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REVIEWS

NONSACRIFICIAL: ZeroSurge flattens the effects of chainsaws, hair dryers and other power disrupters—again and again.

Curbing surge

ZeroSurge's industrial-strength surge protector keeps voltage levels pure against big power fluctuations

BY JOHN BREEDEN II | GCN STAFF

In Washington, it's all about the power: acquiring it, harnessing it and not being burned by its use. For the agency system administrators though, the power in question is electrical rather than political.

All your high-priced servers and low-end notebooks, tablets, personal digital assistants and even office fax machines have one thing in common: Without electricity, they don't work, or at least, not for very long. And the quality of power is almost as important as having power in the first place.

Everyone knows that surges can be a danger to equipment, which is why those little surge protection strips have become so popular. Most people just use them as extension cords without really thinking about their true function. But most of them are supposed to block surges from reaching your important mission-critical equipment. They only work so well, though.

Of spikes and surges

ZeroSurge has released a heavy-duty, rack-mount surge protector, the 1RM15WI, that is certified to withstand up to 1,000 surges of up to 6,000 volts (3,000 amps).

While we couldn't muster an excess 6,000 volts, we did find that the unit easily blocked against surges that fried other protectors.

Technically, a surge is an increase of voltage for three nanoseconds or more. If it peaks for two nanoseconds or less, it's called a spike. Surges are worse than spikes, obviously,

but both can damage equipment or degrade components over time so they have a shorter life.

If the surge is high enough for long enough, components and wires can heat and burn, much like a water pipe bursting in your home. This can be dangerous, as we learned in our outdoor testing.

Most standard surge protectors have a metal oxide varistor, or MOV. The MOV consists of a piece of metal oxide that attaches to the hot line with power, two semiconductors and a grounding wire. Most also have a fuse that sits behind this setup.

When a surplus of voltage hits the protector, the two semiconductors divert the excess power to the grounding wire, sending only the right amount to the hot wire and on to your equipment.

The main problem with this approach is that the MOVs take time to ramp up, and some extra juice can slip through. Also, they tend to be sacrificial components, meaning that they simply wear out after repeated use. One good surge can kill the entire setup.

ZeroSurge's protector is nonsacrificial. The unit is built with additional windings to the input surge inductor, where power spikes hit first. The windings, in effect, convert the unit into a transformer, one that creates a voltage that can offset and cancel the surge voltage.

The two main sources of power disruption are lightning strikes and devices that cause serious disruptions in electrical flow when initially activated, such as refrigerators, hair dryers and air conditioners. Since attracting real lightning would be far too dangerous for this test, we set up an outdoor lab with several of the most disruptive home electronic devices, including a 2,000-watt electric chain saw and a 1,200-watt hair dryer.

For comparison's sake, we purchased two generic surge protectors from Wal-Mart, a $5 unit and a slightly upgraded $20 one. We used an oscilloscope to monitor the power stream.

When no protection was applied at all, we found a fairly clean stream of reliable power.

However, when the chain saw was activated, the power surged at first, and then bottomed out a bit before re-regulating. The hair dryer seemed to have the opposite effect, lowering the power for an instant and then spiking it slightly. Both devices caused the power to spike into unacceptable levels.

We started our testing with the cheapest surge protector, which in hindsight was a bit of a mistake. The first 10 times we activated both the chain saw and the hairdryer, the power stayed mostly clean, though about half the time the power did spike past the safe zones for about a nanosecond. After the 20th test, we started to notice the strong smell of electrical components burning.

We continued the test, since the oscilloscope was not recording major problems, and were rewarded with a huge popping sound that seemed about as loud as a gunshot. The surge protector actually jumped off its table a bit and white smoke curled out of the frame. We were so surprised by this that we did not record the power spike on the oscilloscope, which was thankfully getting its internal power from a different circuit.

We let the smoking unit cool for about an hour and then popped it open. We found that its internal fuse had blown up, practically atomizing itself. The insides of the box were blackened by the blast and the MOV looked melted. Thankfully, the hard plastic case contained most of the explosion, though it scared us quite a bit.

ZERO SURGE IRMI5WI

PERFORMANCE: A+
FEATURES: A
VALUE: B
PRICE: $379

REVIEWER COMMENTS:
The IRMI5WI survived where other surge protectors melted or even exploded during our testing. It is expensive, but if you absolutely have to protect a system from surge or spike damage, this is the way to do it.

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No more explosions

The upgraded $20 unit fared a bit better. There were still some spikes going above safe levels, but not as bad as with the cheaper unit. Gradually however, the spikes got worse until after 47 tests, the results we were getting were identical to the ones we found on the unprotected stream. The strip was simply not doing anything anymore other than passing on power.

Finally, we hooked up the ZeroSurge unit. At first, we thought we had done something wrong. Activating the chain saw and the hair dryer barely registered on the oscilloscope. There were no spikes, just a gentle, barely noticeable increase in the wave as the devices were activated. At no time did the power go into dangerous levels. No spikes or surges were generated.

It was getting dark by the time we had completed our 500th test with the ZeroSurge unit. The last test was the same as the first. Any devices sitting behind the ZeroSurge unit would have been protected.

The ZeroSurge unit is a bit costly, but it does a great job knocking down surges. You might not need it to protect a cheap desktop computer, though it would not hurt. And something like your Domain Name Server or mail server should have this level of protection. Besides protection from catastrophic power events, it will protect them from the rigors of everyday use. ■