

# Energizer Data Chart

		①	②	③	④	⑤	⑥	⑦	⑧	⑨	⑩c	⑩w	⑪c	⑪w	⑫c	⑫w
Product Number	Price	Max. stored joules	Max. output joules released	Moist soils joules	Dry soils joules	Fence load LED	Built-in Min. ground rods(ft)	draw watts/hour	Milli-batt. charge LED	Milli-Hi-lo output switch	Batt amp per hr. clean(a)	Batt amp per hr. weedy(b)	days/charge clean(a)	days/charge weedy(b)	Solar panel clean(a)	Solar panel weedy(b)
<b>6, 9 or 12 volt battery</b>																
IntelliShock 12B 6/12v	117500	\$124	0.14	0.13	0.04	0.09	•	1.25			25	25	100	100	n/a	n/a
IntelliShock 20B 9/12v	117310	\$197	0.28	0.27	0.16	0.22	•	1.25	•	•	10	30	250	85	1	4
Kube 250 9/12v	115120	\$176	0.30	0.29	0.16	0.18		1.25			26	26	80	80	4	4
HotShock B4 9/12v	117350	\$230	0.40	0.35	0.26	0.27	•	1.25	•		40	45	62	55	3.0	3.5
<b>12 volt battery</b>																
IntelliShock 42B	116900	\$244	1.4	0.9	0.8	0.3	•	3	•	•	30	100	83	25	4	10 - 15
IntelliShock 52B	116850	\$298	2.4	2.0	2.0	0.4	•	6	•	•	30	200	83	12	4	20 - 30
IntelliShock 55B	116800	\$336	2.4	2.0	1.8	0.4	•	6	•	•	35	260	71	9	5	18 - 30
IntelliShock 88B (low)	116600	\$698	6.0	5.5	2.2	2.0	•	15	•	•	150	290	16	8	9 - 14	30 - 50
IntelliShock 88B (high)	116600	\$698	6.0	5.5	4.6	4.2	•	15	•	•	310	430	8	5	13 - 19	40 - 60
IntelliShock 77B	116700	\$468	7.0	6.0	3.0	0.6	•	18	•		35	440	71	5	5	40 - 60
Patriot PS15 (solar)	115025	\$194	0.20	0.15	0.06	0.15		1.25							built-in	built-in
Gallagher B100	117000	\$392	0.8	0.55	0.5	0.5		1.65			60	60	40	40	built-in	built-in
<b>AC/DC</b>																
Patriot P5	115000	\$76	0.7	0.5	0.4	0.2		3	4.5		42	42	59	59	6	6
Patriot P10	115010	\$95	1.3	1.0	0.8	0.3		3	4.5		87	87	28	28	10	10
Patriot P20	115020	\$126	2.7	2.0	1.6	0.4		6	4.5		163	163	15	15	20	20
<b>110 volt plug-in</b>																
HotShock 150	114200	\$135	1.5	1.2	1.2	0.4		3	3							
HotShock 300	113900	\$162	3.0	2.4	2.3	0.4		8	4							
HotShock 600	113700	\$258	6.0	5.0	4.0	0.5		16	8							
HotShock 1000	113550	\$443	15.0	10.0	8.5	0.7		30	20							
IntelliShock 284	113800	\$269	3.5	2.8	2.6	1.0	•	5	6							
IntelliShock 506	113600	\$554	6.5	5.0	4.7	4.5	•	8	22							
Kube 3000	115100	\$135	1.5	1.1	0.9	0.8		3	2.5							
Kube 4000	115110	\$162	3.0	2.3	2.3	1.4		5	4.5							
Gallagher M600	113710	\$379	6.0	4.5	4.6	1.6		13.50	8.5							
Gallagher "The Billy"	113560	\$450	7.0	5.62	7.1	0.9		16.86	12							

Red numbers are results that stand out from the norm for "similar" energizers.

## Explanation of columns and values

- A popular method of rating energizers that, like miles of fence, is very misleading. Sales people who use this number are either ignorant or duplicitous. More accurate is the output in joules for conditions in your area (col. 2, 3 and 4).
- Indicates energizer's ability to cope with high levels of green vegetation contacting the energized wires (higher numbers are better). Also misleading, unless the data in columns 3 and 4 are considered. Note the 77B and 88B. Though similar in maximum output, the 88B is 7 times better in dry soils. But in moist soils the 77B is more powerful. Compare also the 284 and Kube 4000 with the HotShock 600.
- Predicts probable pulse size for clean wire fences in joules for fences above moist soils (enough for green grass) and typical animals (cattle). Units with larger numbers will energize more miles or cope with more weeds per 1000 ft.
- Predicts probable pulse size for clean wire fences in dry (but not arid), snow-covered or rocky soils. Units with large numbers can effectively energize more miles of fence in these conditions.
- When available, these LED lights indicate if fence voltage and energy levels are enough to stop most animals. If not lit, check the fence.
- Normal total ground rod requirements. More may help in certain conditions.
- 110v AC input. Indicates expected draw in watts.
- Has LED lights that indicate when a 12v battery needs to be recharged.
- Has switch to reduce both output energy and battery input demand.
- Expected milliamperage (mA) drain by energizer from battery per hour at high output levels for clean and weed-laden fences. Predicts how large a battery (or solar panel) you need and how often you will recharge it. (Large numbers mean larger panels and more frequent recharges.) Note that milliamperage draw of Kube 250 and Patriot units is the same for both clean and weedy fences. However, for IntelliShock units, when a fence is clean (no green weeds or shorts), the mA draw is low. When a fence is weedy, the mA draw of IntelliShock energizers is higher. Therefore, battery and solar panel requirements (columns 11 and 12) are higher and lower.
- With EzePower dry batteries, all the stored energy (55, 75, 120 or 165 amp hours) is available for use, but they are not rechargeable. A 165 amp hour EzePower battery has 165,000 mA. Thus, this battery might run a 20B energizer for 16,000 hours (660 days) on a totally clean fence, but only 5000 hours (200 days) on a weedy fence.
- Predicts when a 12v 100 ampere hour *deep cycle* battery will need recharging under both clean and weedy conditions. Assumes being drawn down to 40% between recharges. (An equal size vehicle battery must be recharged 3 times more often to prevent damage to battery.)
- Predicts solar panel size (in watts) advised for each energizer under both clean and weedy fence conditions. The low number of a range assumes 6 average solar insolation hours per day (southern USA or summer in north). The high number assumes only 4 insolation hours/day. Using a larger panel allows a smaller battery to be used and vice versa.
  - Fence that has no contact with green/wet weeds.
  - Wires in contact with green weeds 6 in. from soil (causes 7 times more energy drain than wires contacting weeds 30 in. from soil).

# To Reduce Risk and Liability...

## What's total fence circuit resistance?

The size of the pulse that travels from an energizer's fence terminal to its earth terminal varies in volts and joules *according to the total of the resistances in the path between these points.*

### These resistances in ohms ( $\Omega$ ) include:

- Resistance of the animal (300 to 3,000 $\Omega$ ).
- Resistance of wire(s) (30 to 10,000 $\Omega$ /mile).
- Resistance of weeds (50 to 50,000 $\Omega$ ).
- Resistance of the soil (20 to 50,000 $\Omega$ ) if it's not a Pos/Neg-wired fence system.
- Resistance of the ground rod system.

Because the only constant is the wire, the total resistance of a fence system varies enormously by the hour, day and week. The primary factor is moisture change—in the soil, air and plants and the animal's nose, hide and feet.

Therefore, the resistance of a mile of single-strand weed-free cattle/deer/horse fence may vary from 600 to 10,000 $\Omega$  depending on the soil moisture. But an extra mile of HT wire may add only 70 $\Omega$  to either total.

The resistance of a mile of multistrand sheep/goat/rabbit fence varies from 50 to 10,000 $\Omega$  depending on the soil moisture and weed contact.

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

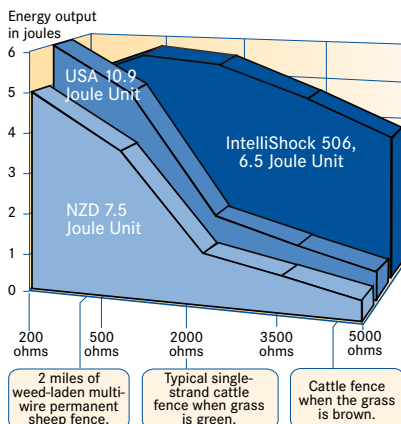
A Pos/Neg fence (alternating hot/ground wires) produces better results when the soil and animal resistances approach 10,000 $\Omega$ .

## Wide vs. High vs. Low Impedance

*The first fence chargers were high-impedance units. Their maximum effect occurred when the fence was weed-free. They could cope with drier soils better than low-impedance units but were very vulnerable to weed contact. Most were too small in output to be effective against difficult animals.*

*Low-impedance energizers cope with high weed contact but not with dry soils or poor conductors.*

*"Wide-impedance" is Premier's term for the capability of some units to perform well both with drier soil and/or poor conductors and with green grass, moist soils and considerable weed-to-fence contact.*



Output of wide-impedance 5-joule energizer compared with 2 larger low-impedance energizers.

## Remember the following:

- Never touch an electric fence wire with your head or upper torso (see photo).
- Never allow anyone else to do so.
- Instruct all visitors & children to never do so.

## Risk & Liability Reduction Methods

1. For reasons not fully understood, contact with the spinal and head area is much worse than contact with hands, arms or legs.
2. Most experts agree that smaller energizers are safer than larger ones. (as long as animal control is not put at risk). So use smaller energizers on fences near children and untrained adults. To do so, change the fence design or management to reduce the weed-to-wire contact.
3. Never connect 2 energizers to one wire at the same time.
4. Never energize barbed wire.
5. With high-joule energizers, reduce the available energy on wires near children or untrained adults with a 500-ohm resistor (not illustrated here).
6. Hang warning signs on the fence at critical areas where children or untrained adults will encounter them (see inset at right).
7. Where practical, do not energize wires less than 12 in. above the soil. Why? To allow humans that might contact a wire enough space to fall away (by gravity) from any energized wires.
8. Ensure that all energized wires are on the inside of your boundary fence (ensuring that anyone who touches them without your permission is a trespasser). For boundary fences, you can achieve this with internal energized offset wires.
9. The shock from electric fences can panic animals that may in turn crash into fences (or people), resulting in injury to one or both. Horses have been known to rear and throw their rider—resulting in injuries to both. To reduce this risk:
  - a. Build only nonelectric fences along horse trails, around livestock corrals and surrounding feedlots.
  - b. Reduce the available volts and joules on fences that enclose very small areas (e.g. night enclosures), thus reducing panic and stress.



*This photo illustrates what not to do! Never place your head near an electrified wire. Accidental head or neck contact can occur when pushing a voltage probe into the soil when checking voltage. Be very careful when you do so to avoid head-to-wire contact*

## Are electric fences a safety risk to humans?

Since touching an electric fence leaves a vivid and painful memory and the voltages are high, most assume that the risk to life and limb must also be high.

But consider that hundreds of thousands of people are "exposed" to electric fences every day throughout the developed world—yet electric fences cause less than one human death per year worldwide. Compare that to the annual injuries and deaths that occur from exposure to tractors, skid loaders, PTO shafts, bales, mowers, combines, bulls, stallions, etc.

This is not to suggest that there is no risk. There is. And with risk, there is also liability to the fence owners. So read and heed the 9 points in the center column!