

Call 1-877-978-7246



# HANDS-ON ELECTRICAL TROUBLESHOOTING & PREVENTIVE MAINTENANCE™

Learn how to fix electrical problems quickly and safely  
Cover the most commonly performed electrical troubleshooting tasks

Specifically Designed for Building, Plant, Facility  
and Electrical Equipment Maintenance



- Reserve your space now either online or by calling us at 1-877-978-7246!
- Check us out online at [live.tpctraining.com](http://live.tpctraining.com) for a complete list of all virtual and in-person seminars.
- This seminar is also available for Virtual or In-Person Private Group Training



...full of useful  
information that pertains  
to what i do at my job.

— Ian A.,  
Engineering Technician

#### Learning Objectives:

- Basic Skills for Electrical Troubleshooting
- Troubleshooting Control Circuits
- Troubleshooting Motors
- Troubleshooting Power Distribution
- Power Quality Problems
- Troubleshooting Lighting Circuits
- Troubleshooting Programmable Logic Controllers
- Troubleshooting Variable Frequency Drives (VFDs)
- Electrical Preventative Maintenance



## SEMINAR OVERVIEW

Working with real-world components, students in this two-day “hands-on” Electrical Troubleshooting course will learn how to fix electrical problems quickly and safely. This two-day course was created to bring students up to speed in their electrical troubleshooting skills as efficiently as possible, and it was designed to cover the most commonly performed electrical troubleshooting tasks a maintenance technician faces in their job every day. For the novice or experienced electrician, this training course provides a no-nonsense, practical, and real-world systematic approach to electrical troubleshooting. This course can also be adopted as part of a company’s regular Qualified Electrical Worker program.

This 2-day seminar is just \$1100. You can also combine it with our Basic Electricity course for a comprehensive 4-day Electrical Workshop. Or take your troubleshooting skills to the next level by adding on the optional two day Advanced Electrical Troubleshooting course.

## WHAT YOU WILL TAKE HOME

- A laminated, full-color TPC Training Reference Guide detailing all the “must-know” information covered in the class. Keep this with you while on the job for immediate knowledge recall.
- Comprehensive classroom materials
- A Personalized Training Certificate with 0.8 TPC Training Continuing Education Units for each day attended, 1.6 for both days.
- All the information you need from asking our instructors specific questions about your own unique equipment or facility.

## CONTINUING EDUCATION

Upon completion of this seminar, the student will receive a Certification of Completion and .8 TPC Training CEUs per day attended. Most employers and many government agencies accept TPC Training CEUs to fulfill their continuing education requirements. If the student needs CEUs to renew a state license, please contact us at 303-867-5039 to ensure the state licensing board has approved the seminar. If we are currently not approved by your state licensing board, we are happy to begin the process as long as we receive your request at least one month before the training date.

## DISCUSSION TOPICS

### Electrical Fundamentals

- Production & Distribution of Electricity
- DC and AC in Plants and Facilities
- Voltage, Current and Resistance; Ohm’s Law
- Basic Electric, Series, and Parallel Circuits
- Power: Types & Control
- Single-phase and Three-phase Systems
- Workplace Electrical Safety

### Basic Skills for Electrical Troubleshooting

- Safety First
- OSHA Requirements Regarding Troubleshooting and Qualified Persons
- Using Electrical Drawings
- Using Electrical Meters
- Systematic Approaches 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
- Performing Electrical Tests on a Motor
- Using the Megohmmeter on a Motor
- Testing Windings
- Phase Unbalance and 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
- Harmonics
- Phase Unbalance

### Troubleshooting Lighting Circuits

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

### Troubleshooting Programmable Logic Controllers

- Components
- Reading PLC Ladder Diagrams
- Status Indicators and Error Codes
- Force and Disable
- Startup Procedures

### Troubleshooting Variable Frequency Drives (VFDs)

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

### Electrical Preventative Maintenance

- Why Perform Electrical Maintenance
- Building Your Own Inspection Checklist

## JOIN OUR CLASSROOM SEMINARS FROM VIRTUALLY ANYWHERE

Our virtual instructor-led training option allows students to connect to a live classroom seminar via a web link, with the ability to participate full in the classroom dialogue, exercises, and Q&A. Online participants get all the benefits of the full classroom experience, plus the convenience of remote access.

### Features include

- Two full days of live, interactive instruction from a TPC Training instructor
- All classroom materials in PDF format
- Certificate of completion for 16 hours of live training
- Full technical support to ensure your online experience is a rewarding one

## SEMINAR FEE & AGENDA

This 2-day course is just \$1195 (Earn 1.6 CEUs)

7:30 am	Registration
8:00 am	Class Begins
12:00 - 1:00 pm	Lunch (on your own)
4:30 pm	Class Ends

## NO RISK REGISTRATION & MONEY-BACK GUARANTEE

You can reserve your space in the class at any time and cancel without penalty. Cancellations made more than 14 days prior to the seminar may be refunded or rescheduled. Cancellations made within 14 days may be rescheduled for any future topic and/or date. If you’re not satisfied with the course, we’ll promptly refund your payment.

## BRING THE TRAINING TO YOUR FACILITY VIRTUALLY OR IN-PERSON

Every public seminar class in our Course Catalog can be conducted virtually or on-site at your facility, with the same expert instructors. To arrange an in-person private group training, call or email us at [virtual@tpctraining.com](mailto:virtual@tpctraining.com).

### Some Advantages of In-Person Private Group Training

- Cost Savings — Save time and travel costs by keeping workers on-site
- Customized Content — Tailor the seminar to your facility and equipment
- Flexibility — Accommodate multiple shifts and different start and end times

“ All questions answered... great depth of information. Time and money well spent. — Robert E., Maintenance Engineer