

Pushbutton and key switches



Section B

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Selection guide

Pushbutton and key switches



Series	ZP	SMT TP	TP	9500	IF	IB-IS	IP	IA	SP	8000	9400-9600
Page	B-3	B-5	B-7	B-13	B-21	B-22	B-26	B-38	B-40	B-46	B-52
Poles	1	1	1,2	1	1	1	1	1	1,2	1,2	1
Maximum current	500mA 48VDC	0,4VA 20V AC/DC	0,5A 48V AC/DC	100mA 30VDC	100mA 50VDC	100mA 50VDC	200mA 50VDC to 2A 125VAC	2A 24VDC	1A 30VDC	3A 250VAC 4A 130VDC	1A 30VDC
Illuminated											
Bushing dimension											
Ø4 (.157)				X							
Ø4,83 (10-48)	X										
Ø6,35 (1/4)									X	X	X
Ø11,9 (15/32)										X	X
Ø12 (.472)						X	X				
Ø16 (.629)					X			X			
Mounting options											
Horizontal SMT		X									
Vertical right angle SMT		X									
Vertical Through hole	X		X	X		X	X		X	X	X
Horizontal Through hole			X						X	X	
Vert. right angle Through hole			X	X					X		
Panel	X			X	X	X	X	X	X	X	X
Snap-in					X	X					
Terminal options											
Solder lugs	X			X		X	X		X	X	X
Quick-connect					X	X	X				X
Wire wrap			X								
Wire leads							X	X			
Sealing	No	Process sealed	Process sealed	Optional	IP67	IP67	IP67	IP67	Process sealed	Optional	Optional



Series	10400	13000	13000X778	18000	PHAP40	AV	IT	1200	1400N	4700-4800	PBA
Page	B-60	B-62	B-70	B-75	B-88	B90	B-116	B-119	B-126	B-129	B-132
Poles	1,2	1,2	2	1,2	2	1,2	2	1	1	1,2	1
Maximum current	2A 250VAC 3A 24VDC	2A 250VAC 4A 30VDC	2A 250VAC 4A 30VDC	7A 30VDC	100mA 30VDC	5A 250VAC	1,5A 250VAC	4A 250VAC 4A 24VDC	6A 12VDC	3A 250VAC	1A 24VDC
Illuminated											
Bushing dimension											
Ø6,35 (1/4)		X		X							
Ø10 (.393)	X										
Ø11,9 (15/32)		X	X								
Ø12 (.472)								X		X	
Ø16 (.629)						X					X
Ø19 (.748)						X					
Ø22 (.866)						X					X
Ø24 (.944)						X					
Mounting options											
Vertical Through hole		X	X	X	X	X			X	X	
Horizontal Through hole		X		X			X				
Vert. right angle Through hole				X							
Panel	X	X	X	X		X		X	X	X	X
Snap-in				X					X		
Terminal options											
Solder lugs	X	X	X	X		X		X	X	X	
Quick-connect						X		X	X	X	
Screw						X		X			
Wire leads											X
Sealing	No	Optional	IP67	No	No	Optional	No	No	No	No	IP68

ZP series

Tiny pushbutton switches - metal bushing

Distinctive features - Specifications - Overview



☐ Ø 4,83 mm threaded bushing

☐ Solder lug and straight PC terminals

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - gold plated contacts : 0,4VA 20V max. AC or DC
 - silver plated contacts : 0,5A 48V max. AC or DC
- Minimum load : 10mA 50mV - 10µA 5VDC
- Contact resistance : 50 mΩ max.
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength: 1.000 Vrms 50 Hz min. between terminals and frame
500 Vrms 50 Hz min. between terminals
- Electrical life at full load :
 - gold plated contacts : 60.000 cycles
 - silver plated contacts: 20.000 cycles

MATERIALS

- Case : thermoplastic UL94-V0
- Actuator : thermoplastic UL94-V0
- Bushing : zamac, tin plated
- Contacts and terminals :
 - 0** : brass, gold plated (standard)
 - 1** : brass, silver plated
 - 3** : brass, gold plated (1,27 micron gold)
- Terminal seal : epoxy

GENERAL SPECIFICATIONS

- Travel :
 - function 2 (ON-MOM) : 1,2 mm (.047) ± 0,3 (.11)
 - function 3 (OFF-MOM) : 1 mm (.039) ± 0,3 (.11)
- Strength of terminals : pull-out force 10N max.
- Torque : 1Nm max. applied between the 2 nuts
- Max. panel thickness : 1,5 mm (.059) with 2 nuts
- Operating temperature : -30°C to +85°C
- Moisture : 21 days 95 % (NFC 20-603 - IEC 68-2-3)

SOLDERING

- Hand soldering : 280°C max. for 5 seconds max.
- Wave soldering : 260°C max. for 5 seconds max.

ZP					
SERIES	Number of poles	Electrical functions		Terminals	Contact and terminal materials
	3 Single pole	2 ON - MOM		S0 Solder lug	0 Brass, gold plated
		3 OFF - MOM		P0 Straight PC	1 Brass, silver plated
					3 Brass, gold plated (1,27 micron gold)
					Bushing
					01 Threaded, with flat

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



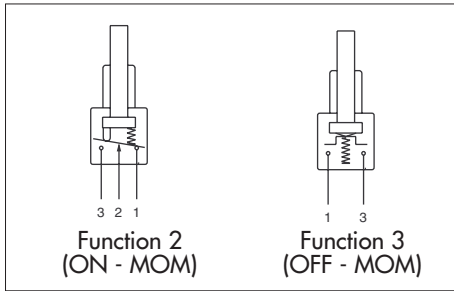
Packaging unit : 100 pieces



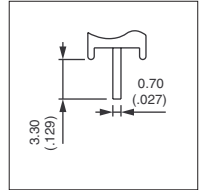
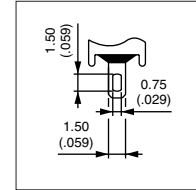
Mounting accessories : Standard hardware supplied with all models : 2 hex nuts 7 mm (.275) across flats P/N U5731, 1 locking ring P/N U5831 and 1 lockwasher P/N U5841.

ZP series

Tiny pushbutton switches - metal bushing



- Single pole
- Gold plated or silver plated contacts
- Epoxy sealed terminals



MODEL
STRUCTURE



Shown in function 2 (ON-MOM)

Solder lug terminals : ZP..S0

→ Flat



ZP32S0

ZP33S0



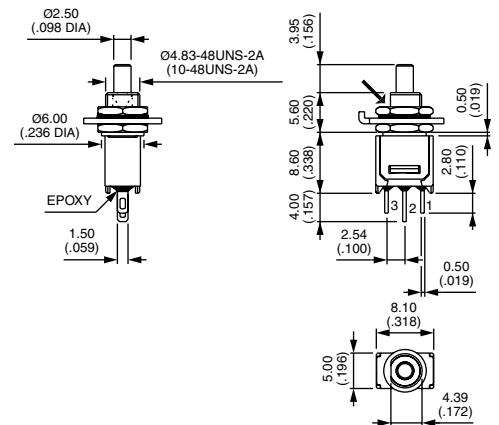
ON



MOM

OFF

MOM



Straight PC terminals : ZP..P0

→ Flat



ZP32P0

ZP33P0



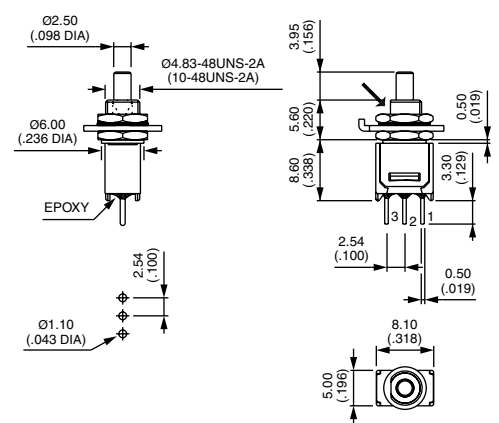
ON



MOM

OFF

MOM

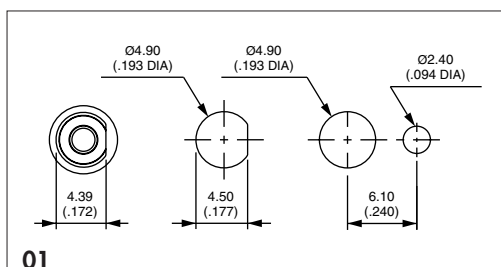
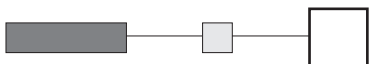


CONTACT & TERMINAL MATERIALS



0 : Brass, gold plated (standard) - 1 : Brass, silver plated - 3 : Brass, gold plated (1,27μ gold)

BUSHING



01

SMT TP series

Surface mount tiny washable pushbutton switches

Distinctive features and specifications



- ☐ Entirely designed for surface mount
- ☐ Tape and reel packaging
- ☐ Reflow solderable
 - High temperature plastic materials
 - Tin plated ground plate
 - Terminal coating : tin alloy over nickel plating
 - Terminals turned to the outside, preventing the shadow effect in infrared soldering and permitting visual inspection of solder joints
 - Distance between case and circuit : 0,55 mm (.021)
 - End stackable with 10,16 mm (.40) pitch
 - Available with positioning pins to ensure switch orientation during the reflow process and increasing switch mechanical resistance
- ☐ Protected against electrostatic discharges (ESD) up to 10 KV
- ☐ Washable

Construction withstands cleaning processes, including hot water under pressure

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load : 0,4VA 20V max. AC or DC
- Minimum load : 10mA 50mV or 10 μ A 5VDC
- Initial contact resistance : 50 m Ω max
- Insulation resistance : 1.000 M Ω min. at 500VDC
- Dielectric strength : 1.000 Vrms. 50 Hz min. between terminals and frame
- 500 Vrms. 50 Hz min. between terminals
- Electrical life at full load : 60.000 cycles
- Static resistance : 10 KV (Schaffner equipment)

GENERAL SPECIFICATIONS

- Actuator travel : function 2 : 1 mm (.039) - function 3 : 0,8 mm (.031)
- Operating temperature : -40°C to +85°C
- Moisture resistance : 21 days per IEC 512-6 test 11c
- Vibration resistance : 10-500 Hz / 10 g per IEC 512-4 test 6d
- Shock resistance : 50 g per IEC 512-4 test 6c

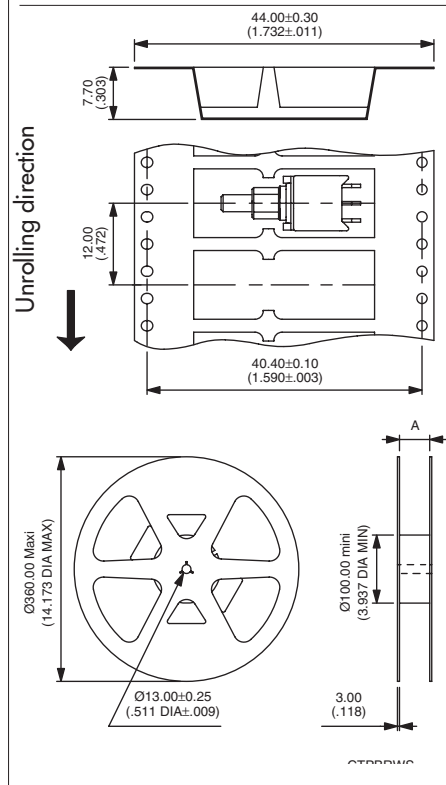
MATERIALS

- Case : high temperature plastic material UL94-V0
- Actuator : high temperature plastic material UL94-V0
- Ground plate and positioning pins : steel, tin plated
- Contacts : brass, gold plated
- Terminals : brass, with pure tin plating over nickel barrier

SOLDERING AND CLEANING

- Reflow soldering : infrared, vapor phase or infrared convection
- Washable per IEA-RS448-2 :
 - water + detergent - preferred
 - solvents
- Further information on reflow soldering : see end of catalogue.

PACKAGING



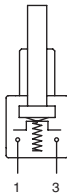
Tape width	24.00 (.944)	44.00 (1.732)
Reel (dimension A)	24.40±2.00/0.00 (.960±.078/.000)	44.40±2.00/0.00 (1.748±.078/.000)

Standard packaging unit : 700 pieces
 Tape meeting international standard IEC - Publication 286-3 (EIA481A)
 Start leader : 400 mm min.

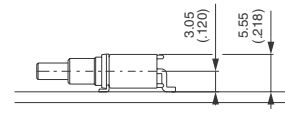
Dimensions : First dimensions are in mm while inches are shown as bracketted numbers.

Surface mount tiny washable pushbutton switches

- Also available for vertical mounting. On request.**



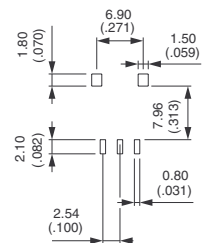
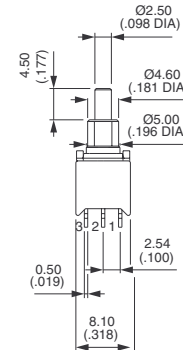
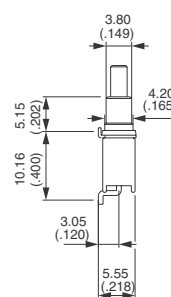
Function 3
(OFF - MOM)



TP33WS83500

MOM

MOM

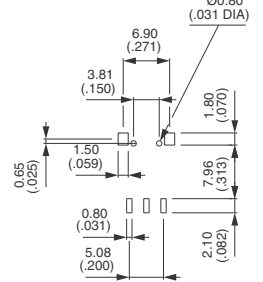
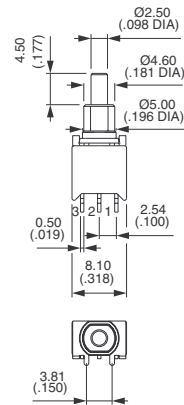
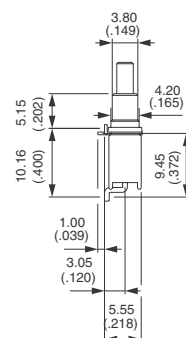


Shown in function 2

TP33WS83565

MOM

MOM



Shown in function 2

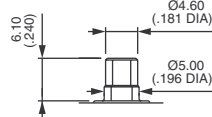
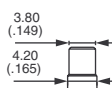
Technical drawing of a stepped shaft with the following dimensions:

- Top diameter: Ø2.50 (.098 DIA)
- Top step height: 3.80 (.149)
- Bottom step height: 4.20 (.165)

Technical drawing of a stepped shaft with the following dimensions:

- Total length: 3.55 (.139)
- Length of the top step: 6.10 (.240)
- Top diameter: $\varnothing 4.60$ (.181 DIA)
- Bottom diameter: $\varnothing 5.00$ (.196 DIA)

Short
Replace 35 with 30 in the above P/N's



Flush
Replace 35 with 32 in the above P/N's.

TP series

Tiny washable momentary pushbutton switches

Distinctive features and specifications



☐ Sealed

- Single piece case
- O-ring seal between actuator and bushing
- Epoxy sealed terminals

☐ Wide variety of contact materials

☐ Same PCB layout as TL, TR and TG tiny switches

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - gold plated contacts : 0,4VA 20V max. AC or DC
 - silver plated contacts : 0,5A 48V max. AC or DC
- Minimum load : 10mA 50mV - 10 μ A 5VDC
- Contact resistance : 50 m Ω max.
- Insulation resistance : 1.000 M Ω min. at 500VDC
- Dielectric strength :
 - 1.000 Vrms 50 Hz min. between terminals and frame
 - 500 Vrms 50 Hz min. between terminals
- Electrical life at full load :
 - gold plated contacts : 60.000 cycles
 - silver plated contacts : 20.000 cycles

GENERAL SPECIFICATIONS

- Total travel :
 - function 2 : 1 mm (.039)
 - function 3 : 0,8 mm (.031)
- Strength of terminals : pull-out force - 10N max.
- Operating temperature : -30°C to +85°C
- Moisture : 21 days 95 % (NFC 20-603 - IEC 68-2-3)
- Cleaning : solvents or water + detergent
- Wave soldering : 260°C - 5 sec.

MATERIALS

- Case : PBT
- Actuator : polyamide, glass filled
- Contacts and terminals :
 - 0 : brass, gold plated
 - 1 : brass, silver plated
 - 3 : brass, gold plated (1,27 micron gold)
 - 8 : contact brass, gold plated + tin plated terminals
 - 9 : contact brass, gold plated (1,27 micron gold) + tin plated terminals
- Terminal seal : epoxy

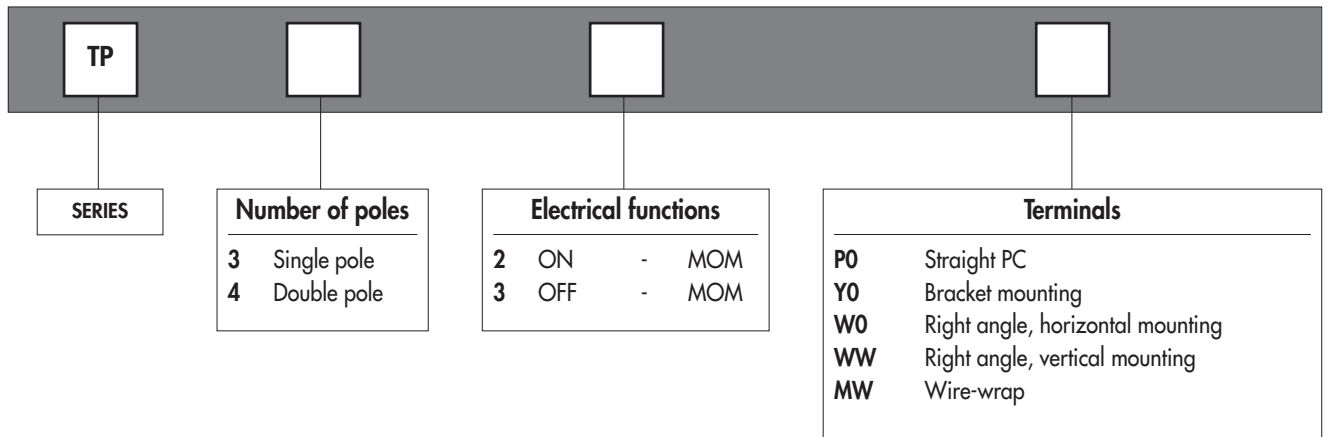
B

TP series

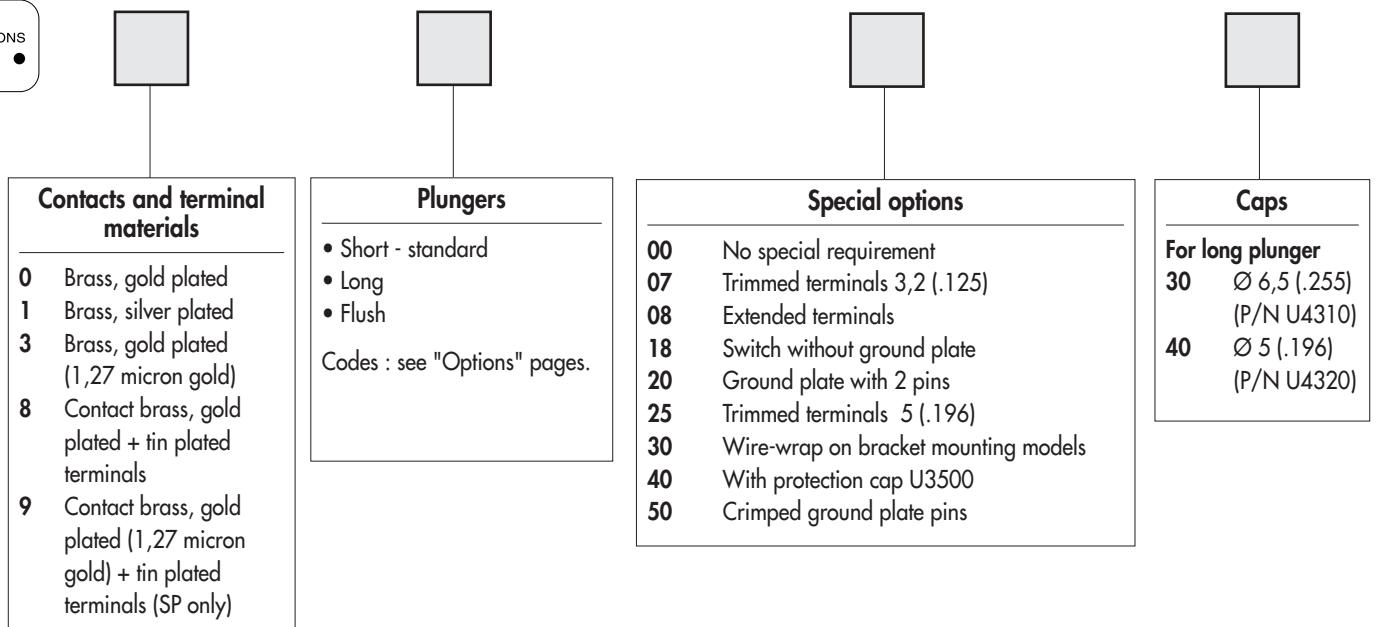
Tiny washable momentary pushbutton switches

Overview

MODEL
STRUCTURE



OPTIONS



ABOUT THIS SERIES

On the following pages, you will find successively :

- model structure of switches
- 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.



Packaging unit : 100 pieces, except for models with WW terminals (50 pieces).

TP series

Tiny washable momentary pushbutton switches

MODEL
STRUCTURE

Shown in function 2, with standard plunger

Right angle terminals - vertical mounting : TP..WW



Single pole Double pole

TP32WW TP42WW

TP33WW TP43WW



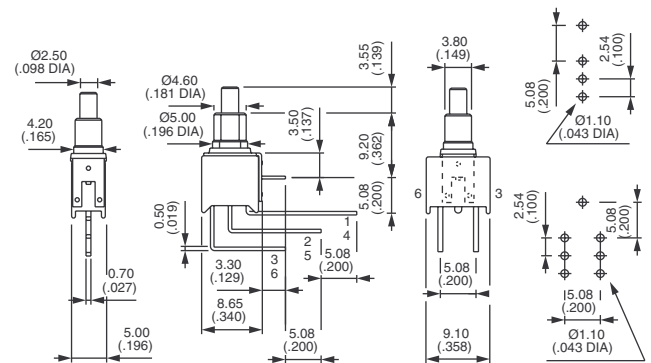
ON



MOM

OFF

MOM



Function 3 has two terminals only (3 and 1) per pole

Wire-wrap terminals : TP..MW



Single pole Double pole

TP32MW TP42MW

TP33MW TP43MW



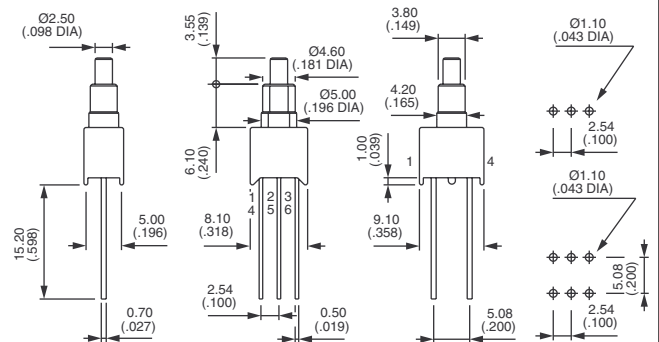
ON



MOM

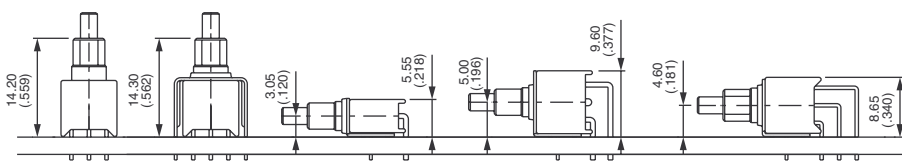
OFF

MOM



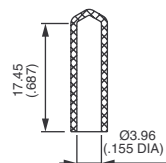
Function 3 has two terminals only (3 and 1) per pole

PCB MOUNTING



CAP FOR PCB PROCESSING

Provide additional protection during PCB processing.
Supplied separately. For cap mounted on the switch, see special option 40.
Material : vinyl



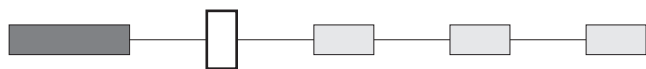
U3502



TP series

Tiny washable momentary pushbutton switches

CONTACT AND TERMINAL MATERIALS

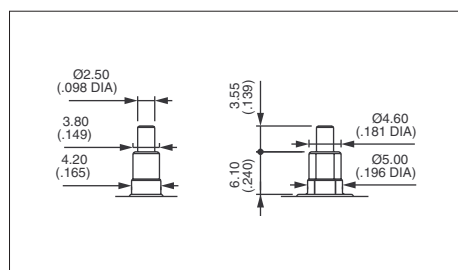


- 0 Brass, gold plated
- 1 Brass, silver plated
- 3 Brass, gold plated (1,27 micron gold)
- 8 Contact brass, gold plated + tin plated terminals
- 9 Contact brass, gold plated (1,27 micron gold) + tin plated terminals (single pole only)

PLUNGERS



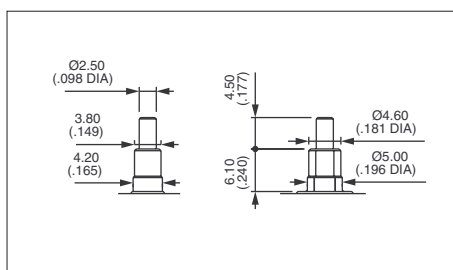
Standard plunger colour is black.



Short - standard

With blue
case
30

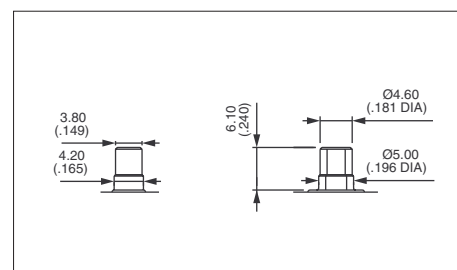
With black
case
80



Long

With blue
case
35

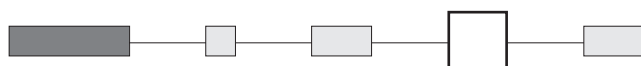
With black
case
85



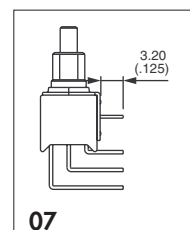
Flush

With black
case
82

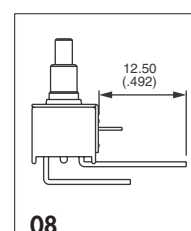
SPECIAL OPTIONS



- 00 No special requirement
- 07 Trimmed terminals - length 3,2 mm (.125) for TP..WW models only
- 08 Extended terminals for TP..W0 models only



07



08

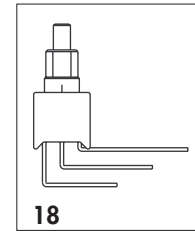
TP series

Tiny washable momentary pushbutton switches

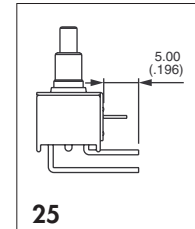
OPTIONS
● ● ●

SPECIAL OPTIONS (continued)

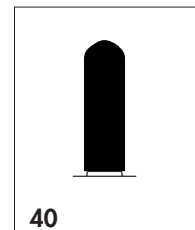
- 18** Switch **without ground plate** for TP..WW models only
- 20** **Ground plate with 2 pins** for TP..WW models only
- 25** **Trimmed terminals** - length 5 mm (.196) for all models, except TP..WW
- 30** **Wire-wrap terminals** on models with mounting **bracket**
- 40** With cap U3500 mounted over plunger and bushing
Further protects the switch during PCB processing
- 50** **Crimping of ground plate pins.**
Retains switch on PC during handling and wave soldering.
For models TP..WO, TP..WW and TP..YO single and double pole.



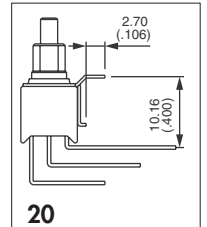
18



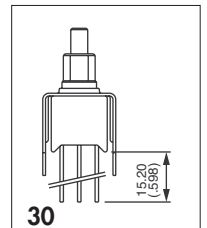
25



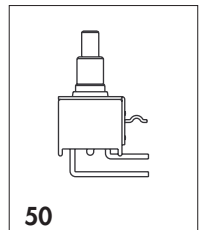
40



20

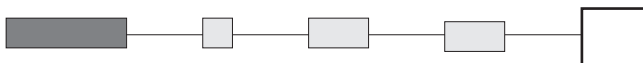


30

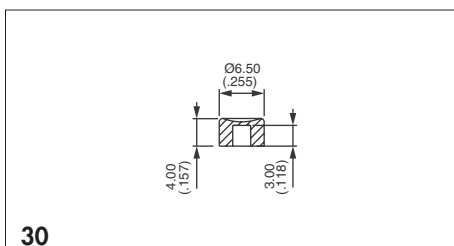


50

CAPS

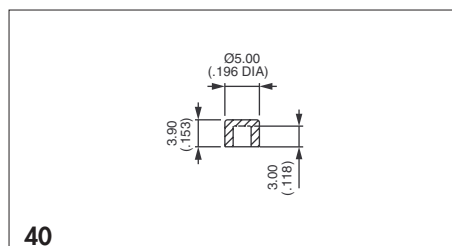


Blank Without cap



30

P/N U4310 - for long plunger only



40

P/N U4320 - for long plunger only

To order caps separately, use their part number (U...).

Cap colours

Replace "0" by number

- | | |
|-----|-----------|
| 1 | blue |
| 1/4 | dark blue |
| 2 | black |
| 3 | green |
| 4 | grey |
| 5 | yellow |
| 6 | red |
| 7 | ivory |
| 7/1 | white |
| 9 | orange |

9000 series

Subminiature momentary pushbutton switches

Distinctive features and specifications



☐ Panel and PC mount models, horizontal or vertical

☐ Self-cleaning and butt action contacts

☐ Several plunger options

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load : 100mA 30VDC
- Initial contact resistance : 30 mΩ max.
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength :
 - 500 Vrms 50 Hz min. between terminals
 - 1.000 Vrms 50 Hz min. between terminals and frame
- Electrical life at full load :
 - 9100 - 9200N and 9500N : 250.000 cycles
 - 9200 - 9500 : 100.000 cycles

MATERIALS

- Case : Pa6T
- Actuator : polyamide, glass filled
- Bushing : brass, nickel plated
- Contacts :
 - CD : brass, gold plated
- Terminal seal : epoxy

GENERAL SPECIFICATIONS

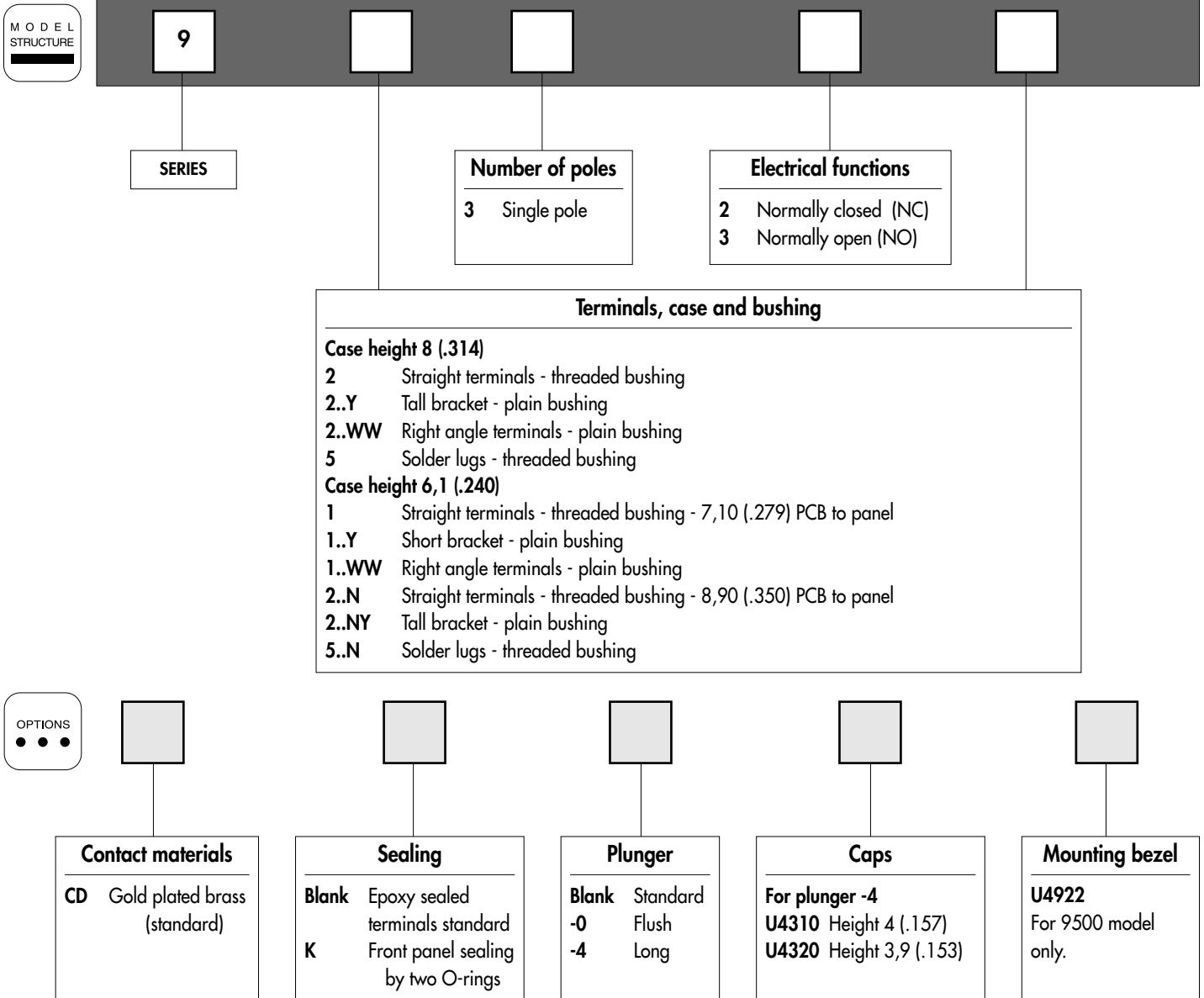
- Torque : 0,5 Nm (.590 Ft.lb) max. applied to nut
- Operating temperature : -30°C to +65°C
- Panel thickness : 1,50 mm (.059) max.
- Travels : see table below
Tolerance : +/- 0,3 mm (.011)

	9533-9233	9532-9232	9533N 9233N-9133
Total travel	1,10 (.043)	1,80 (.070)	1 (.039)
Pre-travel	0,80 (.031)	1,00 (.039)	-
Over travel	0,30 (.011)	0,75 (.029)	-

9000 series

Subminiature momentary pushbutton switches

Overview



ABOUT THIS SERIES

On the following pages, you will find successively :

- model structure of switches
- their 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.



Sealing boots are available to protect the switches. They are presented in section H.



Mounting accessories : standard hardware supplied with all threaded bushing models : 1 nickel plated hex nut 5 (.196) across flats, part number U544. This nut is presented after model structure of switches.



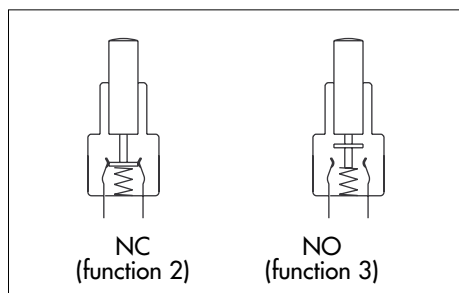
Packaging unit : 100 pieces.



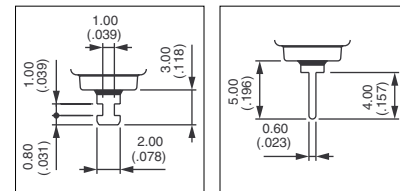
9000 series

Subminiature momentary pushbutton switches

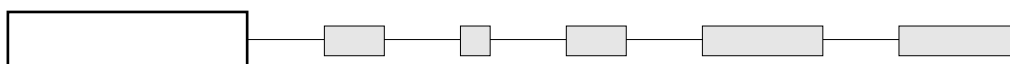
Solder lug or straight PC terminals : 9500 - 9200 - 9200Y



- Case height 8 (.314)
- With over travel
- Self-cleaning contacts
- Epoxy sealed terminals standard



MODEL
STRUCTURE



Threaded bushing - solder lugs : 9500

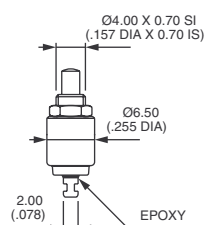
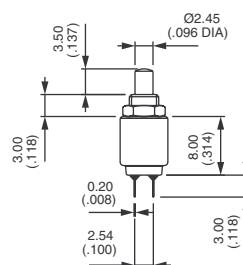


9532

Normally Closed

9533

Normally Open



Threaded bushing - straight PC terminals : 9200

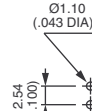
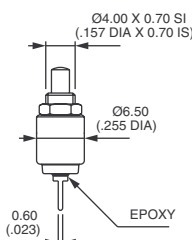
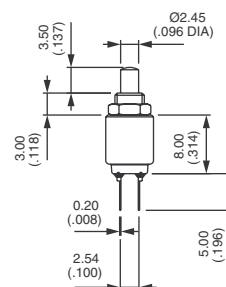


9232

Normally Closed

9233

Normally Open



Straight PC terminals - bracket mounting : 9200Y

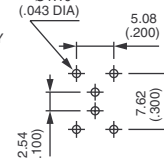
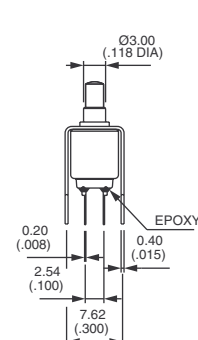
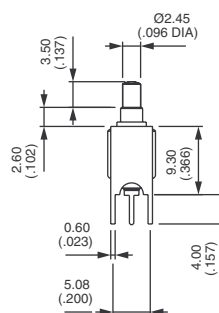


9232Y

Normally Closed

9233Y

Normally Open



Subminiature momentary pushbutton switches

MODEL
STRUCTURE

Right angle terminals : 9200WW

Right angle terminals : 9200WW



9232WW 

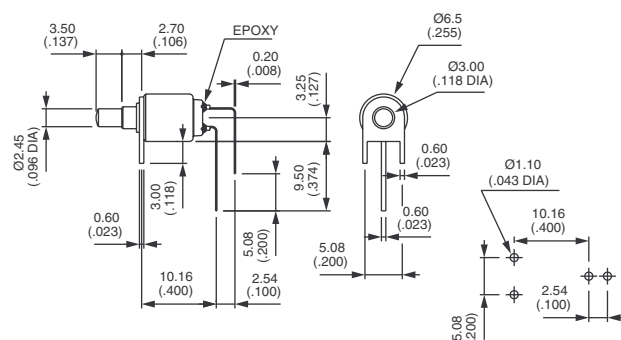


Normally Closed

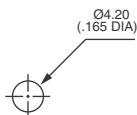
9233WW



Normally Open



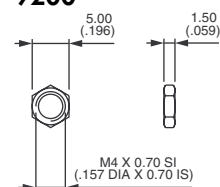
PANEL CUT-OUT



For threaded bushing models.

STANDARD HARDWARE

9500 - 9200



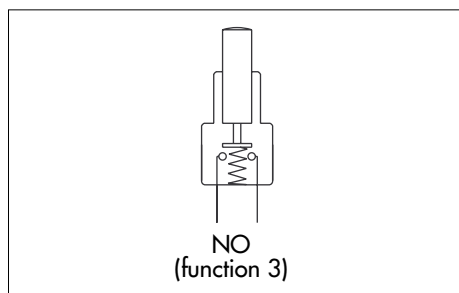
U544 (nickel plated)



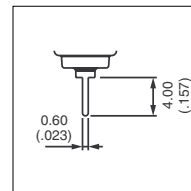
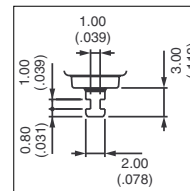
9000 series

Subminiature momentary pushbutton switches

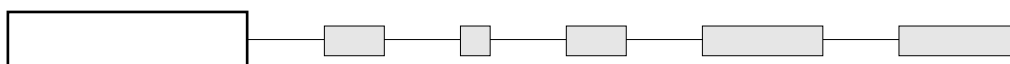
Solder lug or straight PC terminals : 9500N - 9200N - 9100



- Case height 6,1 (.240)
- Epoxy sealed terminals
- Butt action contacts



MODEL
STRUCTURE



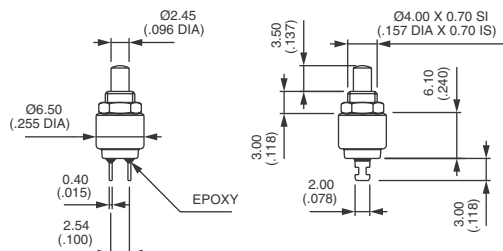
Threaded bushing - solder lugs : 9500N



9533N



Normally Open



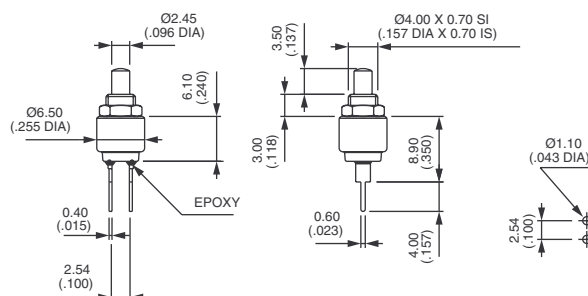
Threaded bushing - straight PC terminals - 8,90 (.350) PCB to panel



9233N



Normally Open



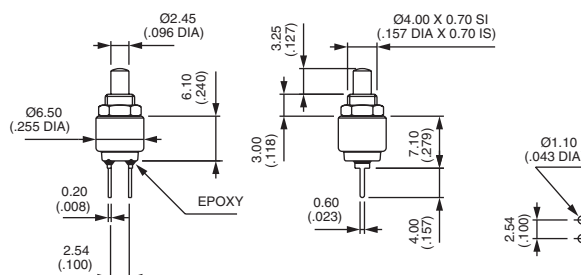
Threaded bushing - straight PC terminals - 7,10 (.279) PCB to panel



9133



Normally Open



9000 series

Subminiature momentary pushbutton switches

Straight PC or right angle terminals : 9200NY - 9100Y - 9100WW

MODEL
STRUCTURE

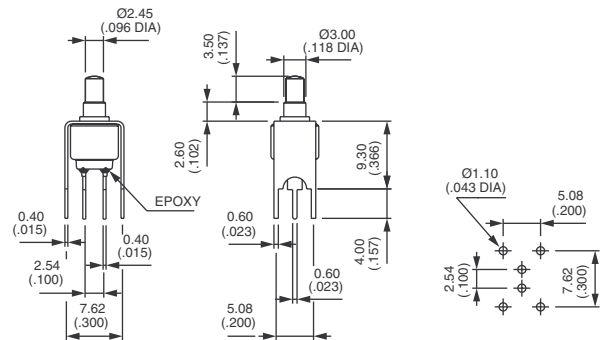
Straight PC terminals - tall bracket : 9200NY



9233NY



Normally Open



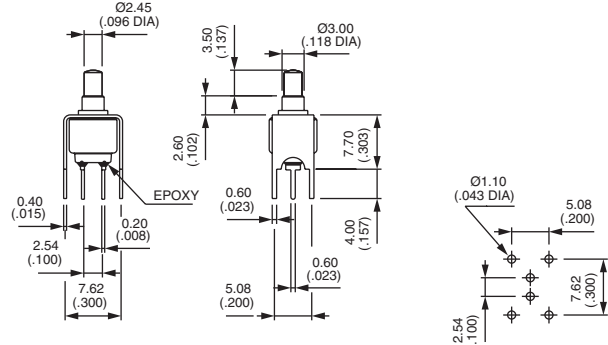
Straight PC terminals - short bracket : 9100Y



9133Y



Normally Open



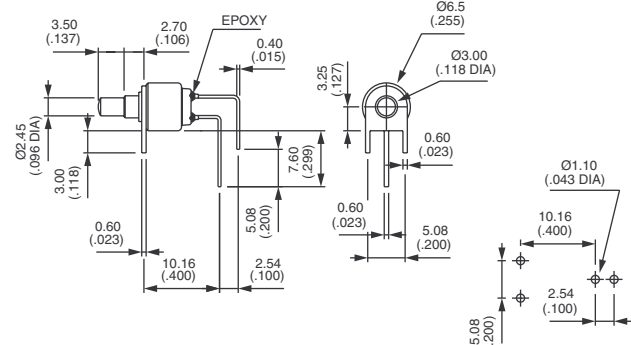
Right angle terminals - vertical : 9100WW



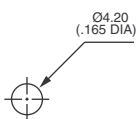
9133WW



Normally Open



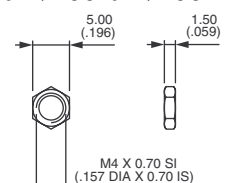
PANEL CUT-OUT



For threaded bushing models.

STANDARD HARDWARE

9500N - 9200N - 9100



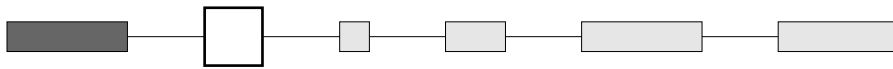
U544 (nickel plated)



9000 series

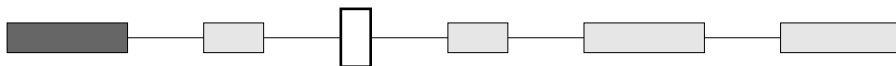
Subminiature momentary pushbutton switches

CONTACT MATERIALS



CD Gold plated brass (standard)

SEALING

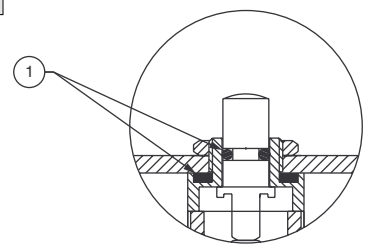


Blank Epoxy sealed terminals standard

K Front panel sealing by two O-rings. Protects the switch against water and dust. Panel seal withstands 0,1 bar pressure.

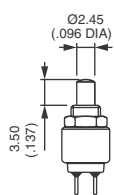
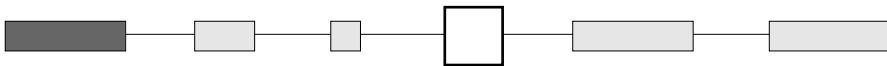


Option K for models 9533N, 9233N and 9133 only.



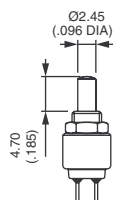
① O-rings

PLUNGERS



Blank

Standard



-4

Long



-0

Flush

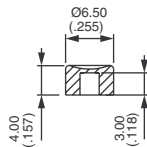
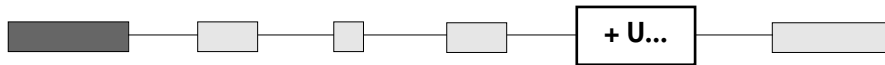


9000 series

Subminiature momentary pushbutton switches

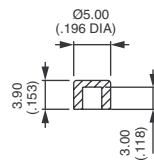
OPTIONS
• • •

CAPS



U4310

For use with plunger -4 only



U4320

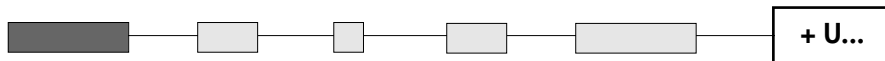
For use with plunger -4 only

Cap colours

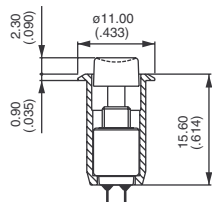
Replace "0" by number

1	blue
1/4	dark blue
2	black
3	green
4	grey
5	yellow
6	red
7	ivory
7/1	white
9	orange

MOUNTING BEZEL



For 9500 model (case height 8 mm) only



Shown with cap U570.

The mounting bezel U4922 has been designed to facilitate the mounting of the 9500 series pushbutton switch onto a panel. The switch + bezel assembly is snapped into the equipment through the front of the panel, then electrically connected by solder lug terminals.

Panel cut-out : $\varnothing 8,15 \text{ mm} \pm 0,05$
(.320 DIA $\pm .002$)

B

B

- B**

B

- B**

B

- B**

B

- B**

B

B



B



B



B



B



B

B



B

IB and IS series

Sealed momentary pushbutton switches

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 IP 67

ENVIRONMENTAL SPECIFICATIONS

- Degree of protection : IP 67 - See details page B36.
- Shock resistance : 100 g according to IEC 512-4, test 6c
- Vibration resistance : 10-500 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
- Plunger : polyamide 6/6
- Bushing/bezel : polyamide 6/6
- Contacts : silver, gold plated
- Terminal seal : epoxy

ELECTRICAL AND GENERAL 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 VAC rms
- Electrical life at full load : 500.000 cycles
- 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 : 1,5 mm (.059)
- Operating force : 2N to 5N
- Contact bounce : 10 ms
- 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.*

IB and IS series

Sealed momentary pushbutton switches

Overview

MODEL STRUCTURE

SERIES	Bezel shape	Electrical function	Terminals	Contacts
IB Snap-in IS Threaded bushing	R Round, curved P Round, flat	3 Normally open (NO)	S Solder lug Z1 Quick-connect 2,8 x 0,5 mm P Straight PC	AD Silver, gold plated

OPTIONS

Plunger colour	Bezel finish	Option
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	00 Black (std) 08 Bright chrome (IS only) 10 White 20 Satin chrome (IS only)	104 High Plunger

ABOUT THIS SERIES

On the following pages, you will find successively :

- model structure of switches and options in the same order as in above chart

Dimensions : first dimensions are in mm while inches are shown as bracketted numbers.



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



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



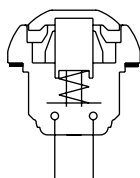
Mounting accessories : Standard hardware supplied : 1 flat seal (IB series)
1 hex nut 14 mm (.551) across flats and 1 flat seal (IS series). The hex nut is presented in section I (part number U166).



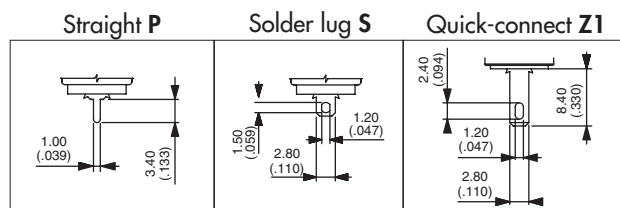
Packaging unit : 50 pieces

IB and IS series

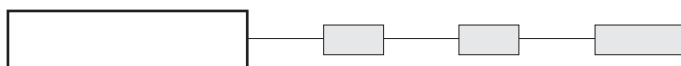
Sealed momentary pushbutton switches



- Ten plunger colours
- Curved or flat actuator
- Antirotation bushing



MODEL STRUCTURE



Snap-in mounting - solder lugs

→ Flat

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



Curved actuator
IBR3SAD

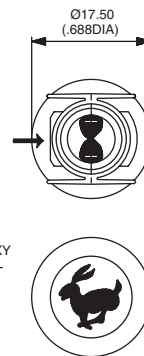
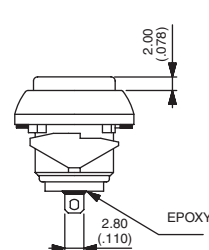
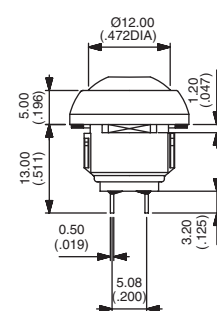


Normally open

Flat actuator
IBP3SAD



Normally open



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

Mounting by threaded bushing - solder lugs

→ Flat

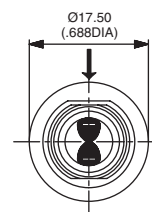
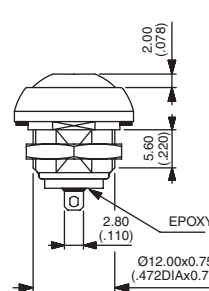
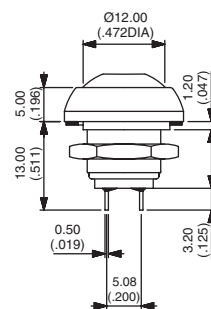
Panel thickness : 1,5 mm to 4 mm



ISR3SAD



Normally open



Also available with straight PC : **ISR3PAD** or quick-connect terminals : **ISR3Z1AD**

Also available with flat actuator. On request.

PLUNGER COLOUR

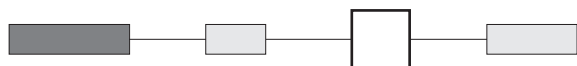


Plunger marking available on IBP models (symbol 10 mm max.). On request.



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

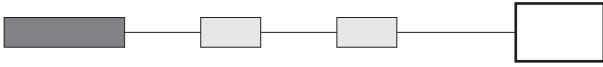


00 : Black (standard)
08 : Bright chrome (IS series only)
10 : White
20 : Satin chrome (IS series only)

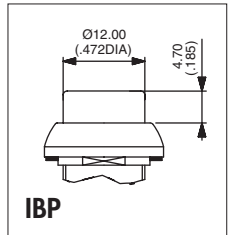
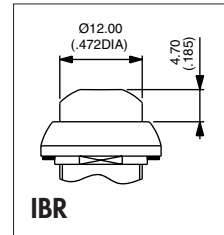
IB and IS series

Sealed momentary pushbutton switches

PLUNGER OPTION

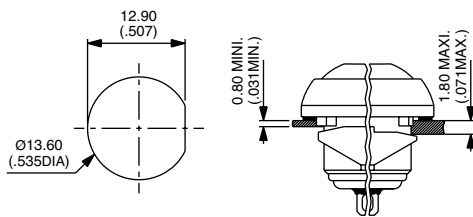


104 : High plunger

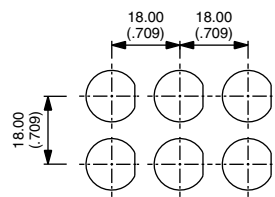


IB SERIES MOUNTING

Panel cut-out

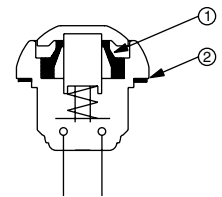


Matrix mounting



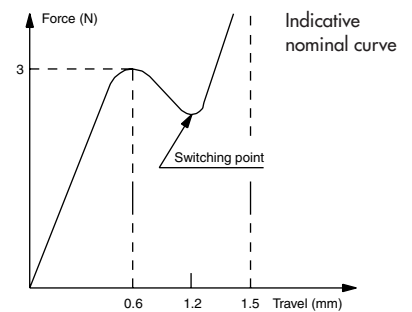
TACTILE FEEDBACK

Cross section



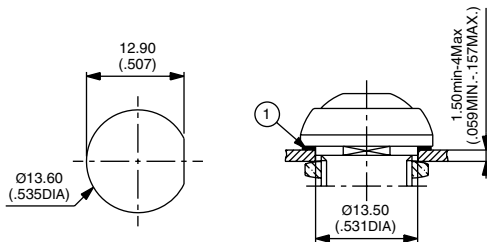
① Elastomeric membrane ② Flat seal

Operating force/travel

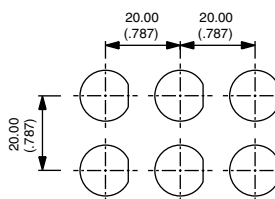


IS SERIES MOUNTING

Panel cut-out



Matrix mounting

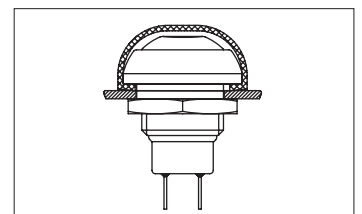
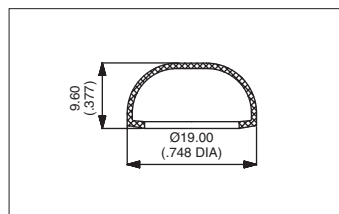


ADDITIONAL SEALING

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

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

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



Example of custom switch



ISR3FADB22X1248-01

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

IP series

Latching action pushbutton switches for harsh environments

Distinctive features and specifications



☐ Latching action

Actuator remains in the low position when "ON".

☐ Illuminated and non-illuminated

☐ Compact

Behind-panel depth less than 20 mm (.787)

☐ Flat round actuator for optional marking

☐ Sealed to IP 67

ENVIRONMENTAL SPECIFICATIONS

- Degree of protection : IP 67 - See details page B36.
- Shock resistance : 100 g according to IEC 512-4, test 6c
- Vibration resistance : 10-500Hz - 10 g according to IEC 512-4, test 6d
- Salt spray : IEC 512-6, test 11f
- Robustness (non-illuminated sw.) : IK06 according to EN 50102 (1 joule)
- Operating temperature : -40°C to +85°C

ELECTRICAL AND GENERAL SPECIFICATIONS

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

LED COMPONENT SPECIFICATIONS

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

A resistor must be series-connected by the user.

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

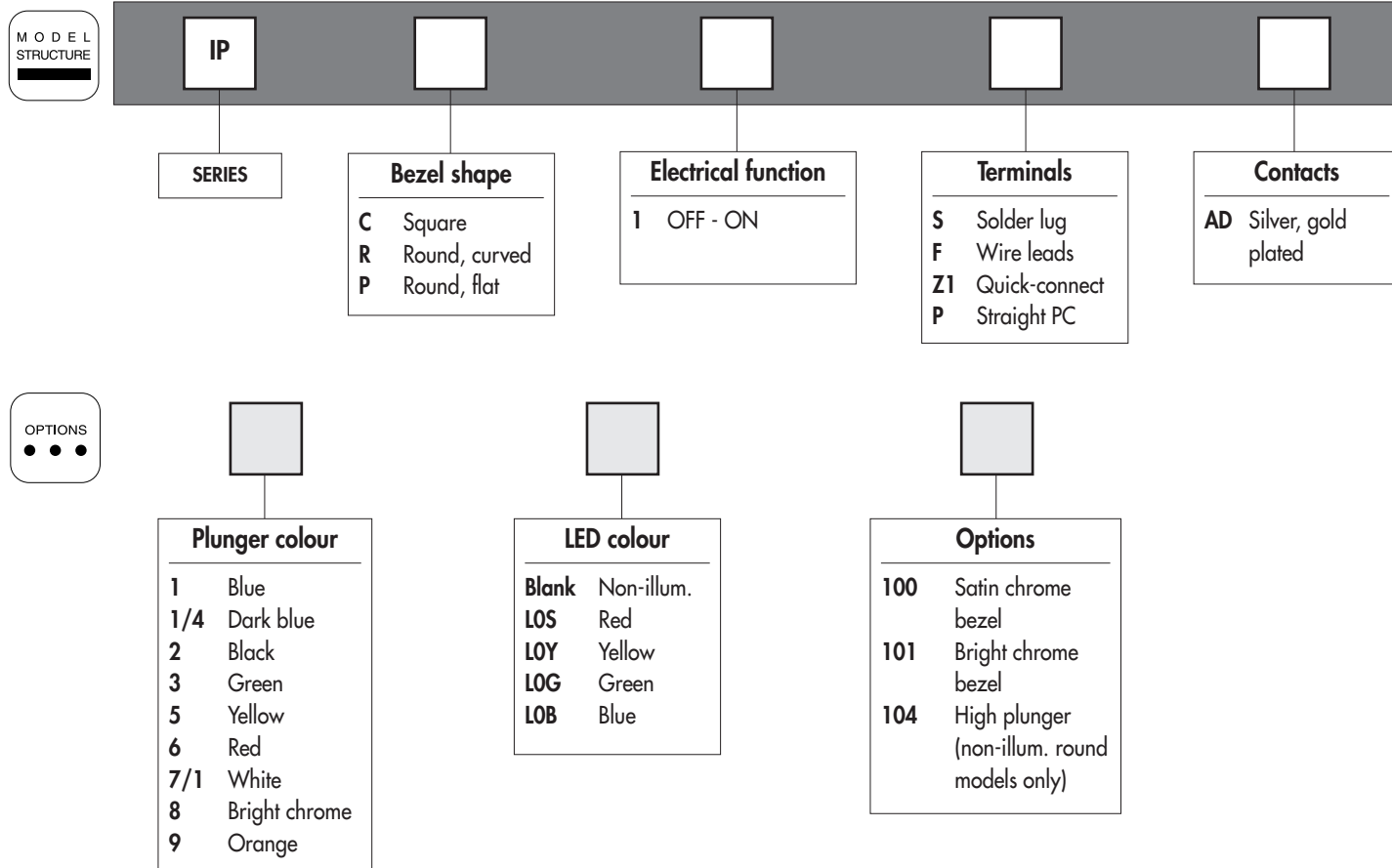
MATERIALS

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

IP series

Latching action pushbutton switches for harsh environments

Overview



ABOUT THIS SERIES

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

Dimensions : first dimensions are in mm while inches are shown as bracketted numbers.



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



A sealing boot is available to protect the switches against frost and sand (P/N U5125).
It is presented at the end of the IP series and in section H.



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

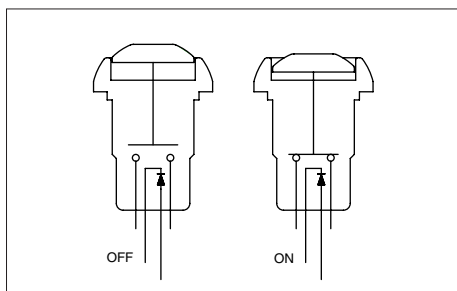


Packaging unit : 25 pieces

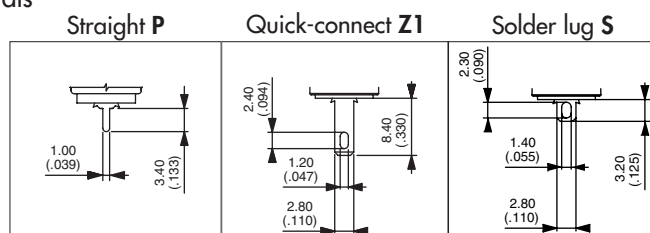
IP series

Latching action pushbutton switches for harsh environments

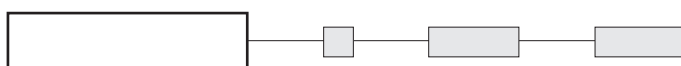
Square or round - illuminated



- Four LED colours
- Tin plated LED terminals



MODEL STRUCTURE



Square models

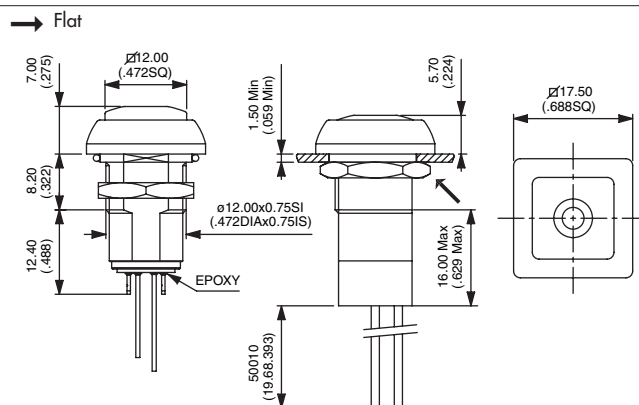


Solder lug terminals
IPC1SAD

OFF - ON

Wire lead terminals
IPC1FAD

OFF - ON



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

Round models

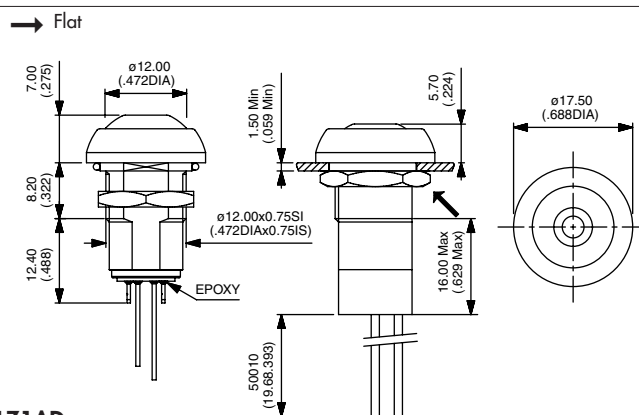


Solder lug terminals
IPR1SAD

OFF - ON

Wire lead terminals
IPR1FAD

OFF - ON



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

PLUNGER COLOUR

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



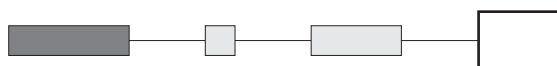
1 : blue - 1/4 : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7/1 : white - 8 : bright chrome - 9 : orange

LED COLOUR



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

OPTIONS



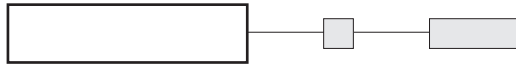
100 : Satin chrome bezel
101 : Bright chrome bezel

IP series

Latching action pushbutton switches for harsh environments

Square or round - non-illuminated

MODEL STRUCTURE



Square models



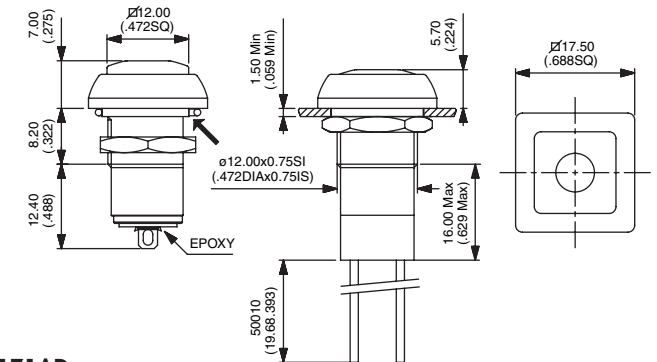
Solder lug terminals
IPC1SAD

OFF - ON

Wire lead terminals
IPC1FAD

OFF - ON

→ Flat



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

Round models



CURVED ACTUATOR

Solder lug terminals
IPR1SAD

OFF - ON

Wire lead terminals
IPR1FAD

OFF - ON

FLAT ACTUATOR

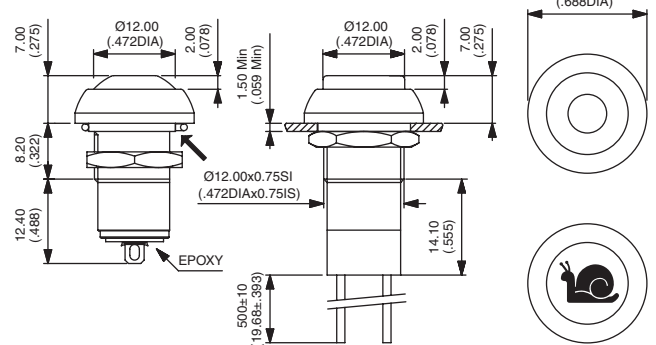
Solder lug terminals
IPP1SAD

OFF - ON

Wire lead terminals
IPP1FAD

OFF - ON

→ Flat



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

PLUNGER COLOUR

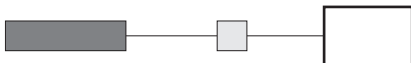


Plunger marking available on IPP models (symbol 10 mm max.). On request.



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

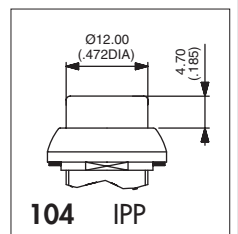
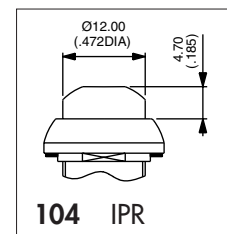
OPTIONS



100 : Satin chrome bezel

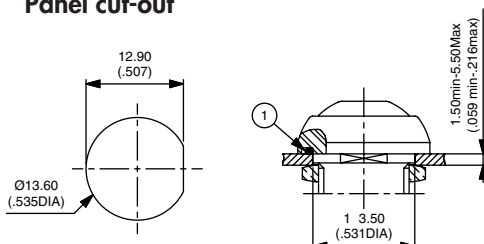
101 : Bright chrome bezel

104 : High plunger (for round model only)

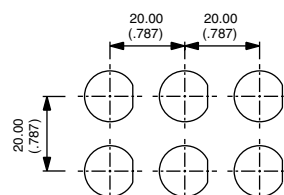


MOUNTING

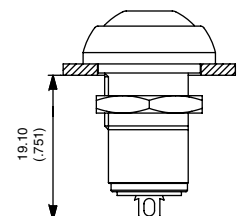
Panel cut-out



Matrix mounting



Back of panel space requirement



IP series

Momentary pushbutton switches for harsh environments

Distinctive features and specifications



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

ENVIRONMENTAL SPECIFICATIONS

- Degree of protection : IP 67
- Shock resistance : 100 g according to IEC 512-4, test 6c
- Vibration resistance : 10-500Hz - 10 g according to IEC 512-4, test 6d
- Salt spray : IEC 512-6, test 11f
- Robustness (non-illuminated sw.) : IK06 according to EN 50102 (1 joule)
- Operating temperature : -40°C to +125°C

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load : 500mA 48VAC - 200mA 50VDC - 200mA 250VAC
- Initial contact resistance : 100 mΩ max.
- Insulation resistance : 1 GΩ min. at 500VDC
- Dielectric strength : 1.500 VAC rms
- Electrical life at full load : 500.000 cycles
- Contact bounce : 10 ms

LED COMPONENT SPECIFICATIONS

LED colour	Forward current	Forward Voltage	Max. lumin. intensity
Super red (LOS)	20mA	2V	125 mcd
Yellow (LOY)	20mA	2V	125 mcd
Green (LOG)	10mA	2V	20 mcd
Blue (LOB)	10mA	3,5V	20 mcd
White (LOW)	20mA	3,5V	280 mcd

A resistor must be series-connected by the user.

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

GENERAL SPECIFICATIONS

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

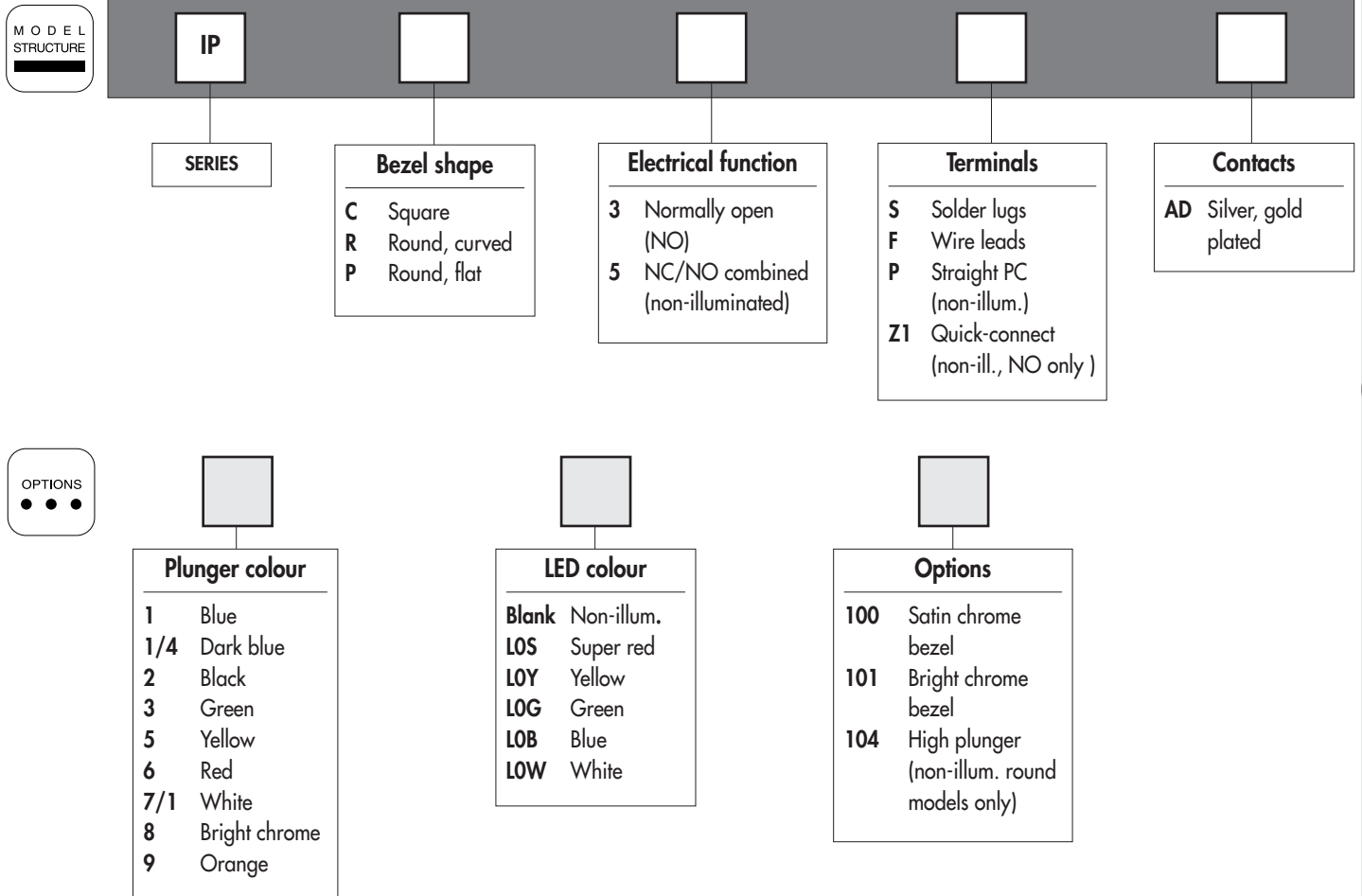
MATERIALS

- Case : thermoplastic UL94-V0
- Plunger : polyamide 6/6
- Bushing/bezel : zinc die-cast (zamac), black painted
- Contacts : silver, gold plated
- Multi-wire lead AWG20, section 0,6 mm², UL approved
- LED wire : AWG26
- Lens : polycarbonate
- Terminal seal : epoxy

IP series

Momentary pushbutton switches for harsh environments

Overview



ABOUT THIS SERIES

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

Dimensions : first dimensions are in mm while inches are shown as bracketted numbers.



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



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



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

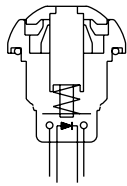


Packaging unit : 25 pieces

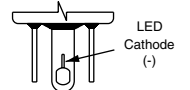
IP series

Momentary pushbutton switches for harsh environments

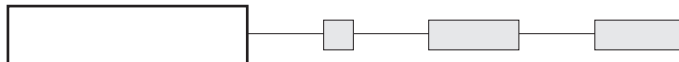
Square - illuminated



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



MODEL
STRUCTURE



Solder lug terminals

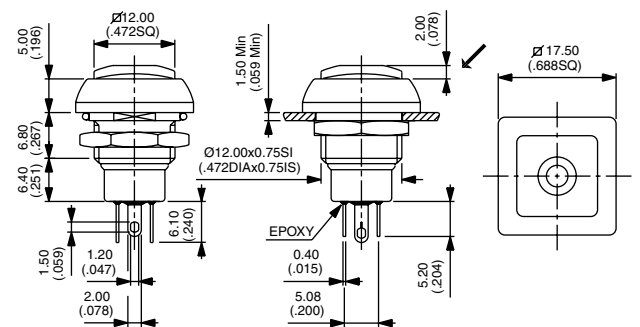


IPC3SAD



Normally Open

→ Flat



Sealed wire lead terminals

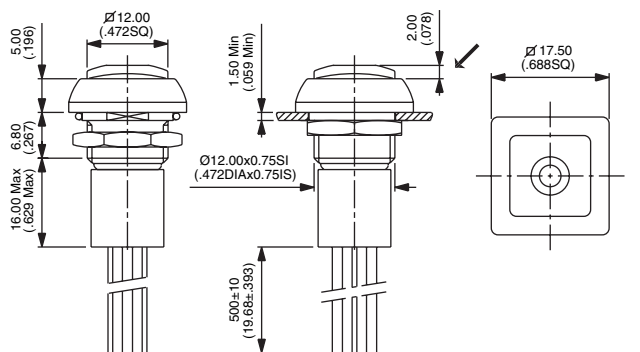


IPC3FAD



Normally Open

→ Flat



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

PLUNGER COLOUR



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

LED COLOUR



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

OPTIONS

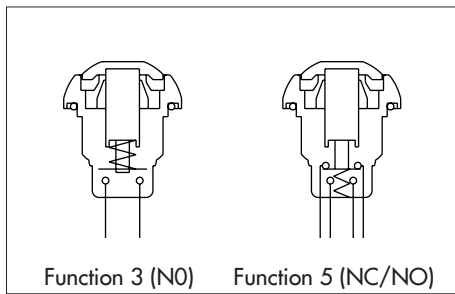


100 : Satin chrome bezel
101 : Bright chrome bezel

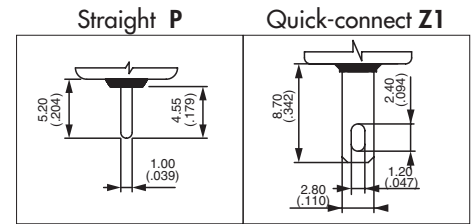
IP series

Momentary pushbutton switches for harsh environments

Square - non-illuminated



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



MODEL STRUCTURE



Solder lug terminals



IPC3SAD



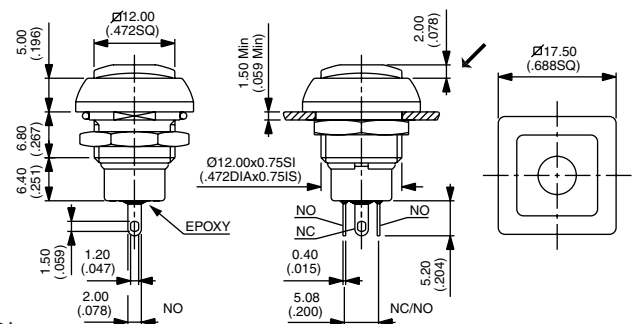
Normally Open

IPC5SAD



NC/NO combined

→ Flat



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

Sealed wire lead terminals



IPC3FAD



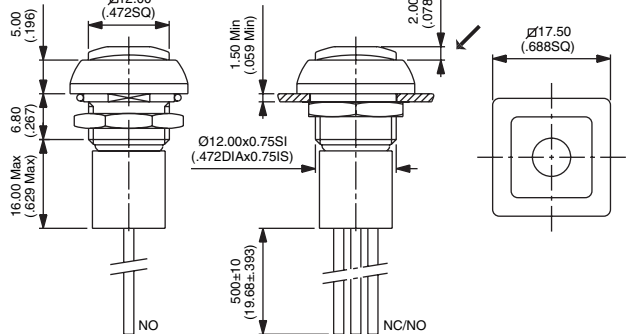
Normally Open

IPC5FAD



NC/NO combined

→ Flat



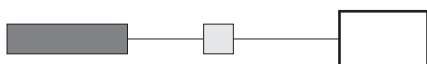
Wire colours (NC/NO) : black : NO, blue : NC

PLUNGER COLOUR



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

OPTIONS

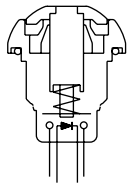


100 : Satin chrome bezel
101 : Bright chrome bezel

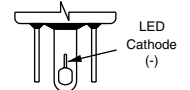
IP series

Momentary pushbutton switches for harsh environments

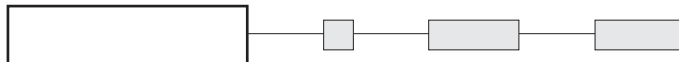
Round - illuminated



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



MODEL STRUCTURE



Solder lug terminals

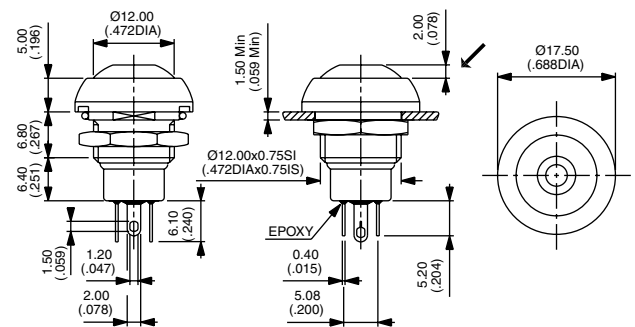


IPR3SAD



Normally Open

→ Flat



Sealed wire lead terminals

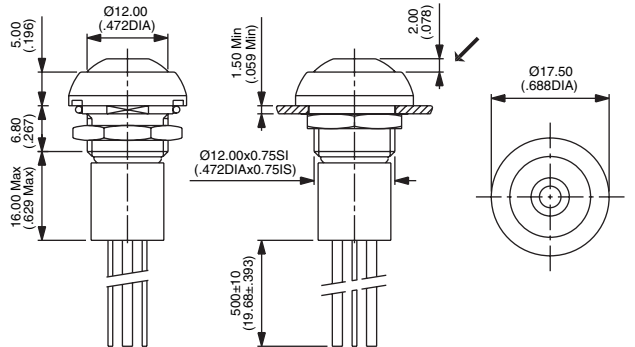


IPR3FAD



Normally Open

→ Flat



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

PLUNGER COLOUR



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

LED COLOUR



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

OPTIONS

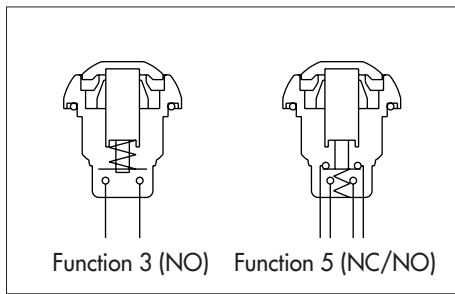


100 : Satin chrome bezel
101 : Bright chrome bezel

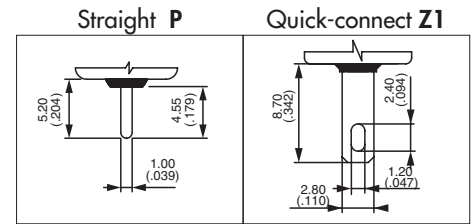
IP series

Momentary pushbutton switches for harsh environments

Round - non-illuminated



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



MODEL STRUCTURE



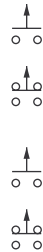
B

Solder lug terminals

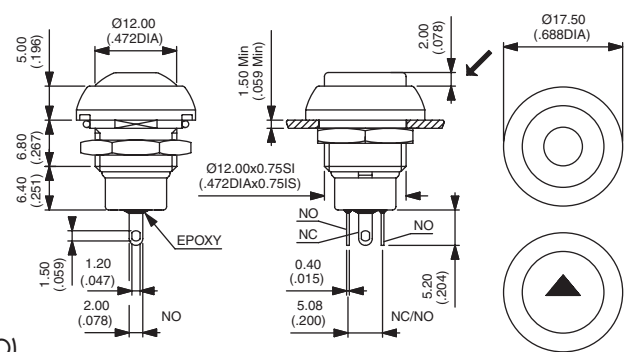


Curved actuator, NO
IPR3SAD
Curved actuator, NC/NO
IPR5SAD

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



→ Flat



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

Sealed wire lead terminals

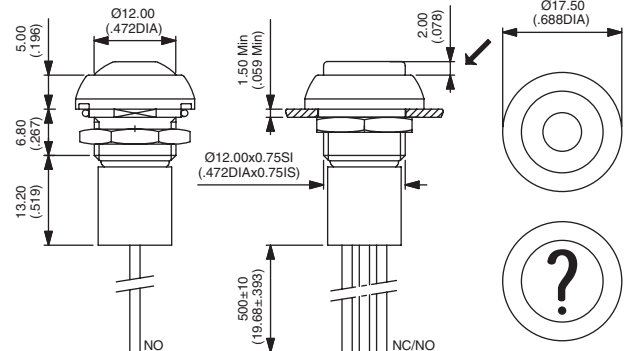


Curved actuator, NO
IPR3FAD
Curved actuator, NC/NO
IPR5FAD

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



→ Flat



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

PLUNGER COLOUR

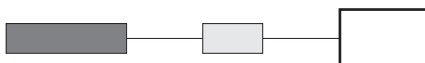


Plunger marking available on IPP models (symbol 10 mm max.). On request.

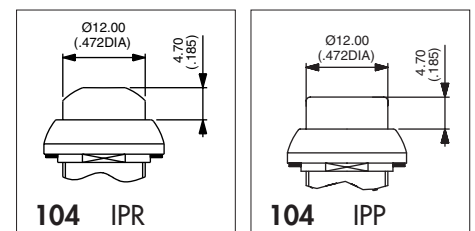


1 : blue - 1/4 : dark blue - 2 : black - 3 : green - 5 : yellow - 6 : red - 7/1 : white - 8 : bright chrome - 9 : orange

OPTIONS



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

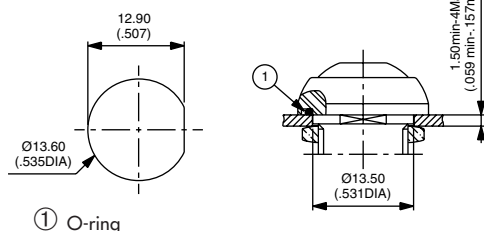


IP series

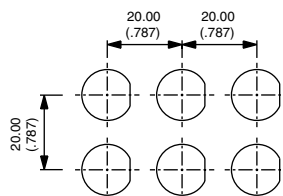
Momentary pushbutton switches for harsh environments

MOUNTING

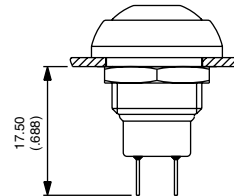
Panel cut-out



Matrix mounting

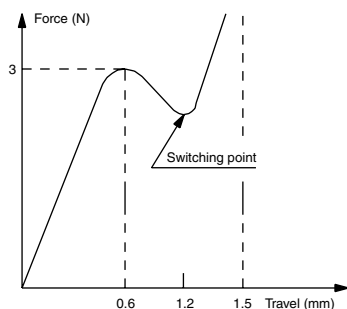


Back of panel space requirement

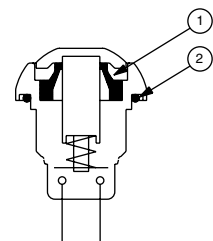


TACTILE FEEDBACK

Operating forces/ travels diagram (indicative nominal curve)



Cross section



① Elastomeric membrane ② O-ring

SEALING

IP 67 for the whole series

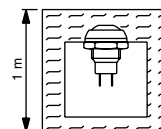
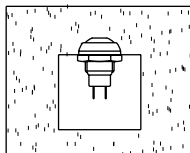
Degree of protection provided by the enclosures of electric appliances according to IEC 529, DIN 40050 and NFC 20-010.

IP
(ingress protection)

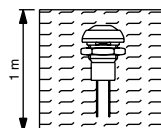
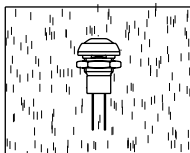
6
Totally protected
against dust

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

**SOLDER LUG
VERSION**



**WIRE LEAD
VERSION**



The above illustrations show non-illuminated models.

IP series

Momentary pushbutton switches for harsh environments

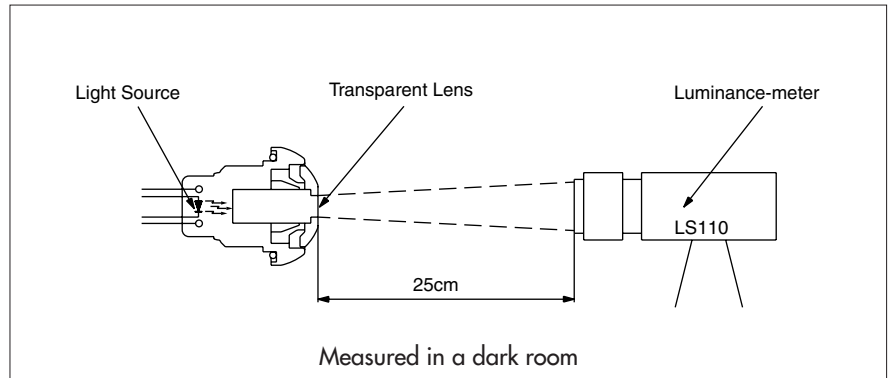
LUMINANCE MEASUREMENT MODE

Test conditions

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

* in our lab conditions

For blue and white Led, consult factory.



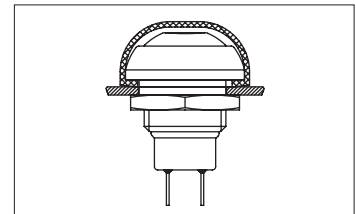
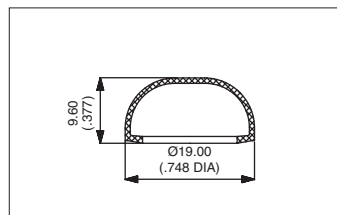
ADDITIONAL SEALING

For ROUND plungers only, illuminated or non-illuminated.

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

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

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



IA series

Low profile pushbutton switches for harsh environments

Distinctive features - Specifications - Overview

- ☐ Resistant to frost, sand and hydrocarbons
- ☐ Tactile feedback
- ☐ Front panel sealed to IP 67

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 VAC rms
- Electrical life at full load : 1 000.000 cycles
- **Torque : 0,5 to 1Nm applied to nut**
- Panel thickness : 7 mm (.276) max.
- Total travel : 1,5 mm +/- 0,3 (.059 +/- .012)
- Operating force : 6,5 N ±2N

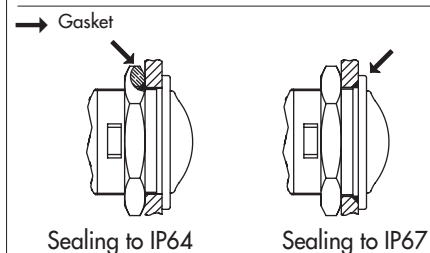
MATERIALS

- Case/bushing : thermoplastic
- Actuator : polyurethane
- Contacts : silver
- Terminal seal : epoxy

ENVIRONMENTAL SPECIFICATIONS

- Front panel sealing (see drawings opposite) :
 - With gasket above the panel : IP67
 - With gasket under the panel : IP64
- Operating temperature : -20°C to +65°C

PANEL MOUNTING



IA

SERIES

Shape

R round

Electrical function

3 Normally open (NO)
5 NC/NO combined

Terminals

F Wire leads

Contacts

1 Silver

Plunger colours

1 Blue
2 Black
3 Green
5 Yellow
6 Red
7/1 White
9 Orange

Case colour

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 section H.



Mounting accessories : Standard hardware supplied : 1 hex nut 19 mm (.748) across flats and 1 gasket. Knurled nut U3327 available on request. This nut is presented in Section I.

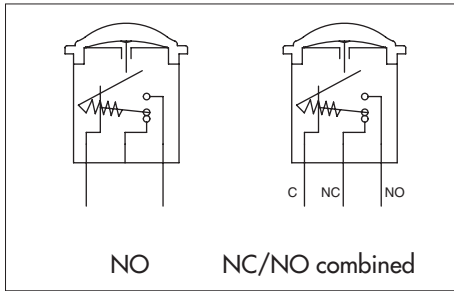


Packaging unit : 25 pieces

IA series

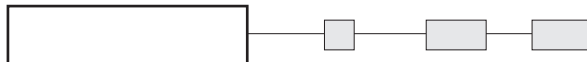
Low profile pushbutton switches for harsh environments

Bushing Ø 16 (.629)



- Panel cut-out Ø 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

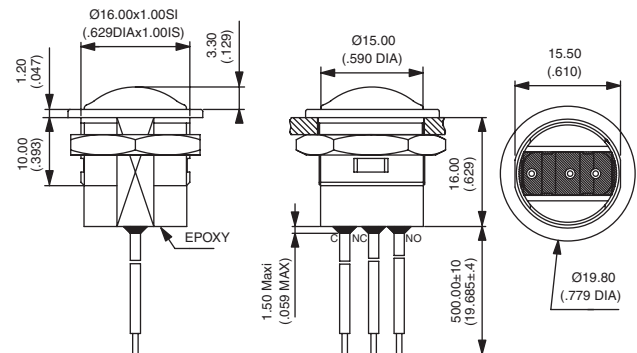


Normally open (NO)

IAR3F

NC/NO combined

IAR5F



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

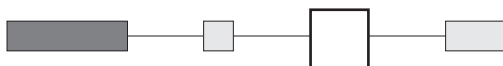
CONTACT MATERIAL



1

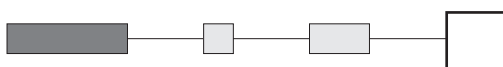
Silver

PLUNGER COLOUR



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

CASE COLOUR

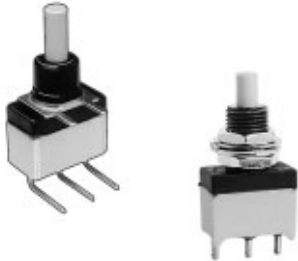


00 : black

SP series

Washable snap-action pushbutton switches

Distinctive features and specifications



☐ Sealed

- Secure assembly of the two case parts
- Internally sealed bushing
- Epoxy sealed terminals

☐ Process compatible (plain bushing models)

- Wave solderable
- Washable

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - gold plated brass contacts : 100mA 30VDC
 - silver or gold plated silver contacts : 1A 120VAC - 1A 30VDC
- Initial contact resistance : 50 mΩ max.
- Insulation resistance : 1.000 MΩ min.
- Dielectric strength : 1.000 Vrms 50 Hz min.
- Electrical life : 60.000 cycles

MATERIALS

- Case and cover : UL94-V0, polyamide, glass filled or PES
- Actuator : polyamide, glass filled
- Contacts
 - 0 : brass, gold plated
 - 1 : silver
 - 2 : silver, gold plated
- Terminal seal : epoxy

GENERAL SPECIFICATIONS

- Torque : 0,25 Nm (.18 Ft.lb) applied to nut (threaded bushing)
- Total travel : 0,50 mm (.019)
- Mechanical strength :
Terminals are strengthened by a bracket or a ground plate ensuring the rigidity of the switch on the board. Actuator strength is 10N max.
- Operating temperature : -20°C to +85°C
- Storage temperature : -40°C to +85°C
- Moisture :
The insulating materials employed and the complete seal permit the switches to withstand a 56 days moisture test (IEC 68-2-3).
- Soldering - thermal shock (plain bushing models only) :
The switches are especially designed for flow soldering at 260°C during 5 seconds owing to high temperature polymer parts.
- Iron soldering (threaded bushing models) : 300°C max., 5 seconds max.
- Solderability : The switches are tested at 235°C according to IEC 68-2-20 after accelerated aging.

AGENCY APPROVAL



Availability : all models with silver or gold plated silver contacts.

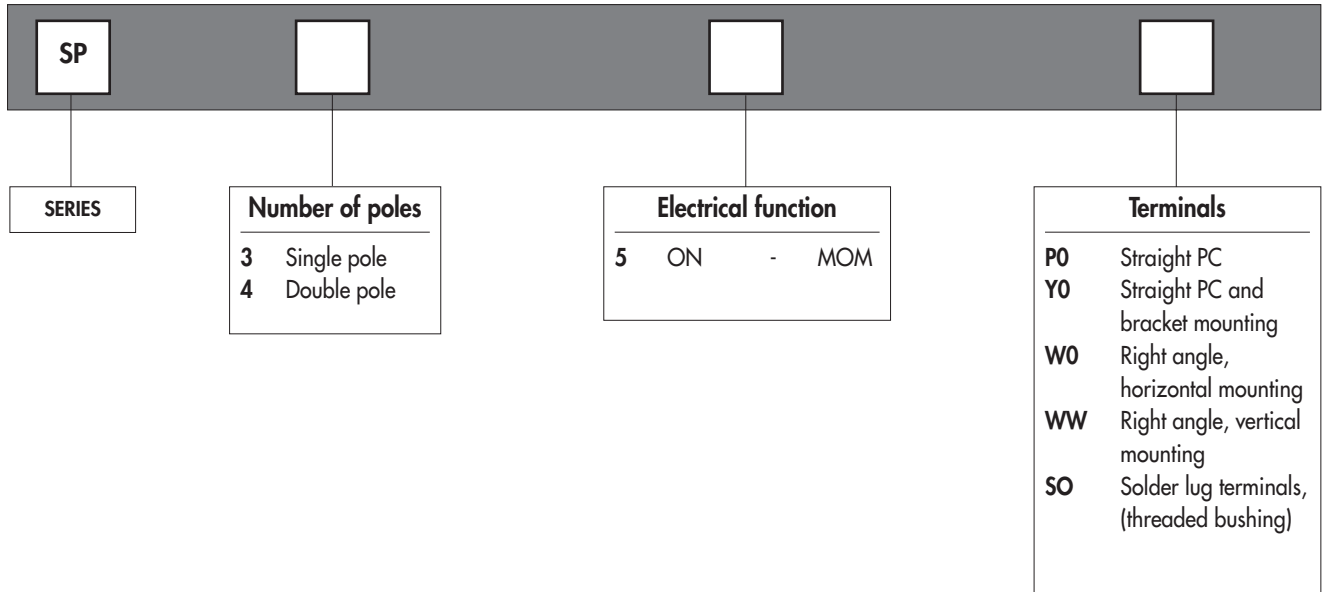
Marking : to order switches marked UL, complete appropriate box of ordering format.

SP series

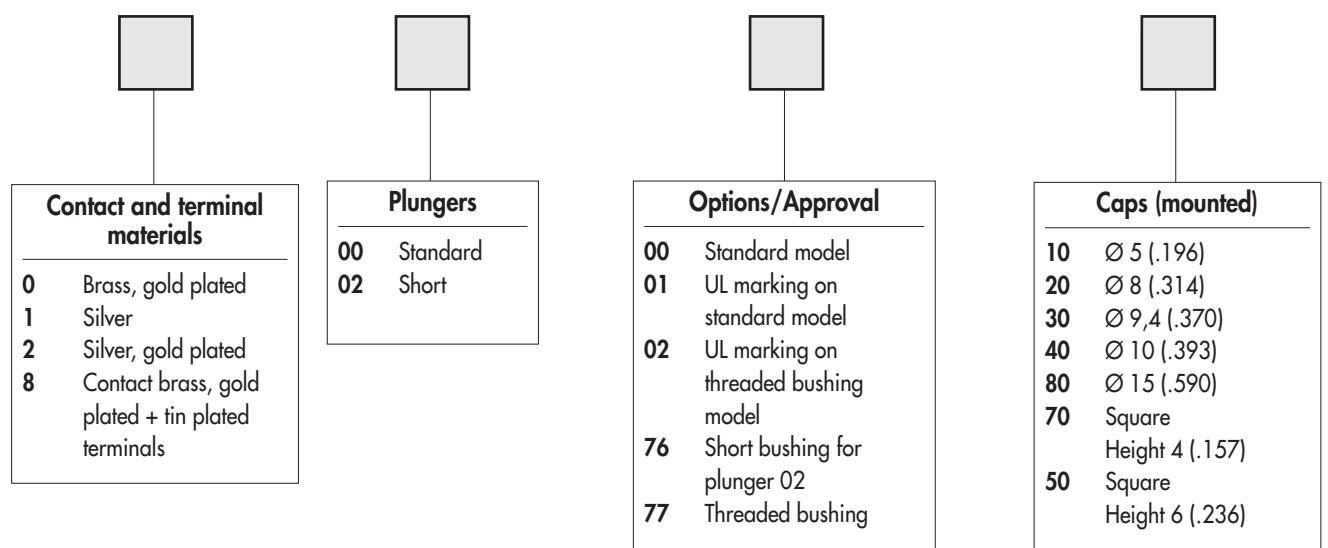
Washable snap-action pushbutton switches

Overview

MODEL
STRUCTURE



OPTIONS



ABOUT THIS SERIES

On the following pages, you will find successively :

- model structure of switches
- options in the same order as above

Specifications are on previous page.

Dimensions : first dimensions are in mm while inches are shown as bracketted numbers.



Mounting accessories : standard hardware supplied with all models with Ø 6,35 (1/4) threaded bushing :

2 hex nuts 8 mm (.314) across flats, 1 locking ring and 1 lockwasher.

Standard and special hardware available are presented in section I.



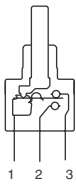
Packaging unit : 25 or 50 pieces depending on model.

SP series

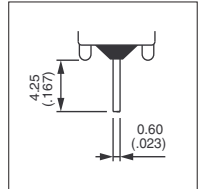
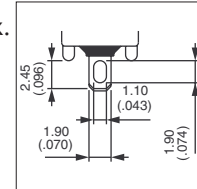
Washable snap-action pushbutton switches

Plain or threaded bushing

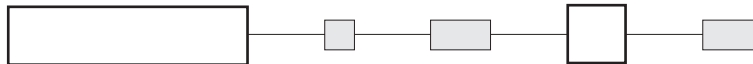
MODEL
STRUCTURE



- Solder lug, straight PC or right angle terminals
- Features of threaded bushing models :
 - max. torque : 0,25 Nm (.18 Ft.lb)
 - iron soldering : 300°C max., 5 seconds max.
- 1 and 2 pole configurations



MODEL
STRUCTURE



Shown with standard plunger

Plain bushing - straight PC terminals



Single pole

SP35P0... 00

Double pole

SP45P0... 00



1-3



1-2

ON

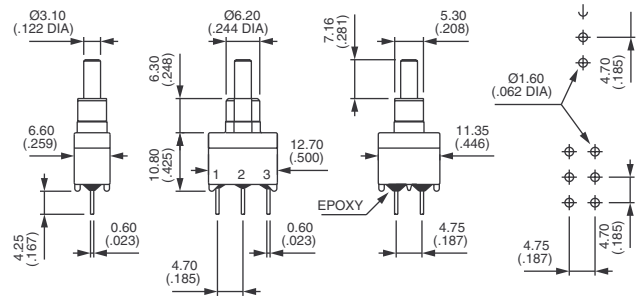
-

MOM

ON

-

MOM



Plain bushing - bracket mounting



Single pole

SP35Y0... 00

Double pole

SP45Y0... 00



1-3



1-2

ON

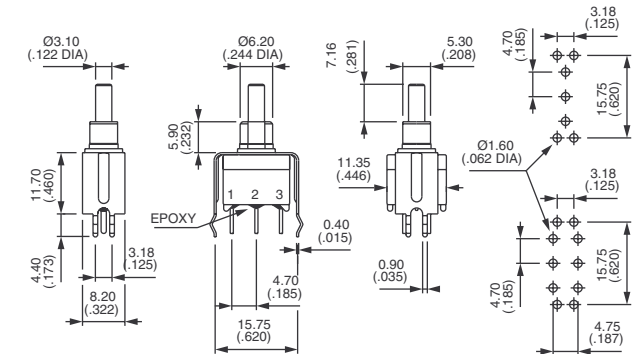
-

MOM

ON

-

MOM



Plain bushing - right angle terminals - horizontal



Single pole

SP35W0... 00

Double pole

SP45W0... 00



1-3



1-2

ON

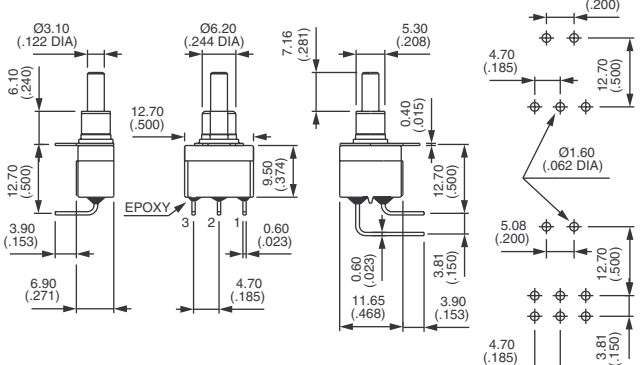
-

MOM

ON

-

MOM



Washable snap-action pushbutton switches

Plain or threaded bushing

Shown with standard plunger

Plain bushing - right angle terminals - vertical



Single pole

SP35WW... 00

Double pole

SP45WW... 00



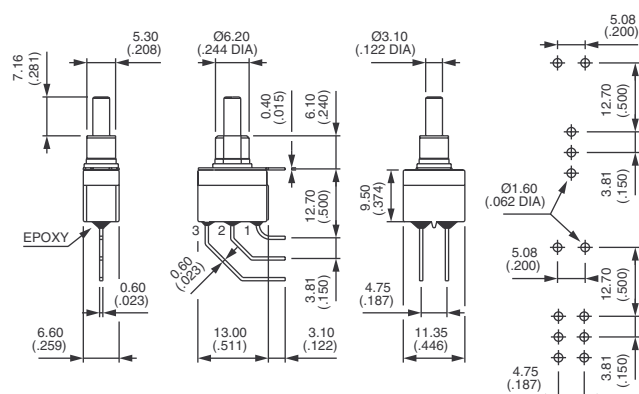
1-3



1-2

ON - MOM

ON - MOM



Threaded bushing - solder lug terminals



Single pole

SP35S0... 77

ON - MOM



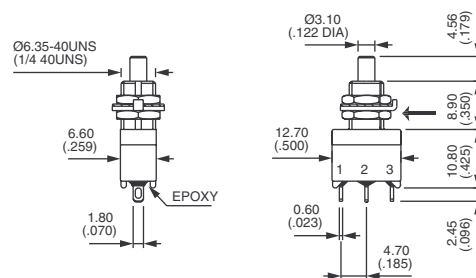
1-3



1-2

ON - MOM

→ Keyway



Threaded bushing - straight PC terminals



Single pole

SP35P0... 77

ON - MOM



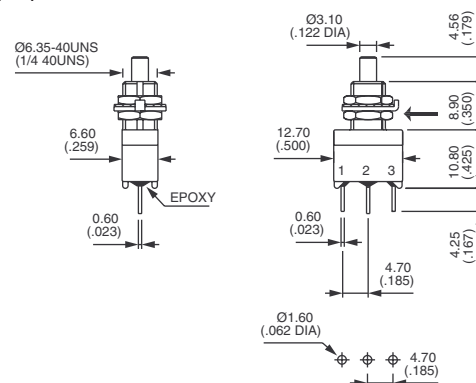
1-3



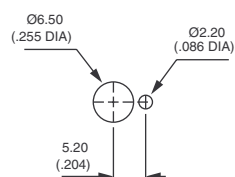
1-2

ON - MOM

→ Keyway



PANEL CUT-OUT



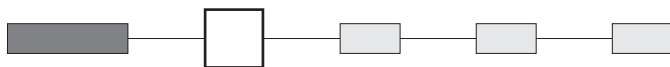
SP series

Washable snap-action pushbutton switches

OPTIONS



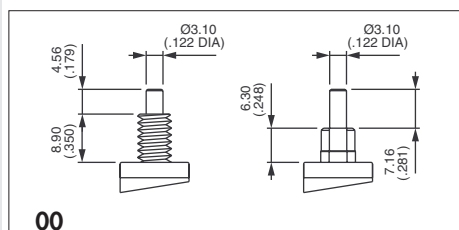
CONTACT AND TERMINAL MATERIALS



- 0 Brass, gold plated
- 1 Silver
- 2 Silver, gold plated
- 8 Contact brass, gold plated + tin plated terminals

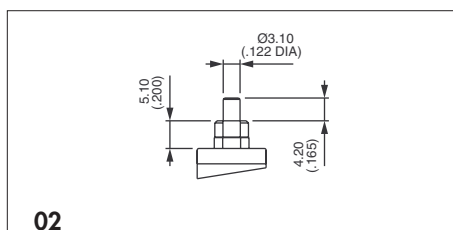
B

PLUNGERS



00

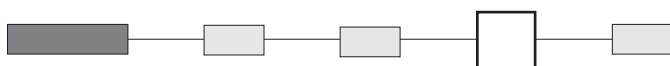
Standard plunger



02

Short (for models with plain bushing, single pole only)
Order with option 76 below.

OPTIONS / AGENCY APPROVAL



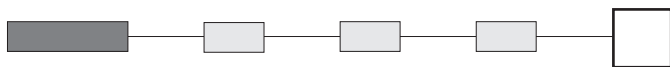
- 00 Standard model
- 01 UL marking for standard model
- 02 UL marking for threaded bushing model
- 76 Short plain bushing for 02 plunger (single pole models only)
- 77 Threaded bushing
(included in model numbers on previous page)



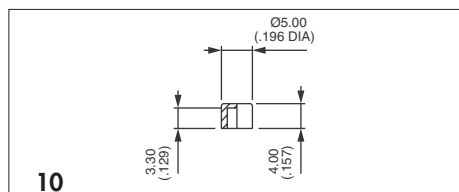
SP series

Washable snap-action pushbutton switches

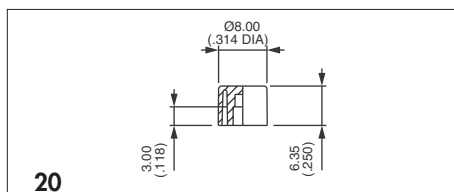
CAPS



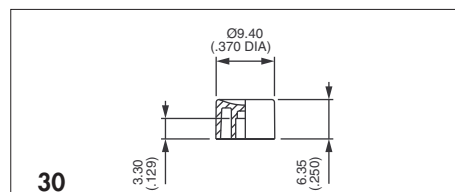
Blank Without cap



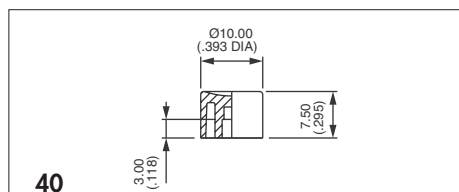
10
P/N U2400



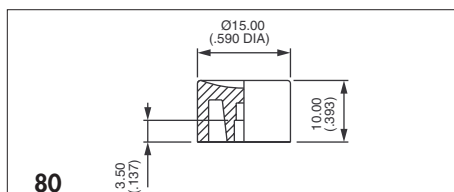
20
P/N U2510



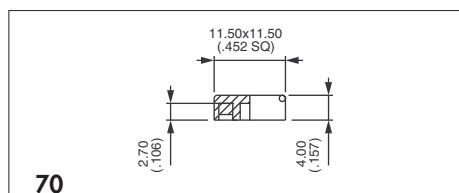
30
P/N U2130



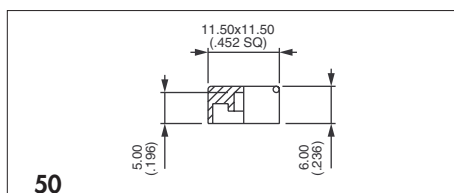
40
Standard - P/N U2900



80
P/N U3400
Not available with plunger 02



70
Square - P/N U910



50
Square - P/N U2340
Not available with plunger 02

Cap colours

Replace last
"0" by number

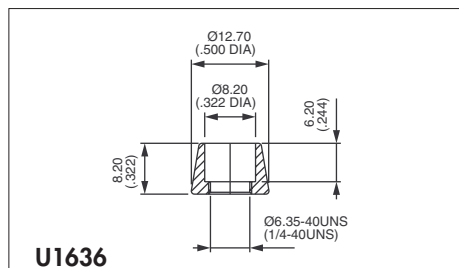
1	blue
1/4	dark blue
2	black
3	green
4	grey
5	yellow
6	red
7	ivory
7/1	white
9	orange

To order caps separately, use their P/N (U...) (for threaded bushing order only separately).

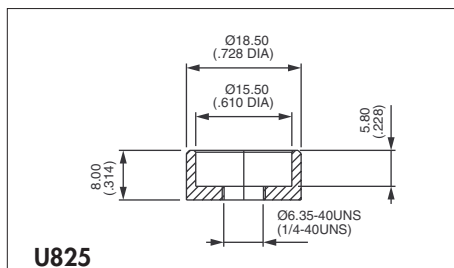
DRESS NUTS

Chrome plated

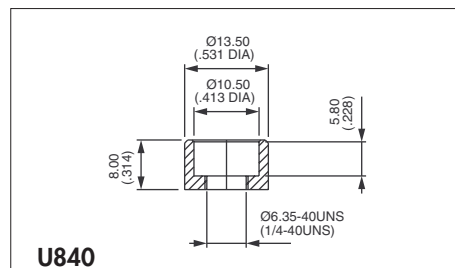
For threaded bushing models only.



U1636
For cap U2510



U825
For cap U3400



U840
For cap U2900

Dress nuts are to be ordered separately.

8000 series

Momentary or alternate action pushbutton switches

Distinctive features and specifications



❑ Bushing Ø 6,35 (1/4) and Ø 11,9 (15/32)

❑ UL approved

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - silver contacts : 3A 250VAC - 6A 125VAC - 4A 30VDC
 - gold plated contacts : 0,4VA max. 20VAC or DC
- Initial contact resistance : 10 mΩ max.
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength :
 - 1.000 Vrms 50 Hz min. between terminals
 - 2.000 Vrms 50 Hz min. between terminals and frame
- Electrical life : 30.000 cycles at full load

MATERIALS

- Case : diallylphthalate (DAP)
- Actuator : brass, nickel plated
- Bushing : brass, nickel plated
- Housing : stainless steel
- Contacts
 - A** : silver
 - AD** : silver, gold plated
 - CD** : brass, gold plated
- Terminal seal : epoxy

GENERAL SPECIFICATIONS

- Torque : 1,25 Nm (.922 Ft.lb) max. applied to nut
- Total travel : 2,70 mm (.106)
- Operating temperature :
 - 40°C to +85°C

AGENCY APPROVAL



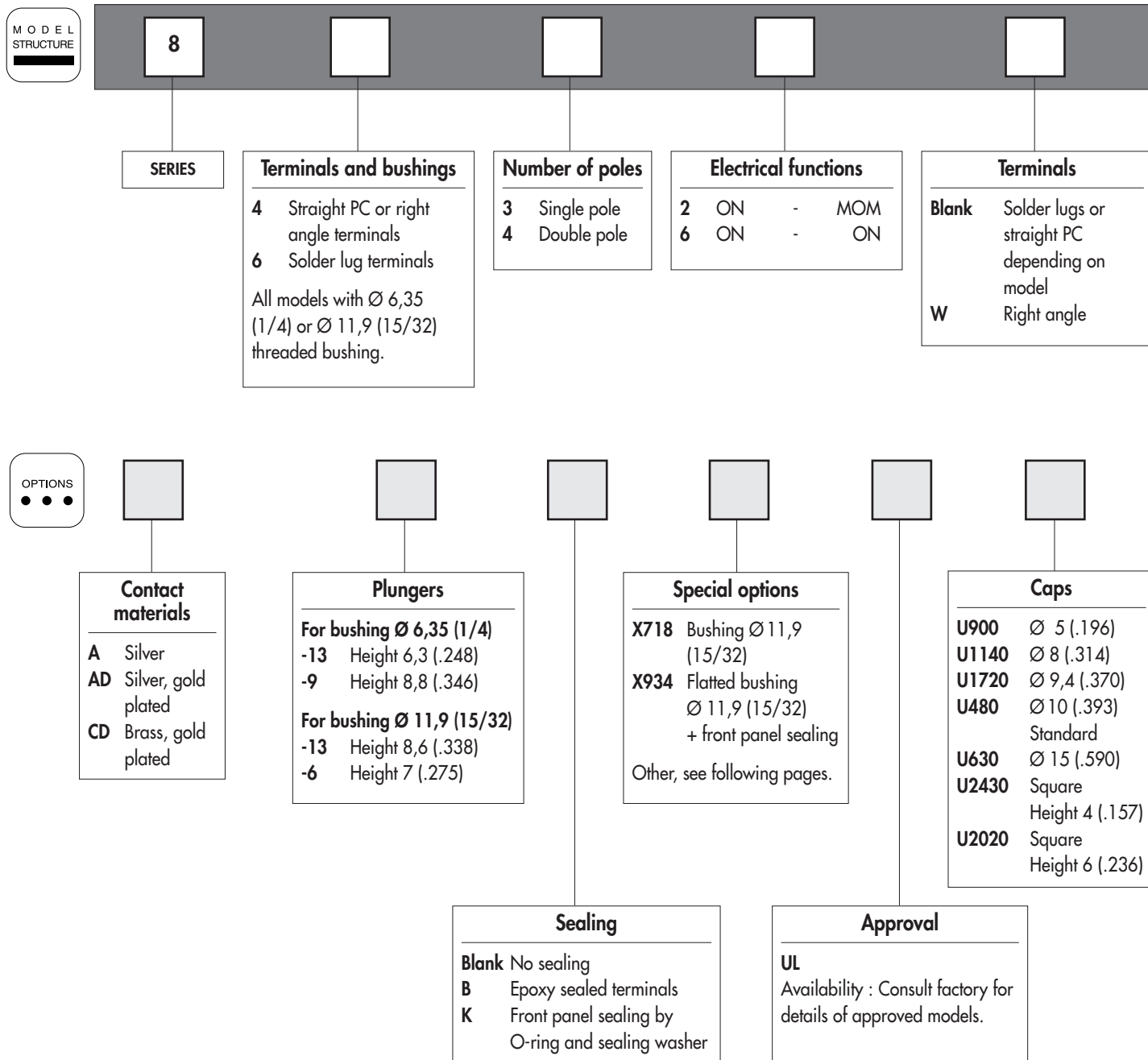
Availability : consult factory for details of approved models.

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

8000 series

Momentary or alternate action pushbutton switches

Overview



ABOUT THIS SERIES

On the following pages, you will find successively :

- model structure of switches
- options in the same order as in above chart

Dimensions : first dimensions are in mm while inches are shown as bracketted numbers.



Sealing boots are available to protect the switches against dust and water. They are presented in section H.



Mounting accessories : standard hardware supplied with all models : 2 hex nuts 8 mm (.314) across flats, 1 locking ring and 1 lockwasher.

Standard and special hardware available are presented in section I.



Packaging unit : 50 pieces, except 8000W (25 pieces).

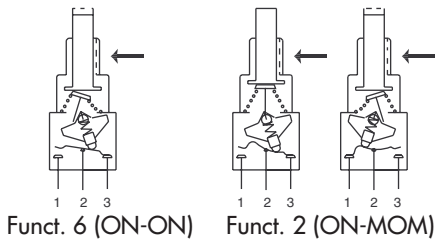
8000 series

Momentary or alternate action pushbutton switches

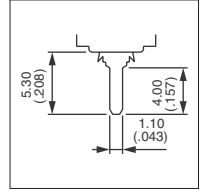
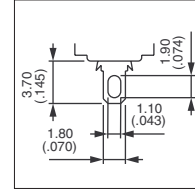
Threaded bushing $\varnothing 6,35$ (1/4)

MODEL
STRUCTURE

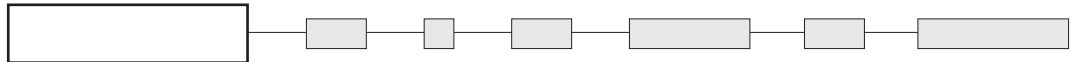
→ Keyway



- Solder lug, straight PC or right angle terminals
- 1 and 2 pole configurations
- Button returns in upper position after actuation.



MODEL
STRUCTURE



Shown with standard plunger (-13)

Solder lug terminals : 8600



Single pole
8632
8636

Double pole
8642
8646



2-3

ON
ON



1-2

MOM
ON

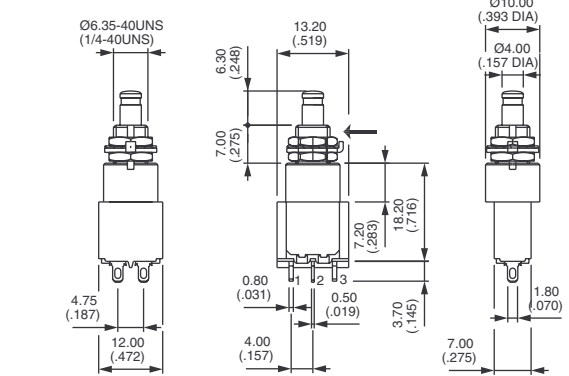
2-3
5-6

ON
ON

1-2
4-5

MOM
ON

→ Keyway



Straight PC terminals : 8400



Single pole
8432
8436

Double pole
8442
8446



2-3

ON
ON



1-2

MOM
ON

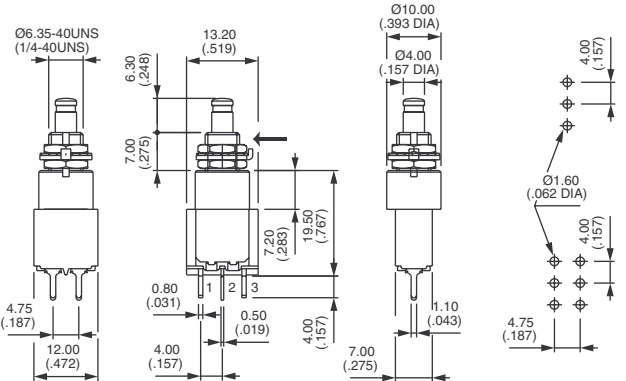
2-3
5-6

ON
ON

1-2
4-5

MOM
ON

→ Keyway



Right angle terminals - horizontal : 8400W



Single pole
8432W
8436W

Double pole
8442W
8446W



2-3

ON
ON



1-2

MOM
ON

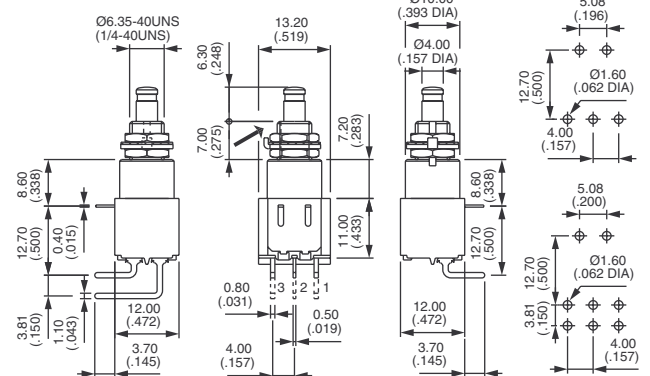
2-3
5-6

ON
ON

1-2
4-5

MOM
ON

→ Keyway

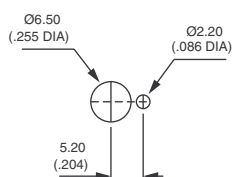




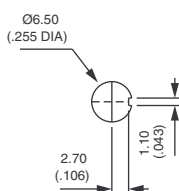
8000 series

Momentary or alternate action pushbutton switches

PANEL CUT-OUT

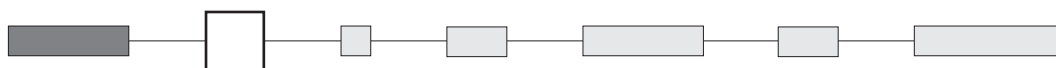


Standard



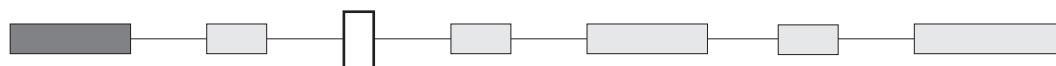
With K sealing option

CONTACT MATERIALS



A	Silver
AD	Silver, gold plated
CD	Brass, gold plated

SEALING



Blank No sealing

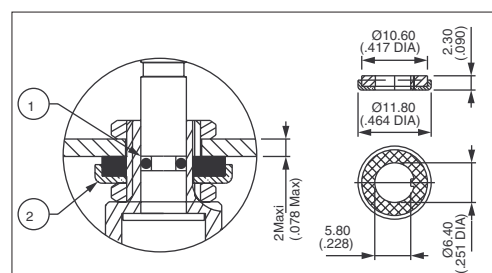
B Epoxy sealed terminals



K Front panel sealing by one O-ring and sealing washer. Protects the switch against water and dust. Panel seal withstands 1 bar pressure and remains sealed even when switch is operated.

KB Combined sealings

Sealing boot : see section H.



- ① O-ring
- ② Sealing washer

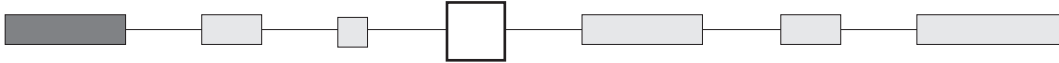
8000 series

Momentary or alternate action pushbutton switches

OPTIONS

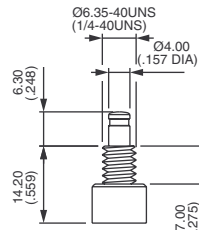


PLUNGERS



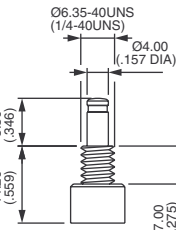
For Ø 6,35 (1/4) bushing

Dash compulsory before plunger code.



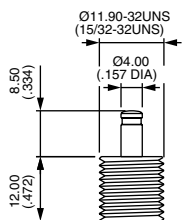
-13

Standard

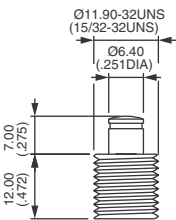


-9

For Ø 11,9 (15/32) bushing (X718 models)



-13



-6

SPECIAL OPTIONS

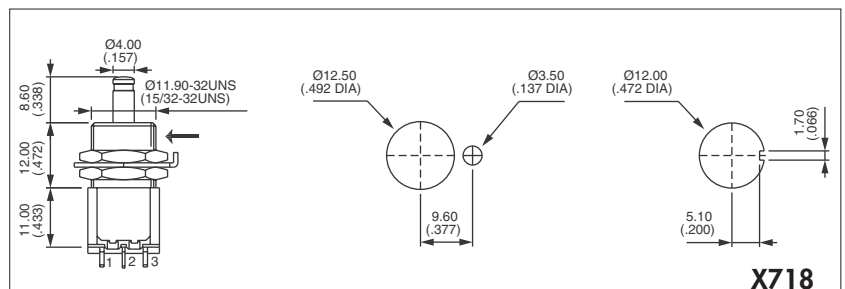


X601 Silver plated brass contacts

Current/voltage rating for an electrical life of 20.000 cycles :
0,2A 250VAC - 0,4A 125VAC - 0,5A 30VDC.
Minimum quantity : 5.000 pieces per model and shipment.

→ Keyway or flat

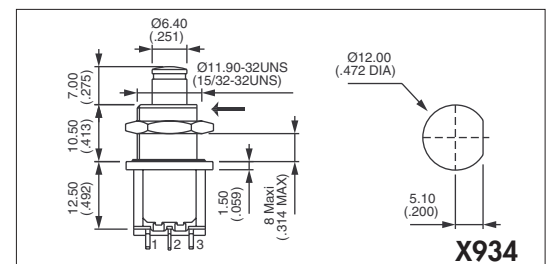
X718 Bushing Ø 11,9 (15/32)
For all basic models (solder lug
straight PC or right angle terminals)
Available with plungers 13 and 6.
K sealing option available.



X718

X748 Snap-in mounting. Consult factory
Panel cut-out 15 x 12,5 (.59 x .492)

X934 Flatted bushing Ø 11,9 (15/32) + sealing by two O-rings
(for plunger -6 only)



X934

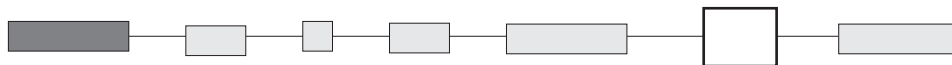
F Tin dipped terminals
For PC terminal models with gold plated contacts only.
Order with option B (epoxy sealing).



8000 series

Momentary or alternate action pushbutton switches

APPROVAL

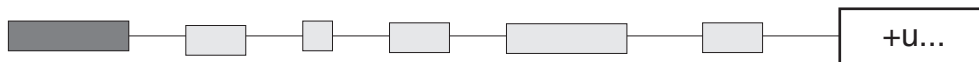


UL

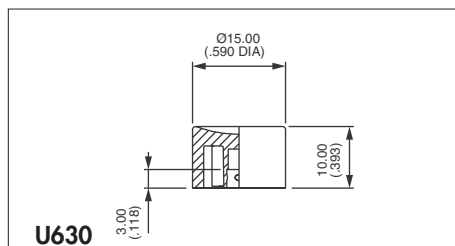
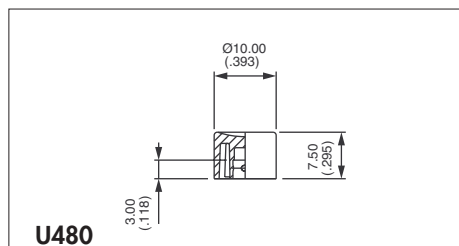
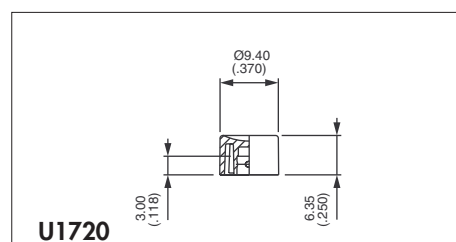
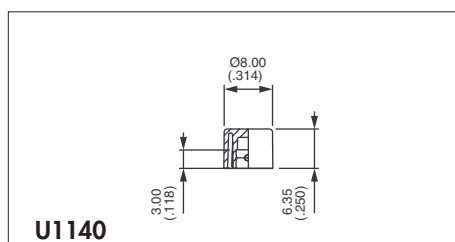
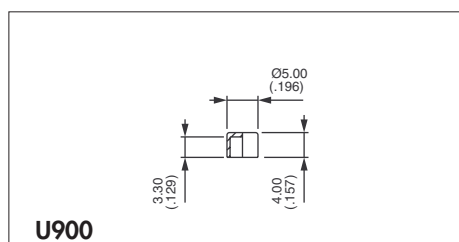
Availability : consult factory for details of approved models.

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

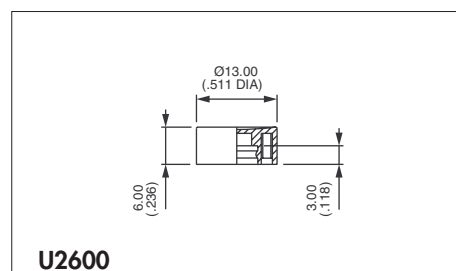
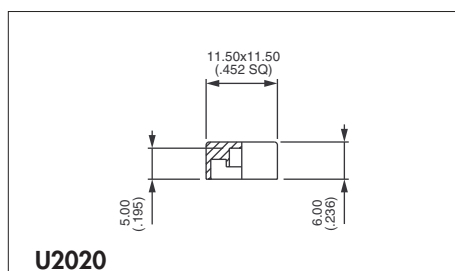
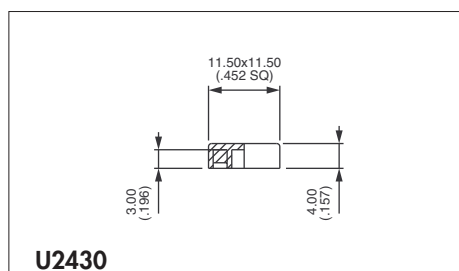
CAPS



The caps below are for Ø 4 mm plungers (-13 and -9), except U2600.

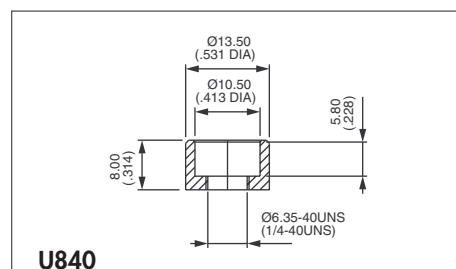
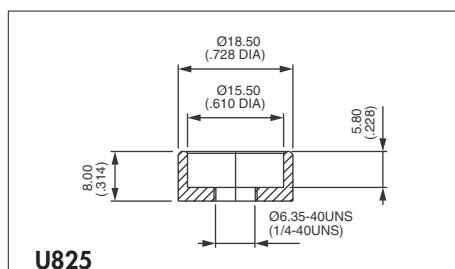
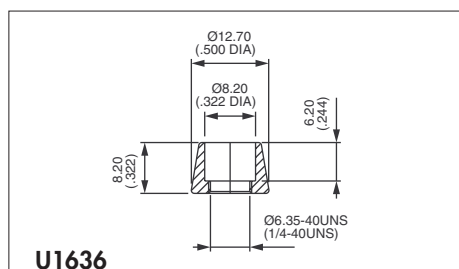


Cap colours			
Replace last "0" by number			
1	blue	5	yellow
1/4	dark blue	6	red
2	black	7	ivory
3	green	7/1	white
4	grey	9	orange



DRESS NUTS

Chrome plated. Order separately.



9000 series

Momentary pushbutton switches

Distinctive features and specifications



- ☐ Two case lengths
- ☐ Three electrical functions
- ☐ Sealing options
- ☐ Model X1146 with Ø 16 (.630) bushing

B

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - silver contact (A) : 0,3A 250VAC - 0,6A 125VAC - 1A 30VDC
 - gold plated contacts (CD) : 100mA 30VDC
- Initial contact resistance : 50 mΩ max.
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength :
 - 1.000 Vrms 50 Hz min. between terminals
 - 1.500 Vrms 50 Hz min. between terminals and frame
- Electrical life : 250.000 cycles

MATERIALS

- Case : thermoplastique UL94-V0
- Actuator : polyamide, glass filled
- Bushing : brass, nickel plated
- Contacts :
 - A** : silver
 - CD** : brass, gold plated
- Terminal seal : epoxy

GENERAL SPECIFICATIONS

- Total travel :

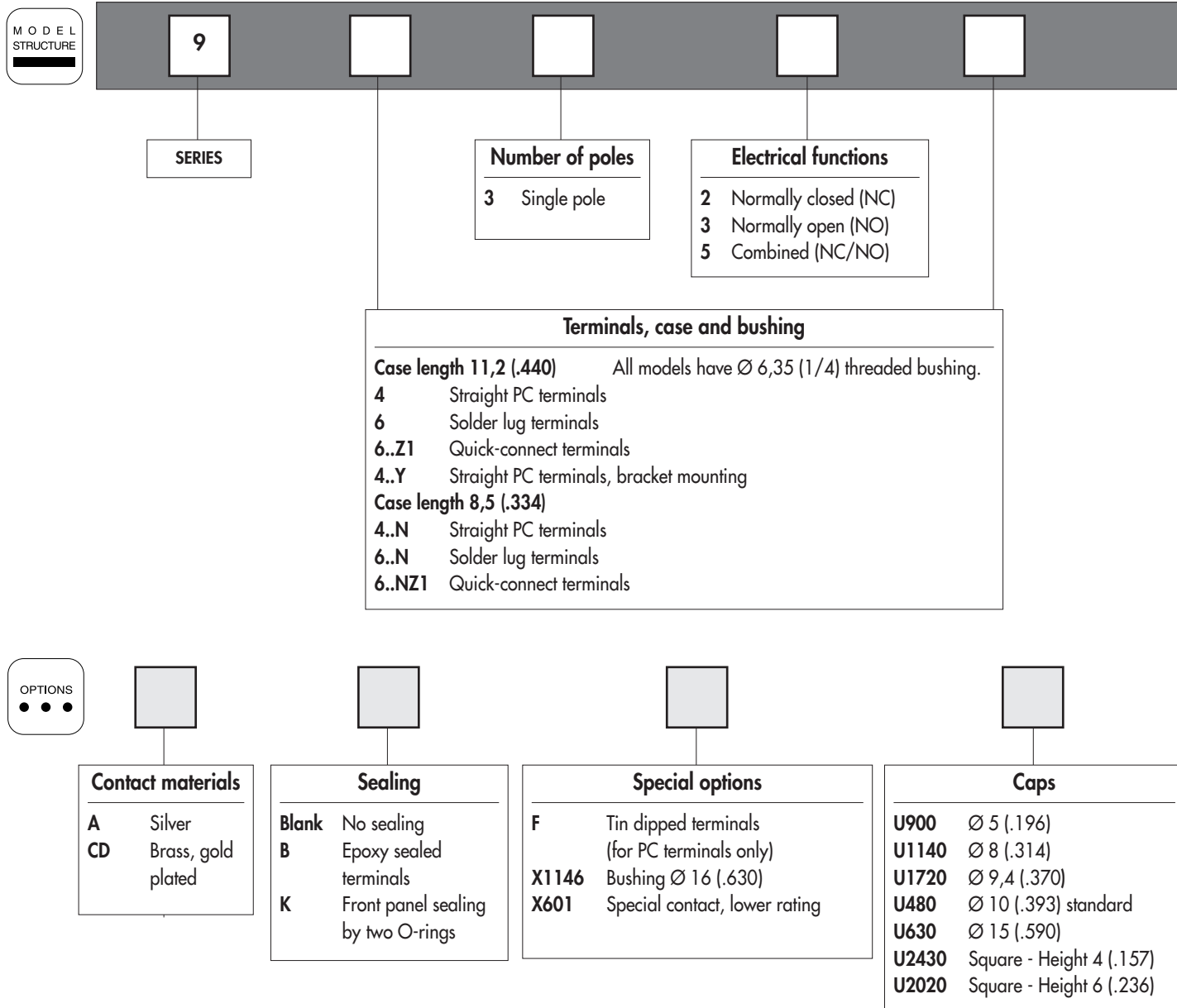
9600-9400-9400Y		9600N-9400N
Functions 3 and 5	Function 2	Function 3
1,3 mm	2 mm	0,9 mm

- Torque : 1,25 Nm (.922 Ft.lb) max. applied to nut
- Operating temperature : -30°C to +65°C

9000 series

Momentary pushbutton switches

Overview



ABOUT THIS SERIES

On the following pages, you will find successively :

- model structure of switches
- their 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.



Sealing boots are available to protect the switches against dust and water. They are presented in section H.



Mounting accessories : standard hardware supplied with all switches : 2 hex nuts 8 mm (.314) across flats and 1 lockwasher. Standard and special hardware available are presented in section I.



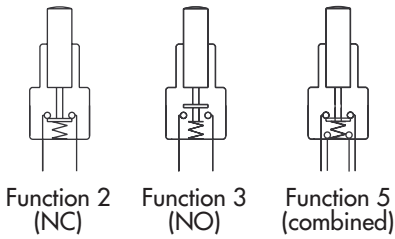
Packaging unit : 50 pieces, except for 9400Y (25 pieces)

9000 series

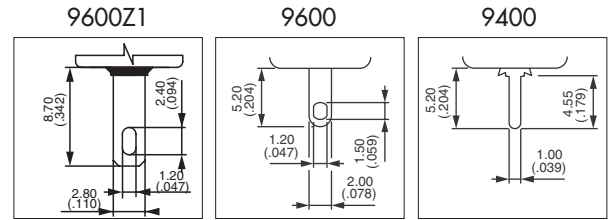
Momentary pushbutton switches

9600 - 9400 - 9400Y

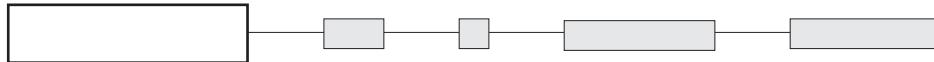
MODEL
STRUCTURE



- Single pole
- Solder lug or straight PC terminals



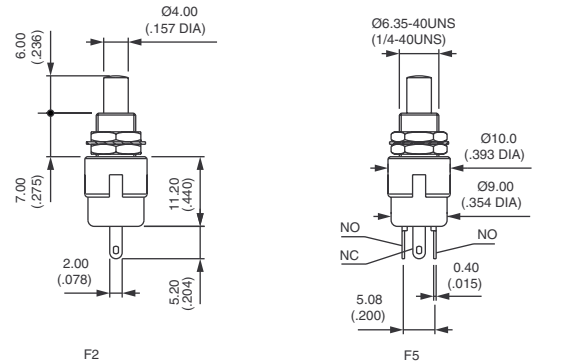
MODEL
STRUCTURE



Solder lug terminals - case length 11,2 (.440) : 9600



9632		Normally Closed
9635		Combined function

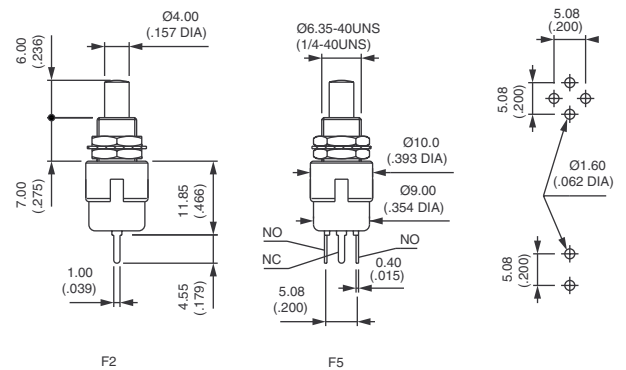


For Normally Open (function 3), see next page
Also available with quick-connect terminals : **9632Z1** or **9635Z1**

Straight PC terminals - case length 11,2 (.440) : 9400



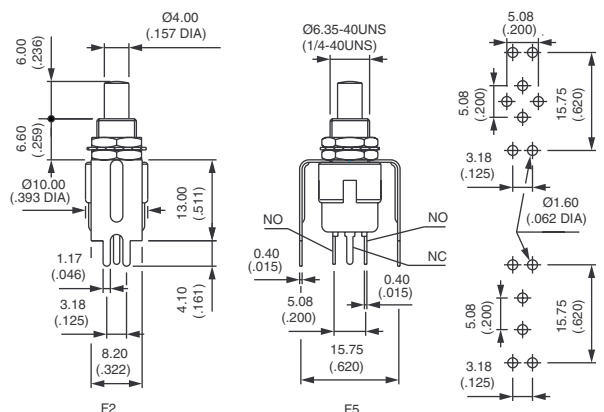
9432		Normally Closed
9433		Normally Open
9435		Combined function



Bracket mounting - case length 11,2 (.440) : 9400Y



9432Y		Normally Closed
9433Y		Normally Open
9435Y		Combined function



The bracket is not fastened to the switch.

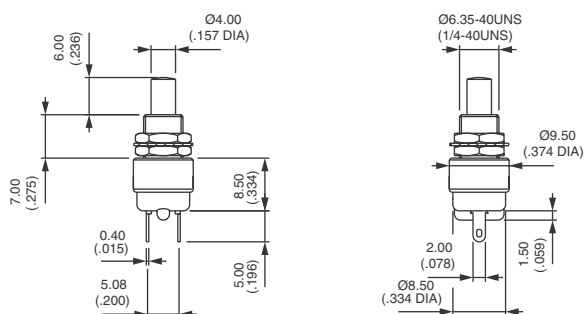
Solder lug terminals - case length 8,5 (.334) : 9600N



9633N



Normally Open



Also available with quick-connect terminals 2,8 x 0,5 mm : 9633NZ1

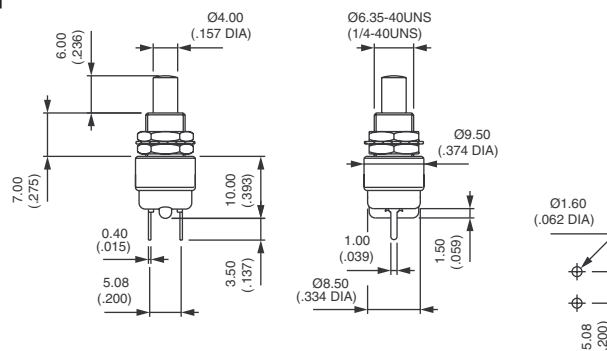
Straight PC terminals - case length 8,5 (.334) : 9400N



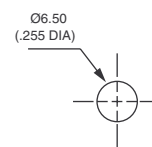
9433N



Normally Open



PANEL CUT-OUT



Bushing Ø 16 (.630) - metal button : 9633•X1146



Silver contacts
9633AX1146

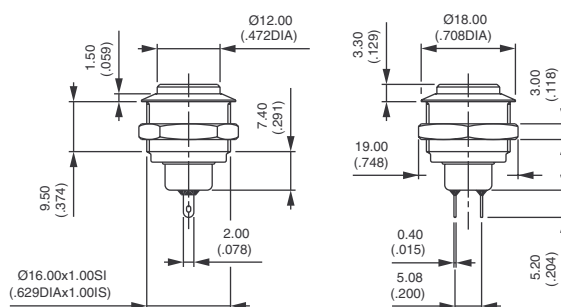


Normally open

Gold plated silver contacts
9633ADX1146



Normally open



Hex nut 19 (.748) across flats

Panel cut-out : Ø 16,2 (.637)

Max. current/voltage rating : 0,3A 250VAC - 1A 30VDC

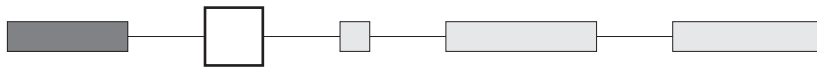
Epoxy sealed terminals. Options of the following pages not applicable.

9000 series

Momentary pushbutton switches

OPTIONS
● ● ●

CONTACT MATERIALS



A Silver
CD Brass, gold plated

Special contact, lower rating : see X601 under "Special options".

SEALING



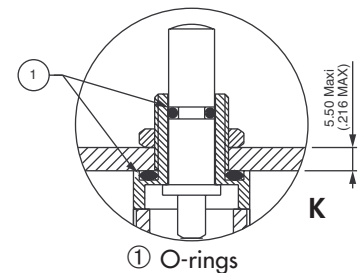
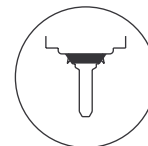
Blank No sealing

B Epoxy sealed terminals

K Front panel sealing by two O-rings. Protects the switch against water and dust.
Panel seal withstands 0,1 bar pressure and remains tight even when switch is operated.

KB Combined sealings

Sealing boots : see section H.



SPECIAL OPTIONS



F **Tin dipped terminals**
For PC terminal models with gold plated contacts only.
Order with option B (epoxy sealing)

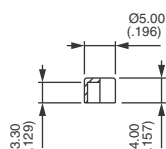
X601 **Silver plated brass contacts**
Current/voltage rating for an electrical life of 20.000 cycles :
0,2A 250VAC - 0,4A 125VAC - 0,5A 30VDC.
Minimum quantity : 5.000 pieces per model and shipment.



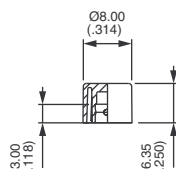
9000 series

Momentary pushbutton switches

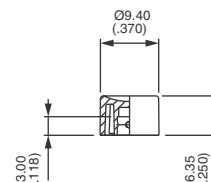
CAPS



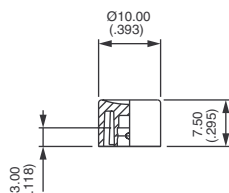
U900



U1140

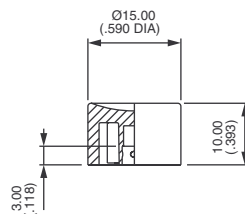


U1720

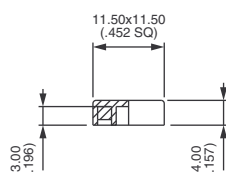


U480

Standard

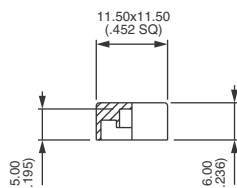


U630



U2430

Square



U2020

Square

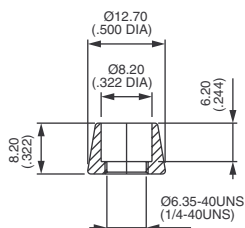
Cap colours

Replace last "0" by number

1	blue
1/4	dark blue
2	black
3	green
4	grey
5	yellow
6	red
7	ivory
7/1	white
9	orange

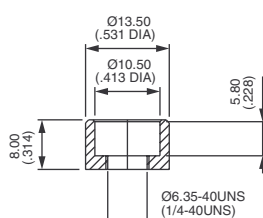
DRESS NUTS

Chrome plated



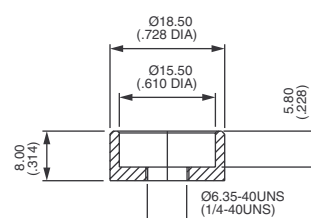
U1636

For cap U1140



U840

For cap U480



U825

For cap U630

Dress nuts are to be ordered separately.

9000 series

Alternate action or momentary pushbutton switches

Distinctive features and specifications

☐ Bushing Ø 6,35 (1/4) and 11,9 (15/32)

☐ Three electrical functions

B

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load and electrical life :
 - silver contacts (A) : 0,5A 250VAC - 1A 28VDC - 250.000 cycles
 - 1,5A 250VAC - 3A 28VDC - 10.000 cycles
- gold plated contacts (CD) : 0,4VA 20V max. AC or DC
- Initial contact resistance : 10 mΩ max. at 0,1A 3VDC
- Insulation resistance : 10.000 MΩ min.
- Dielectric strength :
1.000 Vrms 50 Hz min.

MATERIALS

- Case : diallylphthalate
- Actuator : nylon
black for series 9630M
white for series 9631
- Bushing : brass, nickel plated
- Contacts :
 - A** : silver
 - CD** : brass, gold plated
- Terminal seal : epoxy

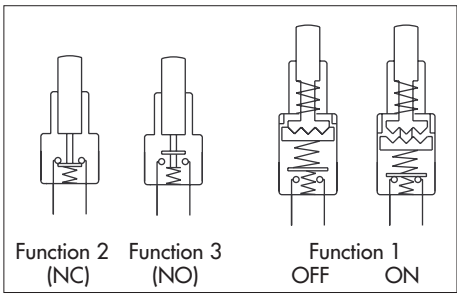
GENERAL SPECIFICATIONS

- Operating temperature : -30°C to +85°C
- Travels : see table below.

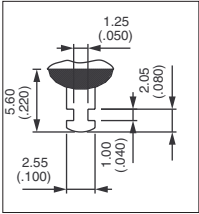
MODELS	9631	9633M	9632M
Total travel	3,48 (.137)	2,79 (.110)	1,40 (.055)
Pre-travel	0,66 (.026)	-	0,51 (.020)
Over travel	2,69 (.106)	0,51 (.020)	-

9000 series

Alternate action or momentary pushbutton switches



- Single pole
- Solder lug terminals
- Epoxy sealed terminals

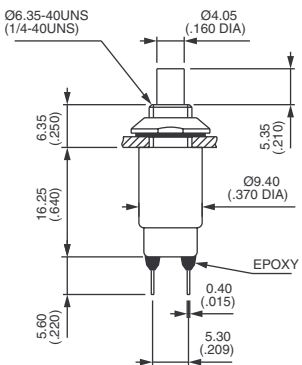


B

Bushing Ø 6,35 (1/4) - Alternate action - tactile feedback



Gold plated contacts 9631CDB	ON	-	OFF
Silver contacts 9631AB	ON	-	OFF

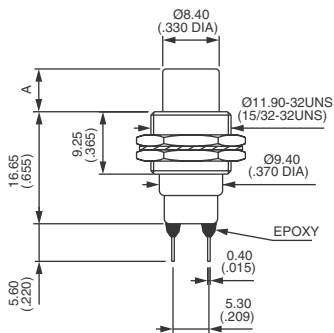


Standard hardware : 1 conic nut and 1 lockwasher

Bushing Ø 11,9 (15/32) - front or rear mounting - NO or NC



9633MCDB		Normally open
9632MCDB		Normally closed



MODEL	A
9633M	6.35 (.250)
9632M	5.70 (.225)

Standard hardware : 2 hex nuts 14 mm (.551) across flats and 1 lockwasher

10400 series

Professional pushbutton switches - threaded bushing Ø 10 (.393)

Distinctive features and specifications

☐ CECC approved

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
2A 220VAC - 3A 110VAC - 3A 24VDC
- Minimum load : 100µA 10mV
- Initial contact resistance : 10 mΩ max.
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength :
1.000 Veff. 50 Hz min. between terminals of the same pole
2.000 Veff. 50 Hz min. between terminals and frame
2.000 Veff. 50 Hz min. between terminals of adjacent poles
- Electrical life : 50.000 cycles

MATERIALS

- Case : diallylphthalate (DAP)
- Actuator : brass, chrome plated
- Bushing : brass, nickel plated
- Housing : brass, nickel plated
- Contacts :
 - silver
 - gold plated silver
- Terminal seal : epoxy

APPROVAL



CECC 96401-001

Availability : consult factory for details of approved models.

Marking : to order switches marked CECC, add "CECC" to model number.

GENERAL SPECIFICATIONS

- Torque : 1,50 Nm (1.106 Ft.lb)
max. applied to nut
- Operating temperature :
-40°C to +85°C
- Max. panel thickness :
3,5 mm (.138)

ABOUT THIS SERIES

Complete part numbers are shown on the following page.

Dimensions : first dimensions are in mm while inches are shown as bracketted numbers.



Sealing boots are available to protect the switches against dust and water. They are presented in section H.



Mounting accessories : standard hardware supplied with all models : 1 knurled nut, 1 hex nut, 1 locking ring and 1 lockwasher. They are presented in section I.

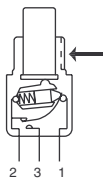


Packaging unit : 25 pieces.

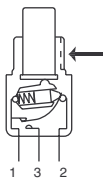
10400 series

Professional pushbutton switches - threaded bushing Ø 10 (.393)

→ Keyway

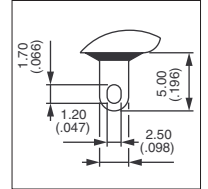


Single pole



Double pole

- 1 and 2 pole configurations
- Available with matt black finish : consult factory for model number



MODEL
STRUCTURE



B

Single pole

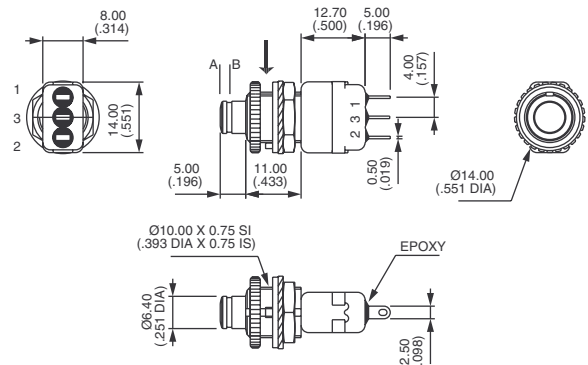
→ Keyway



Silver contacts
104350003

Gold plated silver contacts
104350108

A	B
1-2	1-3
ON - MOM	
ON - MOM	



Double pole

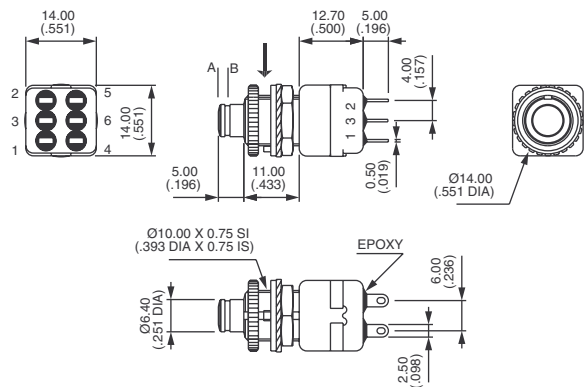
→ Keyway



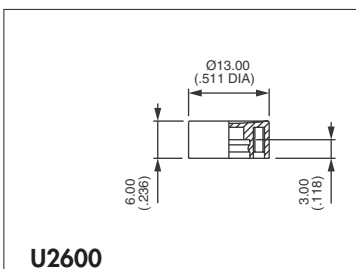
Silver contacts
104450003

Gold plated silver contacts
104450108

A	B
2-1	2-3
5-4	5-6
ON - MOM	
ON - MOM	



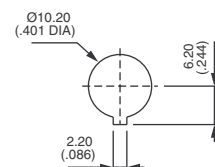
CAP



U2600

Cap colours			
Replace last "0" by number			
1	blue	5	yellow
1/4	dark blue	6	red
2	black	7	ivory
3	green	7/1	white
4	grey	9	orange

PANEL CUT-OUT



13000 series

Professional quick-break momentary pushbutton switches

Distinctive features and specifications



- ☐ PC and panel mount models
- ☐ Bushing Ø 6,35 (1/4) and 11,9 (15/32)
- ☐ UL and CECC approved

B

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - silver contacts (A-AD2) : 2A 250VAC - 4A 125VAC - 4A 30VDC
 - gold plated contacts (CD) : 100mA 30V
- Minimum load (AD2-CD contacts) : 10mA 50mV, 10µA 5V min.
- Initial contact resistance : 10 mΩ max.
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength :
 - 1.000 Vrms 50 Hz min. between terminals
 - 2.000 Vrms 50 Hz min. between poles and between terminals and frame
- Contact bounce : 2 ms max.
- Electrical life :

Contacts	Max. current/voltage rating	Number of cycles
A	2A 250VAC - 4A 125VAC - 4A 30VDC	50.000
AD2	2A 250VAC - 4A 125 VAC - 4A 30VDC (gold plating : 100mA 30VDC max.)	20.000
CD	100mA 30VDC	50.000
	Low level or mechanical life	150.000

MATERIALS

- Case : diallylphthalate (DAP)
- Actuator : brass, chrome plated
- Bushing : brass, nickel plated
- Housing : brass, nickel plated
- Contacts : **A** : silver
AD2 : silver, gold plated
(2 micron gold)
CD : brass, gold plated
- Terminal seal : epoxy

Note : AD2 contacts can be used for high level applications. In this case, the gold layer is considered only as a protection against oxidation during storage.

GENERAL SPECIFICATIONS

- Torque : 1,25 Nm (.922 Ft.lb)
max. applied to nut
- Standard panel thickness : 2 mm
(.078) max.
- Total travel : 2 mm (.078)
- Operating temperature :
-40°C to +85°C

13000 series

Professional quick-break momentary pushbutton switches

Specifications

RELIABILITY - RUN-IN TEST

Upon request, each individual switch can be submitted to a low level run-in test of 50 or 250 cycles to ensure suitability for special applications requiring a very high level of reliability (military, space, etc.).

AGENCY APPROVALS/PREFERENTIAL LISTS



CECC 96401-001

QPL (Europe only)

MUAHAG

Designed to **MIL** specifications

Availability :

UL : all models with silver or gold plated silver contacts

CECC : consult factory for details of approved models.

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

Preferential lists do not appear on the switches.

Dimensions : first dimensions are in mm while inches are shown as bracketted numbers.



Sealing boots are available to protect the switches against dust and water. They are presented in section H.



Mounting accessories : standard hardware supplied with all models : 2 hex nuts 8 mm (.314) across flats, 1 locking ring and 1 lockwasher.

Standard and special hardware available are presented in section I.



Packaging unit : 50 pieces.

13000 series

Professional quick-break momentary pushbutton switches

Overview

MODEL
STRUCTURE

13

SERIES

Terminals and bushing

- 2** Straight PC terminals, bushing Ø 6,35 (1/4)
- 4** Solder lugs, bushing Ø 6,35 (1/4) or 11,9 (15/32)
Right angle terminals, bushing Ø 6,35 (1/4)

No of poles

- 3** Single pole
- 4** Double pole

Electrical function

5 ON - MOM

Terminals

- Blank** Solder lugs or straight PC depending on model
- W** Right angle, horizontal mounting

OPTIONS

Contact materials

- A** Silver
- AD2** Silver, gold plated (2 micron gold)
- CD** Brass, gold plated

Finish

- Blank** Bright chrome finish
- G** Matt black finish on bushing, plunger and hardware

Special options

- Blank** No special requirement
- F** Tin dipped term. (for PC term. only)
- X640** Reinforced sealing by three O-rings
- X768** Bushing Ø 11,9 (15/32) + front panel sealing (double pole only)

Caps

- U900** Ø 5 (.196)
- U1140** Ø 8 (.314)
- U1720** Ø 9,4 (.370)
- U480** Ø 10 (.393) std
- U630** Ø 15 (.590)
- U2430** Square, height 4 (.157)
- U2020** Square, height 6 (.236)
- For models with Ø 4 (.157) plunger only.

Plungers

- Blank** Standard for Ø 6,35 (1/4) bushing
- 4** 4 mm (.157) long, for Ø 11,9 (15/32) bushing (X768)
- 9** 9 mm (.354) long, for Ø 11,9 (15/32) bushing (X768)

Sealing

- Blank** Epoxy sealed terminals standard
- K** Front panel sealing by one O-ring and sealing washer
- Reinforced sealing, see X640 under "Special options".

Approvals

- UL**
- CECC**
- Availability : Consult factory for details of approved models.



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

ABOUT THIS SERIES

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

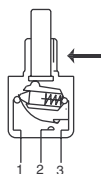


13000 series

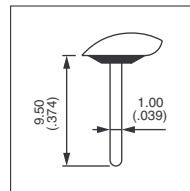
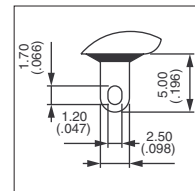
Professional quick-break momentary pushbutton switches

Solder lug terminals : 13400 - Straight PC terminals : 13200

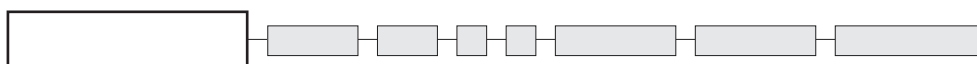
→ Keyway



- Threaded bushing $\varnothing 6,35$ mm (1/4)
- Epoxy sealed terminals standard



MODEL
STRUCTURE



B

Solder lug terminals : 13400

→ Keyway



Single pole
13435

Double pole
13445



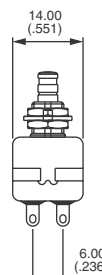
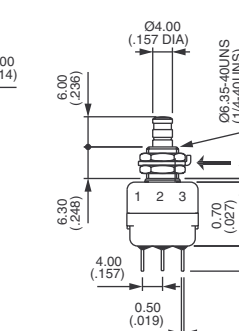
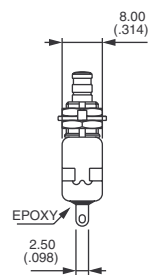
1-3

ON



1-2

MOM



Straight PC terminals : 13200

→ Keyway



Single pole
13235

Double pole
13245



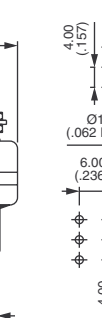
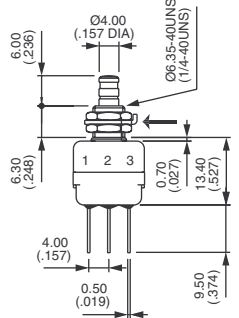
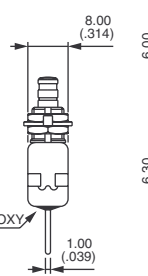
1-3

ON



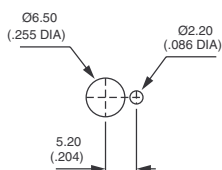
1-2

MOM

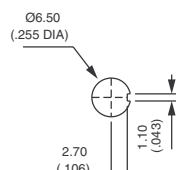


PANEL CUT-OUT

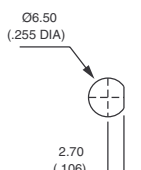
13400 - 13200



Standard



With K
sealing option



With X640
sealing option

13000 series

Professional quick-break momentary pushbutton switches

Right angle terminals : 13400W

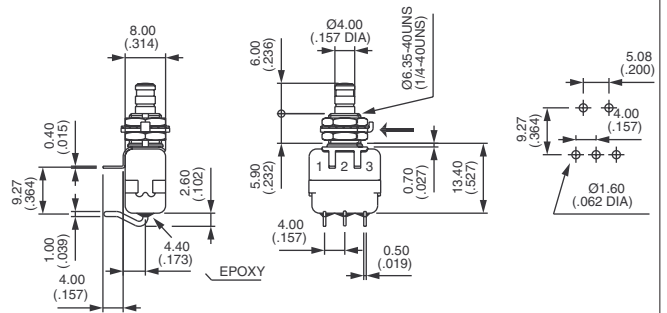
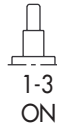
OPTIONS
● ● ●

Right angle terminals - single pole

→ Keyway

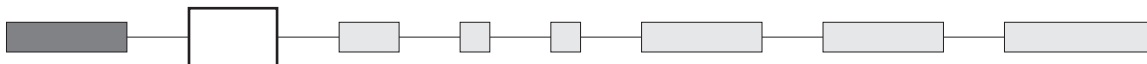


13435W



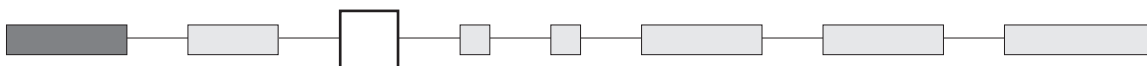
Panel cut-out, see previous page.

CONTACT MATERIALS



A	Silver
AD2	Silver, gold plated (2 micron gold)
CD	Brass, gold plated

PLUNGER



Dash compulsory before plunger code.

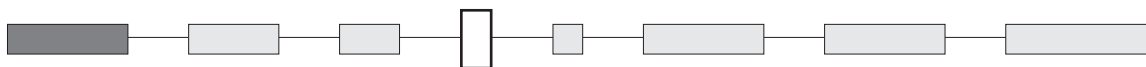
Blank	Standard plunger for Ø 6,35 (1/4) bushing
-4	4 mm (.157) long plunger for Ø 11,9 (15/32) bushing (X768 option)
-9	9 mm (.354) long plunger for Ø 11,9 (15/32) bushing (X768 option)



13000 series

Professional quick-break momentary pushbutton switches

FINISH



Blank Bright chrome finish

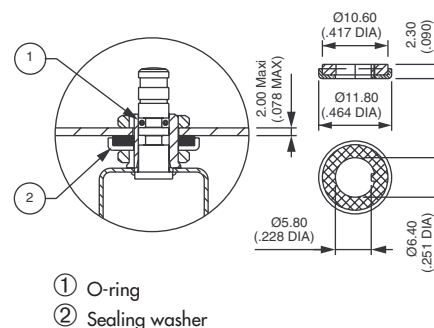
G Matt black finish on bushing, actuator and hardware

SEALING

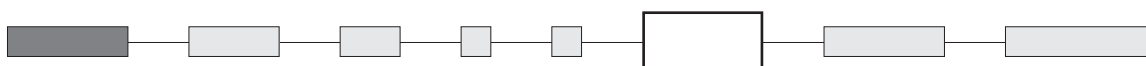


K Front panel sealing by one O-ring and sealing washer. Protects the switch against water and dust. Panel seal withstands 1 bar pressure and remains sealed even when switch is operated.

Reinforced sealing : see X640 under "Special options".



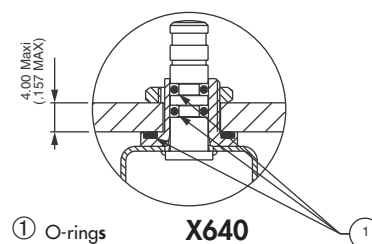
SPECIAL OPTIONS



F **Tin dipped terminals**
For PC terminal models with gold plated contacts only.

X640 Front panel sealing by three O-rings. Flatted bush for precise orientation. Protects the switch against water and dust. Panel seal withstands 1 bar pressure and remains sealed even when switch is operated.

Available on models with Ø 6,35 (1/4) bushing only.



X935 C-ring on plunger for positive stop

13000 series

Professional quick-break momentary pushbutton switches

OPTIONS
● ● ●

X768 Sealed switch with Ø 11,9 (15/32) flatted bushing. Solder lug terminals, double pole. Contact and finish options available.



With short plunger
13445 -4 X768

With long plunger
13445 -9 X768



ON

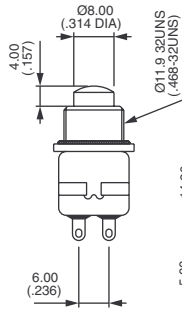


MOM

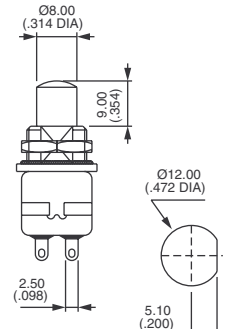
ON

MOM

→ Flat

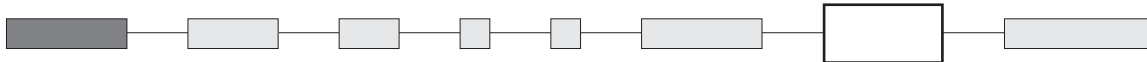


Short (-4)



Long (-9)

AGENCY APPROVALS



UL

CECC CECC 96401-001

Availability :

UL : all models with silver or gold plated silver contacts

CECC : consult factory for details of approved models.

Marking : to order switches marked UL or CECC, please complete above box with desired approval.

Blank : no agency approval required.

Preferential lists : see specifications.



13000X778 series

High performance pushbutton switches - threaded bushing Ø 11,9 (15/32)

Distinctive features

B



☐ Approvals and lists



CECC 96401-001

GAM - MUAHAG and QPL listed.

French defence approved : DAT list No A5999 X001.

This range of professional switches is suitable for use in military and other high specification environments.

☐ Contacts

Highly reliable contacts suitable for low level applications (10mA 50mV, 10µA 5VDC min.) or power applications (2A 250VAC, 4A 125VAC, 4A 30VDC max.)

☐ Double shell case

For high mechanical strength and high electrical insulation.

☐ Compact size

The small rear end of the switch allows space savings behind the panel.

☐ Finish

Matt black finish on body, bushing, plunger and hardware.

☐ Full sealing

Panel sealed to IP 67, these switches are frontal sealed by three O-rings and have full rear end sealing.



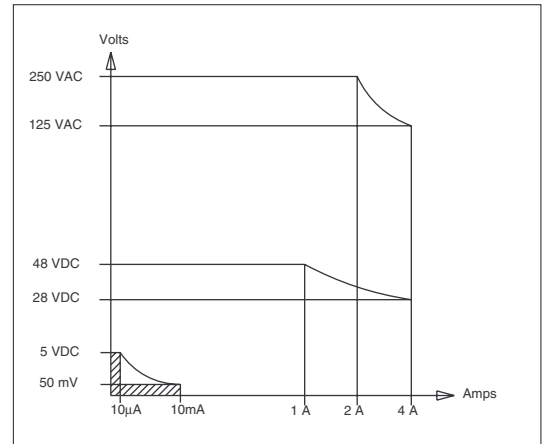
13000X778 series

High performance pushbutton switches - threaded bushing Ø 11,9 (15/32)

Specifications

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load : 2A 250VAC - 4A 125VAC - 4A 28VDC
- Minimum load : 10mA 50mV, 10µA 5VDC
When used above 300mA 28VDC, the gold plating is removed on contact areas and is considered only as a protection against oxidation during storage.
- Initial contact resistance : 10 mΩ max.
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength :
 - 1.000 Vrms 50 Hz min. between terminals
 - 2.000 Vrms 50 Hz min. between poles
 - 2.000 Vrms 50 Hz min. between terminals and frame
- Contact bounce : 2 ms max.
- Electrical life :
 - At 2A 250VAC - 4A 28VDC : 10.000 cycles
 - At low level (50mV 10mA) : 20.000 cycles

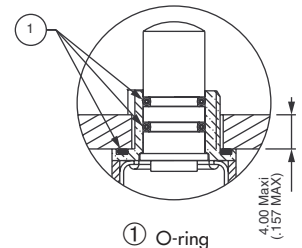


MATERIALS

- Case : diallylphthalate (DAP) with PBT external shell (epoxy sealed)
- Actuator : brass, black chrome plated
- Bushing : brass, black chrome plated
- Contacts : silver inlay - gold plated over nickel barrier

SEALING

- Front panel sealing by three O-rings
- Panel seal withstands 1 bar pressure and remains sealed even when the switch is operated.
- Epoxy sealed terminals
- Splash-proof case



GENERAL SPECIFICATIONS

- Total travel : 2 mm (.078)
- Torque : 1,50 Nm (1.10 Ft.lb) max. applied to nut
- Panel thickness : 5 mm (.196) max.
- Shock test : 50g - 11 ms (IEC 68-2-27)
- Vibrations : 10-500 Hz - 10g (IEC68-2-6)
- Operating temperature : -40°C to +85°C
- Humidity test : 56 days, 93 % R.H., 40°C (IEC 68-2-3)
- Salt spray test : 96 hours (IEC 68-2-11)

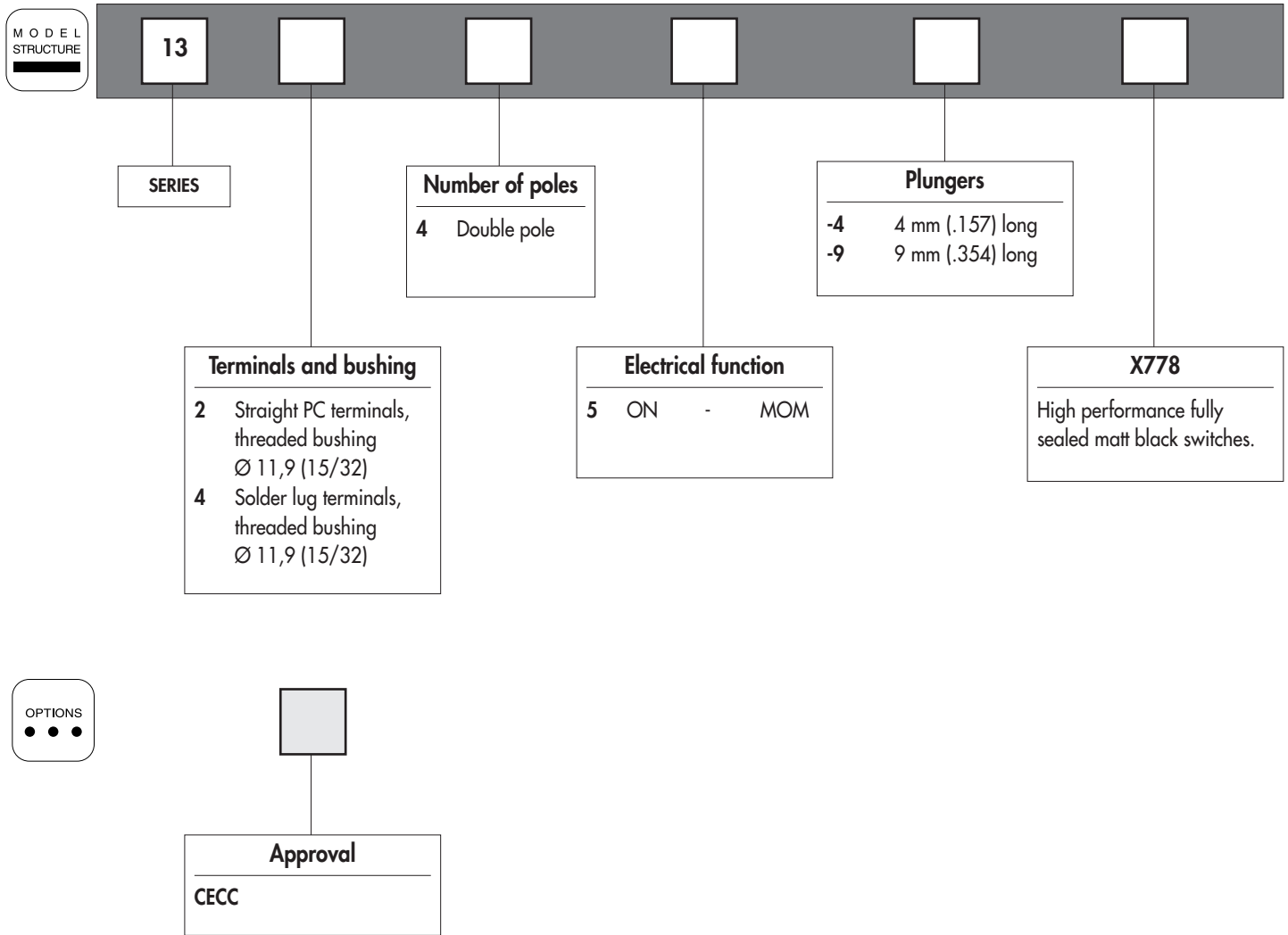
APPROVALS

Many models within this range have full CECC approval. To order switches marked CECC, complete appropriate box of ordering format.

13000X778 series

High performance pushbutton switches - threaded bushing Ø 11,9 (15/32)

Overview



ABOUT THIS SERIES

On the following pages, you will find successively :

- model structure of switches
- options in the same order as in above chart

Dimensions : first dimensions are in mm while inches are shown as bracketted numbers.



Sealing boots can be used to further protect the switches against dust and water. They are presented in section H.



Mounting accessories : standard hardware supplied with all models : 1 hex nut 14 (.551) across flats, part number U41. This nut is presented after model structure of switches.



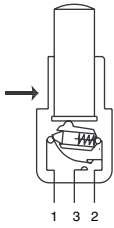
Packaging unit : 25 pieces

13000X778 series

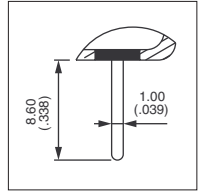
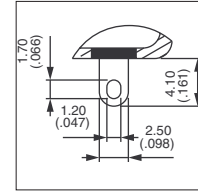
High performance pushbutton switches - threaded bushing $\varnothing 11,9$ (15/32)

Fully sealed - matt black

→ Flat



• Quick-break momentary pushbutton switches



MODEL
STRUCTURE



Solder lug terminals - double pole - 4 mm (.157) plunger → Flat



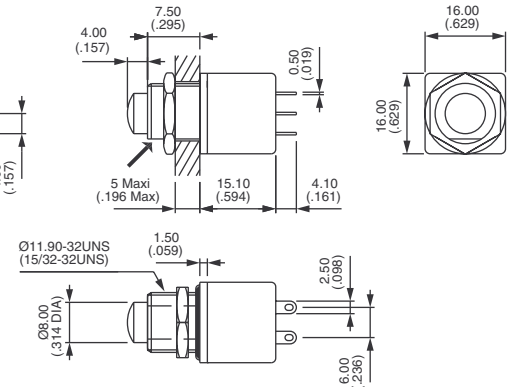
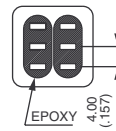
13445-4X778



ON



MOM



Solder lug terminals - double pole - 9 mm (.354) plunger → Flat



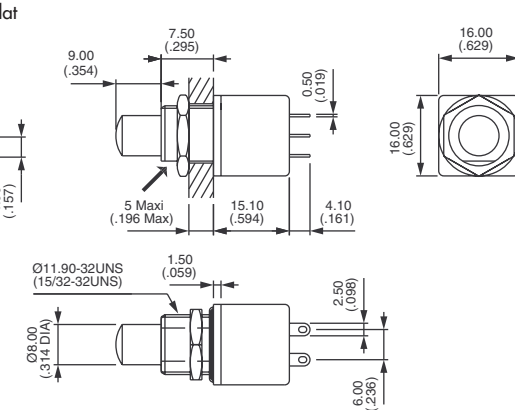
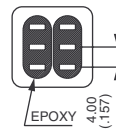
13445-9X778



ON



MOM



Straight PC terminals - double pole - 4 mm (.157) plunger → Flat



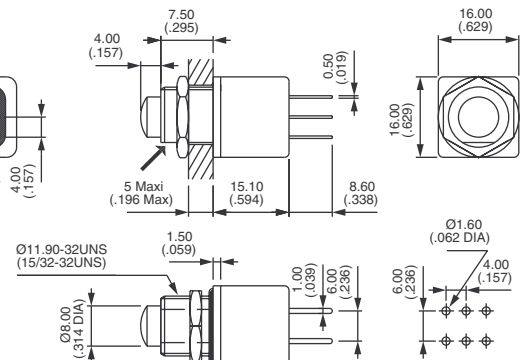
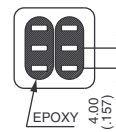
13245-4X778



ON



MOM



13000X778 series

High performance pushbutton switches - threaded bushing Ø 11,9 (15/32)

Fully sealed - matt black

Straight PC terminals - double pole - 9 mm (.354) plunger → Flat



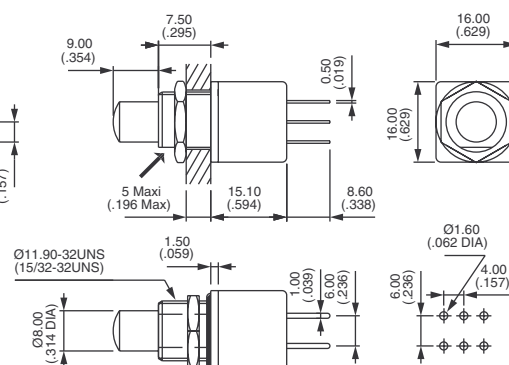
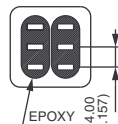
13245-9X778



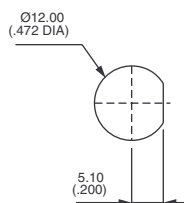
ON



MOM

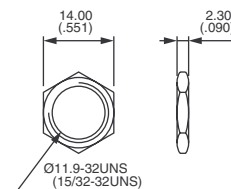


PANEL CUT-OUT



STANDARD HARDWARE

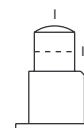
Hex nut



U41 (matt black)

POSITIONS AND CONNECTIONS

FUNCTION	BUTTON POSITION AND CONNECTIONS		TERMINAL IDENTIFICATION
	I	II	
13245 13445	ON A 1-2 B 1-2	MOM A 1-3 B 1-3	→ Flat



AGENCY APPROVAL



CECC CECC 96401-001

Marking : to order switches marked CECC, please complete above box with "CECC".
Blank : no agency approval required.

18000 series

Snap-action momentary pushbutton switches

Distinctive features and specifications



- ☐ Panel and PC mount models
- ☐ Snap-in panel mounting version
- ☐ Tactile feedback

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - gold plated brass contacts : 100mA - 30VDC
 - gold plated silver contacts : 1A 125VAC, 1A 30VDC
- Initial contact resistance : 50 mΩ max.
- Insulation resistance : 1.000 MΩ min.
- Dielectric strength : 1.000 Vrms 50 Hz min.
- Electrical life : 60.000 cycles at full load

Models for high currents : see 18635A and 18645A at the end of the series.

MATERIALS

- Case : PBT
- Actuator : polyamide, glass filled
- Bushing : brass, nickel plated
- Housing : stainless steel
- Bracket : tin plated steel
- Contacts
 - AD** : silver, gold plated
 - CD** : brass, gold plated
- Terminal seal : epoxy

GENERAL SPECIFICATIONS

- Total travel : 0,5 mm (.019)
- Torque : 1,25 Nm (.922 Ft.lb) max. applied to nut
- Operating temperature : -30°C to +65°C
- Soldering : 300°C, 3 sec. max.

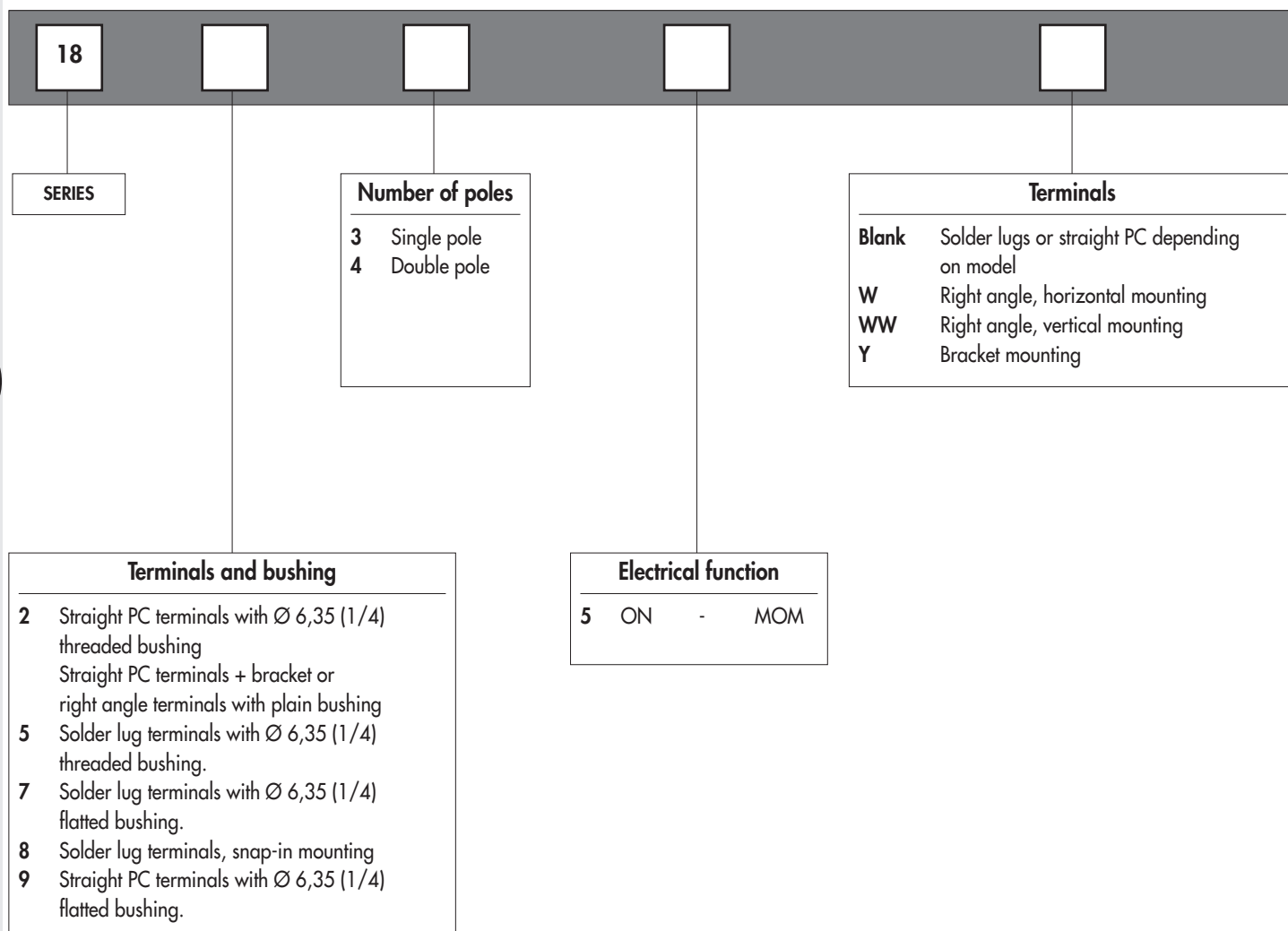
18000 series

Snap-action momentary pushbutton switches

Overview

MODEL
STRUCTURE

B



ABOUT THIS SERIES

On the following pages, you will find successively :

- model structure of switches
- options in the same order as in above chart

Dimensions : first dimensions are in mm while inches are shown as bracketted numbers.



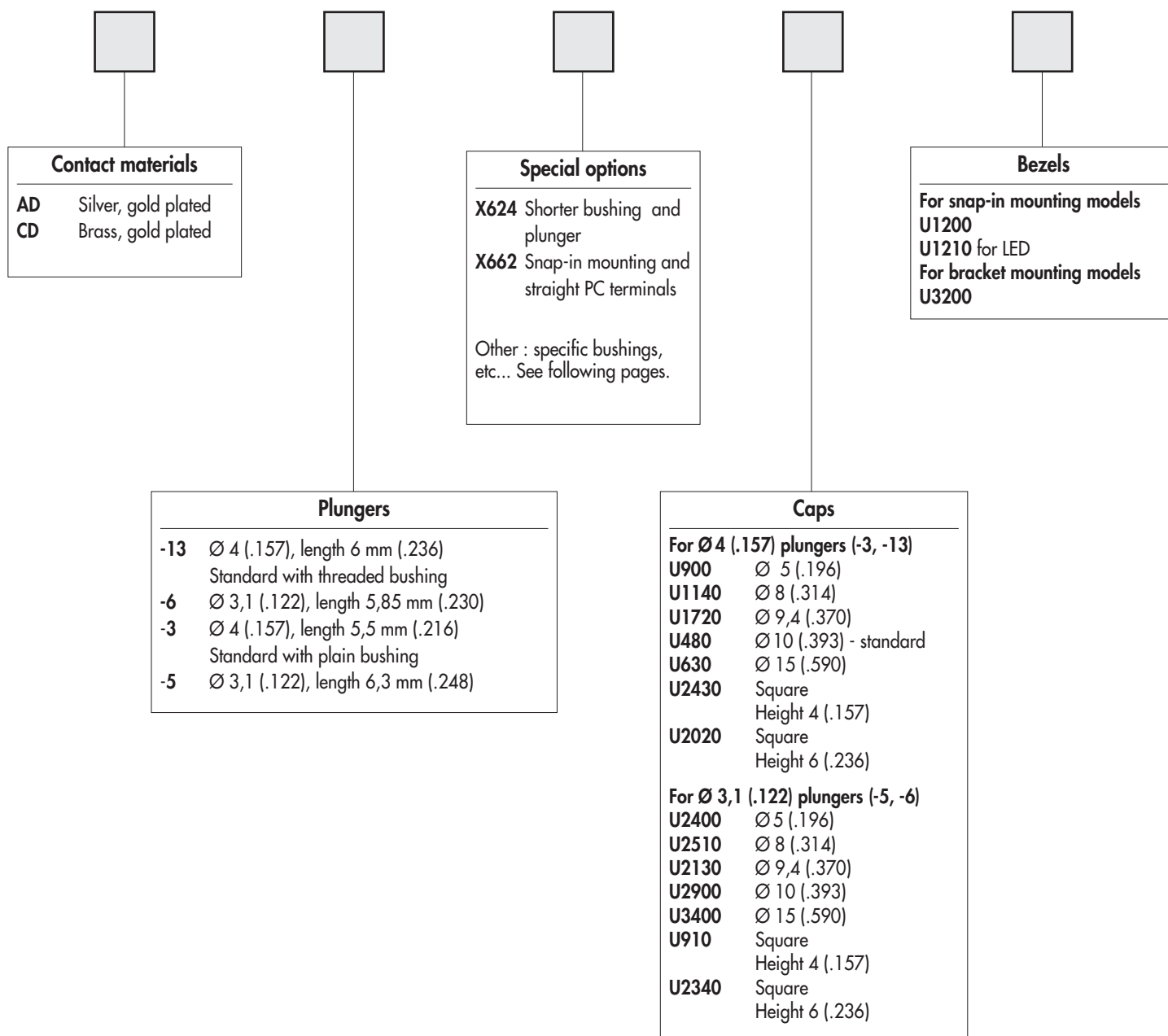
NOTICE : please note that not all combinations of above numbers are available.
Refer to the following pages for further information.



18000 series

Snap-action momentary pushbutton switches

Overview



Sealing boots are available to protect the switches against dust and water. They are presented in section H.



Mounting accessories : standard hardware supplied with all models with Ø 6,35 (1/4) threaded bushing :
2 hex nuts 8 mm (.314) across flats, 1 locking ring and 1 lockwasher.
Standard and special hardware available are presented in section I.



Packaging unit : 25 pieces for W, WW double pole and 18800 models
50 pieces for other models.

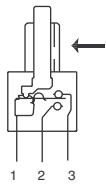
18000 series

Snap-action momentary pushbutton switches

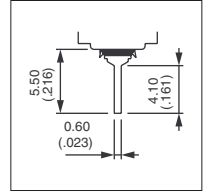
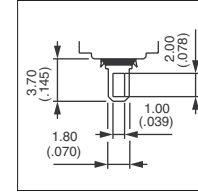
Threaded bushing Ø 6,35 (1/4) : 18500 - 18700 - 18200

MODEL
STRUCTURE

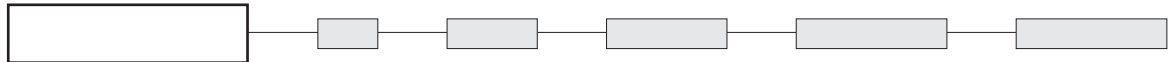
→ Keyway



- Solder lug or straight PC terminals
- Epoxy sealed terminals standard



MODEL
STRUCTURE



Shown with standard plunger (-13)

Solder lug terminals : 18500

→ Keyway



Single pole
18535

Double pole
18545



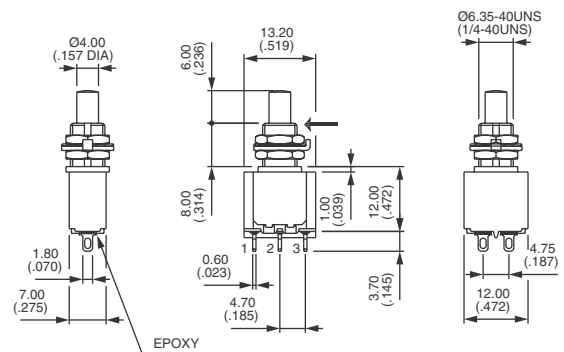
1-3

ON



1-2

MOM



Flatted bushing - solder lug terminals : 18700

→ Flat



Single pole
18735

Double pole
18745



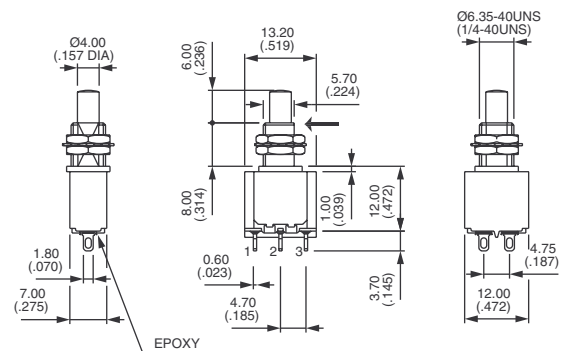
1-3

ON



1-2

MOM



Straight PC terminals : 18200

→ Keyway



Single pole
18235

Double pole
18245



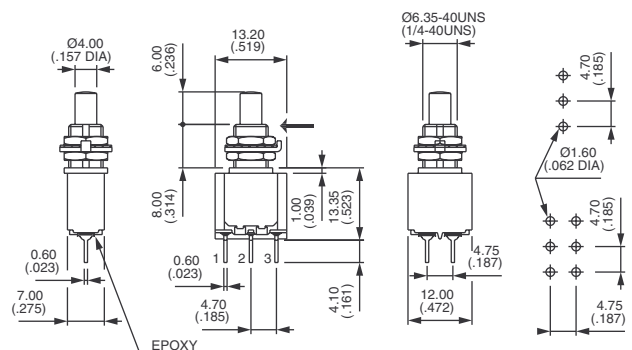
1-3

ON



1-2

MOM



18000 series

Snap-action momentary pushbutton switches

Threaded bushing Ø 6,35 (1/4) : 18900 - Snap-in mounting : 18800

Flatted bushing - straight PC terminals : 18900

→ Flat



Single pole
18935

Double pole
18945



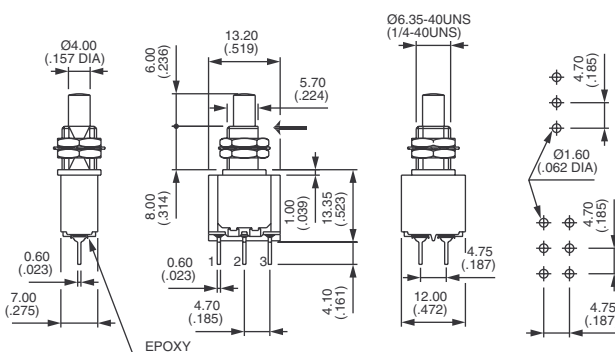
1-3

ON



1-2

MOM



Snap-in mounting - solder lug terminals : 18800

Shown with cap U910 + U1200



Single pole
18835

Double pole
18845



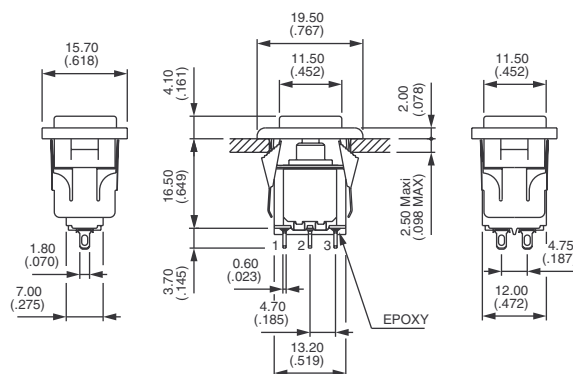
1-3

ON



1-2

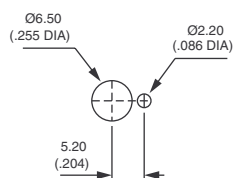
MOM



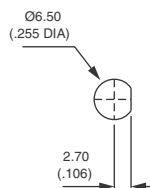
Available with straight PC terminals : see X662 under "Special options".

PANEL CUT-OUT

18500 - 18200

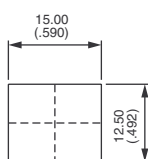


18700 - 18900

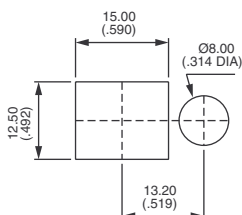


PANEL CUT-OUT

18800



With bezel **U1200**



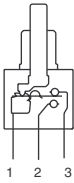
With bezel **U1210** for LED

18000 series

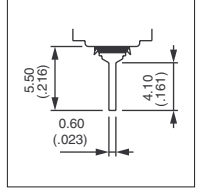
Snap-action momentary pushbutton switches

Plain bushing : 18200Y - 18200W - 18200WW

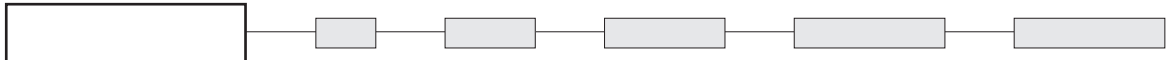
MODEL
STRUCTURE



- Straight PC or right angle terminals
- Epoxy sealed terminals standard



MODEL
STRUCTURE



Shown with standard plunger (-3)

Straight PC terminals - bracket mounting - single pole 18230Y



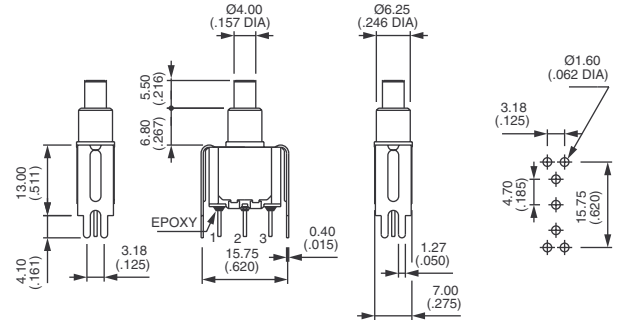
18235Y



ON



MOM



Straight PC terminals - bracket mounting - double pole 18240Y



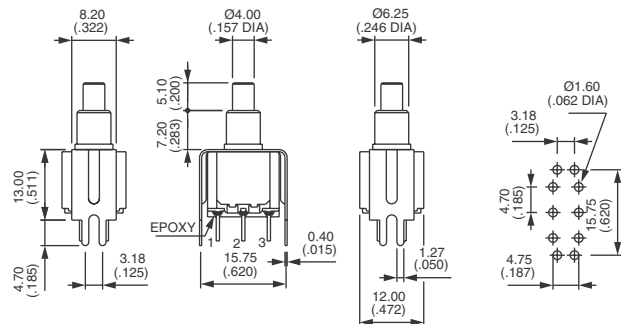
18245Y



ON



MOM



Right angle terminals - horizontal : 18200W



Single pole
18235W



ON



MOM

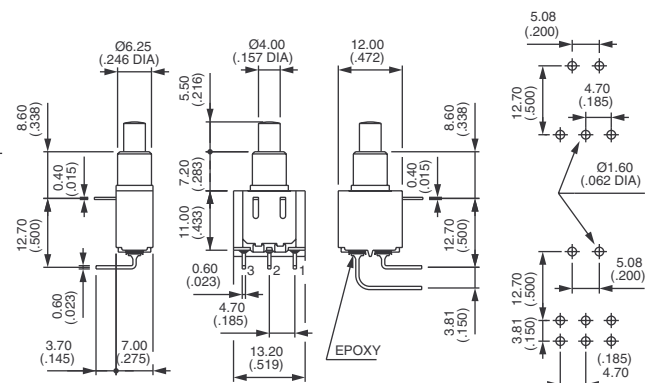
Double pole
18245W



ON



MOM





18000 series

Snap-action momentary pushbutton switches

Right angle terminals - vertical : 18200WW



Single pole
18235WW

Double pole
18245WW



1-3

ON

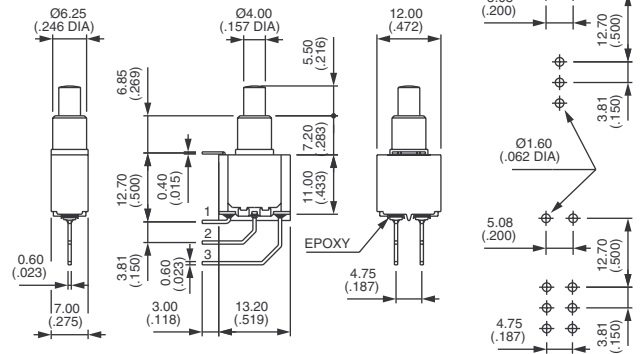


1-2

MOM

ON

MOM



CONTACT MATERIALS

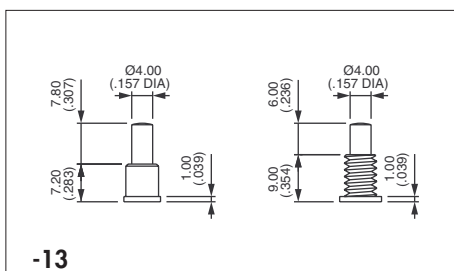


AD Silver, gold plated
CD Brass, gold plated

PLUNGERS

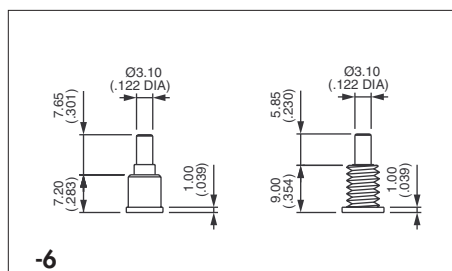


Dash compulsory before plunger code.



-13

Ø 4 (.157) - standard with threaded bushing

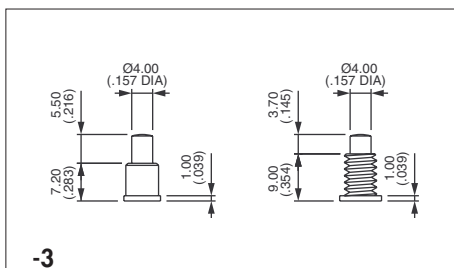


-6

Ø 3,1 (.122)

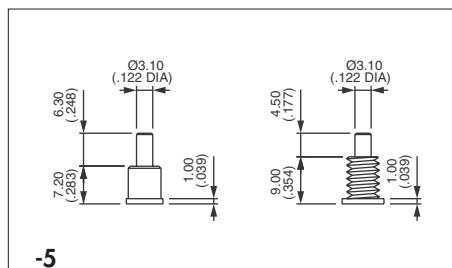


If plunger not specified, we supply former default option -13.



-3

Ø 4 (.157) - standard with plain bushing



-5

Ø 3,1 (.122)

Snap-action momentary pushbutton switches

OPTIONS



SPECIAL OPTIONS



F Tin dipped terminals (for PC terminals only)

X624 Straight PC terminals - bracket mounting - **with shorter bushing and plunger**

Single pole

18235Y -2X624



ON



MOM



Double pole

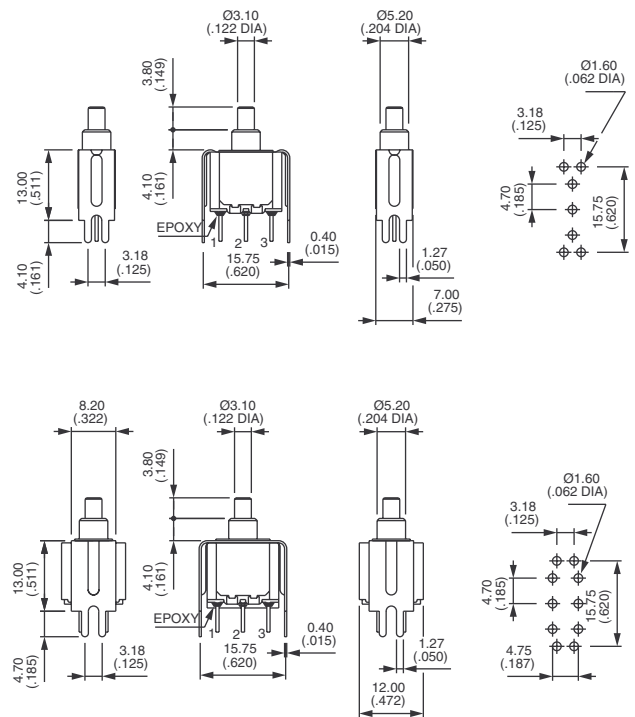
18245Y -2X624



ON



MOM



X662 Snap-in mounting - straight PC terminals



Single pole
18835 X662

Double pole
18845 X662



ON



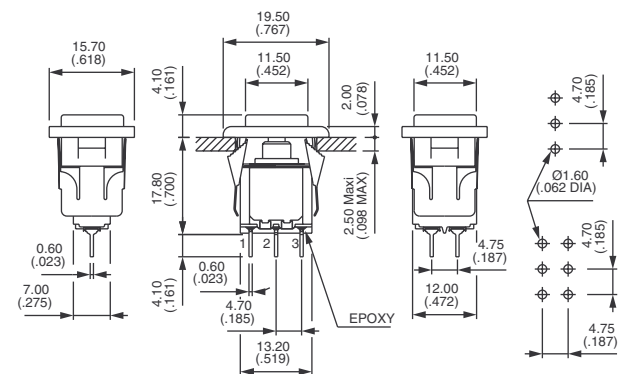
MOM



ON



MOM

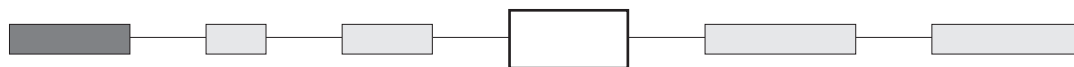




18000 series

Snap-action momentary pushbutton switches

SPECIAL OPTIONS (continued)

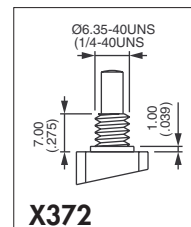


X371 Plain bushing $\varnothing 6,25$ mm (.246) (instead of standard threaded bushing).

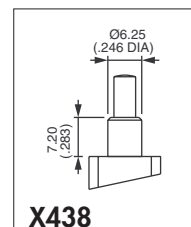
X372 Shorter threaded bushing $\varnothing 6,35$ (1/4). Height 7 mm (.274).

X386 Threaded bushing $\varnothing 6,35$ mm (1/4) to replace plain bushing on models W - WW and Y.

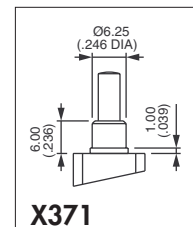
X438 Plain bushing $\varnothing 6,25$ mm (.246). Height 7,2 mm (.283) - without shoulder.



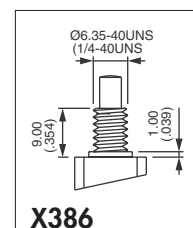
X372



X438

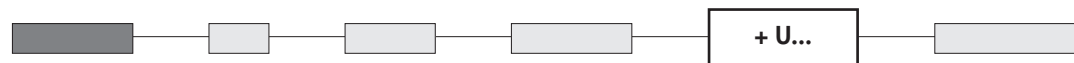


X371

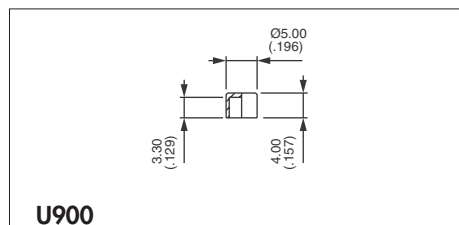


X386

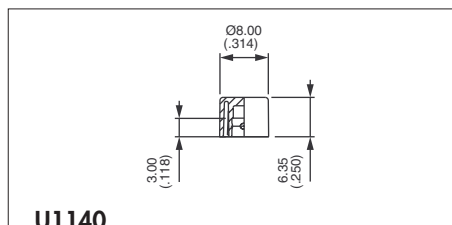
CAPS



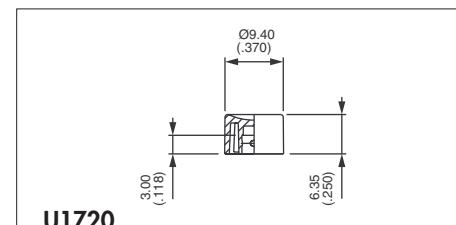
Caps for $\varnothing 4$ (.157) plungers (-13, -3)



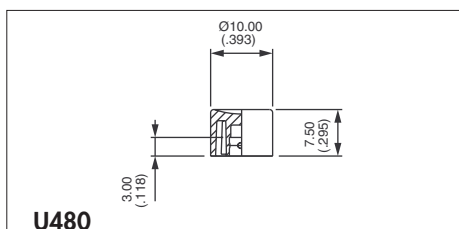
U900



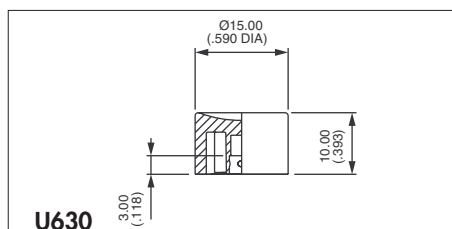
U1140



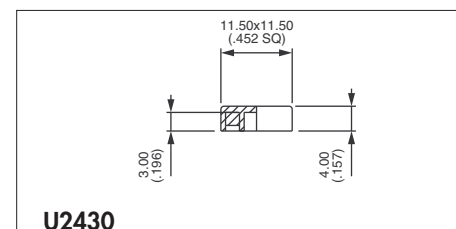
U1720



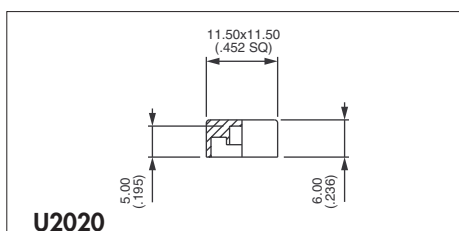
U480



U630



U2430



U2020

Square

Cap colours

Replace last "0" by number

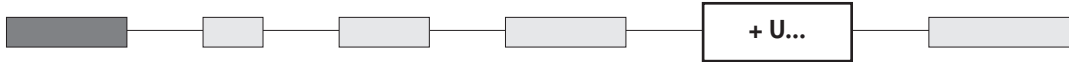
1	blue	5	yellow
1/4	dark blue	6	red
2	black	7	ivory
3	green	7/1	white
4	grey	9	orange

18000 series

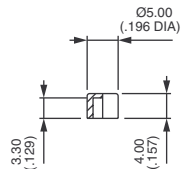
Snap-action momentary pushbutton switches

OPTIONS
● ● ●

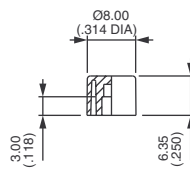
CAPS (continued)



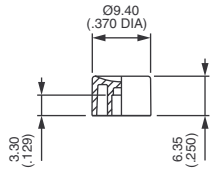
Caps for Ø 3,1 (.122) plungers (-5, -6)



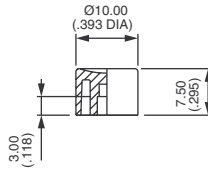
U2400



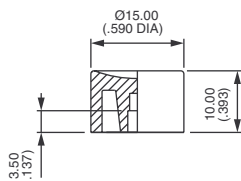
U2510



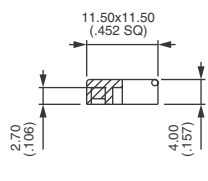
U2130



U2900

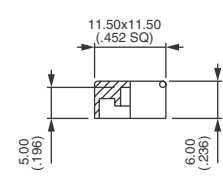


U3400



U910

Square

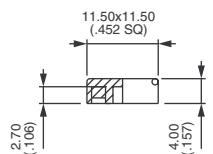


U2340

Square

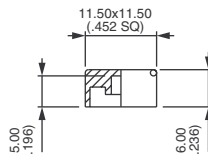
Cap colours	
Replace "0" by number	
1	blue
1/4	dark blue
2	black
3	green
4	grey
5	yellow
6	red
7	ivory
7/1	white
9	orange

Caps for 18800 and 18800X662 models



U910

Square



U2340

Square



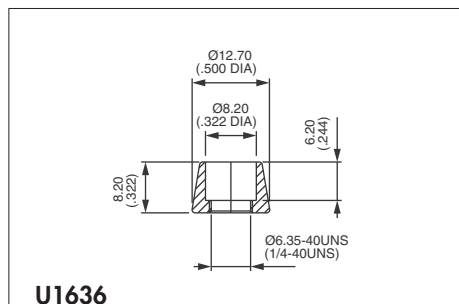
18000 series

Snap-action momentary pushbutton switches

DRESS NUTS

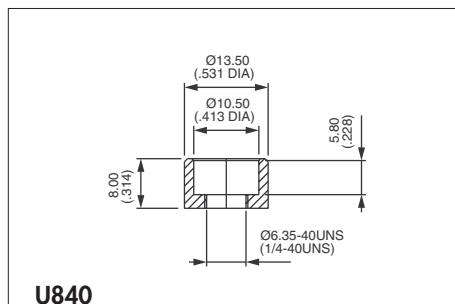
For models with threaded bushing (18500 - 18700 - 18200 - 18900)

Chrome plated - Order separately.



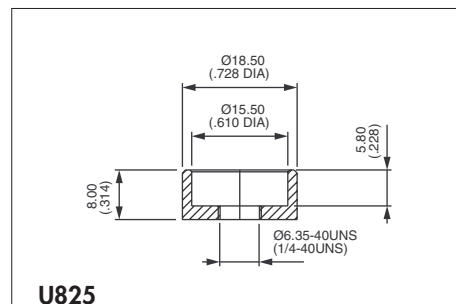
U1636

For caps U1140 and U2510



U840

For cap U480 and U2900



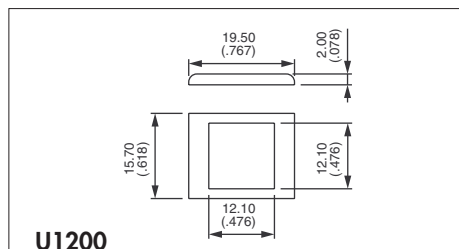
U825

For caps U630 and U3400

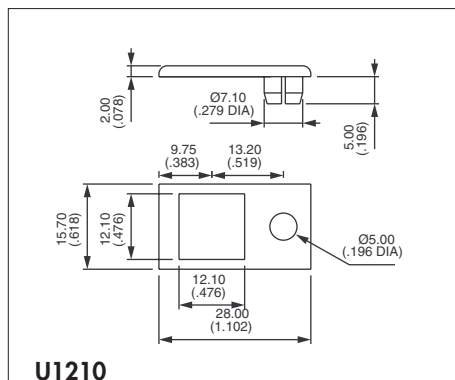
BEZELS



For snap-in models (18800 - 18800X662)



U1200

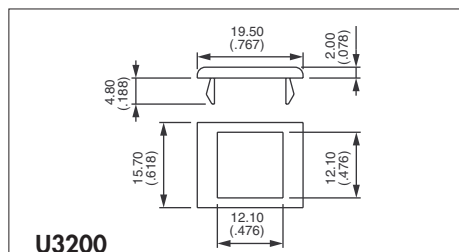


U1210

For LED Ø 5 - not supplied

Bezel colours	
Replace last "0" by number	
1	blue
1/4	dark blue
2	black
3	green
4	grey
5	yellow
6	red
7	ivory
7/1	white
9	orange

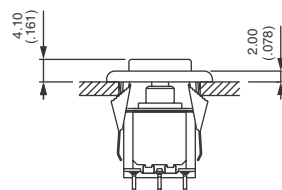
For bracket mounting models (18200Y & 18200YX624)



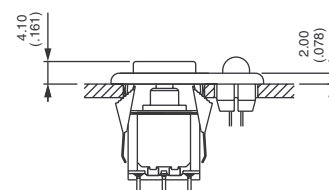
U3200

STANDARD PANEL MOUNTING

Panel thickness with bezel : 1 mm (.039) to 2,5 mm (.098)



18800 + U910 + U1200



18800 + U910 + U1210

18000 series

Snap-action momentary pushbutton switches

☐ For high currents

☐ Tactile feedback

B

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
3A 250VAC - 6A 125VAC - 7A 30VDC
- Initial contact resistance : 20 m Ω max. at 0,1A 3VDC
- Insulation resistance : 200.000 M Ω min. between terminals and frame
- Dielectric strength : 1.500 Vrms 50 Hz min.
- Electrical life : 60.000 cycles at full load

GENERAL SPECIFICATIONS

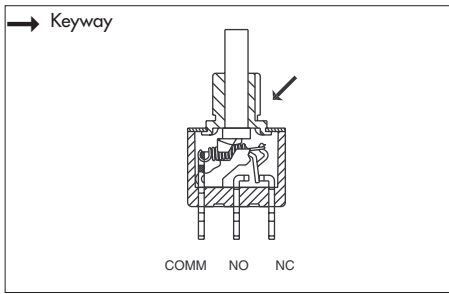
- Travel : 0,90 mm (.035) approx.
- Operating temperature :
-30°C to +85°C

MATERIALS

- Case : diallylphthalate (DAP)
- Actuator : glass filled polyester
- Bushing : brass, nickel plated
- Housing : stainless steel
- Contacts : silver
- Terminal seal : epoxy

18000 series

Snap-action momentary pushbutton switches



- Threaded bushing $\varnothing 6,35$ (1/4)
- Solder lug terminals
- Epoxy sealed terminals

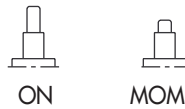
MODEL
STRUCTURE



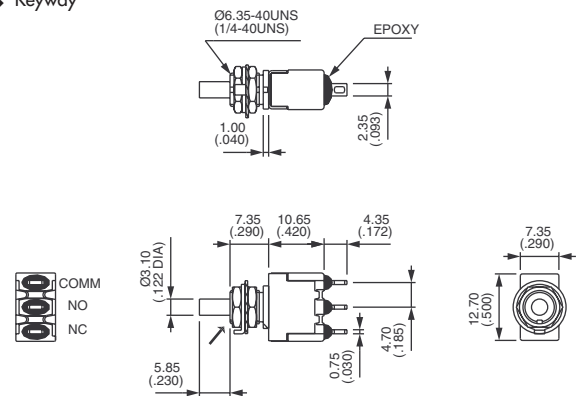
Single pole



18635A



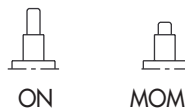
→ Keyway



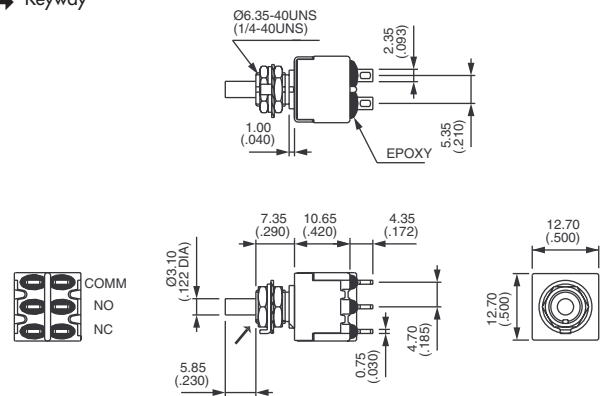
Double pole



18645A



→ Keyway



CAPS



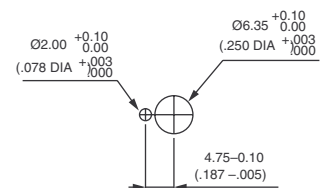
Round

U2400	$\varnothing 5$ (.196)
U2510	$\varnothing 8$ (.314)
U2130	$\varnothing 9,4$ (.370)
U2900	$\varnothing 10$ (.393)
U3400	$\varnothing 15$ (.590)

Square

U910	Height 4 (.157)
U2340	Height 6 (.236)

PANEL CUT-OUT



For cap dimensions, see "Caps for $\varnothing 3,1$ (.122) plungers" on the preceding pages.

PHAP40 series

Momentary or latching action key switches

Distinctive features and specifications

- ☐ The smallest latching action switch of the range
- ☐ Audible "click"
- ☐ Models with 6 x 6 mm case on request

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load : 100mA 30VDC
- Initial contact resistance : 100 mΩ max.
- Insulation resistance : 100 MΩ min. at 500VDC
- Dielectric strength : 500 Vrms min. (1 min.)
- Electrical life : 10.000 cycles

MATERIALS

- Case : polyamide
- Actuator : polyamide
- Contacts : brass, silver plated

GENERAL SPECIFICATIONS

- Travel : see next page.
- Wave soldering : 255°C, 5 seconds
- Manual soldering : 300°C ± 10°C, 3 seconds
- Operating force :
 - Model PHAP4673 : 1,4N ± 0,5N
 - Models PHAP4683W and PHAP4383V : 2N ± 0,5N
- Operating temperature : -20°C to +70°C

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

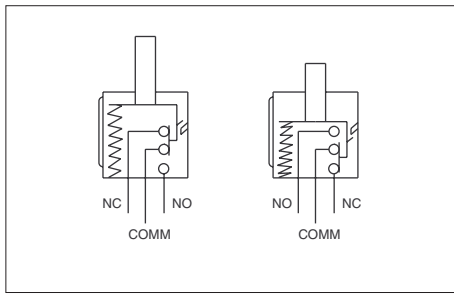


Packaging unit : 1.000 pieces.

PHAP40 series

Momentary or latching action key switches

Straight PC terminals



- Double pole, double throw
- Non-shorting contacts
- Moulded-in terminals

**MODEL
STRUCTURE**

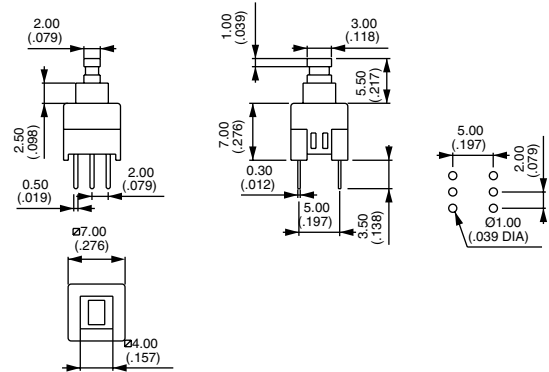


7 x 7 mm case



PHAP4673

ON - ON

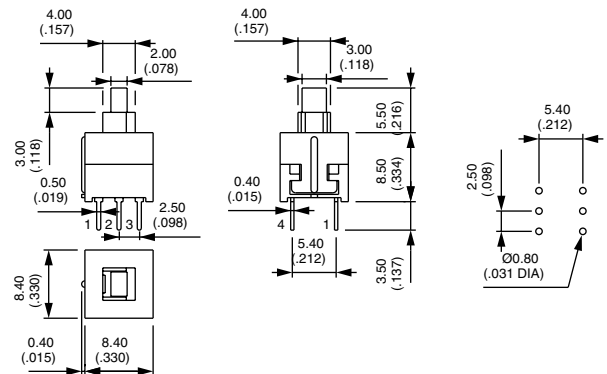
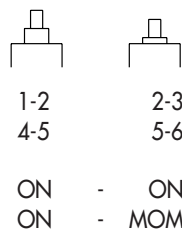


Pre-travel : 1 mm - Total travel : 1,8 mm

8,4 x 8,4 mm case



**PHAP4683W
PHAP4383V ***



Total travel : 2,5 mm * Audible click

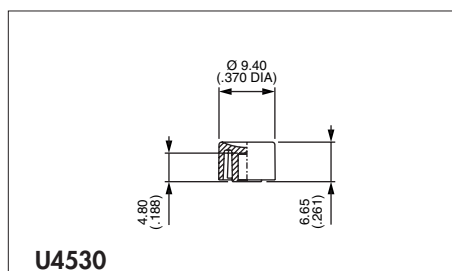
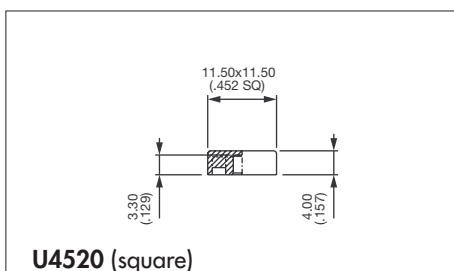
CAPS



Cap colours

Replace "0" by number :

- | | |
|-----|--------|
| 1 | blue |
| 2 | black |
| 3 | green |
| 4 | grey |
| 5 | yellow |
| 6 | red |
| 7 | ivory |
| 7/1 | white |
| 9 | orange |

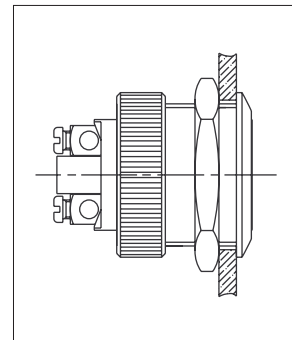


AV series

Anti-vandal and security pushbutton switches

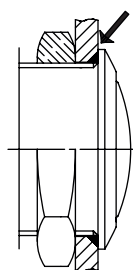
Distinctive features

- ☐ **Attractive, robust and durable**
 - Irremovable
 - Anti-jamming construction : reduced travel to prevent insertion of foreign parts
 - Contact and mechanism protected against crushing
 - Fire resistant
 - Long life
- ☐ **Different actuator shapes**
- ☐ **Sealed versions**
- ☐ **Degree of protection of sealed versions**
(switches mounted on vertical panels) : IP65 to IP67
- ☐ **UL/CSA approved models**

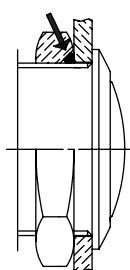


EXAMPLES OF MOUNTING FOR SEALED VERSIONS

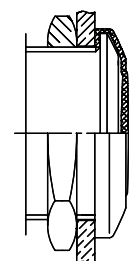
→ Gasket



Preferred



For thin panels



With boot U2187 (sect. H)



Packaging unit : specified on the following pages.



Mounting accessories : Standard and special hardware are presented in section I.



Sealing boots are available for models with $\varnothing 19$ mm (.748) bushing. See Section H.

The AV series is a large range of very robust pushbutton switches, consisting of 2 families :

ANTI-VANDAL PUSHBUTTON SWITCHES (pages B-92 to B-94)

- Great robustness (impact resistance IK08 (Ø 19 mm) and IK10 (Ø 22 mm))
- Actuator and bushing : stainless steel
- Bushing Ø 19 mm (.748) or 22 mm (.866)

	Bushing Ø 19 mm (.748)			Bushing Ø 22 mm (.866)			
Actuator	flat	curved	flush	flat		curved	
Flat on bushing	no	no	no	no	yes	no	yes
48VDC	AV09100	AV19100	AV9D100	AV03100	AVM3100	AV02100	AVM2100
250VAC	AV09000	AV19000	AV9D000	AV03000	AVM3000	AV02000	AVM2000

SECURITY PUSHBUTTON SWITCHES (pages B-95 to B-115)

- Large variety of models
- Actuator and bushing : nickel plated, chrome plated or polished varnished brass, stainless steel
- Bushing diameter 16 mm (.629), 19 mm (.748), 22 mm (.866) or 24 mm (.944)
- Marking
- Illumination, tactile feedback
- Numerous electrical functions (momentary or maintained)

	Bushing Ø 16 mm (.629)				
Actuator	flat		curved		Page
Mounting nut	hex	knurled	hex	knurled	
Momentary (NO) tactile	AV063	AV6P3	AV163	AV6B3	B-95
Latching (on-off)	AV061	-	AV161	-	B-96

	Bushing Ø 19 mm (.748)				
Actuator	flat		curved		Page
Mounting nut	hex	knurled	hex	knurled	
Momentary (NO)	AV09•003	AV9P•003	AV19•003	AV9B•003	B-98
Momentary NC/NO	AV19LP	-	-	-	B-101
Latching (on-on)	AV091••EA	-	AV191••EA	-	B-102
Momentary NO tactile	AV09C7•3	-	AV19C7•3	-	B-104
Momentary NO tactile overmolded actuator	AV9S•D	-	-	-	B-106

	Bushing Ø 22 mm (.866)					
Actuator	flat		curved		concave	Page
Mounting nut	hex	knurled	hex	knurled	hex	
Momentary (NO)	AV03•003	-	AV02•003	-	-	B-108
Momentary (NC)	AV031202	-	AV021202	-	-	B-109
Latching (on-on)	AV031••EA	-	AV021••EA	-	-	B-111
Mom. NC/NO, Ø 26 actuator	AV22LP	-	AV22LB	-	AV22LC	B-113
Mom. NC/NO, Ø 30 actuator	-	-	AV22PNA*	-	-	B-115

	Bushing Ø 24 mm (.944)			
Actuator	flat	curved	concave	Page
Momentary (NO)	AV24LP	AV24LB	AV24LC	B-114

Please contact APEM for any product not mentioned in the above tables.

AV series

Anti-vandal pushbutton switches

Distinctive features and specifications

- ❑ **Very robust**
Impact resistance IK08 for model Ø 19 mm (.748)
and IK10 for model Ø 22 mm (.866)

- ❑ **Stainless steel actuator and bushing**

- ❑ **UL-CSA approved (long case only)**

SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - A contacts : 4A 12VDC, 500.000 cycles
 - C contacts : 2A 48 VDC, 10.000 cycles
- Approved ratings of models with long case and A contacts (AV..000) :
UL-CSA : 4A 250VAC - 8A 125VAC - 6.000 cycles
- Initial contact resistance : 10 mΩ max. at 1A 2V
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength : 2.000 Vrms 50 Hz min. between terminals and frame
2.000 Vrms 50 Hz min. between terminals
- Torque : 5 Nm min.- 14 Nm max. applied to nut
- Panel thickness : 1 (.039) to 11 mm (.433) max.
- Operating temperature : -30°C to +70°C
- Mechanical life : 1.000.000 cycles
- Hand soldering : 300°C, 3 sec. max.
- Packaging unit : 20 pieces (models Ø 22) or 40 pieces (models Ø 19)

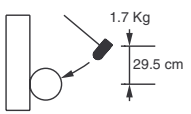
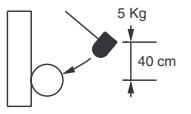
MATERIALS

- Case : PBT
- Contacts : silver (A)
or brass, silver plated (C)
- Bushing : stainless steel
- Actuator : stainless steel

CUT-OUT

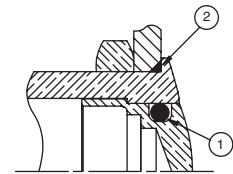
- Panel cut-out :
Ø 19,2 mm (.755)
or Ø 22,2 mm (.874)
- Min. pitch for matrix mounting :
30 mm x 30 mm (1.181x1.181)

ROBUSTNESS

	Model Ø 19 mm (.748)		Model Ø 22 mm (.866)	
Degree of protection according to EN 50102, June 95 (NFC 20-015)				
	Hammer radius 25 mm		Hammer radius 50 mm	
	IK08 Striking energy: 5 joules (5Nm)		IK10 Striking energy: 20 joules (20Nm)	

Increased impact resistance provided by a nut or mechanical stop.

SEALING (OPTION T)



Front panel sealing (IP65)

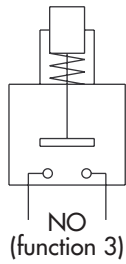
① internal gasket ② external gasket

Option N does not include ① nor ②.

AV series

Anti-vandal pushbutton switches Ø 19 mm (.748)

Momentary (NO)



ORDER FORMAT

AV			3			40	
SERIES	Actuator type	Case	Function	Contacts	Terminals	Bush./act. material	Sealing
09 Flat	19 Curved	000 Long	3 NO	A Silver	9 Screw	40 Stainless steel	N No
9D Flush		100 Short		C Brass, silver pl.	2 Quick-connect		T Sealed

In the following model numbers, replace • with elements selected in the above order format.

Flat actuator - short case - 48VDC - AV09100

Hex nut 22 (.866) across flats



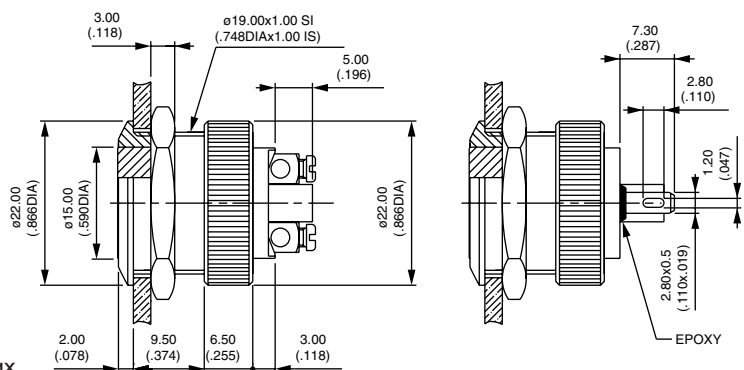
Screw terminals
AV091003•940•



Solder lug /
quick-connect term.
AV091003•240•



Screw terminals for wires 1,5 mm² max.



Flat actuator - long case - 250VAC - UL/CSA - AV09000

Hex nut 22 (.866) across flats

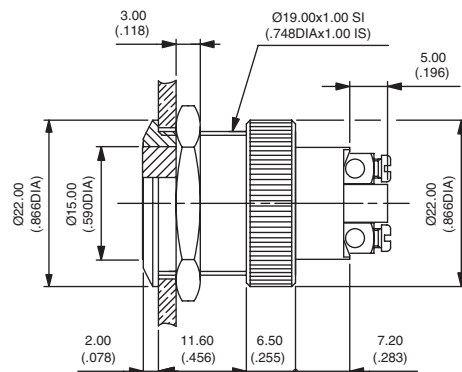


Screw terminals
AV090003A940•

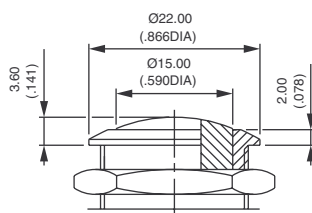


To order switches **marked UL-CSA**, add
"UU" at the end of model number.

Screw terminals for wires 1,5 mm² max.



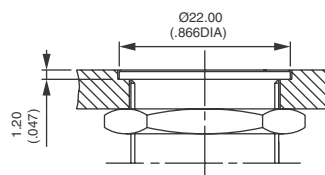
Curved actuator - AV19



Screw terminals
AV19•003•940•

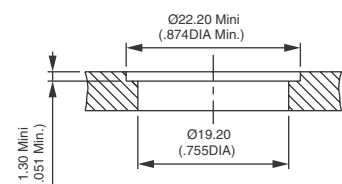
Solder lug/quick-connect term. (short case)
AV191003•240•

Flush model - AV9D



Screw terminals
AV9D•003•940•

Solder lug / quick-connect terminals (short case only)
AV9D1003•240•

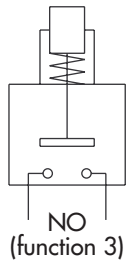


Panel cut-out

AV series

Anti-vandal pushbutton switches Ø 22 mm (.866)

Momentary (NO)



ORDER FORMAT

AV			3			40	
SERIES	Bushing/act. configuration	Case	Function	Contacts	Terminals	Bush./act. material	Sealing
	03 Flat act. 02 Curved act. M3 Flat act + flattened bush. M2 Curved act. + flattened bush.	000 Long 100 Short	3 NO	A Silver C Brass, silver pl.	9 Screw 2 Quick-connect	40 Stainless steel	N No T Sealed

B

In the following model numbers, replace • with elements selected in the above order format.

Flat actuator - short case - 48VDC - AV03100

Hex nut 25 (.984) across flats

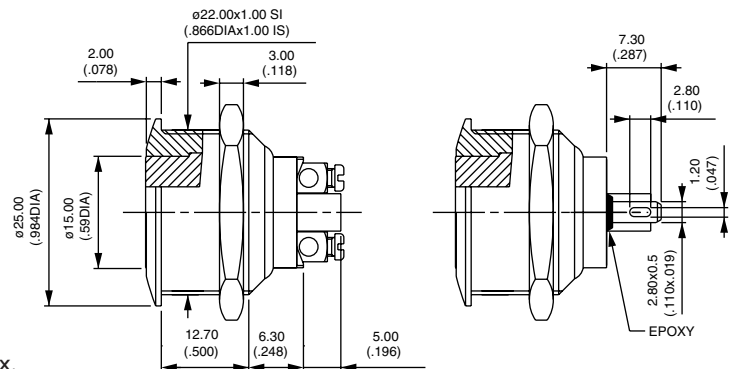


Screw terminals
AV031003•940•

Solder lug /
quick-connect term.
AV031003•240•



Screw terminals for wires 1,5 mm² max.



Flat actuator - long case - 250 VAC - UL/CSA - AV03000

Hex nut 25 (.984) across flats

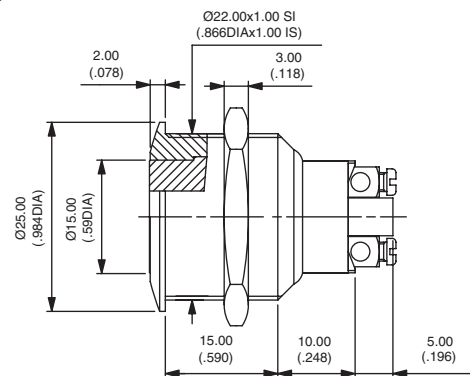


Screw terminals
AV030003A940•

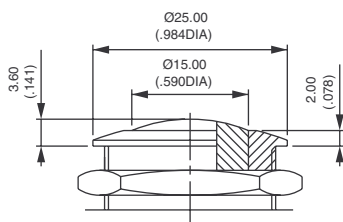
To order switches **marked UL-CSA**, add
"UU" at the end of model number.



Screw terminals for wires 1,5 mm² max.

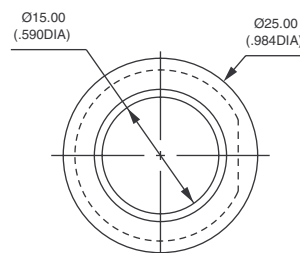


Curved actuator - AV02



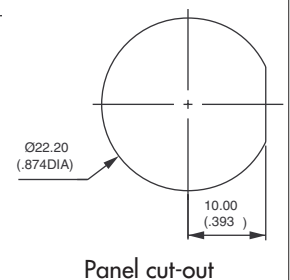
Screw terminals
AV02•003•940•
Solder lug / quick-connect (short case)
AV021003•240•

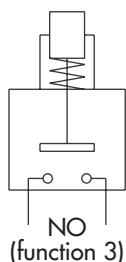
Flatted bushing - AVM3 and AVM2



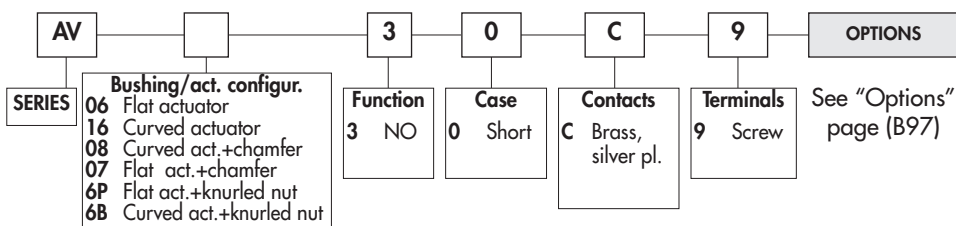
Flat actuator, screw terminals
AVM3•003•940•

Curved actuator, screw terminals
AVM2•003•940•





ORDER FORMAT



SPECIFICATIONS

- Travel : 1,60 mm (.063) ± 0,3 mm (.011)
- Max. current/voltage rating with resistive load : 200mA 48 VDC - 100mA 48VDC
- Initial contact resistance : 50 mΩ max.
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength : 2.000 Vrms 50 Hz min. between terminals and frame
- Electrical life : 50.000 cycles at 200mA 48VDC
100.000 cycles at 100mA 48VDC
- Torque : 5 Nm min.- 14 Nm max. applied to nut
- Panel thickness : 1 (.039) to 6 mm (.236) max.
- Operating temperature : -30°C to +70°C
- Mechanical life : 1.000.000 cycles
- Packaging unit : 60 pieces

MATERIALS

- Case : PBT
- Contacts : brass, silver plated (C)
- Bushing and actuator : see "Options" page

CUT-OUT

- Panel cut-out : Ø 16,2 mm (.637)
- Min. pitch for matrix mounting : 24 mm x 24 mm (.944 x .944) (AV6P & AV6B : 20 mm x 20 mm)

To order a product, select a basic model below and add the desired options.

BASIC MODEL

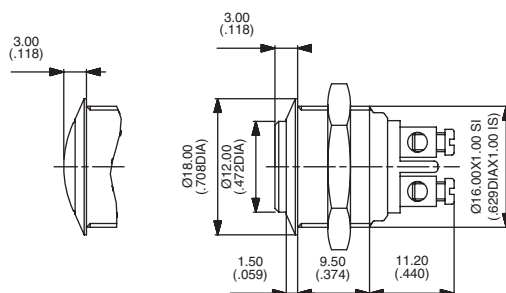
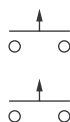
Flat or curved actuator - screw terminals

Hex nut 19 (.748) across flats



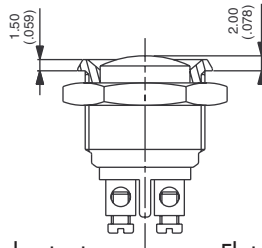
Flat actuator
AV0630C9

Curved actuator
AV1630C9



Screw terminals for wires 1,5 mm² max.

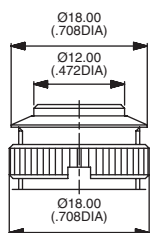
With chamfer



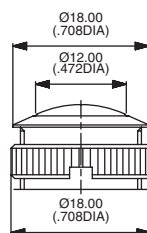
Curved actuator
AV0830C9

Flat actuator
AV0730C9

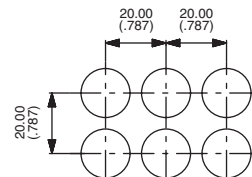
With knurled nut for matrix mounting 20 x 20 - AV6P and AV6B



Flat actuator
AV6P30C9



Curved actuator
AV6B30C9



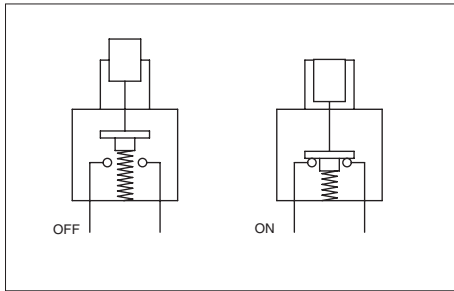
Wrench available under P/N U1990.

AV series

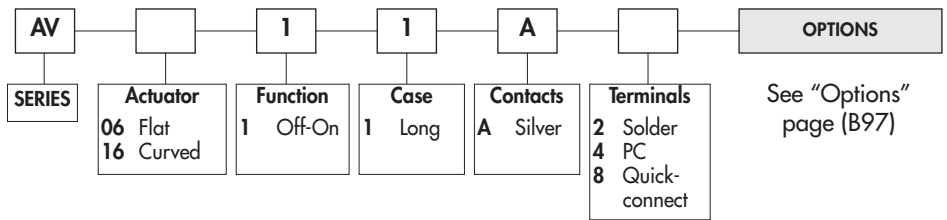
Security pushbutton switches Ø 16 mm (.629)

Latching action

MODEL
STRUCTURE



ORDER FORMAT



SPECIFICATIONS

- Max. current/voltage rating with resistive load : 1,5A 250VAC - 1A 24VDC
- Initial contact resistance : 50mΩ max.
- Insulation resistance : 1 GΩ min. at 500VDC
- Dielectric strength : 1.500 Vrms 50 Hz min. between terminals
1 000 Vrms 50 Hz between terminals and frame
- Electrical life : 100.000 cycles at 1,5A 250VAC
40.000 cycles at 1A 24VDC
- Torque : 5 Nm min. - 14 Nm max. applied to nut
- Panel thickness : 1 (.039) to 6 mm (.236) max.
- Operating temperature : -30°C to +70°C
- Mechanical life : 200.000 cycles
- Hand soldering : 300°C, 5 sec. max.
- Packaging unit : 25 pieces

MATERIALS

- Case : PA-6T, UL94-V0
- Contacts : silver (A)
Gold plated silver (AD) on request
- Bushing and actuator : see "Options" page

CUT-OUT

- Panel cut-out : Ø 16,2 mm (.637)
- Min. pitch for matrix mounting :
24 mm x 24 mm (.944 x .944)

To order a product, select a basic model below and add the desired options.

BASIC MODEL

Flat or curved actuator - solder lug terminals

Hex nut 19 (.748) across flats

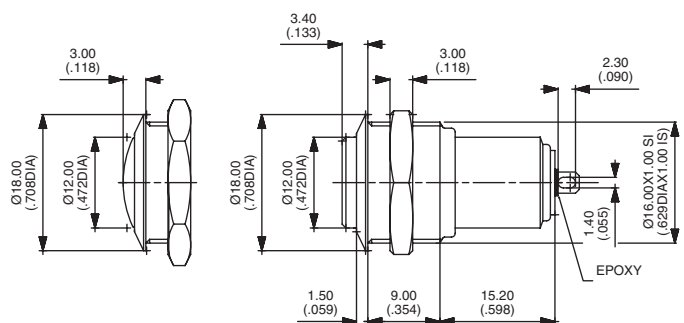


Flat actuator
AV0611A2

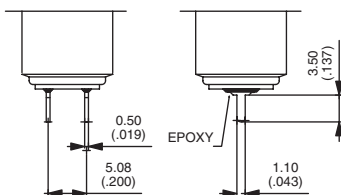
OFF - ON

Curved actuator
AV1611A2

OFF - ON



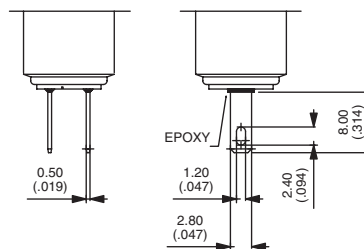
Straight PC terminals



Flat actuator
AV0611A4

Curved actuator
AV1611A4

Quick-connect terminals



Flat actuator
AV0611A8

Curved actuator
AV1611A8

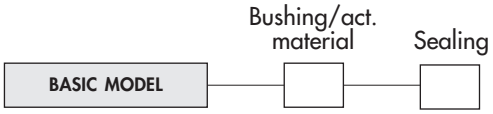


AV series

Security pushbutton switches Ø 16 mm (.629)

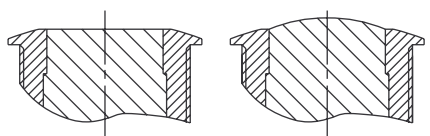
Options

After selecting basic model number,
fill in last 2 boxes
with desired options.



BUSHING/ACTUATOR MATERIALS

Flat or curved metal actuator



CODE	BUSHING	ACTUATOR
00 (standard)	Nickel plated brass	Nickel plated brass
10	Nickel plated brass	Stainless steel
12	Nickel plated brass	Chrome plated brass
20	Chrome plated brass	Chrome plated brass
30	Chrome plated brass	Stainless steel
40	Stainless steel	Stainless steel

SEALING

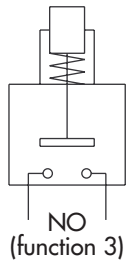
- BlankNo sealing
- KFront panel sealing (IP65)

AV series

Security pushbutton switches Ø 19 mm (.748)

Momentary (NO)

MODEL
STRUCTURE



ORDER FORMAT

SERIES	Bushing/act. config.	Case	Function	Contacts	Terminals	OPTIONS
AV	09 Flat actuator 19 Curved actuator 9P Flat act., knurled nut 9B Curved act., knurled nut	000 Long 100 Short	3 NO	A Silver C Brass silver pl.	9 Screw 2 Quick-connect	See "Options" page (B100)

SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - A contacts : 4A 12VDC, 500.000 cycles
 - C contacts : 2A 48 VDC, 10.000 cycles
- Approved ratings of models with long case and A contacts (AV..000) :
 - UL-CSA : 4A 250VAC - 8A 125VAC - 6.000 cycles
- Initial contact resistance : 10 mΩ max. at 1A 2V
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength : 2.000 Vrms 50 Hz min. between terminals and frame
2.000 Vrms 50 Hz min. between terminals
- Torque : 5 Nm min.- 14 Nm max. applied to nut
- Panel thickness : 1 (.039) to 11 mm (.433) max.
- Operating temperature : -30°C to +70°C
- Mechanical life : 1.000.000 cycles
- Hand soldering : 300°C, 3 sec. max.
- Packaging unit : 40 pieces

MATERIALS

- Case : PBT
- Contacts : silver (A) or brass, silver plated (C)
- Bushing and actuator : see "Options" page

CUT-OUT

- Panel cut-out : Ø 19,2 mm (.755)
- Min. pitch for matrix mounting : 30 mm x 30 mm (1.181x1.181) (AV9P & AV9B : 25 mm x 25 mm)

To order a product, select a basic model below and add the desired options.

BASIC MODEL

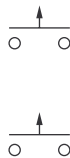
Flat actuator - short case - 48VDC - AV09100

Hex nut 22 (.866) across flats

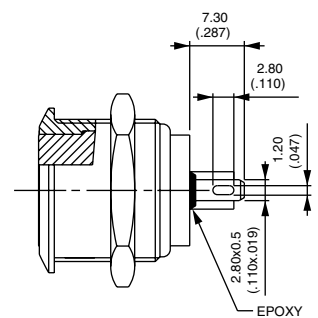
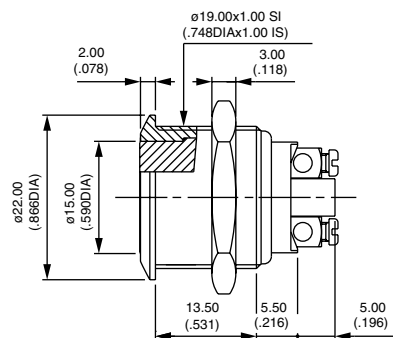


Screw terminals
AV091003•9

Solder lug /
quick-connect term.
AV091003•2

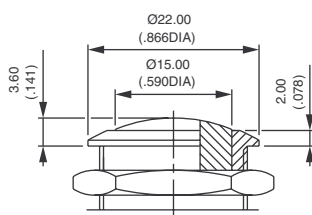


Screw terminals for wires 1,5 mm² max.



Contacts : replace • with A (silver) or C (silver plated brass).

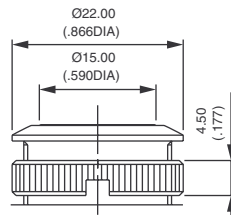
Curved actuator - short case



Screw terminals
AV191003•9

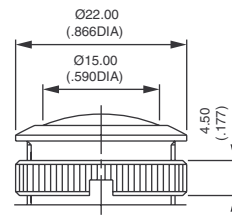
Solder lug / quick-connect terminals
AV191003•2

With knurled nut for matrix mounting 25 x 25 - AV9P and AV9B



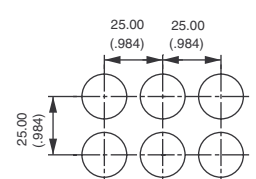
Flat actuator, screw terminals
AV9P1003•9

Flat actuator, solder lug term.
AV9P1003•2



Curved actuator, screw terminals
AV9B1003•9

Curved actuator, solder lug term.
AV9B1003•2



Wrench available
under P/N U1929



AV series

Security pushbutton switches Ø 19 mm (.748)

Momentary (NO)

Flat actuator - long case - 250VAC - UL/CSA - AV09000

Hex nut 22 (.866) across flats

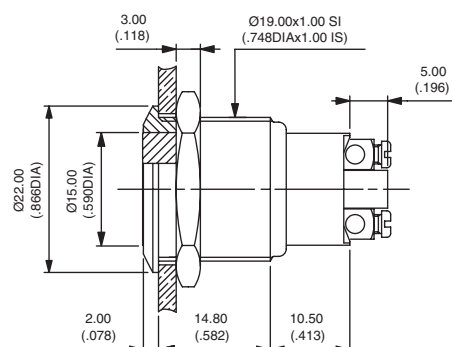


Screw terminals
AV090003A9

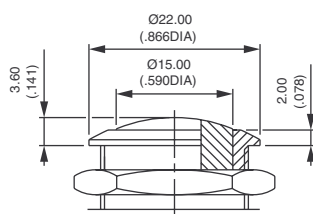


To order switches **marked UL-CSA**, add
"UU" at the end of model number.

Screw terminals for wires 1,5 mm² max.

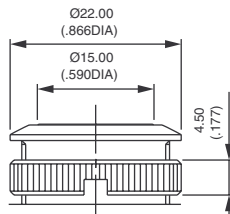


Curved actuator - long case

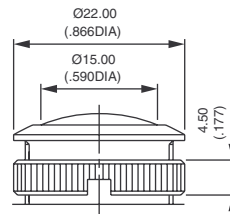


Screw terminals
AV190003A9

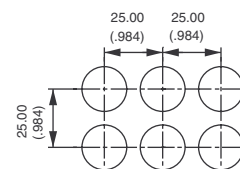
With knurled nut for matrix mounting 25 x 25 - AV9P and AV9B



Flat actuator, screw terminals
AV9P0003A9



Curved actuator, screw terminals
AV9B0003A9



Wrench available
under P/N **U1929**.

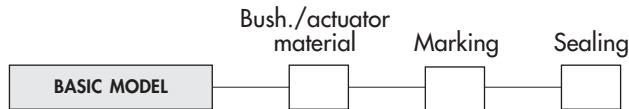
AV series

Security pushbutton switches Ø 19 mm (.748)

Options

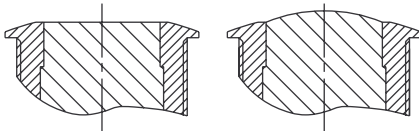
OPTIONS
● ● ●

After selecting basic model number,
fill in last 3 boxes
with desired options.



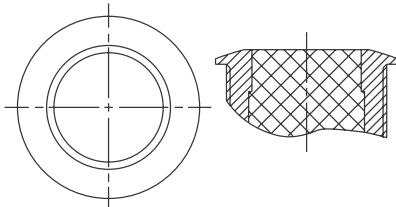
BUSHING/ACTUATOR MATERIALS

Flat or curved metal actuator



CODE	BUSHING	ACTUATOR
00 (standard)	Nickel plated brass	Nickel plated brass
10	Nickel plated brass	Stainless steel
12	Nickel plated brass	Chrome plated brass
20	Chrome plated brass	Chrome plated brass
30	Chrome plated brass	Stainless steel
40	Stainless steel	Stainless steel
80	Varnished polished brass	Varnished polished brass

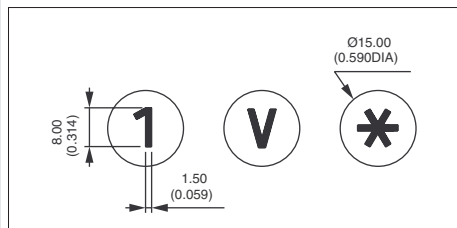
Flat thermoplastic actuator



CODE	BUSHING	ACTUATOR COLOUR
0• (standard)	Nickel plated brass	Replace • with one of the following codes.
2•	Chrome plated brass	1 : blue - 1/4 : dark blue - 2 : black - 3 : green
8•	Varnished polished brass	4 : grey - 5 : yellow - 6 : red - 7/1 : white
		9 : orange

MARKING

- By engraving on flat or curved brass actuator (stainless steel on request)
- by hot stamping on flat thermoplastic actuator



Select an option from each of the two tables below.

TYPE OF MARKING

CODE	TYPE
0 to 9	Numbers 0 to 9
X	Symbol *
Y	Symbol #
A to N	Letters A to N
P to W	Letters P to W
0	Letter O

Letter O : same code and same design as number 0.

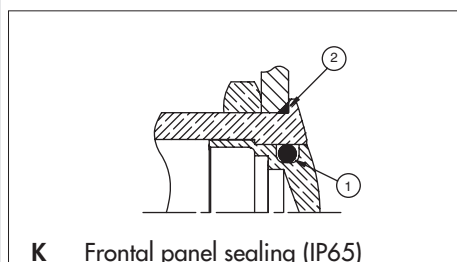
For special symbols, consult factory.
Minimum order : 500 pieces

COLOUR OF MARKING

CODE	COLOUR
Brass actuator	
0 (standard)	Same as finish
2	Black
Note : a finished product supplied in version "0" cannot be modified to version "2".	
Thermoplastic actuator	
2	Black
7	White

SEALING

Blank No sealing



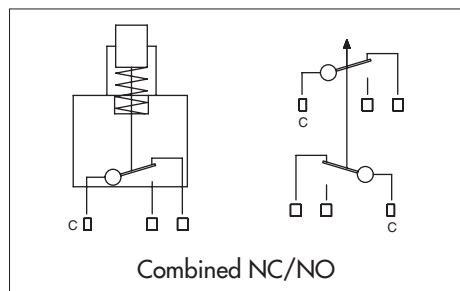
- ① internal gasket
② external gasket

New!

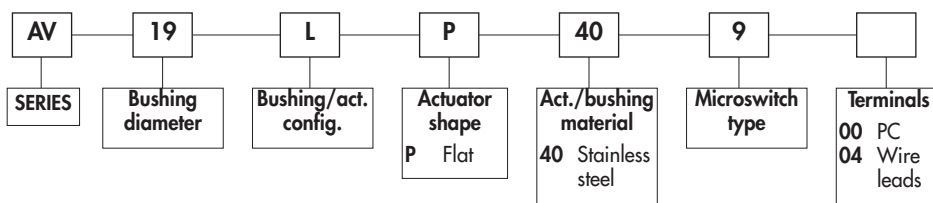
AV series

Security pushbutton switches Ø 19 mm (.748)

Momentary (NC/NO)



ORDER FORMAT



SPECIFICATIONS

- Max. current/voltage rating with resistive load :
2A 12VDC, 200.000 cycles - 1A 24VDC, 200.000 cycles
3A 125Vca - 0,2A 60VDC - 6.000 cycles
- Initial contact resistance : 100 mΩ max.
- Insulation resistance: 100 MΩ min. at 500VDC
- Dielectric strength : 500 Vrms 50 Hz min.
- Torque : 5 Nm min.- 14 Nm max. applied to nut
- Panel thickness : 1 (.039) to 6 mm (.236) max.
- Operating temperature : -20°C to +55°C
- Mechanical life : 1.000.000 cycles
- Front panel sealing : IP65
- Hand soldering : 300°C, 3 seconds max.
- Packaging unit : models with straight PC terminals : 20 pieces
Models with wire lead terminals : individual bags

MATERIALS

- Contacts : silver
- Bushing and actuator : stainless steel

CUT-OUT

- Panel cut-out : Ø 19,2 mm (.755)
- Min. pitch for matrix mounting : 30 mm x 30 mm (1.181x1.181)

BASIC MODEL

The common terminal is indicated by the letter C on the drawing.

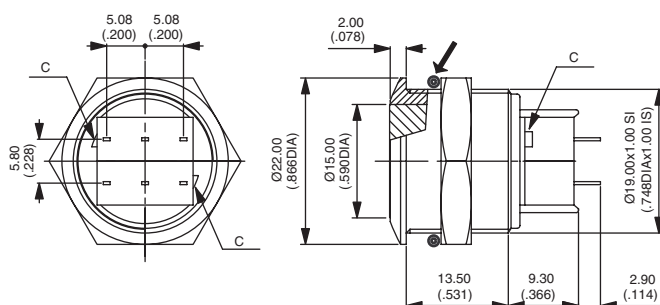
Flat actuator - straight PC terminals

→ O-Ring

Hex nut 22 (.866) across flats



AV19LP40900



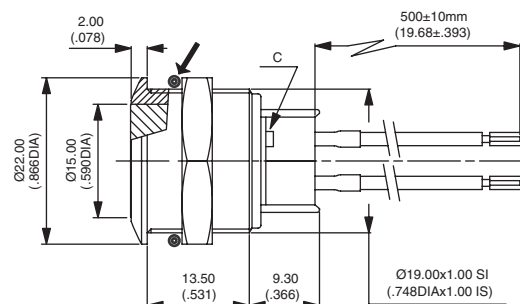
Flat actuator - wire lead terminals

→ O-Ring

Hex nut 22 (.866) across flats



AV19LP40904



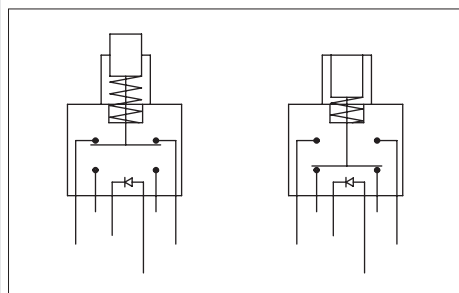
Wire length : 500 mm

In the upper position (ON), the closed circuit is through the red wires.
In the lower position (MOM), the closed circuit is through the blue wires.

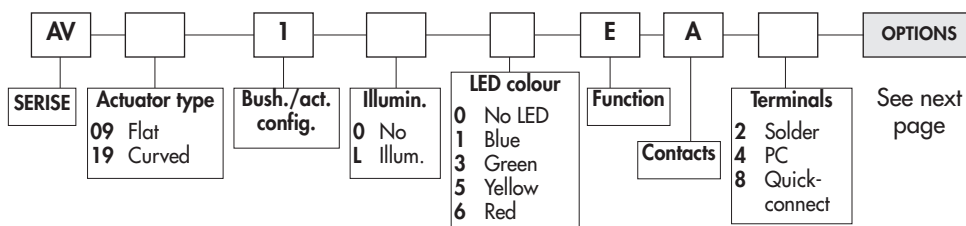
Security pushbutton switches Ø 19 mm (.748)

New!

Latching - illuminated and non-illuminated



ORDER FORMAT



SPECIFICATIONS

- Max. current/voltage rating with resistive load : 2A 48 VDC
- LED voltage and consumption : blue 3,5V 10mA, green : 2V 10mA
yellow & red : 2V 20mA (a resistor must be series-connected by the user)**
- Initial contact resistance : 50 mΩ max.
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength : 1 000 Vrms 50 Hz min. between terminals
500 Vrms 50 Hz min. between terminals and bushing
- Electrical life : 500.000 cycles at 2A 48VDC
- Torque : 5 Nm min.- 14 Nm max. applied to nut
- Panel thickness : 1 (.039) to 9 mm (.354) max.
- Operating temperature : -30°C to +70°C
- Mechanical life : 1.000.000 cycles
- Hand soldering : 300°C, 4 seconds max.
- Packaging unit : 20 pieces

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

MATERIALS

- Case : PA6T UL94-V0
- Contacts : silver
- Bushing and actuator : see next page
- LED

CUT-OUT

- Panel cut-out : Ø 19,2 mm (.755)
- Min. pitch for matrix mounting :
30 mm x 30 mm (1.181 x 1.181)

To order a product, select a basic model below and add the desired options selected on next page.

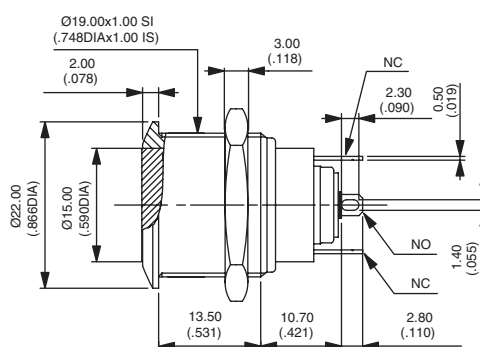
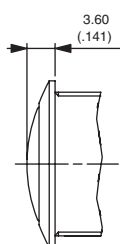
Standard actuator position : the actuator is flush in the non-latched position and recessed in the latched position.

Non-illuminated - solder lug terminals



Flat actuator *
AV09100EA2 ON - ON

Curved actuator
AV19100EA2 ON - ON



Hex nut 22 (.866) across flats

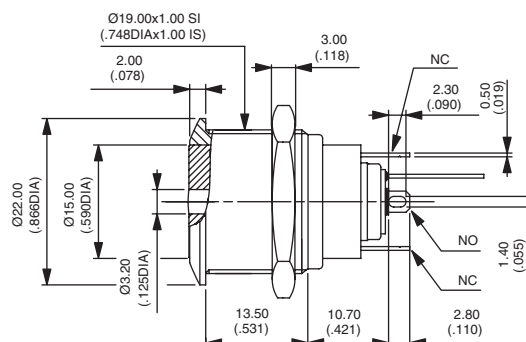
* Also available with prominent actuator in the non-latched position

Illuminated - solder lug terminals



Flat actuator
AV091L•EA2 ON - ON

Replace • with desired LED colour.



Hex nut 22 (.866) across flats

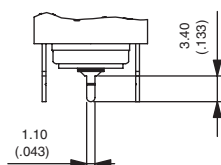
New!

AV series

Security pushbutton switches Ø 19 mm (.748)

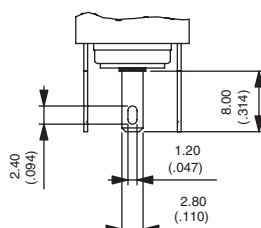
Latching - Options

Straight PC terminals



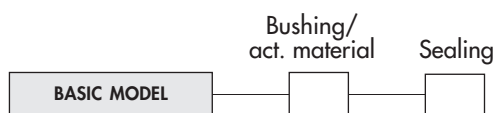
Replace 2 with 4 at the end of the model numbers shown on previous page.

Quick-connect terminals



Replace 2 with 8 at the end of the model numbers shown on previous page.

After selecting basic model number, fill in last 2 boxes with desired options.

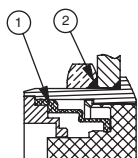


BUSHING/ACTUATOR MATERIALS

CODE	BUSHING	ACTUATOR
00 (std)	Nickel plated brass	Nickel plated brass
10	Nickel plated brass	Stainless steel
40	Stainless steel	Stainless steel
50	Stainless steel	Nickel plated brass

SEALING

Blank No sealing



K Frontal panel sealing (IP65)

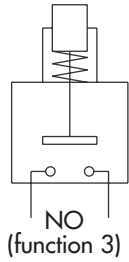
- ① elastomeric membrane
- ② external gasket

AV series

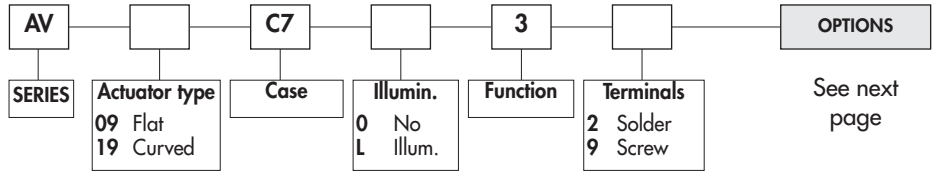
Snap-action security pushbutton switches Ø 19 mm (.748)

Illuminated and non-illuminated - momentary (NO)

MODEL
STRUCTURE



ORDER FORMAT



SPECIFICATIONS

- Travel : 0,7 mm (.027) ±0,1 mm (.003)
- Max. current/voltage rating with resistive load : 50mA 24VDC
- LED voltage and consumption : 2-colour LED : 2V (3V max.) 20mA
Other colours : 2V (3V max.) 10mA
A resistor must be series-connected by the user **
- Initial contact resistance : 100 mΩ max.
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength : 500 Vrms 50 Hz min. between terminals
2.000 Vrms 50 Hz min. between terminals and bushing
- Electrical life : 1.000.000 cycles at full load
- Operating force : 7 N ±2N
- Torque : 5 Nm min.- 14 Nm max. applied to nut
- Panel thickness : 1 (.039) to 6 mm (.236) max.
- Operating temperature : -30°C to +70°C
- Hand soldering : 270°C, 3 seconds max.
- Packaging unit : 40 pieces

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

MATERIALS

- Case : PBT UL94-V0
- Terminals : brass, gold plated
- Contacts : gold plated dome
- Bushing and actuator : see next page
- LED

CUT-OUT

- Panel cut-out : Ø 19,2 mm (.755)
- Min. pitch for matrix mounting : 30 mm x 30 mm (1.181x1.181)

To order a product, select a basic model below and add the desired options selected on next page.

Flat actuator - non-illuminated

Hex nut 22 (.866) across flats

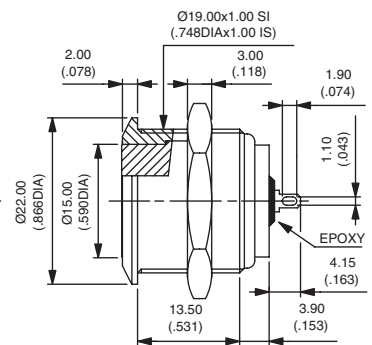
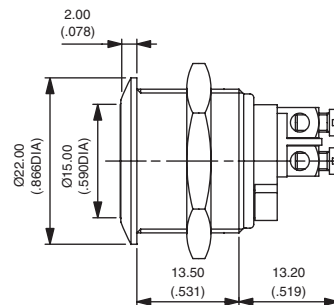


Solder lug terminals
AV09C703D2

Screw terminals
AV09C703D9



Also available with curved actuator :
AV19C703D2 or AV19C703D9



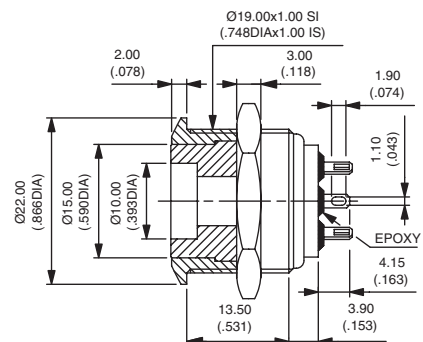
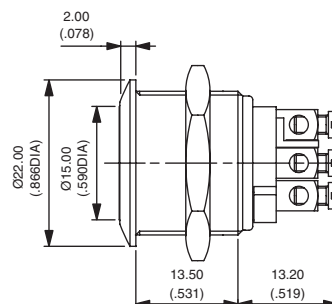
Flat actuator - illuminated

Hex nut 22 (.866) across flats



Solder lug terminals
AV09C713D2

Screw terminals
AV09C713D9



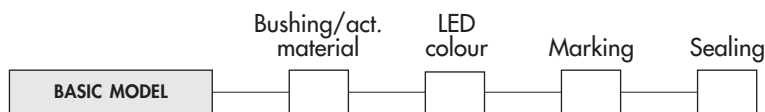


AV series

Snap-action security pushbutton switches Ø 19 mm (.748)

Options

After selecting basic model no.,
fill in last 4 boxes
with desired options.



BUSHING/ACTUATOR MATERIALS

Non-illuminated models			Illuminated models		
CODE	BUSHING	ACTUATOR	CODE	BUSHING	ACTUATOR
00 (std)	Nickel plated brass	Nickel plated brass	00 (std)	Nickel plated brass	Nickel plated brass
10	Nickel plated brass	Stainless steel	20	Chrome plated brass	Chrome plated brass
30	Chrome plated brass	Stainless steel	40	Stainless steel	Stainless steel
40	Stainless steel	Stainless steel	50	Stainless steel	Nickel plated brass
80	Varnished polished brass	Varnished polished brass	80	Varnished polished brass	Varnished polished brass

LED COLOURS

Blank No LED

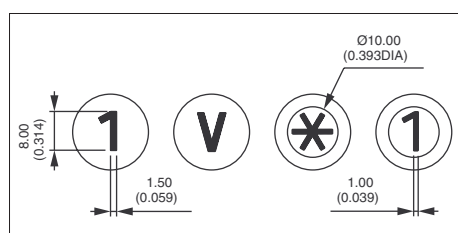
1 : Blue - 3 : Green - 5 : Yellow - 6 : Red - 7 : White - 9 : Amber - 2 : Red/green

MARKING

Select an option from each of the two tables below.

For flat or curved actuator.

- by engraving on non-illuminated brass actuator (stainless steel on request).
- by hot stamping on thermoplastic insert (illuminated actuators)



TYPE OF MARKING

CODE	TYPE
0 to 9	Numbers 0 to 9
X	Symbol *
Y	Symbol #
A to N	Letters A to N
P to W	Letters P to W
O	Letter O

Letter O : same code and same design as number 0.

For special symbols, consult factory.
Minimum order : 500 pieces

COLOUR OF MARKING

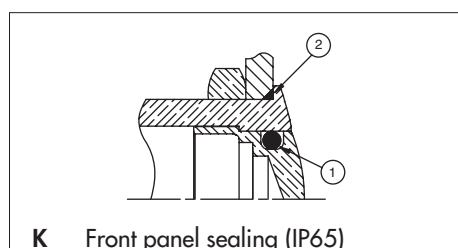
CODE	COLOUR
Non-illuminated actuators	
0 (standard)	Same as finish
2	Black

Note : a finished product supplied in version "0" cannot be modified to version "2".

Illuminated actuators	
2	Black (on white)

SEALING

Blank No sealing



① internal gasket

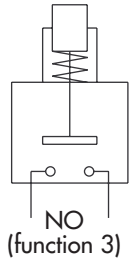
② external gasket

AV series

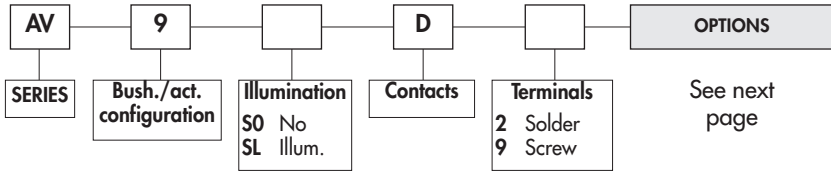
Snap-action security pushbuttons Ø 19 mm (.748) with overmolded actuator

Illuminated and non-illuminated - momentary (NO)

MODEL
STRUCTURE



ORDER FORMAT



SPECIFICATIONS

- Travel : 0,7 mm (.027) ± 0,1 mm (.003)
- Max. current/voltage rating with resistive load : 50mA 24VDC
- LED voltage and consumption : 2-colour LED : 2V (3V max.) 20mA
Other colours : 2V (3V max.) 10mA
(a resistor must be series-connected by the user)**
- Initial contact resistance : 100 mΩ max.
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength : 500 Vrms 50 Hz min. between terminals
2.000 Vrms 50 Hz min. between terminals and bushing
- Electrical life : 1.000.000 cycles at full load
- Operating force : 7 N ± 2N
- Torque : 5 Nm min.- 14 Nm max. applied to nut
- Panel thickness : 1 (.039) to 6 mm (.236) max.
- Operating temperature : -30°C to +70°C
- Hand soldering : 270°C, 3 sec. max.
- Packaging unit : 40 pieces

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

MATERIALS

- Case : PBT UL94-V0
- Terminals : brass, gold plated
- Contacts : gold plated dome
- Bushing : see next page
- Actuator : stainless steel, with thermoplastic overmolding
- LED

CUT-OUT

- Panel cut-out : Ø 19,2 mm (.755)
- Min. pitch for matrix mounting : 30 mm x 30 mm (1.181x1.181)

To order a product, select a basic model below and add the desired options selected on next page.

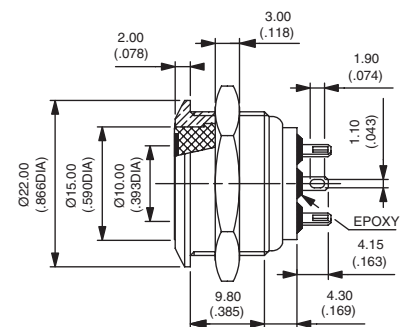
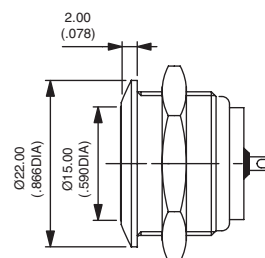
Flat actuator - solder lug terminals

Hex nut 22 (.866) across flats



Illuminated
AV9SLD2

Non-illuminated
AV9SOD2



Also available with bushing Ø 22 (.866) : on request.

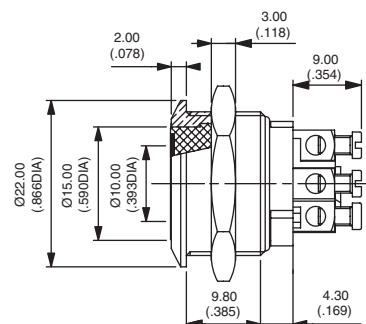
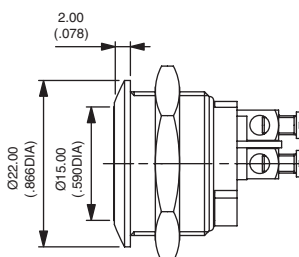
Flat actuator - screw terminals

Hex nut 22 (.866) across flats



Illuminated
AV9SLD9

Non-illuminated
AV9SOD9



Also available with bushing Ø 22 (.866) : on request.



AV series

Snap-action security pushbuttons Ø 19 mm (.748) with overmolded actuator

Options

After selecting basic model no.,
fill in last 5 boxes
with desired options.



BUSHING MATERIALS

CODE	MATERIAL
0 (std)	Nickel plated brass
2	Chrome plated brass
4	Stainless steel
5	Gold plated brass
6	Chrome plated brass, satin
7	Chrome pl. brass, matt black
8	Varnished polished brass
9	Polished brass

OVERMOLDING COLOURS

CODE	COLOUR	CODE	COLOUR
1	Blue	6	Red
2	Black *	7	White
3	Green	8	Translucent
4	Grey *	9	Orange
5	Yellow		
* non-illuminated only			

LED COLOURS

CODE	COLOUR
Blank	No LED
1	Blue
2	Red/green
3	Green
5	Yellow
6	Red
7	White
9	Amber

ACTUATOR STYLES

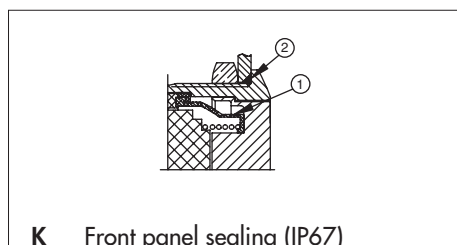
The ring and symbols are obtained by photochemical engraving of a stainless steel insert.
The insert is then overmolded in the desired colour.

The following actuator styles are available. For other types, consult factory.

CODE	001	002	003	004	005
DESCRIPTION	Illuminated ring and disc	Illuminated ring	Arrow	Loudspeaker OFF	Double arrow
RING/SYMBOL					

SEALING

Blank No sealing



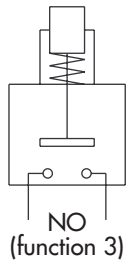
- ① internal membrane
② external gasket

AV series

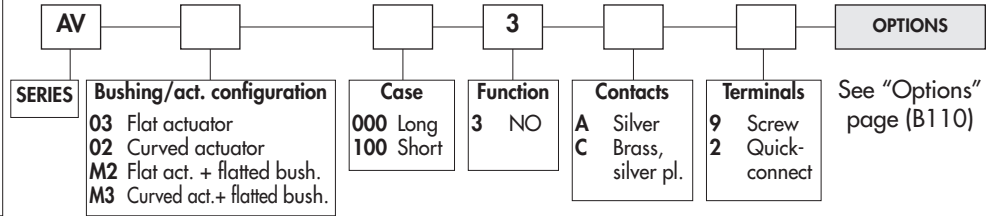
Security pushbutton switches Ø 22 mm (.866)

Momentary (NO)

MODEL
STRUCTURE



ORDER FORMAT



SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - A contacts : 4A 12VDC, 500.000 cycles
 - C contacts : 2A 48 VDC, 10.000 cycles
- Approved ratings of models with long case and A contacts (AV..000) :
 - UL-CSA : 4A 250VAC - 8A 125VAC - 6.000 cycles
- Initial contact resistance : 10 mΩ max. at 1A 2V
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength : 2.000 Vrms 50 Hz min. between terminals and frame
2.000 Vrms 50 Hz min. between terminals
- Torque : 5 Nm min.- 14 Nm max. applied to nut
- Panel thickness : 1 (.039) to 11 mm (.433) max.
- Operating temperature : -30°C to +70°C
- Mechanical life : 1.000.000 cycles
- Hand soldering : 300°C, 3 sec. max.
- Packaging unit : 20 pieces

MATERIALS

- Case : PBT
- Contacts : silver (A) or brass, silver plated (C)
- Bushing and actuator : see "Options" page

CUT-OUTS

- Panel cut-out : Ø 22,2 mm (.874)
- Min. pitch for matrix mounting : 30 mm x 30 mm (1.181x1.181)

To order a product, select a basic model below or on next page and add the desired options.

BASIC MODEL

Flat actuator - short case - 48VDC - AV03100

Hex nut 25 (.984) across flats

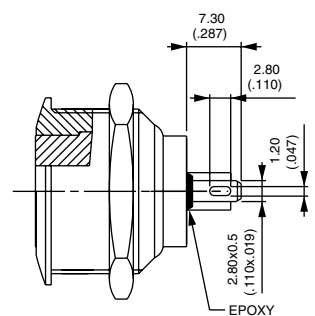
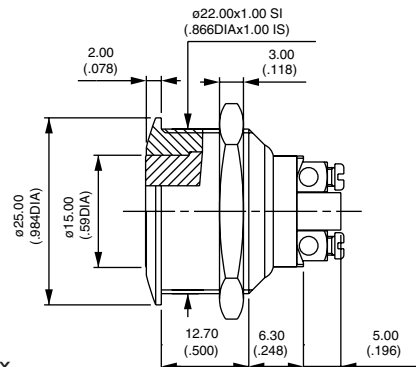


Screw terminals
AV031003•9

Solder lug /
quick-connect term.
AV031003•2

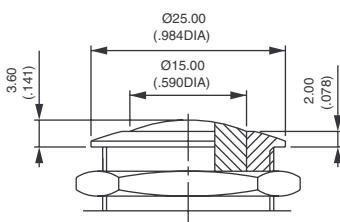


Screw terminals for wires 1,5 mm² max.



Contacts : replace • with A (silver) or C (silver plated brass).

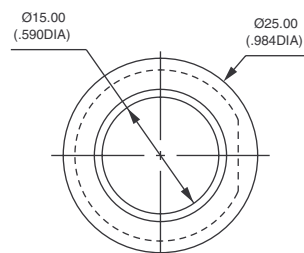
Curved actuator - short case



Screw terminals
AV021003•9

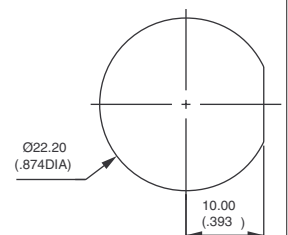
Solder lug / quick-connect terminals
AV021003•2

Flatted bushing - short case - AVM3 and AVM2



Flat actuator, screw terminals
AVM31003•9

Curved actuator, screw terminals
AVM21003•9



Flat actuator - long case - 250VAC - UL/CSA - AV03000

Hex nut 25 (.984) across flats

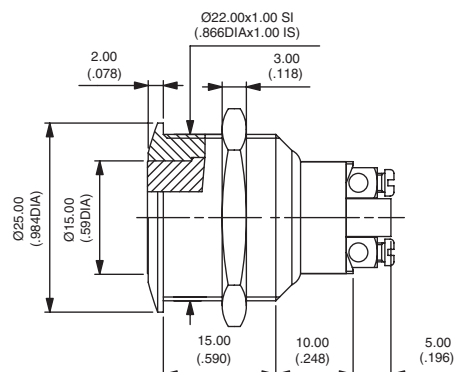


Screw terminals
AV030003A9

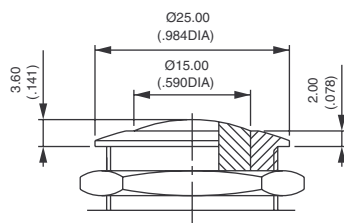


To order switches **marked UL-CSA**, add
"UU" at the end of model number.

Screw terminals for wires 1,5 mm² max.

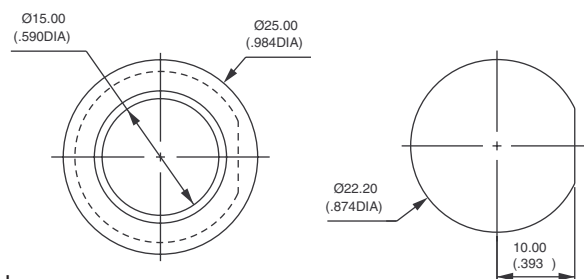


Curved actuator - long case



Screw terminals
AV020003A9

Flatted bushing - long case - AVM3 and AVM2



Flat actuator, screw terminals

AVM30003•9

Curved actuator, screw terminals

AVM20003•9

MOMENTARY NORMALLY CLOSED MODEL (NC)

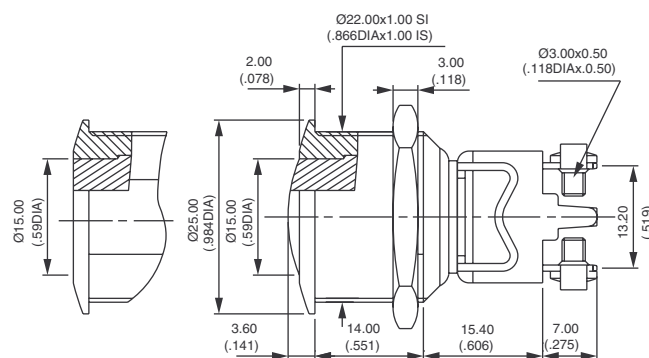
Bushing Ø 22 (.866) - AV..1200

Hex nut 25 (.984) across flats

- Single pole, screw terminals, without marking
- Silver plated copper contacts (C)
- Max. current/voltage rating with resistive load :
2A 250VAC - 3A 125VAC - 2,5A 24VDC
- Dielectric strength :
2.000 Vrms 50 Hz min. betw. term. and frame
2.000 Vrms. 50 Hz min. between terminals
- Electrical life : 100.000 cycles at 0,3A 24VAC or DC
10.000 cycles at full load
- Packaging unit : 20 pieces

Flat actuator
AV031202C900

Curved actuator
AV021202C900



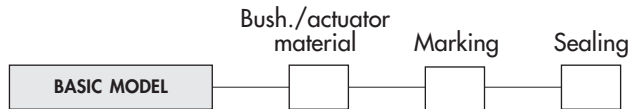
AV series

Security pushbutton switches Ø 22 mm (.866)

Options

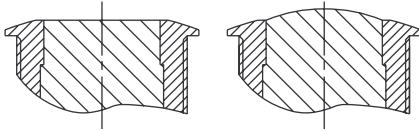
OPTIONS
• • •

After selecting basic model number,
fill in last 3 boxes
with desired options.



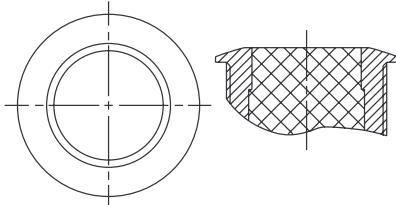
BUSHING/ACTUATOR MATERIALS

Flat or curved metal actuator



CODE	BUSHING	ACTUATOR
00 (standard)	Nickel plated brass	Nickel plated brass
10	Nickel plated brass	Stainless steel
12	Nickel plated brass	Chrome plated brass
20	Chrome plated brass	Chrome plated brass
30	Chrome plated brass	Stainless steel
40	Stainless steel	Stainless steel
80 **	Varnished polished brass	Varnished polished brass

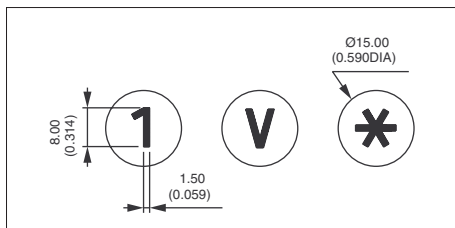
Flat thermoplastic actuator



CODE	BUSHING	ACTUATOR COLOUR
0• (standard)	Nickel plated brass	Replace • with one of the following codes.
2•	Chrome plated brass	1 : blue - 1/4 : dark blue - 2 : black - 3 : green
8•	Varnished polished brass	4 : grey - 5 : yellow - 6 : red - 7/1 : white
		9 : orange

MARKING

- By engraving on flat or curved brass actuator (stainless steel on request)
- by hot stamping on flat thermoplastic actuator



Select an option from each of the two tables below.

TYPE OF MARKING

CODE	TYPE
0 to 9	Numbers 0 to 9
X	Symbol *
Y	Symbol #
A to N	Letters A to N
P to W	Letters P to W
0	Letter O

Letter O : same code and same design as number 0.

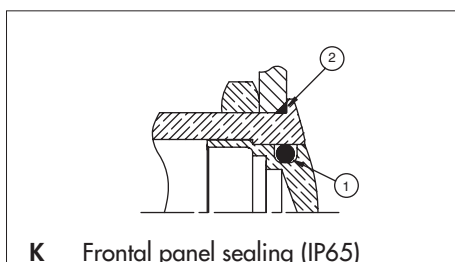
For special symbols, consult factory.
Minimum order : 500 pieces

COLOUR OF MARKING

CODE	COLOUR
Brass actuator	
0 (standard)	Same as finish
2	Black
Note : a finished product supplied in version "0" cannot be modified to version "2".	
Thermoplastic actuator	
2	Black
7	White

SEALING

Blank No sealing



- ① internal gasket
② external gasket

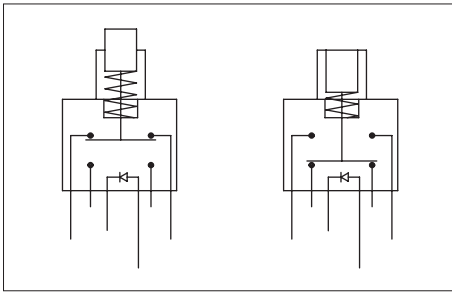
K Frontal panel sealing (IP65)

New!

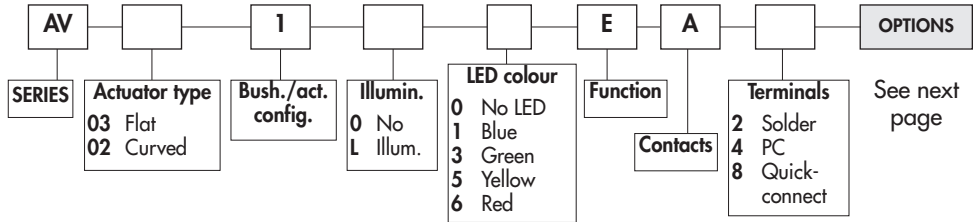
AV series

Security pushbutton switches Ø 22 mm (.866)

Latching - illuminated and non-illuminated



ORDER FORMAT



SPECIFICATIONS

- Max. current/voltage rating with resistive load : 2A 48 VDC
- LED voltage and consumption : blue 3,5V 10mA, green : 2V 10mA
yellow & red : 2V 20mA (a resistor must be series-connected by the user)**
- Initial contact resistance : 50 mΩ max.
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength : 1 000 Vrms 50 Hz min. between terminals
500 Vrms 50 Hz min. between terminals and bushing
- Electrical life : 500.000 cycles at 2A 48VDC
- Torque : 5 Nm min.- 14 Nm max. applied to nut
- Panel thickness : 1 (.039) to 9 mm (.354) max.
- Operating temperature : -30°C to +70°C
- Mechanical life : 1.000.000 cycles
- Hand soldering : 300°C, 4 seconds max.
- Packaging unit : 20 pieces

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

MATERIALS

- Case : PA6T UL94-V0
- Contacts : silver
- Actuator and bushing : see next page
- LED

CUT-OUT

- Panel cut-out : Ø 22,2 mm (.874)
- Min. pitch for matrix mounting : 30 mm x 30 mm (1.181x1.181)

To order a product, select a basic model below and add the desired options selected on next page.

Standard actuator position : the actuator is flush in the non-latched position and recessed in the latched position.

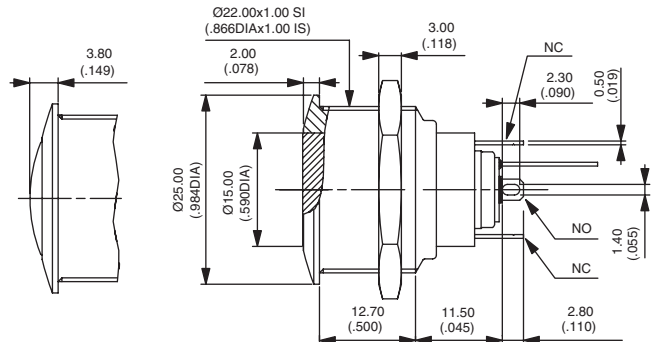
Non-illuminated - solder lug terminals

Hex nut 25 (.984) across flats



Flat actuator *
AV03100EA2 ON - ON

Curved actuator
AV02100EA2 ON - ON



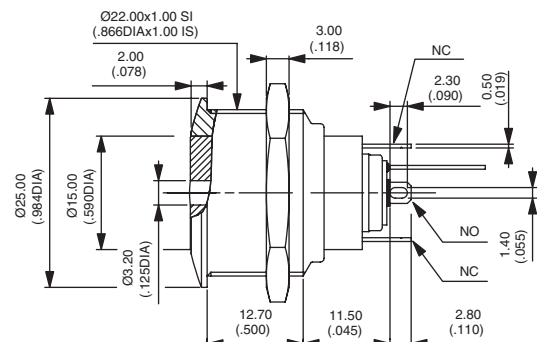
* Also available with prominent actuator in the non-latched position

Illuminated - solder lug terminals

Hex nut 25 (.984) across flats



Flat actuator
AV031L•EA2 ON - ON



Replace • with desired LED colour.

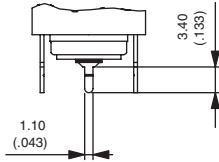
AV series

Security pushbutton switches Ø 22 mm (.866)

New!

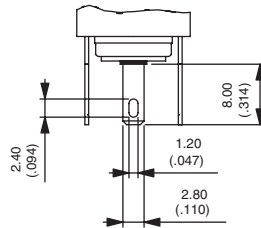
Latching - illuminated and non-illuminated

Straight PC terminals



Replace 2 with 4 at the end of the model numbers shown on previous page.

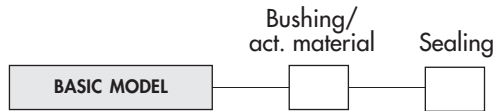
Quick-connect terminals



Replace 2 with 8 at the end of the model numbers shown on previous page.

B

After selecting basic model number, fill in last 2 boxes with desired options.

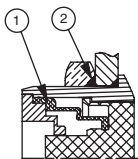


BUSHING/ACTUATOR MATERIALS

CODE	BUSHING	ACTUATOR
00 (std)	Nickel plated brass	Nickel plated brass
10	Nickel plated brass	Stainless steel
40	Stainless steel	Stainless steel
50	Stainless steel	Nickel plated brass

SEALING

Blank No sealing



K Frontal panel sealing (IP65)

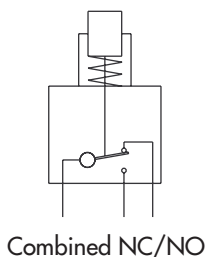
- ① elastomeric membrane
- ② external gasket



AV series

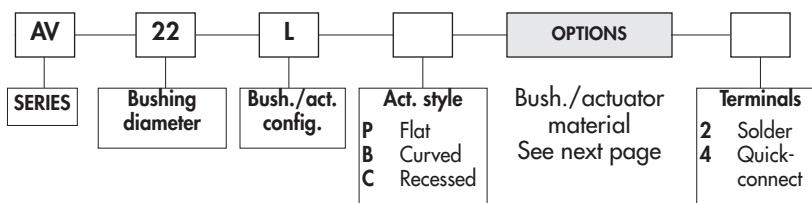
Security pushbutton switches Ø 22 mm (.866) or 24 mm (.944) with large actuator

Momentary (combined NC/NO)



Combined NC/NO

ORDER FORMAT



SPECIFICATIONS

- Max. current/voltage rating with resistive load : 5A 250VAC
- Initial contact resistance : 100 mΩ max.
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength : 2.000 Vrms 50 Hz min. between terminals and frame
- Electrical life : 1.000.000 cycles at 1A 250VAC
100.000 cycles at full load
- Torque : 5 Nm min.- 14 Nm max. applied to nut
- Panel thickness : 1 (.039) to 6 mm (.236) max.
- Operating temperature : -20°C to +55°C
- Mechanical life : 3.000.000 cycles
- Front panel sealing : IP65
- Hand soldering : 300°C, 5 sec. max.
- Packaging unit : 20 pieces (except black chrome plated : 16 pieces)

MATERIALS

- Case : polyester, glass filled
- Contacts : silver/nickel alloy
- Bushing and actuator : see next page.

CUT-OUT

- Panel cut-out : Ø 22,2 mm (.874) or Ø 24,2 mm (.952)
- Min. pitch for matrix mounting : 30 mm x 30 mm (1.181x1.181) or 33 mm x 33 mm (1.299x1.299)

To order a product, select a basic model below or on next page and add the desired bushing/actuator materials.

BASIC MODEL

Flat actuator - AV22LP



Solder lug terminals
AV22LP••2

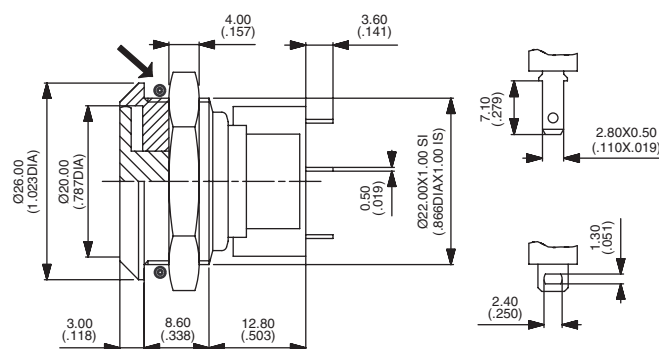


Quick-connect terminals
AV22LP••4

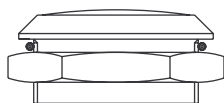


→ O-ring

Hex nut 25 (.984) across flats

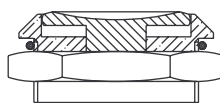


Curved actuator - AV22LB



Solder lug terminals
AV22LB••2
Quick-connect terminals
AV22LB••4

Recessed actuator - AV22LC



Solder lug terminals
AV22LC••2
Quick-connect terminals
AV22LC••4

AV series

Security pushbutton switches Ø 22 mm (.866) or 24 mm (.944) with large actuator

Momentary (combined NC/NO)

OPTIONS
• • •

BASIC MODEL

Flat actuator - low profile - AV24LP



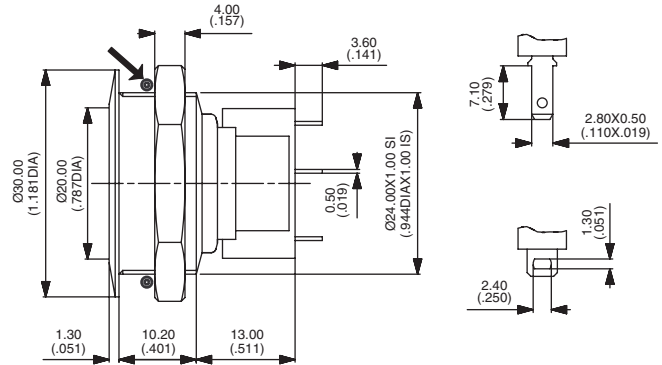
Solder lug terminals
AV24LP••2

Quick-connect terminals
AV24LP••4

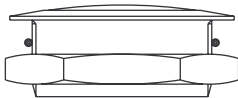


→ O-ring

Hex nut 27 (1.062) across flats

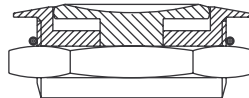


Curved actuator - AV24LB



Solder lug terminals
AV24LB••2
Quick-connect terminals
AV24LB••4

Recessed actuator - AV24LC



Solder lug terminals
AV24LC••2
Quick-connect terminals
AV24LC••4

BUSHING/ACTUATOR MATERIALS

Models with non-anodized actuator

CODE	BUSHING
40 (standard)	Stainless steel
20	Chrome plated brass

ACTUATOR
Stainless steel
Chrome plated brass

Models with anodized actuator

CODE	BUSHING
1•	Black chrome plated brass
2•	Chrome plated brass
4•	Stainless steel

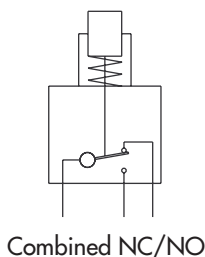
ACTUATOR COLOUR
Replace • with one of the following codes :
1 : blue - 2 : black - 3 : pale green - 3F : dark green - 4 : natural - 5 : gold yellow
6 : red - 6B : maroon



AV series

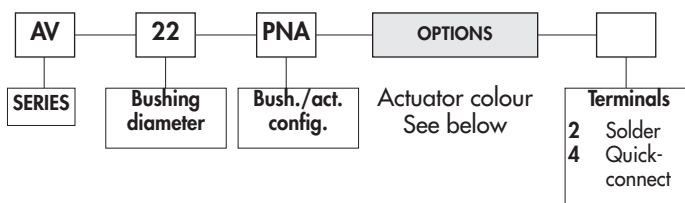
Mushroom head security pushbutton switches Ø 22 mm (.866)

Momentary (combined NC/NO)



Combined NC/NO

ORDER FORMAT



SPECIFICATIONS

- Max. current/voltage rating with resistive load : 5A 250VAC
- Initial contact resistance : 100 mΩ max.
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength : 2.000 Vrms 50 Hz min. between terminals and frame
- Electrical life : 1.000.000 cycles at 1A 250VAC
50.000 cycles at full load
- Torque : 5 Nm min.- 14 Nm max. applied to nut
- Panel thickness : 1 (.039) to 6 mm (.236) max.
- Operating temperature : -20°C to +55°C
- Mechanical life : 1.000.000 cycles
- Front panel sealing : IP65
- Hand soldering : 300°C, 5 sec. max.
- Packaging unit : 16 pieces

MATERIALS

- Case : polyester, glass filled
- Contacts : silver/nickel alloy
- Bushing : brass, nickel plated
- Actuator : aluminium, anodized

CUT-OUT

- Panel cut-out : Ø 22,2 mm (.874)
- Min. pitch for matrix mounting : 30 mm x 30 mm (1.181x1.181)

To order a product, select a basic model below and add the desired actuator colour.

BASIC MODEL

Mushroom head actuator - AV22PNA



Solder lug terminals
AV22PNA•2

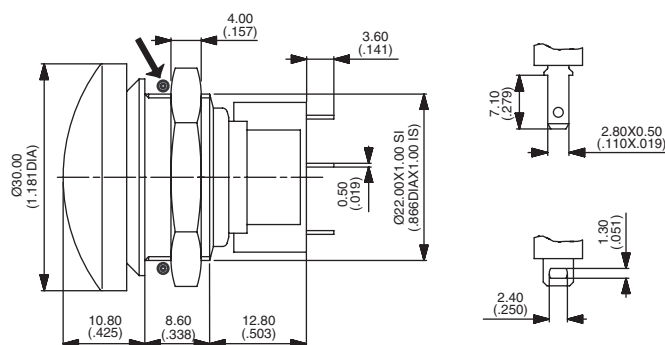


Quick-connect terminals
AV22PNA•4



→ O-ring

Hex nut 25 (.984) across flats



ACTUATOR ANODIZATION COLOURS

1 : blue - 2 : black - 3 : pale green - 3F : dark green - 4 : natural - 5 : gold yellow - 6 : red - 6B : maroon

IT 40 series

Mains pushbutton switches - 6000V dielectric strength

Distinctive features and specifications

☐ Mains pushbutton switches for PC boards

☐ Highest dielectric 6 KV

☐ Latchdown mechanism

B

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load : see table below
- Insulation resistance : 10.000 M Ω min. at 500VDC
- Dielectric strength : 6.000 Vrms 50 Hz min.
(other components to be kept outside protection area A to preserve 6KV on PCB - see drawing on next page)
- Electrical life at full load : 20.000 cycles

CURRENT/VOLTAGE RATINGS	
Certified ratings	Inrush current
IEC 65 NFC 92130 (L.C.I.E. certificate)	according to UL1054
1,5/56A 250VAC 20.000 cycles	TV3 250VAC 25.000 cycles

MATERIALS

- Case and cover : polyester
UL VO
- Plunger : polyamide 6-6
- Contacts : silver/nickel alloy
(Ag/Ni)
- Other molded parts in
UL approved materials

GENERAL SPECIFICATIONS

- Mechanical life : 50.000 cycles min.
- Operating temperature : -10°C to +85°C
- Storage temperature : -30°C to +85°C
- Total travel : 8 mm (.314)

Dimensions : first dimensions are in mm while inches are shown as bracketted numbers.

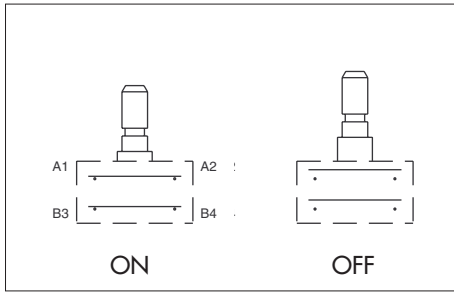


Packaging unit : 40 pieces

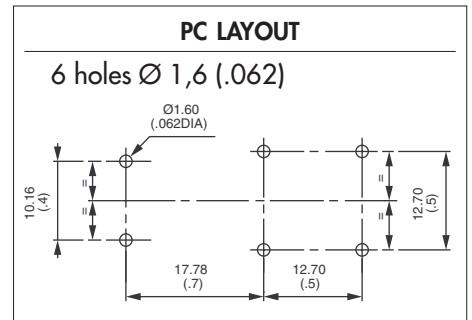
IT 40 series

Mains pushbutton switches - 6000V dielectric strength

MODEL
STRUCTURE



- Double pole configurations



MODEL
STRUCTURE

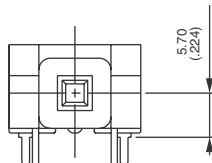


Distance from plunger center to PCB : 5,7 (.224)



IT4100100

ON - OFF

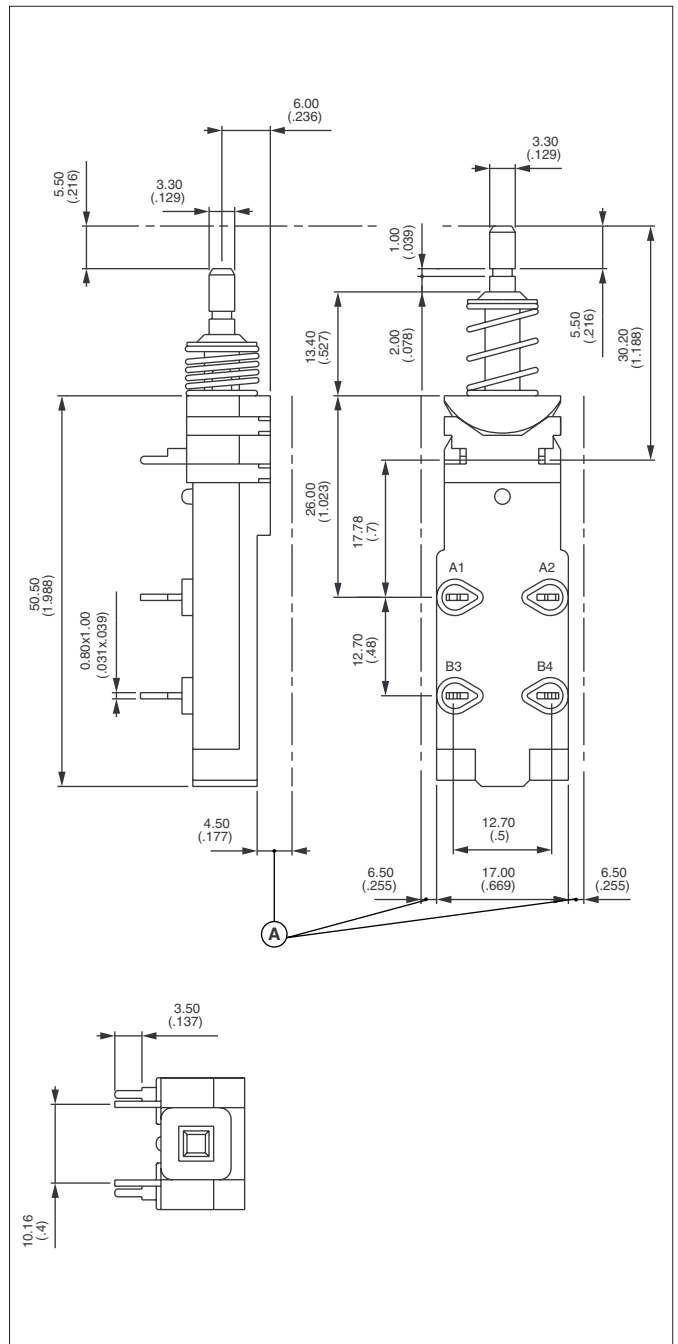
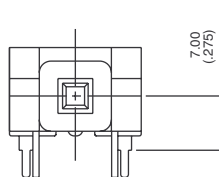


Distance from plunger center to PCB : 7 (.275)



IT4100200

ON - OFF

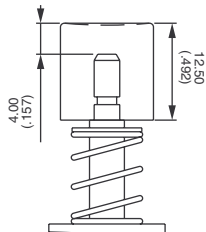
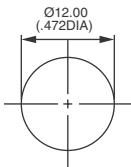


IT 40 series

Mains pushbutton switches - 6000V dielectric strength

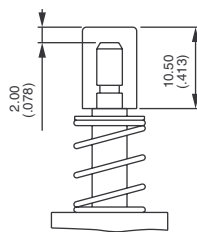
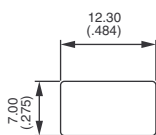
OPTIONS
● ● ●

CAPS



U1670

Round cap



U1680

Rectangular cap

Cap colours

Replace "0" by
number

- | | |
|-----|-----------|
| 1 | blue |
| 1/4 | dark blue |
| 2 | black |
| 3 | green |
| 4 | grey |
| 5 | yellow |
| 6 | red |
| 7/1 | white |
| 9 | orange |

B

1200 series

Momentary pushbutton switches - round plunger

Distinctive features and specifications



☐ Butt action contacts, double break

☐ NF (EN 61058-1), UL and CSA approved

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - silver contacts (A) : 4A 250VAC - 8A 125VAC - 4A 24VDC - 8A 12VDC
 - silver plated copper contacts. (C) : 2A 250VAC - 3A 125VAC - 2A 24VDC - 3A 12VDC
- Initial contact resistance : 10 mΩ at 1A 2VDC
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength :
 - 2.000 Vrms 50 Hz min. between terminals
 - 3.000 Vrms 50 Hz min. between terminals and frame
- Electrical life : 10.000 cycles at full load

MATERIALS

- Case : polyamide
- Plunger : polyamide
- Bushing : brass, nickel plated
- Contacts :
 - A : silver
 - C : copper, silver plated

GENERAL SPECIFICATIONS

- Torque : 1,50 Nm (1.10 Ft.lb) max. applied to nut
- Panel thickness : 5 mm (.196) max.
- Total travel :
 - NO : 4,5 (.177) +/- 0,3 (.011)
 - NC : 3,5 (.137) +/- 0,3 (.011)
- Operating temperature : -20°C to +55°C

AGENCY APPROVALS



EN 61058-1

2A 250VAC or 4A 250VAC, T55/125°C
All models, except 1212 and 1213



4A 250VAC - 8A 125VAC
All models function 3 (NO)

Models 1233X209 and 1233X209L are standard marked NF.
To order switches marked NF, UL or CSA, complete appropriate box of ordering format.

ABOUT THIS SERIES

Dimensions : first dimensions are in mm while inches are shown as bracketted numbers.



Sealing boots are available to protect the switches against dust and water. They are presented in section H.



Mounting accessories : standard hardware supplied :

- silver contact models : 1 hex nut U166 and 1 knurled nut U411
- copper contact models : 1 hex nut U42 and 1 knurled nut U411

Standard and special hardware are presented in section I.



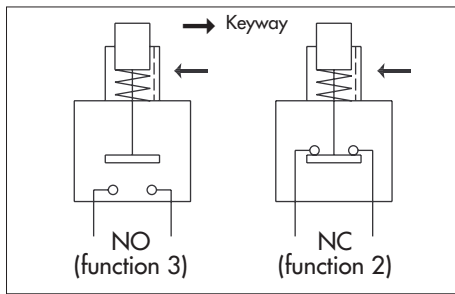
Packaging unit : 40 pieces, except model 1200.L (50 pieces).

1200 series

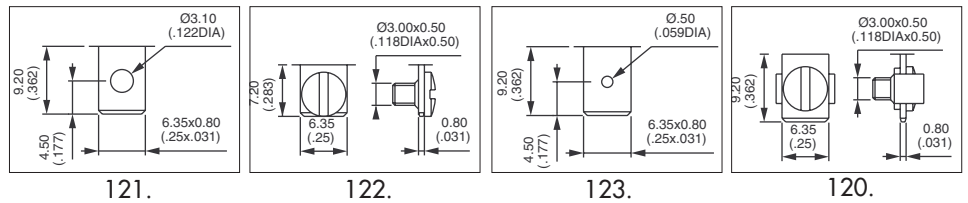
Momentary pushbutton switches - round plunger

Solder lug/quick-connect terminals - screw terminals

MODEL
STRUCTURE



- Single pole configurations
- Approved models : see following pages
- Panel cut-out : $\varnothing 12,2$ (.480)



MODEL
STRUCTURE



Plunger height : NO model : 7,50 mm, NC model : 5,80 mm

Solder lug/quick-connect terminals



1212



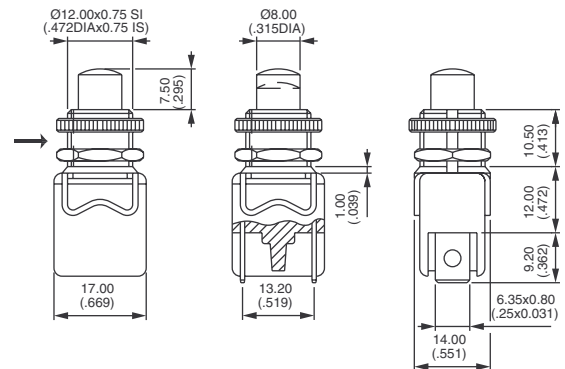
Normally Closed

1213



Normally Open

→ Keyway



Screw terminals



1222



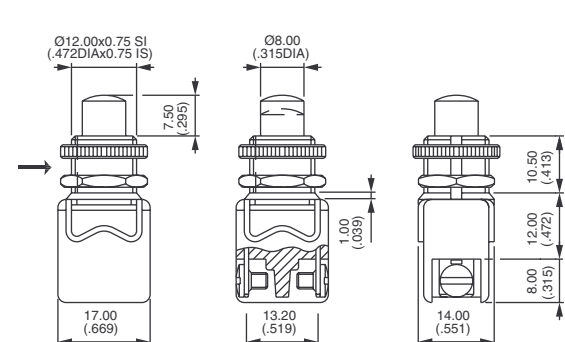
Normally Closed

1223



Normally Open

→ Keyway



Normalized quick-connect terminals



1232



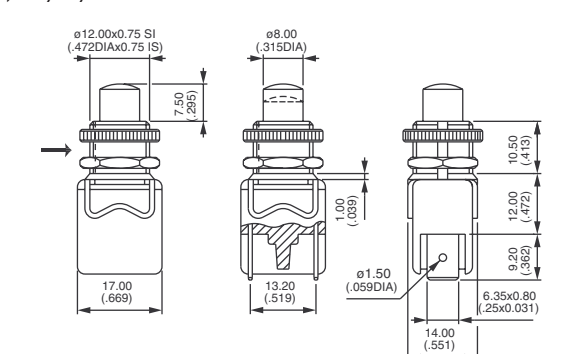
Normally Closed

1233



Normally Open

→ Keyway



1200 series

Momentary pushbutton switches - round plunger

Plunger height : NO model : 7,50 mm, NC model : 5,80 mm

Straight screw terminals + clamp



1202



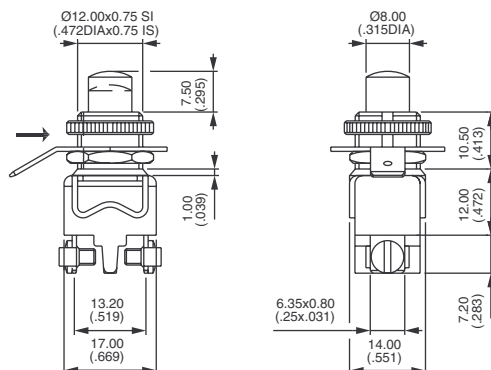
Normally Closed

1203



Normally Open

→ Keyway



Right angle screw terminals + clamp

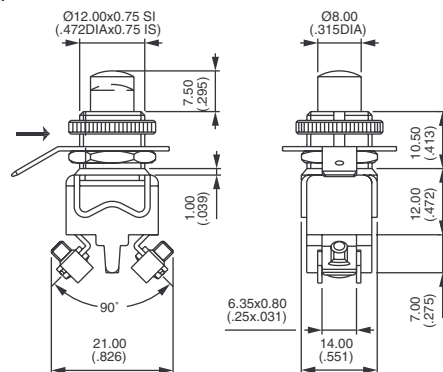


1203-7

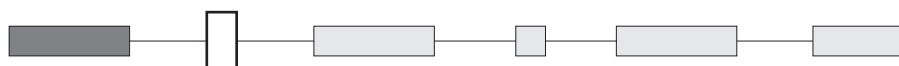


Normally Open

→ Keyway



CONTACT MATERIALS



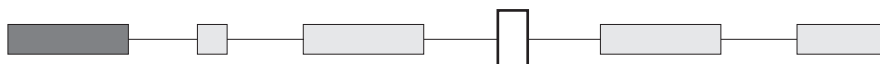
A Silver
C Copper, silver plated

FINISH



LUXE Chrome plated cap nut U117 instead of knurled nut U411

PLUNGER COLOURS



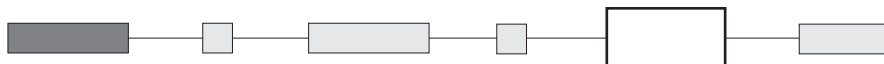
2 : Black - 3 : Green - 6 : Red - 7/1 : White

1200 series

Momentary pushbutton switches - round plunger

OPTIONS

SPECIAL MODELS



X209 NF standard marked - Silver contacts

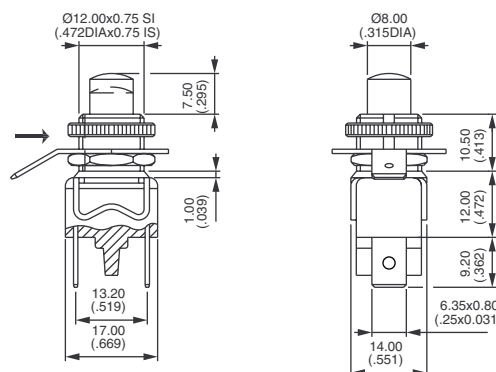


1233AX209



Normally open

→ Keyway



X209L NF standard marked - Silver contacts

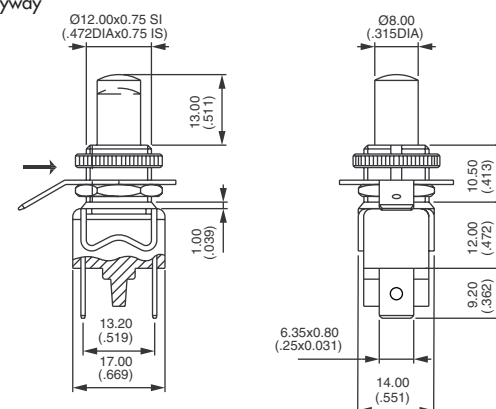


1233AX209L



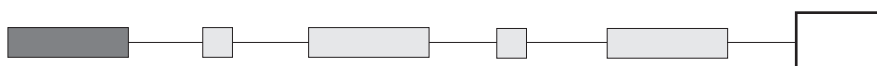
Normally open

→ Keyway



NOTE : Ground connector **U187** compulsory on models X209 and X209L if the panel is not metallic or not connected to ground. Order separately : see section I.

AGENCY APPROVALS



NF All models, except 1212 and 1213.

UL-CSA All models function 3 (NO), including X209 and X209L

Marking : to order switches marked NF, UL or CSA, complete above box with desired approvals.

1200M/MR series

Robust momentary pushbutton switches - metal plunger

Distinctive features and specifications



❑ Butt action contacts, double break

❑ UL and CSA approved

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - silver contacts (A) : 4A 250VAC - 8A 125VAC - 4A 24VDC - 8A 12VDC
 - silver plated copper contacts (C) : 2A 250VAC - 3A 125VAC - 2A 14VDC - 3A 12VDC
- Initial contact resistance : 10 mΩ max. at 1A 2VDC
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength :
 - 2.000 Vrms 50 Hz min. between terminals
 - 3.000 Vrms 50 Hz min. between terminals and frame
- Electrical life : 10.000 cycles at full load

MATERIALS

- Case : polyamide
- Plunger : top chrome plated brass on polyamide base
- Bushing : brass, nickel plated
- Cap nut : brass, chrome plated
- Contacts : **A** : silver
C : copper, silver plated

GENERAL SPECIFICATIONS

- Torque : 1,50 Nm (1.10 Ft.lb) max. applied to nut
- Panel thickness : 4,5 mm (.177) max.
- Total travel :
 - NO : 4,5 mm (.177) +/- 0,3 (.011)
 - NC : 3,5 mm (.137) +/- 0,3 (.011)
- Operating temperature : -20°C to +55°C

AGENCY APPROVALS



4A 250VAC - 8A 125VAC

Availability : approved models are 1213A and 1203A (M or MR)
(model 1223A is only UL approved).

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

ABOUT THIS SERIES

Dimensions : first dimensions are in mm while inches are shown as bracketted numbers.



Mounting accessories : standard hardware supplied with all models : 1 hex nut U166 and 1 conic cap nut U1866-6.
Special cap nut U1874 is presented on the following pages.

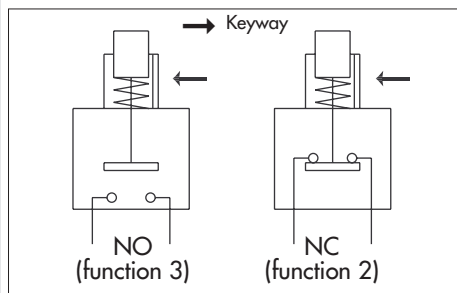


Packaging unit : 40 pieces

1200M/MR series

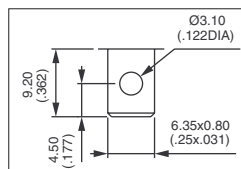
Robust momentary pushbutton switches - metal plunger

Solder lug/quick-connect terminals - screw terminals

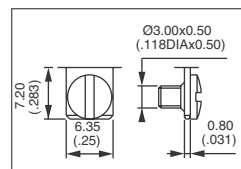


- Flat or curved plunger
- Panel cut-out $\varnothing 12,2$ (.480)
- Single pole

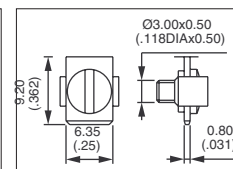
121.



122.



120.



MODEL
STRUCTURE



B

Solder lug/quick-connect terminals 6,35 x 0,8 (.250 x .031) → Keyway



Curved plunger Flat plunger

1212MR 1212M

1212M



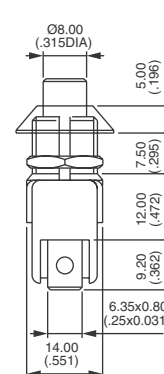
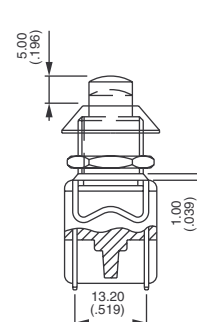
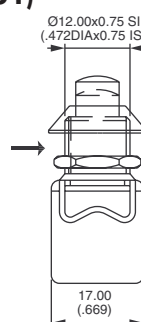
NC

1213MR 1213M

1213M



NO



Screw terminals



Curved plunger Flat plunger

1222MR 1222M

1222M



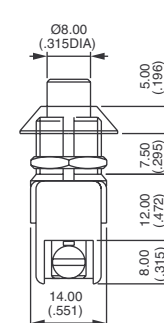
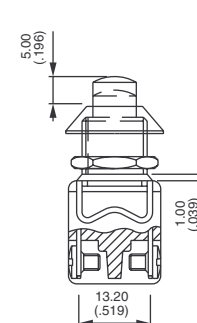
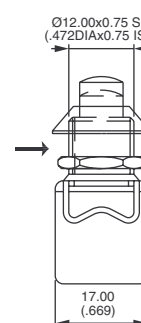
NC

1223MR 1223M

1223M



NO



Screw terminals + clamp



Curved plunger Flat plunger

1202MR 1202M

1202M



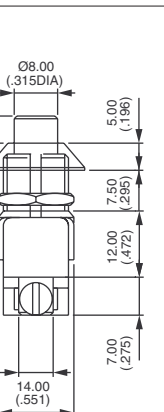
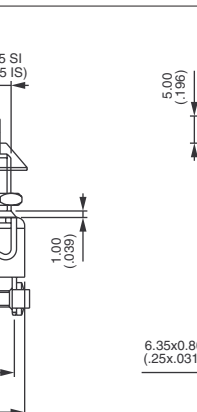
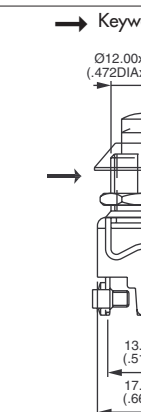
NC

1203MR 1203M

1203M



NO

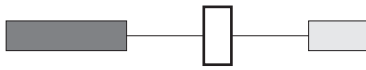




1200M/MR series

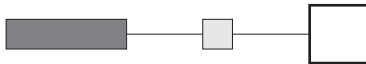
Robust momentary pushbutton switches - metal plunger

CONTACT MATERIALS



A Silver
C Copper, silver plated

AGENCY APPROVALS



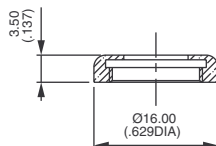
UL - CSA

Availability : approved models are 1213A and 1203A (M or MR) - model 1223A is only UL approved.

Marking : to order switches marked UL or CSA, complete above box with desired approvals.

SPECIAL CAP NUT

Chrome plated cap nut $\varnothing 16$ (.629), flat and plain.
Can be supplied instead of standard cap nut U1866-6.
Order separately.



U1874

1400N series

Momentary pushbutton switches - snap-in mounting - square plunger

Distinctive features and specifications

☐ Butt action contacts, double break

☐ Solder lug, straight PC and quick-connect terminals

B

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - silver contacts (A) : 6A 12VDC
 - silver plated copper contacts (C) : 3A 12VDC
- Initial contact resistance : 10 mΩ at 1A 2VDC
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength :
 - 1.500 Vrms 50 Hz min. between terminals
 - 2.000 Vrms 50 Hz min. between terminals and metal panel
- Electrical life : 10.000 cycles at full load

MATERIALS

- Case : polyamide
- Plunger : polyamide
- Contacts :
 - A : silver
 - C : copper, silver plated

GENERAL SPECIFICATIONS

- Panel thickness : 2 mm (.078) max.
- Operating temperature : -20°C to +55°C

Dimensions : first dimensions are in mm while inches are shown as bracketted numbers.



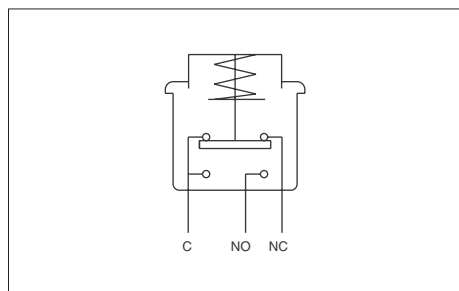
Packaging unit : 60 pieces.



1400N series

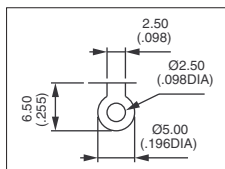
Momentary pushbutton switches - snap-in mounting - square plunger

Solder lug, straight PC or quick-connect terminals

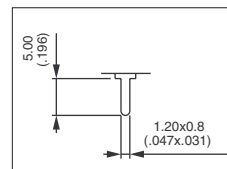


- Single pole configurations

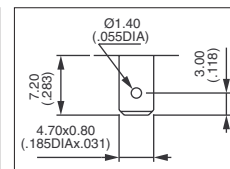
141.N



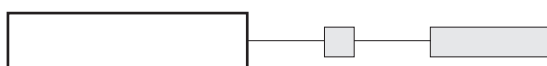
144.N



141.N/8



MODEL
STRUCTURE



Solder lug terminals



1412N



Normally Closed

1413N

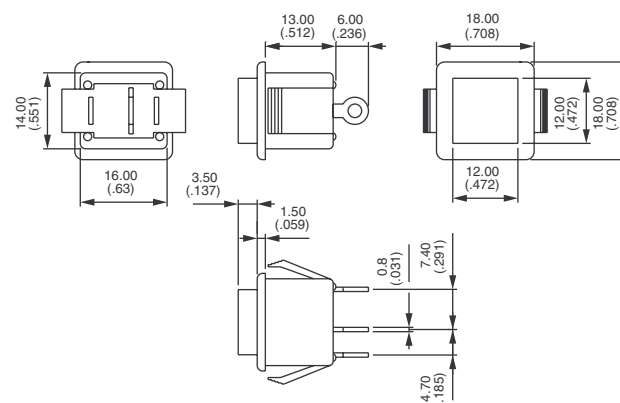


Normally Open

1415N



Changeover



Straight PC terminals



1442N



Normally Closed

1443N

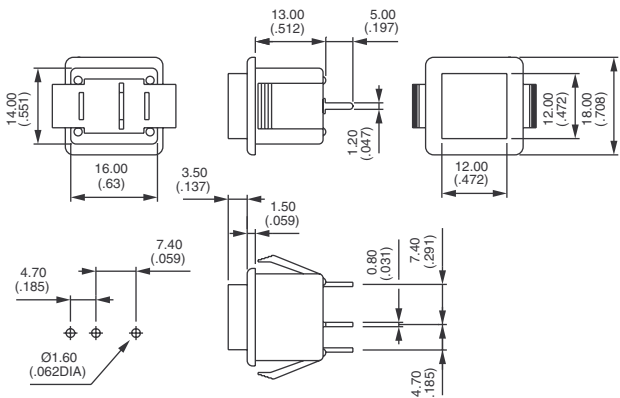


Normally Open

1445N



Changeover



Quick-connect terminals 4,7 x 0,8 (.185 x .031)



1412N/8



Normally Closed

1413N/8

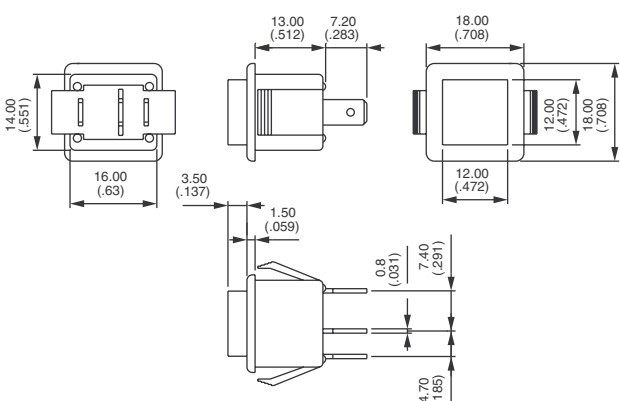


Normally Open

1415N/8



Changeover

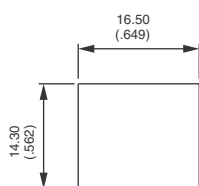


1400N series

Momentary pushbutton switches - snap-in mounting - square plunger

OPTIONS
• • •

PANEL CUT-OUT



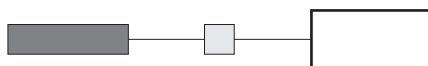
B

CONTACT MATERIALS



- A Silver
C Copper, silver plated

PLUNGER COLOURS



- 2 Black (standard)
3 Green
6 Red
7 Ivory



Switch frame supplied in black.

4700 and 4800 series

Momentary or alternate action pushbutton switches

Distinctive features and specifications



☐ Butt action contacts

☐ UL, CSA and VDE (EN 61058-1) approved

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - silver contacts (A) : 3A 250VAC - 6A 125VAC
 - copper contacts (C) : 2A 250VAC - 4A 125VAC
- Initial contact resistance : 10 mΩ max. at 1A 2VDC
- Insulation resistance : 1.000 MΩ min. at 500VDC
- Dielectric strength : 2.000 Vrms 50 Hz min. between terminals
3.000 Vrms 50 Hz min. between terminals and frame
- Electrical life : 10.000 cycles at full load

MATERIALS

- Case : melamine-phenolic
- Plunger : polyamide
- Bushing : polyamide
- Contacts : A : silver
C : copper, silver plated

GENERAL SPECIFICATIONS

- Torque : 0,95 Nm (.70 Ft.lb) max. applied to nut
- Panel thickness : 5 mm (.196) max. between 2 nuts
- Total travel : 4,5 mm (.177) +/- 0,5 (.019)
- Operating temperature : -20°C to +65°C
- Hand soldering : 270°C max. for 10 seconds max. - Iron Ø 3 mm (.118)

APPROVALS



Models 4731A, 4736A, 4741A, 4746A are UL, CSA and VDE (EN 61058-1) approved.

Models 4831A, 4836A, 4841A, 4846A are VDE (EN 61058-1) approved.

Marking : to order switches marked UL/CSA, complete appropriate box of ordering format. VDE is standard marked.

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



Sealing boots are available to protect the switches against dust and water. They are presented in section H.



Mounting accessories : standard hardware supplied with all models : 1 hex nut U166 and 1 knurled nut U520 in the same colour as the plunger. They are presented in section I.



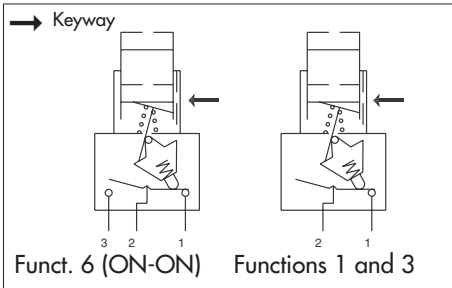
Packaging unit : single pole models : 40 pieces - Double pole models : 20 pieces.

4700 and 4800 series

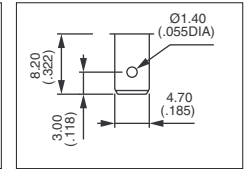
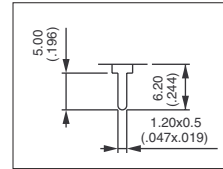
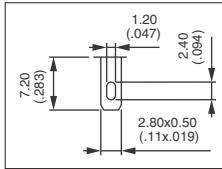
Momentary or alternate action pushbutton switches

Solder lug/quick-connect or straight PC terminals

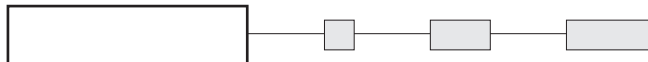
MODEL
STRUCTURE



- 1 and 2 pole configurations
- Button returns in upper position after actuation.
- Panel cut-out :
Ø 12,2 (.480)



MODEL
STRUCTURE

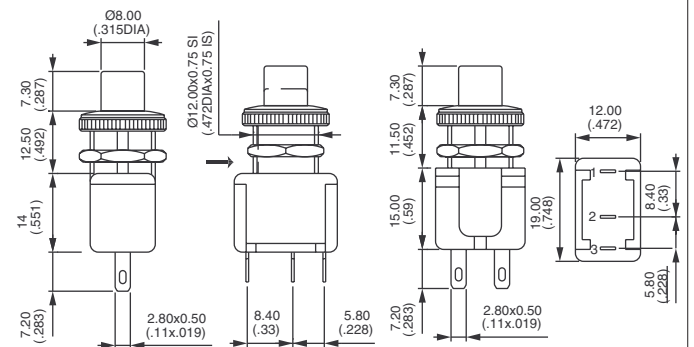


Solder lug/quick-connect terminals



Single pole	Double pole			
4731	4741	ON	-	OFF
4736	4746	ON	-	ON
4733	4743	OFF	-	MOM

→ Keyway

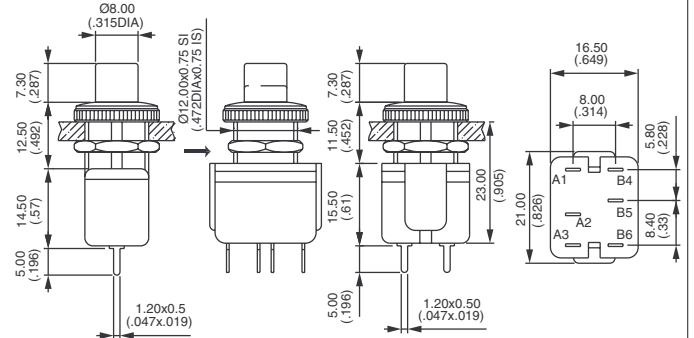


Straight PC terminals



Single pole	Double pole			
4831	4841	ON	-	OFF
4836	4846	ON	-	ON
4833	4843	OFF	-	MOM

→ Keyway

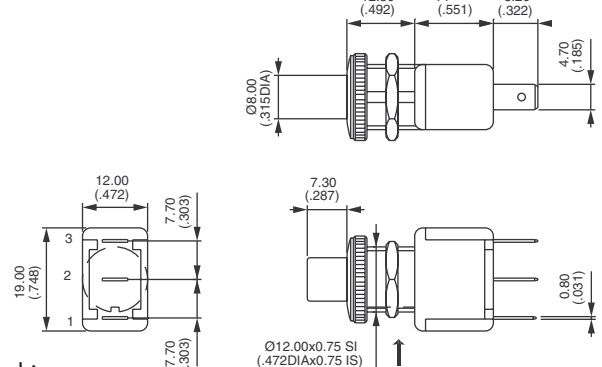


Quick-connect terminals 4,7 x 0,8 (.185 x .031)



4731/8	ON	-	OFF
4736/8	ON	-	ON
4733/8	OFF	-	MOM

→ Keyway



Available with silver contacts only.
Minimum order : 1 000 pieces per type in one shipment.



4700 and 4800 series

Momentary or alternate action pushbutton switches

CONTACT MATERIALS



- A** Silver
C Copper, silver plated (not available on models with quick-connect terminals /8)

ACTUATOR COLOURS



- 01** Blue
02 Black
03 Green
05 Yellow
06 Red
07/1 White
09 Orange

APPROVALS



UU (UL-CSA)

Availability : see specifications for details or approved models.

Marking : to order switches marked UL-CSA, complete above box with "UU".
VDE approval is standard marked.

PBA series

Piezo switches

Distinctive features - Specifications - Overview

- ☐ Sealed to IP 68 (switches mounted on panel)
- ☐ Easy to clean metal surface
- ☐ Long life
- ☐ Ring or dot illumination

ELECTRICAL SPECIFICATIONS

- Rated voltage : 5V to 24 VAC/DC max.
- Rated current : 0,2A to 1A max.
- Switch resistance ON : 10Ω max.
- Switch resistance OFF : 5MΩ min.
- Switch capacitance : 25pF
- LED : 20mA 5VDC

GENERAL SPECIFICATIONS

- Operating force : 2 to 6N
- Life expectancy : 50 million cycles
- Operating temperature : -40°C to +75°C
- EMC compatibility according to EN 61058-1 for the whole range
- EMC compatibility according to EN 61000-4 & EN61000-6-2 for model 1A (code 002)
- Sealing : IP 68 per IEC 529 (switches mounted on panel)

MATERIALS

- Case : aluminium, anodized or stainless steel
- Terminals : multi-wire leads AWG24, length 300 mm (11.81)

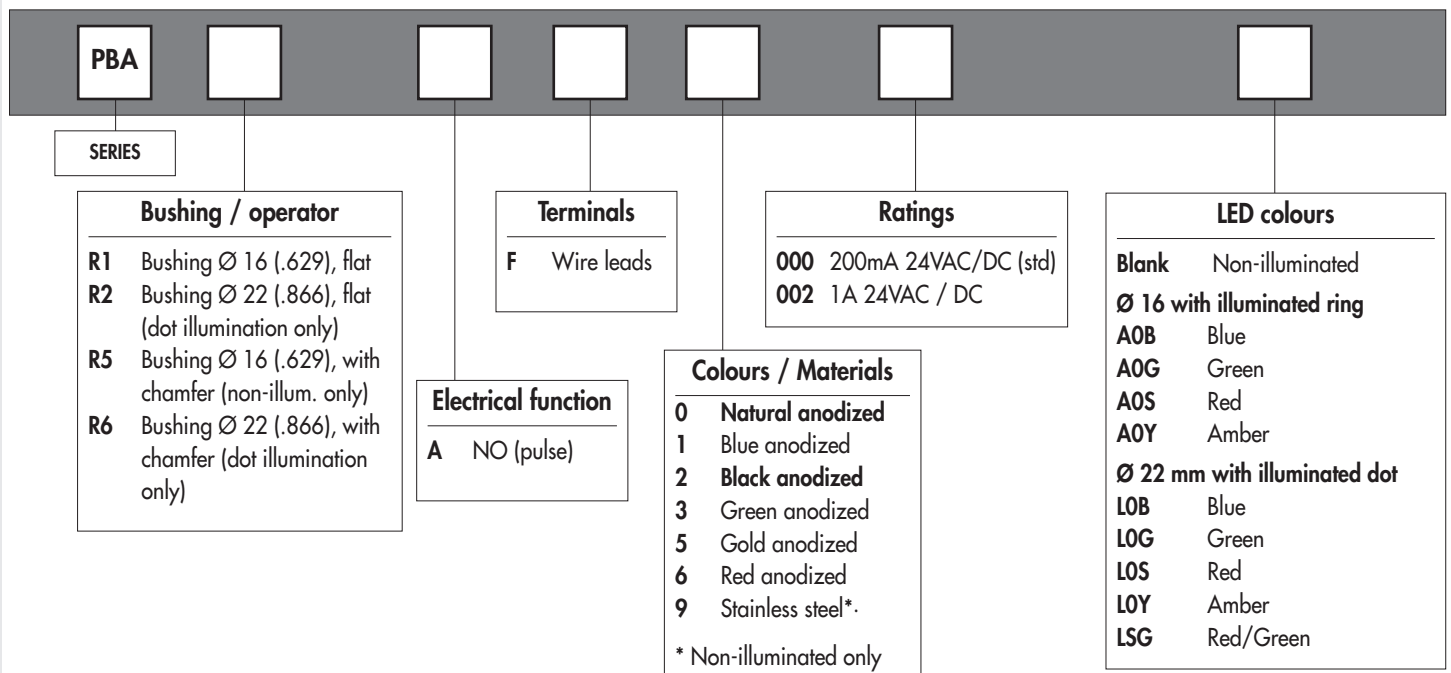
Standard hardware supplied :

1 hex nut U4116 (19 mm ac. flats) or
1 hex nut U6440 (25 mm across flats)

Packaging unit :

Bushing Ø 16 (.629) : 40 pieces
Bushing Ø 22 (.866) : 20 pieces

Dimensions : first dimensions are in mm while inches are shown as bracketted numbers.

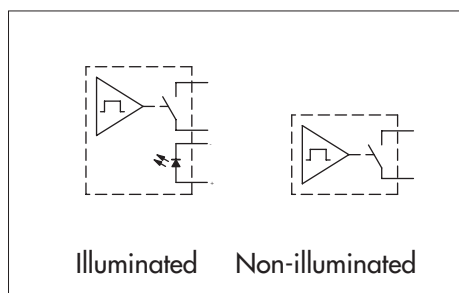


NOTICE : please note that not all combinations of above numbers are available.
Refer to the following pages for further information.

PBA series

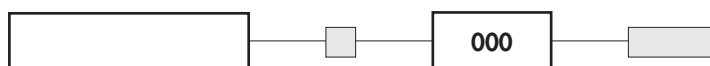
Piezo switches

Bushing Ø 16 (.629) - illuminated and non-illuminated



- Panel cut-out : Ø 16,2 mm (.637)
- Operator Ø 18 mm (.708)

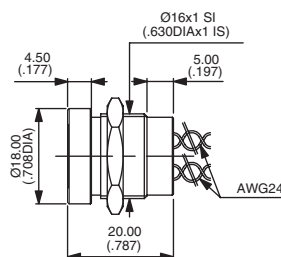
MODEL STRUCTURE



With illuminated ring



Flat operator
PBAR1AF

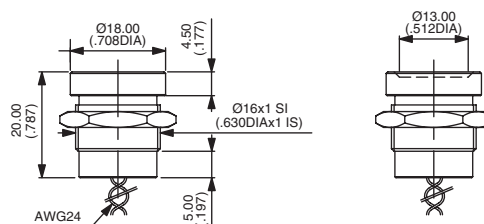


Wire colours : red : contact, yellow : LED anode (+), blue : LED cathode (-)

Non-illuminated



Flat operator
PBAR1AF
With chamfer
PBAR5AF



CASE COLOURS / MATERIALS



0 : natural anodized aluminium - 1 : blue anodized alum. - 2 : black anodized alum. - 3 : green anodized alum.
5 : gold anodized alum. - 6 : red anodized alum. - 9 : stainless steel (non-illum. only)

LED COLOURS



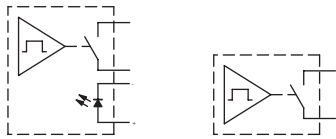
Blank : non-illuminated

A0B : blue - A0G : green - A0S : red - A0Y : amber

PBA series

Piezo switches

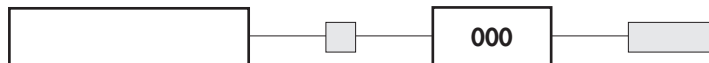
Bushing Ø 22 (.866) - illuminated and non-illuminated



Illuminated Non-illuminated

- Panel cut-out : Ø 22,2 mm (.874)
- Operator Ø 28 mm (1.102)

MODEL STRUCTURE



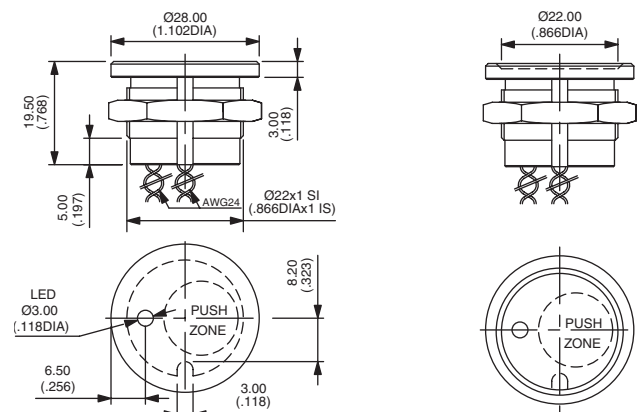
Wire colours : red : contact, yellow : LED anode (+), blue : LED cathode (-)

With illuminated dot



Flat operator
PBAR2AF

With chamfer
PBAR6AF

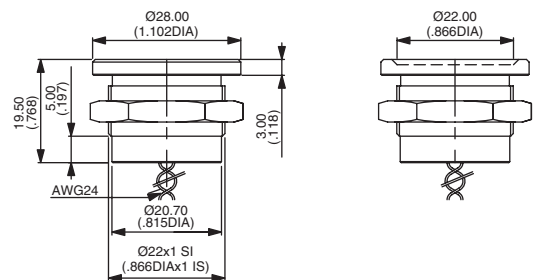


Non-illuminated



Flat operator
PBAR2AF

With chamfer
PBAR6AF



CASE COLOURS / MATERIALS



0 : natural anodized aluminium - 1 : blue anodized alum. - 2 : black anodized alum. - 3 : green anodized alum.
5 : gold anodized alum. - 6 : red anodized alum. - 9 : stainless steel (non-illum. only)

LED COLOURS



Blank : non-illuminated

LOB : blue - LOG : green - LOS : red - LOY : amber - LSG : red/green