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Frequently Asked Questions

1. How does an SCR power controller work?

Phase angle controllers work like a light dimmer. The load voltage is varied by varying the time within each electrical half-cycle during which voltage is applied to the load.

Zero-cross is analogous to a very fast contactor that "makes" only at the beginning of each electrical half-cycle and always "breaks" at the end of the electrical half-cycle.

2. When should phase angle be used and when should zero-cross be used?

Phase angle can be used to control all loads. Phase angle must be used to power transformer coupled loads and fast heating loads like infrared lamps.

Zero-cross has the advantages of being lower in price, slightly more reliable and generates substantially less harmonics than phase angle controllers.

3. What are the advantages of SCR controllers verses mechanical contactors?

- Infinite resolution
- No inherent wear out modes
- Often less expensive
- Voltage compensation, current limiting and over current trip are often in the SCR controller design.

4. How should a controller be fused?

Control Concepts recommends that a class "T" fuse be used to protect the SCR. Control Concepts has found that the class T fuse is an excellent compromise between protection and premature fuse failure.

5. How much heat does the SCR controller generate?

Approximately 1.2 watt's per amp switched per power line controlled by an SCR.



6. What command signals will the SCR controllers operate on?

All of the commonly available command signals of the various temperature controllers and PLC outputs such as; analog signals 4-20mA, 0-5Vdc, 0-10Vdc, Potentiometer and on/off 3-32Vdc, 0-24Vdc, 0-120Vac or 0-240Vac.

Other command signals can be ordered to match with older control signals like 2-12mA, 12-20mA, 1.2-6Vdc.

7. Can I put parallel loads on one controller?

In most cases yes, as long as the total load current is not more than the SCR controller is rated to handle.

8. What size of fuse should I use on a 30-amp single-phase load?

Size the fuses to be 25% over the full load current. In this case, fuse the SCR controller at 40 Amps with a very fast fuse, "Type T" or faster.

9. Do controllers generate harmonics on the electrical lines?

- Yes they do generate harmonics on the power lines.
- A zero cross controller generates most of its harmonics below 50/60 cycles.
- Phase angle controllers generate harmonics above 50/60 cycles with the largest distortions at 3rd, 5th & 7th harmonics for single phase controllers. For three phase controllers, the third, and multiples of the third, are not created.

10. What are the effects of harmonics and should I be concerned?

Harmonics can cause overheating of inductive equipment, such as transformers, motors, etc. However, actual occurrences of this problem from harmonics are essentially non-existent.

11. Are the controllers listed or recognized by a national testing lab?

Most controllers manufactured by Control Concepts have been tested by Underwriters Labs to UL and CSA standards and carry the UL and CUL marking.

12. How do I derate Control Concepts, Inc SCR power control?

While derating is necessary with most manufacturer's controllers, starting at as little as 25 degrees C (room temperature), our controllers are rated at 55 degrees C (130 degrees F). So in most cases, no derating is required. Consider the cost savings: with many controllers, in order to control 120 amps at 55 degree C, you would need to order a 200 amp controller (because of their derating curve). With power controllers from Control Concepts (www.ccipower.com), you can order a 120 amp controller and actually control 120 amps.