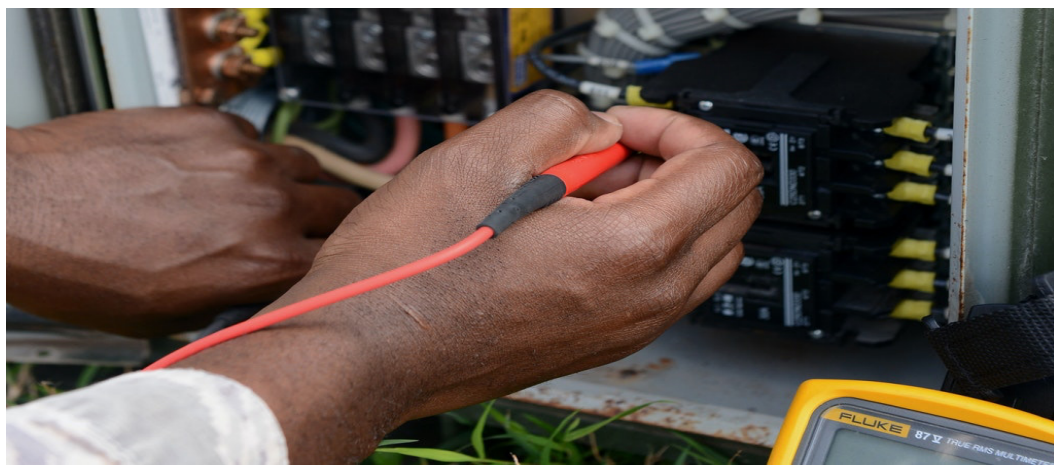


# Motor Controls Troubleshooting Bootcamp



In order for technicians to work on electrical systems, they must be able to understand and follow ladder diagrams and schematics. This course gives a complete understanding of the different types of electrical drawings and how to apply them in the field.

For workers in the industrial and manufacturing sectors, understanding electrical motor controls is a valuable skill for production managers, technicians, designers and line workers. This course is a comprehensive introduction to motor controls , covering the essential topics for employees working in a variety of industrial and production settings. Students will understand, follow and troubleshoot motor control circuits and understand how components work to determine if they are bad. This will save the company money by only changing the bad parts and teach the technician to quickly and accurately diagnose and repair problems.

**One Full Day of Troubleshooting with our Custom  
Designed Troubleshooting Trainers**

# Motor Controls Troubleshooting Bootcamp

## Course Topics and Objectives

- Electrical Symbols
- Ladder Diagrams
- Schematic Diagrams
- Series Circuits
- Parallel Circuits
- Combination Circuits
- Rung Numbers
- Reference Numbers
- Converting Drawings
- Wire Numbers
- Power rails and Wire Colors
- Control element arrangement
- Circuit protection arrangement
- Labels
- Electrical symbol abbreviations
- Power circuits
- Identify common electrical symbols
- Apply common electrical formulas
- Read and interpret a variety of schematics and drawings
- Relate actual equipment components to diagram symbols
- Troubleshoot equipment problems based on symptoms
- Create drawings based on descriptions and observations
- Provide writtenverbal descriptions of circuit diagrams

# Motor Controls Troubleshooting Bootcamp

## Course Topics and Objectives (Cont)

- General Principles of Motor Control
- Overload Relays
- Flow Switches and Sensors
- Solenoid and Motor Operated Valves
- Temperature Sensing Devices
- Proximity Detectors Photodetectors
- Schematics and Wiring Diagrams
- Basic Control Circuits
- Jogging and Inching Sequence Control
- Single-phase, three-phase and DC Motors Motor Installation
- Connection diagrams
- Theory of operation
- Phase/Rotation Control circuits
- Drawing symbols
- One line drawings
- NEMA symbols
- Manual Starters
- Relays, Contactors, and Motor Starters
- The Control Transformer
- Timing Relays
- Pressure Switches and Sensors
- Float Switches
- Limit Switches
- Hand-Off Automatic Controls
- Forward-Reverse Control
- Start-Stop Push-Button Control
- Multi-Pushbutton Stations
- Basic Parts of a motor
- Motor construction
- Motor types
- Wire and troubleshoot basic electrical control circuits to develop a logical, systematic approach to troubleshooting
- How to troubleshoot pushbutton, relay, motor starter and other common component problems
- How to wire basic electrical circuits using wiring diagrams
- Recognize the different types of electrical control ladder diagram
- Read a basic electric circuit diagram
- Perform continuity and resistance checks on relay coils and contacts, overloads, fuses, circuit breakers, switches and other control circuit components.

### **Plus:**

One Full Day of Troubleshooting with our Custom Designed Troubleshooting Trainers

# Motor Controls Troubleshooting Bootcamp

## Who Should Attend:

- All Building Maintenance Personnel
- All Plant & Facility Maintenance Technicians
- Electricians
- Mechanics
- HVAC Technicians
- Boiler Operators
- Machine Operators
- Apprentices
- Alarm Technicians
- Non-Electrical Engineers
- Building Engineers
- Stationary Engineers
- Low Voltage Specialists
- Multi-craft & Cross Training Personnel
- Environmental health & safety personnel
- Maintenance Supervisors
- Plant & facility managers

## Onsite Training:

- We offer onsite training at your facility.
- We can provide the same courses as we offer in public seminars. We can even design courses especially to meet your needs.

## Advantages of On-Site Training:

- Modify the content to your specific needs
- Protect company privacy
- Workers remain on site in case of an emergency
- Saves time and travel costs
- Instructors can discuss your specific equipment
- Problems can be openly discussed
- Flexible scheduling
- Increased price savings as the groups get larger
- Promote teamwork & camaraderie among workers
- More comfortable learning environment

## Class Options:

### 2 Day Class

- Ladder Diagrams and Schematics for Maintenance Technicians

### 2 Day Class

- Motor Controls for Maintenance Technicians

### 2 Day Class

- VFDs for Maintenance Technicians

### 2 Day Class

- Electric Motors for Maintenance Technicians

### 4 Day Class

#### Motor Controls Workshop

- Ladder Diagrams and Schematics for Maintenance Technicians - 2 Days
- Motor Controls for Maintenance Technicians - 2 Days

Note: The 4 day workshop combines Ladder Diagrams and Schematics for Maintenance Technicians and Motor Controls for Maintenance Technicians to form a 4 day class.

Note: The Troubleshooting Bootcamp combines Ladder Diagrams and Schematics for Maintenance Technicians, Motor Controls for Maintenance Technicians and a Full Day of Troubleshooting to form a 5 day class.