

Re: Multimeter Safety

Every electrician carries a multimeter. It's essential for troubleshooting, verifying absence of voltage during lockout-tagout and confirming system status before work begins. **But when used incorrectly, a multimeter can create the very hazard it is meant to prevent.**

In one incident ESA reviewed, an electrician used an approved meter with the test leads inserted in the wrong positions. The result was extensive burns to the electrician, and arc flash damage to the installation and meter. **The takeaway is clear: correct meter selection alone isn't enough. Probe placement and testing method matter just as much.**



Electrician after incident



Meter after incident



Switch after incident

Before you test or troubleshoot a circuit, review these essential multimeter safety tips:

1. Plan your task

Task planning is one of the most important tasks for testing for the absence of voltage, lock-out tag-out procedures and troubleshooting a circuit. Planning requires assessing the issue at hand, identifying the disconnecting means upstream of the circuit you are working on, communication, along with self and environmental assessments. Your company may have a "pre-job safety analysis or assessment" form that can help you with task planning. This step will also dictate what tools and personal protective equipment (PPE) might be required to complete the tasks.

2. Use the correct meter

- Only use multimeters displaying an approved Canadian certification mark
- Ensure the correct category (CAT) rating is selected for the environment and voltage being tested (CAT I, II, III, IV)
- Never assume a lower category rating is "close enough"
- Always follow the multimeter instructions manual for proper use and application
- Use fusible leads

3. Wear appropriate PPE

- PPE should be the last resort according to the hierarchy of control
- Where complete disconnection is not feasible, as per Rule 2-304, while working on or near energized circuits, appropriate PPE,



Fused leads

including eye protection, insulated rubber gloves, dielectric footwear and arc-rated PPE may be required

- CSA Z462 Workplace Electrical Safety Standard provides assistance in determining severity of potential exposure, planning safe work practices and selecting PPE to protect against shock and arc flash hazards
- Training in controlling hazardous energy and workplace electrical safety is highly encouraged
- **Remember, a meter does not eliminate electrical hazards!**

4. Safe testing practices

Before testing:

- Verify the meter is on the correct setting for what you are measuring (voltage, current, resistance, etc.)
- Inspect leads for cracks, exposed conductors, bent probes or loose connections
- Confirm probes are inserted into the correct input jacks
- Test fusible leads fuses
- Ensure the meter is working properly by testing on a known circuit first

While testing:

- Do not switch functions (for example, voltage to resistance or continuity) while probes are connected
- “One person, one tool, one task” rule
- Do not hold the meter or test leads for someone else while testing or troubleshooting a circuit
- Only move probes after disconnecting from the circuit; maintain proper hand positioning/probe control

5. Maintain your equipment

- A poorly maintained meter can provide inaccurate readings or fail when you need it most
- Ensure you store meters properly to prevent internal damage
- Keep leads in good repair, replace damaged components immediately and turn the meter off after use to preserve battery life