

The Live WIRE



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THIS WEEKS TOP

STORIES

- > **Truth about lightning**
- > **Modified VS. pure sinewave**
- > **PHD's Featured product**

TOPICS FOR NEXT WEEK

- > **Lightning and Surge protection , a total approach**
- > **Calculations**
- > **PHD's Featured product**
- > **Any Questions**

Dear devoted "live wire" readers, we are humbled by your exceptional response to our first few PHD News letters, and we would like to thank you for all your ongoing support.

To start this weeks, very exciting volume off, we have a lovely piece written by our own Warren Botten entitled "The truth about Lightning" a definite must read, so Enjoy.

The Truth about Lightning

In the mid 1700's Benjamin Franklin experimented with a kite in a thunderstorm and was the first to postulate the theory that lightning was in fact an electrical discharge. Since those early days research has revealed a great deal about this awe inspiring phenomenon, however in spite of over 250 years of research there is still a great deal we do not know.



One fact however is absolutely certain – lightning is created by an electrical charge of millions of volts between cloud and ground. We have all experienced the mild shocks caused by walking on carpets with rubber soles. These shocks which can be quite startling although seldom very painful are caused by a build up of charge in our bodies when the rubber of our shoes rubs against the fibres of a carpet. When you make contact with an object which is connected to the ground a small spark jumps between your finger and the "grounded" object. The spark has in excess of 1000V of charge which is enough to cause the electrical current to leap through a millimetre or two of air. When lightning occurs the "spark" travels through several thousands of meters (up 16 000m) of air which means that the voltage has to be proportionally larger – several million volts larger!

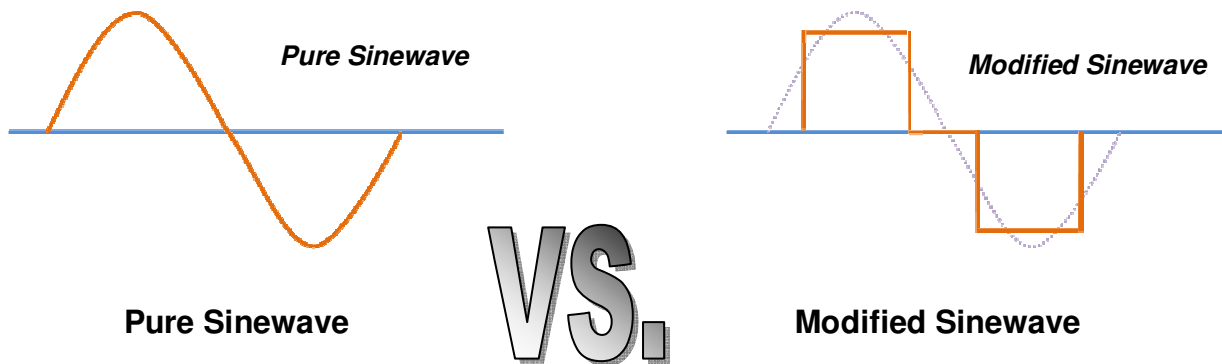
In South Africa we are no strangers to the wonder and power of a thunderstorm. These natural light shows entertain us regularly throughout the summer months and many a Highveld resident has lain awake of a night listening to the comforting rumble of thunder. However there is a more dangerous and costly side to these magnificent natural events. Most of us will attest to having experienced the damaging effects of a nearby lightning strike. TV's, decoders, computers, modems and faxes to name but a few of the expensive electronic items found in homes are all susceptible to the effects of a lightning induced surge.

In the USA it is estimated that the total damage caused by lightning every year is in the order of \$20m. While no official stats on damage are available on South Africa, we do live in one of the most severely affected areas in the world. With an average of up to 30 strikes taking place within 1km of where we live every season, damage to expensive equipment is inevitable.

On more than one occasion I have heard people tell how they run around like crazy at the approach of a thunderstorm unplugging appliances and disconnecting telephone lines. In some cases I have heard about people who won't even watch TV during a storm for fear of damage (what if the springboks are playing!!).

The fortunate truth is that in spite of what we still have to learn about lightning and what causes it, there are devices available which with years of research and development based on extensive field trials are capable of keeping out even very severe surges caused by lightning. PHD is one such company, who with more than 20 years of experience in the design and manufacture of surge protection devices still strive constantly to develop new clever ways to make it possible to watch TV, surf the net or just lie peacefully listening the gentle rumble of a thunderstorm, secure in the knowledge that you won't have to be phoning your insurance company in the morning.

Difference between pure and modified sinewave



Normal AC Mains, given to us from Eskom is of a pure sinewave nature, it has very little harmonic distortion, subject to outside interference, such as lightning and large AC Loads ETC. All AC equipment in the stores today have been designed to run off a Pure sinewave wave form, including Computers, Motors, certain Lights ETC.

The internal components of the inverter/UPS inverts the incoming DC Voltage into a sine-wave wave form, but because of the sophistication of these components, this makes the Inverter/UPS more expensive.

Modified sinewave has been created to save cost, modified sinewave inverters and UPS systems just switch their DC supply between positive and negative poles to give you a simulated sinewave wave form.

Modified sinewave inverters and UPS systems are very cheap to produce but could be very costly if installed onto the incorrect equipment, for example, motors, Fluorescent globes with standard ballasts, anything with a high inrush or speed control or anything that has sensitive information stored on it, or is of a sensitive nature itself.

Please note, some UPS systems most notably the 600VA, under the desk type UPS systems are modified sinewave, but because a PC only runs off the inverter for a short period, when there is a power failure, they are less likely to be damaged as a result from the modified wave form.



IV - Pure Sinewave Inverter

Featured Product

IV Series - Pure Sinewave Inverters (500VA - 3kVA)

Features:

- Pure sine wave
- Efficient inverter
- Short circuit & Overload Protection
- Meter Indicates Output voltage and Battery voltage
- LED indicators to show status of Normal Backup and Fault
- Automatic Charge
- Surge, Spike and Lightning Protection



AVR



LED Display



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