

New circuit protection: Arc Fault Interrupters

Last Updated: Tuesday, May 4th, 2010, Created: Monday, January 15th, 2001

Fuses and circuit breakers will stop the electricity in a wire when the load is excessive or there is a short circuit. They prevent overheating of wires from too much electricity trying to flow through a wire that is not large enough to handle it. Ground fault interrupters (GFI or GFCI) were a major advancement in electrical protection. These devices detect any imbalance in electrical flow, such as when electricity goes down one wire, but rather than coming back the other wire, goes off somewhere else, like through a human. They are so good at preventing shocks that they are now required in all high moisture areas, like outdoors and in bathrooms. But there has been one other electrical problem that there was no device to protect against until now -- ?arc fault?. An arc fault is a little spark between two wires caused by scraped insulation, by a staple too tight to the wire, by a nail just barely striking a wire when you hang a picture on the wall, or any other sparking that does not cause a short circuit. If the spark is major, the circuit breaker will sense an overload and cut the current. But a large number of house fires are started by small sparks that can start a simmering fire, and until now there was no device to detect these arc faults. The graphic shows the test we used on the show -- a spark that did not trip the standard breaker but did trip the Arc Fault Detector. The only way to detect this problem is to have a small computer chip continuously studying the nature of the electrical current. Sparks give off an electrical "signature", and after a lot of research and development, the electrical companies have managed to design a device that can detect this problem and that can be made in a small enough package to fit into your mains box in the place of a regular circuit breaker. It works, but the problem is that it is expensive. A regular circuit breaker could cost \$7-\$8 whereas presently an arc fault detector will cost over \$50. So the code bodies agreed to help the development of this essential safety device by requiring the use of a minimum number of arc fault detectors in new housing as of 2002. That should get the production volume up, and the cost down. Presently an arc fault interrupter is also a circuit breaker, fulfilling both functions. Soon they will have out a combined arc fault detector, circuit breaker and ground fault interrupter in a single package selling for less than the current GFI detectors. In my opinion, safety conscious people should consider investing in replacing all the circuit breakers in their homes with arc fault detectors. Someday that will be the norm, but then again, as they sell more, the price will go down. Anyone with aluminum wiring should consider a conversion to Arc Fault Interrupters immediately as this technology completely solves the problem of aluminum wiring's heat build-up from long term low level sparking. Remember that all electrical work requires a permit; and while some provinces allow homeowners to do their own electrical work, others require that licensed electricians carry out all electrical work. Click here for information on the LEGALITY OF DIY ELECTRICAL WORK.

Keywords:

Aluminum, Arc Fault, Circuit Breakers, Circuits, Electrical, Fire, GFI, Ground, House, Housing, Insulation, Moisture, Outdoors, Protection, Safety, Wire, Wiring