



REDKOH INDUSTRIES

Switch Mode Power Supply Frequently Asked Questions

How Does Switch Mode Power Supply Technology Work?

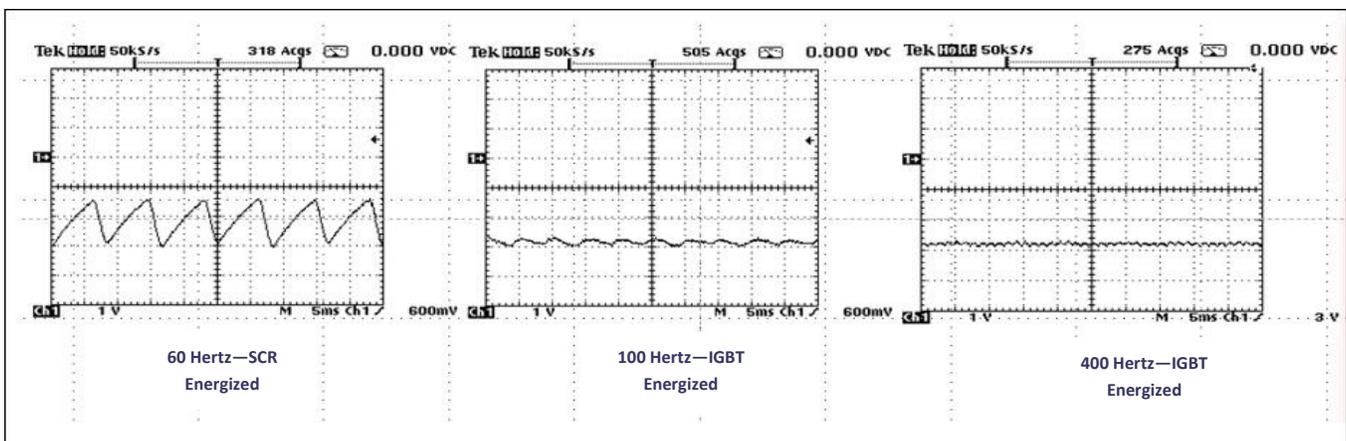
A single phase or three phase AC main power source is fed into a rectifier and filter combination to create a relatively smooth DC power source. The use of an alternate single-phase feed requires additional components for filtering, yet is still viable within existing cabinets. This DC source is then fed into an Integrated Gate Bipolar Transistor (IGBT) full wave bridge circuit where it is converted into a variable frequency AC waveform.

Can I Use My Existing TR Set?

The SMPS output frequency AC source created by the control circuit can be fed into an existing electrostatic precipitator transformer rectifier. In most applications the existing transformer and rectifier system can easily accommodate a feed frequency of up to 1000 Hz without a detrimental effect.

How Will SMPS Affect Collection Efficiency of a Precipitator?

The frequency of the DC voltage to the ESP has been increased from 60 Hz to between 100 and 400 Hz, the ripple voltage is only 5% to 10% of the DC voltage level. With 60 Hz, the ripple voltage can be 35-40%. Because the ripple voltage is less, the ESP can be operated at a much higher average voltage before flashover occurs. An increase in voltage should result in an increase in ESP collection efficiency, and decrease in outlet emissions.



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What Is The Advantage of IGBT Technology, Compared to SCR's?

Unlike SCRs that depend upon the natural zero crossing of 60 Hz feed signal to turn off, IGBT control permits instantaneous (micro-second) turn off. This ability provides the means for drastically reducing the energy delivered to the ESP during sparking and arcing and thus should reduce internal component erosion and insulator tracking.

What Does a Typical Retrofit Set Consist of?

The Redkoh system can be retrofit to a precipitator electrical field through the use of existing control cabinets and existing TR's. Retrofit applications of the Redkoh system also typically permit the reuse of control cabinet components such as: circuit breakers, contactors, PT's, CT's and control wiring.

The installation involves the removal of the 60 Hz SCR assembly and replacement with the Redkoh SMPS switch module. The SMPS module is assembled on a steel panel that occupies roughly the same space as an existing SCR control. Mounted on a common heat sink are the rectifiers, the filter assembly, IGBT modules, and IGBT gate drivers.

Are Demonstration Units Available?

Yes, Redkoh has designed and patented a "Demo Cart," to prove the significant performance improvements due to Redkoh's Mid-Frequency Switch Mode Power Supply. The Demo cart is housed in a NEMA enclosure and is on wheels to allow it to be easily moved into place. Internal to the enclosure are all the components, pre-wired for the control of up to two conventional 60 Hz TRs.



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