APPLICATION NOTES FOR USE WITH SPELLMAN HIGH VOLTAGE POWER SUPPLIES

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Environmental Considerations for Spellman High Voltage Power Supplies, X-Ray Generators and Monoblock® X-Ray Sources

Spellman's product data sheets have a specification listing titled "Environmental". This is where the products operating temperature, storage temperature and humidity are listed. These specifications if followed should prevent environment matters from becoming a concern. However, we'd like to expand upon a couple of related environment topics that may benefit the users of our equipment.

Keeping It Cool with Adequate Air Intake and Air Exhaust

Many of Spellman's high voltage power supplies, X-Ray generators and Monoblock® X-Ray sources utilize forced air cooling by self-contained fans. These internal fans provide the required air exchange needed to keep the unit cool during operation. It is important that the air intake perforations in the units' sheet metal enclosure and the air exhaust perforations and/or fan assembly exhaust vent guard are not blocked or obstructed. Free and unobstructed air flow in and out of the unit is required for proper operation.

Racks: Cool Air Intake Through Side Panels, Hot Exhaust Out the Rear Panel

Many of Spellman's "rack" style high voltage power supplies and X-Ray generators have a standardized air flow pattern to facilitate mounting in cabinet enclosures. Most units draw cool air in via air intake perforations on the forward half of the side panels of the rack assembly. Most units exhaust hot air out (by an internal fan) via rear panel perforations in the sheet metal, or by a rear panel mounted exhaust fan.

Prevent Recirculation of Air When Mounting Rack Units in Cabinets

When mounting one or multiple Spellman "rack" type high voltage power supplies and/or X-Ray generators in a cabinet it is important to prevent recirculation of air inside the cabinet enclosure. Recirculation would be defined as hot exhaust air from the rear panel of the unit finding its way back into the cool air intake perforations on the side panels of the unit. To prevent recirculation of air a baffle may be required to physically isolate cool air intake and hot air exhaust. In some situations, a cabinet mount exhaust fan might be required to provide the need air flow. Occasionally both a baffle and exhaust fan may be required to obtain the necessary airflow when multiple units are mounted in a cabinet enclosure.

Operating Power Supplies in Dusty and/or Contaminated, Unregulated Environments

Virtually all products Spellman manufactures and sells are intended for use in what we would informally call a “regulated office like” environment. We’re assuming the operational temperature and humidity specifications will be followed as per the data sheet. In addition, we’re expecting the units to be operated in a regulated office like environment, free from excessive dust/contamination by dry particles or chemical vapors found in various industrial processes. Over the years Spellman has worked with customers with these kinds of unfavorable local environmental situations and have recommended two solutions. The first is relocating the unit to a more “regulated environment”, that is taking the unit out of the unfavorable environment. This might require the use of a longer high voltage cable that could potentially be problematic:

https://www.spellmanhv.com/en/Technical-Resources/Application-Notes-HVPS/AN-19

The second solution is locally isolating the unit from the problematic environment via the use of a sealed air-conditioned cabinet. Although this might seem a bit dramatic and costly, we’ve seen this fix “save the day” in several nasty industrial situations.

Summary

Provide your high voltage power supplies, X-Ray generators and Monoblock® X-Ray sources favorable ambient environments and you will be rewarded with years of trouble-free operation.