General Specifications

Electrical Capacity (Resistive Load)

Power Level (silver): 6A @ 125V AC & 3A @ 250V AC
4A @ 30V DC for On-None-On; 3A @ 30V DC for all other circuits

Logic Level (gold): 0.4VA maximum @ 28V AC/DC maximum
(Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)

Logic/Power Level (gold over silver): Combines silver & gold ratings
Note: Find additional explanation of dual rating & 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 and case for 1 minute minimum

Mechanical Life: 50,000 operations minimum

Electrical Life: 25,000 operations minimum for silver; 50,000 operations minimum for gold;
50,000 operations minimum for silver at 3A @ 125V AC

Angle of Throw: 25°

Materials & Finishes

Actuator Clip & Mounting Frame: Stainless Steel

Body Frame: Stainless steel

Case: Diallyl phthalate resin (UL94V–0)

Movable Contactor: Phosphor bronze with silver or gold plating

Movable Contacts: Silver alloy (code W); copper with gold plating (code G); or silver alloy with gold plating (code A)

Stationary Contacts: Silver with silver plating (code W); copper or brass with gold plating (code G);
or silver with gold plating (code A)

Terminals: Copper or brass with silver plating; or copper or brass with gold plating

Environmental Data

Operating Temp Range: –30°C through +85°C (–22°F through +185°F)

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/s^2) acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

Processing

Soldering: Wave Soldering (PC version) for Gold: See Profile A in Supplement section.
Manual Soldering for Gold: See Profile A in Supplement section.
Wave Soldering (PC version) for Silver: See Profile B in Supplement section.
Manual Soldering for Silver: See Profile B in Supplement section.
Note: Actuator must be in OFF (center) position while soldering.

Cleaning: These devices are not process sealed. Hand clean locally using alcohol based solution.

Standards & Certifications

Flammability Standards: UL94V–0 for case

UL: **File No. E44145 - Recognized only when ordered with marking on switch.**
Add "/U" or "/CUL " before first dash in part number to order UL recognized switch.
All models recognized at 6A @ 125V AC, 3A @ 250V AC or 0.4VA maximum @ 28V DC maximum.

CSA: **File No. 023535_0_000 - Certified only when ordered with marking on switch.**
Add "/C" before first dash in part number to order CSA certified switch.
All models certified at 6A @ 125V AC or 3A @ 250V AC or 0.4VA maximum @ 28V maximum.

Distinctive Characteristics

Three methods of panel mounting: flat frame for flush with face or subpanel, snap-in, and PCB.

High insulating barriers increase isolation of circuits in multipole devices and provide added protection to contact points.

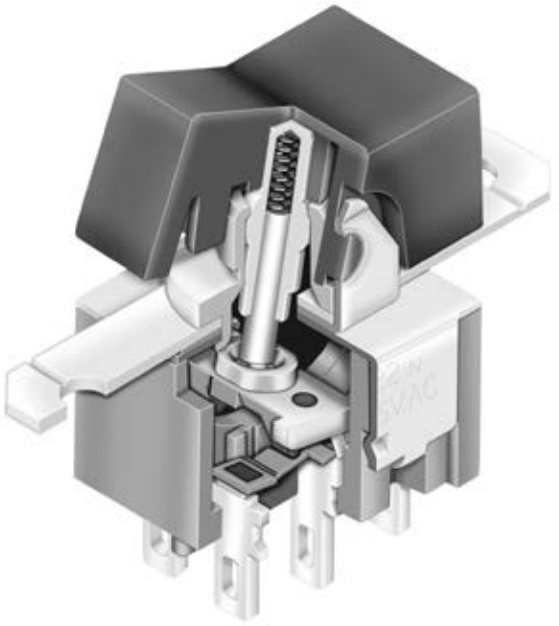
The molded diallyl phthalate case has a UL 94V-0 flammability rating.

Epoxy sealed terminals prevent entry of solder flux and other contaminants.

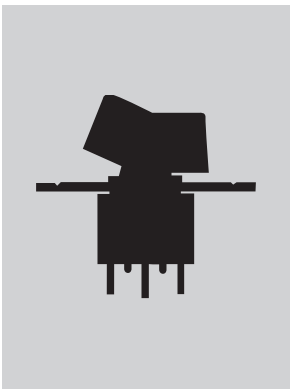
Prominent external insulating barriers increase insulation resistance and dielectric strength.

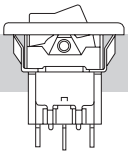
Bias guard prevents misalignment of contacts; interlocking of actuator block with rocker and internal guide does not allow transmission of diagonal force on rocker to reach contact mechanism.

Clinching of the frame to the case well above the base and terminals provides 1,500V dielectric strength.

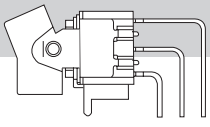


Actual Size

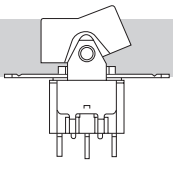




Snap-in Mount Page B64



Bracket PC Mount Page B72



Flat Frame Mount Page B83

TYPICAL SWITCH

M20 | 1 | 2 | TJ | W | 01 | — | F | C

Poles

1	SPDT
2	DPDT SP3T

Mounting Frame

TJ	Snap-in Frame

Terminals

01	Solder Lug
02	Quick Connect
03	.250" (6.35mm) Straight PC
05	.425" (10.8mm) Wirewrap
06	.750" (19.05mm) Wirewrap
07	.964" (24.5mm) Wirewrap
08	1.062" (27.0mm) Wirewrap

Rockers & Paddles

F	.450" (11.43mm) Wide Rocker
G	.450" (11.43mm) Wide Paddle
S	.453" (11.5mm) False Illluminated Rocker in Black only

Circuits

2	ON	NONE	ON
3	ON	OFF	ON
5	ON	NONE	(ON)
8	(ON)	OFF	(ON)
9	ON	OFF	(ON)
*4	ON	ON	ON
*6	(ON)	ON	(ON)
*7	ON	ON	(ON)

( ) = Momentary

* 3-ON circuits

Rocker & Paddle Colors

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

Contact Materials & Ratings

W	Silver; Rated 6A @ 125V AC & 3A @ 250V AC
G	Gold; Rated 0.4VA max @ 28V AC/DC max
A	Gold over Silver; Rated 6A @ 125V AC & 0.4VA max @ 28V AC/DC max

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

M2012TJW01-FC-1A

ORDERING EXAMPLE

— [1] [A] — [ ]

Optional Bezels

1	Bezel without LED
2	Bezel with 1 Round LED
3	Bezel with 2 Round LEDs
4	Bezel with 2 Rectangular LEDs

Bezel Colors

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

LED Colors

1 LED

C	Red
F	Green

2 LEDs

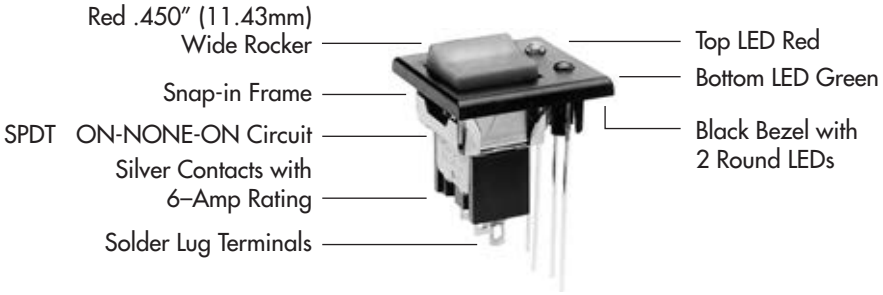
Top LED		Bottom LED	
C	Red	C	Red
E	Yellow	E	Yellow
F	Green	F	Green

IMPORTANT:

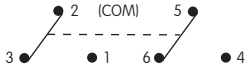
Switches are supplied without UL, cULus & CSA marking unless specified.
UL, cULus & CSA recognized only when ordered with marking on the switch.
Specific models, ratings, & ordering instructions are noted on the General Specifications page.

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

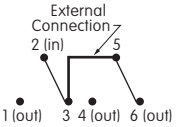
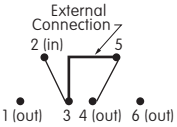
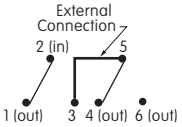
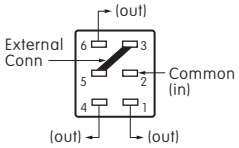
M2012TJW01-FC-3A-CF



POLES & CIRCUITS

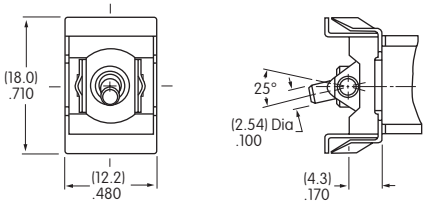
		Rocker Position ( ) = Momentary			Connected Terminals			Throw & Schematics
Pole	Model	Down	Center	Up	Down	Center	Up	Note: Terminal numbers are not actually on the switch.
SP	M2012 M2013 M2015 M2018 M2019	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3	OPEN	2-1	SPDT 
DP	M2022 M2023 M2025 M2028 M2029	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3 5-6	OPEN	2-1 5-4	DPDT 

For 3 Throw (3-On)

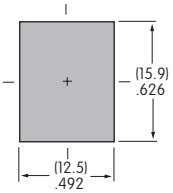
		Connected Terminals & Schematic			
Pole	Model	Down	Center	Up	External Connection
SP	M2024 M2026 M2027	ON (ON) ON  2-3 5-6	ON ON ON  2-3 5-4	ON (ON) (ON)  2-1 5-4	**The SP3T model utilizes a double pole base.** External connection must be made during field installation. 

MOUNTING FRAME

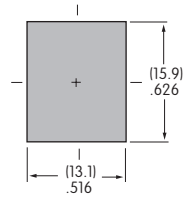
TJ **Snap-in Frame**



Panel Cutout for Single Pole without Bezel



Panel Cutout for Double Pole without Bezel



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

CONTACT MATERIALS & RATINGS

W	**Silver over Silver**	**Power Level**	**6A @ 125V AC & 3A @ 250V AC**
G	**Gold over Brass or Copper**	**Logic Level**	**0.4VA maximum @ 28V AC/DC maximum**

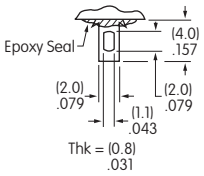
Note: See Supplement section to find complete explanation of operating range.

A	**Gold over Silver**	**Power Level or Logic Level**	**6A @ 125V AC or 0.4VA maximum @ 28V AC/DC maximum**

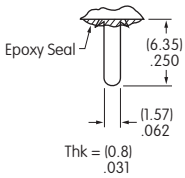
Note: This dual rated option is suitable when two or more identical switches are used in logic and in power circuits within the same application. See Supplement section to find complete explanation of dual rating and operating range.

TERMINALS

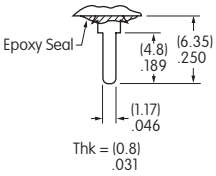
01 **Solder Lug**

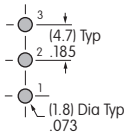


02 **.062" (1.57mm) Wide Quick Connect**

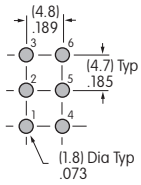


03 **.250" (6.35mm) Straight PC**





Single Pole



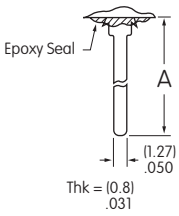
Double Pole

05 **.425" (10.8mm) Wirewrap or Extended PC**

06 **.750" (19.05mm) Wirewrap or Extended PC**

07 **.964" (24.5mm) Wirewrap or Extended PC**

08 **1.062" (27.0mm) Wirewrap or Extended PC**



If using as extended PC terminal, refer to the above footprints.

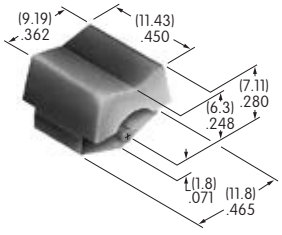
Dimension A = terminal lengths as shown beside the terminal codes at the left.

ROCKERS & PADDLES

F **AT4150 .450" (11.43mm) Wide Rocker**

Material: Polyamide
Finish: Matte

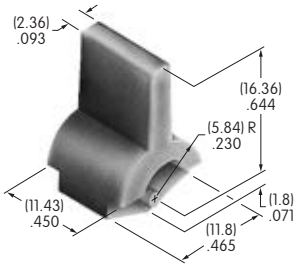
Colors Available:
A, B, C, E, F, G, H



G **AT4151 .450" (11.43mm) Wide Paddle**

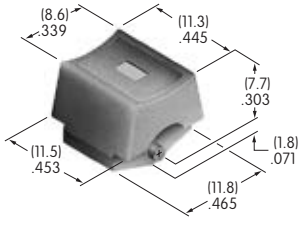
Material: Polyamide
Finish: Matte

Colors Available:
A, B, C, E, F, G, H



S **AT466 .453" (11.5mm) False Illuminated Rocker**

	Rocker	False Illuminator
Material:	Polycarbonate	Acrylonitrile Butadiene Styrene
Finish:	Glossy	
Colors:	Black	White and Red



When a bezel is selected with AT466, glossy polycarbonate AT207 is supplied.

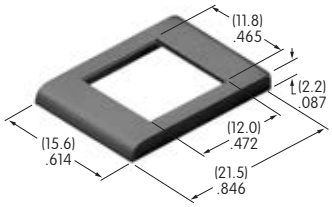
Cap Colors Available: A Black, B White, C Red, E Yellow, F Green, G Blue, H Gray

OPTIONAL SNAP-IN BEZELS & BEZEL COLORS

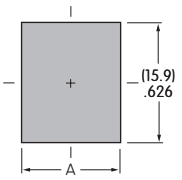
1 AT2107 Bezel

Material: Polyamide

Finish: Matte



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



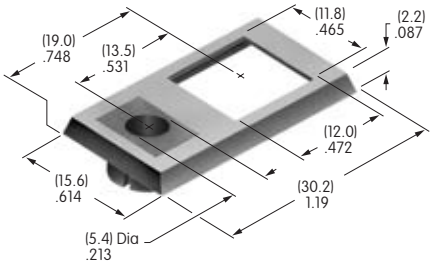
	Single Pole	Double Pole
A	(12.5)mm .492″	(13.1)mm .516″

2 AT208 Bezel for AT070 LED

Material: Polycarbonate

Finish: Glossy

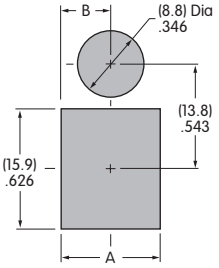
Contact factory for matte finish.



A Black

LED colors & specifications on next page.

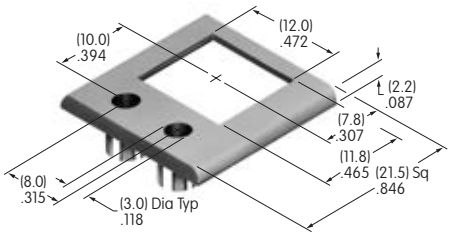
	Single Pole	Double Pole
A	(12.5)mm .492″	(13.1)mm .516″
B	(6.25)mm .246″	(6.55)mm .258″



3 AT212 Bezel for AT617 LED

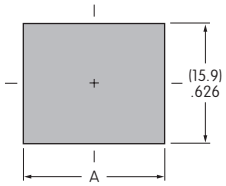
Material: Polycarbonate

Finish: Semi-glossy



A Black

LED colors & specifications on next page.

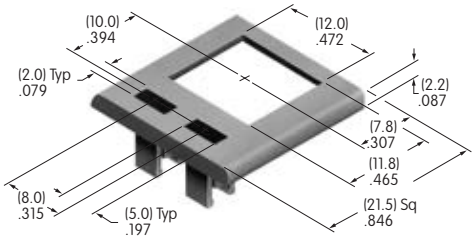


	Single Pole	Double Pole
A	(18.4)mm .724″	(18.7)mm .736″

4 AT213 Bezel for AT618 LED

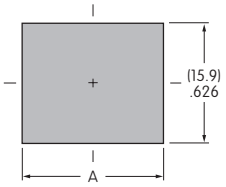
Material: Polycarbonate

Finish: Semi-glossy



A Black

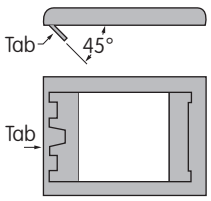
LED colors & specifications on next page.



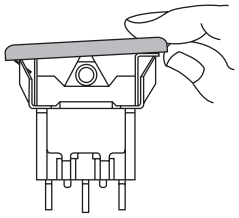
	Single Pole	Double Pole
A	(18.4)mm .724″	(18.7)mm .736″

Bezel Assembly

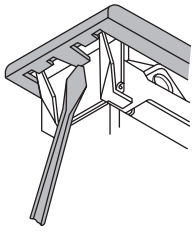
1. Pry out tab on bezel to a 45° angle.



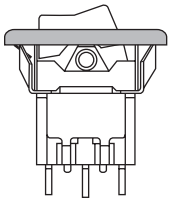
2. Insert switch frame under tab and snap on bezel.



3. Push tab back into place.



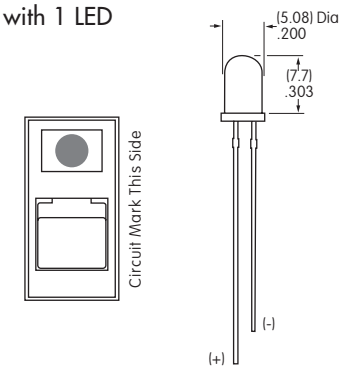
4. Snap assembled bezel and switch into panel.



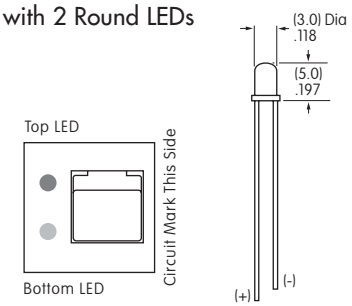
LED COLORS & SPECIFICATIONS

Bezel Orientation on Switch

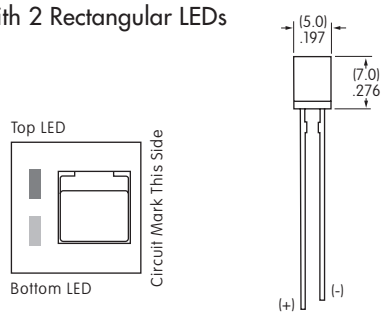
AT070 LED
For Bezel AT208
with 1 LED



AT617 LED
For Bezel AT212
with 2 Round LEDs



AT618 LED
For Bezel AT213
with 2 Rectangular LEDs



Note: Lead lengths may differ from manufacturing lot to lot. The longer lead is the anode (+).

		AT070		AT617			AT618		
(+) (-)		C	F	C	E	F	C	E	F
	Color	Red	Green	Red	Yellow	Green	Red	Yellow	Green
Maximum Forward Current	I_{FM}	25mA	50mA	30mA	30mA	25mA	25mA	30mA	25mA
Typical Forward Current	I_F	20mA	30mA	20mA	20mA	20mA	20mA	20mA	20mA
Forward Voltage	V_F	2.8V	2.1V	2.0V	2.1V	2.25V	2.25V	2.1V	2.2V
Maximum Reverse Voltage	V_{RM}	4V	5V	5V	5V	5V	5V	5V	5V
Current Reduction Rate Above 25°C	ΔI_F	0.33 mA/°C	0.40 mA/°C	0.40 mA/°C	0.40 mA/°C	0.33 mA/°C	0.33 mA/°C	0.40 mA/°C	0.33 mA/°C
Ambient Temperature Range (when used with a bezel)		−10° ~ +70°C		−15° ~ +70°C			−25° ~ +70°C		

The electrical specifications shown are determined at a basic temperature of 25°C.
LED circuit is independent of switch operation. LED is colored in OFF state.

If the source voltage is greater than the rated voltage of the LED, a ballast resistor must be connected in series with the lamp.
The ballast resistor calculation and more lamp detail are shown in the Supplement section.

LEGENDS

NKK Switches can provide custom legends for caps. Contact factory for more information.

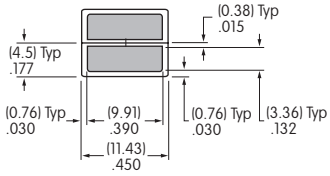
Suggested Printable Area for Cap

Recommended Print Method:

Pad Print

Epoxy based ink is recommended.

AT4150

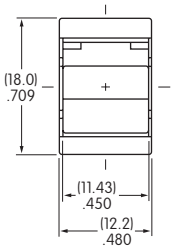


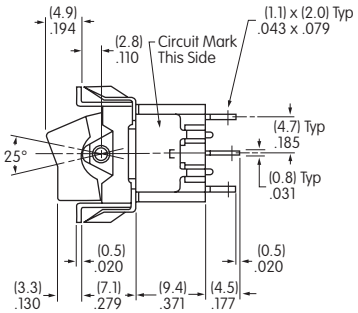
Shaded areas are printable areas.

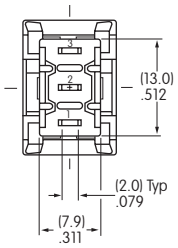
TYPICAL SWITCH DIMENSIONS

Snap-in Frame • Solder Lug

Single Pole



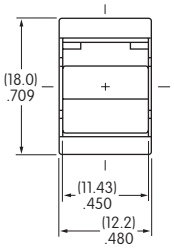


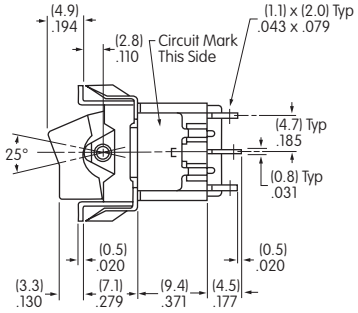


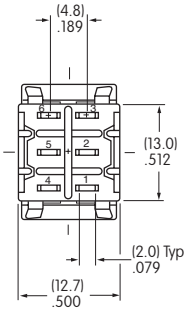
M2012TJW01-FC

Snap-in Frame • Solder Lug

Double Pole



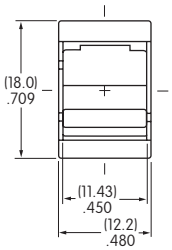


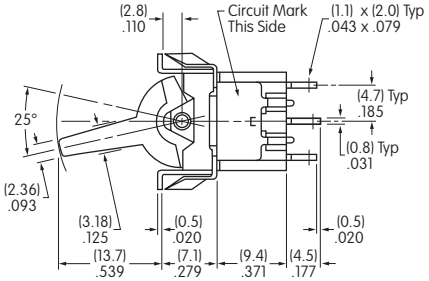


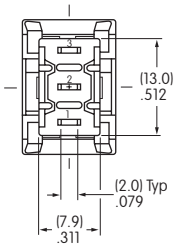
M2022TJW01-FC

Snap-in Frame • Solder Lug

Single Pole



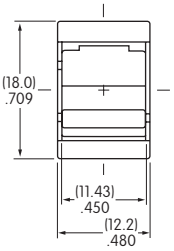


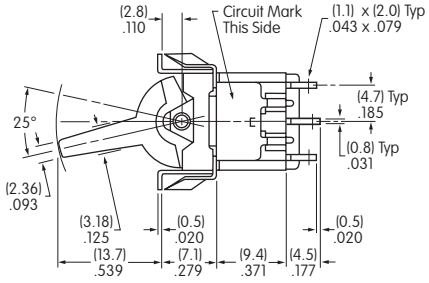


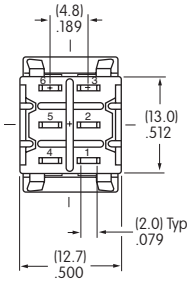
M2012TJW01-GC

Snap-in Frame • Solder Lug

Double Pole



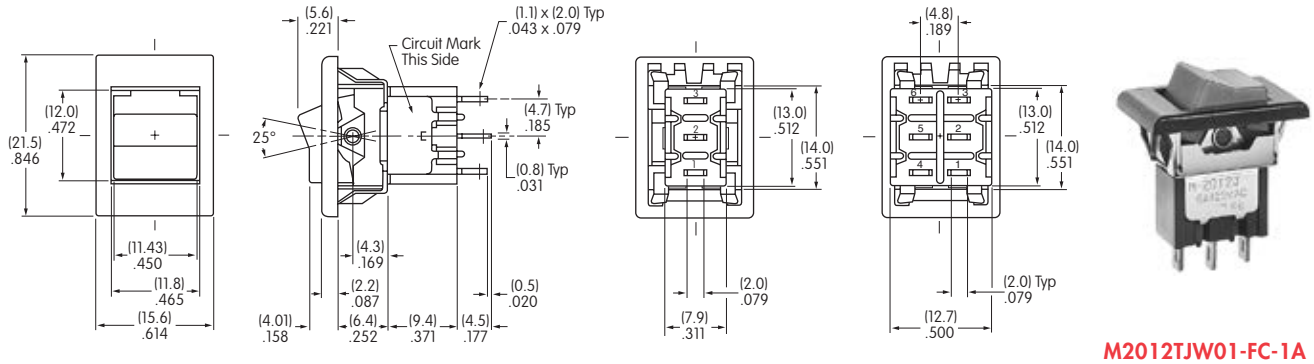




M2022TJW01-GC

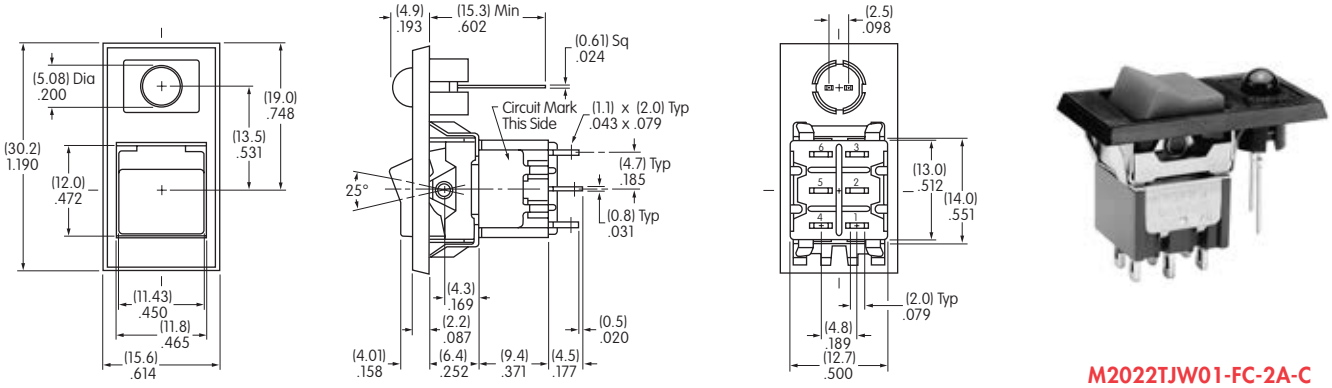
TYPICAL SWITCH DIMENSIONS

Single & Double Pole — Snap-in Frame • AT2107 Bezel • Solder Lug



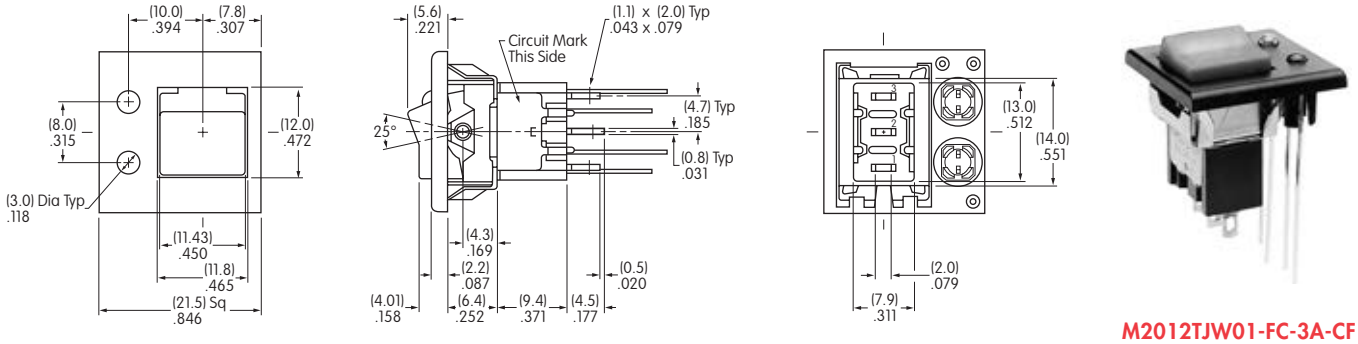
M2012TJW01-FC-1A

Double Pole — Snap-in Frame • AT208 Bezel • Solder Lug



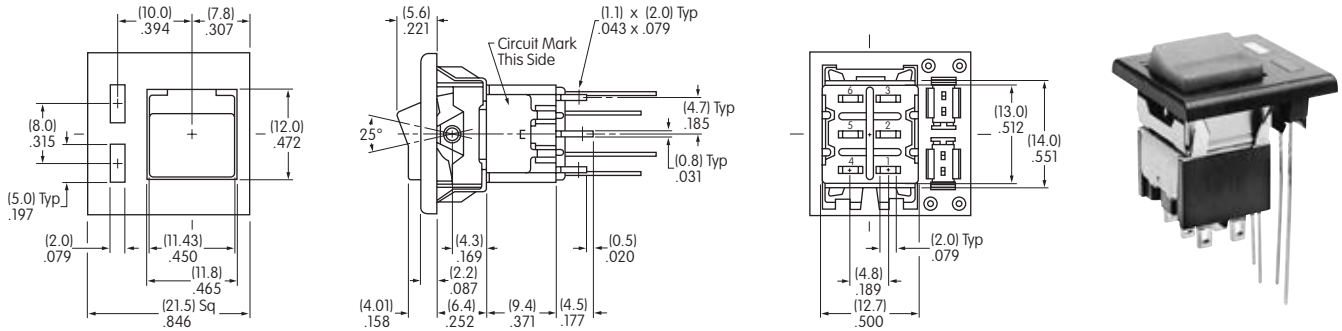
M2022TJW01-FC-2A-C

Single Pole — Snap-in Frame • AT212 Bezel • Solder Lug



M2012TJW01-FC-3A-CF

Double Pole — Snap-in Frame • AT213 Bezel • Solder Lug



M2022TJW01-FC-4A-CF

TYPICAL SWITCH

M20 1 3 TX G

Poles

1	SPDT
2	DPDT SP3T
3	3PDT (used only with terminal codes 30 & 41 & frame code TX)
4	4PDT DP3T (used only with terminal code 41 & frame code TX)

Mounting Frames

TX	Narrow Frame for Small Actuator
TZ	Wide Frame for Large Actuator

Circuits

2	ON	NONE	ON
3	ON	OFF	ON
5	ON	NONE	(ON)
8	(ON)	OFF	(ON)
9	ON	OFF	(ON)
*4	ON	ON	ON
*6	(ON)	ON	(ON)
*7	ON	ON	(ON)

( ) = Momentary

* 3-ON circuits

Contact Materials & Ratings

W	Silver; Rated 6A @ 125V AC & 3A @ 250V AC
G	Gold; Rated 0.4VA max @ 28V AC/DC max
A	Gold over Silver; Rated 6A @ 125V AC & 0.4VA max @ 28V AC/DC max

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

M2013TXG41-DC

ORDERING EXAMPLE

41 — D C

Terminals For TX & TZ Frames

Straight PC with Bracket (1-2 Pole only)	
13	.250″ (6.35mm) Straight PC with .465″ (11.8mm) Bracket
15	.425″ (10.8mm) Straight PC with .630″ (16.0mm) Bracket
17	.964″ (24.5mm) Straight PC with 1.150″ (29.2mm) Bracket
Straight PC with Reinforced Bracket (1-2 Pole only)	
23	.250″ (6.35mm) Straight PC with .465″ (11.8mm) Bracket
25	.425″ (10.8mm) Straight PC with .630″ (16.0mm) Bracket
26	.750″ (19.05mm) Straight PC with .953″ (24.2mm) Bracket

Terminals For TX Frame Only

Right Angle PC with Support (1-3 Pole only)	
30	.150″ (3.81mm) Right Angle PC
Vertical PC with Support (1-4 Pole)	
41	.150″ (3.81mm) Vertical PC

Rockers & Paddles

Small Actuators (TX Frame)	
D	.365″ (9.27mm) Wide Rocker
E	.365″ (9.27mm) Wide Paddle
F	.450″ (11.43mm) Wide Rocker
G	.450″ (11.43mm) Wide Paddle
Large Actuators (TZ Frame)	
J	.595″ (15.11mm) Wide Rocker
H	.595″ (15.11mm) Wide Paddle

Rocker & Paddle Colors

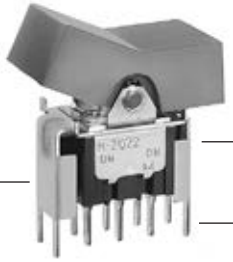
A	Black
B	White
C	Red
E	Yellow
F	Green
G	Blue
H	Gray

IMPORTANT:

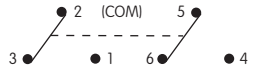
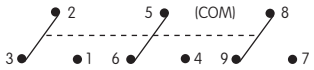
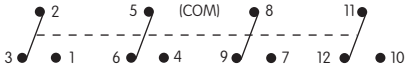
Switches are supplied without UL & CSA marking unless specified. **UL & CSA recognized only when ordered with marking on the switch.** Specific models, ratings and ordering instructions are noted on the General Specifications page.

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

M2022TZG23-JC

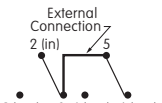
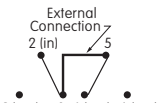
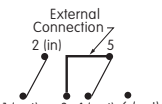
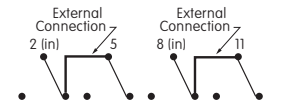
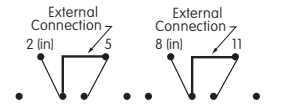
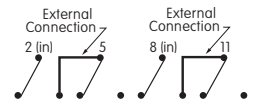


POLES & CIRCUITS

		Rocker Position ( ) = Momentary			Connected Terminals			Throw & Schematics
Pole	Model	Down	Center	Up	Down	Center	Up	Note: Terminal numbers are not actually on the switch. * Reverse circuits available for vertical mount SP & DP upon request.
SP	**M2012** **M2013** ***M2015** **M2018** ***M2019**	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3	OPEN	2-1	SPDT 
DP	**M2022** **M2023** ***M2025** **M2028** ***M2029**	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3 5-6	OPEN	2-1 5-4	DPDT 
3P	**M2022** **M2023** ***M2025** **M2028** ***M2029**	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3 5-6 8-9	OPEN	2-1 5-4 8-7	3PDT 
4P	**M2042** **M2043** ***M2045** **M2048** ***M2049**	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3 5-6 8-9 11-12	OPEN	2-1 5-4 8-7 11-10	4PDT 

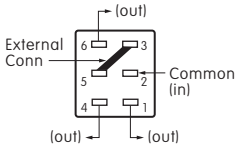
For 3 Throw (3-On)

Connected Terminals & Schematics

Pole	Model	Down	Center	Up	Down	Center	Up
SP	**M2024** **M2026** **M2027**	ON (ON) ON	ON ON ON	ON (ON) (ON)	 2-3 5-6	 2-3 5-4	 2-1 5-4
DP	**M2044** **M2046** **M2047**	ON (ON) ON	ON ON ON	ON (ON) (ON)	 2-3 5-6 8-9 11-12	 2-3 5-4 8-9 11-10	 2-1 5-4 8-7 11-10

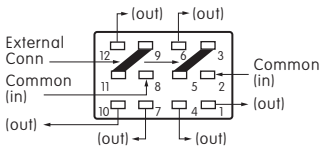
The SP3T model utilizes a double pole base.

External connection must be made during field installation.



The DP3T model utilizes a four pole base.

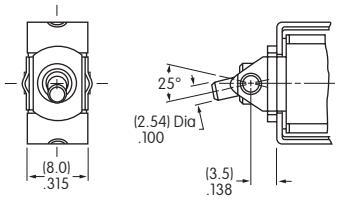
External connection must be made during field installation.



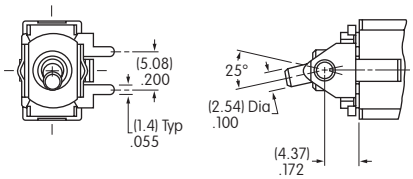
MOUNTING FRAMES

TX **Narrow Mounting Frame for Small Actuators with Straight PC Terminals (codes 13, 15, 17, 23, 25, & 26) or with Angle PC Terminals (codes 30 & 41)**

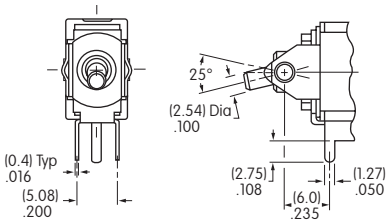
Straight PC Mounting



Right Angle PC Mounting

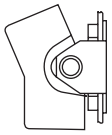


Vertical PC Mounting

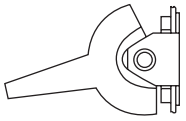


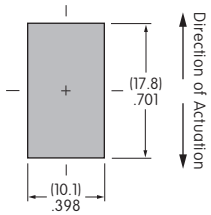
Small Actuators & Panel Cutouts for TX Frame (actuator details on the following pages)

AT4148

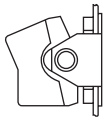


AT4149

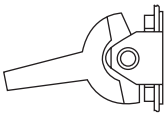


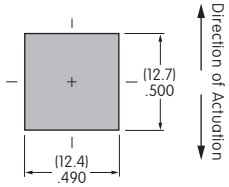


AT4150

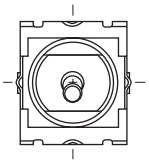


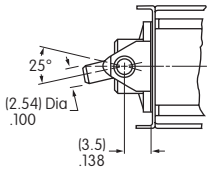
AT4151





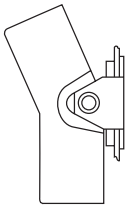
TZ **Wide Mounting Frame for Large Actuators with Straight PC Terminals (codes 13, 15, 17, 23, 25, & 26)**



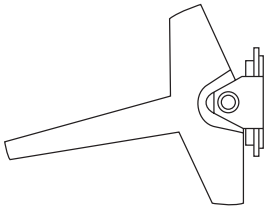


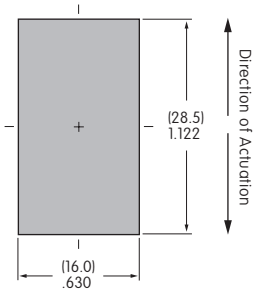
Large Actuators & Panel Cutouts for TZ Frame (actuator details on the following pages)

AT4156



AT4157





CONTACT MATERIALS & RATINGS

W	**Silver over Silver**	**Power Level**	**6A @ 125V AC & 3A @ 250V AC**
G	**Gold over Brass or Copper**	**Logic Level**	**0.4VA maximum @ 28V AC/DC maximum**

Note: See Supplement section to find complete explanation of operating range.

A	**Gold over Silver**	**Power Level or Logic Level**	**6A @ 125V AC or 0.4VA maximum @ 28V AC/DC maximum**

Note: This dual rated option is suitable when two or more identical switches are used in logic and in power circuits within the same application. See Supplement section to find complete explanation of dual rating and operating range.

TERMINALS

For TX and TZ 1-2 Pole Straight PC Mount with Bracket

13 .250" (6.35mm) Terminal with .465" (11.8mm) Bracket

15 .425" (10.8mm) Terminal with .630" (16.0mm) Bracket

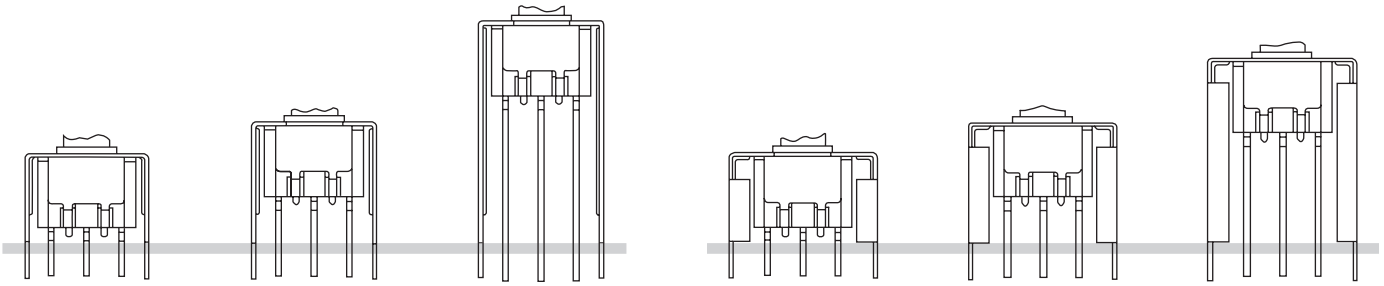
17 .964" (24.5mm) Terminal with 1.150" (29.2mm) Bracket

For TX and TZ 1-2 Pole Straight PC Mount with Reinforced Bracket

23 .250" (6.35mm) Terminal with .465" (11.8mm) Bracket

25 .425" (10.8mm) Terminal with .630" (16.0mm) Bracket

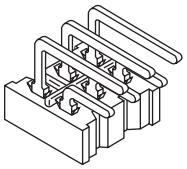
26 .750" (19.05mm) Terminal with .953" (24.2mm) Bracket



PCB footprints are on the following Typical Switch Dimension pages.

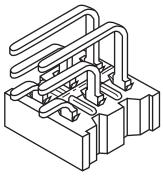
For TX 1-3 Pole Right Angle PC Mount

30 .150" (3.81mm) Right Angle PC



For TX 1-4 Pole Vertical PC Mount

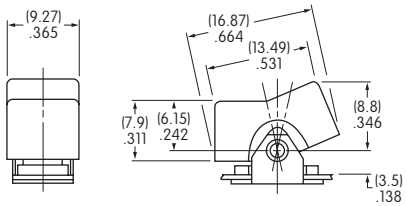
41 .150" (3.81mm) Vertical PC



ROCKERS & PADDLES FOR TX MOUNTING FRAMES

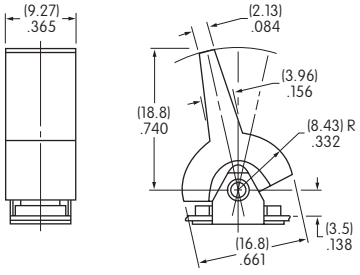
D AT4148 .365" (9.27mm) Wide Rocker

Material: Polyamide
Finish: Matte



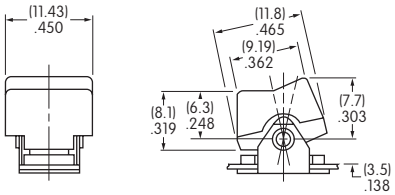
E AT4149 .365" (9.27mm) Wide Paddle

Material: Polyamide
Finish: Matte



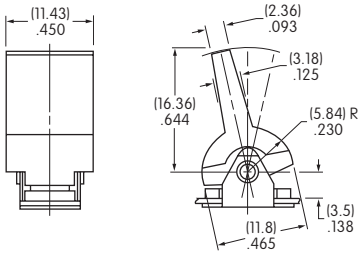
F AT4150 .450" (11.43mm) Wide Rocker

Material: Polyamide
Finish: Matte



G AT4151 .450" (11.43mm) Wide Paddle

Material: Polyamide
Finish: Matte



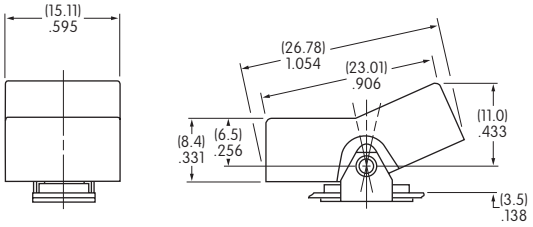
Cap Colors Available:

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

ROCKERS & PADDLES FOR TZ MOUNTING FRAMES

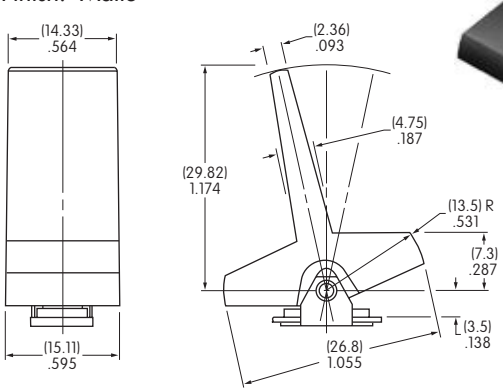
J **AT4156 .595" (15.11mm) Wide Rocker**

Material: Polyamide
Finish: Matte



H **AT4157 .595" (15.11mm) Wide Paddle**

Material: Polyamide
Finish: Matte



Cap Colors Available:

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

OPTIONAL SNAP-IN PANEL FRAMES

Used with AT4148 Rocker and AT4149 Paddle

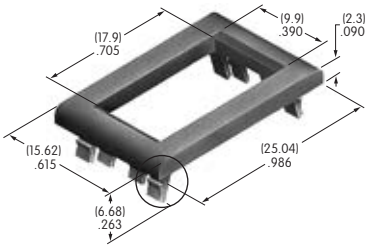
AT064-1
Accommodates .047" ~ .090"
(1.2 ~ 2.3mm) panel thickness

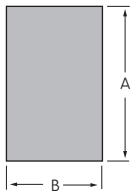
Material: Polyamide
Finish: Matte
Color: Black

Mounted separately from switches

Cutout Tolerances:
Dimension A:
.797" ~ .803" (20.24 ~ 20.4mm)
Dimension B:
.495" ~ .505" (12.57 ~ 12.83mm)

AT064-2
Accommodates .062" ~ .125"
(1.57 ~ 3.18mm) panel thickness





AT064–1 Enlarged Detail

Used with AT4150 Rocker and AT4151 Paddle

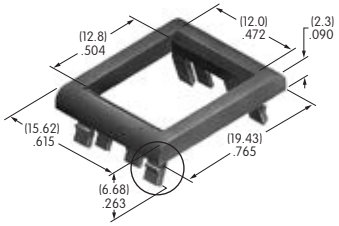
AT065-1
Accommodates .047" ~ .090"
(1.2 ~ 2.3mm) panel thickness

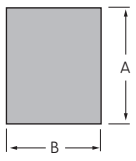
Material: Polyamide
Finish: Matte
Color: Black

Mounted separately from switches

Cutout Tolerances:
Dimension A:
.595" ~ .605" (15.11 ~ 15.37mm)
Dimension B:
.495" ~ .500" (12.57 ~ 12.7mm)

AT065-2
Accommodates .062" ~ .125"
(1.57 ~ 3.18mm) panel thickness



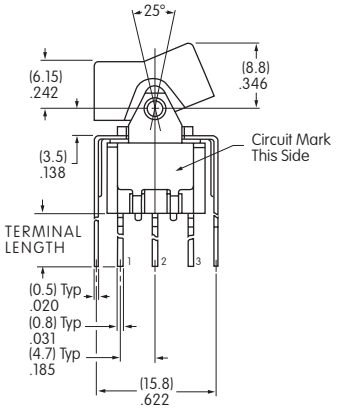


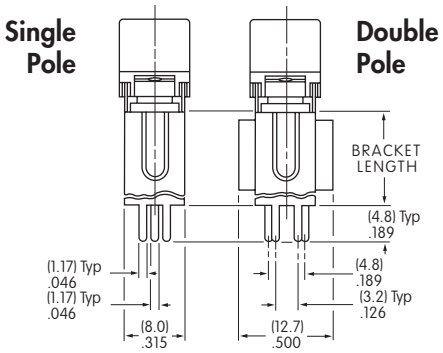
AT065–1 Enlarged Detail AT065–2 Enlarged Detail

TYPICAL SWITCH DIMENSIONS

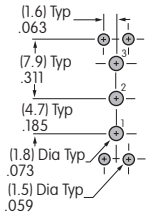
Straight PC • Bracket

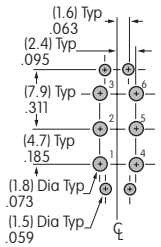
M2012TXG13-DC





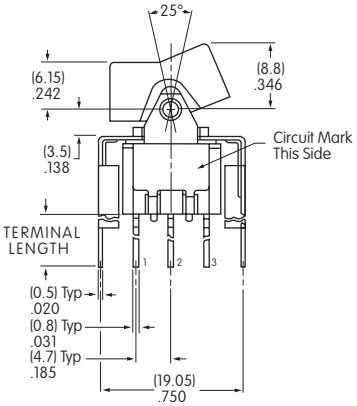
Terminal Code:	Terminal Length:	Bracket Length:
13	.250" (6.35mm)	.465" (11.8mm)
15	.425" (10.8mm)	.630" (16.0mm)
17	.964" (24.5mm)	1.150" (29.2mm)

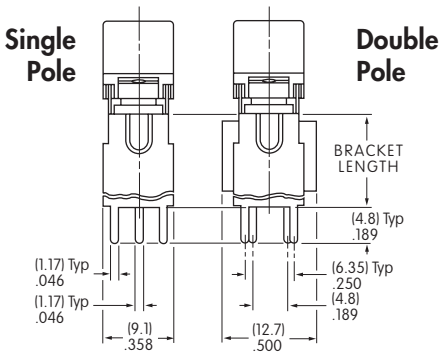




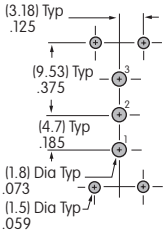
Straight PC • Reinforced Bracket

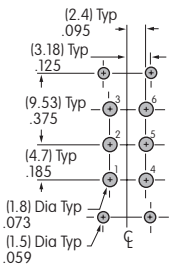
M2012TXG23-DC





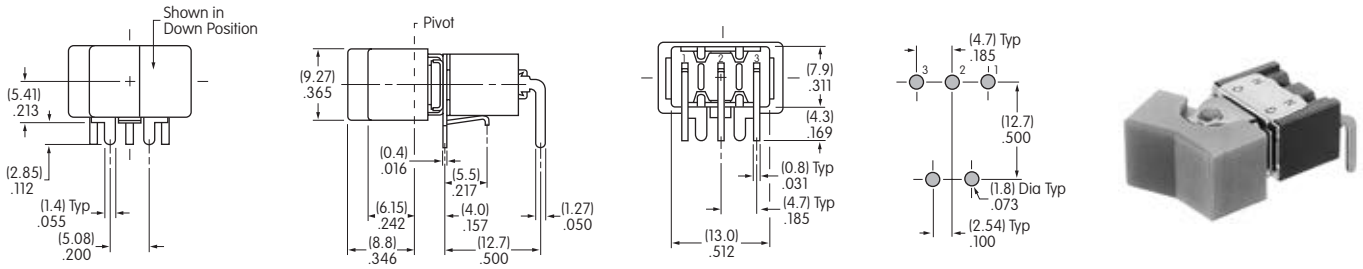
Terminal Code:	Terminal Length:	Bracket Length:
23	.250" (6.35mm)	.465" (11.8mm)
25	.425" (10.8mm)	.630" (16.0mm)
26	.750" (19.05mm)	.953" (24.2mm)





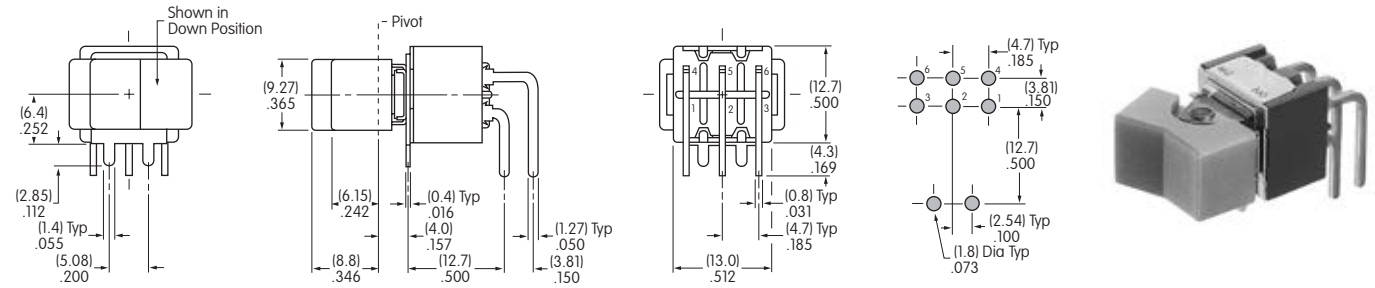
TYPICAL SWITCH DIMENSIONS

Single Pole — .150" (3.81mm) Right Angle PC



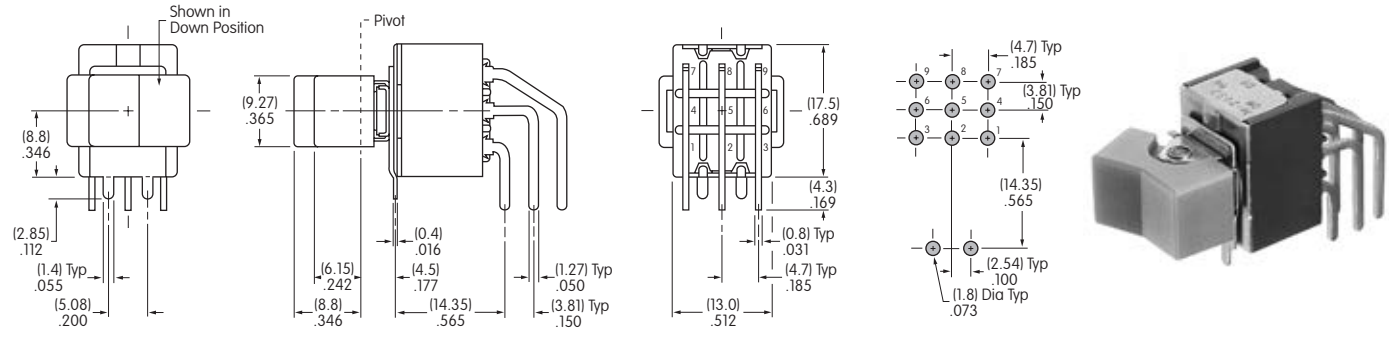
M2012TXG30-DC

Double Pole — .150" (3.81mm) Right Angle PC



M2022TXG30-DC

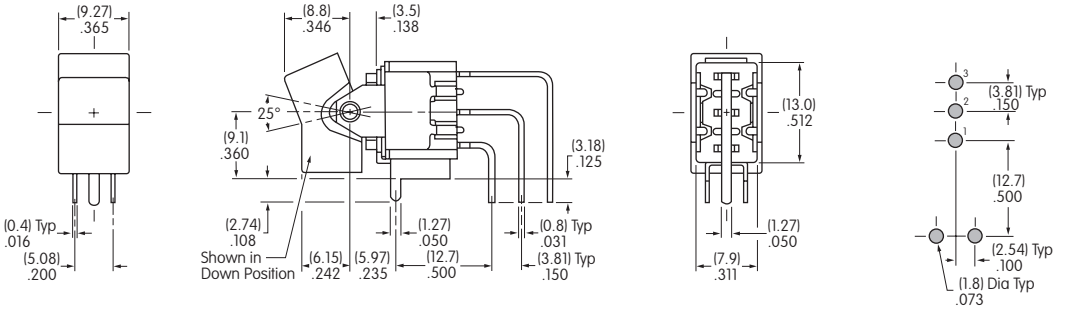
Three Pole — .150" (3.81mm) Right Angle PC



M2032TXG30-DC

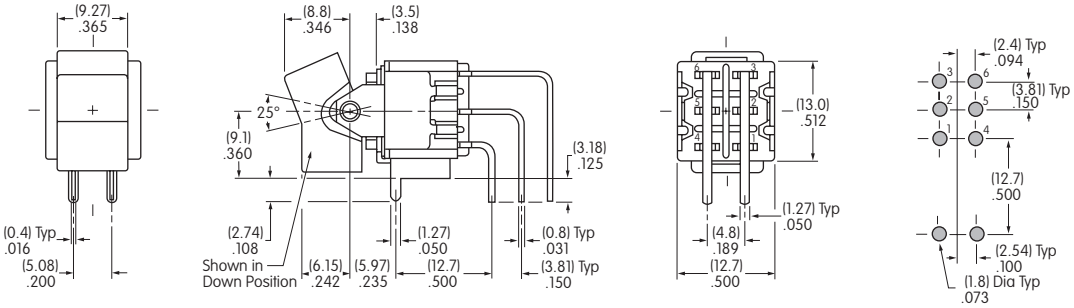
TYPICAL SWITCH DIMENSIONS

.150" (3.81mm) Vertical PC — Single Pole



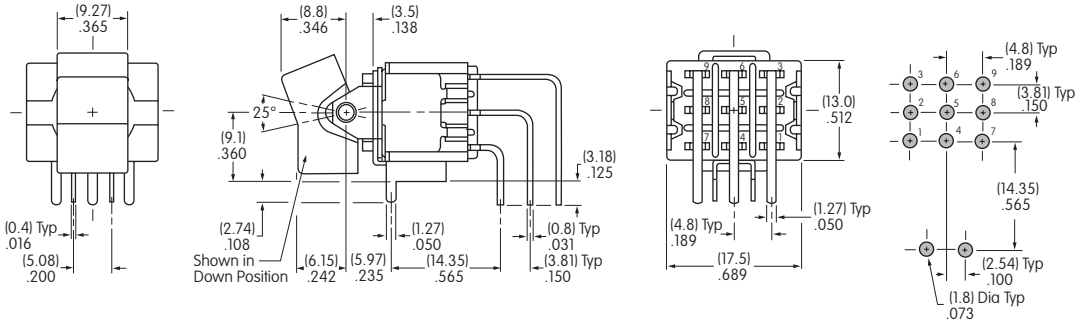
M2012TXG41-DC

.150" (3.81mm) Vertical PC — Double Pole



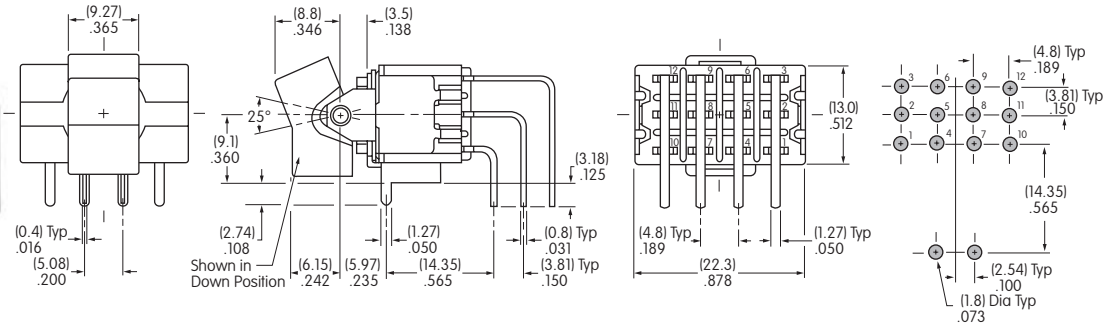
M2022TXG41-DC

.150" (3.81mm) Vertical PC — Three Pole



M2032TXG41-DC

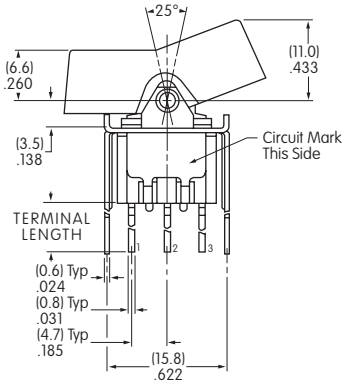
.150" (3.81mm) Vertical PC — Four Pole



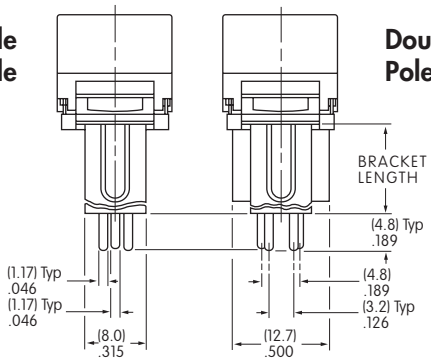
M2042TXG41-DC

TYPICAL SWITCH DIMENSIONS

Straight PC • Bracket

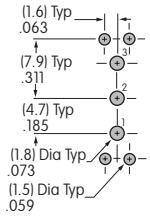


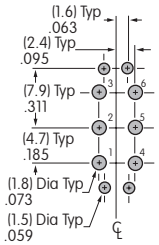
Single Pole



Double Pole

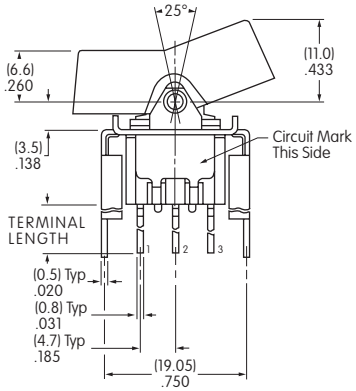
M2012TZG13-JC



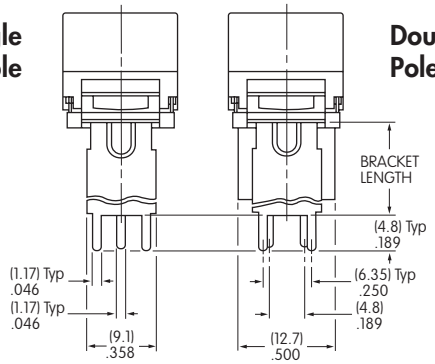


Terminal Code:	Terminal Length:	Bracket Length:
13	.250″ (6.35mm)	.465″ (11.8mm)
15	.425″ (10.8mm)	.630″ (16.0mm)
17	.964″ (24.5mm)	1.150″ (29.2mm)

Straight PC • Reinforced Bracket

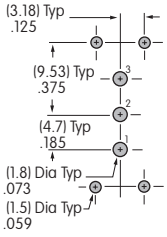


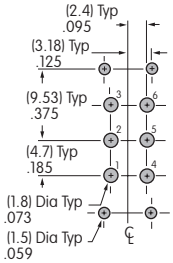
Single Pole



Double Pole

M2012TZG23-JC





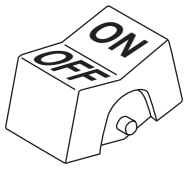
Terminal Code:	Terminal Length:	Bracket Length:
23	.250″ (6.35mm)	.465″ (11.8mm)
25	.425″ (10.8mm)	.630″ (16.0mm)
26	.750″ (19.05mm)	.953″ (24.2mm)

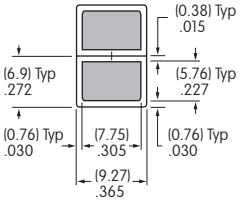
LEGENDS

NKK Switches can provide custom legends for caps. Contact factory for more information.

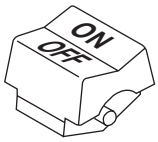
Suggested Printable Area for Cap

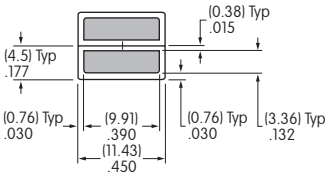
AT4148



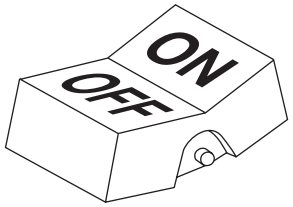


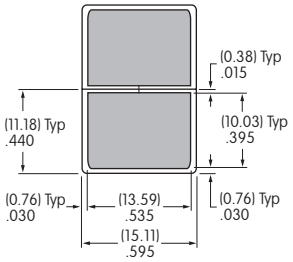
AT4150





AT4156





Shaded areas are printable areas.

Recommended Print Method:

Pad Print

Epoxy based ink is recommended.

TYPICAL SWITCH ORDERING EXAMPLE

M20 | 1 | 2 | TN | W | 01 | — | D | C

Poles

1	SPDT
2	DPDT SP3T
3	3PDT
4	4PDT DP3T

Mounting Frames

TN	.272" (6.9mm) Wide Flat Frame
TY	.504" (12.8mm) Wide Flat Frame

Rockers & Paddles

Small Actuators (TN Frame)

D	.365" (9.27mm) Wide Rocker
E	.365" (9.27mm) Wide Paddle
F	.450" (11.43mm) Wide Rocker
G	.450" (11.43mm) Wide Paddle

Large Actuators (TY Frame)

J	.595" (15.11mm) Wide Rocker
H	.595" (15.11mm) Wide Paddle

Circuits

2	ON	NONE	ON
3	ON	OFF	ON
5	ON	NONE	(ON)
8	(ON)	OFF	(ON)
9	ON	OFF	(ON)
*4	ON	ON	ON
*6	(ON)	ON	(ON)
*7	ON	ON	(ON)

( ) = Momentary

* 3-ON circuits

Contact Materials & Ratings

W	Silver; Rated 6A @ 125V AC & 3A @ 250V AC
G	Gold; Rated 0.4VA max @ 28V AC/DC max
A	Gold over Silver; Rated 6A @ 125V AC & 0.4VA max @ 28V AC/DC max

Terminals

01	Solder Lug
03	.250" (6.35mm) Straight PC

Rocker & Paddle Colors

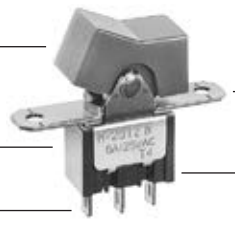
A	Black
B	White
C	Red
E	Yellow
F	Green
G	Blue
H	Gray

IMPORTANT:

Switches are supplied without UL & CSA marking unless specified. **UL & CSA recognized only when ordered with marking on the switch.** Specific models, ratings and ordering instructions are noted on the General Specifications page.

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

M2012TNW01-DC



Red .365" (9.27mm) Wide Rocker

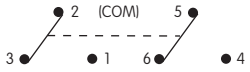
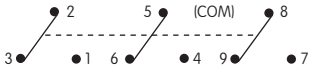
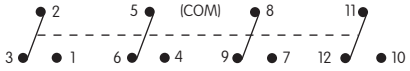
SPDT ON-NONE-ON Circuit

Solder Lug Terminals

.272" (6.9mm) Wide Flat Frame

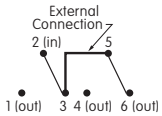
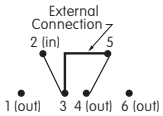
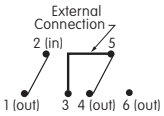
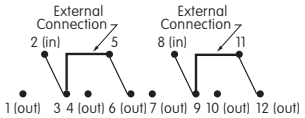
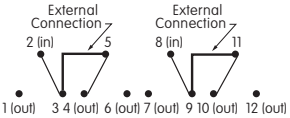
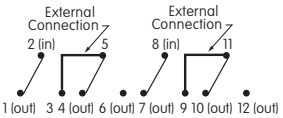
Silver Contacts with 6-Amp Rating

POLES & CIRCUITS

Pole	Model	Rocker Position ( ) = Momentary: Down	Center	Up	Connected Terminals: Down	Center	Up	Throw & Schematics
SP	M2012 M2013 M2015 M2018 M2019	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3	OPEN	2-1	SPDT 
DP	M2022 M2023 M2025 M2028 M2029	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3 5-6	OPEN	2-1 5-4	DPDT 
3P	M2032 M2033 M2035 M2038 M2039	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3 5-6 8-9	OPEN	2-1 5-4 8-7	3PDT 
4P	M2042 M2043 M2045 M2048 M2049	ON ON ON (ON) ON	NONE OFF NONE OFF OFF	ON ON (ON) (ON) (ON)	2-3 5-6 8-9 11-12	OPEN	2-1 5-4 8-7 11-10	4PDT 

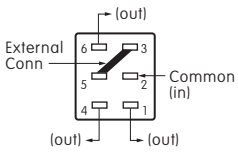
For 3 Throw (3-On)

Connected Terminals & Schematics

Pole	Model	Down	Center	Up	Down	Center	Up
SP	M2024 M2026 M2027	ON (ON) ON	ON ON ON	ON (ON) (ON)	 2-3 5-6	 2-3 5-4	 2-1 5-4
DP	M2044 M2046 M2047	ON (ON) ON	ON ON ON	ON (ON) (ON)	 2-3 5-6 8-9 11-12	 2-3 5-4 8-9 11-10	 2-1 5-4 8-7 11-10

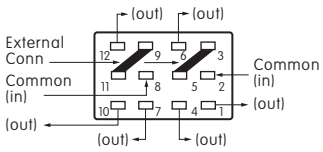
The SP3T model utilizes a double pole base.

External connection must be made during field installation.



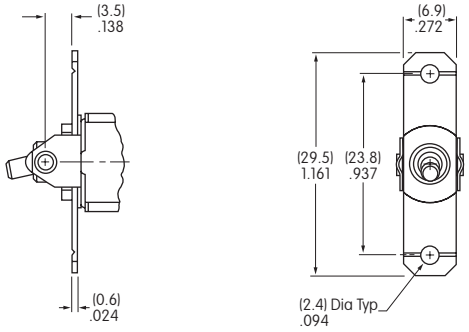
The DP3T model utilizes a four pole base.

External connection must be made during field installation.



MOUNTING FRAMES

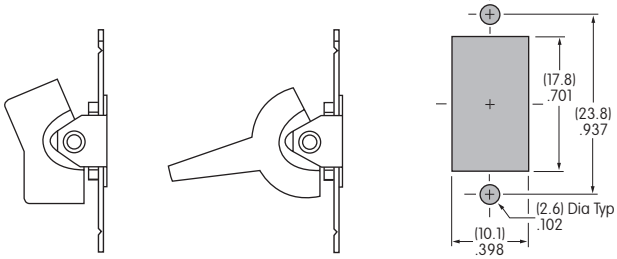
TN **.272" (6.9mm) Wide Flat Frame**



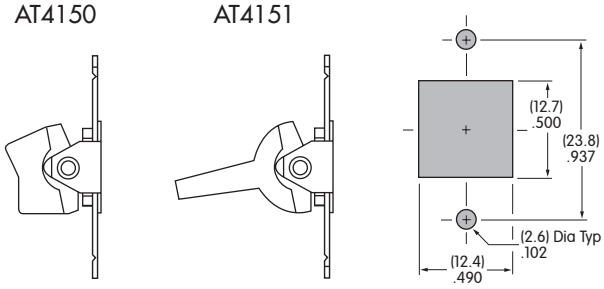
Mounting hardware kit HK-1, as shown on the following page, must be ordered separately.

Small Actuators & Panel Cutouts for TN Frame (actuator details on the following pages)

AT4148 AT4149



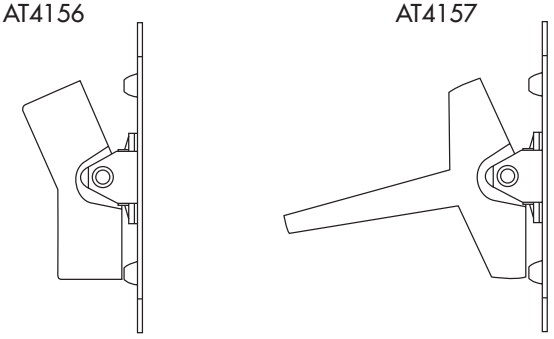
AT4150 AT4151



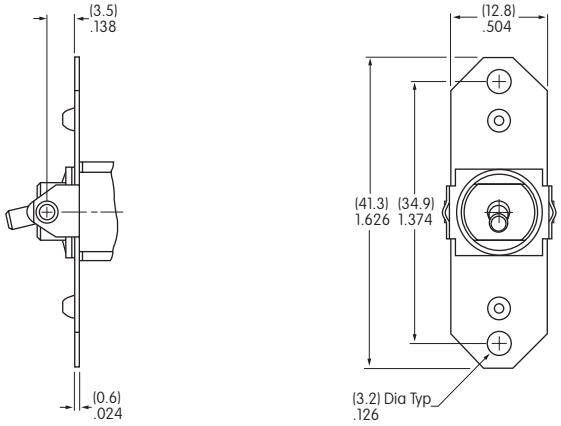
TY **.504" (12.8mm) Wide Flat Frame**

Large Actuators & Panel Cutout for TY Frame (actuator details on the following pages)

AT4156 AT4157

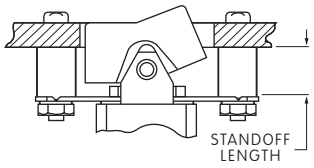


Mounting hardware kit HK-2, as shown on the following page, must be ordered separately.



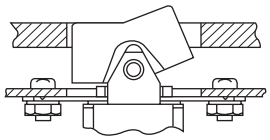
MOUNTING FRAMES (CONTINUED)

Face Panel Mounting



Flat frame devices may also be mounted to the face panel. Standoffs are used to recess the actuator and achieve an attractive front panel appearance.

Subpanel Mounting



These devices are especially designed for subpanel mounting. When installed on a mounting plate behind the panel, hardware is completely concealed and the front panel retains a clean, attractive appearance.

Optional Hardware Kits for Subpanel or Face Panel Mounting			
Frame	Panel Thickness	Standoff Length	Hardware Kit Number
TN Frame	.125" (3.175mm)	.233" (5.918mm)	ATHK-1
TY Frame	.125" (3.175mm)	.312" (7.925mm)	ATHK-2
Hardware kits include: 2 stainless steel screws, 2 hex nuts, 2 lockwashers, & 2 standoffs			

Optional Snap-in Panel Frames

AT064-1
AT064-2

Further details are shown in the previous bracketed PC mount subsection.

AT065-1
AT065-2

CONTACT MATERIALS & RATINGS

W **Silver over Silver** — **Power Level** — **6A @ 125V AC & 3A @ 250V AC**

G **Gold over Brass or Copper** — **Logic Level** — **0.4VA maximum @ 28V AC/DC maximum**

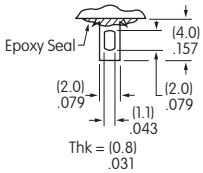
Note: See Supplement section to find complete explanation of operating range.

A **Gold over Silver** — **Power Level or Logic Level** — **6A @ 125V AC or 0.4VA maximum @ 28V AC/DC maximum**

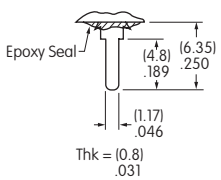
Note: This dual rated option is suitable when two or more identical switches are used in logic and in power circuits within the same application. See Supplement section to find complete explanation of dual rating and operating range.

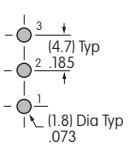
TERMINALS

01 **Solder Lug**

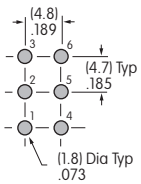


03 **.250" (6.35mm) Straight PC**

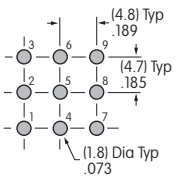




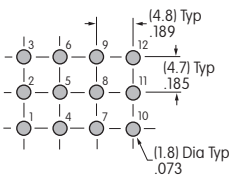
Single Pole



Double Pole



Three Pole



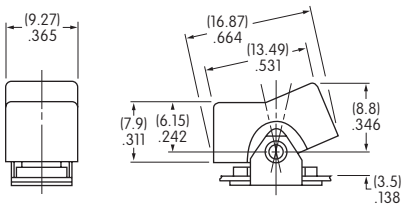
Four Pole

ROCKERS & PADDLES

For TN Frame

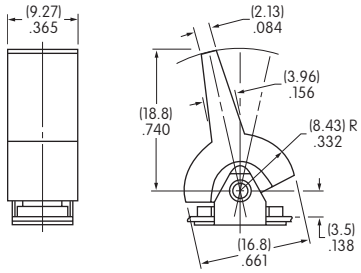
D **AT4148 .365" (9.27mm) Wide Rocker**

Material: Polyamide
Finish: Matte



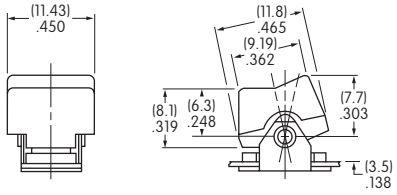
E **AT4149 .365" (9.27mm) Wide Paddle**

Material: Polyamide
Finish: Matte



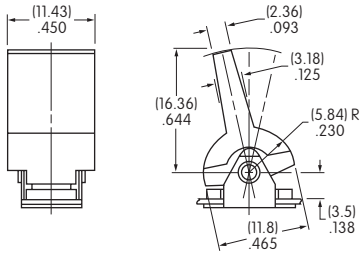
F **AT4150 .450" (11.43mm) Wide Rocker**

Material: Polyamide
Finish: Matte



G **AT4151 .450" (11.43mm) Wide Paddle**

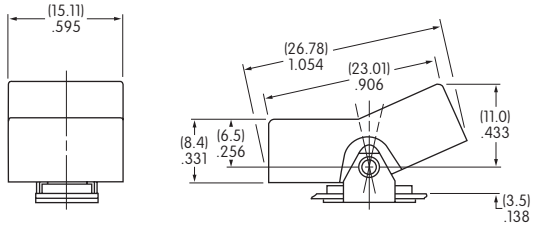
Material: Polyamide
Finish: Matte



For TY Frame

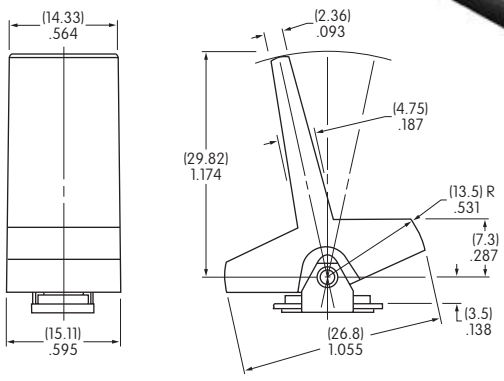
J **AT4156 .595" (15.11mm) Wide Rocker**

Material: Polyamide
Finish: Matte



H **AT4157 .595" (15.11mm) Wide Paddle**

Material: Polyamide
Finish: Matte

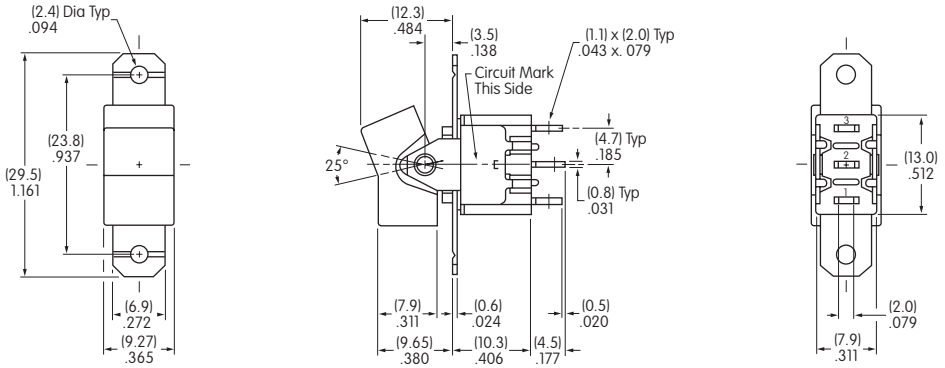


Cap Colors Available: A Black, B White, C Red, E Yellow, F Green, G Blue, H Gray

TYPICAL SWITCH DIMENSIONS

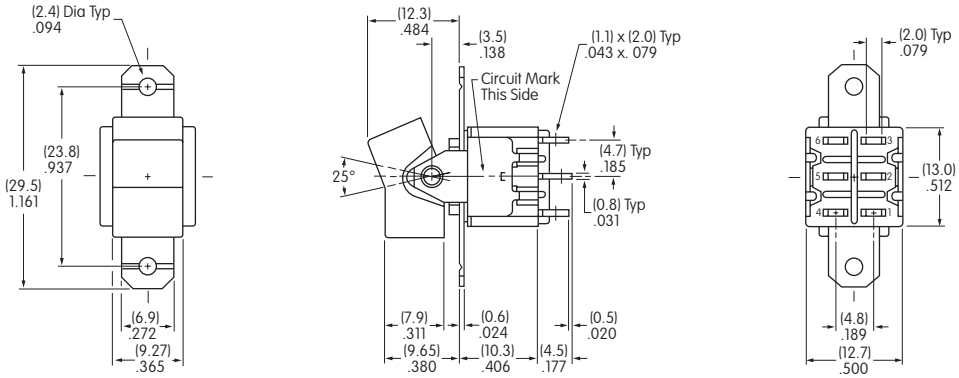
TN Frame • Solder Lug — Single Pole

M2012TNW01-DC



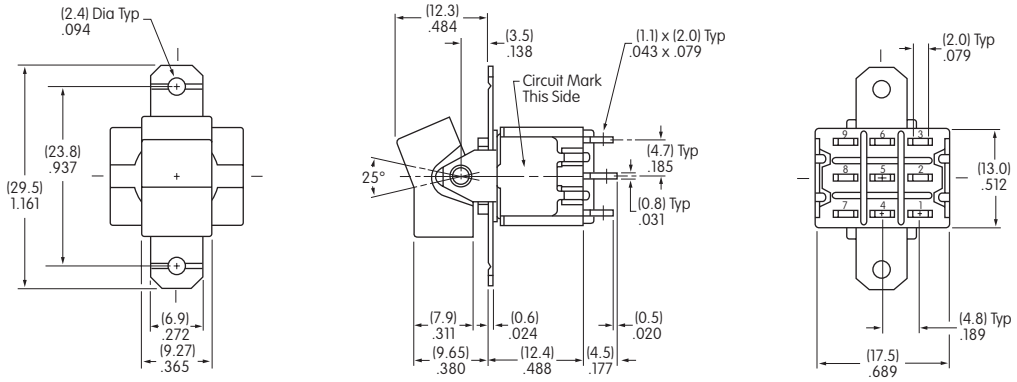
TN Frame • Solder Lug — Double Pole

M2022TNW01-DC



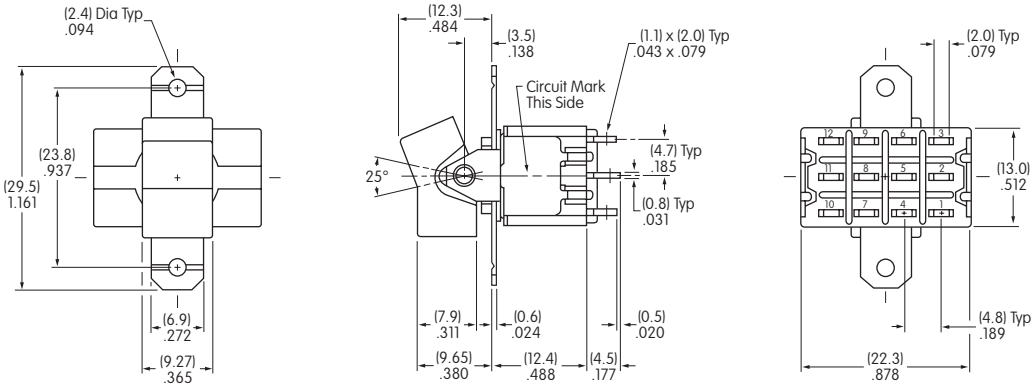
TN Frame • Solder Lug — Three Pole

M2032TNW01-DC



TN Frame • Solder Lug — Four Pole

M2042TNW01-DC

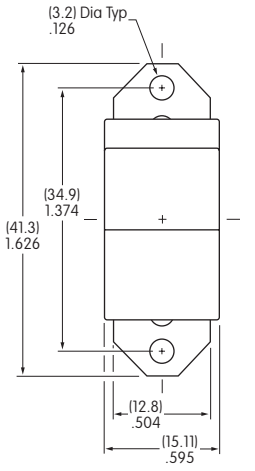


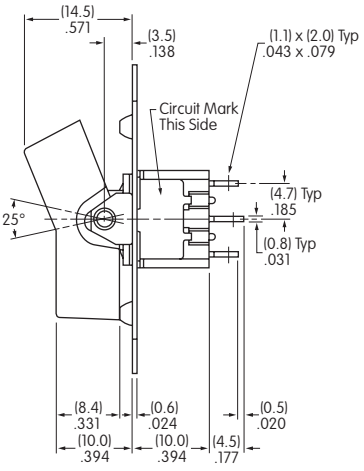
TYPICAL SWITCH DIMENSIONS

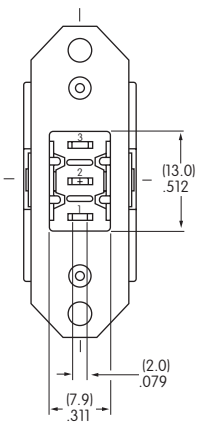
Single Pole

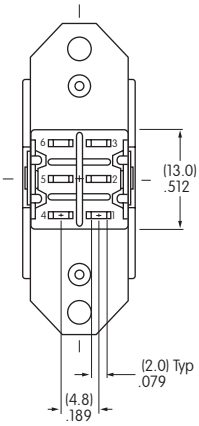
Double Pole

TY Frame • Solder Lug







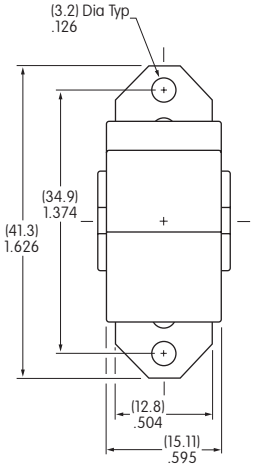


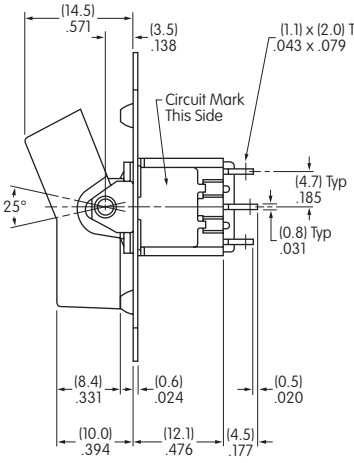
Double pole has barrier between terminals.

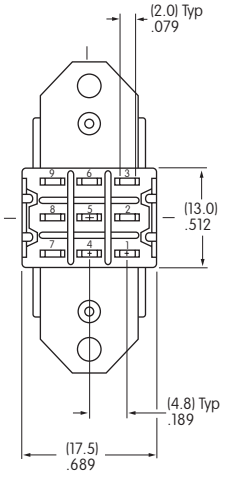
M2012TYW01-JC

Three Pole

TY Frame • Solder Lug



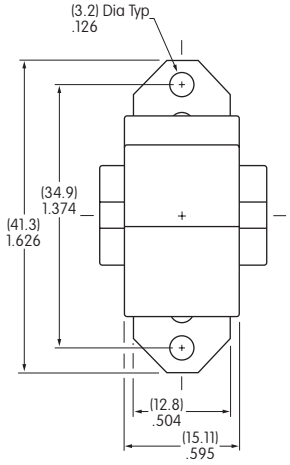


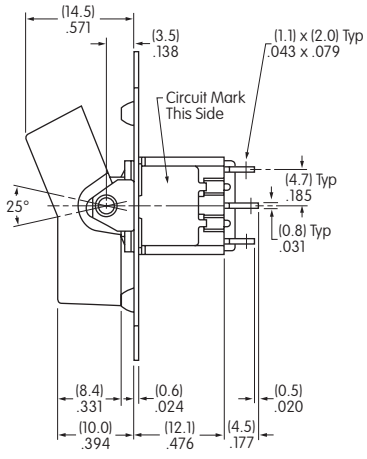


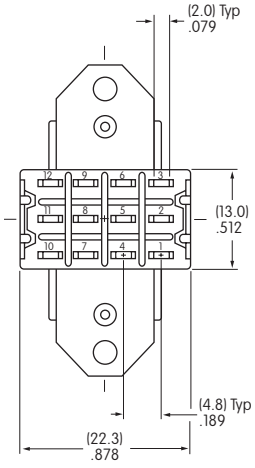
M2032TYW01-JC

Four Pole

TY Frame • Solder Lug







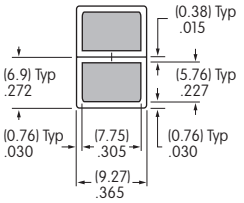
M2042TYW01-JC

LEGENDS

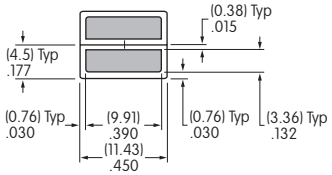
NKK Switches can provide custom legends for caps. Contact factory for more information.

Suggested Printable Area for Caps

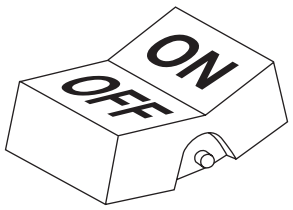
AT4148

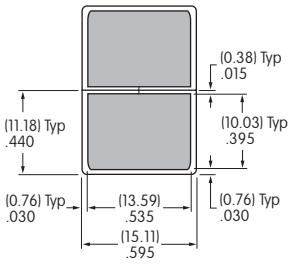


AT4150



AT4156





Shaded areas are printable areas.

Recommended Print Method:

Pad Print

Epoxy based ink is recommended.

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

NKK Switches:

M2012TXG41-DC M2012TXG30-DC M2012TXW15-DH M2012TXW30-FA M2012TZG23-JB M2013TXG30-DA M2018TXG13-DA M2018TXW13-EA M2019TXG30-FA M2022TXG13-DA M2022TXW13-DA M2022TXW13-FA M2022TXW13-GA M2022TXW23/U-DB M2023TXG41-FA M2032TXW30-DA M2012TXW41-FC M2013TXG13-DC M2015TXG23-DA M2018TXG13-DB M2018TXG13-FB M2018TXG41-EC M2018TXW13-FB M2018TXW13/UC M2018TXW13/UC-GA M2018TZW13-JE M2019TXG13-GB M2022TXG13-DC M2022TZW13 M2022TZW13-JB M2022TZW13/UC M2023TXW13-EA M2023TXW13-FA M2024TXW13-EB M2026TXG13-GA M2028TXG13-DC M2028TXG13-FC M2013TXW25-DA M2013TXW25-DF M2013TXW25-DC M2022TXG30-DC M2018TXW13/CUL-GA M2022TXW23-DG M2022TXG30-DB M2029TXG41-DA M2012TZW23/U-JB M2015TZG23-JH M2022TXW41-FA M2032TXG30-DC M2027TXG30-DA M2012TZW23/U-JC M2012TXG13-GA M2015TXG13-EB M2019TXG45-DA M2039TXA41 M2039TXA41-DA M2023TXA13-DH M2023TXG30-FA M2022TXW30-EA M2023TXW13-DH M2012TXW13-GB M2015TXG13-GB M2029TXW30-DC M2029TXW13-DC M2028TXW13-GA M2018TXW13-EE M2018TXW03 M2012TXW30/UC/328-DA M2023TXG13-DB M2025TXW13 M2013TXW41-DA M2012TXW13-DE M2018TXW30 M2022TXG13-DB M2039TXW41-DA M2012TXW45/U M2018TXG41-FA M2015TXW41 M2022TZW24 M2012TXG41-FA M2018TXW26 M2029TXW13-GA M2013TXW30-DA M2012TXG13-GB M2013TXG13-FA M2015TXG23-FH M2018TXG41 M2012TXG23-DB M2022TZW13-JH M2033TXW41 M2012TXW26-DA M2023TZW13-JB M2042TXA41-FA M2027TXW13-DA M2012TXG13/108-FA M2032TXW13 M2012TXW26 M2032TXG30-DA M2012TXW41/CUL M2033TXW13