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# Electrical installation

**WARNING!** Hazardous voltage. Contact with high voltage may cause death or serious injury. The on / off power switches on the circuit breaker **DO NOT** turn off power to all lines in a sign. Remove power at the source.

**Notice:** The following electrical installation requirements must be followed or the sign warranty will be voided.

Electrical installation must only be attempted by a qualified electrician. Electrical connection must comply with all applicable national and local codes.

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## Requirements for electrical installation

The electrical installation of signs varies greatly. The following bullet points are requirements. **It is the installer's responsibility to ensure that the installation complies with all national and local codes.**

- All power wiring **must** be from circuit breaker-protected lines.
- **DO NOT** connect the sign to a GFI-protected circuit.
- A two-pole disconnect device **must** be installed in the building wiring for each branch circuit supplying the sign.
- The sign **must** be properly grounded according to the applicable national and local electrical codes (for example, NEC Article 250 and 600, and IEEE 1100-1999).
- All electrical conduit connections **must** be watertight.
- Use minimum 80° C copper wire only.
- Torque terminals to a minimum of 7 in/lbs and a maximum of 10 in/lbs.
- **DO NOT** drill additional conduit holes.
- **DO NOT** route power and communication wires out of the cube door and around the side of the sign; the wires will be damaged when the door is closed.
- Separate conduits **must** be used for signal wires (for example, RS232, RS485) and for power wires. However, fiber optic wire may be run in the same conduit with power wires.

## Power requirements

Adequate power **must** be run to the sign in accordance with the “Technical specifications” on page 63.

- The sign is configured for **one of two power configurations only**; 115VAC single-phase or 230VAC single-phase power. The sign is **NOT** configured to run off a 208 3-phase power source.
- The sign **must** be run on it's own dedicated circuit to ensure proper operation. This is particularly important when the sign is installed in a structure containing ballasts for fluorescent lamps. They **must** have their own circuit. Not complying with this requirement can lead to intermittent sign operation or malfunction.
  - **Do NOT** run power to the sign and the ballasts off the same circuit.
  - When ballasts are used in the same vicinity of the Adaptive sign, it is recommended that they be of the electronic low harmonic type to further reduce the risk of any interference with the sign.
  - Wire gauge and breakers **must** be sized or verified in accordance with Adaptive's input power specifications, the National Electric Code, and applicable local codes. **Under-sizing the wire gauge or breaker size can lead to intermittent sign operation or malfunction.**
- Some sign sizes require more than one circuit (power entry) according to Adaptive's “Technical specifications” on page 63.

### *Adaptive Explains*

#### **Is it necessary to run two conduits to a sign?**

It is *not* always necessary. Two conduits are only necessary when communication wire, like RS485 wire, is run to a sign from a computer or from another sign. In these cases, one conduit would contain the sign's power wires and the other conduit the communication wires.

If power and communication wires are put in the same conduit, there is a chance the communication wires might pick up electrical interference from the power wires. For example, when a live power cord is placed next to a stereo speaker wire, the interference from this cord may cause the speaker to hum. In the case of a sign, this same effect could disrupt messages sent to the display.

## Earth-grounding Excite signs

Properly grounding each sign is necessary because it is an essential means of preventing shock, shock hazards, and potential fire hazards.

**WARNING!** Failure to properly ground the sign could result in elevated voltage from lightning entering the sign seeking a path to earth. The high voltage can result in electric shock, fires, and the destruction of the sign from lightning.

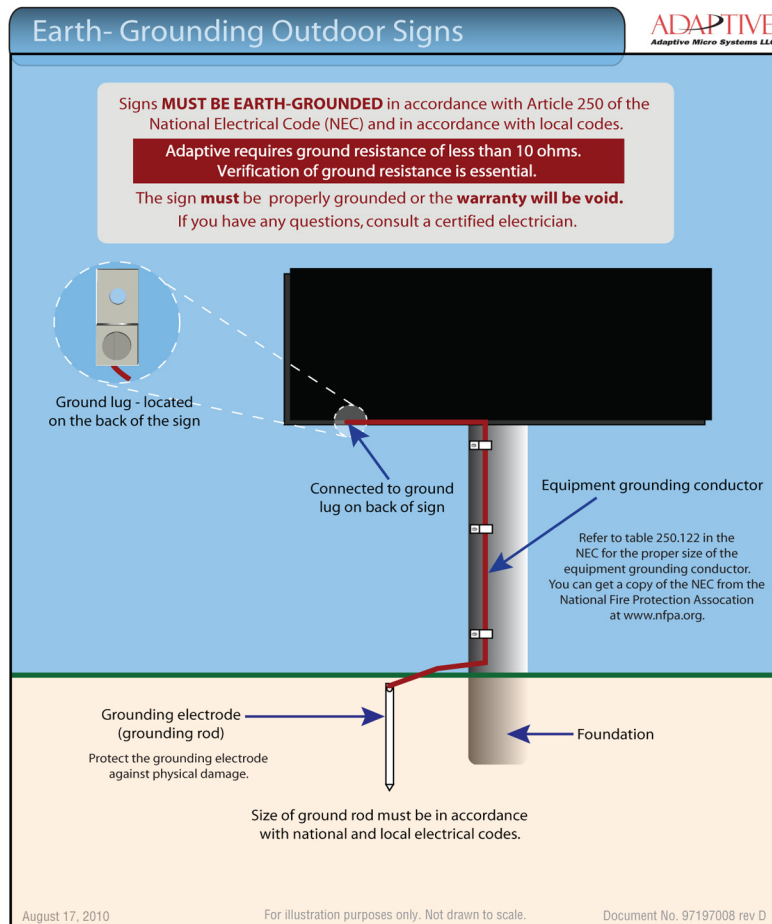


Figure 38. Grounding guidelines

## Lightning strike protection

A sign bonded to an earth ground has a means of dissipating the high voltage and current from a lightning strike. The resistance of the grounding electrode must be as low as possible. However, damage can still occur to a sign's electronic equipment from lightning voltage transients.

Though some surge protection is incorporated into a sign, to protect a sign from high-voltage lightning transients, surge protectors need to be installed in accordance with NEC Articles 280 and 285 and local codes.

The following guidelines must be followed or the warranty will be void:

- Signs **must** be grounded in accordance with Article 250 of the National Electrical Code and in accordance with applicable local codes.
- **Do NOT** terminate the ground on metal poles or buildings. The metal will corrode resulting in deteriorated grounding properties. Additionally, metal poles or buildings are often mounted on material that does not provide an effective ground.

Adaptive also recommends the following guidelines:

- Use copper-clad ground rods as the grounding electrode. They provide effective grounding for an indefinite period of time.
- Depending on the local soil conditions and codes, more than one ground rod may need to be installed.
- Since moisture becomes more stable at greater distances below the earth's surface, when possible, install the ground rod so that eight feet extend below the frost line to lessen the deviation in the system's resistance.
- Verify the grounding electrode conductor is securely attached at both ends.