GB SAFETY HINTS

PRINCIPLE

An electric fence consists of a controller and a connnected fence where the controller feeds electric impulses into the fence. The fence represents a "psychological barrier" for the animals; it can also be used to train a certain behavior (eg. cow trainer in the stable).

STANDARDS FOR THE FENCE CONTROLLER

The fence controller must comply with the EuropeanStandard EN 60335-2-76. Fence controllers must not cause radio + tv interference.
This is ensured if they comply with European Directive (EMC) 89/336/EEC and if they are printed with the CE mark.

There are controllers of different output performances. A main rule is: Not as powerful as possible but as powerful as necessary.
For safety reasons high power controllers (with more than 5 Joule at 500 Ω) shall not be used. Medium power controllers (up to 3,5 Joule) provide safe fencing with all ordinary fences even with some vegetation, dry ground and long fences. There are special controllers for cowtrainers and similar applications. Further application hints can be found in the catalogue.

The time between two pulses must not be shorter than 1 second. Especially in case of accumulator or mains controllers they must be set out of duty immediately and be repaired in an authorized service station.

GENERAL REQUIREMENTS FOR ELECTRIC FENCES

Electric fences shall be installed and operated so that they cause no electrical hazard to persons, animals or their surroundings.

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

An **electric fence** shall not be supplied from two different **energizers** or from independent **fence circuits** of the same **energizer.**

For any two different **electric fence**s, each supplied from a different **energizer** independently timed, the distance between the wires of the two **electric fences** shall be at least 2 m. 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 energizer

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

A distance of at least 10 m shall be maintained between the **energizer earth electrode** and any other earthing system such as the power supply system protective earth or the telecommunication system earth.

Except for low output **battery-operated energizer**s, the **energizer earth electrode** shall penetrate the ground to a depth of at least 1 m.

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 a conduit of insulating material or else insulated high voltage cable shall be used. Care shall be taken to avoid damage to the **connecting leads** due to the effects of animal hooves or tractor wheels sinking into the ground.

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

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

Minimum clearances from power lines

Power line voltage (V)	Clearance (m)
≤ 1000	3
>1000 ≤ 33000	4
> 33000	8

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

This height applies either side of the orthogonal projection of the outermost conductors of the power line on the ground surface, for a distance of
– 2 m for power lines operating at a nominal voltage not exceeding 1000 V;
– 15 m for power lines operating at a nominal voltage exceeding 1000 V.

Mounting
In case of indoor mounting the fence controller shall not be installed at places where there is a risk of fire, eg. barns or stables. Indoor installed connecting leads having a voltage of more than 1000 V require a special insulation which is effective with respect to structural parts connected to earth. This insulation can be achieved by adequate air gaps or with high voltage cable. The controllers shall be so installed that they are out of reach of children and not subject to mechanical damage.

Keep off combustible materials
Combustible materials shall be kept away from the fence wires and the connecting leads.

Gate insulation
Parts of electric fences liable to be handled (e.g.gates) shall be insulated from electric pulse leading parts, e.g. by insulated gate handles.

Fence controllers with metal enclosure
For controllers provided with metal enclosures, fence wires and connecting leads shell be so connected to the controller that they cannot come into contact with the enclosure.

Spacings to other metal parts
Fence wires and connecting leads shall not be in contact with metal parts not belonging to the electric fence, such as the railing of a bridge or a cattle water place.

PARTICULAR REQUIREMENTS FOR ELECTRIC ANIMAL FENCES

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

In **electric fences** intended for deterring birds from roosting on buildings, no **electric fence** wire shall be connected to the **energizer earth electrod**e. A warning plate shall be fitted to every point where persons may gain ready access to the conductors.

A non-electrified fence incorporating barbed wire or razor wire may be used to support one or more off-set electrified wires of an **electric animal fence**. The supporting devices for the electrified wires shall be constructed so as to ensure that these wires are positioned at a minimum distance of 150 mm from the vertical plane of the non-electrified wires. The barbed wire and razor wire shall be earthed at regular intervals.

Where an **electric animal fence** crosses a public pathway, a non-electrified gate shall be incorporated in the **electric 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 plates.

Operation inside stables
Voltage leading parts of fence installations inside stables must be so installed that animals can move freely. It must be ensured that animals cannot get in contact with those parts that are not intended to get into touch in normal use. All voltage leading parts must be seperated automatically from the voltage supply if an animal becomes entangled with the parts.

FENCE WIRE, POSTS AND INSULATORS

Wires
must have a good conductivity and breaking strength and they must be weather resistant. A good visibility can enhance the efficiency. Barbed wire shall not be used for electric fences. Zink galvani zed wires with a diameter of 1,5 - 2,5 mm are used for permanent fencing. Temporary fences are realized preferably with tinsel wires or plastic poly wires or tapes. The conductivity of poly wires and tapes can be different but cannot be assessed from outside.
High quality poly wires or tapes have a typical resistance of less than 1 Ohm/m, low quality can reach 10 Ohm/m, resulting in making even powerful controllers ineffective already with medium fence lengths. The single conductors of the poly wires or tapes must be in contact in order to avoid parts of the fence loosing voltage. **Important:** pay attention to the technical data of the manufacturer and prefer poly wires and tapes with a typical resistance of 1 Ohm/m or less.

Connection cable fence
Using poly wires and tapes as fence wires the connection of the high voltage cable from the controller to the fence wire made e.g. by a heart clamp can be unsafe. The new horizont universal-clamp provides safe contact with all kinds of fence wires.

Fence posts
All materials can be used for fence posts in connection with adequate insulators. Especially suitable are wooden and plastic posts. Metalposts can very easily short the fence voltage to ground in case of brittled insulators and high peak voltages. The distance between the posts can vary between 4 - 10 m, depending on the wire weight. Parts of the electric fence intended to be handled must be insulated, e.g. gate handle. Fence wires and connecting leads shall not be in contact with metal parts not belonging to the electric fence such as railings of a bridge. Fence wires and connecting leads shall not be fixed to poles used for low-voltage, high-voltage, telephone or telegraph lines. When installing electric fences the national safety regulations must be respected.

How to avoid radio interference
Faulty connections on the fence can cause radio and TV interferences. Knot connections and wires loosely put onto eachother are critical as the supplied voltage causes sparks. This may occur especially with poly wire and polytape. The horizont tape connector is an adequate mean to avoid sparks. Control: walk along the fence with a radio - faulty connections cause crack sounds. In the darkness sparks become visible.

Fence installation
Fence wires and connecting leads shall be adequately supported on insulators of electrially and mechanically reliable material. Insulators must be placed in such a manner that fence wires and connecting leads maintain a distance of at least 3 cm to structural parts, pipes, wires and comparable parts. Connecting leads to electric fences for domestic and wild animals shall not be laid into or through buildings or places where there is a risk of fire (barns, stables etc.).