

OLLI

FENCING GUIDE



OLLI
**WINTER FENCING
GUIDE**

**INCLUDES ALSO
WINTER FENCING
GUIDE**

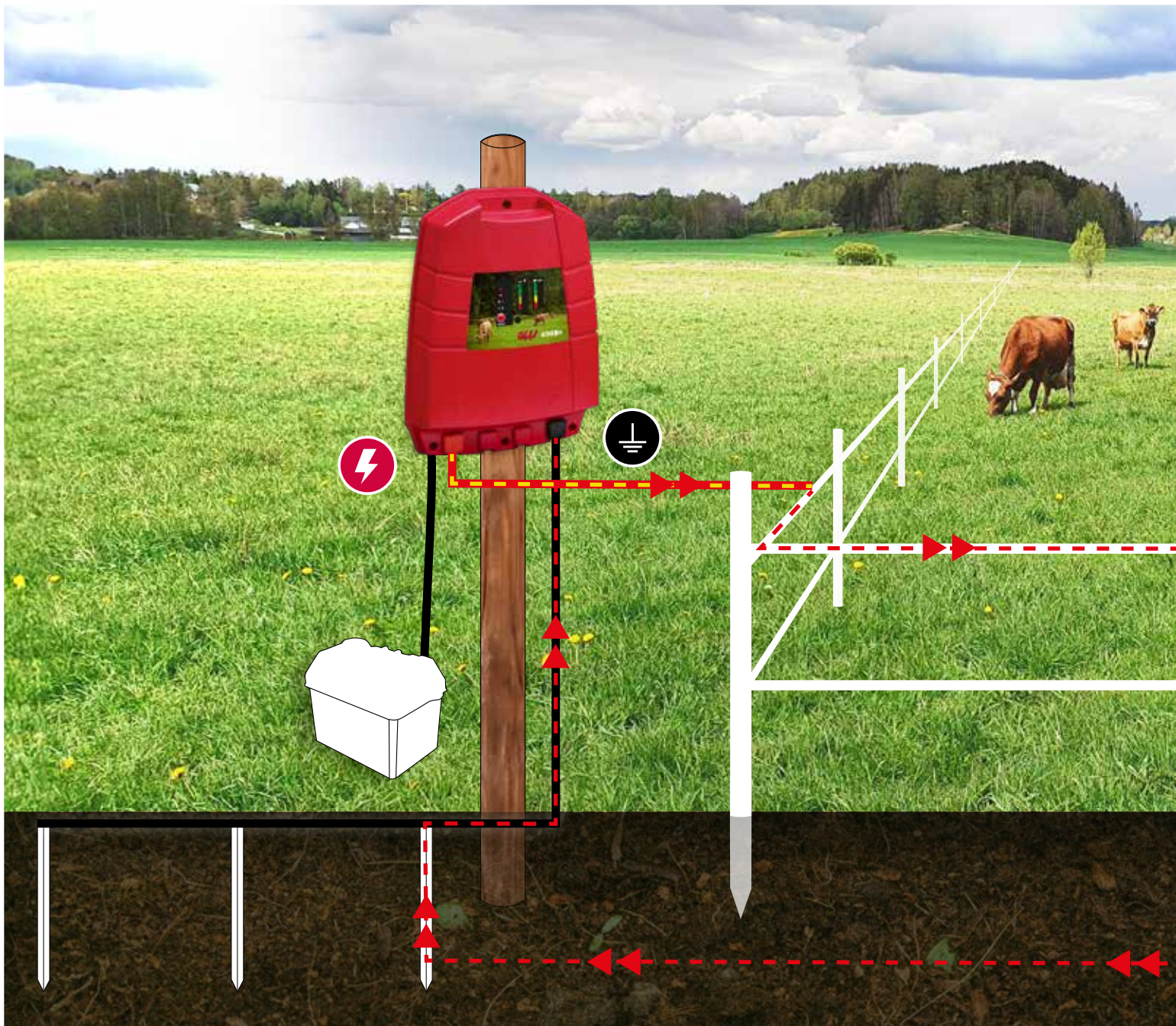
**TAKE IT
ALONG
TO READ**





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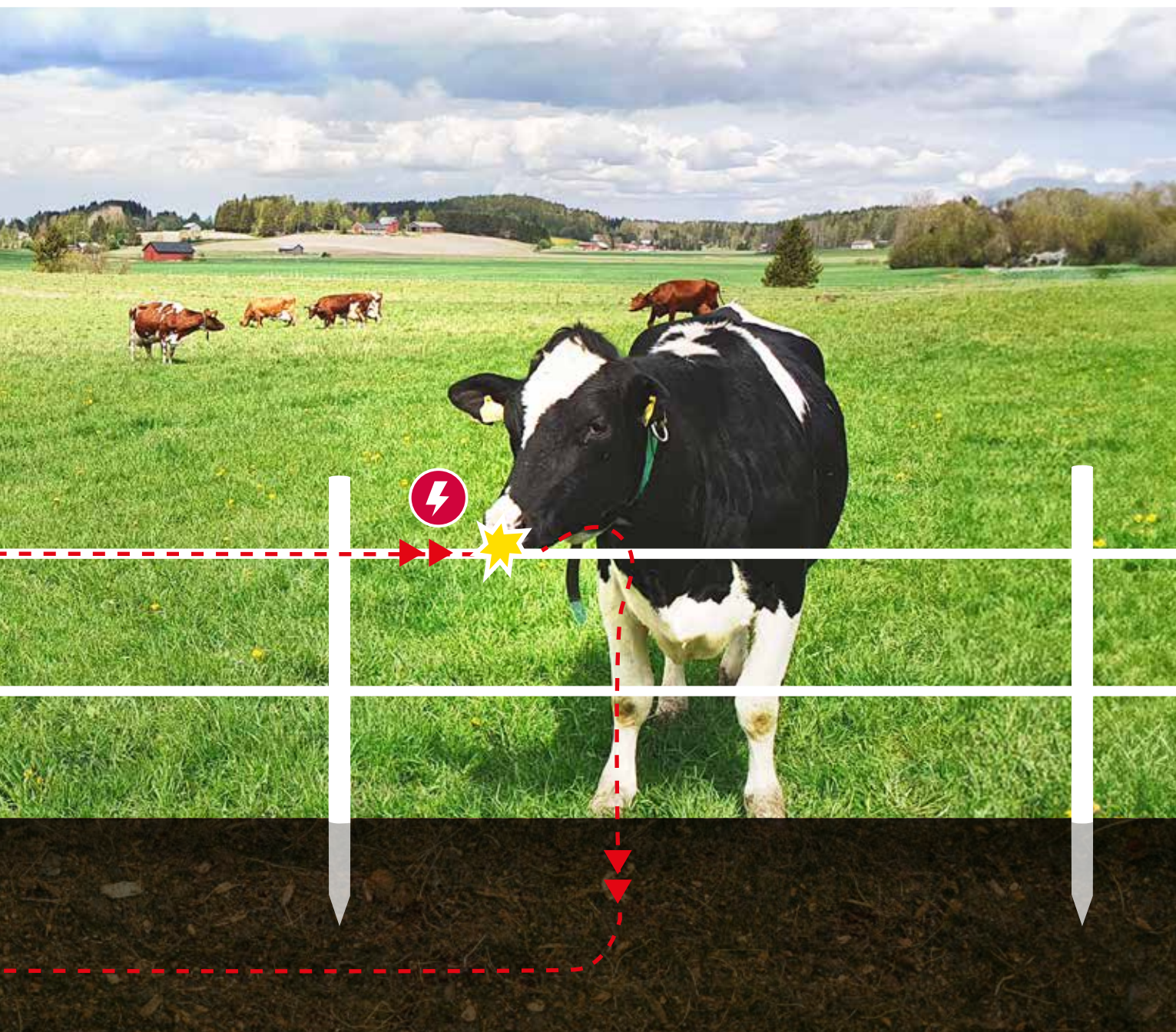
THIS IS HOW AN ELECTRIC FENCE WORKS

WHAT IS REQUIRED FOR A SHOCK?

When an animal touches the electrified fence, electricity passes from the fence through the animal into the ground, through the ground to the earthing rods, and through the earthing rods back to the energiser, giving the animal a shock on the way. So, a circuit is formed.

The shock is therefore not caused by the animal touching the electrified fence, but only when the electricity flows back to the energiser.

If the electric circuit between the animal and the ground is interrupted for some reason, the animal will not receive a shock, even if the energiser functions in the manner intended.



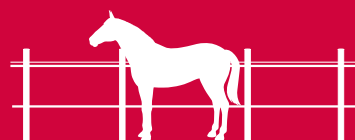
DID YOU KNOW that an electric fence does not need not be a loop? You can electrify a straight fence or a fence of any shape.

DROUGHT, SNOW AND ICE WEAKEN CONDUCTIVITY

In good fencing conditions, earth is suitably moist and conducts electricity well. However, the flow of electricity between the animal and the earth can also be interrupted in very dry conditions or on rocky terrain, or if a section of the fence is, for example, covered with asphalt or concrete.

Snow, ice and frozen soil are also efficient insulators. In winter, electricity cannot pass from the animal's feet into the ground through the snow and ice as easily as when the ground is not frozen.

Thus, even if the energiser functions flawlessly, in the situations described above, the animal does not receive the same shock when it touches the fence as it would under optimal fencing conditions.



A fence assembled in accordance with the winter fencing instructions is a functional solution not only for winter, but also for dry or rocky conditions. Since in these situations the normal return of electricity to the energiser through the ground is prevented, a separate return path for the electric current to the energiser has to be arranged, for example in the form of a two-wire fence or a winter fence tape. For instructions see the winter fencing section of this guide.

2

FENCE ENERGISERS

HOW TO CHOOSE A FENCE ENERGISER

Many things affect the choice of a fence energiser. It is not always necessary to choose the most powerful energiser.

An energiser is suitable when it is appropriate for the specific purpose for which it is to be used.

A fence is always just as strong as its weakest link.

A fence should always be considered as a whole. The fence energiser is only a part of this whole. It is advisable to bear in mind that even the best energiser cannot save the whole if the fence itself is substandard – or vice versa.

The functionality of a fence always depends on all factors, such as the length of the fence, the fence conductors used, i.e. the wires, ropes or tapes, insulators and connections, the vegetation contacting the fence, and the functionality of the earthing. **When the whole works, the fence works.**

TO BE CONSIDERED WHEN CHOOSING A FENCE ENERGISER

- 1 Available power source
- 2 Fence size
- 3 Materials used in the fence
- 4 Animals fenced
- 5 Fence condition and fencing conditions

1 Available power source

A **mains energiser** is an option if mains power is available and there is no need for moving the energiser. If you need a heftier shock, you will find the most powerful Olli energisers from our range of mains energisers.

A **battery energiser** is the right choice when there is no mains power available or when the energiser needs to be moved, for example, between pens, fences or pasture parcels. Some battery energisers may also be operated on mains power using an adapter.

A **solar panel energiser** is an easy-care solution in case of fences located far from your farm. The solar panel reduces the need to charge the battery, as the panel handles the charging.

2 Fence size

The fence always puts a load on the energiser. The longer is the fence, the greater the quantity of fence conductor strands and the thicker vegetation leaning on the fence, the higher is the load. For this reason alone, a sizer fence needs a more powerful energiser than a small

fence. An energiser with too low a power rating for the size of the fence will not be able to maintain sufficient voltage along the entire length of the fence.

The energiser's product information indicates the maximum theoretical length of the fence for which the energiser is suitable. When calculating the length of a fence, remember to add up all fence conductor strands.

3 Materials used in the fence

The fence conductor – in other words, the fence wire, rope, or tape – plays a crucial role in the functioning of the fence. The purpose of the fence conductor is to convey electric current in the fence as good as possible.

If fence conductors with low resistivity are used in a fence, electricity flows well through the fence. Even the most efficient energiser will not be able to raise the voltage sufficiently high in every corner of the fence if the fence conductor excessively blocks the flow of current.

Therefore, in a long fence, in addition to a powerful energiser, fence conductors conducting electric current well (i.e., of low resistivity) are always required.

4 Animals fenced

The animals to be fenced set certain restrictions on the energiser to be acquired. The energiser must not be too powerful for the animals fenced, but a low-power energiser will also not serve its purpose, allowing the animals to escape.

In addition to the size of the animals fenced, their individual differences should be taken into consideration. Some have

more respect for the fence, while others need a snappier shock to stay on the right side of the fence. Thick coat and blankets may also increase the need for a more powerful shock.

5 Fence condition and fencing conditions

A fence in poor condition weakens the flow of electricity. Over the years, dirt, moss and other vegetation accumulate on fence conductors and metal strands breaking over time weaken the flow of electricity in the fence.

Poor or recklessly made connections and extensions add to the problem, as do broken insulators and vegetation contacting the fence.

Inadequate or incorrect earthing is the most common cause of poor fence efficiency. In good fencing conditions, the soil is moist enough and conducts electricity well, as opposed to dry or rocky soil or asphalt or concrete pavement, for example.

To achieve optimal fence functionality even in these challenging conditions, a separate return path for electric current to the energiser has to be arranged. In such cases, a fence built in compliance with the winter fencing instructions is a functional solution.

FIND OUT
MORE ABOUT
OLLI ENERGISERS





MAINS ENERGISERS

The most powerful mains energiser

Olli Protector 11



11 J

The most powerful Olli fence energiser ever! Powerful 11 J output energy that keeps even the most stubborn animals on the right side of the fence. The high-performance and modern smart energiser constantly monitors the condition of the fence and adjusts its power as necessary. The fence energiser limits its shock, for example, when a tree, an animal or a person falls on the fence. Perfectly suited for long fences and wooded paddocks.

Olli 1000



4.5 J

The powerful energiser delivers a wide shock of 4.5 J. Versatile, backlit graphic display for continuous monitoring of the fence condition. The energiser constantly measures the earthing and the fence voltage. The output energy is automatically adjusted to the load. This energiser is suitable for those who want to easily see the condition of their fence at a glance.

Olli 950



4.8 J

A powerful and easy-to-use basic fence energiser for more challenging use. Potent 4.8 J output energy is enough to electrify even a long fence. InfoLED light warns of a drop in fence voltage. Good price-performance ratio. Keeps animals efficiently on the right side of fences.

Olli 600



3.8 J

A reliable basic energiser with medium-level 3.8 J output energy. A reliable mains energiser also for varying fencing conditions. The power level is suitable for medium to long fences and for fencing in horses and farm animals, for example.

Olli 300



2.8 J

A medium-power, easy-to-use basic mains energiser with 2.8 J output energy. Best suited for slightly shorter fences and, e.g., for fencing in horses and cattle.

Olli 100



1.2 J

Olli's lowest-power mains energiser for short fences. Output energy 1.2 J. Suitable for straightforward fencing conditions where the fence can be kept clear of, e.g., branches and grass reaching the fence.

TIP: A retrofitted solar panel kit is available for Olli 9.07B, 122B, 250B+ and 450B+ models.

BATTERY AND SOLAR PANEL ENERGISERS

The most efficient battery energiser

Olli 450B+



3.0 J

Olli's most powerful 12 V battery energiser, 3.0 J output energy. A versatile energiser for longer fences or when a stronger shock is needed. 4 different operating modes, an informative LED display, fence condition monitoring, battery voltage monitoring and deep discharge protection. Solar panel available as an option. Wall or post-mounted model.

Olli 250B+



2.0 J

A versatile 12 V battery energiser, 2.0 J output energy. Low power consumption compared to its power. 4 different operating modes, an informative LED display, fence condition monitoring, battery voltage monitoring and deep discharge protection. Solar panel available as an option. Wall or post-mounted model.

Olli 180B



1.4 J

Basic battery energiser, 1.4 J output energy. Wall or post-mounted model, powered by a 12 V battery. Suitable for fencing wide range of animals. Low power consumption. Deep discharge protection protects the battery and extends its service life. Wall or post-mounted model.

Olli 122B



1.21 J

Olli's most versatile battery energiser, which can be used with mains power, solar panel and batteries. Automatically selects the optimal energy source. 1.21 J output energy. Includes a mains adapter. Solar panel available as an option. Mounting on a wall/post or on an optional earthing spike.

Olli 9.07B & Olli 9.07S



0.71 J

9.07B is a 9 V battery energiser, which can also be connected to a 12 V battery. Includes a mains adapter. Available with solar panel option. The **9.07S** model also includes a 12 V battery and a 6 W solar panel. Suited, e.g., for electrifying fences for rotational pasture parcels.

Olli SG3



0.3 / 0.125 J

The smallest and the least powerful model in the Olli family for fencing small animals and areas. Output energy 12 V battery 0.3 J; and 0.125 J when powered by batteries. The energiser can be handily attached to an earthing rod available separately.

Solar panel available as an accessory



TIP!

It is a good idea to have a spare energiser in case the fence energiser in use malfunctions, for example, as a result of a lightning strike. If you use a mains energiser, a battery energiser intended, for example, for summer pastures make a good backup energiser – you can use it to electrify the fence even during longer power outages. An old, decommissioned energiser can be kept as a backup energiser, and even defective units can in most cases be repaired. It is always a good idea to request a maintenance and cost estimate for reconditioning of an old Olli energiser.

THE OPERATING PRINCIPLE OF AN ELECTRIC FENCE

VOLTAGE

There is no continuous, uninterrupted electric current in an electric fence, instead the energiser supplies electrical pulses to the fence with the interval of just over a second. For safety reasons, the pulse is very short, typically under a thousandth of a second. Fence voltage refers to the highest instantaneous pulse voltage that can be measured with a fence voltage tester. The unit used is volt (V).

In a short fence in good condition, the voltage can reach 10,000 volts, for example. For comparison, the respective figure for an AA battery is 1.5 volts. You can safely touch an AA battery with bare hands without electric shock, as the voltage is so low that no electric current passes through the skin.

The voltage generated by a fence energiser is clearly higher, since the objective is to make sure that when an animal touches the fence, electric current will flow even if the animal is thick-haired and thick-skinned and most of the voltage is lost on the way to the fence conductors. Therefore, sufficient voltage allows the current of the fence energiser's electric pulse to pass through the animal, giving it a shock.

ENERGY

A fence energiser is supplied from the mains, or battery, and accumulates energy before discharging it into the fence in pulses at just over a second.

The technical specifications of fence energisers generally specify the maximum output energy. The unit used is joule (J). Maximum output energy indicates the shock intensity, i.e., the maximum energy the fence energiser is capable of delivering to the fence in a single pulse. The more energy there is, the longer is the fence which the fence energiser is able to supply with sufficiently high voltage. The higher the energy, the longer and the more perceptible the shock. On the other hand, higher energy means higher power consumption, which in battery powered devices means the need for more frequent charging.

However, keep in mind that even the most powerful energiser will not be able to increase the voltage high enough if the fence conductor excessively interferes with the flow of the current. Therefore, a long fence always requires fence conductors that conduct current well, i.e., have low resistance.

Energiser accessories



Lightning protector for fence energisers



Electric fence warning sign



20 W solar panel kit for energiser models Olli 122B, 250B+ and 450B+



Olli Digitester+



Olli Supertester+

SEE ALL ENERGISER ACCESSORIES ►►



Olli energiser service – peace of mind for years

Comprehensive warranty, maintenance, and spare parts stock

All Olli energisers come with a 3-year warranty that also covers damages caused by lightning. We guarantee availability of spare parts for many years to come, including for discontinued models. Olli energisers can be serviced at our factory service shop as well

as at dozens of authorized Olli contract service shops across Finland.

Contact us!

Farmcomp Oy, Jusslansuora 8,
03460 Tuusula, Finland
info@farmcomp.fi | +358 (0)9 7744 970
Mon–Fri: 9 AM–3 PM | www.oli.fi

Note! The warranty does not cover defects caused by incorrect installation. So please read the user manual carefully.

3

CHOOSING A BATTERY FOR THE ENERGISER



CHOOSING THE RIGHT BATTERY SIGNIFICANTLY PROLONGS ITS SERVICE LIFE

Battery tips in a nutshell:

1. Instead of a vehicle starter battery, choose a leisure battery to run the energiser.
2. Charge batteries as soon as they become half-full.
3. Remember to charge a battery regularly even when not in use.
4. In winter, do not store batteries in unheated premises.

Leisure batteries are better suited for running a fence energiser than starter batteries

We specifically recommend using leisure batteries as an energiser's power source. They are suited better as energiser power sources than vehicle starter batteries for a number of reasons.

⚡ Firstly, leisure batteries can be discharged to a fairly low level over a long period of time without their capacity suffering. After all, this is how an energiser is mostly used: quite often, it just waits there at the edge of a pasture and is charged only when the power runs low.

⚡ Secondly, a good leisure battery can provide up to twice the operating time on a single charge in low-current operation compared to a vehicle starter battery of the same size. When used in an energiser, its service life is always longer than that of a comparable starter battery.

The batteries intended for solar panel use are the best choice for solar panel energisers.

Starter batteries

Starter batteries, on the other hand, have been made for momentary supply of high current and should be kept fully charged at all times. Because of this, they are ill suited as a power source for energisers. In practice, a vehicle starter battery can, of course, be used with energisers, but in this case, it is good to bear in mind that using a starter battery for low current supply over a very long period of time will cause internal destruction of the battery (so-called sulphation).

If the vehicle starter battery is discharged too deep-ly, it could be damaged to the point where recharging could become impossible. Furthermore, starter batteries self-discharge quickly, sometimes even faster than the power consumption of a low-power electric fence energiser. In order for a starter battery to last as long as possible, it needs to be charged well before it becomes discharged, at least every month (so-called maintenance charge). The service life can also be extended by using a smart battery charger that performs battery maintenance during the charging process.

Do not forget to charge batteries even when they are not in use

A battery also needs charging when the energiser is not in use, to prevent battery damages caused by self-discharge. Even though storage in a cool place is good for a battery, in extreme cold, the battery can be destroyed by freezing (the lower the charge in the battery, the more likely this is to happen). Therefore, in winter, batteries should not be stored in completely unheated premises. Batteries do not like heat either: excessive heat causes batteries to age.

Do not forget to charge batteries even when they are not in use

Even though Olli battery energisers feature a deep discharge protection function that protects the batteries from being completely discharged, the service life of batteries used in energisers can be extended considerably by charging them regularly before the energiser's deep discharge protection cuts off the power. Self-discharge and low battery sulphation also affect leisure batteries, but to a clearly lesser extent as compared to starter batteries. Therefore, to maximise

the service life, leisure batteries should also be charged as soon as they become half-full.

What should the battery capacity be?

How do you know how long a battery will last? It depends on:

a) the battery capacity

(stated in ampere-hours, Ah)

b) the power consumption of the energiser

(stated in milliampere-hours mAh, the respective information can be found on the energiser's packaging and on the Olli website under the data of the respective energiser).

The maximum battery life (in hours, h) can be estimated as follows:

Divide the stated battery capacity (e.g., 60 Ah = 60,000 mAh) by the energiser's stated power consumption (e.g., 100 mA): 60,000 mAh / 100 mA = 600h = 25 days.

In many energiser models, the power consumption varies depending on the energiser's power setting and/or the fence load. Naturally, this also affects the battery service life.



Make sure that the energiser and its battery are always placed so that they are out of reach of animals and never come into contact with water.

It is also a good idea to protect the battery using a battery box designed for this purpose. These boxes can be purchased at the same places as batteries and the most affordable ones only cost about a tenner or two.

4

ASSESSING THE CONDITION OF A FENCE

ASSESSING THE CONDITION OF AN ELECTRIC FENCE

Assessing the condition of the electric fence requires a systematic approach. This way it is possible identify the root cause of the problem: whether it lies with the energiser or the fence – or perhaps in between.

If there is a problem with the flow of electric current in the fence, it is worth doing some basic checks first.

1. Is the energiser powered on and does it appear to be functioning?
2. Does the fence look intact?
3. Are the gates closed?
4. Is it summer and the conditions are really dry?
5. Has the grass grown so tall that it is touching the fence?
6. Is it winter and is there snow and ice on the ground?

THE TIME OF YEAR

The time of year matters: if the fence has not been built according to winter fencing instructions, it is normal that in winter the performance of the fence is weaker due to the insulating properties of snow, ice and ground frost. The same happens in the summer where the soil is parched.

Such problems caused by winter or drought can be easily fixed either by installing a properly built **TWO-WIRE FENCE** or by using **WINTER FENCE TAPE** (and using

it correctly). You can find instructions for the above in the **Winter Fencing Guide section on pages 30–35**. In summer, problems caused by drought can also be resolved using winter fencing methods. However, watering of the earthing system could bring the quickest relief.

In order to check the condition of the electric fence not just visually, you need a fence tester. With the fence tester, you can both test the performance of the energiser as well as measure the voltage of the fence.

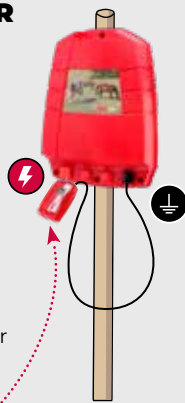
Now, it is time to examine the fence. Here it is advisable to apply the systematic approach. ►►

1. First, test if the energiser works.
2. Check the connector wire between the fence and the energiser.
3. Check earthing.
4. Check the fence itself: fence conductors, connections and insulators.



1 ▶▶ FIRST, TEST IF THE ENERGISER WORKS!

If the fence seems to function poorly, always test the energiser first. This way, you can avoid circling the entire fence and checking each fence conductor (in other words, fence wire, rope or tape), insulator and connection only to find out that the energiser is out of order.



Olli Digitester+

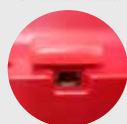
This is how to test the functioning of the energiser

1. Turn off the power to the energiser. Disconnect the energiser from the fence and earthing. Turn the power back on.
2. Using a fence tester, measure the voltage between the energiser's shock terminal and earthing terminal. Set the tester's measuring sensor to the energiser's shock terminal and the earthing rod to the earthing terminal. If the voltage is close to the "maximum voltage, U_{max} " value specified by the manufacturer, the energiser is in order.

If the energiser is working properly, move on to checking the flow of electricity to and in the fence.

2 ▶▶ CHECK THE CONNECTOR WIRE BETWEEN THE FENCE AND THE ENERGISER

First, make sure that the connector wire between the energiser and the fence is in place, and that it has not come loose from the energiser or the fence. Also check that the connector wire from the earthing rod is connected to the energiser's earthing terminal.



Shock terminal of Olli energiser, pushbutton model



Terminals of Olli energiser, screw-fastened model

This is how connector wires are attached to the terminal in the pushbutton model:

1. Press down the button of the energiser's terminal.
2. Carefully insert the cable (do not force the cable in, as this could break the connector inside the terminal).
3. Release the button to connect the cable to the energiser's terminal.

In case of screw-fastened models, check that the connection has not become loose and the fence connector cable has not detached from the energiser.

This is how to measure voltage from a fence connector cable

1. Disconnect the fence connector cable at the fence-side end.
2. Insert the earthing rod into the ground.
3. Touch the fence-side end of the fence connector cable with the fence tester's measuring sensor.

If the voltage reading is significantly lower than that measured at the energiser, the problem lies in the fence connector cable or earthing – or in both.

Causes of a poorly functioning fence connector:

⚡ A wire, other than the fence connector cable delivered with the energiser, has been used as the fence connector cable.

⚡ If the fence is far from the energiser and power has been brought to the energiser with a standard electrical installation cable, its power is insufficient to withstand the voltage generated by the energiser, up to over 10,000 volts.

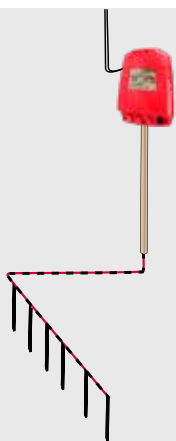
⚡ Electricity can escape from a standard electrical installation cable, causing a voltage drop. If the voltage drops before it reaches the fence, the fence cannot deliver a proper shock. Low voltage = weak shock.

Make sure that you use a high-voltage cable designed specifically for energisers.

If the connector wire between the energiser and the fence has been found to be functional, move on to checking the earthing next.

3 ▶▶ CHECK EARTHING

Inadequate or incorrect earthing is the **most common cause of poor fence performance**. Earthing plays a crucial role in the performance of an electric fence.



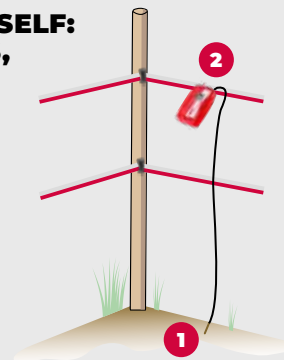
It is not worth skimping on earthing

- ⚡ Earthing rods costing just over a tenner are not the right place to save money. There cannot be too many earthing rods; better have some extra than too few.
- ⚡ If the fence is located in an area where the ground conducts electricity poorly (for example, the ground is dry, rocky or paved), the viable solution, even in summer, is a fence that is built according to the winter fencing instructions, where a separate return path for the electricity to the energiser is arranged.
- ⚡ **By adjusting the earthing to make it compliant with the instructions and functional, it is possible to fix many problems related to poor performance of the fence.**

Read more about common earthing problems and their solutions in the following section. ▶▶

4 ▶▶ CHECK THE FENCE ITSELF: FENCE CONDUCTORS, CONNECTIONS AND INSULATORS

Often, the same energiser is used to supply voltage to protect several pens, and even some pastures. In this case, it is advisable to inspect the fence circuit by circuit. For example, if you disconnect a pasture circuit from the rest of the fence and the problem goes away, you will know that the problem is in that particular circuit.



1. Push the fence tester's earthing rod into the ground.
2. Touch the fence with the tester's measuring sensor. The meter shows the voltage in your fence.
3. Test each fence conductor strand separately.
4. In a winter fence tape, test the voltage between the shock and the earthing wire bundles: touch the tape's shock wire bundle with the tester's measuring sensor and the earthing wire bundle with the earthing rod.

If fence voltage is low, a more detailed examination of the fence should be carried out. Therefore, systematically go through the entire fence, checking the condition of fence conductors, connections, and insulators. For example, if the fence conductor is in contact with a metal post at a single location along the fence, the fence voltage (and the resulting shock) may drop substantially.

5

EARTHING

THE SIGNIFICANCE OF EARTHING

Inadequate or incorrect earthing is the most common cause of poor fence performance. By adjusting the earthing to make it compliant with the instructions and functional, it is often possible to fix many problems related to poor performance of the fence.

An animal touching the electrified fence receives a shock when the electricity passes from the fence through the animal into the ground, through the ground to the earthing rods, and through the earthing rods back to the energiser. If electricity cannot return to the energiser, there will be no shock.

Therefore, the function of the earthing rods is to provide a path for electric current from the ground back to the energiser. The more reliable this path is, the more likely is the fence to deliver a shock.

Adding earthing rods and improving earthing conditions makes it easier for electricity to reach the energiser and may greatly improve the functioning of the fence.

COMMON CAUSES FOR INADEQUATE EARTHING



1

Incorrect placement of earthing rods; for example, in dry macadam under the eaves of a building.

Dry earth is a poor conductor. Dry areas located under the eaves and covered in macadam are a good solution for the building, but a poor choice in terms of electrical conductivity. Also, the earthing rods should be placed at least 10 meters away from residential and farm buildings, since other earthed systems, such as parts of the electrical and water supply networks, are generally located in such buildings.

If there is no suitably moist area for earthing near the energiser, the earthing rods can also be placed away from the energiser. Earthing rods can also be located in several places. We recommend using Olli high voltage cable designed for energiser use to connect remote earthing fields to the energiser.

5

Bad connections in the wire connecting the earthing rods to the energiser.

Poor connections can prevent the return of electricity from the earthing to the energiser. In such cases, there will be no shock. Use screw connections to ensure sufficient contact.

2

Take notice of dry, rocky or stony ground or areas next to the fence which are paved or covered with concrete, rock or otherwise poorly conductive material.

In addition to dry ground, rock, asphalt, and concrete also conduct electricity poorly. Watering temporarily dry soil improves the contact between the earthing rods and the ground. But for permanently dry conditions, we recommend building the fencing according to the winter fencing instructions, in which case a separate return path for electric current to the energiser is arranged, either in the form of a two-wire fence or a winter fence tape.

3

Earthing rods not buried deep enough.

If an earthing rod is not buried completely under the soil, some of its capacity will remain unused. Generally, the deeper you dig, the more likely the soil is to be moist, and for this reason as well it is advisable to cover earthing rods with ground along their entire length. Last but not least, there is the risk of stumbling over earthing rods sticking out of the ground and getting injured.

6

Insufficient quantity of earthing rods in relation to the energiser power and the size of the fence.

The more powerful the energiser and the longer the fence, the more current can flow through the fence and the earthing. If the fence conductors or earthing are not capable of conducting higher currents, the full benefit of a more powerful energiser will not be achieved. The electrical conductivity of earthing can be improved by expanding the size of the earthing field, i.e., by increasing the number and/or quality of earthing rods.

4

Wrong earthing rod material, e.g., one prone to corrosion.

Rebars or other corroding materials are a poor choice for earthing rods, as rust insulates and prevents the flow of electricity.

There cannot be too many earthing rods. Better some extra than too few.



- Olli earthing rod
- Hot-dip galvanised
- Length 1 m
- L profile sharpened at the end
- Includes 3 m connector wire with mounting screws



EARTHING ROD INSTALLATION

Efficient earthing of the fence energiser requires a sufficient number of earthing rods. Depending on the length of the fence and the power of the energiser, 1–6 earthing rods are usually needed. In dry conditions and with long fences, it might be necessary to use more earthing rods than recommended. **There cannot be too many earthing rods; better have some extra than too few.**

The best place for an earthing rod is moist soil or loam – for example, a ditch bank. Bury the earthing rods completely in the ground. Only the wire connection at the top of the rod should be left above ground; this makes it easier to check the condition of the connection. Place the earthing rods at least one meter apart, preferably even further. The wider the earthing field, the more likely it is that there are some damp soil patches in the area. If the soil is completely dry, regular watering of the earthing point will improve the earthing contact with the ground. For permanently dry conditions, we recommend building the fence in accordance with the winter fencing instructions, in which case a separate return path for electric current to the energiser is arranged, either in the form of a two-wire fence or a winter fence tape.

The current in the electric fence flows from the energiser to the fence conductors, passes into the soil through the animal touching the fence, runs through the soil to the earthing rods and from there through the earthing

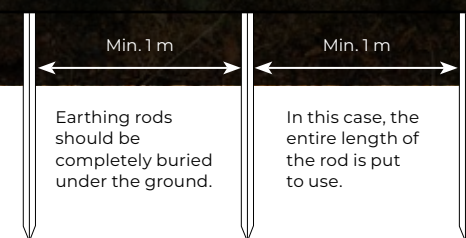
conductor back to the energiser.

To prevent interference caused by the current flowing in the ground, the earthing rods should be placed so that there are no structures between the fence and the earthing rods. If necessary, the earthing rods can be installed at a distance from the energiser using a high voltage cable.

The earthing rods should be placed at least 10 meters away from other earthed systems, such as parts of the electrical or water supply network. Since these are commonly found in residential buildings and other facilities, the safety distance should be measured away from the building's plinth, avoiding wells and power supply and telecommunications system lines.

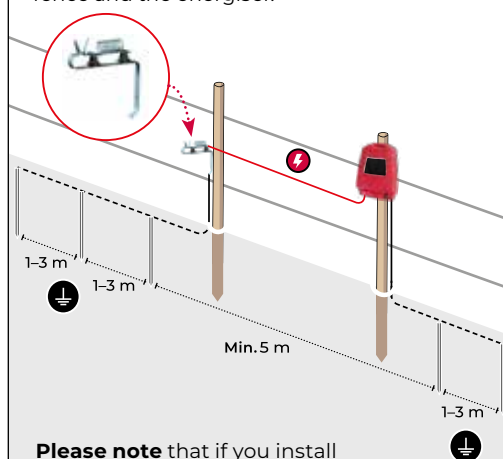
It is a particularly bad idea to connect fence earthing by a wire to the protective earth of the electrical network, as it causes interference with electrical and telecommunications equipment. A lightning conductor intended for protection of other systems is also not intended to be used as earthing of the energiser.

The diameter of the earthing conductor must be at least 1 mm and it must always be connected to the earthing rods by screw joints to ensure adequate contact. Olli earthing rods are supplied with a 3 m connector wire and mounting screws. If the length of this earthing conductor is insufficient, we recommend using Olli high voltage cable designed for energiser use.



LIGHTNING PROTECTOR EARTHING

A lightning protector protects your energiser against lightning strikes conveyed by the fence by diverting the lightning into the ground before it reaches the energiser. It is installed between the fence and the energiser.



Please note that if you install a lightning protector, it will need its own earthing rods. The lightning protector should always have more rods than the energiser, and no less than 3. Therefore, if the number of earthing rods recommended for the energiser is five, then you need six rods for the lightning protector.

DID YOU KNOW? If there is no suitably moist area for earthing near the energiser, the earthing rods can also be placed away from the energiser. Earthing rods can also be located in several places. We recommend using Olli high voltage cable for connecting remote earthing fields to the energiser.



FENCE CONDUCTORS

THE TASK OF FENCE CONDUCTORS

The task of the fence conductor, in other words, fence wire, rope or tape, is to conduct electric current in the fence and to pass it to animals touching the fence. **The lower the resistivity (Ω/m) of the fence conductor, the less it resists the flow of electricity, i.e. the better it conducts electricity.** To ensure the best performance out of the energiser, the fence conductor should conduct electricity as well as possible.

A fence is always a whole, all parts of which affect each other. The list of factors influencing the choice of the fence conductor is very similar to that considered when choosing the fence energiser. Even though good electrical conductivity is the most important feature of a fence conductor, it is not the sole basis for choosing the fence conductor.

To be considered when acquiring fence conductors:

- Is the fence to be built intended for long-term/year-round use or only temporary use?
- What is the size of the fence being built?
- How much fence maintenance and repair works are you prepared to carry out in the future?
- What are the prevailing conditions in the area where the fence is located?
- For what kind of animals is the fence intended?

FENCE SIZE/USE

Both the size of the fence and its period of use (e.g. temporary or year-round fencing) have a significant impact on the choice of fence conductors: the larger and more permanent the fence, the more important it is for the fence conductors to have good electrical conductivity (i.e., low resistivity) and durable quality.

Choosing high-quality, highly conductive fence conductors that are resistant to seasonal changes not only facilitates the flow of electricity, but also reduces the need for future maintenance and repairs to the fence.

FENCING CONDITIONS

Is the fence to be located in an area where there is typically snow and ice in winter? Is the soil rocky or very dry in summer? In all such cases, it is advisable to build a year-round fence according to the winter fencing instructions, ensuring that a separate return path for electric current is arranged to the energiser, for example in the form of a two-wire fence or winter fence tape. This way,

functionality of the electric fence can be ensured regardless of the season.

Fencing conditions also affect the width of the fence conductor you choose. Wide fence tapes can be used to create a fence that is more visible and stands out more clearly from the background than one consisting of thin conductors. On the other hand, the wider the fence conductor, the more susceptible it is to snow, ice, and wind load stretching the fence tapes. Wide fence tapes may need cleaning from insulating snow more often than thin conductors.

Pay attention to vegetation as well: grass or tree branches hitting the fence always put a strain on the energiser, lowering the voltage. If there is no risk of an animal escaping from under the fence, the lowest conductor could be placed at a height where undergrowth cannot reach it. Otherwise, regular mowing of the vegetation must be ensured.

Tip! The bottom conductor strand should also be built so that, if needed, it is easy to disconnect power from it if it comes into contact with vegetation or snowdrifts. This can be efficiently realised, for

example, with a high-voltage circuit switch for fence.

ANIMALS FENCED

The height of the fence and the number of fence conductor strands depend on the animals fenced. The larger the animals, the higher the fence required. A fence is of appropriate height when animals cannot escape over, under, or through it.

It is also worth considering how well the animals being fenced respect the fence; for some, one thin fence conductor strand is enough, while others require a fence with several strands of fence tape visible from far away.

It is also possible to assemble a fence using different fence conductors in different strands of the fence. This way, it is possible to utilise the best qualities of different fence conductors: for example, use wide fence tape or thick rope for improved fence visibility, metal conductor for top-notch electrical conductivity, and thinner and often less expensive fence conductor for reduced snow and wind load.

SHOCKTEQ™



In the Olli fence conductor family, Shockteq products are particularly durable and therefore ideal for year-round, permanent fences. The products can be identified by the product label.

FENCE CONDUCTOR QUALITY IS PARAMOUNT

In order to understand the importance of the role of fence conductors, it is worth to take a closer look at how electricity flows in the fence.

The fence energiser generates a fence pulse about once per second. In case of a high-power energiser, the pulse is longer than that of a low-power one, but for safety reasons the pulse is always very short, typically less than a thousandth of a second. In this short time, electricity must reach even the farthest corner of the fence.

Electricity travels at approximately the speed of light, so it won't be a problem, but the conductivity of fence conductors, the number of conductor strands, and the length of the fence greatly affect the heights that the voltage level reaches during the pulse at different points of the fence. In addition, vegetation contacting fence conductors and defective or damp insulators leak current from the fence conductor to the earthing.

The purpose of the fence conductor is to conduct electricity in the fence. Even if there are no vegetation-related leaks, fencing always induces a load for the energiser. The longer is the fence and the greater the quantity of fence conductor strands, the higher the load. For this reason alone, a long fence requires a more powerful energiser. However, a more powerful energiser is of no use at all if the fence conductor does not fulfil its function, i.e., conduct electricity well enough. As the voltage increases, a more powerful energiser may even add to problems if the fence itself is not in a good condition.

It is therefore advisable to use fence conductors with low resistivity in a long fence. Otherwise, the conductor will slow down the voltage rise at the farthest point of the fence so much that during a short pulse the voltage does not have time to rise high enough. Replacing the energiser with a more powerful one does lengthen

the pulse and can help a little, but often not enough.



For a better idea, imagine that a high-performance energiser is a water bucket from which water is splashed into a hose, i.e., fence conductor at the moment of each pulse. If the hose is a municipal grade water main pipe (a steel fence wire, for example), all of the water splashed will happily flow away.

However, if the hose is a drinking straw (the cheapest fence conductor purchased from a discount store), the water splashed is mostly spilled and only the amount passing through the straw reaches the fence. When dripping water from a drinking glass (that is, a smaller energiser), the straw will do its job – that is, if the fence is short.

EVEN FENCE CONDUCTORS NEED MAINTENANCE

Fence conductors of not just poor quality, but also of poor condition reduce fence functionality. Although the service life of high-quality fence conductors intended for year-round use is long, they do not last forever: there will inevitably come a time when they need to be replaced.

Over the years, dirt, moss and other vegetation accumulating on the fence conductors and metal conductors that break over time (i.e., the very conductors of electricity) weaken the flow of electricity in the fence. Moreover, if fence extensions and connections have been made carelessly, for example, using knots, in which the metal conductors of the fence conductor are not in proper contact and generate sparks, it is difficult for the electricity to flow smoothly in the fence.

Fence conductors also require tensioning from time to time: temperature fluctuations, snow and ice accumulating on the conductors, animals colliding with the fence, etc. cause the fence conductor to stretch over time. Hanging conductors could contact each other and generate sparks, which, over time, will burn the conductor through. If metal posts have been used in the fence, a loosely hanging conductor may contact them and cause voltage drop in the entire fence.



WINTER FENCE TAPE

NEW, 20 mm!



NEW!

Green-and-white Fence Tape 12 mm, basic-quality, 200-meter roll



Polyethylene (PE) highly resistant to UV radiation is used in high-quality fence conductors.

See steel wires and ropes on p. 16. ▶

6

FENCE CONDUCTORS

CONDUCTIVE PARTS OF FENCE CONDUCTORS

Steel fence wires are fully made of conductive material, whereas fence wires, ropes and tapes are not. They consist of plastic and thin metal strands or conductors in which the electricity flows. Besides improving visibility, the plastic in fence tape facilitates handling.

The electrical conductivity of a fence conductor depends not just the metal of which these electrically conductive components are made, but also on their diameter and quantity. The thicker the metal strand, the better the electricity flows through it.

Conductor strands made of different metals are used in fence wires, ropes and tapes. The commonly used material options are stainless steel (inox/RST), aluminium (Al) and copper (Cu). Each of these metals has their advantages: for example, the very widely used steel is both a durable and affordable. Electrical conductivity can be improved by adding aluminium or copper strands in addition to steel strands.

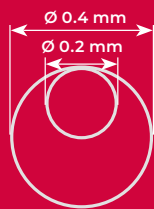
For example, the electrical conductivity of copper is about 40 times higher than that of steel. However, as materials, copper and aluminium are more expensive and not as durable as steel.

When looking for the best possible electrically conductive fence conductor, it needs not contain these more expensive metals: lower electrical conductivity of materials can be compensated by increasing the metal conductor thickness.

When comparing the properties of fence conductors, do not be fooled by the sheer *number* of metal conductors; quantity is no substitute for quality. In 0.4 mm strands, the flow of electricity is considerably smoother than in 0.2 mm strands, even if the amount of these narrower conductors is larger. The price of the most affordable fence tapes has been reduced by compromising on the properties of the very same metal conductors (in terms of their thickness, quantity, and material).



If the conductor diameter is doubled, its area increases four times. Therefore, when it comes to conductors, 2x0.2 mm is not the same as 1x0.4 mm.



0,12
Ω/m



Fencing Wire, 1.5 mm. 1,000 m per roll.
Tensile strength 200 kg.
Roll weight 11.75 kg.

0,091
Ω/m



Fencing wire 1.4 mm.
Hot-dip galvanised metal wire.
400 m per roll. Tensile strength 85 kg.
Roll weight 5.16 kg.

0,03
Ω/m



Steel fence wire 2 mm, High Tensile.
1,013 m / 25 kg per roll.
CrapalOptimum® zinc-aluminium-magnesium alloy coating providing five times the protection against corrosion compared to a heavily galvanised (100% zinc) coating. Tensile strength 380 kg.

0,02
Ω/m



Steel fence wire 2,5 mm, High Tensile.
648 m / 25 kg per roll.
CrapalOptimum® zinc-aluminium-magnesium alloy coating providing five times the protection against corrosion compared to a heavily galvanised (100% zinc) coating. Tensile strength 590 kg.

0,03
Ω/m



Steel fence wire 2 mm, Medium Tensile.
1,025 m / 25 kg per roll.
Heavily galvanised (100% zinc).
Made in Finland.
Tensile strength 270 kg.

0,02
Ω/m



Steel fence wire 2,5 mm, Medium Tensile.
650 m / 25 kg per roll.
Heavily galvanised (100% zinc).
Made in Finland.
Tensile strength 400 kg.

OLLI UTILITY BELT



A **handy utility belt** is perfect for many uses: fence construction, animal care and training, competition arenas – or anywhere you need a lot of pockets. Durable polyester. Several pockets of different sizes. The belt has plenty of adjustment room. Belt length 150 cm.





GRIPPLE PRODUCTS

GRIPPLE
Change the game



20 pcs

Gripple Twister protects and fastens the steel wire end making it safe for animals. Suitable for 1–3 mm thick steel wires. 20 pcs per package.



Gripple installation tool for High Tensile steel wire and connector installation. Allows tensioning of steel fence wires to the desired torque.

10/20 pcs



Gripple T-Clip is an easy and quick connection to the fence conductor ends; no need to tie the steel wire. Suitable for both steel wires and metal fence mesh. Two sizes:
• Gripple T-Clip 1 (1.80 mm – 3.25 mm), 20 pcs
• Gripple T-Clip 2 (3.25 mm – 4.20 mm), 10 pcs.



8 pcs

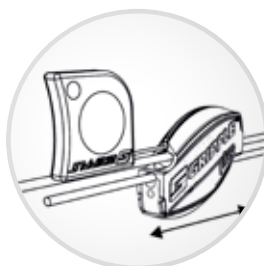
Gripple GP Fix, an easy, fast and safe solution for repairing broken steel wires without tools. Suitable for 1.80–3.20 mm steel wire. Tensile strength 400 kg. 8 pcs per package.



1 pc



Gripple installation wrench for disconnecting Gripple connections. Suitable for all Gripple connectors (Gripple Plus, T-Clip and GP-Fix etc.).



20 pcs

Gripple Plus Small, Medium and Large steel wire joiners for High Tensile steel wire fences. For steel wires or ropes. Package contains 20 connectors. Three sizes:

- Small 1.4–2.2 mm, tensile strength 300 kg
- Medium 2.0–3.25 mm, tensile strength 400 kg
- Large 3.25–4.2 mm, tensile strength 600 kg.



MORE ABOUT ALL HIGH TENSILE STEEL WIRE FENCE ACCESSORIES ON OLLI'S WEBSITE:



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INSULATORS

THE PURPOSE OF INSULATORS

Fence conductors are fastened to fence posts with insulators. In addition to securing the conductors, the function of insulators is, as their name suggests, to insulate, that is to ensure that the electricity passing through the fence conductor does not reach a wrong place, for example a fence post, causing a drop in voltage and a weaker shock.

Invest in high-quality insulators

A poor-quality or poorly-maintained insulator will not perform its insulating function well. A high-quality insulator is mechanically durable and sufficient in terms of its insulating layer. It is also suitable for the demanding weather conditions of Finland and will not, for example, break in frost or flake in the sun right in the first summer. Always choose insulators compatible with the fence conductor used.

TO BE CONSIDERED WHEN CHOOSING INSULATORS:

- 1 Fence conductor used in the fence
- 2 Fence post material
- 3 Sections requiring special durability, such as corners
- 4 Gates

HOW TO CHOOSE INSULATORS

When choosing insulators, attention should be paid not only to the good quality of the insulator, but also to its suitability for the fence conductors and fence posts in use. Some insulators can only be attached to wooden posts.

The fence conductor must fit the insulator without bending. Fence conductors that are bent, wrinkled or extended with knots cause sparking, which makes it difficult for electricity to flow through the fence. In addition, the sparking spot may burn through over time. However, there is a suitable insulator for every fence conductor. Many insulators can be used with more than one type of fence conductors.

Some fence sections may require different insulators than the rest of the fence. For example, in corners, the fence conductor is often subjected to tension, so for those locations it might be necessary to choose a mechanically strong insulator to prevent their self-release due to tension.

In addition, special insulators are required for gates. Gate insulators are available for fence wires and ropes, as well as for fence tapes.



Offset ring insulators keep fenced animals farther away from the fence. The offset ring insulator is a screw-in ring insulator with 19 cm long steel stem. Suitable for all fence wires and max. 8 mm fence ropes. Two package sizes, 10 pcs and 100 pcs.



The **nail-on insulator** is an affordable insulator for fence wires that can be attached with a nail or screw. Weatherproof, white UV-protected special polypropylene. 100 pcs per package.



The **ring insulator** is a screw-in insulator for all fence wires (and fence ropes up to 8 mm thick or fence tapes up to 12 mm wide). Two package sizes, 25 pcs and 100 pcs.



The 100 pcs **ring insulator and tape insulator packages** include a handy **mounting tool** to be fixed on a drill. The tool can also be purchased separately.



The **tape insulator** is a screw-in insulator for 12–40 mm fence tapes. The insulator is provided with quick tape lock. Two package sizes, 25 pcs and 100 pcs.

For corners, we recommend the tension resistant Duo insulator.

2 pcs



Gate insulator for fence tapes up to 12 mm wide, fence wires and fence ropes. The conductive components are made of long-lasting stainless steel. 2 pcs/package.

2 pcs



The package includes all the necessary fastening screws

Gate insulator for 12–40 mm fence tapes. The fence tape can be handily connected to the gate insulator without separate connectors. Exceptionally durable and strong insulator, metal parts of stainless steel. 2 pcs per package.

8/50 pcs



Fastening with two screws, recommendation: 4.5x50 mm

The **Duo insulator** is a multi-purpose insulator for all Olli fence wires, tapes and ropes. The cover part can be turned into two positions depending on the fence conductor (wire, rope or tape). The Duo insulator has exceptional mechanical strength and is thus applicable, for example, in corners to reinforce fencing, even if another type of insulator would otherwise be used.

Tip! Duo insulators are also suitable for extending winter fence tape.

Two package sizes, 8 pcs and a 50 pcs corner package, which also includes mounting screws.

25 pcs



Fastening with two screws

The **multi insulator** is a convenient combination insulator for fence wires, tapes and ropes of any width. The fence wire, rope or tape is easy to replace without detaching the insulator. 25 pcs per package.

For corners, we recommend the tension resistant Duo insulator.

25 pcs



Spare insulator for yellow fibreglass posts. The insulators can be used with fence wires and fence tapes with a maximum width of 20 mm.

FOR HIGH TENSILE STEEL WIRE FENCES

4 pcs



Porcelain corner insulator for steel wire fences. Diameter 50 mm. 4 pcs/package.

10 pcs



Heavy duty **egg insulator** for steel wire fences. For corners and fence conductor ends. 10 pcs/package.

55 pcs



Rope and wire insulator for steel wire fences. Fastening with two nails or screws. 55 pcs/package.

25 pcs



Lockable insulator for steel wire and rope. Fastening with two nails or screws. 25 pcs/package.

25 m



Pipe insulator, 25 m. Used, for example, in steel wire fences at the ends of the fence conductor around a wooden post or in zinc mountings. Outer diameter 9 mm, inner diameter 4 mm.

10 pcs



Pipe insulator, 60 cm. Can hold up to 8 mm rope. 10 pcs per package.



2 pcs

The **tensioner** opens completely, so mounting is also possible later, on an already completed fence.

The **fence tape tensioner** keeps fence tapes straight and prevents them from twisting. It tensions the tape evenly from both directions. Suitable for all Olli fence tape widths and winter fence tape. Fence tape can be tensioned by hand, without tools. 2 pcs per package, fastening to fence post with two screws.

Depending on the fence size and the number of fence tape strands, you need two or more fence tape tensioners. Place the fence tape tensioners at the middle sections of the fence or at locations where the fence tape starts to hang or twist. Do not over-tighten the fence tape to prevent snapping of its plastic and metal strands.

CONNECTORS

THE PURPOSE OF CONNECTORS

Poor connections and extensions prevent smooth flow of electricity in the fence, resulting in voltage drop and weaker shock. By using metal connectors designed for electric fence, it is possible to connect fence conductors without weakening the flow of electricity.

Connections and extensions

Fence conductor connections and extensions must be made in a way that does not weaken the flow of electricity. In practice, this means that the better the thin metal wires in the fence conductor touch each other on both sides of the connection/extension, the better the electricity will flow. It is worth remembering that replacing an energiser with a new or more powerful one will not fix a fence in poor condition.

POOR CONNECTIONS WEAKEN THE FLOW OF ELECTRICITY

Every poor connection weakens the flow of electricity, which of course is compounded if there are many bad connections. Knots are a typical example of a poor connection. They are not recommended for fence conductor connections or extensions for reasons related to the flow of electricity. Naturally, some knots can work perfectly – for a while.

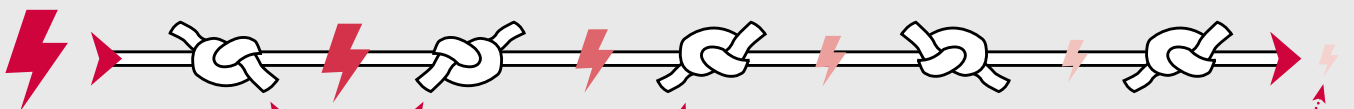
- ⚡ The flow of electricity in a knot is impaired, because metal conductors of the fence conductor do not always line up inside it, and there is nothing to compress the aligned conductors against each other in a reliable manner. An electric fence works best when electricity can flow through it as freely as possible, such that knots or other obstacles do not hinder the functioning of the fence.
- ⚡ When the electrically conductive metal conductors of a fence conductor inside a knot almost touch each other, but are not in proper contact, sparks are generated. Over time, sparking can burn the metal conductors and the conductor completely through. In this case, the fence will stop functioning as well.
- ⚡ It is far more convenient to tension the fence tape whenever required, as it can be done easily at the connector, instead of having to untie, at worst, several sets of tight knots.



AVOID KNOTS AND POOR CONNECTIONS

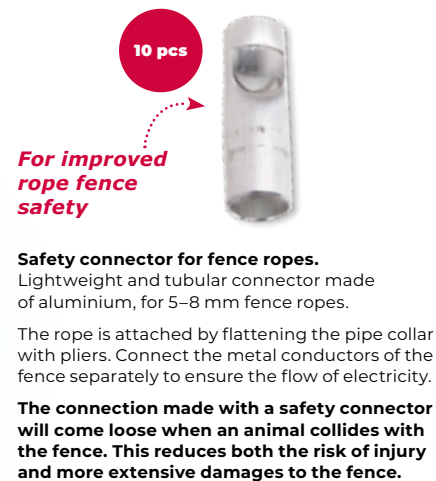
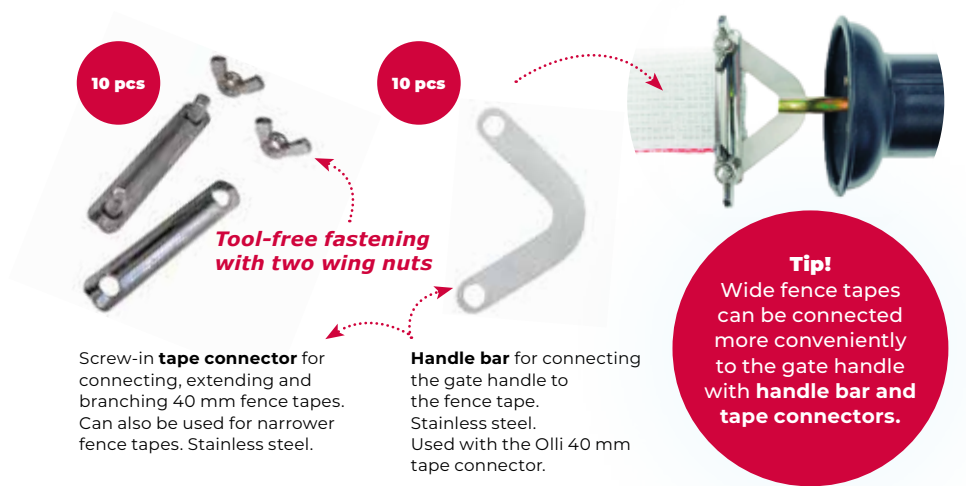
The most reliable way for making connections is by using metal fence connectors, since they conduct electricity well across their entire surface. Always tighten the connections carefully.

However, if the fence conductor needs to be temporarily tied due to a lack of connectors, the flow of electricity can be improved by **disconnecting the metal conductors from a short section at the knot and connecting them tightly together**.



Every poor connection weakens the performance of the fence and the shock it delivers.

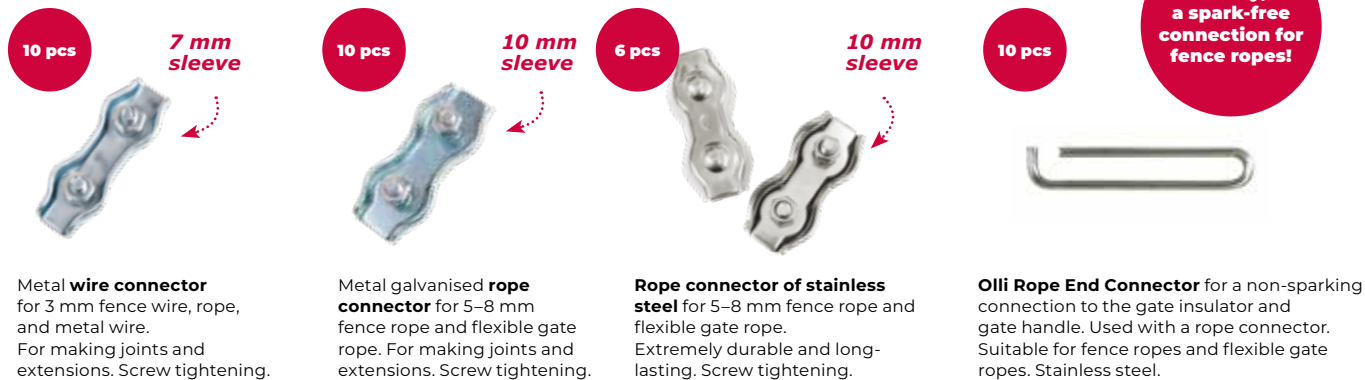
If there are many poor connections, the effect is multiplied and the fence voltage can drop significantly. In such a case, the fence cannot deliver a proper shock even if the energiser functions flawlessly.



Threading a fence tape into a tape connector:



With metal fence connectors, you can make functional, highly conductive connections.



For winter fence tape



Connector cable for winter fence tape
The connector cable reliably connects the tape strands in a fence built using winter fence tape. It connects the winter fence tape's shock wire and the earthing wire. Connector cable length 80 cm. The shock wire is marked in red.

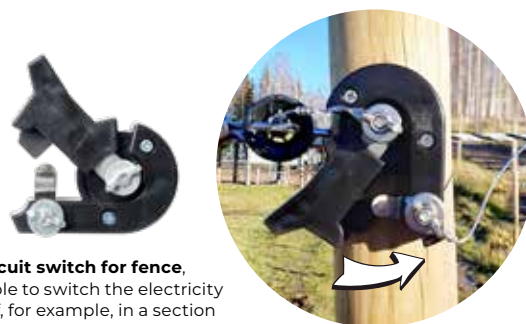


Accessory set for winter fence tape
Accessories for making winter fence tape connections, joints and extensions:
3 m fence connector cable
2 pcs connector cable for winter fence tape
2 pcs Duo insulator
4 pcs wood screws for Duo insulators



GATE ASSEMBLY

When building a fence, design the gates with care from the very start. In addition to the number and location of gates, it is advisable to consider the optimal width of the gates. Wide enough gates also allow using machinery for service and maintenance.



With a **circuit switch for fence**, it is possible to switch the electricity on and off, for example, in a section of the fence or even in the lowest conductor, where grass has grown so high that it touches the conductor.

25 m
50 m
100 m



The **high voltage cable** is a special double-insulated cable for conducting fence electricity underground, for example, under gates or roads, or when making longer transfers from the energiser to the fence. Three package sizes, 25 m, 50 m and 100 m.

When designing gates for your fence, think in advance about the various usage and maintenance situations that may arise in connection with that fence. This way, you can avoid extensive modifications in the future. Consider the following when designing gates:

1 Are several gates needed for the fence? Will some of the gates be used often and others only occasionally? For heavily used gates, it is worth choosing more durable gate handles and making them as user-friendly as possible in every respect: for example, would it be a good idea to make this gate such that it is electrified when closed, but not when someone passes through it with an animal?

2 Are wider gates needed? Should it be possible to drive through the fence by a tractor or even larger earthmoving machines, for example, when delivering extra sand? Is one such gate sufficient or do you need more? Where in the fence should they be located?

3 Are some of the gates kept open for a long time? Gates can also be made so that they can be easily removed, even completely, if necessary. This situation can occur when providing direct access from the winter fence to the pasture. A simple way to make such a gate is to put gate handles at both ends.

4 Is there a need for under gate cabling? When you want to ensure that electricity certainly flows to every corner of the fence even with the gate(s) open, it is a good idea to run cabling under the gates.

Under gate cabling means that that electric current (and in a fence built in accordance with the winter fencing instructions, the return circuit to the energiser as well) flows from one side of the gate to the other through a buried high voltage cable intended for fence energiser application. This way, the entire fence is reliably electrified regardless of whether the gates are open or closed.

5 What material is used for making the gate?

You can make the gates using the same materials as the fence itself or choose, for example, an elastic, electrically conductive gate rope or metal spring gate, depending on the animals fenced in and the purpose of the gate.

Tip! When making a multi-strand gate, using the gate with one hand and passing through the gate with your animal will be easier if you build the gate so that the handles can be chained together when opening the gate.



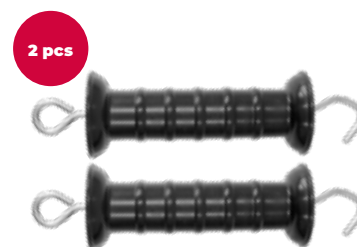
Gate insulator



Fence tape gate insulator



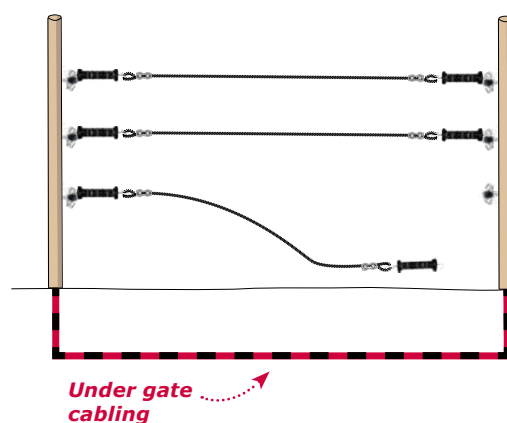
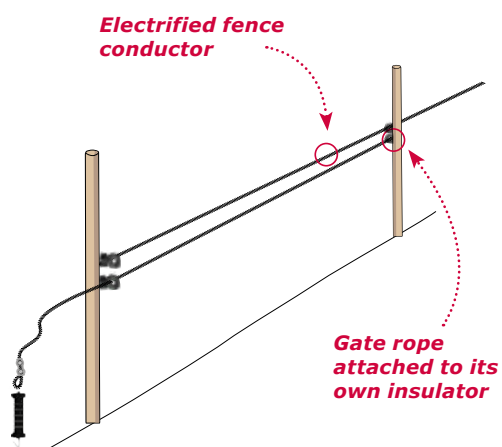
Gate handle, a traditional and affordable model. Black handle, 2 pcs per package.



Heavy-duty gate handle with compression string. In the heavy-duty gate handle the spring, not the elongation, is compressed in a closed space inside the handle. It clearly lasts longer than a standard gate handle without breaking.



Metal spring gate. Package contents: handle, spring, insulators. Max. spring length 4.5 m. **Not recommended for horses** due to the risk of the tail getting caught.



25 m



Use metal rope connectors and rope end connectors with flexible gate rope to avoid sparking.

Tip! You can also build a gate so that, when it is open, the electric current through it is cut. This makes it easier to pass through the gate, for example, with horses who might feel stressed because of an electric fence.

When the starting end of the gate rope is attached to its own, separate insulator, where it is not connected to the shock conductor at all, the gate is only supplied with electricity from the handle side and is only electrified when closed. With this configuration, an under gate cable should be installed.

Tip! You can also make the gate two-sided, i.e., have a handle attached to both ends. In this case, the gate is easy to remove completely. **Two-sided gates** are convenient, for example, when the walkway from one area to another (for example, from the yard or barn to the pasture) is open for long periods at a time.

The **Elastic gate rope** is a conductive, durable, and elastic fence rope intended for gates and supplied in 25 m rolls. Rope diameter 8 mm. The rope sold by the metre is an excellent choice for making a gate of the exactly right size! In a gate made with flexible gate rope, the gate handle is subjected to constant tension. We recommend using an **extra-strong gate handle** for these gates.

NEVER THROW AN ELECTRIFIED GATE ONTO THE GROUND!

A gate that is energised even when open should never be thrown onto the ground, since the animal could then receive an electric shock through damp ground.





UNDER GATE CABLING

ENSURE ELECTRIC CIRCUIT ALSO AT THE GATES

If the fence has several gates, part of the fence may be left without power when the gate is open. The electric circuit (and in a two-wire fence or fence made with winter fence tape, also the return circuit) could be interrupted at the gate. In such situations, the problem can be solved by running cables under the gate.

When installing under gate cabling, it is always advisable to use double-insulated high-voltage cables intended specifically for supplying electric current to the fence, as these can withstand the voltage generated by the energiser, up to over 10,000 volts.

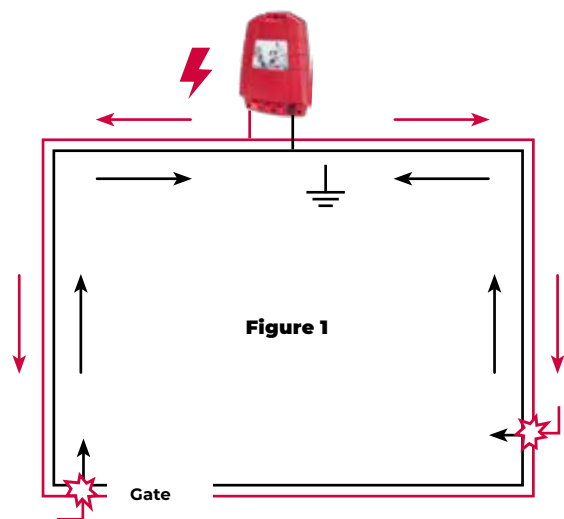
The cable should also be buried deep enough so that animals cannot trample on it even when the ground has softened due to thawing ground frost or heavy or prolonged rain.



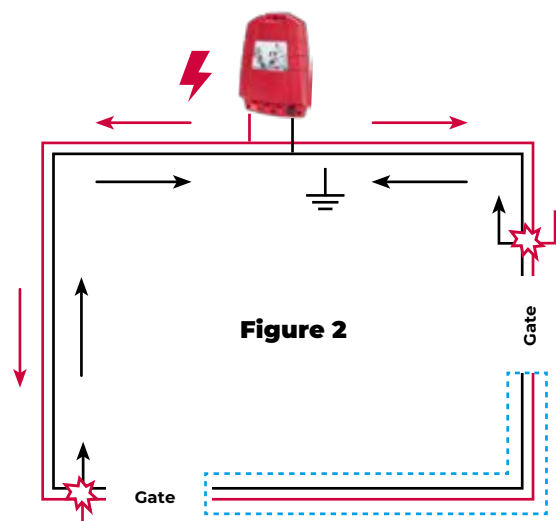
TIP!

When installing under gate cabling, the high-voltage cable can be inserted into a pipe.

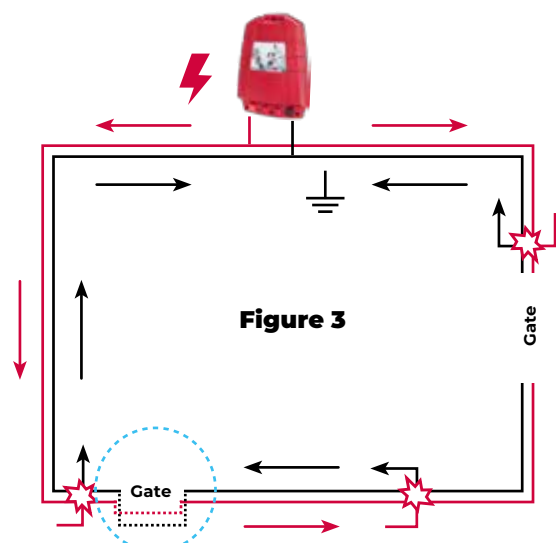
This makes it easy to replace the cable if necessary or add another cable if the fence is later converted into a winter fence.



In the fence shown in **Figure 1**, the animal would receive a shock at any section of the fence, even with the gate open; both the shock (red line) and the return (black line) are connected to the energiser from both sides of the gate. There is no need for separate under gate cabling.



In **Figure 2**, the fence section between the gates marked with blue dashed line is problematic in terms of electricity flow. In order for the animal to receive a shock at this section even when both gates are open, the gate has to have under gate cabling to transmit the electric shock (Figure 3). In a fence built with winter fence tape or in a two-wire fence, the return path for electric current, i.e. the earthing conductor, also requires running cables under the gate.



Note that even if the shock conductor continues in the gate, the return path for electric current required in a winter fence still needs cabling under the gate. So, you can dig the cable for both the shock and return current at the same time.

BUILDING PASTURES

If you are building a pasture fence using plastic or fiberglass posts, reinforce the fence by placing sturdy wooden posts at the corners of the fence. Light plastic or fiberglass posts bend easily if subjected to tensile force. It is also a good idea to reinforce gates with wooden posts.

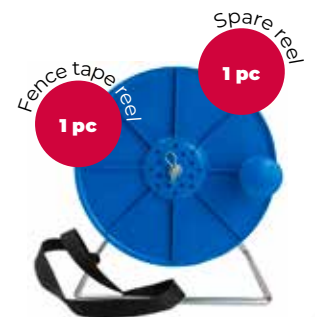
Gather up accessories intended for summer use at the end of the season

Lightweight fiberglass posts and fence conductors for summer pastures should be put in storage at the end of the pasture season. Storage away from the elements significantly extends the service life of both posts and fence conductors. If you want to keep the fence in place during the winter season as well, choose fence posts and conductors intended for year-round use.



Fence tape reel. At the end of the season wind the fence conductors on a reel and store them neatly. You will save both time and nerves as the construction of pastures or paddocks will not have to start with sorting out messy bundles of fence tape.

Spare reel. You can conveniently store, for example, the conductors of different pastures on their own reels or collect fence tapes of different width on their specific reels.



Easy to install



16 fence conductor fastening points!

The horse pasture post (paddock post) (156 cm) with stirrup makes fence assembly extremely easy and fast. It is really easy to drive the post into the ground using the stirrup at the base of the post! Straightening the post is easy as well.

Versatile possibilities for building different fences: all Olli fence wires; ropes and tapes of any width can be used with the posts.

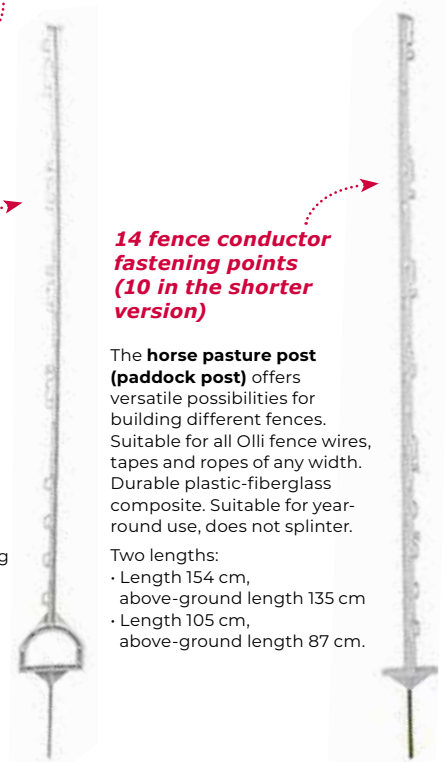
Durable plastic-fiberglass composite. Suitable for year-round use, does not splinter. Length 156 cm, above-ground length 137 cm.

14 fence conductor fastening points (10 in the shorter version)

The **horse pasture post (paddock post)** offers versatile possibilities for building different fences. Suitable for all Olli fence wires, tapes and ropes of any width. Durable plastic-fiberglass composite. Suitable for year-round use, does not splinter.

Two lengths:

- Length 154 cm, above-ground length 135 cm
- Length 105 cm, above-ground length 87 cm.



Electric fence warning sign. According to regulations, electric fences built along walkways must be provided with warning signs. 5 pcs per package.



10 pcs



Standard **yellow fiberglass post**.

The 160 cm long fiberglass post has three insulators, the 110 cm and 140 cm posts have two. Fiberglass post insulators can be used as spare insulators. The surface structure of the post efficiently prevents splintering. Fiberglass posts can be used with fence wires and fence tapes of maximum width 20 mm.

Three lengths:

- length 160 cm, above-ground length 138 cm
- length 140 cm, above-ground length 118 cm
- length 110 cm, above-ground length 88 cm.



The **post driver** is an efficient tool for installation of wooden fence posts. The strikes never miss, the post is easy to straighten and the driver keeps the post end intact. The metal driver weighs 15 kg. The driver is suitable for driving posts of height up to 90 mm.



Spare insulator for yellow fiberglass posts. The insulators can be used with fence wires and fence tapes with a maximum width of 20 mm.

2 m



Star post, 200 cm high fence post for making a higher fence. Featuring 6 fastening points for fence wires or up to 20 mm wide fence tapes. The distance between the fence conductor fastening points is 23 cm, the highest 3 cm from the top edge of the post. Durable plastic.

112 cm
x 50 m



Electrifiable **poultry net**. Height 112 cm, 50 m roll. 15 pcs steel-tipped fiberglass posts included. Resistivity 0.68 Ω /m.

100 cm
x 50 m



Steel **sheep net**. Height 100 cm, 50 m per roll. Mesh size 10 x 10 cm, two bottom rows 10 x 5 cm. Strong hot-dip galvanised 2.5 mm steel wire.

90 cm
x 50 m



Electrifiable **sheep net**. Height 90 cm, 50 m roll. 14 pcs steel-tipped fiberglass posts included. Resistivity 0.92 Ω /m.



REMOVE VEGETATION CONTACTING THE FENCE

Vegetation contacting the fence causes current leakage from the fence to the earthing. The problem is aggravated if the vegetation is moist (for example, where there is morning dew on the grass or in rainy weather).

Current leakage causes a drop in voltage, which means a weaker shock.

Even a powerful energiser cannot perform its task well if there is too much vegetation leaning on the fence. Any grass, branches, etc. in contact with the fence should be removed regularly.

FENCE ENERGISERS							MAXIMUM THEORETICAL FENCE LENGTH			Earthing rods	
MAINS ENERGISERS	ENERGISER	Maximum voltage	Voltage at 500Ω load	Charged energy	Maximum output energy	Power consumption	Ideal fence	Light vegetation	Moderate vegetation		
	Olli Protector 11	11 700 V	7 700 V	14 J	11 J	14 W	475 km	65 km	20 km	2–5 pc	MAINS ENERGISERS
	Olli 1000	9 500 V	5 100 V	9,3 J	4,5 J	13 W	310 km	30 km	12 km	2–5 pc	
	Olli 950	10 000 V	5 000 V	8,9 J	4,8 J	11 W	310 km	30 km	12 km	2–5 pc	
	Olli 600	9 200 V	3 900 V	6 J	3,8 J	7 W	220 km	25 km	10 km	1–3 pc	
	Olli 300	9 000 V	3 700 V	3,8 J	2,8 J	4 W	160 km	20 km	7 km	1–2 pc	
	Olli 100	6 500 V	3 400 V	1,4 J	1,2 J	2 W	60 km	12 km	3 km	1 pc	
BATTERY ENERGISERS	Olli 450B+ 	8 000 V	4 650 V	4,6 J	3,0 J	160–310 mA	190 km	23 km	8 km	1–3 pc	BATTERY ENERGISERS
	Olli 250B+ 	7 400 V	5 000 V	2,6 J	2,0 J	70–200 mA	90 km	18 km	6 km	1–2 pc	
	Olli 180B	9 500 V	3 200 V	1,7 J	1,4 J	130 mA	80 km	15 km	4 km	1–2 pc	
	Olli 122B 	8 500 V	3 880 V	1,63 J	1,21 J	46–109 mA	62 km	12 km	3 km	1–2 pc	
	Olli 9.07B 	9 800 V	3 200 V	0,86 J	0,71 J	40–85 / 30–62 mA ^{a)}	35 km	7 km	2 km	1–2 pc	
	Olli 9.07S 	9 800 V	3 200 V	0,86 J	0,71 J	40–85 / 30–62 mA ^{a)}	35 km	7 km	2 km	1–2 pc	
	Olli SG3 Batteries 12 V battery	4,800 V 6,800 V	2,040 V 3,100 V	0,18 J 0,5 J	0,125 J 0,3 J	17–33 mA 18–40 mA	9 km 20 km	1 km 3 km	0.3 km 1 km	1 pc	

^{a)} Olli 9.07B and 9.07S power consumption (9 V battery/12 V battery).

 Solar panel or a solar panel as an optional accessory.

HOW TO INTERPRET TECHNICAL SPECIFICATIONS

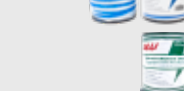


MAXIMUM VOLTAGE (maximum voltage, U_{max})	Volt (V)	Indicates the peak pulse voltage in case of a short, leak-free fence (low load) or without a fence. Because energiser voltages are quite high, the values are often expressed in kilovolts (kV), i.e., in thousands of volts.
VOLTAGE AT 500 OHM LOAD ($U_{500 \Omega}$)	Volt (V)	Indicates the peak pulse voltage if the fence is heavily loaded.
CHARGED ENERGY ($E_{charged}$)	Joule (J)	The maximum energy that the energiser can build up for a shock.
MAXIMUM OUTPUT ENERGY (E_{out})	Joule (J)	Indicates the shock intensity, in other words, the maximum energy the fence energiser is capable of supplying to the fence in a single pulse. The higher the energy, the longer the fence with which the energiser can be used. A high-energy shock is also more perceptible, since it lasts longer. When comparing energisers, this is a value worth paying attention to.
POWER CONSUMPTION (watts, milliamperes)	W, mA	Indicates the maximum actual electricity consumption. In case of a <i>mains energiser</i> , 10 W of power in 24/7 use means 87.6 kWh of annual consumption. At a price of €0.15/kWh, the running of such energiser would cost about €13 a year. A <i>battery energiser</i> gets its power from a battery. In many models, power consumption varies depending on the energiser's power setting and/or fence load. The maximum battery life (in hours, h) can be estimated by dividing the rated capacity of the battery (e.g., 60 Ah = 60,000 mAh) by the energiser's rated power consumption: 60,000 mAh/100 mA = 600h = 25 days.

RECOMMENDED NUMBER OF EARTHING RODS	pcs	Recommended quantity for the energiser in question. Instead of a single figure, it is indicated as a range, for example, 1–3 pcs, since in dry soil, more earthing rods are required than in moist soil. The same applies to more powerful energisers and longer fences.
MAXIMUM THEORETICAL FENCE LENGTH (IDEAL FENCE)	km	The longest theoretical single-wire fence built of thick metal conductor in which the fence voltage can still be sufficient for the fence to function. Indicated in kilometres. In practice, such a situation is truly rare, almost impossible. Nevertheless, this value, like the maximum output energy figure, is useful, for example, when comparing energiser models from different manufacturers.
MAXIMUM THEORETICAL FENCE LENGTH (LIGHT VEGETATION)	km	A value more suitable for comparison when assessing the suitability of an energiser for your fence. Describes a situation where the fence consists of highly conductive fence conductors and there is little vegetation in contact with the fence. Note that this value indicates the total length of the fence, i.e., with all of the fence conductor strands combined.
MAXIMUM THEORETICAL FENCE LENGTH (MODERATE VEGETATION)	km	Describes a situation where there is more vegetation in contact with the fence. Note that this value indicates the total length of the fence, i.e., with all of the fence conductor strands combined.

FENCE CONDUCTORS

The lower the resistivity (Ω/m) of a fence conductor, the better it conducts electricity.

		Roll	Resistivity	Tensile strength
	Fence Wire, 1.5 mm	1000 m	0,12 Ω/m	200 kg
	Fencing wire 1.4 mm	400 m	0,091 Ω/m	85 kg
	Steel fence wire, Medium Tensile 2.0 mm	1025 m	0,03 Ω/m	270 kg
	Steel fence wire Medium High Tensile 2.5 mm	650 m	0,02 Ω/m	400 kg
	Steel fence wire High Tensile 2.0 mm	1013 m	0,03Ω/m	380 kg
	Steel fence wire High Tensile 2.5 mm	648 m	0,02 Ω/m	590 kg
	Olli fence wire 3 mm	200 m / 1000 m	0,98 Ω/m	80 kg
	Olli fence rope 5 mm	300 m	1,60 Ω/m	198 kg
	Olli fence rope 8 mm	200 m	1,60 Ω/m	398 kg
	Olli green fence tape 12 mm	200 m	0,86 Ω/m	86 kg
	Olli green fence tape 20 mm	200 m	0,80 Ω/m	162 kg
	Olli green fence tape 40 mm	200 m	0,48 Ω/m	258 kg
	Olli red-and-white fence tape 12 mm	200 m	0,58 Ω/m	62 kg
	Olli red-and-white fence tape 20 mm	200 m	0,91 Ω/m	121 kg
	Olli red-and-white fence tape 40 mm	200 m	0,73 Ω/m	195 kg
	Olli winter fence tape 40 mm	200 m	0,60 Ω/m	221 kg
	Olli blue-and-white fence tape 12 mm	200 m	0,336 Ω/m	74 kg
	Olli blue-and-white fence tape 20 mm	200 m	0,308 Ω/m	137 kg
	Olli Green-and-white Fence Tape 12 mm	200 m	0,58 Ω/m	62 kg



WINTER FENCING

14

WHY IS A STANDARD FENCE NOT SUITED FOR WINTER?

THIS IS HOW AN ELECTRIC FENCE WORKS

During a thaw and when fencing conditions are good, the ground conducts electricity well. When an animal touches the electrified fence, current passes from the fence through the animal into the ground, and through the earthing rods back to the energiser, delivering the animal a shock on the way.

The shock is therefore not caused by the animal touching the electrified fence, but only when the electricity flows back to the energiser.

If the path of the electric current between the animal and the ground is interrupted, the animal does not receive a shock. This typically happens in winter, as snow, ice and frozen ground are good insulators. In such cases, snow and ice prevent the flow of electric current through the animal's feet into the ground and through the ground back to the energiser, and the animal will not receive a shock when touching the fence.

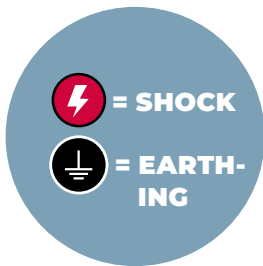
Therefore, in winter a conventionally built fence does not deliver a shock altogether, or the shock is weaker than when the ground is thawed.

A functional winter fence is implemented by providing a separate return circuit for electric current back to the energiser either with e.g., a WINTER FENCE TAPE or by building a TWO-WIRE FENCE.

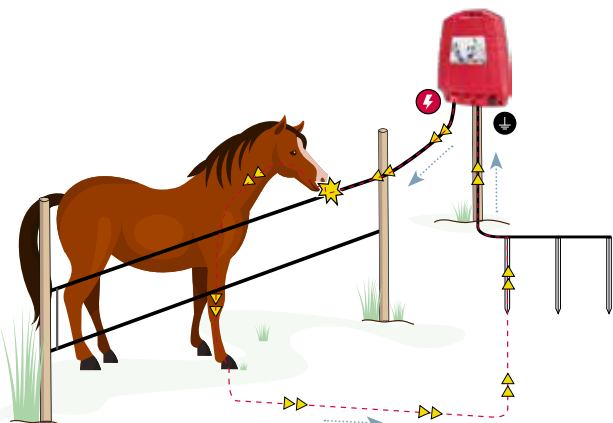


SNOW INTERRUPTS ELECTRIC CURRENT

Snow, ice and frozen soil are good insulators. In winter, electricity cannot pass from the animal's feet into the ground through snow and ice, and the animal will not receive a shock when touching the fence. Thus, even if the energiser functions flawlessly, the flow of electricity is interrupted by the insulating snow and ice. **For this reason, in winter a conventionally built fence does not cause any shock to the animal, or the shock is weaker than when the ground is thawed.**

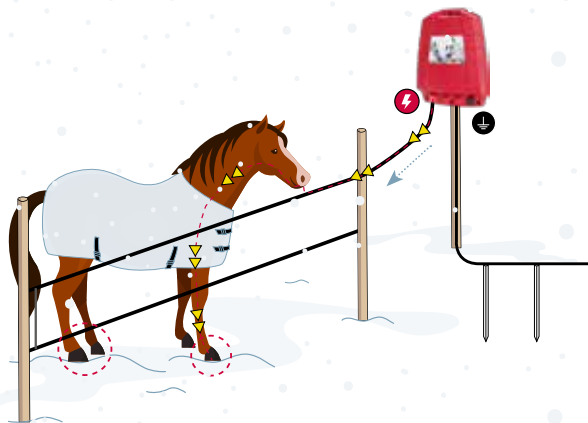


Summer



In an electric fence, a shock is generated when an animal touches the electrified fence, electricity passes through the animal into the ground and through the ground and earthing rods back to the energiser.

Winter



Snow, ice and frozen soil are good insulators. In winter, the flow of electricity is interrupted by the insulating snow and ice and no shock is generated.

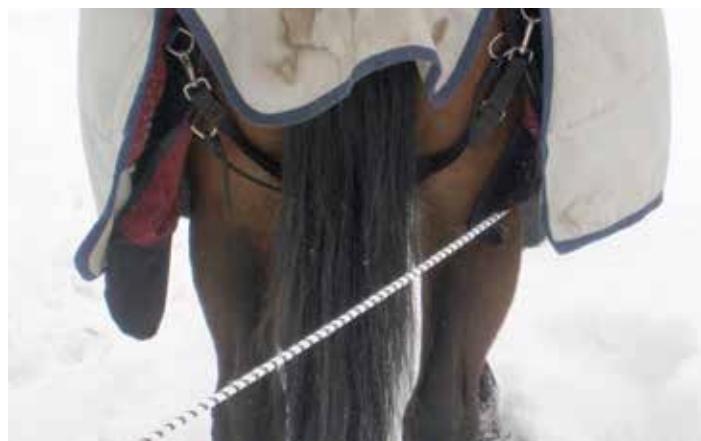
WHAT TO CONSIDER WHEN BUILDING A WINTER FENCE

In addition to electrification of the fence, other season-related special requirements must be considered to set up a functional winter fence. Not just snow, ice and frosty ground, but the animals' thick winter coats and blankets act also as efficient insulators.

Fence tapes should be cleaned regularly, since snow and ice covering the fence tape also have an insulating effect. Moreover, snow, sleet and ice sticking to fence tapes can easily cause sagging and stretching of the tapes. For winter fencing, it is therefore advisable to choose Olli Shockteq designated fence tapes specifically intended for year-round use.

Snow also brings its own challenges in terms of the fence height: in winters with heavy snow, the snow can raise the base of the fence significantly, making the fence lower.

Did you know? The flow of electricity between the animal and the ground can also be interrupted in summer, in very dry conditions or on rocky terrain. In these conditions, a fence built according to the winter fencing instructions would provide a functional solution.



When building a winter fence, remember to:

- 1 Make the fence high enough even winters with heavy snowfalls.
- 2 Provide a separate return circuit for electric current to the energiser.
- 3 When required, clean the fence tapes from snow.
- 4 Build the fence so that the lowest conductor can easily be disconnected from the energiser when it gets covered by snow.

TWO-WIRE FENCE

HOW DOES A TWO-WIRE FENCE FUNCTION?

In a two-wire fence, a separate return circuit for electric current is arranged back to the energiser using a separate earthing conductor, i.e. the second fence conductor.

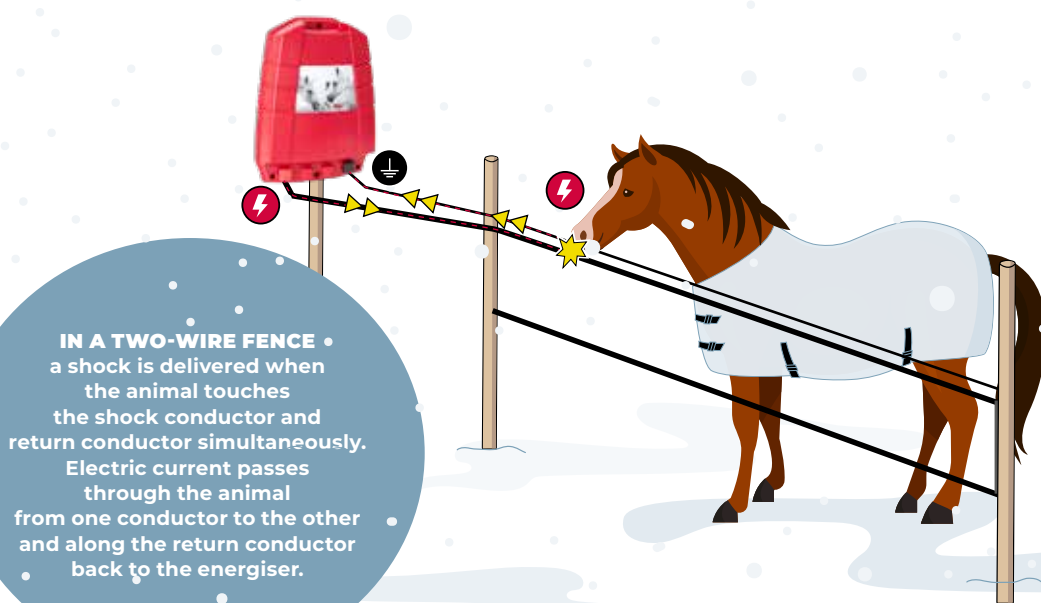
In a two-wire fence, instead of a single fence conductor, the fence conductor strands are made with two conductors: one for electricity supply (shock conductor) and the other takes care of earthing (return conductor). The animal is given an electric shock if both of the conductors are touched at the same time.

IMPORTANT!



Always place the shock conductor and return conductor of a two-wire fence so close to each other that the animal's head cannot get stuck between the conductors under any circumstances.

Make also sure that the shock conductor and return conductor do not touch each other even when snow is pressing on them. A contact will result in a short circuit, which can drop the fence voltage and cause sparking that damages the fence conductors.



IN A TWO-WIRE FENCE • a shock is delivered when the animal touches the shock conductor and return conductor simultaneously. Electric current passes through the animal from one conductor to the other and along the return conductor back to the energiser.

In a regular two-wire fence, there can be several strands of fence conductors, and return conductors do not necessarily need to be placed in each strand. If there is an insulating layer of snow on the ground, the animal gets a shock when both the shock conductor and return conductor are touched simultaneously, i.e. in practice, the shock is delivered by the strands with both conductors installed.

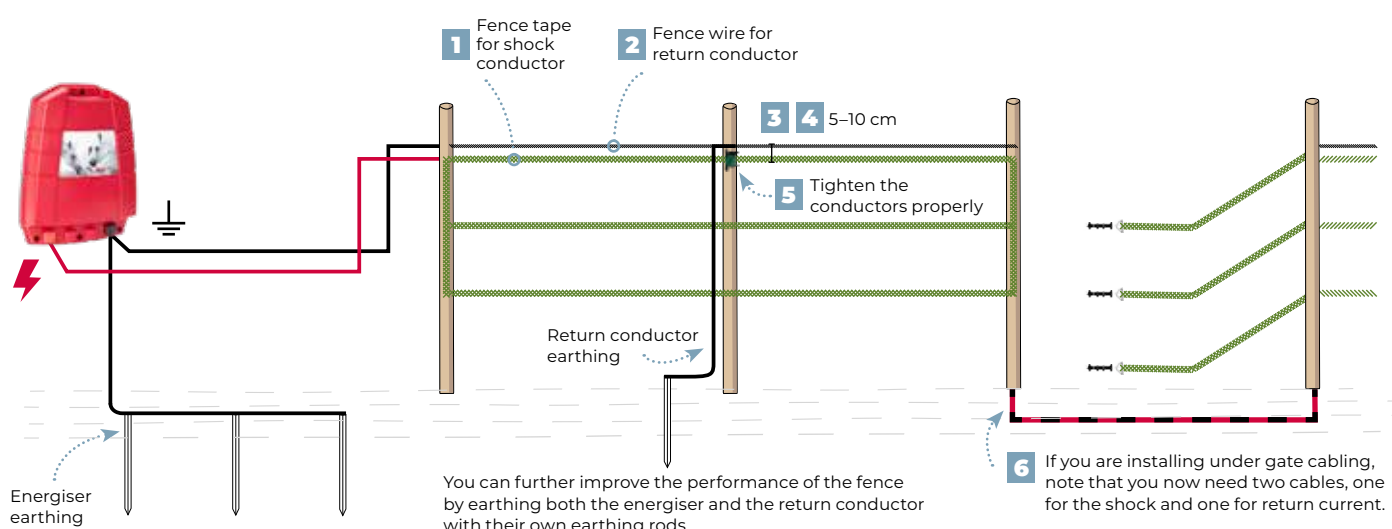
Tip

We recommend using earthing rods with two-wire fences as well. In such a case, the fence will function as a normal fence, and if there is no insulating snow or ice layer, touching any of the shock conductors will result in a shock.

Tip

Upgrade your current fence to a two-wire fence! By adding a return conductor to your existing electrified fence, you can ensure uninterrupted flow of electricity in winter, not just where there is snow, ice or when the ground is frozen, but also in dry or rocky conditions.

TWO-WIRE FENCE



CHOOSING FENCE CONDUCTORS FOR A TWO-WIRE FENCE

There is no need to use a separate Olli winter fence tape in a two-wire fence, instead the solution can be implemented by using normal, year-round fence wires, fence ropes and fence tapes for fence conductors. For example, you can choose a fence tape as the shock conductor and use a thin 3 mm fence wire as the return conductor, which is less susceptible to snow and sleet than a wide tape.

BUILDING A TWO-WIRE FENCE

1 Build the fence as normal, using your preferred year-round fence wire, fence rope, or fence tape as the shock conductor.

2 Connect the shock conductor to the red shock terminal of the energiser marked by the lightning symbol as usual, using the fence connector cable supplied with the energiser.

3 Install the return conductor approx. 5–10 cm above the shock conductor. Connect the return conductor to the earthing terminal of the energiser. The return conductor does not need to be insulated from the ground, so it could also be attached directly to the fence post if desired. Note that the animal must touch **both conductors at the same time for the shock to be delivered**. This can be difficult if the conductors are at very different levels (one farther out in the insulator and the other right on the fence post) and too far apart. Moreover, using insulators makes it easier to tighten the conductor if necessary.

4 Note that the shock conductor and return conductor must be so close to each other that the animal's head cannot get stuck between them under any circumstances.

5 Tighten the conductors properly, since the shock conductor and return conductor must not contact each other even if covered by heavy snow.

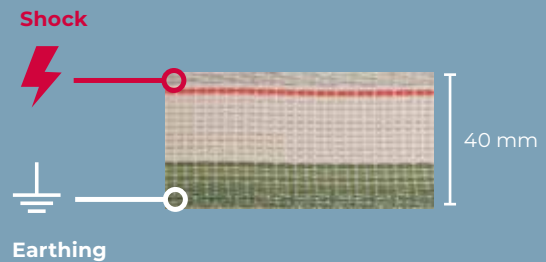
A contact will result in a short circuit, which can drop the fence voltage and cause sparking detrimental to the fence conductors. Fence tapes can be kept taut using the Olli fence tape tensioner, for example, which can be retrofitted to an existing fence and used for tape tensioning whenever required.

6 Important! If the return conductor after the gate has no connection to the energiser's earthing terminal, it is also necessary to ensure that the earthing route continues by running a cable under the gate using the Olli high voltage cable.

7 If you want each strand of fence tape to give a shock even when there is an insulating layer of snow or ice on the ground, install a return conductor in each fence tape strand. In this case, first connect the return conductor strands to each other and then connect them to the black earthing terminal of the energiser (only one conductor at a time can be connected to the push-button terminal).

HOW DOES A WINTER FENCE TAPE WORK?

The 40 mm wide winter fence tape has two separate wire bundles, one for shocks and the other one for earthing. The animal receives a shock if it touches both wire bundles simultaneously.



BUILDING A FENCE USING WINTER FENCE TAPE

You can either use winter fence tape in all winter fence strands or use it in a single strand only. When the ground is covered by an insulating layer of snow, the animal is delivered a shock by the strands where the winter fence tape is **correctly connected**.

1 The easiest way to electrify a winter fence is by using the winter fence tape connector cable included in the Olli accessory set for winter fence tape. The wire bundle marked with red colour running in the white part of the winter fence tape, marked in red, **is connected to the shock terminal of the energiser which is marked with the lightning bolt symbol**, and the wire bundle running in the green part of the tape **is connected to the energiser's black earthing terminal**.

2 If your fence has several strands made of winter fence tape, connect them to each other using the winter fence tape connector cable. The Olli accessory set for winter fence tape also includes two connector cables.

3 If, in addition to winter fence tape strands, your fence has strands made of regular fence wires, tapes or ropes, connect them to each other as normal and then make a connection to the energiser's shock terminal.

4 Important! At the gates, cut and remove the metal conductors (not the plastic tape) in the green part of the winter fence tape approximately 3 cm before the metal connectors (e.g., the fence tape gate insulator and the fence tape handle bar) so that the connector does not short-circuit the winter fence tape's shock wire bundle and earthing wire bundle. **If this happens, the fence will not work.**

5 Important! If an earthing conductor after the gate has no connection to the energiser's earthing terminal, also ensure the continuity of the earthing route by running a cable under the gate using an Olli high voltage cable.

6 Make sure the energiser is properly earthed with earthing rods (1–6 pcs).

7 When testing the fence voltage with a fence tester, do not push the tester's

earthing rod into the ground as usual, instead use it to touch the wire bundle in the green part of the winter fence tape, while touching the red wire bundle marked in the winter fence tape with the measuring sensor on top of the tester.

Depending on the energiser and the length of the fence, the reading should be at least 2,000 V. Normally, if the fence has been built correctly, the reading should exceed 4,000 V.



Earthing is worth the effort

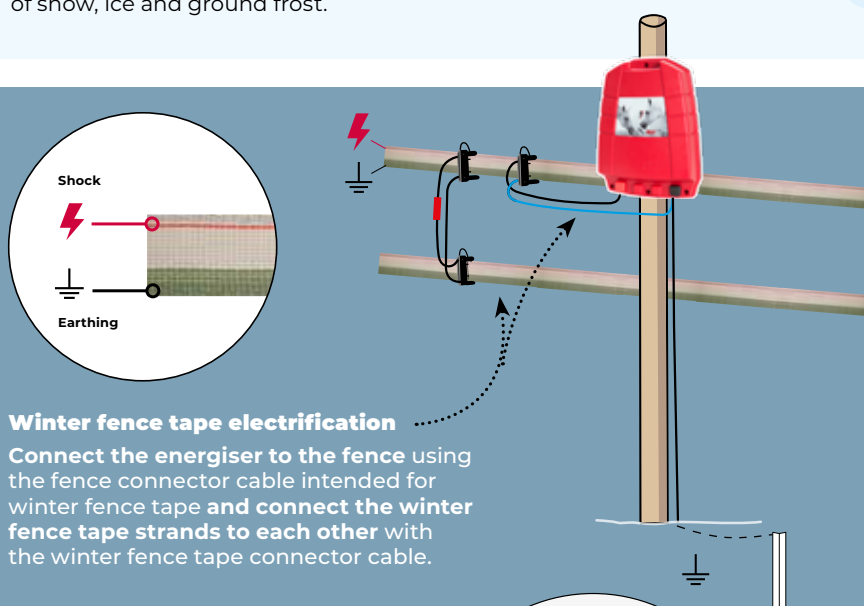
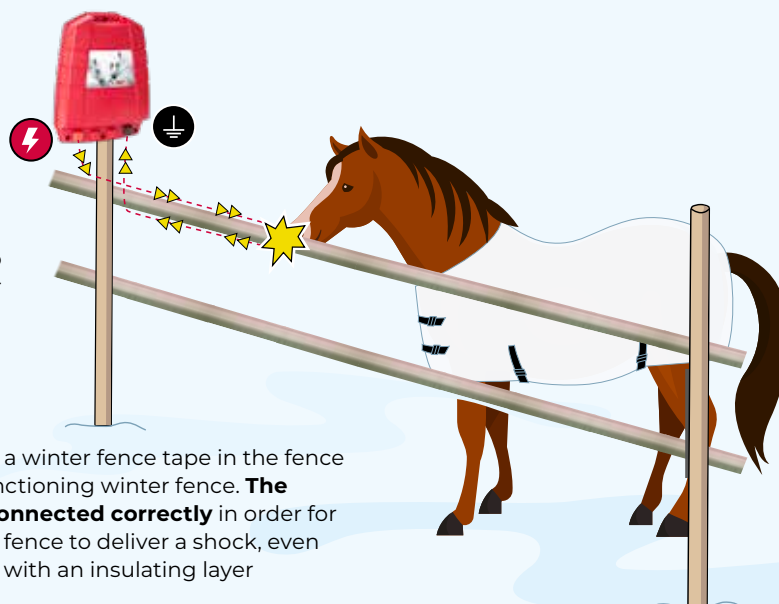
A fence assembled using winter fence tape should also be properly earthed. In this case, the fence will perform like a normal fence, delivering a shock from each shock conductor when there is no insulating layer of snow or ice. There cannot be too many earthing rods; better have some extra than too few.



Functioning of winter fence tape

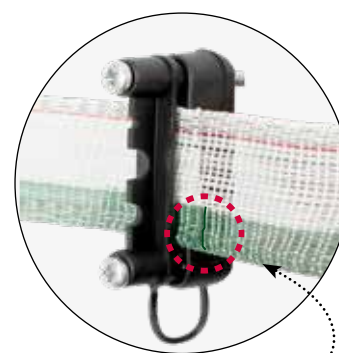
The winter fence tape has two separate wire bundles, one for shock and the other one for earthing. The animal receives a shock if it touches **both** wire bundles simultaneously.

Please note that merely using a winter fence tape in the fence does not make the fence a functioning winter fence. **The winter fence tape must be connected correctly** in order for it to work properly and for the fence to deliver a shock, even though the ground is covered with an insulating layer of snow, ice and ground frost.



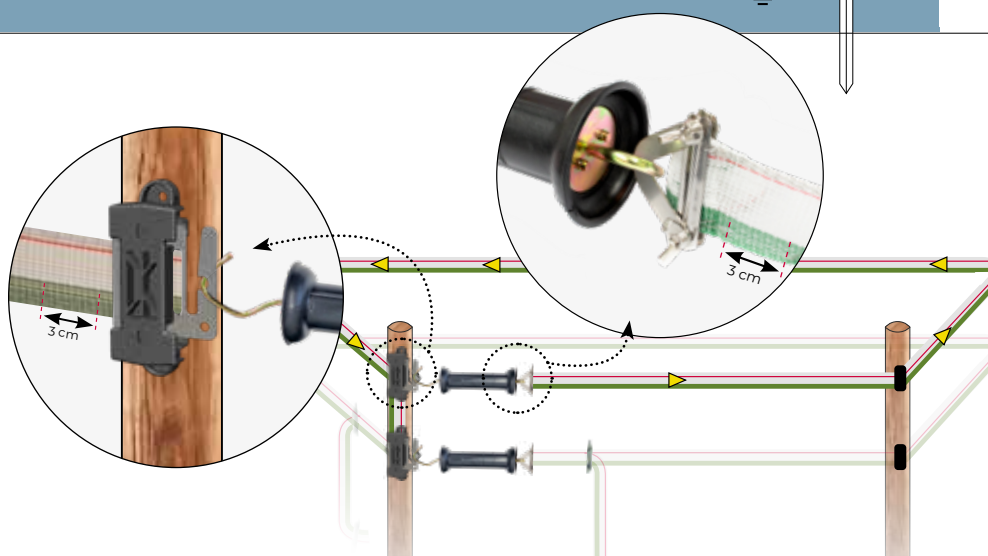
Winter fence tape electrification

Connect the energiser to the fence using the fence connector cable intended for winter fence tape **and connect the winter fence tape strands to each other** with the winter fence tape connector cable.



Winter fence tape extension

If a winter fence tape needs extending, use the plastic **Duo insulator**. Make sure that the wire bundles of the tapes being connected are carefully aligned.



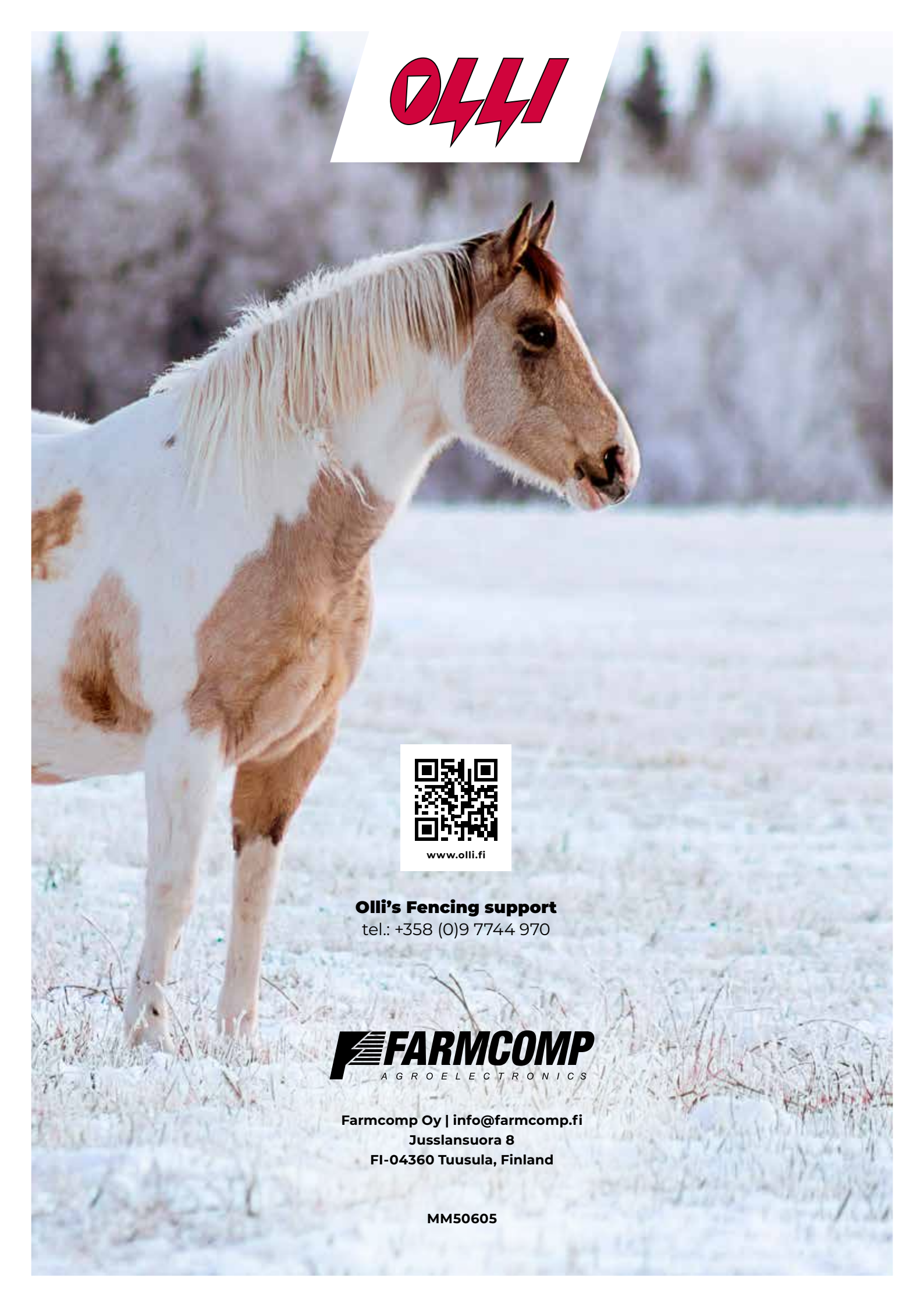
Fence not working?

The most common cause of failure of a fence made using the winter fence tape is a short circuit caused by metal parts of connectors.

At the gates, **cut off and remove the metal conductors of the return wire bundle in the green part of the winter fence tape about 3 cm** before the metal connectors, so that the connector does not short-circuit the shock wire bundle and earthing wire bundle of the winter fence tape. If this happens, the fence will not work.

Therefore, only remove the metal conductors, do not cut the plastic tape itself, so that the durability of the tape is not affected.





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