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. (50 mΩ max. for funtion 4)
- 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:

		Number of cycles	
Contacts	Max. current/voltage rating	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.

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12000 series

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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)
  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.

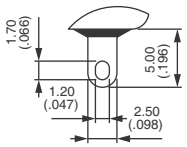
AGENCY APPROVALS

CECC 96201-005
CECC 96201-008

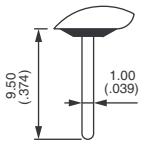
Designed to **MIL** specifications

Availability: consult factory for details of approved models.
Marking: to order switches marked CECC, complete appropriate box of ordering format.

TERMINALS



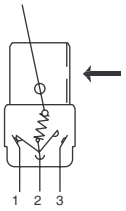
Solder lugs



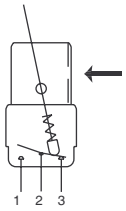
Straight PC

ELECTRICAL FUNCTIONS

→ KEYWAY

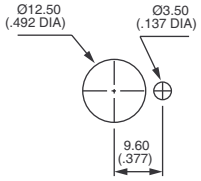


Function 6

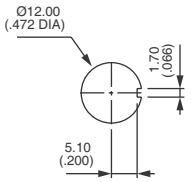


Other functions

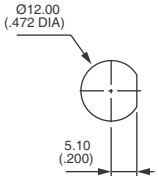
PANEL CUT-OUT



Standard



With **K** sealing option



With **X408** sealing option

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12000 series

Professional toggle switches • threaded bushing Ø 11.9 mm

BUILD YOUR PART NUMBER

BASIC PART NUMBER

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.

CONNECTIONS FOR FUNCTION 4

TH	Standard
CT	Reversed

For functions 4, 4-1R, 4-2R (leave blank for all other functions).
Wiring diagrams, see Technical information on website.

OPTIONS

_ _ _ _ _ _ _ _

CONTACT MATERIALS

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

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

FINISH

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

Satin chrome finish, see "Special options".

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.

FLUORESCENT TIP

Blank	None
-038	White fluorescent tip to lever

Available with black finish (G) only.

LEVERS

Blank	Standard lever
-12	Short lever

LOCKING LEVERS

-1V	1 locked position
-2V	2 locked positions
-3V	3 locked positions

Other: see following pages.

SPECIAL OPTIONS

Blank	No special requirement
X408	Front panel sealing by two O-rings
X822	Bushing Ø 15 (.590)

Other: see following pages..

APPROVALS

CECC	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.

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12000 series

Professional toggle switches • threaded bushing Ø 11.9 mm

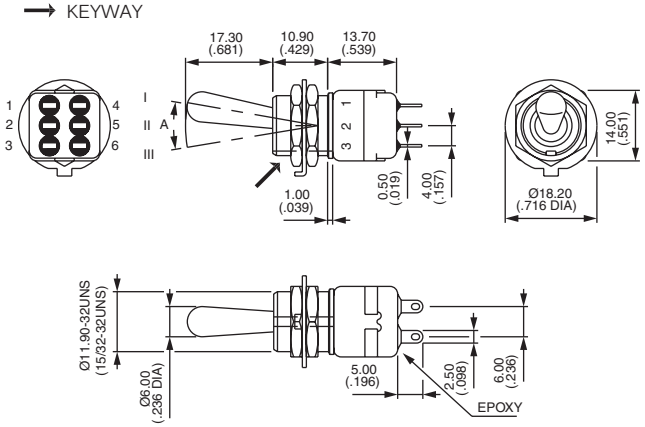
SOLDER LUG TERMINALS - DOUBLE POLE



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

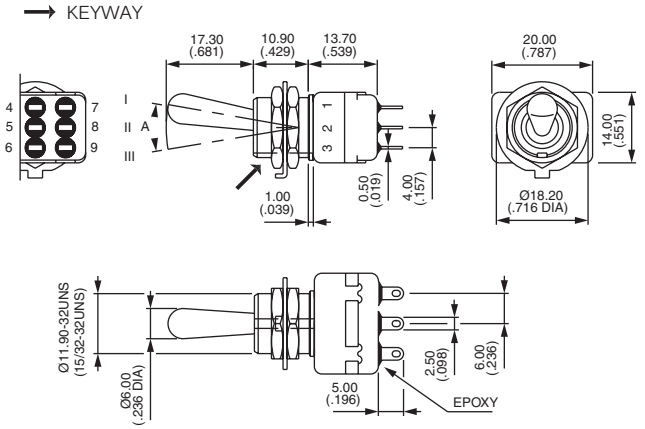
Shown with standard lever



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

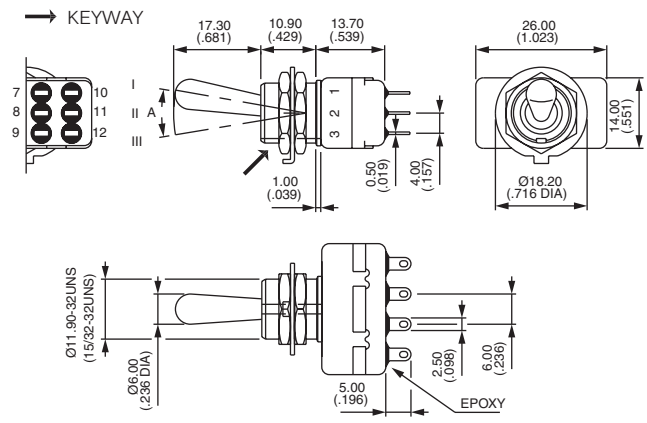


SOLDER LUG TERMINALS - FOUR POLE



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

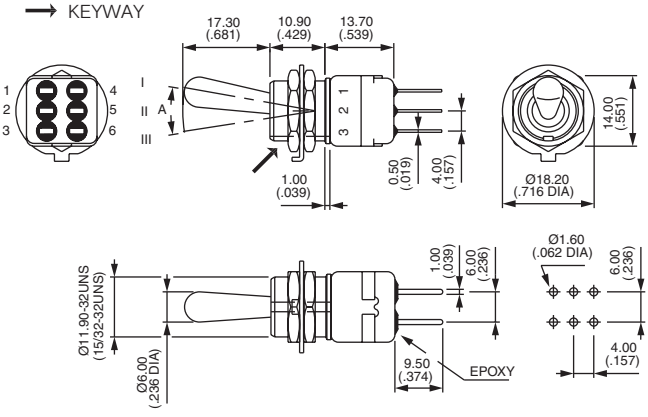
*Function 4: DP in 4P case - connections, see "Technical information" on website



STRAIGHT PC TERMINALS - DOUBLE POLE ▲



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



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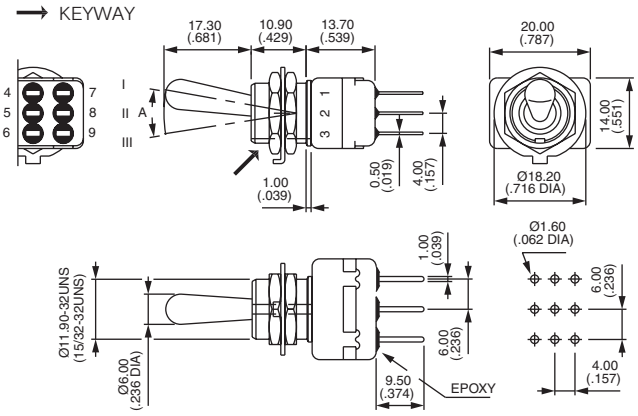
12000 series

Professional toggle switches • threaded bushing Ø 11.9 mm

STRAIGHT PC TERMINALS - THREE POLE ▲



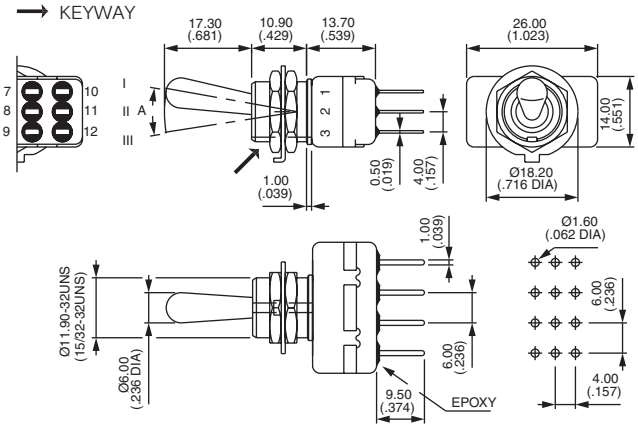
BASIC P/N	Angle of throw (A)	I	II	III
12256	26°	ON	-	ON



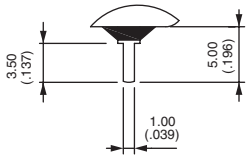
STRAIGHT PC TERMINALS - FOUR POLE ▲



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.



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12000 series

Professional toggle switches • threaded bushing Ø 11.9 mm

CONTACT MATERIALS

BASIC P/N

A	Silver
AD2	Silver, gold plated (2 micron)
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

BASIC P/N

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

For satin chrome finish, see "Special options".

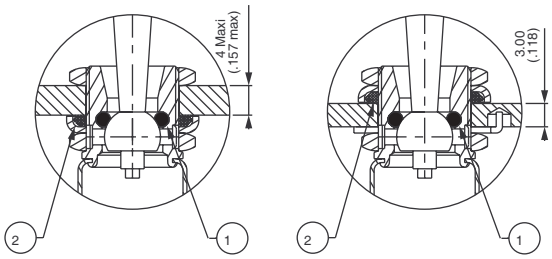
SEALING

BASIC P/N

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.

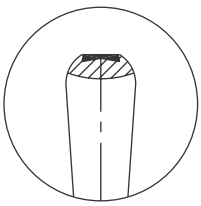


(1) O-ring (2) Sealing washer

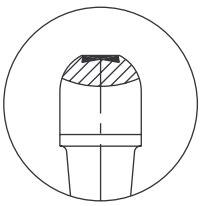
FLUORESCENT TIP

BASIC P/N

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

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12000 series

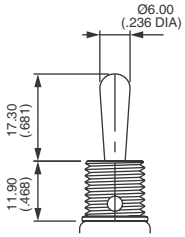
Professional toggle switches • threaded bushing Ø 11.9 mm

ACTUATORS

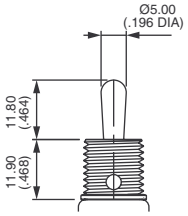
BASIC P/N

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

LEVERS

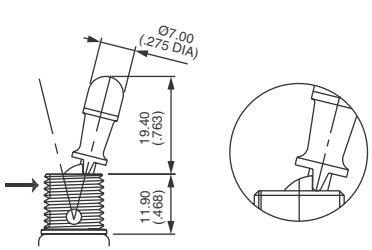


Blank Standard

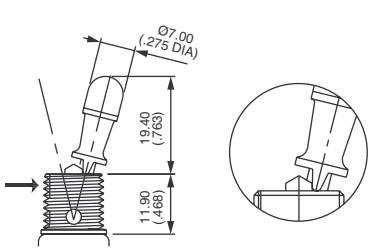


-12 Short lever

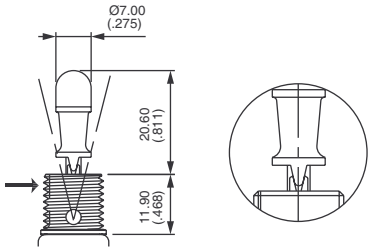
LOCKING LEVERS



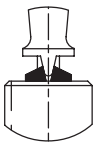
-1V
1 locked position (function 6)
Typical angle of throw : 26°



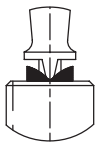
-2V
2 locked positions (function 6)
Typical angle of throw : 26°



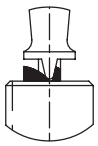
-3V
3 locked positions (functions 9 and 4)
Typical angle of throw : 20°



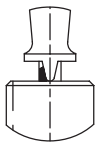
-4V
Functions 9 & 4



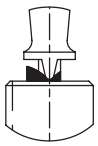
-5V
Functions 7 & 442R



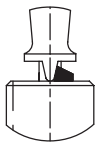
-7V
Functions 8 & 441R



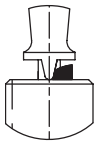
-8V
Functions 9 & 44



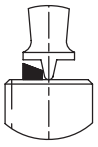
-9V
Functions 8 & 441R



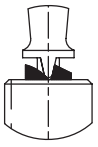
-11V
Functions 8, 9, 44 & 441R



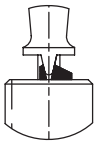
-12V
Functions 7 & 8



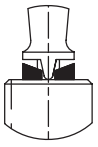
-13V
Funct. 5, 7 & 442R



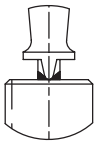
-15V
Functions 8 & 441R



-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.

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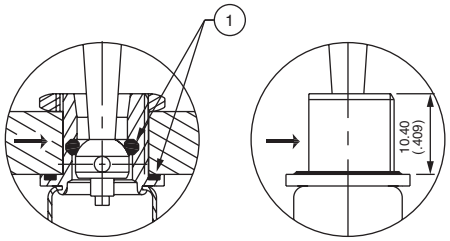
12000 series

Professional toggle switches • threaded bushing Ø 11.9 mm

SPECIAL OPTIONS

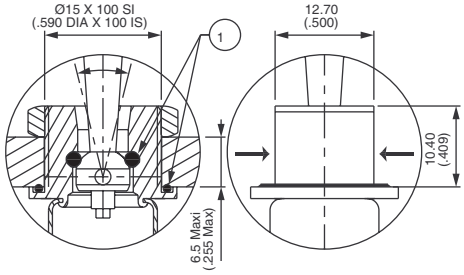
BASIC P/N

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**
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

BASIC P/N

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".

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