

Hoist Application Notes

Moving large heavy loads is crucial to today's manufacturing and construction industries. Hoists are one of the top *productivity-enhancing tools* found almost anywhere goods are regularly moved, worked on and/or mounted into an assembly. Some hoists use chains, ropes, or cable, but regardless, most use A/C motors. A burnt out motor can be replaced in a short time, but fire or serious injury or death caused by a ground fault could shut down a facility for several days or weeks. Fortunately, ground fault protection is easy to apply if you understand the basics.

A ground fault occurs when electrical current finds a bridge to ground via worn insulations, conductive dusts, water or other "soft grounds" instead of the normal path back to its source. More than 80% of short circuits in equipment are ground faults, and 90% of these events are due to insulation deterioration on wires and cables. In cases where workers accidentally bridge power and ground, current in the mA range can send their hearts into ventricular fibrillation.

A GFCI (Ground Fault Circuit Interrupter) functions by measuring the outgoing amperage to a piece of equipment and comparing it against the return amperage. If a difference (leak) of ≥ 5 milliamps occurs (or set higher for certain equipment), the GFCI stops the flow of electricity to protect equipment and workers from potential electrocution.



Avoiding electrical accidents and equipment damage are keys to reducing liability and increasing productivity. Minimum ground fault protection can be incorporated into the main power disconnect device and could be considered adequate for the entire system. In such a design, however, any downstream ground fault could trip the main protective device resulting in a complete substation power outage. The NEC's purpose, in its own words, is "the practical safeguarding of persons and property...but not necessarily efficient, convenient, or ...for good service..." (Article 90.1A, B). In other words, system reliability is left to common sense and good engineering design practices. For this reason ground fault protection of the circuit may be highly desirable and recommended for reliable and continuous operation.

Guidelines for electrical safety are:

- Know where the GFCI is located in the hoist power system. If there is not a GFCI installed, have one installed local to the hoist to confirm you have protection.
- Always test the GFCI before using the hoist.
- Always have a qualified electrician check the hoist for electrical problems after it has tripped a GFCI.

Why Use Technology Research Corporation (TRC) HD-PRO Series?



TRC engineers designed the HD-PRO models specifically for high current, rugged environments and these models are field-proven in all kinds of tough applications. The entire HD-PRO family (120V/30A to 600V/80A) is designed to trip within 25 milliseconds after ground fault detection at an adjustable selected trip level of 6, 10 or 30 mA.

Before the development of the HD-PRO Series, facilities with high current – high voltage equipment or three phase systems employed expensive ground fault breakers at the source of the branch circuit, or went without ground fault protection, leaving personnel and equipment unprotected.

Circuit breakers can withstand high current levels but have short mechanical lives and were not designed for switching duty. Localized ground faults, with circuit breakers, either shut down the whole branch circuit or were overloaded because the available devices were not portable and were often too costly.

The HD-PRO Series utilizes contactors that are fully rated for motor switching demands. In addition to being far less expensive than three phase breakers, the HD-PRO models protect expensive high current – high voltage equipment at the point of use while offering substantial shock protection for personnel.

TRC is an internationally recognized leader in electrical safety products that protect equipment, prevent electrical fires and protect against electrocution and serious injury from electrical shock.

