



# ENTERTAINMENT ELECTRICAL SAFETY ASSOCIATION

## Grounding Of Generators In The Entertainment Industry

The purpose of grounding a generator in a remote location is to eliminate step/touch potentials (establish an equi-potential plane). In an existing building or urban environment, the equi-potential plane has already been established because all system/service and equipment should already be bonded together and all system/service neutrals bonded to ground. In a rural setting, you are setting up the only equi-potential plane.

### What is the difference between grounding and bonding?

**Grounding:** a (low impedance) connection to earth obtained by a grounding electrode(s). Sufficiently sized to carry any potential fault current and allows overcurrent devices to function correctly.

**Bonding:** a connection of all metal parts of any equipment in or near the system with a common (green) conductor. This provides a path for fault current back to the source to reduce the risk of shock. See EESA document “Bonding Of Electrical Systems In The Entertainment Industry” for additional information.

### What is required to ground my generator?

One of the acceptable ground electrodes, a correctly sized copper ground conductor and approved connectors. All ground electrode connections should be verified and must be acceptable to local authorities having jurisdiction.

Ground Electrodes:

- a) two 10’ ground rods spaced 10’ apart (driven to full depth) \*
- b) one approved ground plate (typical 10” x 16” x ¼”), buried 2’ deep \*
- c) a buried metal water piping system, eg fire hydrant or water faucet
- d) an existing metal object of equivalent size and depth to a) or b) above.

\* **Call before you dig.** Make sure all underground services are located before installing ground electrodes. See EESA website ([www.eesa.tech](http://www.eesa.tech)) for existing ground location maps.

Ground Conductor:

A generator ground shall be run directly (max 50 m) between the ground electrode and the generator’s ground connection point using a dedicated grounding conductor with no more than 2 in-line single pin connections.

Ground conductor size (from ESA SPEC-003 Table 3):

1.1 Ampacity of Overcurrent Protection	Size of Copper Grounding Conductor AWG
100 or less	4
101 to 200	2
201 and above	2/0

**Notes:** When different electrical systems are in proximity to each other and do not share the same ground electrode they shall be bonded together. See EESA document “Bonding Of Electrical Systems In The Entertainment Industry”.

*The ground point should be as close as possible to the system.  
Ground plates are preferred over ground rods; in-situ (i.e. existing) ground points are preferred.  
Refer to OESC section 10-102 Grounding Electrodes.*

### **Where do I connect the ground electrode(s)?**

Connect the electrode to the ground point that is closest to the main output terminals of the generator.



**Main output terminals**



**Connection to existing ground electrode**



**Existing (in-situ) metal object**



**Ground Plate installation**

### **How can I verify my generator is grounded?**

All ground electrode connections should be verified with a ground proving device. For operating instructions contact device manufacturer or refer to EESA website ([www.eesa.tech](http://www.eesa.tech)).

### **I have a small generator. Does it need to be grounded?**

Generators under 12kW that are frame grounded and use only cord and plug connected loads do not require connection to a ground electrode subject to the provisions of OESC rule 10-214.

**All** other generators must be grounded.

### **What if I have other questions?**

If you have further questions, visit the EESA website ([www.eesa.tech](http://www.eesa.tech)), consult SPEC-003, the Ontario Electrical Safety Code Section 10 or call your local electrical inspector.