DC Inline Watt Meter

RENOGY 150A
High Precision Watt Meter and Power Analyzer
Important Safety Instructions

This manual contains important safety, installation, and operating instructions for the meter. The following symbols are used throughout the manual to indicate potentially dangerous conditions or important safety information.

⚠️ WARNING: Indicates a potentially dangerous condition. Use extreme caution when performing this task.

⚠️ CAUTION: Indicates a critical procedure for safe and proper operation of the controller

⚠️ NOTE: Indicates a procedure or function that is important to the safe and proper operation of the controller.

General Safety Information

- Read all of the instructions and cautions in the manual before beginning the installation.
- There are no serviceable parts for this controller. Do NOT disassemble or attempt to repair the meter.
- Do NOT allow water to enter the controller.
- Make sure all connections going into and from the meter are tight.

Battery Safety

- NEVER short a rechargeable battery or the meter connected to a rechargeable battery. It can supply high currents and cause fire explosions. Do NOT let the positive (+) and negative (-) terminals of the battery touch each other.
- Ensure wiring and connections are rated to handle the input/output current and are properly assembled for each application
- Carefully read battery manuals before operation.
- Do NOT let the positive (+) and negative (-) terminals of the battery touch each other.
- Recycle battery when it is replaced.
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Limited Warranty for PV Modules

Limited Warranty for Accessories
General Information

The Renogy 150A high precision watt meter and power analyzer is specifically designed for monitoring solar performance. This easy to use meter can monitor eight electrical parameters that are essential to power safety and performance. They include: amps, volts, watts, amp-hours, watt-hours, peak amps, minimum volts (sag) and peak watts. With a 60 volt and 150A capacity, high contrast blue display screen, and auto set features, you will surely find many great uses for this watt meter and power analyzer.

Key Features
- Backlit LCD display
- Extremely low power consumption, practically ineffective to model’s performance
- Precise and accurate readings
- Lightweight with many installation possibilities.
- Bare wire ends to allow the user freedom for their own type of connections.

Optional Component

Auxiliary Power Connector Cable
This cable allows the Renogy Watt Meter to connect to an optional power source, such as a battery pack or a power supply. It allows resetting of the meter's accumulated measurements and has 4 bare, tinned leads for universal application. The cable is not required, but very handy for many applications.

NOTE: Although the cable is an accessory to our product, it is not required. Also, Renogy currently does not carry this accessory and users will need to find their own means on attaining this cable.
Identification of Parts

Key Parts

1. Source Side Connection
2. Load Side Connection
3. Negative Wire
4. Positive Wire
5. Auxiliary Battery Port (Optional Component)

Installation

1. Connect the Positive (+) and Negative (-) leads of SOURCE to the battery or other device's terminals.
2. Connect the Positive (+) and Negative (-) leads of LOAD terminals to a device to complete the circuit.

CAUTION: Make sure connections are secure and expose no wire that may short.

NOTE: The user is responsible for attaching connectors that are rated to handle the expected voltage and current limitations.
Operation

Once the circuit is complete, the watt meter will turn on, display the default screen, then cycle through the remaining displays. You can think of the Watt Meter as a set of jumper cables; essentially a direct connection between same colored SOURCE and LOAD wires. Both the SOURCE and LOAD leads are electrically “hot” when a battery is connected to either side. Current flows from SOURCE to LOAD, assure that all connections are secure to prevent component damage.

Example #1:
Battery on SOURCE side, Motor Speed Controller (ESC) and motor on LOAD side, With the ESC on, the watt meter displays the current into the motor, voltage and power at the battery and the accumulation of Ah and Wh while the motor is running.

Example #2:
Solar Panel on SOURCE side and a battery pack on the LOAD side. The Watt meter demonstrates the charging current into the battery, the voltage and charging power at the battery, and the accumulation of the charge in Ah and Wh.

<table>
<thead>
<tr>
<th>100.00A</th>
<th>10.00V</th>
</tr>
</thead>
<tbody>
<tr>
<td>Data Queue</td>
<td>100.00W</td>
</tr>
</tbody>
</table>

**Startup Screen**
Displays the peak and minimum measurements recorded followed by the Amp-Hours (Ah) and Watt-Hours (Wh) being reset to 0.

<table>
<thead>
<tr>
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<tr>
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</tbody>
</table>

**Measurement Screen**
Displays Amps, Volts, and Watts. Screens are updated every 0.4 seconds and they are presented sequentially every 2 seconds in their appropriate units (Ah, Wh, Ap, Vm, Wp).
# Measurement Screen Glossary

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Amps, A &amp; Ap (Current)</td>
<td>Only the current from <strong>SOURCE to LOAD</strong> is measured. The Amp value displayed is the average current over the last screen update interval. Peak Amp value (Ap) display is the maximum current drawn from the LOAD side. Peaks lasting only a fraction of a second can be captured. Supplying the auxiliary power with a voltage greater than what the meter it is measuring removes the meter's operation current from measurements. To reduce heating, measure currents over 65 amps from reduced time and consider using connector which can handle large current.</td>
</tr>
<tr>
<td>Volts, V &amp; Vm (Voltage)</td>
<td>The displayed value is the average voltage over the last screen update interval. The displayed minimum volts value (vm) is the Minimum voltage (or “sag”) measured on the SOURCE side. The volts value is measured on the SOURCE side.</td>
</tr>
<tr>
<td>Watt-Hours, Wh (Energy)</td>
<td>The displayed value is the total energy delivered in watt-hours and it is measured on the LOAD side. For best results, do not interrupt the SOURCE connection to the watt meter during a charge measurement.</td>
</tr>
<tr>
<td>Amp-Hours, Ah (Charge)</td>
<td>The displayed value is the total charge in Amp-hours(x1000=mAh) delivered since the startup screen and it is measured on the LOAD side. For accurate results, do not interrupt the SOURCE connection to the watt meter during a charge measurement.</td>
</tr>
<tr>
<td>Watts, W &amp; Wp (Power)</td>
<td>The displayed value is the average power delivered in watts (=Volts x Amps) over the last screen update interval. The displayed peak watts value (Wp) is the maximum power drawn on the LOAD side since the startup screen ended. Watts are measured on the LOAD side</td>
</tr>
</tbody>
</table>


Functions

The Renogy Power Analyzer measures parameters key to electric power safety and performance. Use it to:

- Prevent Peak Current from damaging battery
- Motor control
- Wiring and connectors
- Verify sufficient operation voltage under load
- Set cut off voltage
- Check battery capacity and health
- Balance battery cells
- Confirm proper battery charger operation
System Status Troubleshooting

Meter not turning on
Make sure the connections are properly secured onto the LOAD and SOURCE side of the meter. If so, disconnect all connections and connect again to resume proper operation.

Technical Specifications

<table>
<thead>
<tr>
<th>Description</th>
<th>Parameter</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operation Voltage:</td>
<td>7 - 55V</td>
</tr>
<tr>
<td>Auxiliary Battery Operating Voltage</td>
<td>0 – 55 V</td>
</tr>
<tr>
<td>Measurement Resolution:</td>
<td>0 – 150A, 0.01 A Resolution</td>
</tr>
<tr>
<td></td>
<td>0 – 60 V, 0.01 V Resolution</td>
</tr>
<tr>
<td></td>
<td>0 – 9000 W, 0.1 W Resolution</td>
</tr>
<tr>
<td></td>
<td>0 – 65 Ah, 0.001 Ah Resolution</td>
</tr>
<tr>
<td></td>
<td>0 – 9000 Wh, 0.1 Wh Resolution</td>
</tr>
<tr>
<td>LCD Display</td>
<td>62 x 12.5 mm (2.44 x 0.49 in)</td>
</tr>
<tr>
<td>Dimensions:</td>
<td>85 x 45 x 25 mm (3.35x1.77x0.98 in)</td>
</tr>
<tr>
<td>Weight</td>
<td>82 g (0.18 lbs)</td>
</tr>
<tr>
<td>Wire Size</td>
<td>12 AWG</td>
</tr>
</tbody>
</table>

NOTE: Dimensions are in inches.

Updated: July 10, 2015