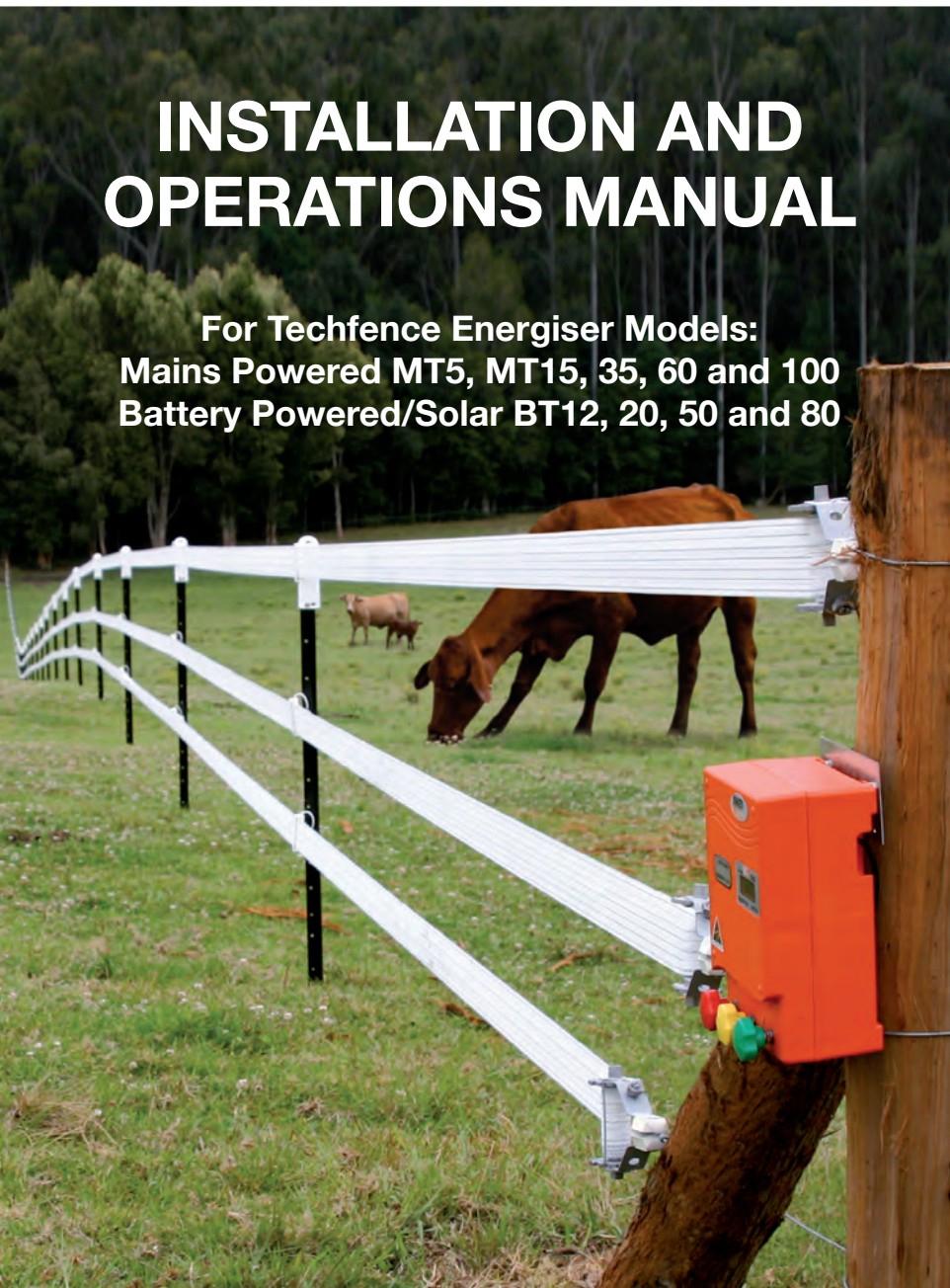


INSTALLATION AND OPERATIONS MANUAL

For Techfence Energiser Models:
Mains Powered MT5, MT15, 35, 60 and 100
Battery Powered/Solar BT12, 20, 50 and 80



For more information **FREECALL 1800 636 451**

email: daken.nsw@clarkequipment.com.au www.daken.com.au

DANGER!

The Energiser 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. Return the unit to an authorised repairer for service.

Electric fences should only be installed with regard to the relevant Australian Standards and local work place health and safety requirements.

This appliance is not intended for use by young children or infirm persons without supervision.

Young children should be supervised to ensure that they do not play with the appliance.

SCOPE

This manual is the users instruction manual for **Daken Techfence** energisers.

Models BT12 BT20 BT50 BT80 battery and solar energisers.

Models MT5 MT15 MT35 MT60 MT100 mains operated energisers.

For more information please see the DAKEN Electric Fencing Manual and Australian Standard AS3014.

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INTRODUCTION

THE ENERGISERS

The MT5, MT15 and MT35 are 15 and 35 km rated# mains (230VAC) electric fence energisers designed for small to medium sized permanent fencing applications.

The BT12 and BT20 are 12 and 20 km rated# battery (D.C) electric fence energisers designed for small to medium sized permanent fencing applications.

The MT60 and MT100 are 60 and 100 km rated# mains (230 VAC) electric fence energisers designed for medium to large sized permanent fencing applications.

The BT50 and BT80 are 50 and 80km rated# battery (D.C) electric fence energisers designed for medium to large sized permanent fencing applications.

SOLAR

When using solar power the BT12, 20, 50 and 80 will run from a battery that is charged from a solar panel.

The BT12 requires a 10W panel and at least a 7Ah battery (preferably 15Ah).

The BT20* requires a 20W panel and at least a 15Ah battery (preferably 30Ah).

The BT50* requires a 40W panel and at least a 30Ah battery (preferably 60Ah).

The BT80* requires a 40W panel and at least a 60Ah battery (preferably 120Ah).

*Solar regulator recommended.

The exact maximum kilometres able to be energised depends on many factors, for example the earth resistance, number and spacing of wires on the fence, type of insulators, resistance of wire etc. The amount of grass or scrub touching the wires also alters the performance. Fence circuit layout is also very important. Another factor is acceptable fence voltage, for some stock situations this is 3kV others require more or less. Therefore the rated km is a guide only.

SPECIFICATIONS MAINS POWERED ENERGISERS

Model	MT5	MT15	MT35	MT60	MT100
Energiser no load output voltage	8.2KV	8.5Kv	8.5kV	8.8kV	8.8Kv
Pulse period	1.2 seconds				
Stored Energy	0.8 Joule	1.7 Joule	3.0J	6J	8J
Input Power	230Vac-50Hz				
Consumption	1.3W	1.8W	3.0W	6.2W	8.0W
Protection	Input surge, noise and over voltage protected Output surge (lightning) protection				

SPECIFICATIONS BATTERY POWERED ENERGISERS

Model	BT12 (Solar)	BT20	BT50	BT80
Energiser output voltage	8.5kV peak no load			
Pulse period	1.3 seconds normal, 1.7 seconds low battery			
Stored Energy	1 Joule	2J	5J	8J
Power	12V or 24V (absolute maximum 30V)			
12V Drain	85mA	150mA	375mA	570mA
Protection	Input surge, noise and over voltage protected Output surge (lightning) protection			
Solar Panel*	10 Watt	20 Watt	40 Watt	40 Watt
Solar Battery	15 Ah	30 Ah	60 Ah	120 Ah

Note: Due to our policy of continual improvement specifications are subject to change without notice.

* Areas that experience low sunlight hours, high seasonal cloud or fog are advised to increase the size of solar panel used.

ENERGISER DISPLAY Models MT5, MT15, 35 & BT12, 20



MT35 Energiser showing LED display

1. **Overload** red LED - flashes slowly (once per pulse) when the load exceeds an acceptable level. When this happens it is likely that the fence has a fault. Operating into an overload will NOT harm the MT15/35, BT10 / 20. This LED also flashes quickly to indicate an energiser error.
2. **Energiser OK** green LED - Flashes with each pulse to show the unit is operating correctly.

ENERGISER DISPLAY MT60, 100 & BT50, 80



BT80 Energiser showing LED display

1. **Overload** red LED - flashes slowly (once per pulse) when the load exceeds an acceptable level. When this occurs it is likely that the fence has a fault. Operating into an overload will NOT harm the MT60 / 100, BT50 / 80. This LED also flashes quickly to indicate a low battery or energiser error.
2. **Energiser OK** green LED - Flashes with each pulse to show the unit is operating correctly.
3. **KiloVolts** display – Shows the voltage on the output terminals of the energiser. The higher the voltage the more effective the fence will be.
4. **Load Factor** display – from 0 to 10, 10 being a dead short circuit, 0 being no fence load at all. Indicates the fence load at the energiser. Useful for a quick check of fence health.

ERROR CODES

Battery powered energisers may see the red Overload LED flash twice (2) in succession, or for models featuring digital display a reading of **Lo b**, this means **low battery voltage**. (Early models will switch themselves off to conserve the battery on re-applying the correct voltage the energiser will start up). At this warning indication your battery needs to be re-charged to prevent permanent battery damage and loss of fence voltage.

Should the red overload LED flash 3 or more times in succession, or for models featuring digital display a reading **Er 03, 04 or 05** your energiser will require service, please return to the point of purchase for professional care.

INSTALLATION AND OPERATION

MAINS AND BATTERY MODELS

INSTALLERS/USERS SHOULD NOTE:

WARNING: 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. The energiser may be mounted from two screws at 55 cm centres, or simply lay or stand on a shelf. The electric fence requires an earth, see the Electric Fence Manual for details.

Mains Powered Energisers must be kept undercover and protected from weather.

Connection to fence and earth are by the Chunky terminal knobs on the front of the energiser. We recommend the use of Daken Underground Cable for all connections from your energiser to fence or earth. Bare the end of the cable exposing 30 to 40mm of the galvanised wire core. With the Energiser not connected to any power unscrew the Chunky Terminal knob, pass the bared end of your cable through the hole in the post and tighten the terminal knob to hold the wire in place.

OUTPUT CONNECTIONS

Full Power Earth



MT15 and BT10
Fence Connections

Full Power Half Power Earth



Conventional
Connections

+ Power Earth - Negative



Bi-Polar Fence
Connections

For more information on fence systems see the Daken Electric fencing manual.

Battery Installation

Attach the battery leads to the battery.

The red positive lead to (+) and the black negative lead to (-) on the battery. The battery should be installed, up off the ground to prevent premature discharge. Use timber blocks or similar to raise the height of the battery, but not concrete! To get the most life out of your battery cover it to protect it from the weather, a cut away clean plastic drum will suffice.

When selecting a location for your energiser and battery take into consideration inquisitive stock, rising water and the possibility of theft.

Battery Model Power Options

- 12V Battery, Heavy Duty or Deep Cycle
- 12V Battery with solar panel

IMPORTANT NOTE:

Always ensure adequate ventilation is given to the enclosure if it houses a battery. Lead Acid batteries may emit explosive gases while charging!

SOLAR POWERED ENERGISERS

Solar powered electric fence energisers consist of an energiser, battery (not supplied) and a solar panel for recharging the battery. If you have purchased a solar "kit" it will come complete with regulator (B10 Solar Kit does not come with a regulator) all you need to do is add a battery. Areas that experience low sunlight hours, high seasonal cloud or fog are advised to increase the size of solar panel used. Your rural store or Daken can advise you.

EARTHING

In order for the animal to receive a shock, there must be a good current flow from the output terminal of the energiser to the animal, and back to the earth terminal at the energiser completing the circuit. Therefore good earthing is essential for a good system.

For detailed information on earthing see the Daken Electric Fencing Manual.

SOLAR ENERGISER KIT INSTALLATION

INSTALLERS/USERS SHOULD NOTE:

WARNING: 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.

Your kit comes with the solar panel pre-mounted. The pre-mounted solar panel assembly can be mounted on a star post or a 2" water pipe. Select a North facing position free from shadows all year. Drive your selected mounting post so that it resides firmly into the ground. Support the pre-mounted solar panel assembly on the top of your post and tighten the "U" bolts. Ensuring the panel is still facing north.

The energiser can now hang on the two small bolt heads protruding from under the solar panel.

Your pre-mounted solar panel assembly leads will come with heavy duty battery terminals, to connect to these simply remove the alligator clips by sliding them off the spade terminal on the energiser leads, a screwdriver will assist with those process. Insert the spade terminals on the spare spade connection on the heavy duty battery terminals. Connect the heavy duty battery terminals to the battery and tighten. Ensure all red positive wires are connected to the positive (+) terminal of the battery and that all the black negative terminals are connected to the negative (-) terminal of the battery.

For battery location see Battery Installation on page 8.

CHECKING YOUR SOLAR ENERGISER IS OPERATING CORRECTLY

When checking a solar powered energiser for correct operation you will require a voltmeter or multi-meter capable of reading DC voltage to 20V.

1. To check the solar panel. Disconnect the panel wires from the regulator. With the voltmeter in 20V DC range check that the panel is delivering approximately 19V in good sunlight.
2. To check the regulator, replace the solar panel leads onto the regulator. Disconnect the regulator leads from the battery. With the voltmeter connected to the output (battery side) of the regulator, check that the regulator is delivering approximately 13.5V.
3. To check the battery, reconnect the regulator with the energiser off. With the voltmeter check the battery voltage. The following table shows state of charge with respect to voltage. Note: this test will only work if the battery is above 50% charge. Turn the energiser on and re-check the battery voltage. If the voltage drops quickly by more than 0.5 volts the battery is probably dead and should be replaced.

NOTE: Never connect a multi meter in current (amps) range across a batteries terminals.

Open circuit voltage	Charge in %	Estimated state-of-charge of a 12V car battery. Test the battery at room temperature. Allow 4-8 hour of rest after charge or discharge.
12.6V and higher	100%	
12.4-12.6V	75-100%	
12.2-12.4V	50-75%	
12.0-12.2V	25-50%	
11.7-12.0V	0-25%	
11.7 and less	0%	

TROUBLESHOOTING

TESTING YOUR FENCE

This should be conducted with a Daken Fence Tester. These read Kilovolts (1,000 volts) and come in several styles, Analogue (needle type), Digital Fence Tester, or the ultimate tester the Daken Fault Finder.

Ideally the voltage reading on the start of your fence will correspond approximately to the figures in the Specification Table on page 4. Unfortunately this is not always the case, voltage readings will vary along the fence due to many factors including construction, length and load, and it will also vary during the course of the day due to factors like the weather. With the assistance of a good quality Daken Fence Tester or Power Probe you will soon learn how well your fence system is performing. As a general rule most fences lose their effectiveness at approximately 3,000 volts or 3kV. Should this point be reached you will need to trouble shoot your fence, to determine the presence of short-circuits or high load from weed growth.

See "Fault finding the fence" on page 7 for assistance or see the Daken Fencing Manual.

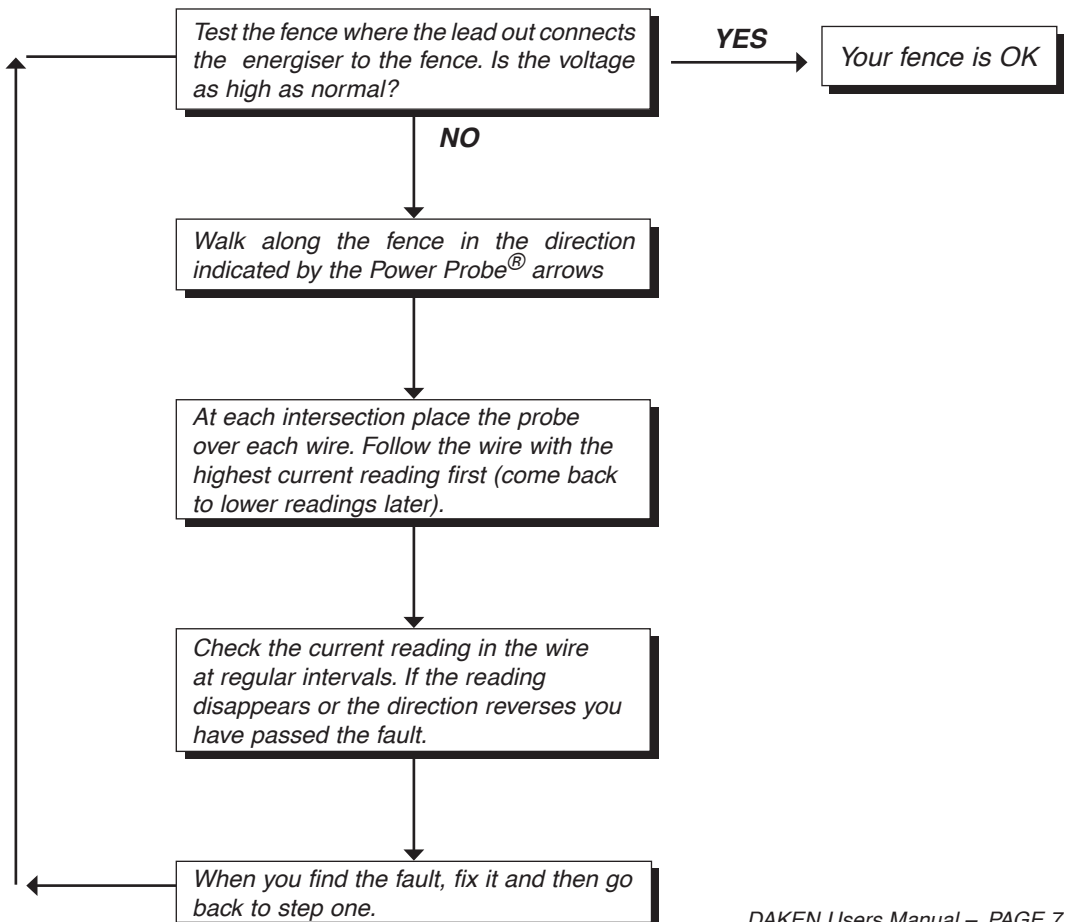
TESTING THE EARTH

This requires a Daken Fence Tester or Daken Fault Finder.

For detailed information on earthing see the Daken Electric Fencing Manual.

FAULT FINDING – THE FENCE

This requires an electric fence voltmeter or Fault Finder



INSTRUCTIONS FOR INSTALLATION AND CONNECTION OF ELECTRIC FENCES IN AUSTRALIA AS REQUIRED UNDER AS3350.2.76

DEFINITIONS

Connecting Lead:

an electric conductor, used to connect the **energiser** to the **electric fence** or the **earth electrode**.

Electric animal fence:

an **electric fence** used to contain animals within or exclude animals from a particular area.

Electric fence:

a barrier which includes one or more electric conductors, insulated from earth, to which electric pulses are applied by an **energiser**.

Electric security fence:

a fence used for security purposes which comprises an **electric fence** and a physical barrier electrically isolated from the **electric fence**.

GENERAL REQUIREMENTS FOR ELECTRIC FENCES

1. **Electric fences** shall be installed and operated so that they cause no electrical hazard to persons, animals or their surroundings.
2. **Electric fence** constructions which are likely to lead to the entanglement of animals or persons shall be avoided.
3. An **electric fence** shall not be supplied from two different **energisers** or from independent fence circuits of the same **energiser**. For any two different **electric fences**, each supplied from a different **energiser** independently timed, the distance between the wires of the two **electric fences** shall be at least 2.5m. 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 **energiser**.
5. Any part of an **electric fence** which is installed along a public road or pathway shall be identified at frequent intervals by warning plates securely fastened to the fence posts or firmly clamped to the fence wires.
 - a. The size of the warning plates shall be at least 100 mm x 200 mm.
 - b. The background colour of both sides of the warning plate shall be yellow. The colour on the plate shall be black and shall be either:
 - i. The symbol of Figure 4, or
 - ii. The substance of TAKE CARE - ELECTRIC FENCE.
 - c. The inscription shall be indelible, inscribed on both sides of the warning plate and have a height of at least 25 mm.

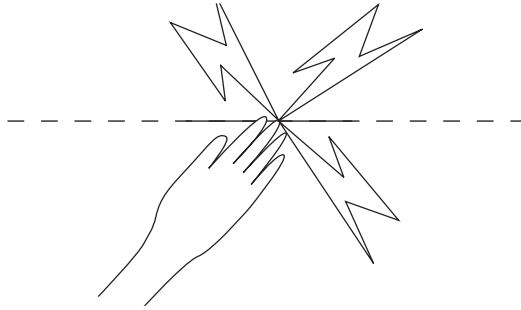


Figure 4 – Warning plate symbol

6. The **energiser earth electrode** shall penetrate the ground to a depth of at least 1 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 shall 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 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 fence** wires are installed near an overhead power line, the clearances shall be not less than those shown in table 3.

Power line voltage V	Clearance in metres
≤ 1000	3
$\geq 1000 \leq 33\ 000$	4
$> 33\ 000$	8

Table 3 - Minimum Clearances from Power Lines

13. If **connecting leads** and **electric fence** wires are installed near an overhead power line, their height above the ground shall not exceed 2 m. 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.

PARTICULAR REQUIREMENTS FOR ELECTRIC ANIMAL FENCES IN AUSTRALIA

14. A distance of at least 10m shall be maintained between the **energiser earth electrode** and any other earthing system such as the power supply system protective earth or the telecommunication system earth.
15. **Electric 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.
16. In **electric fences** intended for deterring birds from roosting on buildings, no **electric fence** wire shall be connected to the **energiser earth electrode**. A warning plate, as described above, shall be fitted to every point where persons may gain ready access to the conductors.
17. 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.
18. Where an **electric animal fence** crosses a public pathway, a non-electrified gate shall be incorporated in the **electric fence** at the point or a crossing by means of stiles shall be provided. At any such crossing, the adjacent electrified wires shall carry warning plates as described above.
19. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.
20. Ensure that all mains operated ancillary equipment connected to the **electric animal fence circuit** provides isolation between the **fence circuit** and the supply mains equivalent to that provided by the **energiser**.

NOTE 1 Ancillary equipment that complies with the requirements relating to isolation between the fence circuit and the supply mains in Clauses 14, 16 and 29 of the standard for the electric fence energiser is considered to provide an adequate level of isolation.

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.

PROHIBITED MOUNTING

Electric fence conductors should not be mounted on a support used for any overhead power line.

WARRANTY

Daken Pty Ltd warrants that this energiser is free from defects in material and workmanship. This warranty is limited to replacing any part which appears, upon inspection by the manufacturer, to be defective in material or workmanship.

The warranty period is for three calendar years from the date of purchase.

This warranty does not obligate the manufacturer, his agent or dealer, to bear the freight costs incurred in the repair or replacement of any defective part.

This warranty is void if energiser is tampered with, or non genuine parts are used, or if repairs or alterations have been made without the manufacturers written authority.

This warranty does not include repairs to energisers that have been damaged through abuse, misuse, neglect, improper and incorrect installation, lightning, water immersion, flood, insect infestation, or damaged battery leakage or damage from livestock, domestic or feral animals, also poor quality water supply from mains and inverters. Please complete and return the attached Warranty Card.

Complete the information below for your information.

Model No: **Date of Purchase:**

Serial No: **Dealer:**