Electrical Motors and Controllers

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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