IP series
Pushbutton switches for harsh environments - bushing Ø 12 mm - momentary
Distinctive features and specifications

- Illuminated or non-illuminated
- Tactile feedback
- Wide variety of configurations
- Flat round actuator for optional marking
- Sealed to IP67

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 50102 (1 joule)
- Operating temperature: -40°C to +85°C

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load (gold plated silver contacts):
  5A 28VDC, 70,000 cycles
  0.2A 48VDC, 500,000 cycles
  0.5A 48VAC, 500,000 cycles
- Initial contact resistance: 100 mΩ max.
- Insulation resistance: 1 GΩ min. at 500VDC
- Dielectric strength: 1.500 Vrms
- Contact bounce: 10 ms

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

LED COMPONENT SPECIFICATIONS

<table>
<thead>
<tr>
<th>LED colour</th>
<th>Forward current</th>
<th>Typ. forward voltage</th>
<th>Max. forward voltage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Super red  (L0S)</td>
<td>20mA</td>
<td>2,1V</td>
<td>2,3V</td>
</tr>
<tr>
<td>Yellow (L0Y)</td>
<td>20mA</td>
<td>2,1V</td>
<td>2,3V</td>
</tr>
<tr>
<td>Green (L0G)</td>
<td>20mA</td>
<td>2,1V</td>
<td>2,3V</td>
</tr>
<tr>
<td>Blue (L0B)</td>
<td>20mA</td>
<td>3,2V</td>
<td>3,8V</td>
</tr>
<tr>
<td>White (L0W)</td>
<td>20mA</td>
<td>3,35V</td>
<td>4,25V</td>
</tr>
</tbody>
</table>

A resistor must be series-connected by the user. Resistor value = supply voltage - LED forward voltage / LED forward current

GENERAL SPECIFICATIONS

- Panel thickness: 1,5 mm (.059) min. 4 mm (.157 max.)
- Total travel:
  Funct. 3: 1,7 mm (.067) +/- 0,3 mm
  Funct. 5: 1,3 mm (.051) +/- 0,3 mm
- Typical operating force: 6N +/- 2N
- Low level/mech. 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
- 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 mm²
  W version: AWG24, section 0,23 mm²
- LED wires:
  F version: AWG26, section 0,12 mm²
  W version: AWG24, section 0,23 mm²
- Lens: polycarbonate
- Terminal seal: epoxy

AGENCY APPROVAL

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

Panel cut-out

Matrix mounting

Back of panel space requirement

A resistor must be series-connected by the user. Resistor value = supply voltage - LED forward voltage / LED forward current
IP series
Pushbutton switches for harsh environments - bushing Ø 12 mm - momentary

Overview

Actuator shapes
- C Square
- R Round, curved
- P Round, flat

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

Terminals
- S Solder lugs
- F Flying leads, standard
- W Flying leads, thin NEW!
- P Straight PC
- Z1 Quick-connect (non-ill., NO only)

Contacts
- AD Silver, gold plated (standard)
- CD Brass, gold plated (option 104)

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

LED colours
- Blank Non-illuminated
- LOS Super red
- LOY Yellow
- LOG Green
- LOB Blue
- LOW White

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

Approval
- UL Consult factory for detail of approved models.

Option 104
If combined with electrical function 5 (NC/NO), this option should be ordered with CD contacts (brass, gold plated). Current/voltage rating: 100mA 30VDC

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 bracketed 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 after the IA series and in section H.

Mounting accessories: Standard hardware supplied: 1 hex nut 14 mm (.551) across flats and 1 O-ring.
Hex nut part number U166.

Packaging unit: 25 pieces
IP series
Pushbutton switches for harsh environments - bushing Ø 12 mm - momentary
Square - illuminated

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

**MODEL STRUCTURE**

Shown with standard flying lead terminals.

**Solder lug terminals**

IPC35AD

Normally Open

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

**Sealed flying lead terminals**

IPC3FAD

Normally Open

For THIN flying leads, replace F with W.

**ACTUATOR COLOURS**

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

**LED COLOURS**

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

**OPTIONS**

100: Satin chrome bezel
101: Bright chrome bezel

**APPROVAL**

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

Visit our website for more information:
www.apem.com
IP series
Pushbutton switches for harsh environments - bushing Ø 12 mm - momentary
Square - non-illuminated

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

**MODEL STRUCTURE**

<table>
<thead>
<tr>
<th>Function 3 (NO)</th>
<th>Function 5 (NC/NO)</th>
</tr>
</thead>
</table>

**Solder lug terminals**

IPC35AD  
IP55AD  

Normally Open  
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  
IP5FAD  

Normally Open  
NC/NO combined

For THIN flying leads, replace F with W.

**ACTUATOR COLOURS**

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

**OPTIONS**

100: Satin chrome bezel
101: Bright chrome bezel

**APPROVAL**

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

**WIRE COLOURS**

(nc/no): black: NO, blue: NC

**OPTIONS**

100: Satin chrome bezel
101: Bright chrome bezel

**APPROVAL**

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

**WIRE COLOURS**

(nc/no): black: NO, blue: NC
IP series

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

Round - illuminated

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

MODEL

STRUCTURE

Shown with standard flying lead terminals.

Solder lug terminals

IPR3SAD

Normally Open

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

Sealed flying lead terminals

IPR3FAD

Normally Open

For THIN flying leads, replace F with W.

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

ACTUATOR COLOURS

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

OPTIONS

100: Satin chrome bezel
101: Bright chrome bezel

LED COLOURS

LOS: super red - LOY: yellow - LOG: green - L0B: blue
LOW: white

APPROVAL

UL
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IP series
Pushbutton switches for harsh environments - bushing Ø 12 mm - momentary
Round - non-illuminated

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

MODEL STRUCTURE

Solder lug terminals
Curved actuator, NO
IPR35AD
Curved actuator, NC/NO
IPR355AD
Flat actuator, NO
IPF35AD
Flat actuator, NC/NO
IPF355AD
Also available with straight PC terminals: IP*3PAD (NO) or IP*5PAD (NC/NO) and quick-connect terminals: IP*3Z1AD (NO only)

Sealed flying lead terminals
Curved actuator, NO
IPR3FAD
Curved actuator, NC/NO
IPR3FAD
Flat actuator, NO
IPF3FAD
Flat actuator, NC/NO
IPF3FAD
For THIN flying leads, replace F with W.

ACTUATOR COLOURS

OPTIONS
100: Satin chrome bezel
101: Bright chrome bezel
104: High actuator - if combined with function 5 (NC/NO), order with CD contacts (instead of AD contacts).

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