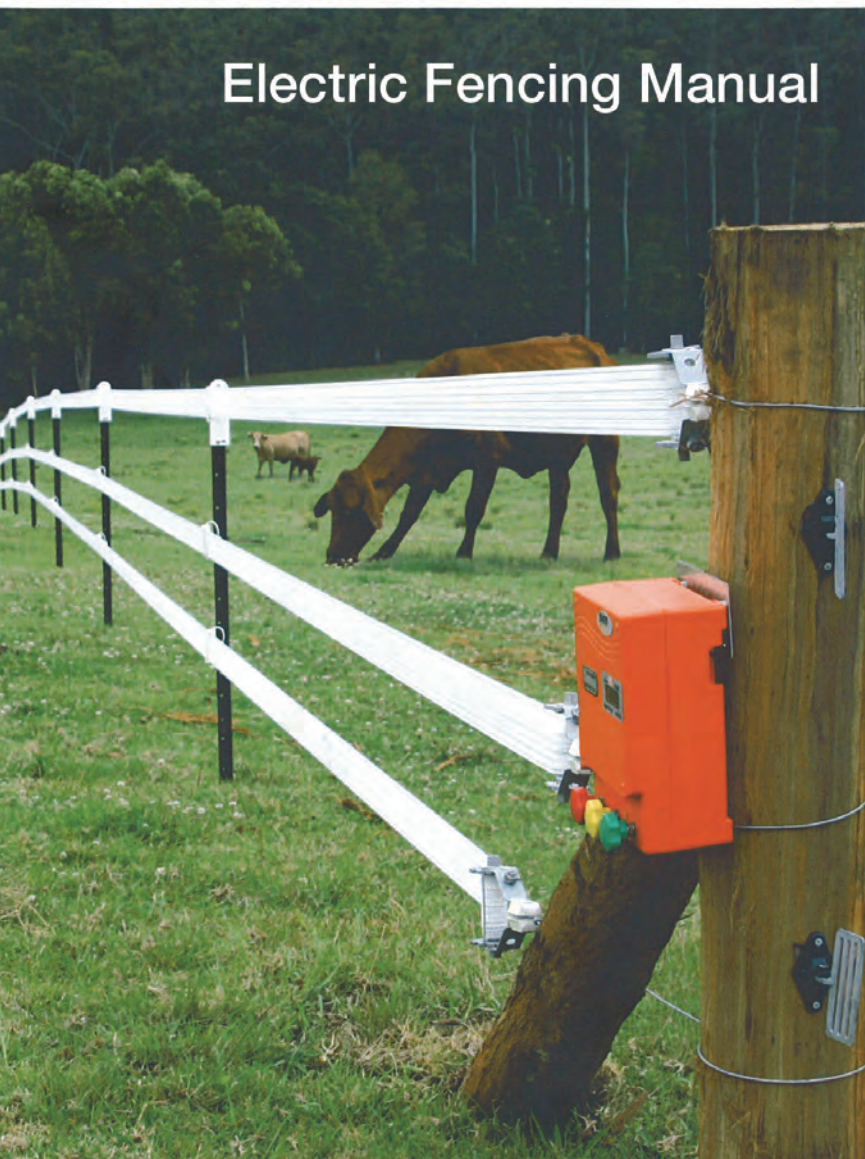


# Daken

## Electric Fencing Manual



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## WARNING

Before operating your electric fence energiser, you must read the SAFETY and INSTALLATION sections of this manual.

Do not let children operate or play with an electric fence energiser.

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# Introduction

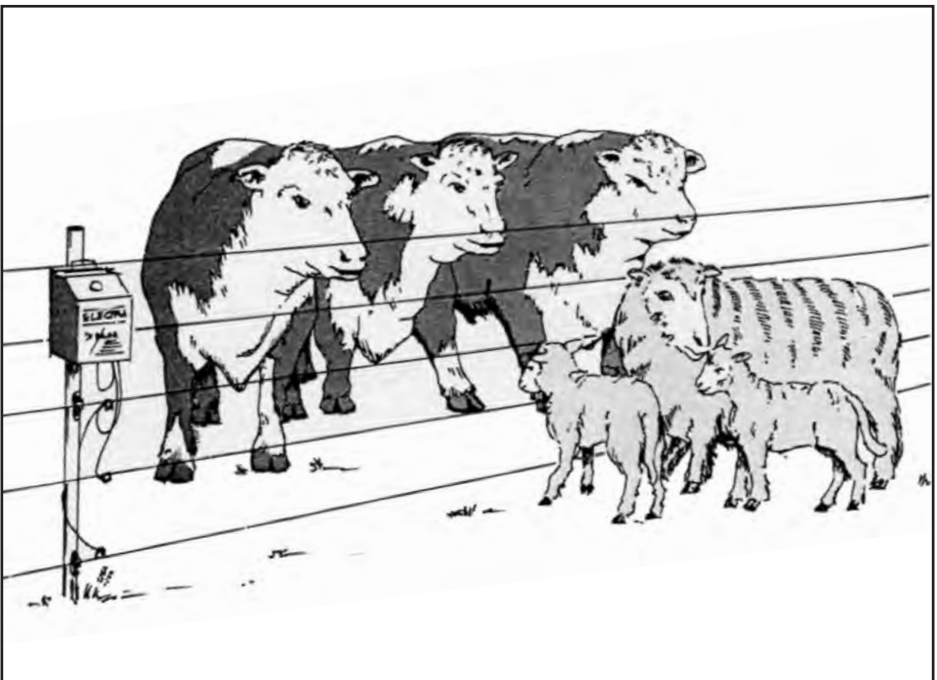
**ELECTRIC FENCING** is now an accepted part of farming operations throughout the world. Modern high reliability electronics coupled with advanced plastics materials in insulators and specialised electric fence wires have seen electric fencing evolve into the superior fencing system.

Using electric fences, it is possible to construct fences which are highly effective in restraining stock and at the same time use less time and materials in their erection.

As the fencing requirements of farms vary depending on the local conditions of soil type, rainfall and vegetation, it is not possible to specify any one design of fence which will work in all situations.

In practice, the results you will achieve using an electric fence will depend upon your own ability to assess what is required in the light of experience.

The aim of this book is to present you with the basic concepts of electric fencing, and to provide you with the information to enable you to develop an effective electric fencing system to suit your needs.



# Advantages of Electric Fencing

ELECTRIC FENCING is an alternative method of fencing which offers you the following benefits:

## **1. LOW COST**

An electric fence can perform the same task as a conventional fence using much less material.

## **2. EASY TO BUILD**

Lower wire strains and generally lighter construction make much quicker and easier construction, especially in difficult terrain.

## **3. EXTENDED LIFE**

Electric fences are not subjected to the same physical pressure from animals, and can therefore be expected to have a greatly extended service life. The life of old fences can be considerably extended using electric fencing.

## **4. UNIVERSAL APPLICATION**

Electric fencing will contain all types of animals and is positive deterrent to wild pigs and kangaroos. Educated stock develop greater respect for electric fencing than for any other type of fence.

## **5. FLEXIBILITY**

There is no quicker or easier way to effectively subdivide a paddock for controlled grazing than with an electric fence.

## **6. LOW MAINTENANCE**

Once your fence is properly installed and your stock are trained, the maintenance requirements of electric fencing are little different from conventional fences.

## **7. LESS STOCK DAMAGE**

The shock from your electric fence causes no physical damage. If your stock is forced through the fence by bushfires or dogs, they are at less risk than with a conventional fence.

# How An Electric Fence Works

An ELECTRIC FENCE works by “educating” your animals so that they learn to associate touching the fence with receiving an unpleasant shock. This is the same principle as barbed wire, but it presents a much more powerful deterrent with very little danger of physical damage to your stock.

Electric fences are used to successfully control many kinds of animals, both domestic and feral.

The source of the shock is an electric fence **energiser**. The energiser provides regular pulses of electricity to your fence. These intermittent high voltage pulses flow from the energiser, along connection cable to the fence, and then along the length of the fence. The “live” wires of your fence should not come into contact with fence posts or corner posts, and this achieved by the use of insulators.

When an animal comes into contact with the fence, it becomes part of an **electric circuit** between the output terminals of your energiser. The strength of the shock the animal receives depends upon the power available from the energiser, and the total resistance of the circuit.

The total resistance of the circuit includes:

1. The resistance of the live fence wire leading from the energiser to the animal.
2. The resistance of the animal itself.
3. The resistance between the animal and the earth.
4. The resistance between the earth and the earth terminal of the energiser.

The general principles of electric fencing can be explained by examining the three basic electric fence systems:

1. Earth Return System
2. Fence Return System
3. Bi-Polar Fencing System

# Earth Return System

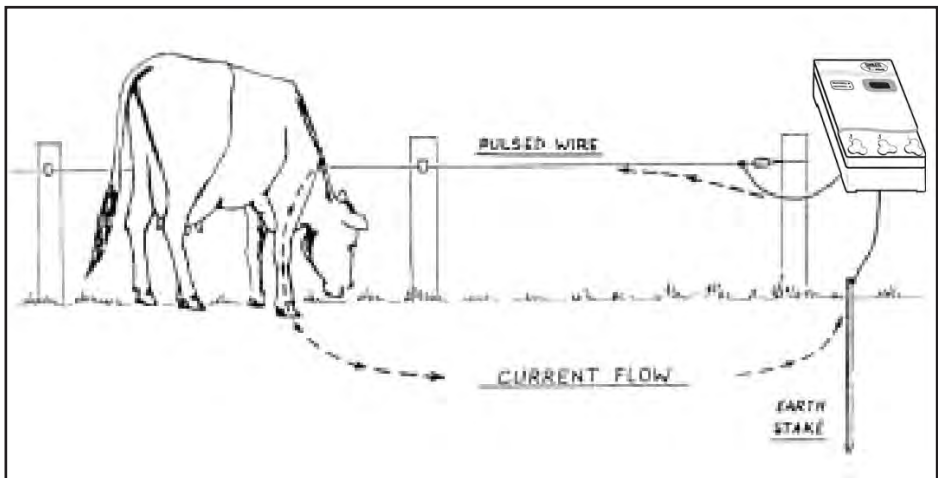
The earth return system uses one or more fence wires to deliver the pulse from the energiser.

To complete the circuit, current must flow through the animal and back to the energiser by way of the earth.

This system therefore relies on the animal making good electrical contact with the ground, and the ground being sufficiently moist to provide a low resistance circuit back to the energiser's earth terminal.

These conditions usually apply in high rainfall coastal areas and on irrigated pastures. Generally, earth return systems are not as effective during the summer, or on long runs of permanent fencing in natural pasture areas.

Earth return is commonly used for strip grazing.





# Fence Return System

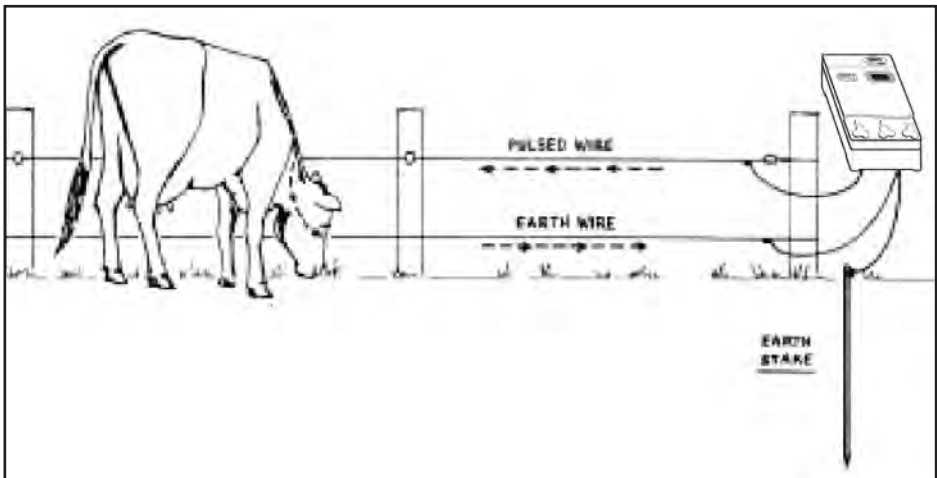
In order to overcome the shortfalls of the earth return system, a fence return system may be used.

This system uses both pulsed and earth wires in the fence. Therefore, the fence construction involves the use of two or more wires. To complete the circuit, current can flow through the animal from the pulsed wire to the earthed wire and back to the energiser.

If the ground is sufficiently moist for the earth return to work, then the animal will receive a shock by touching only the pulsed wire. If however the earth return is not working, then the animal will receive a shock when it pushes far enough through the fence to contact two adjacent wires – one pulsed and the other earthed.

The animal will not receive a shock if it touches only the earthed wire.

Fence return systems are widely used for all types of temporary and permanent fencing.



# Bi-Polar Fencing System

**Bi-Polar Fencing** is an electric fencing system pioneered by DAKENAG, designed specifically for Australian requirements. The Bi-Polar System has a number of advantages over the conventional earth or fence return systems that, in certain circumstances, can be of great benefit. Bi-Polar Fencing is now widely used throughout Australia with great success.

To operate a Bi-Polar Fencing System you require a **DAKENAG Bi-Polar Energiser**. A Bi-Polar Energiser is capable of sending out two powerful simultaneous pulses of energy. One pulse is negative in respect to earth, the other pulse being **positive** in respect to earth.

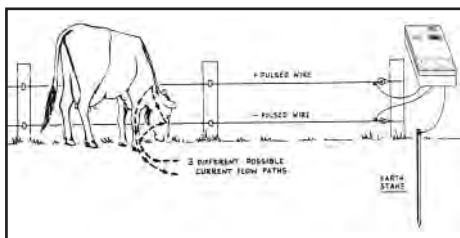
The Bi-Polar Energiser is connected to your fence by connecting the "positive" terminal on your energiser, to one set of fence wires and the "negative" terminal, to the other set of wires. For maximum benefit, it is recommended that each successive wire should be of the opposite polarity.

Both the positively and negatively charged wires require insulation.

When an animal touches only a positively charged wire, the animal receives a shock through the earth return system. Similarly when the animal touches only a negatively charged wire, the animal will again receive a shock through the earth return system.

If the animal touches both the positively and negatively charged wires, it will receive a double strength shock. In this case, the circuit is completed in two ways:

1. Via the earth return system.
2. Via the fence return system, with the charge travelling through the positively charged wire, through the animal, and back through the negatively charged wire.



Effectively, a Bi-Polar Energiser puts half its output into the positively charged wires and the other half of its output into the negatively charged wires.

Less wires required in dry, sandy soil where the earth resistance is too high to provide a good circuit.



# Advantages of Bi-Polar Fencing Systems

## **Protection against short circuits**

On a conventional fence, if you have a short circuit on the “live wire” every wire on the fence is affected. Alternatively, on a Bi-Polar fence, only the wires of the same polarity are affected. The wires of the other polarity retain their charge and remain effective and you will often, after a distance, see an increase in voltage to offset the loss in the other wires.

## **Every wire can be energised**

There is no need for earth wires on your fence. Every wire is capable of delivering a shock. Alternatively on a conventional fence an animal cannot receive a shock from an earth wire – and these are referred to as “dead” wires. An animal may be part way through a fence before coming in contact with an electrified wire and receive a shock. In this case, the animal may attempt to force through, rather than retreating from the Fence.

## **Control of difficult animals**

The combination of the above two features provides a system well suited to control difficult animals e.g. goats, Kangaroos and Wallabies. Goats will search out “dead” wires in a fence to aid there escape, as a Bi-Polar fence has no “dead” wires it is the ideal solution here. Kangaroos and Wallabies, when un-pressured will go under a fence. In this case a live wire very close to the ground is required. Because of its close proximity to ground and weed growth this wire can short out the entire fence, but as a Bi-Polar fence this wire will not adversely affect the entire fence.

# Types of Energisers

Electric fence energisers vary in their source of power and their power output. They fall into three groups – battery powered, mains powered and mains battery powered. Solar powered systems are increasingly popular and involve the use of a battery powered unit, where the battery is charged from a solar panel.

**Battery powered energisers** range from very compact low power units designed for strip grazing or intermittent use, up to high powered 12 volt units designed for permanent installation on long runs of fence. Their advantage is that they can be remotely installed, right at the fence.

Battery life will generally correspond to the output power of the energiser.

High output energisers will require a larger battery in order to operate for a reasonable length of time between recharging.



**Mains powered energisers** are the preferred option for permanent electric fence applications. They are less expensive, they require no battery maintenance. **Mains powered energisers must be installed inside out of the weather to ensure safety**

In Australia mains powered electric fence energisers are a prescribed item under the state electrical safety acts. They must be tested to conform to the relevant standard. Your assurance that your mains powered energiser is approved is the approval number on its label.

**Solar fencing system** consist of three parts, 1) a battery powered energiser, 2) a rechargeable storage battery which powers the energiser, 3) a solar panel which recharges the battery from sunlight. Dakenag manufactures a range of energisers consisting of all 3 elements, usually smaller systems. Most large systems will require the purchase of these elements separately.

Dakenag has a recommendation for Solar panel size, as a balance is required between the power available from the solar panel and the power required to operate the energiser. This balance is needed to ensure that the fence has sufficient reserve to last through bad weather periods, whilst not waste excess panel output. The panel size recommendation assumes average sunlight hours in through summer and winter, should your location experience periods of heavy fog or cloud, you will require a larger solar panel.

Care should be taken to align the solar panel in accordance with instructions to ensure maximum output from the panel.

Solar panels generate electricity from light, not heat. This means that they will continue to work, though less effectively, on overcast days.



*Battery Energiser*



*Solar Energiser*

# Selecting the Right Energiser

To optimise the performance of your electric fence it is essential to select an energiser capable of performing under your prevailing fence conditions and suited to your application. The more fence you intend to electrify the larger the energiser you will need. The following factors should be considered when making this decision.

## **Is mains power available?**

If at all possible use the mains, even if it means buying a larger energiser and running a longer lead out wire (within limits). Mains energisers are easier and more economical to run as there are no batteries to maintain, but must be installed inside out of the weather.

## **The distance and number of wires to be energised**

Dakenag provides an estimate of the expected range of our energisers powering a single well insulated galvanized fence wire under favourable conditions. When using poly wires or tapes this figure becomes null and void. Two or more live wires are electrically easier to power as they provide less resistance, but the trade off is the potential losses from more connections and greater potential loss from shorting. Other measures of size of electric fence energisers are Stored Joules, Output Joules, Kilovolts and Watts. Until all manufacturers agree on a method of rating energisers it will be difficult to make comparisons.

## **The condition of your fence**

A fence that may be subject to leakages such as heavy weed growth, overhanging foliage, or poor insulation, will require a more powerful energiser to effectively power your fence than under normal conditions.

## **The type of animal you wish to control**

The response of different types of animal will vary with the size of the shock. The appropriate shock should be designed to bring about the desired reaction from the animal that you wish to control. Often the coat of the animal provides effective insulation in which case a higher voltage shock is necessary to overcome the insulation (for instance – sheep).

“Educated” animals do not require as large a shock as do animals encountering electric fencing for the first time.

## **Type of conductor**

Permanent fences are usually constructed using galvanized fencing wire. But today more fences are using poly wires and tapes. These products

were originally designed for strip grazing, but they are easy to handle and use and with improved visibility have become more popular. Dakenag have many styles and constructions available care should be taken to select a product that is best suited to your application. For example low resistance poly wires and tapes are better suited to permanent fences and long runs. As many poly wires and tapes are very high resistance your energiser distance rating is no longer applicable.

Consult the *Dakenag Electric Fencing Product Catalogue* for the model that best suits your requirements.

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### Handy Tip

It is advisable to make allowance for fence extensions you may wish to do in the future when calculating the distance of wire to be energised.

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## Energiser Location

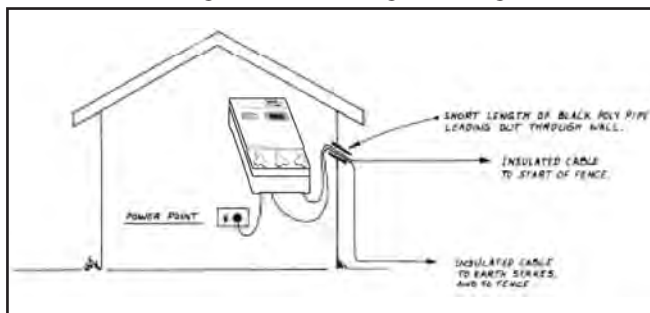
**Mains powered energisers should be installed in a sheltered position, preferably inside a building or shed. For obvious safety reasons, it should be fixed securely to a wall or shelf, out of the reach of children and animals.**

The output terminals (both live and earth terminals) of the energiser should be connected to the fence using Dakenag underground cable.

Where these wires enter the building, they should have a “drop-loop” to prevent water running down the wire to the energiser.

Battery and solar powered energisers should be installed in an outside location in an upright position. In the case of battery energisers, they should be located in a position offering maximum shelter from the weather. The location should be secure and away from inquisitive animals. It should also be installed well off the ground and high enough to clear possible flood waters.

Solar powered energisers should be positioned in a north facing aspect, in an area offering maximum sunlight exposure.



# Earthing

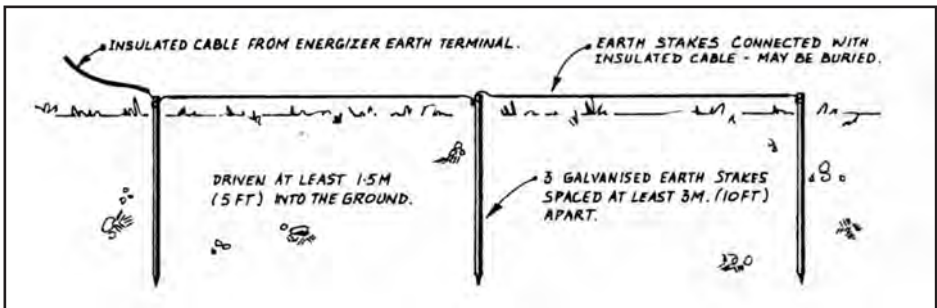
In practice, most problems which occur with electric fences, are caused by poor earthing.

In order for the animal to receive a shock, there must be a good current flow from the pulsed output terminal of the energiser to the animal, and back to the earth terminal. Therefore, it is imperative that the earth terminal is well and truly earthed. Never use your water pipes, windmill or household earth rod for your electric fence earth, because there is a risk of shock under certain conditions.

## Earth Stakes

One of the best systems for adequate earthing is shown below. This consist of a series of galvanized steel posts driven at least 1.5 meters into the ground, and positioned at least 3 meters apart, in a straight line. The posts are connected to each other and to the earth terminal of the energiser, using galvanized nuts and bolts.

Alternatively, you could use a length of galvanized water pipe instead of the steel posts, but it is harder to drive in and is difficult to connect to the earth wire satisfactorily.



The earth stakes should be located well away from your house, and at least 10 meters away from the earth peg of your house wiring. Locate them as close as possible to the start of the fence. For best results a location with permanently moist ground, such as near a creek, dam, trough, or septic absorption trenches or water tank overflow.

# Testing Your Earth

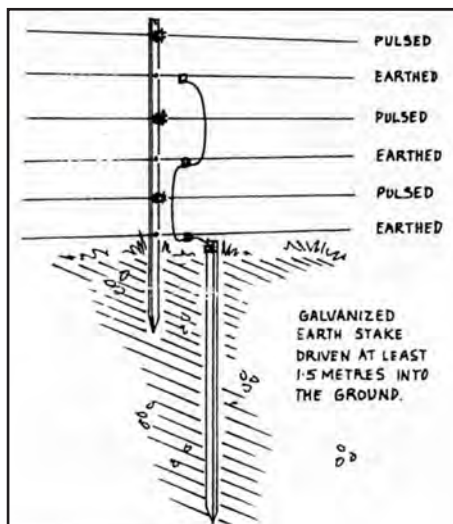
Since good earthing is so important to the performance of your electric fence it should be checked periodically. Measure the voltage on the earth stake (stakes) using an electric fence volt metre or Power Probe®. Every volt on the earth is one less for the fence live wire, so the lower the reading, the better. In general you should see a reading of less than 0.3kV. too high a reading indicates not enough metal in the ground, or poor ground conditions. Add more or better quality earth stakes, or relocate your earth stakes.

## Intermediate Earthing

On long fence runs, or in dry natural pasture areas, there may be insufficient moisture within the soil to provide adequate current flow through the earth return system. In these conditions, it may be necessary to establish earth connections at regular intervals along the length of the fence.

If your earthed fence wires are running through steel posts, this will be sufficient. Otherwise intermediate earthing can be achieved by simply connecting the earth wires to additional earth stakes, periodically spaced, as illustrated.

Connections should be made using line clamps and insulated cable. Where possible, intermediate earths should be established in moist ground (eg, near a dam or creek).





# Fencing Wire

The type of fencing wire you use will depend on the type of fence you are building and in some cases the look you wish to achieve.

## **Strip Grazing**

There are two wire types usually used for this application, poly wire and Tape. These two products are basically constructed combining a UV stabilized plastic monofilament and a metallic conductor. The conductors can be either stainless steel or tinned copper wire. The stainless steel is a strong long life alternative, but has a short fall of very high resistance. The tinned alternative has a very low resistance but lower tensile strength.

Today Dakenag have a wide range of poly wires and tapes, for general strip grazing the standard types of poly wire or tape will be sufficient, but for longer runs or use with high power energisers we would recommend a better quality product with a copper conductor.

The advantage of these types of fence wires is that they can be easily reeled in and out for relocation and storage, they are easy to handle, highly visible, and can be simply joined with a knot. The disadvantage is that their life expectancy is determined by their use and treatment, application and environment. Care must be used if these products are used with a high power energiser. The energiser can destroy the conductor at the point of shorting, or if high resistance or poor joins occurs they will look black and burnt.

## **Permanent Fencing**

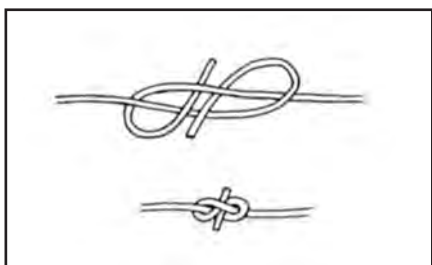
The wire in a permanent electric fence must be strong enough to take the mechanical strain during fence construction, and be strong enough to withstand the animal pressure it is likely to be subjected to.

Today there are many sizes and types of fencing wires available. 2.5mm galvanized fence wire is a good starting point, but your dealer can recommend a wire that is suited to your application. Lighter gauge wire may be acceptable for internal fencing but should be avoided for boundary fencing, and pressure from Kangaroos and emus.

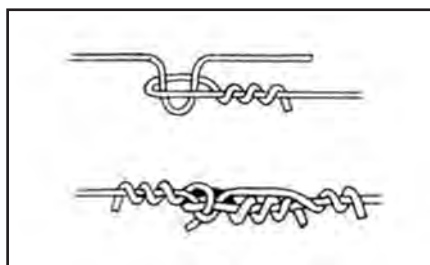
## Wire Joining

When joining wires in an electric fence, any of the commonly used knots will suffice. Your dealer can assist you with your choice. However, the following points should be considered.

1. The knot should provide multiple contact points for carrying the energiser pulse.
2. The knot should not weaken the wire too much.
3. It should not flex after the wire is strained.
4. Loose ends should be cut back close to the knot to avoid short circuits, and animals injuring themselves.



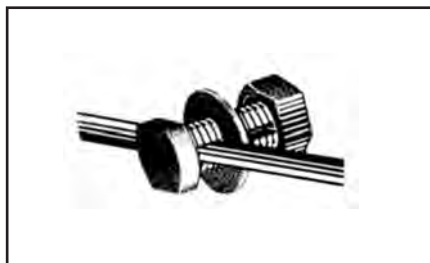
*Figure Eight Knot*



*Pin and Loop Knot*

When joining Poly Wire or Tape it can just be knotted together, but it is preferable to tie a strain knot, expose the wire strands then twist the strands together. This will provide good conductivity and strength.

When using Dakenag underground cable for gateways and general connections, a Dakenag Heavy Duty Line clamps should be used. The advantage is that they can easily join 2 or more wires, provide excellent conductivity, ease of use and can be fitted where ever a connection is required.

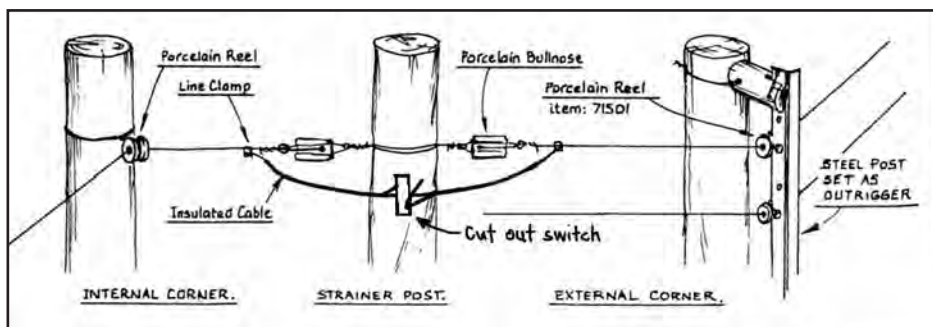


*Dakenag Line Clamp*

# Fencing Insulator

It is essential that your electric fence is properly insulated along its full length. Insulators are designed to take most types of wires for wood or steel posts.

The following diagram shows some of the methods of insulating your fence at internal corners, external corners and at straining posts.

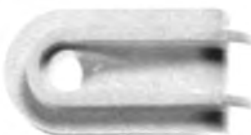


Porcelain insulators are generally regarded as being a longer life insulator, but are more expensive, and can suffer from cracking due to poor installation and changes in temperature.

Plastic insulators are easy to use, offer optimum insulation, are relatively inexpensive, and come in a wide variety of styles for different applications. Dakenag manufacture a range of long life plastic insulators for most applications, the Dakenag Electric Fencing Catalogue will show you the variety that is available.



*Porcelain Reel Insulator & Clip*



*Hi-Strain Bullnose Insulator*



*Steel Post Insulator*



*Wood Post Insulator*

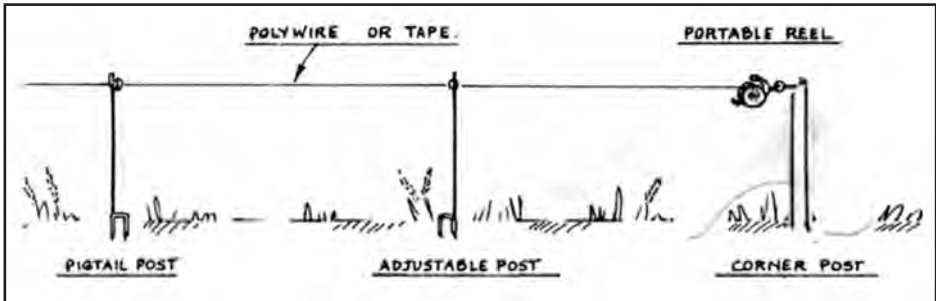


*Nail-On Insulator*

# Fence Construction

## Strip Grazing

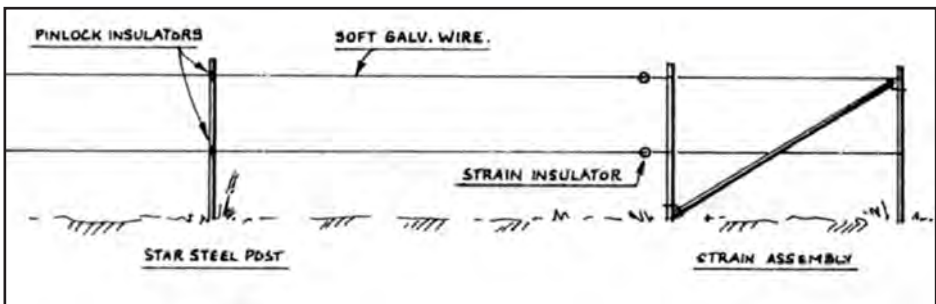
Fences for strip grazing come in many forms. Most commonly they are fully portable single wire fences as shown below. All the components of this fence are easily installed and can be moved by hand quite efficiently.



## Semi-Permanent Fencing

For semi-permanent fences, steel posts are most convenient as these enable you to have two or more pulsed wires. Daiken Pinlock "Y" Insulators or Dakenag Steel Post Insulators are often used here because of their ease of application.

Only light strain assemblies and low wire tensions are required.

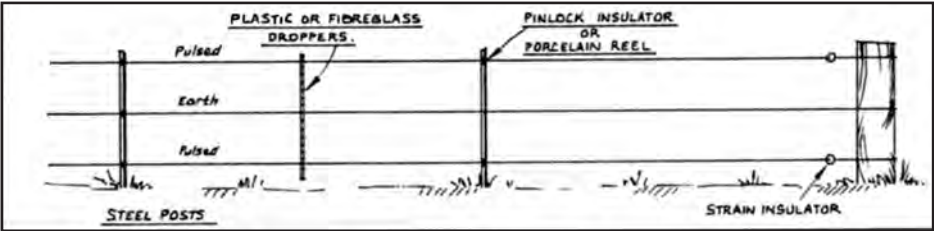


Permanent Fences

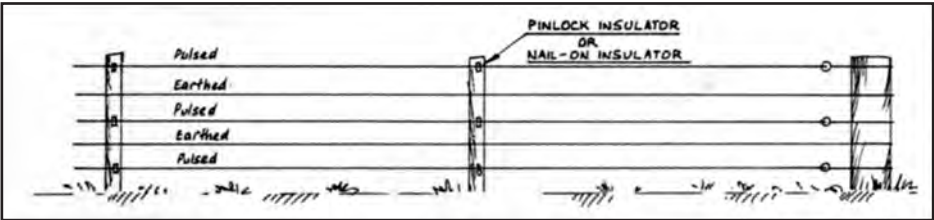
Post spacings will depend upon the terrain, the number of wires, and the level of physical security required.

A wide variety of posts can be used, including timber, steel, and fibreglass posts. Insulators must be used on all steel and wooden posts, while special clips are available for use with fibreglass posts. Earthed wires should never be insulated in the fence.

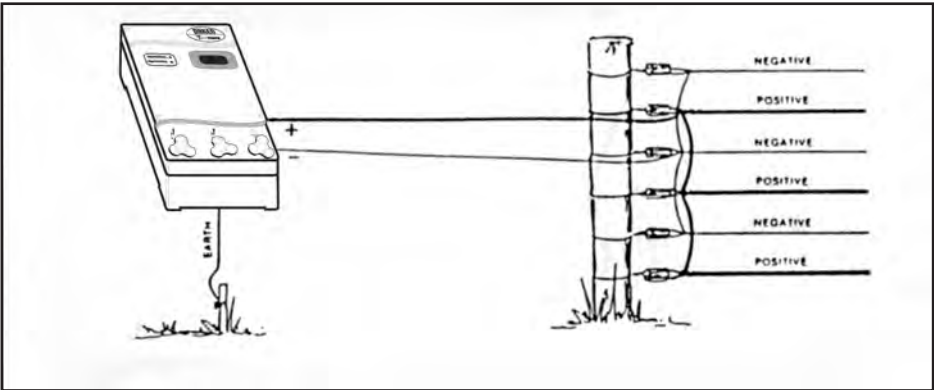
Some of the many arrangements for permanent electrical fencing are shown below:



3 Wire Fence on Steel Posts



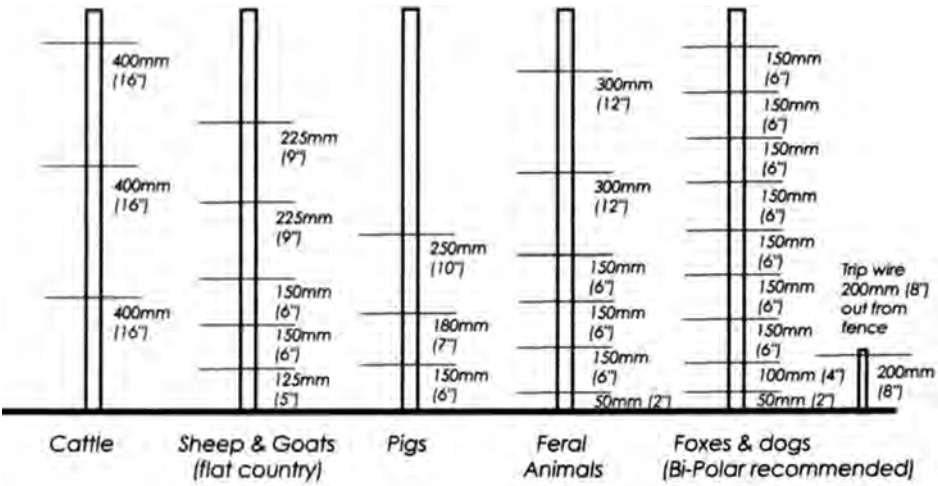
5 Wire Fence on Wooden Posts



6 Wire Bi-Polar Fence

## Suggested Wire Spacings

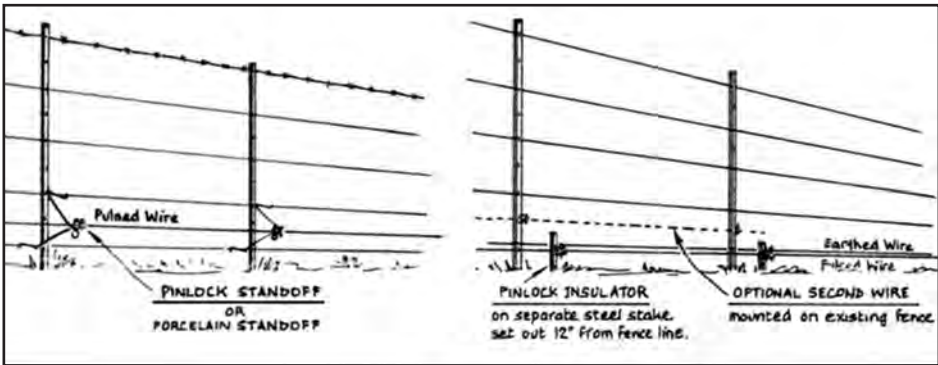
Some of the possible wire spacings for permanent electrical fences are shown below:



## Reinforcing Existing Fences

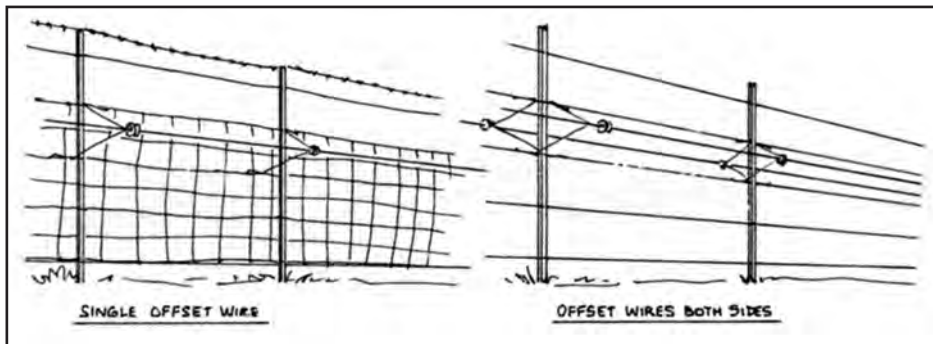
You can successfully extend the life of your old fences, or improve the holding power of an existing fence, by addition of one or more pulsed wires.

To discourage kangaroos, pigs and wild dogs, often only one wire is required, placed low down and out from the bottom of the fence.

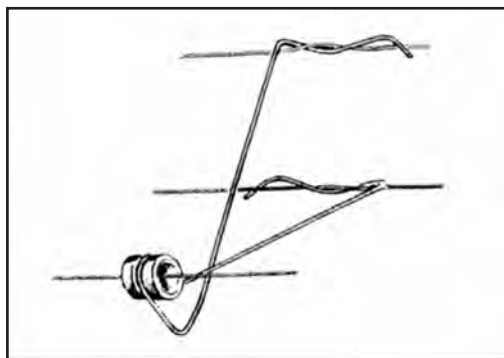


Simple reinforcement of cattle fences requires a single wire at about 75cm from the ground. Depending on the condition of the old fence, it may be necessary to use insulated standoff wires to keep the pulsed wire well away from the old wires.

Standoff wires may be spaced well apart, depending on the risk of tangling with other wires.



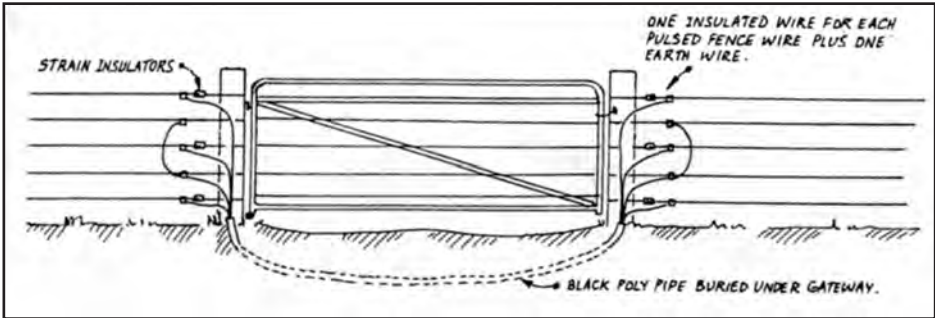
The Dakenag Pinlock Standoff is most suitable for this application because of its ease of application and the lower initial cost. Where high side loads will be applied, such as over the crests of hills or around corners, Dakenag Porcelain Standoffs are recommended (pictured below).





## Gateways - In Permanent Fences

It is not usual to try to electrify an existing steel gate, but the pulsed and earthed wires must be carried past the gate to continue the fence. The wires are generally taken under the gate, as shown below.



You should use Dakenag Insulated Underground Cable to connect each pulsed wire, and the earth, to its mate on the other side of the gate. This will make fault finding easier and help minimise the effects of faults, if they do occur.

it is recommended that Dakenag Cut-out Switches are used on one side of the gateway. This allows for easy disconnection of the fence for testing.

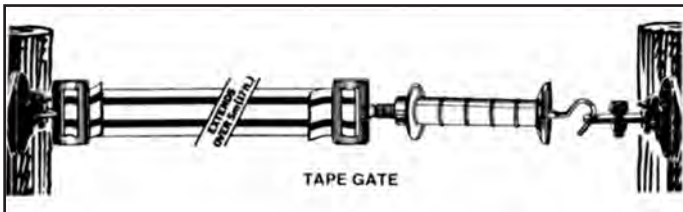
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### Handy Tip

Make sure the ends of the black poly pipe are turned over to avoid water penetration.

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A further low cost alternative for gateways in permanent or semi-permanent fences is Dakenag Tape Gates or Dakenag Spring Gates. Both are easily installed between wooden posts and include a gate handle, gate anchors, and adjustable tape or springs. These items have proved popular with dairy farmers.

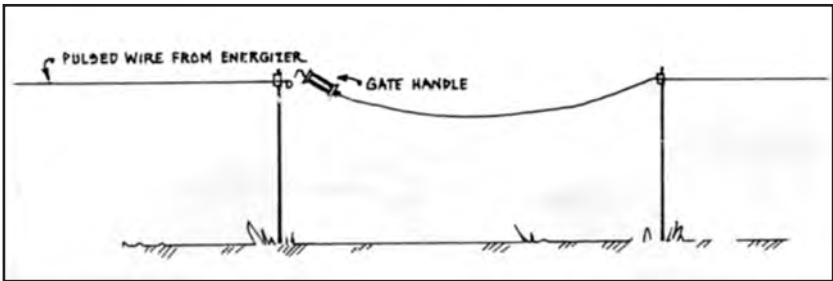


## Gateways - In Temporary Fences

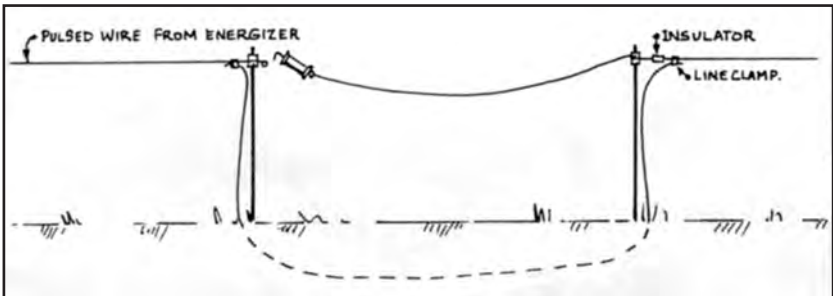
To form a gateway in a temporary fence, you can use a Dakenag Gate Handle. Two possible arrangements are shown below.

In *Diagram A*, the arrangement means that opening the gate will disconnect all of the fence past the gate. *Diagram B* shows an arrangement where the fence remains active, whether the gate is open or not.

Note that the gate handle should always be installed so that it is only connected to the pulsed wire when it is hooked in. In other words, when the gate is opened, the handle and wire are no longer pulsed.



*Diagram A*



*Diagram B*

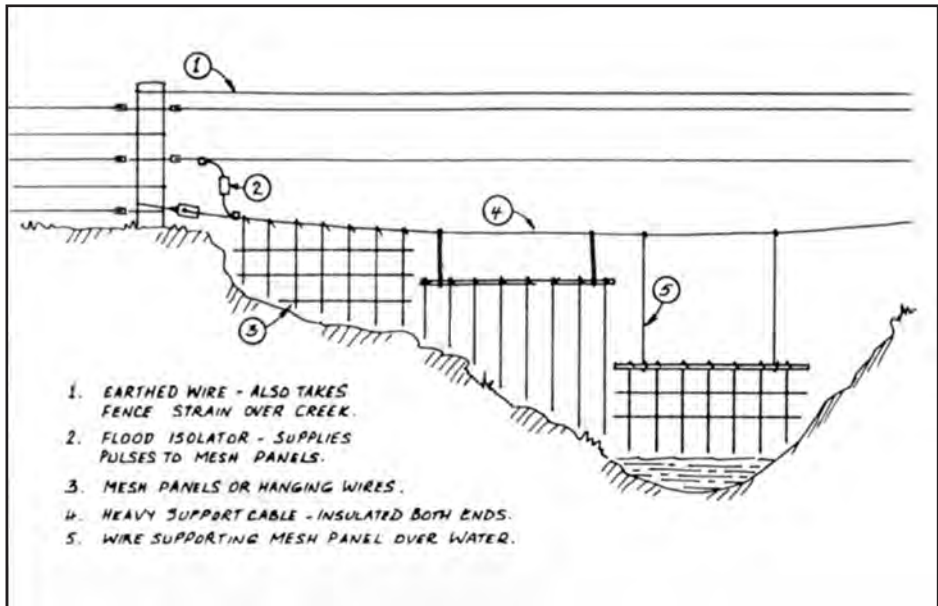


*Dakenag Gate Handle*

## Creeks and Dams

There is a problem with maintaining a pulsed wire at an effective height over irregular ground such as creek beds.

Many different solutions have been tried, with varying degrees of success. The general ideas are illustrated below:

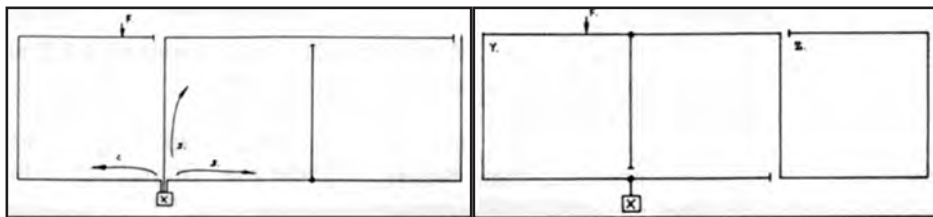


# Fence Layout

The overall layout of your electrical fence system deserves careful planning, because the amount of care taken at the planning stage will determine the amount of time you have to put in to checking and maintaining your fence in the future.

## Length of Runs

It is better to have several short runs of fence leading out from the energiser, rather than one long run.



*Diagram A – Preferred Layout*

*Diagram B – Not Preferred Layout*

*Diagram B* is the sort of layout which can develop when a fence is added to as time goes by. You can see that the pulses must travel from “X” through “Y” almost completely around the boundary to reach “Z”, passing two branches on the way.

In *Diagram A* there are three (3) distinct runs of fence, each kept as short as possible, and each having no more than one branch.

## Compare the effects of a fault at “F”

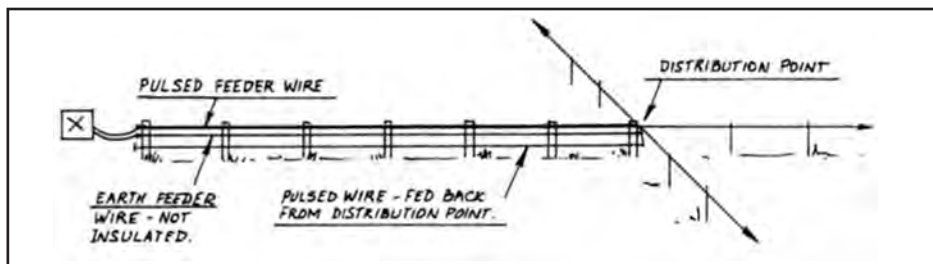
In *Diagram A*, only one short run of fence is seriously affected. In *Diagram B*, almost the entire fence system will be put out of action, or at least seriously affected.

## Branches

In many electrical fence layouts, “branching out” is unavoidable. If you have to take a branch out of a pulsed wire, do so as close as possible to the energiser, and keep the branch as short as practical.

When there are a number of wires branching out, it may be necessary to install a “feeder” line. Feeder wires are often made of heavy gauge wire, carried at, or near, the top of the fence, where they will not normally be touched by livestock.

The use of a feeder line is shown in the following diagram.



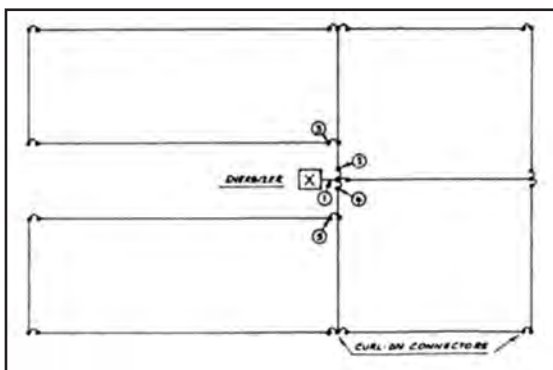
The feeder wire should be kept well insulated, well clear of the ground, and have a low risk of being damaged. If a pulsed wire is needed on the same fence, then a normal pulsed wire is run along the fence at its normal height, as well as the feeder. This pulsed wire should be supplied from the distribution point at the end of the feeder wire, not from the energised end. This arrangement will minimise the effects of any faults on the pulsed wire, and also provides a useful voltage checking point near the energiser.

## Suggested Layout

The following layout represents a good electric fence layout – sections of the fence are easy to isolate, making fault finding simple. With this layout, you only have to perform the following checks to ensure that the fence is working:

A. Disconnect the energiser at point 1.  
Check the energiser output voltage.  
If satisfactory, reconnect and go to point 2.

B. Disconnect fence at point 2.  
Check the voltage at point 2.  
If satisfactory, reconnect and go to point 3.



C. Disconnect and check voltage at points 3, 4 and 5 similarly.

If each check is satisfactory, then you know that all of the fence is working. If any check gives a low (or zero) voltage reading, then you know that there is a fault somewhere around that loop.

# Maintenance and Trouble Shooting

To achieve optimal performance from your electric fence, it is essential to ensure the fence is properly maintained. A volt meter is an essential tool in carrying out maintenance and trouble shooting procedures.

## **Maintenance**

A regular maintenance programme should include the following:

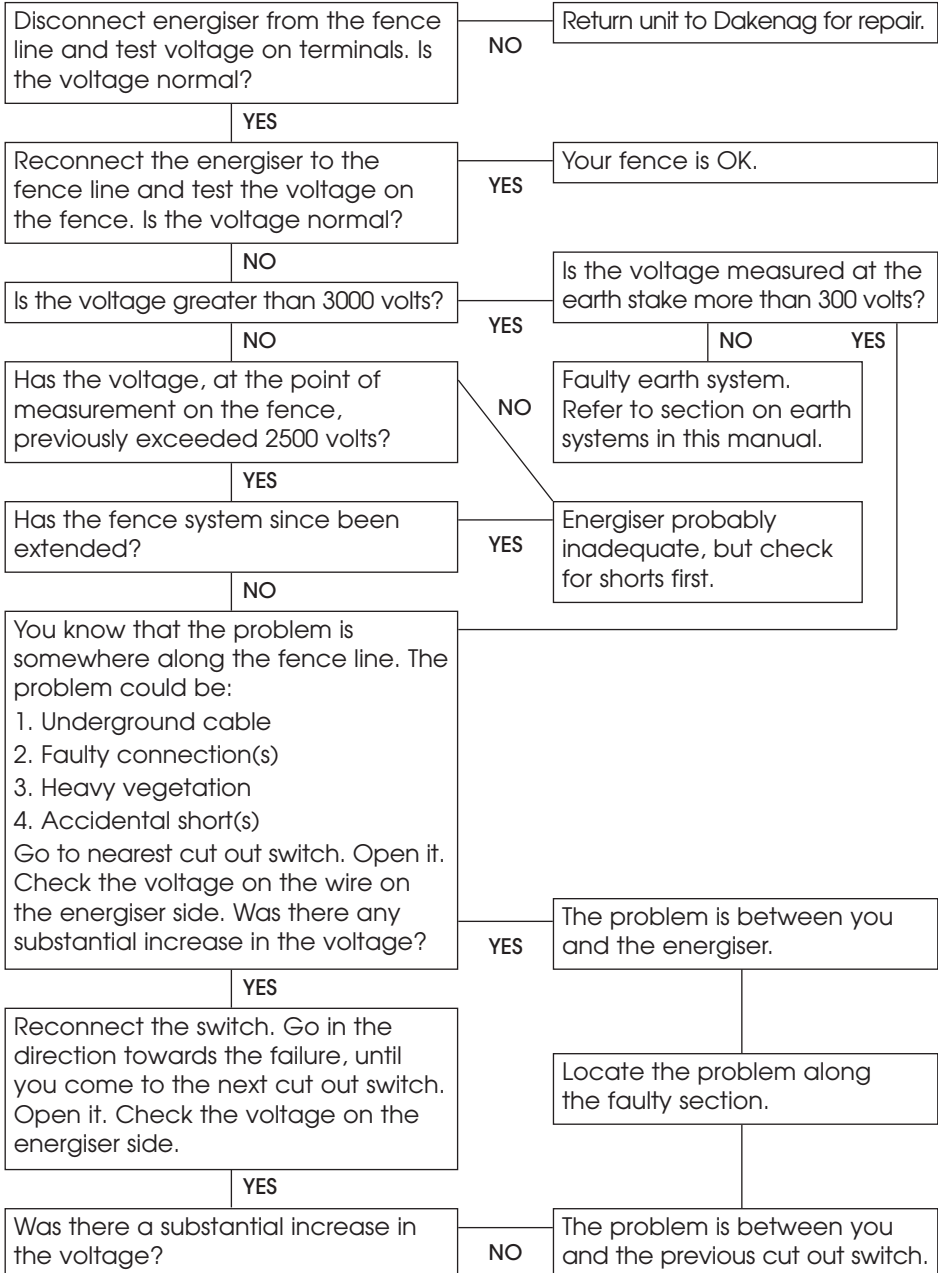
1. Clear your fence line of grass and weed growth.
2. Clear away bracken, branches, or other debris that may have fallen on the fence.
3. Check for slack or broken wires.
4. Battery maintenance for solar or battery powered energisers.
5. Testing for voltage drops along the fence to identify short circuits.

## **Energiser Repairs**

All repairs to Dakenag Energisers should be completed by Daken Pty Ltd or an Authorised Dakenag Repairer.

## Trouble Shooting Procedure

### START





# Safety

You should always treat an electric fence energiser with respect. An electric fence energiser can deliver a very powerful shock, which may be harmful to children or pets under some conditions.

1. Barbed wire should not be electrified.
2. Never use electric fencing where it is likely to be touched by children or infants. This applies especially near swimming pools or dams where they are likely to be on wet ground with bare feet.
3. Energisers should, if possible, be installed inside a building in a position free from the risk of mechanical damage. If mounted outdoors, they should be mounted on a substantial structure in a position free from the risk of mechanical damage.
4. Each electric fence energiser should be fitted with a separate earth electrode and this should not be connected to any other earthing device.
5. Crossings with overhead power lines should be avoided wherever possible. If such a crossing cannot be avoided, it should be made underneath the power line, and as nearly as possible at right angles to it.

If an electric fence has to be installed in the vicinity of an overhead power line, the vertical distance between any fence wire or connecting lead and the surface of the earth should not exceed 2 metres.

6. Fence wiring should be installed so that it is well away from any telephone or telegraph line or radio aerial.
7. An electric fence, when installed in such a position that members of the public might reasonably be expected to touch it, should be identified by suitable signs clamped to the conductor or fastened to the posts at intervals not exceeding 90 metres.

The sign should have a size of at least 200mm x 100mm. The inscription on the sign should take the form of either the symbol below, or the words "ELECTRIC FENCE". The inscription should be indelible and any lettering should have a height of at least 25mm. It is recommended that the basic colour of the sign be yellow with black inscription.

8. Where the electric fence energiser is used to supply a system of conductors for deterring birds from roosting on buildings, no conductors should be connected to earth. A switch should be installed to provide a means of isolating the energiser from all poles of the supply and clear warning notices should be fitted at every point where persons may have ready access to the conductors. The notice should bear the words "LIVE WIRES" in block letters not less than 13mm high. The letters should be red in colour on a white background and the size of each notice should not be less than 62mm x 50mm overall.
9. Never use any part of your household wiring or plumbing as an earth for your electric fence.
10. In periods of extreme fire danger there is a possibility that your electric fence may start a fire. This possibility is greatly reduced if you are using a Bi-polar energiser, or if you connect your fence to the low-power terminal of an ordinary energiser during the danger period.
11. Lightning strikes during thunderstorms are common. You may have miles of carefully insulated fence wires on your property, which will conduct the electricity straight back to your energiser. Apart from the obvious fire risk, this will certainly damage or destroy the energiser. You should disconnect the energiser from the fence, and unplug it from the power source from protection during electrical storms.

# Lightning Protection

Lightning is a potential destroyer of Electric Fence energisers. Some areas are more prone to lightning than others, high areas or areas with iron stone outcrops. Mains energisers are more susceptible than battery powered models simply because of their connection to mains power.

There are 3 possible paths for high voltage from a lightning strike to get to your energiser.

1. Via the electric fence line, usually from a strike to your fence, a nearby tree or ground.
2. Via the mains electricity line due to a strike to power poles or lines.
3. From differing voltages on the electric fence and mains earths, due to a more direct strike to ground near either earth.

There are 2 solutions

1. If you know a storm is coming unplug the energiser from the mains and disconnect all fence and earth leads from the energiser.
2. Since the first is not practical we recommend the installation of a P.T Lightning Arrestor.

The Daken Lightning arrestor is your best protection against Lightning damage, should your energiser be suspected of damage due to Lightning, return it to your dealer for service or return to an authorised service agent.

# Fencing for Horses

Special consideration should be taken when fencing for horses. An Eventing horse in a small area on the city outskirts will require different consideration to a stock horse in the outback, also lively, temperamental and flighty horses need special consideration. Horses are intelligent and therefore respond well to electric fencing.

Electric Fencing for horses is basically the same as other Electric fences, except for the following considerations.

1. Consider using high visibility conductors, such as hot tape, or the 90mm Tape rail.
2. Is there a possibility of horses fighting over a fence, a live top wire should be used
3. Avoid sharp edges, e.g. don't leave wire ends exposed or steel posts un-caped
4. Avoid products that may cause the possibility of hair entanglement.
5. Is the area free of obstacles and large enough should a horse bolt after receiving a shock
6. Is the horse going to receive a shock if it is wearing a rug?

Dakenag have a wide range of products suitable for the successful control of Horses with Electric Fences. Consult the Dakenag Electric Fencing Catalogue for products to suit your application, or consult your Dakenag Dealer.

# “Training Stock”

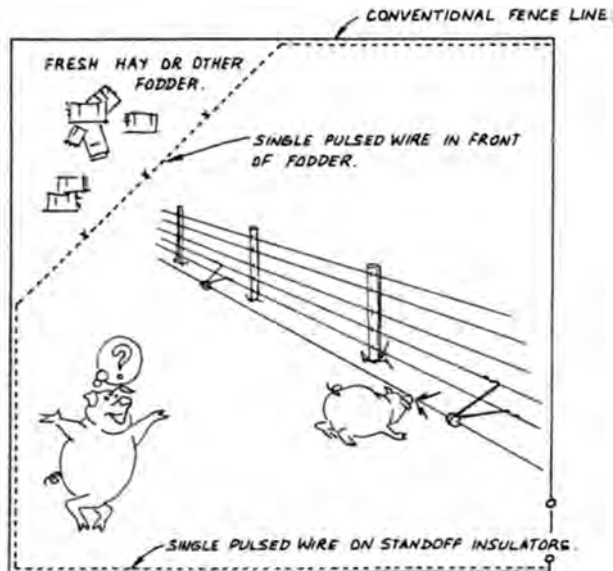
it has been well established that trained stock respect electric (and ordinary) fences more than stock which are simply put into a paddock with an electric fence.

Training requires only that your stock should be put out for about 24 hours in a small holding yard, with a full strength pulsed wire around the boundary. They should be under some kind of pressure to test the fence (e.g. hunger).

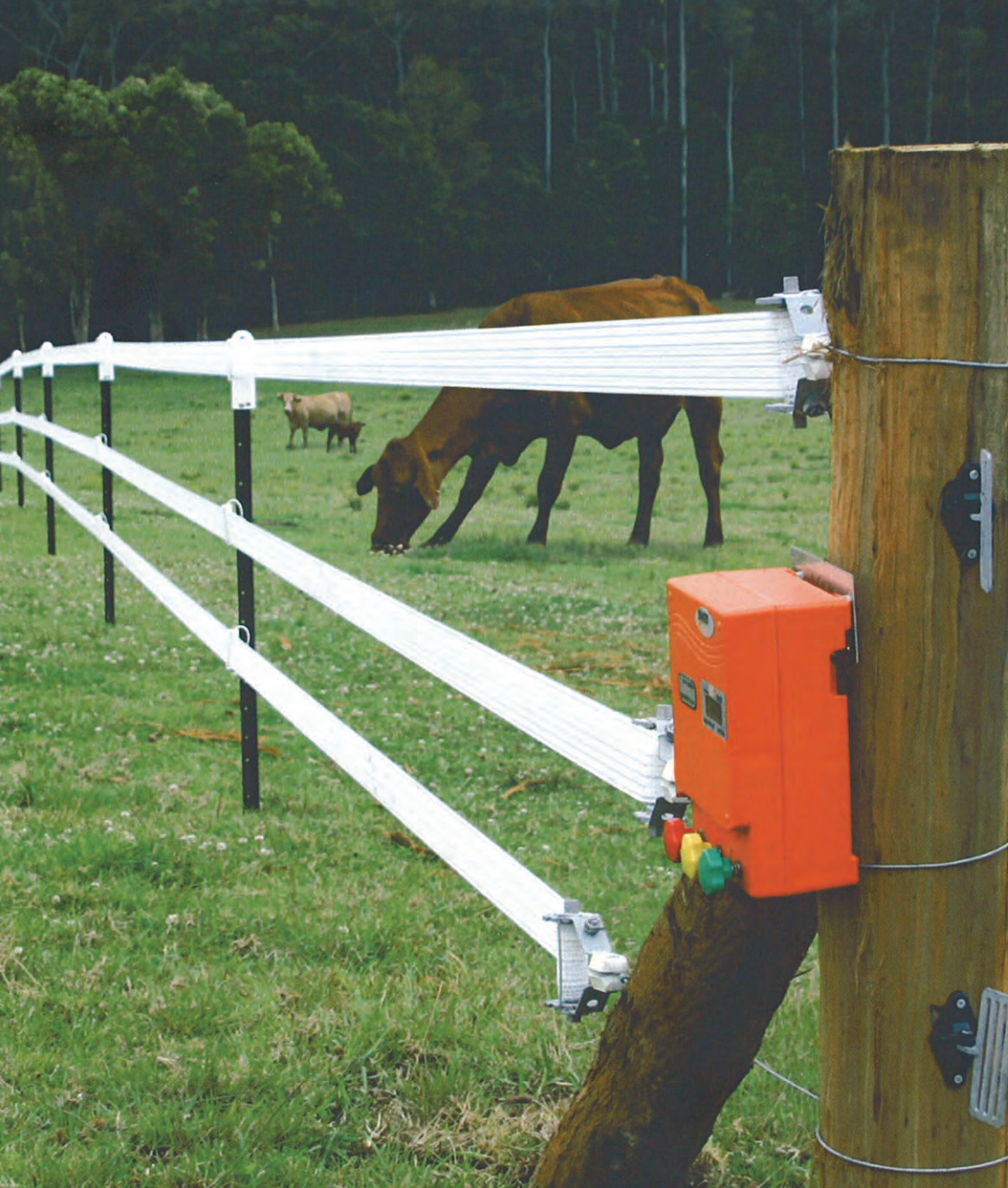
Sheep are best trained when they are just off shears.

Cattle and pigs respond very quickly to training at any time.

You should take particular care when training horses so that they have plenty of room to run when they first experience an electric fence. Reduced power is preferred for horses.







# Daken

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