

Large Aperture Split-core Current Sensors for Heavy Loads

Since the early 1980's, NK Technologies has manufactured AC current sensors with ranges to 200 amps. While this covers a lot of applications, AC current measurement or control loads over 200 amps requires at least two parts (current sensing and signal conditioning) which adds complexity and multiple connections. The use of NK Technologies' sensors in a one-piece design, proven to be safe, reliable and simple to install in applications up to 200 amps, was not an option in applications over 200 amps.

Additionally, our customers asked for larger split-core sensors for many applications ranging from monitoring building cooling tower fans and irrigation pumps to grinders and shredders in recycling plants. NK Technologies wanted to be certain that our products would suit the largest number of applications, and provide the accuracy and reliability our customers expect. With the large aperture, split-core sensors, we feel this goal has been achieved.

These sensors feature a very innovative modular design. There are two sizes of sensing rings which can be mounted to a common base. The rings are also used to enclose the core and windings which make up a current transformer. This design approach allows NK Technologies to offer split-core AC current transducers, current relays and current transformers, all with ranges to 1600 amps.

The smaller of the two rings (MS models for medium split-core) measures 1.19 inches (30.1mm) wide and 2.22 inches (56.4mm) high. This is large enough for two 500MCM THHN or THW wires to be monitored with room to spare. The larger ring measures 2.3 inches (58.4mm) wide and 3.42 inches (86.9mm) high. This can accommodate up to six 500MCM THHN or THW wires. National Electric Code section 310-10 designates the derating factors for calculating the maximum amount of current allowed in a circuit when paralleled conductors are used, so the more conductors per phase the total allowed can be reduced by up to 50% when compared with the allowable current of one wire.

The AT series transducers are designed for maximum accuracy when the AC current wave shape is sinusoidal. The ATR series will produce an accurate measurement even if the current wave shape is not sinusoidal, whether produced through an inverter or distorted from harmonic currents. The ATR utilizes an RMS algorithm to keep the output signal at the highest level of accuracy possible, even in the most difficult conditions.

The ASXP relay output models provide fully adjustable trip points, so the output relay will change state as current increases over the trip point to alarm for over-current conditions, or so the relay is actuated during normal conditions and reverts when the current falls below the trip point. There is a two second delay to keep the output from changing during motor inrush current, and a separate adjustable delay to allow "ride through" of temporary over-current conditions before the relay output changes.

The AT and ATR transducers and the ASXP relays are attached to a base which can be mounted on a DIN rail, or attached to a back panel using screws.

The current transformers are designed to be hung over the conductors, wire or bus bar, and MS size models are provided with extrusions to allow cable ties to help support the CT's and keep them stationary.

All of the new large aperture models have been tested to meet UL standards; the relays and transducers are UL listed. The current transformers are UL recognized as components in a control or monitoring system.

