

Secondary Surge Arresters

Before starting the outline of what a secondary surge arrester is it may help your understanding of the proper use of these and limitations of such devices to read what SQUARE D prints on the package for one of their secondary surge Arresters.

“Designed to meet the requirements of NEC Article 280. Meets ANSI/IEEE Standard C62.11 for location Category C (Service Equipment). Helps protect electrical wiring and major appliances from damage caused by most sudden power surges that may be induced by lightning or utility switching transients.” *

* from: Cat. No. SDSA3650 SQUARE D COMPANY

Inside the package the installation instructions further state the following:

“This secondary surge arrester will protect most secondary distribution wiring systems against surge-related damage but may not protect solid state or electronic equipment from all lightning induced or other large power surges.” **

** from: Form 48040-989-02 REV. 4/93 SQUARE D COMPANY

What does the above tell you? More information may help you. When the power company installs the electrical service to your building they have normally built in primary surge arresters as part of their equipment. If you look up on the power line system you will see fused links and arresters. They do this to protect their equipment (transformers, etc.) from damage.

The installation of a “secondary surge arrester” more commonly known as a lightning arrester is required by electrical codes in most areas. These devices are usually a carbon block, gas tube or spark gap. The correct term for such devices is “crowbar” as they act like a short and by design short the surge to ground. This would be the perfect device if they could short all over voltage to ground. They do short the very high voltages to ground but what they do not do is short all the over voltage to ground.

Now lets look at the wording of the above statements to see what the manufacturer is telling you about their product. Several words should set off alarms when you think about the statements. “Helps protect” not protects electrical wiring and major appliances from damage..” “But may not protect solid state or electronic equipment....”. They are telling you to know the limits of protection the secondary surge arrester offers.

Secondary arresters are not tested nor do they claim to be TVSS devices. What they are is minimal service entrance protection for high voltage wiring and devices. We test both “secondary surge arrester” and TVSS devices and find the average pass voltage of a “secondary surge arrester” to be in well in excess of 2,000 - 3,000 volts when tested to the ANSI/IEEE B-3 impulse wave form. This is the same test as used by Underwriter’s Laboratories for the UL 1449 test when testing panel and other hardwire TVSS devices for high voltage (120 VAC and above).

The high pass voltage and very low energy rating of these devices should warn the user to use high quality main and sub panel TVSS devices behind the secondary surge arrester.

Secondary surge arresters offer minimal protection to almost any electrical or electronic device. Few if any electrical devices do not have “electronic” components. Today even hot water heaters and HVAC systems (Heating Ventilation Air Conditioning) have solid state controls. These control systems are much more efficient and less costly to produce. They offer more and better control to the consumer as well as a multitude of remote monitoring and control options.

If you are familiar with the energy control devices installed by Florida Power, Florida Power and Light and other utility companies you will understand the control aspect. With a small microprocessor located in your home the power company can control your HVAC system, water heater and swimming pool pump. When peak load demands exceed their ability to produce power they turn off your systems from a control point on their own electrical grid. This is electronic control of high voltage loads. Companies such as Taco Bell monitor and control the HVAC systems and other circuits in their restaurants by modem all over this country. These systems use sensitive computer chips to run high voltage systems. The benefit is less power consumption and a reduced bottom line to them. The down side can be damage to the control systems from surges and spikes on the power lines.

When you think about electrical systems today you can not escape solid state (microprocessor) controls. If you only protect a service entrance with a secondary surge arrester you are not protecting even the “high voltage” loads. Name 5 modern high voltage appliances or devices you could purchase for your own home that do not use some form of solid state control device or component. You will not find five and you will be hard pressed to name any.

The secondary surge arrester can be used as part of your power protection system. It is not the only device to be used but can act as the second line of defense after the power company installed arrester. These devices are being required by code more each day so you will see more of them installed. The key is don't stop your power protection plan with the installation of a secondary surge arrester.