

Topic: Electric Energy

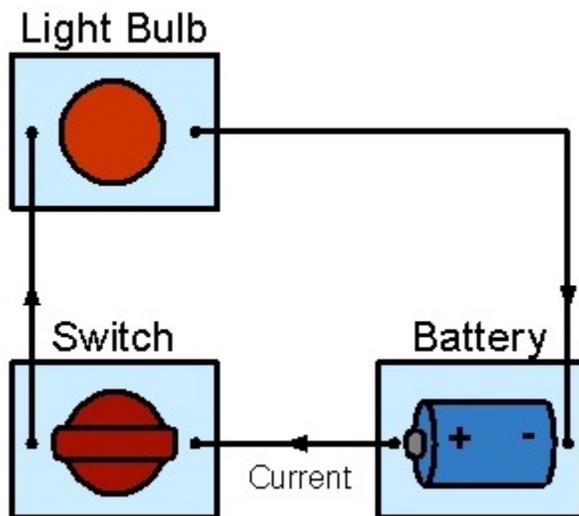
Introduction

Electrical energy plays a dominant role in the economic and social development of nations. It is extensively used in industries, offices and homes for carrying out numerous essential operations. Electrical energy provides a reliable, pollution free energy option for both domestic and industrial purposes.

Concept of Electron Flow

Electrons are tiny negatively charged particles that are found in the atom. The electron moves freely inside the atoms of electrical conductors such as metals. Electrons are invisible to the eye but the effect of their movement can be seen and even measured in every electrical circuit. It is the flow of electrons that produce the flow of electric current

One of the conditions for obtaining electric current is the provision of potential difference between two points. If two such points with a difference in potential are joined together with a metallic conductor such as wire, electrons flow from the low potential point to the higher potential point, whereas electric current would flow from the high potential to the low potential point.

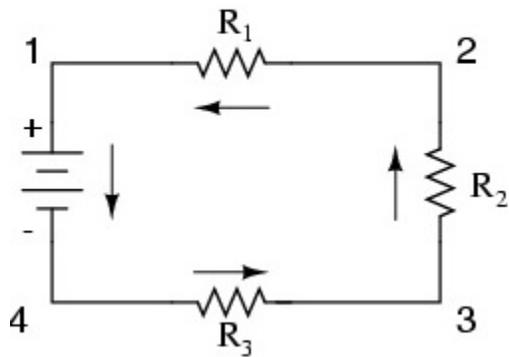


The diagram shows the flow of electrons and current in a closed circuit

Series and Parallel Circuits

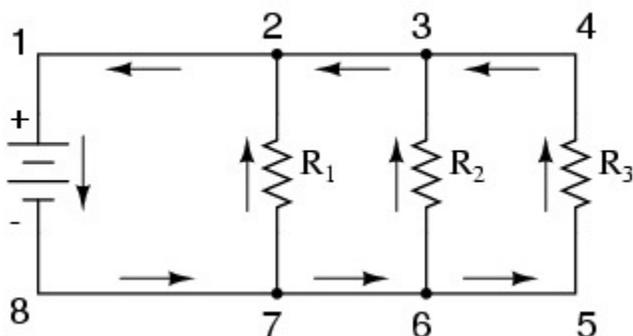
The two major ways of connecting electrical circuits are in series or in parallel. In series circuit, circuit elements are joined end to end so that the same current flows through each circuit element in turn, while the potential difference across elements will differ.

Series



In the case of parallel circuit, elements are connected in such a way that the high potential terminal of two circuit elements are joined to one point and the two low potential terminals of the two elements are joined to another point in the circuit. This arrangement is such that there is a uniform potential difference across the two elements whereas the currents flowing in them differ.

Parallel



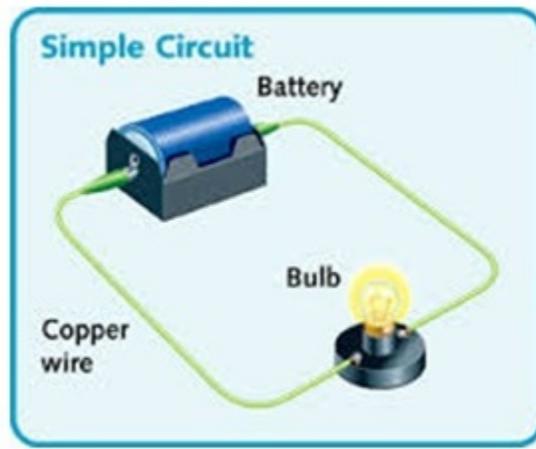
Ammeter and Voltmeter

Ammeters and voltmeters are two of the most commonly used measuring instruments in electric circuits. The ammeter is a low resistance instrument which is connected in series circuit in order to measure the value of the current flowing. The resistance of the ammeter is small so that it does not draw much current for its operation. Electric current is measured in Ampere

The voltmeter is a high resistance instrument that is usually connected in parallel with a circuit element so that the potential difference across the element may be measured. In this arrangement, most of the electric current flows through the circuit element while only a little current flows through the circuit element while only a little current flows through the voltmeter. The unit of measurement of potential difference is the Volt

House Circuit

Houses are wired in parallel because of some advantages of parallel circuit. An example is that if one bulb in a house burns out, others will stay on. However, in a series circuit, all bulbs go off as soon as one of them burns out.



The following elements are in a house circuit: control switch, meter box, fuse box, switches, sockets, lamps and circuit breakers. The functions are as follow:

- Control Switch: This is used to put off every supply to the house when repairs or installation are being made
- Meter Box: This contains the meter used in measuring energy consumption in the home
- Fuse Box: This contains low resistance devices called fuses which melt to cut supply of parts of the house controlled by them when excessive current is being drawn or when there is a sudden bridging in circuit.
- Switches: These are commercially made keys for switching on or off of electric appliances in the house. Examples are the light switch and the fan switch.
- Sockets: These are protected terminals provided to enable devices to be connected when required. Refrigerators, radios, grinders and television sets are usually connected to wall sockets in the home
- Circuit Breaker: This is a modern device that is introduced into house circuits to increase safety in the use of electricity in the home. If there is a short circuit, a large current is drawn through the device which the heats up and breaks the circuit. Some of such devices will fail to reconnect unless the fault has been ratified.

Electric Meter Reading and Billing

The electric meter is installed in house where the Power Holding Authority can access and read them to provide bills for energy use. When an appliance connected to the circuit is

switched on in the house, the meter starts to read. You can read the current value consumed energy through the glass covering the meter.

An example of a meter reading form is provided below:

Month: July 2007

Meter Reading		Units Consumed	Cost per Unit	Total Amount #
Previous	Present			To be paid
47896	48167	271	#4.00	1084.00