CABLES

SWITCHES

EARTHING

CABLE / WIRE

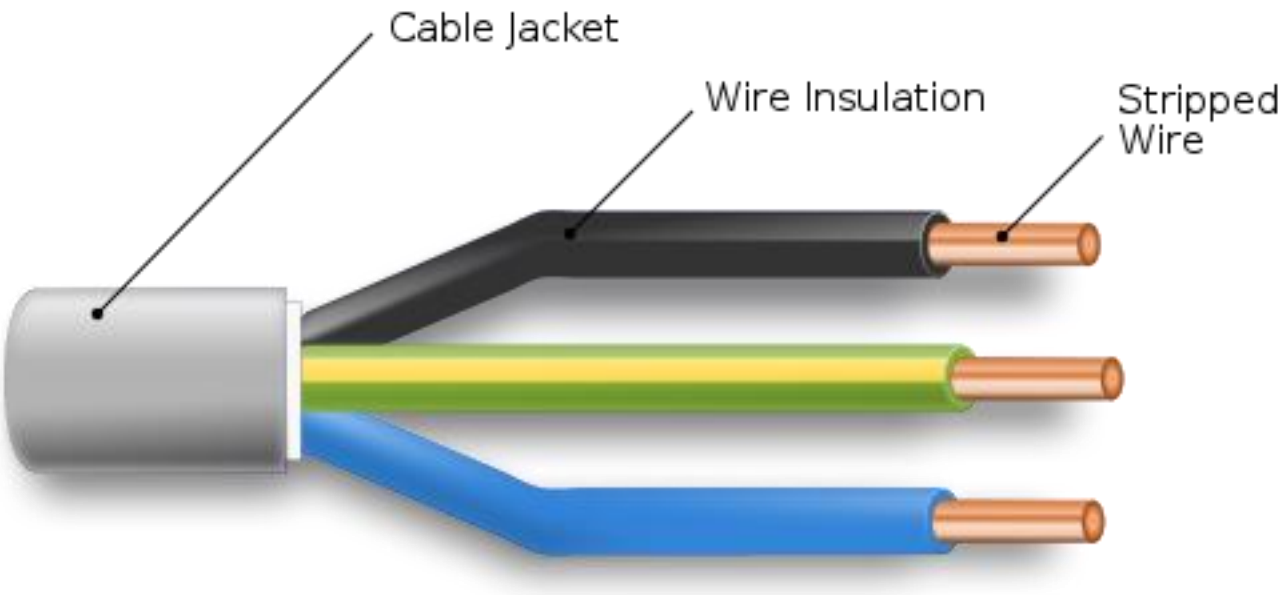
- An electrical cable is an assembly of one or more wires running side by side or bundled, which is used to carry electric current.

- A wire or a wire rope is a single strand of conductive material aluminum or copper. For normal building usage, use aluminum or copper conducted material.

- Two or more wires twisted, braided and running together side by side makes a Cable. While connected with devices, cables transfer electrical signals from one end to another end to give power to devices.

- The size & type of wire/cable must suit the power rating required for their use. The higher the power the thicker the wire/cable.

- Basically, cable and wires are made up of three common parts; *Conductor, Insulator, and Sheath.*
- The conductor is made of Aluminum, or Copper, or Silver. Electricity flows from one place to another inside the conductor.
- Insulator or Insulation is a protection of conductor.
- The Sheath is another protecting material. In cables, we use the inner and outer sheath. The sheath material could be XLPE and PVC.


Cable Jacket
Wire Insulation
Stripped
Wire

SWITCH

- In electrical engineering, a switch is an electrical component that can disconnect or connect the conducting path in an electrical circuit, interrupting the electric current or diverting it from one conductor to another.
- Switch is nothing but a device which is used to turn ON and OFF the equipment.

- If switch is OFF, that means circuit is open and current cannot flow through the conductor and equipment is de-energies (OFF state).

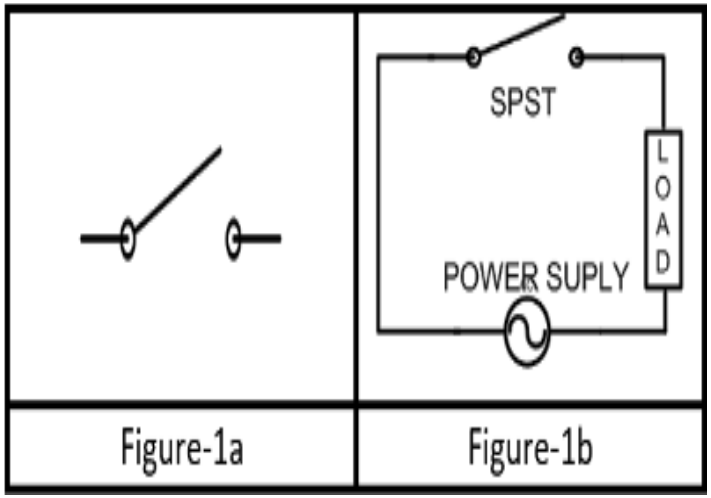
- To make it energies, we have to turn ON switch, it makes a complete circuit and close path. So, current can flow through the equipment and it can turn ON. So, function of switch is to make (switch is ON) and break (switch is OFF) the circuit.

TYPES OF SWITCH

Basic types of switches are:

- Single Pole Single Throw (SPST)
- Single Pole Double Throw (SPDT)
- Double Pole Single Throw (DPST)
- Double Pole Double Throw (DPDT)

- **Single Pole Single Throw (SPST)** switch is a switch that only has a single input and can connect only to one output. This means it only has one input terminal and only one output terminal. A Single Pole Single Throw switch serves in circuits as on-off switches. When the switch is closed, the circuit is on.



- **Single Pole Double Throw (SPDT)** switch is a switch that only has a single input and can connect to and switch between the 2 outputs. This means it has one input terminal and two output terminals. A Single Pole Double Throw switch can serve a variety of functions in a circuit.

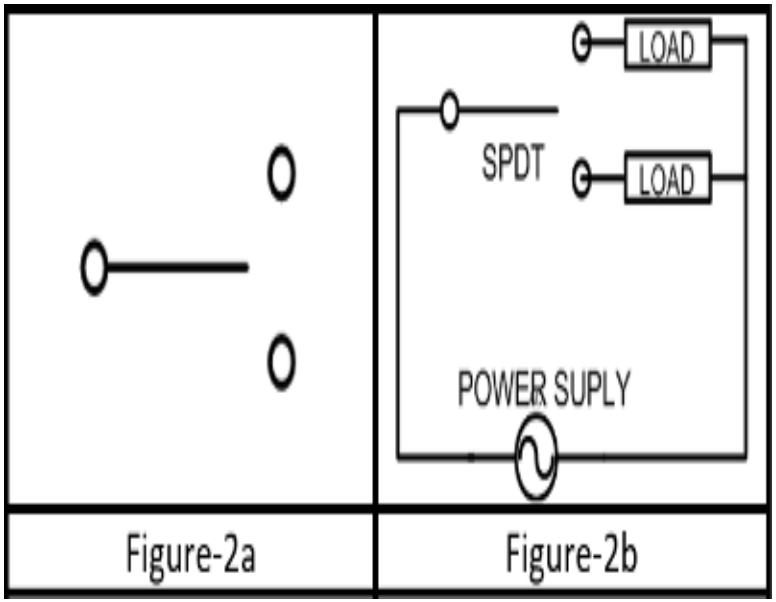
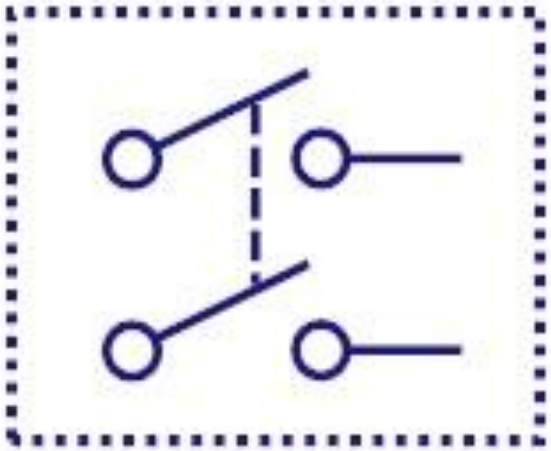


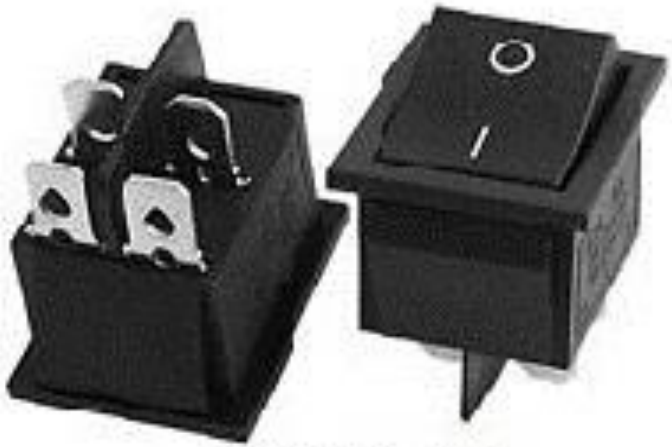
Figure-2a Figure-2b

Double Pole Single Throw (DPST)

- This switch consists of four terminals; two input terminal (pole) and two output terminal (throw)
- This switch is very similar to two SPST switches. Both switches are connected with single liver so, both switches operate at a single time.
- These switches used when we want to control two circuit for same time .



Symbol



DPST Switch

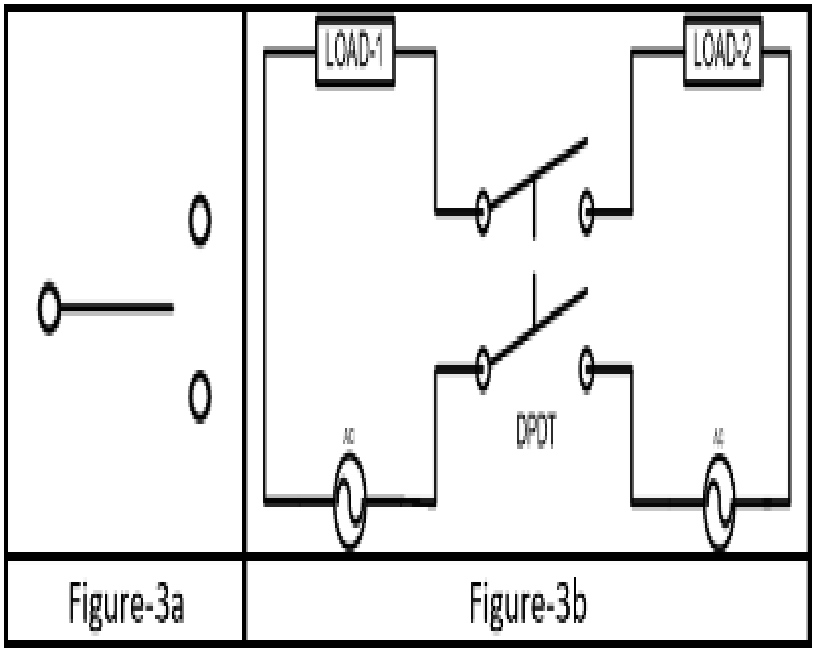


Figure-3a

Figure-3b

- **Double Pole Double Throw** (**DPDT**) switch is a switch that has 2 inputs and 4 outputs; each input has 2 corresponding outputs that it can connect to. Each of the terminals of a double pole double switch can either be in 1 of 2 positions. This makes the the double pole double throw switch a very versatile switch.

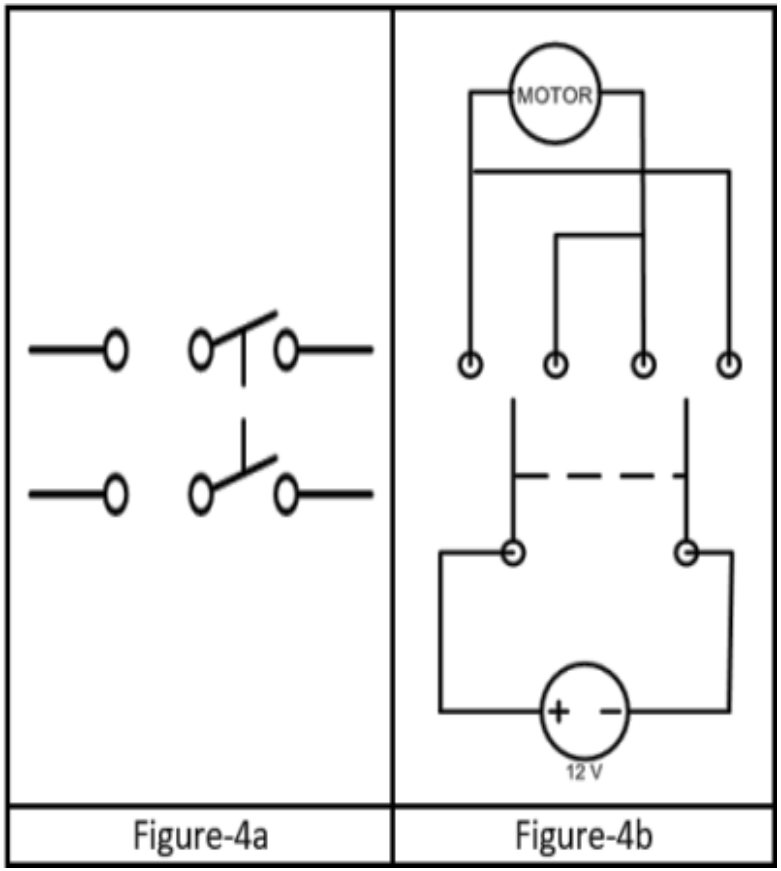


Figure-4a | Figure-4b

EARTHING

- The process of transferring the immediate discharge of the electrical energy directly to the earth by the help of the low resistance wire is known as the electrical earthing.

- The electrical earthing is done by connecting the non-current carrying part of the equipment or neutral of supply system to the ground.

- **Plate Earthing:** A copper plate or galvanized plate is buried in an earth pit below ground level. The plate electrode connects the electrical conductors to the earth.

- **Pipe Earthing:** A galvanized steel perforated pipe inside the ground connects the electrical conductors to the earth.