

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



11000 series

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

Specifications

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load :
 - 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 :
- Peak currents, refer to "Special options".

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.

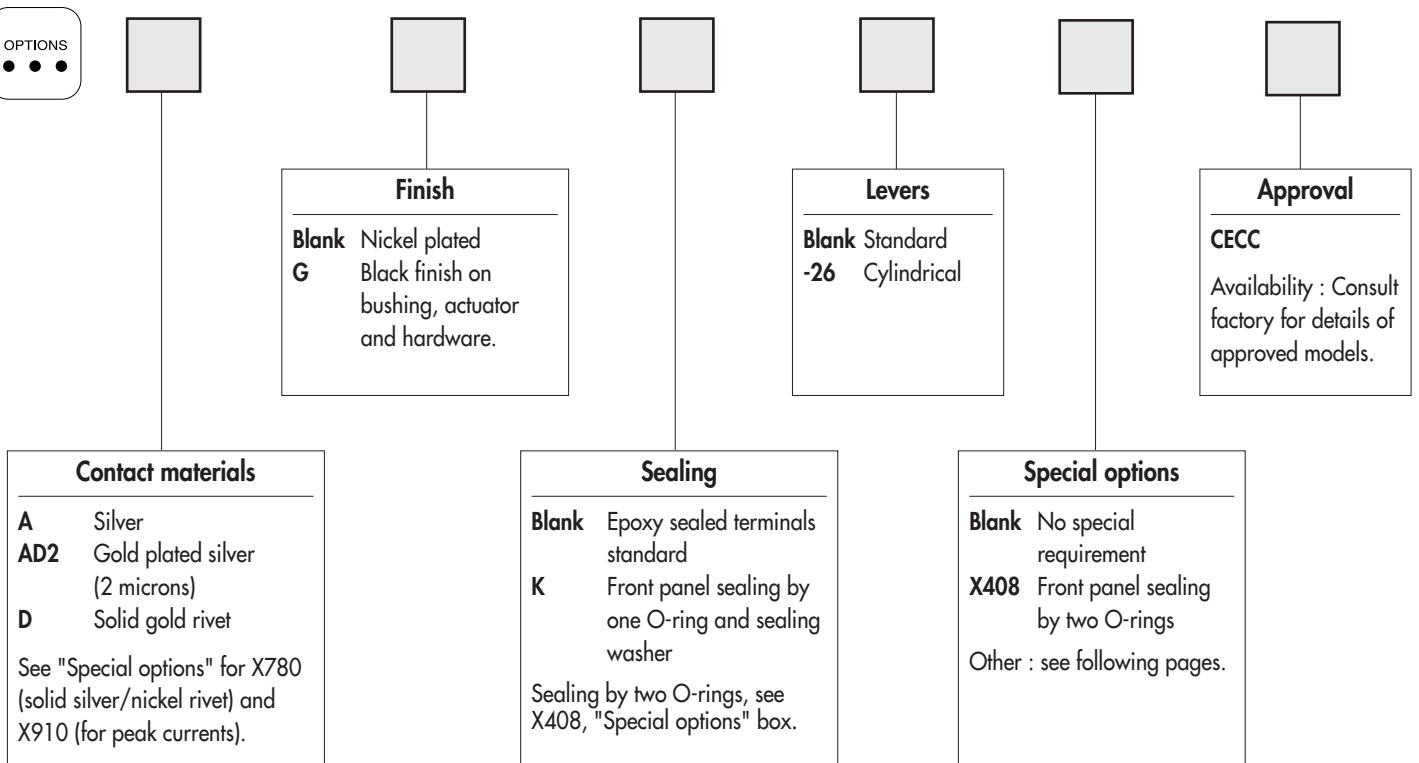
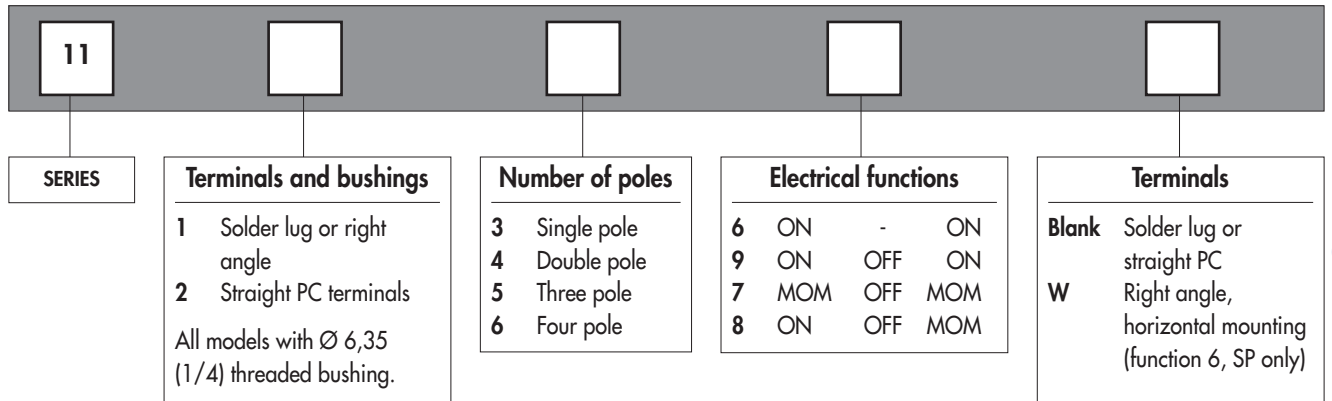


Packaging unit : 25 pieces or 50 pieces depending on models.

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.



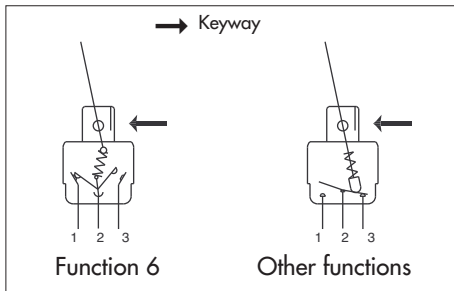
Mounting accessories : standard hardware supplied with all models : 2 hex nuts 8 (.314) across flats, 1 locking ring and 1 lockwasher. Standard and special hardware available are presented in section I.

11000 series

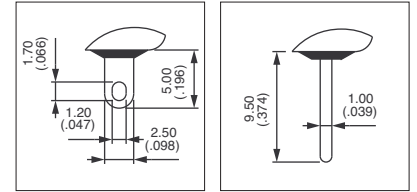
Professional toggle switches - threaded bushing Ø 6,35 (1/4)

MODEL
STRUCTURE

A



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



MODEL
STRUCTURE



Shown with standard lever

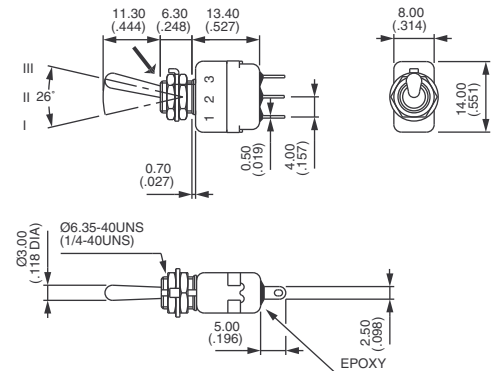
Solder lug terminals - single pole



11136
11139
11137
11138

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

→ Keyway



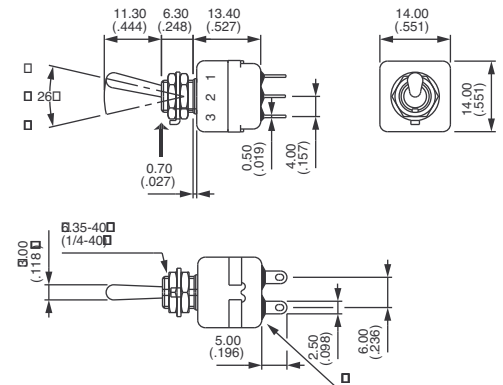
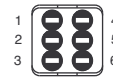
Solder lug terminals - double pole



11146
11149
11147
11148

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

→ Keyway



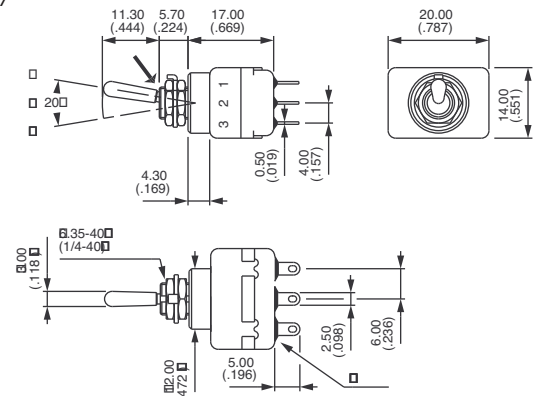
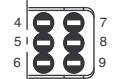
Solder lug terminals - three pole



11156
11159
11157
11158

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

→ Keyway



Solder lug terminals - four pole

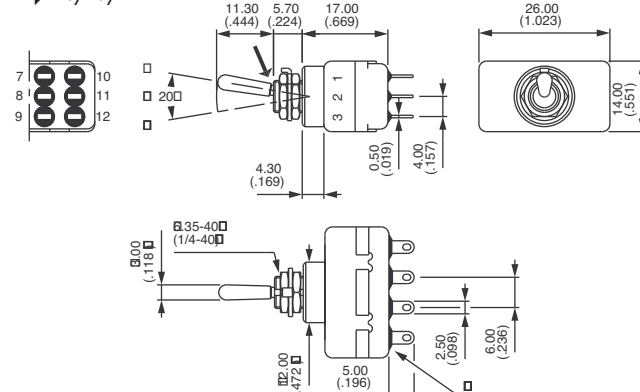


11166
11169
11167
11168

|| || ||||

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

→ Keyway



Straight PC terminals - single pole ▲

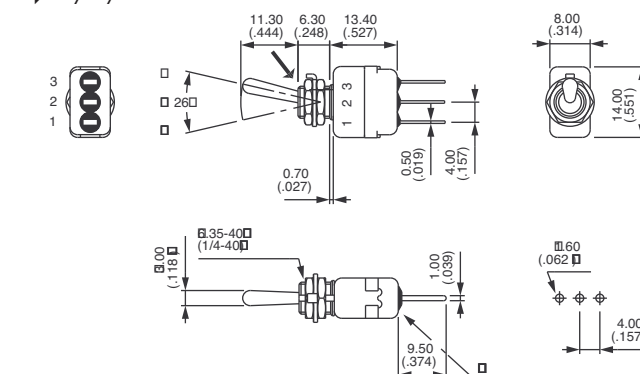


11236

|| || ||||

ON - ON

→ Keyway



Straight PC terminals - double pole ▲

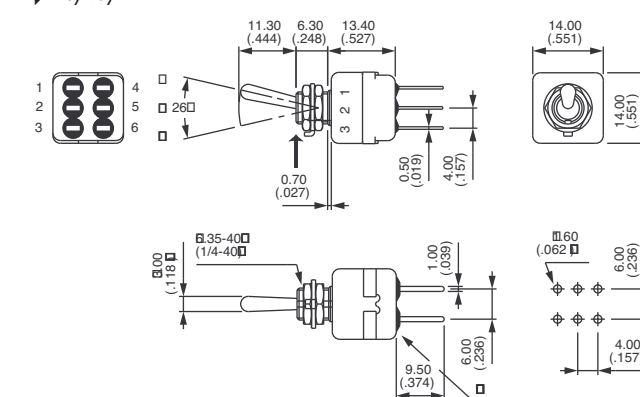


11246

|| || ||||

ON - ON

→ Keyway



Straight PC terminals - three pole ▲

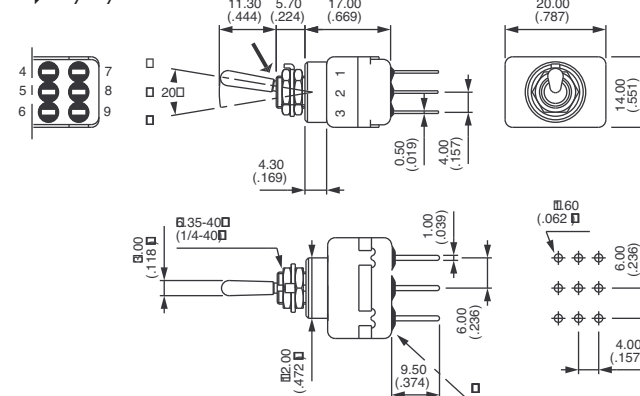


11256

|| || ||||

ON - ON

→ Keyway

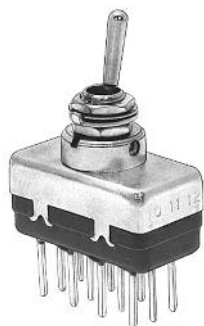


11000 series

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

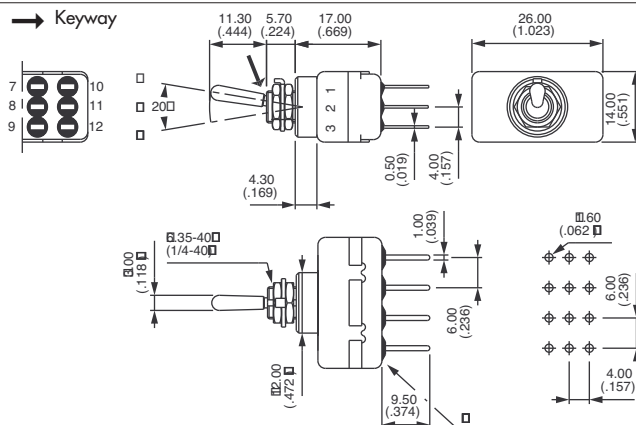
MODEL
STRUCTURE

Straight PC terminals - four pole ▲



11266

II II III
ON - ON

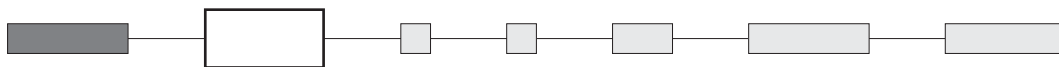




11000 series

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

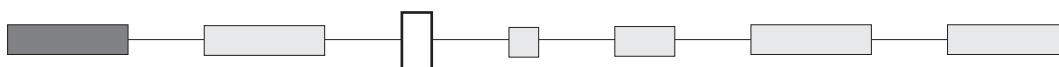
CONTACT MATERIALS



- 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

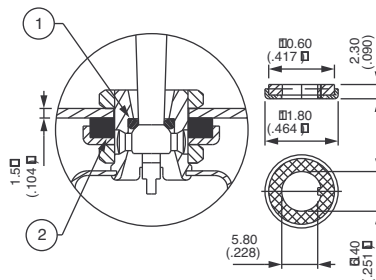


Epoxy sealed terminals are standard.

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



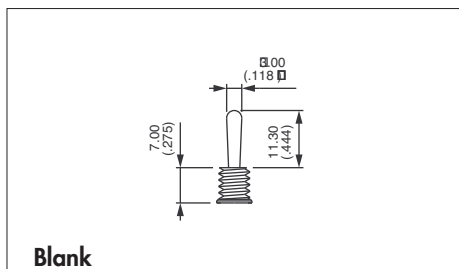
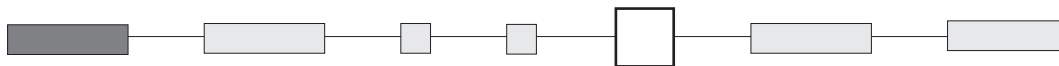
Not available on 11000W model.



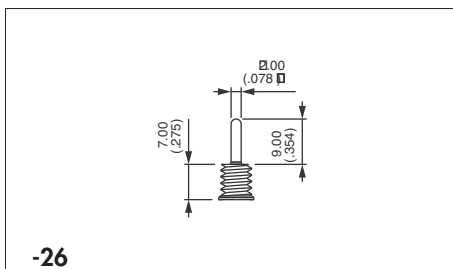
① O-ring ② Sealing washer

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

LEVERS



Blank
Standard



-26
Cylindrical

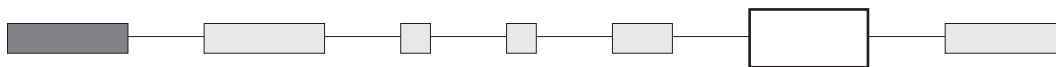
11000 series

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

OPTIONS



SPECIAL OPTIONS

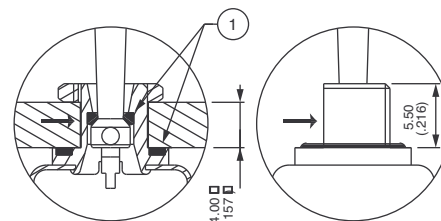


X408

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

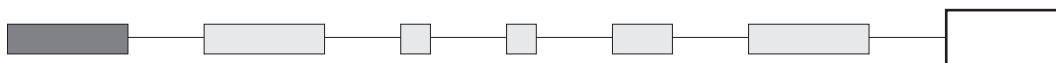
ON - ON

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 :
 - 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 :

Peak currents, refer to "Special options".

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



12

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

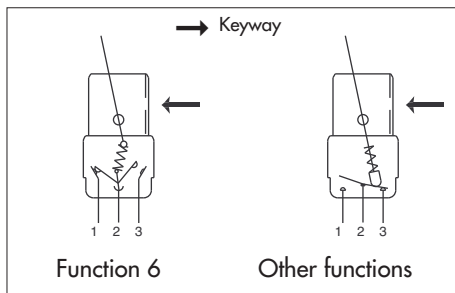


Sealing boots are available to protect the switches against dust and water. They are presented in section H.



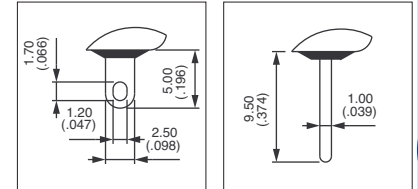
Mounting accessories : standard hardware supplied with all models : 2 hex nuts 14 (.551) across flats and 1 locking ring. Standard and special hardware available are presented in section I.

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

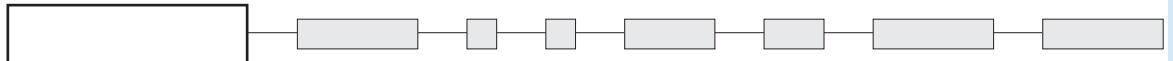


- Epoxy sealed terminals standard

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



MODEL STRUCTURE

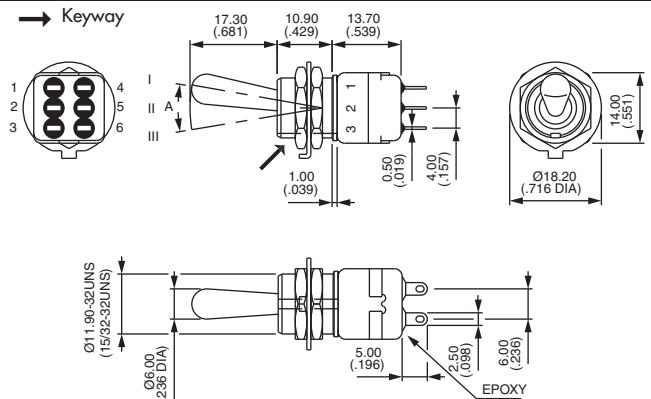


Shown with standard lever

Solder lug terminals - double pole



12146	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

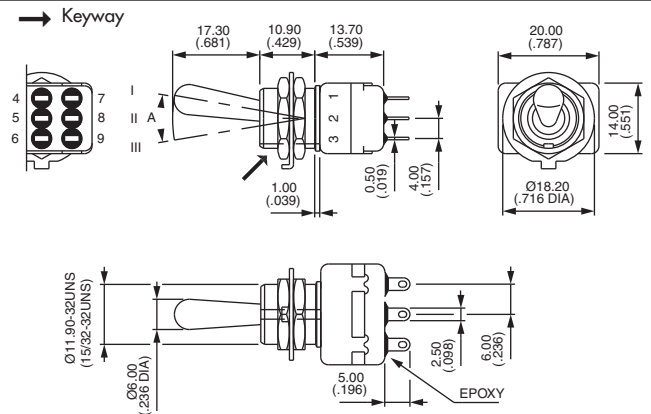


* Function 4 : SP in DP case - connections, see end of catalogue.

Solder lug terminals - three pole



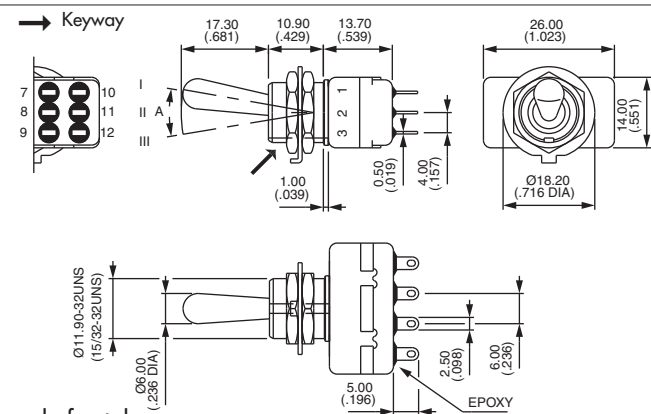
12156	ON	-	ON
12159	ON	OFF	ON
12157	MOM	OFF	MOM
12158	ON	OFF	MOM



Solder lug terminals - four pole



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



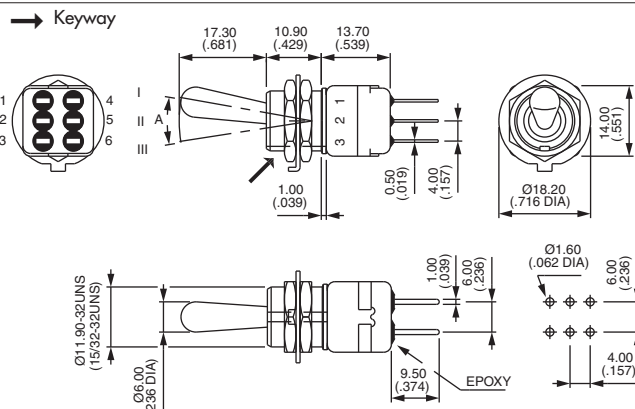
* Function 4 : DP in 4P case - connections, see end of catalogue.

Straight PC terminals : 12200

A detailed view of a 10-pin D-sub connector. It features a threaded metal shield with a locking tab on top. The connector is mounted on a black plastic base with ten pins extending from the bottom.

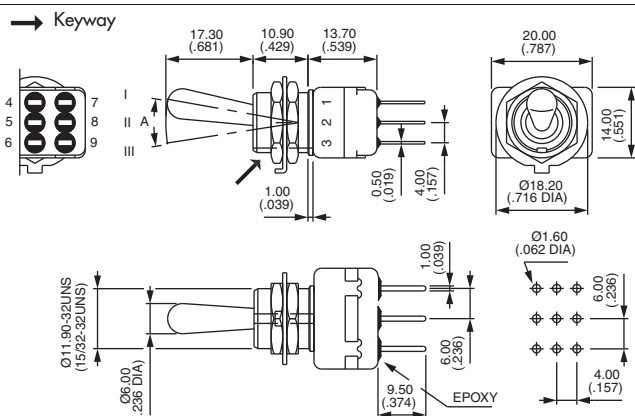
I II III

ON - ON



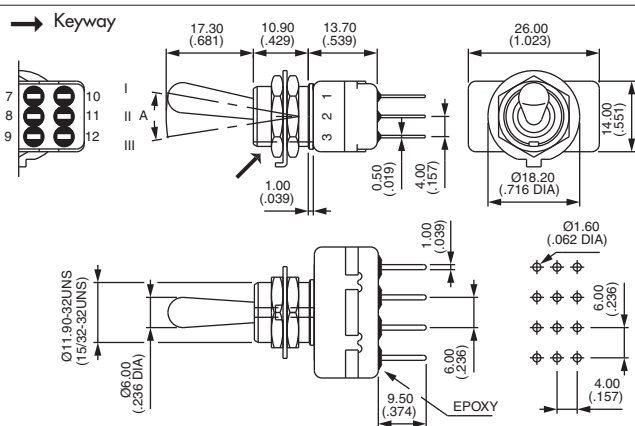
I II III

ON - ON



I II III

ON - ON



Technical drawing of a circular part with the following dimensions:

- Diameter: 2.00 (.472)
- Radius: 1.70 (.066)
- Distance: 5.10 (.200)

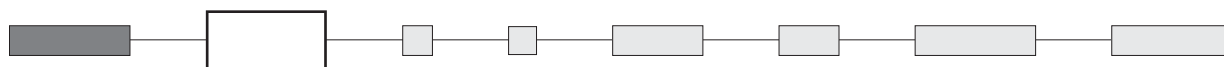
With **X408**
sealing option



12000 series

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

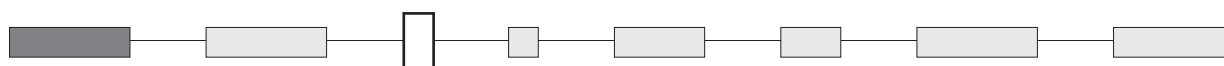
CONTACT MATERIALS



- 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).

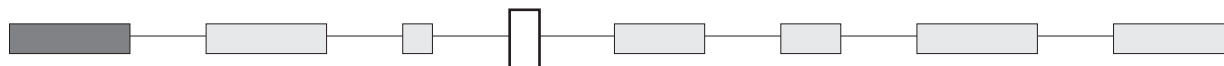
FINISH



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

For satin chrome finish, see "Special options".

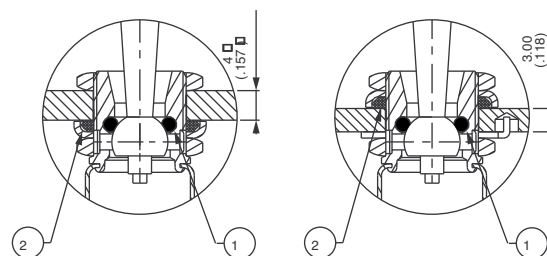
SEALING



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.

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



① O-ring ② Sealing washer

FLUORESCENT TIP



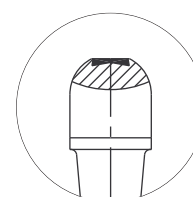
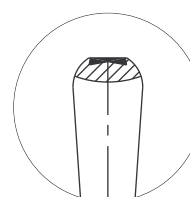
- Blank** None
- 038** White fluorescent tip. Becomes luminous when submitted to ultra-violet rays.



Available with matt black finish (option G) only.

Standard lever

Locking lever

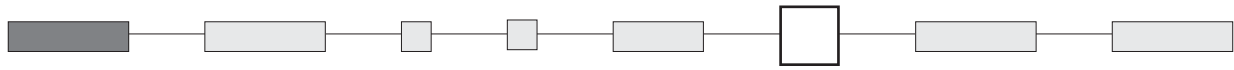


12000 series

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

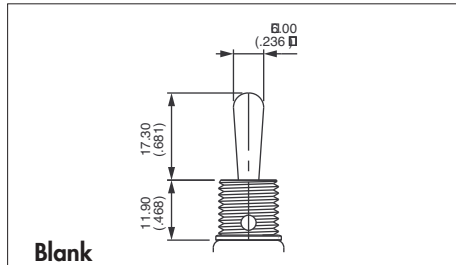
OPTIONS
● ● ●

ACTUATORS



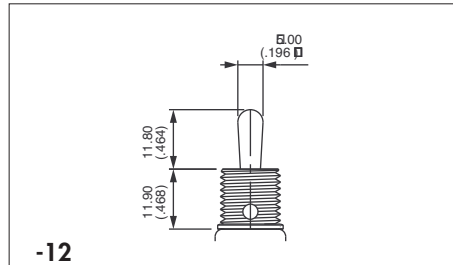
Levers

Dash compulsory before lever code.



Blank

Standard



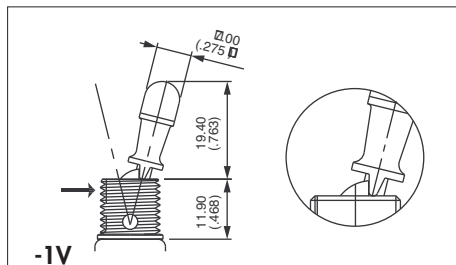
-12

Short lever

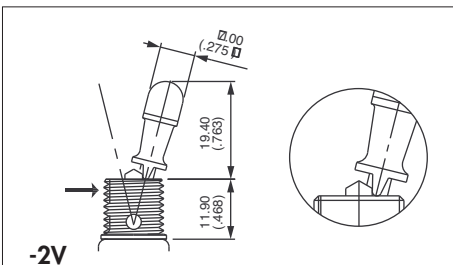
Security caps : see section I.

Locking levers

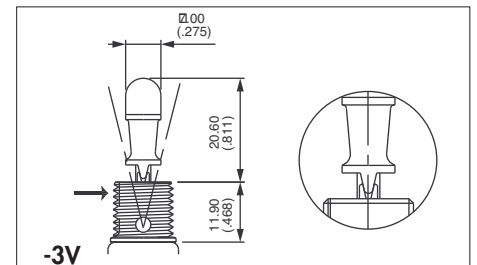
→ Keyway



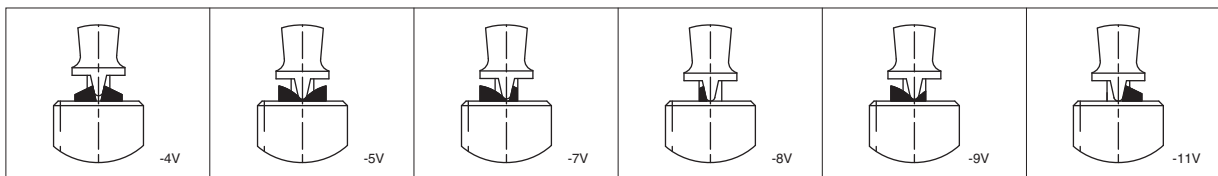
1 locked position (function 6)
Typical angle of throw : 26°



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



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



Functions 9 & 4

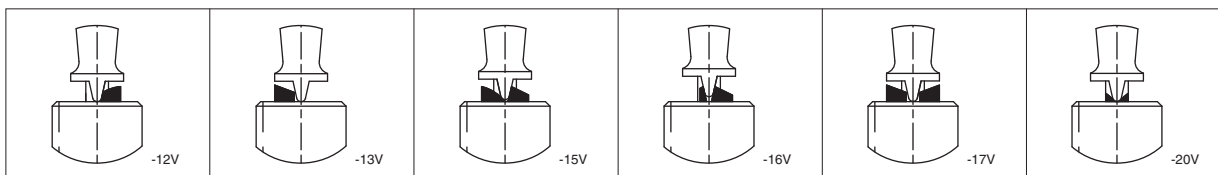
Functions 7 & 442R

Functions 8 & 441R

Functions 8, 9, 44 & 441R

Functions 8 & 441R

Functions 8, 9, 44 & 441R



Functions 8 & 441R

Func. 8, 5 & 441R

Functions 8 & 441R

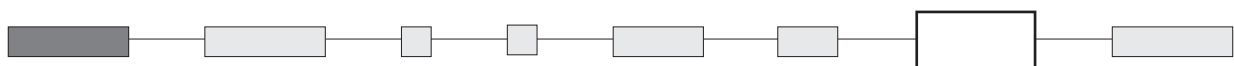
Functions 4 & 9

Functions 7 & 442R

Functions 9 & 44

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

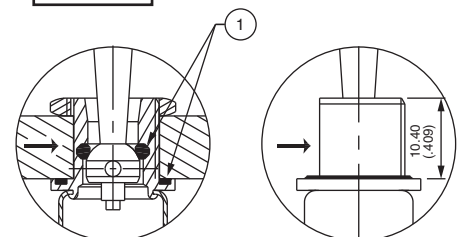
SPECIAL OPTIONS



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



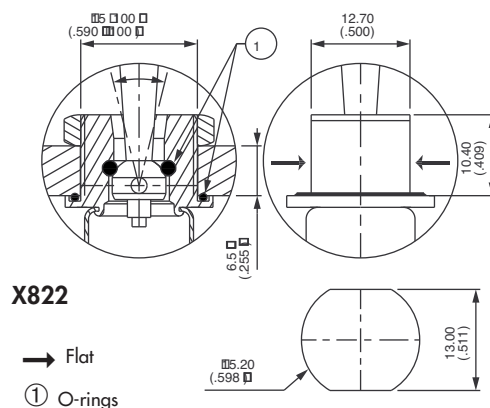
12000 series

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

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

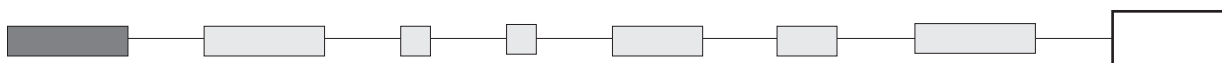


12146 X910

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.

Mouser Electronics

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[12148A](#) [11136AG](#) [11136WA](#) [11137A](#) [11138A](#) [11139A](#) [11148A](#) [11159A](#) [11166A](#) [11236A](#) [12246A](#) [11136AD2](#)
[11136AK](#) [11137AD2K](#) [11137AGK](#) [11137AK](#) [11146D](#) [11148AG](#) [12147AX408](#)