

APEM

"I" range Sealed pushbutton switches

- Sealed to IP67
- Dia. 12 mm or 16 mm bushing
- Momentary or latching
- Illuminated or non-illuminated
- Custom options



Comprehensive range

“I” range

Sealed pushbutton switches

A comprehensive range of matching products

The “I” range at a glance

Bushing dia. 12 mm (.472)



IP series

- For harsh environments
- Momentary or latching
- Square or round actuator
- Illuminated or non-illuminated

Page 5



IB and IS series

- Snap-in or with threaded bushing
- Compact, light in weight
- Momentary
- Round actuator

Page 15

Hole plug U6640 available on request.

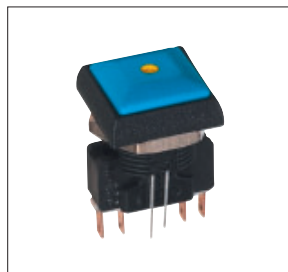
Bushing dia. 16 mm (.630)



IZ series

- Rear panel mounting
- Metal or plastic bushing
- Momentary or latching
- Round actuator
- Illuminated or non-illuminated

Page 19



IR series

- Up to 5A
- Screw version
- Momentary or latching
- Square or round actuator
- Illuminated or non illuminated

Page 37



IA series

- For harsh environments
- Resistant to frost, sand and hydrocarbons
- Low profile
- Momentary
- Round actuator

Page 56

Sealing features Page 58

APEM's vertical integration and engineering expertise have led to the development of custom switches. Example 1 shows a catalogue product adapted to meet a specific need. Examples 2 & 3 show products entirely developed to customer's specifications and produced with specific tooling.

❑ Example 1 - Customized product based on an IP pushbutton



❑ Example 2 - IL pushbutton, customized product based on an IS pushbutton

Compared to a standard IS switch, this pushbutton has a longer threaded bushing allowing mounting onto a thicker panel.

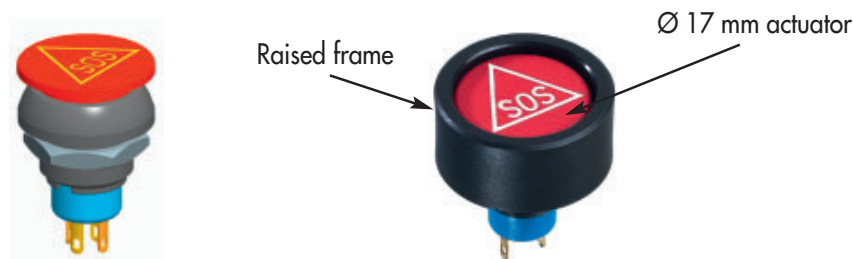
This illuminated pushbutton also features a thinner bezel for compact matrix mounting.



❑ Example 3 - 100 % custom product based on an IP pushbutton : dia. 17 mm actuator

A firm specialized in satellite locating systems asked APEM for a large pushbutton with a **dia. 17 mm actuator**. This emergency pushbutton was intended to be used in trucks and to be the interface of an embedded electronic box. The APEM solution was a normally closed IP-based custom product. Two new parts were created :

- a plunger with a 17 mm diameter
- a raised frame preventing inadvertent actuation or may have the function of a finger-guide.



“|” range

Sealed pushbutton switches

Custom products

Custom configurations can be produced using the following options, combined or not with standard elements, to meet your requirements.

❑ Marking

Pad printing, hot stamping, laser etching



❑ Colours

- “Desert tan” colour for camouflage in desert areas
- Glossy actuator finish
- “Soft feel” painted bushing and actuator



Desert tan



Glossy actuator

❑ Terminals

Colours, length and section

Materials : PVC, teflon, neoprene, external LED resistor

Wire preparation : pre-stripped, tinned, with connector, straight cut



Lead colours



Cable



Flying leads and connector

❑ Sealing

Overmolding (back end total sealing)

Tube + epoxy

Heat shrink sleeves (electrical insulation)



- 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

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
- 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 (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

LED COMPONENT SPECIFICATIONS

LED colour	Forward current	Typ. forward voltage	Max. forward voltage
Super red (LOS)	20mA	2,1V	2,3V
Yellow (LOY)	20mA	2,1V	2,3V
Green (LOG)	20mA	2,1V	2,3V
Blue (LOB)	20mA	3,2V	3,8V
White (LOW)	20mA	3,35V	4,25V

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
- Actuator : polyamide 6/6
- Bushing/bezel : zinc die-cast (zamac), black painted
- Contacts : silver, gold plated (std) brass, gold plated (for option 104)
- Multi-wire lead AWG20, section 0,6 mm²
- LED wire : AWG26, section 0,12 mm²
- Lens : polycarbonate
- Terminal seal : epoxy

AGENCY APPROVAL



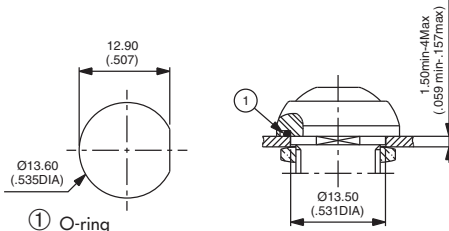
2A 125VAC/250VAC
File E83438

Availability : consult factory for details of approved models.

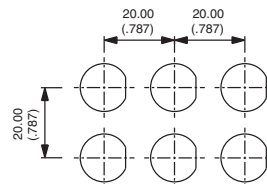
Marking : to order switches marked UL, complete ordering format.

MOUNTING

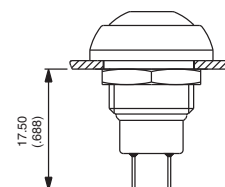
Panel cut-out



Matrix mounting



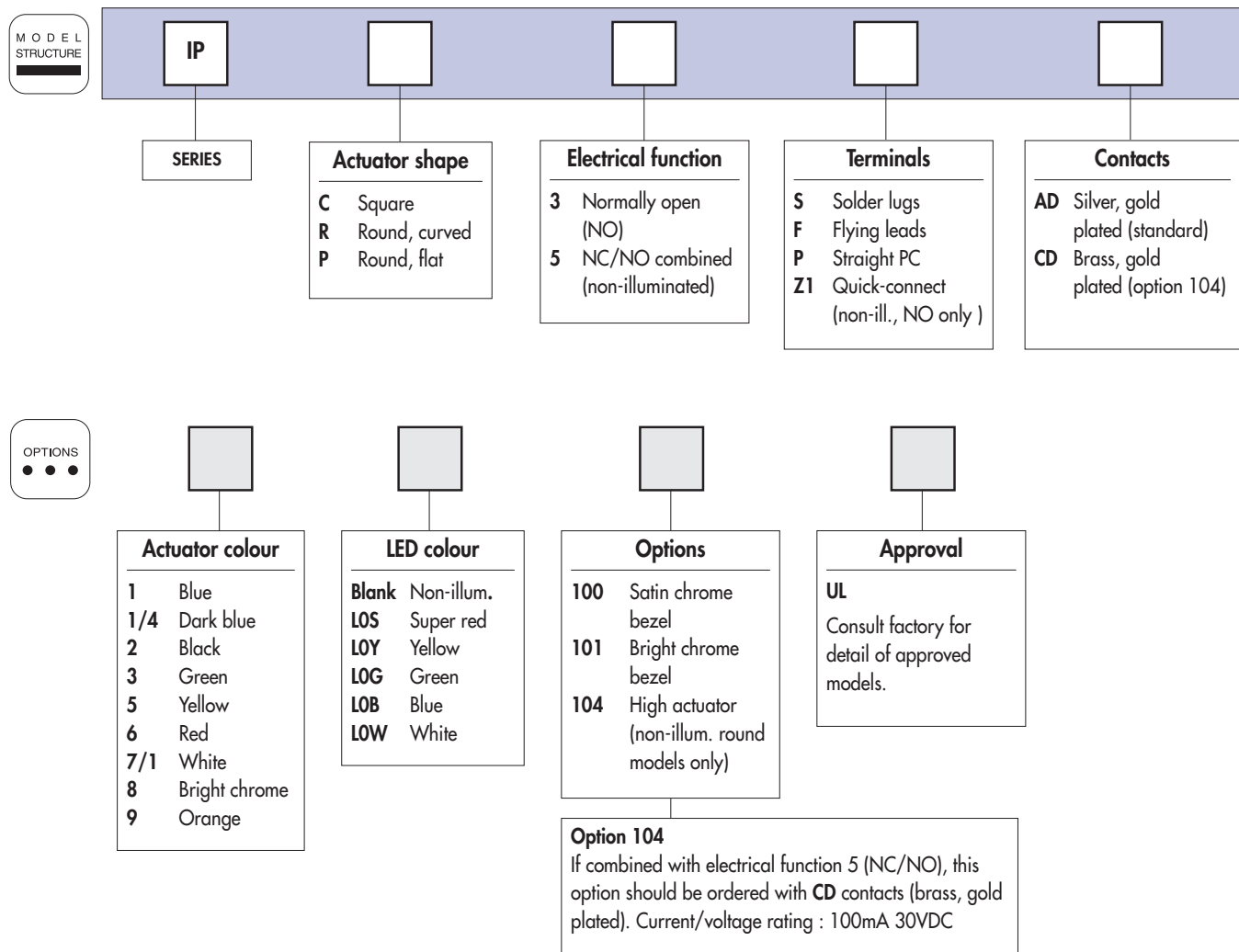
Back of panel space requirement



IP series

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

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 this catalogue.



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

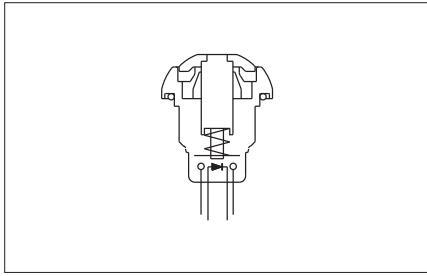


Packaging unit : 25 pieces

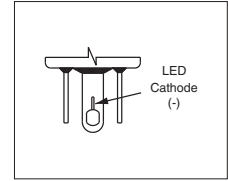
IP series

Pushbutton switches for harsh environments - bushing \varnothing 12 mm - momentary

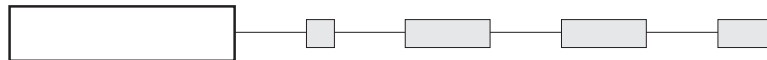
Square - illuminated



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



MODEL STRUCTURE



Solder lug terminals

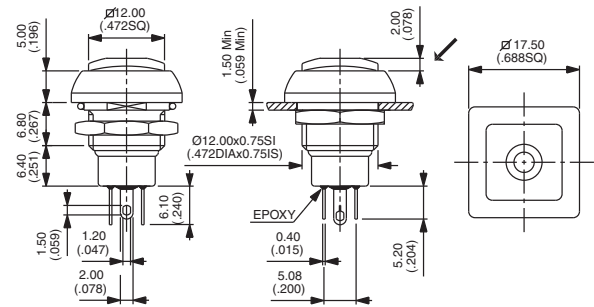


IPC3SAD



Normally Open

→ Flat



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

Sealed flying lead terminals

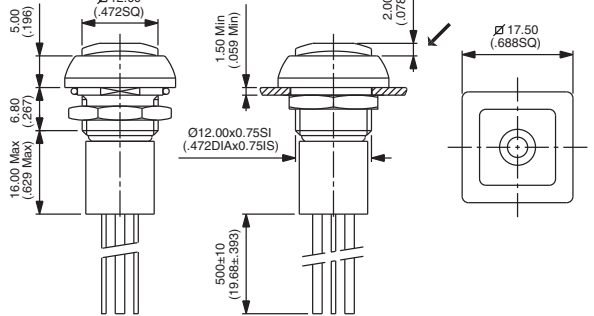


IPC3FAD



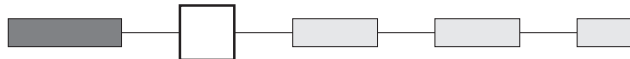
Normally Open

→ Flat



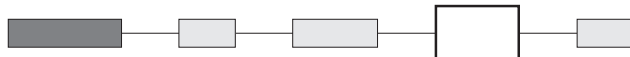
Wire colours : black : NO contact, red : LED anode(+), blue : LED cathode(-)

ACTUATOR COLOUR



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

OPTIONS



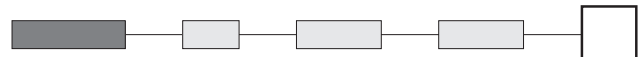
100 : Satin chrome bezel
101 : Bright chrome bezel

LED COLOUR



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

APPROVAL



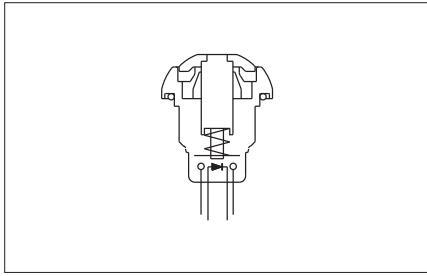
UL

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

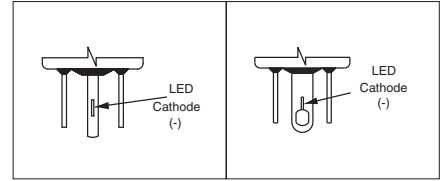
IP series

Pushbutton switches for harsh environments - bushing \varnothing 12 mm - momentary

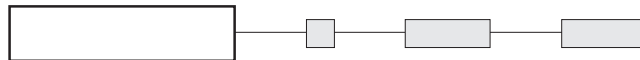
Round - illuminated



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



MODEL STRUCTURE



Solder lug terminals



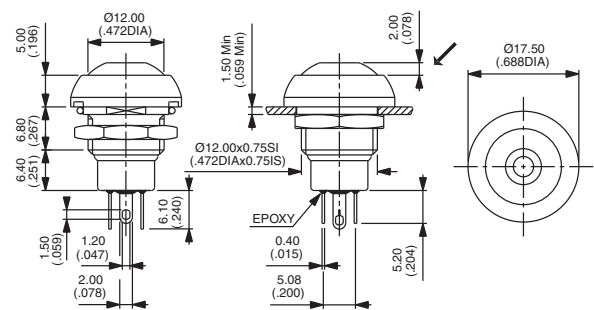
IPR3SAD



Normally Open

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

→ Flat



Sealed flying lead terminals

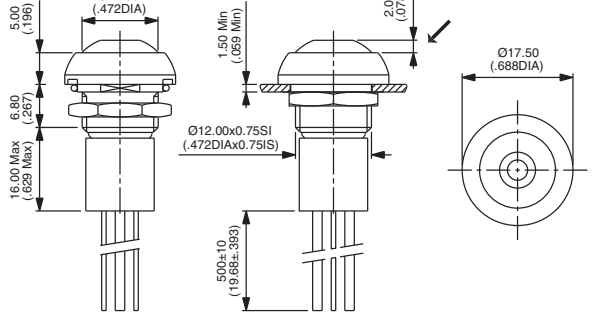


IPR3FAD



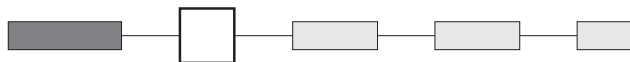
Normally Open

→ Flat



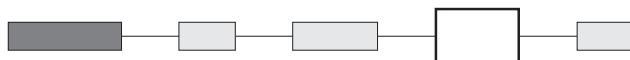
Wire colours : black : NO contact, red : LED anode(+), blue : LED cathode(-)

ACTUATOR COLOUR



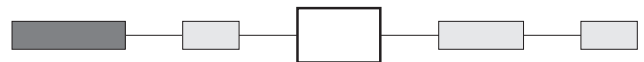
1 : blue - 1/4 : dark blue - 2 : black - 3 : green - 5 : yellow
6 : red - 7/1 : white - 8 : bright chrome - 9 : orange

OPTIONS



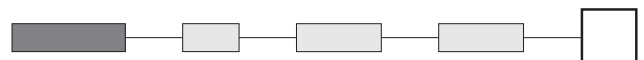
100 : Satin chrome bezel
101 : Bright chrome bezel

LED COLOUR



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

APPROVAL



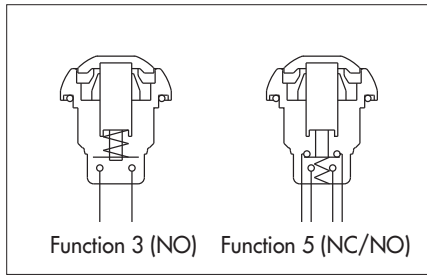
UL

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

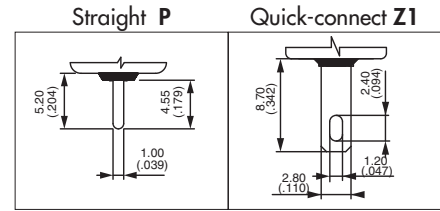
IP series

Pushbutton switches for harsh environments - bushing \varnothing 12 mm - momentary

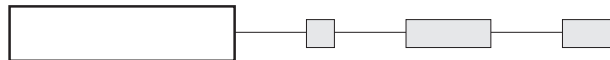
Round - non-illuminated



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



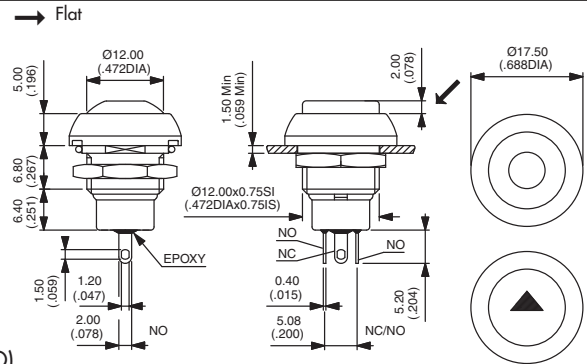
MODEL STRUCTURE



Solder lug terminals



- Curved actuator, NO
IPR3SAD
- Curved actuator, NC/NO
IPR5SAD
- Flat actuator, NO
IPP3SAD
- Flat actuator, NC/NO
IPP5SAD

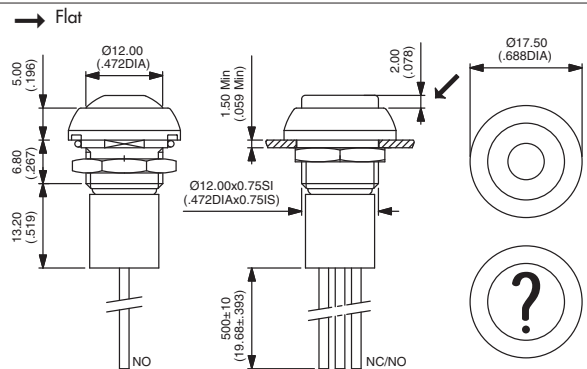
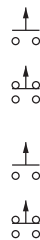


Also available with straight PC terminals : **IP•3PAD** (NO) or **IP•5PAD** (NC/NO) and quick-connect terminals : **IP•3Z1AD** (NO only)

Sealed flying 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

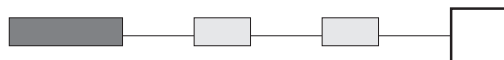
ACTUATOR COLOUR



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

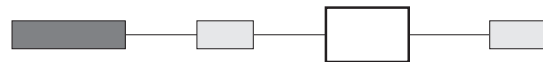
Actuator marking available on IPP models (symbol 10 mm max.).
On request.

APPROVAL

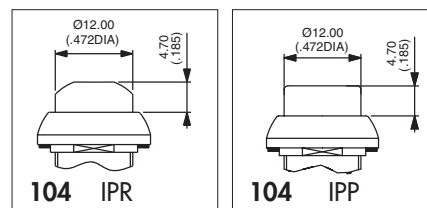


UL
Consult factory for details of approved models. To order switches marked UL, complete above box with "UL".

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).



IP series

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

Distinctive features and specifications



- Latching action**
Actuator remains in the low position when "ON".
- Illuminated or non-illuminated**
- Compact**
Behind-panel depth less than 20 mm (.787)
- Flat round actuator for optional marking**
- Sealed to IP67**

ENVIRONMENTAL SPECIFICATIONS

- Front panel sealing : IP67 according to IEC 60529
- 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

GENERAL SPECIFICATIONS

- Panel thickness : 1,5 mm (.059) min. 5,5 mm (.217) max.
- Total travel : 2,5 mm (.098) +/- 0,3 mm
- Typical operating force : 5 N +/- 2N
- Mechanical life : 200.000 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 :
 - 4A 12VDC, 200.000 cycles
 - 1A 48VDC, 200.000 cycles
 - 2A 48VDC, 100.000 cycles
 - 3A 48VDC, 75.000 cycles
 - 1A 72VDC, 15.000 cycles
- Initial contact resistance : 100 mΩ max.
- Insulation resistance : 1 GΩ min. at 500VDC
- Dielectric strength : 1.500 Vrms between terminals
1.000 VAC rms between terminals and frame

LED COMPONENT SPECIFICATIONS

LED colour	Forward current	Typ. forward voltage	Max. forward voltage
Super red (LOS)	20mA	1,95V	1,95V
Yellow (LOY)	20mA	2V	2,05V
Green (LOG)	20mA	3,2V	3,70V
Blue (LOB)	20mA	3,2V	4V

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, UL 94-V0
- Actuator : polyamide 6/6
- Bushing/bezel : zinc die-cast (zamak), black painted
- Contacts : silver, gold plated
- Multi-wire lead AWG20, section 0,6 mm²
- LED wire : AWG26, section 0,12 mm²
- Lens : polycarbonate
- Terminal seal : epoxy

AGENCY APPROVAL



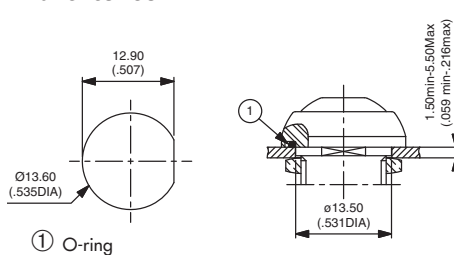
2A 125VAC/250VAC
File E83438

Availability : consult factory for details of approved models.

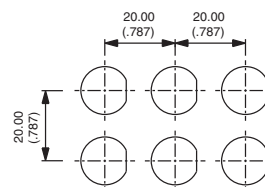
Marking : to order switches marked UL, complete appropriate box of ordering format.

MOUNTING

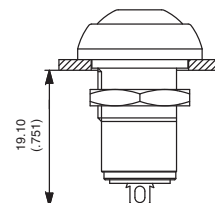
Panel cut-out



Matrix mounting



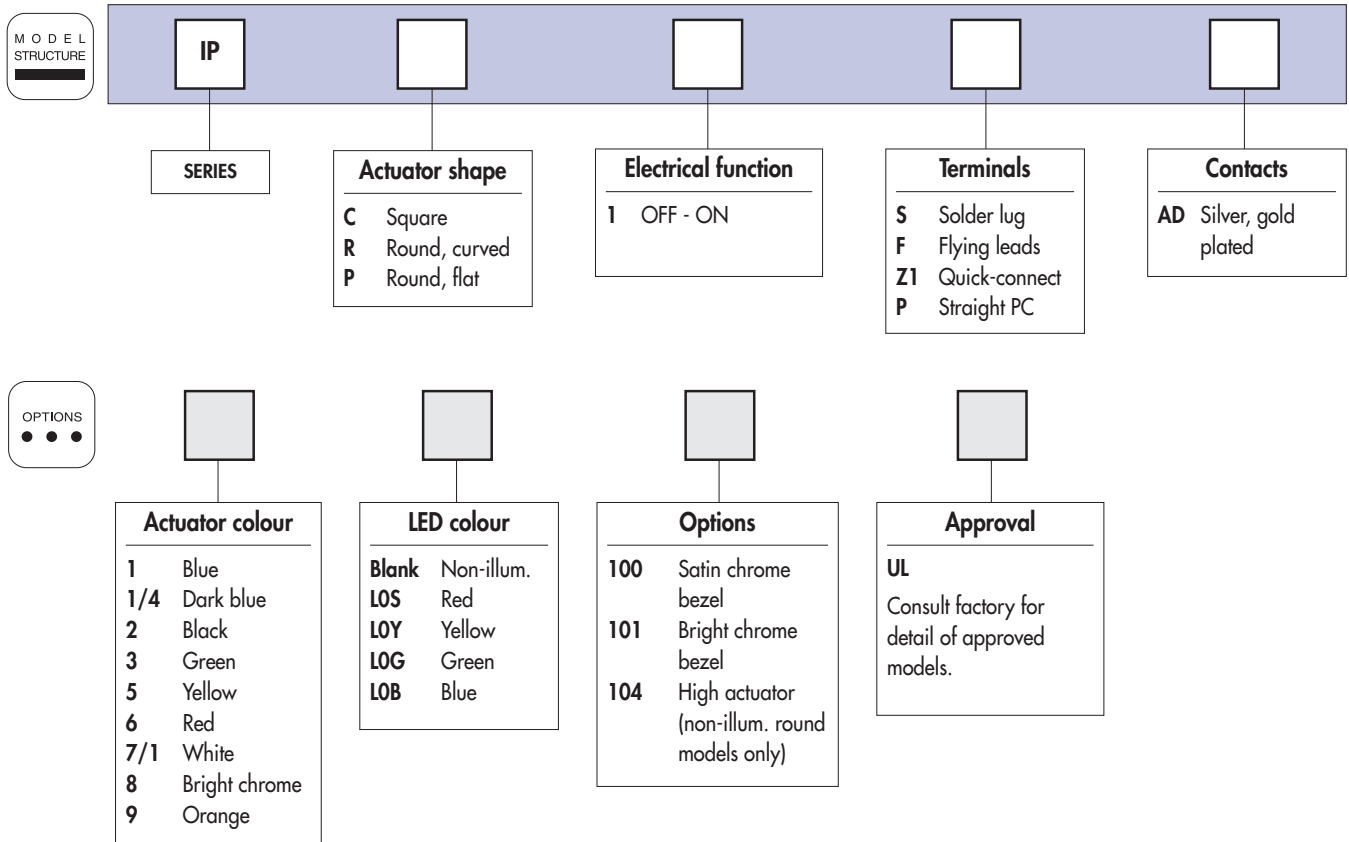
Back of panel space requirement



IP series

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

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

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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 (P/N U5125).
It is presented at the end of this catalogue..



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

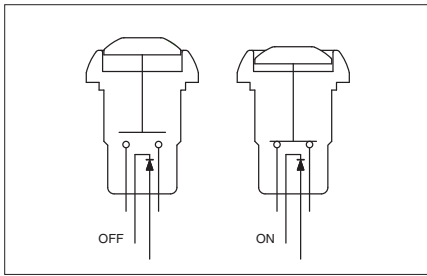


Packaging unit : 25 pieces

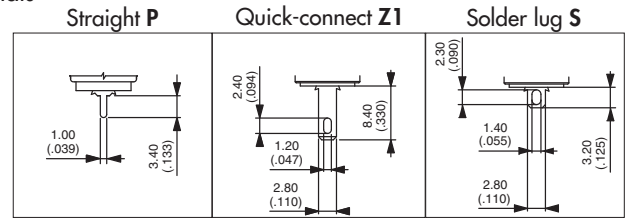
IP series

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

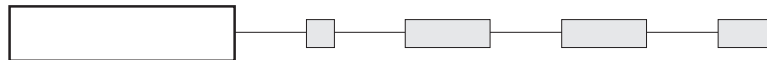
Square or round - illuminated



- Four LED colours
- Tin plated LED terminals



MODEL STRUCTURE



Square models

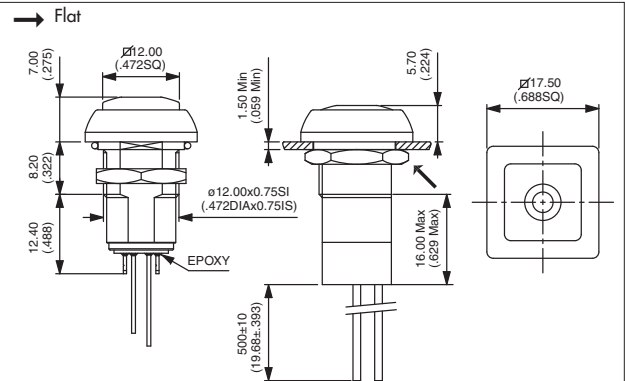


Solder lug terminals
IPC1SAD

OFF - ON

Flying lead terminals
IPC1FAD

OFF - ON



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

Round models

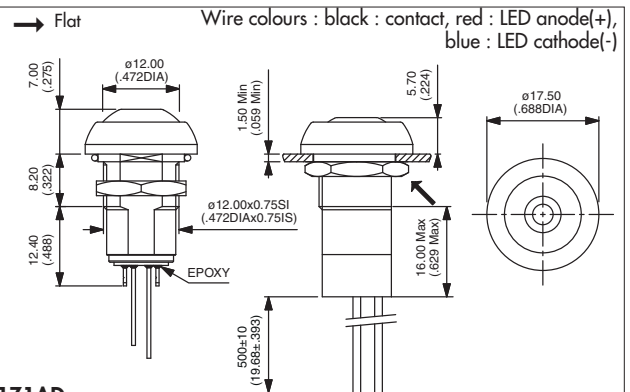


Solder lug terminals
IPR1SAD

OFF - ON

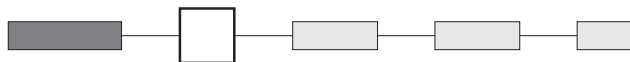
Flying lead terminals
IPR1FAD

OFF - ON



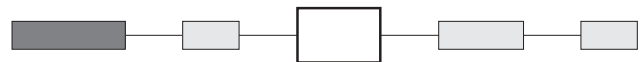
Also available with straight PC : **IPR1PAD** or quick-connect terminals : **IPR1Z1AD**

ACTUATOR COLOUR



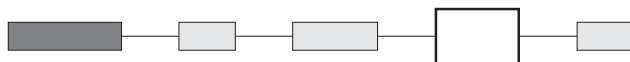
1 : blue - 1/4 : dark blue - 2 : black - 3 : green - 5 : yellow
6 : red - 7/1 : white - 8 : bright chrome - 9 : orange

LED COLOUR



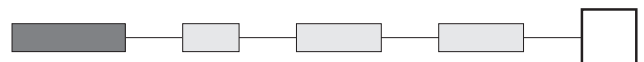
LOS : red - LOY : yellow - LOG : green - LOB : blue

OPTIONS



100 : Satin chrome bezel
101 : Bright chrome bezel

APPROVAL



UL

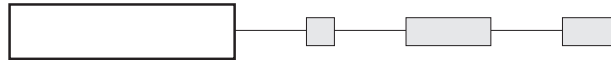
Consult factory for details of approved models. To order switches marked UL, complete above box with "UL".

IP series

Pushbutton switches for harsh environments - bushing \varnothing 12 mm - latching

Square or round - non-illuminated

MODEL STRUCTURE



Square models

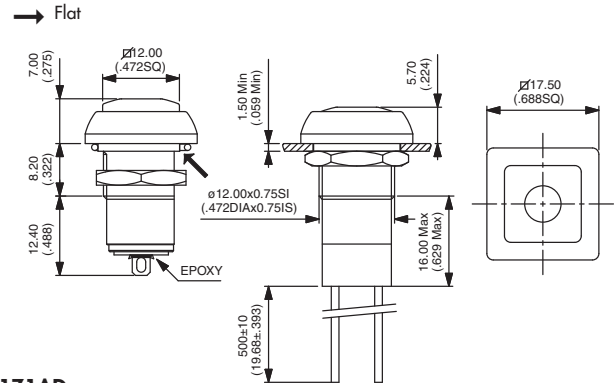


Solder lug terminals
IPC1SAD

OFF - ON

Flying 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

Flying lead terminals
IPR1FAD

OFF - ON

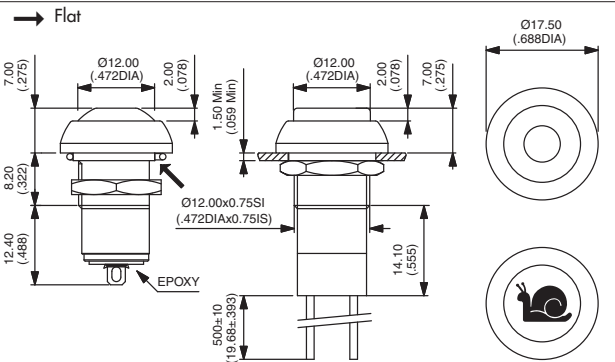
FLAT ACTUATOR

Solder lug terminals
IPP1SAD

OFF - ON

Flying lead terminals
IPP1FAD

OFF - ON



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

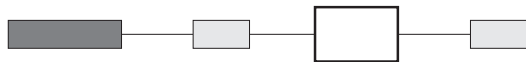
ACTUATOR COLOUR

Actuator 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

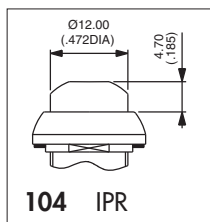
OPTIONS



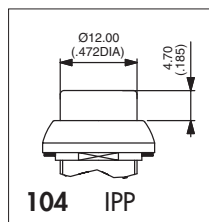
100 : Satin chrome bezel

101 : Bright chrome bezel

104 : High actuator (for round model only)

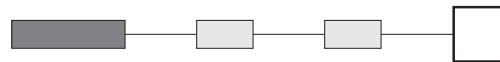


104 IPR



104 IPP

APPROVAL



UL

Availability : consult factory for details of approved models.

Marking : to order switches marked UL, complete above box with "UL".

IB and IS series

Sealed pushbutton switches - bushing Ø 12 mm - momentary

Distinctive features and specifications



- Snap-in and threaded bushing models
- Compact, light in weight
 - Behind-panel depth of 13 mm (.512) only
 - 50 % reduction in weight compared to metallic models
- Tactile feedback
- Sealed to IP67

ENVIRONMENTAL SPECIFICATIONS

- Front panel sealing : IP67 according to IEC 60529
- Shock resistance : 100 g according to IEC 512-4, test 6c
- Vibration resistance : 10-500 Hz - 10 g according to IEC 512-4, test 6d
- Salt spray : IEC 512-6, test 11f
- Operating temperature : -40°C to +85°C

MATERIALS

- Case : thermoplastic UL94-V0
- Actuator : polyamide 6/6
- Bushing/bezel : polyamide 6/6
- Contacts : silver, gold plated
- Terminal seal : epoxy

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
400mA 32VAC - 100mA 50VDC - 125mA 125VAC
- Initial contact resistance : 50 mΩ max.
- Insulation resistance : 1 GΩ min. at 500VDC
- Dielectric strength : 1.000 Vrms
- Electrical life at full load : 500.000 cycles

AGENCY APPROVAL



2A 125VAC/250VAC
File E83438

Availability : consult factory for details of approved models.

Marking : to order switches marked UL, complete appropriate box of ordering format.

GENERAL SPECIFICATIONS

- Panel thickness :
 - IB series : 0,8 mm (.031) min. - 1,8 mm (.071) max.
 - IS series : 1,5 mm (.059) min. - 4 mm (.157) max.
- Total travel : 1,9 mm (.074) +/- 0,3 mm
- Typical operating force : 7N +/- 3N
- Mechanical life : 1.000.000 cycles
- Torque : 1,5 Nm max. applied to nut
- Soldering : 300°C max. for 3 seconds

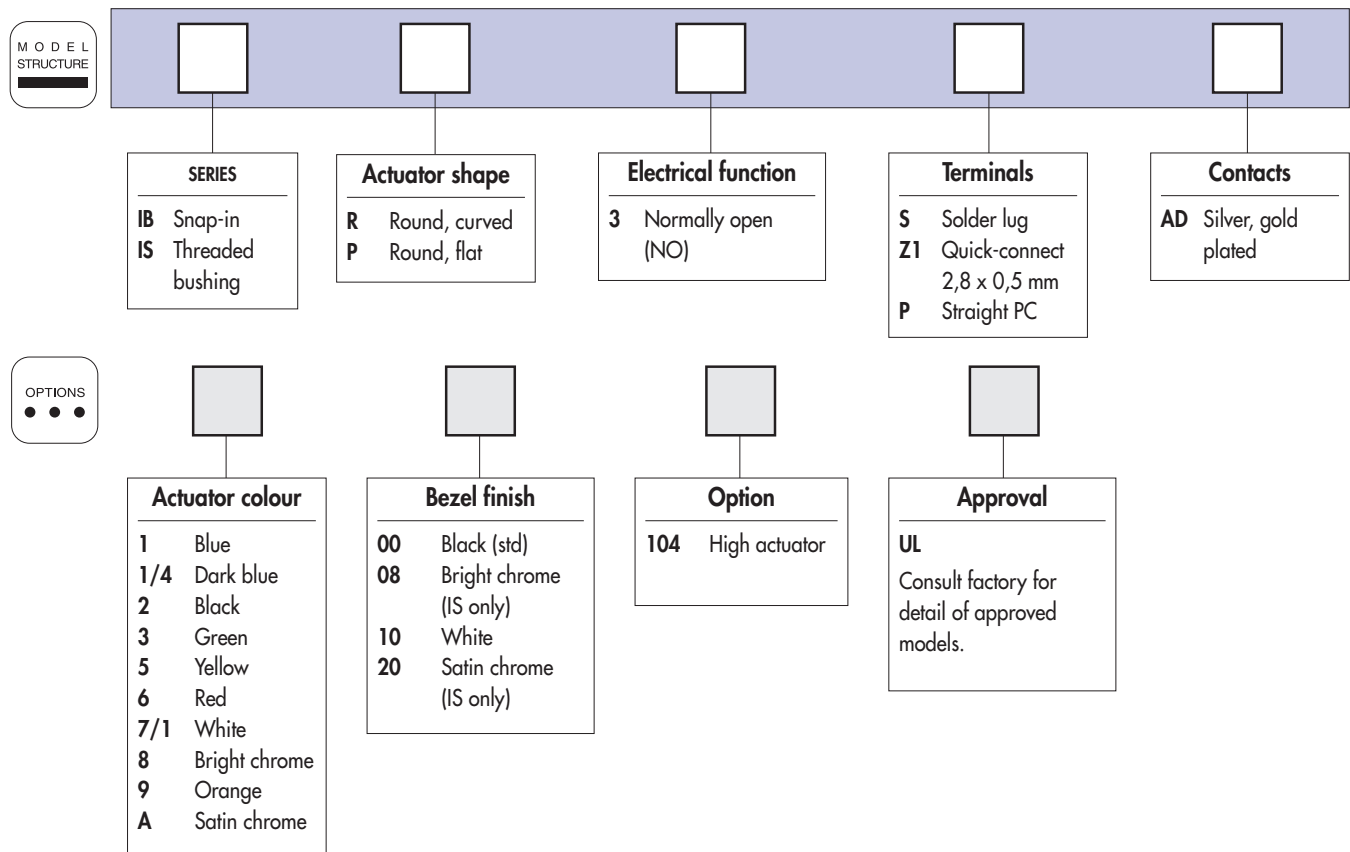
*Example of custom switch:
see end of the series.*

Panel mounting : see next pages.

IB and IS series

Sealed pushbutton switches - bushing Ø 12 mm - momentary

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 this catalogue.



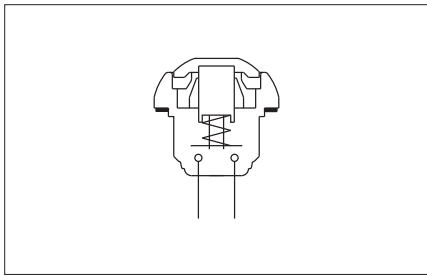
Mounting accessories : Standard hardware supplied : 1 flat seal (IB series)
 1 hex nut 14 mm (.551) across flats and 1 flat seal (IS series). Hex nut part number U166.



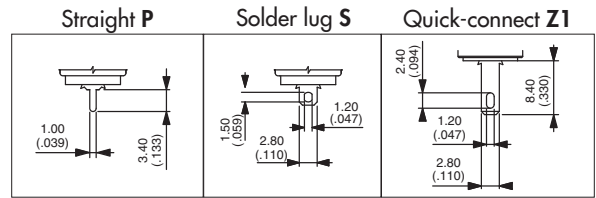
Packaging unit : 50 pieces

IB and IS series

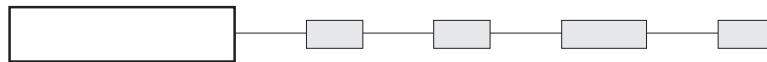
Sealed pushbutton switches - bushing Ø 12 mm - momentary



- Ten actuator colours
- Curved or flat actuator
- Antirootation bushing



MODEL STRUCTURE



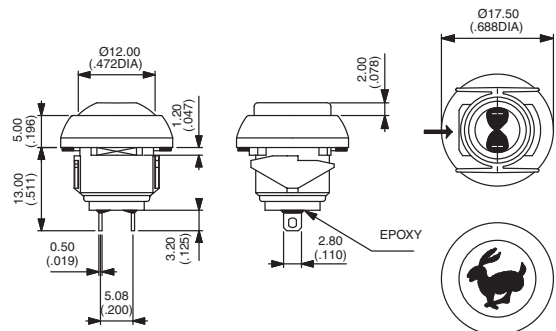
Snap-in mounting - solder lugs

→ Flat

Panel thickness : 0,8 mm to 1,8 mm



- Curved actuator
IBR3SAD Normally open
- Flat actuator
IBP3SAD Normally open



Also available with straight PC : **IBR•3PAD** or quick-connect terminals : **IB•3Z1AD**

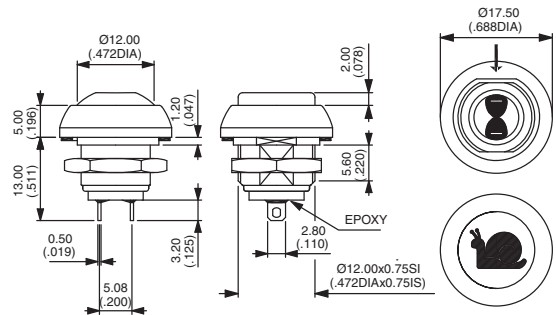
Mounting by threaded bushing - solder lugs

→ Flat

Panel thickness : 1,5 mm to 4 mm



- Curved actuator
ISR3SAD Normally open
- Flat actuator
ISP3SAD Normally open

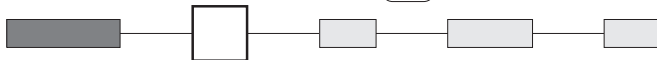


Also available with straight PC : **IS•3PAD** or quick-connect terminals : **IS•3Z1AD**

ACTUATOR COLOUR



Actuator marking available on IBP and ISP 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 - A : satin chrome

BUSHING AND BEZEL FINISH

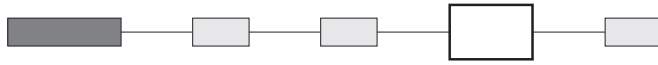


00 : Black (standard)
08 : Bright chrome (IS series only)
10 : White
20 : Satin chrome (IS series only)

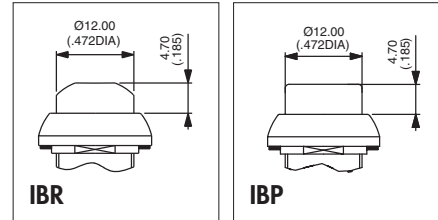
IB and IS series

Sealed pushbutton switches - bushing \varnothing 12 mm - momentary

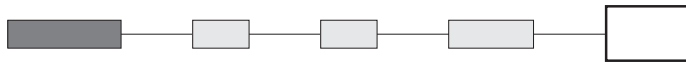
ACTUATOR OPTION



104 : High actuator



APPROVAL



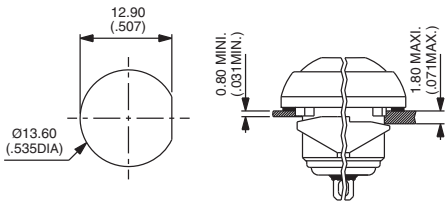
UL

Availability : consult factory for details of approved models.

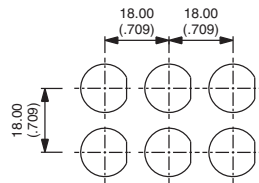
Marking : to order switches marked UL, complete above box with "UL".

IB SERIES MOUNTING

Panel cut-out

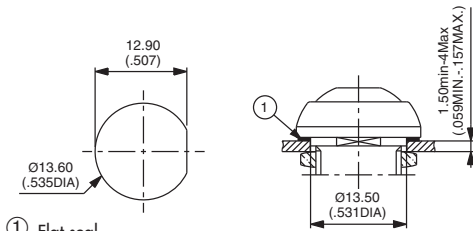


Matrix mounting



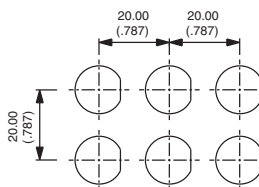
IS SERIES MOUNTING

Panel cut-out



① Flat seal

Matrix mounting



Example of custom switch



ISR3FADB22X1248-01

- Painted bushing and actuator, soft feel
- Flying leads (55 mm) + connector
- Overmolded rear part



- Rear mounting for easier installation
- Momentary metal models
- Fixed or variable panel thickness
- Screw version available up to 4A
- Sealed to IP67
- Illuminated or non-illuminated
- Flat actuator for optional marking

ENVIRONMENTAL SPECIFICATIONS

- Front panel sealing : IP67 according to IEC 60529
- 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
- Operating temperature : -40°C to +85°C

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - Gold plated silver contacts (code 4) : 200mA 48VDC - 200mA 250VAC
 - Silver contacts (code 2) - screw terminals : 2A 250VAC - 4A 48VDC
- Electrical life at full load : 500.000 cycles
- Initial contact resistance : 100 mΩ max.
- Insulation resistance : 1 GΩ min. at 500VDC
- Dielectric strength : 1.000 Vrms 50 Hz

LED COMPONENT SPECIFICATIONS

LED colour	Forward current	Typ. forward voltage	Max. forward voltage
Super red (LOS)	20mA	2,1V	2,3V
Yellow (LOY)	20mA	2,1V	2,3V
Green (LOG)	20mA	2,1V	2,3V
Blue (LOB)	20mA	3,2V	3,8V
White (LOW)	20mA	3,35V	4,25V

A resistor must be series-connected by the user.

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

On flying lead versions, the LED resistor can be integrated by APEM on request.

GENERAL SPECIFICATIONS

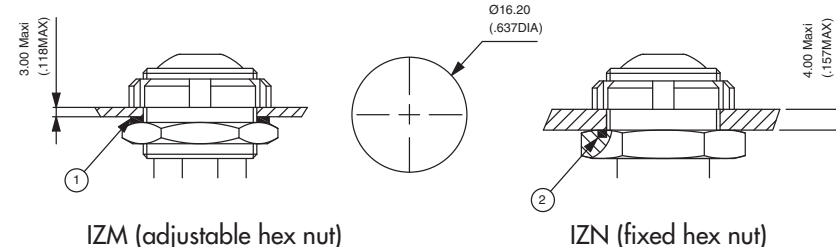
- Panel thickness :
 - IZM : 3 mm (.118) max.
 - IZN : 4 mm (.157) max.
- Total travel : 1,8 mm (.070) +/- 0,3 mm
- Typical operating force : 6N +/- 2N
- Mechanical life : 1.000.000 cycles
- Torque : IZN : 1 Nm max.
IZM : 0,7 Nm max. applied to nut
- Soldering : 320°C max. for 3 sec.

MATERIALS

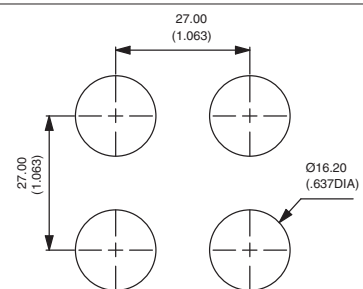
- Case : thermoplastic UL94-V0
- Plunger : polyamide
- Bushing/bezel : brass, nickel plated
- Contacts :
 - 4 : silver, gold plated
 - 2 : silver (screw terminals)
- Multi-wire lead AWG20, section 0,6 mm²
- LED wire : AWG26, section 0,12 mm²
- Lens : polycarbonate
- Terminal seal : epoxy

PANEL CUT-OUT

- ① Flat seal ② O-ring



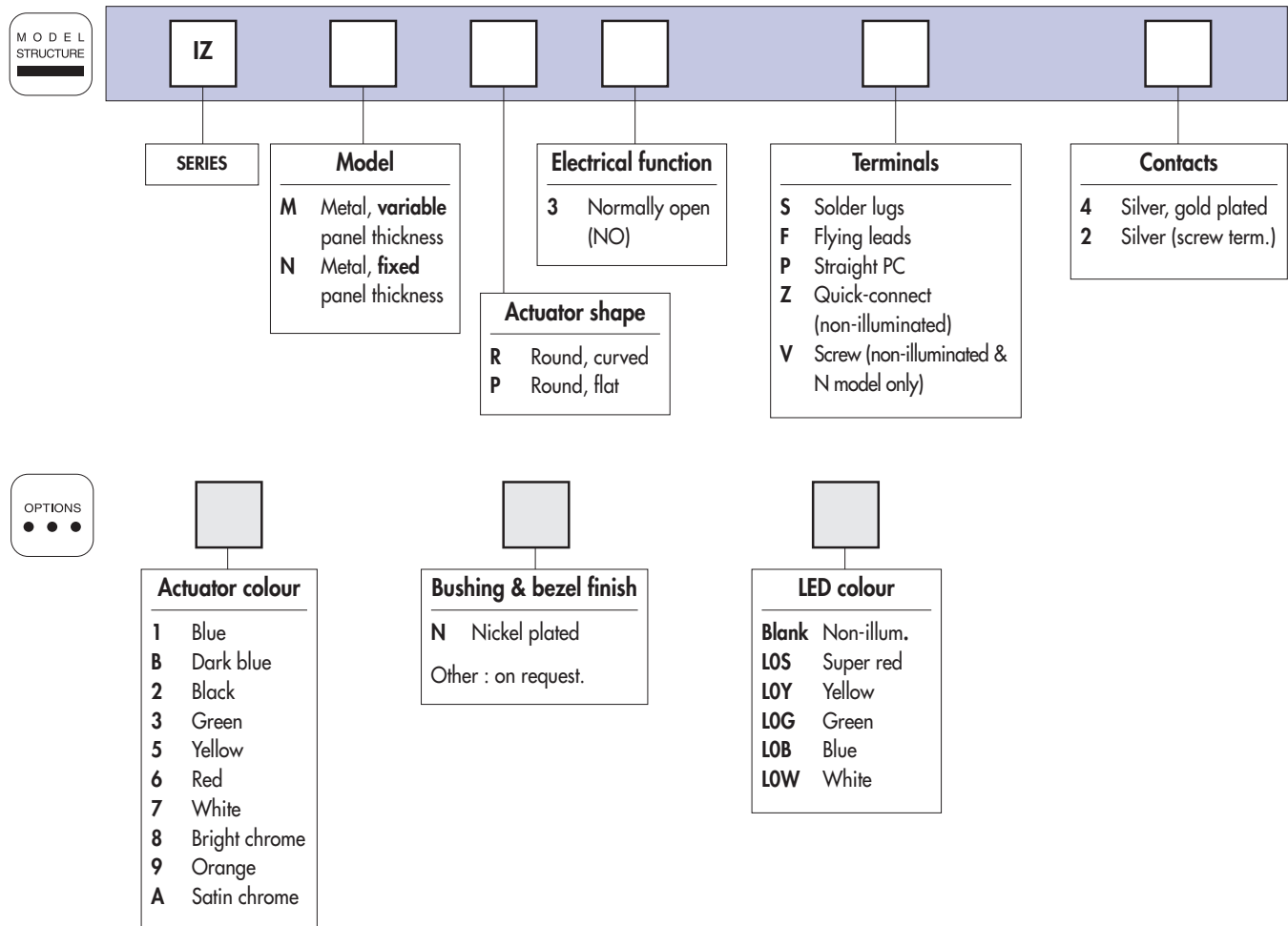
MATRIX MOUNTING



IZ series

Rear mounted sealed pushbutton switches - bushing Ø 16 mm - metal - momentary

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.



Mounting accessories : Standard hardware supplied :

- IZM : 1 castellated nickel plated brass nut U6915 + 1 silicone flat seal + 1 hex nut 19 mm (.748) across flats U4116.
- IZN : 1 castellated nickel plated brass nut U6915 + 1 O-ring

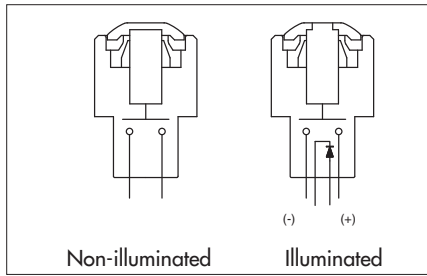


Packaging unit : 25 pieces for flying lead models - 40 pieces for other models

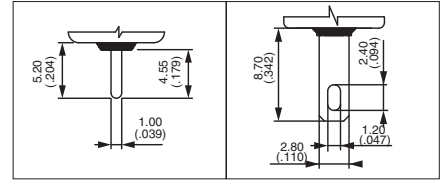
IZ series

Rear mounted sealed pushbutton switches - bushing \varnothing 16 mm - metal - momentary

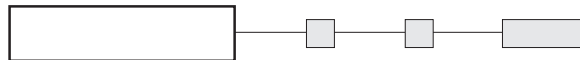
For variable panel thickness : IZM



- Five LED colours
- Tin plated LED terminals
- Gold plated contacts



MODEL STRUCTURE



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

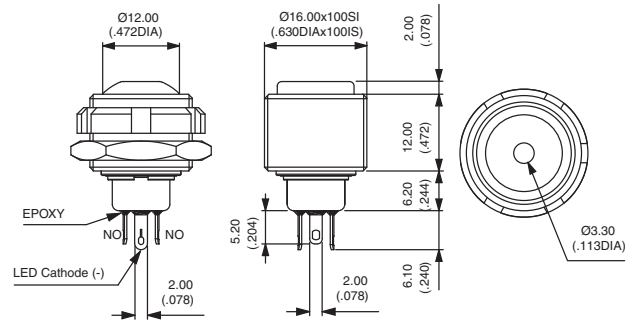
Illuminated - solder lug terminals



Curved actuator
IZMR3S4
Normally Open



Flat actuator
IZMP3S4
Normally Open



Also available with straight PC terminals : **IZM•3P4**.
LED colour is indicated by the bottom of the switch.

Illuminated - flying lead terminals



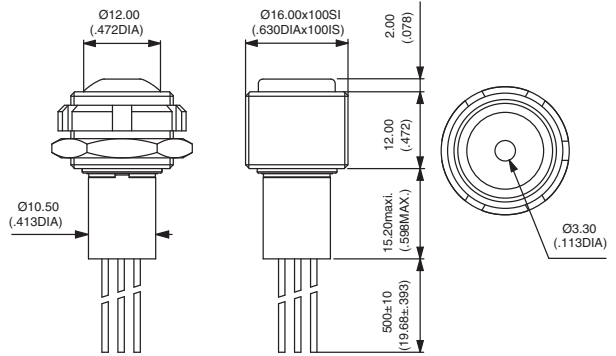
Curved actuator
IZMR3F4
Normally Open



Flat actuator
IZMP3F4
Normally Open



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



Non-illuminated - solder lug terminals



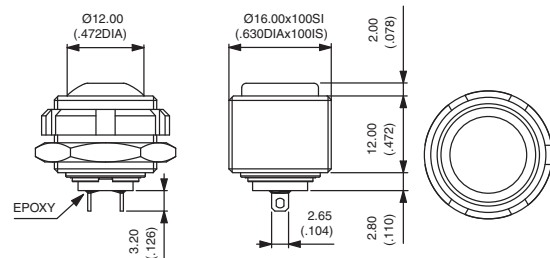
Curved actuator
IZMR3S4
Normally Open



Flat actuator
IZMP3S4
Normally Open



Also available with straight PC terminals :
IZM•3P4 and quick-connect terminals : **IZM•3Z4**.

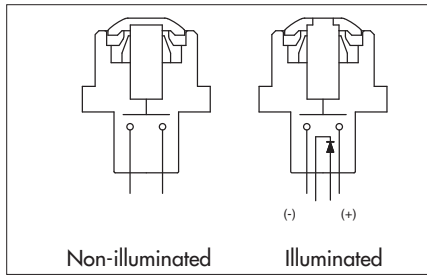


For non-illuminated FLYING LEAD versions, refer to illuminated models above. Non-illuminated have 2 wires only.

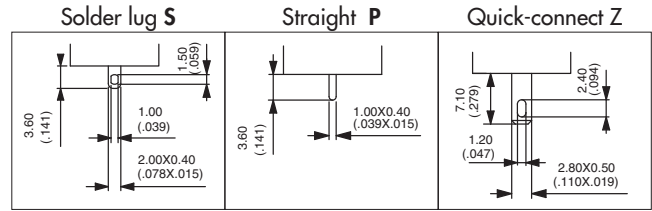
IZ series

Rear mounted sealed pushbutton switches - bushing Ø 16 mm - metal - momentary

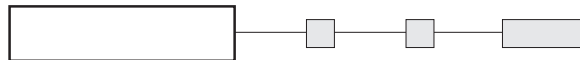
For fixed panel thickness : IZN



- Five LED colours
- Tin plated LED terminals



MODEL STRUCTURE



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

Illuminated - solder lug terminals



GOLD PLATED CONTACTS

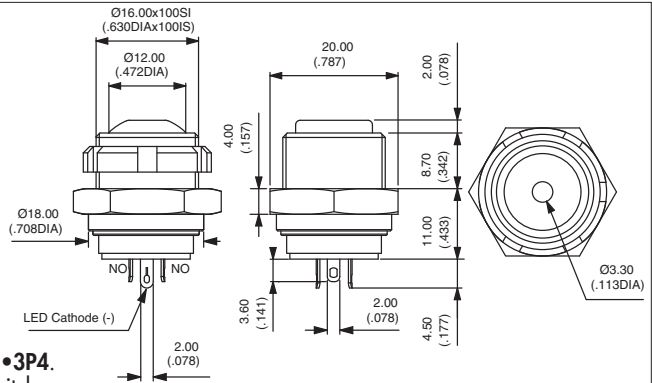
Curved actuator
IZNR3S4
Normally Open



Flat actuator
IZNP3S4
Normally Open



Also available with straight PC terminals : **IZN•3P4**.
LED colour is indicated by the bottom of the switch.



Illuminated - sealed flying lead terminals



GOLD PLATED CONTACTS

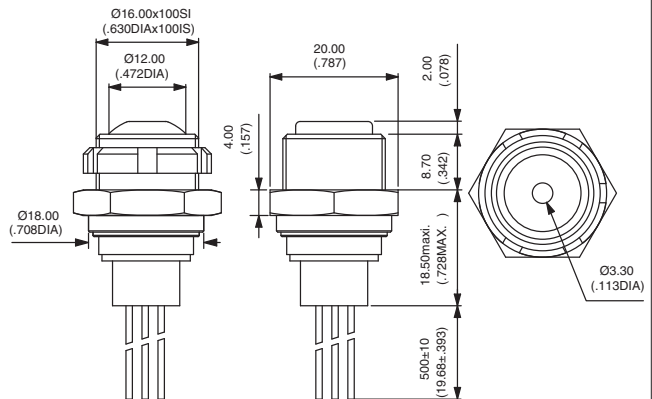
Curved actuator
IZNR3F4
Normally Open



Flat actuator
IZNP3F4
Normally Open



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



Non-illuminated - solder lug terminals



GOLD PLATED CONTACTS

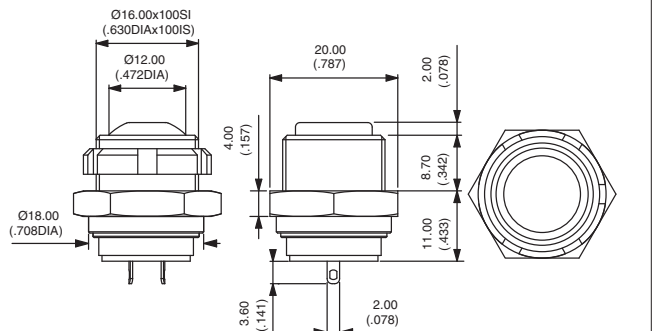
Curved actuator
IZNR3S4
Normally Open



Flat actuator
IZNP3S4
Normally Open



Also available with straight PC terminals :
IZN•3P4 and quick-connect terminals : **IZN•3Z4**.



For non-illuminated FLYING LEAD versions, refer to illuminated models above. Non-illuminated have 2 wires only.

IZ series

Rear mounted sealed pushbutton switches - bushing Ø 16 mm - metal - momentary

For fixed panel thickness : IZN - options

Non-illuminated - screw terminals

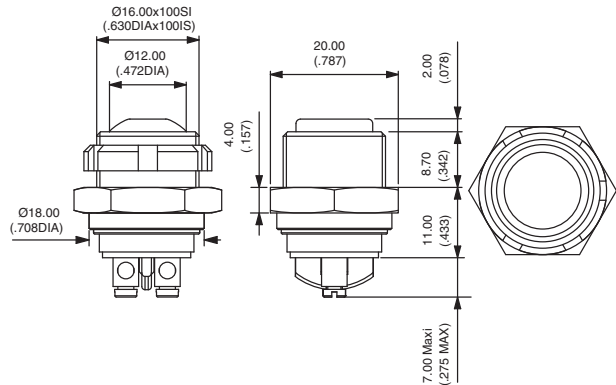
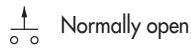


SILVER CONTACTS

Curved actuator
IZNR3V2



Flat actuator
IZNP3V2

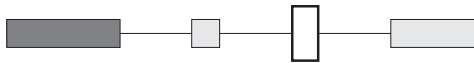


ACTUATOR COLOUR



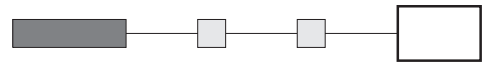
1 : blue - B : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7 : white - 8 : bright chrome - 9 : orange
A : satin chrome

BUSHING AND BEZEL COLOUR



2 : black (standard)
Other : on request.

LED COLOUR



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

IZ series

Rear mounted sealed pushbutton switches - bushing Ø 16 mm - metal - latching

Distinctive features and specifications



- Rear mounting for easier installation
- Latching action metal models
- Fixed or variable panel thickness
- Sealed to IP67
- Illuminated or non-illuminated
- Flat actuator for optional marking

ENVIRONMENTAL SPECIFICATIONS

- Front panel sealing : IP67 according to IEC 60529
- 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 : 100mA 24VDC - 200.000 cycles
- Initial contact resistance : 100 mΩ max.
- Insulation resistance : 1 GΩ min. at 500VDC
- Dielectric strength : 1.500 Vrms between terminals
1.000 Vrms between terminals and frame

LED COMPONENT SPECIFICATIONS

LED colour	Forward current	Typ. forward voltage	Max. forward voltage
Super red (LOS)	20mA	1,95V	1,95V
Yellow (LOY)	20mA	2V	2,05V
Green (LOG)	20mA	3,2V	3,70V
Blue (LOB)	20mA	3,2V	4V

A resistor must be series-connected by the user.

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

On flying lead versions, the LED resistor can be integrated by APEM on request.

GENERAL SPECIFICATIONS

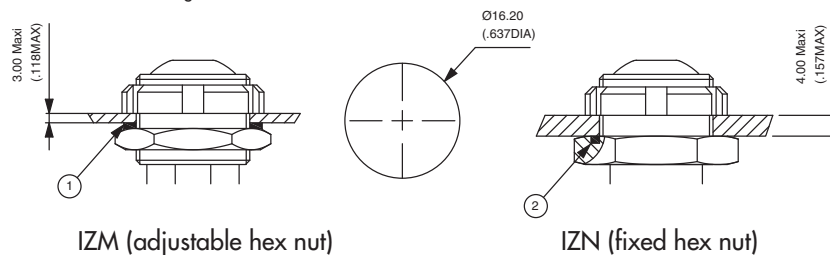
- Panel thickness :
 - IZM : 3 mm (.118) max.
 - IZN : 4 mm (.157) max.
- Total travel : 2,5 mm (.098) +/-0,3 mm
- Typical operating force : 5N +/- 2N
- Mechanical life : 200.000 cycles
- Torque : IZN : 1 Nm max.
IZM : 0,7 Nm max. applied to nut
- Soldering : 320°C max. for 3 sec.

MATERIALS

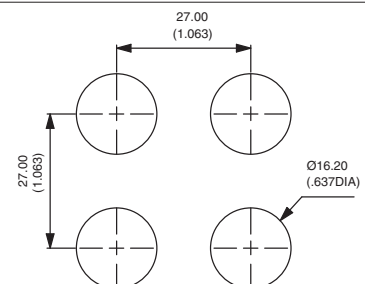
- Case : thermoplastic UL94-V0
- Plunger : polyamide
- Bushing/bezel : brass, nickel plated
- Contacts : silver, gold plated
- Multi-wire lead AWG20, section 0,6 mm²
- LED wire : AWG26, section 0,12 mm²
- Lens : polycarbonate
- Terminal seal : epoxy

PANEL CUT-OUT

- ① Flat seal ② O-ring



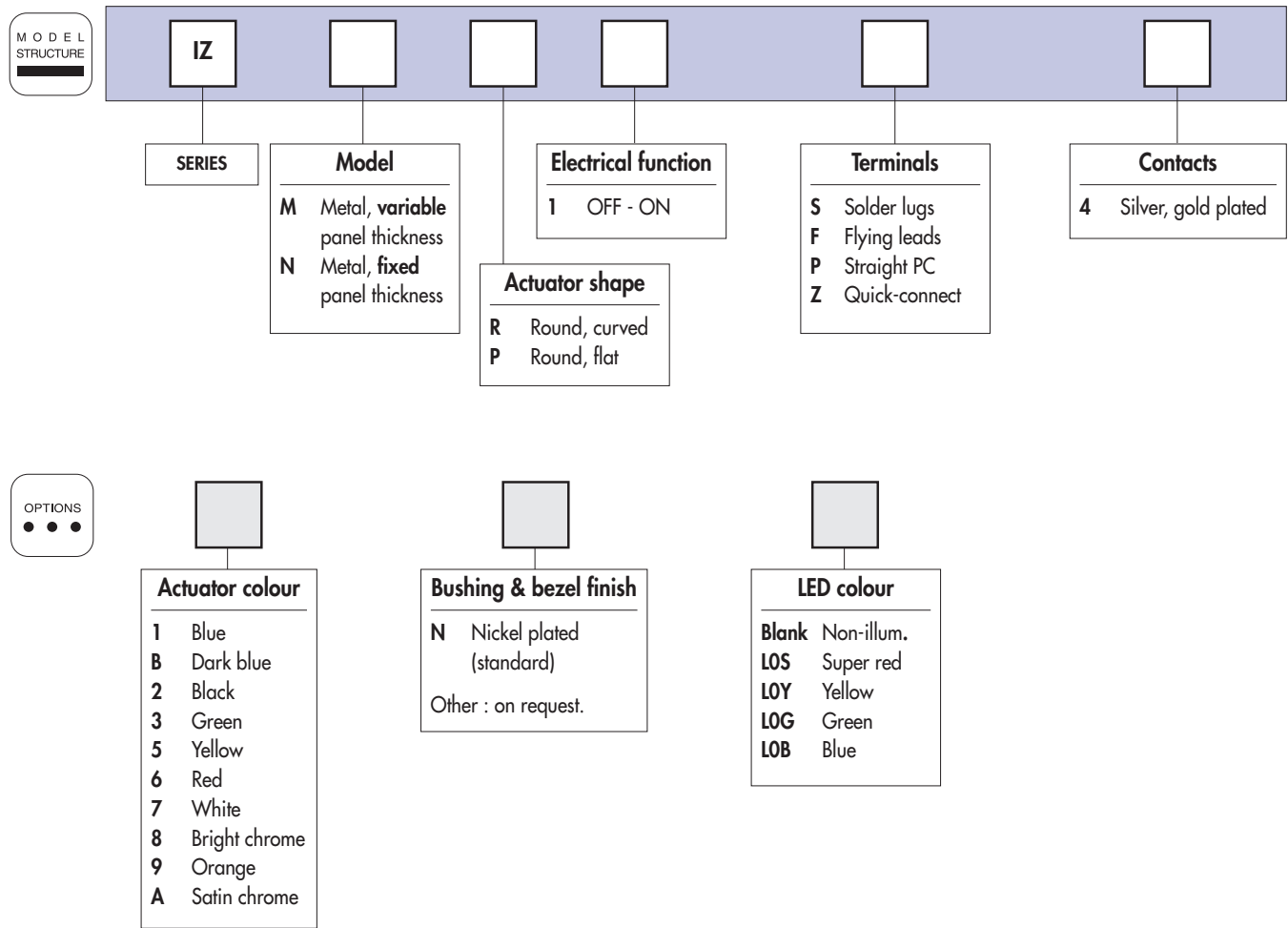
MATRIX MOUNTING



IZ series

Rear mounted sealed pushbutton switches - bushing Ø 16 mm - metal - latching

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.



Mounting accessories : Standard hardware supplied :
- IZN : 1 castellated nickel plated brass nut U6915 + 1 O-ring
- IZM : 1 castellated nickel plated brass nut U6915 + 1 silicone flat seal + 1 hex nut 19 mm (.748) across flats U4116.

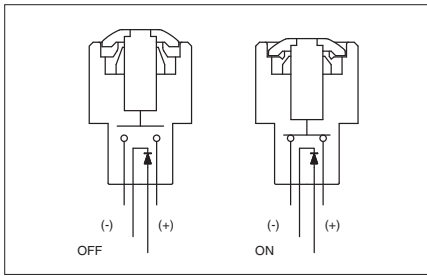


Packaging unit : 25 pieces for flying lead models - 40 pieces for other models

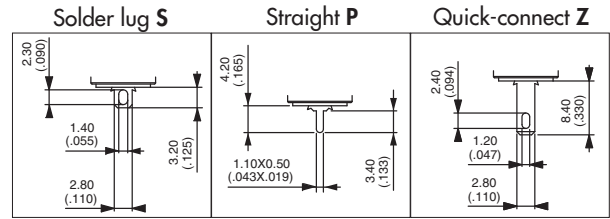
IZ series

Rear mounted sealed pushbutton switches - bushing Ø 16 mm - metal - latching

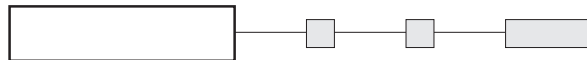
For variable panel thickness : IZM



- Four LED colours
- Tin plated LED terminals
- Gold plated contacts



MODEL STRUCTURE



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

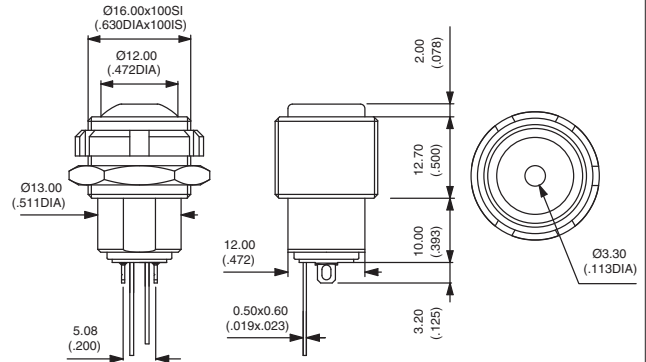
Illuminated - solder lug terminals



Curved actuator
IZMR1S4 OFF - ON

Flat actuator
IZMP1S4 OFF - ON

Also available with straight PC terminals :
IZM•1P4 & quick-connect terminals : **IZM•1Z4**.



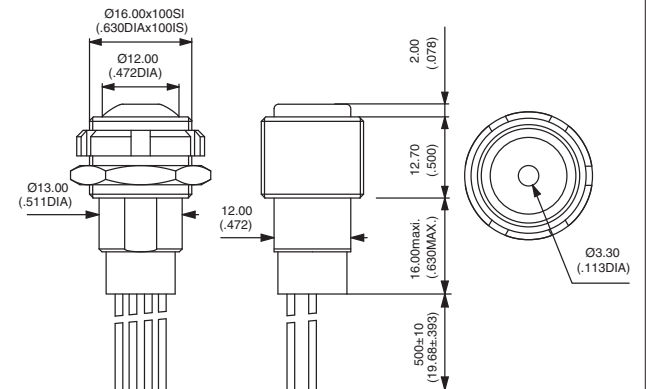
Illuminated - flying lead terminals



Curved actuator
IZMR1F4 OFF - ON

Flat actuator
IZMP1F4 OFF - ON

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



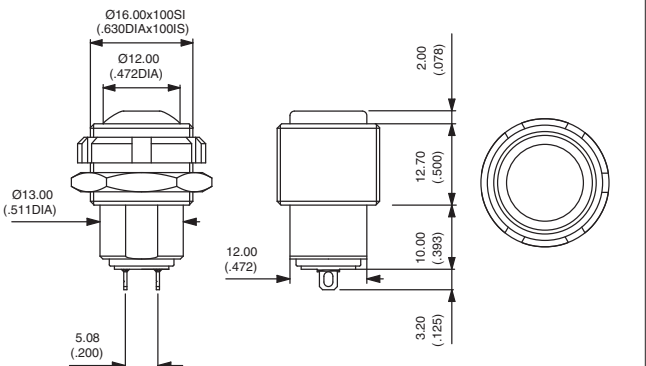
Non-illuminated - solder lug terminals



Curved actuator
IZMR1S4 OFF - ON

Flat actuator
IZMP1S4 OFF - ON

Also available with straight PC terminals :
IZM•1P4 & quick-connect terminals : **IZM•1Z4**.

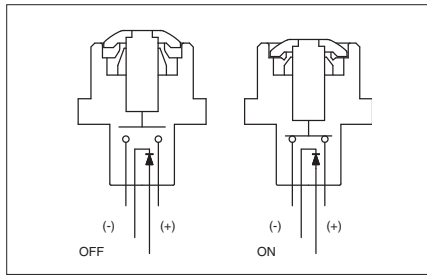


For FLYING LEAD versions, refer to illuminated models above. Non-illuminated have 2 wires only.

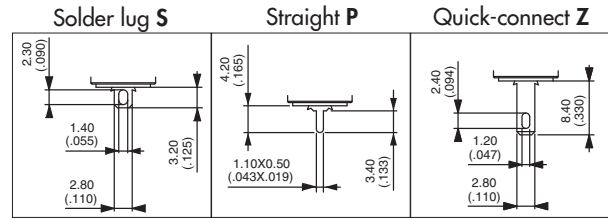
IZ series

Rear mounted sealed pushbutton switches - bushing Ø 16 mm - metal - latching

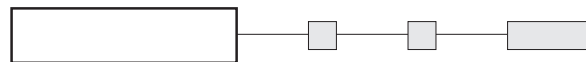
For fixed panel thickness : IZN



- Four LED colours
- Tin plated LED terminals
- Gold plated contacts



MODEL STRUCTURE



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

Illuminated - solder lug terminals



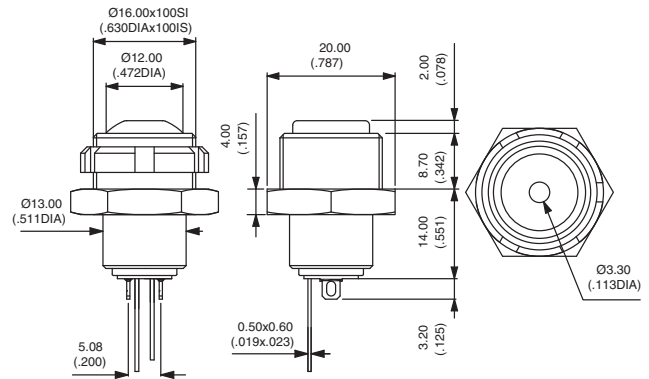
Curved actuator
IZNR1S4

OFF - ON

Flat actuator
IZNP1S4

OFF - ON

Also available with straight PC terminals :
IZN•1P4 & quick-connect terminals : **IZN•1Z4**.



Illuminated - flying lead terminals



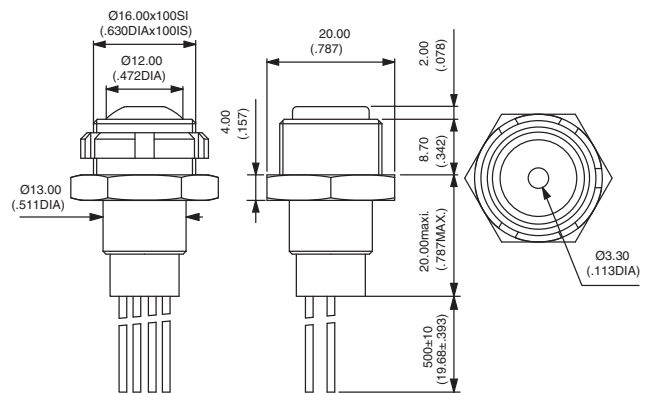
Curved actuator
IZNR1F4

OFF - ON

Flat actuator
IZNP1F4

OFF - ON

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



Non-illuminated - solder lug terminals



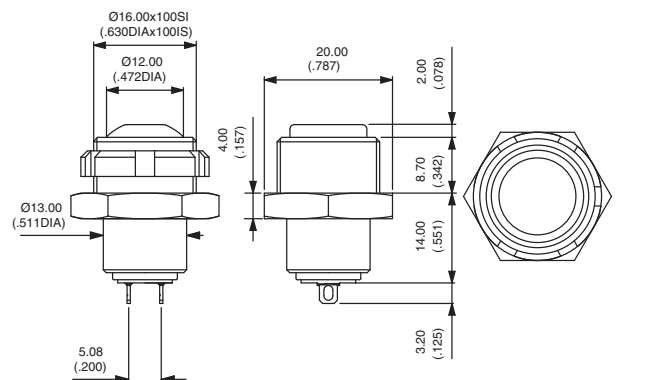
Curved actuator
IZNR1S4

OFF - ON

Flat actuator
IZNP1S4

OFF - ON

Also available with straight PC terminals :
IZN•1P4 & quick-connect terminals : **IZN•1Z4**.



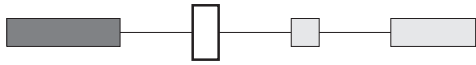
For FLYING LEAD versions, refer to illuminated models above. Non-illuminated have 2 wires only.

IZ series

Rear mounted sealed pushbutton switches - bushing Ø 16 mm - metal - latching

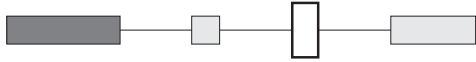
Options

ACTUATOR COLOUR



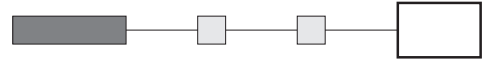
1 : blue - **B** : dark blue - **2** : black - **3** : green - **5** : yellow - **6** : red - **7** : white - **8** : bright chrome - **9** : orange
A : satin chrome

BUSHING AND BEZEL COLOUR



N : nickel plated (standard)
Other : on request.

LED COLOUR



Blank : non-illuminated
LOS : super red - **LOY** : yellow - **LOG** : green
LOB : blue



- Rear mounting for easier installation
- Momentary models
- Screw version available up to 4A
- Sealed to IP67
- Illuminated or non-illuminated
- Flat actuator for optional marking

ENVIRONMENTAL SPECIFICATIONS

- Front panel sealing : IP67 according to IEC 60529
- 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
- Operating temperature : -40°C to +85°C

GENERAL SPECIFICATIONS

- Panel thickness : 3 mm (.118) max.
- Total travel : 1,8 mm (.070) +/- 0,3 mm
- Typical operating force : 6N +/- 2N
- Mechanical life : 1.000.000 cycles
- Torque : 0,7 Nm max. applied to nut
- Soldering : 320°C max. for 3 sec.

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - Gold plated silver contacts (code 4) : 200mA 48VDC - 200mA 250VAC
 - Silver contacts (code 2) - screw terminals : 2A 250VAC - 4A 48VDC
- Electrical life at full load : 500.000 cycles
- Initial contact resistance : 100 mΩ max.
- Insulation resistance : 1 GΩ min. at 500VDC
- Dielectric strength : 1.000 Vrms 50 Hz

LED COMPONENT SPECIFICATIONS

LED colour	Forward current	Typ. forward voltage	Max. forward voltage
Super red (LOS)	20mA	2,1V	2,3V
Yellow (LOY)	20mA	2,1V	2,3V
Green (LOG)	20mA	2,1V	2,3V
Blue (LOB)	20mA	3,2V	3,8V
White (LOW)	20mA	3,35V	4,25V

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

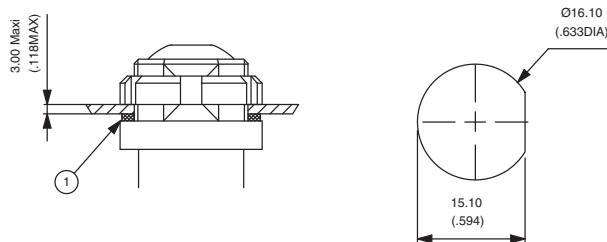
On flying lead versions, the LED resistor can be integrated by APEM on request.

MATERIALS

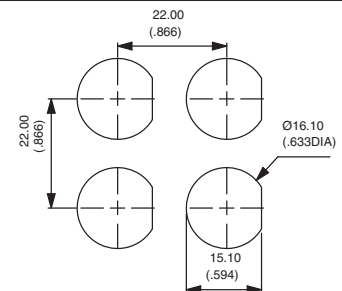
- Case : thermoplastic UL94-V0
- Plunger : polyamide
- Bushing/bezel : polyamide
- Contacts :
 - 4 : silver, gold plated
 - 2 : silver (screw terminals)
- Multi-wire lead AWG20, section 0,6 mm²
- LED wire : AWG26, section 0,12 mm²
- Lens : polycarbonate
- Terminal seal : epoxy

PANEL CUT-OUT

① Flat seal



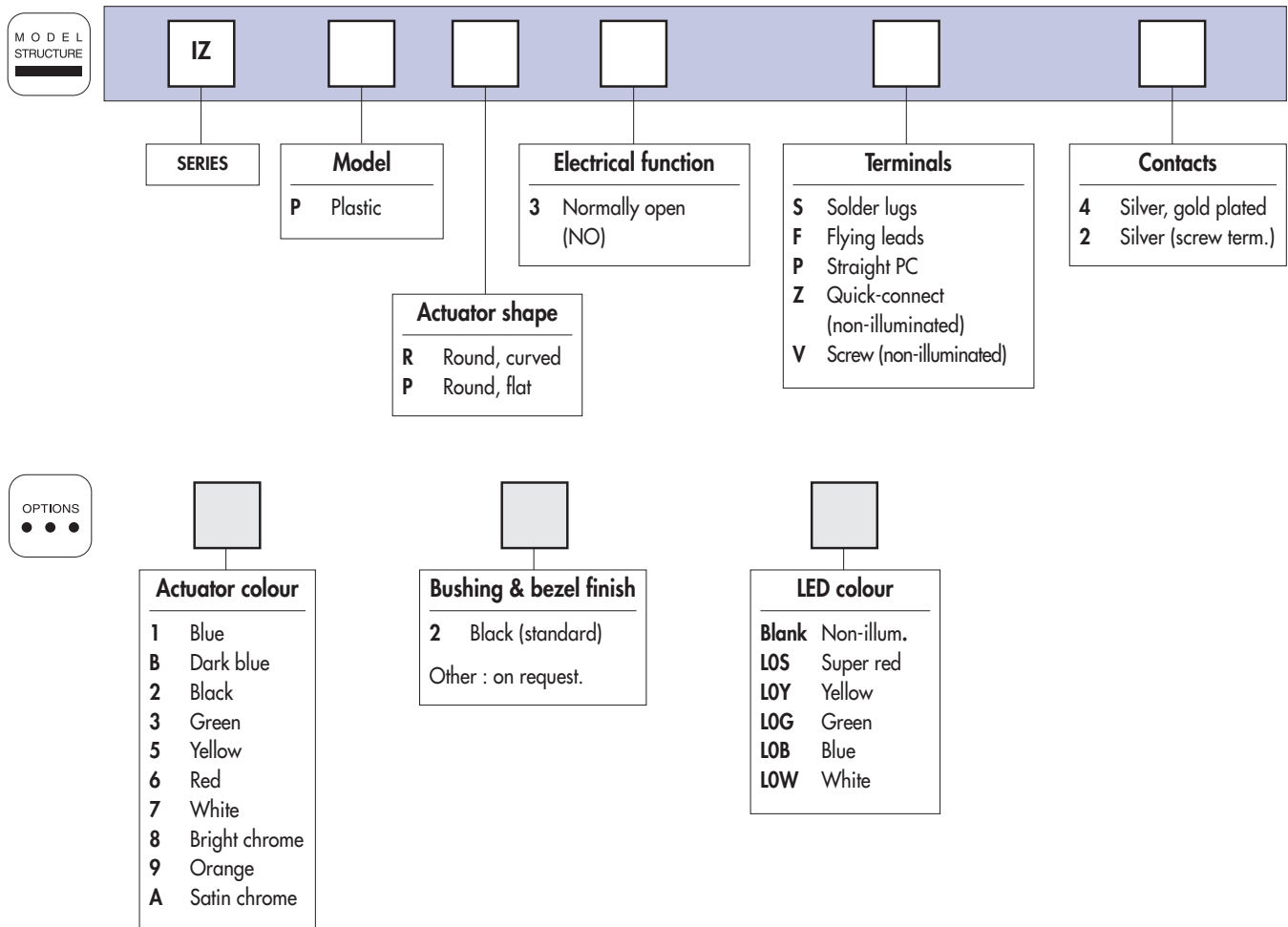
MATRIX MOUNTING



IZ series

Rear mounted sealed pushbutton switches - bushing Ø 16 mm - momentary

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.



Mounting accessories : Standard hardware supplied : 1 castellated black plastic nut U4249 and 1 silicone flat seal.

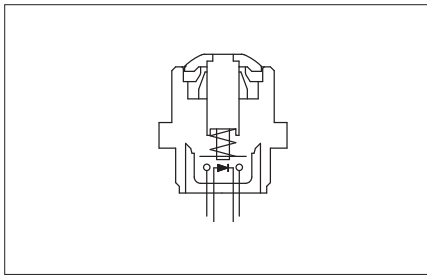


Packaging unit : 25 pieces for flying lead models - 40 pieces for other models

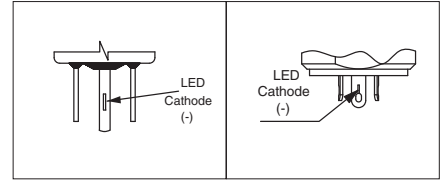
IZ series

Rear mounted sealed pushbutton switches - bushing Ø 16 mm - momentary

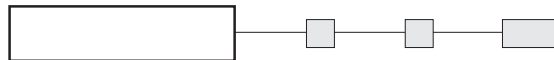
Illuminated



- Five LED colours
- Tin plated LED terminals
- Gold plated contacts



MODEL STRUCTURE



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

Solder lug terminals



Curved actuator

IZPR3S4



Normally Open

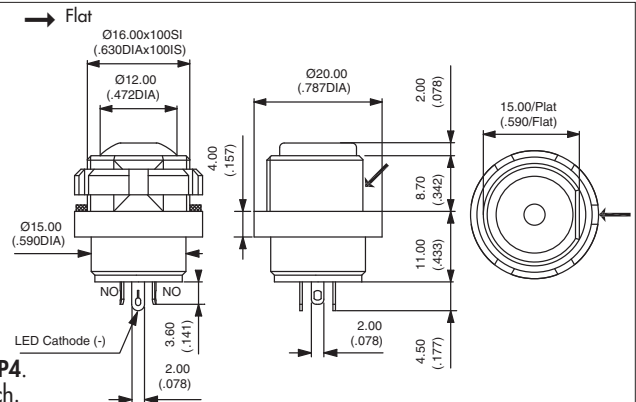
Flat actuator

IZPP3S4



Normally Open

Also available with straight PC terminals : **IZP•3P4**.
LED colour is indicated by the bottom of the switch.



Flying lead terminals - momentary



Curved actuator

IZPR3F4



Normally Open

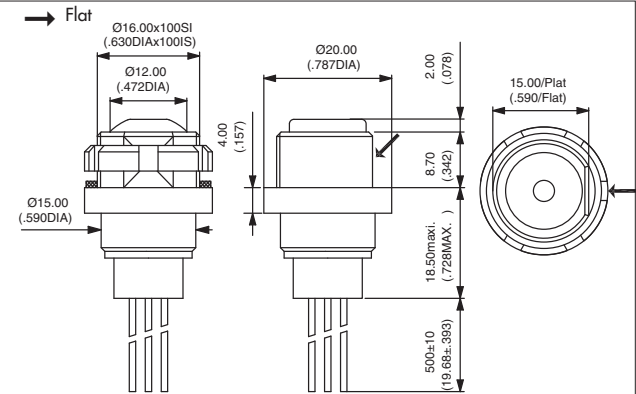
Flat actuator

IZPP3F4



Normally Open

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

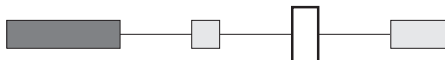


ACTUATOR COLOUR



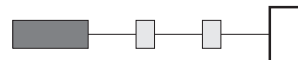
1 : blue - B : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7 : white - 8 : bright chrome - 9 : orange
A : satin chrome

BUSHING AND BEZEL COLOUR



2 : black (standard)
Other : on request.

LED COLOUR

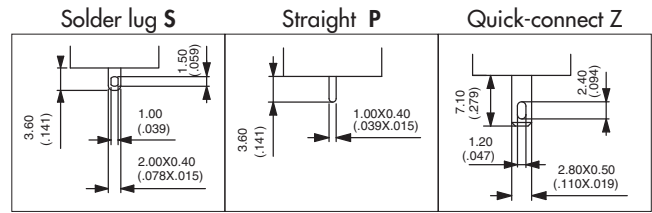
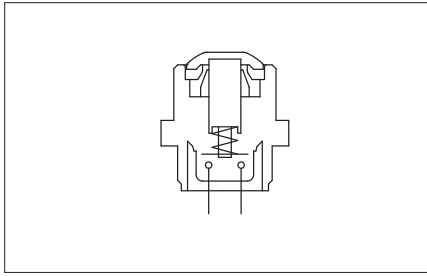


LOS : super red - LOY : yellow - LOG : green
LOB : blue - LOW : white

IZ series

Rear mounted sealed pushbutton switches - bushing Ø 16 mm - momentary

Non-illuminated



MODEL STRUCTURE



Plunger marking available on IZPP models (symbol 12 mm max.). On request.

Solder lug terminals - gold plated contacts



Curved actuator

IZPR3S4

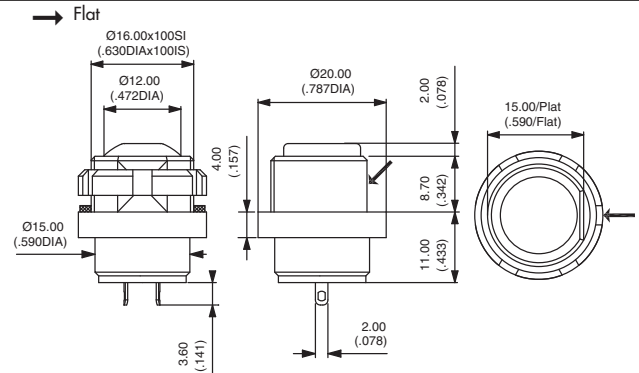
Normally Open

Flat actuator

IZPP3S4

Normally Open

Also available with straight PC terminals : **IZP•3P4** and quick-connect terminals : **IZP•3Z4**.



Sealed flying lead terminals - gold plated contacts



Curved actuator

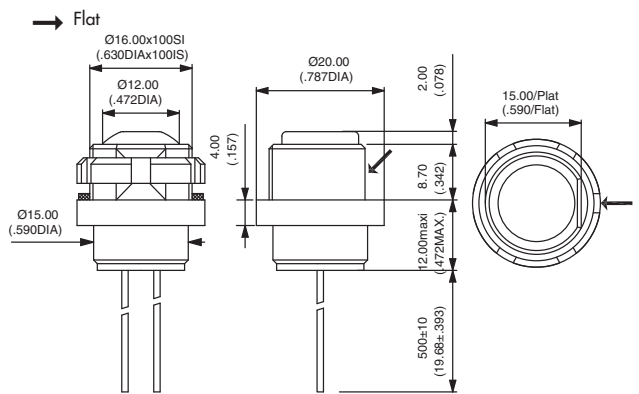
IZPR3F4

Normally Open

Flat actuator

IZPP3F4

Normally Open



Screw terminals - silver contacts



Curved actuator

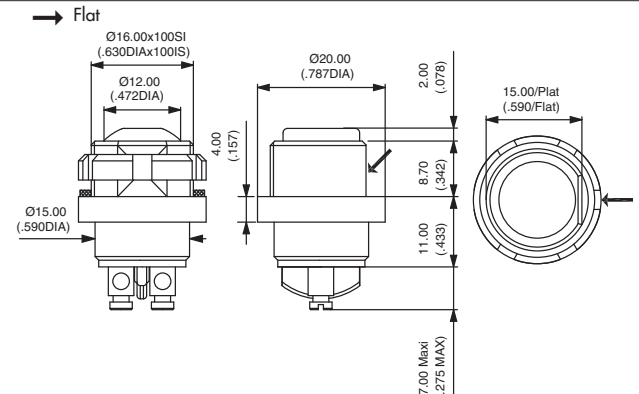
IZPR3V2

Normally open

Flat actuator

IZPP3V2

Normally open



Actuator colour and bushing/bezel colour : select the desired codes on previous page.

I^Z series

Rear mounted sealed pushbutton switches - bushing Ø 16 mm - latching

Distinctive features and specifications



- Rear mounting for easier installation
- Latching action models
- Sealed to IP67
- Illuminated or non-illuminated
- Flat actuator for optional marking

ENVIRONMENTAL SPECIFICATIONS

- Front panel sealing : IP67 according to IEC 60529
- 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
- Operating temperature : -40°C to +85°C

GENERAL SPECIFICATIONS

- Panel thickness : 3 mm (.118) max.
- Total travel : 2,5 mm (.098) +/- 0,3 mm
- Typical operating force : 5N +/- 2N
- Mechanical life : 200.000 cycles
- Torque : 0,7 Nm max. applied to nut
- Soldering : 320°C max. for 3 sec.

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load : 100mA 24VDC - 200.000 cycles
- Initial contact resistance : 100 mΩ max.
- Insulation resistance : 1 GΩ min. at 500VDC
- Dielectric strength : 1.500 Vrms between terminals

LED COMPONENT SPECIFICATIONS

LED colour	Forward current	Typ. forward voltage	Max. forward voltage
Super red (LOS)	20mA	1,95V	1,95V
Yellow (LOY)	20mA	2V	2,05V
Green (LOG)	20mA	3,2V	3,70V
Blue (LOB)	20mA	3,2V	4V

A resistor must be series-connected by the user.

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

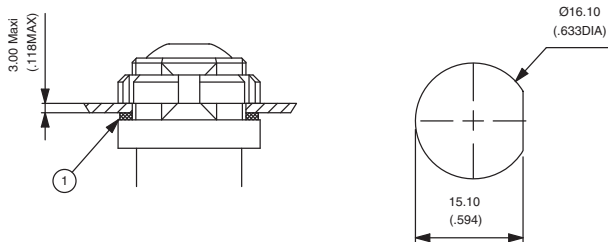
On flying lead versions, the LED resistor can be integrated by APEM on request.

MATERIALS

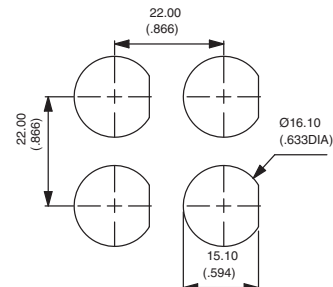
- Case : thermoplastic UL94-V0
- Plunger : polyamide
- Bushing/bezel : polyamide
- Contacts : silver, gold plated
- Multi-wire lead AWG20, section 0,6 mm²
- LED wire : AWG26, section 0,12 mm²
- Lens : polycarbonate
- Terminal seal : epoxy

PANEL CUT-OUT

① Flat seal



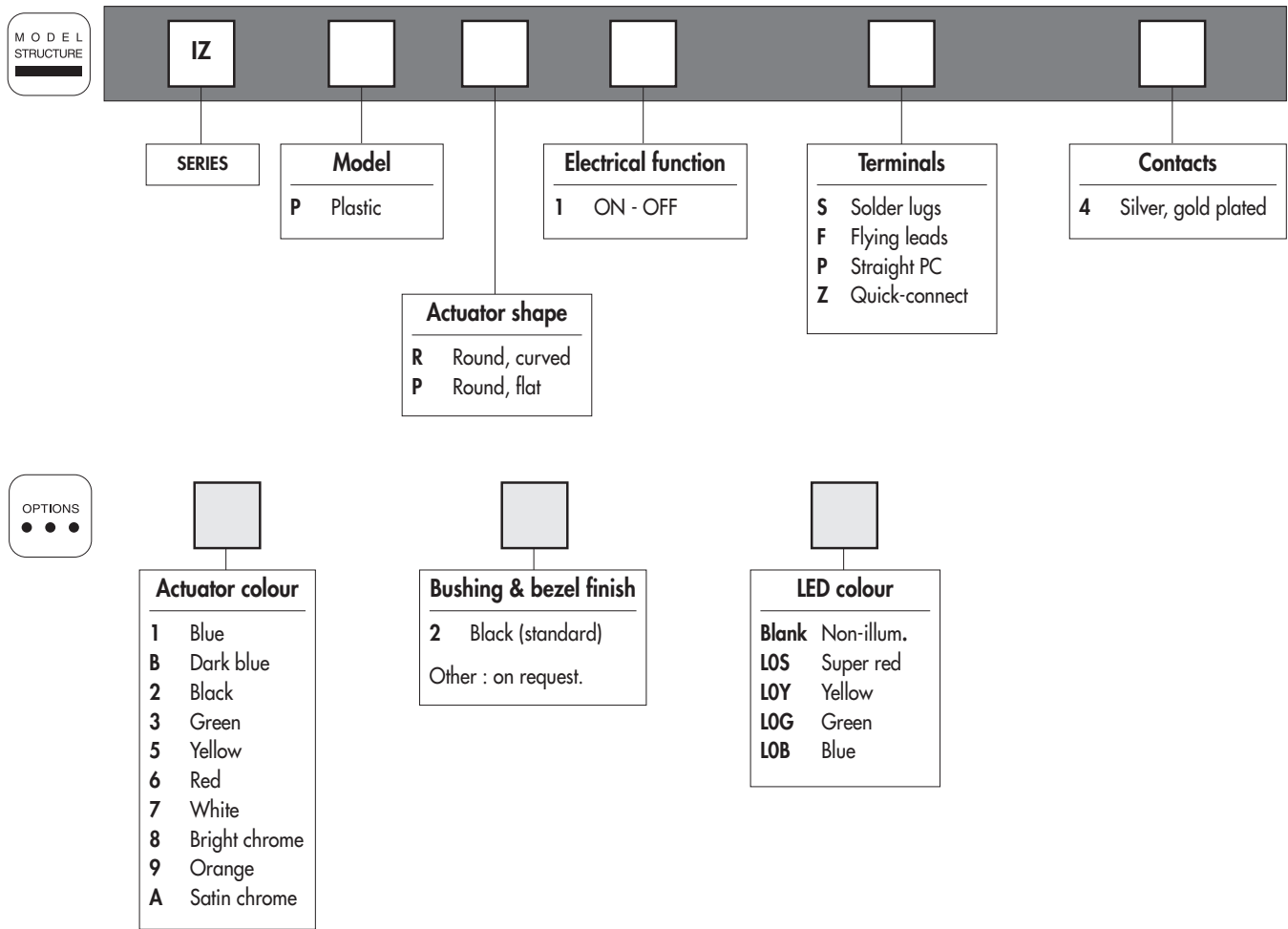
MATRIX MOUNTING



IZ series

Rear mounted sealed pushbutton switches - bushing Ø 16 mm - latching

Distinctive features and specifications



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.



Mounting accessories : Standard hardware supplied : 1 castellated black plastic nut U4249 and 1 silicone flat seal.

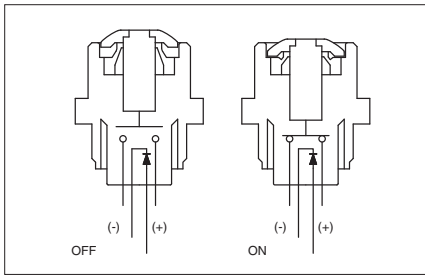


Packaging unit : 25 pieces for flying lead models - 40 pieces for other models

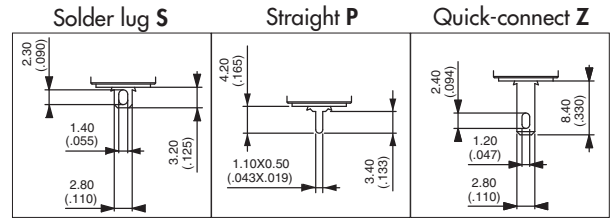
IZ series

Rear mounted sealed pushbutton switches - bushing Ø 16 mm - latching

Illuminated



- Four LED colours
- Tin plated LED terminals
- Gold plated contacts



MODEL STRUCTURE



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

Solder lug terminals



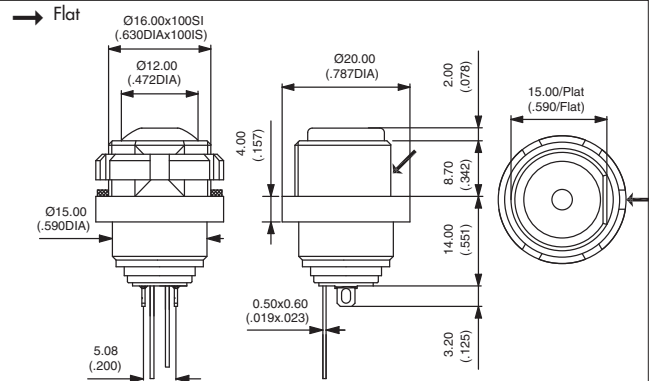
Curved actuator
IZPR1S4

ON - OFF

Flat actuator
IZPP1S4

ON - OFF

Also available with straight PC terminals : **IZP•1P4** and quick-connect terminals : **IZP•1Z4**.



Sealed flying lead terminals



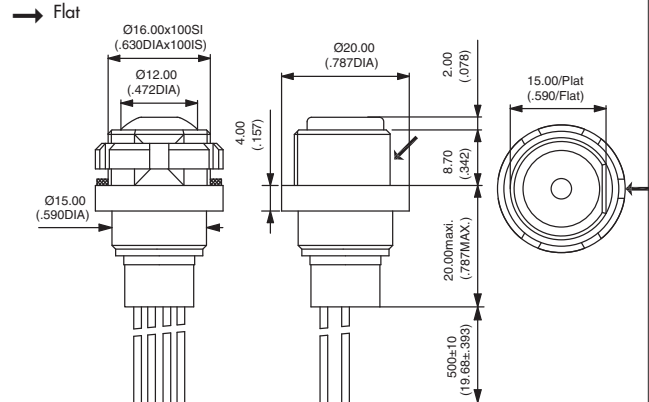
Curved actuator
IZPR1F4

ON - OFF

Flat actuator
IZPP1F4

ON - OFF

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

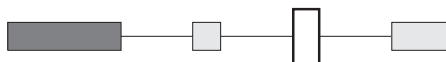


ACTUATOR COLOUR



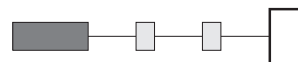
1 : blue - B : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7 : white - 8 : bright chrome - 9 : orange
A : satin chrome

BUSHING AND BEZEL COLOUR



2 : black (standard)
Other : on request.

LED COLOUR

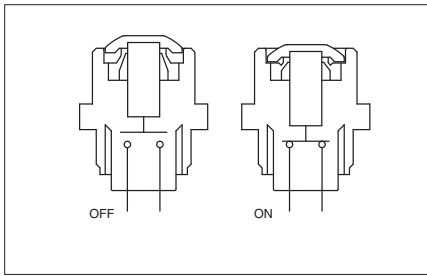


LOS : super red - LOY : yellow - LOG : green
LOB : blue

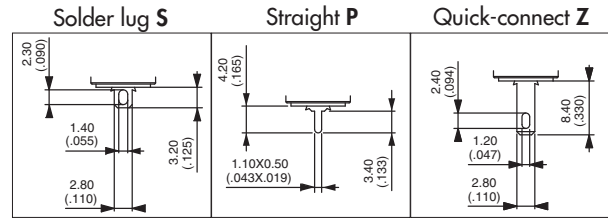
IZ series

Rear mounted sealed pushbutton switches - bushing Ø 16 mm - latching

Non-illuminated



- Gold plated contacts



MODEL STRUCTURE



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

Solder lug terminals

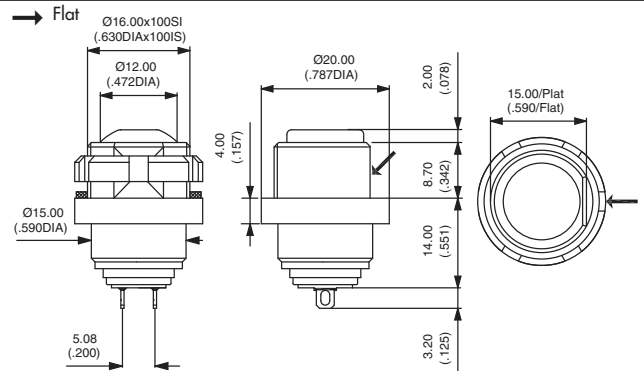


Curved actuator
IZPR1S4

ON - OFF

Flat actuator
IZPP1S4

ON - OFF



Also available with straight PC terminals : **IZP•1P4** and quick-connect terminals : **IZP•1Z4**.

Sealed flying lead terminals

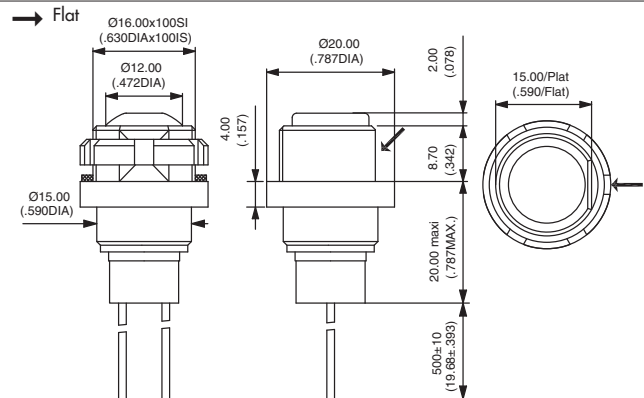


Curved actuator
IZPR1F4

ON - OFF

Flat actuator
IZPP1F4

ON - OFF



ACTUATOR COLOUR



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

BUSHING AND BEZEL COLOUR



2 : black (standard)
Other : on request.

IR series

Sealed pushbutton switches - bushing Ø 16 mm - momentary

Distinctive features

The IR series is a range of sealed momentary pushbutton switches with dia. 16 mm bushing. This series is divided into 2 families : standard models and microswitch technology models.

Common features

- Sealed to IP67
- Illuminated or non-illuminated
- Tactile feedback
- Square or round actuator
- Wide choice of bezel and actuator colours
- Wide choice of illumination colours

Standard versions

- Numerous terminal options : solder, flying lead, straight PC, quick-connect, screw
- Screw versions withstanding up to 4A
- Electrical function : NO (2 terminals)



NO - Screw terminals



NO - Illuminated
Wire lead terminals



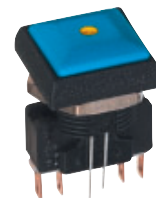
NO - Solder lug
terminals

Microswitch versions

- Withstanding up to 5A
- Two electrical functions :
NC+NO (3 terminals)
NC/NO combined (4 terminals)



NC+NO - 3 terminals



NC/NO - 4 terminals - Illuminated

Optional marking

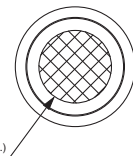
Actuator marking is available on request for models with flat round actuator.



Standard version



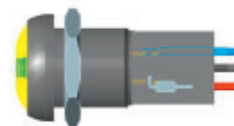
Microswitch version



Ø12.00 Maxi
(.472DIA MAX.)

Integrated resistor

On wire lead illuminated versions, the LED resistor can be integrated in the product by APEM. On request.



IR series

Sealed pushbutton switches - bushing Ø 16 mm - momentary - standard version

Distinctive features and specifications



- Screw version up to 4A
- Tactile feedback
- Sealed to IP67
- Illuminated or non-illuminated
- Flat round actuator for optional marking

ENVIRONMENTAL SPECIFICATIONS

- Front panel sealing : IP67 according to IEC 60529
- 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
- Operating temperature : -40°C to +85°C

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - Gold plated silver contacts (code 4) : 200mA 48VDC - 200mA 250VAC
 - Silver contacts (code 2) - screw terminals : 2A 250VAC - 4A 48VDC
- Electrical life at full load : 500.000 cycles
- Initial contact resistance : 100 mΩ max.
- Insulation resistance : 1 GΩ min. at 500VDC
- Dielectric strength : 1.500 Vrms

LED COMPONENT SPECIFICATIONS

LED colour	Forward current	Typ. forward voltage	Max. forward voltage
Super red (LOS)	20mA	2,1V	2,3V
Yellow (LOY)	20mA	2,1V	2,3V
Green (LOG)	20mA	2,1V	2,3V
Blue (LOB)	20mA	3,2V	3,8V
White (LOW)	20mA	3,35V	4,25V

A resistor must be series-connected by the user.

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

On flying lead versions, the LED resistor can be integrated by APEM on request.

GENERAL SPECIFICATIONS

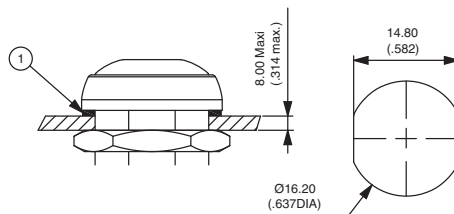
- Panel thickness : 8 mm (.314) max.
- Total travel : 1,6 mm (.062) +/- 0,3 mm
- Typical operating force : 4N +/- 2N
- Mechanical life : 1.000.000 cycles
- Torque : 0,8 Nm max. applied to nut
- Soldering : 320°C max. for 3 sec.

MATERIALS

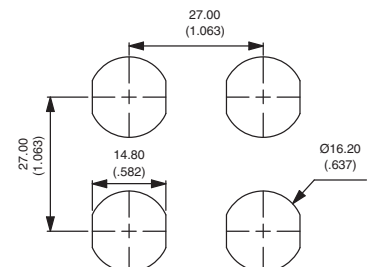
- Case : thermoplastic UL94-V0
- Actuator : polyamide 6/6
- Bushing/bezel : polyamide 6/6
- Contacts :
 - 4 : silver, gold plated
 - 2 : silver (screw terminals)
- Multi-wire lead AWG20, section 0,6 mm²
- LED wire : AWG26, section 0,12 mm²
- Lens : polycarbonate
- Terminal seal : epoxy

PANEL CUT-OUT

① Flat seal



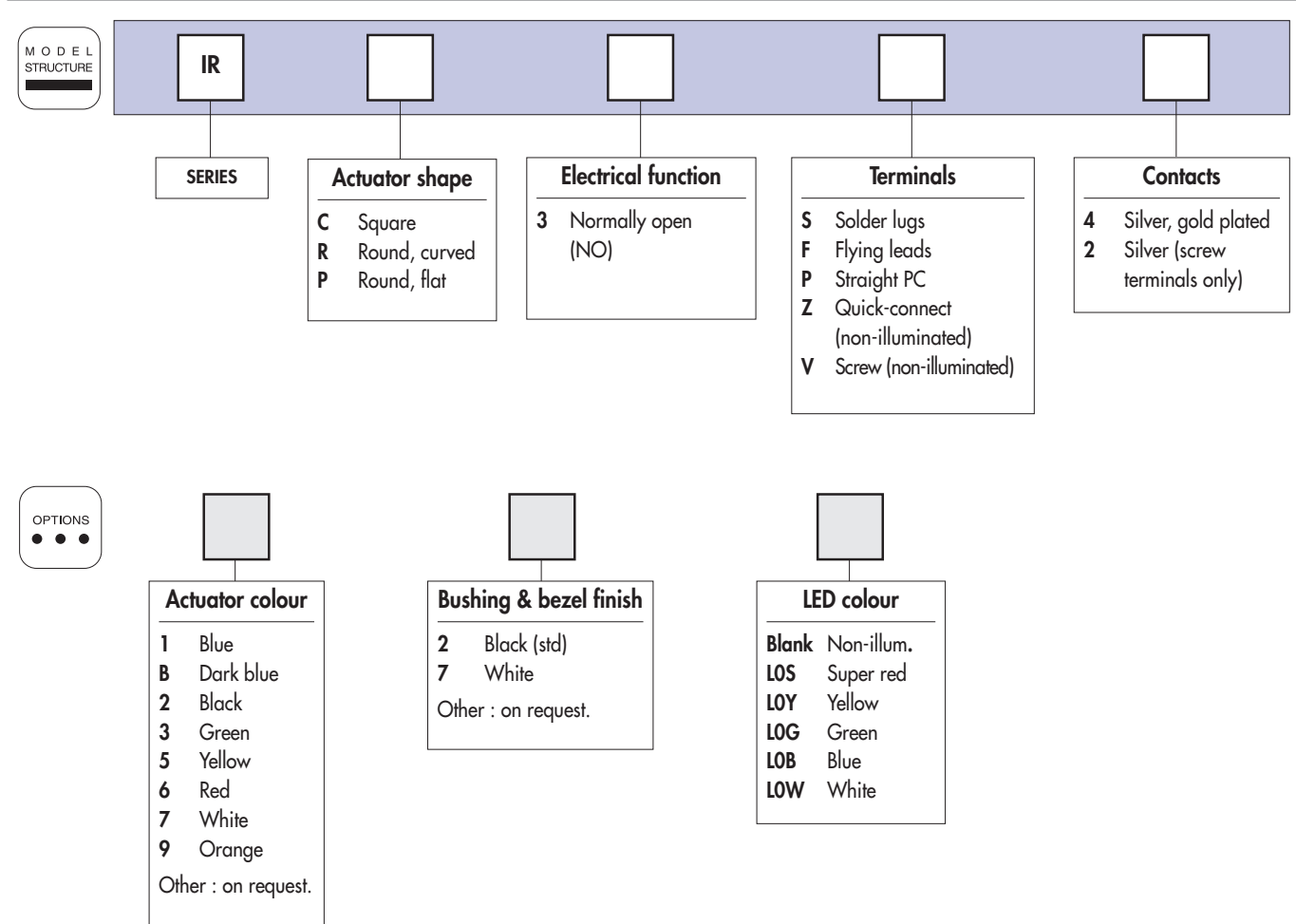
MATRIX MOUNTING



IR series

Sealed pushbutton switches - bushing Ø 16 mm - momentary - standard version

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



NOTICE : please note that not all combinations of above numbers are available.
Refer to the following pages for further information.



Mounting accessories : Standard hardware supplied : 1 hex nut 19 mm (.748) across flats and 1 flat seal
Hex nut P/N U4116.

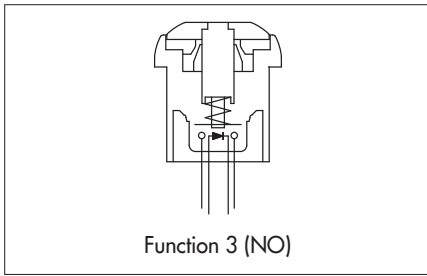


Packaging unit : 25 pieces for flying lead models - 40 pieces for other models

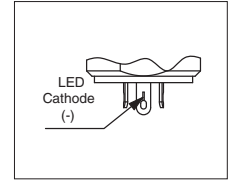
IR series

Sealed pushbutton switches - bushing Ø 16 mm - momentary - standard version

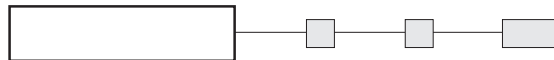
Round - illuminated



- Five LED colours
- Tin plated LED terminals
- Gold plated contacts



MODEL STRUCTURE



Actuator marking available on IRP models (symbol 12 mm max.). On request.

Solder lug terminals



Curved actuator
IRR3S4

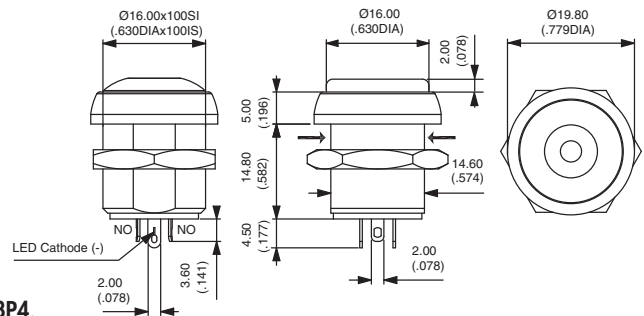
Normally Open

Flat actuator
IRP3S4

Normally Open

Also available with straight PC terminals : **IR•3P4**.
LED colour is indicated by the bottom of the switch.

→ Flat



Sealed flying lead terminals



Curved actuator
IRR3F4

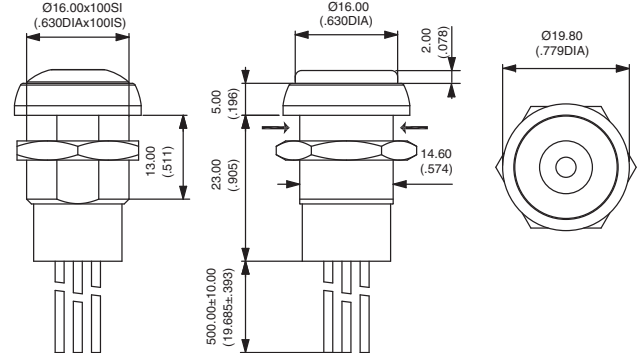
Normally Open

Flat actuator
IRP3F4

Normally Open

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

→ Flat

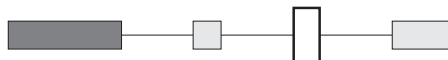


ACTUATOR COLOUR



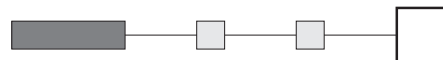
1 : blue - B : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7 : white - 9 : orange

BUSHING AND BEZEL FINISH



2 : black (standard) - 7 : white

LED COLOUR

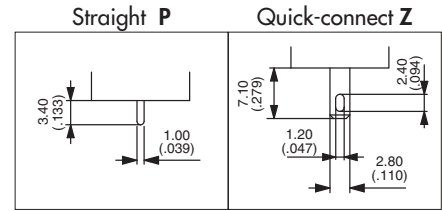
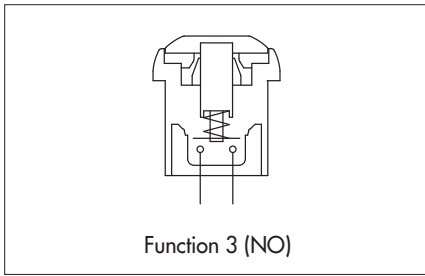


LOS : super red - LOY : yellow - LOG : green - LOB : blue
LOW : white

IR series

Sealed pushbutton switches - bushing Ø 16 mm - momentary - standard version

Round - non-illuminated



MODEL STRUCTURE



Actuator marking available on IRP models (symbol 12 mm max.). On request.

Solder lug terminals - gold plated contacts



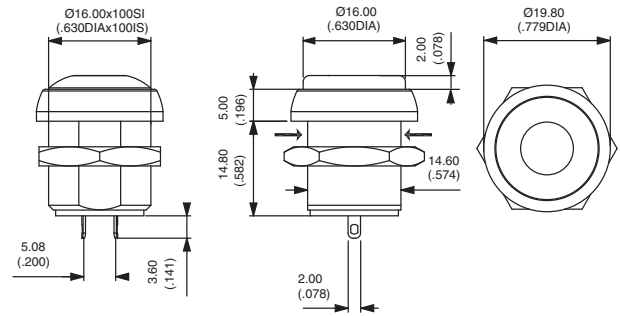
Curved actuator
IRR3S4



Flat actuator
IRP3S4



→ Flat



Also available with straight PC terminals : **IR•3P4** and quick-connect terminals : **IR•3Z4**.

Sealed flying lead terminals - gold plated contacts



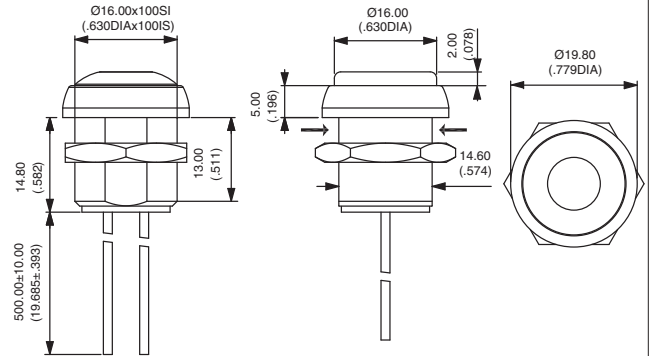
Curved actuator
IRR3F4



Flat actuator
IRP3F4



→ Flat



Screw terminals - silver contacts



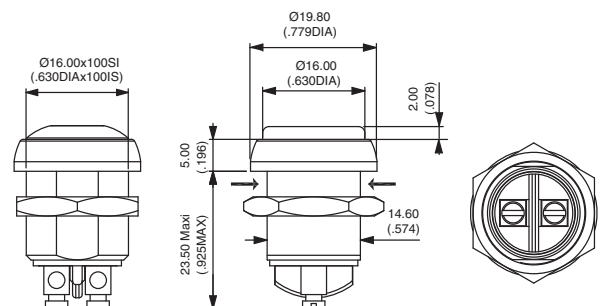
Curved actuator
IRR3V2



Flat actuator
IRP3V2



→ Flat

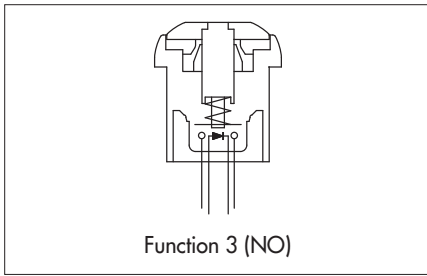


Actuator colour and bushing/bezel finish : select the desired codes on previous page.

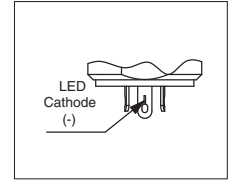
IR series

Sealed pushbutton switches - bushing \varnothing 16 mm - momentary - standard version

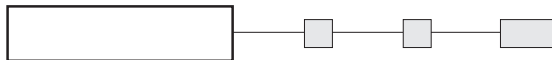
Square - illuminated



- Five LED colours
- Tin plated LED terminals
- Gold plated contacts



MODEL STRUCTURE



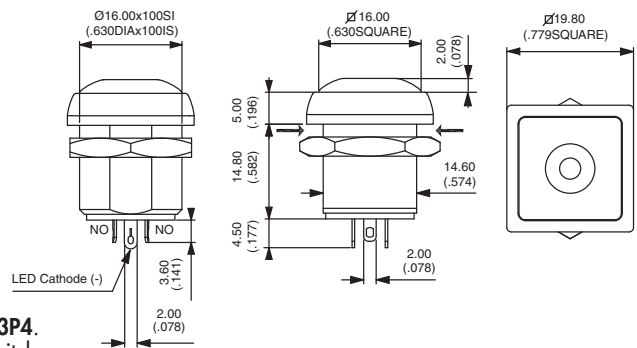
Solder lug terminals



IRC3S4



→ Flat



Also available with straight PC terminals : **IRC3P4**.
LED colour is indicated by the bottom of the switch.

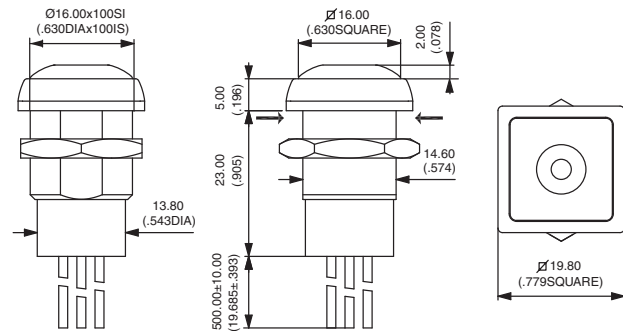
Sealed flying lead terminals



IRC3F4



→ Flat



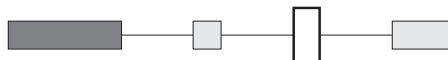
Wire colours : black : NO contact,
red : LED anode (+), blue : LED cathode (-)

ACTUATOR COLOUR



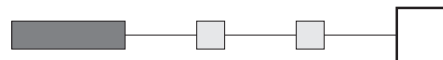
1 : blue - B : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7 : white - 9 : orange

BUSHING AND BEZEL FINISH



2 : black (standard) - 7 : white

LED COLOUR

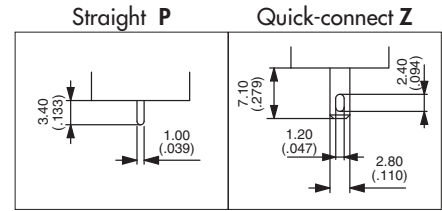
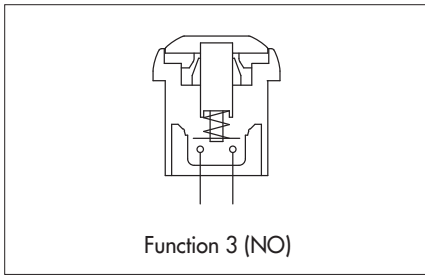


LOS : super red - LOY : yellow - LOG : green - LOB : blue
LOW : white

IR series

Sealed pushbutton switches - bushing \varnothing 16 mm - momentary - standard version

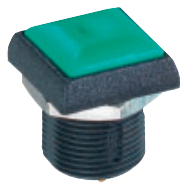
Square - non-illuminated



MODEL STRUCTURE



Solder lug terminals - gold plated contacts

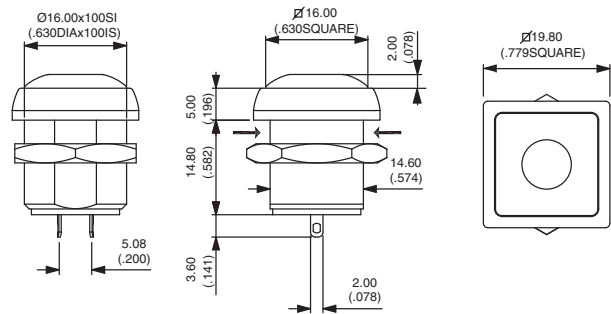


IRC3S4



Normally Open

→ Flat



Also available with straight PC terminals : IRC3P4 or quick-connect terminals : IRC3Z4.

Sealed flying lead terminals - gold plated contacts

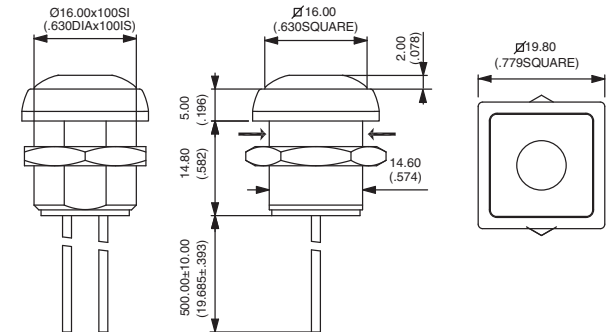


IRC3F4



Normally Open

→ Flat



Screw terminals - silver contacts

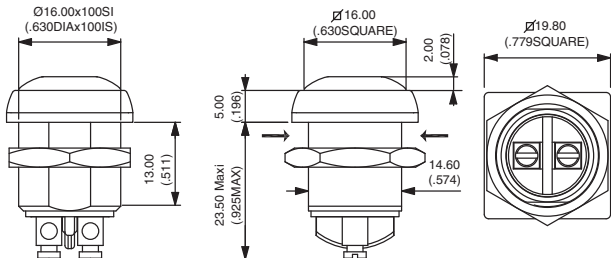


IRC3V2



Normally Open

→ Flat

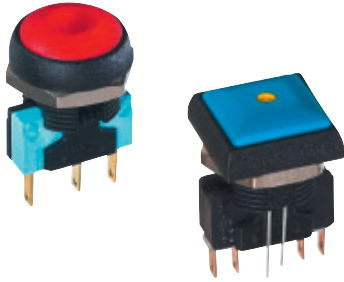


Actuator colour and bushing/bezel finish : select the desired codes on previous page.

IR series

Sealed pushbutton switches - bushing Ø 16 mm - momentary - microswitch version

Distinctive features and specifications



- ❑ Microswitch technology up to 5A
- ❑ Tactile feedback
- ❑ Sealed to IP67
- ❑ Illuminated or non-illuminated
- ❑ Flat round actuator for optional marking

ENVIRONMENTAL SPECIFICATIONS

- Front panel sealing : IP67 according to IEC 60529
- Salt spray : IEC 512-6, test 11f
- Operating temperature : -20°C to +85°C

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
5A 250VAC, 50.000 cycles (function 7)
5A 250VAC, 25.000 cycles (function 8)
- Initial contact resistance : 100 mΩ max.
- Insulation resistance : 1 GΩ min. at 500VDC
- Dielectric strength : 750 Vrms between terminals
2.000 Vrms between terminals and frame

LED COMPONENT SPECIFICATIONS

LED colour	Forward current	Typ. forward voltage	Max. forward voltage
Super red (LOS)	20mA	2V	2,5V
Yellow (LOY)	20mA	2V	2,5V
Green (LOG)	10mA	2V	2,5V
Blue (LOB)	10mA	3,3V	3,8V

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

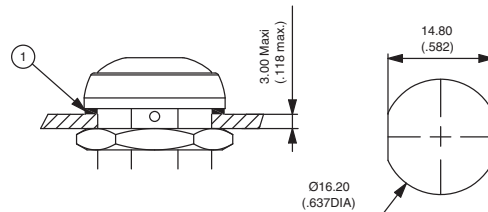
- Panel thickness : 3 mm (.118) max.
- Total travel : 1,6 mm (.062) +/- 0,3 mm
- Typical operating force : 4N +/- 2N
- Mechanical life : 1.000.000 cycles
- Torque : 0,8 Nm max. applied to nut
- Soldering : 320°C max. for 3 sec.

MATERIALS

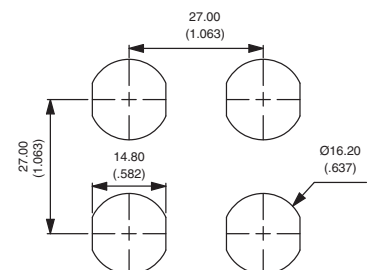
- Case : thermoplastic UL94-V0
- Actuator : polyamide 6/6
- Bushing/bezel : polyamide 6/6
- Contacts : silver
- Lens : polycarbonate

PANEL CUT-OUT

① Flat seal



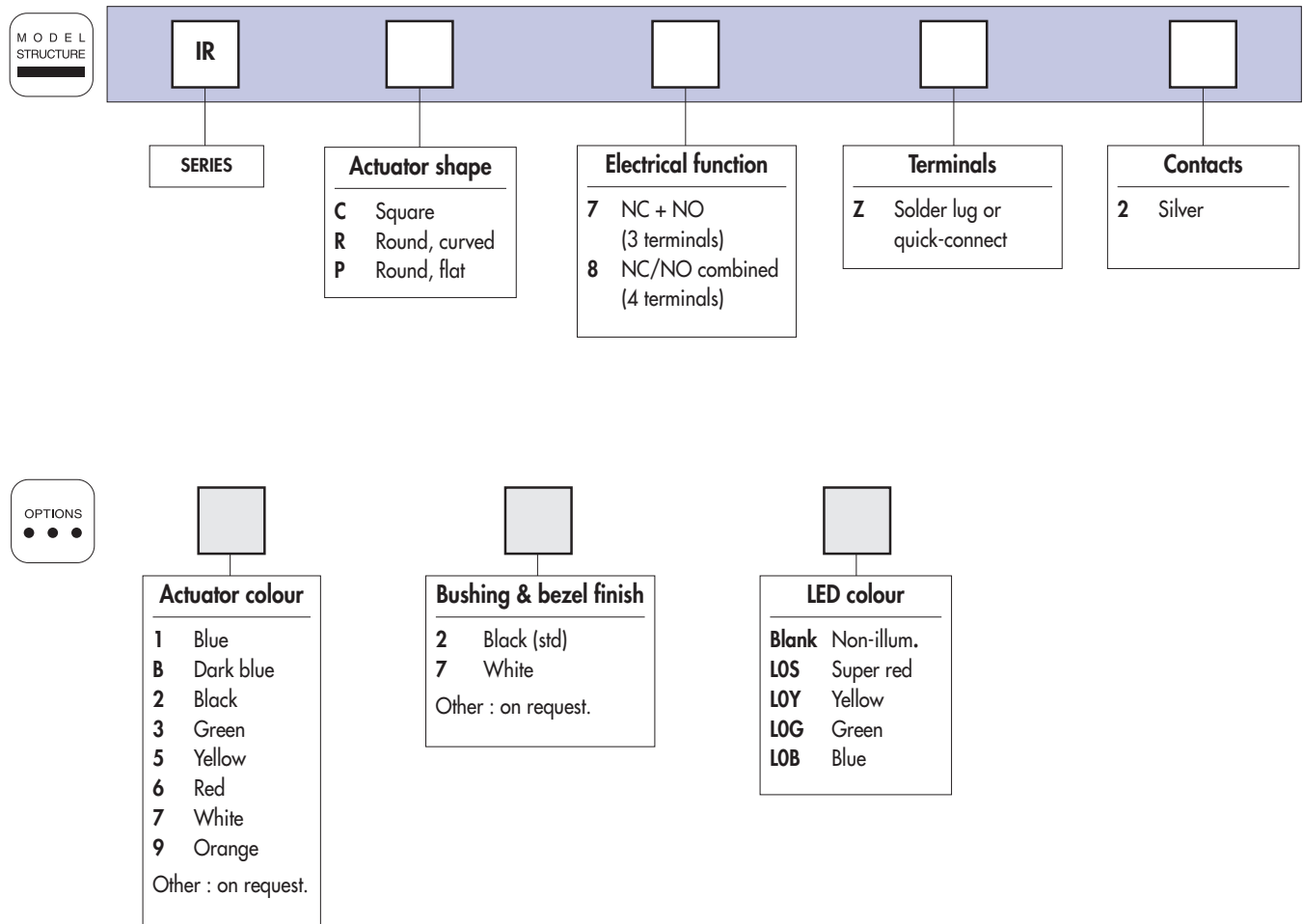
MATRIX MOUNTING



IR series

Sealed pushbutton switches - bushing Ø 16 mm - momentary - microswitch version

Overview



The IR series for high currents is based on a microswitch. Please note that this microswitch is supplied separately.

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



NOTICE : please note that not all combinations of above numbers are available. Refer to the following pages for further information.



Mounting accessories : Standard hardware supplied : 1 hex nut 19 mm (.748) across flats and 1 flat seal. Hex nut P/N : U4116

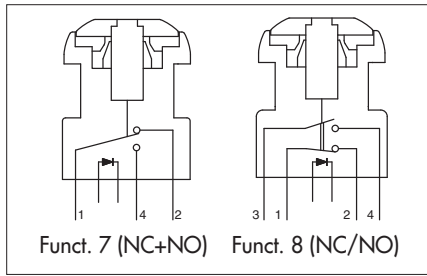


Packaging unit : 25 pieces for flying lead models - 40 pieces for other models

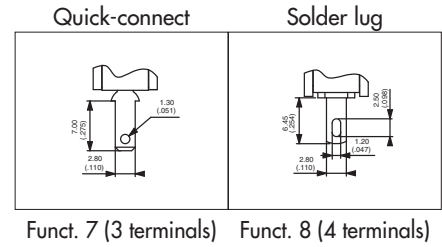
IR series

Sealed pushbutton switches - bushing Ø 16 mm - momentary - microswitch version

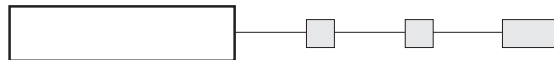
Round - illuminated



- Four LED colours
- Tin plated LED terminals
- Silver contacts



MODEL STRUCTURE

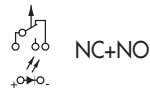


Actuator marking available on IRP models (symbol 12 mm max.). On request.

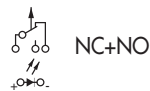
Quick-connect terminals - NC+NO - 3 terminals



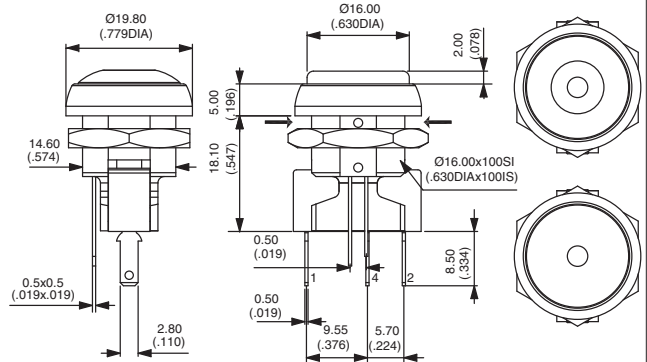
Curved actuator
IRR7Z2



Flat actuator
IRP7Z2



→ Flat



Solder lug terminals - NC/NO - 4 terminals



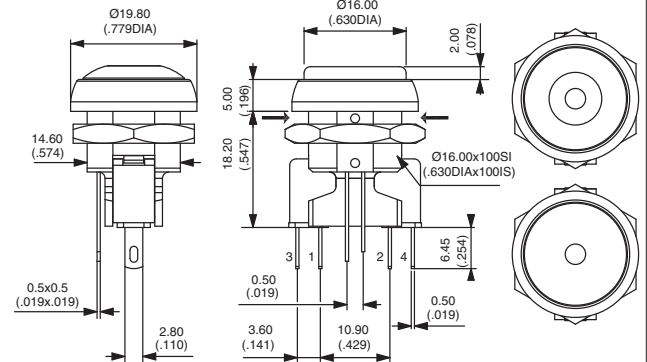
Curved actuator
IRR8Z2



Flat actuator
IRP8Z2



→ Flat



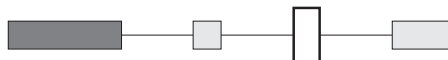
Terminals should be used as solder lugs only.

ACTUATOR COLOUR



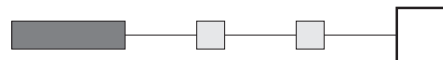
1 : blue - B : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7 : white - 9 : orange

BUSHING AND BEZEL FINISH



2 : black (standard) - 7 : white

LED COLOUR

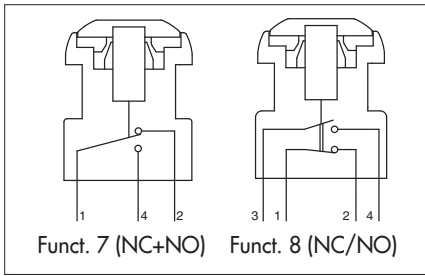


LOS : super red - LOY : yellow - LOG : green - LOB : blue

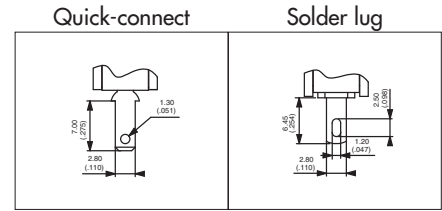
IR series

Sealed pushbutton switches - bushing \varnothing 16 mm - momentary - microswitch version

Round - non-illuminated



• Silver contacts



Funct. 7 (3 terminals) Funct. 8 (4 terminals)

MODEL STRUCTURE



Actuator marking available on IRP models (symbol 12 mm max.). On request.

Quick-connect terminals - NC+NO - 3 terminals



Curved actuator

IRR7Z2



NC+NO

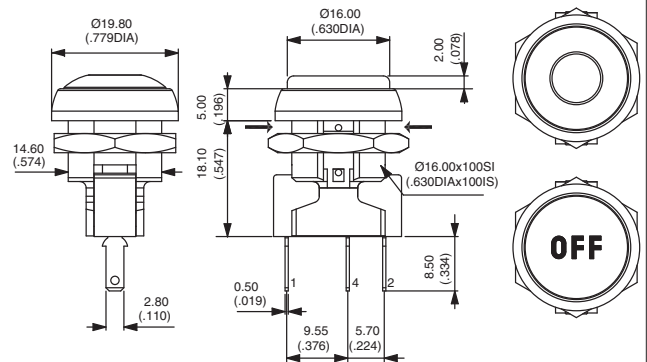
Flat actuator

IRP7Z2



NC+NO

→ Flat



Solder lug terminals - NC/NO - 4 terminals



Curved actuator

IRR8Z2



NC/NO combined

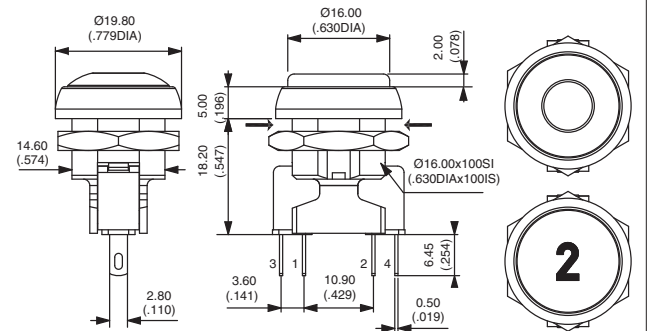
Flat actuator

IRP8Z2



NC/NO combined

→ Flat



Terminals should be used as solder lugs only.

ACTUATOR COLOUR



1 : blue - B : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7 : white - 9 : orange

BUSHING AND BEZEL FINISH

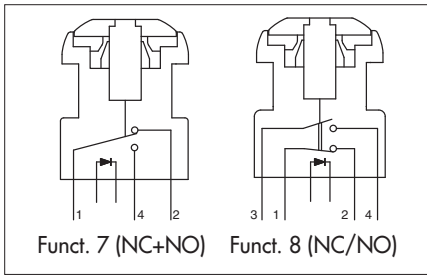


2 : black (standard) - 7 : white

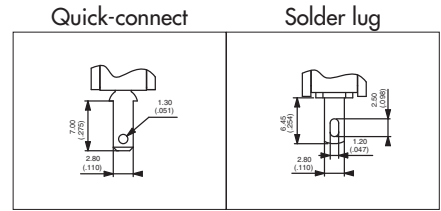
IR series

Sealed pushbutton switches - bushing Ø 16 mm - momentary - microswitch version

Square - illuminated

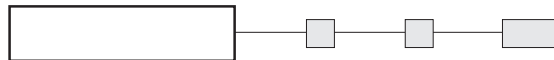


- Four LED colours
- Tin plated LED terminals
- Silver contacts



Funct. 7 (3 terminals) Funct. 8 (4 terminals)

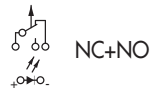
MODEL STRUCTURE



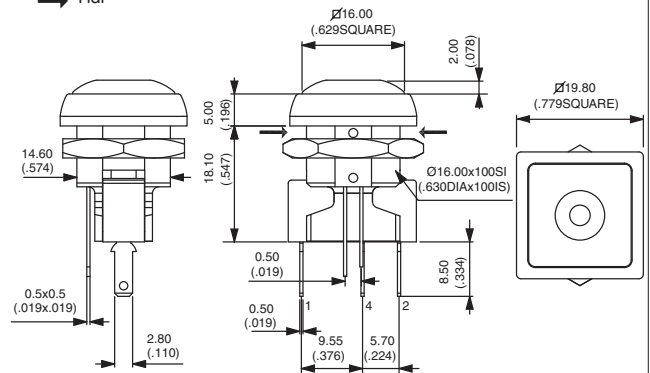
Quick-connect terminals - NC+NO - 3 terminals



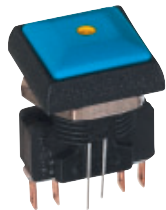
IRC7Z2



→ Flat



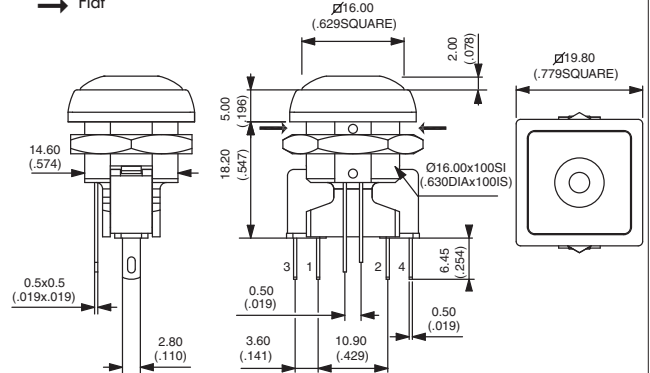
Solder lug terminals - NC/NO - 4 terminals



IRC8Z2



→ Flat



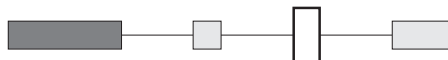
Terminals should be used as solder lugs only.

ACTUATOR COLOUR



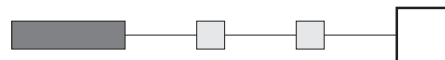
1 : blue - B : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7 : white - 9 : orange

BUSHING AND BEZEL FINISH



2 : black (standard) - 7 : white

LED COLOUR

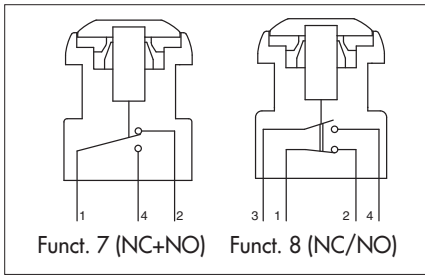


LOS : super red - LOY : yellow - LOG : green - LOB : blue

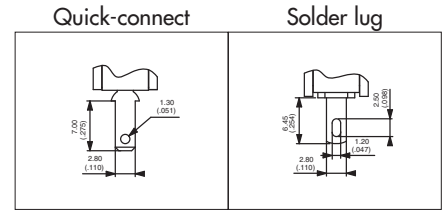
IR series

Sealed pushbutton switches - bushing \varnothing 16 mm - momentary - microswitch version

Square - non-illuminated



• Silver contacts



MODEL
STRUCTURE



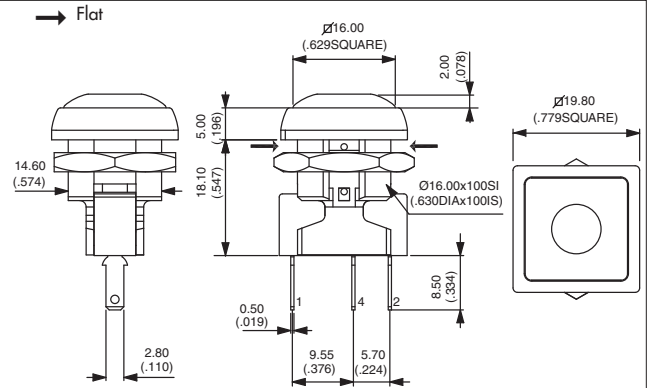
Quick-connect terminals - NC+NO - 3 terminals



IRC7Z2



→ Flat



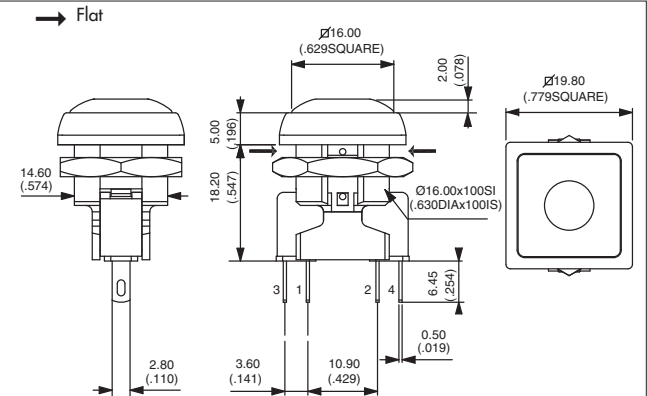
Solder lug terminals - NC/NO - 4 terminals



IRC8Z2



→ Flat



Terminals should be used as solder lugs only.

ACTUATOR COLOUR



1 : blue - B : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7 : white - 9 : orange

BUSHING AND BEZEL FINISH



2 : black (standard) - 7 : white

IR series

Sealed pushbutton switches - bushing Ø 16 mm - latching

Distinctive features and specifications



- Latching action models
- Sealed to IP67
- Illuminated or non-illuminated
- Flat round actuator for optional marking

ENVIRONMENTAL SPECIFICATIONS

- Front panel sealing : IP67 according to IEC 60529
- 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
- Operating temperature : -40°C to +85°C

GENERAL SPECIFICATIONS

- Panel thickness : 8 mm (.314) max.
- Total travel : 2,5 mm (.098) +/- 0,3 mm
- Typical operating force : 5N +/- 2N
- Mechanical life : 200.000 cycles
- Torque : 0,8 Nm max. applied to nut
- Soldering : 320°C max. for 3 sec.

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load : 100mA 24VDC - 200.000 cycles
- Initial contact resistance : 100 mΩ max.
- Insulation resistance : 1 GΩ min. at 500VDC
- Dielectric strength : 1.500 Vrms between terminals

LED COMPONENT SPECIFICATIONS

LED colour	Forward current	Typ. forward voltage	Max. forward voltage
Super red (LOS)	20mA	1,95V	1,95V
Yellow (LOY)	20mA	2V	2,05V
Green (LOG)	20mA	3,2V	3,70V
Blue (LOB)	20mA	3,2V	4V

A resistor must be series-connected by the user.

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

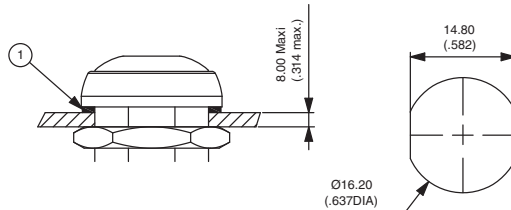
On flying lead versions, the LED resistor can be integrated by APEM on request.

MATERIALS

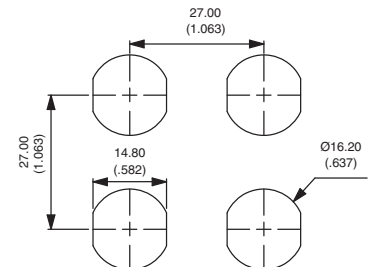
- Case : thermoplastic UL94-V0
- Plunger : polyamide
- Bushing/bezel : polyamide
- Contacts : silver, gold plated
- Multi-wire lead AWG20, section 0,6 mm²
- LED wire : AWG26, section 0,12 mm²
- Lens : polycarbonate
- Terminal seal : epoxy

PANEL CUT-OUT

① Flat seal



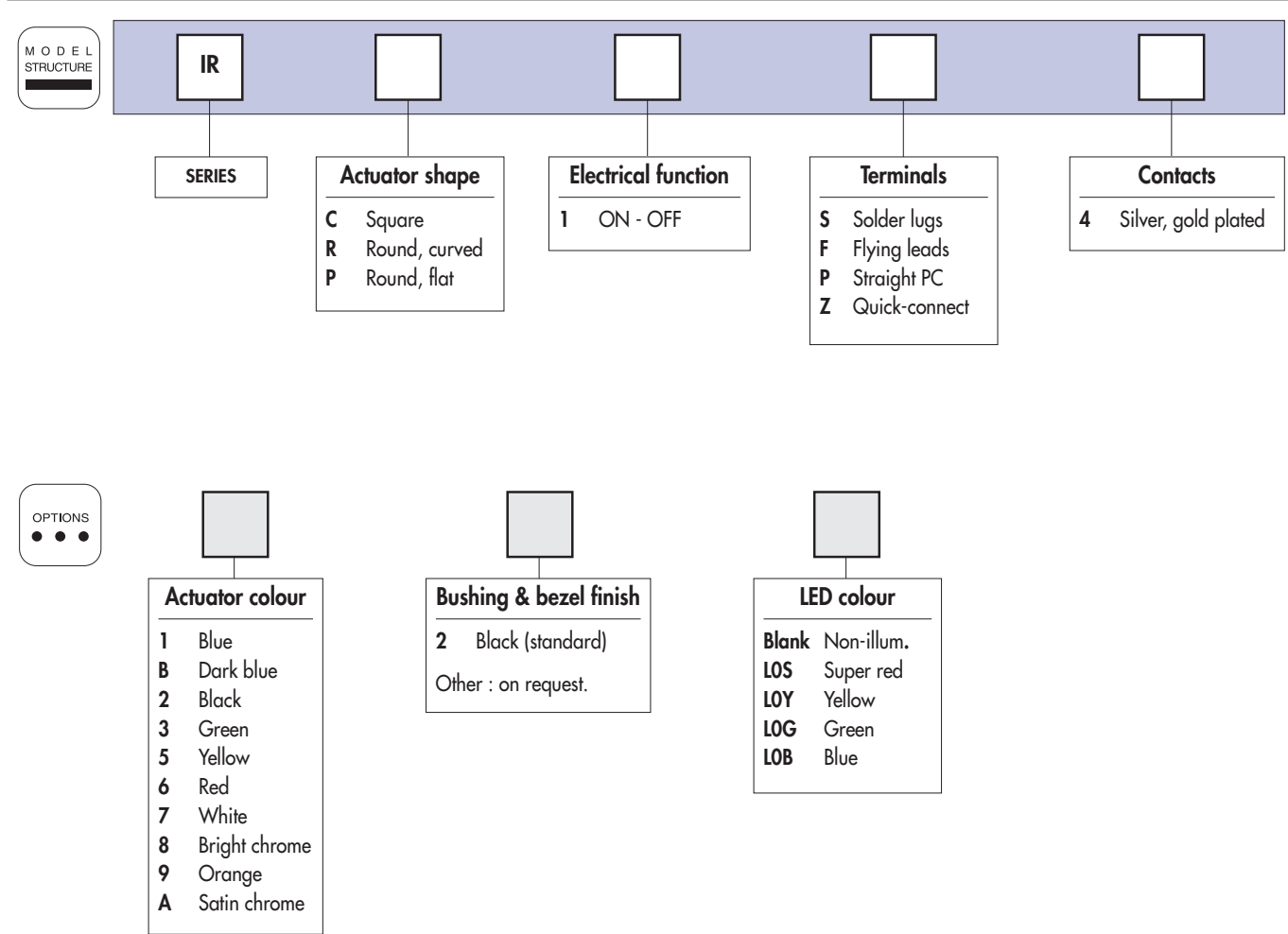
MATRIX MOUNTING



IR series

Sealed pushbutton switches - bushing Ø 16 mm - latching

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.



Mounting accessories : Standard hardware supplied : 1 hex nut 19 mm (.748) across flats and 1 flat seal
Hex nut P/N U4116.

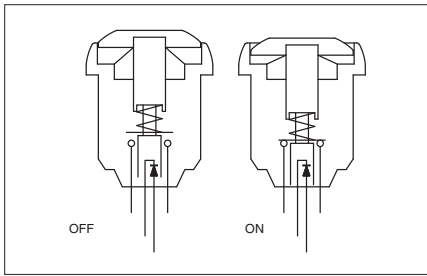


Packaging unit : 25 pieces for flying lead models - 40 pieces for other models

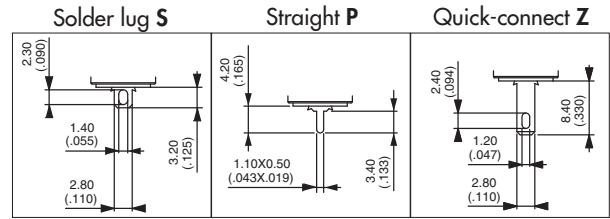
IR series

Sealed pushbutton switches - bushing Ø 16 mm - latching

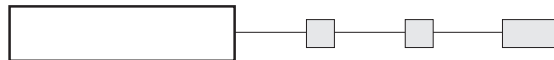
Round - illuminated



- Four LED colours
- Tin plated LED terminals
- Gold plated contacts



MODEL STRUCTURE



Plunger marking available on IRP models (symbol 12 mm max.). On request.

Solder lug terminals



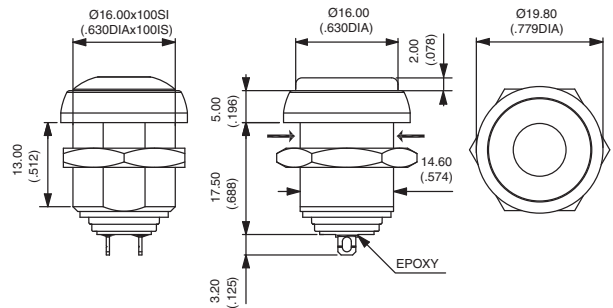
Curved actuator
IRR1S4

OFF - ON

Flat actuator
IRP1S4

OFF - ON

→ Flat



Also available with straight PC terminals : **IR•1P4**
& quick-connect terminals : **IR•1Z4**.

Sealed flying lead terminals



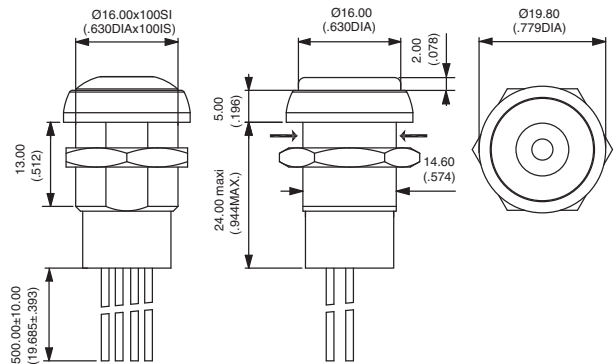
Curved actuator
IRR1F4

OFF - ON

Flat actuator
IRP1F4

OFF - ON

→ Flat



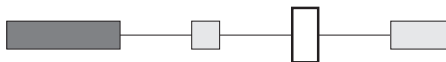
Wire colours : black : contact,
red : LED anode (+), blue : LED cathode (-)

ACTUATOR COLOUR



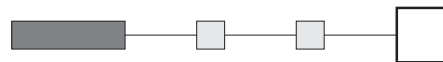
1 : blue - B : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7 : white - 8 : bright chrome - 9 : orange
A : satin chrome

BUSHING AND BEZEL FINISH



2 : black (standard)

LED COLOUR

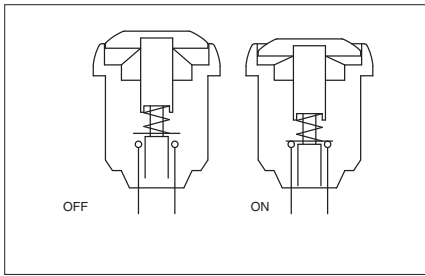


LOS : super red - LOY : yellow - LOG : green - LOB : blue

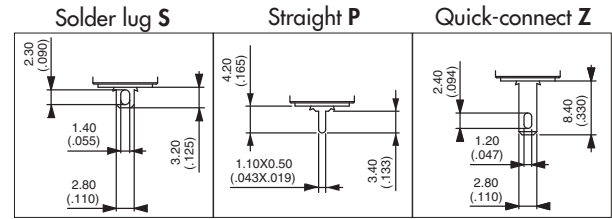
IR series

Sealed pushbutton switches - bushing Ø 16 mm - latching

Round - non-illuminated



- Gold plated contacts



MODEL STRUCTURE



Plunger marking available on IRP models (symbol 12 mm max.). On request.

Solder lug terminals



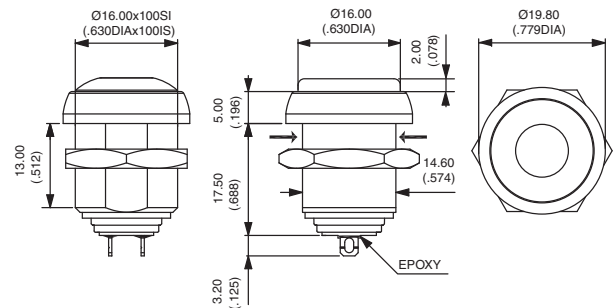
Curved actuator
IRR1S4

OFF - ON

Flat actuator
IRP1S4

OFF - ON

→ Flat



Also available with straight PC terminals : **IR•1P4**
& quick-connect terminals : **IR•1Z4**.

Sealed flying lead terminals



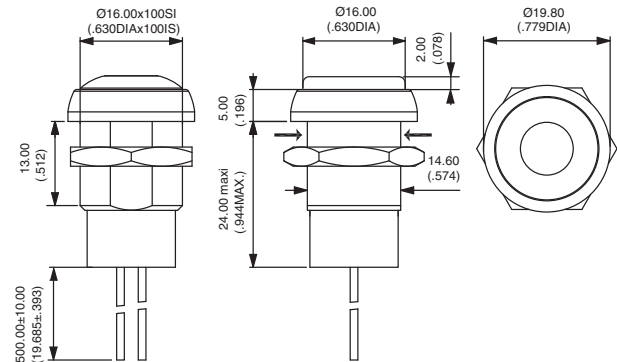
Curved actuator
IRR1F4

OFF - ON

Flat actuator
IRP1F4

OFF - ON

→ Flat



ACTUATOR COLOUR



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

BUSHING AND BEZEL FINISH

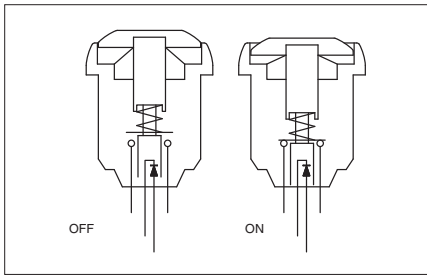


2 : black (standard)

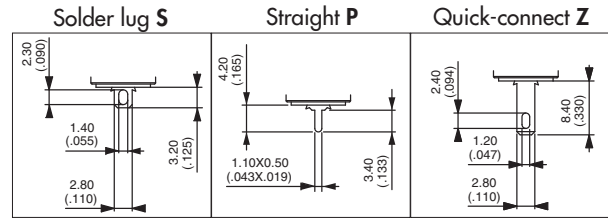
IR series

Sealed pushbutton switches - bushing Ø 16 mm - latching

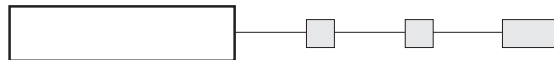
Square - illuminated



- Four LED colours
- Tin plated LED terminals
- Gold plated contacts



MODEL STRUCTURE



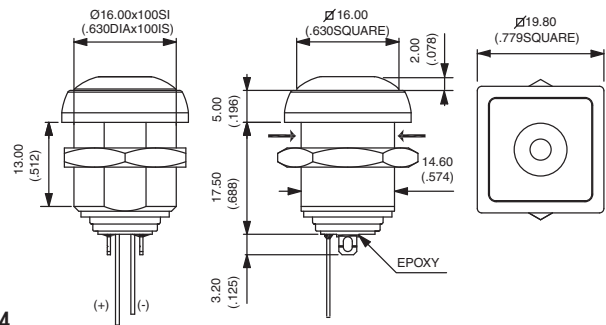
Solder lug terminals



Curved actuator
IRC1S4

OFF - ON

→ Flat



Also available with straight PC terminals : **IRC1P4**
& quick-connect terminals : **IRC1Z4**.

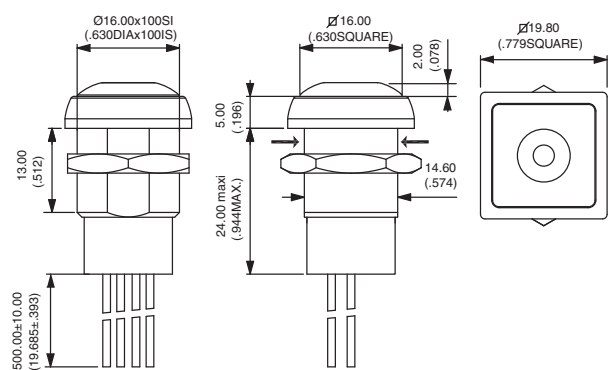
Sealed flying lead terminals



Curved actuator
IRC1F4

OFF - ON

→ Flat



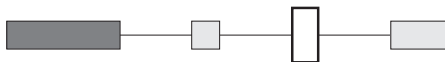
Wire colours : black : contact,
red : LED anode(+), blue : LED cathode (-)

ACTUATOR COLOUR



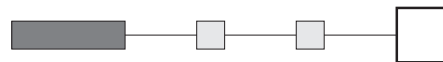
1 : blue - B : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7 : white - 8 : bright chrome - 9 : orange
A : satin chrome

BUSHING AND BEZEL FINISH



2 : black (standard)

LED COLOUR

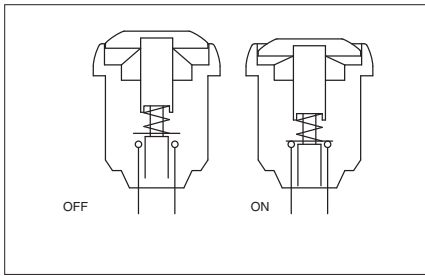


LOS : super red - LOY : yellow - LOG : green - LOB : blue

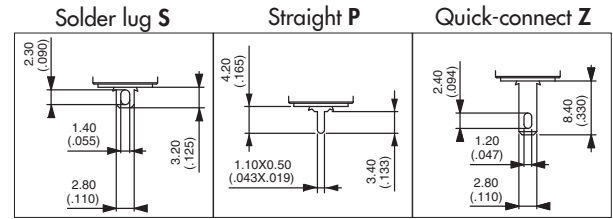
IR series

Sealed pushbutton switches - bushing Ø 16 mm - latching

Square - non-illuminated



- Gold plated contacts



MODEL STRUCTURE



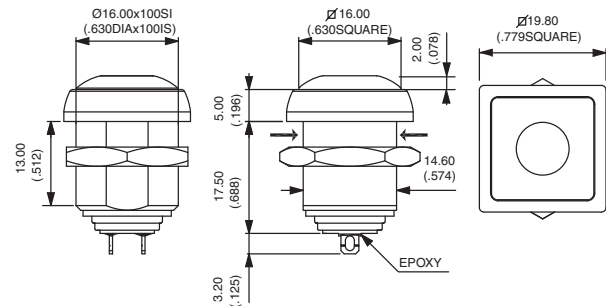
Solder lug terminals



Curved actuator
IRC1S4

OFF - ON

→ Flat



Also available with straight PC terminals : **IRC1P4**
& quick-connect terminals : **IRC1Z4**.

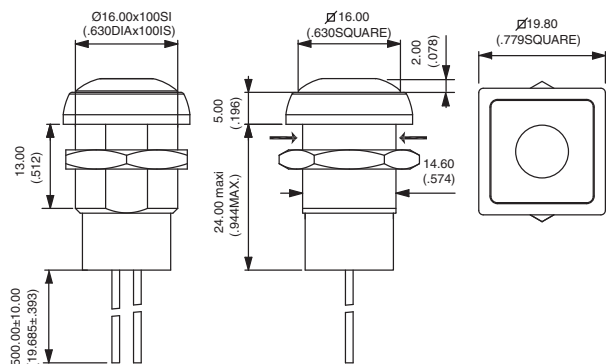
Sealed flying lead terminals



Curved actuator
IRC1F4

OFF - ON

→ Flat



ACTUATOR COLOUR



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

BUSHING AND BEZEL FINISH



2 : black (standard)

IA series

Low profile pushbutton switches for harsh environments - bushing Ø 16 mm - momentary

Distinctive features - Specifications - Overview



- Resistant to frost, sand and hydrocarbons
- Tactile feedback
- Front panel sealed to IP67

ENVIRONMENTAL SPECIFICATIONS

- Front panel sealing (see drawing opposite) : IP67
- Salt spray : IEC 512-6, test 11f
- Operating temperature : -20°C to +65°C

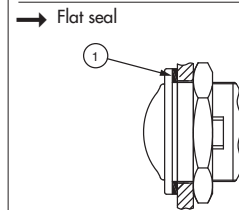
ELECTRICAL AND GENERAL SPECIFICATIONS

- Max. current/voltage rating with resistive load : 2A 24VDC
- Initial contact resistance : 100mΩ max.
- Insulation resistance : 100 MΩ min. at 500VDC
- Dielectric strength : 500 Vrms
- Electrical life at full load : 1.000.000 cycles
- Panel thickness : 7 mm (.276) max.
- Total travel : 1,5 mm (.059) +/- 0,3 mm
- Typical operating force : 7N +/- 2N
- Mechanical life : 1.000.000 cycles
- Torque : 0,5 to 1Nm max. applied to nut

MATERIALS

- Case/bushing : thermoplastic
- Actuator : polyurethane
- Contacts : silver, gold plated
- Multi-wire lead AWG20, section 0,6 mm².
- Terminal seal : epoxy

PANEL MOUNTING



IA						
SERIES	Actuator shape	Electrical function	Terminals	Contacts	Actuator colours	Case colour
	R round	3 Normally open (NO) 5 NC/NO combined	F Flying leads	1 Silver, gold plated	1 Blue 2 Black 3 Green 5 Yellow 6 Red 7/1 White 9 Orange	00 Black

Dimensions : First dimensions are in mm while inches are shown as bracketed numbers.



A **sealing boot** is available to protect the switches against frost and sand. See end of this catalogue.



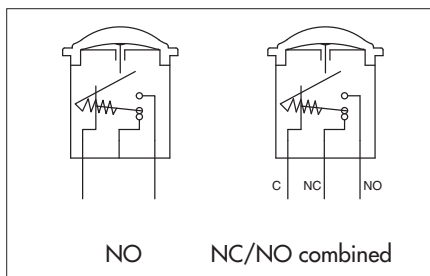
Mounting accessories : Standard hardware supplied : 1 hex nut 19 mm (.748) across flats and 1 flat seal. Knurled nut U3327 available on request.



Packaging unit : 25 pieces

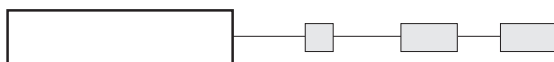
IA series

Low profile pushbutton switches for harsh environments - bushing \varnothing 16 mm - momentary



- Panel cut-out \varnothing 16,2 mm (.657)
- Min. pitch for matrix mounting :
 - with standard hex nut : 27 x 27 mm (1.062 x 1.062)
 - with knurled nut U3327: 20 x 20 mm (.787x.787)

MODEL STRUCTURE



NO model has 2 terminals only.

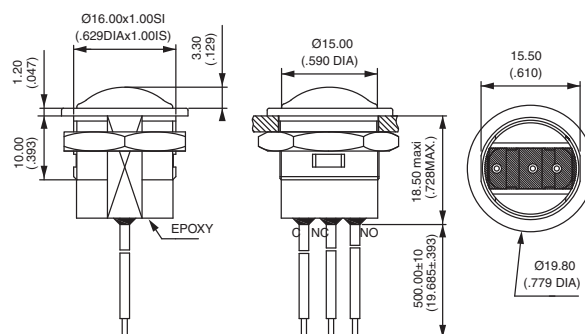
Models



Normally open (NO)
IAR3F



NC/NO combined
IAR5F



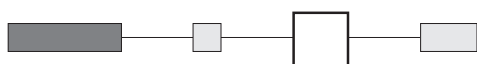
Wire colours (NC/NO) : black = common, brown = NC, blue = NO

CONTACT MATERIAL



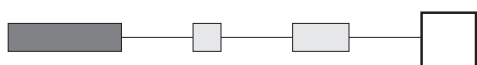
1 Silver, gold plated

ACTUATOR COLOUR



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

CASE COLOUR



00 : black

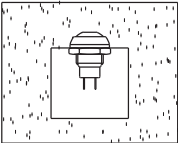
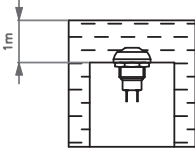
“I” range

Sealed pushbutton switches

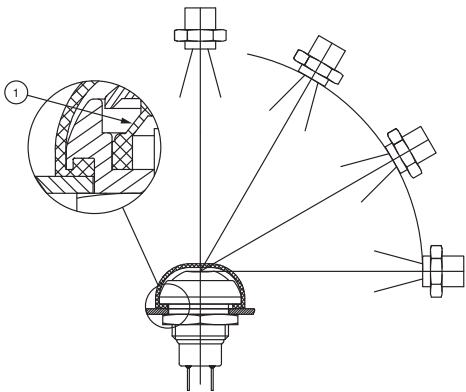
Sealing

Degree of protection provided by the enclosures of electric appliances according to IEC 60529, DIN 40050 and NFC 20-010.

SEALING IP67

IP (Ingress Protection)	6 Totally protected against dust	7 Protected against the effects of immersion up to 1 m water (30 mn)
<p>The illustrations show non-illuminated models.</p>		

SEALING IP69K



High pressure, high temperature wash down

IP69K test conditions

- . Pressure : 80 - 120 bars
- . Distance : 15 cm
- . Temperature : 80°C ± 5°C
- . Flow : 14 - 16 l/mn
- . Duration : 30 seconds per position

① Elastomeric membrane

ADDITIONAL SEALING FOR IP-IB-IS SERIES

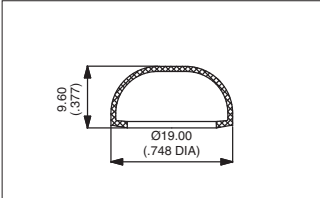
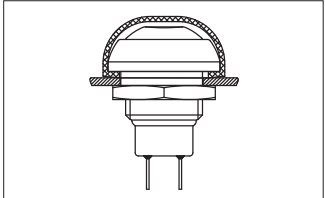
For ROUND plungers only, illuminated or non-illuminated.

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 +85°C
Life expectancy : 500.000 cycles

Note : the flat seal should not be used in this case.

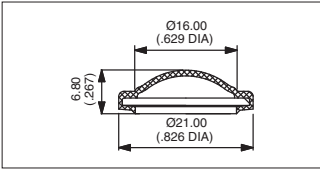



ADDITIONAL SEALING FOR IA SERIES

By silicone boot. Order separately.

- Black : **U6602**
- Yellow : **U6605**
- Red : **U6606**

Operating temperature : -40°C to +85°C
Life expectancy : 1.000.000 cycles



APEM, a world of switching capabilities

The APEM group is one of the world's largest manufacturers of switches, LED indicators, joysticks and switch panels.

APEM manufactures switch products for multiple industrial markets including: instrumentation, medical, security, communications, industrial automation, military and transport.

Other pushbutton switches



■ AV pushbutton switches

The AV series is a range of very robust pushbutton switches consisting of 2 families: anti-vandal and security pushbutton switches. This range features a large variety of models, with different bushing diameters, numerous materials and many electrical functions. Marking and illumination options are also available.



■ PBA piezo switches

PBA series piezo switches feature very long life expectancy, high performance sealing, easy to clean metal surface, ring or dot illumination and a large variety of shapes.

Applications for these products include medical, food-processing, home automation, car wash and mining.

APEM product ranges



APEM

Addresses of sales subsidiaries and distributors
on www.apem.com