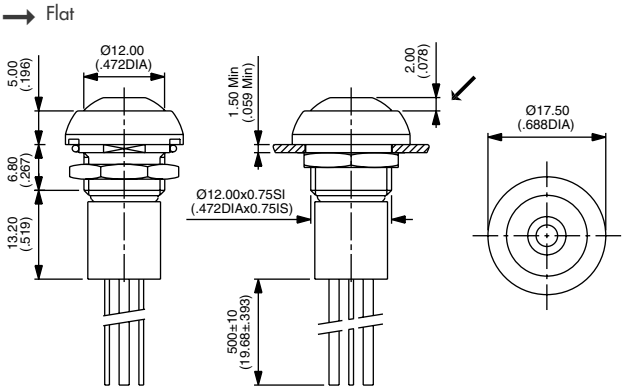
→ Flat




### Sealed flying lead terminals

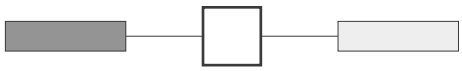
**IPR3FAD**  Normally Open

→ Flat



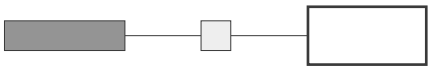

Wire colours : black : NO contact, red : LED anode(+), blue : LED cathode(-)

**PLUNGER COLOUR**



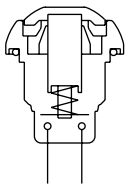
**1** : blue - **2** : black - **3** : green - **5** : yellow - **6** : red - **7/1** : white - **8** : chrome plated - **9** : orange

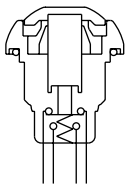
**LED COLOUR**



**L0S** : super red - **L0Y** : yellow - **L0G** : green - **L0B** : blue - **L0W** : white

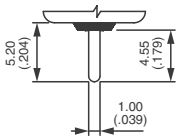
# IP SERIES
## PUSHBUTTON SWITCHES FOR HARSH ENVIRONMENTS
## Round - non-illuminated


Function 3 (NO)

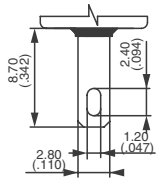

Function 5 (NC/NO)

- Double function (NC/NO combined) with a short behind-panel depth

Straight **P**




Quick-connect **Z1**

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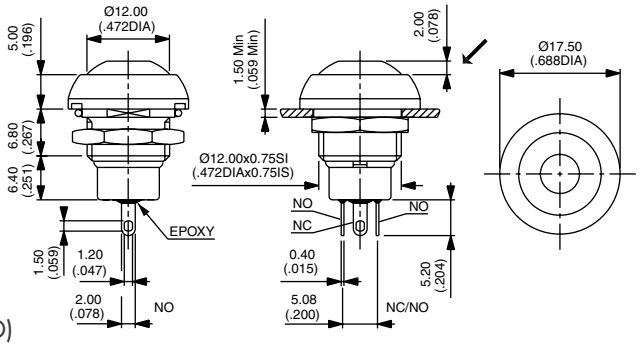
**MODEL STRUCTURE**

### Solder lug terminals

**IPR3SAD** Normally Open

**IPR5SAD** NC/NO combined

→ Flat



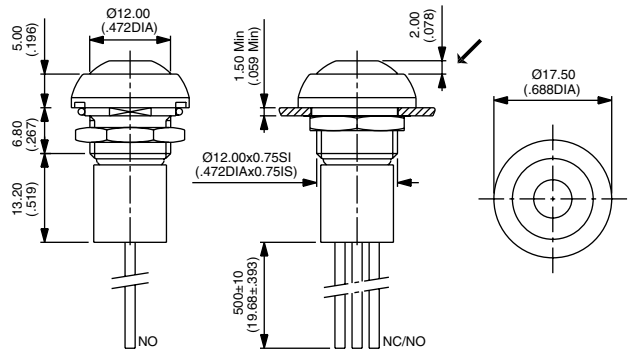

Also available with straight PC terminals : **IPR3PAD** (NO) or **IPR5PAD** (NC/NO) and quick-connect terminals : **IPR3Z1AD** (NO only)

### Sealed flying lead terminals

**IPR3FAD** Normally Open

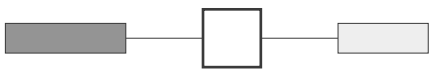
**IPR5FAD** NC/NO combined

→ Flat



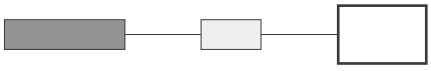

Wire colours (NC/NO) : black : NO, blue : NC

**PLUNGER COLOUR**

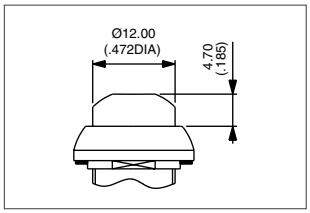


**1** : blue - **2** : black - **3** : green - **5** : yellow - **6** : red - **7/1** : white - **8** : chrome plated - **9** : orange

**PLUNGER OPTION**



**104** : High plunger



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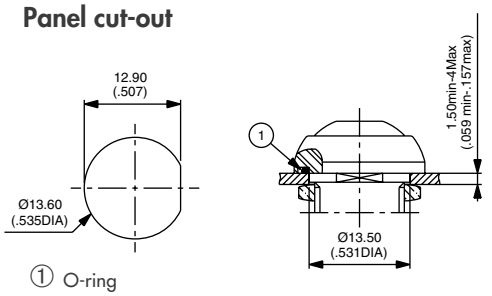
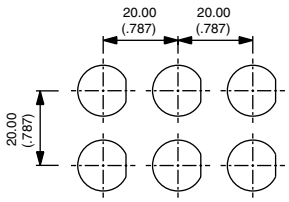
### MOUNTING

**Panel cut-out**

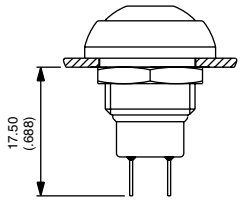



① O-ring

**Matrix mounting**

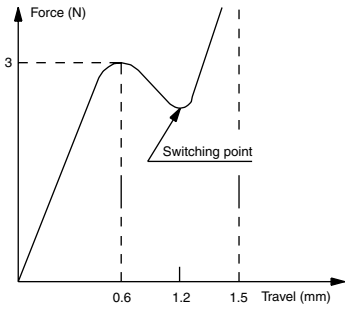



**Back of panel space requirement**

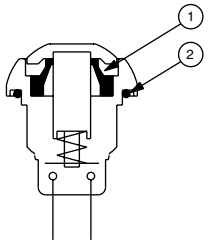



### TACTILE FEEDBACK

**Operating forces/ travels diagram**
(indicative nominal curve)




**Cross section**

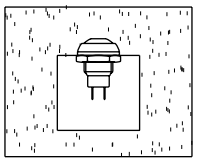
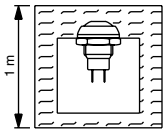
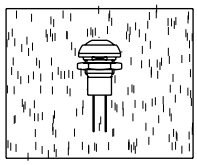
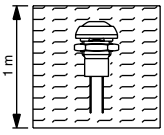



① Elastomer membrane ② O-ring

### SEALING

**IP 67 for the whole series**

Degree of protection provided by the enclosures of electric appliances according to IEC 529, DIN 40050 and NFC 20-010.

| **IP** (ingress protection) | **6** Totally protected against dust | **7** Protected against the effects of immersion up to 1 m water (30 mn) |
|---|---|---|
| **SOLDER LUG VERSION** |  |   |
| **FLYING LEAD VERSION** |  |   |

The above illustrations show non-illuminated models.

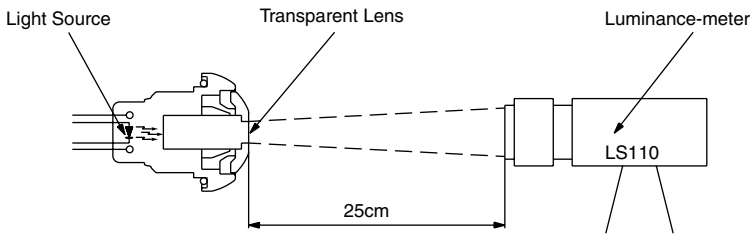
### LUMINANCE MEASUREMENT MODE

| TEST RESULTS * | | |
|---|---|---|
| Led types | Luminance | Forward current |
| **L0S (super red)** | 4000 Cd/m$^2$ | 20mA |
| **L0Y (yellow)** | 3500 Cd/m$^2$ | 20mA |
| **L0G (green)** | 400 Cd/m$^2$ | 10mA |

* in our lab conditions

**For blue and white Led, consult factory.**

**Test conditions**




Measured in a dark room

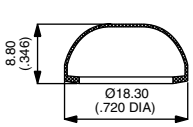
### ADDITIONAL SEALING

For ROUND plungers only, illuminated or non-illuminated.

By transparent silicone overboot U5125 for protection against frost and abrasion by sand. Order separately.

Operating temperature : -40°C to +125°C.

***Note** : The switches remain sealed to IP67 even after eventual perforation of the boot.*




**U5125**