

## Grounding Vs. Lightning

This technote is intended to provide information on basic grounding techniques that will help prevent inverter damage due to lightning. It is not intended to be a complete course on grounding or a guarantee against protection during a lightning strike situation. The NEC is the ultimate authority as to legitimate grounding techniques for your electrical system.

If an electrical system has components grounded at different points in the earth, large voltage differences will exist between these points during a lightning strike (Figure 1). If this voltage appears between the AC and DC side of the inverter it will fail. All Trace inverters are designed to withstand a minimum of 1750 volts between AC and ground, and 500 volts between DC and ground.

### One Ground For All Equipment (Figure 2)

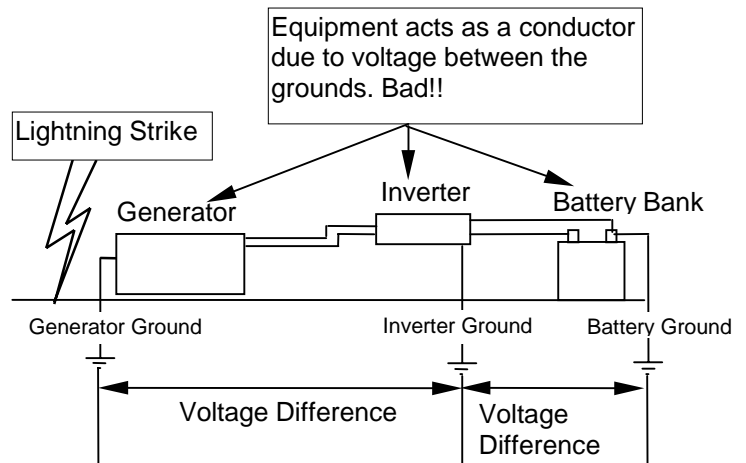
The first step in inverter protection is to make sure that all equipment in the system is physically grounded at the same location. This assures that there is no voltage potential between grounds in the system (Fig.1). No voltage means no current flow through the system. Practically speaking, this would mean connecting the generator and battery grounds together, as well as the case or "safety" grounds in the system, and then attaching all to the same earth grounding rod (See the NEC for specific information on grounding requirements, and hardware).

In severe conditions, the generator frame should physically be isolated from the earth by a wood frame or some other insulating means. This assures that the single point ground system is maintained.

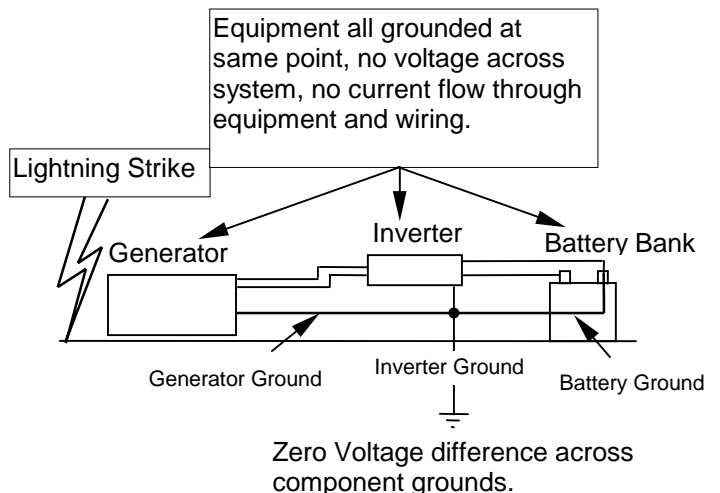
### Keep Equipment Close Together

All equipment involved in a system should physically be located as close as possible to one another. This reduces the potential that is developed between the ground site and the individual components of the system during a lightning strike. This single point grounding greatly reduces the potential for lightning damage to electrical equipment.

If you are unable to achieve single-point grounding due to large distances between equipment or other variables, other means of lightning protection must be considered. Consult a reputable lightning protection company.



**Figure 1- Multiple Point Ground System**



**Figure 2- Single Point Ground System**