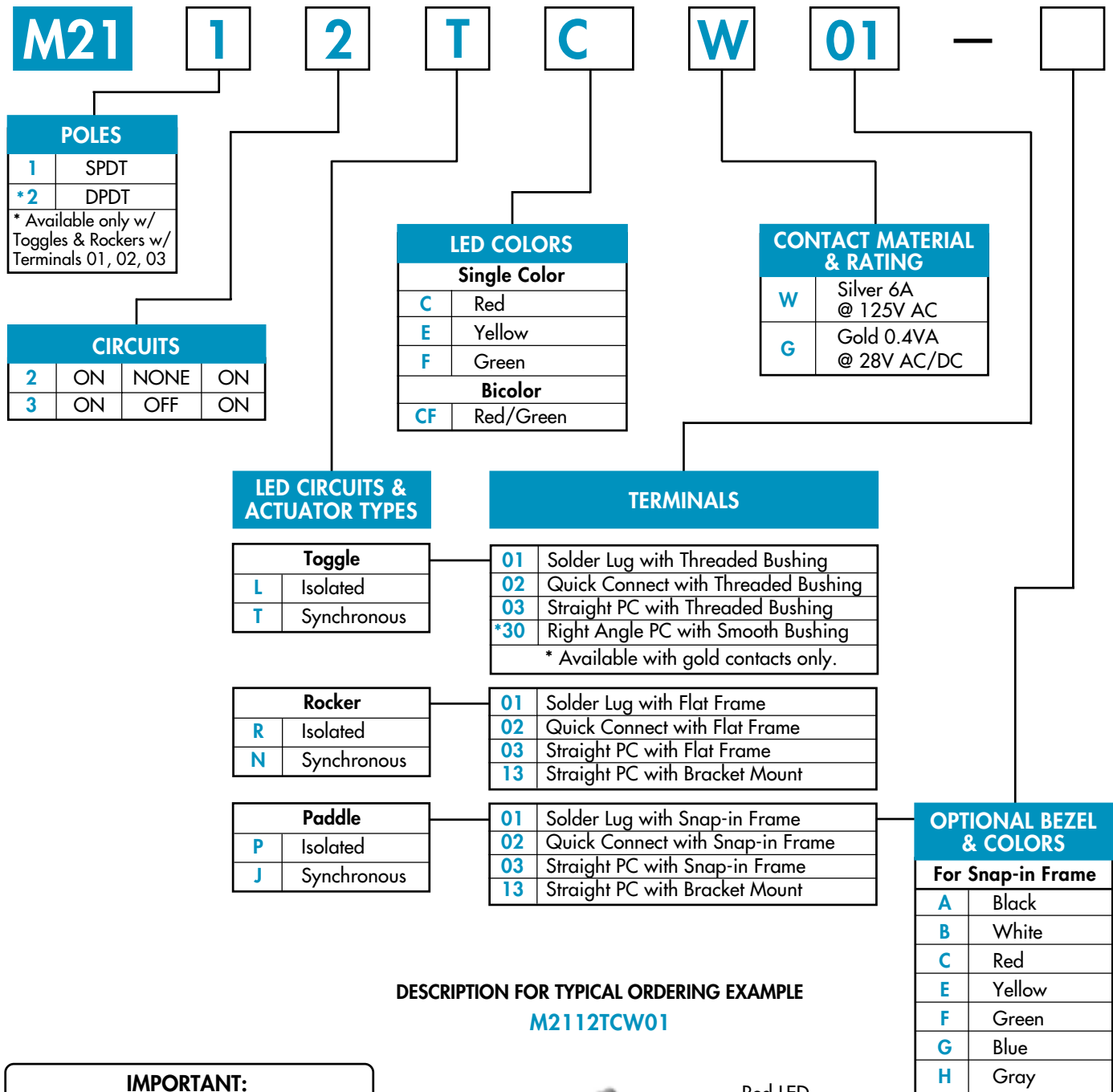


TYPICAL TOGGLE & ROCKER SWITCH ORDERING EXAMPLE



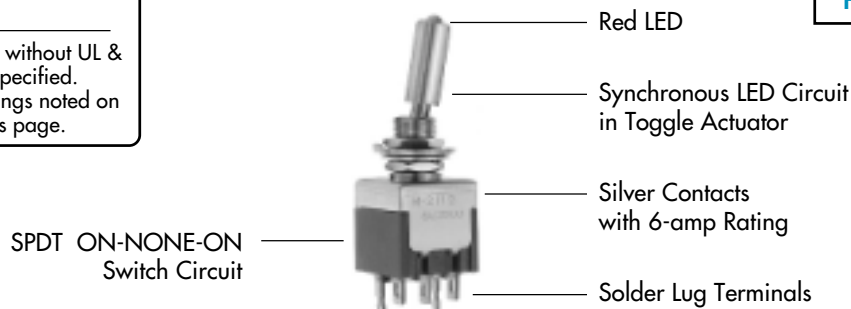
DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

M2112TCW01

IMPORTANT:



Switches are supplied without UL & CSA marking unless specified. Specific models & ratings noted on General Specifications page.



GENERAL SPECIFICATIONS

Electrical Capacity (Resistive Load)

Power Level (code W): 6A @ 125V AC or 3A @ 250V AC or 3 A @ 30V DC
Logic Level (code G): 0.4VA maximum @ 28V AC/DC maximum
 Note: See Supplement Index (page Z1) to find explanation of operating range.

Other Ratings

Contact Resistance: 10 milliohms maximum for silver; 20 milliohms maximum for gold
Insulation Resistance: 1,000 megohms minimum @ 500V DC
Dielectric Strength: 1,000V AC minimum between contacts; 1,500V AC minimum between contacts & case
Mechanical Life: 50,000 operations minimum
Electrical Life: 25,000 operations minimum
Nominal Operating Force: Toggles & Paddles:
 On to On position ~ 325 grams for single pole; 450 grams for double pole
 Off to On position ~ 400 grams for single pole; 720 grams for double pole
 Rockers:
 On to On position ~ 650 grams for single pole; 1400 grams for double pole
 Off to On position ~ 1000 grams for single pole; 1800 grams for double pole
Angle of Throw: 20°

Materials & Finishes

Bushing: Brass with nickel plating
Housing: Stainless steel
Mounting Bracket: Steel with tin plating
Movable Contacts: Silver alloy or silver alloy with gold plating over nickel
Stationary Contact: Silver with silver plating or copper or brass with gold plating over nickel
Lamp Contacts: Phosphor bronze
Base: Diallyl phthalate
Power Terminals: Copper with silver or gold plating
Lamp Terminals: Brass with silver or gold plating

Environmental Data

Operating Temp Range: -10°C through +55°C (+14°F through +131°F) for toggles & rockers
 -25°C through +70°C (-13°F through +158°F) for paddles
Humidity: 93% humidity for 96 hours @ 40°C (104°F)
Vibration: 10 ~ 55Hz with peak-to-peak amplitude of 1.5mm traversing the frequency range & returning in 1 minute; 3 right angled directions for 2 hours
Shock: 50g acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

Installation

Mounting Torque: 15 kgf/cm (13 lb/in) for double nut; 7 kgf/cm (6 lb/in) for single nut
Soldering Time & Temperature: 3 seconds @ 350°C or 5 seconds @ 270°C
Process Seal: Not Available

Standards & Certifications

Flammability Standards: UL94V-0 base
UL Recognized: Single pole toggles & rockers with synchronous circuits & solder lug or PC recognized at 6A @ 125V AC; UL File No. E44145
CSA Certified: All single pole toggles & rockers with synchronous circuits recognized at 6A @ 125/250V AC; CSA File No. LR23535

POLES & CIRCUITS & LED ILLUMINATION

Model		Pole & Throw	Actuator Position & Terminal Numbers			Schematics
			Down <small>Keyway</small>	Center	Up	
M2112		SPDT	ON	NONE	ON	<p>Notes: Terminal numbers are not actually on the switch. LEDs require an external power source.</p> <p>Isolated Single Color LED</p> <p>Synchronous Single Color LED</p> <p>Synchronous Bicolor LED</p>
Connected Power Terminals			2-3	NONE	2-1	
LED Circuit	Isolated Single Color LED Connected LED Terminals		ON	NONE	ON	
	Synchronous Single Color LED Connected LED Terminals		ON	NONE	OFF OPEN	
	Synchronous Bicolor LED Connected LED Terminals		Red	NONE	Green	
M2113		SPDT	ON	OFF	ON	
Connected Power Terminals			2-3	OPEN	2-1	
LED Circuit	Isolated Single Color LED Connected LED Terminals		ON	ON	ON	
	Synchronous Single Color LED Connected LED Terminals		ON	OFF OPEN	ON	
	Synchronous Bicolor LED Connected LED Terminals		Red	OFF OPEN	Green	
M2122		DPDT	ON	NONE	ON	<p>Isolated Single Color LED</p> <p>Synchronous Single Color LED</p> <p>Synchronous Bicolor LED</p>
Connected Power Terminals			2-3 5-6	NONE	2-1 5-4	
LED Circuit	Isolated Single Color LED Connected LED Terminals		ON	NONE	ON	
	Synchronous Single Color LED Connected LED Terminals		ON	NONE	OFF OPEN	
	Synchronous Bicolor LED Connected LED Terminals		Red	NONE	Green	
M2123		DPDT	ON	OFF	ON	
Connected Power Terminals			2-3 5-6	OPEN	2-1 5-4	
LED Circuit	Isolated Single Color LED Connected LED Terminals		ON	ON	ON	
	Synchronous Single Color LED Connected LED Terminals		ON	OFF OPEN	ON	
	Synchronous Bicolor LED Connected LED Terminals		Red	OFF OPEN	Green	

LED COLORS & SPECIFICATIONS

Single Element LED	For Toggles & Rockers				For Paddles				
	Single Color		Bicolor		Single Color		Bicolor		
LED factory assembled Not Available Separately Bicolor is white in OFF state.	C	E	F	CF	C	E	F	CF	
Color	Red	Yellow	Green	Red/Green	Red	Yellow	Green	Red/Green	
Forward Peak Current	I_{FM}	25mA	30mA	30mA	25mA	10mA	30mA	30mA	30mA
Continuous Forward Current	I_F	20mA	20mA	20mA	20mA	8mA	24mA	24mA	25mA
Forward Voltage	V_F	2.1V	2.1V	2.1V	2.1V	1.9V	2.0V	2.1V	2.1V
Reverse Peak Voltage	V_{RM}	4V	4V	4V	—	5V	5V	5V	—
Current Reduction Rate Above 25°C	ΔI_F	0.33mA/°C	0.40mA/°C	0.40mA/°C	0.33mA/°C	0.13mA/°C	0.40mA/°C	0.40mA/°C	0.33mA/°C
Ambient Temperature Range	-10°C ~ +55°C				-25°C ~ +70°C				

LED CIRCUIT, TOGGLE, & MOUNTING TYPE COMBINATIONS



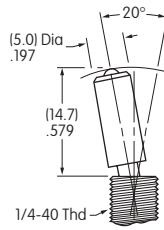
Toggle with Isolated LED Circuit



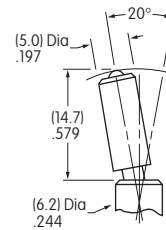
Toggle with Synchronous LED Circuit

Finish: Brushed aluminum

Standard Hardware: 2 AT513H Hex Nuts, 1 AT507H Locking Ring, 1 AT509 Lockwasher
Standard & optional hardware details in Accessories & Hardware section.



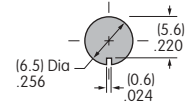
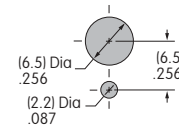
Threaded Bushing combines with terminal codes 01, 02, & 03.



Smooth Bushing combines with terminal code 30.

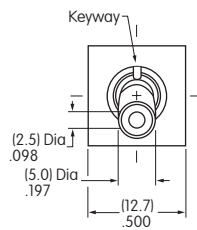
Max. Panel Thickness With Standard Hardware 2.6mm (.102")

Max. Panel Thickness Without Locking Ring 3.4mm (.134")

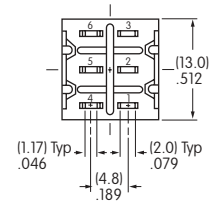
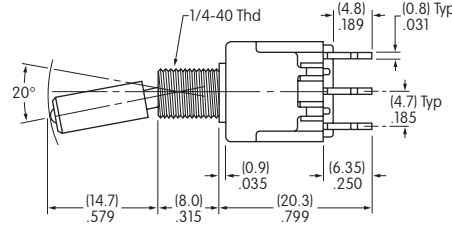


TYPICAL TOGGLE SWITCH DIMENSIONS

Solder Lug



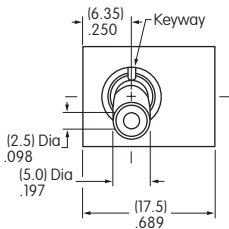
Single Pole



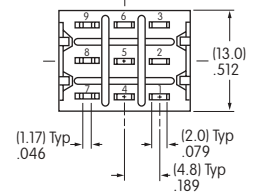
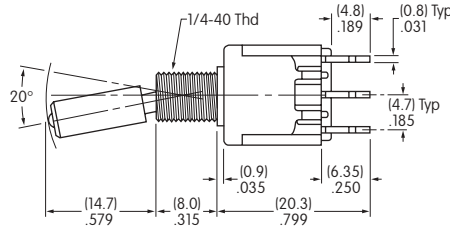
M2112TCFW01

Single color LED switch does not have terminal 5.

Solder Lug



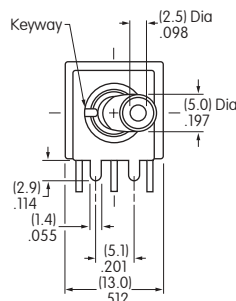
Double Pole



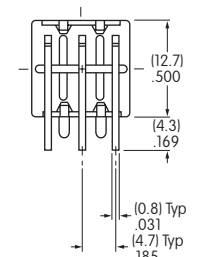
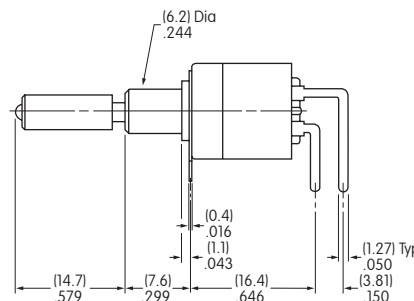
M2122TCFW01

Single color LED switch does not have terminal 8.

Right Angle PC



Single Pole Only



M2112TCFG30

Gold contact material only.

Single color LED switch does not have terminal 5.

LED CIRCUIT, ROCKER, & MOUNTING TYPE COMBINATIONS

R

Rocker with Isolated LED Circuit

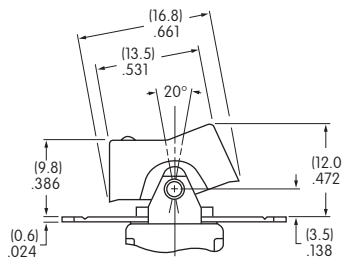
N

Rocker with Synchronous LED Circuit

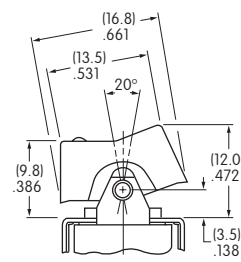
Material: Polyamide

Finish: Matte

Color: Black

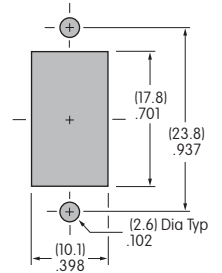


Flat Frame combines with Terminal codes 01, 02, & 03.



Bracket combines with Terminal code 13.

Max. Panel Thickness
3.2mm (.126")



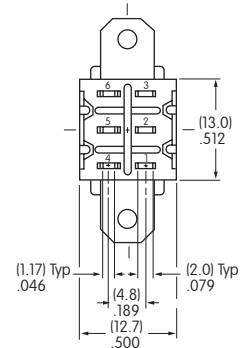
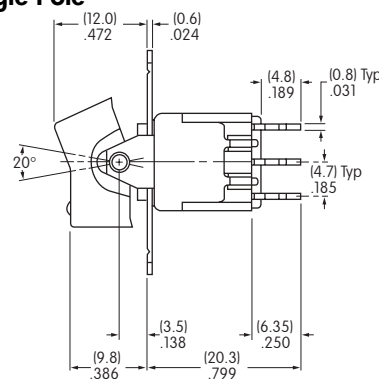
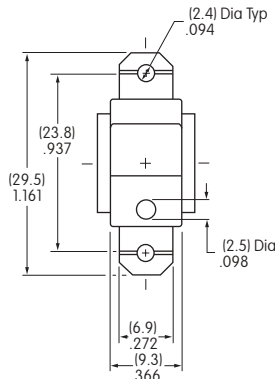
TYPICAL ROCKER SWITCH DIMENSIONS

Solder Lug



M2112NCFW01

Single Pole



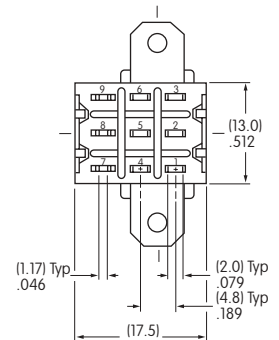
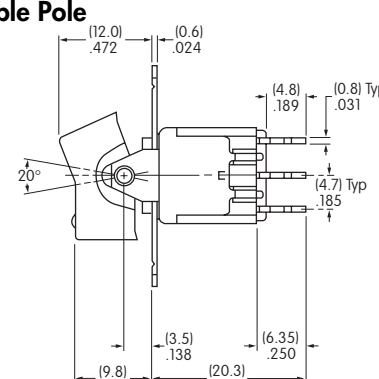
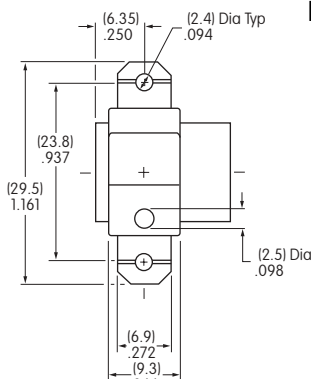
Single color LED switch does not have terminal 5.

Solder Lug



M2122NCFW01

Double Pole



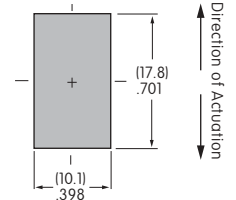
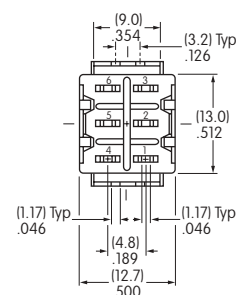
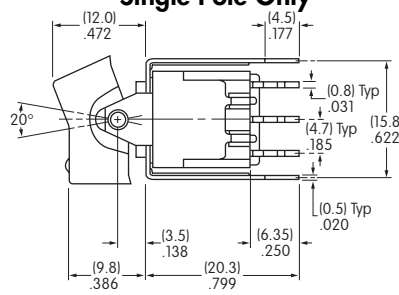
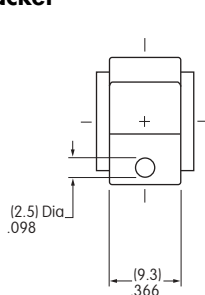
Single color LED switch does not have terminal 8.

Straight PC • Bracket



M2112NCFW13

Single Pole Only



Single color LED switch does not have terminal 5.

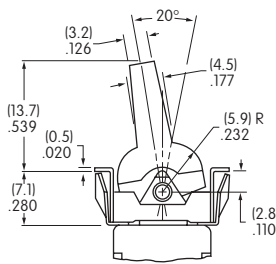
Silver contact material is standard.

LED CIRCUIT, PADDLE, & MOUNTING TYPE COMBINATIONS

P Paddle with Isolated LED Circuit

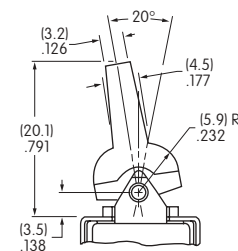
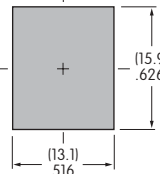
J Paddle with Synchronous LED Circuit

Material: Polyamide
Finish: Matte
Color: Black



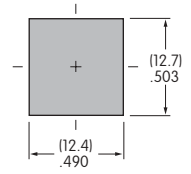
Snap-in combines with Terminal codes 01, 02, & 03.

Max. Panel Thickness
1 ~ 3.2mm (.039" ~ .126")
without Bezel
1 ~ 2.5mm (.039" ~ .098")
with Bezel



Bracket combines with Terminal code 13.

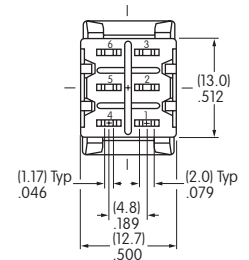
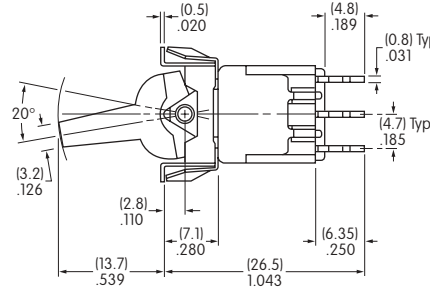
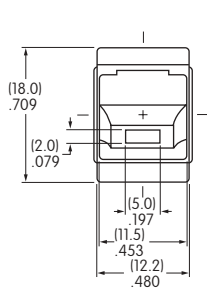
Max. Panel Thickness
3.2mm (.126")



TYPICAL PADDLE SWITCH DIMENSIONS

Solder Lug • Snap-in

Single Pole Only

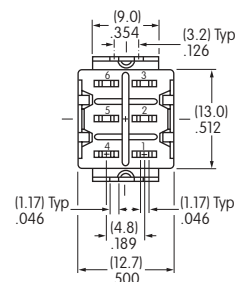
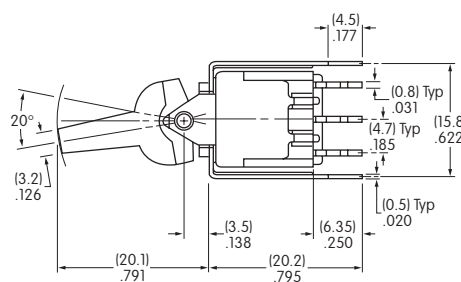
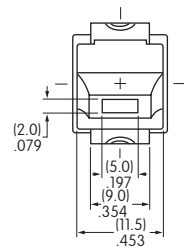


M2112JCFW01

Single color LED switch does not have terminal 5.

Straight PC • Bracket

Single Pole Only



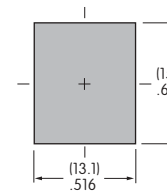
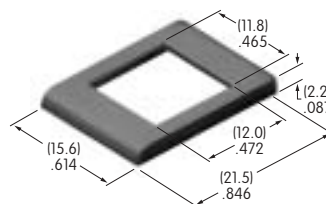
M2112JCFW13

Silver contact material is standard. Single color LED switch does not have terminal 5.

OPTIONAL BEZEL & COLORS

AT2107 Bezel for Snap-in Panel Frame

Material: Nylon
Finish: Matte



Colors Available:

A

Black

B

White

C

Red

E

Yellow

F

Green

G

Blue

H

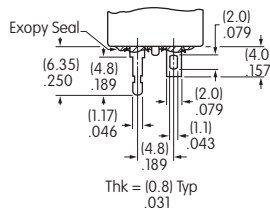
Gray

CONTACT MATERIALS & RATINGS

W Silver Contacts	Power Level	6A @ 125V AC & 3A @ 250V AC
G Gold Contacts	Logic Level	0.4VA maximum @ 28V AC/DC
See Supplement Index (page Z1) for complete explanation of operating range.		

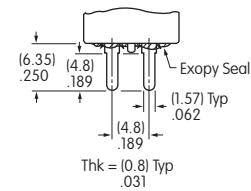
TERMINALS

01 Solder Lug with Turret LED Terminal

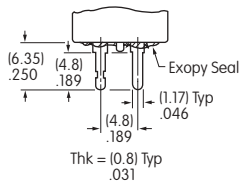


Wiring:
Solder lug terminals have a .043" x .079" oval hole which accommodates one solid 18-gauge wire or two solid or stranded 20-gauge wires.

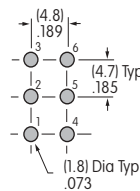
02 Quick Connect



03 Straight PC with Turret LED Terminal

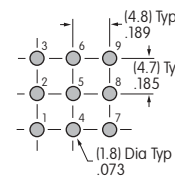


Single Pole



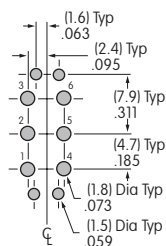
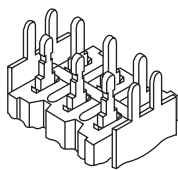
Single color LED switch does not have terminal 5.

Double Pole



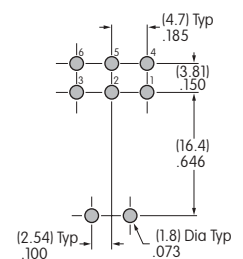
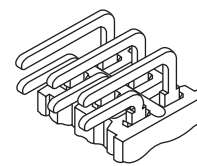
Single color LED switch does not have terminal 8.

13 Straight PC with Bracket & Turret LED Terminal



Single color LED switch does not have terminal 5.

30 Right Angle PC

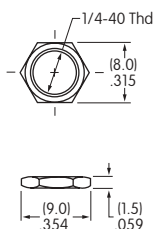


STANDARD MOUNTING HARDWARE

AT513H

Hexagon nuts (2 per switch)

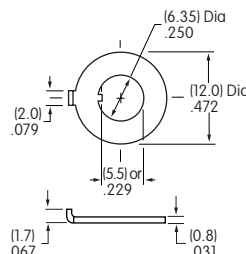
Material: Brass with nickel plating



AT507H

Locking ring (1 per switch)

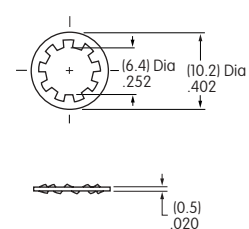
Material: Steel with chromate over zinc



AT509

Lockwasher (1 per switch)

Material: Steel with chromate over zinc



Optional Hardware: Knurled nuts, dress nuts, and ON-OFF plates are available; see details in Accessories & Hardware section.