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# ***JVA ELECTRIC FENCE ENERGIZER***

## **RSG1 • SV2 • SV5 • SV10**

### ***Installation and User Manual***



October 2019 Edition



***JVA AGRIRANGE ENERGIZERS***

## INTRODUCTION

Congratulations, and welcome to the shocking world of JVA. We thank you for placing your faith in our product range. In doing so you have joined the world-wide body of satisfied JVA users who are benefiting from our products.

The JVA range of energizers is the result of a joint venture between the Australian company, Pakton Technologies and the South African company Ndlovu Fencing (Pty) Ltd. With over 40 years' experience in some of the harshest agricultural and security environments around the globe, JVA Technologies has produced a comprehensive range of agricultural, wildlife and security energizers that meet the needs of these diverse markets. The range extends from small strip grazing energizers to very high-powered units which incorporate Wi-Fi, Auto-Sync™, capable of partitioning long game fences into fifty individual sectors. For full particulars of our energizer ranges and fencing accessories, visit our websites:

[www.jva-fence.com](http://www.jva-fence.com) or [www.jvasecurity.com](http://www.jvasecurity.com)

- ★ SOLAR POWERED
- ★ PORTABLE
- ★ ROBUST
- ★ VERSATILE
- ★ AUTO-SYNC™
- ★ ADVANCED BATTERY FEATURES
- ★ AUDIBLE ALARM
- ★ IEC/SANS 60335.2.76 APPROVED



### **TWO-YEAR WARRANTY**

All JVA products carry a 2-year warranty against defective components and faulty workmanship. The warranty excludes damage caused by acts of Nature such as lightning, fire and flooding, power supply surges, rough handling, malicious action or incorrect wiring. Consumable components (i.e. batteries) are also not covered under the warranty agreement.



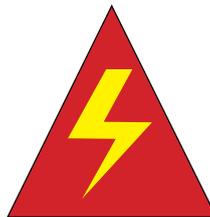
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**WARNING**  
**Risk of shock!**

- ▶ High voltages exist inside the electric fence energizer and on the fence terminals.
- ▶ High voltages are also retained for a while after switching off. It is advisable to wait for at least 10 minutes before opening the energizer case.
- ▶ Before working on the high voltage wiring of an electric fence, it is recommended that the energizer be turned off and an intentional short circuit be placed from the fence live wires to earth. This is a precaution against the energizer being turned on while work on the fence is in progress



# 1. IMPORTANT NOTES – PLEASE READ

## 1.1 Electric Fences

1. Electric fences must be installed only in accordance with the relevant Standards and Workplace Health and Safety regulations.
2. Electric fences are designed to deliver a short, safe shock. Do not let children play near them.
3. Electric fences must have warning signs. These must comply with IEC standards and should be prominently displayed on electric fences at distances specified by the country in which they are installed.
4. In order to operate effectively, electric fences must be well earthed. This involves the use of galvanized, \*steel stakes/spikes/rods/electrodes (various terms are in use) driven into the earth at a depth of at least 1.2m. A minimum of 3 earth stakes are recommended at the energizer. Additional earth stakes may be required on higher powered energizers and along the fence in dry soil conditions. The deeper the earth stakes, the better.
  - \* Hot-dipped galvanized steel earth stakes are recommended because the effectiveness of the earthing is reduced by corrosion at the joints. This is caused by the electrolytic effect resulting from a current flowing through unlike metals making contact in a moist environment.

## 1.2 Energizers

1. The energizer places a very short, safe, high voltage pulse on the fence live wires approximately once every second. Please be advised that there is always a risk associated with any device designed to impart an electric shock. Do not allow children or elderly persons to touch the energizer or fence live wires.
2. The maximum length of fence able to be energized depends on many factors, for example the earth resistance, competition from vegetation, number, spacing and configuration of wires – series or parallel, type/quality of insulators, resistance of wire type used, etc. Another factor to consider is acceptable fence voltage: for some livestock situations this is 3kV, others require more or less. Therefore the rated mileage of fence that the energizer will power effectively is a guide only.
3. **WARNING!** The energizer should never be operated with the cover removed as high voltages exist inside the enclosure while operating. High voltage may remain on some internal parts long after the unit has been switched off.

## 1.3 Power Supply Options

The JVA SV series of electric fence energizers are fully self-contained, solar powered energizers. Each energizer in the SV series comes with an internal 12V battery, integrated battery charger, solar panel bracket and solar panel.

The JVA RSG1 energizer has limited power supply options. For more information please refer to section 2.2.

## 1.4 Solar Panels

1. Mount solar powered energizers so that the solar panel is facing due north in the Southern hemisphere, due south in the Northern hemisphere, and at an angle of degree latitude plus 10 degrees. If in doubt, confirm with an online solar panel angle calculator.
2. Solar panels need as much direct sunlight as possible, preferably full sun all day. Unlike small solar powered items such as calculators, all JVA Solar-Powered Energizers need direct sunlight to generate enough electricity to charge the battery.
3. The solar panel also needs to be clean to operate properly. Clean off any dust or dirt using a damp cloth.
4. Keep the SV2/SV5/SV10 from being immersed in water and out of extreme heat.
5. Be aware that thieves target solar powered items, so a padlock may be useful in securing the SV2/SV5/SV10 to a fence post.

## 1.5 Rechargeable Batteries

1. The SV2, SV5 and SV10 contain a rechargeable, sealed, lead-acid (SLA) battery. SLA battery life is shortened considerably if it is:
  - a) left in a discharged state or;
  - b) exposed to very high temperatures.
2. When not in use store the energizer in such a way as to allow the panel to get as much light as possible, such as on a window sill with the panel facing out. Take the energizer out into sunlight for a few hours once every month to keep the battery from self-discharging.

# 2. JVA MODELS AND FEATURES

## 2.1 Features

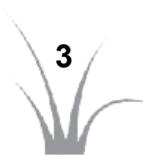
Table 1

	RSG1	SV2	SV5	SV10
Mains powered				
Battery powered	✓			
Solar powered		✓	✓	✓
Digital control	✓	✓	✓	✓
'Smooth' wave shape	✓	✓	✓	✓
Power on demand	✓	✓		
LCD showing kV and stored energy			✓	✓
Ant & moisture protection	✓	✓	✓	✓
UV stable enclosure	✓		✓	✓
Fence OK indication	✓		✓	✓

	RSG1	SV2	SV5	SV10
Lightning protection	✓	✓	✓	✓
Reverse battery protection	✓	✓	✓	✓
Self-resetting fuse	✓	✓	✓	✓
Solar Ready (includes battery, regulator & solar panel)		✓	✓	✓
Low battery indication	✓	✓	✓	✓
Flat battery indication	✓	✓	✓	✓
Over discharge battery protection	✓	✓	✓	✓
Battery life maximization	✓	✓	✓	✓
Battery voltage measurement	✓	✓	✓	✓
Stored joules	0.1J	0.14J	0.7J	1.1J
Energy output	0.085J	0.1J	0.5J	0.8J
Power consumption at 12.5Vdc	14mA	0.55mA	67mA	84mA
Warranty	2 Years	2 Years	2 Years	2 Years
Power adapter included (24Vdc)	✓			
Battery leads included				
Audible alarm				
Auto recover	✓	✓	✓	✓
Auto-Sync™				
Bi-Polar output				
Built-In Wi-Fi				

Table 2

Models	Features
<i>Battery</i>	
RSG1	<ul style="list-style-type: none"> <li>• Internal rechargeable battery</li> <li>• 7-day battery life</li> <li>• Ant and moisture protection</li> <li>• Recharge from a car or mains power</li> <li>• Portable</li> <li>• Large knobs</li> <li>• Energizer OK LED</li> </ul>
<i>Solar</i>	
SV2	<ul style="list-style-type: none"> <li>• Integrated solar panel and battery</li> <li>• Angled mounting bracket</li> <li>• Low battery indication</li> <li>• Digital control</li> <li>• Smooth wave shape</li> <li>• Ant &amp; moisture protection</li> <li>• Lightning protection</li> <li>• Power on demand</li> </ul>



## 2.2 Benefits of Features

- ▶ The **battery life maximization** works by slowing the frequency of high voltage pulses just before the battery dies to keep the energizer operating for as long as possible without damaging the battery.
- ▶ The **over discharge battery** protection will stop the energizer when the battery is flat and flash the status LED twice each second. This stops too much charge being extracted from the battery and prevents permanent damage. The energizer will restart automatically once the battery voltage returns to a normal level.
- ▶ The **reverse battery protection** protects the energizer from damage should the external battery be connected the wrong way round in error.
- ▶ The SV series of energizers has the **electronics enclosed inside a durable UV stable case** to protect against ants, moisture and dust and so maximize reliability.
- ▶ The **overload indication** warns if the fence is heavily loaded by flashing a warning LED and alerting with a short audible beep.
- ▶ The SV series utilizes the latest **digital microcontroller** technology to extend battery life, provide useful feedback on the energizer status, and increase reliability and performance.
- ▶ The **audible alarm** will sound in the event of a serious error for 30 seconds and then shut down for 7 minutes before sounding again.
- ▶ The **Auto Recover** feature will attempt to recover the energizer from severe errors which cause the energizer to stop working. This automatic recovery process will occur at 7-minute intervals.
- ▶ Our patented **Auto-Sync™** technology prevents the potentially dangerous condition of receiving a shock of more than one pulse per second.
- ▶ Power on demand automatically increases the power to heavy fence loads.

## 2.3 Specifications

Table 3

Specifications							
Model	*a Energizer output voltage	Stored Energy	Power	*b 12V drain	Recommended Solar Panel Size	Solar Battery	Peak Output
RSG1	9.2kV	0.1J	12Vdc	14mA	20W		0.08J
SV2	6.4kV	0.14J	solar	–			0.1J
SV5	7.5kV	0.7J	solar	–			0.5J
SV10	7.5kV	1.1J	solar	–			0.8J

### KEY

\*a No load, actual voltage on a short fence can be as high as 10kV

\*b Current drain rating is for a 12V power source. Current drain will vary with voltage.

In line with our policy of continual improvement, specifications are subject to change without notice.

### 3. PARTS OF THE ENERGIZER

**SV5**



1. On/Off button (not on M1.5 and M3)
2. Fence OK indicator (red LED)
3. Energizer On and OK indicator (green LED)
4. Rubber O-ring seal between front and back case pieces
5. Power cable extends from base of case
6. Fence connection terminal
7. Earth connection terminal
8. Model number
9. Solar panel bracket (SV2/SV5/SV10 only)
10. Solar panel (SV2/ SV5/SV10 only)
11. LCD (Liquid Crystal Display) (SV5/SV10 only)

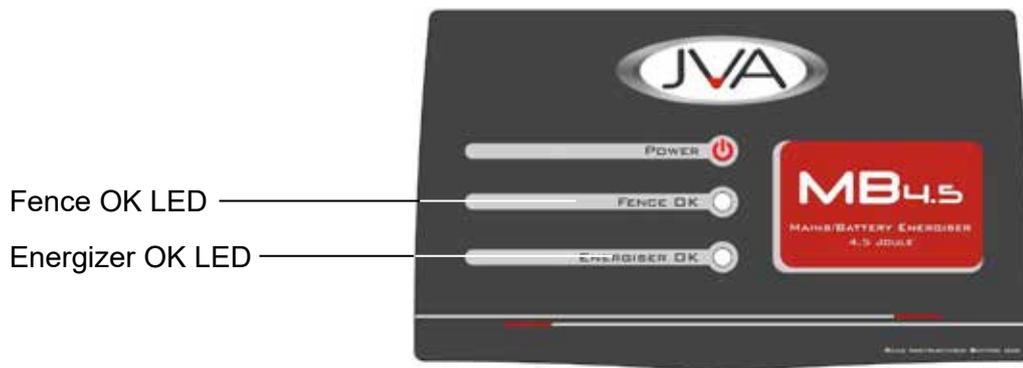
### 3.1 Fence Connectors



- Fence terminal** – should be connected to the live wires of the fence.
- Earth terminal** – should be connected to a suitable electric fence stake.

### 3.2 Energizer LED Display

This feature is included in all units.



**Fence OK** red LED – Flashes if fence voltage is good. If it goes off there is a problem on the fence. (Note: SV2 does not have a Fence OK LED)

**Energizer OK** green LED – Flashes with each pulse to show the unit is on and operating correctly.

## 4. INSTALLATION

### 4.1 Mounting the Energizer

1. Location of the Energizer:
  - Ensure that the Energizer Solar Panel is kept in a dry environment if operating from mains power, either indoors or covered.
  - Mount any solar energizer so that the solar panel is facing the noon sun (due north in the Southern hemisphere, due south in the Northern hemisphere, and at an angle of degree latitude plus 10 degrees).
2. Mounting the Energizer
  - The RSG1 can be hung from the plastic hanger bracket.
  - There are two different methods for mounting the SV2,5 and 10. These are shown on the following page.

### Post or Star Picket Mounting



- a) Position the Energizer's Mounting Bracket against the post.
- b) Insert the U-Bolts around the post and into the appropriate holes.
- c) Slide the flat metal piece over the bolts and tighten with nuts. Make sure the energizer is stable in its fixed position.

### Star Picket Mounting



Simply slide the bracket over the star picket.

## 4.2 Connecting the Energizer to the Fence

1. The electric fence requires a dedicated ground/earth system. Drive at least three galvanized earth stakes into the ground to a depth of at least 1.2m. Attach a wire from the green Earth Terminal connector on the front of the energizer to the earth stakes.
2. Connect a wire from the red Fence Terminal connector on the front of the energizer to the live wire of the fence.

## 4.3 Powering the Energizer

**Battery Power Source (RSG1):** Attach the battery, red to positive and black to negative battery terminals. For battery choice see specification table 3 on page 4. Turn the energizer ON at the On/Off switch.

**Solar Power Source (RSG1)** It is recommended that a solar regulator is used in conjunction with a solar panel and a rechargeable battery. Please refer to the instructions provided with the solar regulator for information regarding its setup. Once the solar regulator, solar panel and rechargeable battery have been configured, connect the energizer to the rechargeable battery: red to positive and black to negative battery terminals.

Turn the energizer on by pushing the Power button once.

The internal battery is already connected. Ensure that the battery is charged:

The RSG1 can be charged by plugging the external power supply into the mains.

The SV2, 5 and 10's batteries can be charged by placing the energizer and solar panel facing direct sunlight.

## 5. OPERATION

### 5.1 Electric Fences

Electric fence energizers work by discharging a short, safe, high voltage pulse onto the fence wires. The animal will not be harmed by a pulse, but it will remember to avoid contact with the energized fence in future.

The high voltage is discharged from the red, positive fence terminal of the energizer and this is connected to the fence wire or electric fence tape to make them live or 'hot' wires. Live wires must be insulated from earth or any conductive material touching the ground, e.g. fence posts.

The green terminal connector on the energizer is the earth (or ground) terminal. Electric fences need earthing to complete the circuit: When an animal touches the live wire of the fence, a current will flow from the live wire, through the animal, back through the ground or the earth return wires to the earth stake and back up to the energizer earth terminal thereby completing the circuit. (See Fig 1 below)

On touching the earth terminal on the energizer or the earth stakes in the ground, no shock should be felt. If a shock is felt on either of the above, it is an indication that the earthing is insufficient. To overcome this problem, extra earth stakes need to be added to the system. The better the quality of the earthing system, the more effective and efficient the electric fence system will be.

The more earth stakes in the ground and the higher the moisture content in the soil, the better the system will function. The higher powered (higher joule rated) the energizer and the longer the fence, the more earthing is required.

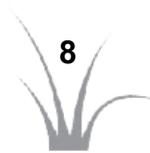
In very dry conditions and sandy soils, it is recommended that a dedicated earth wire be added to the fence line. This in turn should be connected to the energizer earth and the ground/earth stakes. (See Fig 2)

For best results locate the energizer as centrally as possible in a fencing layout.

The fence and the earth voltages can be measured using an electric fence digital voltmeter, or a digital electric fence directional fault finder, such as the JVA Electric Fence Digital Directional Fault Finder.

### 5.2 Benefits of Electric Fences

- ▶ An electric fence offers a psychological barrier as well as a physical barrier.
- ▶ The risk of injury to livestock is lower than with barbed wire fences.
- ▶ Electric fences cost less to install and maintain than conventional fencing. Users enjoy low maintenance costs because their stock stays off the fence.
- ▶ Their use is versatile:
  - they can be permanent or portable systems
  - they can be arranged in variety of designs to suit needs
  - they are quick and easy to erect

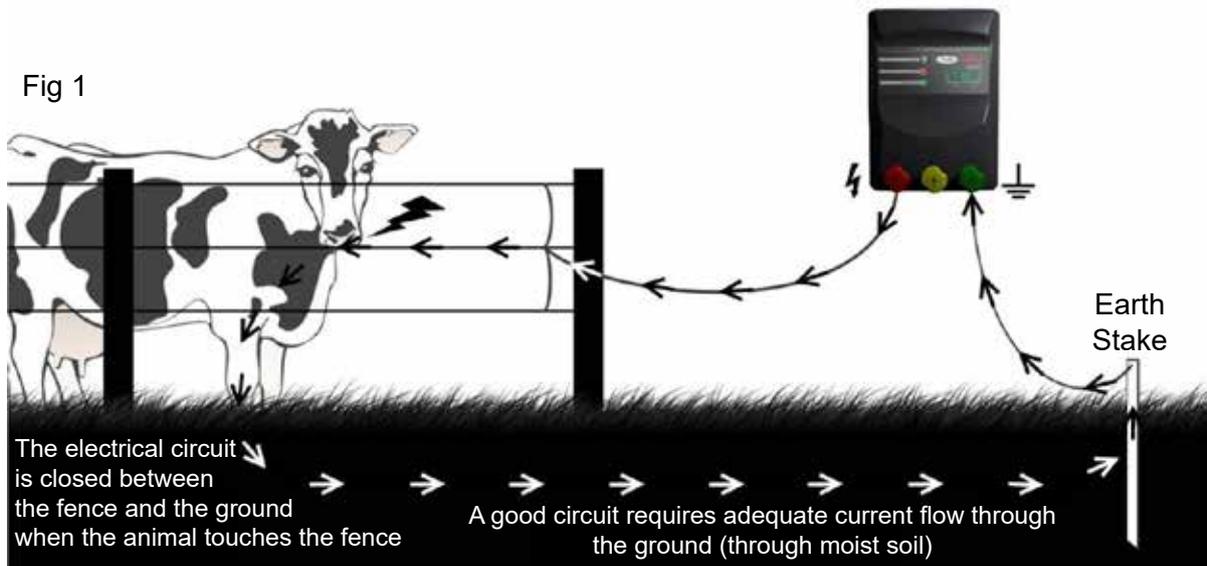


- ▶ They improve pasture and grazing control
- ▶ They can improve existing fence life as a result of less physical pressure on the fence
- ▶ They are easy to set up compared with traditional fences.

### 5.3 All-Live Wire, Earth Return System

The Earth Return (also called Ground Return) configuration is the most common method of configuration for electric fences, particularly smaller fence applications like strip grazing. The fence live wire(s) are electrified and rely on the soil to complete the circuit back to the energizer Earth Terminal when an animal touches the fence.

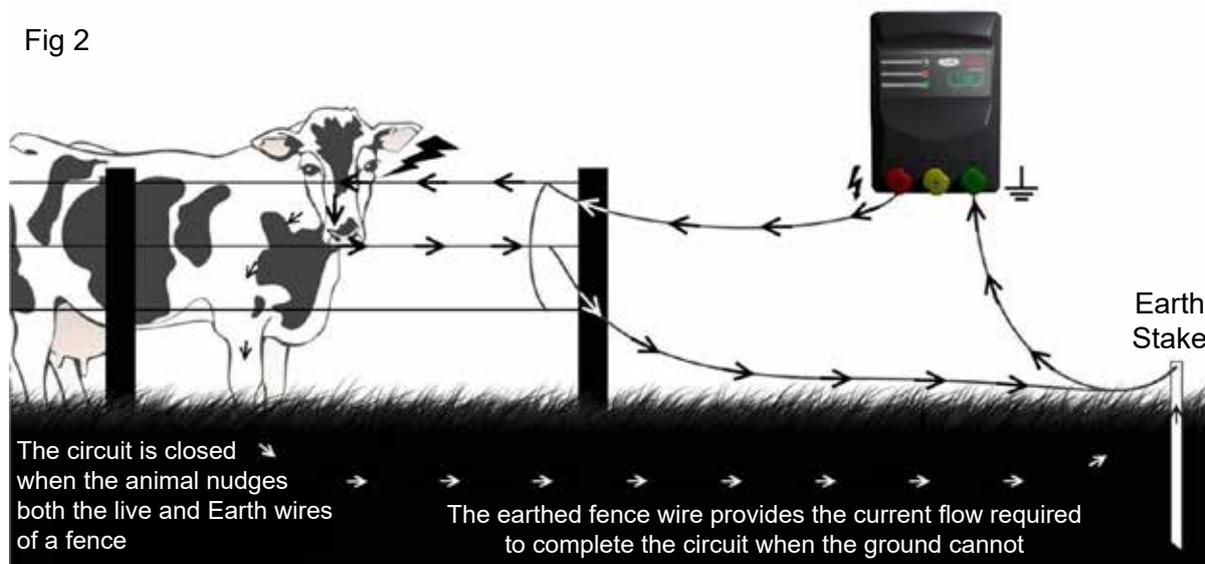
Fig 1



### 5.4 Live-/Earth-Wire Fence Return System

The live-/earth-wire fence return configuration for electric fences is used where the soil is too dry to complete the circuit adequately, or the animals are likely to try to force their way through between the fence wires. In this system earth wire(s) are also run along the fence with the live wire(s) to provide a low resistance path for the current to return to the energizer. In this system if the soil is moist enough it will also function as a return path for the current when the animal touches the live wire, but if the soil is not moist or has poor conductance, this system will keep your fence effective provided the animal touches both a live and the earth wire simultaneously.

Fig 2



## 5.5 Earthing Your Energizer

The best way to earth an energizer is to use a minimum of 1.2 metre galvanized earth stakes. If the earth stake is too rusty it will not work properly. The best place to install the earth stake is somewhere close to where the fence commences and if possible where the ground is damp such as a garden bed, a water course, or the overflow from a rain water tank. (South African regulations require a minimum of 3 earth stakes to be located close to the energizer.) Do not connect the earth of the energizer to a metal shed, metal pipes or utility earthing system as this could lead to shock from tap, showers etc.

## 5.6 Semi-Permanent and Permanent Fences

The quickest and easiest way to set up a permanent fence is to use steel posts, but timber and fiberglass posts can also be used. Make sure that the wires are tight enough to eliminate sagging. 2.5mm galvanized fence wire is recommended as poly tape or rope will degrade and break over time. Warning signs need to be fitted as per the requirements outlined in the, General Requirements for Electric Fences section of this manual.

## 5.7 The Importance of Insulators

If the live wire is not well insulated the fence load will be much higher. This means that, for any given length of fence, the voltage will be lower. Pieces of wood and garden hose are not good insulators! For reliable results standard insulators designed for this purpose are recommended.

In a live-/earth-wire fence return system the earth wire(s) do not need to be insulated. In fact, if using steel intermediates, the more times the earth wire touches a metal post the better it is earthed/grounded.

UV stable poly insulators will last much longer than non-UV stable plastics. Plastic insulators are not as susceptible to fracture as ceramic insulators. However, ceramic insulators are better in grass, fire prone areas as they do not melt.

## 5.8 Maintenance

Maintaining permanent fences is important, especially during the warmer months when plant growth is at its highest and after any disruptive weather events.

1. Check the fence voltage using an electric fence voltmeter. The JVA Fault Finder will also detect faults and direct you towards them.
2. Keep vegetation away from the fence. If it touches the fence it will reduce its performance. The judicious use of weed killer may be used if so wished to deter any growth.
3. Check that nothing has fallen against the fence and that the wires are not broken or have been unclipped from insulators.
4. Check the condition of the earthing system for corrosion and loose joints.
5. Check that lightning diverters are all still operational.
6. Check and tighten any loose line clamps along the fence.
7. Check the energizer battery. If the energizer is flashing a low battery warning it is time to recharge or replace the battery.

## 6. COMMON ENERGIZER PROBLEMS

The most common problems with electric fence energizers are:

- Flat batteries
- Lightning
- Moisture and ants
- Blown fuses

The intelligent JVA Series of energizers will self-diagnose and report their status. (See *Errors and Error Codes*) on the LED and LCD displays.

### 6.1 Flat batteries

The JVA series energizers, to run effectively, require a battery that is in good condition. The energizer will protect the battery by slowing down and eventually stopping altogether as the battery charge is depleted. For best results, check on the energizer at regular intervals. If not receiving the expected life from a battery consider having it checked by an electrician.

### 6.2 Lightning

The JVA range of energizers is covered with a two-year warranty that excludes lightning. Surge protection components inside the energizer are fitted to reduce the risk of damage by lightning. However, nature is capable of performing more extremely than can be tested for in the laboratory; to ensure the wellbeing of your JVA investment for the long term, it is recommended that a Lightning Protection Kit is installed to prevent lightning damage and possible costly repairs.



### 6.3 Moisture and Ants

Moisture and ants should not be a significant problem for the JVA range of energizers as they are supplied in a weatherproof case. However, where possible, keep the energizer protected from the weather.

### 6.4 Blown Fuses

The fuse used is a self-resetting type. Disconnect the power for a minute and then reapply the power. If the unit still does not power up, return it to a service centre.

### 6.5 Battery replacement – RSG1 and SV2

Before commencing, read *Important Notes* section 1.5 on page 2 and below. If the solar unit stops as soon as the sun sets (and it has been getting 8 hours or more sun a day) or if the unit's battery charge does not last more than 5 days (a good battery will last 7 days and needs 18 hours to charge), the battery may need replacing. The battery is a sealed, lead-acid, battery. Open the unit and read the battery Ah rating and part number before ordering a new one. These may be available from the manufacturer or through the store where the solar unit was purchased. This type of battery is also readily available through general electronics stores and hardware stores.

#### Notes:

- The battery must be a rechargeable sealed lead-acid battery; never use non-rechargeable batteries.
- The battery should last up to 5 years depending on average temperature and usage. Make sure that the battery actually does need replacing.
- Lead-acid batteries should be recycled, not sent to land fill.
- If unsure, send them back to the manufacturer.
- Should you experience any difficulties with changing the battery, please return the unit to one of our service centres for battery replacement.

**WARNING:** Risk of electrical shock! (See *Important Notes* on page 1)

1. Turn the SV2/RSG1 off. Be careful not to press firmly on the front of the case as this can sometimes turn the unit on.
2. Place the SV2/RSG1 face down on a clean working surface.
3. Unscrew the six main case screws.
4. Turn the unit over so that its face is facing up.
5. Pry off the front. Note there is an O-ring seal. The seal may be stuck to either or both surfaces. If it comes out of the groove simply press it back in.
6. Disconnect the battery leads. Always disconnect the leads at the battery terminals NOT the PCB. Do not allow the wires from battery terminals to touch each other.
7. Remove the old battery.
8. Place the new battery in and secure it in the same way as the original was secured. Do not short the battery terminals.
9. Reconnect the battery leads.



10. Replace the cover ensuring the O-ring seal is in the groove and cables are NOT pinched between the lid and case.
11. While holding the unit together firmly, turn it back over onto its face and replace the six main case screws.

## 6.6 Battery Replacement – SV5 and SV10

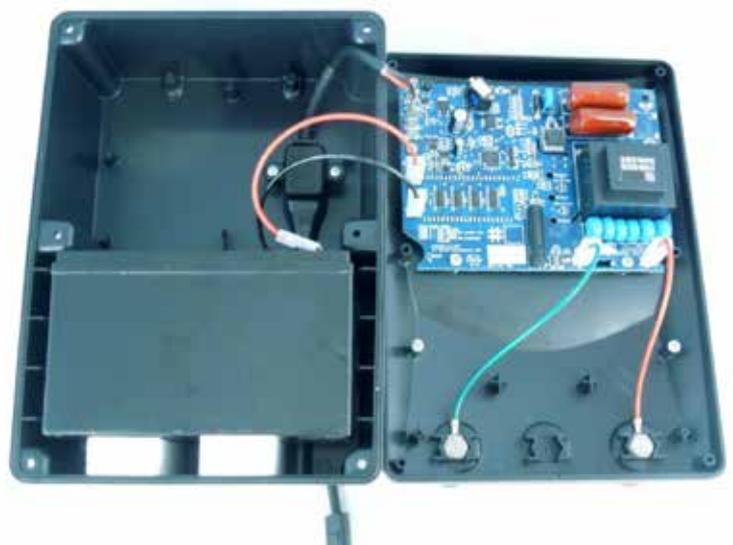
The JVA SV series of energizers contain a sealed lead-acid (SLA) battery that is charged by the solar panel. If the unit indicates a depleted battery it will flash the red Error LED twice. The unit should be turned off and placed in full sun for 2 to 3 days to allow the battery to charge fully.

If after this time the unit still indicates a depleted battery, or the life of the battery is reduced, the battery may be damaged or at the end of its life and should be replaced.

### To replace the battery

1. Place the unit with the solar panel flat on a smooth surface.  
Unplug the solar panel from the unit. Remove the six screws attaching the solar panel to the solar panel bracket.
2. Next place the unit face down. Remove the three screws attaching the bracket to the unit. Remove the six screws which secure the back case to the front of the unit.
3. Hold the front and back of the unit together and turn the unit over.  
Gently separate the front from the case back and place the front face down to the right of the case back.
4. The battery will now be visible. Disconnect the red and black battery leads from the battery. Remove the battery and replace it with an equivalent 12V SLA battery of the same dimensions.
5. Re-attach the battery leads, being careful to connect red to positive and black to negative.
6. Re-assemble the unit by performing the above steps in reverse.

Replacing the battery should be performed with care according to the steps as described. If performed correctly it will not affect the warranty. However, any damage to the unit caused during battery replacement, particularly swapping the battery leads, or physical damage to the circuit board, will void the warranty.



## 6.7 Errors and Error Codes

The JVA energizer may stop and display error codes. The error codes are displayed in two places.

The first of these is on the Status (red) LED, where it will flash rapidly a number of times. The number of these flashes corresponds to the Error Code. The second place is on the LCD, where it will display a message.

Table 4

Error Code #	Red LED Flashes	LCD Display	Meaning
2	2	Battery symbol "Lo b"	Flat Battery: the energizer will recover and re-start when the battery is recharged.
6	6	"Er 06"	High battery: the energizer will re- start when the battery voltage is reduced.

Errors 2 and 6 indicate the battery voltage is either too low or too high. The energizer will restart as soon as the voltage returns to the correct range. All other errors indicate an internal malfunction.

Should the error continue to re-occur, please return the unit to a qualified service centre for repair. There are no user-serviceable parts inside the energizer. All internal fuses will automatically reset themselves.

## 6.8 Soiled Solar Panels

The solar panels on the SV2/SV5/Sv10 need to be clean to operate properly and keep the battery charged. Clean off dust etc. using a damp cloth.

## 7. COMMON FENCE PROBLEMS

The most common problem with electric fences is low voltage on the live wires caused by

- Inadequate earthing/grounding
- Shorts on the fence

For tips on fence construction please refer to an Electric Fencing Manual.

### 7.1 Testing the Earthing/Grounding System

The earth/ground is essential to all electric fence systems. Larger energizers require more earth spikes/stakes/rods/electrodes. Additionally, all energizers require a low resistance wired connection from the energizer earth terminal to the earth stake.

Short the end of your fence to earth by hammering a metal stake into the soil and connecting this to the live fence wire. Using an electric fence voltmeter or a JVA Electric Fence Fault Finder, (Do not use a standard multimeter.) check the voltage is at the earth terminal of the energizer. In general it should be a reading less than 300 volts (0.3kV).

## 7.2 Testing the Fence, Finding Shorts

To test the performance of the fence or find faults on the fence, an electric fence voltmeter is essential, and a JVA Electric Fence Fault Finder is even better. An effective fence will have more than 2 kV (2000 volts).

## 8. INSTRUCTIONS FOR THE INSTALLATION AND CONNECTION OF ELECTRIC FENCES

Instructions for installation and connection of electric fences vary from country to country. Most are based on the International Electrical Commission (IEC) AS60335.2.76 specifications.

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### 8.1 Definitions

<b>Connecting lead</b>	an electric conductor, used to connect the <b>energizer</b> to the <b>electric fence</b> or the <b>earth electrode</b> (stake)
<b>Electric animal fence</b>	an <b>electric fence</b> used to contain animals within or exclude animals from a particular area
<b>Electric fence</b>	a barrier which includes one or more electric conductors, insulated from earth, to which electric pulses are applied by an <b>energizer</b>

### 8.2 General Requirements for Electric Fences

1. Electric animal fences shall be installed and operated so that they cause no electrical hazard to persons, animals or their surroundings.
2. Electric animal fence constructions which are likely to lead to the entanglement of animals or persons shall be avoided.
3. An electric animal fence shall not be supplied from two different energizers or from independent fence circuits of the same energizer. For any two separate electric animal fences, each supplied from a separate energizer independently timed, the distance between the wires of the two electric animal fences shall be at least 2 m. If this gap is to be closed, this shall be effected by means of electrically non-conductive material or an isolated metal barrier.
4. Barbed wire or razor wire shall not be electrified by an energizer.
5. Any part of an electric animal fence that is installed along a public road or pathway shall be identified at frequent intervals by warning signs securely fastened to the fence posts or firmly clamped to the fence wires.



- a) The size of the warning sign shall be at least 100 mm × 200 mm.
- b) The background colour of both sides of the warning sign shall be yellow. The inscription on the sign shall be black and shall be either:
  - the symbol of Figure 3, or
  - the substance of TAKE CARE – ELECTRIC ANIMAL FENCE
- c) The inscription shall be indelible, inscribed on both sides of the warning sign and have a height of at least 25 mm.

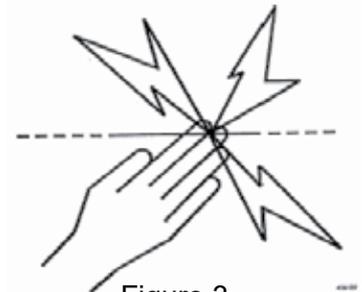


Figure 3  
Warning plate symbol

- 6. The **energizer earth electrode** shall penetrate the ground to a depth of at least 1.2 m.
- 7. **Connecting leads** that are run inside buildings shall be effectively insulated from the earthed structural parts of the building. This may be achieved by using insulated high voltage cable.
- 8. **Connecting leads** that are run underground shall be run in a conduit of insulating material or else insulated high voltage cable shall be used. Care must be taken to avoid damage to the **connecting leads** due to the effects of animal hooves or tractor wheels sinking into the ground.
- 9. **Connecting leads** shall not be installed in the same conduit as the mains supply wiring, communicating cables or data cables.
- 10. **Connecting leads** and **electric animal fence wires** shall not cross above overhead power or communication lines.
- 11. Crossings with overhead power lines shall be avoided wherever possible. If such a crossing cannot be avoided, it shall be made underneath the power line and as nearly as possible at right angles to it.
- 12. If **connecting leads** and **electric animal fence wires** are installed near an overhead power line, the clearances shall be not less than those shown in table 5 below.

Table 5

Power line voltage V	Clearance m
≤1 000	3
>1 000 ≤33 000	4
>33 000	8

Minimum Clearances from Power Lines

- 13. If connecting leads and electric animal fence wires are installed near an overhead power line, their height above the ground shall not exceed 3m. This height applies either side of the orthogonal projection of the outermost conductors of the power line on the ground surface, for a distance of
  - 2 m for power lines operating at a nominal voltage not exceeding 1,000 V
  - 15 m for power lines operating at a nominal voltage exceeding 1,000 V.



## 9. WARRANTY

### 9.1 For Assistance

If you have any questions or need further assistance, or for more information on our complete range of electric fencing products, please see the JVA website at [www.jva-fence.com.au](http://www.jva-fence.com.au) and [www.jva.security.co.za](http://www.jva.security.co.za)

### 9.2 Service or Repairs

If service is required, package your energizer carefully and return it to the place of purchase or your nearest JVA distributor along with your proof of purchase.

### 9.3 Contacts

[www.jva-fence.com.au](http://www.jva-fence.com.au)

[www.jva.security.co.za](http://www.jva.security.co.za)



[www.jva-fence.com](http://www.jva-fence.com)

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The JVA range of agricultural and security electric fence energizers are the result of a joint venture between the Australian company, *Pakton Technologies* and South African company, *Ndlovu Fencing (Pty) Ltd.* With a combined experience of well over 40 years in the industry, and drawing on experiences from operating in some of the hardest agricultural and security environments around the globe, JVA produce a comprehensive range of both agricultural and security energizers that meet the needs of both markets. For full particulars of our ranges of energizers and accessories visit:

[www.jva-fence.com](http://www.jva-fence.com)

[www.jvasecurity.com](http://www.jvasecurity.com)

