

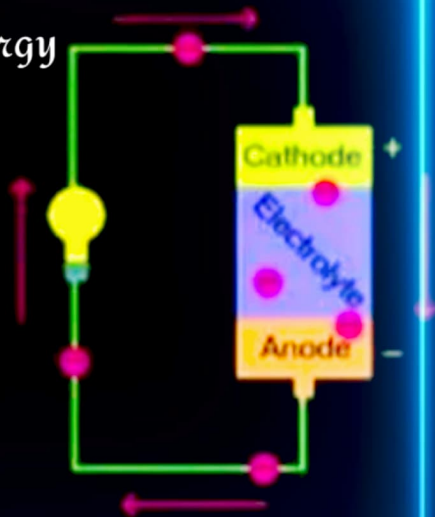
TOPIC :

BATTERIES

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BATTERY

- ✓ Convert stored chemical energy into electrical energy
- ✓ Reaction between chemicals take place
- ✓ Consisting of electrochemical cells
- ✓ Contains : (i) Electrodes
(ii) Electrolytes



APPLICATIONS USING BATTERIES



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ELECTRODES AND ELECTROLYTES

✓ CATHODE :

- Positive terminal
- Chemical reduction occurs (gain electrons)

✓ ANODE :

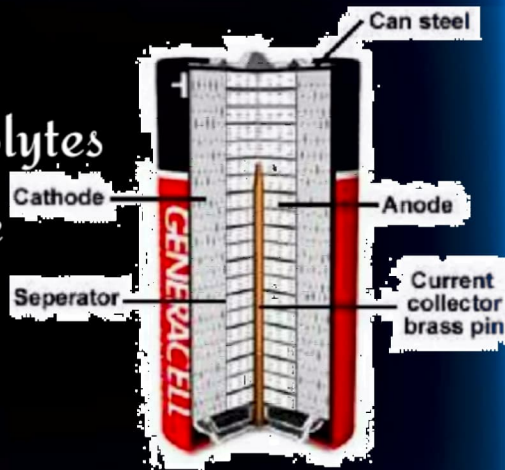
- Negative terminal
- Chemical oxidation occurs (lose electrons)

✓ ELECTROLYTES ALLOW :

- Separation of ionic transport and electrical transport
- Ions to move between electrodes and terminals
- Current to flow out of the battery to perform work

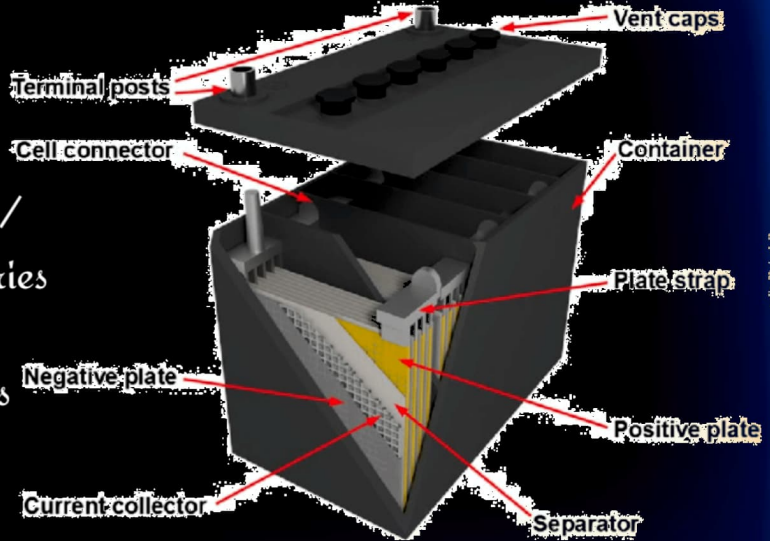
BATTERY OVERVIEW

- ✓ Battery has the metal or plastic case
- ✓ Inside case are cathode, anode & electrolytes
- ✓ Separator creates barrier between cathode and anode
- ✓ Current collector brass pin in middle of cell conducts electricity to outside circuit



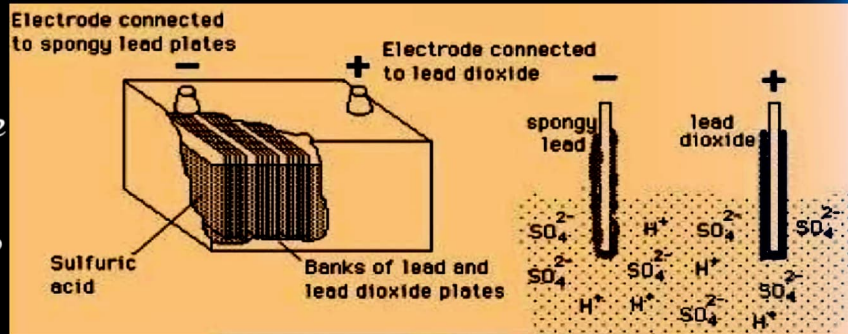
TYPES OF BATTERIES

- ✓ Vented/Flooded Lead Acid batteries
- ✓ Sealed maintenance free Batteries/ Valve Regulated Lead Acid Batteries
- ✓ Nickel Cadmium (Ni+Cd) Batteries



LEAD-ACID BATTERIES

- ✓ Batteries use a chemical reaction to do work on charge and produce a voltage between their output terminals
- ✓ Lead acid batteries can be found in a wide variety of applications including small scale power storage such as UPS systems, starting lighting and ignition power sources for automobiles, along with large, grid-scale power systems.



BATTERIES OF DIFFERENT SIZES

✓ BATTERIES COME IN STANDARD SIZES, LIKE AA, AAA, C, AND 9V.



D



C



PP3



AA



AAA



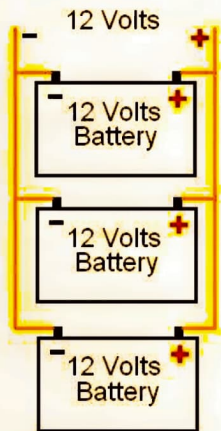
1/2AA



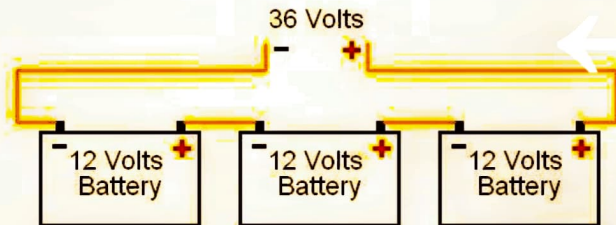
BUTTON

CONNECTION

Parallel Circuit



Series Circuit



Diagram

Parallel Setup



Series Setup



Practically →

VENTED/FLOODED LEAD ACID BATTERIES- TWO TYPE

TUBULAR

- ✓ Normal life 8-10 years
- ✓ Nominal cell voltage is 2V/Cell
- ✓ First charge at 2.6 to 2.7 V/Cell
- ✓ Away from delicate electronic equipments
- ✓ It needs separate room/racks with acid proof tiles for installation
- ✓ Regular maintenance to check specific gravity, to add water and acid
- ✓ Initial charging take about 55 to 90 hours

PLANTE

- ✓ Normal life 15 - 20 years

VRLA/SMF TYPE LEAD ACID BATTERY

- ✓ Being sealed, these batteries do not emit any fumes
- ✓ Normal life 3-5 years
- ✓ Nominal cell voltage is 12 V/Cell
- ✓ Float voltage 13.8Volts
- ✓ SMF batteries should not be left in totally discharged state more than 72 hours

NICKEL CADMIUM BATTERIES (NI-CD)

- ✓ Normal service life is 20-25 years
- ✓ Nominal cell voltage is 1.2 V/Cell
- ✓ Initial cost may be approximately three times
- ✓ Used in Hazardous environment such as chemical, fertilizer, cement industry.
- ✓ Batteries occasionally demand boost charging, 1.4V/Cell

TESTING YOUR IQ

Q (1) What are the 4 parts of a battery?

Q (2) What is primary cell and secondary cell?

Q (3) Do temperature have effect on battery?

Q (4) What factors that decide the VRLA battery to completely charged from fully discharged condition?

Q (5) Can VRLA batteries be enclosed in sealed containers?

Thank
you

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