

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

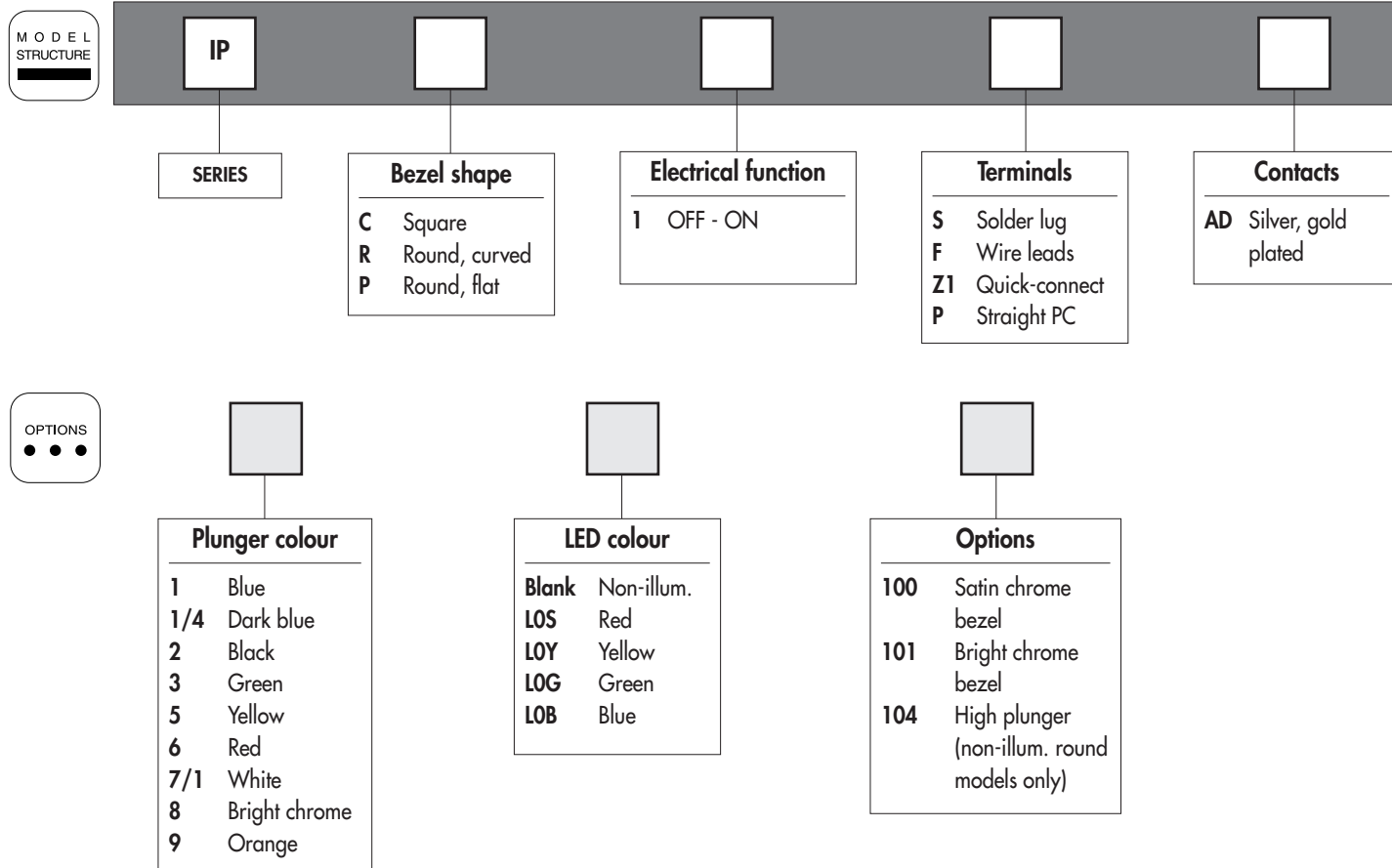
MATERIALS

- 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 mm², UL approved
- LED wire : AWG26
- Lens : polycarbonate
- Terminal seal : epoxy

IP series

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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.

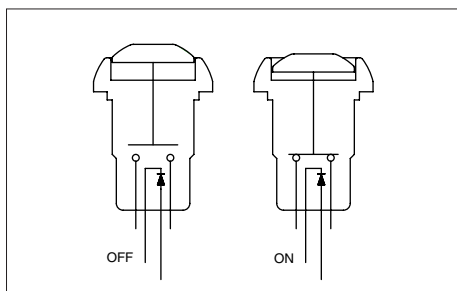


Packaging unit : 25 pieces

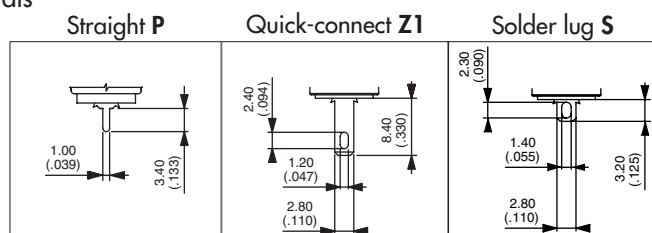
IP series

Latching action pushbutton switches for harsh environments

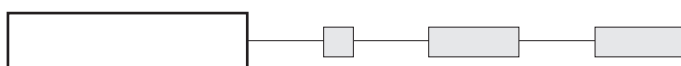
Square or round - illuminated



- Four LED colours
- Tin plated LED terminals



MODEL STRUCTURE



Square models

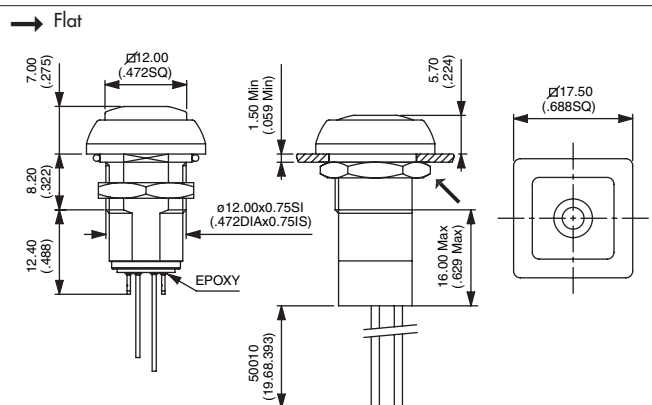


Solder lug terminals
IPC1SAD

OFF - ON

Wire lead terminals
IPC1FAD

OFF - ON



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

Round models

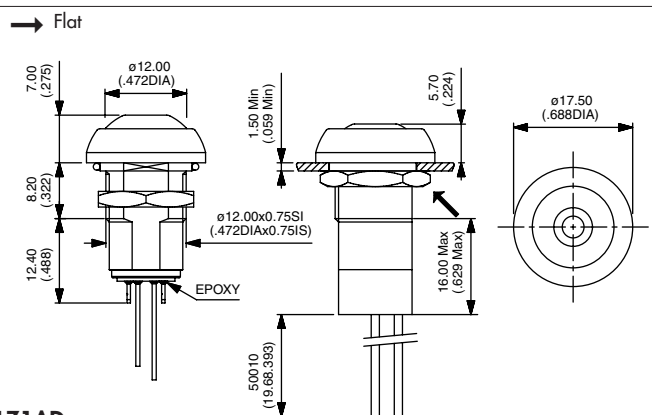


Solder lug terminals
IPR1SAD

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(-)



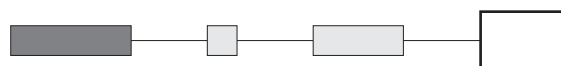
1 : blue - 1/4 : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7/1 : white - 8 : bright chrome - 9 : orange

LED COLOUR



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

OPTIONS



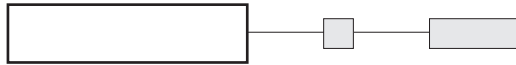
100 : Satin chrome bezel
101 : Bright chrome bezel

IP series

Latching action pushbutton switches for harsh environments

Square or round - non-illuminated

MODEL STRUCTURE



Square models



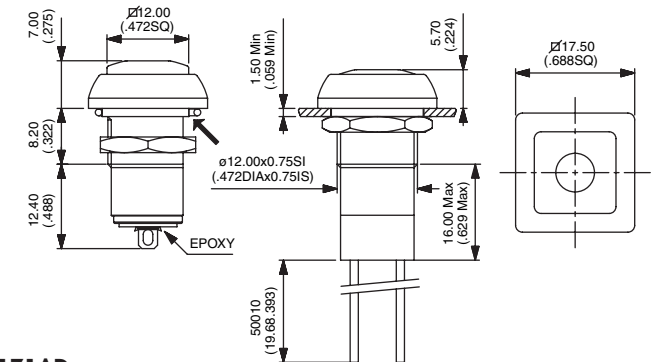
Solder lug terminals
IPC1SAD

OFF - ON

Wire lead terminals
IPC1FAD

OFF - ON

→ Flat



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

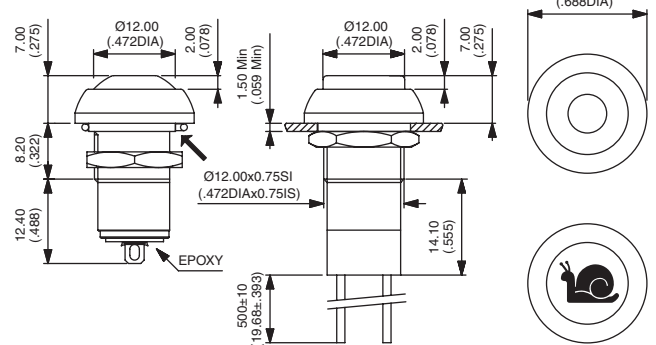
Solder lug terminals
IPP1SAD

OFF - ON

Wire lead terminals
IPP1FAD

OFF - ON

→ Flat



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

PLUNGER COLOUR

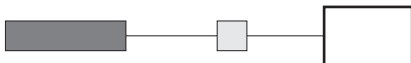


Plunger marking available on IPP models (symbol 10 mm max.). On request.



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

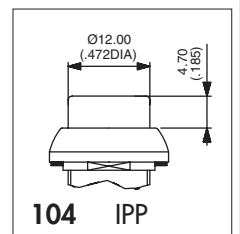
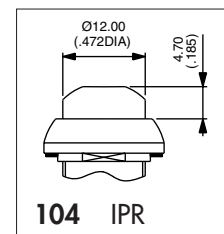
OPTIONS



100 : Satin chrome bezel

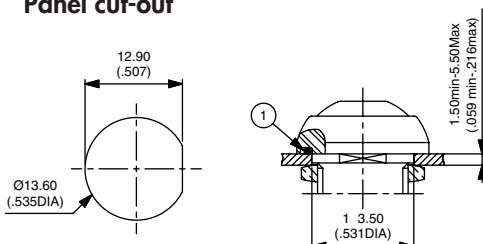
101 : Bright chrome bezel

104 : High plunger (for round model only)

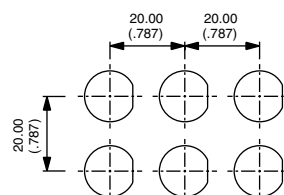


MOUNTING

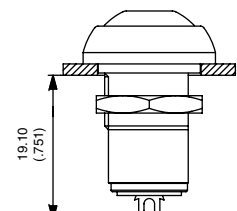
Panel cut-out



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

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

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.

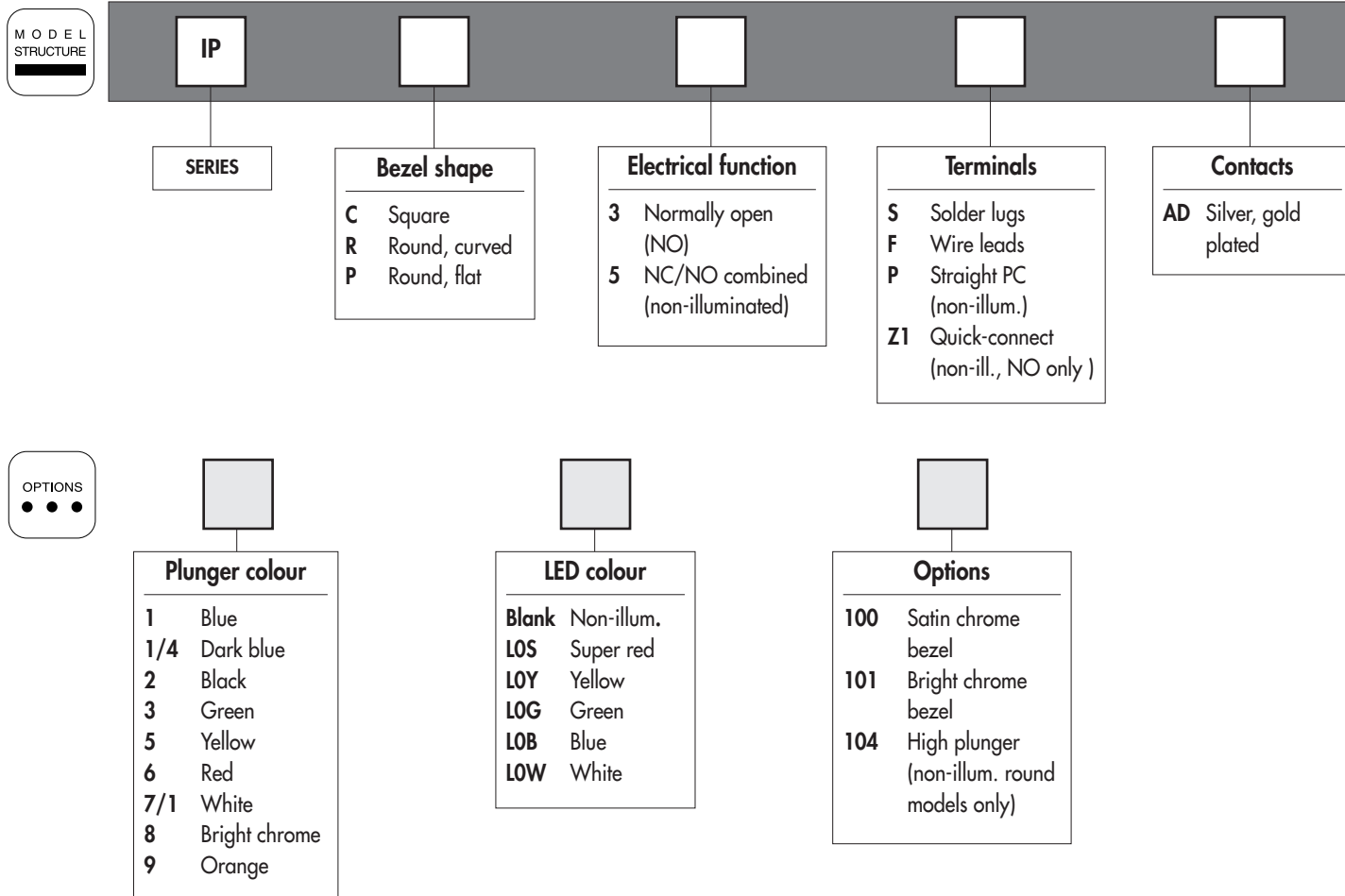
MATERIALS

- 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 mm², UL approved
- LED wire : AWG26
- Lens : polycarbonate
- Terminal seal : epoxy

IP series

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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).

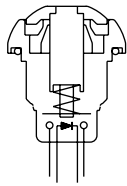


Packaging unit : 25 pieces

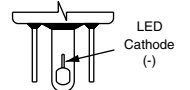
IP series

Momentary pushbutton switches for harsh environments

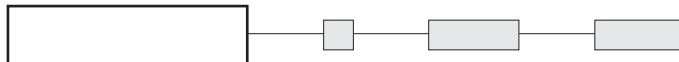
Square - illuminated



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



MODEL
STRUCTURE



Solder lug terminals

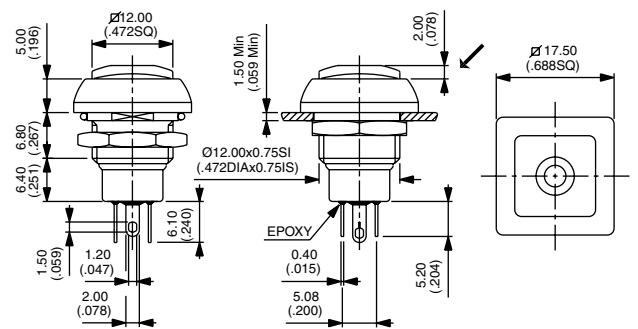


IPC3SAD



Normally Open

→ Flat



Sealed wire lead terminals

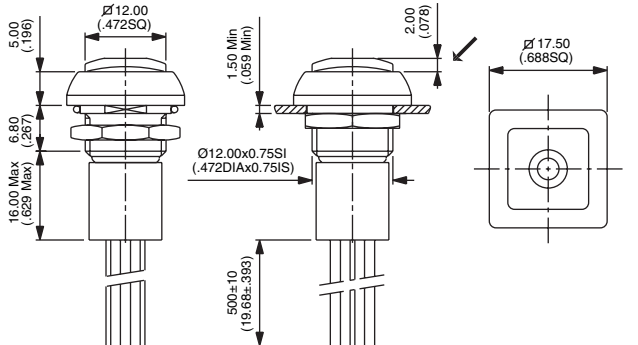


IPC3FAD



Normally Open

→ Flat



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

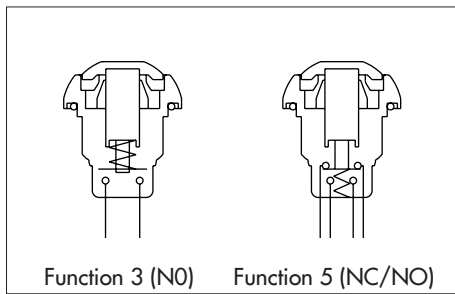


100 : Satin chrome bezel
101 : Bright chrome bezel

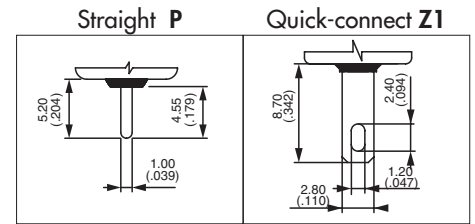
IP series

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



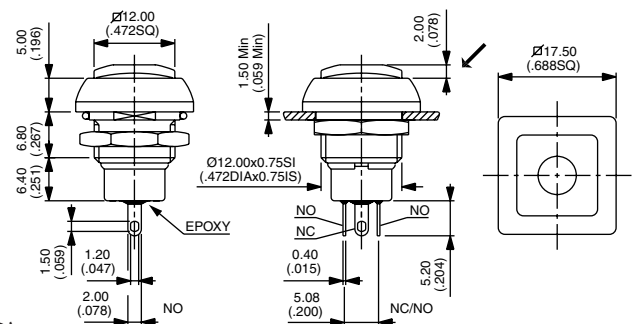
Normally Open

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



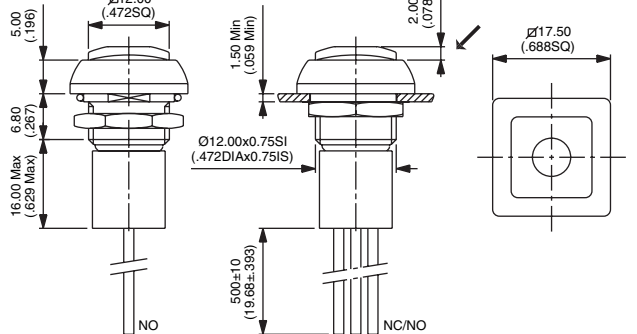
Normally Open

IPC5FAD



NC/NO combined

→ Flat



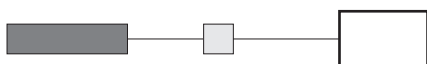
Wire colours (NC/NO) : black : NO, blue : NC

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

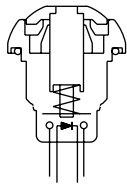


100 : Satin chrome bezel
101 : Bright chrome bezel

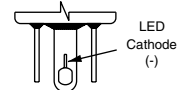
IP series

Momentary pushbutton switches for harsh environments

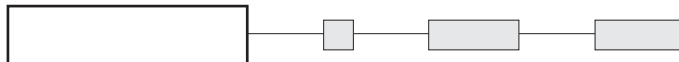
Round - illuminated



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



MODEL STRUCTURE



Solder lug terminals

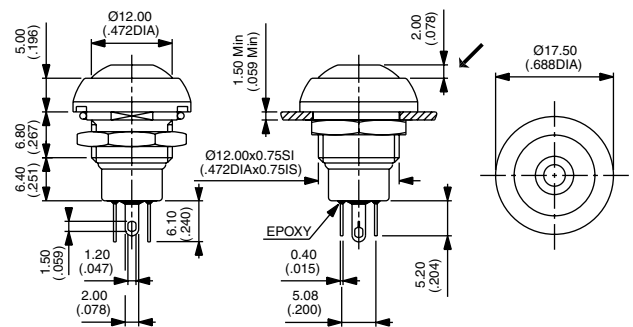


IPR3SAD



Normally Open

→ Flat



Sealed wire lead terminals

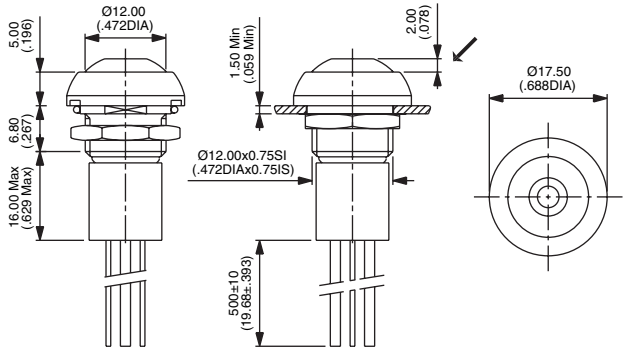


IPR3FAD



Normally Open

→ Flat



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

PLUNGER COLOUR



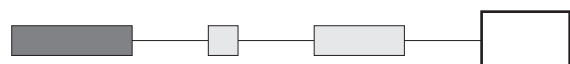
1 : blue - 1/4 : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7/1 : white - 8 : bright chrome - 9 : orange

LED COLOUR



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

OPTIONS

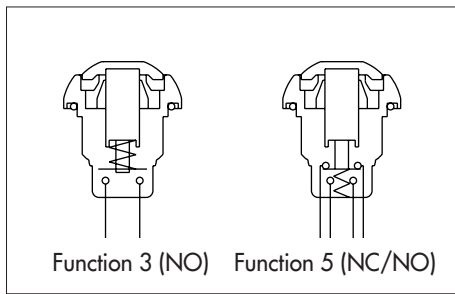


100 : Satin chrome bezel
101 : Bright chrome bezel

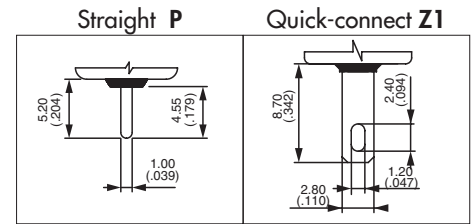
IP series

Momentary pushbutton switches for harsh environments

Round - non-illuminated



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



MODEL STRUCTURE

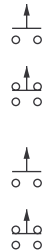


Solder lug terminals

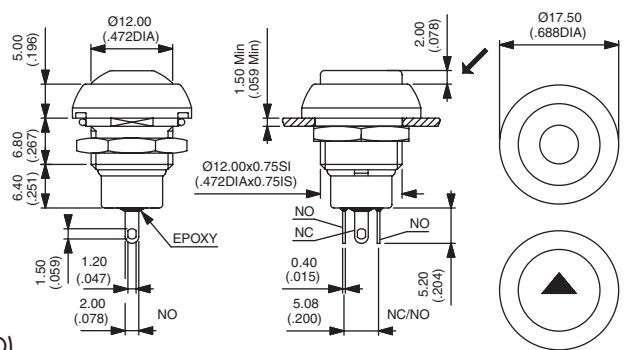


Curved actuator, NO
IPR3SAD
Curved actuator, NC/NO
IPR5SAD

Flat actuator, NO
IPP3SAD
Flat actuator, NC/NO
IPP5SAD



→ Flat



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

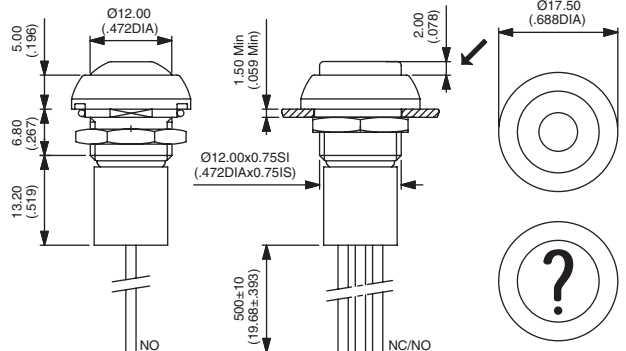


Curved actuator, NO
IPR3FAD
Curved actuator, NC/NO
IPR5FAD

Flat actuator, NO
IPP3FAD
Flat actuator, NC/NO
IPP5FAD



→ Flat



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

PLUNGER COLOUR

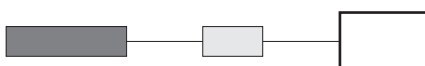


Plunger marking available on IPP models (symbol 10 mm max.). On request.

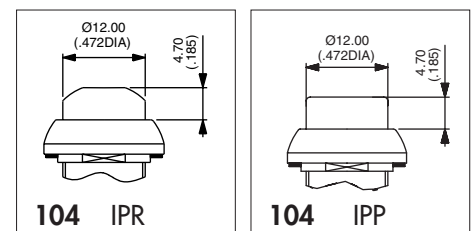


1 : blue - 1/4 : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7/1 : white - 8 : bright chrome - 9 : orange

OPTIONS



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

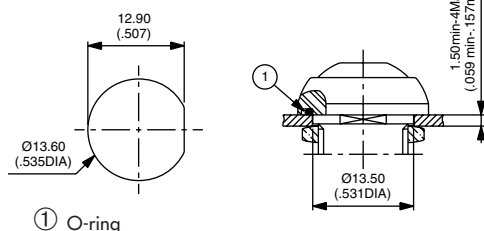


IP series

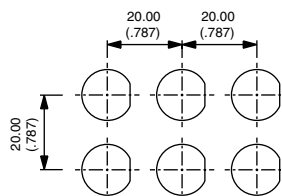
Momentary pushbutton switches for harsh environments

MOUNTING

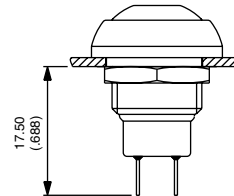
Panel cut-out



Matrix mounting

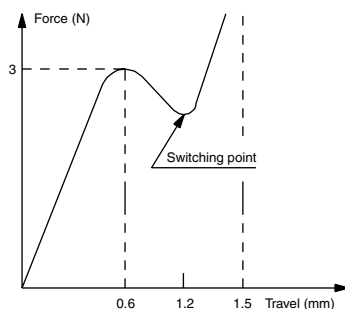


Back of panel space requirement

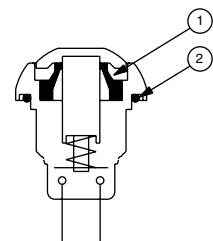


TACTILE FEEDBACK

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)

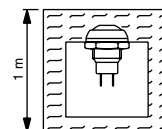
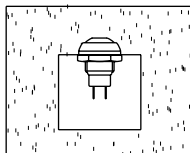
6

Totally protected
against dust

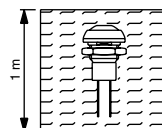
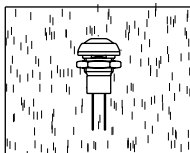
7

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

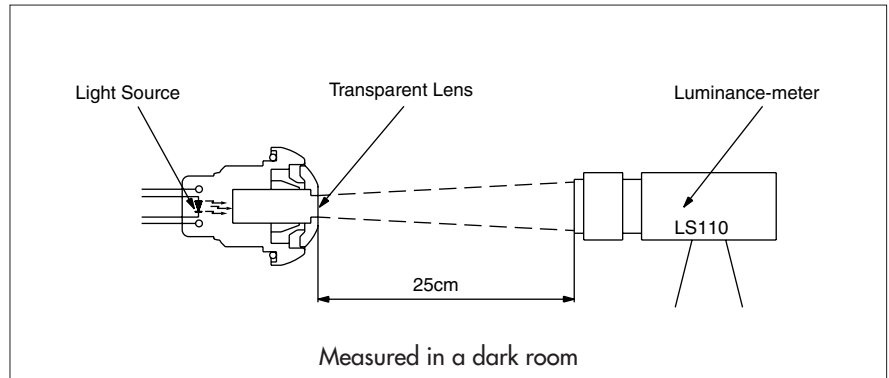
LUMINANCE MEASUREMENT MODE

Test conditions

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

