



MAINTENANCE TROUBLESHOOTING INTERNATIONAL LLC

ETA-302

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ETA-302 ELECTRICAL THEORY & APPLICATION FOR HVAC TECHNICIANS

Over 75% of problems with HVAC systems are electrically related, yet most courses spend little time on the subject. If you are working in the HVAC world and want to become proficient in electrical troubleshooting that directly connects to maintaining your equipment this course gives you those skills and then some. Basic electricity is explained as well as various meters and how to use them. Circuits and their components are presented in schematics as well as ladder diagrams. Motor and motor control circuits are presented including megger testing. Many HVAC wiring diagrams are used to familiarize the attendee with circuitry similar to what will be encountered in field situations. If you are an HVAC professional still puzzled with the electrical end of troubleshooting, this unique course will make you an all-around expert capable of addressing any of the electrically related issues that could be keeping your equipment from running. As far as we know, there is no other course dedicated to this most needed skill offered by other training companies.



Safety and Hazard Awareness

- Electrical Shock
- Lockout-Tagout Procedures
- Learn First Aid

What is Electricity?

- Electrons
- Potential Difference
- Volts & Measuring Volts
- Amperage and Resistance
- Ohm's Law
- Inductive Reactance
- Capacitive Reactance
- Impedance
- Measuring Resistance
- Wattage

Circuits and Components

- Series Circuit Laws
- Parallel Circuit Laws
- Combination Circuits
- Loads and Switches
- Solenoid Valves
- Sequencer
- Contactors
- Thermostats

Motors

- Induction Motors
- Parts of a Motor
- Stator Poles & Stators
- Rotors
- Motor Speed
- Shaded Pole
- Split Phase

- Direction of Rotation
- Disconnecting the start windings
- CS or CSIR Motors
- PSC Motors
- CSR Motors
- ID-ing Hermetic Motor Terminals
- Electronically Communicated Motors (ECM)
- Shaded Pole and PSC Motors
- Start Capacitors
- Run Capacitors
- Capacitor Ratings
- Single-Phase Starting Relays
- Current Relay
- Potential Relay
- Solid State and PTC
- Calculating Motor Horsepower
- Service Factor
- Locked Rotor Amps
- Full Load Amps
- Overload Protectors
- Three-Phase Motors
- Changing Rotation 3 -Phase Motor
- Checking Resistance of Windings
- Dual Voltage 3-Phase Motors
- Motor Name Plate
- Name Plate Definitions
- Variable Frequency Drives (VFD)
- Variable Speed Drives

Understanding Wiring Diagrams

- Pictorial and Schematic Diagrams
- Pictorials vs Schematics

- Line-Side vs Load-Side
- Ladder Diagrams
- Reading a Wiring Schematic
- Schematic Diagram Symbols
- Automate Control Systems
- Building Automation
- System Protocols
- Controller Types
- Network Connections
- Troubleshooting
- Lineal Searching
- Split Searching
- Troubleshooting Using Voltmetetr
- Ohmmeters
- Ammeters
- Troubleshooting Switches
- Systematic Troubleshooting
- Testing Capacitors

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

ESCO Press Book (\$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