

Lesson 2: Electrical Terminology

Power line installer and repairer
Power line troubleshooters
Cable splicer
Construction electrician
Maintenance electrician

Lesson 2: *Electrical Terminology*

In addition to safety practices, anyone working with electricity needs to understand the basic terminology associated with it. Without a knowledge of these basics, it is impossible to work with electricity effectively.

Terms and Definitions for Electricity

In every occupation, including those that require working with electrical systems, terms and definitions exist that an individual must learn to be competent in that field. This terminology includes the names of devices used in electrical systems, types of current, units of measurement, and common problems in electrical systems.

A typical electrical system contains a number of components. The conductors are the wires through which the electrical current is carried through a circuit, which is the complete, uninterrupted path of electricity. Most conductors are made from copper, aluminum, or copper-clad aluminum. In the system are positive, or hot, wires that act as the conductors of electrical power. The insulation on these wires is typically color-coded red or black. The other wires, which are called neutral wires, conduct electricity from the appliance back to the source, completing the electrical circuit. These wires are color-coded white or gray. Insulation made of plastic or rubber forms the protective covering on the wires. All electrical systems should be grounded to function safely. Grounding is the electrical connection from the appliance or piece of equipment to the earth.

The system also contains circuit protection devices in the form of fuses or circuit breakers. The fuse is a safety device that prevents the overload of an electrical circuit by “burning out” and interrupting the electrical flow. A circuit breaker is an automatic flip switch located on an electrical circuit that breaks, or shuts off, the current when overloaded.

An electrical system may use one of two types of current. Alternating current (AC) is the most. In 1911, the National Fire Protection Association (NFPA) sponsored the development of the National Electrical Code (NEC). The goal of the NEC is to address four issues: changing power needs in the United States, safe user practices

common type of electricity supplied to the home or farm. The electrical current alternates, or changes its direction of flow at regular intervals, usually 60 times per second. Direct current (DC) is electrical current that flows steadily in one direction through a conductor, either from the positive pole to the negative or from the negative to the positive. A generator or battery produces direct current.

The three major units of measurement in electricity are amperage, voltage, and wattage. Amperage is a measurement of the flow of current through an electrical system; it is measured in amperes, or amps (A). Voltage is the measurement of the pressure created by electricity moving through the conductor. It is measured in volts (V). Wattage is the measurement of the total electrical power within a system. Wattage is calculated by multiplying amperage and voltage and is measured in watts (W). A term most people are familiar with is kilowatt (kW), which is 1,000 watts. Electrical meters read electricity in kilowatt hours, which is the use of 1,000 watts of electricity in one hour. Another important measurement is resistance. Resistance, which is measured in ohms, is the opposition to the flow of current as it moves through a conductor.

Two common problems that occur in electrical systems are voltage drops and short circuits. Voltage drop is the loss of electrical pressure from the source to the point of use. This problem normally occurs in overload situations. Short circuits occur when wires in the same circuit come into contact, causing the flow of electrical current to move from its desired path. Worn insulation or loose connections at the appliance or piece of equipment may cause a short circuit.

The National Electrical Code (NEC)

of new technology, minimum standards for electric wiring practices and materials used nationwide, and increased energy use in the home, workplace, and community. The electrical code is printed periodically in book

form. Topics covered in the 1996 edition include: wiring and protection, wiring methods and materials, equipment for general use, special occupancies, which are buildings for particular purposes, special equipment, special conditions, and communication systems. Revisions to the NEC are done under the supervision of the NFPA and identify new issues and technologies related to electrical installations.

Enforcement of NEC Guidelines

The NEC is basically a reference and resource for state and local governments and for insurance companies. Government agencies utilizing the NEC include the Occupational Safety and Health Administration (OSHA) and state and local building inspectors. Insurance companies may require the use of NEC guidelines in buildings they insure, primarily for those structures being built for rental or resale. Through these entities, the regulations found in the NEC handbooks are enforced.

UL Listings

The Underwriters Laboratories, Inc. (UL) is an independent, not-for-profit testing and certification organization that evaluates products, materials, and systems, such as electrical outlets and appliances, in the interest of public safety. The UL has been functioning in this capacity for over a century.

A UL listing means that representative samples of the product have been tested and evaluated with reference to nationally recognized safety standards for electric shock, fire, and related safety hazards. A UL listing is important because it provides a degree of product quality assurance, which is vital when dealing with an item that has the potential of being a fire or shock hazard.

Summary

Certain terms are very important to know in order to understand electricity. Knowing these terms will help to understand the concepts relating to electricity and how it works. Individuals working with electricity must also understand and utilize those practices outlined in the NEC. Products with a UL listing are useful because their quality has been assured.

Credits

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Phipps, Lloyd J., and Carl L. Reynolds. *Mechanics in Agriculture*. 4th ed. Danville, Ill.: Interstate Publishers, 1990.