Switches & Isolators

Definitions (Part 2 BS7671)

Switch:-

A mechanical device capable of making, carrying and breaking under normal circuit conditions, which may include specific operating overload conditions, and also of carrying for a specified time currents under specified abnormal circuit conditions such as those of short-circuit. It may also be capable of making, but not breaking, short-circuit currents.

Switches/Isolstors

Switches and Isolators must always switch the live supply e.g Live wire

Live & Neutral together at the same time on the same switch

L1, L2, and L3 together at the same time on the same isolator

L1, L2, L3 and Neutral together at the same time on the same isolator

In some situations neutral is not switched
Never switch the neutral by itself through a switch or isolator

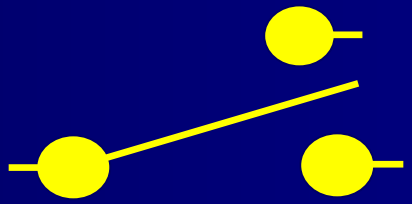
Never switch the Earth this should be a continuous connection and never be switched or have an open circuit.

Switch Symbols and terminology

SPST

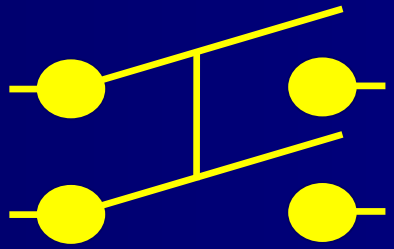
Single pole single throw

SPDT



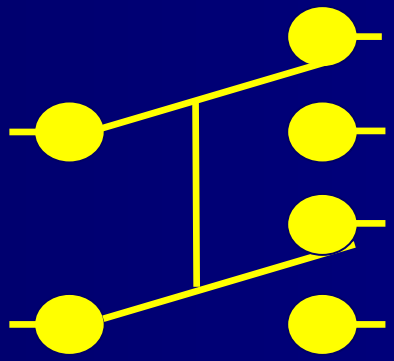
Single pole double throw

DPST



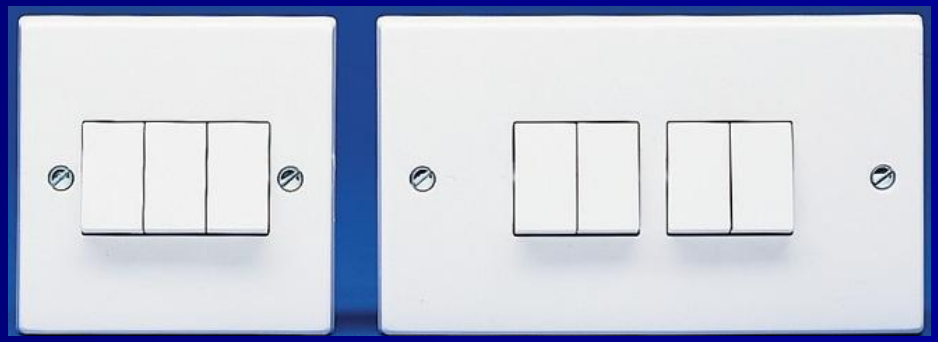
Double pole single throw

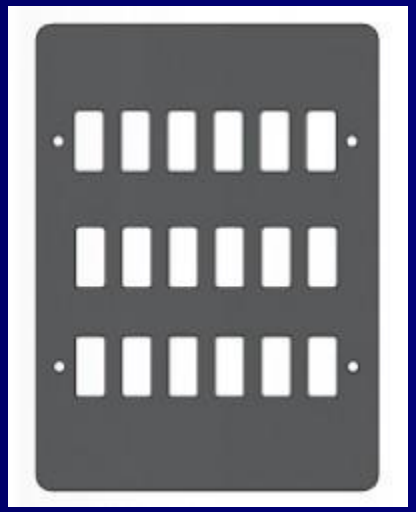
DPDT



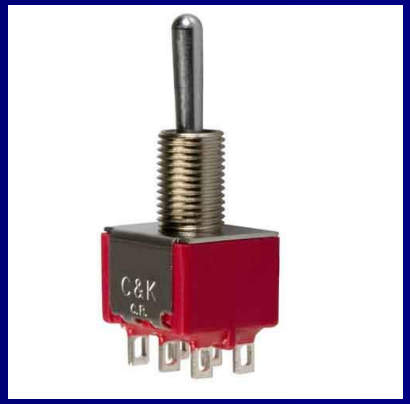
Double pole double throw

Domestic switches





Industrial switches



Definitions (Part 2 BS 7671)

Isolator:-

A mechanical switching device which, in the open position, complies with the requirements for the isolating function.

An isolator is otherwise known as a disconnector.

Must comply with Section 537 BS7671 (2008) and Regulation 12 EAWR (1989)

Isolators

Isolator Construction

Can be plastic or Metal clad

Ingress seal around cover or door

Spring assisted switch mechanism

Flat blade nickel-plated contacts

Arc suppression shields

Mechanical Interlock

Neutral block

Earth stud attached to body on metal isolators

Safety Features

Switch handle can be locked off
Interlock prevents operation while terminals are accessible, also prevents access when isolator is on.
Arc shields cover terminals to limit flashover when breaking loads
Spring loaded switch mechanism minimises arc time when breaking loads
Ingress seal protects from environment

Emergency switches/isolators should be single action.

Note: Isolators should normally only be operated under no load conditions

Maintenance

Secure Terminals
Inspection of contacts for signs of arcing/damage
Lubrication of switch contacts and mechanism
Inspection of seals/gaskets, check for moisture dust/debris
Check mechanical operations