

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 function 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:

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.



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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

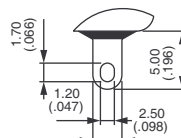
Designed to **MIL** specifications

Availability: consult factory for details of approved models.

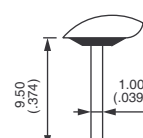
Marking: to order switches marked CECC, complete appropriate box of ordering format.



TERMINALS



Solder lugs

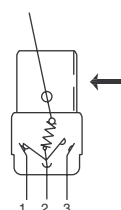


Straight PC

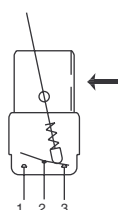


ELECTRICAL FUNCTIONS

→ KEYWAY



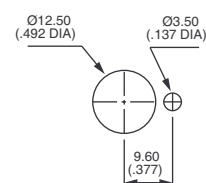
Function 6



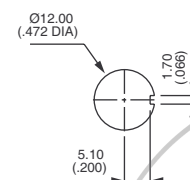
Other functions



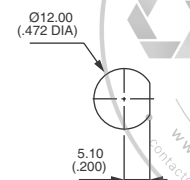
PANEL CUT-OUT



Standard



With K sealing option



With X408 sealing option



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BUILD YOUR PART NUMBER

BASIC PART NUMBER			
12			
SERIES	TERMINALS AND BUSHINGS	ELECTRICAL FUNCTIONS	CONNECTIONS FOR FUNCTION 4
	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".	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.	TH Standard CT Reversed For functions 4, 4-1R, 4-2R (leave blank for all other functions). Wiring diagrams, see Technical information on website.
	NUMBER OF POLES 4 Double pole 5 Three pole 6 Four pole	MOMENTARY FOR FUNCTION 4 1R ON ON MOM 2R MOM ON MOM Leave blank for other functions.	
OPTIONS			
	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 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 following pages..
CONTACT MATERIALS	SEALING	LEVERS	APPROVALS
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).	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.	Blank Standard lever -12 Short lever ... LOCKING LEVERS -1V 1 locked position -2V 2 locked positions -3V 3 locked positions Other: see following pages.	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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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



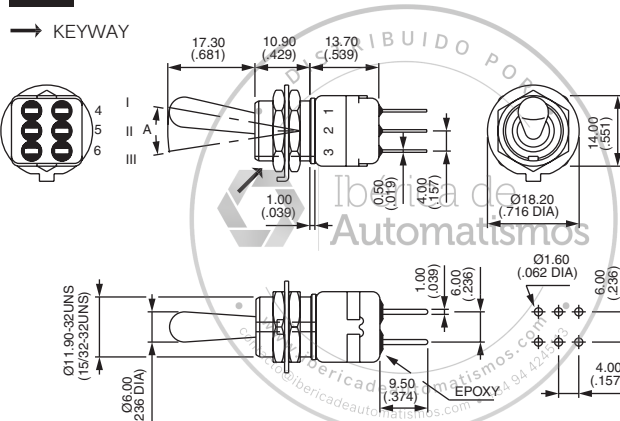
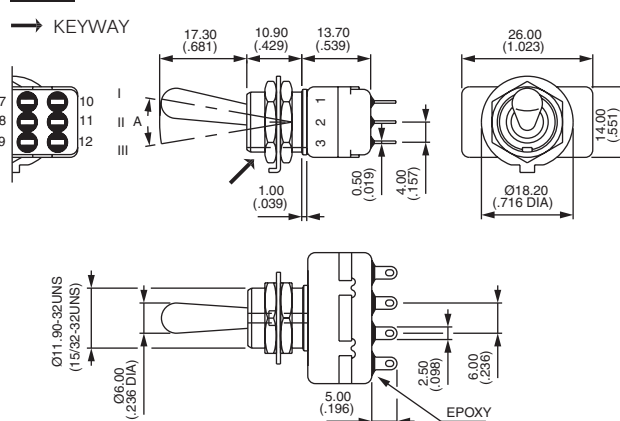
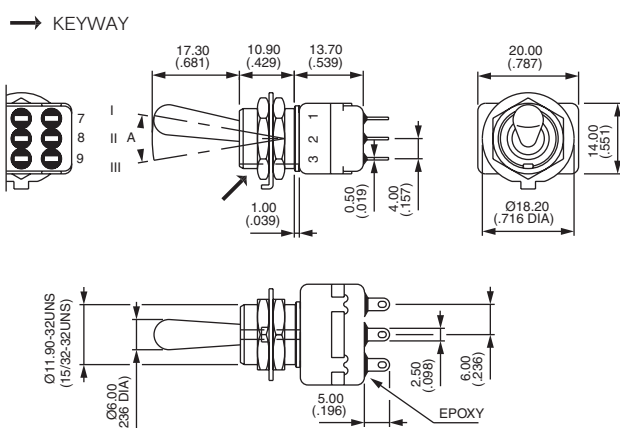
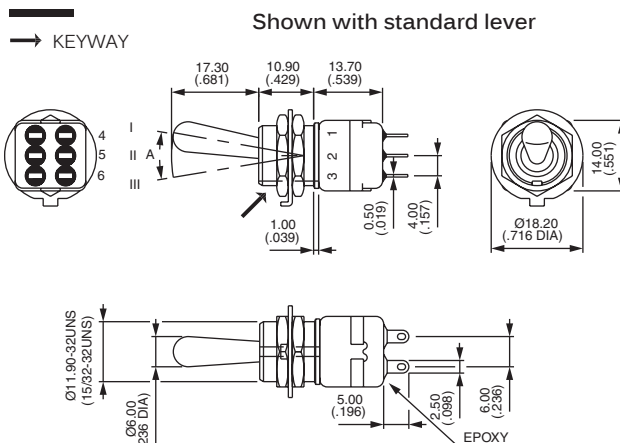
BASIC P/N	Angle of throw (A)	I	II	III
12166	26°	ON	-	ON
12169	20°	ON	OFF	ON
12167	20°	MOM	OFF	MOM
12168	20°	ON	OFF	MOM
12164*	20°	ON	ON	ON
12164 1R*	20°	ON	ON	MOM
12164 2R*	20°	MOM	ON	MOM

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

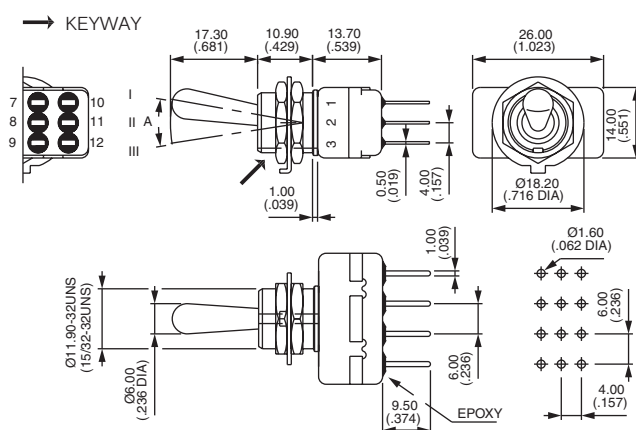
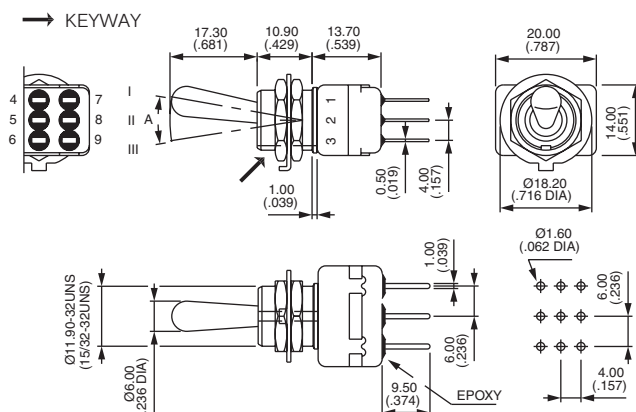
STRAIGHT PC TERMINALS - DOUBLE POLE ▲



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



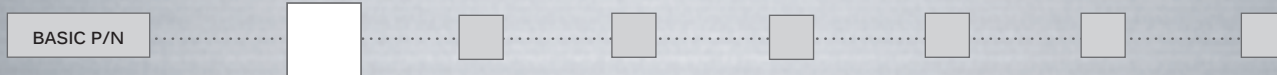
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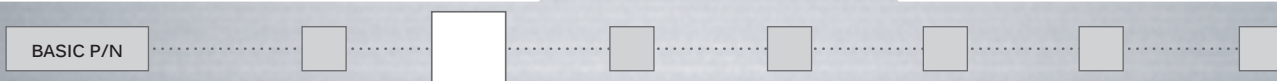
CONTACT MATERIALS



- 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).

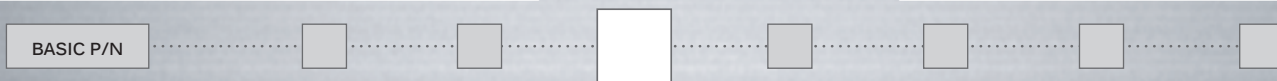
FINISH



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

For satin chrome finish, see "Special options".

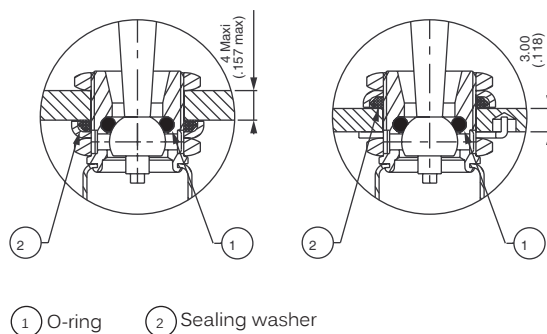
SEALING



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.

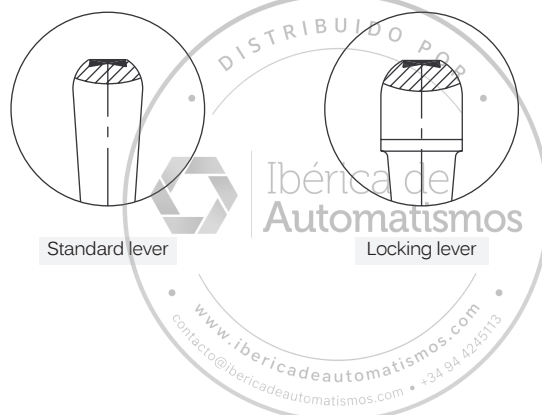
Sealing by two O-rings, see X408 under "Special options".
See "Sealing Boots" section of website.



FLUORESCENT TIP



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



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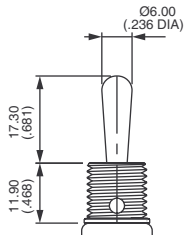
ACTUATORS

BASIC P/N

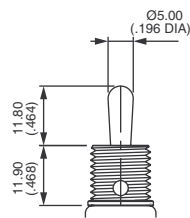
Dash compulsory before lever code.

Switch guards : see "Switch Guards" section of website.

LEVERS

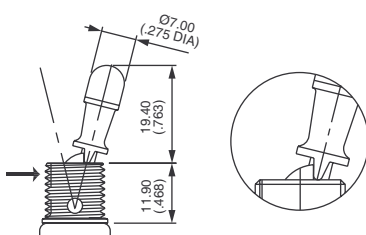


Blank Standard



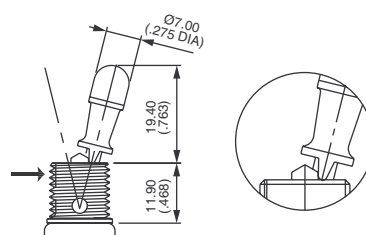
-12 Short lever

LOCKING LEVERS



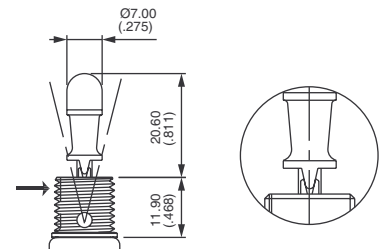
-1V

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



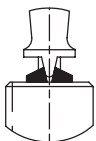
-2V

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



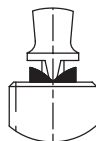
-3V

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



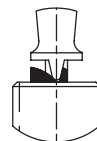
-4V

Functions 9 & 4



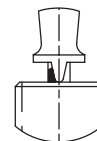
-5V

Functions 7 & 442R



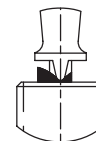
-7V

Functions 8 & 441R



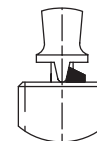
-8V

Functions 9 & 44



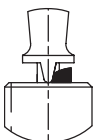
-9V

Functions 8 & 441R



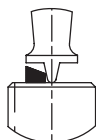
-11V

Functions 8, 9,
44 & 441R



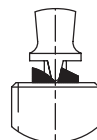
-12V

Functions 7 & 8



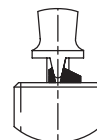
-13V

Funct. 5, 7 & 442R



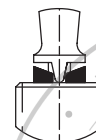
-15V

Functions 8 & 441R



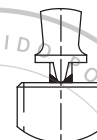
-16V

Functions 4 & 9



-17V

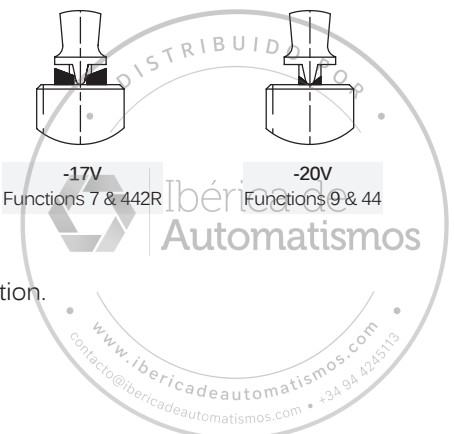
Functions 7 & 442R



-20V

Functions 9 & 44

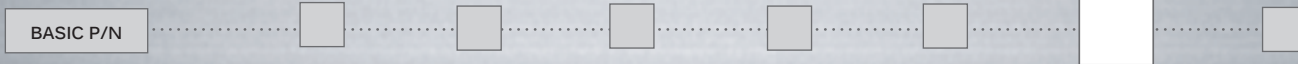
Note: -5V and -12V are not true locking levers: no pulling is required before actuation.



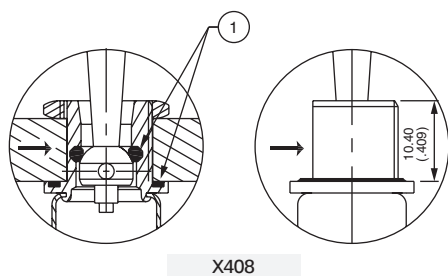
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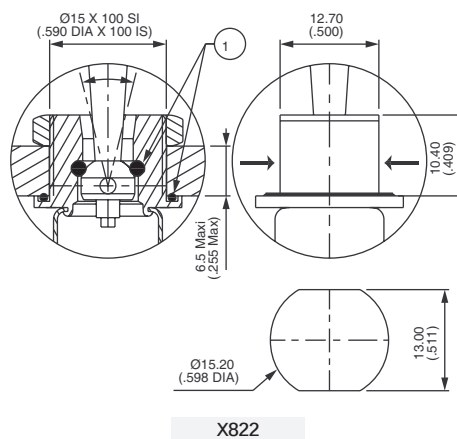
SPECIAL OPTIONS



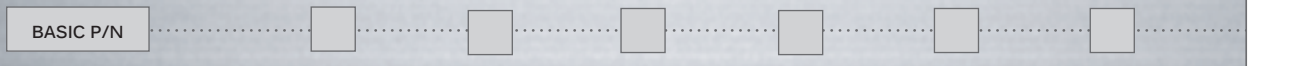
- Blank** No special requirement
- X408** Front panel sealing by two O-rings. Flatted bushing for precise orientation. Panel thickness: 8 mm (.314) max., 3 mm (.118) min. Protects the switch against water and dust. Panel seal withstands 1 bar pressure and remains sealed even when switch is operated.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



1 O-ring
→ Flat



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".

