Fence Energizers

Solar in winter? It's possible depending on location and amount of available sunlight.

Issues to consider before buying an energizer:

1. **Total length of fence:** This is ***actually of minimal importance!***
   Why? Because even small units will energize very long fences and stop animals—***if there are no leaks of energy to the soil via weeds or poor quality insulators.***
2. **Amount of wet/green weed contact** with the energized wires. ***This is very important!*** 1/4 mile of high-tensile wire that's covered with weeds and is only 6" above wet soil may leak or drain away more energy than a 3-joule energizer can provide!
3. **How high above the soil will the lowest live wire be?** Low wires (6") cause much more leakage from weed contact than high wires (>18").
4. **Species to be contained or deterred:** Animal and birds vary in their internal resistance (in ohms) to electricity.
   Wide-impedance units (or large low-impedance ones) are best for species with high internal resistance (poultry, goats, deer). Low-impedance units work well for cattle, horses and pigs.
5. **Climate:** Low-impedance units are ideal for places where the grass stays green. Wide-impedance units are superior when grass turns brown for 2 or more weeks.
6. **Soil:** Wide-impedance units are better for rocky and/or sandy soil. Low-impedance units are better for clay and/or loam soils.
7. **Power source:** 110v AC plug-in units are best if the fence is close to power. If not, look at solar (battery) options.
8. **Cost:** *The most expensive energizer is the one that isn't big enough and therefore results in escaped animals or predator attacks.*

Key advice from experts…

- **Buy a larger energizer than necessary.** If the fence works, most folks will buy more fence—and need a larger energizer.
- **Use a fence tester** to check the voltage—often.
- **Install a ground rod(s)—** included in our kits.
- **Don't go below 40% charge level** on a deep cycle battery.
- **Use insulated wire** that is specifically designed for electric fences.
- **Never connect a fence directly to a 110v AC outlet.** This can be lethal and may cause fires.

Fence Energizer FAQs

Key Definitions

Volts/voltage: A measure of the pressure upon electrons to move from "A" to "B". Very similar to psi in water and air systems.

Electrons can't flow from A to B unless enough voltage (pressure) exists to overcome the sum of the resistances between the 2 points.

Joule(s): A measure of the volume of electrical energy (electrons) in a pulse. Comparable to pints, quarts or gallons in water systems.

When enough electrons (joules) suddenly pass through an animal's (or human's) nervous system, the pain is memorable and cause for avoidance in the future.

Amps/ampere/amperage: Measure of the rate of flow of electrons per unit of time. Similar to gallons per minute for water systems.

Pulse frequency: The number of pulses that occur each minute; 40 pulses/minute equals a pulse every 1.5 seconds.

Ohms (Ω): Measure of resistance to electrical flow. More Ω = more resistance. It's additive. If 1000 ft of wire is 200Ω then 2000 ft is 400Ω.

Conductor: Any material with low ohms/1000 ft numbers such as copper, aluminum, tin or steel.

Water is a conductor. Wood, if wet internally (e.g. sap) or externally (dew, rain), can become a conductor. Similarly moist soil and grass stems are conductors. Animal tissue with moisture in or on it is a conductor.

Electroplastic conductors/netting: A cable or ribbon comprised of small conductive metal (copper or steel) filaments and nonconductive plastic filaments. The metal carries the electrons. The plastic provides visibility, strength and elasticity.

Insulators: Materials with high resistance (ohm numbers) such as fiberglass and plastic.

Wood is an insulator *if it is dry* internally and externally.

Dry animal hair, wool and feet are poor conductors and thus are insulators (albeit often poor ones).

Q. What is a fence energizer?
A. A box that takes in electrical energy from an outside source (either a battery or a 110 volt outlet).

The energizer pushes the energy out through the *positive* terminal in very brief, high voltage, high amperage pulses. The ground (*negative*) terminal's purpose is to absorb any excess pulse energy back into the energizer.

Q. What is an electric fence?
A. An extension of the 2 terminals (fence and ground/earth) of the energizer.

The earth/negative terminal is extended by driving metal rods into the soil and connecting them to the terminal with conductive wire.

The outbound/positive/fence terminal is extended by attaching conductive wires to it. They are suspended above the soil and kept separate from the soil by insulators or nonconductive posts.

Q. How high is the voltage of a pulse?
A. Up to 14,000 volts. That sounds extreme—but static electricity is often as much as 25,000 volts.

Q. How brief is the electric pulse?
A. Less than 3/10,000 of a second.

Q. Will I feel anything if I touch a terminal when the energizer is on?
A. Yes and no. You will feel nothing if you touch only one.

But if you accidentally touch both at the same time ***(we strongly advise against this!)*** you will feel the full impact of the pulse.

Note: We never contact the terminals (even when the energizer is off) without first carefully touching both terminals with an insulated metal wire!

Q. What happens when grass touches an energized fence wire?
A. The fence wire is "pressurized" with excess electrons from the pulse.

Green vegetation is a conductor—particularly when wet. When it contacts an energized wire, the pressurized energy (measured in volts) is pushed down through the moisture in the stem to the soil. Folks call this a "leak" (similar to a hole in a water hose) or a "short."

Q. What happens when an animal touches energized wires?
A. The high voltage of the pulse pushes electrons through the animal's point of contact (often the nose or ears), then through the body's tissue and fluids and out through the feet/hooves/paws into the soil moisture.

Q. Why is animal weight a factor?
A. The weight of a heavy animal compresses the soil. This reduces electrical resistance of the topsoil and increases the joules of energy that can flow through the animal.

This explains why heavy animals are more affected by electric fence and light animals less so.

Weight (or the lack of it) explains why calves, lambs or goat kids seem to be less affected by a pulse than adult cattle, sheep, goats or horses.

Q. Why is grass color a factor in choosing a suitable energizer?
A. Green grass indicates the soil is moist, so the soil will have less resistance to a pulse.
Brown grass indicates the opposite.

Q. Which species are most affected by an electric fence pulse?
A. In order from most to least affected: pigs, horses, cattle, canines (wet noses, bare pads), raccoons, sheep, goats, deer, geese, chickens and rabbits.

This assumes adult animals are contacting the fence with their nose, beak or paw.

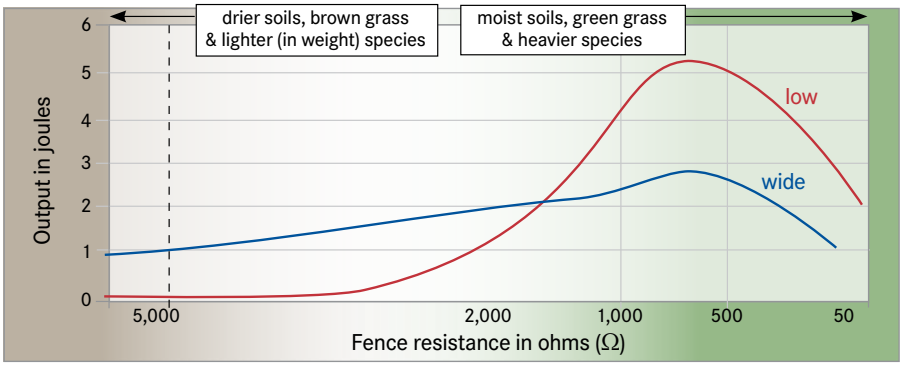
Q. I'm confused by all the energizers that Premier offers. Why so many?
A. Some users have strong preferences based on prior experience.

Q. Why is Premier's energizer know-how unique?
A. Other firms may supply more units—but no one supplies more units (50,000) direct to end-users ***and*** tracks the results.

We know what failed, when and why. Often the energizer is not the problem.

When you join our community of satisfied customers, you tap into that experience and expertise.

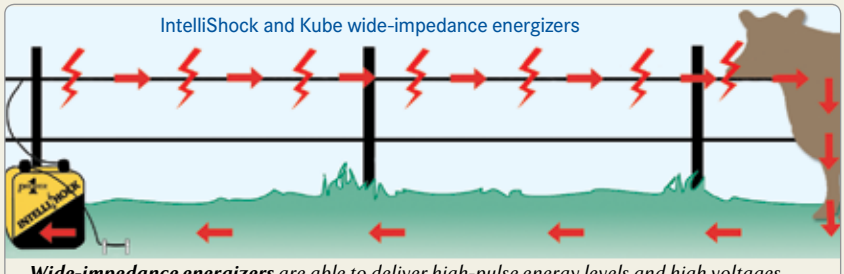
Energizer Impedance—wide vs low?



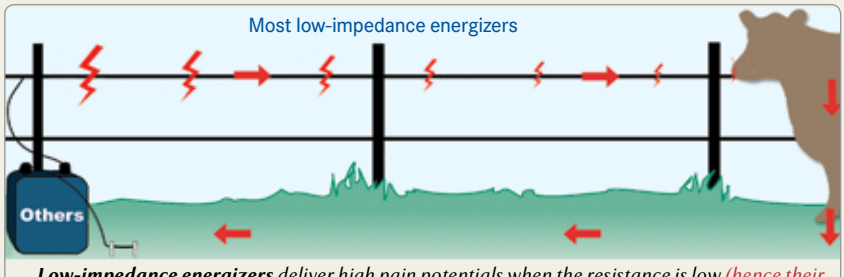
Wide vs low impedance output curves *(chart above)*

1. ***An energizer's output is not a constant!*** The stated number on the outside of the box is a optimum ***peak.*** It's never more than stated—and almost always much less.
2. **The curve shape is important.** The chart above shows 2 energizer output curves in joules. One is a wide-impedance unit with 2.7 joule peak output. The other is a low-impedance unit with 5.2 joules peak output.
3. **Low-impedance units excel when the soil is moist**, the grass is green, the animal is a good conductor and there are plenty of ground rods.
4. **Wide-impedance units excel when the total resistance is higher—**due to brown grass, dry soil, the animal is not a good conductor or the total ground rod is less.
5. **The higher an energizer's peak joule output is at 500Ω,** the more likely it will be effective when there is high green-weed contact on the wires close to the ground.
6. **The higher an energizer's output in joules at 5000Ω,** the more likely it is to be effective when the soil becomes dry.

Why animals respect wide-impedance energizers!



Wide-impedance energizers *are able to deliver high-pulse energy levels and high voltages through a wider range of fence situations—including those with high total fence circuit resistance due to inferior polywire/netting; dry, sandy, rocky soils; dry, brown grass; and fewer ground rods. Animals have greater respect for and fear of such fences when energized by wide-impedance units.*



Low-impedance energizers *deliver high pain potentials when the resistance is low (hence their well-deserved reputation for working well when the soil is moist and the grass is green), but much less as the combined resistance of the soil, animal and wire rises. Illustrates how the joules of pulse energy at the end of the fence (and thus the potential pain available to animals) drop as the total resistance of the fence circuit increases—due to wet soils becoming dry, reliance upon stainless steel polywire and tape fences, or fencing across sandy/rocky soils.*

High vs Low vs Wide impedance energizers

Impedance is similar to resistance.

For energizers it means the level of ohms (resistance) that matches an energizer's peak output. If low ohms then it's a low-impedance energizer, etc.

The first fence chargers (50 years ago) were high-impedance units.

Their maximum output (never very much) occurred when the fence was weed-free. They could cope with drier soils but *their effectiveness disappeared when a few green weeds touched the fence.*

Most were too small in energy output/pulse to be effective against difficult-to-contain animals (sheep, goats, chickens).

The next generation was low-impedance energizers.

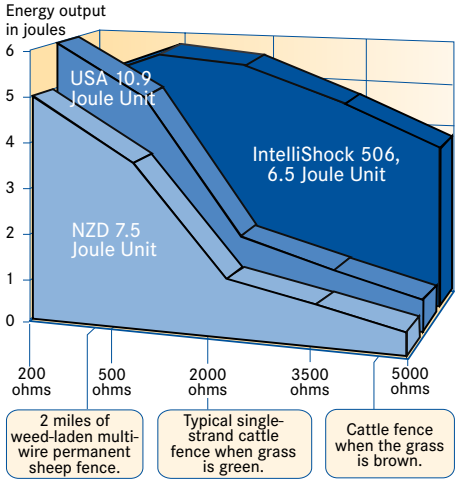
They coped well with high weed contact but not with dry soils or poor conductors.

They are very effective against low-resistance animals (cattle, horses, pigs) standing on moist soils.

Wide-impedance **is Premier's term for energizers that perform well in *both* dry and wet situations.**

In dry soils or with animals of high resistance (goats, wildlife and poultry), wide-impedance units outperform low-impedance units of similar output.

Graph comparing 2 low-impedance units with a wide-impedance energizer—IntelliShock 506



- *Note when each excelled.*
- *Note also that the larger low-impedance unit did better than its low-impedance little brother in all conditions.*