Electrical Motors and Controllers

This five-day course covers AC and DC motor theory including three-phase and single-phase motors, motor inspection, and maintenance. The course also provides an overview of variable frequency drives.

I. AC and DC Motor Fundamentals
- Basic Magnetic Principles
- Electric Current and Magnetism
- Motor Operation Principles

II. Direct Current Motors
- DC Motor Principles
- Shunt Motors
- Series Motors
- Compound Motors
- Terminal Identification for DC Motors
- Determining Direction of Rotation for DC Motors
- Speed Control
- Field Loss Relay
- Horsepower
- Brushless DC Motors
- Converters
- Permanent Magnet Motors

III. Three Phase Motors
- Operating Principle
- Rotating Magnetic Field
- Connecting Dual-Voltage 3Ø Motors
- Squirrel-Cage Induction Motors
- Wound Rotor Induction Motors
- Synchronous Motors
- Seisyn Motors

IV. Single Phase Motors
- Operating Principle
- Split-Phase Motors
- Resistance-Start Induction-Run Motors
- Capacitor-Start Induction-Run Motors
- Dual-Voltage Split-Phase Motors
- Determining Direction of Rotation for Split-Phase Motors
- Capacitor-Start Capacitor-Run Motors
- Shaded-Pole Induction Motors
- Multi-Speed Motors
- Repulsion-Type Motors
- Single-Phase Synchronous Motors
- Stepping Motors

V. Motor Inspection and Maintenance
- DC Motors
- AC Motors

VI. Controllers
- Types
- Troubleshooting

VII. Introduction to AC Drives
- Power Section
- Logic Section
- Variable Frequency Drive Parameters
VIII. VFD Overview
  · Drive and Option Identification
  · Drive Firmware Identification
  · Drive Schematic Overview

IX. VFD Operation
  · Programming and Display Panel
  · Control Inputs
  · Drive Functions