

11000 and 12000 series

Professional toggle switches

Distinctive features



Applications

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

Approvals and lists



- 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



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11000 series

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

Specifications

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load : Peak currents, refer to "Special options".
 - 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 (Gold plating : 100mA 30VDC max.)	20.000	20.000
D	200mA 250VAC - 400mA 125VAC	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.

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, space, etc.).

AGENCY APPROVALS/PREFERENTIAL LISTS



CECC 96201-005
CECC 96201-008

QPL (Europe only)
MUAHAG

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.

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



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

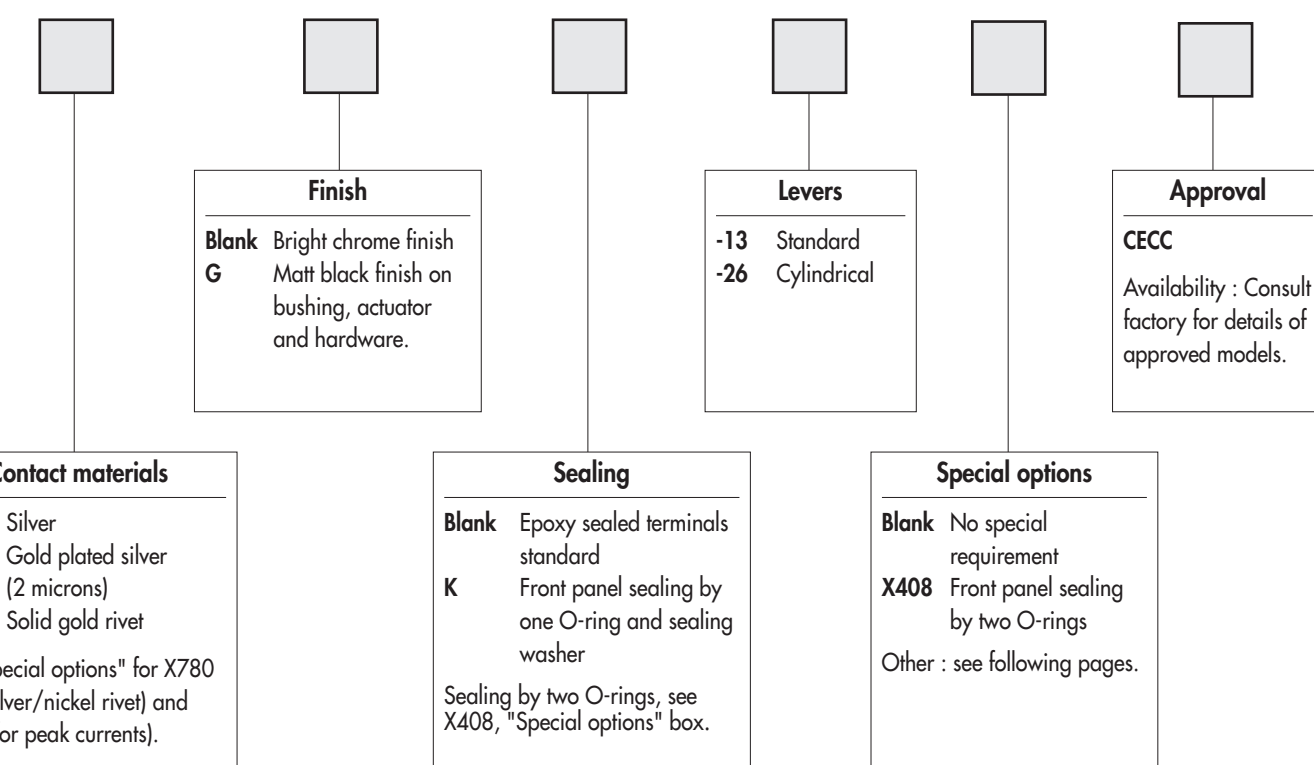
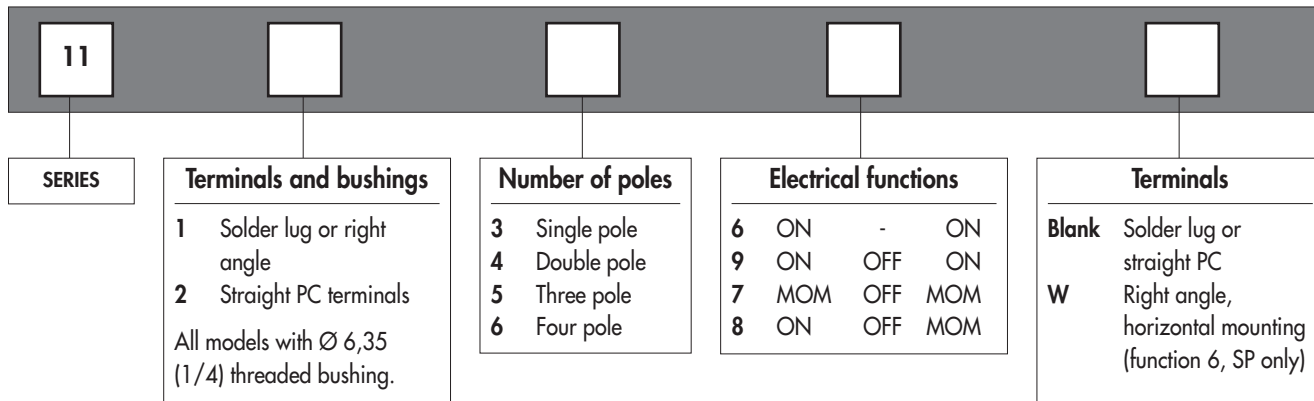


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11000 series

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.



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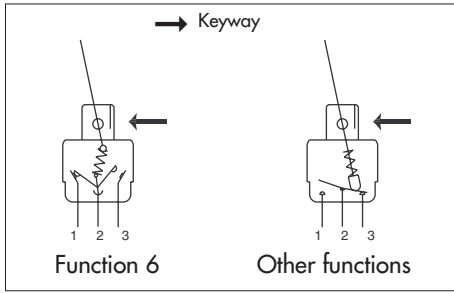
11000 series

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

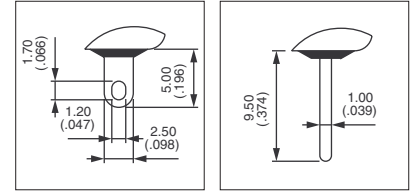
ermec@ermec.com



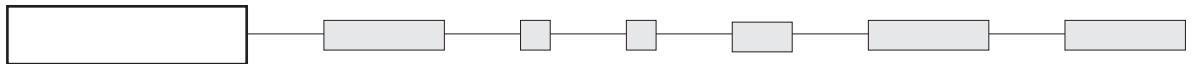
A



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



MODEL STRUCTURE



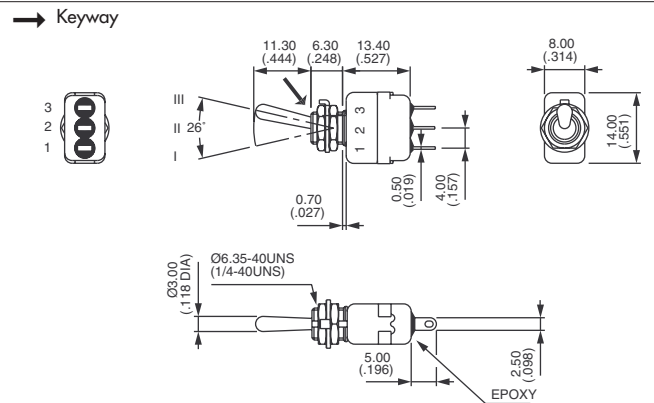
Shown with standard lever (-13)

Solder lug terminals - single pole



11136
11139
11137
11138

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

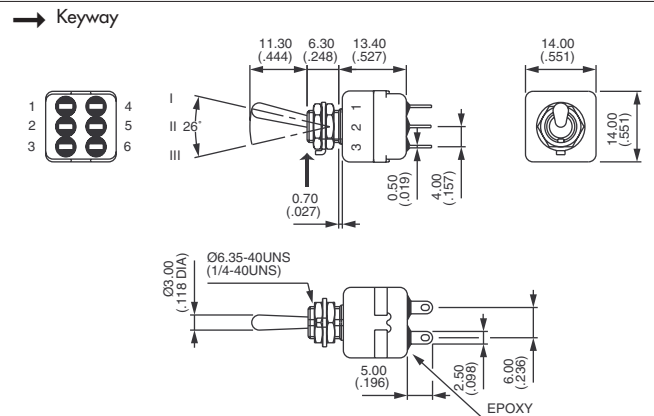


Solder lug terminals - double pole



11146
11149
11147
11148

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

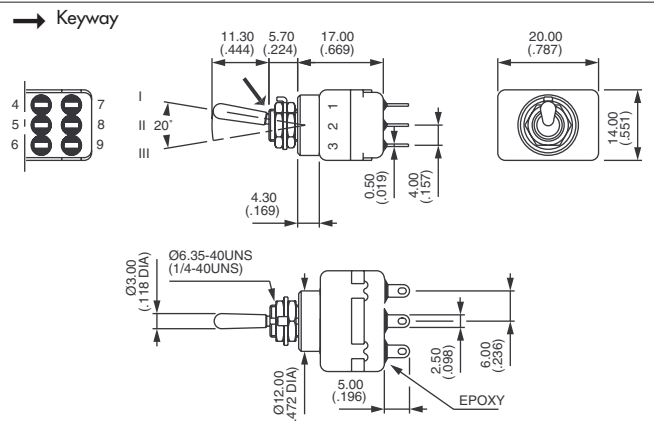


Solder lug terminals - three pole



11156
11159
11157
11158

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



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11000 series

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

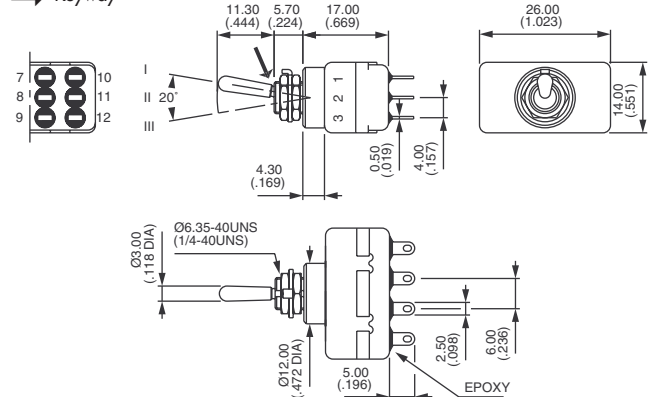
Solder lug terminals - four pole



11166
11169
11167
11168

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

→ Keyway



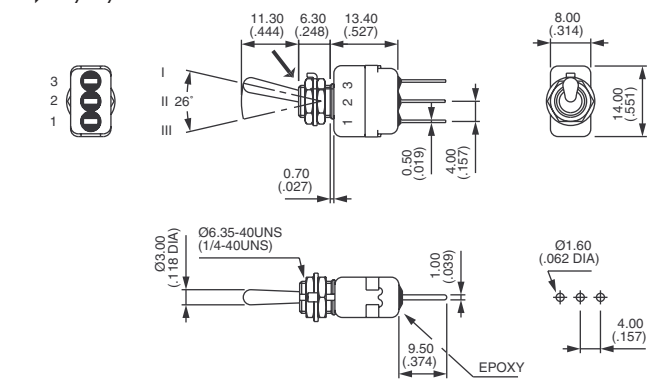
Straight PC terminals - single pole ▲



11236

II	II	III
ON	-	ON

→ Keyway



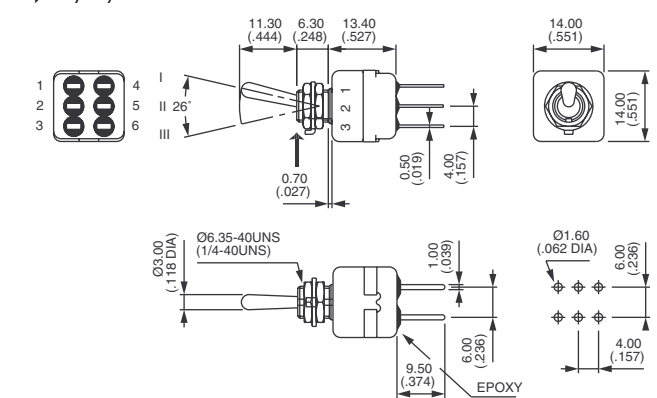
Straight PC terminals - double pole ▲



11246

II	II	III
ON	-	ON

→ Keyway



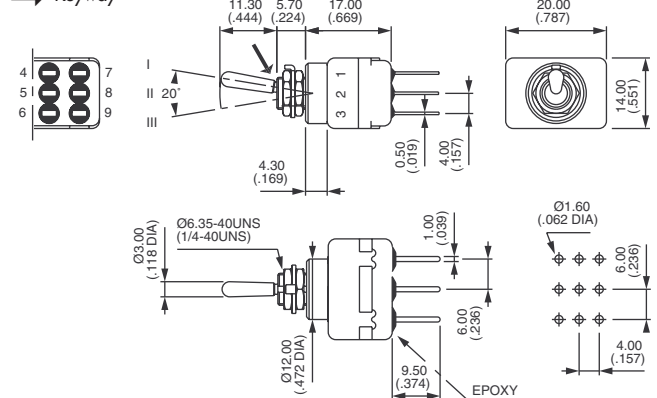
Straight PC terminals - three pole ▲



11256

II	II	III
ON	-	ON

→ Keyway



11000 series

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

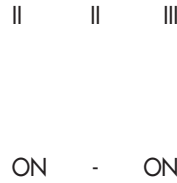
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WORLDWIDE L
STRUCTURE

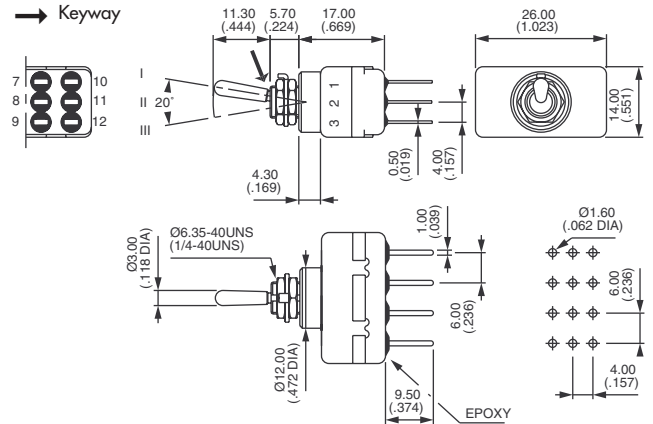
Straight PC terminals - four pole ▲



11266



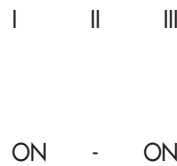
ON - ON



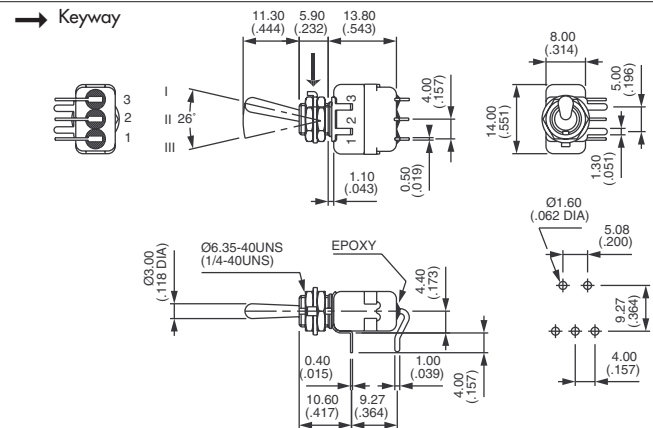
Right angle terminals - horizontal - single pole



11136W

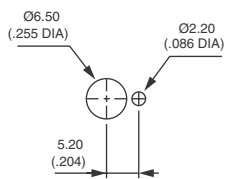


ON - ON

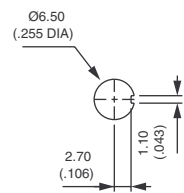


▲ Models with straight PC terminals are also available with 3,5 mm (.138) short terminals, functions 6, 9, 7 and 8. On request.

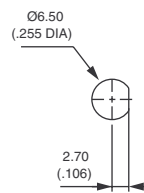
PANEL CUT-OUT



Standard



With K
sealing option



With X408
sealing option



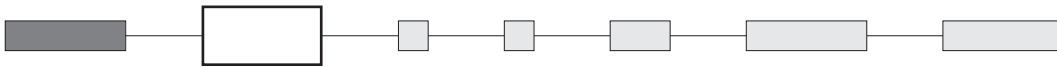
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11000 series

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

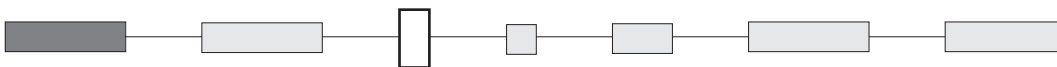
CONTACT MATERIALS



- 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).

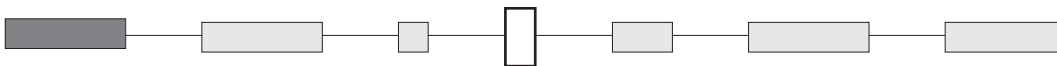
FINISH



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

Other finish, consult factory.

SEALING

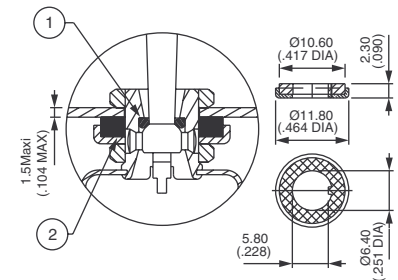


Epoxy sealed terminals are standard.

- 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.



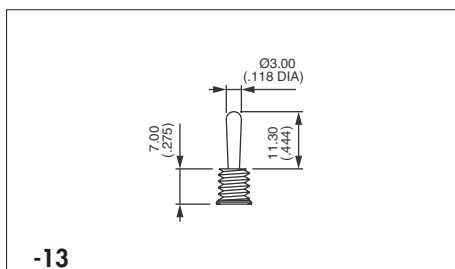
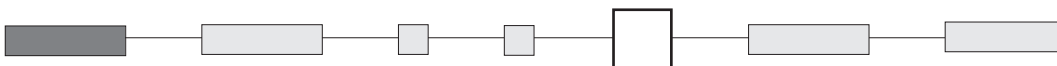
Not available on 11000W model.



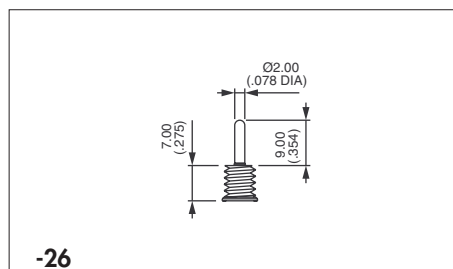
① O-ring ② Sealing washer

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

LEVERS



-13
Standard



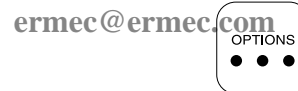
-26
Cylindrical



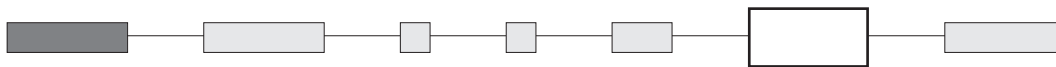
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11000 series

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



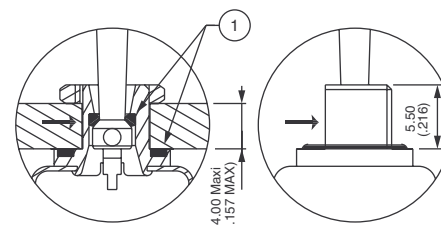
SPECIAL OPTIONS



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

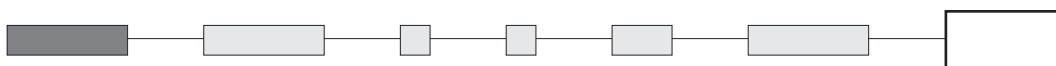


Single pole
11136 X910 ON - ON

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
2/30A 250VAC - 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.

Preferential lists : see specifications.



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12000 series

Professional toggle switches - threaded bushing \varnothing 11.9 (15/32)

Specifications

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load : Peak currents, refer to "Special options".
 - 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, 10 μ A 5V min.
- Initial contact resistance : 10 m Ω max.
- Insulation resistance : 1.000 M Ω 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 (Gold plating : 100mA 30VDC max.)	20.000	20.000
D	200mA 250VAC - 400mA 125VAC	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/PREFERENTIAL LISTS



CECC 96201-005
CECC 96201-008

QPL (Europe only)
MUAHAG
Designed to **MIL** specifications

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.

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



Packaging unit : 2 pole models : 25 pieces - 3 & 4 pole models : 20 pieces.



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Professional toggle switches - threaded bushing \varnothing 11.9 (15/32)

Overview



SERIES

12

Terminals and bushings

1 Solder lug terminals
2 Straight PC terminals

All models with threaded bushing \varnothing 11,9 (15/32). Bushing \varnothing 15 (.590), see X822 under "Special options".

Number of poles

4 Double pole
5 Three pole
6 Four pole

Electrical functions

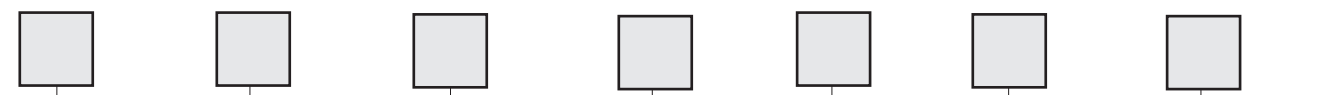
6	ON	-	ON
9	ON	OFF	ON
7	MOM	OFF	MOM
8	ON	OFF	MOM
5	-	ON	MOM
4	ON	ON	ON
	ON	ON	MOM ▲
	MOM	ON	MOM ▲

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
G Matt black finish on bushing, actuator and hardware.
Satin chrome finish, see "Special options".

Fluorescent tip

Blank None
0.38 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 \varnothing 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

-13 Standard lever
-12 Short lever

Locking levers

-1V 1 locked position
-2V 2 locked positions
-3V 3 locked positions
Other, consult factory.

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.



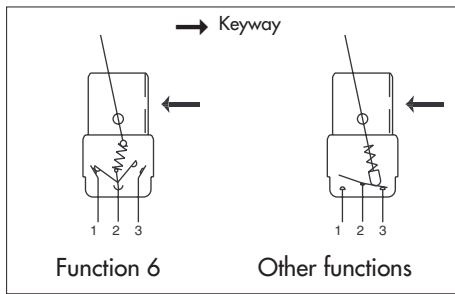
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12000 series

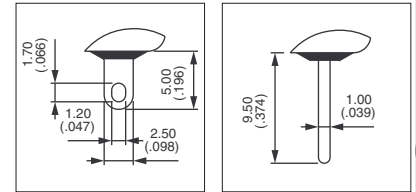
Professional toggle switches - threaded bushing \varnothing 11.9 (15/32)

Solder lug terminals : 12100

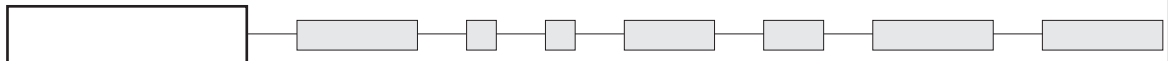


• Epoxy sealed terminals standard

Typical angle of throw (A)	
Function 6	24°
Functions 9, 7, 8, 4	20°
Function 5	12°



MODEL STRUCTURE

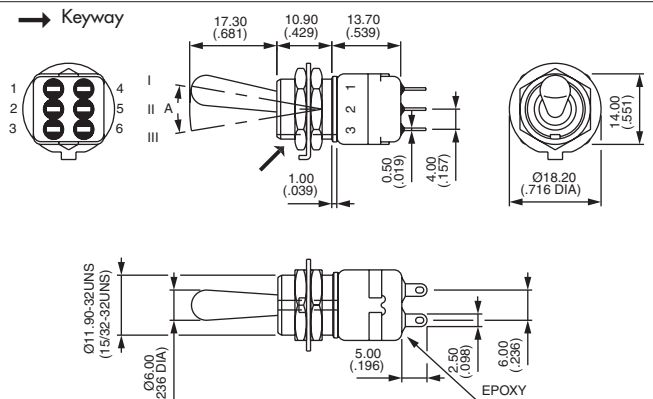


Shown with standard lever (-13)

Solder lug terminals - double pole



	I	II	III
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

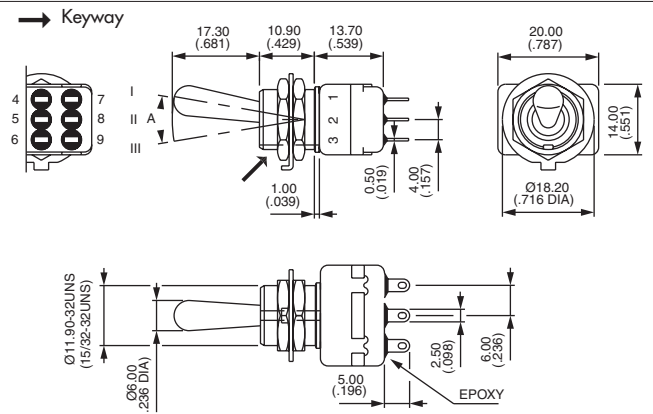


* Function 4 : SP in DP case - connections, see end of catalogue.

Solder lug terminals - three pole



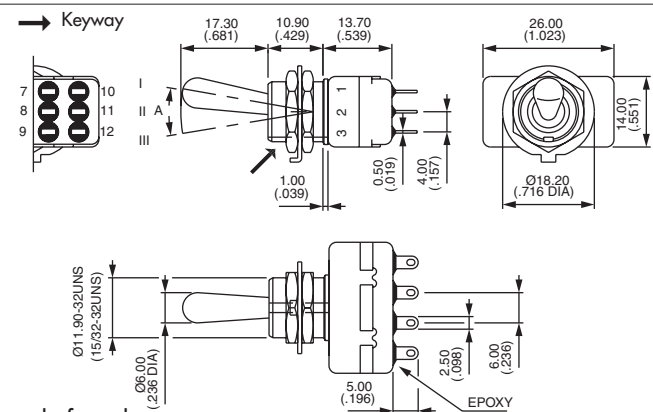
	I	II	III
12156	ON	-	ON
12159	ON	OFF	ON
12157	MOM	OFF	MOM
12158	ON	OFF	MOM



Solder lug terminals - four pole



	I	II	III
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.

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MODEL STRUCTURE

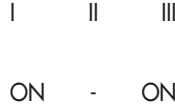
Professional toggle switches - threaded bushing \varnothing 11.9 (15/32)

Straight PC terminals : 12200

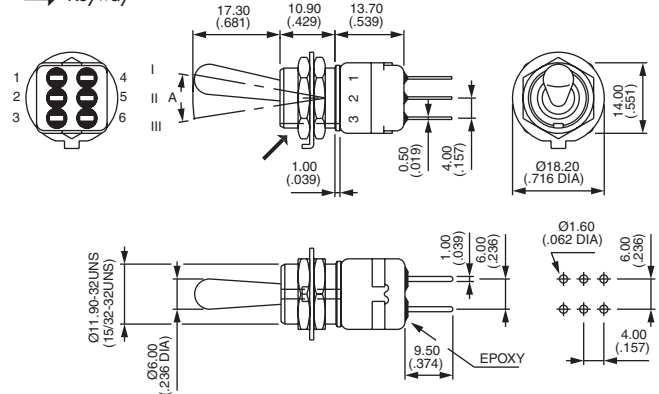
Straight PC terminals - double pole ▲



12246



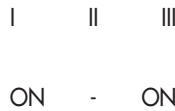
→ Keyway



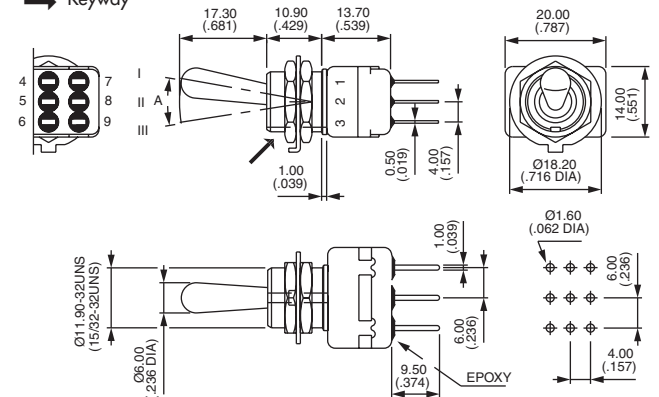
Straight PC terminals - three pole ▲



12256



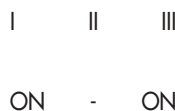
→ Keyway



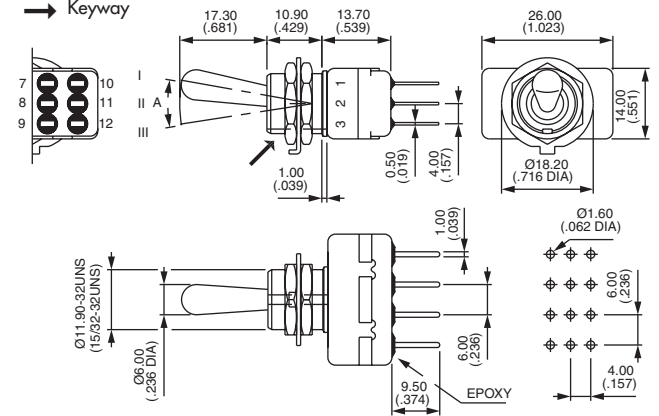
Straight PC terminals - four pole ▲



12266

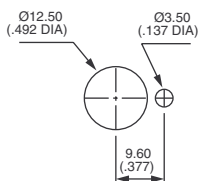


→ Keyway

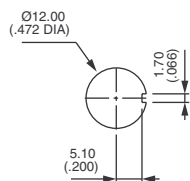


▲ Models with straight PC terminals are also available with 3,5 mm (.138) short terminals, functions 6, 9, 7 and 8. On request.

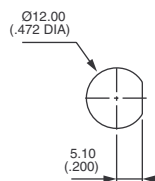
PANEL CUT-OUT



Standard



With K
sealing option



With X408
sealing option



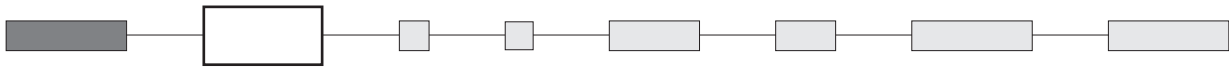
www.ermec.com



12000 series

Professional toggle switches - threaded bushing \varnothing 11.9 (15/32)

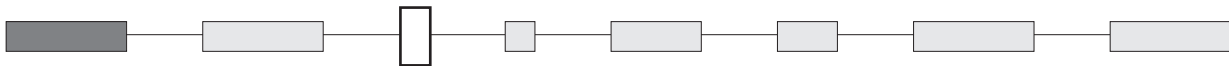
CONTACT MATERIALS



- 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).

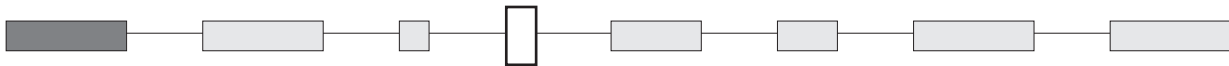
FINISH



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

For satin chrome finish, see "Special options".

SEALING

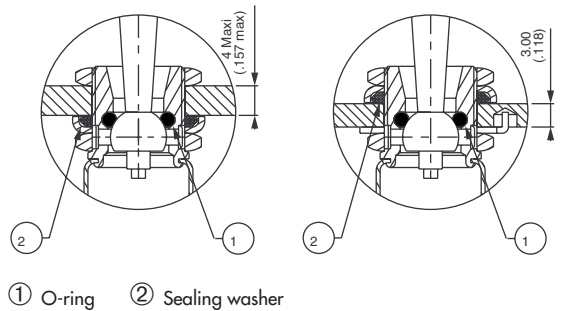


Epoxy sealed terminals are standard.

- 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.

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



FLUORESCENT TIP



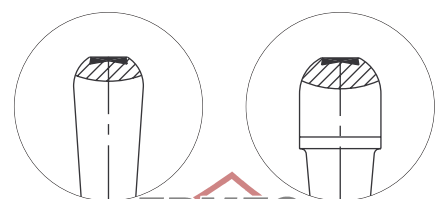
- Blank** None
- 0.38** White fluorescent tip. Becomes luminous when submitted to ultra-violet rays.



Available with matt black finish (option G) only.

Standard lever

Locking lever



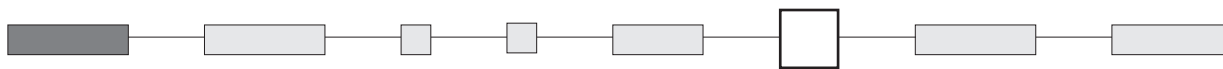
ERMEC
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www.ermec.com

12000 series

Professional toggle switches - threaded bushing \varnothing 11.9 (15/32)

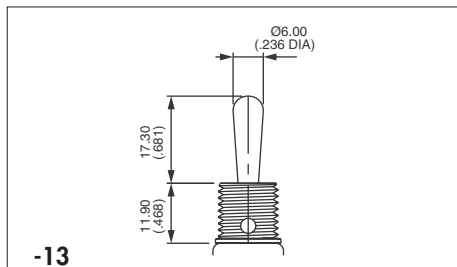
ACTUATORS



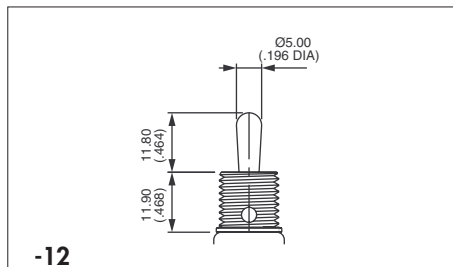
Dash compulsory before lever code.

Levers

A



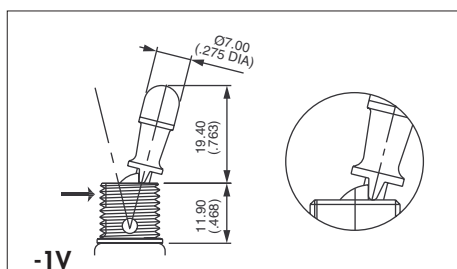
-13
Standard



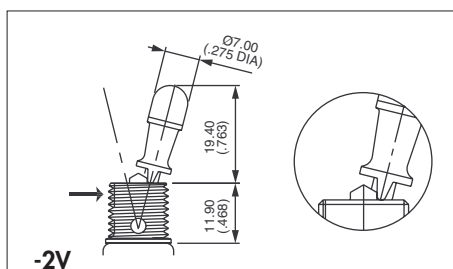
-12
Short lever

Security caps : see section I.

Locking levers

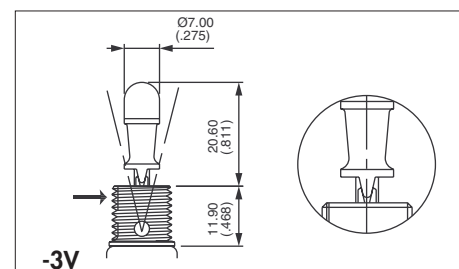


-1V
1 locked position (function 6)
Typical angle of throw : 26°



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

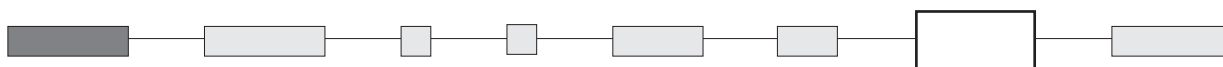
→ Keyway



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

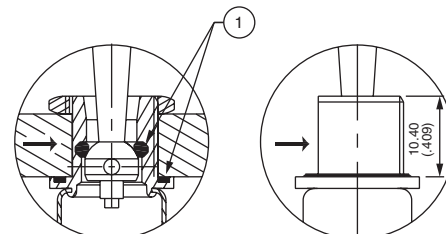
Consult factory for other locking lever options.

SPECIAL OPTIONS



Blank No special requirement.

X408 Front panel sealing by two O-rings. Flatted bushing for precise orientation. 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.



→ Flat ① O-rings

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



12000 series

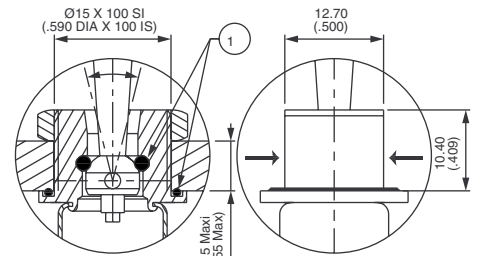
Professional toggle switches - threaded bushing \varnothing 11.9 (15/32)

SPECIAL OPTIONS (continued)

X822 Threaded bushing \varnothing 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.

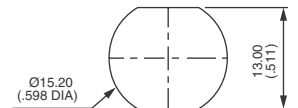
X910 Switches for peak currents



X822

→ Flat

① O-rings



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

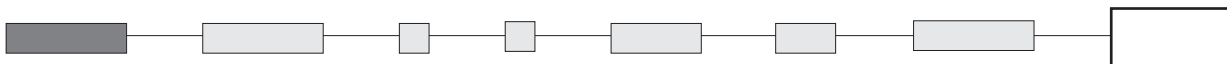


12146 X910

ON - ON

- Contacts : solid rivet - silver/nickel alloy (AgNi)
- Max. current/voltage rating :
3/80A (1 ms) 60VDC - 10.000 cycles
2/30A 250VAC - 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.

Preferential lists : see specifications.



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12000X778 series

ermec@ermec.com

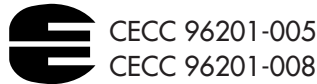
High performance toggle switches - threaded bushing Ø 11,9 (15/32)

Distinctive features

A



□ Approval and lists



CECC 96201-005
CECC 96201-008

MUAHAG and QPL listed (Europe only)

French defence approved : DAT list No A5999 X001.

This range of professional toggle switches is suitable for use in military and other high specification environments.

□ Contacts

Highly reliable contacts suitable for low level applications (10mA 50mV - 10µA 5VDC min.) or power applications (2A 250VAC - 4A 125VAC - 4A 30VDC max.)

□ Pinned lever

The base of the switch lever is pinned to the bushing, thus earthing the lever to the bushing. This also provides strain relief to protect the switch if accidentally knocked.

□ Double shell case

For high mechanical strength and high electrical insulation.

□ Compact size

The small rear end of the switch allows space saving behind the panel.

□ Finish

Matt black finish on body, bushing, lever and hardware.

□ Sealing

Panel sealed to IP 67, these switches are frontal sealed by two O-rings and have full rear end sealing.

□ Accessories

A comprehensive range of protection boots (both full and half length), locking levers and security caps are available.



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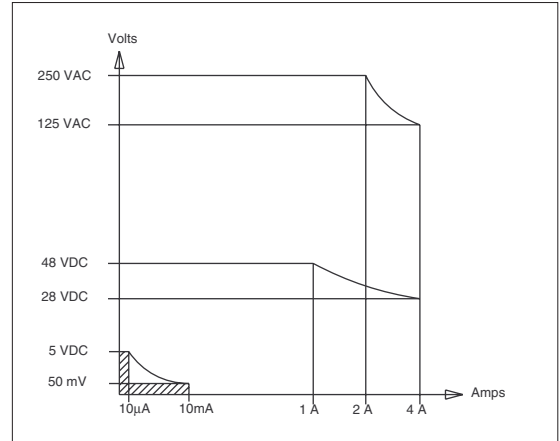
12000X778 series

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

Specifications

ELECTRICAL SPECIFICATIONS

- Max. current/voltage rating with resistive load : 2A 250VAC - 4A 125VAC - 4A 28VDC
- Minimum load : 10mA 50mV, 10µA 5VDC
When used above 300mA 28VDC, the gold plating is removed on contact areas and is considered only as a protection against oxidation during storage.
- 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
 - 2.000 Vrms 50 Hz min. between terminals and frame
- Contact bounce : 2 ms max.
- Electrical life :
 - At 2A 250VAC - 4A 28VDC :
20.000 cycles (10.000 for functions 5, 4-1R, 4-2R)
 - At low level (50mV 10mA) :
150.000 cycles (switches with 2 maintained positions)
100.000 cycles (switches with 3 maintained positions)
50.000 cycles (momentary functions 7, 8, 4-1R, 4-2R, 5)

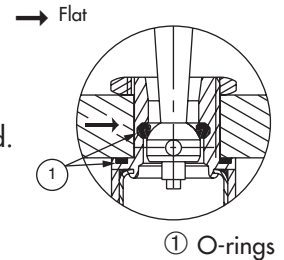


MATERIALS

- Case : diallylphthalate (DAP) with plastic external shell (epoxy sealed)
- Actuator : brass, black chrome plated
- Bushing : brass, black chrome plated
- Contacts : solid rivet - gold plated silver/nickel alloy

SEALING

- Front panel sealing by two O-rings
Flatted bush for precise orientation
- Panel seal withstands 1 bar pressure and remains sealed even when the switch is operated.
- Epoxy sealed terminals
- Splash-proof case



GENERAL SPECIFICATIONS

- Torque : 1,50 Nm (1.10 Ft.lb) max. applied to nut
- Panel thickness : 8 mm (.314) max. - 3 mm (.118) min.
- Shock test : 50g - 11ms (IEC 68-2-27)
- Vibrations : 10-500 Hz - 10g (IEC68-2-6)
- Operating temperature : -40°C to +85°C
- Humidity test : 56 days, 93 % R.H., 40°C (IEC 68-2-3)
- Salt spray test : 96 hours (IEC 68-2-11)

APPROVALS

Many models within this range have full CECC approval and are marked CECC. Please consult factory for list of approved models.



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12000X778 series

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

Overview

MODEL
STRUCTURE

12

SERIES

Terminals and bushings

- 1 Solder lug terminals, threaded bushing Ø 11,9 (15/32)
- 2 Straight PC terminals, threaded bushing Ø 11,9 (15/32)

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
4	ON	ON	ON
	ON	ON	MOM Δ
	MOM	ON	MOM Δ
5		ON	MOM

Function 4

- . For 2 and 4 poles only.
- . Δ Must not have blank in "momentary" box.

Momentary

1R	ON	ON	MOM
2R	MOM	ON	MOM

- . For function 4 only.
- . Leave blank for other functions.

OPTIONS

Fluorescent tip

Blank	None
0.38	White fluorescent tip to lever

Levers

Blank	Standard lever
-12	Short lever

Locking levers

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

X778

High performance fully sealed matt black switches.

Approval

CECC

Availability : Consult factory for details of approved models.

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.



Sealing boots can be used to further protect the switches against dust and water. They are presented in section H.



Mounting accessories : standard hardware supplied with all models : 1 hex nut 14 mm (.551) across flats, part number U41. This nut is presented after model structure of switches.

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



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



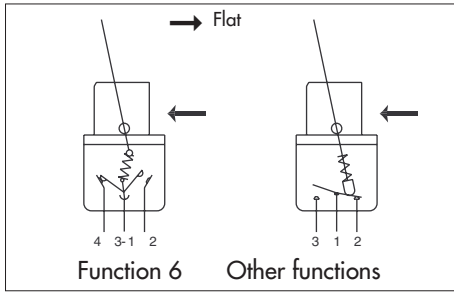
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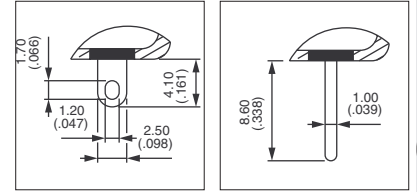
12000X778 series

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

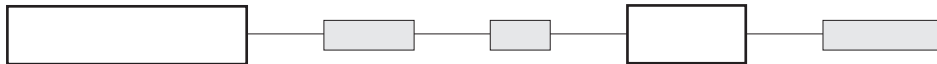
Fully sealed - matt black



Typical angle of throw (A)	
Function 6	24°
Functions 9, 7, 8, 4	20°
Function 5	12°



MODEL STRUCTURE



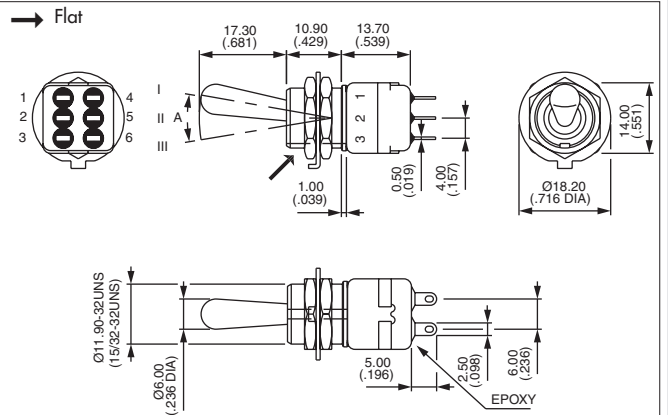
Shown with standard lever

Solder lug terminals - double pole



- 12146 X778
- 12149 X778
- 12147 X778
- 12148 X778
- 12144 X778
- 12144-1R X778
- 12144-2R X778
- 12145 X778

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

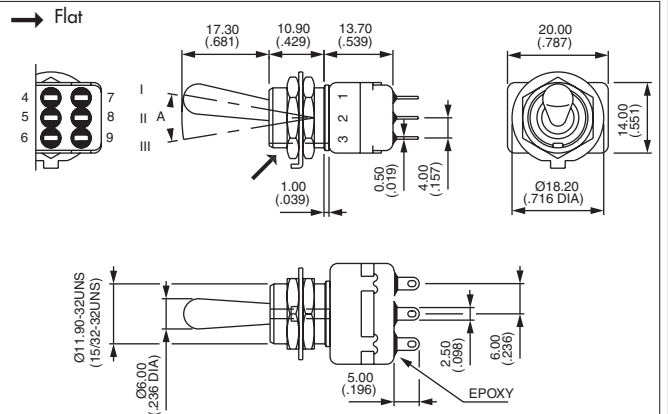


Solder lug terminals - three pole



- 12156 X778
- 12159 X778
- 12157 X778
- 12158 X778

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

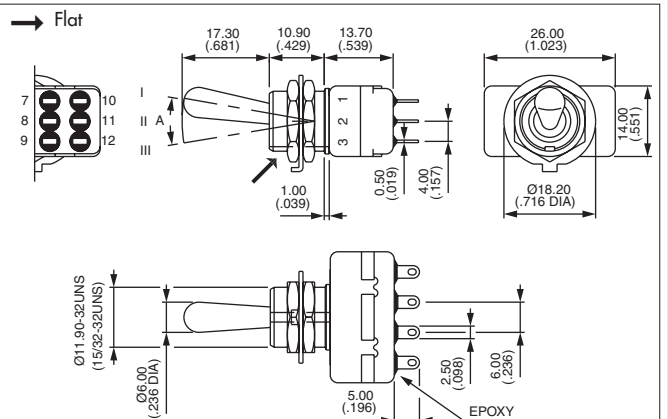


Solder lug terminals - four pole



- 12166 X778
- 12169 X778
- 12167 X778
- 12168 X778
- 12164 X778
- 12164-1R X778
- 12164-2R X778

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



12000X778 series

ermec@ermec.com
 M O D E L
 STRUCTURE

High performance toggle switches - threaded bushing \varnothing 11,9 (15/32)

Fully sealed - matt black

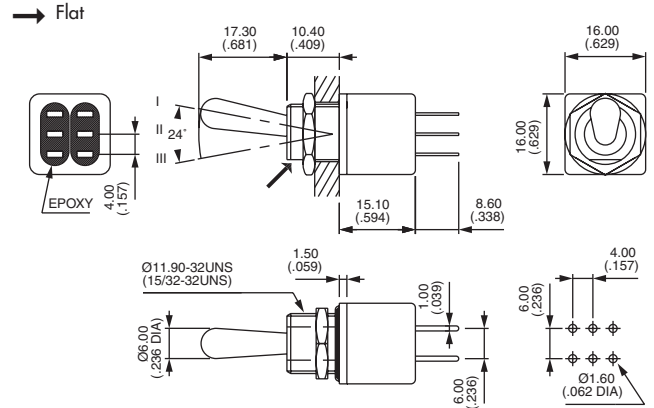
A

Straight PC terminals - double pole ▲



12246 X778

I II III
 ON - ON

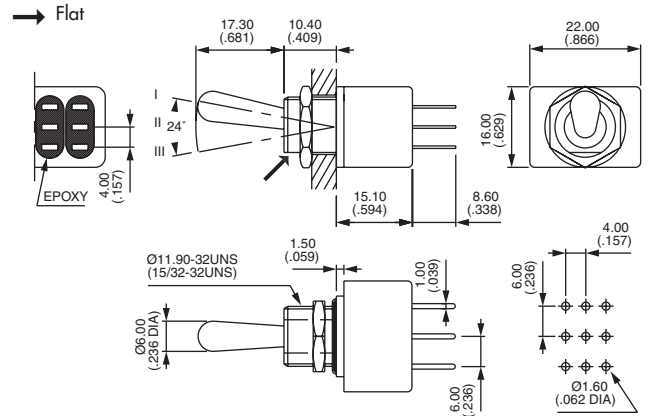


Straight PC terminals - three pole ▲



12256 X778

I II III
 ON - ON

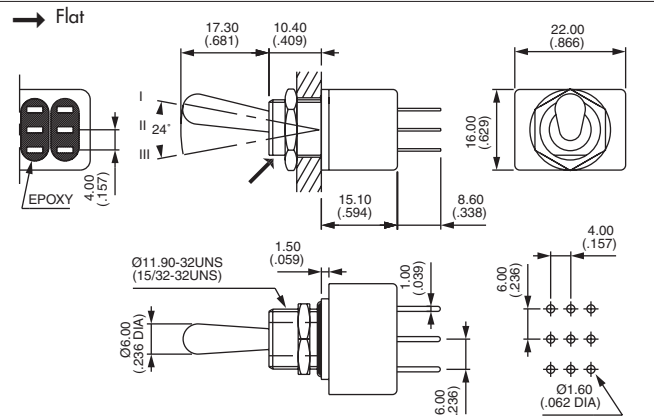


Straight PC terminals - four pole ▲



12266 X778

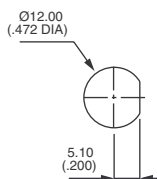
I II III
 ON - ON



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

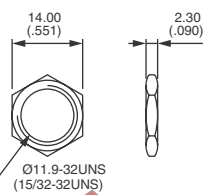
Positions and connections, see next page.

PANEL CUT-OUT



STANDARD HARDWARE

Hex nut



ERMEC (matt black)

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12000X778 series

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

Positions and connections

FUNCTION	LEVER POSITION AND CONNECTIONS			TERMINAL IDENTIFICATION	WIRING FOR 3-WAY SWITCHES (FUNCTION 4)
	I	II	III (Flat)		
12146	ON (1-3)-4 (5-7)-8	-	ON (1-3)-2 (5-7)-6		<p>→ External jumper (added by customer)</p> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>12144</p> </div> <div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> <p>12144-1R</p> </div> <div style="border: 1px solid black; padding: 5px;"> <p>12144-2R</p> </div>
12147 12148 12149 12148CT	MOM ON ON MOM	OFF OFF OFF OFF	MOM MOM ON ON	→ Flat	
12145	-	ON 1-2 4-5	MOM 1-3 4-6		
12144 12144-1R 12144-2R	ON MOM MOM	ON ON ON	ON ON MOM		
	1-2 4-5	1-3 4-5	1-3 4-6		
12156	ON (1-3)-4 (5-7)-8 (9-11)-12	-	ON (1-3)-2 (5-7)-6 (9-11)-10		
12166	ON 1A - 3A 1C - 3C 1E - 3E 1G - 3G	-	ON 1A - 2A 1C - 2C 1E - 2E 1G - 2G		
12164	ON 1A - 2A 1C - 2C 1E - 2E 1G - 2G	ON 1A - 2A 1C - 3C 1E - 2E 1G - 3G	ON 1A - 3A 1C - 3C 1E - 3E 1G - 3G		<div style="border: 1px solid black; padding: 5px;"> <p>12164</p> </div>

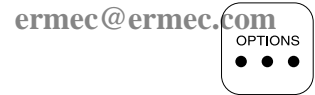
A



www.ermec.com

12000X778 series

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

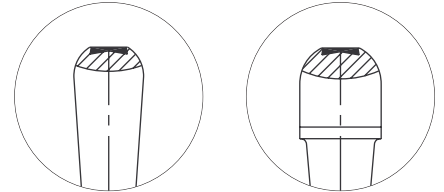


FLUORESCENT TIP



Standard lever

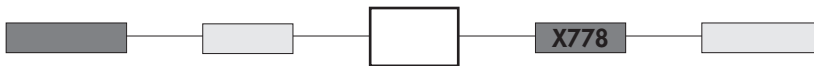
Locking lever



Blank None

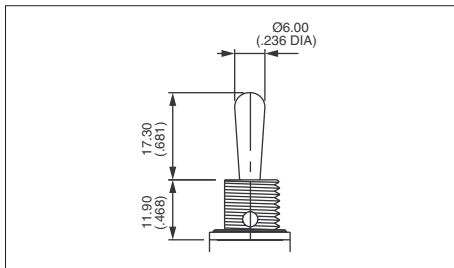
0.38 White fluorescent tip.
Becomes luminous when submitted to ultra-violet rays.

LEVERS / LOCKING LEVERS

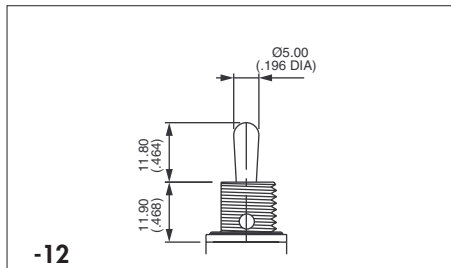


Dash compulsory before lever code.

Levers



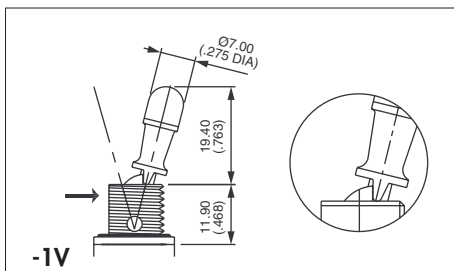
Standard (leave blank)



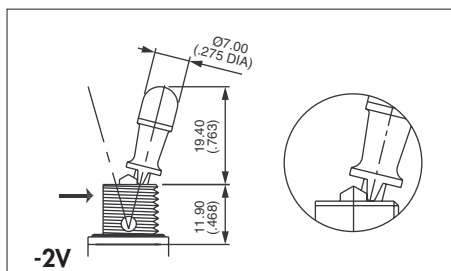
-12
Short lever

Sealing boots : see section H.
Security caps : see section I.

Locking levers

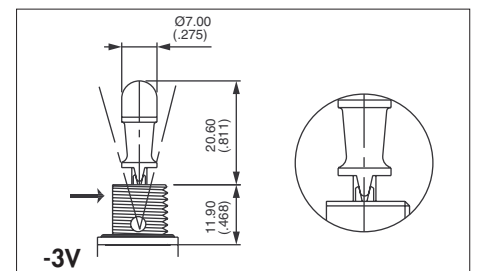


-1V
1 locked position (function 6)
Typical angle of throw : 26°



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

→ Flat



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

Consult factory for other locking lever options.

AGENCY APPROVAL



CECC CECC 96201-005 and CECC 96201-008

Availability : consult factory for details of approved models.

Marking : to order switches marked CECC, please complete above box with "CECC".
Blank : no agency approval required.



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