

DC Power Installation & Troubleshooting Guide

(New battery installation, Battery Replacement
& System Troubleshooting)





WARNING:

To avoid injury and damage read the manual for operation and safety information.

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What Is Needed

Installation material and hardware is **NOT INCLUDED**

- I. Phillips screwdriver
- II. Socket wrench (1/4")
- III. Allen wrench (1/8")
- IV. Wire clips
- V. 3 prong AC power cord
- VI. Batteries

Package Contains

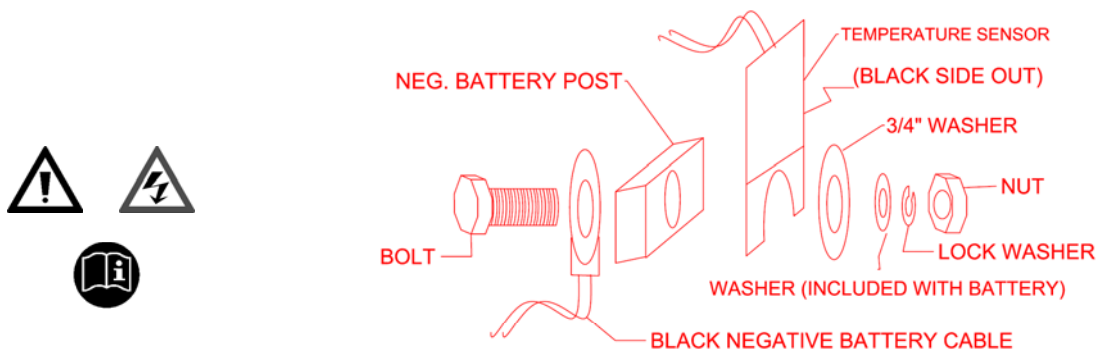
The package contains parts that can be damaged. Do not stack the DC systems.

1. Lid
 - a) Overlay (Fuel Gauge)
 - b) 8-32 Socket Head screws; 3/8" long (3)
2. Internal parts
 - a) Series 301 Controller
 - b) AC Input: IEC-320 AC Inlet
 - c) Fan Extension wire
 - d) 50mm Fan
3. Accessories
 - a) 2 foot Cat5 Cable
 - b) Battery temperature sensors (2)
 - c) 1/2" Polypropylene battery straps and 1/2" Strapping Buckles (2) or 22" Tie Wraps (2)
 - d) 15" Ring Lug to Power Pole Cable
 - e) 0.94" x 3.62" Tie Wraps (2)
4. External parts
 - a) Specification Label
 - b) Serial number Label



Getting Started

1. Connect the Red ring terminals (Package item 3d) to the Red battery posts (reference #)
 - Use a Phillips screw driver and socket wrench
 - Red to Red (positive)
 - Ensure very tight connections
2. Connect the Black ring terminals (Package item 3d) and the Temp sensors (package item 3b) to the Black battery posts (Reference #)



- Use a Phillips screw driver and socket wrench
 - Black to Black (negative)
 - Temp sensor on opposite side of battery post from ring terminal
 - Temp sensor black side facing away from battery post
 - Temp sensor in vertical orientation
 - Ensure very tight connections
3. Bend the Temp sensors (Package item 3b) to a horizontal position (Reference #)
 - Bend close to the washer



Do not bend the electronic components in the temp sensor (bumps in temp sensor covered with black rubber)

4. Repeat steps 1-3 on the Second Battery



5. Remove the DC Power System's lid
 - Use an Allen wrench
 - 1 bolt in front (under lip by fuel gauge)
 - 2 bolts in rear (under lip on side opposite of fuel gauge)
 - GENTLY lift lid a few inches
 - Disconnect Ethernet cable from fuel gauge under the lid
 - Remove lid completely
6. Put Cable ties and Batteries in place (Reference #)
 - Thread cable ties or Tie Wrap (Package item 3c) through slots in base of the DC Power System (as shown on Reference)
 - Place SLA batteries on top of pads
 - Do not tighten cable ties or Tie Wrap ***YET***
7. Connect battery wires to the controller (Reference #)
 - **MAKE SURE BLACK TO BLACK AND RED TO RED**
 - Black "Power Poles" to Black "Power Poles"
 - Red "Power Poles" to Red "Power Poles"
8. Connect the Temp sensor wires to the controller (Reference #)
 - Plug the Temp Sensor connectors into slots on controller located on side facing the wall of the power system box
9. Secure Batteries with cable ties (Reference #)
 - Pull cable ties tight around SLA batteries
 - Clip excess cable tie with wire cutters or scissors
10. Replace the lid onto power system (Reference #)
 - Connect Ethernet cable to controller and fuel gauge
 - Place lid on power supply box
 - Tighten 1 bolt in front and 2 bolts in rear





11. Connect the devices (computer/monitor/etc) to DC Power System

- a) DC output and USB on DC Power System Included(Reference #)
(DC ports and USB port located at rear of power system next to fan)
 - Plug Device into DC ports
 - Plug USB cable from computer to DC Power System
- b) DC output cabling and USB cable for the DC Power System **are NOT** included (Reference #)
 - Plug Device into RED and BLUE “Power Poles”
 - Plug USB cable from computer to power system

12. Plug the Power System into an AC wall outlet

- The Power System is in sleep mode until “woken up”
- Plugging into AC outlet will “wake up” power system
 - AC port is located at rear of power system below DC/USB ports
- Charge the battery to full state
- **If not deploying immediately, make sure the power system remains PLUGGED IN**



Replacing Batteries



WARNING! Disconnect Both (2) Red/Black Battery Connections Before Servicing Batteries.

1. Disconnect AC power, the USB and DC port from DC Power System
2. Remove the power system lid
 - Use an Allen wrench
 - 1 bolt in front (under lip by fuel gauge)
 - 2 bolts in rear (under lip on side opposite of the fuel gauge)
 - GENTLY lift lid a few inches
 - Disconnect Ethernet cable from fuel gauge under the lid
 - Remove lid completely



3. **UNPLUG the Battery's RED and BLACK "Power Poles" from the Controller**

REFER TO THE OPERATOR'S MANUAL



4. Cut battery strap or Tie Wrap on each battery
5. Disconnect Red ring terminals (Package item 3d) to Red battery posts (reference #)
 - Use Phillip screw driver and socket wrench
6. Disconnect Black ring terminals (Package item 3d) and Temp sensors (package item 3b) to Black battery posts (Reference #)
 - Use Phillip screw driver and socket wrench
7. Repeat steps 2-3 on Second Battery
8. Discard of the Battery Properly
9. Connect Red ring terminals (Package item 3d) to Red battery posts (reference #)
 - Use Phillip screw driver and socket wrench
 - Red to Red (positive)
 - Ensure very tight connections



10. Connect Black ring terminals (Package item 3d) and Temp sensors (package item 3b) to Black battery posts (Reference #)

- Use Phillip screw driver and socket wrench
 - Black to Black (negative)
 - Temp sensor on opposite side of battery post than ring terminal
 - Temp sensor black side facing away from battery post
 - Temp sensor in vertical orientation
 - Ensure very tight connections

11. Reconnect Bend Temp sensors to horizontal position (Reference #)

12. Repeat steps 9-11 on Second Battery

13. Reconnect Battery RED and BLACK “Power Poles” from Power System (Reference#)

14. Replace lid onto power system (Reference #)

- Connect Ethernet cable to controller and fuel gauge
- Place lid on power supply box
- Tighten 1 bolt in front and 2 bolts in rear

15. Reconnect AC power, the USB and DC port from Power System (Reference #)



Troubleshooting

1. The Controller will not power up with battery connected
 - I. The Controller may be in “Sleep Mode”. This is a low current mode intended for storage / shipping so that the battery is not drained. There are three reasons for Sleep Mode to be active:
 - a. When a battery is initially connected to the Controller.
 - b. Sleep Mode selected using the GUI program on a host PC.
 - c. Battery voltage is less than 10.0V.

In all cases, to bring the Controller out of Sleep Mode, connect the AC Line power. Once the Controller processor starts, operation will continue under battery power.

- II. Check Battery polarity. A reversed battery connection will not harm the Controller, but it will not operate.
2. The unit does not have DC output
 - I. If on Battery power, check voltage – If less than 10.5V, the DC output is disabled.
 - II. There may be an overload condition (load current greater than 15A for more than 10 seconds) or short circuit on the output. This causes the DC output to be disabled. Check the status indicators on the Remote Indicator or on the GUI display for the following indications:
 - If on Battery power:

Overlay – shows “DC” and “Recovery” flashing simultaneously

GUI – pop-up message indicating an overload condition
 - If on AC power:

Overlay – shows “AC” and “Recovery” flashing simultaneously

GUI – pop-up message indicating an overload condition



Remove the cause of the overload or short condition, and cycle between Battery power and AC power. This will re-enable the DC output and clear the status displays.

3. The Charge cycle does not complete; the Remote Display shows “AC” and “Recovery” flashing simultaneously

If the temperature on the Battery terminal or Controller exceeds 50C, the charge cycle will end regardless of the charge level of the battery. The Overlay will show “AC” and “Recovery” flashing simultaneously

Determine if the Controller is overheating by reading the event log or viewing the controller temp on the GUI program. There may not be adequate cooling. Check fan operation and air obstructions. If the Battery is overheating, it may be faulty, or the charge settings may be incorrect. Check Battery condition, and verify proper software setting for battery.

4. “Recovery” indicator is lit on Overlay during charge cycle

This indicates that the Battery is in an over-discharged state, and the Controller is attempting to recover the battery back to normal operation. This process may take 24-48 hours. If successful, the “Recovery” light will extinguish and a normal charge cycle will complete. If not successful, the “Recovery” light will stay on, and the charging cycle will end. Check the event log for “Charge Timeout” status – this indicates that the battery has not successfully recovered.

Recovery may be tried again by cycling between Battery power and AC power.

5. No USB Connection

- Click Start -> Control Panel-> System
- Click the Device Manager tab and open Universal Serial Bus Controllers by clicking the plus sign (+). One of the following four conditions are displayed

1. If the device displays in Device Manager, the USB port recognizes Series 301 port. There is a physical problem with the device or there is an issue with the device software drivers. Try disconnecting the USB device, closing any software for the device that may be open, uninstalling the USB device software driver, and then reinstalling the driver. Connect the USB device to the computer after the software drivers are installed. Refer to the device manufacturer for more information.



2. If the device displays as an unknown device, check the following items:
 - If the USB device is connected to a USB port on a port replicator, unplug it and plug it directly into a USB port.
 - The device may not be getting enough power. If other USB devices are connected to the system, remove all other USB devices (except keyboard and mouse) and restart the computer. Check the Device Manager again. If this solves the issue, use a powered USB hub to power more devices.
 - Disconnect the USB device, close any software for the device that may be open, uninstall the USB device software driver, and then reinstall the device software driver.
3. If the device displays under “Other Devices”, the USB ports are working but the device software drivers need to be installed. Unplug the USB device and install the software drivers.
4. The device is not listed at all.

The USB device is not detected by the computer: Perform the following steps to troubleshoot the USB port when the computer does not detect a USB device.

- I. Check Device manager to see whether the device displays under the USB section or the Other Devices section. To do this, follow the procedures below:
 - Right-click My Computer, and click Properties
 - Double-click the System icon, and then click the Device Manager tab.
 - Check for the device under the Universal Serial Bus controllers or under the Other Devices section.
 - If the device is found under Universal Serial Bus controllers or Other Devices, then remove the device from Device Manager, disconnect the USB device, restart the computer, and install the USB device software following the manufacturer's suggestions.



Alternate Resources

Safety, Software, and Service information

The following table describes where to get more HES and Component related Safety, Software and Service information.

To learn about	Reference
Using DC Power System Safety	See the Important Information Guide at H-E-Systems.com for latest safety and regulatory information
DC Power System services and support, tips, forums, and HES software	www.H-E-System.com
HES Power System And Remote Fuel Gauge	Open HES GUI > Advance Screen > Help > Content; to see user and information manual
Mobile Med AC Inverter	www.H-E-System.com
State of Health (SOH)	www.H-E-System.com