HT-2000 Battery Backpack Electro-fisher Manual

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Introduction

Halltech's HT-2000 Battery Backpack Electro-fisher is a 24-volt Battery Powered Electro-fisher enclosed in a watertight pelican case, mounted on a non-conductive backpack frame. The HT-2000 works effectively in waters with high to low conductivity. A 24 volt, rechargeable sealed gel type battery powers the HT-2000. The battery is comprised of two 12 volt, 7.5 AH batteries bonded and wired together to provide a 24-volt output. Each HT-2000 unit is supplied with two batteries and a charger to extend operating time. Smaller batteries are also available for light duty.

The HT-2000 transforms the battery output into higher voltages. The output voltage is variable from 50-950 V using 11 settings. The output frequency is variable from 5-250 Hz using 11 settings. The maximum output power produced by the HT-2000 Battery Backpack Electro-fisher is 1 kW peak with a 2 ms pulse width.

The Battery and electrical circuits are contained in a water tight, rugged pelican case, attached to a non-conductive, durable pack frame. The pack frame straps are adjustable to fit a wide range of body sizes. The straps are also equipped with military style quick release shoulder harnesses. To remove the unit quickly, release the waist belt and pull down on the red release straps.

The HT-2000 Battery Backpack Electro-fisher is also equipped with two LCD displays. One is the eight-digit seconds counter and the other is a four-digit readout connected directly to the multifunction meter. The multifunction meter can display mean current, peak power, and battery voltage.

The HT-2000 comes with a wide range of safety features; red strobe light , audible “power on” alarm, water immersion alarm , tilt alarm , waterproof internal battery , anode pole operator switch, electrode out of water shut off, emergency shut-off switch on pulsator unit (ESO), non-conductive, light-weight backpack frame, and the harness quick release mechanisms. Light emitting diodes (LED's) indicate which feature was triggered. The LED's indicate when an overload, immersion, low battery, electrode out of water, or tilt sensor has been tripped.

Each new unit is supplied with a lightweight fiberglass telescoping anode pole (straight grip or crutch style) with waterproof switch, anode ring, and stainless steel trailing cathode. These accessories along with the batteries and charger fit in the aluminum field case provided.

Controls and Features

All of the HT-2000's controls, except the emergency shut off switch (ESO) and anode pole switch, are located within the watertight pelican case. The front panel displays, controls, and connectors are shown on page 6 and described below.

Halltech's new anode design is very different from historical anode designs. The HT-2000's anode is a telescoping pole that allows the anode to be reduced to half its size to allow for easier transportation and storage. It may also be adjusted to a comfortable length based on the operator. The anode ring angle is also adjustable. If desired we also have an anode pole that comes equipped with a crutch style handle. This crutch style handle allows the user to grasp and hang on to the anode with greater ease. There is also an area on the handle where a strap can be added to reduce fatigue to the users arm. The switch on the anode is the last of three safety switches; the anode switch must be depressed in for the unit to produce an output voltage. The **output voltage switch** is located in the middle of the unit on the far right side. The output voltage ranges from 50-950 V in 11 steps (50, 100, 150, 250, 350, 450, 550, 650, 750, 850, 950V). 50 to 350 volts is typically used in high conductivity waters (>300 microsiemens). 450 to 750 volts work best in moderately conductive waters (100 to 300 microsiemens). 850 and 950 output voltage should typically only be used in low conductivity waters (less than 100 microsiemens). Increasing the output voltage just one step may increase the output peak wattage 100% plus or minus depending on the conductivity on the water and the voltage setting.

The **Frequency [Hz] switch** is located in the middle of the unit on the far left side of the panel. The output frequency is in a range from 5-250 Hz in 11 steps (5, 10, 20, 40, 60, 80, 100, 130, 160, 200, 250Hz). The frequency is best described as the number of times the fish is shocked in a given time period, or the number of pulse waves produced each second. When first shocking a new site start with the lowest frequency setting. Gradually increase the frequency until the desired effect is achieved. For example when shocking a water body with a high conductivity (> 300 microsiemens) at an output voltage of 150 volts and a frequency of 60, if you are rolling some fish but feel you aren't getting all of them, try increasing the frequency to 80 or 100 Hz before increasing the voltage to 250 V.

The **Multifunction Meter switch** is located directly in the middle of the panel. The multifunction meter readout is located at the top right of the panel. The multifunction meter can display mean current in Amps (xx.x display), peak power in Watts (xxxx display), and battery voltage in Volts (xx.x display). The battery voltage option is very useful for checking the level of charge of the battery being used. The peak power option displays how many peak watts the unit is producing. This is also useful because the unit will automatically overload when this value becomes too high.

To indicate if a feature has been activated the HT-2000 has been equipped with a series of LED lights located near the top of the panel. The **Overload Function** enables the unit to automatically shutdown and sound the tone alarm when the output power becomes excessive. The LED light located at the far left will light up if an overload has occurred. You must use a lower output voltage or frequency if an overload occurs. To reset the **overload LED** you must push the front panel reset button, or cycle power with the ESO button or the on/off switch located on the panel.

Toggling the anode pole switch will reset the unit and allow it to continue shocking but will not clear the LED indicator lights. The front panel reset button and the seconds counter reset must be simultaneously depressed to reset the seconds counter.

The **Immersed Function** is a safety feature that will not allow the unit to operate when the water level is up to or above the anode connection on the bottom of the backpack unit. A sensor is connected between the two screws beside the anode connector. If these screws become immersed in water or if water is present between them the unit will shutdown, the tone alarm will sound and the **immersed LED** (second from the left) will light up.

The **Tilt Function** is a safety feature that will not allow the unit to operate if it is not perpendicular. If the operator was to fall or lean greater then 45^{o} front and back or to either side the unit will shutdown, the tone alarm will sound, and the **tilt LED** (second from the right) will light up. A poleswitch reset will restore normal operation. If an operator were to fall, this feature would disable the unit .

The **Electrode out of Water Function** will inhibit output voltage when either the anode or cathode is not in the water. If the unit is running and an electrode is removed from the water the unit will shutdown, the tone alarm will sound, and the **Electrode out of Water (EoW) LED** will light up. Areas exist where keeping both of the electrodes in the water all of the time is impossible. In extremely low conductivity waters, the electrode out of water feature is activated. These two conditions can be resolved by disabling the out of water feature. The switch at the centre of the LED's **(reset and disable)** allows the operator to disable the function when needed. The operator must press the button to disable the feature every time the unit is powered on using either the emergency off switch or the on/off toggle switch on the panel. The reason for this is so that **the operator is consciously aware that the feature has been disabled. When the feature is disabled the unit will still be emitting a output voltage when one of the electrodes are out of the water, the operator must take every precaution not to allow any contact with either electrode because this could result in injury or death.** The **EoW disabled LED** indicates that the anode is always live when pulsed, even when removed from the water.

In addition the HT2000 has indicators to notify the operator when the battery is too low to operate the unit effectively, and an LED to indicate if the fuse in blown. There is a **tone volume** screwdriver adjustment for the loudness of the alarm on the front panel.

HT-2000 Battery Backpack Electro-fisher Operation

1. Plug the anode and cathode into their proper connectors located on the bottom of the pelican case. Connect the anode pole strain relief clip to the backpack frame. Place the battery in the allotted area and connect it to the unit via the connectors. Place the multifunction meter to battery voltage and turn the unit on using the on/off switch on the front panel then pull and turn the emergency off switch to turn it on. The readout in the display at the top right of the panel will tell you how much of a charge is in the battery. A fully charged battery will give a reading from 24 – 26V.

2. Next get into the water and make sure both electrodes are in the water as well. Choose the desired output voltage and frequency. If the conductivity of the water is unknown use a low output voltage (100 or 150V) and frequency (40 or 60Hz) to start. Depress the anode pole switch and observe the reaction of the fish. If the unit is not producing satisfactory results try increasing the frequency a few levels before increasing the output voltage. Only increase the output voltage one-step at a time. Repeat this procedure until satisfactory results are obtained. **Never change voltage ranges while the anode thumb switch is depressed, this may damage the unit**. By placing the multifunction meter to the peak power option, you can see the output wattage of the unit. Make sure the anode ring is not directly above the cathode because this will greatly increase the output wattage and is a common source of overloads.

3. Check all of the unit's safety features and functions before using the unit each day and ensure all operators are familiar with all controls and safety features. The anode pole switch should be toggled on and off to ensure proper operation. The overload feature is tested by passing the anode ring over the cathode and the unit should overload and shutdown The immersed function should be checked An easy way to check this function is to hold a small piece of wire between the two screws by the anode connection located on the bottom of the unit. The immersed LED should light up and the tone alarm should sound when a connection is made between the two sensors. To test the electrode out of water function, submerge the anode, depress the anode thumb switch, and raise the anode ring out of the water. The alarm will sound and the unit will shutdown. Test the tilt feature by depressing the anode thumb switch, and leaning either forward or to a side. The unit will shutdown and the tone alarm should sound before the operator reaches a 90^{o} bend.

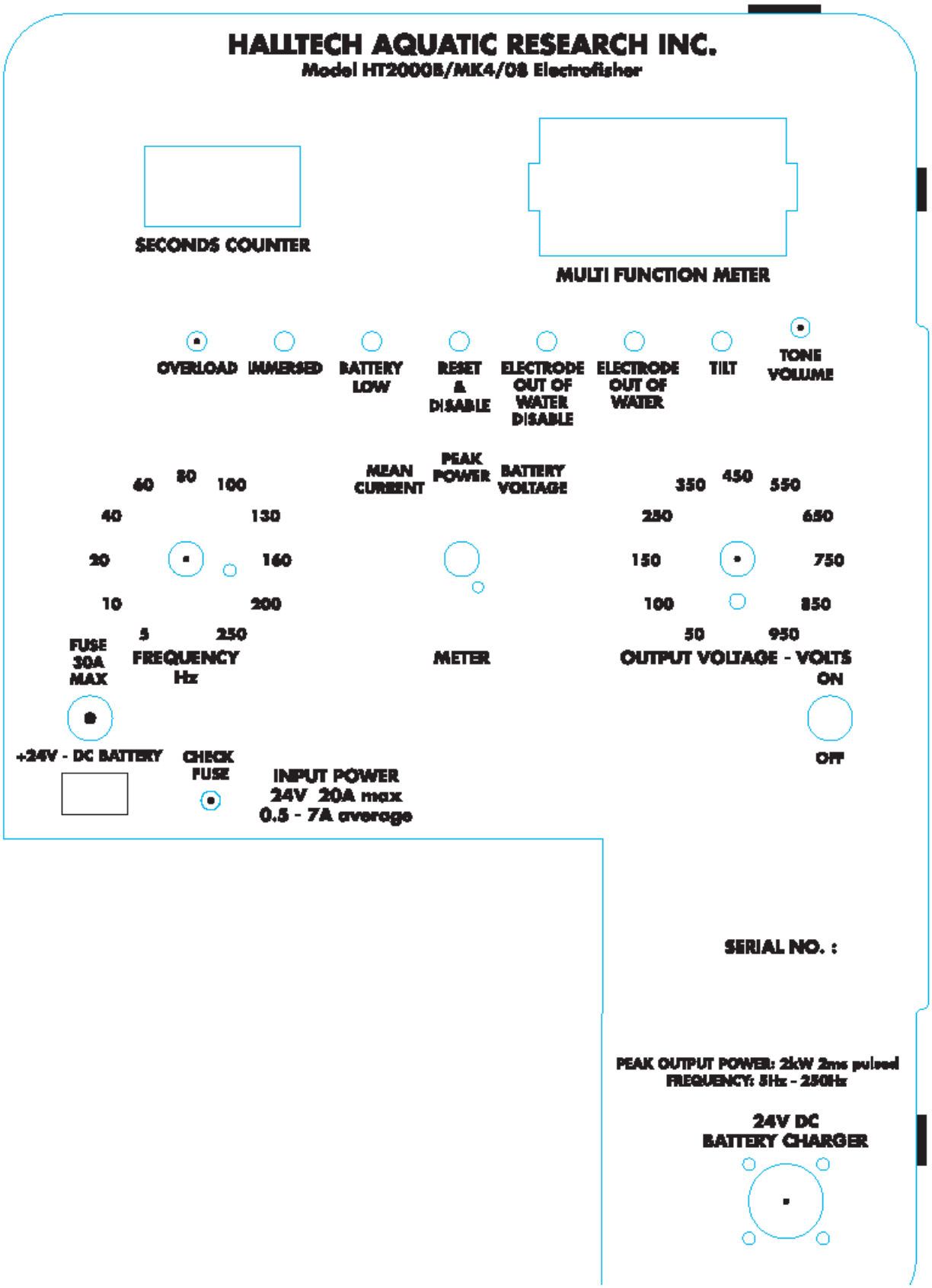
HT-2000 Electro-fisher Trouble-shooting

The following section is a trouble-shooting section to help you correct some of the more common problems associated with using the HT-2000 Battery Backpack Electro-fisher.

1. Turning the unit off and on by using the emergency off switch on top of the unit or the on/off switch located on the panel is a hard reset, toggling the anode switch on the anode pole is a soft reset. A hard reset or pushing the front panel reset button is required to extinguish any of the LED light functions such as Overload , Tilt, Electrode out of Water, and Immersed. To reset the seconds counter both the front panel reset and the seconds counter reset must be pressed simultaneously.

2. The Voltage used is very dependent on the conductivity of the water. If an overload occurs when the output is activated using the anode pole switch, it is likely that the conductivity of the water is too high for the voltage selected. Reduce the voltage and activate the output again, continue this process until an appropriate voltage is selected. To compensate for using a lower voltage, increase the frequency to better the unit's results. Keep an eye on the fish being captured to ensure they are recovering quickly and no burns or spinal abnormalities are present.

3. The HT-2000 Electro-fisher is equipped with a tilt feature that will not allow an output voltage to be produced if the unit is not in its normal operating position. The unit's normal operating position is vertical, the same way it would sit on the operators back. A tilt condition is indicated by a tone alarm and the tilt LED will be lit up. Turning the unit off then on using the emergency off switch located on top of the unit will fix the problem.


HALLTECH AQUATIC RESEARCH INC.
Model HT2000B/MK4/08 Electrofisher
SECONDS COUNTER
MULTI FUNCTION METER
OVERLOAD
IMMERSED
BATTERY LOW
RESET & DISABLE
ELECTRODE OUT OF WATER DISABLE
ELECTRODE OUT OF WATER
TILT
TONE VOLUME
MEAN CURRENT
PEAK POWER
BATTERY VOLTAGE
60 80 100
40 130
20 160
10 200
350 450 550
250 650
150 750
100 850
5 250
FREQUENCY Hz
METER
50 950
OUTPUT VOLTAGE - VOLTS
FUSE 30A MAX
ON
OFF
+24V - DC BATTERY
CHECK FUSE
INPUT POWER
24V 20A max
0.5 - 7A average
HALLTECH - HT2000B/MK4/08 ELECTROFISHER - OP WHITE
DEC 17/08 - WO#27533
SERIAL NO. :
PEAK OUTPUT POWER: 2kW 2ms pulsed
FREQUENCY: 5Hz - 250Hz
24V DC
BATTERY CHARGER

Halltech's HT-2000 Battery Backpack Electro-fisher Specifications

Conductivity Range:	10-3000 microsiemens/cm
Battery:	24 volt gel type (12V+12V)
Output Voltage:	50-950 V in 11 steps (50,100, 150, 250, 350, 450, 550, 650, 750, 850, 950V)
Output Power:	1kW peak (1000W) 2ms pulsed
Output Frequency:	5-250 Hz in 11 steps (5, 10, 20, 40, 60, 80, 100, 130, 160, 200, 250Hz)
Output Pulse Shape:	+ DC pulse 2 millisecond max
Weight:	Approximately 29 lbs.
Overload Protection:	automatic Electronic and 30A safety fuse
Electrodes:	Telescoping anode pole, stainless steel trailing cathode
Timer:	8-digit seconds counter with +/- 0.003% accuracy
Multifunction meter:	Mean Current (xx.x display) Amperes
	Peak Power (xxxx display) Watts
	Battery Voltage (xx.x display) Volts

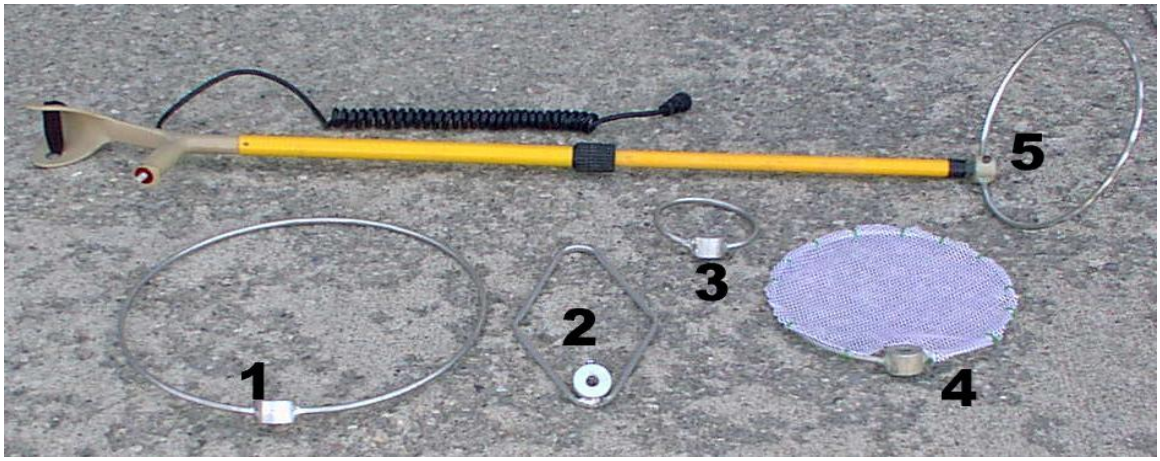
Standard Equipment Supplied

Halltech's HT-2000 Battery Backpack Electro-fisher, telescoping anode pole, anode ring, trailing cathode, two 24V (12V+12V) gel type batteries, battery charger, and an aluminum field case.

Parts Identification

.Red “Power On” Strobe Light
.Emergency Off Switch

Anode

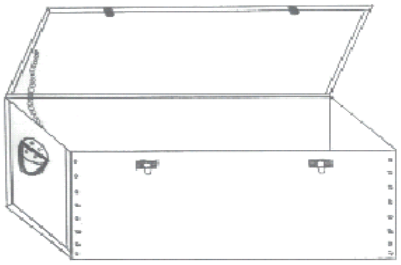


Anode Ring Options

1.....Oversized Round Anode Ring
2.....Diamond Shaped Anode Ring
3.....Small Round Anode Ring
4.....Round Net Anode Ring
5.....Standard Round Anode Ring

Accessories

24V, 7.2Amp Battery
Telescoping Anode Pole
Anode Rings (various shapes & sizes)
Aluminum Field Cases (various sizes)
Battery Charger
Cathode tail
Electro-fishing Dip Nets (various net shapes)
Polarized Sunglasses
Shoulder Length Rubber Gloves
Excellent Selection of GPS Units
Excellent Sonde Units and Y.S.I. Meters
Large assortment of Hack Kits
Dry Bags
Fish Measuring Boards
Head Lamps and Flashlights
First Aid Kits



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Ht-2000 Electro-fisher Return Instructions

Please print page number (2) of this document. Fill out and complete the form and attach it to the equipment you are sending back for service.

Securely pack unit in its field case. If a field case is not available choose an appropriate sized box (double wall preferred with at least 4" of space surrounding the equipment) If you add additional items in the case pack them with the utmost care as loose items have been known to damage the strobe lens.
Double check to make sure every part is packed in the kit (**unless told otherwise**).
Cathode tail, Anode pole, both batteries, charger, Anode ring, and electorfisher unit with back pack rack.

Pack the surrounding space with packing material. Bubble wrap, and expanding packing foam are recommended.

If shipping the unit across any border, make sure all the necessary shipping documents are securely fastened to the field case or chosen box. Contact your shipping company if you're unsure of what documents are necessary.

If you have any other questions or concerns please contact our service manager:

Gordon Robb
Service Manager
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HALLTECH Aquatic Research Inc.

REPAIR ORDER
Please Enclose With Unit

Bill To

Company	**Contact**
Address	**Phone**
City	**E-Mail**
Prov/State **PC/Zip**	**PO#**

Ship To ☐ **Check if same as Bill To**

Name	**Phone**
Address	**City**
Prov/State	**PC/Zip**

Unit Information **In Warranty ☐ Yes ☐ No**

Unit Type	**Model#**	**Serial#**

Symptom/Problem

Special Instructions

Shipping Instructions

Thank you for using Halltech Aquatic Research Inc.

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