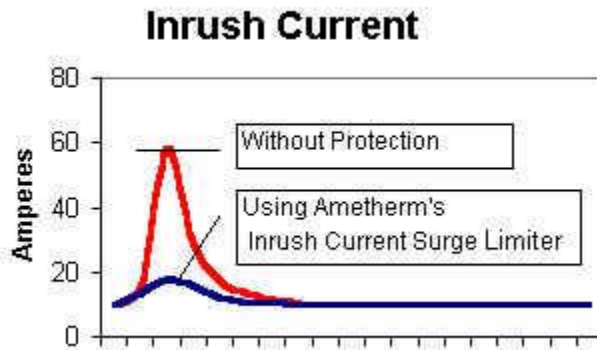


Inrush Current

Switching power supplies, AC motors, and lighting ballasts can develop extremely high peak inrush currents at t on unless inrush current protection is used. Without protection, the only limits on the amount of inrush current drawn is the line impedance, input rectifier drop, and capacitor equivalent series resistance.



High inrush current can affect electrical systems by tripping fuses and circuit breakers unnecessarily. If inrush current protection is not in place, relays and fuses must be used that are rated higher than any possible inrush current. Inrush current can also cause pitted contacts on switches and relays due to the arcing of the contacts.

Inrush current can be as high as 100 times the normal steady state current and normally lasts for less than 1/2 a normal 60 hertz cycle.

Inrush Current Protection

Inrush current protection can be provided by an active circuit that uses a combination of power resistors, thyristors, and triacs. Active circuits are generally expensive and difficult to design. Another option for inrush current protection is an NTC thermistor. Ametherm manufactures a special type of NTC thermistor designed specifically for inrush current protection called Inrush Current Limiters.

It is estimated that 90% of inrush current limiting applications use inrush current Limiters. Circuits using Inrush Current Limiters are easy to design and are inexpensive compared to active circuits. A Inrush Current Limiter is used in series with the line voltage. At turn on, it presents a high resistance to inrush current and quickly removes itself from the circuit allowing the electrical system to behave normally.