

Distinctive Characteristics

Industry's first LED illumination at tip of toggle and paddle switches.

Single color LEDs of red, yellow, and green, plus bicolor red/green, to meet varied design requirements.

LEDs can operate independently from or synchronously with switching operation.

Antijamming feature to protect contacts from damage due to excessive downward force on the toggle.

High torque bushing prevents the bushing from rotating or separating from the metal frame during installation.

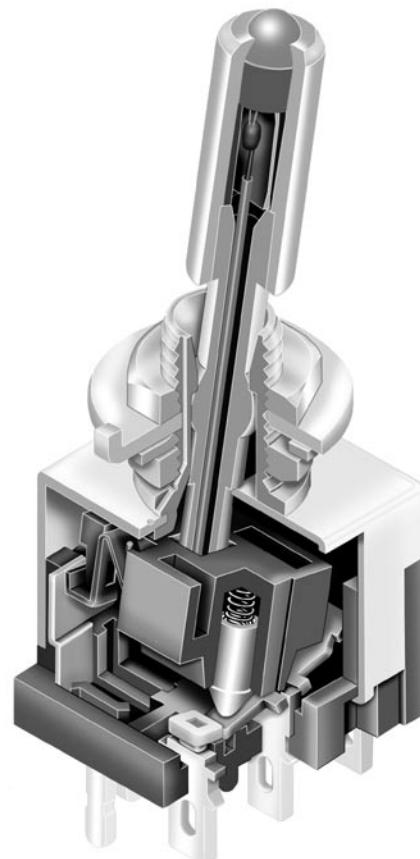
Stainless steel frame resists corrosion.

Silver contacts are of specially composed alloy for hardness.

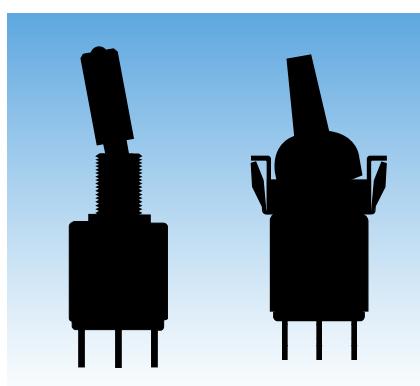
High insulating barriers protect against crossover in double pole devices.

Terminals are molded in and epoxy sealed to lock out flux, dust, and other contaminants.

1,500V dielectric strength between switch contacts and case is accomplished by clinching the frame away from the terminals.



Actual Size



General Specifications

Electrical Capacity (Resistive Load)

Power Level (code W): 6A @ 125V AC or 3A @ 250V AC or 3A @ 30V DC

Logic Level (code G): 0.4VA maximum @ 28V AC/DC maximum

(Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)

Note: Find additional explanation of operating range in Supplement section.

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 for 1 minute minimum;
1,500V AC minimum between contacts & case for 1 minute minimum

Mechanical Life: 50,000 operations minimum

Electrical Life: 25,000 operations minimum

		On-to-On Position	Off-to-On Position
	Toggles & Paddles	Single Pole 3.19N	3.92N
		Double Pole 4.41N	7.06N
	Rockers	Single Pole 6.37N	9.80N
		Double Pole 13.73N	17.65N

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

Stationary Contacts: Silver with silver plating or copper or brass with gold plating

Lamp Contacts: Phosphor bronze

Base: Diallyl phthalate (UL94V-0)

Switch 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: 90 ~ 95% 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 (490m/s²) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

Installation

Mounting Torque: 1.47Nm (13 lb-in) for double nut; .67Nm (6 lb-in) for single nut

Soldering Time & Temp: Wave Soldering (PC version): See Profile B in Supplement section.

Manual Soldering: See Profile B in Supplement section.

Note: Lever must be in center position while soldering.

Cleaning: PC mountable device is not process sealed. Hand clean locally using alcohol based solution.

Standards & Certifications

Flammability Standards: UL94V-0 base

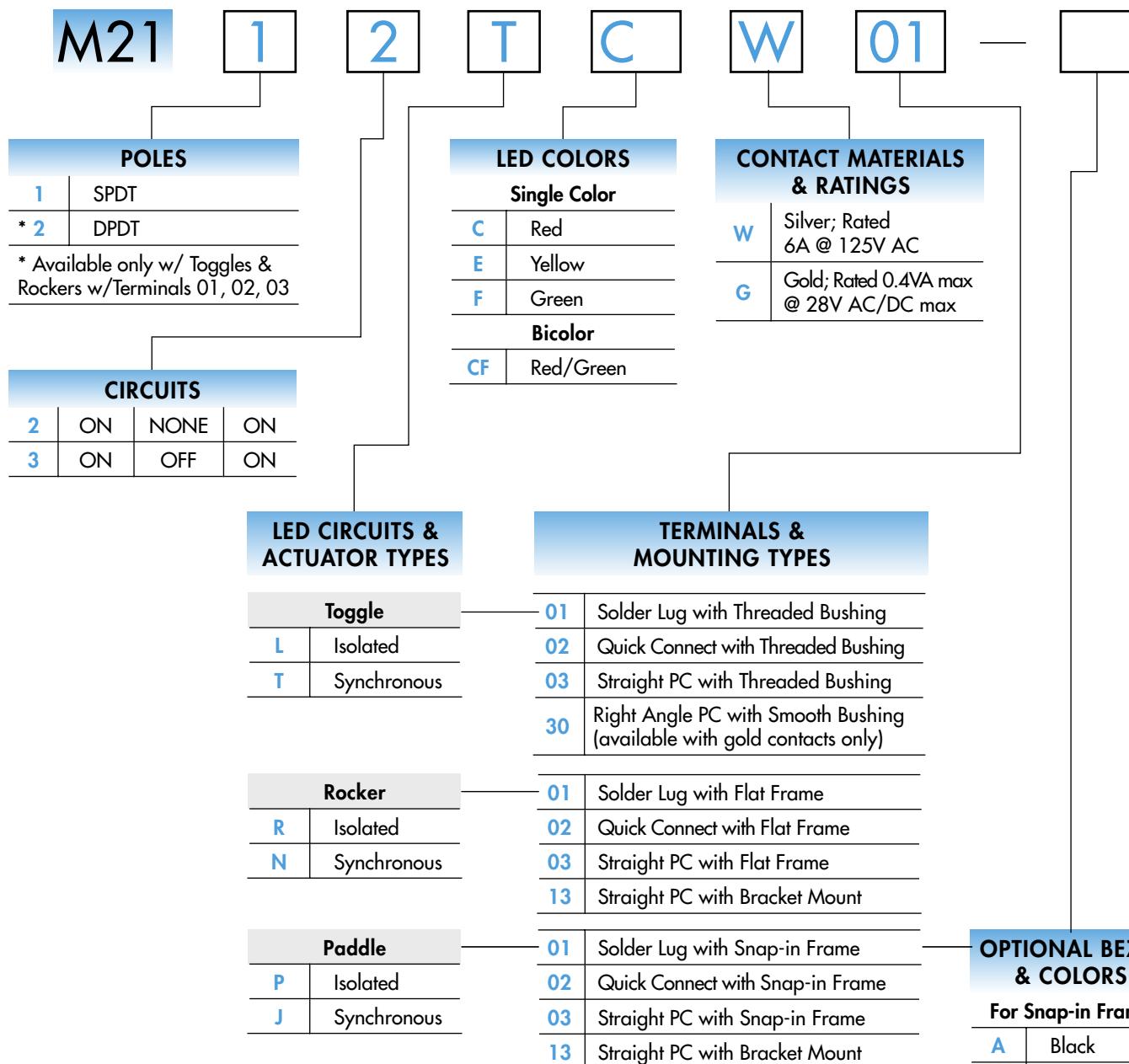


UL Recognized: Single pole toggles & rockers with synchronous circuits & solder lug or PC recognized at 6A @ 125V AC; UL File No. WOYR2.E44145; add "/U" to end of part number to order UL mark on switch.



CSA Certified: All single pole toggles & rockers with synchronous circuits certified at 6A @ 125V AC; CSA File No. 023535-0-000; add "/C" to end of part number to order CSA mark on switch.

TYPICAL SWITCH ORDERING EXAMPLE



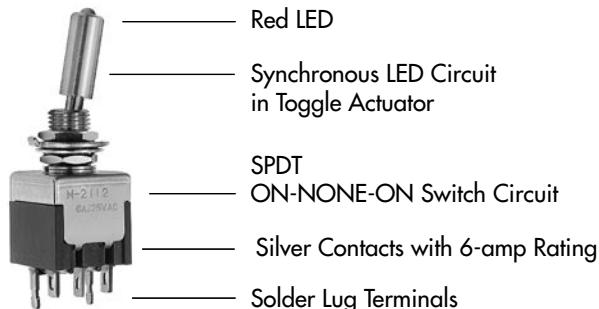
OPTIONAL BEZEL & COLORS

For Snap-in Frame

A	Black
B	White
C	Red
E	Yellow
F	Green
G	Blue
H	Gray

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

M2112TCW01

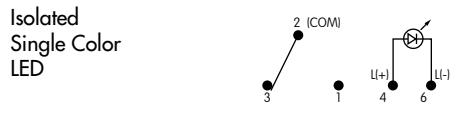
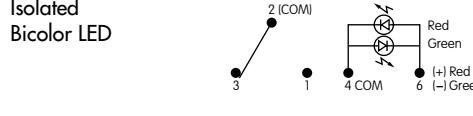
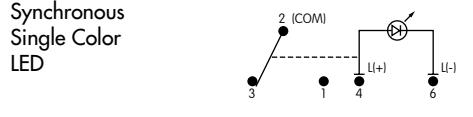
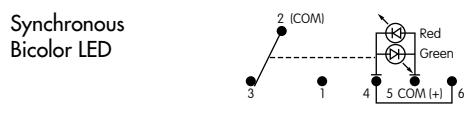
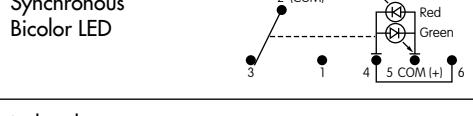
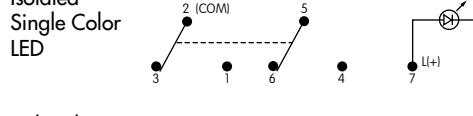
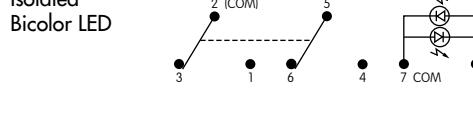
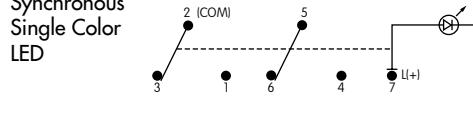
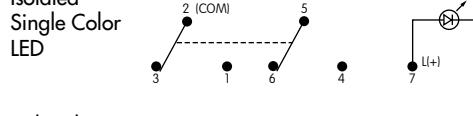
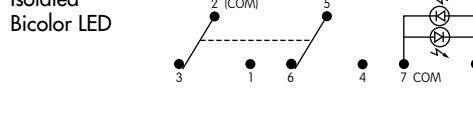
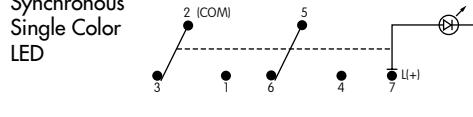
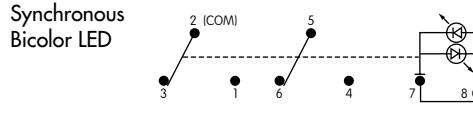
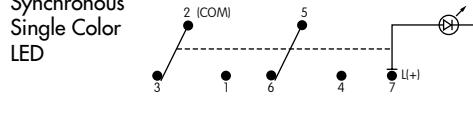
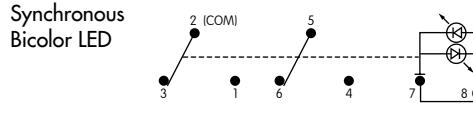
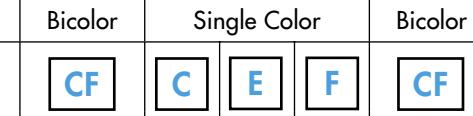


IMPORTANT:



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

POLES & CIRCUITS & LED ILLUMINATION

Model	Pole & Throw	Toggle Position & Terminal Numbers			Schematics
		Down Keyway	Center	Up	
M2112	SPDT Connected Power Terminals	ON 2-3	NONE NONE	ON 2-1	<p>Notes: Terminal numbers are not actually on the switch. LEDs require an external power source.</p>    
LED Circuit	Isolated LEDs (see schematics) Connected LED Terminals	ON 4-6	NONE NONE	ON 4-6	
	Synchronous Single Color LED Connected LED Terminals	ON 4-6	NONE NONE	OFF OPEN	
	Synchronous Bicolor LED Connected LED Terminals	Red 5-6	NONE NONE	Green 5-4	
	M2113	SPDT Connected Power Terminals	ON 2-3	OFF OPEN	ON 2-1
LED Circuit	Isolated LEDs (see schematics) Connected LED Terminals	ON 4-6	ON 4-6	ON 4-6	   
	Synchronous Single Color LED Connected LED Terminals	ON 4-6	OFF OPEN	ON 4-6	
	Synchronous Bicolor LED Connected LED Terminals	Red 5-6	OFF OPEN	Green 5-4	
	M2122	DPDT Connected Power Terminals	ON 2-3 5-6	NONE NONE	ON 2-1 5-4
LED Circuit	Isolated LEDs (see schematics) Connected LED Terminals	ON 7-9	NONE NONE	ON 7-9	   
	Synchronous Single Color LED Connected LED Terminals	ON 7-9	NONE NONE	OFF OPEN	
	Synchronous Bicolor LED Connected LED Terminals	Red 8-9	NONE NONE	Green 8-7	
	M2123	DPDT Connected Power Terminals	ON 2-3 5-6	OFF OPEN	ON 2-1 5-4
LED Circuit	Isolated LEDs (see schematics) Connected LED Terminals	ON 7-9	ON 7-9	ON 7-9	   
	Synchronous Single Color LED Connected LED Terminals	ON 7-9	OFF OPEN	ON 7-9	
	Synchronous Bicolor LED Connected LED Terminals	Red 8-9	OFF OPEN	Green 8-7	

LED COLORS & SPECIFICATIONS

Single Element LED	Toggles & Rockers			Toggles	Rockers	Paddles							
	Single Color					Single Color		Bicolor					
	Color	C	E	F	CF	CF	C	E	F	CF	Red/Green	Red/Green	Red/Green
Forward Peak Current	I_{FM}	25	30	30	25	25	10	30	30	30/25	mA		
Continuous Forward Current	I_F	20	20	20	10	20	8	24	24	20/20	mA		
Forward Voltage	V_F	2.1	2.1	2.1	1.9	2.1	1.9	2.0	2.1	2.0/2.2	V		
Reverse Peak Voltage	V_{RM}	4	4	4	—	—	5	5	5	—	V		
Current Reduction Rate Above 25°C	ΔI_F	0.33	0.40	0.40	0.33/0.33	0.33/0.33	0.13	0.40	0.40	0.43/0.38	mA/°C		
Ambient Temperature Range	$-10^\circ \sim +55^\circ\text{C}$						$-25^\circ \sim +70^\circ\text{C}$						

LED CIRCUIT, TOGGLE, & MOUNTING TYPE COMBINATIONS



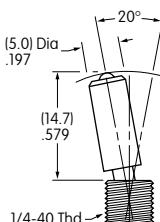
Toggle with Isolated LED Circuit



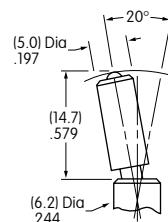
Toggle with Synchronous LED Circuit

Finish: Brushed aluminum

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

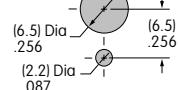


Threaded Bushing combines with Terminal codes 01, 02, & 03.

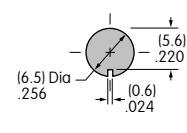


Smooth Bushing combines with Terminal code 30.

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

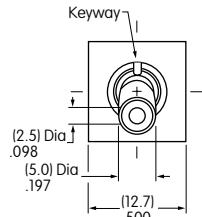


Max. Panel Thickness without Locking Ring .134" (3.4mm)



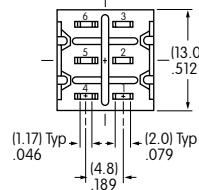
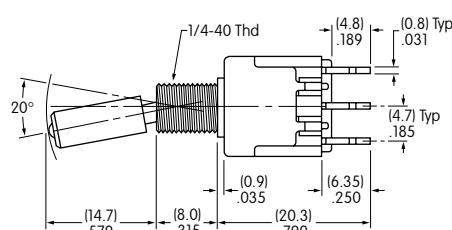
TYPICAL TOGGLE SWITCH DIMENSIONS

Solder Lug



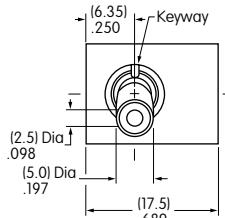
M2112TCFW01

Single Pole



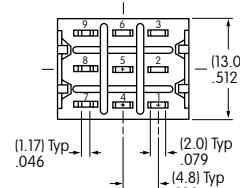
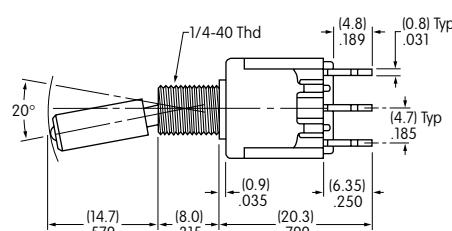
Single color LED switch does not have terminal 5.

Solder Lug



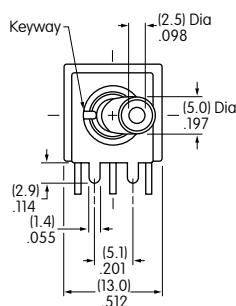
M2122TCFW01

Double Pole



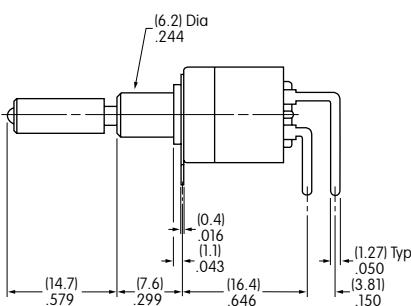
Single color LED switch does not have terminal 8.

Right Angle PC



M2112TCFG30

Single Pole Only



Single color LED switch does not have terminal 5.

Gold contact material only

LED CIRCUIT, ROCKER, & MOUNTING TYPE COMBINATIONS

R

Rocker with Isolated LED Circuit

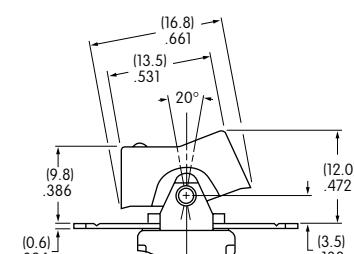
N

Rocker with Synchronous LED Circuit

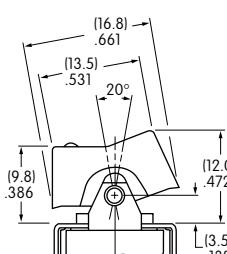
Material: Polyamide

Finish: Matte

Color: Black

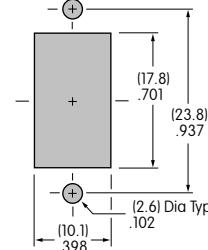


Flat Frame combines with Terminal codes 01, 02, & 03.



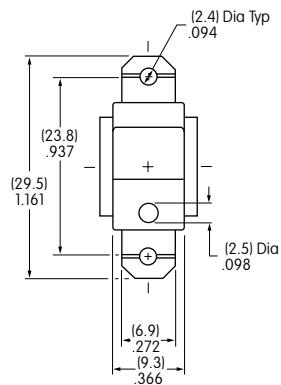
Bracket combines with Terminal code 13.

Max. Panel Thickness
.126" (3.2mm)



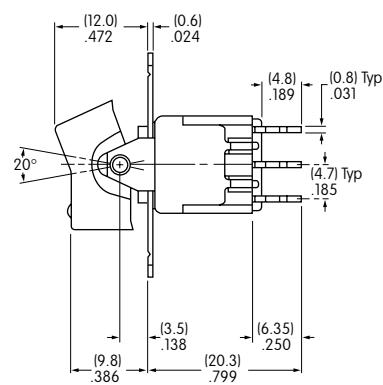
TYPICAL ROCKER SWITCH DIMENSIONS

Solder Lug

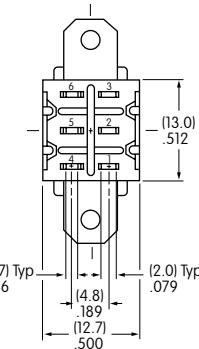


M2112NCFW01

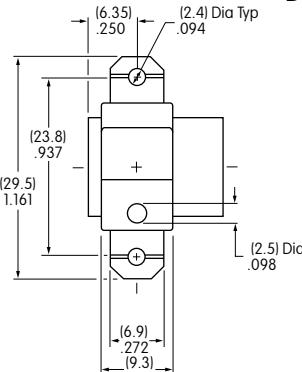
Single Pole



Single color LED switch does not have terminal 5.

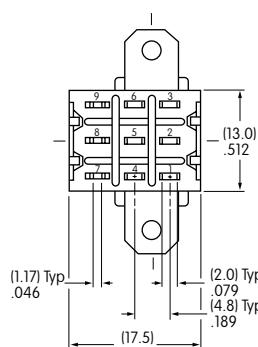
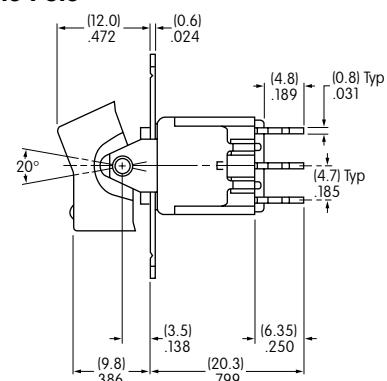


Solder Lug



M2122NCFW01

Double Pole

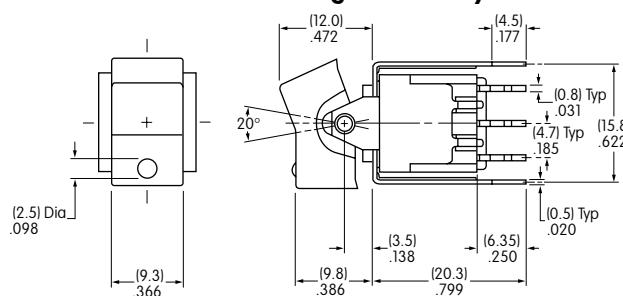


Single color LED switch does not have terminal 8.

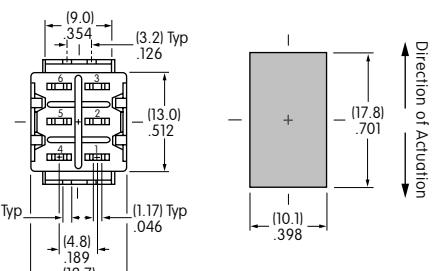
Straight PC • Bracket



Single Pole Only



M2112NCFW13



Direction of Actuation

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

LED CIRCUIT, PADDLE, & MOUNTING TYPE COMBINATIONS

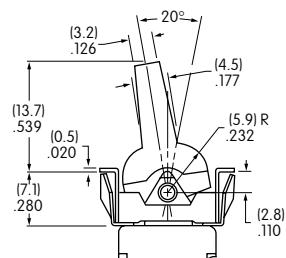


Paddle with Isolated LED Circuit



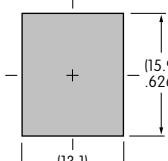
Paddle with Synchronous LED Circuit

Material: Polyamide
Finish: Matte
Color: Black

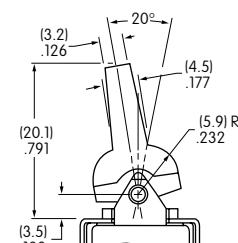


Snap-in combines with
Terminal codes 01, 02, & 03

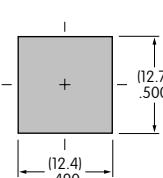
Maximum Panel Thickness
.039" ~ .126" (1.0 ~ 3.2mm)
without Bezel
.039" ~ .098" (1.0 ~ 2.5mm)
with Bezel



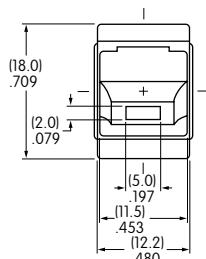
Maximum Panel Thickness
.126" (3.2mm)



Bracket combines with
Terminal code 13

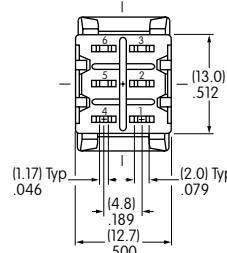
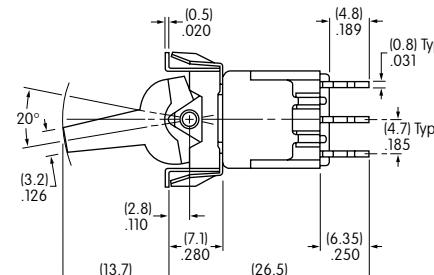


Solder Lug • Snap-in



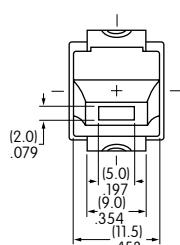
M2112JCFW01

Single Pole Only



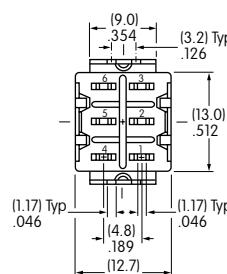
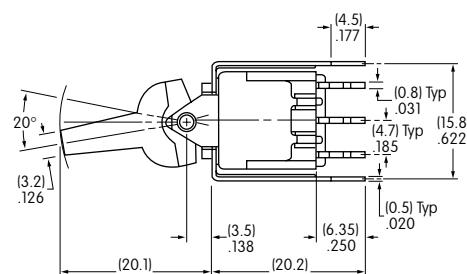
Single color LED switch does not have terminal 5.

Straight PC • Bracket



M2112JCFW13

Single Pole Only



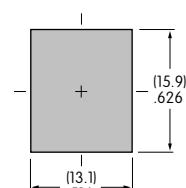
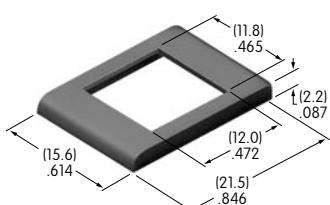
Silver contact material is standard. Single color LED switch does not have terminal 5.

OPTIONAL BEZEL & COLORS

AT2107 Bezel for Snap-in Panel Frame

Material: Polyamide

Finish: Matte



Colors Available:



Black



White



Red



Yellow



Green



Blue



Gray

