

# SWITCH CATALOG



# REFERENCE DOCUMENTS

## Glossary of Terms

### -A-

**ACTUATOR** - Mechanism of the switch that when operated transfers the internal contacts.

**ALLOY** - A metal composed of two or more different metals to obtain a desired physical property.

**ALTERNATE ACTION** - Typically associated with pushbutton switches; switch contacts remain in a given circuit condition after removal of actuating force; when actuating force is applied a second time, the opposite circuit is engaged.

**ALTERNATING CURRENT (AC)** - An electric current that reverses direction at regularly recurring intervals of time.

**AMBIENT TEMPERATURE RANGE** - Operating temperature range.

**ANGLE OF THROW** - Associated with rocker and toggle switches to indicate the total travel arc of the actuator, measured in degrees.

**ANNEALED** - To heat and then cool (as steel or glass) for softening and making the material less brittle; for example, annealed copper is less brittle.

**ARCING** - The flow or movement of electric current between opening or closing switch contacts.

### -B-

**BASIC SWITCH** - Classified as a self-contained switching unit. May be used independently or with a gang-mounted assembly. Usually mechanically actuated.

**BREAK** - To open an electrical set of closed contacts.

**BREAK BEFORE MAKE** - To interrupt one circuit of a pole before completing a second circuit of the same pole.

### -C-

**CAPACITIVE LOAD** - A lumped capacitance that is switched as a unit.

**CONTACT BOUNCE** - The repeated rebounding of the movable contact during the transfer from one throw to the next; typically measured in micro or milliseconds.

**CONTACT RESISTANCE** - The resistance measured across a pair of closed contacts, which is in series with the load. Resistance levels will increase over time based on usage load conditions and environment. Measured in milliohms.

**CREEPAGE** - The unwanted flow of electrical current from one conductive part to another.

**CURRENT** - The flow of electrons within a wire or a circuit; measured in amperes.

**CYCLE** - An interval of time during which a sequence of a recurring succession of events or phenomena is completed.

### -D-

**DETENT** - A mechanical positioning device designed to stop the actuator travel at each successive electrical circuit.

**DIELECTRIC STRENGTH** - The potential gradient at which electric failure or breakdown occurs.

**DIFFERENTIAL TRAVEL (D.T.)** - The amount of actuator or plunger travel measured from the point where contacts "snap over" to the point where they "snap back."

**DIRECT CURRENT (DC)** - A unidirectional current in which changes in value are either zero or so small that they may be neglected. As originally used, the term designates a practically non-pulsating current.

**DOUBLE BREAK CONTACTS** - (Twin break.) Switch circuit breaks in two places. Also referred to as form Z circuitry.

**DOUBLE POLE (DP)** - see Pole.

**DOUBLE-POLE DOUBLE-THROW (DPDT)** - Switches which make and break two separate circuits. Both normally open and normally closed set of contacts offered with each pole.

**DOUBLE THROW (DT)** - see Throw.

**DRY CIRCUIT** - A low energy circuit condition where no arcing occurs during contact switching; typically in millivolt and milliamp ranges of current and voltage.

### -F-

**FLASH PLATING** - A very thin or "instant plating" process usually measuring less than 10 micro-inches thick.

**FLUX** - A substance (such as rosin) applied to surfaces to be joined by soldering, brazing or welding to clean and free them from oxide and promoting their union.

**FREE POSITION (FP)** - Switch plunger or actuator position when no outside force is applied, other than gravity.

**FULL OVERTRAVEL FORCE** - The amount of force required to achieve full overtravel of the switch actuator.

### -G-

**GROUND** - A conducting path between an electric circuit or equipment and the earth, or some large conducting body serving in place of the earth whether the connection is intentional or accidental.

### -H-

**HERMETICALLY SEALED SWITCH** - A switch in a gas tight enclosure that has been completely sealed by fusion or comparable means to insure a low rate of gas leakage over a long period of time. All junctures made with glass-to-metal or metal-to-metal.

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#### -I-

**INDUCTIVE LOAD** - A load in which the initial current on make (contact closing) is lower than steady state and the voltage is greater than steady state upon break (contact opening). When contacts are opened (break), the stored energy of the inductor combined with the long arcing time is severe on the switch contacts.

**INRUSH** - The amount of current that a load draws when initially closing the switch contacts. May cause severe degradation of contacts.

**INSULATION RESISTANCE** - The electrical resistance between two normally insulated parts.

**IP** - Part of the IEC529 standard recommending the degree of protection of enclosures for low-voltage switch gear. Deals with the prevention of ingress of liquids and solid foreign matter in enclosures.

**ISOLATED LAMP CIRCUIT** - Independent of switching circuit; lamp is operated on a completely separate circuit from the switch circuit.

#### -L-

**LAMP LOAD** - Upon initial contact closure (make), high inrush current occurs (approximately 10 times greater than the steady state).

**LATCHDOWN** - One type of alternate action in which the push-button is mechanically secured in the down position; the pushbutton is at "normal" position for one circuit and latched down position for the other circuit condition.

**LED (LIGHT EMITTING DIODE)** - A solid state diode that provides variable light.

**LOGIC LEVEL** - An application in which power levels do not cause arcing, melting, or softening of contacts; also referred to as dry circuit or low energy; typically requiring gold contacts for reliability.

#### -M-

**MAINTAINED ACTION** - To remain in a given circuit condition until actuated into the next circuit condition.

**MAKE BEFORE BREAK** - Completing one circuit of a pole before interrupting another of the same pole.

**MOMENTARY ACTION** - Mechanically returning from a temporary circuit condition to the maintained circuit condition as soon as the actuating force is removed.

#### -N-

**NC** - Normally Closed contacts; circuit is closed when actuator is in its normal at-rest position.

**NEMA** - National Electrical Manufacturers Association, an agency of the United States, setting standards for products distributed worldwide; applied to switches in their degrees of protection

against the intrusion of liquids, dust, and other contaminants.

**NO** - Normally Open contacts; circuit is open when actuator is in its normal or at-rest position.

**NOISE, ELECTRICAL** - Unwanted electrical signals that produce undesirable effects in the circuits of the control systems in which they occur.

**NOMINAL** - The result of the calculated actual value range.

**NONSHORTING CONTACTS** - Contacts which break before make.

#### -O-

**OPAQUE** - A condition that is not pervious to radiant energy and especially light.

**OPERATING FORCE (O.F.)** - A measured amount of force applied to switch plunger or actuator to cause contact "snap-over" to occur.

**OPERATING POSITION (O.P.)** - Position of switch plunger or actuator at which point the internal switch contacts snap from normal to operated position.

**OVERTRAVEL (O.T.)** - Switch plunger or actuator travel designed to go safely beyond the operating position.

#### -P-

**PANEL SEAL** - Prevents liquids and solid particles from reaching the switch contacts from the front of the panel if the panel is subjected to foreign contamination usually caused by spills or splashing.

**PARALLEL CIRCUIT** - Electrical circuit having two or more inductors or paths for the current to flow.

**PF** - Power Factor; a means of determining contact capability when used with inductive loads relative to the standard resistive load rating; for example, if PF = 1.0, the inductive load is 100% of the resistive load, or if PF = 0.6, the inductive load is 60% of the resistive load.

**POLE** - A single common electrical input having one or more outputs.

**POSITION** - The mechanical stops or detents associated with the switch actuator.

**PRECISION SNAP-ACTING SWITCH** - An electromechanical switch having predetermined and accurately controlled characteristics and having a spring-loaded quick make and break contact action.

**PRETRAVEL (P.T.)** - Measured travel associated with the moving of the plunger or actuator from free position to operating position.

**PUSH-PUSH** - Considered a form of alternate action, but is not latchdown.

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### -R-

**RELEASE FORCE (R.F.)** - Amount of force still applied to switch plunger or actuator at moment contacts snap from operated position to unoperated position.

**RMS** - Root Mean Square.

### -S-

**SHORTING CONTACTS** - Electrical switch contacts that are designed to make before break.

**SILICONE RUBBER** - Rubber produced from silicone elastomers with a high amount of flexibility, resilience, and tensile strength over a wide temperature range.

**SNAP ACTION** - Very fast mechanical transfer of contacts from one position to another. Contact transfer action is independent of speed of actuator travel.

**SPST** - Single Pole Single Throw - see Pole; also Throw.

### -T-

**TACTILE FEEDBACK** - The switching action felt by an operator as he operates the switch from position to position.

**THROW** - The number of electrical circuits within a switch pole.

**TOTAL TRAVEL** - Combined distance of actuator pretravel and overtravel; total distance actuator moves from relaxed position past the point of electrical contact and to the end of travel.

**TRANSLUCENT** - Transmitting and diffusing light so that objects beyond cannot be seen clearly.

**TRANSPARENT** - Having the property of transmitting light without appreciably scattering so that objects lying beyond are entirely visible.

**TRAVEL** - The distance the switch actuator moves which causes a change of electrical circuits.

**TWO CIRCUIT** - Circuit in which one circuit is made in one position and a separate circuit is made in the other position.

### -V-

**VOLTAGE DROP** - The difference of voltages at the two terminals of a passive impedance.

### -W-

**WIPING ACTION** - The action caused by the movable switch contact sliding across the stationary contact, resulting in the cleaning of the contact surfaces.