Operating Instruction

for the

EFGI 650

Electric Fishing Device

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1 Function of the Inclination Sensor (Tilt-switch)

The control device is equipped with an inclination sensor which switches the device off or prevents its switching on if the control device were tilted to an angle of more than 45 degrees relative to the vertical. This is to prevent the person using the electric fishing device from being hurt if he/she slipped so that the device tilted.
The response of the inclination sensor is indicated by an interval sound of the acoustic signal transmitter. In this state, the electrodes are voltage-free and cannot be switched on even by pressing the dead man's button.
To reset the sensor, you have to bring the control device into its normal perpendicular operating
position, switch it off for a moment and then on again, and press the dead man's button once for a moment. The next pressing of the dead man's button makes the device operate so that you can hear the acoustic signal transmitter's signals in time with the dead man's button.
To avoid accidental responses of the sensor,

- do not switch on the control device until it is hanging perpendicularly in front of your body,
- avoid hasty, uncontrolled movements,
- switch the control device off if its response is expected, e.g. when climbing up an embankment.

2 Translation front panel

Batteriesatz	battery box
Gegenelektrode	counterelectrode (cathode)
Fangelektrode	catching electrode (anode)
Batteriestrom	battery current
Puls	pulse
GS	DC
P/s	Pulse per second (frequency)
ms	millisecond (time constant)
fein	fine (output voltage)
grob	coarse (output voltage)
EIN	ON
AUS	OFF

3 Safety Instructions

As a user of an electric fishing device, you are responsible for observing the applicable legal provisions.

In addition, you ought to keep in mind the following instructions:

Electric safety

- Touching the live electrodes is extremely perilous!
- Stop using the device if the cable insulation or the housings of the plug-in connectors, the control unit including the viewing window of the battery current display, or the battery packs are damaged or if the dead man switch unit does not function properly!
- Do not use any devices or components produced by other manufacturers together with the EFGI 650 even if the plug-in connectors match!
- Persons suffering from heart diseases, convulsive disorders, major impairment of sight and hearing or disorders of balance, persons using pacemakers and persons being under the influence of alcohol, psychopharmaceutic or other drugs face increased risks and should not participate in electrical fishing.

Handling of batteries

- In case of certain faults in the charger or the batteries, detonating oxyhydrogen gas may be generated during battery charging. Charge the battery packs in well ventilated rooms only!
- The lids of the battery packs may only be opened with the plug-in connectors being disconnected!
- Do not short-circuit the batteries!
- Dispose of consumed batteries at a recycling company!

4 Technical Specification

Control unit

Input:	24 V/max. 30 A DC
Output:	115 ... 565 V DC or pulse in 3 coarse and 11 fine steps max. 650 W DC/1,200 W pulse no residual ripple at DC
Pulse data:	Frequency 20 ... 200 P/s, progressively adjustable time constant 1... 10 ms, progressively adjustable
Pulse shape:	fast ascent, slow exponential descent similar to the pulse shape of the electric eel
Weight:	approx.1.7kg
Properties:	overload and short-circuit proof, reverse battery protection, battery voltage monitoring

Battery pack:

Weight:	approx.10kg
Components:	maintenance-free lead batteries 4 pcs. 12V/6.5Ah 2 serial pairs connected in parallel

The device has been constructed according to the German DIN VDE standard. All device components are designed to match protection class II (protective insulation). The protection degree is IP 54 (protected against sprinkling and rain water).

5 Operating Elements and Functions of the Control Unit

5.1 Main Switch

The device will be ready for operation a few seconds after switch-on (readiness indicated by a low click sound). Until reaching the ready state, the device does not react to actuations of the dead man switch (DMS). The waiting period will be shorter if the device had been switched on a moment ago.
The first actuation of the DMS after reaching the ready state is always ignored by the device. This is a safety function, i.e. the device checks whether the DMS is able to switch off.

5.2 Operating Mode Switch

DC: Direct current output; the output voltage is completely smooth in order to achieve the best galvanotaxis possible.

P: Pulse output; the pulse data are set by the frequency and time constant operating elements.

DC/P: This mode is selected when you move the flip switch to its medium position (not marked for lack of space).
Optional DC or pulse output to be selected with the death man switch.
If the interval between the last release of the DMS and its new actuation exceeds 1 second, DC will be selected, if it is shorter than 1 second, the pulse mode will be selected.

5.3 Output Voltage Selection Switches

These switches are used to adjust the device to different water conductivity values and electrode sizes. Moreover, this adjustment is used to define the effective power and thus the battery current and the expected duration of the operation.
The output voltage is the sum of the settings of the coarse and fine adjustment switch. When the fine adjustment switch has reached its right stop while you want to further increase the voltage, you have to set the coarse adjustment switch one step up and restart fine adjusting at the left stop of the fine adjustment switch.

NOTE:
Both voltage selection switches must only be switched if the DMS has NOT been actuated. Voltage switching under load with active DMS would quickly destroy the switch contacts due to arc formation.
(This limitation does not concern the operating mode switch and the frequency and time constant setting switch which may also be used with active DMS.)

5.4 Battery Current Display

The pointer deflection indicates the power consumption and - in case of DC operation - the effective capacity. At full deflection (pointer at 100) about 650 W are delivered. At a deflection to 60, 60 % of 650 W are delivered, i.e. approx. 390 W.
The smaller the deflection of the pointer, the longer you may fish until the battery is exhausted. You should always try to adjust your device so as to ensure a sufficient catching effect at minimum pointer deflection.

5.5 Acoustic Signal Emitter

An acoustic signal emitter (whistle) has been built into the device and connected to the device output. This sound indicates that the device is operating and the electrodes are live.

5.6 Frequency and Time Constant

These settings are effective in pulse mode only. Frequency is the number of pulses per second. It has essential influence on the fish as well as power consumption which wilt both increase with increasing frequencies. The time constant determines how quickly the pulse fades. The output voltage then equals a DC voltage with residual ripple.
A reduced time constant reduces power consumption and increases galvanonarcotization.

5.7 Run-up Time

The EFGI 650 provides a technological novelty. On actuation of the DMS, the output voltage is not effective immediately at its full strength, but raises gradually during the run-up time from zero to the maximum value.
This run-up time is also effective in pulse mode. In the DC/pulse mode the run-up time affects DC while the pulse starts immediately.
The run-up at DC mostly inhibits the 1st anodic reaction and its chasing effect. In both the DC and the pulse mode the fish (mainly those being close to the anode) have time to turn. The fish approach more steadily and are less exposed to stress.
The run-up time is fixedly set to about 1 second.

5.8 Overload Protection

This safety function prevents the electronic components from being destroyed by overload and short circuits in the anode circuit.
In DC mode, this function is effective and automatically switches the device off when the battery current exceeds 30 A. when releasing the DMS, the function is reset and the device returns to the ready state.
In pulse mode, switching-off is done depending upon the frequency and time constant settings. In case of overload switch-off, you have to reduce the output voltage.

5.9 Low Voltage Monitoring

This safety function prevents the deep discharge of the batteries by switching off the device if the voltage falls below certain limits.
The battery voltage is monitored in the idle state (DMS off) as well as under load (DMS on).
If the voltage is below the idle operation limit, the device cannot be switched on while the device is switched off if the voltage falls short of the slightly lower load limit.
Exhausted batteries typically cause irregular switching-off in the beginning. At reduced power (voltage decrease) the device is operable again for a short period.

6 Start-up and Operation of the EFGI 650

6.1 Start-up

Put a battery pack into the back holder and lift the holder. Hang the control unit into the straps in front of your body. Connect the battery pack (leading the cables below your left arm), the cathode, and the anode to the sockets of the control unit (while the main switch is in the "OFF" position). Hang the strain relief of the counter electrode into the short strap end at the lower left side of the holder. Now you can switch on the main switch and start fishing.

6.2 DC Fishing

Select "DC" with the operating mode switch. DC fishing provides the best galvanotaxis, being supported by the complete smoothness of the output voltage of the
EFGI 650.
Compared with pulse fishing, the chasing effect is low. DC fishing reduces the stress on the fish. The high power consumption compared with pulse fishing and the relative narrow range are inevitable.

You should prefer DC fishing if:

- the water is shallow and a low power is sufficient,
- you want to catch "hard-to-catch" fish,
- the conductivity is low.

Start at lower voltages and raise the voltage until the fish are approaching the anode well. The voltage has been set properly if no or slight narcosis occurs. The fish ought to return to their normal swimming position a few seconds after switching off the device.

Experience shows that 20 ... 50 % of the power are sufficient when fishing in creeks or shallow water. At deeper places, the power has to be increased in most cases by raising the output voltage to 50 ... 100 %. In shallow creeks the operating time per

battery pack reaches a standard of 1.5 ... 3 hours catching fish on a track of approximately 500 ... 1000 m.
In deep creeks you can expect an operating time of 1 ... 1.5 hours. In generally deep water, the operating times tend to be too short, and you should preferably switch over to pulse mode.

6.3 Pulse Fishing

Set the operating mode switch to "Pulse". The frequency setting buttons (marked with "P/s", pulse per second) and time constant (marked with "ms", milliseconds) are now active.

Characteristic features of pulse fishing:

-- All effects as well as power consumption essentially depend upon the frequency and time constant pulse settings.
– The ranges are considerably larger than in the DC mode at equal power or the power consumption is much lower at equal ranges.
– The chasing effect is stronger and affects a larger area.

Use pulse fishing if:

- the catching effect is too low in the DC mode,
- the operating times are too short in the DC mode,
- the water has a very high conductivity.

Keep in mind that the risk of fish injuries is higher in the pulse fishing mode. Reduce the voltage if the narcosis period is too long.

You should preferably set the device to approx. 70 P/s and 3 ms. An increased time constant reduces the anaesthesizing effect while raising power consumption.

6.4 DC/Pulse Operating Mode

You may want to fish using the DC mode but benefit from the larger range and the narcotizing effect of pulse fishing in specific situations.

Such situations are:
– Catching escaping fish
– Narcotizing fish for an easier hand catching

As long as you want to have DC you must keep a minimum interval of 1 second between releasing and pressing the DMS. The preset run-up time is active. If one of the specific situations occurs you have to react quickly. Release the DMS and actuate it again within 1 second. Now the pulse mode is active, and as speed is essential the pulse comes immediately without any run-up time effect.
Periods of 1 ... 3 seconds are sufficient for narcotizing, so there is no need to have

the pulse mode activated longer than necessary. In this operating mode, you must keep a certain time regime when actuating the DMS. You will certainly master this after some practice.
This method is especially useful for catching eels and considerably facilitates the fishing.

7 Charging the battery

Please see the extra manual for charging the batteries.

8 Electrode Dimensions

The catching capability of an electric fishing device is essentially determined not only by the effective power but also by the dimensions of the electrodes.
Larger anodes being operated with lower voltages but higher currents due to their favourable resistance make better use of the power and bring about better catching results. As they distribute the current at broader ranges, they reduce stress on the fish.

You should prefer medium-size or large anodes although they are a bit more difficult to handle. Use the small electrode only in small creeks up to a width of approx. 1 m or in case of an extremely high conductivity if the power consumption of larger anodes is too high.
The power delivered by the device is transformed in part at the anode and in part **at** the cathode. The latter means a loss and should be as low as possible.
In order to meet this requirement, the length of the usual cathode must have a certain relation to the anode ring.
In most cases, the most suitable compromise is to select 3 ... 4 times the circumference of the anode as length of the cathode. The loss will then amount to approximately 25 %.
The electrodes supplied to you are harmonized with each other. You should not change the electrodes, particularly the cathode length, without consultation with the manufacturer.

9 Care and Maintenance

– Avoid exposing the control unit to shocks and beats!

– Keep the plug-in connectors free of dirt and water!

– The control unit is tight against sprinkling and rain water from any direction provided that the plugs are plugged in. When disconnecting wet plugs, avoid water from penetrating into the plug-in connectors as it may get into the control unit from there.

– Store the device in a dry place at normal temperatures, if possible!

Battery replacement

Avoid short circuits at the batteries! Note the correct pole positions when connecting new batteries. If necessary, draw a connection sketch before replacing the old batteries. The plus pole must be connected with the connector marked by a red insulating hose.
Clean corroded connectors if necessary and grease them.
Reassemble the components of the battery box in their original positions!

10 Troubleshooting

After having used the device for longer periods, the heavily strained cables may break mainly at the bends near the connectors. The typical feature of this fault is that it occurs rarely in the beginning and becoming to appear more often later on. Check the conductivity of suspicious cables and at the same time pull/turn/press them at the bends.

The cathode is connected to the respective plug at pin No. 1, the anode at pin No. 3, the separate death man switch at pins No. 1 and 2. Unused pins have been removed. The pin numbers are identified.
A cable break is very probable if you hear the whistling sound while the device cannot catch fish.
If you choose not to have faulty cables replaced by the manufacturer, you must make sure that the new cables are of the original type.
In case of trouble, please contact the manufacturer first and in no case intervene into the control and charger units!