



# 21<sup>st</sup> Century Protection

Discover the EP Solution for internal power pollution and learn why legacy solutions do not work!



## Background

Just 50 years ago the biggest threat to electrical equipment was catastrophic surge events. Equipment was rugged and designed to withstand harsh conditions. Now, equipment is smaller, faster and extremely sophisticated. These advancements to equipment have significantly improved the production process and operation efficiency. However, the advancements to equipment have come at a steep price, functionality.

Modern equipment is sensitive to power quality and it is also responsible for degrading power quality. Computerized, digital and electronic equipment all generate high frequency noise. This noise is responsible for ballast failures, equipment malfunctions, nuisance tripping of breakers and VFD's and shortened asset lifecycles. Approximately 85% of power pollution is generated inside facilities.

Environmental Potentials' patented waveform correction technology converts harmful noise directly into heat inside the unit.



## Testing



The modern facility has undergone radical changes in the past 50 years, the biggest change is to equipment. Modern equipment is computerized, digital and electronic. This equipment is nonlinear in nature, meaning voltage and current are not proportional to each other. This change from linear to nonlinear pollutes power quality and is harmful to sophisticated electrical equipment.

“The irony of sophisticated electric equipment is that it is sensitive to power distortions but it is also responsible for generating power distortions,” said EP’s president of sales Doug Joseph. “The electrical distribution system was not designed to power this type of equipment.”

Environmental Potentials’ decided to design a product capable of dealing with the 21st century problem of internal power pollution. Standard surge testing does not reveal how a product combats the real threat of internally generated noise. A real test of how a device can protect sophisticated equipment is how well that device deals with A1 and B3 Ring Waves. These waveforms are typical of internally generated waveforms which are responsible for ballast failures, equipment malfunctions, computer freezes, wasted energy and shortened asset lifecycles.

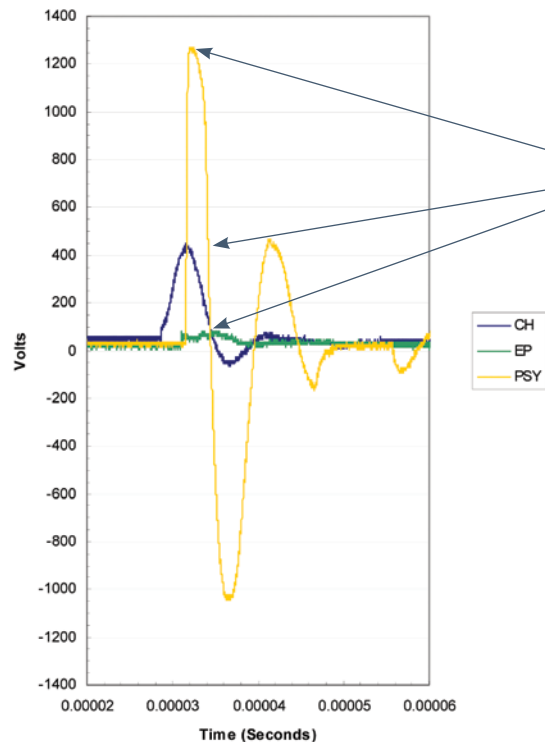


Figure 1: An A1 ring wave at 180 degrees. The green line represents EP. The blue line represents Cutler Hammer and the yellow line represents Psytronics. The higher the line goes the more danger there is to equipment.

“The important numbers to focus on are let through voltage,” said Joseph. “EP only let through 64 volts, this is a negligible amount of energy that is harmless to equipment. The competing products let through enough voltage to trip breakers and damage equipment.”



### Testing



Let through voltage is the amount voltage let through the device and into the electrical system. Both of the EP competitors let through enough voltage to cause equipment malfunctions, waste energy and shorten the asset lifecycle.

Now examine figure 2, which shows the results from the B3 ring wave at 180 degrees. Again it is obvious that EP protects significantly better than its competitors.

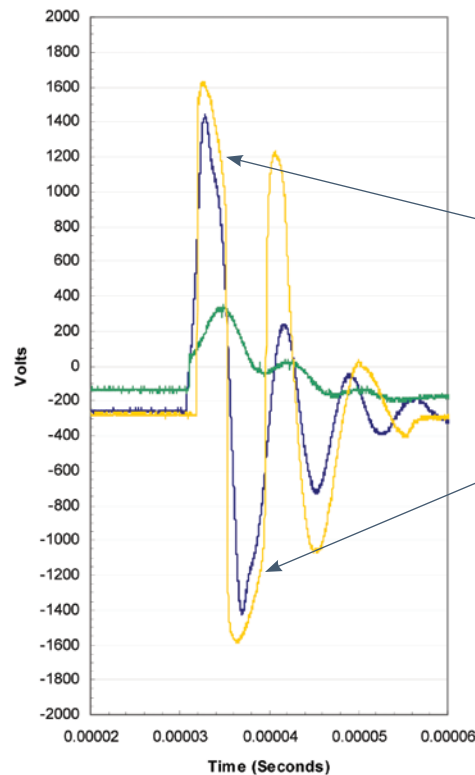


Figure 2: A B3 ring wave at 180 degrees. Notice the yellow and blue lines go above 1200V on both the positive and negative half cycle. This dangerous energy goes directly to expensive electrical equipment.

“Again, the important number to analyze here is the let through voltage. CH let through more than three times as much as EP, while Psy let through more than four times as much voltage as EP,” said Joseph. “Protecting equipment from these two ring waves is critical to the efficient operation of the loads.”

Environmental Potentials’ patented waveform correction technology is the only technology available that protects facilities from the 15% of external threats such as lightning and the 85% of internal threats such as noise. Every other company focuses on protecting from only the 15% of catastrophic surge events and not the 85% of the surges that disrupt the production process.



### Durability

Not only does Environmental Potentials' patented waveform correction technology protect facilities from 100 percent of surge events, but the circuit is rugged and able to withstand thousands of surge events with no degradation to the filtration capabilities.

Figure 3 shows the attenuation levels after 10,602 surges. The waveform is a B3 Combination and has 1.2  $\mu$ s rise time and 50  $\mu$ s decay time voltage wave with a 6 kV peak voltage under open circuit, and an 8  $\mu$ s rise time with 20  $\mu$ s decay time current wave at 3000 A peak under short circuit.

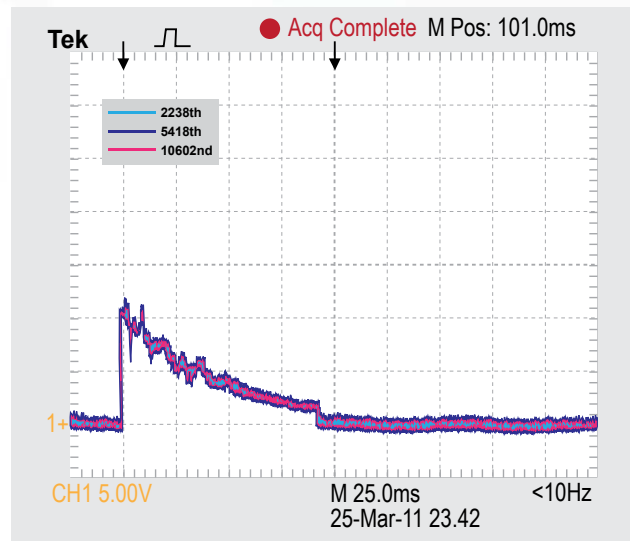


Figure 3 clearly shows EP's waveform correction technology maintains its attenuation levels after more than 10,000 surges. Typical MOV based technology degrades with each surge and does not protect from A1 or B3 ring waves.

Contact an official Environmental Potentials distributor to discover what EP's waveform correction technology can do for your facility!

*\*to see the full testing reports please visit [www.ep2000.com](http://www.ep2000.com) and click on the library link.  
Or email [info@ep2000.com](mailto:info@ep2000.com)*



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