

Today's HVAC equipment is more susceptible to power issues than equipment produced 10 years ago. Why is this? The best answer is the use of sophisticated electronics coupled with the increased frequency and severity of storms. Couple this with issues created by the power generation companies such as rolling brown outs and you have the recipe for disaster with new equipment. Also, other equipment in a home, condo or apartment can create power issues such as surges and transients upon start up and shut down. Power issues can be transmitted through power lines to the home and also may be created by other equipment and appliances in the home.



Why does HVAC/R equipment require protection from power spikes, surges and transients? Isn't that protection designed into the equipment? Some minimal protection may be part of the design but all components are still at risk. Some of the most sensitive components are control boards, ECM motors and inverters in Mini-Split systems.

So why add a surge suppression device?

As an example, when we purchase a new computer we all buy a power surge strip to protect our investment so why aren't we doing the same for our HVAC equipment? After all, the same chips and processors in our P.C. are now being utilized in HVAC equipment to provide increased functionality, efficiency and allow systems to communicate.

The MARS Surge Suppression Device is designed to protect all connected equipment in your HVAC/R system. This includes motors, compressors, electromechanical devices, sensors and control boards. Some Surge Suppressors only cover electro-mechanical devices such as motors so you want make sure you are getting a device capable of protecting all components. The MARS Surge Protective Device carries a three year product warranty as well as \$7,500 connected device coverage.

How does a Surge Protection Device (SPD) work? A surge device absorbs surges, spikes and transients through the use of metal oxide varistors (MOV) and dissipates them as heat and shunts them to ground. During this process the MOV can get warm and in some cases a thermal failure

can occur if the spike is significant. Some thermal failures can present a danger to the homeowner and structure.

MARS surge devices use a patented TPMOV (Thermally Protected MOV). The thermal protection eliminates potentially dangerous thermal failures.

How do you know the SPD is working? A green LED on the device indicates the device is operational.

Where are Surge Suppression Devices installed? Typically they are connected to the external disconnect box for compressors, heat pumps and mini-split units. For indoor furnace or air handler protection they are installed at the disconnect switch. MARS SPD's are type 1 and 2 approved which means they can be installed on the line or load side for ease of wiring. The MARS unit can be installed on 120V and 240V systems. Always refer to the included wiring instructions and follow safety instructions.

## Technical Terms

- MOV – Metal Oxide Varistor – Susceptible to destructive thermal failure.
- TPMOV – Thermally Protected Metal Oxide Varistor. Disconnects prior to thermal failure.
- U.L. 1449 3rd Edition – Covers all Surge Suppression Devices and outline performance and safety requirements.
- Surge Arrestor – A term that is no longer relevant. Sure Suppression Device is the current term used in accordance with U.L. 1449 3rd edition.
- **Type 1 SPD**  
Devices previously known as Secondary Surge Arresters, Type 1 SPDs are permanently connected devices intended for installation between the secondary of the service transformer and the line side of the main service breaker, but are also suitable for installation on the load side as well. Type 1 SPDs are designed and rated to be installed without the requirement for an external overcurrent protective device.
- **Type 2 SPD**  
Devices previously known as Transient Voltage Surge Suppressors, Type 2 SPDs are permanently connected devices intended for installation on the load side of the main service breaker; including SPDs located at the branch panel.