

# IP series

## Latching action pushbutton switches for harsh environments

*Distinctive features and specifications*



- Latching action**  
Actuator remains in the low position when "ON".
- Illuminated and non-illuminated**
- Compact**  
Behind-panel depth less than 20 mm (.787)
- Flat round actuator for optional marking**
- Sealed to IP 67**

### ENVIRONMENTAL SPECIFICATIONS

- Degree of protection : IP 67 - See details page B36.
- 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 +85°C

### ELECTRICAL AND GENERAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :  
100mA 24VDC - life expectancy 200 000 cycles  
2A 125VAC - life expectancy 10 000 cycles (tested according to UL 1054)
- Initial contact resistance : 100 mΩ max.
- Insulation resistance : 1 GΩ min. at 500VDC
- Dielectric strength : 1.500 VAC rms between terminals  
1.000 VAC rms between terminals and frame
- Panel thickness : 1,5 mm (.059) min. - 5,5 mm (.217) max.
- Total travel : 2,5 mm (.098)
- Operating force : 5,5 N +/- 1N
- Contact bounce : 10 ms
- Torque : 1,5 Nm applied to nut
- Soldering : 320°C max. for 3 seconds

#### LED COMPONENT SPECIFICATIONS

LED colour	Forward current	Forward Voltage	Max. lumin. intensity
Super red (LOS)	20mA	2V	180 mcd
Yellow (LOY)	20mA	2V	280 mcd
Green (LOG)	10mA	2V	28 mcd
Blue (LOB)	10mA	3,5V	22 mcd

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

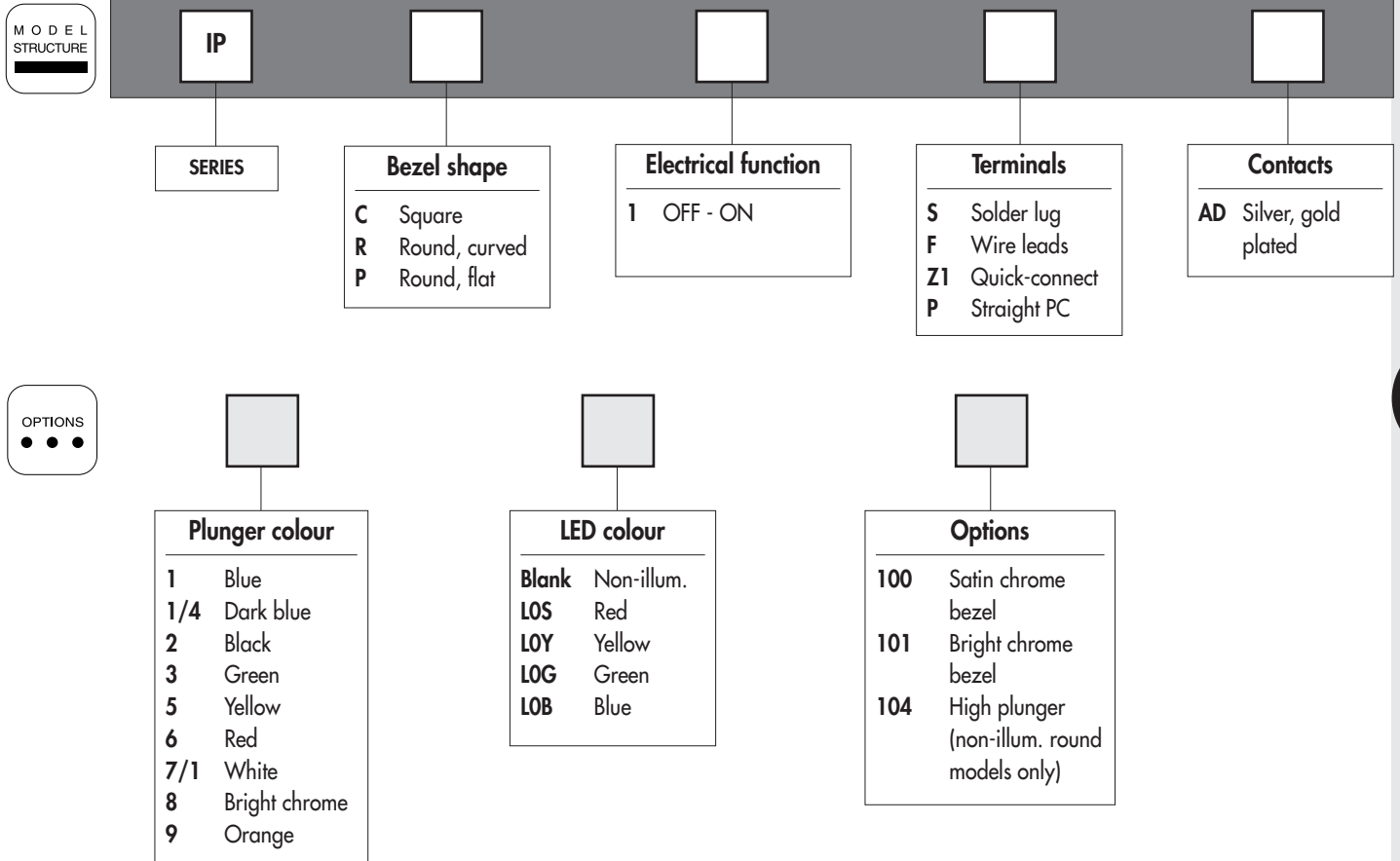
### MATERIALS

- Case : PA-6T, UL 94-V0
- Plunger : polyamide 6/6
- Bushing/bezel : zinc die-cast (zamak), black painted
- Contacts : silver, gold plated
- Multi-wire lead AWG20, section 0,6 mm<sup>2</sup>, UL approved
- LED wire : AWG26
- Lens : polycarbonate
- Terminal seal : epoxy

# IP series

## Latching action pushbutton switches for harsh environments

Overview



### ABOUT THIS SERIES

On the following pages, you will find successively :  
 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 (P/N U5125).  
 It is presented at the end of the IP series and in section H.



**Mounting accessories** : Standard hardware supplied : 1 hex nut 14 mm (.551) across flats and 1 O-Ring.

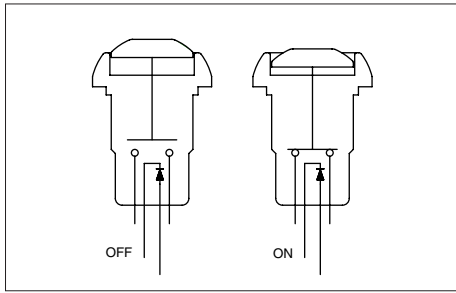


**Packaging unit** : 25 pieces

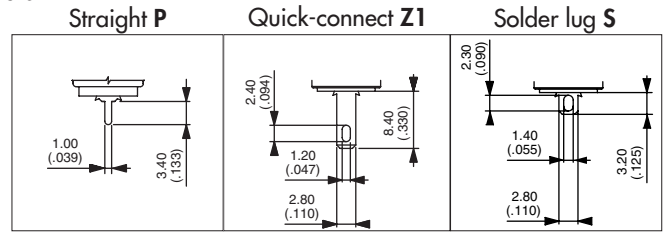
# IP series

Latching action pushbutton switches for harsh environments

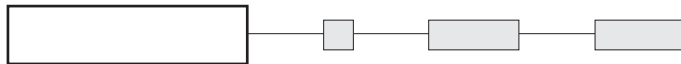
Square or round - illuminated



- Four LED colours
- Tin plated LED terminals



MODEL STRUCTURE



B

## Square models

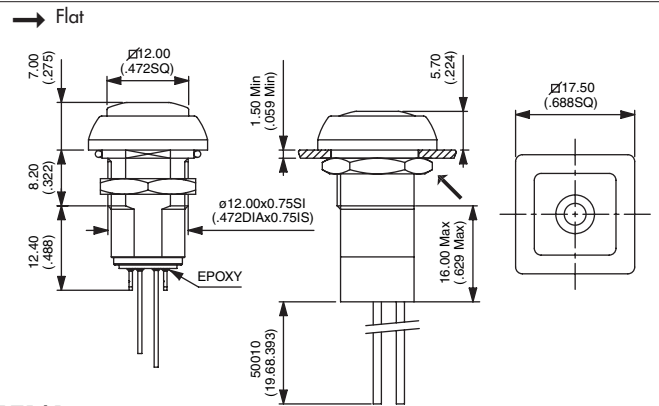


Solder lug terminals  
**IPC1SAD**

OFF - ON

Wire lead terminals  
**IPC1FAD**

OFF - ON



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

## Round models

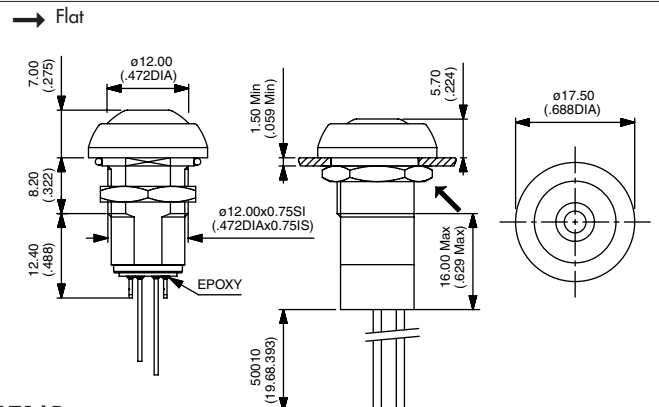


Solder lug terminals  
**IPR1SAD**

OFF - ON

Wire lead terminals  
**IPR1FAD**

OFF - ON



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

## PLUNGER COLOUR

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



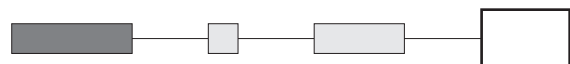
1 : blue - 1/4 : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7/1 : white - 8 : bright chrome - 9 : orange

## LED COLOUR



LOS : red - LOY : yellow - LOG : green - LOB : blue

## OPTIONS



100 : Satin chrome bezel  
101 : Bright chrome bezel

# IP series

Latching action pushbutton switches for harsh environments

Square or round - non-illuminated

## MODEL STRUCTURE



### Square models

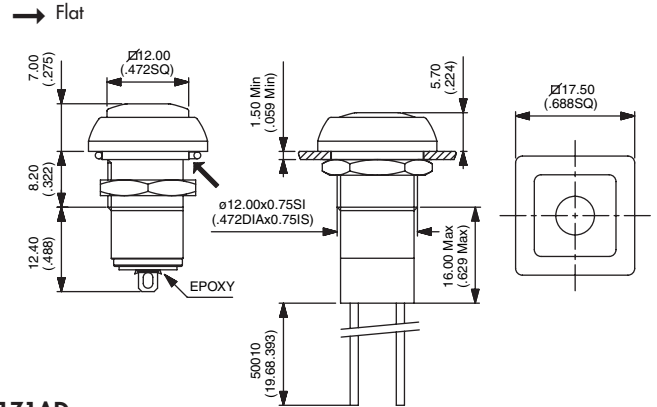


Solder lug terminals  
**IPC1SAD**

OFF - ON

Wire lead terminals  
**IPC1FAD**

OFF - ON



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

### Round models



CURVED ACTUATOR  
Solder lug terminals  
**IPR1SAD**

OFF - ON

Wire lead terminals  
**IPR1FAD**

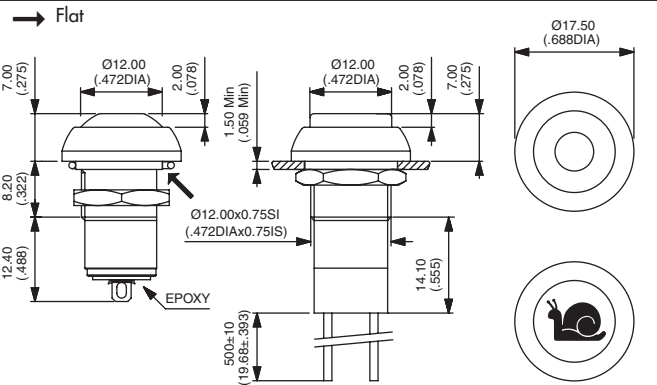
OFF - ON

FLAT ACTUATOR  
Solder lug terminals  
**IPP1SAD**

OFF - ON

Wire lead terminals  
**IPP1FAD**

OFF - ON

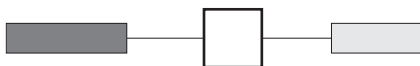


Also available with straight PC : **IP•1PAD** or quick-connect terminals : **IP•1Z1AD**

## PLUNGER COLOUR

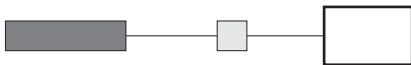


Plunger marking available on IPP models (symbol 10 mm max.). On request.

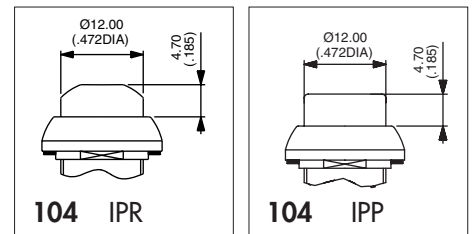


1 : blue - 1/4 : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7/1 : white - 8 : bright chrome - 9 : orange

## OPTIONS

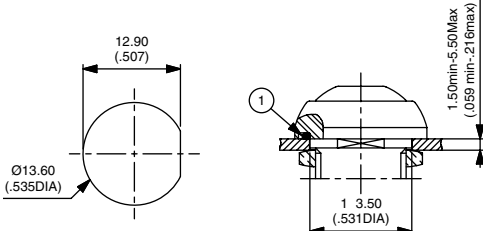


100 : Satin chrome bezel  
101 : Bright chrome bezel  
104 : High plunger (for round model only)

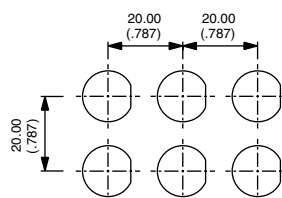


## MOUNTING

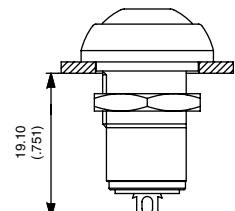
### Panel cut-out



### Matrix mounting



### Back of panel space requirement



# IP series

## Momentary pushbutton switches for harsh environments

*Distinctive features and specifications*



- Illuminated and non-illuminated
- Tactile feedback
- Wide variety of configurations
- Flat round actuator for optional marking
- Sealed to IP 67

### 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

### GENERAL SPECIFICATIONS

- Panel thickness : 1,5 mm (.059) min. 4 mm (.157 max.)
- Total travel : 1,5 mm (.059)
- Operating force : 2N to 5N
- Mechanical life : 1.000.000 cycles
- Torque : 1,5 Nm max. applied to nut
- Soldering : 320°C max. for 3 sec.

### ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load : 500mA 48VAC - 200mA 50VDC - 200mA 250VAC
- Initial contact resistance : 100 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 current	Forward Voltage	Max. lumin. intensity
Super red (LOS)	20mA	2V	125 mcd
Yellow (LOY)	20mA	2V	125 mcd
Green (LOG)	10mA	2V	20 mcd
Blue (LOB)	10mA	3,5V	20 mcd
White (LOW)	20mA	3,5V	280 mcd

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

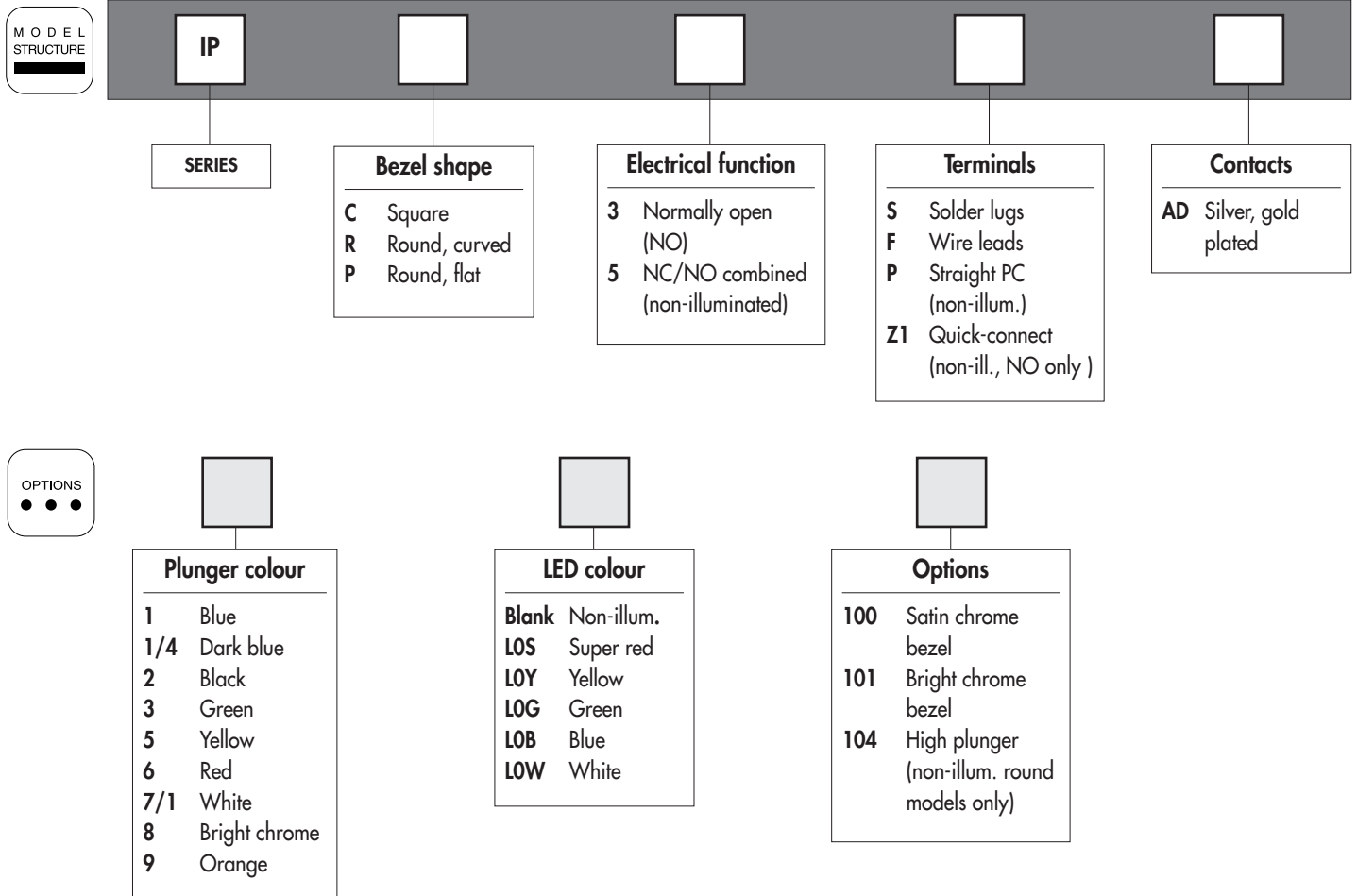
### MATERIALS

- 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<sup>2</sup>, UL approved
- LED wire : AWG26
- Lens : polycarbonate
- Terminal seal : epoxy

# IP series

## Momentary pushbutton switches for harsh environments

Overview



### ABOUT THIS SERIES

On the following pages, you will find successively :  
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 H.



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

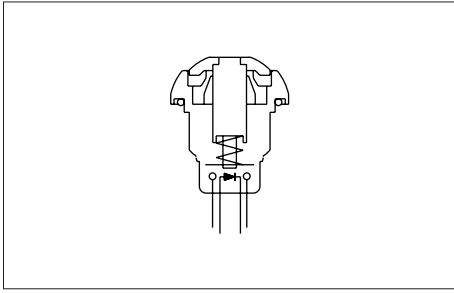


**Packaging unit** : 25 pieces

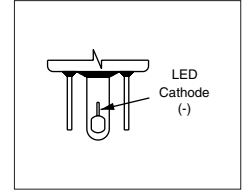
# IP series

## Momentary pushbutton switches for harsh environments

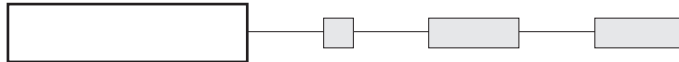
Square - illuminated



- High brightness illumination
- Five LED colours
- Tin plated LED terminals



MODEL  
STRUCTURE



B

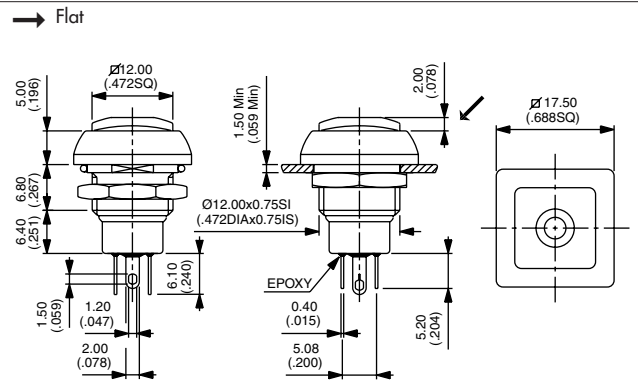
### Solder lug terminals



IPC3SAD



Normally Open



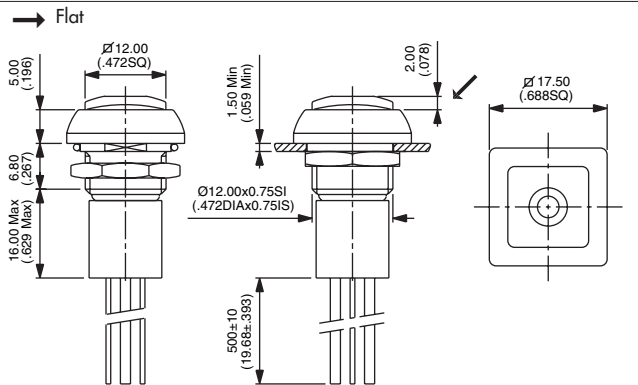
### Sealed wire lead terminals



IPC3FAD



Normally Open



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

### PLUNGER COLOUR



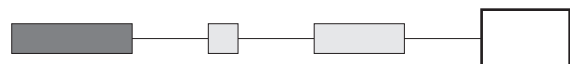
1 : blue - 1/4 : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7/1 : white - 8 : bright chrome - 9 : orange

### LED COLOUR



LOS : super red - LOY : yellow - LOG : green  
LOB : blue - LOW : white

### OPTIONS

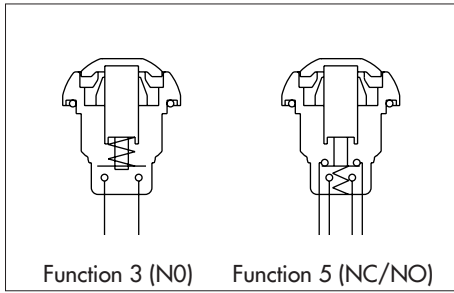


100 : Satin chrome bezel  
101 : Bright chrome bezel

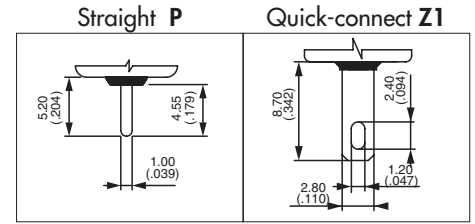
# IP series

## Momentary pushbutton switches for harsh environments

Square - non-illuminated



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



### MODEL STRUCTURE



### Solder lug terminals



IPC3SAD



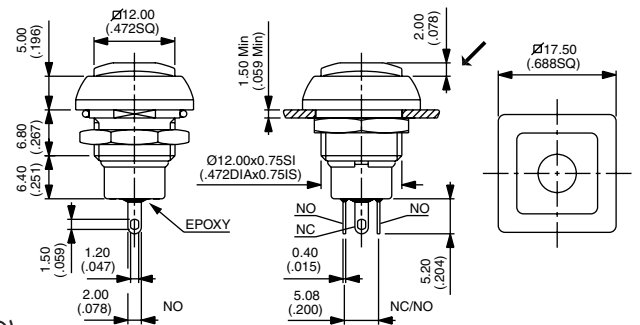
Normally Open

IPC5SAD



NC/NO combined

→ Flat



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

### Sealed wire lead terminals



IPC3FAD



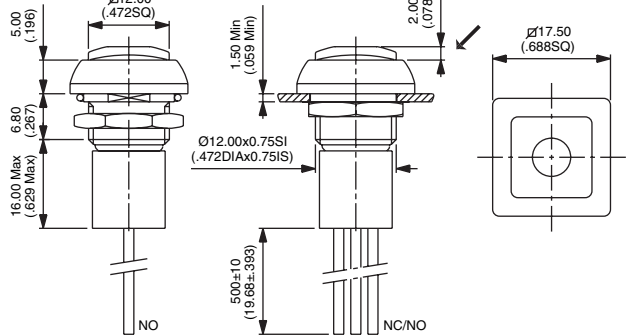
Normally Open

IPC5FAD



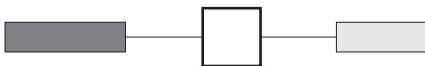
NC/NO combined

→ Flat



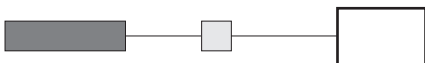
Wire colours (NC/NO) : black : NO, blue : NC

### PLUNGER COLOUR



1 : blue - 1/4 : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7/1 : white - 8 : bright chrome - 9 : orange

### OPTIONS



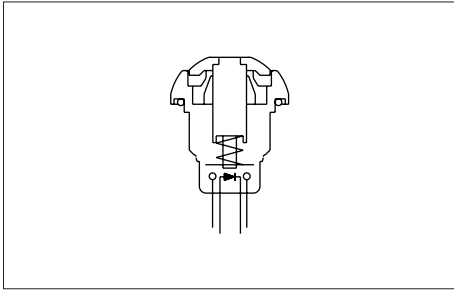
100 : Satin chrome bezel  
101 : Bright chrome bezel



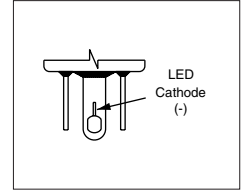
# IP series

## Momentary pushbutton switches for harsh environments

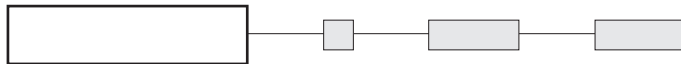
Round - illuminated



- High brightness illumination
- Five LED colours
- Tin plated LED terminals



MODEL  
STRUCTURE



B

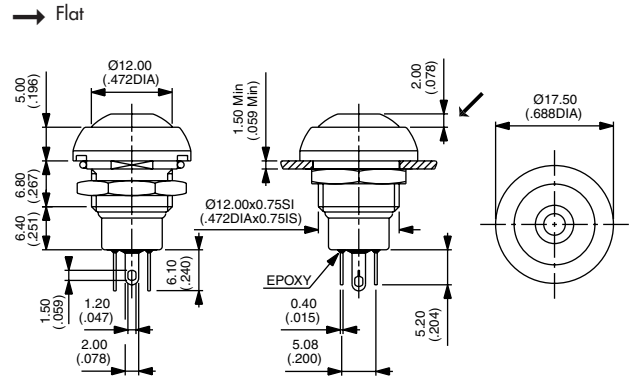
### Solder lug terminals



IPR3SAD



Normally Open



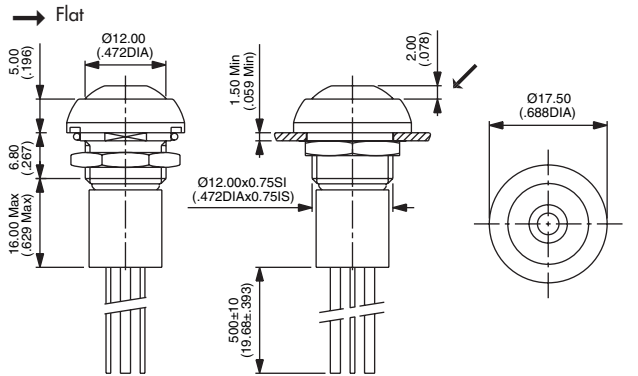
### Sealed wire lead terminals



IPR3FAD



Normally Open



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

### PLUNGER COLOUR



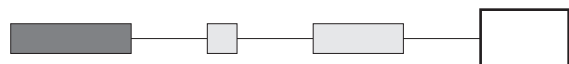
1 : blue - 1/4 : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7/1 : white - 8 : bright chrome - 9 : orange

### LED COLOUR



LOS : super red - LOY : yellow - LOG : green  
LOB : blue - LOW : white

### OPTIONS

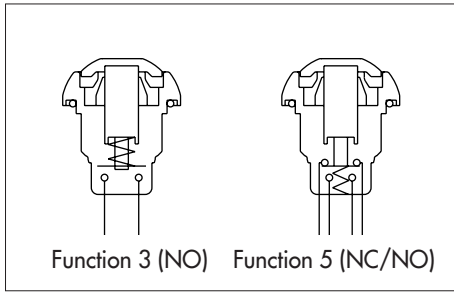


100 : Satin chrome bezel  
101 : Bright chrome bezel

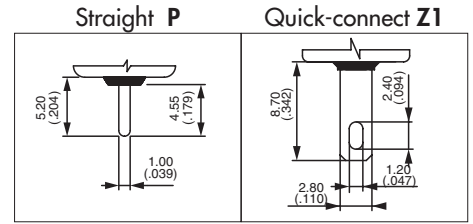
# IP series

## Momentary pushbutton switches for harsh environments

Round - non-illuminated



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



### MODEL STRUCTURE



### Solder lug terminals



Curved actuator, NO  
**IPR3SAD**



Curved actuator, NC/NO  
**IPR5SAD**



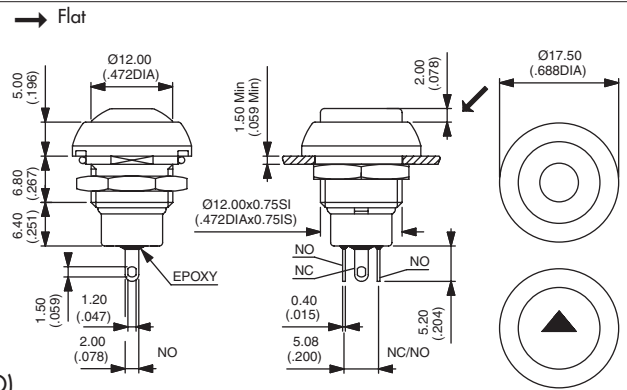
Flat actuator, NO  
**IPP3SAD**



Flat actuator, NC/NO  
**IPP5SAD**



Also available with straight PC terminals : **IP•3PAD** (NO) or **IP•5PAD** (NC/NO) and quick-connect terminals : **IP•3Z1AD** (NO only)



### Sealed wire lead terminals



Curved actuator, NO  
**IPR3FAD**



Curved actuator, NC/NO  
**IPR5FAD**



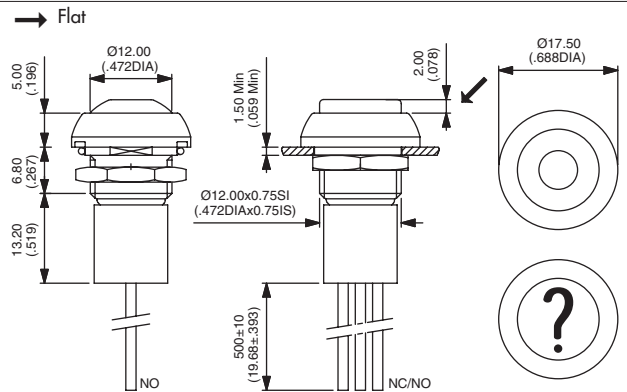
Flat actuator, NO  
**IPP3FAD**



Flat actuator, NC/NO  
**IPP5FAD**



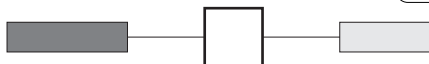
Wire colours (NC/NO) : black : NO, blue : NC



### PLUNGER COLOUR

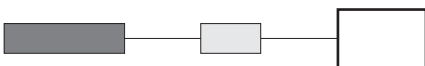


Plunger marking available on IPP models (symbol 10 mm max.). On request.

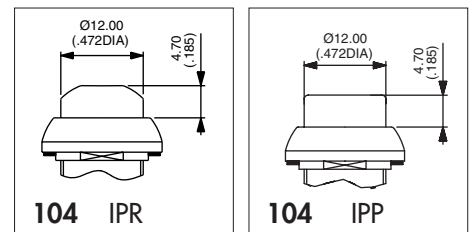


1 : blue - 1/4 : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7/1 : white - 8 : bright chrome - 9 : orange

### OPTIONS



100 : Satin chrome bezel  
101 : Bright chrome bezel  
104 : High plunger

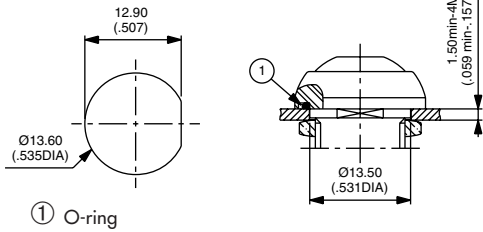


# IP series

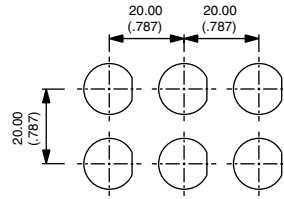
Momentary pushbutton switches for harsh environments

## MOUNTING

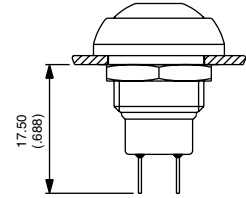
### Panel cut-out



### Matrix mounting



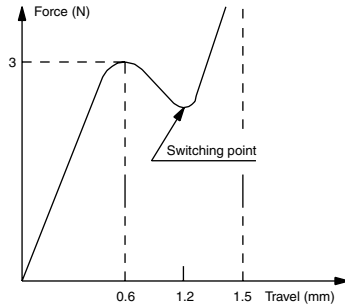
### Back of panel space requirement



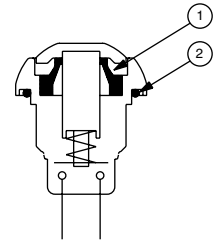
B

## TACTILE FEEDBACK

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



### Cross section



① Elastomeric membrane ② O-ring

## SEALING

### IP 67 for the whole series

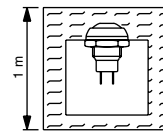
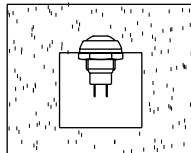
Degree of protection provided by the enclosures of electric appliances according to IEC 529, DIN 40050 and NFC 20-010.

**IP**  
(ingress protection)

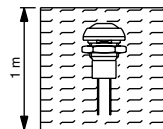
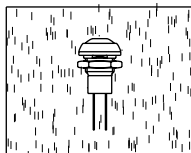
**6**  
Totally protected against dust

**7**  
Protected against the effects of immersion up to 1 m water (30 mn)

**SOLDER LUG VERSION**



**WIRE LEAD VERSION**



The above illustrations show non-illuminated models.

# IP series

## Momentary pushbutton switches for harsh environments

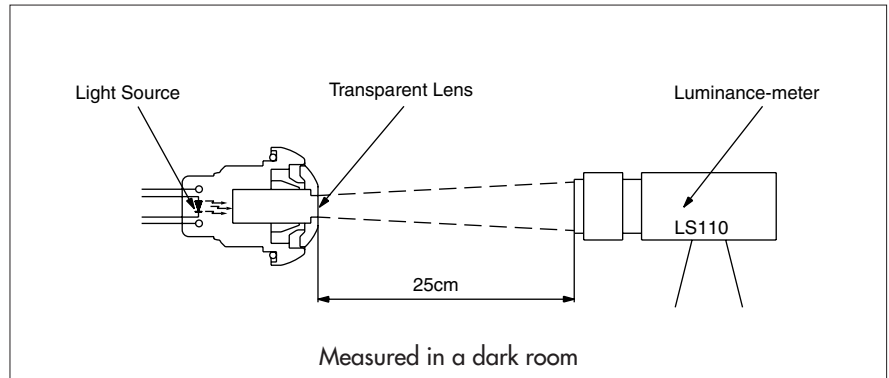
### LUMINANCE MEASUREMENT MODE

#### Test conditions

TEST RESULTS *		
Led types	Luminance	Forward current
<b>LOS (super red)</b>	4000 Cd/m <sup>2</sup>	20mA
<b>LOY (yellow)</b>	3500 Cd/m <sup>2</sup>	20mA
<b>LOG (green)</b>	400 Cd/m <sup>2</sup>	10mA

\* in our lab conditions

For blue and white Led, consult factory.



### ADDITIONAL SEALING

For ROUND plungers only, illuminated or non-illuminated.

By silicone boot for protection against frost and abrasion by sand. Order separately.

- transparent : **U5125**
- blue : **U5125-1**
- black : **U5125-2**
- red : **U5125-6**

Operating temperature : -40°C to +125°C  
Life expectancy : 500.000 cycles

