

Detecting DC Current Leakage to Earth

Detecting low level AC current without adding a physical connection and added burden to the circuit is relatively easy, and quite common. In North America, all electrical outlets mounted in wet environments are required by codes to be protected with ground fault circuit interrupters; since the adoption of this requirement countless lives have been saved by turning off the power if a very small fault to earth is detected. If AC current of 5 to 7mA passes to ground, a circuit breaker or the contacts in the power receptacle open before electrocution can occur. Similar methods are used with higher shut-off levels for decorative fountains, pools and other locations. Most electrical heating elements must also be protected to keep equipment from damage in the event of a fault.

Trying to detect the same fault condition in a DC circuit with a floating ground is not as easy. With the proliferation of photovoltaic panels and other "alternative" power sources, the need for ground fault detection in DC powered systems is apparent. Some methods have been utilized, most requiring the measurement of the voltage in some manner.

With solar panels or battery operated systems, the positive and negative conductors are insulated to contain the voltage potential between each and also to earth. When connections get wet, this isolation becomes compromised, and current can pass to earth. Water is the most common cause of DC fault current, but deteriorating insulation and contaminants on battery housings are also factors.

While Charles Daziel's research in the 1960's showed that human electrocution occurs at a lower amount of AC current than with DC current, leakage to earth presents a very dangerous situation. Detecting a fault before it causes harm is obviously essential. Finding a way to detect a fault without having to hard wire to the circuit being monitored is the safest approach. NK Technologies' new DC ground fault relay can be installed at a fraction of the cost of products currently available.

DG Series DC Ground Fault Relay

DG Series Ground Fault Sensors keep machinery and their operators safe from accidental shocks. The one-piece, solid-core design allows for installation over wires feeding loads to about fifty amps. The output relay will change state at factory setpoint between 5 and 50 mA of DC current to earth.



DC Fault Current Sensing

