

THUNDERBIRD



MB Series **Remote Ready Energisers**



INSTRUCTION MANUAL

for models

MB2750R and MB5600R

Contents

Page	Topic
2	Introduction
2	Description
3	Warnings
3	Regulations
5	How an electric fence works
6	Installation
6	Fence Layout
7	Fence Design
8	Earthing
9	Lightning Diverter
9	Gateways
10	Signs
10	Floodways
11	Energiser Mounting
12	Operating Instructions
12	Adjustable Output Voltage
12	Adjustable Pulse Period
13	Adjustable Alarm Level
13	Earth Sensing
13	Fence Feedback
13	Real Time Clock
14	Alarm History
14	Mounting and Connections
15	Energiser Operation
15	Monitoring Fence Condition
16	Battery Monitoring
16	Self Diagnosis
16	Specifications
17	Remote Control
17	Operation
17	Security Code
18	Interference
18	Battery
19	Trouble Shooting
19	Fence Voltage
20	TV or Radio Interference
20	Remote Control
20	Phone or Internet Interference
21	Warranty

Introduction

Thank you for purchasing this product. Thunderbird has had over 20 years experience in manufacturing electric fence equipment. All Thunderbird energisers are manufactured in Mudgee, NSW Australia, and we pride ourselves on being 100% Australian owned.

A lot of effort is spent on research and development to constantly improve our products. This energiser is the result of many years experience on improving reliability and service life.

Description

This MB range of energisers are a universally powered electric fence energiser. They can operate from mains, a solar system, or a stand alone battery.

This range of energisers incorporate “intelligent adaptive control” of the output power. This feature allows the energiser to be more efficient in its use of energy from the power source, and yet deliver maximum voltage when the fence becomes heavily loaded. As much as 50% power saving can be achieved by maintaining a well insulated fence that is free from the burden of green grass around the live wires, and with the live wires 200mm or more away from earth wires and ground.

These remote ready electric fence energisers can be turned from standby to on or vice versa from any point along its electric fence by means of an optional remote control. This is a valuable time and fuel saving feature when additions, repairs or access is required on the fence system. The remote control is capable of operating even when there is a heavy load on the fence.

They have 2 extra terminals, an earth sense terminal and a fence return terminal, which may be utilised to ensure that the fence system is functioning as it should. An alarm will be enabled if a problem is sensed on these inputs.

An internal clock may be set. This clock will put a time stamp on any problem that is sensed from the fence or the unit itself. Up to 16 alarms will be stored and referred to if the clock is set, but only one alarm is stored if the clock is not set.

Warnings

Read this instruction manual fully before installing or operating the energiser.

- > Regular inspections of electric fences must be undertaken to ensure continued operational safety and compliance with Australian Standard AS/NZS 60335.2.76:2003 and AS/NZS 3014:2003.
- > Persons coming into contact with high voltage pulses may have their normal physiological functions interrupted.
- > 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.
- > Extended periods of sunlight and excessive heat on the liquid crystal display will cause deterioration over time. This is not covered by warranty.
- > A power reducer device must be in series with the live wire(s) where young children or infirm persons are likely to contact the fence, such as around house yards. This is a Standards Australia requirement.
- > Avoid contacting electric fence wires, especially with the head, neck or torso. Do not climb under, through or over a multi-wire electric fence. Use a gate or a specially designed crossing point.
- > Do not connect this device to non-rechargeable batteries.
- > Any battery connected to this energiser must be located in a well ventilated area during charging.
- > The attached AC inlet cover must be fitted to the AC socket whenever the AC lead is not connected. A new cover must be fitted if the existing cover is missing.

Standards Australia Instructions for Electric Fence Installation

The following information is taken from the Australian Standard AS/NZS 60335.2.76:2003 Amendment 2. Refer to AS/NZS 3014:2003 for the full details on electric fencing.

- > Electric fences and ancillary devices must be installed, operated and maintained so that they do not cause an electrical hazard to persons, animals or their surroundings.
- > Construction of electric fences that is likely to lead to entanglement of animals or persons is to be avoided.
- > An electric fence must not be supplied from two separate energisers or from independent fence circuits of the same energiser.
- > For any two separate electric fences that are supplied from separate independently timed energisers, the distance between the two wires must be at least 2.5 metres. If this gap is to be closer, it must be effected by means of an electrically non-conductive (insulating) material and/or an isolated metal barrier.
- > Barbed wire or razor wire must not be electrified by an energiser.
- > A non-electrified fence incorporating barbed or razor wire may be used to support one or more offset electrified wires on an electric fence. The supporting devices for the electrified wires must be constructed so as to ensure that these wires are positioned at a minimum distance of 150mm from the vertical plane of the non-electrified wires. The barbed or razor wire must be earthed at regular intervals in accordance with Country Electronics earthing recommendations.

- > A distance of at least 10 metres must be maintained between the energiser's earth electrode and any other earthing system connected parts - for example, mains power protective earth or telecommunications system earth.
- > Electric fence connecting leads located inside buildings must be effectively insulated from the earthed structural parts of the building - use suitable high voltage insulated cable. Important: always ensure metal parts of the building are effectively earthed.
- > Electric fence connecting leads located underground must be run in a suitable conduit of insulating material, or high voltage insulated cable be used. Care must be taken that the effects of animal hooves or vehicle wheels sinking into the ground cannot damage the connecting leads.
- > Electric fence connecting leads must not be installed in the same conduit as mains supply wiring, communications cables or data cables.
- > Crossing with overhead power lines must be avoided wherever possible. If such a crossing cannot be avoided, it must be made underneath the power line and near as possible right angles to it.
- > If electric fence connecting leads and wires are installed near an overhead power line, the clearances must not be less than indicated in the table below.

Power Line Voltage - V	Clearances - Metres
Up to 1000V	3
1000V - 33000V	4
Above 33000V	8

- > If electric fence connecting leads and wires are installed near an overhead power line, their height above the ground must not exceed 3 metres. 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 metres for power lines operating at a voltage not exceeding 1000V
 - 15 metres for power lines operating at a voltage exceeding 1000V
- > Connecting leads and electric animal fence wires shall not cross above overhead power or communication lines.
- > Electric fences intended for deterring birds from roosting on buildings, no electric fence wire shall be connected to an earth electrode. A warning sign must be fitted to every point where a person or persons may gain access to the conductors.
- > Where an electric fence crosses a public pathway, a non-electrified gate must be incorporated into the electric fence at that point, or a crossing by means of stiles must be provided. At any such crossing, the adjacent electrified wires must carry warning signs.

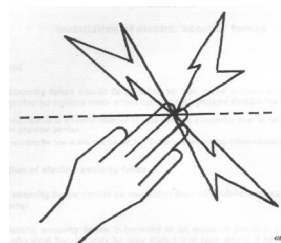


Figure BB1

- > Any part of an electric fence that is installed along a public road or pathway must 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 must be at least 100mm x 200mm.
- > The background colour of both sides of the warning sign is to be yellow.
- > The inscription on the sign is to be black and shall be either the symbol shown in figure BB1 of the Standard, or the substance of "CAUTION: Electric Fence".
- > The lettering on the sign must be indelible, be on both sides of the sign and in letters not less than 25mm in height.
- > Ensure at all times that mains operated ancillary equipment connected to the electric fence circuit provides a degree of isolation between the fence circuit and the mains

supply equivalent to that provided by the fence energiser.

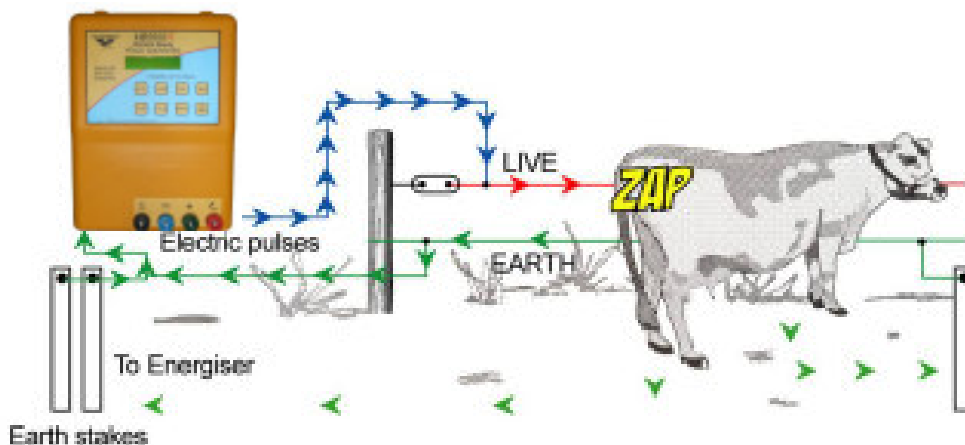
>Electric animal fences intended for deterring birds, household pet containment or training animals such as cows need only be supplied from low output energisers to obtain satisfactory and safe performance.

>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.

> **This energiser must be installed in accordance with the standard AS/NZS 3014:2003.**

How an Electric Fence Works

An electric fence energiser delivers a high voltage pulse, typically 8000 volts, every 1 - 2 seconds. The high voltage is required because most farm animals have a high resistance to electricity due to thick skins and fur or wool, as well as cloven hooves. Although the voltage is high, the pulse is very short, typically 20 - 300 microseconds



depending on the size of the energiser. This short pulse in itself will deliver a painful shock, but does not last long enough to stop bodily functions.

The diagram below shows a typical electric fence and how an animal receives a shock.

An animal needs to simultaneously touch both an electric fence live wire and an earth of some sort to receive a shock. The high voltage pulse must return to the energiser through the earth system before a shock is delivered. The ground is not always a good earth, as it needs moisture to be able to conduct electricity. Sandy or rocky areas are poor conductors of electricity. Therefore it is highly recommended that 1 or more earth return wires be installed.

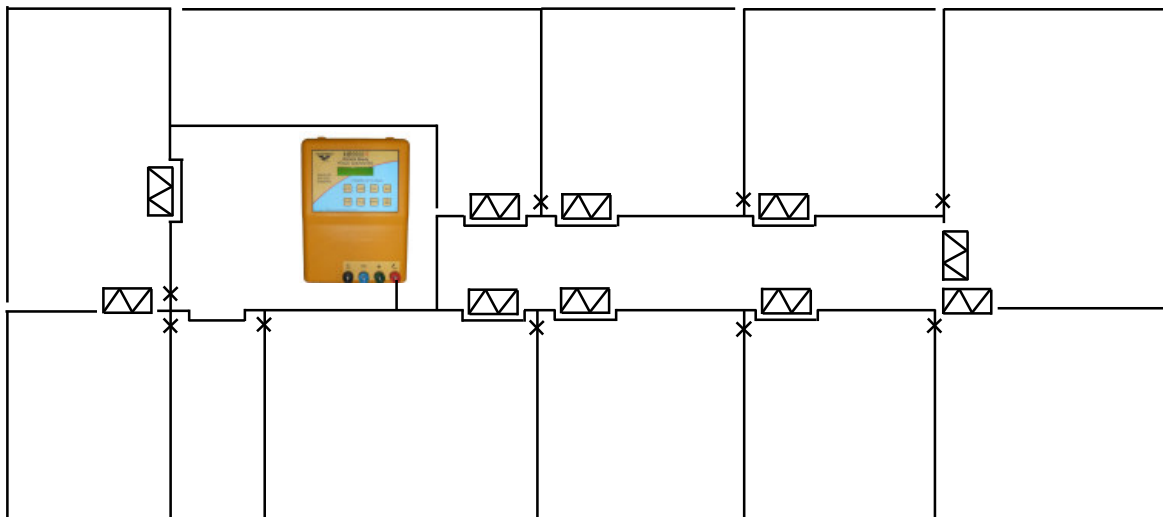
Installation

Fence Layout

Good planning will ensure a reliable electric fence system. There are a few things to keep in mind when designing your fence layout:

- > Have a main lead out feeder wire or wires that individual paddocks can be tapped off from.
- > The main feeder wires should not be run parallel within 100m of phone or communication lines, irrespective of above or below ground.
- > The electric fence wires should not run parallel and/or in close proximity to power lines.
- > Avoid making complete loops around paddocks. Terminate the wire with an end insulator close to the another live wire or gateway instead. This will make fault finding easier.
- > Install a cut out switch at every tap off from the main feeder line. This will also make fault finding easier.
- > Put underground cable in poly pipe when running the cable under the ground for protection. Never run live and earth wires in the same pipe.
- > No two separately powered electric fences can be closer than 2.5m apart. Ask your neighbour if you can power his side of the fence if they are close together. It won't cost you any more in electricity.
- > All joins should be done with joint clamps for reliability.

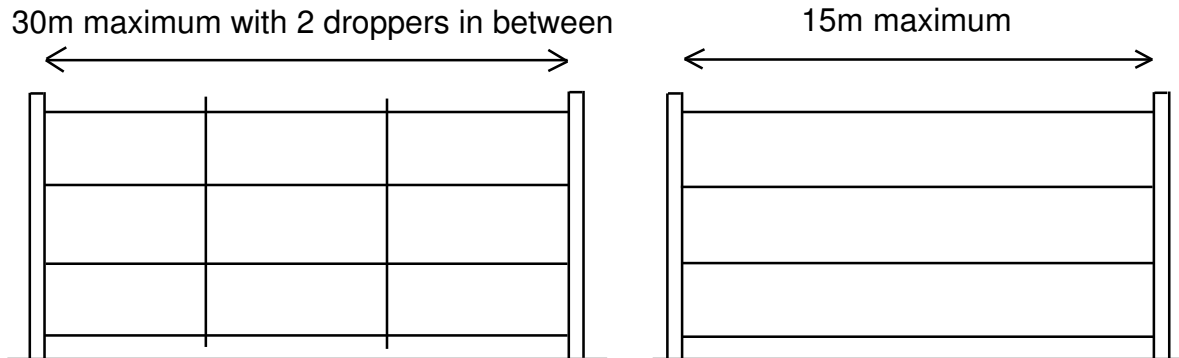
Below is a suggested basic fence layout.



X = cut out switch; underground cable under gates; end strain insulators and the ends

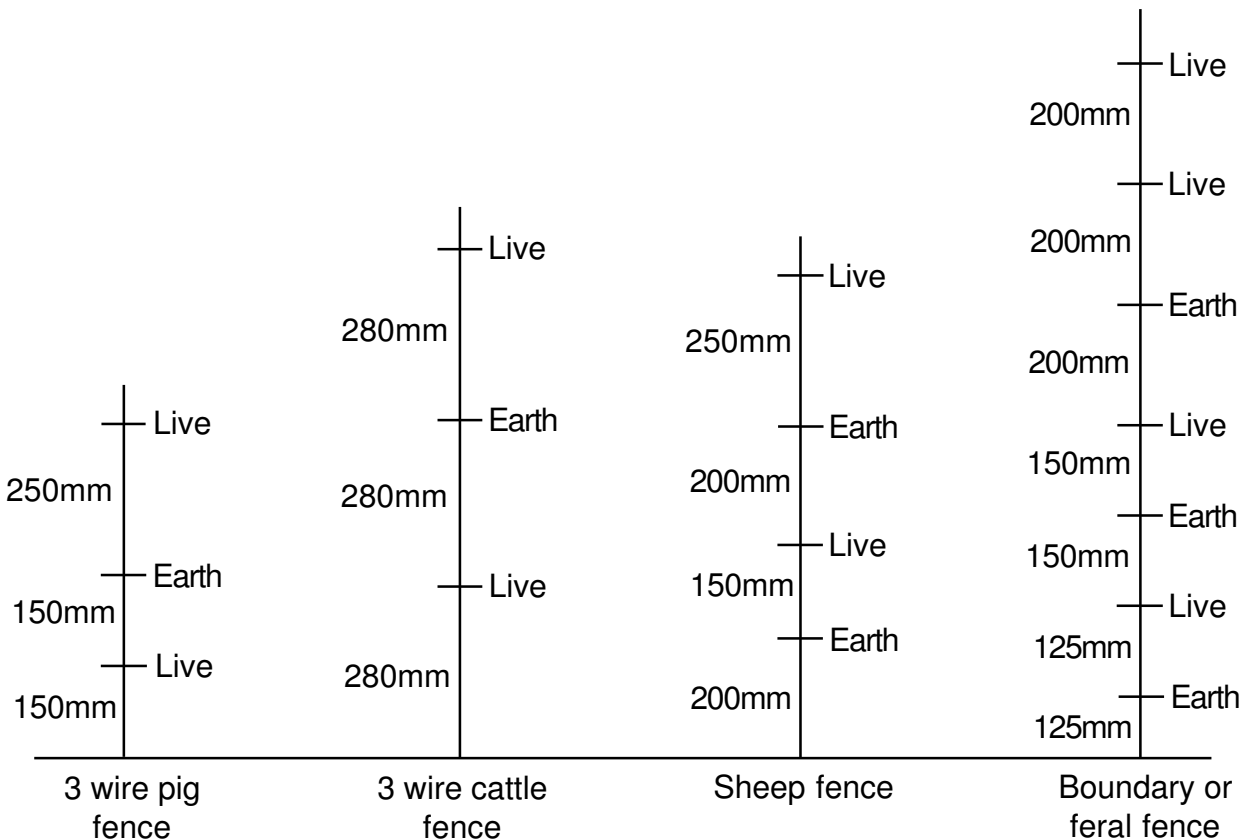
Fence Design

Post Spacing - Post spacings can be further apart for electric fences. Below are the maximum recommended spacing for flat land. Distances will need to be reduced depending on the terrain.



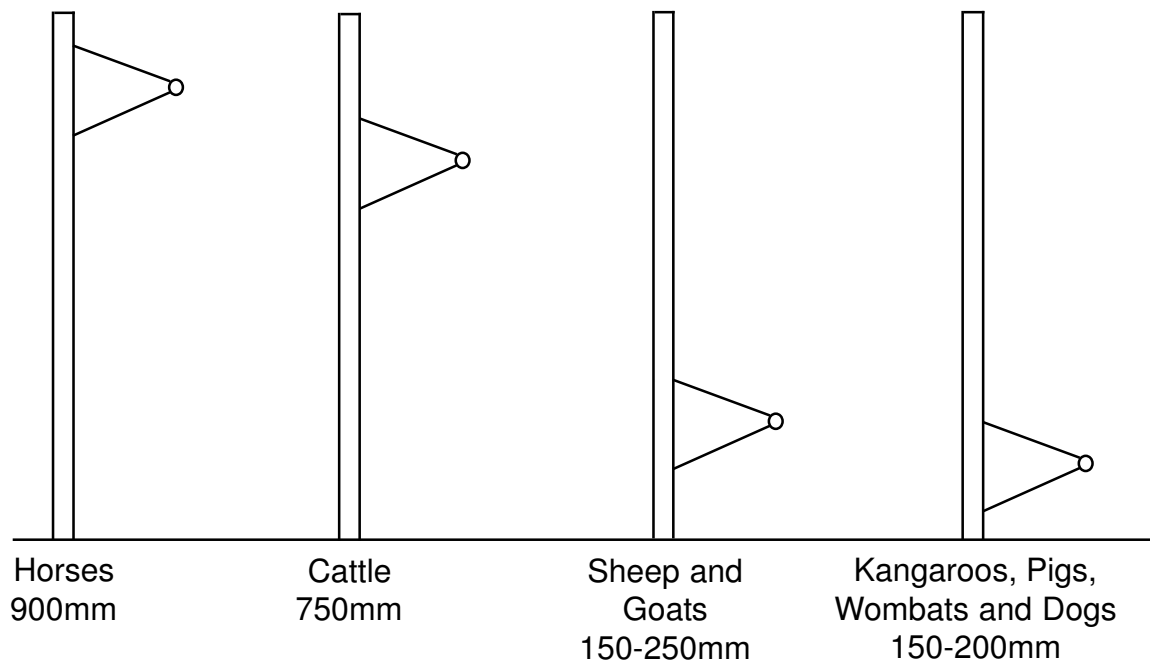
Steel and wood posts require insulators for the live wires. Although wood appears to be an insulator, it will conduct electricity when it is wet. There are a variety of insulators to choose from depending on the application.

Wire Spacing - Wire spacings vary depending on the animal to be contained and other conditions. Live and earth wire spacings closer than 200mm apart will affect the distance that the energiser is effective due to capacitance between the wires. Wires should be strained to around 90kg (200lb). Multiple live wires and earth wires should be linked together at the start and ends of the fence and at gateways. Below are recommended spacings for different animals.

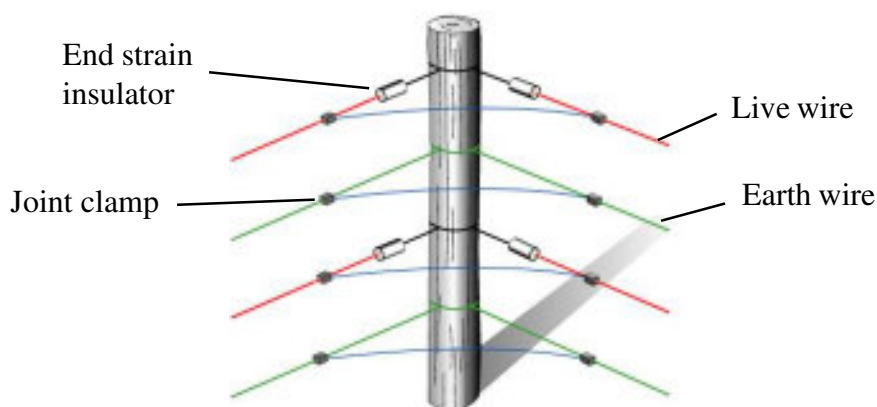


Wire Size - Generally 2.5mm or 3mm galvanised wire will work well in most situations. For large installations, the main feeder wire might need to be 4mm or 2 x 3mm wires in parallel over long distances. 1.6mm wire is OK for small areas, but can be difficult to see. Most poly wires and poly tapes are only suitable for short distances.

Upgrading Existing Fences - Offset insulators are used to attach electric fence live wires to existing fences. They will extend the fence life and reduce the damage to the fence due to stock. They can be installed on 1 or both sides of the fence. **All wires in the existing fence must be earthed.** Below are recommended offset heights.



Fence Corners - Live wires should not be touching wood posts, as the wood can conduct electricity to the ground in wet weather. Below is the recommended way of taking electric fence wires from one side of the paddock to the next.



Earthing

Good earthing is just as important, if not more important, as the live wire. The earth system must conduct the electricity back to the energiser in order for the animal to receive a shock. Things to keep in mind are:

- > Earth stakes must be driven at least 1.5m into the ground.
- > Only use galvanised or stainless steel earth stakes. Do not use copper or tar covered fence posts.
- > Electric fence earth stakes must be a minimum of 10m from any existing electrical or communication earthing.
- > Position earth stakes in a permanently moist area if possible.
- > Earth return wires in the fence are required for good earthing. Ground return earthing is only suitable for strip grazing with moist soil.
- > A minimum of 1 earth stake is required at the energiser for power levels below 1.5 joules, 2 earth stakes for power levels below 4 joules, and 3 earth stakes for power levels above 4 joules.
- > Additional earth stakes are required every 1.5km along a fence. Use wire joint clamps to connect the earth stakes to non-electrified wires and to any existing fences.
- > Use Thunderbird Super Earth Kits in dry soils such as sandy or rocky areas (bentonite type).

Lightning Diverter

It is highly recommended that a good quality lightning diverter be installed. This will help protect the energiser from lightning damage. The lightning diverter should ideally be placed between the lead out wire from the energiser and the fence.

Earthing is extremely important with the lightning diverter. The energy from the lightning strike will follow the path of least resistance into the ground, so the lightning diverter earth should be much better than the fence earth. This will direct the lightning's energy into this earth, rather than through the energiser and into the fence earth. The lightning diverter earth should be separated from the fence earth.

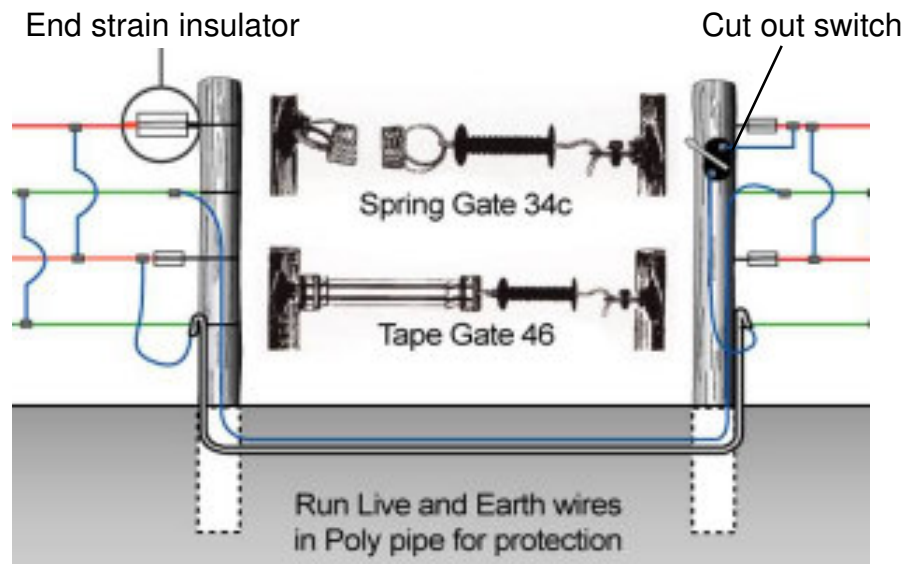
Up to 6 galvanized earth stakes should be placed a few metres apart, driven 1.5m into the ground, all electrically connected together, and then connected to the lightning diverter earth terminal. The lightning diverter should be connected between the energiser fence terminal lead out wire and the fence.

Gateways

Electric fence cables that need to cross a gateway can be buried underground. Use double insulated underground electric fence cable for both live and earth wires and run inside poly pipe for protection. The cables should be buried 300mm underneath the ground. Do not put both live and earth wires in the same pipe.

The ends of the poly pipe should be bent over to face the ground so that rain doesn't fill the pipe. It is highly recommended that a cut out switch be used in the live wire supply side entering the pipe so that it is easier to locate a fault should a short occur under the ground.

Below shows a typical gateway installation.



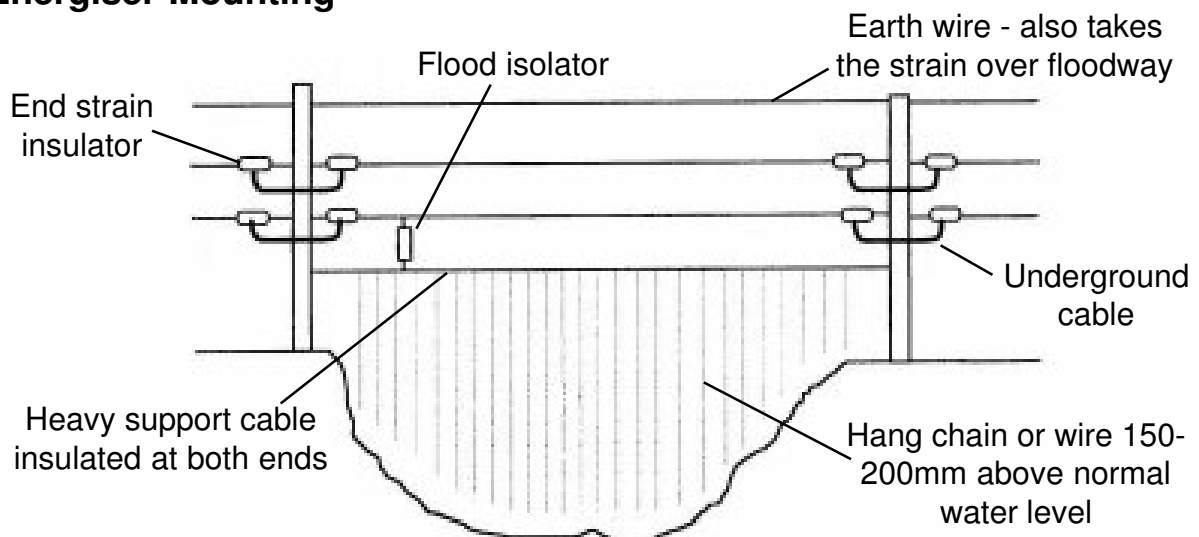
Signs

Electric fence warning signs must be placed at regular intervals along electric fences where there is a possibility of the general public coming into contact with the fence. This is an Australian Standard requirement. Such situations are where the fence runs parallel with or crosses over a public road, or where the fence comes in proximity to a public pathway. A warning sign must be placed both sides of the road where an electric fence crosses the road.

Floodways

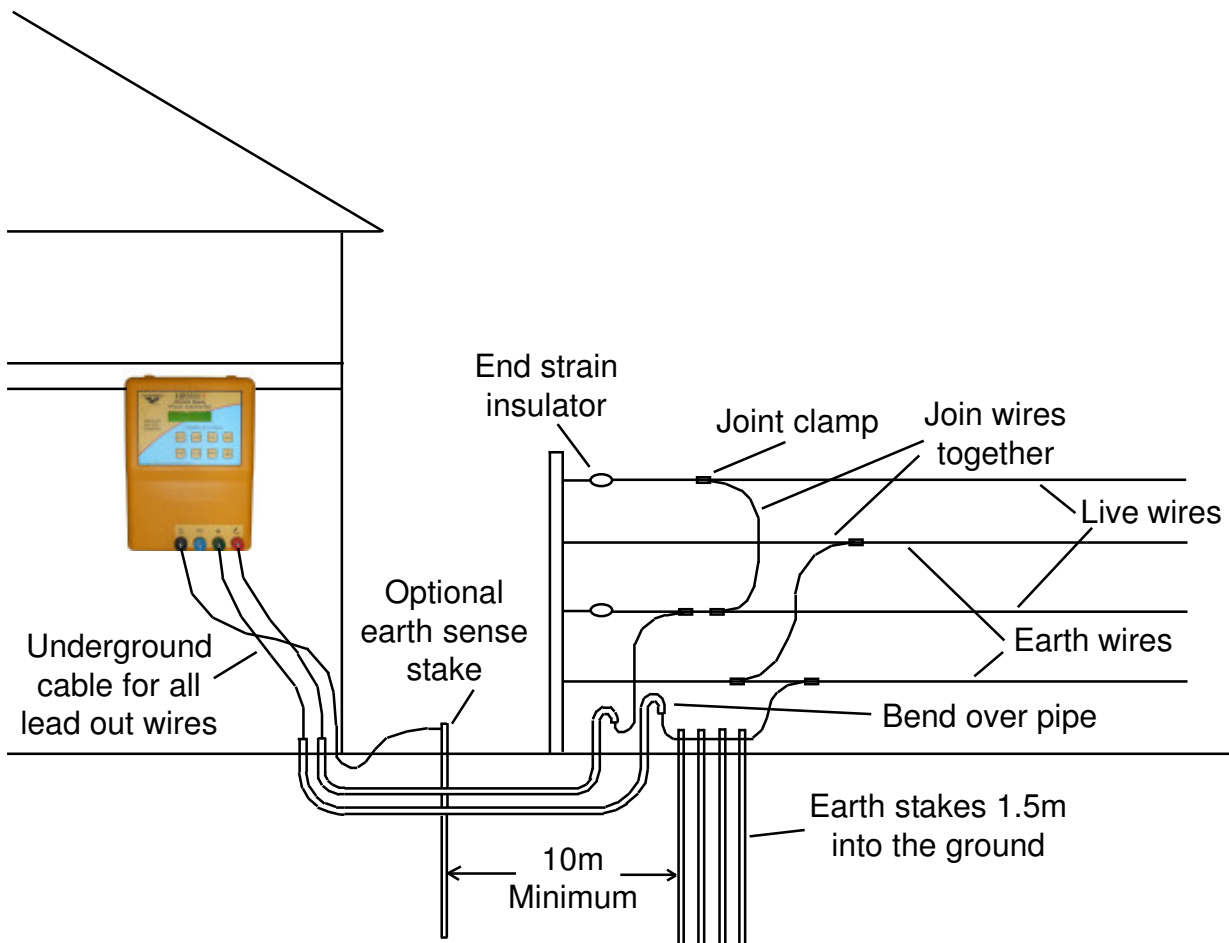
All floodways should utilise a flood isolator. This will prevent high water levels from shorting out the entire fence. Below is one way of installing an electric fence over a floodway:

Energiser Mounting



- > Mains energisers and mains/battery energisers powered from the mains must be installed under cover and out of the weather, such as in a shed.
- > Solar panels must face the equator and be in a position where shade cannot block the sun from the solar panel.
- > All energisers must be mounted up out of the reach of children.
- > Do not allow any energiser to operate by sitting it on the ground.
- > Use double insulated electric fence underground cable to connect from the terminals of the energiser to the fence live wire and earth stakes.
- > Run the underground cable inside poly pipe for protection where it has to exit out of a building.

The diagram below illustrates a typical energiser mounted in a shed. Note that all earth wires in the fence and all live wires in the fence are joined together.



Operating Instructions

Important! Read the warnings, regulations and installation instructions earlier in this manual before installing and operating this energiser.

This energiser is supplied with both a 3 pin 240V lead for connection to the mains, as well as a battery lead for connection to a 12V battery. Always operate the energiser under cover.

This energiser is packed with numerous features to enable you to tailor the unit to suit your needs. The features are explained as follows:

16 Character x 2 Line Display - The display indicates the condition of the fence as viewed by the energiser. Fence voltage, current, stored joules and earth voltage are displayed while the unit is running. Set up menus, error messages and other information are easily read in plain english. A backlight aids viewing the information, but turns off after a few seconds to conserve the battery if operating from one.

Intelligent Adaptive Control - This feature allows the energiser to be more efficient in its use of energy from the power source, and yet deliver maximum voltage when the fence becomes heavily loaded. As much as 50% power saving can be achieved by maintaining a well insulated fence that is free from excessive loads.

Remote Ready - This energiser can be turned from standby to on or vice versa from any point along the fence by means of an optional remote control. Refer to the remote control section later in these instructions.

Alarm and Siren Outputs - Early warning of a problem with the fence can be achieved by plugging in an optional strobe or siren/strobe. The siren and strobe will be activated if the fence voltage falls below the set alarm level. An alarm will also be indicated if the earth voltage is too high. The siren will automatically turn off after 5 minutes to comply with noise laws, but the strobe will continue to flash until the alarm is acknowledged. Never connect a siren to the strobe output, as this will violate noise laws.

Adjustable Output Voltage - This feature allows the output power to be turned down for animals such as horses that are sensitive to high power energiser pulses, but full power can be restored for other animals. Reducing the output voltage helps conserve power consumption as well. There are 3 power levels to select from, LOW, MEDIUM and HIGH. To change, press the "LEVEL" key, confirm that you want to change by pressing "YES", use the up and down arrow keys to select one of three power levels, then press "ENTER". Pulsing will cease while the change is being made. The energiser will abandon this change if there is a delay of more than 10 seconds between key presses. The remote control won't work while this procedure is taking place.

Adjustable Pulse Period - This feature also allows you to reduce the power consumption by slowing down the pulse rate when a rapid pulse is not required. To change, press the "RATE" key, confirm that you want to change by pressing "YES", use the up and down arrow keys to select between 1.2 and 2.4 seconds, then press "ENTER". Pulsing will cease while the change is being made. The energiser will abandon this change if there is a delay of more than 10 seconds between key presses. The remote control won't work while this procedure is taking place.

Adjustable Alarm Level - The alarm level is the fence voltage below which an alarm will be indicated, as well as triggered the siren and strobe outputs. The internal buzzer will also beep below this level. Pressing the “ENTER” key will reset the alarm. To change, press the “ALARM” key, confirm that you want to change by pressing “YES”, use the up and down arrow keys to select between 5.0 and 8.5kV, then press “ENTER”. Pulsing will cease while the change is being made. The energiser will abandon this change if there is a delay of more than 10 seconds between key presses. The remote control won't work while the alarm is being adjusted.

Earth Sensing - The energiser has an extra terminal for sensing the earth condition. A good earth is vital for the fence to work properly, so sensing whether the earth is satisfactory makes good sense. The energiser measures the voltage between the ground via a separate earth stake and the earth terminal on the energiser. A bad earth will not allow the animal to receive a decent shock if it touches the fence. Refer to “Earthing” in the Installation section.

If the earth voltage rises above 1kV for more than 10 consecutive pulses, a warning will be displayed. If the earth voltage rises above 3kV for more than 10 consecutive pulses, an alarm will be displayed, the internal buzzer will beep continuously, and the strobe and siren outputs will be activated. The earth voltage will only rise above 3kV if the earth lead has become detached from the earth stake or the energiser. This alarm can be reset, but will occur again after 10 pulses if the problem is not fixed.

It is not mandatory that the earth sense terminal be used. Simply leave it disconnected and ignore any displayed earth voltage if you don't want to use this feature. The diagram on page 11 shows how to implement earth sensing.

The earth sense stake must be a minimum of 10m from other fence earths.

Fence Feedback - There is an extra terminal on the energiser labelled “Fence Return”. This terminal may be connected to the end of the fence, or a critical part of the fence, and is used to check that the energiser pulse is reaching the end of the fence.

This feature may be enabled as one of the menu selections. To enable the fence return sensing, press the “MENU” key twice, then select whether you want to enable it. The threshold voltage for an alarm is then to be set between 5.0kV and 8.5kV using the up and down arrow keys. Press the “ENTER” key to exit the fence feedback sequence.

Once enabled, the energiser will display an alarm and activate the strobe and siren outputs if the voltage on the fence feedback voltage falls below the set threshold level.

Real Time Clock - This energiser has a clock facility that may be set if desired. The advantages of setting the clock is that you will know when a problem or an alarm has occurred, and a more extensive alarm history may be viewed. Up to 16 previous alarms will be stored for later viewing if the clock has been set, but only the last alarm may be viewed if the clock has not been set.

A disadvantage is that the clock doesn't have battery backup, so if there is a power failure the time setting will be lost. This won't affect the storage of the alarms, but the clock will have to be set again to view the previous alarms.

Press the “MENU” key once, and press “YES” to set the clock. Follow the screen

prompts and use the up and down arrows to set the date and time.

Alarm History - The energiser will store the previous alarm data if the clock has not been set, but will store the data of up to the last 16 alarms if the clock has been set. This is useful if you only periodically check the fence, or if you want to find a reason why an alarm occurred. It is also useful for an overseer to check on what has been happening to the fence system.

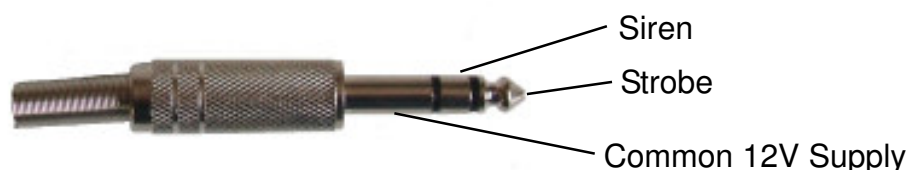
To view the alarm history, press the “MENU” key 3 times, then press “YES” to see the alarm(s). The alarms are viewed in date order, and there is 2 screens of data for each alarm. Press “ENTER” to exit this function.

Mounting and Connections

The energiser must be mounted in a vertical position under cover, such as in a shed. Use underground cable to connect the energiser to the fence and to the earth stakes. If using a solar system or stand alone battery in the field, make sure that the energiser is mounted vertically and under cover so that the connections are at the bottom of the energiser. This will prevent rain or dew from entering the case. **DO NOT** leave the energiser laying on the ground.

Fence Connections - Connect the fence live wire to the “FENCE” terminal, the earth stakes and earth return wire to the “EARTH” terminal, and the earth sense stake to the “EARTH SENSE” terminal if earth sensing is required. Connect the end of the fence to the fence return terminal if this feature is to be used. Make sure all terminals are screwed tightly onto the wires. Refer to the Installation section for the rest of the fence construction.

Strobe and Siren Connection - There is a 6.5mm stereo socket available on the bottom of the enclosure. This is for connecting a strobe and/or siren as an external alarm indication. The strobe supplied by Thunderbird has a plug suited to this socket. **DO NOT apply an external 12V to the strobe or siren!** The energiser powers the strobe and siren outputs itself from the 12V source. Below is the connection diagram. A maximum of 500mA may be drawn from each connection to power the strobe and siren.



Power Supply - Two sockets are provided on the bottom of the energiser for connecting to mains power or a 12V battery. A battery lead with clips is provided to connect to a 12V battery. **Keep the battery lead as short as possible if you are using a 12V battery.** Long battery leads can have a significant voltage drop, which reduces the voltage reaching the energiser and affect its performance. The battery connection may be used as a backup in case the mains power fails. The energiser will provide approximately 200mA to trickle charge the battery whilst operating from mains power.

Battery and Solar Panel Selection - For solar use or stand alone battery use, the minimum recommended sizes are:

MB2750R - 12V 500 amp hour deep cycle or solar rated battery system
MB5600R - 12V 1000 amp hour deep cycle or solar rated battery system

These battery sizes will give a maximum of approximately 10 days running time without any charge. Repeatedly discharging a lead-acid battery by more than 40-50% will severely shorten its life.

The minimum recommended sizes of solar panels are as follows:

MB2750R - 12V 240W solar panel system
MB5600R - 12V 480W solar panel system

These panels require a solar regulator. The regulator for the 240W system should be rated at 30A, and 50A for the 480W system. The output of the regulator should be connected directly to the battery.

Ensure that the solar panel is facing the equator, and that it can receive full sun throughout the day. The solar panel should be angled at approximately 10 degrees more than your latitude for maximum effect during winter.

Energiser Operation

There are 2 operating modes that the energiser can be in. They are standby, where there are no pulses but it listens for any remote command; and on. The 2 modes can be selected by the keypad or by an optional remote control.

Warning beeps are given when the unit is about to turn on. This is a safety feature that, for example, warns someone near the energiser that it's about to turn on by a remote command.

The fence condition is constantly monitored. If the output voltage falls below the selected alarm voltage for more than 10 consecutive pulses, a low fence alarm will be displayed, the internal buzzer will beep continuously, and the strobe and siren outputs will be activated. This alarm can be reset and will not occur again within 24 hours of being reset.

This energiser operates at a minimum power level to maintain a good fence voltage. The display will show the stored joules, which is an indication of the load on the fence terminals. If a brief short or heavy load lasting less than 16 pulses occurs, the energiser will ignore any power level increase regardless of the fence voltage. If the heavy load lasts more than 16 pulses, the energiser will increase its power output accordingly. If the load is removed, the energiser immediately reduces its power output. This is a safety feature that will help protect the stock if they are caught in the fence for a brief period.

A heavy fence load warning will be displayed if the fence current is higher than a preset level. This warning won't trigger an alarm, but is a reminder that something is wrong with the fence.

Monitoring Fence Condition - The energiser display can indicate the condition of the fence. If the fence is OK, the volts should be high (around 8-9kV), and the amps should be low (3 - 15A, depending on the length of the fence). The stored joules should also

15.

be less than the rated level. You should take note of the displayed values when the fence is in good condition.

If a short or heavy load appears on the fence, the volts may decrease and the amps and stored joules will increase. How much they change will depend on the severity of the load, the number of kilometres of fence connected, and the distance between the energiser and the short. The pulse rate of the energiser may slow briefly as it increases the output energy to maintain the fence voltage.

Battery Monitoring - The battery voltage is monitored while in operation if 240V is not connected. If the battery voltage falls below approximately 12.0V, a low battery warning will be displayed, the energiser output will be reduced, and the pulsing will slow down. If the battery falls below about 11.2V, the energiser will stop pulsing and a warning will be displayed. These measures are to protect your battery. The energiser may fail to function or turn on if the battery voltage is less than 8V. If this is the case, charge the battery before using it on the energiser.

Self Diagnosis - The energiser is also constantly monitoring itself in case a problem occurs internally. Should it detect a problem, the cause will be shown on the display. The unit should be returned to Thunderbird for repair if any unusual error is displayed.

One internal problem is a high temperature warning. This may occur on a hot day if the sun is shining onto the energiser and there is inadequate ventilation. The energiser will reduce its output and slow down the pulse rate until it has cooled sufficiently, and then will resume normal operation.

Specifications

Mains Input -	100-240Vac, 47-63Hz
Mains Input Power* -	MB2750R - 33W maximum MB5600R - 60W maximum
Battery Voltage -	11.8 - 16Vdc
Supply Current*-	Standby - 20-25mA MB2750R - 1 - 4.0A MB5600R - 1.8 - 6.6A
Output Voltage -	MB2750R - 8.9kV no load 7.6kV into 100 ohms resistive load MB5600R - 9.0kV no load 8.4kV into 100 ohms resistive load
Stored Energy	MB2750R - 27.8 joules maximum MB5600R - 55.3 joules maximum
Maximum Output -	MB2750R - 17.6J into 100 ohms resistive load MB5600R - 37.3J into 60 ohms resistive load
Strobe Output -	15Vdc, 500mA maximum
Siren Output -	15Vdc, 500mA maximum
Temperature -	-10 - 50 degrees celcius
Humidity -	0 - 90% non condensing

*Supply power and current varies with fence load

Remote Control

The MB2750R and MB5600R can be controlled by an optional Thunderbird remote control. The remote control allows you to turn the pulsing on and off anywhere along the fence line.

The remote control can be security coded if desired. All remote controls leaving the factory have the same security code, and all energisers that haven't had a security code change will receive the remote signal. However the code may be changed.

The remote control has a built in voltmeter, so that you can also monitor the fence voltage. The display shows the fence voltage in kV, or kilovolts.

Operation - Connect the remote to the fence by clipping the earth lead to an earthed wire in the fence first, then place the metal clip on the back of the remote onto the live wire.

Warning - The earth wire must be connected first, otherwise you might receive a shock from the fence.

To turn the energiser on or off, hold the remote either the ON or OFF button down respectively for a minimum of 2.5 seconds, or until the transmit light blinks. The reason for the delay is that the remote listens for more than the maximum pulse period time to make sure that the energiser is not already pulsing. If it is, a signal is sent immediately after the pulse.

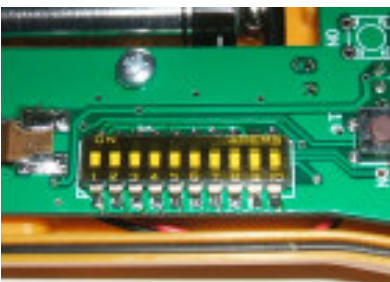
Briefly pressing and releasing a button on the remote will power the remote. This will cause the the fence voltage to be displayed and pulse segment to flash at every fence pulse while it's connected to the fence. From this you can ascertain the fence condition and whether the energiser is working.

The fence voltage won't be displayed if the energiser is turned off or the fence is shorted between where to are standing and the energiser.

The remote control will turn itself off after a few seconds if no button is pressed or no fence voltage is detected.

The display will show "loP" if the battery has become flat. Replace the battery if this occurs.

Security Coding - There are 1024 different security combinations. The remote control has a 10 position DIL switch inside to set the security code. The switch is shown at left. You may set the switches to any code you decide on, but the energiser must be set to the same code.



To set the code in the energiser, follow the procedure below:

1. Disconnect the power from the energiser
2. Hold down the ENTER button and apply the power.

Keep holding the ENTER button down until the display reads "Change remote device ID?". Release the ENTER button and press YES.

3. Starting from position 1 on the remote DIP switch, use the up and down arrows to set the first position (1 is on, 0 is off). Press ENTER.

4. Repeat step 3 until all 10 positions of the DIP switch are entered, then exit this mode.

Multiple remote controls may be used on the energiser, but each remote must have the switches in the same position.

Interference - A signal will also be sent immediately after any induced pulse from a neighbouring electric fence. These induced pulses can cause 2 transmissions from the remote in one pulse period, which can cause problems with communication. Induced pulses are most commonly caused by 2 electric fences powered by different energisers running next to each other for some distance. A solution is to fit a resistive load to the fence near the source of the problem to eliminate these induced pulses.

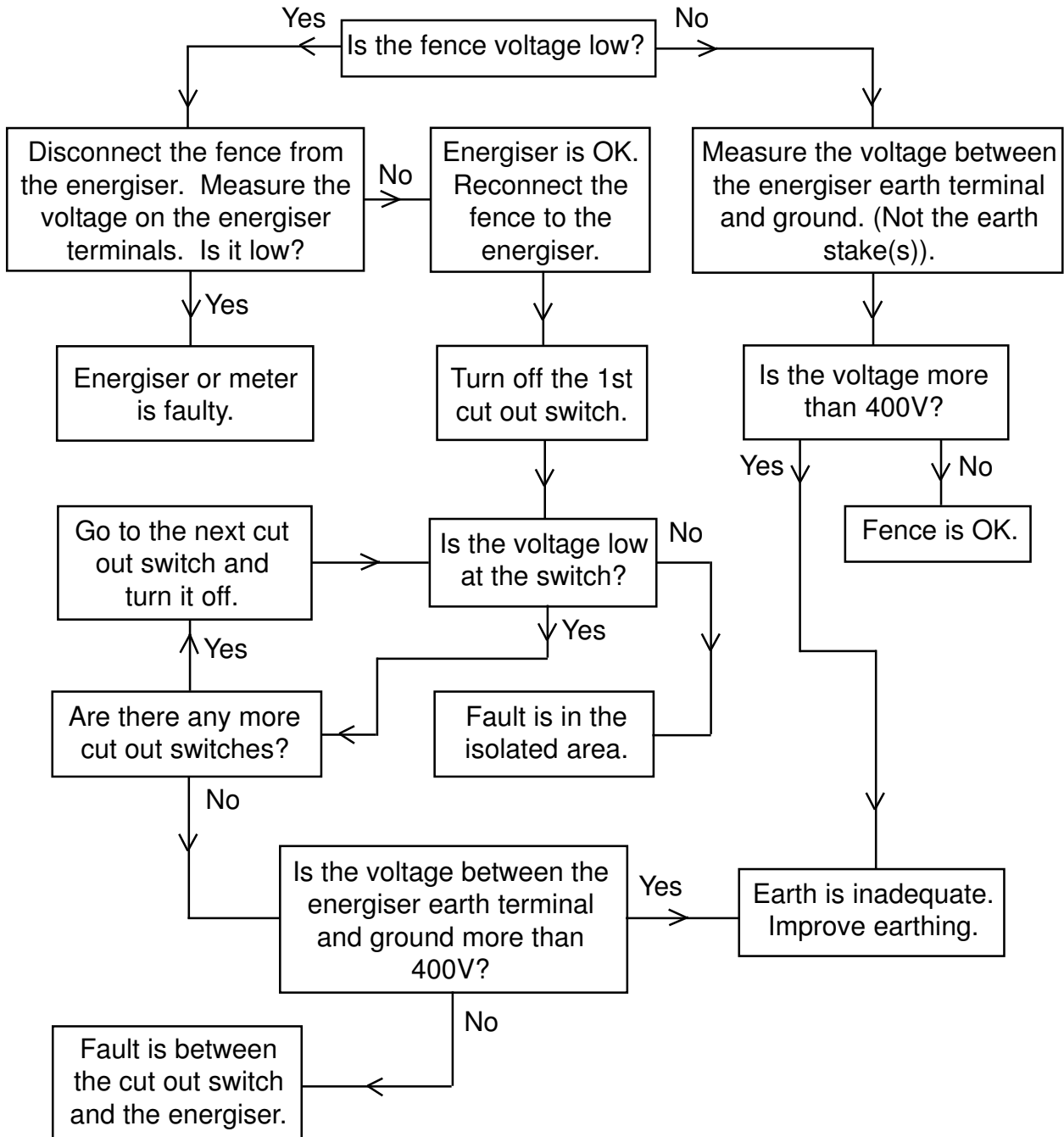
Battery - The remote uses a 9V battery. It must be an alkaline type battery for the energiser to operate, because the remote draws a large amount of current for a very brief period. A normal carbon-zinc battery cannot supply the required current. A good quality alkaline battery should last for 150 - 200 activations.

Trouble Shooting

Fence Voltage - It is highly recommended that you have an electric fence digital voltmeter or fault locator when trying to find problems with an electric fence. Having one of

these will make the job easier and save time. Below is a fault tree to follow if there is a problem with the fence:

TV or Radio Interference - Interference to TV or radio from an electric fence is always caused by an arc or spark somewhere along the fence. It can be on the high voltage section or can be caused by a poor earth contact. It can be a tedious process to find the problem. Common causes are loose connections, live wire close to an earth, or insulator breaking down. All energisers are designed not to cause interference. Some



tips are:

1. Check that all connections along the fence, including those on the energiser, are tight.
2. Go along the fence and check that there are no wires close together.
3. If all looks OK, take a radio tuned to a weak AM station, and go along the fence. Loudest interference will indicate that the problem is nearby.
4. Failing that, go along the fence and look carefully on a dark, moonless night. It is possible to see a faint bluish or purplish glow where the spark is occurring. Don't forget to check earth points as well.

Remote Control - The fence must be well constructed, with all wire joins to be done with joint clamps in order for the remote control to work effectively. If the remote control doesn't work, check the following:

1. Check that the security codes match.
2. Make sure that the earth clip is connected to the fence earth.
3. Make sure that the energiser is either in standby or running.
4. Check that the fence and joins to the energiser are OK.
5. Check that the section of fence you are standing at is not isolated by a cut out switch.
6. Move at least 100m towards the energiser from a short.
7. Replace the battery. The battery **must** be an alkaline type.

Phone or Internet Interference - There are 2 main causes of interference onto phone lines. One is the same as TV interference, refer to that section above. The other is induced voltage into the phone line.

Induced voltage occurs when there is a relatively long section of fence that is conducting a lot of current and running close to and in parallel with an underground or above ground phone line. Reducing the current in the electric fence will solve this. Here's how:

1. The main fence feeder wire for the property must be at least 100m from any underground or above ground phone line.
2. Make sure any fence earth is more than 10m from any phone earth.
3. Check for shorts or heavy loads on the fence.
4. If an electric fence must run close to a phone line, place an end strain insulator in the middle of the fence section running close to the phone line, and feed the fence voltage from both ends of that section of fence. This will limit the current flow in the fence.

WARRANTY THUNDERBIRD

Electric Fence Systems

Thunderbird warrant all electric fence systems against defective workmanship and faulty materials for 2 years, **plus** a warranty for 6 months against lightning damage, from the date of purchase. We undertake, at our option, to replace or repair free of charge each product, or part thereof, on condition that it is returned to our factory or authorised agent freight prepaid, and found on examination to be suffering from material or constructional defect. We cannot be held responsible for any repair other than those carried out by us or our authorised agents.

A photocopy of your proof of purchase and a request for warranty must also be returned with the item.

This warranty is void if the product is subject to improper use or handling, incorrect power input voltage, damage through contact with chemicals, flooding, fire, explosion, excessive heat, lightning strikes outside the lightning warranty period, insect damage, moisture damage or damage to external wiring.

For your records:

Model No.:

Serial No.:

Date of Purchase:

Place of Purchase:

Receipt No.:

To register for warranty, please email the model number, serial number and date of purchase to sales@thunderbird.net.au

Country Electronics Pty Ltd
ABN 38 003 806 040

11 Industrial Avenue
Mudgee NSW 2850
Australia

Phone:02 63723600
Web: www.thunderbird.net.au
Email: sales@thunderbird.net.au