



APPLICATION NOTES FOR USE WITH SPELLMAN HIGH VOLTAGE POWER SUPPLIES

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Arc Intervention Circuitry and External Series Limiting Resistors

Spellman's power supplies that have arc intervention features sense arc currents via a fast acting current sense transformer in the low end return of the multiplier circuitry. This circuitry converts the actual measured short circuit discharge current to a proportional voltage signal and then level sensing is done to determine when an arc has occurred.

Discrimination must be performed to prevent typical multiplier charging currents from setting off the arc detection circuitry which could prevent normal operation. The purpose of the arc intervention circuitry is to prevent damage to the power supplies output limiting resistors due to continuous, long term arcing. Our arc detection circuitry is not a sophisticated, precision circuit; nor is it designed or intended to sense every possible arcing event.

Series limiting resistors in the multiplier assembly limit short circuit discharge currents to safe and predictable levels. Knowing what these levels are the trip point for the arc detection circuitry can be set by Spellman that will protect the power supply from excessive arcing, while allowing normal power supply functionality.

If a large customer provided external limiting resistor is placed in series with the power supply output it may effectively render the arc intervention circuitry unable to detect an arc. This is due to the fact that short circuit discharge currents may be dramatically reduced below the detection threshold due to the external limiting resistor.

From the power supplies standpoint this is typically a beneficial situation as it reduces the stress on our internal short circuit limiting resistors, the very thing we are trying to protect with the arc intervention circuitry. Short circuit discharge currents are lowered, power dissipation in the internal output limiters are reduced ...customer provided external short circuit limiting is typically a good thing from the power supplies perspective.

There are some unique conditions where the continuous arc discharge rate required for a particular application far exceeds the capability of the high voltage power supplies design. In these situations a customer provided external limiting resistor may be a viable solution to this problem. Spellman can even configure a custom supply to regulate on the "far side" or output node of the customer provided external limiting resistor, effectively canceling out any voltage drop.

If your application requires unique arc intervention capability beyond the ability of a standard unit, please discuss your requirements with Spellman to see what hardware solutions we can provide.