

# Electric Fence

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## Overview

Electric fencing systems have been utilized as a tool to effectively manage livestock grazing. While this temporary, or portable, fencing works great for intensive rotational grazing systems on irrigated pastures, it can also be effective on public lands in controlling grazing in sensitive areas. Electric fence is not only utilized to keep animals in, but can also be a tool to aid in protection of livestock from predators including bears, coyotes, and wolves. There are many different options of materials and fence energizers to select from. Electric fences can be permanent or temporary in application. These materials include Hi-Tensile Wire, Hi-Tensile fixed Wire, Polywire, Polytape, Polyrope, and Electro-Netting.

## How Electric Fence Works

Fence Energizers regulate electricity flow, store electrons and release them in a pulse. A good charger's pulse will last for .0003 seconds. Power sources for electric fence chargers can be AC or DC and are low impedance that resist leakage of current that can overcome loads such as the fence touching itself, vegetation or animals. High voltage pulses generated by the energizer are activated when an animal touches the live wire completing the electrical circuit back to the energizer through the ground (earth), delivering a shock to the animal (Dan Macon) which instantly deters the animal (livestock or predator) from going through the fence. In order to have an effective shock you need to have good grounding to complete the circuit. Grounding rods should be connected to a charger with 12.5 gauge insulated wire and attached to the grounding rod clamps. For best results use 6 ft. long ground rods set 10 feet apart, hammered into moist soil when possible. If fence area is going to be longer than 1500 ft., another ground rod needs to be included and connected to the wire every 1500 feet to be effective.

## Setting up Electric Fence

Permanent fences can last up to 40 years and are typically made of steel wire. These can range in wire strands from 2-7 wires depending on the livestock one is trying to contain or the type of predators one is trying to keep out. Materials needed include wood or metal pipe for corner braces and t-posts, rods or wood for strength along the wire.

Temporary fences could be used to divide a pasture; they are portable and usually used for short distances. The type of fencing used for temporary fences includes wire, tape, polywire etc and can be one to three strands. One can use step in plastic posts to



hold wire along the area. This type of fence is relatively quick and easy to build.

Another option that is effective for small ruminants and poultry is Electro-Netting. Spacing of wire depends on the species one is trying to keep in or out. Typically, Cattle/horses need about 17" between wires while goats/sheep need 10" for the bottom 2 strands then 12" for the upper strand. The distance between line posts can vary from 15-30' depending on the ground area, bends or turns in the line (Dan Macon).

Joules Needed	
Minimum Recommended Joule Rating	Miles of electrified wire
1	6
2	12
3	18
4	24

**Table 1.** Miles of wire run by specific joule ratings



Example Energizer Performance		
Model	1000	3600RS
Output	1J	36J
Size	Small-Range	Large-Range
Range	40 acres	2,500 acres
Open Circuit	9,800V	9,500V
1000ohm load	7,000V	8,800V
500 ohm load	5300V	8,500V
100 ohm load	1800V	8,000V

**Table 2.** Example energizer performance of two different models.

- Note: Both energizers will produce over 8,000 volts. The difference is the amount of load (resistance) that each energizer can overcome. A larger energizer produces more energy to overcome bigger loads.
- An electric fence is like a water pump (energizer) and a pipe (fence wire) with water (voltage) flowing through it.

### Testing Electric Fence

Voltmeters are the best option to determine if fence is working properly.

### Cost

Initial purchase of electric fence set up can be expensive whether permanent or temporary, however, materials can be reused year after year and the general financial cost is less than a fully permanent barbed wire fence for example.



Solar Stafix chargers range	\$ 90-1152
Battery powered range	\$ 226-271
Pigtale posts	\$ 3.85 each
T post insulators 25/ bag	\$ 16.45
Wire depending on the type per roll approximately 600 ft	\$ 81.79
Grounding kit	\$ 31.99

**Table 3.** Example costs of necessary equipment to erect successful electric fence. Cost from Live Wire Products, Inc website.