General Specifications

Electrical Capacity (Resistive Load)

Power Level (silver): 3A @ 125V AC or 2A @ 250V AC
Logic Level (gold): 0.4VA maximum @ 28V AC/DC maximum
(Applicable Range 0.1mA ~ 0.1A @ 20mV ~ 28V)

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 for silver; 50,000 operations minimum for gold
Contact Timing: Nonshorting (break-before-make)
Total Travel: On-None-On circuit .087" (2.2mm); all other circuits .138" (3.5mm)

Materials & Finishes

Actuator: Glass fiber reinforced PBT resin (UL94V-0)
Frame: Stainless steel for terminals 01 & 03; phosphor bronze with tin plating for terminals 13, 30 & 40
Dust Cover: Phosphor bronze with nickel plating
Case: Diallyl phthalate resin (UL94V-0)
Movable Contacts: Silver or Silver alloy (code W); copper or phosohor bronze with gold plating (code G);
or silver alloy with gold plating (code A)
Stationary Contacts: Silver alloy with silver plating (code W); copper or brass with gold plating (code G);
or silver alloy with gold plating (code A)
Terminals: Copper or brass with silver or gold plating

Environmental Data

Operating Temp Range: –30°C through +85°C (–22°F through +185°F)
Humidity: 90 ~ 95% humidity for 240 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: 500m/s^2 acceleration (tested in 6 right angled directions, with 5 shocks in each direction)

Processing

Soldering: Wave Soldering recommended (PC Mount). See Profile A in Supplement section.
Manual Soldering: See Profile A in Supplement section.
Cleaning: These devices are not process sealed. Hand clean locally using alcohol based solution.

Standards & Certifications

Flammability Standards: UL94V-0 rated actuator & case
UL: Contact NKK Switches for UL or CUL marking option requirments.

Distinctive Characteristics

Available in flat frame and bracketed PC mounting types.

Over-center actuator block and plunger design gives crisp actuation with clear indication of circuit status; this design also diminishes sparking and increases operating life.

Guide interlocked with actuator block prevents window locking and maintains correct plunger alignment to assure contact stability.

Antijamming design protects contacts from damage due to excessive downward force on the actuator.

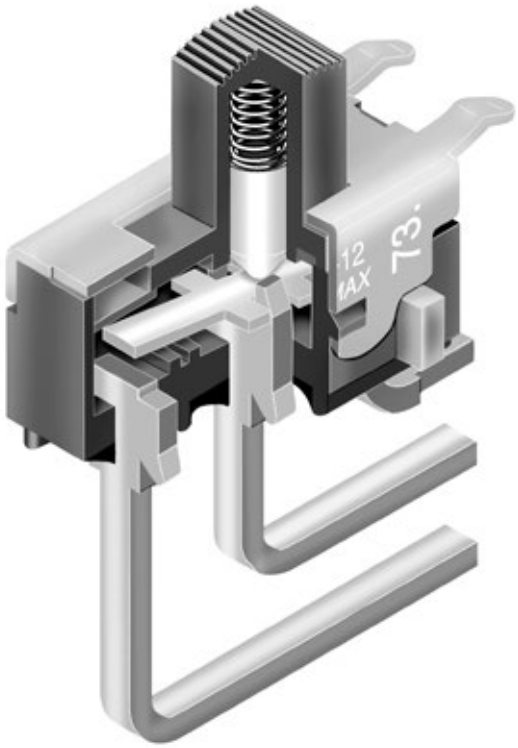
High internal barriers between poles and insulating sheet between case and actuator block give added protection to contacts.

Specially composed silver alloy contacts for power applications or gold contacts for logic level applications give high contact reliability.

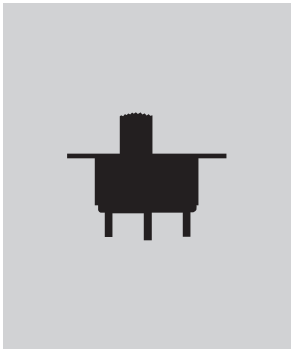
Prominent external insulating barriers increase insulation resistance and dielectric strength.

Epoxy sealed terminals prevent entry of flux, solvents, and other contaminants.

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



Actual Size



TYPICAL SWITCH ORDERING EXAMPLE

M	SN	1	2	A	S	G	30

Poles

1	SPDT
2	DPDT SP3T

Actuators

A	.150" (3.8mm) Wide for Single or Double Pole
B	.323" (8.2mm) Wide for Double Pole

Contact Materials & Ratings

W	Silver; Rated 3A @ 125V AC & 2A @ 250V AC
G	Gold; Rated 0.4VA max. @ 28V AC/DC max.

Circuits

2	ON	NONE	ON
3	ON	OFF	ON
4	ON	ON	ON

NONE = No Position

Mounting

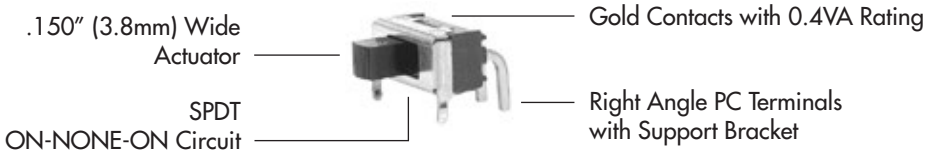
F	Panel Mount (Terminal 01 only)
N	PCB Mount (Terminal 03 only)
S	Bracket Mount (Terminals 13, 30, & 40 only)

Terminals

01	Solder Lug
03	Straight PC
13	Straight with Bracket
30	Right Angle PC
40	Vertical PC

DESCRIPTION FOR TYPICAL ORDERING EXAMPLE

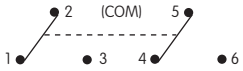
MSN12ASG30



POLES & CIRCUITS

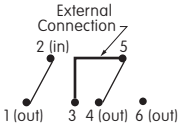
Pole	Model	Slide Position: Left	Slide Position: Center	Slide Position: Right	Connected Terminals: Left	Connected Terminals: Center	Connected Terminals: Right	Throw & Schematics
SP	**MSN12** **MSN13**	ON ON	NONE OFF	ON ON	2-1	OPEN	2-3	SPDT
DP	**MSN22** **MSN23**	ON ON	NONE OFF	ON ON	2-1 5-4	OPEN	2-3 5-6	DPDT

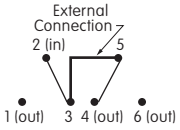
Note: Terminal numbers are not actually on the switch.

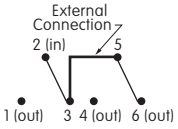


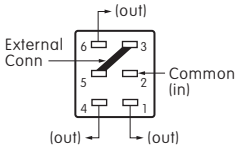
For 3 Throw (3-On)

Pole	Model	Connected Terminals & Schematics: Left	Connected Terminals & Schematics: Center	Connected Terminals & Schematics: Right	External Connection
SP	**MSN24**	ON 2-1 5-4	ON 2-3 5-4	ON 2-3 5-6	**The SP3T model utilizes a double pole base.** External connections must be made during field installation.



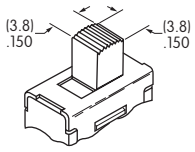




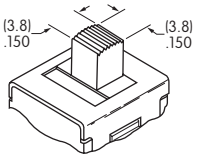


ACTUATORS

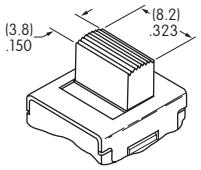
A **.150" (3.8mm) Wide for Single Pole**



.150" (3.8mm) Wide for Double Pole



B **.323" (8.2mm) Wide for Double Pole Only**



CONTACT MATERIALS & RATINGS

W	**Silver**	**Power Level**	**3A @ 125V AC & 2A @ 250V AC**
G	**Gold**	**Logic Level**	**0.4VA maximum @ 28V AC/DC maximum**
	Gold over Silver	**Power Level or Logic Level**	**3A @ 125V AC or 0.4VA maximum @ 28V AC/DC maximum**

Note: Complete explanation of operating range in Supplement section.

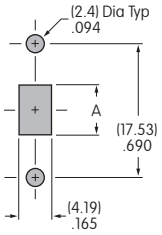
Note: Gold over silver is available as a custom option. This dual rated option is suitable when two or more identical switches are used in logic and in power circuits within the same application. See Supplement section to find complete explanation of dual rating and operating range.

MOUNTING TYPES & TERMINALS

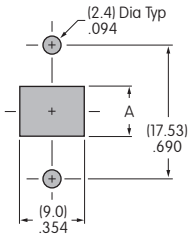
F **Panel Mount (Combines with Solder Lug Terminal 01 only)**

Dimension A =
.268″ (6.8mm) for on-none-on
.319″ (8.1mm) for on-off-on & on-on-on

Maximum Panel Thickness: .197″ (5.0mm)



SP or DP with .150″ (3.8mm) Actuator



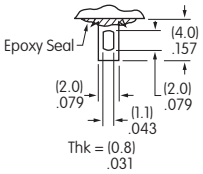
DP only with .323″ (8.2mm) Actuator

N **Straight PC Mount (Combines with Straight PC Terminal 03 only)**

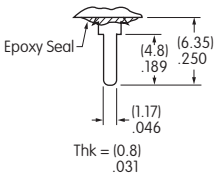
S **Support Bracket Mount (For Terminals 13, 30, & 40)**

Maximum Panel Thickness:
For Straight PC with Bracket Terminal 13: .197″ (5.0mm)
For Angle Mount Terminals 30 & 40: .177″ (4.5mm)

01 **Solder Lug**



03 **Straight PC**



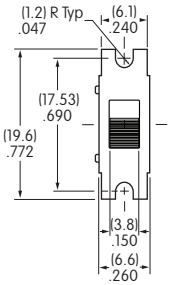
13 **Straight PC with Bracket**

30 **Right Angle PC**

40 **Vertical PC**

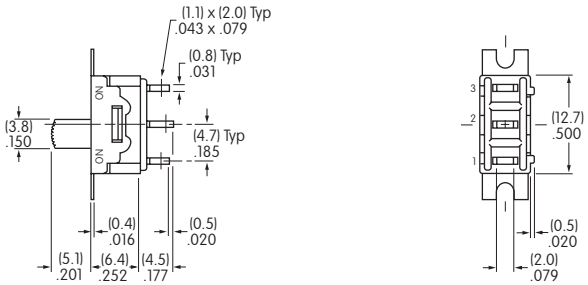
TYPICAL SWITCH DIMENSIONS

Solder Lug Terminals



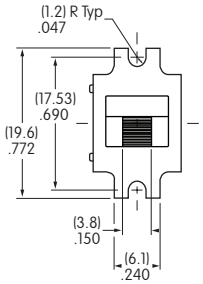
MSN12AFW01

Single Pole



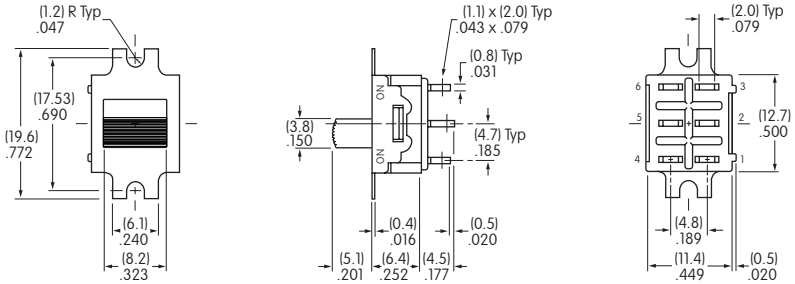
Actuator in LEFT Position

Solder Lug Terminals



MSN22BFW01

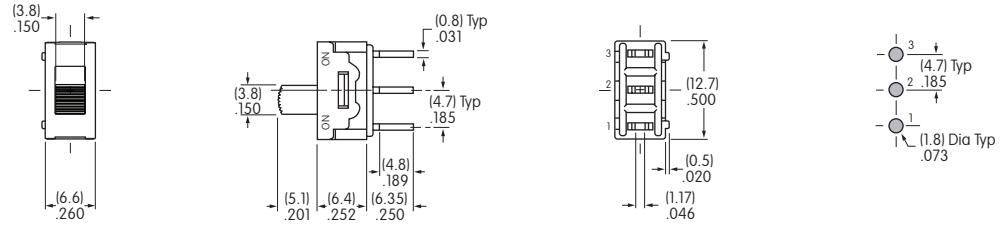
Double Pole



Actuator in LEFT Position

TYPICAL SWITCH DIMENSIONS

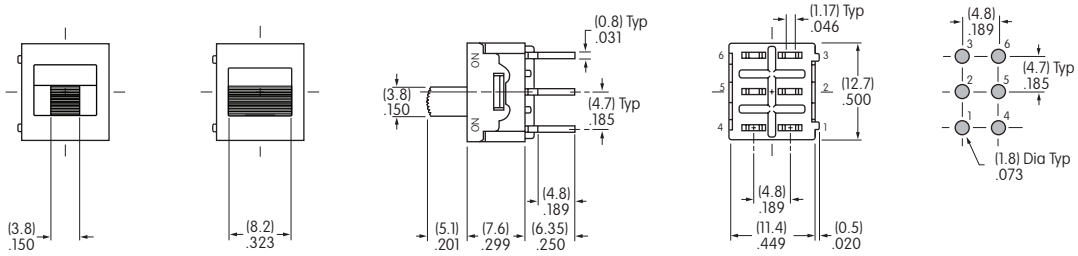
Single Pole — Straight PC Terminals



Actuator in LEFT Position

MSN12ANG03

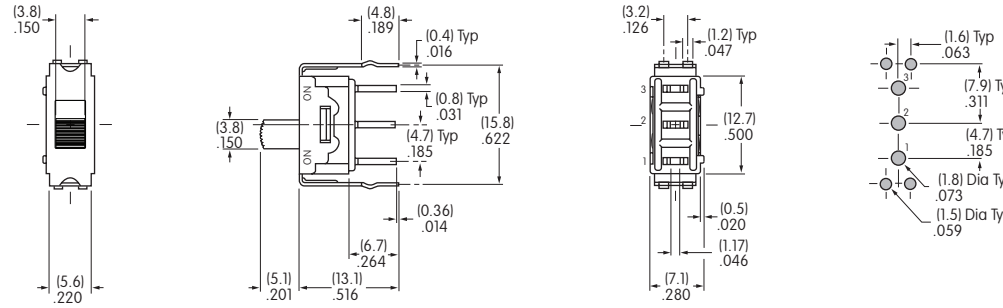
Double Pole — Straight PC Terminals



Actuator in LEFT Position

MSN22BNG03

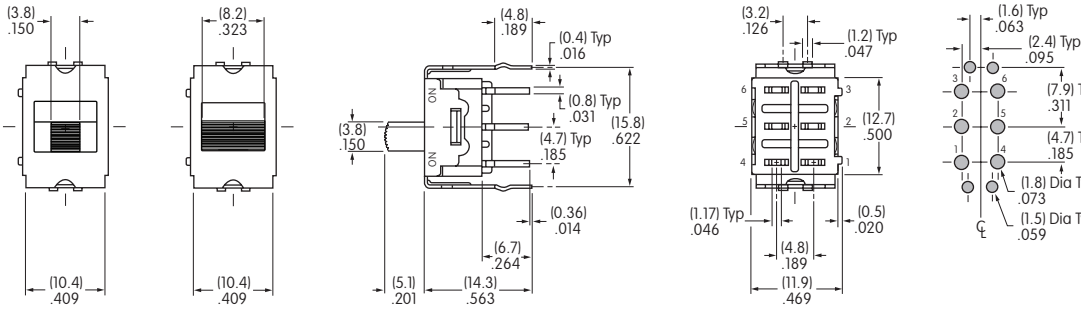
Single Pole — Straight PC Terminals with Bracket



Actuator in LEFT Position

MSN12ASG13

Double Pole — Straight PC Terminals with Bracket

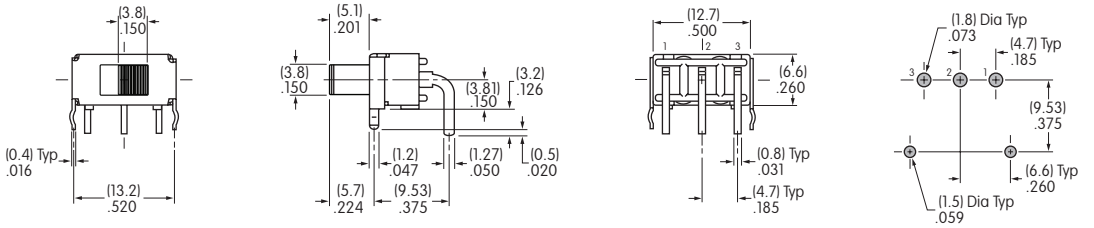


Actuator in LEFT Position

MSN23BSG13

TYPICAL SWITCH DIMENSIONS

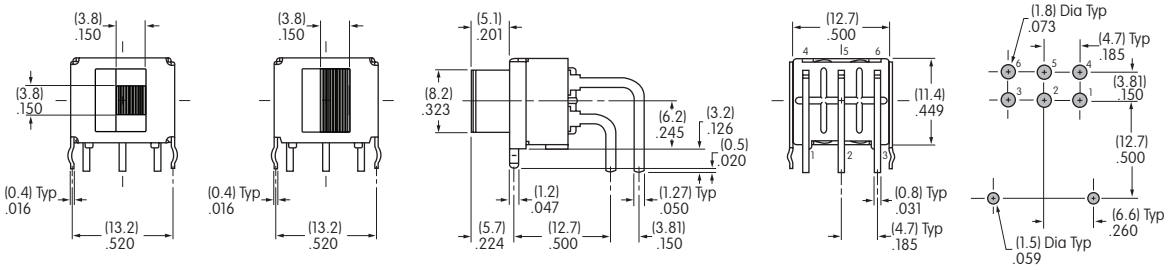
Right Angle PC Terminals — Single Pole



MSN12ASG30

Actuator in LEFT Position

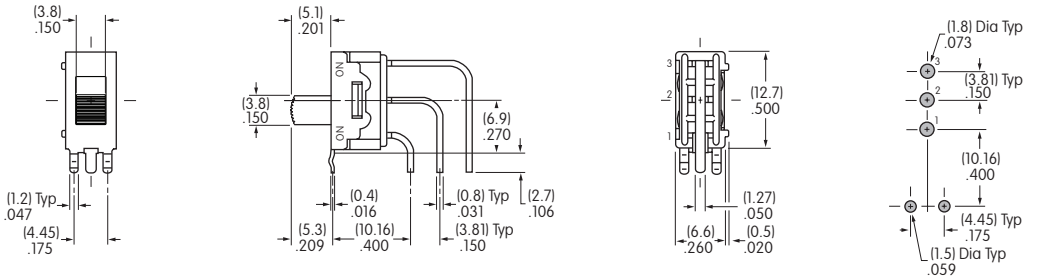
Right Angle PC Terminals — Double Pole



MSN22BSG30

Actuator in LEFT Position

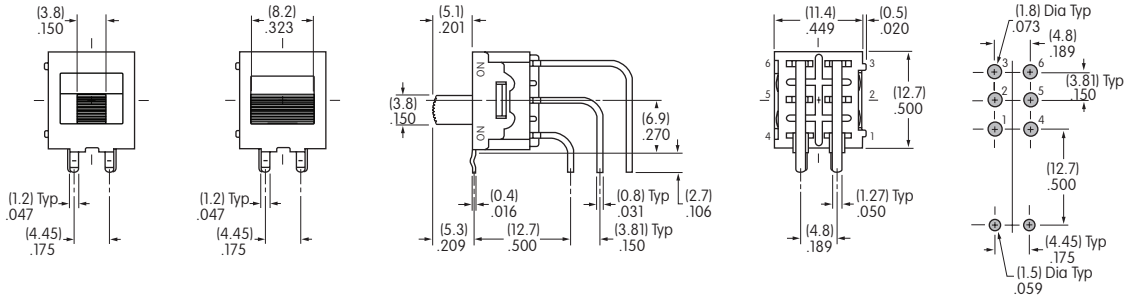
Vertical PC Terminals — Single Pole



MSN12ASG40

Actuator in LEFT Position

Vertical PC Terminals — Double Pole



MSN22BSG40

Actuator in LEFT Position