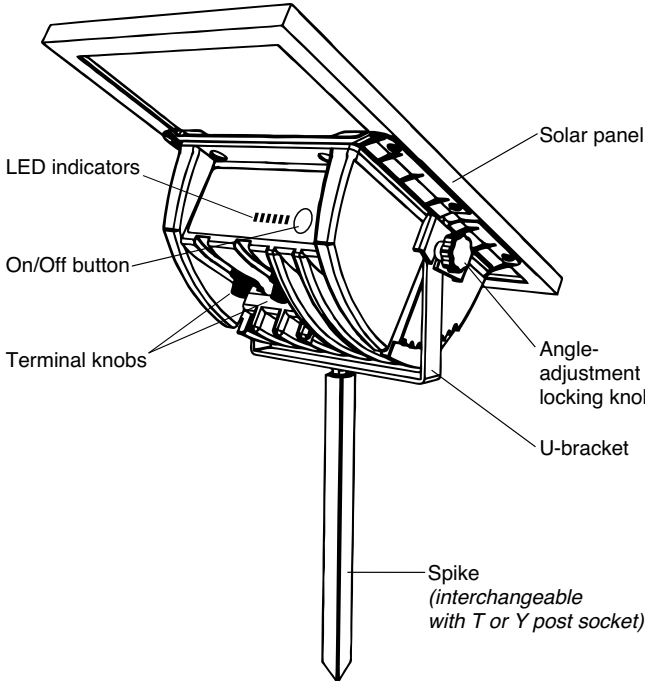


FORCEFIELD
ACTIVE TECHNOLOGY

SOLAR FENCE

SOLAR POWERED ENERGISER

Installation and Operation Instructions



FEATURES & APPLICATIONS

- **12V internal battery with solar charging**
Automatic solar charging.
Battery level monitoring.
- **External battery charging adapter**
In case the battery needs a top-up.
- **Simple operation**
One button to switch ON / OFF and check battery voltage.
- **Fence voltage indicator**
LED indicators let you know your fence condition.
- **Battery voltage indicator**
LED indicators let you know your battery voltage.
- **3 different models: 0.5J, 0.75J, 1.0J.**
Output energy, not stored.
- **Easy mounting**
Can be fixed to a T or Y post (star picket), wooden post or into the ground.
- **Adjustability**
Able to be tilted from 7.5° to 60°.
& can be rotated 360° on the mounting.
- **Replaceable solar panel**
Able to easily swap solar panel to a new one if damaged.
- **UV stabilised plastic enclosure**

What's in the box:

1. 1 unit S50 or S75 or S100.
2. 1 pcs U-bracket.
3. 1 pcs Spike with bolt.
4. 1 pcs T/Y Post Socket (Australia markets only).
5. 1 set of fence connection wires.
6. 1 set 15V DC Adapter.
7. 1 Product Manual.

NOTICE

Read all instructions before installing this equipment

Save these instructions for future reference

IMPORTANT INFORMATION FOR ALL ELECTRIC FENCE ENERGISERS

READ ALL INSTRUCTIONS BEFORE INSTALLATION.

INSTALLERS / USERS SHOULD NOTE:

- **RISK OF ELECTRIC SHOCK.** This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.
- Only use an electric fence energiser for the purposes indicated in this manual.
- Avoid contacting electric fence wires especially with the head, neck or torso.
- Do not climb over, through or under a multi-wire electric fence. Use a gate or a specially designed crossing point
- An electric animal fence shall not be supplied from two separate energisers or from independent fence circuits of the same energiser.
For any two separate electric animal fences, each is to be supplied from a separate energiser, independently timed. The distance between the wires of the two electric animal fences shall be at least 2.5 m. If this gap is to be closed, this shall be effected by means of electrically non-conductive material or an isolated metal barrier.
- Barbed wire or razor wire shall not be electrified by an energiser. A non-electrified fence incorporating barbed wire or razor wire may be used to support one or more off-set electrified wires of an electric animal fence.
The supporting devices for the electrified wires shall be constructed so as to ensure that these wires are positioned at a minimum distance of 150 mm from the vertical plane of the non-electrified wires. The barbed wire and razor wire shall be earthed at regular intervals.
- Follow the earthing recommendations in this manual. A distance of at least 10m shall be maintained between the energiser's ground electrode and any other ground/earthing system connected parts such as the power supply system protective earth or the telecommunication system earth.
- 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.
- Connecting leads that are run underground shall be run in 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.
- Connecting leads shall not be installed in the same conduit as the mains supply wiring, communication cables or data cables.
- Connecting leads and electric animal fence wires shall not cross above overhead power or communication lines. 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.
If connecting leads and electric animal fence wires are installed near an overhead power line, the clearances shall not be less than those shown in table below:

Power Line Voltage V	Clearance Dist. m
≤ 1000V	3m
>1000 and ≤ 33000V	4m
> 33000V	8m

- 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 to 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 1000 V;
 - 15 m for power lines operating at a nominal voltage exceeding 1000 V.
- Electric animal fences intended for deterring birds, household pet containment or training animals such as cows need only be supplied from low output energisers to obtain satisfactory and safe performance.
- In electric animal fences intended for deterring birds from roosting on buildings, no electric fence wire shall be connected to the energiser earth electrode. A warning sign shall be fitted to every point where persons may gain ready access to the conductors.
- Where an electric animal fence crosses a public pathway, a non-electrified gate shall be incorporated in the electric animal fence at that point or a crossing by means of stiles shall be provided. At any such crossing, the adjacent electrified wires shall carry warning signs. *continued...*

IMPORTANT INFORMATION FOR ALL ELECTRIC FENCE ENERGISERS continued

- 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.

The size of the warning sign shall be at least 100 mm x 200 mm.

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 1, or
- the substance of the wording: **"CAUTION: Electric fence"**.

The inscription shall be indelible, inscribed on both sides of the warning sign and have a height of at least 25 mm.



Figure 1

- Ensure that all mains-operated, ancillary equipment connected to the electric animal fence circuit provides a degree of isolation between the fence circuit and the supply mains equivalent to that provided by the energiser.
- Protection from the weather shall be provided for the ancillary equipment unless this equipment is certified by the manufacturer as being suitable for use outdoors, and is of a type with a minimum degree of protection IPX4.
- To reduce the risk of electric shock do not open the energiser. Always turn off an energiser before handling.
- REFER TO AUTHORIZED REPAIR CENTER FOR SERVICE.** Never alter the design of the energiser. Doing so is hazardous and will void the warranty.
- In areas prone to brush fires, turn off fence energiser on very dry days.
- During lightning storms do not disconnect wires or approach an electric fence.
- Do not operate an electric fence energisers near any combustible materials (gasoline, cleaning fluids, kerosene).
- Follow all national, state and local codes and regulations that apply to installation of electric fence in your area.

NOTE: Electric fences are very effective psychological barriers when properly installed and when animals are trained to the fence. Electric fences are NOT complete physical barriers. Erratic animal behavior cannot be predicted and occasional fence penetration can occur. Therefore, the manufacturer assumes no liability for animal containment, injury or the consequences for the misuse of the equipment.

NOTE: The fence live (hot) terminal is either indicated by a red knob or a lightning bolt symbol (⚡).
The ground (earth) is indicated by a black knob or a ground symbol (⏚).

SAVE THESE INSTRUCTIONS

GUIDE TO SUCCESSFUL ENERGISER INSTALLATION

Tools Needed:

- Compass - To check where North or South is for optimum sun exposure.
- Hammer - To hammer in the spike into the ground.
- Screwdriver - If fixing the spike to a wooden post.
- 13mm flat spanner - To tighten up the U-bracket bolt.
- Wire cutters - To cut and strip wire insulation.
- Post driver - To install ground rods and posts.
- Digital volt meter - To test electric fence voltage.

Accessories Needed:

- At least 3pcs #.10 x 1" wood screws to drive into a wooden post to hold the spike.
- 1 to 2 galvanized ground rods - 1.0m to 1.5m long by 10-15mm diameter.
- 1-2 ground rod clamps.
- Insulated underground connection wire - (20,000V rating).
- Line clamps or Split Bolts.
- Highly Recommended: One lightning choke and one lightning diverter or a combination choke and diverter.
Lightning is the primary cause of energiser failure. Use these to extend the life of your energiser.

INSTALLATION

STEP 1: Set up a Ground System:

- The “Ground System” consists of 1 or more highly conductive ground rods driven into the soil and then connected by wire to the ground terminal of your fence energiser (⊥), the black knob. This system allows current to flow through the soil to complete the circuit needed for delivering an effective shock.
 - Most electric fence failures or poor performance are caused by an improper ground system.
 - Properly connect lead out wires, ground wire and fence line splices. This is the second most common cause of poor performance or electric fence failure. Use clamps, split bolts and taps for securing wire connections. Make sure all connection surfaces are of bare, shiny metal.
1. Locate an area of soil for placing ground rods that contains good conductive earth (not dry, sandy or rocky). Soil that is moist throughout the year is best. The ground system should be located within 25m of your fence energiser and at least 10m from buildings.
 2. Locate a ground system a minimum of 25m away from: Utility company (electric, gas, water) ground system, underground water pipe, metal water tanks, and metal siding on building.
 3. Drive one 1m by 10-15mm diameter galvanized ground rod into the ground. Leave 120-150mm above the ground for securing ground clamps. ***It is advised to mark as a hazard***
 4. If more than 1 ground rod is used, connect the ground rods in a series, 3m apart with one piece of continuous 10 to 14 gauge galvanized wire. Use clamps to secure the wire to the ground rods. The ground connection wire should be equal to or larger than the diameter of the fence wire.

- Refer to **Figure 2** for a typical **Ground System set up**.

1. 12-14 gauge galvanized fence wire.
2. Ground rods – 1m long by 10-15mm diameter, galvanized steel rods.

- **IMPORTANT:**

Avoid pounding your ground rods into **SANDY, DRY** and **ROCKY** soil.

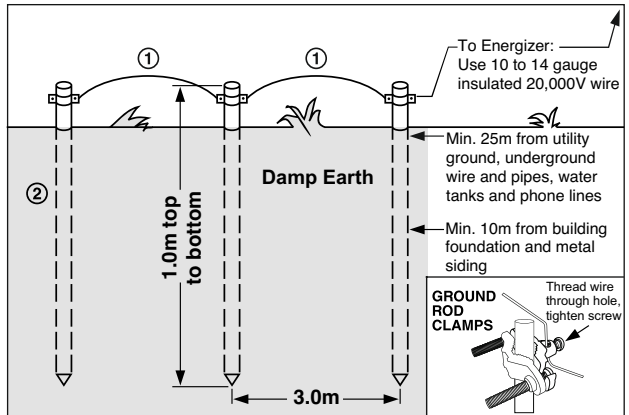


Figure 2

STEP 2: Fix the U-bracket mount.

The Solar Fence can be mounted in a manner of different ways.

A, B & C show three suggestions:

A: Ground Level Mounting: see Figure 3

- Using the provided spike, hammer it into the ground at the desired location.
- Attach the U-bracket with the M8 bolt and spring washer.
- Adjust the U-bracket to be perpendicular to North/South. (see step 4).
- Tighten the bolt with a 13mm spanner.
- Proceed to step 3.

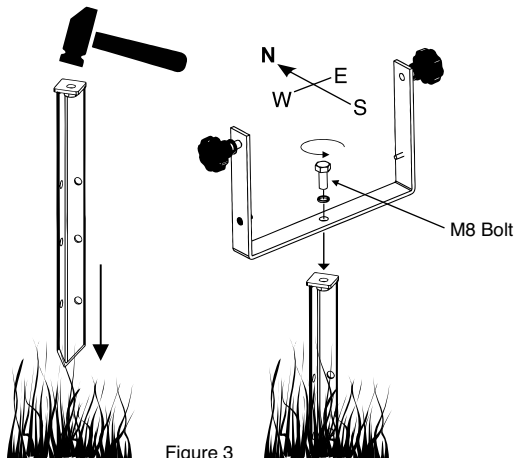
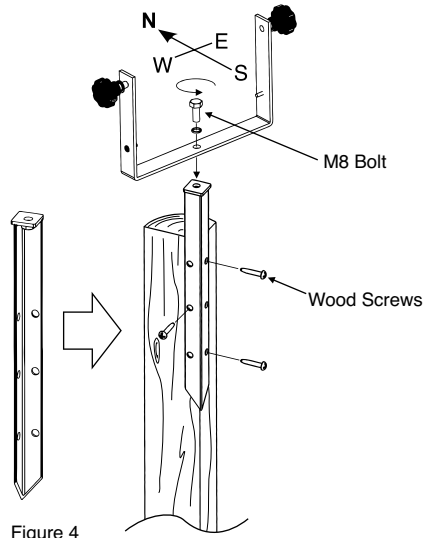


Figure 3

STEP 2: Fix the U-bracket mount. *continued*

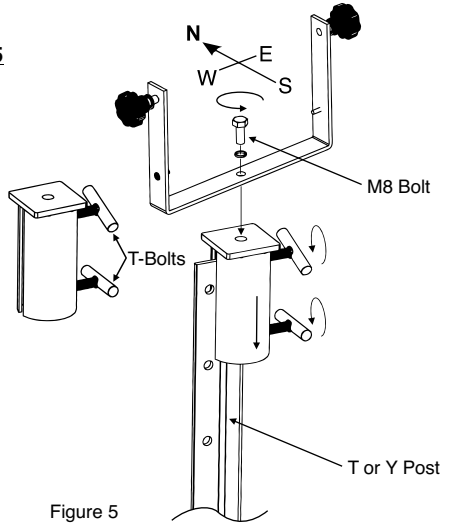
B: Wooden Post: see Figure 4

- Use the spike and at least 3 wood screws (suggested: #10x1" - not included).
- Hold the spike to the most straight and vertical corner of the post and drive in the 4 screws from different angles.
- Attach the U-bracket with the M8 bolt and spring washer.
- Adjust to face North or South (see step 4).
- Tighten the bolt with a 13mm spanner.
- Proceed to step 3.



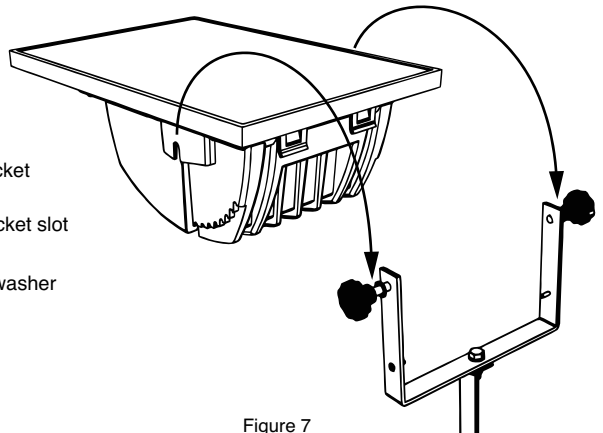
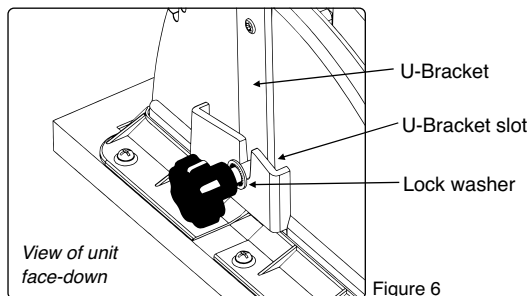
C: T/Y Post Socket (for Star picket or T-post): see Figure 5

- Use the T/Y Post socket to slot onto the top of a suitably sturdy Y-post (AUS star picket) or a USA type T-Post.
- Tighten up the 2 T-bolts to clamp the post socket to the T or Y post.
- Attach the U-bracket with the M8 bolt & spring washer.
- Adjust to face North or South (see step 4).
- Tighten the bolt with a 13mm spanner.
- Proceed to step 3.



STEP 3: Mount the Solar Fence:

The Solar Fence should be lowered onto the U-bracket horizontally so that the hand wheel and lock-washer are on the outside of the plastic and the arm of the bracket is inside the enclosure slots. See Figure 6 & 7



INSTALLATION (STEPS 1-5) continued.

STEP 4: Set the angle to the sun:

The Solar Fence's tilt angle is able to be adjusted from 7.5° to 60° to optimise the angle to the sun. This is done by loosening the side knobs and lifting the Solar Fence slightly and rotating. Lower the Solar Fence so that the pins lock into a slot, then re-tighten the knobs as tight as possible to lock.

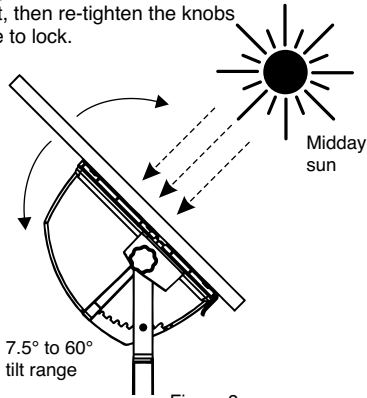


Figure 8

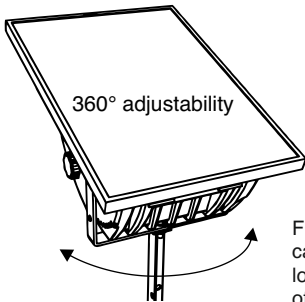


Figure 10

Figure 10 shows the Solar Fence can be rotated horizontally by loosening the M8 bolt on the top of the U-Bracket or T/Y post socket.

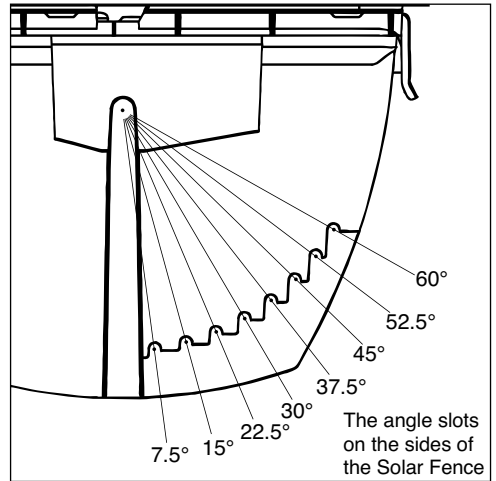


Figure 9

Figure 9 shows the various possible tilt angles. The tilt angle of any solar panel helps to optimise the power generation of the panel and depends on the global latitude where it is located. As a basic rule, you can take your latitude in degrees and subtract 5° to get a good tilt angle, where 0° is a horizontal panel.

The tilt angle can be set at one angle for the year or can be changed seasonally as the sun's elevation changes. The chart below shows the best angles for the Solar Fence if setting for the whole year and if changing seasonally.

Latitude North / South	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°
Full year angle (lat.-5°)	7.5°	7.5°	7.5°	7.5°	15°	22.5°	22.5°	30°	37.5°	37.5°	45°	45°	52.5°
Summer angle	7.5°	7.5°	7.5°	7.5°	7.5°	7.5°	7.5°	15°	22.5°	22.5°	30°	37.5°	37.5°
Winter angle	15°	22.5°	30°	30°	37.5°	37.5°	45°	52.5°	52.5°	60°	60°	60°	60°

Figure 11

The chart below (Figure 12) shows the best time of year to alter the tilt angle

	Northern Hemisphere	Southern Hemisphere
Adjustment date	30th March	29th Sept
Adjustment date	12th Sept	14th March

Figure 12

INSTALLATION (STEPS 1-5) continued

STEP 5: Connect up the Solar Fence:

ENSURE THE ENERGISER IS OFF BEFORE TOUCHING THE TERMINALS OR YOU MAY RECEIVE A SHOCK.

The Solar Fence has the 2 fence terminals on the underside of the enclosure. They are marked (\perp) for ground and (⚡) for live. The Ground is the Black knob, Live is the Red knob. See Figure 13.

If using the supplied connection wires with ring terminals, remove the terminal knobs and the first washer. Place the ring terminal over the bolt and replace the washers and knobs. Re-tighten the knobs. See Figure 13.

If using other connection wires, strip the end of the wires and make a "J" - shape in a bare end. Wrap this bare end around the fence terminal bolt and between the two washers. Replace and hand tighten the knobs.

Properly connect the other end of the live wire to your fence wire and ground wire to the ground rod(s). See Figure 14.

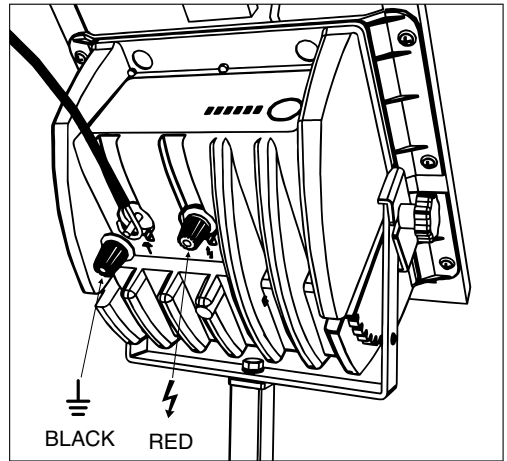


Figure 13

NOTE: DO NOT use pliers or other mechanical means to tighten the terminal knobs or they may be damaged which can void the warranty.

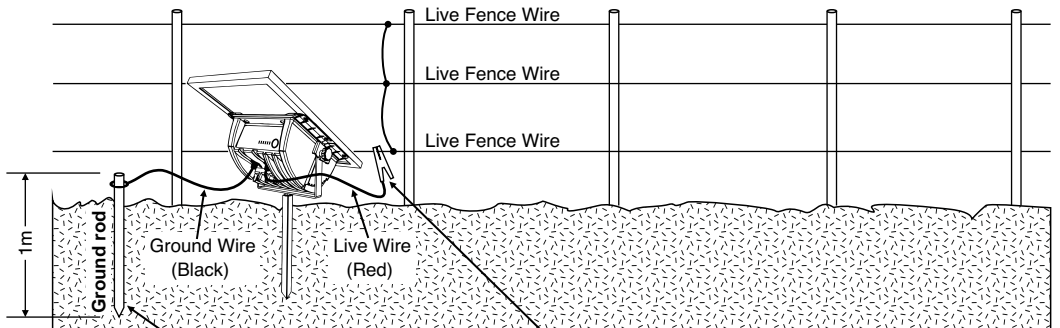


Figure 14

Connect the Black terminal (\perp) to the Ground rod using the Black lead.

Connect the Red terminal (⚡) to the Fence line using the Red lead.

Recommendations:

- Use adequately insulated hook-up wire (rated for at least 20,000V) where the live wire must travel underground. Never use standard household insulated wire, which is typically rated for only 600 volts or less.
- Maintain at least 25m from buried and above ground utility company ground rods, water pipes, metal siding, telephone wire and stock watering tanks.
- Finally, it is very important that an animal's first experience with an electric fence shock is one of respect. Some animals require more than one shock experience for lasting respect of the fence line. Always train the animal to the fence prior to unsupervised entry into pastures by insuring that the animal's first approach to the fence is slow, without stress and that an effective repelling shock is experienced.

OPERATION INSTRUCTIONS.

Switching on the Solar Fence:

The Solar Fence has one ON / OFF button that also doubles as a battery-check button.

Note: When the internal battery is connected, the unit will be in “standby” mode. This is indicated by the first green LED blinking every 2 seconds. It is only totally off when the battery is disconnected.

Press the button once and the LED light bar will show a start-up sequence lighting each LED, then the Solar Fence will start to produce the high voltage pulse. Each pulse is shown on the green LED bar.

See Figure 15

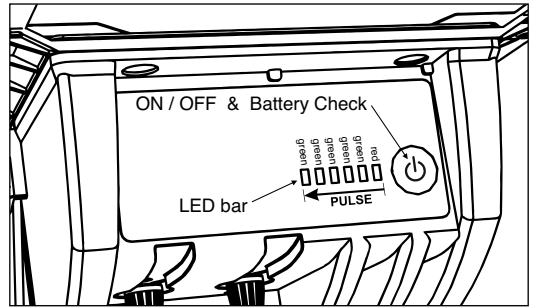


Figure 15

The higher the output to the fence, the more green LEDs will light up. If only the red LED lights up, the output kV is very low meaning there is a problem with the fence condition (bad leakage) or a problem with the Solar Fence.

Battery-Check:

If you press and hold the ON / OFF button for more than 2 seconds, an indication of the battery voltage will be displayed on the LED bar. This is a rough guide.

When you release the button, the Solar Fence will resume the mode it was in (ON or Standby) prior to pressing the button.

Figure 16 shows approximate Fence Voltage readings and Battery Voltage from the LED bar.

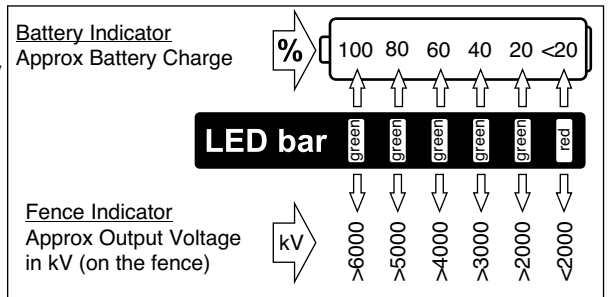


Figure 16

LED indicators - Meanings:

- 1st green LED blinking = in standby mode. No output pulse.
- 1st green LED constant = in standby mode and charging.
- Red LED is blinking = in standby mode but no battery connected, but receiving solar power.
- Green LEDs lighting up and dropping off in sequence = Unit is ON and producing the high voltage pulse.

Battery Life:

The Solar Fence will charge the battery whenever possible, so long as there is sufficient output from the solar panel. As soon as the battery is connected it will be in “standby” mode where the first green LED will blink every 2 seconds, unless charging, then it will be on constantly.

The Solar Fence will charge the battery at any time there is sufficient sunlight. Therefore the Solar Fence will continue to run non-stop (throughout the night), so long as it had sufficiently charged up the battery during the day.

If there is no charging occurring, (possibly on very dull or rainy rays) the internal 7.2Ah battery can run the Solar Fence models for a few days. Refer to the table (Figure 17) for a rough guide.

Model	Battery Capacity	Output Joules	Battery Life without charging
S50	7.2Ah	0.5J	7 days
S75	7.2Ah	0.75J	5 days
S100	7.2Ah	1.0J	3.5 days

This data is based on a fully charged, new battery.

Figure 17

Battery Saving:

The Solar Fence has smart technology to prolong the life of the battery. This is done by constantly monitoring the battery voltage and adjusting the output pulse. At a battery voltage less than 12.2V the unit will reduce the output power by 1/2 and start to increase the time between pulses incrementally as the battery voltage falls further.

This has the ability to extend the battery life by 2 times until the battery reaches 11V.

At 11V battery voltage, the Solar Fence will go into Standby Mode (stops pulsing). This is to prevent damaging the lead-acid battery by draining it.

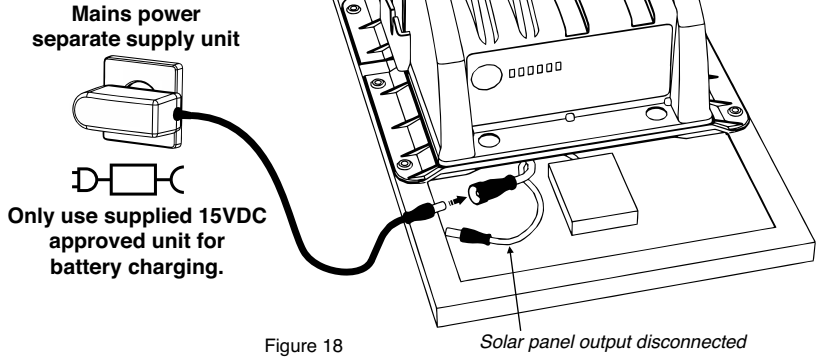
Conversely, the it has a charging circuit that will protect the battery from over-charging.

OPERATION INSTRUCTIONS. cont.

External battery charging:

The Solar Fence battery can also be charged externally by use of the supplied 15V DC adapter. Simply disconnect the solar panel connection and plug in the adapter plug to the input of the Solar Fence.

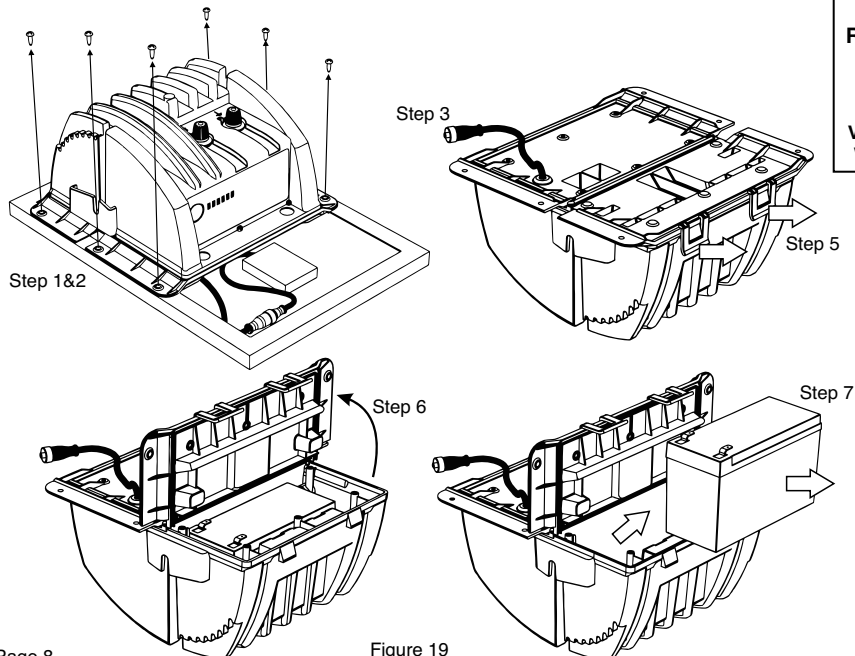
See Figure 18



Replacing the battery:

The Solar Fence uses a 12V 7.2Ah sealed lead-acid battery fitted internally. This battery will need to be replaced periodically when the battery can no longer take a charge. **ONLY REPLACE WITH RECHARGEABLE TYPE.**

- Step 1. Remove the Solar Fence from its mount and place face-down on a flat surface.
- Step 2. Unscrew the 6 screws holding the plastic enclosure to the solar panel.
- Step 3. Disconnect the solar panel connector.
- Step 4. Lift the enclosure from the solar panel and place face-up on a table.
- Step 5. Lift the 2 catches on the back-end (opposite end to the ON/OFF button) to release the battery cover.
- Step 6. Lift up the cover and pull off the 2 terminal connectors from the battery.
- Step 7. Lift out the battery.



WARNING
ONLY USE A
RECHARGEABLE
BATTERY

PLACE IN
VENTILATED AREA
WHEN CHARGING

Battery Specs:
12V 7.2Ah Sealed Lead Acid
Size: 151(L)x65(W)x95(H)mm
Terminal type: T2

ACCESSORIES

- **Fence Connection Lead (included):**

Red wire and Red battery clip to connect from the Live (L) terminal to the fence line.



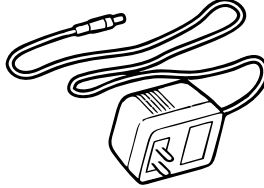
- **Ground Connection Lead (included):**

Black wire with two ring terminals to connect from the Ground (GND) terminal to the Ground Spike.



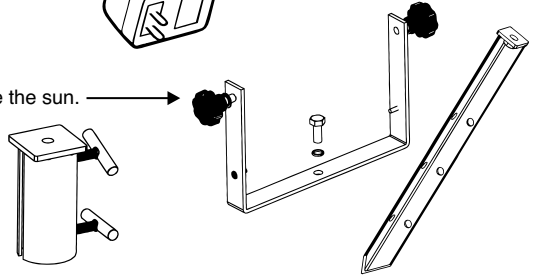
- **Separate Power Supply (included):**

110 - 220V AC to 15V DC adapter, used to charge the internal battery if there is a lack of sun.



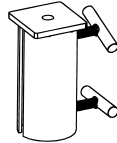
- **U-Bracket and Spike (included):**

To mount the Solar Fence and provide means to face the sun.



- **T/Y Post Socket (included for AUS & US):**

To mount the Solar Fence to a Star picket or T-post. (sold in Australian or US markets only)

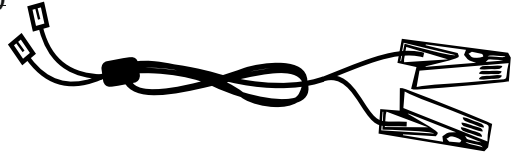


- **External Battery Connection Leads (not included)**

The Solar Fence also has the ability to have a 12V external battery connected. With the internal battery removed, a punch-out in the bottom can be removed allowing for a PG7 cable gland to be installed.

This allows for an external battery (12V rechargeable lead-acid only) to power the unit for an extended battery life and be charged by the solar panel.

Please enquire with your dealer for this accessory.



External Battery Leads - (sold separately)

OTHER NOTES

1. Should the battery cover clips or the cover hinge fail over time, provision has been made for 5 screws (#6 x 1/2") to be driven in to hold down the cover.
The screw holes have a thin layer that can be punctured by the screws.
See the positions marked by the arrows in Figure 20.
2. Should the solar panel be damaged in any way, it can be easily replaced.
Simply disconnect the connector, unscrew the 6 screws holding the enclosure to the aluminium frame and swap for a new panel.
Please enquire with your dealer should you require a new panel.

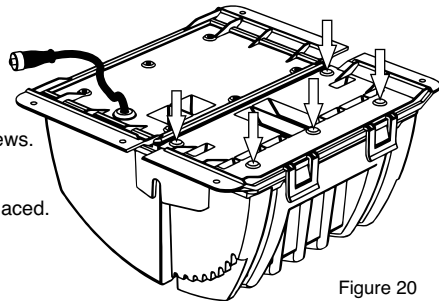


Figure 20

WINTER STORAGE - IMPORTANT

If you intend to not use the Solar Fence, for example: storing during winter, it is important to fully charge the battery before doing so. This is so the battery will not get damaged by being in-active at a low voltage for a long period. Storing a lead-acid battery when it is <90% charged for a period of a few months can lead to damage and the inability to be re-charged again.

Recommended re-charging methods:

- 1). Disconnect the solar panel and plug in the supplied 15V adaptor for 8 hours.
Press & hold the ON/OFF button to see if the LED bar shows 5 green LEDs. If not, try charging for 4 more hours.
- 2). Leave the Solar Fence in Standby mode (no output pulse) in the sun for full day.
Press and hold the ON/OFF button to see if the LED bar shows 5 green LEDs. If not, leave it in the sun again.

Product Specifications:

Product type: Battery-Operated Electric Fence Energiser.
Input: Internal 12V DC battery with solar charging.
Output: 9kV pulsed, 0.5J, 0.75J, 1.0J Outputs.
IP Rating: PCB compartment: IP54. Battery compartment: IP34.
Enclosure: UV stabilized Polypropylene.
Solar Panel: 10W, 15W or 20W Polycrystalline, low iron glass with anodized aluminium frame.

Complies with:

EN 60335-1 & 60335-2-76
AS/NZS 60335.1 & 60335.2.76
EN 61000-3-2, EN 61000-3-3
EN 61000-6-2, EN 61000-6-4
AS/NZS 61000.6.4

A copy of this manual is available online.
Scan the QR code:



<http://forcefield.ie/shop/item.aspx?itemid=118>

Or visit the Force Field website:
www.forcefield.ie

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