

MGG Solar Powered Electric Fence Energiser

Operator's Manual for Model No's: SF015, SF030, SF080

This MGG Solar Powered Electric Fence Energiser is a comprehensive perimeter or strip fencing energiser and an ideal solution for those who want a simple, efficient and cost-effective portable solution to power their fences. It comes as a ready-to-use unit complete with solar panel & sealed lead-acid storage battery and is designed to supply power to a single strand fence, up to the distance rated for each model as shown in Table 1.



Performance Characteristics	SF015	SF030	SF080
Discharge Energy	0.15J	0.3J	0.8J
Output Voltage	8KV +/-1.5KV	8KV +/-1.5KV	8KV +/-1.5KV
Fence Length	Up to 5km	Up to 8km	Up to 12km
Panel Size	110 x 96mm	140 x 160mm	140 x 160mm
Panel Output	1.3 watts	3.0 watts	3.0 watts
Charge Voltage	7.5VDC	7.5V – 9.5VDC	7.5V – 9.5VDC
Battery	6V4.5Ah sealed	6V7Ah sealed	6V7Ah sealed
Dimensions	194 x 178 x 175mm	265 x 225 x 230mm	265 x 225 x 230mm
Weight	1.66kgs	2.95kgs	3.54kgs

Table 1: Performance Characteristics for Model No's: SF015, SF030, SF080

Package Contents

- Operator's Manual
- 1 x MGG Solar Fence Energiser
- 1 x Set of leadout wires

Warranty

MGG electric fence energisers are warranted against faulty manufacture for a period of 12 months. This is a “return to base” warranty and if the unit cannot be repaired immediately it will be replaced with a new one. The customer will cover the cost of returning the unit to MGG and MGG will cover the cost of returning the repaired/replaced unit to the customer.

MGG Operator’s Manual

This manual is designed to ensure you achieve optimum results from your MGG Solar Powered Electric Fence Energiser. To ensure maximum output with minimum complications and optimum safety, we advise you to follow the guidelines carefully concerning the correct installation of your fence energiser and the required earthing system. Anything less will substantially affect the performance of the energiser and can result in unnecessary complications.

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How does an electric fencing system work?

An electric current, generated from an energiser which is earthed, travels along a fence wire as a pulse. The circuit between the fence and the ground is completed when an animal touches the fence wire and consequently receives a short, sharp but safe shock. This provides enough of a deterrent to an animal, making the electric fence a psychological barrier rather than a physical one.

Installing the MGG Solar Powered Electric Fence Energiser

- Mount out of reach of children & animals
- Keep energiser off the ground to protect electrical components from insect, livestock and moisture damage
- Fix to a suitable wooden post to ensure that air can circulate freely around and underneath the unit.
NEVER STAND THE ENERGISER ON A BOX/CRATE. AIR MUST BE ALLOWED TO FREELY CIRCULATE. THE UNIT MUST BE MOUNTED OR HUNG WELL ABOVE THE GROUND
- If possible, site the energizer in the middle of the fencing system
- Position the solar panel to face NORTH in the southern hemisphere and SOUTH in the northern hemisphere
- Adjust the solar panel to a 90° angle towards the midday sun
- Some adjustment of the panel may be required to accommodate the midday, winter sun
- If necessary, build a protective fence around the energiser to protect from possible damage from livestock

Components



- 1) Solar Panel
- 2) Carry Handle
- 3) ON/OFF switch
- 4) BLACK terminal is EARTH
- 5) Wall or post supports (situated behind solar panel)
- 6) Security Tab
- 7) High voltage pulse indicator light
- 8) RED terminal is FENCE LINE

Installing the earthing system

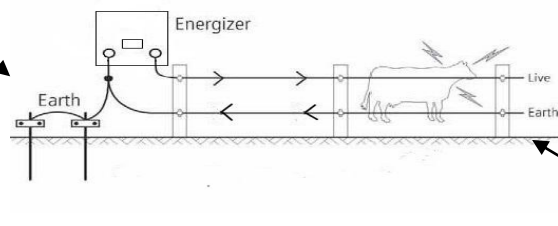
This is a vital component of any powered fence system. Electrons travelling from the energiser must complete a circuit in order to give the animal an electric shock. From the energiser, electrons travel along the insulated fence wires, through the animal's body, through the soil to the earthing system – a number of connected earth stakes that absorb electrons in the soil - then return to the energiser. If an electric fence is not earthed correctly, it will be much less effective – see table 2.

Known factors	What happens?	What's the solution?
Dry, sandy &/or pumice soil types	Allows electrons to disperse rather than be absorbed completely by earthing stakes. Reduces effectiveness.	<ul style="list-style-type: none"> • If possible, choose a better location or an alternative method of earthing such as a bentonite salt earth system • Consider additional earthing stakes • Water earthing system to improve soil conductivity
Weeds/vegetation touching live fence wires	Electrons leak causing fence circuit to 'short' and voltage to drop	<ul style="list-style-type: none"> • Check entire fence lines regularly • Weed/grass management to ensure nothing touches the fence wires • Trim back over-hanging tree branches which may also touch the fence wires
Rusty or corroded earthing stakes	Do not conduct electrons	<ul style="list-style-type: none"> • Use clean, GALVANISED earth stakes
Animal urine and manure	Long term exposure corrodes earth stakes	<ul style="list-style-type: none"> • Site earthing system away from animal excreta
Metal pipes, dairy-shed pipework, other electrical or telephone earths	Interference	<ul style="list-style-type: none"> • Ensure the earthing system is sited at least 10m away from any mains earth system and 20m from any dairy-shed pipework
Steel or iron-clad buildings	Interference	<ul style="list-style-type: none"> • Do not connect earthing system to metal buildings
Machinery or livestock	Can damage components of earthing system	<ul style="list-style-type: none"> • Position earthing system away from livestock or other traffic thoroughfares
Mixed metals within the earthing system	Electrolysis, causing some components of the earthing system to corrode	<ul style="list-style-type: none"> • Do not mix metals of differing conductivity e.g. never use copper wire directly onto galvanized earth stakes

Table 2: Factors known to affect an earthing system

Location of the earthing system

- All-live earthing system: Recommended where the soil is highly conductive, i.e. most moist soils.



- Earth-wire return earthing system: Where soils are not conductive e.g. dry, sandy, pumice soils as well as frozen soils or snow conditions, an earth-return wire should be used in conjunction with the earthing system – as per diagram
- Bentonite salt earthing system: A known alternative for extremely dry soil conditions. A mixture of bentonite and coarse salt (10lbs bentonite: 5lbs coarse salt, mixed into a slurry) is placed in and around each earth stake. The salt attracts moisture making it highly conductive, while the bentonite retains moisture over prolonged periods. **Note:** For this particular application stainless steel earth stakes are required to prevent salt corrosion and should be spaced 10m apart. You will find some great information about the use of Bentonite at the following website: <http://informedfarmers.com/the-bi-polar-system-ef/>

Earth stakes

- For normal earthing use clean, GALVANISED earth stakes. Rust will not conduct electricity!
- For permanent powered fencing systems, a minimum of 3 earth stakes is recommended, each 2m in length. Depending on the location and conditions of the earthing system, additional stakes may be required
- Space the earth stakes at least 3m apart (10m apart if using the bentonite salt earthing system) then drive them deeply into the soil leaving a minimum of 10 centimetres (cms) above ground level for the single connecting cable
- Join the earth stakes in a continuous series using clamps and insulated connecting cable
- If using the bentonite salt earthing system, use stainless steel earth stakes and space them at least 10m apart

Connecting the earthing system to the energiser

The MGG Solar Powered Electric Fence Energiser comes with an earthing wire which can be connected as follows:

- Unscrew the BLACK cap on the energiser unit
- Attach the metal ring of the BLACK earthing wire then replace the BLACK cap, tighten to secure in place
- Attach the metal ring at the other end of the earthing wire to one of the EARTH STAKES

Connecting the lead-out wire from the energiser to the fence

The MGG Solar Powered Electric Fence Energiser comes with a short length, low resistance lead-out wire which can be connected as follows:

- Unscrew the RED cap on the energiser unit
 - Attach the metal ring of the RED lead-out wire then replace the RED cap, tighten to secure in place
 - Attach the RED clip at the other end of the leadout wire, to the FENCE WIRE
- Important** – grease the clip of the leadout wire to prevent corrosion
- To start the energiser, rotate the ON/OFF lever to the ON position
 - To stop the energiser, rotate the ON/OFF lever to the OFF position

Recharging

When fully charged, the MGG Solar Powered Electric Fence Energiser can work for up to 2 weeks with limited sunshine. One good sunny day in three should maintain a full battery charge. Should there be insufficient sunshine or, long periods of persistent rain shorting out the fence, the battery can be re-charged with the optional mains battery charger.

Safety requirements

This MGG Solar Powered Electric Fence Energiser complies with safety requirements of EN 6100-6-1-2001 and EN 61000-6-3-2007

- NEVER use more than ONE energiser on one fence at any given time
- The earthing system must be at least 10m from the mains electrical earth
- Try to avoid electric fence wires passing under or parallel to overhead power lines, telephone lines or cables
- If the crossing is unavoidable, make it as close to a right angle as possible
- Electric fences near or under power lines should be no higher than 2m (6ft 8ins)
- All wires should be at least 5.5m (18ft) above ground when crossing a public road
- Don't use power poles to support electric fence or lead-out cable/wire
- Electric fences bordering public walkways require regulation warning signs
Regulation is 200mm x 100mm with 25mm lettering
- Signs should be located within 20m of each end of the fence. Additional signs need to be 100m apart on an electric fence which is adjacent to a public road or thoroughfare and 50m in urban areas
- Under no circumstances should barbed or razor wire be electrified
- Removal of the safety tab is recommended when the energiser is not in use
- Lightning Protection - If lightning strikes your electric fence it will damage your energiser. In areas prone to severe lightning, installing an earthing system to include a lightning diverter is essential. These are generally available from your local Farm Supply Company. The lightning diverter has its own earthing system which provides an alternative path for the lightning that strikes the fence to reach the ground. It consists of separate earthing stakes from the energisers earthing system, (minimum of 3), and should be installed at least 20m away from it. However, **incorporating a lightning diverter is not a guarantee for total protection**, particularly when there is a direct lightning strike to the fence or the energiser itself. Alternatively, completely disconnect the energizer from the power source and earthing system during lightning storms.
- For further information regarding NZ Safety Requirements for electric fencing systems, please visit www.standards.co.nz and see publication number: AS/NZS 3014:2003

Trouble-shooting

A fence tester, such as the MGG Electric Fence Tester, is an essential piece of equipment required to monitor the electrical output along the fence line, perform regular maintenance checks along the fence-lines as well as assisting to find faults quickly and easily, should they occur. If your fence-line is registering less than 3000v on your fence tester it will not be effective in deterring stock and you should check the following:

Possible cause	Action
Energiser itself	<ul style="list-style-type: none"> • The MGG Solar Powered Electric Fence Energiser is designed to power a single strand fence up to the distance rated for each model (see table 1). If you require greater distances, you will need to try a more powerful energiser. Alternatively, re-plan your powered fence system to within the maximum capacity of the energiser. Additional fence requirements will require a second unit • Never use more than one energiser to power one fence line • Check the battery storage. For optimum effectiveness, the MGG Solar Powered Electric Fence Energiser battery needs to be above 5.8v. Ideally, 6 – 6.5v. If below this level, it is recommended that you ‘top-up’ the battery using the optional inexpensive mains battery charger • Check the solar panel performance. With the battery disconnected and the solar panel facing towards the sun, attach a voltmeter to the terminals which connect to the battery. In optimum conditions the reading should be above 7.0v
Earthing System	<ul style="list-style-type: none"> • Re-check the earthing system as per the installation instructions on page 4
Lead-out wire	<ul style="list-style-type: none"> • Check the connection to the energiser is secure • If using a longer length lead-out cable/wire to the one supplied, ensure a large diameter, low resistance, cable/wire. Do not use household electrical cable, copper wire or barbed wire • Ensure the wire is sufficiently insulated, particularly if sited underground • Check there are no stray wires and no vegetation touching the lead-out wire • Check all cable joins to ensure connections are insulated and secure
Fence line	<ul style="list-style-type: none"> • Walk the entire fence perimeter tracing a fence tester along the line, checking about every 100m. If the short is serious the voltage will continue to drop until the fault is reached • Check all joins in the wire to ensure they are secure • Check the fence wire itself for any signs of corrosion • Vegetation touching the fence line is the greatest cause of voltage loss. Maintain fence lines, ensuring weeds, low hanging branches and other vegetation growth are kept away from the fence lines. Ensure the wire position and tension is adequate to keep the lines above any vegetative growth
Radio interference	<ul style="list-style-type: none"> • Ensure the earthing system is highly conductive • Install the energiser away from any mains power earthing system • Make certain the energiser earth wire does not touch a building or anything which could act as an aerial • Keep all radios and similar equipment away from the energiser • Keep vegetation away from the energiser itself
Telecommunication interference can be detected by either: i) Clicking noises on the telephone line ii) Slow or variable internet connection	<ul style="list-style-type: none"> • Know where the telecommunications cables are. This includes buried and overhead lines. You may need assistance here from your local telecommunications company • DO NOT run the lead-out wire or the fence wires, for any distance in parallel with telecommunications wires • Lead-out wire and fence wire must be sited at least 100m away from telecommunications lines • Ensure the earthing system is sited at least 10m from telecommunications lines and other earthing systems • Check all wires and connections along the entire perimeter of the powered fence system and ensure they are in good condition • If the fault persists, find an alternate route for the lead-out wire and fence wire so that it runs away from the telecommunications lines rather than alongside them

Maintenance

For a safe reliable electric fencing system, we recommend you follow these helpful tips:

- Regularly wipe down the unit with a soft damp cloth to ensure that there is no build-up of mould etc.
- Do not use any abrasives which may damage the coating of the energiser
- Clean any connections and terminals which may be showing signs of corrosion
- Re-grease the clip of the fence wire to prevent corrosion
- Perform a thorough test of the earthing system at least ONCE each year and also during any dry season
- Inspect fence lines regularly, clearing any weeds, low hanging branches or other vegetation in direct contact with the wire
- Check fence wire positions and tensions to ensure they are adequate to keep the fence lines above vegetative growth
- Ensure all fence wire insulators are intact and in good condition

Contact information

Should you have any questions or concerns please do not hesitate to contact the team at MGG:

Website: www.MGG.co.nz

Email: info@MGG.co.nz