NK Technologies

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Application Note

Monitoring DC Systems In Industry and Alternative Energy

Direct current is used in many industrial processes. In most cases, AC power is used for delivery of the power, and then converted to DC though electronic modification. Computers use 5 and 12 volts DC, servo motors operate with voltages from lower than ten to 200 or much higher, and large DC motors often are designed to use 750 VDC. Since the speed of the motor is directly proportional to the voltage supplied, DC motors have historically been the first choice for moving loads at varying speeds. From system control to heavy lifting, DC power is used all over the plant.

With the renewed interest in alternative power sources, DC systems are found in photovoltaic solar power and wind power generation. Photovoltaic systems produce low voltage DC power from each cell, and each cell is connected in series to boost the voltage to higher levels so the effect of impedance is minimized. Wind generators are often designed to charge batteries at 12 or 24 volts, and some produce DC voltages to 240 depending on the need or application.

Monitoring DC Voltage

- **Industrial Motors**
  Cranes, crushers, shredders, debarkers, saws
- **Battery Chargers**
  Cell phone sites, water craft, UPS backup
- **Photovoltaic Arrays**
  Detect reduced panel output caused by dirt or unexpected shade
- **Wind Generators**
  Monitor the output voltage from your generator with the assurance that the system is operating properly

VDT Series DC Voltage Transducers

NK Technologies manufactures small, DIN-rail mounted DC voltage transducers with ranges from 15 to 600 volts. The standard output is 4–20 mA, powered by an external 24 VAC/DC supply. They can be installed in any control cabinet, enabling a control system to know exactly what voltage is being applied to a load. The sensor output can be used with most data acquisition systems, programmable logic controllers, and panel meters. Field connections are made easy by attaching the sensor output to the controller, adding the external power supply, and connecting the sensor to the positive and negative of the primary circuit. The controller is scaled so the 20mA signal represents the sensor range maximum, with standard ranges to 600 volts.

DC Voltage Transducer Control

PLC Inputs

24 VAC/DC Supply