

13000 series

ermec@ermec.com

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

B2

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - silver contacts (A-AD2) : 4A 30VDC
 - gold plated contacts (CD) : 100mA 30V
- Minimum load (AD2-CD contacts) : 10mA 50mV, 10 μ A 5V min.
- Initial contact resistance : 10 m Ω max.
- Insulation resistance : 1.000 M Ω 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	4A 30VDC	50.000
AD2	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, nickel 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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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



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.

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 : 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.

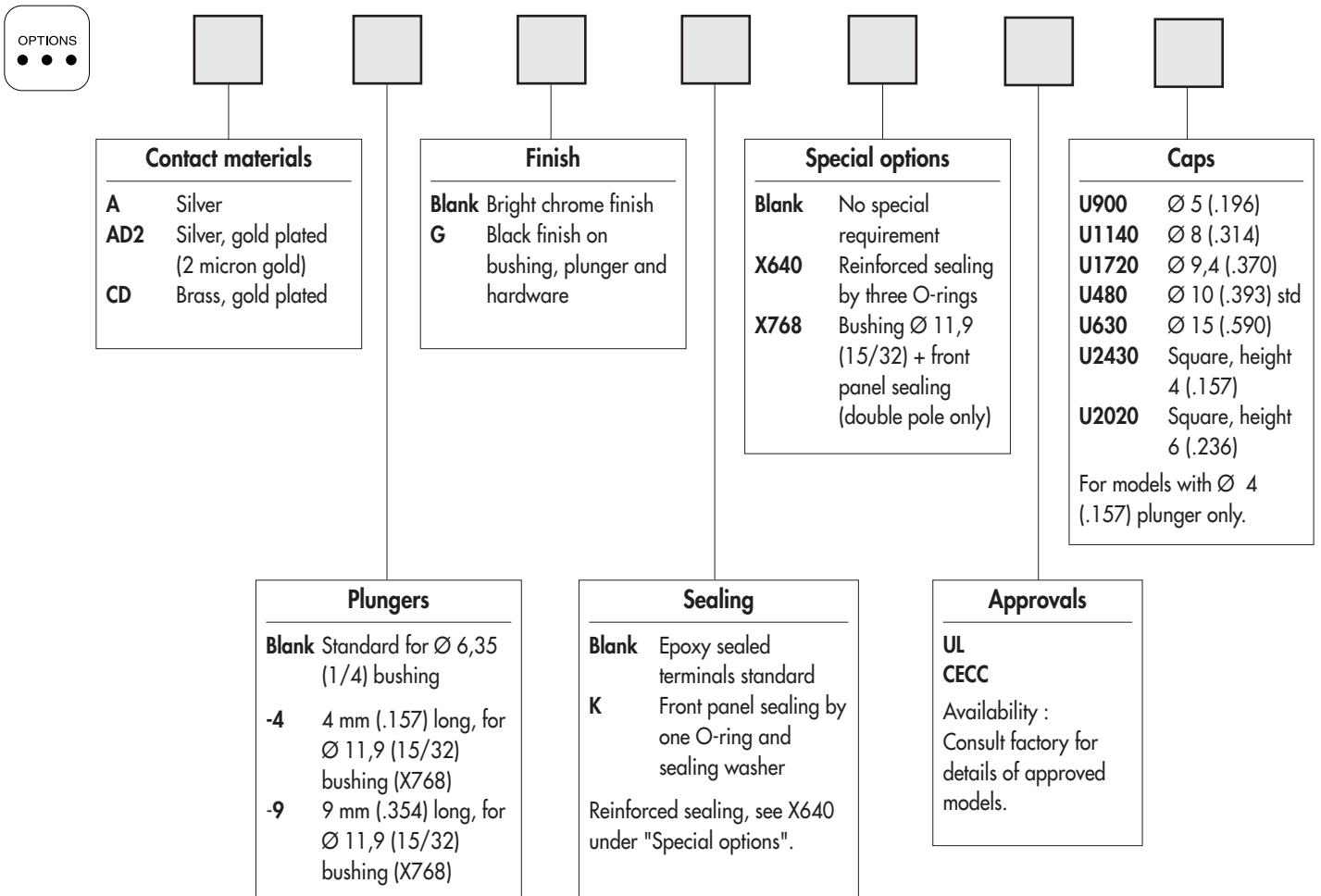
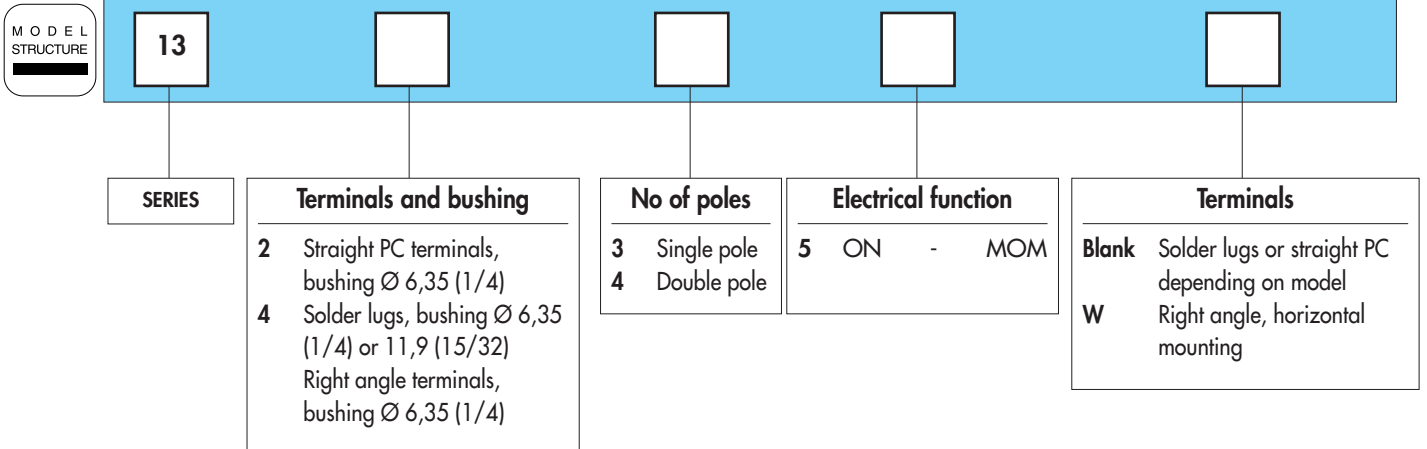


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Overview



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



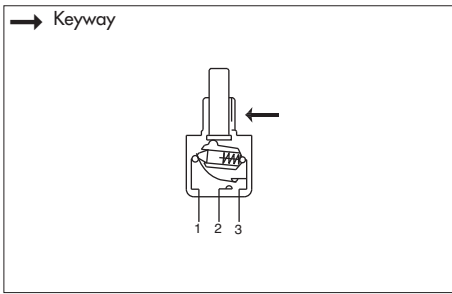
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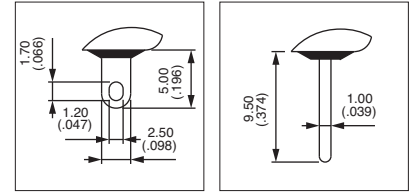
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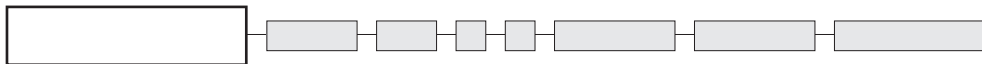
Solder lug terminals : 13400 - Straight PC terminals : 13200



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



MODEL STRUCTURE



B2

Solder lug terminals : 13400

→ Keyway



Single pole
13435

Double pole
13445



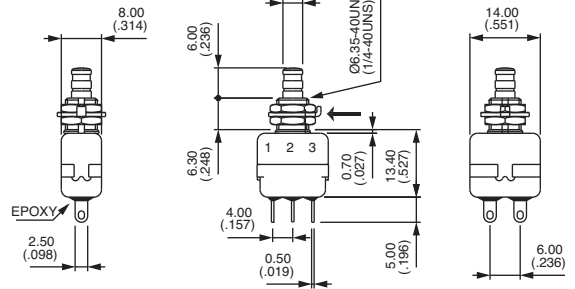
1-3

ON



1-2

MOM



Straight PC terminals : 13200

→ Keyway



Single pole
13235

Double pole
13245



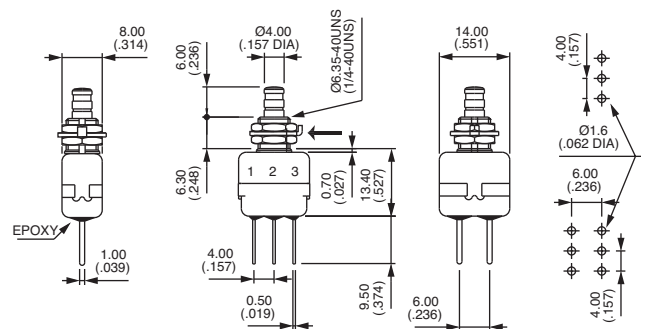
1-3

ON



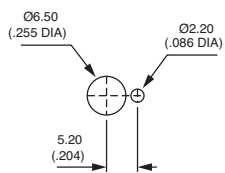
1-2

MOM

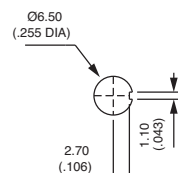


PANEL CUT-OUT

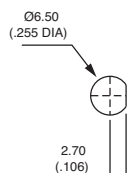
13400 - 13200



Standard



With K
sealing option



With X640
sealing option



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Right angle terminals : 13400W

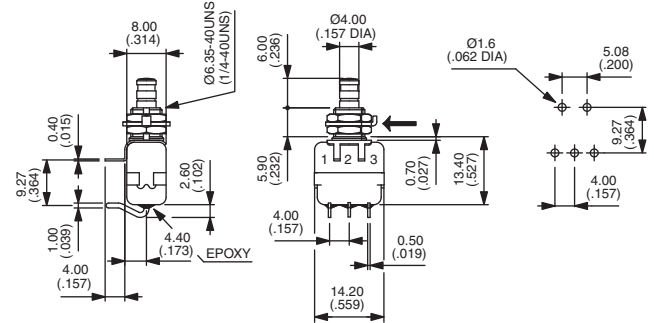
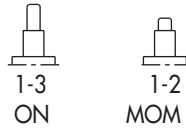


Right angle terminals - single pole

→ Keyway



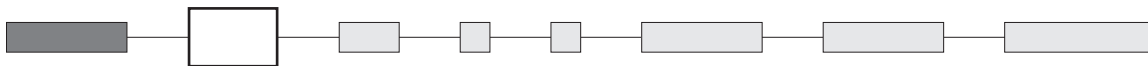
13435W



B2

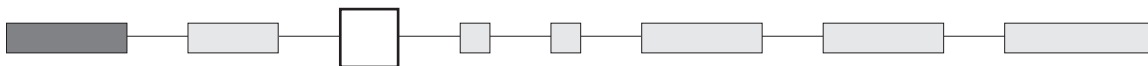
Panel cut-out, see previous page.

CONTACT MATERIALS



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

PLUNGER



Dash compulsory before plunger code.

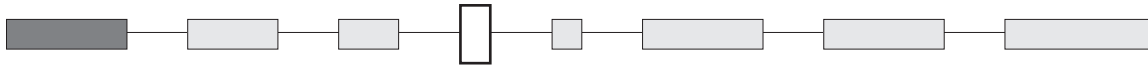
- Blank Standard plunger for Ø 6,35 (1/4) bushing
- 4 4 mm (.157) long plunger for Ø 11,9 (15/32) bushing (X768 option)
- 9 9 mm (.354) long plunger for Ø 11,9 (15/32) bushing (X768 option)



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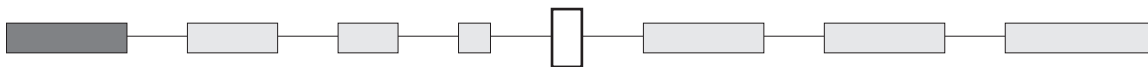
FINISH



Blank Bright chrome finish

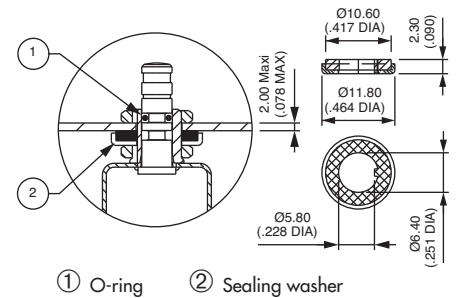
G Black finish on bushing, actuator and hardware

SEALING



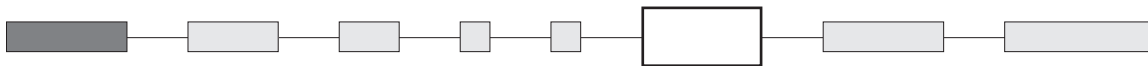
K Front panel sealing by one O-ring and sealing washer. Protects the switch against water and dust. Panel seal withstands 1 bar pressure and remains sealed even when switch is operated.

Reinforced sealing : see X640 under "Special options".




① O-ring ② Sealing washer

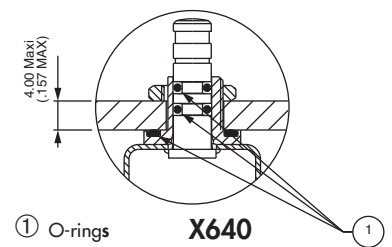
SPECIAL OPTIONS



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**



13000 series

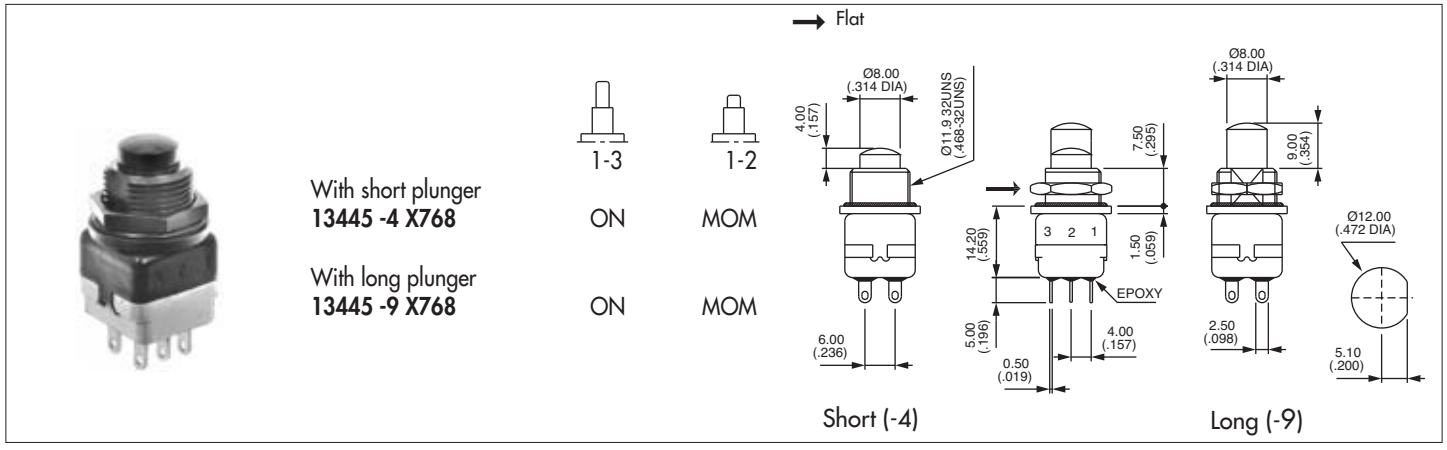
Professional quick-break momentary pushbutton switches



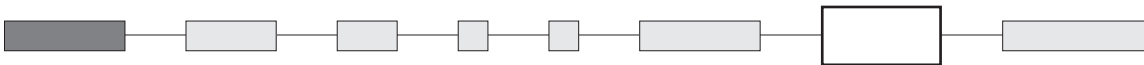
X768 Sealed switch with $\varnothing 11,9$ (15/32) flatted bushing. Chrome plated actuator. Solder lug terminals, double pole. Contact and finish options available.

Security cap for this model : see section I.

B2



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.

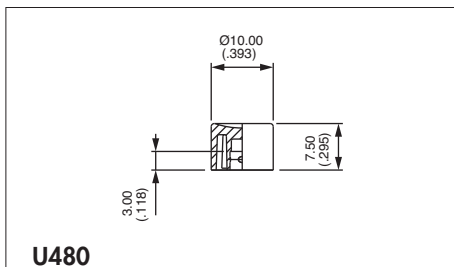
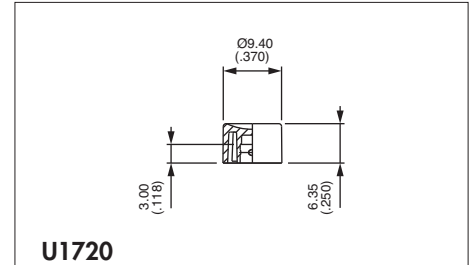
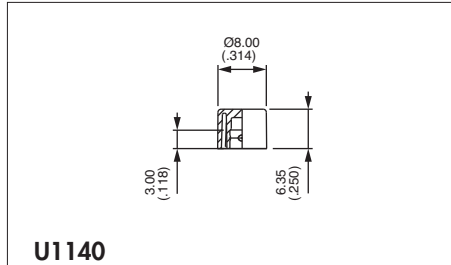
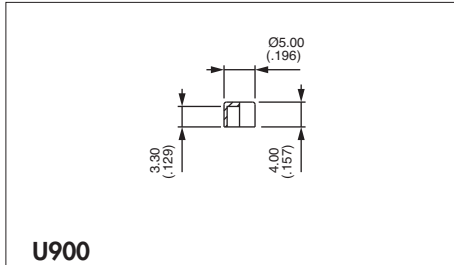
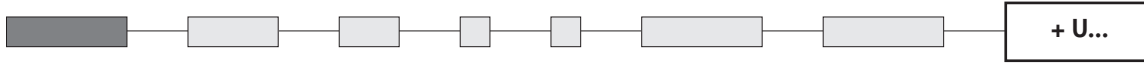
Blank : no agency approval required.



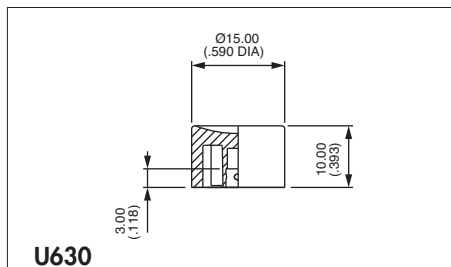
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CAPS



Standard

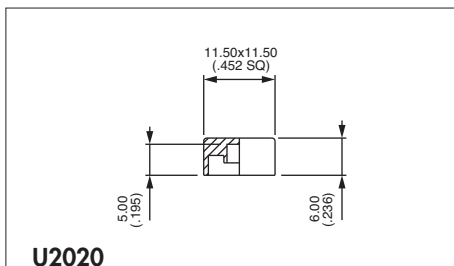


For models with Ø 6,35 (1/4) bushing only.

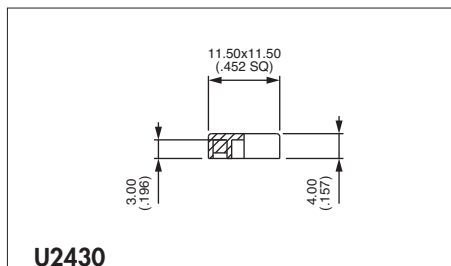
Cap colours

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



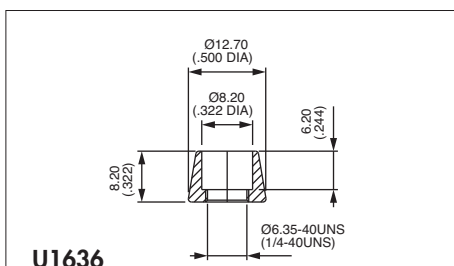
Square

DRESS NUTS

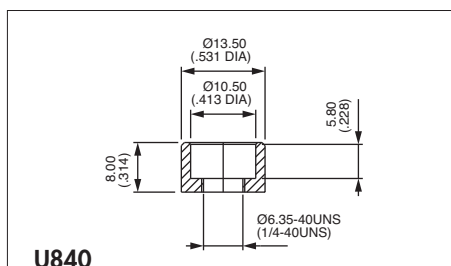
Chrome plated



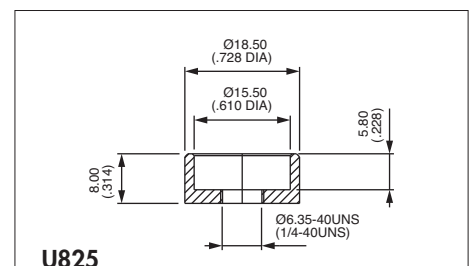
For models with Ø 6,35 (1/4) bushing only.



For cap U1140



For cap U480



For cap U630

Dress nuts are to be ordered separately.



13000X778 series

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

Distinctive features

New!



3-pole configurations now available !

Agency approvals



CECC 96401-001 (double pole only)

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 or power applications.

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

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.



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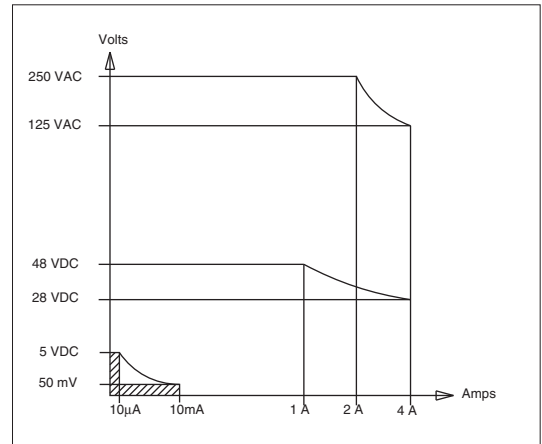
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High performance pushbutton switches - threaded bushing Ø 11,9 (15/32) - momentary

Specifications

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load : 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 4A 28VDC : 10.000 cycles
 - At low level (50mV 10mA) : 150.000 cycles

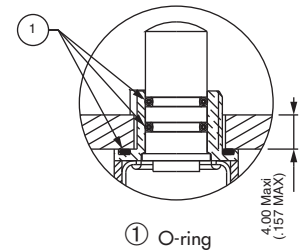


MATERIALS

- 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 double pole models have full CECC approval. Consult factory for details of approved models. To order switches marked CECC, complete appropriate box of ordering format.



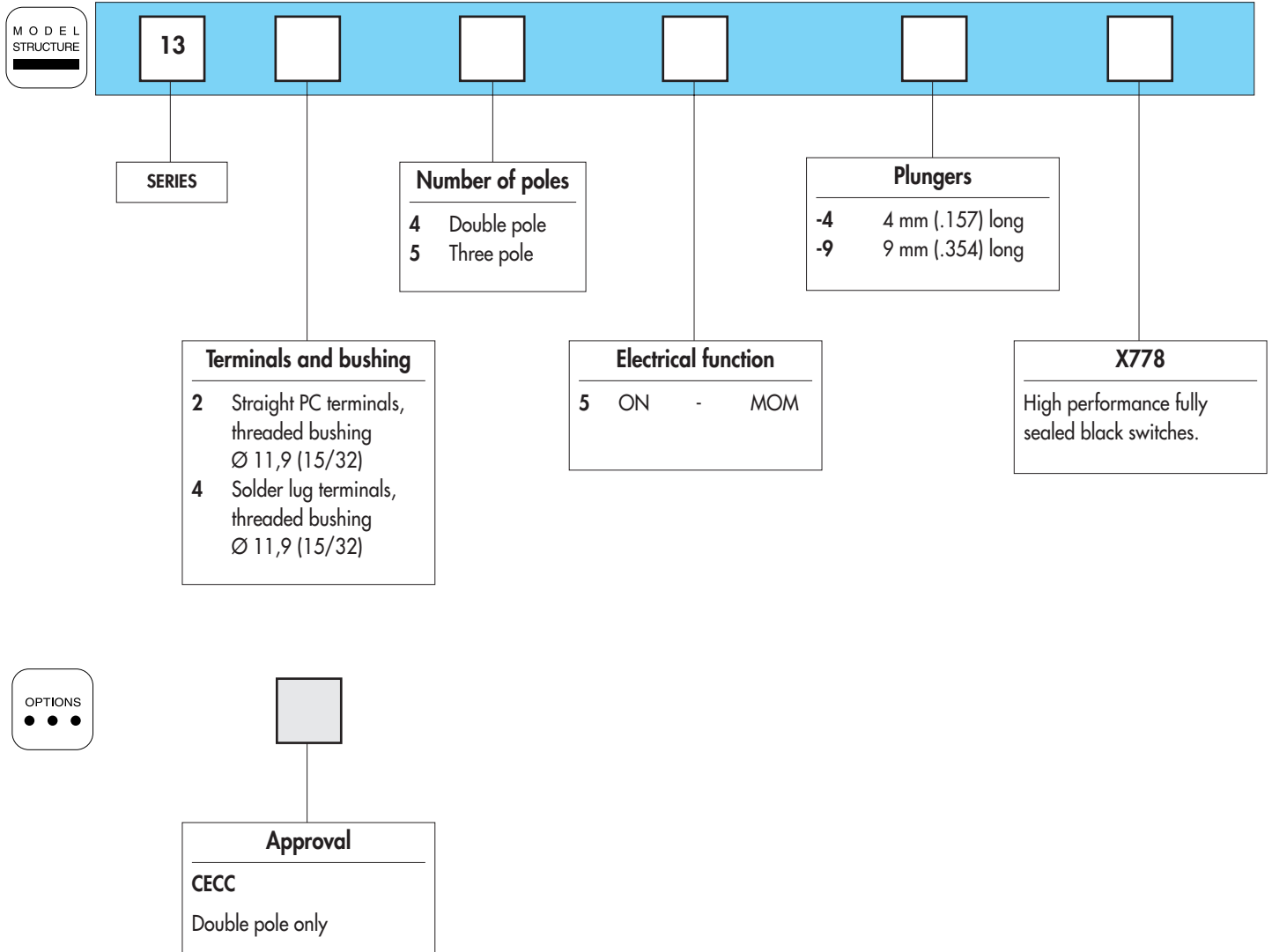
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13000X778 series

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

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 bracketed 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.

Security cap available to prevent inadvertent plunger operation. See section I.



Packaging unit : 25 pieces

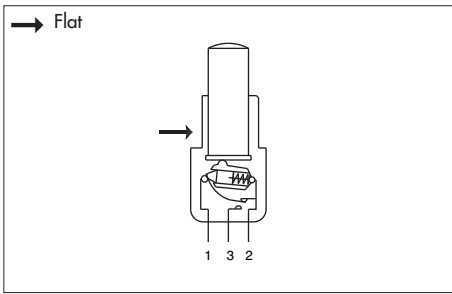


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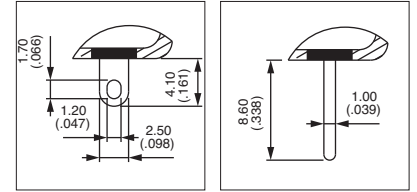
13000X778 series ermec@ermec.com

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

Fully sealed - black



- Quick-break momentary pushbutton switches



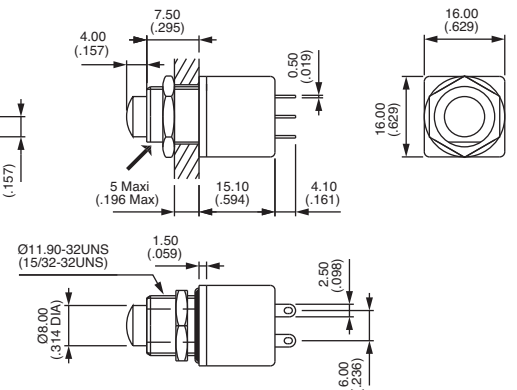
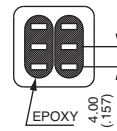
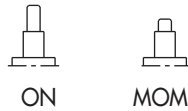
MODEL
STRUCTURE



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



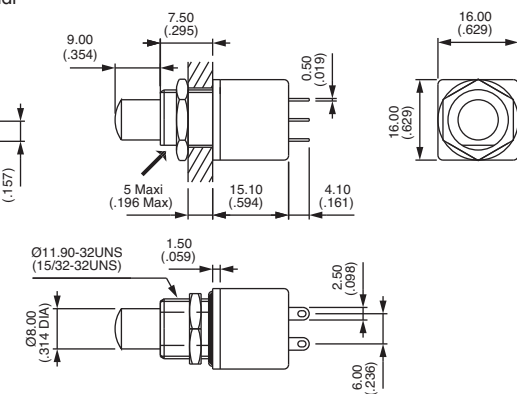
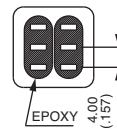
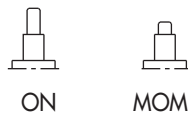
13445-4X778



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



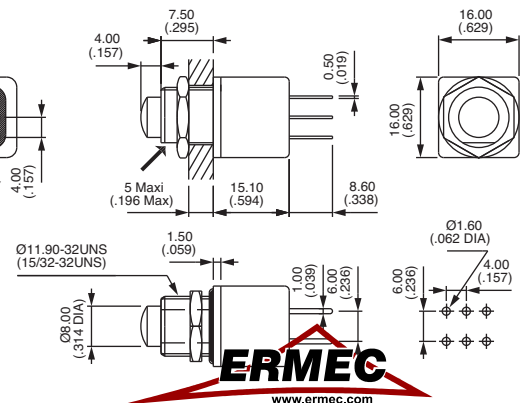
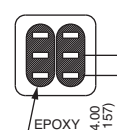
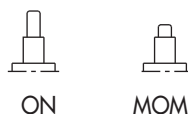
13445-9X778



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



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

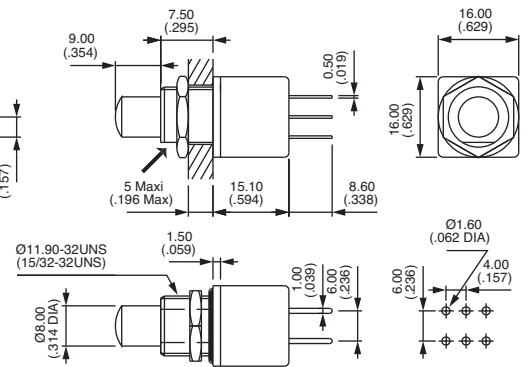
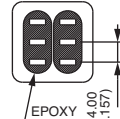
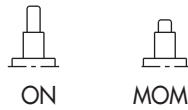
Fully sealed - black

B2

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



13245-9X778

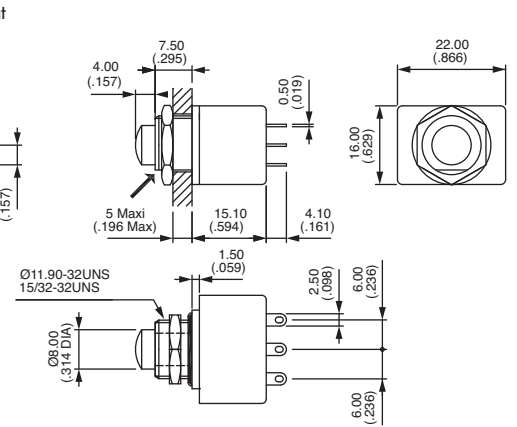
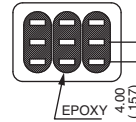
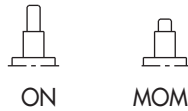


Solder lug terminals - three pole - 4 mm (.157) plunger → Flat

New!



13455-4X778

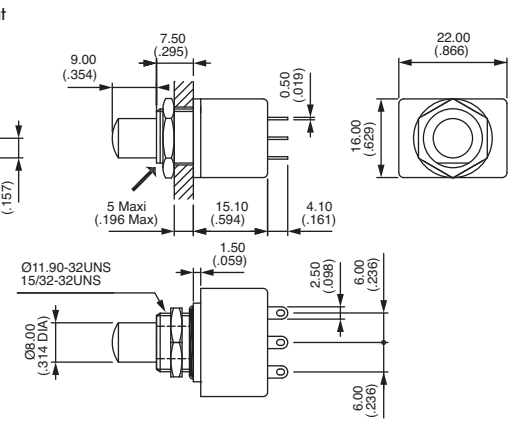
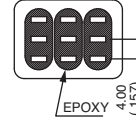


Solder lug terminals - three pole - 9 mm (.354) plunger → Flat

New!



13455-9X778

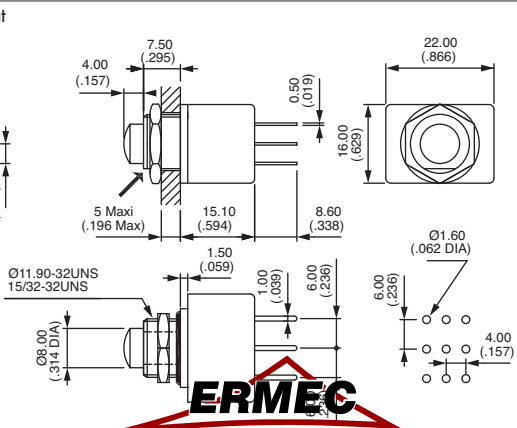
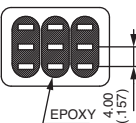
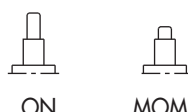


Straight PC terminals - three pole - 4 mm (.157) plunger → Flat

New!



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

Fully sealed - black

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



13255-9X778

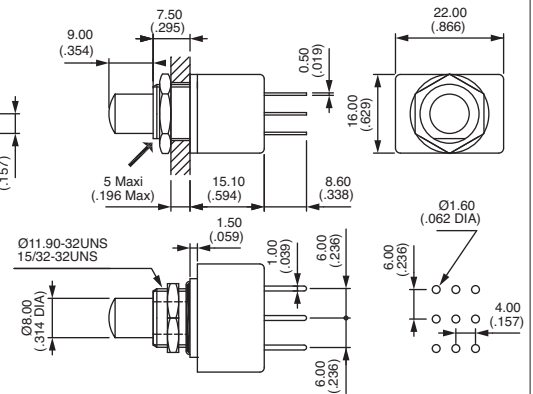
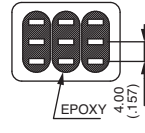
New!



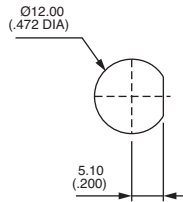
ON



MOM

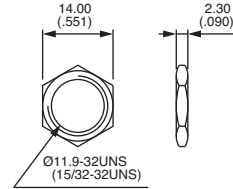


PANEL CUT-OUT



STANDARD HARDWARE

Hex nut



U41 (matt black)

POSITIONS AND CONNECTIONS

FUNCTION	BUTTON POSITION AND CONNECTIONS		TERMINAL IDENTIFICATION
	I	II	
DOUBLE POLE 13245 13445	ON A 1-2 B 1-2	MOM A 1-3 B 1-3	→ Flat
THREE POLE 13255 13455	A 1-2 B 1-2 C 1-2	A 1-3 B 1-3 C 1-3	

AGENCY APPROVAL



CECC CECC 96401-001 (double pole only)

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



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13000X778 series **New!** ermec@ermec.com

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

Distinctive features

Applications

These professional switches are suitable for use in military and other high specifications environments.

Alternate action

Now available as a bistable switch to have a maintained electrical contact.

Contacts

Highly reliable contacts suitable for low level applications or power applications.

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

Black finish on body, bushing, plunger and hardware.

Full sealing

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



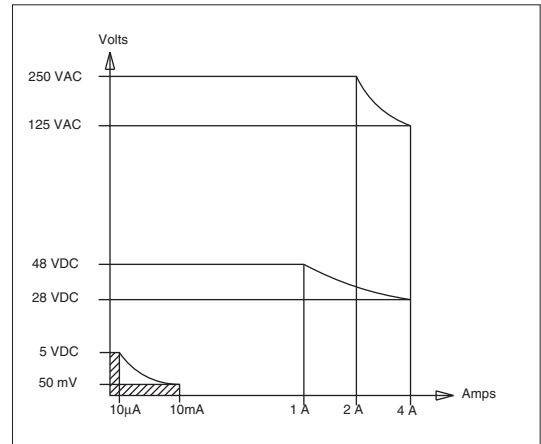
B2



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ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load : 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 4A 28VDC : 10.000 cycles
- At low level (50mV 10mA) : 150.000 cycles

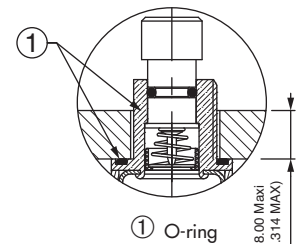


MATERIALS

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



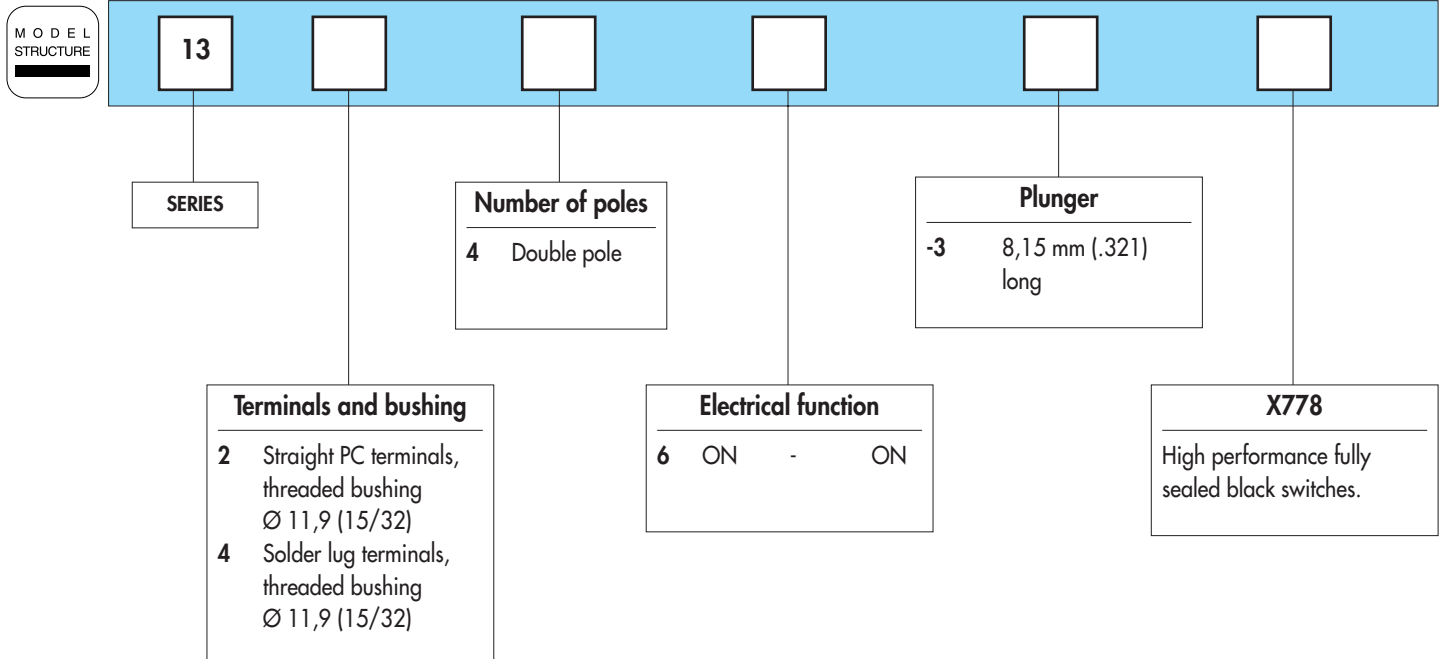
GENERAL SPECIFICATIONS

- Total travel : 2,5 mm (.098)
- Torque : 1,50 Nm (1.10 Ft.lb) max. applied to nut
- Panel thickness : 8 mm (.315) 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)

13000X778 series **New!** ermec@ermec.com

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

Overview



ABOUT THIS SERIES

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

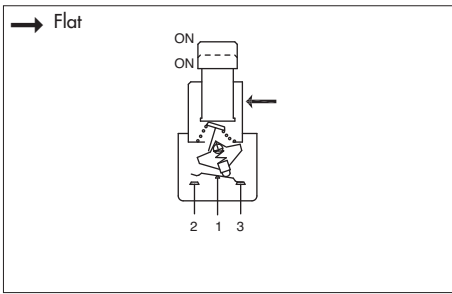


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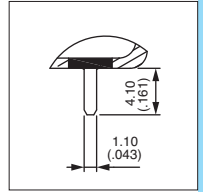
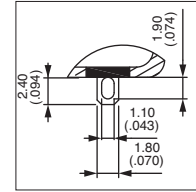
New! 13000X778 ermec@ermec.com series

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

Fully sealed - black



- Alternate action pushbutton switches
- Button returns in upper position after actuation.



MODEL
STRUCTURE



Solder lug terminals - double pole

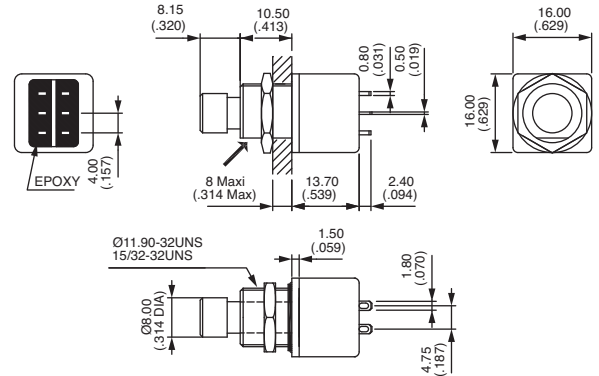


13446-3X778

ON

ON

→ Flat



Straight PC terminals - double pole

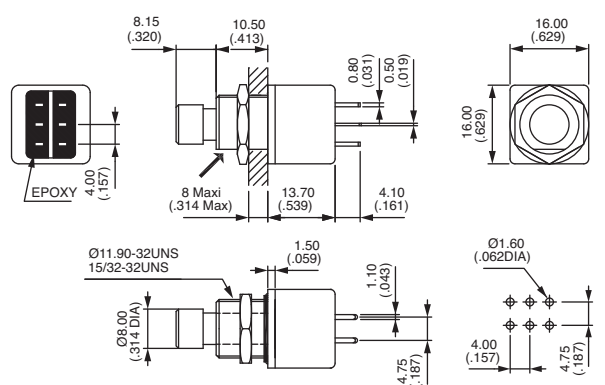


13246-3X778

ON

ON

→ Flat



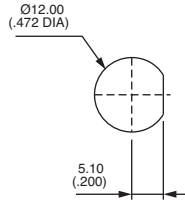
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13000X778 series **New!** ermec@ermec.com

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

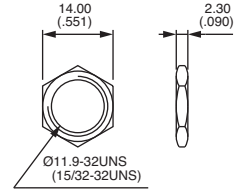
Fully sealed - black

PANEL CUT-OUT



STANDARD HARDWARE

Hex nut



U41 (matt black)

POSITIONS AND CONNECTIONS

FUNCTION	BUTTON POSITION AND CONNECTIONS		TERMINAL IDENTIFICATION
	I	II	
13246 13446	ON A 1-2 B 1-2	ON A 1-3 B 1-3	<p>→ Flat</p>



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