



## Frequently Asked Questions - Meter Based Surge Protection Devices

### 1. What is a meter based surge protector?

A meter based SPD (Surge Protection Device) is a primary Type 1 listed protector for application/use in an IEEE category C operating environment. The IEEE location is defined as the area from the load side of the utility transformer to the main breaker located on the home.

#### A. Unit Description:

The product line is based upon a Meter-Treater patented design that has been deployed in the field since 1987; the current Meter-Treater products are offered in a number of configurations to meet industry needs. There is the basic or standard design and a low profile version both rated for single phase 200Amp service. Special models are available for 3 phase 200Amp continuous service and there is a class 320 model available for single phase applications.

#### B. Suppression Technology Employed:

All meter based SPDs employ large diameter MOVs (metal oxide varistors) as the surge suppression element. This technology has seen decades of use and has been field proven for performance and longevity. MOVs are cost-effective and provide the necessary reaction time and energy handling to protect the ac service entrance of the modern home. The MOVs in the meter based SPD react within nanoseconds and have a joule rating of 2000 joules per phase (for IEEE Category C).

### 2. How does the device work?

Basically, SPDs utilizing MOV technology will:

- Conduct when voltage is too high
- Send current where voltage is lower
- Divert, store or use the energy associated with the surge
- Divide surge energy among conductors
- Equalize voltage across conductors
- Keep voltage to equipment below immunity/survival levels of the equipment

*Note: Good grounding and bonding is required to realize optimum SPD performance. Grounding needs to be established per the guidelines of the NEC (National Electric Code).*

### 3. What makes the SPD device credible?

Surge Protectors are one of the most tested and controlled products in the electrical industry.

#### A. OSHA (Occupational Safety and Health Administration)

The U.S. Government mandates that all low voltage (under 1000 volts) surge protectors be tested and certified for purpose by a NRTL (Nationally Recognized Testing Laboratory). NRTLs are accredited and empowered to perform industry approved testing and upon successful completion an identifying stamp/logo is authorized to be placed on the product. The stamp/logo signifies to the market/consumer that the device has met the listing requirements of the certification process.



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### **B. ANSI/UL 1449**

The current industry test standard that all SPDs must meet (per OSHA) is the 4th Edition of ANSI/UL 1449. This is the standard that OSHA requires NRTLs to test to. The current version of the standard went into effect on March 17, 2016 and all products manufactured since that date are required to be tested and approved for purpose. As proof of this testing, all SPDs must be marked with the logo of the testing/approving NRTL.

### **C. NEC (National Electric Code)**

The NEC Article 285 states that SPDs below 1000 Volts shall be Listed for purpose.

### **4. Where does it install?**

The meter based SPD installs directly into the electric meter can. It goes across (in series) with the line (incoming) side terminals and the load (customer premise) side terminals. Installers simply remove the electric meter from service and insert the SPD. A ground pigtail must be attached then the installer reinserts the electric meter back into the can, replaces the cover, reinserts the electric meter and then places the seal. The process routinely takes about 15 to 20 minutes from start to finish.

*Note: All safety procedures should be followed when working with utility service voltages and only qualified personnel should perform an installation.*

Because there are always additional ingress point locations and/or internal transients it is recommended that point-of-use SPDs (plug-in devices) be used to protect products like TVs, DVR/DVD players, computers, printers, modems, low voltage lighting, security and irrigation systems. Other sensitive/costly products from golf carts to electric cars that use special 240V plugs may require custom SPDs.

### **5. Who does the installation?**

Installation of the meter based SPD should only be done by qualified personnel authorized and approved by the utility providing the electrical service.

### **6. Do Meter Base SPDs lower electric bills?**

No! There is currently no Meter Base SPD technology available on the market today that is capable of lowering an electric bill by as much as one cent.

### **7. What does the device protect against?**

Meter Based Surge Protectors protect against surges that come down utility power lines and enter a site at the ac service entrance. Surges or transients are a significant contributor to poor power quality. Surges increase the electrical stress on connected user equipment and appear in all applications involving electricity, no matter the source. The cumulative effect of repeated applications of small surges (or perhaps one large surge) may cause undesirable operation at best, and complete device failure at worst.



## Frequently Asked Questions - Meter Based Surge Protection Devices

### A. Transient Definition:

The IEEE (Institute of Electrical and Electronics Engineers) defines a transient surge as a spike in voltage that typically lasts for less than 1/60th of a second.

*To compare, a human blink is approximately 18/60th to 24/60th of a second. Therefore a transient surge occurs significantly faster than a blink of an eye.*

### B. Transient Sources:

- Lightning (indirect)
- Utility operations
- Poor wiring
- Load switching
- Magnetic coupling
- Accidents
- Intermittent shorts

## 8. What will it not protect against?

Almost every other power quality problem has been called a surge. However, surges can be created in conjunction with these events too.

Although SPDs will not stop the things listed in “a” through “c” below they can reduce the surge risks associated with them. In other words, the simple building and collapsing of an electric field (the turning on and off a light switch) will create a transient event. As an example the power goes off (a blackout) and then comes back on. Surges were created at both the off and on event. To have protected against the blackout you would need either an uninterruptable power system or a backup power system, however; you should still use a Surge Protector to take care of the surges associated with the event.

### A. Other power anomalies:

- Sags (undervoltages)
- Swells (overvoltages)
- Blackouts
- Harmonics
- RFI/EMI Noise

### B. Problem Faults:

- Supply Failures
- Transformer Failures
- Accidents (causing damage to or interruption of service)
- Faulty Structural Wiring and/or Poor Grounding and Bonding



## Frequently Asked Questions - Meter Based Surge Protection Devices

### C. Acts of God:

- Direct Lightning Strike
- Hurricanes
- Tornados
- Flooding

### D. Other ingress points (depends upon a structure's physical makeup):

- Telephone Systems
- Cable TV/Closed Circuit TV and/or Satellite Systems
- Irrigation Systems (Lawn Sprinklers)
- Pool Systems
- Well Pumps (includes submersibles)
- Secondary Buildings (Garages/Work Shops, Gazebos etc.)
- Security Systems (Fire/Burglar Alarms)
- Outdoor Lighting Systems
- Flag Poles (if lighted)
- Proximity to any other tall objects like trees etc.

### 9. Does it work with other protection devices/systems?

Yes! The Meter Based SPD will coordinate with all other power quality solutions from structural lightning protection systems to UPS (uninterruptable power systems) and plug-in protectors. All power quality products should be NRTL listed for specific function.

### 10. What happens if the device fails?

The SPD is fused and will simply disconnect from the service (without stopping power to the residence) and one or both of the RED indicator lights will extinguish (go out). In the unlikely event of this happening, the SPD will need to be replaced.

*Note: The protection present indicating light(s) for the SPD are RED not green. Red lights were chosen because they are significantly more identifiable in bright sunlight over a greater distance.*

### 11. What kind of warranty(s) are there?

The Meter Based SPD has a 15 year limited warranty for materials and workmanship. There is (subject to utility approval) an optional 15 year concurrent extended warranty for motor based equipment, including its associated control circuitry. Consult your utility for full warranty information.

### 12. Does use pose any risks to life/health or property?

No! With more than a quarter of a century of service and millions of circuits in the field there has never been an incident involving a life or health issue. However; with the severe and unpredictable nature of the weather there can be no assurances that damage from a direct lightning strike or other such event will not adversely impact a residence.



## Frequently Asked Questions - Meter Based Surge Protection Devices

### 13. What is the difference between this product and others on the market?

Meter based SPDs are uniquely designed products, unlike most other devices on the market, because they interface directly (in series) with the incoming power and install in the meter can. This enables them to intercept surges before they can ever enter the residence.

In addition, the Meter-Treater meter based SPD is a product of the USA and all levels of the production, testing and delivery process are tightly controlled.

### 14. Do insurance companies provide any discounts for use?

Unknown! It is best to check with your own underwriter for clarification.

### 15. Are there independent sources that qualify/recommend the application of this product?

- A. NIST (National Institute of Standards and Testing)
- B. IEEE (Institute of Electrical and Electronics Engineers)
- C. Insurance Underwriters (i.e. State Farm etc.)

### 16. Are there specific performance parameters that need to be considered?

The design, performance and safety of today's SPDs are pretty much defined by the ANSI/UL 1449 standard. If the product is listed for purpose then it will meet the requirements for the operating environment and will provide protection to the residence.

However, what is important is how much energy the SPD can handle (in amps) and what is its voltage protection rating (VPR). Both of these values are required to be placed on the SPD's label.

### 17. What are the sources or causes of surges generated inside the home?

Surge sources inside the home are:

- HVAC cycling on and off
- Motors: Refrigerators, Garbage Disposals, Hair Dryers, Garage Doors, Fans, Pumps etc.
- Power Tools

These internal surge sources are why it is so critical to install secondary (point-of-use) surge protectors throughout the residence. Even if there is nothing plugged into the secondary device it will provide general protection if it is securely installed into a properly wired NEMA wall receptacle.



## Frequently Asked Questions - Meter Based Surge Protection Devices

### **18. Are there specific items or systems in the home that should be protected with additional SPD products?**

The following items represent a significant investment and/or are critical in their functionality and should have applicable point-of-use protection devices applied:

- Electric Car And/or Golf Cart Charging Systems/Stations
- Home Security Systems (including remote access/gate controls)
- Swimming Pool Controls and Pumps
- Irrigation Systems
- Submersible Pumps
- Elevators and Handicap Stair Climbing Systems
- Any remote buildings containing valuable equipment
- Important Home Office Systems And/or Networks
- Satellite and Antenna Systems
- Communication (telephone) Systems
- Entertainment And Gaming Systems
- Electromechanical Exercise Equipment
- Specialized Culinary Equipment
- Specialized Power Tools and Hobby Equipment

Home medical equipment and systems should only be protected in accordance with the directions/guidelines of the manufacturer/supplier.

### **19. Are there other types of SPDs that can be used as a primary protection device?**

Yes! Primary, Type 1, protectors can be configured for parallel installation at the meter can and can be made available through your servicing power company.

### **20. What is the real purpose of a primary SPD device?**

Homes today are network environments where all kinds of electromechanical devices have to share a common ground and, in many cases, interact with other types of equipment. In order to prevent high magnitude surge currents from entering a home's electrical wiring it is necessary to install SPD devices at the power entrance to the home.

The SPD at the service entrance is your first line of defense against these disruptive and damaging surges that couple on to power lines and flow directly into the home. Like the seatbelt in your car it is there to lower risk and minimize damage. It is not a one product does all kind of device.

The effectiveness of the primary SPD is subject to many variables including the quality of installation, the integrity of the ground, the capabilities of the device and the types and severity of the event(s). For these reasons, and because there are other ingress points and surge generators inside the home, it is recommended that secondary protection be used throughout the home's network environment.