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Technical note 101,

Low current temporary services and AFCI testing

Detection of arcing faults requires the recognition of particular current signatures in a branch circuit. Arcing faults will draw instantaneous currents up to what a service can deliver to a circuit, in many cases 100 plus amps. An arc fault breaker will recognize these currents as a problem and interrupt the current flow before a standard thermo-magnetic breaker could react.

A nation wide study of residential services indicated that 80 amps is the minimum current available in any installed service. UL therefore established a 75 amp minimum arcing current sense requirement for arc fault circuit breakers. This is above nuisance trip currents, yet below the 80 amp minimum service.

The ARC SMART units test arc fault breakers by simulating an arc fault condition. This condition is simulated by a pulsed resistive load of 1.07 ohms. A 120 VAC 200 amp service will therefore generate 112 amp pulses. An 80 amp service will generate 77 amp pulses that are adequate to trip arc fault breakers.

At new construction sites, many times a 5 kw generator is used to provide temporary power, with a 40 amp capability, this is not enough capacity to trip arc fault breakers reliably. The test button on the breaker will trip the breaker, but a simulated arc may not.

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