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## Motor Control Training

Contact us Today for a FREE quotation to deliver this course at your company's location.

<https://www.electricityforum.com/onsite-training-rfq>

The purpose of this motor control training course is to educate both new or experienced industrial electricians and motor technicians who are responsible for the installation, maintenance, and repair motor control centers. Students will learn proper motor control maintenance and troubleshooting techniques which will allow them to ensure optimal operation of electric motors while at the same time reducing repair times.

This course is designed to educate industrial, commercial and institutional motor users about the many savings to be gained from optimum motor control, protection, and maintenance.

Electric motors consume almost 50 per cent of all electricity and in industry, that percentage increases to about 70 per cent. Optimum motor control affects plant production, energy savings, and motor replacement costs.

Students will have an opportunity to ask specific questions and exchange ideas relating to their own unique situations. This motor control training course is designed to be an interactive, problem-solving, learning environment for delegates of all disciplines.

This motor control training course provides the basic information required to safely operate

and maintain low and medium voltage motors and controls. At the conclusion of the course, students will understand the basics of electric motor control maintenance procedures.

### WHO SHOULD ATTEND

- Engineering and design personnel
- Maintenance and technical services personnel
- Process and operations personnel
- Technical and process managers
- Engineering and design personnel
- Electrical consulting engineers
- Electrical contractors

### STUDENTS RECEIVE

- This Course Includes Our Latest Electric Motor And VFD Handbook Volume!! (Value \$20)
- **\$100 Coupon** Toward Any Future Electricity Forum Event (Restrictions Apply)
- 1.4 Continuing Education Unit (CEU) Credits
- **FREE** Magazine Subscription (Value \$50.00)
- Course Materials In Paper Format

### *Related Courses*

[Electric Motor Training,](#)

[Motor Testing Training,](#)

[Variable Frequency Drive Basics,](#)

[VFD Training](#)

[Motors, Drives and Automation Systems](#)

## **COURSE OUTLINE**

### **Motor Control Training Course Program Outline**

#### **DAY ONE**

#### **Session 1: General Motor Control Design and Operation**

##### **Basic Motor Control Theory**

##### **AC Motors**

- Induction
- Synchronous
- Wound Rotor
- DC Motors

##### **Power System Effects on Motors**

- Voltage

- Frequency
- Harmonics

### **Application of Motor Loads**

- Variable Torque
- Constant Torque
- Constant Horsepower

### **High Efficiency Motors**

- Cost vs. Energy Saving Analysis
- Inrush Characteristics
- kVA Code

### **Power Factor Correction**

- What is power factor?
- Methods to improve it

### **Session 2: Motor Control Techniques**

#### **Symbology and Terminology**

- Basic Symbols
- The Power Circuit
- The Control Circuit

### **Starting Methods**

- Full Voltage
- Reduced Voltage
- Wye-Delta
- Soft Starting
- Vacuum Contactors

### **Stopping Methods**

- Dynamic Braking
- Plugging
- Mechanical Braking

### **Speed Control**

- Separate Winding
- Consequent Pole
- Wound Rotor
- Mechanical
- Variable Voltage
- Variable Frequency

### **VFD Effects on Motor Performance**

- Reflected wave phenomena
- Grounding
- Shaft Currents
- Insulation Failure

### **Session 3: Motor Protection**

## **Induction Motor Characteristics**

- Insulation Systems
- Temperature Limits
- Service Factor
- Thermal Limit Curves
- Vendor Motor Data

## **Short Circuit Protection**

- Fuses
- Circuit Breaker
- MCP

## **Overload Protection**

- Overload Relay

## **Thermal Protection**

- RTD
- Thermistor

## **Solid State Motor Protection Relay**

- Advantages
- Enhanced Protection
- Application Examples
- Relay Setting

## **DAY ONE**

### **Session 4: Motor Failure Analysis**

#### **Electrical Failures**

- Insulation Failure
- Thermal Heating
- Harmonic Heating
- Improper Grounding

#### **Mechanical Failures**

- Bearing Failures
- Belt Alignment
- Shaft Alignment

#### **Load Related Failures**

- Application Abuse
- Overloading

### **Session 5: Motor Testing Methods**

## **Insulation Life Overview**

### **Testing methods**

- Insulation Resistance
- Polarization Index
- DC Hipot
- DC Ramp Test
- AC Hipot
- Capacitance test
- Dissipation Factor
- Partial Discharge
- Surge Test
- Mechanical Testing
- On-line Testing

## **Session 6: Motor Maintenance Practices**

### **Electrical Maintenance**

- Cooling Components
- Periodic Testing
- Load Check
- Temperature

### **Mechanical Maintenance**



- Mechanically Intact
- Vibration
- Cleaning
- Belts/ Couplings
- Guards

## **COURSE TIMETABLE**

### **Both days:**

Start: 8:00 a.m.

Coffee Break: 10:00 a.m.

Lunch: 12:00 noon

Restart: 1:15 p.m.

Finish: 4:30 p.m.

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