

# 12000 series

Professional toggle switches •  
threaded bushing Ø 11.9 mm



## DISTINCTIVE FEATURES

- CECC approved - conforms to MIL specifications
- Robust switches for high specification environments
- Toggle action on 2-position models for a smooth mechanical operation
- Several front panel sealing options
- Several locking lever options



## ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load:
  - silver contacts (A-AD2-X780): 4 A 30 VDC
  - gold contacts (D): 100 mA 30 VDC
- Minimum load: AD2-X780-D contacts: 10 mA 50 mV, 10 µA 5 V min.
- Peak currents: refer to "Special options".
- Initial contact resistance: 10 mΩ max.
- Insulation resistance: 1,000 MΩ min. at 500 VDC
- 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	4 A 30 VDC	50,000	50,000
AD2 X780	4 A 30 VDC (Gold plating: 100 mA 30 VDC max.)	20,000	20,000
D	100 mA 30 VDC	80,000	50,000
	Low level or mechanical life	150,000	100,000



## 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 (-40 °F to +185 °F)

The company reserves the right to change specifications without notice.



# 12000 series

Professional toggle switches • threaded bushing Ø 11.9 mm

## MATERIALS

- Case: diallyphthalate (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

APEM products may be recycled at end-of-life for the re-claiming of valuable metal components.

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.

## AGENCY APPROVALS



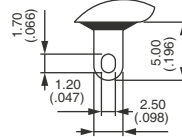
CECC 96201-005  
CECC 96201-008

Designed to MIL specifications

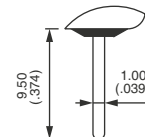
**Availability:** consult factory for details of approved models.

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

## TERMINALS



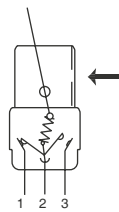
Solder lugs



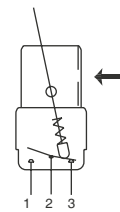
Straight PC

## ELECTRICAL FUNCTIONS

→ KEYWAY

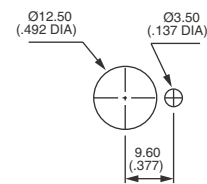


Function 6

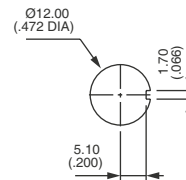


Other functions

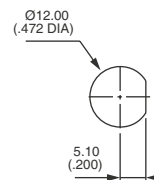
## PANEL CUT-OUT



Standard



With K sealing option



With X408 sealing option

# 12000 series

Professional toggle switches • threaded bushing Ø 11.9 mm



## BUILD YOUR PART NUMBER

**BASIC PART NUMBER**

12																																																						
<b>SERIES</b>	<b>TERMINALS AND BUSHINGS</b>	<b>NUMBER OF POLES</b>	<b>ELECTRICAL FUNCTIONS</b>	<b>MOMENTARY FOR FUNCTION 4</b>																																																		
	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;"><b>1</b></td> <td>Solder lug terminals</td> </tr> <tr> <td style="text-align: center;"><b>2</b></td> <td>Straight PC terminals</td> </tr> </table> <p>All models with threaded bushing Ø 11.9 (15/32). Bushing Ø 15 (.590), see X822 under "Special options".</p>	<b>1</b>	Solder lug terminals	<b>2</b>	Straight PC terminals	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;"><b>4</b></td> <td>Double pole</td> </tr> <tr> <td style="text-align: center;"><b>5</b></td> <td>Three pole</td> </tr> <tr> <td style="text-align: center;"><b>6</b></td> <td>Four pole</td> </tr> </table>	<b>4</b>	Double pole	<b>5</b>	Three pole	<b>6</b>	Four pole	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;"><b>6</b></td> <td>ON</td> <td>-</td> <td>ON</td> </tr> <tr> <td style="text-align: center;"><b>9</b></td> <td>ON</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td style="text-align: center;"><b>7</b></td> <td>MOM</td> <td>OFF</td> <td>MOM</td> </tr> <tr> <td style="text-align: center;"><b>8</b></td> <td>ON</td> <td>OFF</td> <td>MOM</td> </tr> <tr> <td style="text-align: center;"><b>5</b></td> <td>-</td> <td>ON</td> <td>MOM</td> </tr> <tr> <td style="text-align: center;"><b>4</b></td> <td>ON</td> <td>ON</td> <td>ON</td> </tr> <tr> <td></td> <td>ON</td> <td>ON</td> <td>MOM ▲</td> </tr> <tr> <td></td> <td>MOM</td> <td>ON</td> <td>MOM ▲</td> </tr> </table> <p><b>Function 4</b> ▲ Must not have blank in "momentary" box.</p>	<b>6</b>	ON	-	ON	<b>9</b>	ON	OFF	ON	<b>7</b>	MOM	OFF	MOM	<b>8</b>	ON	OFF	MOM	<b>5</b>	-	ON	MOM	<b>4</b>	ON	ON	ON		ON	ON	MOM ▲		MOM	ON	MOM ▲	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;"><b>1R</b></td> <td>ON</td> <td>ON</td> <td>MOM</td> </tr> <tr> <td style="text-align: center;"><b>2R</b></td> <td>MOM</td> <td>ON</td> <td>MOM</td> </tr> </table> <p>Leave blank for other functions.</p>	<b>1R</b>	ON	ON	MOM	<b>2R</b>	MOM	ON	MOM
<b>1</b>	Solder lug terminals																																																					
<b>2</b>	Straight PC terminals																																																					
<b>4</b>	Double pole																																																					
<b>5</b>	Three pole																																																					
<b>6</b>	Four pole																																																					
<b>6</b>	ON	-	ON																																																			
<b>9</b>	ON	OFF	ON																																																			
<b>7</b>	MOM	OFF	MOM																																																			
<b>8</b>	ON	OFF	MOM																																																			
<b>5</b>	-	ON	MOM																																																			
<b>4</b>	ON	ON	ON																																																			
	ON	ON	MOM ▲																																																			
	MOM	ON	MOM ▲																																																			
<b>1R</b>	ON	ON	MOM																																																			
<b>2R</b>	MOM	ON	MOM																																																			

**OPTIONS**

<b>FINISH</b>	<b>FLUORESCENT TIP</b>	<b>SPECIAL OPTIONS</b>															
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;"><b>Blank</b></td> <td>Bright chrome finish on actuator</td> </tr> <tr> <td style="text-align: center;"><b>G</b></td> <td>Black finish on bushing, actuator and hardware.</td> </tr> </table> <p>Satin chrome finish, see "Special options".</p>	<b>Blank</b>	Bright chrome finish on actuator	<b>G</b>	Black finish on bushing, actuator and hardware.	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;"><b>Blank</b></td> <td>None</td> </tr> <tr> <td style="text-align: center;"><b>-038</b></td> <td>White fluorescent tip to lever</td> </tr> </table> <p>Available with black finish (G) only.</p>	<b>Blank</b>	None	<b>-038</b>	White fluorescent tip to lever	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;"><b>Blank</b></td> <td>No special requirement</td> </tr> <tr> <td style="text-align: center;"><b>X408</b></td> <td>Front panel sealing by two O-rings</td> </tr> <tr> <td style="text-align: center;"><b>X822</b></td> <td>Bushing Ø 15 (.590)</td> </tr> </table> <p>Other: see following pages..</p>		<b>Blank</b>	No special requirement	<b>X408</b>	Front panel sealing by two O-rings	<b>X822</b>	Bushing Ø 15 (.590)
<b>Blank</b>	Bright chrome finish on actuator																
<b>G</b>	Black finish on bushing, actuator and hardware.																
<b>Blank</b>	None																
<b>-038</b>	White fluorescent tip to lever																
<b>Blank</b>	No special requirement																
<b>X408</b>	Front panel sealing by two O-rings																
<b>X822</b>	Bushing Ø 15 (.590)																

<b>CONTACT MATERIALS</b>	<b>SEALING</b>	<b>LEVERS</b>	<b>APPROVALS</b>																										
<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;"><b>A</b></td> <td>Silver</td> </tr> <tr> <td style="text-align: center;"><b>AD2</b></td> <td>Silver, gold plated (2 micron gold)</td> </tr> <tr> <td style="text-align: center;"><b>D</b></td> <td>Solid gold rivet</td> </tr> </table> <p>See "Special options" for X780 (solid silver/nickel rivet) and X910 (for peak currents).</p>	<b>A</b>	Silver	<b>AD2</b>	Silver, gold plated (2 micron gold)	<b>D</b>	Solid gold rivet	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;"><b>Blank</b></td> <td>Epoxy sealed terminals standard</td> </tr> <tr> <td style="text-align: center;"><b>K</b></td> <td>Front panel sealing by one O-ring and sealing washer</td> </tr> </table> <p>Sealing by two O-rings, see X408, "Special options" box.</p>	<b>Blank</b>	Epoxy sealed terminals standard	<b>K</b>	Front panel sealing by one O-ring and sealing washer	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;"><b>Blank</b></td> <td>Standard lever</td> </tr> <tr> <td style="text-align: center;"><b>-12</b></td> <td>Short lever</td> </tr> <tr> <td style="text-align: center;">⋮</td> <td></td> </tr> <tr> <td colspan="2" style="text-align: center;"><b>LOCKING LEVERS</b></td> </tr> <tr> <td style="text-align: center;"><b>-1V</b></td> <td>1 locked position</td> </tr> <tr> <td style="text-align: center;"><b>-2V</b></td> <td>2 locked positions</td> </tr> <tr> <td style="text-align: center;"><b>-3V</b></td> <td>3 locked positions</td> </tr> </table> <p>Other: see following pages.</p>	<b>Blank</b>	Standard lever	<b>-12</b>	Short lever	⋮		<b>LOCKING LEVERS</b>		<b>-1V</b>	1 locked position	<b>-2V</b>	2 locked positions	<b>-3V</b>	3 locked positions	<table style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20px; text-align: center;"><b>CECC</b></td> <td>Availability: Consult factory for details of approved models.</td> </tr> </table>	<b>CECC</b>	Availability: Consult factory for details of approved models.
<b>A</b>	Silver																												
<b>AD2</b>	Silver, gold plated (2 micron gold)																												
<b>D</b>	Solid gold rivet																												
<b>Blank</b>	Epoxy sealed terminals standard																												
<b>K</b>	Front panel sealing by one O-ring and sealing washer																												
<b>Blank</b>	Standard lever																												
<b>-12</b>	Short lever																												
⋮																													
<b>LOCKING LEVERS</b>																													
<b>-1V</b>	1 locked position																												
<b>-2V</b>	2 locked positions																												
<b>-3V</b>	3 locked positions																												
<b>CECC</b>	Availability: Consult factory for details of approved models.																												



## ABOUT THIS SERIES

On the following pages, you will find successively basic part numbers of switches and options in the same order as in above chart

- ⚠ **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. See "Sealing Boots" section of website.
- 👉 **Switch guards** are available to prevent inadvertent lever operation. See "Switch Guards" section of website.
- 👉 **Mounting accessories:** standard hardware supplied with all models: 2 hex nuts 14 (.551) across flats and 1 locking ring. Standard and special hardware is presented in the "Hardware" section of website.

# 12000 series

Professional toggle switches • threaded bushing Ø 11.9 mm

## SOLDER LUG TERMINALS - DOUBLE POLE



BASIC P/N	Angle of throw (A)	I	II	III
12146	26°	ON	-	ON
12149	20°	ON	OFF	ON
12147	20°	MOM	OFF	MOM
12148	20°	ON	OFF	MOM
12144*	20°	ON	ON	ON
12144 1R*	20°	ON	ON	MOM
12144 2R*	20°	MOM	ON	MOM
12145	12°	-	ON	MOM

\*Function 4: SP in DP case - connections, see "Technical information" on website

## TERMINALS - THREE POLE



BASIC P/N	Angle of throw (A)	I	II	III
12156	26°	ON	-	ON
12159	20°	ON	OFF	ON
12157	20°	MOM	OFF	MOM
12158	20°	ON	OFF	MOM

## SOLDER LUG TERMINALS - FOUR POLE



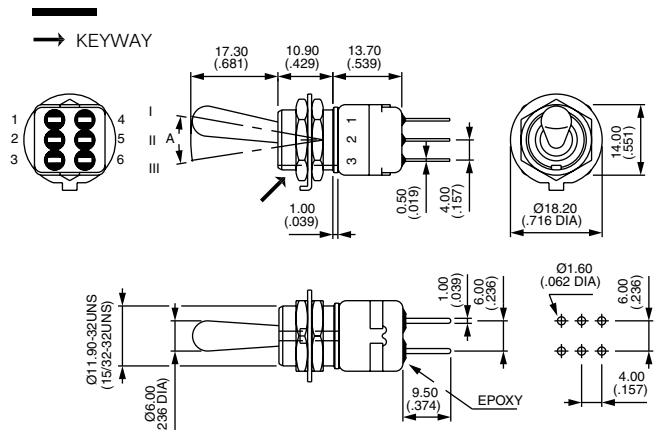
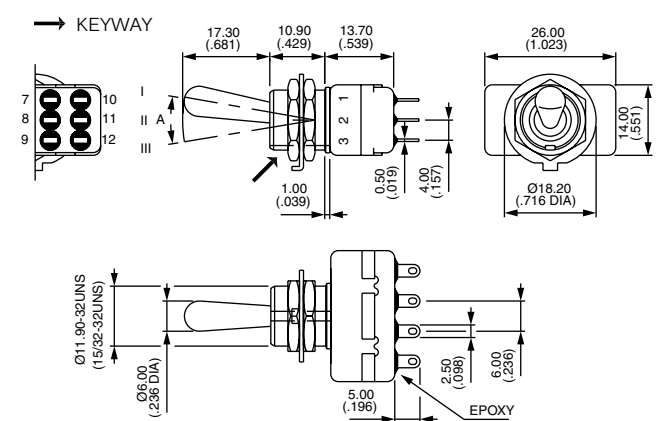
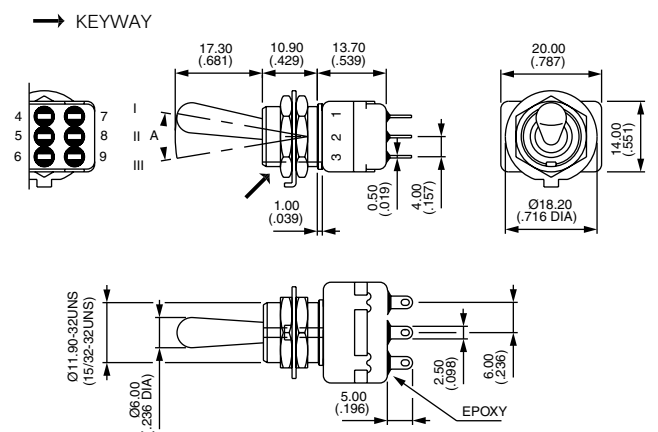
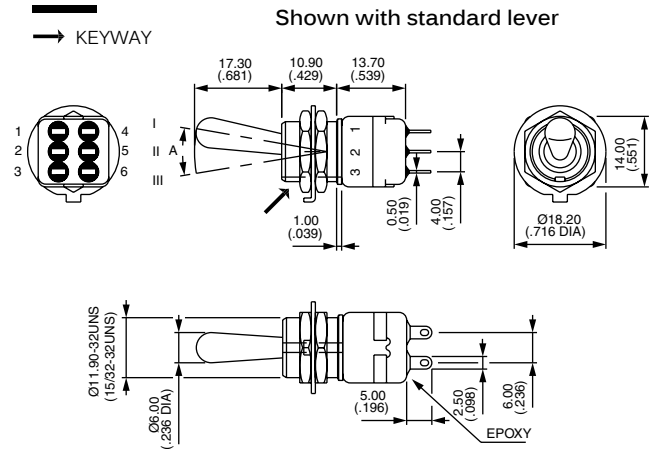
BASIC P/N	Angle of throw (A)	I	II	III
12166	26°	ON	-	ON
12169	20°	ON	OFF	ON
12167	20°	MOM	OFF	MOM
12168	20°	ON	OFF	MOM
12164*	20°	ON	ON	ON
12164 1R*	20°	ON	ON	MOM
12164 2R*	20°	MOM	ON	MOM

\*Function 4: DP in 4P case - connections, see "Technical information" on website

## STRAIGHT PC TERMINALS - DOUBLE POLE ▲



BASIC P/N	Angle of throw (A)	I	II	III
12246	26°	ON	-	ON



# 12000 series

Professional toggle switches • threaded bushing Ø 11.9 mm

## STRAIGHT PC TERMINALS - THREE POLE ▲



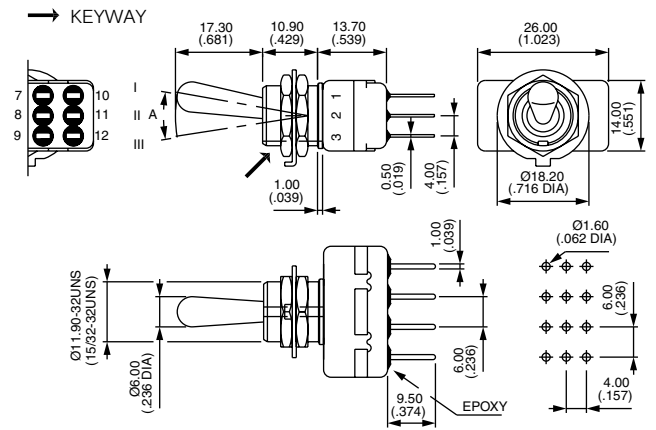
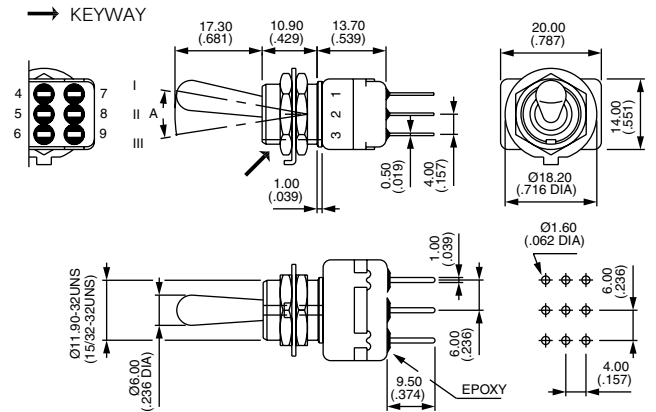
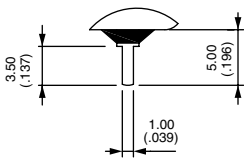
BASIC P/N	Angle of throw (A)	I	II	III
12256	26°	ON	-	ON

## STRAIGHT PC TERMINALS - FOUR POLE ▲



BASIC P/N	Angle of throw (A)	I	II	III
12266	26°	ON	-	ON

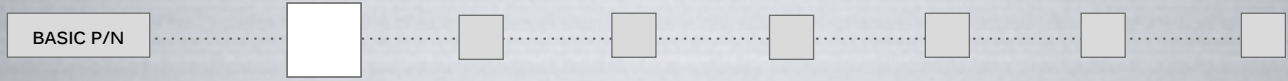
▲ 3.5 mm (.138) short terminals available on request for function 6. Standard for functions 9, 7, 8, 4 and 5.



# 12000 series

Professional toggle switches • threaded bushing Ø 11.9 mm

## 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".

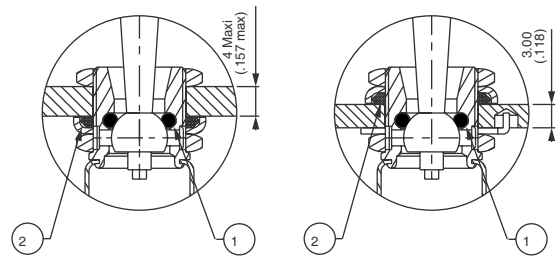
## SEALING



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". See "Sealing Boots" section of website.

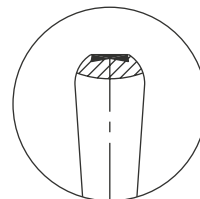


① O-ring    ② Sealing washer

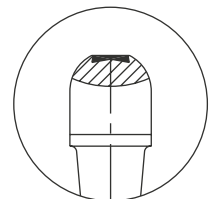
## FLUORESCENT TIP



- Blank None
- 038 White fluorescent tip. Becomes luminous when submitted to ultra-violet rays.
- ⓘ Available with black finish (option G) only



Standard lever

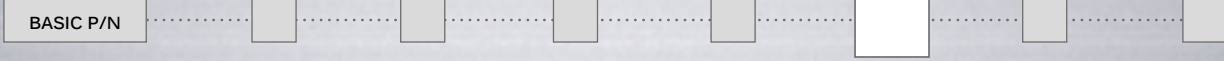


Locking lever

# 12000 series

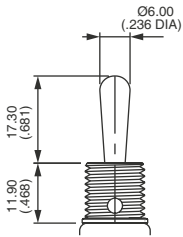
Professional toggle switches • threaded bushing Ø 11.9 mm

## ACTUATORS

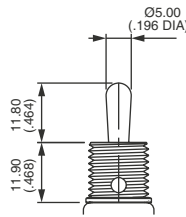


Dash compulsory before lever code.  
Switch guards : see "Switch Guards" section of website.

### LEVERS

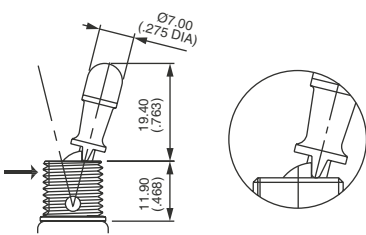


Blank Standard



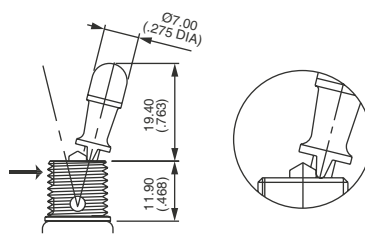
-12 Short lever

### LOCKING LEVERS



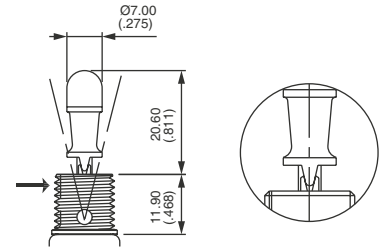
-1V

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



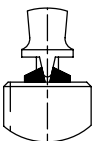
-2V

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



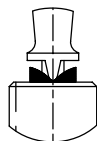
-3V

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



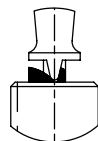
-4V

Functions 9 & 4



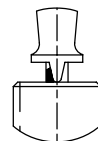
-5V

Functions 7 & 442R



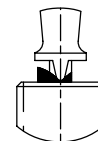
-7V

Functions 8 & 441R



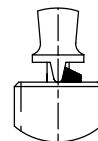
-8V

Functions 9 & 44



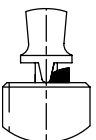
-9V

Functions 8 & 441R



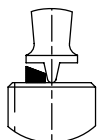
-11V

Functions 8, 9, 44 & 441R



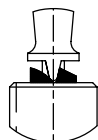
-12V

Functions 7 & 8



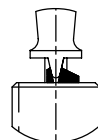
-13V

Funct. 5, 7 & 442R



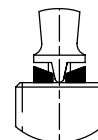
-15V

Functions 8 & 441R



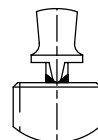
-16V

Functions 4 & 9



-17V

Functions 7 & 442R



-20V

Functions 9 & 44

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

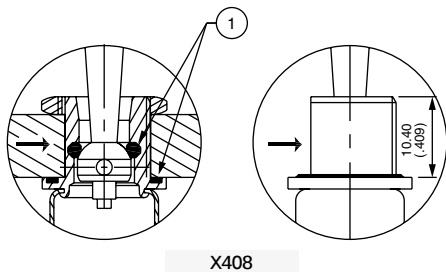
# 12000 series

Professional toggle switches • threaded bushing Ø 11.9 mm

## SPECIAL OPTIONS

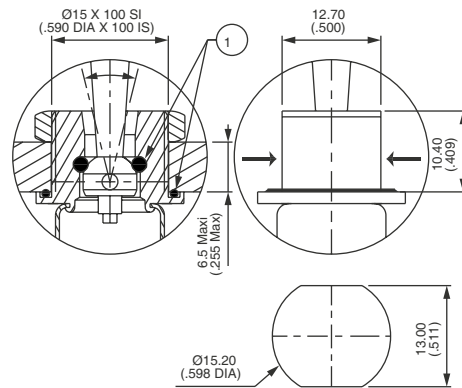


- Blank** No special requirement
- X408** Front panel sealing by two O-rings. Flatted bushing for precise orientation. Panel thickness: 8 mm (.314) max., 3 mm (.118) min. Protects the switch against water and dust. Panel seal withstands 1 bar pressure and remains sealed even when switch is operated.
- X545** Lever, bushing, housing, nuts and washers with **satín chrome finish**
- 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 - double pole - on request.



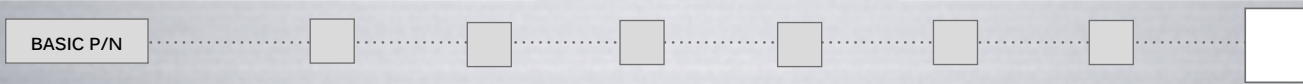
X408

1 O-ring  
→ Flat



X822

## AGENCY APPROVAL



- CECC** CECC 96201-005 (high level - contacts X780) - CECC 96201-008 (low level - contacts AD2 or D)
- Blank** No agency approval required.

**Availability:** consult factory for details of approved models.  
**Marking:** to order switches marked CECC, complete above box with "CECC".