

Amp Rating and Interrupting Rating

Slash voltage devices are limited in application to solidly grounded, wye systems due to the nature of the way that these devices are tested, listed and labeled. Any piece of equipment that utilizes a slash voltage rated overcurrent protective device is therefore, limited to installation only in a solidly grounded, wye system and should require marking that notes this limitation.

Equipment that utilizes straight voltage rated overcurrent protective devices provides more value and utilization to the owner or potential future owners than equipment that utilizes slash voltage rated devices. In today's business environment, machinery and equipment may be moved several times during its useful life. Equipment utilizing slash voltage rated overcurrent devices is not suitable for many electrical systems found in industrial environments.

Amp Rating

Every fuse has a specific amp rating. In selecting the amp rating of a fuse, consideration must be given to the type of load and code requirements. The amp rating of a fuse normally should not exceed the current carrying capacity of the circuit. For instance, if a conductor is rated to carry 20A, a 20A fuse is the largest that should be used. However, there are some specific circumstances in which the amp rating is permitted to be greater than the current carrying capacity of the circuit. A typical example is motor circuits; dual-element fuses generally are permitted to be sized up to 175% and non-time-delay fuses up to 300% of the motor full-load amps. As a rule, the amp rating of a fuse and switch combination should be selected at 125% of the continuous load current (this usually corresponds to the circuit capacity, which is also selected at 125% of the load current). There are exceptions, such as when the fuse-switch combination is approved for continuous operation at 100% of its rating.

Testing Knife-Blade Fuses

A common practice when electricians are testing fuses is to touch the end caps of the fuse with their probes. Contrary to popular belief, fuse manufacturers do not generally design their knife-blade fuses to have electrically energized fuse caps during normal fuse operation. Electrical inclusion of the caps into the circuit occurs as a result of the coincidental mechanical contact between the fuse cap and terminal extending through it. In most brands of knife-blade fuses, this mechanical contact is not guaranteed; therefore, electrical contact is not guaranteed. Thus, a resistance reading taken across the fuse caps is not indicative of whether or not the fuse is open.

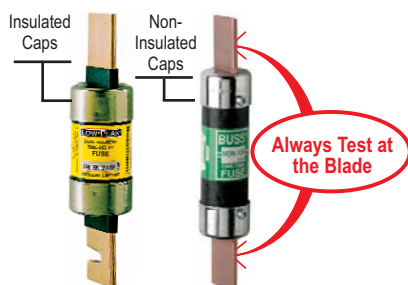
In a continuing effort to promote safer work environments, Cooper Bussmann has introduced newly designed versions of knife-blade Fusetron® fuses (Class RK5) and knife-blade Low-Peak fuses (Class RK1) for some of the amp ratings. The improvement is that the end caps are insulated to reduce the possibility of accidental contact with a live part. With these improved fuses, the informed electrician knows that the end caps are isolated. With older style non-insulated end caps, the electrician doesn't really know if the fuse is "hot" or not. A portion of all testing-related injuries could be avoided by proper testing procedures. Cooper Bussmann hopes to reduce such injuries by informing electricians of proper procedures.



This photograph vividly illustrates the effects of overcurrents on electrical components when protective devices are not sized to the amp rating of the component.

Interrupting Rating

A protective device must be able to withstand the destructive energy of short-circuit currents. If a fault current exceeds a level beyond the capability of the protective device, the device may actually rupture, causing additional damage. Thus, it is important when applying a fuse or circuit breaker to use one which can sustain the largest potential short-circuit currents. The rating which defines the capacity of a protective device to maintain its integrity when reacting to fault currents is termed its "interrupting rating". The interrupting rating of most branch-circuit, molded case, circuit breakers typically used in residential service entrance panels is 10,000A. (Please note that a molded case circuit breaker's interrupting capacity will typically be lower than its interrupting rating.) Larger, more expensive circuit breakers may have interrupting ratings of 14,000A or higher. In contrast, most modern, current-limiting fuses have an interrupting rating of 200,000 or 300,000A and are commonly used to protect the lower rated circuit breakers. The National Electrical Code® 110.9, requires equipment intended to break current at fault levels to have an interrupting rating sufficient for the current that must be interrupted. The subjects of interrupting rating and interrupting capacity are treated later in more detail.



A continuity test across any knife-blade fuse should be taken ONLY along the fuse blades. Do NOT test a knife-blade fuse with meter probes to the fuse caps.