MC-100

AC and DC Variable Speed Motor Drives
Maintenance & Troubleshooting

Course Description

This 36-hour hands-on training program is designed to provide maintenance electricians with a thorough understanding of AC and DC motor construction, operation and variable speed control. Hands-on lab exercises are used throughout the training program to simulate actual plant conditions. Course hardware will include Variable Frequency AC and DC Motor Drive Workstations, Circuit Test Workstations, Oscilloscopes and Multimeter test equipment. Hands-on labs will explain operation and troubleshooting of diodes, transformers, SCR's, transistors and other electrical control devices.

Topical Outline

- Electrical Review
  - Voltage, Current, Power, Resistance, Magnetism, Reactance
- Motor Fundamentals
  - Motor Construction and Operation
- Variable Speed Drives
- Power Module (Converter)
  - Transformer, Rectifiers, SCR's, Bridge Rectifier
- Soft Start
- DC Motor Speed Control
  - Field and Armature Voltage/Current Control
- Braking
- AC Motor Speed Control
  - Reading, Setting and Adjusting Parameters
  - Converters, Inverters
- Six-step, PWM, Vector
- Transistors, GTO, IGBT, Darlington
- Control Circuits
- Troubleshooting

Prerequisites

A basic understanding of electrical principles of voltage, power, current and resistance.

Course Length

36 hours

CEU's

3.3

Objectives

Persons completing this course will be able to:

- Explain basic AC and DC motor operation
- Identify motor parts and function
- Describe variable speed motor control
- Explain main drive units operation and function
- Understand basic theory of SCR's, diodes, transistors, triacs, and other electrical control devices
- Troubleshoot circuits using a multimeter and an oscilloscope
- Use prints to isolate drive and motor problems
- Read and Set Drive Parameters