Service Bulletin

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Subject: Digital DC clamp meter use to verify Superwind turbine output

Scope
This service bulletin provides information on verifying output of the Superwind turbine utilizing a digital DC clamp (aka clamp-on) amp meter.

Background
A DC clamp amp meter provides a simple way to verify the output of a Superwind turbine installation that does not include a dedicated amp meter. They are also a useful troubleshooting tool, as their portability allows a technician to easily check current levels at various test points throughout the system without the need for disassembly or shutting down operation of the turbine.

Description
A DC clamp meter is an advanced variation of a regular multimeter, with the major difference being the addition of a jaw-like structure on the top which allows for contactless measurement of current and voltage. This structure can be 'clamped' around a conductor or wire to detect the current running through it.

Note: The clamp meter used must have the ability to measure DC amps; an AC only clamp meter will not measure DC amps. The meter must also be able to read DC amps up to a minimum of 30 amps.

Basic use
While the manufacturer's instructions must be followed regarding the proper use of a specific meter, the following outlines the basic steps used to take test readings and measure DC current.

1. Power up the meter and remove the two test probes (if attached).
2. Select the DC current function. The display should show a jaw sign, indicating the measurement is being detected through the clamp (consult the user manual to see how your meter indicates this).
3. Open the jaw-like structure and clamp it around the conductor to be measured. Ensure that the current flow arrow on the meter points in the direction of the load (batteries, power consumers, etc); otherwise a "negative" reading will be displayed if current is present.
4. Close the jaw-like structure and position the conductor in the center of the clamp.
5. The display will show the appropriate reading. Users can change the resolution as required, although most meters will do this automatically.

How to measure the output amps of a Superwind turbine

With the wind blowing at 7 mph (3.5 m/s) or greater, clamp the amp meter around the positive (+) output wire of the turbine between the turbine and the charge controller. A small value of amps should be visible, with higher numbers at higher wind speeds.

A new Superwind turbine requires a bearing 'break-in' period of one to two weeks, depending on wind availability during the first few weeks of commissioning. Afterwards, the turbine will generate increased amounts of energy - particularly at lower wind speeds.

Note: For trouble shooting purposes, the meter can also be clamped around the positive (+) output wire between the charge controller and the battery bank to measure current output from the charge controller. **Keep in mind however**, that this reading will be lower than the turbine's actual output if the charge controller is regulating current flow to the battery bank or diverting it completely to the dump load / power resisters. For example, a measurement of 15 amps between turbine and charge controller and a measurement of only 2 amps between the charge controller and battery bank indicates charge control and temperature compensation, depending on battery State of Charge (SOC).

Additional notes on DC clamp amp meter use

1. When using a clamp meter, make sure that the current flow arrow on the meter points in the direction of the load (i.e., the batteries). Otherwise a "negative" reading will be displayed, which some new users have mistakenly interpreted to mean that the turbine is draining power from the batteries. This will never be the case.
2. Only measure conductors that are properly insulated.
3. When taking readings, clamp the meter around a single conductor only. Never clamp around two conductors at the same time as erroneous readings can result.
4. Observe all applicable industry standard safety instructions while operating a clamp meter.
5. Disconnect the test probes/leads before using a clamp meter to measure current using the jaws.
6. Keep fingers behind the tactile barrier (base) of the clamp when taking measurements to avoid shocks.
7. Most meters will indicate if the current being measured is below 0.5 A. Use the "zero" function while measuring DC current, which removes DC offset from the measurement, providing more accurate results.
8. When readings seem inaccurate, first verify that the meter is set to the correct function before conducting additional checks.

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