

# 11000 and 12000 series

Professional toggle switches

*Distinctive features*

UG1410A-R1



## Applications

These switches are specially manufactured for defence, telecommunications and other professional applications.

## Approvals

 CECC 96201-005  
CECC 96201-008

- Meeting the requirements of MIL standard (MIL 3950)



## Robust switches for high specification environments

## Toggle action on 2-position models giving smooth mechanical operation

## Plastic material with high insulation resistance

## Several front panel sealing options

## Several locking lever options (12000 series)

## Bright chrome, satin chrome or black finish



The company reserves the right to change specifications without notice.

# 11000 series

## Professional toggle switches - threaded bushing Ø 6,35 (1/4)

### Specifications

#### ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load : Peak currents, refer to "Special options".
  - silver contacts (A-AD2-X780) : 4A 30VDC
  - gold contacts (D) : 100mA 30VDC
- Minimum load : AD2-X780-D 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 at full load :

| Contacts    | Max. current/voltage rating                   | Number of cycles |             |
|-------------|---|------------------|-------------|
|             |   | 2 positions      | 3 positions |
| A           | 4A 30VDC                                      | 50.000           | 50.000      |
| AD2<br>X780 | 4A 30VDC<br>(Gold plating : 100mA 30VDC max.) | 20.000           | 20.000      |
| D           | 100mA 30VDC                                   | 80.000           | 50.000      |
|             | Low level or mechanical life                  | 150.000          | 100.000     |

#### MATERIALS

- Case : diallylphthalate (DAP)
- Actuator : brass, nickel plated
- Bushing : brass, nickel plated
- Housing : brass, nickel plated
- Contacts
  - A** : silver
  - AD2** : gold plated silver (2 microns gold)
  - X780** : solid rivet - gold plated silver/nickel alloy
  - D** : solid gold rivet
  - X910** : silver/nickel alloy (for peak currents, see "Special options")
- Terminal seal : epoxy

Note : AD2 and X780 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 (.92 Ft.lb) max. applied between the 2 nuts
- Standard panel thickness : 2,5 mm (.098) max.
- Operating temperature : -40°C to +85°C

#### 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, etc.).

#### AGENCY APPROVALS



CECC 96201-005  
CECC 96201-008

**Availability** : consult factory for details of approved models.

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

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

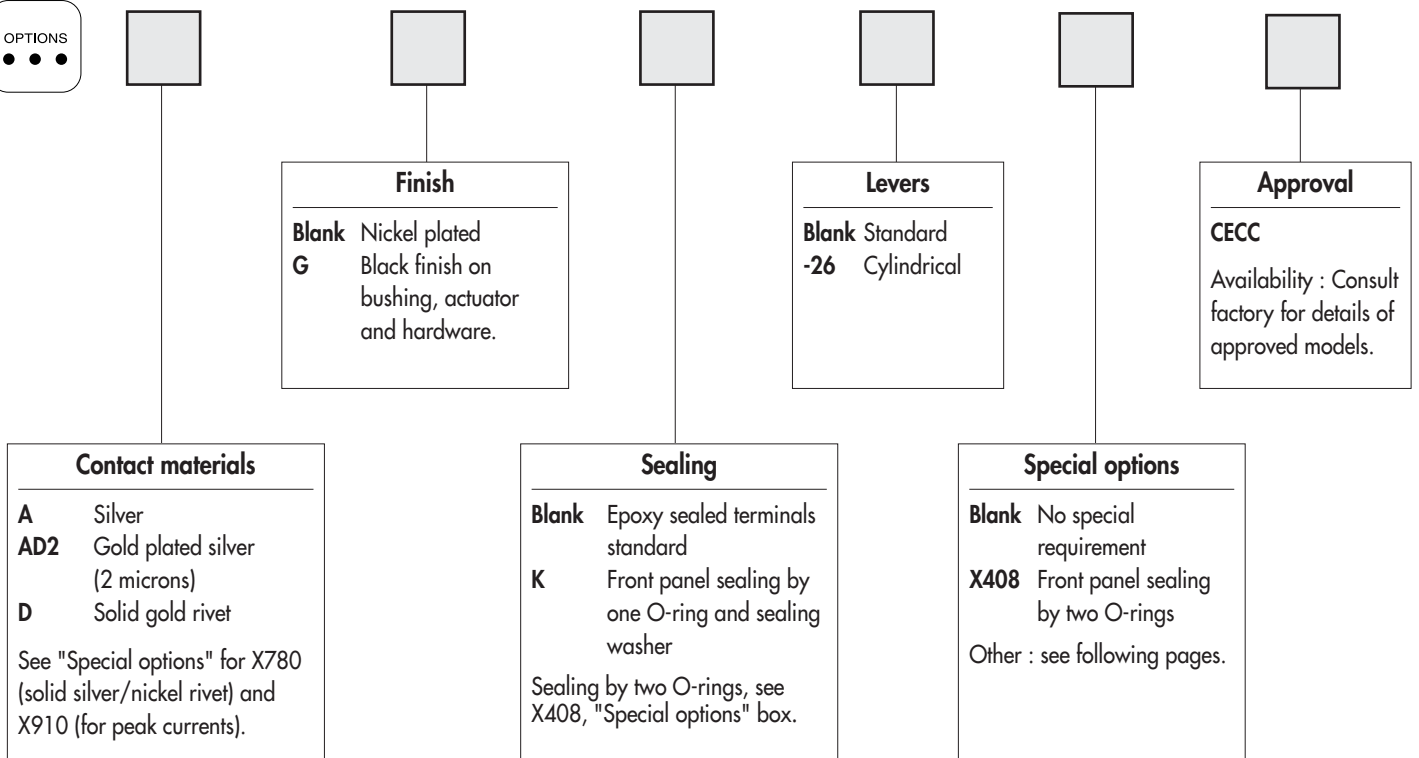
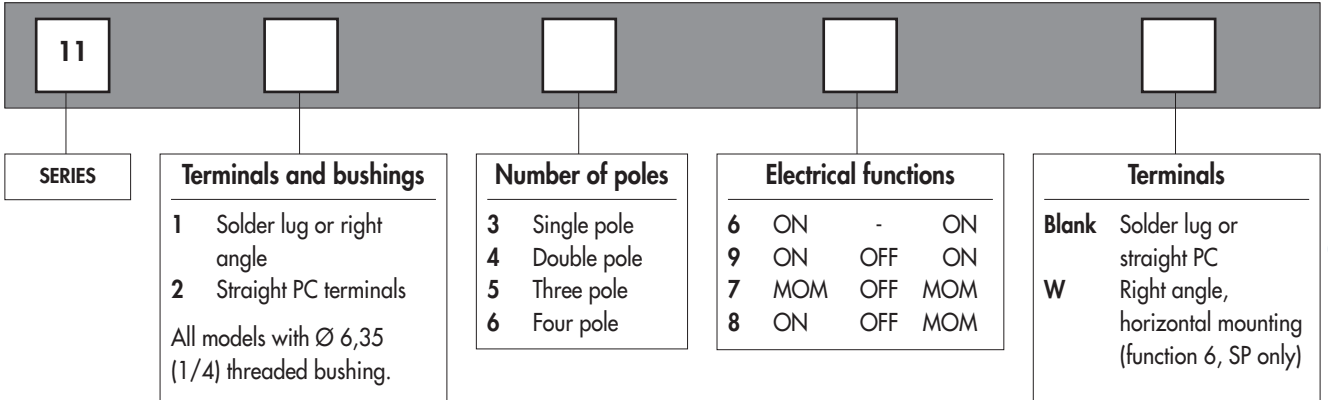


**Packaging unit** : 25 pieces or 50 pieces depending on models.

# 11000 series

Professional toggle switches - threaded bushing Ø 6,35 (1/4)

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



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



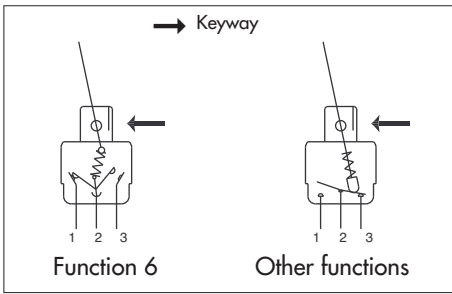
**Mounting accessories** : standard hardware supplied with all models : 2 hex nuts 8 (.314) across flats, 1 locking ring and 1 lockwasher. Standard and special hardware available are presented in section I.

# 11000 series

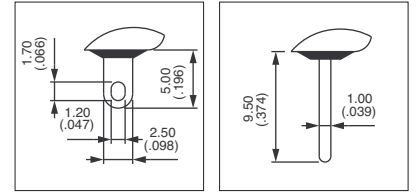
Professional toggle switches - threaded bushing  $\varnothing 6,35$  (1/4)

MODEL  
STRUCTURE

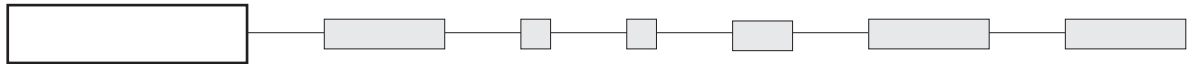
A



- Solder lug, straight PC or right angle terminals
- Epoxy sealed terminals standard



MODEL  
STRUCTURE



Shown with standard lever

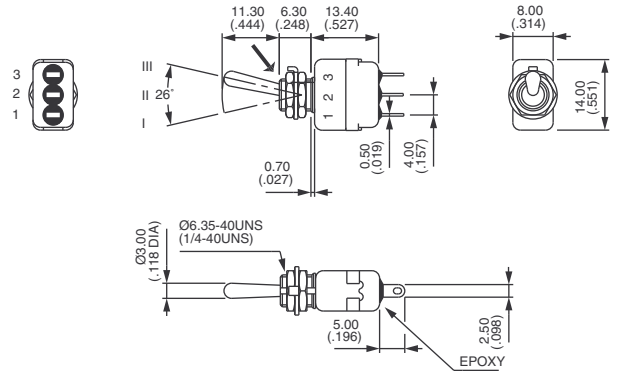
## Solder lug terminals - single pole



11136  
11139  
11137  
11138

|     | I   | II  | III |
|-----|-----|-----|-----|
| ON  | -   | ON  |     |
| ON  | OFF | ON  |     |
| MOM | OFF | MOM |     |
| ON  | OFF | MOM |     |

→ Keyway



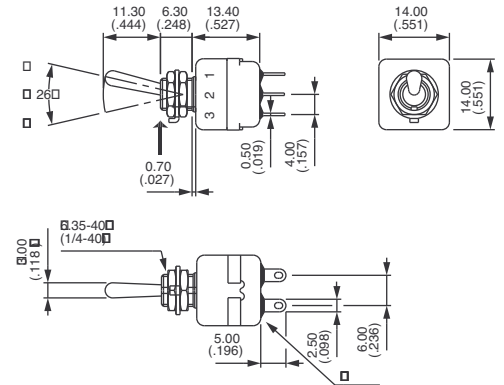
## Solder lug terminals - double pole



11146  
11149  
11147  
11148

|     | I   | II  | III |
|-----|-----|-----|-----|
| ON  | -   | ON  |     |
| ON  | OFF | ON  |     |
| MOM | OFF | MOM |     |
| ON  | OFF | MOM |     |

→ Keyway



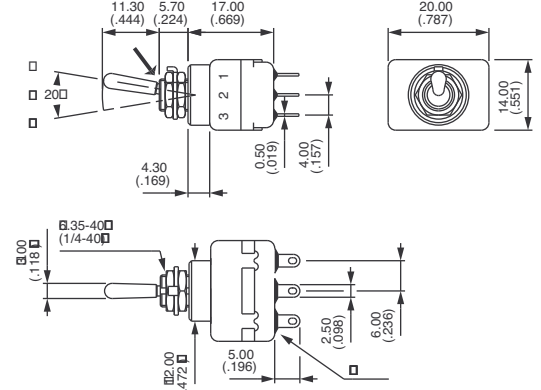
## Solder lug terminals - three pole



11156  
11159  
11157  
11158

|     | I   | II  | III |
|-----|-----|-----|-----|
| ON  | -   | ON  |     |
| ON  | OFF | ON  |     |
| MOM | OFF | MOM |     |
| ON  | OFF | MOM |     |

→ Keyway





# 11000 series

Professional toggle switches - threaded bushing  $\varnothing 6,35$  (1/4)

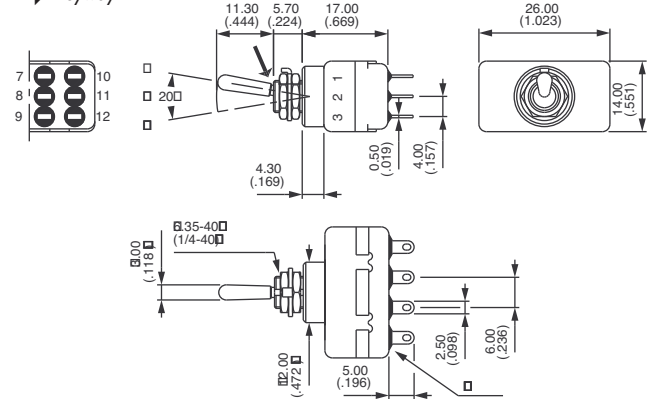
## Solder lug terminals - four pole



11166  
11169  
11167  
11168

|     |     |     |
|-----|-----|-----|
|     |     |     |
| ON  | -   | ON  |
| ON  | OFF | ON  |
| MOM | OFF | MOM |
| ON  | OFF | MOM |

→ Keyway



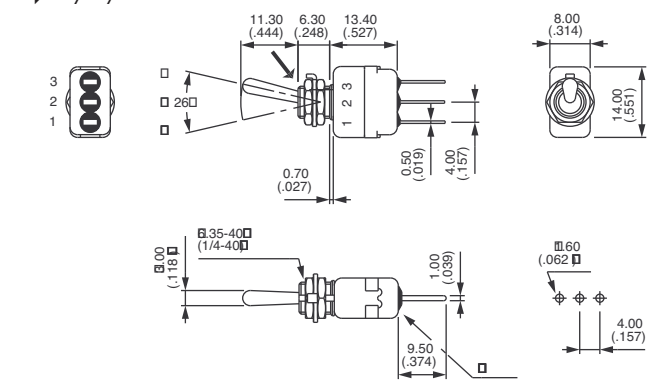
## Straight PC terminals - single pole ▲



11236

|    |   |    |
|----|---|----|
|    |   |    |
| ON | - | ON |

→ Keyway



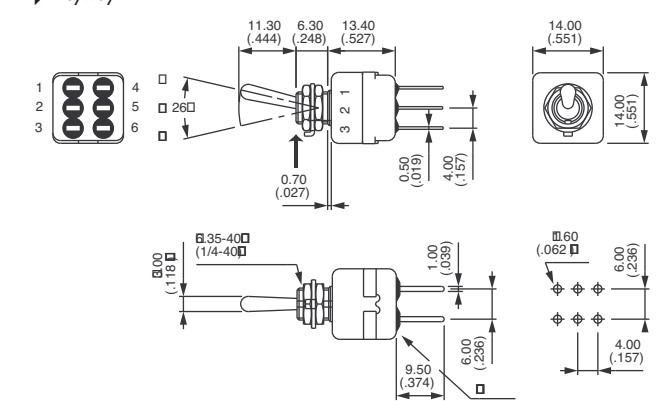
## Straight PC terminals - double pole ▲



11246

|    |   |    |
|----|---|----|
|    |   |    |
| ON | - | ON |

→ Keyway



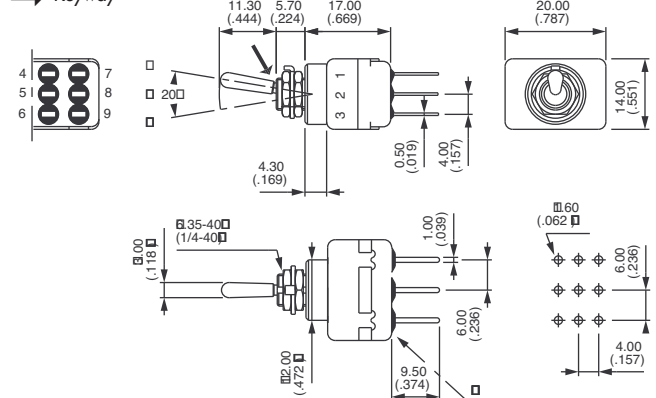
## Straight PC terminals - three pole ▲



11256

|    |   |    |
|----|---|----|
|    |   |    |
| ON | - | ON |

→ Keyway



# 11000 series

Professional toggle switches - threaded bushing  $\varnothing 6,35$  (1/4)

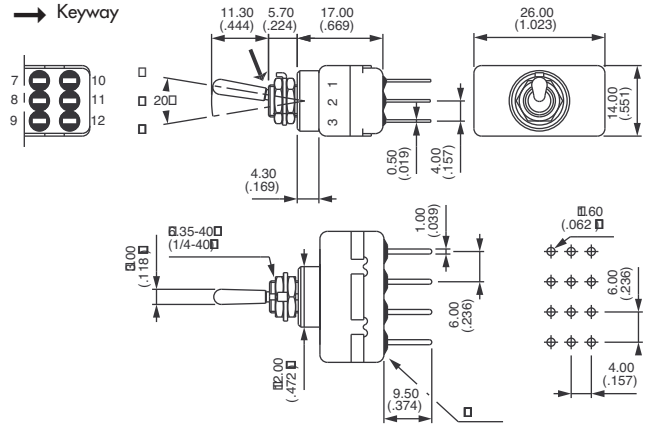
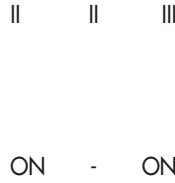
MODEL  
STRUCTURE

A

## Straight PC terminals - four pole ▲



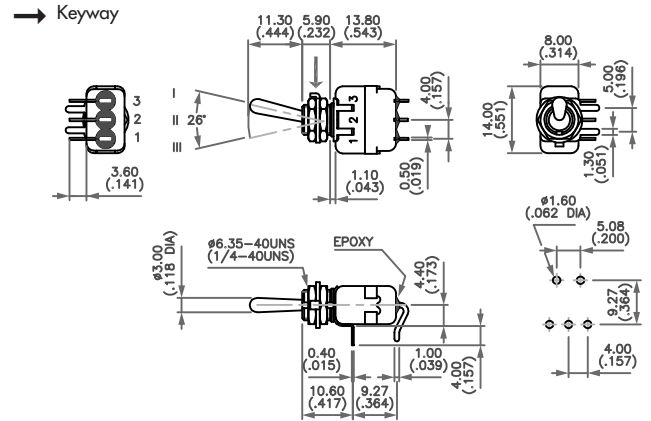
11266



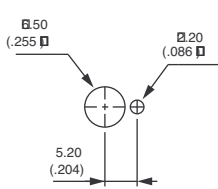
## Right angle terminals - horizontal - single pole



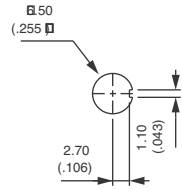
11136W



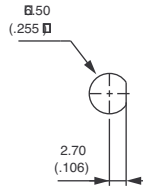
### PANEL CUT-OUT



Standard

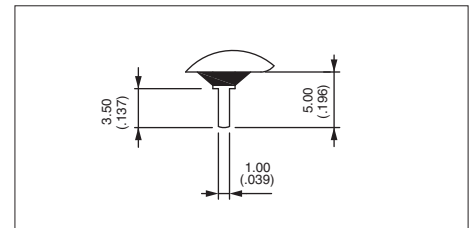


With K  
sealing option



With X408  
sealing option

▲ 3,5 mm (.138) short terminals available for function 6, as well as for functions 9, 7 and 8. On request.

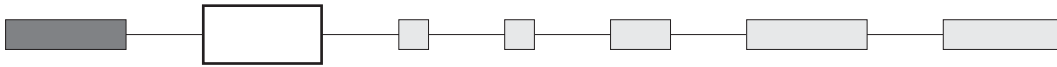




# 11000 series

Professional toggle switches - threaded bushing  $\varnothing 6,35$  (1/4)

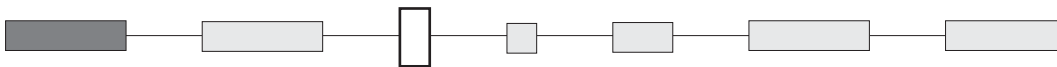
## CONTACT MATERIALS



- A** Silver
- AD2** Gold plated silver (2 micron gold)
- D** Solid gold rivet

See "Special options" for contacts X780 (solid silver/nickel rivet) and contacts X910 (for peak currents).

## FINISH



- Blank** Nickel plated
- G** Black finish on bushing, lever and hardware.

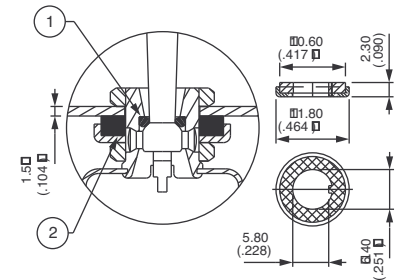
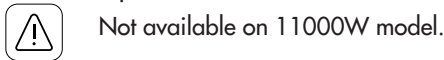
Other finish, consult factory.

## SEALING



Epoxy sealed terminals are standard.

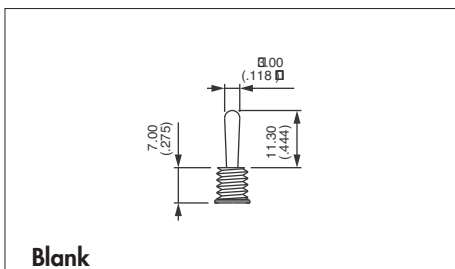
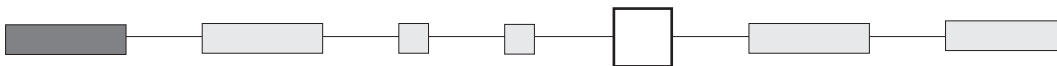
- Blank** No sealing except standard
- K** Front panel sealing by O-ring and sealing washer. Protects the switch against panel water and dust. Panel seal withstands 1 bar pressure and remains sealed even when switch is operated.



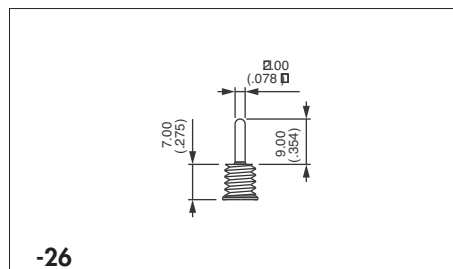
① O-ring ② Sealing washer

Sealing by two O-rings, see X408 under "Special options".  
Sealing boots : see section H.

## LEVERS



**Blank**  
Standard



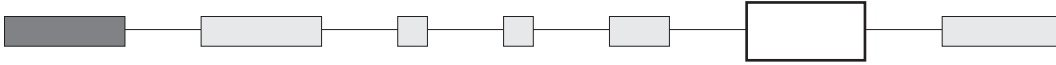
**-26**  
Cylindrical

# 11000 series

Professional toggle switches - threaded bushing  $\varnothing 6,35$  (1/4)



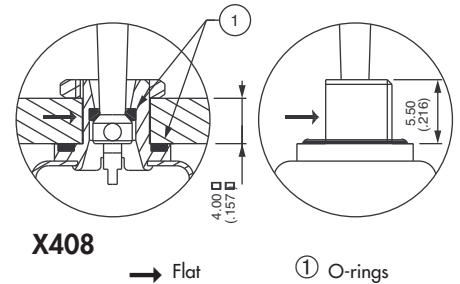
## SPECIAL OPTIONS



**X408** Front panel sealing by two O-rings. Flatted bushing for precise orientation.  
Protects the switch against water and dust.  
Panel seal withstands 1 bar pressure and remains sealed even when switch is operated.



Not available on 11000W model.



**X408**

→ Flat

① O-rings

**X780** Solid rivet, gold plated silver/nickel alloy

**X910** Switches for peak currents

Peak current up to 80A (1 ms) 60VDC - single/double pole

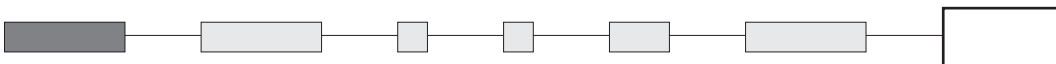


Single pole  
**11136 X910** ON - ON

Double pole  
**11146 X910** ON - ON

- Contacts : solid rivet - silver/nickel alloy (AgNi)
- Max. current/voltage rating :  
3/80A (1 ms) 60VDC - 10.000 cycles
- Further specifications and dimensions : see previous pages
- General information on peak currents : see end of catalogue.

## AGENCY APPROVALS



**CECC** CECC 96201-005 (high level - contacts X780)  
CECC 96201-008 (low level - contacts AD2 or D)

**Availability** : consult factory for details of approved models.

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



# 12000 series

## Professional toggle switches - threaded bushing Ø 11,9 (15/32)

Specifications

### ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load : Peak currents, refer to "Special options".
  - silver contacts (A-AD2-X780) : 4A 30VDC
  - gold contacts (D) : 100mA 30VDC
- Minimum load : AD2-X780-D 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 at full load :

| Contacts    | Max. current/voltage rating                   | Number of cycles |             |
|-------------|---|------------------|-------------|
|             |   | 2 positions      | 3 positions |
| A           | 4A 30VDC                                      | 50.000           | 50.000      |
| AD2<br>X780 | 4A 30VDC<br>(Gold plating : 100mA 30VDC max.) | 20.000           | 20.000      |
| D           | 100mA 30VDC                                   | 80.000           | 50.000      |
|             | Low level or mechanical life                  | 150.000          | 100.000     |

### MATERIALS

- Case : diallylphthalate (DAP)
- Actuator : brass, chrome plated
- Bushing : brass, nickel plated
- Housing : brass, nickel plated
- Contacts
  - A** : silver
  - AD2** : gold plated silver (2 microns gold)
  - X780** : solid rivet - gold plated silver/nickel alloy
  - D** : solid gold rivet
  - X910** : silver/nickel alloy (for peak currents, see "Special options")
- Terminal seal : epoxy

Note : AD2 and X780 contacts can be used for high level applications. In this case, the gold layer is considered only as a protection against oxidation during storage. Tin dipped terminals available, see "Special options".

### GENERAL SPECIFICATIONS

- Torque : 1,50 Nm (1.10 Ft.lb) max. applied between the 2 nuts
- Standard panel thickness : 4,5 mm (.177) max.
- Operating temperature : -40°C to +85°C

### 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



CECC 96201-005  
CECC 96201-008

Designed to MIL specifications

**Availability** : consult factory for details of approved models.

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

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



**Packaging unit** : 2 pole models : 25 pieces - 3 & 4 pole models : 20 pieces.

# 12000 series

## Professional toggle switches - threaded bushing Ø 11,9 (15/32)

### Overview



**SERIES**

**Terminals and bushings**

1 Solder lug terminals  
2 Straight PC terminals

All models with threaded bushing Ø 11,9 (15/32). Bushing Ø 15 (.590), see X822 under "Special options".

**Number of poles**

4 Double pole  
5 Three pole  
6 Four pole

**Electrical functions**

|   |     |     |       |
|---|-----|-----|-------|
| 6 | ON  | -   | ON    |
| 9 | ON  | OFF | ON    |
| 7 | MOM | OFF | MOM   |
| 8 | ON  | OFF | MOM   |
| 5 | -   | ON  | MOM   |
| 4 | ON  | ON  | ON    |
|   | ON  | ON  | MOM ▲ |
|   | MOM | ON  | MOM ▲ |

**Function 4**  
. ▲ Must not have blank in "momentary" box.

**Momentary for function 4**

1R ON ON MOM  
2R MOM ON MOM

Leave blank for other functions.



**Finish**

**Blank** Bright chrome finish on actuator  
**G** Black finish on bushing, actuator and hardware.  
Satin chrome finish, see "Special options".

**Fluorescent tip**

**Blank** None  
**-038** White fluorescent tip to lever  
Available with matt black finish (G) only.

**Special options**

**Blank** No special requirement  
**X408** Front panel sealing by two O-rings  
**X822** Bushing Ø 15 (.590)  
Other : see foll. pages.

**Contact materials**

**A** Silver  
**AD2** Silver, gold plated (2 micron gold)  
**D** Solid gold rivet

See "Special options" for X780 (solid silver/nickel rivet) and X910 (for peak currents).

**Sealing**

**Blank** Epoxy sealed terminals standard  
**K** Front panel sealing by one O-ring and sealing washer  
Sealing by two O-rings, see X408, "Special options" box.

**Levers**

**Blank** Standard lever  
**-12** Short lever

**Locking levers**

**-1V** 1 locked position  
**-2V** 2 locked positions  
**-3V** 3 locked positions  
Other : see foll. pages.

**Approvals**

**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



**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 14 (.551) across flats and 1 locking ring. Standard and special hardware available are presented in section I.

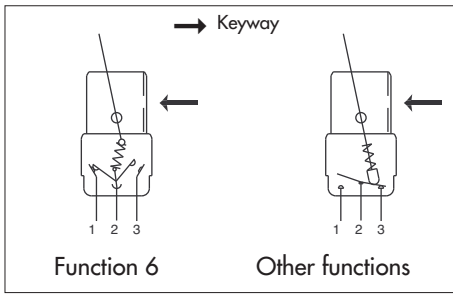
**Security caps** are available to prevent inadvertent lever operation. They are presented in section I.



# 12000 series

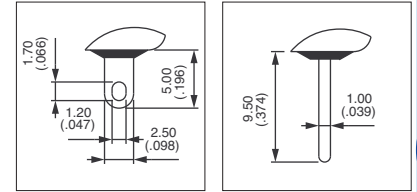
Professional toggle switches - threaded bushing  $\varnothing 11,9$  (15/32)

Solder lug terminals : 12100

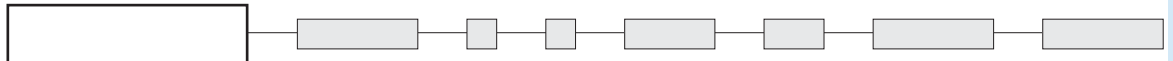


• Epoxy sealed terminals standard

| Typical angle of throw (A) |     |
|----------------------------|-----|
| Function 6                 | 26° |
| Functions 9, 7, 8, 4       | 20° |
| Function 5                 | 12° |



MODEL STRUCTURE



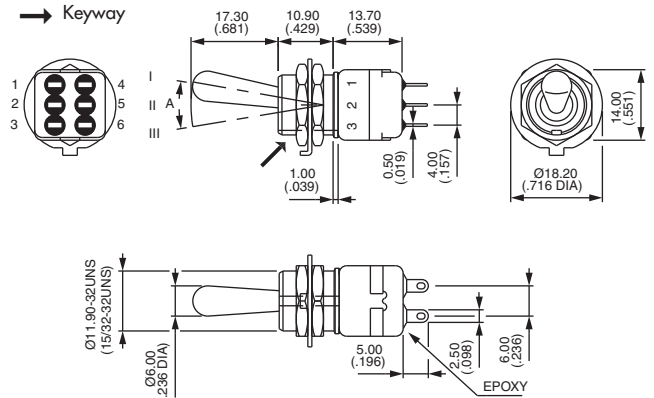
Shown with standard lever

## Solder lug terminals - double pole



- 12146
- 12149
- 12147
- 12148
- 12144\*
- 12144 1R\*
- 12144 2R\*
- 12145

| I   | II  | III |
|-----|-----|-----|
| ON  | -   | ON  |
| ON  | OFF | ON  |
| MOM | OFF | MOM |
| ON  | OFF | MOM |
| ON  | ON  | ON  |
| ON  | ON  | MOM |
| MOM | ON  | MOM |
| -   | ON  | MOM |



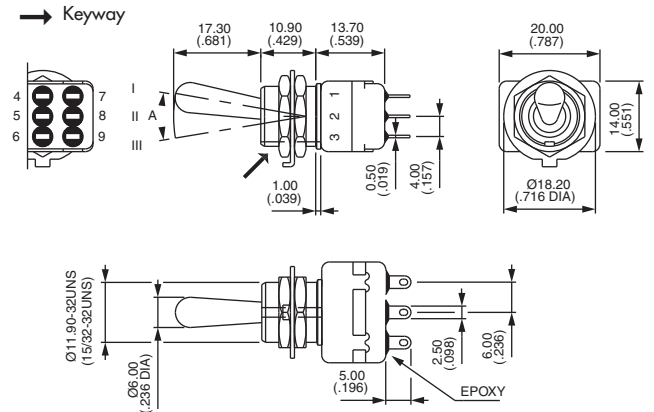
\* Function 4 : SP in DP case - connections, see end of catalogue.

## Solder lug terminals - three pole



- 12156
- 12159
- 12157
- 12158

| I   | II  | III |
|-----|-----|-----|
| ON  | -   | ON  |
| ON  | OFF | ON  |
| MOM | OFF | MOM |
| ON  | OFF | MOM |

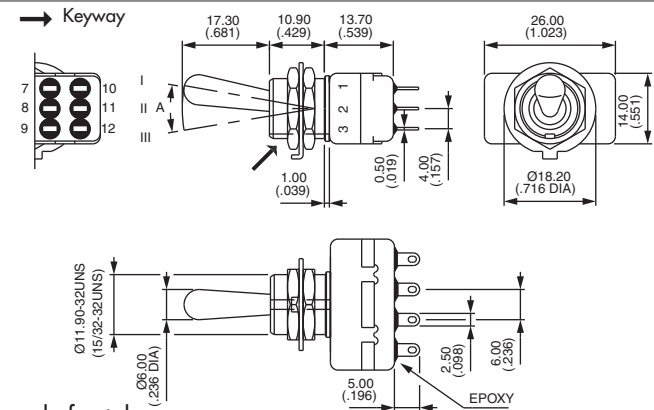


## Solder lug terminals - four pole



- 12166
- 12169
- 12167
- 12168
- 12164\*
- 12164 1R\*
- 12164 2R\*

| I   | II  | III |
|-----|-----|-----|
| ON  | -   | ON  |
| ON  | OFF | ON  |
| MOM | OFF | MOM |
| ON  | OFF | MOM |
| ON  | ON  | ON  |
| ON  | ON  | MOM |
| MOM | ON  | MOM |



\* Function 4 : DP in 4P case - connections, see end of catalogue.

# 12000 series

Professional toggle switches - threaded bushing  $\varnothing 11,9$  (15/32)

Straight PC terminals : 12200

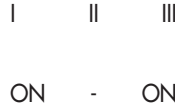


A

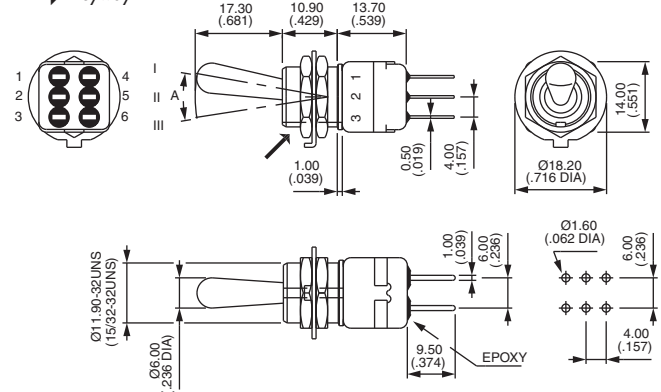
## Straight PC terminals - double pole ▲



12246



→ Keyway



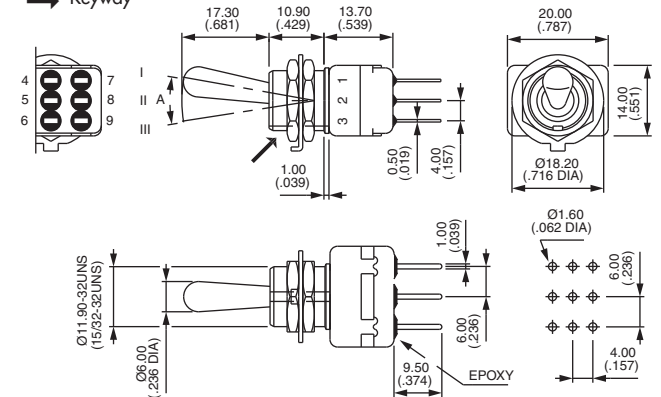
## Straight PC terminals - three pole ▲



12256



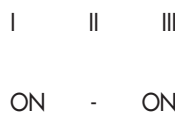
→ Keyway



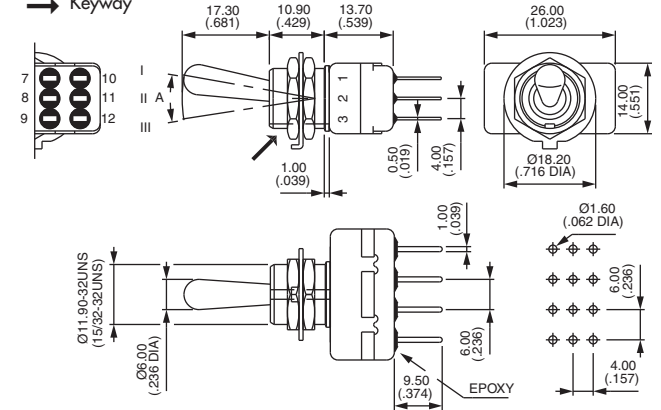
## Straight PC terminals - four pole ▲



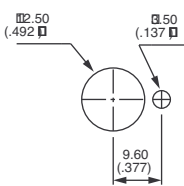
12266



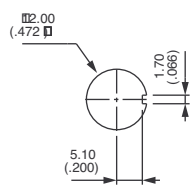
→ Keyway



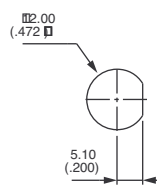
### PANEL CUT-OUT



Standard

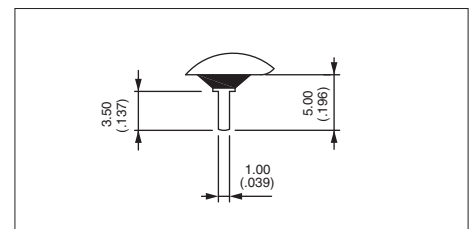


With K  
sealing option



With X408  
sealing option

▲ 3,5 mm (.138) short terminals available on request for function 6. Standard for functions 9, 7, 8, 4 and 5.

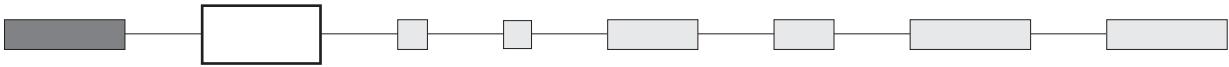




# 12000 series

Professional toggle switches - threaded bushing  $\varnothing 11,9$  (15/32)

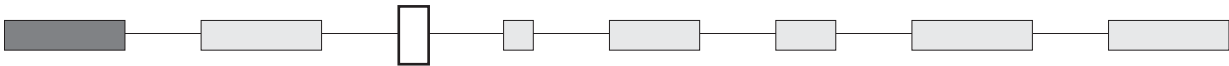
## CONTACT MATERIALS



- A** Silver
- AD2** Silver, gold plated (2 micron gold)
- D** Solid gold rivet (except functions 4 and 5)

See "Special options" for contacts X780 (solid silver/nickel rivet) and contacts X910 (for peak currents).

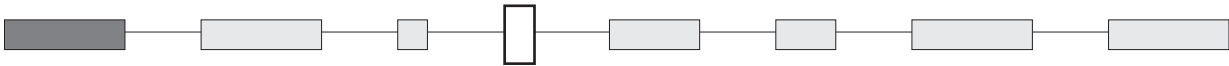
## FINISH



- Blank** Bright chrome finish on actuator
- G** Black finish on bushing, lever and hardware.

For satin chrome finish, see "Special options".

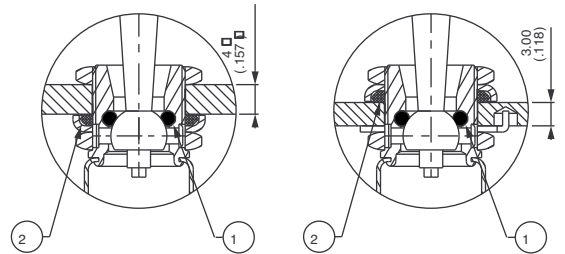
## SEALING



Epoxy sealed terminals are standard.

- Blank** No sealing except standard.
- 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.

Sealing by two O-rings, see X408 under "Special options".  
Sealing boots : see section H.



① O-ring    ② Sealing washer

## FLUORESCENT TIP



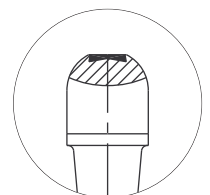
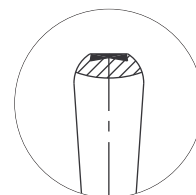
- Blank** None
- 038** White fluorescent tip. Becomes luminous when submitted to ultra-violet rays.



Available with matt black finish (option G) only.

Standard lever

Locking lever



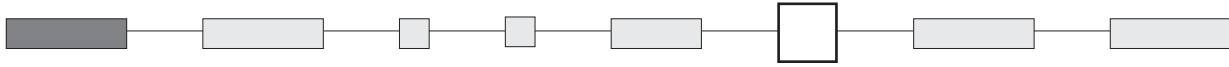
# 12000 series

Professional toggle switches - threaded bushing  $\varnothing 11,9$  (15/32)

OPTIONS

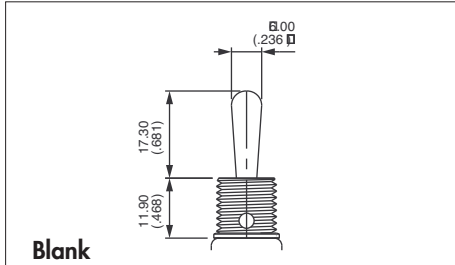


## ACTUATORS



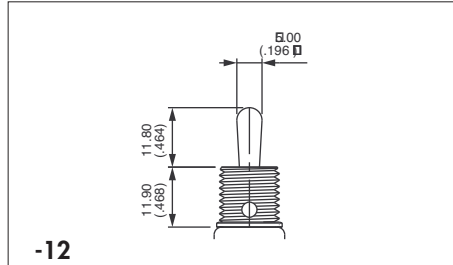
### Levers

Dash compulsory before lever code.



Blank

Standard



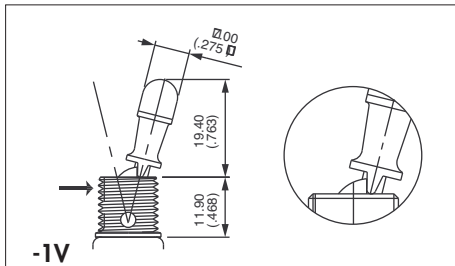
-12

Short lever

Security caps : see section I.

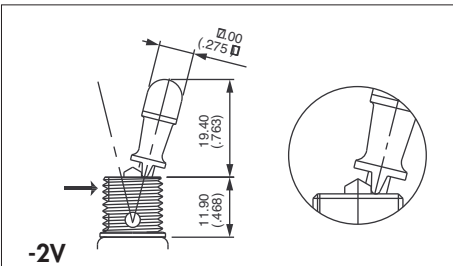
### Locking levers

→ Keyway



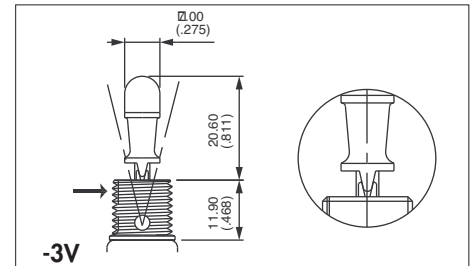
-1V

1 locked position (function 6)  
Typical angle of throw : 26°



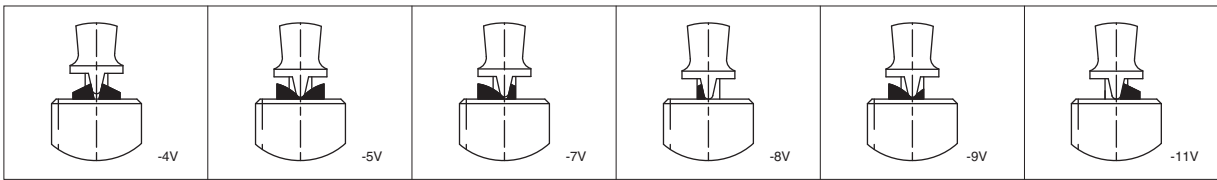
-2V

2 locked positions (function 6)  
Typical angle of throw : 26°



-3V

3 locked positions (functions 9 and 4)  
Typical angle of throw : 20°



Functions 9 & 4

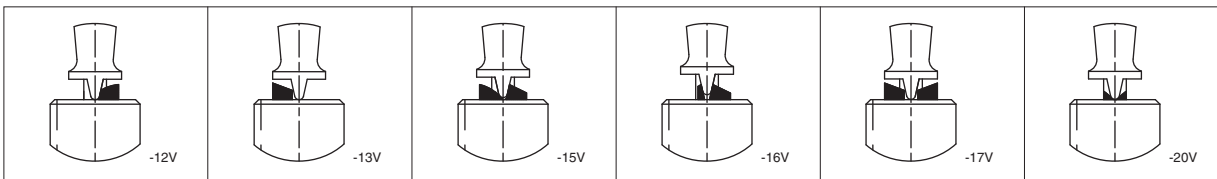
Functions 7 & 442R

Functions 8 & 441R

Functions 8, 9, 44 & 441R

Functions 8 & 441R

Functions 8, 9, 44 & 441R



Functions 8 & 441R

Funct. 8, 5 & 441R

Functions 8 & 441R

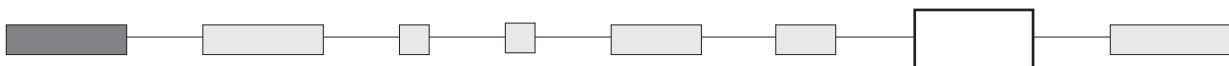
Functions 4 & 9

Functions 7 & 442R

Functions 9 & 44

**Note :** -5V and -12V are not true locking levers : no pulling is required before actuation.

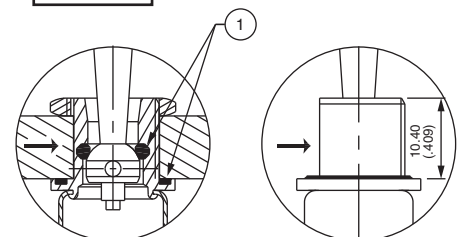
## SPECIAL OPTIONS



**Blank** No special requirement.

**X408** Front panel sealing by two O-rings. Flatted bushing for precise orientation. Panel thickness : 8 mm (.314) max., 3 mm (.118) min. Protects the switch against water and dust. Panel seal withstands 1 bar pressure and remains sealed even when switch is operated.

**X545** Lever, bushing, housing, nuts and washers with satin chrome finish.



→ Flat ① O-rings



# 12000 series

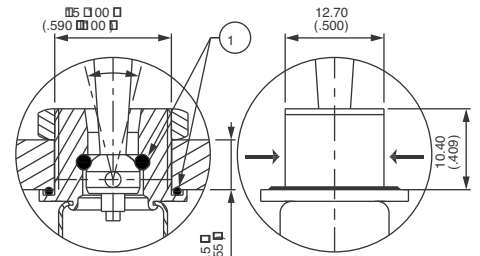
Professional toggle switches - threaded bushing  $\varnothing$  11,9 (15/32)

## SPECIAL OPTIONS (continued)

**X822** Threaded bushing  $\varnothing$  15 (.590), with double flat  
Not available with function 5 or locking levers.  
Includes front panel sealing and X780 contact material.

**X780** Solid rivet - gold plated silver/nickel alloy contacts  
Not available with function 5.

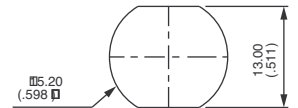
**X910** Switches for peak currents



**X822**

→ Flat

① O-rings



Peak current up to 80A (1 ms) 60VDC - double pole

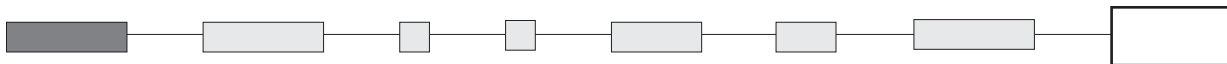


12146 X910

ON - ON

- Contacts : solid rivet - silver/nickel alloy (AgNi)
- Max. current/voltage rating :  
3/80A (1 ms) 60VDC - 10.000 cycles
- Further specifications and dimensions : see previous pages
- General information on peak currents : see end of catalogue.

## AGENCY APPROVAL



**CECC** CECC 96201-005 (high level - contacts X780)  
CECC 96201-008 (low level - contacts AD2 or D)

**Availability** : consult factory for details of approved models.

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