Battery Charging Controller

Safety Warnings

- Dangerous voltage levels are present within the Battery Charging Controller enclosure – only qualified personnel should attempt to perform service or adjustments.
- Be certain all power is switched OFF before making connections.
- Ensure all local electrical codes and safety procedures are followed.
- Complete High and Low set point adjustments BEFORE connecting Skystream to the Battery Charging Controller.
- Consult with your battery supplier for High and Low Voltage set point recommendations.

Operational Description

The Battery Charging Controller may be utilized with a Skystream wind turbine to maintain a battery bank voltage within a voltage range set by the user. The voltage range is set by adjusting Low and High Voltage set points.

When the battery bank voltage drops below the Low Voltage Set Point for 3 seconds (batteries require charging) the relay is energized, closing the connection between the Common “C” and Normally Open “NO” terminals. This connects the Skystream “Line” wire to the system, effectively turning Skystream on and enabling recharging the batteries – assuming there is adequate wind to produce power. Note that Skystream will require approximately 5 – 7 minutes before starting operation after the Low Voltage Set Point is achieved.

When the battery bank voltage reaches the High Voltage Set Point (batteries are charged) for 3 seconds the relay is de-energized and the Skystream “Line” is “opened”, disconnecting Skystream from the system and placing it in a braked mode. Skystream will remain disconnected from the system and in its braked mode until the battery bank voltage drops below the Low Voltage Set Point.

Wiring Connections

The Battery Charging Controller is wired to the battery bank and one of the Skystream output “Line” wires as depicted in figures at the end of these instructions.

While each installation is different the Controller should be mounted close (within line of sight) to the Main Utility panel so power to the Controller may be turned off during installation.

It is left to the installer to provide appropriate and adequate wires, strain relief, wire ways or conduit, as required for the particular installation.

Battery Connections (Refer to accompanying figure)

- Using wire of sufficient gauge #18 minimum recommended, connect the Battery Negative terminal to the “GND” terminal.
- Using wire of sufficient gauge #18 minimum recommended, connect the Battery Positive terminal to the “V+” terminal.
- Follow good wiring practice and color code wires: Black = Negative, Red = Positive is typical for DC wires.

Set Point Adjustments

The following voltages are provided as set points recommendations. Consult with your battery supplier for set points appropriate for your battery type and installation.

Note: As received the Battery Charging Controller ships with the High and Low Voltage set points nominally adjusted to 14.0 and 12.0 volts.

System Voltage	Low Voltage Set Point	High Voltage Set Point
12 Volt	13.4	14.4
24 Volt	26.8	28.8
36 Volt	40.2	43.2
48 Volt	53.6	57.6

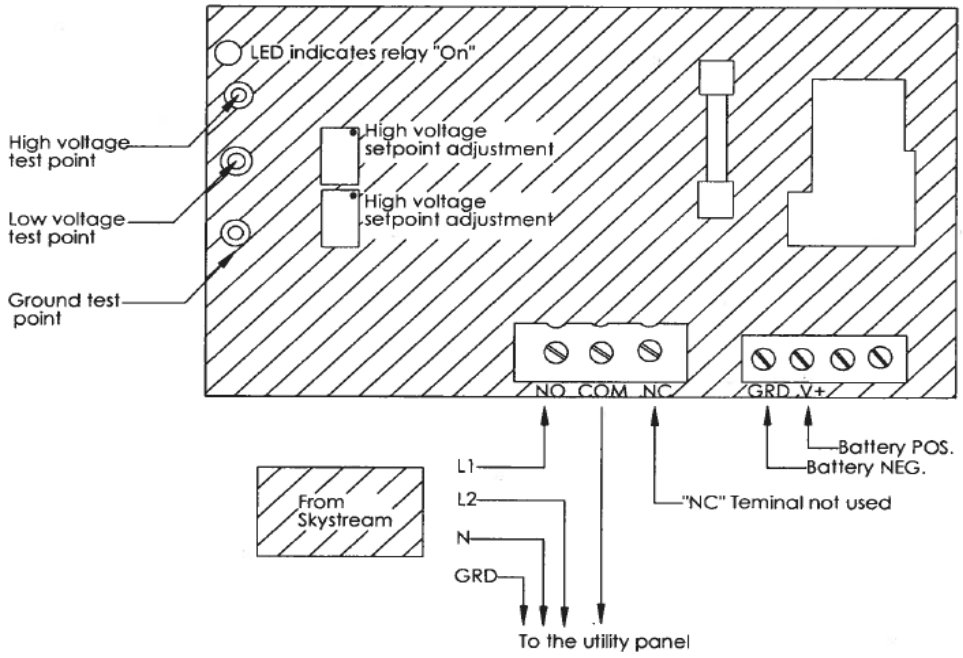
- Power the Battery Charging Controller by connecting 10 – 60 VDC to the "V+" and "GND" terminals.

Warning: To avoid unexpected operation of Skystream adjust the High and Low Voltage Set Points PRIOR to connecting Skystream to the Battery Charging Controller .

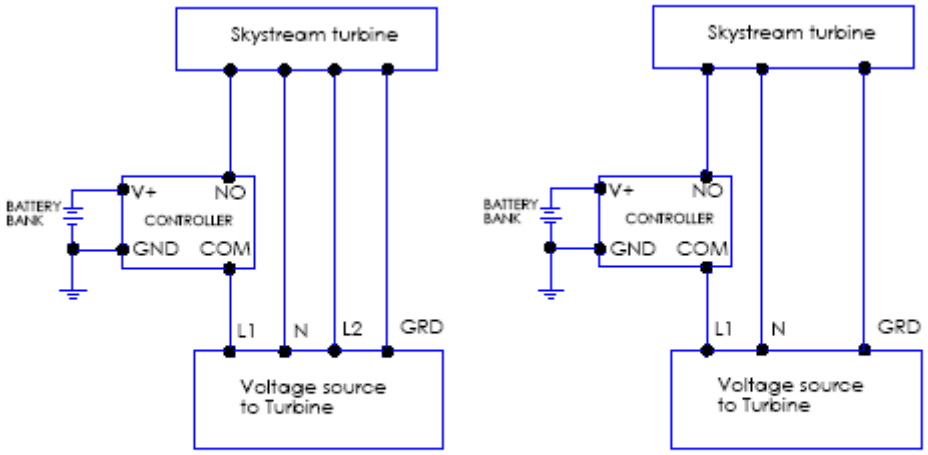
- When making voltage adjustments the voltmeter will display in a 1/10 scale factor. For example 3.80 volts indicates 38.0 volts or 0.850 volts indicates 8.50 volts.
- With a voltmeter connected to the "High Trip Set Point" and Gnd" terminals adjust the "High Trip Set Point" to the desired value. Refer to the accompanying chart for recommended Set Points.
- With a voltmeter connected to the "Low Trip Set Point" and Gnd" terminals adjust the "Low Trip Set Point" to the desired value. Refer to the accompanying chart for recommended Set Points.

Skystream Power Connections

- Refer to the Skystream Owner's Manual to determine the correct gauge wire for the installation.
- Refer to the appropriate wiring diagrams below – a typical US split phase (2 phase) configuration and a typical single phase (EU) configuration are presented; and connect the "line" wire from Skystream to the Battery Charging Controller "NO" (normally open) terminal.
- Connect an appropriate gauge wire from the common "COM" terminal of the Battery Charging Controller to the utility panel.



The above figure indicates the Voltage Set Point adjustment locations, voltage test point locations and wire connection locations. A typical US split phase (2 phase) wiring configuration is depicted.



Typical US Split (2) phase installation

Typical Single Phase installation

The above figure depicts a typical US split (2) phase (120/240 VAC) installation and a typical single phase installation as might be found in EU (230 VAC) or US (120 VAC) installations.