

## AC Power Switching with Air-Gap Relays vs. Solid-State Relays

By Shaun Johnson

Facilities with entertainment and architectural light “dimmer control systems” have been trending towards smaller more efficient lighting sources in recent years. The reasons are numerous and range from decreasing their lighting power costs and reducing their HVAC cooling requirements to utilizing newer lighting technologies such as LED’s.

Many of these newer technology lighting fixtures tend to require and are typically designed for “pure” sinusoidal AC power. Attempting to provide “full power” to such devices via existing SCR/SSR dimmers can result in either damage to the fixture and/or substantially reduced fixture life spans, not to mention a voided warranty depending on the manufacturer and resulting fixture damage.

Some facilities with existing SCR/SSR dimming systems have attempted to “by-pass” their dimmers in an attempt to provide this “pure” 100% AC power. This has traditionally had numerous shortcomings including:

1. Loss of circuit control (no DMX control) if the SCR/SSR had been “by-passed”.
2. If the “by-pass” did not include removal of the dimmer’s choke, numerous other issues can result due to the current lag that results from such a large inductor connected in series with the power line.
3. No visual indication of knowing when a given dimmer/circuit is “live” or energized.
4. Voiding the original safety approval that particular dimmer was designed to operate under.

**JOHNSON SYSTEMS INC.** (JSI) now offers a range of Non-Dim Relay Relay retrofit products for existing popular dimmer racks. Stand-alone products such as our J-PACK Relay offer a unique 6 Channel Hi-Power Non-Dim relay pack capable of switching up to 9000 Watts. The J-PACK’s provide pure AC sinusoidal Non-Dim power control to modern loads that can be controlled via DMX, Ethernet and other modern communication protocols. Additional benefits of our relay products include:

1. Higher inrush surge current capacity than SCR/SSR dimmers with a greater tolerance for damaging short-circuits.
2. Fully rated circuit protection via premium UL489 rated magnetic breakers.
3. Onboard hi-speed microprocessor that permits precise switching and visual indication of a “live circuit” via face mounted blue LED indicators.
4. “Air-Gap” relays are 250% rated for continuous current and spec’d at 1 million operations at 277 VAC. Each relay also has an easily accessible manual over-ride switch permitting ease of “by-pass”.
5. In the “OFF” state there are no idle currents associated as there are with solid-state devices. Additionally, relay power switching is much more efficient than solid-state switching and results in significantly less heat produced and consequently reduced HVAC cooling requirements of the facility.
6. Power Modules and J-PACK Relay Packs are ETL Listed and designed specifically for the application.
7. J-PACK Relay Packs are available in a multitude of voltages and mounting options.

For more information on J-PACK Relay Pack, [click here](#).

For more information on Retrofit Power Modules, [click here](#).