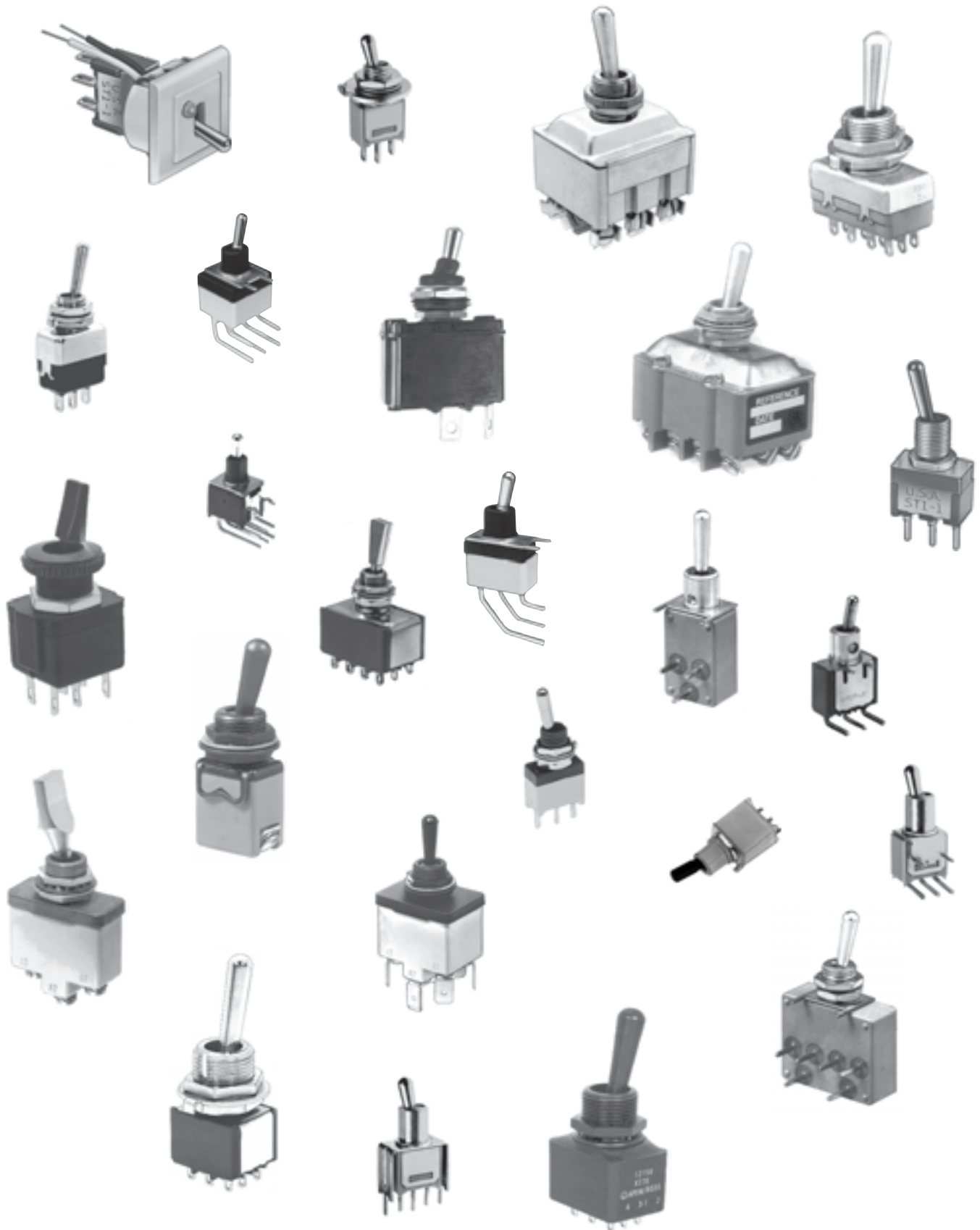


TOGGLE SWITCHES

SEE TOGGLE SWITCH SELECTION GUIDE ON NEXT PAGE

A

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE



TOGGLE SWITCHES

TOGGLE SWITCH SELECTION GUIDE: This catalog contains an extensive variety of toggle switches with numerous options and accessories. To facilitate easy selection of the desired switch for your application, this guide lists the various Series with some key selection parameters.

SERIES	SIZE	RATINGS (Max. in bold)	POLES	SMT MOUNT	PANEL MOUNT	P. C. MOUNT	UL	CSA	VDE	WASHABLE	ESD PROTECTION	PAGE(S)
TL	TINY	0.4VA 20V	SP	X						X	X	A3-A6
TL	TINY	1/2A 48V 0.4VA 20V	SP,DP			X				X	X	A7-A10
ZL <i>New!</i>	TINY	0.5A 48V 0.4VA 20V	SP		X	X						A11-A13
21000N <i>New!</i>	MINIATURE	4A 125VAC 2A 250VAC 4A 30VDC	SP,DP			X						A14-A15
S	MINIATURE	0.4VA 20V 2A 250VAC 5A 125VAC 4A 30VDC	SP,DP			X	X			X	X	A16-A19
SF	MINIATURE	0.4VA 20V 2A 250VAC 5A 125VAC 4A 30VDC	SP		X		X			X	X	A20-A22
5000	MINIATURE	0.4VA 20V 3A 250VAC 6A 125VAC 4A 30VDC	SP,DP,3P,4P		X	X	X	X				A23-A40
55000	MINIATURE	6A 125VAC 3A 250VAC	SP,DP		X	X	X	X	X			A41-A44
ST	MINIATURE	6A 125VAC 0.4VA 20V 3A 250VAC 7A 30VDC	SP,DP		X	X	X	X				A45-A58
11000	STANDARD	4A 125VAC 2A 250VAC 4A 30VDC	SP,DP,3P,4P		X	X						A59-A62
12000	STANDARD	4A 125VAC 2A 250VAC 4A 30VDC	DP,3P,4P		X	X						A63-A66
12000X778	STANDARD	4A 125VAC 2A 250VAC 4A 28VDC	DP,3P,4P		X							A67-A71
4100&4200	STANDARD	6A 125VAC 3A 250VAC 6A 30VDC	DP		X		X	X	X			A72-A73
4600	STANDARD	6A 125VAC 4A 250VAC	SP,DP		X		X	X	X			A74-A75
1500 <i>New!</i>	STANDARD	10A 125VAC 6A 250VAC	SP		X							A76
6000 <i>New!</i>	STANDARD	10A 125VAC 5A 250VAC 6.5A 30VDC	SP,DP,3P,4P		X							A77-A79
3600NF <i>New!</i>	STANDARD	12A 28VDC 6A 250VAC	SP,DP		X							A80-A81
3500 <i>New!</i>	STANDARD	15A 125VAC 10A 250VAC 10A 28VDC	SP,DP		X							A82-A85
600H&NH	STANDARD	20A 125VAC 15A 250VAC 10A 24VDC 15A 1/2HP125/250VAC PEAK CURRENT 150A 250VAC	SP,DP,3P		X		X	X	X			A86-A90

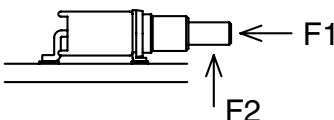
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

DESIGNED EXCLUSIVELY FOR SURFACE MOUNTING

SMT TL Series switches incorporate many desirable features that include:

- **Higher protection against p.c. board tear-offs**

The switch operating force is approx. .56 lbs. while forces required to tear switch off p.c. board are approx. 38 lbs. (F1) and 14 lbs. (F2).



- **Tape & reel packaging**

Recommended for:

- economy
- suitability for automated placement
- handling of large quantities of components per packaging unit
- positive component positioning
- protection of terminals against damage during handling
- high static resistance

- **Reflow solderable**

- High temperature plastic materials
- Tin plated grounding brackets
- Tin-lead alloy over nickel terminal plating
- Terminals turned outward to prevent the shadow effect in infrared soldering and to permit visual inspection of the solder joints
- .021" (0.55mm) air gap between p.c. board and switch case
- End stackable pitch .400" (10.16mm)
- Available with positioning pins to assure correct switch orientation during the reflow process and provide additional mechanical integrity

- **Protected against electrostatic discharges (ESD) up to 10 KV.**

- **Washable**

Switches are designed to withstand cleaning processes, including hot water under pressure.

Surface mount devices (SMD) are subject to more stringent constraints of temperature, solderability, sealing and space savings than through-hole components.

To meet these requirements, APEM has designed a family of tiny surface mount switches that include TL Series toggle switches, TP Series pushbutton switches, TR Series rocker switches & TG Series slide switches. See pushbutton, rocker & slide switch sections of catalog for TP, TR & TG Series respectively.



TL SERIES - SMT WASHABLE TINY TOGGLE SWITCHES

ELECTRICAL SPECIFICATIONS

Contact ratings (resistive lds.):	0.4 VA at 20 V max. (AC or DC)
Minimum load:	10 mA at 50 mV or 10 μ A at 5 VD
Initial contact resistance:	20 milliohms maximum
Insulation resistance:	1000 M Ω min. at 500 VDC
Dielectric strength:	1000 V rms between terminals & frame. 500 V rms between terminals
Electrical life (at full load):	2 position switches: 60,000 cycles 3 position switches: 30,000 cycles
Static resistance:	10 KV (Schaffner equipment)

GENERAL SPECIFICATIONS

Operating temperature range:	-40°C to +85°C
Moisture resistance:	21 days per IEC 512-6 test 11c
Vibration resistance:	10-500 Hz/10g per IEC 512-4 test 6d
Shock resistance:	50 g per IEC 512-4 test 6c

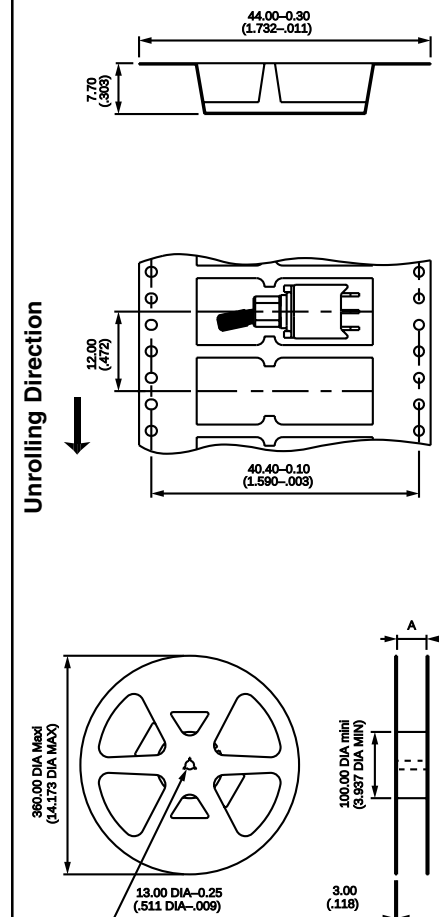
MATERIALS

Case:	High temperature plastic UL94V-0
Actuator:	Nickel plated brass with high temperature plastic UL94V-0 cap
Grounding brackets:	Tin plated steel (includes positioning pins)
Contacts:	Gold plated brass
Terminals:	Brass with tin-lead alloy over nickel plate
Terminal seal:	Epoxy

SOLDERING AND CLEANING

Reflow soldering:	Infrared, vapor phase and infrared convection
Washable:	Per IEA-RS448-2: water and detergent preferred. Solvents.

PACKAGING



Standard packaging unit:

700 pieces
Tape meeting international standard IEC Publication 286-3 (EIA481A)
Start leader: 15.7" (400mm) min.
Dimension 'A': 1.732" (44.00mm)

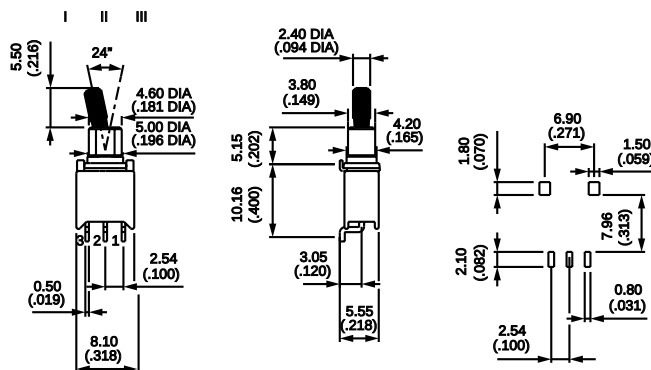
TL SERIES - SMT WASHABLE TINY TOGGLE SWITCHES

A

Single pole toggle switches



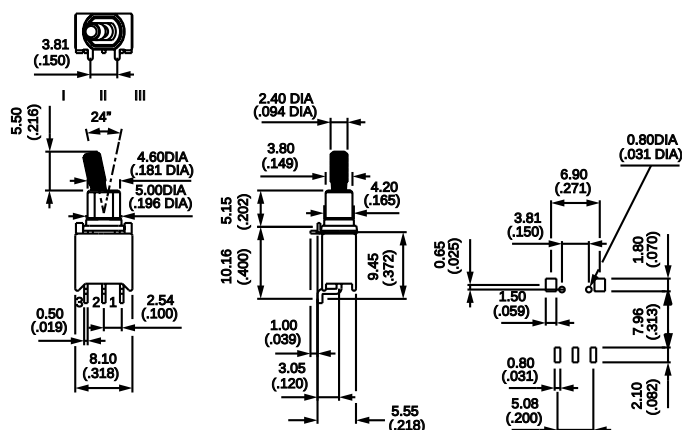
MODEL NO.	CIRCUIT		
TL36WS84000	ON	-	ON
TL39WS84000	ON	OFF	ON
TL37WS84000	MOM	OFF	MOM
TL38WS84000	ON	OFF	MOM
TL32WS84000	ON	-	MOM
Handle position:	III	II	I



Single pole toggle switches with positioning pins

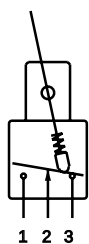


MODEL NO.	CIRCUIT		
TL36WS84065	ON	-	ON
TL39WS84065	ON	OFF	ON
TL37WS84065	MOM	OFF	MOM
TL38WS84065	ON	OFF	MOM
TL32WS84065	ON	-	MOM
Handle position:	III	II	I

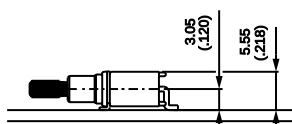


SWITCH ACTION

ON - ON Model shown



P.C. BOARD DIMENSIONS



LED INDICATOR IN TINY TOGGLE PACKAGE

ELECTRICAL SPECIFICATIONS

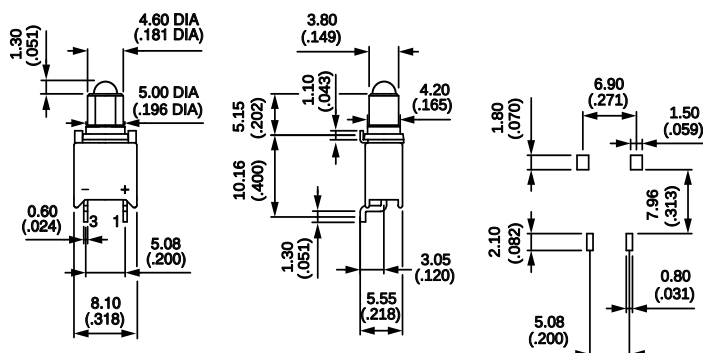
Forward voltage:	Red; 3.0 volts at 10 milliamps (2V typical) Green; 3.0 volts at 20 milliamps (2.2V typical) Yellow; 3.0 volts at 10 milliamps (2.1V typical)
Reverse voltage:	5.0 volts minimum
Viewing angle (total):	90°
Wavelength:	Red; 635 nm Green; 565 nm Yellow; 585 nm

PACKAGING

Tape & reel



MODEL NO.	COLOR
TV01WS00100	Red
TV02WS00100	Green
TV03WS00100	Yellow



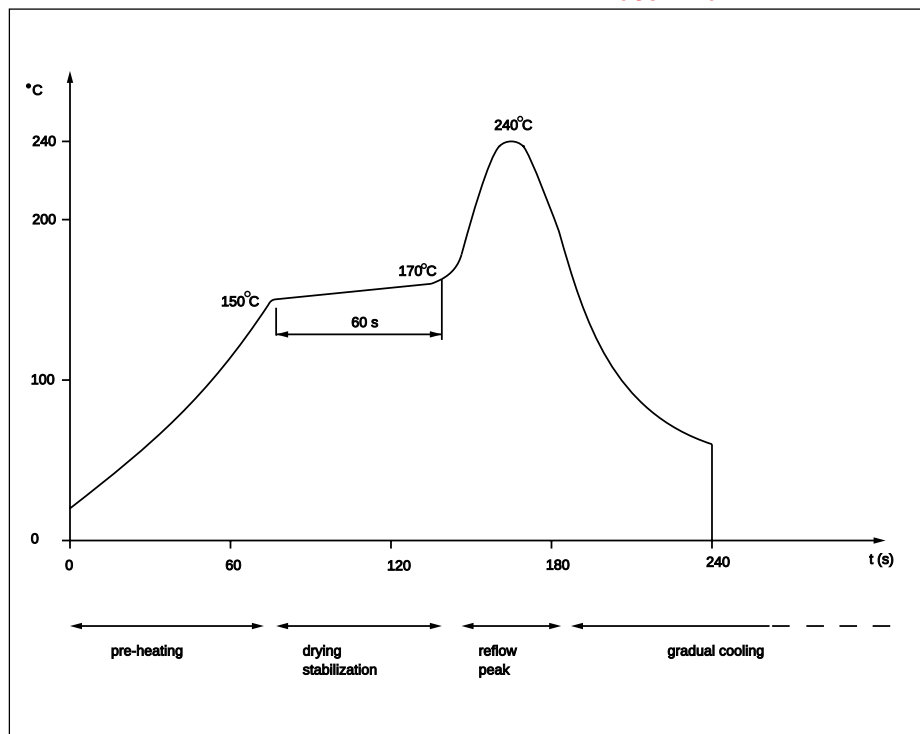
TL SERIES - SMT WASHABLE TINY TOGGLE SWITCHES

REFLOW SOLDERING - STANDARD PROFILE

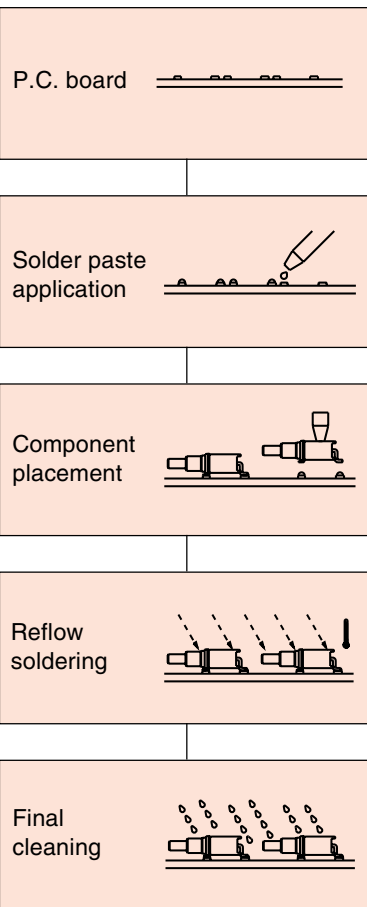
The printed circuit board, carried by a conveyor belt, travels through the reflow soldering oven and experiences the following programmed cycles:

- pre-heat to a maximum of 200°C for 30 seconds
- reflow at a maximum of 245°C for 10 seconds
- final cleaning

TEMPERATURE/TIME PROFILE (typical)

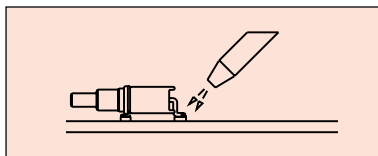


PROCESSING STEPS



P.C. BOARD REWORK RECOMMENDATIONS

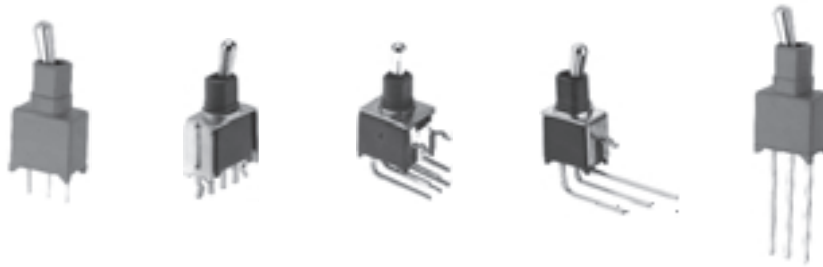
Hot air reflow technique is preferred. Avoid the use of a soldering iron.



Caution: Excessive and/or repeated high temperature exposure may affect switch performance & reliability.

TL SERIES - WASHABLE TINY TOGGLE SWITCHES, P.C. MOUNTING

A



FEATURES

- Wave solderable.
- Fully sealed for process compatibility.
- Ultra-compact case size.
- Brize.

SPECIFICATIONS

Contact ratings (resistive loads):	Gold plated brass; 0.4 Volt-Amps max. at 20 V max. Silver plated brass; 0.5 Amps at 48 V max.
Minimum load:	10 mA at 50 mV - 10 μ A at 5 VDC
Initial contact resistance:	20 milliohms maximum
Insulation resistance:	1000 megohms minimum at 500 VDC
Dielectric strength:	1000 V rms minimum between terminals and frame. 500 V rms between terminals..
Electrical life:	2 position switches - 60,000 cycles minimum. 3 position switches - 30,000 cycles minimum.
Operating temperature range:	-30°C to +85°C
Washing:	Permissible with water, detergents and freons.

MATERIALS

Contacts & Terminals:	Gold or silver plated brass
Actuator:	Nickel plated brass
Bracket:	Tin plated steel
Case:	PBT
Terminal seal:	Epoxy

ABOUT THIS SERIES

The material in this series is organized in the following sequence:

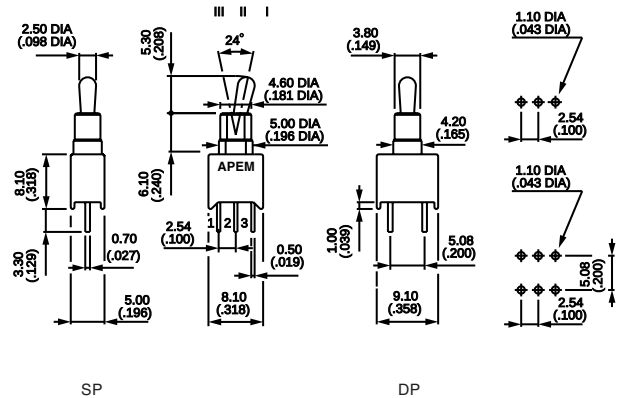
- a. Completely specified switch models
- b. 'build your own switch' order format
- c. Option drawings & special options

TL SERIES - WASHABLE TINY TOGGLE SWITCHES, P.C. MOUNTING

Straight p.c. terminals - gold plated brass contacts



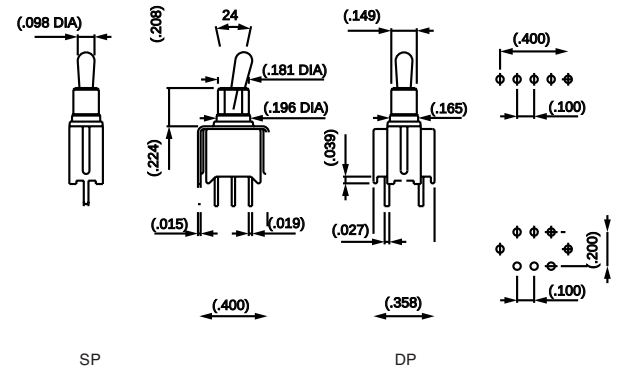
SINGLE POLE MODEL NO.	DOUBLE POLE MODEL NO.	CIRCUIT		
TL36P000000	TL46P000000	ON	-	ON
TL39P000000	TL49P000000	ON	OFF	ON
TL37P000000	TL47P000000	MOM	OFF	MOM
TL38P000000	TL48P000000	ON	OFF	MOM
TL32P000000	TL42P000000	ON	-	MOM
Handle position (see dwg.) :		III	II	I
Terminals connected: SP & DP		2-3		2-1
DP		5-6		4-5



Straight p.c. terminals - mounting bracket - gold plated brass contacts



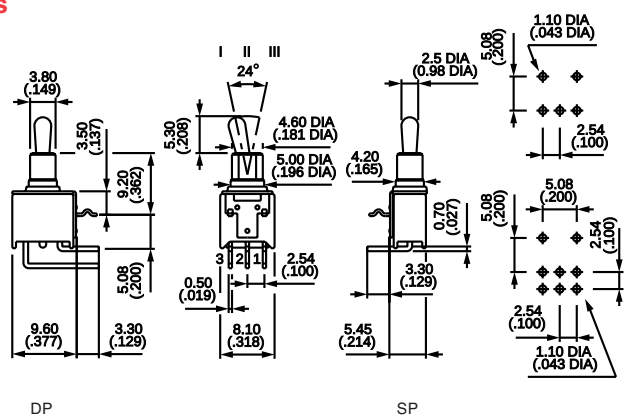
SINGLE POLE MODEL NO.	DOUBLE POLE MODEL NO.	CIRCUIT		
TL36Y000050	TL46Y000050	ON	-	ON
TL39Y000050	TL49Y000050	ON	OFF	ON
TL37Y000050	TL47Y000050	MOM	OFF	MOM
TL38Y000050	TL48Y000050	ON	OFF	MOM
TL32Y000050	TL42Y000050	ON	-	MOM
Handle position (see dwg.) :		III	II	I
Terminals connected: SP & DP		2-3		2-1
DP		5-6		4-5



Horizontal right angle terminals - gold plated brass contacts



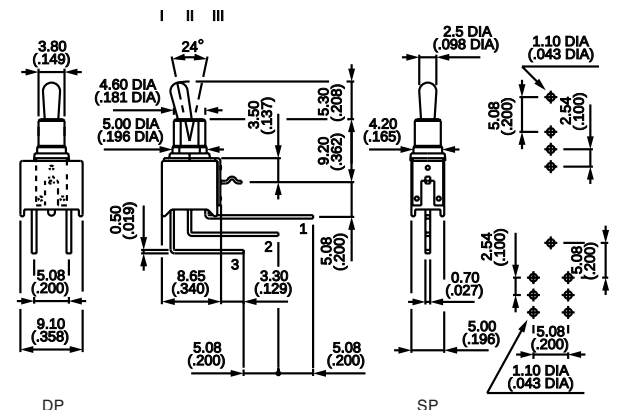
SINGLE POLE MODEL NO.	DOUBLE POLE MODEL NO.	CIRCUIT		
TL36W000050	TL46W000050	ON	-	ON
TL39W000050	TL49W000050	ON	OFF	ON
TL37W000050	TL47W000050	MOM	OFF	MOM
TL38W000050	TL48W000050	ON	OFF	MOM
TL32W000050	TL42W000050	ON	-	MOM
Handle position (see dwg.) :		III	II	I
Terminals connected: SP & DP		2-3		2-1
DP		5-6		4-5



Vertical right angle terminals - gold plated brass contacts



SINGLE POLE MODEL NO.	DOUBLE POLE MODEL NO.	CIRCUIT		
TL36WW000050	TL46WW000050	ON	-	ON
TL39WW000050	TL49WW000050	ON	OFF	ON
TL37WW000050	TL47WW000050	MOM	OFF	MOM
TL38WW000050	TL48WW000050	ON	OFF	MOM
TL32WW000050	TL42WW000050	ON	-	MOM
Handle position (see dwg.) :		III	II	I
Terminals connected: SP & DP		2-3		2-1
DP		5-6		4-5



TL SERIES - WASHABLE TINY TOGGLE SWITCHES, P.C. MOUNTING

A

Wire-wrap terminals - gold plated brass contacts



SINGLE POLE MODEL NO.	DOUBLE POLE MODEL NO.	CIRCUIT		
TL36MW00000	TL46MW00000	ON	-	ON
TL39MW00000	TL49MW00000	ON	OFF	ON
TL37MW00000	TL47MW00000	MOM	OFF	MOM
TL38MW00000	TL48MW00000	ON	OFF	MOM
TL32MW00000	TL42MW00000	ON	-	MOM
Handle position (see dwg.) :		III	II	I
Terminals connected:		SP & DP	2-3	2-1
		DP	5-6	4-5

SP9.409.(6.10)T2989.409.(6.10)T298

DP

Additional ordering information: Commonly ordered models are shown above with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.
(Allowable options are shown below each respective box).

Model Structure:

Series	Number of poles	Electrical functions	Terminals
T L			
	3 Single pole	6 ON - ON	P 0 Straight p.c.
	4 Double pole	9 ON OFF ON	Y 0 Straight p.c.with bracket
		7 MOM OFF MOM	W 0 Horizontal right angle
		8 ON OFF MOM	W W Vertical right angle
		2 ON - MOM	M W Wire-wrap

Options:

Contact & terminal mat'ls.

- 0 Brass, gold plated
- 1 Brass, silver plated
- 3 Brass, gold plated - (1.27 microns gold)
- 8 Brass, gold plated contacts with tin plated terminals
- 9 Contacts brass, gold plated - (1.27 microns gold) and tin plated terminals

Actuators & case colors

Specify 00, 01, 02, 03, 04, 05, 30, 40, 50, 51, 52, 53, 54, 55, 56, 90, or 94
See drawings below with specifications and dimensions.

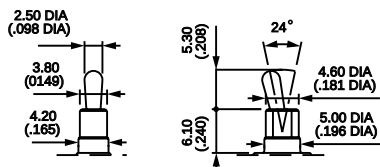
Special options

- 0 0 No special requirement
 - 5 0 Crimped bracket terminals - specify for models with brackets
- See additional listings on following page.

Example of completely specified model number: **TL36W015150**

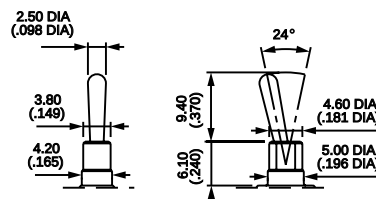
OPTION DRAWINGS

Brass actuators & case colors



Short (standard)

	Blue case	Black case
nickel plated	00	50
matte black	01	51

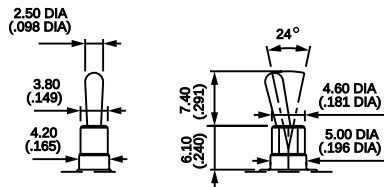


Long

	Blue case	Black case
nickel plated	02	52
matte black	03	53

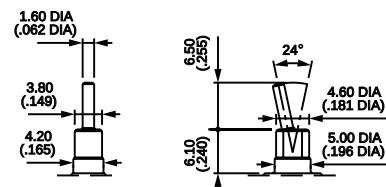
TL SERIES - WASHABLE TINY TOGGLE SWITCHES, P.C. MOUNTING

Brass actuators & case colors (cont'd.)



Medium

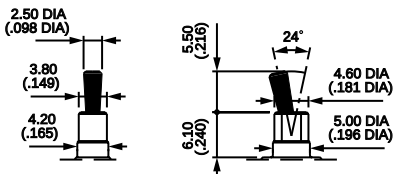
	Blue case	Black case
nickel plated	04	54
matte black	05	55



Cylindrical

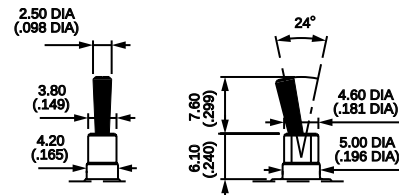
	Black case
nickel plated	56

Black plastic insulative actuators & case colors (protects against electrostatic discharges (ESD) up to 10 KV)



Short

	Blue case	Black case
	40	94

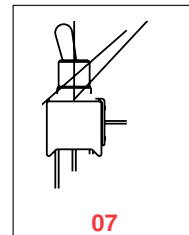


Long

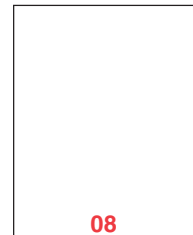
	Blue case	Black case
	30	90

SPECIAL OPTIONS

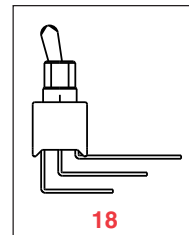
- 00** No special requirement
- 07** Trimmed terminals for **WW** models only - .125" (3.2mm).
- 08** Extended terminals for **W0** models only.
- 18** **WW** models without mounting bracket.
- 20** Mounting bracket for **WW** models with p.c. board spacer tab.
- 25** Trimmed terminals for all models except **WW** - .196" (5mm).
- 30** Wire-wrap terminals on models with **Y** bracket.
- 50** Crimped bracket terminals (retains switch on p.c. board during assembly and soldering). For models with **W0**, **WW** & **Y0** terminals.



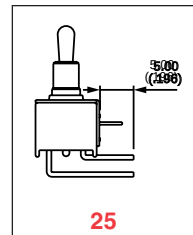
07



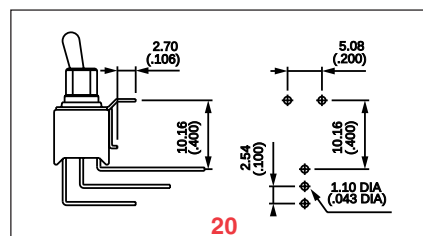
08



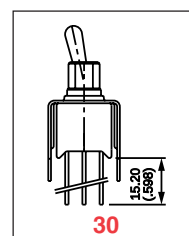
18



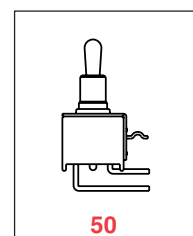
25



20



30



50

New! ZL SERIES - TINY TOGGLE SWITCHES, PANEL & P.C. MTG.

A



FEATURES

- Metal bushing, threaded with flat or keyway, or plain.
- Wave solderable.
- Ultra-compact case size.
- SPDT models with epoxy sealed terminals.

SPECIFICATIONS

Contact ratings (resistive loads):	Gold plated brass; 0.4 Volt-Amps max. at 20 V max. Silver plated brass; 0.5 Amps at 48 V max.
Minimum load:	10 mA at 50 mV - 10 μ A at 5 VDC
Initial contact resistance:	20 milliohms maximum
Insulation resistance:	1000 megohms minimum at 500 VDC
Dielectric strength:	1000 V rms minimum between terminals and frame. 500 V rms between terminals..
Electrical life:	Gold contacts: 2 position - 60,000 cycles min. - 3 position - 30,000 cycles min. Silver contacts: 2 position - 20,000 cycles min. - 3 position - 10,000 cycles min.
Operating temperature range:	-30°C to +85°C
Moisture resistance:	21 days 95% (NFC 20-603 - IEC 8-2-3)
Torque:	1Nm (0.96 ft-lbs) max. applied between 2 nuts
Panel thickness (max.):	1.5mm (.059") with 2 nuts - 3mm (.118") with 1 nut
Hardware:	Threaded models supplied with 2 hex nuts 7mm (.275") across flats, 1 locking ring and 1 lockwasher. See hardware section of catalog.

MATERIALS

Contacts & Terminals:	Gold or silver plated brass
Actuator:	Nickel plated brass
Bushing:	Tin plated zamac
Bracket:	Tin plated steel
Case:	UL94-VO thermoplastic
Terminal seal:	Epoxy

ABOUT THIS SERIES

The material in this series is organized in the following sequence:

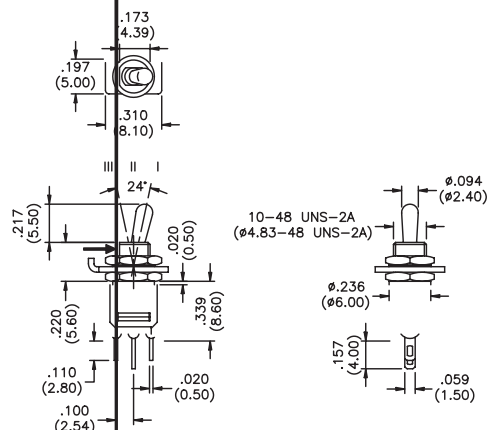
- a. Completely specified switch models
- b. 'build your own switch' order format
- c. Option drawings

New! ZL SERIES - TINY TOGGLE SWITCHES, PANEL & P.C. MTG.

Solder lug terminals - silver contacts - threaded bushing



MODEL NO.	CIRCUIT		
ZL31S0102	ON	-	OFF
ZL36S0102	ON	-	ON
ZL39S0102	ON	OFF	ON
ZL37S0102	MOM	OFF	MOM
ZL38S0102	ON	OFF	MOM
ZL32S0102	ON	-	MOM
Handle position (see dwg.) :			
	III	II	I



Straight p.c. terminals - gold contacts - threaded bushing



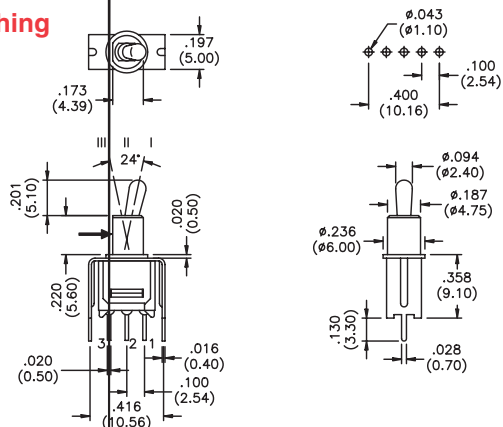
MODEL NO.	CIRCUIT		
ZL31P0002	ON	-	OFF
ZL36P0002	ON	-	ON
ZL39P0002	ON	OFF	ON
ZL37P0002	MOM	OFF	MOM
ZL38P0002	ON	OFF	MOM
ZL32P0002	ON	-	MOM
Handle position (see dwg.) :			
	III	II	I

15.20mm (.598") wire-wrap terminals
also available - to specify substitute
MW for **P0** in above model numbers.

Straight p.c. terminals - mtg. bracket - gold contacts - plain bushing



MODEL NO.	CIRCUIT		
ZL31Y0000	ON	-	OFF
ZL36Y0000	ON	-	ON
ZL39Y0000	ON	OFF	ON
ZL37Y0000	MOM	OFF	MOM
ZL38Y0000	ON	OFF	MOM
ZL32Y0000	ON	-	MOM
Handle position (see dwg.) :			
	III	II	I



Horizontal right angle terminals - gold contacts - plain bushing



MODEL NO.	CIRCUIT		
ZL31W0000	ON	-	OFF
ZL36W0000	ON	-	ON
ZL39W0000	ON	OFF	ON
ZL37W0000	MOM	OFF	MOM
ZL38W0000	ON	OFF	MOM
ZL32W0000	ON	-	MOM
Handle position (see dwg.) :			
	III	II	I

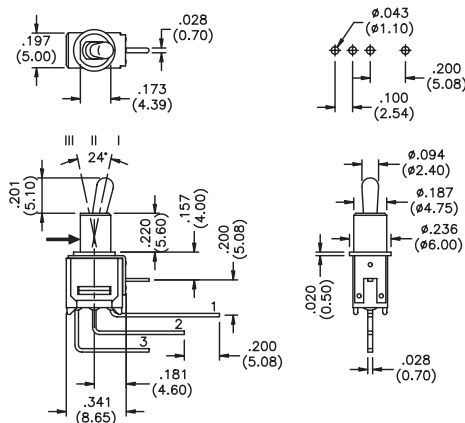
New! ZL SERIES - TINY TOGGLE SWITCHES, PANEL & P.C. MTG.

A

Vertical right angle terminals - gold contacts - plain bushing



MODEL NO.	CIRCUIT		
ZL31WW000	ON	-	OFF
ZL36WW000	ON	-	ON
ZL39WW000	ON	OFF	ON
ZLS7WW000	MOM	OFF	MOM
ZL38WW000	ON	OFF	MOM
ZL32WW000	ON	-	MOM
Handle position (see dwg.) : III II I			



Additional ordering information: Commonly ordered models are shown above with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

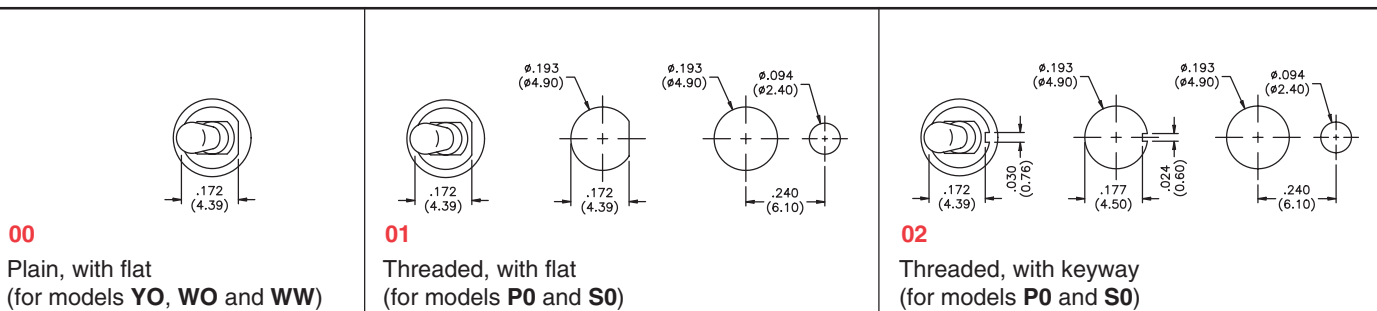
Fill in boxes with selections shown for complete model number.
(Allowable options are shown below each respective box).

Series	Single pole	Electrical functions	Terminals	Contact & terminal mat'ls.	Bushings
Z L	3				
		1 ON - OFF 6 ON - ON 9 ON OFF ON 7 MOM OFF MOM 8 ON OFF MOM 2 ON - MOM	S 0 Solder lug P 0 Straight p.c. Y 0 Straight p.c. with bracket W 0 Horizontal right angle W W Vertical right angle M W Wire-wrap	0 Brass, gold plated 1 Brass, silver plated 3 Brass, gold plated - (1.27 microns gold)	0 0 Plain 0 1 Threaded with flat 0 2 Threaded with keyway

Example of completely specified model number: **ZL36S0302**

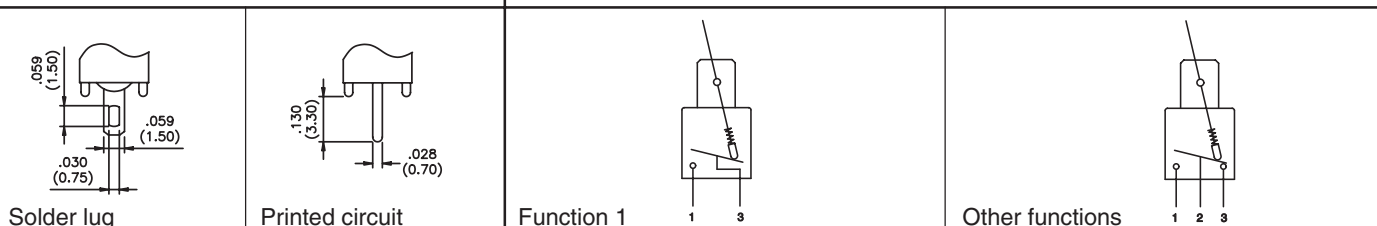
Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

BUSHINGS

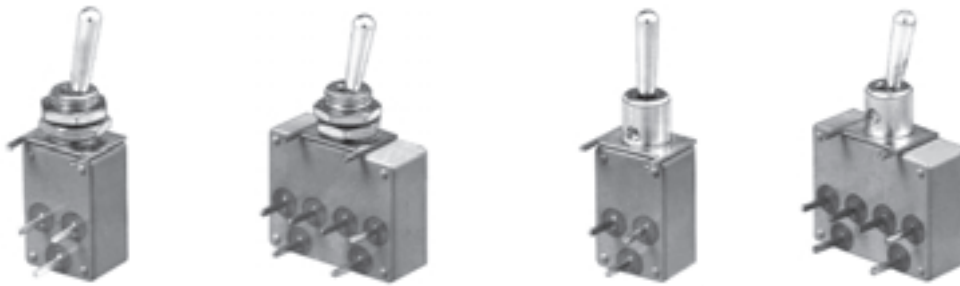


TERMINALS

CROSS SECTIONS



New! 21000N SERIES - MINIATURE TOGGLE SWITCHES



FEATURES

- SPDT & DPDT models with uniform low profile height for p.c. mounting.
- Threaded or plain bushing with mounting bracket.
- Epoxy terminal sealing standard on all models.
- Straight p.c. terminals designed for wave soldering.

SPECIFICATIONS

Contact ratings (resistive loads):	2 Amps at 250 VAC, 4 Amps at 125 VAC or 4 Amps at 30 VDC
Initial contact resistance:	20 milliohms maximum
Insulation resistance:	1000 megohms min. at 500 VDC
Dielectric strength:	1000 V rms min. - between terminals 2000 V rms min. - between poles and terminals and frame
Electrical life (resistive):	20,000 cycles minimum
Operating temperature range:	-40°C to +85°C

MATERIALS

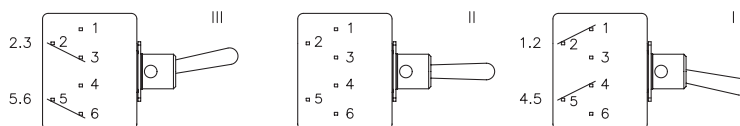
Contacts & Terminals:	Silver
Actuator:	Chrome plated brass
Bushing:	Nickel plated brass
Case & Cover:	PBT
Terminal seal:	Epoxy
Hardware:	Panel mounting models supplied with 2 Hex Nuts .314" (8mm) across flats (See hardware section of catalog).

POSITIONS AND CONNECTIONS

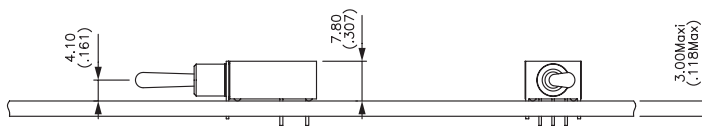
CIRCUIT

ON	-	ON
ON	OFF	ON
MOM	OFF	MOM
Consult factory for other circuits.		

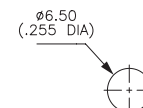
VIEWED FROM BOTTOM OF SWITCH



PRINTED CIRCUIT BOARD MOUNTING



PANEL CUT-OUT



New! 21000N SERIES - MINIATURE TOGGLE SWITCHES

A

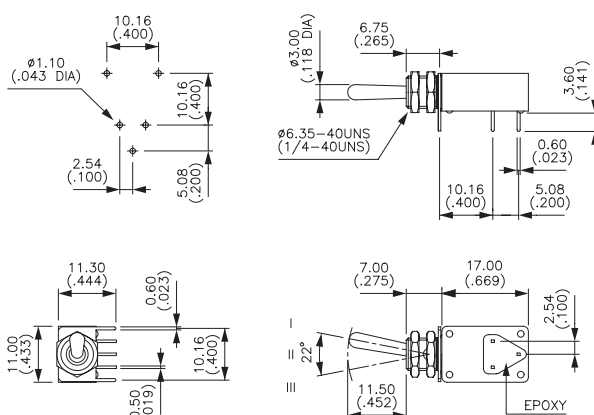
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Threaded bushing - single pole



MODEL NO.	CIRCUIT		
21136NA	ON	-	ON
21139NA	ON	OFF	ON
21137NA	MOM	OFF	ON
Handle position (see dwg.) :	III	II	I
Terminals conn.	2-3		1-2

Consult factory for other configurations.

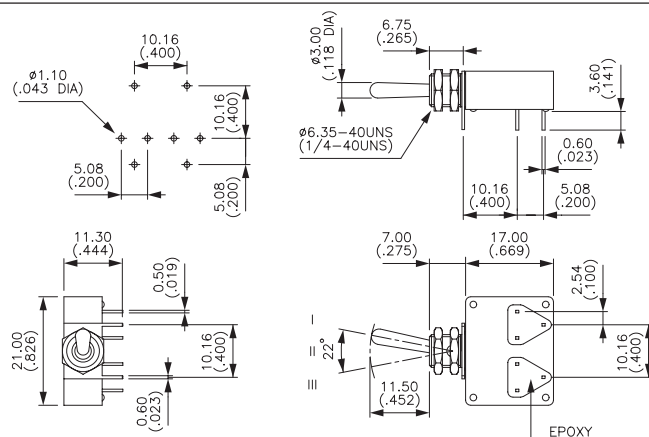


Threaded bushing - double pole



MODEL NO.	CIRCUIT		
21146NA	ON	-	ON
21149NA	ON	OFF	ON
21147NA	MOM	OFF	ON
Handle position (see dwg.) :	III	II	I
Terminals conn.	2-3		1-2
	5-6		4-6

Consult factory for other configurations.

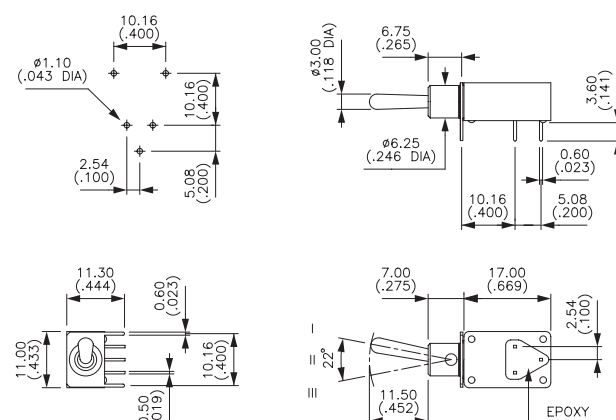


Plain bushing - single pole



MODEL NO.	CIRCUIT		
21236NA	ON	-	ON
21239NA	ON	OFF	ON
21237NA	MOM	OFF	ON
Handle position (see dwg.) :	III	II	I
Terminals conn.	2-3		1-2

Consult factory for other configurations.

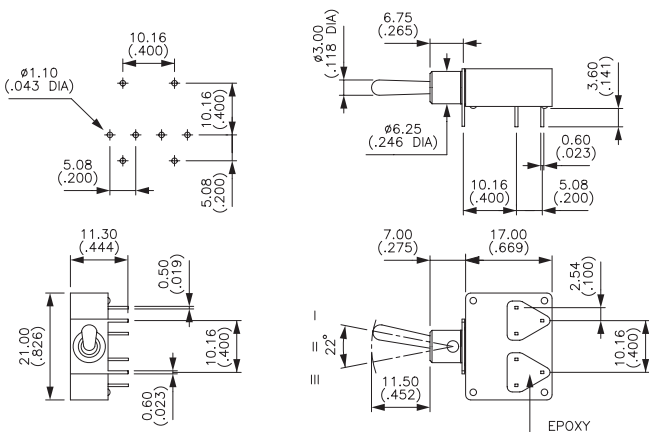


Plain bushing - double pole

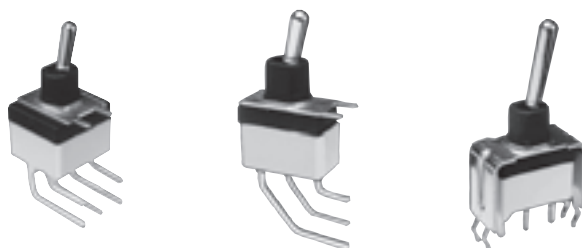


MODEL NO.	CIRCUIT		
21246NA	ON	-	ON
21249NA	ON	OFF	ON
21247NA	MOM	OFF	ON
Handle position (see dwg.) :	III	II	I
Terminals conn.	2-3		1-2
	5-6		4-6

Consult factory for other configurations.



S SERIES - WASHABLE MINIATURE TOGGLE SWITCHES, P.C. MOUNTING



FEATURES

- Wave solderable.
- Fully sealed for process compatibility.
- SPDT & DPDT models.
- Compact case size with ESD protection options.
- Agency recognition (see below).

SPECIFICATIONS

Contact ratings (resistive loads):	Gold plated brass; 0.4 Volt-Amps max. at 20 V max. Silver; 2 Amps at 250 VAC, 5 Amps at 125 VAC or 4 Amps at 30 VDC. Gold plated silver; 2 Amps at 250 VAC, 5 Amps at 125 VAC or 4 Amps at 30 VDC. Gold plating withstands up to 300 mA at 30 VDC.
Initial contact resistance:	10 milliohms maximum
Insulation resistance:	1000 megohms minimum
Dielectric strength:	1000 V rms minimum
Electrical life:	Gold: 2 positions - 100,000 cycles min. 3 positions - 50,000 cycles min. Silver: 40,000 cycles minimum.
Operating temperature range:	-20°C to +85°C
Washing:	Permissible with water, detergents and freons.

MATERIALS

Contacts & Terminals:	Gold plated brass, silver or gold plated silver
Actuator:	Chrome plated brass
Bracket:	Tin plated steel
Case:	UL94V-0 - Polyamide, glass filled or PES
Terminal seal:	Epoxy

AGENCY RECOGNITION



UL, CECC, GAM T1 (military)
 Availability: consult factory for details of recognized models.
 Marking: to order switches marked UL or CECC, complete the appropriate box of the ordering format.
 GAM T1 listing does not appear on the switches.

ABOUT THIS SERIES

The material in this series is organized in the following sequence:

- Completely specified switch models
- 'build your own switch' order format
- Option drawings & special options
- Miscellaneous

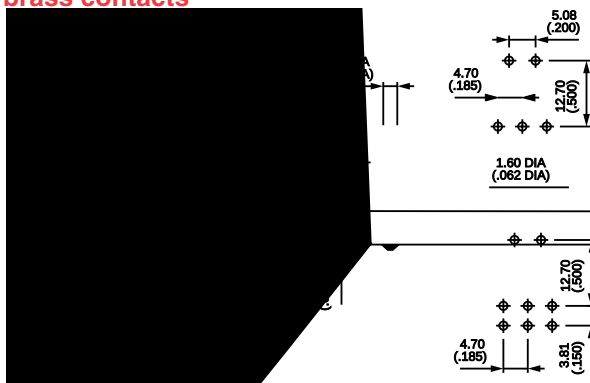
S SERIES - WASHABLE MINIATURE TOGGLE SWITCHES, P.C. MOUNTING

A

Horizontal right angle terminals - .185" spacing - gold plated brass contacts

SINGLE POLE MODEL NO.	DOUBLE POLE MODEL NO.	CIRCUIT		
SW236CD7	SW246CD7	ON	-	ON
SW239CD7	SW249CD7	ON	OFF	ON
SW237CD7	SW247CD7	MOM	OFF	MOM
SW238CD7	SW248CD7	ON	OFF	MOM
SW232CD7	SW242CD7	ON	-	MOM
-	SW244THCD7*	ON	ON	ON
Handle position (see dwg.) :		III	II	I
Terminals connected: SP & DP		2-3		2-1
DP		5-6		4-5

* Function 4: SP in DP case - see diagram at end of section.



Horizontal right angle terminals - .200" spacing - gold plated brass contacts

SINGLE POLE MODEL NO.	DOUBLE POLE MODEL NO.	CIRCUIT		
SW036CD7	SW046CD7	ON	-	ON
SW039CD7	SW049CD7	ON	OFF	ON
SW037CD7	SW047CD7	MOM	OFF	MOM
SW038CD7	SW048CD7	ON	OFF	MOM
SW032CD7	SW042CD7	ON	-	MOM
-	SW044THCD7*	ON	ON	ON
Handle position (see dwg.) :		III	II	I
Terminals connected: SP & DP		2-3		2-1
DP		5-6		4-5

* Function 4: SP in DP case - see diagram at end of section.

Vertical right angle terminals - gold plated brass contacts

SINGLE POLE MODEL NO.	DOUBLE POLE MODEL NO.	CIRCUIT		
SWW236CD7	SWW246CD7	ON	-	ON
SWW239CD7	SWW249CD7	ON	OFF	ON
SWW237CD7	SWW247CD7	MOM	OFF	MOM
SWW238CD7	SWW248CD7	ON	OFF	MOM
SWW232CD7	SWW242CD7	ON	-	MOM
-	SWW244THCD7*	ON	ON	ON
Handle position (see dwg.) :		III	II	I
Terminals connected: SP & DP		2-3		2-1
DP		5-6		4-5

* Function 4: SP in DP case - see diagram at end of section.

Straight p.c. terminals - mounting bracket - gold plated brass contacts

SINGLE POLE MODEL NO.	DOUBLE POLE MODEL NO.	CIRCUIT		
SY236CD7	SY246CD7	ON	-	ON
SY239CD7	SY249CD7	ON	OFF	ON
SY237CD7	SY247CD7	MOM	OFF	MOM
SY238CD7	SY248CD7	ON	OFF	MOM
SY232CD7	SY242CD7	ON	-	MOM
-	SY244THCD7*	ON	ON	ON
Handle position (see dwg.) :		III	II	I
Terminals connected: SP & DP		2-3		2-1
DP		5-6		4-5

* Function 4: SP in DP case - see diagram at end of section.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

S SERIES - WASHABLE MINIATURE TOGGLE SWITCHES, P.C. MOUNTING

Additional ordering information: Commonly ordered models are shown above with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number. Allowable options are shown below each respective box.

Note: 'NONE' indicates box may be left empty.

Model Structure:

Series	Terminals	Bushing & terminals	Number of poles	Electrical functions
S				
	W	horizontal	2	Terminal spacing
		rt. angle mtg.		.185" (4,7mm) or
	W W	vertical		.150" (3,81mm)
		rt. angle mtg.	0	Terminal spacing
	Y	Bracket mtg.		.200" (5,08mm)
				(SY & SW models)
				All models have plain bushing
			3	Single pole
			4	Double pole
			6	ON - ON
			9	ON OFF ON
			7	MOM OFF MOM
			8	ON OFF MOM
			2	ON - MOM
			4 T H	ON ON ON

Options:

Contact materials	Actuators	Agency recognition	Special options
A	7	(NONE)	(NONE)
A D	1 3	U L	F
		C E C C	
C D	Insulated actuators:	Consult factory	X 6 0 1
	1 1 Long	for availability.	X 6 9 6
	8 Short		

Examples of completely specified model numbers:

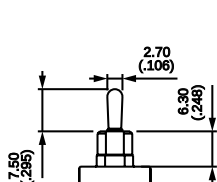
SW236CD7, SW244THAD11ULX696

Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

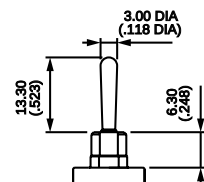
OPTION DRAWINGS

ACTUATORS

CHROME PLATED BRASS



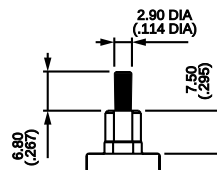
7 Standard



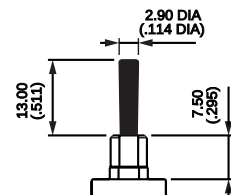
13 Long

INSULATED

Protects against electrostatic discharges (ESD) up to 12 KV.
Color: black Note: must be ordered with option X696.



8 Short



11 Long

SPECIAL OPTIONS

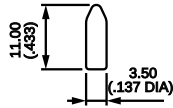
- F** Tin plated terminals.
- X601** Silver plated brass contacts. Lower rating. Minimum quantity: 5000 pcs.
- X696** Longer bushing - .295" (7.5mm). Specify for actuators 8 and 11.

S SERIES - WASHABLE MINIATURE TOGGLE SWITCHES, P.C. MOUNTING

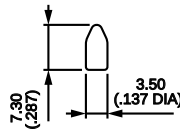
A

OPTION DRAWINGS & MISCELLANEOUS

INSULATING CAPS (replace '0' in part numbers with color code)



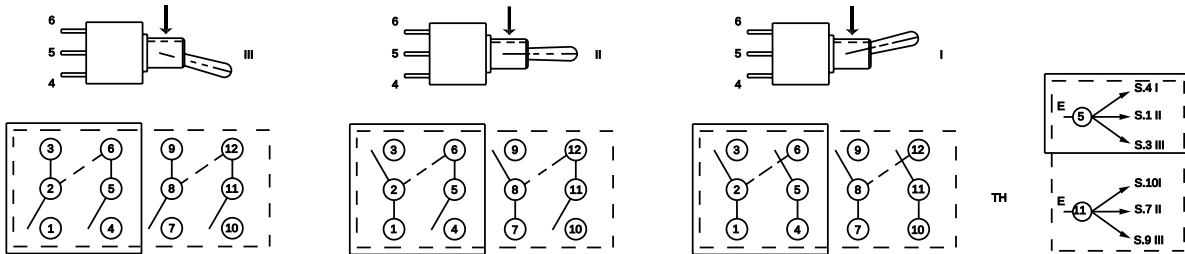
U270 For actuator 13



U1710 For actuator 7

- | | |
|-----|--------|
| 1 | blue |
| 2 | black |
| 3 | green |
| 4 | grey |
| 5 | yellow |
| 6 | red |
| 7/1 | white |
| 9 | orange |

WIRING for function 4 switch



Above diagrams are viewed from bottom of switch.

Equivalent to single pole 3 throw switch. Dotted lines between terminals 2 & 6 and 8 & 12 indicate external jumpers to be added by customer

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

SF SERIES - WASHABLE MINIATURE TOGGLE SWITCHES, PANEL MTG.



FEATURES

- Insulated threaded bushing.
- Fully sealed for process compatibility.
- SPDT models.
- Compact case size with ESD protection options.
- Agency recognition (see below).

SPECIFICATIONS

Contact ratings (resistive loads):	Gold plated brass; 0.4 Volt-Amps max. at 20 V max. Silver; 2 Amps at 250 VAC, 5 Amps at 125 VAC or 4 Amps at 30 VDC. Gold plated silver; 2 Amps at 250 VAC, 5 Amps at 125 VAC or 4 Amps at 30 VDC. Gold plating withstands up to 300 mA at 30 VDC.
Initial contact resistance:	10 milliohms maximum
Insulation resistance:	1000 megohms minimum
Dielectric strength:	1000 V rms minimum
Electrical life:	Gold: 2 positions - 100,000 cycles min. 3 positions - 50,000 cycles min. Silver: 40,000 cycles minimum.
Operating temperature range:	-20°C to +85°C
Washing:	Permissible with water, detergents and freons.

MATERIALS

Contacts & Terminals:	Gold plated brass, silver or gold plated silver
Actuator:	Chrome plated brass
Bracket:	Tin plated steel
Case:	UL94V-0 - Polyamide, glass filled or PES
Terminal seal:	Epoxy
Hardware:	Supplied with 2 Hex Nuts .314" (8mm) across flats, 1 Locking Ring & 1 Lockwasher. See hardware section of catalog.

AGENCY RECOGNITION



UL, CECC, GAM T1 (military)
 Availability: consult factory for details of recognized models.
 Marking: to order switches marked UL or CECC, complete the appropriate box of the ordering format.
 GAM T1 listing does not appear on the switches.

ABOUT THIS SERIES

The material in this series is organized in the following sequence:

- Completely specified switch models
- 'build your own switch' order format
- Option drawings
- Miscellaneous

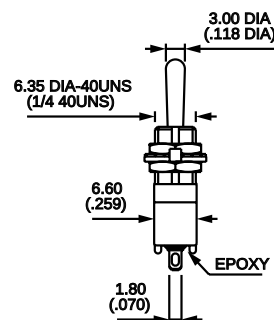
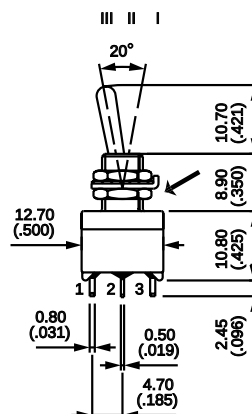
SF SERIES - WASHABLE MINIATURE TOGGLE SWITCHES, PANEL MTG.

A

Solder lug terminals - silver contacts



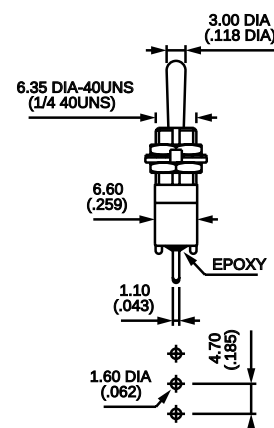
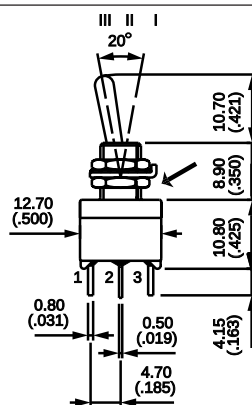
SINGLE POLE MODEL NO.	CIRCUIT		
SF36S0100	ON	-	ON
SF39S0100	ON	OFF	ON
SF37S0100	MOM	OFF	MOM
SF38S0100	ON	OFF	MOM
SF32S0100	ON	-	MOM
Handle pos. (see dwg.): III II I			
Terminals connected: 2-3 2-1			



Straight p.c. terminals - gold plated brass contacts



SINGLE POLE MODEL NO.	CIRCUIT		
SF36P0000	ON	-	ON
SF39P0000	ON	OFF	ON
SF37P0000	MOM	OFF	MOM
SF38P0000	ON	OFF	MOM
SF32P0000	ON	-	MOM
Handle pos. (see dwg.): III II I			
Terminals connected: 2-3 2-1			



Additional ordering information: Commonly ordered models are shown above with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number. Allowable options are shown below each respective box.

Model Structure:

Series	Number of poles	Electrical functions	Terminals
☐ S ☐ F	3 Single pole	6 ON - ON 9 ON OFF ON 7 MOM OFF MOM 8 ON OFF MOM 2 ON - MOM	S 0 Solder lug terminals P 0 Straight p.c. terminals

Options:

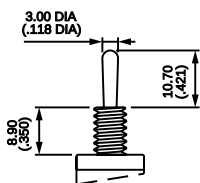
Contact & terminal materials	Actuators	Model	Insulating Cap
0 1 2 5 8	0 0 1 8 1	0 0 Standard	1 0
0 Brass, gold plated 1 Silver 2 Silver, gold plated 5 Special contact, lower rating 8 Brass, gold plated contacts with tin plated terminals	0 0 Long (standard) 0 1 Short Insulated actuators: 0 8 Short 1 1 Long		* - Specify color - see next page Example of completely specified model number: SF37S01000012

SF SERIES - WASHABLE MINIATURE TOGGLE SWITCHES, PANEL MTG.

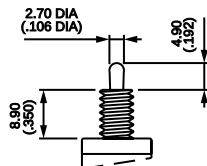
OPTION DRAWINGS & MISCELLANEOUS

ACTUATORS

Chrome plated brass



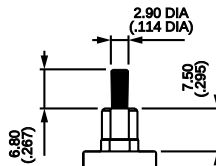
00 Standard



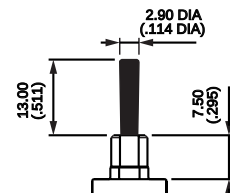
01 Short

INSULATED LEVERS

Insulates against electrostatic discharges (ESD) up to 12 KV. Color: black



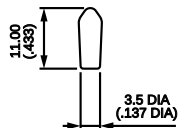
08 Short



11 Long

INSULATING CAPS (replace '0' in part numbers with color code)

For actuator 00 only

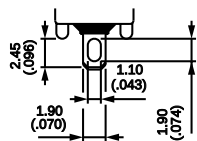


- | | |
|-----|--------|
| 1 | blue |
| 2 | black |
| 3 | green |
| 4 | grey |
| 5 | yellow |
| 6 | red |
| 7/1 | white |
| 9 | orange |

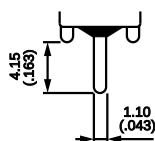
10

U270 If ordered separately

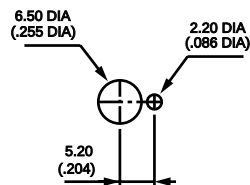
MISCELLANEOUS



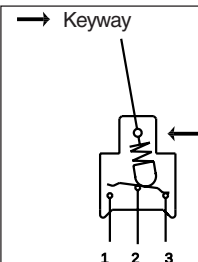
Solder lug terminal



P.C. terminal



Panel Cut-out



5000 SERIES - MINIATURE TOGGLE SWITCHES

A

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE



FEATURES

- Broadest selection offered in miniature switches.
- SPDT, DPDT, 3PDT & 4PDT models with numerous options.
- Numerous configurations for panel, panel & p.c. and p.c. mounting.
- Extensive agency recognition (see below).

SPECIFICATIONS

Contact ratings (resistive loads):	Gold plated brass; 0.4 Volt-Amps max. at 20 V max. Silver; 3 Amps at 250 VAC, 6 Amps at 125 VAC or 4 Amps at 30 VDC Gold plated silver; 3 Amps at 250 VAC, 6 Amps at 125 VAC or 4 Amps at 30 VDC. Gold plating withstands up to 100 mA at 30 VDC.
Initial contact resistance:	10 milliohms maximum
Insulation resistance:	1000 megohms min. at 500 VDC
Dielectric strength:	1000 V rms min. - between terminals 1500 V rms min. - between poles and terminals and frame
Electrical life:	Gold: 100,000 cycles min. Silver (at full load): SP & DP - 50,000 cycles min. 3P: 40,000 cycles min. 4P: 30,000 cycles min.
Operating temperature range:	-40°C to +85°C

MATERIALS

Contacts & Terminals:	Gold plated brass, silver or gold plated silver
Actuator:	Chrome plated brass
Bushing:	Nickel plated brass
Housing:	Stainless steel or tin plated steel
Case:	Diallyl phthalate (DAP)
Terminal seal:	Epoxy
Hardware:	Panel mounting models supplied with 2 Hex Nuts .314" (8mm) across flats, 1 Locking Ring & 1 Lockwasher. See hardware section of catalog.

AGENCY RECOGNITION



UL, CSA, CECC, LNZ, GAM T1, QPL (Europe), MUAHAG, NATO. Availability: Consult factory for details of recognized models. Marking: To order switches marked UL, CSA or CECC, complete the appropriate box of the ordering format. Other listings do not appear on the switches.

ABOUT THIS SERIES

The material in this series is organized in the following sequence:

- Completely specified switch models:
 - Panel mounting
 - Panel and/or p.c. mounting
 - P.C. mounting
- 'build your own switch' order format
- Option drawings & special options
- Panel cut-outs & miscellaneous

ALSO IN THIS SERIES

5000 Series switches for peak currents - for switching power supplies, DC-DC converters, motors, etc. See specifications on last page of completely specified models.

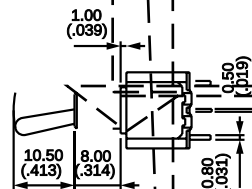
VDE approved 5000 Series models - see 55000 Series following.



5000 SERIES - MINIATURE TOGGLE SWITCHES

Single pole - standard actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts

MODEL NO.	CIRCUIT		
5636AB	ON	-	ON
5639AB	ON	OFF	ON
5637AB	MOM	OFF	MOM
5638AB	ON	OFF	MOM
5632AB	ON	-	MOM
Handle position (see dwg.) :	III	II	I
Terminals connected	2-3		1-2



Double pole - standard actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts

MODEL NO.	CIRCUIT		
5646AB	ON	-	ON
5649AB	ON	OFF	ON
5647AB	MOM	OFF	MOM
5648AB	ON	OFF	MOM
5642AB	ON	-	MOM
5644THAB*	ON	ON	ON
5644TH1RAB*	ON	ON	MOM
5644TH2RAB*	MOM	ON	MOM
Handle position (see dwg.) :	III	II	I
Terminals connected:	2-3		1-2
	5-6		4-5

* Function 4: SP in DP case. see diagram at end of section

Three pole - standard actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts

MODEL NO.	CIRCUIT		
5656AB	ON	-	ON
5659AB	ON	OFF	ON
5657AB	MOM	OFF	MOM
5658AB	ON	OFF	MOM
5652AB	ON	-	MOM
Handle position (see dwg.) :	III	II	I
Terminals connected:	2-3		1-2
	5-6		4-5
	8-9		7-8

Four pole - standard actuator - 1/4-40 threaded bushing - solder lug terminals -silver contacts

MODEL NO.	CIRCUIT		
5666AB	ON	-	ON
5669AB	ON	OFF	ON
5667AB	MOM	OFF	MOM
5668AB	ON	OFF	MOM
5662AB	ON	-	MOM
5664THAB*	ON	ON	ON
5664TH1RAB*	ON	ON	MOM
5664TH2RAB*	MOM	ON	MOM
Handle position	III	II	I
Terminals	2-3		1-2
connected:	5-6		4-5
	8-9		7-8
	11-12		10-11

* Function 4: SP in DP case. see diagram at end of section.

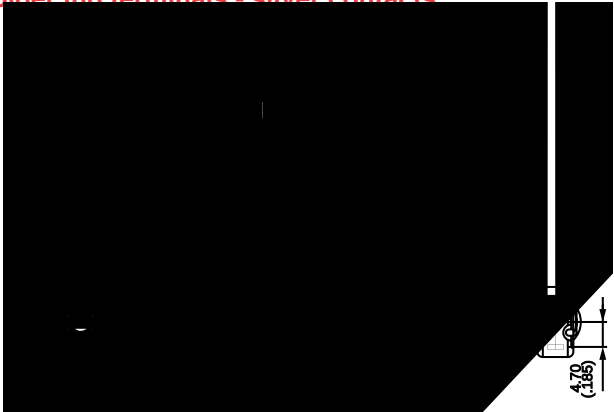
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

5000 SERIES - MINIATURE TOGGLE SWITCHES

A

Single pole - flatted actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts

MODEL NO.	CIRCUIT		
5636AB9	ON	-	ON
5639AB9	ON	OFF	ON
5637AB9	MOM	OFF	MOM
5638AB9	ON	OFF	MOM
5632AB9	ON	-	MOM
Handle position (see dwg.):	III	II	I
Terminals connected	2-3		1-2



Double pole - flatted actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts

MODEL NO.	CIRCUIT		
5646AB9	ON	-	ON
5649AB9	ON	OFF	ON
5647AB9	MOM	OFF	MOM
5648AB9	ON	OFF	MOM
5642AB9	ON	-	MOM
5644THAB9*	ON	ON	ON
5644TH1RAB9*	ON	ON	MOM
5644TH2RAB9*	MOM	ON	MOM
Handle position:	III	II	I
Terminals	2-3		1-2
connected:	5-6		4-5

* Function 4: SP in DP case, see diagram at end of section.

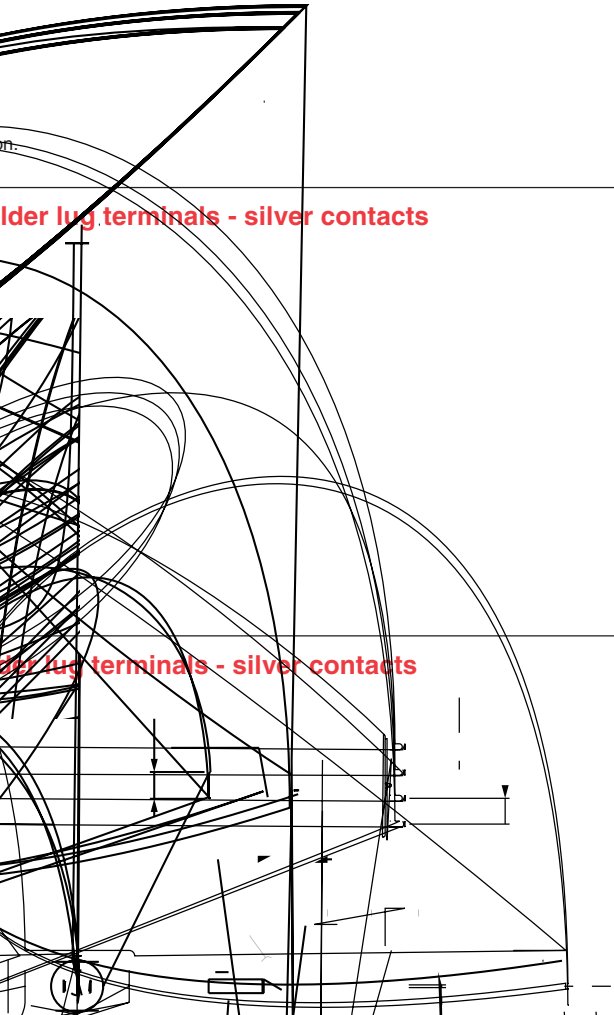
Three pole - flatted actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts

MODEL NO.	CIRCUIT		
5656AB9	ON	-	ON
5659AB9	ON	OFF	ON
5657AB9	MOM	OFF	MOM
5658AB9	ON	OFF	MOM
5652AB9	ON	-	MOM
Handle position (see dwg.):	III	II	I
Terminals connected:	8-9		7-8

Four pole - flatted actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts

MODEL NO.	CIRCUIT		
5666AB9	ON	-	ON
5669AB9	ON	OFF	ON
5667AB9	MOM	OFF	MOM
5668AB9	ON	OFF	MOM
5662AB9	ON	-	MOM
5664THAB9*	ON	ON	ON
5664TH1RAB9*	ON	ON	MOM
5664TH2RAB9*	MOM	ON	MOM
Handle position	III	II	I
Terminals	2-3		1-2
connected:	5-6		4-5
	8-9		7-8
	11-12		10-11

* Function 4: SP in DP case, see diagram at end of section.



5000 SERIES - MINIATURE TOGGLE SWITCHES

Single pole - standard actuator - 1/4-40 threaded bushing - quick connect terminals - silver contacts

MODEL NO.	CIRCUIT		
5236ZA	ON	-	ON
5239ZA	ON	OFF	ON
5237ZA	MOM	OFF	MOM
5238ZA	ON	OFF	MOM
5232ZA	ON	-	MOM
Handle position (see dwg.) :	III	II	I
Terminals connected:	2-3	1-2	

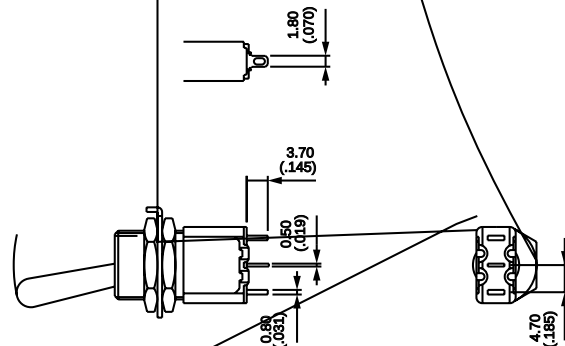
Double pole - standard actuator - 1/4-40 threaded bushing - quick connect terminals - silver contacts

MODEL NO.	CIRCUIT		
5246ZA	ON	-	ON
5249ZA	ON	OFF	ON
5247ZA	MOM	OFF	MOM
5248ZA	ON	OFF	MOM
5242ZA	ON	-	MOM
5244THZA*	ON	ON	ON
5244TH1RZA*	ON	ON	MOM
5244TH2RZA*	MOM	ON	MOM
Handle position (see dwg.) :	III	II	I
Terminals connected:	2-3	1-2	4-5

* Function 4: SP in DP case. see diagram at end of section.

Single pole - large actuator - 15/32-32 threaded bushing - solder lug terminals - silver contacts

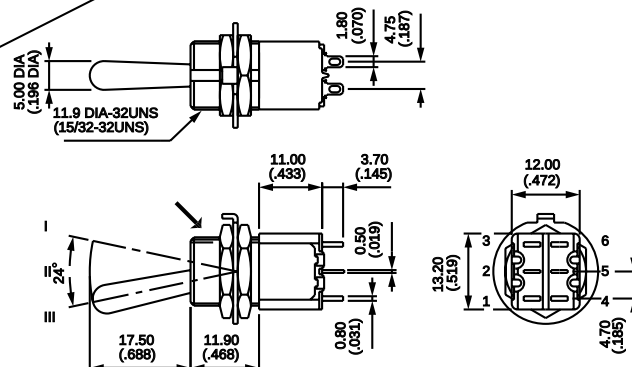
MODEL NO.	CIRCUIT		
5636MAB	ON	-	ON
5639MAB	ON	OFF	ON
5637MAB	MOM	OFF	MOM
5638MAB	ON	OFF	MOM
5632MAB	ON	-	MOM
Handle position (see dwg.) :	III	II	I
Terminals connected:	2-3	1-2	



Double pole - large actuator - 15/32-32 threaded bushing - solder lug terminals - silver contacts

MODEL NO.	CIRCUIT		
5646MAB	ON	-	ON
5649MAB	ON	OFF	ON
5647MAB	MOM	OFF	MOM
5648MAB	ON	OFF	MOM
5642MAB	ON	-	MOM
5644MTHAB*	ON	ON	ON
5644MTH1RAB*	ON	ON	MOM
5644MTH2RAB*	MOM	ON	MOM
Handle position (see dwg.) :	III	II	I
Terminals connected:	2-3	1-2	4-5

* Function 4: SP in DP case. see diagram at end of section.



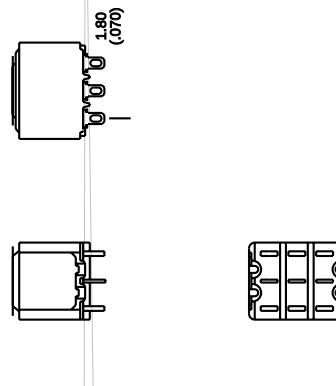
5000 SERIES - MINIATURE TOGGLE SWITCHES

A

Three pole - large actuator - 15/32-32 threaded bushing - solder lug terminals - silver contacts



MODEL NO.	CIRCUIT		
5656MAB	ON	-	ON
5659MAB	ON	OFF	ON
5657MAB	MOM	OFF	MOM
5658MAB	ON	OFF	MOM
5652MAB	ON	-	MOM
Handle position (see dwg.):	III	II	I
Terminals connected:	2-3	1-2	
	5-6	4-5	
	8-9	7-8	



Four pole - large actuator - 15/32-32 threaded bushing - solder lug terminals - silver contacts



MODEL NO.	CIRCUIT		
5666MAB	ON	-	ON
5669MAB	ON	OFF	ON
5667MAB	MOM	OFF	MOM
5668MAB	ON	OFF	MOM
5662MAB	ON	-	MOM
5664MTHAB*	ON	ON	ON
5664MTH1RAB*	ON	ON	MOM
5664MTH2RAB*	MOM	ON	MOM
Handle position (see dwg.):	III	II	I
Terminals connected:	2-3	1-2	
	5-6	4-5	
	8-9	7-8	
	11-12	10-11	

* Function 4: SP in DP case. see diagram at end of section.

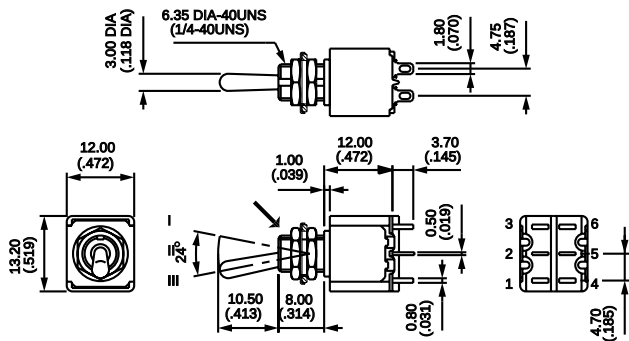
Single pole - standard actuator - 1/4-40 splashproof bushing - solder lug terminals - silver contacts

MODEL NO.	CIRCUIT		
5636AKB	ON	-	ON
5639AKB	ON	OFF	ON
5637AKB	MOM	OFF	MOM
5638AKB	ON	OFF	MOM
5632AKB	ON	-	MOM
Handle position (see dwg.):	III	II	I
Terminals connected:	2-3	1-2	

Double pole - standard actuator - 1/4-40 splashproof bushing - solder lug terminals - silver contacts

MODEL NO.	CIRCUIT		
5646AKB	ON	-	ON
5649AKB	ON	OFF	ON
5647AKB	MOM	OFF	MOM
5648AKB	ON	OFF	MOM
5642AKB	ON	-	MOM
5644THAKB*	ON	ON	ON
5644TH1RAKB*	ON	ON	MOM
5644TH2RAKB*	MOM	ON	MOM
Handle position:	III	II	I
Terminals	2-3	1-2	
connected:	5-6	4-5	

* Function 4: SP in DP case. see diagram at end of section.



5000 SERIES - MINIATURE TOGGLE SWITCHES

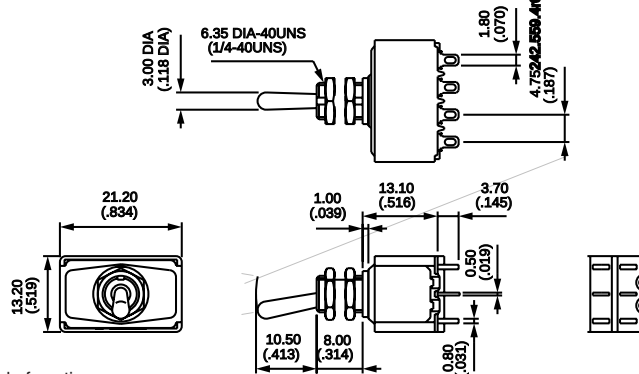
Three pole - standard actuator - 1/4-40 splashproof bushing - solder lug terminals - silver contacts

MODEL NO.	CIRCUIT		
5656AKB	ON	-	ON
5659AKB	ON	OFF	ON
5657AKB	MOM	OFF	MOM
5658AKB	ON	OFF	MOM
5652AKB	ON	-	MOM
Handle position (see dwg.) :	III	II	I
Terminals connected:	2-3		1-2
	5-6		4-5
	8-9		7-8

Four pole - standard actuator - 1/4-40 splashproof bushing - solder lug terminals - silver contacts

MODEL NO.	CIRCUIT		
5666AKB	ON	-	ON
5669AKB	ON	OFF	ON
5667AKB	MOM	OFF	MOM
5668AKB	ON	OFF	MOM
5662AKB	ON	-	MOM
5664THAKB*	ON	ON	ON
5664TH1RAKB*	ON	ON	MOM
5664TH2RAKB*	MOM	ON	MOM
Handle position:	III	II	I
Terminals connected:	2-3		1-2
	5-6		4-5
	8-9		7-8
	11-12		10-11

* Function 4: SP in DP case. see diagram at end of section.



Single pole - locking actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts

MODEL NO.	CIRCUIT		
1 locked position			
5636AB-1V	ON	-	ON
2 locked positions			
5636AB-2V	ON	-	ON
3 locked positions			
5639AB-3V	ON	OFF	ON
Handle position (see dwg.) :	III	II	I
Terminals connected:	2-3		1-2

Double pole - locking actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts

MODEL NO.	CIRCUIT		
1 locked position			
5646AB-1V	ON	-	ON
2 locked positions			
5646AB-2V	ON	-	ON
3 locked positions			
5649AB-3V	ON	OFF	ON
Handle position (see dwg.) :	III	II	I
Terminals connected:	2-3		1-2
	5-6		4-5

5000 SERIES - MINIATURE TOGGLE SWITCHES

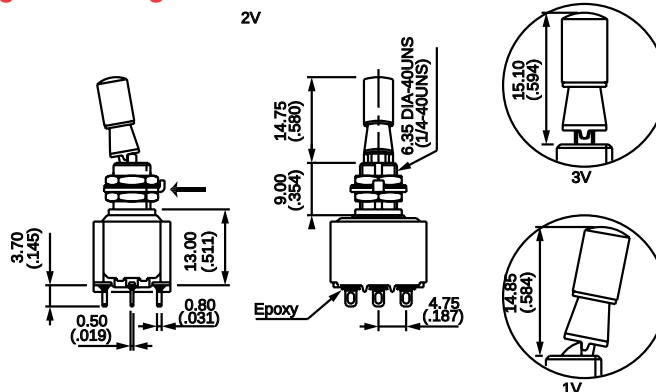
A

Three pole - locking actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts



MODEL NO.	CIRCUIT		
1 locked position 5656AB-1V	ON	-	ON
2 locked positions 5656AB-2V	ON	-	ON
3 locked positions 5659AB-3V	ON	OFF	ON
Handle position (see dwg.):	III	II	I
Terminals connected:	2-3	1-2	
	5-6	4-5	
	8-9	7-8	

→ Keyway

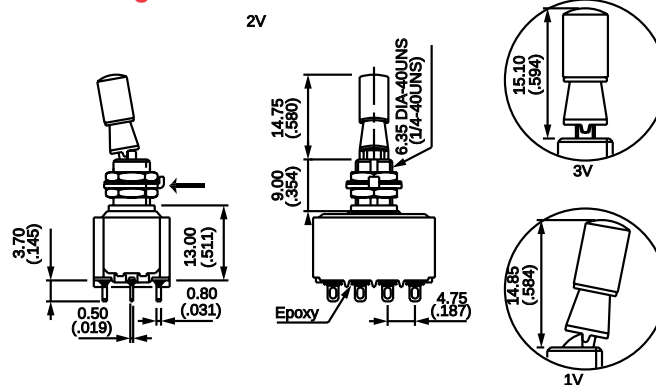


Four pole - locking actuator - 1/4-40 threaded bushing - solder lug terminals - silver contacts



MODEL NO.	CIRCUIT		
1 locked position 5666AB-1V	ON	-	ON
2 locked positions 5666AB-2V	ON	-	ON
3 locked positions 5669AB-3V	ON	OFF	ON
Handle position (see dwg.):	III	II	I
Terminals connected:	2-3	1-2	
	5-6	4-5	
	8-9	7-8	
	11-12	10-11	

→ Keyway

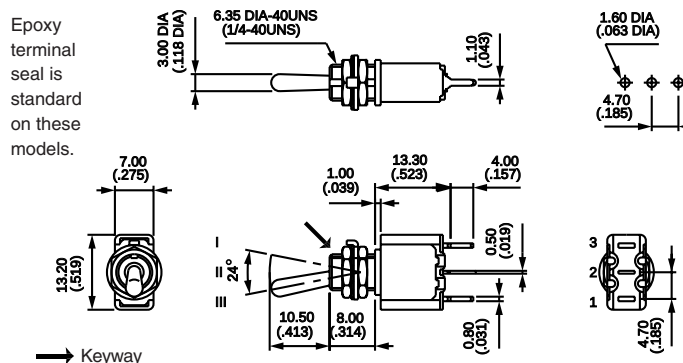


Single pole - standard actuator - 1/4-40 threaded bushing - straight p.c. terminals - gold or silver contacts



MODEL NO.	CIRCUIT		
5236CDB	ON	-	ON
5239CDB	ON	OFF	ON
5237CDB	MOM	OFF	MOM
5238CDB	ON	OFF	MOM
5232CDB	ON	-	MOM
Handle position (see dwg.):	III	II	I
Terminals connected:	2-3	1-2	

Note: above models have gold contacts.
Substitute 'A' for 'CD' for silver contacts.



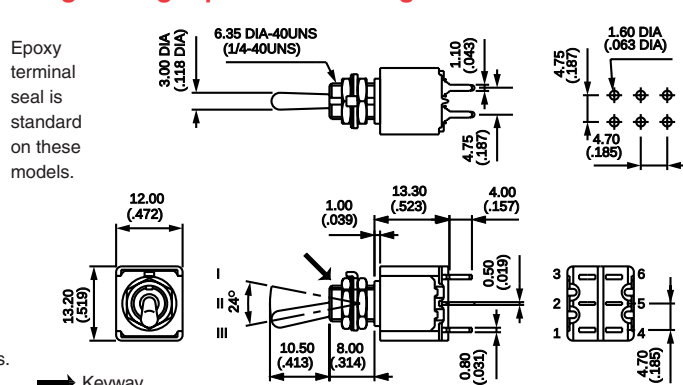
→ Keyway

Double pole - standard actuator - 1/4-40 threaded bushing - straight p.c. terminals - gold or silver contacts



MODEL NO.	CIRCUIT		
5246CDB	ON	-	ON
5249CDB	ON	OFF	ON
5247CDB	MOM	OFF	MOM
5248CDB	ON	OFF	MOM
5242CDB	ON	-	MOM
5244THCDB*	ON	ON	ON
5244TH1RCDB*	ON	ON	MOM
5244TH2RCDB*	MOM	ON	MOM
Handle position:	III	II	I
Terminals connected:	2-3	1-2	
	5-6	4-5	

* Function 4: SP in DP case. see diagram at end of section. Note: above models have gold contacts.
Substitute 'A' for 'CD' for silver contacts.



→ Keyway

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

5000 SERIES - MINIATURE TOGGLE SWITCHES

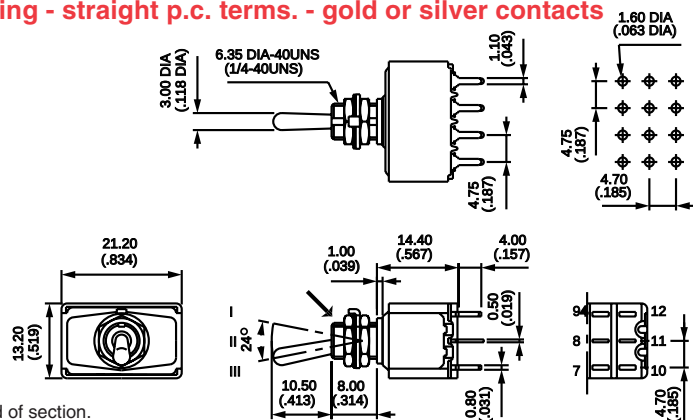
Three pole - standard actuator - 1/4-40 threaded bushing - straight p.c. terminals - gold or silver contacts

MODEL NO.	CIRCUIT		
5256CDB	ON	-	ON
5259CDB	ON	OFF	ON
5257CDB	MOM	OFF	MOM
5258CDB	ON	OFF	MOM
5252CDB	ON	-	MOM
Handle position (see dwg.):	III	II	I
Terminals connected:	2-3	1-2	
	5-6	4-5	
	8-9	7-8	

Four pole - standard actuator - 1/4-40 threaded bushing - straight p.c. terms. - gold or silver contacts

MODEL NO.	CIRCUIT		
5266CDB	ON	-	ON
5269CDB	ON	OFF	ON
5267CDB	MOM	OFF	MOM
5268CDB	ON	OFF	MOM
5262CDB	ON	-	MOM
5264THCDB*	ON	ON	ON
5264TH1RCDB*	ON	ON	MOM
5264TH2RCDB*	MOM	ON	MOM
Handle position (see dwg.):	III	II	I
Terminals connected:	2-3	1-2	
	5-6	4-5	
	8-9	7-8	
	11-12	10-11	

* Function 4: SP in DP case. see diagram at end of section.



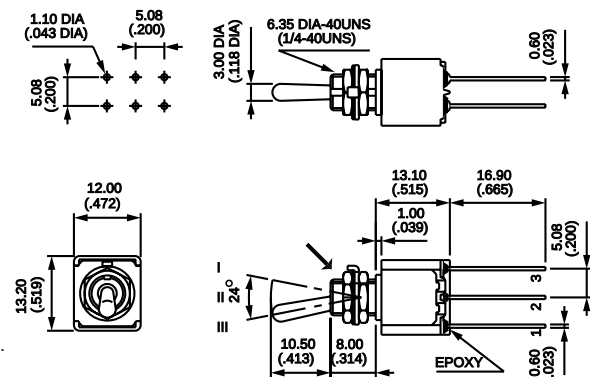
Single pole - standard actuator - 1/4-40 threaded bushing - wire-wrap terminals - gold or silver contacts

MODEL NO.	CIRCUIT		
5236MIWRCD	ON	-	ON
5239MIWRCD	ON	OFF	ON
5237MIWRCD	MOM	OFF	MOM
5238MIWRCD	ON	OFF	MOM
5232MIWRCD	ON	-	MOM
Handle position (see dwg.):	III	II	I
Terminals connected:	2-3	1-2	

Double pole - standard actuator - 1/4-40 threaded bushing - wire-wrap terminals - gold or silver contacts

MODEL NO.	CIRCUIT		
5246MIWRCD	ON	-	ON
5249MIWRCD	ON	OFF	ON
5247MIWRCD	MOM	OFF	MOM
5248MIWRCD	ON	OFF	MOM
5242MIWRCD	ON	-	MOM
5244MIWRTHCD*	ON	ON	ON
5244MIWRTH1RCD*	ON	ON	MOM
5244MIWRTH2RCD*	MOM	ON	MOM
Handle position:	III	II	I
Terminals connected:	2-3	1-2	
	5-6	4-5	

* Function 4: SP in DP case. see diagram at end of section.



5000 SERIES - MINIATURE TOGGLE SWITCHES

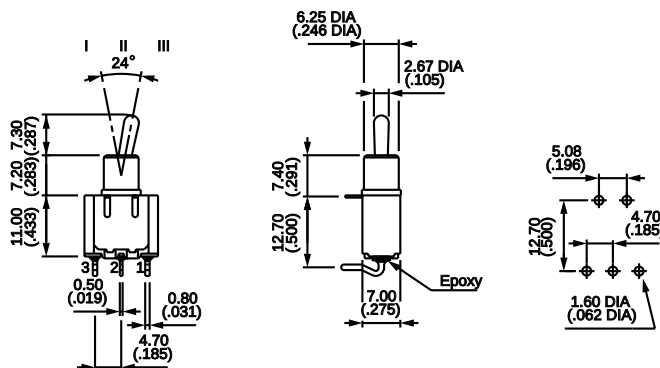
A

Single pole - short actuator - 1/4" smooth bushing - horizontal rt. angle p.c. terms. - gold or silver contacts



MODEL NO.	CIRCUIT		
5236WCDB16X404	ON	-	ON
5239WCDB16X404	ON	OFF	ON
5237WCDB16X404	MOM	OFF	MOM
5238WCDB16X404	ON	OFF	MOM
5232WCDB16X404	ON	-	MOM
Handle position (see dwg.):	III	II	I
Terminals connected:	2-3		1-2

Note: above models have gold contacts.
Substitute 'A' for 'CD' for silver contacts.



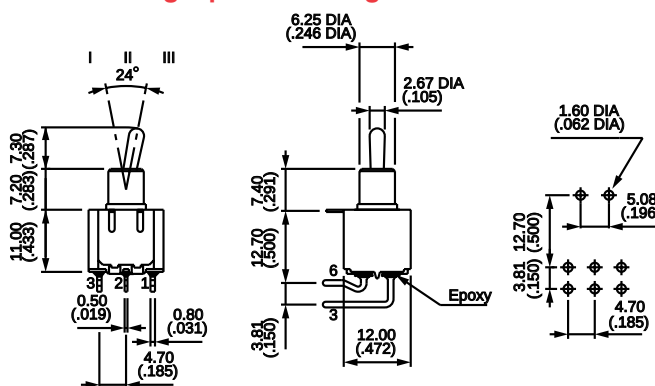
Double pole - short actuator - 1/4" smooth bushing - horizontal rt. angle p.c. terms. - gold or silver contacts



MODEL NO.	CIRCUIT		
5246WCDB16X404	ON	-	ON
5249WCDB16X404	ON	OFF	ON
5247WCDB16X404	MOM	OFF	MOM
5248WCDB16X404	ON	OFF	MOM
5242WCDB16X404	ON	-	MOM
5244WTHCDB16X404*	ON	ON	ON
5244WTH1RCDB16X404*	ON	ON	MOM
5244WTH2RCDB16X404*	MOM	ON	MOM
Handle position: (see dwg.):	III	II	I
Terminals connected:	2-3		1-2
	5-6		4-5

Note: Listed models have gold contacts. Substitute 'A' for 'CD' for silver contacts.

* Function 4: SP in DP case. see diagram at end of section.

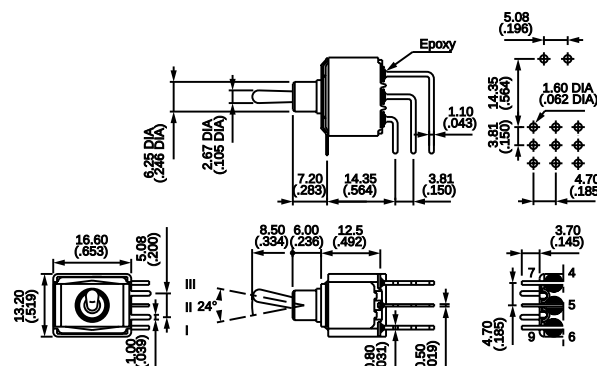


Three pole - short actuator - 1/4" smooth bushing - horizontal rt. angle p.c. terms. - gold or silver contacts



MODEL NO.	CIRCUIT		
5256WCDB16	ON	-	ON
5259WCDB16	ON	OFF	ON
5257WCDB16	MOM	OFF	MOM
5258WCDB16	ON	OFF	MOM
5252WCDB16	ON	-	MOM
Handle position (see dwg.):	III	II	I
Terminals connected:	2-3		1-2
	5-6		4-5
	8-9		7-8

Note: above models have gold contacts.
Substitute 'A' for 'CD' for silver contacts.

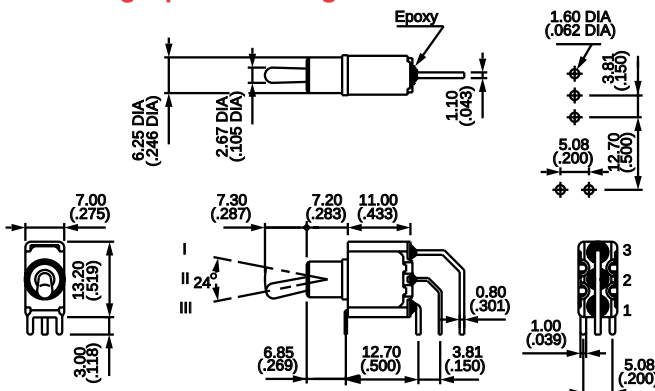


Single pole - short actuator - 1/4" smooth bushing - vertical rt. angle p.c. terms. - gold or silver contacts



MODEL NO.	CIRCUIT		
5236WWCDB16X445	ON	-	ON
5239WWCDB16X445	ON	OFF	ON
5237WWCDB16X445	MOM	OFF	MOM
5238WWCDB16X445	ON	OFF	MOM
5232WWCDB16X445	ON	-	MOM
Handle position (see dwg.):	III	II	I
Terminals connected:	2-3		1-2

Note: above models have gold contacts.
Substitute 'A' for 'CD' for silver contacts.



5000 SERIES - MINIATURE TOGGLE SWITCHES

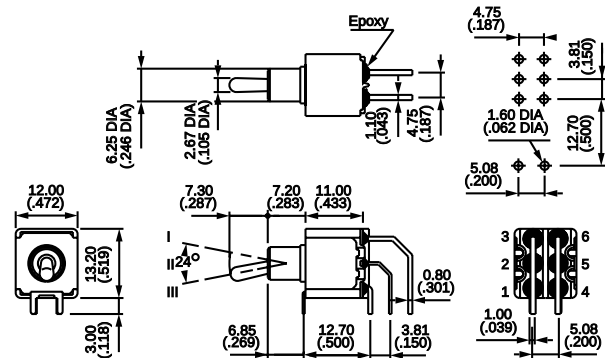
Double pole - short actuator - 1/4" smooth bushing - vertical rt. angle p.c. terms. - gold or silver contacts



MODEL NO.	CIRCUIT		
5246WWCDB16X445	ON	-	ON
5249WWCDB16X445	ON	OFF	ON
5247WWCDB16X445	MOM	OFF	MOM
5248WWCDB16X445	ON	OFF	MOM
5242WWCDB16X445	ON	-	MOM
5244WWTHCDB16X445*	ON	ON	ON
5244WWTH1RCDB16X445*	ON	ON	MOM
5244WWTH2RCDB16X445*	MOM	ON	MOM
Handle position:	III	II	I
Terminals connected:	2-3	1-2	
	5-6	4-5	

Note: Listed models have gold contacts. Substitute 'A' for 'CD' for silver contacts.

* Function 4: SP in DP case. see diagram at end of section.

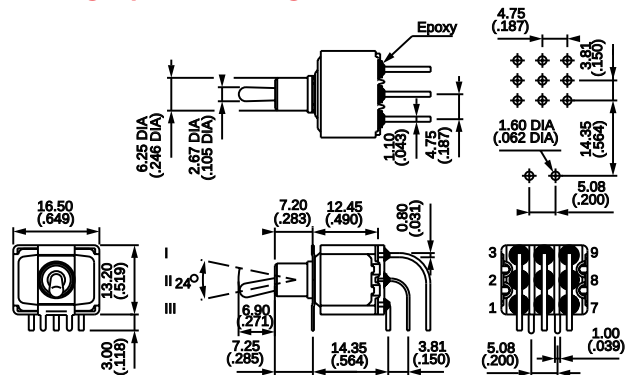


Three pole - short actuator - 1/4" smooth bushing - vertical rt. angle p.c. terms. - gold or silver contacts



MODEL NO.	CIRCUIT		
5256WWCDB16X514	ON	-	ON
5259WWCDB16X514	ON	OFF	ON
5257WWCDB16X514	MOM	OFF	MOM
5258WWCDB16X514	ON	OFF	MOM
5252WWCDB16X514	ON	-	MOM
Handle position:	III	II	I
Terminals connected:	2-3	1-2	
	5-6	4-5	
	8-9	7-8	

Note: above models have gold contacts. Substitute 'A' for 'CD' for silver contacts.



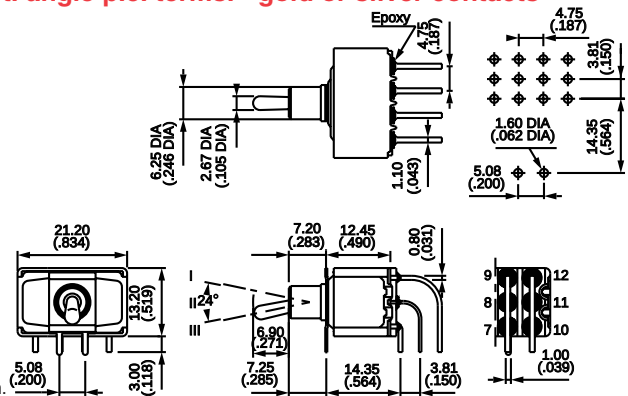
Four pole - short actuator - 1/4" smooth bushing - vertical rt. angle p.c. terms. - gold or silver contacts



MODEL NO.	CIRCUIT		
5266WWCDB16X514	ON	-	ON
5269WWCDB16X514	ON	OFF	ON
5267WWCDB16X514	MOM	OFF	MOM
5268WWCDB16X514	ON	OFF	MOM
5262WWCDB16X514	ON	-	MOM
5264WWTHCDB16X514*	ON	ON	ON
5264WWTH1RCDB16X514*	ON	ON	MOM
5264WWTH2RCDB16X514*	MOM	ON	MOM
Handle position:	III	II	I
Terminals connected:	2-3	1-2	
	5-6	4-5	
	8-9	7-8	
	11-12	10-11	

Note: Listed models have gold contacts. Substitute 'A' for 'CD' for silver contacts.

* Function 4: SP in DP case. see diagram at end of section.

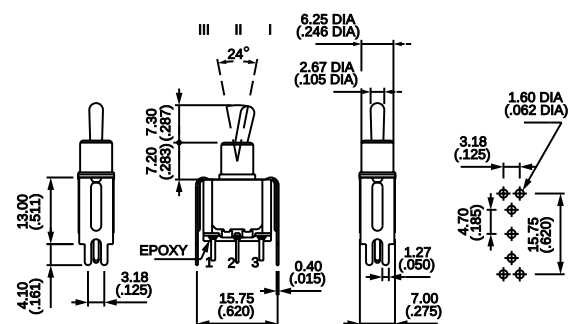


Single pole - short actuator - 1/4" smooth bush. - straight p.c. terms. - bracket mtg. - gold or silver contacts



MODEL NO.	CIRCUIT		
5236YCDB16X445	ON	-	ON
5239YCDB16X445	ON	OFF	ON
5237YCDB16X445	MOM	OFF	MOM
5238YCDB16X445	ON	OFF	MOM
5232YCDB16X445	ON	-	MOM
Handle position (see dwg.):	III	II	I
Terminals connected:	2-3	1-2	

Note: above models have gold contacts. Substitute 'A' for 'CD' for silver contacts.



5000 SERIES - MINIATURE TOGGLE SWITCHES

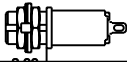
A

MODEL NO.	CIRCUIT		
5246YCDB16X445	ON	-	ON
5249YCDB16X445	ON	OFF	ON
5247YCDB16X445	MOM	OFF	MOM
5248YCDB16X445	ON	OFF	MOM
5242YCDB16X445	ON	-	MOM
5244YTHCDB16X445*	ON	ON	ON
5244YTH1RCDB16X445*	ON	ON	MOM
5244YTH2RCDB16X445*	MOM	ON	MOM
Handle position:	III	II	I
Terminals	2-3		1-2
connected:	5-6		4-5

* Function 4: SP in DP case. see diagram at end of section.

Single pole - paddle actuator - 1/4" threaded bushing - solder lug terminals - silver contacts

MODEL NO.	CIRCUIT		
5636AB4N+U242N	ON	-	ON
5636AB4N+U242N	ON	OFF	ON



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

5000 SERIES - MINIATURE TOGGLE SWITCHES

5000 Series switches for peak currents

- 2-120 amps at 60 VDC - 10,000 cycles minimum.
- 3-40 amps at 125/250 VAC - 10,000 cycles minimum.
- Silver nickel alloy (AgNi) contacts.

Other specifications same as 5000 Series.

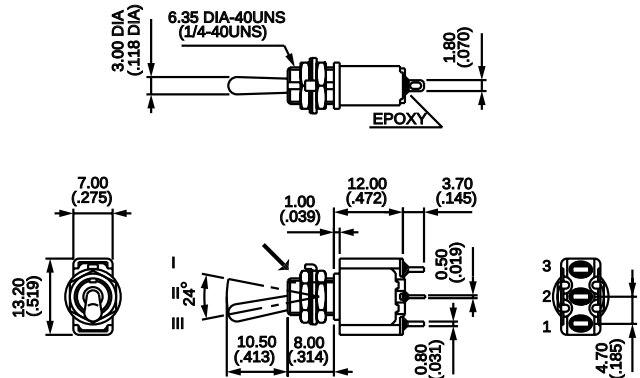
Also see 'Switches for Peak Currents' technical page in rear of catalog.

Single pole - standard actuator - 1/4-40 threaded bushing - solder lug terminals



MODEL NO.
5636ABX814

CIRCUIT
ON - ON



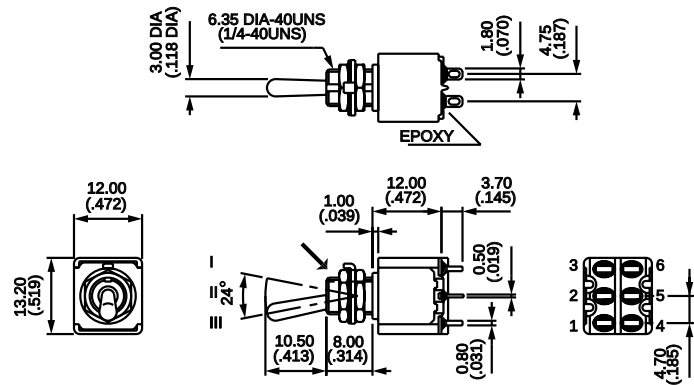
→ Keyway

Double pole - standard actuator - 1/4-40 threaded bushing - solder lug terminals



MODEL NO.
5646ABX814

CIRCUIT
ON - ON



→ Keyway

5000 SERIES - MINIATURE TOGGLE SWITCHES

A

Additional ordering information: Commonly ordered models are shown on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.

Allowable options are shown below each respective box.

Note 'NONE' indicates box may be left empty.

Model Structure:

Series	Terminals & bushings	Number of poles	Electrical functions	Terminals	(For function 4 models only) connections / functions	Contact materials
5						
		3 Single pole 4 Double pole 5 Three pole 6 Four pole	6 ON - ON 9 ON OFF ON 7 MOM OFF MOM 8 ON OFF MOM 2 ON - MOM 4* ON ON ON 4* ON ON MOM 4* MOM ON MOM * specify selection from 'connections/ functions' box also - (For double & four pole only).	(NONE) M Solder lugs with 15/32-32 (11.9mm) bushing M I W R Wire-wrap (epoxy term. seal standard) W Horizontal right angle p.c. W W Vertical right angle p.c. Y Straight p.c. w/mounting brk't. Z Quick connect (epoxy term. seal standard)	(NONE) T H ON ON ON T H 1 R ON ON MOM T H 2 R MOM ON MOM	A Silver A D Silver, gold plated C D Brass, gold plated
	2 Straight p.c., right angle, quick connect or wire-wrap terminals with 1/4-40 (6.35mm) threaded bushing. 6 Solder lug terminals with 1/4-40 (6.35mm) or 15/32-32 (11.9mm) threaded bushings.					

Options:

Black finish	Sealing	Actuators	Agency Recognition	Special options	Caps and paddles
(NONE) G Matte black finish on bushing, actuator & hardware.	(NONE) Unless standard - (see Terminals above) B Epoxy sealed terminals K Front panel sealing with o-ring & gasket. K B Both of above	(NONE) 1 3 Standard 2 7 8 Flat 9 Flat 1 2 Flat 1 6 1 7 2 1 Insulated 2 2 2 3 2 4 Large (long) 2 5 2 7 Large (short) 4 N For paddles only 1 V Locking (1 position) 2 V Locking (2 positions) 3 V Locking (3 positions) (see actuator drawings).	(NONE) U L C S A V D E L N Z Telecommunications listing G A M Military listing (consult factory for details of approved models).	(NONE) See listing on pg. C39	(NONE) Caps U 2 7 0 U 1 7 1 0 U 6 4 0 Paddles U 2 4 0 N U 2 9 0 N U 3 9 0 N (see drawings and color codes).
Examples of completely specified model numbers: 5636AB, 5244WWTH2RAB16UL					

Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

5000 SERIES - MINIATURE TOGGLE SWITCHES

OPTION DRAWINGS

SEALING

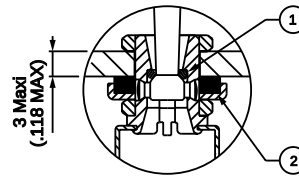
(NONE) Indicates no terminal sealing.

B Indicates epoxy terminal sealing. Note: for models with 'Z' and 'MIWR' epoxy terminal sealing is standard and need not be specified with 'B'.

K Indicates front panel sealing with o-ring (1) and gasket (2) to protect the switch from water and dust. Withstands 1 bar pressure. Available on models with 1/4" (6.35mm) or 15/32" (11.9mm) threaded bushings. Not available with actuators 8,9, 12, 22 or 23.

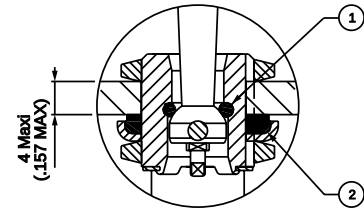
K B Includes both **B** and **K** above.

K with 1/4" (6.35mm) keyway bushing



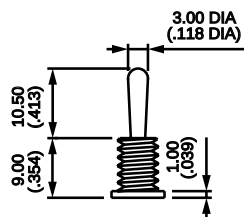
Includes gasket washer **U360**

K with 15/32" (11.9mm) flatted bushing

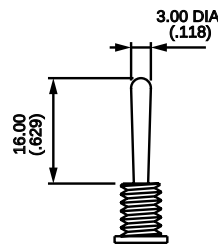


Includes gasket washer **U60**

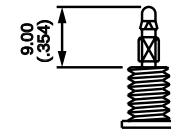
ACTUATORS for 1/4" (6.35mm) threaded bushings



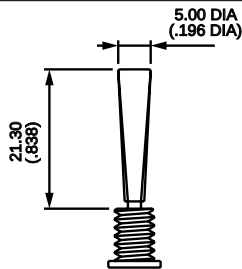
13 Standard



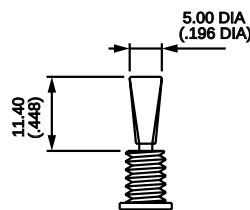
2



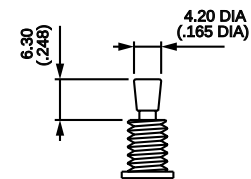
4N For use with paddles only



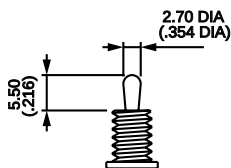
8 Not available with option K



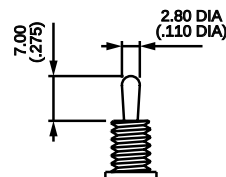
9 Not available with option K



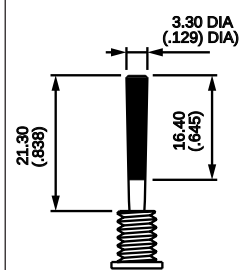
12 Not available with option K



16

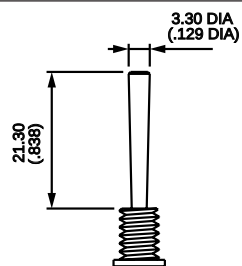


17

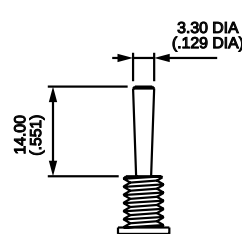


21 Specify **U640** insulative extension with this actuator and replace '0' with color selection below.

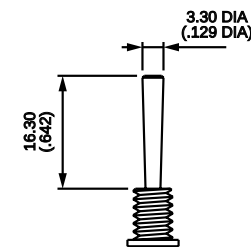
1 blue	2 black
3 green	4 grey
5 yellow	6 red
7/1 white	9 orange



22 Not available with option K



23 Not available with option K



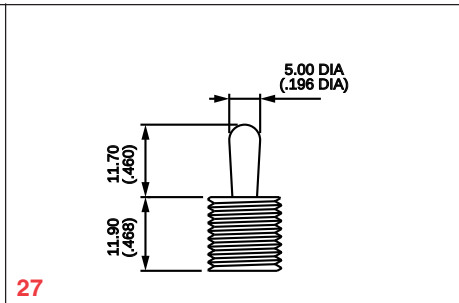
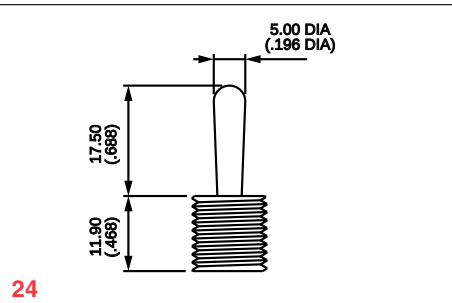
25 Not available with option K

5000 SERIES - MINIATURE TOGGLE SWITCHES

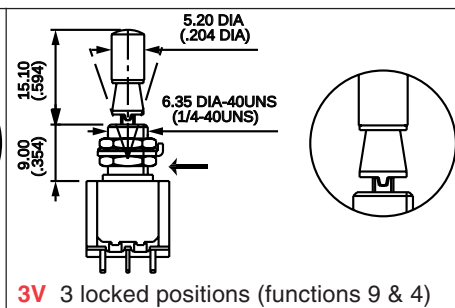
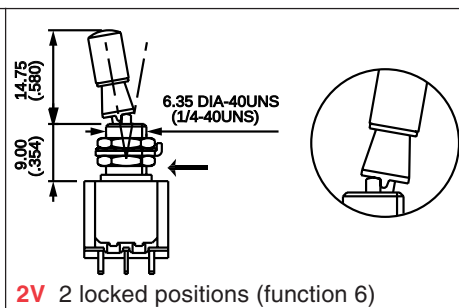
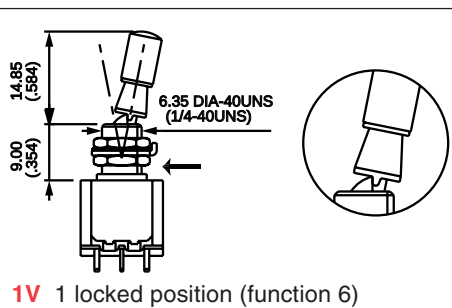
A

OPTION DRAWINGS (cont'd.)

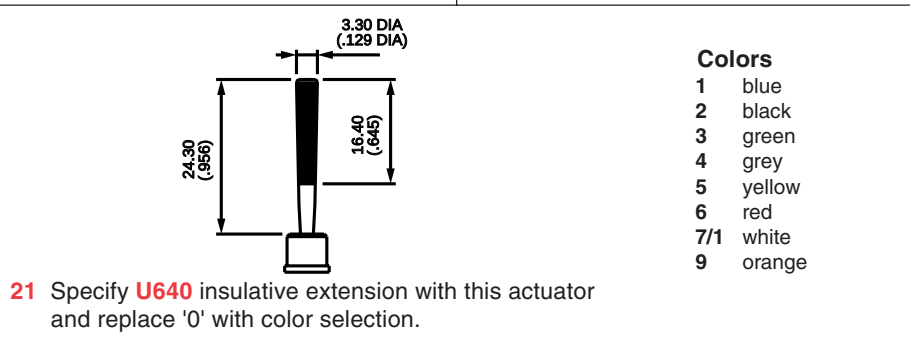
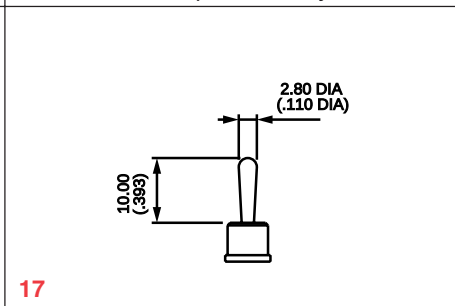
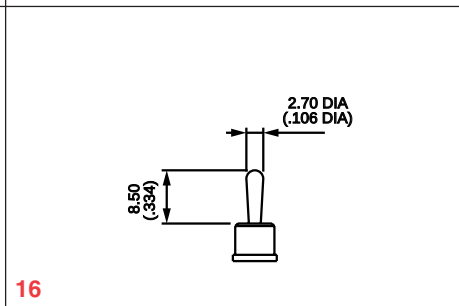
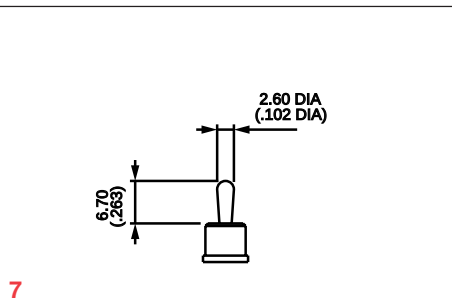
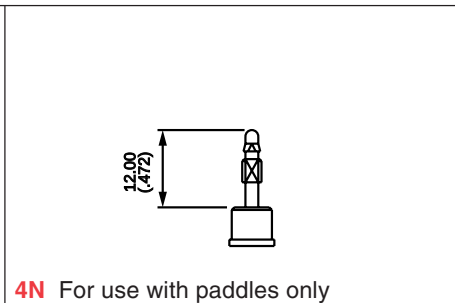
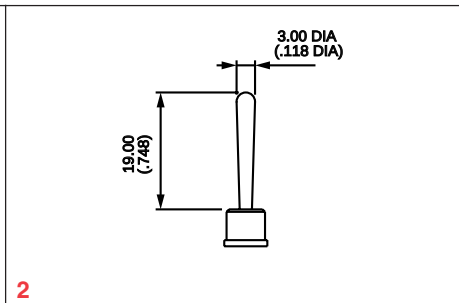
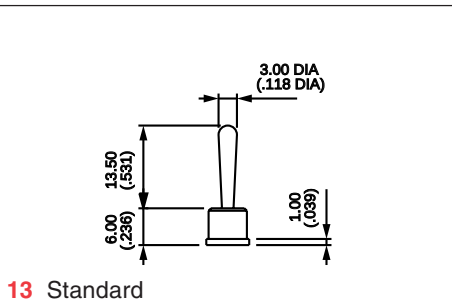
ACTUATORS for 15/32" (11.9mm) threaded bushings



LOCKING ACTUATORS for 1/4" (6.35mm) threaded bushings Other locking actuator styles available - consult factory.



ACTUATORS for smooth bushing models (W, WW & Y)



Colors

- 1 blue
- 2 black
- 3 green
- 4 grey
- 5 yellow
- 6 red
- 7/1 white
- 9 orange

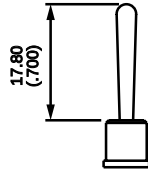
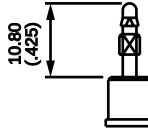
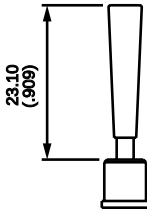
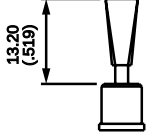
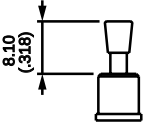
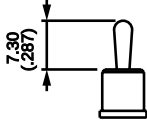
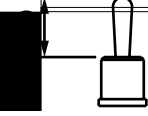
Note that for switches with mounting brackets, the actuator length may be reduced by .015" (0.4mm). Refer to individual switch drawings. '

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

5000 SERIES - MINIATURE TOGGLE SWITCHES

OPTION DRAWINGS (cont'd.)

ACTUATORS for switches with X404 and X445 options (see 'special options' pages following)

13 Standard	 2	 4N For use with paddles only
 8 Not available w/function 2 (ON - MOM)	 9 Not available w/function 2 (ON - MOM)	 12 Not available w/function 2 (ON - MOM)
 16	 17	21 Specify U640 insulative extension with this actuator and replace '0' with color selection below. Colors 1 blue 2 black 3 green 4 grey 5 yellow 6 red 7/1 white 9 orange
22 Not available with sealing option K or X408	23	

INSULATING CAPS (replace '0' in part numbers below with color code)

U270 For actuator 13 and threaded bushing only	U1040 For actuator 13 and smooth bushing only	U1710 For actuator 17 and threaded bushing or actuator 7 and smooth bushing only
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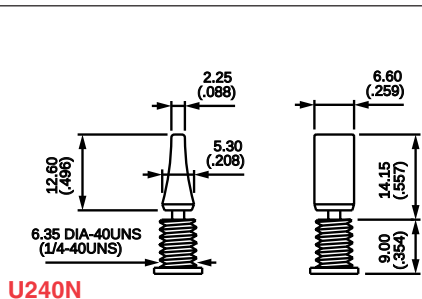
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

5000 SERIES - MINIATURE TOGGLE SWITCHES

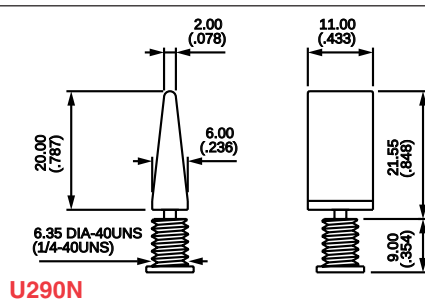
A

OPTION DRAWINGS (cont'd.)

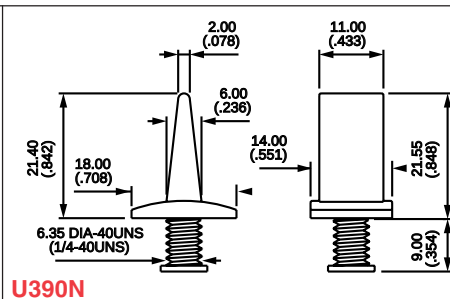
PADDLES for actuator 4N only. Mat'l: UL94HB Polyamide (replace '0' in part numbers below with color code from preceeding pg.)



U240N



U290N

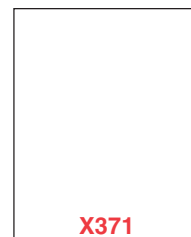


U390N

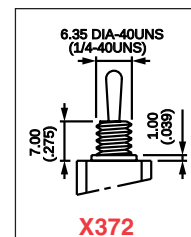
SPECIAL OPTIONS

- F** Tin plated terminals (for p.c. terminals only).
- X371** Smooth bushing .246" (6.25mm) instead of standard threaded bushing.
- X372** Threaded bushing 1/4" (6.35mm). Height .274" (7mm).
- X386** Threaded bushing 1/4" (6.35mm) to replace plain bushing on models with **W**, **WW** & **Y**.
- X404** Switches with **W** option with short actuator and offset terminal bends (see Page A25).
- X435** .732" (18.6mm) long p.c. terminals - epoxy terminal seal standard.
- X438** Smooth bushing .246" (6.25mm). Height .283" (7.2mm) without shoulder.
- X442** Threaded bushing 1/4" (6.35mm). Height .389" (9.9mm).
- X445** Smooth bushing .283" (7.2mm) for **W**, **WW** & **Y** models. Available with same actuators, insulating cap and paddles as X404.
- X500** Threaded bushing 1/4" (6.35mm). Height .354" (9mm) without shoulder.
- X507** .293" (10mm) long p.c. terminals.
- X512** 1.062" (27mm) long p.c. terminals - epoxy terminal seal standard.
- X514** Spacing .564" (14.35mm) instead of .500" (12.7mm) for 3 and 4 pole **WW** models.
- X515** Smooth bushing .246" (6.25mm) without shoulder.
- X601** Silver plated brass contacts. Ratings - 0.2 amps 250 VAC, 0.4 amps 125 VAC or 0.5 amps 30 VDC. Electrical life : 20,000 cycles min. Minimum quantity: 5000 pcs.
- X681** Satin chrome actuator for flat actuators.
- X729** 1/299" (33mm) long p.c. terminals.
- X764** Special customer specified marking.
- X769** Red anodized locking lever top.
- X806** Smooth bushing .246" (6.25mm) instead of standard threaded bushing and silver plated brass contacts.
- X814** Switches for peak current. See pg. A28.
- X916** Locking lever on model with smooth bushing.

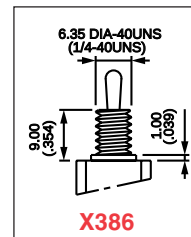
Printed circuit terminal lengths	
Option	Length L
X435	.732 (18.6mm)
X507	.293 (10mm)
X512	1.062 (27mm)
X729	1.299 (33mm)



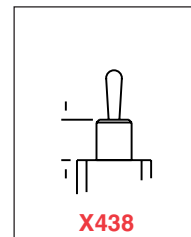
X371



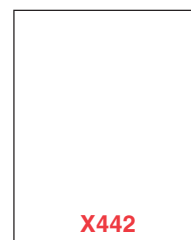
X372



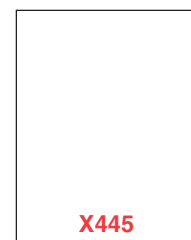
X386



X438



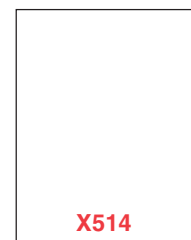
X442



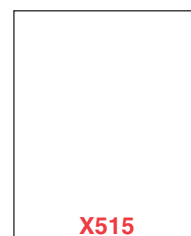
X445



X500



X514



X515



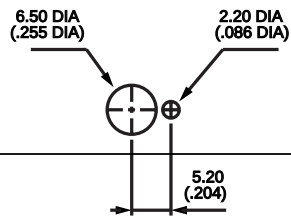
X916

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

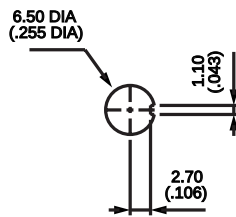
5000 SERIES - MINIATURE TOGGLE SWITCHES

PANEL CUT-OUTS & MISCELLANEOUS

PANEL CUT-OUTS for 1/4" (6.35mm) bushings

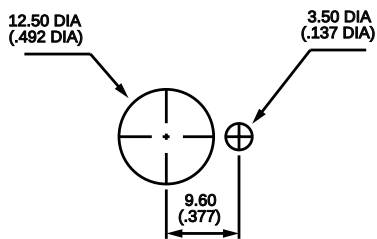


Standard (with locking ring supplied)

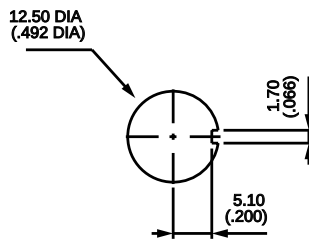


With K sealing option

PANEL CUT-OUTS for 15/32" (11.9mm) bushings

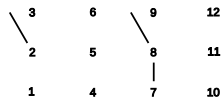
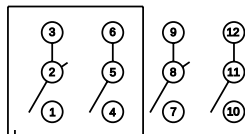
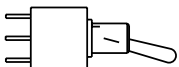


Standard (with locking ring supplied)



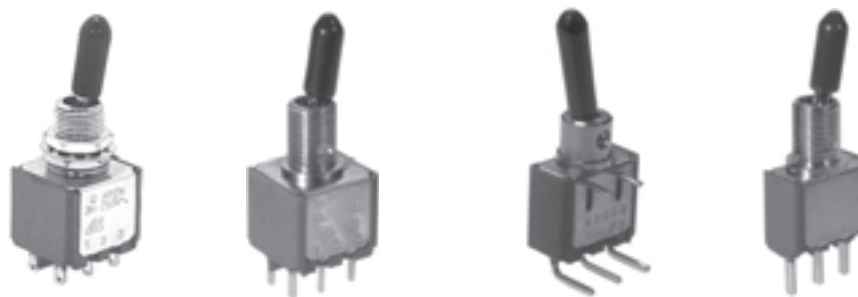
With K sealing option

WIRING for function 4 switch



Equivalent to single pole 3 throw switch. Dotted lines between terminals 2 & 6 and 8 & 12 indicate external jumpers to be added by customer.

55000 SERIES - VDE APPROVED MINIATURE TOGGLE SWITCHES



FEATURES

- VDE, UL and CSA recognition standard on all models.
- SPDT & DPDT models with numerous options.
- Configurations for panel, panel & p.c. and p.c. mounting.
- Epoxy terminal sealing standard on all models.

SPECIFICATIONS

Contact ratings (resistive loads):	3 Amps at 250 VAC, 6 Amps at 125 VAC
Initial contact resistance:	10 milliohms maximum
Insulation resistance:	1000 megohms min. at 500 VDC
Dielectric strength:	1000 V rms min. - between terminals 2000 V rms min. - between poles and terminals and frame
Electrical life (resistive):	50,000 cycles minimum
Operating temperature range:	-40°C to +85°C
Insulation:	Class 1 per IEC 1058-1
Contact opening:	less than .118" (3mm)
Creepage distance & air gap:	.118" (3mm) minimum

MATERIALS

Contacts & Terminals:	Silver
Actuator:	Chrome plated brass with insulating vinyl cap or UL94HB polyamide paddle
Bushing:	Nickel plated brass
Housing:	Stainless steel
Case:	Diallyl phthalate (DAP)
Terminal seal:	Epoxy
Hardware:	Panel mounting models supplied with 2 Hex Nuts .314" (8mm) across flats, 1 Locking Ring & 1 Lockwasher. See hardware section of catalog.

AGENCY RECOGNITION



VDE, UL & CSA
Standard, and marked on all models

ABOUT THIS SERIES

The material in this series is organized in the following sequence:

- Completely specified switch models
- 'build your own switch' order format
- Option drawings & miscellaneous

55000 SERIES - VDE APPROVED MINIATURE TOGGLE SWITCHES**1/4-40 threaded bushing - solder lug terminals**

SINGLE POLE MODEL NO.	CIRCUIT
55636AVDEULCSA+U272	ON - ON
55639AVDEULCSA+U272	ON OFF ON
DOUBLE POLE MODEL NO.	CIRCUIT
55646AVDEULCSA+U272	ON - ON
55649AVDEULCSA+U272	ON OFF ON
Handle position (see dwg.) :	III II I
Terminals connected:	2-3 1-2 5-6 4-5

Above models have black cap.

1/4-40 threaded bushing - straight p.c. terminals

SINGLE POLE MODEL NO.	CIRCUIT
55236AVDEULCSA+U272	ON - ON
55239AVDEULCSA+U272	ON OFF ON
DOUBLE POLE MODEL NO.	CIRCUIT
55246AVDEULCSA+U272	ON - ON
55249AVDEULCSA+U272	ON OFF ON
Handle position (see dwg.) :	III II I
Terminals connected:	2-3 1-2 5-6 4-5

4.00 DIA
(.157 DIA)

24

6.35 DIA-40UNS
(1/4-40UNS)(.523)(.157)(.551)(.129)(.043)

SPECIFICATION SUBJECT TO CHANGE WITHOUT NOTICE

013.3014003.301.1

55000 SERIES - VDE APPROVED MINIATURE TOGGLE SWITCHES

A

Additional ordering information: Commonly ordered models are shown on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.

Allowable options are shown below each respective box.

Note 'NONE' indicates box may be left empty.

Model Structure:

Series	Terminals & bushings	Number of poles	Electrical functions	Terminals	Contact material
5 5					
	2 Printed circuit or quick-connect terminals with 1/4-40 (6.35mm) threaded or smooth bushing. 6 Solder lug terminals with 1/4-40 (6.35mm) threaded bushing.	3 Single pole 4 Double pole	6 ON - ON 9 ON OFF ON	(NONE) W Horizontal right angle p.c. Z Quick connect	A Silver

Options:

Actuators

NONE

4 N For paddles

Agency Recognition

VDE, UL & CSA standard

Insulating caps and paddles

Caps

U 2 7 0

U 1 0 4 0

Paddles

U 2 4 0 N

U 2 9 0 N

U 3 9 0 N

(see drawings and color codes).

Note:
VDE requires cap or paddle selection.

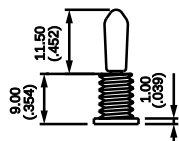
Example of completely specified model number:

55236ZAVDEULCSA+U272

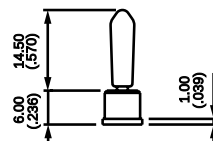
Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

OPTION DRAWINGS

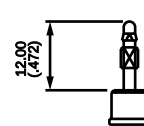
ACTUATORS



13 for threaded bushing models
Cap U270 is required

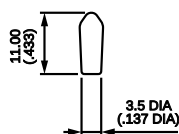


13 for smooth bushing models
Cap U1040 is required

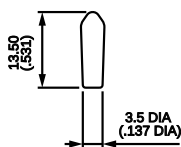


4N For use with paddles only
Paddle U240N, U290N or U 390N is required.

INSULATING CAPS supplied cemented to lever (replace '0' in part number with color code)



U270 for threaded bushing models



U1040 for smooth bushing models

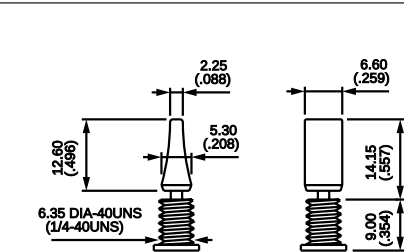
Colors

- 1** blue
- 2** black
- 3** green
- 4** grey
- 5** yellow
- 6** red
- 7/1** white
- 9** orange

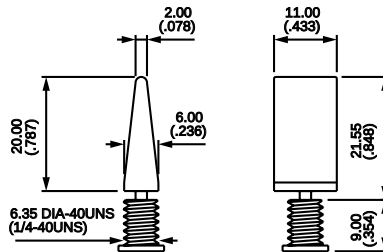
55000 SERIES - VDE APPROVED MINIATURE TOGGLE SWITCHES

OPTION DRAWINGS & MISCELLANEOUS

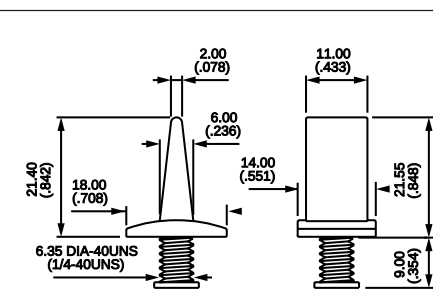
PADDLES for use with lever 4N Note: Order Paddle separately.
(shown with threaded bushing)



U240N



U290N



U390N

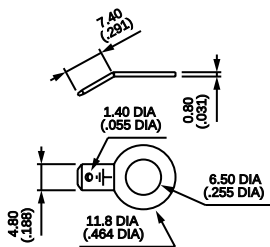
Replace '0' in part numbers
with color code.

Colors

- | | |
|-----|--------|
| 1 | blue |
| 2 | black |
| 3 | green |
| 4 | grey |
| 5 | yellow |
| 6 | red |
| 7/1 | white |
| 9 | orange |

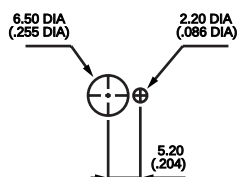
GROUNDING LUG Note: Order Grounding Lug separately.

IMPORTANT: required on models with threaded bushing if panel is non-metallic or not connected to ground.



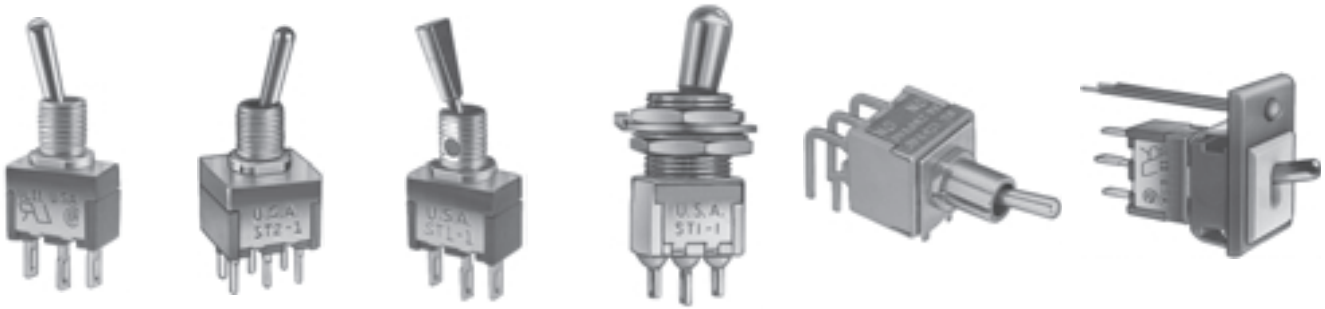
U721

PANEL CUT-OUT for 1/4" threaded bushing



ST SERIES - MINIATURE TOGGLE SWITCHES

A



FEATURES

- Dry circuit through power ratings .
- Ultra-rugged construction SPDT & DPDT models with numerous options.
- Panel, panel & p.c. and p.c. mounting models, lighted and unlighted.

SPECIFICATIONS

Contact ratings (resistive loads):	(Q) power models - coin silver: 6 Amps at 125 VAC, 3 Amps at 250 VAC or 7 Amps at 30 VDC. (B) dry circuit models - gold over nickel over brass: 0.4 VA max. at 20 V max. UL models - coin silver: 6 Amps at 125 VAC or 3 Amps at 250 VAC (75% power factor). UL file no. E66367. CSA models - coin silver: same ratings as UL models. CSA file no. LR54592-1.
Initial contact resistance:	3 milliohms max. at 3 VDC, 0.1 Amp.
Insulation resistance:	Greater than 200,000 megohms between terminals & case ground.
Dielectric strength:	Greater than 2000 VAC for 1 minute between terminals & case ground.
Electrical life (resistive loads):	100,000 cycles min. for ST1-1 & ST2-1. Other models, 40,000 cycles min.
Operating temperature range:	-30°C to +85°C

MATERIALS

Contacts:	Coin silver for power, UL & CSA models. Gold over nickel over brass for dry circuit models.
Actuator:	Brass, bright nickel or chrome plated.
Bushing:	Nickel plated brass
Strap:	Stainless steel
Case:	Melamine Phenolic, color red
Terminal seal:	Epoxy (optional)
Support bracket:	Brass or steel, tin plated
Spring mounting bracket:	Stainless steel
Bezel & bezel insert:	Nylon. Available in black, red & white. Consult factory for other colors.
Hardware:	See 'Miscellaneous' section.
LED:	Intensity: 2.0 mcd at 10 mA. Forward voltage: 2.0V (3.0V max.). Max. continuous forward current: 15 mA for red, 30 mA for green & 20 mA for yellow. Red is standard. Yellow & green are optional. Specifications are subject to change without notice - consult factory.

AGENCY RECOGNITION



UL, & CSA. Marking: Switches ordered by UL model number are supplied with recognition marking. Switches ordered by UL model no. and with 'CSA' added at end of model no. are supplied with both recognitions marked.

ABOUT THIS SERIES

The material in this series is organized in the following sequence:

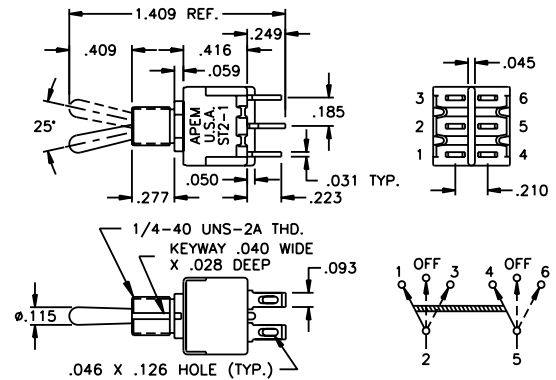
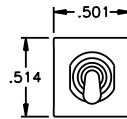
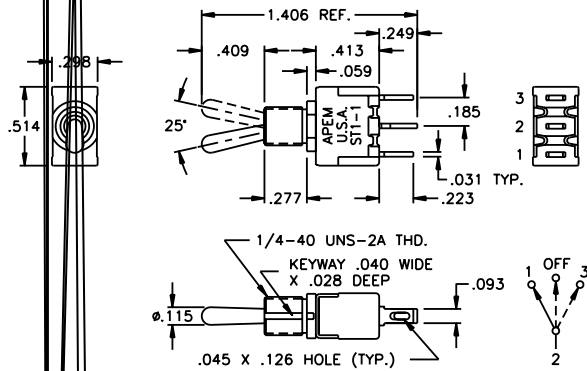
- Completely specified switch models
- Miscellaneous
- 'build your own switch' order format
- Option drawings & information
- Panel cut-outs

ST SERIES - MINIATURE TOGGLE SWITCHES

Solder lug terminals - panel mounting

SINGLE
POLE

DOUBLE
POLE



Terminal numbers
for reference only

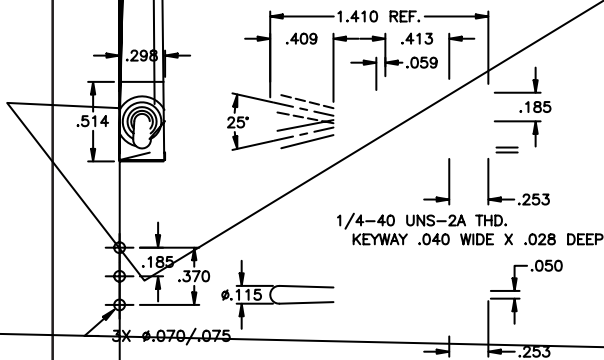
SINGLE POLE

DOUBLE POLE

Straight p.c. terminals - panel mounting

SINGLE
POLE

DOUBLE
POLE



Terminal numbers
for reference only

SINGLE POLE

DOUBLE POLE

	POWER CKT. MODEL NO.	UL MODEL NO.				Key way
Single pole	ST1-1KMZQ	UL11KMZQ	ON	NONE	ON	
	ST1-2KMZQ	UL12KMZQ	ON	OFF	ON	
	ST1-3KMZQ	UL13KMZQ	MOM	OFF	MOM	
	ST1-4KMZQ	UL14KMZQ	ON	OFF	MOM	
	ST1-5KMZQ	UL15KMZQ	ON	NONE	MOM	
Double pole	ST2-1KMZQ	UL21KMZQ	ON	NONE	ON	
	ST2-2KMZQ	UL22KMZQ	ON	OFF	ON	
	ST2-3KMZQ	UL23KMZQ	MOM	OFF	MOM	
	ST2-4KMZQ	UL24KMZQ	ON	OFF	MOM	
	ST2-5KMZQ	UL25KMZQ	ON	NONE	MOM	
	ST2-6KMZQ	UL26KMZQ	ON	ON	ON	
	ST2-7KMZQ	UL27KMZQ	ON	ON	MOM	
	ST2-8KMZQ	UL28KMZQ	MOM	ON	MOM	
Terminals connected (-6, -7 & -8)			1-2, 4-5	1-2, 5-6	2-3, 5-6	

	DRY CKT. MODEL NO.	UL MODEL NO.				Key way
Single pole	ST1-1KMCB	UL11KMCB	ON	NONE	ON	
	ST1-2KMCB	UL12KMCB	ON	OFF	ON	
	ST1-3KMCB	UL13KMCB	MOM	OFF	MOM	
	ST1-4KMCB	UL14KMCB	ON	OFF	MOM	
	ST1-5KMCB	UL15KMCB	ON	NONE	MOM	
Double pole	ST2-1KMCB	UL21KMCB	ON	NONE	ON	
	ST2-2KMCB	UL22KMCB	ON	OFF	ON	
	ST2-3KMCB	UL23KMCB	MOM	OFF	MOM	
	ST2-4KMCB	UL24KMCB	ON	OFF	MOM	
	ST2-5KMCB	UL25KMCB	ON	NONE	MOM	
	ST2-6KMCB	UL26KMCB	ON	ON	ON	
	ST2-7KMCB	UL27KMCB	ON	ON	MOM	
	ST2-8KMCB	UL28KMCB	MOM	ON	MOM	
Terminals connected (-6, -7 & -8)			1-2, 4-5	1-2, 5-6	2-3, 5-6	

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

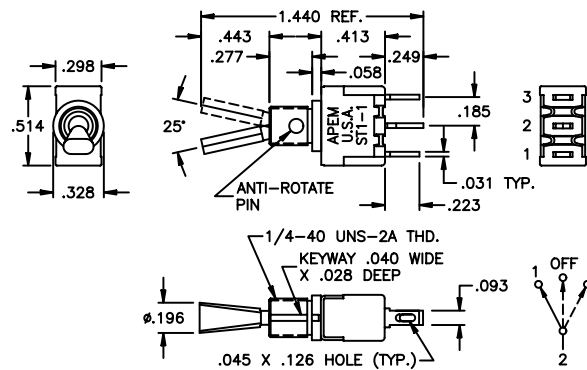
ST SERIES - MINIATURE TOGGLE SWITCHES

A

Flatted actuator - panel mounting

SINGLE POLE

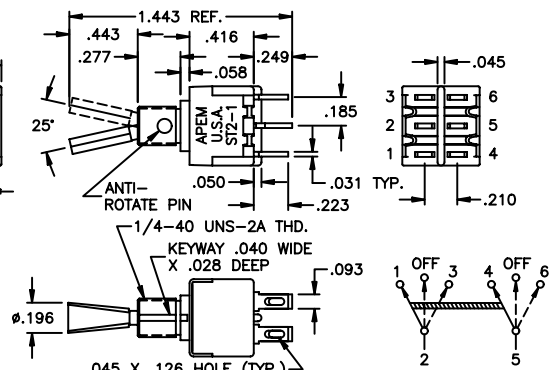
DOUBLE POLE



Terminal numbers for reference only

SINGLE POLE

	POWER CKT. MODEL NO.	UL MODEL NO.	ON	NONE	OFF	Key way
Single pole	ST1-1F1MZQ	UL11F1MZQ	ON	NONE	ON	
	ST1-2F1MZQ	UL12F1MZQ	ON	OFF	ON	
	ST1-3F1MZQ	UL13F1MZQ	MOM	OFF	MOM	
	ST1-4F1MZQ	UL14F1MZQ	ON	OFF	MOM	
	ST1-5F1MZQ	UL15F1MZQ	ON	NONE	MOM	
Double pole	ST2-1F1MZQ	UL21F1MZQ	ON	NONE	ON	
	ST2-2F1MZQ	UL22F1MZQ	ON	OFF	ON	
	ST2-3F1MZQ	UL23F1MZQ	MOM	OFF	MOM	
	ST2-4F1MZQ	UL24F1MZQ	ON	OFF	MOM	
	ST2-5F1MZQ	UL25F1MZQ	ON	NONE	MOM	
	ST2-6F1MZQ	UL26F1MZQ	ON	ON	ON	
	ST2-7F1MZQ	UL27F1MZQ	ON	ON	MOM	
	ST2-8F1MZQ	UL28F1MZQ	MOM	ON	MOM	
Terminals connected (-6, -7 & -8)			1-2, 4-5	1-2, 5-6	2-3, 5-6	



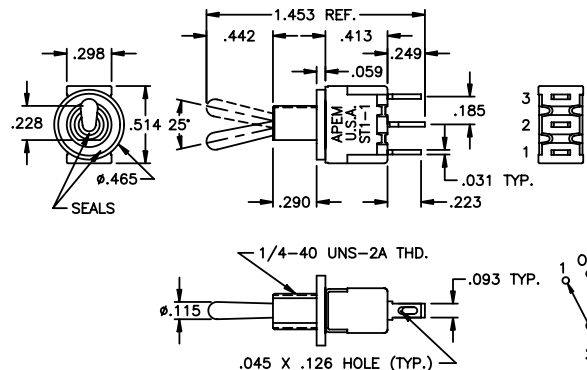
DOUBLE POLE

Splashproof bushing - panel mounting

An 'o'-ring placed internally between the actuator and the bushing, and a gasket placed externally between the bushing flange and mounting panel provides static protection from 3.3 ft. (1 meter) of water for 30 minutes.

SINGLE POLE

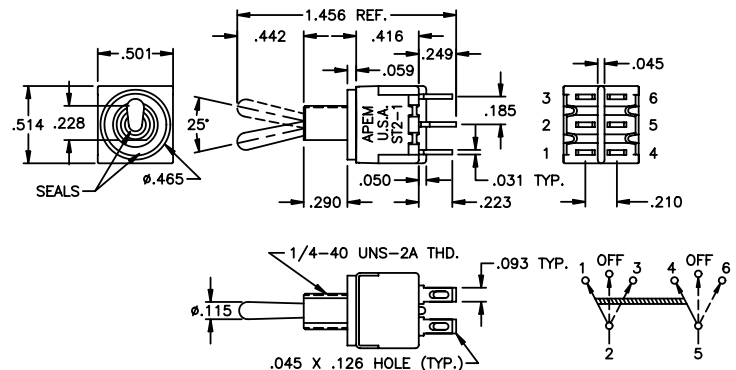
DOUBLE POLE



Terminal numbers for reference only

SINGLE POLE

	POWER CKT. MODEL NO.	UL MODEL NO.	ON	NONE	OFF	Key way
Single pole	ST1-1KHZQ	UL11KHZQ	ON	NONE	ON	
	ST1-2KHZQ	UL12KHZQ	ON	OFF	ON	
	ST1-3KHZQ	UL13KHZQ	MOM	OFF	MOM	
	ST1-4KHZQ	UL14KHZQ	ON	OFF	MOM	
	ST1-5KHZQ	UL15KHZQ	ON	NONE	MOM	
Double pole	ST2-1KHZQ	UL21KHZQ	ON	NONE	ON	
	ST2-2KHZQ	UL22KHZQ	ON	OFF	ON	
	ST2-3KHZQ	UL23KHZQ	MOM	OFF	MOM	
	ST2-4KHZQ	UL24KHZQ	ON	OFF	MOM	
	ST2-5KHZQ	UL25KHZQ	ON	NONE	MOM	
	ST2-6KHZQ	UL26KHZQ	ON	ON	ON	
	ST2-7KHZQ	UL27KHZQ	ON	ON	MOM	
	ST2-8KHZQ	UL28KHZQ	MOM	ON	MOM	
Terminals connected (-6, -7 & -8)			1-2, 4-5	1-2, 5-6	2-3, 5-6	



DOUBLE POLE

ST SERIES - MINIATURE TOGGLE SWITCHES

15/32" threaded bushing - panel mounting

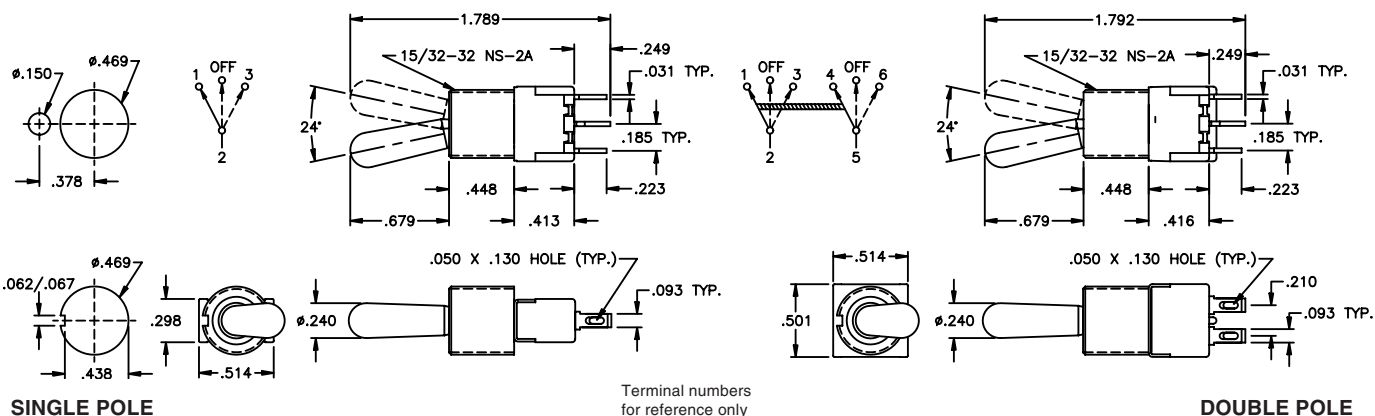
**SINGLE
POLE
WITH T1
ACTUATOR**



**DOUBLE
POLE
WITH T2
ACTUATOR**



	POWER CKT. MODEL NO.	UL MODEL NO.				Key way
Single pole	ST1-1T1M4ZQ	UL11T1M4ZQ	ON	NONE	ON	
	ST1-2T1M4ZQ	UL12T1M4ZQ	ON	OFF	ON	
	ST1-3T1M4ZQ	UL13T1M4ZQ	MOM	OFF	MOM	
	ST1-4T1M4ZQ	UL14T1M4ZQ	ON	OFF	MOM	
	ST1-5T1M4ZQ	UL15T1M4ZQ	ON	NONE	MOM	
Double pole	ST2-1T1M4ZQ	UL21T1M4ZQ	ON	NONE	ON	
	ST2-2T1M4ZQ	UL22T1M4ZQ	ON	OFF	ON	
	ST2-3T1M4ZQ	UL23T1M4ZQ	MOM	OFF	MOM	
	ST2-4T1M4ZQ	UL24T1M4ZQ	ON	OFF	MOM	
	ST2-5T1M4ZQ	UL25T1M4ZQ	ON	NONE	MOM	
	ST2-6T1M4ZQ	UL26T1M4ZQ	ON	ON	ON	
	ST2-7T1M4ZQ	UL27T1M4ZQ	ON	ON	MOM	
	ST2-8T1M4ZQ	UL28T1M4ZQ	MOM	ON	MOM	
Terminals connected (-6, -7 & -8)			1-2, 4-5	1-2, 5-6	2-3, 5-6	



Straight p.c. terminals with bracket - p.c. mounting

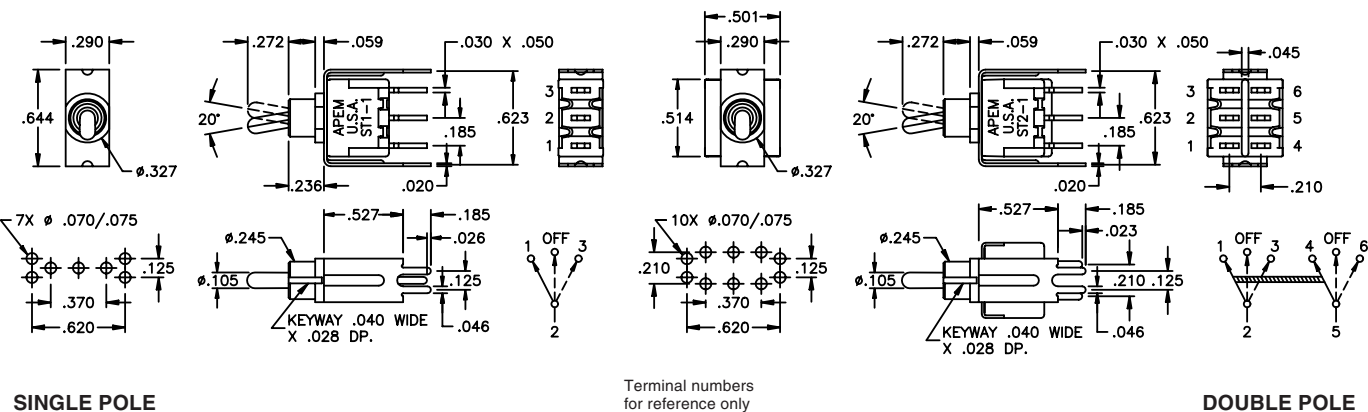
**SINGLE
POLE**



**DOUBLE
POLE**



	DRY CKT. MODEL NO.	UL MODEL NO.				Key way
Single pole	ST1-1L3S3V30B	UL11L3S3V30Q	ON	NONE	ON	
	ST1-2L3S3V30B	UL12L3S3V30Q	ON	OFF	ON	
	ST1-3L3S3V30B	UL13L3S3V30Q	MOM	OFF	MOM	
	ST1-4L3S3V30B	UL14L3S3V30Q	ON	OFF	MOM	
	ST1-5L3S3V30B	UL15L3S3V30Q	ON	NONE	MOM	
Double pole	ST2-1L3S3V30B	UL21L3S3V30Q	ON	NONE	ON	
	ST2-2L3S3V30B	UL22L3S3V30Q	ON	OFF	ON	
	ST2-3L3S3V30B	UL23L3S3V30Q	MOM	OFF	MOM	
	ST2-4L3S3V30B	UL24L3S3V30Q	ON	OFF	MOM	
	ST2-5L3S3V30B	UL25L3S3V30Q	ON	NONE	MOM	
	ST2-6L3S3V30B	UL26L3S3V30Q	ON	ON	ON	
	ST2-7L3S3V30B	UL27L3S3V30Q	ON	ON	MOM	
	ST2-8L3S3V30B	UL28L3S3V30Q	MOM	ON	MOM	
Terminals connected (-6, -7 & -8)			1-2, 4-5	1-2, 5-6	2-3, 5-6	



ST SERIES - MINIATURE TOGGLE SWITCHES

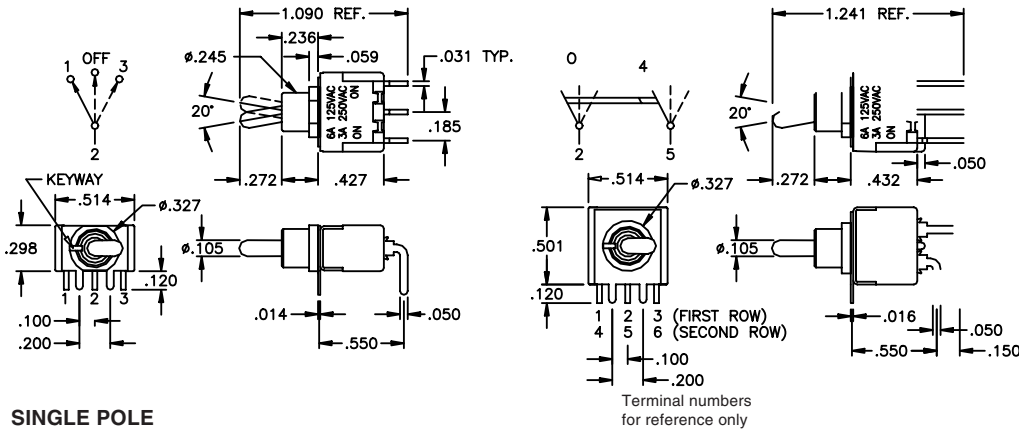
A

Horizontal right angle p.c. terminals - p.c. mounting

SINGLE
POLE

DOUBLE
POLE

	DRY CKT. MODEL NO.	UL MODEL NO.				Key way
Single pole	ST1-1L3S3AB	UL11L3S3AQ	ON	NONE	ON	
	ST1-2L3S3AB	UL12L3S3AQ	ON	OFF	ON	
	ST1-3L3S3AB	UL13L3S3AQ	MOM	OFF	MOM	
	ST1-4L3S3AB	UL14L3S3AQ	ON	OFF	MOM	
	ST1-5L3S3AB	UL15L3S3AQ	ON	NONE	MOM	
Double pole	ST2-1L3S3AB	UL21L3S3AQ	ON	NONE	ON	
	ST2-2L3S3AB	UL22L3S3AQ	ON	OFF	ON	
	ST2-3L3S3AB	UL23L3S3AQ	MOM	OFF	MOM	
	ST2-4L3S3AB	UL24L3S3AQ	ON	OFF	MOM	
	ST2-5L3S3AB	UL25L3S3AQ	ON	NONE	MOM	
	ST2-6L3S3AB	UL26L3S3AQ	ON	ON	ON	
	ST2-7L3S3AB	UL27L3S3AQ	ON	ON	MOM	
	ST2-8L3S3AB	UL28L3S3AQ	MOM	ON	MOM	
Terminals connected (-6, -7 & -8)			1-2, 4-5	1-2, 5-6	2-3, 5-6	



SINGLE POLE

DOUBLE POLE

Vertical right angle p.c. terminals - p.c. mounting

SINGLE
POLE

DOUBLE
POLE

	DRY CKT. MODEL NO.	UL MODEL NO.				Key way
Single pole	ST1-1L3S3V-1B	UL11L3S3V-1Q	ON	NONE	ON	
	ST1-2L3S3V-1B	UL12L3S3V-1Q	ON	OFF	ON	
	ST1-3L3S3V-1B	UL13L3S3V-1Q	MOM	OFF	MOM	
	ST1-4L3S3V-1B	UL14L3S3V-1Q	ON	OFF	MOM	
	ST1-5L3S3V-1B	UL15L3S3V-1Q	ON	NONE	MOM	
Double pole	ST2-1L3S3V-1B	UL21L3S3V-1Q	ON	NONE	ON	
	ST2-2L3S3V-1B	UL22L3S3V-1Q	ON	OFF	ON	
	ST2-3L3S3V-1B	UL23L3S3V-1Q	MOM	OFF	MOM	
	ST2-4L3S3V-1B	UL24L3S3V-1Q	ON	OFF	MOM	
	ST2-5L3S3V-1B	UL25L3S3V-1Q	ON	NONE	MOM	
	ST2-6L3S3V-1B	UL26L3S3V-1Q	ON	ON	ON	
	ST2-7L3S3V-1B	UL27L3S3V-1Q	ON	ON	MOM	
	ST2-8L3S3V-1B	UL28L3S3V-1Q	MOM	ON	MOM	
Terminals connected (-6, -7 & -8)			1-2, 4-5	1-2, 5-6	2-3, 5-6	

SINGLE POLE

Terminal numbers
for reference only

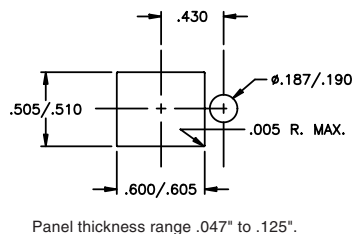
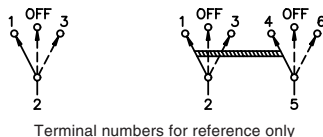
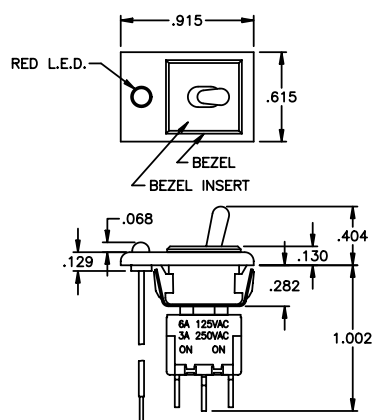
DOUBLE POLE

ST SERIES - MINIATURE TOGGLE SWITCHES

Snap-in bezel with outboard LED

PATENT NO.
Des. 282,524

UL11KMZQJ6128



	POWER CKT. MODEL NO.	UL MODEL NO.	USA marking on opposite side		
Single pole	ST1-1KMZQJ6122	UL11KMZQJ6122	ON	NONE	ON
	ST1-2KMZQJ6122	UL12KMZQJ6122	ON	OFF	ON
	ST1-3KMZQJ6122	UL13KMZQJ6122	MOM	OFF	MOM
	ST1-4KMZQJ6122	UL14KMZQJ6122	ON	OFF	MOM
	ST1-5KMZQJ6122	UL15KMZQJ6122	ON	NONE	MOM
Double pole	ST2-1KMZQJ6122	UL21KMZQJ6122	ON	NONE	ON
	ST2-2KMZQJ6122	UL22KMZQJ6122	ON	OFF	ON
	ST2-3KMZQJ6122	UL23KMZQJ6122	MOM	OFF	MOM
	ST2-4KMZQJ6122	UL24KMZQJ6122	ON	OFF	MOM
	ST2-5KMZQJ6122	UL25KMZQJ6122	ON	NONE	MOM
	ST2-6KMZQJ6122	UL26KMZQJ6122	ON	ON	ON
	ST2-7KMZQJ6122	UL27KMZQJ6122	ON	ON	MOM
	ST2-8KMZQJ6122	UL28KMZQJ6122	MOM	ON	MOM
Terminals connected (-6, -7 & -8)			1-2, 4-5	1-2, 5-6	2-3, 5-6

Above models have black bezel and insert.

Snap-in bezel with 0, 1 or 2 inboard LEDs

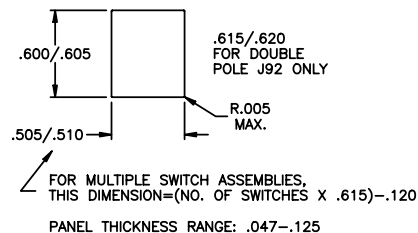
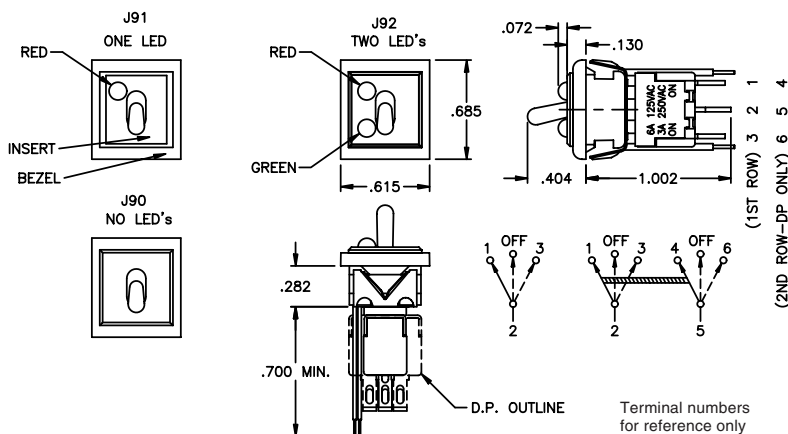
PATENT NO.
Des. 282,524

ST1-1KMZQJ9128



	POWER CKT. MODEL NO.	UL MODEL NO.	USA marking on opposite side		
Single pole	ST1-1KMZQJ9122	UL11KMZQJ9122	ON	NONE	ON
	ST1-2KMZQJ9122	UL12KMZQJ9122	ON	OFF	ON
	ST1-3KMZQJ9122	UL13KMZQJ9122	MOM	OFF	MOM
	ST1-4KMZQJ9122	UL14KMZQJ9122	ON	OFF	MOM
	ST1-5KMZQJ9122	UL15KMZQJ9122	ON	NONE	MOM
Double pole	ST2-1KMZQJ9122	UL21KMZQJ9122	ON	NONE	ON
	ST2-2KMZQJ9122	UL22KMZQJ9122	ON	OFF	ON
	ST2-3KMZQJ9122	UL23KMZQJ9122	MOM	OFF	MOM
	ST2-4KMZQJ9122	UL24KMZQJ9122	ON	OFF	MOM
	ST2-5KMZQJ9122	UL25KMZQJ9122	ON	NONE	MOM
	ST2-6KMZQJ9122	UL26KMZQJ9122	ON	ON	ON
	ST2-7KMZQJ9122	UL27KMZQJ9122	ON	ON	MOM
	ST2-8KMZQJ9122	UL28KMZQJ9122	MOM	ON	MOM
Terminals connected (-6, -7 & -8)			1-2, 4-5	1-2, 5-6	2-3, 5-6

Above models have black bezel and insert.



A

A51

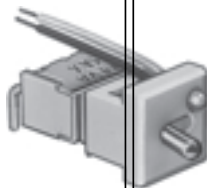
ST SERIES - MINIATURE TOGGLE SWITCHES

Bezel for right angle p.c. mtd. switches with 0, 1 or 2 LEDs

PATENT NO.
Des. 282,524

ST1-1KMA-1BJ9488

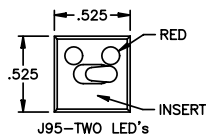
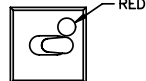
Poles	Option	Dim. A	Dim. B
SP	A	.148	.045 max.
SP	A-1	.164	.095 max.
DP	A	.250	.300 max.
DP	A-1	.266	.350 max.



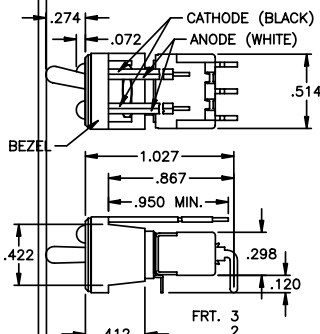
J93—NO. LED



J94—ONE LED



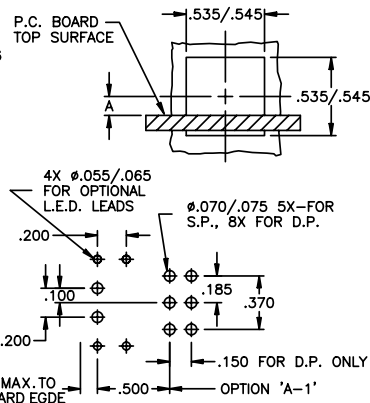
J95—TWO LED's



Terminal numbers
for reference only

	DRY CKT. MODEL NO.	UL MODEL NO.	USA marking on opposite side		
			ON	NONE	ON
Single pole	ST1-1KMA-1BJ9422	UL11KMA-1QJ9422	ON	NONE	ON
	ST1-2KMA-1BJ9422	UL12KMA-1QJ9422	ON	OFF	ON
	ST1-3KMA-1BJ9422	UL13KMA-1QJ9422	MOM	OFF	MOM
	ST1-4KMA-1BJ9422	UL14KMA-1QJ9422	ON	OFF	MOM
	ST1-5KMA-1BJ9422	UL15KMA-1QJ9422	ON	NONE	MOM
Double pole	ST2-1KMA-1BJ9422	UL21KMA-1QJ9422	ON	NONE	ON
	ST2-2KMA-1BJ9422	UL22KMA-1QJ9422	ON	OFF	ON
	ST2-3KMA-1BJ9422	UL23KMA-1QJ9422	MOM	OFF	MOM
	ST2-4KMA-1BJ9422	UL24KMA-1QJ9422	ON	OFF	MOM
	ST2-5KMA-1BJ9422	UL25KMA-1QJ9422	ON	NONE	MOM
	ST2-6KMA-1BJ9422	UL26KMA-1QJ9422	ON	ON	ON
	ST2-7KMA-1BJ9422	UL27KMA-1QJ9422	ON	ON	MOM
	ST2-8KMA-1BJ9422	UL28KMA-1QJ9422	MOM	ON	MOM
Terminals connected (-6, -7 & -8)			1-2, 4-5	1-2, 5-6	2-3, 5-6

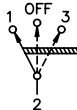
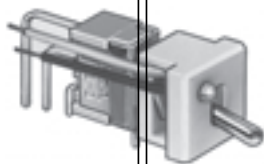
Above models have black bezel and insert.



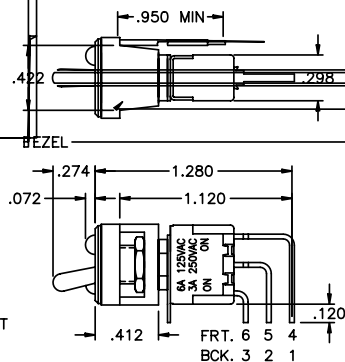
Bezel for right angle p.c. mtd. switches with 0, 1 or 2 LEDs

PATENT NO.
Des. 282,524

ST1-1KMV-1BJ9488



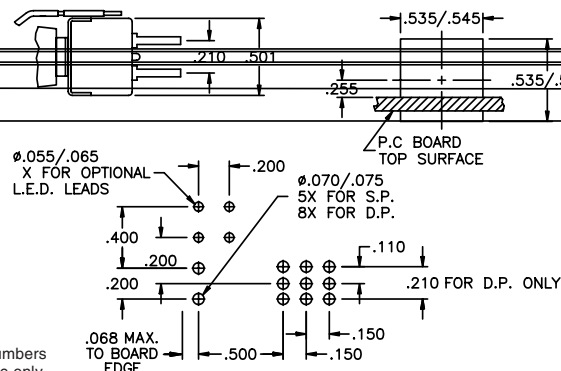
J95—TWO LED's



Terminal numbers
for reference only

	DRY CKT. MODEL NO.	UL MODEL NO.	USA marking on opposite side		
			ON	NONE	ON
Single pole	ST1-1KMV-1BJ9422	UL11KMV-1QJ9422	ON	NONE	ON
	ST1-2KMV-1BJ9422	UL12KMV-1QJ9422	ON	OFF	ON
	ST1-3KMV-1BJ9422	UL13KMV-1QJ9422	MOM	OFF	MOM
	ST1-4KMV-1BJ9422	UL14KMV-1QJ9422	ON	OFF	MOM
	ST1-5KMV-1BJ9422	UL15KMV-1QJ9422	ON	NONE	MOM
Double pole	ST2-1KMV-1BJ9422	UL21KMV-1QJ9422	ON	NONE	ON
	ST2-2KMV-1BJ9422	UL22KMV-1QJ9422	ON	OFF	ON
	ST2-3KMV-1BJ9422	UL23KMV-1QJ9422	MOM	OFF	MOM
	ST2-4KMV-1BJ9422	UL24KMV-1QJ9422	ON	OFF	MOM
	ST2-5KMV-1BJ9422	UL25KMV-1QJ9422	ON	NONE	MOM
	ST2-6KMV-1BJ9422	UL26KMV-1QJ9422	ON	ON	ON
	ST2-7KMV-1BJ9422	UL27KMV-1QJ9422	ON	ON	MOM
	ST2-8KMV-1BJ9422	UL28KMV-1QJ9422	MOM	ON	MOM
Terminals connected (-6, -7 & -8)			1-2, 4-5	1-2, 5-6	2-3, 5-6

Above models have black bezel and insert.

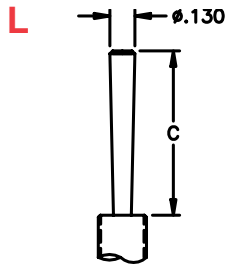


ST SERIES - MINIATURE TOGGLE SWITCHES

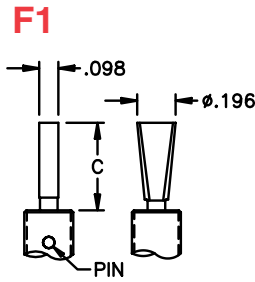
A

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

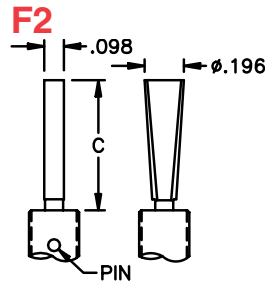
ACTUATOR OPTIONS



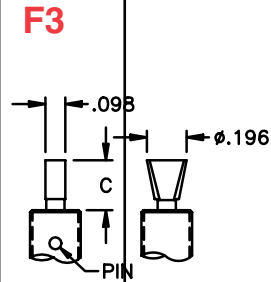
L
LONG ROUND



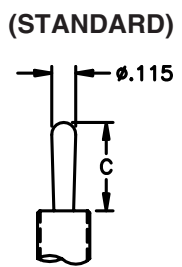
F1
FLATTED



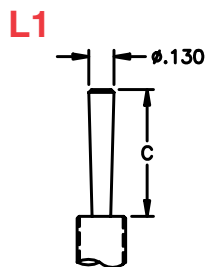
F2
LONG FLATTED



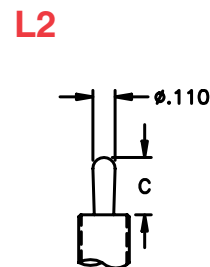
F3
SHORT FLATTED



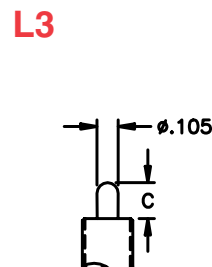
K (STANDARD)
ROUND



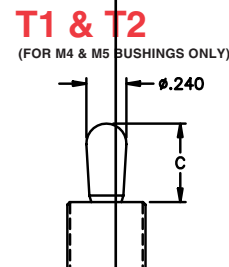
L1
MEDIUM ROUND



L2
SHORT ROUND



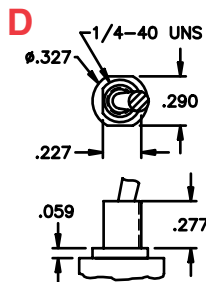
L3
SHORT ROUND



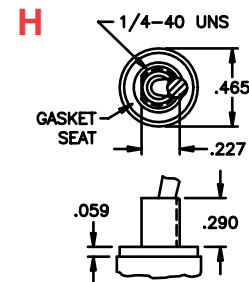
T1 & T2
(FOR M4 & M5 BUSHINGS ONLY)
LONG & SHORT ROUND

T3 & T4
Same as T1 & T2 respectively except with positive internal keying and sideways support to provide more ruggedness in harsh applications.
Available only with M4 bushing

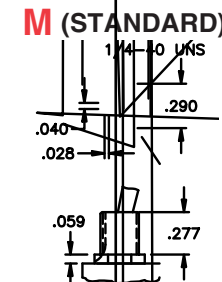
BUSHING OPTIONS



D
THREADED



H
GASKET SEAT
SPLASHPROOF



M (STANDARD)
THREADED

Y
LONG THREADED

S2

NON THREADED

S3

NON THREADED

M4 & M5

THREADED

M5 FEATURES
'O'-RING FOR
SPLASHPROOF
APPLICATIONS

ACTUATOR & BUSHING COMPATIBILITY TABLE WITH DIMENSIONS FOR SELECTIONS

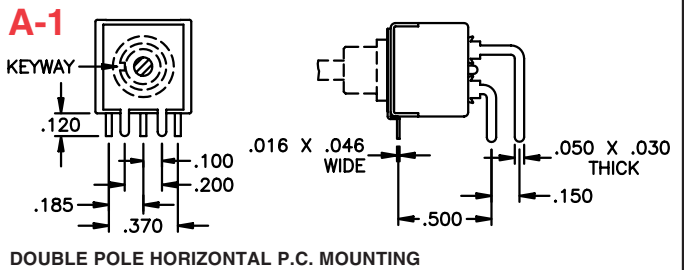
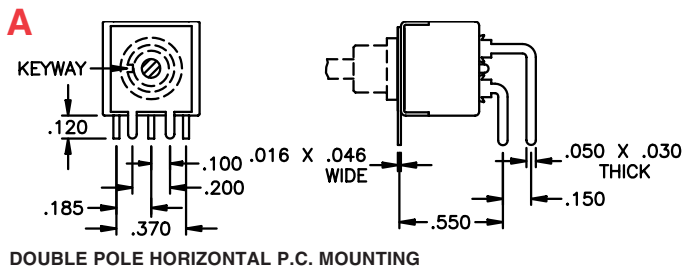
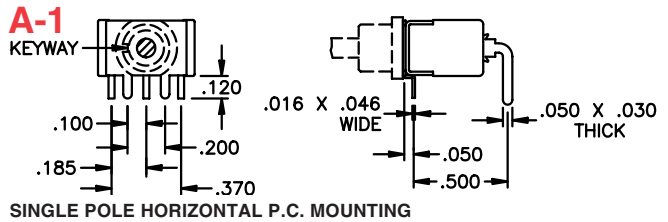
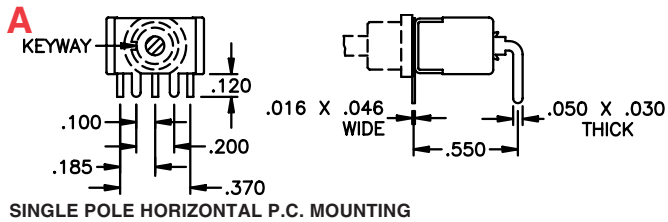
Bushing Option	Bushing Dims. Dim A	Bushing Dims. Dim B	Actuator				length dimension C					
			F1	F2	F3	K	L	L1	L2	L3	T1	T2
D	.277	.060	N/A	N/A	N/A	.410	.840	.640	.270	.170	N/A	N/A
H	.290	.060	N/A	N/A	N/A	.410	.840	.640	.270	.170	N/A	N/A
M	.277	.060	.450	.650	.250	.410	.840	.640	.270	.170	N/A	N/A
Y	.330	.040	N/A	N/A	N/A	.410	.840	.640	.270	.170	N/A	N/A
S2	.277	.060	.450	.650	.250	.410	.840	.640	.270	.170	N/A	N/A
S3	.177	.060	N/A	N/A	N/A	.510	.940	.740	.370	.270	N/A	N/A
M4	.448	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	.460	.687
M5	.448	-	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	.460	.687

N/A - NOT AVAILABLE

CONSULT FACTORY FOR SPECIAL REQUIREMENTS

ST SERIES - MINIATURE TOGGLE SWITCHES

TERMINATION OPTIONS



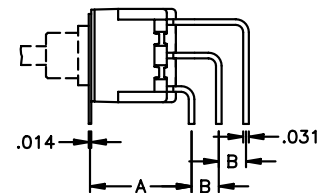
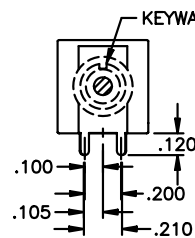
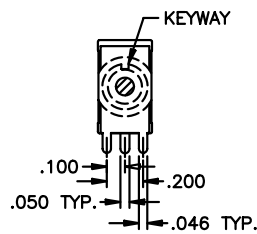
V, V-1 & V-2

FRONT VIEW
SINGLE POLE

FRONT VIEW
DOUBLE POLE

SIDE VIEW - SINGLE & DOUBLE POLE

Option	Dim. A	Dim. B
V	.550	.150
V-1	.500	.150
V-2	.500	.100

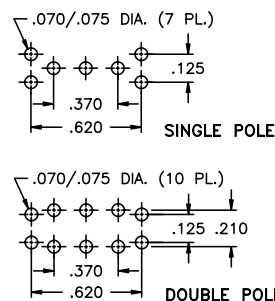


VERTICAL P.C. MOUNTING

V30, V40, V70, V80, V31, V41, V71 & V81

PANEL LAYOUT
V30, V31, V40 & V41

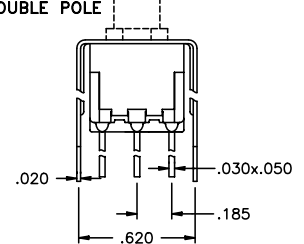
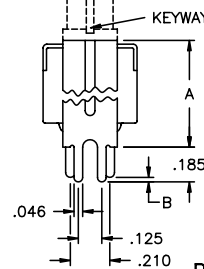
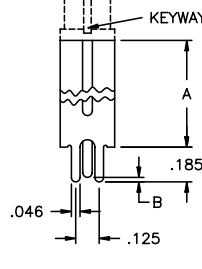
Option	Dim. A	Dim. B
V30-V31	.527	.024
V40-V41	.647	.048



FRONT VIEW
SINGLE POLE

FRONT VIEW
DOUBLE POLE

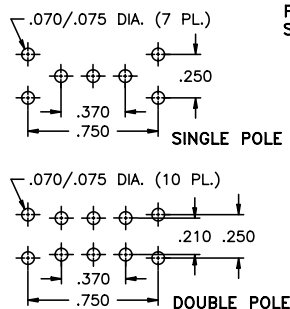
SIDE VIEW -
SINGLE AND
DOUBLE POLE



PRINTED CIRCUIT MOUNTING

PANEL LAYOUT
V70, V71,
V80 & V81

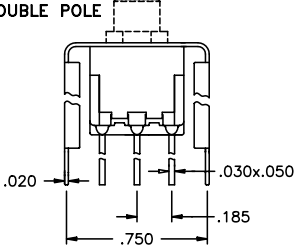
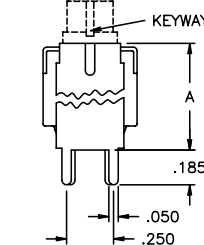
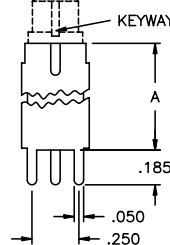
Option	Dim. A
V70-V71	.630
V80-V81	.953



FRONT VIEW
SINGLE POLE

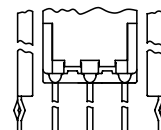
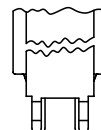
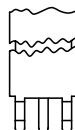
FRONT VIEW
DOUBLE POLE

SIDE VIEW -
SINGLE AND
DOUBLE POLE



PRINTED CIRCUIT MOUNTING

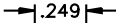
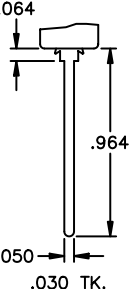
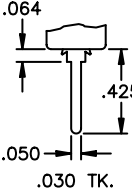
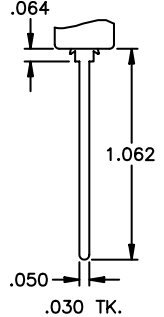
V31, V41, V71 & V81 ARE THE SAME AS V30, V40, V70 & V80 RESPECTIVELY, EXCEPT WITH CRIMPED LEG DESIGN FOR P.C. BOARD RETENTION, AS SHOWN TO RIGHT.



ST SERIES - MINIATURE TOGGLE SWITCHES

A

TERMINATION OPTIONS (CONT'D.)

Z	C	W	W1	W3	X
					
			LONG WIREWRAP	SHORT WIREWRAP	EXTRA LG. WIREWRAP

MATERIAL OPTIONS

- other models 40,000 cycles min.)

ps at 30 VDC (resistive loads).

- other models 40,000 cycles min.)

.

can be used in either dry circuit or power circuit, however once used in power circuit, those customers who have both dry circuit and power circuit requirements, but prefer

n B option.

e.

Solder dipped terminals and custom contact plating available - contact factory.

istive loads).

e.

CSA OPTIONS

power factor).

UL model no. Note - applicable only to terminations with coin silver contacts

power factor). Canadian Standards Association file no. LR54592-1. To specify, per. Note - applicable only to terminations with coin silver contacts (Q or G options)

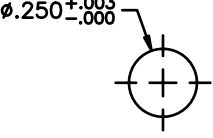
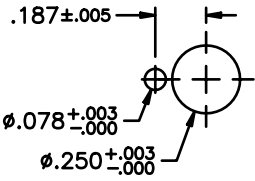
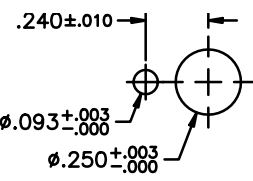
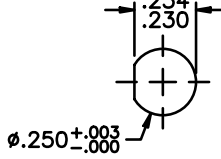
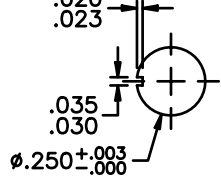
SCCELLANEOUS OPTIONS

	/R To specify reverse switch action on non-symmetrical models with bushing keyway, add '/R' to switch model no.
	22 Black finish is available on actuator, bushing & hardware. To specify, add '-22' to switch model no.

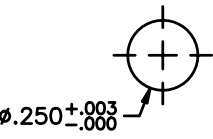
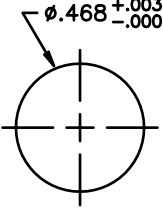
ST SERIES - MINIATURE TOGGLE SWITCHES

PANEL CUT-OUTS

Cut-outs that accept all 1/4-40 threaded bushings:

 Without keying	 With A107 anti-rotate ring	 With A158 anti-rotate ring	 With D bushing	 With slotted keyway bushings
---	---	---	--	---

Cut-outs that accept non-threaded 1/4" bushings and 15/32" threaded bushings:

 Accepts all non-threaded 1/4" bushings	 15/32" threaded bushings
---	---

11000 SERIES - PROFESSIONAL TOGGLE SWITCHES

A



FEATURES

- Designed for high rel defense, space and telecommunications applications.
- SPDT, DPDT, 3PDT & 4PDT models with 1/4-40 threaded bushing.
- Models for panel and p.c. mounting.
- Bright chrome or matte black finish on bushing, actuator and hardware.

SPECIFICATIONS

Contact ratings (resistive loads):	Silver & gold plated silver; 2 Amps at 250 VAC, 4 Amps at 125 VAC or 4 Amps at 30 VDC. (Less than 100 mA 30 VDC to prevent damage to gold plating.) Gold rivet; 200 mA at 250 VAC or 400 mA at 125 VAC
Initial contact resistance:	10 milliohms maximum
Insulation resistance:	1000 megohms min. at 500 VDC
Dielectric strength:	1000 V rms min. - between terminals 2000 V rms min. - between poles and terminals and frame
Electrical life:	Silver: 50,000 cycles min. Gold plated silver: 20,000 cycles min. Gold rivet: 2 positions - 80,000 cycles min. 3 positions - 50,000 cycles min.
Low level or mechanical life:	2 positions - 150,000 cycles min. 3 positions - 100,000 cycles min.
Operating temperature range:	-40°C to +85°C

MATERIALS

Contacts :	Silver, gold plated silver or solid gold rivet
Actuator:	Chrome plated brass
Bushing:	Nickel plated brass
Housing:	Nickel plated brass
Case:	Diallyl phthalate (DAP)
Terminal seal:	Epoxy
Hardware:	Supplied with 2 Hex Nuts .314" (8mm) across flats, 1 Locking Ring & 1 Lockwasher. See hardware section of catalog.

AGENCY RECOGNITION

CECC, LNZ, GAM T1, QPL (Europe), MUAHAG

Availability: Consult factory for details of recognized models.

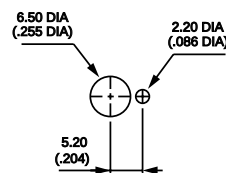
Marking: To order switches marked CECC or ESA/SCC, complete the appropriate box of the ordering format. Other listings do not appear on the switches.

ABOUT THIS SERIES

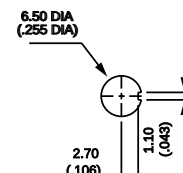
The material in this series is organized in the following sequence:

- Completely specified switch models
- 'build your own switch' order format
- Option drawings

PANEL CUT-OUTS



Standard



With K sealing option

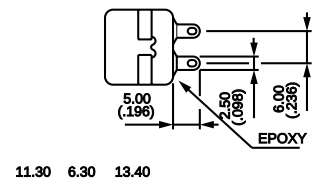
11000 SERIES - PROFESSIONAL TOGGLE SWITCHES

Solder lug terminals - single pole - silver contacts

MODEL NO.	CIRCUIT		
11136A	ON	-	ON
11139A	ON	OFF	ON
11137A	MOM	OFF	MOM
11138A	ON	OFF	MOM
Handle position (see dwg.):	I	II	III

Solder lug terminals - double pole - silver contacts

MODEL NO.	CIRCUIT		
11146A	ON	-	ON
11149A	ON	OFF	ON
11147A	MOM	OFF	MOM
11148A	ON	OFF	MOM
Handle position (see dwg.):	I	II	III



11.30 6.30 13.40

26



0.70

Solder lug terminals - three pole - silver contacts

MODEL NO.	CIRCUIT		
11156A	ON	-	ON
11159A	ON	OFF	ON
11157A	MOM	OFF	MOM
11158A	ON	OFF	MOM
Handle position (see dwg.):	I	II	III

Solder lug terminals - four pole - silver contacts

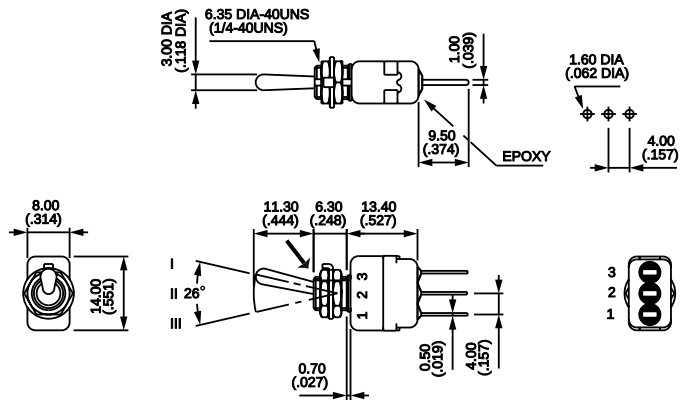
MODEL NO.	CIRCUIT		
11166A	ON	-	ON
11169A	ON	OFF	ON
11167A	MOM	OFF	MOM
11168A	ON	OFF	MOM
Handle position (see dwg.):	I	II	III

11000 SERIES - PROFESSIONAL TOGGLE SWITCHES

A

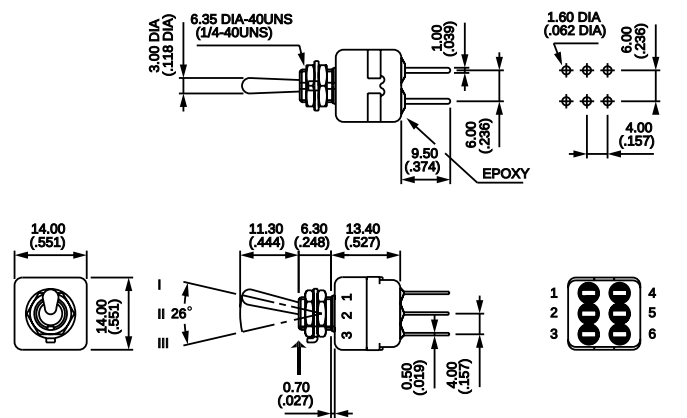
Straight p.c. terminals - single pole - silver contacts

MODEL NO.	CIRCUIT		
11236A	ON	-	ON
Handle position (see dwg.):	I	II	III



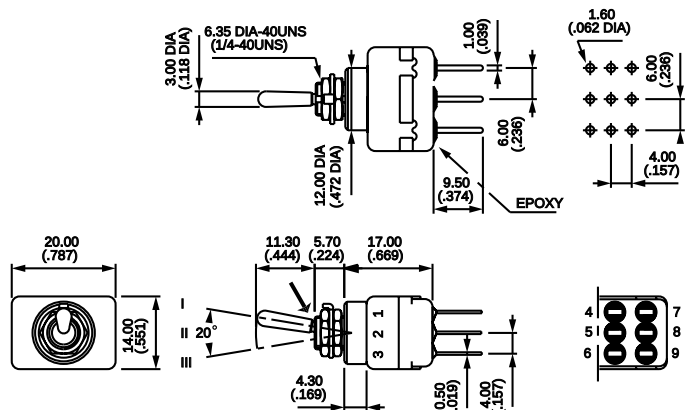
Straight p.c. terminals - double pole - silver contacts

MODEL NO.	CIRCUIT		
11246A	ON	-	ON
Handle position (see dwg.):	I	II	III



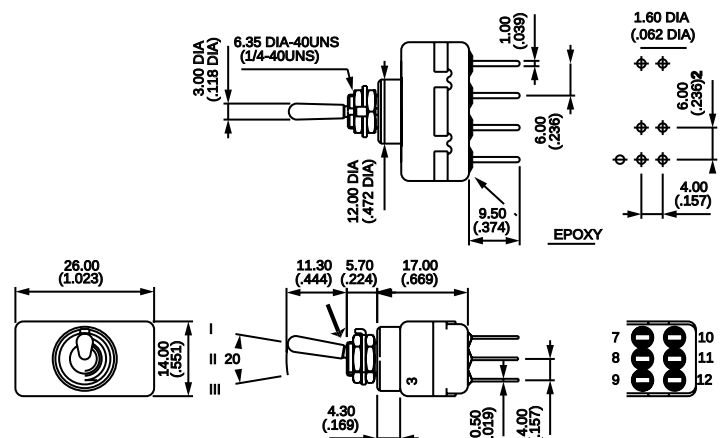
Straight p.c. terminals - three pole - silver contacts

MODEL NO.	CIRCUIT		
11256A	ON	-	ON
Handle position (see dwg.):	I	II	III



Straight p.c. terminals - four pole - silver contacts

MODEL NO.	CIRCUIT		
11266A	ON	-	ON
Handle position (see dwg.):	I	II	III



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

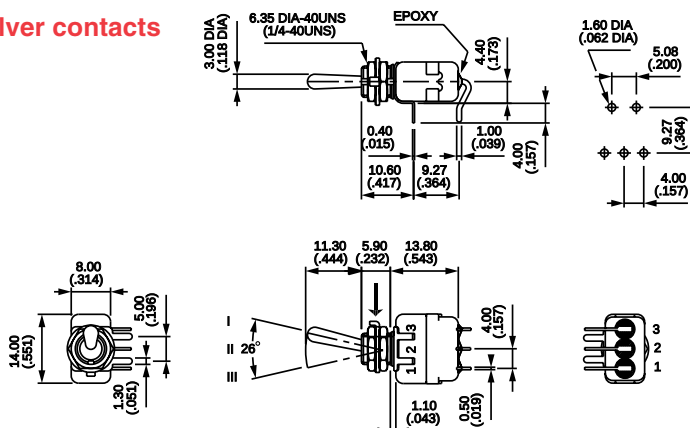
11000 SERIES - PROFESSIONAL TOGGLE SWITCHES

Horizontal right angle p.c. terminals - single pole - silver contacts



MODEL NO.	CIRCUIT		
11136WA	ON	-	ON
Handle position (see dwg.):	I	II	III

→ Keyway



Additional ordering information: Commonly ordered models are shown on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.

Allowable options are shown below each respective box.

Note 'NONE' indicates box may be left empty.

Model Structure:

Series	Terminals & bushings	Number of poles	Electrical functions	Terminals	Contact materials
1	1				
	1 Solder lug or right angle terminals 2 Straight p.c. terminals (all models have 1/4-40 thd'd. bushing)	3 Single pole 4 Double pole 5 Three pole 6 Four pole	6 ON - ON 9 ON OFF ON 7 MOM OFF MOM 8 ON OFF MOM	(NONE) W Horizontal right angle p.c.- function 6, single pole only	A Silver A D 2 Gold plated silver (2 microns) D Solid gold rivet

Options:

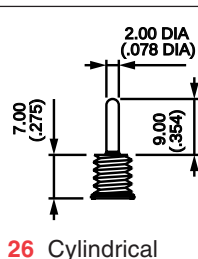
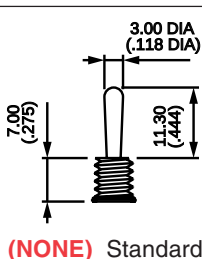
Black finish	Sealing	Actuators	Special options	Approvals/listings
(NONE) G Matte black finish on bushing, actuator & hardware.	(NONE) K Epoxy sealed terminals std'd. Front panel sealing with o-ring & gasket. (not avail. w/W)	(NONE) Standard 2 6 Cylindrical (see actuator dwgs.)	(NONE) F Tin plated terminals (p.c. only)	(NONE) C E C C L N Z Telecommunications G A M Military M U A H A G Q P L (Europe only) (consult factory for details of approved models).

Example of completely specified model number:

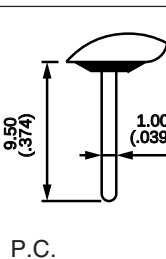
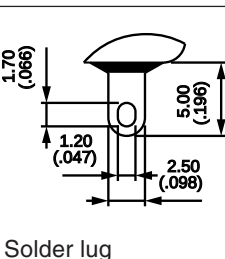
11136WAD2GFCECC

Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

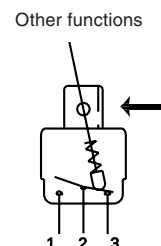
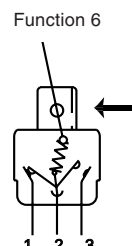
ACTUATOR OPTIONS



TERMINALS



SWITCH ACTION (arrow indicates keyway)



12000 SERIES - PROFESSIONAL TOGGLE SWITCHES

A



FEATURES

- Designed for high rel defense, space and telecommunications applications.
- DPDT, 3PDT & 4PDT models with 15/32-32 threaded bushing.
- Models for panel and p.c. mounting.
- Supplied with 2 Hex Nuts, 1 Locking Ring & 1 Lockwasher.
- Bright chrome or matte black finish on bushing, actuator and hardware.

SPECIFICATIONS

Contact ratings (resistive loads):	Silver & gold plated silver; 2 Amps at 250 VAC, 4 Amps at 125 VAC or 4 Amps at 30 VDC. (Less than 100 mA 30 VDC to prevent damage to gold plating.) Gold rivet; 200 mA at 250 VAC or 400 mA at 125 VAC
Initial contact resistance:	10 milliohms maximum
Insulation resistance:	1000 megohms min. at 500 VDC
Dielectric strength:	1000 V rms min. - between terminals 2000 V rms min. - between poles and terminals and frame
Electrical life:	Silver: 50,000 cycles min. Gold plated silver: 20,000 cycles min. Gold rivet: 2 positions - 80,000 cycles min. 3 positions - 50,000 cycles min.
Low level or mechanical life:	2 positions - 150,000 cycles min. 3 positions - 100,000 cycles min.
Operating temperature range:	-40°C to +85°C

MATERIALS

Contacts :	Silver, gold plated silver or solid gold rivet
Actuator:	Chrome plated brass
Bushing:	Nickel plated brass
Housing:	Nickel plated brass
Case:	Diallyl phthalate (DAP)
Terminal seal:	Epoxy
Hardware:	Supplied with 2 Hex Nuts .551" (14mm) across flats and 1 Locking Ring. See hardware section of catalog.

AGENCY RECOGNITION

CECC, LNZ, GAM T1, QPL (Europe), MUAHAG

Availability: consult factory for details of recognized models.

Marking: to order switches marked CECC or ESA/SCC, complete the appropriate box of the ordering format.

Other recognized marks do not appear on the switches.

ABOUT THIS SERIES

The material in this series is organized in the following sequence:

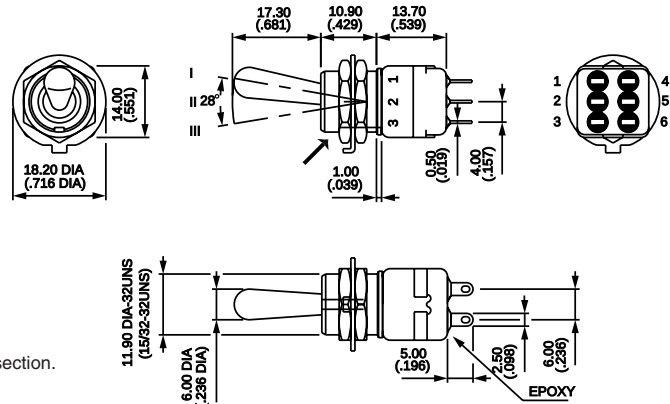
- a. Completely specified switch models:
- b. Option drawings
- c. 'build your own switch' order format & miscellaneous

12000 SERIES - PROFESSIONAL TOGGLE SWITCHES

Solder lug terminals - double pole - silver contacts

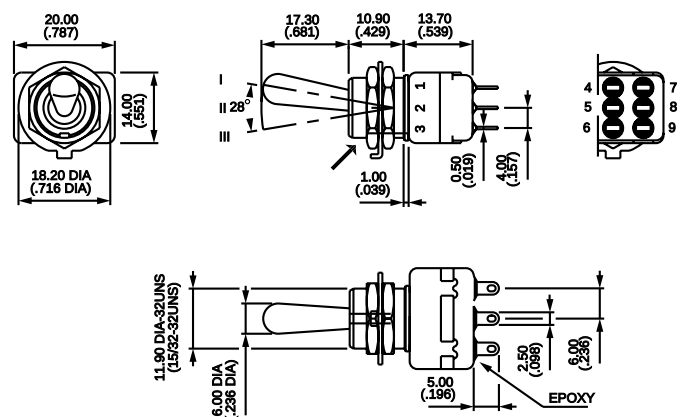
MODEL NO.	CIRCUIT		
12146A	ON	-	ON
12149A	ON	OFF	ON
12147A	MOM	OFF	MOM
12148A	ON	OFF	MOM
12144A*	ON	ON	ON
121441RA*	ON	ON	MOM
121442RA*	MOM	ON	MOM
12145A	-	ON	MOM
Handle position (see dwg.):	I	II	III

*Function 4: SP in DP case, See diagram at end of section.



Solder lug terminals - three pole - silver contacts

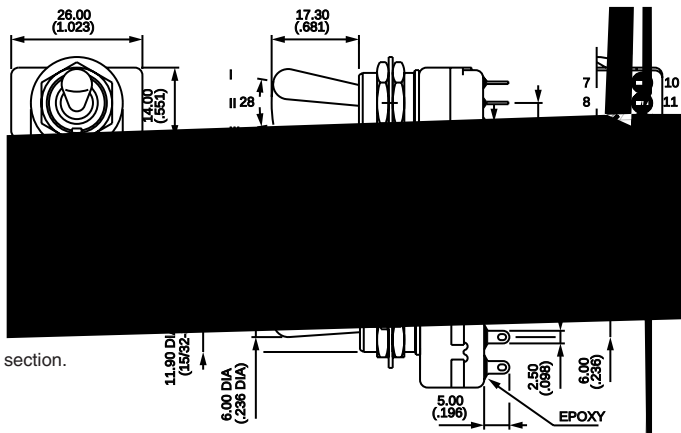
MODEL NO.	CIRCUIT		
12156A	ON	-	ON
12159A	ON	OFF	ON
12157A	MOM	OFF	MOM
12158A	ON	OFF	MOM
Handle position (see dwg.):	I	II	III



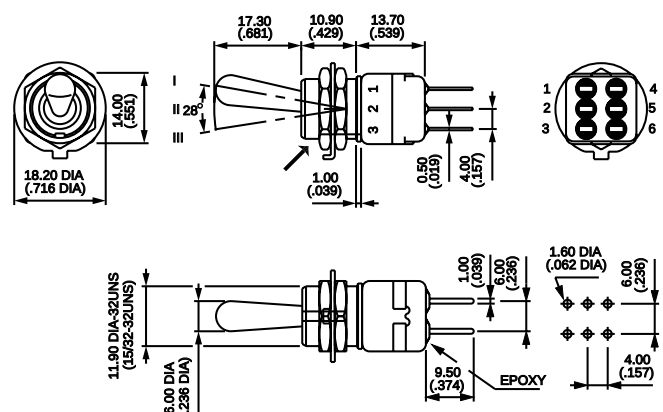
Solder lug terminals - four pole - silver contacts

MODEL NO.	CIRCUIT		
12166A	ON	-	ON
12169A	ON	OFF	ON
12167A	MOM	OFF	MOM
12168A	ON	OFF	MOM
12164A*	ON	ON	ON
121641RA*	ON	ON	MOM
121642RA*	MOM	ON	MOM
Handle position (see dwg.):	I	II	III

*Function 4: SP in DP case, See diagram at end of section.



Straight p.c. terminals - double pole - silver contacts



12000 SERIES - PROFESSIONAL TOGGLE SWITCHES

A

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Straight p.c. terminals - three pole - silver contacts

Straight p.c. terminals - four pole - silver contacts

ACTUATOR OPTIONS		TERMINALS	
13 Standard	12 Short lever	Solder lug	P.C.
LOCKING ACTUATOR OPTIONS (arrow indicates keyway)			
1V 1 locked position (function 6)	2V 2 locked positions (function 6)	3V 3 locked positions (functions 9 & 4)	

12000 SERIES - PROFESSIONAL TOGGLE SWITCHES

Additional ordering information: Commonly ordered models are shown on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.

Allowable options are shown below each respective box.

Note 'NONE' indicates box may be left empty.

Model Structure:

Series	Terminals & bushings	Number of poles	Electrical functions	Momentary for function 4	Contact materials
1 2					
	1 Solder lug or terminals 2 Straight p.c. terminals (all models have 15/32-32 thd'd. bushing)	4 Double pole 5 Three pole 6 Four pole	6 ON - ON 9 ON OFF ON 7 MOM OFF MOM 8 ON OFF MOM 5 - ON MOM 4 ON ON ON 4* ON ON MOM 4* MOM ON MOM * specify selection from 'Mom. for function 4' box also - (For double & four pole only)	(NONE) 1 R ON ON MOM 2 R MOM ON MOM	A Silver A D 2 Gold plated silver (2 microns) D Solid gold rivet

Example of completely specified model number:
121442RAD2GFCECC

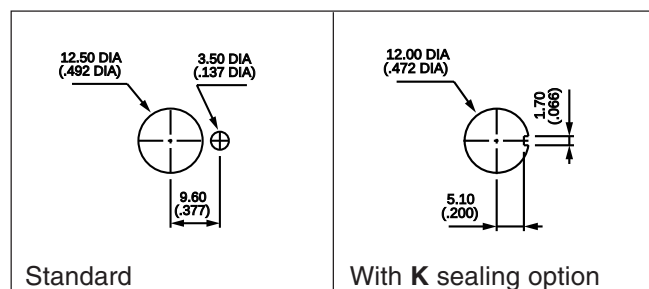
Options:

Black finish	Sealing	Actuators	Special options	Agency Recognition
(NONE) G Matte black finish on bushing, actuator & hardware.	(NONE) Epoxy sealed terminals std'd. K Front panel sealing with o-ring & gasket.	(NONE) Standard 1 2 Short 1 V Locking (1 position) 2 V Locking (2 positions) 3 V Locking (3 positions) (see actuator dwgs.)	(NONE) F Tin plated terminals (p.c. only)	(NONE) C E C C L N Z Telecommunications G A M Military M U A H A G Q P L (Europe only) (consult factory for details of approved models).

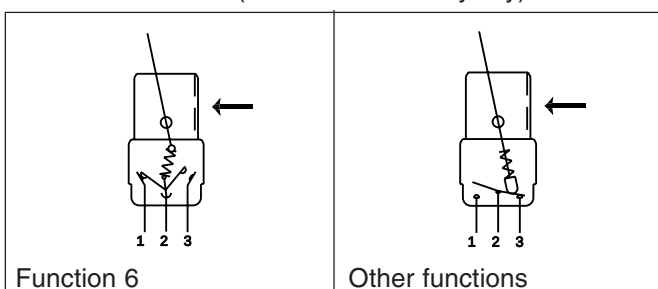
Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

MISCELLANEOUS

PANEL CUT-OUTS

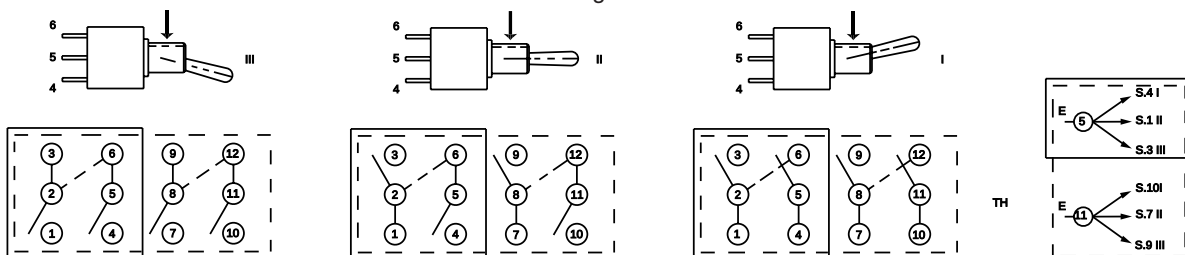


SWITCH ACTION (arrow indicates keyway)



WIRING for function 4 switch

Below diagrams are viewed from bottom of switch.



Equivalent to single pole 3 throw switch. Dotted lines between terminals 2 & 6 and 8 & 12 indicate external jumpers to be added by customer.

12000X778 SERIES - HIGH PERFORMANCE TOGGLE SWITCHES

A



FEATURES

- Designed for high reliability environments.
- Double shell case for high mechanical strength & high electrical insulation.
- Pinned actuator for ruggedness and permanent grounding to switch bushing.
- Panel sealed to IP 67 and fully sealed switch body.
- DPDT, 3PDT & 4PDT models with 15/32-32 threaded bushing with flat.
- Highly reliable for low level or power applications.
- Matte black finish on body, bushing, actuator and hardware.

SPECIFICATIONS

Contact ratings (resistive loads):	2 Amps at 250 VAC, 4 Amps at 125 VAC or 4 Amps at 28 VDC. (Less than 300 mA at 28 VDC to prevent damage to gold plating). Minimum load - 10 mA at 50 mV, 10 μ A at 5 VDC
Initial contact resistance:	10 milliohms maximum
Insulation resistance:	1000 megohms min. at 500 VDC
Dielectric strength:	1000 V rms min. - between terminals 2000 V rms min. - between poles and terminals and frame
Electrical life:	At 2 Amps 250 VAC or 4 Amps at 28 VDC - 20,000 cycles min. (10,000 for functions 4 & 5) At low level (10 mA 50 mV) - 40,000 cycles min. (20,000 for functions 4 & 5)
Operating temperature range:	-40°C to +85°C
Environmental:	Shock: 50g - 11 ms (IEC 68-2-27). Vibration: 10-500 Hz - 10 g (IEC 68-2-6). Salt spray: 96 hrs.(IEC 68-2-11) Humidity: 56days,93% R.H.,40°C (IEC 68-2-3).

MATERIALS

Contacts :	Solid rivet - gold plated silver/nickel alloy
Actuator:	Black chrome plated brass
Bushing:	Black chrome plated brass
Case:	Diallyl phthalate (DAP) with plastic external shell, epoxy sealed
Hardware:	Supplied with 1 Hex Nut with black finish. See drawing at end of section.

AGENCY RECOGNITION

CECC, GAM , QPL (Europe), MUAHAG & DAT (French defense military). Marking: Many models have full CECC recognition and are marked CECC. Consult factory for list of recognized models.

ABOUT THIS SERIES

The material in this series is organized in the following sequence:

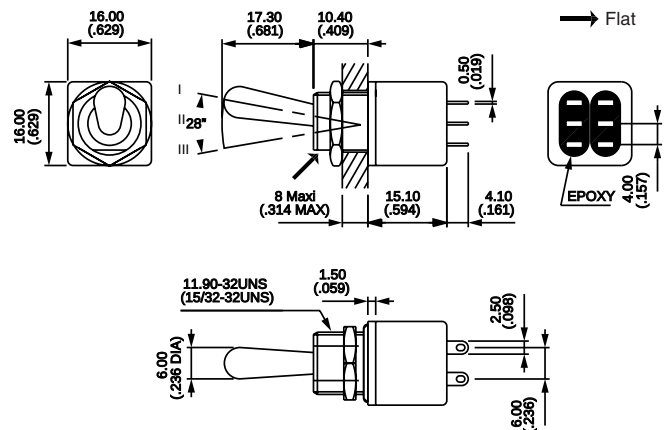
- Completely specified switch models
- Option drawings
- 'build your own switch' order format
- Miscellaneous and Positions & Connections

12000X778 SERIES - HIGH PERFORMANCE TOGGLE SWITCHES

Solder lug terminals - double pole



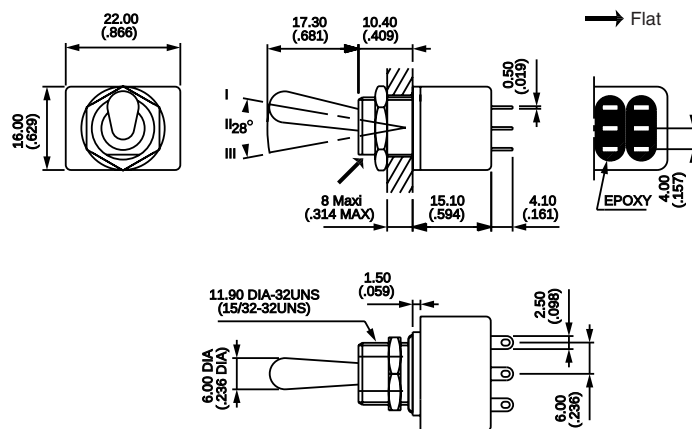
MODEL NO.	CIRCUIT		
12146X778	ON	-	ON
12149X778	ON	OFF	ON
12147X778	MOM	OFF	MOM
12148X778	ON	OFF	MOM
12144X778	ON	ON	ON
121441RX778	ON	ON	MOM
121442RX778	MOM	ON	MOM
12145X778	-	ON	MOM
Handle position (see dwg.):	I	II	III



Solder lug terminals - three pole



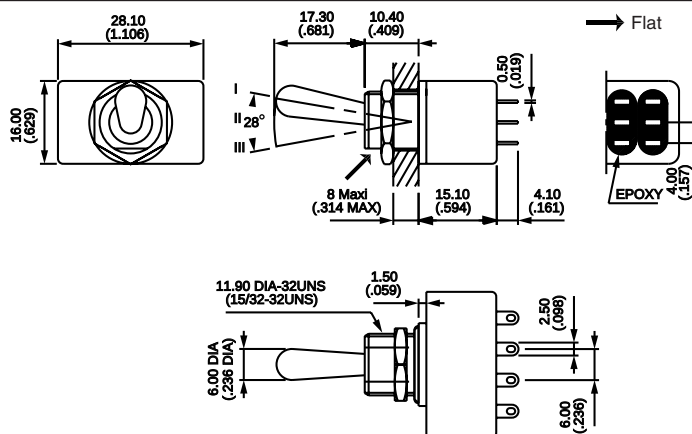
MODEL NO.	CIRCUIT		
12156X778	ON	-	ON
12159X778	ON	OFF	ON
12157X778	MOM	OFF	MOM
12158X778	ON	OFF	MOM
Handle position (see dwg.):	I	II	III



Solder lug terminals - four pole



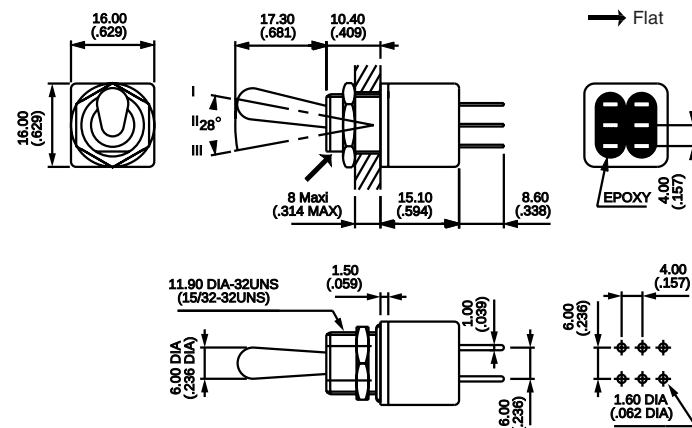
MODEL NO.	CIRCUIT		
12166X778	ON	-	ON
12169X778	ON	OFF	ON
12167X778	MOM	OFF	MOM
12168X778	ON	OFF	MOM
12164X778	ON	ON	ON
121641RX778	ON	ON	MOM
121642RX778	MOM	ON	MOM
Handle position (see dwg.):	I	II	III



Straight p.c. terminals - double pole



MODEL NO.	CIRCUIT		
12246X778	ON	-	ON
Handle position (see dwg.):	I	II	III



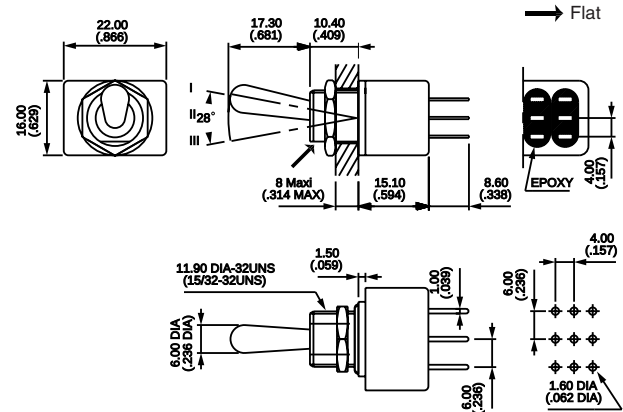
12000X778 SERIES - HIGH PERFORMANCE TOGGLE SWITCHES

A

Straight p.c. terminals - three pole



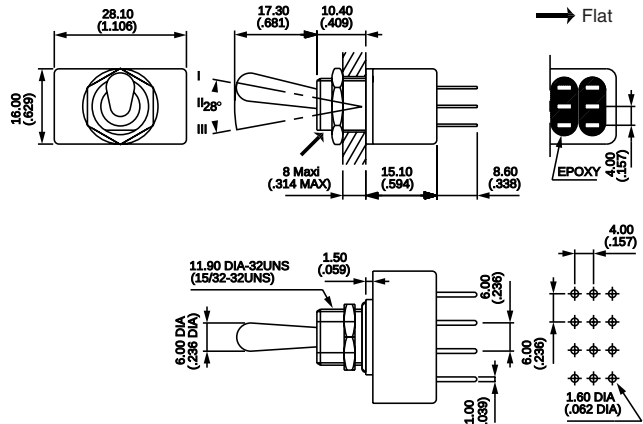
MODEL NO.	CIRCUIT		
12256X778	ON	-	ON
Handle position (see dwg.):	I	II	III



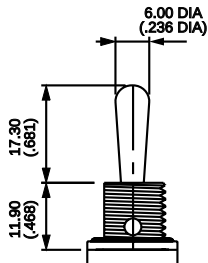
Straight p.c. terminals - four pole



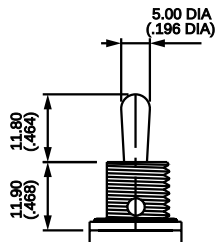
MODEL NO.	CIRCUIT		
12266X778	ON	-	ON
Handle position (see dwg.):	I	II	III



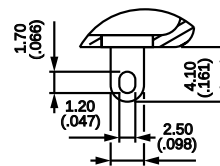
ACTUATOR OPTIONS



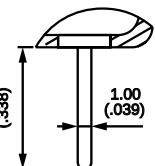
(NONE) Standard



12 Short

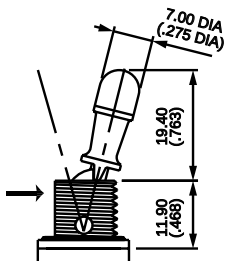


1 Solder lug

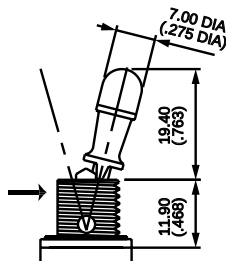


2 P.C.

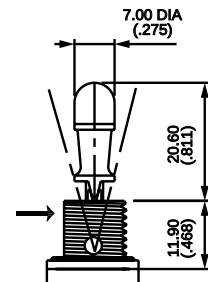
LOCKING ACTUATOR OPTIONS (arrow indicates flat)



1V 1 locked position (function 6)



2V 2 locked positions (function 6)



3V 3 locked positions (functions 9 & 4)

Security Guards available - see Miscellaneous & Accessories section D.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

12000X778 SERIES - HIGH PERFORMANCE TOGGLE SWITCHES

Additional ordering information: Commonly ordered models are shown on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.

Allowable options are shown below each respective box.

Note 'NONE' indicates box may be left empty.

Model Structure:

Series	Terminals & bushings	Number of poles	Electrical functions	Momentary for function 4
1 2				
	1 Solder lug or terminals	4 Double pole	6 ON - ON	(NONE)
	2 Straight p.c. terminals (all models have 15/32-32 thd'd. bushing)	5 Three pole	9 ON OFF ON	1 R ON ON MOM
		6 Four pole	7 MOM OFF MOM	2 R MOM ON MOM
			8 ON OFF MOM	
			5 - ON MOM	
			4 ON ON ON	
			4* ON ON MOM	
			4* MOM ON MOM	
			* specify selection from 'Mom. for function 4' box also	

Options:

Actuators	Special options	Approvals/listings
	X 7 7 8	
(NONE) Standard	High performance	(NONE)
1 2 Short		C E C C
1 V Locking (1 position)		(consult factory for details of approved models).
2 V Locking (2 positions)		
3 V Locking (3 positions)		
(see actuator dwgs.)		

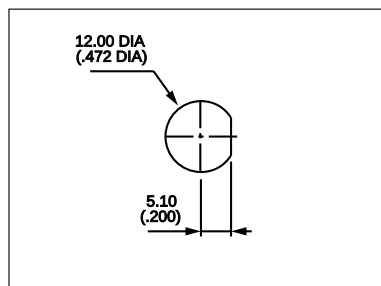
Example of completely specified model number:

121442R3VX778CECC

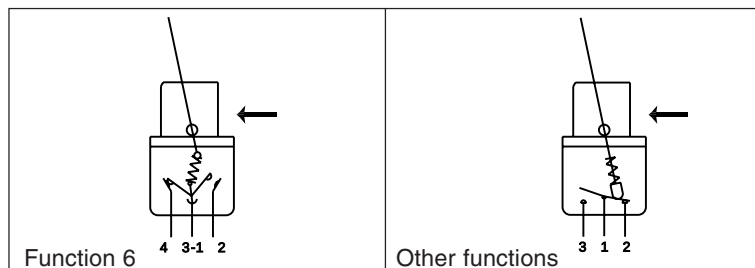
Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

MISCELLANEOUS

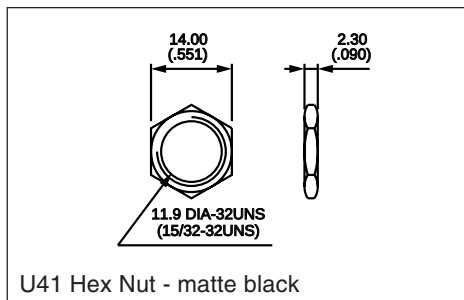
PANEL CUT-OUT



SWITCH ACTION (arrow indicates flat)



STANDARD HARDWARE



12000X778 SERIES - HIGH PERFORMANCE TOGGLE SWITCHES

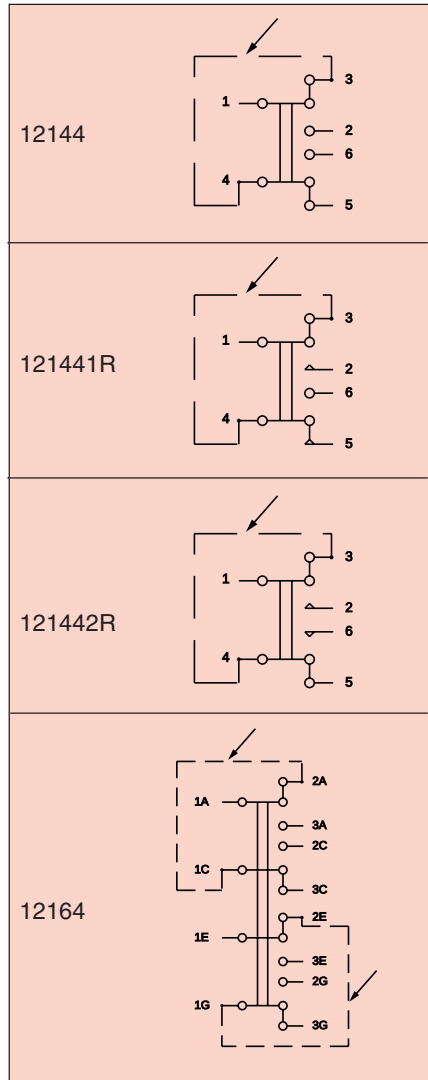
A

POSITIONS AND CONNECTIONS

Function	Lever position & connections			Terminal identification
	I	II	III (flat)	
12146	ON	-	ON	
	(1-3)-4		(1-3)-2	
	(5-7)-8		(5-7)-6	
12147	MOM	OFF	MOM	
12148	ON	OFF	MOM	
12149	ON	OFF	ON	
12148CT	MOM	OFF	ON	
	1-2		1-3	
	4-5		4-6	
12145	-	ON	MOM	
		1-2	1-3	
		4-5	4-6	
12144	ON	ON	ON	
121441R	MOM	ON	ON	
121442R	MOM	ON	MOM	
	1-2	1-3	1-3	
	4-5	4-5	4-6	
12156	ON	-	ON	
	(1-3)-4		(1-3)-2	
	(5-7)-8		(5-7)-6	
	(9-11)-12		(9-11)-10	
12166	ON	-	ON	
	1A-3A		1A-2A	
	1C-3C		1C-2C	
	1E-3E		1E-2E	
	1G-3G		1G-2G	
12164	ON	ON	ON	
	1A-2A	1A-2A	1A-3A	
	1C-2C	1C-3C	1C-3C	
	1E-2E	1E-2E	1E-3E	
	1G-2G	1G-3G	1G-3G	

Wiring for 3 way switches (function 4)

Arrow indicates external jumper added by customer.



4100 & 4200 SERIES - VDE APPROVED TOGGLE SWITCHES



FEATURES

- VDE frequent duty listing standard on all models.
- DPDT panel mounting models with solder lugs or p.c. terminals.
- Knee action quick-break toggle mechanism.
- Insulated actuator & bushing with actuator color options.

SPECIFICATIONS

Contact ratings (resistive loads):	3 Amps at 250 VAC, 6 Amps at 125 VAC or 30 VDC
Initial contact resistance:	10 milliohms maximum
Insulation resistance:	1000 megohms min. at 500 VDC
Dielectric strength:	2000 V rms min. - between terminals and between poles
Electrical life (resistive):	50,000 cycles 3 Amps 250 VAC. 10,000 cycles 6 Amps 125 VAC or 30 VDC
Operating temperature range:	-20°C to +55°C

MATERIALS

Contacts:	Silver inlay
Actuator:	Polyamide 6-6
Bushing:	Polyamide 6-6
Case:	Phenolic resin
Hardware:	Supplied with 1 Hex Nut p/n U166 and 1 insulating Knurled Nut p/n U520. Knurled Nut supplied same color as actuator. See hardware section of catalog.

AGENCY RECOGNITION



VDE (frequent duty), UL & CSA
VDE, UL & CSA marking is standard.

Note: Ideal switch for pump manufacturers.

4100 & 4200 SERIES - VDE APPROVED TOGGLE SWITCHES

A

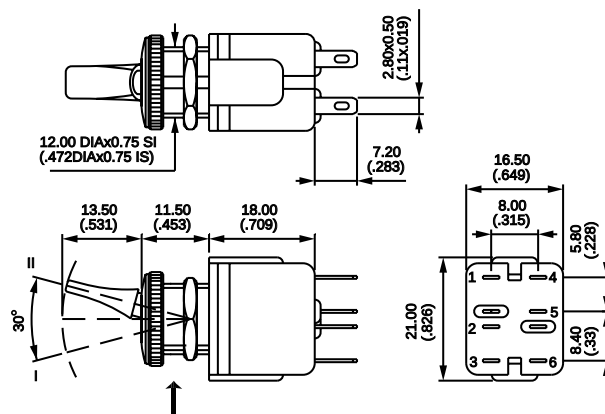
Solder lug terminals - 4100



DOUBLE POLE MODEL NO.	CIRCUIT
4141A22UU	ON - OFF
4146A22UU	ON - ON
Handle position (see dwg.) :	II I

Above models have black actuator.

→ Keyway



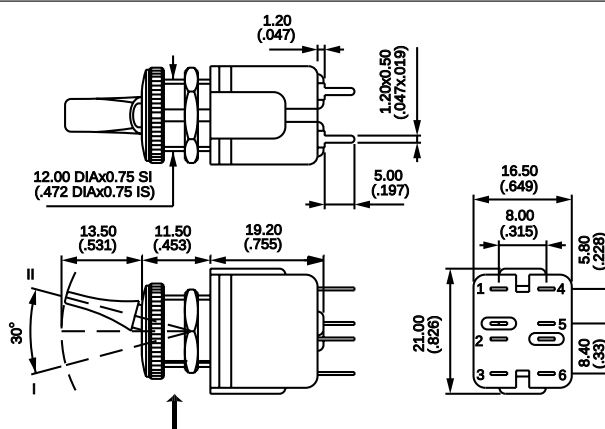
Straight p.c. terminals - 4200



DOUBLE POLE MODEL NO.	CIRCUIT
4241A22UU	ON - OFF
4246A22UU	ON - ON
Handle position (see dwg.) :	II I

Above models have black actuator.

→ Keyway



OPTIONS & MISCELLANEOUS

ACTUATOR COLORS

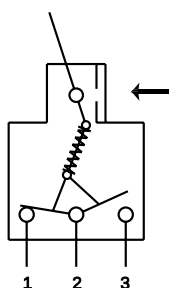
The last numeric digit in above switch model numbers indicates actuator and knurled mounting nut color. Other selections:

Colors

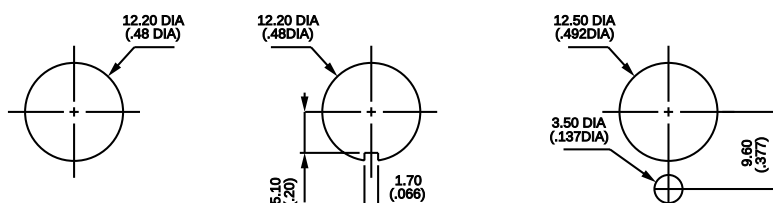
- 1 blue
- 2 black
- 3 green
- 4 grey
- 5 yellow
- 6 red
- 7/1 white
- 9 orange

SWITCH ACTION

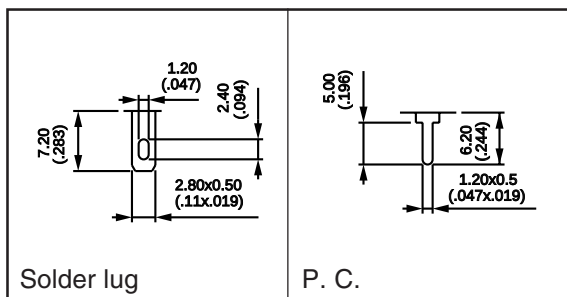
Arrow indicates keyway



PANEL CUT-OUTS



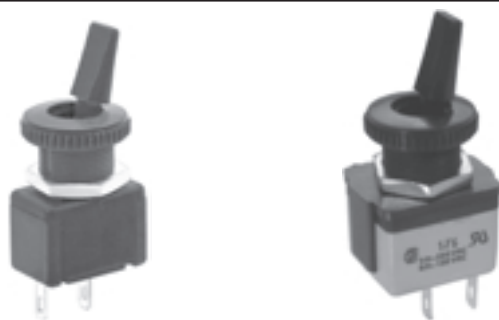
TERMINALS



Solder lug

P. C.

4600 SERIES - UL, CSA & VDE RECOGNIZED TOGGLE SWITCHES



FEATURES

- High current & voltage ratings in small case.
- SPDT & DPDT panel mounting models with solder lug/quick-connect terminals.
- Insulated actuator & bushing with lever color options.

SPECIFICATIONS

Contact ratings:	4 Amps at 250 VAC, 6 Amps at 125 VAC (resistive loads) UL/CSA: 3 Amps at 250 VAC, 6 Amps at 125 VAC VDE: ON-OFF & ON-ON models only - 4(2)A 380 VAC
Initial contact resistance:	10 milliohms maximum
Insulation resistance:	1000 megohms min. at 500 VDC
Dielectric strength:	2000 V rms min. - between terminals and between poles
Electrical life (resistive):	10,000 cycles minimum at full load
Operating temperature range:	-20°C to +55°C

MATERIALS

Contacts:	Silver
Actuator:	Polyamide 6-6
Bushing:	Polyamide 6-6
Case:	Melamine phenolic
Hardware:	Supplied with 1 Hex Nut p/n U166 and 1 insulating Knurled Nut p/n U520. Knurled Nut supplied same color as actuator. See hardware section of catalog.

AGENCY RECOGNITION



VDE for functions ON-OFF & ON-ON. UL & CSA for all functions.
Switches are supplied with recognized mark.

4600 SERIES - UL, CSA & VDE RECOGNIZED TOGGLE SWITCHES

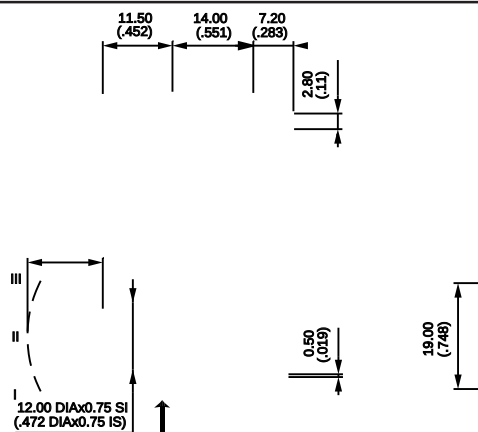
A

Solder lug/quick-connect terminals - single pole



SINGLE POLE MODEL NO.	CIRCUIT		
4631A22UU	ON	-	OFF
4636A22UU	ON	-	ON
4639A22UU	ON	OFF	ON
Handle position (see dwg.) :	III	II	I

Above models have black actuator.



Solder lug/quick-connect terminals - double pole



DOUBLE POLE MODEL NO.	CIRCUIT		
4641A22UU	ON	-	OFF
4646A22UU	ON	-	ON
4649A22UU	ON	OFF	ON
Handle position (see dwg.) :	III	II	I

Above models have black actuator.

OPTIONS & MISCELLANEOUS

ACTUATOR COLORS

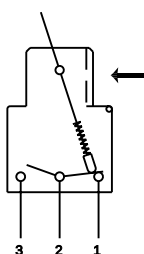
The last '2' in above switch model numbers indicates actuator and knurled mounting nut color. Other selections:

Colors

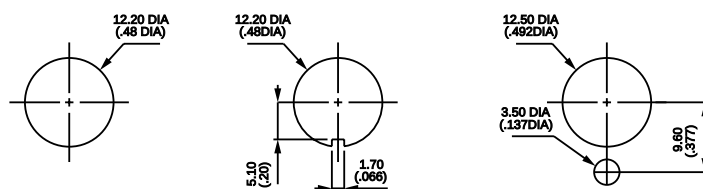
- 1 blue
- 2 black
- 3 green
- 4 grey
- 5 yellow
- 6 red
- 7/1 white
- 9 orange

SWITCH ACTION

Arrow indicates keyway

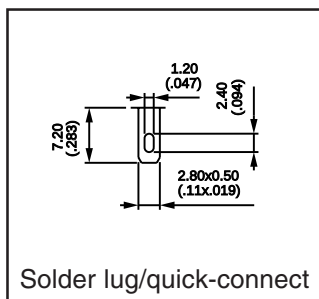


PANEL CUT-OUTS

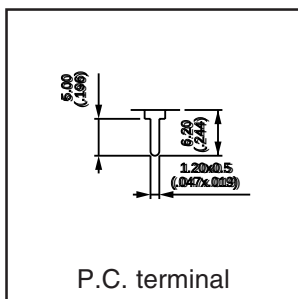


Panel thickness: .196" (5mm) max. between 2 nuts

TERMINALS



Solder lug/quick-connect



P.C. terminal

To specify P.C. terminals replace 46 with 44 in part no.- example: 4631A22UU becomes 4431A22UU

New! 1500 SERIES - TOGGLE SWITCHES W/INSULATED LEVER & BUSHING



FEATURES

- High current & voltage ratings in small case.
- SPDT panel mounting models with solder lug or quick-connect terminals.
- Insulated actuator & bushing with lever color options.

SPECIFICATIONS

Contact ratings & life:	6 Amps at 250 VAC (10,000 cycles), 10 Amps at 125 VAC (6,000 cycles). (Above loads are resistive)
Initial contact resistance:	10 milliohms maximum
Insulation resistance:	1000 megohms min. at 500 VDC
Dielectric strength:	2000 V rms min. - between terminals and between terminals & metal panel
Operating temperature range:	-20°C to +55°C
Torque:	0.95 Nm (.700 ft. lb.) between 2 nuts
Panel thickness:	4.5 mm (.177") between 2 nuts

MATERIALS

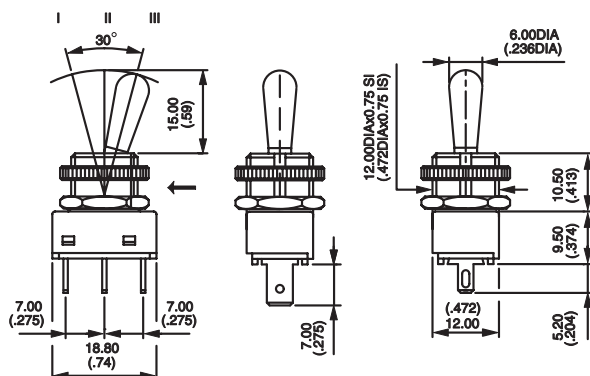
Contacts:	Silver
Actuator:	Polyamide
Bushing:	Polyamide
Case:	Polyamide
Hardware:	Supplied with 1 Hex Nut p/n U166 and 1 Knurled Nut p/n U411. See hardware section of catalog.

Solder lug or quick-connect (.185"x.031") terminals

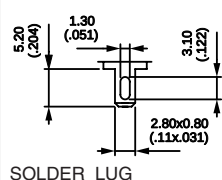


MODEL NUMBER		
SOLD. LUG	QUICK-CON.	CIRCUIT
1531A2L12	1531A8L12	ON - OFF
1536A2L12	1536A8L12	ON - ON
1539A2L12	1539A8L12	ON OFF ON
Handle position (see dwg.) :		
		I II III

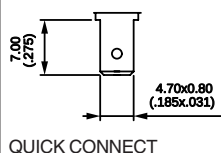
Above models have black actuator - consult factory for other actuators and colors.



TERMINALS

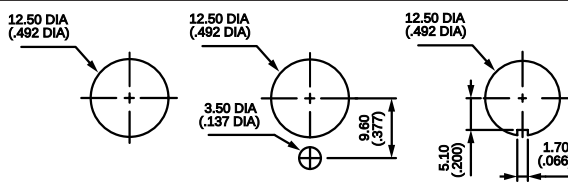


SOLDER LUG

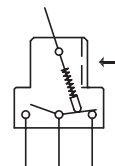


QUICK CONNECT

PANEL CUT-OUTS



SWITCH ACTION



New! 6000 SERIES - TOGGLE SWITCHES FOR MILITARY APPLICATIONS

A



FEATURES

- 1, 2, 3 & 4 pole models for military applications include portable measuring equipment generators, beacons and fixed and mobile radiotransmitters.
- AIR 8461 (maintenance only).
- Sealing and locking lever applications.
- Matte black finish on actuator and bushing.

SPECIFICATIONS

Contact ratings (voltage/current):		30VDC	250VAC	125VAC	115V 400Hz
	Resistive load	6.5A	5A	10A	7A
	Inductive load	5A	3A	6A	5A
	Lamp load	3A	1A	3A	3.5A
Initial contact resistance:	10 milliohms maximum at 1A 2VDC				
Insulation resistance:	1000 megohms min. at 500 VDC				
Dielectric strength:	2000 V rms min. - between terminals				
	3000 V rms min. - between terminals and frame				
Electrical life:	10,000 cycles at full load.				
Operating temperature range:	-40°C to +85°C				
Torque:	1.50 Nm (1.10 ft.lb.) max. applied to nut				
Panel thickness:	5 mm (.196") max.				

MATERIALS

Contacts :	Silver
Actuator:	Black, chrome plated brass
Bushing:	Black, chrome plated brass
Case:	Diallylphthalate (DAP)
Hardware:	Supplied with 2 matte black nuts (U41), matte black locking ring (U12) and zinc plated lockwasher (U13). (See hardware section of catalog).

ABOUT THIS SERIES

The material in this series is organized in the following sequence:

- a. Completely specified switch models
- b. Options & miscellaneous

New! 6000 SERIES - TOGGLE SWITCHES FOR MILITARY APPLICATIONS

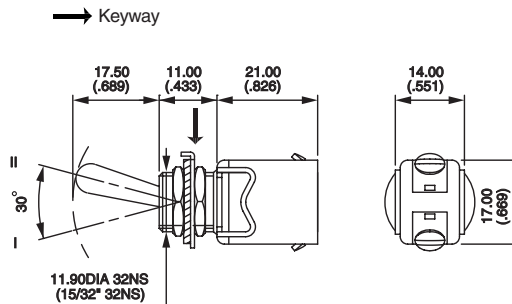
CORRESPONDING AMERICAN SPECIFICATIONS (note: APEM models not MIL approved as of catalog printing.)

Double pole, screw terminals		Double pole, solder lug terminals		Four pole, screw terminals	
APEM	MIL S3950	APEM	MIL S3950	APEM	MIL S3950
664103LM	MS35059-22	664103LM/2	MS35059-9	666103LM	
664203LM	MS35059-29	664203LM/2	MS35059-10	666103LM	
664303LM	MS35059-30	664303LM/2	MS35059-11	666103LM	
664403LM	MS35059-26	664403LM/2	MS35059-17	666103LM	MS25068-26
664603LM	MS35059-23	664603LM/2	MS35059-15	666103LM	MS25068-23
664703LM	MS35059-27	664703LM/2	MS35059-18	666103LM	MS25068-27
664803LM	MS35059-31	664803LM/2	MS35059-19	666103LM	MS25068-31
664903LM	MS35059-21	664903LM/2	MS35059-16	666103LM	MS25068-21

Single pole -screw terminals



Model No.	I	II
6421A03LM	ON -	OFF

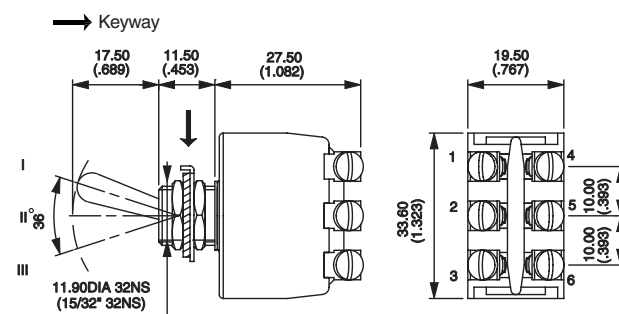


Double pole - screw terminals



Model No.	III	II	I
	2-1		2-3
	5-4		5-6
664103LM	ON	-	OFF
664203LM	ON	-	mom.OFF
664303LM	MOM	-	OFF
664403LM*	ON	ON	ON
664503LM	MOM	-	ON
664603LM	ON	-	ON
664703LM	MOM	OFF	MOM
664803LM	ON	OFF	MOM
664903LM	ON	OFF	ON

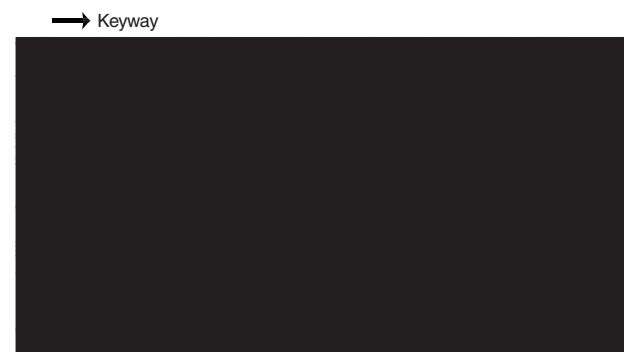
* - Function 4: SP in DP case. See specs.
for 600H & 600NH series.



Three pole - screw terminals



Model No.	III	II	I
	2-1		2-3
	5-4		5-6
	9-7		8-9
665103LM	ON	-	OFF
665203LM	ON	-	mom.OFF
665303LM	MOM	-	OFF
665503LM	MOM	-	ON
665603LM	ON	-	ON
665703LM	MOM	OFF	MOM
665803LM	ON	OFF	MOM
665903LM	ON	OFF	ON

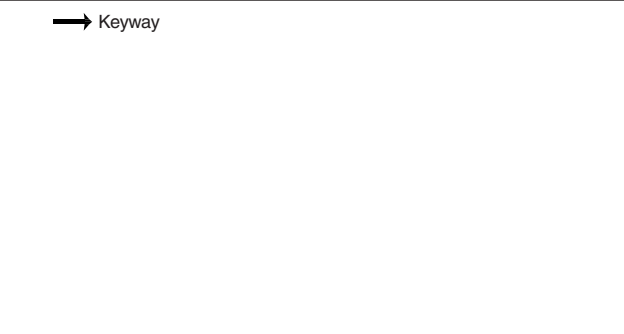


Double pole - screw terminals



Model No.	III	II	I
	2-1,5-4,		2-3,5-6,
	8-7,11-10		8-9,11-12
666103LM	ON	-	OFF
666203LM	ON	-	mom.OFF
666303LM	MOM	-	OFF
666403LM*	ON	ON	ON
666503LM	MOM	-	ON
666603LM	ON	-	ON
666703LM	MOM	OFF	MOM
666803LM	ON	OFF	MOM
666903LM	ON	OFF	ON

* - Function 4: SP in DP case. See specs.
for 600H & 600NH series.



SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

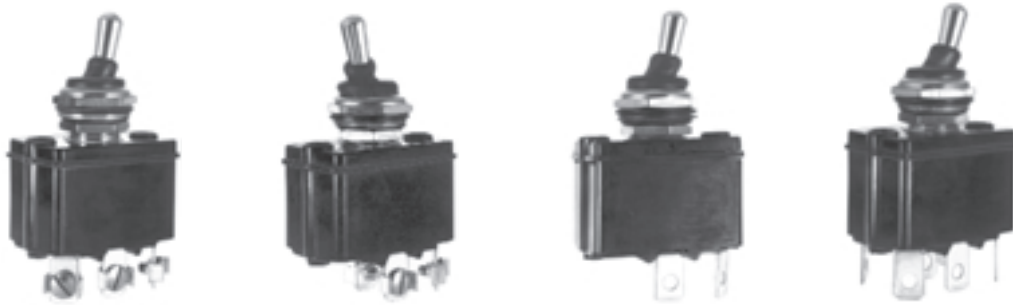
New! 6000 SERIES - TOGGLE SWITCHES FOR MILITARY APPLICATIONS

A

OPTIONS & MISCELLANEOUS

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

New! 3600NF SERIES - SEALED TOGGLE SWITCHES FOR OUTSIDE APPLICATIONS



FEATURES

- Multiple seals - 'o' ring between lever & bushing, mounted half length boot & nylon washer, case/covergasket, sealing washer and molded-in terminal inserts
- SPDT & DPDT panel mounting models with screw or solder lug/quick-connect terminals.

SPECIFICATIONS

Contact ratings (resistive loads):	12A 28VDC, 6A 250VAC
Initial contact resistance:	10 milliohms maximum at 1 amp 2 VDC
Insulation resistance:	1000 megohms min. at 500 VDC
Dielectric strength:	2500 V rms min. - between terminals, 3000 V rms min - between terminals & metal frame
Electrical life (resistive):	10,000 cycles minimum at full load
Operating temperature range:	-40°C to +85°C
Torque:	1.50 Nm (1.10 ft. lb.) applied to nut
Panel thickness:	5 mm (.196") max.

MATERIALS

Contacts:	Silver
Actuator:	Nickel plated brass
Bushing:	Nickel plated brass
Case:	Phenolic
Hardware:	Supplied with 1/2 length sealing boot & nylon washer, 1 sealing washer & 1 nickel plated hex nut.

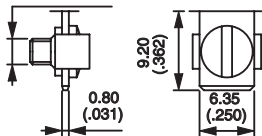
AGENCY RECOGNITION



Availability: consult factory for details of recognized models.

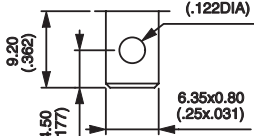
TERMINALS

3.00DIAx0.50 SI
(.118DIAx0.50 IS)



Screw

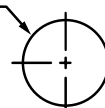
3.10DIA
(.122DIA)



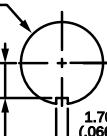
Sold. lug/Quick-connect

PANEL CUT-OUTS

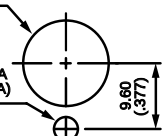
12.50 DIA
(.492 DIA)



12.50 DIA
(.492 DIA)



12.50 DIA
(.492 DIA)



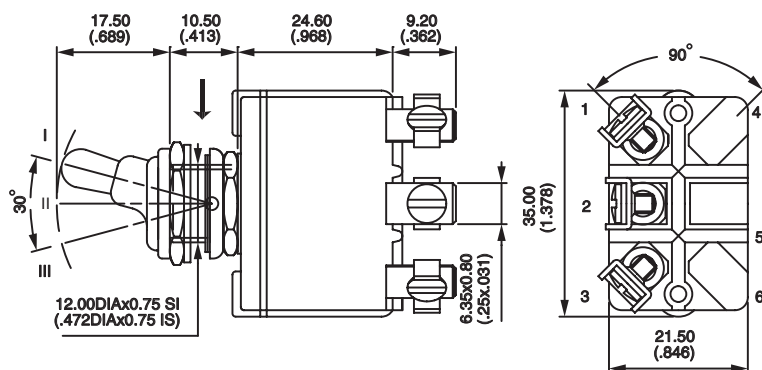
New! 3600NF SERIES - SEALED TOGGLE SWITCHES FOR OUTSIDE APPLICATIONS

A

Screw terminals - single pole



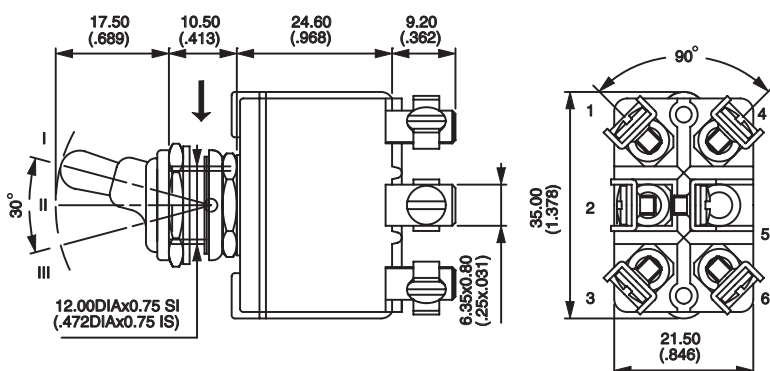
MOD. NO	CIRCUIT		
3631NF	ON	-	OFF
3635NF	MOM	-	ON
3636NF	ON	-	ON
3637NF	MOM	OFF	MOM
3638NF	ON	OFF	MOM
3639NF	ON	OFF	ON
Handle pos. (see dwg.) :	I	III	II
	2-1		2-3



Screw terminals - double pole



MOD. NO	CIRCUIT		
3641NF	ON	-	OFF
3644NF*	ON	ON	ON
3645NF	MOM	-	ON
3646NF	ON	-	ON
3647NF	MOM	OFF	MOM
3648NF	ON	OFF	MOM
3649NF	ON	OFF	ON
Handle pos. (see dwg.) :	I	III	II
	2-1		2-3
	5-4		5-6

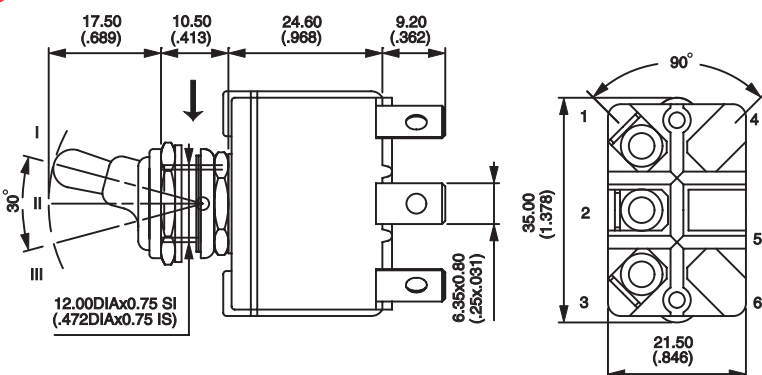


* Function 4: SP in DP case - see specs. for 600H - 600 NH series.

Solder lug/quick-connect terminals - single pole



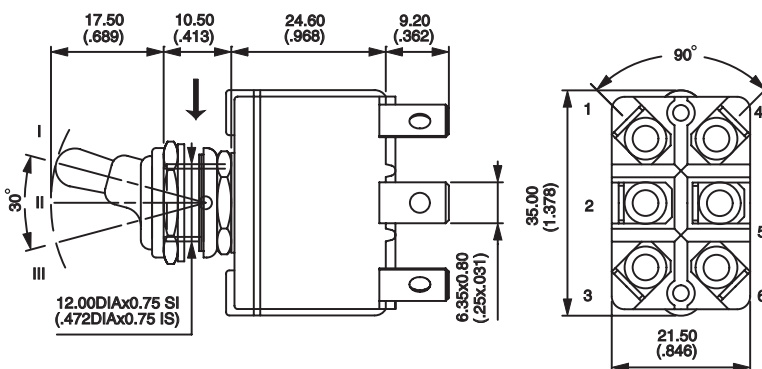
MOD. NO	CIRCUIT		
3631NF/2	ON	-	OFF
3635NF/2	MOM	-	ON
3636NF/2	ON	-	ON
3637NF/2	MOM	OFF	MOM
3638NF/2	ON	OFF	MOM
3639NF/2	ON	OFF	ON
Handle pos. (see dwg.) :	I	III	II
	2-1		2-3



Solder lug/quick-connect terminals - double pole



MOD. NO	CIRCUIT		
3641NF/2	ON	-	OFF
3644NF/2*	ON	ON	ON
3645NF/2	MOM	-	ON
3646NF/2	ON	-	ON
3647NF/2	MOM	OFF	MOM
3648NF/2	ON	OFF	MOM
3649NF/2	ON	OFF	ON
Handle pos. (see dwg.) :	I	III	II
	2-1		2-3
	5-4		5-6



* Function 4: SP in DP case - see specs. for 600H - 600 NH series.

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

New! 3500 SERIES - MILITARY STYLE SEALED TOGGLE SWITCHES



FEATURES

- Sealed to withstand 1 bar pressure at front panel & 0.1 bar pressure total immersion.
- SPDT & DPDT panel mtg. models with 15/32 32NS (11.90 32NS) threaded bushing.
- Approved to European standards CECC 96000.
- Numerous lever styles, including locking types.

SPECIFICATIONS

Contact ratings :	See table on next page
Initial contact resistance:	10 milliohms maximum at 1A 2VDC
Insulation resistance:	1000 megohms min.
Dielectric strength:	2500 V rms min. - between terminals 3000 V rms min. - between terminals and frame
Electrical life:	40,000 cycles at full load.
Operating temperature range:	-40°C to +85°C
Torque:	2 Nm (1.47 ft.lb.) max. applied to nut
Moisture resistance:	56 days

MATERIALS

Contacts :	Silver cadmium oxide alloy
Actuator:	Chrome or nickel plated brass
Bushing & cover:	Zamac
Case:	Mineral filled polyester, UL94-VO
Terminal seal:	Molded-in inserts
Case & actuator seal:	Silicone rubber

AGENCY RECOGNITION

CECC 92601-004

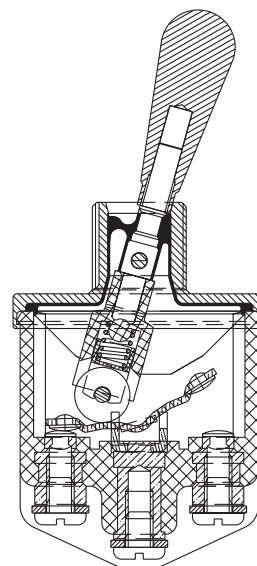
Availability: Consult factory for details of recognized models.

Marking: To order switches marked CECC, complete the appropriate box of the ordering format

ABOUT THIS SERIES

The material in this series is organized in the following sequence:

- Completely specified switch models
- Terminals & panel cut-outs
- 'build your own switch' order format
- Options & miscellaneous



SWITCH CROSS SECTION

New!

3500 SERIES - MILITARY STYLE SEALED TOGGLE SWITCHES

A

CONTACT RATINGS AND GENERAL PERFORMANCE

FUNCTIONS	According to UL1054, CSA22.2	According to CEE24, IEC65	Direct current	According to CECC 96201-004
ON-OFF & ON-ON	6,000 cycles, T65°C 20A, 125VAC, 3/4HP 15A 250VAC, 1.5HP T5, 115VAC, 50/400Hz	10,000 cycles, T55°C 20(9)A 125VAC 15(6)A 250VAC 15/150A 250VAC	10,000 cycles, T20°C 15A 28VDC resistive 10A 28VDC inductive 5A 28VDC lamp load	10,000 cycles 16A 250 VAC 15A 32 VDC
ON-OFF-ON	6,000 cycles, T65°C 18A, 125VAC, 1/2HP 10A 250VAC, 1/2HP T2, 115VAC, 50/400Hz	10,000 cycles, T55°C 15(6)A 125VAC 10(4)A 250VAC 10/150A 250VAC	10,000 cycles, T20°C 10A 28VDC resistive 8A 28VDC inductive 3A 28VDC lamp load	
OTHER FUNCTIONS	6,000 cycles, T65°C 15A, 125VAC 10A 250VAC T2, 115VAC, 50/400Hz	10,000 cycles, T55°C 15A 125VAC 10A 250VAC 10/150A 250VAC	10,000 cycles, T20°C 10A 28VDC resistive 8A 28VDC inductive 3A 28VDC lamp load	

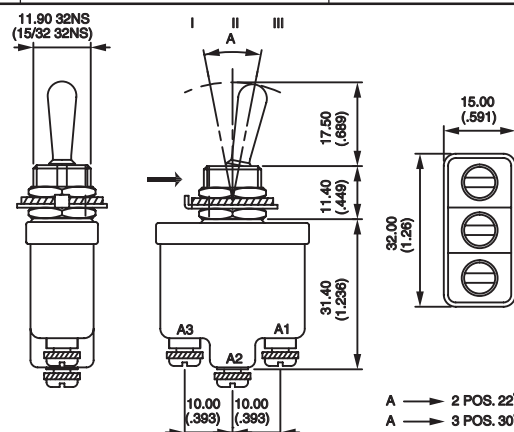
Single pole



Solder lug/ quick-connect	Screw terminals	III A2-A3	II	I A1-A2
3531021N000	3531001N000	ON	-	OFF
3536021N000	3536001N000	ON	-	ON
3537021N000	3537001N000	MOM	OFF	MOM
3538021N000	3538001N000	ON	OFF	MOM
3539021N000	3539001N000	ON	OFF	ON

Above listed models have standard bat lever (1) with bright nickel finish (N).
Model shown in photo has flattened lever (3) with satin chrome finish (B).

→ Keyway



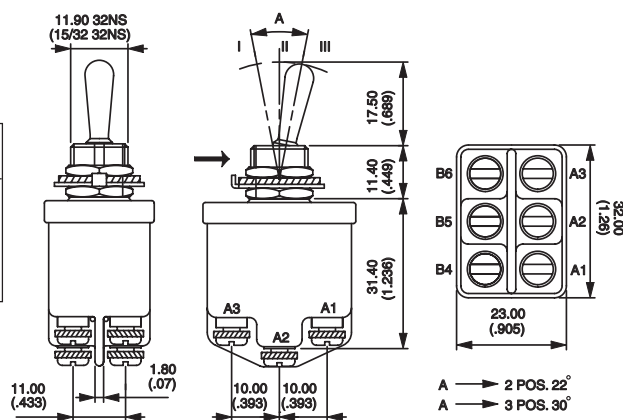
Double pole



Solder lug/ quick-connect	Screw terminals	III A2-A3	II	I A1-A2
3541021N000	3541001N000	ON	-	OFF
3546021N000	3546001N000	ON	-	ON
3547021N000	3547001N000	MOM	OFF	MOM
3548021N000	3548001N000	ON	OFF	MOM
3549021N000	3549001N000	ON	OFF	ON

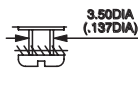
Above listed models have standard bat lever (1) with bright nickel finish (N) and screw terminals (O).
Model shown in photo has standard bat lever (1) with matte black finish (G) on lever and bushing, and standard quick-connect terminals.

→ Keyway

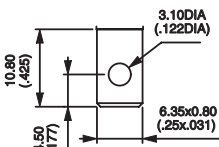


TERMINALS

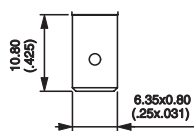
PANEL CUT-OUTS (see mounting accessories at end of section)



Screw



Sold.lug/Quick-conn.



Quick-connect

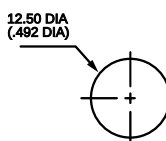


Fig. 1

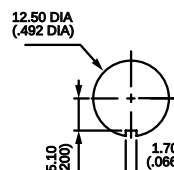


Fig. 2

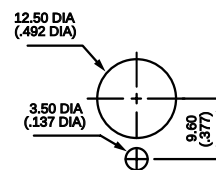


Fig. 3

Additional ordering information: Commonly ordered models are shown on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.

Allowable options are shown below each respective box.

Note 'NONE' indicates box may be left empty.

Model Structure:

Series	Number of poles	Electrical functions	Terminals
3 5			
	3 Single pole 4 Double pole	1 0 ON - OFF 2 0 ON - m.OFF 3 0 OFF - MOM 4 1 ON ON(3-4) ON* 4 2 ON ON(3-4) MOM* 4 3 MOM ON(3-4) MOM* 4 4 ON ON(1-6) ON* 4 5 ON ON(1-6) MOM* 4 6 MOM ON(1-6) MOM* 5 0 ON - MOM 6 0 ON - ON 7 0 MOM OFF MOM 8 0 ON OFF MOM 9 0 ON OFF ON	0 Screw 2 Solder lug/quick-connect 3 Standard quick-connect

* - Function 4 is for double pole only - terminals connected indicated (see drawings)

Options:

Lever styles	Lever finish	Locking lever styles	Agency recognition	Mounting Accessories	Locking lever special finish
1 Std'd. length 17.5mm (.688") or locking, length 20mm (.787") 2 Length 30mm (1.181") 3 Flatted, length 24mm (.944") 4 Length 40mm (1.574") 5 Length 50mm (1.968")		0 No locking A Locked in 3 positions B Locked in ctr. & keyway side D Locked out of ctr. position E Locked in ctr. position F Locked in side opposite keyway G Locked in keyway side H Locked out of ctr. & keyway side J Locked out of ctr. & side opposite keyway K Locked in ctr. & side opp. keyway L Locked out of keyway side M Locked out of & into side opposite keyway N Locked out of side opp. keyway P Locked out of & into keyway side	0 None 1 CECC		(NONE) P 5 Painted yellow A 6 Anodized red This option is for lever finish C only. (consult factory for others).
	N Bright nickel B Satin chrome G** Matte black F** Matte black w/ fluorescent tip (lever style 1 only) C Painted or anodized T Sulphamate gray			0 2 hex nuts, 1 locking ring & 1 lockwasher 2 2 hex nuts & 1 sealing washer	

** - includes matte black on bushing

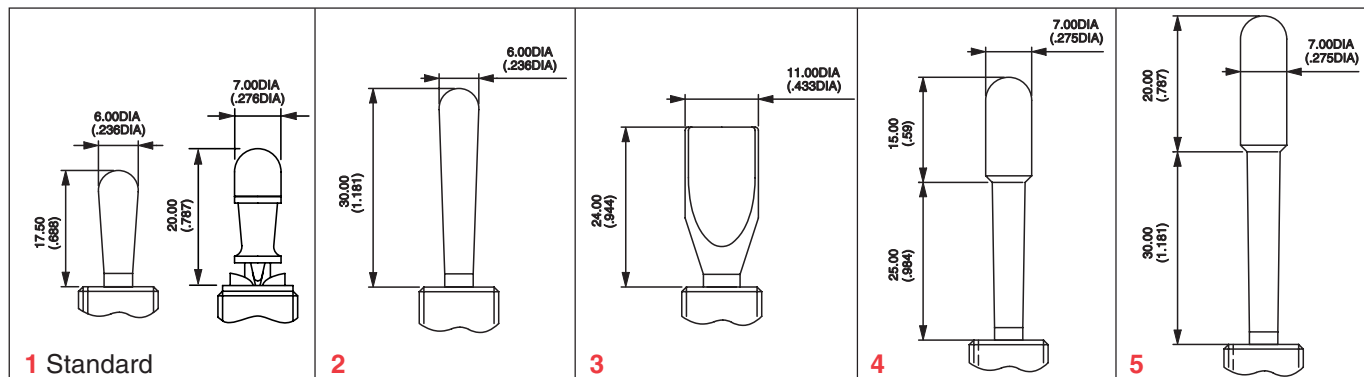
Example of completely specified model number:

3531001NA00

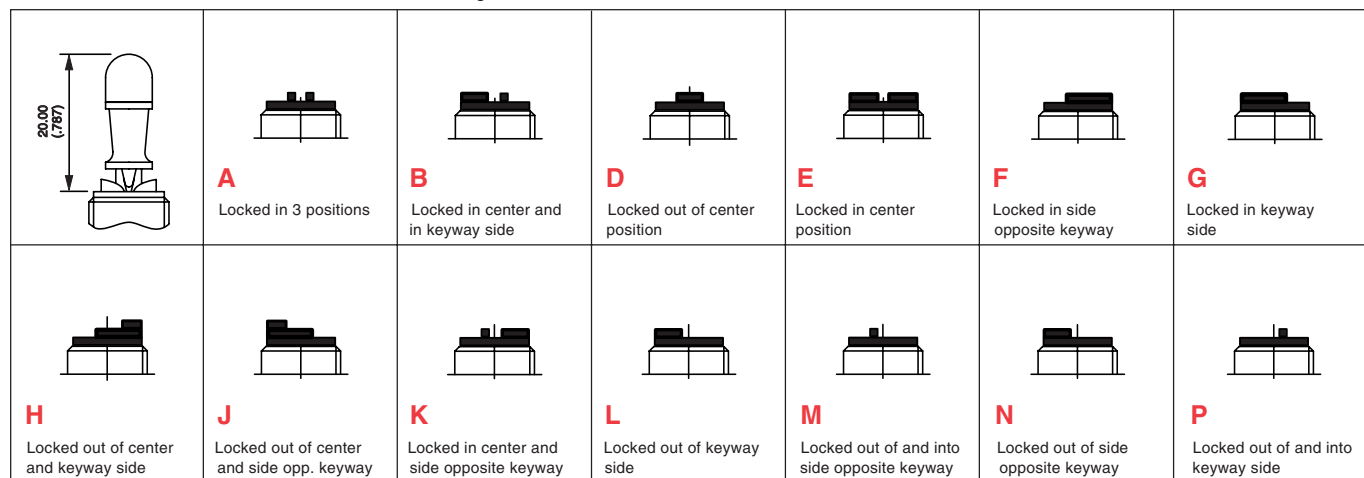
Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

New!**3500 SERIES - MILITARY STYLE SEALED TOGGLE SWITCHES****A****OPTIONS & MISCELLANEOUS****LEVER STYLES**

Security Guards available - see Miscellaneous & Accessories section D.

**LEVER FINISH**

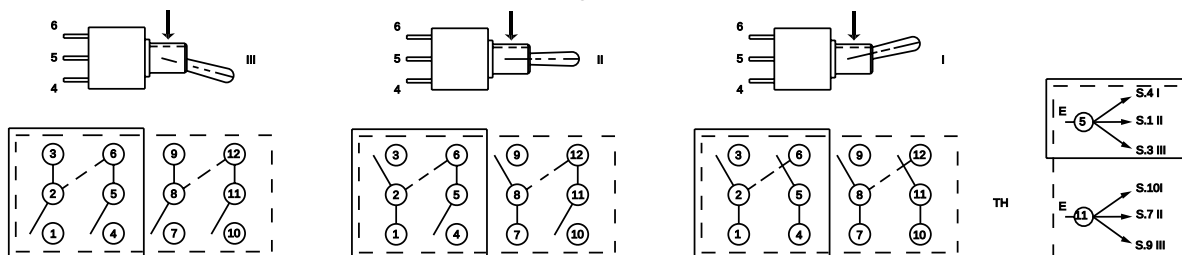
N Standard **B** Satin chrome **G*** Matte black **F*** Matte black with fluorescent tip (lever style 1 only)
C Painted or anodized **T** Sulphamate gray * - Includes matte black finish on bushing

LOCKING LEVER STYLES 0 - No locking**AGENCY RECOGNITION** 0 NONE 1 CECC**MOUNTING ACCESSORIES**

- 0** For non-sealed mounting (see panel cut-outs Fig. 1, 2 or 3): 2 hex nuts 14mm (.551") across flats, 1 locking ring U121 or U12, 1 lockwasher U13. (See hardware section of catalog). Panel thickness: 5mm (.196") max.
2 For sealed mounting (see panel cut-out Fig. 2): 2 hex nuts 14mm (.551") across flats and 1 sealing washer U60. (See hardware section of catalog).

LOCKING LEVER SPECIAL FINISH (for lever finish C above only)

(Blank) None **P5** Painted yellow **A6** Anodized red Other colors on request

SCHEMATICS FOR FUNCTION 4 MODELS Below diagrams are viewed from bottom of switch.

Equivalent to single pole 3 throw switch. Dotted lines between terminals 2 & 6 and 8 & 12 indicate external jumpers to be added by customer.

600H & 600NH SERIES - POWER TOGGLE SWITCHES**FEATURES****MATERIALS**

Contacts:	Silver/nickel alloy
Actuator:	600H: nickel plated brass 600NH: black polyamide
Bushing:	Nickel plated brass
Housing:	Stainless steel or tin plated steel
Case:	Melamine/polyester
Hardware:	600H models are supplied with 1 Hex Nut p/n U166 & 1 Knurled Nut p/n U411. 600NH models are supplied with 1 Hex Nut U166 & 1 black Knurled Nut p/n U522. See hardware section of catalog.



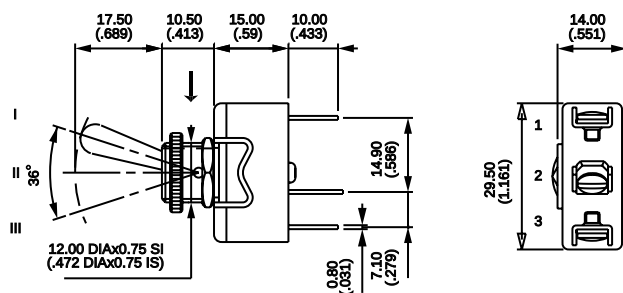
600H & 600NH SERIES - POWER TOGGLE SWITCHES

A

Single pole - nickel plated brass actuator



SOLDER LUG	SCREW TERMS.	CIRCUIT		
631H/2	631H	ON	-	OFF
635H/2	635H	MOM	-	ON
636H/2	636H	ON	-	ON
637H/2	637H	MOM	OFF	MOM
638H/2	638H	ON	OFF	MOM
639H/2	639H	ON	OFF	ON
Handle position (see dwg.) :		III	II	I
Terminals connected:		2-1		2-3



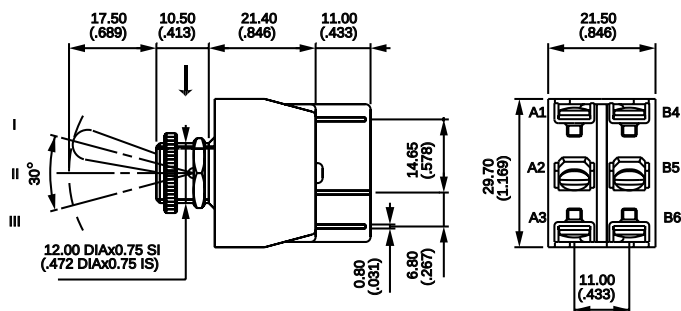
→ Keyway

Double pole - nickel plated brass actuator



SOLDER LUG	SCREW TERMS.	CIRCUIT		
641H/2	641H	ON	-	OFF
644H/2*	644H*	ON	ON	ON
644H/21R*	644H1R*	ON	ON	MOM
644H/22R*	644H2R*	MOM	ON	MOM
645H/2	645H	MOM	-	ON
646H/2	646H	ON	-	ON
647H/2	647H	MOM	OFF	MOM
648H/2	648H	ON	OFF	MOM
649H/2	649H	ON	OFF	ON
Handle position:		III	II	I
Terminals connected:		2-1		2-3
		5-4		5-6

* Function 4: SP in DP case. See info. at end of section.

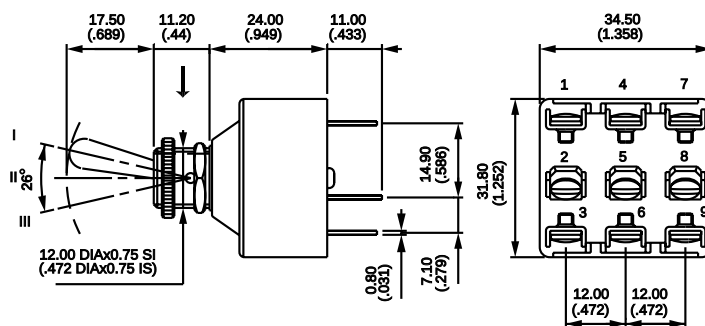


→ Keyway

Three pole - nickel plated brass actuator



SOLDER LUG	SCREW TERMS.	CIRCUIT		
651H/2	651H	ON	-	OFF
655H/2	655H	MOM	-	ON
656H/2	656H	ON	-	ON
657H/2	657H	MOM	OFF	MOM
658H/2	658H	ON	OFF	MOM
659H/2	659H	ON	OFF	ON
Handle position:		III	II	I
Terminals connected:		2-1		2-3
		5-4		5-6
		8-7		8-9

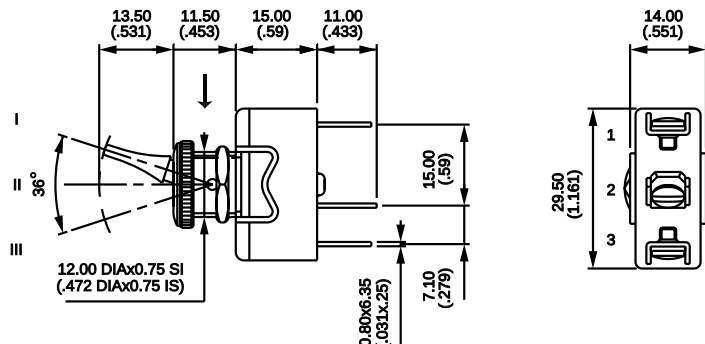


→ Keyway

Single pole - insulated actuator



SOLDER LUG	SCREW TERMS.	CIRCUIT		
631NH/2	631NH	ON	-	OFF
635NH/2	635NH	MOM	-	ON
636NH/2	636NH	ON	-	ON
637NH/2	637NH	MOM	OFF	MOM
638NH/2	638NH	ON	OFF	MOM
639NH/2	639NH	ON	OFF	ON
Handle position (see dwg.) :		III	II	I
Terminals connected:		2-1		2-3



→ Keyway

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

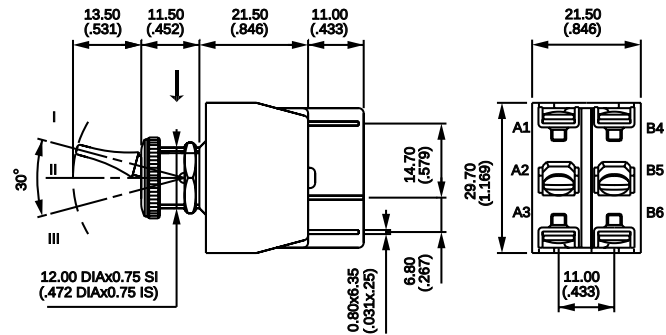
600H & 600NH SERIES - POWER TOGGLE SWITCHES

Double pole - insulated actuator



SOLDER LUG	SCREW TERMS.	CIRCUIT		
641NH/2	641NH	ON	-	OFF
644NH/2*	644NH*	ON	ON	ON
644NH/21R*	644NH1R*	ON	ON	MOM
644NH/22R*	644NH2R*	MOM	ON	MOM
645NH/2	645NH	MOM	-	ON
646NH/2	646NH	ON	-	ON
647NH/2	647NH	MOM	OFF	MOM
648NH/2	648NH	ON	OFF	MOM
649NH/2	649NH	ON	OFF	ON
Handle position:		III	II	I
Terminals connected:		2-1	2-3	
		5-4	5-6	

* Function 4: SP in DP case. See info. at end of section.

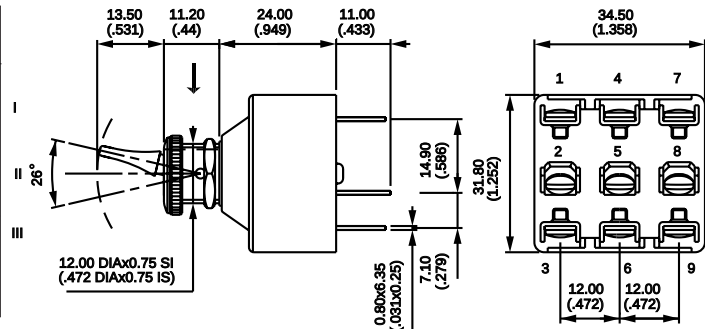


→ Keyway

Three pole - insulated actuator



SOLDER LUG	SCREW TERMS.	CIRCUIT		
651NH/2	651NH	ON	-	OFF
655NH/2	655NH	MOM	-	ON
656NH/2	656NH	ON	-	ON
657NH/2	657NH	MOM	OFF	MOM
658NH/2	658NH	ON	OFF	MOM
659NH/2	659NH	ON	OFF	ON
Handle position:		III	II	I
Terminals connected:		2-1	2-3	
		5-4	5-6	
		8-7	8-9	



→ Keyway

600SH & 600SNH - switches for peak currents - up to 150 Amps at 250 VAC

Contacts: Silver cadmium oxide

Capacitive load ratings: 15/150A 125VAC & 250VAC - 5,000 cycles
10/150A 125VAC & 250VAC - 10,000 cycles
4/90A (10ms) 60VDC - 10,000 cycles

Motor load ratings: 15(6)A 250VAC - 10,000 cycles 10(4)A 380VAC - 10,000 cycles
(note: 15(6)A 250VAC= 17(6)A 125VAC - 6,000 cycles 1 HP 250VAC - 10,000 cycles
15A resistive and 6A motor) 2 HP 250VAC - 6,000 cycles 1/2 HP 125VAC - 6,000 cycles

Lamp load ratings: 10A 125VAC & 250VAC - 10,000 cycles

Other specs. & dimensions: Same as 600H & 600NH models previously described.
Compatible with options T, G, K, 1V, 2V & 3V.



Single and double pole models are UL approved (3/4 HP 125VAC)

Also see 'Switches for Peak Currents' technical page in rear of catalog.

SCREW TERMINALS WITH CLAMP	SOLDER LUG QUICK-CONNECT TERMINALS	CIRCUIT		
SINGLE POLE				
631SH	631SH/2	ON	-	OFF
636SH	636SH/2	ON	-	ON
DOUBLE POLE				
641SH	641SH/2	ON	-	OFF
646SH	646SH/2	ON	-	ON
THREE POLE				
651SH	651SH/2	ON	-	OFF
656SH	656SH/2	ON	-	ON

Above models have nickel plated brass actuator. For insulated actuator, replace 'SH' in above model numbers with 'SNH'.

600H & 600NH SERIES - POWER TOGGLE SWITCHES

A

Additional ordering information: Commonly ordered models are shown on prior pages with complete model numbers and specifications. Below is an order format that enables you to 'build your own switch' and specify the correct switch model number by simply selecting from all available options shown and filling in the boxes.

'BUILD YOUR OWN SWITCH' ORDER FORMAT

Fill in boxes with selections shown for **Model Structure**, then add **Options** selections for complete model number.

Allowable options are shown below each respective box.

Note 'NONE' indicates box may be left empty.

Model Structure:

Series	Number of poles	Electrical functions	Actuator and terminals	Momentary for function 4
6				
	3 Single pole	1 ON - OFF	H Metal actuator, screw terminals	(NONE)
	4 Double pole	5 MOM - ON	H / 2 Metal actuator, solder lug/quick connect style terminals	1 R ON ON MOM
	5 Three pole	6 ON - ON		2 R MOM ON MOM
		7 MOM OFF MOM		
		8 ON OFF MOM		
		9 ON OFF ON	N H Insulated actuator, screw terminals	
		4 ON ON ON		
		4* ON ON MOM		
		4* MOM ON MOM	N H / 2 Insulated actuator, solder lug/quick-connect style terminals	
		* specify selection from 'connections/functions' box also.		

Options:

Misc. options

☐

(NONE)

- T** High temperature DAP case: -40°C to +85°
- G** Matte black finish on actuator, bushing & nuts. Includes option 'T' above.
- K** Front panel sealing with 'O'-ring and sealing washer

Locking actuators

☐

(NONE)

- 1 V Locking (1 position)
- 2 V Locking (2 positions)
- 3 V Locking (3 positions)
- (see actuator drawings).

Example of completely specified model number:

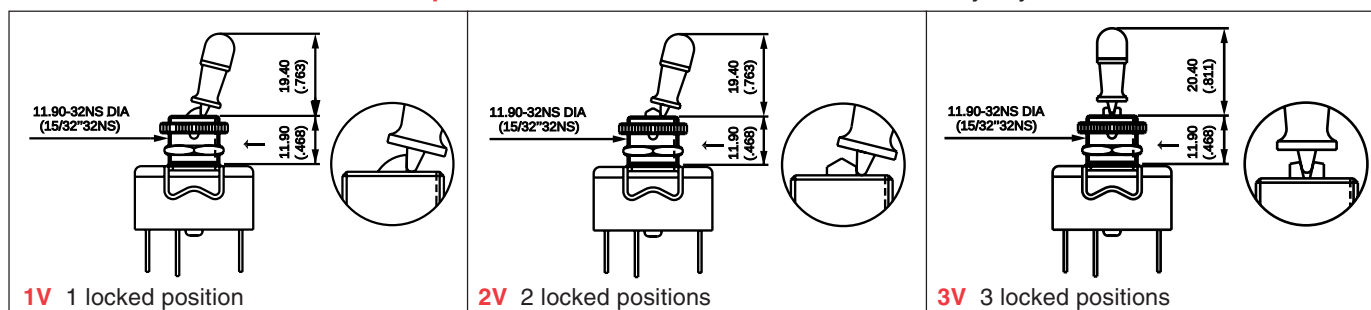
644H/21RGK

Although most combinations of options are available, some may result in incompatibilities. Consult factory if there is any question.

OPTIONS & SPECIAL OPTIONS

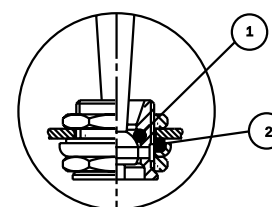
LOCKING ACTUATORS for 1 & 2 pole models

Arrow indicates keyway



SPECIAL OPTIONS

- T** High temperature diallyl phthalate case (-40°C to +85°C).
- G** Matte black finish on actuator, bushing and nuts. Includes option **T** above.
- K** Front panel sealing with 'O'-ring and sealing washer.



K

Security Guards available - see Miscellaneous & Accessories section D.

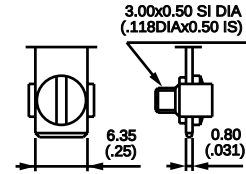
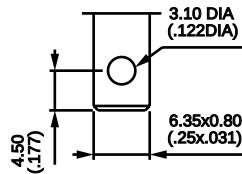
SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

600H & 600NH SERIES - POWER TOGGLE SWITCHES

OPTIONS & MISCELLANEOUS

GROUNDING LUG RING

TERMINALS



U187 (required for switches used at 380VAC - order separately)

600H/2 Solder lug terminals

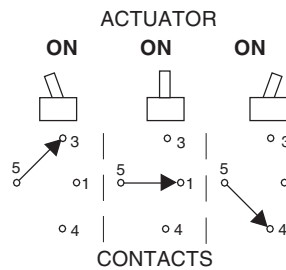
600H Screw terminals

POSITIONS & CONNECTIONS for function 4 switches

FUNCTION 4			FUNCTION 41R			FUNCTION 42R		
ACTUATOR			ACTUATOR			ACTUATOR		
ON	ON	ON	MOM	ON	ON	MOM	ON	MOM
CONTACTS			CONTACTS			CONTACTS		
ON	ON	ON	MOM	ON	ON	MOM	ON	MOM
5-6	5-6	5-4	5-6	5-6	5-4	5-6	5-6	5-4
ON	ON	ON	MOM	ON	ON	MOM	ON	MOM
2-3	2-1	2-1	2-3	2-1	2-1	2-3	2-1	2-1

WIRING FOR 3 WAY SWITCH for function 4 switches

Equivalent to single pole 3 throw switch. External jumper must be connected between terminals 2 & 6 by customer.



PANEL CUT-OUTS

SWITCH ACTION

(arrow indicates keyway)

