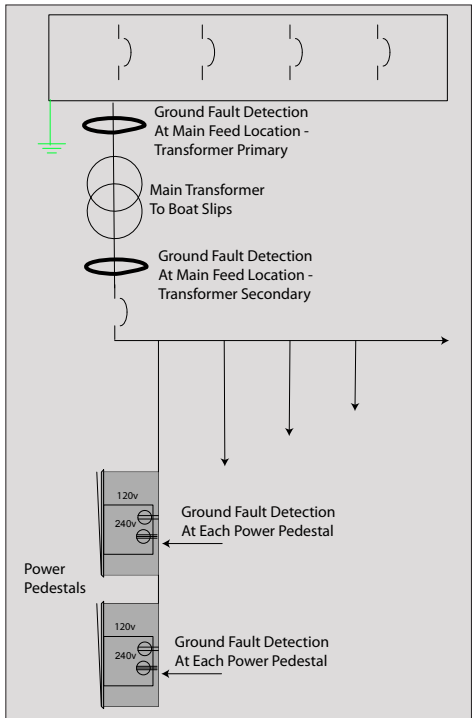
Ground Fault Detection at Docks and for Other Large Equipment Using High Current Circuits

Since the early 1980's, NK Technologies has been designing and manufacturing ground fault sensors for industrial and commercial applications. These applications include protecting heat trace and snow melt cable, submersible pumps, water features, pools and many electrical heating applications.

In the early 2000's, NK Technologies' engineers designed a larger sensor with the capacity to monitor circuits up to around 300 amps. For applications drawing more current or using conductors that are larger than would fit through the sensing window, an external "zero sequence" current transformer was needed; the fault would be expressed at 10% of the actual fault current. To increase the amount of current through the sensor, the CT secondary is looped two or three times through the sensing aperture to get the current up to a detectable level. This approach is not very attractive, even to those who frequently install electrical equipment in less than ideal conditions. Now the design engineers at NK have developed a sensor with an aperture measuring four inches in diameter. This allows conductors carrying 800 amps or more to pass through easily.



The diagram above illustates the wiring of a sensor for ground fault detection in marinas.

The National Electric Code 2011 added section 555.3 to require ground fault circuit protection for all circuits feeding a dock. The trip point was specified to be 100 mA. The 2017 Edition reduced that trip point to 30 mA. Not all jurisdictions have accepted this lower detection level, but they may in the future. The smaller NK Technologies' sensors can be used to monitor individual circuits to each slip at a dock, with the sensor output energizing a shunt trip breaker operating mechanism circuit. The entire feed can be used to monitor the main feeding circuit to the pedestals, to again complete the circuit to operate a shunt trip breaker.

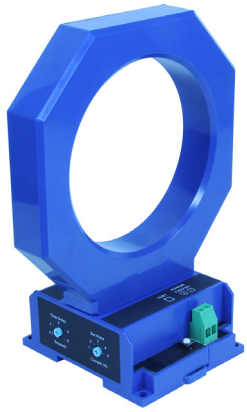
Docks and marinas are not the only place where higher current circuits should be protected with ground fault detection sensors. Adding ground fault protection to amusement park rides, whether permanently installed or temporary, should be considered even in places where it is not specifically required under NEC section 525 or 518. The last thing anyone would want is to be shocked while taking the newest roller coaster at their favorite park.

Another place where there is a need for larger ground fault sensors is on chair lifts at ski resorts. The motors and lighting required by this equipment draw considerable amounts of power and there is always a chance of dangerous conditions when the environment is wet and the skier's clothing is soaked. Whether controlling a contactor or a shunt trip breaker, ground fault sensors from NK Technologies are the first choice by experienced personnel and designers.

AG-LC Ground Fault Sensors for Monitoring Higher Current Circuits

AG-LC series ground fault sensors are the latest design innovation from NK Technologies. The NEC added section 555.3 to require ground fault protection of the main over current device feeding marinas and boat yards. These services are often carrying up to 800 amps; most sensor designs will not allow the conductors to pass through a single sensing ring.

By designing a sensor in a large solid-core housing, the conductors will not have to be passed through a separate sensing device like a zero sequence current transformer. This design makes monitoring of larger circuits a breeze, whether to protect boaters, or large equipment like amusement park rides or gantry cranes.



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