



Electric Fencing: Lightning Protection

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Introduction

Electric fencing energizers are commonly damaged by lightning, either directly by lightning strikes on the fence side, or indirectly on the utility side by power surges that are often caused by lightning strikes. This publication, one of a series on Electric Fencing, reviews how to protect the energizer in both cases.

Protecting your energizer from lightning

Electrical surges coming from utility electric supply are one of the main causes of damage to energizers. It is important to purchase an external, after-market surge protector (like those used for household electronics) to protect your energizer from electrical surges (fig. 1).



Figure 1. Surge protector Image source: Matt Booher.

Lightning strikes on the fence are also possible and can severely damage an energizer. You should consider installing a lightning diverter (also called a lightning arrester) between the energizer and the fence. Lightning diverters have two to three terminals. One terminal will always hold a wire that leads to a grounding system designated specifically for grounding lightning. This is a separate grounding system than the one used by the energizer, and the two grounding systems should be at

least 50 feet apart. It is usually recommended that the lightning diverter's grounding system contain at least one more rod than the number used by the energizer's grounding system; doing so creates a better ground and ensures that lightning is properly diverted. The remaining terminal or terminals on the lightning diverter hold two wires. One connects to the positive terminal of the energizer and the other connects to the fence. See figure 2 for examples of several common lightning diverters but be sure to follow the recommendations specified for the one you purchase.

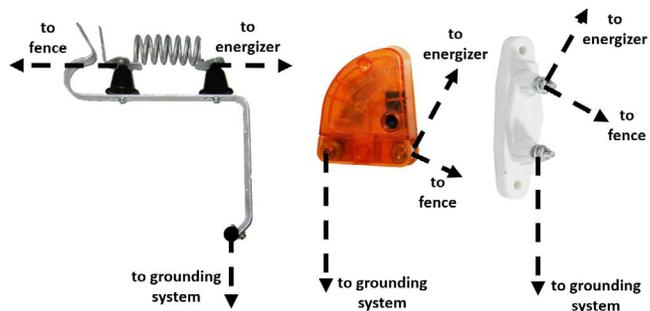


Figure 2. Lightning diverter installation for several common lightning diverters. Image source: Matt Booher.

Installing an induction coil can provide additional lightning protection (fig. 3). An induction coil should be constructed as part of your lead-out to the fence. You will need about 50 feet of insulated lead-out cable, gathered and fastened in 10-inch-diameter loops until all the slack is taken up. One end of the looped lead-out cable is then connected to the positive terminal of the energizer, and the other end goes to the fence (or to a lightning diverter). The loops built into the lead-out cable will help to arrest any voltage coming from the fence.

Some energizers come with internal lightning and surge protection, but these are not infallible, so it is still good insurance to install primary protection with a surge protector, lightning diverter, and even an induction coil.

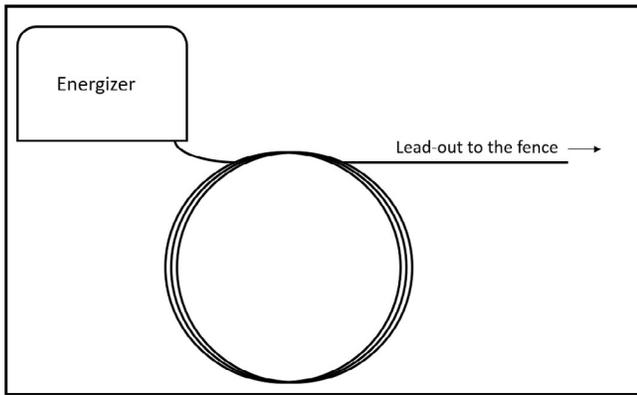


Figure 3. Induction coil. Image source: Matt Boher.

Protecting an energizer from lightning strikes requires additional effort when building an electric fence system, but offers a significant safeguard from such damage (fig. 4).

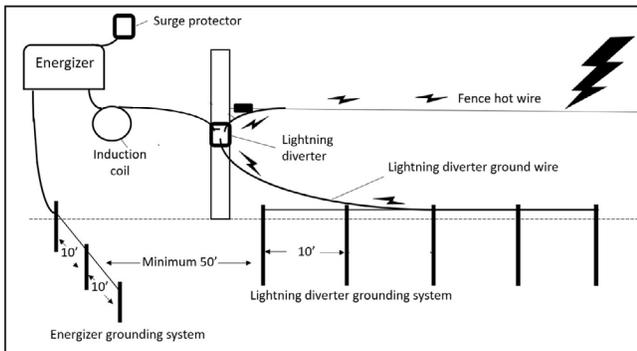


Figure 4. Diagram of fence system incorporating surge protector, induction coil, and lightning diverter. Image source: Matt Boher.

Repeated issues with lightning damage to energizers

If you have repeated issues with lightning damage to energizers after installing a good surge protector and lightning diverter, it could be that your electric fence grounding system is a better ground than that of the residential electric service. When lightning hits a nearby power line, the electrical surge can bypass the residential service ground and travel through the energizer to get to your fence's grounding system. To remedy this, you can ask an electrician about installing additional ground rods to your residential grounding system.

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