



DO YOU NEED
A SWITCH?





E-SWITCH®

Questions to ask when specifying a switch

1

WHAT TYPE OF SWITCH ARE YOU LOOKING FOR?

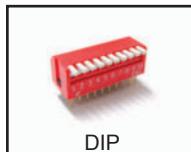
The switch categories below show the different types to choose from.



Anti-vandal



Detector



DIP



Keylock



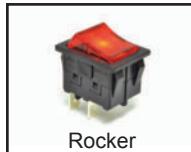
Navigation



Pushbutton



Push-pull



Rocker



Rotary



Slide



Snap-action



Tactile



Tilt



Toggle



Trigger

2

WHAT ELECTRICAL RATINGS ARE NEEDED?

1. Is the product AC or DC?
 - Common Voltages for AC: 125VAC, 250VAC
 - Common Voltages for DC: 3, 6, 12, 24 and 48VDC
2. How many amperes does the switch need to handle?
 - Low Power is in the millamps
 - Medium Power is from 2 amps to 5 amps
 - High Power is greater than 6 amps
3. If you're looking at medium to high power, what agency approvals are needed?
 - Where the product is sold determines what approvals are needed.



(cULus)

North American Agency



(ENEC)

European Agency



(VDE)

German Agency



(TUV)

Worldwide Agency

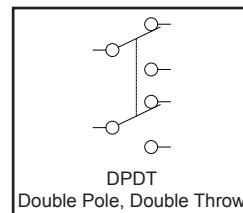
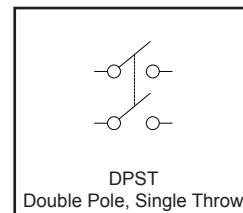
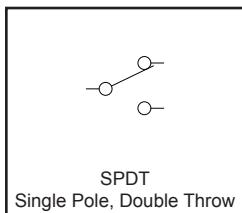
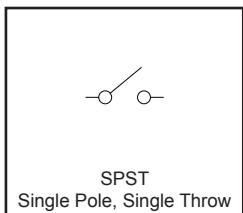
3

HOW MANY POLES AND THROWS DO YOU NEED?

Poles are the number of closed independent circuits.

Throws are the number of positions in which a given pole is closed.

Common pole/throw configurations are:



Basic examples of above configurations are:

SPST - Flashlight: 1 pole for turning the light on or off.

SPDT - Vacuum Cleaner: 1 pole for power, 1 throw for low speed, 1 throw for high speed.

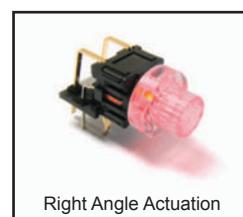
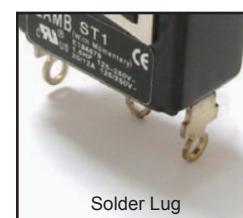
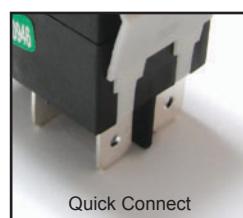
DPST - Air Conditioner: 1 pole controls the chiller, 1 pole controls the fan.

DPDT - Hair Dryer: 1 pole controls the heater, 1 pole controls the fan, 1 throw is for low speed, 1 throw is for high speed.

4

HOW DOES THE SWITCH ATTACH TO YOUR PRODUCT?

1. Panel Mount
 - What is the panel cutout size?
 - What is the thickness of the panel?
 - What type of termination?
 - » Quick connect or solder lug
2. PC Board Mount
 - What type of termination?
 - » Through hole or surface mount
 - What type of actuation?
 - » Right angle or vertical
 - Do you need a process sealed component?



5

WHAT IS YOUR APPLICATION?

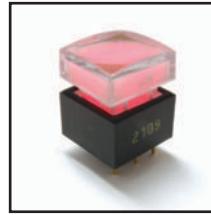
Knowing the application that the switch goes into aids us in the ability to look for unique instances where certain switches work better than others. Below are some examples of industries we sell our switches to.

**6**

ARE THERE ANY ADDITIONAL REQUIREMENTS?

Many products have requirements that are not initially thought of. Some might make the switch more aesthetically pleasing and others will help the switch perform better under special circumstances. Below are examples that should be brought up during discussion:

- Momentary or Latching
- Illumination
- Sealed Protection (IP Rating)
- Custom Cap Options
 - » Colors
 - » Graphics
 - » Styles
- Long Life Expectancy
- High Inrush or Horse Power Rating
- Extreme Temperature Rating
- Custom User Requirements

**7**

WHAT IS THE ESTIMATED ANNUAL USAGE (EAU)?

If you are looking for a custom switch, it is important to know an accurate EAU for your project. Once we know, we are able to determine how feasible certain customizations are. Since unique requirements sometimes incur additional tooling charges, knowing in the beginning will help expedite the process.

CALL NOW!
to talk to an E-Switch engineer
(800) 867-2717
www.e-switch.com

GLOSSARY OF TERMS

Actuator: The mechanical interface between the basic switch contacts and the means of operation, such as the operator's finger.

Actuation Force: The required force to change a circuit's electrical state.

Alternate Action Switch: A Pushbutton style switch where the change of the electrical state is maintained between actuations.

Ampere: A unit of electrical current flow.

Base (Housing): A base of a switch is the main member to which the conducting parts or insulator unit are attached. It may also have parts of the operating or control mechanism attached.

Bounce: Rebounding of moving contact against fixed contact during transfer.

Break: Interruption of a circuit. Double-break occurs when a single mechanism interrupts two contacts simultaneously.

Break Before Make: The term given to a double throw switch where the first circuit is opened before the second circuit is closed.

Capacity: Usually refers to the current handling capability of a switch.

Chatter: Rapid opening and closing of contacts, usually exhibited during extreme vibration and/or shock.

Clearance (Spacing): Distance through air between electrically live parts of opposite polarity or to ground.

Contact: The contact is a conducting part designed to be united by pressure to another conducting part for the purpose of carrying current.

Contact Bounce: Oscillation of the movable contact upon closure of the circuit.

Contact Gap: The minimum distance between the fixed and moveable contacts.

Contact Resistance: The resistance of current flow across closed contacts.

Dead-Break: Open circuit condition, usually caused when slowly actuating snap-action switches. Results from low contact pressure or contact lift-off.

Detent: Feature that indicates actuation point has been reached. Can also be referred to as tactile feel.

Dielectric Strength: The ability of an insulating material to resist voltage from arcing across its surface.

Differential: Distance between trip point (or force) and reset point (or force).

Double-Break: A mechanism that breaks the circuit at two points simultaneously by means of a "shorting bar" like device.

Double-Throw: Contact arrangement that alternately transfers normally open and normally closed circuits.

Dust-Tight: Sealed switch will withstand sand and dust contamination.

Electrical Life: Expected cycle life when switch is operated at full rated load.

Free Position: Point at which plunger exists in the un-operated condition.

Insulation Resistance: The resistance to current flow of the insulating materials between contacts.

Lever Actuator: A device, hinged or spring type, applied to a basic switch to facilitate its application.

Make Before Break: The term given to a double throw switch when the second circuit is closed before the first circuit is opened.

Momentary Action Switch: The term given to a switch where a circuit is continuously closed or opened only when force is applied. The electrical state returns to its normal position when the force is removed.

Normally Closed: The term given to a switch where a circuit is closed in the normal switch position.

Normally Open: The term given to a switch where a circuit is open in the normal switch position.

Operating Point: Point at which contacts transfer. Usually measured from the switch mounting holes.

Over Travel: The distance an actuator travels after the circuit is closed.

Pole: The term to denote a completely separate circuit, which passes through a switch at one time.

Pre Travel: The movement of the actuator prior to closing the circuit. Sometimes identical to "Travel to Make".

Reset Point: Point at which contact resumes normal position. Single-Break: Mechanism that transfers one contact.

Single Throw Switch: A single throw switch is a switch by means of which the circuit can be opened or closed by moving the switch blade into or out of one set of contacts only.

Snap Action: The abrupt transfer of contacts from one position to another. This action is relatively independent of the speed of actuator travel.

Splash Proof: Sealed switch will withstand heavy rain or stream of water.

Switch: A switch is a device for making, breaking, or changing the connections in an electric circuit.

Switch Abbreviations:

N.C.: Normally Closed circuit

N.O.: Normally Open circuit

SPST: Single Pole Single Throw

SPDT: Single Pole Double Throw

DPST: Double Pole Single Throw

DPDT: Double Pole Double Throw

MBB: Make Before Break

BBM: Break Before Make

Throw: The term denotes the number of positions in which a given pole is closed.

Travel to Make: The distance parallel to the designated direction of the actuator movement at which point a circuit is closed.

Watertight: Sealed switch will withstand submersion to various depths depending on specification level.

Wiping Action: Lateral travel of movable contact over fixed contact while pressure between the two contacts exists. Occurs during plunger travel. This action helps clean the contacts of contamination.

IP Rating Chart

First Number	Definition	Second Number	Definition
<i>Protection against solid objects</i>		<i>Protection against liquids</i>	
0	No protection	0	No protection
1	Protected against solid objects over 50mm (e.g. accidental touch by hands)	1	Protected against vertically falling drops of water
2	Protected against solid objects over 12mm (e.g. fingers)	2	Protected against direct sprays up to 15° from the vertical
3	Protected against solid objects over 2.5mm (e.g. tools and wires)	3	Protected against direct sprays up to 60° from vertical
4	Protected against solid objects over 1mm (e.g. tools, wires and small wires)	4	Protected against sprays from all directions - limited ingress permitted
5	Protected against dust - limited ingress (no harmful deposit)	5	Protected against low pressure jets if water from all directions - limited ingress permitted
6	Totally protected against dust	6	Protected against strong jets of water e.g. for use on shipdecks - limited ingress permitted
		7	Protected against the effects of temporary immersion between 15cm and 1m. Duration of test 30 min.
		8	Protected against long periods of immersion under pressure

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