

# 13000 series

## Professional quick-break momentary pushbutton switches

*Distinctive features and specifications*



- PC and panel mount models
- Bushing  $\varnothing$  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, 10 $\mu$ A 5V min.
- Initial contact resistance : 10 m $\Omega$  max.
- Insulation resistance : 1.000 M $\Omega$  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

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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.

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Overview

MODEL  
STRUCTURE

13

SERIES

### Terminals and bushing

- 2** Straight PC terminals, bushing  $\varnothing$  6,35 (1/4)
- 4** Solder lugs, bushing  $\varnothing$  6,35 (1/4) or 11,9 (15/32)  
Right angle terminals, bushing  $\varnothing$  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
- X640** Reinforced sealing by three O-rings
- X768** Bushing  $\varnothing$  11,9 (15/32) + front panel sealing (double pole only)

### Caps

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

### Plungers

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

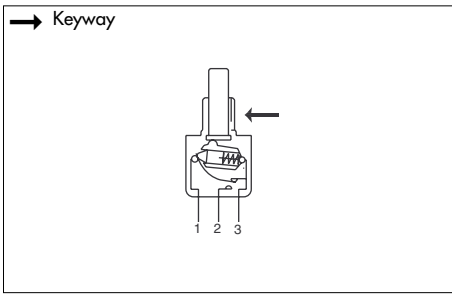
- On the following pages, you will find successively :
- model structure of switches
  - options in the same order as in above chart



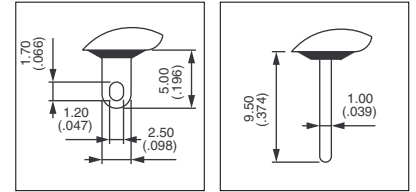
# 13000 series

## Professional quick-break momentary pushbutton switches

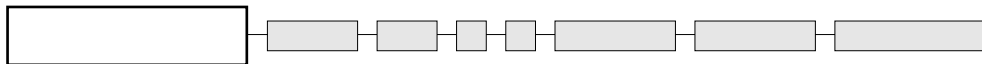
Solder lug terminals : 13400 - Straight PC terminals : 13200



- 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



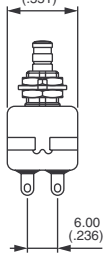
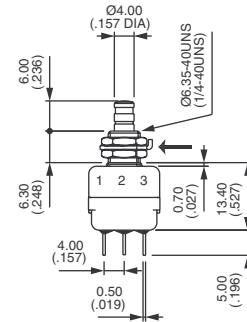
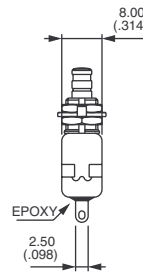
1-3

ON



1-2

MOM



### Straight PC terminals : 13200

→ Keyway



Single pole  
13235

Double pole  
13245



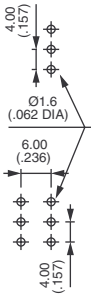
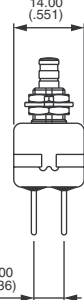
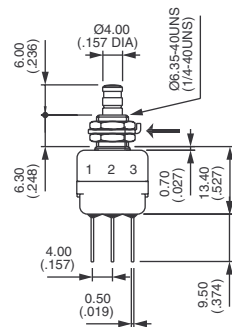
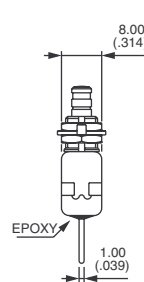
1-3

ON



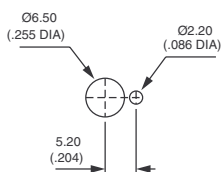
1-2

MOM

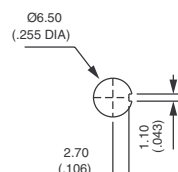


### PANEL CUT-OUT

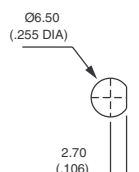
#### 13400 - 13200



Standard



With K  
sealing option



With X640  
sealing option

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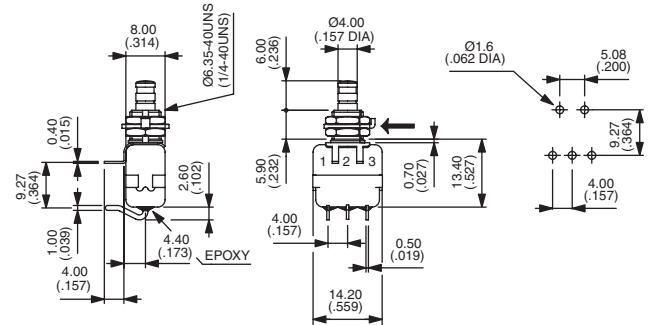
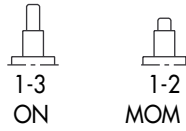
Right angle terminals : 13400W

## Right angle terminals - single pole

→ Keyway



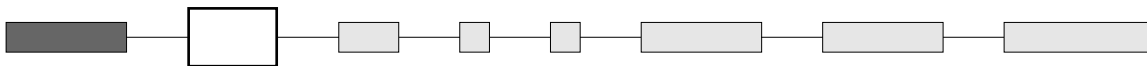
13435W



B

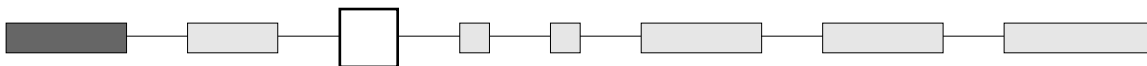
Panel cut-out, see previous page.

## CONTACT MATERIALS



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

## PLUNGER



Dash compulsory before plunger code.

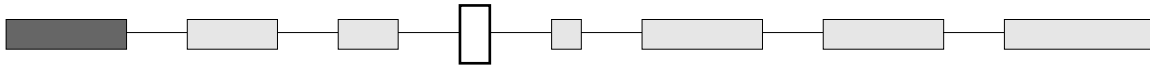
- Blank Standard plunger for  $\varnothing 6,35$  (1/4) bushing
- 4 4 mm (.157) long plunger for  $\varnothing 11,9$  (15/32) bushing (X768 option)
- 9 9 mm (.354) long plunger for  $\varnothing 11,9$  (15/32) bushing (X768 option)



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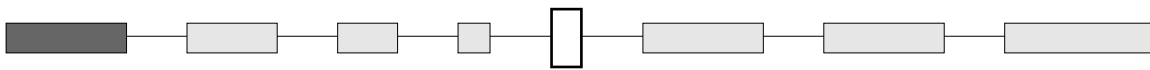
### FINISH



**Blank** Bright chrome finish

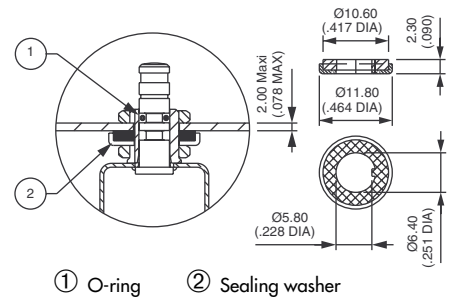
**G** Matt black finish on bushing, actuator and hardware

### SEALING



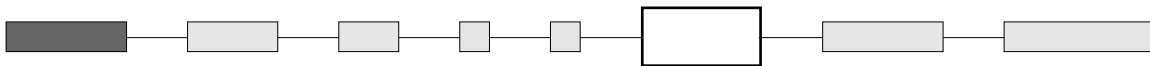
**K** Front panel sealing by one O-ring and sealing washer. Protects the switch against water and dust. Panel seal withstands 1 bar pressure and remains sealed even when switch is operated.

Reinforced sealing : see X640 under "Special options".




① O-ring    ② Sealing washer

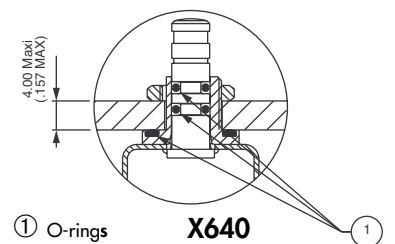
### SPECIAL OPTIONS



**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



① O-rings    **X640**


B

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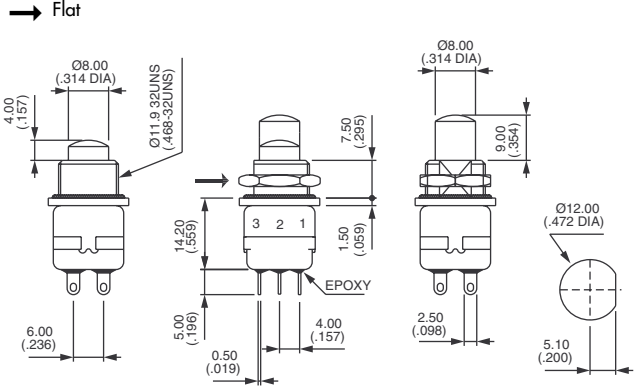
**X768** Sealed switch with  $\varnothing 11,9$  (15/32) flatted bushing. Solder lug terminals, double pole. Contact and finish options available.



With short plunger  
**13445 -4 X768**

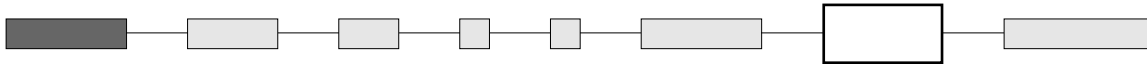
With long plunger  
**13445 -9 X768**

 1-3	 1-2	→ Flat
ON	MOM	
ON	MOM	



**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.

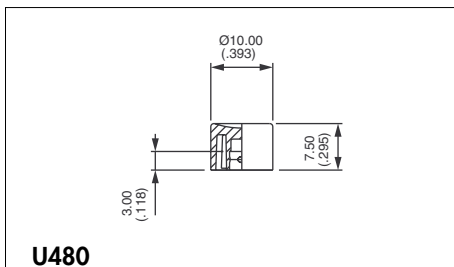
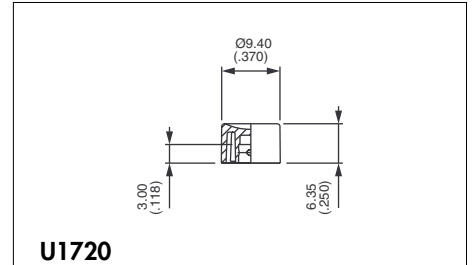
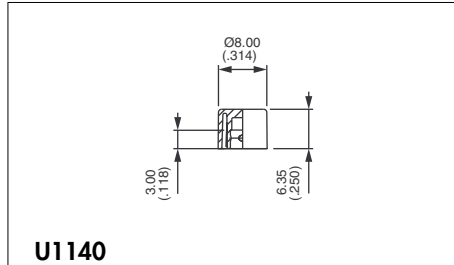
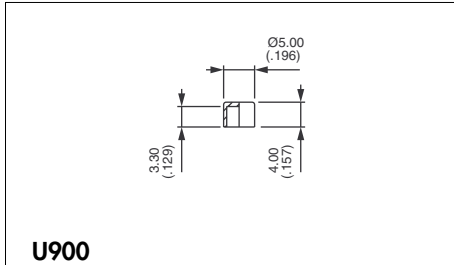
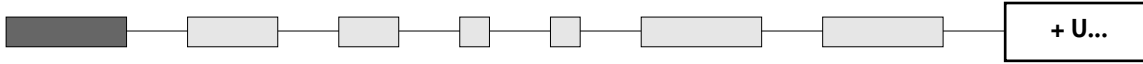
Preferential lists : see specifications.



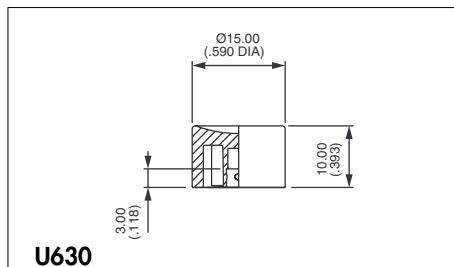
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## CAPS

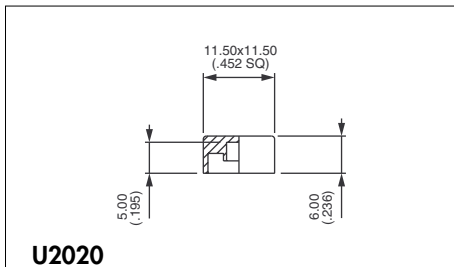


Standard

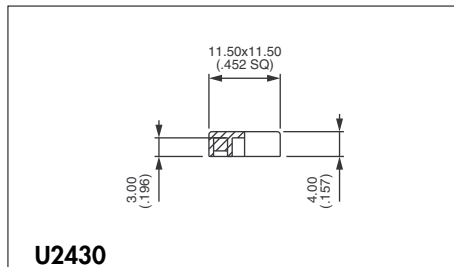


For models with Ø 6,35 (1/4) bushing only.

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



Square



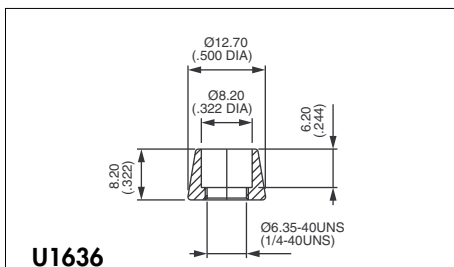
Square

## DRESS NUTS

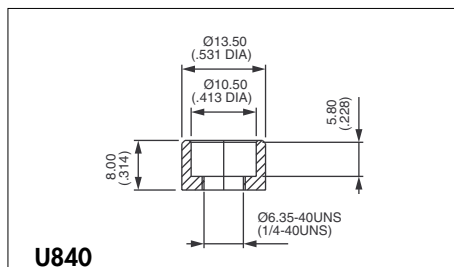
Chrome plated



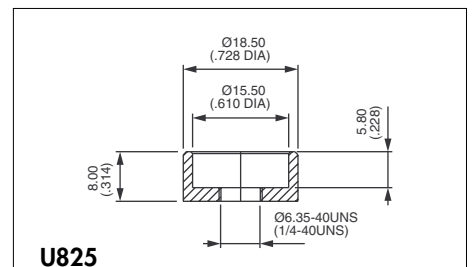
For models with Ø 6,35 (1/4) bushing only.



For cap U1140



For cap U480



For cap U630

Dress nuts are to be ordered separately.