

# 11000 and 12000 series

## Professional toggle switches

*Distinctive features*

UG1410A



### Applications

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

### Approvals



- 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



# 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 X780	4A 30VDC (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.

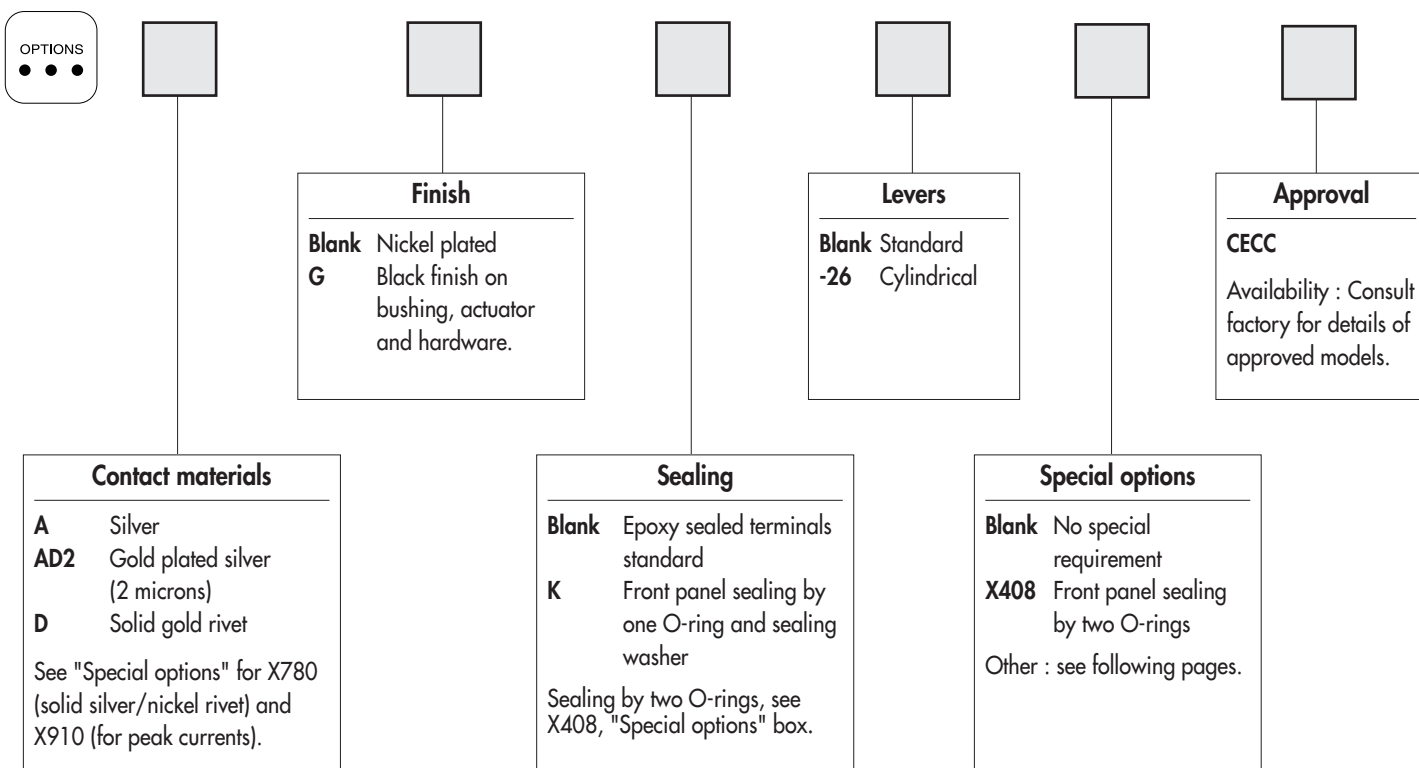
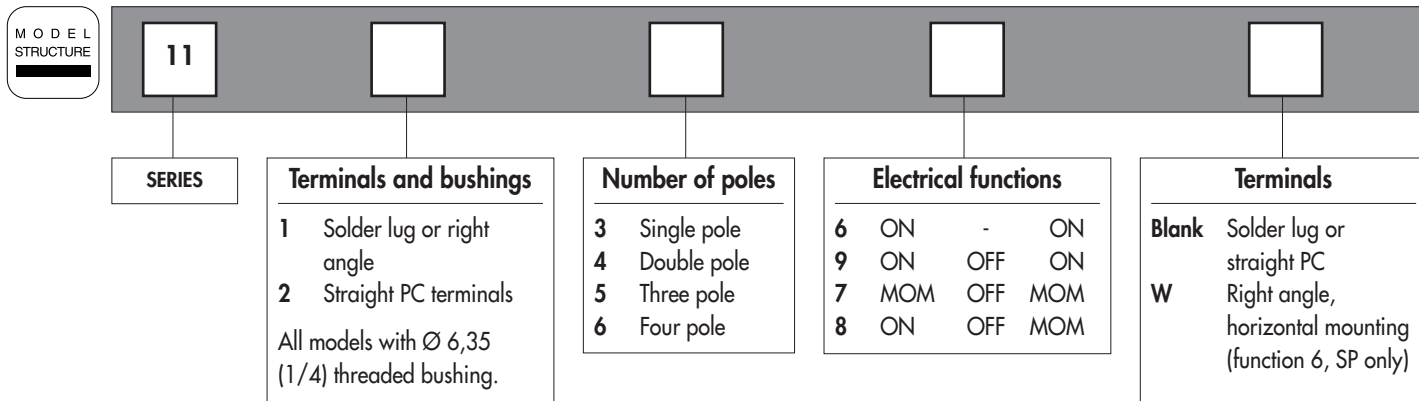


**Packaging unit** : 25 pieces or 50 pieces depending on models.

# 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.



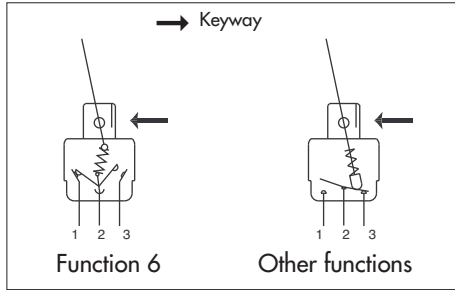
**Mounting accessories** : standard hardware supplied with all models : 2 hex nuts 8 (.314) across flats, 1 locking ring and 1 lockwasher. Standard and special hardware available are presented in section I.

# 11000 series

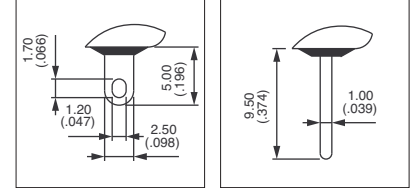
Professional toggle switches - threaded bushing  $\varnothing 6,35 (1/4)$

MODEL  
STRUCTURE

A



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



MODEL  
STRUCTURE



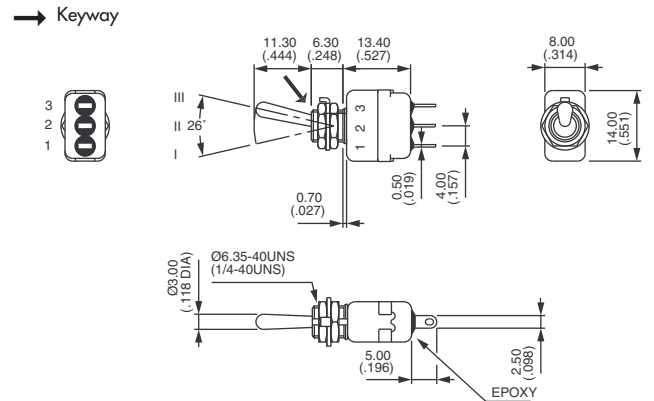
Shown with standard lever

## Solder lug terminals - single pole



11136  
11139  
11137  
11138

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

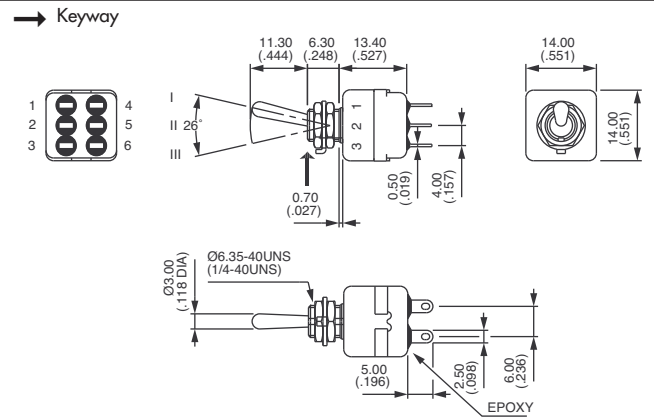


## Solder lug terminals - double pole



11146  
11149  
11147  
11148

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

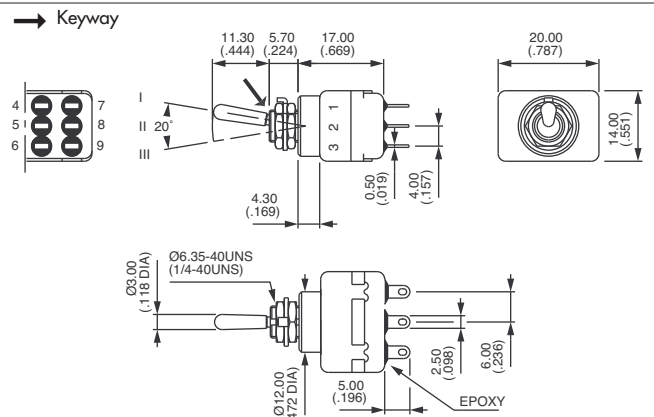


## Solder lug terminals - three pole



11156  
11159  
11157  
11158

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





# 11000 series

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

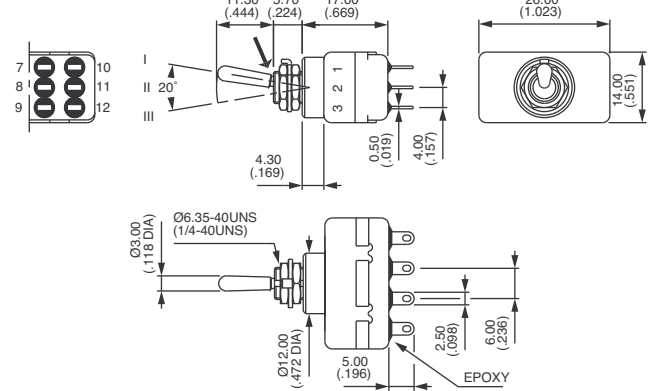
## Solder lug terminals - four pole



11166  
11169  
11167  
11168

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

→ Keyway



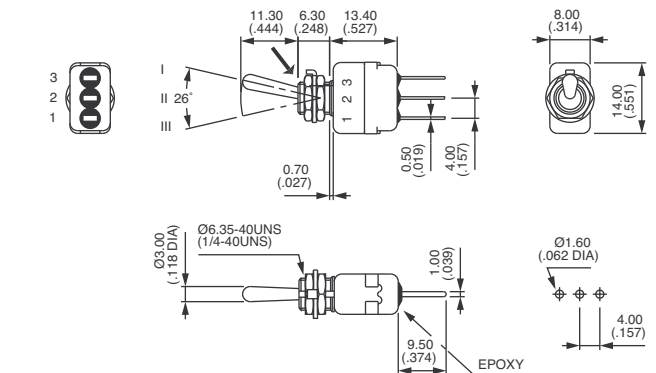
## Straight PC terminals - single pole ▲



11236

|| || |||  
ON - ON

→ Keyway



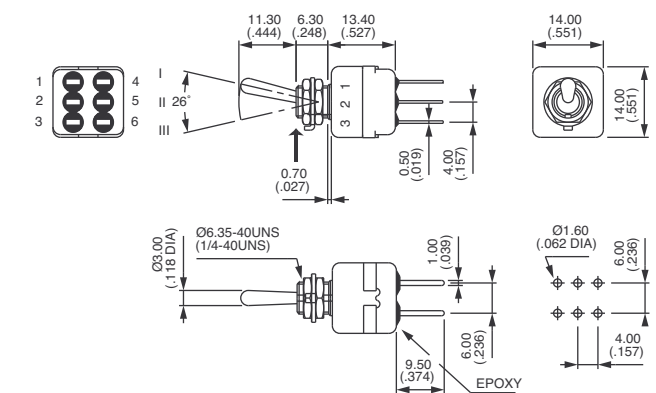
## Straight PC terminals - double pole ▲



11246

|| || |||  
ON - ON

→ Keyway



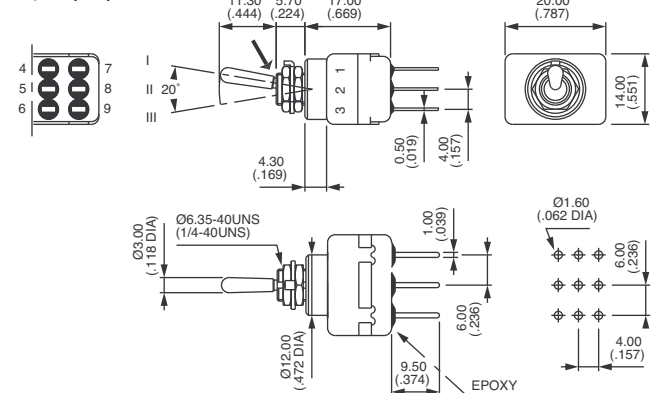
## Straight PC terminals - three pole ▲



11256

|| || |||  
ON - ON

→ Keyway



# 11000 series

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



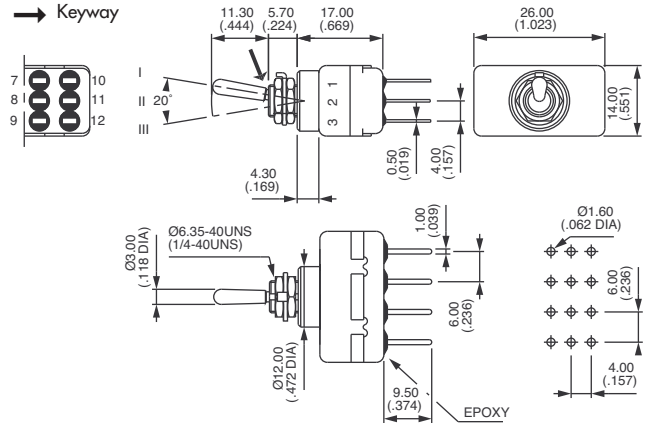
A

## Straight PC terminals - four pole ▲



11266

II II III  
ON - ON

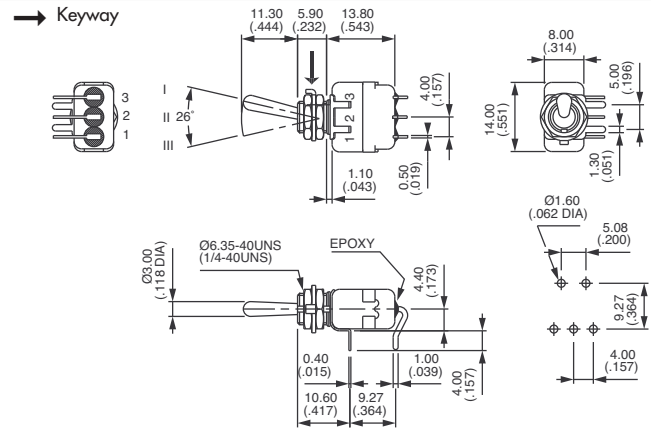


## Right angle terminals - horizontal - single pole

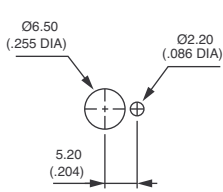


11136W

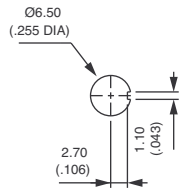
I II III  
ON - ON



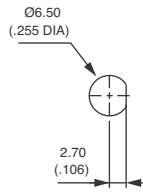
### PANEL CUT-OUT



Standard

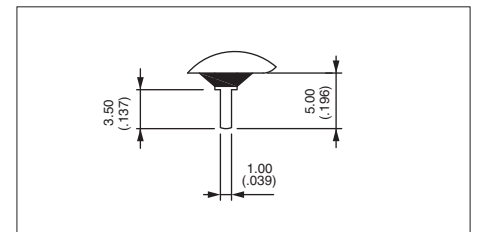


With K sealing option



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.

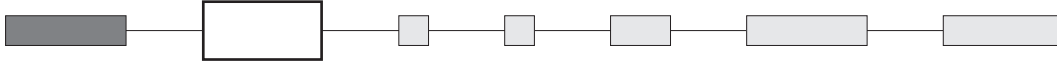




# 11000 series

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

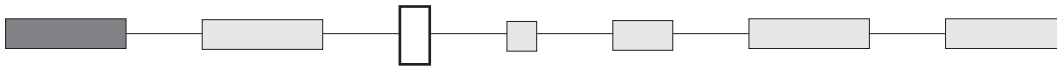
### CONTACT MATERIALS



- 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).

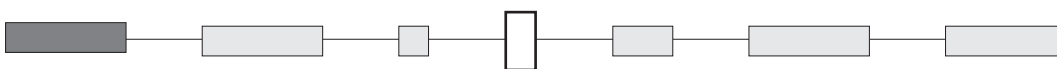
### FINISH



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

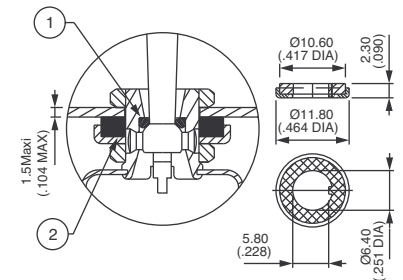
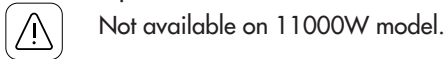
Other finish, consult factory.

### SEALING



Epoxy sealed terminals are standard.

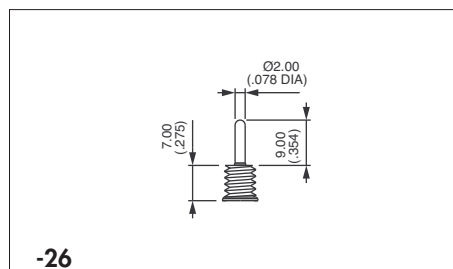
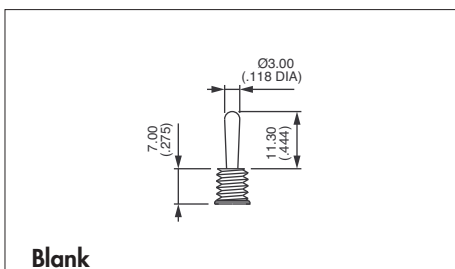
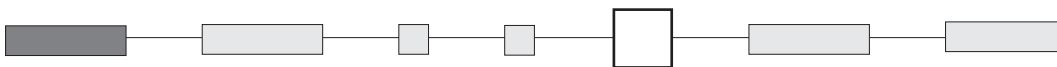
- Blank** No sealing except standard
- K** Front panel sealing by O-ring and sealing washer. Protects the switch against water and dust. Panel seal withstands 1 bar pressure and remains sealed even when switch is operated.



① O-ring ② Sealing washer

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

### LEVERS

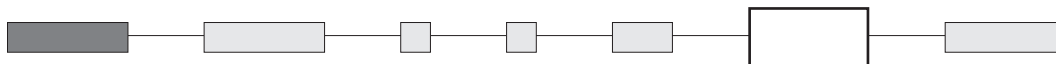


# 11000 series

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



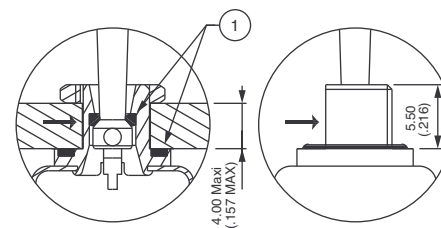
## SPECIAL OPTIONS



**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

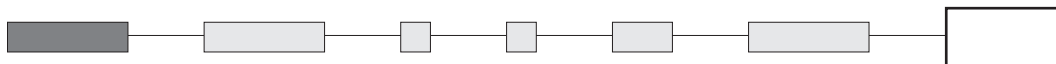


Single pole  
**11136 X910** ON - ON

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 X780	4A 30VDC (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.

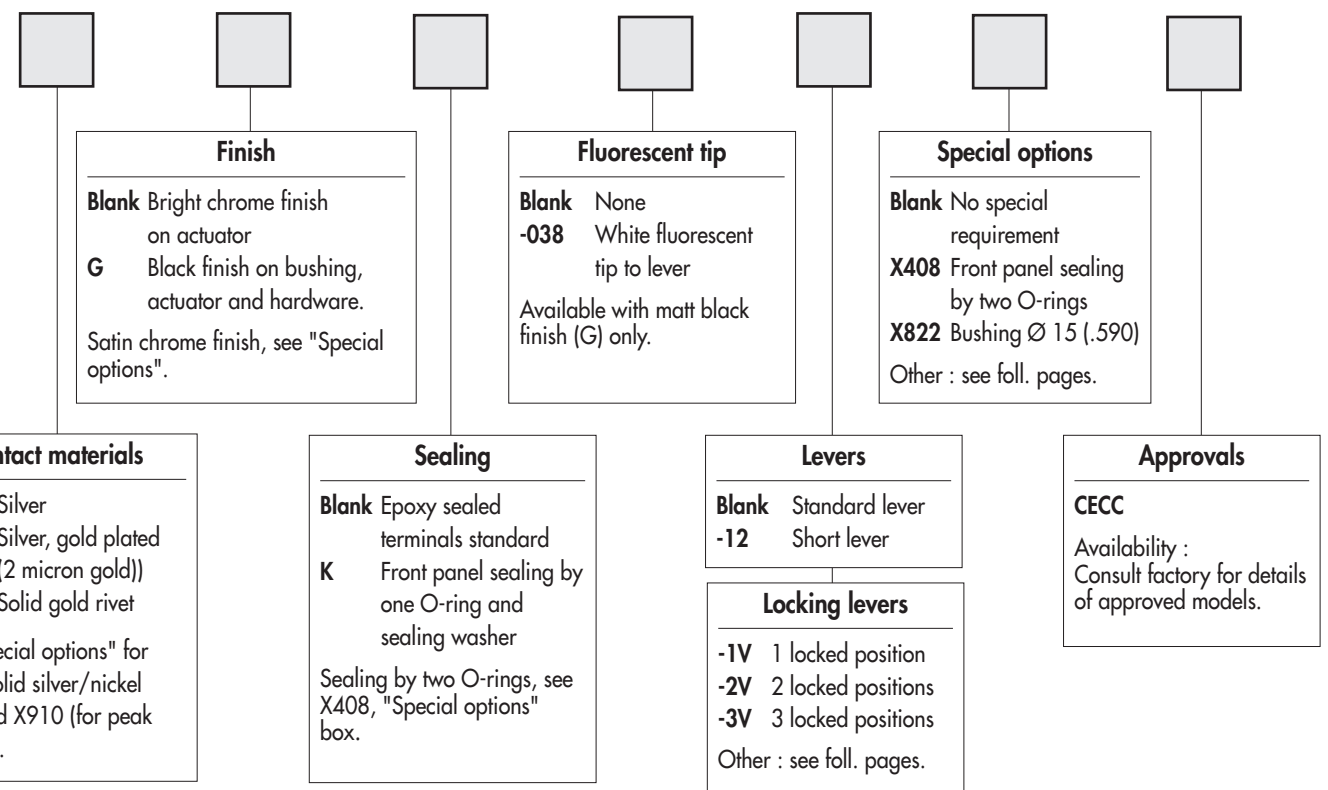
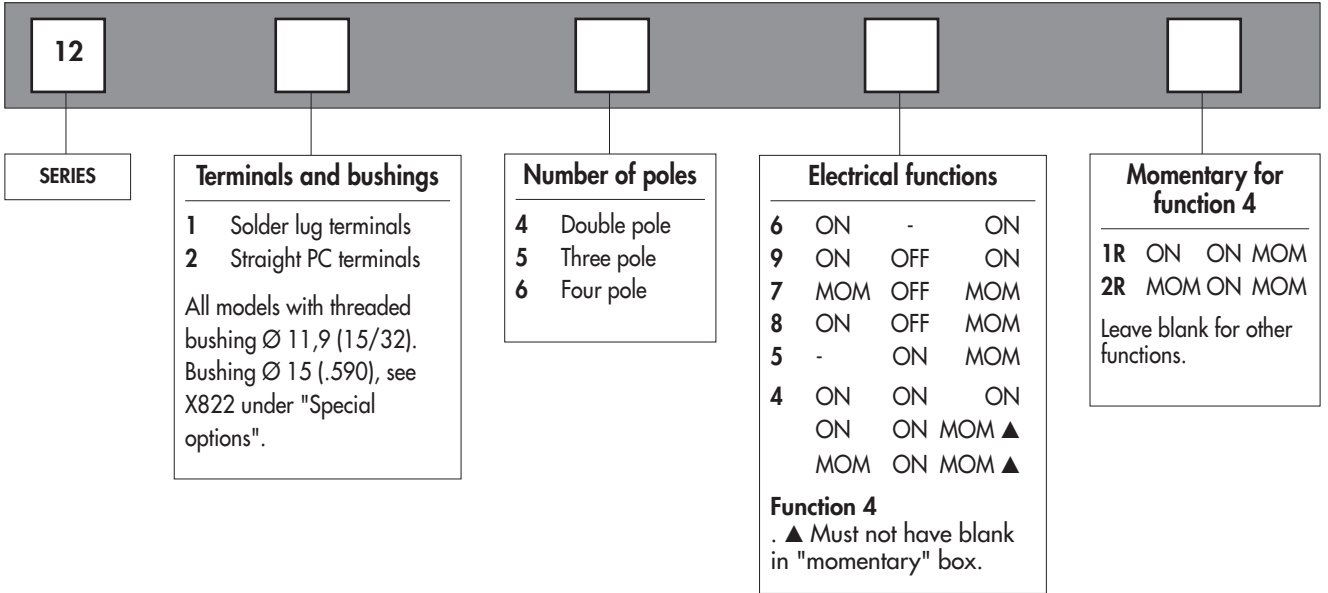


**Packaging unit** : 2 pole models : 25 pieces - 3 & 4 pole models : 20 pieces.

# 12000 series

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

### Overview



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

#### ABOUT THIS SERIES

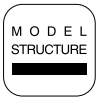
On the following pages, you will find successively :  
- model structure of switches  
- options in the same order as in above chart



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



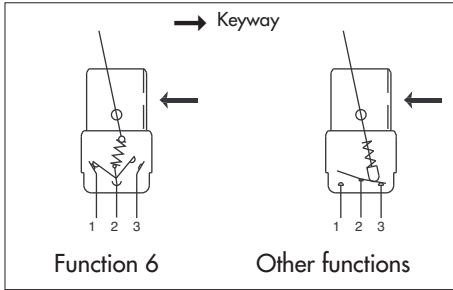
**Mounting accessories** : standard hardware supplied with all models : 2 hex nuts 14 (.551) across flats and 1 locking ring. Standard and special hardware available are presented in section I.



# 12000 series

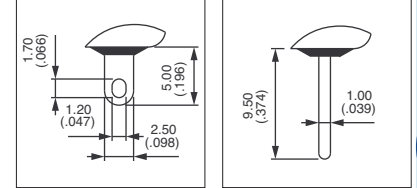
## Professional toggle switches - threaded bushing Ø 11,9 (15/32)

Solder lug terminals : 12100

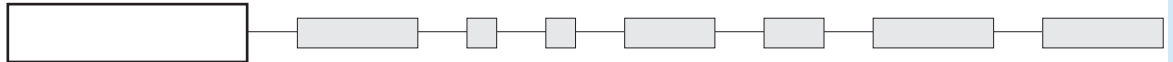


• Epoxy sealed terminals standard

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



MODEL STRUCTURE

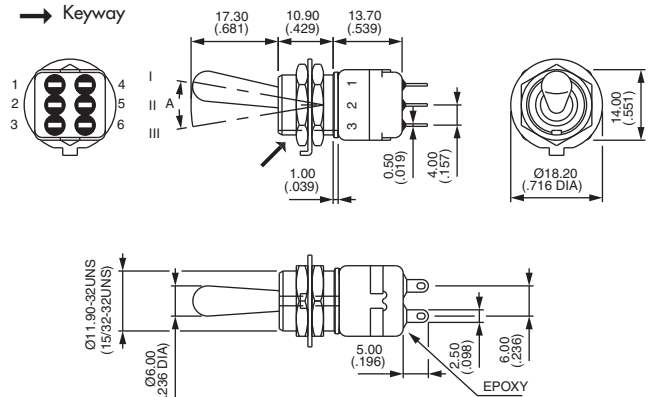


Shown with standard lever

### Solder lug terminals - double pole



	I	II	III
12146	ON	-	ON
12149	ON	OFF	ON
12147	MOM	OFF	MOM
12148	ON	OFF	MOM
12144*	ON	ON	ON
12144 1R*	ON	ON	MOM
12144 2R*	MOM	ON	MOM
12145	-	ON	MOM

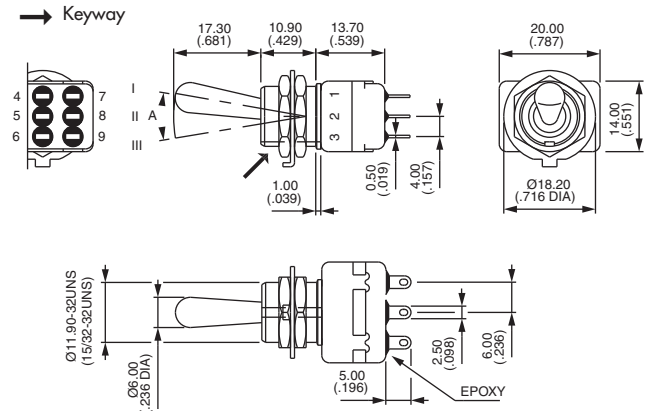


\* Function 4 : SP in DP case - connections, see end of catalogue.

### Solder lug terminals - three pole



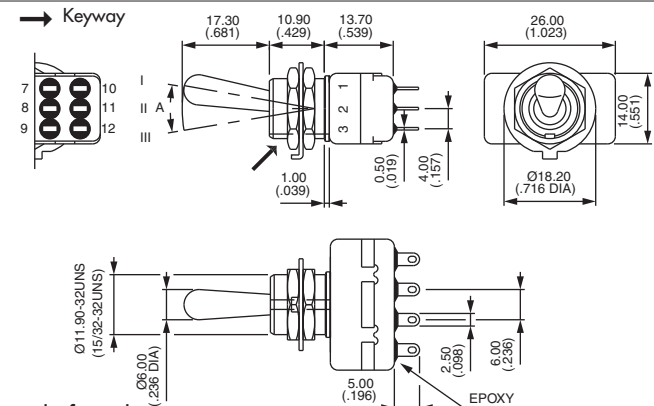
	I	II	III
12156	ON	-	ON
12159	ON	OFF	ON
12157	MOM	OFF	MOM
12158	ON	OFF	MOM



### Solder lug terminals - four pole



	I	II	III
12166	ON	-	ON
12169	ON	OFF	ON
12167	MOM	OFF	MOM
12168	ON	OFF	MOM
12164*	ON	ON	ON
12164 1R*	ON	ON	MOM
12164 2R*	MOM	ON	MOM



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

# 12000 series

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

Straight PC terminals : 12200

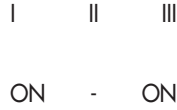


A

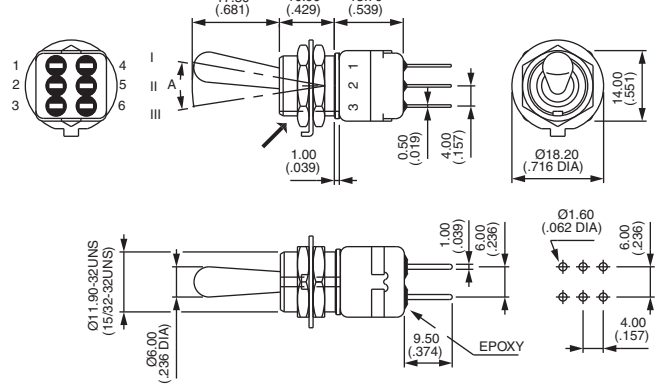
### Straight PC terminals - double pole ▲



12246



→ Keyway



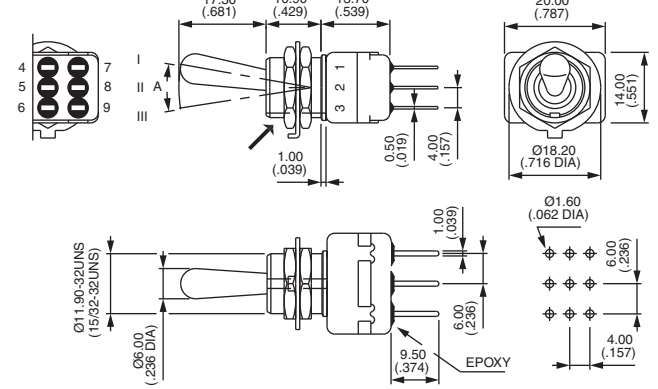
### Straight PC terminals - three pole ▲



12256



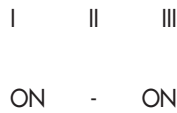
→ Keyway



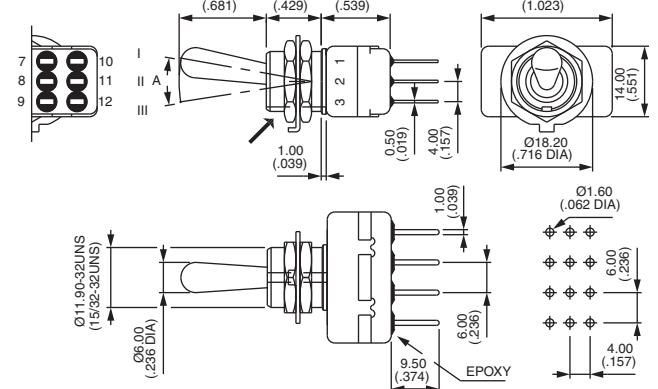
### Straight PC terminals - four pole ▲



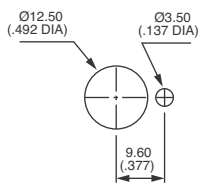
12266



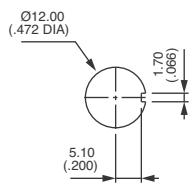
→ Keyway



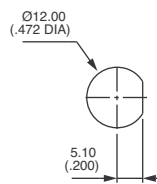
### PANEL CUT-OUT



Standard

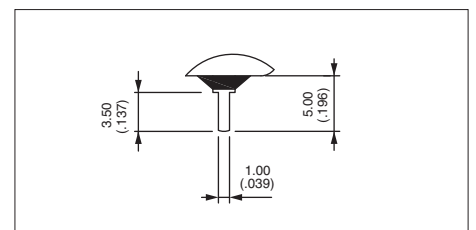


With K sealing option



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.

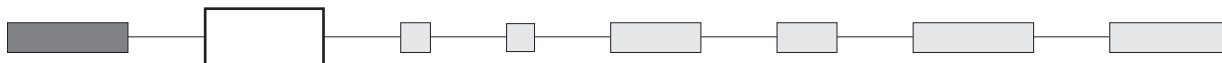




# 12000 series

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

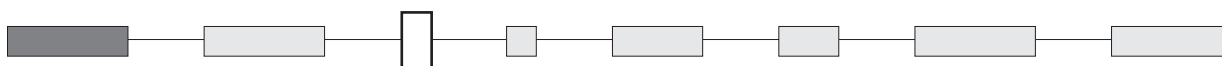
### CONTACT MATERIALS



- 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).

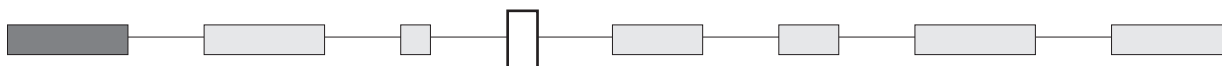
### FINISH



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

For satin chrome finish, see "Special options".

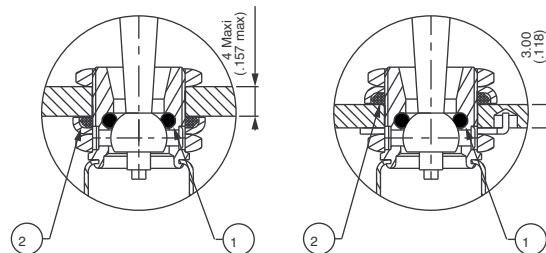
### SEALING



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.



① O-ring ② Sealing washer

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

### FLUORESCENT TIP



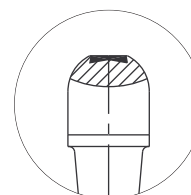
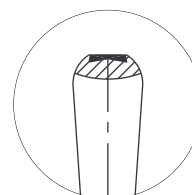
- Blank** None
- 038** White fluorescent tip. Becomes luminous when submitted to ultra-violet rays.



Available with matt black finish (option G) only.

Standard lever

Locking lever

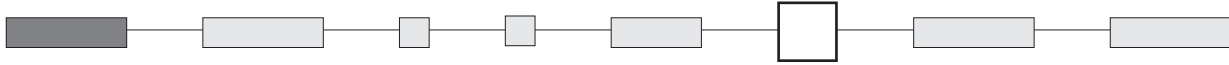


# 12000 series

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

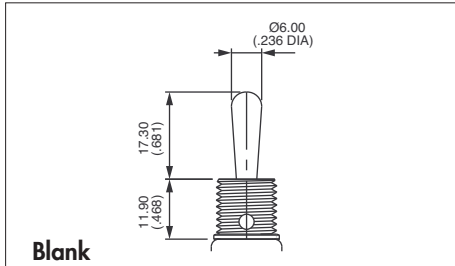


### ACTUATORS



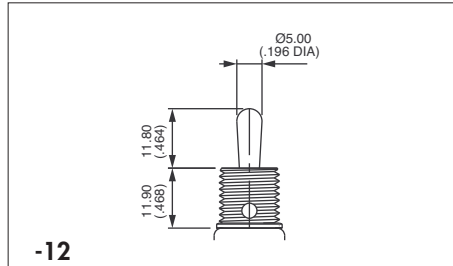
#### Levers

Dash compulsory before lever code.



Blank

Standard



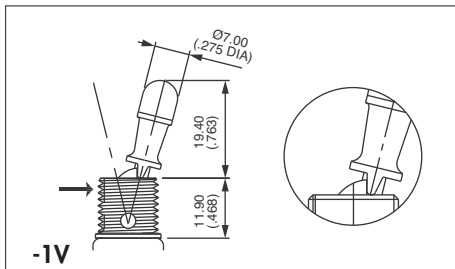
-12

Short lever

Security caps : see section I.

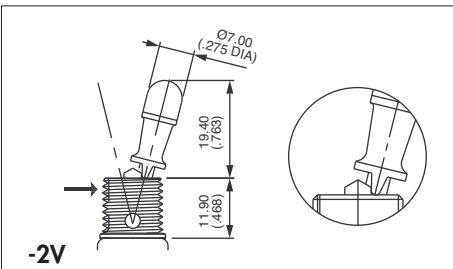
#### Locking levers

→ Keyway



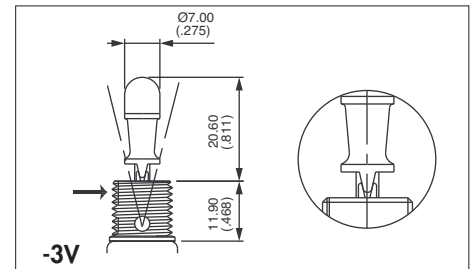
-1V

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



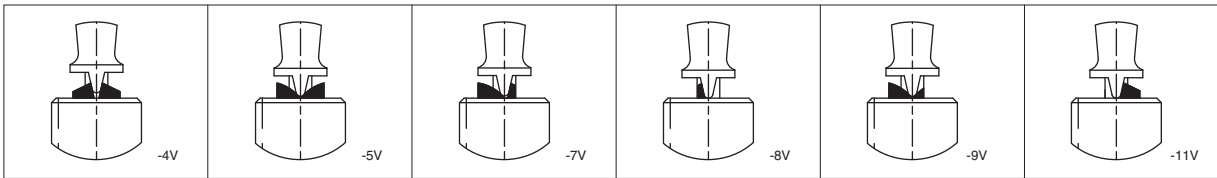
-2V

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

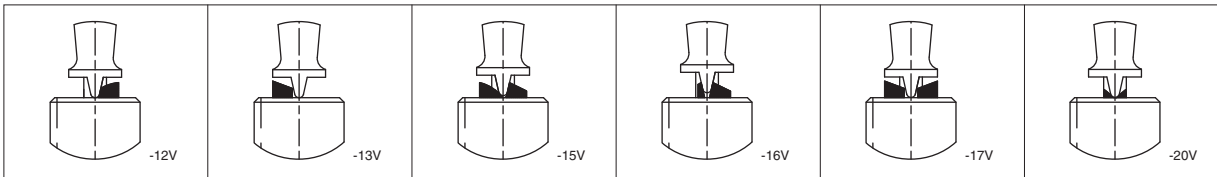
Functions 7 & 442R

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

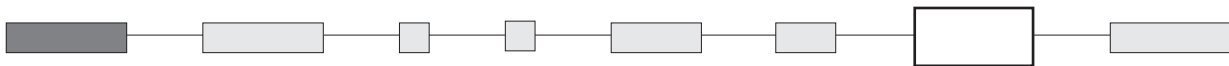
Functions 4 & 9

Functions 7 & 442R

Functions 9 & 44

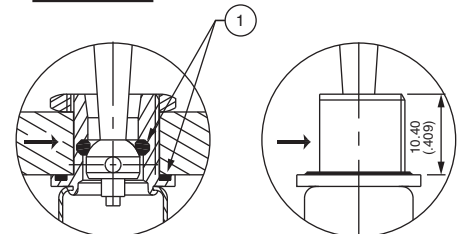
**Note** : -5V and -12V are not true locking levers : no pulling is required before actuation.

### 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

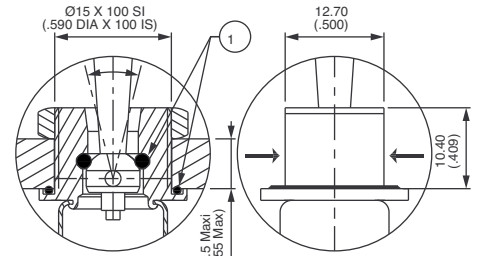
## Professional toggle switches - threaded bushing Ø 11,9 (15/32)

### SPECIAL OPTIONS (continued)

**X822** Threaded bushing Ø 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.

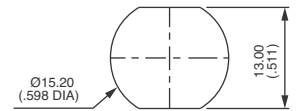
**X910** Switches for peak currents



**X822**

→ Flat

① O-rings



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

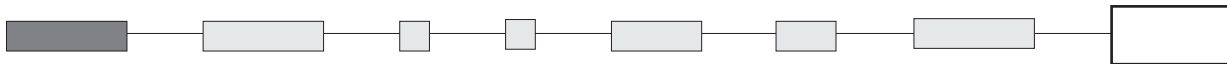


12146 X910

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.

进口钮子开关 APEM 开关 军用摇头开关

APEM 钮子开关选型说明 军用钮子开关

M6 6mm 安装钮子开关型号

11136AG; 11146AG; 11156AG; 11166AG;

11137AG; 11147AG; 11157AG; 11167AG;

11138AG; 11148AG; 11158AG; 11168AG;

11139AG; 11149AG; 11159AG; 11169AG;

11136AGK; 11146AGK; 11156AGK; 11166AGK;

11137AGK; 11147AGK; 11157AGK; 11167AGK;

11138AGK; 11148AGK; 11158AGK; 11168AGK;

11139AGK; 11149AGK; 11159AGK; 11169AGK;

M12 12mm 安装钮子开关

12136AG; 12146AG; 12156AG; 12166AG;

12137AG; 12147AG; 12157AG; 12167AG;

12138AG; 12148AG; 12158AG; 12168AG;

12139AG; 12149AG; 12159AG; 12169AG;

12136AGK; 12146AGK; 12156AGK; 12166AGK;

12137AGK; 12147AGK; 12157AGK; 12167AGK;

12138AGK; 12148AGK; 12158AGK; 12168AGK;

12139AGK; 12149AGK; 12159AGK; 12169AGK;