

Electrical Blog No. 36 - Uninterruptible Power Supply?

An Uninterruptible Power Supply (UPS) is a device or a system that maintains electric power supply for critical equipment continuously when utility power is not available or stable. Some people are confused by the use of a UPS and a Standby Generator. A Standby Generator does not provide instant protection for a momentary power interruption. A UPS, however, can be used to provide uninterrupted power to equipment for a period of time until a generator can be turned on or utility power is restored. A UPS can also provide power conditioning function.

To achieve this, a UPS will normally have an energy storage device which can be a battery system or a flywheel. Normally, the capacity of the storage device is sufficient for a generator to start and come online or allow orderly shutdown of equipment.

There are many types of UPS systems with different components and configurations. A basic UPS system typically consists of a rectifier, inverter and battery. The rectifier receives the normal alternating current (AC) power supply and rectifies it to direct current (DC) power for charging the battery. The inverter converts the DC power back to AC power to supply the loads. During power interruptions or when the supply voltage drops below acceptable limits, the battery discharges to maintain the DC supply for the inverter, so that the inverter continues supplying the connected loads with regulated power without interruption.

In the market today, the major application of UPS is to support computers and some telecommunication equipment in the information technology sector due to huge down-time costs. UPS is also used in industrial markets where process disturbances may cause serious irreversible production losses. Other applications include healthcare, tunnel lighting, etc, where UPS can be used to reduce risks to life safety during power interruption.

The Electrical Blog is contributed by the Electrical Division. If you would like to know more about this topic, please contact the Division Hon Secretary, Ir K.M. LEUNG at 'kmlung@emsd.gov.hk'