The *Salamander* News

October 2002 Vol. 10 No. 10

You are in Control

(Control of your SCR power control source)

Silicon-Controlled Rectifiers, or SCRs, are making a fast name for themselves as the best choice for controlling infrared heat. And the number and choices of these solid-state switching devices is growing equally as fast. There are so many manufactures, and options available that it may be confusing to customers as to which one is right for their particular application. Mor Electric Heating carries a wide variety, and this article is intended to clarify those that have proven most effective for use with *Salamander* Ceramic Heaters, and the differences between them.

SCRs are the chosen replacement for mechanical relays, mercury contactors, and solid-state relays. Unlike the mechanical relays, they have no moving parts to wear out or be affected by dirt or dust. Mercury contactors, though faster than mechanical relays, have limitations on cycling speed and can easily be overloaded, allowing the potential for explosion. They are also regarded as hazardous material so shipping and disposing of them is becoming increasingly difficult. Solid-state relays are not effective with higher power levels and often lack voltage protection for safe operation. They are also rated at a much lower operating temperature than SCRs.

There are three ways SCRs can deliver power to ceramic heaters: on/off control, zero-voltage switching, and phase-angle fired. On/off controls function similarly to mechanical or mercury relays but with the advantage of faster cycle times. Zero-voltage switching turn on and off with each full cycle. By using a variable time base the optimum number of cycles can be achieved. Phase-angle is the most precise method of control. They turn on a percentage of each power line half-cycle, giving a smooth application of power to the heaters.

It really doesn't take much to switch *Salamander* heaters, and the majority of our customers opt to use a basic Solid State Relay (SSR) or "hockey pucks" as they are casually referred. The need to move into zero-voltage switching and phase-angle fired is determined by the amount of precision needed in the application and the price the customer is willing to spend. These more advanced methods of control can actually be custom designed to include heat sinks, fuses, fans, voltage monitors, etc;

Keep in mind that as the price goes up so does the efficiency, and we have had many customers happy to report that though they spent more money on the SCR they received a return on their investment by having a more economical, energy savings system.

If this has convinced you that you would like to "take control" of your application, study the products on the other side offered by Mor Electric. They are listed in order of precision, variety and price to help you understand the differences between them and how to make the best decision.

Continued on back . . . .

Crydom

Crydom is one of the biggest names in Solid State Relays providing an inexpensive SSR (hockey puck) control as pictured. Crydom's extensive range of SSRs, from 1 Amp to 150 Amps, in industry-standard designs and mounting options, are standard factory stocked products.

HBControls

HBControls provides value added controls using Crydom components. They have developed a family of solid state relay and heat sink assemblies which include a convenient DIN rail mounting configuration, (as pictured), finger-safe covers and utilize the highest quality relays available.

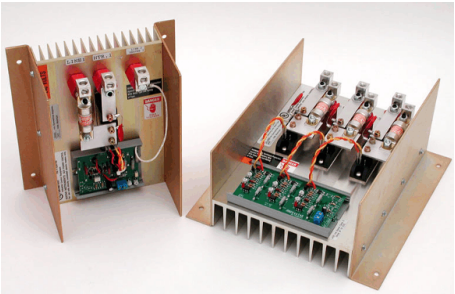
Payne

A niche control product for Payne is a pre-packaged, low amperage, benchtop, portable, plug-in model. Payne also offers power control products for process heating applications with solid state power switching technology from 10 amps to 1650 amps, single and three phase, 120vac to 600vac.

Avatar

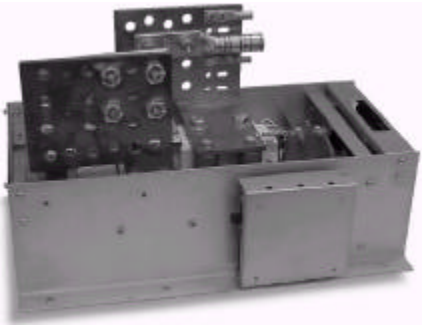
Avatar can ship custom controls the same day as well as delivery from stock. Their high quality, rugged power controls are industry proven and are competitively priced. Avatar builds custom controllers and provides options to the standard product line. They provide high performance proportional controls for industrial electric heaters, offering the following:

- 10 - 600 Amp
- 24-600 volt
- Single or three phase
- UL Listed.



Chromalox

Chromalox recently introduced a family of MaxPac Controllers. They have a broad product line, most of which is in stock. Chromalox, being a full line manufacturer, is the best vendor to provide complete custom designed control systems.



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