

# Fence Energizer FAQs

## 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 then pushes the energy out through the fence (*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 the ground terminal.

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

We never contact the terminals (on or off) without first touching both terminals with insulated metal wire (to displace the charge)!

## 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/hoooves/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.

# 2-Year Energizer Warranty

*When you buy an energizer from Premier, you purchase more than an energizer.*

## You obtain these benefits:

### 1. If an energizer fails within 2 years of its date of purchase, we will replace the failed module or unit at our cost.

Your credit card will be charged for the replacement but you will receive full credit when the failed item is back at Premier. Your only cost is shipping the failed item to us. If the original energizer is over 2 years old, we will repair it, but you pay for the repair cost and freight.

*Note: Policy does not apply to failure due to abuse or neglect.*

*Warranty does not cover batteries.*

### 2. Free next-day air shipment of warranty replacement energizers.

If you think your energizer has failed, call us at 1-800-282-6631. We'll help you test your energizer to ensure that it has truly failed. This is important as we've found that 25% of the units returned to us work fine; the fence was at fault, not the energizer.

### 3. Free technical support.

We provide free advice before you purchase an energizer and free support afterwards for as long as you wish. All you have to do is call.

### 4. Solar energizer packages.

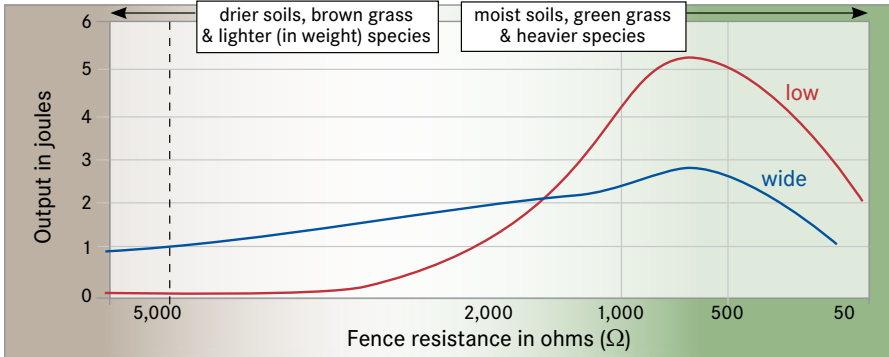
With larger energizers (over 1 joule), the panel, battery and energizer need to be correctly sized for each situation. Call us and talk to our consultants.

### 5. Three-year assurance against energizer obsolescence.

Premier's “contract” with customers includes repair or replacement of any nonworking units for up to 3 years.

During the 2-year warranty period, Premier pays for the replacement cost.

# Energizer Impedance—wide vs low?



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

- An energizer's output is not a constant!** The stated number on the outside of the box is an optimum peak. It's never more than stated—and almost always much less.
- 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.
- 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.
- 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.
- 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.
- The higher an energizer's output in joules at 5000Ω**, the more likely it is to be effective when the soil becomes dry.

## 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.**

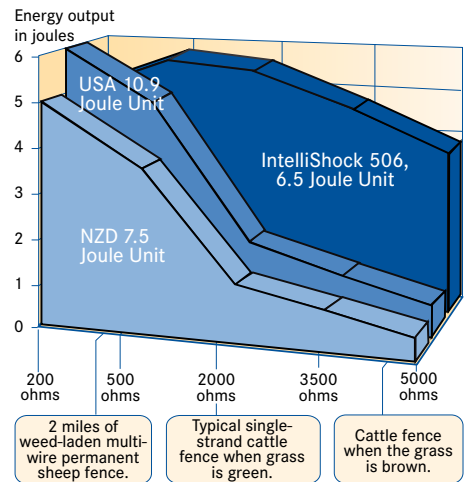
They coped well with high weed contact but not with dry soils or poor conductors.

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.**

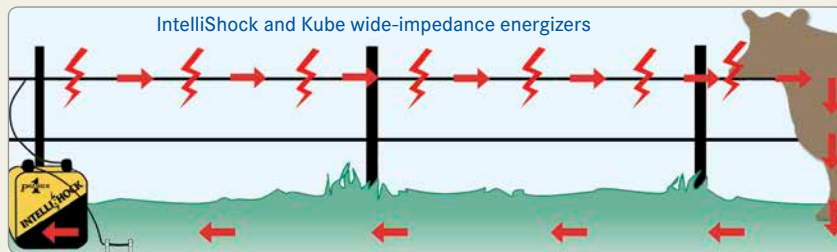
In dry soils or with animals of high resistance (goats, wildlife and poultry), wide-impedance units outperform low-impedance units of similar output.

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

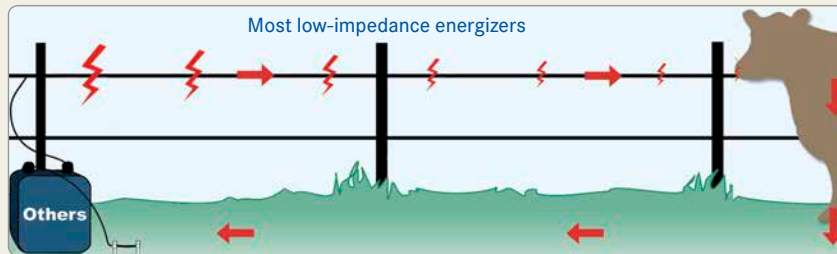


- Note when each excelled.
- Note also that the larger low-impedance unit did better than its low-impedance little brother in all conditions.

## 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.

# Solar Energizer FAQs

## Q. How do solar energizers compare to other fence energizers?

- A.
- Their output is identical—a brief high voltage pulse of energy.
  - Their input source is a DC battery.
  - When the sun shines, the solar panel recharges the battery—which eliminates the hassle of carrying the battery to/from a recharger.
  - They're larger in physical size than 110 volt energizers—because of the solar panel, battery and case.
  - They are more expensive per unit of output—again because of the battery, solar panel and larger case.

## Q. How do solar energizers differ from one another?

- A.
- Input needs (in milliamperes per hr).
  - Pulse energy output (joules).
  - Pulse rate per minute.
  - Size of battery (in amp hrs) per milliampere of draw.
  - Size of solar panel (in watts and volts) per milliampere of draw.
  - Number of days the battery will last on its own without sunlight.
  - Cost/joule of output and durability.

## Q. What are the negatives of solar?

- A.
- Expensive per joule of output.
  - Usually have less frequent pulses—which reduces its ability to stop animals and their predators.
  - More maintenance including:
    1. Keeping the panel free of dust, debris, snow and ice.

2. Keeping the panel fully exposed to the sun—unshaded by trees, grass, fence posts or buildings.
3. During winter the capability of the battery is lower—just when the available sunlight to recharge batteries is also low.

## Q. Are solar energizers less expensive?

- A. No. Plug-in units cost less because they don't need a battery or a solar panel.

## Q. Are they less costly to operate?

- A. No. The cheapest energizer to operate plugs into 110-volt AC current.

Surprised? A Kube 4000 provides 10 times more pulse energy than most farmstore solar units. Yet it uses less than 70 watts/day. That's only \$2.50 per year!

By comparison the battery in a typical farmstore solar fence energizer (1/10 the energy output of a Kube 4000) costs \$24 and may need replacing every 2 years—an annual operating cost of \$12.

## Q. So how do Premier solar energizers differ from farmstore energizers?

- A. In summary:

1. Premier's solar energizers have much higher pulse output—from 0.25 to 2.0 joules.

However, most farmstore solar units vary from .04 to .17 joules—enough to stop a mature horse or dairy cow but not nearly enough power for

sheep, goats, poultry and wildlife or fences that experience weed contact.

2. We also offer "extreme" versions of PRS units for areas with less sunlight and/or colder temperatures—and we tell you where those areas are.
3. We use larger solar panels and larger batteries per unit of output.
4. Our units cost less per joule of output.

## Solar energizer best practices

- **When not in use**, turn off the unit and face the panel toward the sun to recharge its batteries.

If in use, leave the energizer turned on face its panel toward the sun. Adjust panel angle based on the diagram below.

- If an energizer tests less than 2000v across the energizer terminals (*while disconnected from the fence/ground*), **test the battery with a battery meter** to make sure it is fully charged.

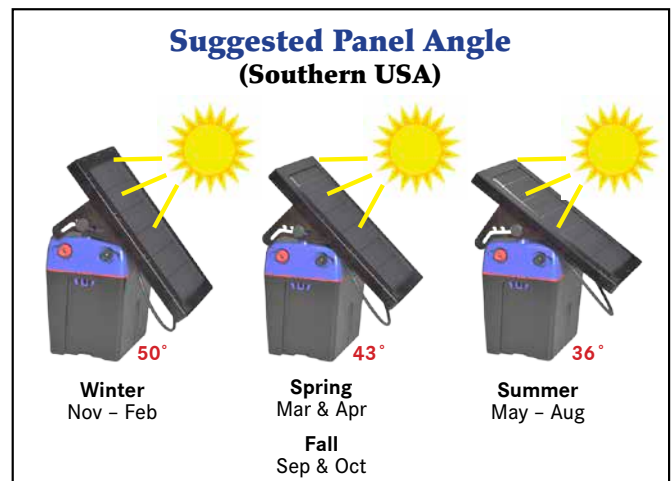
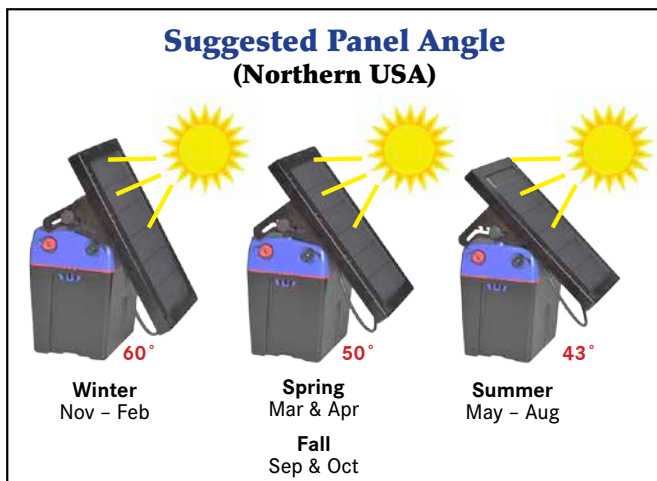
Fence voltage testers can't be used to test batteries (regrettably).

- **Check batteries** to make sure there is no corrosion on the terminals.
- Reduce risk of rodents chewing on wiring harnesses by **keeping the connecting harness off the ground**.
- Do not allow animals access to the energizer.

## Correct placement of the energizer and solar panel is critical to the best operation of the unit.

- Position the energizer so that the solar panel faces due south.
- Correct tilt angle for the solar panel is dependent on the sun's position above the horizon. Use the diagram below to determine the proper angle needed to maximize solar collection—which depends on season and location.

Note: During winter in the far northern USA—charge batteries externally due to lack of sunlight to adequately charge the unit.



# Common user mistakes with solar fence energizers *(please read!)*

**1. Not facing it toward the sun.** This reduces the sun exposure needed to charge the battery. Best practice is to face the unit's panel due south.



**2. Not elevating it above the grass or snow (above).** A solar panel covered with snow will not work.

**3. Allowing dust to cover the panel.**

A light film is not a problem—but if the unit is in a dusty location it will accumulate a layer of dust thick enough to reduce the abilities of the solar cells. A flat battery will result.

Rain, of course, washes it off.

**4. Not turning off the energizer when it's not in use.** A common mistake because the insulated clips connecting it to the fence and ground rod allow users to remove them without turning off the energizer.

**5. Allowing the battery to gradually discharge when not in use.** When storing, disconnect battery (fully charged) from the energizer. Store both in a heated area. **Ensure battery charge stays above 40%.**



**6. Allowing posts, grass (above) or trees to shade it for a portion of the day.** If a solar panel is not **fully exposed to the sunlight all day, it won't develop enough voltage to recharge the battery.**

It's easy to forget that grass can rapidly grow enough to shade a unit sitting on the ground.

## Fire Risk! Avoid "Continuous Current" Energizers for Electric Fence



*The lowest electrified strand (conductor) of the netting was in contact with combustible vegetation. The "continuous current" from this particular energizer combined with the vegetation to ignite a serious fire.*

In 2016 a fire that burned grass, trees, and a UTV was only 30 ft from a barn when emergency services arrived.

It occurred because the property owner used netting with a "continuous current" fence energizer.

### Was Premier's netting the cause of the fire?

Absolutely not. This fire would never have happened if a pulse-type energizer of the right size had been used.

### Would it have mattered if the fence wasn't netting?

No. A fire can (but not always) occur if and when a continuous current energizer is connected to any conductor (netting, rope, tape, twine, wire) that is in contact with combustible material (brown grass, leaves, straw).

### So it was the energizer that caused the fire?

Yes. What enabled this unit to cause the fire was that it, as indicated by the label, is a continuous current fence energizer.



### What is a continuous current fence energizer (see above)?

It's a very old design that is also very cheap to manufacture—thus attractive in pricing to the uninitiated.

Unlike the great majority of energizers sold today, it does not release an intermittent pulse. Instead, it charges the wire continuously, as the label indicates, to no more than 1200 volts.

When a conductor attached to the energizer finds a conductive path to the soil (via grass, stray piece of wire), a continuous flow of electricity travels down this path to the soil. This creates a buzzing sound.

If the right conditions are present, it does not take long for the buzz to create enough heat to ignite the combustible material.

### How do pulsed units work?

Most modern fence energizers send a very brief (less than 3/10,000 of a second), high voltage (2000-6000 volts) pulse down the conductor every 1-2 seconds.

Though powerful enough to deter animals, a pulse this brief and infrequent rarely poses a fire risk when the conductor is near combustible material. There simply isn't enough time for heat to build and allow ignition to occur.

### The label calls this a "low impedance" energizer. Aren't they safe?

Until now that was true. This is the first time that we've seen "low impedance" on the same energizer as "continuous current." Unfortunately, this encourages folks to buy an energizer that will damage netting and is a potential fire risk.

### How do I make the right choice?

If you have questions, contact Premier directly. Our experts have years of experience and can help.