



# IEC 62040-3 UPS Types and Methods

To more clearly define the various UPS topologies, the IEC (International Electrotechnical Commission) established standards in November 1999 that will help consumers more easily understand what type of UPS they need. It defines the different types of UPS, how each different kind functions and methods used to measure their performance. This standard defines a UPS in terms of its performance and not individual UPS functional units. It has been adopted by Cenelec, the European standardization committee.

Standard **IEC 62040-3** defines the three types of UPS as:

- ▶ Passive Standby
- ▶ Line-Interactive
- ▶ Double Conversion

These terms define how the UPS operates with utility power, that is, the way the power is passed on to the critical load. The following definitions are taken verbatim from IEC Standard 62040-3.

## **Passive Standby (IEC 62040-3.2.20)**

In the normal mode of a passive standby UPS the load is primarily supplied by the utility and is subject to input voltage and frequency variations within stated limits. When the input supply is outside UPS design load tolerances, the UPS inverter is activated from the battery, and maintains continuity of load power in stored energy mode of operation. It is noted in the standard that the primary power from the utility may be regulated by additional devices, such as ferro-resonant regulators or static devices.

## **Line-Interactive (IEC 62040-3.2.18)**

Line-Interactive operation is any UPS operation where, in normal mode of operation, the continuity of load power is maintained by the use of a UPS inverter or a power interface while conditioning primary power at the input supply frequency. When the input voltage and/or frequency is out of UPS preset variation limits, the UPS inverter and battery maintain continuity of load power in stored energy mode of operation within the stated output voltage/frequency tolerances.

## **Double Conversion (IEC 62040-3.2.16)**

Double conversion operation is any UPS operation, where continuity of load power is maintained by a UPS inverter, with energy from the DC link in normal mode of operation or from the energy storage system in stored energy mode of operation. The output voltage and frequency are independent of input voltage and frequency conditions.

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Reprinted 6/00  
Revision 6/00

  
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