

Side-by-Side Energizer Comparisons

Type	Energizer	Product Number	① Impedance Type	② Peak Output (in joules)	③ Joules at 5000Ω	④ Pulses per Minute	⑤ Battery Input	⑥ Fence Load LED
AC 110 volt Plug-In	 Kube 4000	115110	wide	2.30	1.24	48		
	 IntelliShock 506	113600	wide	5.00	4.00	48		•
	 HotShock 600	113700	low	5.00	0.29	50		
	 Gallagher 1200i	119020	low	6.60	0.50	42		•
	 HotShock 1000	113550	low	10.00	0.74	48		
	 Gallagher 1800i	119021	low	12.40	0.30	42		•
	 Gallagher 2800i	119022	low	15.50	0.30	42		•
AC/DC Plug-In or Battery	 HotShock 5	1120051	low	0.50	0.24	38	12v	
	 Patriot P5	115000	low	0.50	0.26	40	12v	
	 IntelliShock 10	1120101	low	1.00	0.32	38	12v	
	 Patriot P10	115010	low	1.00	0.35	40	12v	
	 Speedrite 1000	119006	low	1.00	0.35	25-40	12v	•
	 IntelliShock 20	1120201	low	2.00	0.45	38	12v	
	 Patriot P20	115020	low	2.00	0.40	40	12v	
	 Speedrite 2000	119005	low	2.00	0.39	25-40	12v	•
	 Patriot P30	115030	low	3.00	0.45	40	12v	
	 Speedrite 3000	119004	low	3.00	0.45	25-40	12v	•
	 Speedrite 6000	119003	low	6.00	0.59	25-40	12v	•
	 Speedrite 6000(i)	119002	low	6.00	0.59	25-40	12v	•
	 Speedrite 12000(i)	119001	low	12.00	0.60	25-40	12v	•
 Speedrite 18000(i)	119050	low	18.00	0.86	25-40	12v	•	
DC Battery	 Speedrite AN90	119008	low	0.12	0.09	25-40	6v/12v	
All-in-One Solar	 Solar IntelliShock 30	113200	low	0.30	0.16	40	12v	
	 Solar IntelliShock 60	113300	low	0.60	0.27	40	12v	
	 Solar IntelliShock 120	113500	low	1.2	0.37	40	12v	
	 Premier PRS 100	114025	low	1.00	0.35	40	12v	
	 Premier PRS 100X	114050	low	1.00	0.35	40	12v	
	 Premier PRS 200	114052	low	2.00	0.40	40	12v	
 Premier PRS 200X	114070	low	2.00	0.40	40	12v		



	7 Min. Ground Rods (ft)	8 Draw in Watts/hr	9 High Low Output	10c mA per hr draw Clean (c)	10w mA per hr draw Weedy (w)	11c Days per Charge Clean (c)	11w Days per Charge Weedy (w)	12c Solar Panel Clean (c)	12w Solar Panel Weedy (w)
	6	4.5							
	15	22	•						
	16	8							
	20	6	•						
	30	20							
	37	9	•						
	46	11	•						
	3	1		46	46	54	54	7	7
	3	4.5		42	42	59	59	6	6
	3	1.5		31	90	80	27	10	10
	3	4.5		87	87	28	28	10–20	10–20
	3	2.0	•	90	90	28	28	10–20	10–20
	6	3.3		32	196	78	13	10–20	20–40
	6	4.5		163	163	15	15	20–40	20–40
	6	3.2	•	180	180	14	14	20–40	20–40
	9	4.5		210	210	12	12	20–60	20–60
	9	4.8	•	295	295	8.5	8.5	20–60	20–60
	18	10	•	650	650	4	4	50–70	50–70
	18	10	•	650	650	4	4	50–70	50–70
	36	15	•	1100	1100			90–120	90–120
	54	19	•	1400	1400			120–160	120–160
	built-in		•	31	31	80	80	n/a	n/a
	1			15	29	166	86	built-in	built-in
	1.8			20	58	125	43	built-in	built-in
	3			28	104	89	24	built-in	built-in
	3			87	87	28	28	built-in	built-in
	3			87	87	28	28	built-in	built-in
	6			163	163	15	15	built-in	built-in
	6			163	163	15	15	mounted-on	mounted-on

Notes...

Red numbers indicate energizers with a “wide” impedance output curve.

The larger the number in column ② the longer the fence can be, the more weed contact can occur and still have an effective fence. 2 joules will cope with twice as many weeds as a 1 joule unit.

The higher the number in column ③ the better this unit will perform in dry soils and with species that have high electrical resistance (i.e. deer, goats).

The higher the number in column ③ the better this unit is for species with higher internal electrical resistance, such as goats, deer and poultry.

Draw in watts per hr in column ⑧—Plug-in units use relatively little energy when compared to bulbs.

A Patriot P5 uses less than 5 watts per hour. At 13¢ per kWh, that’s only 1.5¢ per day.

The Kube 4000, at current prices, is an excellent combination of value and performance for a plug-in unit for short fences—because of its capabilities in both dry and moist soils.

The IntelliShock 506 and HotShock 1000, Speedrite 12000 and Gallagher units are not suitable for horse or domestic pig fences (too much energy).

The AN90 is not large enough in output for electrified netting.

Energizer Chart Data

Explanation of columns and values

1. Impedance type (wide or low)

A simple way to indicate which units are more capable of responding to challenges of drier soils, snow-covered soils, and pushing energy through animals with high internal electrical resistances (deer, goats, rabbits, poultry and small sheep).

2. Peak output (in joules)

Guide to an energizer's ability to cope with high levels of green vegetation contacting the energized wire. Higher joules are better (for green grass).

3. Joules at 5000 ohms

The ohms refer to total circuit resistance (*see below*). Units with higher joules can energize more fence when soil is dry or snow-covered.

4. Pulses per minute

More is better. Less time between pulses means it's more likely to stop untrained animals.

5. Battery input

This column describes the battery input required by each energizer.

6. Fence load LED lights

Not the same as a simple "on" light. These indicate if voltage and energy levels are enough to stop most animals. If not lit, check the fence for problems.

7. Minimum ground rods (ft)

Normal total ground rod requirements. More may help in certain conditions.

8. Draw in watts/hour

Expected AC draw in watts.

9. High-low output

If there is a switch to reduce output energy and battery input demand.

10. Battery amp draw per hour on clean(c) and weedy(w) fences

Expected milliamperes (mA) drain from battery per hour at high output levels for clean or weed-laden fences.

Predicts size of battery needed (or solar panel) and how often you will need to recharge it. Large numbers mean larger panels or more frequent recharges.

Note that mA draw of Patriot units is the same for both clean and weedy fences. For IntelliShock units, when a fence is clean (no green weeds), the mA draw is low. If a fence is weedy, the mA draw of IntelliShock energizers is higher. Thus battery and solar panel requirements (columns 11 and 12) are higher and lower.

Use Deep Cycle (DC) instead of automotive batteries. Why? Automotive batteries can only be drawn down 5% before they lose recharging ability. DC

batteries can be drawn down 60%. DC batteries recharge slowly (1 to 2 amp/hr).

Do not go below a 40% charge on a DC battery whether in use or in storage.

11. Days between recharging for clean(c) and weedy(w) fences

Predicts when a 12v 100 amp hr deep cycle battery will need recharging under clean (no weeds) conditions. Assumes being drawn down to 40% between recharges. (An equal size vehicle battery must be recharged 3X more often to prevent damage to battery.)

12. Solar panel for clean(c) and weedy(w) conditions

Predicts solar panel size (in watts) advised for each energizer under clean vs weed-laden fence conditions.

The low number of a range assumes 6 average solar insolation hours per day (southern US or summer in north).

The high number assumes only 4 insolation hours per day. Using a larger panel allows a smaller battery to be used and vice versa.

Note regarding 10, 11 and 12: Clean (c) fences have no contact with green/wet weeds. Wires in contact with green weeds (w) 6" from soil cause 7 times more energy drain than wires contacting weeds 30" from soil.

What's total fence circuit resistance?

The size of the pulse that travels from an energizer's fence terminal varies in volts and joules according to the sum total of the resistances in the path between the 2 terminals.

These resistances in ohms (Ω) include all of these "numbers":

- The resistance of wire/rope/polywire/tape (100 to 10,000 Ω /mile).
- The resistance of the animal at the point of contact (50 to 2,000 Ω).
- The internal resistance of the animal's body, hooves, hair (100 to 500 Ω).
- Resistance at point of contact with the soil (grass, leaves, wet vs dry soil).
- Resistance of the soil (20 to 50,000 Ω) if it's not a Pos/Neg-wired fence system.
- The resistance of the ground rod system and the soil around it.
- The resistance of weeds (25 to 50,000 Ω). It operates in "parallel" with b, c and d.

The total circuit resistance of a fence varies enormously by the hour, day and week. The key factor is the moisture in the soil, air, plants and the animal's nose, hide and feet. They depend on changes in dew, rain, type of vegetation, wind, etc.

The only constant is the conductor.

Therefore, the total resistance of a mile of single-strand, weed-free cattle/deer/horse fence may vary from 600 to 10,000 Ω throughout the season. But an extra mile may add only 10 Ω to either total (because the other factors do not change).

The circuit resistance of 1500 ft of weed-free, temporary electric netting varies from 200 Ω to 10,000 Ω depending on the soil moisture. Again, adding an extra 1500 ft of ElectroNet may add only 50 Ω .

A Pos/Neg fence (alternating hot/ground) is a wise option when the soil and animal resistances exceed 5,000 Ω .

What is heavy weed load?

Grass growing up to and onto the conductive strands of the fence (this drains the pulse strength). Green (moist) grass drains a fence; brown (dry) does not.

Does the length of the grass stems reaching the fence make a difference?

A big difference. The longer the stem the less energy leakage will occur.

Why should I care?

More resistance and weed drain = a weaker pulse. Livestock and predators will not be stopped by weak pulses.

Wide-impedance vs low-impedance?

Wide-impedance energizers offer higher pulse strength when the soil is dry and grass is brown.

Low-impedance units excel when soil is moist and grass is green.

To Reduce Risk & Liability



What **NOT** to do!

- Never place your head or upper spine near an electrified wire. Accidental head or neck contact can occur when pushing a voltage probe into the soil. Be careful when doing so to avoid head-to-wire contact!
- Never attempt to step over or climb through an energized fence of any kind.
- Never encourage anyone to touch an electric fence.

What **TO** do!

- Instruct all visitors and children to never touch electric fence.

Are electric fences a serious safety risk to humans?

Because touching an electric fence is painful and the voltages are high, most assume that the risks from an energized fence must also be high.

That's a myth. Consider that millions of people throughout the world are "exposed" to millions of miles of electric fences every day—**yet there is less than one death or serious injury per year worldwide—and the fence is often not the cause.**

Compare that to the number of annual injuries and deaths that occur from exposure to tractors, skid loaders, PTO shafts, balers, mowers, combines, bulls, stallions, etc.

This is not to suggest that there is no risk at all. There is, indeed, a small level of risk. And with risk, there is also liability.

To reduce the risk...

1. Be especially careful **not to touch an energized wire with the head or spine.** For reasons not fully understood, this contact point is worse than contact with hands, arms, feet or legs.
2. Never approach a fence without footwear. And **wear footwear that fully encloses the foot** (not sandals). Why? Most footwear are poor conductors. So they reduce (by absorbing it) the energy that will pass through your body if you touch a fence with your hands or head.
3. **Never energize barbed wire.** Animals and humans can become entangled and repeatedly shocked—and thus die.
4. **Hang warning signs** (see right) at critical areas where children or untrained adults encounter the fence.
5. Use smaller energizers on fences located near children and untrained adults. (Most experts agree that **smaller energizers are safer than large ones** as long as animal control isn't put at risk.)
6. **Make the fence as visible as possible to both humans and animals.** Use conductors and posts that can be seen both day and night, and against all backgrounds. That's why Premier has long advised the use of white/black conductors—to provide contrast and visibility. Fence suppliers worldwide are now following our lead.
7. **If possible, do not energize wires lower than 12".** This allows humans who might contact a wire enough space to fall away from energized wires.
8. Build fences so **all energized wires are on the inside of your boundary fence** (less likely to be touched, and anyone who touches them without your permission is trespassing). We achieve this with internal energized offset wires.
9. **Never connect 2 energizers to the same fence. (It doubles the pulse frequency).**
10. The shock from electric fences can panic animals (e.g. horses) and cause them to crash into fences (or people) resulting in injury to one or both.
To reduce this risk:
 - a. **Do not install electrified wires on feedlot fences, corral fences or around riding arenas.**
 - b. Reduce the available volts and joules on fences that enclose very small areas (e.g. night pens) to lessen the likelihood of animal stress and possible panic.

Warning: In 1991 an accidental fatality occurred when a young child's head contacted an electrified fence while the child was crawling on wet grass. The fence was correctly installed and functioning properly. The energizer was a UL approved unit. As a result, Premier strongly advises against allowing toddlers access to any electrified fences. Also, due to this incident and others, experts now suggest that human contact by an energized wire to the head and neck may be the most dangerous point of contact. We urge all to especially avoid this kind of contact.

