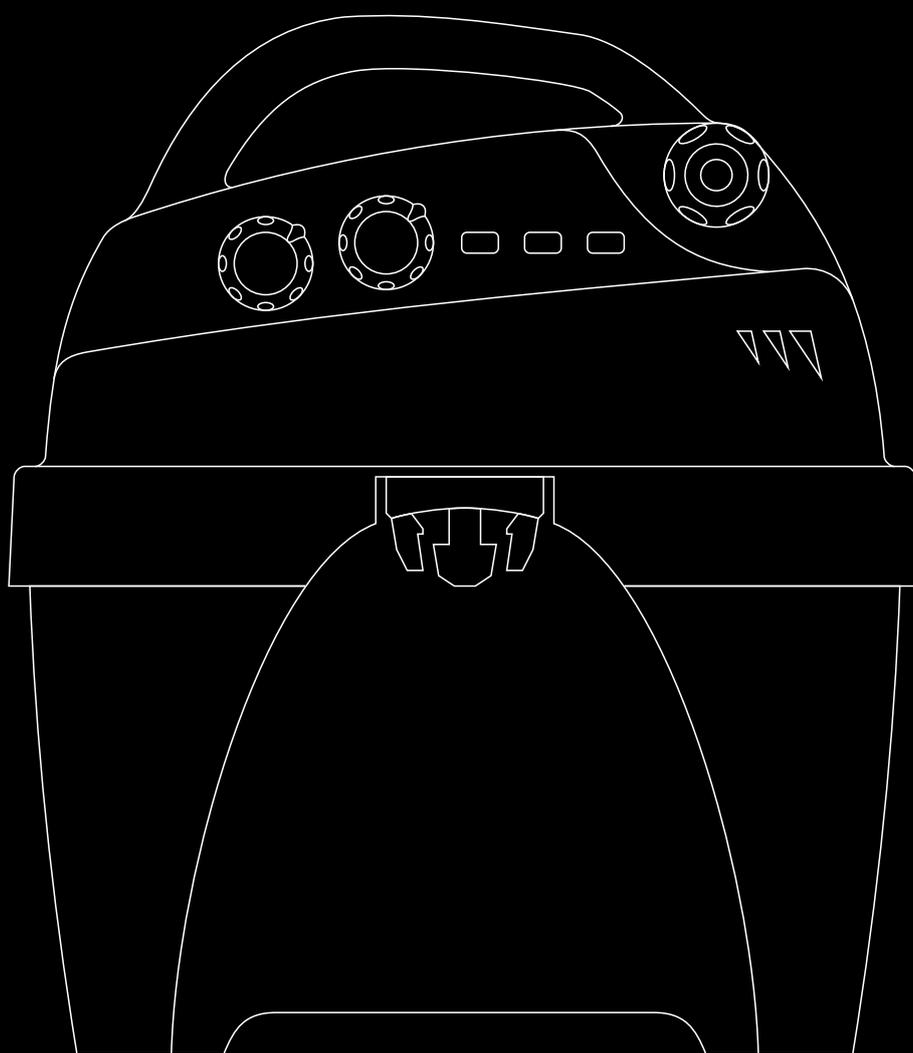




Instruction Manual



12 V



Read all instructions
Save these instructions

innovation
technology
performance
power

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For more information about the Stafix range of quality products, see www.stafix.com.

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Electric fencing and your Stafix energiser

Congratulations on your purchase of a Stafix battery energiser.

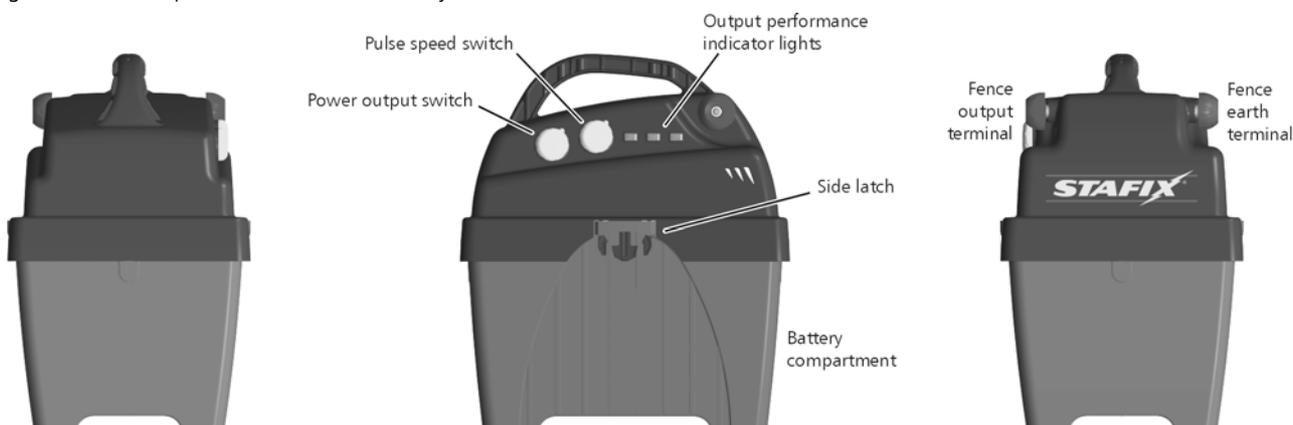
This product has been constructed using the latest technology and construction techniques. It has been engineered to give superior performance and many years of service.

It is important to carefully and thoroughly read these instructions. They contain important safety information and will assist you in ensuring that your electric fencing system gives maximum performance and reliability.

Warning!

- Do not connect to mains-operated or line-operated equipment.
- Remove the battery from the energiser before using an external battery charger to recharge the battery.
- Switch the energiser off before installation or performing any work on the fence.

Note: This product has been designed for use with electric animal fences.



Explanation of symbols that may be on your energiser



CAUTION

To reduce the risk of electric shock, the energiser should only be opened and/or repaired by qualified Stafix appointed personnel.



Read full instructions before use.



This battery energiser is intended for connection to a 12 V battery.



DO NOT CHARGE

This battery energiser must not be connected to a battery while the battery is being charged by a mains/line operated charger. Do not connect the energiser or the battery wiring to any other mains /line operated equipment.

How does an electric fence work?

An electric fence system comprises an energiser and an insulated fence. The energiser puts very short pulses of electricity onto the fence line. These pulses have a high voltage, but are of very short duration (less than 3/10,000ths of a second). However, a shock from an electric fence pulse is very uncomfortable and animals quickly learn to respect electric fences. An electric fence is not only a physical barrier, but is also a strong psychological barrier.

What are the benefits of an electric fence?

An electric fence has many benefits over conventional fencing:

- Requires less labour and material to construct than conventional fencing.
- Flexibility to change or add paddocks when required. The use of strip grazing techniques can allow temporary fencing to be quickly and easily erected or removed.
- Controls a broader range of animals.
- Minimises damage to expensive livestock when compared with other fencing mechanisms, for example barbed wire.

Installation

To set up the energiser for use, install the battery and connect the energiser to an electric fence and an earthing system.

Installing the battery

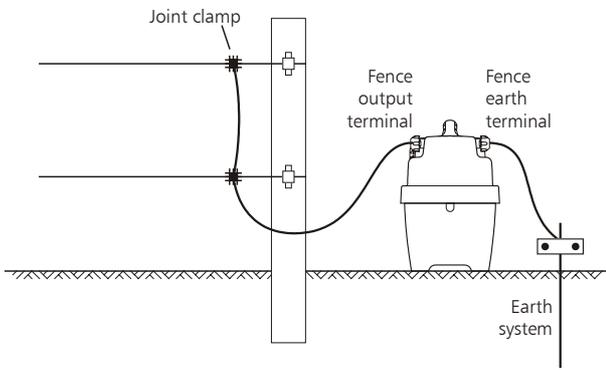
- 1 Place the energiser on a flat surface. Open the lid of the energiser by releasing the side latches. Remove any loose accessories from the battery compartment.
- 2 Select a 12 V battery to use with the energiser.
- 3 Place the battery in the battery compartment.
- 4 Connect the red, positive (+ve) energiser clip to the positive terminal on the battery and the black, negative (-ve) energiser clip to the negative terminal on the battery.
- 5 Close the lid of the energiser.

Positioning

Position the energiser on firm ground away from flooding and out of reach of animals and children. If possible, position the energiser in a sheltered area to protect it from the weather.

Connecting to an electric fence

- 1 Push earth rods fully into firm ground. See *Installing and testing an earth system* on page 6.
- 2 Connect the green lead from the energiser's Fence earth terminal  (green) to the earthing system.
- 3 Connect the red lead from the energiser's Fence output terminal  (red) to the fence. Make sure there is a good contact. If necessary, carefully strip the polywire to expose steel strands in order to provide a good connection.



Solar installation

Solar panel selection, assembly and positioning

Refer to the Stafix website www.stafix.com for information about selecting components, assembling and positioning a solar energiser system.

Operation

- Keep this manual in a handy location.
- Carefully read all the safety information in this manual. See *Safety Considerations* on page 6.
- Carefully check your installation to ensure that it complies with all local safety regulations.

- Select the output setting using the Power Output switch (see *Power Output switch* on page 2). One of the three output performance indicator lights will flash with each pulse. The lights indicate the approximate voltage at the Fence output terminals, except when the Power Output switch is set to Full Power with Battery Test.

- Recommended.
- Indicates a load on the energiser. Attention required to ensure reliable animal control.
- Fence is heavily loaded and needs urgent attention.

- If at any time all the indicator lights flash for more than 10 seconds, turn off the energiser for approximately 10 seconds, then turn it on again.
- If the indicator lights continue to flash, return the energiser to the nearest authorised service agent.

The energiser functions according to the position of the Power Output and Pulse Speed switches. See the diagram of the energiser on page 1.

Power output switch

This switch controls the power output setting of the energiser.

Setting	Description
	Full power The energiser is operating at full output power.
	Full power with battery test The energiser is operating at full output power, but indicator lights show the battery level. See <i>Battery test setting</i> on page 2 for an explanation of the indicator lights.

	Half power The energiser is operating at approximately half the output power of the Full Power setting.
	Off The energiser is off and is not operating.

Pulse speed switch

This switch controls the output pulse speed and behaviour of the energiser. There are four settings:

Setting	Description
	Fast The energiser will pulse fast at all times.
AUTO	Auto The energiser will adjust its pulse speed to conserve battery power, depending on the battery charge level. See the table below.
	Fast - nocturnal The energiser will pulse fast at night and slow speed during the day (used where stock or predators are nocturnal). However, if the battery charge level is Low, the pulse speed during the day will change to being very slow.
	Slow - nocturnal The energiser will pulse at slow speed at night and fast speed during the day. However, if the battery charge level is Low, the pulse speed during the night will change to being very slow.

Note: In all switch positions, the energiser will stop functioning before the battery discharges completely. This helps to prevent battery damage.

Auto setting

When the Pulse Speed switch is set to Auto, the pulse speed varies according to the battery charge level.

Battery charge level	Pulse speed
Optimal	Fast – approximately 1½ seconds between pulses
Medium	Slow – approximately 2½ seconds between pulses
Low	Very slow – approximately 3½ seconds between pulses

Battery test setting

When the Power Output switch is set to Full Power with Battery Test, the indicator lights show the charge level of the battery and other battery information. The battery test is only relevant when a lead-acid battery is used. The table below explains what the indicator lights represent and any action required for each installation.

Lights	Battery-only installation	Solar installation
Green light on	Optimal battery charge level: <ul style="list-style-type: none"> No action required. 	Optimal battery charge level. (Readings for a solar installation are only accurate in the early morning or late evening when the solar panel has been out of the sunlight for several hours.)
Yellow light on	Medium battery charge level: <ul style="list-style-type: none"> Monitor battery charge level. Recharge the battery to avoid long term battery damage. 	Low to Medium battery charge level: <ul style="list-style-type: none"> Recharge the battery immediately. Check the solar panel wiring is connected properly and is intact. Check that the solar panel is installed correctly and is clean. <p>If the problem recurs, the panel may be inadequate or faulty.</p> <ul style="list-style-type: none"> Take the entire system to an authorised service agent for assessment.
Red light on	Low battery charge level: <ul style="list-style-type: none"> Recharge the battery immediately. 	Low battery charge level: <ul style="list-style-type: none"> See Low to Medium battery charge level above
Green light flashing	Not applicable.	Battery connections may be faulty: <ul style="list-style-type: none"> Check that the battery clips are connected properly and that the wiring is intact. <p>Battery may be over-charged or faulty:</p> <ul style="list-style-type: none"> Disconnect the solar panel for 24 hours Reconnect the solar panel and monitor for seven days. <p>If the light flashes within seven days, there may be something wrong with the system.</p> <ul style="list-style-type: none"> Take the entire system to an authorised service agent for assessment.
Red light flashing	Battery may be faulty: <ul style="list-style-type: none"> Recharge the battery and monitor battery performance for seven days. If the light flashes within seven days, the battery should be checked by a battery specialist and replaced if necessary. 	Battery may be faulty: <ul style="list-style-type: none"> Recharge the battery and monitor battery performance for seven days. If the light flashes within seven days, the battery should be checked by a battery specialist and replaced if necessary.

Battery selection and management

This section refers exclusively to rechargeable, wet-cell lead-acid batteries, for example car, tractor, truck, marine or specialist deep-cycle batteries.

The battery you select will depend on whether your installation is a battery-only or a solar installation.

Battery selection for a battery-only installation

The battery selected should have the highest amp hour (Ah) rating possible while still fitting inside the battery compartment. The dimensions of the battery compartment are 210x240x290 mm (8¼x9½x11½") (WxHxD).

For best system reliability and long term battery life, the preferred battery and charging regime is use a deep-cycle, lead-acid battery and to recharge it when it has discharged to Medium charge level.

The table below shows the number of days the energiser can operate before the battery requires recharging. The table is based on the energiser operating with an 80 Ah battery discharged to 20%. Although operating time can exceed the number of days shown here, this is likely to cause battery damage and will necessitate frequent replacement of the battery.

Energiser model	Selector switch positions	Current required	Operating time (days)
CB1.2	Full Power-Fast Pulse	125 mA	21
	Full Power-Slow Pulse	70 mA	38
CB2.3	Full Power-Fast Pulse	240 mA	11
	Full Power-Slow Pulse	125 mA	21

Battery selection for a solar installation

The battery and solar panel must be selected carefully to suit the energiser's electrical current consumption. This will depend on the position of the energiser selector switch, the energiser model being used and the amount of sunshine at the location of the installation.

As a guide, the minimum amp hour (Ah) rating of the 12 V lead-acid battery required for each model is shown below. This table is based on average usage over seven days with no sunlight. For more detailed information, refer to the Stafix website www.stafix.com.

Energiser model	Selector switch positions	Current required	Minimum battery capacity
CB1.2	Full Power-Fast Pulse	125 mA	26 Ah
	Full Power-Slow Pulse	70 mA	15 Ah
CB2.3	Full Power-Fast Pulse	240 mA	50 Ah
	Full Power-Slow Pulse	125 mA	26 Ah

Battery management

Battery charging

Warning! The battery energiser is not rated for connection to mains-operated or line-operated equipment. Ensure that the battery is disconnected from the energiser before connecting the battery to any mains-operated or line-operated battery charging device. Failure to observe this precaution could result in damage to the energiser and possible electrocution.

A battery-only installation has unique requirements. Regular recharging of the battery is essential. Use a suitably-rated battery charger to recharge the battery. Refer to the battery manufacturer's recommendations.

- 1 Disconnect the battery from the energiser.
- 2 Attach the positive (+) battery charger lead to the positive terminal of the battery, and the negative (-) battery charger lead to the negative terminal on the battery.
- 3 Insert the battery charger's input power plug into a mains or line socket and turn on the power supply.
- 4 After the battery is charged, disconnect it from the battery charger before connecting it to the energiser.

Caution! Over-charging the battery will reduce its life. Do not exceed the recommendations of the battery manufacturer on recharging the battery from a mains- or line-powered source.

A correctly installed solar energiser system requires very little battery maintenance. The solar panel selected should be sufficient to maintain the battery at full or near-full charge.

Warning! Batteries contain harmful chemicals and when used incorrectly, may cause injury. Observe the guidelines for battery care, maintenance and safety in this manual and in the documentation supplied with your battery.

Battery care and maintenance

- When not in use, keep the battery as fully charged as possible.
- Recharge a discharged battery as soon as possible.
- Batteries should be stored fully charged and recharged at regular intervals (every 8 weeks)
- Inspect the battery regularly to ensure that the electrolyte level does not fall below 12 mm (½") above the surface of the battery plates.
- Fill using deionised, distilled or rain water. Do not overfill. Refer to the battery manufacturer's recommendations for more information.

Battery safety

- Ensure that the battery is well ventilated when recharging.
- Avoid temperatures greater than 50 °C (120 °F).
- Ensure the battery is not exposed to naked flame or sparks.

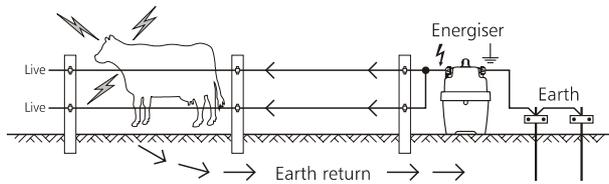
Building a permanent electric fence

Components of an electric fence

An electric fence system comprises the following elements:

- **An energiser.**
- **An earth system.** This comprises a number of metal rods inserted into the ground, which are connected to the Fence earth terminal on the energiser.
- **Stafix insulated underground cables.** Used to connect the energiser to the earth and fence.
- **An insulated fence.** Connected to the Fence output terminal of the energiser. Fences can be made to a variety of designs (see below).

Note: The animal receives a shock when it completes a circuit between the fence and the earth system. The fence below has all live wires and requires conductive soils. These fences are often referred to as 'all-live' or 'earth-return' fences.



Other useful components that can be added:



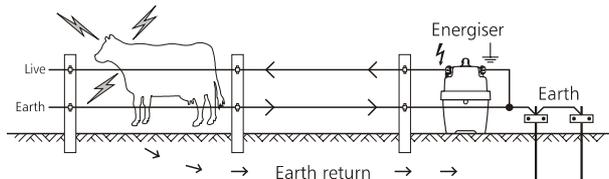
Cut-out switches. Installed at regular intervals, these allow you to isolate sections of the fence for repair.



Lightning diverter kit. Used to minimise the damage to your energiser from lightning conducted down the fence line.

Alternative installation

For poor conductivity soils (dry or sandy), a 'fence-return' or 'earth-wire-return' system is recommended. On these fences the Fence earth terminal is connected directly to at least one of the fence wires. The animal gets maximum shock from touching a live and earth wire at the same time.

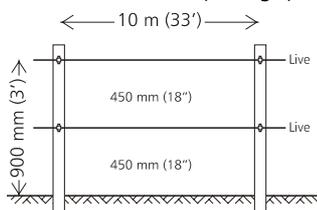


Fence designs

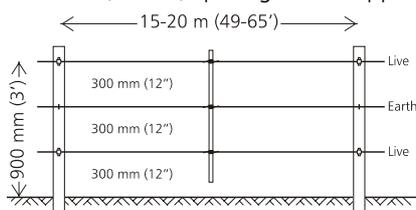
Fences can be constructed to suit the type of livestock and materials available. Discuss with your Stafix distributor which design best suits your needs. Some suggested fence configurations are below.

Cattle and horses

10-15 m (33-49') spacing, posts only

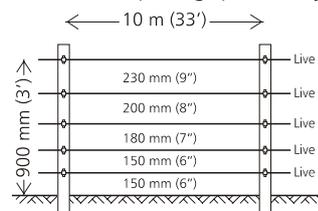


15-20 m (49-65') spacing with droppers

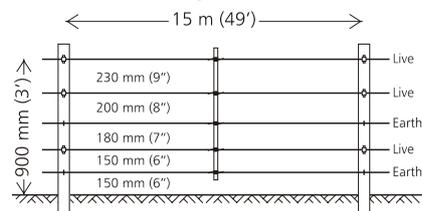


Sheep, goats, cattle and horses

10 m (33') spacing, posts only

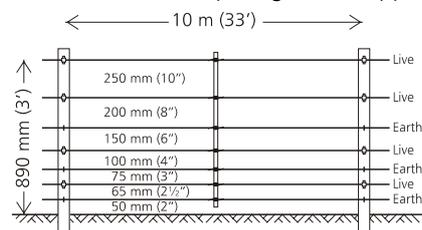


15 m (49') spacing with droppers



Wild animals

7 wire, 10 m (33') spacing with droppers



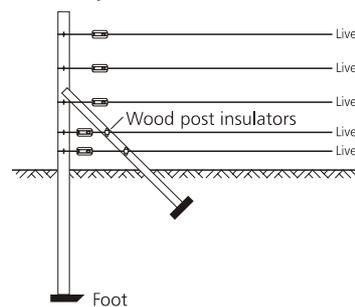
End assemblies

Angle stay

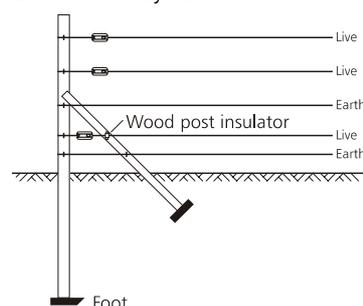
Suitable for field gate, high-tension strainer.

After firmly setting the footed strainer in the ground, dig in the stay block just below ground level, at a distance to ensure the angle stay will be held snugly in position. The stay can be levered into position with a spade.

All-live system



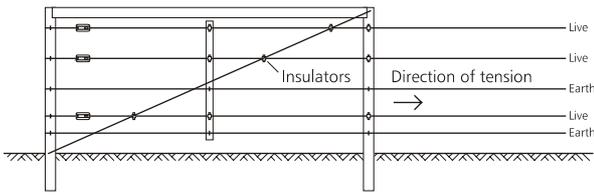
Earth-return system



Horizontal stay

Suitable for field gate, high-tension strainer.

Very simple to erect and most suitable as a high tension strainer, excellent in areas where the soil gets very wet or where heavy frost occurs.



Installing and testing an earth system

Select a suitable site for the earth system. Sites need to be:

- At least 10 m (33') from other earth systems (e.g. telephone, mains power or the earth system from another energiser).
- Away from stock or other traffic that could interfere with the installation.
- At a site that can be easily observed for maintenance.
- Ideally at a site that has damp soil (e.g. a shaded or swampy location). Note that the earth does not need to be directly adjacent to the energiser installation.

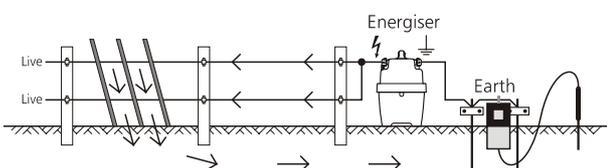
Drive Stafix earth rods into the ground. Use high-voltage, insulated cable and earth clamps to continuously connect the earth rods and the energiser's Fence earth terminal. Make sure the insulation is stripped back to ensure good contact between the wire and the earth rod. The table below specifies the minimum number of 2 m (6'6") earth rods recommended for an earthing system:

Energiser	Earth rods
CB1.2: 1.2 J	2
CB2.3: 2.3 J	3

Test the earth system, using the following procedure:

- 1 Turn off the energiser.
- 2 At least 100 m (330') away from the energiser, short circuit the fence by laying several steel rods or lengths of pipe against the fence. For best results, the fence voltage should be lowered to 2000 V or less. In dry or sandy conditions, it may be necessary to drive the rods up to 300 mm (12") into the earth.
Note: It is not acceptable to short-circuit a fence return system to the earth wire of the fence.
- 3 Turn the energiser back on.
- 4 Using a Stafix Digital Voltmeter, ensure that the fence voltage is below 2 kV.
- 5 **Check your earth system.** Insert the voltmeter's earth probe into the ground at the full extent of the lead, and hold the hook against the last earth rod. The tester should not read more than 0.3 kV. Anything higher than this indicates that better earthing is required. Either add more earth rods or find a better ground area to drive in the earth rods.

Note: When earthing energisers located in dairies, earth at least 20 m (65') away from the dairy using double-insulated wire to avoid touching the dairy building or equipment.



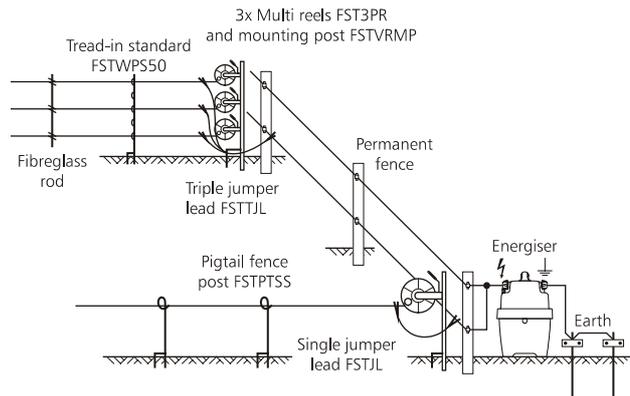
Temporary electric fencing

Stafix offers a range of products that allow the farmer to construct a temporary electric fence. A temporary fence that can be quickly erected and easily moved allows the farmer to:

- Make smaller paddocks (fields)
- Keep herds of animals separated
- Ration feed

Note: Use more wires for smaller animals and wild animals. Politape should be used when greater visibility is required (e.g. horses).

An example of a temporary fence is shown below.



Safety considerations

Definition of special terms

Electric fence energiser – An appliance that is intended to periodically deliver voltage impulses to a fence connected to it.

Fence – A barrier for animals or for the purpose of security, comprising one or more conductors such as metal wires, rods or rails.

Electric fence – A barrier which includes one or more electric conductors, insulated from earth, to which electric pulses are applied by an energiser.

Fence circuit – All conductive parts or components within an energiser that are connected or are intended to be connected, galvanically, to the output terminals.

Earth electrode – Metal structure that is driven into the ground near an energiser and connected electrically to the Fence earth terminal of the energiser, and that is independent of other earthing arrangements.

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

Physical barrier – A barrier not less than 1.5 m (5') high intended to prevent inadvertent contact with the pulsed conductors of the electric fence. Physical barriers are typically constructed from vertical sheeting, rigid vertical bars, rigid mesh, rods or chainwire mesh.

Public access area – Any area where persons are protected from inadvertent contact with pulsed conductors by a physical barrier.

Pulsed conductors – Conductors which are subjected to high voltage pulses by the energiser.

Secure area – The side of an electric security fence where a person may come into contact with the electric fence, without the protection of a physical barrier.

Requirements for electric animal fences

Electric animal fences and their ancillary equipment shall be installed, operated and maintained in a manner that minimises danger to persons, animals or their surroundings.

This energiser is not intended for use by young children or infirm persons unless they have been adequately supervised by a responsible person to ensure that they can use the energiser safely.

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

Electric animal fence constructions that are likely to lead to the entanglement of animals or persons shall be avoided.

An electric animal fence shall not be supplied from two separate energisers or from independent fence circuits of the same energiser.

For any two separate electric animal fences, each supplied from a separate energiser independently timed, the distance between the wires of the two electric animal fences shall be at least 2 m (6'6"). If this gap is to be closed, this shall be effected by means of electrically non-conductive material or an isolated metal barrier.

Barbed wire or razor wire shall not be electrified by an energiser.

A non-electrified fence incorporating barbed wire or razor wire may be used to support one or more offset 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 (6") from the vertical plane of the non-electrified wires. The barbed wire and razor wire shall be earthed at regular intervals.

Follow our recommendations regarding earthing. See *Installing and testing an earth system* on page 6.

A distance of at least 10 m (33') shall be maintained between the energiser earth electrode and any other earthing system connected parts such as the power supply system protective earth or the telecommunication system earth.

Connecting leads that are run inside buildings shall be effectively insulated from the earthed structural parts of the building. This may be achieved by using insulated high voltage cable.

Connecting leads that are run underground shall be run in conduit of insulating material or else insulated high voltage cable shall be used. Care must be taken to avoid damage to the connecting leads due to the effects of animal hooves or vehicle wheels sinking into the ground.

Connecting leads shall not be installed in the same conduit as the mains supply wiring, communication cables or data cables.

Connecting leads and electric animal fence wires shall not cross above overhead power or communication lines.

Crossings with overhead power lines shall be avoided wherever possible. If such a crossing cannot be avoided it shall be made underneath the power line and as nearly as possible at right angles to it.

If connecting leads and electric animal fence wires are installed near an overhead power line, the clearances shall not be less than those shown in the table below.

Minimum clearances from power lines for electric animal fences

Power line voltage	Clearance
≤1000 V	3 m (10')
>1000 ≤33,000 V	4 m (13')
>33,000 V	8 m (27')

If connecting leads and electric animal fence wires are installed near an overhead power line, their height above the ground shall not exceed 3 m (10'). This height applies to either side of the orthogonal projection of the outermost conductors of the power line on the ground surface, for a distance of:

- 2 m (6'6") for power lines operating at a nominal voltage not exceeding 1000 V.
- 15 m (50') for power lines operating at a nominal voltage exceeding 1000 V.

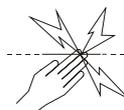
Electric animal fences intended for deterring birds, household pet containment or training animals such as cows need only be supplied from low output energisers to obtain satisfactory and safe performance.

In electric animal fences intended for deterring birds from roosting on buildings, no electric fence wire shall be connected to the energiser earth electrode. A warning sign shall be fitted to every point where persons may gain ready access to the conductors.

Where an electric animal fence crosses a public pathway, a non-electrified gate shall be incorporated in the electric animal fence at that point or a crossing by means of stiles shall be provided. At any such crossing, the adjacent electrified wires shall carry warning signs.

Any part of an electric animal fence that is installed along a public road or pathway shall be identified at frequent intervals by warning signs securely fastened to the fence posts or firmly clamped to the fence wires.

- The size of the warning sign shall be at least 100x200 mm (4x8").
- The background colour of both sides of the warning sign shall be yellow. The inscription on the sign shall be black and shall be either:



or the substance of "CAUTION: Electric animal fence".

- The inscription shall be indelible, inscribed on both sides of the warning sign and have a height of at least 25 mm (1").

Ensure that all mains-operated, ancillary equipment connected to the electric animal fence circuit provides a degree of isolation between the fence circuit and the supply mains equivalent to that provided by the energiser.

Protection from the weather shall be provided for the ancillary equipment unless this equipment is certified by the manufacturer as being suitable for use outdoors, and is of a type with a minimum degree of protection IPX4.

Frequently asked questions/Troubleshooting

What voltage is required to control animals?

4 kV is widely accepted as the recommended minimum voltage to control animals. However, you also require a well constructed fence system to ensure that animals cannot push through electrified wires.

The fence voltage is below 4 kV. How do I increase the voltage?

Check the energiser. Ensure that the energiser is not set to operate at half power. Disconnect the energiser from the fence and earth system. Measure the voltage across the energiser terminals with a Stafix Fence Compass, DVM or Lite Tester. If the voltage is less than 6 kV, request your Stafix service agent to check the energiser.

Check the energiser earthing. Use the procedure described in *Installing and testing an earth system* on page 6.

Check your fence system for faults. The most common source of low voltage is faults on the fence line.

If the fence, earth and energiser are in good condition and the voltage is still below 4 kV, talk to your Stafix distributor. They will help you identify whether recent extensions to your fence, a poor fence layout, or soil conditions may be causing inadequate voltage.

How do I locate faults?

The recommended tool for locating faults is the Stafix Fence Compass. This combined voltage and current meter allows you to rapidly locate sources of current leakage. Alternatively, use a Stafix DVM or Lite Tester. Use cut-out switches to turn off the power to different sections of the farm. If the voltage on the fence increases when a section of the farm is turned off, then investigate that section for possible faults.

There are no lights flashing on the energiser.

Check the power supply. Ensure that the power is switched on. If the energiser still does not operate, request your Stafix service agent to check the energiser.

Servicing

This energiser contains no user serviceable parts. It must be returned to a Stafix-appointed service agent for repair.

Product specifications

	CB1.2	CB2.3
Power supply (12.6 V nominal)	11–15 V dc	11–15 V dc
Current consumption		
Full power-fast pulse	125 mA	240 mA
Half power-fast pulse	70 mA	125 mA
Output voltage		
No load	10.5 kV	10.7 kV
500 Ω	5.3 kV	5.9 kV
Maximum output energy	1.28 J at 600 Ω	2.5 J at 400 Ω
Stored energy	1.65 J	3.3 J
Dimensions (WxHxD)	342x400x253 mm (13½x15¾x10")	342x400x253 mm (13½x15¾x10")
Weight	3.14kg (6 lb, 15 oz)	3.14 kg (6 lb, 15 oz)



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