

What is Inrush Current?

When switching on solid state equipment such as computers, copiers, and electronic ballasts found in lighting systems, as well as magnetic devices like motors, drives, and core & coil ballasts, peak inrush currents can be several orders of magnitude greater than the circuit's steady state current. It can be as high as 20 times normal operating current. Usually this inrush is reduced after 10ms, but could take up to 30 to 40 cycles until the current is at a normal value.

Switching power supplies produce high inrush current at turn on, resulting from filter capacitor impedance. These large filter capacitors act like a short circuit, producing an immediate inrush surge current with a fast rise time.

What are the effects of Inrush Current: Inrush current can affect electrical components such as tripping circuit breakers and fuses. During startup, momentary contact bouncing in switches or relays may cause the contacts to become pitted due to arcing between the contact points. This surge in current can also cause serious damage, such as welding switch contacts together.

Measuring of Inrush Current: Measuring this high startup current is important to determine the proper corrective equipment to install, such as surge limiters, soft start devices or simply increasing wire size.

Meter Selection: Clamp-on meters are the product of choice by most electricians, maintenance and field technicians to detect inrush current.



When selecting a meter of this type, the important specs to look at is the peak capture time or transient response time and whether it has a peak hold function. Several meters on the market today claim to measure inrush but have response times of 100ms or longer. Most, if not the entire, inrush current has dissipated by the time these meters even begin to see it.

AEMC has three clamp-on meters that are well suited to measure inrush current. The Model 511, 512 (TRMS), and 514 (TRMS) have a peak

measurement time of 1ms. This is ten times faster than typical inrush current duration. They also measure up to 1000A giving them plenty of headroom for inrush current measurement. The hold function lets the user review the min, max and peak values.

These are important points to bring out in your presentations to end-users. They make these meters the clear choice for this application.



Models 511, 512 & 514

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