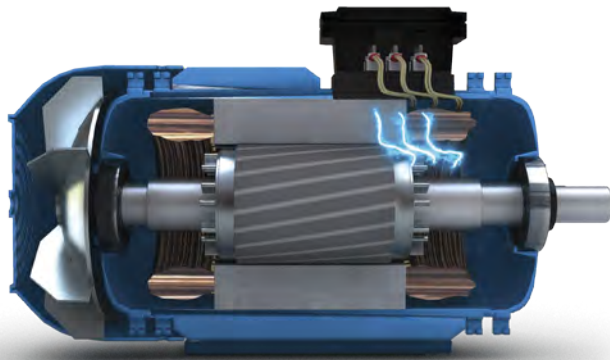


ELECTRIC MOTOR FUNDAMENTALS

eLearning courses designed to increase productivity and profits



Learning made Simple, Visual, and Interactive

This course will teach learners the basic electrical concepts relevant to motors, the different types of electric motors and nameplates utilized in the industry, as well as common failure modes. This course depicts the inner workings of the various types of electric motors with in-depth animations and illustrations, as well as short GIFs portraying the different motor failures. The material in this course is beneficial for both those who contain some knowledge of electric motors, and those who are new to the industry.

Credit Hours **3**

Learning Objectives

- Recognize the difference between an electric motor and a generator.
- Recall basic electrical concepts to further understand how an electric motor works.
- Learn and understand the functional elements of an electric motor.
- Differentiate between the types of electric motors, their components, applications, and advantages as well as disadvantages.
- Examine the difference between the European and U.S. standard nameplates.
- Understand and recognize various failure modes that may occur in electric motors and their causes, along with corrective actions.

Table of Contents

I. Basic Concepts

- **Electric Motor vs. Generator**
- **Basic Electrical Concepts**
 - o Current
 - o Single and Three-Phase Power
 - o Series and Parallel Connections
- **Functional Elements of a Motor**
 - o Magnets
 - o Terminal Box
 - o Electromagnetic Components
 - o Mechanical Components
 - o Thermal Cooling
 - o Electric Motor Energy Conversion

II. Types of Motors

- **DC Motors**
 - o Brushed DC Motors
 - o Brushless DC Motors
- **AC Motors**
 - o AC Induction Motors
 - o AC Synchronous Motors

III. Nameplates and Failure Modes

- **Motor Nameplates**
 - o IEC Nameplate
 - o NEMA Nameplate
- **Common Failure Modes**
 - o Bearing Failure
 - o Stator Winding Failure
 - o External Failure
 - o Rotor Winding Failure
 - o Shaft Coupling Failure
 - o Other Failures

