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Do you need a surge protector for your RV?

By Mike Sokol

This article was prompted by an RVtravel.com reader who wrote asking if it made sense to spend \$300 on a surge protector for her RV.

Surge is one of those words that has fallen into common usage when in fact, it's not very descriptive of the situation. And interestingly "surge strips" do little to stop a long-term voltage "surge."

So let's start with a basic definition of voltage and the types of situations that can ruin your electrical gear. To gain a better understand of what we're going to discuss, re-read [my article about voltage](#). As you will see, voltage is really electrical pressure, much like the water pressure in your pipes feeding the kitchen sink.

Electrical voltage (pressure) needs to be near a certain amount for electrical gear (like your computer) to be happy. And the voltage (pressure) we use in the USA is rated at 120 volts, give or take 5% according to the National Electrical Code. That means it could vary from a low of 114 volts to a high of 126 volts, and still be strictly within code. From a realistic standpoint though, it's more likely to be as much as 8% low, so a 110 volt measurement is pretty common.

ELECTRICAL APPLIANCES are generally designed to run perfectly fine on anything from 105 volts to 130 volts or so. And 99.9% of the time that's what you're feeding them from the power line. But you can have under-voltage (brownouts) or over-voltage (broken neutral) conditions at a campground where this sustained voltage can go below 90 volts or above 150 volts. These are not voltage "surges," so a so-called surge strip will do nothing to stop them from getting into your coach. But more on that later.

However, there are voltage "spikes" that can be induced on a power line from a variety of causes, the most dramatic one being a lightning strike near your area. That can cause a voltage "spike" of many hundreds or even thousands of volts to appear on your 120-volt wiring. Fortunately, that "spike" only lasts for a tiny fraction of a second (milliseconds) so it's pretty easy to get rid of with a simple MOV device (Metal Oxide Varistor) built into a common "surge" strip which shorts these high-voltage spikes harmlessly to ground.

But MOV devices (which looks like a nickel with wires attached to both sides) are sacrificial elements. That is, just like a boxer in the ring, all "hits" are accumulated and they'll eventually wear out and stop protecting your circuits from damage. Better "surge strips" have an indicator light to tell you if their MOV is still functioning or if it's time to get a new surge strip. These MOV's are not field replaceable unless you have a soldering iron and a meter, so don't try to fix one yourself.

The other common cause of voltage spikes are big motors being turned off, which then induces a reverse voltage spike of 10 to 100 times the nominal voltage. Again, these are short duration spikes of only a few milliseconds (1/1000 of a second) so a MOV protected "surge strip" will do a good job of shunting this voltage to ground without harm. I think the most common cause of this type of spike would be a big water pump at a campground when it switches off.

However, there's an even bigger electrical boogie man at campgrounds that many RVers are unaware of. And that's sustained over and under voltage conditions. This is where the voltage going into your coach from the power pedestal can dip very low (say, below 90 volts) or swing very high (180 volts or more) depending on the condition.

The low voltage condition is hard on appliances that need serious start-up current (like air conditioners) while the high-voltage condition is hard on electronics (like your computer, microwave electronics, and most everything else you plug in). And there have been instances where entire campground areas have been miswired with 208 volts instead of 120 volts. And certainly, a broken neutral connection in your 120/240 volt shore power plug can let the one side of your power dip to 60 volts while the other side raise to 180 volts with predictable disaster. In that case, the MOV in your surge strip will think that nothing is wrong and happily pass 180 volts right into your computer and microwave. Then it's new appliance time.

TO TAKE CARE OF THIS SITUATION, companies such as Progressive Industries build a voltage monitoring device which checks the incoming voltage for correct levels and will trip a relay to disconnect your coach from the power pedestal if it goes above or below a set limit. Those same voltage monitoring devices generally include a MOV "surge protector" which will get rid of the quick "spikes" that the relay can't act quickly enough to disconnect.

Checking around, the \$300 "surge" device you're probably referring to is a voltage monitor with disconnect relay that goes between the shore power plug and campsite pedestal. For instance the Progressive Industries EMS-PT30C has both surge protection from nearby lightning strikes and voltage protection from over and under voltage conditions as well as reversed polarity on miswired campsite pedestals and extension cords. It includes a readout that will display any power problems as well as notify you when your MOV devices need to be replaced. [See here to learn more.](#)

Progressive Industries also makes just a [surge protector for \\$99](#) that will stop the surge (voltage spike) caused by a lightning strike in the area or a water pump switching off. And it also includes monitoring lights to tell you if it's MOV circuits have been worn out by too many spikes. However, it can't shut off your power if the voltage swings below 90 or above 130 volts. In that case, your appliances could fry while the surge protector MOV sits there perfectly happy.

In either event, I talked to Tom Fanelli at Progressive industries about MOV replacement in their products, and he said they would replace the worn-out MOV devices in their products for free if you paid for shipping one-way to them. They'll then ship it back to you for free. That's a fantastic deal!

However, both of these aforementioned devices are WAY BETTER than the \$20 "surge strip" you may have your computer plugged into. These extension cord surge strips have smaller MOV devices, so they can only dissipate much smaller "surges" and often don't have an indicator light to tell you they're worn out. And they will do nothing to protect your inverters or built-in RV appliances.

I would get some sort of overall protector on the shore power connector. So do you spend \$99 on an RV "surge protector" or \$300 to \$500 on a "voltage protector"? Well, that's up to you. But considering that the cost of an RV refrigerator or microwave can be \$1,000 and up,



plus the cost of all the electrical things you plug in like computers, iPods, phone chargers, etc, I think the \$300 to \$500 of a voltage protector to be well worth the investment, and probably costs less than the deductible on your RV insurance policy.

And yes, there are a number of other manufacturers who make voltage protectors and surge protectors for RVs. But I've studied the Progressive Industries gear the most so I'm just more familiar with them. Perhaps I'll review a number of Voltage and Surge Protectors in a future article.

[Read more about RV electricity and safety issues.](#)

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