

# 11000 AND 12000 SERIES

## PROFESSIONAL TOGGLE SWITCHES

### Distinctive features

B

#### Applications

These switches are specially manufactured for defence, avionics, space and telecommunications applications.

#### Approvals and lists



CECC 96201-005  
CECC 96201-008

- QPL (in Europe) and MUAHAG listed
- 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 matt black finish

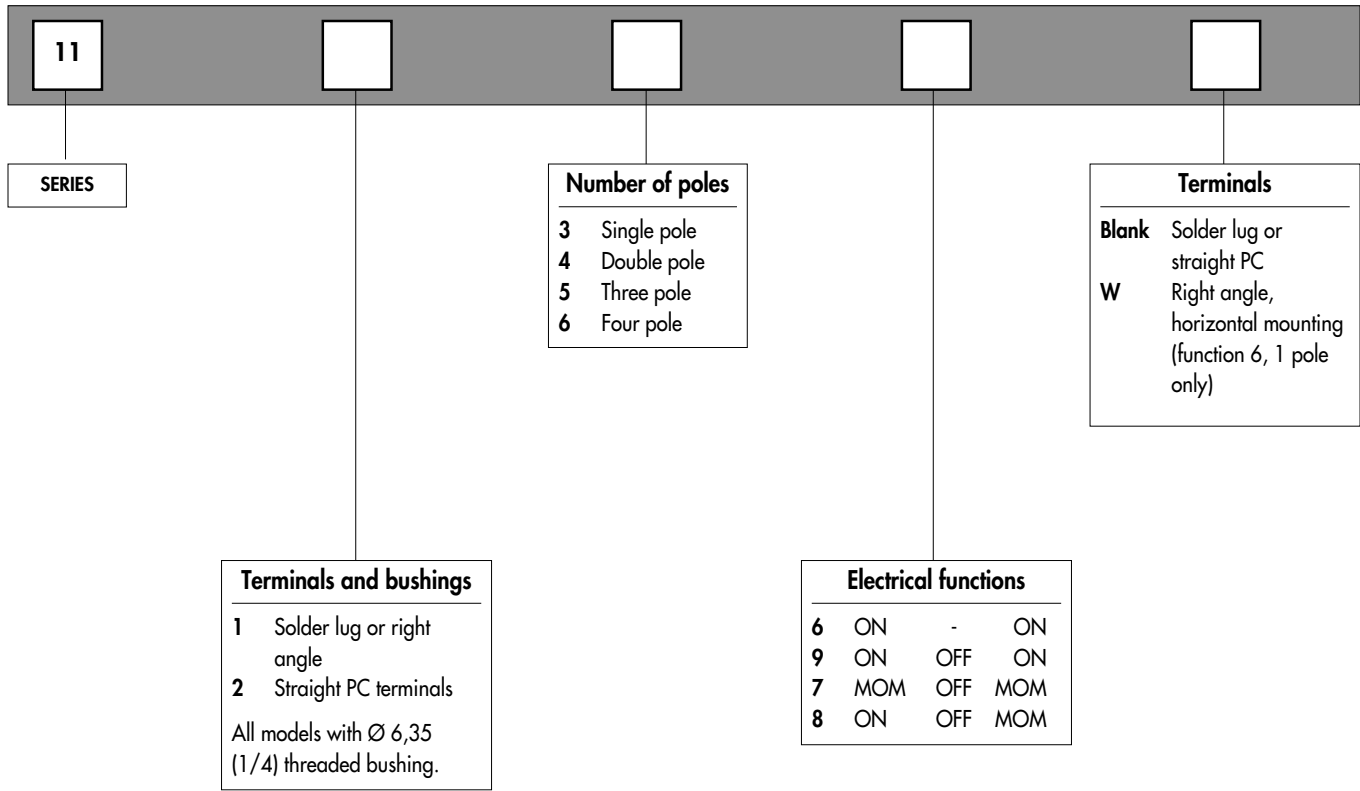
# 1 1000 SERIES

## PROFESSIONAL TOGGLE SWITCHES - THREADED BUSHING Ø 6,35 (1/4)

### Overview



**B**



#### ABOUT THIS SERIES

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

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

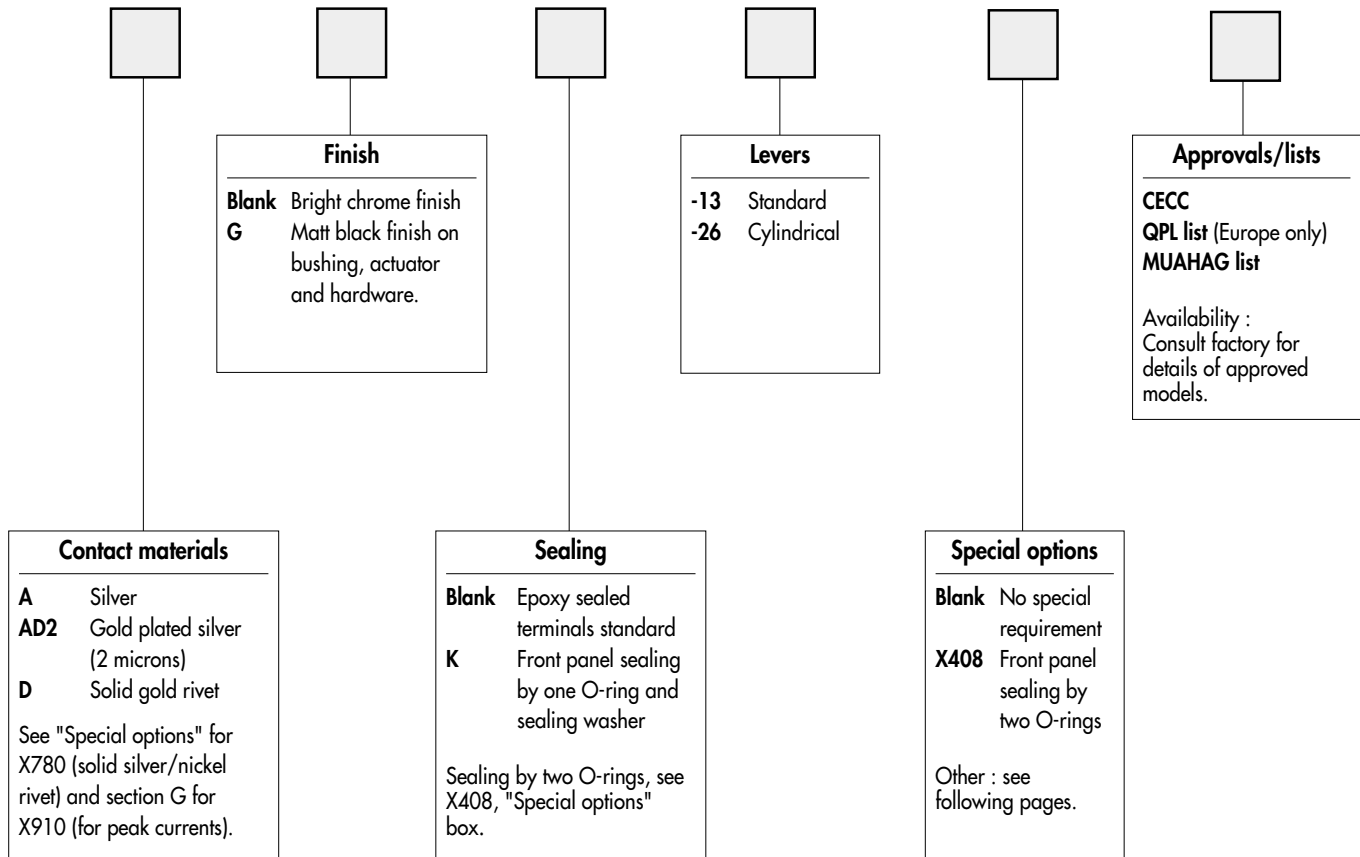
# 1 1000 SERIES

## PROFESSIONAL TOGGLE SWITCHES - THREADED BUSHING Ø 6,35 (1/4)

### Overview



B



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



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



**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 N.



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

# 11000 AND 12000 SERIES

## PROFESSIONAL TOGGLE SWITCHES

### Specifications

B

#### ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
  - silver contacts (A-AD2-X780) : 2A 250VAC - 4A 125VAC - 4A 30VDC
  - gold contacts (D) : 200mA 250VAC - 400mA 125VAC
- 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	2A 250VAC - 4A 125VAC - 4A 30VDC	50.000	50.000
AD2 X780	2A 250VAC - 4A 125 VAC - 4A 30VDC Under 100mA 30VDC without damaging the gold plating	20.000	20.000
D	200mA 250VAC - 400mA 125VAC	80.000	50.000
	Low level or mechanical life	150.000	100.000

For peak current, refer to section G.

#### 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 current, see section G)
- 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 plated PC terminals available, see "Special options".

#### GENERAL SPECIFICATIONS

- Torque :
  - 11000 = 1,25 Nm (.92 Ft.lb) max. applied between the 2 nuts
  - 12000 = 1,50 Nm (1.10 Ft.lb) max. applied between the 2 nuts
- Standard panel thickness :
  - 11000 = 2,5 mm (.098) max.
  - 12000 = 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/PREFERENTIAL LISTS



CECC 96201-005  
CECC 96201-008

**QPL** (Europe only)

**MUAHAG**

Designed to **MIL** specifications (12000 only)

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

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

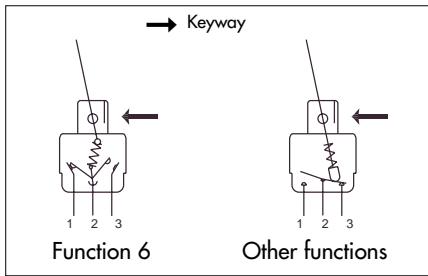
Preferential lists do not appear on the switches.

# 11000 SERIES

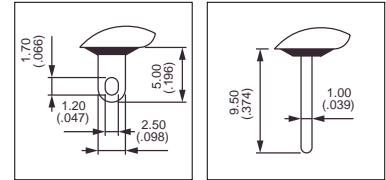
## PROFESSIONAL TOGGLE SWITCHES - THREADED BUSHING Ø 6,35 (1/4)

MODEL  
STRUCTURE

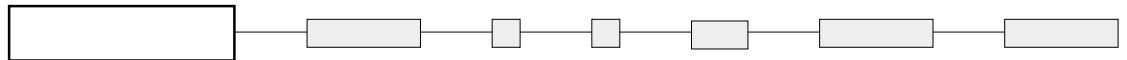
B



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



MODEL  
STRUCTURE



Shown with standard lever (-13)

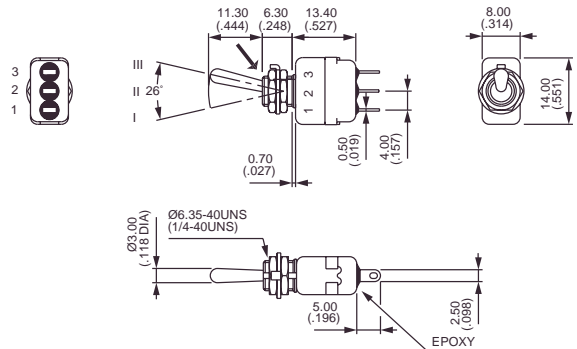
### Solder lug terminals - single pole



11136  
11139  
11137  
11138

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

→ Keyway



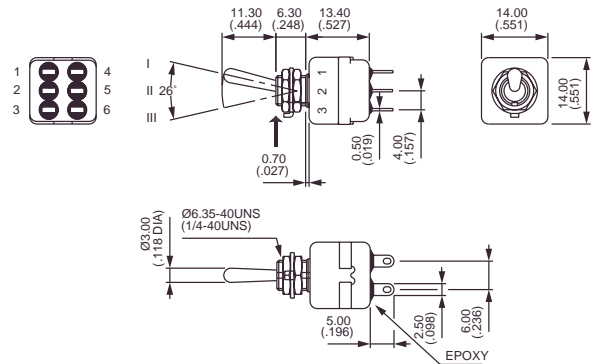
### Solder lug terminals - double pole



11146  
11149  
11147  
11148

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

→ Keyway



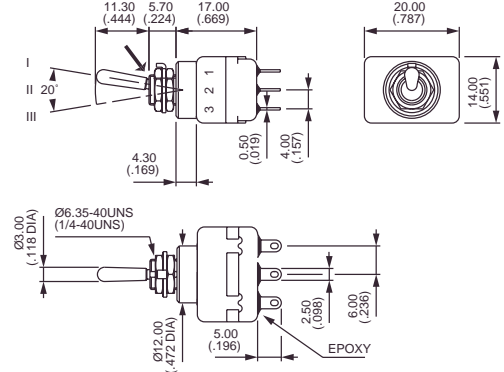
### Solder lug terminals - three pole



11156  
11159  
11157  
11158

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

→ Keyway



# 1 1000 SERIES

PROFESSIONAL TOGGLE SWITCHES - THREADED BUSHING Ø 6,35 (1/4)

MODEL  
STRUCTURE

B

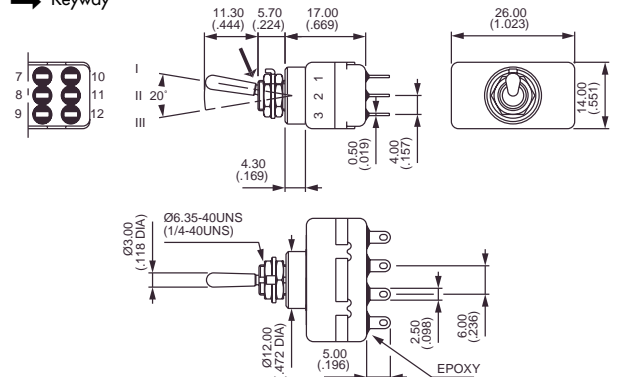
## Solder lug terminals - four pole



11166  
11169  
11167  
11168

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

→ Keyway



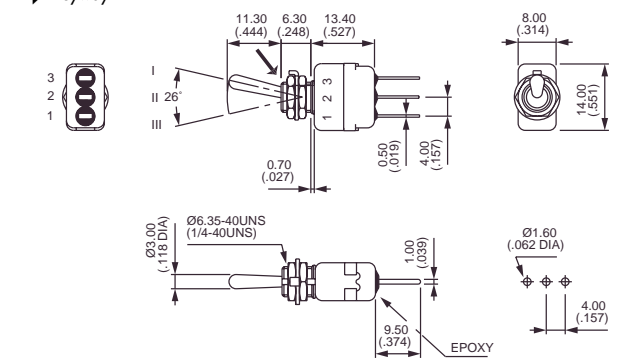
## Straight PC terminals - single pole ▲



11236

ON	-	ON

→ Keyway



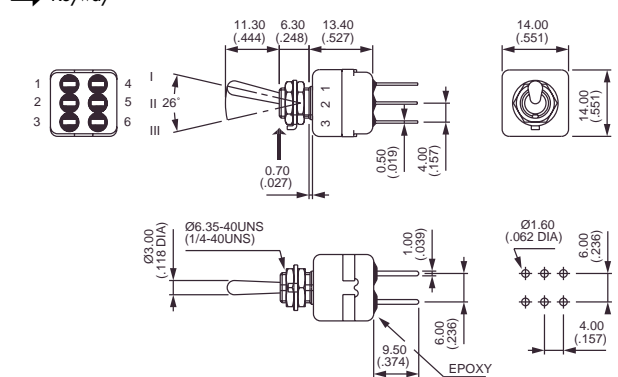
## Straight PC terminals - double pole ▲



11246

ON	-	ON

→ Keyway



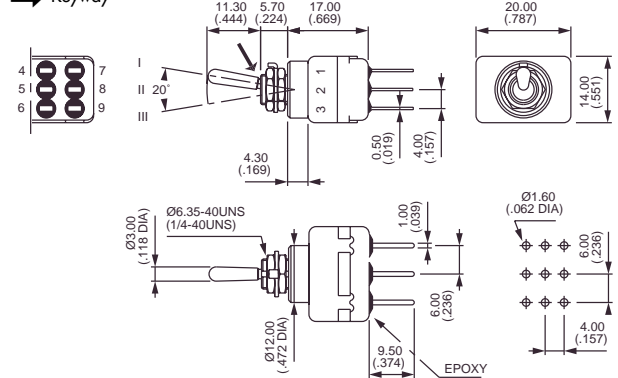
## Straight PC terminals - three pole ▲



11256

ON	-	ON

→ Keyway



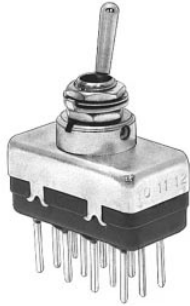
# 11000 SERIES

## PROFESSIONAL TOGGLE SWITCHES - THREADED BUSHING Ø 6,35 (1/4)

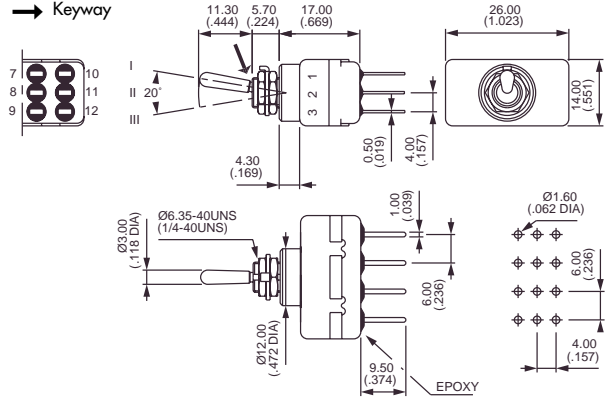
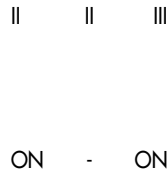
MODEL  
STRUCTURE

B

### Straight PC terminals - four pole ▲



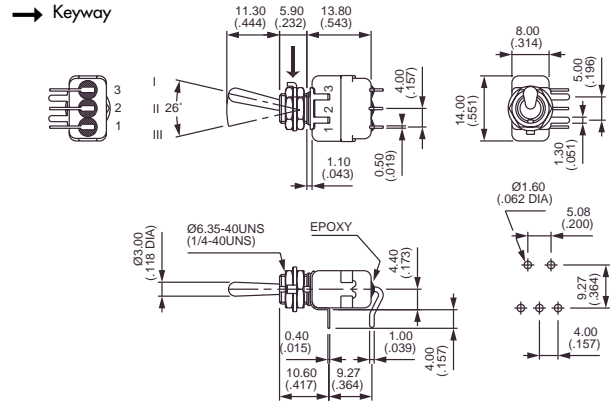
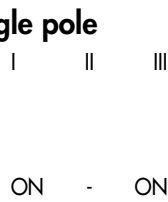
11266



### Right angle terminals - horizontal - single pole

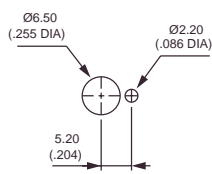


11136W

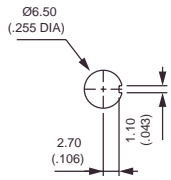


▲ Models with straight PC terminals are also available with 3,5 mm (.138) short terminals, functions 6, 9, 7 and 8. On request.

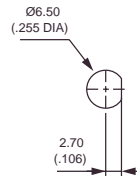
### PANEL CUT-OUT



Standard



With K  
sealing option



With X408  
sealing option

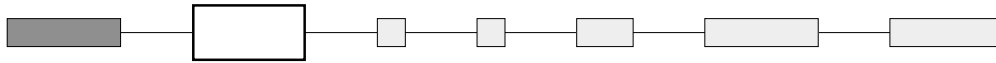
# 1 1000 SERIES

## PROFESSIONAL TOGGLE SWITCHES - THREADED BUSHING Ø 6,35 (1/4)



**B**

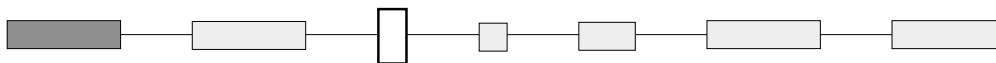
### CONTACT MATERIALS



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

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

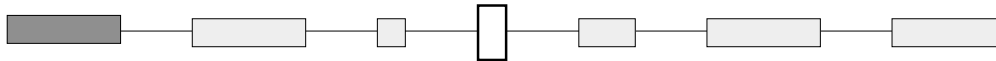
### FINISH



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

Other finish, consult factory.

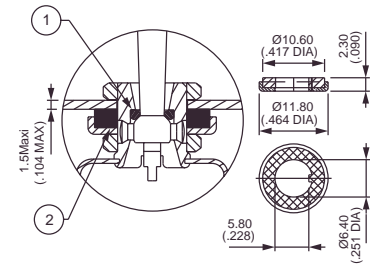
### SEALING



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.

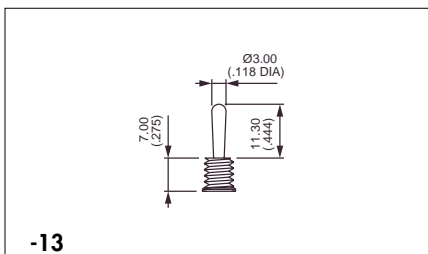
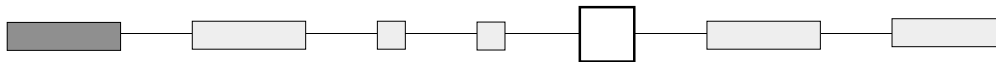
Not available on 11000W model.



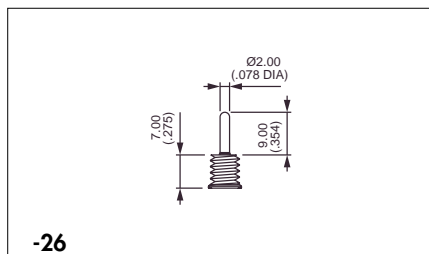
- ① O-ring
- ② Sealing washer

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

### LEVERS



**-13**  
Standard



**-26**  
Cylindrical



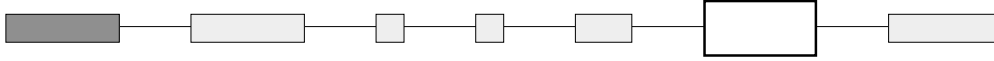
# 1 1000 SERIES

## PROFESSIONAL TOGGLE SWITCHES - THREADED BUSHING Ø 6,35 (1/4)



B

### SPECIAL OPTIONS



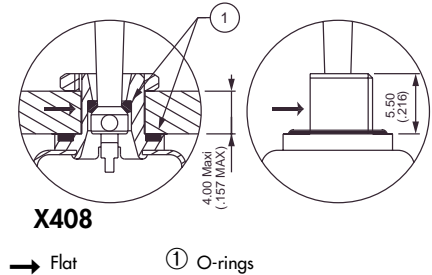
**X408** Front panel sealing by two O-rings. Flatted bushing for precise orientation.  
Protects the switch against water and dust.  
Panel seal withstands 1 bar pressure and remains sealed even when switch is operated.



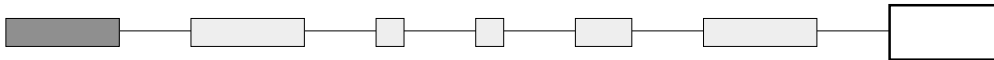
Not available on 11000W model.

**F** Tin dipped terminals (PC terminals only)

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



### 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.

Preferential lists : see specifications.

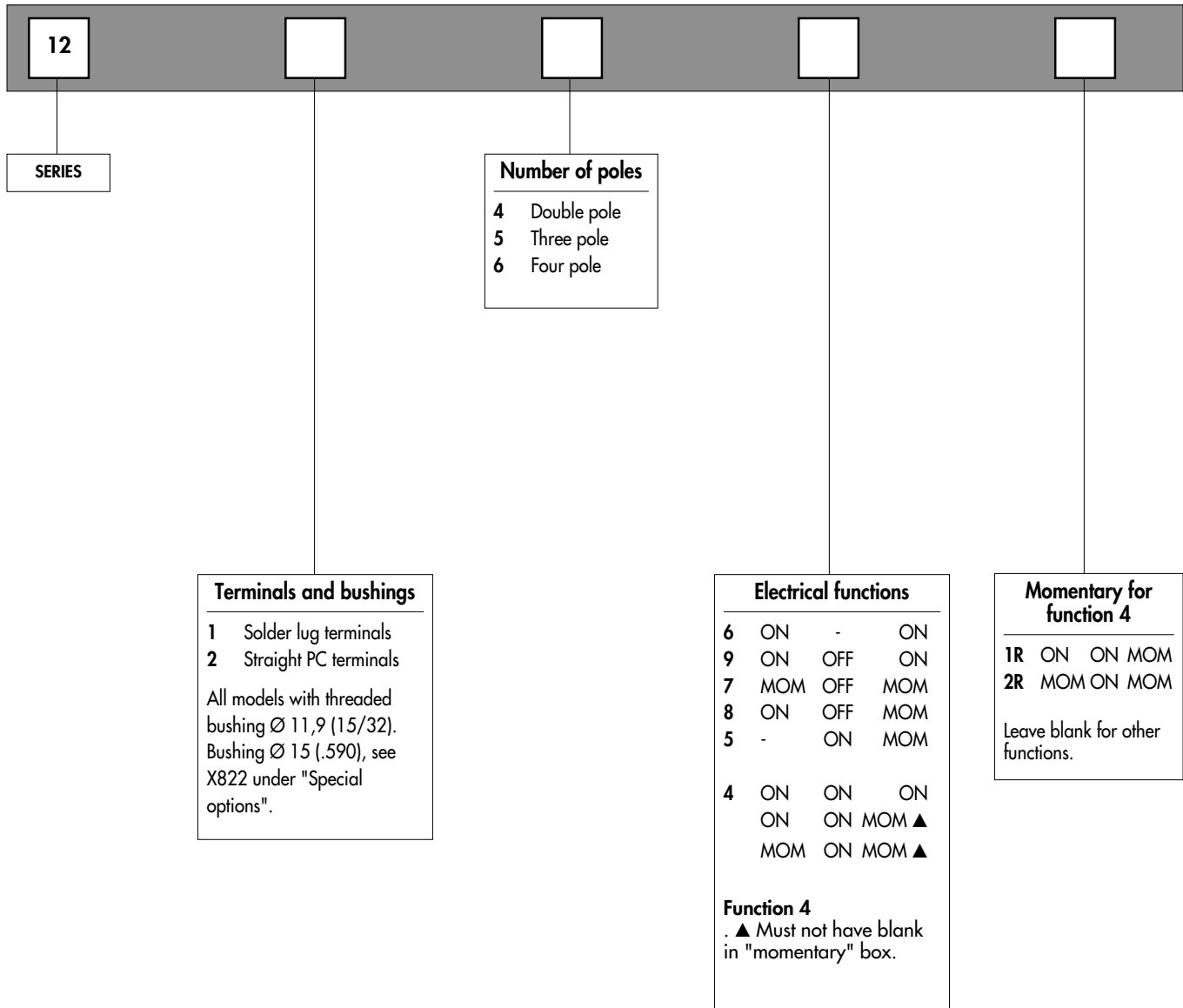
# 12000 SERIES

## PROFESSIONAL TOGGLE SWITCHES - THREADED BUSHING Ø 11.9 (15/32)



### Overview

**B**



#### ABOUT THIS SERIES

On the following pages, you will find successively :

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

**Specifications**, refer to beginning of 11000 series

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

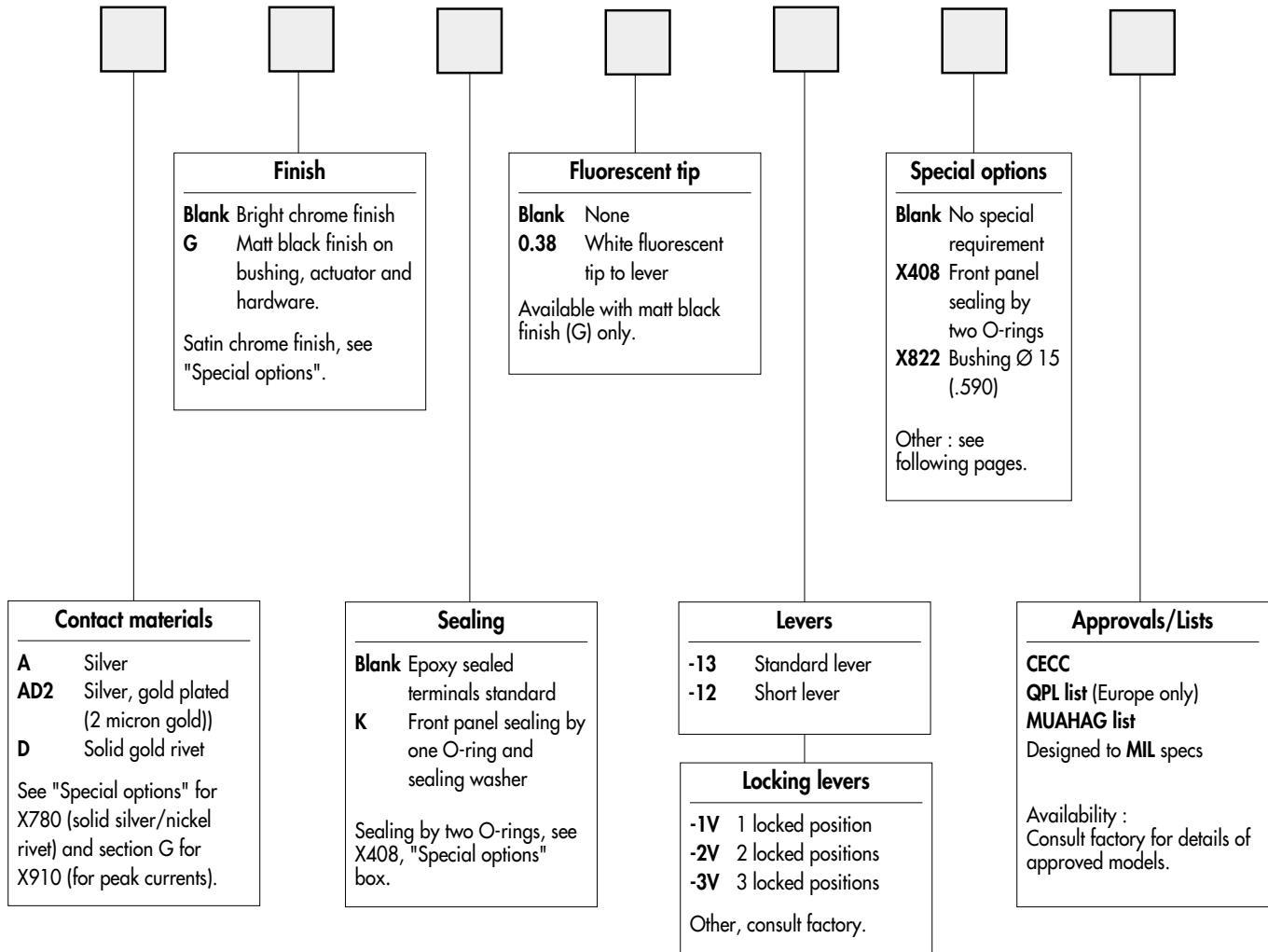
# 12000 SERIES

## PROFESSIONAL TOGGLE SWITCHES - THREADED BUSHING Ø 11.9 (15/32)



### Overview

B



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



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

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



**Packaging unit** : 2 pole models : 25 pieces  
 3 and 4 pole models : 20 pieces

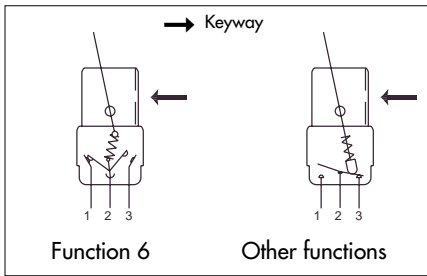
# 12000 SERIES

PROFESSIONAL TOGGLE SWITCHES - THREADED BUSHING Ø 11.9 (15/32)

Solder lug terminals : 12100

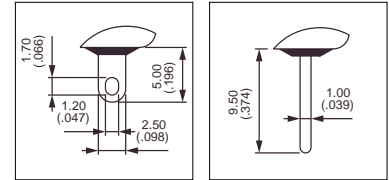


B

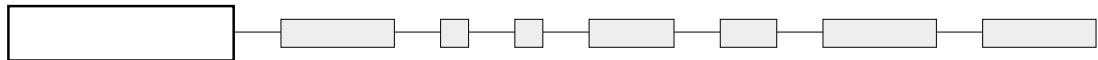


Due to high reliability, this type was chosen for the Spacelab and Columbus programmes.

- Epoxy sealed terminals standard



MODEL STRUCTURE



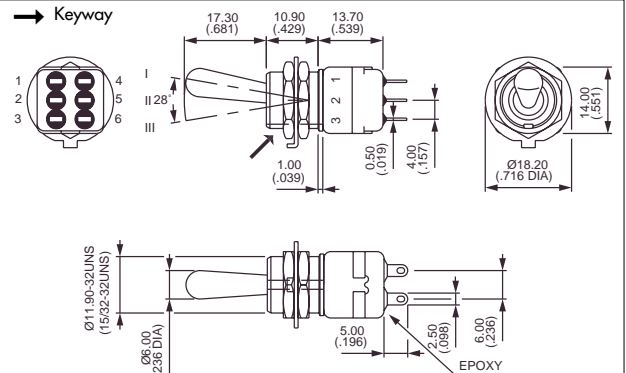
Shown with standard lever (-13)

## Solder lug terminals - double pole



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

	I	II	III
1	ON	-	ON
2	ON	OFF	ON
3	MOM	OFF	MOM
4	ON	OFF	MOM
5	ON	ON	ON
6	ON	ON	MOM
	MOM	ON	MOM
	-	ON	MOM



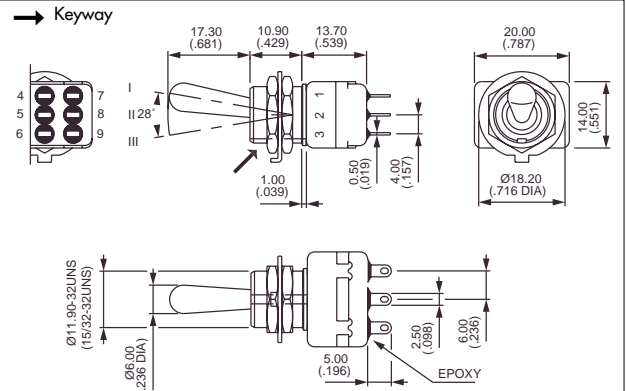
\* Function 4 : SP in DP case - connections, see end of section B.

## Solder lug terminals - three pole

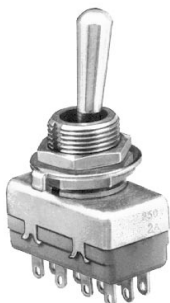


12156  
12159  
12157  
12158

	I	II	III
4	ON	-	ON
5	ON	OFF	ON
6	MOM	OFF	MOM
7	ON	OFF	MOM
8	ON	ON	ON
9	ON	ON	MOM

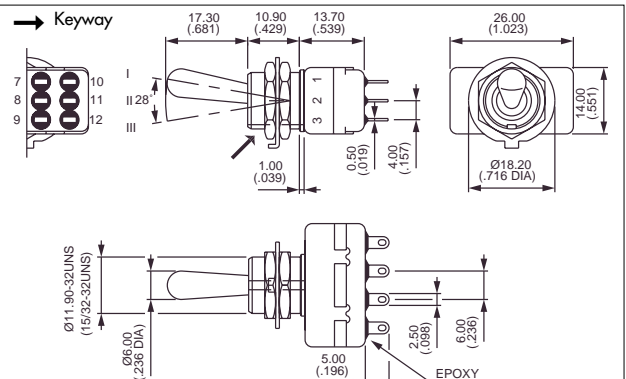


## Solder lug terminals - four pole



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

	I	II	III
7	ON	-	ON
8	ON	OFF	ON
9	MOM	OFF	MOM
10	ON	OFF	MOM
11	ON	ON	ON
12	ON	ON	MOM
	MOM	ON	MOM



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

# 12000 SERIES

PROFESSIONAL TOGGLE SWITCHES - THREADED BUSHING Ø 11.9 (15/32)

Straight PC terminals : 12200

MODEL  
STRUCTURE

B

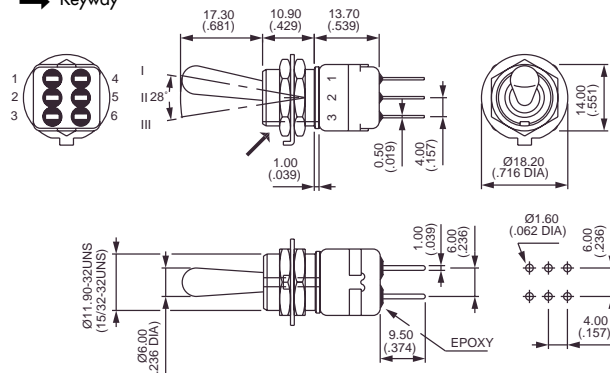
## Straight PC terminals - double pole ▲



12246

I II III  
ON - ON

→ Keyway



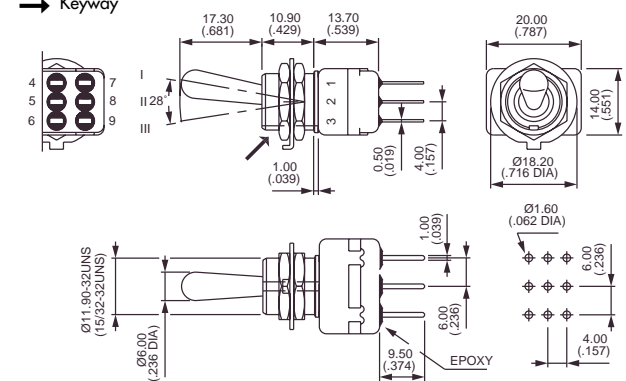
## Straight PC terminals - three pole ▲



12256

I II III  
ON - ON

→ Keyway



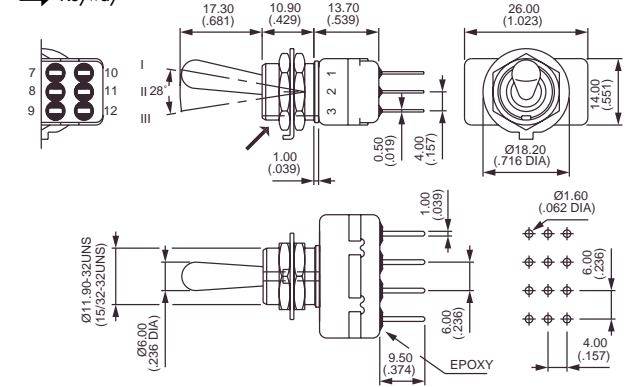
## Straight PC terminals - four pole ▲



12266

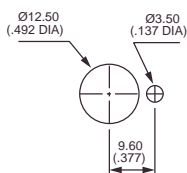
I II III  
ON - ON

→ Keyway

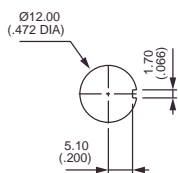


▲ Models with straight PC terminals are also available with 3,5 mm (.138) short terminals, functions 6, 9, 7 and 8. On request.

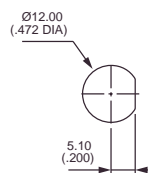
### PANEL CUT-OUT



Standard



With K  
sealing option



With X408  
sealing option

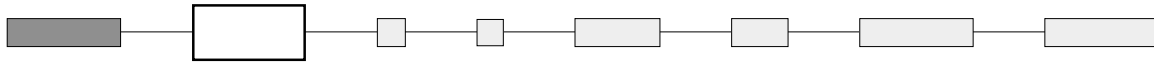
# 12000 SERIES

## PROFESSIONAL TOGGLE SWITCHES - THREADED BUSHING Ø 11.9 (15/32)



**B**

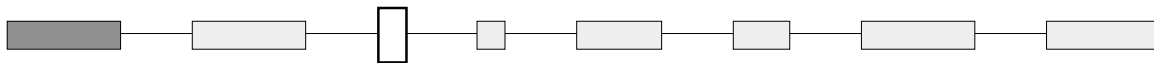
### CONTACT MATERIALS



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

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

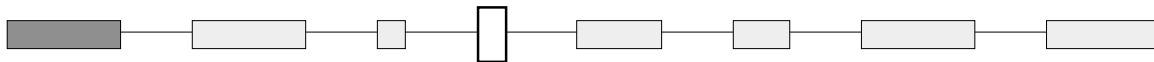
### FINISH



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

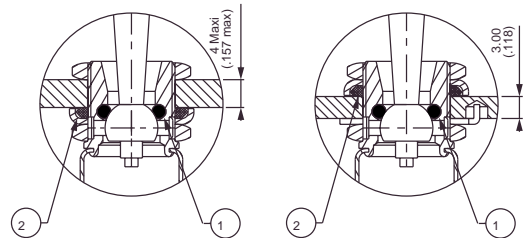
For satin chrome finish, see "Special options".

### 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 N.

### FLUORESCENT TIP



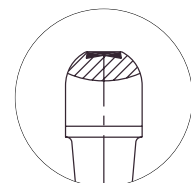
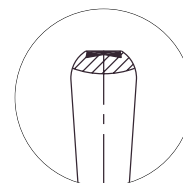
- Blank** None
- 0.38** White fluorescent tip. Becomes luminous when submitted to ultra-violet rays.



Available with matt black finish (option G) only.

Standard lever

Locking lever



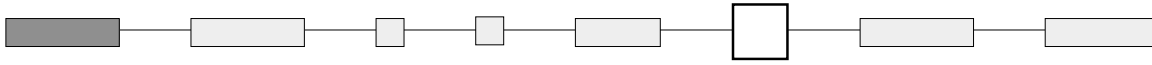
# 12000 SERIES

## PROFESSIONAL TOGGLE SWITCHES - THREADED BUSHING Ø 11.9 (15/32)

OPTIONS

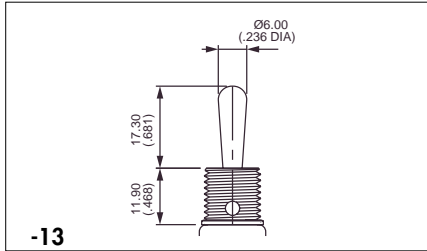
B

### ACTUATORS



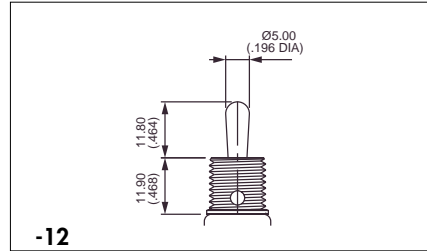
Dash compulsory before lever code.

### Levers



-13

Standard

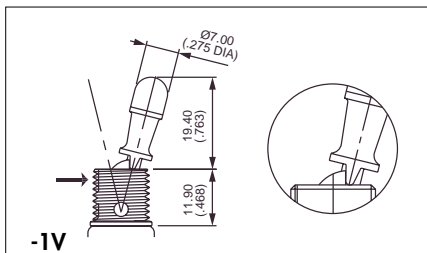


-12

Short lever

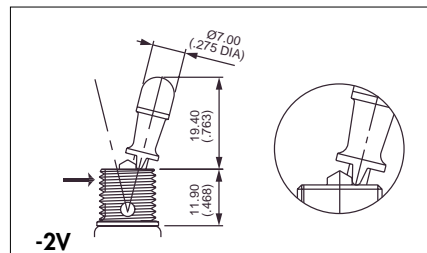
Security caps : see section M.

### Locking levers



-1V

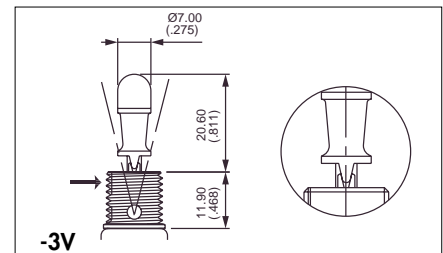
1 locked position (function 6)



-2V

2 locked positions (function 6)

→ Keyway

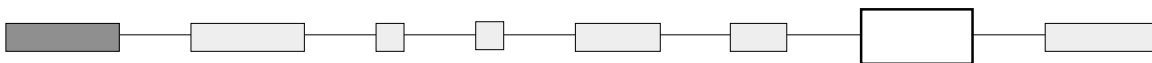


-3V

3 locked positions (functions 9 and 4)

Consult factory for other locking lever options.

### SPECIAL OPTIONS

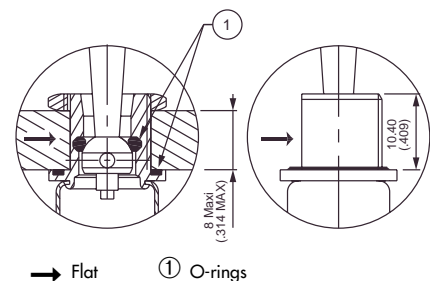


**Blank** No special requirement.

**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.

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

**F** Tin dipped terminals (for PC terminals only).



→ Flat ① O-rings

# 12000 SERIES

## PROFESSIONAL TOGGLE SWITCHES - THREADED BUSHING Ø 11.9 (15/32)

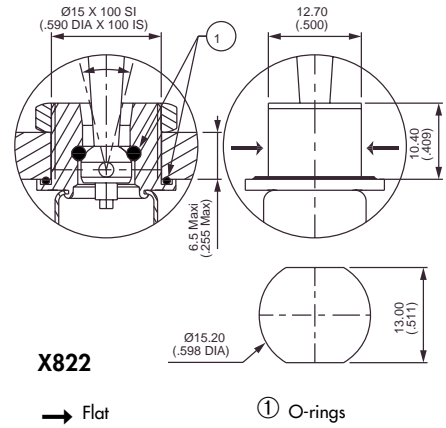


**B**

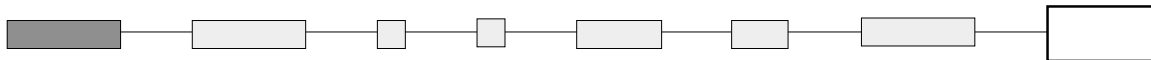
### SPECIAL OPTIONS (continued)

**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.



### 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.

Preferential lists : see specifications.