



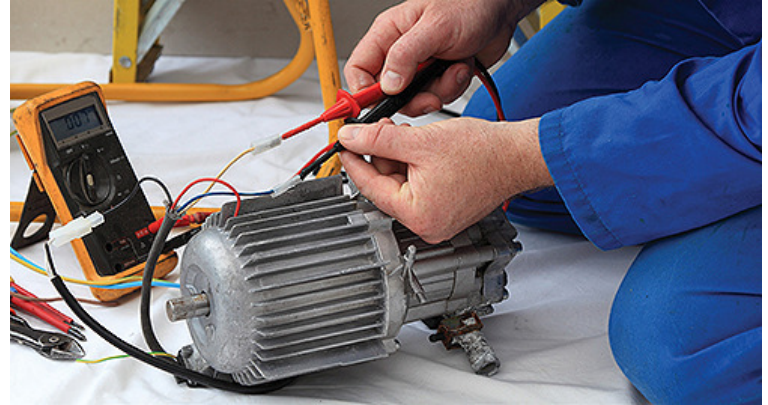
MAINTENANCE TROUBLESHOOTING INTERNATIONAL LLC

EMC-302

Hands-On Training Center: 2860 Ogletown Road, Newark, DE 19711
 Corporate Offices & Mailing Address: 2917 Cheshire Road Wilmington, DE 19810
 Phone/TXT: 302.593.2698 (Frank) Email: Frank@mtroubleshooting.com
 Website: www.mtroubleshooting.com

EMC-302 ELECTRIC MOTOR CONTROL CIRCUITS

For those employed in the industrial and manufacturing sectors, understanding electrical motor controls is a valuable skill for electricians, production managers, technicians, designers and even 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. Attendees will understand, follow and troubleshoot motor control circuits and understand how components work to determine if they are bad. This will drastically reduce down time by only changing the bad parts and teach the technician to quickly and accurately diagnose and repair problems. The class uses plug and play components built into shippable cases that allow progressive education during the hand on portions or the training. This course can easily be transported to your place of employment as well at our hands-on training center.



General Principles of Motor Control

- Series circuit configuration
- Parallel circuit configuration
- Combination circuit configuration
- Overload Relays
 - Bimetal strip
 - Solder pot
 - Dashpot
- Flow Switches and Sensors
- Solenoid & Motor Operated Valves Sensing Devices
- Proximity Detectors Photodetectors
- Schematics and Wiring Diagrams
 - Converting schematics to wiring diagrams
 - Converting wiring diagrams to schematics
 - Converting wiring diagrams to ladder diagrams
 - Converting wiring to ladder diagram
 - Converting ladder diagrams to wiring diagrams
 - Numbering of conductors
- Basic Control Circuits
- Jogging and Inching Sequence Control
- Single-phase and three-phase Motors
- Motor Installation
 - Wiring for low voltage
 - Wiring for high voltage
- Connection diagrams
- Theory of operation
- Phase/Rotation Control circuits
 - Reversing motor starter
 - Interlocks

- Drawing symbols
- One line drawings
 - Power distribution
 - Disconnect means
 - Use of a relay coordination study
- NEMA symbols
- Manual Starters
- Relays, Contactors, and Motor Starters
- The Control Transformer
 - Taps
 - Turns ratio
- Timing Relays
 - On delay
 - Off delay
- Pressure Switches and Sensors
- Float Switches
- Limit Switches
- Hand-Off Automatic Controls
- Forward-Reverse Control
- Start-Stop Push-Button Control
- Multi-Pushbutton Stations
 - Two wire control circuits
 - Three wire control circuit
- Basic Electrical Parts of a motor
 - Single phase
 - o Start winding
 - o Run winding,
 - o Centrifugal switch
 - o Overload protection
 - Three-phase
 - o Windings
- Motor construction

- Motor types
 - Delta
 - Wye
- 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.

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% 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. On-site sessions? Request a quick 48-hour turnaround quote. Revised: 03/02/2021