

# NIELIT Gorakhpur

**Course Name: O Level (2nd Sem)**

**Subject: ICT**

**Topic: UPS**

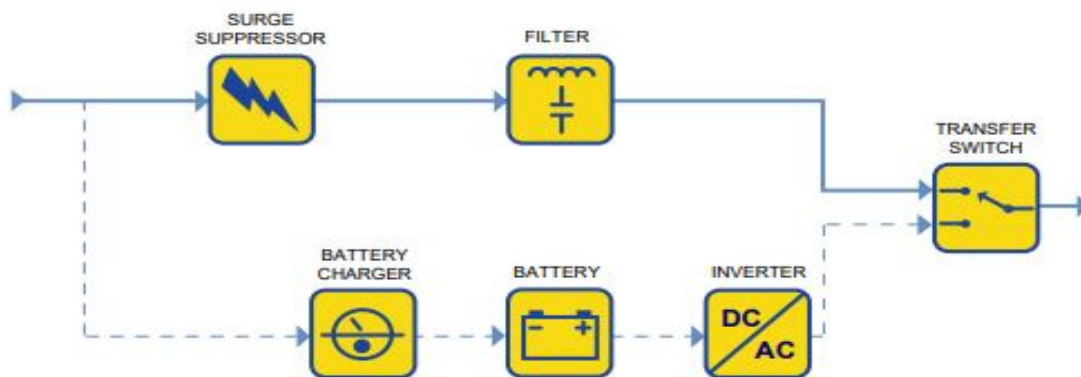
**Date: 15-04-2020**

**UPS:-** An Uninterruptible Power Supply (UPS) is defined as a piece of electrical equipment which can be used as an immediate power source to the connected load when there is any failure in the main input power source. In a UPS, the energy is generally stored in batteries, or super capacitors. When compared to other immediate power supply system, UPS have the advantage of immediate protection against the input power interruptions. UPS can be used as a protective device for some hardware which can cause serious damage or loss with a sudden power disruption. The available size of UPS units ranges from 200 VA which is used for a solo computer to several large units up to 46 MVA.

## **Types of UPS:**

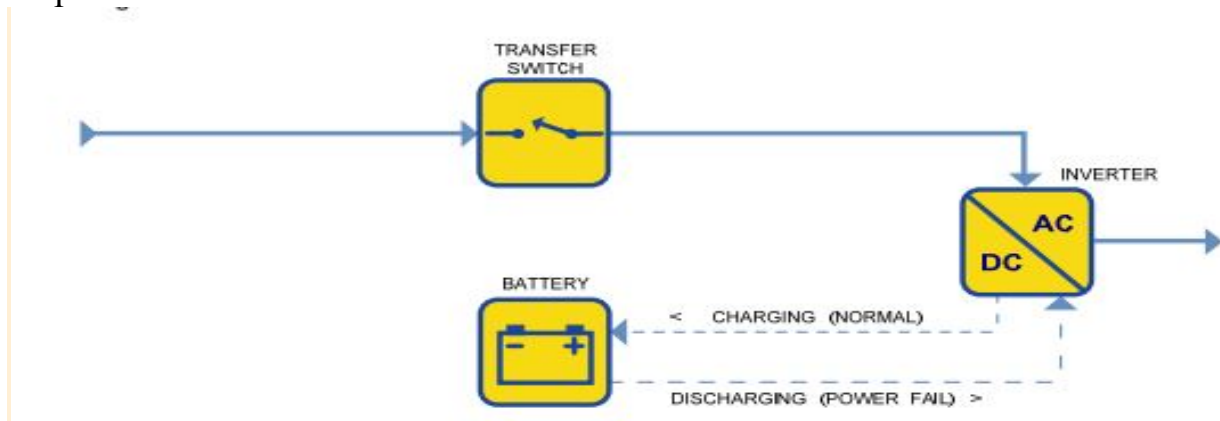
### **The standby UPS:**

The standby UPS is the most common type used for desktop computers. , the transfer switch is set to choose the filtered AC input as the primary power source (solid line path), and switches to the battery / inverter as the backup source should the primary source fail. When that happens, the transfer switch must operate to switch the load over to the battery / inverter backup power source (dashed path). The inverter only starts when the power fails, hence the name "standby." With proper filter and surge circuitry, a standby ups can also provide adequate noise filtration and surge suppression.



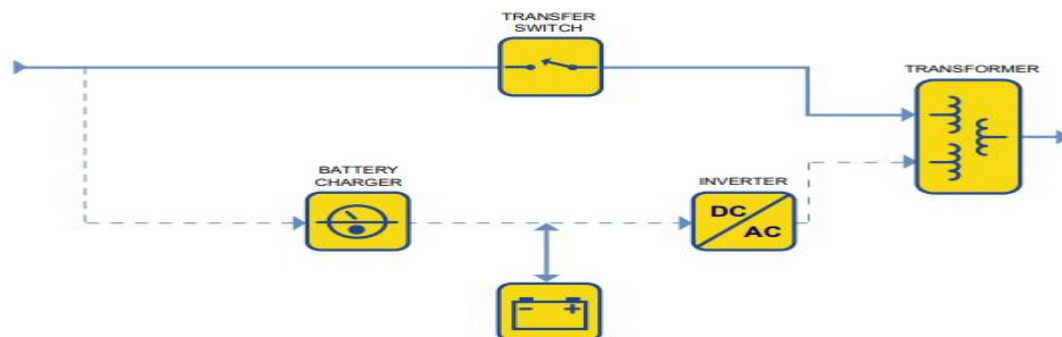
## Line interactive UPS

The line-interactive UPS is similar in operation to a standby UPS, but with the addition of a multi-tap variable-voltage autotransformer. This is a special type of transformer that can add or subtract powered coils of wire, thereby increasing or decreasing the magnetic field and the output voltage of the transformer. In this design, the battery-to-AC power converter (inverter) is always connected to the output of the UPS.



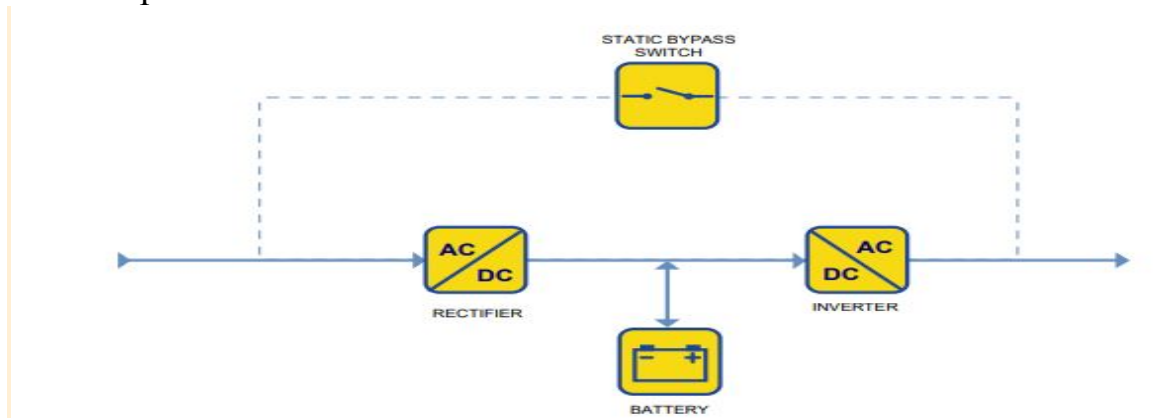
## The standby-ferro UPS

This design depends on a special saturating transformer that has three windings (power connections). The primary power path is from AC input, through a transfer switch, through the transformer, and to the output. In the case of a power failure, the transfer switch is opened, and the inverter picks up the output load.



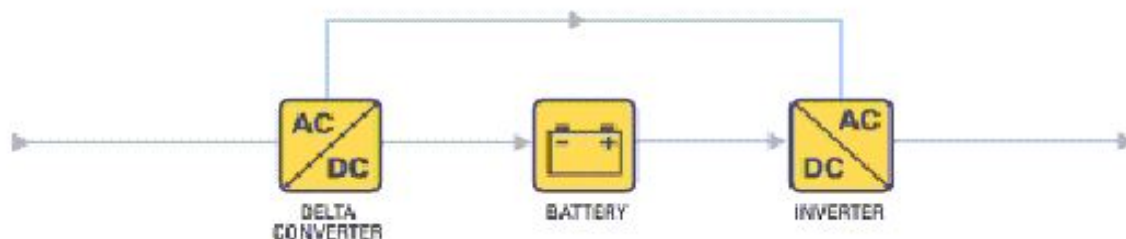
## The double conversion on-line UPS

This is the most common type of UPS above 10kVA. same as the Standby, except that the primary power path is the inverter instead of the AC main. In the double conversion on-line design, failure of the input AC does not cause activation of the transfer switch, because the input AC is charging the backup battery source which provides power to the output inverter. Therefore, during an input AC power failure, on-line operation results in no transfer time.



## The delta conversion on-line UPS

Delta conversion technology saves energy by carrying the package only the difference (delta) between the starting and ending points. is available in the range of 5kVA to 1 MW. It has always the inverter supplying the load voltage. Under conditions of AC failure or disturbances, this design exhibits behavior identical to the Double Conversion On-Line.



### Exercise:

Expalin the different types of UPS used today.