

Field Portability for the WP4C PotentiaMeter

On occasion, a researcher may require water potential measurements in the field where sampling and returning to the lab is not feasible. The following is a procedure for powering the WP4C using your vehicle as a power source at sites where AC power is not readily available.

Required Adapter

Purchase a portable power inverter that plugs into the 12-volt output (cigarette lighter) of a car. We strongly recommend that this inverter have a continuous output of at least 140 watts.

Procedure

1. Place the WP4C on a secure level surface. Care should be taken to minimize temperature gradients that will affect the instrument while in the field. A Styrofoam box will help minimize temperature effects.
 2. Plug the power inverter into the 12-volt output port of the vehicle or connect the inverter directly to the 12-volt car battery.
 3. Plug the WP4C into the power inverter, and then turn it on. When the instrument is on, it draws one amp. Check your car battery's rating to find the length of time it can power the instrument; for example, if the battery is rated to for 60 amp-hours, then the battery will power the WP4C for 60 hours when the car is not running.
 4. Allow 20 to 30 minutes for the WP4C to warm up before using it, as you would do in the lab. Check the calibration as outlined in Chapter 5 of the WP4C user's manual.
5. Empty a vial of 0.5m KCl solution into a sample cup and place it the WP4C's sample drawer. Turn the drawer knob to the READ position to take a reading. Take two readings. The second reading should be within ± 0.1 of 2.19 MPa. If your WP4C is reading within 0.1 MPa of the 0.5m KCl solution, proceed with sampling. If the reading is not within 0.1 MPa, a change in calibration may have occurred, or the sensor chamber may be contaminated. For cleaning instructions, see Chapter 10 of the WP4C user's manual. After cleaning, repeat the calibration check.
 6. *Taking a reading:*
 - a) Prepare your sample, and place the sample in a disposable sample cup, completely covering the bottom of the cup if possible.
 - b) Turn the sample drawer knob to the OPEN/LOAD position and pull the drawer open.
 - c) Place your prepared sample in the drawer. Check the top lip of the cup to make sure it is free from sample residue (**remember, an overfilled sample cup may contaminate the chamber's sensors!**).

- d) Carefully slide the drawer closed, being especially careful if you are using a liquid sample that may splash or spill, contaminating the chamber. **NOTE:** If you wish to access the sample temperature menu, press the lower right-hand button. When the Ts-Tb is in the 0 to -0.5 range, the temperatures are close enough that your read time should not be long.
- e) Turn the sample drawer knob to the READ position to seal the sample cup with the chamber. This begins the read cycle. In about 40 seconds, the WP4C will display the first measurement. The WP4C will signal you when the measurement is complete, and the final water potential and temperature will be displayed on the screen. **NOTE: Never leave samples inside the chamber for extended periods of time, as this can contribute to contamination of the chamber.**

We strongly recommend careful packaging of your WP4C during travel to the field. The WP4C case model 577 helps keep the WP4C safe during transportation, and storage of the instrument in the field.

If you have difficulty finding the appropriate type of power inverter, please contact your local sales representative or Decagon for assistance.

Other Application Notes by Decagon Devices using the WP4C Dewpoint PotentiaMeter

Generating a Soil Moisture Characteristic using the WP4C (13380-01) – This application note describes a procedure to obtain a moisture release curve using the WP4C. A moisture release curve relates the water potential of a particular soil to its water content. It is important for describing water storage in soil and water availability for plants, and for predicting water and contaminant transport in soil.

Water Potential: The Key to Successful Seed Priming (13387-01) – The purpose of seed priming is to reduce the germination time, cause germination to occur over a short time period, and improve stand and percentage germination. This application note describes why knowing the water potential in seed priming is important.

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