



MAINTENANCE TROUBLESHOOTING INTERNATIONAL

ETP-302

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ETP-302 ELECTRICAL TROUBLESHOOTING AND PREVENTIVE MAINTENANCE

This two-day course was created to improved electrical troubleshooting skills as efficiently as possible, and it was designed to cover the most commonly performed electrical troubleshooting tasks that a maintenance technician faces in their job every day. Classroom activities have plenty of hands-on and meter work training technicians to resolve problems using logic and testing. The attendee will work with schematics to diagnose problems related to MCC's (motor control centers), timing circuits, remote starting circuits, and control circuits. Preventive maintenance includes testing and troubleshooting polyphase induction motors, checking lighting circuits, checking fuses and testing calibration of molded case circuit breakers using primary voltage injection to "exercise" the breaker. mechanical or electrical in nature.



Basic Skills for Electrical Troubleshooting

- Safety First
- OSHA Requirements Regarding Troubleshooting and Qualified Persons
- Using Electrical Drawings for Troubleshooting
- Using Electrical Meters to Perform Circuit Measurements
- Developing a Logical, Systematic Approach to Troubleshooting

Troubleshooting Control Circuits

- Building a Circuit from a Ladder Diagram
- Control Circuit Industrial Applications
- Control Relay Logic Circuits
- Automatic Motor Control Circuits
- Timer Sequence Circuits
- Testing Field Components:
- Control Relays
- Motor Starter Contactors
- Overload Devices
- Solid State Timers
- Limit Switches
- Auxiliary Contact Blocks
- Indicator Lamps
- Push Buttons and Selector Switches
- Circuit Breakers and Fuses

Troubleshooting Motors

- Most Common Motor Problems
- Electrical and Mechanical Concerns
- Performing Electrical Tests on a Motor
- Using the Megohmmeter on a Motor
- Testing Windings for Shorts, Opens and Ground Faults
- Phase Unbalance
- Phase Rotation Testing
- Forward/Reverse Motor Starters

Troubleshooting Power Distribution

- Wye and Delta Systems
- Overcurrent Protection
- Checking and Replacing Fuses
- Branch Circuits

Power Quality Problems

- Sources of Power Quality Problems
- Test Equipment for Troubleshooting Power Quality Problems
- Harmonics
- Phase Unbalance

Troubleshooting Lighting Circuits

- Lighting Terminology
- Types of Lighting Circuits
- Incandescent Lighting
- Fluorescent Lighting
- HID Lighting
- LED Lighting

Troubleshooting Programmable Logic Controllers

- Overview of PLCs
- Reading PLC Ladder Diagrams
- Status Indicators and Error Codes
- Force and Disable
- Startup Procedures

Troubleshooting Variable Frequency Drives

- VFD Terminology
- VFD Basic Operation
- Common Problems and Corrective Action

Electrical Preventative Maintenance

- Why Perform Electrical PM
- Overview of Electrical PM Program
- Building Your Own PM Checklist

CLASS FORMATS AVAILABLE

- MTI Hands-On Center \$995/person
 - ZOOM Interactive \$995/person
 - On-Site (Your Location) Ask for Quote
- Quick Quote Available in 48 hrs.

CLASS DURATION AND HANDS-ON

2-days, 15 hours of instruction
 50% - 60% hands-on activities

FREE BOOK ISSUED

Ugly's Electrical References
 (\$30 value)

Class Details: Each student will receive class books, work activity sheets, self-test progress evaluations, as well as questions from the instructor to make sure they understand the material presented. It is expected that an attendee will leave the class with the basic knowledge of the subject and possess new found skills to better equip them when they return to their job. A certificate suitable for framing will be issued to each attendee who successfully completes the course. Call, email or check the website for the next time this course is scheduled at the MTI training center or as a ZOOM interactive session. On-site sessions? Request a quick 48-hour turnaround quote. Revised: 12/23/2020