

SPIKES, SURGES AND OVER VOLTAGE

DIFFERENT PROBLEMS REQUIRE DIFFERENT SOLUTIONS

There are at least 6 different power problems that can damage our appliances.

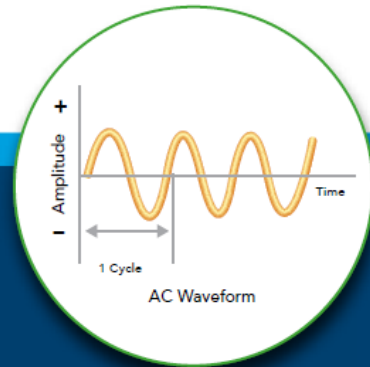
But in South Africa, most of these power problems have often been grouped under one general category; Spikes & Surges

As a result, the common solution is simplified to a single protection method: Surge Protection Devices (SPDs).

However, an SPD – which is a very critical protection device – is not the only solution.

In fact, with certain problems, it will be completely ineffectual. To understand why, we first need to define common power problems, starting with clean power.

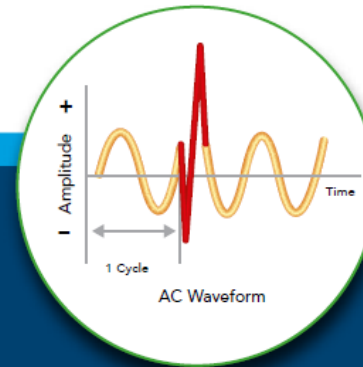
NORMAL VOLTAGE



If you look at Voltage on a scope, it is a perfectly formed sinewave which moves from 0 to +230 V back to 0 and then -230 V. This is known as Alternating Current (AC), and in South Africa, the standard voltage is 230 V AC. The duration of this AC Wave is 20 milliseconds.

A spike or surge takes place INSIDE this AC Wave, lasting only nanoseconds, far shorter than a full cycle. Hence these problems are not visible to the observer and often filter to equipment unnoticed but in time they will cause a failure.

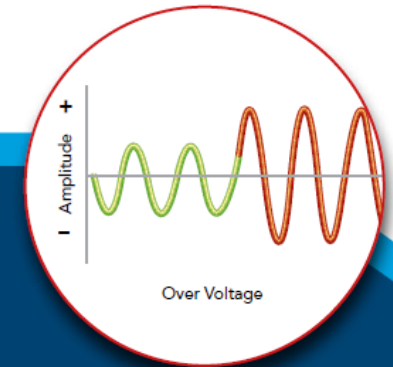
SPIKES/SURGES



A high energy spike, ones that could be generated by nearby lightning, can cause catastrophic instant damage. This is exactly where an SPD will be most effective and protective.

Spikes and surges and especially ones generated by lightning, have been around in SA as long as electricity has been used. A poor infrastructure might make them more prevalent due to lack of protection on distribution lines. Overhead power lines could make them also more prevalent.

OVER VOLTAGE



However, with our recent power problems especially with the distribution network, other problems have become more common and causing significant damage to equipment and sometime human life.

The main problems that we need to focus on and protect against would be different types of over voltage. **Over Voltage** is sustained rise in the voltage and lasting at least one full AC cycle (20 milliseconds) or more. It could last for seconds, minutes, hours, days or permanent. Any voltage rise above 260 V should be either suppressed or blocked to prevent damage.